COMMERCIAL TEST REPORT

THIS TEST REPORT VALID UP TO : 30th NOVEMBER, 2025

RALLI ULTRA MAX, ENGINE OPERATED
KNAPSACK SPRAYER

Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
Northern Region Farm Machinery Training and Testing Institute
Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001
[ISO 9001:2015 CERTIFIED]

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Tele./FAX: 01662-276984
### 3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. **Date of test:** 27.09.2018

2. **Atmospheric conditions:**
   - **a) Temperature:** 31° C
   - **b) Relative humidity:** 63 %
   - **c) Pressure:** 98.4 kPa

3. **Data recorded**

<table>
<thead>
<tr>
<th>Speed of engine (rpm)</th>
<th>Working pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow</th>
<th>Average delivery from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
<th>Hydraulic Power (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6135</td>
<td>9.0</td>
<td>1</td>
<td>6600</td>
<td>NIL</td>
<td>6525.0</td>
<td>6525.0</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>6500</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>3</td>
<td>6550</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
<td>4</td>
<td>6450</td>
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<tr>
<td>6008</td>
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<td>6400</td>
<td>NIL</td>
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<td>5400</td>
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</tbody>
</table>

- **Minimum discharge rate** = 5475.0 ml/min at 12 kg/cm²
- **Maximum discharge rate** = 6525.0 ml/min at 9 kg/cm²
- **Discharge at rated pressure** = 6525.0 ml/min at 9 kg/cm²

### 4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

[vide clause 8.4 of IS: 11313-2007]

**Rated pressure, kg/cm²**: 9
**Engine speed corresponding to rated pressure (rpm)**: 6135
**Theoretical cubic capacity of pump, ml**: 7196.46
**Actual volume at rated pressure, ml**: 6525.0
**Volumetric efficiency, %**: 91

NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE, HISAR

[THIS REPORT VALID UP TO 30th NOVEMBER, 2025]
MARKING AND PACKING
(CL.10 IS:11313-2007)

<table>
<thead>
<tr>
<th>Cl.10.1 Marking</th>
<th>Each sprayer shall be marked with the following particulars:-</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Manufacturer’s name &amp; his registered trade mark, Sl. No. and batch or code No.</td>
<td>KNAPSACK POWER SPRAYER ULTRA MAX</td>
</tr>
</tbody>
</table>

15. CONFORMITY TO INDIAN STANDARDS

i) IS:11313-2007 (Reaffirmed 2012)-Hydraulic power sprayer-specification: Does not conform in toto

ii) Spray nozzle and spray gun as per IS:3652-1995 (Reaffirmed 2011): Does not conform in toto

iii) Hose and hose connection as per IS:10134-1994: Conforms

iv) IS: 2643-2005-Pipe threads where pressure-tight joint are not made on the threads-dimensions, tolerance and designation: Conforms

v) IS: 7347-1974 (Reaffirmed 2006)-Specification for performance of small size spark ignition engines for agricultural water pumps, sprayers, tillers, reapers and other similar applications: Could not be ascertained

16. COMMENTS AND RECOMMENDATIONS

16.1 The sprayer serial number is not specified. It MUST be specified.

16.2 The sprayer year of manufacture is not specified. It should be specified.

16.3 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard, MUST be provided.

16.4 The pump make, model manufacturing year, serial No & Country of origin is not specified. It MUST be specified.

16.5 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian Standard, MUST be provided.

16.6 The strainer in nozzle is not provided. It may be considered for providing.

16.7 The manufacturer’s name or recognized trade mark and batch or code number on nozzle is not provided. It MUST be provided.

16.8 The spray gun manufacturer’s name or recognized trade mark & batch or code number is not marked on gun. It MUST be marked.

16.9 The material of pump inlet port end fitting does not meet the requirement of IS-11313-2007. It MUST be looked into.
16.10 The discharge rate for fine cone spray pattern and jet spray pattern of spray gun at the pressure of 600 kPa does not conform to the requirement of IS: 3652:1995. It MUST be looked into for appropriate improvement.

16.11 The discharge rate for fine cone spray of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

16.12 The spray angle for fine cone spray pattern of gun at a pressure of 600 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into for further improvement.

16.13 The diameter of connecting rod of gun does not meet the requirement of Indian Standard. It MUST be looked into.

16.14 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

16.15 As an important thing as pressure regulator was found “not working”. It MUST be looked into.

16.16 At rated pressure of 9 Kg/cm² the pump discharge was observed as 6525.0 ml/min. against the minimum requirement of 8000 ml/min. This must be examined.

16.17 At the rated pressure of 9 kg/cm², the engine speed dropped up to 6135 rpm against the rated engine speed of 7000 rpm. This MUST be looked into for necessary action.

16.18 The pressure gauge with fuel scale reading 120 bar is provided, thus it does not conform to requirement of IS: 11313-2007. It MUST be looked into.

16.19 Though a pressure regulator provided but that was not in working condition therefore its conformity to IS: 11313-2007 could not be ascertained. It MUST be looked into for corrective action.

16.20 A suitable labeling plate (not sticker) needs to be provided with, inter alia, following information:-
   i. Manufacturer's name
   ii. Make
   iii. Model
   iv. Month & year of manufacture
   v. Rated speed
   vi. Rated pressure
   vii. Discharge rate
   viii. Power rating of engine
   ix. SFC of engine

16.21 Safety provision/safety wear

   i) Hand gloves must be added on safety wear.

   ii) Safety instructions regarding handling poisonous agro-chemical before, during and after spraying operations should be provided on sprayer.