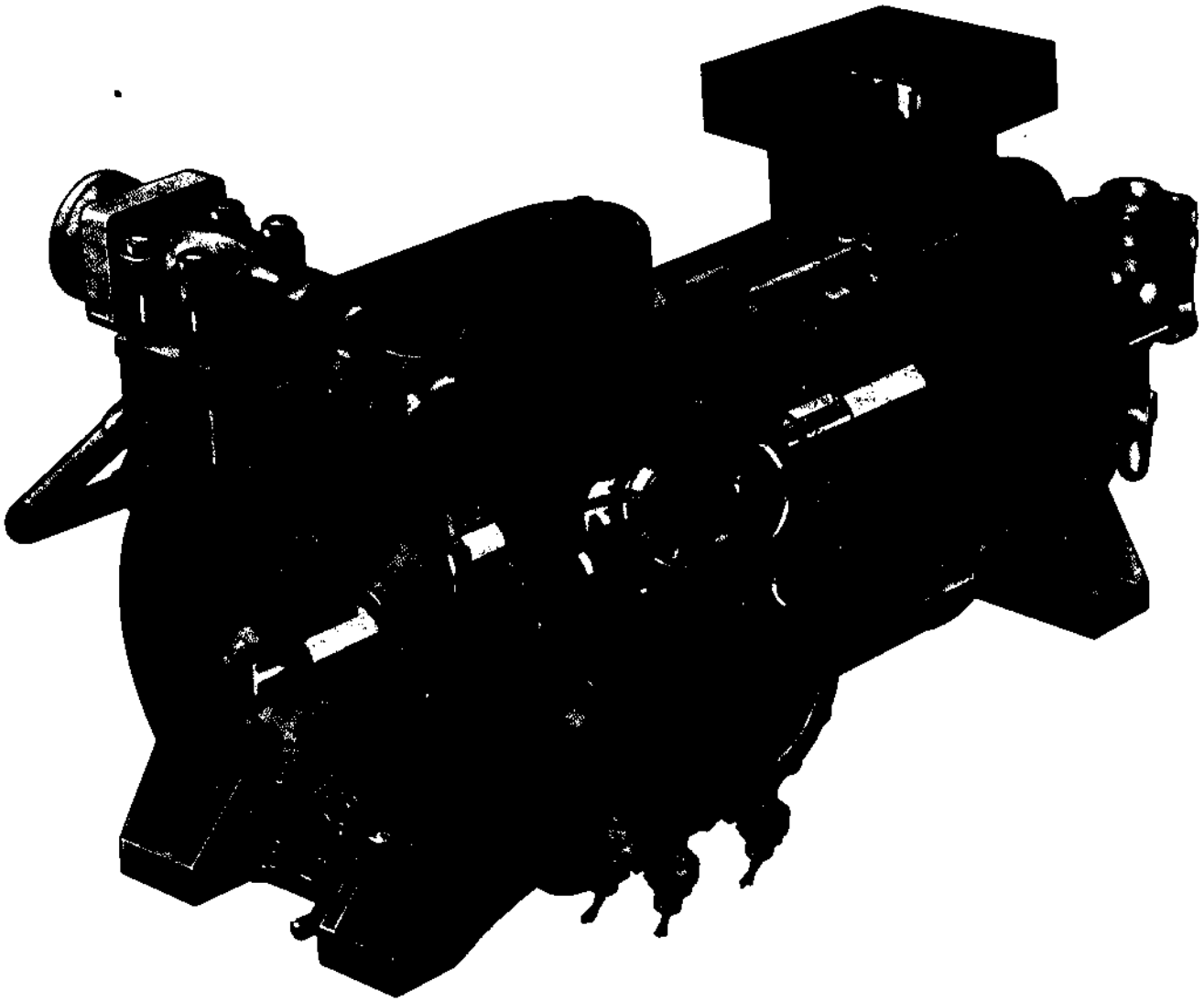
YORK®

MODEL J — STYLES E & F

HERMETIC COMPRESSORS

MAINTENANCE	Supersedes: 180.23-M2 (1188)	1092	Form 180.23-M2

MODELS
JS42, JS43, JS63, JS83 (STYLE E — SHORT STROKE)
JS44, JS64, JS84 (STYLE E — LONG STROKE)
JS43, JS63, JS83 (STYLE F — SHORT STROKE)
JS44, JS64, JS84 (STYLE F — LONG STROKE)



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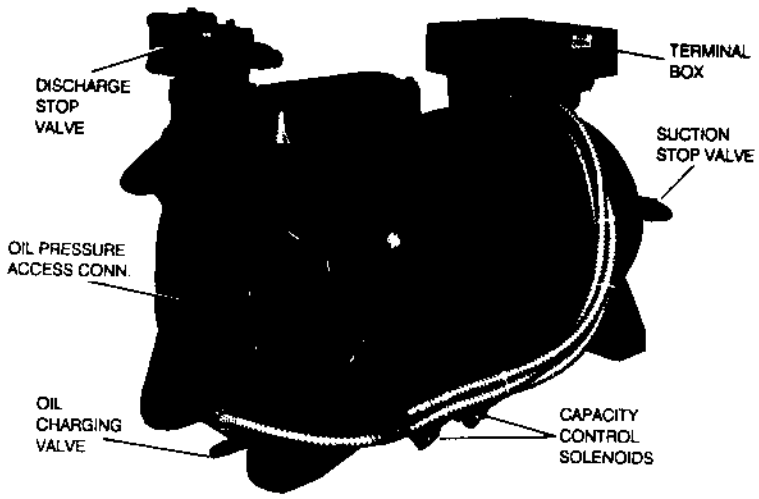


FIG. 1 – 6 CYLINDER MODEL J "E" COMPRESSOR

SECTION I - GENERAL

GENERAL DESCRIPTION

YORK Style E or F Model J Hermetic Compressors are designed to meet air conditioning requirements using R12 or R22. They are available in 4, 6, or 8 cylinder models in either "short stroke" or "long stroke" versions (See NOMENCLATURE). Varying steps of capacity control are available utilizing solenoid valves. (Control of solenoid valves must be by external device.) Nominal compressor speeds are 1750 RPM (60 Hz) and 1460 ("short stroke") or 1440 ("long stroke") RPM (50 Hz).

NOMENCLATURE

COMPRESSOR IDENTIFICATION

Each compressor is identified by nomenclature as shown below. The nomenclature is stamped on a data plate which is located next to the oil pump as shown in Fig. 2. When contacting the factory or ordering renewal parts include the complete Nomenclature, Serial Number, and Date Code as illustrated. Be sure these numbers are copied accurately.

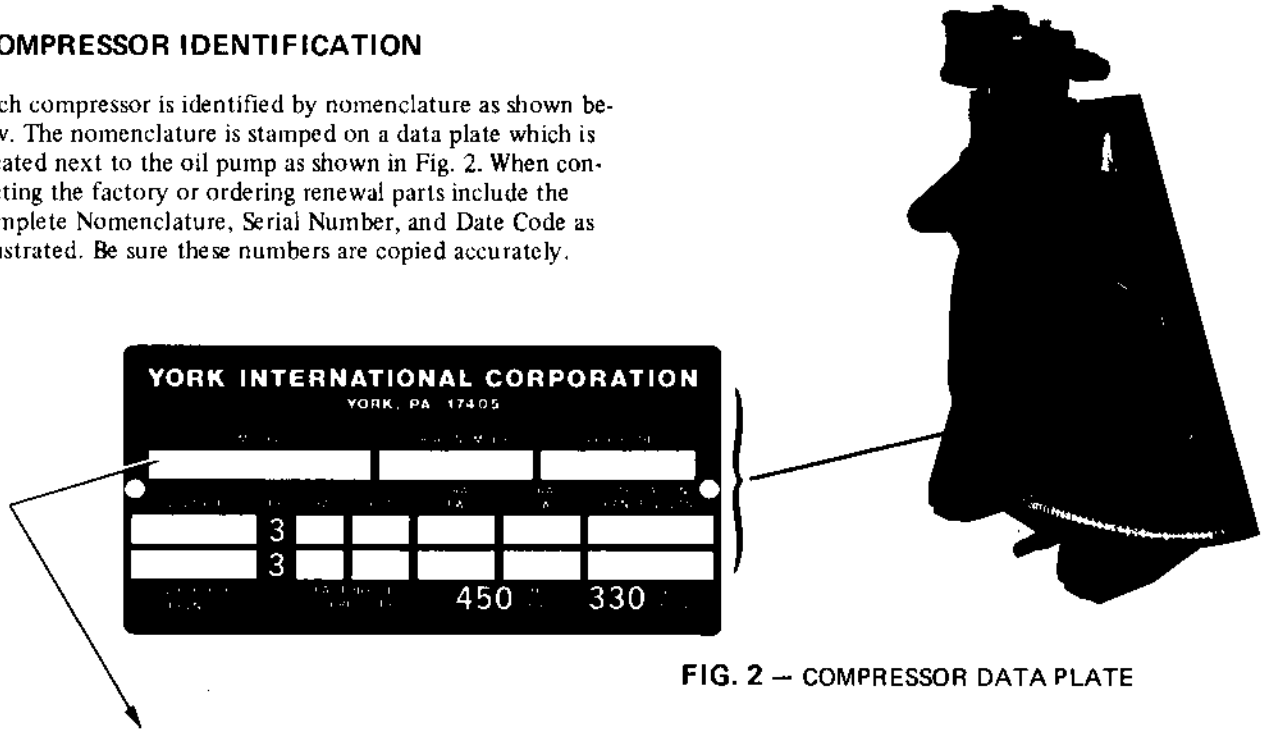
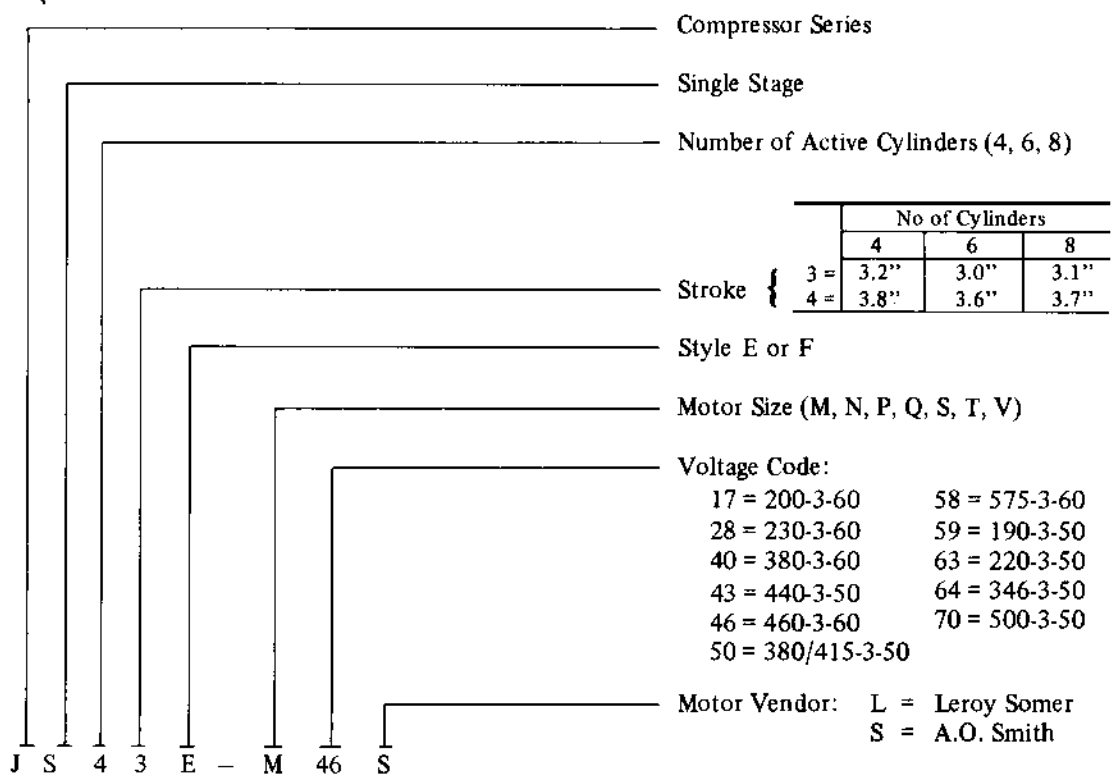


FIG. 2 – COMPRESSOR DATA PLATE



	No of Cylinders		
	4	6	8
3 =	3.2"	3.0"	3.1"
4 =	3.8"	3.6"	3.7"

PHYSICAL DATA

COMPRESSOR MODEL	JS43 & JS44		JS63 & JS64		JS83 & JS84	
No. of Cylinders	4		6		8	
Nom. CFM Displacement 60 Hz.	143	170	201	242	278	331
50 Hz.	119	140	168	199	232	273
Bore (Inches)	3-3/4		3-3/4		3-3/4	
Stroke (Inches)	3.2	3.8	3.0	3.6	3.1	3.7
Suction Conn. (ODF)	3-1/8		3-1/8		3-5/8	
Discharge Conn. (ODF)	2-5/8		2-5/8		3-1/8	
Oil Charge (Gals.)	3		3		3	
Weight (Lbs.)	1370		1480		1640	

LIMITATIONS

VOLTAGE LIMITATIONS

The following voltage limitations are absolute and operation beyond these limits may cause serious damage to the compressor or motor.

Nameplate Voltage	Mininum Voltage	Maximum Voltage
200-3-60	180	220
230-3-60	207	253
460-3-60	414	506
575-3-60	517	633
220-3-50	198	242
380-3-60	355	415
380/415-3-50	342	440
190-3-50	171	208
346-3-50	311	381
500-3-50	450	550
440-3-50	396	484

COMPRESSOR OPERATING LIMITATIONS

Maximum Compression Ratio	9.5:1
Maximum Operating Differential (PSI)	325
Maximum Suction Pressure (PSIG)	95
Maximum Discharge Temp. (°F)	275
Superheat (Nominal) (At Compressor)	20°F
Min. Oil Pressure (above suction pressure)	60 psi
Maximum Oil Temperature [1]	160°F
Maximum Sat. Discharge Temp.[2]	150°F
Maximum Ambient	130°F
Minimum Ambient	0°F

[1] Measured externally on pump suction boss as shown in Fig. 3.

