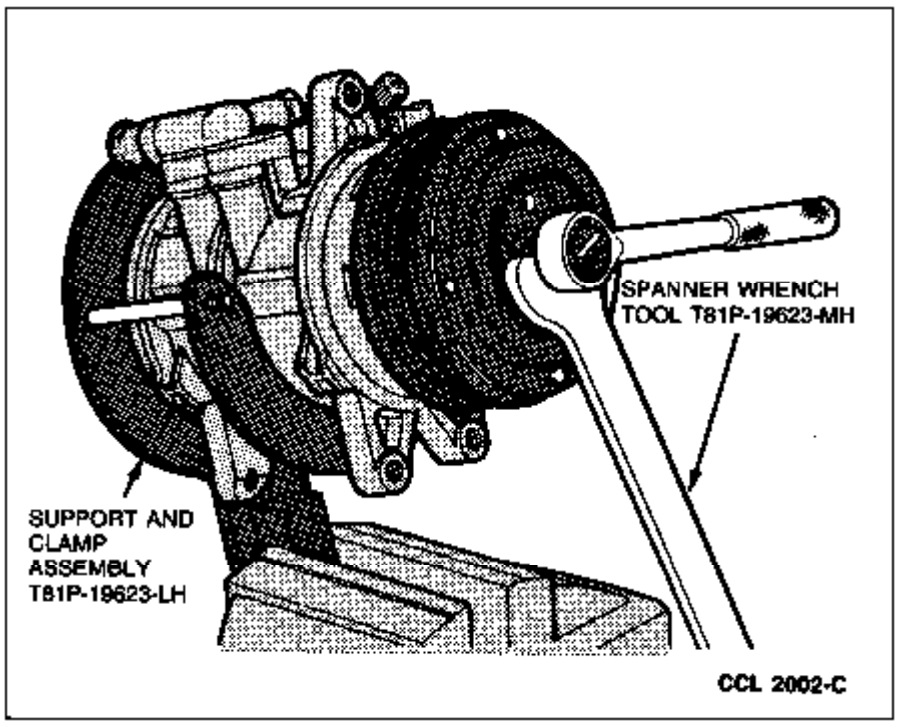
Clutch Hub and Pulley

Removal

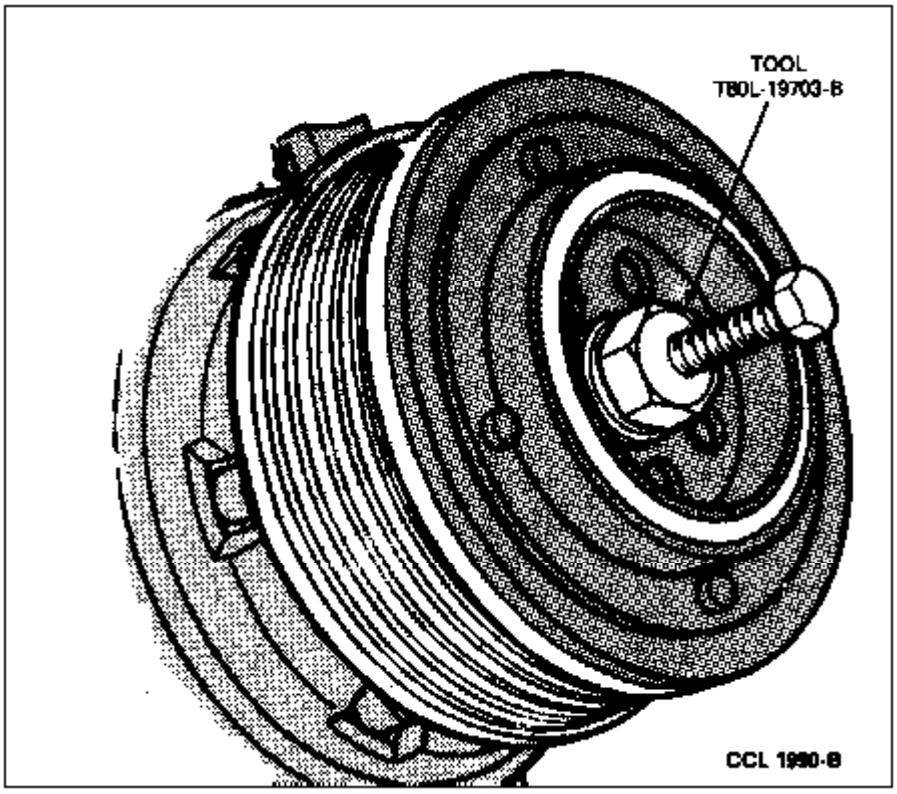
1. Remove the clutch retaining nut. Use Spanner Wrench T81P-19623-MH or equivalent, if necessary (Fig. 4).

