To reassemble:

1. Rotate crankshaft to position piston at top center.
2. Lubricate piston rings and beveled surface at lower edge of cylinder sleeve.
3. Stagger ring gaps around piston.
4. With turning motion, work sleeve over piston and rings. Compress and align each ring with beveled edge of sleeve.
5. Seat sleeve in suction manifold partition and cylinder deck recess.
6. Rotate sleeve so that any 2 valve lifter-pin holes lie equal distances from longitudinal axis of compressor (Fig. 34). In this position, lifter pins line up with suction valve springs.

⚠ CAUTION

Never operate compressor with heads or valve plate removed.

Connecting Rods and Pistons

REMOVAL — Remove cylinder head, valve plate and hand-hole cover or bottom plate to gain access to rods and pistons.

Remove connecting rod caps (Fig. 22). Label caps and rods so they may be reinstalled in same places on crankshaft. Remove cylinder sleeve, connecting rod and piston assembly as a unit by pushing assembly up through cylinder deck. *Do not allow piston to come up through top of sleeve during removal process.* Remove retaining rings and piston pins to disassemble connecting rods from pistons. Remove rings.

Keep each individual connecting rod and piston assembly together to aid reassembly. Check all parts and crankpin journals for wear (Table 11).

INSPECTION AND REPLACEMENT — Attach connecting rods to pistons with piston pins and lock in place with retaining rings. Piston pins are selectively fitted for a push fit; reassemble in the piston from which they were removed. Place piston pin retaining rings, with gap on side, on piston (Fig. 35). They should be tight enough to inhibit rotation under finger pressure.

Check Rings

1. Check ring gap by inserting each ring separately in cylinder approximately ⅜ in. from top. Ring gap should be between .007 and .017 inches.
2. Install compression rings on piston with *marked side up* (see Fig. 35) toward piston head. Install oil rings either side up.
3. Stagger ring gaps around piston.
4. Measure side clearance between ring and piston (approximately .001 inch). Check rings for free action.

Check Rod Bearing Inserts (Fig. 22) — If bearing inserts are damaged and crankshaft is not worn, it is only necessary to replace inserts. Do not file bearing caps. Place the inserts in connecting rod and connecting rod caps so knobs on inserts fit into notches on rod cap. Lubricate insert bearing and crankpin freely before installing caps.

Install cylinder sleeve, connecting rod and piston assembly at the same time. *Turn connecting rod, and install cap so chamfered sides are against radius of crankpin. (Small knobs on rod and caps must be on same side of journal.)*

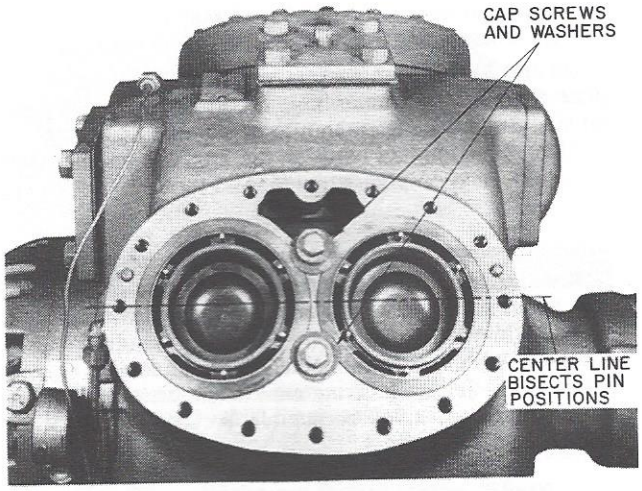
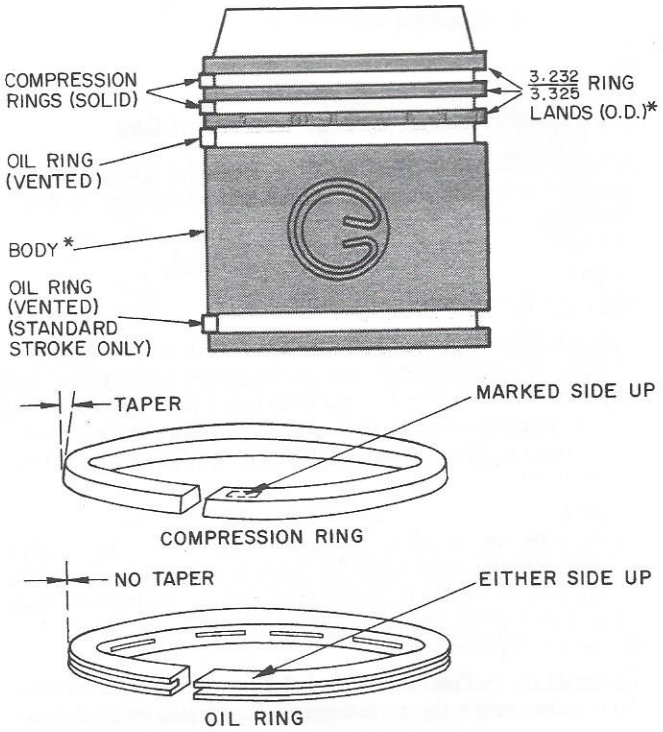


Fig. 34 — Position of Cylinder Sleeves



*See Table 11 for piston diameters.

Fig. 35 — Piston and Rings

Capacity Control Operation — All 5F,H series compressors, except 5F20 and 30 units, include hydraulic capacity control unloader systems as standard equipment. (Field-installed accessory unloader packages are available for the 5F20 and 30.) The unloader system activates and deactivates the compressor's cylinder banks, by permitting suction valves to seat or preventing them from doing so, in response to changing load demands. Capacity control unloaders can reduce a unit's actual operating capacity by steps down to as little as 25% of its total capacity. Figure 17 shows the sequence and number of cylinders that unload with each step.

Capacity control unloader systems consist of 4 major components:

1. **A capacity control valve,** which increases or decreases control oil pressure to the hydraulic relay piston proportionally when the suction pressure from the crankcase rises or falls.

