Larry

SERVICE MANUAL

15.0-INCH STROKE TYPE 4HHE-VL-3
BLOCK-MOUNTED GAS COMPRESSOR

13.0" & 9.5" & 9.75" & 9.75" x 15.0"

BECHTEL CORPORATION
FOR
CHEVRON PRODUCTS CO.
PASCAGOULA, MS

CLIENT P.O. NUMBER: 25380-200-POA-MCPS-00001

D-R ORDER NUMBER: 028-77419

UNIT SERIAL NUMBERS: XHH3579/80

DRESSER-RAND

Reciprocating Products

NOVEMBER 2008

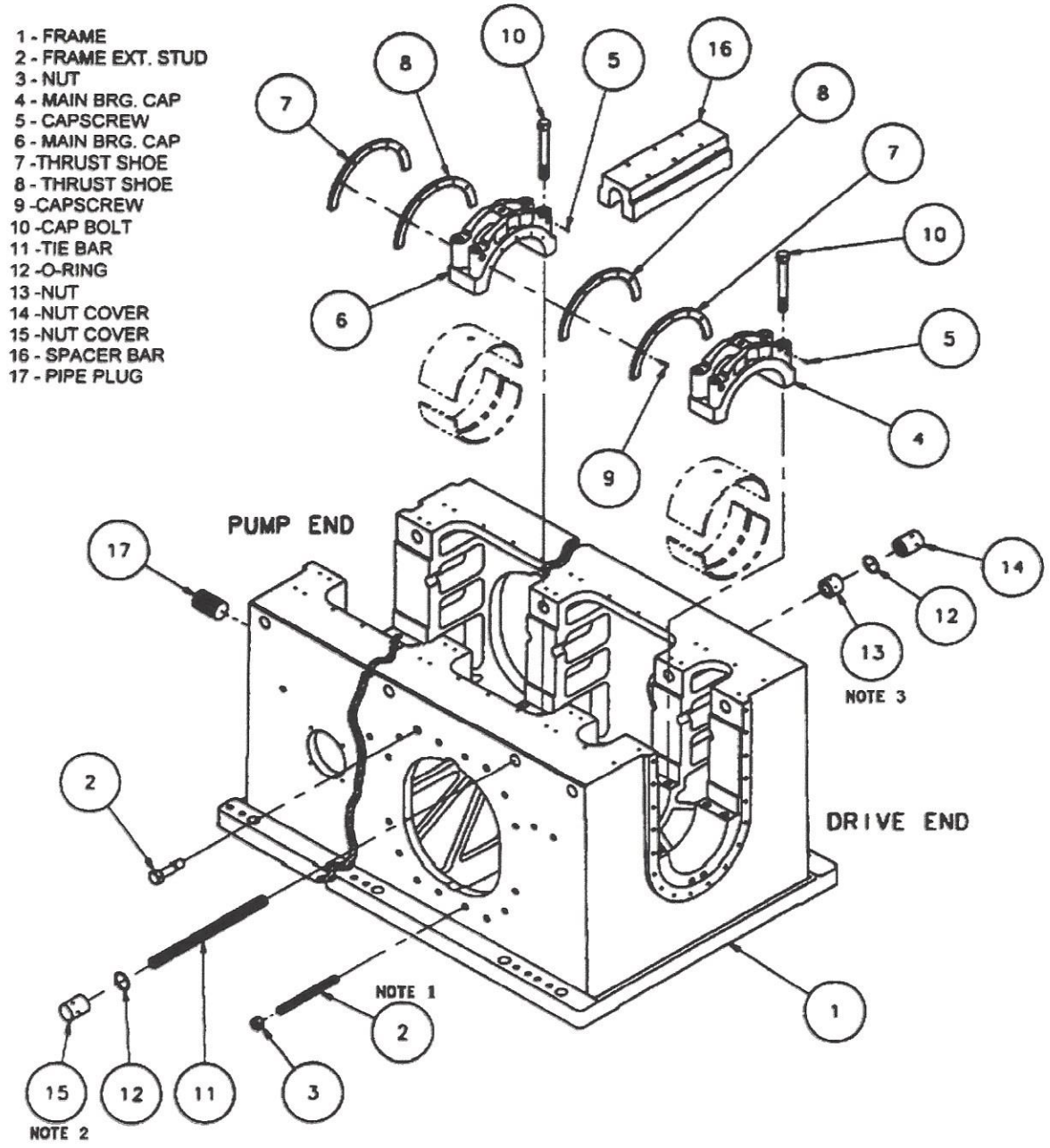
CHAPTER 1
EQUIPMENT DESCRIPTION
PG-4727-I (HHE-VL)

1-1. FRAME

The HHE compressor frame (Figure 1-1) is a "U" type frame made of cast iron with bolt-on frame top covers for easy access to the main and crankpin bearings. The frame has heavily ribbed cross-members supporting the main bearings, which ensure precise bearing alignment. Main bearing saddles are precision bored in a single setup. The main bearing bore alignment is then confirmed after machining and recorded. When the main bearing bore alignment is confirmed, all frame leveling pads are scraped in and identified.

The frame is then taken to the assembly floor where it is supported on jacks and leveled using a precision machinist's level on the frame leveling pads and in the crosshead guide bores. The main bearing alignment is then checked. This can be done using optical, laser or wire alignment techniques. At Dresser-Rand's Painted Post plant, wire alignment is utilized because the accuracy of wire alignment is well-established and equal to optical or laser alignment, and wire alignment is readily transportable for use throughout the world.

The accuracy demanded for a new frame machining is usually a maximum step between adjacent main bearing saddles of 0.001 inch vertically and horizontally, and 0.003 inch total variation over the entire length of the frame.



NOTE:

1. SET STUDS (ITEM 2) USING ANAEROBIC SEALANT
2. TIE STUD SET DEPTH INTO O-RING NUT MUST BE 2.00". DO NOT USE ANAEROBIC SEALANT. THE PROJECTION OF THE STUD ON OPPOSITE SIDE OF FRAME SHOULD BE 3.50".
3. HYDRAULICALLY TENSION NUTS (ITEM 13).

