KISAN SHAKTHI KS-899H, 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

[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: 07.12.2018
2. Atmospheric conditions:
   a) Temperature: 24° C
   b) Relative humidity: 50%
   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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</table>

Minimum discharge rate = 6242.5 ml/min at 20 kg/cm²
Maximum discharge rate = 7242.5 ml/min at 5 kg/cm²
Discharge at rated pressure = 6902.5 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): 6645
Theoretical cubic capacity of pump, ml : 7372.8
Actual volume at rated pressure, ml : 6902.5
Volumetric efficiency, % : 94
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, 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 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 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 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.
16.12 The thickness of the wall of the barrel of gun does not meet the requirement of relevant Indian Standard. It MUST be looked into.
16.13 The diameter of connecting rod of gun does not meet the requirement of Indian Standard. It MUST be looked into.
16.14 Suction strainer aperture size does not meet the requirement relevant Indian Standard. It MUST be looked into.
16.15 Percentage variation of discharge for fine cone spray pattern was not within limit specified by the relevant Indian Standard.
16.16 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to requirement of IS : 3652-1995. It MUST be looked into.
16.17 At rated pressure of 10 Kg/cm² the pump discharge was observed as 6902.5 ml/min. against the minimum requirement of 8000 ml/min. This must be examined.
16.18 At the rated pressure of 10 kg/cm², the engine speed dropped up to 6645 rpm against the rated engine speed of 7000 rpm. This MUST be looked into for necessary action.
16.19 The pressure gauge with full scale reading 120 bar is provided, thus it does not conform to requirement of IS: 11313-2007. It MUST be looked into.
16.20 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.
16.21 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

16.22 Safety provision/safety wear
   i) Safety instructions regarding handling poisonous agro-chemicals before, during and after spraying operations should be provided on sprayer.

17. TECHNICAL LITERATURE

The following literatures are provided with sprayer for guidance to the user.
   i) Operator’s instruction manual and parts catalogue of sprayer.

The following literature MUST be provided with the sprayer :-
   i) Parts catalogue of engine.
   ii) Service manual of engine.

The operator instruction manual of sprayer needs to be updated as per IS 8132-1999.

TESTING AUTHORITY

R. K. NEMA  
SENIOR AGRICULTURAL ENGINEER

P. K. PANDEY  
DIRECTOR

18. APPLICANT’S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our reference</th>
<th>Applicant’s comments</th>
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<td>18.2</td>
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<td>Now we are providing safety wear at the time of delivery of sprayers to farmers along with the packing.</td>
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