FIG. 4 Clutch Hub Retaining Nut--Removal



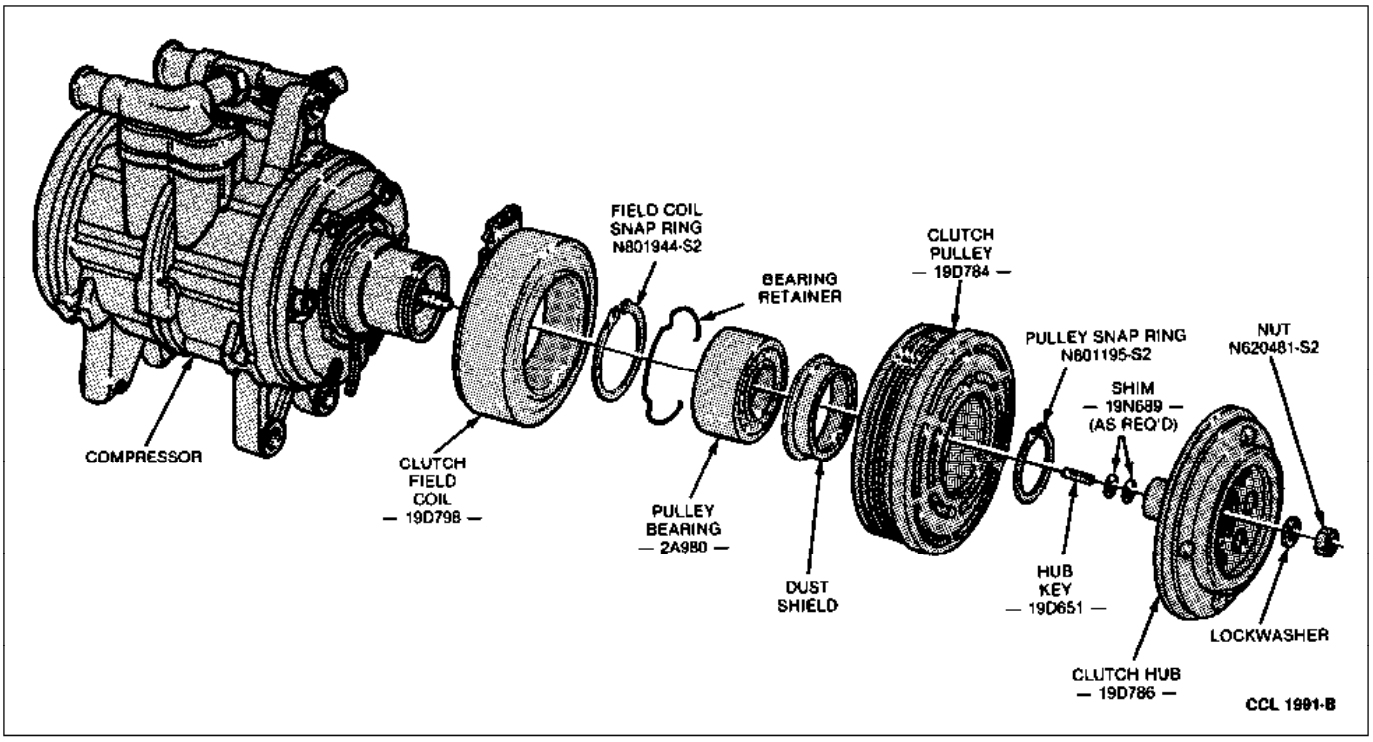
2. Remove the clutch hub and shims from the compressor shaft with Hub Driven Plate Remover T80L-19703-B or equivalent (Fig. 5). Hold the tool with a 1-inch wrench. Tighten the bolt with a 1/2-inch wrench to pull the hub from the compressor shaft.

FIG. 5 Clutch Hub--Removal



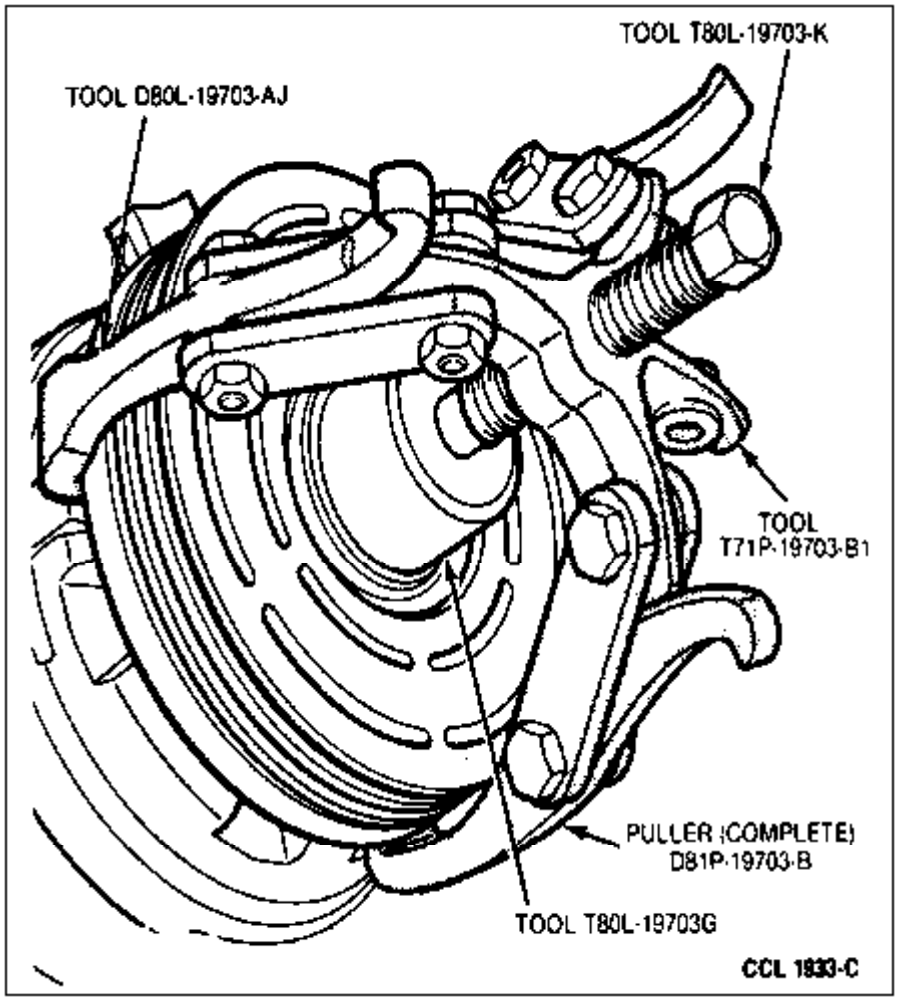
3. Remove clutch pulley retaining snap ring (Fig. 6).

FIG. 6 Nippondenso Clutch Disassembled



4. Pull the pulley and bearing assembly from the compressor. If the pulley and bearing assembly cannot be removed by hand, use Shaft Protector T80L-19703-G and Pulley Puller D81P-19703-B or equivalent to remove pulley (Fig. 7).

