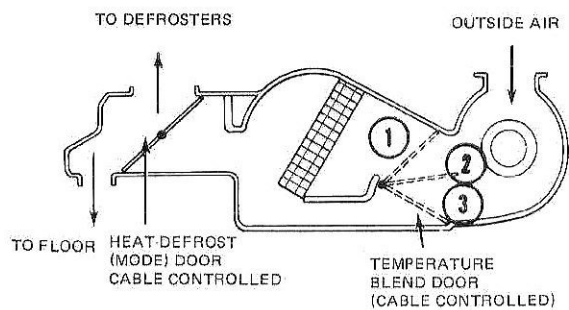
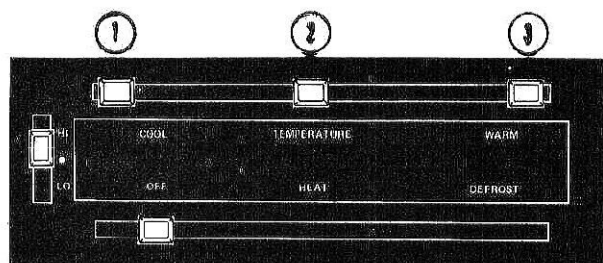
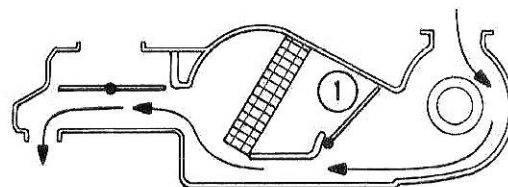
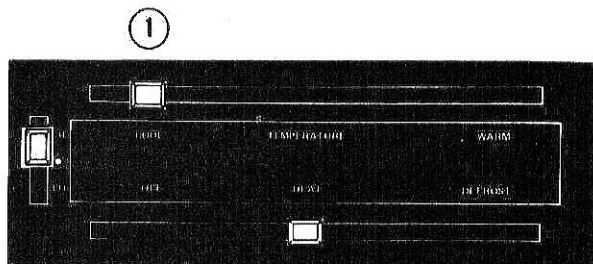
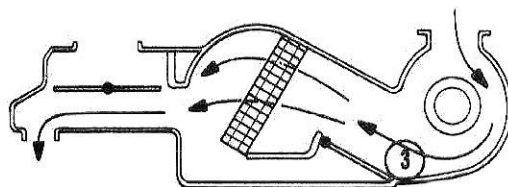
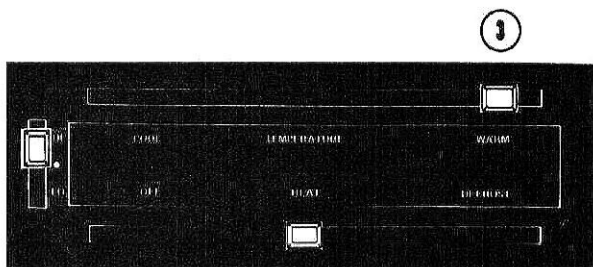




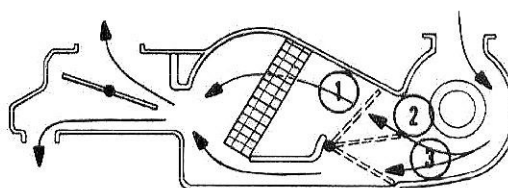
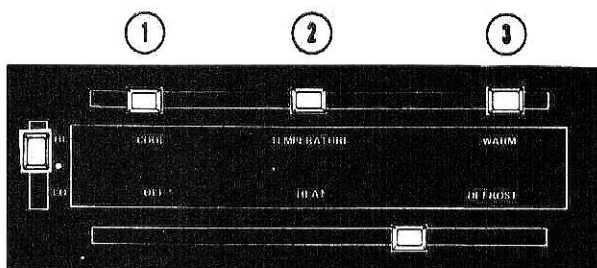
CONTROL IN "OFF" POSITION



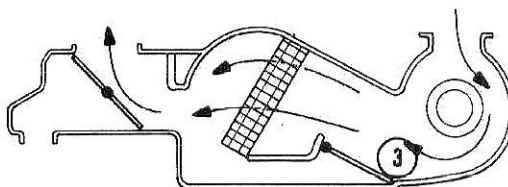
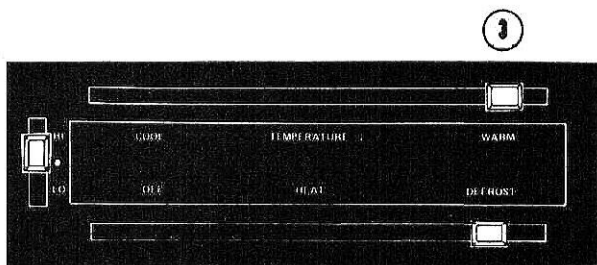
MINIMUM "HEAT" POSITION



MAXIMUM "HEAT" POSITION



MODULATED "HEAT-DEFROST" POSITION



MAXIMUM "DEFROST" POSITION

FIG. 1 Heating System Air Flow

L1985-2A

ADJUSTMENTS

TEMPERATURE CONTROL CABLE

Adjust the Temperature Control Cable in the following manner:

1. With the cable housing to heater attaching screw loose, rotate the temperature door to the full clockwise (left) position (Fig. 2).
2. Push the Temperature Control Lever to the WARM side, allowing a gap of 3/16 inch between the lever and the end of the slot.
3. Tighten the cable housing to heater attaching screw. Torque to 20 in-lb maximum.
4. Check for and insure full travel of the blend door.

FUNCTION CONTROL CABLE

Adjust the Function Control Cable in the following manner:

1. With the cable housing to heater attaching screw loose (Fig. 2), rotate the Heat-Defrost Door crank arm to the full clockwise (left) position.
2. Push the Function Control Lever to the DEFROST position, allowing a gap of 3/16 inch between the lever and the end of the slot.
3. With the door crank arm and the lever in these positions, tighten the attaching screw. Torque to 20 in-lbs maximum.

REMOVAL AND INSTALLATION

CONTROL ASSEMBLY

1. Remove windshield wiper, light switch, and radio control knobs.
2. Remove the light switch control bezel.
3. Remove three screws at the top of the cluster applique and pull the lower edge of the applique rearward to disengage four (4) snap-in retainers.
4. Remove the temperature and function control cables from the control head (Fig. 3).
5. Remove four (4) screws from the face of the control assembly.
6. Disconnect the electrical wiring connectors from the blower switch, system off-on switch, accessory

switch, if so equipped, and the illumination bulb (Fig. 3).

7. Remove the control head from the rear of the instrument panel.
8. To install, reverse the above procedure and adjust the control cables as required.

HEATER ASSEMBLY (FIG. 2)

1. Drain the cooling system.
2. Disconnect the two heater hoses from the heater core tubes at the dash panel. Position or plug the hoses so that the coolant will not drain out.
3. Remove the glove box.

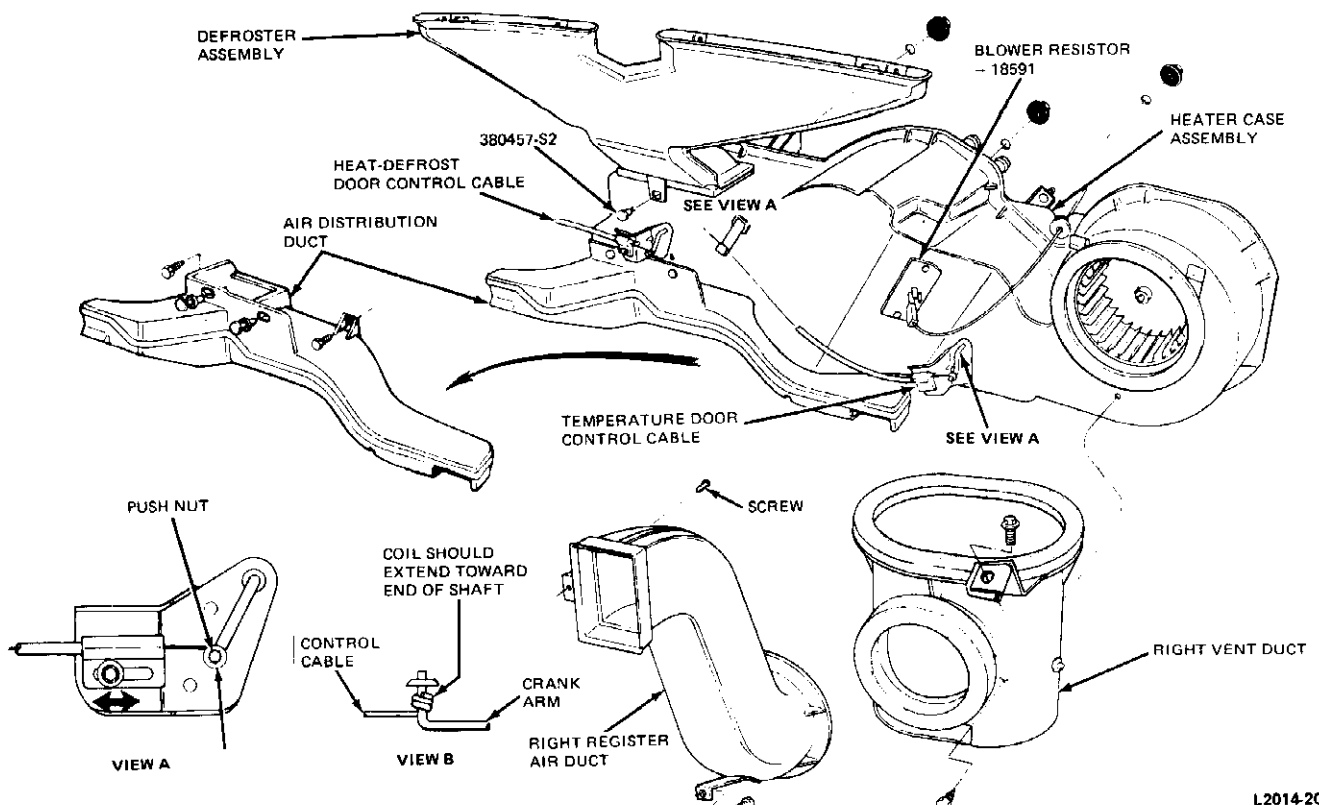


FIG. 2 Heater and Defroster Assembly

L2014-2C

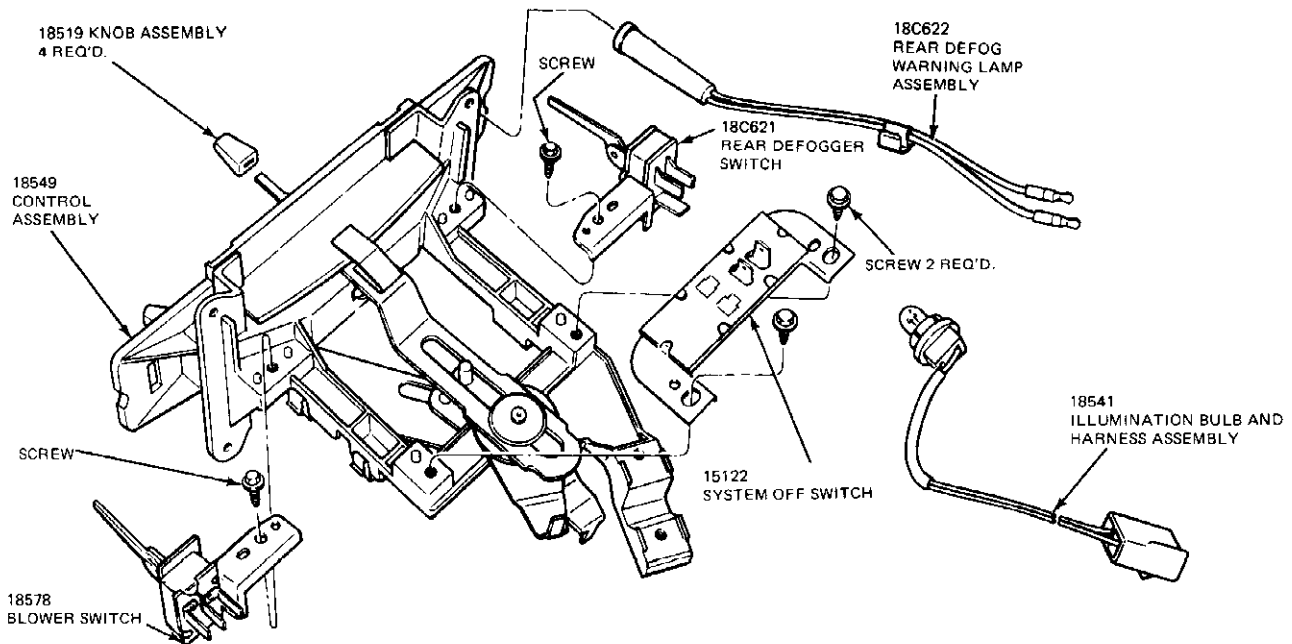


FIG. 3 Heater Control Service Components

L2013-2B

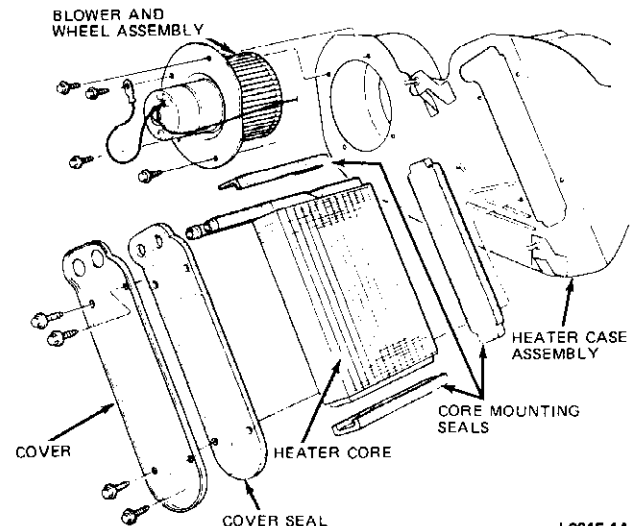
4. Remove the right register air duct.
5. Remove the floor discharge duct assembly. Remove the clip securing the defroster nozzle to the heater.
6. Disconnect the two air door control cables from the heater case and doors. Remove the right vent cable bracket from the instrument panel.
7. Disconnect the electrical connector from the resistor assembly.
8. Remove the vent duct-to-upper-cowl mounting bolt.
9. Remove the three (3) heater case to dash panel mounting stud nuts and remove the heater case and vent duct as an assembly.
10. To install, reverse the above procedure. Adjust the control cables.

HEATER CORE

1. Remove the heater assembly from the vehicle as described in the preceding procedure and place it on a bench.
2. Remove the heater core cover and pad and slide the core out of the case (Fig. 4).
3. If the core is being replaced, transfer the butyl rubber pads to the new core (Fig. 4).

BLOWER MOTOR AND WHEEL ASSEMBLY

1. Remove the heater assembly from the vehicle as described in the preceding procedure and place it on a bench.
2. Remove the four (4) mounting screws and slide the blower motor and wheel assembly from the blower scroll in the case (Fig. 4).
3. To install, reverse the above procedure. Attach the ground wire as shown in Fig. 4.



L2015-1A

FIG. 4 Blower Motor and Heater Core Removal

DEFROSTER NOZZLE

1. Remove the upper instrument panel finish panel.
2. Remove the radio speaker or instrument panel to cowl brace.
3. Remove two (2) screws from the left defroster outlet.
4. Remove two (2) screws from the right defroster outlet.
5. Remove one clip holding the defroster nozzle to the heater case.
6. Carefully move defroster nozzle upward through opening in instrument panel.
7. To install, reverse the above procedure.

HEATING SYSTEM - GRANADA AND MONARCH

Blower Motor Current Draw

At 12.8 Volts	7 to 9 Amps on High Blower
Protection Device	15 Amp Fuse in Fuse Panel

Fan Illumination	0.70 CP No. 1445 Bulb
Control Illumination	0.75 CP No. 1892 Bulb

CL2332-2B

Air Conditioning Basic Theory

PART
36-31

SUBJECT	PAGE	SUBJECT	PAGE
BASIC PRINCIPLES		DIAGNOSIS	31-3
Effect of Pressure on Boiling or			
Condensation	31-2		
Heat Transfer	31-1		
Latent Heat of Vaporization	31-1		

CL2341-2B

BASIC PRINCIPLES

Car Air Conditioning is the cooling or refrigeration of the air in the passenger compartment. Refrigeration is accomplished by making practical use of three laws of nature. These laws of nature and their practical application are outlined in the following paragraphs.

HEAT TRANSFER

If two substances of different temperature are placed near each other, the heat in the warmer substance will always travel to the colder substance until both are of equal temperature. For example, a cake of ice in an ice box does not communicate its coldness to the bottle of milk standing nearby. Rather, in obedience to nature's law, the heat in the warm milk automatically flows into the ice which has a lesser degree of heat. In order to determine the amount of heat that transfers from one substance to another, science has established a definite standard of measurement called the British Thermal Unit or BTU. One BTU is the amount of heat required to raise the temperature of one pound of water 1 degree F. For example, to raise the temperature of one pound of water from 32 degrees F to 212 degrees F, one BTU of heat must be added for each degree rise in temperature or a total of 180 BTU's of heat. Conversely, in order to lower the temperature of one pound of water from 212 degrees F to 32 degrees F, 180 BTU's of heat must be removed from the water.