[2] Motor selection and operating conditions may limit maximum saturated discharge temperature to lower values.

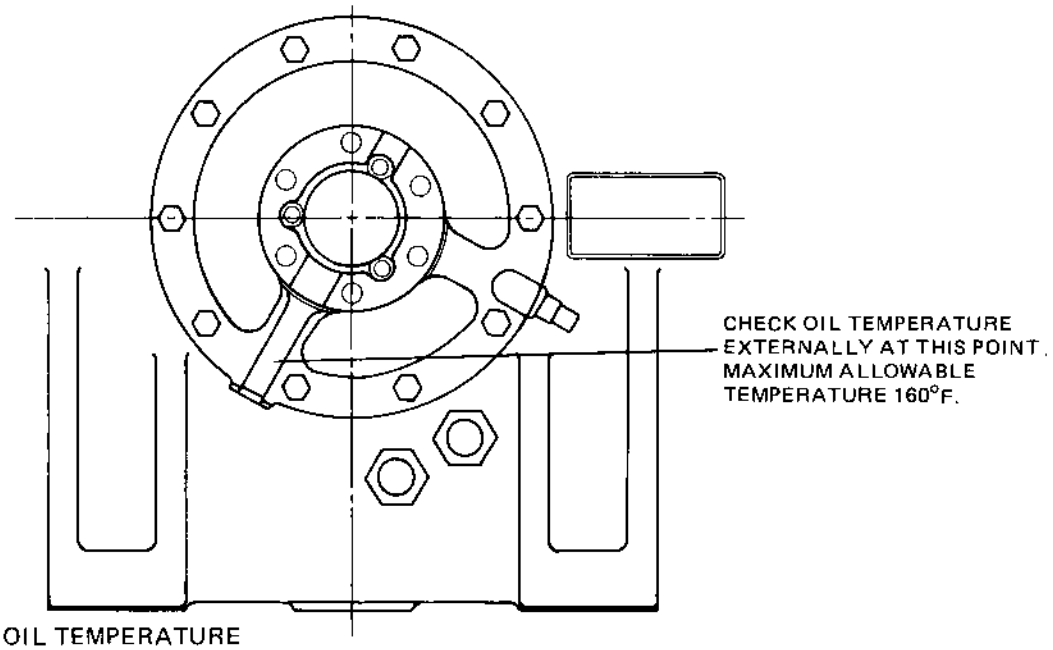


FIG. 3 — CHECKING OIL TEMPERATURE

ELECTRICAL DATA

Motor Size Code[2]	Voltage	Phase	Hertz	Rated Amps	Locked Rotor Amps		Maximum Dual Element Fuse Size[1]	Minimum Circuit Ampacity	Disconnect Switch Size (Amps)[3]
					A/L	PW			
M	200	3	60	202	913	731	250	253	400
	230	3	60	174	794	636	225	218	400
	380	3	60	105	480	385	125	131	200
	460	3	60	87	397	318	110	109	200
	575	3	60	70	318	254	90	88	100
	190	3	50	177	764	585	225	221	400
	220	3	50	157	731	560	200	196	200
	346	3	50	98	465	343	125	123	200
	380/415	3	50	87	392	290	110	109	200
	500	3	50	68	322	238	90	85	100
N	200	3	60	238	1099	865	300	298	400
	230	3	60	207	956	752	250	259	400
	380	3	60	124	579	412	150	155	200
	460	3	60	104	478	376	125	130	200
	575	3	60	83	382	300	100	104	100
	190	3	50	214	895	712	250	268	400
	220	3	50	183	856	635	225	229	400
	346	3	50	115	544	400	150	144	200
	380/415	3	50	104	459	358	125	130	200
	500	3	50	84	377	277	110	105	200
P	200	3	60	280	1203	950	350	350	400
	230	3	60	244	1046	826	300	305	400
	380	3	60	144	633	467	175	180	200
	460	3	60	122	523	413	150	153	200
	575	3	60	97	418	330	125	121	200
	190	3	50	251	930	776	300	314	400
	220	3	50	217	876	709	250	271	400
	346	3	50	133	557	412	175	166	200
	380/415	3	50	121	488	400	150	151	200
	500	3	50	97	386	310	125	121	200
Q	200	3	60	318	1541	1101	400	398	400
	230	3	60	275	1340	976	350	344	400
	380	3	60	166	806	591	200	208	200
	460	3	60	137	670	488	175	171	200
	575	3	60	110	536	390	150	138	200
	190	3	50	282	1241	964	350	353	400
	220	3	50	244	1187	876	300	305	400
	346	3	50	155	755	557	200	194	200
	380/415	3	50	139	637	470	175	174	200
	500	3	50	108	522	386	125	135	200
S	200	3	60	387	1746	1322	500	484	600
	230	3	60	336	1518	1150	450	420	600
	380	3	60	204	919	696	250	255	400
	460	3	60	168	759	575	225	210	400
	575	3	60	134	607	460	175	168	200
	190	3	50	343	1484	1098	400	429	400
	220	3	50	298	1420	1051	400	373	400
	346	3	50	189	903	668	250	236	400
	380/415	3	50	167	761	570	225	205	400
	440	3	50	148	710	526	200	185	200
	500	3	50	131	625	462	175	164	200
T	380	3	60	247	1143	862	300	309	400
	460	3	60	210	960	724	250	263	400
	575	3	60	168	768	579	200	210	200
	346	3	50	234	1110	838	300	293	400
	380/415	3	50	207	975	741	250	259	400
	440	3	50	184	873	659	225	230	400
	500	3	50	163	768	580	200	204	200
V	380	3	60	280	1271	997	350	350	400
	460	3	60	238	1050	830	300	298	400
	575	3	60	190	840	664	250	238	400
	346	3	50	269	1210	948	350	336	400
	380/415	3	50	243	1077	853	300	304	400
	440	3	50	213	950	721	250	266	400
	500	3	50	191	836	656	250	239	400

[1] When optional external overloads are used, fuse sizes should be increased to approx. 175% of nameplate amps.
[2] Sixth character in compressor model designation. (See NOMENCLATURE)
[3] Based on National Electric Code (NEC). Switch is rated for isolating duty only – Do Not Open Under Load.

THREADED FASTENER TORQUES AND SEQUENCE

When assembling a compressor or compressor parts, it is essential to tighten all nuts and cap screws to their proper torque, using an accurate torque wrench. Table 1 shows the recommended torques for this compressor. All cap screws or bolts should be oiled lightly unless they are intended for use with a sealing compound. Insert all cap screws and tighten them lightly. Then, using the torque wrench, tighten each to its proper torque.

When tightening the screws on the top heads, handhole covers, oil pump bearing head, motor cover, and terminal block, it is important that the screws be tightened in the proper sequence. This will help to eliminate leaks and/or damage to the parts or gaskets. Figure 4 shows the recommended tightening sequence.

It is advisable to "double-check" the torque on all screws before starting the compressor.

