SECTION VIII COMPRESSOR SERVICE

All compressor service operations, except belt and clutch replacement, can be performed only after the unit has been isolated from the rest of the system.

The compressor is not completely serviceable. All necessary repairs can be made by replacement of the compressor shaft seal or the cylinder head and valve plate. If these parts will not restore normal compressor service, replace the compressor.

The compressor service operations are similar regardless of year or compressor model. However, it is important to use the correct parts for each compressor.

CHECKING COMPRESSOR OIL LEVEL

After the compressor has been installed on a vehicle and operated for 15 minutes, the oil level should be checked. The oil level should also be checked whenever a component of the air conditioning system is replaced.

1. Run the engine at 1500 rpm, blowers high, control on maximum cooling. The ambient temperature should be 60°F or above and the compressure crankcase warm to the touch.

2. Stop the engine and close both service valves (front seated). Relieve the refrigerant pressure by loosening the high pressure service port cap slightly. Wait 15 minutes after the high pressure cap has been loosened before checking the oil level. This is to allow the refrigerant 12 to evaporate out of the refrigeration oil, giving a true reading.

3. Remove the oil filler plug and insert a clean ⅛ inch steel rod until it bottoms, (it may be necessary to rotate the compressor shaft to permit the rod to bottom). The oil level should be within specifications above the bottom of the rod. (See figure 8-1.)

   An engine dipstick works well for this application.

4. Add oil as required from a sealed can and install the filler plug.

5. Open the suction valve slightly to allow the refrigerant pressure to purge all air and moisture from the compressor.

6. Tighten the high pressure service port cap.

7. Open both service valves.

8. Run the unit at maximum cooling, 1500 rpm for 5 minutes. If bubbles appear in the sight glass, add a partial charge to the system.

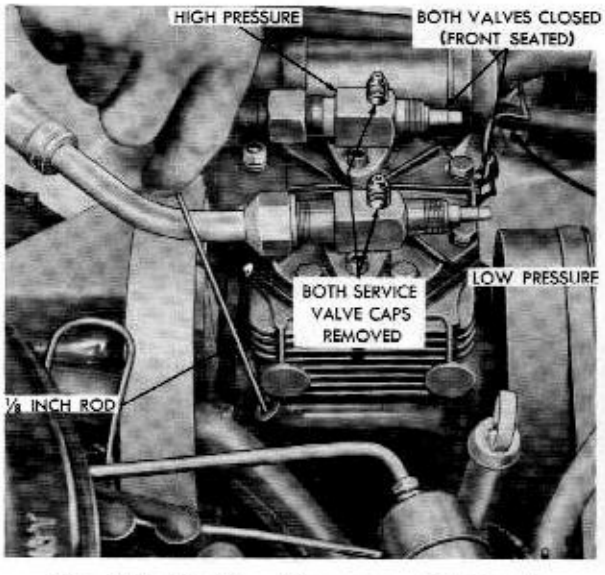

Fig. 8-1—Checking Compressor Oil Level (61LM-8809)

CYLINDER HEAD AND VALVE PLATE ASSEMBLY

1. Clean the cylinder head and crankcase in the area of the cylinder head of all dirt.

2. Isolate the compressor from the rest of the system. Refer to "Isolating The Compressor" in Section II.

3. Remove the capscrews securing the high and low pressure service valves to the compressor cylinder head.

   NOTE: *Compressors that do not have service valves or outlets attached to the cylinder head, it is not necessary to remove them. However, in some cases, it may be necessary to remove the compressor or other components from the car for accessibility.*

4. Remove the capscrews securing the cylinder head to the compressor.
   LINCOLN 4 CYLINDER COMPRESSOR: The cylinder heads and valve plates are not interchangeable. When viewed from the rear, the left cylinder bank is No. I and the right No. II. The cylinder banks may be identified by the numbers I and II cast in the clutch end of the crankcase flange.

5. Remove the cylinder head and valve plate assembly from the compressor. Remove the old gaskets or pieces of gasket that may stick to the gasket surfaces. Figure 8-2 shows a cylinder head and valve plate disassembled.

