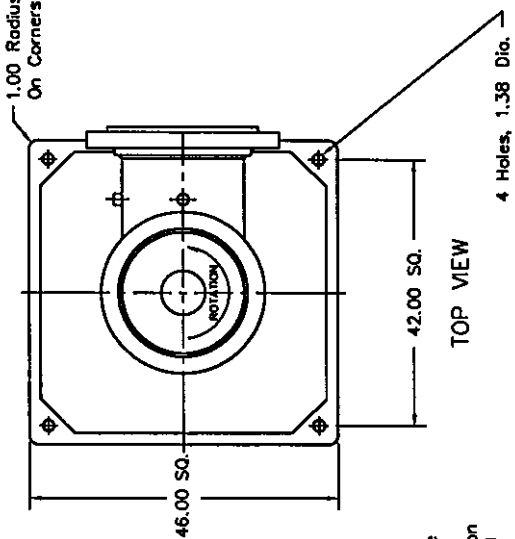
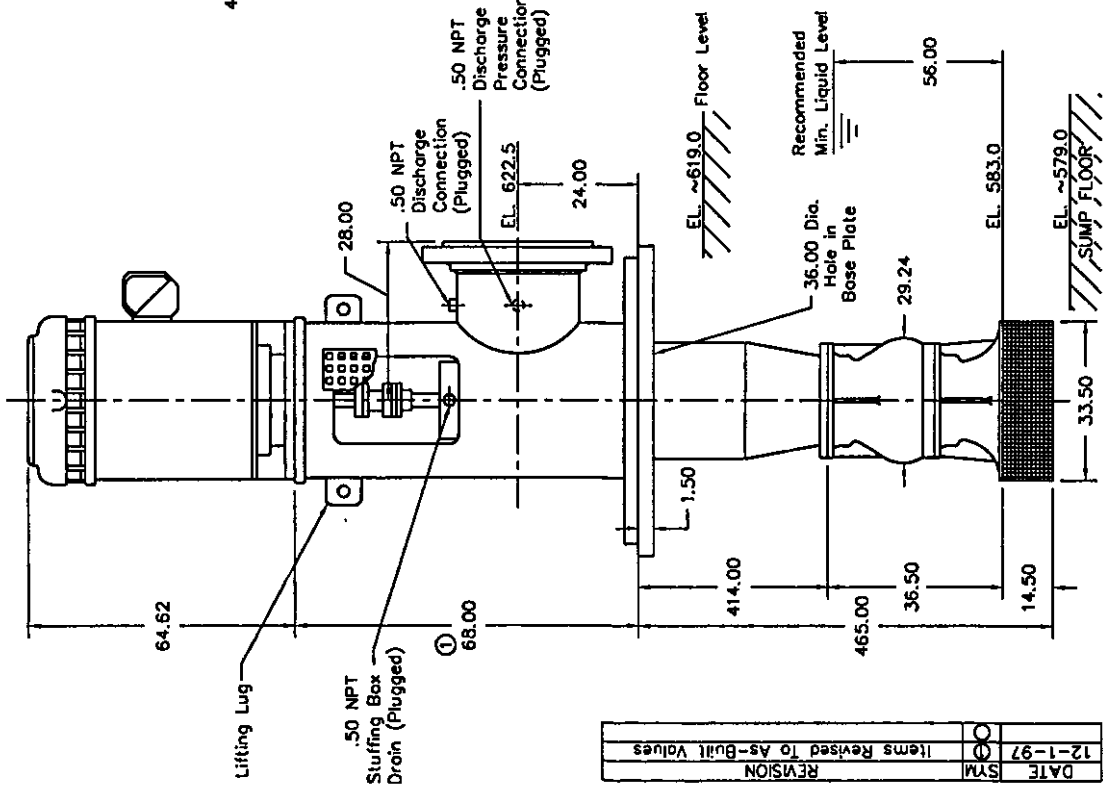
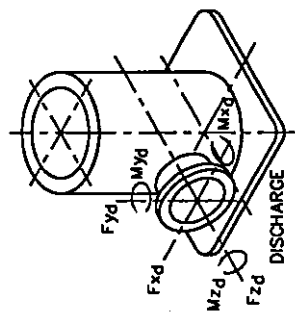


CERTIFIED FOR CONSTRUCTION
 BY *Paul C. Johnson* DATE 12-1-97

ALL DIMENSIONS
 IN INCHES



DATE	SYM	REVISION
12-1-97		Items Revised To As-Built Values



MAXIMUM ALLOWABLE FORCES		
DIRECTION	FX	FY
DISCHARGE	1350	1100
	FZ	1600
MAXIMUM ALLOWABLE MOMENTS		
DIRECTION	MX	MY
DISCHARGE	4000	3000
	MZ	2000

MOTOR
 250 H.P. Vertical SOLID Shaft
 900 R.P.M. 3 Phase 60 Cycle 460 Volts
 WP-1 Enclosure Mfg. General Electric

DISCHARGE HEAD - TYPE HF
 24HFH Discharge Head
 24" 150# Raised Face Discharge Flange
 flange holes straddle vertical centerline
 Shaft Seal MECHANICAL SEAL

COLUMN
 20" Column Pipe
 2.44" Diameter Open Lineshaft

PUMP
 1 Stage 29KMB Bowl ENCLOSURE Impeller
 10,000 USGPM 70 Ft. Total Head
 Strainer Type BASKET

MATERIALS
 Bowls/Bell CAST IRON/C.I. Column STEEL
 Impellers BRONZE Brg. Retainer STEEL
 Pump Shaft 416 S.S. Lineshaft 416 S.S.
 Bowl Brgs. BRONZE Lineshaft Brgs. RUBBER
 Head STEEL Lineshaft Srv. CERAMIC COAT/S.S.
 Strainer 316 S.S.
 Wear Rings (Bowl/Imp.) BRONZE/BRONZE
 Driver Weight 3620 lbs. Pump Weight 13,800 lbs. ①

① Pump will be shipped UNASSEMBLED except for bowl assembly.

