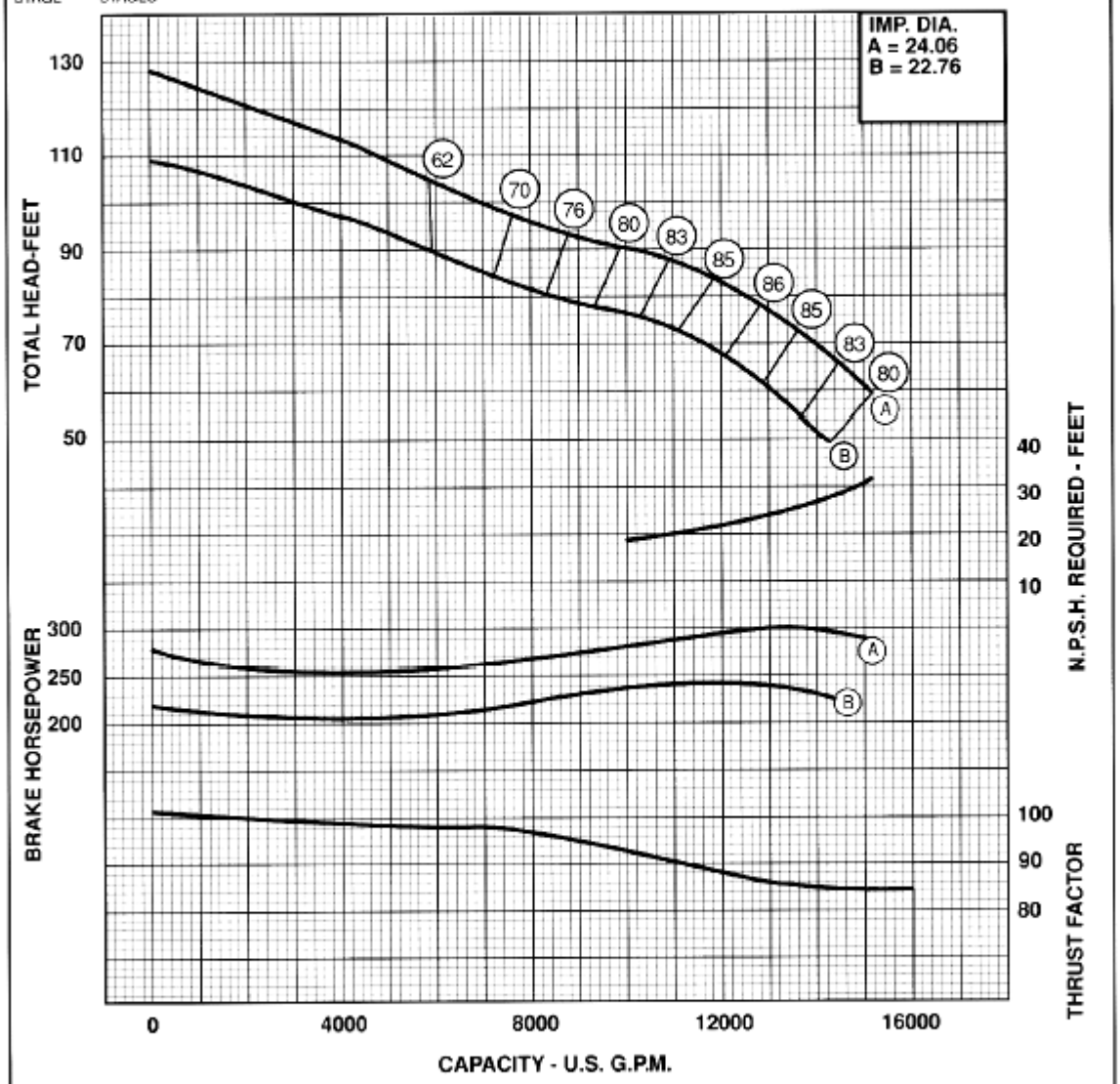
No. Stages	Eff. Change	MATERIAL	Eff. Change
1		IMP. – C.I.	
2		IMP. – NI-RI	
3		BOWL – BRZ.	
4		BOWL – NI-R.	

