

COMPRESSOR DRIVE BELT TENSION

1. Check the belt tension with Tool T63L-8620-A or equivalent. The belt tension should be within specifications.
2. If the belt tension is not within specification, loosen the two idler pulley arm attaching bolts until they are just snug.
3. Insert the end of a 1/2 inch flex-handle into the square hole in the idler pulley arm and apply pressure to the idler pulley arm with the flex handle until the belt tension is within specifications. Then, tighten the idler pulley arm attaching bolts while holding pressure on the idler pulley arm. Again, check the belt tension and tighten the idler pulley arm attaching bolts to the specified torque.
4. Remove the belt tension gauge and the flex handle.

REMOVAL AND INSTALLATION

CONTROL ASSEMBLY

Removal

1. Disconnect the negative (ground) cable from the battery.
2. Remove the knob from the headlight switch following the procedure in Part 32-02.
3. Remove the headlight switch bezel.
4. Pull the control knobs from the radio shafts.
5. Remove four screws attaching the top edge of the instrument panel finish panel to the instrument panel. Then, tilt the finish panel rearward and remove the finish panel.
6. Remove four (4) screws attaching the control assembly to the instrument panel.
7. Remove the control assembly from behind the instrument panel and disconnect the vacuum harness connector and control cable.
8. Disconnect the wire connectors and remove the control assembly from the vehicle.

Installation

1. Connect the wiring to the control assembly.
2. Connect the control cable and vacuum harness connector to the control assembly.
3. Position the control assembly to the instrument panel and install the four attaching screws.
4. Position the finish panel to the instrument panel and install the four attaching screws.
5. Install the headlight switch bezel and knob and the radio control knobs.
6. Connect the negative (ground) cable to the battery.
7. Test the ATC system for proper operation.

TEMPERATURE CONTROL CABLE

Removal

1. Remove the instrument panel pad assembly. Refer to the procedure.
2. Remove the retaining bolts (2) securing the Instrument Panel-to-Cowl Brace and remove the brace.
3. Remove the seat belt chime mounting screws (2) and position the chime aside.
4. Remove the Cable Housing-to-Sensor attaching screw. Remove the cable assembly from the sensor assembly.
5. Disconnect the multiple vacuum connector from the vacuum selector valve on the control assembly.
6. Remove the push-nut securing the cable wire loop to the temperature lever shaft of the control assembly.
7. Remove the retaining screw securing the cable housing to the control assembly and disconnect the cable housing and cable wire loop from the control assembly.
8. Note the temperature control cable assembly routing and remove the assembly from the vehicle.

NOTE: The cable assembly may be temporarily kept in place as a guide for installing a new assembly.

Installation

1. Route the temperature control cable assembly into position using the previous routing as a guide.
2. Rotate the sensor control to align the calibration notch with the calibration pin and rotate the pin to lock the sensor control arm in the calibration position.
3. Slip the control cable wire loop onto the sensor control arm with the wire loop coil pointing toward the end of the control arm.
4. Position the cable housing end onto the sensor and loosely install the cable housing-to-sensor attaching screw.
5. Slip the control cable wire loop (on the control end of the cable assembly) onto the temperature control lever shaft with the wire loop coil pointing toward the end of the temperature control lever shaft.
Install the push-nut on the temperature control lever shaft to secure the wire loop on the shaft.
7. Position the control cable housing to the control assembly bracket and install and tighten the retaining screw.
8. Move the temperature control lever to 75 and tighten the cable housing-to-sensor attaching screw to calibrate the temperature lever setting with the locked and calibrated sensor assembly.
9. Install the multiple vacuum connector on the vacuum selector valve of the control assembly.
10. Position the seat belt chime and secure with the mounting screws (2).
11. Position the seat belt chime and secure with the mounting screws (2).
12. Install the instrument panel pad assembly. Refer to the procedure.
13. Test the system for proper operation.

BLOWER SWITCH

Removal

1. Disconnect the negative (ground) battery cable.
2. Remove the steering column opening cover located below the steering column.
3. Depress the spring and pull the knob from the blower switch shaft.
4. Remove one screw attaching the switch to the control assembly.
5. Remove the switch from the control assembly and disconnect the wire connector.

Installation

1. Connect the wire connector to the blower switch and position the blower switch to the control assembly.
2. Install the blower switch attaching screw.
3. Install the knob on the blower switch.
4. Install the steering column opening cover.
5. Connect the ground cable to the battery.
6. Test the ATC system for proper operation.

REAR DEFOG SWITCH

Removal

1. Depress the spring and pull the control knob from the rear defog switch shaft.
2. Perform steps 1 thru 6 of the Control Assembly Removal Procedure.
3. Remove the control assembly from behind the instrument panel.
4. Disconnect the wire harness connector from the rear defog switch.
5. Remove one screw attaching the switch and the jewel lamp assembly bracket to the control assembly and remove the rear defog switch assembly.

Installation

1. Connect the wire harness connector to the rear defog switch and position the rear defog switch and jewel lamp assembly bracket to the control assembly.
2. Install the attaching screw (1) securing the rear defog switch and jewel lamp assembly bracket to the control assembly.
3. Perform steps 3 thru 6 of the control assembly installation procedure.
4. Install the control knob on the rear defog switch shaft and test the rear defog system for proper operation.

FUNCTION CONTROL VACUUM SELECTOR VALVE

Removal

1. Perform steps 1 thru 6 of the Control Assembly Removal Procedure.
2. Disconnect the multiple vacuum connector from the function control vacuum selector valve.
3. Disconnect the electrical wire harness connectors (2) from the function control vacuum selector valve.
4. Remove the retaining screws (2) securing the function control vacuum selector valve to the control assembly and remove the function control vacuum selector valve.

Installation

1. Align the function lever slot with the pin on the function control vacuum selector valve, position the alignment pins of the control assembly with the alignment holes on the selector valve body and install the function control vacuum selector valve-to-control assembly retaining screws (2). Tighten the screws to specification.
2. Install the electrical wire harness connectors (2).
3. Install the multiple vacuum connector.
4. Perform steps 3 thru 6 of the Control Assembly Installation Procedure.

SERVO ASSEMBLY

Removal

1. Remove the glove compartment liner.
2. Remove the tan hose from the end of the servo motor.
3. Remove the self-threading nut retaining the vacuum harness connector to the servo diverter valve and remove the harness connector.
4. Remove the spring nut retaining the servo assembly to the blend door crank area (Fig. 19).
5. Remove two screws attaching the servo assembly to the mounting bracket. Disengage the servo arm and spring from the blend door crank arm and remove the servo assembly.

Installation

1. Position the servo assembly to the mounting bracket engaging the motor end with the bracket and the servo arm with the blend door crank arm. Install the spring nut to retain the servo arm on the crank arm.
2. Install the two servo assembly retaining screws.
3. Connect the tan vacuum hose to the servo motor and the vacuum harness connector to the diverter valve. Install the self-threading nut to retain the vacuum hose connector on the diverter valve.
4. Check the operation of the servo assembly. Then, install the glove compartment liner.

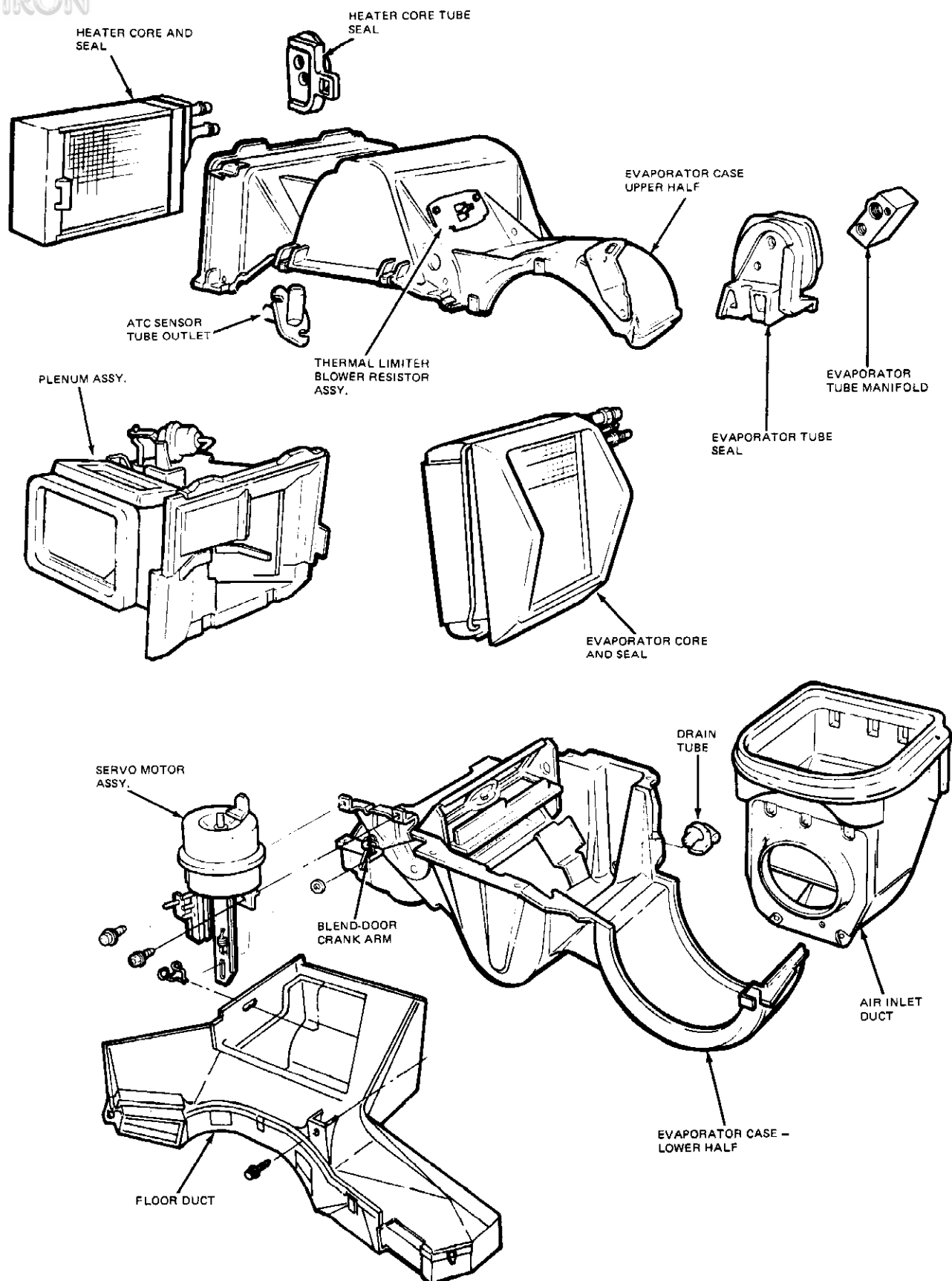


FIG. 19 ATC Evaporator Case Assembly—Disassembled

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ELECTRO VACUUM RELAY (EVR)

The E.V. Relay is located on the left end of the evaporator case below the A/C-defrost door vacuum motor.

Removal

1. Remove one screw attaching the E.V. relay to the mounting bracket.
2. Remove the self-threading nut retaining the vacuum harness connector to the relay and remove the connector from the relay.
3. Disconnect the wire harness connector from the E.V. relay and remove the relay.

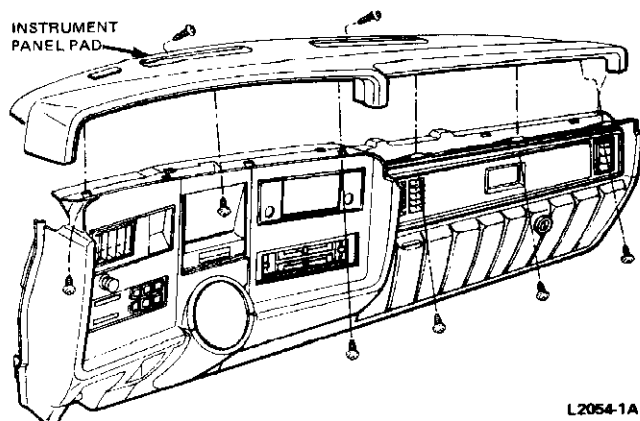
Installation

1. Connect the wire harness to the E.V. relay.
2. Connect the vacuum harness connector to the E.V. relay and install the retaining nut.
3. Position the E.V. relay to the mounting bracket and install the retaining screw.

INSTRUMENT PANEL PAD

Removal

1. Using a magnetic or locking tang-type phillips screwdriver, remove the retaining screws (2) securing the leading edge of the upper finish panel to the defroster openings (Figs. 20 and 21).



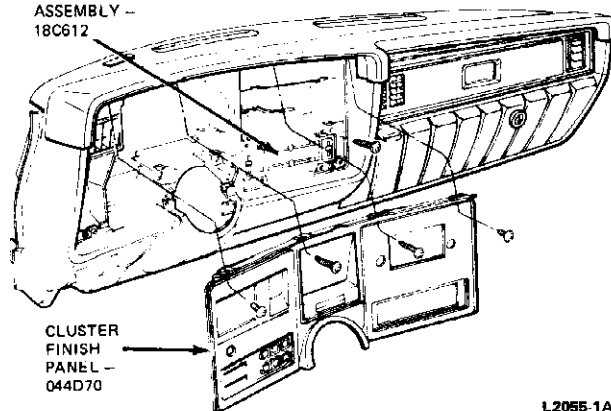
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FIG. 20 Instrument Panel Pad

CAUTION: CARE SHOULD BE TAKEN TO PREVENT RETAINING SCREW LOSS IN THE DEFROSTER OUTLET OPENINGS. DAMAGE TO THE PLENUM DOORS MAY OCCUR, RESULTING IN CASE ASSEMBLY REMOVAL AND DISASSEMBLY FOR PROBLEM CORRECTION.

2. Remove the retaining screws (3) securing the instrument panel pad to the instrument panel, above the glove box door.
3. Remove the retaining screws (3) securing the instrument panel pad to the instrument panel, above the top of the instrument cluster.
4. Raise the brow edge the instrument panel pad and carefully remove the instrument panel pad and upper finish panel assembly from the vehicle.

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ASSEMBLY --
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FIG. 21 Instrument Cluster Finish Panel

Installation

1. Carefully position the instrument panel pad and upper finish panel assembly onto the instrument panel (Figs. 20 and 21).
2. Using a magnet or locking tang-type phillips screwdriver, loosely install the upper finish panel retaining screws (2) in the retaining screw holes of the defroster outlet openings.

CAUTION: CARE SHOULD BE TAKEN TO PREVENT RETAINING SCREW LOSS IN THE DEFROSTER OUTLET OPENINGS. DAMAGE TO THE PLENUM DOORS MAY OCCUR, RESULTING IN CASE ASSEMBLY REMOVAL AND DISASSEMBLY FOR PROBLEM CORRECTION.

3. Loosely install the retaining screws (3) securing the instrument panel pad to the instrument panel, above the instrument cluster.
4. Loosely install the retaining screws (3) securing the instrument panel pad to the instrument panel, above the glove box door.
5. Secure the instrument panel pad and upper finish panel in position by tightening the retaining screws (8) described in Steps 2, 3 and 4 to specifications.

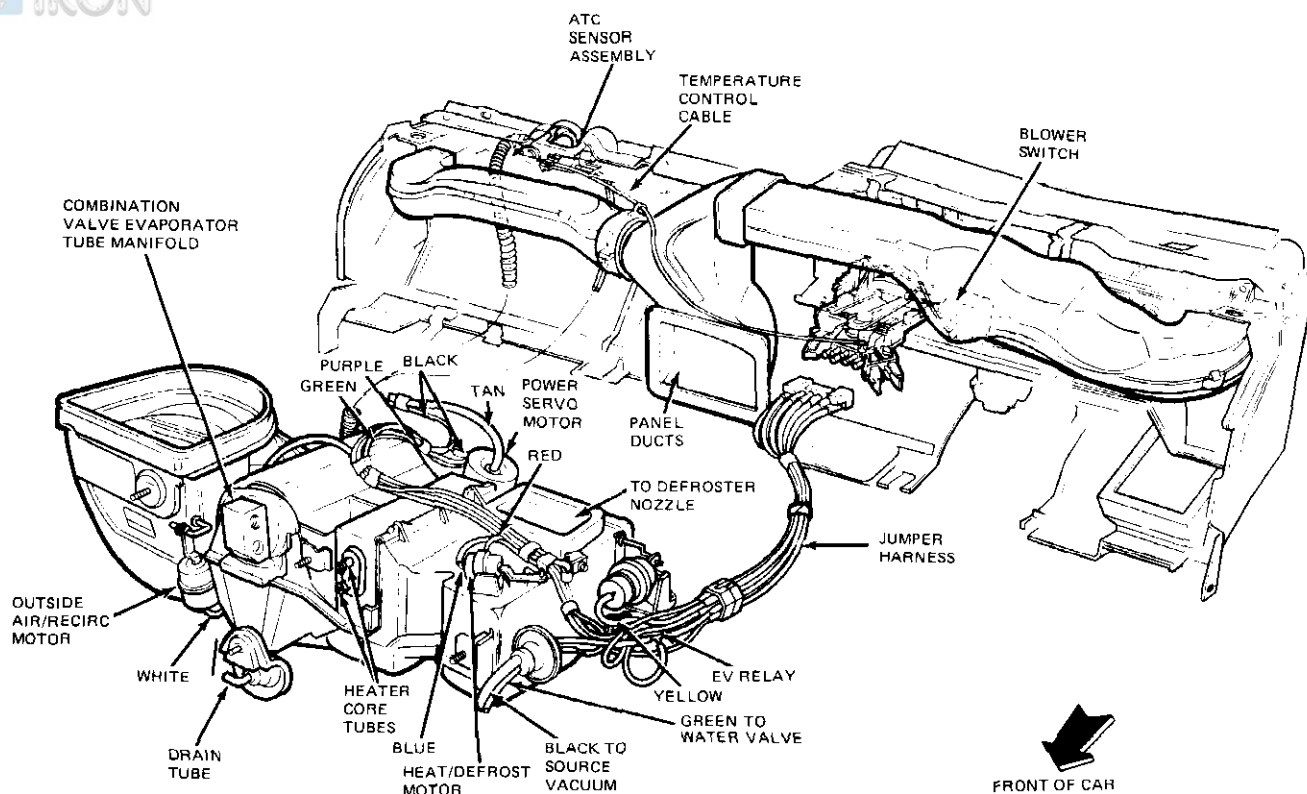


FIG. 22 Rear View of Instrument Panel—ATC

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INSTRUMENT PANEL REGISTER DUCTS

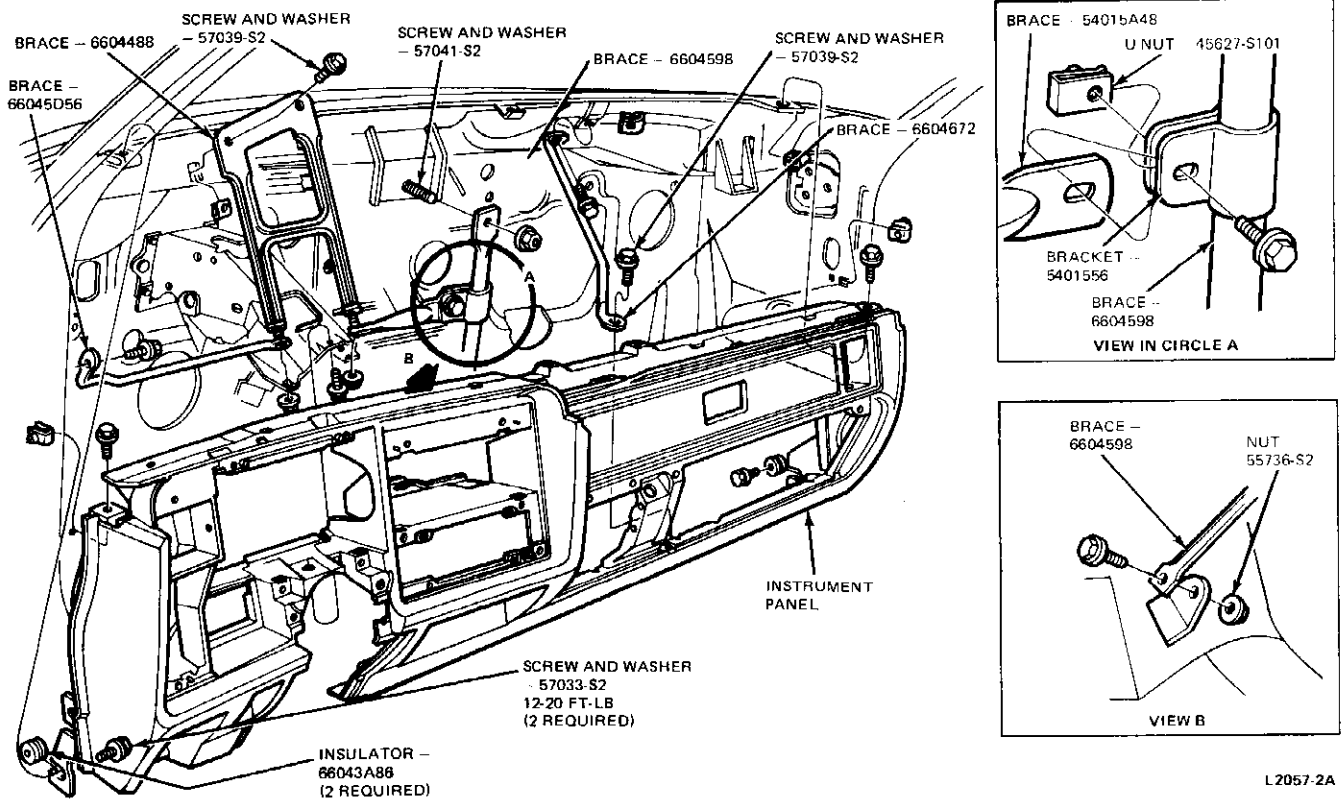
Removal

1. Disconnect the ground cable from the battery.
2. Remove the instrument panel lower finish panel.
3. Loosen the front door sill plate attaching screws and remove the right and left cowl side trim panels.
4. Remove two screws and remove the steering column opening cover panel.
5. Remove the steering column-to-brake pedal support clamp and lay the steering column on the front seat.
6. Remove one screw from the top of the steering column opening attaching the instrument panel to the brake pedal support.
7. Remove the hood latch release handle and bracket from the lower edge of the instrument panel.
8. Remove the instrument panel pad following the procedure under Instrument Pad Removal.
9. Remove the radio speaker or instrument panel-to-cowl brace.
10. Remove the glove compartment liner.
11. Remove the screw attaching the brace to the lower edge of the instrument panel below the glove compartment.
12. Disconnect the vacuum hose connector and sensor tube from the sensor assembly.
13. Disconnect the speedometer cable from the speedometer following the procedure in Part 33-01.

14. Remove one screw and washer assembly attaching each lower end of the instrument panel to the side cowl (Fig. 23).
15. Remove one screw and washer assembly attaching each end of the instrument panel to the cowl at the windshield (Fig. 23) and lay the instrument panel back on the front seat. Disconnect any wires, vacuum hoses, and other components as necessary.
16. Remove one screw attaching the register ducts to each instrument panel register opening. Remove one screw attaching the center register duct to the lower edge of the instrument panel (Fig. 24), and remove the register ducts.

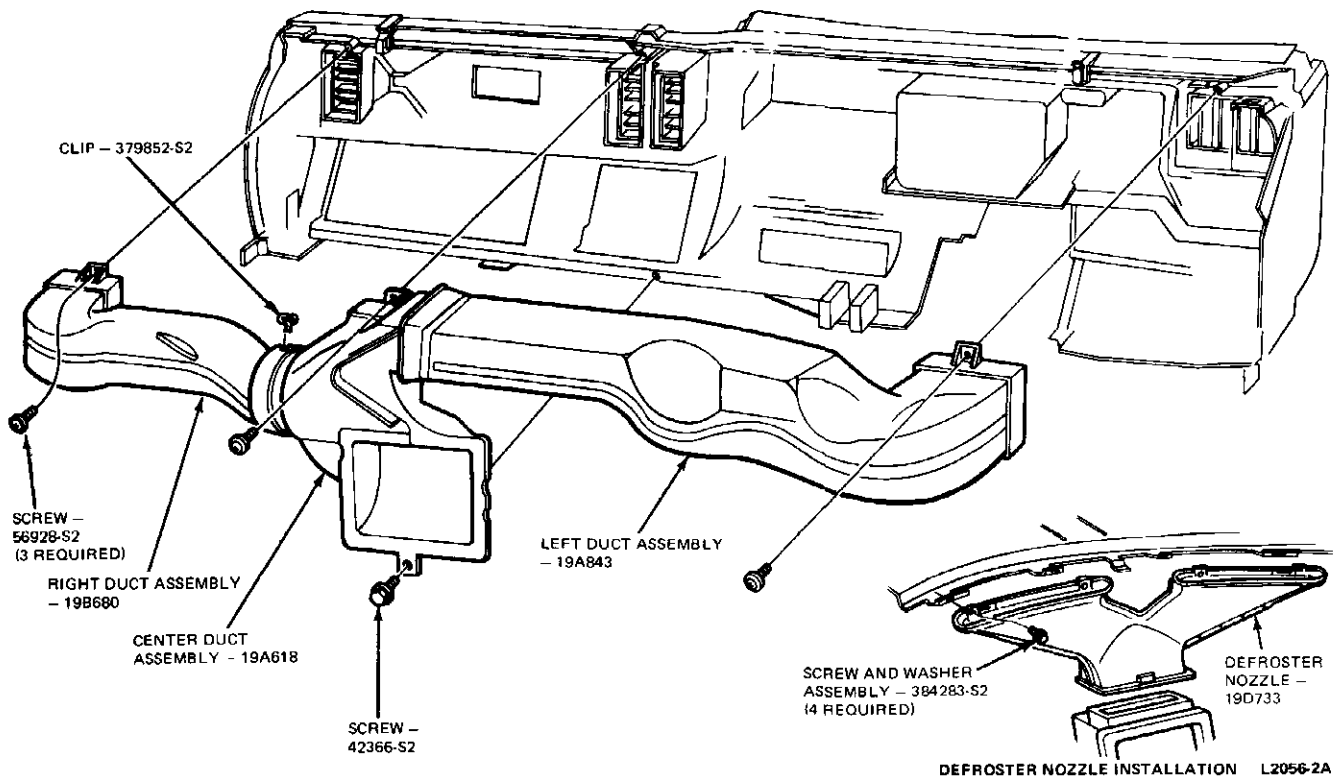
Installation

1. Position the register ducts to the instrument panel and install the attaching screws (Fig. 24).
2. Position the instrument panel to the cowl, making sure the center register duct is properly positioned to the plenum assembly.
3. Install one screw and washer assembly to attach each upper end of the instrument panel to the cowl at the windshield opening.
4. Install one screw and washer assembly to attach each lower end of the instrument panel to the side cowl (Fig. 24).
5. Connect the speedometer cable to the speedometer (Part 33-01).
6. Connect wires, vacuum hoses and any other components that were disconnected in step 15 during removal of the instrument panel.