Ingersoll-Dresser Pumps

GENERAL ARRANGEMENT DRAWING

ARCHER-WESTERN CONTRACTORS, LTD. PO# 0298
 TULSA METROPOLITAN UTILITY AUTHORITY
 MOHAWK WTP CONTRACT #6.CLEARWELL & DISTRIBUTION PUMPING
 EQUIP.#: 9-P-3, 4, & 5 SPEC.SECTION: 11103
 SERVICE: BACKWASH SUPPLY PUMPS
 IDP SALES # 047-77029 IDP # S000099

DWG. NO. GS000099 SCALE NONE REV. 01

DRAWN P. HODGSON DATE 9-14-96

**Mechanical Equipment
Summary Form**

Contract No.: _____ Contract 6 - Archer-Western Contractors, Ltd. _____ Project No.: TMWA94-1

Equipment Item: 9-P-3, Backwash Supply Pump _____

Equipment Supplier: Ingersoll-Dresser Pump Co. _____ Local Vendor: Boone & Boone Sales Co., Inc. _____

5310 Taneytown Pike, Taneytown, MD 21787 _____ 5484 S. 103rd E. Avenue, Tulsa, OK 74146 _____

Tel.: (410) 756-2602 _____ Tel.: (918) 664-9756 _____

Component Information: Nameplate Data

Manufacturer:	Ingersoll-Dresser Pump	Rated Output:	10,000 GPM
Serial No.:	9703MS000099 -	RPM:	890 (Variable Speed)
Model/Part No.:	29LKM	Operation:	Continuous
Type:	Vertical Turbine Pump	Service:	Backwash Supply
Size:	1 Stage	Capacity:	10,000 GPM @ 70 feet TDH

Component Information: Drive Motor Data

Manufacturer:	General Electric	Rated Output:	250 HP
Serial No.:	063007, 062006, 062007	RPM:	890 (Variable Speed)
Model/Part No.:	5KAF509DT8403M	Voltage:	460
Frame:	L509VP20	Amperage:	297
Type:	KAF	Phase:	3
Enclosure:	Dripproof	Hertz:	60
Service Factor:	1.15	AC/DC:	AC

Comments: _____

INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD
 S/N: 9703MS000099-1/3 MODEL: 29LKM-1 STAGE
 S/O No.: S000099 CUSTOMER: ARCHER-WESTERN CONTRACTORS, LTD.
 No. PUMPS: 3 PROJECT: TULSA M.U.A., MOHAWK W.T.P
 PAGE 1 of 4 CONTRACT NO. 6-CLEARWELL & DISTRIB
 IDP ORDER No: 047-77029 EQUIP. NOS.: 9-P-3, 4, & 5
 DATE: 11-21-97 SERVICE: BACKWASH SUPPLY PUMPS
 PARTS LIST BY: P. HODGSON

QTY	QTY PART	REF	DESCRIPTION	MATERIAL
REQ	ASY NUMBER	NO.		

***** PUMP PARTS LIST *****

1	86200599	424	SERIAL PLATE IDP TANEYTOWN	SS
4	82130428	425	DRIVE SCREW F/SERIAL PLT	SS
1	81798001	304	HEAD 24HFH 68HT 7.50BC 150RF 24M 44SQ	FAB/STL
1	81806622	471	CPLG FLG 3PSA 2.63DR 2.44DN 2.13GV .63x3.50 STL --ADJUSTABLE FLANGED SPACER COUPLING ASSEMBLY	
4	81800419		SCREW CAP HEX/HEAD .38-16UNC X .50 --COUPLING BALANCE SCREWS	J429GR2PL
20	82094442	326	STUD THD .88 X 4.50	316SS
20	82094459	327	NUT HEX .88	316SS
4	81161400	381	SCREW CAP HEX/HEAD .63-11UNC X 3.75	316SS
4	82065517	382	NUT HEX .63	316SS
5	82123894	416	PLUG .50NPT SQ/HEAD --DISCHARGE HEAD CONNECTION PLUGS (REMOVE AS REQ'D)	A105STL
1	86213725	131	GUARD COUPLING	ALUMINUM
12	82064825	417	SCREW CAP .25 X .50	316SS
12	82231317	418	WASHER .25	316SS
1	81806408	23	PLT BASE 46.00 SQ 36.00 HL 1.50 THK --SOLEPLATE	STL
8	82266149	412	STUD THD 1.25- 8UN X 5.50	316SS
8	82261132	413	NUT HEX 1.25- 8UN --DISCHARGE-HEAD-TO-SOLEPLATE STUDS & NUTS	316SS
1	SS000099	349	SEAL MECH 2.44 SHF SEALOL TYPE EZ-SPLIT	-
2	82123894		FITNG PIPE PLUG SQ/HEAD .50NPT 6000# --MECHANICAL SEAL GLAND CONNECTION PLUGS (REMOVE AS REQUIRED)	A105STL
1	81806630	348	HSG THROT/BUSH 7.50 3.00 5.00BC F/SPLT SEAL	1018STL

INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD
 S/N: 9703MS000099-1/3 MODEL: 29LKM-1 STAGE
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 PAGE 2 of 4 CONTRACT NO. 6-CLEARWELL & DISTRIB
 IDP ORDER No: 047-77029 EQUIP. NOS.: 9-P-3, 4, & 5
 DATE: 11-21-97 SERVICE: BACKWASH SUPPLY PUMPS
 PARTS LIST BY: P. HODGSON

QTY REQ	QTY ASY	PART NUMBER	REF NO.	DESCRIPTION	MATERIAL
1		82062076	117	BRG SLV 2.45 ID X 3.00 OD X 4.50 LG	C844
4		80604900	326A	SCREW CAP HEX/HEAD .63-11UNC X 2.75	316SS
6		81806697	354	SCREW CAP SOCKET/HD .63-11UNC X 2.00 LG	316SS
1		82082884	347	ORING 5.73 ID .139THK	BUNA-N
1		82218181		PLAN 13 FAB HSG .38 TUBE	COPPER
1		81816449		PLAN GREASE/LINE/SUCT .50TUBE F/HF 5/UNION	316SS
1		82282278	431	ORING 23.94 ID .210 THK	BUNA-N
1		81797698	101	COL ADPT FLG/HD 24.00 .688 54.0 3.50ID OR --TOP COLUMN SECTION	STL
3		81797714	101	COL PIPE FLG/HD 20.00 .594 96.0 3.50ID --INTERMEDIATE COLUMN SECTIONS	STL
1		81797730	101	COL ADPT FLG/HD 20.00 .594 72.0 3.50ID OR --BOTTOM COLUMN SECTION	STL
4		81816423		BRKT HOLDING F/.50 TUBE .88/BOLT 6.38LG	STEEL
4		80187456		GROMMET .62 ID X 1.00 OD --GREASE LINE BRACKETS & GROMMETS FOR COLUMN-TO-COLUMN JUNCTIONS	NEOPRENE
4		82314691	325	SCREW CAP .88 X 5.00 COL TO COL --LONGER CAP SCREWS FOR GREASE LINE BRACKETS, ONE USED AT EACH COLUMN-TO-COLUMN JUNCTION	316SS
60		82255449	325	SCREW CAP .88 X 4.50 COL TO COL	316SS
64		82094459	327	NUT HEX .88	316SS
5		82063751	39	BRG RUB 2.72 ID X 3.52 OD X 5.00 LG	BUNA-S
5		81801094	14	SLV LINSHF 2.44 X 2.69 X 7.75LG W/METCO101	316L/SS
10		82065269	366	SCREW SET HEX/SOCKT .25-20UNC X .25	316/SS
1		81806838	12A	TOPSHAFT 2.44 1.94LH 89.50 F/KEY/LINSFT --TOP SHAFT	416SS
3		81806846	12	SHF LINE KEY 2.44 2.44WX 96.00 F/WX/CPLG --INTERMEDIATE LINE SHAFTS	416SS

INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD
 S/N: 9703MS000099-1/3 MODEL: 29LKM-1 STAGE
 S/O No.: S000099 CUSTOMER: ARCHER-WESTERN CONTRACTORS, LTD.
 No. PUMPS: 3 PROJECT: TULSA M.U.A., MOHAWK W.T.P
 PAGE 3 of 4 CONTRACT NO. 6-CLEARWELL & DISTRIB
 IDP ORDER No: 047-77029 EQUIP. NOS.: 9-P-3, 4, & 5
 DATE: 11-21-97 SERVICE: BACKWASH SUPPLY PUMPS
 PARTS LIST BY: P. HODGSON

QTY REQ	QTY ASY	PART NUMBER	REF NO.	DESCRIPTION	MATERIAL
1		81806853	12	SHF LINE KEY 2.44 2.44WX 72.00 F/WX/CPLG --BOTTOM LINE SHAFT	416SS
5		81806887	70	SLEEVE CLAMP CPLG 2.44"	416SS
5		81806895	435A	RING CLAMP 2.44"	416SS
10		97897887	433	KEY STR .63 SQ X 3.25 LG	416SS
10		82126665	434	RING RETANR F/2.44/SHF	15-7PH
1		81806879	6	SHF PUMP KEY KEY 2.94 2.44WX 55.50LG F/WXCP	416SS
1		81816431		BRKT HOLDING F/.50 TUBE .75/BOLT 4.88LG	STEEL
1		80187456		GROMMET .62 ID X 1.00 OD --GREASE LINE BRACKET & GROMMET FOR COLUMN-TO-BOWL-ASSEMBLY JUNCTION	NEOPRENE
1		07542528	356	SCREW CAP HEX .75-10UNC X 4.25 --LONGER CAP SCREW FOR GREASE LINE BRACKET AT COLUMN-TO-BOWL ASSEMBLY JUNCTION	316SS
19		82184946	356	SCREW CAP HEX .75-10UNC X 4.00	316SS
20		82140070	357	NUT HEX .75-10UNC	316SS
20		82226655	358	SCREW CAP HEX .75-10UNC X 2.50	316SS
2		82348780	430	ORING 22.94 ID X 23.22 OD X .139THK	BUNA-N
1		82308677	472	CONE DIFFUSION 2.94/SHF 28K/B-E	1018STL
1		81789844	310	BOWL 29LK UNLIND FLG F/B-E OR	CI
1		82300302	322	BRG SLV 2.95 ID X 3.50 OD X 3.00 LG	C844
1		82300310	322	BRG SLV 2.95 ID X 3.50 OD X 7.88 LG	C844
1		81831323	492	IMP STD 29LKM KEY 21.75 W/WR/C954	ASSY
	1	82387374	2	IMP STD 29LKM KEY 21.75 F/WR	C86500
	1	82369141	8	RING WEAR IMP 29LK	C954
1		82280389	32	KEY STR .75 SQ X 3.25 LG	316SS
1		82285362	312	RING THRUST SPLIT IMP STD F/2.94/SHF	316SS
6		82285347	26	SCREW CAP SOCKT/HD .50-13UNC X 1.50 6 RQD	316SS

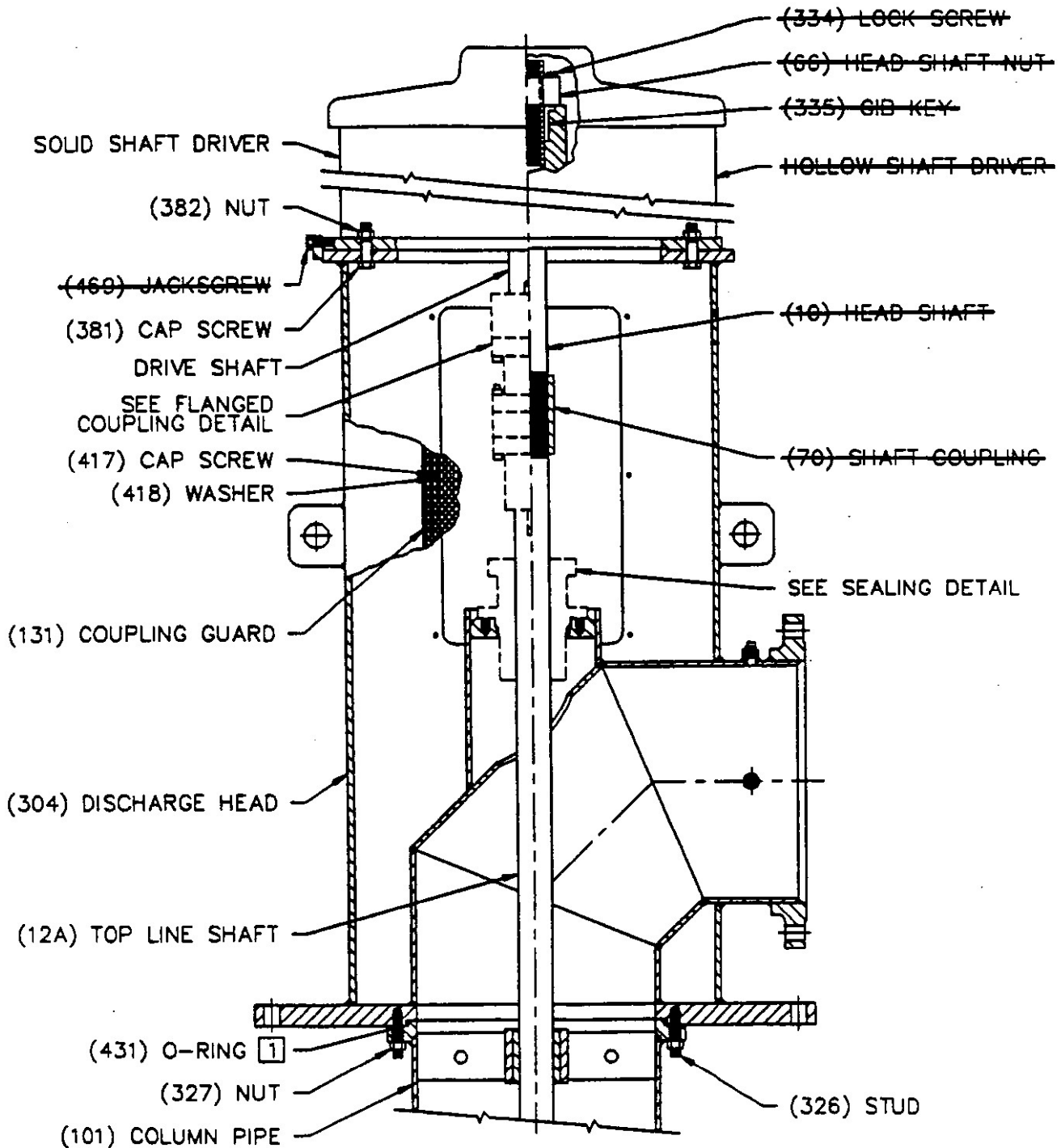
INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD
 S/N: 9703MS000099-1/3 MODEL: 29LKM-1 STAGE
 S/O No.: S000099 CUSTOMER: ARCHER-WESTERN CONTRACTORS, LTD.
 No. PUMPS: 3 PROJECT: TULSA M.U.A., MOHAWK W.T.P
 PAGE 4 of 4 CONTRACT NO. 6-CLEARWELL & DISTRIB
 IDP ORDER No: 047-77029 EQUIP. NOS.: 9-P-3, 4, & 5
 DATE: 11-21-97 SERVICE: BACKWASH SUPPLY PUMPS
 PARTS LIST BY: P. HODGSON