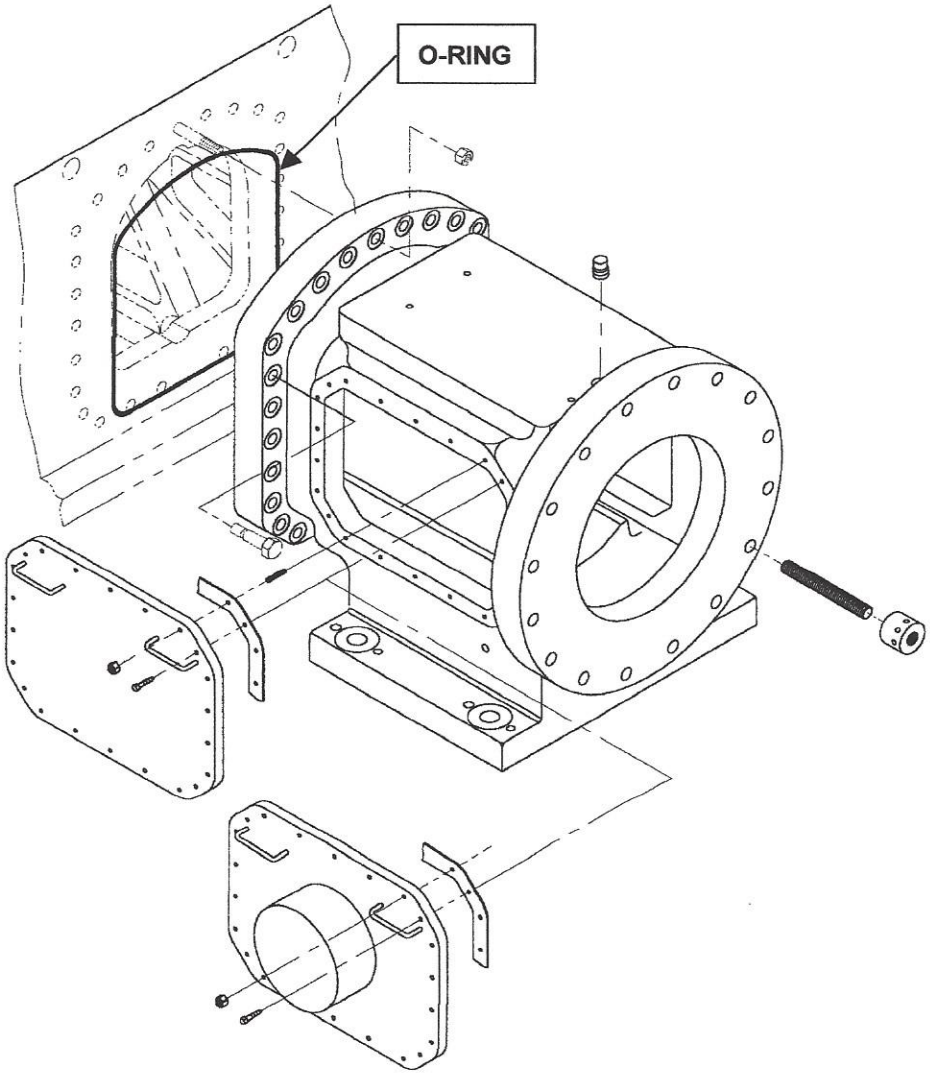
Figure 1-1. HHE-VL Frame

1-1.1. Frame Spacer Bars

Frame spacer bars and hydraulically-tensioned tie rods are used above each main bearing to provide rigidity and prevent distortion of the frame. Spacer bar dimensions are stamped on the frame top to ensure the frame is brought back to original specifications when tie rods are re-tensioned.

1-1.2 Frame Extensions

The frame extensions or crosshead guides are stud-mounted to the frame and sealed with an O-ring as shown in Figure 1-2. One fitted bolt is used to facilitate alignment in the field. Typically, the frame extensions, distance pieces and cylinders are shipped to the jobsite pre-assembled.



TP-4978

Figure 1-2. Frame Extension with Standard or Explosion-Proof Cover

1-1.3 Frame Nameplate

A metal nameplate (Figure 1-3) attached to the frame provides important data about the compressor, such as the size, stroke, model, serial number, rated RPM, and year built.

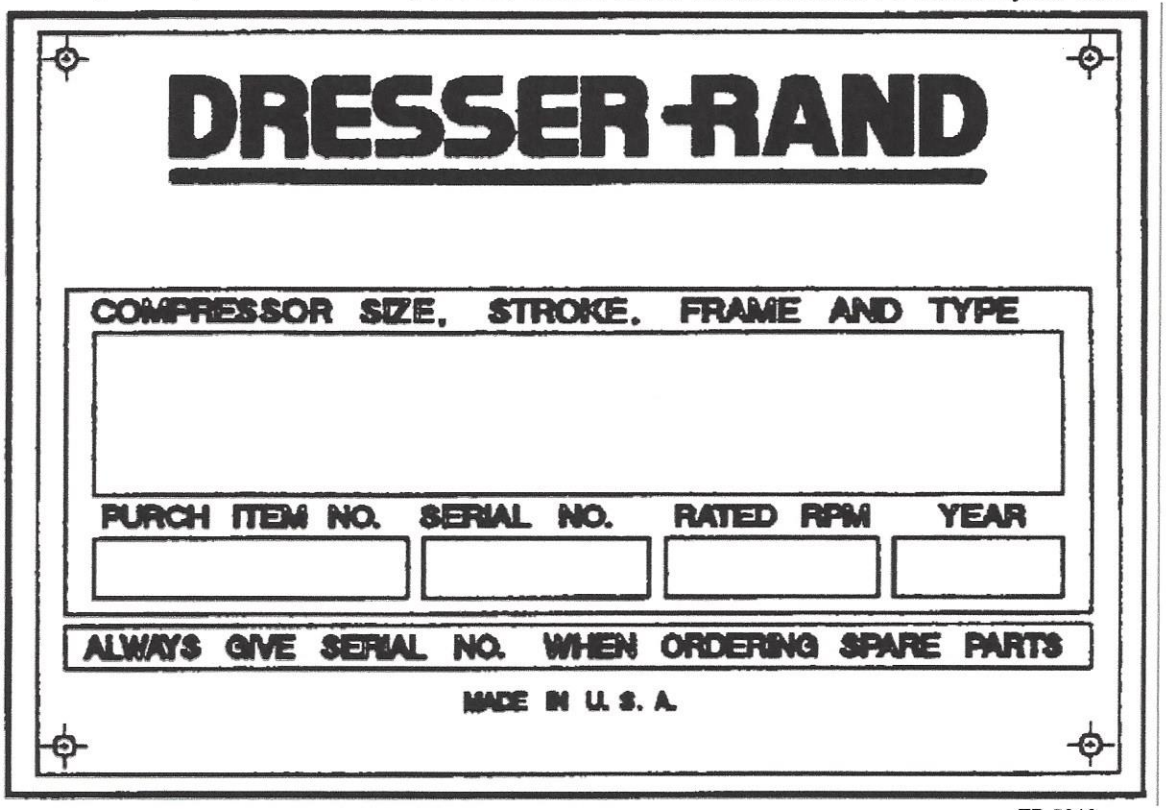


Figure 1-3. Frame Nameplate

1-2. CRANKSHAFT

The crankshaft (Figure 1-4) is a high tensile-strength alloy-steel forging, stress relieved and heat treated. All journals and crankpins are precision ground and polished to a 16 Ra surface finish. The variable crankthrow design allows an odd or even number of throws and smoother crank effort through each revolution. One main bearing is used between each crankthrow and two main bearings are used at the drive end to minimize deflections, stresses and bearing loads. Bolt-on counterweights can be added to the crankshaft when required.

1-2.1. Drive End Flange

The drive end of the crankshaft consists of a large integrally-forged flange that is connected to the barring wheel and motor extension shaft flange with high-grade studs and hydraulically tensioned nuts.

