

AIR CONDITIONER

GENERAL DESCRIPTION

The 1955 Cadillac Air Conditioner system is basically the same as that used on 1954 cars, but several important changes, including a new compressor, have been made in the individual units to provide a faster cooling rate and to permit more accurate control of interior temperature. Fig.16-A-1

The new compressor is a five cylinder reciprocating type, having intake and discharge valve reeds for each cylinder which permits a definite separation between the discharge (high pressure) and intake (low pressure) side.

Both the high and low pressure hand shut off valves and the gage fittings are located in the head casting at the rear of the compressor. Fig. 16-A-2

The compressor shaft is engaged with the drive pulley by means of an internal clutch assembly which is actuated by an internal coil. Fig. 16-A-3 This coil, when energized, magnetizes the coil and seal housing to attract the armature which is riveted to the rear clutch plate. As the rear clutch plate moves toward the coil housing, the frictional material on the plate contacts the rear flange of the compressor pulley, causing the clutch plate to rotate. This rotation forces the three balls, between the clutch plates, to the shallow end of their depressions. The front clutch plate, then, is forced into contact with the front inner face of the pulley so that both front and rear clutch plates are rotating with the pulley. The splined hub of the front clutch plate drives the compressor shaft and compressor.

The Air Conditioner control panel, which consists of a toggle switch, blower motor control rheostats, and a temperature control lever, is lo-

cated on the lower flange of the instrument panel just below the radio. While the toggle and blower switches serve the same purpose as on previous model cars, the temperature control lever permits regulation of cooling to the desired degree.

The electrical circuit is arranged so that current flows from the battery, through a 20 ampere fuse, to the toggle switch. With the toggle switch in the "Vent" position, current is directed to the blower switches and to the temperature control lever. Fig. 16-A-4

When the temperature control lever is in the extreme right position, current flows directly to the relay, mounted on the left front fender dust shield. The relay coil is energized and the points close, completing a circuit to the clutch coil to engage the compressor and provide full cooling without temperature control.

When the temperature lever is moved to the left, current flows through a variable resistance to a thermostat mounted on the top of the evaporator housing.

The thermostat has a temperature sensitive coil which extends into the evaporator, where it is exposed to the return air flow from the passenger compartment. As the temperature of the return air increases, the thermostat bellows moves upward and closes the circuit to the relay to operate the compressor. As the resistance in the circuit to the thermostat is increased, by moving the control lever to the left, the points in the thermostat will not close the circuit until the return air reaches a higher temperature, providing the driver with complete control of the interior temperature.

SERVICE INFORMATION

(1) Precautions in Handling Freon-12

While Freon-12 was selected as the safest and best refrigerant to use in the Cadillac Air Conditioner, it is very important that the following precautions be observed to avoid serious accidents and personal injury.

a. Do not leave drum uncapped. The metal cap furnished with the drum when it is shipped is to protect the valve and safety plug from damage. It should be replaced after each use of the drum.

b. Do not carry the drum in the passenger compartment of a car. Always place drum in luggage compartment of car or if in an open truck, cover drum to protect it from radiant sun heat. The re-

sultant increase in pressure may cause safety plug to release or drum to burst.

c. Do not subject drum to high temperature when charging system. Use water no warmer than 125° F. to heat drum. Never place drum on radiator, stove, or use torches for heating during charging.

d. Do not fill drum completely - when filling one drum from another, always allow space above liquid for expansion.

e. Do not discharge Freon-12 into a room having an exposed flame - concentrations of this gas in contact with an open flame will produce a toxic gas.

f. Do not expose the eyes to liquid - protect

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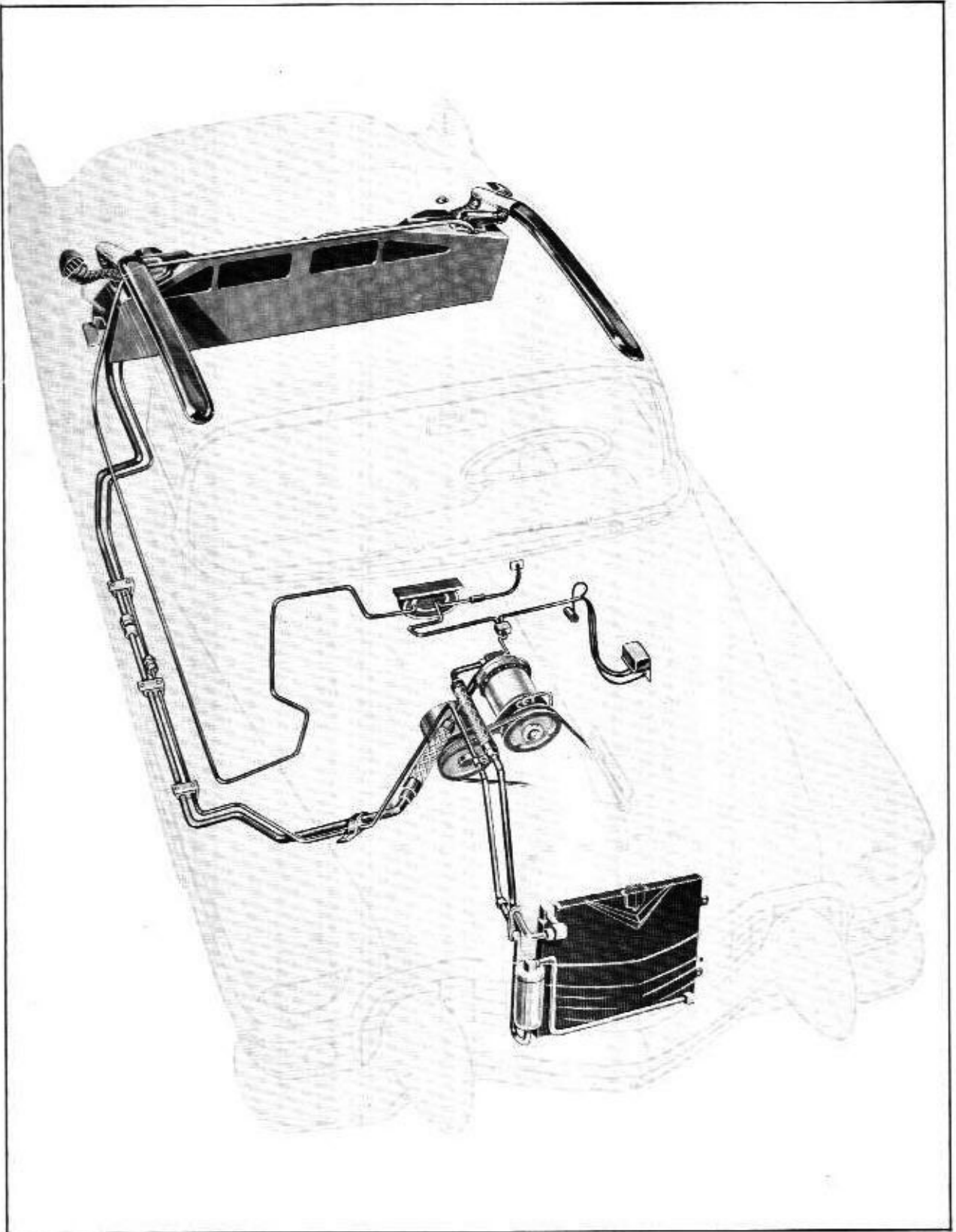


Fig. 16-A-1 Location of Air Conditioner Units

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them with glasses or goggles. If Freon-12 liquid should strike the eyeballs:

1. Apply a few drops of sterile mineral oil to the eyes as an irrigator.
2. If irritation continues, wash the eyes with a weak solution of boric acid.
3. See an eye specialist at once.

If liquid Freon-12 comes in contact with the skin, the injury should be treated for frostbite.