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FIG. 23 Instrument Panel Installation



DEFROSTER NOZZLE INSTALLATION L2056-2A

FIG. 24 Duct Assembly Installation

7. Connect the vacuum hose connector and the sensor tube to the sensor assembly.
8. Position the brace to the instrument panel below the glove compartment and install the attaching screw. Then, install the glove compartment liner.
9. Install the radio speaker or the instrument panel-to-cowl brace.
10. Install the instrument panel pad following the procedure under Instrument Panel Pad Installation.

11. Install the screw to attach the instrument panel at the steering column opening to the brake pedal support.
12. Position the steering column to the brake pedal support and install the clamp.
13. Install the steering column opening cover panel.
14. Install the hood latch release handle and bracket on the lower edge of the instrument panel.

15. Install the right and left cowl side trim panels. Then, tighten the front door sill plate attaching screws.
16. Install the instrument panel lower finish panel.
17. Connect the ground cable to the battery.

SENSOR ASSEMBLY

Removal

1. Remove the instrument panel pad following the procedure.
2. Carefully disconnect the sensor air inlet tube and elbow from the sensor assembly (Fig. 25).
3. Remove the control cable-to-sensor attaching screw and disconnect the control cable from the sensor temperature lever (Fig. 25).
4. Disconnect the vacuum connector from the sensor assembly. Then, remove the two sensor attaching screws and remove the sensor assembly.

Installation

1. Rotate the sensor control arm to position the notch in the arm at the calibration pin (Fig. 25). Then, rotate the plastic calibration locking pin so that it engages the notch in the sensor control arm.

2. Position the sensor assembly to the instrument panel (Fig. 25) and install the two attaching screws.
3. Connect the sensor air inlet tube and elbow to the sensor.
4. Connect the vacuum harness connector to the sensor assembly (Fig. 25).
5. Position the control cable on the sensor control arm with the pigtail away from the sensor as shown in (Fig. 25).
6. Adjust the control cable as outlined under adjustments.
7. Install the instrument panel pad following the procedure.

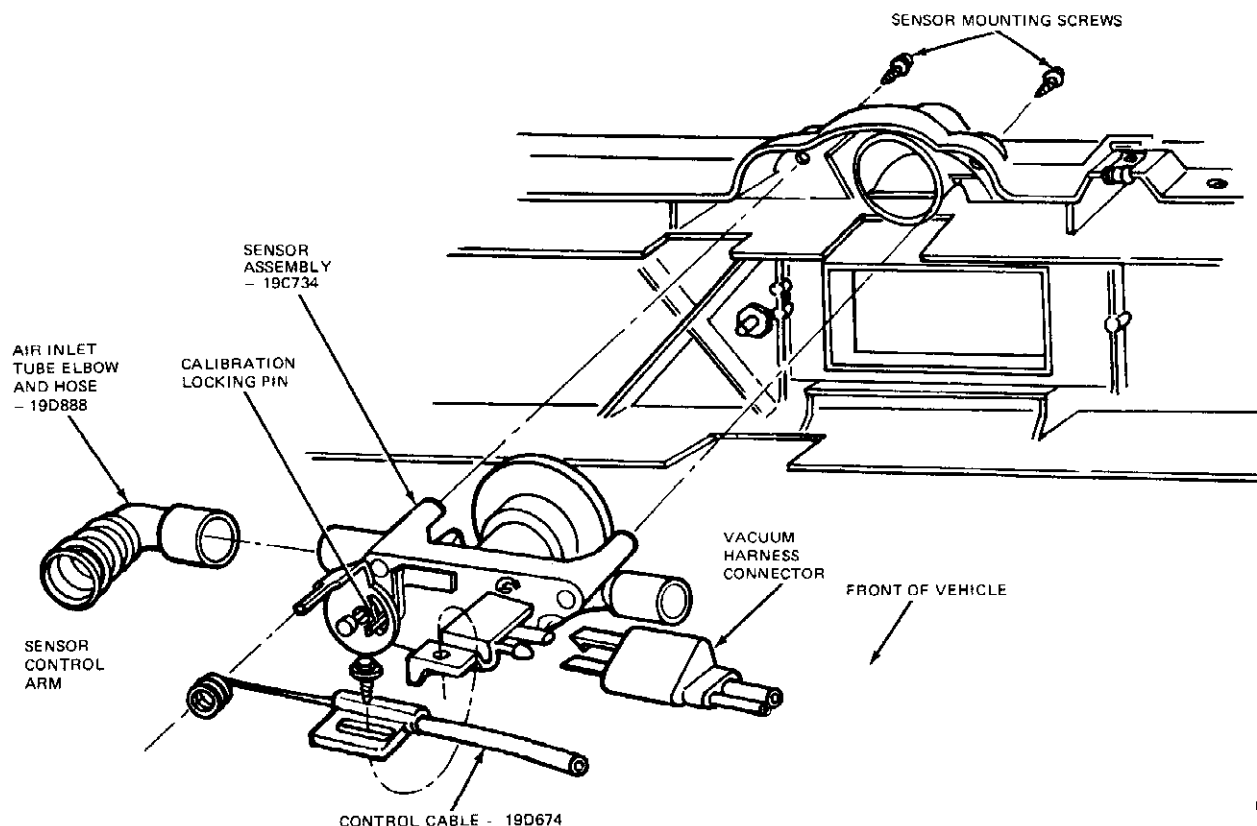


FIG. 25 Sensor Assembly Installation

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OUTSIDE - RECIRCULATING AIR DOOR VACUUM MOTOR

Removal

1. Disconnect the vacuum hose (white) from the vacuum motor.
2. Remove the attaching screws (2) securing the vacuum motor to the mounting bracket.
3. Remove the spring nut securing the vacuum motor arm on the crank arm. (Be certain the stop washer remains on the crank arm) and remove the vacuum motor.

CAUTION: NEVER MANUALLY OPERATE ANY VACUUM MOTOR OR VACUUM MOTOR CONTROLLED DOOR WHEN CONNECTED TO THE VACUUM MOTOR — THIS MAY CAUSE INTERNAL DAMAGE TO THE VACUUM MOTOR DIAPHRAGM.

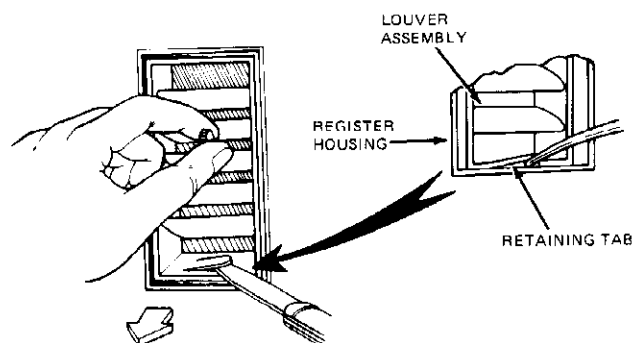
Installation

1. Check to be sure the stop washer is on the crank arm, then slide the vacuum motor arm into position on the crank arm.
2. Install the crank arm spring nut.
3. Position the vacuum to the mounting bracket and install the attaching screws (2) to secure the vacuum motor on the mounting bracket. Tighten the attaching screws to specification.
4. Connect the vacuum hose (white) to the vacuum.
5. Test the system for proper operation.

REGISTER ASSEMBLIES

Removal

1. Insert a thin blade under the retaining tab (Fig. 26) and pry the retaining tab toward the louvers until the retaining tab pivot clears the hole in the register opening.
2. Pull the register assembly end out from the housing only enough to prevent the pivot from going back into the pivot hole.
3. Repeat Step 1 for the other retaining tab and pull the register assembly from the register opening.



INSERT A THIN BLADE THROUGH THE LOUVER AND CAREFULLY PRY THE RETAINING TAB TOWARD THE LOUVERS TO ALLOW THE PIVOT TO CLEAR THE HOLE IN THE REGISTER OPENING. R2195-1A

FIG. 26 Instrument Panel Registers

Installation

The pivots on each end of the register assembly are different diameters and therefore determine the installed position of the register assembly.

1. Position the register assembly into the opening with the largest diameter pivot near the largest pivot hole.
2. Depress the retaining tabs, push the register assembly into the register opening and engage the retaining tab pivots in the pivot holes.

BLOWER MOTOR RESISTOR

Removal

1. Remove the glove compartment.
2. Working through the glove compartment opening, disconnect the wire connector from the resistor (Fig. 33).
3. Remove two screws attaching the resistor to the case and remove the resistor.

Installation

1. Position the resistor in the evaporator case opening.
2. Install the two (2) resistor attaching screws.
3. Connect the wire harness connector to the resistor and check the operation of the blower motor in all speeds.
4. Install the glove compartment.

BLOWER MOTOR AND WHEEL

Removal

1. Disconnect the ground cable from the battery.
2. Remove the lower finish plate from the instrument panel.
3. Remove the glove compartment.
4. Loosen the right door opening sill plate. Then, remove the right side cowl trim panel.
5. Remove the instrument panel to-side cowl lower right attaching bolt.
6. Remove the bolt attaching the brace to the lower edge of the instrument panel below the glove compartment.
7. Disconnect the motor wires.
8. Remove four blower attaching screws and remove the blower motor and wheel.
9. Remove the blower wheel from the blower motor. **DO NOT REMOVE THE MOUNTING PLATE FROM THE BLOWER MOTOR. THE PLATE LOCATION IS CRITICAL AND SHOULD NOT BE CHANGED.**

Installation

1. Position the blower wheel on the motor shaft with the flat surface on the blower hub aligned with the flat surface of the shaft.
2. Slide the blower wheel onto the motor shaft until it is fully seated. Then, install a new hub clamp spring in the position shown in Fig.
3. Position the blower motor in the blower housing and install the four attaching screws.
4. Connect the blower motor wires.
5. Install the instrument panel to right side cowl attaching bolt.
6. Install the bolt attaching the brace to the lower edge of the instrument panel.
7. Install the right side cowl trim panel and tighten the door opening sill plate attaching screws.

8. Install the lower finish plate on the instrument panel.

9. Connect the negative (ground) cable to the battery.

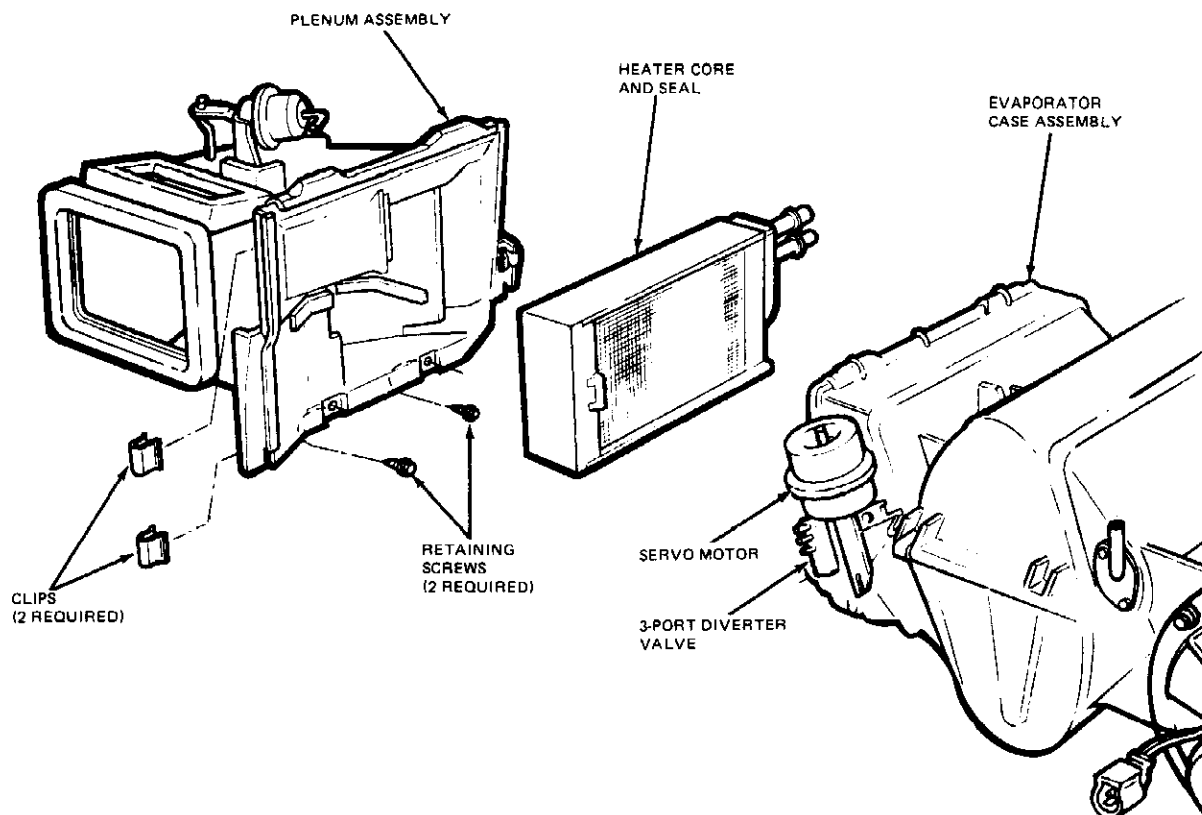


FIG. 27 Heater Core Removal

PLENUM ASSEMBLY

Removal

1. Disconnect the ground cable from the battery.
2. Remove the instrument panel lower finish panel and the support brace bolt below the glove compartment.
3. Remove the instrument panel pad following the procedure under Instrument Panel Pad Removal.
4. Loosen the right door sill plate retaining screws. Then, remove the side cowl trim panel attaching screws and remove the trim panel.
5. Remove the instrument panel lower attaching screw at the right end of the instrument panel.
6. Remove two screws and remove the floor air distribution duct from the plenum assembly.
7. Remove the radio speaker or instrument panel-to-cowl brace.
8. Remove four screws attaching the defroster nozzle to the cowl mounting tabs. Then, lift the defroster nozzle up and out from behind the instrument panel.
9. Remove the cowl-to-floor brace located at the left side of the plenum assembly.
10. Disconnect the vacuum hoses from the A/C-defrost and heat-defrost door vacuum motors.
11. Remove the retaining nut and remove the vacuum harness connector from the E.V. relay.
12. Remove the screw attaching the vacuum harness clamp to the plenum assembly.

13. Remove two heat-defrost door motor retaining nuts and swing the motor rearward.
14. Remove two screws attaching the front corner of the plenum assembly to the plenum-to-cowl mounting bracket.
15. Remove two screws attaching the lower edge of the plenum to the evaporator case.
16. Remove two clips retaining the rear edge of the plenum assembly to the evaporator case.
17. Raise the plenum assembly until the top edge of the plenum is disengaged from the evaporator case. Then, move the plenum to the left as far as possible.
18. Carefully pull rearward on the lower edge of the instrument panel and remove the plenum assembly from behind the instrument panel.

Installation

1. Carefully position the plenum behind the instrument panel and to the evaporator case.
2. Raise the plenum until the top edge is locked over the top edge of the evaporator case. Then, install the two lower attaching screws.
3. Install two clips to retain the rear edge of the plenum to the evaporator case rear edge.
4. Install two screws to attach the front corner of the plenum assembly to the mounting bracket at the cowl.
5. Position the heat-defrost door vacuum motor to the mounting bracket and install the retaining nuts.

6. Connect the vacuum harness connector to the E.V. relay and install the retaining nut.
7. Connect the yellow vacuum hose to the A/C-defrost door vacuum motor.
8. Connect the blue vacuum hose to the end of the heat-defrost door vacuum motor and the red vacuum hose to the side of the motor.
9. Secure the vacuum harness clamp to the evaporator case with an attaching screw.
10. Install the cowl-to-floor brace at the left of the plenum assembly.
11. Position the defroster duct to the plenum assembly and the cowl mounting tabs. Then, install the four defroster duct attaching screws. **USE CARE NOT TO DROP THE SCREWS DOWN INTO THE DEFROSTER OPENING.**
12. Install the radio speaker or instrument panel-to-cowl brace.
13. Position the floor air distribution duct to the plenum and evaporator case and install the two attaching screws.
14. Install the instrument panel lower attaching screw at the right side cowl.
15. Install the right cowl side trim panel. Then, tighten the door sill attaching screws.
16. Install the instrument panel pad as outlined under Instrument Panel Pad Installation.
17. Install the instrument panel lower finish panel and the support brace bolt below the glove compartment.
18. Connect the ground cable to the battery and check the operation of the ATC system.

DEFROSTER NOZZLE

Removal

1. Remove the instrument panel pad.
2. Remove the radio speaker or instrument panel-to-cowl brace.
3. Remove four screws attaching the defroster nozzle to the cowl brackets at the defroster openings.
4. Lift the defroster nozzle up and remove the nozzle from behind the instrument panel.

Installation

1. Position the defroster nozzle to the top of the plenum assembly and the cowl mounting brackets.
2. Install the four attaching screws. Take care not to drop the attaching screws down the defroster duct.
3. Install the radio speaker or the instrument panel-to-cowl brace.
4. Install the instrument panel pad.

FLOOR DISTRIBUTION DUCT

Removal

1. Remove the clip securing the floor distribution duct to the left side of the plenum.
2. Remove the retaining screw (1) securing the floor distribution duct to the evaporator case.
3. Remove the floor distribution duct.

Installation

1. Position the floor distribution duct on the plenum opening.
2. Install the retaining screw (1) securing the floor distribution duct to the evaporator case.
3. Install the clip securing the floor distribution duct to the left side of the plenum.

HEATER CORE

Removal

1. Drain the engine coolant from the radiator.
2. Remove the two heater hose clamps at the heater core tubes. Remove the hoses from the tubes and plug the core tubes to prevent coolant leakage during removal of the heater core.
3. Remove the plenum assembly from the vehicle following the procedure under Plenum Assembly Removal.
4. Carefully pull the heater core from the evaporator housing using the tab moulded into the heater core seal. Disengage the heater core tubes from the dash panel seal as the core is removed. As the heater core clears the evaporator case, pull the heater core rearward and downward to clear the instrument panel.

Installation

1. Position the heater core and seal in the evaporator case making sure the dash panel seal is in the correct position.
2. Install the plenum assembly in the vehicle following the procedure under the Plenum Assembly Installation.
3. Connect the heater hoses to the heater core. The hose from the water valve should be connected to the heater core lower tube.
4. Install the heater hose clamps.
5. Fill the cooling system with the recommended mixture of coolant. Then, check the system operation and inspect for leaks.

HEAT-DEFROST OR A/C-DEFROST DOOR

Removal

1. Remove the plenum assembly. Refer to procedure.
2. Remove the push-nut and disconnect the vacuum motor actuating arm from the door crank arm. Tape the end of the crank arm to retain the stop washer and protect it from loss.

CAUTION: NEVER MANUALLY OPERATE ANY VACUUM MOTOR OR VACUUM MOTOR CONTROLLED DOOR WHEN CONNECTED TO THE VACUUM MOTOR — THIS MAY CAUSE INTERNAL DAMAGE TO THE VACUUM MOTOR DIAPHRAGM.

3. Remove the retaining screw (1) securing the door to the crank arm loop and remove the door from the plenum housing.

Installation

1. Position the door onto the crank arm loop and loosely install the door retaining screw.
2. Move the door to the maximum no vacuum position and tighten the retaining screw to specification. Move the door back and forth to assure freedom of movement and readjust if necessary.
3. Check to be certain the crank arm stop washer is in position and install the vacuum motor actuating arm onto the door crank arm. Secure with a new push-nut.
4. Install the plenum assembly. Refer to Procedure.
5. Test the system for proper operation.

HEAT-DEFROST DOOR VACUUM MOTOR

Removal

1. Remove Instrument panel pad. Refer to procedure.
2. Remove retaining screws (3) securing the speaker and bracket assembly, disconnect the wire harness connector and remove the speaker and bracket assembly.
3. Remove the defroster nozzle. Refer to procedure.
4. Remove the push-nut securing the vacuum motor arm to the crank arm and disconnect the vacuum motor arm. Be certain the stop washer remains in place.
5. Disconnect the partial (top-blue) and Full (side-red) vacuum hoses from the vacuum motor.
6. Remove the nuts (2) securing the vacuum motor to the bracket and remove the vacuum motor.

CAUTION: NEVER MANUALLY OPERATE ANY VACUUM MOTOR OR VACUUM MOTOR CONTROLLED DOOR WHEN CONNECTED TO THE VACUUM MOTOR — THIS MAY CAUSE INTERNAL DAMAGE TO THE VACUUM MOTOR DIAPHRAGM.

Installation

1. Check to be certain the stop washer is in place on the crank arm and that the door operates without sticking or binding.
2. Position the opening of the vacuum motor actuating arm onto the crank arm and install a new push-nut to secure the vacuum motor actuating arm on the door crank arm.
3. Position the mounting studs at the vacuum motor into the holes of the mounting bracket and install and tighten the mounting nuts to specification.
4. Connect the partial (Top-blue) and full (Side-red) vacuum hoses to the vacuum motor.
5. Install the defroster nozzle. Refer to Procedure.
6. Position the speaker and mounting bracket and secure with the retaining screws (3).
7. Connect the speaker wire harness connector.
8. Install the Instrument Panel Pad. Refer to procedure.
9. Test the system for proper operation.

A/C-DEFROST DOOR VACUUM MOTOR

Removal

1. Remove the retaining bolts (2) securing the Instrument Panel-to-Dash Panel brace and remove the brace.
2. Remove the floor distribution duct assembly. Refer to procedure.
3. Remove the push-nut securing the vacuum motor actuating arm to the door crank arm.
4. Remove the retaining nuts (2) securing the vacuum motor to the mounting bracket and disengage the actuating arm from the door crank arm. Use a piece of masking tape to assure the crank-arm stop washer remains on the crank arm.
5. Lower the vacuum motor and disconnect the vacuum hose (yellow).

CAUTION: NEVER MANUALLY OPERATE ANY VACUUM MOTOR OR VACUUM MOTOR CONTROLLED DOOR WHEN CONNECTED TO THE VACUUM MOTOR — THIS MAY CAUSE INTERNAL DAMAGE TO THE VACUUM MOTOR DIAPHRAGM.

Installation

1. Check to be certain the stop washer is in place on the crank arm and that the door operates without sticking or binding.
2. Position the opening of the vacuum motor actuating arm onto the crank arm and install a new push-nut to secure the vacuum motor actuating arm on the door crank arm.
3. Position the mounting studs of the vacuum motor into the holes of the mounting bracket and install and tighten the mounting nuts to specification.
4. Connect the vacuum hose (yellow) to the vacuum motor.
5. Position the Instrument Panel-to-Dash Panel Brace and install and tighten the retaining bolts.
6. Install the floor distribution duct assembly. Refer to the procedure.
7. Test the system for proper operation.

OUTSIDE - RECIRCULATING AIR DOOR

Removal

1. Remove the blower motor and wheel assembly. Refer to the procedure.
2. Disconnect the vacuum hose (white) from the vacuum motor, connect a hand operated vacuum pump and evacuate the outside-recirc vacuum motor to position the door to recirculate air.
3. Remove the retaining screw securing the door to the crank arm.
4. Partially relieve the vacuum to allow the door to move to the approximate 1/2 position, pull the door off of the crank arm loop and remove out of the blower opening.

CAUTION: NEVER MANUALLY OPERATE ANY VACUUM MOTOR OR VACUUM MOTOR CONTROLLED DOOR WHEN CONNECTED TO THE VACUUM MOTOR — THIS MAY CAUSE INTERNAL DAMAGE TO THE VACUUM MOTOR DIAPHRAGM.

Alternate Removal

Remove the retaining screws (2) securing the vacuum motor to the mounting bracket. This will relieve the spring pressure on the door and simplify removal.

Installation

1. Insert the door through the blower opening and position the door on the crank arm (with the crank arm loop pocket on bottom).
2. Loosely install the retaining screw.
3. Evacuate the door vacuum motor to the full recirculating air position to properly position the door
or

Alternate: If the motor was disconnected, pull down on the crank arm.

4. Tighten the door retaining screw to specification.
5. Operate the door several times to assure free operation without sticking or binding.
6. Relieve the vacuum on the vacuum motor, disconnect the hand operated vacuum pump and reconnect the vacuum hose (white) to the vacuum motor.
or

Alternate: Install the vacuum motor retaining screws (2) securing the vacuum motor to the mounting bracket.

7. Install the blower motor and wheel assembly. Refer to the procedure.
8. Test the system for proper operation.

BLOWER WHEEL

Removal

1. Remove the blower motor and wheel assembly from the vehicle. Refer to the procedure.
2. Remove the hub clamp spring from the wheel hub.

NOTE: Hose clamp pliers for flat spring type clamps will simplify this operation.