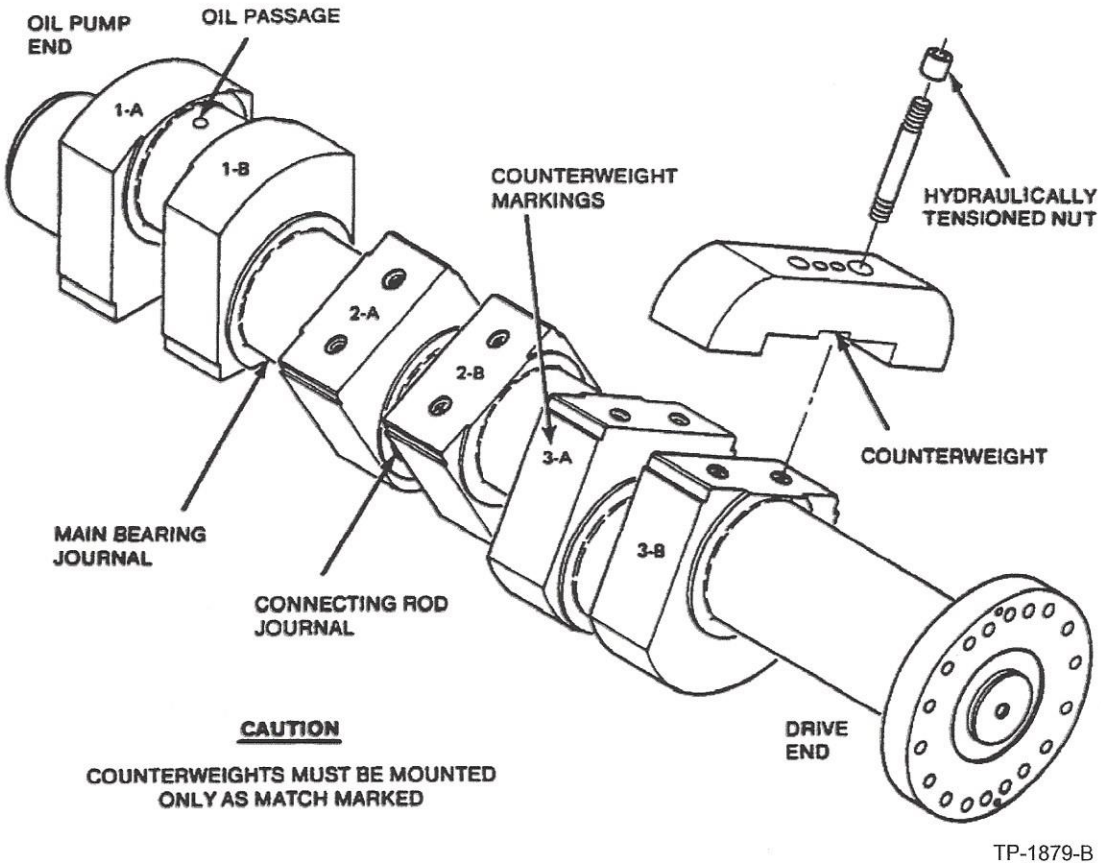


Figure 1-4. Crankshaft with Counterweights

1-2.2. Extension Shaft

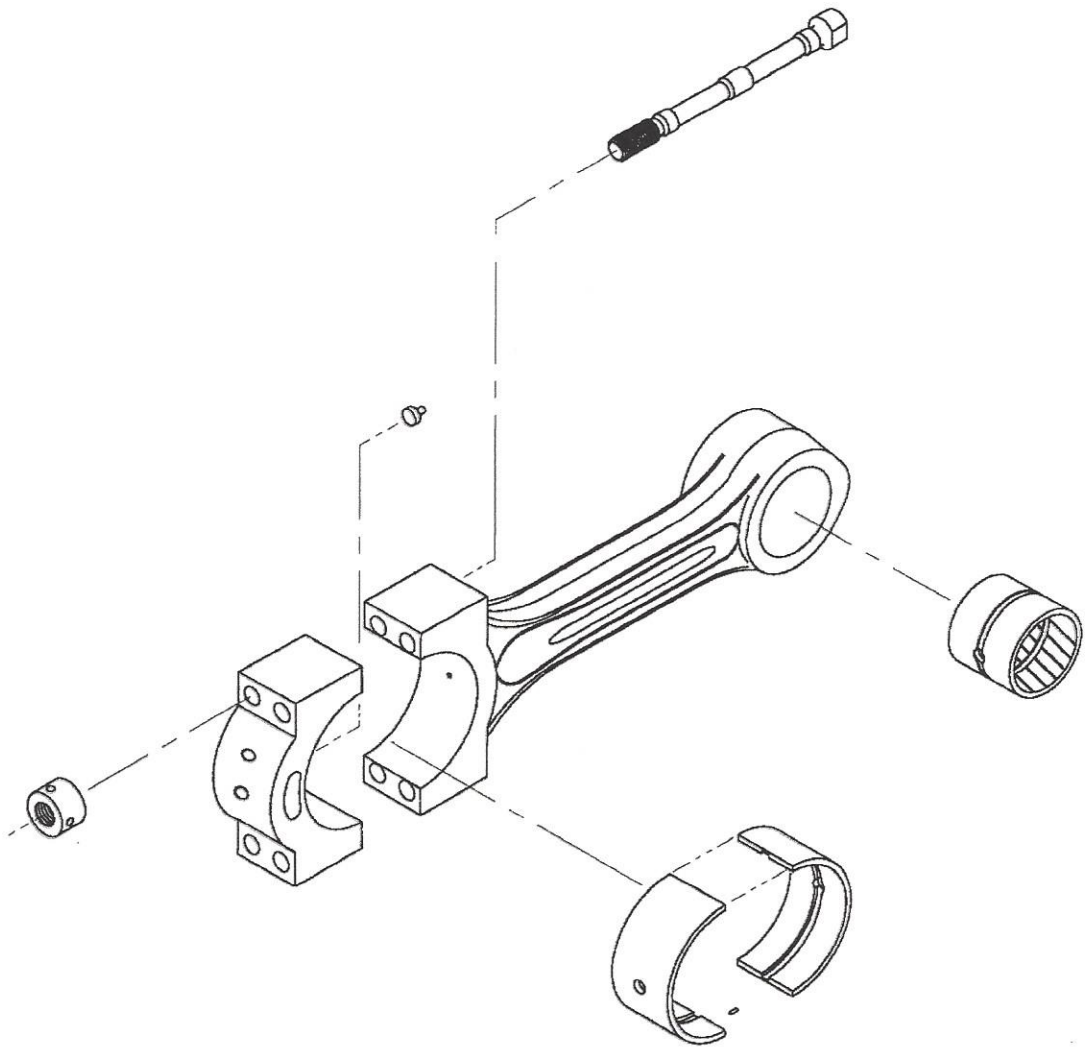
The extension shaft is a steel forging, stress relieved and heat treated. The extension shaft is shipped to the motor manufacturer for installation with the motor rotor.

1-3. BEARINGS

Precision shimless main and crankpin bearings are made of aluminum that use a microbabbit coating for break-in and long operating life. Tri-metal bearings are also available. No adjustments to the bearings are required. All bearings are pressure lubricated from a completely packaged lube oil console designed for the application.

1-4. CONNECTING RODS

The connecting rods (Figure 1-5) are made of die-forged steel. The connecting rod is rifle-drilled for positive crosshead pin lubrication. A bronze bushing is located in the eye of the connecting rod. The connecting rod and cap are match marked to facilitate realignment.



TP-4979

Figure 1-5. Connecting Rod

1-5. CROSSHEADS

The piston rod-to-crosshead joint (Figure 1-6) uses a flanged connection with multiple studs. The assembly consists of a drilled flange that is fastened onto the piston rod and necked-down studs that are threaded into the crosshead. The flange is then installed over the necked-down studs that are hydraulically tensioned with special tension nuts to complete the connection.

