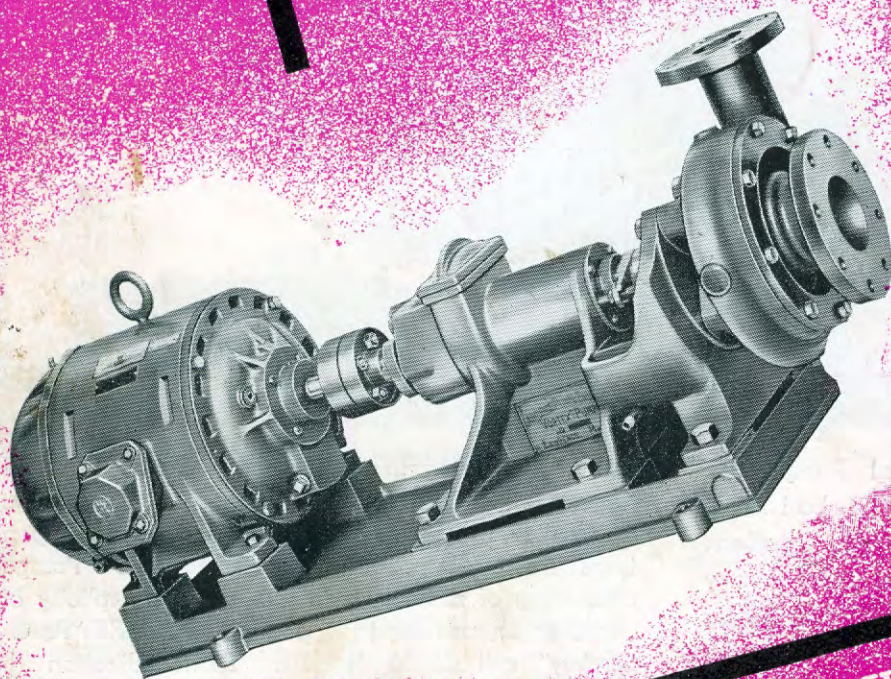


THE TYPE HBD VORTEX PUMP

A QUALITY UNIT FOR
GENERAL INDUSTRIAL
SERVICES EVERYWHERE

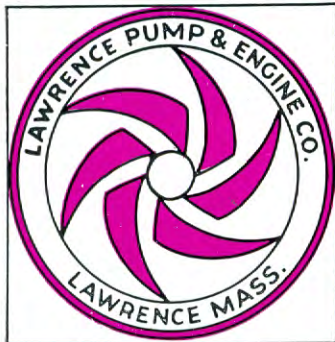


BULLETIN D-48

LAWRENCE PUMP & ENGINE CO.
P. O. BOX 70 · LAWRENCE, MASS.



*Centrifugal
Pumps*

VORTEX*"Symbol of Pump Efficiency"*

thoroughly tested to insure head, capacity, and efficiency guarantees as well as mechanical performance.

Centrifugal Pumps

TYPE "HBD"

A Modern, Efficient Pump

Single Stage - End Suction - Ball Bearing

For more than half a century the Lawrence Pump & Engine Company has designed and manufactured Centrifugal Pumps under the trade name VORTEX PUMPS. During this time, our reputation as a manufacturer of high quality, heavy duty Centrifugal Pumps has been firmly established by the dependable performance of our equipment. VORTEX pump designs are

