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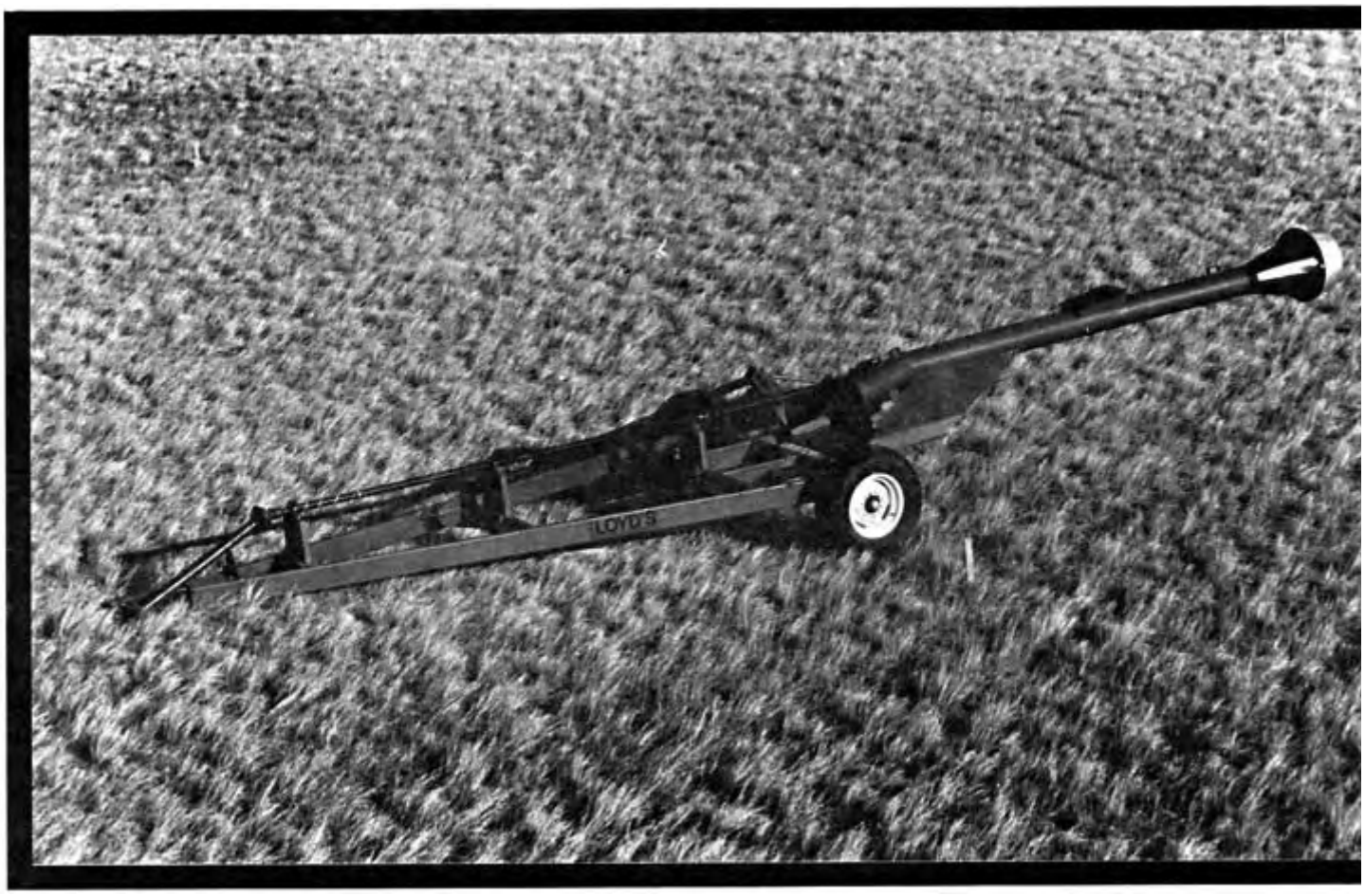

LLOYD'S MODEL RE-80 LIFT PUMP

A Co-operative Program Between
ALBERTA FARM MACHINERY RESEARCH CENTRE
PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

LLOYD'S MODEL RE-80 LIFT PUMP

MANUFACTURER AND DISTRIBUTOR:

Lloyd's Manufacturing Ltd.
P.O. Box 850Wadena, Saskatchewan
S0A 4J0

RETAIL PRICE:

$5064.00 (December 1983, f.o.b. Lethbridge, Alberta; with 50 ft (15.2 m) of rubber hose and two hose clamps.)