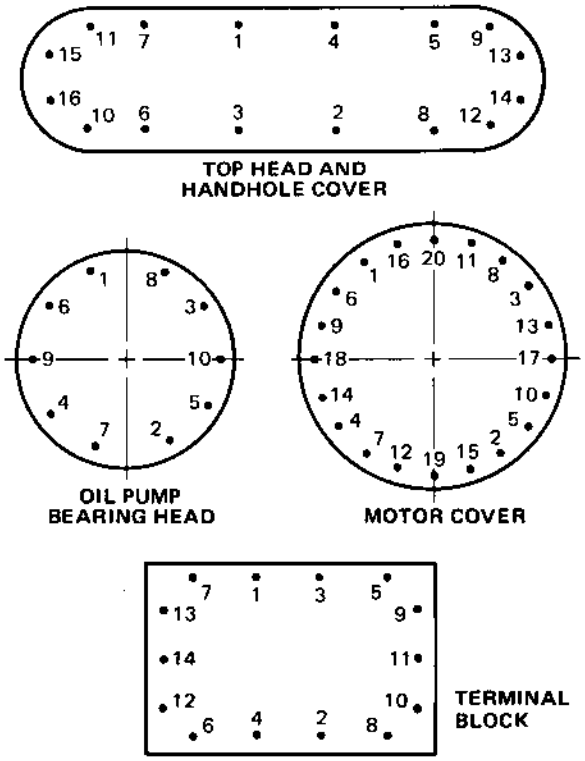


FIG. 4 — SCREW TIGHTENING SEQUENCE

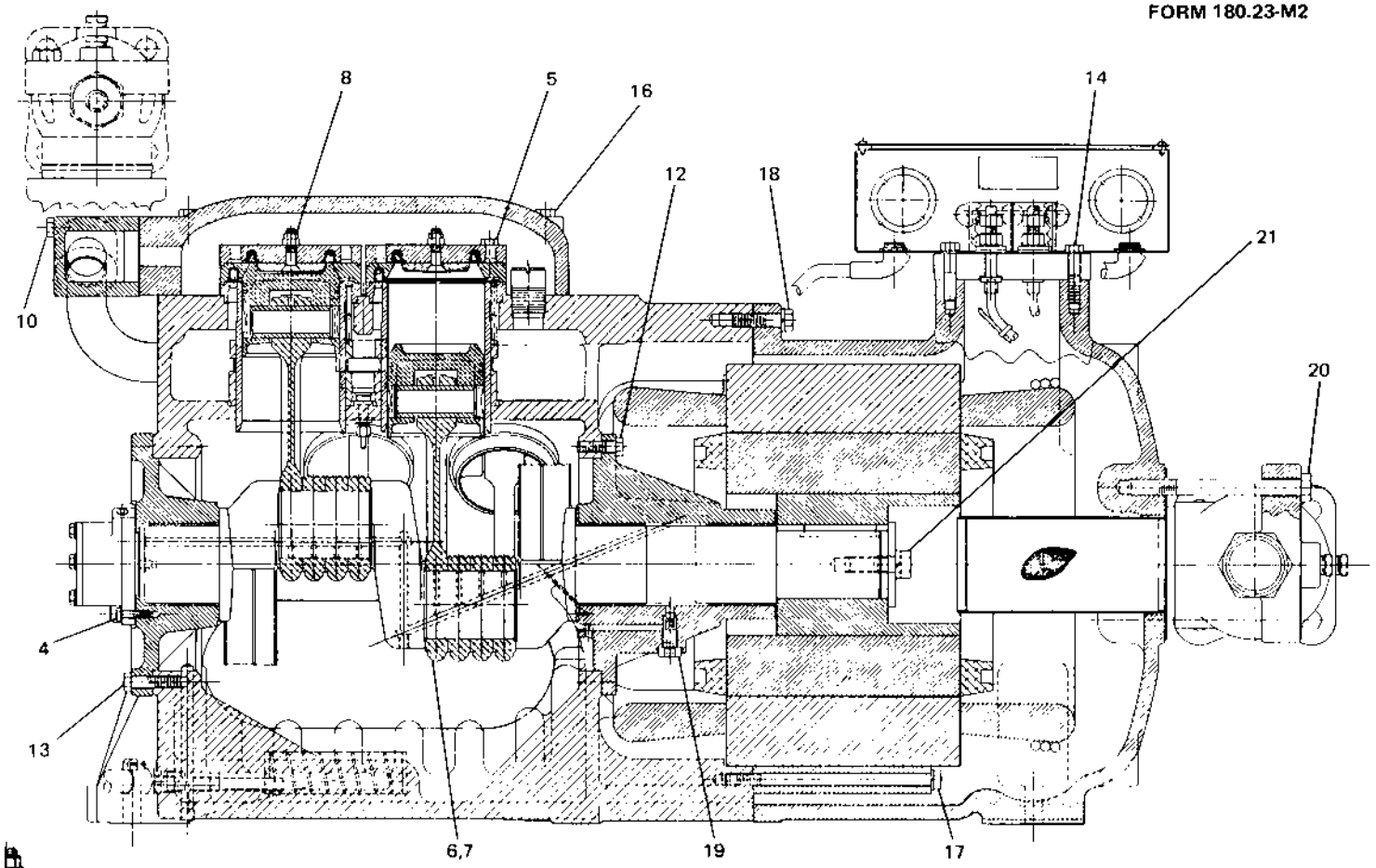
TABLE 1 — THREADED FASTENER TORQUE

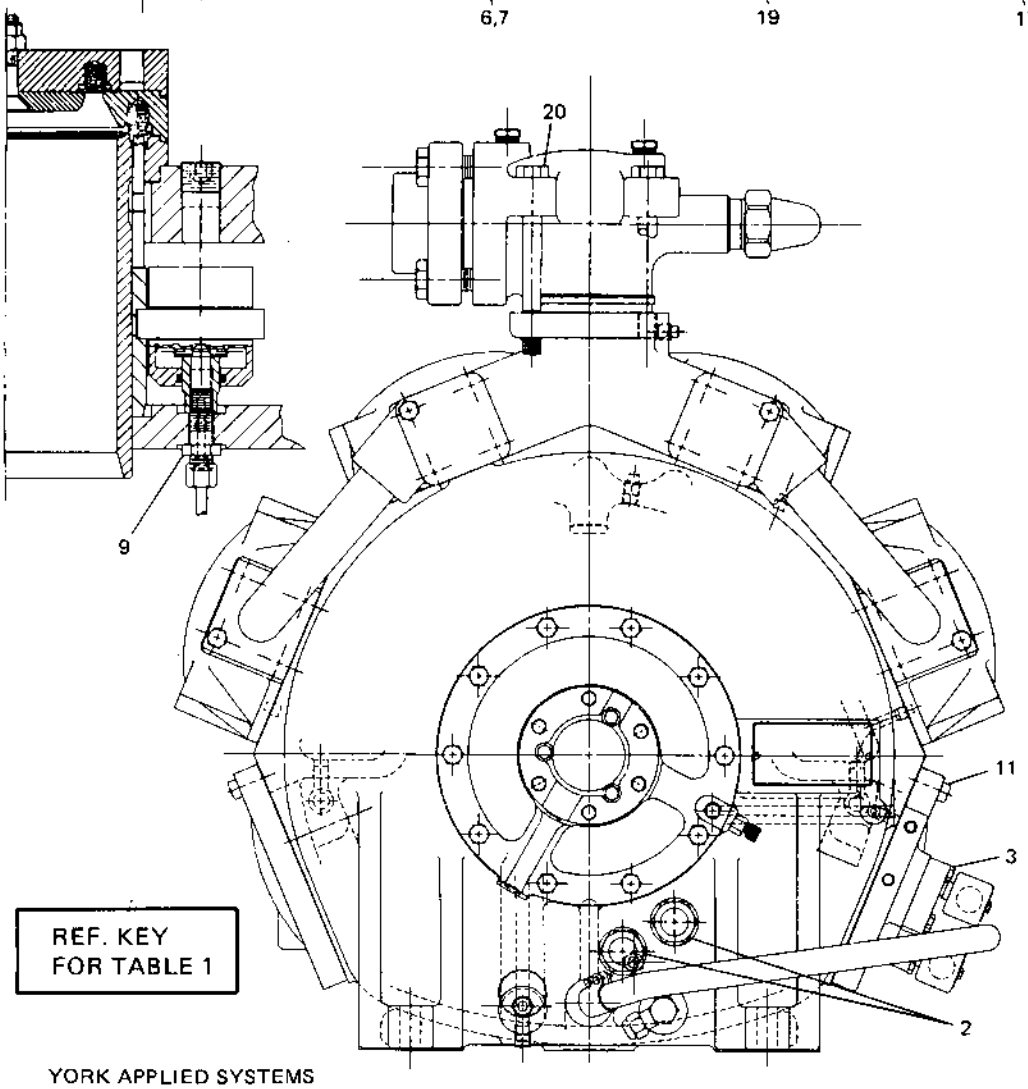
LOCATION	THREAD	TORQUE		REF. KEY (See page 7)
		LB.-IN.	LB.-FT.	
Motor Protector Terminal (NUT)*	No. 8-32 UNC	15	–	1
Sight Glass	1- 11-1/2 MPT	–	95-100	2
Solenoid Valve	1/4 -20 UNC	112-129	–	3
Oil Pump	1/4 -20 UNC	112-129	–	4
Valve Assy. Mounting*	3/8 -16 UNC	–	20	5
Connecting Rod[1] *	3/8 -24 UNF	–	21-22	6
Connecting Rod[1] *	5/16 -18 UNC	–	19-22	7
Discharge Valve Cage Assy. *	3/8 -24 UNF	–	See Note 2	8
Unloader Power Assy.	3/8 -24 UNF	–	15	9
Discharge Manifold	7/16 -14 UNC	–	55-64	10
Hand Hole Cover	7/16 -14 UNC	–	55-64	11
Motor End Bearing Head	7/16 -14 UNC	–	55-64	12
Pump End Bearing Head	7/16 -14 UNC	–	55-64	13
Terminal Plate	7/16 -14 UNC	–	45-50	14
Terminal Stud (NUT)	7/16 -20 UNC	–	35-40	15
Top Head	7/16 -14 UNC	–	55-64	16
Stator	7/16 -14 UNC	–	55-64	17
Motor Cover	1/2 -13 UNC	–	84-98	18
Oil Pressure Relief Cap	9/16 -18 UNF	–	30	19
Suct. & Disch. Shut-off Valve	5/8 -11 UNC	–	107-129	20
Rotor	5/8 -11 UNC	–	110	21

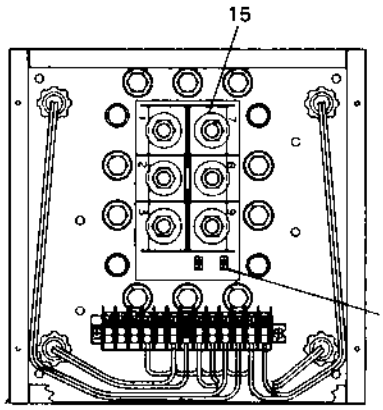
*Critical Items – Torque Only As Specified.

[1] Key Ref. #6 is connecting rod with thru bolts and lock nuts. Key Ref. #7 is for connecting rod with tapped hole, standard screws and dowel pins.

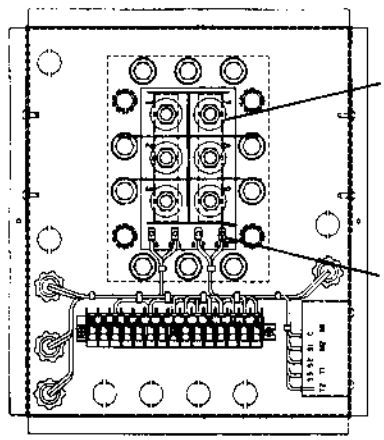
[2] Current design 53-61 lb. ft. / Original design 35-40 lb. ft., See DESIGN HISTORY.(page26)







STYLE E



STYLE F

REF. KEY
FOR TABLE 1

GASKETS AND "O" RINGS

It is recommended that new gaskets and/or "O" rings be installed each time a compressor part is removed or the compressor is dis-assembled. This will assure that the compressor will function properly when returned to operation. Use care when installing gaskets so that they are installed properly. Be sure that any holes in the gasket for oil passage etc. are aligned with the matching hole in the related part or parts. Also, check that "O" rings are not cut or damaged in any way. Gaskets and "O" rings should be coated LIGHTLY with YORK "C" oil. *Do not soak gaskets or "O" rings in oil.* Also, do not apply oil to the mating surfaces. Grease must never be applied to gaskets or "O" rings.

HANDLING COMPRESSOR PARTS

Internal machined parts of the compressor such as valves, pistons, shaft seal and crankshaft, must be protected from damage due to crushing or scratching. They should be coated with oil, wrapped in clean tough paper and stored in a safe place.

Before reassembling any compressor part, it should be thoroughly cleaned by immersing or flushing it with an approved safety solvent and allowing it to dry in air without touching any wearing or contact surfaces. After it is cleaned, each part should be carefully examined to be sure it is free from cracks, flaws, bump marks, burrs or distortion and the part be oiled to prevent damage due to rusting or oxidation. New clean oil should be applied to the wearing surfaces of any part just before it is installed.

RIGGING THE COMPRESSOR

When it becomes necessary to remove a compressor from a unit or base, proper rigging methods must be used to avoid damage to the equipment and/or injury to service personnel. Portable cranes must be of adequate capacity and properly positioned and blocked to prevent tipping or slipping while lifting the compressor. Do not attempt to lift a compressor with eye bolts threaded into tapped holes in the compressor casing. Instead, use approved and well maintained slings as illustrated in Fig. 5. Be sure slings are of adequate strength to safely lift the compressor. Compressor weights are shown. in PHYSICAL DATA, page 4. The use of chains or cables is not recommended.

COMPRESSOR OIL SYSTEM

The compressor oil system has two functions as follows:

1. Lubrication of all moving parts.
2. Furnishing hydraulic pressure for operation of cylinder unloading system.

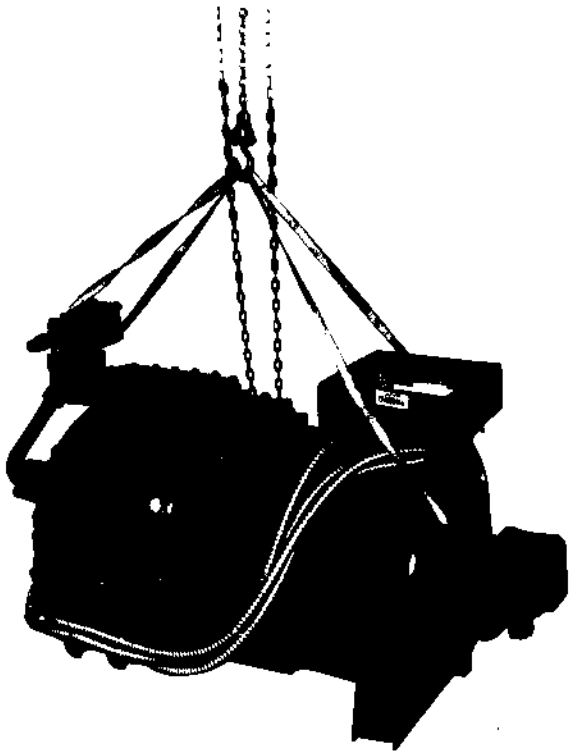


FIG. 5 — RIGGING THE COMPRESSOR

LUBRICATION SYSTEM – See Fig. 6 – The compressor oil supply is contained in the crankcase which is provided with two oil sight glasses (located in the pump end of the compressor) to permit a visual check of the oil level.

YORK REFRIGERATION OIL "C" SHOULD ALWAYS BE USED IN THESE COMPRESSORS.

The internal gear type compressor oil pump, which is designed to operate with either clockwise or counter-clockwise compressor rotation, is directly connected to the crankshaft and is located externally on the pump end bearing head.

Internal passages in the pump end bearing housing and compressor housing connect to an internal suction tube which in turn connects to the oil strainer. The oil strainer consists of a large area wire mesh cylinder with sheet metal ends and an internal spring to prevent collapse of the strainer screen if it should become coated with foreign material.

LUBRICATION, MAIN BEARINGS, OIL PUMP END & MOTOR END – Oil under pressure leaves the oil pump and flows internally through the pump housing to lubricate the pump end bearing.

Simultaneously, oil is fed through internal oilways in the crankshaft to supply oil to the thrust collar and motor end bearings. An oil pressure relief valve installed in the motor end bearing housing relieves oil pressure back to the crankcase. Normal oil pressure is approximately 60 psi minimum above crankcase (suction) pressure.

The thrust collar positions the crankshaft longitudinally in the compressor housing and takes the thrust forces imposed upon the shaft. Radial grooves for oil are provided on the inner or thrust surface which is in contact with the crankshaft shoulder.

LUBRICATION, CYLINDER WALLS, CONNECTING ROD AND PISTON PIN BEARINGS -- Oil under pressure is conducted through drilled oilways in the crankshaft to the crankpins. The crankpin is provided with one radially drilled hole (which connects with the drilled oilway in the crankshaft) for each connecting rod bearing.

Lubrication of the cylinder walls and piston pins is accomplished by the spray from the spaces between the connecting rod bearings and between these bearings and the cheeks of the crankpin as some of the pressurized oil leaves these bearings.

The compressor oil level must be maintained between the middle of the upper and middle of the lower sight glass at all operating conditions.

At part load operating conditions, it is not abnormal for the oil level to be in the lower sight glass.

CAPACITY CONTROL OIL PRESSURE – In addition to supplying oil pressure to the compressor lubrication system as described above, the compressor oil pump also provides oil pressure to operate the compressor Capacity Control System.

An internal oil passage in the oil pump end bearing housing connects to an internal passage in the end of the compressor housing. The internal passage in the compressor housing connects to an internal passage in the compressor handhole cover on which the capacity control solenoid valves are mounted. There are no external oil lines used on these compressors. (Also see following section on CAPACITY CONTROL SYSTEM.)

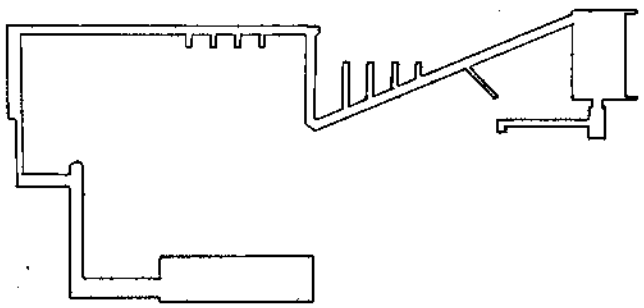


FIG. 6 – LUBRICATION SYSTEM

CAPACITY CONTROL SYSTEM

Capacity of the YORK Model J Compressor is controlled automatically. Externally mounted solenoids, controlled by a signal from a remote device provide reliable response to system load and assure that the compressor starts at its minimum step of capacity.

Compressor capacity is reduced by unloading one, or more, cylinders as required. Some cylinders are not equipped with unloaders. This prevents the possibility of overheating, since a definite minimum volume of cool refrigerant gas flows through the compressor at all times during operation regardless of load conditions.

Unloading is accomplished by lifting and holding the suction valve off its seat. The gas, drawn into the unloaded cylinders on the down stroke of the piston, is pumped back into the suction chamber of the compressor housing, without compression, when the piston returns on its up stroke. All cylinders, equipped with unloaders, will remain unloaded on start-up until the oil pressure has built up to normal, regardless of load conditions.

The compressor capacity control system is actuated by means of high pressure oil from the compressor oil pump. Oil pressure to the power element loads the associated cylinders and release of this pressure unloads them. All piping between the capacity control solenoid valves and the individual power elements is located inside the crankcase.

The unloader power elements are fastened into the compressor deck between the suction gas chamber and the crankcase. This element consists of a stationary piston and a movable cylinder. The movable cylinder engages the unloader sleeve which is free to move up or down on the cylinder sleeve. When oil pressure is admitted to the power element, the movable cylinder pushes the unloader sleeve down and permits the suction valve to operate normally and permit refrigerant gas compression. When oil pressure to the power element is relieved through the capacity control solenoid valves, the spring loaded cylinder moves the unloader sleeve up, raising the suction valve off its seat by means of lift pins. In this position the cylinder is completely unloaded. (See Fig. 7)

Solenoid valves are de-energized to load the compressor and energized to unload the compressor.

The compressor handhole cover is stamped 1, 2 and 3 adjacent to the solenoid valves. When wiring the compressor unit, the capacity control solenoid valves should be wired so that solenoid No. 1 is de-energized first, solenoid No. 2 is de-energized second, and solenoid No. 3 is de-energized last. They should be energized in the reverse order. This will assure that the compressor cylinders load (and unload) in the proper sequence.

The number of capacity steps varies with each compressor and its application. Figure 8 and the accompanying table show the different arrangements that are available.