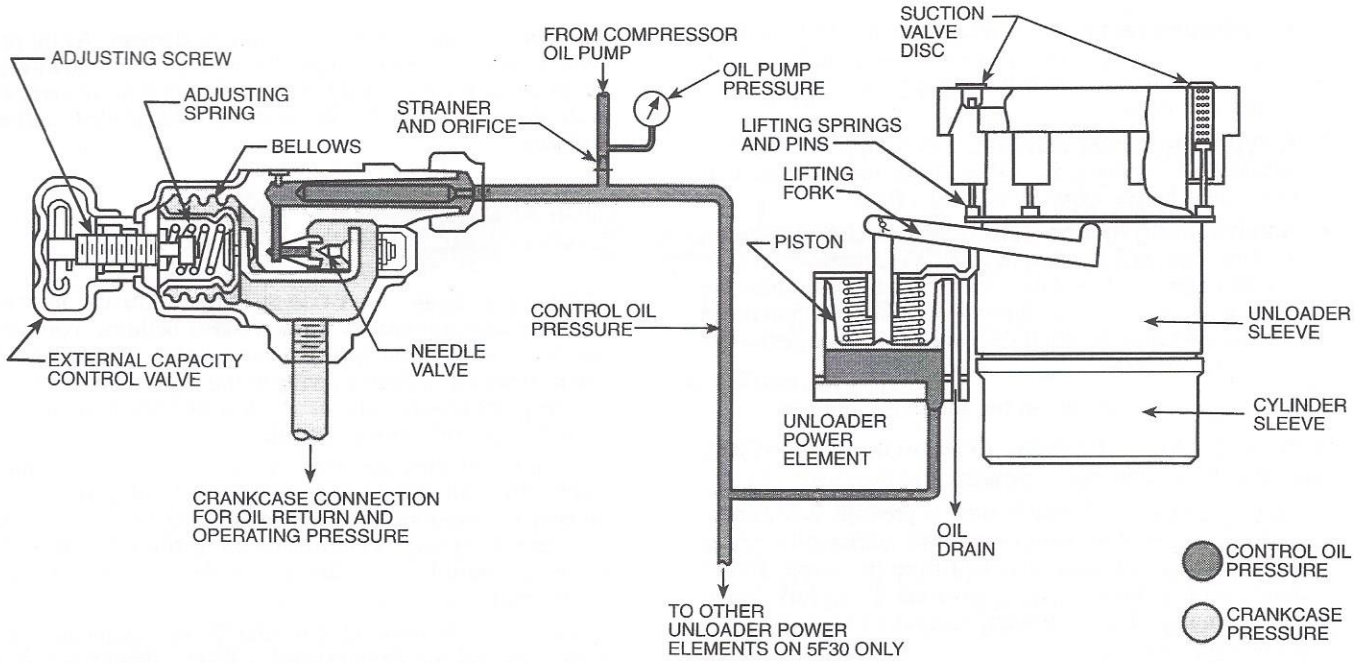


Fig. 36 — Capacity Control (5F20, 5F30)

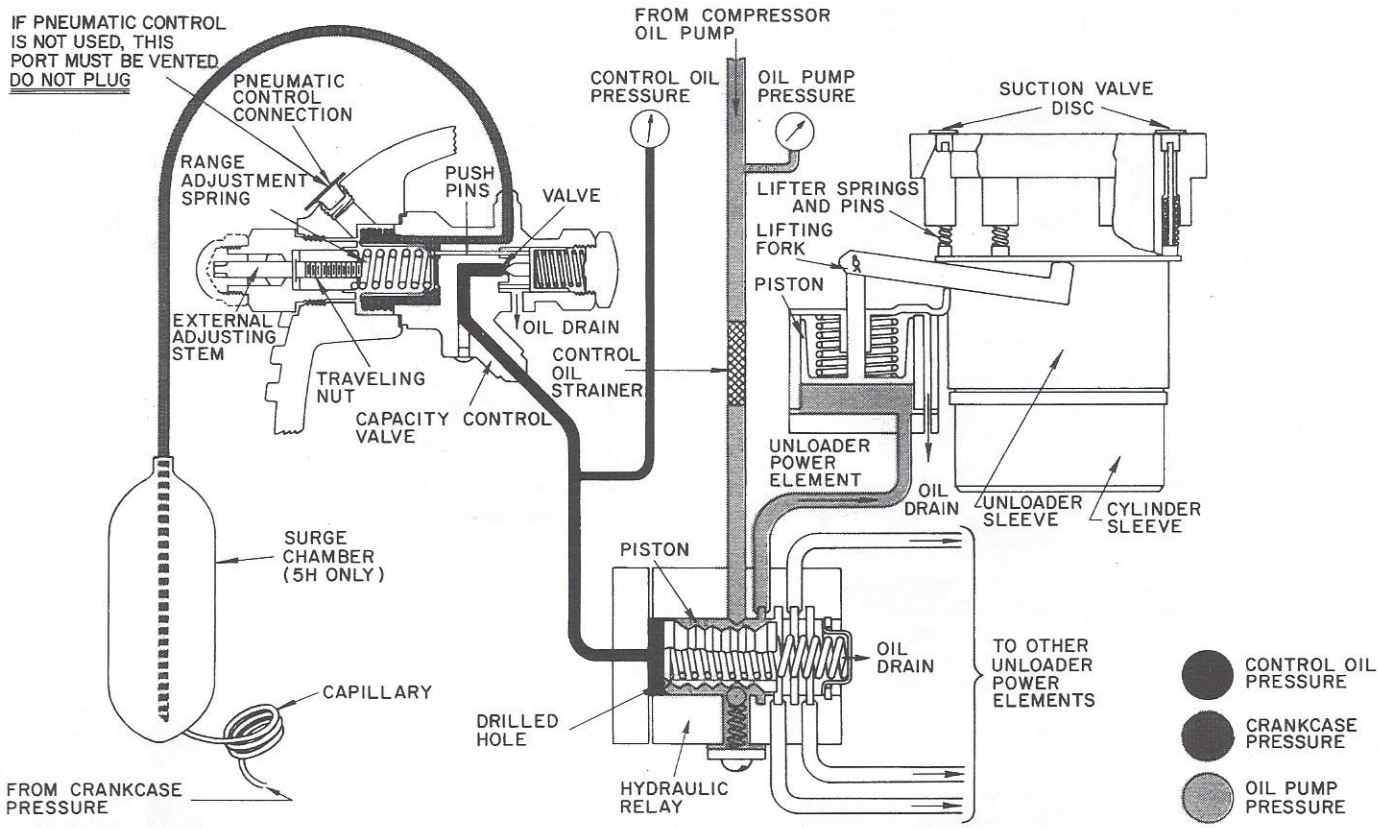


Fig. 37 — Capacity Control Operation (5F40, 60; 5H40, 60, 66, 80 and 86)

2. **A hydraulic relay,** which (except on the 5F20 and 30) feeds oil to the unloader power elements in sequence. Control oil pressure from the capacity control valve activates this relay.
3. **A hydraulic power element,** which supplies the power necessary to operate the valve-lifting mechanism. It is modulated by the capacity control valve.
4. **A valve-lifting mechanism,** which consists of a sleeve, a lifting fork and a push-pin assembly around each controlled cylinder. The valve-lifting mechanism holds the suction valve open, or permits the valve to remain in normal operating position depending on its actuation by the power element.

These components operate in the following manner:

5F20 AND 30 CAPACITY CONTROL OPERATION (Fig. 36) (With Optional Unloaders and Control)

Loaded Operation — A rise in suction pressure causes needle valve to close. Oil pressure in power element increases as oil enters capacity control circuit from oil pump. Power element piston is forced upward, pivoting lifting fork downward. Lifter pins drop, allowing suction valve to seat and load controlled cylinder.

Unloaded Operation — A drop in suction pressure causes needle valve to open. Oil bleeds through valve to crankcase, decreasing oil pressure in power element. As oil pressure to power element drops, the piston moves downward. Lifting fork pivots upward, moving lifting pins upward; suction valve rises from its seat and controlled cylinder unloads.

5F40 AND 60, AND 5H40 THROUGH 126 CAPACITY CONTROL OPERATION (Fig. 37 and 38)

Loaded Operation — A rise in suction pressure increases pressure against capacity control valve bellows, compressing range adjustment spring. Compression of range adjustment spring allows valve spring to move push pins and valve needle point toward valve seat. Flow of control oil to crankcase through oil drain is throttled.

