North Carolina Department of Environment, Health, and Natural Resources
Division of Environmental Health, Public Water Supply Section

SOURCE INFORMATION
GROUND WATER

Date Form Completed: M M D D Y Y: 01/27/95

PWSID: 0467042

Owner Assigned Source Code: 255

Well Name (If purchase, name of system): MCAS WATER PLANT 1255 well TC

Code: G (G=Ground, W=Purchase/G, Y=G w/direct influence, Z=W w/direct influence)

If Purchase, seller ID#:

Source Begin Date: M M Y Y

Source exempt—SWTR? Y N

Direct Influence Date: M M D D Y Y

Availability: P (P=Permanent, E=Emergency, S=Seasonal, I=Interim, O=Other)

Location of well within the system (If purchase, location of master meter): CURTIS ROAD

Latitude (N): Deg. Min. Sec.: 34 43 29

Longitude (W): Deg. Min. Sec.: 077 27 54

How Determined: G=GPS, M=Map, S=Surveyed

GPS Data: Q# or DOP #

No. of Sats. Locked on

(If purchase, use seller's primary source lat/long)

Vulnerable (VOCs)? Y N

Assessment Date: M M D D Y Y

ENTRY POINT INFORMATION

Use Code: C (C=Ground/Permanent, D=Ground/non-permanent)

Availability: P (P=Year-round, S=Seasonal, E=Emergency, I=Interim, O=Other)

Owner Assigned Entry Point Code: 400

Entry Point Name: ~~well 255~~ MCAS NEW RIVER WTP

Location:

Well Site: Owned or controlled? Y (Y,N) Control Area (100' radius)? N (Y,N) If no, explain:

Sources of pollution/distance: 60' to Rd 40' to HW

monitoring wells on site for CAST (removed)

Surface water within 200'? N Y N If yes, actual distance ___ feet If yes, bact. samples collected? ___ (Y,N)

Adequate slope? ___ (Y,N) Flooding? ___ (Y,N) Maintenance:

Well House: Free of stored materials? Y (Y,N) Properly drained? Y (Y,N) Locked? Y (Y,N)

Condition of house: OK Type of freeze protection: None

Well: Diameter: 8" Type: SCREENED Yield (gpm): 200 Properly sealed? Y (Y,

Properly vented? N (Y,N) Casing depth UNK ft. (If unknown, put 'UNK') Well depth: 250 Meter available? N (Y,

Concrete slab adequate? ___ (Y,N) If no, explain: Size:

Size of blow-off: 4 1/2 Sample tap: Before treatment? Y (Y,N) After treatment? ___ (Y,

Pumps: Capacity: GPM: 50 1/2 required HP: Pump intake depth: 70 Auxiliary Power? Y (Y,

Type pump: VERTICAL TURBINE Height above floor (pump/casing): 1 ft on

Storage at well site: Elev: Hydro: Ground:

If hydroautomatic, air volume control? ___ (Y,N) Safety valves? ___ (Y,N) Coded? ___ (Y,N)

High service pumps: 1. ___ gpm ___ hp 2. ___ gpm ___ hp 3. ___ gpm ___ hp Auxiliary Power? ___ (Y,

Is the water treated at this well? N Y N If yes, complete back of form.

If other wells are treated here, which ones? If treated elsewhere, where? MCAS/Water Plant

If purchase, retreat? Y N If yes, complete back of form.

(1) No Vent
(2) No Meter

WELL NUMBER 1255		BY THOMAS / STEVENSON			DATE 5-11-94	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
140	28	61	33	23	@ 50	

REMARKS Dead head @ 40 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER 1755 BY THOMAS DATE 6-5-91

AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
100'	31	47	36	74	104.	00
	Brake suction @ 20 PSI					20

REMARKS Dead head 43

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE
MID SOUTH PUMP CO. J-LINE		MODEL 8LCB4 SN 10103K		

WELL NUMBER 1255		BY THOMAS / HUNTER			DATE 6-28-89	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME
80	13	56	43	10	104	10

REMARKS Dead head @ 42 PSI

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

WELL NUMBER AS 1255		BY Thomas - BROWN			DATE 1-3-85	
AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAIN DOWN	DISCHARGE PRESSURE	GPM	START TIME 1400
80	13	60	47	18	104	1420

REMARKS left set @ 18 PSI 104 gpm 60' P/L A/L 80 S/L 13 P/D 47

MANUFACTURER	STAGE	S.N.	TOTAL HEAD	SIZE

AS 1-55

10-10-83

A/L	S/L	P/L	D/D	PSI	GPM	Time
80	15	41	46	0	100	15

Industrial Sales Company, Inc.

P. O. BOX 2148
BLUE CLAY ROAD
WILMINGTON, N. C. 28402

TELEPHONE 919-763-8126
FAX 919-762-2149

FAX TO: USMC
ATTENTION: Stanley Miller X-1081
FROM: Roy Marshall, Gene Wells
PAGES TO FOLLOW: 1
DATE: 3-12-91
COMMENTS:

THANK YOU

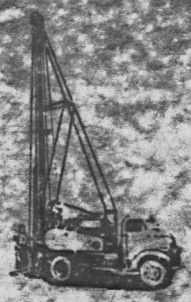
CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

P. O. BOX 1085 TELEPHONE 776-3415

SANFORD, NORTH CAROLINA 27330

N.W.W.A.
N.C.W.W.A.



Re: Well Q
Camp Lejune, North Carolina
New River Job

We set up and drilled a hole to 250'. While we were drilling this hole we kept an accurate drillers log and soil samples log. We then ran an electric log on the hole and took water samples from 3 stratus. (Analysis enclosed)

Our recommendation would be to set 60' of pit casing and drill the hole to the depth of 220'. Take water from 124' to 200'. We feel like that a gravel pack well would produce 200 GPM. Screen settings would be 124' to 132'; 156' to 166'; 180' to 190'.

CURVE PAGE 76
SIZE XH6 P.C.3186
SUPERSEDES P.C.2622

TS CATALOG - SECTION C - 1750 RPM
VERTICAL TURBINE PUMP CURVES
PERFORMANCE PER STAGE

CRANE - DEMING PUMPS
CRANE CO.
SALEM, OHIO, U.S.A.

SIZE XH6 — SINGLE STAGE PERFORMANCE — **1770 R.P.M.**

EFFICIENCY CHANGE:

___ STAGE DEDUCT		0	POINTS
3 STAGE DEDUCT		2	POINTS
2 STAGE DEDUCT		4	POINTS
1 STAGE DEDUCT			

ENAMELED BOWLS

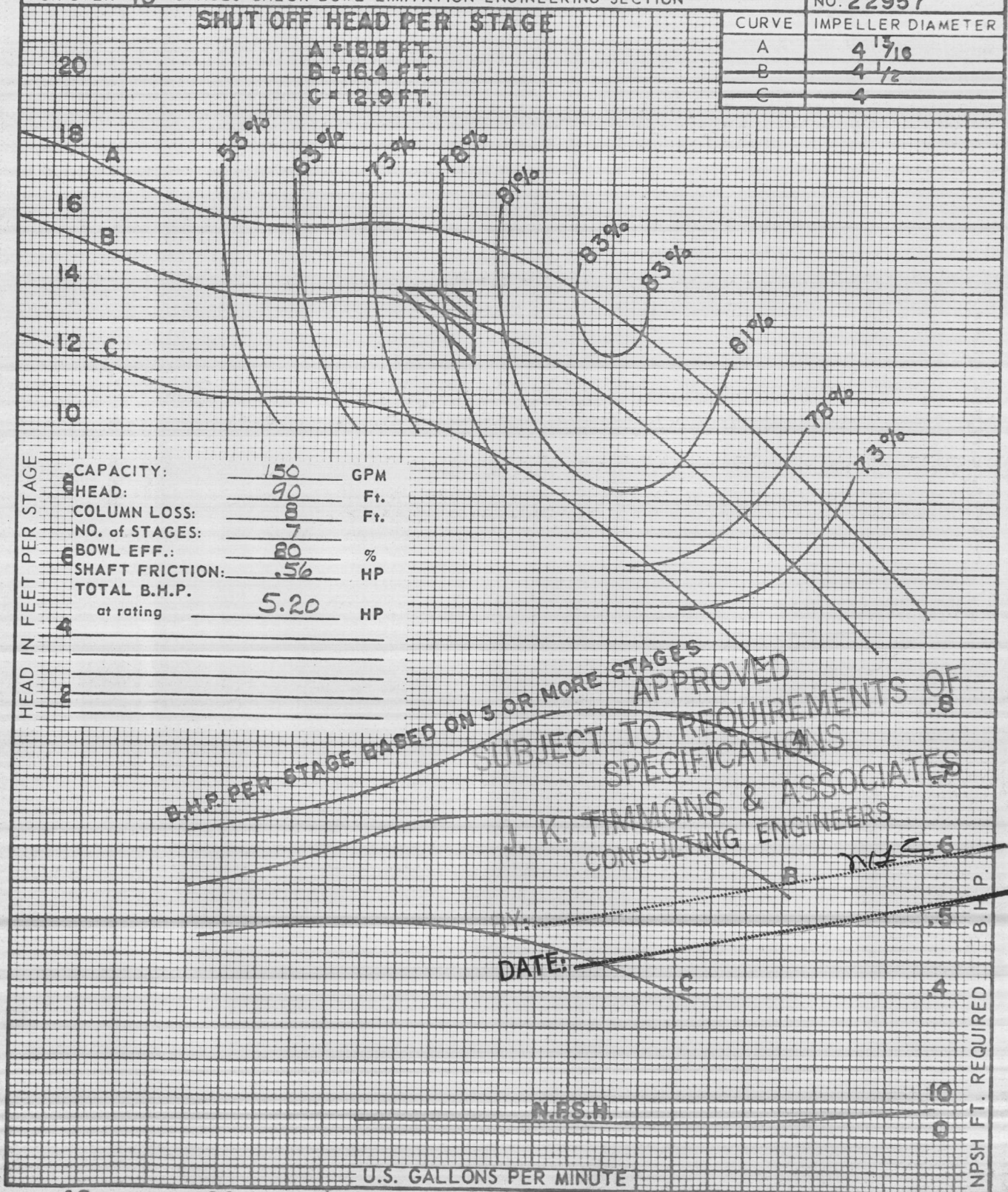
DIMENSIONS	FIG. 4700	FIG. 4750
BOWL DIAMETER	5 3/4	5 3/4
IMPELLER SHAFT DIA.	1	1
LENGTH FIRST STAGE	17 1/8	20 1/8
ADDITIONAL STAGE	6 1/2	6 1/2
THRUST FACTOR =	3.9	3.9

SUCTION – I.D. PIPE SIZE 4" SIZE COLUMN ADAPTER (4)" " OR 5 " SEMI-ENC. IMPELLER

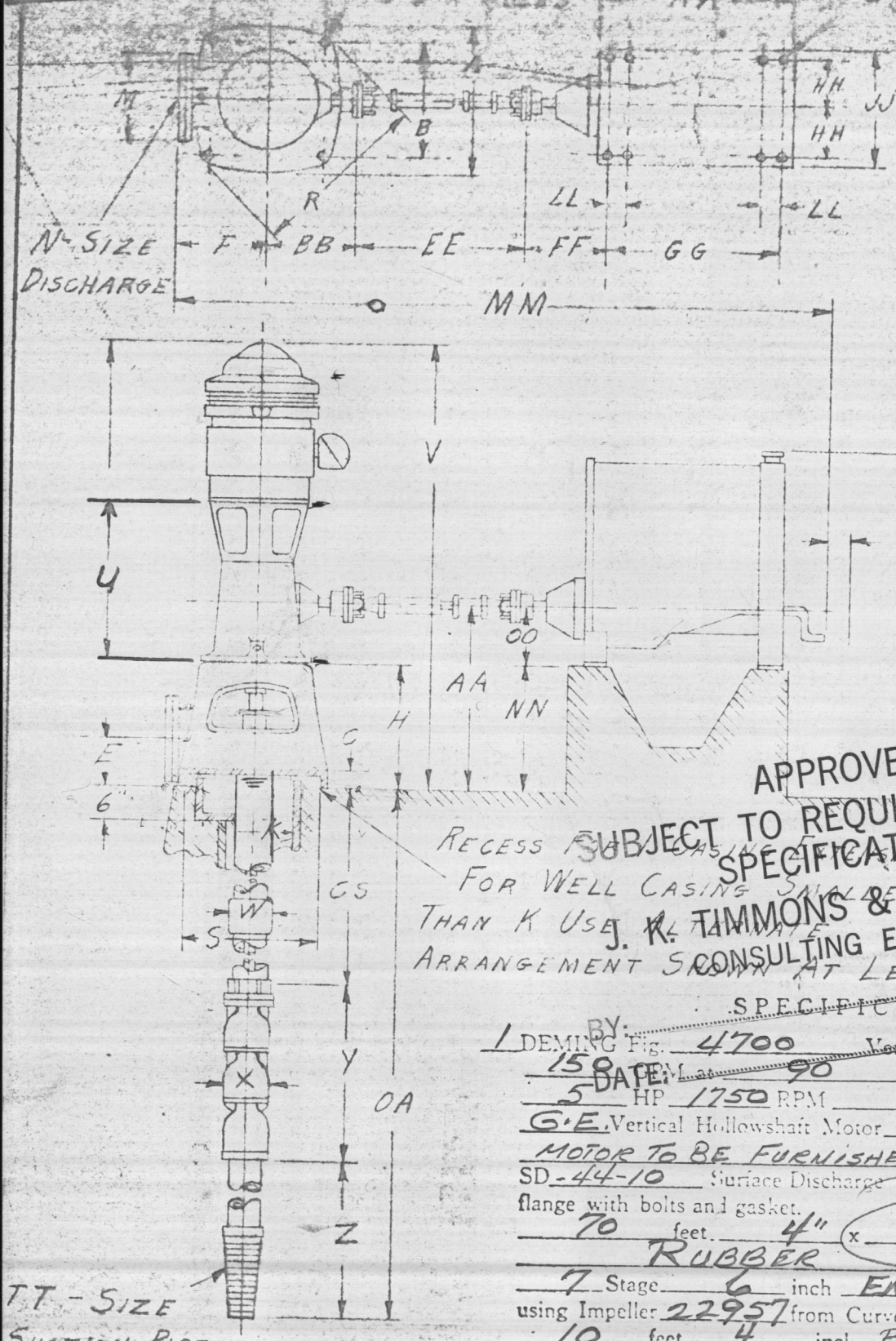
FOR OVER 40 STAGES CHECK BOWL LIMITATION ENGINEERING SECTION — NO. 22957

CURVE	IMPELLER DIAMETER
A	4 15/16
B	4 1/2
C	4

SHUT OFF HEAD PER STAGE
A = 18.8 FT.
B = 16.4 FT.
C = 12.9 FT.



CAPACITY:	150	GPM
HEAD:	90	Ft.
COLUMN LOSS:	8	Ft.
NO. of STAGES:	7	
BOWL EFF.:	80	%
SHAFT FRICTION:	.56	HP
TOTAL B.H.P. at rating	5.20	HP



DIMENSION			
A	14"	CS	70'-0"
B	12 3/8"	OA	85'-7 1/8"
C	2"	AA	21 7/8"
D	5/8"	BB	13"
E	6"	EE	—
F	9"	FF	—
H	15 1/2"	GG	—
K	6"	HH	—
M	11"	JJ	—
N	6"	KK	—
R	19 1/8"	LL	—
S	12 3/4"	MM	—
U	19 1/8"	NN	—
V	—	OO	—
W	5"	RR	—
X	5 3/4"	SS	—
Y	4'-8 1/8"	TT	4"
Z			

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: mjc
DATE: 4-10-75

SPECIFICATIONS

1 DEMING Fig. 4700 Vertical Turbine Pump designed for 150 GPM at 90 feet head, including:
5 HP 1750 RPM ____ Volt ____ Phase ____ Cycle G.E. Vertical Hollowshaft Motor
MOTOR TO BE FURNISHED BY OTHERS.
SD-44-10 Surface Discharge Head with ____ inch discharge flange with bolts and gasket.
70 feet 4" x 1 1/4" Column and shaft with RUBBER Bearings on 10 foot centers
7 Stage 6 inch ENAMELED Bowl Assembly using Impeller 22957 from Curve PC-3186
10 feet 4 inch BLACK STEEL suction pipe
4 inch KEYSTONE TYPE TC GALV. strainer

When properly endorsed this print is correct for
ENVIRONMENTAL PRODUCTS INC.
Customer's P.O. 2188 Turbine No. J. 74760
Date 4-7-75 By David E. Snyder 50-6109-00

DATE OF ISSUE
MARK NEW RIVER WELL
DESTROY ALL PREVIOUS PRINTS

THE DEMING CO. SALEM, OHIO	TITLE VERTICAL TURBINE PUMP WITH RIGHT ANGLE GEAR DRIVE & ENG. WITH MOTOR	FIG. 47	SIZE
V-47	DATE 4-20-49	SCALE —	DRAWING NO. 18464

1255

DATE	LENGTH OF AIR LINE	STATIC LEVEL	PUMPING LEVEL	DRAW DOWN	DISCHARGE PRESSURE	GPM CAP. PER FOOT OF DRAW DOWN	TOTAL CAP.
7-23-82	80'	13'	49	36'	8	100 GPM	0900

REMARKS:

used direct reading gage
at 0 pressure pulled to 68 pt. 122 GPM

24

"O"

Floating Aerators • Water & Sewage Pumps • Sewage Lift Stations

EPI

ENVIRONMENTAL PRODUCTS INC.

P. O. BOX 2385 HICKORY, NORTH CAROLINA 28601 TELEPHONE 704/322-7003

Prepared For: Carolina Well & Pump Company

Project: N62470-73B-1155

Location: New River Utilities Expansion - MCAS (Helicopter)

Subject: Well "O"

Conditions: 150 GPM @ 90' TDH, 1770 RPM - Setting 85' 7⅛"

Description

One(1) Crane Deming Figure 4700, size XH6, seven stage bowl assemblies, ~~bronze fitted~~ 304 SS 44-10 discharge head, ~~standard~~ 4" x 1¼" Column and shafting for above design conditions, ~~J. K. Line~~ lubricated with suction pipe, strainer, Johnson ~~Model~~ HA-15, 43 rabbit right angle gear drive, and ~~5~~ 7½ HP, 1800 RPM, 3 phase, 60 cycle, ~~230/460~~ 200Y volt, vertical hollow shaft motor, with non-reverse ratchet, 1.15 service factor, 213TP10 frame, open dripproof, WP-1 enclosure

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
DATE:

April 14, 1975

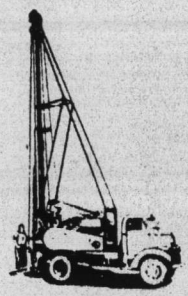
CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

P. O. BOX 1085 TELEPHONE 776-3415

SANFORD, NORTH CAROLINA 27330

N.W.W.A.
N.C.W.W.A.



Re: Well O
Camp Lejune, North Carolina
New River Job

We set up and drilled a hole to 250'. While we were drilling this hole we kept an accurate drillers log and soil samples log. We then ran an electric log on the hole and took water samples from 3 stratus. (Analysis enclosed)

Our recommendation would be to set 60' of pit casing and drill the hole to the depth of 220'. Take water from 124' to 200'. We feel like that a gravel pack well would produce 200 GPM. Screen settings would be 124' to 132'; 156' to 166'; 180' to 190'.

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

CHEMICAL ANALYSIS OF WATER

Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

MCAS
161

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: CAMP LEJEUNE

Address: JACKSONVILLE, N. C.

Well No. 0

County: ONSLOW

Report to: WORTH F. PICKARD

Address: BOX 1085

SANFORD, N. C. 27330

Collected by: HAYDEN HARRISON

Date Collected: _____ Time: _____

Remarks: 168-172

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[X] 9-Other _____

Source of Water:
[ ] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] Purchased

Source of Sample:
[X] 1-Well tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[X] 1-Raw
[ ] 2-Treated

Type of Treatment:
[X] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[X] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[X] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS &
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY:
DATE:

ANALYSIS

Color	(000)	12 units	pH	(00.0)	8.0

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	325	Fluoride	(0.00)	1.19
Total Hardness	(000)	58	Arsenic	(0.00)	< 0.01
Iron	(00.00)	< 0.05	Cadmium	(0.00)	< 0.01
Manganese	(00.00)	< 0.03	Chromium	(0.00)	< 0.05
Turbidity, SiO_2	(000)	.7	Copper	(00.00)	< 0.05
Acidity $CaCO_3$	(000)	8	Lead	(0.00)	< 0.05
Chloride	(000)	80	Zinc	(00.00)	0.05
Sodium	(000)	160	Calcium		17.3
Potassium	(00.0)	11.0	Magnesium		3.6

Date received: May 7, 1975 Date reported: May 13, 1975

Date analyzed: _____ Reported by: _____ Lab. No. 07447

QUOTATION

QUOTATION NO. _____

Industrial Sales Co., Inc.

Please Reference This Number Concerning This Quote.

☐ Location 1
Blue Clay Rd. P.O. Box 2148
Wilmington, N.C. 28402
919-763-5126
N.C. Toll Free 1 800-672-0446

☐ Location 2
Hwy. 264 W. P.O. Box 127
Washington, N.C. 27889
919-946-9131
N.C. Toll Free 1 800-682-0761

☐ Location 3
Hwy. 17 A. P.O. Box 118
Summerville, S.C. 29483
803-871-7810
S.C. Toll Free 1 800-922-8192

☐ Location 4
P.O. Box 964
609 Kaminski St.
Georgetown, S.C. 29442
803-527-2423

Quotation for

U.S.M.C.

☐ CONFIRMING

Your Inquiry No. _____ Date 3-12-91

Prices Are F.O.B. Delvd.
Terms 1% Ten Net-30
Delivery 2-3 WEEKS

ATTN.: STANLEY Miller X-108T

Salesman Roy Marshall

WE SUBMIT OUR QUOTATION AS FOLLOWS

QUANTITY	DESCRIPTION	U/M	UNIT PRICE	EXTENSION
1	Pump For 8" Well 150 GPM @ 110 Ft T.D.H. To consist of the following! 6-pcs 4"X1" X10' Column /w C1045 Shaft + Coup 1-pc 4"X1"X 5' Top Column 1-pc 4" X" X 5' Bottom Column 1- 4 Stage 8LC B-Trim Bowl Assembly 1- TR-6C Discharge Hd w/2 P Head Shaft 1- 4"X10' Tail Piece 1- 4" Female Galv Cone Strainer 1- 7½ H.P. 230/460 Volt 3ph motor # WP-1-NRR 1- # CH20 Johnson Combination Right Angle Gear Complete			TC 1255

PRICES SUBJECT TO ACCEPTANCE WITHIN _____ DAYS

TOTAL $7390.00

May We Have Your Order Please?

By Roy D. Marshall

Title Inside Sales

-WHITE—ORIGINAL
-YELLOW—FILE COPY
-PINK—SALESMAN

1½% FINANCE CHARGE MAY BE APPLIED ON ALL PAST DUE ACCOUNTS PER MONTH (18% ANNUAL RATE).
RETURNED MERCHANDISE SUBJECT TO RESTOCKING CHARGE.

WPCo

QUOTATION

QUOTATION NO.

Please Reference This Number Concerning This Quote.

Industrial Sales Co., Inc.

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Georgetown, S.C. 29442
803-527-2423

Quotation for

☐ CONFIRMING

U.S.M.C.

Your Inquiry No. _____ Date 3-12-91

Prices Are F.O.B. Delivd.
Terms 1% Ten Net-30
Delivery 2-3 WEEKS

ATTN: STANLEY Miller X-108

Salesman Roy Marshall

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WPCo

J-LINE
FORMERLY JACUZZI

OWNER'S MANUAL

INSTALLATION INSTRUCTIONS

Water Lubricated Lineshaft Turbine Pumps

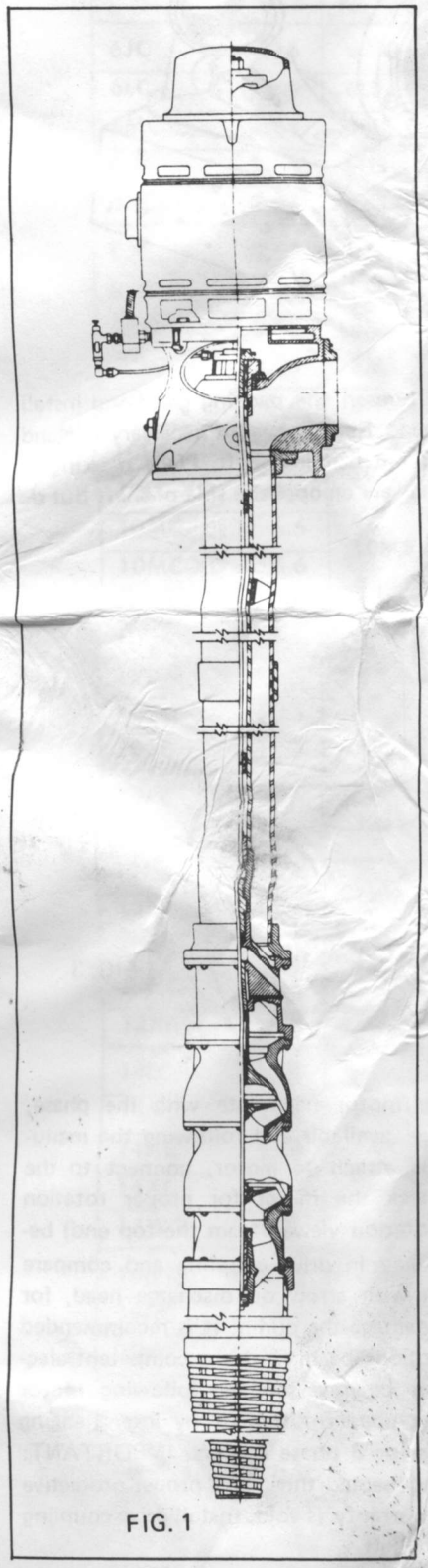


FIG. 1

WELL CHECK: Check well for ample depth, diameter and straightness before starting installation. Completely remove any oil from water surface by bailing, as oil will damage the rubber bearings in the pump and column.