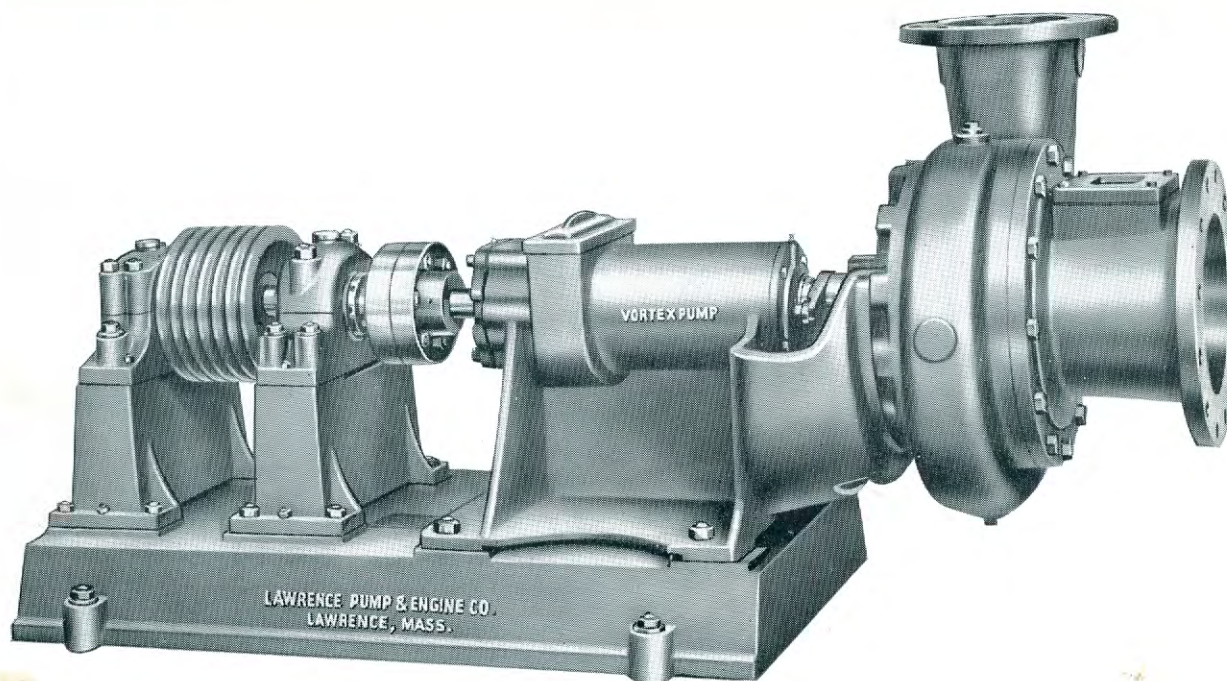


Fig. 300

VORTEX type "HBD" Centrifugal Pumps are single stage, end suction, radially split, ball bearing units equipped with open or enclosed impellers. These pumps are designed efficiently for heavy duty continuous service applications with heavy shafts, bearings, and casing sections. Consequently, VORTEX "HBD" Pumps can be used on a wide range of industrial applications. When handling

clear liquids the pumps are equipped with enclosed impellers. When pumping sewage, paper stock, and slurries containing suspended materials, open impellers are furnished. VORTEX "HBD" Pumps offer ease of maintenance due to the simplicity of construction and are equipped with VORTEX "Parts-Saving" adjustable feature. Standardization of parts makes possible maximum interchangeability on many pump sizes.

Sizes: From 1" - 12" discharge size

Capacities: From 10 - 6000 GPM

Heads: From 10 - 300 ft. in the smaller sizes.

SPECIFICATIONS

CASING — Proportioned for Heavy Duty.

The pump casing is of the solid volute type, radially split with a removable suction cover. To insure perfect alignment the casing and supporting bracket are machined with male-female fits. Equally spaced casing studs allow rotation of the discharge nozzle to any of four positions. Pumps are available in close grained cast iron, ductile iron, bronze, steel, Ni-Resist, nickel, monel, all grades of stainless steel, Hastelloy, and other machineable alloys.

IMPELLER — Balanced for Smooth Operation.

Both open and enclosed impellers are designed to give high efficiency over a broad operating range. Impellers are machine finished outside, filed smooth inside, and keyed

and locked on the shaft with an impeller lock nut. Accurate balance and sound hydraulic design insure smooth operation.

SUCTION COVER — Permits Easy Access to Impeller.

The suction cover is equipped with an eccentric nozzle and is easily removed. On stock handling applications, suction covers with handholes are available.

SHAFT — Heavy Duty.

A large diameter heavy shaft of high tensile alloy steel is machined smoothly to accurate dimensions. A stainless shaft sleeve protects the shaft from wear in the stuffing box area.

