



HYDRAULIC PERFORMANCE WARRANTY
GUARANTEED AT DESIGNED POINT ONLY AND IS
CONTINGENT ON:
1. PROPER NPSS OR SUBMERGENCE AVAILABLE.
2. PROPER AND ADEQUATE FLOW TO PUMP SUCTION.
3. FLUID FREE OF GAS, AIR, AND ABRASIVE MATTER.
4. IMPELLER WITH PROPER LATERAL ADJUSTMENT
(VERTICAL PUMP ONLY).

PUMP BOWL PERFORMANCE

CUSTOMER:

Fluor-Daniel, Inc.

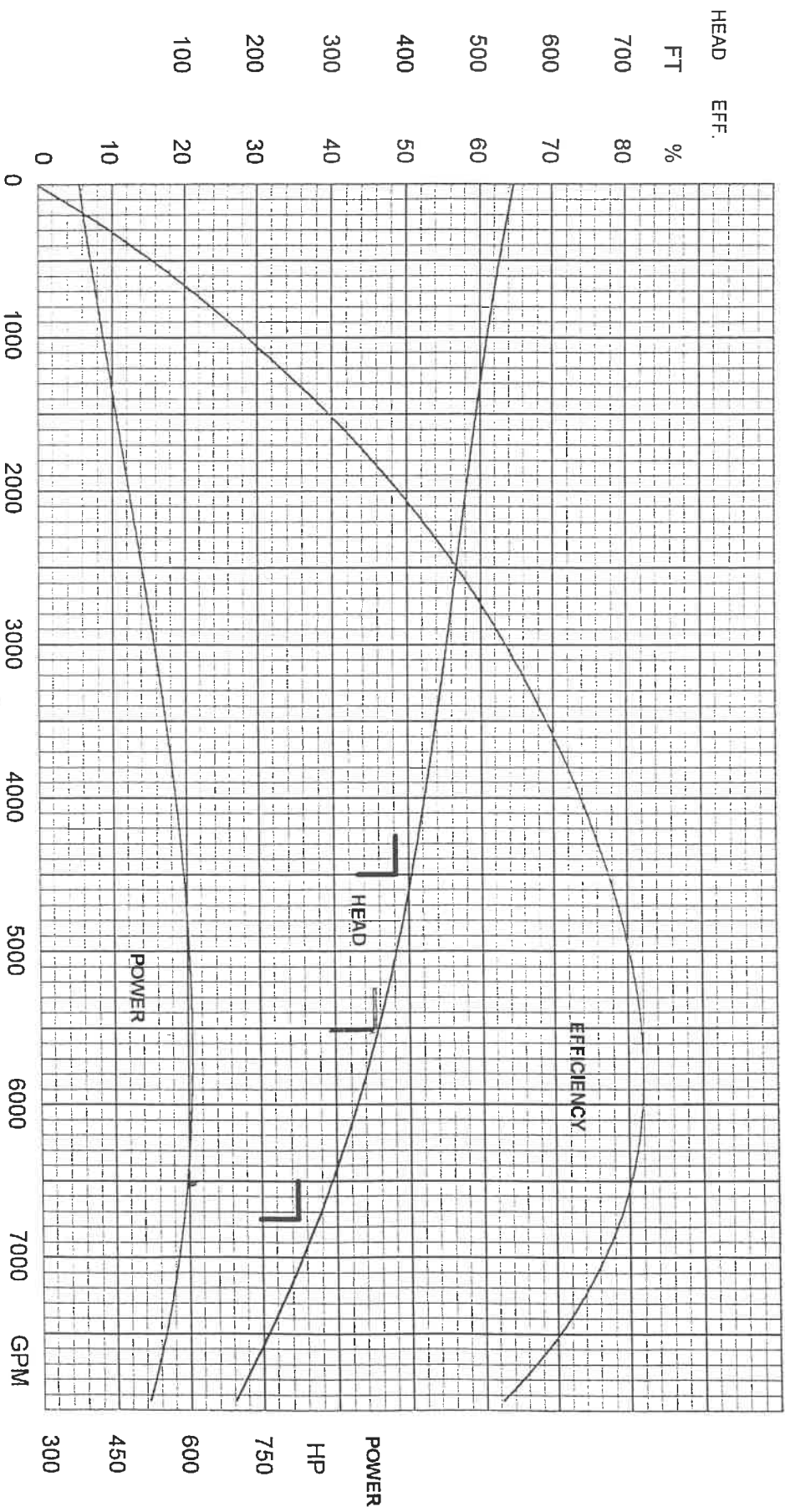
P-903

BY: DAR

DATE: 2/23/99

CURVE NO.: C199598W

PUMP:	20 HXBF	TEST NO.:	199598W
STAGES:	3	SHOP ORDER:	214089 VFOX
IMP. NO. 1:	2617886-011	Rated Flow:	4500.00 GPM
IMP. NO. 2:	2634615-011	Rated Head:	381.15 FT
IMP. D.I.A. 1:	(1) 14.88 x 15.22	Rated Speed:	1775 RPM
IMP. D.I.A. 2:	(2) 11.88 x 13.38	Spec. Gravity:	1.000