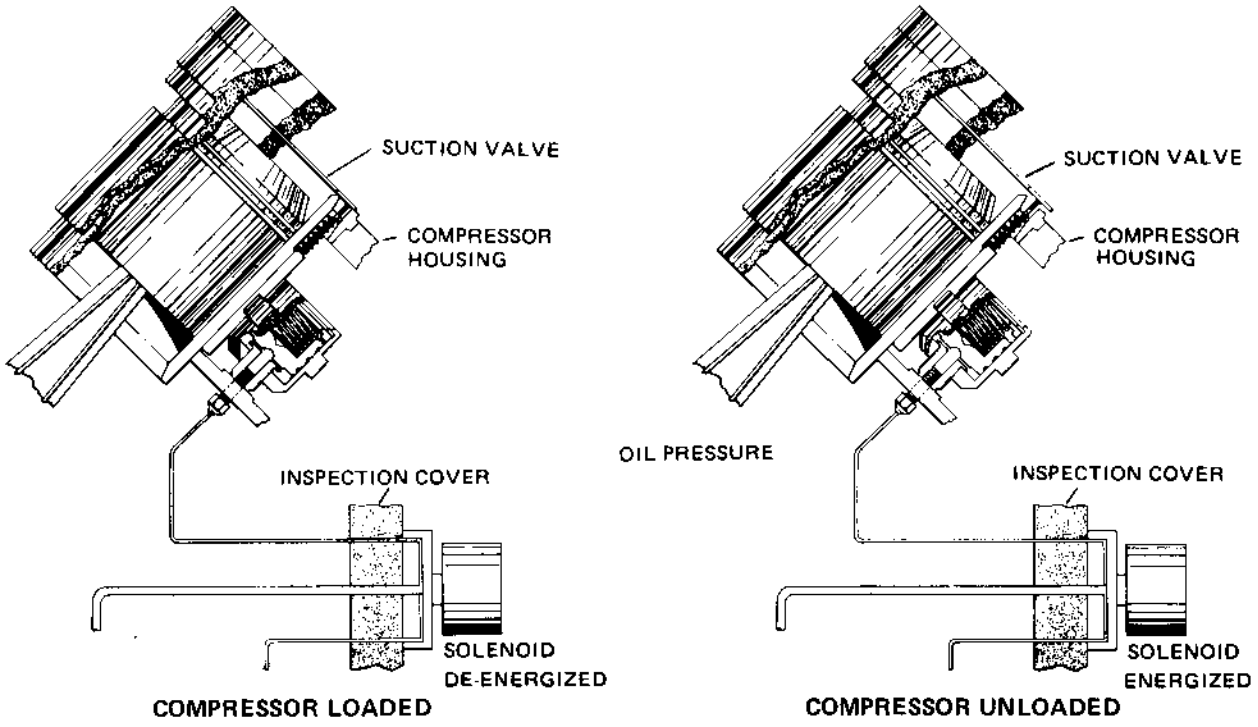
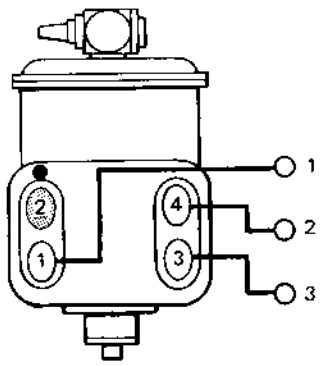
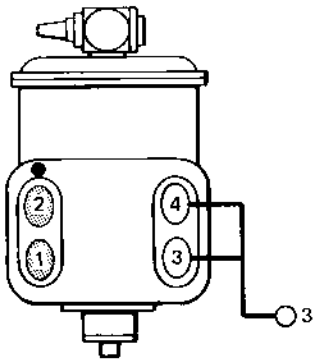


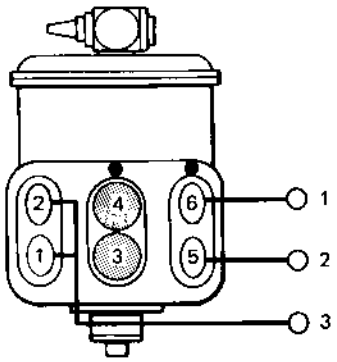
FIG. 7 — CAPACITY CONTROL OPERATION



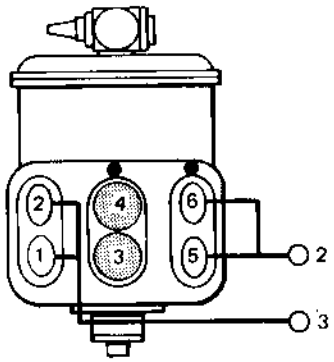
4 CYLINDER



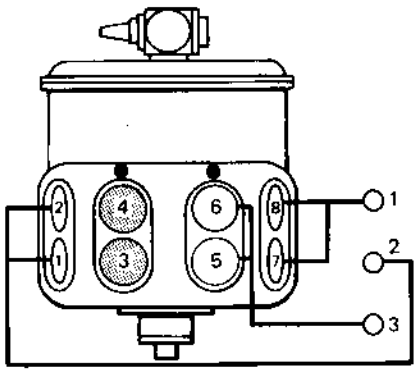
4 CYLINDER



6 CYLINDER

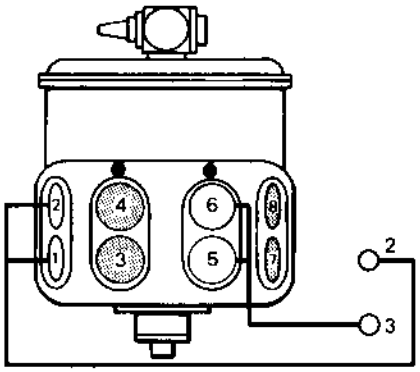


6 CYLINDER



8 CYLINDER

STANDARD



8 CYLINDER

OPTIONAL

NUMBER OF CYLINDERS	CAPACITY REDUCTION STEPS (%)	
	STANDARD	OPTIONAL
4	100, 75, 50, 25	100, 50
6	100, 66, 50, 33	100, 66, 33
8	100, 75, 50, 25	100, 75, 50

FIG. 8 — CYLINDER UNLOADING STEPS

5 AND 7 CYLINDER COMPRESSOR CONVERSION

Style E & F compressors are available in 4, 6 & 8 cylinder models only. Earlier styles (A, B, C & D) were also available in 5 and 7 cylinder models. A 5 cylinder model is basically a 6 cylinder compressor with one cylinder permanently unloaded. A 7 cylinder model is basically an 8 cylinder compressor with one cylinder permanently unloaded.

It may become necessary to convert a Style E or F 6 cylinder compressor to 5, or an 8 cylinder compressor to 7 cylinders in the field in order to match capacity of an existing unit. This can readily be accomplished by removing the suction valve and suction valve springs from one cylinder of the compressor. (Refer to page 16 for detailed procedure.) It is important that these parts be removed from the correct cylinder to assure proper compressor operation. To convert to 5 cylinders, remove the suction valve and springs from cylinder No. 1 of a 6 cylinder compressor. To convert to 7 cylinders, remove the suction valve and springs from cylinder No. 5 of an 8 cylinder compressor. (Refer to Fig. 8 for cylinder numbers.)

ORDERING RENEWAL PARTS

All compressor parts are designed and manufactured for a specific application. They are selected to withstand the pressures normally associated with compressor operation. The substitution of non-standard parts is not recommended as these parts could cause serious damage to the compressor or operator. Parts should be replaced with genuine YORK Renewal Parts.The Renewal Parts Manual Form 180.23-RP3 lists replacement parts for these compressors. When ordering parts be sure to follow all instructions included in the Renewal Parts Manual.

ANALYSIS OF FAULTY COMPRESSOR VALVE OPERATION

The operator soon becomes accustomed to the sound of the compressor when it is running under normal conditions. As long as the compressor runs normally, and the sound does not change, it can safely be assumed that the compressor is operating properly. Any unusual noise within the compressor should be investigated immediately.

External indications of trouble within the compressor are as follows:

1. When operating on suction pressure control, long "on" cycles with short "off" periods may indicate leaking or broken compressor valves, piston rings or both.

2. A definite rise in temperature of the discharge gas may indicate defective suction or discharge valves, or a leaking relief valve, or both.

3. Failure to pull down is a possible indication of a broken suction or discharge valve, or both.

4. Unusual pressure gauge readings.

5. The operator should feel the heads periodically to check for hot spots or one particular head which is running hot. If this condition occurs, it is an indication of broken or leaking valves within that bank of cylinders.

If leaking or broken valves are suspected, the heads should be removed and the valves should be examined for breakage.

NOTE: Some cylinders are not equipped with unloaders. (See Fig. 8.) This prevents the possibility of overheating, since a definite minimum volume of cool refrigerant gas flows through the compressor at all times during operation, regardless of load conditions. The permanently loaded cylinders do not have unloader sleeves, unloader device, or lift pins.

SECTION II — DIS-ASSEMBLY & RE-ASSEMBLY

GENERAL

Service on these compressors should be performed only by qualified service personnel, trained in the service of this type of equipment, and equipped with the proper tools and familiar with their use.

Before opening a compressor for repairs, the following paragraphs should be thoroughly checked to aid in locating and correcting the trouble:

1. Check the compressor oil level. (See page 9.)

2. Check the refrigerant charge to be sure the system is fully charged. The unit sight glass should be clean and dry.

3. Be sure the faulty operation of the unit is caused by the compressor and not some other part of the unit. Unit safety and operating controls should be checked for proper operation as explained in the SERVICE INSTRUCTION included with the unit.

4. The voltage at the compressor motor must be within the limits shown on the unit data plate.

5. Check for a burnout in the motor windings. This may be evidenced by discoloration of the compressor oil or by a burnt odor. A further check for motor burnout would be to use an ohmmeter and check if the windings are grounded, or check for an open circuit between the motor terminals. These are an indication of motor burnout.

6. Dismantle only the part of the hermetic compressor necessary to correct the fault.

7. Never open any part of a hermetic compressor which is under vacuum; be sure there is some pressure inside the compressor. If the compressor is opened while under a vacuum, moisture laden air may be drawn into the system and rapid corrosion of internal machined parts may result. The refrigerant is an excellent cleaning agent and will remove any natural protective coating from the iron or steel, leaving the raw metal exposed.

8. Internal machined parts of the compressor such as valves, pistons and crankshaft must be immediately protected as they are removed from the compressor. See HANDLING COMPRESSOR PARTS, page 8.

9. Before removing the cylinder heads, each head should be match marked in relation to its position on the housing. When re-installing a head, line it up with the discharge manifold and bolt the head to the manifold before bolting the head to the compressor housing.

10. When assembling a compressor or compressor parts, it is essential to draw all nuts and cap screws to their proper torque, using an accurate torque wrench. See THREADED FASTENER TORQUES & SEQUENCE, page 6.

WARNING

Before dis-assembling any part of the J Compressor, be sure the following Safety Precautions are read and observed.

HANDLING

When performing service on the compressor it may be convenient to remove it from the unit base. If so, refer to RIGGING THE COMPRESSOR, page 8.

DISCONNECT ELECTRICAL POWER

Before attempting any service on the compressor, all disconnect switches must be locked out and tagged to prevent accidental starting of the compressor and/or electrical shock.

VENTING THE COMPRESSOR BEFORE REPAIRS

Before opening the compressor for repairs, the pressure within the compressor must be relieved. Close the suction and discharge stop valves, loosen the pressure tap next to the adjusting stem on the suction stop valve, and vent the compressor to the atmosphere.

EVACUATION AFTER REPAIRS

During the compressor repair procedure, the crankcase and oil should be examined for the presence of metal particles. This would indicate wearing of parts within the compressor. New oil should be charged into the compressor using the oil charging valve. (See PHYSICAL DATA.)

The compressor should be given a thorough leak test as explained in instruction Form 55.05-NM.

If the compressor was open for only a few hours, it should be evacuated to a pressure of 300 microns using a quality vacuum pump and following the procedure outlined in instruction Form 55.05-NM.

If the compressor was open for more than 24 hours, the compressor should be completely dehydrated; then evacuated to a pressure of 300 microns following the procedures outlined in Form 55.05-NM.

REPLACING THE OIL PUMP

If it becomes necessary to replace the oil pump, a complete new pump assembly should be installed. To replace the oil pump, refer to Fig 9 and proceed as follows:

1. Remove the oil pump cover cap screws and pull the pump assembly out of the bearing head.

2. Install the new oil pump assembly using a new gasket. Be sure that the flat end of the pump drive shaft engages the slot in the end of the compressor crankshaft and the word "TOP" is at the top.

3. Tighten the pump cover cap screws evenly by drawing down opposite and alternate pairs.

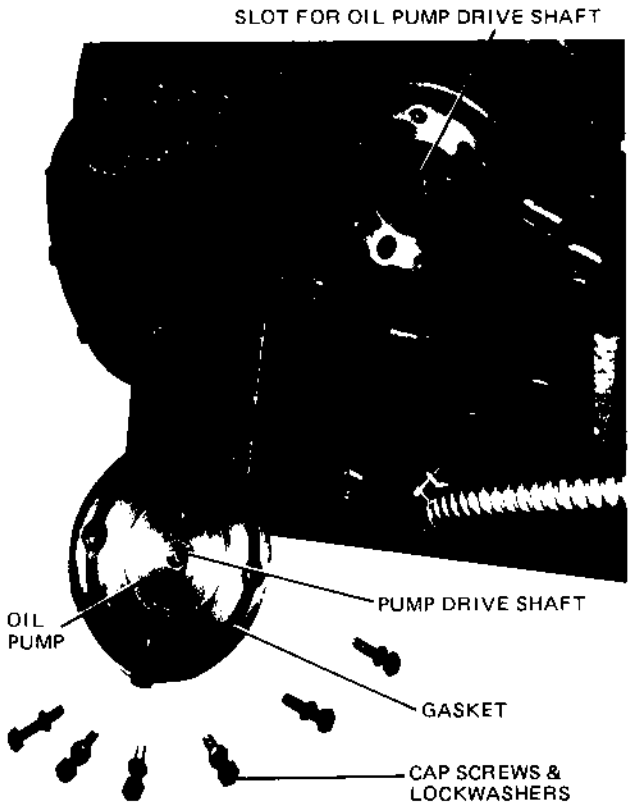


FIG. 9 — COMPRESSOR OIL PUMP

CAPACITY CONTROL SOLENOIDS

Normally, the coil is the only part of the solenoid valve that requires replacement. To replace the coil, proceed as follows:

1. Remove the conduit and the wires from the solenoid valve.

2. Remove the screw from the top center of the valve and remove the coil.

3. Install the new coil. Use caution when reconnecting the conduit to avoid placing stress on the valve. Stress on the valve may deform the stem and cause the valve to malfunction. Reconnect the wires.