3. Slide the blower wheel from the motor shaft.

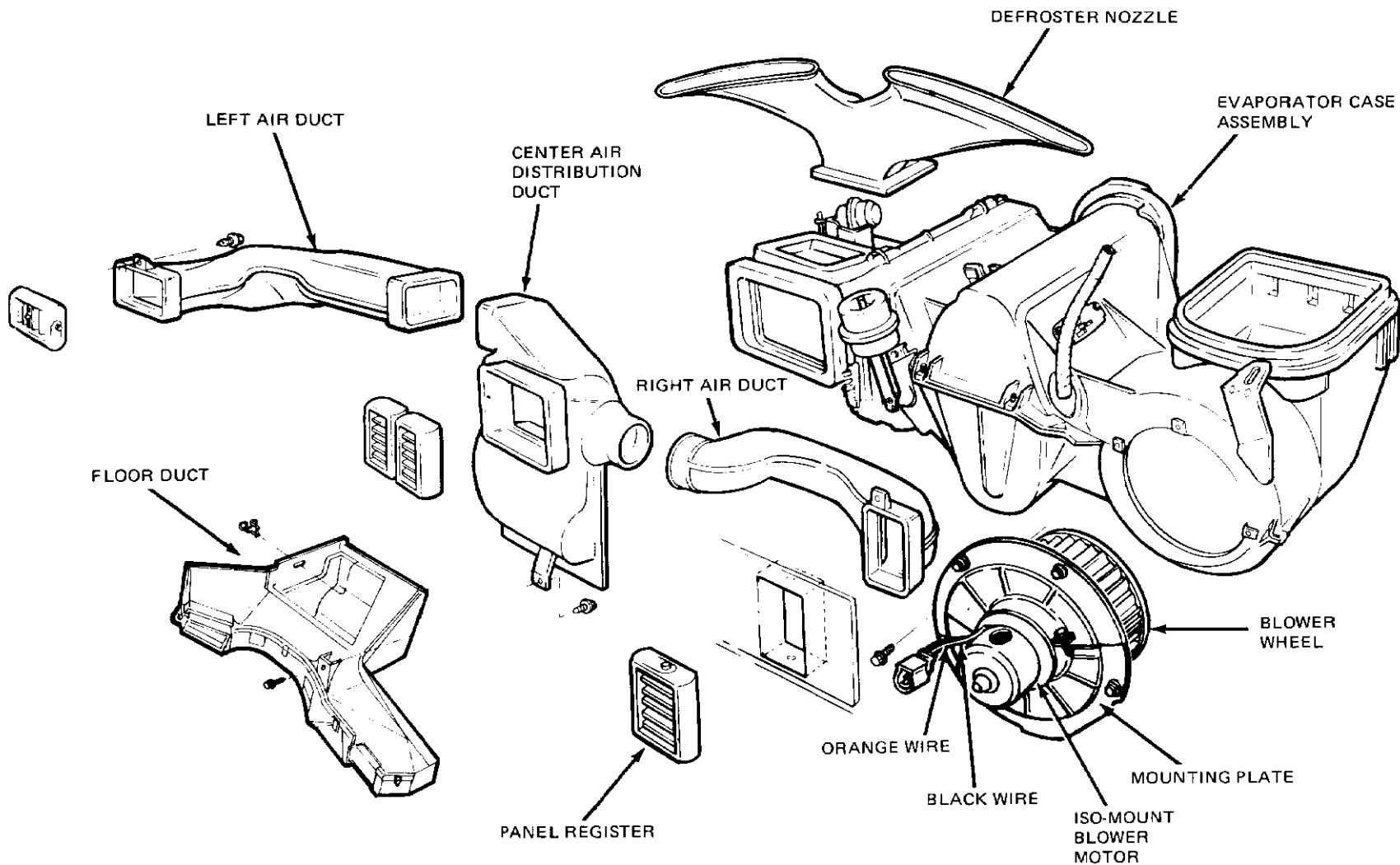
Installation

1. Align the flat surface on the I.D. of the blower wheel hub with the flat surface of the motor shaft.
2. Slide the blower wheel onto the motor shaft until it is fully seated.
3. Using flat spring type hose clamp pliers, install a **new** hub clamp spring. Position clamp 90° to the flat on the motor shaft. **NOTE: DO NOT RE-USE THE OLD HUB CLAMP SPRING.**
4. Connect the blower to a battery and check for excessive wheel runout and/or vibration before installing the blower motor and wheel assembly in the vehicle.
5. Install the blower motor and wheel assembly in the vehicle. Refer to procedure.
6. Check the system for proper blower operation.

EVAPORATOR CASE

Removal

1. Disconnect the ground cable from the battery and partially drain the cooling system.
2. Remove the air cleaner assembly from the engine compartment.
3. Discharge the refrigerant from the system.
4. Remove the heater hoses from the heater core and plug the hoses and heater core to prevent coolant leakage.
5. Remove two screws attaching the expansion valve and STV to the evaporator manifold plate. Separate the expansion valve and STV from the evaporator manifold plate and position them to one side.
6. Remove four nuts on the engine side of the dash panel retaining the evaporator to the dash panel.
7. Remove the instrument panel pad as outlined in Group 45.
8. Remove the glove compartment and the instrument panel lower finish panel.
9. Remove four screws attaching the defroster duct to the cowl at the defroster openings and remove the defroster duct.
10. Remove the instrument panel-to-cowl upper right attaching bolt.
11. Remove the cowl-to-floor brace at the center of the instrument panel.
12. Disconnect the vacuum hose from the servo motor and the vacuum harness connector from the diverter valve.
13. Remove the spring nut retaining the servo assembly to the blend door crank arm.
14. Remove two servo retaining screws and remove the servo.
15. Disconnect the wires at the blower motor resistor and at the blower motor.
16. Loosen the right door sill plate attaching screws and remove the right cowl side trim panel.
17. Remove the bolt attaching the lower right side of the instrument panel to the cowl side panel.
18. Disconnect the evaporator case upper support from the bracket at the top of the evaporator.
19. Remove the floor air distribution duct.
20. Remove two screws and two clips retaining the plenum to the evaporator case.
21. Remove the mirror remote control and courtesy light bracket from the underside of the instrument panel.
22. Disengage the vacuum harness locator tabs from the evaporator case and disconnect the vacuum hose from the outside-recirc. door vacuum motor.
23. Remove one screw attaching the blower housing bracket to the cowl bracket.
24. Pull the evaporator case assembly away from the dash panel and separate it from the plenum. Then, raise the plenum end of the evaporator case while pulling the blower end down and out from under the instrument panel.



K3464-2C

FIG. 28 Air Distribution Ducts—ATC

Installation

1. Position the evaporator case to the dash panel and the plenum assembly. Install the two screws and two clips to retain the plenum to the evaporator case.
2. Install the four nuts to retain the evaporator case and plenum to the dash panel.
3. Position the expansion valve and STV to the evaporator manifold plate and install the two attaching screws. Use new o-rings dipped in refrigeration oil.
4. Connect the heater hoses to the heater core.
5. Position the servo assembly to the mounting bracket engaging the motor end with the bracket, and the servo arm and spring with the blend door crank arm. Install the spring nut to retain the servo arm on the crank arm.
6. Install the two servo assembly retaining screws.
7. Connect the fan vacuum hose to the vacuum motor and the vacuum harness connector to the diverter valve. Then, install the self threading nut to retain the vacuum hose connector on the diverter valve.
8. Install one screw to attach the upper support strap to the evaporator case.
9. Install the screw to attach the blower housing bracket to the cowl bracket.
10. Route the vacuum harness over the evaporator case and engage the locator tabs. Connect the white hose to the outside-recirc. door vacuum motor.
11. Connect the blower motor wires at the connector.
12. Connect the mirror remote control and the courtesy light to the instrument panel.
13. Install the floor air distribution duct.
14. Position the defroster duct to the plenum and cowl and install the four attaching screws.
15. Install the upper and lower bolts attaching the right end of the instrument panel to the cowl.
16. Install the right cowl side trim panel. Then, tighten the right door sill plate attaching screw.
17. Install the cowl-to-floor brace at the left end of the plenum assembly.
18. Install the glove compartment and the instrument panel lower finish panel.
19. Install the instrument panel pad as outlined in Group 45.
20. Connect the ground cable to the battery negative terminal.
21. Install the carburetor air cleaner.
22. Fill the cooling system with the coolant removed during removal of the evaporator case.
23. Leaktest, evacuate and charge the system.

EVAPORATOR CORE

Removal

1. Remove the evaporator case from the vehicle following the procedure listed under Evaporator Case Removal.
2. Remove the heater core from the evaporator case.

3. Remove four screws and remove the blower motor and wheel from the blower housing.
4. Remove three screws inside the blower housing and one screw outside the blower housing and separate the blower housing from the evaporator case.
5. Remove one clip and eight screws and separate the top of the evaporator case from the bottom.
6. Remove the evaporator core, seal and the evaporator manifold plate from the case lower half.
7. Remove the evaporator manifold plate from the evaporator core.
8. Remove the core seal and the tube seal from the evaporator core.

Installation

1. Position the core tube seal on the tubes. Then, install the evaporator manifold plate on the evaporator core tubes using new O-rings dipped in clean refrigeration oil.
2. Install the core seal on the core and position the core in the evaporator case.
3. Assemble the evaporator case and blower housing, making sure the blend door is positioned properly.
4. Install the blower motor and wheel in the housing.
5. Install the heater core in the evaporator case.
6. Install the evaporator core in the vehicle following the procedure under Evaporator Case Installation.

STV HOUSING MANIFOLD AND EXPANSION VALVE ASSEMBLY

Observe the Safety Precautions outlined in Part 36-31.

Removal

1. Discharge the refrigerant system.
2. Remove the (2) refrigerant lines from the STV Housing Manifold and Tube Assembly using back-up wrenches on the STV Housing Manifold hex fittings to prevent component damage.
3. Remove the (2) hex-head attaching bolts from the side of the Manifold Plate and remove the By-Pass Orifice (BPO) Expansion Valve and STV Housing Manifold and Tube Assembly from the Evaporator Manifold Plate.
4. Remove the (2) socket-head (Allen) screws attaching the STV Housing Manifold and Tube Assembly to the By-Pass Orifice (BPO) Expansion Valve body.
5. Separate the STV Housing Manifold and Tube Assembly from the By-Pass Orifice (BPO) Expansion Valve body.
6. Using Rotunda STV wrench T776-19703-D, Motorcraft Tool YT-366, or 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.

7. 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 By-Pass Orifice (BPO) Expansion Valve body.
2. Thread the STV into the Expansion Valve body and tighten, hand tight, with either tool or 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 and Tube Assembly.
4. Place the STV Housing Manifold and Tube Assembly over the STV and position against the Expansion Valve body.
5. Install the (2) socket-head (Allen) screws and torque to 4 - 6 lbs. ft.
6. Lubricate and install (3) new O-rings on the Evaporator Manifold Plate.
7. Position the By-pass Orifice (BPO) Expansion Valve and the STV Housing Manifold and Tube Assembly on the Evaporator Manifold Plate. Install the (2) hex-head attaching bolts and torque to 4 - 8 Ft.-Lb.
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 and Tube Assembly hex fittings to prevent component damage.
10. Evacuate, leak check, and recharge the refrigerant system to specifications.

WATER VALVE

Removal

1. Loosen the radiator cap, open the radiator drain cock and partially drain the coolant from the engine cooling system. Close the radiator drain cock.
2. Disconnect the vacuum hose (green) from the vacuum motor.
3. Loosen the hose clamps (2) securing the heater core inlet hose to the water valve.
4. Disconnect the Engine-to-Water Valve inlet hose.
5. Disconnect the water valve from the heater core inlet hose and remove the water valve.

Installation

1. Position and install the water valve into the heater core inlet hose.

NOTE: THE ARROW ON THE SIDE OF THE VALVE SHOULD POINT TOWARD THE HEATER CORE INLET TUBE.

2. Connect the Engine-to-Water Valve inlet hose and tighten the water valve hose clamps (2) to specification.
3. Connect the vacuum hose (green) to the water valve vacuum motor.

4. Refill the engine cooling system to proper level with a 50-50 mix of coolant and water.
5. Move the function control lever to HEAT and start the engine to refill the heater core and hoses.
6. Recheck the engine coolant level after operating the engine and, if necessary, add additional 50-50 mixed coolant to proper level.
7. Check the system for proper operation.

AMBIENT CUT-OFF SWITCH

Removal

1. Remove one screw attaching the horn to the hood latch support. Then, disconnect the wire and remove the horn.
2. Reach down between the grille and remove one screw attaching the ambient cut-off switch to the hood latch support brace (Fig. 29).
3. Disconnect the wires at the connector and remove the switch.

Installation

1. Position the ambient cut-off switch to the hood latch support brace and install the attaching screw.
2. Connect the wires at the connector.
3. Install the horn and connect the horn wire.

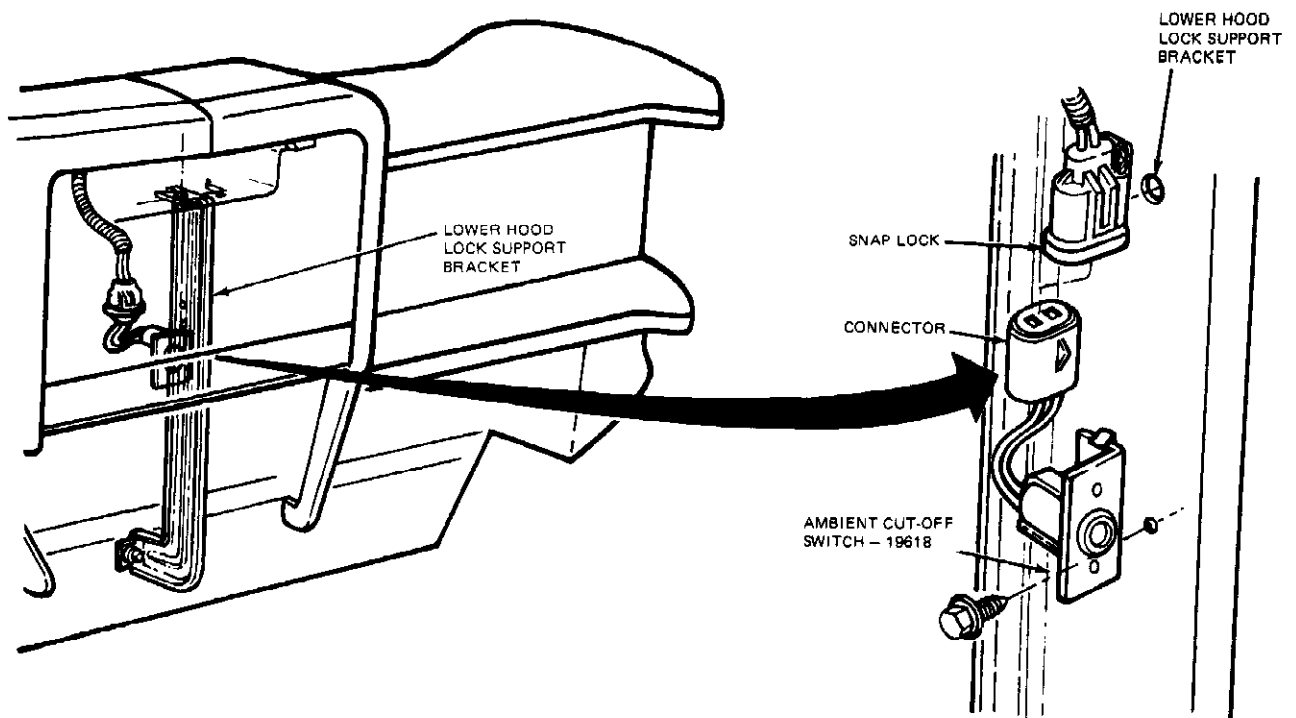
CONDENSER AND/OR RECEIVER-DRIER

Removal

1. Discharge the refrigerant from the system following recommended procedures and safety precautions.
2. Remove the hood latch attaching bolts and remove the hood latch and hood latch support from the vehicle.
3. Remove one screw attaching the ambient cut-off switch to the hood latch support brace. Disconnect the wires at the connector and remove the switch.
4. Disconnect the refrigerant lines from the condenser.
5. Remove the two nuts retaining the bottom of the condenser to the mounting brackets (Fig. 30).
6. Remove two screws attaching the condenser upper brackets to the radiator support and remove the condenser from the vehicle.
7. Disconnect the two refrigerant lines from the receiver-drier, remove the attaching screws, and remove the receiver-drier.

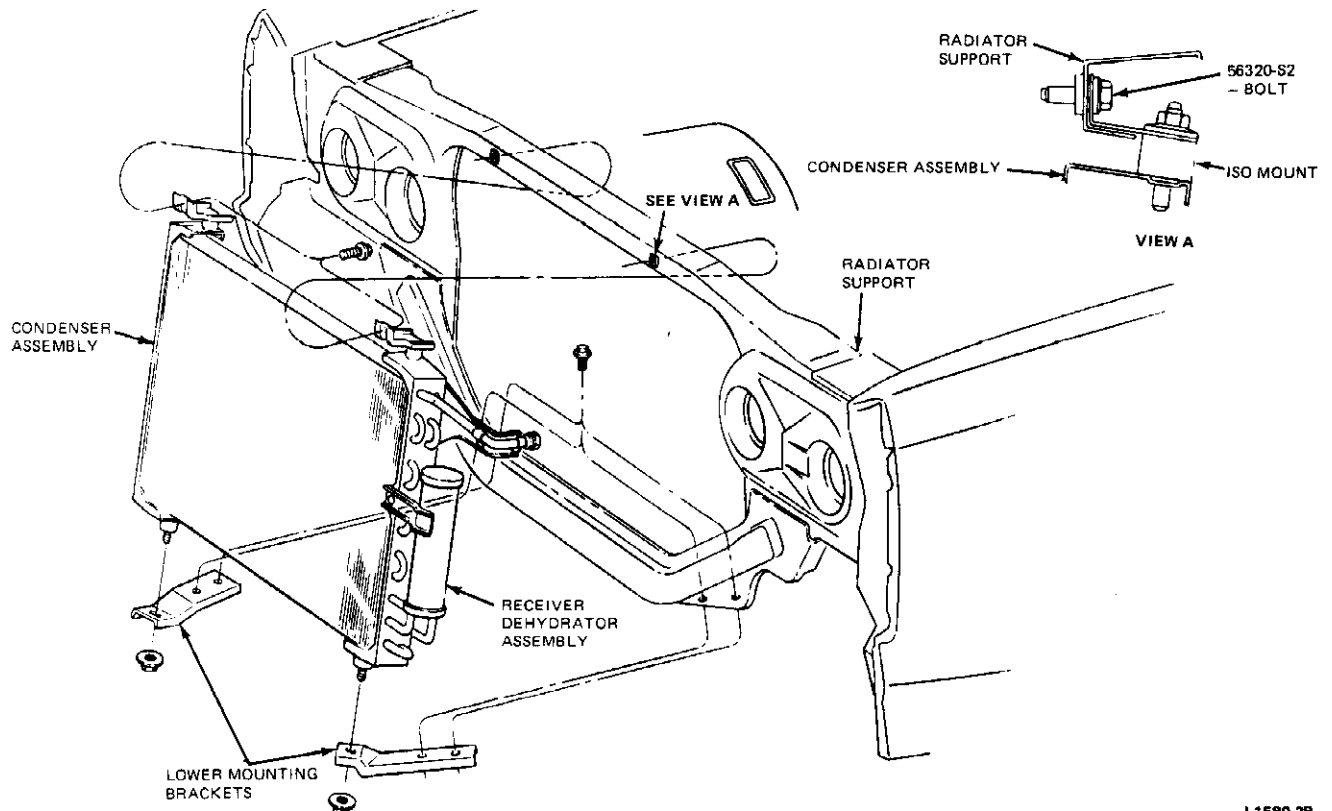
Installation

1. Transfer the two refrigerant tubes to the new condenser. Use new O-rings dipped in refrigeration oil.
2. Position the receiver-drier to the condenser. Use new O-rings dipped in refrigeration oil on the tube fittings. Install the receiver-drier attaching screws.
3. Transfer the mounting studs and upper mounting brackets to the new condenser.



K3471-2C

FIG. 29 Ambient Cut-Off Switch Installation



L1680-2B

FIG. 30 Condenser Installation

4. Position the condenser in the vehicle and install the bolts attaching the upper mounting brackets to the radiator support.
5. Install the nuts to attach the lower studs to the mounting brackets.
6. Install new O-rings dipped in refrigeration oil on the refrigerant tubes and connect the refrigerant lines to the condenser.
7. Leak test, evacuate and charge the refrigerant system.

8. Position the ambient cut-off switch to the hood latch support brace and install the attaching screw. Then, connect the wires at the connector.
9. Install the hood latch support and hood latch.

COMPRESSOR

Removal

1. Discharge the refrigerant from the A/C system observing all safety precautions.
2. Loosen the two idler pulley attaching bolts (Fig. 31), and remove the drive belt from the compressor pulley.
3. Remove the bolt attaching the refrigerant line manifold to the end of the compressor (Fig. 31).
4. Separate the refrigerant line manifold from the compressor and cap the manifold to prevent the entry of dirt or other contaminating materials.
5. Disconnect the clutch feed wire.
6. Disconnect the three braces from the rear of the compressor (Fig. 31).
7. Remove three compressor front attaching bolts and remove the compressor from the vehicle.
8. Remove the clutch and pulley from the compressor following the procedure in Part 36-34.

Installation

1. Install the clutch and pulley on the compressor following the procedure in Part 36-34.
2. Position the compressor to the mounting bracket end braces and install the three front attaching bolts.
3. Install three bolts to attach the three rear braces to the compressor.
4. Tighten the compressor attaching bolts to specification.
5. Install the refrigerant line manifold on the compressor using new O-rings dipped in refrigerant oil. Tighten the manifold attaching bolt to specification.
6. Install the drive belt on the compressor pulley and adjust the drive belt tension following the procedure under Adjustments.
7. Connect the clutch wire to the clutch.
8. Leak test, evacuate and charge the refrigerant system following established procedures and observing all safety precautions.

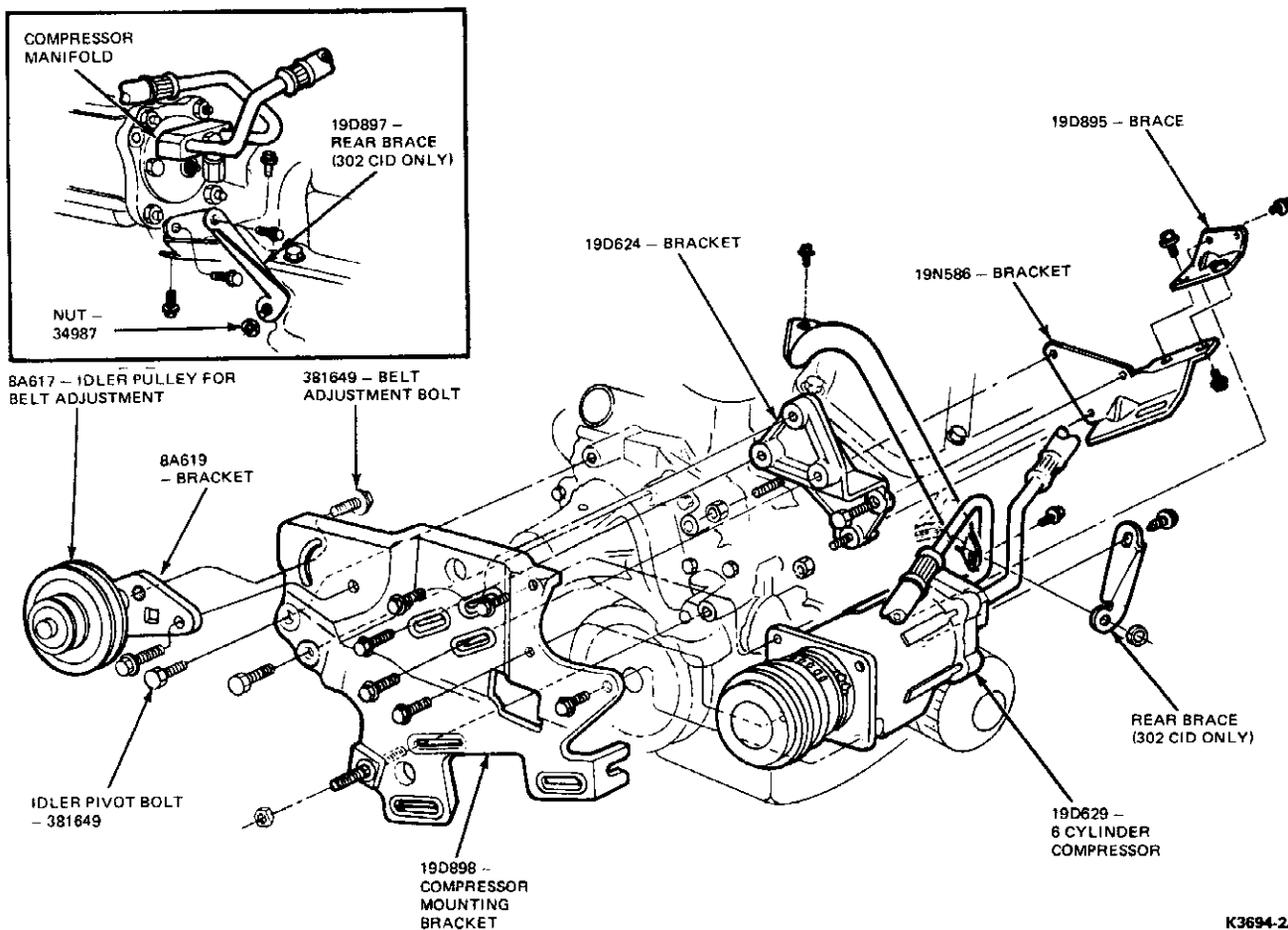
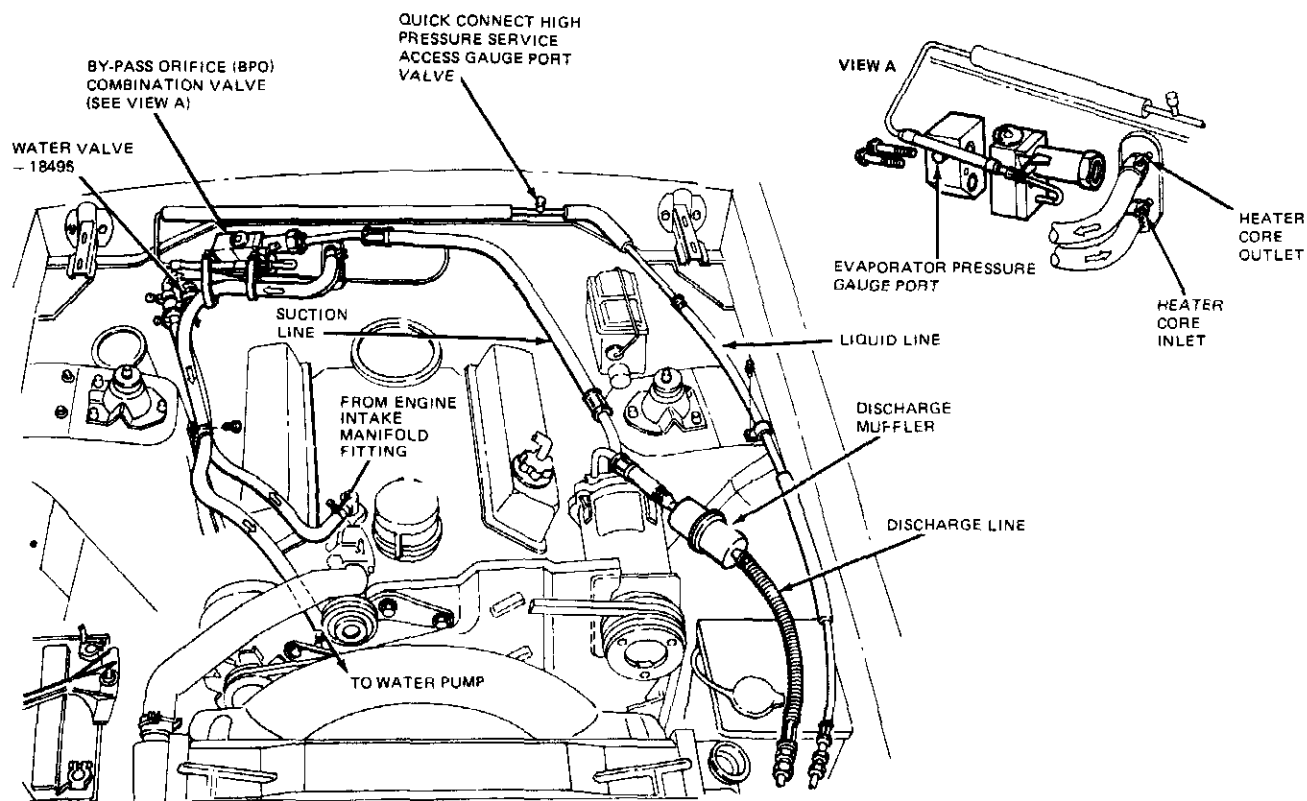


