

Evaluation Report

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DURO P&S BIG GIANT SHALLOW WELL JET PUMP

A Co-operative Program Between



ALBERTA
FARM
MACHINERY
RESEARCH
CENTRE



PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

DURO P&S BIG GIANT SHALLOW WELL JET PUMP

MANUFACTURER:

Pumps and Softeners, Limited
680 Waterloo Street
P.O. Box 5332
London, Ontario
N6A 4N8

DISTRIBUTORS:

Mid-Continental Pump Supply Ltd.
539 Pepperloaf Crescent
Winnipeg, Manitoba
R3R 1E6

Pumps and Softeners, Limited
305 Dewdney Avenue East
Regina, Saskatchewan
S4N 4G3

Pumps and Softeners, Limited
615 Manitou Road, S.E.
Calgary, Alberta
T2G 4C2

RETAIL PRICE: \$311.00 (March, 1980, f.o.b. London, Ontario).

SUMMARY AND CONCLUSIONS

Measured water flow of the Duro Big Giant jet pump varied from 41 L/min (9 gal/min) to 4 L/min (0.9 gal/min) over a range of total heads from 8 to 40 m (28 to 131 ft) with a 4.5 m (15 ft) suction lift. At peak efficiency, flow was 3% lower than the manufacturer's, published data.

Peak overall efficiency of 13% occurred at a discharge head of 25 m (82 ft) with a flow of 37.1 L/min (8.2 gal/min). The corresponding pump power output was 0.18 kW.

The owner's manual supplied with the pump was clearly written, and contained comprehensive installation, electrical, priming, maintenance and troubleshooting instructions. A pressure switch was supplied with the pump.

RECOMMENDATIONS

No need for recommendations was apparent.

Chief Engineer -- E.O. Nyborg
Senior Engineer -- J. C. Thauberger
Project Engineer: Gregory R. Pool

THE MANUFACTURER STATES:

We have reviewed your report and agree, in general, with your findings.

Note: This report has been prepared using SI units of measurement. A conversion table is given in APPENDIX II.

GENERAL DESCRIPTION

The Duro Big Giant is a single stage, shallow well jet pump, with a 35 mm (nominal 1.25 inch NPT) inlet and a 25 mm (nominal 1 inch NPT) outlet, designed for use in wells up to 7.5 m (25 ft) deep. It is powered by a 115/230V, 0.37 kW Franklin Electric electric motor.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The performance characteristics of the Duro Big Giant were determined with water, over a full range of discharge heads and suction lifts, using a standard pump testing procedure¹. In addition, ease of installation, the suitability of the owner's manual and the safety of the pump were evaluated.

RESULTS AND DISCUSSION

PERFORMANCE CHARACTERISTICS

Pump performance characteristics, over a range of total heads² from 6 to 41 m (20 to 135 ft) of water, are given in FIGURE 1, for a 4.5 m (15 ft) suction lift. Maximum flow at 6 m (20 ft) total head was 41 L/min (9 gal/min), while flow ceased at a total head of 41 m (135 ft). The manufacturer's published performance data indicated higher flows than those obtained, up to a total head of 30 m (98 ft). At the point of peak overall efficiency, the measured flow was 3% lower than that indicated by the manufacturer. The peak efficiency, occurring at a discharge head of 25 m (82 ft), was 13%. The corresponding flow was 37.1 L/min (8.2 gal/min).

Maximum pump power output was 0.18 kW, occurring at the peak efficiency point, with a corresponding current draw of 5.7A at a 230V line voltage.

EASE OF INSTALLATION

One street elbow was required to connect the suction pipe to the pump inlet. A plastic foot valve was supplied with the pump, and was installed on the lower end of the suction pipe throughout the test. Access to the inlet and outlet, for plumbing connections, was convenient.

A priming plug was conveniently located on top of the pump body. Priming of the pump required filling the pump body with water three or four times.

OPERATOR'S MANUAL AND SAFETY ASSESSMENT

The installation and operating instructions were clearly written and contained comprehensive installation, electrical, priming, maintenance and troubleshooting instructions. Wiring and plumbing recommendations were provided. If the instructions were followed closely, a safe electrical connection could be made. The pump motor had CSA approval.

1PAMI T7821, Detailed Test Procedure for Domestic Water Pumps.
2Total head is the sum of the discharge head and the suction lift.

