PARTS LIST

FB-1600
TRIPLEX MUD PUMP

(EPL-1339)

NATIONAL-OILWELL
P.O. BOX 4638
HOUSTON, TEXAS 77210-4638

Issue Date: August 2000

Printed in U.S.A.

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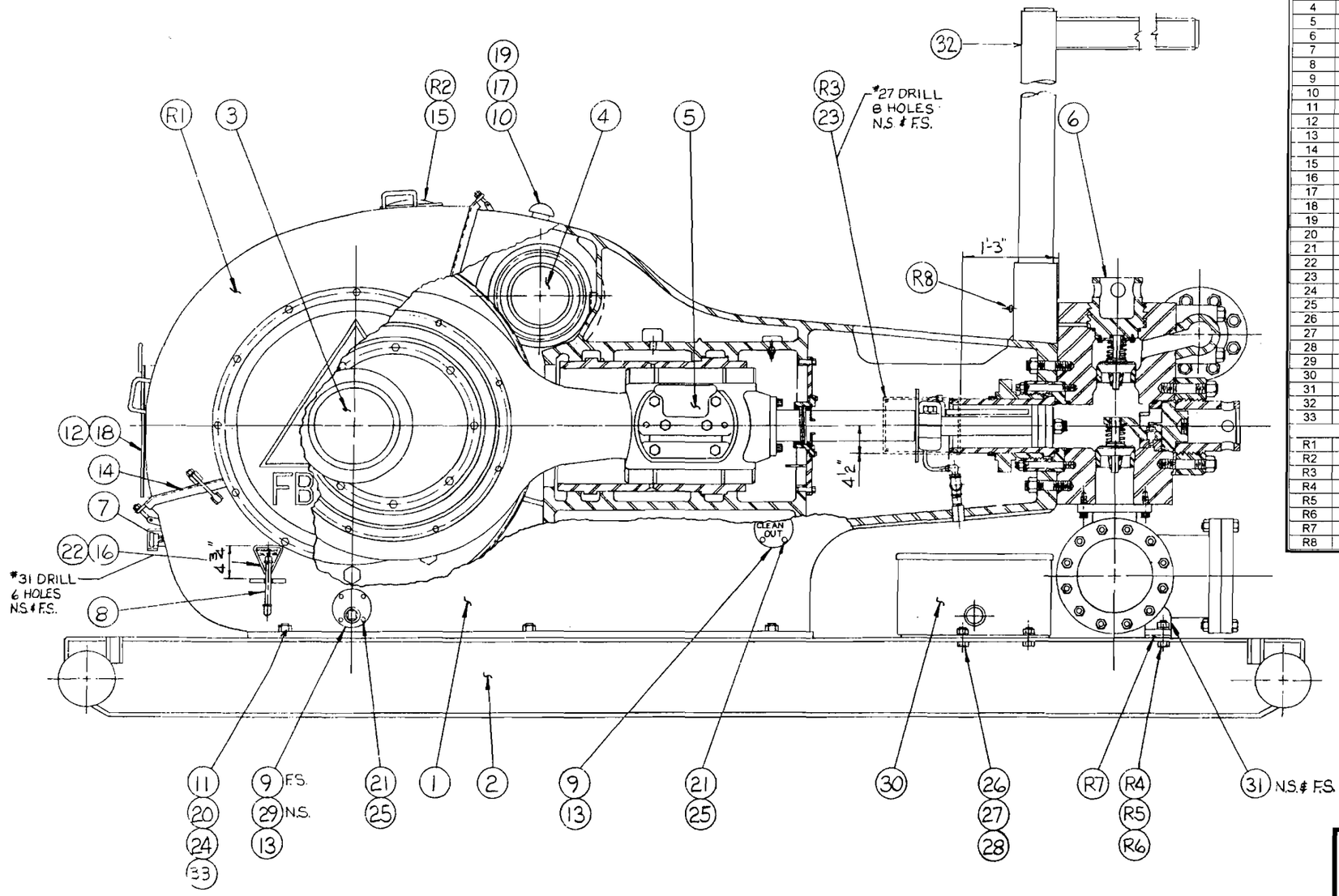
FB-1600
TRIPLEX MUD PUMP

EPL-1339

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1	PL 6316-0374-00	General Assembly, FB-1600 Triplex Pump	F
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10	PL 6923-0016-00	3" Type B Shear Relief Valve Assembly	DD
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Issue Date: August 2000

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SEE 6316-0376-00
DIMENSIONAL DRWG.

BILL OF MATERIAL

ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0374-00	GENERAL ASSEMBLY, FB-1600 TRIPLEX MUD PUMP (CONSISTS OF THE FOLLOWING)
1	1	6316-0226-01	FRAME ASSEMBLY
2	1	6316-0310-00	SKID, MAIN
3	1	6316-0099-00	CRANKSHAFT ASSEMBLY
4	1	6316-0098-00	PINION SHAFT ASSEMBLY
5	1	6316-0183-00	CROSSHEAD ASSEMBLY
6	1	6316-0375-00	FLUID END ASSEMBLY
7	1	6316-0227-00	LUBRICATION ASSEMBLY
8	2	6397-0668-00	INDICATOR ASSEMBLY, OIL LEVEL
9	3	6397-264-00	COVER, CLEAN-OUT
10	1	6397-0186-00	CAP, BREATHER
11	1	6316-0259-00	SHIM SET (AS REQUIRED)
12	1	6316-0127-00	GASKET, DOOR
13	4	7502-0581-00	GASKET, CLEAN-OUT COVER
14	1	7602-5940-19	GASKET, GEAR CASE COVER
15	2	7502-0103-00	GASKET, INSPECTION DOOR
16	2	7506-0032-00	PLATE, OIL LEVEL NAME
17	1	7602-1070-13	COPPER WOOL (2 OZ.)
18	1	6316-0126-00	PLATE, COVER
19	1	7507-0200-00	STUD, BREATHER CAP
20	6	7601-0338-08	CAPSCREW, 1" - 8 X 3" LG. HEX HEAD
21	16	7601-0330-51	CAPSCREW, 1/2" - 13 X 1-1/2" LG. HEX HEAD
22	6	7601-1060-06	SCREW, #6 X 3/8" P.K. DRIVE
23	8	7601-1060-09	SCREW, #8 X 5/8" P.K. DRIVE
24	6	7601-0720-17	NUT, 1"-8 HEAVY HEX LOCK
25	16	7601-1330-04	WASHER, 1/2" PLAIN
26	4	7601-0330-77	CAPSCREW, 5/8" - 11 X 1-3/4" LG. HEX HEAD
27	4	7601-0610-12	NUT, 5/8" - 11 HEX
28	4	7601-1320-30	WASHER, 5/8" LOCK
29	1	6316-0349-00	COVER WITH COUPLING, CLEAN-OUT
30	1	6317-0164-00	TANK, 90 GALLON RECIRCULATING
31	2	6316-0284-00	FOOT, MOUNTING
32	1	6316-0020-20	CRANE, F.E. EXPENDABLE SERVICE
33	6	7601-1430-03	WASHER, 1" HARDENED
			REFERENCE ITEMS
R1	1	6316-0068-00	COVER, GEAR CASE
R2	2	7510-0201-00	DOOR, INSPECTION
R3	2	7506-0419-50	PLATE, NAME
R4	4	7601-0331-34	CAPSCREW, 1" - 8 X 3-1/4" LG. HEX HEAD
R5	4	7601-0610-18	NUT, 1" - 8 HEX
R6	8	7601-1320-33	WASHER, 1" LOCK
R7	2	6316-0279-00	SPACER
R8	1	7601-2070-08	FITTING, 1/8" GREASE

NATIONAL OILWELL
Houston, Texas, U.S.A.

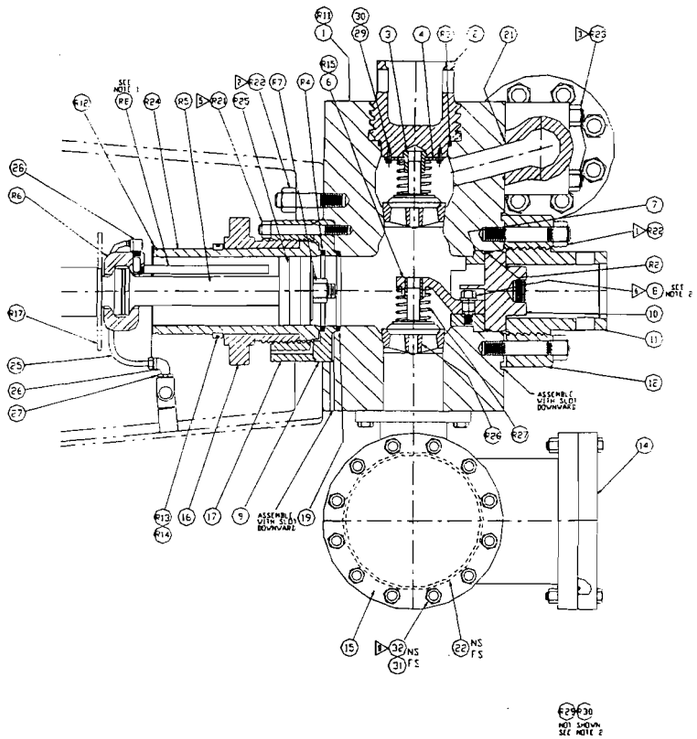
GENERAL ASSEMBLY
FB-1600 TRIPLEX MUD PUMP

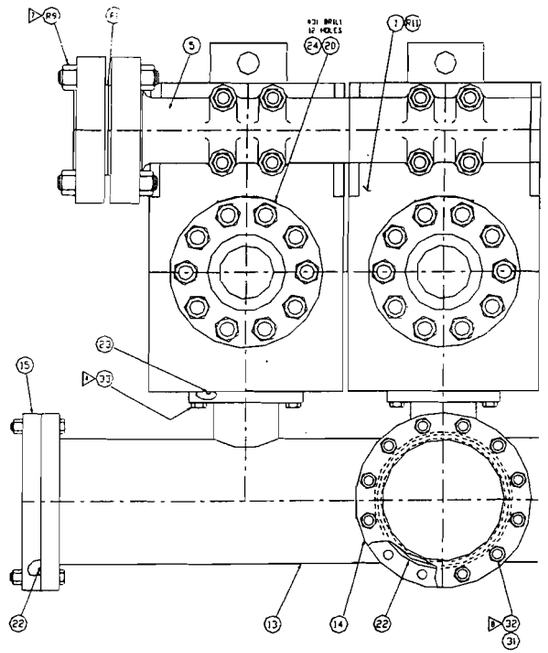
SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0374-00	F