QTY REQ	QTY ASY	PART NUMBER	REF NO.	DESCRIPTION	MATERIAL
1		82420241	493	BELL SUCT 29LK FLG 32.00 B-E W/WR/C954	CI
	1	82377318	55	BELL SUCT 29LK FLG 32.00 B-E F/WR	CI
	1	82369117	319	RING WEAR BWL 29LK	C954
1		82280363	323	BRG SLV 2.95 ID X 3.50 OD X 11.00 LG	C844
1		82465287	125	FITNG PIPE REDCR 3.50NPT X .50NPT F/INJ	A197MALL
1		81806978	316	STRAIN SUCT SLIP-ON 32.00 ID X 14.50LG HOLE --SUCTION STRAINER	316SS
8		82064866	422	SCREW CAP HEX/HEAD .38-16UNC X 1.25 8 RQD --SUCTION STRAINER ATTACHMENT SCREWS	316SS

DISCHARGE HEAD
TYPE HFH

903.04.02

TYPICAL CROSS SECTION



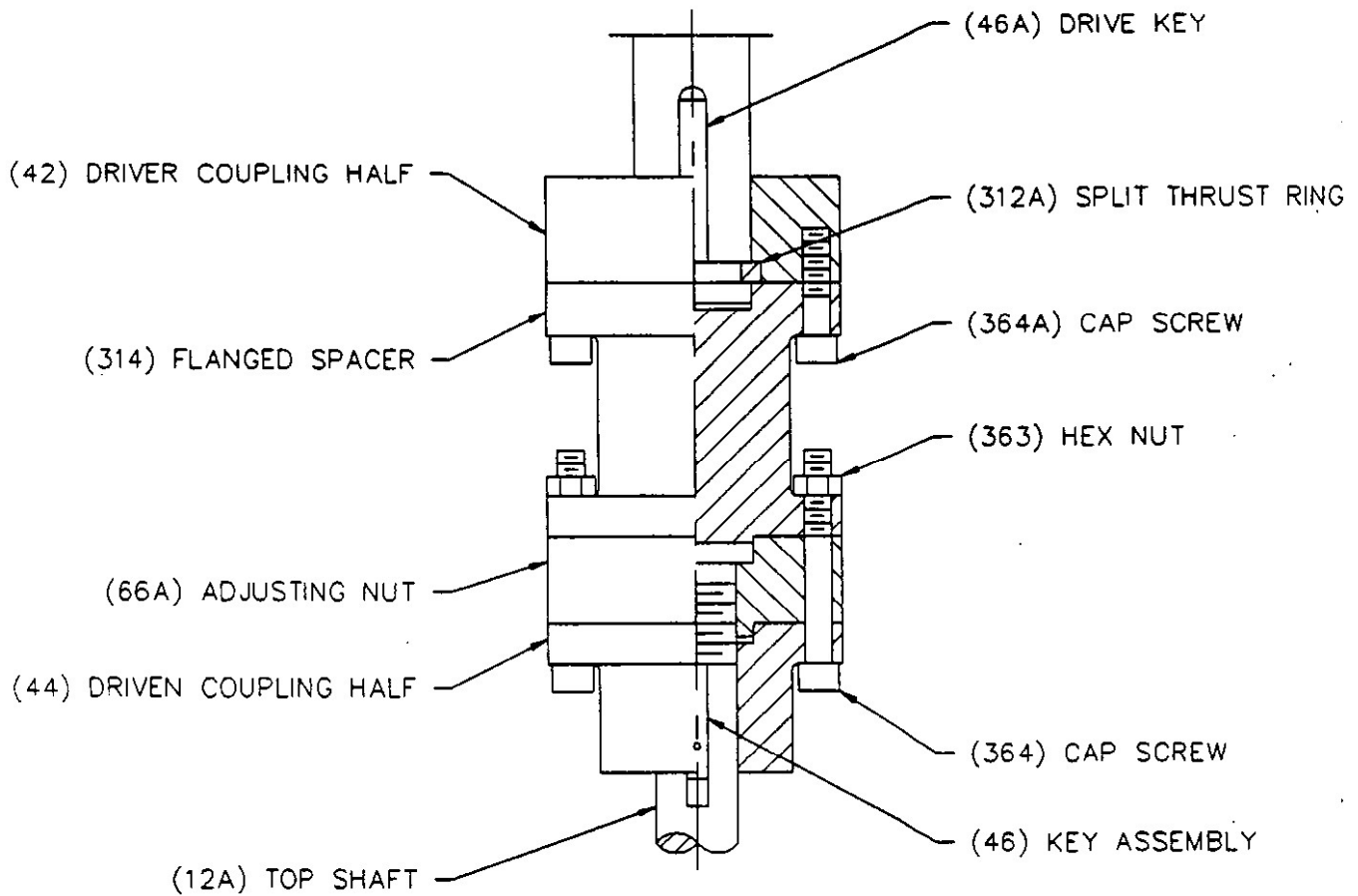
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REFERENCE NUMBERS.