FOUNDATION: An adequate concrete foundation is desirable. For average soil conditions and settings, a foundation 12" thick is sufficient if it is placed on firm soil. See Figure 2.

INSTALLATION RIG: Use a tripod or rig of sufficient strength to lift the complete pump safely with sufficient height to raise the top of the column at least 12 feet above the pump foundation.

TOOLS: Two sets of pipe clamps and the regular hand tools for this class of work.

UNCRATING AND CHECKING: Uncrate all parts and examine carefully for shipping damage or shortages before starting installation. See Figure 1. Lay the column and shafting on cross timbers with the coupling end toward and near the well.

SPECIAL PRECAUTIONS: Check the shafting for straightness and damage, taking great care to keep all threads clear on shaft, column and coupling. Inspect the bowls for damage or foreign material and see tha the shaft turns freely and has sufficient end play.

IMPORTANT: All shaft and column joints must butt squarely, metal to metal, and any dirt will prevent proper joints and result in unsatisfactory service. All shaft joints should be tight. Use a good grade of clean thread lubricant or pipe compound on each joint of column and shafting.

CAUTION: This pump is provided with the highest quality rubber bearings, which must be wet before the pump is started, or serious damage may result. Therefore, the pump must be installed with a foot valve or provided with a prelubrication system.

BOWLS: Assemble one end of the suction pipe with the bowls and the other end to the strainer.

CAUTION: Use tapered thread pipe on suction only. Column sections have butt joint thread. Place a pipe clamp near top of the bowls and, using an installation rig, lower the bowls into the well until the pipe clamp rests on the well casing or other support. See Figure 3. Install a shaft coupling on the bowl shaft.

CAUTION: Be certain the shaft coupling and bowl shaft end are perfectly clean. If the bowls and suction pipe are too long for the installation rig, the bowls may be attached to the suction pipe after the pipe is suspended in the well.

COLUMN AND SHAFTING: Insert a 5 foot length of shaft with bearing sleeve up, into a 5 foot length of outer column, attaching pipe clamps just below the pipe coupling. Using a piece of ½" rope, place a clove hitch around the lower end of the outer column and another around the lower end of the shaft. With the rig, raise the column above the pump, maintaining tension on the rope to prevent the shaft from slipping out of the outer column while it is being elevated. CAUTION: Keep column and shafting threads out of the dirt. Lower the lineshaft into the bowl shaft coupling after cleaning both threads and shaft end. tighten until the shaft ends butt. NOTE: Threads are left hand. Lower the outer column into the pump bowls. Apply thread lubricant or compound and tighten until the pipe butts. Raise the pump a few inches, remove the lower clamp, and lower the pump into the well until the upper pipe clamp rests on the clamp supports. With open end down, place the lineshaft bearing assembly over shaft. Screw the bearing assembly into the column coupling until it butts. See Figure 4. Screw the coupling on the shaft until it butts with the sleeve. The shaft under the stainless steel sleeve is rust-proofed before shipping and therefore the sleeve should not be removed except for repair or replacement. Repeat above procedure for the remaining 10 foot lengths of column with the following precautions:

(a) Keep the shaft threads and ends absolutely clean.
(b) Install the shafting with sleeve end up.
(c) Do not bend shafting.
(d) Put pipe compound on the column pipe threads.
(e) Make all threaded joints tight.

Remove the column head flange from the head and screw to remaining 5 foot section of column pipe. The end receiving the column head flange is marked. Install this 5 foot section with the 4 foot length of lineshaft on the last 10 foot section and screw the head shaft into the top lineshaft coupling.

DISCHARGE HEAD: Install and bolt pump head to the column flange using a gasket between flange and head. Raise the pump head slightly, remove the pipe clamps, lower the head on the foundation with the discharge opening in the desired direction. Place the complete packing gland assembly over the head shaft but do not insert the gland in the discharge head but suspend the assembly on the shaft by tightening the packing gland. After removing canopy and drive coupling, lower the motor over the head shaft and bolt to the pump head: CAUTION Do not bend the head shaft or damage threads.

ALIGNMENT OF DISCHARGE HEAD: Center the shaft through the driver quill (bore) by placing metal shims between the pump head and foundation at the proper corners. NEVER USE A SPIRIT LEVEL to align the head since wells are rarely plumb. After the head is aligned, raise it again and place a soft cement grouting on the foundation without disturbing the shims. Apply a coating of grease to the bottom of the head to prevent sticking to the grouting Lower the pump head, allowing the surplus grouting to squeeze out so the head again rests on the shims.

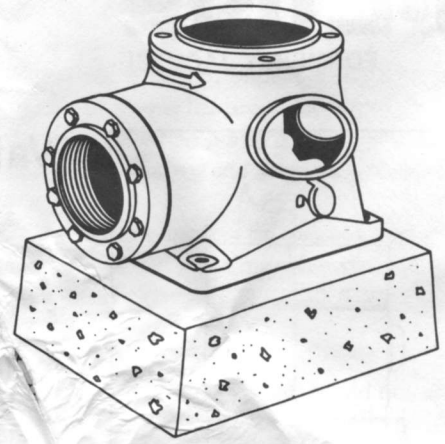


FIG. 2

PACKING GLAND: Loosen the packing gland and install the assembly in the head. Realign head if necessary so gland will fall in place without bending shaft. Place packing so joints of adjacent rings are on opposite side of shaft but do not tighten packing.

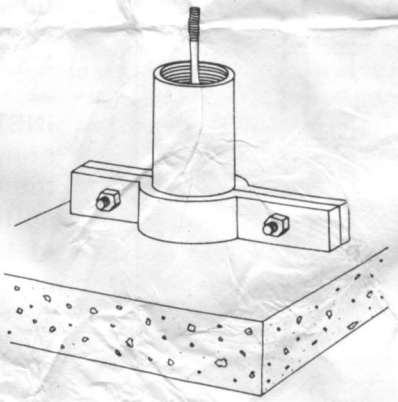


FIG. 3

MOTOR: Check the motor nameplate with the phase, frequency and voltage available and following the manufacturer's instructions attach to motor, connect to the magnetic starter. Check the motor for proper rotation (counter clockwise rotation viewed from the top end) before installing drive key in drive coupling and compare direction of rotation with arrow on discharge head, for wrong rotation may damage the pump. It is recommended that electrical connections be made by a competent electrician. Rotation can be reversed by following motor instructions for single phase motors or by interchanging any two power leads for 3 phase motors. IMPORTANT: The motor must be connected through a proper protective starter or the motor warranty is void. Install drive coupling and drive key on head shaft.

IMPELLER ADJUSTMENT: Install head shaft nut on top of motor shaft and tighten until the shaft turns freely or impellers are not resting on bottom of the bowls. Holding the shaft, tighten nut carefully until the impellers touch top of the bowls. CAUTION: Care should be taken not to force the impellers against the top of the bowls. Note total distance raised and lower to mid-position and lock the nut by inserting the locking screw in the proper hole of the head shaft nut.

HEAD SHAFT: With a hack saw, cut off the head shaft to a length that will accommodate the motor canopy. CAUTION: Place a clean rag over the bearing and around the shaft to protect the bearing from saw filings.

BELTED DRIVE: The belted head turbine is installed in the same manner as electric drive, except the discharge head should be secured to the foundation to withstand belt pull.

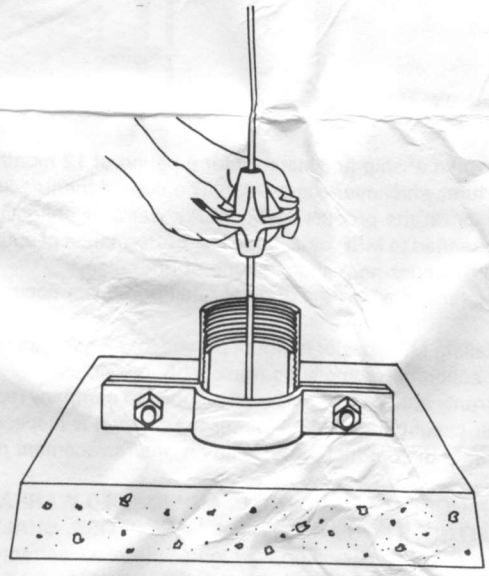


FIG. 4

GEAR DRIVE: A right angle gear drive is installed in the same manner as the electric drive.

PACKING GLAND ADJUSTMENT: Tighten the packing gland until the packing seizes the shaft and then back off the gland until the shaft turns freely.

DISCHARGE PIPE: Install the discharge pipe and va[illegible] on the pump discharge.

PRELUBRICATION: Prelubricate lineshaft bearings by introducing water into the pump column through the auxiliary discharge in the back of the head. IMPORTANT: Column bearings must be water lubricated before starting pump.

STARTING PUMP: Start the pump with the discharge valve closed, and open in small steps, allowing water to clear of sand between each step. CAUTION: DO NOT STOP PUMP WHEN WELL IS DELIVERING SAND. If necessary, close the valve gradually, allowing the water to clear and stop the pump when valve is closed. After the well is free of sand at open discharge pumping, and after the pump has been started a few times without delivering excess sand, the impellers may be reset to the normal running position.

RESETTING IMPELLERS: For maximum performance, semi-open or end seal impellers should be set only a few thousandths of an inch above the bottom of the bowls. The following table indicates the approximate distance the semi-open or end seal type impellers should be raised above the bowl face to allow for the shaft stretch due to hydraulic thrust. The distance is expressed in turns of the adjusting nut after the impellers start to turn freely. For electric drive, the adjustment should be checked by observing the horsepower; if the power is excessively high the impellers are probably dragging and should be raised slightly.

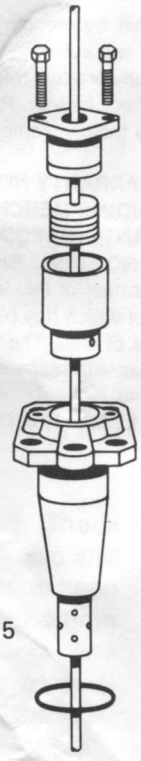


FIG. 5

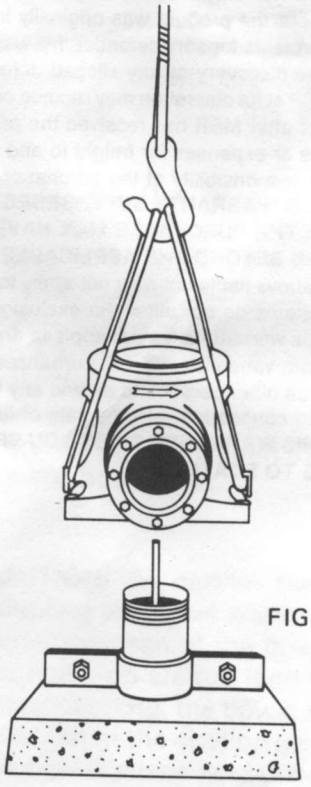


FIG. 6

INSTRUCTIONS FOR USING ADJUSTMENT CHARTS: First determine the constant "C", which is the total head in feet x setting (length of shaft in feet) x thrust constant (K). Thrust constant is determined from Table I, corresponding to bowls installed. Turns of adjusting nut will be found in Table II under the diameter of shaft corresponding to the value of "C" determined.

EXAMPLE:
200 ft. total head – 140' setting – 12MS bowl – 1½" shaft "C" 200 x 140 x 12.5 = 350,000. From Table II, for "C" = 350,000 and shaft diameter of 1½", number of turns = 1.

SIDE SEAL IMPELLERS: For side seal impellers, the impellers should be raised at least one additional turn over that determined from the table.

POWER METER CHECK: If the impellers are dragging, the power input would be excessive, which can be determined with the power meter on electric drive installation. The horsepower can be determined approximately as follows:

Motor HP = .08 x K x R, where K is the meter constant (usually stamped on meter nameplate or on revolving disc) or meter constant times current transformer ratio for a 5 ampere power company meter. R is turns for one minute.

AMMETER CHECK: The load may also be checked by comparing the ampere input with the motor nameplate rating.

INSTALLATION RECORD

Purchased From IND. SALES, MID SOUTH PUMP CO.
Date of Installation 6-3-91
Well I.D. (In.) TC 12 5-5 Well Depth (ft.) 195
Water level (Ft.) Standing 31 Pumping
Pump Bowl Model No. 8LC84
Pump Bowl Serial No. 10103K
Bowl Setting (ft.) 70
Suction Pipe, Size (In.) 4" Length (Ft.) 10'
Discharge Column Size (In.) 6" X 6"
Discharge Column, Total Length (Ft.) 70' WITH 10' TAIL
Discharge Column, Section Length (Ft.) 10'
Motor US ELECT HP 7.5 Phase 3H Cycle 60 Volts 220/460 20A/10A
Motor Speed RPM 1735

GEAR DRIVE SN 121865 - CHZ6
BHP 20 1760

TURBINE IMPELLER ADJUSTMENT TABLES

TABLE I

HYDRAULIC THRUST CONSTANT "K" LBS./FT. HEAD			
Closed Impeller		Semi-Open Impeller	
Bowl Fig. No.	"K"	Bowl Fig. No.	"K"
6JC	1.56	6JS	1.74
6LC	1.56	6LS	1.72
6MC	2.24	6MS	2.43
6HC	2.24	6HS	2.29
6XC	2.83	6XS	2.35
8JC	2.98	8JS	3.52
8LC	2.98	8LS	3.34
8KC	3.93	8KS	4.42
8MC	3.93	8MS	4.28
8HC	5.4	8HS	5.4
10LC	6.6	10LS	7.5
10LC-XD	6.6		
10MC	6.6	10MS	7.5
10MC-XD	6.6		
10HC	8.1	10HS	9.2
10HC-XD	8.1		
10WC	10.3	10WS	11.2
10YC	10.3	10YS	11.4
10ZC	13.7	10ZS	13.5
12LC	10.6	12LS	12.5
12LC-XD	10.6		
12MC	10.6	12MS	12.5
12MC-XD	10.6		
12HC	16.5	12HS	19.0
12HC-XD	16.5		
12XC	18.0		
14LC	17.2	14LS	19.7
14MC	21.8	14MS	23.4
14HC	21.8	14HS	25.2
14XC	21.8	14XS	23.4
14WC	24.8	14WS	26.2
16MC	34.9	16MS	38.9
16HC	34.9	16HS	39.5
20MC	38.0		
20HC	38.0		
24HC	59.0		
28HC	83.0		

TABLE II

Constant C TDH x Setting x "K"	SHAFT DIAMETER (inches)							
	3/4	1	1 3/16	1 1/2	1 11/16	1 15/16	2 3/16	2 7/16
	Threads per inch							
	16	12	12	12	12	12	12	8
	Turn of Adjusting Nut							
25,000	1/4	1/6	1/6	1/6	1/6	1/6	1/6	1/6
50,000	2/3	1/4	1/6	1/6	1/6	1/6	1/6	1/6
75,000	1	1/3	1/3	1/6	1/6	1/6	1/6	1/6
100,000	1-1/3	1/2	1/2	1/4	1/6	1/6	1/6	1/6
150,000	2-1/6	5/6	2/3	1/3	1/3	1/6	1/6	1/6
200,000	2-3/4	1-1/4	5/6	1/2	1/2	1/4	1/6	1/6
250,000	3-1/2	1-1/2	1-1/6	2/3	1/2	1/3	1/3	1/6
300,000	4-1/16	1-3/4	1-1/4	5/6	2/3	1/2	1/3	1/4
350,000	5	2-1/2	1-1/2	1	2/3	1/2	1/2	1/4
400,000	5-1/2	2-1/3	1-2/3	1-1/6	3/4	2/3	1/2	1/3
450,000	6-1/3	2-2/3	2	1-1/4	5/6	2/3	2/3	1/3
500,000	7-1/2	3	2-1/6	1-1/3	1-1/6	2/3	2/3	1/3
600,000	8-1/3	3-1/2	2-1/2	1-2/3	1-1/4	1	2/3	1/3
700,000		4-1/6	3	2	1-1/2	1-1/6	5/6	1/2
800,000		4-3/4	3-1/3	2-1/6	1-2/3	1-1/4	1	1/2
900,000		5-1/3	3-3/4	2-1/2	1-5/6	1-1/2	1-1/6	2/3
1,000,000		6	4-1/6	2-2/3	2-1/6	1-2/3	1-1/4	2/3
1,200,000			5	3-1/3	2-1/2	2	1-1/2	5/6
1,400,000			5-2/3	3-5/6	3	2-1/4	1-2/3	1
1,600,000			6-2/3	4-1/3	3-1/3	2-1/2	2-1/6	1-1/6
1,800,000				5	3-2/3	3	2-1/4	1-1/4
2,000,000				5-1/2	4-1/3	3-1/4	2-1/2	1-1/3
2,500,000					5-1/3	4	3-1/6	1-3/4
3,000,000					6-1/3	4-5/6	3-3/4	2
3,500,000						5-2/3	4-1/3	2-1/2
4,000,000						6-1/2	5	2-5/6
4,500,000							6-1/3	3-1/6
5,000,000								3-1/2

CAUSES OF IMPROPER OPERATION

MOTOR FAILS TO START

(a) Check to see that the motor shaft turns freely.
(b) See if the power is on.
(c) Check all fuses.
(d) See if the contacts close on the starter, pressure switch, or any other controls.
(e) Check for loose or broken wire connections.
(f) See that the reset button on the starter is pushed in.

MOTOR WILL NOT COME UP TO SPEED

(a) Check to see that motor shaft turns freely.
(b) Check motor connections for proper voltage.
(c) Check to see that impellers are not set too low.
(d) Check for loose electrical connections.
(e) Check packing gland for overheating.

MOTOR RUNS VERY HOT

NOTE: Modern motors are designed to run hot and if the hand can be held on the motor for 10 seconds without extreme discomfort the temperature is not dangerous.

(a) Check the motor current with an ammeter, and if the current under normal pressures does not exceed the motor nameplate reading by more than 15% for the 3 HP motors or larger, the load may be considered safe.
(b) Check to see that the motor shaft turns freely.
(c) Check the packing gland for over-heating.
(d) Check for proper voltage and motor connections.

LOW CAPACITY OR PRESSURE

(a) Check for proper speed.
(b) Check for correct setting of impellers and refer to installation instructions for proper adjustment.
(c) Measure water level when pump is running. If lower than anticipated, capacity and pressure will normally be less.
(d) Ascertain if well contains foreign matter, such as leaves, sticks, mud, etc., that may clog strainer or impeller and bowl passages.

PUMP VIBRATES BADLY

(a) This pump when properly installed should not vibrate or rattle; if the pump does vibrate, check for misalignment or faulty installation. See installation instructions for proper installation and aligning technique.
(b) If the pump shakes and rattles on starting only, the lineshaft bearing may not be getting proper pre-lubrication. Make certain that the pump lineshaft bearings are fully wetted before each start.

LIMITED WARRANTY

Mid-South Pump (MSP) warrants its new products to be free from defects in workmanship and material for a period of 12 months from the date of initial sale to the ultimate user or 36 months from the date of manufacture, whichever comes first. The date of manufacture will be clearly marked or imprinted on the product package, in the product literature, or on the product itself. MSP's warranty obligation with regard to equipment not of its own manufacture is limited to the warranty actually extended to MSP by its supplier. Performance of equipment is further warranted to be in accordance with stated ratings when properly installed under normal conditions of operation.

This warranty extends only to the original retail purchaser and only during the time in which the original retail purchaser occupies the site where the product was originally installed.

Requests for service under this warranty shall be made by contacting the installing MSP dealer (point of purchase) as soon as possible after the discovery of any alleged defect. MSP will subsequently take corrective action as promptly as reasonably possible.

MSP at its discretion may replace or repair any product that fails under this warranty after inspection by an authorized company representative or after MSP has received the product at our factory. Replacement or repair cannot be made until after the product is inspected. All charges or expenses for freight to and from the factory, removal and reinstallation of the product, or installation of a replacement product are the responsibility of the purchaser.

THIS WARRANTY SUPERSEDES ANY WARRANTY NOT DATED OR BEARING AN EARLIER DATE. ANY IMPLIED WARRANTIES WHICH THE PURCHASER MAY HAVE, INCLUDING MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE APPLICABLE WARRANTY PERIOD. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. **IN NO EVENT SHALL MSP BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.** Some states do not allow the exclusion or limitation of incidential or consequential damages, so the above may not apply to you.

This warranty does not apply to any product which has been subjected to negligence, alteration, accident, abuse, misuse, improper installation, vandalism, civil disturbances, or acts of God. The only warranties suthorized by MSP are those set forth herein. MSP does not authorize other persons to extend any warranties with respect to its products, nor will MSP assume liability for any unauthorized warranties made in connection with the sale of its products.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

Mid-South Pump Company

1555 THREE [illegible]CE • MEMPHIS, TENNESSEE 38116 • (901) 345-7204 • TOLL FREE: 1-800-238-7167

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. By: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: 0 Location: County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Crifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
8-11-75							
4:25							
4:30		Pumping Test Started				22.11	
4:35	15	5	100				
5:00	30	5	100			56.11	
5:15	45	5	100			57.9	
5:30	60	5	100			58.7	
5:45	75	5	100			58.8	
6:00	90	5	100			58.9	
6:30	120	5	100			58.11	
7:00	150	5	100			58.11	
7:30	180	5	100			58.11	
8:00	210	5	100			58.11	
8:30	240	5	100			58.11	
9:00	270	5	100			58.11	
9:30	300	5	100			58.11	
10:00	330	5	100			58.11	
10:30	360	5	100			58.11	
11:00	390	5	100			58.11	
11:30	420	5	100			58.11	
12:00	450	5	100			58.11	
12:30	480	5	100			58.11	
1:00	510	5	100			58.11	
1:30	540	5	100			58.11	
2:00	570	5	100			58.11	
2:30	600	5	100			58.11	
3:00	630	5	100			58.11	
3:30	660	5	100			58.11	
4:00	690	5	100			58.11	
4:30	720	5	100			58.11	
5:00	750	5	100			58.11	
5:30	780	5	100			58.11	
6:00	810	5	100			58.11	
6:15	825	13	150			58.11	
6:30	840	13	150			79.7	
6:45	855	13	150			80.8	
7:00	870	13	150			80.9	
7:15	885	13	150			81.2	
7:30	900	13	150			81.5	
8:00	930	13	150			82.0	
8:30	960	13	150			82.0	
9:00	990	13	150			82.0	
9:30	1020	13	150			82.0	
10:00	1050	13	150			82.0	
10:30							

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. Per: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: 6 Location: County: Onslow
Observation Well Locations:
Pipeline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
11:00	1110	13	150			82.0	
11:30	1140	13	150			82.0	
12:00	1170	13	150			82.0	
12:30	1200	13	150			82.0	
1:00	1230	13	150			82.0	
1:30	1260	13	150			82.0	
2:00	1290	13	150			82.0	
2:30	1320	13	150			82.0	
3:00	1350	13	150			82.0	
3:30	1380	13	150			82.0	
4:00	1410	13	150			82.0	
4:30	1440	13	150			82.0	
5:00	1470	13	150			82.0	
5:30	1500	13	150			82.0	
6:00	1530	13	150			82.0	
6:30	1560	13	150			82.0	
7:00	1590	13	150			82.0	
7:30	1620	13	150			82.0	
7:45	1635	23	200			102.11	
8:00	1650	23	200			103.7	
8:15	1665	23	200			104.0	
8:30	1680	23	200			104.5	
8:45	1695	23	200			104.8	
9:00	1710	23	200			104.8	
9:15	1725	23	200			104.9	
9:30	1740	23	200			104.10	
10:30	1800	23	200			104.10	
11:30	1860	23	200			104.10	
12:30	1920	23	200			104.10	
1:30	1980	23	200			104.10	
2:30	2040	23	200			104.10	
3:30	2100	23	200			104.10	
4:30	2160	23	200			104.10	
5:30	2220	23	200			104.10	
6:30	2280	23	200			104.11	
7:30	2340	23	200			104.11	
8:30	2400	23	200			104.11	
9:30	2460	23	200			104.11	
10:30	2520	23	200			104.11	
11:30	2580	23	200			105.0	
12:30	2640	23	200			105.0	
1:30	2700	23	200			105.0	
2:30	2760	23	200			105.0	
3:30	2820	23	200			105.0	

PUMPING TEST DATA

st conducted by: Carolina Well and Pump Company, Inc By: Ralph W. Harrison
r Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
mp d Well No.: 6 Location: County: Onslow
ser ation Well Locations:
rlin e Lengths: Pumped Well Observation Wells
na ks:

mp ng rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Da e a d Ti e	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
5: 0	2940	23	200			105.0	
6: 0	3000	23	200			105.0	
7: 0	3060	23	200			105.0	
8: 0	3120	23	200			105.0	
9: 0	3180	23	200			105.8	
		Recovery Time					
9: 5						32.4	
9: 0						28.3	
9: 5						27.7	
9: 0						27.5	
9: 5						27.3	
0: 0						27.0	
0: 5						26.9	
0: 0						26.7	
0: 5						26.5	
1: 0						26.4	
1: 5						26.3	
1: 0						26.2	

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. By: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: Q Location: County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
3- 11-75							
3: 25							
3: 30						18.6	
3: 45	15	Pumping Test Started 5	100				
4: 00	30	5	100			20.5	
4: 15	45	5	100			20.7	
4: 30	60	5	100			20.10	
5: 00	90	5	100			20.10	
5: 30	120	5	100			20.10	
6: 00	150	5	100			20.10	
6: 30	180	5	100			20.10	
7: 00	210	5	100			20.10	
7: 30	240	5	100			20.10	
8: 00	270	5	100			20.10	
8: 30	300	5	100			20.10	
9: 00	330	5	100			20.10	
9: 30	360	5	100			20.10	
10: 00	390	5	100			20.10	
10: 30	420	5	100			20.10	
11: 00	450	5	100			20.10	
11: 30	480	5	100			20.10	
12: 00	510	5	100			20.10	
12: 30	540	5	100			20.10	
1: 00	570	5	100			20.10	
1: 30	600	5	100			20.10	
2: 00	630	5	100			20.10	
2: 30	660	5	100			20.10	
3: 00	690	5	100			20.10	
3: 30	720	5	100			20.10	
4: 00	750	5	100			20.10	
4: 30	780	5	100			20.10	
4: 45	795	13	150			22.2	
5: 00	810	13	150			22.3	
5: 15	825	13	150			22.5	
5: 30	840	13	150			22.6	
6: 00	870	13	150			22.7	
6: 30	900	13	150			22.7	
7: 00	930	13	150			22.7	
7: 30	960	13	150			22.7	
8: 00	990	13	150			22.7	
8: 30	1020	13	150			22.7	
9: 00	1050	13	150			22.7	
9: 30	1080	13	150			22.8	
10: 00	1110	13	150			22.8	
[illegible]	[illegible]	13	[illegible]			[illegible]	