LATENT HEAT OF VAPORIZATION

When a liquid boils (changes to a gas) it absorbs heat without raising the temperature of the resulting gas. When the gas condenses (changes back to a liquid), it gives off heat without lowering the temperature of the resulting liquid.

For example, place one pound of water at 32 degrees F in a container over a flame. With each BTU

of heat that the water absorbs from the flame, its temperature rises 1 degree F. Thus, after it has absorbed 180 BTU's of heat, the water reaches a temperature of 212 degrees F. Here the law of nature is encountered. Even though the flame continues to give its heat to the water, the temperature of the water remains at 212 degrees F. The water, however, starts to boil or change from the liquid to the gaseous state, and it continues to boil until the water has passed off into the atmosphere as vapor. If this vapor were collected in a container and checked with a thermometer, it also would show a temperature of 212 degrees F. In other words, there was a rise of only 180 degrees F (from 32 to 212) in the water and vapor temperature even though the flame applied many more than 180 BTU's of heat. In this case, the heat is absorbed by the liquid in the process of boiling and disappears in the vapor. If the vapor were brought in contact with cool air, the hidden heat would reappear and flow into the cooler air as the vapor condensed back to water. Scientists refer to this natural law as the latent (hidden) heat of vaporization.

Water has a latent heat of vaporization of 970 BTU's and a boiling point of 212 degrees F. This means that 1 pound of water at 212 degrees F will absorb 970 BTU's of heat in changing to vapor at 212 degrees F. Conversely, the vapor will give off 970 BTU's of heat in condensing back to water at 212 degrees F.

This tremendous heat transfer, that occurs when a liquid boils or a vapor condenses, forms the basic principle of all conventional refrigeration systems.

For a liquid to be a good refrigerant, the amount of heat that it absorbs when vaporizing is not the only factor. It must also have a low boiling point. That is, the temperature at which it boils must be lower than the substance to be cooled. To illustrate with water, place a bottle of milk at room temperature (70 degrees F) next to boiling water (212 degrees F). The heat would flow

from the (higher temperature) water to the (lower temperature) milk. The milk would be heated rather than cooled, because the boiling point of water is too high.

In order to make practical use of the heat transfer that takes place when a liquid boils, we must choose a liquid with a low boiling point. Refrigerant 12 is the liquid most commonly used in automotive air conditioning systems because it boils at 21.7 degrees F below zero in an open container. Here is a liquid that boils or vaporizes well below passenger compartment temperatures and, in vaporizing, will absorb tremendous amounts of heat without getting any warmer itself.

EFFECT OF PRESSURE ON BOILING OR CONDENSATION

The saturation temperature (the temperature where boiling or condensation occurs) of a liquid or vapor increases or decreases, according to the pressure exerted on it.

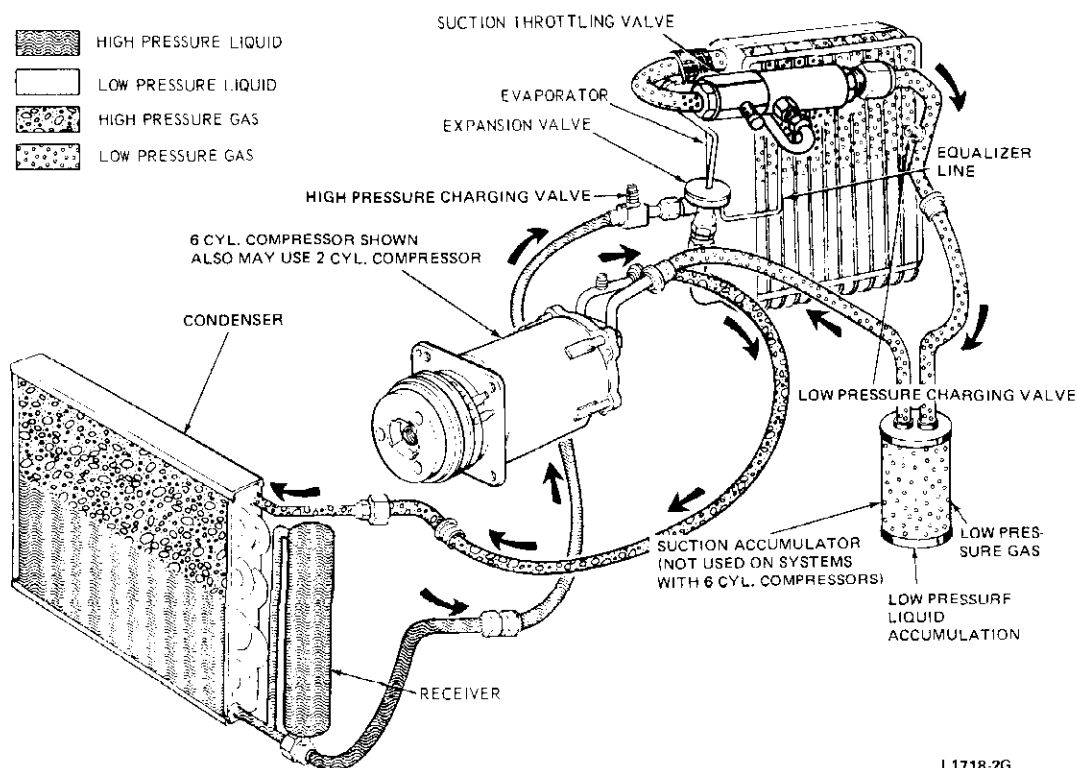
In any Ford air conditioning system, liquid refrigerant (R-12) is stored in the receiver under high pressure (Fig. 1). When the liquid R-12 is released into the evaporator by the expansion valve, the resulting decrease in pressure and partial boiling lowers its temperature to its new boiling point. As the R-12 flows through the evaporator, passenger compartment air passes over the outside surface of the coils. As it boils, the R-12 absorbs heat from the air and thus cools the passenger compartment. The heat from the passenger compartment is absorbed by the boiling refrigerant and hidden in the vapor. The refrigeration cycle is now under way. To complete the cycle, the following remains to be done:

1. **Dispose of the heat in the vapor.**
2. **Convert the vapor back to liquid for re-use.**
3. **Return the liquid to the starting point in the refrigeration cycle.**

The compressor (Fig. 1) performs these functions. It pumps the refrigerant vapor (containing the hidden heat) out of the evaporator and forces it under high pressure into the condenser which is located in the outside air stream at the front of the car. The increased pressure in the condenser raises the R-12 condensation or saturation temperature to a point higher than that of the outside air. As the heat transfers from the hot vapor to the cooler air, the R-12 condenses back to a liquid. The liquid under high pressure now returns to the reservoir where it is stored for re-use.

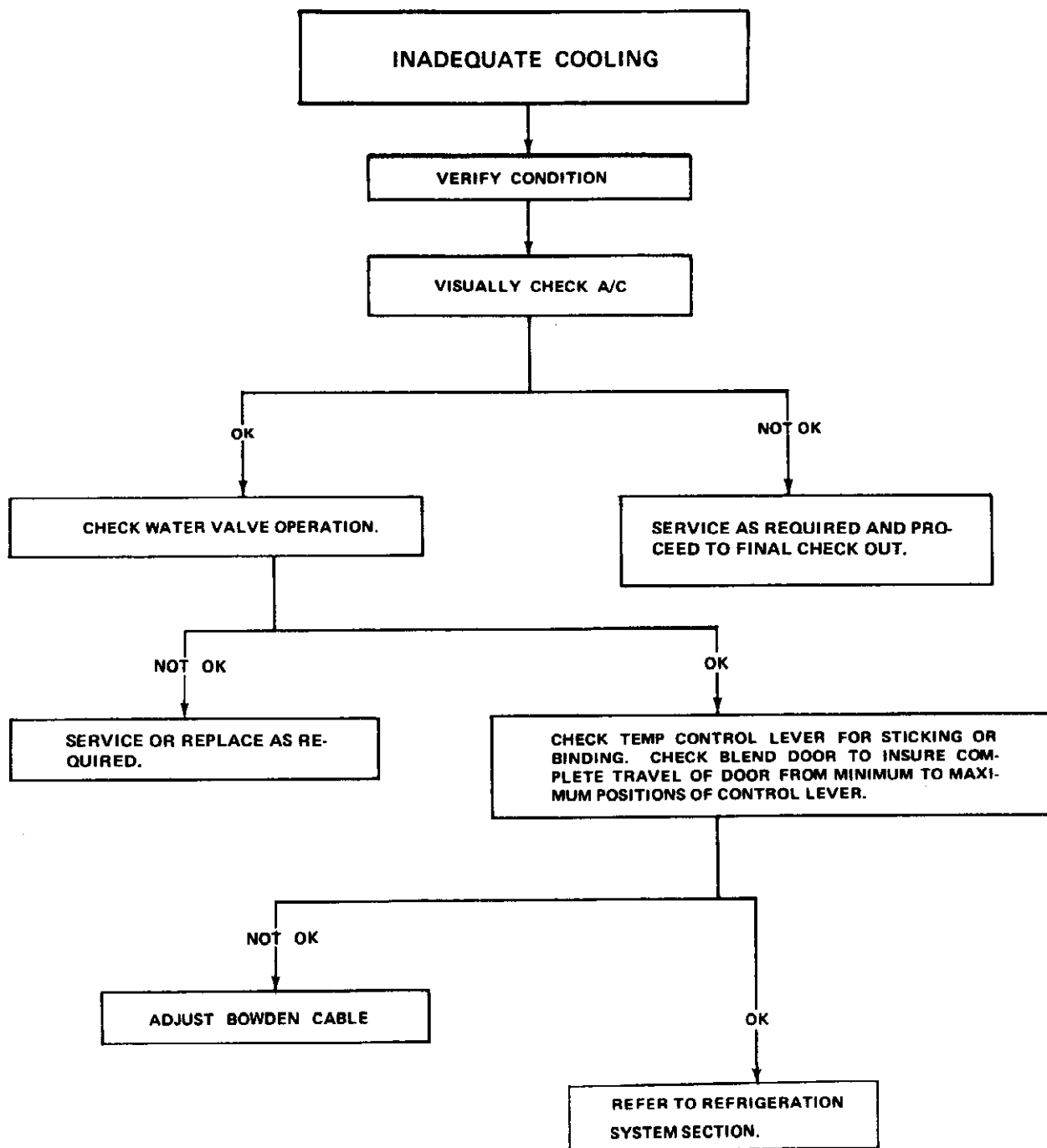
It may seem difficult to understand how heat can be transferred from a comparatively cooler car passenger compartment to the hot outside air. The answer lies in the difference between the refrigerant pressure that exists in the evaporator and the pressure that exists in the condenser. In the evaporator, the expansion valve reduces the pressure and the boiling point below the temperature of the passenger compartment. Thus, heat transfers from the passenger compartment to the boiling refrigerant. In the condenser, the compressor raises the condensation point above the temperature of the outside air. Thus, the heat transfers from the condensing refrigerant to the outside air. The expansion valve and the compressor simply create pressure conditions that permit the laws of nature to function.

Refer to Part 36-32 for information on types of refrigerant systems.



L1718-2G

FIG. 1 Typical A/C Basic Suction Throttling Valve Type



A/C General Service — Refrigerant Systems

PART 36-32

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION		REFRIGERANT SYSTEM	
Compressor Unit	32-4	Charging From Small Containers	32-17
Condenser	32-5	Charging the System	32-16
Combination Valve	32-4	Discharging the System	32-16
Evaporator Unit	32-1	Evacuating the System	32-16
Expansion Valve	32-1		
Gauge Port Valves	32-5	TESTING	
High Pressure Relief Valve	32-5	Clutch Test — Magnetic	32-16
Magnetic Clutch and Ambient Temperature		Leaks — Checking for	32-14
Switch	32-5	Manifold Gauge Set Installation	32-14
Receiver — Dehydrator Unit	32-1	Performance Test — A/C	32-15
Suction Throttling Valve	32-4	Receiver — Dryer Test	32-16
DIAGNOSING	32-7	Suction Throttling Valve	32-15

CL2342-2B

This Part covers the refrigerant system of all vehicles.

Reference both to this Part and to the Part covering the pertinent vehicle system is necessary for complete coverage.

DESCRIPTION AND OPERATION (FIGS. 1 THROUGH 5)

RECEIVER-DEHYDRATOR UNIT

The air conditioning system stores the liquid Refrigerant-12 under pressure in a combination receiver and dehydrator (Fig. 1). The pressure in the receiver normally varies from about 120 to 300 psi, depending on the surrounding air temperature and compressor speed.

The dehydrator removes any traces of moisture from the system. Even small amounts of moisture will cause trouble.

EVAPORATOR UNIT

When the system is in operation, liquid Refrigerant-12 flows from the receiver dehydrator unit through a flexible hose to the expansion valve and from there into the evaporator where it evaporates at a reduced pressure, and cools the evaporator. Outside or recirculating air is blown through the evaporator fins and is thus cooled and dehumidified. A liquid bleed line (leading to the suction side of the suction throttling valve) allows refrigerant to by-pass the evaporator to cool the compressor under low load or low charge conditions. A calibrated pressure differential valve controls the flow through the bleed line.

EXPANSION VALVE (FIG. 1)

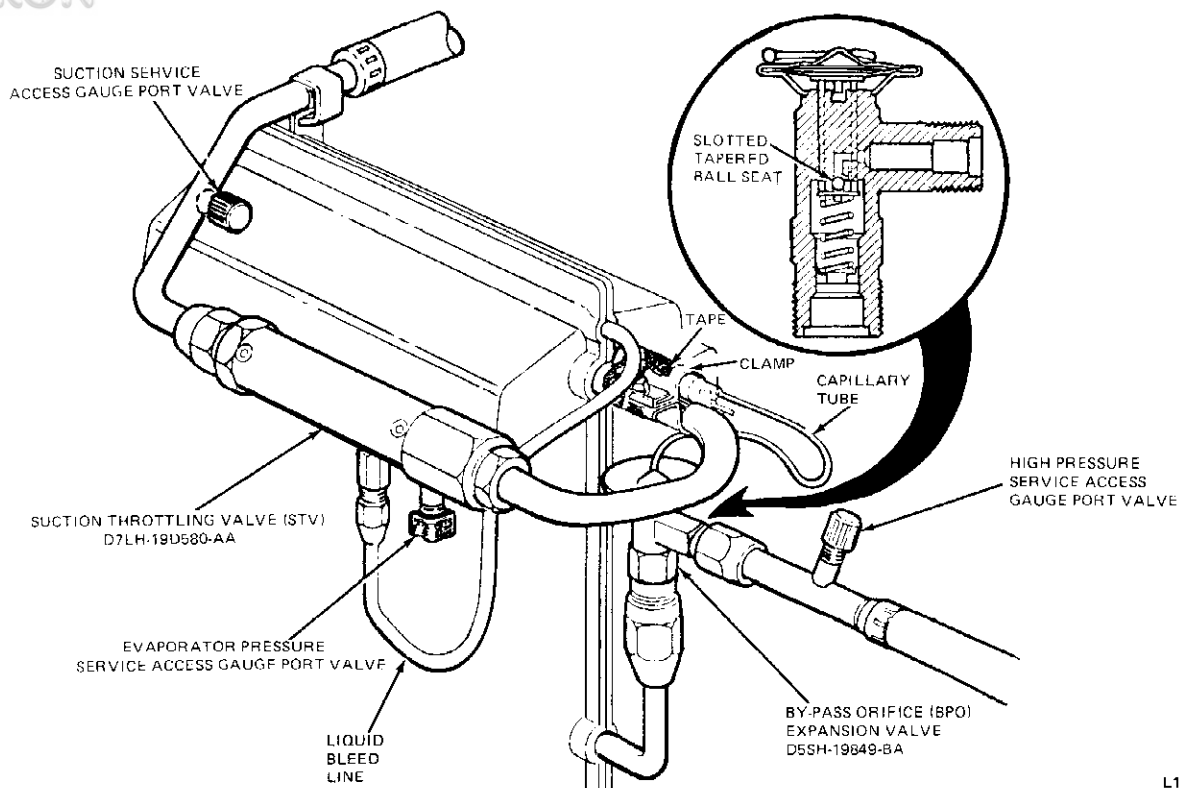
The expansion valve meters refrigerant into the evaporator according to cooling requirements.

EXTERNAL EQUALIZED EXPANSION VALVE

With this expansion valve, refrigerant flow is controlled by evaporator outlet temperature and suction pressure. A bulb clamped to the evaporator outlet senses evaporator outlet temperature and a capillary tube bulb attached to the suction throttling valve outlet senses suction pressure. Increased evaporator outlet temperature opens the expansion valve and increased suction pressure closes the expansion valve. The expansion valve is calibrated to provide the correct flow based on evaporator pressure and outlet temperature.