6. Examine the reed valves for damage. Replace the valve plate assembly if the valves or gasket surfaces are damaged. If the valve plate assembly is to be reinstalled, it should be washed in clean solvent and dried with compressed air *only*.

   CAUTION: *The valve retainers and reeds should not be removed as they are installed in a paritcular position. Incorrect positioning of of the valve reeds or retainers will reduce the capacity of the compressor.*

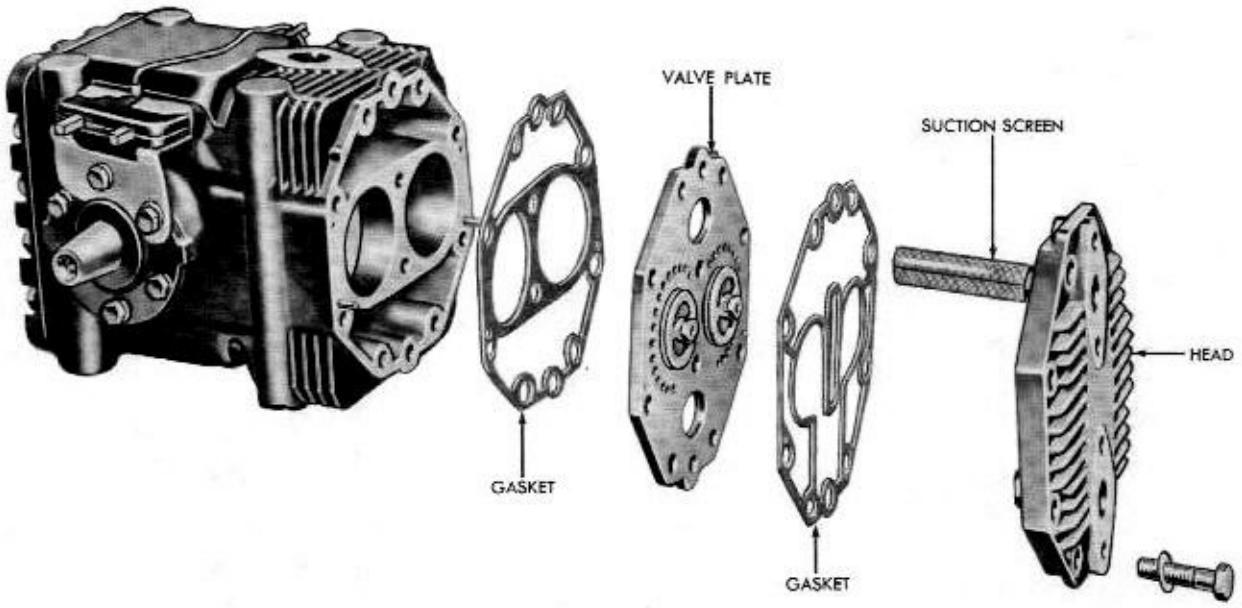

Fig. 8-2–Compressor Cylinder Head and Valve Plate Disassembled–Typecal–(61LM-8811)

INSTALLATION

1. Dip the valve plate gasket in clean refrigeration oil and place it on the compressor block so that all holes are in alignment.

   NOTE: *The gaskets for the No. I bank of the 1957 Lincoln 4 cylinder compressor can be identified by the word "TOP" printed in red ink on the gasket. The No. II bank gaskets have the word "TOP" printed in green ink.*

2. Install the valve plate assembly to the compressor block with the discharge valves and retainers up.

3. Dip the cylinder head gasket in clean refrigeration oil and place it over the valve plate assembly.

4. Install the compressor cylinder head to the compressor. On the 1957 Lincoln 4 cylinder compressor, install 2 stripper bolts in the holes at the extreme ends of each cylinder head. Turn the stripper bolts in by hand until all parts are aligned.

   NOTE: *The stripper bolts have a shorter thread length and a larger diometer shoulder that the remaining head bolts.*

5. Torque the head bolts evenly to 15 lbs. ft. LINCOLN 4 CYLINDER COMPRESSOR: Torque the head bolts gradually in the sequence shown in figure 8-3 to 21 lbs. ft.

