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Public

TEST REPORT No. T/60

OCTOBER 1976

LIQUID MANURE PUMP UNITS

- ENTRANT: Turnbull & Jones Ltd
PO Box 98
Christchurch
- MANUFACTURER: Gorman-Rupp Company
Mansfield
Ohio
- PUMP MODELS: Two German-Rupp pump units were tested
- (a) Model 11 1/2 A2B
 - (i) Pump - surface mounted, open impeller centrifugal pump with a 38 mm inlet and outlet.
 - (ii) Motor - Crompton Parkinson
2.2 kW. Continuous rating
2850 rpm
Three phase
4.55 A per phase current rating
 - (b) Model 12 B2B
 - (i) Pump - surface mounted, open impeller, centrifugal pump with 51 mm inlet and outlet.
 - (ii) Motor - Kapak Induction Type
5.5 kW. Continuous rating
2820 rpm
Three phase
11.0 A per phase current rating

REPORT

This report presents the results of clean water hydraulic tests carried out by the NZAEI on two pump models manufactured by the Gorman-Rupp Company.

The pumps tested were prototypes.

DEFINITION OF TERMS

Pump Total Head (H_p): The head imparted to the liquid by the pump. This includes static head, velocity head, friction head and other significant head losses. It is measured in metres of water.

Pump Discharge (Q): The flow rate measurement in cubic metres per hour.

Power Input (P_i): The electrical power input, in kilowatts, to the pump motor.

Current Input (I): The average current per phase in amps.

Efficiency (η): The overall efficiency of the pump-motor unit. It is the ratio of water power output in kilowatts to electrical power input to the pump motor in kilowatts, expressed as a percentage.

TEST PROCEDURE

The test procedure and method of analysis of results is detailed in Project Report P/12 *Liquid Manure Pumps: Procedure for Clean Water Hydraulic Testing* NZAEI 1976.

RESULTS

The test results are tabulated in Tables 1 and 2 and performance curves given in Figures 1 and 2.

CONVERSION FACTORS

1 m ³ /hr	=	3.67 gpm
1 l/sec	=	3.6 m ³ /hr
1 m	=	3.28 ft
1 m water	=	1.65 psi
1 kW	=	1.34 h. p.

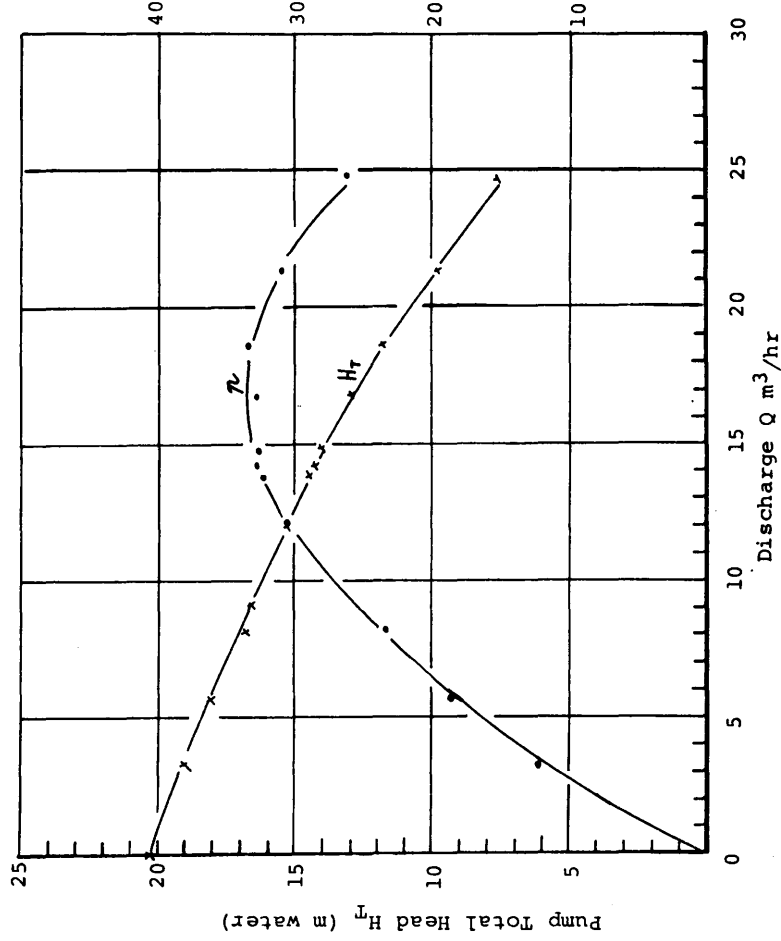
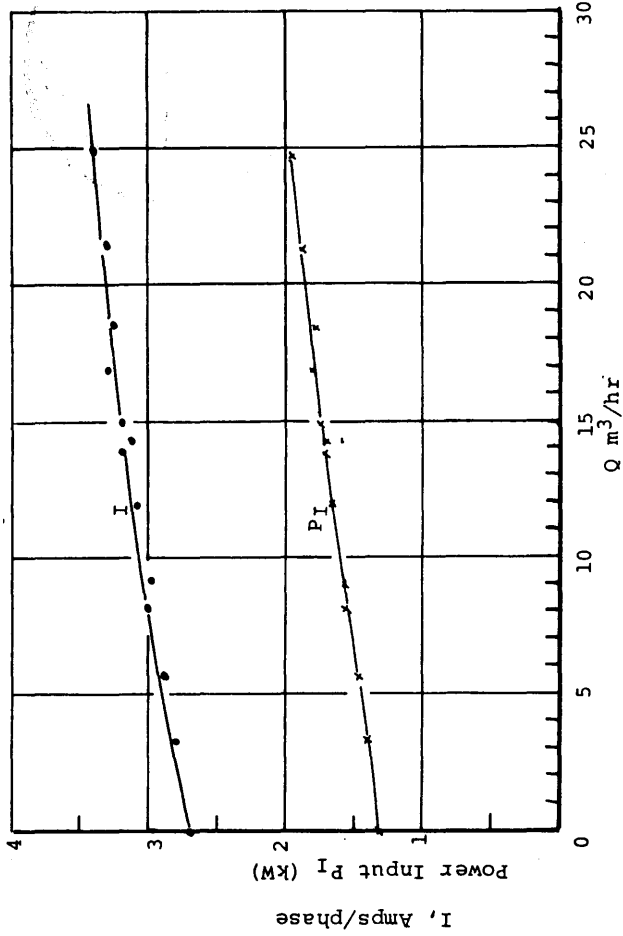