RECOMMENDED SPARES:

1 CLASS 1 & 2

2 CLASS 2

TYPICAL CROSS SECTION

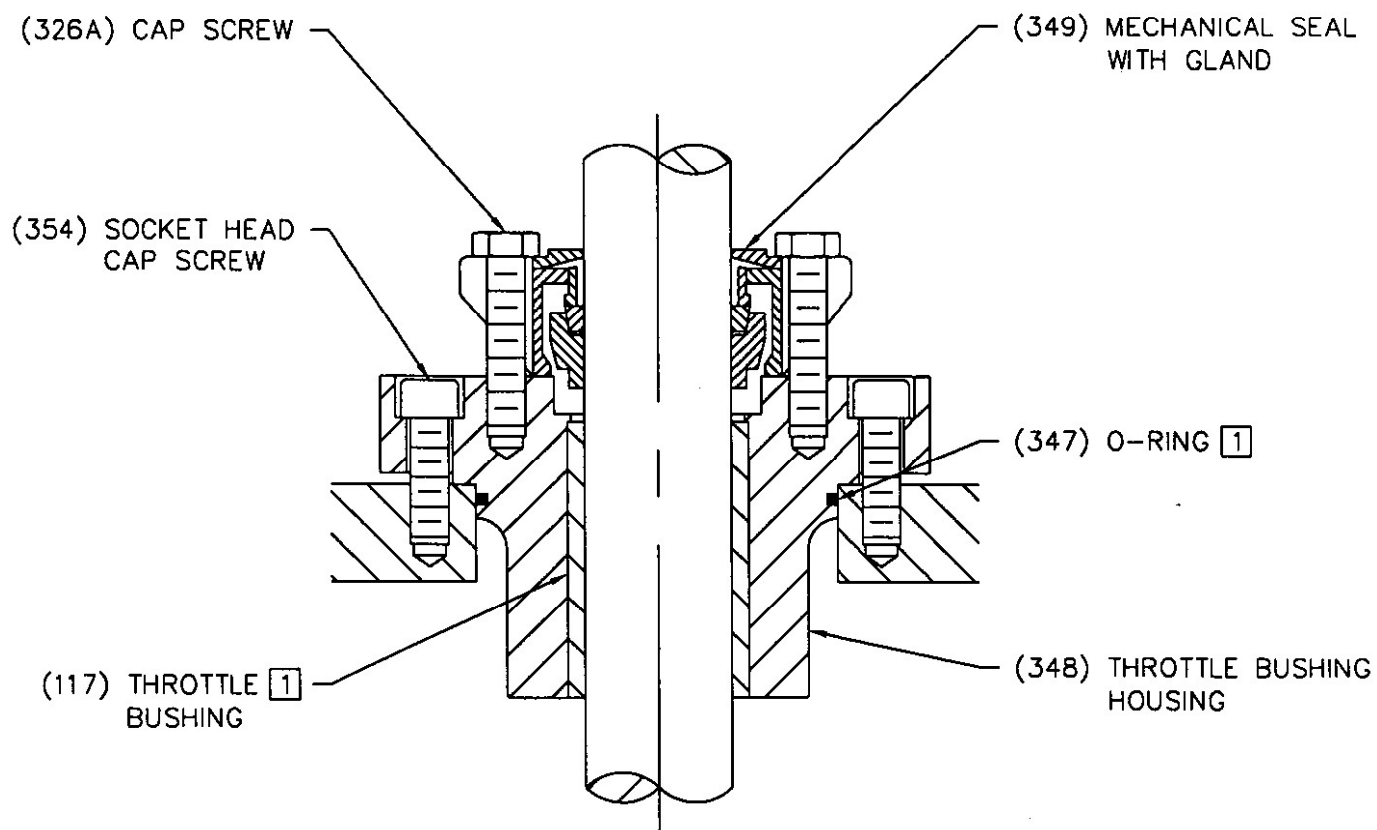


NUMBERS IN PARENTHESES ARE
REFERENCE NUMBERS.

SEALING DETAIL
SPLIT MECHANICAL SEAL

904.05.01M

TYPICAL CROSS SECTION



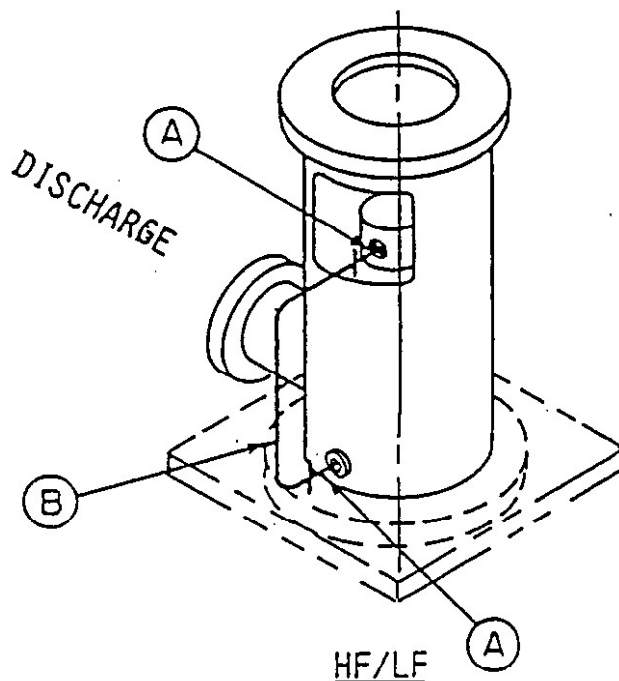
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RECOMMENDED SPARES:

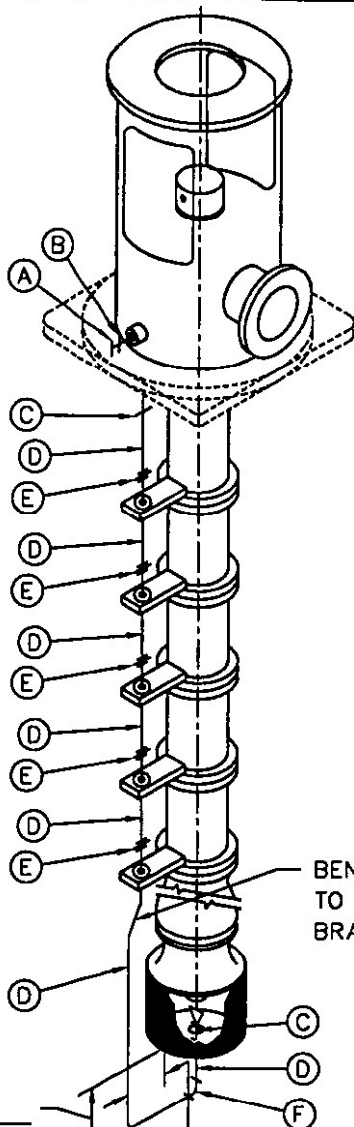
[1] CLASS 1 & 2

[2] CLASS 2

REF.	PART NO.	DESCRIPTION	MATERIAL	QUAN
A	82115759	MALE CONNECTOR- .50NPT x .375 TUBE	BRONZE	2
B	-----	TUBING- .375 O.D.- K TYPE	COPPER	1