An adjusting plate is used to adjust piston rod runout and two shim plates are used to set cylinder end clearances. Both piston rod runout and cylinder end clearances are set at the factory prior to shipment; no further adjustment is required, except to adjust piston rod runout to compensate for wear and as new or different components are installed. Piston rod runout adjustment is achieved by installing and adjusting four capscrews located in the O.D. of the adjusting plate (two in the vertical plane and two in the horizontal plane). Crosshead shoe shims are used to set crosshead-to-guide running clearance.

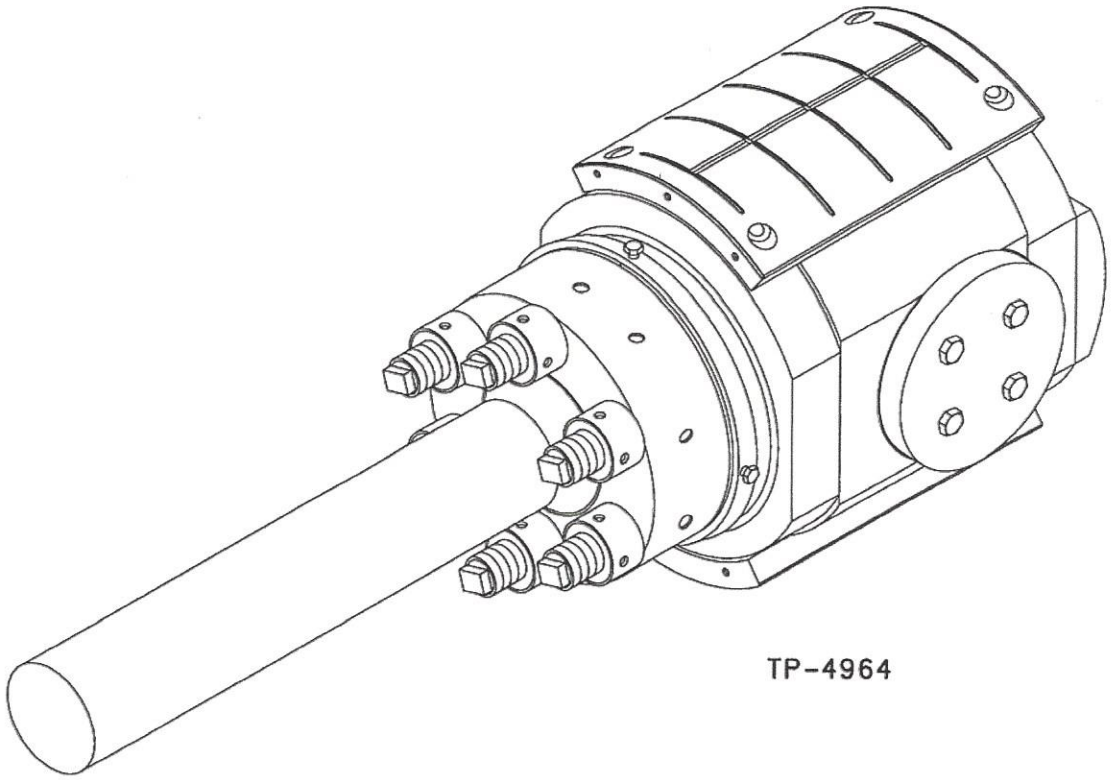


Figure 1-6. Flanged Crosshead

1-6. DISTANCE PIECES

Distance pieces are selected for each job-specific application. Single or two-compartment distance pieces are available with large gas-tight covers that provide access for packing maintenance. External bolting is used between mating components along with O-ring face seals. Distance pieces are vented or purged as the application requires.

1-7. CYLINDERS

A complete selection of lubricated or non-lubricated (NL) cylinders are available to meet the compression requirements of each application. Cylinder materials include nodular iron, cast steel, fabricated carbon or stainless steel, and forged steel. Flange-type liners are supplied as standard. The flange-type liner uses the clamping force of the outer head to hold the liner in place and to prevent the liner from rotating during operation. Cylinder frame head, outer head and valve covers have studded connections. O-ring type valve covers improve sealing and reduce fugitive emissions.

Foundation-mounted cylinder supports maintain cylinder alignment and minimize strain on the cylinder connections.

A metal nameplate (shown in Figure 1-7) attached to each cylinder provides important data about the cylinder.