Figure 1. Performance curves of the Gorman Rupp 11½ ABB pump unit.

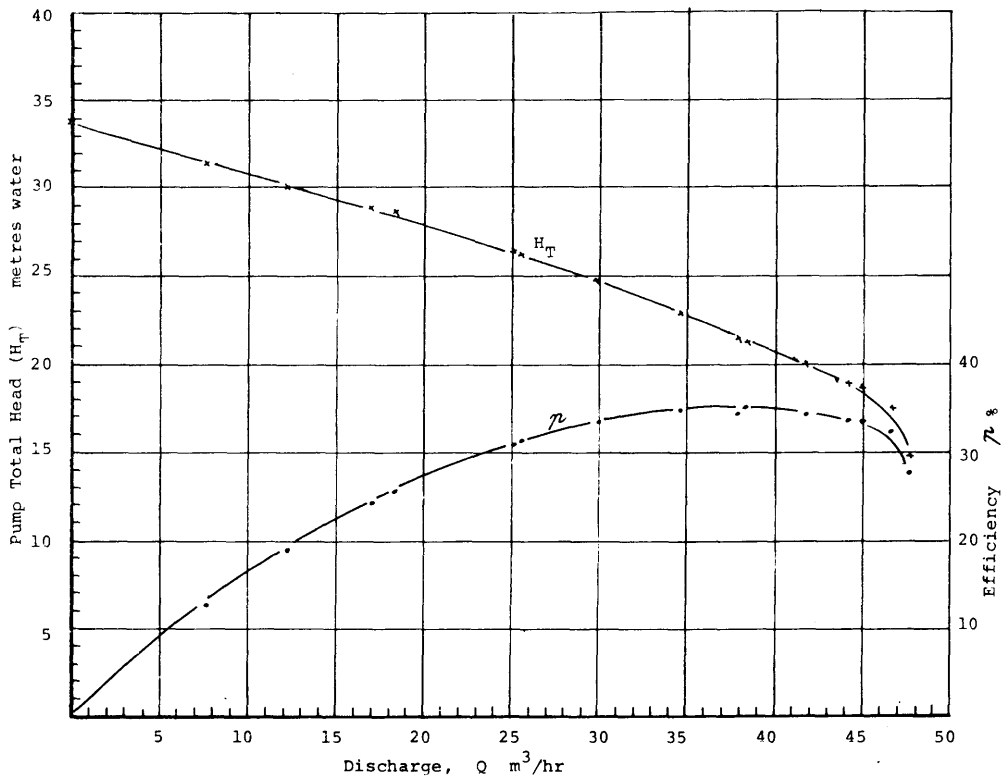
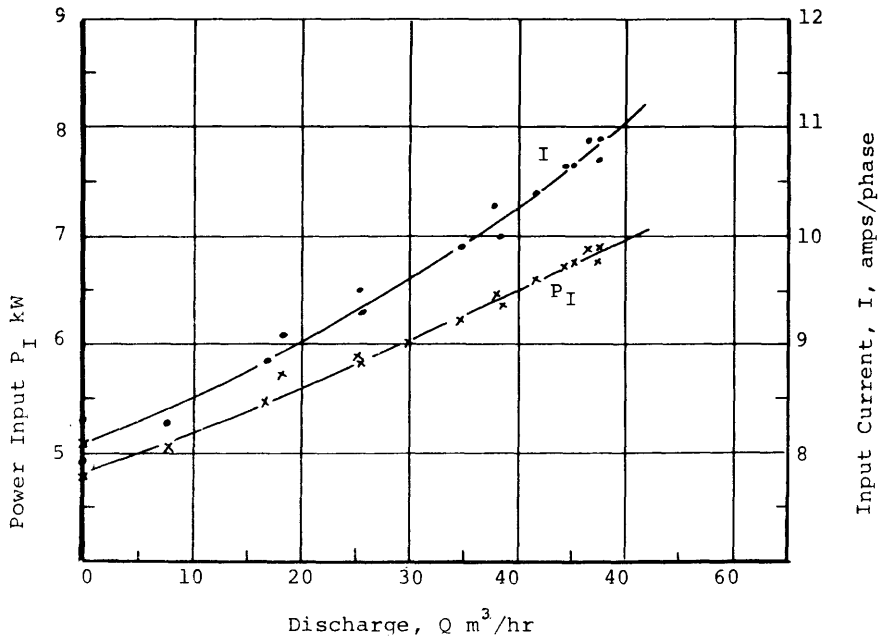