DATE		SYM		REVISION		DIM. WAS		AUTH		DRG		ECN	
0		1 (in)											
0 5 10 15 20 25 (mm)													
DRAWN LL		CHECKED RH		APPD. RH		APPD. ENG.		DATE 8-29-84		MATERIAL SPEC.		SEE COMPONENTS	
Ingersoll-Rand		HASTINGS DIV.		TITLE		PLAN 13- FAB HEADS- SEAL TO SUCTION- .38 COPPER TUBING F/MECH. SEAL HOUSING		DWG. NO. 82218181		ASSY		REV. 00	
SCALE NONE		ECN: 3694		SHEET 1		of 1							



REF	PART NO.	DESCRIPTION	MAT'L	QTY
A	82259169	GREASE ZERK .13NPT	SS	1
B	82286550	BUSHING-REDUCER .50NPT X .13NPT	316SS	1
C	801592-57	CONN.-MALE STR. .50 TUBE X .50NPT	316SS	2
D	-----	TUBING-.50 O.D. X .065 WALL	316SS	7
E	82259128	UNION .50 TUBE	316SS	5
F	82142514	ELBOW-UNION .50 TUBE	316SS	1

NOTE:

BRACKETS AND GROMMETS ARE INCLUDED IN PUMP BILL OF MATERIAL.

BEND TUBE
TO ALIGN WITH
BRACKET OPENING

MAX.
FROM BOTTOM
OF STRAINER TO
BOTTOM OF ELBOW UNION

MAX. CLEARANCE BETWEEN
STRAINER AND TUBING

DATE	SYM	REVISION	DIM. WAS	AUTH	DRG	ECN

**CAD DRAWING
NO MANUAL
CHANGES PERMITTED**

DRAWN PCH

CHECKED

DATE 04-18-97

MATERIAL SPEC.

SEE COMPONENTS



Ingersoll-Dresser Pumps

TITLE

PLAN - GREASE LINE TO SUCTION
.50 TUBING X .065 WALL
F/ HF OR LF HEAD - W/ STRAINER -
W/ BEND - W/ FIVE UNIONS

DWG.
NO.

81816449

ASSY

REV.
A

SCALE

NONE

34

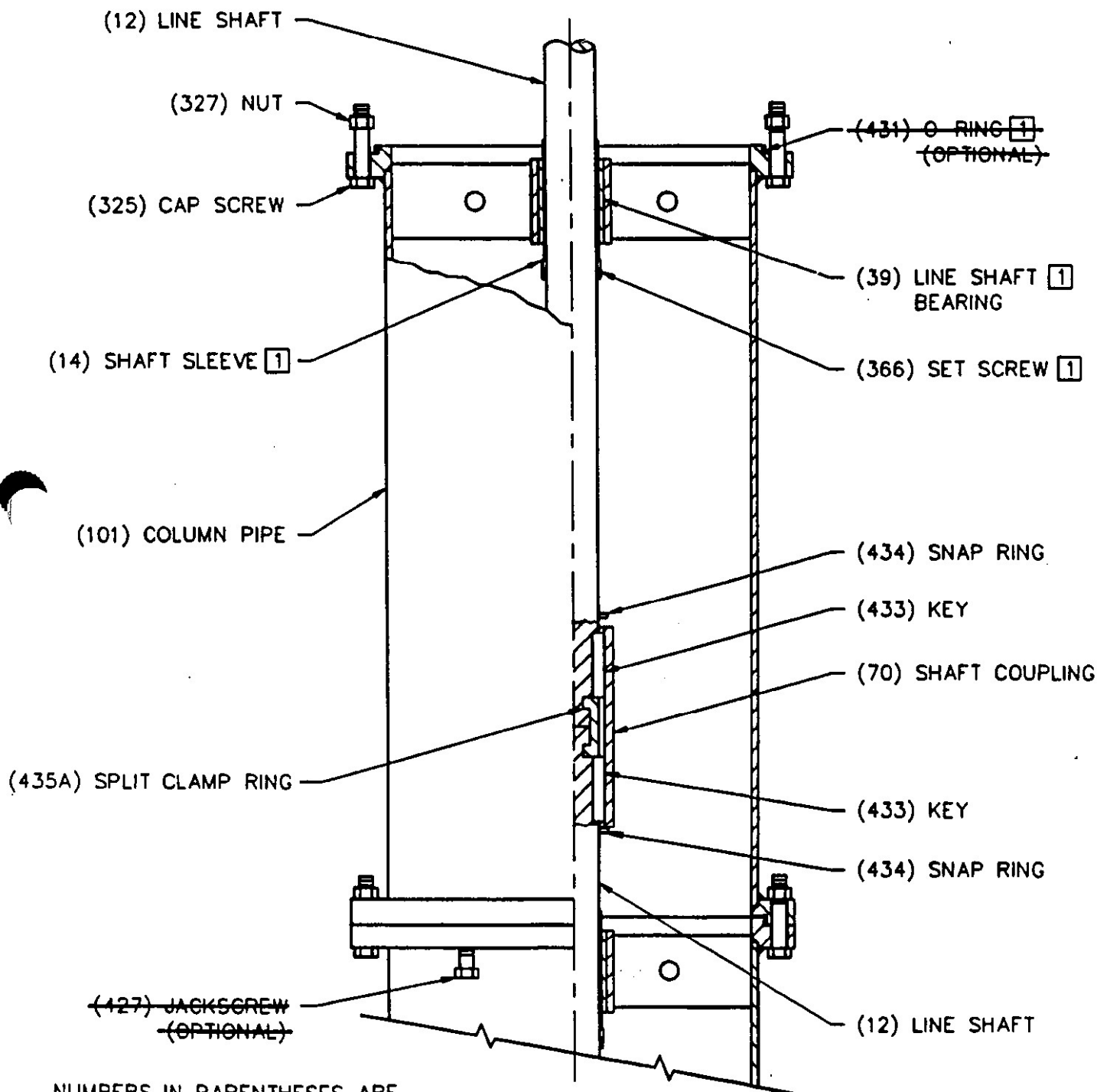
40

81816449

FLANGED COLUMN ASSEMBLY
MALE TO FEMALE-PRODUCT LUBE
W/ KEYED & SNAP RINGED SLEEVE COUPLING

902.01.07M

TYPICAL CROSS SECTION



NUMBERS IN PARENTHESES ARE
REFERENCE NUMBERS.