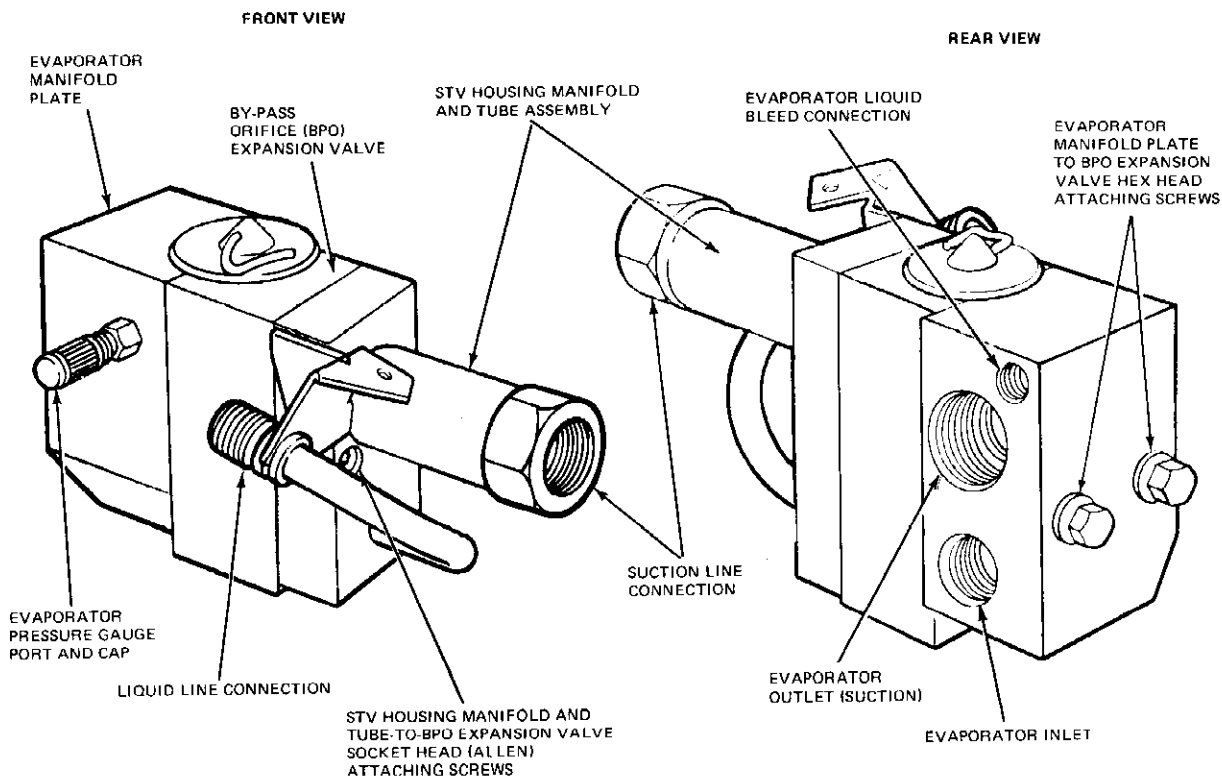
BY-PASS ORIFICE (BPO) EXPANSION VALVE

The BPO expansion valve is similar to the external equalized expansion valve except it senses evaporator pressure instead of suction pressure. Internal passages replace the external equalizer capillary. To prevent the expansion valve from closing entirely under low load conditions, the valve seat has been notched.



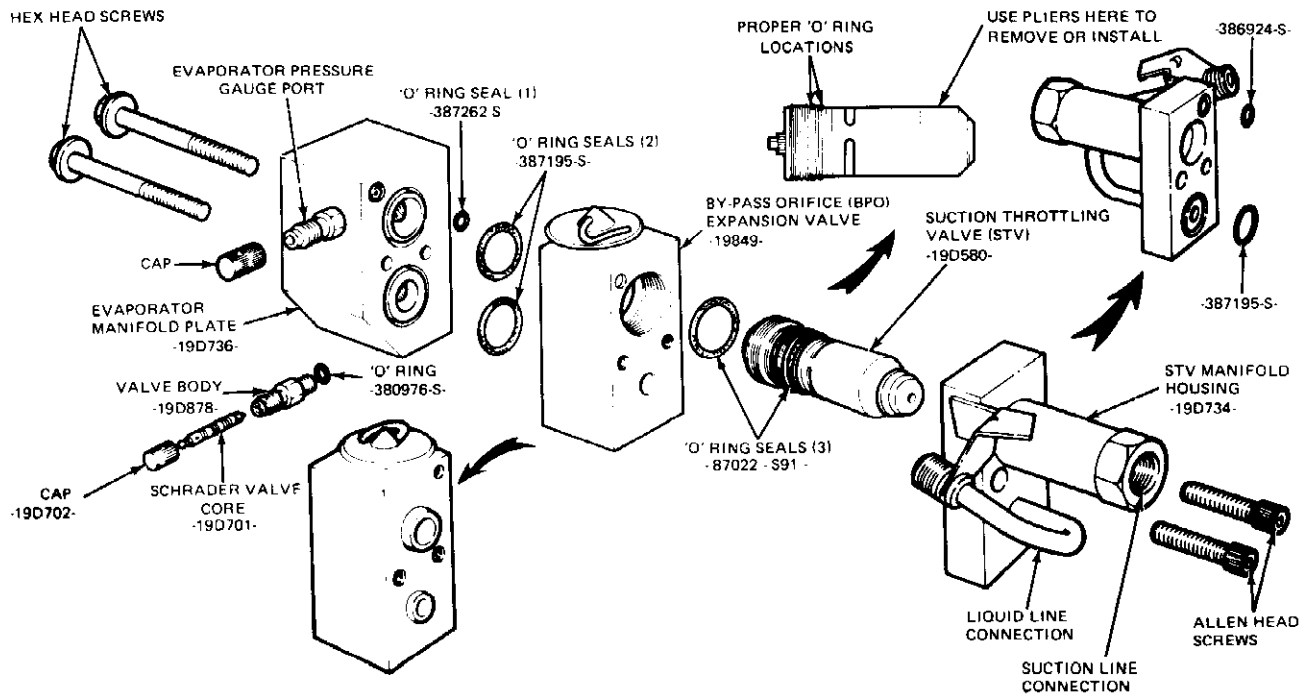
L1719 2D

FIG. 1 Expansion Valve and Suction Throttling Valve



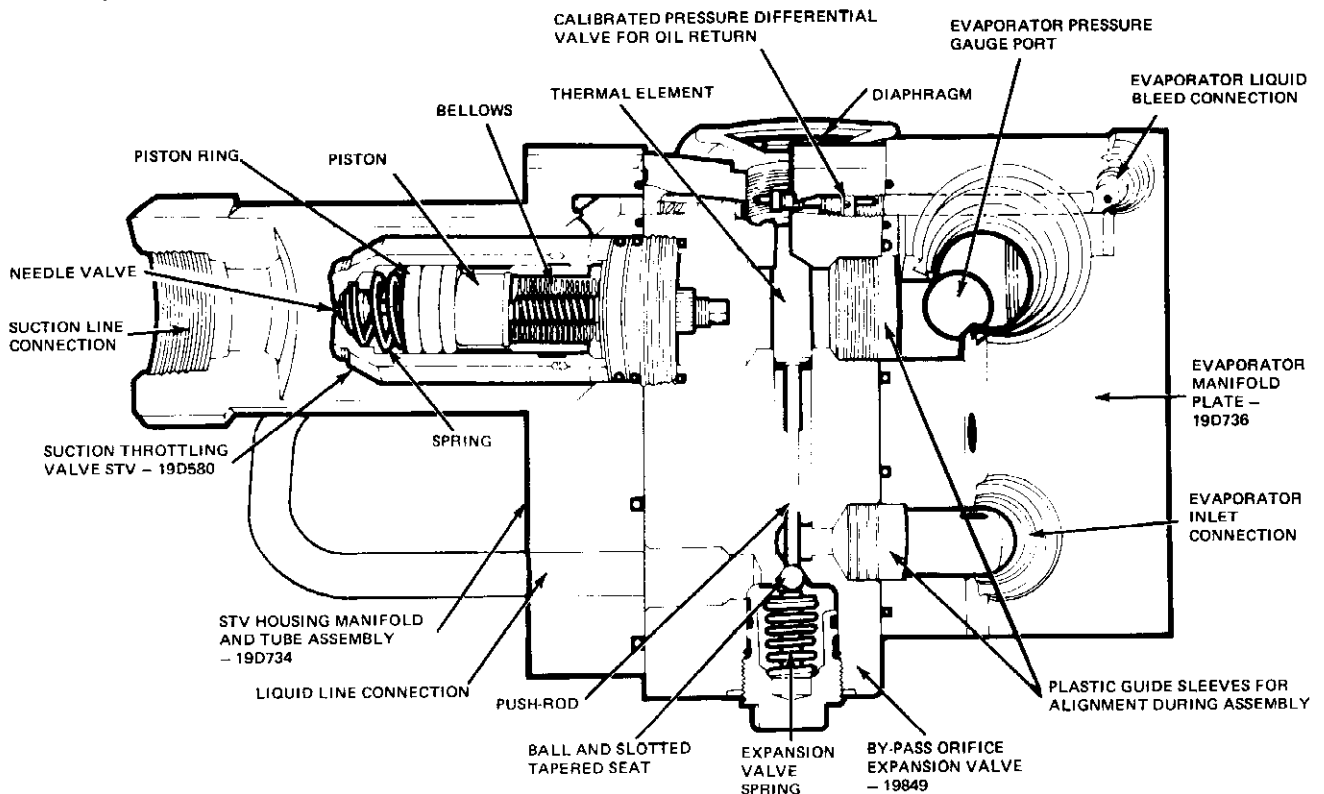
L2442-2A

FIG. 2 By-Pass Orifice (BPO) Combination Valve Assembly—Front and Rear



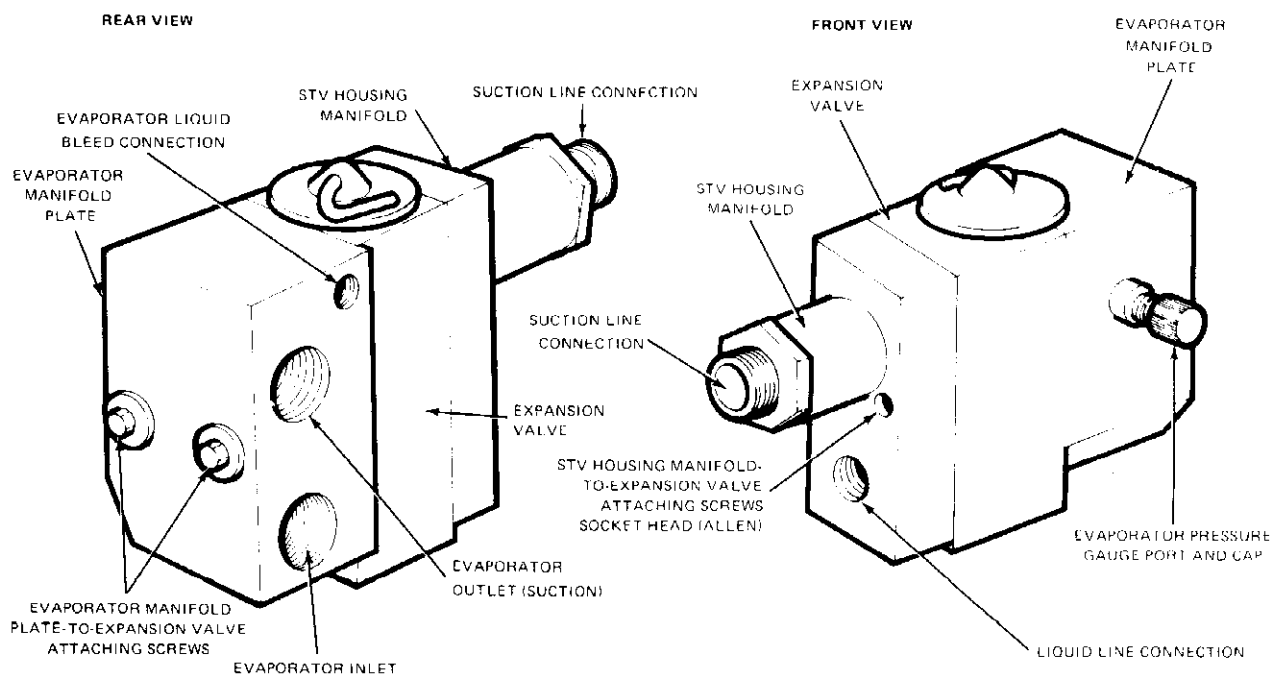
L2443-2A

FIG. 3 By-Pass Orifice (BPO) Combination Valve Disassembled



L2444-2A

FIG. 4 By-Pass Orifice (BPO) Combination Valve Assembly—Cut-Away View



K3480-2A

FIG. 5 Combination Valve—Front and Rear—Pinto, Bobcat, Mustang II

SUCTION THROTTLING VALVE

The suction throttling valve controls suction pressure in the evaporator to prevent ice or frost from blocking the flow of air through the heat exchanging surfaces of the evaporator. Since gauge readings change as altitude changes, acceptable ranges are shown in the normal evaporator pressure gauge readings v/s altitude chart.

EXTERNAL EQUALIZED COMBINATION VALVE

This combination valve includes an externally equalized block-type expansion valve and a suction throttling valve cartridge. Evaporator outlet temperature and suction pressure are sensed internally, eliminating the need for the temperature sensing bulb and equalizer capillary tube. The evaporator liquid bleed line attaches to the combination valve manifold. Internal passages direct the flow to the suction side of the STV. The pressure differential valve is installed in the expansion valve passage. System operation is the same as the external equalized system with separate expansion valve and STV. The external equalized block expansion valve is identified by part number and by its gold color. It is not interchangeable with the by-pass orifice block type expansion valve (silver colored).

BY-PASS ORIFICE (BPO) COMBINATION VALVE

This combination valve includes a by-pass orifice block-type expansion valve and a suction throttling valve cartridge. Evaporator outlet temperature and

evaporator pressure are sensed internally, eliminating the need for the capillary and bulb.

In the Fairmont/Zephyr application the expansion valve block attaches directly to the evaporator, eliminating the manifold used on other applications. In Granada/Monarch and Versailles applications, the evaporator liquid bleed passages are internal as in the external equalized combination valve. The Fairmont and Zephyr combination valve has an external line leading to the suction side of the STV. The pressure differential valve is installed in the fitting on the STV housing. System operation is the same as the BPO system with separate expansion valve and STV. The by-pass orifice block type expansion valve is identified by part number and by its silver color. It is not interchangeable with the external equalized block type expansion valve (gold colored).

COMPRESSOR UNIT

The refrigerant leaves the suction throttling valve as a low pressure gas.

The compressor pumps the refrigerant from the suction throttling valve into the top of the condenser located in front of the radiator.

The compressor maintains the refrigerant at a high pressure in the condenser and receiver.

The six-cylinder, Frigidaire-type compressor is covered in Part 36-34 of this manual.

The two-cylinder-type compressor is covered in Part 36-35 of this manual.

CONDENSER

The air conditioning condenser, located in front of the radiator, receives heated and compressed refrigerant gas from the compressor.

As the refrigerant gas flows down through the condenser, it is cooled by air passing between the sections of the condenser. The cooled, compressed refrigerant gas condenses to liquid refrigerant which then flows into the receiver.

MAGNETIC CLUTCH AND AMBIENT TEMPERATURE SWITCH

The compressor clutch and the compressor are off when the system selector lever is in the OFF, ECONOMY VENT, HI-LO (except ATC) or HEAT positions. In all other positions of the system selector lever, the clutch will be engaged or disengaged, depending upon ambient temperature. At ambient temperatures above 50°F. maximum, the ambient switch located in front of the condenser will close to complete the circuit to the compressor clutch. Below 35°F. minimum, the ambient switch will be open and the compressor cannot operate.

The ambient switch requires at least 10 minutes exposure to the surrounding temperature prior to checking for correct switch function; either open or closed.

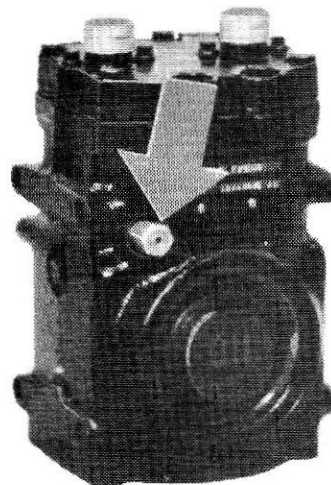
HIGH PRESSURE RELIEF VALVE

Under extreme pressure conditions, the valve will open allowing refrigerant vapor to escape. In this way the excessive pressure that might damage the compressor is relieved.

With six-cylinder compressors, the valve is located in the manifold at the rear of the compressor. With two-cylinder compressors, the valve is located on the compressor block (Fig. 6).