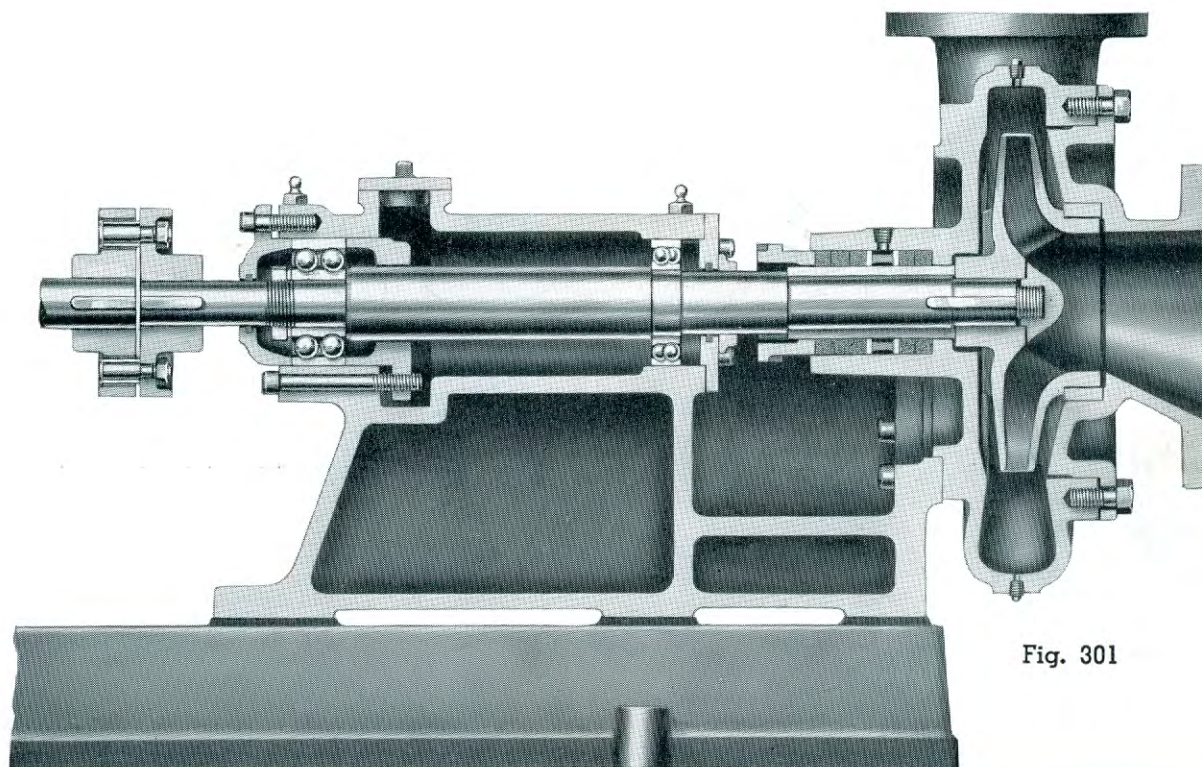


Fig. 301

BEARING HOUSING — Permanent Alignment Assured.

Accurate alignment is permanently maintained between the casing and bearing housing by a male and female fit. Housing is bored on one set-up for both bearing and pump casing fits. A drip pocket is furnished below the stuffing box area with tapped drain connection.

BALL BEARINGS — For Radial and Thrust Loads.

The pump shaft is supported in the bearing housing by the two adequately spaced heavy duty double row ball bearings arranged for grease lubrication. The inboard bearing nearest the pump carries radial loads only, while the outboard bearing carries thrust and radial loads.

STUFFING BOX — Extra Deep.

A lantern gland is furnished in the deep stuffing box for liquid sealing and packing lubrication. The two-piece split packing gland permits easy removal and access to the stuffing box.

VORTEX "PART-SAVING" ADJUSTABILITY

To compensate for wear between the suction cover and the impeller, loosen the longer Allen head bolts marked "X" and tighten the shorter bolts marked "Y" until the impeller strikes the suction cover. Then loosen bolts "Y" just less than one-eighth of a turn. Tighten bolts "X" making certain that all bolts have been adjusted equally. See cross section Pg. 4.

Construction

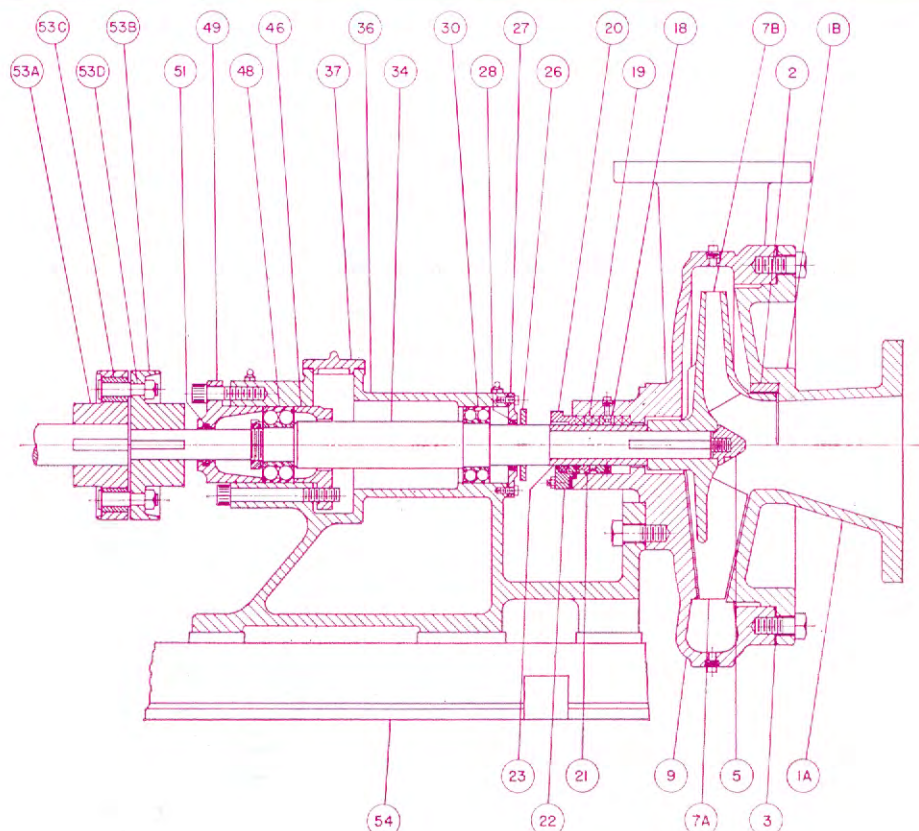


Fig. 303. Cross section illustrates the construction of type "HBD" enclosed impeller pump.