FIG. 31 Compressor Installation

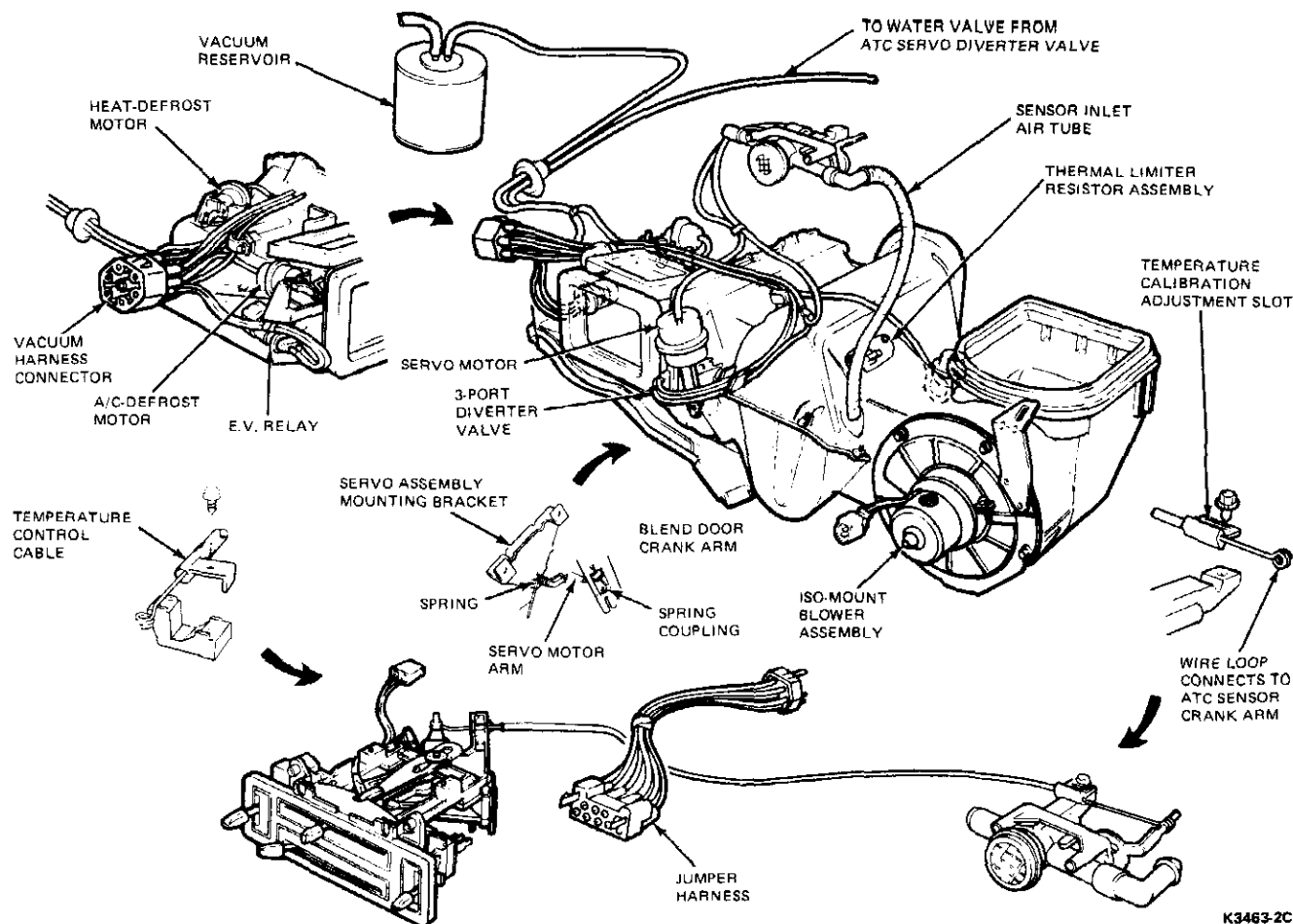
A/C AND HEATER HOSE ROUTING

Refer to Fig. 32 for the installation and routing or replacement of A/C and Heater hoses.



K3472-2C

FIG. 32 Engine Compartment Hose Routings



K3463-2C

FIG. 33 ATC Vacuum Hose Routings

SPECIFICATIONS

ELECTRICAL

System Protection	20 Amp Fuse (Yellow, 7AG-20 or AGW-20) in Panel F-9	
Clutch Circuit		
Blower Circuit	35 Amp Fuse (Silver, 8AG-35 or AGX-35) in Panel F-3	
Blower Motor Current Draw		
Switch Setting	Amps	Volts
Low	8	5
Medium Low	11	7
Medium High	20	10
High	25	14
Magnetic Clutch		
Current Draw	— Approximately 3.44 Amps @ 12.8 Volts.	
Illumination		
Control Assembly	One ICP-161 Bulb	

REFRIGERANT

Capacity	4 Lbs. Plus 1/4 Lb., Minus 0 64 Oz. Plus 4 Oz., Minus 0 1.814 Kg Plus .113 Kg, Minus 0
Type	Refrigerant 12 (R-12)

COMPRESSOR — 6 CYLINDER

Type	Swash Plate — Three Double Acting Pistons — Axial Type
Cylinder Bore	1-1/2 Inches
Stroke	1-3/16 Inches
Rotation	Clockwise
Refrigeration Oil	
Type	TL 4538 Texaco 525 Viscosity
Capacity	10-1/2 Fluid Ounces (Ford D1VY-19557-A)
Drive Belt Tension	
New	120-160 Lbs.
Used	(after operation for 10 minutes or more) 75-120 Lbs.

TORQUE SPECIFICATIONS

Compressor-To-Mounting Bracket Bolt	20 to 30 lb-ft
Idler Pulley Arm-To-Mounting Bracket Bolt	30 to 45 lb-ft
Heater Hose Clamps	13 to 18 lb.in.
Combination Valve Screws:	
Manifold to Expansion Valve	4 to 8 lb-ft
STV Housing to Expansion Valve	4 to 6 lb-ft

CL2053-2A

Automatic Temperature Control

PART
36-74

LTD II, Cougar, Thunderbird and Continental Mark V

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION		REMOVAL AND INSTALLATION	
Automatic Temperature Control		Condenser	74-12
Operation	74-1	Control Head Assembly	74-11
Components	74-2	Electro Vacuum Relay (EVR)	74-10
Control Lever Operation	74-1	Resistor Assembly	74-11
Operation	74-1	Sensor Assembly	74-10
System Air Flow	74-2	Servo Assembly	74-11
ADJUSTMENTS		SPECIFICATIONS	74-12
Readjusting Calibration Point	74-10		
Sensor Calibration	74-9		

CK3427-2B

DESCRIPTION

The Automatic Temperature Control System is a split case design, independent blower system and will automatically control the temperature and reduce the relative humidity of air inside the car. Two slide control levers are provided to maintain the desired temperature and system function. The system (Fig. 1) 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, depending on the operating condition.

Automatic control of temperature is maintained in both summer and winter. In hot weather, it will cool the car to the pre-set comfort level and then modulate cooling to whatever is required to maintain the desired temperature.

In mild weather, the interior of the vehicle is heated or cooled automatically as required to maintain comfort. 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 outlets. The system will then heat the car to the desired temperature and level out to maintain the pre-set temperature.

During operation, outside air is drawn from the cowl vent just below the windshield at all times, except during maximum cooling in the A/C function lever position 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 of the evaporator outlet air 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 diverted to the heater ducts, (Figs. 3 and 4) the defroster nozzles, or the panel (A/C) registers according to the selected function lever position.

CONTROL LEVER OPERATION

The Automatic Temperature Control includes a function control slide lever for OFF, ECONOMY-VENT, A/C, HI-LO, HEAT, DEFOG (V) and DEFROST that determines the manner in which the system will operate, a calibrated temperature control slide 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.

AUTOMATIC TEMPERATURE CONTROL OPERATION

The electrical and air flow schematics and vacuum charts shown in Figs. 1, 2, and 3 may be used in conjunction with the following explanation to clarify system operations:

Temperature control of the ATC system is primarily determined by the vacuum modulation produced by the mechanical sensor assembly that controls the servo vacuum motor. Discharge air flow is manually controlled by the control head assembly. Temperature control is

accomplished by means of a control cable between the control head assembly and sensor assembly. The location of ducts and vacuum motors are shown in Figs. 4 and 5.

The sensor assembly (Figs. 6 and 7) is basically a bimetal operated vacuum modulator. The sensor directly converts 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.

Blower motor speed is manually controlled to satisfy the operator. There are four switch positions to provide four blower speeds. Low speed is automatic in all positions. 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.

COMPONENTS

Servo Assembly (Fig. 8)

The servo assembly is a large calibrated vacuum motor and vacuum diverter valve. The calibrated vacuum motor provides specific temperature blend door positions for given vacuum levels. The attached vacuum diverter valve controls water valve operation and recirc or outside air operation.

Electro-Vacuum Relay (E.V.R.)

E.V.R. is a combination normally closed vacuum solenoid valve and a single pole single throw normally closed electrical relay, both are actuated by one electrical coil. The E.V.R. receives an automatic signal from the engine water temperature switch and performs two functions in the system. It is used during cold engine operation, in the HEAT function lever position, to lock-out blower operation simultaneously, and to switch the system to recirculating air until the engine coolant warms up to about 115°F.

Control Assembly (Figs. 9 and 10)

The control head consists of three main parts: 1) the function selector—a nine-port vacuum selector valve combined with two cam operated electrical switches; 2) blower switch—an electrical switch that provides four speeds of blower operation; and 3) the temperature control lever which connects through a Bowden control cable to the sensor assembly.

1. The 9-port vacuum selector valve is very similar to the manual A/C 9-port vacuum selector valve. It directs source vacuum to various vacuum motors and connects the vacuum from the electro-vacuum relay to the outside air-recirc door in HEAT (See Vacuum Schematic - Fig. 2). A single pole and double pole cam operated electrical switch is also controlled by the vacuum selector. The combination of these cam operated electrical switches controls the electrical supply to the A/C clutch and blower switch.
2. The four-position blower switch is identical to the manual A/C-heater system blower switch.
3. The temperature control lever is connected to the sensor assembly by a Bowden cable control wire. Movement of the control lever from 65°F to 85°F causes a corresponding movement on the pre-load (bias) portion of the sensor assembly, and determines the temperature that the system will maintain.

Resistor Assembly

The blower motor resistor assembly is located on the evaporator assembly and is identical to the manual A/C heater resistor assembly. There are three resistance elements mounted on the resistor board to provide four blower speeds. Depending on the blower switch position, series resistance is added or shorted out of the blower motor circuit to decrease or increase speed.

Water Temperature Switch

In the HEAT position only, a ground circuit from the E.V. relay to the engine water temperature switch prevents blower operation until the engine coolant temperature reaches about 115°F. This minimizes any cold air discharge from the heater ducts. See Figs. 1 and 2. The E.V. relay also provides vacuum to position the outside air/recirc door in recirc during cold engine operation.

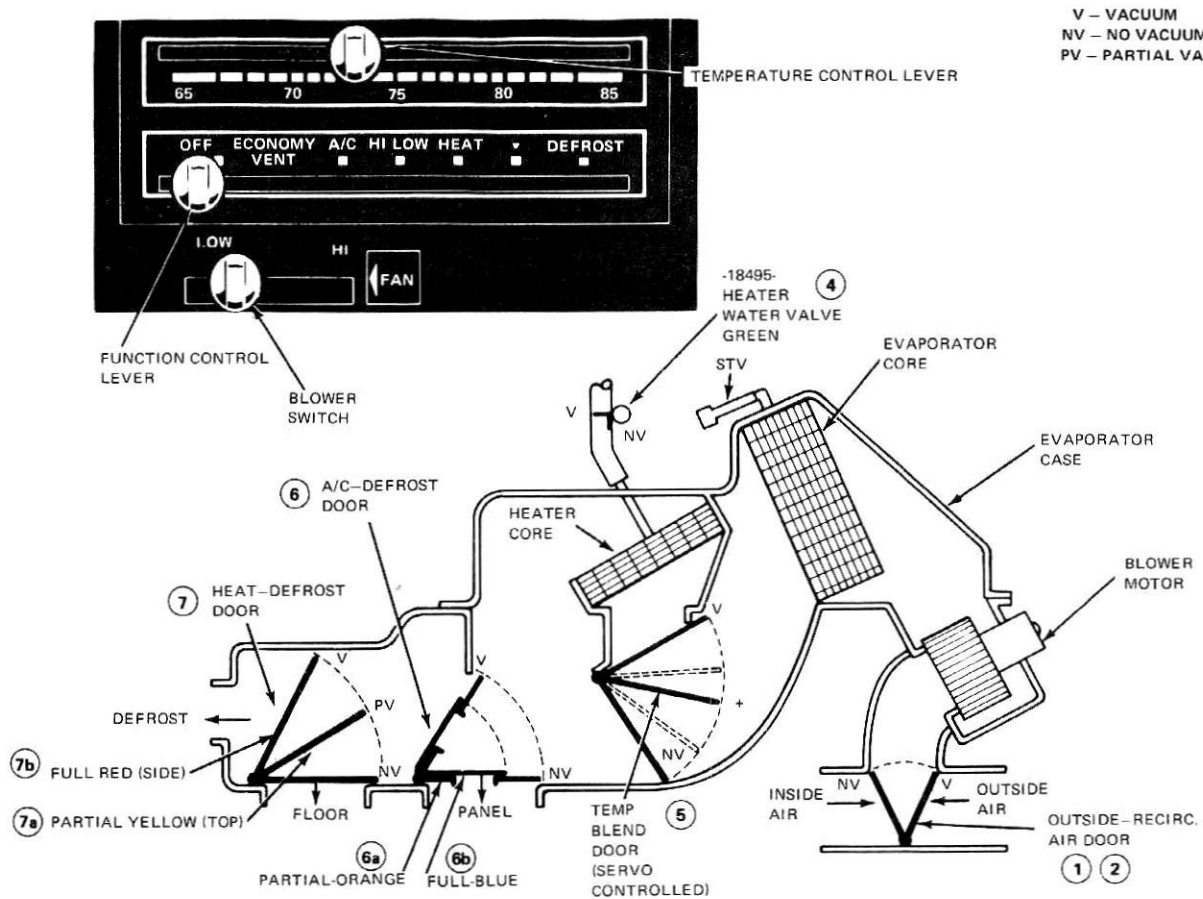
SYSTEM AIR FLOW

Fig. 2 contains system vacuum schematics and vacuum motor charts which illustrate vacuum routings and air flow during the various system conditions. Fig. 1 is a system electrical wiring diagram including continuity test information.

Off Position

In Off position the outside-recirc air door is in recirculating position. The A/C-heat door is in the heat (no vacuum) position, and the heat-defrost door is in the heat (full vacuum) position. The blower is off and the temperature blend door and water valve assume a position depending on the modulated vacuum from the sensor to the power servo.

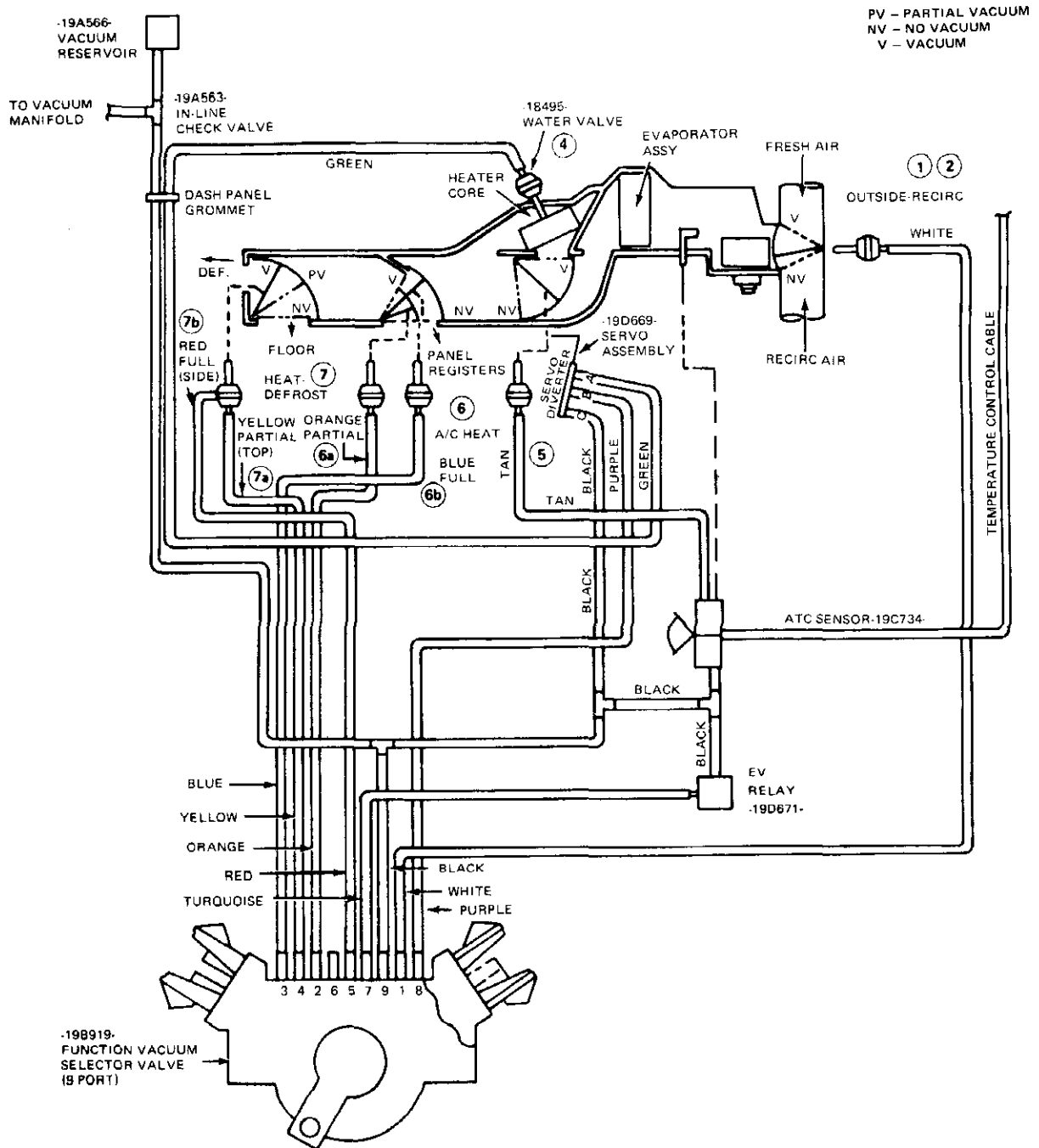
NOTE: A modulated vacuum is produced in ALL function control lever positions and is entirely



LTD II, COUGAR, THUNDERBIRD AND MARK V AUTOMATIC TEMPERATURE CONTROL SYSTEM VACUUM MOTOR TEST CHART								
FUNCTION CONTROL LEVER POSITION	ATC REQUIREMENT	VACUUM MOTORS APPLIED WITH VACUUM						
		OUTSIDE - RECIRC.	WATER VALVE **	TEMP. BLEND +	A/C-HEAT		HEAT-DEFROST	
					PARTIAL	FULL	PARTIAL	FULL
OFF	-	1-2	**	+	-	-	7a	7b
ECONOMY VENT	Cool	-	4	5	6a	6b	7a	7b
	Mid	-	-	+	6a	6b	7a	7b
	Warm	-	-	-	6a	6b	7a	7b
A/C *	Cool	1-2 **	4	5	6a	6b	7a	7b
	Mid	-	-	+	6a	6b	7a	7b
	Warm	-	-	-	6a	6b	7a	7b
HI - LO *	Cool	-	4	5	6a	-	7a	7b
	Mid	-	-	+	6a	-	7a	7b
	Warm	-	-	-	6a	-	7a	7b
HEAT	Cool	-	4	5	-	-	7a	7b
	Mid	-	-	+	-	-	7a	7b
	Warm	1-2 †	-	-	-	-	7a	7b
▽ (DEFOG) *	Cool	-	4	5	-	-	7a	-
	Mid	-	-	+	-	-	7a	-
	Warm	-	-	-	-	-	7a	-
DEFROST *	Cool	-	4	5	-	-	-	-
	Mid	-	-	+	-	-	-	-
	Warm	-	-	-	-	-	-	-
VACUUM LINE COLOR CODE		WHITE	GREEN	TAN	ORANGE	BLUE	YELLOW (TOP)	RED (SIDE)

- * COMPRESSOR CLUTCH ENGAGED WHEN AMBIENT CUT-OFF SWITCH IS CLOSED
- † DELAYED BY ENGINE TEMP. SENDER AND E.V. RELAY UNTIL 130°F. ENGINE COOLANT TEMP.
- ** DEPENDENT ON HEATING/COOLING REQUIREMENT OF SERVO DIVERter VALVE
- + MODULATED VACUUM
- NO VACUUM

FIG. 1 ATC System Air Flow Schematic and Vacuum Control Chart for LTD II, Cougar, Thunderbird and Continental Mark V



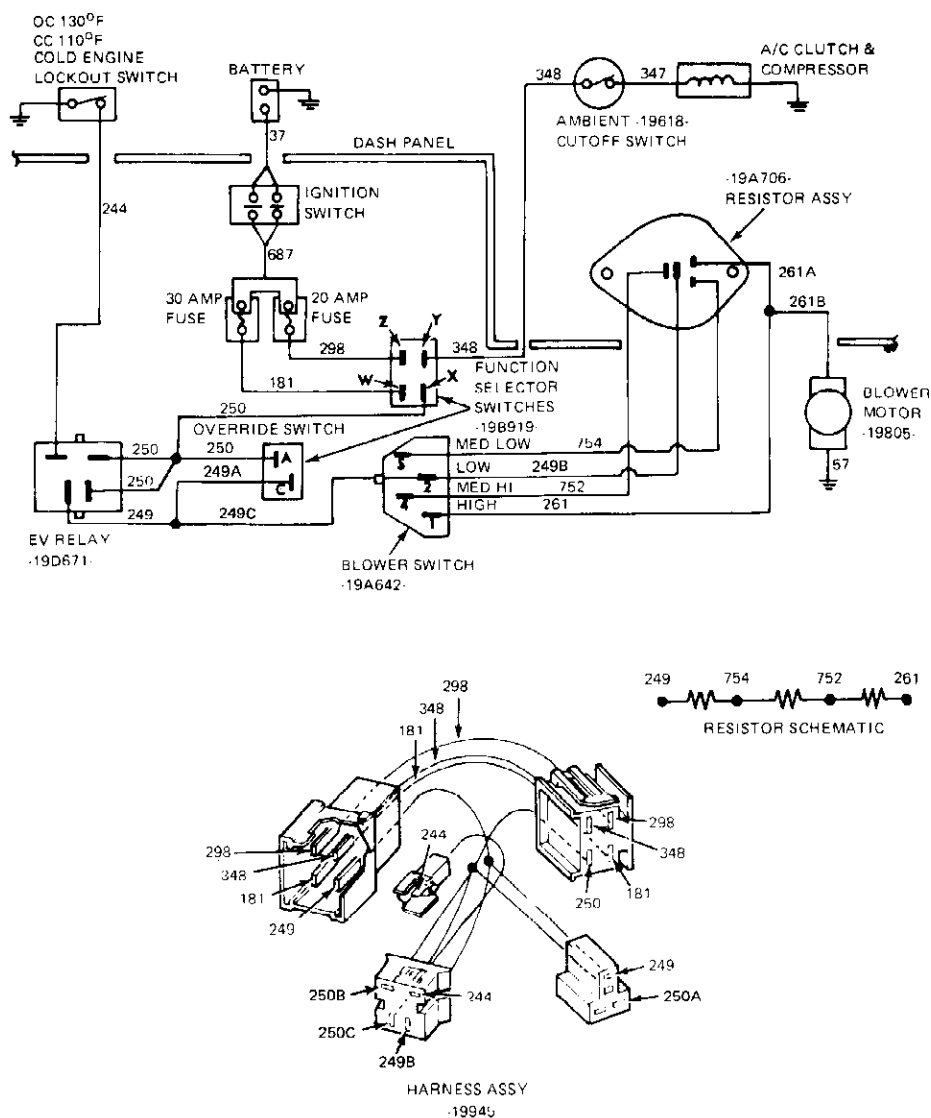
PORT	FUNCTION	FUNCTION SELECTOR VALVE LEVER POSITIONS							HOSE COLOR
		OFF	ECONOMY VENT	A/C	HI-LO	HEAT	DEFROST	DEFROG	
1	Outside-Recirc.	V		To 8		To 7			White 1-2
2	Partial A/C-Heat		V	V	V				Orange 6a
3	Full A/C-Heat		V	V	V				Blue 6b
4	Partial Heat-Defrost	V	V	V	V	V	V		Yellow 7a
5	Full Heat-Defrost	V	V	V	V	V			Red 7b
6	No Function	Seal	Seal	Seal	Seal	Seal	Seal	Seal	
7	From EV Relay	Seal	Seal	Seal	Seal	To 1	Seal	Seal	Turquoise
8	From Servo Diverter Port B	Seal	Seal	To 1	Seal	Seal	Seal	Seal	Purple
9	Source Vacuum	V	V	V	V	V	V	V	Black