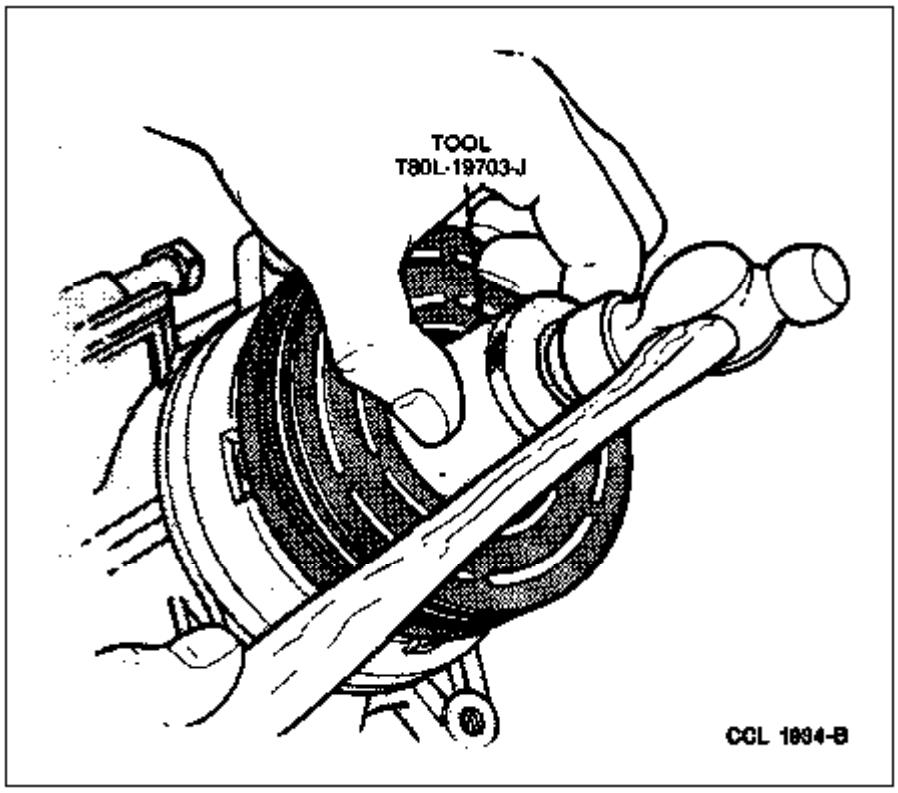
FIG. 7 Clutch Pulley--Removal



Installation

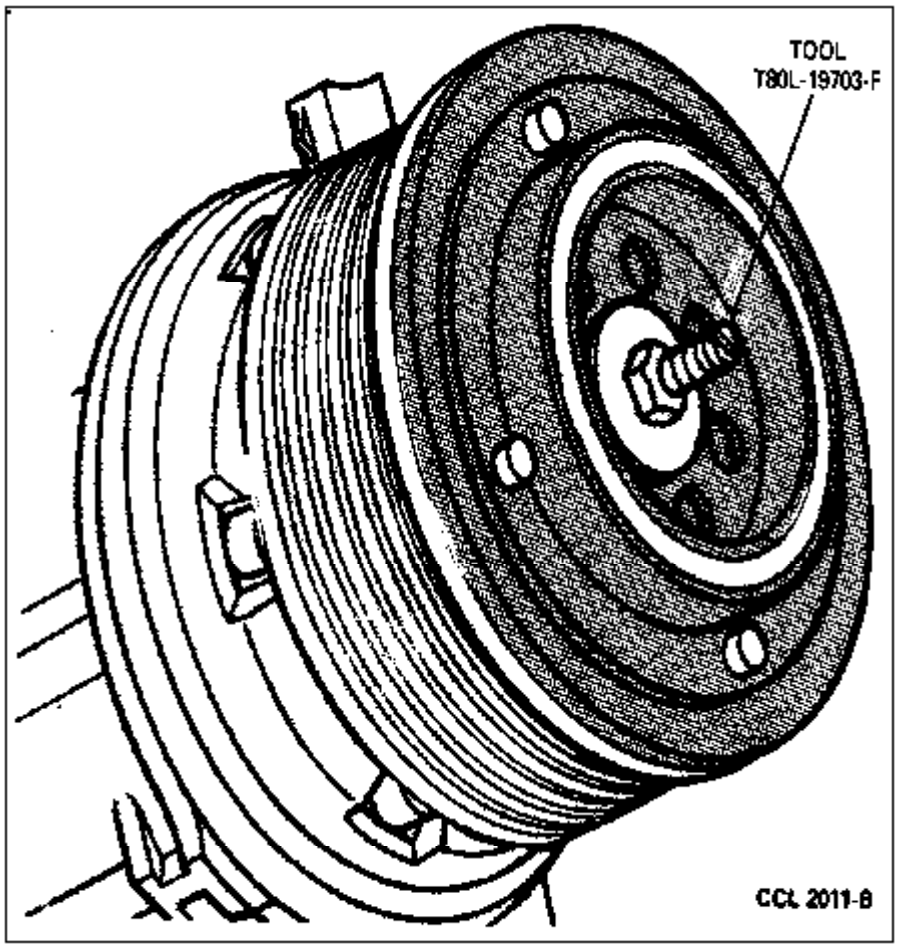
1. Clean the pulley bearing surface of the compressor head to remove any dirt or corrosion.
2. Install the pulley and bearing on the compressor. The bearing is a slip fit on the compressor head and, if properly aligned, should slip on the compressor head. If difficulty is encountered installing the pulley, gently tap the pulley on the compressor using Pulley and Bearing Tool T80L-19703-J or equivalent (Fig. 8).**Ensure pulley bearing is aligned with the compressor head.**

FIG. 8 Clutch Pulley--Installation



3. Install the pulley retaining snap ring with the bevel side of the snap ring out.
4. Install the clutch hub on the compressor shaft using the two thickest shims of the shim pack between the clutch hub and the end of the compressor shaft. Ensure shaft key is aligned with the keyway in the clutch hub. Use Hub Driven Plate Replacer T80L-19703-F or equivalent to press the hub on the compressor shaft if necessary (Fig. 9). **Do not attempt to drive the hub on the compressor shaft** as damage to the compressor will result. Use only the specified tool if the hub will not easily slide on the compressor shaft.