Control oil pressure rises as oil enters capacity control circuit through orifice from compressor oil pump circuit. Increased control oil pressure advances hydraulic relay piston (against spring) which feeds oil at full pressure to one or more controlled cylinder power elements depending on position of control valve.

Pump oil pressure in unloader power elements forces piston upward, pivoting the lifting fork(s) downward. Lifter pins drop, allowing suction valve(s) to seat and load cylinder(s).

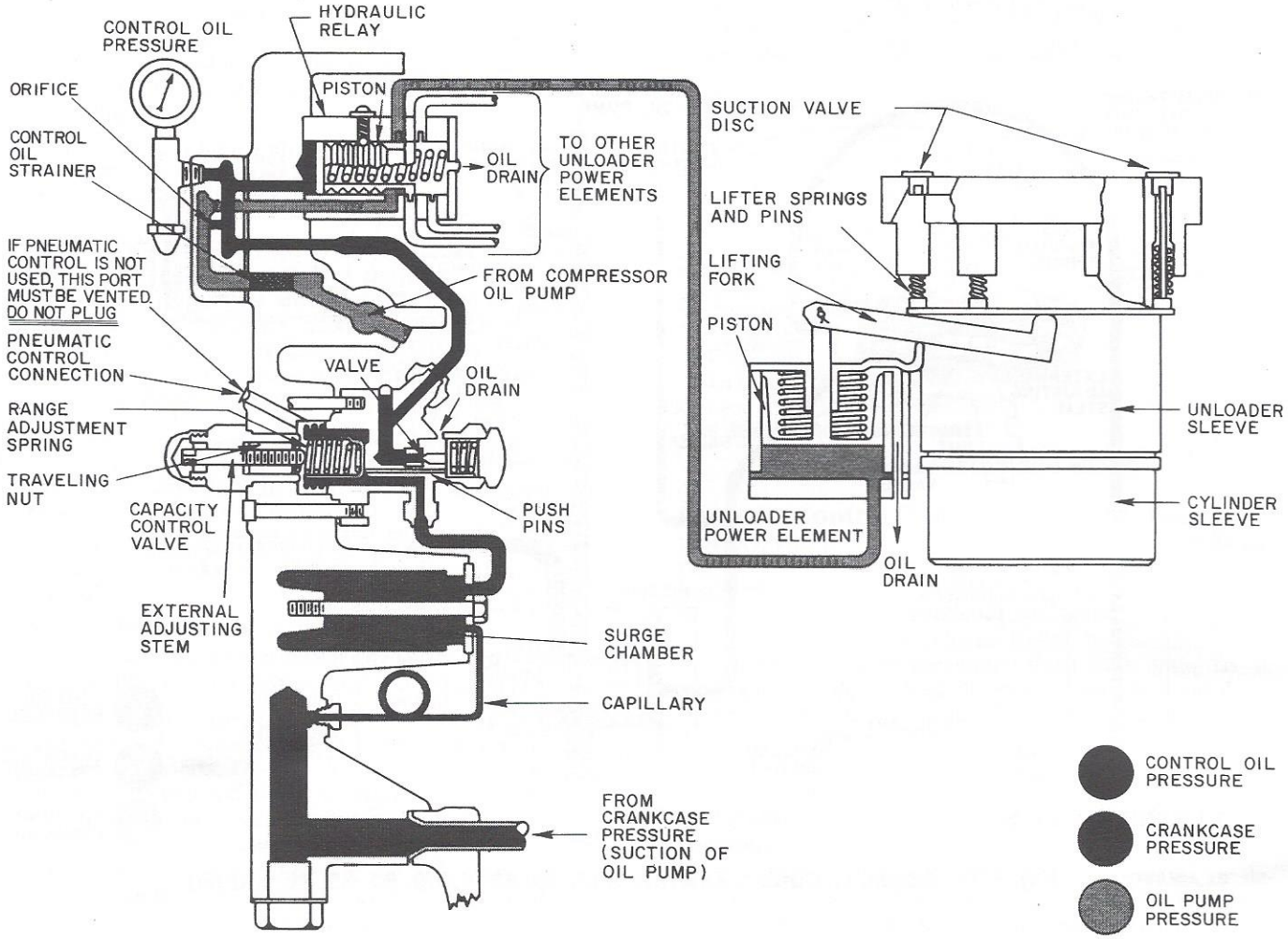


Fig. 38 — Capacity Control (5H120, 5H126)

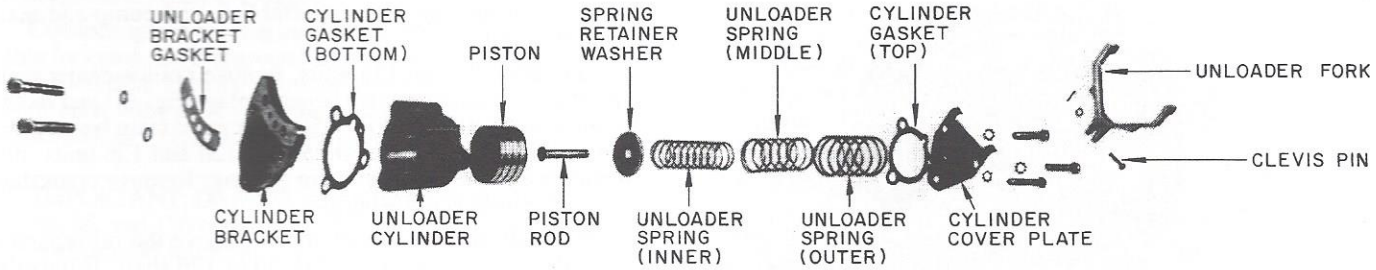


Fig. 39 — Unloader Power Element (Typical)

Unloaded Operation — A drop in suction pressure decreases pressure against control valve bellows. Range adjustment spring presses against the push pins, compressing the valve spring. This moves the needle valve off the seat.

Control oil bleeds from hydraulic relay and control valve to crankcase, relieving oil pressure on hydraulic pistons. The piston retracts, preventing transmission of pressurized oil to controlled cylinder power element(s), and the oil drains to crankcase.

As oil pump pressure on power element drops, the piston moves downward. Lifting fork(s) pivot(s) upward, moving lifting pins upward; suction valves rise from their seats and controlled cylinder(s) unload(s). It should be noted that a minimum of 33 to 35 pounds of oil pressure is required for proper unloader operation.

Capacity Control Inspection and Service

UNLOADER POWER ELEMENT REMOVAL — Remove cylinder head, valve plate, connecting rod, piston and cylinder sleeve. Remove Allen head cap screws (2) holding unloader power element in position.

Remove power element (Fig. 39) and disassemble. Check all parts for wear or damage.

POWER ELEMENT REPLACEMENT — Check unloader fork height (Fig. 40) of new or assembled power element.

Attach power element to internal suction manifold. Replace cylinder sleeve piston, connecting rod, valve plate, cylinder head and hand-hole cover.