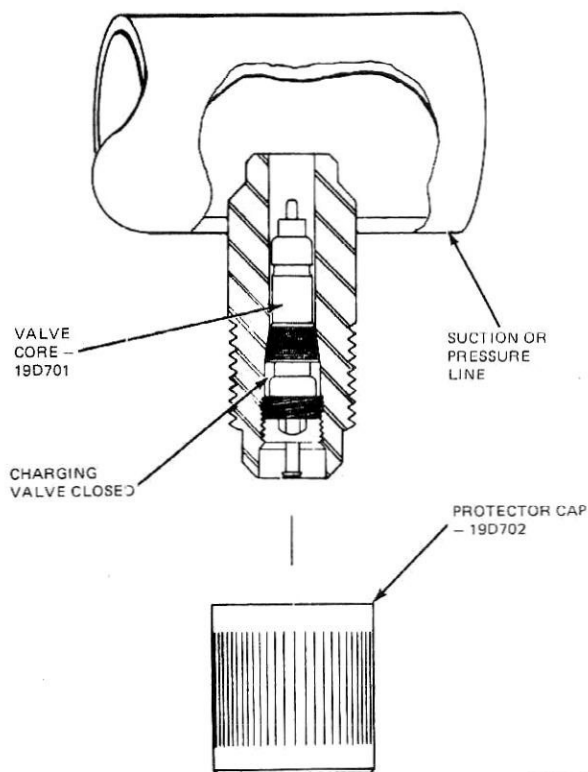
SERVICE ACCESS GAUGE PORT VALVES

These valves are similar to a tire valve (Figs. 7 and 8). The gauge port in the high pressure line (from compressor to condenser) allows access to the high pressure side of the system for attaching a service hose and pressure gauge. The gauge port in the low pressure line (from evaporator to condenser) allows access to the low pressure side of the system for attaching a service hose and pressure gauge (Figs. 7 and 8).



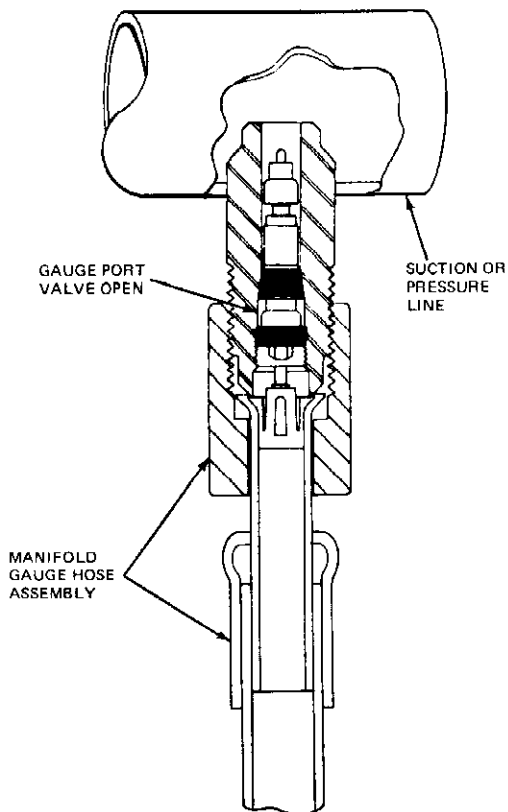
L1721-1A

FIG. 6 High Pressure Relief Valve



L1672-1C

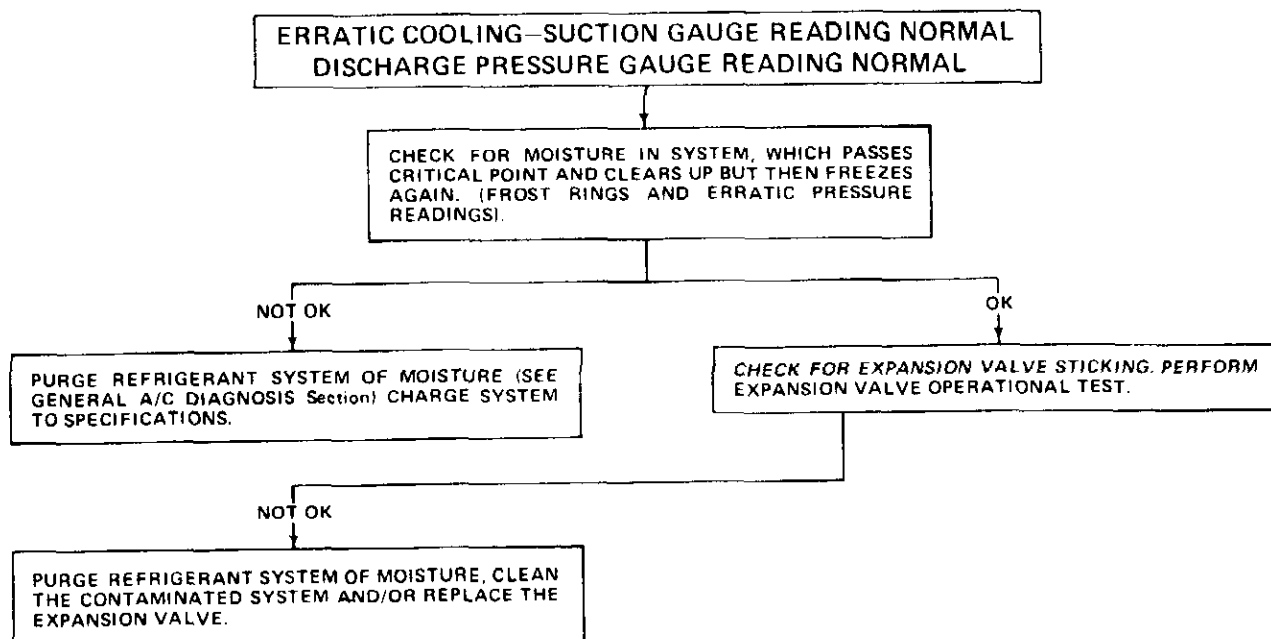
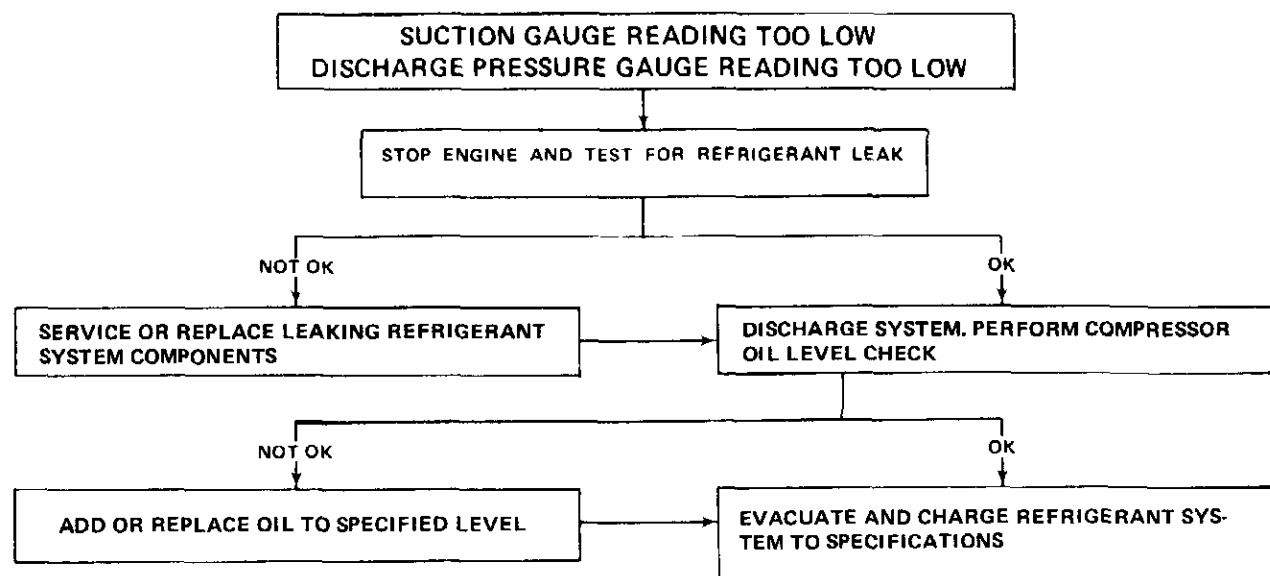
FIG. 7 Disconnected Gauge Set from Service Access Gauge Port Valve