BILL OF MATERIAL			
ITEM	REQ'D	PART NO	DESCRIPTION
---	---	6316-0375-00	FLUID END ASSMBLY (CONSISTS OF THE FOLLOWING)
1	3	6316-0357-00	FLUID END, STUDDED
2	3	6316-0039-00	COVER, VALVE POT
3	3	6397-0575-00	GUIDE, UPPER VALVE
4	3	6397-0603-00	RETAINER, VALVE GUIDE
5	1	6316-0043-00	MANIFOLD, DISCHARGE
6	3	6316-0354-00	GUIDE, BUSHING AND LOWER VALVE
7	3	6316-0363-00	RING, ALIGNMENT
8	3	6316-0360-00	BOLT, VALVE GUIDE LOCK
9	3	6316-0365-00	PLATE, WEAR
10	3	6316-0364-00	PLUG, CYLINDER HEAD
11	3	6316-0362-00	HEAD, CYLINDER
12	3	6316-0361-00	RING, CYLINDER THREAD
13	1	6316-0201-00	MANIFOLD, SUCTION
14	1	6316-0105-00	FLANGE, SUCTION
15	1	6317-0074-00	FLANGE, BLIND
16	3	6316-0367-00	LOCK, LINER
17	3	6316-0366-00	RING, LINER THREAD
19	3	6316-0373-00	SEAL
20	3	7506-0378-00	PLATE, INFORMATION
21	3	7602-1600-25	"O"-RING
22	3	7602-1600-52	"O"-RING
23	3	7602-1600-61	"O"-RING
24	12	7601-1060-06	SCREW, NO. 6 X 3/8 P.K. DRIVE
25	3	7503-0230-49	HOSE ASSEMBLY 1/2"
26	3	7601-2570-89	ELBOW, 1/2" X 90 DEG. GALV. STREET
27	3	7601-2530-40	BUSHING, 1" X 1/2" GALV.
28	3	7601-2090-40	ADAPTER, 90 DEG. ELBOW
29	12	7501-0051-00	SCREW, RETAINER
30	1	7602-5280-72	WIRE, .063 DIA. X 6 FT. LG. SOFT
31	36	7601-0331-39	CAPSCREW, 1" - 8 X 5" LG. HEX HEAD
32	36	7601-0630-20	NUT, 1" - 8 HEAVY HEX
33	18	7601-0333-30	CAPSCREW, 7/8 " - 9 X 2-1/2" LG. GR. 5 HEX HEAD
LOOSE PARTS REFERENCE			
R1	2	7602-0661-11	SEAL, RING JOINT
R2	3	6316-0369-00	SEAL, HEAD
R3	3	6316-0092-00	SEAL, VALVE POT COVER
R4	3	6316-0373-00	SEAL, LINER
R5	3	6316-0359-00	ROD, PISTON
R6	3	6316-0107-11	CLAMP, PISTON ROD
R7	3	7601-0720-58	NUT, 1-1/2" - 8 HEAVY LOCK
R8	3	7601-2588-50	PIPE, 1/2" X 13" LG. GALV. (T.O.E.)
R9	16	7601-1260-47	STUD WITH NUTS, 1-1/2" - 8 UNC -2A X 10" LG.
MISCELLANEOUS PARTS REFERENCE			
R11	3	6316-0356-00	FLUID END
R12	3	6316-0164-00	COVER, LINER END
R13	3	6316-0333-00	RING, LINER LOCK
R14	3	7602-1600-44	"O"-RING
R15	3	6316-0096-00	BUSHING, VALVE GUIDE
R17	3	6316-0093-00	DISC, FLUID BAFFLE
R21	12	7601-0610-18	NUT, 1" - 8 HEX

BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
R22	48	7601-0630-17	NUT, 1-1/2" - 8 HEAVY HEX
R23	12	7601-0630-24	NUT, 1-1/4" - 8 HEAVY HEX
OPTIONAL PARTS REFERENCE			
R24	3	6316-0368-00	LINER, BASIC
R25	3		PISTON
R26	6		VALVE AND SEAT
R27	6		SPRING, VALVE
R29	1	7601-3010-65	WRENCH, BOX
R30	1	6316-0392-00	EXTENSION, WRENCH

TORQUE NUTS TO THESE VALUES			
SYM	LB-FT	THREAD	DESCRIPTION
1	1575-1625	1-1/2 - 8	CYL. THREAD RING TO BLOCK
2	1575-1625	1-1/2 - 8	FLUID END TO FRAME
3	950-1000	1-1/4 - 8	DISCHARGE MANIFOLD TO BLOCK
4	220-250	7/8 - 9	SUCTION MANIFOLD TO BLOCK
5	470-510	1" - 8	LINER THREAD RING TO BLOCK
6	300-340	7/8 - 9	LOWER VALVE GUIDE LOCK BOLT
7	1575-1625	1-1/2 - 8	DISCHARGE MANIFOLD FLANGE
8	184-194	1" - 8	SUCTION MANIFOLD FLANGE





NOTES:

1. ITEM R8, 1/2 PIPE NIPPLE, WILL ACCOMMODATE 5-1/2 MINIMUM LINER.
2. USE ITEMS R29 AND R30 TO TIGHTEN VALVE GUIDE LOCK BOLT, ITEM 8.

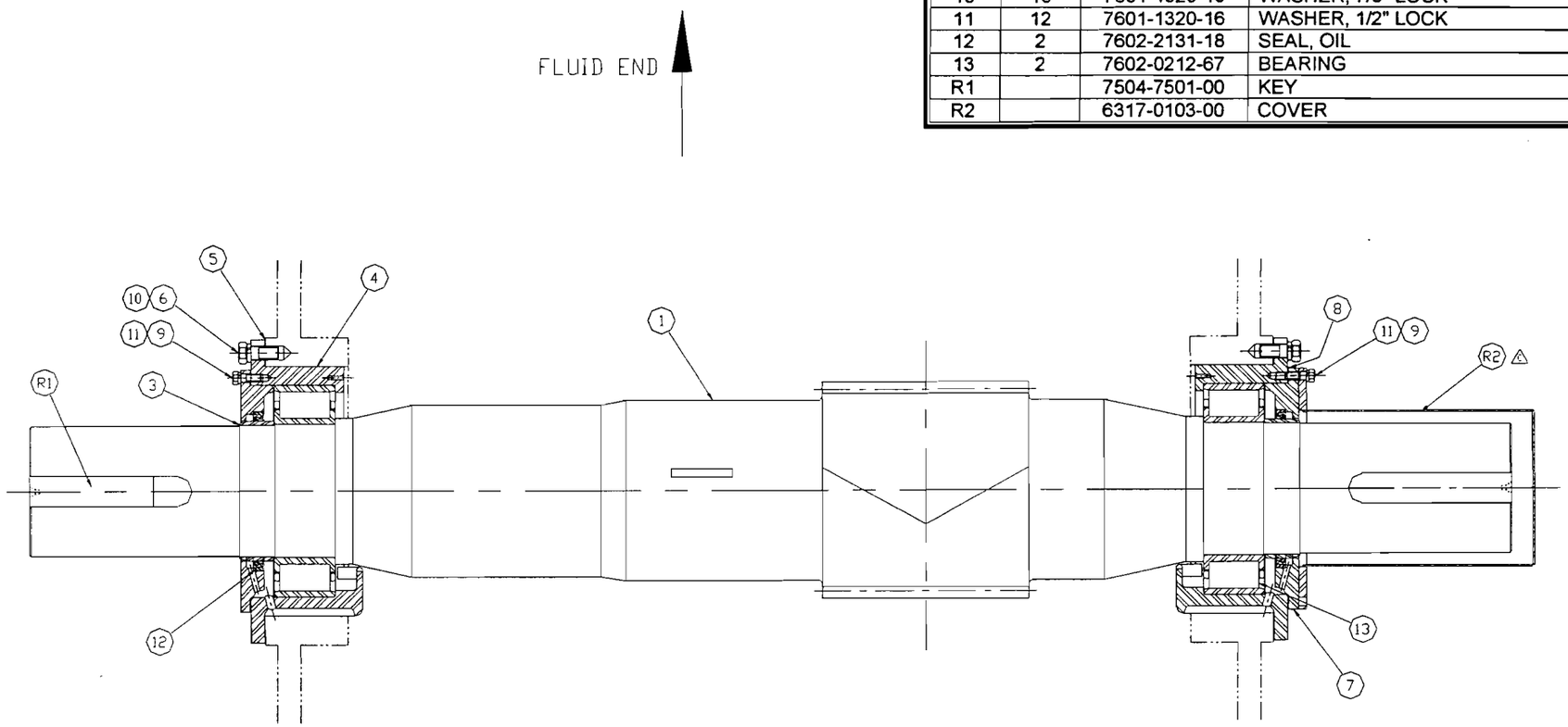
NATIONAL OILWELL

Houston, Texas, U.S.A.