V - VACUUM

BLANK ATMOSPHERE

K3500-2A

FIG. 2 ATC System Vacuum Schematic and Selector Test for LTD II, Cougar, Thunderbird and Continental Mark V



FUNCTION SELECTOR SWITCH -19B919-							
SWITCH SCHEMATIC	OFF	ECONOMY VENT	A/C	HI-LO	HEAT	DEFROG	DEFROST
A - C	A - C	A - C	A - C	A - C	Open	A - C	A - C
X - Y	None	W - X	W - X	W - X	W - X	W - X	W - X
W - Z			Y - Z	Y - Z	Y - Z	Y - Z	Y - Z

BLOWER SWITCH -19A642-			
BLOWER SPEED	TERMINAL CONNECTIONS	CURRENT IN CAR (AMPS)	BLOWER VOLTAGE
Low	2	6	5
Med Low	2 - 5	10	7
Med High	2 - 4 - 5	17	10
High	2 - 1 - 4	25	12.4

CIRCUIT NO.	WIRE COLOR
57	Black
347	Black W/Yellow Hash
348	Lt. Green W/Purple Hash
298	Purple W/Orange Hash
181	Brown W/Orange Stripe
752	Yellow W/Red Dot
754	Lt. Green W/White Hash
37	Yellow
687	Gray W/Lt. Blue Stripe
249	Dk. Blue W/Lt. Gr. Stripe
250	Orange
261	Orange W/Black Stripe
244	Yellow W/White Hash

FIG. 3 ATC System Electrical Wiring Diagram and Continuity Test for LTD II, Cougar, Thunderbird and Continental Mark V

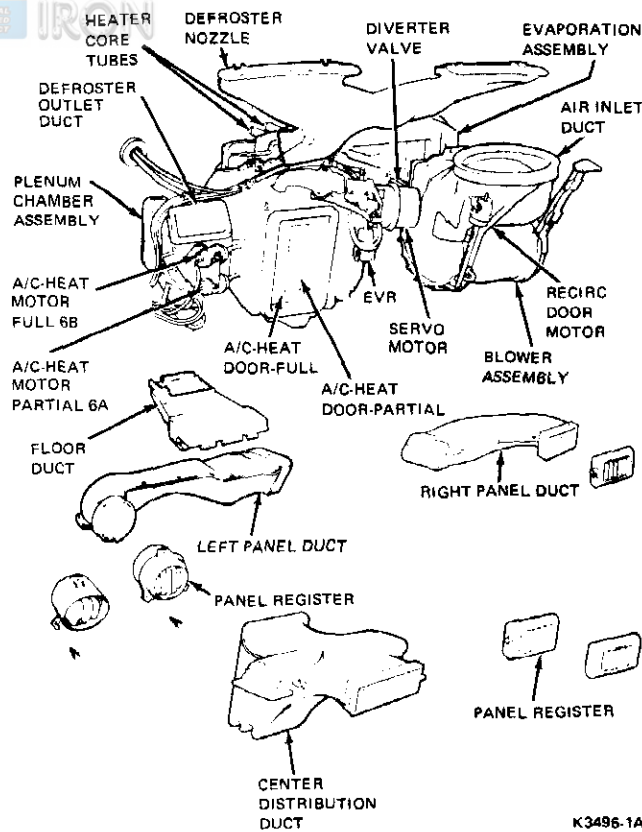


FIG. 4 Air Distribution Ducts, LTD II, Thunderbird and Cougar

dependent on the temperature lever setting and existing in-vehicle temperature conditions.

Economy-Vent Position

In **ECONOMY-VENT** position, outside air is directed through the panel (A/C) registers with automatic control of discharge air temperatures and water valve actuation. However, refrigerated cooling is not available. **ECONOMY-VENT** and **HEAT** positions provide the most economical operations because the compressor does not operate.

A/C Position—Maximum Cooling (Recirculate)

With the functional lever in A/C position and the car interior temperature considerably above the temperature setting, the modulated vacuum is high at the servo motor, causing:

1. The outside-recirc door to go to the recirc position;
2. The water valve to close;
3. The temperature blend door to close, allowing all air to by-pass the heater core. Air is drawn from the passenger compartment, directed through the evaporator core where it is cooled and returned to the car interior through the panel (A/C) ducts and registers.

A/C Position—Modulated Cooling (Outside-Air)

When the interior car temperature and the temperature setting are nearly balanced, the temperature blend door is actuated to near the mid-position, allowing air door to open and the water valve to turn on. The blend door has moved to a position where part of the air leaving the evaporator core is directed through the heater core where it is warmed. Blend air (the combination of cooled and heated air) is then mixed in the plenum and directed into the car

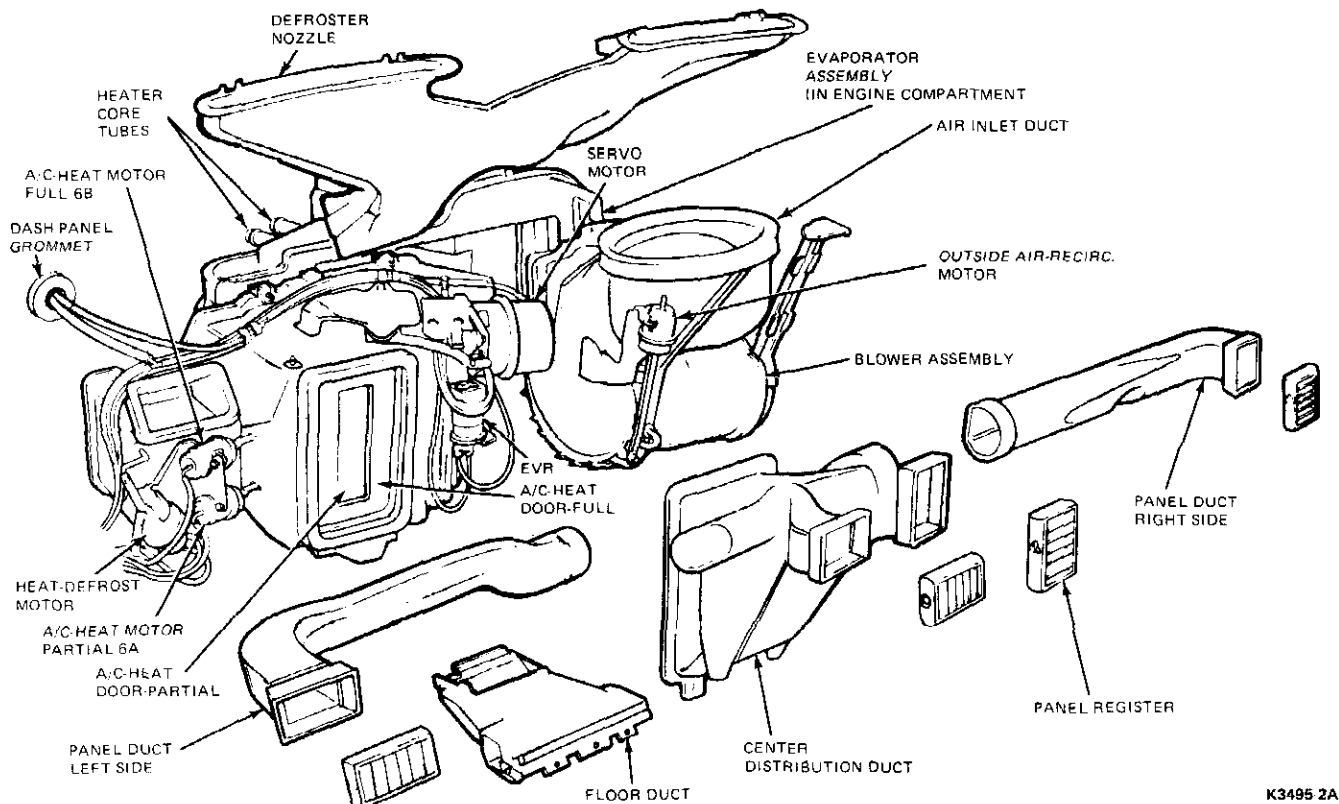
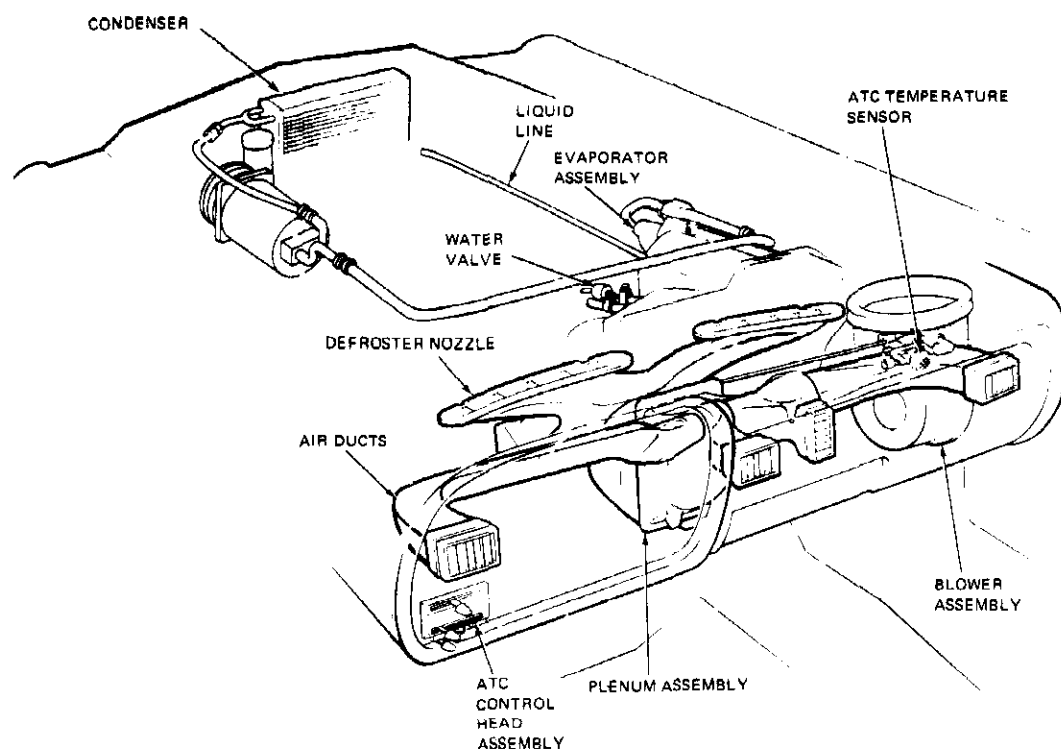
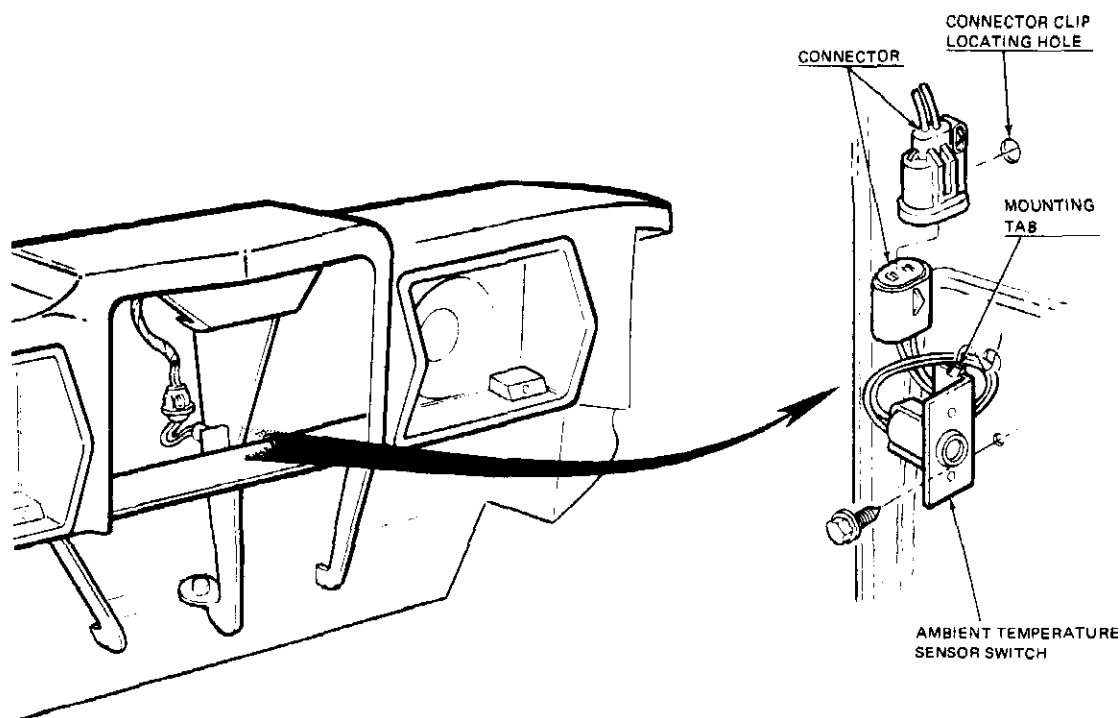


FIG. 5 Air Distribution Ducts, Continental Mark V



K3490-2A

FIG. 6 Location of System Components, Continental Mark V



L2361-2A

FIG. 7 Ambient Temperature Sensor Switch Installation

interior through the panel (A/C) ducts and registers. The position of the temperature blend door changes automatically to maintain the temperature selected. If

the in-car temperature rises above the temperature lever setting, the blend door moves to admit more cooled air and less heated air. If the in-car temperature drops

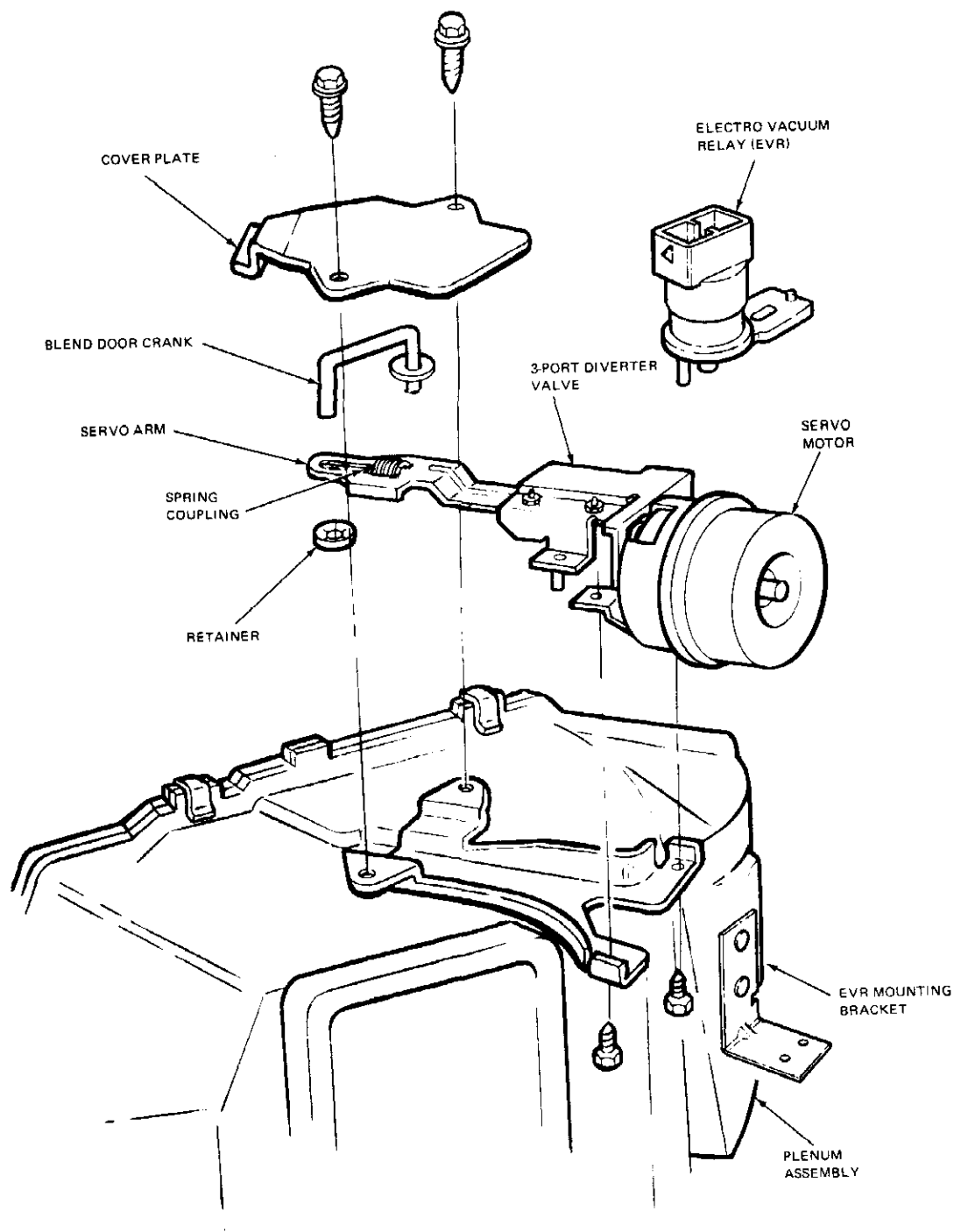


FIG. 8 Servo Motor Installation

below the setting, the blend door moves to admit more heated air and less cooled air.

HI-LO Positions

Operation is similar to that described in the A/C position paragraphs, except that airflow is divided between the panel registers and floor ducts. The system will not recirculate interior air for maximum cooling.

Heat Position—Maximum Heating

With the function control lever in the HEAT position and the car interior temperature below the temperature setting, the modulated vacuum is low, causing the water valve to open and the temperature blend door to fully open. Blower operation will be delayed until the engine coolant reaches about 115°F, then the air is forced by the blower through the evaporator and all of the air passes through the heater core before being distributed through the heater (floor) ducts into the car interior. A portion of this air is diverted to the defroster nozzles.

Heat Position—Modulated Heating

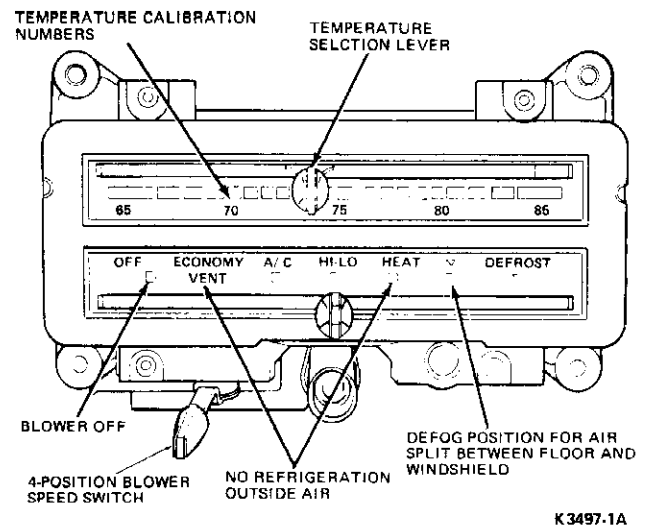
When the interior car temperature and the temperature setting are nearly balanced, the temperature blend door has moved to a position so that only part of the air leaving the evaporator core is directed through the heater core where it is warmed. Blended air (the mixture of outside air and heated air) then is directed into the car interior. The A/C clutch does not operate in this position.

Defog (∇) Position

In DEFOG (∇) operation is the same as the heating position, except that the A/C-Heat doors are in the Heat (no vacuum) position and the heat-defrost door is in a partial position. There is no blower delay. The air flow is directed to the defroster nozzles and the floor outlets. The A/C clutch will also be engaged when the outside air temperature is sufficiently high enough to close the ambient cutoff switch. This assists in reducing the windshield fogging by dehumidifying the outside air.

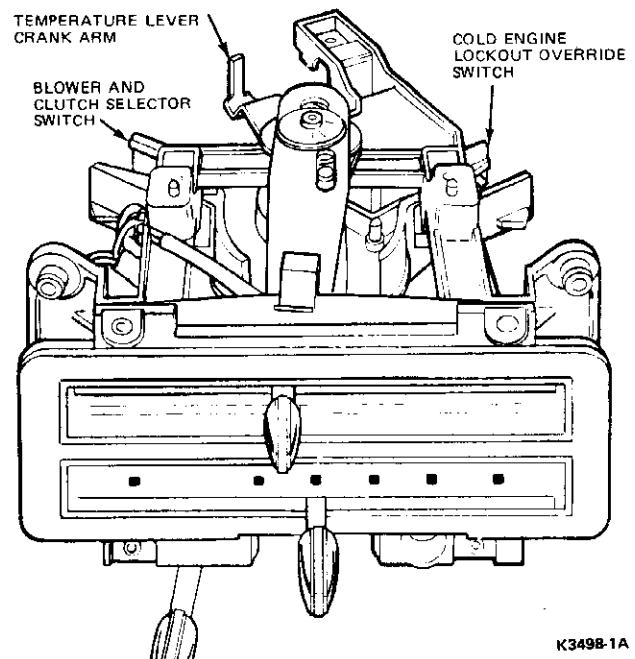
Defrost Position

When the function lever is in the DEFROST position, the A/C-heat doors and the heat-defrost door are in the full defrost (no vacuum) positions so that all incoming air is directed to the defroster nozzles with a slight bleed to the floor. The temperature blend door modulates in this position but maximum heat can be obtained only by moving the temperature lever to the highest temperature position. The A/C clutch also



K3497-1A

FIG. 9 ATC Control Assembly Functions



K3498-1A

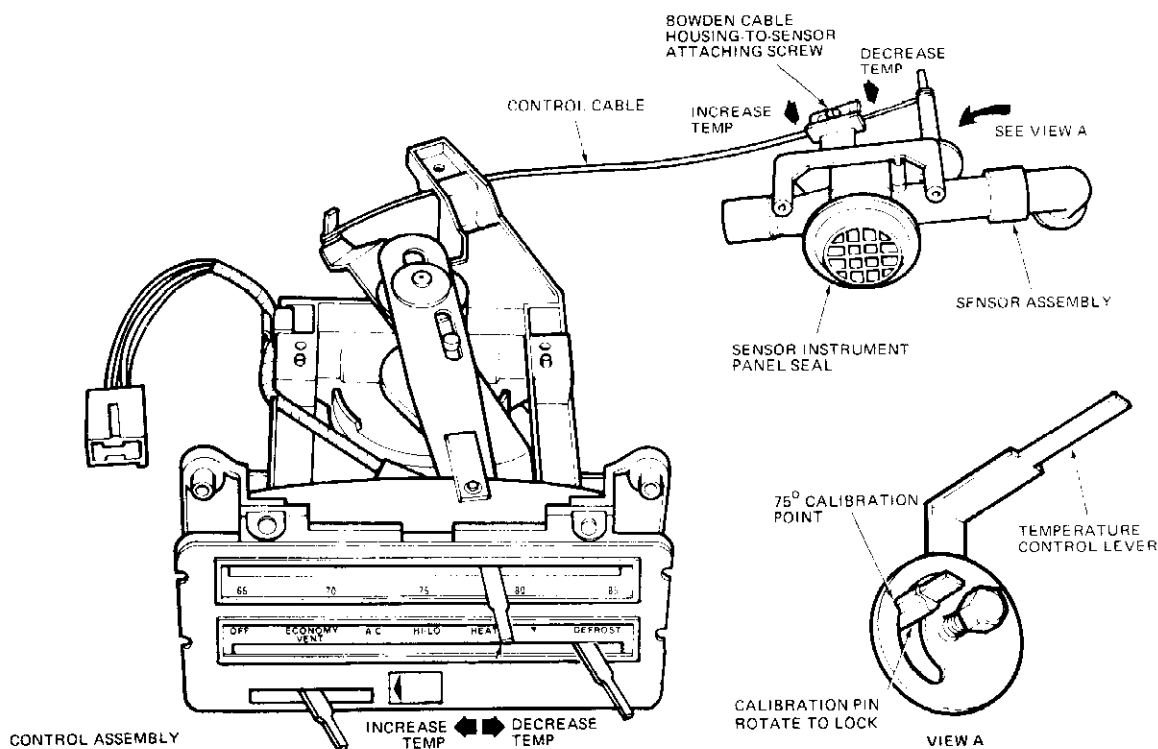
FIG. 10 ATC Control Head, Top View

operates in this position to dehumidify the air and reduce windshield fogging when the outside temperature is warm enough to close the ambient cut-off switch.