6. If the compressor was removed from the car, reinstall the compressor.

7. Install the low pressure (suction) service valve screen and install both compressor service valves. Torque the attaching capscrews 10-13 lbs. ft.

8. Purge all air and moisture from the compressor. Refer to "Purging The Compressor " in Section II.

9. Operate the engine for 15 minutes at 1500 rpm with the air conditioning unit on maximum cooling and the blower on high. Check the liquid sight glass for bubbles and partially charge the system, if necessary.

10. Leak test the area around the compressor.

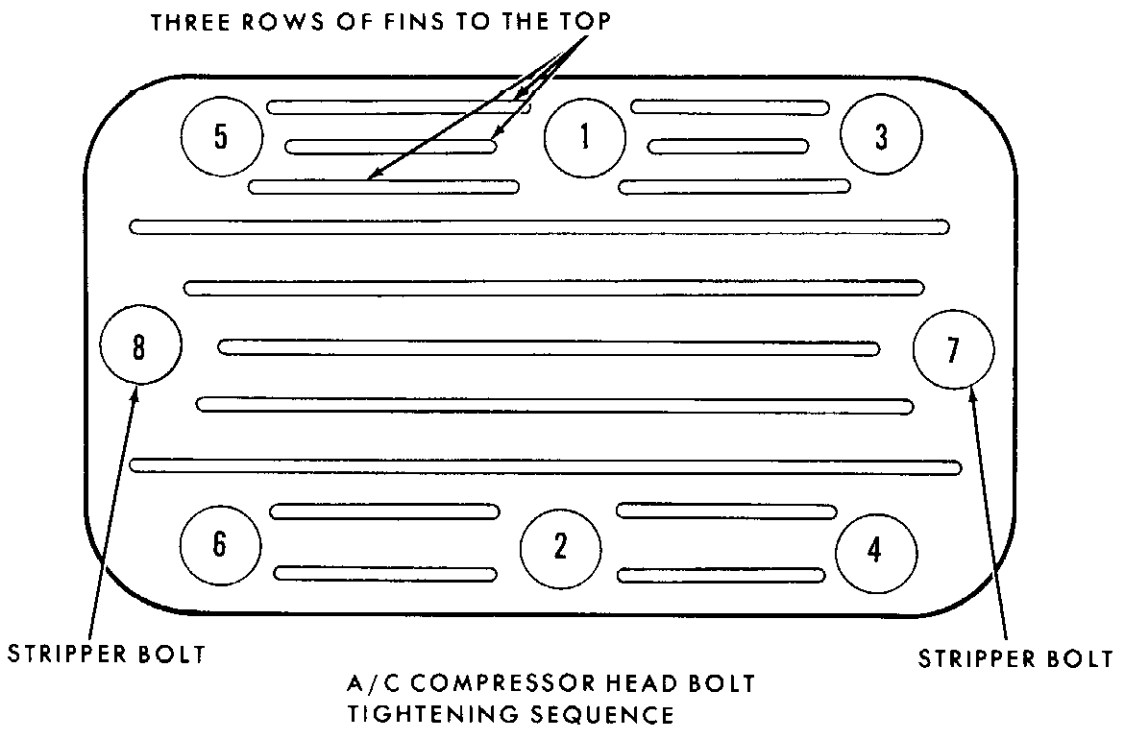

Fig. 8-3–Compressor Head Tightening Sequence–1957–4 Cylinder–(61LM-8810)