FLUID END ASSEMBLY
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0375-00	M

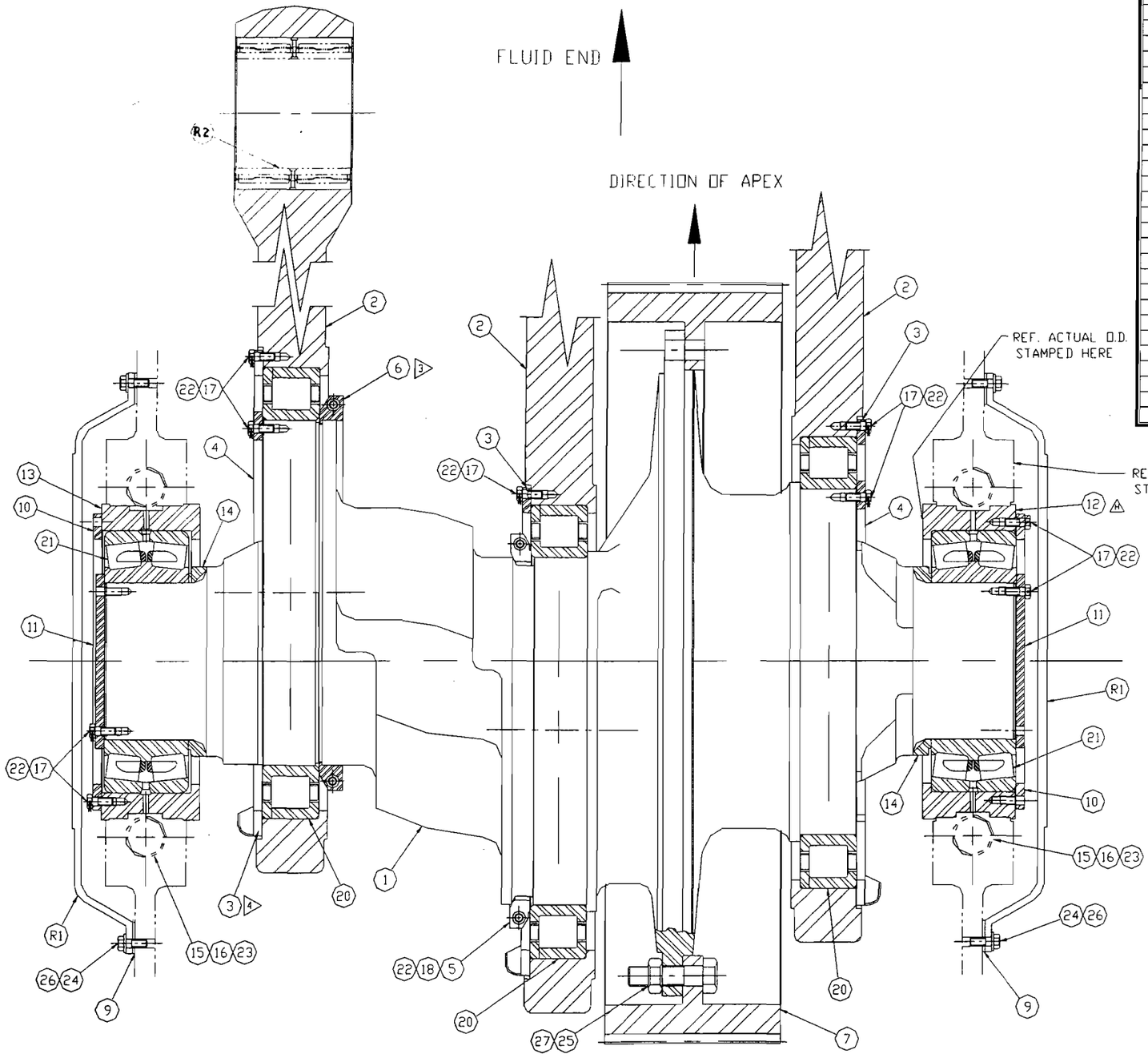
BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0098-00	PINION SHAFT ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	1	6317-0027-00	SHAFT, PINION
3	2	6301-0002-00	RING, OIL SEAL WEAR
4	2	6317-0024-00	CARRIER, PINION BEARING
5	2	7502-0840-00	GASKET, PINION BEARING CARRIER
6	16	7601-0336-00	CAPSCREW, 7/8" - 9 X 2" LG. GR. 5 HEX HEAD
7	2	6317-0023-00	CARRIER, OIL SEAL
8	2	7502-0841-00	GASKET, OIL SEAL CARRIER
9	12	7601-0332-20	CAPSCREW, 1/2" -13 X 1-1/2" LG. GR. 5 HEX HEAD
10	16	7601-1320-19	WASHER, 7/8" LOCK
11	12	7601-1320-16	WASHER, 1/2" LOCK
12	2	7602-2131-18	SEAL, OIL
13	2	7602-0212-67	BEARING
R1		7504-7501-00	KEY
R2		6317-0103-00	COVER



NATIONAL OILWELL
Houston, Texas, U.S.A.

PINION SHAFT ASSEMBLY
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0098-00	D



BILL OF MATERIAL

ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0099-00	CRANKSHAFT ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	1	6316-0021-01	CRNAKSHAFT
2	3	6316-0023-00	STRAP, ECCENTRIC
3	3	6316-0034-00	RETAINER, OUTER RACE
4	2	6316-0070-00	RETAINER, INNER RACE
5	1	6316-0071-00	RETAINER, INNER RACE (CENTER)
6	1	6317-0176-00	RETAINER, INNER BEARING
7	1	6316-0030-00	GEAR, ECCENTRIC RING
9	2	6316-0049-00	GASKET, MAIN BEARING COVER
10	2	6316-0032-00	RETAINER, MAIN BEARING OUTER RACE
11	2	6316-0031-00	RETAINER, MAIN BEARING INNER RACE
12	1	6316-0037-00	CARRIER, BEARING (LEFT)
13	1	6316-0288-00	CARRIER, BEARING (RIGHT)
14	2	6316-0091-00	SPACER, MAIN BEARING
15	4	6316-0077-00	BOLT, MAIN BEARING HOUSING
16	4	6316-0097-00	SHIM SET, MAIN BEARING HOUSING
17	70	7501-0004-00	SCREW, 5/8" X 1-1/2" LG. DRLD. HEX HEAD
18	2	7501-1256-00	CAPSCREW, 5/8" X 4-1/2" LG. DRLD. SOCKET HEAD
20	3	7602-0212-68	BEARING, ECCENTRIC
21	2	7602-0201-37	BEARING, MAIN
22	1	7602-5289-60	WIRE, 1/16" DIA. X 80 FT. LONG SOFT IRON
23	1	7602-5200-60	WIRE, 11 GA. X 5 FT. LONG SOFT IRON
24	24	7601-0330-77	CAPSCREW, 5/8" - 11 X 1-3/4" LG. HEX HEAD
25	12	7601-0335-97	CAPSCREW, 1-1/2" - 6 X 5-1/2" LG. GR. 5 HEX HEAD
26	24	7601-1330-05	WASHER, 5/8" SMALL O.D. PLAIN
27	12	7601-0720-20	NUT, 1-1/2" - 6 HEAVY HEX LOCK
R1	2	6316-0042-00	COVER, MAIN BEARING
R2	3	6301-0038-00	BEARING, CROSSHEAD
R3	1	7602-3010-47	WRENCH, MAIN BEARING BOLT

NOTES:

1. SHIM TO OBTAIN NET FIT OF .004" TIGHT BETWEEN CARRIERS AND FRAME. REFER TO 6399-0066-00 FOR DETAILS.
2. TORQUE MAIN BEARING BOLTS TO 9,750 FT. LBS. CHECK ROLLERS TO BE SURE NO MORE THAN 4 ARE TIGHT (EXCEPT AT BOTTOM DUE TO WEIGHT) . ZERO TIGHT ROLLERS IS OK.

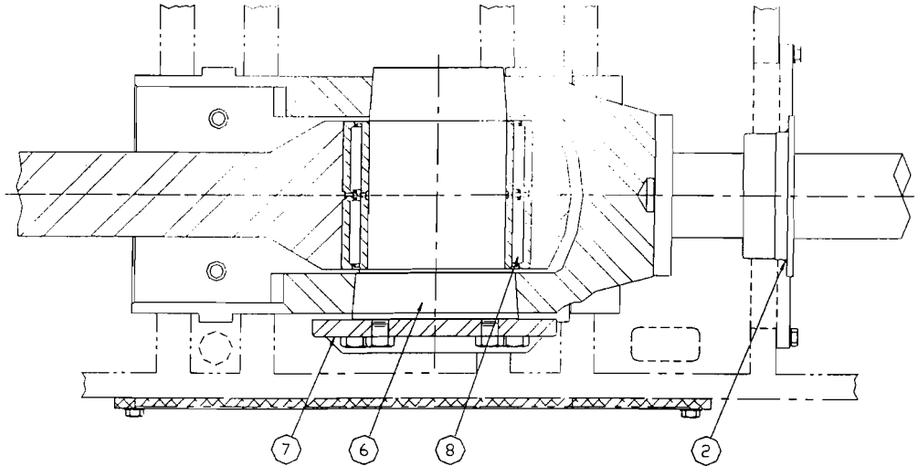
△3 1. ASSEMBLE RETAINER ITEM 6 SNUG.
2. INSTALL BEARING HARD AGAINST RETAINER.
3. LET BEARING COOL TO ROOM TEMPERATURE.
4. TIGHTEN SAFTEY WIRE RETAINER BOLTS.

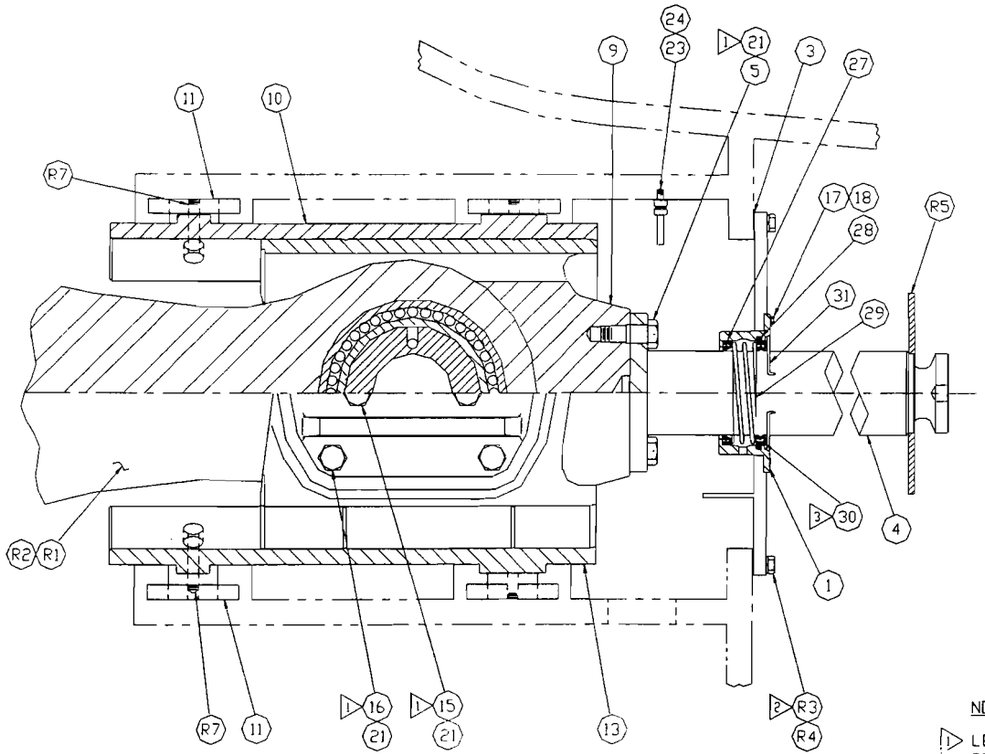
△4 INSTALL WITH OIL SCOOP AT BOTTOM. TYP. 3 PLACES.