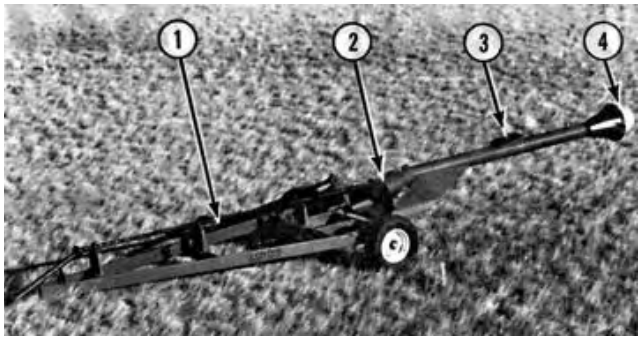

FIGURE 1. Lloyd's Model RE-80 Lift Pump: (1) Lift Mechanism, (2) Discharge Tube, (3) Bearing Inspection Plate, (4) Impeller.

SUMMARY AND CONCLUSIONS

Performance Characteristics: Performance of the Lloyd's model RE-80 lift pump was very good. Measured water flow rate for the 1000 rpm power take-off speed varied from 1850 to 600 gal/min (8410 to 2730 L/min) over a range of total heads from 15 to 40 ft (4.6 to 12.2 m) with a 17 in (430 mm) inlet submergence depth. A peak efficiency of 43% occurred at a 540 rpm power take-off speed and 700 gal/min (3180 L/min) flow rate. Maximum power required at 1000 rpm power take-off speed was 41 hp (31 kW).

Ease of Operation: Hitching the model RE-80 was easy. Caution had to be used when transporting on rough roads due to bouncing. The pump was easy to service and positioning of the model RE-80 at a pump site was easy.

Operator Safety: The pump was safe to use if common sense was exercised. Operator's Manual: The operator's manual was clearly written and included a well illustrated parts list.

Mechanical Problems: One mechanical problem occurred during testing. The transport lock bent due to bouncing of the inlet and discharge tube while travelling over rough roads.

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Project Engineer: M. V. Eliason

GENERAL DESCRIPTION

The Lloyd's model RE-80 is an 8 in (200 mm) diameter centrifugal pump. It consists of an impeller, discharge tube and lift mechanism mounted on a mainframe supported by a single axle and two wheels. Power is supplied through a 1000 rpm power take-off. The test machine was equipped with 50 ft (15.2 m) of 8 in (200 mm) diameter rubber discharge hose.

FIGURE 1 shows the location of major components while detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The Lloyd's model RE-80 was operated for about 25 hours while pumping water. Performance characteristics were determined with water over a range of discharge heads and speeds. Ease of operation, operator safety and suitability of the operator's manual were also evaluated.

RESULTS AND DISCUSSION

PERFORMANCE CHARACTERISTICS

Flow Rate: Flow rate characteristics of the Lloyd's model RE-80 pump are given in FIGURE 2 for a range of total heads and power take-off speeds. Performance curves were determined for a 17 in (430 mm) inlet submergence depth as measured from the water surface to the centre of the impeller.

Maximum flow rate at 15 ft (4.6 m) total head was 1850 gal/min (8410 L/min) for the 1000 rpm power take-off speed. The manufacturer's stated capacity was 3000 gal/min (13 650 L/min).

Flow rate increased for increasing power take-off speeds. For example, flow at 20 ft (6.1 m) total head increased from 300 to 1650 gal/min (1365 to 7500 L/min) when power take-off speed was increased from 700 to 1000 rpm. Increasing power take-off speed also increased the head at which flow ceased. For example, at a 540 rpm power take-off speed, flow ceased at 12.5 ft (3.8 m) total head while at a power take-off speed of 1000 rpm, flow ceased at 42.5 ft (13.0 m) total head.