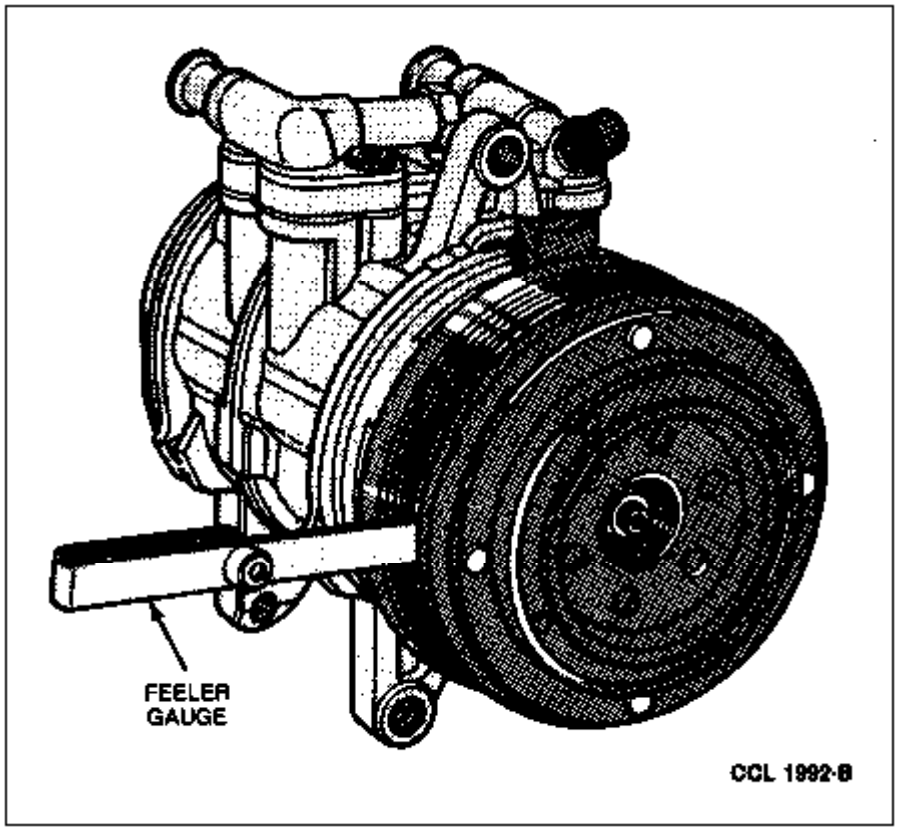
FIG. 9 Clutch Hub--Installation



5. Install the hub retaining nut on the compressor shaft. Tighten the nut to 13-20 N-m (10-14 lb-ft).**DO NOT USE AIR TOOLS.**

6. Check the air gap between the hub and the mating pulley surface in three locations equally spaced around the pulley (Fig. 10). Record the air gap readings.

FIG. 10 Clutch Air Gap Check



7. Rotate the compressor pulley one-half turn (180 degrees) and again check the air gap in three equally spaced locations. The smallest air gap must be within the specified limits for the air gap. Add or remove shims between the hub and the compressor shaft as necessary until the smallest air gap is within 0.021-0.036 inch.

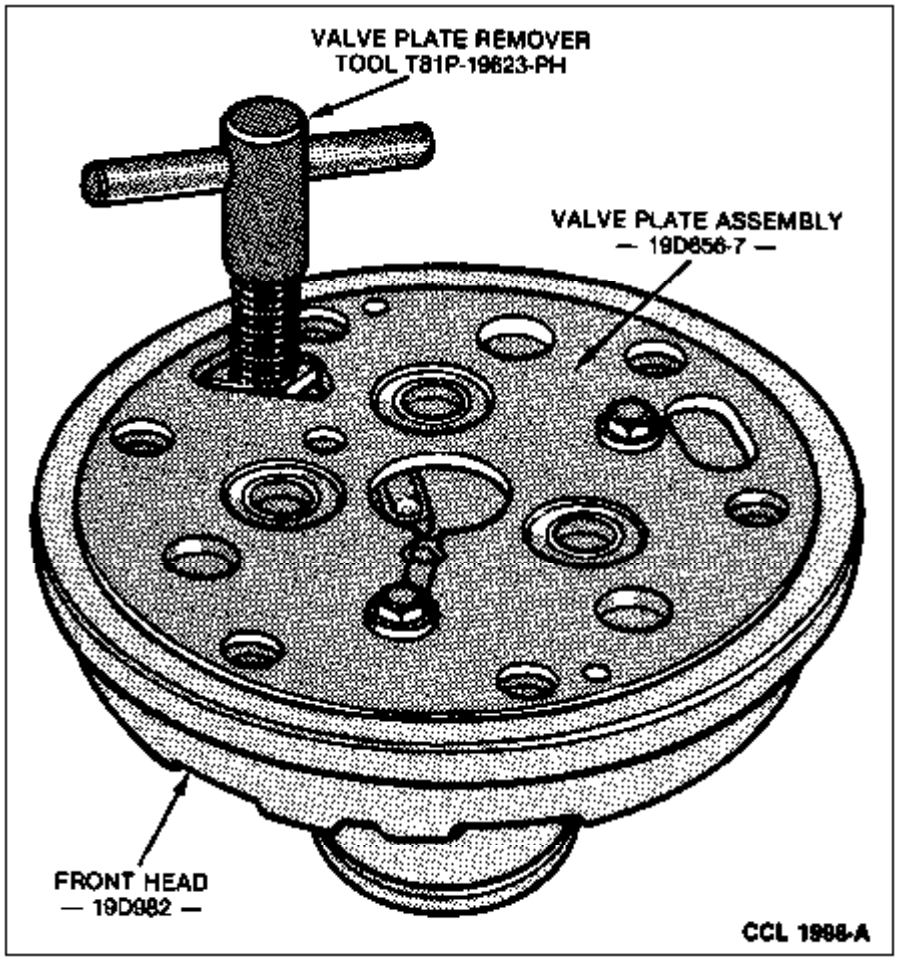
Shaft Seal and/or Front Head Gasket and O-Ring

Removal

1. Remove clutch assembly following the procedure for Clutch Field Coil Removal.
2. Invert compressor and pour the refrigerant oil from the compressor into a calibrated measuring container from the manifold openings. Record the amount of oil removed.
3. Install Housing Clamp T81P-19623-LH or equivalent on compressor to retain the cylinder assembly and the rear head in position («Fig. 4»). Then, clamp the tool in a vise.
4. Remove the key from the compressor shaft with Shaft Key Remover T81P-19623-NH or equivalent.
5. Remove the six cylinder bolts from the compressor using a 6mm Allen wrench. Then, pull the front head from the compressor. The valve plate assembly, inlet reed, shaft seal and cylinder gasket normally will come off with the head assembly.