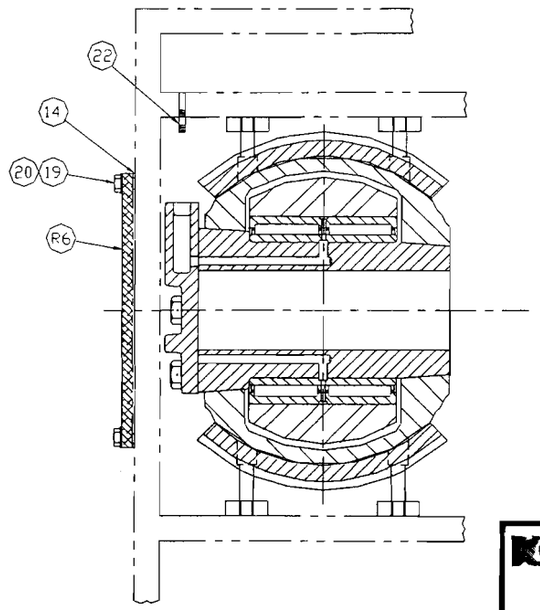
NATIONAL OILWELL
Houston, Texas, U.S.A.

CRANKSHAFT ASSEMBLY
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0099-00	J







BILL OF MATERIAL

ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0183-00	CROSSHEAD ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	3	6397-0544-00	STUFFING BOX, DIAPHRAGM
2	3	7601-1610-22	"O"-RING
3	3	6316-0081-00	GASKET, DIAPHRAGM PLATE
4	3	6316-0028-00	EXTENSION, CROSSHEAD
5	12	7501-1269-00	CAPSCREW, 1" - 8UNC-2B X 2-1/2" LG. SOCKET HEAD
6	3	6316-0087-00	PIN, CROSSHEAD
7	3	6316-0026-00	RETAINER, CROSSHEAD PIN
8	3	6301-0038-00	BEARING, CROSSHEAD
9	3	6316-0022-00	CROSSHEAD
10	3	6316-0687-00	GUIDE ASSEMBLY, UPPER CROSSHEAD
11	24	6319-0131-00	PLATE, LOCKING
13	3	6316-0688-00	GUIDE ASSEMBLY, LOWER CROSSHEAD
14	2	6316-0047-00	GASKET, CROSSHEAD DOOR
15	6	7501-0141-00	CAPSCREW, 1" - 8 X 2-1/4" LG. GR. 5 DRLD. HEX HEAD
16	12	7501-0139-00	CAPSCREW, 1" - 8 X 2-1/2" LG. GR. 5 DRLD. HEX HEAD
17	12	7601-0330-29	CAPSCREW, 3/8" - 16 X .88 LG. HEX HEAD
18	12	7601-1320-14	WASHER, 3/8" LOCK
19	28	7601-0330-76	CAPSCREW, 5/8" - 11 X 1-1/2" LG. HEX HEAD
20	28	7601-1330-05	WASHER, 5/8" SMALL O.D. PLAIN
21	1	7602-5312-40	WIRE, .06 DIA. X 240.00 LG. STAINLESS STEEL
22	4	7601-2580-08	NIPPLE, 3/8" X 2" LG. PIPE
23	3	7601-2730-07	CONNECTOR, 5/8" - 18 X 3/8" MPT MALE
24	3	7508-0020-31	TUBING ASSEMBLY, 3/8" COPPER
27	3	7602-2131-47	SEAL, SINGLE LIP OIL
28	3	7602-1600-39	"O"-RING
29	3	6397-0548-00	SPRING, DIAPHRAGM STUFFING BOX
30	3	7602-2132-76	SEAL, DOUBLE LIP OIL
31	3	6397-0546-00	SPRING, DIAPHRAGM STUFFING BOX LOCK
R1	3	6316-0023-00	STRAP, F-1600 ECCENTRIC
R2	3	6317-0026-00	STRAP, F-1300 ECCENTRIC
R3	24	7601-0330-77	CAPSCREW, 5/8" - 11 X 1-3/4" LG. HEX HEAD
R4	24	7601-1320-49	WASHER, 5/8" LOCK
R5	3	6317-0093-00	BAFFLE, DISCHARGE FLUID
R6	2	6316-0045-00	DOOR, CROSSHEAD
R7	24	7601-0341-86	CAPSCREW W/ NYLOK LOCK, 3/4" - 10 X 2-1/2" LG. SKT HEAD

NOTES :

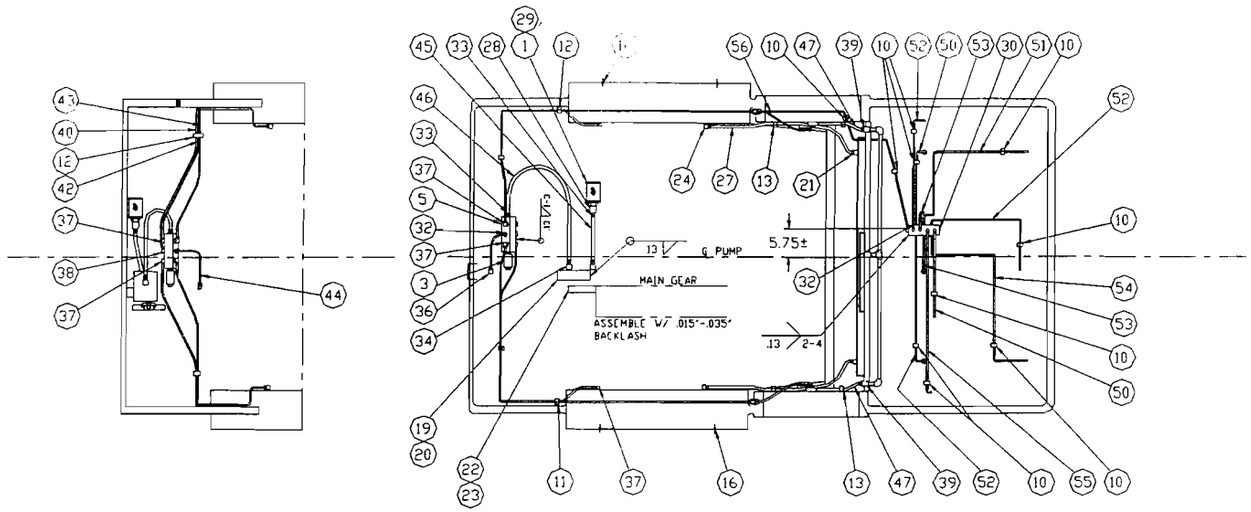
1. LOCTITE & TORQUE PIN RETAINER BOLTS PER 6399-0066-02
2. PERMATEX BOTTOM 3 CAPSCREW ON EACH DIAPHRAGM.
3. INSTALL MAIN LIP TOWARD POWER END.

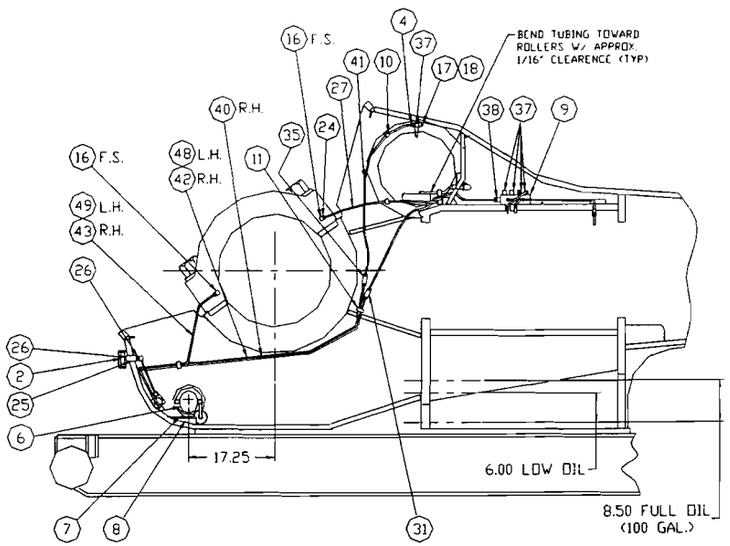
NATIONAL OILWELL

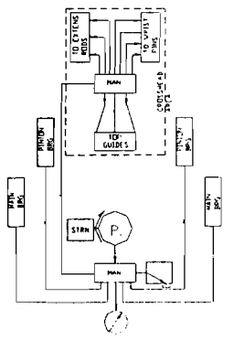
Houston, Texas, U.S.A.