(2) Precautions in Handling Lines

- a. Store all lines to avoid crushing or kinking. If a line is kinked, it should not be used.
- b. Lines should be kept sealed and dehydrated in stock. Do not remove caps from lines until just before installation.
- c. When tightening fittings, use proper size wrenches to avoid over or under tightening. Always use two wrenches, when tightening fittings, to prevent twisting the soft copper tubing. A drop of Frigidaire oil on the pipe flare will allow the flare nut to be tightened without twisting the pipe.
- d. Close ends of lines, which have been disconnected for any reason to prevent entrance of moisture or dirt.

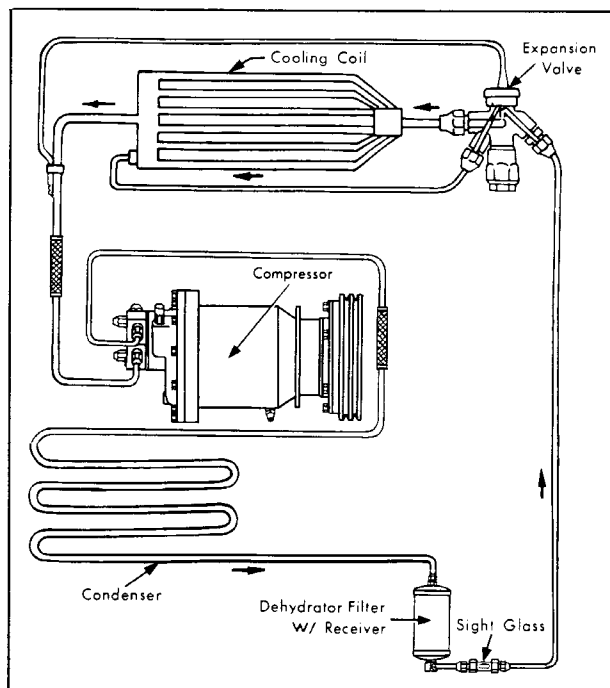


Fig. 16-A-2 Cycle of Operation

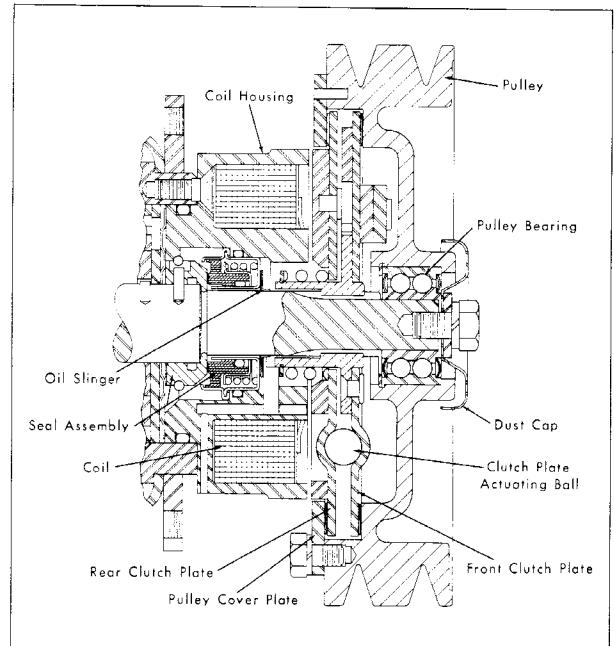


Fig. 16-A-3 Cross-Section of Compressor

- e. Gage set and lines should be kept clean and free from moisture.
- f. Do not leave Frigidaire oil container open any longer than necessary, as the special oil is moisture-free and will absorb moisture from the air if left uncapped.
- g. Use the Vacuum Pump, Tool No. J-5428, to remove any air or moisture which may have entered the system when it was opened to replace a part.

(3) Maintenance and Inspection

a. Preliminary Check

1. High and low pressure shut-off valves at compressor must be fully open.
2. Drive belts must be installed properly to prevent slippage.
3. Make certain clutch is engaging and dis-engaging.
4. Using Leak Detector, Tool No. J-5419, test entire system for leaks, and make necessary repairs.
5. If there is evidence of oil leaks, check oil level.
6. Check operation of blower fans at all control knob positions.

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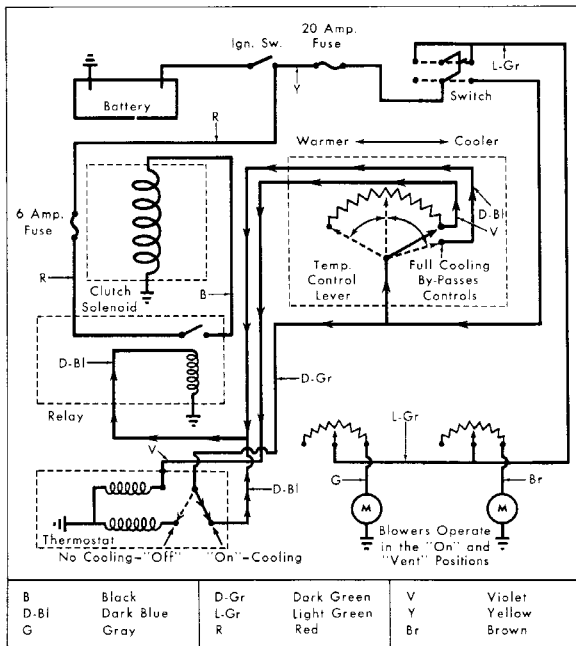


Fig. 16-A-4 A/C Wiring Diagram

7. Check operation of temperature control lever relay and thermostat.

b. Seasonal Operation

1. Winter Operation

Close outside air intake ducts.

It is advisable to operate the compressor for a few minutes each month during the winter season.

2. Summer Operation

To start the Air Conditioner after the winter season, the following operations should be performed:

Leak test complete system and make necessary repairs.

If leaks are found, check oil level.

Check belts for proper tension.

See that clutch engages and disengages. Make certain clutch is not slipping by observing dust cover bolt at center of pulley. Bolt should be turning at same speed as pulley.

Place toggle switch in "On" position with control lever to extreme right position and operate engine for five minutes at 1300 RPM.

Check sight glass for absence of bubbles which would indicate that system has sufficient Freon-12 charge.

Open outside air intake ducts.

Check conditioning unit blower fans for variable speed control at panel.

c. 2000 Mile Inspection

The procedure outlined below may be used as a guide to check the Air Conditioner system when the car is brought in for the 2000 mile inspection.

1. Check unit for an indication of leaks and make necessary repairs.

2. If there is an indication of an oil leak, check compressor for proper oil level.

3. Tighten compressor mounting brackets and check belt tension.

4. Check sight glass for absence of bubbles indicating proper charge of Freon-12. This should only be done after running engine at a speed of 1300 RPM for five minutes in the "On" position - clutch engaged.

(4) Service Precautions

a. Collision Service

It is very important that the Air Conditioner system be inspected as soon as possible whenever a car, so equipped, has been involved in a collision. If the system has been opened as a result of the collision, it will permit the entrance of air, moisture, and dirt which will cause internal damage. As the length of time the system has been open, and the extent of damage to the components, will govern the replacement of parts and the service operations required, a definite procedure cannot be recommended which will cover all cases. The following procedure, however, may be used as a guide:

1. Make certain clutch is disengaged if car is to be operated before repairs are made. Replace belts with shorter belts if necessary.

2. Close both valves at compressor.

3. Inspect all units and pipes, noting any damage.

a. If the condenser is damaged, it should be replaced. No repairs such as soldering, brazing, or welding should be attempted.

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b. Replace dehydrator-receiver assembly if damaged, leaking, clogged, restricted, or if open for any period of time.