If the solenoid valve must be replaced, proceed as follows:

1. Close the suction stop valve.

2. Open the discharge stop valve two turns of the stem.

3. Operate the compressor until a pressure of approximately 5 psi is obtained, placing a jumper across the terminals of the low pressure cut-out to prevent stopping before the desired pressure is obtained.

4. Stop the compressor and immediately close the discharge stop valve.

5. Remove the solenoid coil as described above.

CAUTION: Before proceeding to step 6, place a can beneath the solenoid valve to catch the oil. A small amount of oil will leak out when the valve is disconnected, however this should not be objectionable if the serviceman is prepared and works quickly.

6. Remove the bolts holding the valve to the handhole cover plate.

7. Replace the valve.

8. Reinstall the solenoid coil and reconnect the wires and conduit.

CRANKCASE OIL HEATER

The crankcase heater is located on the oil pump end of the compressor. The heater is located within a well in the compressor casing; it is not in direct contact with the refrigerant or oil. To replace the heater, remove the conduit and disconnect the heater wires. Pull the heater from the compressor. (See Fig. 10.)

When installing the new heater, coat it with heat conductive compound. (York Part No., 013-00898.)

OIL STRAINER

The compressor oil strainer does not contain a flare fitting in the line between the strainer and the compressor crankcase. The one-piece line is rolled into a hole in the compressor crankcase and therefore is not readily removable in the field.

REMOVING THE SUCTION STRAINER

The compressor suction strainer is located in the motor housing cover just under the suction stop valve. (See Fig. 11.) To clean or replace the suction strainer proceed as follows:

1. Remove the four bolts which hold the suction stop valve to the motor housing cover.

2. Pull the suction strainer out of the housing and clean with an approved safety solvent or install a new strainer if required.

3. Replace the suction strainer using new gaskets. Note that two gaskets are used; one between the suction stop valve and the suction strainer, the other between the suction strainer and the compressor housing.

4. Bolt the suction valve in place, making sure that it seats squarely.

REPLACING THE OIL SIGHT GLASS

Compressors are equipped with 2 plug type sight glasses located on the pump end of the compressor. (See Fig. 12.) If they become broken or damaged in any way, they must be replaced. Proceed as follows:

1. Drain the oil level below the sight glass that is to be replaced.

2. Remove the damaged sight glass(es).

3. Clean the threads in the housing and on the new sight glass with an approved safety solvent.

4. Apply LOCTITE to the threads of the sight glass and screw it into the compressor housing using a socket wrench. Do not over-tighten as this may crack the glass. (See Table 1.)

5. Fill the crankcase with clean oil.

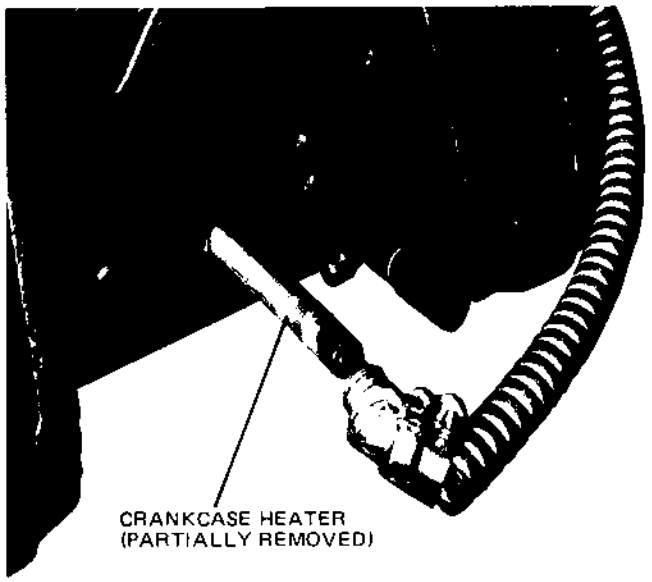


FIG. 10 — CRANKCASE HEATER

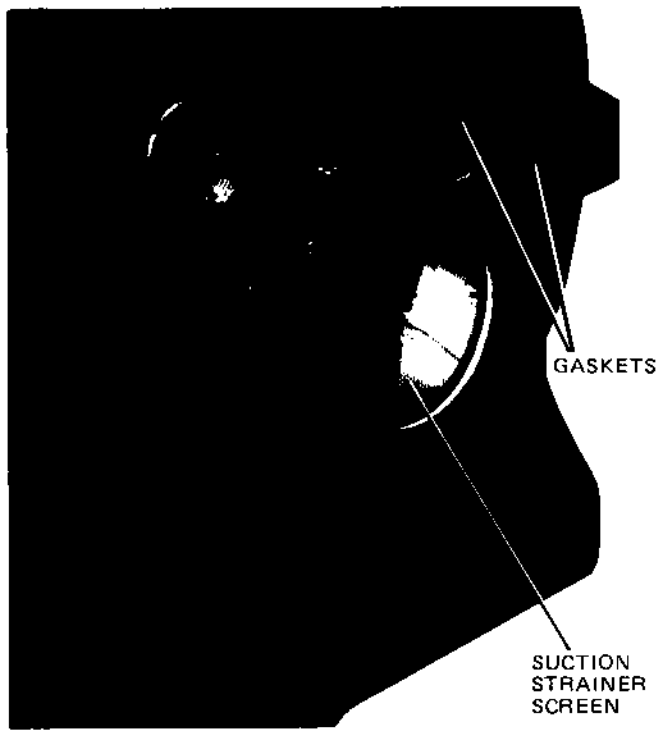


FIG. 11 — COMPRESSOR SUCTION STRAINER

REMOVING THE DISCHARGE MANIFOLD AND TOP HEADS

To remove the discharge manifold and the compressor top heads, proceed as follows:

1. Disconnect the discharge manifold from the compressor top heads and remove the top heads from the compressor.

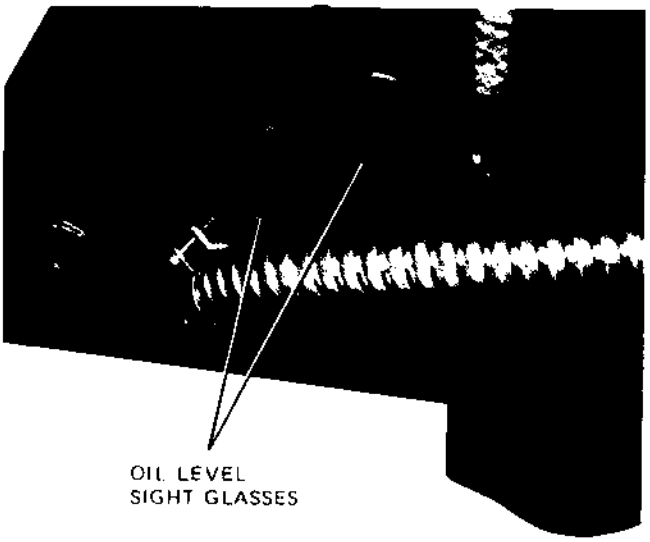


FIG. 12 — OIL LEVEL SIGHT GLASSES

Before removing the cylinder heads, each head should be match marked in relation to its position on the housing. When reinstalling a head, line it up with the discharge manifold before bolting the head to the compressor housing. Be sure to use proper tightening sequence as shown in Fig. 4.

REMOVING THE DISCHARGE AND SUCTION VALVES, CYLINDER SLEEVES AND UNLOADER SLEEVES

To remove the valve assemblies, cylinder sleeves and unloader sleeves, refer to Figs. 13, 14 and 15 and proceed as follows:

1. Disconnect the discharge manifold from the compressor top heads and remove the top heads from the compressor.
2. Remove the four cap screws which secure the discharge valve cage assembly to the housing and lift out this assembly. The inner discharge valve plate, the discharge valve, and the discharge valve springs will come out with the cage as an assembly.
3. Slip the fingers inside the suction valve plate and under the suction valve. Lift off the suction valve plate, the suction valve, and suction valve springs.
4. Lift the cylinder sleeve, with unloader lift pins, out of the compressor housing. The lift pins are fastened in place by a retaining ring at each end. To remove the lift pins, push the pin up against the spring, remove the upper retaining ring and pull the pin and spring out from the bottom.
5. Lift the unloader sleeve out of the housing.
6. Disassemble the discharge valve cage assembly. Remove the locking nut, center screw and beveled gasket. Then

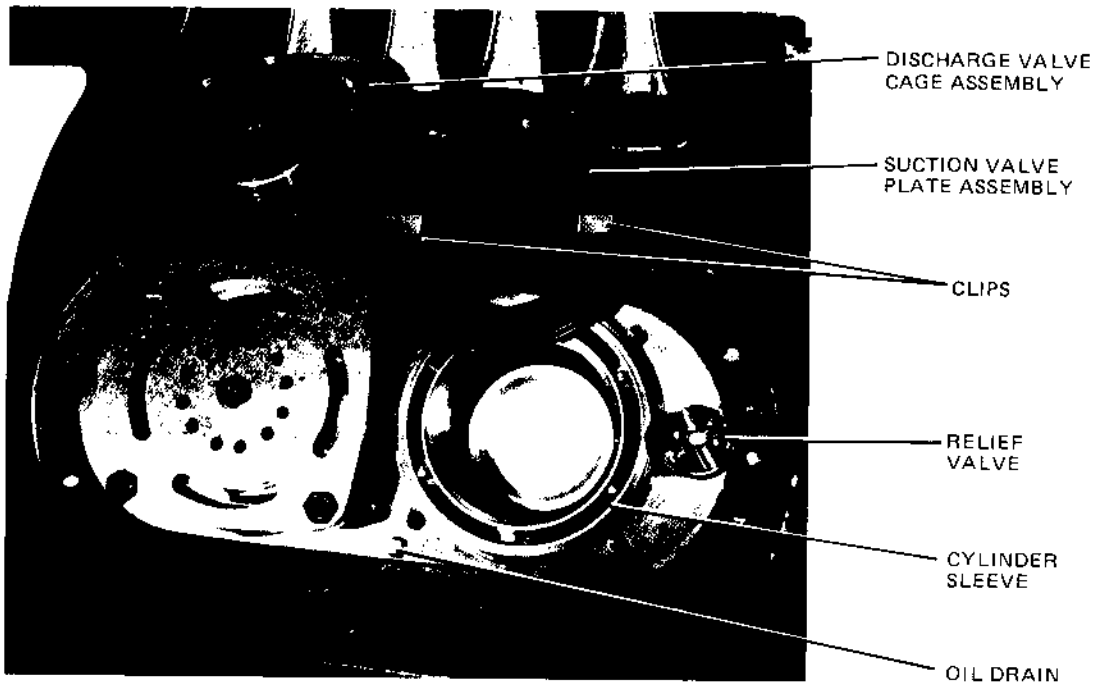


FIG. 13 — SUCTION AND DISCHARGE VALVES

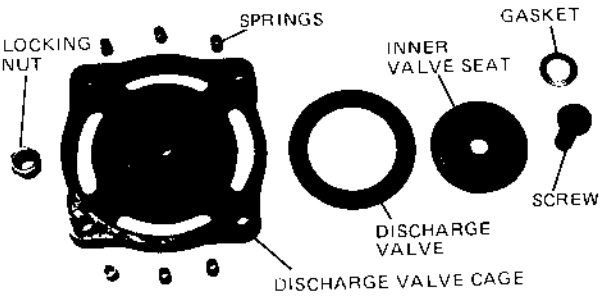


FIG. 14A – ORIGINAL DISCHARGE VALVE CAGE ASSEMBLY

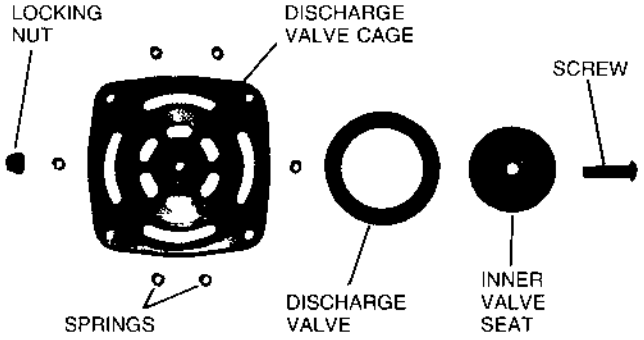


FIG. 14B –CURRENT DISCHARGE VALVE CAGE ASSEMBLY

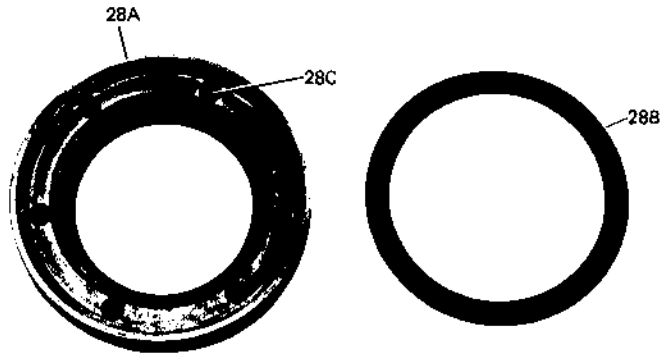


FIG. 15 – SUCTION VALVE

lift out the inner discharge valve plate, discharge valve and springs.

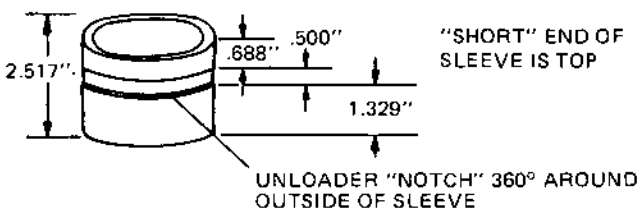
7. Clean, dry and oil all parts. If it was necessary to remove the lift pins, replace the retaining rings. Inspect the valves for grooves and replace, if necessary.