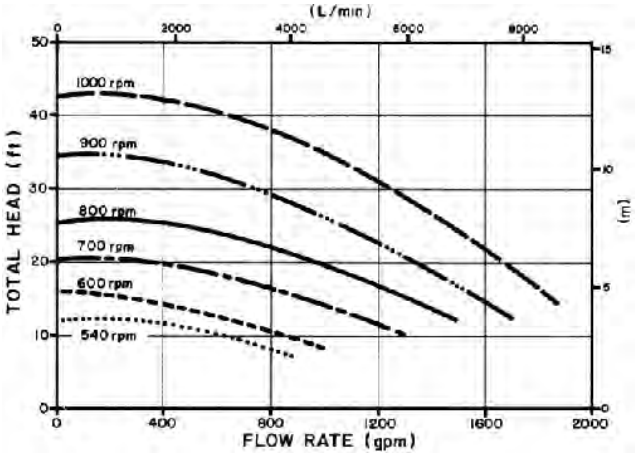

FIGURE 2. Lloyd's Model RE-80 Pump Performance Curves at Various Power Takeoff Speeds.

Power Requirements: FIGURE 3 shows the power required to operate the Lloyd's model RE-80 pump at various power takeoff speeds and flow rates. The maximum power required at a 1000 rpm power take-off speed was 41 hp (31 kW).

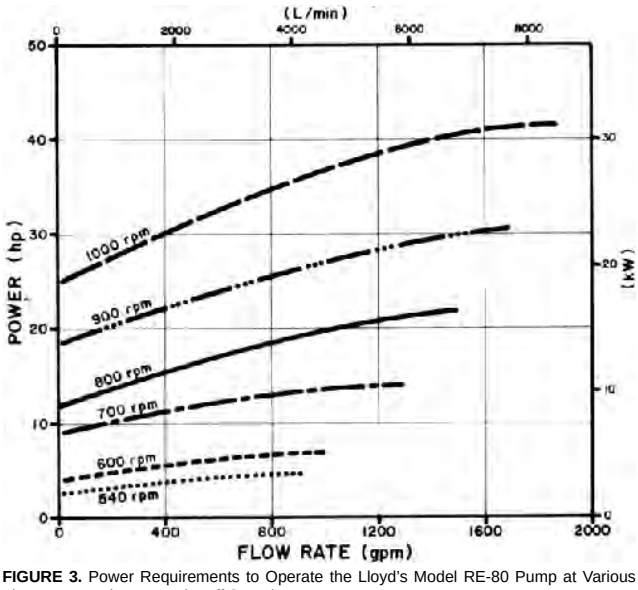

FIGURE 3. Power Requirements to Operate the Lloyd's Model RE-80 Pump at Various Flow Rates and Power Take-off Speeds.

Pump Efficiency: FIGURE 4 shows the pump efficiency of the model RE-80 pump at various flow rates and power take-off speeds. A peak efficiency of 43% occurred at a 540 rpm power take-off speed and 700 gal/min (3180 L/min) flow. Peak efficiencies at other power take-off speeds were less.

EASE OF OPERATION

Installation: Positioning the Lloyd's model RE-80 at the pump site was easy. The 16.2 ft (4.9 m) discharge tube reach was adequate for most pumping installations. The pump inlet was easily lowered and the rubber discharge hose could be easily installed by

one person.

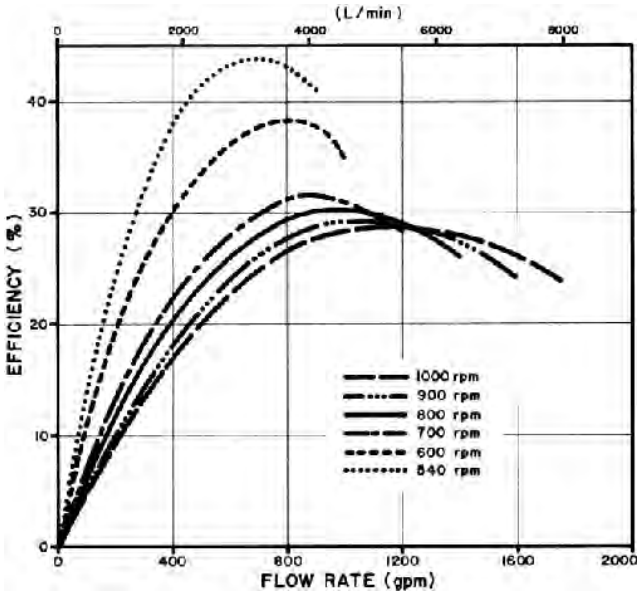

FIGURE 4. Pump Efficiency of the Lloyd's Model RE-80 at Various Flow Rates and Power Take-off Speeds.