4. Check compressor and clutch pulley for cracks. If compressor does not show evidence of external damage, it may be used.

b. Steam Cleaning and Welding

Excessive heat applied at any section of the refrigerant lines will create excessively high pressures. For this reason, steam cleaning or welding should not be performed on any portion of the car adjacent to the refrigeration units or lines.

c. Undercoating

To simplify service operations, undercoating should not be applied to any connections on the refrigeration system. While it is permissible to undercoat the copper refrigerant lines, all flare joints and connections should first be masked.

(5) Installing Gage Set

In performing service operations, the system must be prepared and processed before and after the work is performed.

In order to save time and to avoid repetition in several of these operations, the step-by-step procedure of this operation is explained here, and in other procedures only a reference to it will be made.

a. To Check Operation of System

1. With gage set valves closed, connect gage line to the high pressure Schrader type gage fitting at compressor. Fig. 16-A-5

NOTE: Make certain center connection of gage set is plugged.

2. Open both valves on gage set 1/4 turn counter-clockwise, purging Freon and air from the lines and, at the same time, install the low pressure gage line to the gage fitting at the compressor. Close gage valves.

3. Leak test all gage connections. If no leaks are found, proceed as follows:

4. Position temperature control lever to extreme right position to energize clutch.

5. Turn Air Conditioner switch to "ON" position and blowers on full speed. A check of the system pressures can now be made.

6. After completing check, remove gage lines and replace caps.

b. To Purge the System

1. Remove caps from high and low pressure gage connection fittings at compressor.

2. Connect gage lines to compressor. Make certain gage valves are closed tightly.

3. Connect gage line to center connection of gage set, removing plug from end of line.

c. To Evacuate and Charge the System

1. Remove caps from high and low pressure gage fittings at compressor.

2. Connect gage lines to fittings as shown in Fig. 16-A-5. Make certain gage set valves and shut-off valve at vacuum pump are closed tightly.

3. Remove valve caps from compressor hand shut-off valves and make certain valves are fully open.

(6) Purging the System

In replacing any of the air conditioning components, (except compressor) the system must be

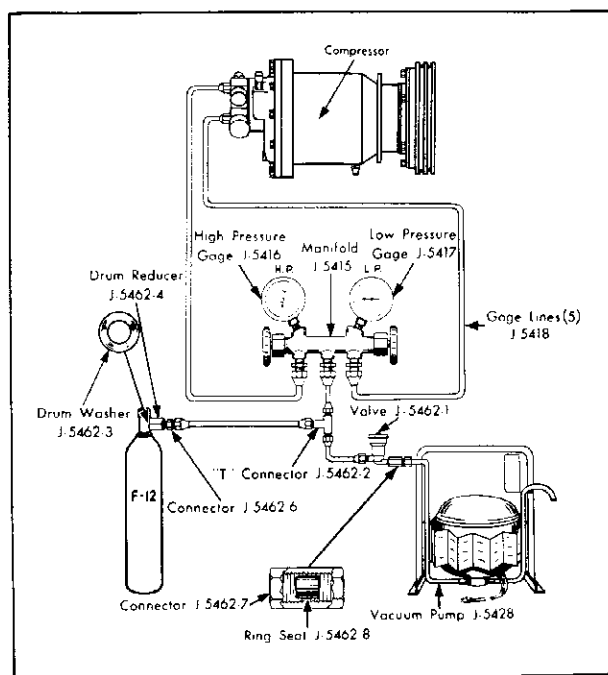


Fig. 16-A-5 Gage Connections For Evacuating or Adding Refrigerant

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completely purged (drained) of refrigerant. The purpose is to lower the pressure inside the system so that a component part can be safely removed.

1. Connect gage set to compressor as described in Note 5b.

2. Purge refrigerant from system through the center connection of gage set by first opening high pressure valve on gage set.

NOTE: Do not open valve wide until pressure in system has been lowered, as refrigerant under pressure will force oil out of the compressor.

3. Close valve on gage set from time to time for the purpose of allowing 1-2 pounds of refrigerant pressure to remain in the system, then close both valves on gage set.

NOTE: Allowing 1-2 pounds of refrigerant pressure to remain in system will prevent air and dirt from entering the system when a part is replaced.

4. Leave gage set connected in preparation for evacuating and recharging.

(7) Evacuating the System

Whenever the Air Conditioning system is opened for any reason, it should not be put into operation again until it has been evacuated. For this operation, use Vacuum Pump, Tool No. J-5428, to remove air and moisture which may have entered

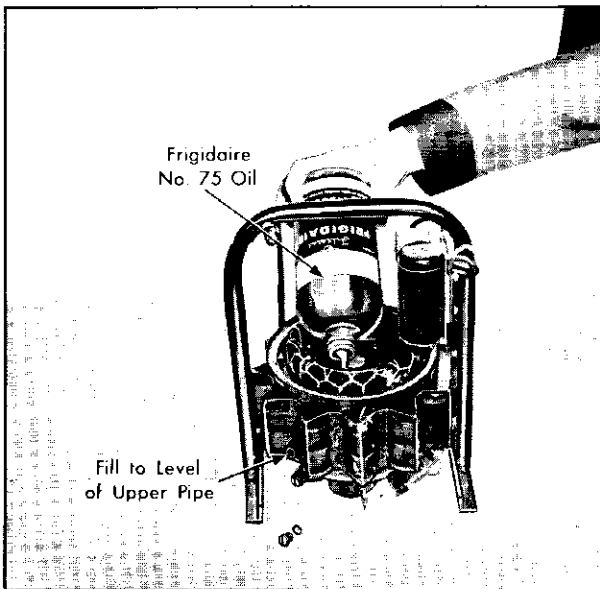


Fig. 16-A-6 Adding Oil to Vacuum Pump

the system when it was opened to replace a part.

Make sure dust cap on discharge side of vacuum pump has been removed. Check fluid level. This should be between the high and low screws in the side of the pump, Fig. 16-A-6. Add Frigidaire 75 viscosity oil to bring to proper level. Change oil in pump every 250 hours of operation by removing top and laying pump on its side with discharge oil trap up. Hold rotor firmly in position to prevent its coming out while draining oil. A small amount of 75 viscosity oil may be drawn into the pump occasionally to insure protection of internal parts during periods of disuse. If the pump should fail to start; check capacitor, relay, or remove the top and turn the rotor by hand to relieve a temporary stuck condition.

CAUTION: Do not use the vacuum pump as an air compressor as it will not receive proper lubrication under such usage. Keep suction and discharge fittings capped when not in use.

1. Connect gage lines as described in Note 5c if not installed previously.

2. Open the high and low pressure valves on gage set.

3. Connect and start vacuum pump.

4. Slowly open the shut-off valve at the vacuum pump to avoid forcing oil out of pump. This will permit drawing of a vacuum on both the high and low pressure sides of system at same time.

5. Operate to obtain approximately 28" of vacuum for ten minutes. If sufficient vacuum cannot be obtained, vacuum pump or gage may be faulty. Close the shut-off valve at the pump and then stop the pump. Check gage to see if vacuum holds for at least three minutes. If not, proceed with step 6.

6. Open the Freon drum valve and allow system to reach drum pressure. Close drum valve. Leak test complete system, including gage fittings, with leak detector, Tool No. J-5419; if leak cannot be found, the vacuum pump or gage may be faulty.

NOTE: If oil is blown out of vacuum pump, it should be refilled to proper level with Frigidaire 75 viscosity oil.

7. Correct all leaks, then operate pump to obtain vacuum as in Step 5. Watch the gage and see if vacuum will hold for ten minutes. If not, repeat Step 6.

8. With all leaks eliminated, open Freon drum

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and bring system to drum pressure. Close drum valve.

9. Evacuate the system again as previously described. This second charging and evacuating is for the purpose of picking up any air or moisture that may have remained in the system.

10. Close gage valves.

11. The system is now ready for a complete charge of refrigerant.

(8) Adding Refrigerant

If the entire charge of refrigerant has been lost through accident, or in the replacement of any components, a complete charge will be necessary. Procedure "b", below, outlines the steps to be followed.