8. See DESIGN HISTORY (pg.26) for torques on discharge valve lock nut.

INSTALLING UNLOADER SLEEVES AND CYLINDER SLEEVES

To install the unloader sleeves and cylinder sleeves, refer to Figs. 13, 14 and 15 and proceed as follows:

1. It is important that the unloader sleeves be installed properly, with the correct end "up" (toward the top of the cylinder sleeve) as shown in the illustration below.



Set the unloader sleeve in the compressor housing (with the correct end up) and the notch engaged on the shoulder on the unloader device. Be sure the unloader sleeve is centered in the bored recess in the compressor deck.

2. Be sure the lift pins, with springs and retainer rings are inserted into the cylinder sleeves.

3. Carefully lower the cylinder sleeve over the piston and inside of the unloader sleeve.

   Push the cylinder sleeve down until it enters the hole in the lower compressor deck. Do not force the cylinder sleeve. The lower end of the cylinder sleeve is chamfered to facilitate compressing the piston rings and entering the compressor deck. Enter the sleeve squarely into the housing and rotate it as it is being lowered. If the cylinder sleeve is properly seated in the housing, it should not bind but should spring up approximately 1/8" due to the action of the unloader device.

INSTALLING SUCTION AND DISCHARGE VALVES

When re-installing valves, install as originally removed, mating the seats; do not turn over.

To install the suction and discharge valves, refer to Figs. 13, 14 and 15 and proceed as follows:

1. With the spring pocket side of the suction valve plate up, assemble the suction valve springs in their pockets and set the suction valve in place. Expanded coil is to be located in the bottom of the spring pocket. Push spring gently into hole until the expanded coil snaps to retain the spring.

2. To hold the suction valve and springs firmly in place during installation, two sheet metal clips should be placed over the suction valve plate and suction valve. These clips may be ordered from the Factory – York Part No. 064-37274.

3. Assemble the discharge valve cage assembly.

   a. Insert the discharge valve springs in their recesses in the valve cage and set the discharge valve in place.

   b. Insert the discharge valve screw, with beveled gasket, through the inner discharge valve plate and the discharge valve cage. Then bolt the assembly together, using the self locking nut.

4. It is important that the suction valve not be pinched during re-assembly. The following steps are recommended.

   a. The piston in the respective cylinder should be close to the bottom of its stroke.

      CAUTION: Never rotate the crankshaft when one or more piston and connecting rod assemblies are in place unless the related cylinder sleeve or sleeves are in their proper position in the compressor housing. If this caution is not observed, serious damage could occur.

   b. Pull the cylinder sleeve out of the housing approximately 1/8" - 3/16". (Just far enough to allow the lift pins to retract below the top of the cylinder sleeve.)

   c. Place the suction valve plate, with suction valve clipped in space, on the cylinder sleeve. Using one hand, hold the suction valve plate firmly against the cylinder sleeve, but do not push the cylinder sleeve down against the housing. With your free hand remove the valve clips. A distinct click will be heard as the clips are removed, if the valve is seated properly.

   d. Holding the suction valve plate in place on top of the cylinder sleeve (do not allow the sleeve to slip down against the compressor housing) place the discharge valve gage assembly on top of the suction valve plate. Insert 2 cap screws through holes in diagonally opposite corners of the discharge valve cage and tighten them "finger-tight".

   e. Push the discharge valve cage suction valve plate and cylinder sleeve down firmly against the compressor housing. Insert remaining cap screws and tighten all cap screws to their proper torque.

5. Using new gaskets if required, install the compressor top heads and reconnect the discharge manifold to them.

REPLACING THE HIGH PRESSURE RELIEF VALVE

The high pressure relief valve is screwed into the upper machined surface of the cylinder bank under the top head to relieve any abnormally high discharge pressure back to the suction side of the compressor (See Fig. 8). It is factory set to open at 375 psi differential pressure. If leakage of the valve is suspected, replace.

To replace the high pressure relief valve when the compressor is not open for repairs or inspection, proceed as follows:

1. Disconnect the discharge manifold from the proper top head and remove the top head.

2. Unscrew the leaking relief valve and screw in the new valve.

3. Reassemble the top head and the discharge manifold.

REMOVING PISTONS AND CONNECTING RODS

To remove the pistons and connecting rods, refer to Figs. 16 and 17 and proceed as follows:

NOTE: The width of the connecting rods at their large end is greater than the inside diameter of the cylinder sleeve. Before a piston and connecting rod assembly can be removed from the compressor housing, the cylinder sleeve must first be removed. Then the piston and connecting rod assembly can be pulled outward from the compressor.

Connecting rods used on J "E" compressors are of 2 different designs. Original design used thru bolts and lock nuts to secure the bottom end bearing cap. Connecting rods used in later design compressors have tapped holes in the bottom end of the rod, and use dowel pins and standard screws to locate and secure the bottom end bearing cap. (See Fig 17.)

The 2 different designs are not interchangeable. When connecting rods are replaced, they must be replaced with rods of the same design.

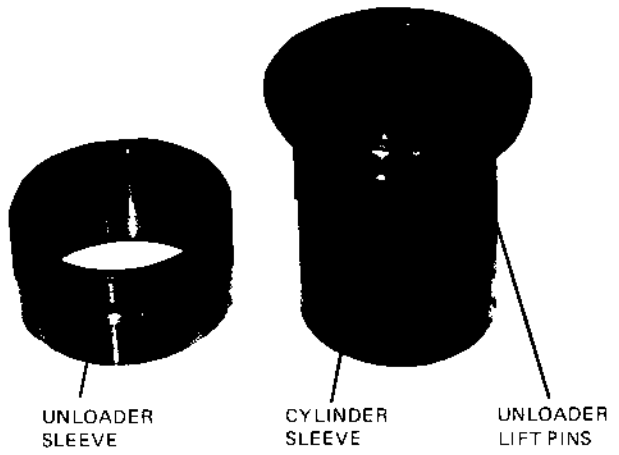
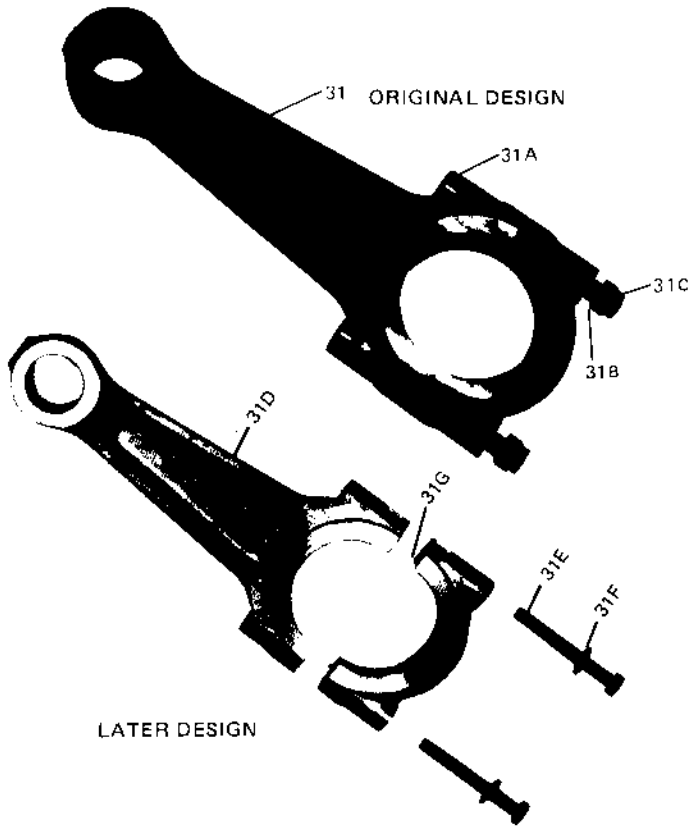


FIG. 16 — CYLINDER SLEEVE AND UNLOADER SLEEVE



Connecting rods are not interchangeable. Replacement rod must match the remaining rods in any one unit.

FIG. 17 — REMOVING PISTONS AND CONNECTING RODS

1. Remove the suction and discharge valve assemblies. Allow the cylinder sleeve and unloader sleeve to remain in place in the housing.

2. Remove the crankcase hand hole cover plate(s).

3. With the cylinder sleeves in place, rotate the crankshaft to a position that will permit ready access to the connecting rod bolts to be removed. Loosen the nuts and remove the lower half of the connecting rod bearing. Note the identification number stamped on the half-bearing just removed.

4. Using care to make certain that the upper half of the connecting rod bearing remains in place on its crankpin, rotate the crankshaft to the point where the piston is very near the top of its stroke.

5. Remove the cylinder sleeve and unloader sleeve.

6. Lift out the piston and its connecting rod. Note that the identification number stamped on the upper half of the rod bearing, matches the number on the lower half of the rod bearing. These numbers should ALWAYS match.

CAUTION: Never rotate the crankshaft when one or more piston and connecting rod assemblies are in place unless the related cylinder sleeve or sleeves are in their proper position in the compressor housing. If this caution is not observed, serious damage could occur. Make certain also that when the bottom half of the rod bearing has been removed and it is necessary to rotate the crankshaft, that the upper half of the rod bearing does not leave its proper place on its crankpin.

7. Remove piston assemblies ONE AT A TIME, repeating the above steps 3 through 6 for each piston assembly. Proceed to step 8.

8. Remove the piston pin retaining rings.

9. Push the piston pin out of the piston.

10. Remove the piston rings.

11. Clean, dry and oil all parts.

REPLACING THE UNLOADER DEVICE (POWER UNITS)

If an unloader device (power unit) fails to function, a complete unit will be furnished for replacement purposes. Replacement can be accomplished most easily when the pistons and connecting rods have been removed as described above. Then proceed as follows: (See Fig. 18.)

1. Remove the hex nut which connects the oil supply tubing to the bottom of the unloader device fitting (inside the crankcase).

2. Hold the hex on the bottom of the fitting with a socket

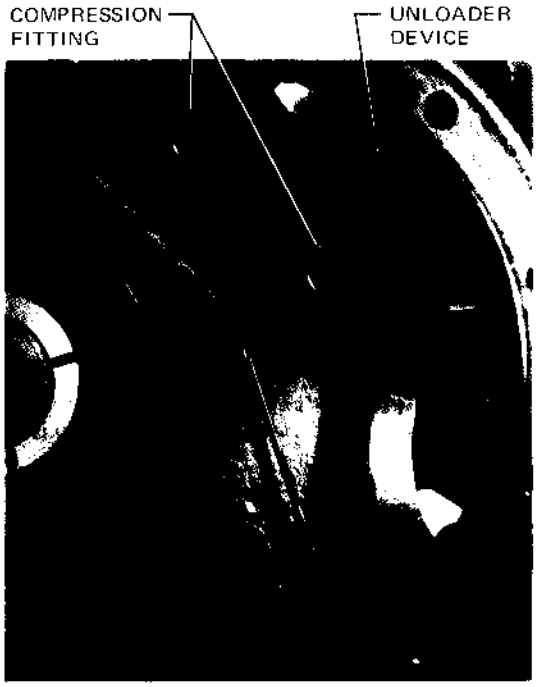


FIG. 18 — UNLOADER DEVICE

wrench, and using a short handled open end wrench, remove the unloader device.

3. When replacing the unloader device ALWAYS install a new fitting.

4. Be sure all threads are clean. Apply a thread sealing compound such as LOCTITE to the male threads, then install the unloader device and reconnect the oil supply tubing.

5. When an unloader device (power unit) is replaced, the unloader function of the lift pins must be checked. Temporarily replace the cylinder sleeve, and unloader sleeve with the cylinder sleeve clamped securely to the housing. Apply air pressure to the unloader device. The lift pins must retract at least .015" below the suction valve seat. When air pressure is released the lift pins must extend at least .120" above the suction valve seat.

INSTALLING PISTONS AND CONNECTING RODS

To install the piston and connecting rod assemblies, refer to Figs. 16 and 17 and proceed as follows:

1. Each piston is equipped with two piston rings. When installing the rings, use copper or brass strips under the rings and spread the rings only enough to slide them down over the piston.

NOTE: Piston rings are tapered and must be installed correctly. The wider part of the ring must be down. The top surface of the ring is stamped with a dot. (See Fig. 19.)

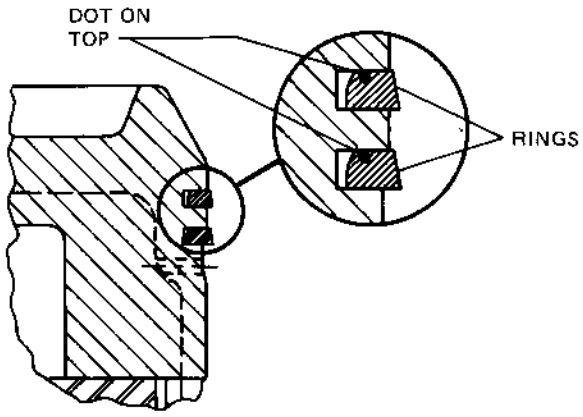


FIG. 19 — PISTON RING INSTALLATION

2. Set the piston with its top surface down on a bench. Insert the small end of the rod into the piston and slide the piston pin into position. The pin is a sliding fit into the piston and rod. Install the retaining rings in each side of the piston.

3. Cylinder sleeves and piston assemblies, when re-used, should be installed in their original locations in the compressor housing.

   Remove the lower half of the connecting rod bearing, allowing the connecting rod bolts to remain in position. Check to see that the numbers on the two halves of the bearing are matched and that they are on the same side of the connecting rod. Apply a few drops of oil to the crankpin. Insert the piston and connecting rod assembly through the cylinder bore and carefully position the upper half of the connecting rod bearing on its crankpin.

   Insert the unloader sleeve and cylinder sleeve. (Refer to INSTALLING THE UNLOADER AND CYLINDER SLEEVES.)

4. Install the lower half of the connecting rod bearing as described in step 3 above. Tighten the nuts (or screws) evenly to the proper torque. (See Table 1.) Hand turn the crankshaft to be sure there is no binding. Install all piston assemblies, turning the shaft after each rod is installed, to be sure that no binding exists.