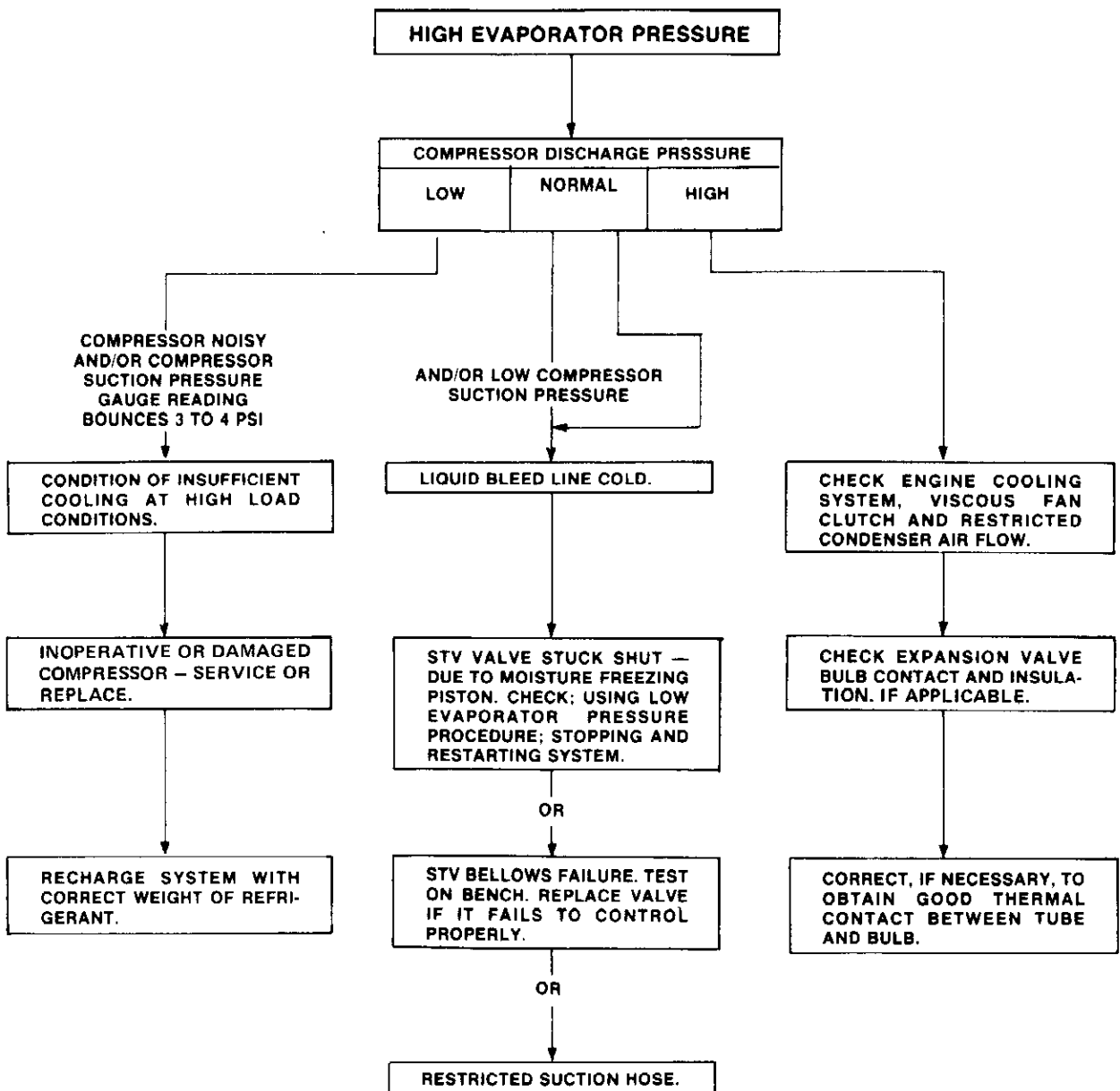


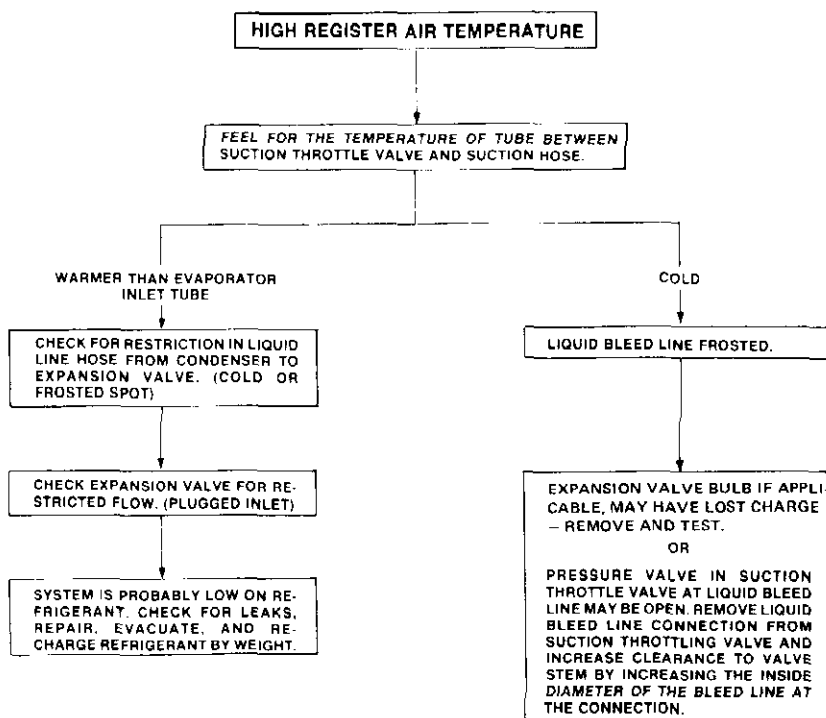
L1673-1D

FIG. 8 Gauge Set Connected to Service Access Gauge Port Valve

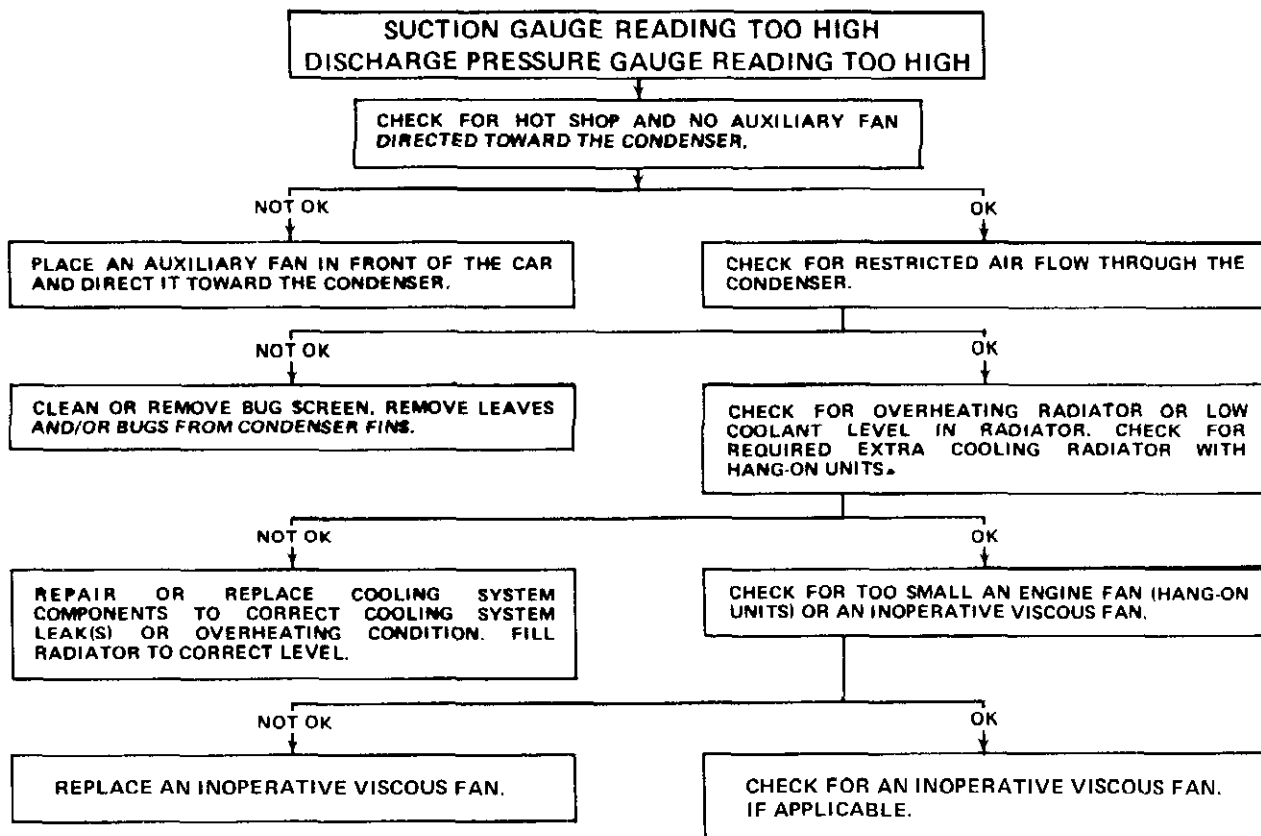
DIAGNOSIS



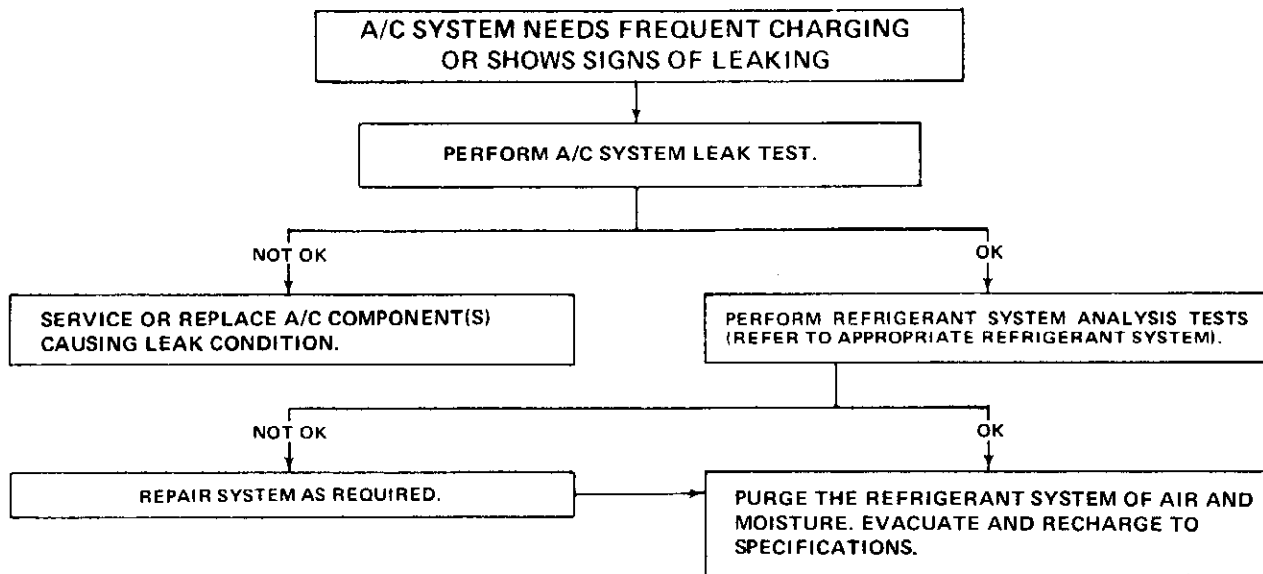




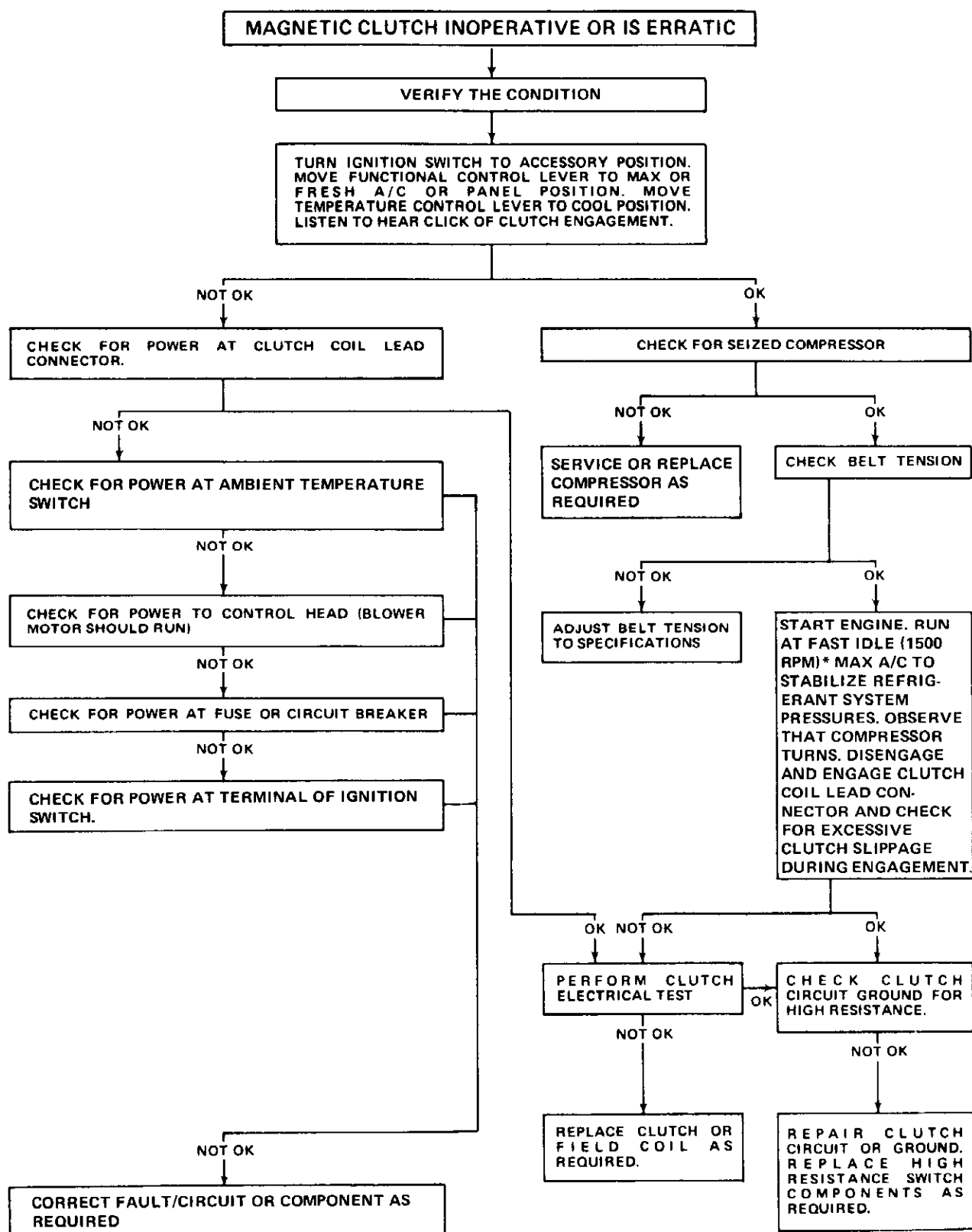
CL2377-2C

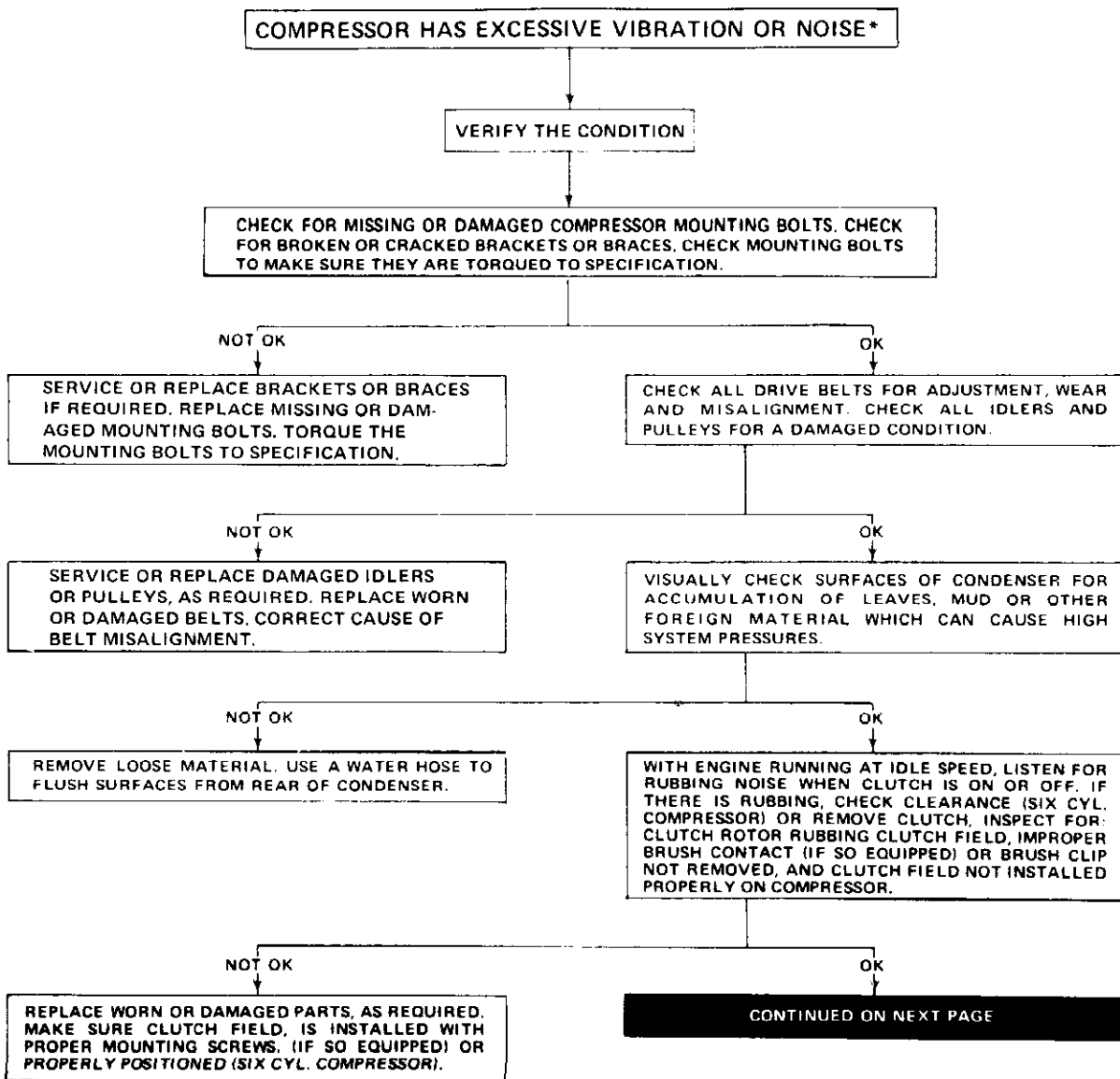


CL2378-2C



CL2379-2C





*SOME NOISE AND VIBRATION IS NORMAL IN ALL AIR CONDITIONING SYSTEMS. HIGH TEMPERATURES AND PROGRESSIVELY INCREASED SYSTEM PRESSURES WILL INCREASE THE NOISE AND VIBRATION LEVEL. THIS IS A NORMAL CONDITION. COMPARISON AND EXPERIENCE WITH AIR CONDITIONING SYSTEMS UNDER VARIOUS OPERATING CONDITIONS WILL TELL THE TECHNICIAN WHICH SYSTEMS ARE NOT CONFORMING TO THE NORMAL PUMPING SOUND AND VIBRATION PATTERNS MADE BY A PROPERLY FUNCTIONING COMPRESSOR.

COMPRESSOR HAS EXCESSIVE VIBRATION OR NOISE – Continued

CONTINUED FROM PREVIOUS PAGE

CHECK CLUTCH FOR LOOSENESS OR PLAY ON COMPRESSOR SHAFT. REMOVE CLUTCH AND INSPECT TAPER (2 CYL. COMPRESSOR) AND KEYWAY IF LOOSENESS IS SUSPECTED.

NOT OK

REPLACE KEY IF WORN. REMOVE MINOR IMPERFECTIONS FROM TAPER WITH A CROCUS CLOTH OR FINE HONING STONE.

OK

OPERATE ENGINE AT IDLE SPEED WITH A/C CLUTCH DISENGAGED. IF CLUTCH BEARING IS DAMAGED, THE NOISE WILL STOP WHEN THE CLUTCH IS ENGAGED (2 CYL. COMPRESSOR ONLY). THE BEARING NOISE MAY BECOME LOUDER WITH SIX CYL. COMPRESSOR.

NOT OK

REPLACE THE DAMAGED CLUTCH BEARING

OK

WITH ENGINE OPERATING AT IDLE SPEED. CHECK A/C CLUTCH FOR SCRAPING NOISE WHEN CLUTCH IS DISENGAGED. ENGAGE CLUTCH TO SEE IF NOISE DISAPPEARS.

NOT OK

CYCLE CLUTCH A FEW TIMES TO BURNISH AND SEAT THE CLUTCH FACE WHEN ACTIVATED. REPLACE CLUTCH, IF REQUIRED.

OK

RUN ENGINE AT IDLE SPEED. CHECK CLUTCH MAXIMUM RUNOUT WITH A DIAL INDICATOR.

NOT OK

IF MAXIMUM ALLOWABLE RUNOUT EXCEEDS SPECIFICATIONS, REPLACE CLUTCH.

OK

PERFORM REFRIGERANT SYSTEM PRESSURE CHECK (REFER TO APPROPRIATE ANALYSIS CHART) EXCESSIVE PRESSURES CAN CAUSE VIBRATION OR NOISE. *

NOT OK

SERVICE OR REPLACE THE A/C COMPONENTS AS INDICATED.

OK

PERFORM COMPRESSOR TEST

NOT OK

REPLACE THE VALVE PLATE AND/OR HEAD GASKET, AS REQUIRED. REPLACE THE COMPRESSOR IF THE CYLINDER WALLS ARE SCORED OR PIECES OF METAL ARE IMBEDDED IN THE PISTON.

OK

RUN THE ENGINE AT 1500 RPM, A/C ON MAXIMUM COOLING AND HIGH BLOWER. LISTEN TO THE COMPRESSOR FOR AN EXCESSIVE RUMBLE OR KNOCK THAT DISAPPEARS WHEN CLUTCH IS DEACTIVATED.*

NOT OK

SERVICE OR REPLACE COMPRESSOR IF RUMBLE OR KNOCK DISAPPEARS WHEN CLUTCH IS DEACTIVATED.

*SOME NOISE AND VIBRATION IS NORMAL IN ALL AIR CONDITIONING SYSTEMS. HIGH TEMPERATURES AND PROGRESSIVELY INCREASED SYSTEM PRESSURES WILL INCREASE THE NOISE AND VIBRATION LEVEL. THIS IS A NORMAL CONDITION. COMPARISON AND EXPERIENCE WITH AIR CONDITIONING SYSTEMS UNDER VARIOUS OPERATING CONDITIONS WILL TELL THE TECHNICIAN WHICH SYSTEMS ARE NOT CONFORMING TO THE NORMAL PUMPING SOUND AND VIBRATION PATTERNS MADE BY A PROPERLY FUNCTIONING COMPRESSOR.

CL2382-2C

TESTING

ATTACHING THE MANIFOLD GAUGE SET

When performing any of the various tests, test equipment must be connected to the system. If charge station-type equipment is used, follow the instructions of the manufacturer.

To attach a manifold gauge set to the system proceed as follows:

1. Remove the caps from the high and low pressure charging valves in the high and low pressure lines at the compressor.
2. Turn both manifold gauge valves fully clockwise to close the gauge set to the center outlet hoses.
3. If the gauge hoses do not have the valve opening pins in them, install fitting adaptors T71P-19703-S and R on the manifold gauge low and high pressure hoses.
4. Connect the high and low pressure gauge hoses with adaptors, to the respective high and low pressure gauge port at the compressor.

CHECKING FOR LEAKS

Attach the manifold gauge set. Leave both manifold gauge valves at the maximum clockwise (closed) position. Both gauges should show approximately 60 to 80 pounds pressure at 75 degrees F with the engine not running. If very little or no pressure is indicated, leave the vacuum pump valve closed, open the Refrigerant-12 tank valve, and set the low pressure (suction) manifold gauge valve to the counterclockwise position. This opens the system to tank pressure. Check all connections, and the compressor head gasket, oil filler plug, and shaft seal for leaks, using a good refrigerant leak detector.

With a flame-type detector (Fig. 9), avoid inhaling the fumes from the leak detector. The smaller the flame the more sensitive it is to leaks. Therefore, to insure accurate leak indication keep the flame as small as possible. The copper element must be red hot. If it is burned away, replace the element. Hold the open end of the hose just below each suspected leak point for two or three seconds. The flame will normally be almost colorless. The slightest leak will be indicated by a bright green blue color to the flame. Be sure to check the manifold gauge set and hoses for leaks as well as the rest of the system.

If the surrounding air is contaminated with refrigerant gas, the leak detector will indicate this gas all the time. Good ventilation is necessary to prevent this situation. A fan, even in a well ventilated area, is very helpful in removing small traces of refrigerant vapor.

Another testing device can be used to detect leaking refrigerant gas. This device is called the Electronic Leak Detector (Fig. 10). The controls of the Electronic Leak Detector are an on/off control knob and a toggle-type sensitivity switch (search and pinpoint), also a flexible sensing probe.