If the diagnosis indicated a shortage of refrigerant, add Freon-12 as outlined in procedure "c" below.

An important rule to follow in charging is that refrigerant should always be added to the low pressure side of the compressor in a vapor state and should not, under any condition, exceed five pounds. Do not add a complete charge of refrigerant until the system has been leak tested and properly evacuated.

In order to charge refrigerant in a vapor state, the Freon-12 drum should be heated. This can best be accomplished by placing the drum in a container of hot water. The temperature of the hot water should not exceed 125°F. Since the temperature of the water and drum will decrease, as the vapor leaves the drum, the water and drum will be cooled. This may result in lowering of drum pressure and temperature to the extent where it will be necessary to replenish or reheat the water.

Both the Freon-12 drum and container of hot water should be placed on suitable scales, with the drum in an upright position. Note the scale reading before opening the valve on the drum so you can determine when a complete charge of five pounds of refrigerant has been added to the system.

a. Charging Precautions

In all refrigerant charging procedures where the compressor is in operation, the following cautions should be observed.

1. Always wear goggles whenever handling Freon-12, and when breaking line connections.

2. The high pressure should not exceed 275 pounds.

3. Drum pressure should not exceed a maximum of 90 pounds.

b. Adding Refrigerant—Complete Charge

1. Evacuate complete system as described in Note 7.

2. With gage set connected as when evacuating system, Note 5c, open low pressure valve on gage set.

3. Open drum valve to obtain a maximum pressure of 90 pounds.

4. Freon-12 vapor under pressure will flow into the system without operating the compressor. This amount should not exceed five pounds.

NOTE: If it is not possible to charge the total of five pounds by the method just described, it is permissible after 1 to 2 pounds has been forced into the system, to operate the engine and compressor at slow idle. The hand shut-off valve on the high pressure side of gage set should be CLOSED. Continue to operate engine and compressor at slow idle until five pounds has been charged into the system.

5. Close drum valve and low pressure shut-off valve on gage set.

6. Operate the engine at 1500 RPM with compressor clutch engaged to observe the high and low pressure gages as well as sight glass and general performance of the system.

7. Stop engine and remove gage set.

c. Adding Refrigerant—Partial Charge

This operation is performed when a shortage of refrigerant is noted without any evidence of leakage or necessary part replacement.

1. Connect gage set to compressor as described in Note 5a, Steps 1 and 2. Fig. 16-A-5

2. Operate engine and compressor at slow idle.

3. Open low pressure valve on gage set. High pressure valve on gage set must be closed.

4. Open drum valve to obtain a maximum pressure of 90 pounds.

5. Watch sight glass until solid column of liquid appears without bubbles.

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6. Note scales, and allow compressor to operate until 1 additional pound of Freon-12 has been charged into the system.

7. Close drum valve.

8. Close low pressure valve on gage set.

9. Operate engine at 1500 RPM with compressor clutch engaged - control lever in extreme right position or jumper wire attached to clutch coil from battery.

10. Observe gages, sight glass, and entire system for proper performance.

11. After five minutes of operation, should bubbles reappear at sight glass, add 1 more pound of refrigerant. If bubbles still appear, check operation of system. Adequate cooling may be obtained even when a few bubbles are still evident.

12. Remove gage set from compressor and install gage fitting caps.

13. Remove jumper wire from clutch coil if installed in Step 9.

(9) Checking and Adding Oil

The compressor was originally charged with nine ounces of 525 viscosity Frigidaire oil. During normal operation, due to the affinity of Freon-12 for oil, a certain amount of oil will circulate throughout the system along with the liquid and vapor.

To determine whether the compressor has sufficient oil, an elbow fitting has been placed on the underside of the compressor shell.

a. Checking Oil Level

1. Remove flare nut from oil test elbow.

2. Depress Schrader core allowing first surge of oil to escape. If oil continues to escape with Freon vapor, the oil level is satisfactory.

NOTE: It is desirable to allow the escaping oil and vapor to blow against a clean white cloth. The cloth should become oily.

3. If oil does not continue to escape from test fitting, the oil is below the minimum level.

4. Add oil as described in Note 9b, if oil is required.

NOTE: Compressors with serial numbers

between 12XB756 and 14XB771 do not have a standpipe to permit oil level checking as described above. In order to check oil level on these compressors, the procedure outlined below should be used.

b. Adding Oil--Major/Minor Loss

1. Remove compressor as described in Note 11.

2. Purge pressure from compressor by depressing Schrader valve at gage fittings on compressor until low audible hiss is heard.

3. Remove oil test elbow from compressor.

4. Invert compressor and drain oil into a clean container.

NOTE: Examine condition of oil to determine whether or not it is contaminated with any foreign material, such as metal chips, water, sludge, etc. This oil should be discarded and new oil used. If an excessive amount of water is found, install a new liquid dehydrator-receiver assembly in the high pressure liquid line.

5. Pour nine ounces of 525 viscosity Frigidaire oil into the compressor at the oil fitting opening.

NOTE: Do not add oil at the relief valve opening.

6. Install oil test elbow.

7. Install compressor, using new "O" ring seals at the hand shut-off valves as described in Note 15.

(10) Purging Air or Excess Refrigerant from the System

Connect gage set. Higher than normal head pressure, as evidenced by experience with other normally operating systems under similar conditions, is caused either by air in the system or an over-charge of Freon-12. Proceed as follows:

1. Bleed off excess refrigerant and air and observe pressure readings. If pressure is still too high, then proceed with Steps 2 and 3.

2. Discharge and evacuate complete system as described in Notes 6 and 7.

3. Recharge complete system with only five pounds of refrigerant as described in Note 8b.

(11) Compressor Removal

When damaged compressor is to be replaced, the

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replacement compressor name plate must be stamped with the numeral "5" 1/8" high on blank space provided. "5" indicates five pounds of Freon and is required by law in some states.

1. Remove shut-off valve caps from ends of both pressure lines.

2. Using Tool No. J-5427, close both hand shut-off valves at the compressor.

CAUTION: Do not operate compressor with shut-off valves closed. REMOVE IGNITION KEY.

3. Remove high and low pressure valve fitting center bolt and remove fitting from compressor.

NOTE: A momentary release of vapor should be expected as the fitting leaves its bore in the compressor. If vapor continues to escape, the spring loaded automatic valve in the compressor is not seating properly. If this is the case, purge the Freon vapor pressure by depressing the Schrader core in the high pressure gage connection until a low audible hiss is heard. Any air in the compressor must be forced out when the unit is reinstalled.

4. Cover the pressure openings in both the compressor and pressure line fitting with masking tape to keep out dirt.

5. Disconnect clutch coil wires and drive belts.

6. Remove compressor from mounting brackets.

(12) Compressor Clutch Pulley Removal and Disassembly

a. Removal

1. Remove compressor from car as described in Note 11.

2. Remove dust cap, bolt and washer at front end of pulley. Fig. 16-A-7

3. Using universal type puller, remove clutch pulley assembly from shaft.

CAUTION: Make certain puller does not damage internal threads of shaft nor inner race of pulley bearing.

b. Precautions

1. Use only a clean, dry cloth to wipe off clutch parts.

NOTE: The following clutch plate cleaners may be used to clean the frictional material on the clutch plates: Vapor De-Greaser, Tri-Chloro Ethylene and Carbon Tetrachloride.

2. Do not clean the pulley bearing with any type of solvent as it will wash the grease out of the bearing. The pulley bearing is supplied with the correct lubricant or grease when assembled by the manufacturer and requires no other lubricant at any time.

3. Prevent dirt, grease, oil, or any type of foreign matter from coming in contact with ball bearings, frictional and mating surfaces of the clutch plates.