CROSSHEAD ASSEMBLY
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0183-00	M







PRESSURE LUBE SCHEMATIC

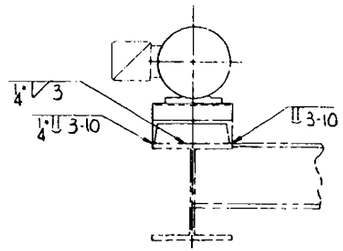
BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0227-00	LUBRICATION ASSEMBLY, POWER END INTERNAL (CONSISTS OF THE FOLLOWING)
1	1	7602-1070-03	FILTER, OIL STRAINER
2	1	7602-1150-98	GAUGE (0-160 P.S.I.), OIL PRESSURE
3	1	7602-2914-78	VALVE, RELIEF
4	2	6397-0316-01	JET, OIL
5	1	6920-0259-00	MANIFOLD
6	1	7602-1830-82	PUMP WITHOUT RELIEF VALVE, OIL
7	1	6319-0095-00	SHIM SET
8	1	6316-0124-00	PLATE, OIL PUMP MOUNTING
9	1	6316-0169-00	MANIFOLD, CROSSHEAD
10	13	7514-0212-00	CLAMP, 3/8" TUBING (SINGLE)
11	4	7514-0209-00	CLAMP, 3/8" TUBING (DOUBLE)
12	2	7514-0231-00	CLAMP, 3/8" TUBING (TRIPLE)
13	4	7514-0007-00	CLAMP, 1/2" TUBING (SINGLE)
16	4	7601-2590-94	PLUG, 1/4" - 18 COUNTERSUNK ALLEN HEAD PIPE
17	4	7601-0330-03	CAPSCREW, 1/4" - 20 X 3/4" LG. HEX HEAD
18	4	7601-1320-38	WASHER, 1/4" LOCK
19	4	7601-0330-32	CAPSCREW, 3/8" - 16 X 1-1/2" LG. HEX HEAD
20	4	7601-1320-14	WASHER, 1/4" LOCK
21	2	7601-2730-08	CONNECTOR, 1/2" INV.
22	1	6319-0094-00	GEAR, OIL PUMP
23	1	7504-0002-00	KEY, 3/16" X 3/16" X 1" LG.
24	2	7601-2750-35	ELBOW, 90 DEG. MALE
25	1	7601-2550-27	COUPLING, 1/2" X 3000# PIPE
26	2	7601-2530-04	BUSHING, 1/2" X 1/8"
27	2	7508-0240-37	TUBING ASSEMBLY,1/2" COPPER
28	1	7601-2550-85	COUPLING, 1/2" STD. PIPE
29	1	7601-2091-39	ADAPTER, 3/4" FNPT X 1/2" MNPT REDUCING
30	1	7601-2590-76	PLUG, 1/4" PIPE
31	1	7601-2810-03	UNION
32	5	7601-2730-04	CONNECTOR, MALE
33	2	7601-2730-86	CONNECTOR, MALE
34	2	7601-2752-00	ELBOW, MALE
35	2	7601-2810-02	UNION
36	1	7601-2750-04	ELBOW, MALE
37	14	7601-2750-05	ELBOW, MALE
38	2	7601-2750-06	ELBOW, MALE
39	2	7601-2750-27	ELBOW, 45 DEGREE MALE
40	1	7508-0770-28	TUBING ASSEMBLY, 3/8" COPPER
41	2	7508-0320-19	TUBING ASSEMBLY, 5/16" COPPER
42	1	7508-0770-19	TUBING ASSEMBLY, 5/16" COPPER
43	1	7508-0490-19	TUBING ASSEMBLY, 5/16" COPPER
44	1	7508-0120-19	TUBING ASSEMBLY, 5/16" COPPER
45	1	7508-0130-45	TUBING ASSEMBLY, 5/8" COPPER
46	1	7508-0270-45	TUBING ASSEMBLY, 5/8" COPPER
47	2	7508-0120-40	TUBING ASSEMBLY, 1/2" COPPER
48	1	7508-0910-19	TUBING ASSEMBLY, 5/16" COPPER
49	1	7508-0630-19	TUBING ASSEMBLY, 5/16" COPPER
50	2	7508-0200-22	TUBING ASSEMBLY, 5/16" COPPER
51	1	7508-0360-22	TUBING ASSEMBLY, 5/16" COPPER
52	3	7508-0300-22	TUBING ASSEMBLY, 5/16" COPPER
53	2	7508-0090-22	TUBING ASSEMBLY, 5/16" COPPER
54	1	7508-0470-22	TUBING ASSEMBLY, 5/16" COPPER
55	1	7508-0400-22	TUBING ASSEMBLY, 5/16" COPPER
56	1	7508-0330-28	TUBING ASSEMBLY, 3/8" COPPER

NATIONAL OILWELL

Houston, Texas, U.S.A.

INTERNAL LUBRICATION ASSEMBLY FB-1600 TRIPLEX MUD PUMP

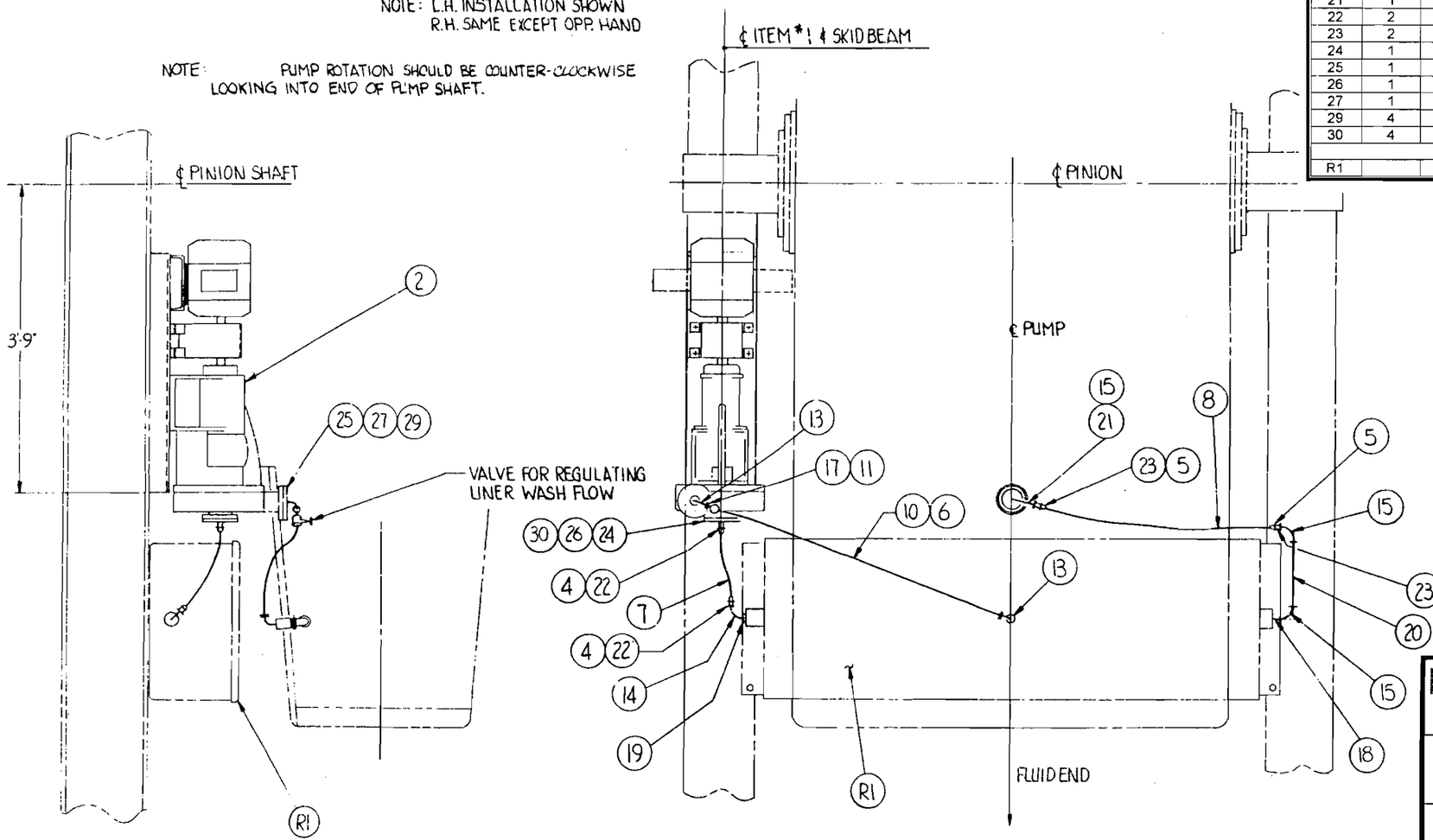
SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0227-00	M



ITEM #2 MOUNTING DETAIL

NOTE: L.H. INSTALLATION SHOWN
R.H. SAME EXCEPT OPP. HAND

NOTE: PUMP ROTATION SHOULD BE COUNTER-CLOCKWISE LOOKING INTO END OF PUMP SHAFT.



BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6316-0275-00 (RH) 6316-0275-01 (LH)	PISTON & LINER WASH ASSEMBLY (CONSISTS OF THE FOLLOWING)
2	1	6316-0265-00	PUMP ASSEMBLY LESS MOTOR, CENTRIFUGAL
4	2	7602-0720-04	CLAMP, 2" HOSE
5	2	7602-0720-41	CLAMP, 2-1/2" HOSE
6	1	7503-0480-66	HOSE ASSEMBLY, 1" I.D.
7	1	7601-3240-24	HOSE, 1-1/2" I.D. X 2 FT. LONG
8	1	7601-4310-36	HOSE, 2-1/2" I.D. X 36" LG.
10	1	7601-2090-28	ADAPTER, 1-5/16" - 14 X 1" LG. MALE PIPE
11	1	7602-2910-19	VALVE, 1" GLOBE
13	2	7601-2570-91	ELBOW, 1" X 90 DEG. GALV. STREET
14	1	7601-2570-93	ELBOW, 1-1/2" X 90 DEG. GALV.
15	3	7601-2570-47	ELBOW, 2-1/2" X 90 DEG. GALV.
17	1	7601-2581-60	NIPPLE, 1" X CLOSE GALV. PIPE
18	1	7601-2582-34	NIPPLE, 2-1/2" X 4" LG. GALV. PIPE
19	1	7601-2530-98	BUSHING, 2-1/2" X 1-1/2" HEX HEAD GALV. PIPE
20	1	7601-2588-24	NIPPLE, 2-1/2" X 12" LG. GALV. PIPE
21	1	7601-2582-38	NIPPLE, 2-1/2" X 8" LG. GALV. PIPE
22	2	7601-2583-84	NIPPLE, 1-1/2" COMBINATION HOSE
23	2	7601-2583-52	NIPPLE, 2-1/2" COMBINATION HOSE
24	1	7602-0661-45	GASKET, 1-1/2" 150# FLANGE
25	1	7602-0661-44	GASKET, 1" 150# FLANGE
26	1	7601-2060-13	FLANGE, 1-1/2" 150# THREADED
27	1	7601-2063-17	FLANGE, 1" 150# THREADED
29	4	7601-1261-19	BOLT WITH NUTS, 1/2" - 13 X 2-1/2" LG. STUD
30	4	7601-1261-20	BOLT WITH NUTS, 1/2" - 13 X 2-3/4" LG. STUD
REFERENCE ITEMS			
R1		6317-0164-00	TANK, 90 GALLON