The Electronic Leak Detector is operated by turning the control knob clockwise until a steady ticking sound

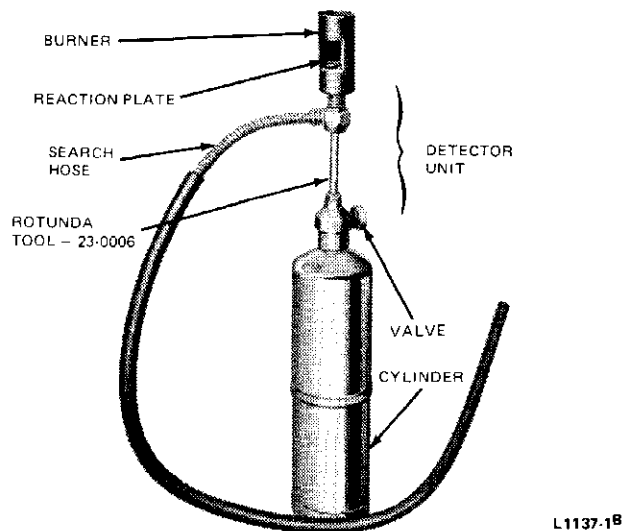


FIG. 9 Flame Type Leak Detector

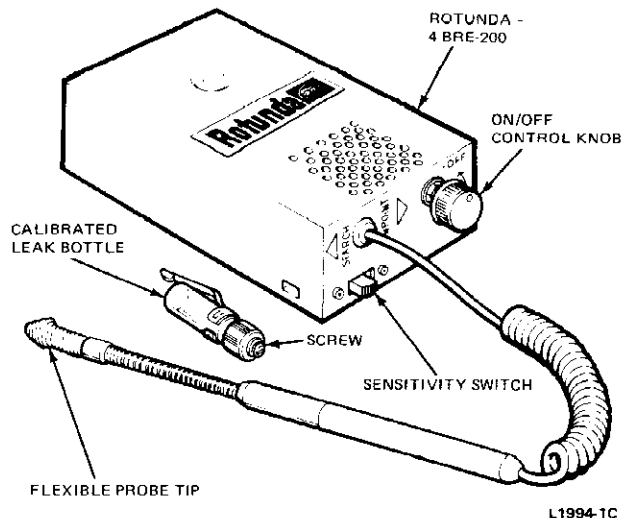


FIG. 10 Electronic Leak Detector

is audible. The toggle switch is placed in the search position. Then move the probe at about one inch per second in the suspected area. When escaping refrigerant gas is located, the ticking signal will increase. If the gas is relatively concentrated the signal will be increasingly shrill. If you are unable to tell exactly where the leak is, move the toggle to the pinpoint position and adjust the control knob to the steady ticking position. Now search in the concentrated area again. The pinpoint setting will de-sensitize the probe tip and allow you to find the leak exactly.

To test the Electronic Leak Detector:

1. Remove the screw from the top of the calibrated leak bottle.
2. Bring the probe tip near the top of the leak bottle and the instrument will respond to the refrigerant gas by quickening the ticking signal to a squeal.

CAUTION: Be sure to remove only the screw from the calibrated leak bottle. The refrigerant spilled on fingers could cause frostbite.

AIR CONDITIONER PERFORMANCE TEST

The pressures developed on the high pressure (discharge) and low pressure (suction) side of the compressor indicate whether or not the system is operating properly.

Attach the manifold gauge set. Set both manifold gauge valves at the maximum clockwise, or closed position.

Check the system pressures with the engine running at 1100-1300 rpm, all controls set for maximum cooling, and the front of the car at least 5 feet from any wall. The actual pressures indicated on the gauges will depend on the temperature of the surrounding air and the humidity. Higher air temperatures along with high humidity, will give higher system pressures. At

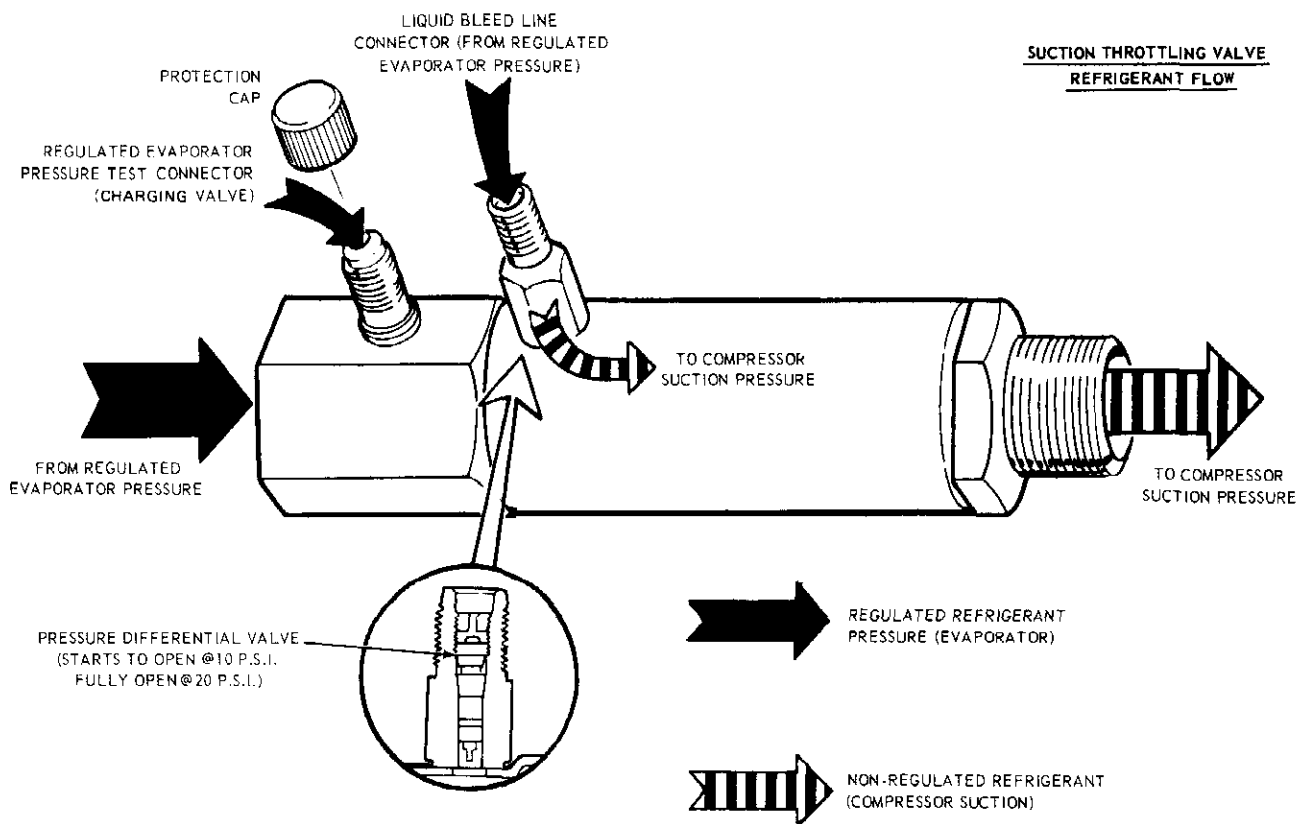
idle speed and a surrounding air temperature of 110 degrees F, the high pressure may go as high as 300 pounds or more.

If it becomes necessary to operate the air conditioner under these conditions, keep the high pressure down with a fan directed at the condenser and radiator.

The low pressure gauge should indicate 5 to 20 psi; the high pressure gauge should indicate 120 to 180 psi at 70 to 80 degrees F.

SUCTION THROTTLING VALVE

1. Connect the manifold gauge set into the system and connect a separate pressure gauge to the evaporator gauge connection on the suction throttling valve (Fig. 11).



SUCTION THROTTLE VALVE PRESSURE/ALTITUDE CHART

ALTITUDE OF TEST SITE (FEET)	REQUIRED GAUGE READING -1 psi +2 psi
0 FEET (Sea Level)	28.5
1000 FEET	29.0
2000 FEET	29.5
3000 FEET	30.0
4000 FEET	30.5
5000 FEET	31.0
6000 FEET	31.4
7000 FEET	31.8
8000 FEET	32.3
9000 FEET	32.7
10,000 FEET	33.2

FIG. 11 Suction Throttling Valve and Pressure/Altitude Chart

2. Perform the air conditioner performance test as outlined in the foregoing procedure. Make any repairs indicated by the test.
3. After operating the system for 10 to 15 minutes, be sure that normal operating pressures are indicating on the manifold gauge set (low pressure gauge 10 to 20 psi and high pressure gauge 120-180 psi). Then check the reading on the evaporator gauge.
4. Any gauge used to check the evaporator pressure at the suction throttling valve will be affected by atmospheric pressure, whereas the pressure within the valve itself remains unaffected. To compensate for this, use of the pressure-altitude chart in Fig. 9 will give the required gauge reading for correct evaporator pressure at a given altitude.
5. If the valve does not show the specified reading, check the gauge calibration.

REFRIGERANT SERVICE

DISCHARGING THE SYSTEM

When replacing any component in the air conditioning system, the system must be discharged. To discharge the system proceed as follows:

1. Remove the caps from the high and low charging valves in the high and low pressure lines (Figs. 12 or 13).
2. Turn both manifold gauge valves fully clockwise to close the gauge set to the center outlet hoses.
3. If the gauge set hoses do not have the gauge port actuating pins, install fitting adapters T71P-19703-S and R on the manifold gauge low and high pressure hoses.
4. Connect the high and low pressure gauge hoses with adapters, to the respective high and low pressure gauge port (Fig. 12). Some vehicles do not have a service access gauge port valve. On these vehicles, connect the manifold gauge set low pressure hose to the evaporator service access gauge port valve. A special adaptor (Tool No. T77L-19703-A) is required to attach the manifold gauge set to the high pressure service access gauge port valve.
5. Place the open end of the center hose in a garage exhaust outlet.
6. Slowly depressurize the refrigeration system by opening the low pressure gauge valve a slight amount and allowing the refrigerant to discharge slowly from the system.
7. After the system is nearly discharged, open the high pressure gauge valve very slowly to avoid losing an excessive amount of refrigerant oil and allow any refrigerant remaining in the compressor and high pressure line to discharge.

EVACUATING THE SYSTEM

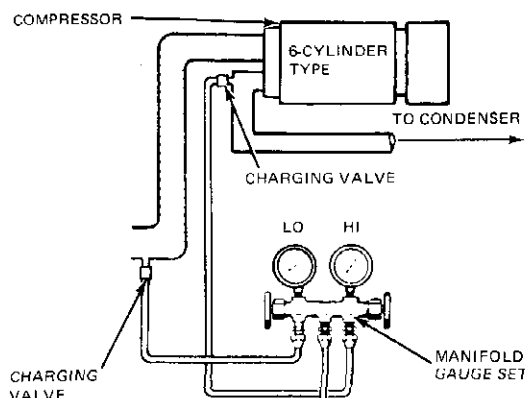
1. Discharge the system as described in the preceding procedure.

RECEIVER DRYER TEST

The receiver-dryer should be replaced if it has been damaged in an accident, leaks, or has become restricted or clogged. Do not attempt to repair the receiver-dryer. It is a refrigerant storage area, filter, and a moisture collecting device. If there is any indication of moisture or contamination in any of the components, or if the outlet connection is cool, the receiver-dryer should be replaced.

MAGNETIC CLUTCH TEST

Disconnect the magnetic clutch wire at the bullet connector, and connect it to the negative lead of an ammeter. Connect the positive lead of the ammeter to the battery positive terminal. The magnetic clutch should pull in with a distinct click and the current reading on the ammeter should be to specification.



L1871-1B

FIG. 12 Service Connections for System with Six-Cylinder Compressor

2. Attach a tank of Refrigerant-12 and a vacuum pump to the manifold gauge set. Make certain the Refrigerant-12 tank valve is tightly closed.
3. Open both manifold gauge set valves.
4. Run the vacuum pump until the low pressure gauge reads 25 inches and as close to 30 inches of vacuum as possible. Continue vacuum pump operation for 10 minutes. If there has been a parts replacement continue vacuum pump operation for an additional 20-30 minutes. Turn off the pump and close both gauge valves.

CHARGING THE SYSTEM

1. Discharge and evacuate the system as outlined in the preceding procedures.
2. Leave the vacuum pump valve closed.
3. Set the low pressure (suction) manifold gauge valve at the full counterclockwise or open position.

4. Set the high pressure (discharge) manifold gauge valve at the full clockwise or closed position.
5. Open the Refrigerant-12 tank valve to allow refrigerant to enter the system, and observe the gauges. When both gauges reach 60 to 80 pounds at approximately 75 degrees F, shut off the tank valve.
6. Perform the leak test with the leak detector.
7. Set the A/C controls for maximum cooling.
8. Start the engine and open the Refrigerant-12 tank valve again to prevent drawing vacuum on the suction side.
9. With the engine running at 1500 rpm, complete charging the system until the specified weight of refrigerant has entered the system.
10. If the refrigerant will not enter the system due to low temperature, it may be necessary to place the Refrigerant-12 tank in a container of hot water at about 150 degrees F. This will increase the Refrigerant-12 pressure and force the gas from the tank during charging. **Never heat the Refrigerant-12 tank with a torch. A dangerous explosion may result.**
11. During the charging, the high pressure (discharge) side may build up to an excessive value. This can be caused by an overcharge of refrigerant, or an overheated engine, in combination with high surrounding temperatures. Never allow the high pressure to exceed 240 pounds while charging. If it does, stop the engine, determine the cause, and correct it.
12. After the proper charge has been made, close the Refrigerant-12 tank valve, and check the system pressures for proper operation. (Low pressure **suction** gauge 4-25 psi; high pressure **discharge** gauge 120-210 psi at 70 to 90 degrees F ambient.)

13. After satisfactory operation has been achieved, disconnect the manifold gauge set high and low pressure hoses from the charging valves.
14. Install caps on the gauge ports and the manifold gauge set lines.

CHARGING FROM SMALL CONTAINERS

Refrigerant-12 is available in fourteen-ounce cans. **Do not open the high pressure (discharge) gauge valve on the manifold because the container can explode.**

1. A special valve and valve retainer is required for connecting the small can to the A/C system. Attach the valve retainer to the can by engaging the three tabs of the retainer to the lip at the top of the can. Turn the valve assembly into the threaded hole in the center of the valve retainer. In containers where the center of the can is deeply recessed, a washer should be inserted before installing the valve.
2. Connect the manifold gauge set to the system (Fig. 11 or 12). Connect the hose (normally connected to the large Refrigerant-12 tank) to the special valve on the small can. **Make sure that the valve is closed (full clockwise position).**
3. Once the can is connected, charge the system as outlined in the foregoing procedure. When the can is empty, close the valve and remove the empty can. Connect a new can, open the valve again and continue charging until the specified weight of Refrigerant-12 has entered the system. When you need a half pound of refrigerant such as with a 2 1/2-pound charge capacity, stop charging from one can when extreme cold is felt or a mist appears half-way down the can. Weigh the can to make sure one-half pound of refrigerant is installed.

Six — Cylinder Compressor

PART
36-34

SUBJECT	PAGE	SUBJECT	PAGE
DESCRIPTION AND OPERATION	34-1	MAJOR REPAIR OPERATIONS	
MAINTENANCE		Compressor Assembly	34-12
Adding Oil	34-1	Compressor Disassembly	34-11
REMOVAL AND INSTALLATION		Compressor Leak Testing — External	
Clutch	34-3	and Internal	34-14
Clutch Coil and Housing	34-6	SPECIFICATIONS AND SPECIAL TOOLS	34-15
Hub and Driven Plate	34-3		
Pulley and/or Bearing	34-5		
Compressor	34-2		
Compressor Shaft Seal	34-6		

CL2343-2B

DESCRIPTION AND OPERATION

The compressor mainshaft is driven by a belt from the crankshaft pulley. Three double-acting pistons, positioned axially around the compressor shaft, operate in a front and rear cylinder assembly. The pistons are actuated by a swash plate that is pressed on the compressor shaft. The swash plate changes the rotating action of the shaft to provide a reciprocating driving force to each of the three pistons. This driving force is applied, through the shoes and balls, to the midpoint of each of the double ended pistons. The mainshaft also drives the oil pump which is located in cavities in the cylinder rear head.

Reed-type suction and discharge valves are mounted in valve plates between the cylinder assembly and the head at each end of the compressor. The heads are

connected with each other by gas-tight passageways which direct refrigerant gas to a common output.

A magnetic clutch is used to drive the compressor shaft. When voltage is applied to the clutch coil, the clutch plate and hub assembly, (which is solidly coupled to the compressor shaft) is drawn by magnetic force rearward toward the pulley which rotates freely on the front head casting. The magnetic force locks the clutch plate and pulley together as one unit. The compressor shaft then turns with the pulley. When voltage is removed from the clutch coil, springs in the clutch plate and hub assembly move the clutch plate away from the pulley and the clutch plate and compressor shaft cease to rotate.