4. It is important that no attempt be made to dress down the frictional lining material on clutch plates as this will result in improper operation.

c. Disassembly

1. Remove clutch pulley assembly as described in Note 12a.

2. Remove clutch cover ring from pulley. Fig. 16-A-7

3. Remove clutch assembly and spacer shims from pulley housing.

4. Using Tool No. J-4880, remove snap ring retaining the two clutch plates. Fig. 16-A-8

5. Remove clutch spring, armature clutch plate (rear plate) and three ball bearings.

6. Inspect all parts for dirt, rust, wear or other damage. Replace if necessary.

d. Removal and Installation of Pulley Bearing

1. Remove clutch pulley assembly as described in Note 12a, Steps 1, 2 and 3.

2. Remove bearing retaining snap ring, using Tool No. J-4245.

3. Remove bearing from pulley housing with fingers or by tapping lightly with block of wood at outer race. Bearing is installed with only a snug fit. Fig. 16-A-9.

4. Inspect bearing and pulley bore for dirt, rust, wear or other damage, and replace if necessary.

5. To install, use reverse procedure.

(13) Removal and Installation of Clutch Actuating Coil

1. Remove compressor from car as described in Note 11.

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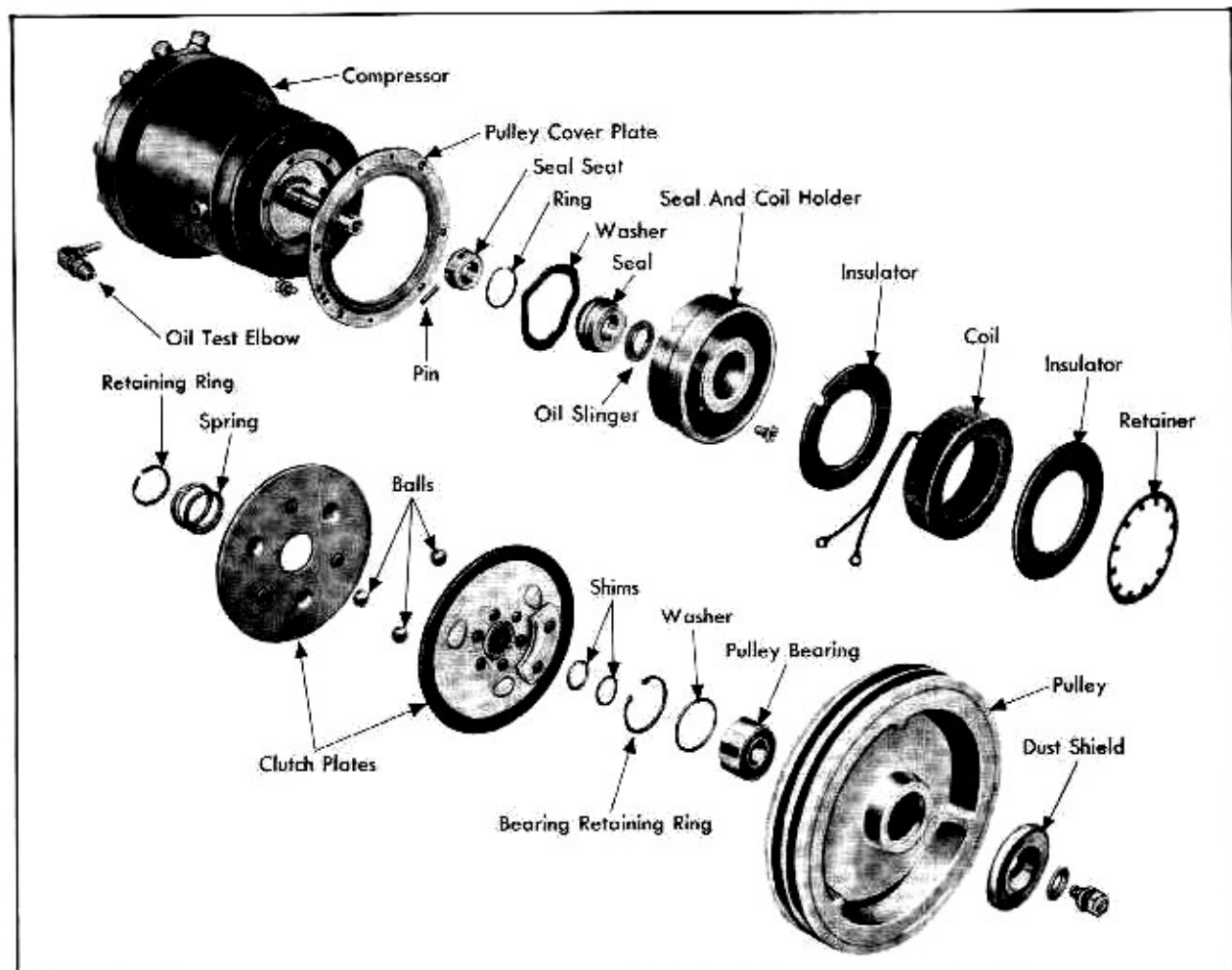


Fig. 16-A-7 Clutch Assembly Disassembled

2. Remove and disassemble clutch pulley assembly as described in Notes 12a and 12c.

3. Remove clutch coil retainer by bending retainer teeth forward with small screwdriver.

NOTE: Do not damage coil insulator gasket or coil. Retainer should be replaced with new one on assembly.

4. Remove insulator gasket, and remove coil from holder, working coil wire leads from holder.

5. Remove insulator gasket from rear of coil.

6. Inspect all parts for dirt, oil damage, or other damage and replace as necessary.

7. When installing, use reverse procedure, assembling and installing clutch pulley assembly as described in Notes 14a and 14b.

8. Install compressor as described in Note 16.

(14) Compressor Clutch Pulley Assembly and Installation

a. Assembly

1. Clean all clutch parts observing the precautions listed above.

2. Assemble clutch plates together with three balls in position.

3. Install spring over front clutch plate hub and place snap ring on top of spring.

4. Expand snap ring, using Tool No. J-4880 and force downward on ring and spring until ring engages groove in hub.

5. Place clutch cover plate ring over coil and seal housing with ground surfaces facing pulley end of shaft.

b. Installation

1. Install clutch assembly on splined shaft with clutch spring toward seal.

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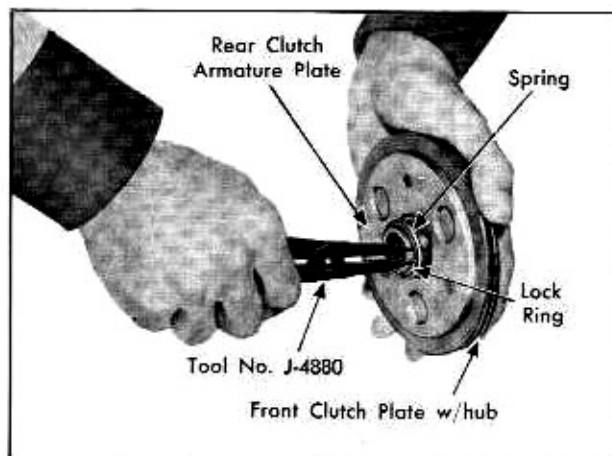


Fig. 16-A-8 Removing Clutch Plate Snap Ring

2. Install spacer shims on shaft using original shims.
3. Install pulley by exerting pressure on inner race of bearing.
4. Install clutch cover ring to pulley.
5. Install washer and pulley to shaft attaching bolt. Then install neoprene dust cap.
6. Check clutch adjustment as described in Note 14c before installing compressor.

c. Adjustment

1. Energize clutch coil from a 12 volt battery and check clearance between clutch plate armature (not rear pulley cover ring) and coil housing at three different positions. Fig. 16-A-10. This clearance should be between .025" and .035".

