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Evaluation Report



Report On

GSW STA-RITE 350303 SUBMERSIBLE DEEP WELL PUMP - 79

prairie agricultural machinery institute

Humboldt, Saskatchewan · Lethbridge, Alberta · Portage la Prairie, Manitoba

DIRECTOR

J.A. Peck

GSW STA-RITE 350303 SUBMERSIBLE DEEP WELL PUMP

MANUFACTURER:

GSW Pump Division
599 Hill Street West
Fergus, Ontario
N1M 1G6

RETAIL PRICE:

\$416.26 (f.o.b. Winnipeg March, 1979)

SUMMARY AND CONCLUSIONS:

Measured capacity of the Sta-Rite 350303 submersible pump varied from 58 L/min to 20 L/min over a range of discharge heads from 5 to 70 m. Capacity was 8% lower than manufacturer's published data at peak efficiency.

Peak pump-motor efficiency of 20.5% occurred at a discharge head of 52 m with a flow of 34 L/min. The corresponding power output was 0.29 kW.

The operator's manual was clearly written, and contained comprehensive installation, servicing and operating instructions. An electrical wiring kit was provided with the pump.

RECOMMENDATIONS:

It is recommended that the manufacturer consider:

1. Modifying the operator's manual to include the recommendation that a safety line be attached to the pump during installation.
2. Providing a power cable selection chart and suggested fuse sizes with the operator's manual.

Chief Engineer -- E.O. Nyborg

Senior Engineer -- J. C. Thauberger

Project Engineer -- G.R. Pool

THE MANUFACTURER STATES:

With regard to items 1 and 2 under Recommendations, we will immediately include an insert in our installation manual clearly explaining the installation instructions and benefits of attaching a safety line to the pump. Additionally, and on the same insert, will be a power cable selection chart and suggested fuse sizes. On our next installation manual reprint, the insert will form part of the manual.

ADDITIONAL COMMENTS:

In respect to the efficiency performance of the units tested, recent engineering tests on similar units produced considerably higher efficiency ratings.

GENERAL DESCRIPTION

The Sta-Rite 350303 is a 100 mm diameter, 8 stage, deep well, submersible water pump with a 25 mm (nominal 1 inch NPT) discharge outlet. It is designed for use in wells up to 45 m deep. It is powered by a 230 V, 0.37 kW Sta-Rite electric motor.

Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The performance characteristics of the Sta-Rite 350303 were determined with water, over a full range of discharge heads, using a standard pump testing procedure¹. In addition, the suitability of the operator's manual and the safety of the pump were assessed.

DISTRIBUTORS:

Prairie Water Services
88 Fennell Street
Winnipeg, Manitoba

Wig's Sandpoint
1510 Alberta Avenue
Saskatoon, Saskatchewan

Russel Steel (Alberta) Ltd.
2020 - 17th Avenue S.E.
Calgary, Alberta

Russel Steel (Alberta) Ltd.
7016 - 99th Street
Edmonton, Alberta

RESULTS AND DISCUSSION

PERFORMANCE CHARACTERISTICS

Pump performance characteristics, over a range of discharge heads from 5 to 80 m, are given in FIGURE 1. Maximum flow rate, at 5 m discharge head, was 58 L/min while flow ceased at a discharge head of 80 m. The manufacturer's published performance data indicated higher pumping rates than those obtained, up to 70 m of discharge head. At the point of peak pump-motor efficiency, the PAMI test data were 9% lower than the manufacturer's published capacity data. Actual performance was higher than manufacturer's data from 70 m to 80 m head. The peak efficiency, occurring at a head of 52 m, was 20.5%. The corresponding flow rate was 34 L/min.

Maximum power output was 0.29 kW, occurring at the peak efficiency point, with a corresponding current draw of 6.4 A.

OPERATOR'S MANUAL AND SAFETY ASSESSMENT

The operator's manual was clearly written and contained comprehensive installation, servicing and operating instructions. Detailed drawings were provided to illustrate various equipment installations.

Power cable selection charts and fuse size recommendations were not provided. Two methods for splicing the power cable to the motor drop cable were clearly explained. These provided a safe electrical connection, if the instructions were followed closely.

The manual recommended that a suitable pressure relief valve be installed if the pump could generate more than 55 m pressure at the well head. Detailed explanations were given for proper well development and pump testing before hooking up the pump.

