BCS 622 FH FODDER HARVESTER

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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11. AIR CLEANER OIL PULL OVER TEST

Date : 03.09.2019
Range of atmospheric conditions:
- Temperature(°C) : 39.5 to 40.3
- Pressure (kPa) : 97.6
- Relative humidity (%) : 52.6 to 54.1
Mass of oil in the air cleaner : 185.9 g
assemblies when filled with recommended grade of oil 5% in excess than marked level (g)

<table>
<thead>
<tr>
<th>Position</th>
<th>Slope (degree)</th>
<th>Loss of oil (g)</th>
<th>Oil pull over (%)</th>
<th>Remarks if any</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Horizontal</td>
<td></td>
<td>0°</td>
<td>0.5</td>
<td>0.27</td>
</tr>
<tr>
<td>ii) Tilted longitudinally with front end up</td>
<td>15°</td>
<td>0.1</td>
<td>0.05</td>
<td>The oil pull over is considered on higher side</td>
</tr>
<tr>
<td>iii) Tilted longitudinally with rear end up</td>
<td>15°</td>
<td>0.6</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>iv) Tilted laterally with right side up</td>
<td>15°</td>
<td>0.2</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>v) Tilted laterally with left side up</td>
<td>15°</td>
<td>0.1</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>

12. FIELD TEST

The fodder Harvester was operated in field for 28.56 hours (including running in 0.25 hours) only in Barceem harvesting.
The Fodder parameters recorded during the test with barceem crop are as given in Annexure-I and summarized in Table-2
Table-2 : Fodder parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Barceem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety</td>
<td>Mascavi</td>
</tr>
<tr>
<td>Plant height (cm)</td>
<td>42 to 97</td>
</tr>
<tr>
<td>Plant population (No of tillers per m²)</td>
<td>203 to 305</td>
</tr>
</tbody>
</table>

The results of field performance test are given in Annexure – II and are summarized in Table-3
Table 3: Summary of field Test:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Observation</th>
<th>Barceem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speed of operation, kmph</td>
<td>4.66 to 4.97</td>
</tr>
<tr>
<td>2</td>
<td>Rate of work</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ha/h</td>
<td>0.320 to 0.426</td>
</tr>
<tr>
<td></td>
<td>h/ha</td>
<td>2.35 to 3.13</td>
</tr>
<tr>
<td></td>
<td>t/h</td>
<td>6.41 to 15.02</td>
</tr>
<tr>
<td>3</td>
<td>Width of cut, m</td>
<td>1.18 to 1.27</td>
</tr>
<tr>
<td>4</td>
<td>Fuel consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>l/h</td>
<td>0.87 to 1.26</td>
</tr>
<tr>
<td></td>
<td>l/ha</td>
<td>2.04 to 2.98</td>
</tr>
<tr>
<td></td>
<td>l/t</td>
<td>0.06 to 0.18</td>
</tr>
<tr>
<td>5</td>
<td>Stubble height after harvesting,(cm)</td>
<td>2 to 13</td>
</tr>
<tr>
<td>6</td>
<td>Field efficiency (%)</td>
<td>55.9 to 77.6</td>
</tr>
</tbody>
</table>

12.1 Rate of work:
   i) During the tests the rate of work varied from:
      ha/h: 0.320 to 0.426
      h/ha: 2.35 to 3.13
      t/h: 6.41 to 15.02
   ii) The fuel consumption varied from:
        l/h: 0.87 to 1.26
        l/ha: 2.04 to 2.98
        l/t: 0.06 to 0.18

12.2 Quality of work:
   i) Stubble height after harvesting was observed from 2.0 to 13.0 cm.

12.3 Time required for daily maintenance:
   About 15 minutes are required for daily servicing and maintenance of Fodder harvester with one man only.

12.4 Labour requirement:
   Two person including driver are required for smooth operation of the machine in the field. Additional labour are required for collection of the sheaves fodder

12.6 Harvesting any other crop:
   The harvesting of Barceem Fodder was done by the reaper binder.

13. DEFECTS, ADJUSTMENT, BREAKDOWN & REPAIRS
   The ball joint of LHS wheel rim of BCS, 622 FH Fodder harvester was found broken during the Brake test.
14.7 Valve guides and valve springs:
Valve and valve guide clearance, mm
  Inlet valve : 0.05
  Exhaust valve : 0.05
Valve spring rate, kgf/mm
  Inlet valve : 1.45
  Exhaust valve : 1.44

No noticeable defect was observed for valve guide and valve spring.