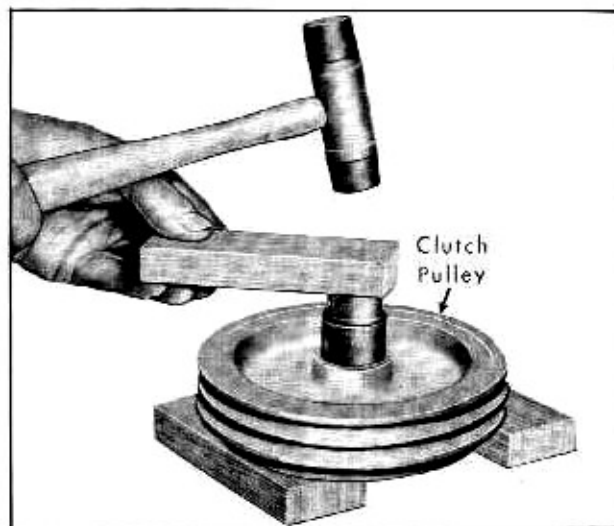


Fig. 16-A-9 Removing Pulley Bearing

2. If clearance is not correct, it will be necessary to remove pulley and add or remove shims accordingly. Shims are available in the following sizes: .015", .020", and .025". By proper selection of shims, .005" variation in clearance can be obtained.

3. Install compressor on car as described in Note 16.

d. Checking Clutch Operation

With the engine idling and control lever to extreme right position (clutch engaged), turn the air conditioning switch 'On' and 'Off' a number of times to burnish the clutch plates until the clutch properly engages. By observing the relationship in speed of the pulley to the attaching screw, slippage can be noted.

(15) Compressor Shaft Seal and Seat Removal and Installation

a. Removal of Seal

1. Remove compressor as described in Note 11.
2. Drain oil from compressor as described in Note 9b.

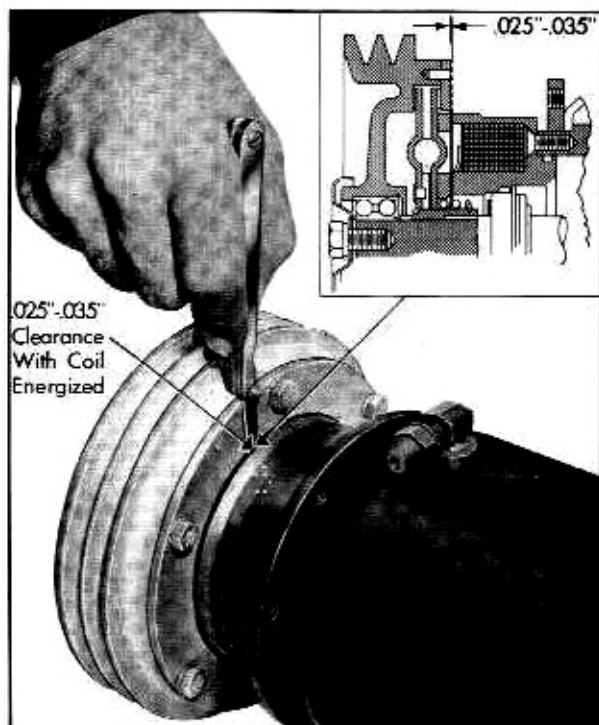


Fig. 16-A-10 Clutch Adjustment

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Fig. 16-A-11 Installing Seal

3. Remove clutch coil as described in Note 13.
4. Remove seal and coil housing and also oil slinger from compressor shaft.
5. Press seal from housing.
6. Clean seal cavity thoroughly and replace internal "O" ring seal with new one coated with clean Frigidaire oil.

b. Installation of Seal

1. Using Tool No. J-5922, press new seal assembly in the cavity. Make certain not to damage the seal surface. Fig. 16-A-11
2. Replace the large external "O" ring seal on housing with new one coated with clean Frigidaire oil.

c. Removal of Seal Seat

1. Remove wave washer from compressor.
2. Force retainer snap ring from groove of rotating seal seat ring.

CAUTION: Do not scratch, nick, or score oil pump cover when performing this operation.

3. Remove drive pin from seal seat groove using needle nose pliers.
4. Remove seal seat from shaft. Wipe shaft clean with lint free tissues.

5. Inspect shaft spline for burrs or sharp edges. Remove as necessary using fine stone. Clean all metal dust from shaft.

d. Installation of Seal Seat

1. Install new "O" ring seal inside the new seal seat and place seat face down on a piece of oil soaked tissue to protect polished face.
2. Force snap ring over seal seat ring.
3. Coat "O" ring with clean Frigidaire oil.
4. Install new seal seat ring on shaft.

CAUTION: Exercise care not to damage "O" ring when starting seal seat over splined end of shaft. Also keep fingers off seal surfaces.

5. Align hole in seat with one in shaft and insert drive pin.
6. Force snap ring into seat groove over pin.
7. Examine oil pump cover plate to make certain dowel pin is in proper place and flush with outer cover.
8. Install wave washer over seat.
9. Install seal and coil housing, exercising care not to damage large "O" ring.
10. Install oil slinger shield on compressor shaft allowing approximately .010" between oil slinger flange and the oil seal assembly.

NOTE: Special Tool J-6086-A, Compressor Oil Slinger Installer, will automatically position the slinger on the shaft to provide the required .010" clearance between the slinger flange and oil seal assembly.

11. Install clutch coil as described in Note 13.
12. Add oil as described in Note 9b.
13. Install compressor as described in Note 16.

(16) Installing Compressor

Before installing a replacement compressor, make certain the numeral "5" is stamped on the blank space provided in the lower right hand corner of the compressor name plate. If numeral is not evident, then stamp numeral as indicated. "5" indicates five pounds of Freon and must be shown on all 1955 compressors as required by law in some states.

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1. Check clutch adjustment as described in Note 14c if not previously performed.
2. Install compressor on front and rear mounting brackets.
3. Place belts on pulley and adjust tension at generator. Tighten adjusting bracket screw.
4. Connect clutch coil wires.
5. Install new "O" rings and flange gaskets on high and low pressure line valve fitting. Apply a slight amount of Frigidaire oil to "O" ring before installing fitting into bore.
6. Insert pressure line fitting into bore in compressor and tighten securely. Use care to be sure "O" ring seals are not damaged.
7. Using the 1/4" key, Tool No. J-5427, open both the high and low pressure line valves all the way (counter-clockwise).

NOTE: These valves open against a seal type seat, and therefore, must be turned open all the way against stop to prevent leaks.

8. Depress Schrader valves to purge air from high and low sides of compressor.
9. Test for leaks at all connections on the compressor.
10. If leaks are indicated in above test, connection must be removed and "O" rings and gaskets replaced.

CAUTION: It is very important that all leaks be repaired. Under no circumstances should the compressor be run when a leak exists, as a complete loss of refrigerant would damage the compressor.

11. Connect gage set and check clutch operation and general performance of system. See Note 14d.
12. Remove gage set and install caps on fittings

(17) Checking Operation of Compressor Discharge Valve Reeds

1. Connect gage set to compressor as described in Note 5a.
2. Connect jumper wire from positive battery post to magnetic clutch coil.
3. Operate engine and compressor at slow idle for five minutes.

4. Slowly close the low side valve on the compressor until low side gage reads between 5 and 10 pounds pressure.

5. Stop engine and immediately close the low side valve on the compressor.

6. Allow system to remain idle for approximately 5 minutes.

7. At the end of this time, the low side gage should not show any rapid rise of pressure. Nor should the low pressure gage have equalized to the high side pressure. If this has occurred, it is evident that the discharge valve reeds are leaking and the compressor should be replaced.

8. If the low side pressure did not show a rapid rise, the compressor can be considered satisfactory as the discharge reeds were holding properly.