ADJUSTMENTS

SENSOR CALIBRATION (FIG. 13)

1. Remove the instrument panel pad (right-hand applique on the Continental Mark V) and visually determine which direction to rotate the sensor calibration locking pin. Loosen the sensor and bracket from the instrument panel on the Continental Mark V.
2. While moving the temperature control lever, rotate the calibration locking pin into the 75°F calibration notch of the sensor control arm.
3. Check the position of the temperature control lever, it should be at 75. If it is not, loosen the bowden cable housing-to-sensor attaching screw and move the temperature control lever to 75 while the sensor control arm is locked in the calibration position. Retighten the bowden cable housing-to-sensor attaching screw, making sure the temperature control stays at 75 and the sensor arm stays locked.



K 3494-2B

FIG. 11 A.T.C. System Temperature Calibration
READJUSTING CALIBRATION POINT

If it should become necessary to change the calibration point to suit a customer, first check the sensor calibration as described in the above procedure. If OK, use the following procedure:

1. Establish the customers preference and the difference between the present and desired comfort level setting.
2. Determine the direction of change.
3. To decrease or increase, adjust the temperature control lever position with the sensor arm locked in

the 75°F. calibration notch. Loosen the bowden cable housing-to-sensor attaching screw, move the temperature control lever the desired amount and retighten the attaching screw.

NOTE: Move the temperature control lever HIGHER to DECREASE and LOWER to INCREASE the controlled temperature at a given setting.

CAUTION: If a readjustment of the temperature control lever of more than 4°F. is required, and the cable adjustment is correct, per Sensor Calibration Procedure above, replace the sensor assembly.

REMOVAL AND INSTALLATION

SENSOR ASSEMBLY

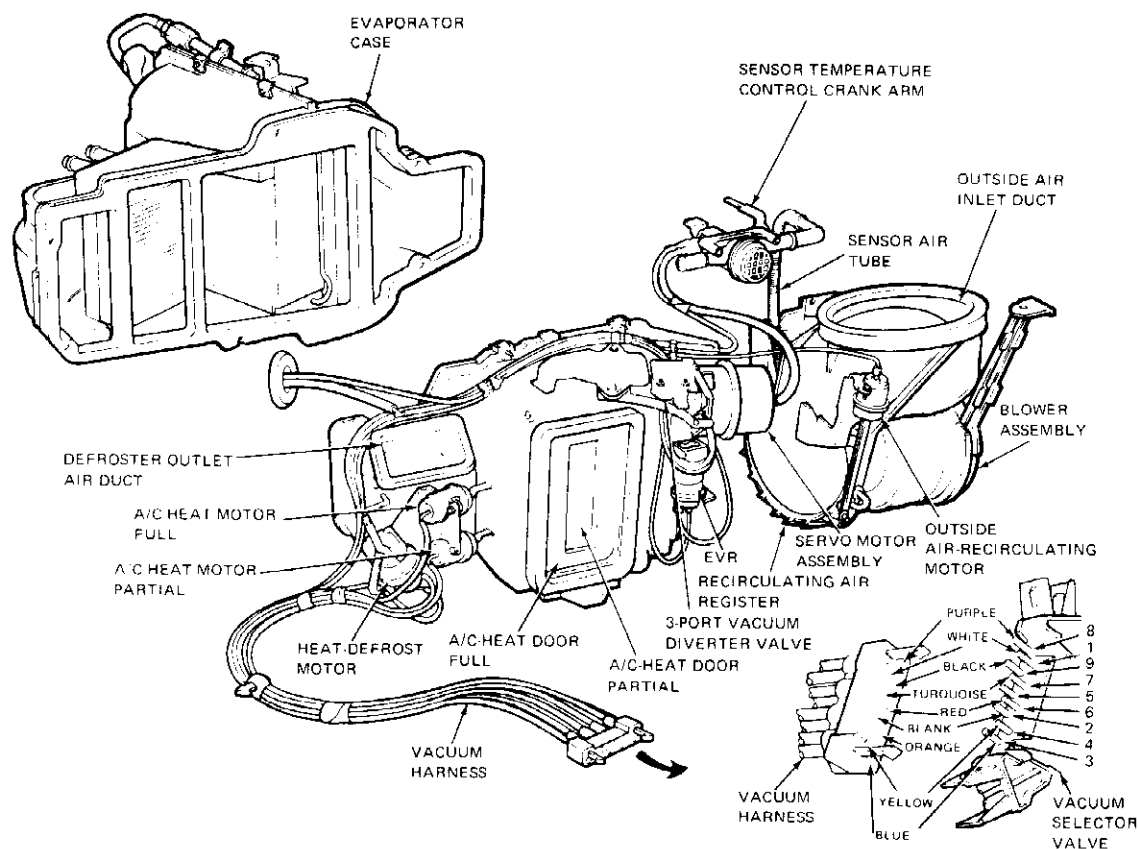
Remove the instrument panel pad to gain access to the sensor assembly on the LTD II, Cougar, and Thunderbird and the right hand instrument panel applique on the Continental Mark V. Carefully disconnect the inlet air elbow, the vacuum connector and control cable. Remove two (2) mounting screws, and remove the sensor (sensor and bracket on Mark V). On Mark V, disconnect the control cable **after** removing the sensor and bracket.

To install, rotate the sensor control arm to the mid position and turn the plastic calibration pin to the locked 75°F. position. Install the sensor, connect the inlet air elbow and vacuum connector. Connect the control cable to sensor control arm and adjust cable with reference

to Sensor Calibration Procedure in Section VI. On Continental Mark V, connect and adjust the cable before mounting the sensor and bracket to the instrument panel.

ELECTRO VACUUM RELAY (EVR)

1. The EVR is located on the plenum assembly below the servo motor. See Fig. 12.
2. Remove EVR mounting screw from bracket on plenum assembly.
3. Disconnect the vacuum connector and electrical connector. Carefully exert outward pressure on the two locking tabs on the connector to remove connector.
4. Reverse this procedure to install.



K3493-2A

FIG. 12 ATC Vacuum System Locations

SERVO ASSEMBLY

1. Remove the ATC plenum.
2. Remove tan hose from servo motor.
3. Remove one (1) retaining nut and remove vacuum multiple connector from diverter valve.
4. Remove cover plate (2 screws) over temperature blend door crank arm.
5. Remove retainer from temperature blend door crank arm. Avoid bending the crank arm.
6. Remove two (2) servo mounting screws, remove the servo arm and tension spring from the temperature blend door crank arm and remove the servo assembly.
7. Install a new servo assembly by reversing the above procedure.

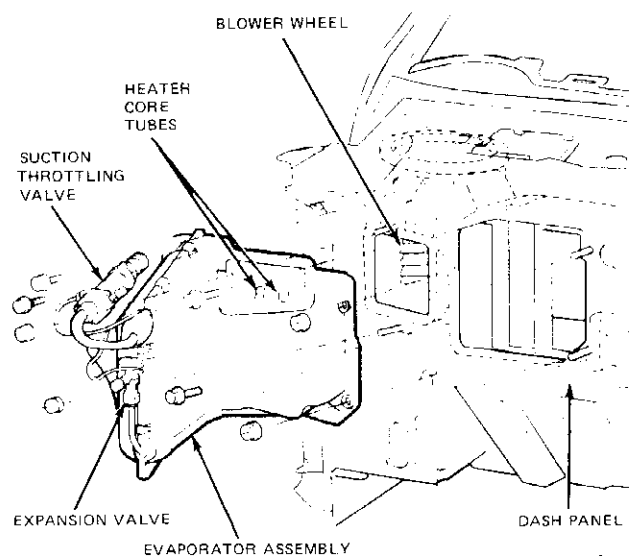
CONTROL HEAD ASSEMBLY

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 head (1 screw).
5. Disconnect multiple vacuum harness connector from the 9-port vacuum selector valve.
6. Disconnect electrical wiring connectors from blower switch, override switch, selector switch, illumination bulb and rear defogger switch.

7. Reverse the above procedure to install and check the temperature control cable adjustment using Sensor Calibration Procedure in Section VI, Paragraph 3. Adjust if required.

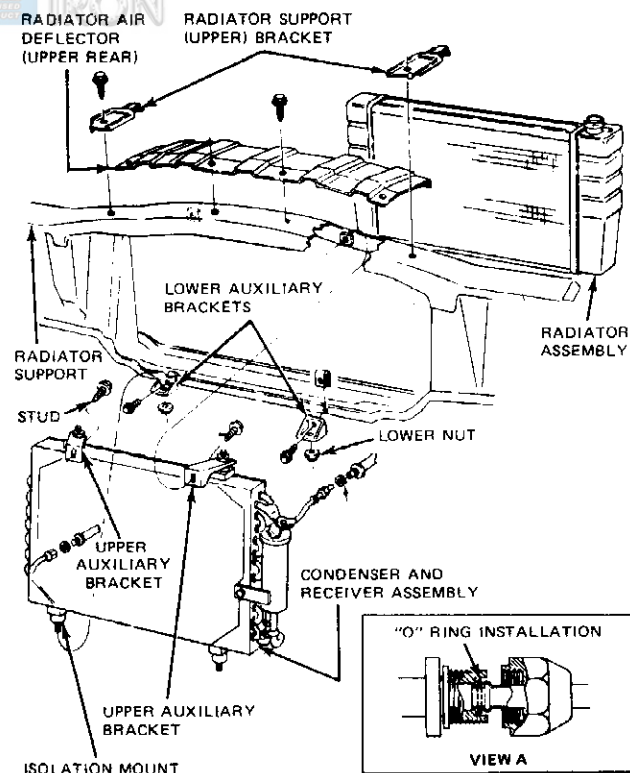
RESISTOR ASSEMBLY

1. Disconnect the electrical connector.
2. Remove the resistor assembly from the evaporator assembly (Fig. 13). To install, reverse the above procedure.



L2352-1A

FIG. 13 Evaporator Assembly Installation



L2354-1A

FIG. 14 Condenser Installation—Continental Mark V

SPECIFICATIONS

Refrigerant Capacity: $4\frac{1}{2}$ lbs; + $\frac{1}{4}$ lbs, — 0 lbs.

Protective Device: - 20 amp fuse in clutch circuit;
30 amp fuse in blower circuit.

Control Illumination - one ICP-161 bulb.

Blower Motor Current (Amps) and Voltage:

Low - 6 amps - 5 volts

Medium Low - 10 amps - 7 volts

Medium High - 17 amps - 10 volts

High - 25 amps - 12.4 volts

Compressor - Mark V:

Type - Swash Plate - Three double acting pistons
- axial type

Cylinder Bore - 1-1/2 inches

Stroke - 1-3/16 inches

Displacement - 12.6 cubic inches

Rotation - Clockwise

Type of Oil - TL4538 Texaco 525 Viscosity

CONDENSER (FIG. 14)

1. The Continental Mark V condenser is serviced by removing the plastic shield (four screws), the upper radiator mounts (2 screws), the upper condenser mounting brackets at radiator support (2 screws), the upper condenser brackets and mounts (2 nuts), the liquid line to condenser bracket (1 screw), and the liquid and discharge lines.
2. 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.

Refrigeration Oil or equivalent

Oil Capacity - 10-1/2 ounces (Ford Part No. D1VY-19577-A)

Clutch - Magnetic - Approximately 3.44 amps @ 12.8 volts

Compressor - LTD II, Thunderbird and Cougar

Displacement - 10.3 cubic inch (York and Tecumseh)

Oil Capacity - York - 10 oz.

Tecumseh - 11 oz.

Oil Specification - ESA -M2C31-A (Ford Part No. C9AZ-19577-A)

Clutch - Magnetic - Approximately 3.75 amps @ 12.8 volts

Compressor Drive Belt Tension

New: 120 to 160 lbs.

Used: 75 to 120 lbs. (after operation for 10 minutes or more)

Rear Window Defogger

**PART
36-80**

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	80-1	REMOVAL AND INSTALLATION (Cont'd.)	
REMOVAL AND INSTALLATION		Defogger Switch	80-1
Defogger Motor	80-1	SPECIFICATIONS	80-3

CK3428-2B

DESCRIPTION AND OPERATION

The rear window defogger is an integral unit and is located in the center of the package tray (Fig. 1). Inside air is drawn into the defogger assembly through the front part of the grille and is discharged towards the rear window through the rear part of the grille. The two-speed defogger blower switch is located next to the heater or heater-air conditioner blower switch on the instrument panel.

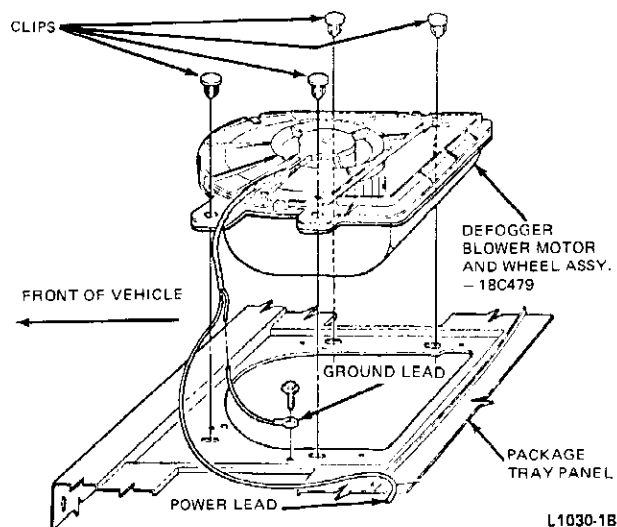


FIG. 1 Defogger Motor Installation (Ford Shown)

REMOVAL AND INSTALLATION

DEFOGGER MOTOR

1. From inside the luggage compartment, disconnect the motor power lead.
2. Remove the defogger grille which retains the defogger assembly (Fig. 2 or 3) by removing either 4 twist lock clips or 4 retaining nuts located beneath the package tray (inside the luggage compartment).
3. Lift the defogger from the package tray support, remove the ground wire retaining screw, and remove the assembly.
4. Motors are not serviced separately. Complete blower packages are supplied incorporating balanced motor and wheel assemblies.

DEFOGGER SWITCH

To replace the defogger switch, separate the control assembly from the instrument panel, as outlined in the respective vehicle section. Then, remove the switch from the control assembly.

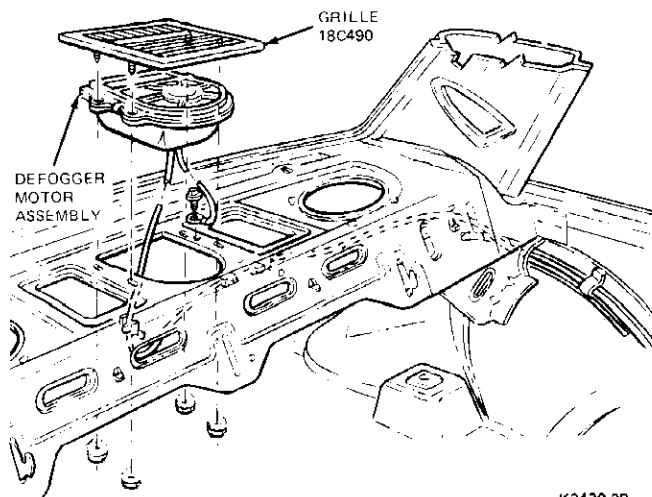


FIG. 2 Rear Window Defogger—Fairmont and Zephyr

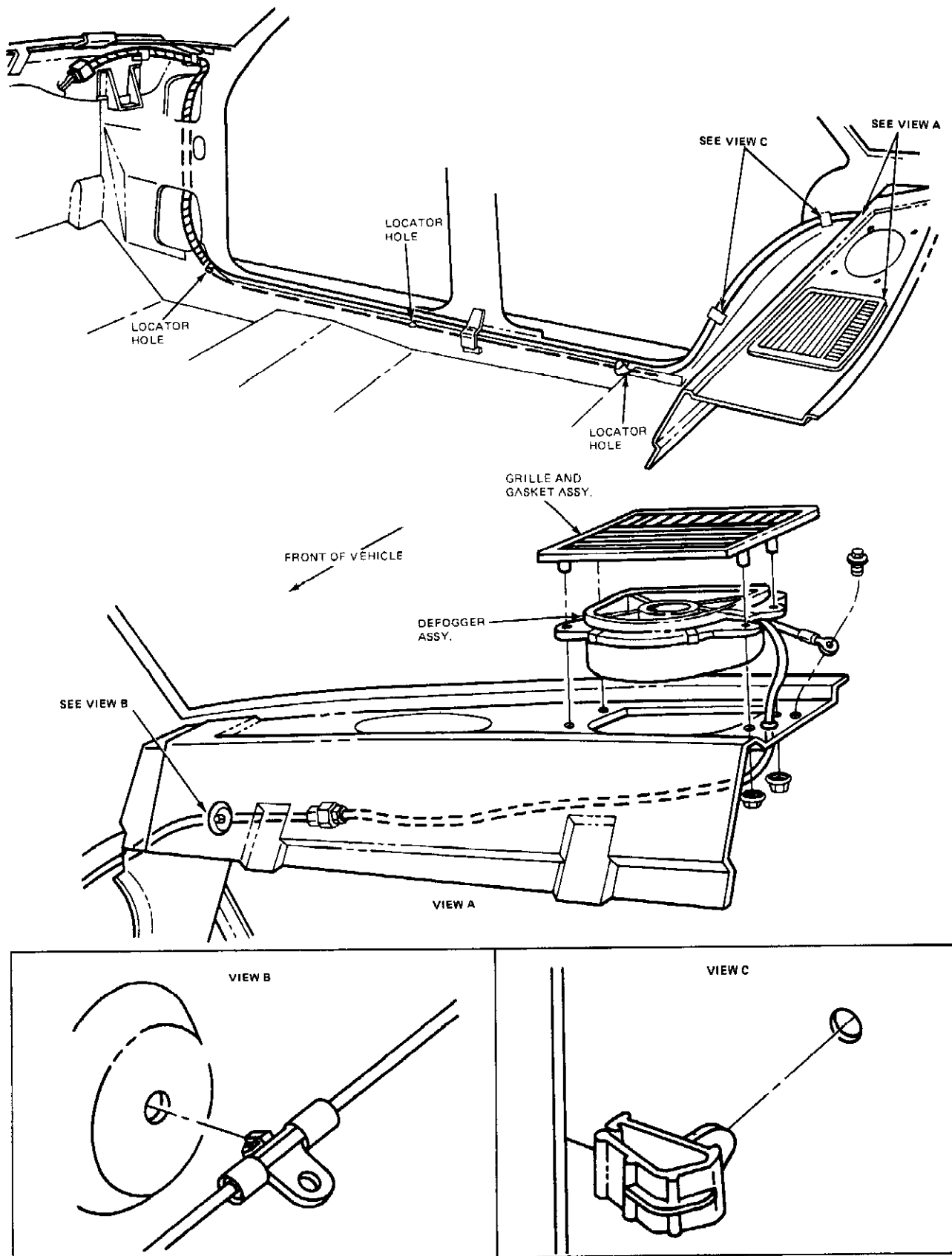


FIG. 3 Rear Window Defogger—Granada and Monarch

SPECIFICATIONS

DEFOGGER BLOWER MOTOR

Speed	Voltage	Maximum Amps
High	12.8	1.8
Low	6.4	—

CK3432-2A

Heated Rear Window System

PART
36-86

All Models

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REMOVAL AND INSTALLATION	
General	86-1	Control Switch	86-3
Latching Relay System	86-1	Heated Rear Window	86-3
TESTING		Relay	86-3
Back Window Grid Wire Test	86-2	MAJOR REPAIR OPERATIONS	
Control Switch Continuity Test	86-3	Lead Wire Repair	86-4
Relay Tests	86-3	Rear Window Grid Wire Repair	86-4

CK3429-2B

DESCRIPTION AND OPERATION

GENERAL

The heated back window system consists of a control switch, a relay, and a series of grid wires baked on the inside surface of the back window.

When the switch is moved to the ON position, current is directed through the relay to the grid wires on the rear window. The heated grid wires keep the rear window clear of fog or ice.

All systems are basically the same, using a latching relay system.

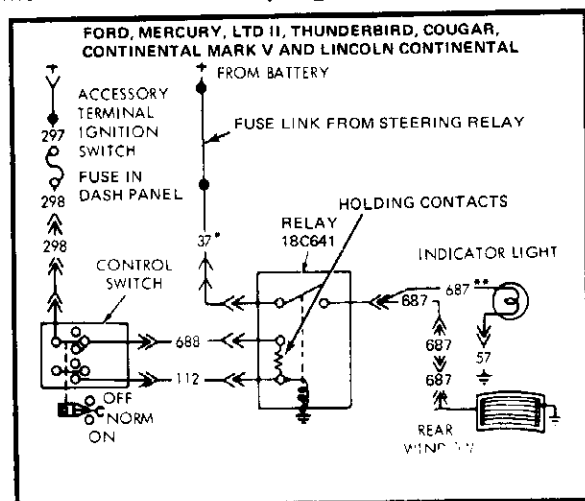
LATCHING RELAY SYSTEM

Power for the relay coil comes from the accessory terminal of the ignition switch to the heated rear window control switch. This power is available whenever the ignition switch is in the Run or Accessory positions.

The heated rear window control switch is a three-position switch which is spring-loaded to return from

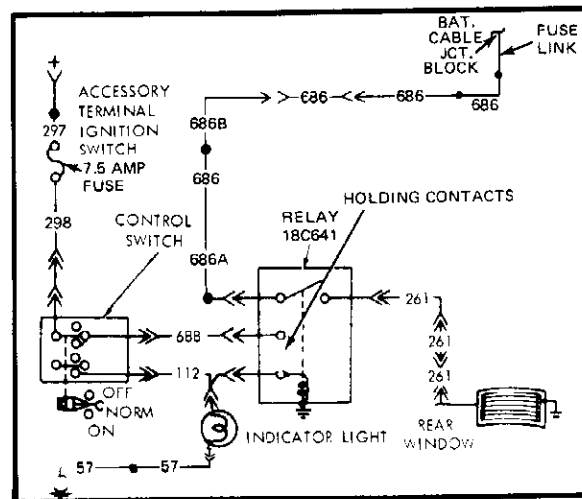
ON or OFF to its CENTER or NORMAL position. In the NORMAL position, the switch connects power from the ignition switch through wire 688 to the internal holding contacts in series with the relay coil (Fig. 1). As soon as the switch is moved to ON position, it also connects power to energize the relay coil, thereby causing the normally open relay load contacts and holding contacts to close and provide power to the warning indicator lamp in the instrument panel and the rear window grid wires. Even after current is cut off by the spring-loaded switch returning to the NORMAL position, current is provided to the relay coil through the holding contacts (Wire 688) to maintain the relay coil energized and the relay contacts closed. In this way, the warning indicator lamp and the rear window grid wires will continue to receive power.

The relay is called a latching relay because it turns on and remains latched with only a momentary application of a control signal.



*37 IS 686 FOR LINCOLN CONTINENTAL
**687 IS 186 FOR LINCOLN CONTINENTAL

LATCHING RELAY SYSTEM



L1607-2H

FIG. 1 Heated Rear Window Wiring Diagram

TESTING

BACK WINDOW GRID WIRE TEST

1. Using a strong light inside the vehicle, visually inspect the wire grid from the outside (Fig. 3). A broken grid wire will appear as a brown spot.
2. Run the engine at idle. Set the control switch to ON. The indicator lamp should come on.
3. Working inside the car with a 12-volt DC voltmeter, contact the broad red-brown strips on the back window. The meter should read 10-13 volts. A lower voltage reading indicates a loose ground wire (pigtail) connection at the ground side of the glass.
4. Contact a good ground point with the negative lead of the meter. The voltage reading should not change.
5. With the negative lead of the meter grounded, touch each grid line of the heated back window at its mid-point with the positive lead. A reading of approximately 6 volts indicates that the line is good. A reading of 0 volts indicates that the line is broken between the mid-point and the side of the line. A reading of 12 volts indicates that the circuit is broken between the mid-point of the grid line and ground.

In the latter case, either the grid line would be broken between the mid-point and the passenger side, or the ground wire (pigtail) connection at the passenger end of the glass would be loose (Fig. 3).

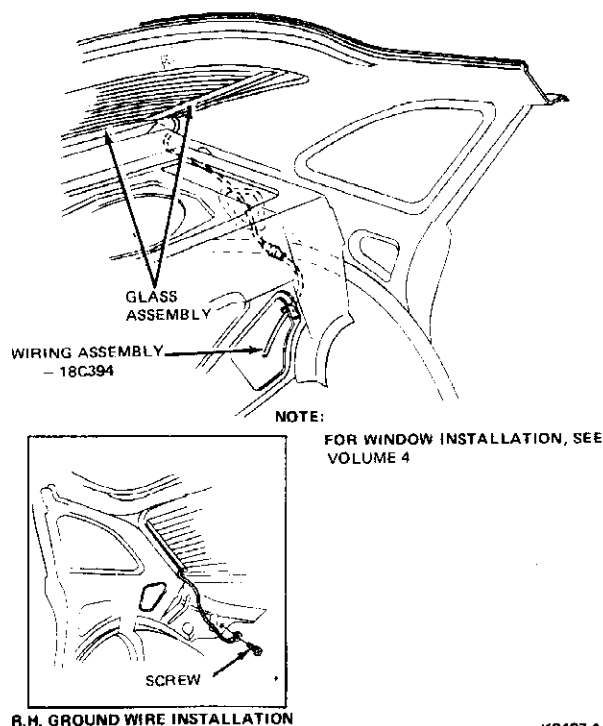
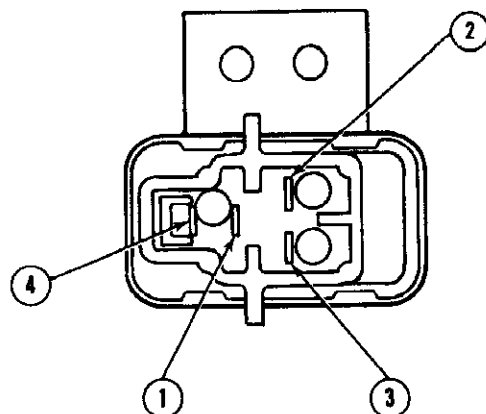
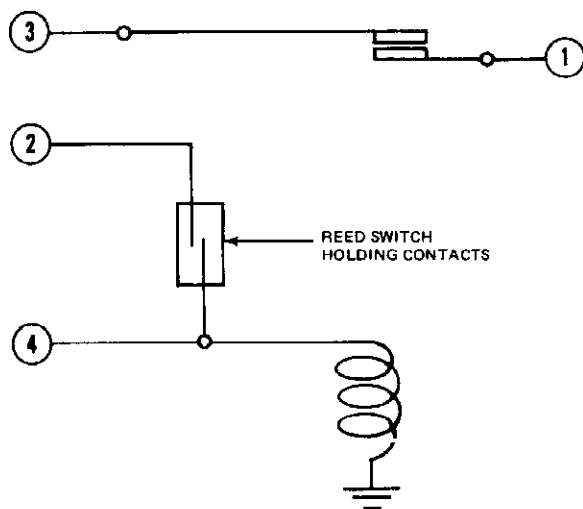


FIG. 3 Typical Heated Rear Window System—Thunderbird, LTD II and Cougar Shown



L1629-2D

FIG. 2 Latching Relay Test

RELAY TESTS

LATCHING RELAY

1. Ground the relay case and connect a jumper wire between pins 1 and 2 (Fig. 2). Connect a 12 V test lamp between pin 3 and ground.
2. Apply power to pin 2. The test lamp should not light.
3. Momentarily short pins 2 and 4. The test lamp should come on and stay on after the short is removed.

