e AGRO CARE EAC GX 25 HONDA 4S 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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3. TEST FOR DISCHARGE RATE OF PUMP
[vide Clause 8.3 of IS-11313: 2007]

1. Date of test : 11.05.2019
2. Atmospheric conditions :
   a) Temperature : 35° C
   b) Relative humidity : 37 %
   c) Pressure : 98.7 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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</thead>
<tbody>
<tr>
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<td>10</td>
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<tr>
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<tr>
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<td>4. 5450</td>
<td></td>
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</tr>
</tbody>
</table>

Minimum discharge rate = 5432.5 ml/min at 13 kg/cm²
Maximum discharge rate = 6580.0 ml/min at 10 kg/cm²
Discharge at rated pressure = 6580.0 ml/min at 10 kg/cm²

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

Date : 08.06.2019
Rated pressure, kg/cm² : 10
Engine speed corresponding to rated pressure (rpm) : 6195
Theoretical cubic capacity of pump, ml : 6832.82
Actual volume at rated pressure, ml : 6580.00
Volumetric efficiency, % : 96
5. POWER REQUIREMENT
During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.12 kW against the declared net power output of engine as 0.72 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/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 4 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>25</td>
</tr>
<tr>
<td>v</td>
<td>Net power out put</td>
<td>0.72 kW@ 7000 rpm</td>
</tr>
<tr>
<td>vi</td>
<td>Max Torque</td>
<td>1.28 Nm at @ 5000 rpm</td>
</tr>
</tbody>
</table>

7. PRESSURE ADJUSTMENT TEST
(Vide clause 8.7.1 of IS: 11313-2007)

1. Date of test : 11.05.2019
2. Atmospheric conditions :
   a. Temperature : 35 °C
   b. Relative humidity : 37 %
   c. Pressure : 98.7 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>10</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>11</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>3.</td>
<td>12</td>
<td>NIL</td>
<td>NIL</td>
<td>--</td>
</tr>
<tr>
<td>4.</td>
<td>13</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 : 30.04.2019
Type of gun : Screw type

8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN
The discharge rate for fine cone spray & jet spray pattern as 1650 ml/min & 2800 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under
- For fine cone spray pattern : 2742.5 ml/min
- For jet spray pattern : 5032.5 ml/min
10. Necessary tools & spares  
   Spanners, set of gasket, measuring jar should be provided  
   Spark plug spanner and open spanner are provided. Suction strainer having 1000 μm aperture size was provided  
   Does not conform in toto

11. Marking/Labeling of sprayer  
   Must be riveted on the body of sprayer having name & address of manufacturer, month & Year of manufacture, Rated speed, Rated pressure, discharge rate, Power rating of engine, SFC of engine  
   Just a sticker provided on pump & engine with following information :-
   • HONDA
   • Agro Agricultural Care
   • Knapsack Power Sprayer
   • e Agro Care  
   Does not conform

12. Literature  
   Operator manual, Service manual & parts catalogue should be provided, One day training.  
   Instruction Manual of engine provided.  
   Does not conform in toto

16. 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

17. COMMENTS AND RECOMMENDATIONS

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

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

17.3 The spray gun is not designated and marked by identification mark. The identification mark as specified by relevant Indian Standard. It MUST be specified.

17.4 The pump manufacturing year and serial No is not specified. It MUST be specified.

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

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

17.7 The material of pump cylinder does not meet the requirement of relevant code/Standard. It MUST be looked into.
17.8 The material of spreader does not meet the requirement of relevant code/Standard. It MUST be looked into.

17.9 The material of pressure regulator does not meet the requirement of relevant code/Standard. It MUST be looked into.

17.10 The material of spray nozzle does not meet the requirement of relevant code/Standard. It MUST be looked into.

17.11 The material of pump inlet port end fitting does not meet the requirement of relevant code/Standard. It MUST be looked into.

17.12 The material used for different components are not declared. It MUST be provided.

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

17.14 The manufacturer's name or recognized trade mark and batch or code number is not marked on spray gun. It MUST be marked.

17.15 The diameter of connecting rod is less than the value specified in the relevant code/Standard. It MUST be improved.

17.16 The thickness of wall of barrel does not meet the requirement of relevant code/Standard. It MUST be improved.

17.17 The discharge rate for fine cone spray pattern and jet spray pattern of spray gun at pressure at 600 kPa does not conform to the requirement of IS: 3652-1995. It MUST be looked into.

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

17.19 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.

17.20 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.

17.21 At rated pressure of 10 Kg/cm² the pump discharge was observed as 6580.0 ml/min. against the minimum requirement of 8000.0 ml/min. This MUST be examined.

17.22 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.

17.23 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.

17.24 The engaged threaded length of outlet port does not meet the requirement of relevant code/Standard. It MUST be improved.
17.25 The percentage variation of discharge rate of pump does not meet the requirement of relevant code/Standard. It MUST be looked into.

17.26 At the rated pressure of 10 Kg/cm² the engine speed dropped up to 6195 rpm against the rated engine speed of 7000 rpm. This MUST be looked into.

17.27 Necessary tools are not provided with sprayer. It MUST be provided.

17.28 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

17.29 Safety provision/safety wear

   i) Apron, gum boots and ear protector 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.

18. TECHNICAL LITERATURE

   The following literatures are provided with sprayer for guidance to the user.
   i) Owner's manual of engine.

The following literature MUST be provided with the sprayer.
   i) Instruction manual and parts catalogue of sprayer.
   ii) Parts catalogue of engage

The sprayer instruction manual should be developed as per IS: 8132-1999.

TESTING AUTHORITY

R. K. NEMA
SENIOR AGRICULTURAL ENGINEER

\[\text{Signature}\]

P. K. PANDEY
DIRECTOR

\[\text{Signature}\]

19. APPLICANT'S COMMENTS

No comments received from applicant