MAINTENANCE

ADDING OIL

The six-cylinder compressor uses TL4538 Texaco 525 viscosity refrigerant oil (D1VY-19577-A) or equivalent. An oil charge of 10-1/2 fluid ounces is required. It is important that only the specified type and quantity of oil be used in the compressor. If there is a surplus of oil in the system, too much oil will circulate with the refrigerant, causing the cooling capacity of the system to be reduced. Too little oil will result in poor lubrication of the compressor.

When it is necessary to replace a component of the refrigeration system, certain procedures must be followed to assure that the total oil charge in the system is correct after the new part is on the car. When the compressor is operated, oil gradually leaves the compressor and is circulated through the system with the refrigerant. Eventually a balanced condition is reached in which a certain amount of oil is retained in the compressor and a certain amount is continually

circulated. If a component of the system is removed after the system has been operated, some oil will go with it. To maintain the original total oil charge, it is necessary to compensate for this by replacing the oil in the new replacement part.

The procedures for replacing oil are as follows:

COMPRESSOR ONLY

1. Idle engine for 10 minutes at 1,000-1,500 rpm at maximum cooling and high blower speed to allow oil to distribute itself in the system in a normal manner.
2. Discharge the system and remove the compressor from the vehicle. Remove the drain plug and pour the oil into a measuring container. **Make a note of the amount of drain oil then discard it.**
3. A new six cylinder replacement compressor is shipped containing 10-1/2 fluid ounces. This oil should also be drained.

4. If the oil drained from the removed compressor measured less than 4 ounces, replace 6 ounces of new oil in the replacement compressor.
5. If the oil drained from the removed compressor measured between 4 and 6 ounces, the oil is properly distributed throughout the system. Simply replace an equal amount of new oil in the replacement compressor.
6. If the oil drained from the removed compressor measured 6 ounces or more, replace **only** 6 ounces of new oil in the replacement compressor.

Replacing Components

Whenever replacing a component of the air conditioning system, add measured quantities of 525 viscosity refrigeration oil to the component to assure that the total oil charge in system is correct before unit is operated.

Oil should be added to replacement components as follows:

Evaporator: Add 3 fluid ounces.

Condenser: Add 1 fluid ounce.

Receiver: Add 1 fluid ounce.

Condenser and Receiver Assembly: Add 2 fluid ounces.

Oil should be poured directly into the replacement component. If an evaporator is installed, pour oil into inlet pipe with pipe held vertically so oil will drain into core.

If any other components, such as valves or hoses are replaced, no additional oil is necessary.

REMOVAL AND INSTALLATION COMPRESSOR

Removal

1. Discharge the refrigeration system as outlined in Part 36-32.
2. Loosen the capscrew that retains the hose connector plate to the rear of the compressor (Fig. 1). As the screw is being loosened, work the high and low pressure hose fittings back and forth to break the seal and carefully bleed off any pressure remaining in the compressor. **High pressure may still exist at the discharge fitting. If this**

pressure is released too rapidly, there will be a considerable discharge of refrigerant and oil.

3. Immediately cover the compressor openings with the pressure test plate, Tool T71P-19703-Q, as shown in Fig. 2. **Make sure that the plate is properly positioned on the rear surface of the compressor flush against the seals to make a complete seal.**
4. Disconnect the compressor clutch coil wiring connector.

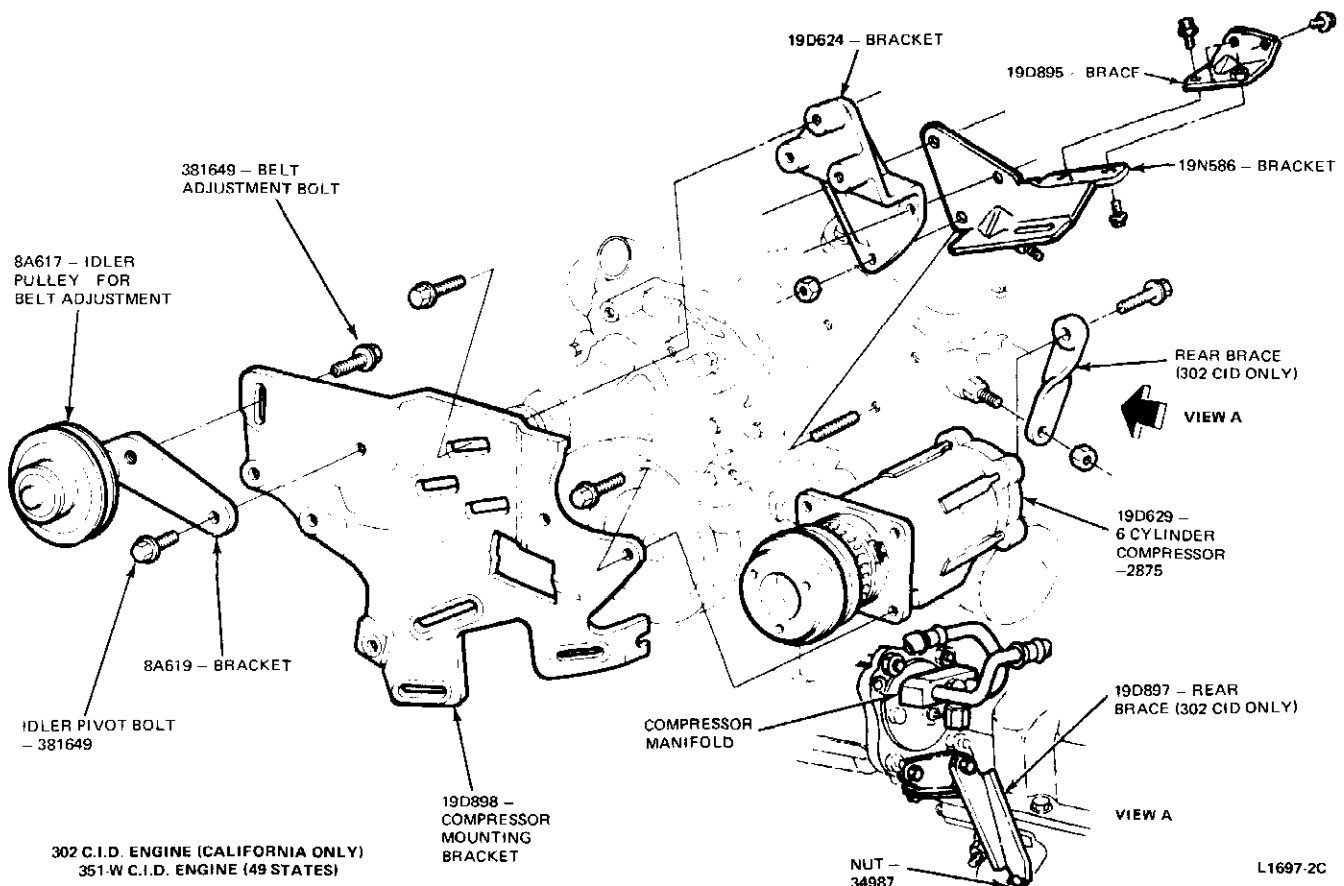


FIG. 1 Compressor Installation and Belt Adjustment

5. Loosen the three belt tension adjusting screws (Fig. 1), and rotate the compressor and bracket assembly in the front slot to disengage the belt.
6. While supporting the weight of the compressor, remove the three belt tension adjusting screws (they are also mounting screws).
7. Lower the compressor and then carefully lift the compressor (with front and rear brackets attached) up between the power steering pump and fender apron and out of the engine compartment.
8. Drain all oil from the compressor into a clean dry container, and replace the drain plug. Measure the amount of oil drained. See Adding Oil.

Installation

Before installing a new compressor, rotate compressor shaft four or five times. This permits proper lubrication of compressor seal over all its surface. Before compressor clutch is mounted to the new compressor, wipe the front face of the compressor thoroughly with a clean dry cloth and, if necessary, clean front of compressor with a solvent to remove any excess oil. Cleaning compressor in this manner will prevent any oil from being thrown onto the clutch surfaces which would cause slippage and eventual clutch damage.

Indicate the amount of refrigerant charge specified for the system on the plate provided for this information on the new compressor. Follow the procedure for replacing oil in the new compressor as explained under Adding Oil.

1. Carefully install the compressor with the pressure test plate (T71P-19703-Q) and the front and rear brackets installed on compressor. Lower compressor into the engine compartment between the power steering pump and the fender apron.
2. Position the compressor so that its front and rear bracket screw holes are aligned with the holes in the large mounting bracket, and install the three belt tension adjusting (mounting) screws (Fig. 1). The screws should be snug but not torqued until after the belt is installed and adjusted.
3. For a 460 engine, install the compressor belt and adjust the tension with a flex handle having 1/2-inch drive. Insert the 1/2-inch drive in the belt tensioning pry bar slot (Fig. 1) and move the compressor toward or away from the engine to obtain the specified belt tension. Use Tool T63L-8620-A to measure the belt tension. After obtaining the specified belt tension (see Specifications), tighten the three adjusting screws.
4. Remove the pressure test plate Tool T71P-19703-Q from the rear of the compressor very slowly to bleed off any pressure. **New compressors are charged with a mixture of nitrogen, refrigerant and 10-1/2 fluid ounces of 525 viscosity refrigerant oil. If the cover is removed too rapidly, the oil will be blown out violently with the sudden release of pressure.**
5. Connect the wiring connector to the clutch coil.
6. Evacuate and charge the system as outlined in Part 36-32 under Refrigerant Service.
7. Check the system operation and test for leaks.

CLUTCH ASSEMBLY

HUB AND DRIVEN PLATE

Removal

1. Remove the compressor from the vehicle as outlined in the preceding procedure.
2. Install the compressor and clutch assembly into the holding fixture T57L-500-A or equivalent (Fig. 2) or a fabricated fixture (Fig. 3).
3. Hold the clutch hub with T70P-4067-A wrench or an oil filter removing strap and, using a special thin

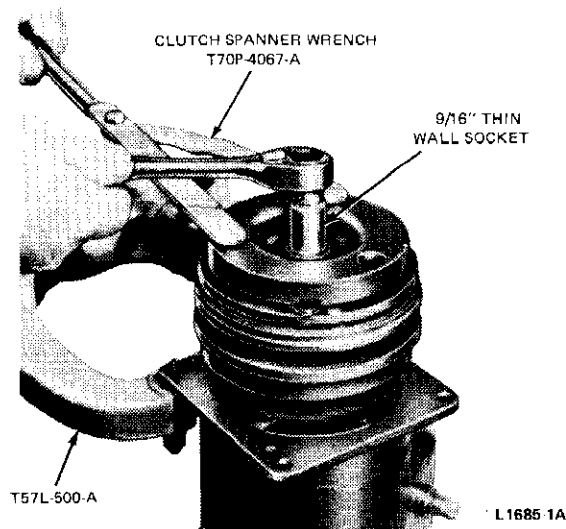


FIG. 2 Removing Lock Nut

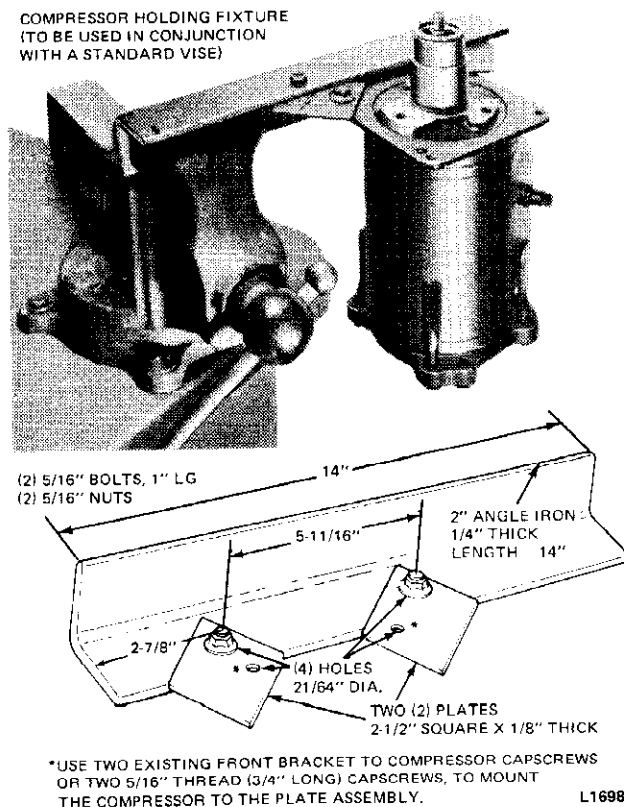


FIG. 3 Fabricated Holding Fixture

wall 9/16-inch socket, remove hub and driven plate assembly lock nut from shaft (Fig. 2).

4. Remove hub and driven plate assembly retainer ring, using standard snap ring pliers. Remove spacer (Fig. 4).
5. Screw the threaded hub puller T71P-19703-E into the hub of the driven plate. Hold the main body of the tool with the wrench and turn the forcing screw clockwise to remove the driven plate (Fig. 5).
6. Remove the tool from the hub of the driven plate.
7. Remove the hub and driven plate assembly key from the shaft.

Installation

1. Insert the square drive key into the slot in the shaft so that it projects approximately 3/16 inch out of the end of the keyway slot (Fig. 6). Wedge into the keyway with slight pressure. The key is slightly curved to provide wedge action.
2. Align the keyway in the hub with the keyway in the shaft. **To avoid internal damage to the compressor, do not drive or pound on hub and driven plate assembly or on the end of the shaft. If proper tools to remove and replace clutch parts are not used, it is possible to disturb the position of the swash plate (keyed to mainshaft) resulting in compressor damage.**
3. Position the hub and driven plate assembly into the compressor front end casting.
4. Position the driven plate installing Tool T71P-19703-F on the threaded end of the shaft. This tool has a right hand thread on the body (Fig. 7).
5. Using one wrench on the end of the tool body and another wrench on the hex nut, tighten the nut so as to press the hub and driven plate assembly onto the shaft until there is approximately a 3/32-inch space between the frictional faces of the clutch plates.
6. Remove the installing tool.
7. Install the hub spacer washer and the retainer snap ring (Fig. 4).

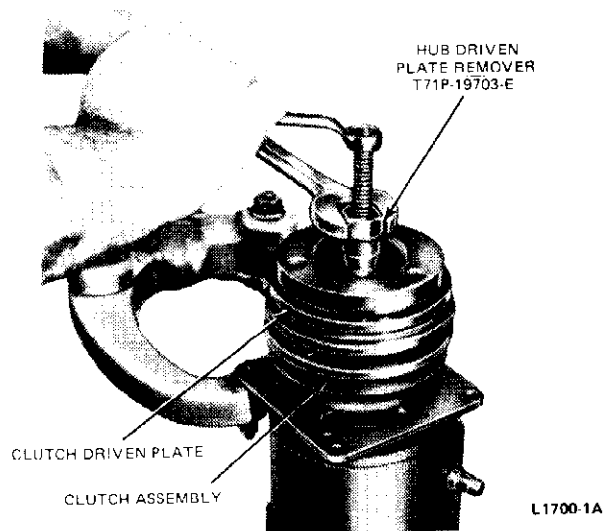


FIG. 5 Removing Hub and Driven Plate

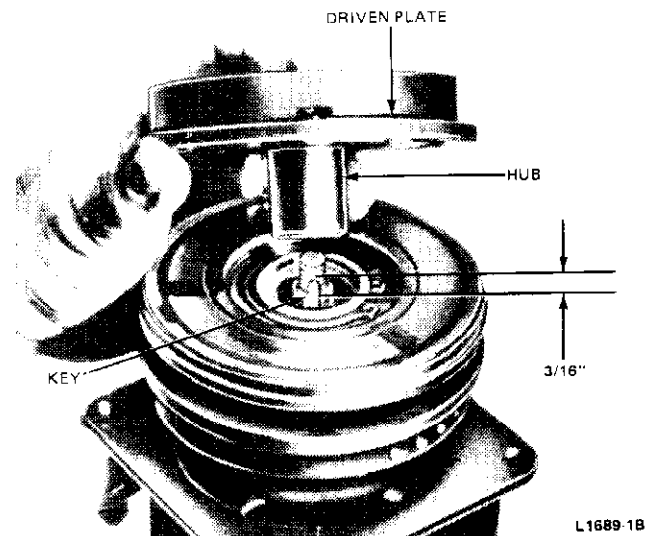


FIG. 6 Aligning the Driven Plate Key

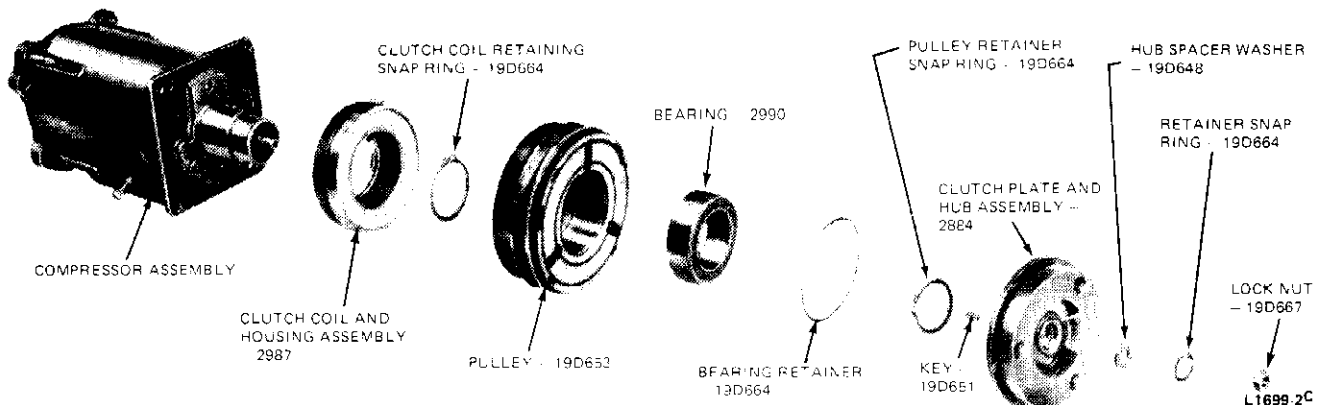
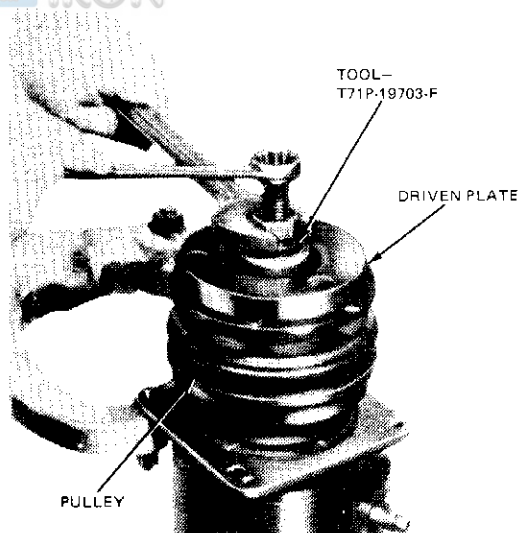