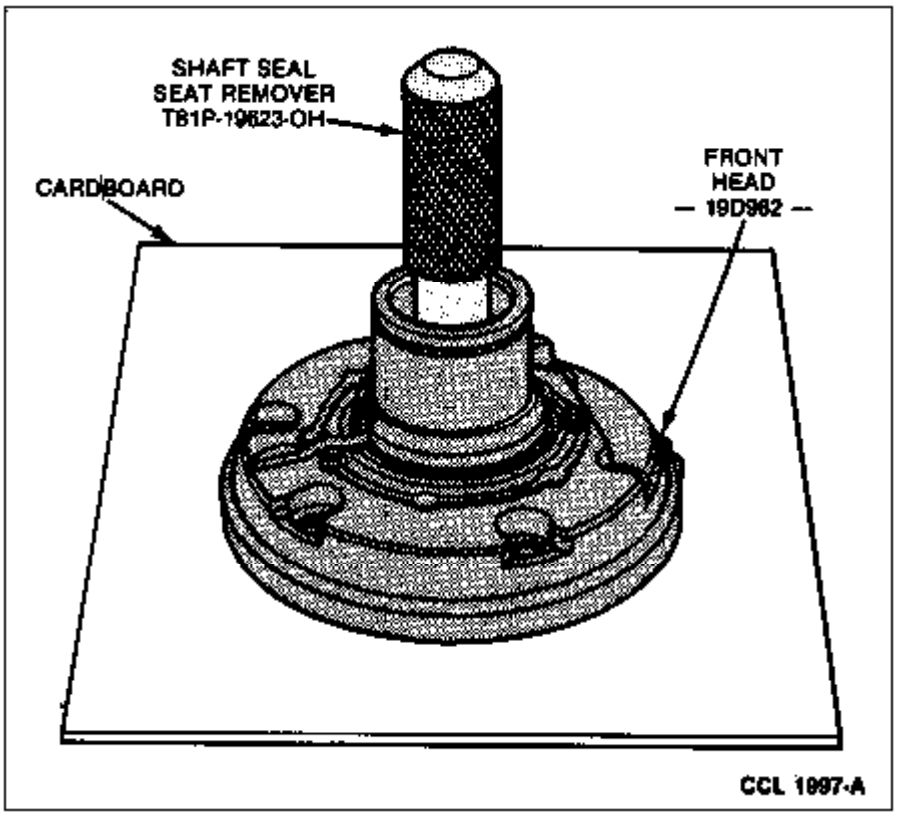
   NOTE:
   Use extreme care not to damage any sealing surfaces.
6. Carefully lift inlet reed valve from the head assembly.
7. Remove the front valve plate assembly and gasket from the front head with Valve Plate Remover T81P-19623-PH or equivalent (Fig. 13).

FIG. 13 Valve Plate--Removal



8. Carefully remove the gasket from the valve plate assembly using care not to damage the surface of the valve plate assembly.
9. Remove the two dowel pins from the front head or cylinder assembly.
10. Remove shaft seal assembly and the felt seal from the head.
11. Place the head on a piece of clean corrugated cardboard and remove the seal seat assembly from the head with Shaft Seal Seat Remover T81P-19623-OH or equivalent (Fig. 14).

FIG. 14 Shaft Seal Seat Assembly--Removal

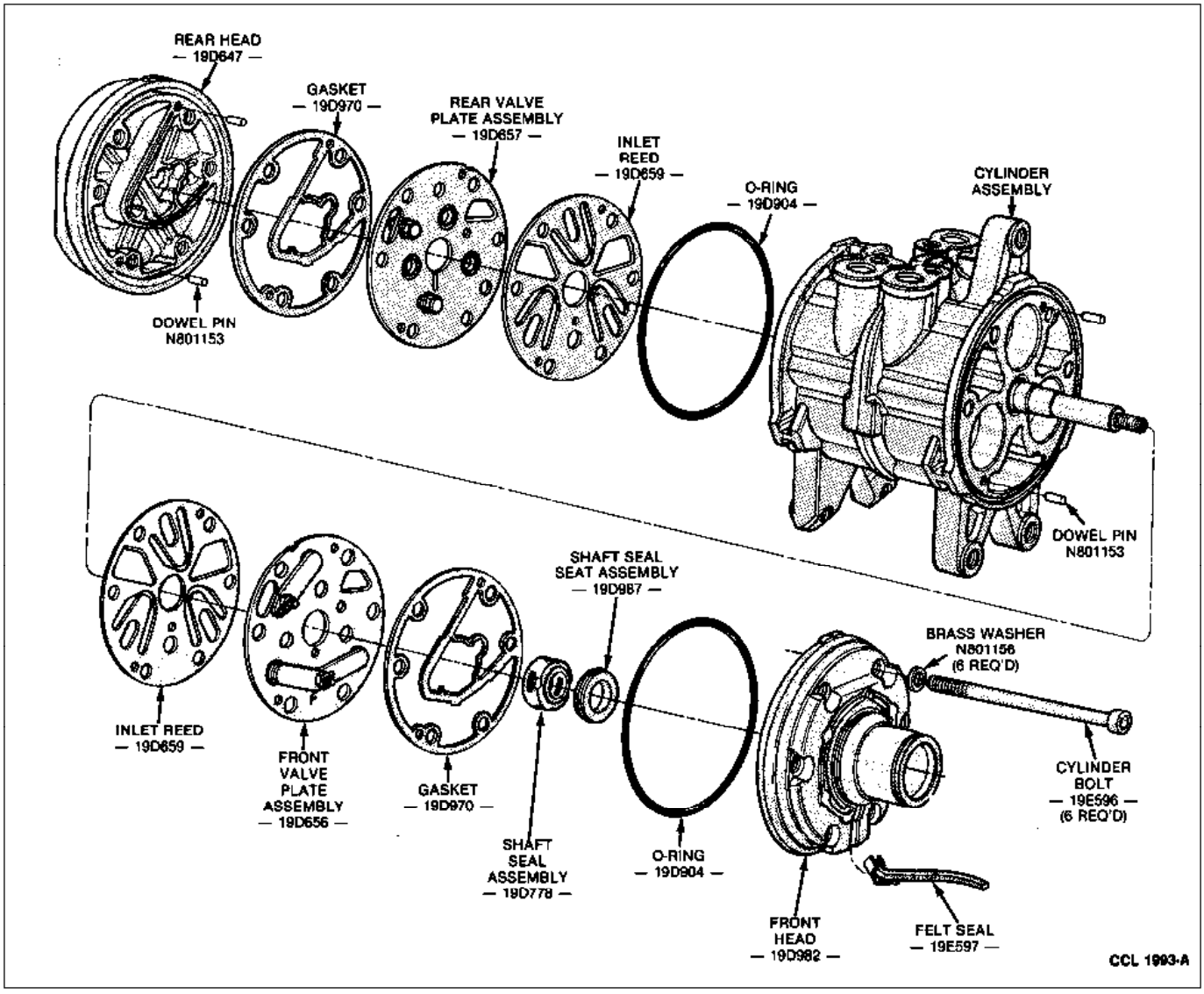


12. Clean the front head, valve plate assembly and inlet reed with clean cleaning solvent and allow them to dry. **DO NOT BLOW DRY the inlet reed or valve plate assembly with compressed air.**