FRAME AND ACCESSORIES PARTS INDEX

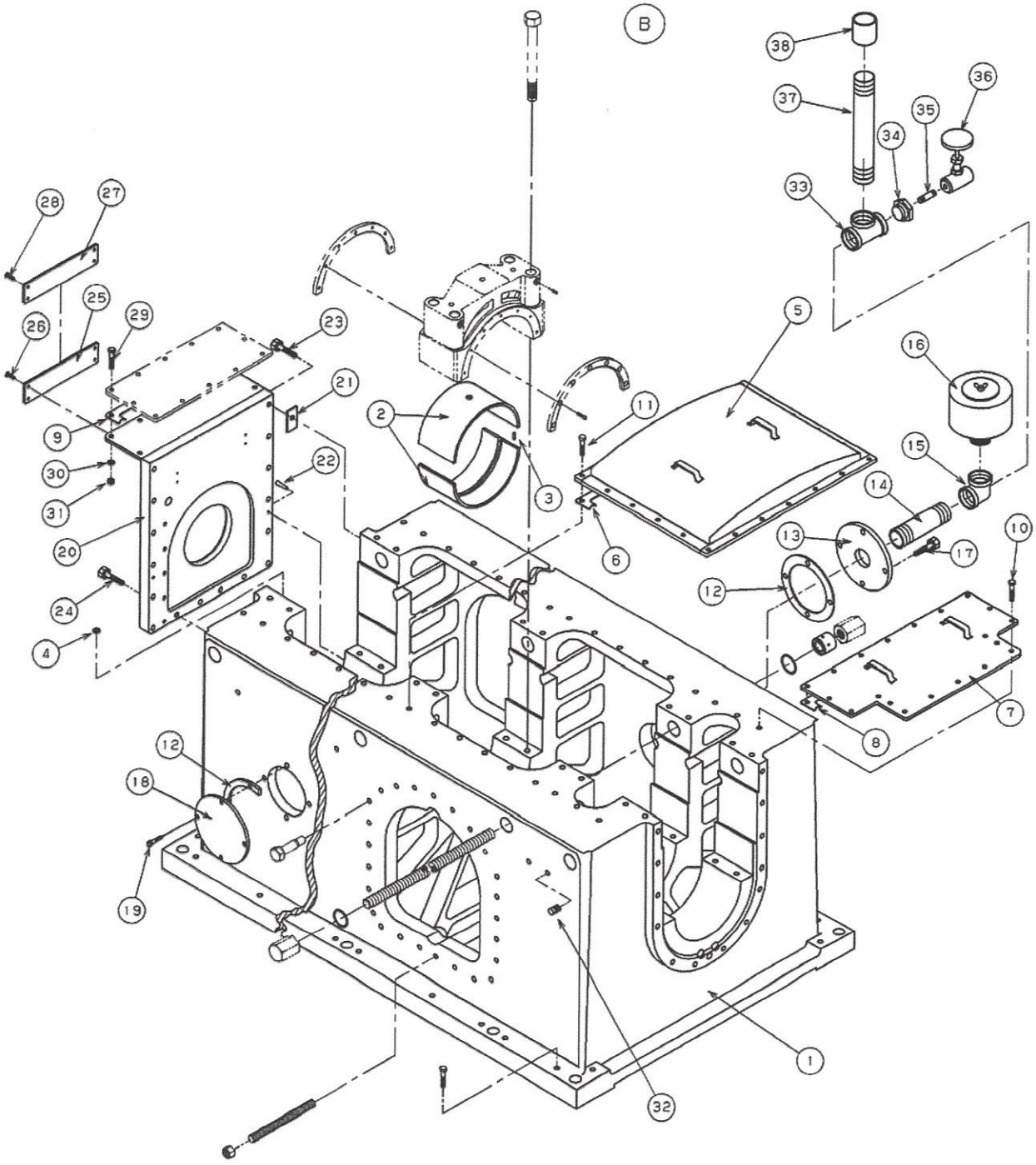
XHH3579/80

MISCELLANEOUS PARTS

* NOT ILLUSTRATED
\+ SEE ACCESSORY LITERATURE SECTION
\# SEE DRAWING SECTION

PARTS LIST

4-CYLINDER FRAME ASSEMBLY



H62604, REV. B

PARTS LIST

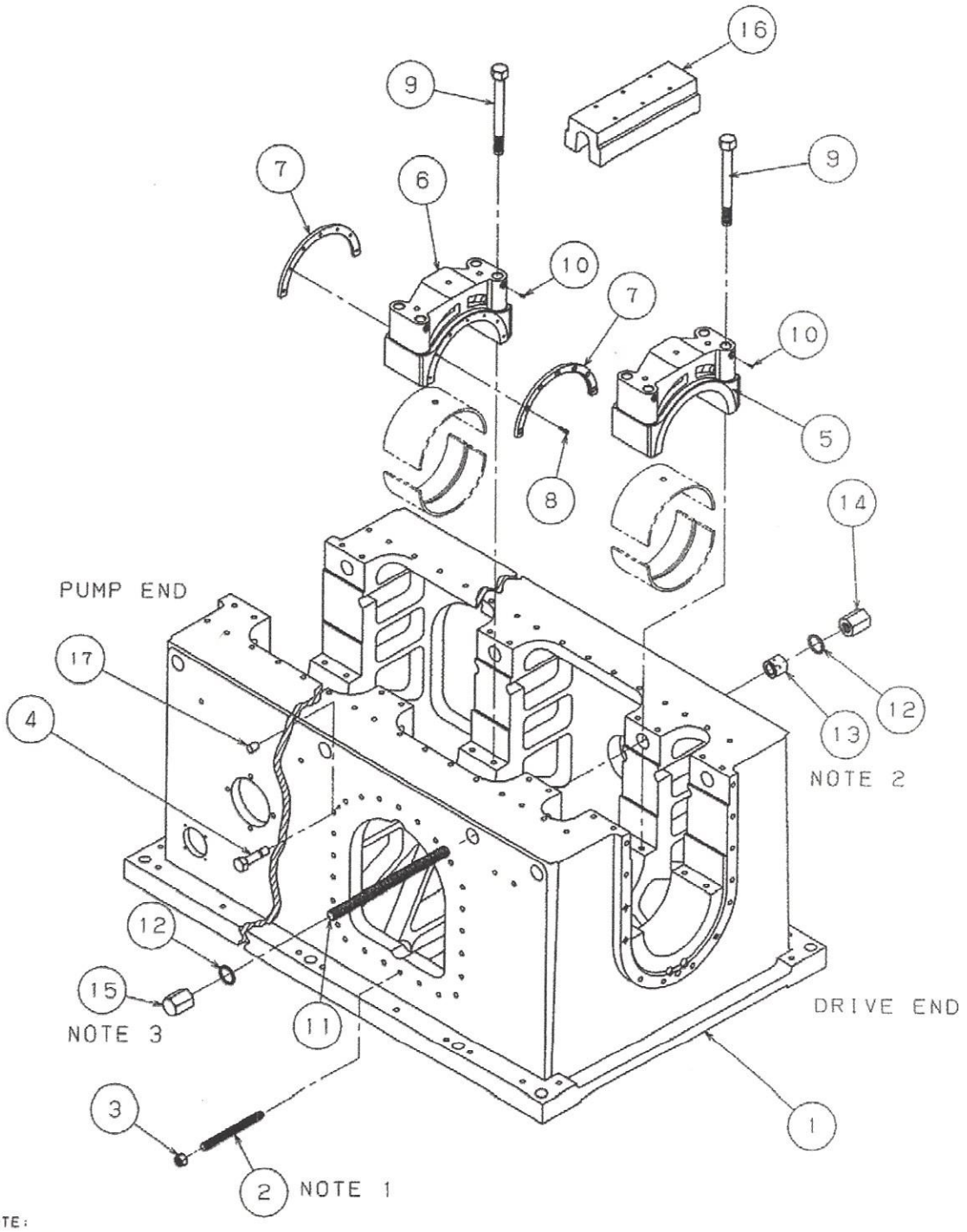
FRAME 4 CYL MLH62604G9 REV. 08E0803

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.MLH62605G5	FRAME 4 CYL		1.00	PC	
2	.1R45251BP1PY1	BEARING MAIN		6.00	PC	OEM
4	.W144826A	STOP BEARING		6.00	PC	OEM
5	.MLF38262G1	COVER FRAME TOP		4.00	PC	
6	.W44647	GASKET FR TOP CVR		4.00	PC	ROCEM
7	.MLH62508G1	COVER FRAME TOP DE		1.00	PC	
8	.H62511	GASKET FR TOP CVR		1.00	PC	ROCEM
9	.W66415	GASKET PE TOP CVR		1.00	PC	ROCEM
10	.35A2C219	CAPSCREW		21.00	PC	
11	.35A2C220	CAPSCREW		88.00	PC	
12	.W27805D	GASKET HAND HOLE		4.00	PC	ROCEM
13	.MLR77331P2G1	COVER FR BREATHER		2.00	PC	
14	.2SCH40S4.0C	NIPPLE		2.00	PC	
16	.W82559H	BREATHER		2.00	PC	ROCEM
17	.35A2C324	CAPSCREW		16.00	PC	
18	.R77329P1	COVER HAND HOLE		2.00	PC	
19	.35A2C321	CAPSCREW		16.00	PC	
20	.MLH24152P3G1	COVER PUMP END		1.00	PC	
21	.W44659	GASKET PE COVER		1.00	PC	ROCEM
22	.12A13C84	PIN TAPER		2.00	PC	
23	.35A2C330	CAPSCREW		12.00	PC	
24	.35A2C328	CAPSCREW		4.00	PC	
25	.R78546K	NAMEPLATE D-R		1.00	PC	
26	.77A2C144P	MACHSCREW		4.00	PC	
27	.W45100	NAMEPLATE ROTATION		1.00	PC	
28	.125A2C45P	MACHSCREW		4.00	PC	
29	.35A2C218	CAPSCREW		7.00	PC	
32	.32A7S6	PIPE PLUG RD HD		8.00	PC	

+SEE ACCESSORY LITERATURE SECTION

PARTS LIST

4-CYLINDER FRAME (BARE)



NOTE:

1. SET STUDS (ITEM 2) USING ANAEROBIC SEALANT PER D-R STD 97.007-99.
2. HYDRAULICALLY TENSION NUTS (ITEM 13) SEE D-R STANDARD 95,000-05.
3. TIE STUD SET DEPTH INTO NUT MUST BE 2.50" DO NOT USE ANAEROBIC SEALANT. THE PROJECTION OF STUD ON OPPOSITE SIDE OF FRAME SHOULD BE 4.50"