PARTS LIST FOR "HBD" HORIZONTAL

1-A. Suction Cover, Open	20. Packing Gland	37. Frame Cover
1-B. Suction Cover, Enclosed	21. Mechanical Seal	46. Thrust Bearing Adjuster Ring
2. Suction Cover Wearing Ring	22. Gland Plate	48. Thrust Bearing
3. Suction Cover, Gasket	23. Shaft Sleeve	49. Thrust Bearing Cover
5. Impeller Nut	26. Shaft Slinger	51. Thrust Bearing Cover Seal
7-A. Impeller, Open	27. Radial Bearing Cover	53-A. Coupling, Motor Half
7-B. Impeller, Enclosed	28. Radial Bearing Cover Seal	53-B. Coupling, Pump Half
9. Casing	30. Radial Bearing	53-C. Coupling, Insert
18. Lantern Ring	34. Shaft	53-D. Coupling Bolt and Nut
19. Packing	36. Frame	54. Base Plate

MATERIALS OF CONSTRUCTION

	ALL IRON	BRONZE FITTED	ALL BRONZE	ALL STAINLESS
VOLUTE	Cast iron	Cast iron	Bronze	Stainless
SUCTION HEAD	Cast iron	Cast iron	Bronze	Stainless
IMPELLER	Cast iron	Bronze	Bronze	Stainless
WEARING RING	Cast iron	Bronze	Bronze	Stainless
SHAFT	Steel	Steel	Stainless	Stainless
SHAFT SLEEVE	Stainless	Stainless	Stainless	Stainless
PACKING GLAND	Steel	Bronze	Bronze	Stainless
SUPPORTING BRACKET	Cast iron	Cast iron	Cast iron	Cast Iron

Pumps are also available in other special alloys: monel, nickel, Ni-Resist, all grades of stainless steel, Hastelloy, Inconel, etc.

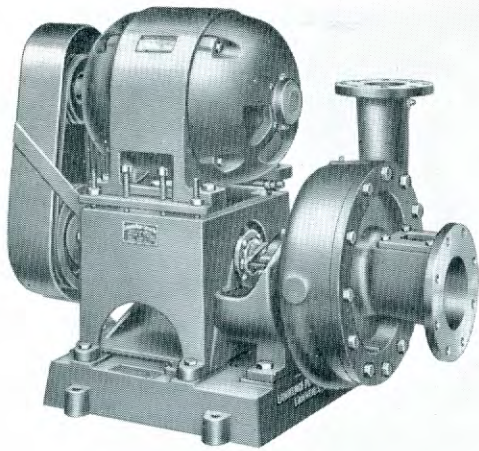


Fig. 304. A versatile dependable unit the VORTEX "Piggy-Back" HBD Pumps offer flexibility through V-belt drive, conserve space, and raise the motor above wet foundation conditions.

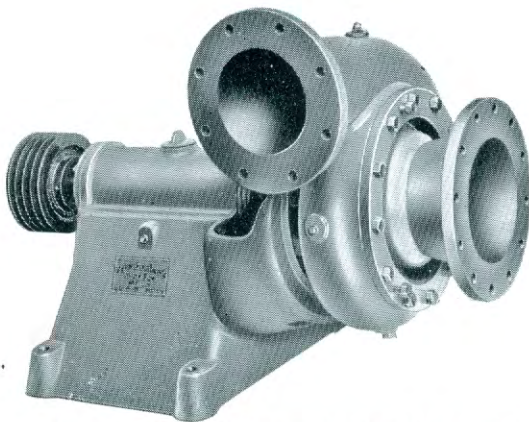


Fig. 305. Type "HBD" arranged with sheave for V-belt drive.

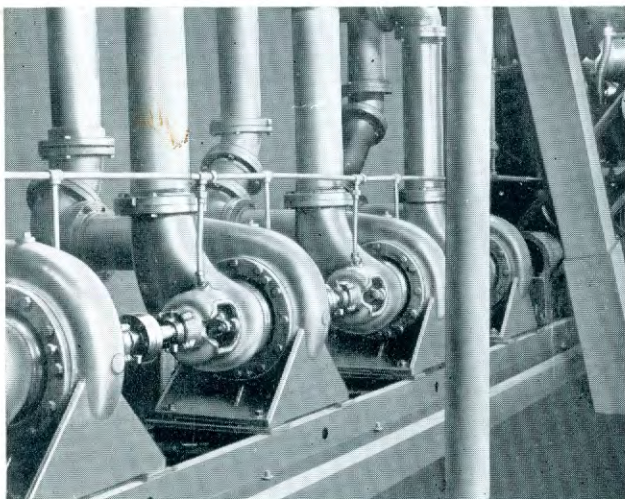


Fig. 306. Eight special "HBD" pumps designed for white water circulating service on a paper board machine. Vertical up suction and horizontal top discharge insure smooth flow through pump.