Signed By:

[Signature]

CERTIFIED TEST CURVES

Serial No. 214089-A



HYDRAULIC PERFORMANCE WARRANTY
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PUMP BOWL PERFORMANCE

CUSTOMER:

Fluor-Daniel, Inc.

P-903

PUMP:
STAGES:

20 HXBF
3

TEST NO.:

199598m

SHOP ORDER:

214089 VFOX

Buttinge Oil Terminal Project

IMP. NO. 1:
IMP. NO. 2:

2617886-011
2634615-011

Rated Flow:

1022.03 m³/h

BY: DAR

IMP. D.I.A. 1:

(1) 14.88 x 15.22
378 x 387 mm

Rated Speed:

1775 RPM

DATE: 2/23/99

IMP. D.I.A. 2:

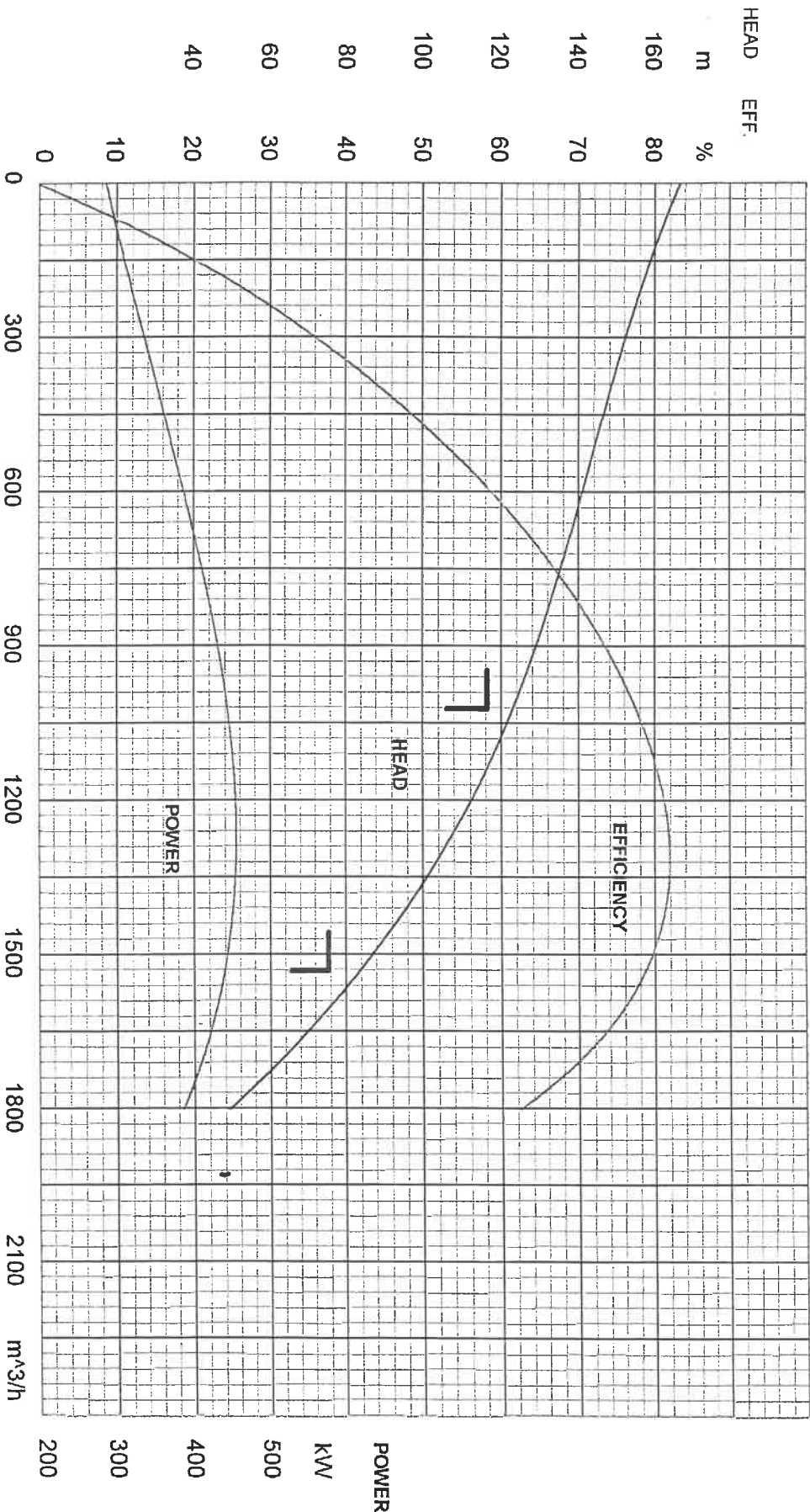
(2) 11.88 x 13.38
302 x 340 mm

Spec. Gravity:

1.000

CURVE NO.:

C199598m



Signed By:

CERTIFIED TEST CURVES

Serial No. 214089-A

VERTICAL PUMP TEST DATA IN METRIC UNITS
PUMP BOWL PERFORMANCE

Test No.: **199598m** Test Date: **2/23/99** Pump: **20 HXBF** Serial No: **214089-A**

Rated Flow:	1022.03	m ³ /h	Rated Head:	116.17	m	Min. Plot Flow:	0.00	m ³ /h
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PERFORMANCE DATA AT				1775	RPM
No.	Capacity m ³ /h	TDH m	Power kW	Efficiency %	
1	0.000	166.188	284.904	0.00	
2	563.838	145.291	394.036	56.58	
3	837.187	127.837	410.569	70.94	
4	1148.429	115.251	446.969	80.58	
5	1259.808	109.264	456.419	82.07	
6	1395.950	97.958	458.225	81.21	
7	1600.361	76.146	435.479	76.15	
8	1761.543	55.345	398.979	66.50	
9	1802.718	48.928	385.326	62.29	
10					
11					
12					
13					
14					
15					

NPSH DATA		
No.	Capacity m ³ /h	NPSHR m