9. Open low side valve on compressor.

10. Remove gage set from compressor.

(18) Adjusting the Expansion Valve

If the expansion valve is out of adjustment (ineffective cooling by either starving the cooling coil of refrigerant, or by flooding the cooling coil with refrigerant) proceed as follows:

1. Remove access plate from evaporator.
2. Remove cap nut from expansion valve making certain valve is supported by a second wrench to prevent damage to lines and fittings.
3. Using Tool No. J-5426, first CLOSE the valve completely, then OPEN (counter-clockwise) 5 complete turns. Fig. 16-A-12.

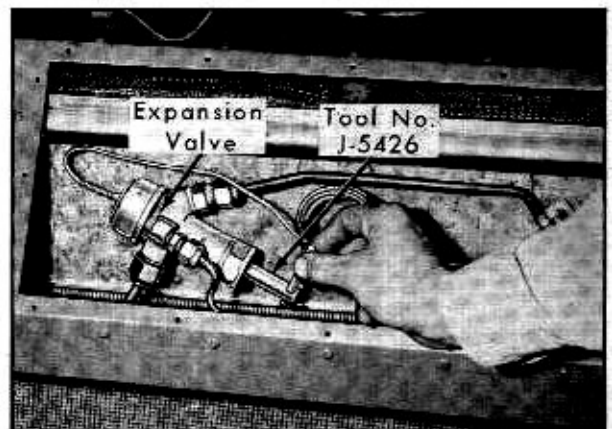


Fig. 16-A-12 Adjusting Expansion Valve

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4. Install access plate.

5. If this does not eliminate the condition, replace the expansion valve as described in Note 19, assuming that the remainder of the system is in good operating condition.

(19) Replacing the Expansion Valve

1. Purge the system as described in Note 6. (Have replacement valve within reach for immediate installation).

2. Remove access plate from evaporator housing.

3. Disconnect power element bulb from low pressure line.

4. Remove the equalizing, low pressure and high pressure line flares in that order at the valve. Fig. 16-A-13.

5. Remove valve assembly with power element bulb.

6. Install new valve by connecting the lines, and clamp power element of new valve to the TOP or SIDE of LOW PRESSURE LINE.

NOTE: Under no circumstances should the smaller high pressure liquid line contact the bulb.

7. Open gage and Freon drum valves and bring system up to drum pressure for checking leaks.

8. Leak test the three expansion valve connections carefully for leaks.

9. Evacuate the system as previously described in Note 7.

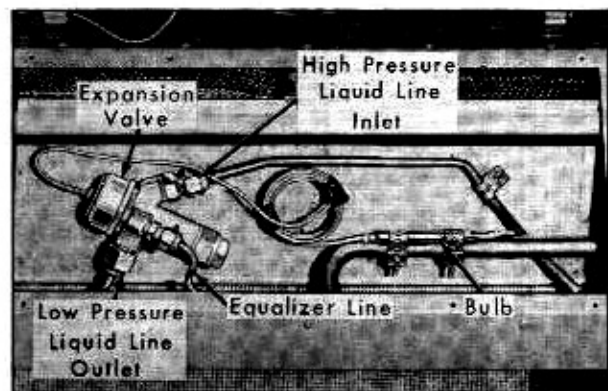


Fig. 16-A-13 Expansion Valve Connections

10. Add refrigerant as previously described in Note 8b.

11. Replace access plate. Check operation of system.

(20) Replacing Blower Motor

1. Disconnect electrical lead to blower motor.

2. Remove flat rubber pad at rear of motor housing, and motor assembly from housing.

3. Remove fan and mounting plate from the motor and install it on the new motor. Make certain that the fan is in the corresponding position on the new shaft.

4. Install the new motor and its assembly in reverse order of removal.

(21) Replacing the Cooling Coil

1. Purge the system as previously described in Note 6.

2. Remove spare tire and disconnect all of the air ducts from the evaporator.

3. Disconnect blower motor leads.

4. Disconnect thermostat leads.

5. Remove access panel and disconnect refrigerant line connections at the evaporator unit housing.

6. Remove evaporator unit from luggage compartment.

7. Remove panels from unit housing, including blower assemblies.

8. Disconnect and remove expansion valve as described in Note 19, and install it on new cooling coil.

9. Remove the cooling coil, and install new one. Installation is reverse of removal procedure.

10. Evacuate the system. Note 7.

11. Add refrigerant to the system. Note 8b.

(22) Removal and Installation of Filters

Two filters are located on top of the evaporator housing in the return air stream. Air inside the car is filtered before passing across the cooling coil and then back into the interior of the car. The

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air filter must be cleaned regularly during those months in which the air conditioner is in operation. This should be done every two months or 2,000 miles, or more frequently in those areas of the country which are extremely dusty. To remove the filters for cleaning or replacement purposes, proceed as follows:

1. Remove access panel on the evaporator housing in the trunk compartment.
2. Remove one filter at a time through opening in evaporator housing. Fig. 16-A-14.
3. The filter may be cleaned in solvent or by washing in a soapy solution made with household detergent. After filter is cleaned, it should be rinsed and dried with compressed air. Then apply (spray) a light coating of an SAE 30 detergent free non-odorous engine oil or RP filter coat to the entire filter surface.
4. To install filter, reverse above procedure.

(23) Replacing Dehydrator Receiver Assembly

The purpose of the dehydrator is to absorb moisture and to trap foreign matter (dirt-solder-filings-etc.) that may not have been removed during the installation or during service operations. When the filter becomes saturated with moisture or clogged with foreign matter, replacement is necessary. The receiver area of unit stores Freon-12 for use as needed. No service should be performed on the dehydrator-receiver assembly. To replace assembly, proceed as follows:

1. Purge the system as described in Note 6 and remove assembly.

NOTE: Do not uncap the new assembly until it is in position for installing as it will quickly absorb moisture from the air and decrease its efficiency in the system.

2. Install the new assembly, making certain refrigerant flow through it will be in the direction of the arrow on the label or the letters "IN" stamped on inlet fitting.

3. Before evacuating the system, apply sufficient drum pressure to the system to obtain a good leak test of all connections.

4. Evacuate the system as described in Note 7.
5. Add refrigerant as described in Note 8b.
6. Check performance of system, then remove

the evacuating and charging equipment. Be sure all shut-off valves in the system are fully open.

(24) Replacing the Sight Glass

The sight glass provides a way of determining whether or not the refrigerant charge in the system is sufficient. It is so designed that a shortage of refrigerant in the receiver and liquid line will be indicated by the appearance of bubbles or foam beneath the glass. A continuous flow of liquid is indicated by the magnification noticed when any printing is read through the sight glass. Whenever replacement of the sight glass is required, proceed as follows:

1. Purge the system as outlined in Note 6. Have replacement sight glass within reach for immediate installation.
2. Remove sight glass.
3. Install new sight glass.
4. Before evacuating the system, apply sufficient drum pressure to the system to obtain a good leak test.
5. Evacuate the system as described in Note 7.
6. Add refrigerant as described in Note 8b.

(25) Replacing the Condenser

1. Purge the complete system down to 1 - 2 lbs. maximum as described in Note 6.
2. Remove the hood lock plate support, baffle, and horn.
3. Disconnect condenser inlet and outlet lines.
4. Remove condenser.

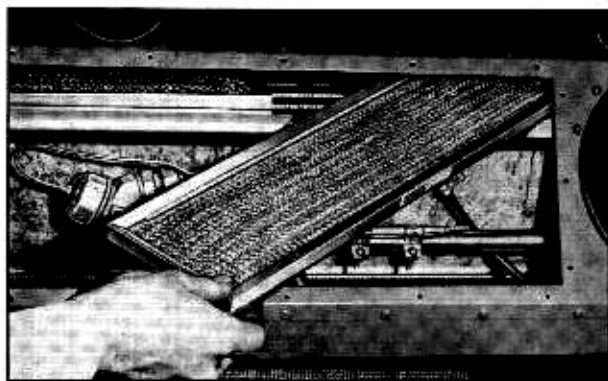


Fig. 16-A-14 Removing Filter

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5. Install new condenser by reversing the procedure for removal.