5. Make sure that the compressor crankcase is clean. Install the crankcase hand hole cover plates. Fill the crankcase to the proper level with new oil.

6. Re-install the suction and discharge valves and the compressor top heads, making sure they are in their original locations and reconnect the discharge manifold and top heads, using new gaskets as required.

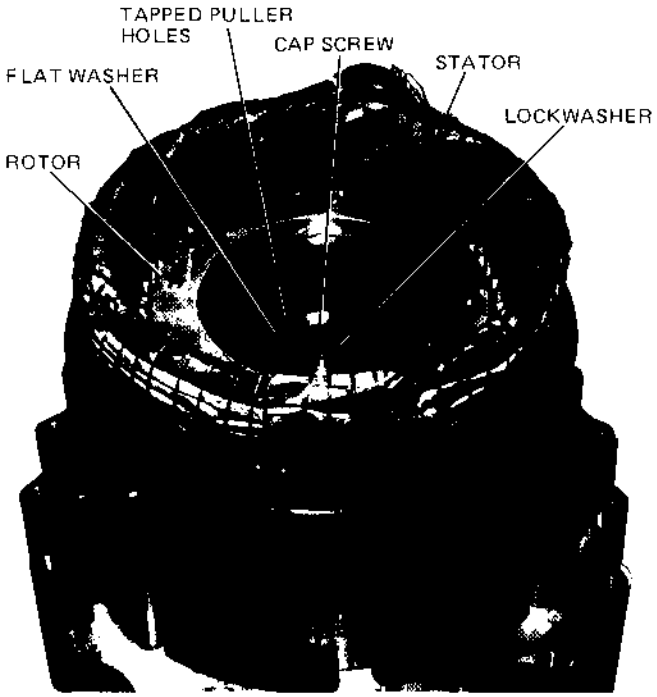


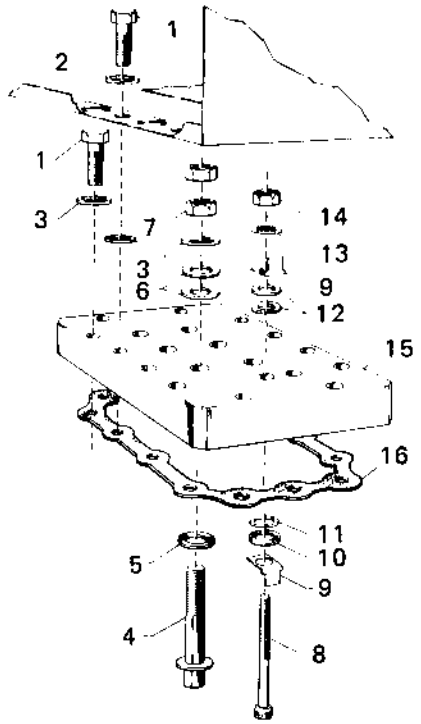
FIG. 20 — MOTOR END OF COMPRESSOR

REMOVING ROTOR

It is necessary to remove the rotor in order to remove the crankshaft and/or motor end bearings. Also, if it becomes necessary to replace the rotor or stator, both rotor & stator must be replaced. To remove the rotor, proceed as follows:

WARNING
Be sure electrical power to unit has been disconnected.

1. Remove the cap screws that hold the suction stop valve to the motor cover. Remove the suction strainer screen and gaskets.
2. Disconnect the power wiring from the motor terminal bolts.
3. Mark each terminal bolt with the correct lead number. (Ex. 1, 2, 3, 7, 8, 9)
4. On Style F, mark each overload bolt with correct numbers. (Ex. S1, S2, S3)
5. Remove the terminal box and the terminal plate.
6. Remove the nuts from the terminal bolts and the overload bolts and push these bolts down thru the holes in the terminal plate.
7. Support the main body of the compressor using a crane or other suitable method. Loosen, but do not remove, the cap screws that hold the motor cover to the compressor housing. Insert guide pins (1/2" - 13) into 2 of the screw holes before removing the cap screws. Remove the motor cover, taking care not to damage the stator windings.
8. Remove the cap screw, lockwasher and flat washer that hold the rotor to the crankshaft.
9. Insert 2 cap screws (9/16" - 12) or similar item into the tapped holes in the end of the rotor.



ITEM NO.	DESCRIPTION
1	Screw — 7/16 - 14 x 2 (14 Req'd.)
2	Lockwasher — 7/16 (4 Req'd.)
3	Washer, Plain — 7/16 (20 Req'd.)
4	Bolt, Terminal (6 Req'd.)
5	Gasket, Terminal Bolt (6 Req'd.)
6	Washer, Terminal Bolt (12 Req'd.)
7	Nut, Hex (12 Req'd.)
8	Screw, Overload Protector (2 Req'd. Style E) (4 Req'd. Style F)
9	Terminal, Overload (4 Req'd. Style E) (8 Req'd. Style F)
10	Washer, Plain (2 Req'd. Style E) (4 Req'd. Style F)
11	Seal, O-Ring (2 Req'd. Style E) (4 Req'd. Style F)
12	Washer, Terminal (4 Req'd. Style E) (8 Req'd. Style F)
13	Lockwasher (2 Req'd. Style E) (4 Req'd. Style F)
14	Nut, Hex (2 Req'd. Style E) (4 Req'd. Style F)
15	Block, Terminal
16	Gasket, Terminal Block
17	Spacer, Insulating (2 Req'd.)
18	Block, Term. Base, Flat (13 Req'd.)
19	Block, Term. End
20	Bar, Jumper

FIG. 21 — MOTOR TERMINAL PLATE DETAIL

10. It is not advisable to attempt to remove the rotor without using the rotor mandrel (York Part Number 364-37273). Screw the rotor mandrel into the end of the crankshaft and slide the rotor onto it.

11. To re-install the rotor or to install a new rotor follow steps 7, 8 & 9 in reverse order.

12. Re-install the motor cover using a new gasket. Be sure motor cover is properly located on the compressor housing.

13. Pull all power terminals and overload connectors up thru the terminal box opening.

14. Be sure to place a new terminal block gasket in position before inserting the power terminal and overload protectors into the terminal plate.

15. Re-install the terminal bolts and overload protectors. Be sure the terminal bolts are re-installed in the correct hole. (1, 2, 3, 7, 8 or 9) Refer to Fig. 21 to be certain all gaskets, washers, seals, etc. are installed properly.

16. Re-install the terminal plate, terminal box, power wiring and cover.

17. Replace the suction strainer screen, gaskets and stop valve.

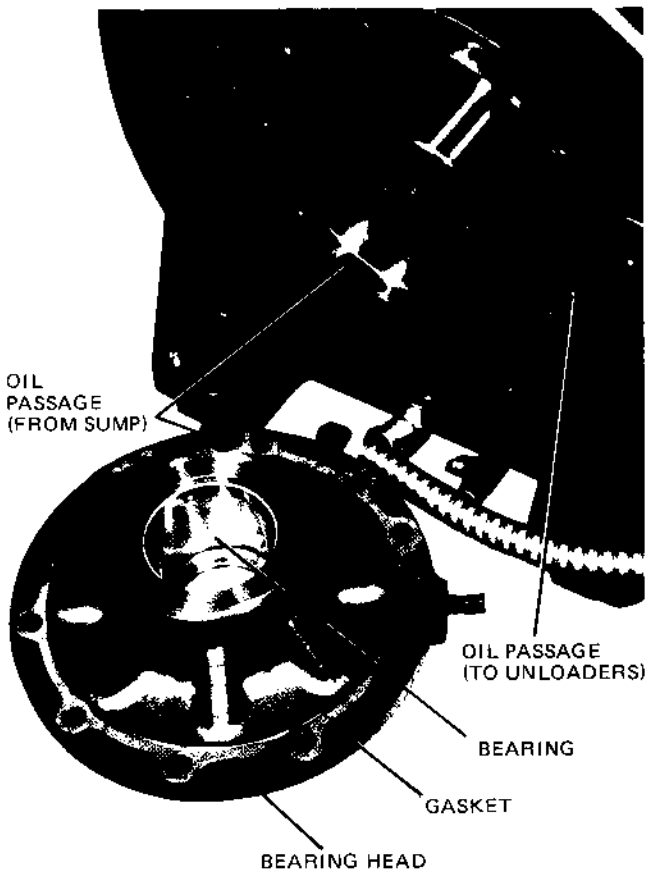


FIG. 22 — REMOVING PUMP END BEARINGS

REMOVING BEARINGS AND CRANKSHAFT

PUMP END BEARING

To remove the pump end bearing refer to Fig. 22 and proceed as follows:

1. "Match-mark" the bearing head and compressor housing.

2. Remove the cap screws which hold the bearing head to the housing and remove the bearing head.

3. The YORK Bearing Removal Tool (Part Number 364-37260) is required to remove the bearing from the bearing head. (See Fig. 23.)

4. Using the bearing removal tool as shown in Fig. 24, Detail A, pull the old bearing from the bearing head. Note that the back-up plate and the split plates must be installed from the inboard end of the bearing head.

5. Apply clean oil to the outside surface of the new bearing and to the inside portions of the bearing head into which the bearing is to be pressed.

6. Using the bearing removal tool as shown in Fig. 24, Detail B, pull the bearing into the bearing head, taking care that the bearing enters the bearing head squarely. Note that the "split" in the bearing should be at the top of the bearing head. Continue to pull the bearing into the bearing head until the bearing is .15" below the surface on the inboard end of the bearing head.

7. Re-install the bearing head using a new gasket. Be sure the gasket and bearing head are properly aligned with the oil passages. Tighten the cap screws to the proper torque.

MOTOR END BEARING

To remove the motor end bearings, refer to Fig. 25 and proceed as follows:

1. Drain the oil from the compressor and remove the crankcase cover plates, the motor cover, and the rotor, following procedures described in the applicable sections of this manual.

2. Using suitable timber, support the crankshaft inside the crankcase.

3. Remove the cap screws that hold the bearing head assembly to the compressor housing.

4. Screw the rotor mandrel (YORK Part No. 364-37273) into the end of the crankshaft and pull the bearing head out onto it. Use of the mandrel aids in preventing damage to the stator windings.

5. The motor end thrust collar will possibly come out with the bearing head. If it does not, pull it off the crankshaft. Examine the thrust collar and replace if necessary. A roll pin prevents the thrust collar from turning with the crankshaft.

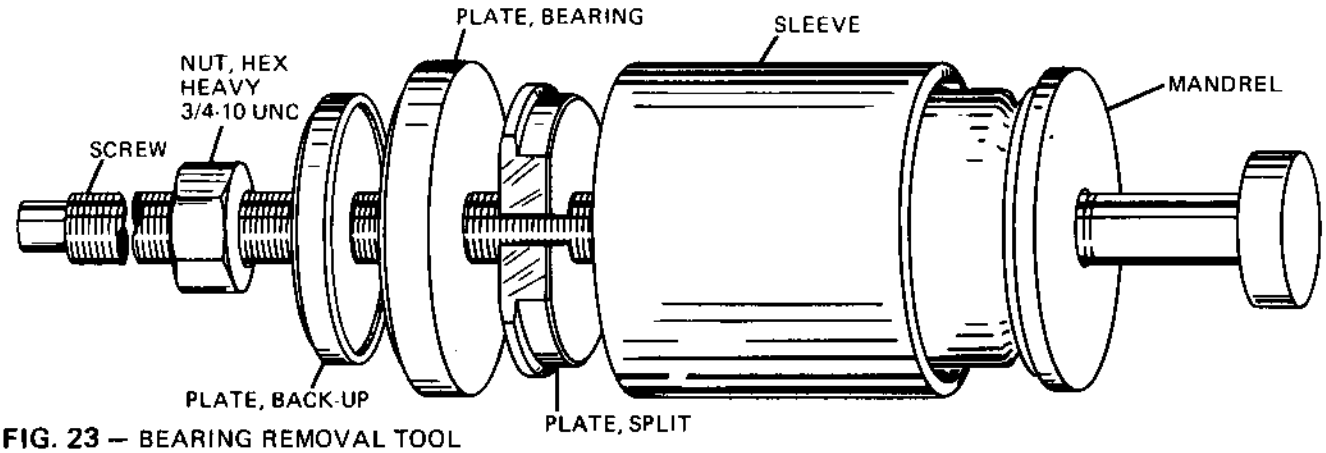
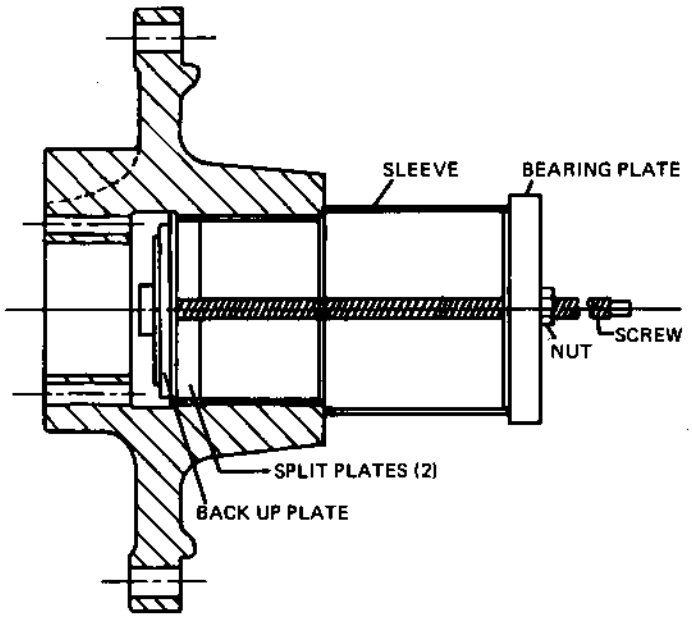
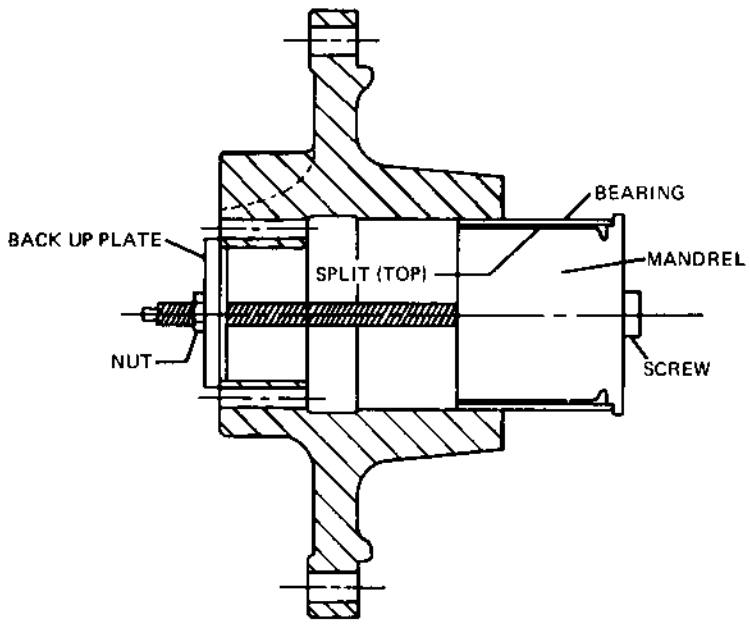