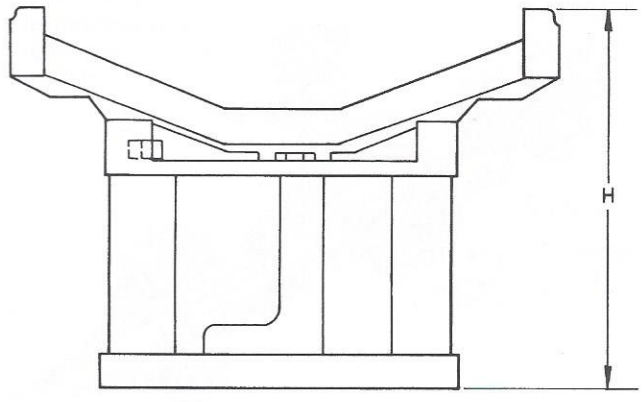


Fig. 40 — Unloader Fork Height (5F and 5H)

EXTERNAL ADJUSTING STEM REMOVAL does not require compressor to be pumped down. Loosen hex nut at valve stem base and remove adjusting stem assembly.

REMOVAL OF CAPACITY CONTROL VALVE AND HYDRAULIC RELAY — Assembly is located in hand-hole cover (Fig. 41) of 5F40 and 5F60 units; in pump-end cover (Fig. 42) of 5H40 through 86 units; and in pump-end bearing head (Fig. 43) of 5H120 and 126 units.

Remove capacity control valve and hydraulic relay.

NOTE: It is *not* practical to remove hydraulic relay from 5H40 through 5H86 compressors.

Inspect parts for wear, damage or evidence of leaking or sticking.

A new hand-hole cover, pump-end cover or pump-end bearing head with control valve assembly and hydraulic relay may be installed. However, capacity control valve (and hydraulic relay on 5H120 and 126 units) is available as a separate parts item for installation on original hand-hole cover, pump-end cover, or pump-end bearing head.

INSPECT CONTROL OIL STRAINER — On 5F compressors, the control oil strainer is located on the side of the pump-end bearing head (Fig. 23). Strainer is located behind the control oil pressure gage connection block on the 5H120 and 126 units (Fig. 20) and on pump-end cover (Fig. 42) of all other 5H compressors.

Remove strainer and inspect it for holes and dirt. Clean it with solvent and replace.

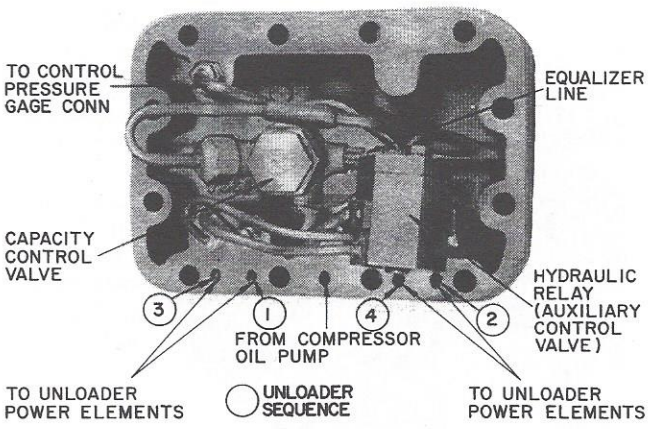
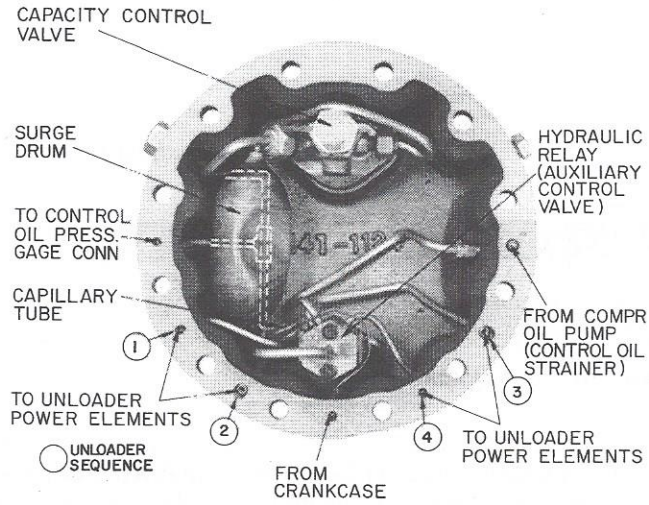


Fig. 41 — Compressor Hand-Hole Cover and Assembly (5F40 and 5F60)



NOTE: Dotted lines indicate piping behind surge drum.

Fig. 42 — 5H Pump-End Cover and Control Assembly (5H40 through 86)

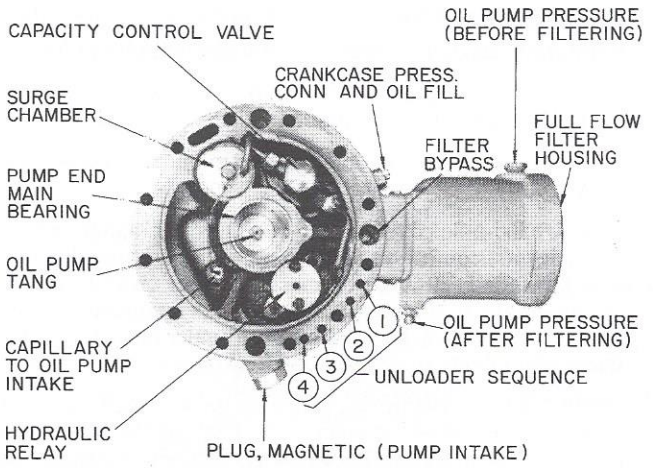


Fig. 43 — 5H120 and 126 Pump-End Bearing Head

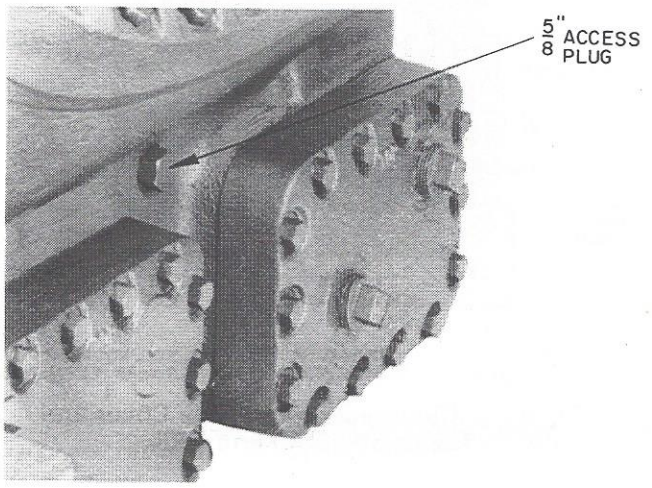


Fig. 44 — 5H80 through 126 Center Main Bearing Housing Setscrew Location

Crankshaft Inspection and Service

DISASSEMBLY — Remove cylinder heads, valve plates, connecting rod and piston assemblies, and pump-end main bearing head.