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

VERTICAL PUMP TEST DATA REDUCTION PROGRAM

Test No.: 199598W Test Date: 2/23/99 Pump: 20 HXBF Serial No: 214089-A

PUMP BOWL PERFORMANCE						
No.	Capacity (GPM)	TDH (FT)	BHP (HP)	Efficiency (%)	As Run Speed (RPM)	Line shaft Loss (HP)
1	0.000	555.979	383.114	0.00	1792.4	0.290
2	2503.000	484.550	541.151	56.58	1789.6	0.289
3	3715.000	426.006	563.196	70.94	1787.8	0.289
4	5093.000	383.595	611.997	80.58	1787.5	0.289
5	5586.000	363.545	624.622	82.07	1787.6	0.289
6	6190.000	325.963	627.198	81.21	1788.0	0.289
7	7098.000	263.495	596.465	76.15	1789.4	0.289
8	7819.000	184.537	547.757	66.50	1789.4	0.289
9	8004.000	163.230	529.455	62.29	1789.9	0.289
10						
11						
12						
13						
14						
15						

PUMP BOWL PERFORMANCE				
CORRECTED TO 1.0 SPECIFIC GRAVITY AND 1775 RPM				
No.	Capacity (GPM)	TDH (FT)	BHP (HP)	Efficiency (%)
1	0.000	545.236	381.908	0.00
2	2482.680	476.676	628.188	66.58
3	3686.134	419.411	650.361	70.94
4	5056.536	378.122	699.164	80.58
5	5546.937	358.478	611.822	82.07
6	6146.369	321.384	614.242	81.21
7	7046.393	249.822	583.762	76.15
8	7766.077	181.579	634.826	66.50
9	7937.371	160.524	616.622	62.29
10				
11				
12				
13				
14				
15				

Add NPSH Data? (Yes / No):			No
No.	Capacity (GPM)	NPSHR (FT)	
1			
2			
3			
4			
5			
6			
7			
8			
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10			
11			
12			
13			
14			
15			



VERTICAL PUMP TEST DATA REDUCTION PROGRAM

BOWL PERFORMANCE

Unit:

GPM

Test No.: 199598W	Pump Type: 20 HXBF	Flow Line (in): 16.00	Pres. Gg. To Water (in): 55.44	Pking Cntner Losses: 0.35
Test Date: 2/23/99	Impeller No. 1: 2617886-011	Flow Meter Type: Flowmeter	Bowl Flange to Tap (in): 30.000	Windage Loss (hp): 0.00
By: DAR	Impeller No. 2: 2634615-011	Number: 0-600	Submergence (in): 134.500	Impeller Thrust: 25.30
Test Standard: HI	Top Bowl No.: 2618526-631	Pressure Gauge: Max. PSI: 0-600	Bottom Suc. to Eye (in): 8.500	Imp. & Shaft Wgt (lb): 120.00
Shop Order No.: 214089-VFOX	Std. Bowl No.: 2618527-041	Number: 3	Oil Tube OD (in): 0.000	Specific Gravity: 0.9997
Serial No.: 214089-A	No. of Stages: 3	Pres. Unit (PSI, FT): PSI	Shaft Dia. (in): 2.188	Vapor Pres. (ft): 0.87
Customer info.: Fluor-Daniel, Inc.	Impeller Dia. 1: (1) 14.88 x 15.22	Water Temp. (°F): 71.2	Max. Dia. (in): 2.188	Submergence (Eye) (ft): 10.500
Customer info.: 2	Impeller Dia. 2: (2) 11.88 x 13.38	Barometer (in Hg): 30.12	Shaft Length (in): 149.00	NPSHA (ft): 43.71
Rated Capacity (gpm): 4500.00	Imp. Filling 1: Std.	Lateral Set (in): 0.06	Column ID (in): 12.000	If Field Test, Enter:
Rated Head (ft): 381.15	Imp. Filling 2: Std.	Press. Conv. Factor: 2.3108	Column Length (in): 60.00	Discharge Pipe ID (in):
Rated Speed (rpm): 1775	Imp. Polish: 75 Ra		Column Equ. Dia.: 11.799	Pipe Flange to Tap (in):
Power Measured by: CALIBRATED MOTOR	Calibrated Motor:	Taper Column Geometry:	1	Head Corrections:
Dyna Type: large	Mtr. Number = 71	Taper Inlet ID (in) =	0.000	Vel. Hd. & Loss @ Cap.: 4500.00
Dyna Number: 3	CT Constant = 1.000	Taper Exit ID (in) =	0.000	Velocity Head (ft): 2.710
Dyna Constant: 0.000380514	Mtr. Pwr. (BHP) = 700	(Dinlet - Dexit)/Length =	0.000	Friction Loss (ft): 0.182
If Mtr. Num. = 1 (Customer motor), Enter:	Rated HP (%)	Taper Loss Coef. Kt =	0.000	Taper Head Loss (ft): 0.000
Motor BHP: 25	100.0	Taper Equ. Inlet ID (in) =	0.000	Additional Loss (ft): 0.000
Motor RPM: 3500	75.0	Taper Equ. Exit ID (in) =	0.000	Motor:
	50.0	Taper Exit Vel. Head (ft):	0.000	Mtr Constant = -13.1068743
		Taper Loss (ft):	0.000	Mtr Coef. A1 = 1.2633138
		Addition Head Loss (ft):	0.000	Mtr Coef. A2 = 0.000108133
		Chw: 100.0	AI Capacity (gpm) =	Mtr Coef. A3 = -1.28762E-07
				Mtr Coef. A4 = 0

TEST DATA:

Minimum Plot Capacity (gpm): 0									
No.	Capacity (GPM)	Pressure Reading (PSIG)	Gauge Calib. Correction (PSIG)	Speed (RPM)	CT Reading	Thrust Bearing Loss (HP)	Gauge Head (FT)	Velocity Head (FT)	Head Losses (FT)
1	0.00	237.10	1.500	1792.4	318.210	1.939	551.359	0.000	0.000
2	2503.00	205.80	1.500	1789.6	432.810	1.694	479.030	0.838	0.061
3	3715.00	180.00	1.500	1788.9	449.830	1.494	419.411	1.847	0.128
4	5093.00	160.90	1.500	1787.8	487.850	1.350	375.275	3.471	0.229
5	5586.00	151.90	1.500	1787.5	497.690	1.281	354.478	4.175	0.271
6	6190.00	135.20	1.500	1787.6	499.610	1.154	315.887	5.127	0.328
7	7098.00	103.10	1.500	1788.0	475.350	0.908	241.710	6.742	0.423
8	7819.00	72.60	1.500	1789.4	437.160	0.675	171.231	8.181	0.506
9	8004.00	63.20	1.500	1789.9	422.860	0.603	149.509	8.573	0.528
10									
11									
12									
13									
14									
15									