Figure 2. Performance curves of the Gorman Rupp 12 B2B pump unit.

Pump	GORMAN RUPP 11½ A2B				
Tester	A J DAKERS		Date 26 APRIL 1976		
Q (m ³ /hr)	H _T (m of water)	P _i (kW)	η (%)	Amperes/ Phase	Speed (rpm)
0	20.37	1.32	-	2.70	2820
24.88	7.57	1.94	26.4	3.40	2800
21.41	9.87	1.85	31.04	3.30	2800
18.57	11.84	1.78	33.59	3.24	2820
16.79	12.96	1.80	32.89	3.30	2820
14.85	14.09	1.74	32.70	3.20	2820
14.25	14.22	1.68	32.81	3.12	2820
13.85	14.51	1.70	32.15	3.20	
12.04	15.37	1.64	30.68	3.10	
9.11	16.67	1.55	26.68	2.98	2820
8.09	16.73	1.58	23.30	3.02	
5.60	18.03	1.47	18.69	2.88	
3.33	18.99	1.40	12.29	2.80	
0	20.56	1.31	-	-	2820

Table 1. Test results - Gorman Rupp pump unit 11½ A2B.

Pump	GORMAN RUPP 12 B2B Serial No. 602525				
Tester	A J DAKERS		Date 18 AUGUST 1976		
Q (m ³ /hr)	H _T (m of water)	P _i (kW)	η (%)	Amperes/ Phase	Speed (rpm)
0	33.70	5.10	0	8.30	2800
18.38	28.61	5.71	25.05	9.10	
25.22	26.39	5.89	30.73	9.50	
29.87	24.78	6.04	33.33	9.60	
34.67	22.99	6.22	34.88	9.90	
37.99	21.44	6.48	34.19	10.30	
41.70	19.91	6.60	34.23	10.40	
44.18	18.86	6.72	33.73	10.66	
46.64	17.48	6.89	32.19	10.90	
47.61	14.75	6.89	27.70	10.90	
44.98	18.51	6.74	33.61	10.64	
38.39	21.28	6.33	35.11	10.04	
25.52	26.18	5.83	31.17	9.3	
16.92	28.82	5.49	24.16	8.84	
12.10	30.09	5.27	18.79	8.50	
7.61	31.47	5.02	12.98	8.26	
0	33.90	4.77	0	7.90	
47.56	13.25	6.75	25.40	10.70	

Table 2. Test results - Gorman Rupp pump unit 12 B2B.

TESTING OFFICER *A. J. Dakers*

DATE *19/10/76*

DIRECTOR *G. J. T. Wood*