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. By: Ralph W. Harrison

Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina

Pumped Well No.: Q Location: County: Onslow

Observation Well Locations:

Pipeline Lengths: Pumped Well Observation Wells

Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
11:00	1170	13	150			22.8	
11:30	1200	13	150			22.8	
12:00	1230	13	150			22.8	
12:30	1260	13	150			22.8	
1:00	1290	13	150			22.8	
1:30	1320	13	150			22.8	
2:00	1350	13	150			22.8	
2:30	1380	13	150			22.8	
3:00	1410	13	150			22.8	
3:30	1440	13	150			22.8	
4:00	1470	13	150			22.8	
4:30	1500	13	150			22.8	
5:00	1530	13	150			22.8	
5:30	1560	13	150			22.8	
5:45	1575	23	200			24.4	
6:00	1590	23	200			24.5	
6:15	1605	23	200			24.6	
6:45	1635	23	200			24.7	
7:15	1665	23	200			24.8	
7:45	1695	23	200			24.8	
8:15	1725	23	200			24.8	
8:45	1755	23	200			24.8	
9:15	1785	23	200			24.8	
9:45	1815	23	200			24.8	
10:15	1845	23	200			24.8	
10:45	1875	23	200			24.8	
11:15	1905	23	200			24.8	
11:45	1935	23	200			24.8	
12:15	1965	23	200			24.8	
12:45	1995	23	200			24.8	
1:15	2025	23	200			24.8	
1:45	2055	23	200			24.8	
2:15	2085	23	200			24.8	
2:45	2115	23	200			24.8	
3:15	2145	23	200			24.8	
3:45	2175	23	200			24.8	
4:15	2205	23	200			24.8	
4:45	2235	23	200			24.8	
5:15	2265	23	200			24.8	
5:45	2295	23	200			24.8	
6:15	2325	23	200			24.8	
6:40	2340	35	250			26.1	
6:55	2355	35	250			26.3	
7:10	2370	35	250			26.3	

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. By: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: Q Location: County: Onslow
Observation Well Locations: Location:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
9:00	2490	35	250				
10:00	2550	35	250			26.4	
11:00	2610	35	250			26.4	
12:00	2670	35	250			26.5	
1:00	2730	35	250			26.5	
2:00	2790	35	250			26.6	
3:00	2850	35	250			26.7	
4:00	2910	35	250			26.7	
5:00	2970	35	250			26.7	
6:00	3030	35	250			26.7	
7:00	3090	35	250			26.7	
8:00	3150	35	250			26.7	
9:00	3210	35	250			26.7	
0:00	3270	35	250			26.7	
1:00	3330	35	250			26.7	
2:00	3390	35	250			26.7	
1:00	3450	35	250			26.7	
2:00	3510	35	250			26.7	
3:00	3570	35	250			26.7	
4:00	3630	35	250			26.7	
5:00	3690	35	250			26.7	
6:00	3750	35	250			26.7	
7:00	3810	35	250			26.7	
						26.7	
		Recovery Time					
:05							
:10						20.5	
:15						20.2½	
:20						20.2	
:25						20.1½	
:30						20.1	
:45						20.1	
:00						20.½	
:15						20.0	
:30						19.11	
:45						19.10½	
:00						19.10	
						19.9½	

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

CHEMICAL ANALYSIS OF WATER

Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: CAMP LEJUNE

Address: JACKSONVILLE, N.C.

Well No. 0

County: ONSLOW

Report to: WORTH F. PICKARD

Address: BOX 1085

SANFORD, N.C. 27330

Collected by: RALPH W. HARRISON

Date Collected: 8/13/75

Remarks: ON PUMPING TEST MARINE BASE

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[x] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[x] 1-Well tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[x] 1-Raw
[ ] 2-Treated

Type of Treatment:
[x] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[x] 0-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

UTILITIES EXPANSION
MARINE CORPS AIR STATION
NEW RIVER
CONTRACT N62470 3-2-15
JACKSONVILLE, NORTH CAROLINA
SPEC. PAR. NO. 15H.35 CONTRACT DWG. NO.
CK. & APP. BY [signature] DATE 8 Sept 75
PEABODY-PETERSEN CO.
Job No. 7409

ANALYSIS

Color	(000)	10 units	Ph	(00.0)	8.4

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	294	Fluoride	(0.00)	1.22
Total Hardness	(000)	76	Arsenic	(*0.00)	< 0.01
Iron	(*00.00)	0.10	Cadmium	(*0.00)	< 0.01
Manganese	(*00.00)	< 0.03	Chromium^{+6}	(*0.00)	< 0.05
Turbidity SiO_2	(000)	.25	Copper	(*00.00)	< 0.05
Acidity $CaCO_3$	(000)	0	Lead	(*0.00)	< 0.05
Chloride	(000)	78	Zinc	(*00.00)	0.05
Sodium	(000)	155	Calcium		24.5
Potassium	(00.0)	12.0	Magnesium		3.6

Date received August 20, 1975 Date reported August 27, 1975

Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: CAMP LEJUNE

Address: JACKSONVILLE, N.C.

Well No. Q

County: ONSLOW

Report to: WORTH F. PICKARD

Address: BOX 1085

SANFORD, N. C. 27330

Collected by: RALPH W. HARRISON

Date Collected: 8/14/75

Remarks: ON PUMPING TEST MARINE BASE

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[x] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[x] 1-Well tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[x] 1-Raw
[ ] 2-Treated

Type of Treatment:
[x] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[x] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

UTILITIES EXPANSION
MARINE CORPS AIR STATION
NEW RIVER
CONTRACT NO. [illegible]
JACKSONVILLE, NORTH CAROLINA
SPEC. PAR. NO. 15H.3.5 CONTRACT DWG. NO.
CK. & APP. BY [signature] DATE 12 Sept 75
PEABODY-PETERSEN CO.
Job No. [illegible]

ON PUMPING TEST MARINE BASE

ANALYSIS

Color (000)	10 units	Ph (00.0)	8.3

Results in Parts per Million

Alkalinity $CaCO_3$ (000)	295	Fluoride (0.00)	1.36
Total Hardness (000)	34	Arsenic (*0.00)	< 0.01
Iron (*00.00)	< 0.05	Cadmium (*0.00)	< 0.01
Manganese (*00.00)	< 0.03	Chromium^{+6} (*0.00)	< 0.05
Turbidity SiO_2 (000)	30	Copper (*00.00)	< 0.05
Acidity $CaCO_3$ (000)	0	Lead (*0.00)	< 0.05
Chloride (000)	62	Zinc (*00.00)	0.05
Sodium (000)	165	Calcium	9.0
Potassium (00.0)	12.0	Magnesium	2.7

Date received August 20, 1975 Date reported August 27, 1975

Date analyzed _____ Reported by _____ Lab. No. 00133

TRANSMISSION REPORT

TTI NO.	919-762-2149
DATE AND TIME	02 27 91 09:13AM
DURATION	01:18
MODE	
PAGE	02
RESULT	GOOD

CRANE | DEMING PUMPS

TELEPHONE-(216) 337-8741
TELEX NO.-098-6445

CRANE CO. • 884 SOUTH BROADWAY • SALEM, OHIO 44460

Environmental Products, Inc.
P.O. Drawer 2385
Hickory, N. Car. 28601

DATA TRANSMITTAL

DATE: 4-10-75

Attention: Mr. Bob Darnell

Subject: Purchase Order 2188
Deming Order 6109 S/N T-74760
Project:

Gentlemen:

Attached is data as listed below:

QTY:	DESCRIPTION:	NUMBER & REMARKS:
11	DIMENSION DRAWING	DATED
11	PERFORMANCE CURVE	
11	BULLETIN	Fig. 4700
11	INSTRUCTION MANUAL WITH PARTS LIST	" "

(xxx) Above submittal is for APPROVAL and we are withholding the order from entry for production awaiting receipt of approved data at this office along with full information to enable us to proceed. See note * below.

( ) Above submittal is for record and file. We are proceeding with production in accordance with same. Please note that any changes after this date may result in delays and possible additional charges.

( ) Above for record and file.

REMARKS:

Richard Fergason Turbine Dept.

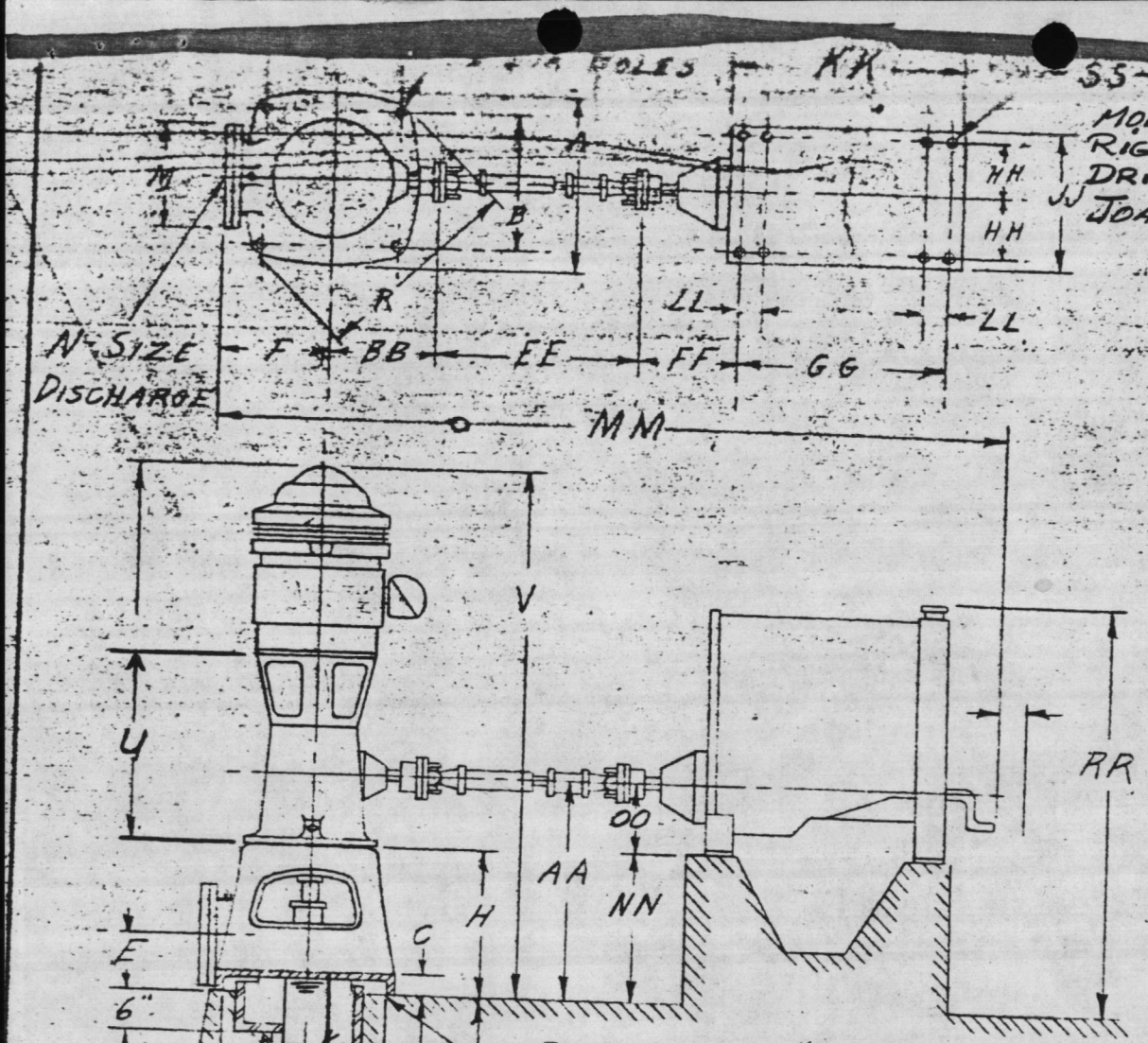
Application Engineering Dept.

* NOTE: When for approval, attached copy of this letter returned with your release will facilitate identification and handling.

APPROVED FOR PRODUCTION. .....
(date)

For .....

FILE



MODEL HA-15 COMB. RIGHT ANGLE GEAR DRIVE 1:1 RATIO JOHNSON

DIMENSION			
A	14"	CS	70'-0"
B	12 3/8"	OA	85'-7 1/8"
C	2"	AA	21 7/8"
D	5/8"	BB	13"
E	6"	EE	—
F	9"	FF	—
H	15 1/2"	GG	—
K	6"	HH	—
M	11"	JJ	—
N	6"	KK	—
R	19 1/8"	LL	—
S	12 3/4"	MM	—
U	19 1/8"	NN	—
V	—	OO	—
W	5"	RR	—
X	5 3/4"	SS	—
Y	4'-8 1/8"	TT	4"
Z	10'-11"		

RECESS FOR 1" CASING EXTENSION. FOR WELL CASING SMALLER THAN K USE ALTERNATE ARRANGEMENT SHOWN AT LEFT.

SPECIFICATIONS

1 DEMING Fig. 4700 Vertical Turbine Pump designed for 150 GPM at 90-110 feet head, including: 5 HP 1750 RPM ____ Volt ____ Phase ____ Cycle G.E. Vertical Hollowshaft Motor MOTOR TO BE FURNISHED BY OTHERS. SD-44-10 Surface Discharge Head with ____ inch discharge flange with bolts and gasket. 70 feet 4" x 1 1/4" Column and shaft with RUBBER Bearings on 10 foot centers 7 Stage 6 inch ENAMELED Bowl Assembly using Impeller 22957 from Curve PC-3186 10 feet 4 inch BLACK STEEL suction pipe 4 inch KEYSTONE TYPE TC GALV. strainer

When properly endorsed this print is correct for

ENVIRONMENTAL PRODUCTS INC.

Customer's P.O. 2188 Turbine No. J-74760

Date 4-7-75 By David E. Snyder SO-6109-00

DATE OF ISSUE MARK NEW RIVER WELL #1

DESTROY ALL PREVIOUS PRINTS

THE DEMING CO. SALEM, OHIO V-467

TITLE VERTICAL TURBINE PUMP WITH RIGHT ANGLE GEAR DRIVE & ENG. WITH MOTOR

DATE 4-20-49 SCALE 1/2

FIG. 47 SIZE

DRAWING NO. 18464

ADS

CURVE PAGE 76.
SIZE XH6 P.C.3186
SUPERSEDES P.C.2622

TS CATALOG - SECTION C - 1750 RPM
VERTICAL TURBINE PUMP CURVES
PERFORMANCE PER STAGE

CRANE-DEMING PUMPS
CRANE CO.
SALEM, OHIO, U.S.A.

SIZE XH6 — SINGLE STAGE PERFORMANCE — **1770 R.P.M.**

EFFICIENCY CHANGE:

___	STAGE DEDUCT	___	POINTS
3	STAGE DEDUCT	0	POINTS
2	STAGE DEDUCT	2	POINTS
1	STAGE DEDUCT	4	POINTS

ENAMELED BOWLS

DIMENSIONS	FIG. 4700	FIG. 4750
BOWL DIAMETER	5 3/4	5 3/4
IMPELLER SHAFT DIA.	1	1
LENGTH FIRST STAGE	17 1/8	20 1/8
ADDITIONAL STAGE	6 1/2	6 1/2
THRUST FACTOR =	3.9	3.9

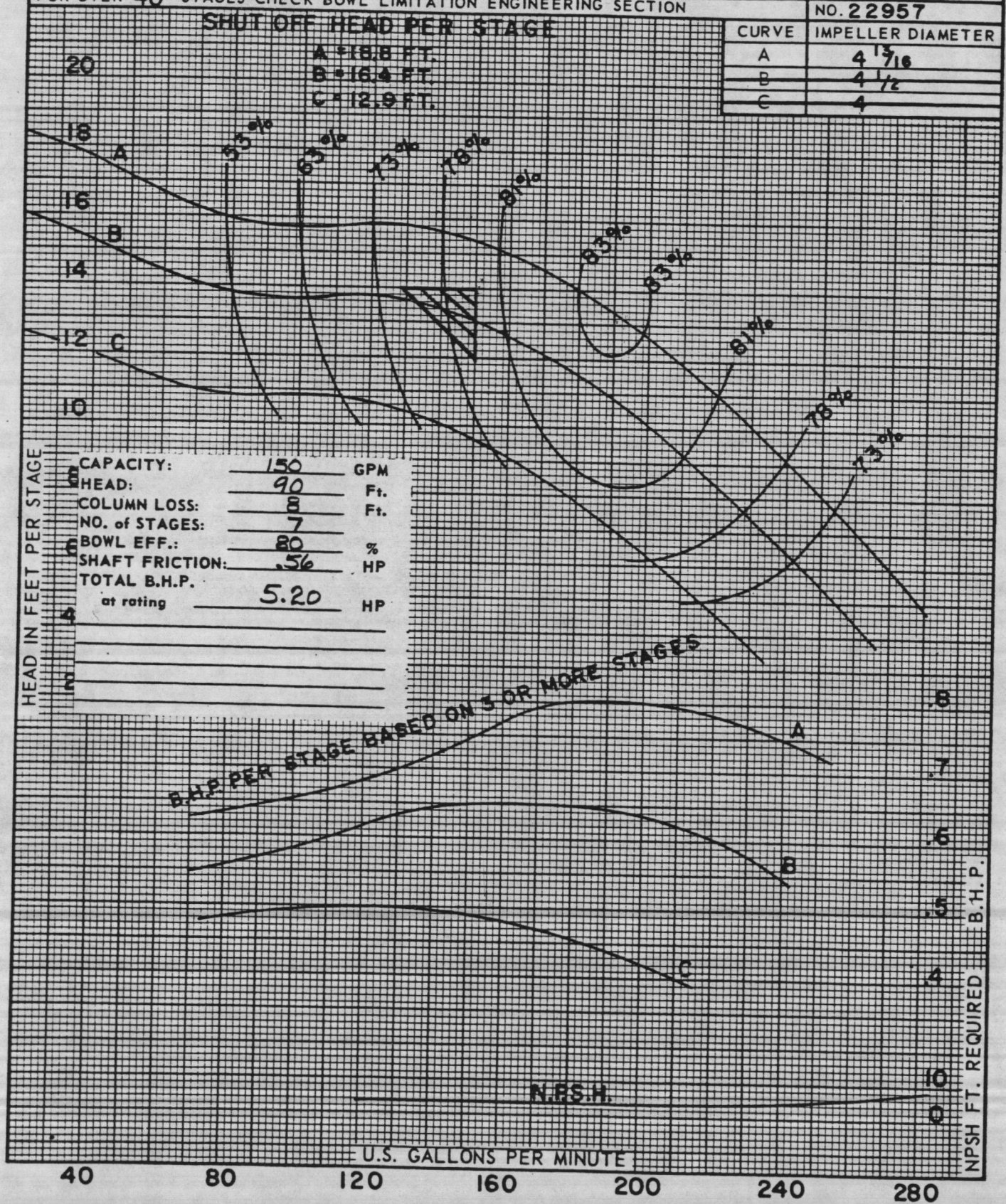
SUCTION – I.D. PIPE SIZE 4" SIZE COLUMN ADAPTER (4)" " OR 5 " SEMI-ENC. IMPELLER

FOR OVER 40 STAGES CHECK BOWL LIMITATION ENGINEERING SECTION

NO. 22957

CURVE	IMPELLER DIAMETER
A	4 13/16
B	4 1/2
C	4

SHUT OFF HEAD PER STAGE
A = 18.8 FT.
B = 16.4 FT.
C = 12.9 FT.



CRANE | DEMING PUMPS

TELEPHONE - (216) 337-8741
TELEX NO. - 098-6445

CRANE CO. • 884 SOUTH BROADWAY • SALEM, OHIO 44460

Environmental Products, Inc.
P.O. Drawer 2385
Hickory, North Carolina 28601

DATA TRANSMITTAL

DATE: 4-11-75

Attention: Mr. Bob Darnell

Subject: Purchase Order 2189
Deming Order 6108 S/N T-74759
Project:

Gentlemen:

Attached is data as listed below:

QTY:	DESCRIPTION:	NUMBER & REMARKS:
11	DIMENSION DRAWING	DATED Johnson Right Angle Gear Drive
	PERFORMANCE CURVE	
	BULLETIN	
	INSTRUCTION MANUAL WITH PARTS LIST	

(xxxx) Above submittal is for APPROVAL and we are withholding the order from entry for production awaiting receipt of approved data at this office along with full information to enable us to proceed. See note * below.

( ) Above submittal is for record and file. We are proceeding with production in accordance with same. Please note that any changes after this date may result in delays and possible additional charges.

( ) Above for record and file.

REMARKS:

David E. Snyder · Turbine Dept.

Application Engineering Dept.

* NOTE: When for approval, attached copy of this letter returned with your release will facilitate identification and handling.

APPROVED FOR PRODUCTION. .....
(date)

For .....

FILE

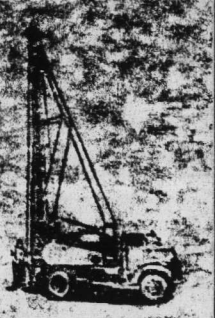
CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

P. O. BOX 1085 TELEPHONE 776-3415

SANFORD, NORTH CAROLINA 27330

N.W.W.A.
N.C.W.W.A.



Drillers Log
Camp Lejune
New River Job
Well # 0

0 - 1	Brown Sand
1 - 15	Light Gray Zinc Sand
15 - 27	Gray clay and gravel
27 - 33	Sand
33 - 37	Clay
37 - 66	Sand & Shell
66 - 77	Sand gray
77 - 85	Clay and shell (Gray)
85 - 87	Clay not as much shell
87 - 96	Hard clay
96 - 123	Clay, Light (soft)
123 - 137	Rock and clay
137 - 154	Limestone
154 - 167	Hard rock
167 - 207	Rock and sand (took alot of water)
207 - 213	Limestone and rock
213 - 221	Clay
221 - 223	Rock
223 - 231	Clay
231 - 250	Rock and clay

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: [signature]
DATE: [illegible]

MCAS-1255

UTILITIES EXPANSION
MARINE CORPS AIR STATION
NEW RIVER
CONTRACT NO. [illegible]
JACKSONVILLE, [illegible] CAROLINA
SPEC. [illegible] SUBMITTAL
PARAGRAPH 15H.3.7
DATE 5/22/75
APP'D. BY [signature]
PEABODY-PETERSEN CO.
Job No. 7400

ACKNOWLEDGEMENT

JOHNSON RIGHT ANGLE GEAR DRIVE

DIVISION OF ARROW GEAR COMPANY

921 PARKER ST. • BERKELEY, CALIF. 94710 • AREA (415) 845-7377
CABLE: JOHNSDRIVE TELEX 336-435

April 8, 1975 Our Job #1162

Deming Division
Crane Co.
884 South Broadway
Salem, Ohio 44460

APR 11 '75-1 00 PM

Attn: Mr. Ed Rowedda

Re: Our Serial #49841

Gentlemen:

We wish to thank you for your Order No. 404539 dated 3/26/75
for: 1 Model HA 15 Johnson Combination Right Angle Gear Drive, 1:1 ratio, Figure 1 rotation, Non Reverse, 3/4" clutch bore, Motor Stand: MH-8 1/2", BD1-10", Serial #49841

Please check enclosed dimension prints carefully as they indicate our interpretation of your order.

This order is accepted subject to the terms and conditions printed on the reverse side hereof.

Shipment will be scheduled for delivery from our plant after approval.

Very truly yours,

JOHNSON RIGHT ANGLE GEAR DRIVE
DIVISION OF ARROW GEAR COMPANY

Mrs Patricia Smith

MEMBER OF AGMA

Enc. :12
:cj

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

CHEMICAL ANALYSIS OF WATER

Division of Health Services, Laboratory Section

P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

163

Name of Owner or Supply: CAMP LEJUNE

Address: JACKSONVILLE NC

Well No. 0

County: ONSLOW

Report to: WORTH F PICKARD

Address: BOX 1085

SANFORD NC 27330

Collected by: HAYDEN HARRISON

Date Collected: _____ Time: _____

Remarks:

218 - 225

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[ ] 1-Ground
[ ] 2-Surface
[ ] 3-Soth
[ ] 4-Purchased

Source of Sample:
[ ] 1-Well tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[ ] 1-Raw
[ ] 2-Treated

Type of Treatment:
[ ] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[ ] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

ANALYSIS

Color	(000)	20	units	Ph	(00.0)	8.2

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	330	Fluoride	(0.00)	1.48
Total Hardness	(000)	39	Arsenic	(*0.00)	< 0.01
Iron	(*00.00)	0.08	Cadmium	(*0.00)	< 0.01
Manganese	(*00.00)	< 0.03	Chromium^{+6}	(*0.00)	< 0.05
Turbidity SiO_2	(000)	3	Copper	(*00.00)	< 0.05
Acidity $CaCO_3$	(000)	4	Lead	(*0.00)	< 0.05
Chloride	(000)	66	Zinc	(*00.00)	0.08
Sodium	(000)	200	CALCIUM		11.0
Potassium	(00.0)	13.0	MAGNESIUM		2.9

Date received 3-7-75 Date reported 3-21-75

Date analyzed _____ Reported by _____ Lab. No. 7446

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
CHEMICAL ANALYSIS OF WATER
Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: CAMP LEJEUNE

Address: JACKSONVILLE, N. C.