Fig. 309. Vertical top suction non-submerged "HBD" pump with outside liquid sealing well for handling hot volatile liquids. See bulletin D-85 for other "HBD" vertical pumps.

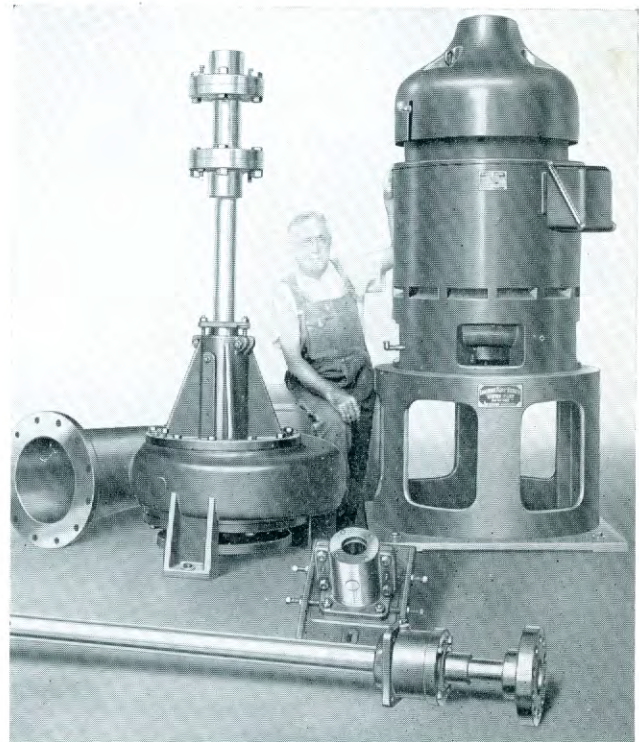
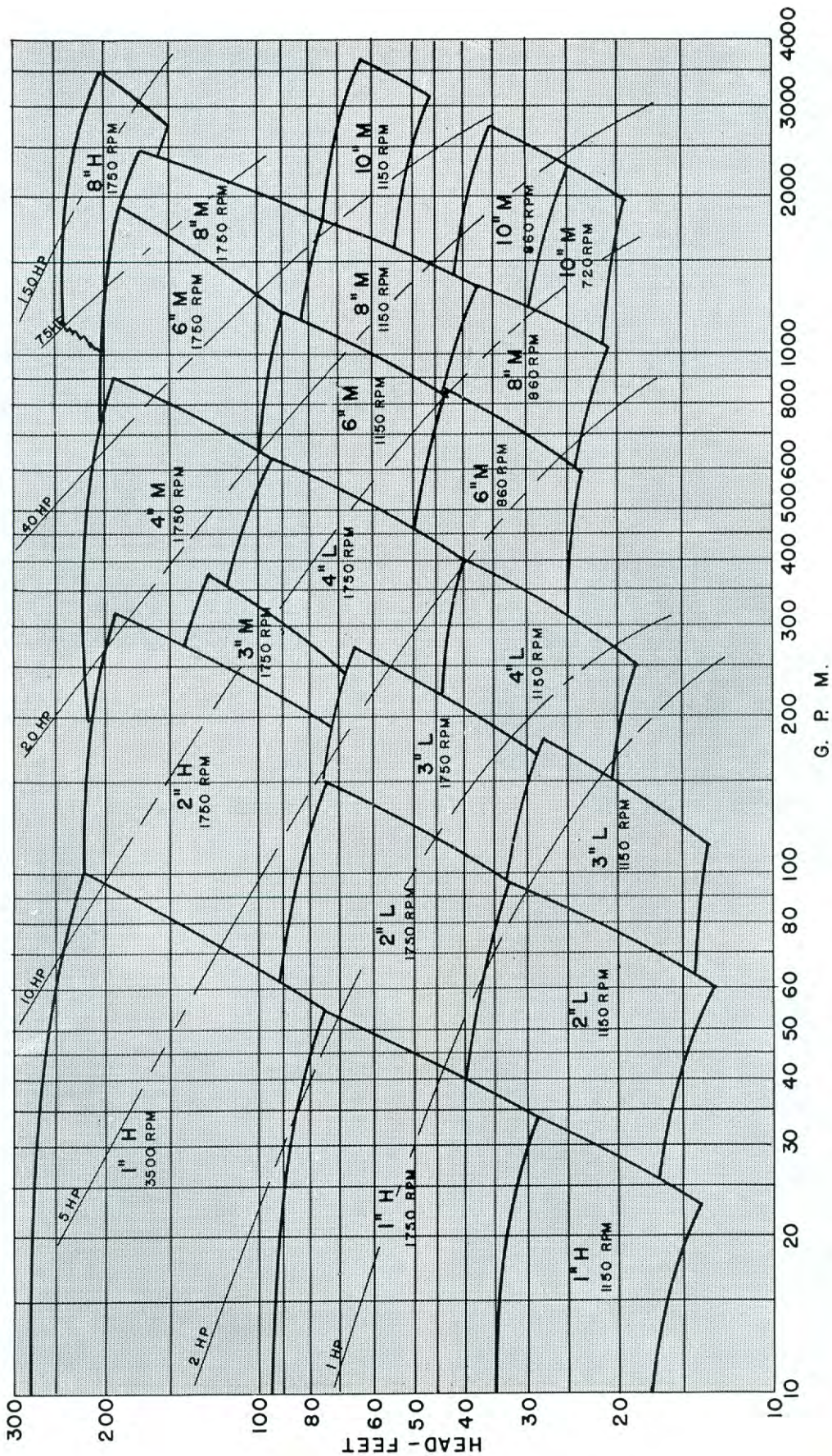