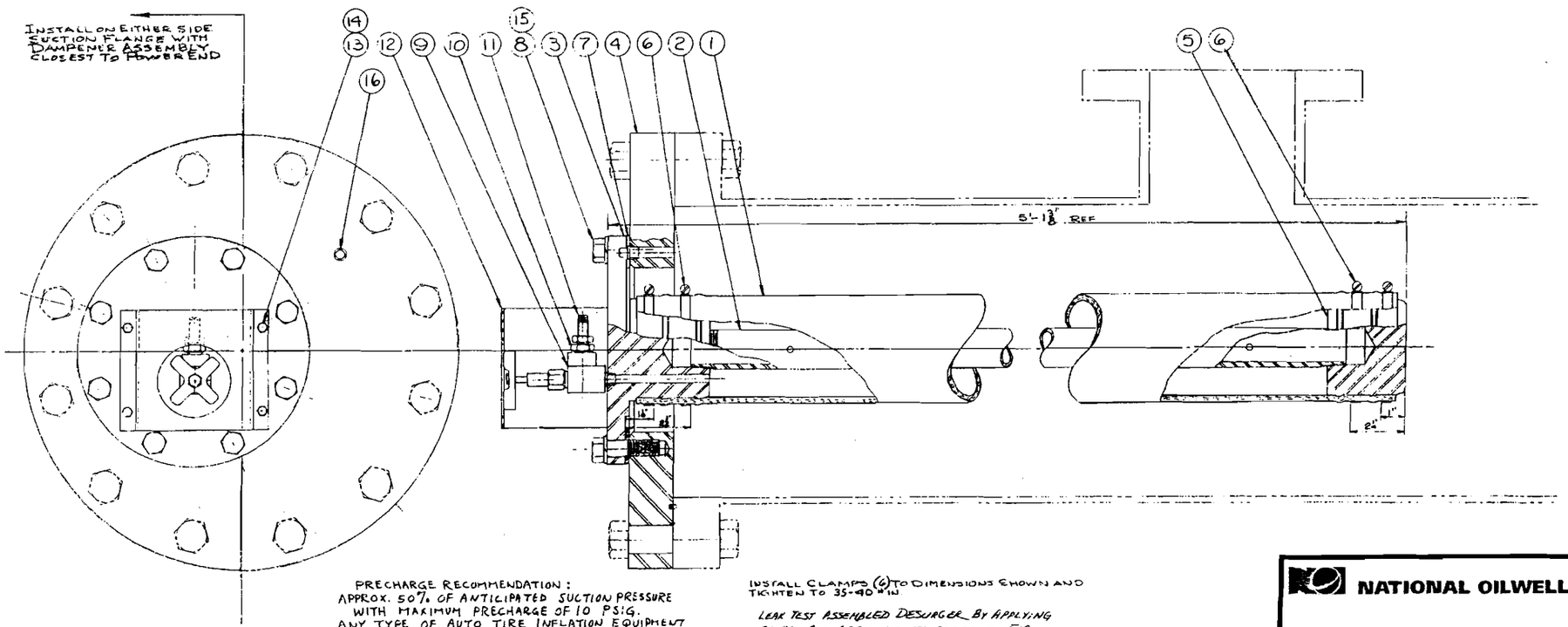
NOTE: **OPTIONAL EQUIPMENT, PLEASE SPECIFY WHEN ORDERING.**

NATIONAL OILWELL
Houston, Texas, U.S.A.

PISTON & LINER WASH ASSY.
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0275-00 (L.H.) PL 6316-0275-01 (R.H.)	D

BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6922-0062-00	SD-8 SUCTION DESURGER ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	1	6922-0054-00	BLADDER
2	1	6922-0066-00	ROD, SUPPORT
3	1	6922-0063-00	FLANGE, CHARGING
4	1	6922-0048-01	FLANGE, ADAPTER
5	1	6922-0065-00	PLUG, END
6	4	7602-072130	CLAMP, HOSE
7	1	6022-0053-00	GASKET
8	8	7601-033077	CAPSCREW, 5/8" X 1-3/4" LG. HEX HEAD
9	1	7602-291077	VALVE, 1/4" NEEDLE
10	1	7601-253001	BUSHING, 1/4" X 1/8" HEX HEAD PIPE
11	1	7602-291805	VALVE WITH VALVE STEM, 1/8" TANK
12	1	6922-0067-00	GUARD, VALVE
13	4	7601-033001	CAPSCREW, 1/4" - 20 X 1/2" LG. HEX HEAD
14	4	7601-132038	WASHER, 1/4" LOCK
15	8	7601-132030	WASHER, 5/8" LOCK
16	1	7601-259008	PLUG, 1/4" PIPE



PRECHARGE RECOMMENDATION:
APPROX. 50% OF ANTICIPATED SUCTION PRESSURE WITH MAXIMUM PRECHARGE OF 10 PSIG.
ANY TYPE OF AUTO TIRE INFLATION EQUIPMENT MAY BE USED TO CHARGE DAMPENER. LIKEWISE, AN AUTO TIRE GAUGE MAY BE USED TO CHECK THE PRESSURE.
IF DESIRED PRESSURE IS EXCEEDED, BLEED OFF PRESSURE BY DEPRESSING PIN IN CENTER OF VALVE STEM (ITEM 11)

INSTALL CLAMPS (6) TO DIMENSIONS SHOWN AND TIGHTEN TO 35-40 IN-LB

LEAK TEST ASSEMBLED DESURGER BY APPLYING 20 PSI AIR PRESSURE TO BLADDER FOR 30 MINUTES.

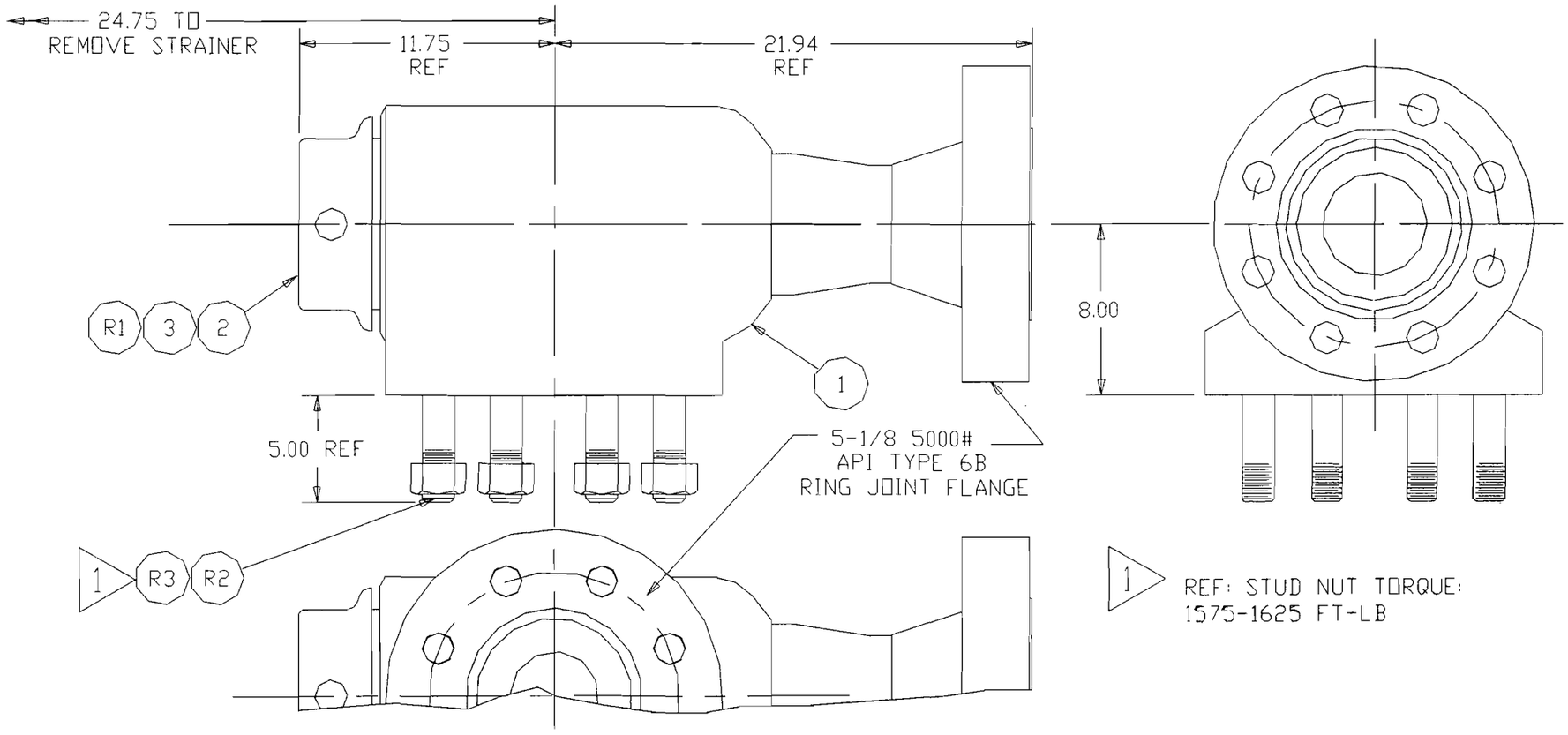
NOTE: OPTIONAL EQUIPMENT, PLEASE SPECIFY WHEN ORDERING.

NATIONAL OILWELL
Houston, Texas, U.S.A.