14.8 Timing gear:
No noticeable defect was observed.

14.9 Clutch:
Overall thickness of clutch plate, mm : 4.4 to 4.5
No noticeable defect was observed.

14.10 Brake:
Thickness of brake shoe/ring, mm
  LHS : 5.14 to 7.40
  RHS : 5.20 to 7.35
No noticeable defect was observed.

15. SUMMARY OF OBSERVATION, COMMENTS AND RECOMMENDATION

15.1 Engine performance test
  i) The maximum power of the engine was observed as 6.93 kW against declared value of 7.35 kW. **The variation between observed value and declared value is too much, and therefore, MUST be looked into for corrective measure.**

  ii) The specific fuel consumption during two hour maximum power test was observed as 332 g/kWh against declared value of 279 g/kWh. **The variation between observed value and declared value is too much, and therefore, MUST be looked into for corrective action.**

15.2 Field test
  i) During the tests the rate of work varied from:
      ha/h: 0.320 to 0.426
      h/ha: 2.35 to 3.13
      t/h: 6.41 to 15.02

  ii) The fuel consumption varied from:
      l/h: 0.87 to 1.26
      l/ha: 2.04 to 2.98
      l/t: 0.06 to 0.18

15.3 Ease of operation & adjustment
No noticeable difficulties were observed during the test.

15.4 Assessment of wear:
No noticeable defect was observed in engine and machine components.
15.5 Hardness and chemical composition:
   i) The hardness of knife blade and knife guard does not conform to the requirement of IS: 6025-1982.
   ii) The carbon content of knife blade is not within the required limit specified as per IS: 6025-1982.
   iii) Carbon content of knife back is not within the requirement specified in IS: 10378-1982. Use of materials for knife blade and knife back meeting BIS requirement is recommended.

15.6 Dimensional requirement of cutter bar assembly:
   i) The specifications of knife section, knife back and knife guard does not conform to IS: 6025-1999, IS: 10378 and IS: 6024-1983 respectively. This should be looked into at production level.

15.7 Noise measurement:
   Maximum noise level at by standard’s position and at operator’s ear level was observed as 89 dB (A) and 96 dB (B) respectively.

15.8 Mechanical vibration:
   The amplitude of mechanical vibration of components marked as (*) in chapter 10 of this report may be consider on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub-assemblies.

15.9 Labeling plate
   Labeling plate is not provided on machine. A metallic labeling plate of permanent nature should be provided on machine with following information:-
   i) Make
   ii) Model
   iii) Serial No.
   iv) Year of manufacturer
   v) Manufacturer’s address
   vi) Engine make and model
   vii) Engine serial No.
   viii) Maximum power (kW)
   ix) Specific fuel consumption (g/kWh)

15.10 The dimension of knife blade does not meet the requirement of IS: 6025-1982. It should be improved.

15.11 The dimension of knife guard and ledger does not meet the requirements of IS: 6024-1983. It should be looked into for improvement.

15.12 The accelerator lever and stop lever does not meet the requirement of IS: 8133-1983. It should be looked into for corrective action.

15.13 The ball joint of LHS wheel rim of fodder harvester was found broken during brake test. This is a serious problem. The broken part was allowed to be replaced. This MUST be looked into.
16. TECHNICAL LITERATURE
The following literature was supplied with the machine during the course of test.
3. Parts catalogue Fodder Harvester
The operator's manual needs to be updated as per IS: 8132-1999.

TESTING AUTHORITY

MAAN SINGH
SENIOR TECHNICAL ASISATANT

P. K. PANDEY
DIRECTOR

Test report compiled by: C. Veeranjaneulu, Senior Technician

17. APPLICANT'S COMMENTS

<table>
<thead>
<tr>
<th>Para No</th>
<th>Our reference</th>
<th>Applicants comment's</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.1</td>
<td>15.1 (i) (ii)</td>
<td>These points have been up with our principals to take necessary corrective action.</td>
</tr>
<tr>
<td>17.2</td>
<td>15.5, 15.6, 15.7, 15.8, 15.10, 15.11, 15.12</td>
<td>Corrective actions are being taken and very soon a better available solution will be implemented in future production.</td>
</tr>
<tr>
<td>17.3</td>
<td>15.9</td>
<td>In future all supply, we will provide the labeling plate (as per report) with machines.</td>
</tr>
<tr>
<td>17.4</td>
<td>15.13</td>
<td>We have been taken corrective action already on this part</td>
</tr>
</tbody>
</table>