Well No. 0

County: ONSLOW

Report to: WORTH F. PICKARD

Address: BOX 1085

SANFORD, N. C. 27330

Collected by: HAYDEN HARRISON

Date Collected: _____ Time: _____

Remarks:

168-172

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[X] 9-Other _____

Source of Water:
[X] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[X] 1-Well Tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[X] 1-Raw
[ ] 2-Treated

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: _____
DATE: _____

Type of Treatment:
[X] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[X] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

ANALYSIS

Color	(000)	12	units	Ph	(00.0)	8.0

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	325	Fluoride	(0.00)	1.19
Total Hardness	(000)	58	Arsenic	(*0.00)	< 0.01
Iron	(*00.00)	< 0.05	Cadmium	(*0.00)	< 0.01
Manganese	(*00.00)	< 0.03	Chromium $^{+6}$	(*0.00)	< 0.05
Turbidity SiO_2	(000)	.7	Copper	(*00.00)	< 0.05
Acidity $CaCO_3$	(000)	8	Lead	(*0.00)	< 0.05
Chloride	(000)	80	Zinc	(*00.00)	0.05
Sodium	(000)	160	Calcium		17.3
Potassium	(00.0)	11.0	Magnesium		3.6

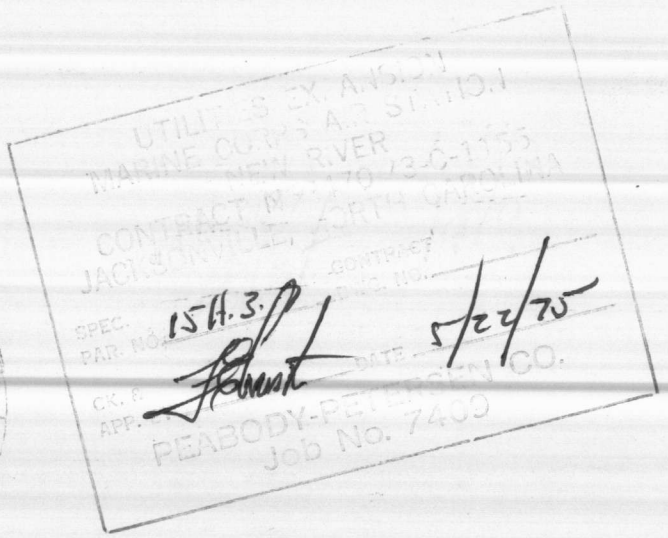
Date received May 7, 1975 Date reported May 13, 1975

Date analyzed _____ Reported by _____

Lab. No. 07447

Peabody S. E., Inc.
P. O. Drawer 7248
Jacksonville, N. C. 28540

REC'D MAY 21 1975



NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
CHEMICAL ANALYSIS OF WATER
Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: Camp LeJeune
Address: Camp LeJeune N.C.
Well No. 0
County: Onslow
Report to: Worth F. Pickard
Address: P.O. Box 1095
Sanford N.C. 27330
Collected by: R. Harrison
Date Collected: 5/6/75 Time: 7:15
Remarks:
124 - 129

Type of Supplier:
[V] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[V] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[V] 1-Well Tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[V] 1-Raw
[ ] 2-Treated

Type of Treatment:
[V] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[V] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

APPROVED
SUBJECT TO REQUIREMENTS OF SPECIFICATIONS
J.K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: W x 3
DATE: 1 AUG 75

ANALYSIS

Color	(000)		units	Ph	(00.0)	8.2

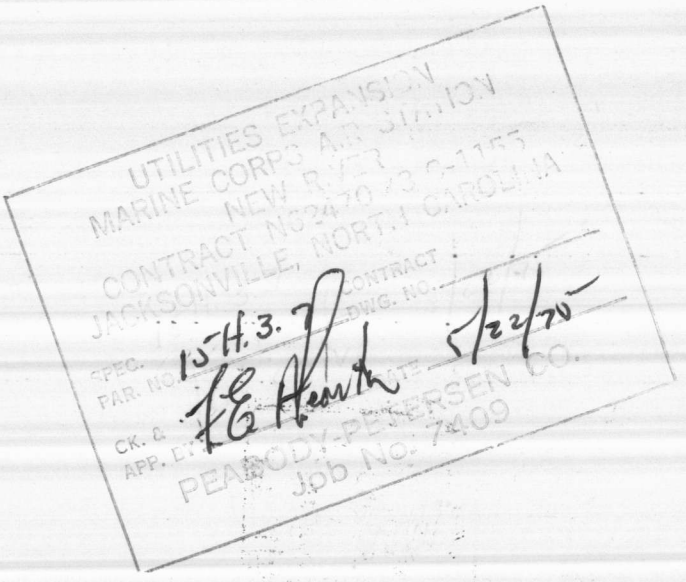
Results in Parts per Million

Alkalinity $CaCO_3$	(000)	288	Fluoride	(0.00)	1.23
Total Hardness	(000)	68	Arsenic	(*0.00)	< 0.01
Iron	(*00.00)	0.10	Cadmium	(*0.00)	< 0.01
Manganese	(*00.00)	< 0.03	Chromium $^{+6}$	(*0.00)	< 0.05
Turbidity SiO_2	(000)	0.6	Copper	(*00.00)	< 0.05
Acidity $CaCO_3$	(000)	7	Lead	(*0.00)	< 0.05
Chloride	(000)	50	Zinc	(*00.00)	< 0.05
Sodium	(000)	130	Calcium		22.3
Potassium	(00.0)	8.5	Magnesium		3.0

MAY 22 1975

Date received _____ Date reported 5-15-75

Date analyzed _____ Reported by _____ Lab. No. _____



Peabody S. E., Inc.
P. O. Drawer 7248
Jacksonville, N. C. 28540

REC'D MAY 21 1975

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
CHEMICAL ANALYSIS OF WATER
Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all Items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: Camp Lejeune

Address: Jacksonville, NC

Well No. 0

County: Onslow

Report to: Mark T. Pickard

Address: Box 1085

Sanford, NC 27330

Collected by: Hayden Harrison

Date Collected: _____ Time: _____

Remarks: 218 - 225

Type of Supplier:
- [ ] 1-Municipal
- [ ] 2-Sanitary District
- [ ] 3-Mobile Home Park
- [ ] 4-Community
- [ ] 5-Association
- [ ] 6-Industrial
- [ ] 7-Institution
- [ ] 8-Private
- [ ] 9-Other _____

Source of Water:
- [ ] 1-Ground
- [ ] 2-Surface
- [ ] 3-Both
- [ ] 4-Purchased

Source of Sample:
- [ ] 1-Well Tap
- [ ] 2-House Tap
- [ ] 3-Distribution Tap

Type of Sample:
- [ ] 1-Raw
- [ ] 2-Treated

Type of Treatment:
- [ ] 0-None
- [ ] 1-Chlorinated
- [ ] 2-Fluoridated mgz
- [ ] 3-Filtered
- [ ] 4-Alum 1AW475
- [ ] 5-Lime
- [ ] 6-Soda Ash
- [ ] 7-Polyphosphate
- [ ] 8-Water Softener
- [ ] 9-Other

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY:
DATE:

Analysis Desired:
- [ ] 1-Complete analysis (18 tests)
- [ ] 2-Partial analysis (9 tests)

ANALYSIS

Color	(000)	20 units	Ph	(00.0)	8.2

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	330	Fluoride	(0.00)	1.48
Total Hardness	(000)	39	Arsenic	(*0.00)	<0.01
Iron	(*00.00)	0.08	Cadmium	(*0.00)	<0.01
Manganese	(*00.00)	<0.03	Chromium $^{+6}$	(*0.00)	<0.05
Turbidity SiO_2	(000)	3	Copper	(*00.00)	<0.05
Acidity $CaCO_3$	(000)	4	Lead	(*0.00)	
Chloride	(000)	66	Zinc	(*00.00)	0.08
Sodium	(000)	20	Calcium		11.0
Potassium	(00.0)	13.0	Magnesium		2.9

HIGH - MIX OK

Date received _____ Date reported _____

Date analyzed _____ Reported by _____

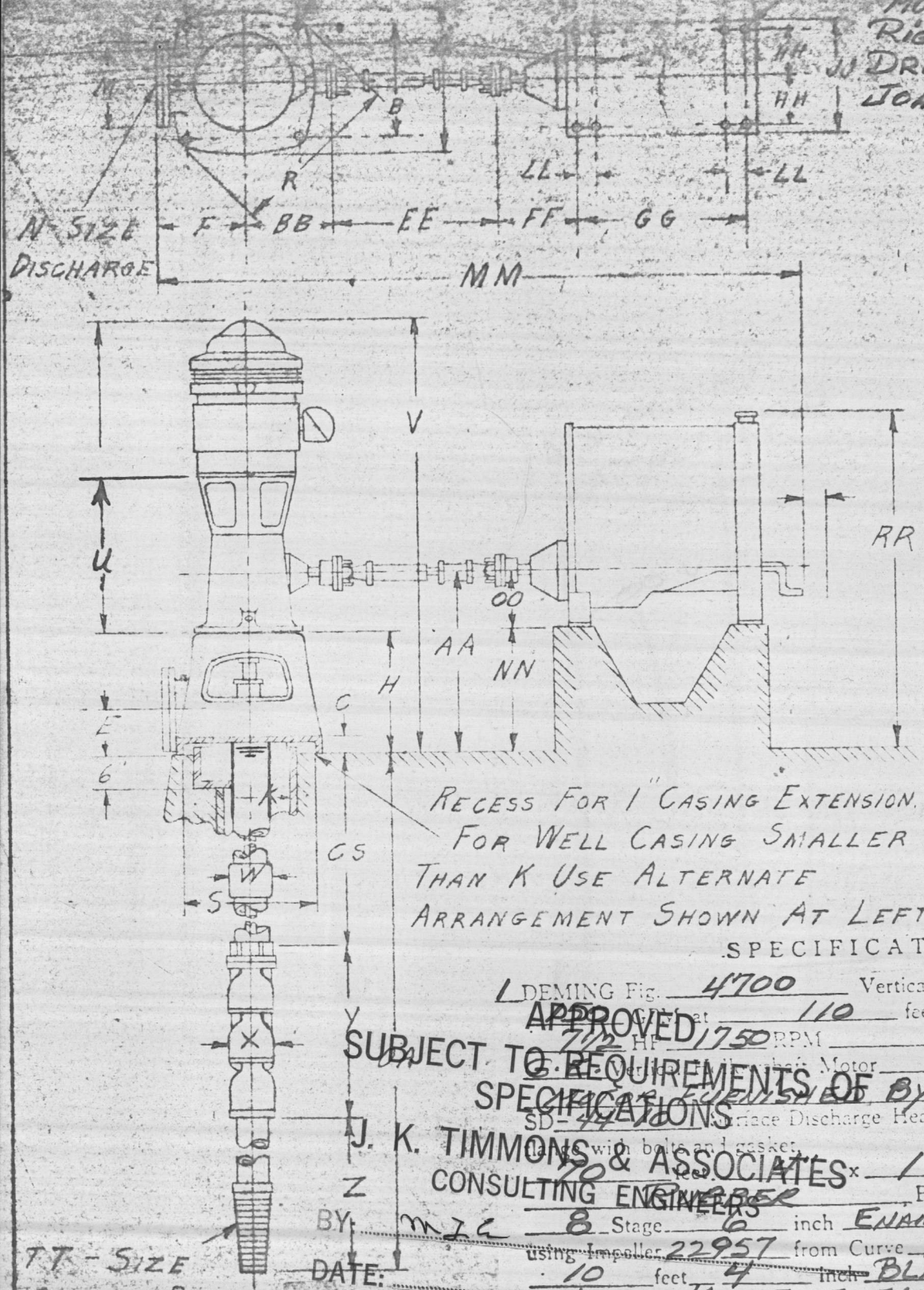
Lab. No. 17263

Peabody S. E., Inc.
P. O. Drawer 7248
Jacksonville, N. C. 28540

REC'D MAY 2 1 1975

UTILITIES EXPANSION
MARINE CORPS AIR STATION
NEW RIVER
CONTRACT N62470-73-C-1155
JACKSONVILLE, NORTH CAROLINA
SPEC. PAR. NO. 15H.3.7 CONTRACT DWG. NO.
CK. & APP. DATE 1/22/75
PEABODY-PETERSEN CO.
Job No. 7409

MODEL HA-15 COMB. RIGHT ANGLE GEAR DRIVE 1:1 RATIO JOHNSON



DIMENSION			
A	14"	CS	70'-0"
B	12 3/8"	OA	86'-1 5/8"
C	2"	AA	21 7/8"
D	5/8"	BB	13"
E	6"	EE	—
F	9"	FF	—
H	15 1/2"	GG	—
K	6"	HH	—
M	11"	JJ	—
N	6"	KK	—
R	19 1/8"	LL	—
S	12 3/4"	MM	—
U	19 1/8"	NN	—
V	—	OO	—
W	5"	RR	—
X	5 3/4"	SS	—
Y	5'-2 5/8"	TT	4"
Z	10'-11"		

RECESS FOR 1" CASING EXTENSION. FOR WELL CASING SMALLER THAN K USE ALTERNATE ARRANGEMENT SHOWN AT LEFT.

SPECIFICATIONS

1 DEMING Fig. 4700 Vertical Turbine Pump designed for
110 feet head, including:
7½ HP 1750 RPM ____ Volt ____ Phase ____ Cycle
____ Vertical Hollow Shaft Motor ____
CASING EXTENSION BY OTHERS
SD-44 Surface Discharge Head with ____ inch discharge
flange with bolts and gasket
20 Length 1 1/4" x 1 1/4" Column and shaft with
Enclosed Lineshaft Bearings on 10 foot centers
8 Stage 6 inch ENAMELED Bowl Assembly
using Impeller 22957 from Curve PC-3186 ____
10 feet 4 inch BLACK STEEL suction pipe
4 inch KEYSTONE TYPE TC GALV. strainer

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: MJC
DATE:

When properly endorsed this print is correct for
ENVIRONMENTAL PRODUCTS INC.
Customer's P.O. 2189 Turbine No. T- 74759
Date 4-7-75 By Maud E. Snyder So. 0610B-00

DATE OF ISSUE
MARK NEW RIVER WELL "R"
DESTROY ALL PREVIOUS PRINTS

THE DEMING CO. SALEM, OHIO Y-467
TITLE VERTICAL TURBINE PUMP WITH RIGHT ANGLE GEAR DRIVE FOR 8" CASING WITH WATER LUBRICATED LINESHAFT
DATE 4-26-49 SCALE 1/2"
FIG. 47 SIZE
DRAWING NO. 18464

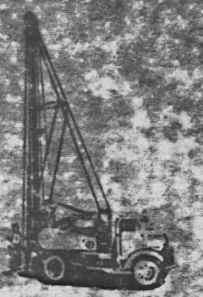
CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

P. O. BOX 1085 TELEPHONE 775-3415

SANFORD, NORTH CAROLINA 27330

N.W.W.A.
N.C.W.W.A.



Re: Well O
Camp Lejune, North Carolina
New River Job

We set up and drilled a hole to 250'. While we were drilling this hole we kept an accurate drillers log and soil samples log. We then ran an electric log on the hole and took water samples from 3 stratus. (Analysis enclosed)

Our recommendation would be to set 60' of pit casing and drill the hole to the depth of 220'. Take water from 124' to 200'. We feel like that a gravel pack well would produce 200 GPM. Screen settings would be 124' to 132'; 156' to 166'; 180' to 190'.

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

CHEMICAL ANALYSIS OF WATER

Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all Items above Heavy Line
(see instructions on reverse side)

Name of Owner: Camp LeJeune
Address: Camp LeJeune N.C.
Well No. C
Name: Low
Address: North Fork Road
P.O. Box 1495
Swansboro N.C. 28584
Collected by: R. Harrison
Date Collected: 5/6/75 Time: 7:15

Remarks:
124 - 129 Beaufort clay - Eocene
160 - 172 Cretaceous clay

Type of Supplier:
[V] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[V] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[ ] 2-House Tap
[V] 1-Well tap
[ ] 3-Distribution Tap

Type of Sample:
[V] 1-Raw
[ ] 2-Treated

Type of Treatment:
[V] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Aeration
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY:
DATE: JAN 25

Analysis Desired:
[V] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

ANALYSIS

Color	(000)		units	Ph	(00.0)	8.2

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	288	Fluoride	(0.00)	1.23
Total Hardness	(000)	68	Arsenic	(*0.00)	< 0.01
	(*00.00)	0.10	Cadmium	(*0.00)	< 0.01
	(*00.00)	< 0.03	Chromium +6	(*0.00)	< 0.05
	(000) SiO_2	0.6	Copper	(*00.00)	< 0.05
	(000)	7	Lead	(*0.00)	< 0.05
	(000)	50	Zinc	(*00.00)	< 0.05
	(000)	130	Solids		232
	(00.0)	8.5	Nitrate		3.0

Date reported 5-15-75

Reported by

Lab. No.

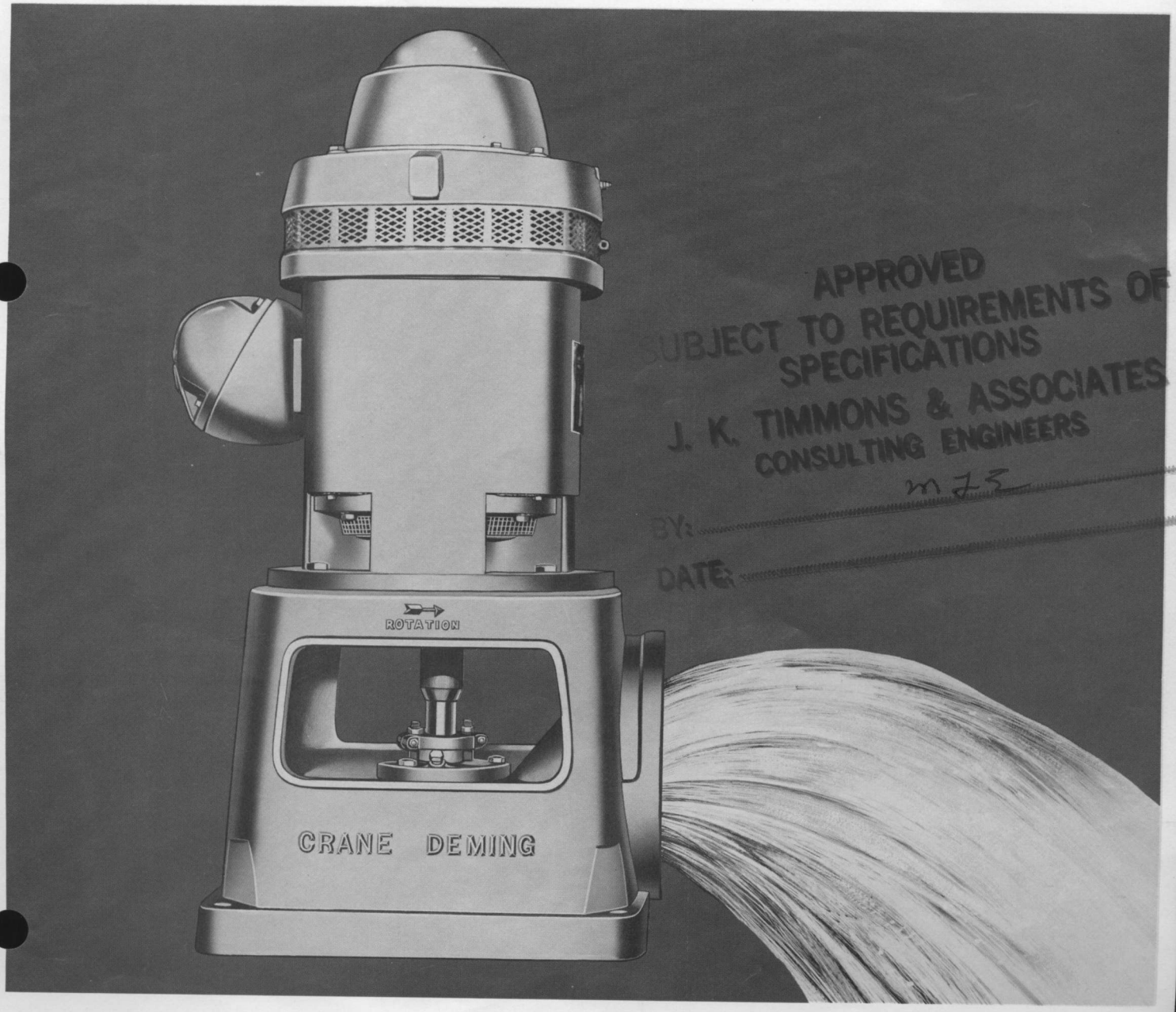
Well "O"
Item 4-24

CRANE DEMING

BULLETIN NO. 4700B

Water and Oil Lubricated

VERTICAL TURBINE PUMPS



APPROVED
SUBJECT TO REQUIREMENTS OF SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY:
DATE:

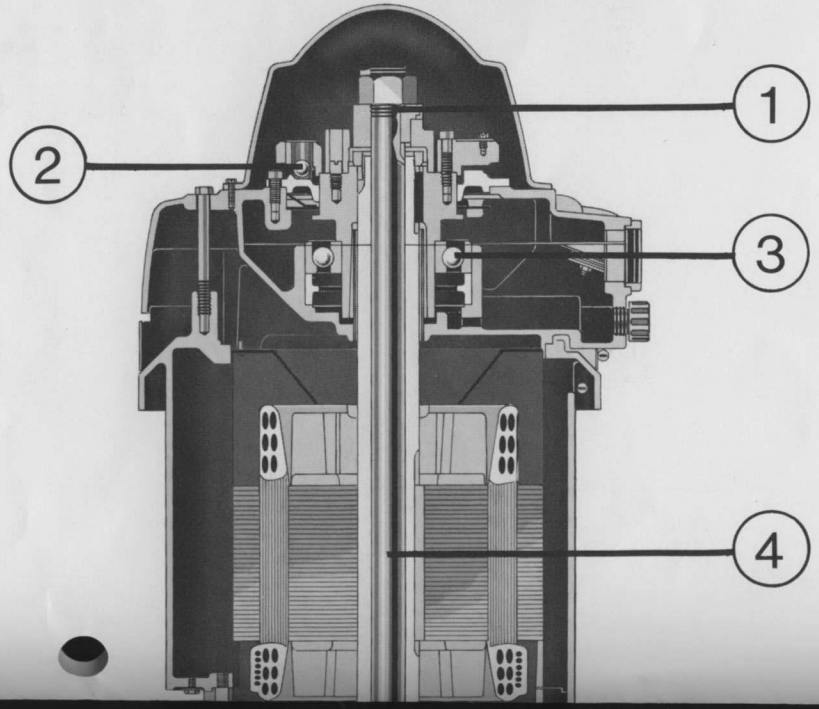
PRECISION ENGINEERED TO FILL EVERY MUNICIPAL, INDUSTRIAL & AGRICULTURAL REQUIREMENT

CRANE DEMING

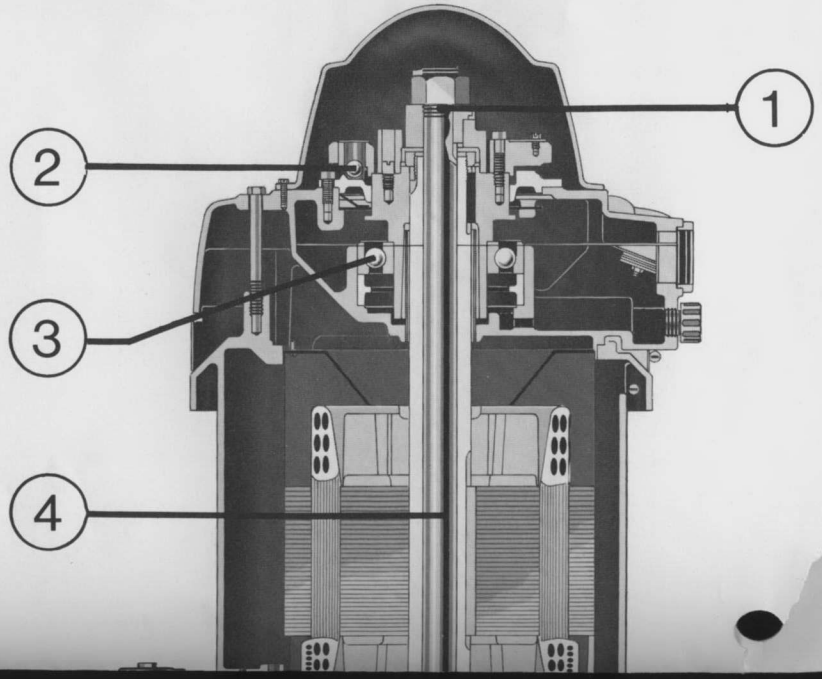
VERTICAL TURBINE PUMPS

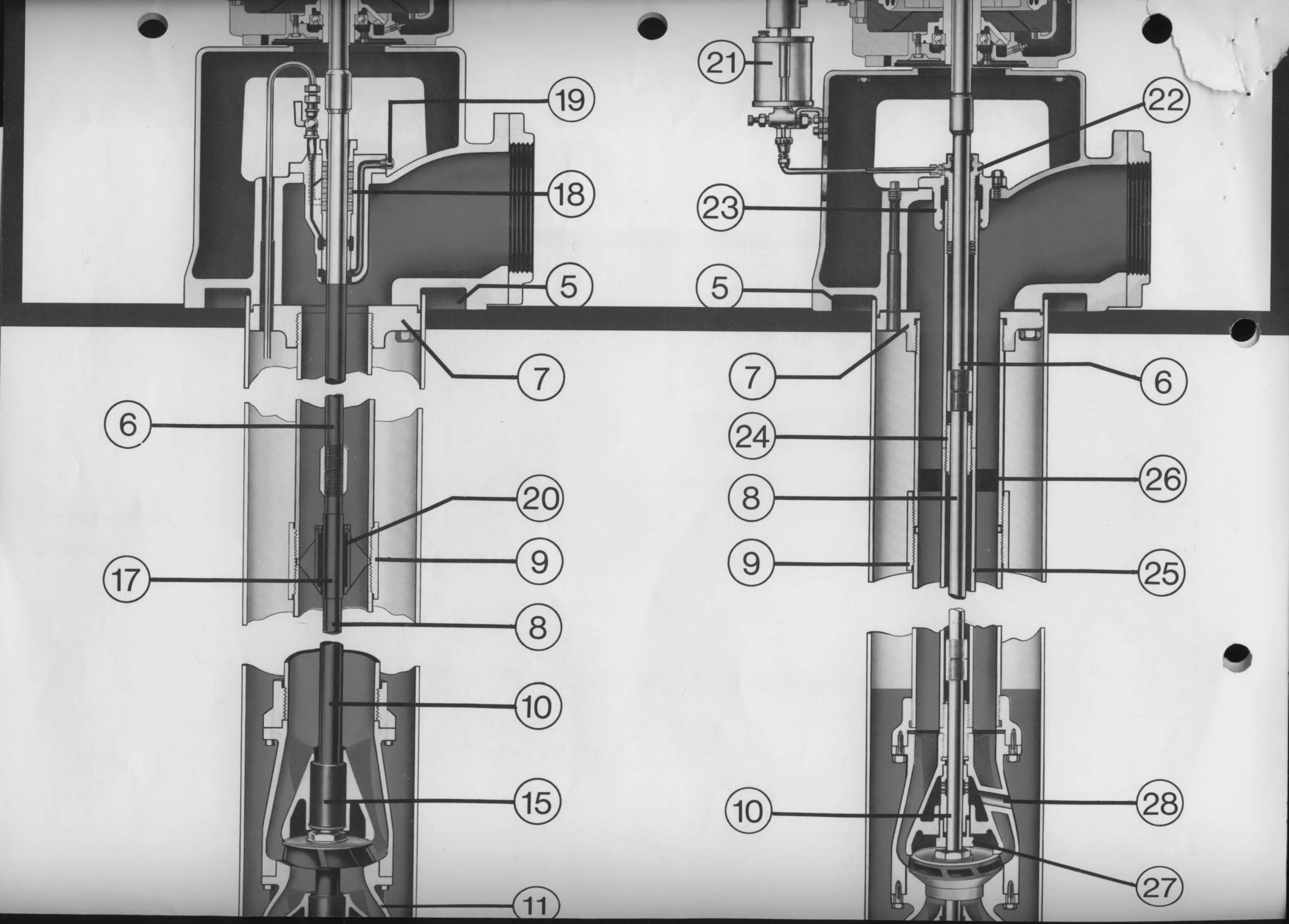
precision engineered to fill every municipal, industrial & agricultural requirement