COMPRESSOR SHAFT SEAL REPLACEMENT

1957-61

1. Remove the compressor from the car.
2. Remove the clutch and Woodruff key.
3. Carefully clean the area around the seal.
4. Remove the capscrews securing the seal plate to the crankcase and remove the seal plate. (Figure 8-4 shows the shaft seal removed.)
5. Remove the carbon seal ring and retainer from the seal plate.
6. Remove the rubber shaft seal by pulling out the spring and seal.
7. Examine the carbon seal ring for cracks and scratches. Examine the rubber shaft seal for wear and deterioration. Inspect the plate and shaft surfaces for nicks, burrs, and scratches. Polish with crocus cloth and replace parts as necessary.
8. Install the seal spring seat and spring.
9. Apply a small quantity of clean compressor oil to the crankshaft area where the rubber seal will fit.
10. Install the rubber shaft seal with the large diameter end to the front of the compressor.
11. Dip the carbon seal ring in clean compressor oil and install it in the seal retainer with the flat surface toward the retainer seat.
12. Apply a quantity of clean compressor oil to the sealing surface of the seal plate.
13. Hold the seal plate gasket in place with a small quantity of clean compressor oil; then, install the carbon seal ring and retainer assembly and seal plate. Secure the seal plate in place with six capscrews. Tighten the capscrews evenly to avoid distortion. Torque to 10-13 lbs. ft.
14. Install the Woodruff key and clutch assembly on crankshaft and torque the retaining capscrew to 18-22 lbs. ft.
15. Check the oil level and add oil if necessary.
16. Install the compressor on the vehicle.
17. Operate the system for 15 minutes and recheck the oil level in the compressor.
18. Check the shaft seal and gasket visually and with a leak detector.
19. Check sight glass with the engine running at 1500 rpm, blowers on high, and the control at maximum cooling. If bubbles appear, partially charge the system.

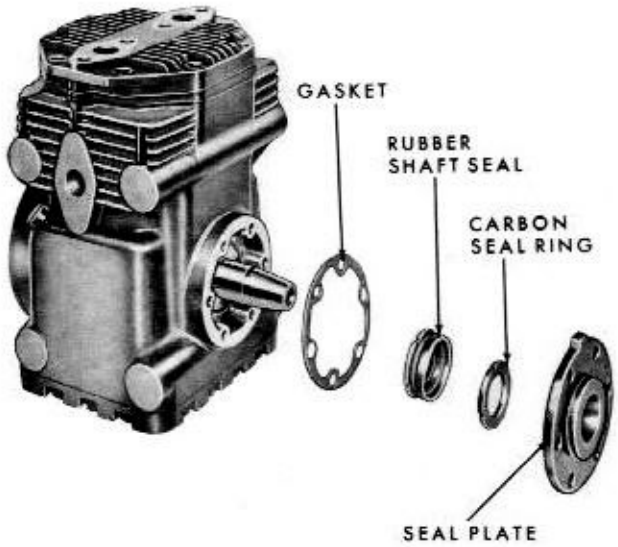

Fig. 8-4—Compressor Shaft Seal Disassembled 1957-61—(61LM-8810)

1955-58

Figure 8-5 shows the compressor shaft seal disassembled.

1. Remove the compressor from the car and remove the clutch and key from the compressor shaft. Use a wheel puller to remove the clutch.

NOTE: *If a pulley is used, remove two 1/8" allen set screws from the pulley hub. Both set screws are in the same hole, one on top of the other. Remove the pulley with a gear or wheel puller.*

2. Remove the magnetic clutch bush assembly, if so equipped. Mark the location of the brush assembly attaching holes on the compressor housing.

3. Compress the bellows seal assembly with tool ACE-58-20 and remove the snap ring. (See figure 8-6.)

4. Remove the bellows seal assembly from the compressor shaft.

5. Remove the bearing support plate mounting

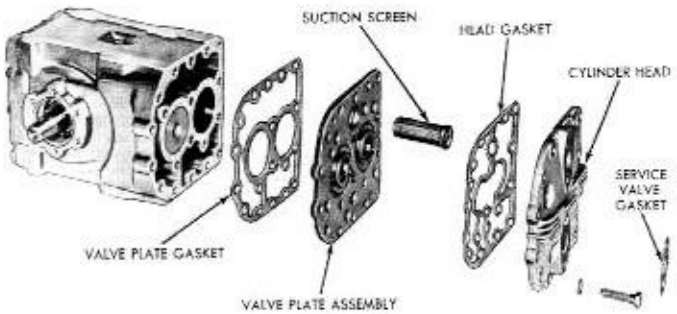

Fig. 8-5–Compressor Shaft Seal Disassembled 1955-58–(61LT-8831)

screws. Attach tool ACE-58-20 to the bearing support plate, using the two threaded holes in the plate.