38HH **880** R.P.M.

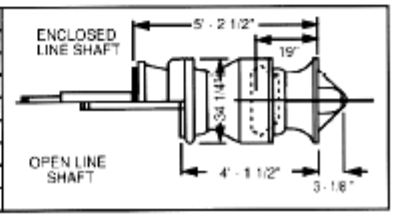
SINGLE STAGE LAB PERFORMANCE WITH STANDARD MATERIALS. EFFICIENCY SHOWN FOR 1 OR MORE STAGES. HORSE POWER SHOWN FOR ONE STAGE BASED ON 1 STAGE EFFICIENCY. CORRECTIONS SHOULD BE MADE FOR STAGES AND MATERIAL.

ONE STAGE ( ) STAGES

PUMP PERFORMANCE



EYE AREA - SQ. IN.	= 205	IMPELLER WT. - LBS.	= 320
WR² PER IMPELLER LB.-FT.²	= 160 LB.-FT.²	ONE STAGE WT. - LBS.	= 4000
MAX. SPHERE SIZE	= — IN.	ADD'L STAGE WT. - LBS.	= 2370
MAX. NO. STD. STAGES	= 4	IMPELLER NUMBER	= —
MAX. OPERATING - P.S.I.	= 320	DISCH. - SIZES	= 20 . 24
STD. LATERAL - IN.	= 1.12 IN	SUCTION - SIZES	= BELL
STD. SHAFT DIA. - IN.	= 3.437 IN	MAX. LATERAL - IN.	= — IN
MAX. SHAFT DIA. - IN.	= — IN	BOWL CONN. FLANGED-KEYED	
MIN. SUBMERGENCE - IN.	= 32 IN	ADD 2' - 9 1/2" PER ADDITIONAL STAGE.	

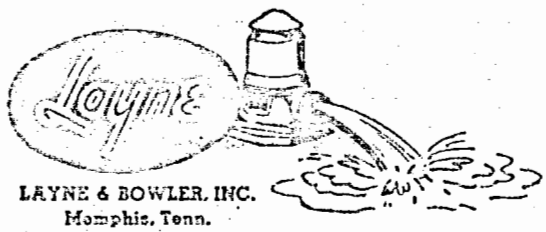


Curves reflect typical performance, refer to factory for certification

CURVE NO.

CHANGE EFFICIENCY AS FOLLOWS	NUMBER OF POINTS	FOR NUMBER OF STAGES

NOTE: ANY CHANGE IN EFFICIENCY CHANGES EITHER THE HEAD OR HORSE POWER IN PROPORTION.



LAYNE & BOWLER, INC.
Memphis, Tenn.

38" HH
880 RPM

SINGLE STAGE LABORATORY
HEAD & HORSE POWER
THRUST "K" = 94

19H17

HEAD CAPACITY

N.P.S.H.

EFFICIENCY

HORSE POWER

HEAD IN FEET

N.P.S.H. REQUIRED (FT.)