FIG. 4 Clutch and Pulley Disassembled



L1690-1A

FIG. 7 Installing the Driven Plate

8. Again, position the driven plate installing Tool T71P-19703-F on the threaded end of the shaft and continue pressing the driven plate assembly on the shaft until the spacer washer seats against the shoulder of the shaft.
9. Install the retainer snap ring with the flat side toward the hub spacer washer.
10. Install a new lock nut, using a special thin wall 9/16-inch socket. Tighten to 15 ft-lbs torque. The air gap between the friction faces of pulley and driven plate should now be between .022-.057-inch clearance (Fig. 8).

11. Remove the compressor and clutch assembly from the holding fixture. **After the compressor is installed, the engine at idle and the system is operating satisfactorily, cycle the clutch (by turning air conditioning off and on) at least 20 times at approximately one-second intervals to SEAT or RUN-IN the mating parts of the clutch.**

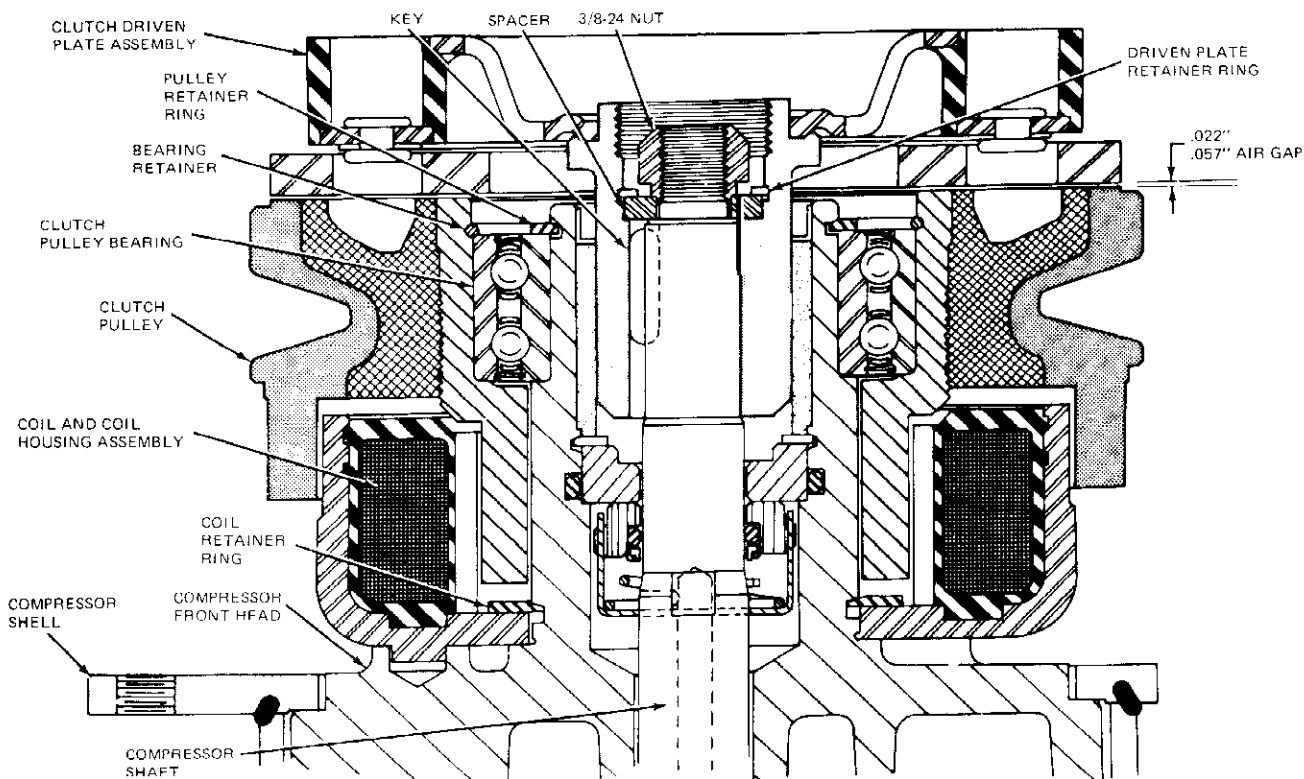
PULLEY AND/OR BEARING ASSEMBLY

Removal

1. Remove the hub and driven plate assembly as outlined in the foregoing procedure.
2. Remove the pulley assembly retainer ring, using standard snap ring pliers (Fig. 9).
3. Place T71P-19703-N puller pivot over the compressor shaft and remove the pulley assembly, using T71P-19703-B pulley remover (Fig. 10).
4. Remove the pulley and the puller pivot.
5. Remove the pulley bearing wire retainer ring with an awl or a small screwdriver (Fig. 9).
6. Remove the ball bearing assembly, using T71P-19703-D bearing remover and handle to press out the bearing (Fig. 11).

Installation

If the existing pulley and the driven plate and hub assembly are to be reused, clean the drive faces on each part with alcohol or similar solvent. If these parts show evidence of warpage due to overheating, they should be replaced (Fig. 12).



L1691-2A

FIG. 8 Clutch and Pulley Assembly Cross Sectional View

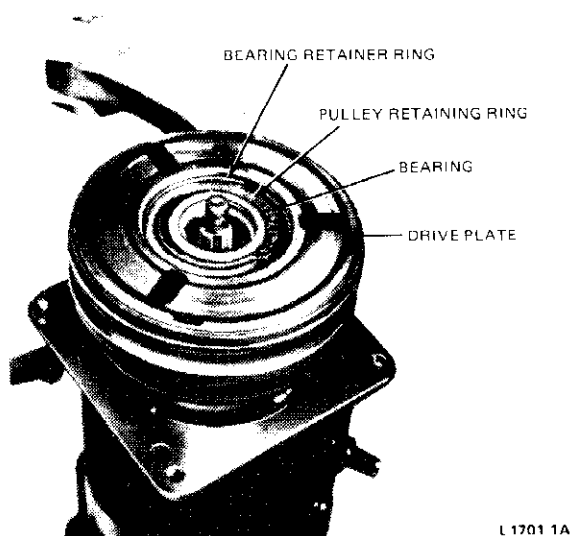


FIG. 9 Location of Bearings and Retainers

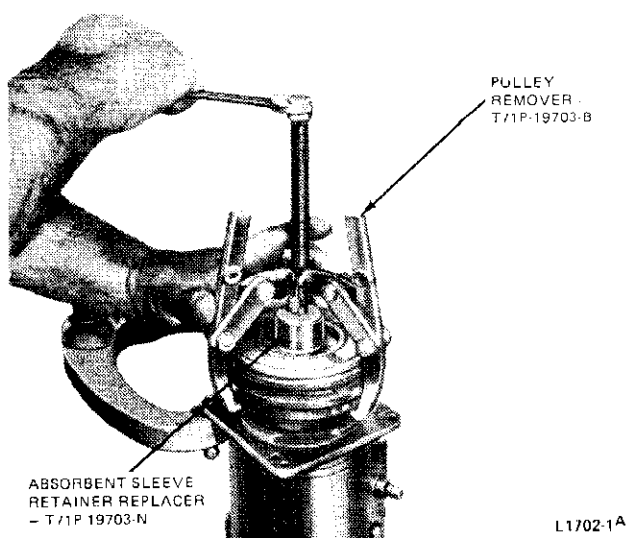


FIG. 10 Removing Pulley Assembly

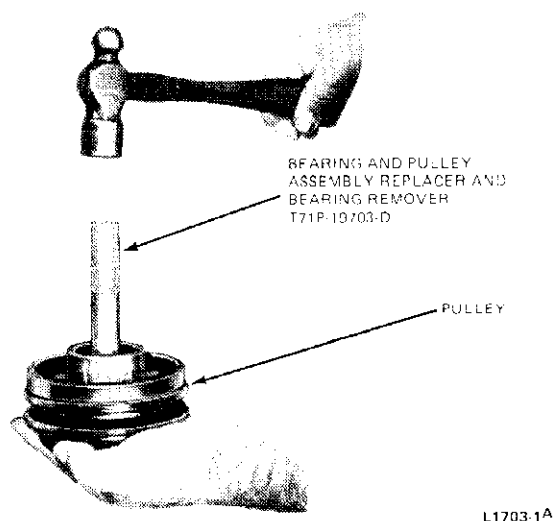


FIG. 11 Removing the Bearing from the Pulley

1. When replacing a new ball bearing assembly into the pulley, use T71P-19703-D pulley bearing installer (Fig. 13).
2. Replace the pulley assembly wire retainer ring in the pulley (Fig. 9).
3. Press or tap the pulley and bearing assembly on the neck of the compressor, using T71P-19703-D (Fig. 14).
4. The pulley should rotate freely.
5. Install pulley snap ring retainer, using standard snap ring pliers. Assure installation of snap ring by tapping with bearing installer tool T71P-19703-D.
6. Install the hub and driven plate assembly as outlined in the foregoing procedure.

CLUTCH COIL AND HOUSING ASSEMBLY

Removal

1. Remove the hub and driven plate assembly and the pulley and bearing assembly as outlined in the two preceding procedures.
2. Note the position of the electrical terminals, and scribe the location of the coil housing terminals on the compressor body.
3. Using standard snap ring pliers, remove coil housing retainer ring (Fig. 4).
4. Remove the coil housing assembly.

Installation

1. Position the clutch coil on the compressor front head casting, so that the electrical terminals are in their proper location as previously scribed on the compressor body. **Make certain that the coil is properly seated on the dowels.**
2. Replace the coil retainer ring with the flat side of the ring facing the coil (Fig. 4). Use standard snap ring pliers.
3. Install first the pulley and bearing assembly and then the hub and driven plate assembly as outlined in the two preceding procedures.

COMPRESSOR SHAFT SEAL

LEAK DETECTION

A shaft seal should not necessarily be changed because of an oil streak on the components. The seal is designed to seep some oil for lubrication purposes. Only change a shaft seal when a leak is detected by the following procedure:

Be sure there is refrigerant in the system. This can be determined by feeling the suction line (suction throttling valve to compressor line) while operating the compressor. Cooling of the line indicates refrigerant in the system.

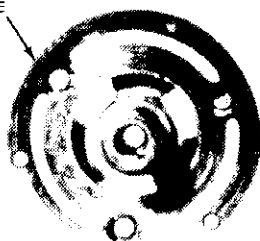
Turn off the engine.

Blow off compressor clutch area with compressed air. Blow out clutch vent holes to completely remove all freon and oil accumulations (Fig. 15).

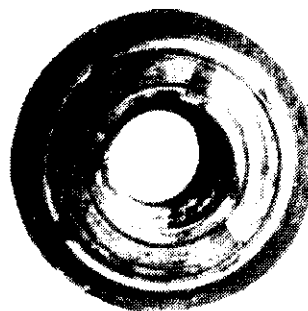
Allow the car to set for 5 minutes without operating the compressor.

Rotate the compressor clutch driven plate by hand until one of the vent holes is at the lower part of driven

DRIVEN PLATE



DRIVE PLATE



SCORING OF DRIVE PLATE AND DRIVEN PLATE IS NORMAL -
DO NOT REPLACE FOR THIS CONDITION.

VIEW A

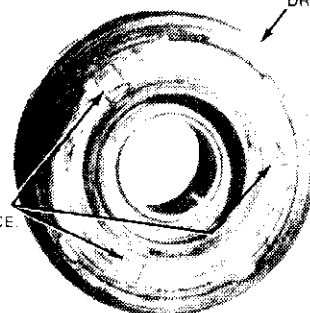
DRIVEN PLATE



VIEW B RESILIENT MATERIAL SEPARATION-REPLACE.

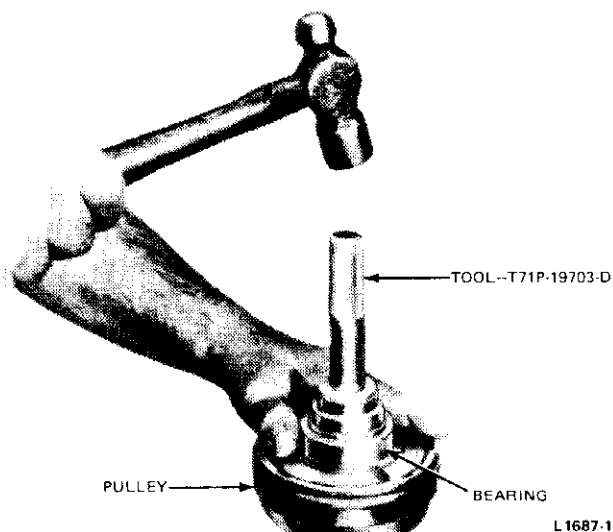
DRIVE PLATE

SEPARATION OF FRICTION
MATERIAL FROM METAL-REPLACE
VIEW C



L1686-2A

FIG. 12 Clutch Hub and Pulley Inspection



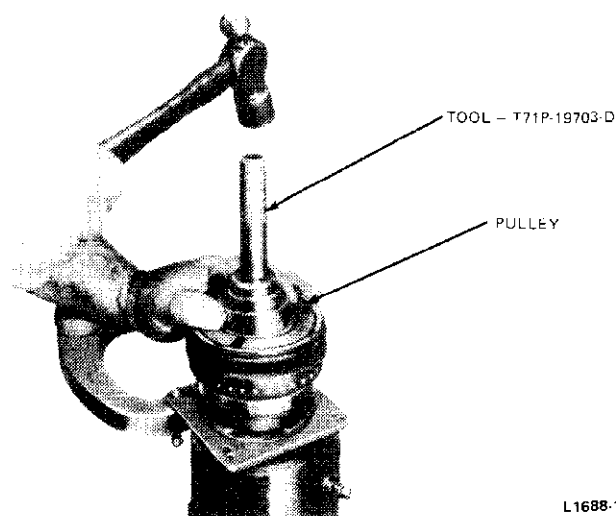
L1687-1A

FIG. 13 Installing Bearing in Pulley

plate. Using a leak detector, sense through vent hole at lower part of driven plate only.

Some compressor shaft seal leaks may be the result of mispositioning of the swash plate (wobble plate) on the compressor shaft. The mispositioning of the swash plate may be caused by improper procedures used during pulley and driven plate removal, pounding, collisions or dropping the compressor. If the swash plate is mispositioned, the carbon face of the shaft seal assembly may not contact the seal seat and the rear thrust races and bearing may be damaged.

If there appears to be insufficient air gap between the drive and driven plates, dislocation of the shaft



L1688-1A

FIG. 14 Installing Pulley and Bearing Assembly on Compressor

should be suspected. If the carbon seal is not seating against the seal seat, it will not be possible to evacuate the system completely as outlined under evacuating the system.

To check for proper positioning of the swash plate on the shaft, remove the clutch driven plate and measure the distance between the front head extension and the flat shoulder on the shaft as shown in Fig. 15. To measure this distance, use a wire gauge; the clearance should be between .029 and .073 inch. If the shaft has been pushed back in the swash plate (measurement greater than .073 inch), disassemble the