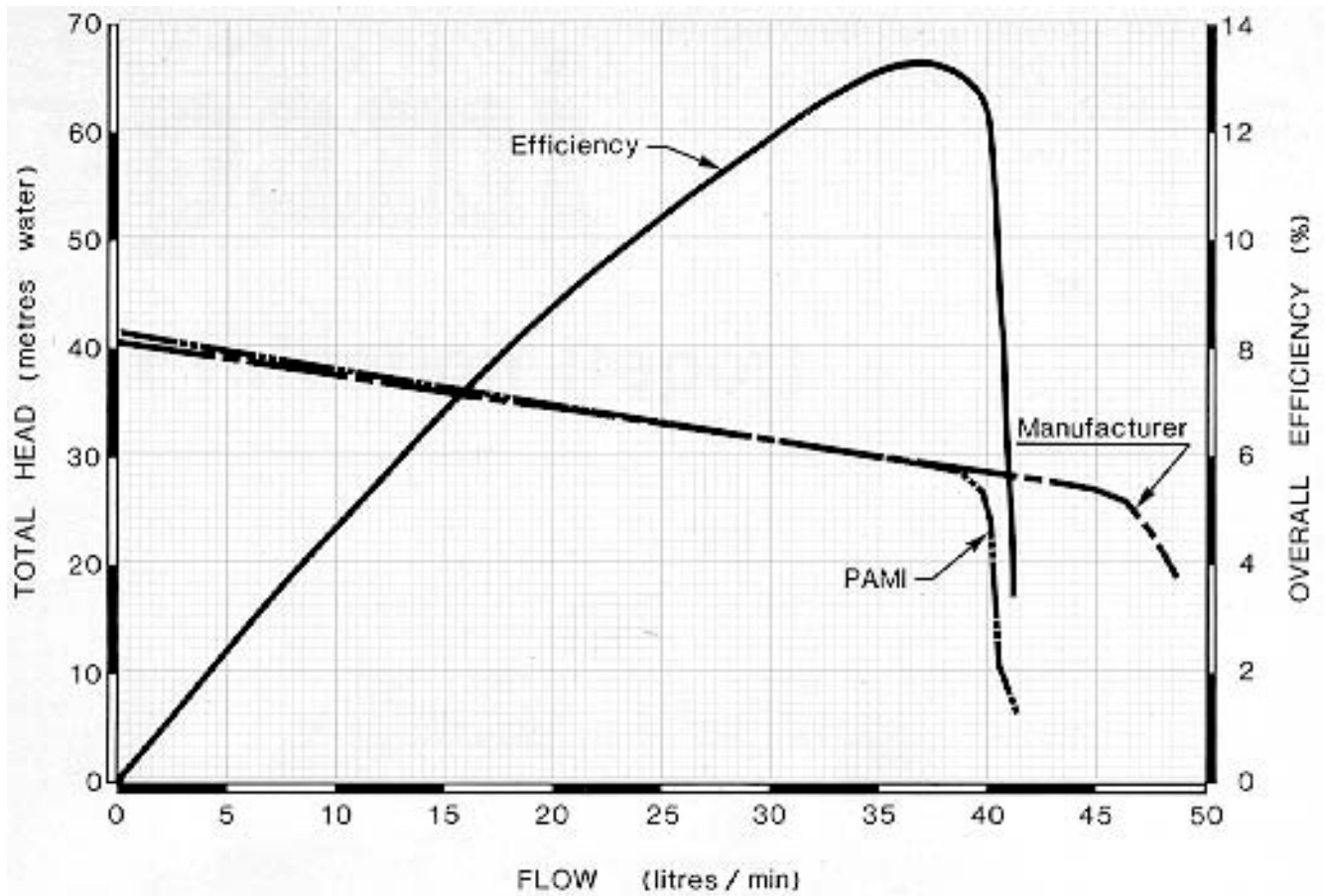


FIGURE 1. Performance Characteristics.

APPENDIX I

SPECIFICATIONS

PUMP:

-- make Duro P&S
 -- model Big Giant
 -- serial no. 8001

MOTOR:

-- make Franklin Electric
 -- model 11030 12486
 -- power rating 0.37 kW
 -- voltage rating 115/230 V
 -- current rating 8.2/4.1 A
 -- service factor 1.6
 -- speed 3450 rpm

OVERALL DIMENSIONS:

-- length 380 mm
 -- width 270 mm
 -- height 250 mm

TOTAL WEIGHT:

18.3 kg

INLET:

-- location middle of left side
 -- nominal size 35 mm (1.25 inch NPT)

OUTLET:

-- location top of pump body
 -- nominal size 25 mm (1 inch NPT)

FOOT VALVE:

-- type plastic
 -- nominal size 35 mm (1.25 inch NPT)

PRESSURE REGULATOR SWITCH:

-- make Pumptrol -- Square 'D'
 -- switching pressure range 140 - 280 kPa

APPENDIX II

CONVERSION TABLE

1 litre (L) = 0.22 Imperial gallon (gal)
 1 kilowatt (kW) = 1.3 horsepower (hp)
 1 metre water(m) = 1.4 pounds force/square inch (psi)
 1 metre water (m) = 3.3 feet water (ft)
 1 kilopascal (kPa) = 0.15 pounds force/square inch (psi)



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