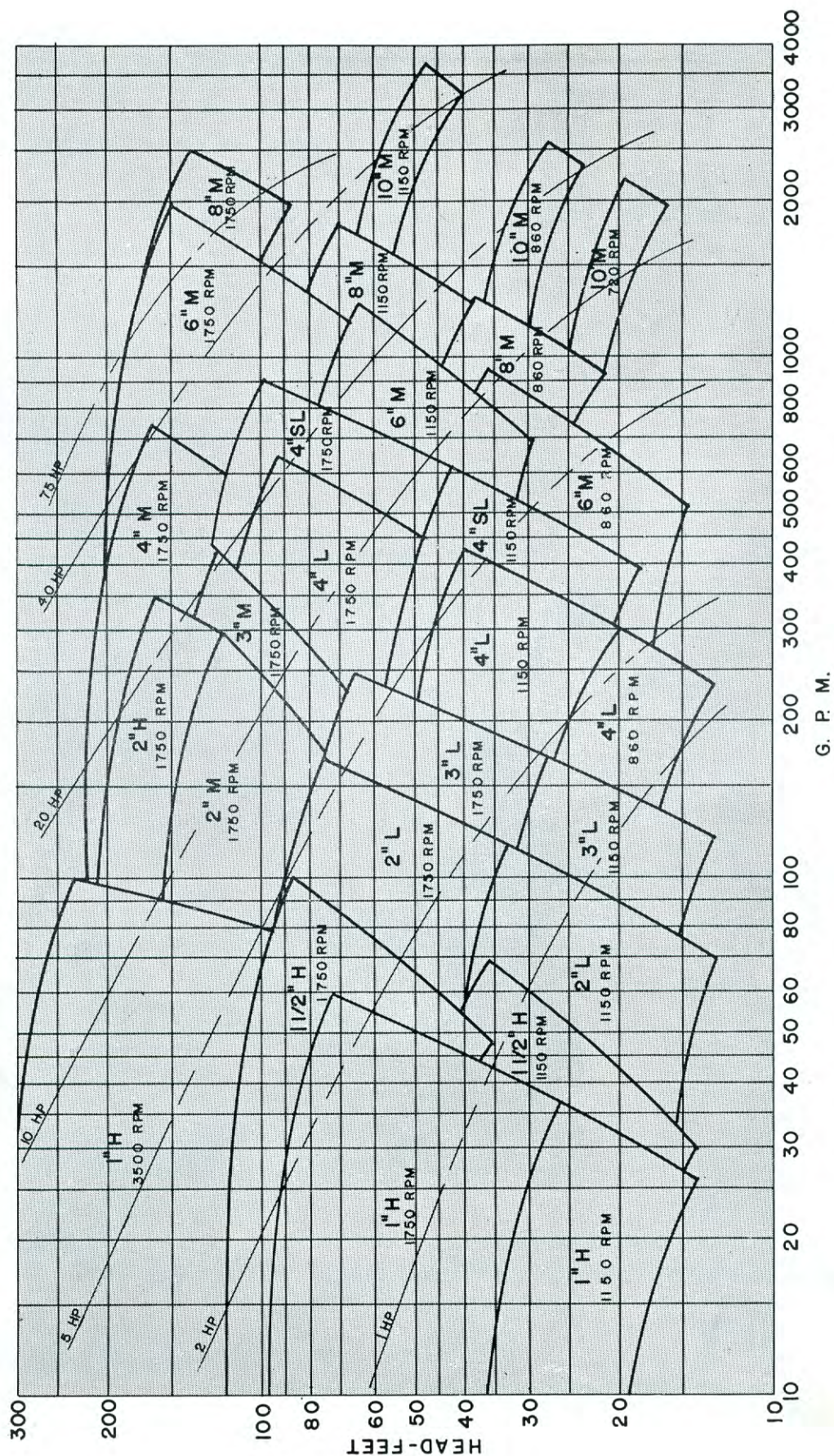
Fig. 307. Open line shaft, heavy duty vertical "HBD" pump, with adjustable guide bearings and decoupler in line shaft. VORTEX Pumps are custom built to meet individual customer requirements.