1. PAMI 77821, *Detailed Test Procedure for Domestic Water Pumps*

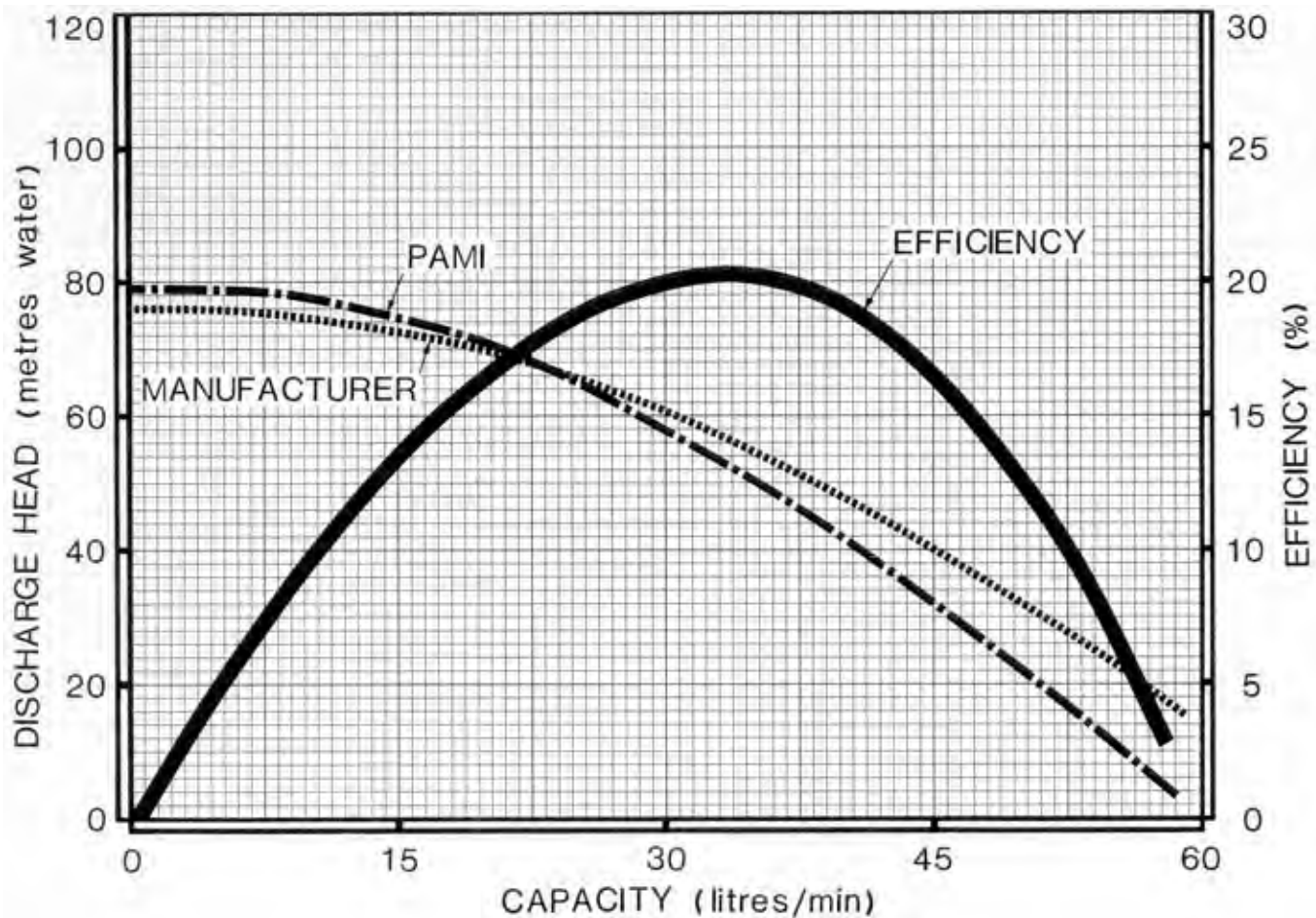


FIGURE 1. Performance Characteristics

APPENDIX I

SPECIFICATIONS

Pump:

- make Sta-Rite (GSW)
- model 350303 (50K1BA8)
- serial no. 12-77
- number of impellers 8
- speed 3450 rpm

Motor:

- make Sta-Rite (GSW)
- model M4C02S-01
- size 0.37 kW
- voltage 230 V
- ampere rating 6.3 A
- service factor 1.6
- speed 3450 rpm

Overall Dimensions:

- motor length 370 mm
- pump length 465 mm
- total length 835 mm
- clearance diameter 100 mm

Total Weight:

15.7 kg

Inlet:

- location 400 mm above pump foot

- screen type plastic
 - screen mesh 3.0 mm
 - inlet area 13 250 mm²
- Outlet:*
- nominal size 25 mm (1 inch NPT)
- Rope Eyes:*
- number 1
 - diameter 10 mm

APPENDIX II

METRIC UNITS

In keeping with the Canadian metric conversion program, this report has been prepared in SI units. For comparative purposes, the following conversions may be used.

- 1 litre/min (L/min) = 0.22 Imperial gallon/min (gal/min)
- 1 kilowatt (kW) = 1.34 horsepower (hp)
- 1 metre water (m) = 1.42 pounds/square inch (psi)
- 1 metre water (m) = 3.28 feet water (ft)



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