WATER LUBRICATED



OIL LUBRICATED

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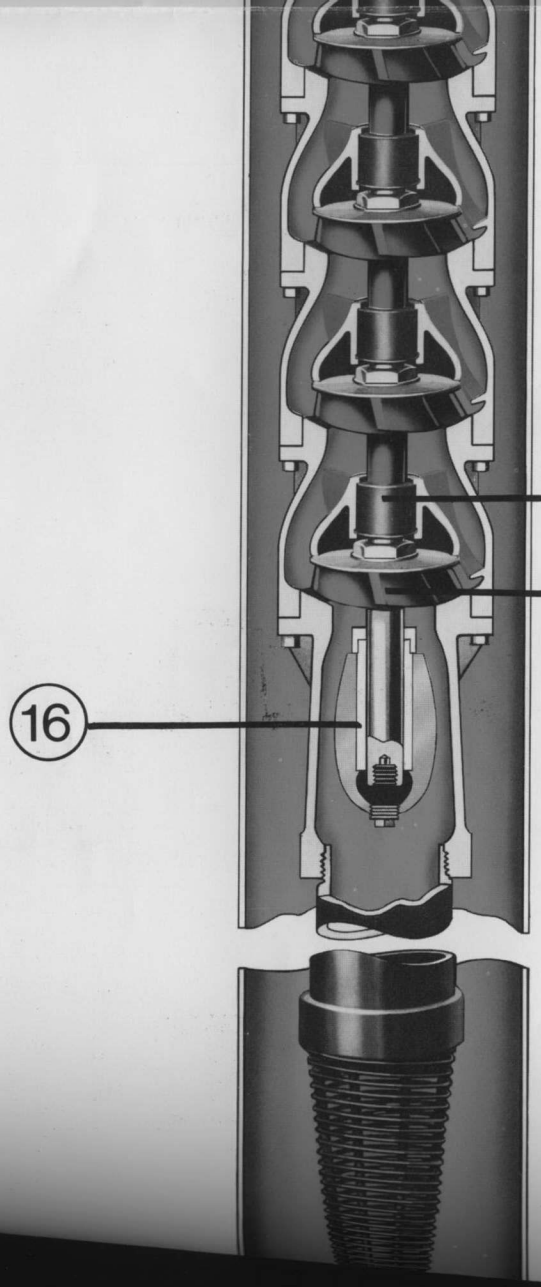
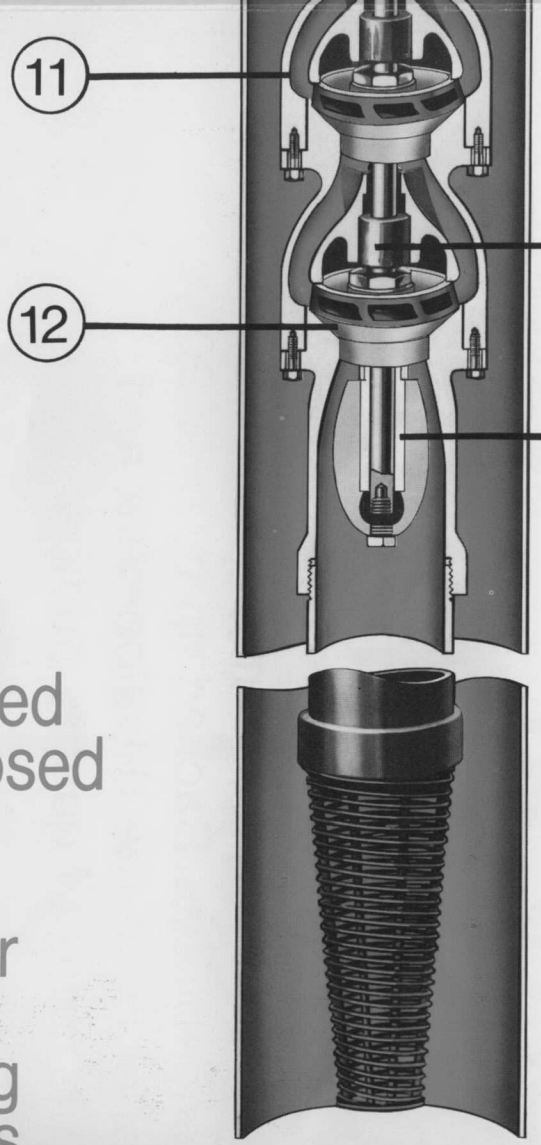




NOTE: Enclosed or Semi-Enclosed Impellers are available on either Water or Oil Lubricated Crane-Deming Turbine Pumps

Crane Deming quality design features provide longer life...lower operating costs

OIL AND WATER LUBRICATED

1. IMPELLERS EASILY ADJUSTABLE – with adjusting nut located at top of motor.

2. RATCHET PREVENTS BACKSPIN – and avoids damage to pump in case of phase reversal.

3. HEAVY-DUTY THRUST BEARING – cooled by air entering motor.

4. SEPARATE HEADSHAFT – with coupling in pump head facilitates installation. Permits changing drives without raising pump.

5. BASE OF HEAD RECESSED – permits casing or sleeve to extend above foundation as required by many Public Health Departments.

6. STAINLESS STEEL STUFFING BOX SHAFT – may be inverted to renew wearing surface.

7. FLANGED HEAD CONSTRUCTION – facilitates assembly of column and discharge head. Maintains accurate alignment between motor and column shaft assembly.

8. HIGH STRENGTH LINE SHAFT – of heat treated steel, ground and polished – one-third stronger than ordinary shaft.

9. COLUMN COUPLINGS – machined with 8 pitch threads for tight fitting butt joints.

10. STAINLESS STEEL IMPELLER SHAFT – specially heat treated, ground and polished for longer life.

11. STREAMLINED BOWL PASSAGEWAYS – enameled to reduce friction and give greater pump efficiency.

12. ENCLOSED BRONZE IMPELLERS – have completely finished surfaces for maximum efficiency.

13. BRONZE BOWL BEARINGS – on all enclosed impeller pumps.

14. SEMI-ENCLOSED BRONZE IMPELLERS – have completely finished surfaces for greater efficiency.

15. RUBBER BOWL BEARINGS – on all semi-enclosed impeller pumps.

16. ENCLOSED BRONZE BEARING – in suction bowl, protected with sand cap and packed with non-soluble grease.

WATER LUBRICATED ONLY

17. STAINLESS STEEL SHAFT SLEEVES – welded to shaft. Specially heat treated, ground and polished for maximum resistance to wear and corrosion. Replaceable in the field.

18. ACCESSIBLE EXTRA-DEEP STUFFING BOX – with controlled lubrication for long packing life.

19. PRE-LUBRICATION CONNECTION – through stuffing box distributes water around shaft for proper lubrication before start up.

20. WATER LUBRICATED SHAFT BEARINGS – fluted, resilient rubber shaft bearings are lubricated by water flowing through the pump. Bearings are held in place by a machined bronze bearing retainer secured between two pipe ends.

OIL LUBRICATED ONLY

21. AUTOMATIC LINE SHAFT LUBRICATOR – on motor driven units – opens when pump starts, closes when it stops.

22. BRONZE TUBING TENSION NUT – is easily accessible for placing tube under proper tension – also provides close fitting bearing in pump head.

23. TUBING HEAD ADAPTER WITH "O" RING – assures water tight seal around shaft enclosing tube.

24. BRONZE LINESHAFT BEARINGS – provide accurate alignment for lineshaft and a coupling for enclosure tube. A spiraling internal oil groove permits uniform bearing lubrication and by-pass of oil to bearings below.

25. HEAVY-DUTY TUBULAR STEEL SHAFT ENCLOSURE TUBE – protects lineshaft. Specially machined for accurate bearing alignment.

26. ENCLOSURE TUBE STABILIZERS – reinforced rubber "spiders" are regularly spaced to maintain enclosure tube alignment.

27. BEARING PROTECTING SLINGER – prolongs bearing life by preventing entrance of sand into top bowl bearing.

28. RELIEF PORTS IN TOP BOWL – prevent water from rising in tube above water level in well.

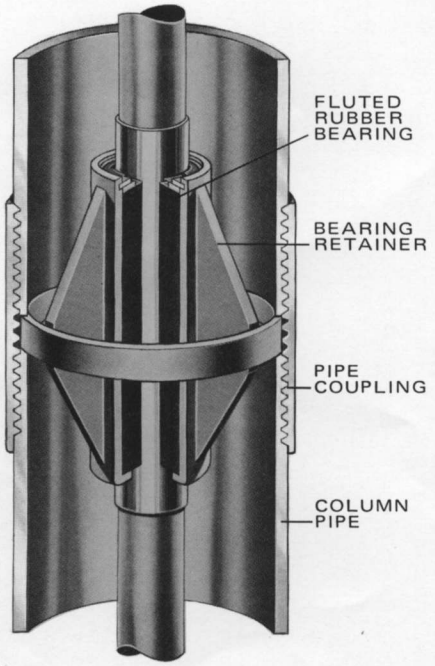
WATER OR OIL LUBRICATED

Crane Deming Vertical Turbine Pumps are available with either oil or water lubrication. The basic difference is in the construction of the lineshaft, its supporting mechanism and the bearings supplied with each. Either type may be furnished with semi-enclosed or enclosed impeller design.

WATER LUBRICATED CONSTRUCTION

Crane Deming water lubricated pumps are lubricated by the water that is being pumped, and require no supplemental lubricants or maintenance.

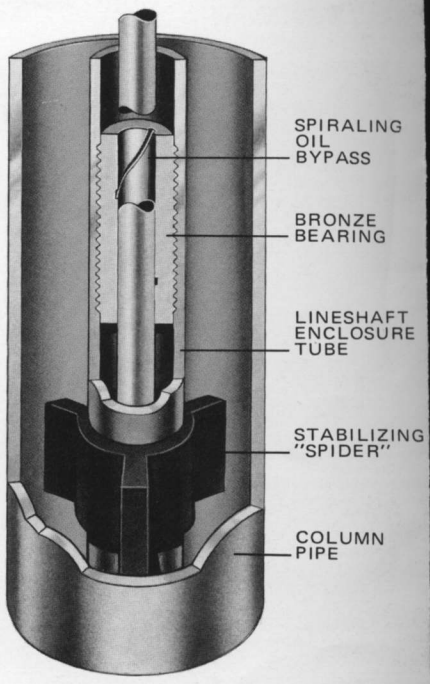
Water lubricated construction includes high strength steel lineshaft and rubber bearings throughout.



Bronze lineshaft bearing retainers are centered in each pipe coupling — tightly secured between the two pipe ends. Retainers are precision cast and machined to house the water lubricated, resilient rubber bearings and assure perfect vertical alignment of pump lineshaft. Rubber bearings are fluted to provide adequate lubrication and permit sand and other abrasive particles to flow through.

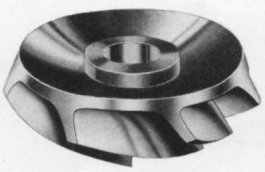
OIL LUBRICATED CONSTRUCTION

Oil lubricated construction has an enclosed lineshaft with bronze bearings used throughout. A heavy-duty steel enclosure tube contains the lubricating oil around the lineshaft and bearings, and shields both from foreign matter and corrosion.

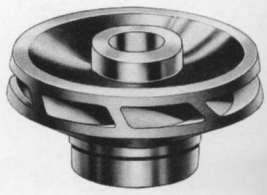


In standard construction, machined bronze bearings are spaced every five feet to assure true pumpshaft alignment and smooth, quiet operation. Bearings are threaded and also serve as a coupling for lineshaft enclosure tubing. A spiraling groove in the bearing inner wall provides uniform oil distribution over the lineshaft surface and permits oil passage through the bearing to each succeeding bearing below. Reinforced rubber "spiders" are spaced at regular intervals to center the enclosure tube in the column pipe.

IMPELLERS



Corrosion-resistant bronze semi-enclosed impellers are easily adjustable at the top of the driver to handle changes in well capacity or ground conditions. Impellers can be temporarily adjusted upward to avoid pump wear when clearing a sandy well. Top pump efficiency can easily be maintained.



Enclosed impellers are high quality corrosion-resistant bronze with completely finished surfaces. The hydraulic design developed from years of engineering experience assures maximum efficiency with minimum operating costs in Crane Deming Vertical Turbine Pumps.

CRANE DEMING

precision engineered

Vertical Turbine Pumps

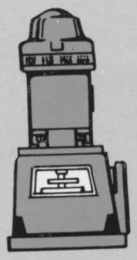
offer Unequaled Economy, Performance and Dependability...Backed up by over 90 years experience in the development and manufacture of quality pumps.

Crane Deming vertical turbine pumps are scientifically engineered and constructed of top quality materials to provide years of dependable service.

Close tolerance machining to increase operating efficiency – precision balancing of moving parts to eliminate vibration – special heat treating to reduce maintenance – using bronze to combat corrosion – stainless steel at critical wear points . . . Crane Deming has expended every effort to design and build a pump that runs smoother, lasts longer and yet stays in line with competition. The pumps described in this bulletin are the result of this manufacturing philosophy – no short cuts – no sacrificing of quality.

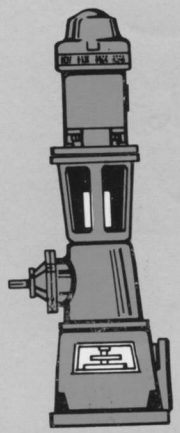
Over 90 years of research, engineering and manufacturing experience stand behind your selection of a Crane Deming Vertical Turbine Pump. It will prove a wise choice.

Top Performance With All Types of Drives



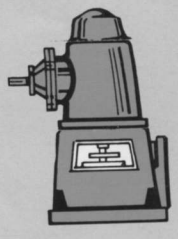
Unit Drive Head

For installations where electric power is available the Unit Drive with hollowshaft motor is compact, quiet and efficient.



Combination Motor – Right Angle Drive

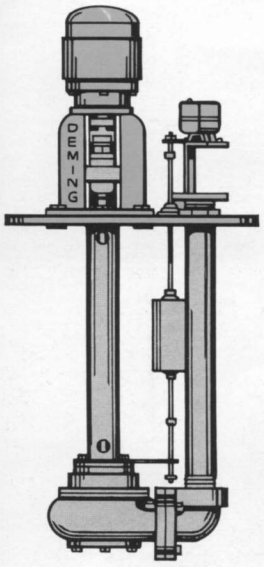
For municipal waterworks and installations where an auxiliary source of power must be available at a moment's notice.



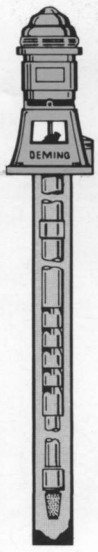
Right Angle Drives

For direct connection to gasoline or diesel power unit. Gear ratio permits unit to operate at the most economical speed.

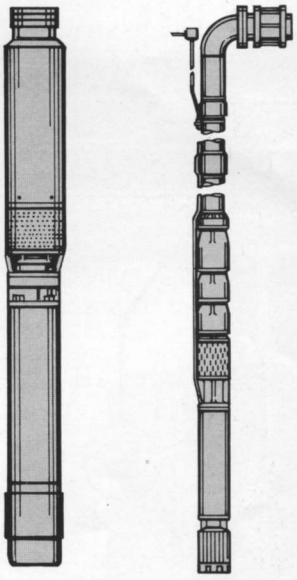
For Maximum operating efficiency
Specify CRANE DEMING
For all your pumping requirements



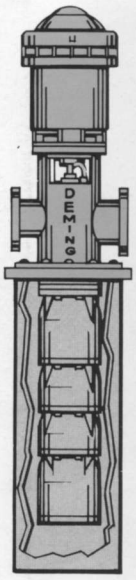
Sewage Pumps and
Cellar Drainers



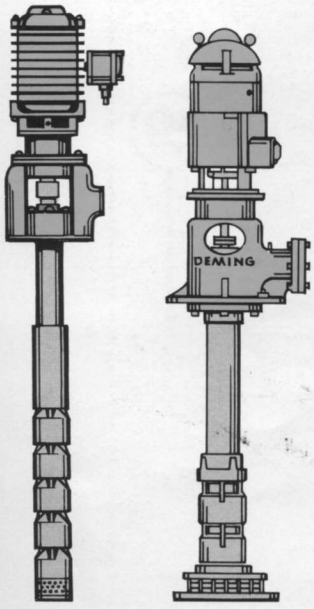
Close-Coupled
Vertical Turbine Pumps



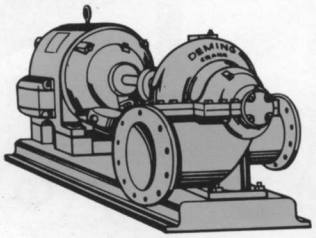
Submersible Pumps



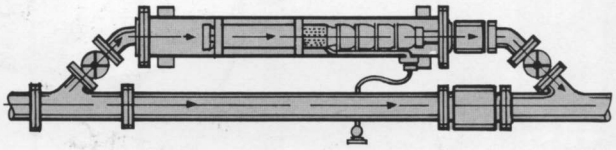
Tee Head Booster Pumps



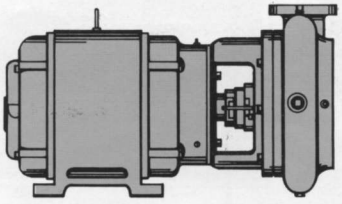
Gasoline, Fuel Oil and
Industrial Solvent Pumps



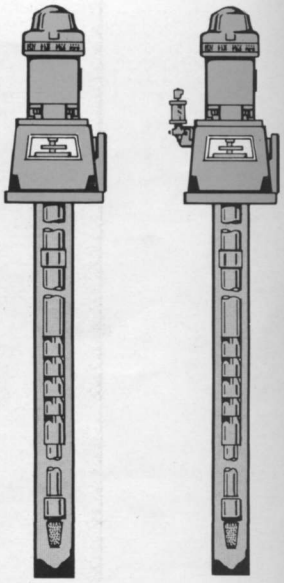
Split Case Centrifugal Pumps



Horizontal Submersible Pumps



Horizontal Motor Mount Pumps



Water Lubricated, Oil Lubricated
Vertical Turbine Pumps

CRANE DEMING PUMPS ARE SOLD AND SERVICED BY:

VALVES • PUMPS • FITTINGS • WATER TREATMENT • CONTROLS • PLUMBING • HEATING

CRANE® DEMING PUMPS

CRANE CO. DEMING DIV. • P. O. BOX 450 • SALEM, OHIO 44460

Form 4700B

SP

JOHNSON RIGHT ANGLE GEAR DRIVE

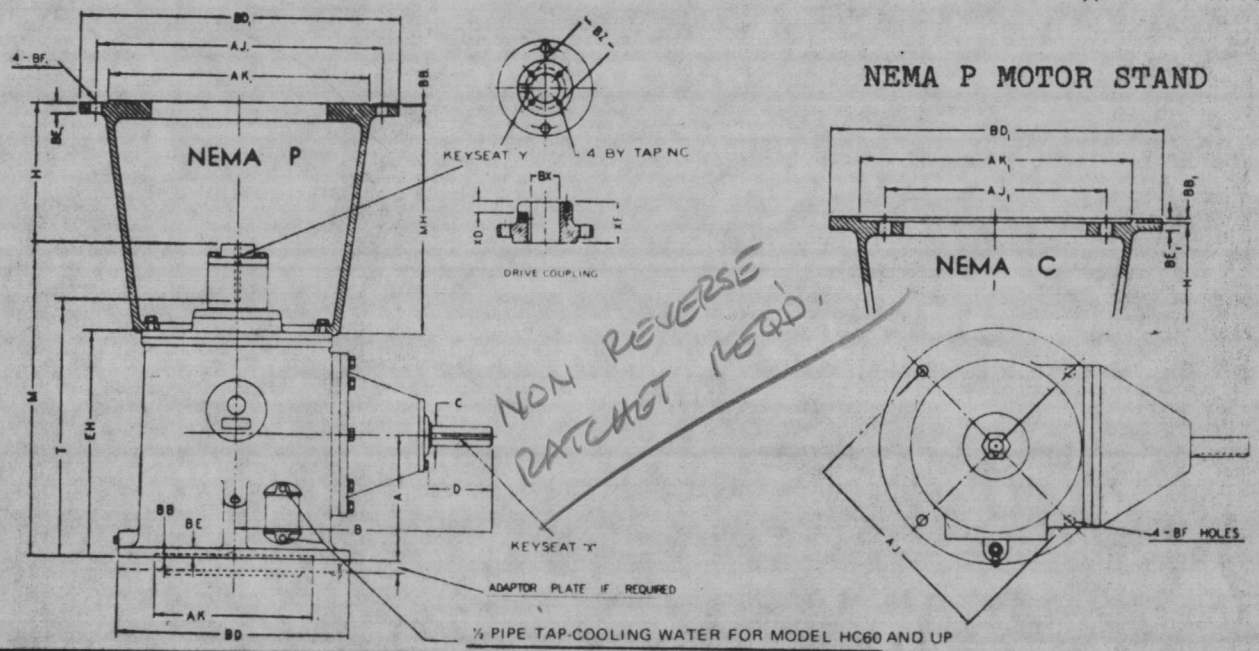
DIVISION OF ARROW GEAR COMPANY

Customer . . . Crane CO. . . . . Order No. 404537

Customer's Reference . . . . .

Serial No. 49840 . . . . . Model HA 15 . . . . . Ratio 1:1 . . . . . Rotation Fig. 1 . . .

Approved by . ps . . . . . Date . . 4/8/75 . . . . . Drive Coupling "BX" . 3/4" . . . . . Type NR . . . . . .