Selection Curve—Type “HBD” Pump with Enclosed Impeller.



Refer to nearest office for final HP recommendations.
Curves are based on handling cold water at sea level.

Selection Curve — Type "HBD" Pump with Open Impeller.



Refer to nearest office for final HP recommendations.
Curves are based on handling cold water at sea level.

G. P. M.

Approximate Dimensions

DIMENSIONS OF MOTOR DRIVEN "HBD" PUMPS

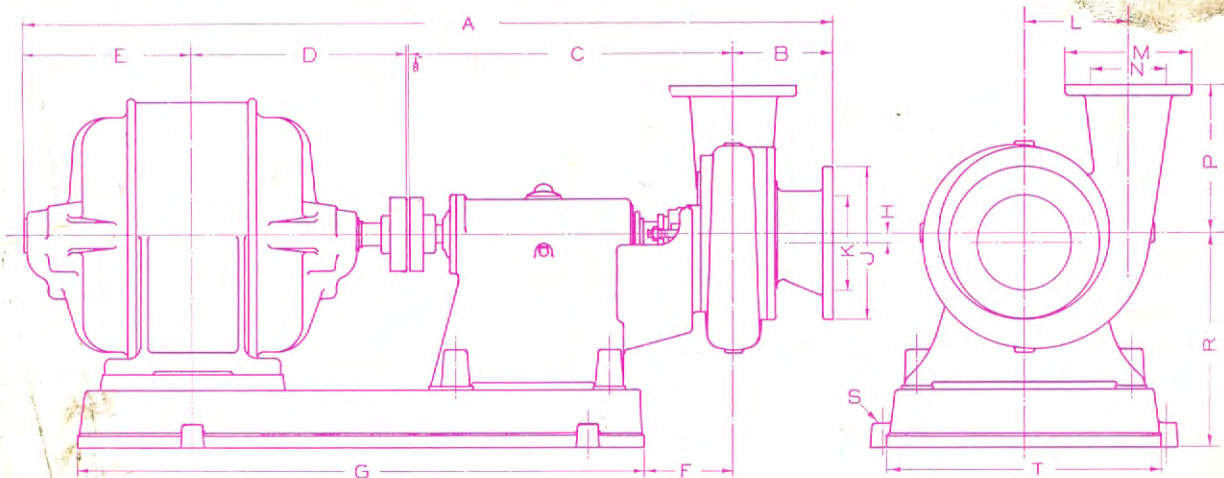


Fig. 308

Pump No.	A	B	C	D	E	F	G	H	I	Suction K	L	M	Discharge N	P	R	S	T
1 HBD-H	40 ⁷ / ₈	3 ³ / ₄	20 ¹ / ₄	9 ⁷ / ₈	6 ⁷ / ₈	2 ³ / ₈	36	0	5	11 ¹ / ₂	5 ¹¹ / ₈	4 ¹ / ₄	1	6	8 ³ / ₈	3 ¹ / ₄	10
1 1/2 HBD-H	43 ⁵ / ₈	3 ¹ / ₄	20 ¹ / ₄	11 ³ / ₄	8 ¹ / ₄	2 ³ / ₈	35 ⁵ / ₈	0	7	2 ¹ / ₂	6 ³ / ₈	5	1 1/2	8	9 ⁵ / ₈	3 ¹ / ₄	12 ³ / ₄
2 HBD-L	48	5	20 ¹ / ₄	13 ¹ / ₄	9 ³ / ₈	2 ³ / ₈	42 ³ / ₄	0	7 1/2	3	5 ⁷ / ₈	6	2	7	12 ¹ / ₄	7 ¹ / ₈	18
2 HBD-M	57 ³ / ₄	5 ¹ / ₄	26 ⁵ / ₈	15 ⁵ / ₈	10 ¹ / ₂	2 ¹ / ₈	49 ¹ / ₈	0	7 1/2	3	7 ³ / ₄	6	2	7 ³ / ₄	13 ³ / ₈	7 ¹ / ₈	20
2 HBD-H	60 ¹ / ₂	5 ¹ / ₂	26 ⁵ / ₈	17 ¹ / ₈	11 ¹ / ₄	3 ¹ / ₈	49 ⁷ / ₈	0	7 1/2	3	8 ³ / ₄	6	2	8	13 ³ / ₈	7 ¹ / ₈	22 ³ / ₄
3 HBD-L	57 ³ / ₈	5 ¹ / ₄	26 ⁵ / ₈	13 ¹ / ₄	12 ¹ / ₈	2 ⁵ / ₈	43 ³ / ₄	1 ⁷ / ₈	9	4	6 ¹ / ₄	7 ¹ / ₂	3	9	11 ¹ / ₂	7 ¹ / ₈	18
3 HBD-M	59 ¹ / ₂	4 ³ / ₈	26 ⁵ / ₈	17 ¹ / ₈	11 ¹ / ₄	2 ¹ / ₈	49 ⁷ / ₈	0	9	4	7 ³ / ₄	7 ¹ / ₂	3	8 ³ / ₄	13 ³ / ₈	7 ¹ / ₈	22 ³ / ₄
4 HBD-L	64 ¹ / ₂	8 ³ / ₈	26 ⁵ / ₈	17 ⁵ / ₈	11 ³ / ₄	3 ¹ / ₈	50 ³ / ₈	3 ¹ / ₄	11	6	7 ⁵ / ₈	9	4	8	13 ³ / ₈	7 ¹ / ₈	22 ³ / ₄
4 HBD-SL	68 ¹ / ₈	11 ³ / ₄	27 ¹ / ₈	17 ⁵ / ₈	11 ³ / ₄	3 ¹ / ₈	52 ¹ / ₈	0	11	6	7 ³ / ₄	9	4	8 ¹ / ₂	14 ¹ / ₄	7 ¹ / ₈	22 ³ / ₄
4 HBD-SM	67 ⁷ / ₈	11 ¹ / ₈	27 ¹ / ₈	17 ⁵ / ₈	11 ³ / ₄	3 ¹ / ₈	52 ¹ / ₈	0	11	6	8	9	4	12 ¹ / ₄	14 ¹ / ₄	7 ¹ / ₈	22 ³ / ₄