Hitching: The Lloyd's model RE-80 was equipped with a fixed clevis hitch, which was suitable for most tractor drawbars. Lowering the inlet housing, to adjust the hitch weight, permitted easy hitching.

Transporting: The Lloyd's model RE-80 towed well on smooth roads at speeds up to 55 mph (90 km/h). Caution had to be exercised when towing on rough roads due to inlet and discharge tube bouncing.

Servicing: The model RE-80 had six grease fittings on the drive shaft, two grease fittings on the lift mechanism and two wheels that required servicing. Lubrication was convenient with good access to all grease fittings.

Water lubricated bearings supported the impeller drive shaft within the discharge tube. To avoid failure, water lubricated bearings must be submerged in water before operating the pump.

OPERATOR SAFETY

The Lloyd's model RE-80 was safe to operate if common sense was used. Care had to be exercised when priming the discharge system to prevent excessive shock loads and possible discharge hose whipping.

OPERATOR'S MANUAL

The operator's manual was clearly written and contained useful operating and assembly instructions. A well illustrated parts list was included.

MECHANICAL PROBLEMS

The intent of the test was evaluation of functional performance. An extended durability evaluation was not conducted. Only one mechanical problem occurred during the 25 hours of operation. The transport lock bent (FIGURE 5) due to bouncing of the inlet and discharge tube while travelling over rough roads. Caution had to be exercised while towing on rough roads to prevent excessive bouncing.

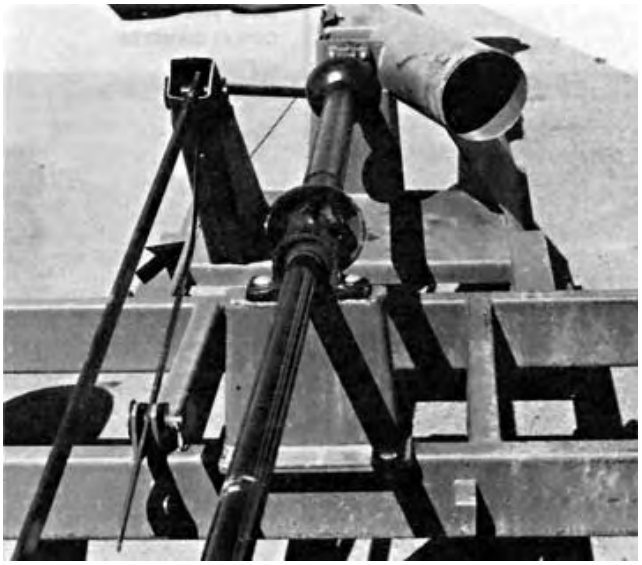

FIGURE 5. Bent Transport Lock.

APPENDIX I
SPECIFICATIONS

MAKE:	Lloyd's
MODEL:	RE-80
SERIAL NUMBER:	83-0201-8
MANUFACTURER:	Lloyd's Manufacturing Ltd. P.O. Box 850 Wadena, Saskatchewan S0A 4J0
OVERALL DIMENSIONS:	
-- length	31.3 ft (9525 mm)
-- width	7.6 ft (2310 mm)
-- height	
-field position	3.4 ft (1030 mm)
-transport position	4.3 ft (1295 mm)
-- tire tread	6.8 ft (2080 mm)
INLET DIAMETER:	6.9 in (175 mm)
OUTLET DIAMETER:	8.0 in (200 mm)
IMPELLER:	
-- number of vanes	6
-- diameter	11.9 in (300 mm)
WEIGHT:	
-- left wheel	650 lb (295 kg)
-- right wheel	680 lb (309 kg)
-- hitch	25 lb (11 kg)
TOTAL	1355 lb (615 kg)
LUBRICATION POINTS:	
-- gearbox	1
-- drive shaft	6, five hour service
-- lift mechanism	2, weekly service
TIRES:	2, 9.5L-15SL, 6-ply

APPENDIX II
MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports:

-Excellent	-Fair
-Very Good	-Poor
-Good	-Unsatisfactory

APPENDIX III
CONVERSION TABLE

feet (ft) x 0.305	= metres (m)
imperial gallons (gal) x 4.55	= litres (L)
horsepower (hp) x 0.75	= kilowatts (kW)
inches (in) x 25.4	= millimeters (mm)
mile/hour (mph) x 1.61	= kilometres/hour (km/h)
pounds (lb) x 0.45	= kilograms (kg)

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