EFFICIENCY IN %

140
120
100
80
60
40
20

40
30
20
10

90
80
70
60
50
40
30
20
10

300
200

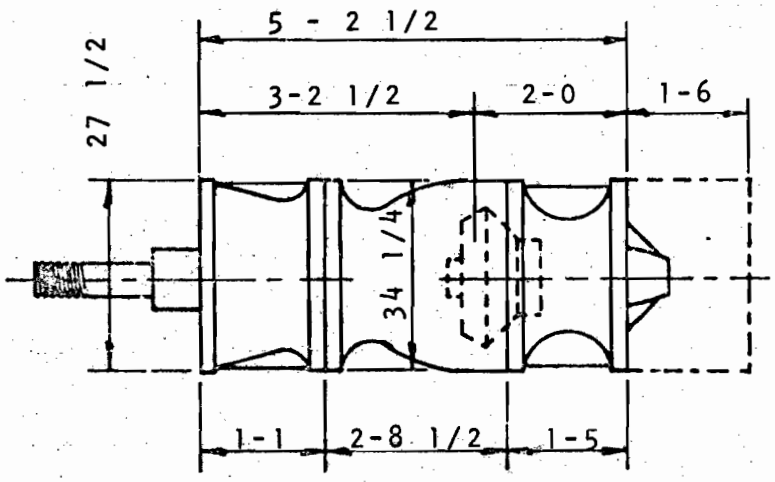
4000
8000
12000
16000
20000

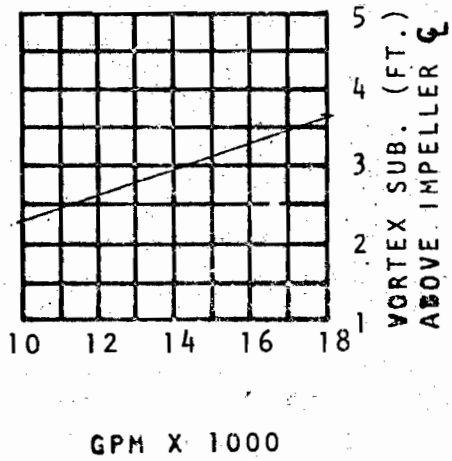
U. S. GALLONS PER MINUTE

PRINTED IN

38"HH - 880 RPM

IMPELLER (PATTERN NO.)	19H17
INTERMEDIATE (PATTERN NO.)	19H8
SHAFT SIZE (INCHES)	3 7/16 - 1900 HP
TUBE SIZE (INCHES)	5
STANDARD LATERAL (INCHES)	1 1/8
DISCHARGE CONNECTION (FLANGED)(INCHES)	24
SUCTION CONNECTION	BELL
IMPELLER FULL DIAMETER (INCHES)	24 1/16
IMPELLER EYE AREA (INCHES SQUARED)	205
IMPELLER EYE DIAMETER (INCHES)	17
IMPELLER WEIGHT (LB)	360
IMPELLER WR^2 (LB FT. SQUARED)	160
MAXIMUM DIAMERER SOLID (INCHES)	2 1/2
MAXIMUM WORKING PRESSURE (PSI)	328
MAXIMUM HYDROSTATIC PRESSURE(PSI)	436
MAXIMUM PRESSURE (STANDARD STUDS)(PSI)	258
MAXIMUM STAGES (BOWL PRESSURE)	6
MAXIMUM STAGES (SHAFT)	6
BOWL WEIGHT (ONE STAGE) (LB)(NET)	3866
BOWL WEIGHT (ADDITIONAL STAGES) (LB)(NET)	2370





LAYNE & BOWLER, INC.
MEMPHIS, TENN.

PUMP TEST PERFORMANCE CHART

TEST NO. 283-1264
DATE 10-1- 72

SIZE DISCHARGE COLUMN 18 x 12 5/16 x 5
SIZE OF SUCTION PIPE BoN
TYPE OF LUBRICATION Oil

IMPELLER 19H17
FILING HF V.C
DIAMETER 1/4 To 23 13/16

PUMP NO. 70832
ORDER NO. 71H 5804

U.S. Bureau Of Reclamation
CUSTOMER Quincy Pumping Plant
SUBSIDIARY Layne Pumps, Pasco

SIZE OF PUMP 38"
TYPE OF PUMP FIGURE HH
NUMBER OF STAGES 3
R.P.M. 885 ±

3 Intermediates
No Enamel

Test Witnessed By
Mr. P.R. Waters
Resident Inspector

Pump Tested With
Jos Motor. U.S.
Electrical 900 H.P.
2300 V-WH5
Frame Y1689PA
5H 52-00962-878

TOTAL HEAD IN FEET (MERCURY COLUMN PRESSURE GAUGE)

PER CENT EFFICIENCY

Field Head Capacity

Laboratory Efficiency

Overall Efficiency

Electrical Input Horse Power

Laboratory Horse Power
Including Thrust Bearing Losses

HORSE POWER

U.S. GALLONS PER MINUTE (By 24" x 16" Venturi)

KEUFFEL & ESSER CO. N.Y.