DIMENSIONS OF JOHNSON COMBINATION RIGHT ANGLE GEAR DRIVES TABLE 2

Model	A	B	C	D	EH	H	M	BE	BD	AJ	AK	BB	BF	Keyseat X
HA15	6⅜	13	1⅛	2¾	10⅝	3 1/8	16	⅝	10	9⅛	8¼	3/16	7/16	¼ x ⅛ x 2½
~~HB40(12)~~	~~9~~	~~16~~	~~1½~~	~~3½~~	~~15¼~~		~~22¼~~	~~¾~~	~~12~~	~~9⅛~~	~~8¼~~	~~3/16~~	~~7/16~~	~~⅜ x 3/16 x 3~~
HB40	9	16	1½	3½	15¼		22¼	¾	16½	14¾	13½	3/16	11/16	⅜ x 3/16 x 3
HC60	9	16	1½	3½	15¼		22¼	¾	16½	14¾	13½	3/16	11/16	⅜ x 3/16 x 3
HD90	11⅜	17½	2	3½	19⅝		26¾	1	16½	14¾	13½	3/16	11/16	½ x ¼ x 3
HE150	13¼	20½	2 7/16	4¾	23⅛		31¾	1	20	14¾	13½	3/16	11/16	⅝ x 5/16 x 4
HF200	15	24	2¾	5½	26⅜		36	1¼	20	14¾	13½	3/16	11/16	⅝ x 5/16 x 5
HG250	16½	29	2¾	5½	29⅞		40¼	1¼	20	22	13½	⅜	* 15/16	⅝ x 5/16 x 5
HH350	16½	30	3	5¾	29⅞		41¾	1¼	24½	22	13½	⅜	* 15/16	¾ x ⅜ x 5
HH425	16½	31	3½	6¾	29⅞		43¼	1½	24½	22	13½	⅜	* 15/16	⅞ x 7/16 x 5¾
HI500	16½	33	3¾	7½	31⅞		45⅜	1½	24½	* 22	13½	⅜	* 15/16	⅞ x 7/16 x 5¾
HJ600	19	36	4	7½	37		48¾	1½	26			⅜	15/16	x ½ x 7

*Also 5/8-11 Tap on 14¾ AJ 1" Deep

MAX. DRIVE COUPLING AND KEYSEAT

Model	XF	XD	BX Fig. 1 & 4	BX Fig. 2 & 3	BY	BZ	T	Y
HA15	1⅜	5/16	¾	X	10-32	1⅛	12¼	3/16 x 3/32 x 5¼
HB40	2⅛	9/16	1½	1¼	¼-20	2⅛	17¾	⅜ x 3/16 x 6½
HC60	2⅛	9/16	1½	1¼	¼-20	2⅛	17¾	⅜ x 3/16 x 6½
HD90	2⅛	9/16	1½	1½	¼-20	2⅛	22⅛	⅜ x 3/16 x 6½
HE150	2⅜	9/16	1 15/16	1¾	¼-20	2½	26½	½ x ¼ x 7
HF200	2⅝	11/16	2	2	¼-20	2½	30	½ x ¼ x 8
HG250	3	11/16	2 3/16	2 3/16	⅜-16	3¼	34	½ x ¼ x 9
HH350	3¼	13/16	2 7/16	2 7/16	⅜-16	3¼	34	⅝ x 5/16 x 10
HH425	3¼	13/16	2 7/16	2 7/16	⅜-16	3¼	35	⅝ x 5/16 x 11
HI500	4	13/16	2 11/16	2 11/16	⅜-16	3¾	39½	⅝ x 5/16 x 12
HJ600	4	1	3 3/16	3 3/16	⅜-16	4¼	39½	¾ x ⅜ x 12

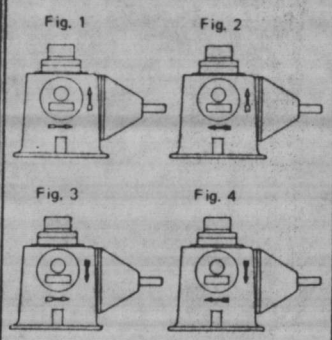
MOTOR STAND

MH	8 1/2
BD1	10
AJ1	9 1/8
AK1	8 1/4
BB1	1/8
BF1	3/8-16
BE1	1/2

SPEC. DRIVE COUPLING

BX	
Y	
BY	
BZ	
XD	

ROTATION DIAGRAM



Tolerances: Drive Shaft "C" plus .000 minus .001; Base Rabbet 'AK" plus .002 plus .005; Coupling Bore "BX" plus .0005 plus .0015; Motor Stand Rabbet "AK1" plus .000 minus .005 – Unfinished cast surfaces subject to normal variation.

921 PARKER ST. • BERKELEY, CALIF. 94710 • AREA (415) 845-7377

TELEX 336-435

36C2

MEMO OF
DATA TRANSMITTAL

GENERAL ELECTRIC COMPANY

SAN JOSE, CALIFORNIA

Refer to G.E. Req'n No. in Correspondence

MARCH 19, 1975 (DATE) | (LOCATION) | FIRST CLASS (PRINTS FORWARDED VIA)

CUSTOMER
ENVIRONMENTAL PRODUCTS, INC.
P. O. DRAWER 2385
HICKORY, NORTH CAROLINA 28601

STATION OR PROJECT NO.

CUSTOMER ORDER	CUSTOMER REQN.	G.E. CONTRACT	G.E. REQUISITION
2191			348-39536

PRINTS ARE:
[YYY] FOR APPROVAL [ ] FOR INSTALLATION [ ] FOR REFERENCE [ ] .....

APPROVAL REQUIRED BY ..... (DATE)

RETURN OF "FOR APPROVAL" PRINTS SHOULD BE ADDRESSED TO THE GENERAL ELECTRIC OFFICE WITH WHOM YOUR ORDER IS PLACED.
—NOT TO THE FACTORY—

Drawings are intended to be in accordance with applicable purchase order specifications. Comments are solicited concerning any departures in this respect. Features not covered by purchase order specifications portray General Electric Company standard design practice. The shipping date for this equipment is based on obtaining approval by the above specified date, and any delay in approval may extend the shipping schedule. Any requested changes from the purchase order specifications, resulting in additional engineering and/or manufacturing costs, will entail an increase in price and the extension of the shipping schedule.

7 PRINTS TO:
MR. BOB DARNELL
ENVIRONMENTAL PRODUCTS, INC.

MDT TO:
MR. W.L. RICHBOURG
GENERAL ELECTRIC CO.
P. O. BOX 10367
GREENSBORO, N. C. 27404

MDT TO:
B. HILL
801 SUMMIT AVE.
GREENSBORO, N. C. 27405

ITEM NO: 2
MOTOR MODEL:
OUTLINE NO: GEM 2296F
TYPE: K
FRAME: 213TP10
HORSEPOWER: 5
RPM: 1800
PHASE: 3
CYCLES: 60
VOLTS: ~~230/460~~ USE 200 V SERVICE TO BLDG. IS 208 V
THRUST: HIGH
ENCLOSURE: OPEN DRIPPROOF
SHAFT TYPE: HOLLOW
VERTICAL INDUCTION MOTOR.
1.15 SERVICE FACTOR
NON REVERSE CPLG. 1" BORE

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS
BY: mjz
DATE: 5-13-75

SPARE PARTS LIST:

ORDER SERVICE - S.J.

VIRGINIA KIMMY
COPY OF M/S TO

AP-866-CM 4-62 (new)

PRINTS ARE NOT TO SCALE, are loaned subject to return upon demand, and the express condition that they will not be used in any way detrimental to the General Electric Company.

REPRODUCTION OR DATA SECTION
By TRUDY HABENICHT

INDUCTION MOTORS—INTEGRAL-HP, 3- AND 2-PHASE
VERTICAL — SQUIRREL-CAGE

TRI-CLAD • Hollow-shaft • Shielded (Dripproof)*

High-thrust • Normal-starting-torque • NEMA Type P Base

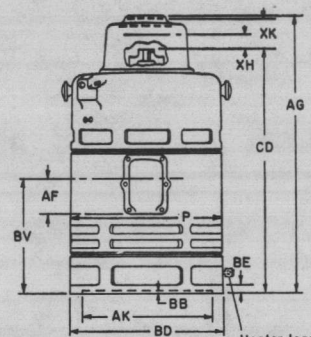
Type K
Frames 213TP10 to B405TP20, 3600 Rpm and Below
Frames B444TP16 to B445TP20, 1800 Rpm and Below θ

Self-release, Bolted or Nonreverse Coupling

GEM-2296F

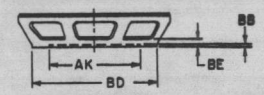
Sept. 8, 1970

DIMENSIONS

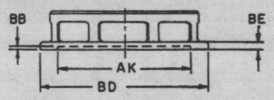


For Frames: B364TP16, B365TP16, B444TP20, and B445TP20

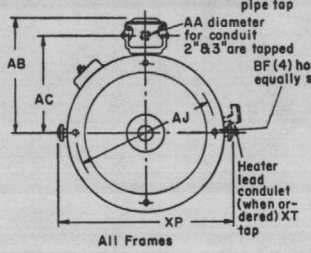
Heater lead conduit (when ordered) XT pipe tap



For Frames: 213TP10, 215TP10, B254TP10, 254TP10, 254TP12, 256TP10, 256TP12, B284TP10, B284TP12, B286TP10, B286TP12, B324TP12, B326TP12, B364TP12, B365TP12, B404TP16, B405TP16, B444TP16, B445TP16



254TP16, 256TP16, B284TP16, B286TP16, B324TP16, B326TP16, B404TP20, B405TP20



All Frames

FOR 3600-RPM MOTORS ONLY

For a given pump-shaft diameter, the following table gives the maximum distance between the motor's top coupling and the pump's first line-shaft bearing. This table is based on keeping the headshaft critical at least 25% above operating speed. The selection of a small headshaft diameter may make it necessary to support the headshaft in a close-fitting bushing in the lower end of the motor shaft.

Pump-shaft Diameter in Inches	Maximum Distance Between Top Coupling and Lower Support in Inches
0.750	33
1.000	38
1.187	42
1.437	45
1.500	47
1.688	50
1.750	51

Frame No.	Approx Net Wt in Lb	Dimensions in Inches																
		P	AA	AB	AC	AF	AG	AJ	AK †	BB Min	BD	BE	BF	BV	CD	XH ‡	XK	XP	XT
213TP10	165	10 7/8	1 1/4	9 3/8	7 5/16	3 1/2	23 13/16	9 1/8	8 1/4	3/16	10	3/4	7/16	10 15/16	20 15/16	1 3/4	2 3/4	....	1/2
~~215TP10~~	~~180~~	~~10 7/8~~	~~1 1/4~~	~~9 3/8~~	~~7 5/16~~	~~3 1/2~~	~~23 13/16~~	~~9 1/8~~	~~8 1/4~~	~~3/16~~	~~10~~	~~3/4~~	~~7/16~~	~~10 15/16~~	~~20 15/16~~	~~1 3/4~~	~~2 3/4~~	....	~~1/2~~
B254TP10	205	10 7/8	1 1/2	9 3/8	7 5/16	3 1/2	23 13/16	9 1/8	8 1/4	3/16	10	3/4	7/16	10 15/16	20 15/16	1 3/4	2 3/4	....	1/2
254TP10	270	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	9 1/8	8 1/4	3/16	10	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
254TP12	270	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	9 1/8	8 1/4	3/16	12	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
254TP16	270	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16	13	23 9/16	1 3/4	2 3/4	....	1/2
256TP10	310	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	9 1/8	8 1/4	3/16	10	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
256TP12	310	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	9 1/8	8 1/4	3/16	12	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
256TP16	310	12 15/16	1 1/2	10 3/8	8 5/16	3 1/2	26 1/2	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B284TP10	330	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	9 1/8	8 1/4	3/16	10	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B284TP12	330	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	9 1/8	8 1/4	3/16	12	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B284TP16	330	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B286TP10	355	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	9 1/8	8 1/4	3/16	10	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B286TP12	355	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	9 1/8	8 1/4	3/16	12	3/4	7/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B286TP16	355	12 15/16	2	11 3/8	8 7/8	4 5/8	26 1/2	14 3/4	13 1/2	1/4	16 1/2	3/4	11/16	13	23 9/16	1 3/4	2 3/4	....	1/2
B324TP12	460	14 1/4	2	12 3/16	9 11/16	4 5/8	32 7/16	9 1/8	8 1/4	3/16	12	7/8	7/16	15 7/16	28 3/16	3 1/8	4	15 3/4	1/2
B324TP16	460	14 1/4	2	12 3/16	9 11/16	4 5/8	32 7/16	14 3/4	13 1/2	1/4	16 1/2	7/8	11/16	15 7/16	28 3/16	3 1/8	4	15 3/4	1/2
B326TP12	510	14 1/4	3	13 15/16	10 5/16	6 1/2	32 7/16	9 1/8	8 1/4	3/16	12	7/8	7/16	15 7/16	28 3/16	3 1/8	4	15 3/4	1/2
B326TP16	510	14 1/4	3	13 15/16	10 5/16	6 1/2	32 7/16	14 3/4	13 1/2	1/4	16 1/2	7/8	11/16	15 7/16	28 3/16	3 1/8	4	15 3/4	1/2
B364TP12	600	16 1/4	3	14 13/16	11 3/16	6 1/2	35 7/16	9 1/8	8 1/4	3/16	12	1 1/8	7/16	16 1/8	31 3/16	3 1/8	4	17 7/8	3/4
B364TP16	600	16 1/4	3	14 13/16	11 3/16	6 1/2	35 7/16	14 3/4	13 1/2	1/4	16 1/2	1	11/16	16 1/8	31 3/16	3 1/8	4	17 7/8	3/4
B365TP12	660	16 1/4	3	14 13/16	11 3/16	6 1/2	35 7/16	9 1/8	8 1/4	3/16	12	1 1/8	7/16	16 1/8	31 3/16	3 1/8	4	17 7/8	3/4
B365TP16	660	16 1/4	3	14 13/16	11 3/16	6 1/2	35 7/16	14 3/4	13 1/2	1/4	16 1/2	1	11/16	16 1/8	31 3/16	3 1/8	4	17 7/8	3/4
B404TP16	890	18 7/16	3	15 3/4	12 1/8	6 1/2	41 1/4	14 3/4	13 1/2	1/4	16 1/2	7/8	11/16	19 1/2	36 7/16	3 1/4	4 1/2	20 1/8	3/4
B404TP20	890	18 7/16	3	15 3/4	12 1/8	6 1/2	41 1/4	14 3/4	13 1/2	1/4	20	7/8	11/16	19 1/2	36 7/16	3 1/4	4 1/2	20 1/8	3/4
B405TP16	990	18 7/16	3	15 3/4	12 1/8	6 1/2	41 1/4	14 3/4	13 1/2	1/4	16 1/2	7/8	11/16	19 1/2	36 7/16	3 1/4	4 1/2	20 1/8	3/4
B405TP20	990	18 7/16	3	15 3/4	12 1/8	6 1/2	41 1/4	14 3/4	13 1/2	1/4	20	7/8	11/16	19 1/2	36 7/16	3 1/4	4 1/2	20 1/8	3/4
B444TP16	1180	20 3/8	3	16 15/16	13 5/16	6 1/2	47 1/8	14 3/4	13 1/2	1/4	16 1/2	1 1/8	11/16	23 1/4	41 7/8	3 3/8	5	22	3/4
B444TP20	1180	20 3/8	3	16 15/16	13 5/16	6 1/2	47 1/8	14 3/4	13 1/2	1/4	20	1 1/8	11/16	23 1/4	41 7/8	3 3/8	5	22	3/4
B445TP16	1330	20 3/8	3	16 15/16	13 5/16	6 1/2	47 1/8	14 3/4	13 1/2	1/4	16 1/2	1 1/8	11/16	23 1/4	41 7/8	3 3/8	5	22	3/4
B445TP20	1330	20 3/8	3	16 15/16	13 5/16	6 1/2	47 1/8	14 3/4	13 1/2	1/4	20	1 1/8	11/16	23 1/4	41 7/8	3 3/8	5	22	3/4

~~200Y~~

Coupling dimensions on reverse side.

* These motors meet NEMA specifications for weather-protected Type 1 motors.

† 'AK' diameters of 8 1/4 inches will come within the limits of +0.003 inch, −0.000 inch; diameters of 13 1/2 inches will come within the limits of +0.005 inch, −0.000 inch.

‡ The total height of pump shaft and locking nut above top of coupling must not exceed dimension XH.

§ For 3600 rpm, Frames B324TP12 and B324TP16, conduit box dimensions are same as for Frames B326TP12 and B326TP16.

θ For 3600 rpm in this frame size, refer to the Company.

Frames 213TP10 through B286TP16 have grease-lubricated upper guide and lower thrust bearings. All other frames have oil-lubricated upper thrust bearing and grease-lubricated lower guide bearing.

For 3600 rpm, Frames B404TP16 through B405TP20 inclusive maximum shaft permissible 1.751 inches.

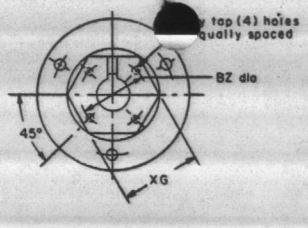
Nonreverse coupling assemblies, Frames 213TP to B286TP are complete, nonreverse assemblies, Frame B324TP to B445TP, must be used together with appropriate self-release coupling.

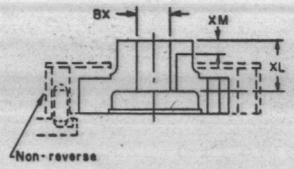
Provided mounting conditions permit, conduit box may be turned so that entrance can be made upward, downward, or from either side.

For shipping weight add 5 per cent to the above net weights.

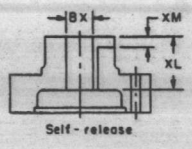
For ESTIMATING ONLY unless endorsed for construction.

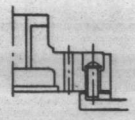
COUPLING DIMENSIONS





B324TP-B445TP





213TP-B286TP

DIMENSIONS OF COUPLINGS IN INCHES

Frame No.	Cat. No. Self-release or Bolted	Cat. No. Nonreverse ¶	BX Bore Nominal	BX Bore Actual □	BY	BZ	XG	XL	XM	KEYWAY Width	KEYWAY Depth
213TP	148X420G7	148X421G2	¾	0.751	10–32	1 ⅜	2 ¼	1 3/16	11/32	3/16	3/32
215TP	148X420G8	148X421G3	⅞	.876	10–32	1 ⅜	2 ¼	1 3/16	7/16	¼	⅛
B254TP	148X420G6	148X421G1	1	1.001	10–32	1 ⅜	2 ¼	1 3/16	7/16	¼	⅛
	148X250G15	148X251G3	¾	.751	10–32	1 ⅜	2 ¼	1 ½	11/32	3/16	3/32
254TP	148X250G17	148X251G5	⅞	.876	10–32	1 ⅜	2 ¼	1 ½	7/16	¼	⅛
256TP	148X250G13	148X251G1	1	1.001	10–32	1 ⅜	2 ¼	1 ½	7/16	¼	⅛
B284TP	148X250G14	148X251G2	1 3/16	1.188	¼–20	1 ¾	2 ¼	1 ½	7/16	¼	⅛
B286TP	148X250G16	148X251G4	1 ¼	1.251	¼–20	1 ¾	2 ¼	1 ½	7/16	¼	⅛
	148X250G22	148X251G7	1 ¼	1.251	¼–20	1 ¾	2 ¼	1 ½	9/16	⅜	3/16
	148X399G3	148X400G1	1	1.001	10–32	1 ⅜	2 ⅝	1 13/16	7/16	¼	⅛
	148X399G2	Use	1 3/16	1.188	¼–20	1 ¾	2 ⅝	1 13/16	7/16	¼	⅛
B324TP	148X399G6	with	1 ¼	1.251	¼–20	1 ¾	2 ⅝	1 13/16	7/16	¼	⅛
B326TP	148X399G5	Self-	1 ¼	1.251	¼–20	1 ¾	2 ⅝	1 13/16	9/16	⅜	3/16
	148X399G7	release	1 7/16	1.438	¼–20	2 ⅛	2 ⅝	1 13/16	9/16	⅜	3/16
	148X399G1	Coupling	1 ½	1.501	¼–20	2 ⅛	2 ⅝	1 13/16	9/16	⅜	3/16
	148X403G5		1	1.001	10–32	1 ⅜	3 ¼	2	7/16	¼	⅛
	148X403G6	148X404G1	1 3/16	1.188	¼–20	1 ¾	3 ¼	2	7/16	¼	⅛
	148X403G9	Use	1 ¼	1.251	¼–20	1 ¾	2 ¼	2	9/16	⅜	3/16
B364TP	148X403G2	with	1 ⅜	1.376	¼–20	2 ⅛	3 ¼	2	9/16	⅜	3/16
B365TP	148X403G10	Self-	1 7/16	1.438	¼–20	2 ⅛	3 ¼	2	9/16	⅜	3/16
	148X403G4	release	1 ½	1.501	¼–20	2 ⅛	3 ¼	2	9/16	⅜	3/16
	148X403G8	Coupling	1 11/16	1.688	¼–20	2 ½	3 ¼	2	9/16	⅜	3/16
	148X403G1		1 ¾	1.751	¼–20	2 ½	3 ¼	2	9/16	⅜	3/16
	148X455G6	174L509G5	1 3/16	1.188	¼–20	1 ¾	3 ¼	2 ¼	7/16	¼	⅛
	148X455G5	Use	1 ¼	1.251	¼–20	1 ¾	3 ¼	2 ¼	9/16	⅜	3/16
04TP	148X455G2	with	1 7/16	1.438	¼–20	2 ⅛	3 ¼	2 ¼	9/16	⅜	3/16
405TP	148X455G3	Self-	1 ½	1.501	¼–20	2 ⅛	3 ¼	2 ¼	9/16	⅜	3/16
	148X455G4	release	1 11/16	1.688	¼–20	2 ½	3 ¼	2 ¼	9/16	⅜	3/16
	148X455G7	Coupling	1 ¾	1.751	¼–20	2 ½	3 ¼	2 ¼	9/16	⅜	3/16
	148X455G1		1 15/16	1.938	¼–20	2 ½	3 ¼	2 ¼	11/16	½	¼
B404TP	148X499G2	174L511G1	1 3/16	1.188	¼–20	1 ¾	2 ¾	2 ¼	7/16	¼	⅛
B405TP	148X499G1	Use with	1 ¼	1.251	¼–20	1 ¾	2 ¾	2 ¼	9/16	⅜	3/16
(2-pole only)	148X499G3	Self-release Coupling	1 ½	1.501	¼–20	2 ⅛	2 ¾	2 ¼	9/16	⅜	3/16
	148X460G7	148X461G1	1 3/16	1.188	¼–20	1 ¾	3 ¾	2 ¾	7/16	¼	⅛
	148X460G5	Use	1 7/16	1.438	¼–20	2 ⅛	3 ¾	2 ¾	9/16	⅜	3/16
	148X460G4	with	1 ½	1.501	¼–20	2 ⅛	3 ¾	2 ¾	9/16	⅜	3/16
B444TP	148X460G3	Self-	1 11/16	1.688	¼–20	2 ½	3 ¾	2 ¾	9/16	⅜	3/16
B445TP	148X460G6	release	1 13/16	1.813	¼–20	2 ½	3 ¾	2 ¾	11/16	½	¼
	148X460G2	Coupling	1 15/16	1.938	¼–20	2 ½	3 ¾	2 ¾	11/16	½	¼
	148X460G1		2 3/16	2.188	⅜–16	3 ¼	3 ¾	2 ¾	11/16	½	¼

□Tolerances for the "BX" dimensions are +0.001 inch, −0.000 inch, up to and including 1½ inch diameter, and +0.0015 inch, −0.000 inch for larger diameters.

¶ Nonreverse coupling assemblies, frames 213TP—B286TP are complete, nonreverse assemblies, frames B324TP—B445TP, must be used together with appropriate self-release coupling. Standard rotation of nonreverse coupling is counter clockwise when viewed from top of motor.

GEM-2296F

Prints are: For Approval XXX

Prints are: Approved for Construction ☐

Customer ENVIRONMENTAL PRODUCTS, INC.

Customer's Order No. 2191 Frame 213TP10

Our Req. No. 348-39536 Item 1 Approved by T. HABENICHT

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. **By:** Ralph W. Harrison
Well Owner: Air Station - Camp Lejune **Address:** Jacksonville, North Carolina
Pumped Well No.: 0 **Location:** **County:** Onslow
Observation Well Locations:
Airline Lengths: Pumped Well **Observation Wells**
Remarks:

Pumping rate measured with: 3 X 4 Orifice **Water levels measured with:** Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
8-11-75							
4:25							
4:30		Pumping Test Started				23.11	
4:45	15	5	100				
5:00	30	5	100			56.11	
5:15	45	5	100			57.9	
5:30	60	5	100			58.7	
5:45	75	5	100			58.8	
6:00	90	5	100			58.9	
6:30	120	5	100			58.11	
7:00	150	5	100			58.11	
7:30	180	5	100			58.11	
8:00	210	5	100			58.11	
8:30	240	5	100			58.11	
9:00	270	5	100			58.11	
9:30	300	5	100			58.11	
10:00	330	5	100			58.11	
10:30	360	5	100			58.11	
11:00	390	5	100			58.11	
11:30	420	5	100			58.11	
12:00	450	5	100			58.11	
12:30	480	5	100			58.11	
1:00	510	5	100			58.11	
1:30	540	5	100			58.11	
2:00	570	5	100			58.11	
2:30	600	5	100			58.11	
3:00	630	5	100			58.11	
3:30	660	5	100			58.11	
4:00	690	5	100			58.11	
4:30	720	5	100			58.11	
5:00	750	5	100			58.11	
5:30	780	5	100			58.11	
6:00	810	5	100			58.11	
6:15	825	13	150			79.7	
6:30	840	13	150			80.8	
6:45	855	13	150			80.9	
7:00	870	13	150			81.1	
7:15	885	13	150			81.5	
7:30	900	13	150			82.0	
8:00	930	13	150			82.0	
8:30	960	13	150			82.0	
9:00	990	13	150			82.0	
9:30	1020	13	150			82.0	
0:00	1050	13	150			82.0	

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc By: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: 9 Location: County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
5:30	2940	23	200			105.0	
6:30	3000	23	200			105.0	
7:30	3060	23	200			105.0	
8:30	3120	23	200			105.0	
9:30	3180	23	200			105.8	
		Recovery Time					
9:35						32.4	
9:40						28.3	
9:45						27.7	
9:50						27.5	
9:55						27.3	
10:00						27.0	
10:15						26.9	
10:30						26.7	
10:45						26.5	
11:00						26.4	
11:15						26.3	
11:30						26.2	

PUMPING TEST DATA

Test conducted by: Carolina Well and Pump Company, Inc. By: Ralph W. Harrison
Well Owner: Air Station - Camp Lejune Address: Jacksonville, North Carolina
Pumped Well No.: 6 Location: County: Onslow
Observation Well Locations:
Airline Lengths: Pumped Well Observation Wells
Remarks:

Pumping rate measured with: 3 X 4 Orifice Water levels measured with: Electric Tape

Pump Well Data

Date and Time	Elapsed Time Min.	Piezometer Tube Reading Inches	Pumping Rate GPM	Pump Discharge Pressure	Altitude Gauge Reading Feet	Feet to Water	Remarks
11:00	1110	13	150			82.0	
11:30	1140	13	150			82.0	
12:00	1170	13	150			82.0	
12:30	1200	13	150			82.0	
1:00	1230	13	150			82.0	
1:30	1260	13	150			82.0	
2:00	1290	13	150			82.0	
2:30	1320	13	150			82.0	
3:00	1350	13	150			82.0	
3:30	1380	13	150			82.0	
4:00	1410	13	150			82.0	
4:30	1440	13	150			82.0	
5:00	1470	13	150			82.0	
5:30	1500	13	150			82.0	
6:00	1530	13	150			82.0	
6:30	1560	13	150			82.0	
7:00	1590	13	150			82.0	
7:30	1620	13	150			82.0	
7:45	1635	23	200			102.11	
8:00	1650	23	200			103.7	
8:15	1665	23	200			104.0	
8:30	1680	23	200			104.5	
8:45	1695	23	200			104.8	
9:00	1710	23	200			104.8	
9:15	1725	23	200			104.9	
9:30	1740	23	200			104.10	
10:30	1800	23	200			104.10	
11:30	1860	23	200			104.10	
12:30	1920	23	200			104.10	
1:30	1980	23	200			104.10	
2:30	2040	23	200			104.10	
3:30	2100	23	200			104.10	
4:30	2160	23	200			104.10	
5:30	2220	23	200			104.10	
6:30	2280	23	200			104.11	
7:30	2340	23	200			104.11	
8:30	2400	23	200			104.11	
9:30	2460	23	200			104.11	
10:30	2520	23	200			104.11	
11:30	2580	23	200			105.0	
12:30	2640	23	200			105.0	
1:30	2700	23	200			105.0	
2:30	2760	23	200			105.0	
3:30	2820	23	200			105.0	

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

CHEMICAL ANALYSIS OF WATER

Division of Health Services, Laboratory Section
P. O. Box 28047, Raleigh, North Carolina 27611

Complete all items above Heavy Line
(see instructions on reverse side)

Name of Owner or Supply: CAMP LEJUNE

Address: JACKSONVILLE, N.C.