On 5H80 through 126 units, remove hollow-center main bearing lock screw located beneath plug (Fig. 44) and loosen hollow-cup setscrew (Fig. 45) until center main bearing can be slid from its support. On 5H86, 120 and 126 units, disconnect oil line to center main bearing. Remove crankshaft through pump-end opening.

Normally it is not necessary to remove the oil separator impeller (Fig. 29) from the 5H120 or 126 shaft. If impeller must be removed for any reason, however, immerse it in hot water or oil until heated to 180 F or more. Remove all traces of water before reassembly. *Do not heat impellers with torch.*

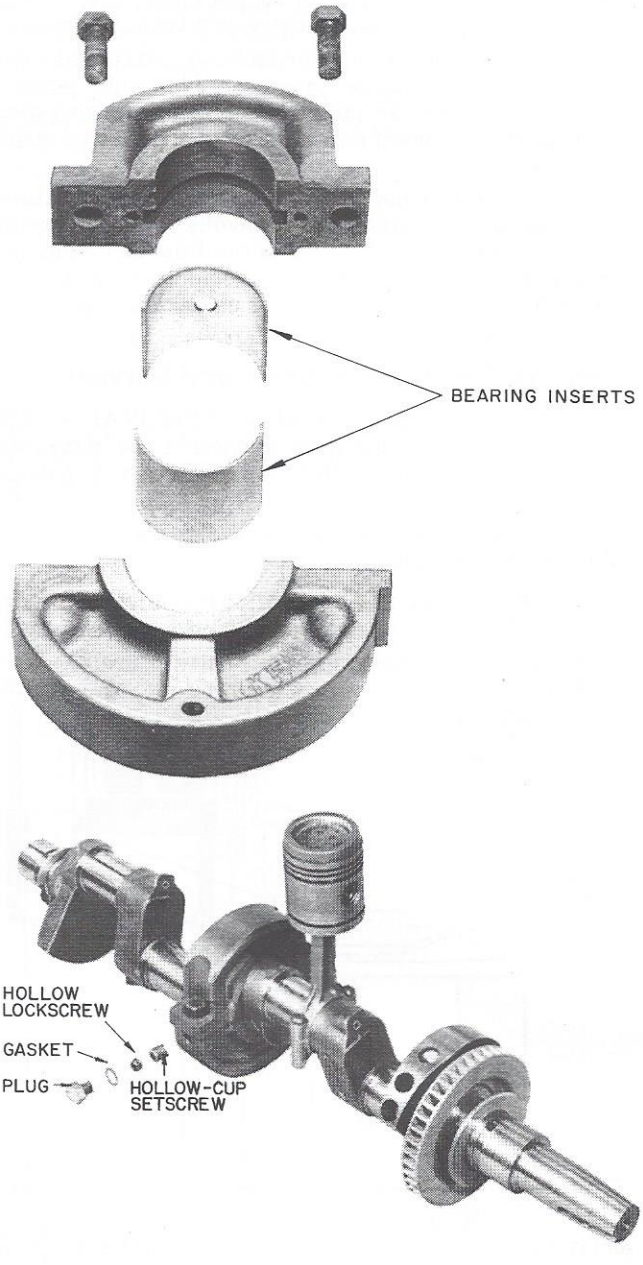


Fig. 45 — Center Main Bearing (5H120 and 126)

INSPECTION — Check crankshaft journals for wear and tolerances (Table 11). Remove crankshaft plugs, check oil passages and clean if clogged.

Connecting-rod bearing inserts and main bearings are available for crankshafts reground from .010-in., .020-in., or .030-in. undersized. Factory-reground crankshafts are stamped on both ends with an A (.010-in. undersized), B (.020-in. undersized), or C (.030-in. undersized).

IMPORTANT: Do *NOTE* regrind crankshafts for 5H46, 66, 86, and 126 compressors in the field. Replace shafts with scored journals.

All instructions for field grinding apply only to standard-stroke crankshafts.

On crankshafts reground locally, hold throw to 1.001 in. for 5F compressors and to 1.376 in. on 5H compressors. Stamp A or B on crankshaft and pump-end bearing head next to oil pressure gage connection.

To determine maximum and minimum journal diameters for undersized shafts, subtract the amount (in.) that the shaft will be ground undersize from factory from the tolerances specified in Table 11. For example, the factory tolerance for 5H40 seal-end journal is 2.6225 in. to 2.6235 inches. Tolerance for a crankshaft reground to .010 in. undersize should therefore be held between 2.6125 in. and 2.6135 inches.

IMPORTANT: When regrinding the seal-end journal on 5H120 crankshaft, do not grind in the area of the oil separator impeller. This is not journal area, and must remain intact or the oil separator impeller will not fit properly.

REASSEMBLY — *If 5H120 or 5H126 oil separator has been removed, read impeller paragraph below before installing crankshaft.*

When regrinding crankshaft, remove crankshaft plugs and clean oil passages as well. Before replacing crankshaft, insert and tighten plugs, and reinstall the 5H120 and 126 oil separator impeller:

1. Insert dowel key (Fig. 29) with axis parallel to axis of crankshaft. Position key so chamfered edge is toward radius of crankshaft journal.
2. Immerse oil separator impeller in oil or hot water to heat it to 180 F or more. If water is used, remove all traces before reassembly. Install impeller on crankshaft with dowel key lined up with impeller keyway. Impeller must fit key snugly.
3. Check that seal-end thrust washer is in place on dowel key in crankcase.

Insert crankshaft and install pump-end bearing head, connecting rod and piston assemblies, valve plate and cylinder heads. On 5H80 through 126 units, insert center main bearing setscrew and lock screw as described under Servicing Center Main Bearing. On 5H86, 120 and 126 units, reconnect oil line to center main bearing.

Pump-End Main Bearing (Fig. 46)

DISASSEMBLY AND INSPECTION — On 5H40 through 86 units, remove pump-end cover. Remove pump-end bearing head on all units. Inspect bearing for tolerances shown in Table 11. If a pump-end main bearing is worn, remove bronze bearing washer, and chisel out bearing. Inspect bearing housing for wear (Table 11) and damage. Remove any burrs.

REASSEMBLY

1. Lubricate outside of new bearing with heavy grease.
2. Line up hole in bearing with oil port in housing.
3. Press bearing into place using a puller shoulder (Table 12 and Fig. 47 and 48) and jack screw or bearing press.
4. Place bearing washer on bearing with notch in washer properly positioned around dowel pin (Fig. 46).

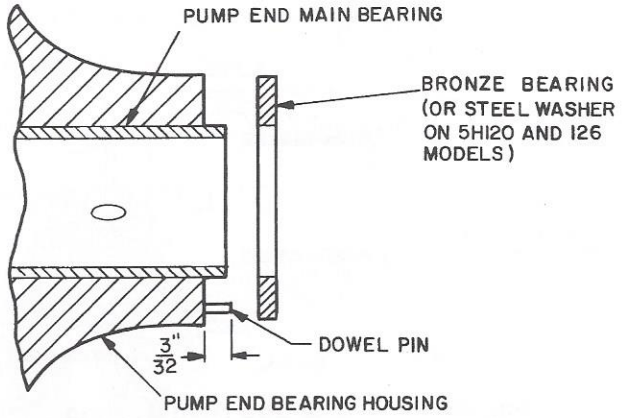


Fig. 46 — Pump-End Main Bearing Position

Table 12 — Main Bearing Puller Sizes

COMPRESSOR	PULLER SIZE
5F20, 5F30	5F20
5F40, 5F60	5F40
5H40, 46, 60, 66, 80, 86, 120, 126	5H140

→ NOTE: Bearing pullers can be ordered through Carrier or Totaline Parts.