FIG. 23 – BEARING REMOVAL TOOL



DETAIL A – PUMP END BEARING (REMOVAL)



DETAIL B – PUMP END BEARING (INSTALLATION)

FIG. 24 – PUMP END BEARINGS

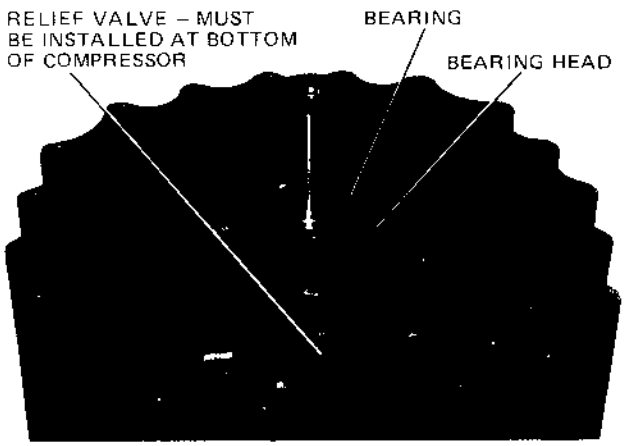


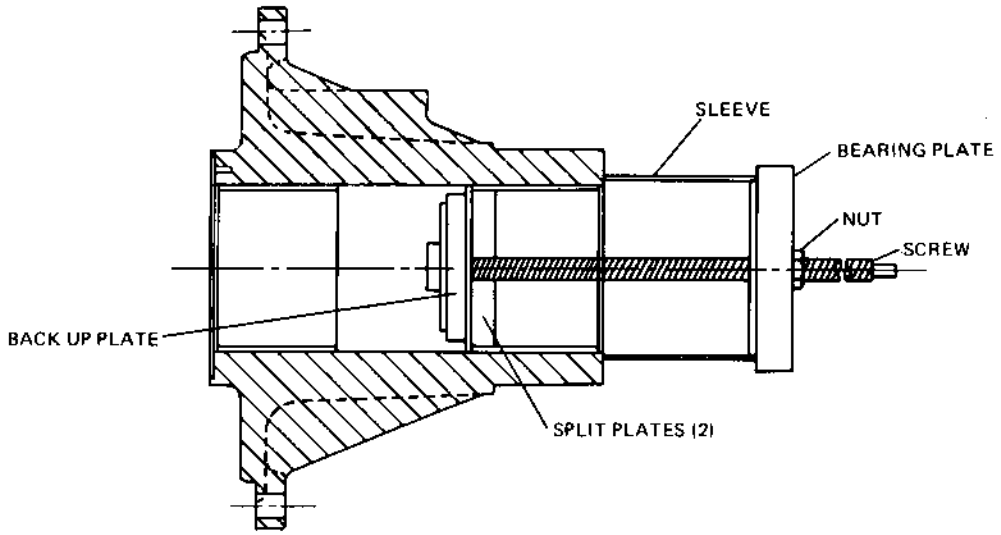
FIG. 25 – MOTOR END BEARING ASSEMBLY

6. Using the bearing removal tool as shown in Fig. 26, Detail A, remove the old bearings from the housing. Bearings are removed one at a time in a similar manner from opposite ends of the bearings head.

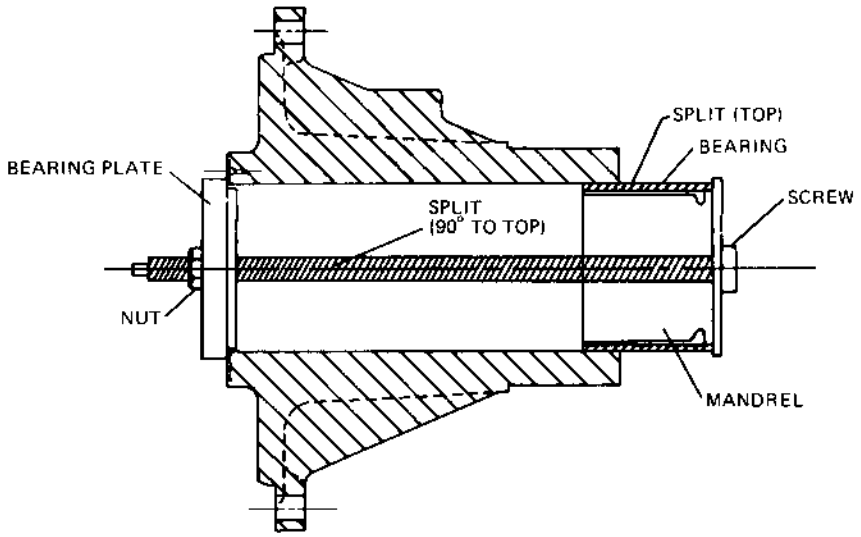
7. Apply clean oil to the outside surface of the new bearings and to the inside portions of the bearing head into which the bearings are to be pressed.

8. Using the bearing removal tool as shown in Fig. 26, Detail B, pull the bearings into the bearing head one at a time from opposite ends, taking care that the bearings enter to bearing head squarely. Note that the "split" in one bearing should be at the top; the "split" in the second bearing should be turned 90° to either side. Continue to pull the bearings into the head until they are 1/32" below the end surfaces of the bearing head.

9. Reassemble the compressor by following steps 1, 2, 3, 4 and 5 above in reverse order. Be sure that the relief valve is at the bottom of the compressor.



DETAIL A – MOTOR END BEARING (REMOVAL)



DETAIL B – MOTOR END BEARING (INSTALLATION)

FIG. 26 – MOTOR END BEARINGS

CRANKSHAFT

The compressor crankshaft can be removed from either end of the compressor depending on which end is more accessible. To remove the crankshaft, proceed as follows:

1. Drain the oil from the compressor. Remove the crankcase cover plates, discharge manifold, top heads, suction and discharge valve assemblies, pistons and connecting rods, motor cover, and rotor following procedures outlined previously.

2. Using suitable timber, support the crankshaft solidly inside the crankcase.

3. Determine from which end the crankshaft is to be removed and remove the bearing head from that end of the compressor.

4. Screw the rotor mandrel (YORK Part No. 364-37273) into the end of the crankshaft.

5. Using two men, carefully remove the crankshaft from the compressor.

6. If the crankshaft was removed through the pump end, the thrust collar will probably remain in place in the compressor on the motor end. Be sure that this thrust collar is properly positioned on the roll pin before re-installing the crankshaft.

7. Reassemble the compressor by following the above procedure in reverse order.

REMOVING THE STATOR (SEE FIG. 27)

Normally it should not be necessary to replace the stator unless a complete motor failure (burn-out) occurs. If it becomes necessary to replace the stator, a new rotor must also be installed. To replace the stator proceed as follows:

1. It is advisable to remove the compressor from the unit before attempting to remove the stator.

2. Drain the oil from the compressor. Remove the crankcase cover plates, discharge manifold, top heads, suction and discharge valve assemblies, pistons and connecting rods, motor cover and rotor, using procedures outlined previously.

3. The compressor should now be placed in a vertical position, on the pump end.

> *WARNING*
>
> *Be sure the compressor is supported and blocked adequately so that it does not tip or fall during the disassembly procedure.*

4. Remove the 4 cap screws that hold the stator to the compressor housing. Insert guide pins into 2 diagonally opposite holes. (Largest stator weighs approximately 300 lbs.)

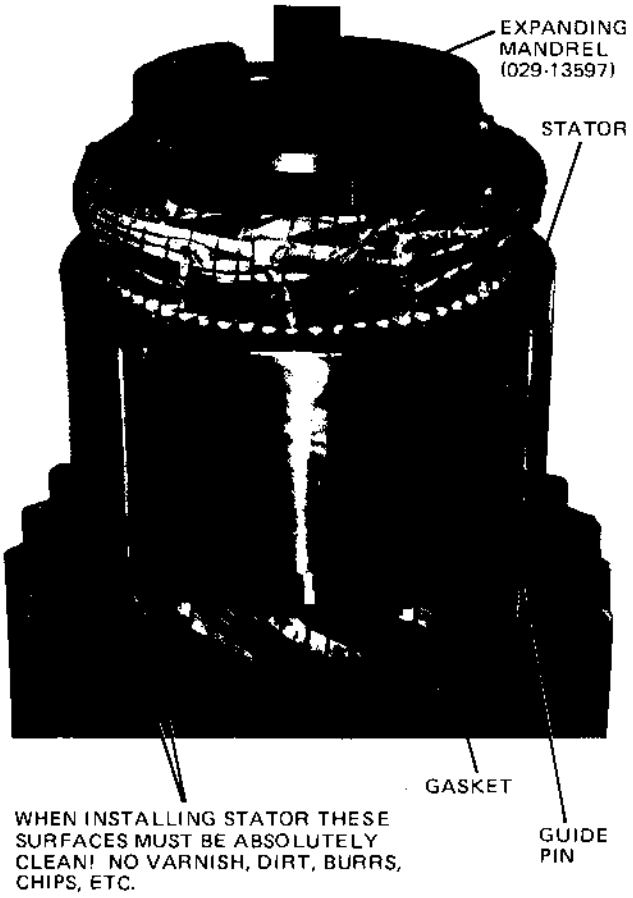


FIG. 27 — REMOVING THE STATOR

5. Install the expanding mandrel (YORK Part No. 029-13597) inside the stator, and adjust the mandrel so that it is tight within the stator.

6. Using a hoist or crane attached to the mandrel, remove the stator from the housing being careful not to damage the windings. Do not rest the stator on the windings.

7. When installing a stator, the surfaces where the stator rests on the housing must be absolutely clean; free of varnish, dirt, etc. (See Fig. 27.)

8. Using the mandrel and guide pins, lower the stator into position, being careful not to damage the windings. Be sure the stator is properly positioned with respect to motor leads.

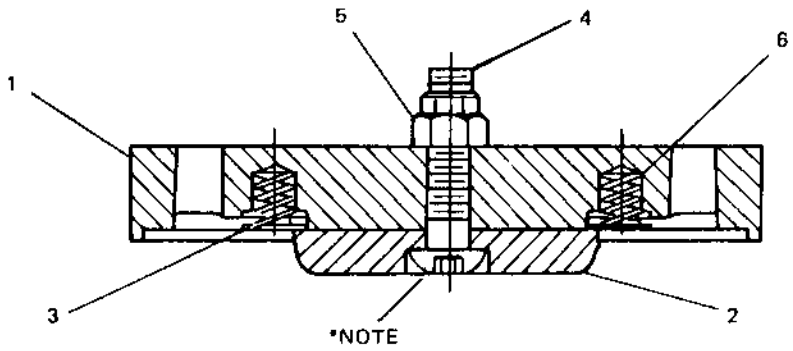
9. Remove the hoist, mandrel and guide pins. Insert the 4 cap screws and tighten them to the proper torque.

10. Reassemble the compressor using procedures described in the respective sections of this manual. Use a new gasket between the motor cover and compressor housing.

DESIGN HISTORY

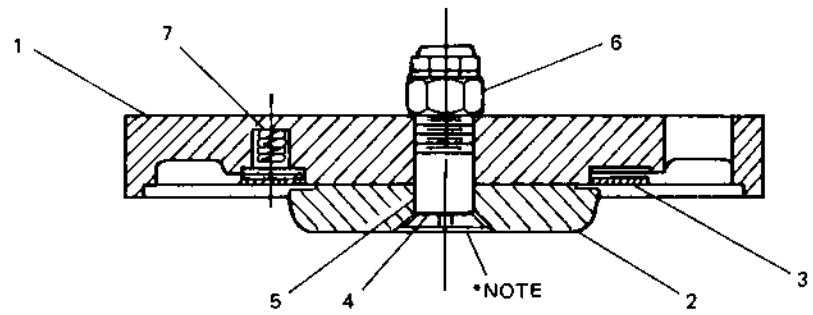
CURRENT DESIGN – ITEM #5 TORQUE TO BE 53 - 61 LB. FT.

1st PRODUCTION DATE	J Compressor Date: 8/1/92	G Compressor Date: 8/12/92
1st SERIAL NUMBER	J Compressor Ser. No.: 93536601	G Compressor Ser. No.: 84246301



ITEM	COMPONENT	DESCRIPTION
!	064-43146-000	Cage Valve Discharge
2	064-48032-000	Plate Valve
3	064-43012-000	Valve Discharge
4	021-17649-000	Screw Cap Bu
5	021-09932-000	Nut Hex Self
6	028-13248-000	Spring Hel C
*	064-48037-000	Dwg. - Cage Discharge (Current Design)

ORIGINAL DESIGN – ITEM #6 TORQUE TO BE 35 - 40 LB. FT.



ITEM	PART NO.	DESCRIPTION	QUAN. PER UNIT
1	064-43146C	Cage, Discharge Valve	1
2	064-46281B	Plate, Discharge Valve	1
3	064-43012A	Valve, Discharge	1
4	028-08386	Gasket	1
5	021-13856A	Screw, Inner Discharge	1
6	021-09932A	Nut, Self-locking, Hex	1
7	029-13248A	Spring, Helical	6
*	364-42306	Dwg. - Cage Discharge (Original Design)	

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