6. Remove the bearing support plate from the compressor.

CAUTION: *Do not force the bearing support plate from its seat with the use of two screws through the threaded holes in the plate. This will put undue force on the crank rear bearing. Always use the removing tool.*

7. Press the bearing plate carbon seal from the plate and remove the "O" ring. Clean all old gasket material from the bearing plate and the compressor.

8. Lubricate the new shaft seal parts in clean refrigerant oil. Install the new "O" ring in the bearing plate and carefully insert the new carbon seal into place.

9. Attach Tool ACE-58-20 to the bearing support plate. Position the bearing support gasket and force the bearing support plate into position. (See figure 8-7.) When

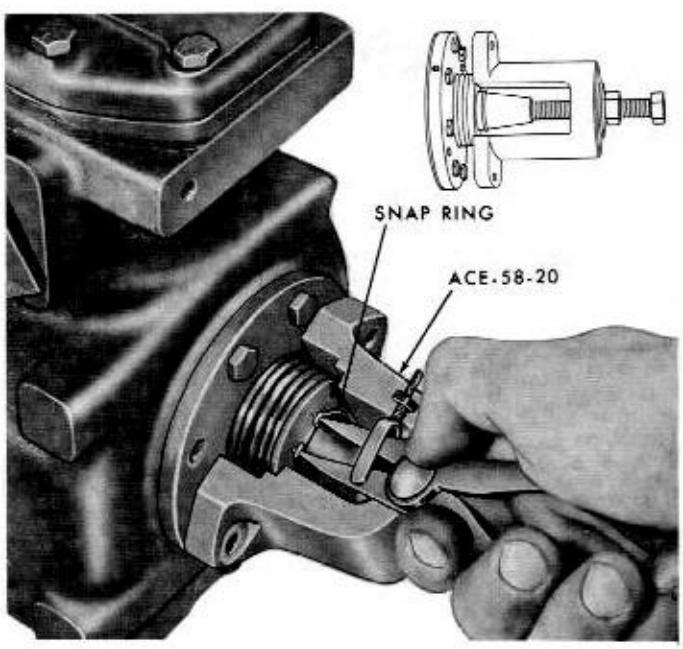

Fig. 8-6–Removing the Compressor Shaft Snap Ring –(61MT-8831)

the plate is nearly in position, rotate it so that the brush assembly mounting holes are in their correct position.

10. Install two bearing support plate attaching bolts to act as guides and seat the plate with tool ACE-58-20.

11. Remove the tool and install the remaining bearing support plate attaching bolts. Tighten the bolts evenly.

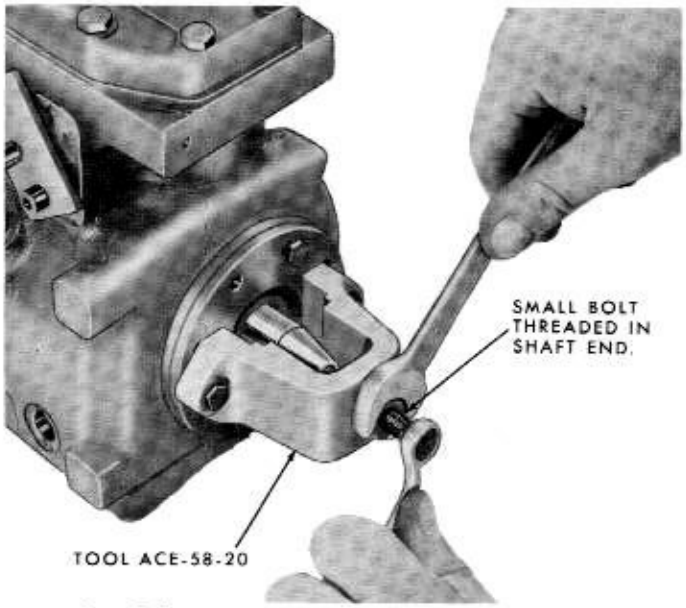

Fig. 8-7–Installing the Bearing Support Plate –(61MT-8830)

12. Position the bellows seal assembly on the compressor shaft. Install tool ACE-58-20 and compress the bellows; then, install the snap ring. (See figure 8-6.)

