ALAP, APH-2S
ENGINE OPERATED PORTABLE POWER 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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3. TEST FOR DISCHARGE RATE OF PUMP
[vide Clause 8.3 of IS-11313: 2007]

1. Date of test: 13.03.2019
2. Atmospheric conditions:
   a) Temperature: 26 °C
   b) Relative humidity: 39%
   c) Pressure: 98.9 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>
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<tbody>
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</table>

Minimum discharge rate = 6897.5 ml/min at 15 kg/cm²
Maximum discharge rate = 7387.5 ml/min at 10 kg/cm²
Discharge at rated pressure = 7387.5 ml/min at 10 kg/cm²

4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP
[vide clause 8.4 of IS: 11313-2007]

Rated pressure, kg/cm²: 10
Engine speed corresponding to rated pressure, (rpm): 6503
Theoretical cubic capacity of pump: 7625.13
Actual volume at rated pressure, ml: 7127.50
Volumetric efficiency, %: 93

Remarks: - The high idle engine speed had to be set at 7300 rpm against declared high idle 7500 to obtain rated pressure at rated rpm of pump.

NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE, HISAR
[THIS REPORT VALID UP TO: 30TH April 2026]
5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range the max. hydraulic power was observed as 0.17 kW against the declared net power output of engine as 0.75 kW.

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 have been endorsed.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Parameter</th>
<th>Declaration</th>
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<tbody>
<tr>
<td>i</td>
<td>Engine Type</td>
<td>Single cylinder two stroke air cooled spark ignition engine.</td>
</tr>
<tr>
<td>ii</td>
<td>Bore,(mm)</td>
<td>33</td>
</tr>
<tr>
<td>iii</td>
<td>Stroke (mm)</td>
<td>30</td>
</tr>
<tr>
<td>iv</td>
<td>Displacement,(cc)</td>
<td>26</td>
</tr>
<tr>
<td>v</td>
<td>Net power output</td>
<td>0.75 kW @ 6500 rpm</td>
</tr>
<tr>
<td>vi</td>
<td>Max Torque</td>
<td>1.1 Nm@6000</td>
</tr>
</tbody>
</table>

7. PRESSURE ADJUSTMENT TEST

1. Date of test : 13.03.2019
2. Atmospheric conditions :
   a. Temperature : 26°C
   b. Relative humidity : 39%
   c. Pressure : 98.9 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>
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</thead>
<tbody>
<tr>
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<td>NIL</td>
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<td>2.</td>
<td>11.7</td>
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<td>NIL</td>
<td>--</td>
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<td>3.</td>
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<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>15</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
</tbody>
</table>
4. Resistance of pressure: Yes

8. TEST FOR HYDRAULIC SPRAY GUN

[Vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]

Date of test : 13.03.2019
Type of gun : Trigger type
F-6.3 The screw thread shall be well formed and the crests of the threads shall be free from burrs or any other defects which may prevent free engagement. Satisfactory Conforms

F-11 Marking Each nozzle shall be marked with following particulars:-

  a) Manufacturer’s name or recognized trade mark Not marked Does not conform
  b) Nozzle designation. Not marked Does not conform
  c) Batch or code number Not marked Does not conform

Cl.9

Cl. 9.1 All the components of the sprayer shall be free from burrs, pits and other visual defects which may be detrimental for their use. Nothing that may be detrimental for use was noticed Conforms

Cl. 9.2 The exposed metallic parts shall have a protective coating to prevent surface deterioration. Exposed metallic parts have the protective coating. Conforms

Cl.10. MARKING AND PACKING (Cl.10 IS:11313-2007)

Cl.10.1 Marking Each sprayer shall be marked with the following particulars :-

  a) Manufacturer’s name & his registered trade mark, Sl. No. and batch or code No. Just a sticker on frame is provided with following information:-

  Alap Hi Power Portable Sprayer
  Code : A.P.H-2S

  Does not conform in spirit and also in toto

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 manufacturing year and serial number of sprayer is not marked. It MUST be looked into.

16.2 The manufacturing year and serial number of pump is not specified. It MUST be looked into.
16.3 The thickness of wall of barrel does not meet the requirement of relevant code/Standard. It **MUST** be looked into.

16.4 The length of spray gun does not meet the requirement of relevant code/Standard. It **MUST** be looked into.

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

16.6 The manufacture’s name or recognized trade mark and batch or code number on spray gun is not provided. It **MUST** be provided.

16.7 The spray angle for fine cone spray pattern of gun at a pressure 600 kPa does not conform to the requirement of IS : 3562-1995. It **MUST** be looked into for further improvement.

16.8 The spray angle for fine cone spray pattern of nozzle at a pressure 300 kPa does not conform to the requirement of IS : 3562-1995. It **MUST** be looked into for further improvement.

16.9 The discharge rate for fine cone spray pattern and 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.

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

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

16.12 The distance between the edge outside of trigger and pivot of trigger does not meet the requirement of relevant code/Standard. It **MUST** be looked into.

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

16.14 The pressure gauge with full scale reading of 100 bar is provided, thus it does not conform to requirement of IS: 11313-2007. It **MUST** be looked into.

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

16.16 The pump discharge at rated pressure was observed as 7387.5 ml/min. against the requirement of 8000 ml/min. It should be looked into.
16.17 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

16.18 **Safety provision/safety wear**
   i) The safety instructions before, during and after spraying operation **MUST** be provided on sprayer.

17. **TECHNICAL LITERATURE**

The following literature are provided with the sprayer:
   i) Operator's service manual of sprayer with parts catalogue.
   ii) Operator's manual of engine with parts catalogue.

The following literature **MUST** be provided with the sprayer.
   iii) Operator's manual containing all the information including safety instructions before, during and spraying operation.
   iv) Service manual of engine.

**TESTING AUTHORITY**

<table>
<thead>
<tr>
<th>R. K. NEMA</th>
<th>SENIOR AGRICULTURAL ENGINEER</th>
</tr>
</thead>
<tbody>
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<table>
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<tr>
<th>P. K. PANDEY</th>
<th>DIRECTOR</th>
</tr>
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18. **APPLICANT'S COMMENTS**

No comments received from applicant