4 HBD-M	64 ³ / ₄	8 ⁵ / ₈	26 ⁵ / ₈	17 ⁵ / ₈	11 ³ / ₄	2 ¹ / ₈	52 ¹ / ₈	3 ¹ / ₄	11	6	9 ¹ / ₂	9	4	14 ³ / ₄	14 ¹ / ₄	7 ¹ / ₈	22 ³ / ₄
6 HBD-M	81 ¹ / ₂	9 ¹ / ₂	35	20 ³ / ₄	16 ¹ / ₄	2 ¹ / ₈	68 ¹ / ₈	3 ¹ / ₄	13 1/2	8	10 ¹ / ₂	11	6	12	20	7 ¹ / ₈	28 ¹ / ₂
8 HBD-M	82 ³ / ₄	10 ⁵ / ₈	35	20 ³ / ₄	16 ¹ / ₄	2 ¹ / ₈	68 ¹ / ₈	1	16	10	11	13 ¹ / ₂	8	15 ¹ / ₂	22 ³ / ₈	7 ¹ / ₈	28 ¹ / ₂
8 HBD-H	112 ¹ / ₈	10 ¹ / ₈	48 ¹ / ₈	28	25	2 ¹ / ₈	93 ¹ / ₂	1	16	10	12 ¹ / ₄	13 ¹ / ₂	8	14 ⁵ / ₈	25 ⁷ / ₈	13 ³ / ₈	33 ³ / ₄
10 HBD	88 ¹ / ₄	9 ⁵ / ₈	40	22 ⁷ / ₈	15 ¹ / ₂	6	80 ¹ / ₈	1	16	10	13	16	10	16	23	1	34
12 HBD	113 ¹ / ₄	15	52 ⁵ / ₈	27 ⁵ / ₈	17 ⁷ / ₈	10 ³ / ₄	103 ³ / ₄	1	21	14	16 ¹ / ₂	19	12	20	29 ¹ / ₂	1 ¹ / ₈	47

* Dimensions A, D, E, G are approximate only, being dependent on the size and type of motor.
DIMENSIONS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS APPROVED.

JUST A FEW OF THOSE WE SERVE

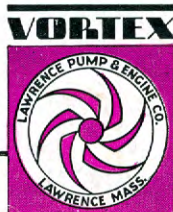
American Cyanamid Company
Amoco Chemicals Corporation
Barrett Division, Allied Chemical Corp.
Bechtel Corporation
Bolta Products Division General Tire & Rubber
Carbide & Carbon Chemicals Corp.
Chemical Construction Corp.
Crocker-Burbank & Co. Assn.
E. I. duPont
Federal Paper Board Co., Inc.

Fitchburg Paper Co.
The Glidden Company
Hollingsworth & Vose Company
Homasote Company
Johns-Manville
Kalamazoo Paper Co.
M. W. Kellogg Co.
National Aniline Div., Allied Chemical Corp.
National Petro Chemicals Co.
New Jersey Zinc Co.

Nitrogen Division, Allied Chemical Corp.
Olin Mathieson Chemical Corp.
Oxford Paper Co.
Chas. Pfizer & Co., Inc.
Reichhold Chemicals Inc.
Scientific Design Co.
J. P. Stevens & Co., Inc.
U. S. Industrial Chemicals Co.
Western Electric Co.
Westvaco Chlor-Alkali Division

LAWRENCE PUMP AND ENGINE CO.

Centrifugal Pumps



POST OFFICE BOX 70

LAWRENCE, MASS.