Well No. 0

County: ONSLOW

Report to: WORTH F. PICKARD

Address: BOX 1085

SANFORD, N.C. 27330

Collected by: RALPH W. HARRISON

Date Collected: 8/13/75

Time: NEW RIVER

Remarks: ON PUMPING TEST MARINE BASE

UTILITIES EXPANSION
MARINE CORPS AIR STATION
CONTRACT N62470 73-C-1152
JACKSONVILLE, NORTH CAROLINA
SPEC. PAR. NO. 15435 CONTRACT DWG. NO.
CK. & APP. BY [signature] DATE 8 Sept 75
PEABODY-PETERSEN CO.
Job No. 7409

Type of Supplier:
[ ] 1-Municipal
[ ] 2-Sanitary District
[ ] 3-Mobile Home Park
[ ] 4-Community
[ ] 5-Association
[ ] 6-Industrial
[ ] 7-Institution
[ ] 8-Private
[ ] 9-Other

Source of Water:
[x] 1-Ground
[ ] 2-Surface
[ ] 3-Both
[ ] 4-Purchased

Source of Sample:
[x] 1-Well tap
[ ] 2-House Tap
[ ] 3-Distribution Tap

Type of Sample:
[x] 1-Raw
[ ] 2-Treated

Type of Treatment:
[x] 0-None
[ ] 1-Chlorinated
[ ] 2-Fluoridated
[ ] 3-Filtered
[ ] 4-Alum
[ ] 5-Lime
[ ] 6-Soda Ash
[ ] 7-Polyphosphate
[ ] 8-Water Softener
[ ] 9-Other

Analysis Desired:
[x] 1-Complete analysis (18 tests)
[ ] 2-Partial analysis (9 tests)

ANALYSIS

Color	(000)	10	units	Ph	(00.0)	8.4

Results in Parts per Million

Alkalinity $CaCO_3$	(000)	294	Fluoride	(0.00)	1.22
Total Hardness	(000)	76	Arsenic	(*0.00)	< 0.01
Iron	(*00.00)	0.10	Cadmium	(*0.00)	< 0.01
Manganese	(*00.00)	< 0.03	Chromium $^{+6}$	(*0.00)	< 0.05
Turbidity SiO_2	(000)	.25	Copper	(*00.00)	< 0.05
Acidity $CaCO_3$	(000)	0	Lead	(*0.00)	< 0.05
Chloride	(000)	78	Zinc	(*00.00)	0.05
Sodium	(000)	155	Calcium		24.5
Potassium	(00.0)	12.0	Magnesium		3.6

Date received August 20, 1975 Date reported August 27, 1975

CAROLINA WELL AND PUMP COMPANY, INC.

Complete Well and Pump Service

P. O. BOX 1085 TELEPHONE 776-3415

SANFORD, NORTH CAROLINA 27330

N.W.W.A.
N.C.W.W.A.

Drillers Log
Camp Lejune
New River Job
Well # 0

0 - 1	Brown Sand
1 - 15	Light Gray Zinc Sand
15 - 27	Gray clay and gravel
27 - 33	Sand
33 - 37	Clay
37 - 66	Sand & Shell
66 - 77	Sand gray
77 - 85	Clay and shell (Gray)
85 - 87	Clay not as much shell
87 - 96	Hard clay
96 - 123	Clay, Light (soft)
123 - 137	Rock and clay
137 - 154	Limestone
154 - 167	Hard rock
167 - 207	Rock and sand (took alot of water)
207 - 213	Limestone and rock
213 - 221	Clay
221 - 223	Rock
223 - 231	Clay
231 - 250	Rock and clay

APPROVED
SUBJECT TO REQUIREMENTS OF
SPECIFICATIONS
J. K. TIMMONS & ASSOCIATES
CONSULTING ENGINEERS

UTILITIES EXPANSION
MARINE CORPS AIR STATION
NEW RIVER
CAROLINA
DATE 5/22/75
PEABODY-PETERSEN CO.
Job No. 7409

IMPORTANT

DO NOT DESTROY

This Envelope Contains Installation and Operating Manual.

Read Carefully Before Installing.

It is important that these instructions be given to the purchaser for his future reference.

JOHNSON RIGHT ANGLE GEAR DRIVE
DIVISION OF ARROW GEAR COMPANY

LINCOLN, NEBRASKA 68521
U.S.A.

253-642

AS-1255

NOTE

1) THIS UNIT HAS BEEN FILLED WITH OIL PRIOR TO SHIPMENT. ***PLEASE CHECK OIL LEVEL BEFORE STARTING*** TO INSURE THAT NO SPILLAGE HAS OCCURRED IN TRANSIT.
   CONSULT OPERATOR'S MANUAL FOR APPROVED OILS AND CAPACITY.

2) KEYS, RATCHET PINS AND RATCHET PIN SPRINGS ARE INSIDE THE KEYBAG UNDERNEATH DOME COVER.

JOHNSON GEAR

RIGHT ANGLE DRIVE DIVISION OF ARROW GEAR CO.

1401 W. BOND CIRCLE LINCOLN, NE 68521

945-644 5M—5/89

NOTE

1) THIS UNIT HAS BEEN FILLED WITH OIL PRIOR TO SHIPMENT. ***PLEASE CHECK OIL LEVEL BEFORE STARTING*** TO INSURE THAT NO SPILLAGE HAS OCCURRED IN TRANSIT.
   CONSULT OPERATOR'S MANUAL FOR APPROVED OILS AND CAPACITY.

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JOHNSON GEAR
RIGHT ANGLE DRIVE DIVISION OF ARROW GEAR CO.
1401 W. BOND CIRCLE LINCOLN, NE 68521

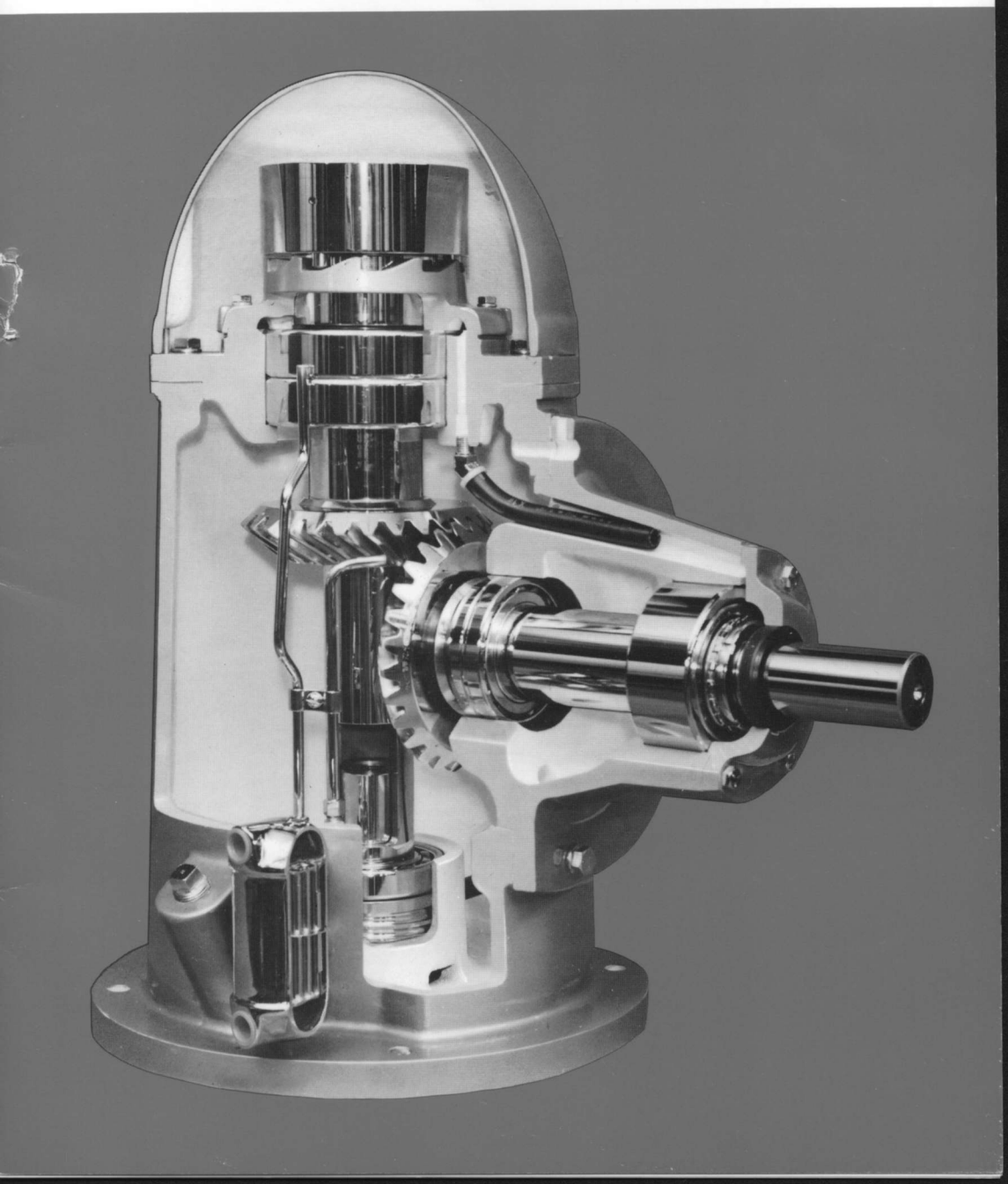
945-644 5M—5/89

AS 1255

Bulletin OM-90

JOHNSON GEAR

OPERATOR'S MANUAL FOR THE JOHNSON GEAR RIGHT ANGLE DRIVE



INDEX

FOUNDATION

A *solid level* foundation is necessary to prevent vibration and misalignment, both of which are detrimental to your gear drive. Width and length of the base will be governed by size of gear drive, size of engine, and specifications of the pump head.

SHORT COUPLED INSTALLATIONS BETWEEN GEAR DRIVE AND ENGINE SHOULD HAVE A COMMON FOUNDATION.

The depth of the foundation should extend down to a solid footing, if possible, and will depend on the type of soil, total weight of the installation, and the climate. Where freezing temperatures occur, the foundation should extend below the frost line.

INSTALLATION

The base of every Johnson Right Angle Gear Drive is provided with a machined rabbet to insure centering on the pump head. Therefore, it is essential that the pump shaft be in the exact center of the corresponding rabbet in the pump base.

Since a faulty headshaft will cause vibration and ultimately destroy the bearings and gears, it must be thoroughly checked for straightness and alignment. The procedure for checking the headshaft, which is outlined below, requires removal of the dome cover from the drive. *While the dome is off, care must be taken to protect against grit and dirt as even a small amount might cause damage to the bearing located in the top of the drive.*

Checking the Headshaft

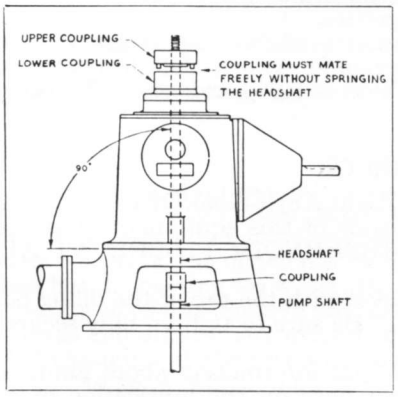


Figure 1

Before an alignment check can be made, it is necessary to ascertain that the headshaft is true to size, that diameters are concentric if shaft changes in diameter, and that it is absolutely straight throughout its length.

Combination drives are furnished with a steady bearing to prevent whipping of the headshaft under electric motor operation. The headshaft of such drives must therefore be tested for fit in the steady bearing.

Steady bearings are of the sealed ball bearing type and are mounted on adaptor sleeves through which the head shaft *must be a sliding fit* but not a press fit.

Headshafts are sometimes made with the pump coupling end larger than the hole in the hollow shaft of the gear drive. This makes it necessary to lower the drive on the pump head with the headshaft coupled in place. Particular care must be taken in such cases to avoid bending the headshaft or damaging the oil seal tube.

Mounting the Drive

After the headshaft has been thoroughly checked, inspect the machine fit of both gear drive and pump head for burrs or obstructions. Install the drive on the pump head and bolt in place, tightening thoroughly and evenly.

With the headshaft in place, slip on the upper coupling and lower it carefully into position. WHEN THE UPPER COUPLING POSITIONS ON THE LOWER COUPLING WITHOUT SPRINGING THE HEADSHAFT, IT INDICATES THAT THE UNIT IS CORRECTLY ALIGNED. Correct the alignment if upper and lower couplings do not meet properly.

With the gear drive and headshaft correctly aligned, install the ratchet pins and gib head key in the upper coupling. This key should be a slide fit, permitting adjustment of the headshaft by means of the adjusting nut. Tighten the nut as directed by the pump manufacturer, and lock with screw provided for this purpose. DO NOT OIL THE RATCHET PINS.

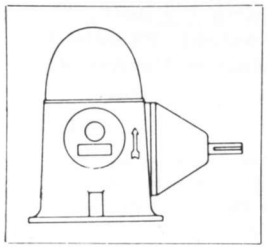


Figure 2

Checking the Rotation

Check the rotation of the power unit and pump in relation to that of the drive, as shown by the arrow on the case. DO NOT OPERATE IN THE REVERSE DIRECTION OF THE ARROW, as the lubrication system will not function and the destruction of the drive will result. Rotate the drive by hand before applying the power as a precaution against a bound or locked installation. Figure 2 shows drive with standard rotation.

Oil Cooler Connection

Models H-60 and larger are supplied with counter-flow oil coolers with water connections taped for ½" standard pipe. These connections are arranged vertically, the top connection for the inlet and the bottom connection for the outlet. Use rubber hose or copper tubing for water supply. DO NOT MAKE A RIGID PIPE CONNECTION. A moderate amount of cold water should flow through the cooler when the drive is operating, and provision should be made in the piping to permit draining the cooler in localities subject to freezing weather conditions.

Under normal conditions with 70°F water available, requirements are approximately 1 to 3 gal/min (4 to 12 liters/min) for models H60 thru H200 and 4 to 6 gal/min (15 to 23 liters/min) for models H280 and above. Maximum allowable water pressure 100 psi.

Filling with Oil

Correct lubrication of your Johnson Right Angle Gear Drive is a MUST for satisfactory operation. As the operator of this equipment, it is your responsibility to KEEP THE OIL RESERVOIR FILLED AT ALL TIMES.

Fill the oil reservoir until the oil is level with the top of the filling hole or the line on the gauge marked "Full." Be sure to tighten plug securely after filling or draining.

Look in the section on "Lubrication" for information about grades of oil, frequency of oil changes, and other data on the lubrication of the gear drive.

Oil reservoir capacities are as listed below:

Models	*Gallons—U.S.*	*Liters*
H20-H30	½	2
H40 (12)	¾	3
H40-H60-H80	1	4
H110-H125	1½	6
H150-H200	3	12
H300	4	15
H350-H425-H500-H600	6	23
H750	10½	40

OUR WARRANTY DOES NOT PROTECT YOU IN THE EVENT OF FAILURE FROM NEGLIGENCE IN MAINTAINING SUFFICIENT OIL OF RECOMMENDED GRADE IN THE GEAR DRIVE.

CONNECTING THE POWER UNIT

Coupling Installation

Care should be taken in selecting the proper type and size of coupling. The great majority of installations will require a Universal joint of standard length, as this type is capable of absorbing the misalignment which may occur due to installation errors or settling of earth around the well. Installation should be preferably made as nearly in line as possible and it is extremely important that the center line of the engine be parallel to the center line of the drive shaft within 2 or 3 degrees. This precaution will prevent an unbalanced condition which would result in vibration and be detrimental to the gear drive bearings and drive shaft.

Certain types of flanged flexible couplings are suitable for close coupled drives, providing pump head and power unit are on the SAME RIGID FOUNDATION. Such couplings should be mounted and maintained according to the manufacturer's instructions. NEVER USE A RIGID FLANGED COUPLING.

IN FITTING THE UNIVERSAL JOINT OR FLEXIBLE COUPLING FLANGE TO THE DRIVE, IT SHOULD BE MACHINED FOR A PUSH FIT WITHOUT THE USE OF EXCESS POWER, AS HAMMERING ON THE DRIVE SHAFT WILL DAMAGE THE BEARINGS AND DESTROY THE ADJUSTMENT OF THE GEARS.

LUBRICATION

General Information

Careful attention to the lubrication requirements and use of the correct grade of oil is essential to continued and satisfactory operation of your Johnson Right Angle Gear Drive. *Gear drives should not be operated at speeds 15% above or below the nameplate RPM without consulting the Factory*. The operating speed of your drive is shown on the nameplate.

Changing Oil

Proper lubrication requires that the oil be changed at least once every six months or after 2000 hours of operation, whichever occurs first. Should extreme changes of temperature or humidity cause condensation in the reservoir, the oil should be changed more frequently. Drain the oil when hot, inspecting for water. Be sure to change the oil at the end of the operating season to remove any moisture which would otherwise rust the bearings and other finely machined parts.

Oil changing at the recommended time interval aids in restricting the amount of acid which may form in oils under high temperature and pressure conditions. Acids are injurious impurities in lubricating oils, since they attack the machine parts.

Keep the "Lubrication Record" as a guide for making these oil changes at the proper intervals.

Cold Weather

Close attention should be given the drive when starting under freezing conditions. The oil becomes very thick at low temperatures, which may result in flooding the thrust bearing (as evidenced by oil leak at top of drive). In such cases, providing the leak does not cease as the drive warms up, stop the drive and allow the oil to drain and then restart. Removal of dome on standard drives is required for above observations. CAUTION: *Be sure to check oil flow to gears* when starting under low temperature conditions.

Recommended Oil

The high-grade oils approved for the Johnson Right Angle Gear Drives are less susceptible to emulsification (mixing with water) and oxidation than other oils.

RECOMMENDED OILS

Ambient Temp °F	15-60	50-125
A.G.M.A. Grade	2	3
Visc. S.S.U. @ 100°F	284-347	417-510
I.S.O. Visc. (cSt) @ 40°C	68	100
Amoco	Ind. Oil 68	Ind. Oil 100
Cato Oil	AW/AL 20	AW/AL 30
Chevron—USA	A.W. Mach 68	A.W. Mach 100
Citgo	Pacemaker 68	Pacemaker 100
Exxon—USA	Teresstic 68	Teresstic 100
Getty—USA	Skelvis—MP 20	Skelvis—MP 30
Gulf—USA	Harmony 68	Harmony 100
Mobil Oil	Mobil DTE Hvy. Med.	Mobil DTE Heavy
Pacer	Thermal T68	Thermal T100
Phillips	Magnus 68	Magnus 100
Shell—USA	Turbo 68	Turbo 100
Sun Oil	Sunvis 931	Sunvis 951
Texaco	Regal R & O 68	Regal R & O 100

S.A.E. Automotive oils are NOT satisfactory and *must not be used* in the gear drive. USE OF AUTOMOTIVE OILS WILL VOID OUR WARRANTY.

OPERATION

The following operating recommendations are made to aid you in keeping your gear drive in the best possible condition. Careful attention to these details will prolong the useful life of your equipment.

Starting

Always check the oil level in the housing of the gear drive and add oil if needed. Inspection when starting and regular checks during the operating period will prevent failure of the gear drive due to poor oil circulation. Should the circulation appear to be lagging, check the oil level and the age of the oil in the drive. Oil tends to thicken with use and old oils will not circulate properly in the gear drive oiling system.

Turn by hand the drive shaft between pump and engine to check whether pump turns freely. (When the engine has no clutch, as in fire pump drives, it will be necessary to uncouple the shaft.)

When the drive is furnished with a non-reverse clutch, check to see that ratchet pins are clean and drop readily. Do not oil pins.

Before applying power replace dome and all covers and guards.

Apply power to drive gradually, but do not idle at low speed for a long period.

Observe carefully the entire installation during the starting period and do not leave until satisfied that all units are functioning properly.

Operating Temperatures

A standard drive operating at 1750 RPM pump speed under rated load and normal atmospheric conditions will reach a temperature of approximately 130-170°F depending on whether the unit is air or water cooled and local conditions peculiar to the installation. It is not possible to hold one's hand on the gear drive case except momentarily when temperatures exceed 135°F.

Increased speed, high loads, or lack of air circulation will cause the temperature to rise, but the oil temperature should not at any time exceed 200°F. A thermometer may be used at the oil filling hole of the drive to obtain actual temperatures if unusual conditions exist. When starting the drive at temperatures below 10°F, the oil should first be checked to see whether it is above the pour point. The drive must not be operated if the oil does not flow, which limiting condition exists at approximately 10°F.

Shutdown Periods

When the installation is to be inoperative for a considerable time, such as after the completion of an irrigation period, the gear drive should be drained while hot and then replenished with new oil.

Occasional brief operation during extended shutdown periods will help prevent damage from condensation and will benefit the bearings by changing the position of the balls and races. This procedure is of equal benefit to the engine, as it spreads an oil film on the cylinder walls, rings, bearings, etc.

In localities where freezing conditions prevail, drain the water from the oil coolers of drives so equipped.

Long Term Storage

1. Fill with oil in appropriate amount for storage period only. Replace oil when put into regular duty.
2. Spray exposed machined parts (i.e., base, shaft end, upper coupling) with rust-retarding oil.
3. Operate gear drive every month long enough to oil bearings and gears to prevent condensation and rusting.
4. Store in heated building if at all possible.
5. Cover with tarpaulin or other dust shield.

General Precautions

The bearings furnished are of high quality and have been approved by the manufacturer for the rated loads and speeds of the gear drives in which they are used. Bearing life is directly affected by the care given in operating the equipment and adherence to the instructions given in this manual. Usually a bearing will become noisy and give adequate warning of impending failure. Do not operate the gear drive with noisy bearings as destruction of the gears will result if the bearing should fail.

Changes sometimes occur in the water level, or alterations may be made to the pump subsequent to selection and installation of the gear drive. Such changes will usually affect the operating conditions of the gear drive and should be thoroughly investigated.

As mentioned repeatedly in this manual, lubrication is the most important factor affecting the life of the drive, which, given ordinary care and properly operated, will give exceptionally trouble-free service.

Special Instructions

Johnson Right Angle Hollow Shaft Gear Drives used for Factory Mutual and NPFA fire pump installations are not permitted to omit or disable the non-reverse ratched coupling. Nor is the use of disconnecting couplings or clutches permitted between the engine and gear drive, or to reset the engine from its pre-set speed.

COMBINATION DRIVES

All the preceding operating instructions are applicable to the combination drive. There are also special instructions which must be followed according to the particular application.

Standard Combination

In most installations, the gear drive and engine are required for standby service only. The installation is therefore made so that the electric motor drives the pump and also carries the thrust load. The coupling at the top of the gear drive is free to turn when the electric motor is driving the pump, running clearance being maintained by a compressible spacer. (Figures 3 & 4)

When pump operation by the engine through the gear drive is required the stainless steel bolts are used to fasten the coupling halves together (Figure 4). This procedure permits transmission of power through the right angle gear drive, but does not alter the setting of the pump. The pump thrust load is still carried by the electric motor.

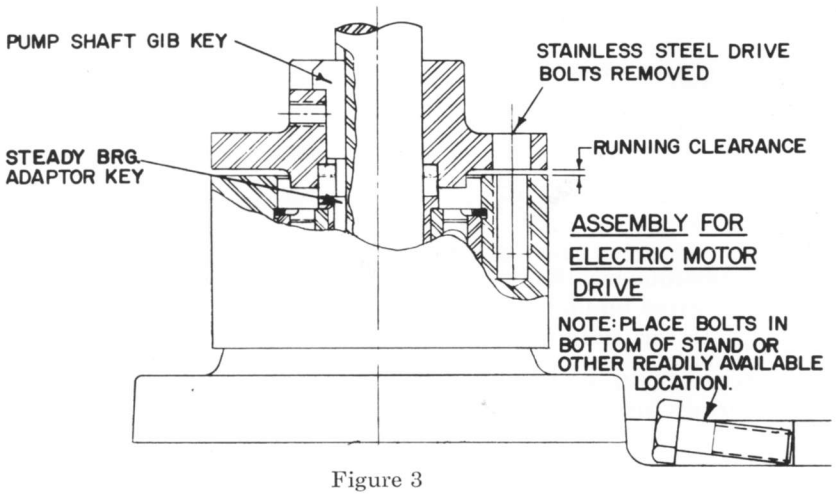


Figure 3

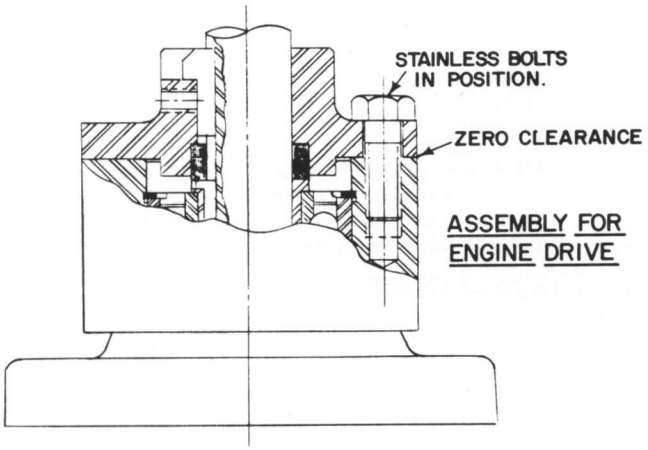


Figure 4

Redi-Torq®

The Johnson Redi-Torq® Gear Drive is manufactured specifically for automatic installations and permits the use of standard flexible shafting between the gear drive and engine. If your gear drive is a Redi-Torq® you must read and comply with the supplementary instructions accompanying this manual. Contact the factory prior to making the installation if the pamphlet is missing.