SD-8 SUCTION DESURGER ASSY.
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6922-0062-00	H

BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6917-0039-00	DISCHARGE STRAINER ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	1	6317-0049-00	HOUSING ASSEMBLY, STRAINER
2	1	6397-0290-00	STRAINER ASSEMBLY
3	1	7602-1600-40	GASKET, STRAINER
R1	1	6397-0293-01	STRAINER
R2	8	7507-2201-00	STUD, 1-1/2" - 8 X 6.88 LG.
R3	8	7601-0630-17	NUT, 1-1/2" - 8 HEAVY HEX

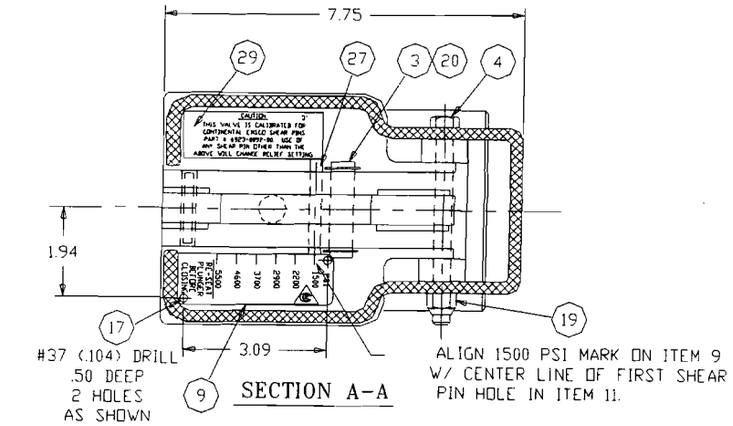


NATIONAL OILWELL
Houston, Texas, U.S.A.

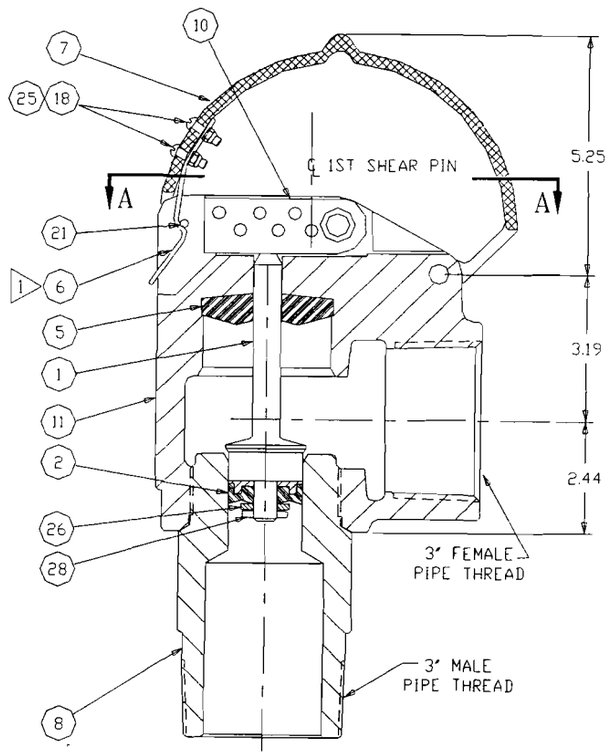
DISCHARGE STRAINER ASSEMBLY DRAWING

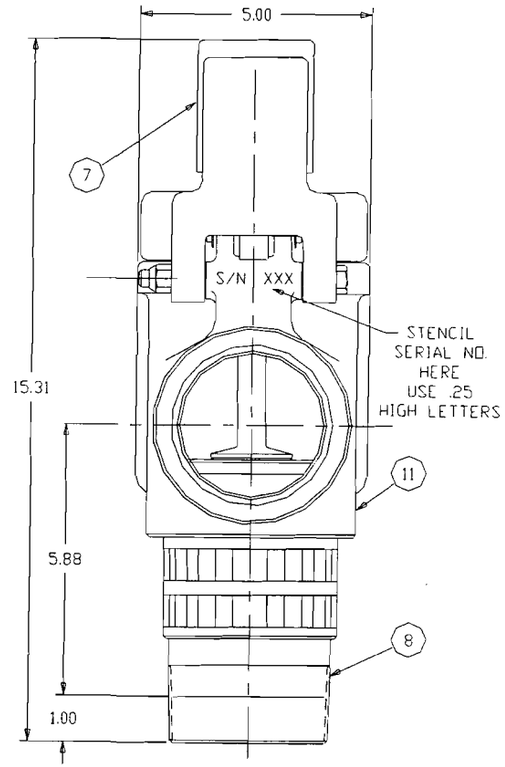
SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	B	PL 6317-0039-00	H

NOTE: OPTIONAL EQUIPMENT, PLEASE SPECIFY WHEN ORDERING.



BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6923-0016-00	3" TYPE B SHEAR RELIEF VALVE ASSEMBLY (CONSISTS OF THE FOLLOWING)
1	1	6923-0006-00	STEM, PLUNGER
2	1	6923-0007-00	SEAL, PLUNGER
3	1	6923-0011-00	PIN, SHEAR BAR
4	1	7601-0335-43	CAPSCREW, 3/8" - 16 X 4-1/2" LG. CAD PLTD. HEX HEAD
5	1	6923-0012-00	BUMPER
6	1	6923-0013-00	SPRING, COVER
7	1	6923-0014-00	COVER
8	1	6923-0015-00	ADAPTER, THREADED
9	1	7506-0087-00	PLATE, NAME
10	1	6923-0096-00	BAR, SHEAR
11	1	6923-0018-00	BODY
17	2	7601-1060-03	SCREW, NO. 4 X .31 LG. DRIVE
18	2	7601-0720-25	NUT, NO. 8 - 32 LIGHT THIN LOCK
19	1	7601-0720-26	NUT, 3/8" -16 LIGHT LOCK
20	2	7602-2040-78	RING, RETAINER
21	1	7601-0840-07	PIN, ROLL
25	2	7601-0010-35	SCREW, NO. 8 - 32 X .38 LG. CAD. PLTD. SKT. BUTTON HD.
26	1	7601-1330-10	WASHER, 1.06 O.D. X .53 I.D. X .13 THK. SPEC. FOR SKT. SCREW
27	12	6923-0092-00	PIN, SHEAR
28	1	7602-0810-62	PIN, .13 DIA. X 1" LG. CAD PLTD. COTTER
29	1	6923-0094-00	LABEL, WARNING





NOTES:

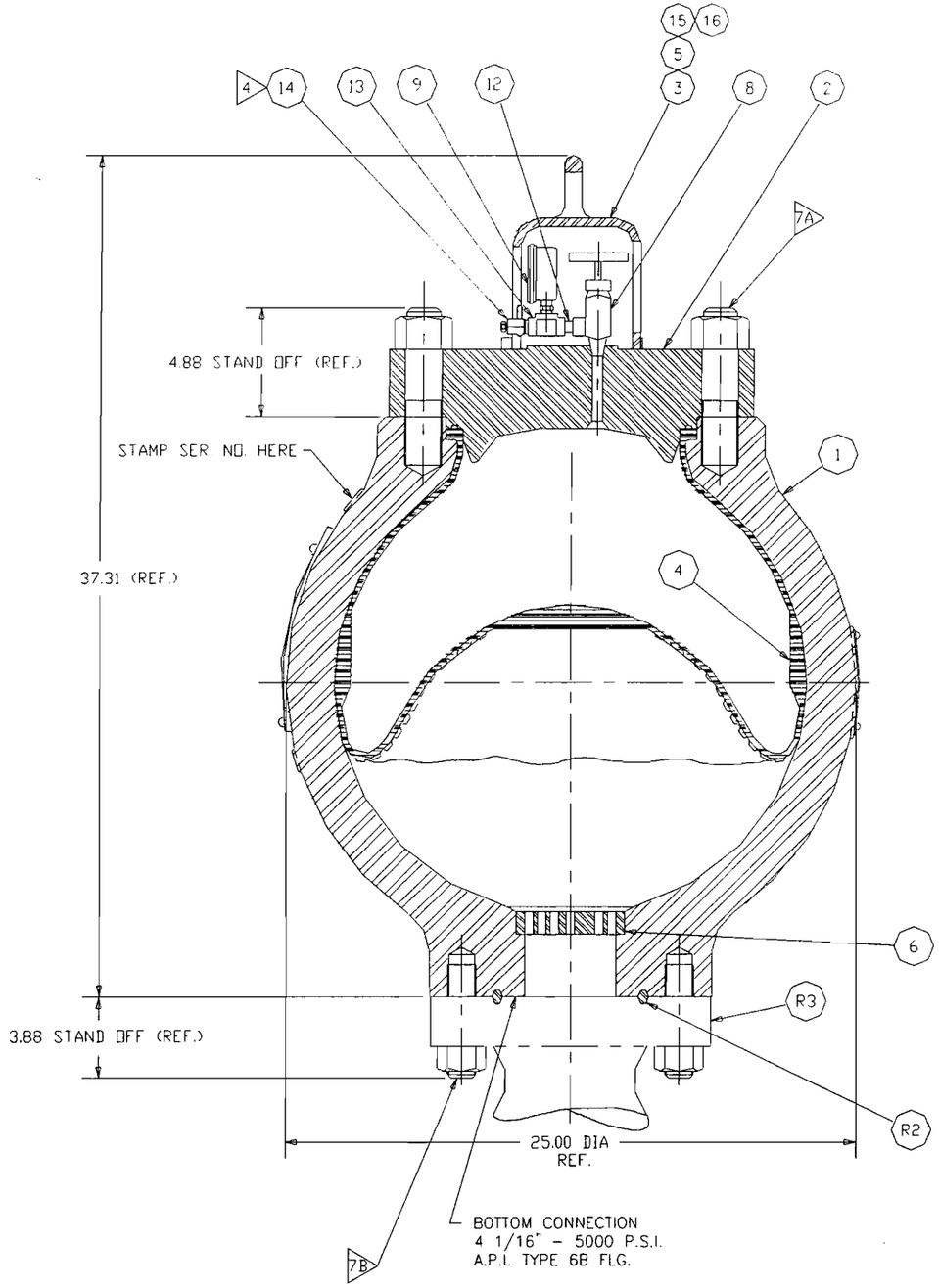
1. AFTER COMPLETE ASSEMBLY OF VALVE, ADJUST THE COVER SPRING, ITEM 6, IF REQUIRED TO HOLD COVER SECURELY IN PLACE. MAKE ADJUSTMENT BY BENDING BACK OR FORTH NEAR LOWER SCREW, ITEM 25.
2. AFTER ASSEMBLY, TEST VALVE BY SHEARING PIN AT 5500 PSI SHEAR HOLE. VALVE SHOULD BE WITHIN ±10 PERCENT PSI RATED
3. LUBRICATE PLUNGER AND SEAL FRICTION SURFACES WITH SUNVIS 911 OR EQUAL.

NOTE: **OPTIONAL EQUIPMENT, PLEASE SPECIFY WHEN ORDERING.**

NATIONAL OILWELL
Houston, Texas, U.S.A.