H62605, REV. B

PARTS LIST

FRAME 4 CYL MLH62605G5 REV. 06E0279

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.G10841AMP2	FRAME 4 CYLINDER		1.00	PC	
2	.R78164MX09028	STUD		108.00	PC	
3	.46A4K11	NUT HVY HEX		108.00	PC	
5	.1H23832BP20	CAP MB		5.00	PC	
6	.1W117075R4	CAP MB THRUST		1.00	PC	
	..W132379	INSTRUCTIONS BRG C		1.00	PC	
7	.R20575P3	SHOE THRUST		1.00	PC	OEM
8	.77A2B202	MACHSCREW		14.00	PC	
9	.W44701	BOLT MB CAP		24.00	PC	
10	.110A2A48	SETSCREW HEX SKT		24.00	PC	EM
11	.R78164MX18228	STUD		6.00	PC	
13	.R83250T10	NUT ROUND TORQUE		6.00	PC	M
14	.R83276F	NUT FRAME TIEROD		6.00	PC	
15	.R83276F	NUT FRAME TIEROD		6.00	PC	
16	.R74650	SPACER M B TIE ROD		6.00	PC	
17	.17A13A465	DOWEL PIN		4.00	PC	ROCEM

+SEE ACCESSORY LITERATURE SECTION

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PARTS LIST

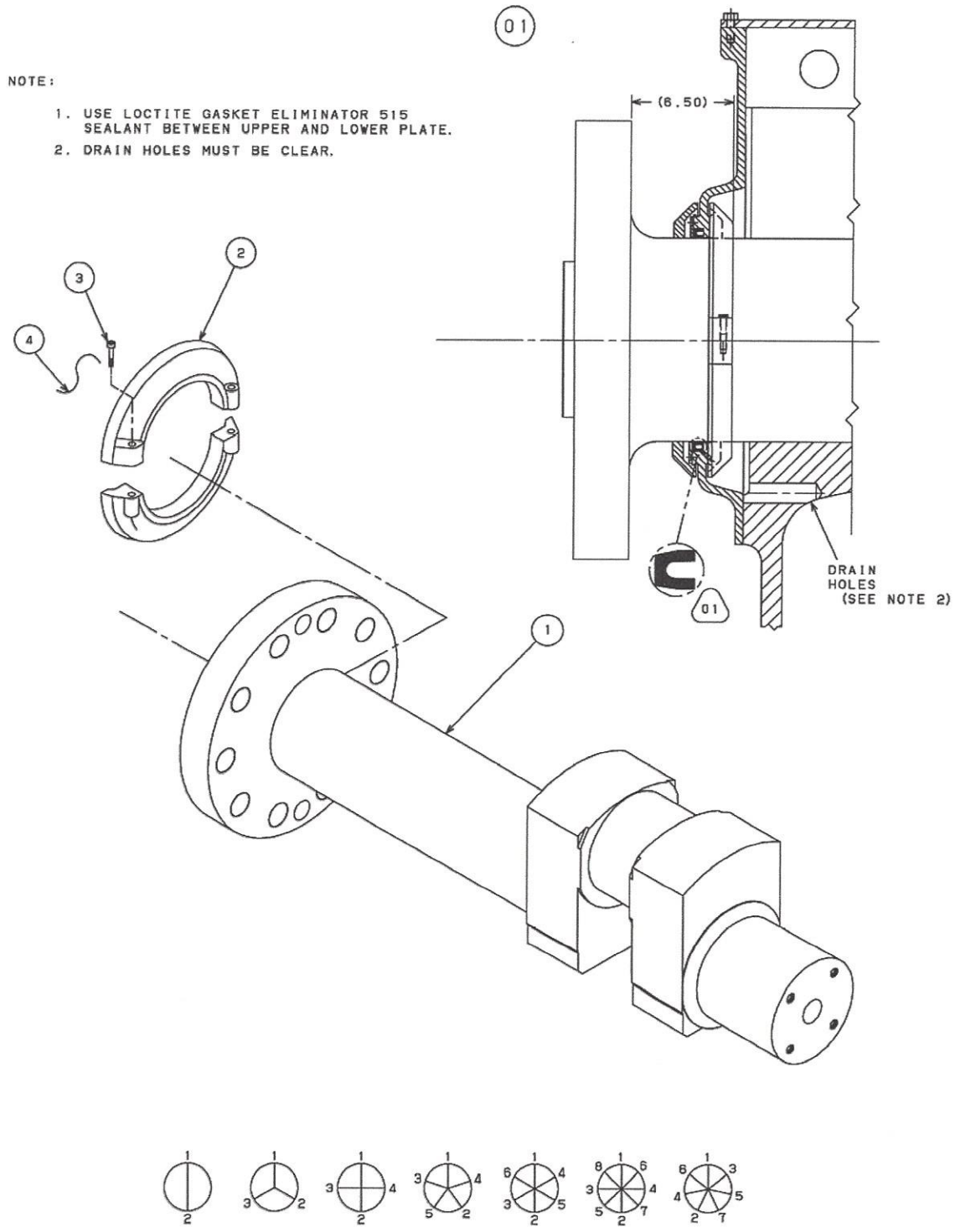
ACCESSORIES LVL FR ML74225AG6 REV. 01

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
	.W95171P2	PLATE LEVELING		1.00	PC	
	.X1001T877	SETSCREW		1.00	PC	EM