RECOMMENDED SPARES:

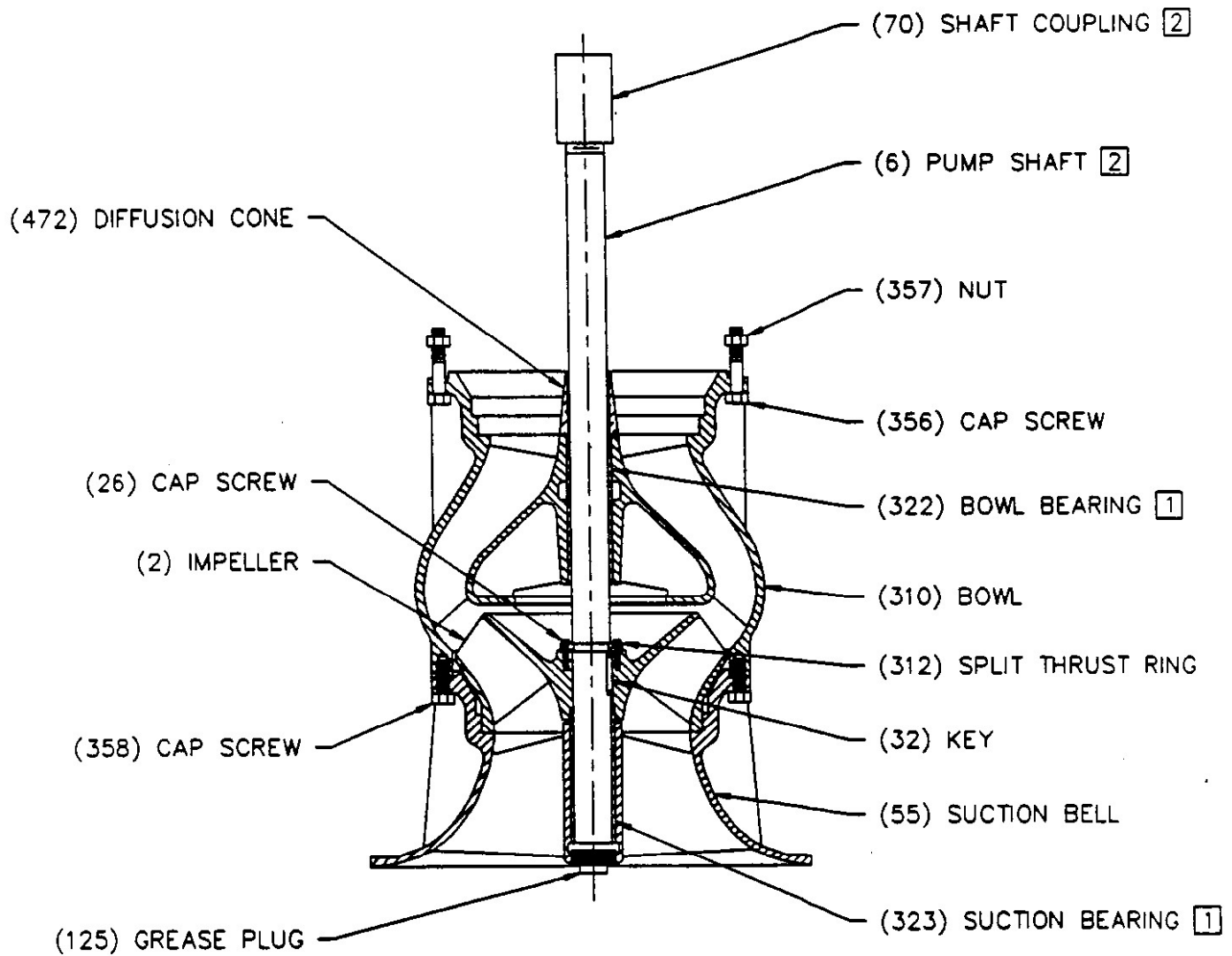
[1] CLASS 1 & 2

[2] CLASS 2

BOWL ASSEMBLY
ENCLOSED KEYED IMPELLER
PRODUCT LUBE

901.14

TYPICAL CROSS SECTION



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REFERENCE NUMBERS.

RECOMMENDED SPARES:

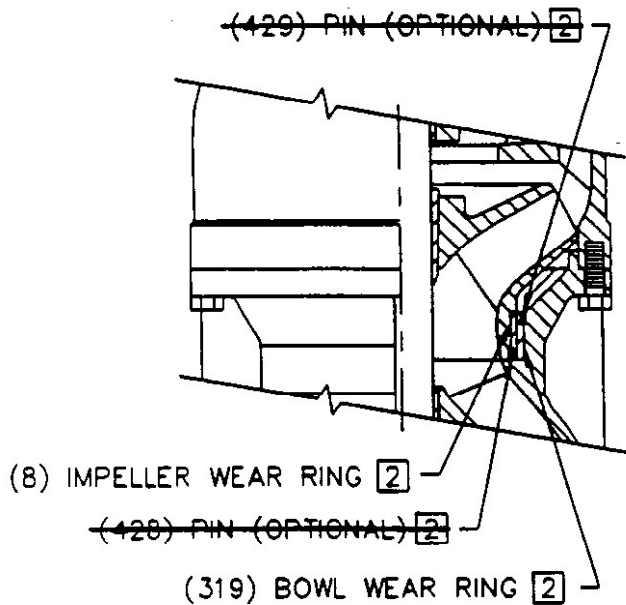
[1] CLASS 1 & 2

[2] CLASS 2

BOWL ASSEMBLY
CONSTRUCTION OPTIONS
TYPICAL CROSS SECTION

901.20

WEAR RINGS



O-RINGS

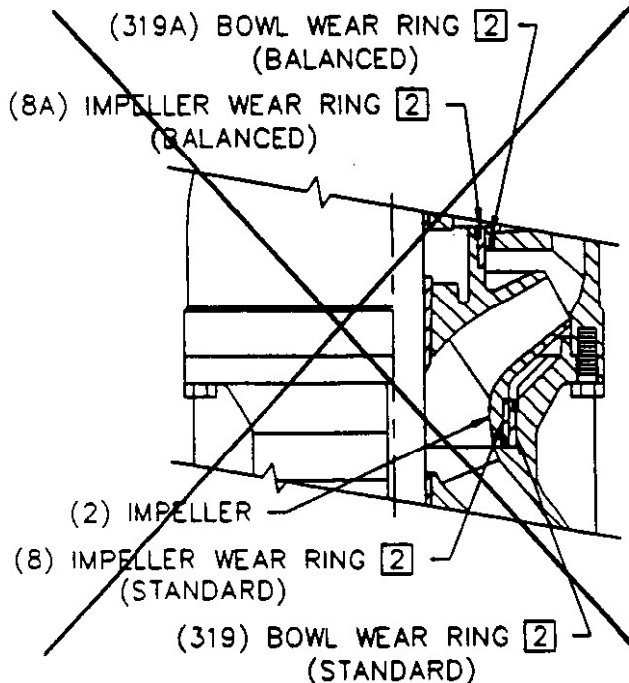
(430) O-RING [1]