Installation

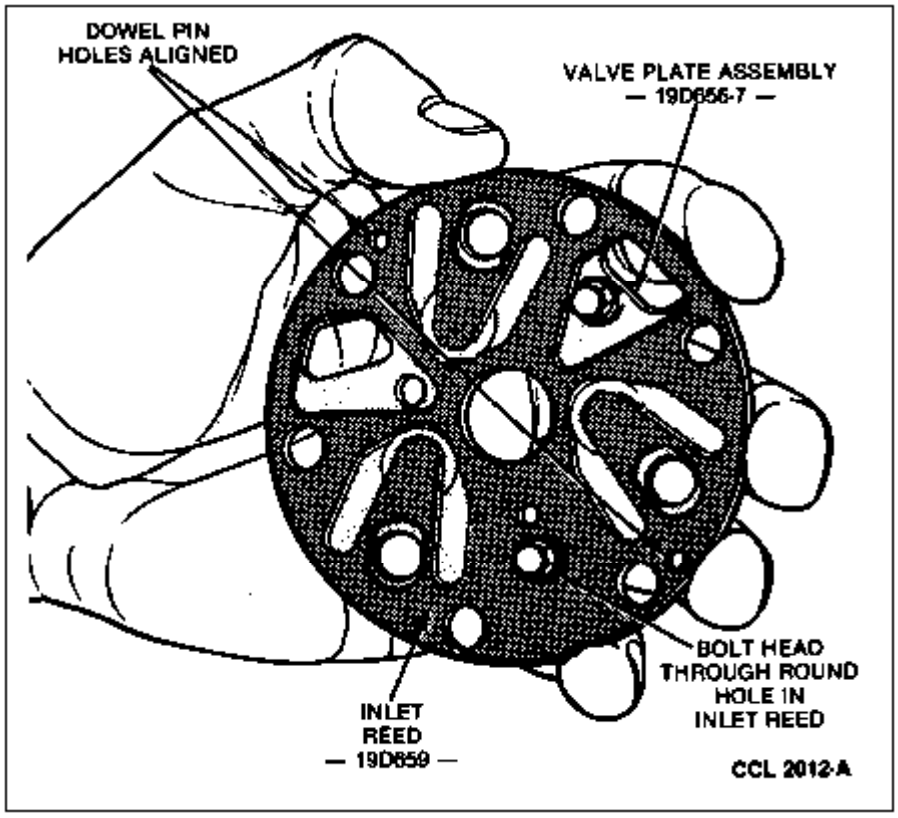
1. Inspect inlet reed, valve plate assembly and front head for damage. Replace any damaged parts.
2. Install the two dowel pins in the dowel pin holes of the cylinder assembly (Fig. 15).

FIG. 15 Compressor Disassembled



3. Lubricate inlet reed with a light coating of clean refrigerant oil. Position the inlet reed to the valve plate assembly, aligning the dowel pin holes (Fig. 16).

FIG. 16 Correct Assembly of Inlet Reed and Valve Plate Assembly



4. Assemble the valve plate assembly and inlet reed to the cylinder assembly aligning the dowel pin holes with the dowel pins.

5. Assemble a new cylinder gasket to the head side of the valve plate assembly aligning the dowel pin holes with the dowel pins (Fig. 15).

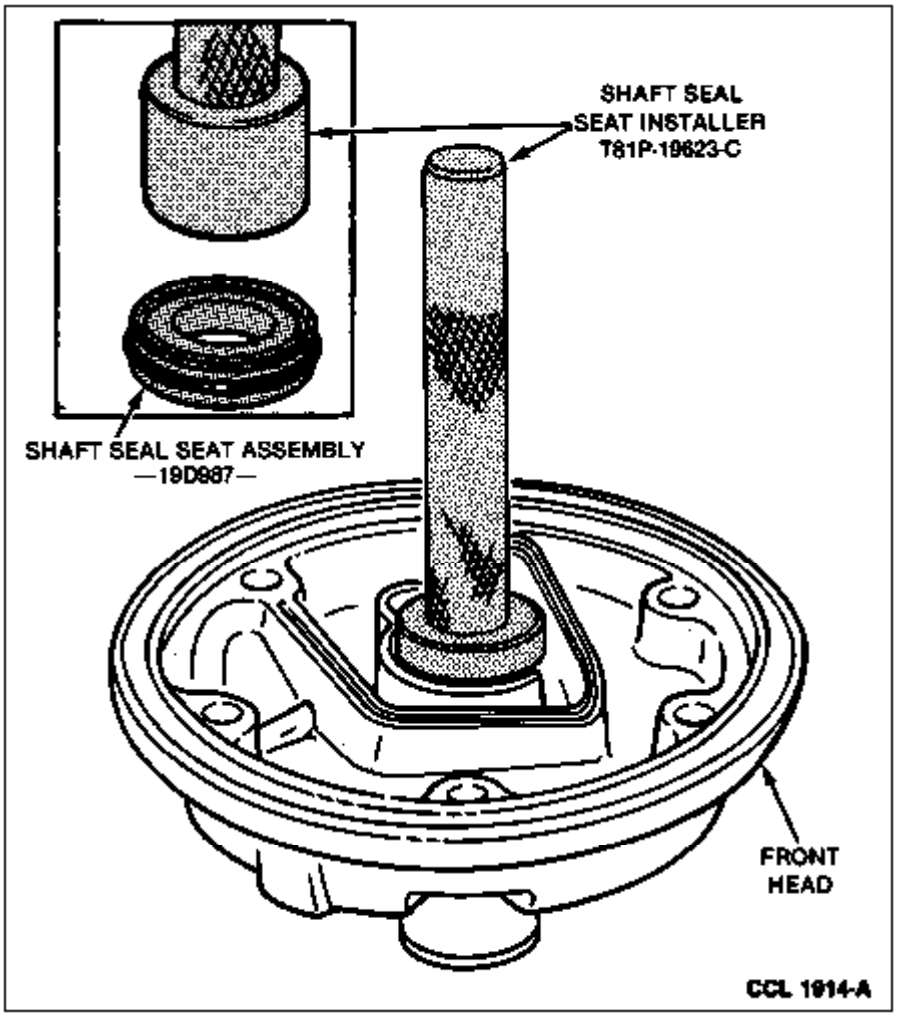
6. Carefully remove the shaft seal seat and seal from the protective package.

   DO NOT CUT the transparent protective cover but peel it back from the backing to expose the seal and seat.

   NOTE:
   DO NOT TOUCH the sealing surfaces of the shaft seal or seal seat.

7. Lubricate shaft seal seat with clean refrigerant oil. Install the seat in the front head with the groove on the seat sealing surface up. Do not touch the sealing surface of the seat. Use Shaft Seal Seat Installer T81P-19623-C or equivalent in the groove of the seat to install the seat in the head (Fig. 17).

FIG. 17 Shaft Seal Seat Assembly--Installation



8. Lubricate the shaft seal with clean refrigerant oil and assemble the seal to the compressor with the sealing surface toward the end of the shaft. Engage the internal flats of the seal with the two flats on the shaft.