Center Main Bearing — Size 5H80 through 126 compressors have a center main bearing and housing.

DISASSEMBLY AND INSPECTION — On 5H86, 120 and 126 compressors, disconnect oil line to center main bearing. (5H80 center main bearings are fed through the shaft.)

Remove plug on compressor crankcases (Fig. 44). Then remove hollow lock screw beneath the plug (Fig. 45). Next, loosen hollow-cup setscrew until center main bearing assembly can be slid from its support. Remove crankshaft and bearing assembly.

Disassemble bearing (Fig. 45) and inspect for proper tolerances (Table 11).

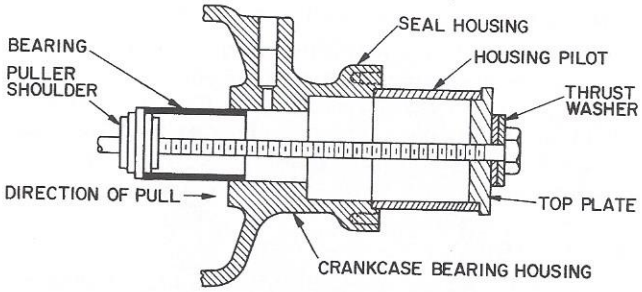


Fig. 47 — Seal-End Main Bearing (5F40, 60)

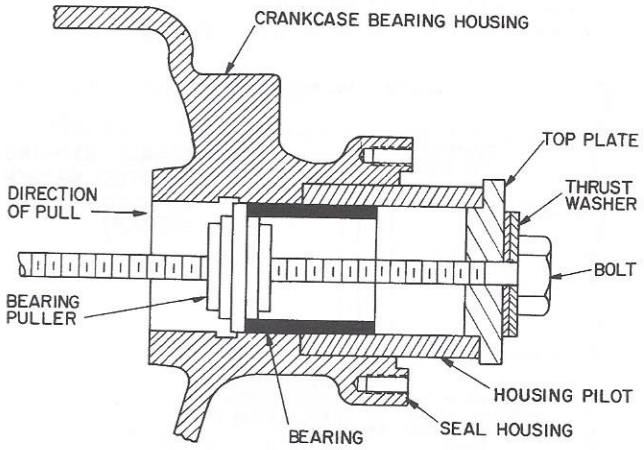


Fig. 48 — 5H Seal-End Main Bearing

REASSEMBLY — Install the new bearing inserts. Assemble bearing housing on crankshaft, *but do not tighten the hollow-cup setscrews*. Install crankshaft, center main bearing and housing, and pump-end main bearing assembly. Tighten bolts holding the pump-end main bearing assembly. *Rotate crankshaft* while tightening setscrew on center main bearing housing. Setscrew should tighten fully without any binding of crankshaft. If binding occurs, shim the opposite side of bearing housing, using .001-in. shim stock.

Seal-End Main Bearing

DISASSEMBLY AND INSPECTION — With crankshaft removed, use a bearing puller with a shouldering device to remove and install seal-end main bearings (Fig. 47 and 48). Bearing pullers can be ordered through Carrier or Totaline Parts.

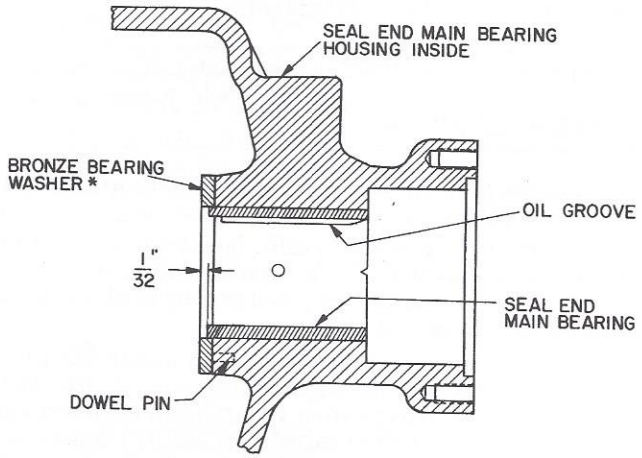
Inspect bearing and bearing housing for tolerances shown in Table 11.

REASSEMBLY — Remove any burrs and clean bearing housing before replacing bearing. Lubricate outside of bearing with heavy grease.

→ 1. Position bearing so chamfered edge enters bearing housing first, oil holes in bearing and housing are aligned (see note below), and bearing relief groove is at top.

NOTE: On size 5 120 and 126 compressors oil hole in bearing and housing will not be aligned.

2. Pull bearing into housing (Fig. 49). Edge of bearing should be 1/32-in. below surface of bronze bearing washer.
3. Look through oil pressure regulator opening to check oil passage for blockage.
4. Blow out oil groove in bearing housing and oil lines (if any) to it.



*Steel washer on 5H120 and 126 models.

Fig. 49 — Seal-End Main Bearing Positioning

Crankshaft Seal Inspection and Replacement

— The crankshaft seal in all current 5F,H compressors is a rotating, bellows-type seal. This seal is the service replacement for all earlier seal assemblies. Figure 50 shows Types I and II of this design (5F20 through 60 and 5H40 through 5H126 compressors).

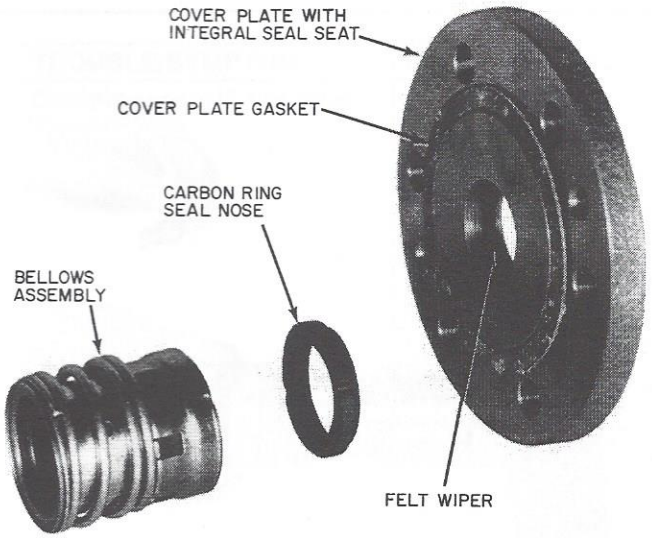
IMPORTANT: Do not attempt to repair or replace seal components. Replace complete seal assembly with current rotating-bellows-type assembly. Do not disassemble bellows assembly of service replacement seal.