U.S. Bureau of Reclamation

TEST RECORD—LAYNE & BOWLER, INC., MEMPHIS, TENN.

CUSTOMER INCY Pumping Plt. SUBSIDIARY Layne Pumps-Pasco ST. 3 R. P. M. 885 G. P. M. 11,760 HEAD 250'

CURVE NO. _____ NOTES Witness Test of Pump Using Job Motor Test Witnessed by Mr. Phillip Walters of Bureau of Reclamation. Motor S/N 52-00862-848 U.S. V.H.S.

TYPE PUMP HH SIZE 38" STAGES 3 MOTOR 900HP-2300V. ORDER NO. 7114-3804 TEST NO. 283-72W

DATE 10-17-72 TYPE LUBR. Oil IMP. PATT. NO. 19H12 IMP. FILING H.F.-V.C. BLD. DIA. 14" to 23 9/16" SHD. DIA. Std-14"

BLADE TIP Std SIZE COLUMN 24" 18"x24 5/16"x5" SIZE SUCTION Bell INT. SHELL Cast Iron PUMP NO. 70832

READING NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LB. PRESSURE							107.8	109.2	112.2	117.1	122.4	128	135	156	
FT. HEAD	248.4	246.5	223.7	199.1	175.6	133.4	249.02	252.25	254.18	270.5	288.74	295.68	311.85	360.36	
GAUGE TO WATER LEVEL	3.0	3.0	3.0	3.0	3.0	3.0	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	
VELOCITY HEAD-24"	1.1	1.14	1.34	1.54	1.76	2.14	1.05	0.96	0.81	0.67	0.55	0.41	0.2	—	
LAB. TOTAL HEAD	252.5	249.64	228.04	203.64	180.36	138.54	252.32	260.96	261.24	278.42	290.54	303.34	319.3	362.61	
HEAD LOSS 4 IN 24-18" DOE COLUMN	1.5	1.31	1.82	2.08	2.36	2.8	1.45	1.33	1.13	0.92	0.74	0.58	0.32	—	
FIELD HEAD	251.0	248.13	226.22 226.02	201.56	178.0	135.74	255.87	259.16 259.63	260.12	277.5	289.8	302.76	318.98	362.61	
VENTURI 24x16 G.P.M.	11750	12000	13000	14000	15000	16500	11500	11000	10000	9000	8000	7000	5000	0	
SPEED	886	886	886	886	887	889	886	886	887	887	887	888	887		
METER K.W. X1600	0.417	0.417	0.462	0.402	0.39	0.362	0.417	0.415	0.408	0.395	0.39	0.38	0.36	0.355	
ACTUAL K.W.	667.2	667.2	659.2	643.2	624	579.2	667.2	664	652.8	636.8	624	608	576	568	
HORSEPOWER INPUT	894.37	894.37	883.65	862.2	836.46	776.41	894.37	890.1	875.01	853.62	836.46	815.01	772.12	761.39	
MOTOR EFF.	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	93.8	
LAB OR FIELD HORSEPOWER OUTPUT	838.92	838.92	828.86	808.14	784.6	728.27	838.92	834.91	820.82	800.7	784.6	764.48	724.25	714.15	
LABORATORY PUMP EFFICIENCY	89.3	90.17	90.31	89.01	87.07	74.26	89.07	86.83	83.21	79.02	74.8	70.14	55.66	0	
FIELD OVERALL EFFICIENCY	83.21	84.07	83.96 84.04	81.64	80.6	72.84	83.08	89.87 87.02	76.79	73.88	69.99	65.66	52.16	0	

TEST WITNESSED BY

P.K. Shelton

OF Ober

DATE Oct. 17, 1972

SINGER - LAYNE & BOWLER DIV.