REMOVAL AND INSTALLATION

RELAY

To remove the relay, remove the attaching screw and lower the relay from its mounting. Disconnect the wires from the relay and remove the unit from the vehicle.

The locations of the relays on the various car lines are as follows:

FORD, AND MERCURY

The relay is mounted on a bracket under the lower edge of the instrument panel at the left side.

COUGAR, THUNDERBIRD AND LTD II

The relay bracket is mounted on the instrument panel left end panel above the headlamp switch. The instrument panel pad must be removed for access to the relay.

PINTO AND BOBCAT

The relay is mounted on the upper portion of the instrument panel to the right hand side above the glove box.

MUSTANG

The relay is mounted onto a brace between the steering column Y-brace and the left-hand cowl side panel under the instrument panel.

CONTINENTAL MARK V

The relay is mounted under the instrument panel onto a brace which is alongside the brake pedal support bracket.

LINCOLN CONTINENTAL

The relay is mounted to a bracket under the instrument panel between the glove box and ash tray.

GRANADA, MONARCH AND VERSAILLES

The relay is attached to the right-hand lower reinforcement, near the instrument panel.

FAIRMONT AND ZEPHYR

The relay is mounted on the relay mounting bracket above the glove box (must be removed for service).

CONTROL SWITCH

FORD MERCURY

Remove the knob from the heated rear window control switch lever. Remove the ash tray and ash tray

CONTROL SWITCH CONTINUITY TEST

For each of the switch positions, there should be continuity between the terminals as follows: Normal position—continuity between 2 terminals; ON position—continuity between all terminals; and OFF position—no continuity between any terminals.

retainer. From beneath the instrument panel, remove the screw retaining the switch to the mounting bracket. Pull the switch away from the instrument panel. Disconnect the multiple connector from the switch and remove the switch.

PINTO AND BOBCAT

The lever-type switch is located on the lower edge of the instrument panel to the left of the steering column. To replace the switch, loosen the knob set screw and remove the knob. Then, take out the two attaching screws, disconnect the connector, and remove the switch.

LTD II, COUGAR, THUNDERBIRD, CONTINENTAL MARK V, GRANADA, MONARCH, VERSAILLES, FAIRMONT AND ZEPHYR

The sliding lever type switch is mounted on the lower right hand corner of the heater or A/C control assembly. To replace the switch, first remove the control assembly as outlined in the pertinent Shop Manual Part.

With the control head dismounted from the instrument panel, remove the switch-to-control head mounting screw, disconnect the wiring connector and remove the heated back window switch.

LINCOLN CONTINENTAL

Remove the map lamp housing from the instrument panel (3 retaining screws). Disconnect the multiple connector from the heated rear window control switch. Depress the two switch retaining clips, and pull the switch from the map lamp housing (Fig. 3).

Snap the new switch into the map lamp housing. Connect the wiring connector to the switch, and install the map lamp housing to the instrument panel.

HEATED REAR WINDOW

Disconnect the wire leads at each end of the glass. Remove the window as outlined in Part 43-16.

MAJOR REPAIR OPERATIONS

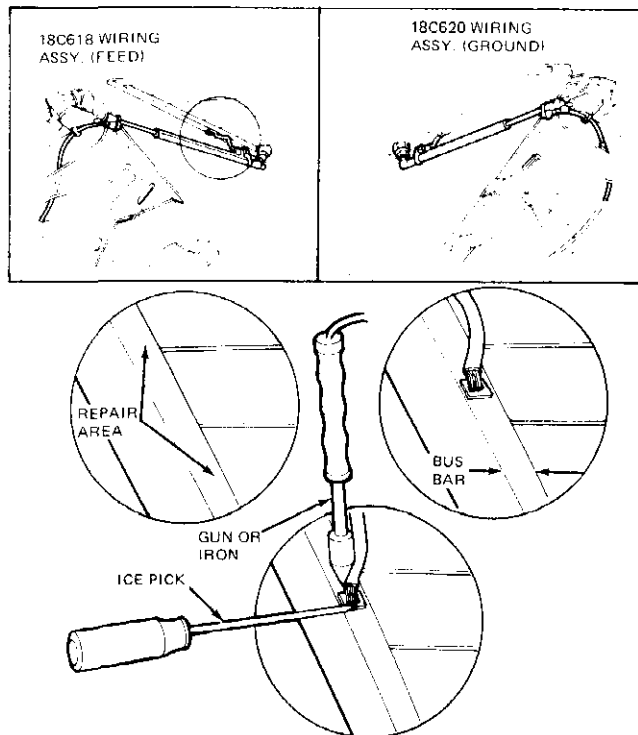
REAR WINDOW GRID WIRE REPAIR

Any break in the line longer than one inch cannot be repaired. The back window must be replaced. For breaks less than one inch long use the following procedure:

1. Mark the location of the break on the outside of the window.
2. Using fine steel wool, lightly rub the line inside the repair area. Then, clean the repair area with alcohol.
3. Apply a two inch long strip of cellulose tape on each side of the broken line and parallel to it. The break in the line should be at the center of the tape, and the gap between the tape strips should be only as wide as the line.
4. Mix the repair coating (ECCOCOAT CC-2 or equivalent) until it is of uniform consistency with the silver particles mixed throughout the fluid and apply it to the break with a small brush. Apply a heavy coat extending approximately 1/4 inch on either side of the break.
5. Allow the coating to dry at least 30 minutes, then apply a second heavy coat extending about 1/4 inch on either side of the break.
6. Allow to dry for three or four hours, then remove the tape. **Do not scour or clean the area with alcohol, highly abrasive materials or sharp instruments. After 24 hours, the repaired area may be cleaned with a mild window cleaner.**
7. Test the back window grid wire, as described under Testing.

LEAD WIRE REPAIR—PINTO AND BOBCAT ONLY (Fig. 4)

1. Allow the back window to warm up to room temperature for a half hour to an hour.
2. Clean the bus bar in the area to be repaired using fine steel wool (3/0 to 4/0 grade).
3. Restore the area where the bus bar terminal was originally attached by applying three coats of Eccocoat CC-2 or equivalent. Allow approximately ten minutes drying time between coats.
4. Working as quickly as possible to avoid overheating the glass, tin the bus bar with solder in the area where the terminal will be re-attached.



L2447-1A

FIG. 4 Heated Back Window Repair

5. Using a heat gun or heat lamp, pre-heat the glass in the solder area to 120°-150°F just prior to soldering the terminal on.
6. Position the terminal on the bus bar in the area that was tinned and hold it in place with an ice pick or screwdriver.
7. Apply soldering heat to the pad of the terminal until the solder flows. **NOTE:** To avoid damaging the bus bar, remove the soldering gun or iron as soon as the solder flows.
8. Start the vehicle, turn the heated back window on and leave it on for 5 minutes. Inspect the terminal and apply Eccocoat CC-2 or equivalent to the required area.

SPEED CONTROL

GROUP
37

PART TITLE	PART NO.	PART TITLE	PART NO.
Speed Control System	37-01	Sure-Track Brake System	37-20

CL2307-2B

Speed Control System

PART
37-01

Applies to All Except Pinto, Bobcat, and Mustang II

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		TESTING (Cont'd.)	
Decreasing Set Speed	01-2	Simulated Road Test	01-21
Increasing Set Speed	01-2	Speed Sensor Test	01-8
Speed Control System	01-1	Supply Circuit Test	01-21
		Visual Inspection	01-8
DIAGNOSIS	01-3		
TESTING		ADJUSTMENTS	
Amplifier Test	01-8	Linkage Adjustment	01-22
Brake Stoplamp Switch and Circuit Test	01-21		
Coast Circuit Test	01-21	REMOVAL AND INSTALLATION	
Control Switches Test	01-8	Amplifier Assembly	01-23
Horn Relay Circuit Test	01-21	Control Switches	01-22
OFF Circuit Test	01-8	Ground Brush	01-22
ON Circuit Test	01-8	Servo Assembly (Throttle Actuator)	01-23
Servo Assembly Test	01-8	Speed Sensor	01-23
Set Accelerate Test	01-21	Vacuum Reservoir	01-23

CL2308-2B

DESCRIPTION AND OPERATION

SPEED CONTROL

The speed control system is composed of the **OFF-ON** switch and the **SET-ACC** and **COAST** switches, a servo (throttle actuator) assembly, a speed sensor, an amplifier assembly and the necessary wires, check valve assembly, vacuum reserve tank and vacuum hose to connect the components. The switches are located in the steering wheel spokes. The amplifier assembly is located under the instrument panel. The servo assembly (throttle actuator) is mounted in the engine compartment and connects to the throttle linkage with a bead chain. The speed control sensor is located in the engine compartment on Continental Mark V and Lincoln

Continental. The sensor is located in the passenger compartment on Ford, Mercury, LTD II, Thunderbird, Ranchero, Granada, Monarch and Cougar XR-7 vehicles. The vacuum reservoir is located near the left or right fender apron. To operate the speed control system the engine must be running and the vehicle speed above 30 mph. Manifold vacuum is constantly supplied when the engine is running. When the on/off switch in the steering wheel is actuated to the **ON position the system is made ready to accept a set speed signal**. When the vehicle has been accelerated and stabilized at a speed over 30 mph and the **ON switch engaged, the operator may quickly depress and release the set/accelerate button. This speed**

will be maintained until a new speed is set by the operator, the brake pedal is depressed, or the system is turned OFF.

DECREASING SET SPEED

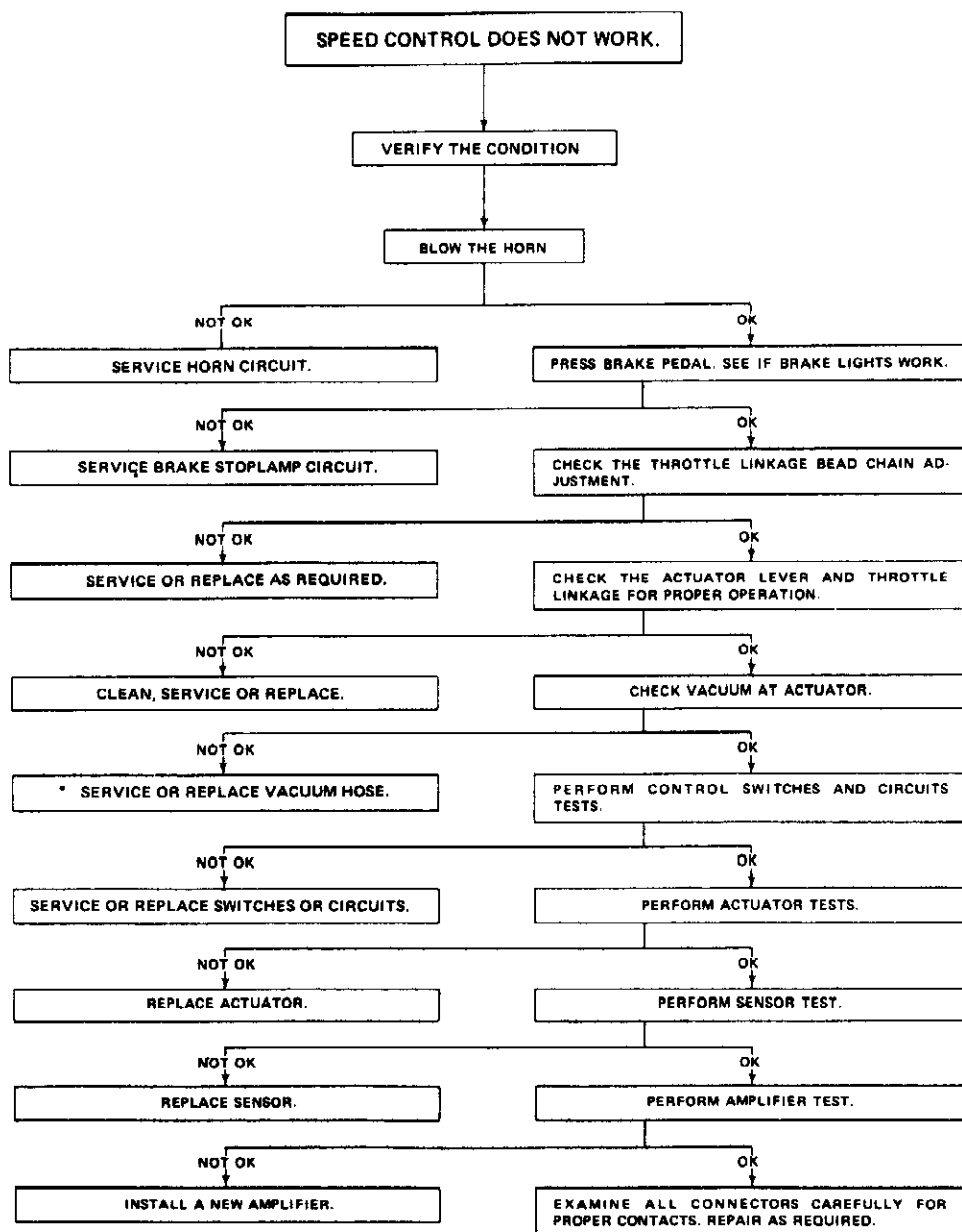
The vehicle speed may be reduced by applying the brake and then resetting the speed using the foregoing method or by depressing the coast switch. When the vehicle has slowed to the desired speed the coast switch is released and the new speed is set automatically. If the vehicle speed is reduced below 30 mph, the operator must manually increase the speed and reset the system.

INCREASING SET SPEED

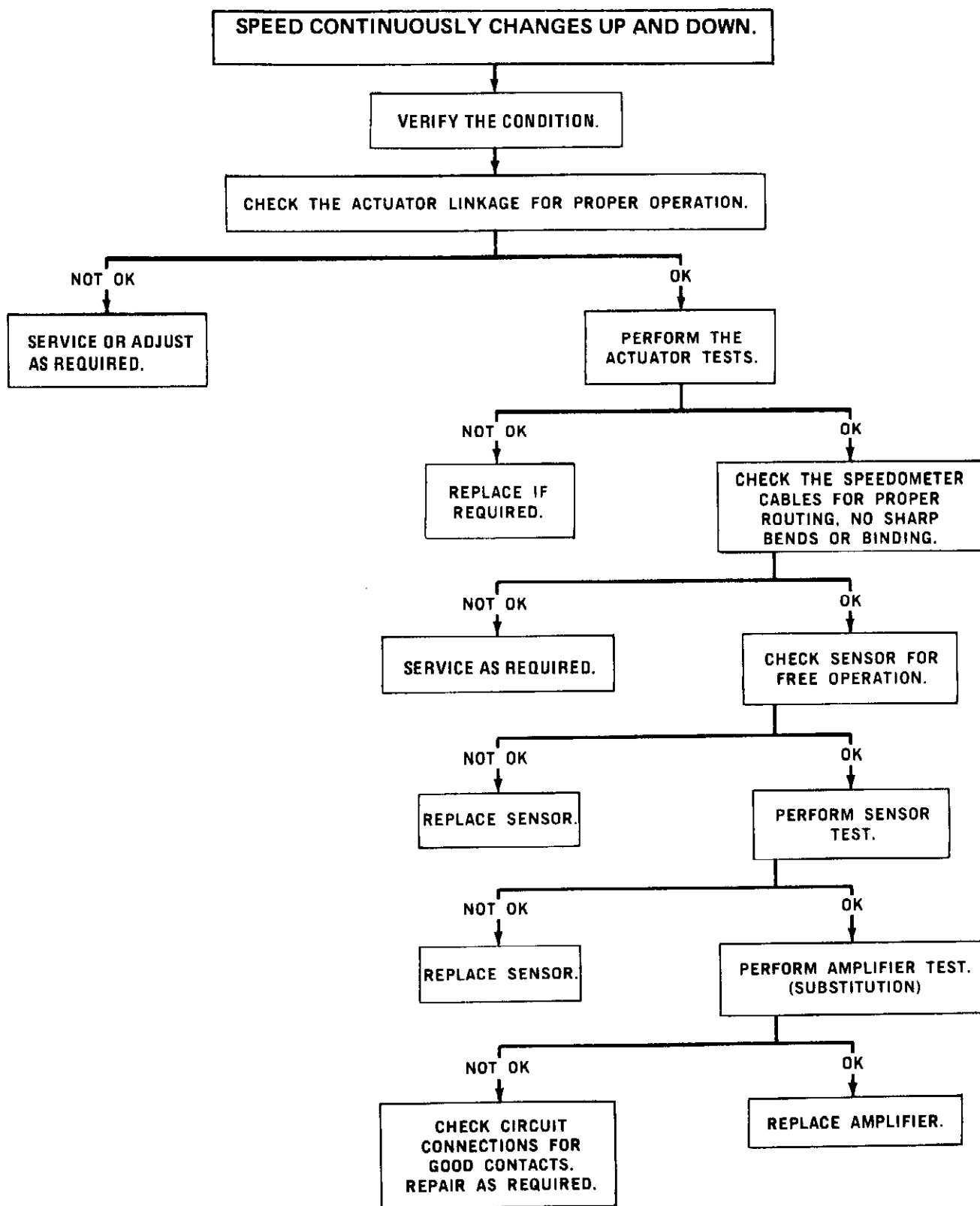
The vehicle set speed may be increased at any time by depressing the accelerator until the higher speed is reached and stabilized, then depressing and releasing the set speed button.

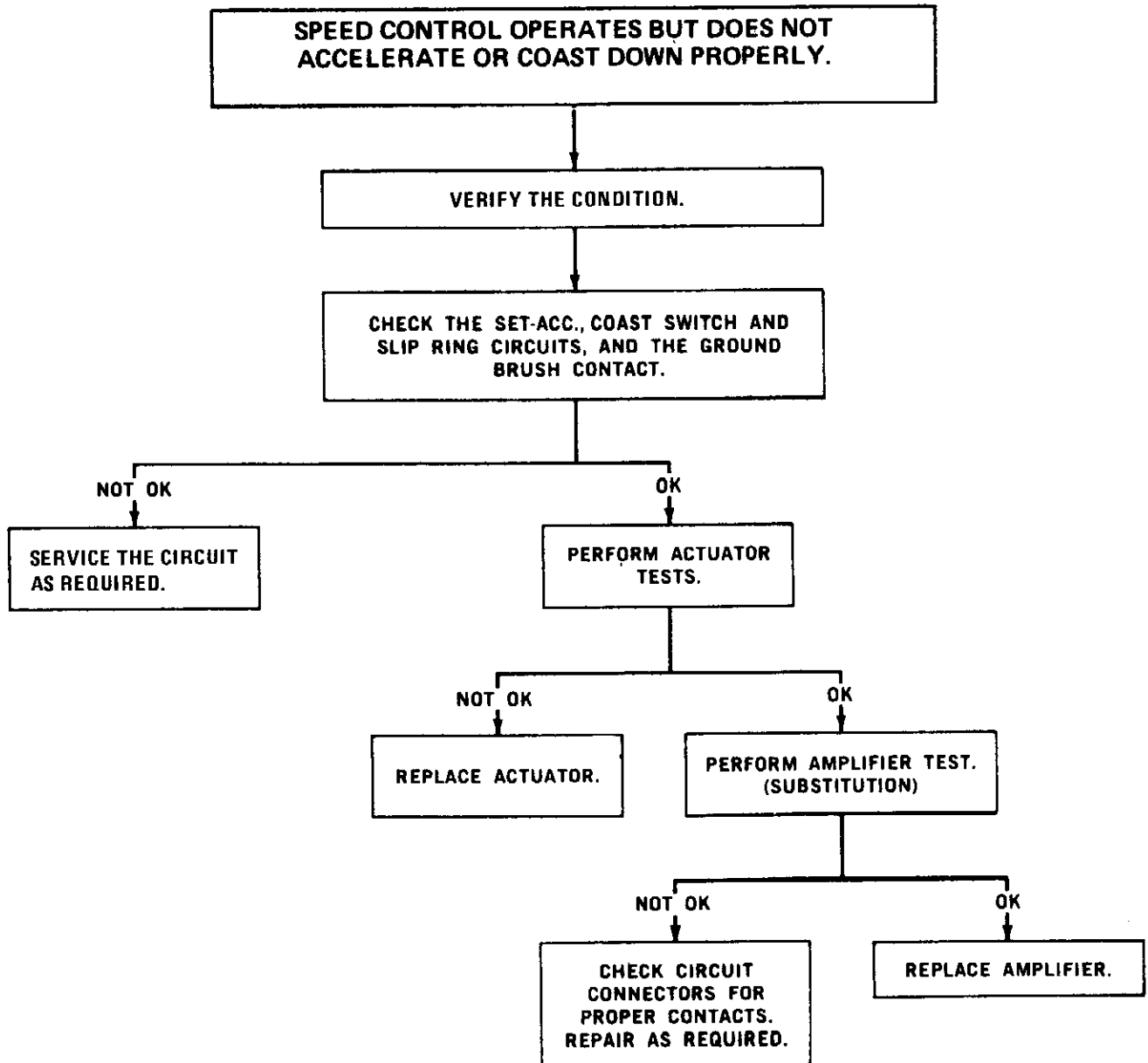
Speed may also be increased by depressing the set/accelerate switch button (at speeds over 30 mph) and holding it in that position. The vehicle will then automatically increase speed. When the desired rate of speed is attained and the button is released, that new set speed will be maintained.