3" TYPE B SHEAR RELIEF VALVE ASSEMBLY

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	C	PL 6923-0016-00	DD



BILL OF MATERIAL			
ITEM	REQ'D	PART NO.	DESCRIPTION
---	---	6922-0021-00	PD-55 PULSATION DAMPENER ASSY. (CONSISTS OF THE FOLLOWING)
1	1	6922-0022-00	STUDDED ASSEMBLY
2	1	6922-0017-00	HEAD
3	1	6922-0008-00	COVER, GUAGE
4	1	6922-0003-00	BLADDER
5	1	6922--0023-00	PLATE ASSEMBLY, NAME
6	1	6922-0019-00	PLUG, BOTTOM
8	1	7602-2910-00	VALVE, NEEDLE
9	1	7602-1153-03	GAUGE (0-6000 PSI), PRESSURE
12	1	7601-6582-79	NIPPLE, 1/4" X CLOSE S.S. PIPE
13	1	7601-2612-29	TEE, 1/4" STAINLESS STEEL PIPE
14	1	7602-2938-29	VALVE, 1/4" S.S. BLEED
15	4	7601-0340-29	CAPSCREW, SOCKET HEAD
16	4	7601-1320-16	WASHER, 1/2" LOCK
17	1	6399-0088-00	CHARGING INSTRUCTIONS
REFERENCE INFORMATION			
R2	1	7602-0660-03	GASKET, R-39 RING JOINT
R3	1	6397-0498-00	FLANGE, ADAPTER

NOTES:
1. TEST WITH 100 PSI AIR PRESSURE AFTER ASSEMBLY, THEN VENT.
2. VENT
3. 7511-0110-12 TEST REPORT.
4. BEFORE CHARGING OR DISASSEMBLY, BLEED OFF ANY EXISTING PRESSURE IN GAUGE AREA BY TURNING APPROX. 1/4 TO 1/2 TURN, THEN REMOVE PURGE VALVE.
5. BLADDERS MUST BE STORED IN AN AREA PROTECTED FROM THE WEATHER. THE CONTAINER MUST BE CLOSED TO PREVENT AIR AND LIGHT EXPOSURE TO BLADDER.
6. APPROX. MUD VOL. 20 GALLONS.
7. A REF STUD NUT TORQUE 1575 - 1625 FT. LBS (1 1/2 -8 THREAD).
   B REF. STUD NUT TORQUE 950 -- 1000 FT. LBS. (1 1/4 - 8 THREAD)
8. PRIOR TO USE, PRECHARGE WITH DRY NITROGEN GAS. REFER TO NAMEPLATE OR OPERATION AND MAINTENANCE MANUAL FOR INSTRUCTIONS.

17 NOT SHOWN

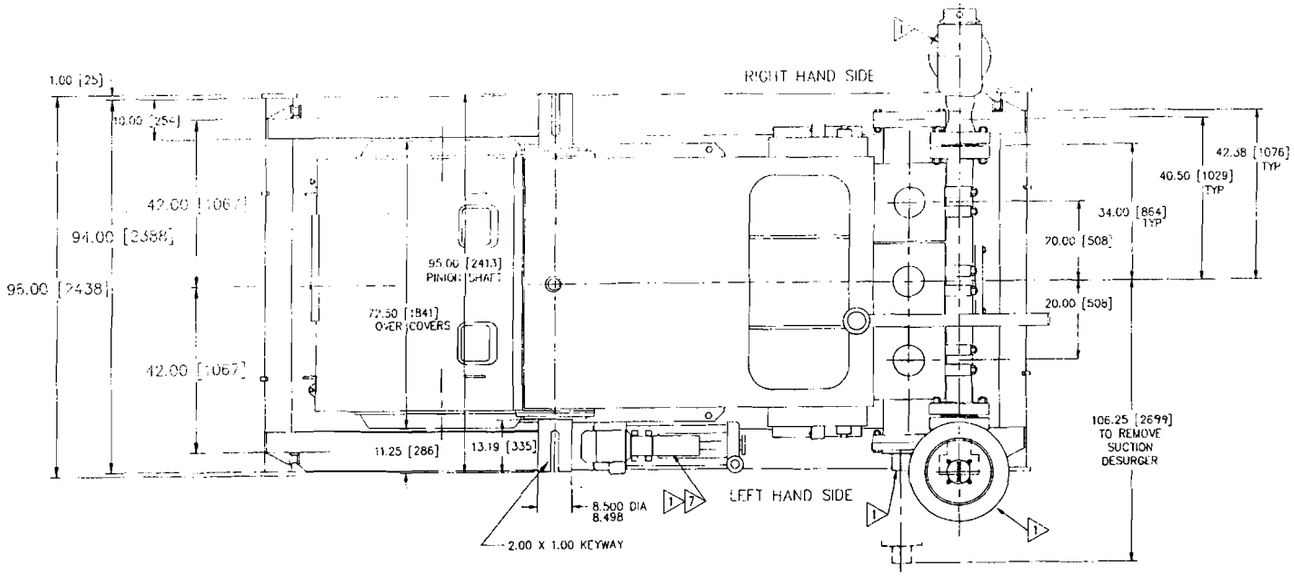
REF. DIMENSIONAL DWG. 6399-0091-00

NOTE: **OPTIONAL EQUIPMENT, PLEASE SPECIFY WHEN ORDERING.**

NATIONAL OILWELL
Houston, Texas, U.S.A.

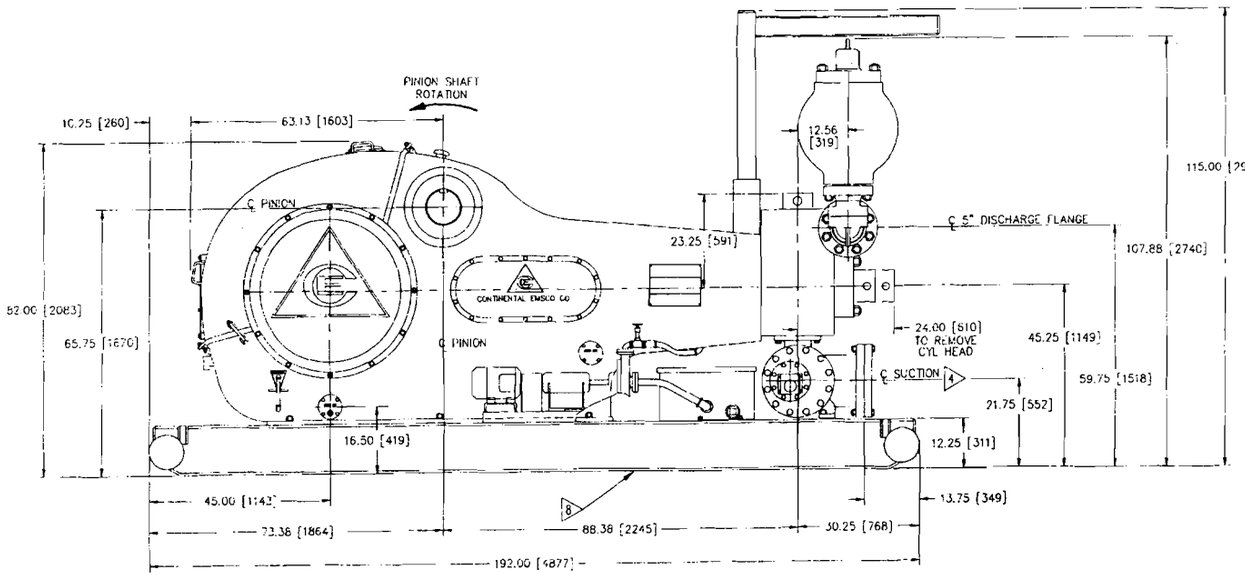
PD-55 PULSATION DAMPENER ASSY.

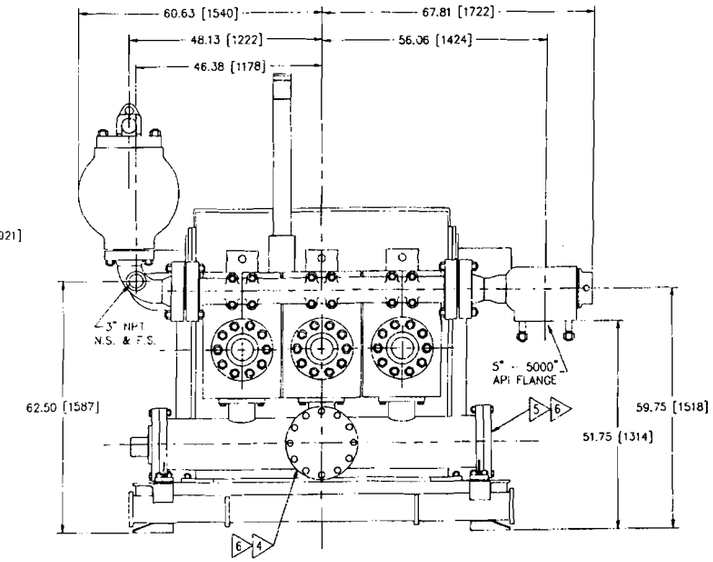
SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	C	PL 6922-0021-00	S



NOTES:

1. LINER WASH PUMP, SUCTION DESURGER, PULSATION DAMPENER AND STRAINER MAY BE MOUNTED RIGHT OR LEFT HAND SIDE.
2. VERTICAL DIMENSIONS SUBJECT TO SKID BEAM TOLERANCE $^{+.25}_{-.13}$
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS, EXCEPT AS NOTED
4. 12-8 NPT THREADED FLANGE
5. BLIND FLANGE
6. FLANGE LOCATIONS MAY BE SWITCHED TO PROVIDE INLET ON SIDE OF PUMP
7. LINER WASH PUMP AND MOTOR DIMENSIONS WILL VARY WITH EQUIPMENT SUPPLIED
8. PUMP MAIN SKID BEAMS ARE W12 X 58#
9. STRUCTURAL SHAPES ARE SUBJECT TO MILL TOLERANCES PER ASTM A6





NATIONAL OILWELL
Houston, Texas, U.S.A.

GENERAL DIMENSIONS
FB-1600 TRIPLEX MUD PUMP

SHEET 1 OF 1	SIZE:	DRAWING NO.:	REV.:
	D	PL 6316-0376-00	D