RSR RETAIL PVT. LTD. HY-802H
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 9001:2008 COMPLIANT INSTITUTION]

Website: http://nrfmtti.gov.in/
E-mail: fmti-nr@nic.in
Tele./FAX: 01662-276984
3. TEST FOR DISCHARGE RATE OF PUMP
 [vide Clause 8.3 of IS-11313: 2007]

1. Date of test: 27.08.2016
2. Atmospheric conditions:
   a) Temperature: 32.8° C
   b) Relative humidity: 48.3%
   c) Pressure: 729.7 mm of Hg
3. Data recorded

<table>
<thead>
<tr>
<th>Specified 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 discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5865</td>
<td>15</td>
<td>1</td>
<td>2240</td>
<td></td>
<td></td>
<td>5842</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2250</td>
<td>3590</td>
<td>2252</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2290</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2230</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5635</td>
<td>17</td>
<td>1</td>
<td>2380</td>
<td></td>
<td></td>
<td>5308</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>2360</td>
<td>2946</td>
<td>2362</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>2350</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>2360</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5349</td>
<td>20</td>
<td>1</td>
<td>2000</td>
<td></td>
<td></td>
<td>4180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>1890</td>
<td>2240</td>
<td>1940</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>1880</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>1990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5413</td>
<td>22</td>
<td>1</td>
<td>620</td>
<td></td>
<td></td>
<td>859</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>640</td>
<td>223</td>
<td>636</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>650</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>635</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Minimum discharge rate = 859 ml/min at 22 kg/cm²
Maximum discharge rate = 5842 ml/min at 15 kg/cm²

REMARK: Tendency of stalling of engine was observed beyond 22 kg/cm² pressure and therefore test could not be taken up to the max. pressure of 30 kg/cm² declared by the applicant, and therefore the sprayer does not conform to the requirement laid down in Clause 6.4 of IS:11313-2007.

4 TEST FOR VOLUMETRIC EFFICIENCY OF PUMP

As applicant has not specified the rated pressure and rated speed of pump, hence volumetric efficiency could not be ascertained. as per the requirement of relevant code.

However, volumetric efficiency, so to speak, was found to be 85.18 % & 13.61% at 15 kg/cm² and at 22 kg/cm² pressure respectively. Hence the Volumetric Efficiency was not found as much as required by the code throughout the range of working pressure declared by the applicant.
14. COMMENTS AND RECOMMENDATIONS

14.1 The construction material of piston or plunger is not as per Indian Standard. It may be looked into.

14.2 The pressure gauge marking exceeds 2.5 times the declared value of pressure. Suitable pressure gauge may be provided to ensure the compliance of the relevant Indian Standard.

14.3 The maximum achievable pressure was observed drastically lower than the value specified by applicant. It must be looked into.

14.4 The thickness of the wall of the barrel is less than the value specified in the relevant Indian Standard. It may be looked into.

14.5 The diameter of connecting rod is less than the value specified in the relevant Indian Standard. It may be looked into.

14.6 The spray nozzle is not designated by its identification mark. The identification mark as specified by relevant Indian Standard, needs to be provided.

14.7 Manufacturer's name or recognized trade mark, batch or code number or nozzle is not specified. It needs to be specified, in compliance with relevant Indian Standard.

14.8 Relevant Indian Standard must be followed with regard to marking on spray gun.

14.9 As applicant has not specified the rated pressure and rated speed of pump, hence volumetric efficiency could not be ascertained, as per the requirement of relevant code. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.10 As the applicant has not specified the specific speed for sprayer operation, the power requirement cannot be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.11 As the discharge rate for fine cone spray & jet spray pattern of spray gun at the pressure of 600 ± 60 kPa was not declared by the applicant, the conformity of spray angle of spray gun to Cl E 3.1 of Annexure E of IS 3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.12 As the spray angle for fine cone spray pattern at a pressure of 600 ± 60kPa was not declared by the applicant, the conformity of discharge to Cl E 3.2 of Annexure E of IS 3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.13 As the discharge rate for fine cone spray & jet spray pattern at a pressure of 300 kPa was not declared by the applicant, the conformity of discharge of nozzle to Cl F 3.1 of Annexure F of IS 3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.14 As the spray angle for fine cone spray pattern at a pressure of 300 kPa was not declared by the applicant, the conformity of spray angle of nozzle to Cl F 3.2 of Annexure F of IS:3652-1995 could not be ascertained. In order to facilitate the testing in the true letter and spirit, this needs to be declared.

14.15 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
14.16 Safety provision/safety wear
   i) The accessories viz. mask, hand gloves and safety goggles for operator’s safety has been provided with sprayer.
   ii) Safety instructions regarding handling poisonous agro-chemical and first aid MUST be supplied with the sprayer.

15. TECHNICAL LITERATURE

No literature has been provided with the sprayer. The user manual containing information on operation of sprayer, working pressure and safety instructions regarding handling poisonous agro-chemical and first aid should be provided as per IS:8132-1999.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY
DIRECTOR

16. APPLICANT’S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.1</td>
<td>14.1-14.5</td>
<td>We will take up the matter with principal manufacturer.</td>
</tr>
<tr>
<td>16.2</td>
<td>14.6, 14.7 &amp; 14.8</td>
<td>We will mention identification mark on the nozzle in future.</td>
</tr>
<tr>
<td>16.3</td>
<td>14.9-14.14</td>
<td>We will take up the matter with principal manufacturer.</td>
</tr>
<tr>
<td>16.4</td>
<td>14.15</td>
<td>In future, all sprayers will be marked with labeling plate with all the necessary information.</td>
</tr>
<tr>
<td>16.5</td>
<td>14.6 (ii) &amp; 15</td>
<td>In future, we will mention all the safety signs and hazard pictorials and other required details on operator’s manual.</td>
</tr>
</tbody>
</table>