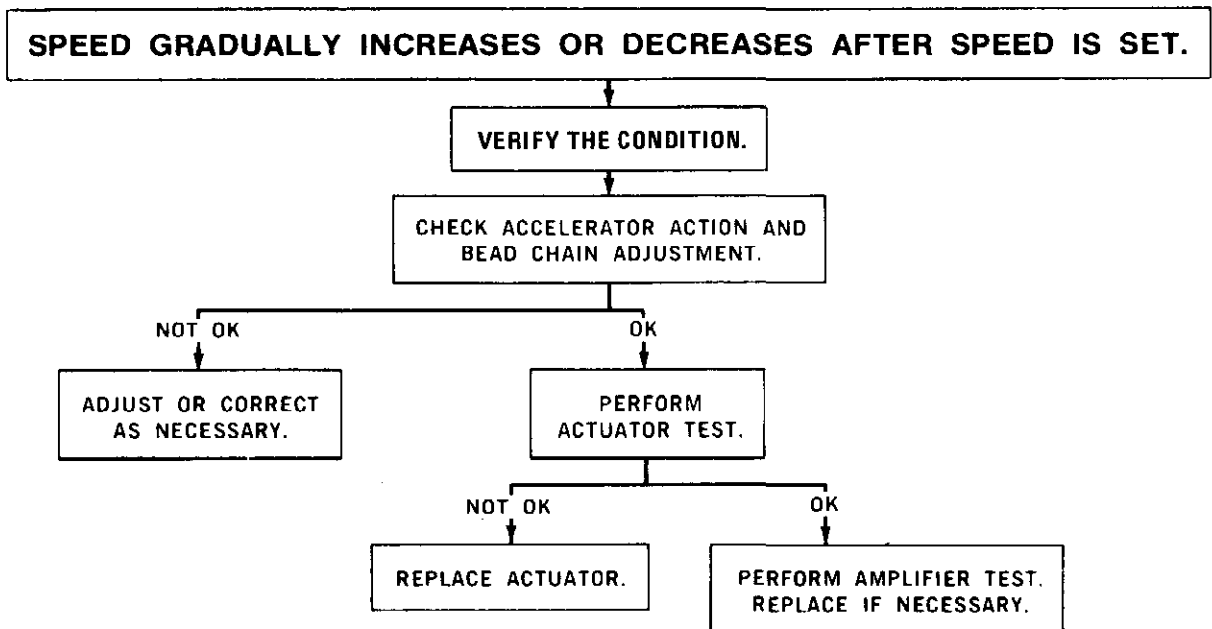
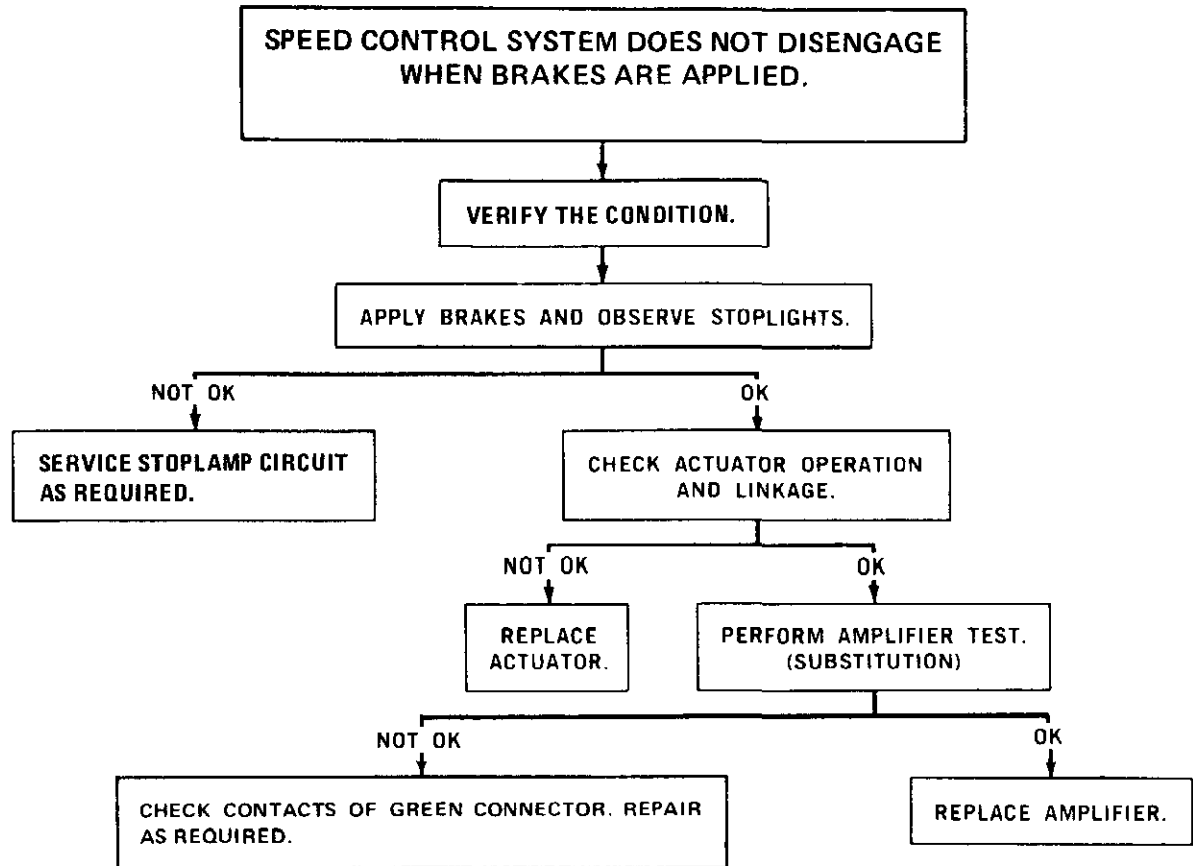
DIAGNOSIS

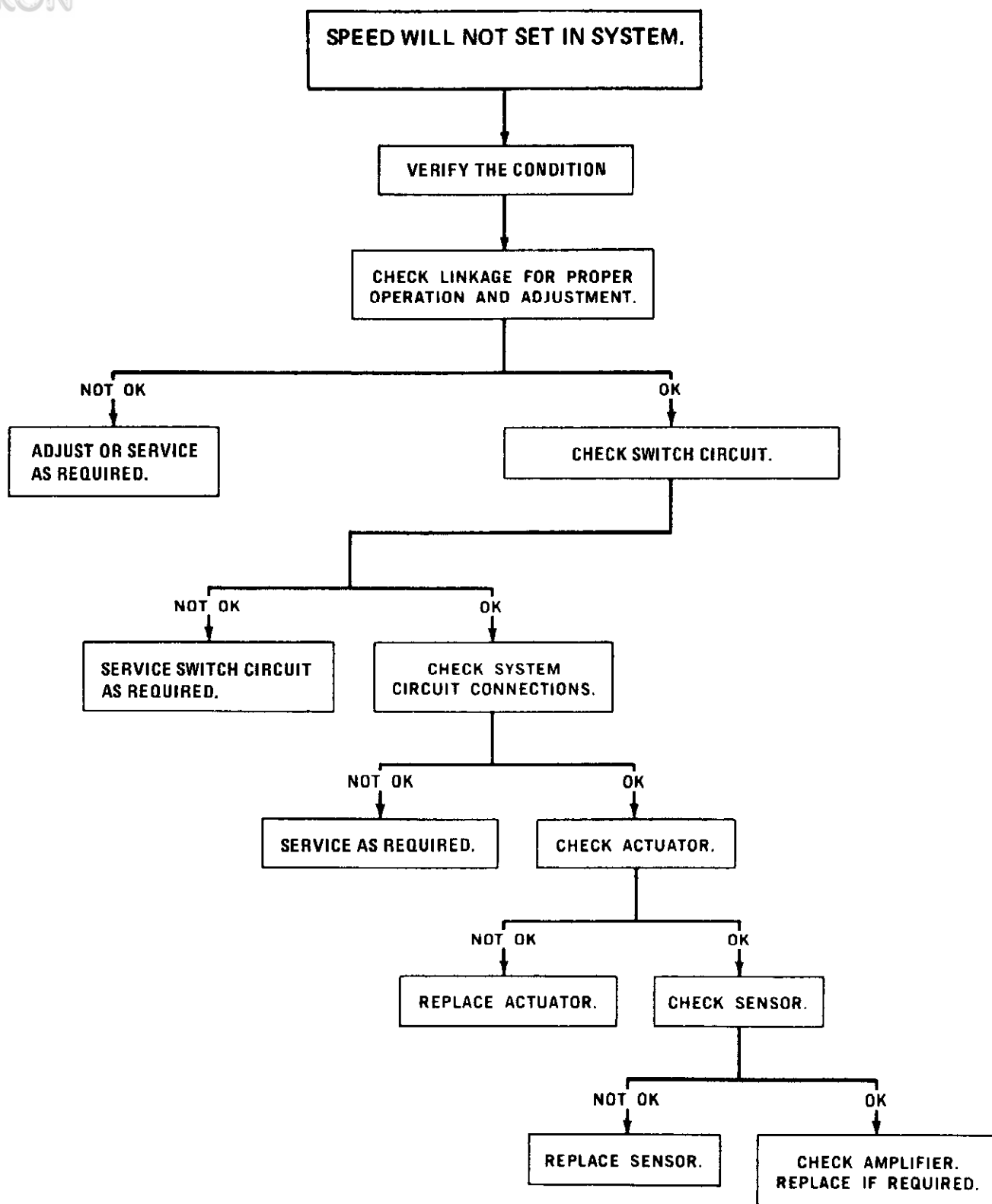


CL2317-2C









CL2321-2C

TESTING

Speed control system tests should be performed using the Tester ARE-22015. If the ARE-22015 Tester is not available, use the following procedures.

VISUAL INSPECTION

A visual inspection is an important part of the system test. When performing a visual inspection, check all items for abnormal conditions such as bare, broken or disconnected wires and damaged vacuum reserve tanks and hoses. For the speed control system to function properly, it is necessary that the speedometer cables be properly routed and securely attached. All vacuum hoses must be securely attached and routed with no sharp bends or kinks. The servo (throttle actuator) and throttle linkage should operate freely and smoothly. **The bead chain should have no more than 1/4 inch free play. Electrical connections must be complete and tight. The wiring harness must be properly routed. Look for damaged wiring insulation or evidence of shorts.** Any problems revealed by the visual inspection should be corrected before further tests of the speed control system are made.

CONTROL SWITCHES TEST

Disconnect the 6 way connector at the amplifier assembly. See Figs. 1 through 12 and perform the following checks:

1. Connect a voltmeter between the Light Blue-Black Hash lead and ground. Depress the "ON" button and check for battery voltage.
2. Turn off key and connect an ohmmeter between the Light Blue-Black Hash lead and ground.
3. Rotate the steering wheel throughout its full range while making the following checks:
 - a. Depress the "OFF" button and check for a reading between 0 and 1 ohm.
 - b. Depress the "SET" button and check for a reading between 714 and 646 ohms.
 - c. Depress the "COAST" button and check for a reading between 126 and 114 ohms.

If resistance values are within specification, but needle fluctuates, remove the steering wheel and clean the ground brush contact surfaces and the turn signal brush contact surfaces.

If resistance values are above the allowable limits, check the switch assemblies and ground circuit in the steering column.

SPEED SENSOR TEST

Connect the 6 way connector at the amplifier assembly, Figs. 1 through 5 and connect an ohmmeter between the wire connector terminals (Dark Green-White Stripe and Black) at the speed sensor end. A reading of approximately 40 ohms should be obtained. A reading of 0 ohms indicates a shorted coil and a maximum reading indicates an open coil. Replace the sensor in either case.

If the ohmmeter records 40 ohms and the speedometer operates properly within needle waver,

the speed sensor is probably good. A speed sensor of known good quality can also be substituted in place of the existing sensor to check for proper operation.

SERVO ASSEMBLY TEST

Disconnect the ball chain from the throttle linkage in the system drawings Figs. 2, 3, 5, 7, 9 and 12. Separate the 8 way connector at the amplifier. Connect an ohmmeter between the Orange-Yellow hash and Gray-Black hash wire leads at the 8 way connector. A resistance of approximately 85 ohms should be obtained. Connect the ohmmeter between the Orange-Yellow hash mark and White-Pink hash mark wire leads. A resistance of approximately 85 ohms should be obtained. Reconnect the ball chain to the carburetor.

Start the engine, and with the servo disconnected from the amplifier, connect the Orange-Yellow hash mark lead of the servo to the battery positive terminal. Connect the White-Pink hash mark lead of the servo to ground, and momentarily touch the Gray-Black hash mark lead of the servo to ground. The servo throttle actuator arm should pull in. The arm should hold in that position or slowly release. When the White-Pink hash mark wire is removed from ground, the servo should release. Replace the servo if it fails any part of the proceeding test. If the Orange-Yellow hash mark lead is shorted to either the White-Pink hash mark or Gray-Black hash mark leads, it may be necessary to replace the amplifier.

AMPLIFIER TEST

CAUTION: Do not use a test lamp to perform the following tests as excessive current draw will damage electronic components inside the amplifier. Use only a voltmeter of 5,000 ohm/volt rating or higher.

"ON" CIRCUIT TEST

Turn on the ignition switch and connect a voltmeter between the Light Blue-Black hash mark lead and ground in the amplifier 6-way connector. The voltmeter should read battery voltage when the "ON" switch on the steering wheel is depressed and held. If voltage is not available check the horn relay circuit and perform control switch test. Release the "ON" button; battery voltage should remain at the blue wire indicating the "ON" circuit is engaged. If the voltage does not remain, check for ground on the amplifier (black wire on the 6-way connector). Also check the fuse and/or circuit breaker and/or hang in a known good amplifier and recheck for a good "ON" circuit.

"OFF" CIRCUIT TEST

With the ignition on and the voltmeter connected to the Lt. Blue-Black hash mark wire, depress the OFF switch on the steering wheel. Voltage on the blue wire should drop to zero indicating the ON circuit is de-energized. If the voltage does not drop to zero, perform the control switch test. If the switches check OK hang in a known good amplifier and recheck the OFF circuit as above.

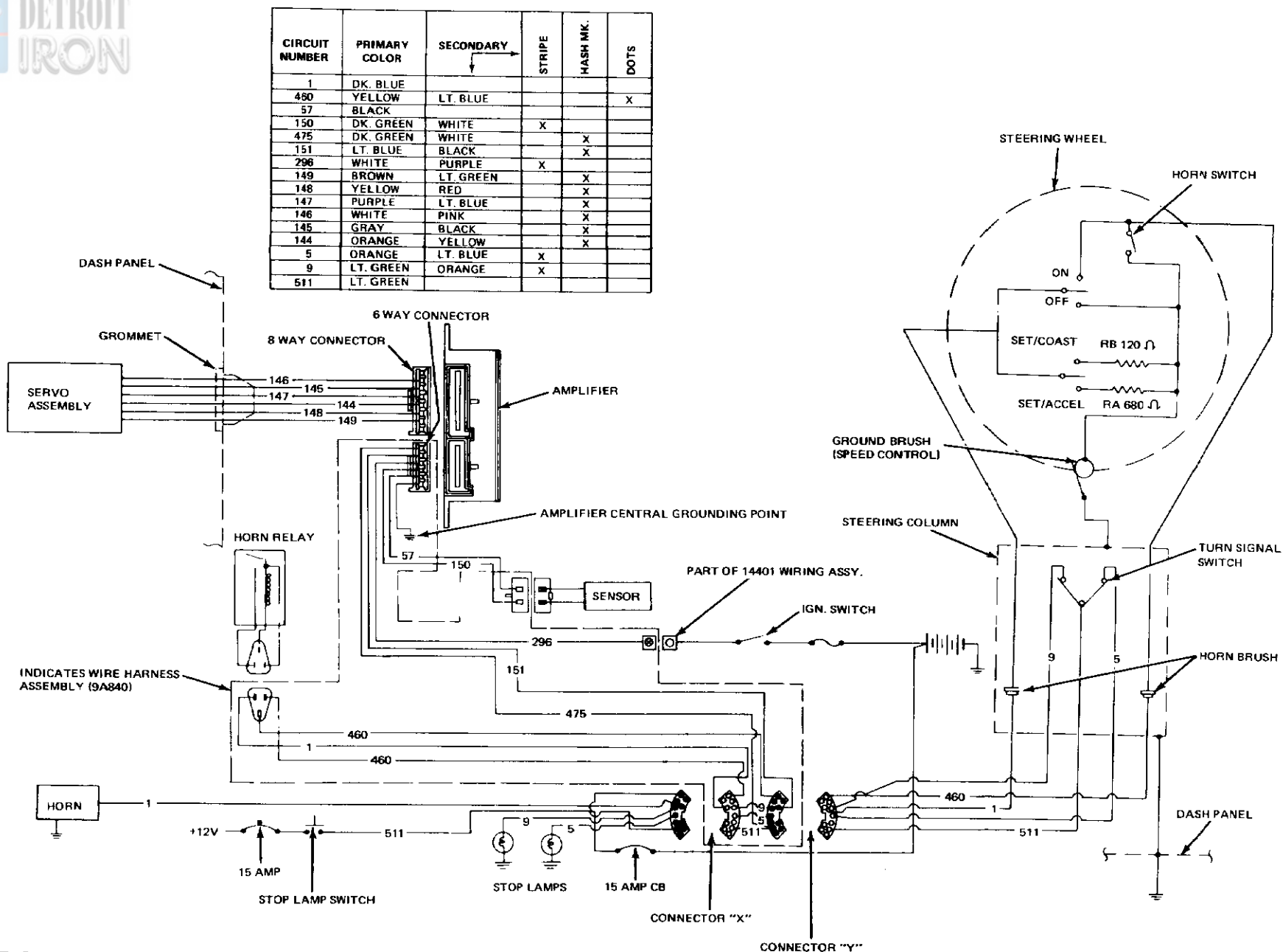
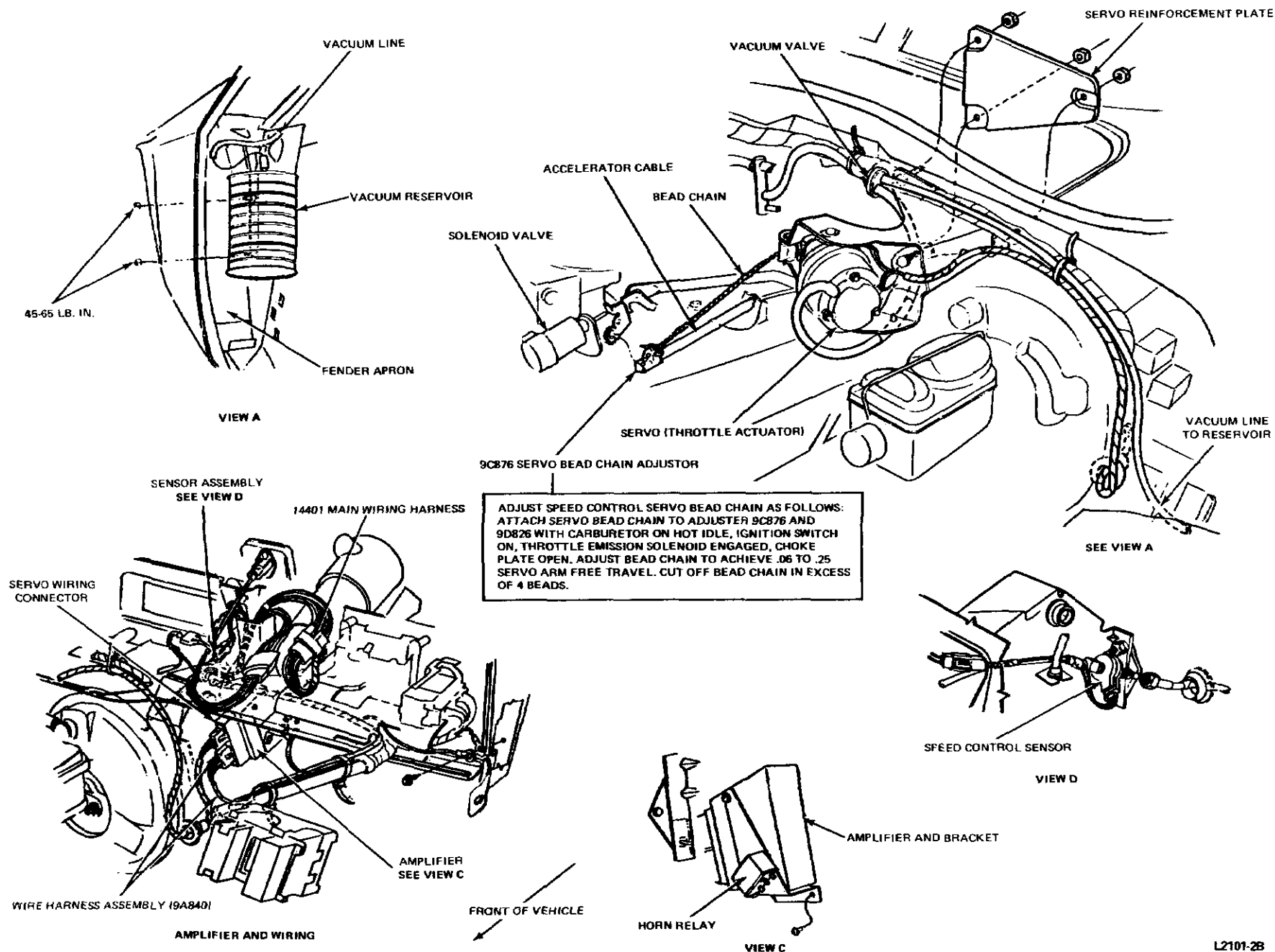


FIG. 1 Wiring Diagram—LTD II, Thunderbird, Cougar XR-7 and Ranchero

L2097-2B



L2101-28

FIG. 2 Speed Control System—LTD II, Thunderbird, Cougar XR-7 and Ranchero—5.8L and 6.6L (351M and 400 CID) Engines

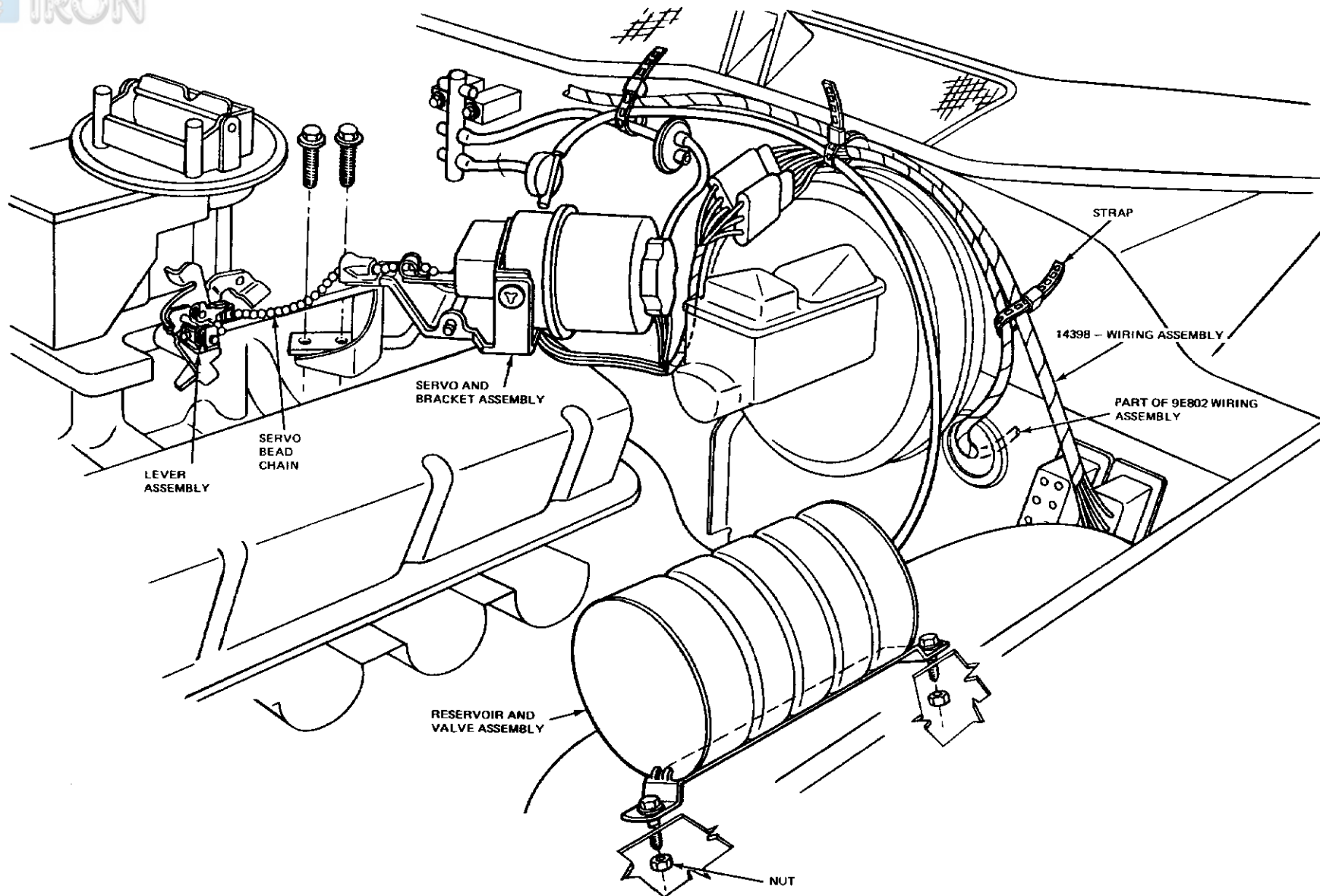


FIG. 3 Speed Control System—LTD II, Thunderbird, Cougar XR-7 and Ranchero—5.0L (302 CID) Engine

L2386-2A

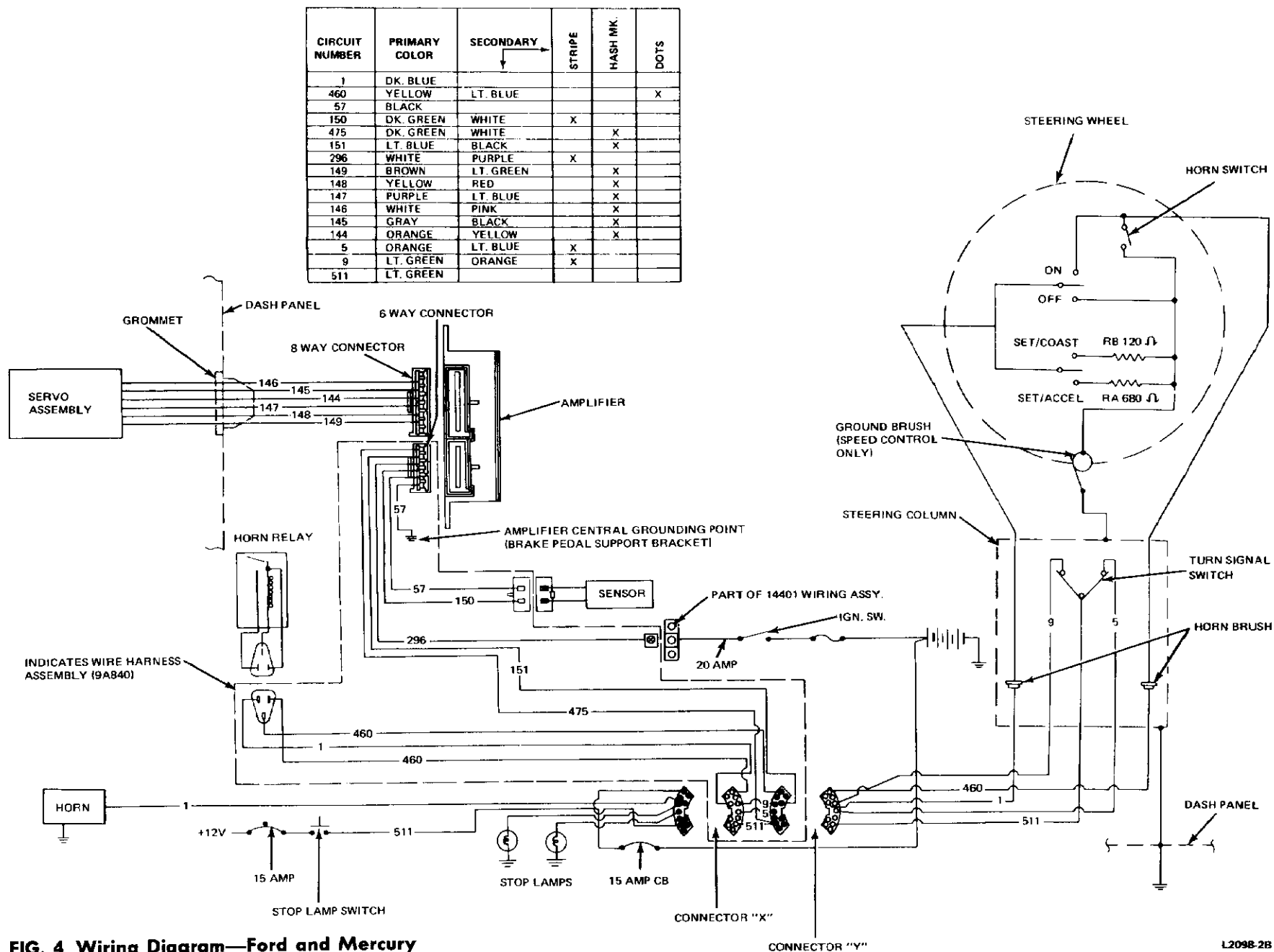


FIG. 4 Wiring Diagram—Ford and Mercury

L2098-2B