Solid Shaft

This type of drive is used with solid shaft electric motors. The gear drive and electric motor are connected together by a flexible coupling. Most installations using this drive are of dry pit design and flexible shafting is used between the pump and gear drive.

With solid shaft combination drives, the electric motor revolves when the engine is driving. Means of disconnecting the gear drive and engine must be provided.

MAINTENANCE

General

A Johnson Right Angle Gear Drive which has been properly installed and operated according to instructions furnished will give years of dependable service with a minimum of maintenance. Instructions included in this manual are to inform you of correct maintenance procedure.

Repairs should only be undertaken by a skilled mechanic, fully capable of doing the work; and when for any reason extensive maintenance beyond the scope of this manual is required, the drive should be returned to our factory with transportation charges prepaid. This allows our trained mechanics, aided by specialized tools and equipment, to reassemble and test your gear drive under controlled conditions. Factory reconditioning, wherein all worn parts which in our judgement require renewal are replaced, has the additional advantage of carrying a new drive warranty. No allowance is made for parts removed, and such parts are returned on request.

Alterations or repairs made outside the factory without our approval are at buyer's risk and void the warranty. We suggest that you read the terms of our warranty before undertaking any repair work on the drive. (See back cover.)

When conditions do not permit return of the drive to the factory, consult with our Engineering Department, giving full information on your problem. Make your data as complete as possible, and be sure to include the serial number of the drive and approximate length of service.

Non-Reverse Coupling

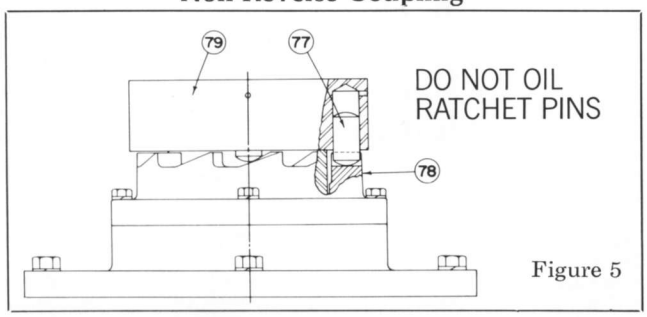
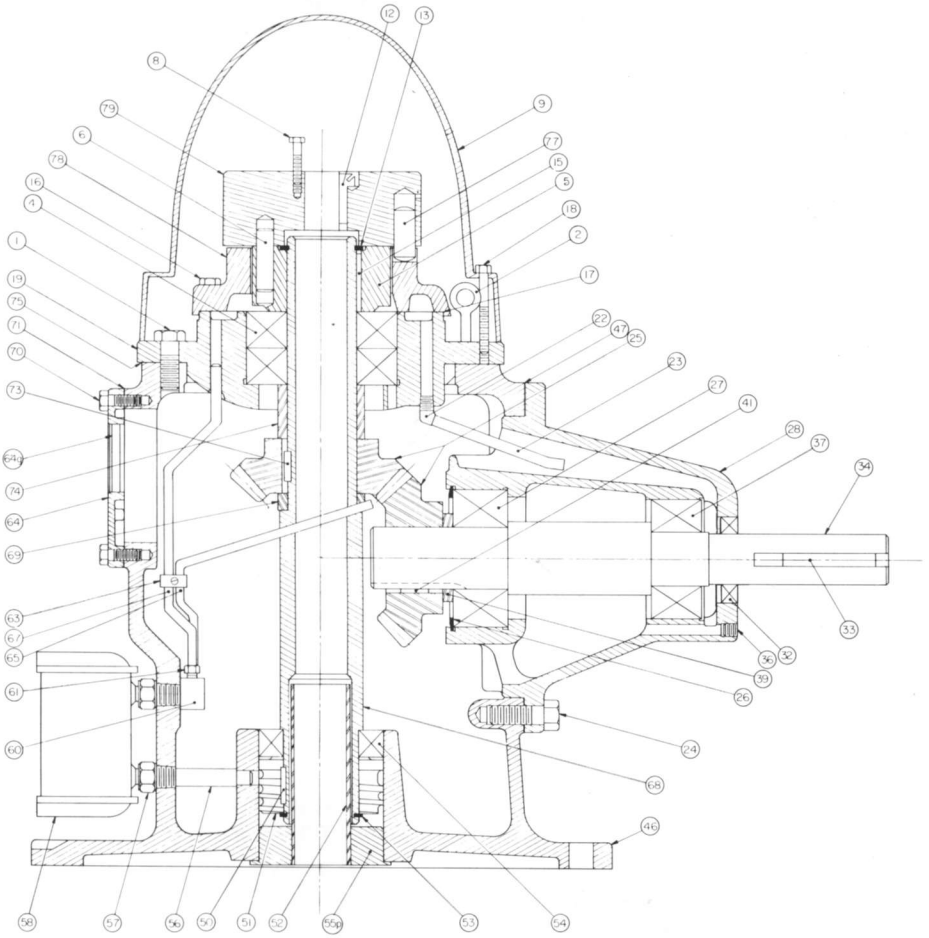


Figure 5

The operation of a Johnson Non-Reverse Coupling is extremely simple and requires a minimum of maintenance. The ratchet pins must operate freely, and will therefore require an occasional cleaning. They must never be oiled as this would result in formation of a gummy film, preventing their dropping freely into position as forward rotation slows down.

TYPICAL MODEL H-20 — H-60



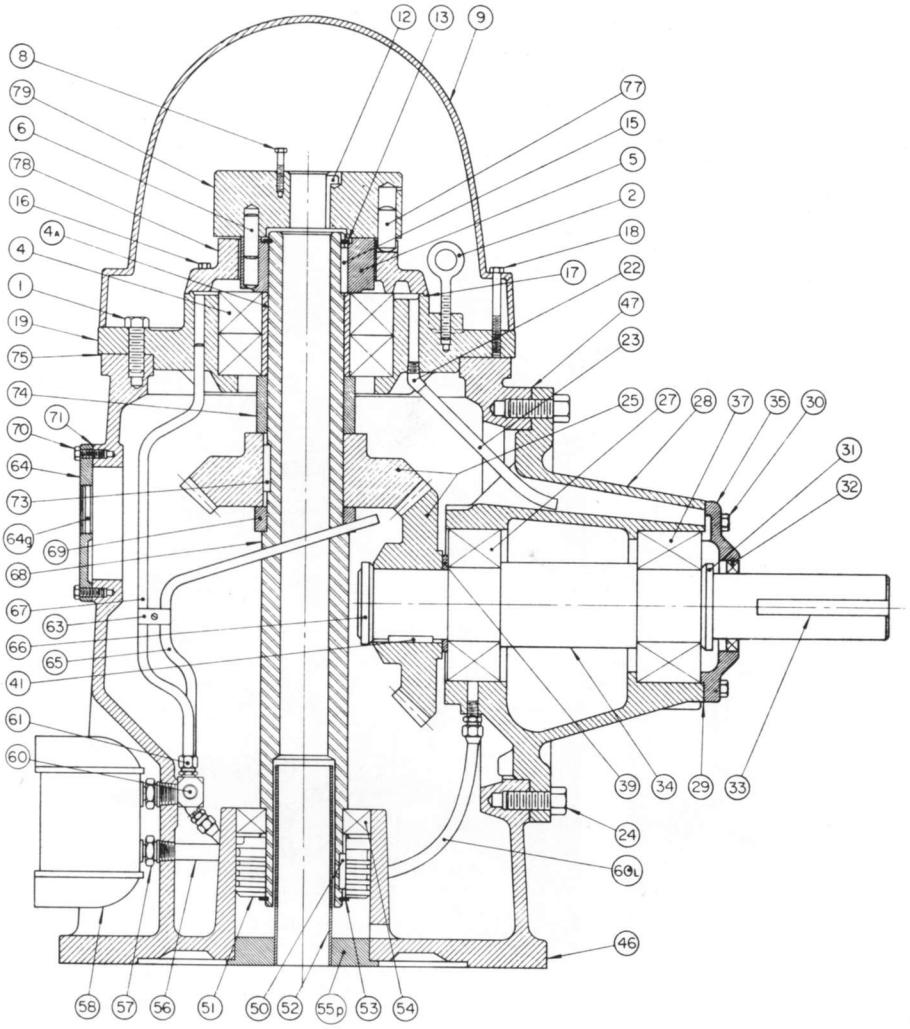
No.	*Part Name*
1	Capscrew—Thrust Cage
* 2	Lifting Eyebolt
4	Thrust Bearing
5	Lower Coupling
6	Coupling Pin
8	Capscrew
9	Dome
12	Gib Key
13	External Snap Ring
15	Key—Lower Coupling
16	Capscrew—Thrust Cover
17	Gasket—Thrust Cover
18	Capscrew—Dome
19	Thrust Bearing Cage
*22	Flexible Tube Fitting
*23	Flexible Tube
24	Capscrew—Horiz. Hsg.
25	Gears
26	Internal Snap Ring
27	Inner Bearing
28	Horizontal Housing
32	Oil Seal

No.	*Part Name*
33	Key
34	Driveshaft
36	Drain Plug-Set Screw
37	Outer Bearing
39	Horizontal M.D. Spacer
41	Key—Drive Gear
46	Main Housing
47	Shim—Horiz. Hsg.
50	Key—Pump Runner
51	Pump Runner
52	Seal Tube
53	External Snap Ring
54	Pump Bearing
55P	Seal Plug
*56	Oil Tube From Pump
*57	Cooler Flexible Fittings
*58	Oil Cooler (H60 Only)
60	Oil Distributor
61	Compression Fitting
63	Oil Tube Clamp
64	Inspection Plate
*64G	Oil Sight Glass

No.	*Part Name*
65	Oil Tube to Gears
67	Oil Tube to Thrust Bearing
68	Hollow Shaft
*69	Lower Hollow Shaft Spacer
70	Capscrew—Insp. Plate
71	Gasket—Insp. Plate
73	Key—Driven Gear
74	Vertical M.D. Spacer
75	Shim—Thrust Bearing Cage
77	Ratchet Pins
78	Thrust Bearing Cover
79	Upper Clutch

* These parts are not universal and are omitted in certain ratios and models.

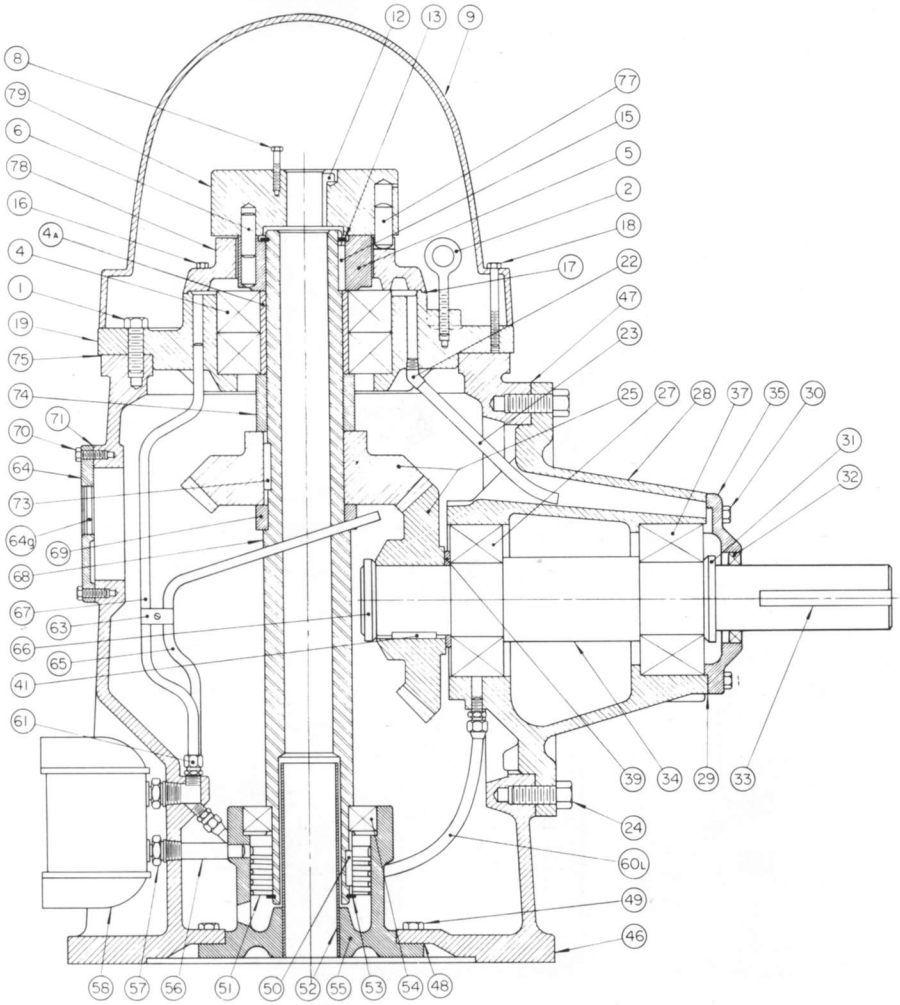
TYPICAL MODEL H-80 — H-200



No.	Part Name
1	Capscrew—Thrust Cage
2	Lifting Eyebolt
4	Thrust Bearing
*4A	Thrust Bearing Sleeve
5	Lower Coupling
6	Coupling Pin
8	Capscrew
9	Dome
12	Gib Key
13	External Snap Ring
15	Key—Lower Coupling
16	Capscrew—Thrust Cover
17	Gasket—Thrust Cover
18	Capscrew—Dome
19	Thrust Bearing Cage
*22	Flexible Tube Fitting
*23	Flexible Tube
24	Capscrew—Horiz. Hsg.
25	Gears
27	Inner Bearing
28	Horizontal Housing
29	Gasket—Horiz. Hsg. Cover
30	Capscrew—Horiz. Hsg. Cover
*31	Locknut & Washer
32	Oil Seal
33	Key
34	Driveshaft
35	Horizontal Housing Cover
37	Outer Bearing
39	Horizontal M.D. Spacer
41	Key—Drive Gear
46	Main Housing
47	Shim—Horiz. Hsg.
50	Key—Pump Runner
51	Pump Runner
52	Seal Tube
53	External Snap Ring
54	Pump Bearing
55P	Seal Plug
56	Oil Tube From Pump
57	Cooler Flexible Fittings
58	Oil Cooler
60	Oil Distributor
60L	Oil Tube to Inner Bearings
61	Compression Fittings
63	Oil Tube Clamp
64	Inspection Plate
*64G	Oil Sight Glass
65	Oil Tube to Gears
*66	Locknut & Washer
67	Oil Tube to Thrust Bearing
68	Hollow Shaft
*69	Lower Hollow Shaft Spacer
70	Capscrew Insp. Plate
71	Gasket—Insp. Plate
73	Key—Driven Gear
74	Vertical M.D. Spacer
75	Shim—Thrust Bearing Cage
77	Ratchet Pins
78	Thrust Bearing Cover
79	Upper Clutch

* These parts are not universal and are omitted in certain ratios and models.

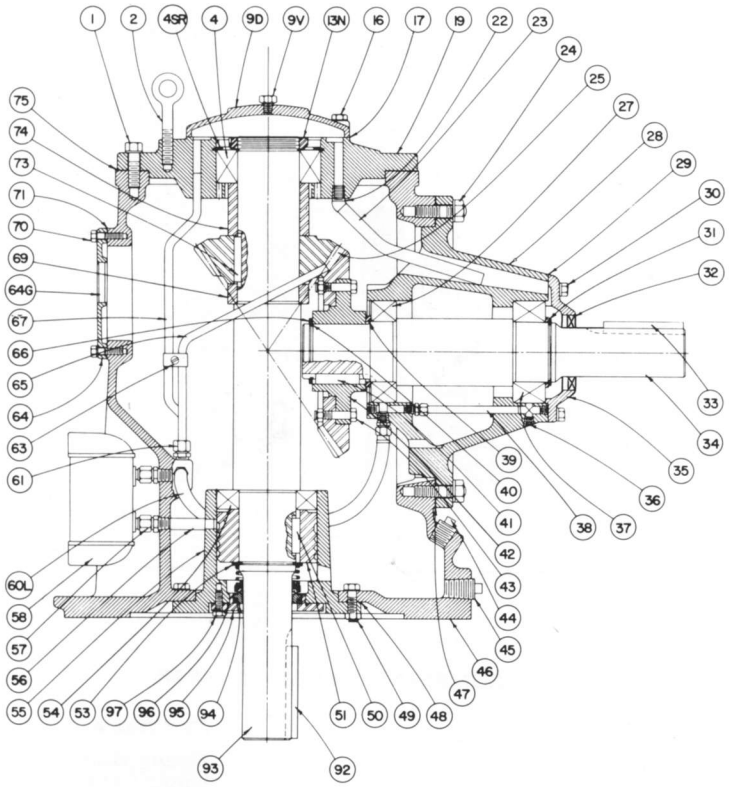
TYPICAL MODEL H-280 and LARGER



No.	Part Name
1	Capscrew—Thrust Cage
2	Lifting Eyebolt
4	Thrust Bearing
*4A	Thrust Bearing Sleeve
5	Lower Coupling
6	Coupling Pin
8	Capscrew
9	Dome
12	Gib Key
13	External Snap Ring
15	Key—Lower Coupling
16	Capscrew—Thrust Cover
17	Gasket—Thrust Cover
18	Capscrew—Dome
19	Thrust Bearing Cage
*22	Flexible Tube Fitting
*23	Flexible Tube
24	Capscrew—Horiz. Hsg.
25	Gears
27	Inner Bearing
28	Horizontal Housing
29	Gasket—Horizontal Housing Cover
30	Capscrew—Horiz. Hsg. Cover
*31	Locknut & Washer
32	Oil Seal
33	Key
34	Driveshaft
35	Horizontal Housing Cover
37	Outer Bearings
39	Horizontal M.D. Spacer
41	Key—Drive Gear
46	Main Housing
47	Shim—Horizontal Housing
48	Gasket—Pump Housing
49	Capscrew—Pump Housing
50	Key—Pump Runner
51	Pump Runner
52	Seal tube
53	External Snap Ring
54	Pump Bearing
55	Pump Housing
56	Oil Tube From Pump
57	Cooler Flexible Fittings
58	Oil Cooler
60L	Oil Tube to Inner Bearings
61	Compression Fittings
63	Oil Tube Clamp
64	Inspection Plate
*64G	Oil Sight Glass
65	Oil Tube to Gears
*66	Locknut & Washer
67	Oil Tube to Thrust Bearing
68	Hollow Shaft
*69	Lower Hollow Shaft Spacer
70	Capscrew—Insp. Plate
71	Gasket—Insp. Plate
73	Key—Driven Gear
74	Vertical M.D. Spacer
75	Shim—Thrust Bearing Cage
77	Ratchet Pins
78	Thrust Bearing Cover
79	Upper Clutch

* These parts are not universal and are omitted in certain ratios and models.

TYPICAL SOLID SHAFT

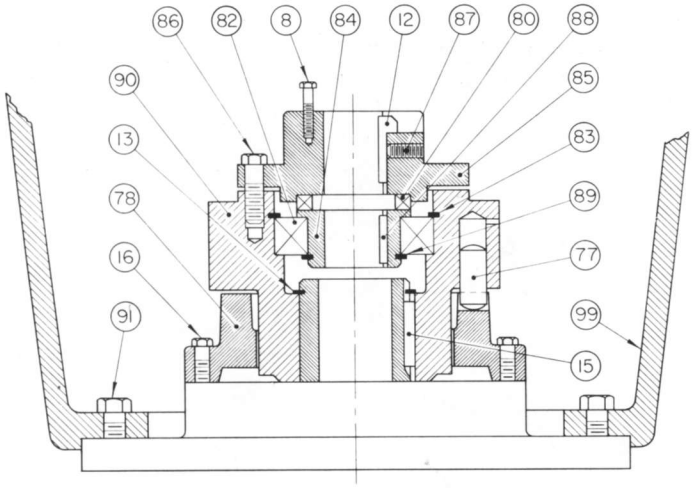


No.	*Part Name*
1	Capscrew
2	Lifting Eyebolts
*4SR	Thrust Bearing Internal Snap Ring
4	Thrust Bearing
9D	Thrust Bearing Dome
9V	Vent Plug
13N	Locknut and Lockwasher
16	Capscrew
17	Gasket—Thrust Bearing Dome
19	Thrust Bearing Cage
*22	Flexible Tube Fitting
*23	Flexible Tube
24	Capscrew
25	Gears
27	Inner Bearing
28	Horizontal Housing
29	Gasket—Horizontal Housing Cover
30	Capscrew
31	Snap Ring and Washer
32	Oil Seal
33	Key
34	Driveshaft
35	Horizontal Housing Cover
36	Pipe Plugs—Hollow Head
37	Outer Bearing
*38	Oil Tube to Outer Bearing
*39	Gear Spacer
40	Shim
41	Key
*42	Drive Gear Hub
*43	Capscrew
44	Pipe Plug
45	Pipe Plug
46	Main Housing
47	Shim—Horizontal Housing
48	Gasket—Pump Housing
49	Capscrew
50	Key
51	Pump Runner
53	External Snap Ring
54	Pump Bearing
*54W	Pump Bearing Spacer (Fig. 2 or 3)
*55	Pump Housing
*56	Oil Tube from Pump
*57	Cooler Flexible Fittings
*58	Oil Cooler
*60L	Oil Tube to Inner Bearing
*61	Compression Fittings
*63	Clamp Assembly (Oil Tubes)
64	Inspection Plate
*64G	Oil Sight Glass
65	Oil Tube to Gears
66	External Snap Ring or Locknut & Washer
67	Oil Tube to Thrust Bearing
*69	Driven Gear Spacer
70	Capscrew
71	Gasket—Inspection Plate
73	Key
74	Pinion Spacer
75	Shim—Thrust Bearing Cage
92	Key
93	Vertical Shaft
94	Mechanical Seal
95	Seal Cage
*96	"O" Ring
*97	Capscrew

*These parts not universal and are omitted in certain ratios and models. Lock washers furnished when fastening is not self-locking.

When ordering parts, the serial number, ratio, and size of drive stamped on the nameplate MUST be furnished.

COMBINATION



COMBINATION NON-REVERSE

No.	*Part Name*
8	Capscrew
12	Gib Key
13	External Snap Ring
15	Key (Lower Coupling)
16	Capscrew
77	Ratchet Pins
78	Thrust Bearing Cover
80	Wave Spring
82	Steady Bearing
83	Internal Snap Ring
84	Steady Bearing Adaptor
85	Upper Coupling Combination
86	Stainless Steel Capscrews
87	Set Screw
88	Key (Steady Bearing Adaptor)
89	External Snap Ring
90	Lower Coupling Combination Non Reverse
91	Capscrew
99	Motor Stand

LUBRICATION RECORD

Date	Estimated Hrs. Operation	Oil Changed	Oil Added	Trade Name

USE ONLY APPROVED OILS

Serial No._____

Model_____

Ratio_____

__BHP at_____RPM of vertical shaft

This manual contains information which will assist you to obtain the maximum service. Keep it readily available for reference in the event any question arises as to the proper care of your right angle gear drive.

Communications with your dealer or the manufacturer having reference to your gear drive, should state the SERIAL NUMBER and approximately how long the drive has been operated.

Filed under the SERIAL NUMBER, Johnson Right Angle Gear Drive keeps complete data on every gear drive manufactured. This service is maintained for the customer so that replacement parts can be furnished by the factory to fit each individual drive, once the serial number is known. The SERIAL NUMBER and rating of each drive is stamped on the nameplate fastened to the inspection hole coverplate. If the nameplate is missing or illegible remove the inspection coverplate and gasket. The SERIAL NUMBER is stamped on the machined surface of the inspection opening of the main housing.

WARRANTY

1. The Johnson Right Angle Gear Drive is warranted to be free from defects in material and workmanship under normal use and service for a period of one year from the date of factory shipment by us for the original purchaser and then only when operated within the rated capacity for which it was sold and in accordance with recognized usage and practice. Our obligation under this warranty is limited to the replacement of any part or parts which shall be returned to us with transportation charges prepaid, within one year after shipment for the original purchaser; and, which it is determined by the company, to have proven defective under normal and proper use. This warranty shall not apply to any drive which shall have been altered or repaired outside our factory without our written consent and approval, nor any drive which has been subject to misuse, neglect, accident, improper oiling or mounted on foundations which are not vibration proof.

2. We make no warranty of any kind whatever, express or implied, in regard to bearings, trade accessories, machinery, or other articles of merchandise not manufactured by us. The bearings which we have selected for the thrust position will cover most installations, but there are many cases which will require special treatment.

3. No warranty or guarantee is binding upon the company and no asserted breach thereof can be claimed against the company unless the company has been notified in detail and in writing of any alleged defect within seven (7) days after the discovery thereof.

4. The express warranties and guarantees contained herein are exclusive and are made in lieu of any other representation by the company or its agents, and any implied warranty of Merchantability or Fitness for a Particular Purpose are hereby expressly disclaimed. It is agreed that the language contained herein shall be the final and exclusive expression of the agreement with respect to sale of equipment by the company.

JOHNSON
RIGHT ANGLE GEAR DRIVE
A Division of Arrow Gear Company

Sales Office and Manufacturing Plant:
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Phone: (402) 474-5285 Telex: 48 4307
Fax: (402) 474-6781

Bulletin OM90 3/90 5M

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