6. Evacuate the entire system and completely recharge it with refrigerant. Notes 7 and 8b.

(26) Replacing the Thermostat

1. Disconnect lead wires to thermostat which is mounted on top of the evaporator housing in the

trunk compartment.

2. Remove thermostat from housing by lifting thermostat upward until coil winding is clear of housing.

3. Install new thermostat by reversing above procedure for removal, exercising extreme care not to damage the coil winding when positioning thermostat on evaporator housing.

AIR CONDITIONER SERVICE DIAGNOSIS

CONDITION	CAUSE
<p>A. POOR COOLING</p> <p>Blowers not operating</p>	<p>20 Amp. fuse blown A/C Switch in "off" position A/C Switch inoperative Blower rheostats inoperative Wire broken or loose connections Blower motor defective Blower motor rotates in wrong direction</p>
<p>Restricted air flow</p>	<p>Filter(s) in evaporator clogged with dirt and/or other foreign material Outside air scoops restricted Roof ducts restricted Air flow under rear seat restricted Evaporator fins clogged or restricted with frost</p>
<p>Refrigerant flow to cooling coil incorrect</p>	<p>Expansion valve improperly adjusted Power element does not contact pressure line properly Restriction in liquid line between receiver and cooling coil Power element discharged Not enough refrigerant</p>
<p>Refrigerant not condensing properly</p>	<p>Air flow through condenser restricted High engine operating temperatures Air or excess refrigerant in system Restriction in high pressure side and condenser</p>
<p>Clutch does not engage</p>	<p>Defective coil or relay Clutch plate lining worn or saturated with oil causing slippage Toggle Switch defective Thermostat inoperative Clutch adjustment incorrect</p>
<p>Electrical</p>	<p>Loose connections or broken wires between electrical units Blown fuses</p>

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(Cont'd)

CONDITION	CAUSE
B. TOO COLD	
Clutch does not disengage	Thermostat inoperative Relay stuck closed Toggle switch inoperative
Blower speed can not be reduced	Defective blower switch
C. VIBRATION - NOISE	
Blowers	Loose on shaft Striking housing Foreign material Motor bearings or mounts loose or worn
Compressor	Mounting brackets loose Loose internal parts
Air flow	Foreign material in air system Small slits or openings in ducts
D. INCORRECT OPERATING PRESSURE	
Excessive pressure in high pressure side	Air or excess refrigerant in system Air flow through condenser core restricted Kinks or restrictions in line on high pressure side High engine temperature Shut-off valve on high pressure side of compressor not fully open Insufficient air flow through cooling coil Incorrect expansion valve adjustment
Insufficient pressure on high pressure side	Shortage of refrigerant Incorrect expansion valve adjustment
Excessive pressure on low pressure side	Expansion valve element bulb not making proper contact Expansion valve needle stuck open or leaking
Insufficient pressure on low pressure side	Restriction in lines Shortage of refrigerant Expansion valve needle stuck shut Expansion valve not open far enough

OTHER NOTES AND REFERENCES

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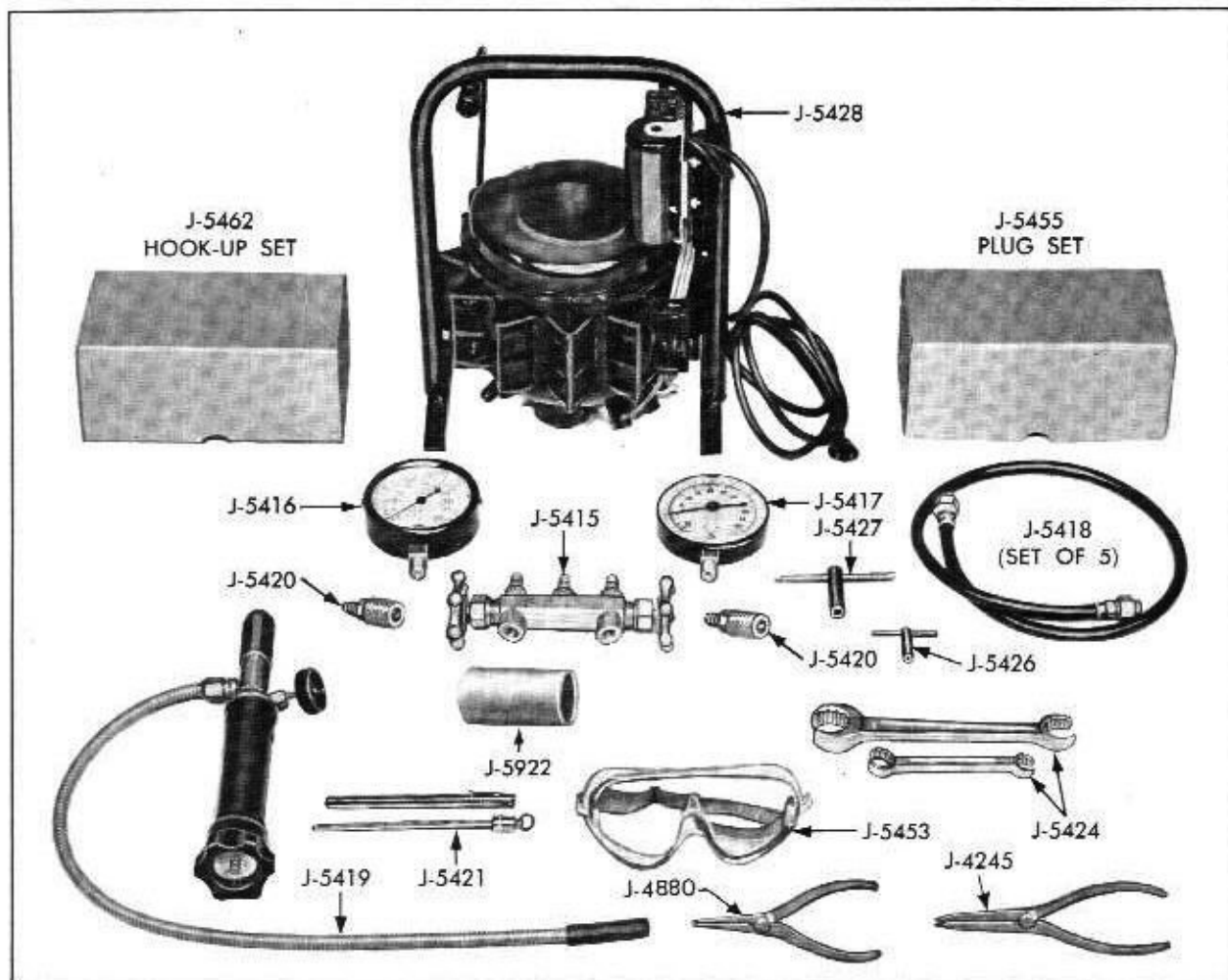


Fig. 16-A-15 Special Tools

Tool No.	Description
J-5415	Gauge Manifold
J-5416	High Pressure Gauge
J-5417	Low Pressure Gauge
J-5418	Gauge Charging Line (Set of 5)
J-5419	Leak Detector With Anhydrous Alcohol
J-5420	Gauge Adapters (Set of 2)
J-5421	Pocket Thermometer (0°-220°)
J-5424	9/16" Tube Wrench-3/4" Tube Wrench
J-4245	Tru Arc Pliers #3
J-4880	Tru Arc Pliers #2
J-5922	Seal Installing Tool
J-5426	3/16" Valve Key
J-5427	1/4" Liquid Valve Key
J-5428	Vacuum Pump 115v, 50-60 Cycle 1/7 HP With Special Oil
J-5453	Goggles
J-5455	Plug Set
J-5462	Gauge Hookup Set