BEFORE INSTALLING SEAL

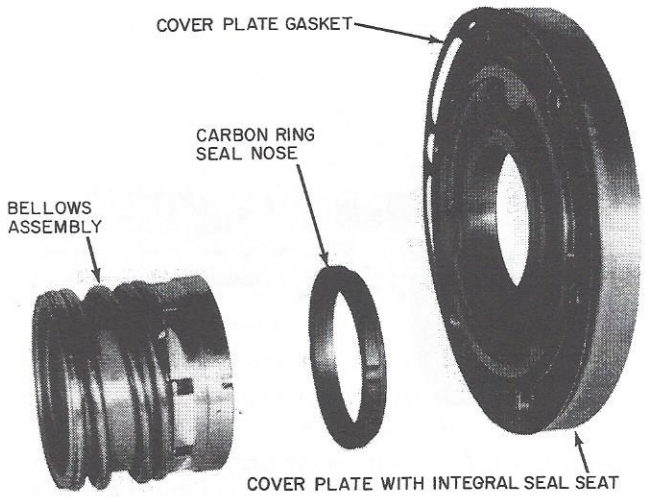
1. Pump-end bearing head must be in place for proper positioning of seal on crankshaft.
2. Be sure shaft extension and *edges of keyway* are free of sharp edges and nicks. Also, shaft must be clean and free of rust. Polish shaft with crocus cloth.
3. Check seal assembly for proper bellows placement and cleanliness.
4. Apply *compressor* oil to seal assembly and crankshaft, completely saturating bellows and carbon ring.

INSTALLATION — Refer to Fig. 51 for procedure.

Accessories — For accessory installation literature, refer to Table 13.

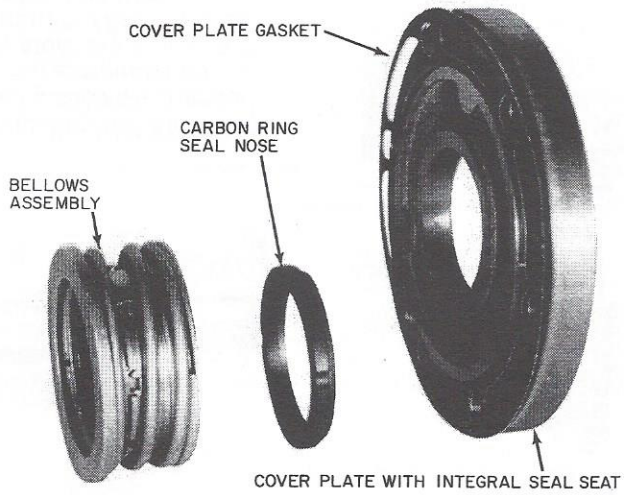


A — 5F20, 30 (Type I)



B — 5F40, 60 AND 5H40 THROUGH 86* (Type I) — Typical

*F540 and 60 — 1.5" diameter; 5H40 through 86 — 2.0" diameter.



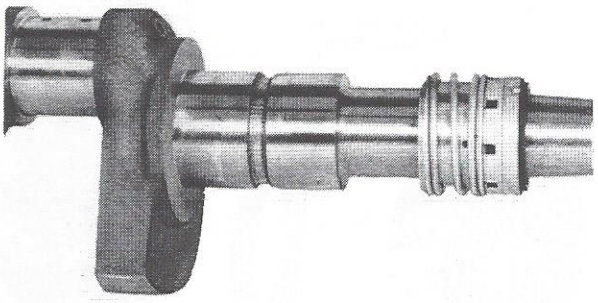
C — 5H120, 126 (Type II)

Fig. 50 — Service Replacement Seals

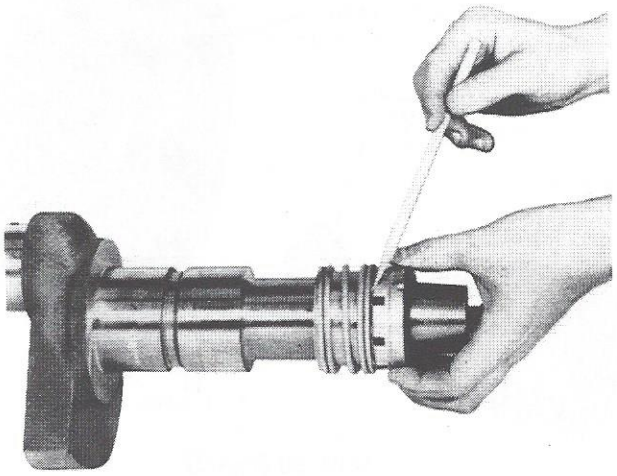
Table 13 — Accessory Literature

ACCESSORY	LITERATURE AVAILABLE
Condensing Unit Piping **Accessory Control Panel** **Accessory Compressor Crankcase Heater** **Accessory Belt Drive Package** **Flexible Couplings for Direct-Drive Units** **Water-Cooled Condensers** **Accessory Water-Cooled Heads Package** **Accessory Oil Filter Package** **Accessory Oil Cooler** **Accessory Oil Safety Switch Package** **Capacity Control Valve** **Accessory Unloader Package** **Accessory Muffler Package**	Installation Instructions*

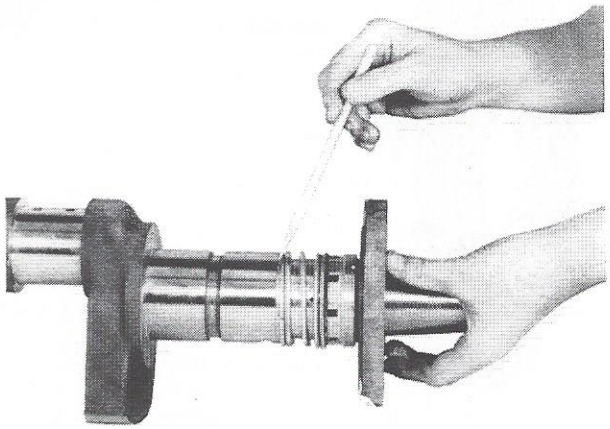
*See your Carrier Distributor for current form numbers.



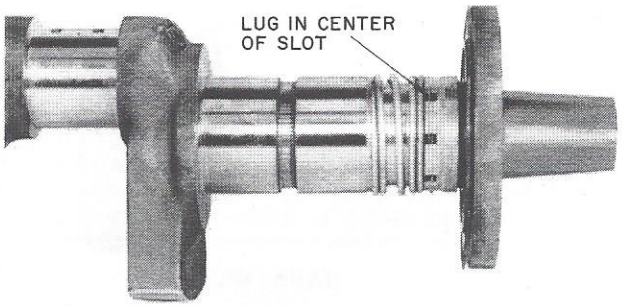
Step 1 — Lubricate the shaft and the neoprene bellows where it comes in contact with the shaft. Slide the seal assembly, as it is shipped from the factory, onto the shaft until the neoprene just starts to grasp the shaft.



Step 2 — Holding the sleeve and spring assembly, pull forward on the seal nose assembly at the same time, turning it so that the lugs on the driving band are out of the slots in the remainer shell and rest on the surface of the retainer shell as shown by the pencil. (This does not apply to the 5H120 Type II seal. Lugs are permanently fixed.)