+SEE ACCESSORY LITERATURE SECTION

PARTS LIST

CRANKSHAFT ASSEMBLY



F37869P1, REV. 01

PARTS LIST

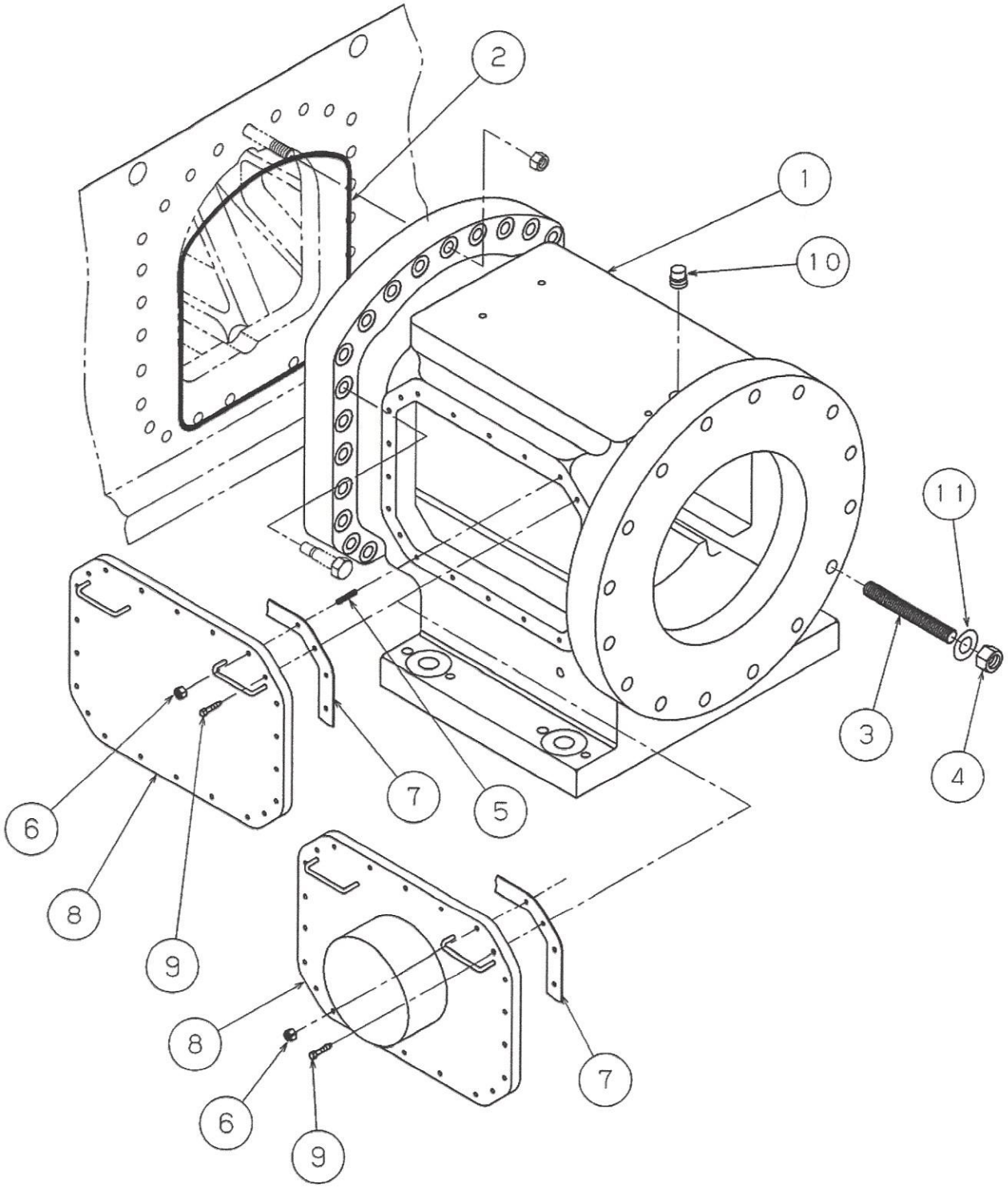
CRANKSHAFT MLF37869P1G3 REV. 07E0455

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.F37869D	CRANKSHAFT		1.00	PC	
2	.1H61734BR1	RING CRKSFT OIL		1.00	PC	M
3	..119A2A206E	CAPSCREW		2.00	PC	
	...119A2A206	CAPSCREW		1.00	PC	
4	.X1636T062	LOCKWIRE STL .062		75.00	IN	

+SEE ACCESSORY LITERATURE SECTION

PARTS LIST

EXTENSION FRAME



H62512A

PARTS LIST

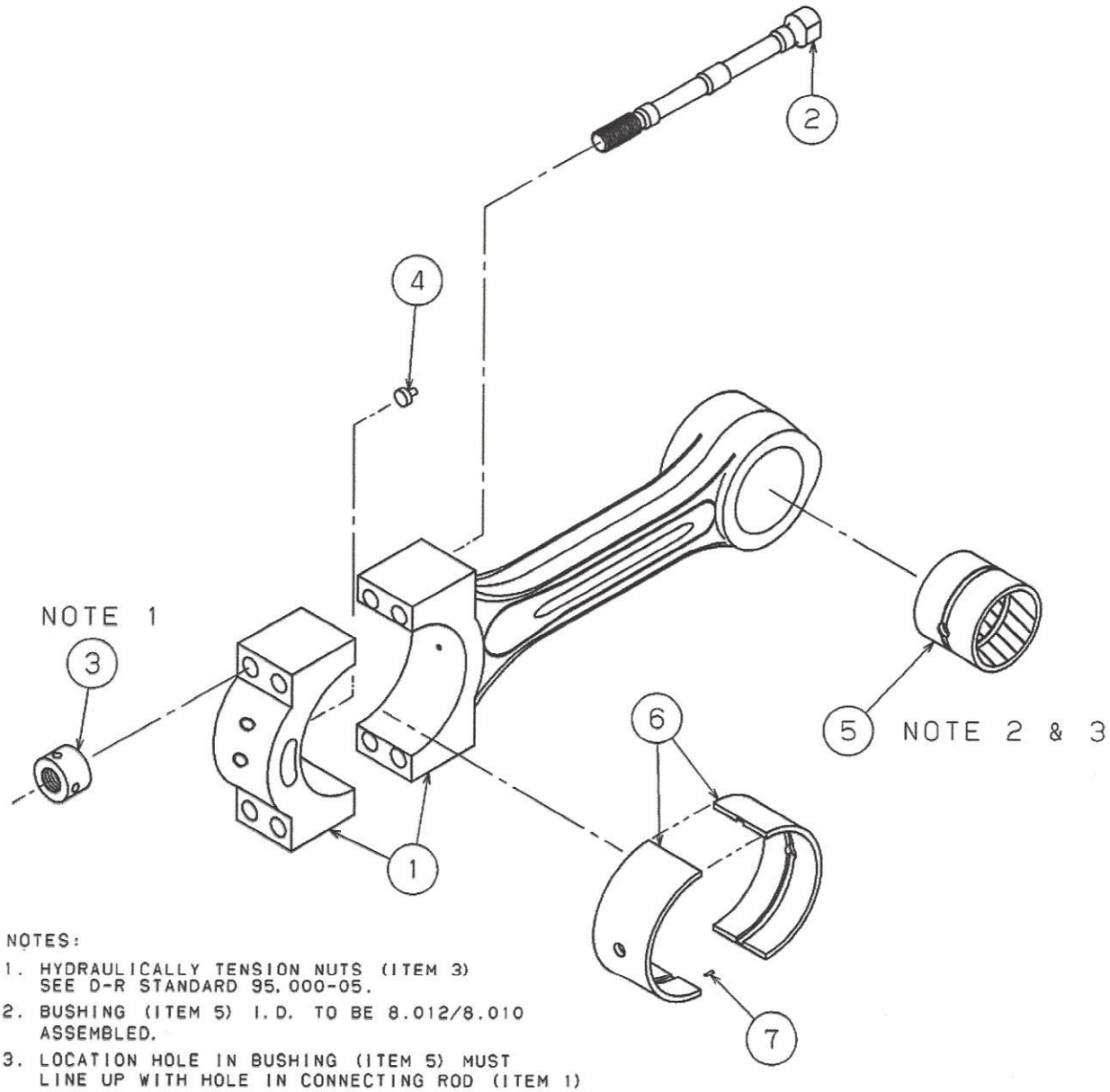
EXTENSION FRAME MLH62512AG2 REV. 01 1997

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.1G12419R1	EXTENSION FRAME		1.00	PC	
2	..20A11CMS1025	ORING		1.00	PC	ROCEM
3	..R78164MX11028	STUD		16.00	PC	
4	..46A4K13	NUT HVY HEX		16.00	PC	
5	..R78164VX04008	STUD		4.00	PC	
6	..38A4C5	NUT		4.00	PC	
7	.H62505	GASKET XHD COVER		2.00	PC	ROCEM
8	.H62504A	COVER FRAME EXT		2.00	PC	
9	.35A2C218	CAPSCREW		40.00	PC	
10	.32A7S9	PIPE PLUG RD HD		1.00	PC	
11	.R83707T12	WASHER		16.00	PC	

+SEE ACCESSORY LITERATURE SECTION

PARTS LIST

CONNECTING ROD



NOTES:

