ENGINE OPERATED KNAPSACK SPRAYER
KRIMPON, KP-708 PRO 2 STROKE

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]

Website: http://nrfmtti.gov.in/
Tele./FAX: 01662-276984
The material used for different components shall be declared by the manufacturer all the components mentioned in the table-I may not be present in a particular sprayer.

### 3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS-11313: 2007]

1. Date of test: 19.03.2018
2. Atmospheric conditions:
   a) Temperature: 26°C
   b) Relative humidity: 36%
   c) Pressure: 99.1 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 (ml/min)</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>5117</td>
<td>7.0</td>
<td>1</td>
<td>5500</td>
<td>Nil</td>
<td>5477.5</td>
<td>5477.5</td>
<td>0.06</td>
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<td>3</td>
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<td>4</td>
<td>5450</td>
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</tr>
<tr>
<td>5062</td>
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<td>1</td>
<td>5300</td>
<td>Nil</td>
<td>5362.5</td>
<td>5362.5</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>5400</td>
<td></td>
<td></td>
<td></td>
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</tr>
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</tr>
<tr>
<td>4997</td>
<td>9.0</td>
<td>1</td>
<td>5210</td>
<td>400.0</td>
<td>5165.0</td>
<td>5165.0</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
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<td>2</td>
<td>5100</td>
<td></td>
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<td></td>
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<td>5150</td>
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</tr>
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<td></td>
<td>4</td>
<td>5200</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4960</td>
<td>10.0</td>
<td>1</td>
<td>4200</td>
<td>Nil</td>
<td>4232.5</td>
<td>4232.5</td>
<td>0.07</td>
</tr>
<tr>
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</tr>
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<td>4</td>
<td>4250</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum discharge rate = 4232.5 ml/min at 10 kg/cm²
Maximum discharge rate = 5477.5 ml/min at 7 kg/cm²
Discharge at rated pressure = 5477.5 ml/min at 7 kg/cm²

NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE, HISAR 9 of 24
4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
[vide clause 8.4 of IS: 11313-2007]

Rated pressure, kg/cm² : 7
Engine speed corresponding to rated pressure (rpm) : 5117
Theoretical cubic capacity of pump, ml : 5641.02
Actual volume at rated pressure, ml : 5477.5
Volumetric efficiency, % : 97

5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.07 kW against the declared net power output of engine as 1.5 HP.

6. ENGINE PERFORMANCE TEST

In pursuance of Ministry’s order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test has not been conducted and the specifications/performance as specified by the applicant/declared in the manual have been endorsed.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameter</th>
<th>Declaration</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Engine Type</td>
<td>Single cylinder 2 stroke air cooled spark ignition engine.</td>
</tr>
<tr>
<td>ii</td>
<td>Bore,(mm)</td>
<td>35</td>
</tr>
<tr>
<td>iii</td>
<td>Stroke (mm)</td>
<td>26</td>
</tr>
<tr>
<td>iv</td>
<td>Displacement,(cc)</td>
<td>Not specified</td>
</tr>
<tr>
<td>v</td>
<td>Net power output</td>
<td>0.70 kW @ 5500 rpm</td>
</tr>
<tr>
<td>vi</td>
<td>Net Torque</td>
<td>Not specified</td>
</tr>
</tbody>
</table>

7. PRESSURE ADJUSTMENT TEST
[Vide clause 8.7.1 of IS: 11313-2007]

1. Date of test : 19.03.2018
2. Atmospheric conditions :
   a. Temperature : 26 °C
   b. Relative humidity : 36 %
   c. Pressure : 99.1 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working pressure(kg/cm²)</th>
<th>Fluctuation range (kg/cm²)</th>
<th>Pressure drop (kg/cm²)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>7.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>8.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>9.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>10.0</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
</tbody>
</table>

4. Resistance of pressure: Yes
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
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 & engine serial number are not specified. These 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 year of manufacture 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 manufacture’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 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
16.10 The discharge rate for jet 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.
16.11 As an important thing as pressure regulator was found “not working”. It MUST be looked into.
16.12 At rated pressure of 7 Kg/cm² the pump discharge was observed as 5477.5 ml/min. against the minimum requirement of 8000 ml/min. This must be examined.
16.13 At the rated pressure of 7 kg/cm², the engine speed dropped up to 5117 rpm against the rated engine speed of 5500 rpm. This MUST be looked into for necessary action.
16.14 The pump inlet port and fitting, spreader and spray nozzle material does not meet the requirement of Indian Standard. It MUST be looked into.
16.15 The engine max. torque and compression ratio is not specified. It MUST be specified.
16.16 The diameter of connecting rod of the gun does not meet the requirement of Indian Standard. It MUST be looked into.
16.17 During the endurance test of sprayer the breakage of starter recoil was observed. The starter recoil was replaced with new one. This MUST be looked into.
16.18 The material used for different component is not declared. It should be declared.
16.19 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

16.20 Safety provision/safety wear
   i) Safety wear for operator's safety during operation was not provided. It MUST be provided.

17. TECHNICAL LITERATURE
   No literature was provided with sprayer during test.
   The following literature MUST be provided with the sprayer.
   (i) Operator's manual containing all the information including safety instructions before, during and after spraying operation.
   (ii) Parts catalogue.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

18. APPLICANT'S COMMENTS
   (i) We will follow the comments and recommendations.
   (ii) In response to draft test report the applicant has declared the following :-
        (a) Sprayer year of manufacture : September, 2017.
        (b) Pump year of manufacture : September, 2017.