   NOTE:
   Avoid handling the carbon sealing surface of the seal assembly to prevent damaging the surface. Use extreme care to keep the seal and seal seat clean at all times.

9. Install a new O-ring in the O-ring groove of the front head (Fig. 15).

10. Position the front head to the cylinder assembly aligning the dowel pin holes in the head with the dowel pins. Install the six head bolts and tighten to 24.5-26.5 N-m (18-19 lb-ft) in a diagonally opposite sequence. **DO NOT USE AIR TOOLS.**

11. Add new refrigerant oil to the compressor. Refer to «Adding Refrigerant Oil, During Compressor Replacement» , as outlined.

12. Install the key in the slot of the compressor shaft. Then, with the clutch hub, turn the compressor shaft

13. Leak test the compressor as outlined.

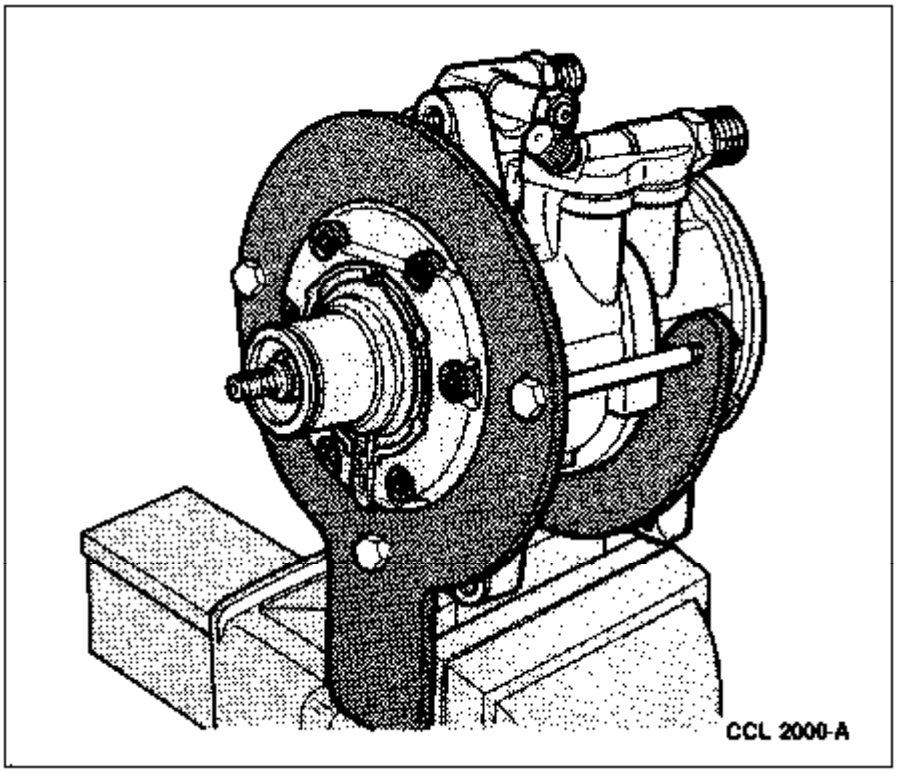
14. Install clutch assembly on the compressor following the procedure for Clutch Field Coil Installation.

Head Gasket and O-Ring, Rear

Removal

1. Remove the clutch assembly from the compressor following the procedure for Clutch Field Coil Removal.
2. Invert compressor and pour the refrigerant oil into a calibrated measuring container from the manifold openings and record the amount of oil removed.
3. Install Housing Clamp T81P-19623-LH or equivalent on the front of the compressor to retain the cylinder assembly and the front head in position (Fig. 18). Then, clamp the tool in a vise.

FIG. 18 Compressor Clamped for Rear Head Removal



4. Hold the rear head and remove the six-cylinder bolts from the cylinder assembly.
5. Separate the rear head assembly from the cylinder assembly and remove the O-ring from the head.
6. Remove the two dowel pins («Fig. 15»).
7. Remove inlet reed from the rear head and valve plate assembly.
8. Remove the valve plate assembly from the rear head with Valve Plate Remover T81P-19623-PH or equivalent («Fig. 13»).
9. Carefully remove the cylinder gasket from the head and/or valve plate assembly.
10. Wash the rear head, valve plate assembly and inlet reed with clean cleaning solvent and allow them to dry. **DO NOT BLOW DRY the inlet reed or valve plate assembly with compressed air.**

Installation

1. Install the two dowel pins in the dowel pin holes of the cylinder assembly.
2. Lubricate inlet reed with clean refrigerant oil. Assemble the inlet reed on the cylinder assembly aligning the dowel pin holes with the dowel pins.
3. Install valve plate assembly on the cylinder head aligning the dowel pin holes with the dowel pins («Fig. 15»).
4. Assemble cylinder gasket to the cylinder assembly taking care to align the dowel pin holes with the dowel pins.
5. Install a new O-ring gasket lubricated with clean refrigerant oil into the O-ring groove of the rear head.
6. Position the rear head to the cylinder assembly and align the dowel pins with the dowel pin holes.
7. Hold the rear head in place. Install the six- cylinder bolts with new brass washers and tighten to 24.5-26.5 N-m (18-19 lb-ft) in a diagonally opposite sequence. **DO NOT USE AIR TOOLS.**
8. Remove compressor from Housing Clamp T81P-19623-LH or equivalent.
9. Pour new refrigerant oil into the compressor. Refer to «Adding Refrigerant Oil, During Compressor Replacement» , as outlined.
10. Leak test the compressor as outlined.
11. Install the clutch assembly on the compressor following the procedure for Clutch Field Coil Installation.**DO NOT USE AIR TOOLS.**