1. HYDRAULICALLY TENSION NUTS (ITEM 3) SEE D-R STANDARD 95.000-05.
2. BUSHING (ITEM 5) I.D. TO BE 8.012/8.010 ASSEMBLED.
3. LOCATION HOLE IN BUSHING (ITEM 5) MUST LINE UP WITH HOLE IN CONNECTING ROD (ITEM 1)

W125097A, REV. B

PARTS LIST

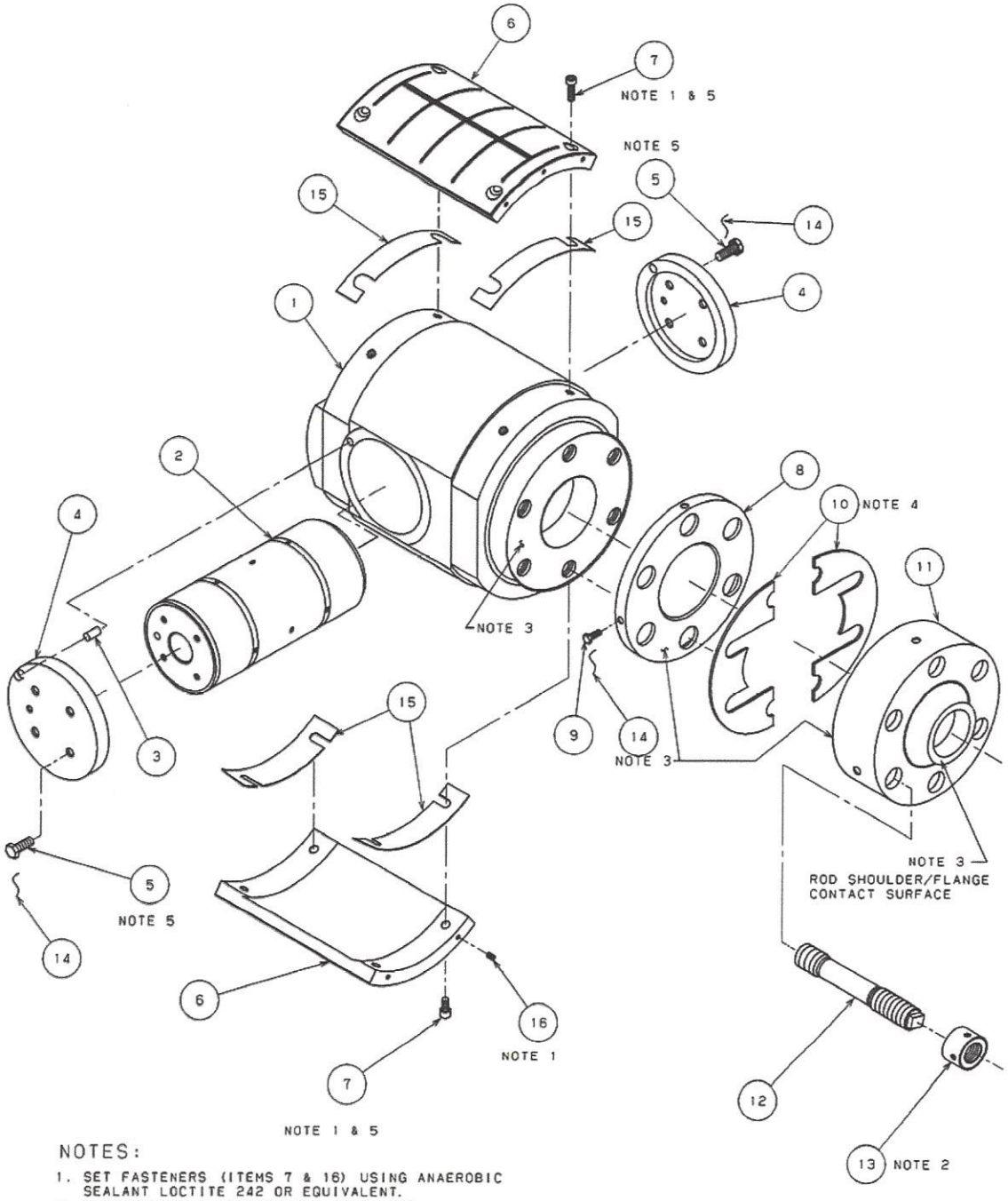
CONNROD COMPR MLW125097AG2 REV. 03E0781

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.1G12500R1	ROD CONNECTING		1.00	PC	
2	..H62196	BOLT CONN ROD		4.00	PC	M
3	..R83250T7	NUT ROUND TORQUE		4.00	PC	M
4	..R83291A	RETAINER ROD BRG		1.00	PC	OEM
5	..H62513	BUSHING CONN ROD		1.00	PC	OEM
6	.1H62514	BEARING		1.00	PC	OEM
7	..25A13C93	ROLLPIN		4.00	PC	ROCEM

+SEE ACCESSORY LITERATURE SECTION

PARTS LIST

CROSSHEAD ASSEMBLY



NOTES:

1. SET FASTENERS (ITEMS 7 & 16) USING ANAEROBIC SEALANT LOCTITE 242 OR EQUIVALENT.
2. HYDRAULICALLY TENSION NUT (ITEM 13) SEE D-R STANDARD 95.000-05.
3. APPLY A THIN COATING OF DOW CORNING G-N MOLYBDENUM DISULPHIDE (M_oS_2) BASED LUBRICANT ON THESE FACES
4. ONLY ONE THICKNESS OF SHIM (ITEM 10) WILL BE USED. CORRECT THICKNESS IS TO BE DETERMINED AT ASSEMBLY.
5. TORQUE TO 40,000 PSI
6. SHOP IS TO POSITION CROSSHEAD WITH DOWEL PIN HOLE ABOVE THE HORIZONTAL CENTERLINE AND ARE TO ALIGN THE EUTECTIC HOLE IN THE PIN WITH THE HOLE IN THE PIN COVER.

H62195, REV. D

PARTS LIST

CROSSHEAD MLH62195G10 REV. 07E0326

ILLUS. NO.	PART NUMBER	PART NAME	KIT	UNITS PER ASSEMBLY	UNIT MEAS	SPARES USAGE CODE
1	.F41543	CROSSHEAD		1.00	PC	
2	.R83255B	PIN CROSSHEAD		1.00	PC	EM
3	.17A13A289	DOWEL PIN		1.00	PC	ROCEM
4	.R83260B	CAP CROSSHEAD PIN		2.00	PC	
5	.35A2D375E	CAPSCREW		8.00	PC	
6	.H62194	SHOE CROSSHEAD		2.00	PC	OEM
	..34560086	BABBITT .187 SPRAY		18.00	LB	
	..34560102	WIRE .125 DIA METCO		.10	LB	
7	.119A2A344	CAPSCREW		8.00	PC	
8	.R83284B	PLATE ADJUSTING		1.00	PC	
9	.36A2D323E	CAPSCREW		4.00	PC	
10	.R83285BT1	SHIM CROSSHEAD		1.00	PC	OEM
11	.H62097D	FLANGE CROSSHEAD		1.00	PC	
12	.R83274X13098	STUD		6.00	PC	
13	.R83250T6	NUT ROUND TORQUE		6.00	PC	M
14	.X1636T062	LOCKWIRE STL .062		115.00	IN	
15	.1W151880B	SHIM XHD SHOE		4.00	PC	OEM
16	.109A2A90	SETSCREW HEX SKT		8.00	PC	EM
	.MLH62195G17	CROSSHEAD		1.00	PC	M

+SEE ACCESSORY LITERATURE SECTION