Step 3 — Using the seal cover plate, push the seal assembly into its proper location on the shaft. DO NOT use cover plate bolts to push seal into position. The spring guide should be tight against the shaft shoulder as shown by the pencil. Remove the cover plate, being careful not to damage the carbon washer. GRASP THE SEAL NOSE ASSEMBLY AND TURN IT UNTIL THE LUGS ON THE DRIVING BAND DROP BACK INTO THE SLOTS IN THE RETAINER SHELL.



Step 4 — Lubricate the carbon seal washer and seal seat. Reinstall the seal cover plate, drawing the bolts down evenly to prevent damage to the carbon seal nose. This view shows the lugs of the driving band properly positioned in the center of the slots in the seal retainer shell. This is the correct position during operation. This prevents the seal from being used as a thrust washer under all operating conditions.

NOTE: The seal may leak slightly immediately after installation, but a short period of operation will correct the condition.

→ **Fig. 51 — Installation of Sleeve-Type Rotary Seal**

TROUBLESHOOTING

TROUBLE/SYMPTOM	PROBABLE CAUSE	REMEDY
Compressor will not start	Power off.	Check main switch, fuse and wiring.
	Thermostat set too high.	Reset thermostat.
	Thermal overload switch open.	Reset switch.
	Oil safety switch open.	Reset switch.
	Dirty contacts.	Clean all control contacts.
	Loose electrical connections or faulty wiring.	Tighten connections; check wiring and rewire.
	Compressor motor burned out.	Check and replace if defective.
	Liquid line solenoid valve closed.	Check for burned-out holding coil. Replace if defective.
	Evaporator fan off.	Check fuses, overload. Restart.
	Evaporative condenser or cooling tower fan or pump not operating.	Check fuses, overloads and controls. Restart.
Compressor cycles intermittently	Low-pressure switch erratic in operation.	Check for clogged tubing to switch. Check switch setting.
	Low refrigerant charge.	Add refrigerant.
	Capacity control setting incorrect.	Reset.
	Thermostat differential too narrow.	Reset.
	Suction valve closed or throttled.	Open up valve.
Compressor cycles on high pressurestat	Tubing to pressurestat restricted.	Check and clean tubing.
	Faulty pressurestat.	Repair or replace.
	Refrigerant overcharge.	Remove excess refrigerant.
	Insufficient condenser water flow or clogged condenser.	Adjust water regulating valve to condenser. Clean condenser.
	Discharge service valve not fully open.	Open valve.
	Air in system.	Purge air.
	Condenser water pump off.	Check pump and start.
High discharge pressure	Condenser inlet water temperature too high.	Increase water quantity by adjusting water regulating valve. Use colder water.
	Insufficient water flow through condenser.	Readjust water regulating valve. Increase size of water supply main to condenser.
	Plugged or scaled condenser tubes.	Clean tubes.
	Discharge service valve partially closed.	Open valve.
	Refrigerant overcharge.	Remove excess refrigerant.
	Air in system.	Purge air.
Low discharge pressure	Excessive water flow through condenser.	Adjust water regulating valve.
	Suction service valve partially closed.	Open valve.
	Leaky compressor suction valves.	Examine valve discs and valve seats. Replace if worn.
	Worn piston rings.	Replace.
Flooding	Defective or improperly set expansion valve.	Reset to 5 F - 10 F superheat. Valve operation must be stable (no hunting).
Low suction pressure	Low refrigerant charge.	Add refrigerant.
	Excessive superheat.	Reset expansion valves.
System noises	Loose or misaligned coupling.	Check alignment and tightness.
	Insufficient clearance between piston and valve plate.	Replace defective parts.
	Motor or compressor bearing worn.	Replace bearings.
	Loose or misaligned belts.	Check alignment and tension. (Belt slack should be at top.)
	Loose holddown bolts.	Tighten bolts.

TROUBLESHOOTING (cont)

TROUBLE/SYMPTOM	PROBABLE CAUSE	REMEDY
System noise (cont)	Unit foundation improperly isolated.	Isolate foundation.
	Improper support or isolation of piping.	Use correct piping techniques and support piping with suitable hangers.
	Slugging from refrigerant feedback.	Check expansion valve setting. Check thermal bulb looseness and correct location. See Carrier System Design Manual, Part 3 for standard piping techniques.
	Hydraulic knock from excessive oil in circulation.	Remove excess oil. Check expansion valve for floodback.
	Defective valve lifter mechanism (noise level varies with unloading).	Replace sticking filter pins. Check unloader fork for alignment. Check power element for sticking piston. Check for oil leakage at tube connection to power element. Check amount of valve pin lift above valve seat (0.33 in. for 5F; 0.125 in. for 5H).
	Piping vibration.	Support pipes are required. Check pipe connections.
	No muffler in discharge line or improperly located.	Install muffler. Move muffler closer to compressor.
	Hissing (insufficient flow through expansion valves, or clogged liquid line strainer).	Add refrigerant. Clean strainer.
Compressor will not unload	Capacity control valve not operating.	Repair.
	Unloader element sticking.	Repair.
	Hydraulic relay sticking.	Replace control cover assembly.
	Plugged pressure line to power element.	Clean line.
	External adjusting stem damaged.	Replace.
Compressor will not load	Low oil pressure (below 35 psig).	Check oil charge, switch settings.
	Capacity control valve stuck open.	Repair or replace.
	Unloader element sticking.	Repair.
	Plugged or broken pressure line to power element.	Clean or repair.
	External adjusting stem damaged.	Replace.
	Control oil strainer blocked.	Clean or replace.
	Control valve bellows leaking.	Remove thread protector and leak test.
		Replace valve body if bellows leaks.
	Pipe plug in pneumatic connection.	Remove pipe plug.
	Foaming in crankcase from refrigerant flooding.	Check expansion valve and piping.
	Hydraulic relay sticking.	Replace control cover assembly.
Rapid unloader cycling	Excessive fluctuation in suction pressure from oversized expansion valve.	Resize expansion valve.
	Partially plugged control oil strainer.	Clean or replace strainer.
	Low oil pressure.	See Trouble/Symptom — low oil pressure.
Low oil pressure	Low oil charge.	Add oil.
	Faulty oil gage.	Check and replace.
	Defective oil pressure regulator.	Repair or replace.
	Clogged oil suction strainer.	Clean strainer.
	Broken oil pump tang.	Replace pump assembly.

TROUBLESHOOTING (cont)

TROUBLE/SYMPTOM	PROBABLE CAUSE	Remedy
Low oil pressure (cont)	Clogged oil line.	Remove obstruction.
	Worn oil pump.	Replace pump assembly.
	Worn compressor bearings.	Replace.
Cold compressor	Liquid carryover from evaporator.	Check refrigerant charge and expansion valves.
Low crankcase oil level	Oil return check valve stuck closed.	Repair or replace check valve.
Cylinders and crankcase sweating	Refrigerant floodback.	Check refrigerant charge and expansion valves.
High crankcase temperature (should be 150 F to 160 F max. at seal housing)	Liquid line strainer clogged.	Clean strainer.
	Excessive superheat.	Reset expansion valves.
	Compression ratio too high.	Recheck design.
	Discharge temperature over 275 F.	Check unit application.
	Leaking suction or discharge valves.	Replace valves.