Valve Plates and Inlet Reeds

Removal and Installation

1. Remove clutch assembly from the compressor.
2. Invert the compressor and pour refrigerant oil from the compressor into a calibrated measuring container from both manifold openings and record the amount of oil removed.
3. Install Housing Clamp T81P-19623-LH or equivalent on the compressor to retain the front head and cylinder assembly together («Fig. 18»). Then, clamp the tool in a vise.
4. Remove the six-cylinder bolts from the compressor using a 6mm Allen wrench. Remove the rear head from the compressor. The valve plate assembly, inlet reed and the cylinder gasket will normally be removed with the rear head. Use care not to lose the two dowel pins.
5. Remove the O-ring and inlet reed from the rear head.
6. Remove the valve plate assembly from the rear head with Valve Plate Remover T81P-19623-PH or equivalent.
7. Clean the rear head with clean cleaning solvent. Dry the head with compressed air.
8. Install the two dowel pins in the dowel pin holes of the cylinder assembly «Fig. 15» .
9. Position inlet reed (lightly lubricated with refrigerant oil) to the valve plate assembly, aligning the dowel pin holes («Fig. 16»).
10. Position the valve plate assembly and inlet reed to the cylinder assembly, aligning the dowel pin holes with the dowel pins.
11. Install the cylinder gasket over the valve plate assembly, aligning the dowel pin holes with the dowel pins.
12. Install a new O-ring into the O-ring groove of the cylinder assembly. Position the rear head to the cylinder assembly, aligning the dowel pin holes in the head with the dowel pins.
13. Hold the rear head against the cylinder assembly. Install two cylinder bolts into opposite holes to hold the rear head in place. Tighten the two bolts just snug.
14. Remove the Housing Clamp T81P-19623-LH or equivalent from the front of the compressor. Install the tool to clamp the rear head to the cylinder assembly.
15. Remove the key from the compressor shaft with Shaft Key Remover T81P-19623-NH or equivalent.
16. Remove the two cylinder bolts from the compressor.
17. Pull the front head from compressor assembly. The valve plate assembly, inlet reed and shaft seal assembly will usually come off with the front head («Fig. 15»). Then, remove the two dowel pins.
18. Remove the O-ring and inlet reed from the front head.
19. Remove valve plate assembly from the front head with Valve Plate Remover T81P-19623-PH or equivalent («Fig. 13»).

20. Remove the shaft seal and the cylinder gasket from the front head.
21. Place the front head on a piece of clean corrugated cardboard. Remove the seal seat assembly from the front head with Shaft Seal Seat Remover T81P-19623-OH or equivalent («Fig. 14»).
22. Remove the felt wick and retainer from the drain hole in the front head.
23. Clean the front head with clean cleaning solvent and dry with compressed air.
24. Install the two dowel pins in the dowel pin holes of the cylinder assembly.
25. Lubricate inlet reed with a light coating of clean refrigerant oil ESH-M2C31-A2 or equivalent. Position the inlet reed to the cylinder assembly, aligning the dowel pin holes of the inlet reed with the dowel pins.
26. Assemble the valve plate assembly to cylinder assembly, aligning the dowel pin holes with the dowel pins.
27. Assemble the cylinder gasket to valve plate assembly, aligning the dowel pin holes with the dowel pins.
28. Carefully remove shaft seal seat and seal from protective package.**DO NOT CUT** the transparent protective cover but peel it from the backing to expose the seal and seat.

    NOTE:
    DO NOT TOUCH the sealing surfaces of the shaft seal or seal seat.
29. Lubricate the new shaft seal seat with clean refrigerant oil and install the seat in the front head (groove side up) with Shaft Seal Seat Installer T81P-19623-C or equivalent («Fig. 17»). Do not touch the sealing surface of the seat. Ensure the shaft seal seat is seated against the recess in the front head.
30. Lubricate the shaft seal with clean refrigerant oil and carefully assemble the seal on the compressor shaft with the sealing surface toward the end of the shaft. Engage the internal flats of the seal with the two flats on the shaft.

    NOTE:
    Avoid handling the carbon sealing surface of the seal assembly to prevent damaging the surface. Use extreme care to keep the seal and seal seat clean at all times.
31. Install a new O-ring in the O-ring groove of the front head.
32. Position the front head to cylinder assembly aligning the dowel pin holes in the head with the dowel pins. Install the six cylinder bolts using new brass flatwashers («Fig. 15»). Tighten the cylinder bolts to 24.5-26.5 N-m (18-19 lb-ft) in a diagonally opposite sequence.**DO NOT USE AIR TOOLS.**
33. Pour new refrigerant oil into the compressor. Refer to «Adding Refrigerant Oil» , During Compressor Replacement, in this Section.
34. Install a new felt wick and retainer in the front head drain hole («Fig. 15»).
35. Install the key in the slot of the compressor shaft with the rounded end toward the compressor body.
36. Rotate the compressor shaft with the clutch hub about 10 revolutions to distribute the oil in the compressor.
37. Leak test the compressor as outlined.
38. Install the clutch assembly on the compressor.

Adding Refrigerant Oil

The 6P148 compressor uses a special paraffin base Refrigerant Oil YN-9 (E73Z-19557-A) or equivalent. A total oil charge of 300ml (10 fluid oz) is used in a new system. It is important that only the specified type and quantity of refrigerant oil be used in the compressor. If there is a surplus of oil in the system, too much oil will circulate with the refrigerant reducing the cooling capacity of the system. Too little oil will result in poor lubrication of the compressor.

When it is necessary to replace a component of the refrigerant system, the procedures given here must be followed to ensure that the total oil charge in the system is correct after the new part is installed. 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 adding the lost oil to the new replacement part.

The procedures for replacing oil follow.

During Compressor Replacement

A new service replacement compressor contains 300ml (10 fluid oz) of YN-9 (E73Z-19577-A) or equivalent refrigerant oil. Prior to installing the replacement compressor, drain the refrigerant oil from the removed compressor into a calibrated container. Then, drain the refrigerant oil from the new compressor into a clean calibrated container. If the amount of oil drained from the removed compressor was between 90 and 148ml (3 and 5 oz), pour the same amount of clean refrigerant oil into the new compressor. If the amount of oil that was removed from the old compressor is greater than 148ml (5 oz), pour 148ml (5 oz) of clean refrigerant oil into the new compressor. If the amount of refrigerant oil that was removed from the old compressor is less than 90ml (3 oz), pour 90ml (3 oz) of clean refrigerant oil into the new compressor. This will maintain the system total oil charge within the specified limits.

> NOTE:
> The suction accumulator/drier and the orifice tube should also be replaced whenever the compressor is replaced.

During Component Replacement

When replacing other components of the air conditioning refrigerant system, measured quantities of refrigerant oil should be added to the component to ensure that the total oil charge in the system is correct before the system is operated.

Clean refrigerant oil should be added to the replacement components as follows:

- Evaporator Core: Add 88.71ml (3 fluid oz).
- Condenser: Add 29.57ml (1 fluid oz).
- Accumulator: Drain the oil from the removed accumulator/drier. Add the same amount plus 59ml (2 fluid oz) of clean refrigerant oil to the new accumulator.

Clean refrigerant oil should be poured directly into the replacement component.

If any other components, such as an orifice tube or hose are replaced, no additional refrigerant oil is necessary unless a hose bursts with a fully charged system. Then, the addition of refrigerant oil may be necessary, with the amount to be determined by the technician. The suction accumulator/drier should also be replaced under these circumstances.