BOWL CONNECTION
FLANGED CONSTRUCTION

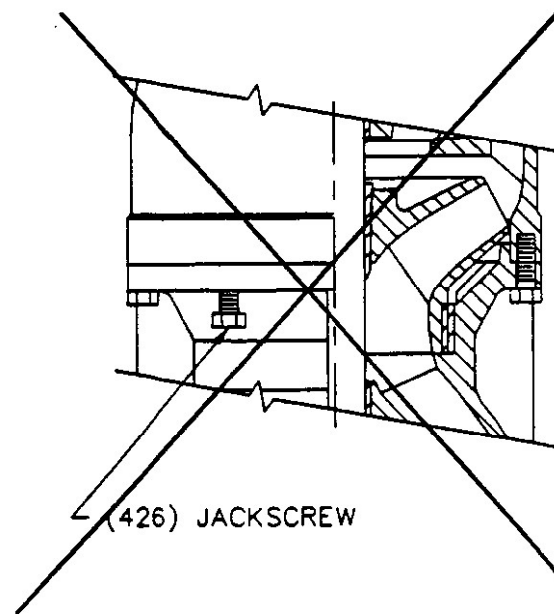
(430) O-RING [1]

~~BOWL CONNECTION
THREADED CONSTRUCTION - 6" & 8" ONLY~~

~~THRUST BALANCED IMPELLER
WEAR RINGS/PINS OPTIONAL~~



~~JACKSCREWS~~



RECOMMENDED SPARES:

- [1] CLASS 1 & 2
- [2] CLASS 2

NUMBERS IN PARENTHESES
ARE REFERENCE NUMBERS.

INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD
 S/N: 9703MS000099-1/3 MODEL: 29LKM-1 STAGE
 S/O No.: S000099 CUSTOMER: ARCHER-WESTERN CONTRACTORS, LTD.
 No. PUMPS: 3 PROJECT: TULSA M.U.A., MOHAWK W.T.P
 PAGE 1 of 2 CONTRACT NO. 6-CLEARWELL & DISTRIB
 IDP ORDER No: 047-77029 EQUIP. NOS.: 9-P-3, 4, & 5
 DATE: 05-23-98 SERVICE: BACKWASH SUPPLY PUMPS
 PARTS LIST BY: P. HODGSON

QTY	QTY PART	REF	DESCRIPTION	MATERIAL
REQ	ASY NUMBER	NO.		

***** PUMP SPARE PARTS LIST *****

The following spare parts have been furnished for the pumps identified above and are recommended to be maintained in storage:

- One suction bell bearing
- One set of bowl bearings
- One complete line shafting set which includes all line shafting, shaft couplings, shaft sleeves and bearings between the motor coupling and the bowl shaft
- One set of all wear rings
- Two sets of o-rings (No gaskets are included as spare parts because no gaskets are used in this pump.)
- One split ring mechanical seal

Part numbers and quantities for the spare parts are listed below. The quantities listed are the totals for all three pumps. The items are listed in the order in which they appear on the cross sections.

2	82282278	431	ORING 23.94 ID	.210 THK	BUNA-N
1	SS000099	349	SEAL MECH 2.44 SHF	SEALOL TYPE EZ-SPLIT	-
1	82062076	117	BRG SLV 2.45 ID X 3.00 OD X	4.50 LG	C844
2	04368200	347	ORING 5.73 ID	.139THK	BUNA-N
5	82063751	39	BRG RUB 2.72 ID X 3.52 OD X	5.00 LG	BUNA-S
5	81801094	14	SLV LINSHF 2.44 X 2.69 X	7.75 PLTD/CERAMIC	316SS
10	82065269	366	SCREW SET HEX/SOCKT .25-20UNC X	.25	316/SS
1	81806838	12A	TOPSHAFT 2.44 1.94LH	89.50 F/KEY/LINSFT	416SS
3	81806846	12	SHF LINE KEY 2.44 2.44WX	96.00 F/WX/CPLG	416SS
1	81806853	12	SHF LINE KEY 2.44 2.44WX	72.00 F/WX/CPLG	416SS
5	81806887	70	SLEEVE CLAMP CPLG 2.44"		416SS
5	81806895	435A	RING CLAMP 2.44"		416SS
10	97897887	433	KEY STR .63 SQ X 3.25 LG		416SS
10	82126665	434	RING RETANR F/2.44/SHF		15-7PH

INGERSOLL DRESSER PUMP COMPANY - TANEYTOWN, MD

S/N: 9703MS000099-1/3

MODEL: 29LKM-1 STAGE

S/O No.: S000099

CUSTOMER: ARCHER-WESTERN CONTRACTORS, LTD.

No. PUMPS: 3

PROJECT: TULSA M.U.A., MOHAWK W.T.P

PAGE 2 of 2

CONTRACT NO. 6-CLEARWELL & DISTRIB

IDP ORDER No: 047-77029

EQUIP. NOS.: 9-P-3, 4, & 5

DATE: 05-23-98

SERVICE: BACKWASH SUPPLY PUMPS

PARTS LIST BY: P. HODGSON

QTY REQ	QTY ASY	PART NUMBER	REF NO.	DESCRIPTION	MATERIAL
1		82300302	322	BRG SLV 2.95 ID X 3.50 OD X 3.00 LG	C844
1		82300310	322	BRG SLV 2.95 ID X 3.50 OD X 7.88 LG	C844
1		82280363	323	BRG SLV 2.95 ID X 3.50 OD X 11.00 LG	C844
1		82369141	8	RING WEAR IMP 29LK	C954
1		82369117	319	RING WEAR BWL 29LK	C954
4		82348780	430	ORING 22.94 ID X 23.22 OD X .139THK	BUNA-N