13. Remove the tool and install the brush assembly and clutch or the pulley.

14. Install the clutch mounting bolt and Torque it to 18-22 lbs. ft.

15. Check the oil level and add oil, if necessary.

16. Install the compressor in the car.

17. Operate the system for 15 minutes and recheck the compressor oil level.

18. Leak test the system and check the liquid sight glass. Add a partial charge, if necessary.

MAGNETIC CLUTCH REPAIR

EATON

The magnetic clutch may be disassembled and the bearing replaced if necessary. (See figure 8-8.) This may be accomplished by using the following procedure:

1. Remove the clutch from the compressor.

2. Remove 3 contact ring assembly retaining screws and the terminal screw and remove the contact ring assembly.

3. Remove the snap ring retaining the clutch drive plate in the pulley bearing.

4. Press the clutch drive plate out of the pulley bearing while supporting the pulley by the belt sheave. Use Tool No. 6052 (Replacer–Cylinder Head Water Outlet Plug).

5. Remove the snap ring retaining the bearing in the pulley.

6. Press out the pulley bearing from the pulley using Tool 6261-C-1 and 6052 (Remover and Replacer, Camshaft Bearing). Press from the front of the pulley towards the rear. *Be careful in the disassembly and assembly operations to prevent damage to the porcelain insulator, bearing surface, and pulley sheave.*

7. To assemble, reverse disassembly procedure. Wipe excess grease from around the clutch bearing.

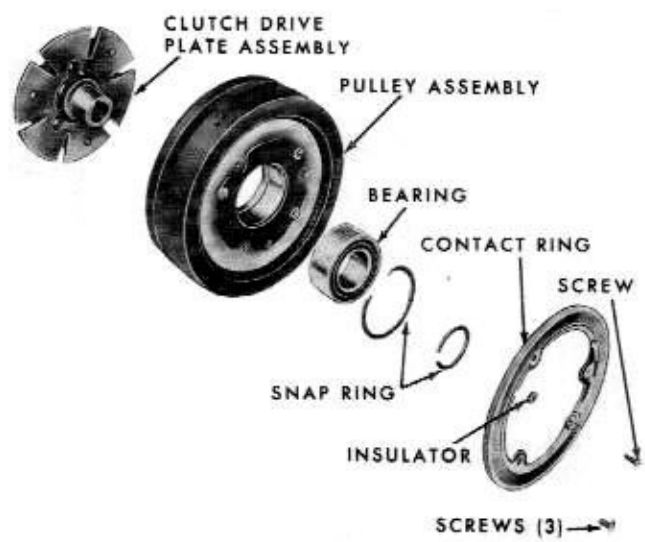

Fig. 8-8–Magnetic Clutch Disassembled-Eaton (60M-7825)

The clutch may be disassembled and the bearing replaced if necessary. This can be accomplished using the following procedure:

1. Remove the clutch from the compressor.
2. Remove the snap ring retaining the clutch and hub in the bearing. (See figure 8-9.)
3. Press the clutch and hub out of the pulley bearing, while supporting the pulley by the belt sheave.
4. Remove the snap ring retaining the bearing in the pulley.
5. Press out the pulley bearing from the pulley. Press from the front of the clutch towards the rear.
6. To assemble, reverse the disassembly procedure.

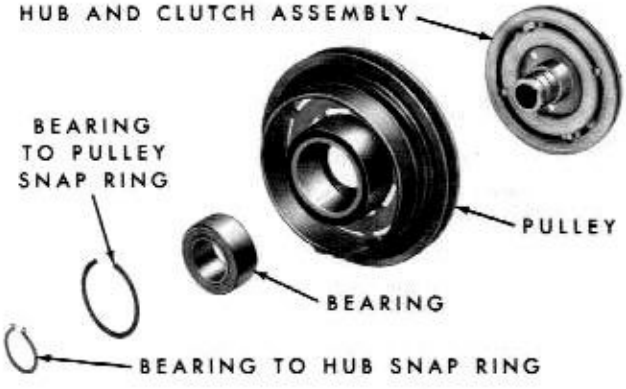

Fig. 8-9–Magnetic Clutch Disassembled-Warner (61LT-8834)