COMMERCIAL TEST REPORT

No.: IMP-639/1570
Month: December, 2013

RICE TRANSPLANTER
‘CLAAS PADDY PANTHER 26’
(SELF PROPELLED- RIDE ON)

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE & COOPEARATION)

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE TRACTOR NAGAR,
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14.2.3 Seedling holders & platform

The seedling holder, seedling platform and conveyor belt were visually inspected and found in normal working condition.

14.2.4 Floats

All the three floats were examined visually for cracks, punctures, etc and found in satisfactory working condition.

14.2.5 Hydraulic system

All components of the main and lateral feeding speed control hydraulic systems were inspected visually and found to be in normal working condition.

15. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

15.1 Engine Performance Test

<table>
<thead>
<tr>
<th>Brake power kW (Ps)</th>
<th>Crank shaft torque Nm (kgf-m)</th>
<th>Crank shaft speed (rpm)</th>
<th>Specific fuel consumption kg/kWh (kg/hph)</th>
<th>Specific energy kWh/l (hph/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum power two hours test</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>14.0 (19.0)</td>
<td>38.15 (3.89)</td>
<td>3500</td>
<td>0.392 (0.289)</td>
<td>2.006 (2.722)</td>
</tr>
<tr>
<td>13.8 (18.8)</td>
<td>37.66 (3.84)</td>
<td>3500</td>
<td>0.385 (0.282)</td>
<td>2.025 (2.760)*</td>
</tr>
<tr>
<td>Power at rated engine speed (3600 rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.8 (17.4)</td>
<td>33.93 (3.46)</td>
<td>3600</td>
<td>0.401 (0.295)</td>
<td>1.960 (2.665)</td>
</tr>
<tr>
<td>Maximum torque</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.0 (15.0)</td>
<td>45.90 (4.68)</td>
<td>2300</td>
<td>0.347 (0.255)</td>
<td>2.270 (3.086)</td>
</tr>
<tr>
<td>11.1 (15.1)</td>
<td>44.23 (4.51)</td>
<td>2400</td>
<td>0.358 (0.263)</td>
<td>2.181 (2.967)*</td>
</tr>
</tbody>
</table>

- The maximum gross power of engine was recorded as 14.0 kW (19.0 Ps) at 3500 rpm against manufacturer's declaration of 14.5 kW (19.7 Ps) under natural ambient temperature condition.
- The specific fuel consumption corresponding to maximum power was recorded as 0.392 kg/kWh (0.289 kg/hph) under natural ambient temperature condition.
- The maximum torque of the engine was recorded as 45.90 (4.68) Nm (kgf-m) against 2300 rpm of crank shaft of engine.
- The maximum back up torque of engine was recorded as 20.3% under natural ambient condition.
- The maximum lubricating oil temperature was recorded as 128.6 °C under high ambient condition.
15.2 Noise Level

Noise level at bystander position/operator's ear level were recorded as 74.4/89.4 dB(A), which are well within the maximum/ danger limit of 88/98 dB(A) respectively, specified for continuous exposure of 8 hours.

15.3 Mechanical Vibration

The amplitude of mechanical vibration on some of the controls marked as (*) under chapter 10 of the report is on higher side.

15.4 Field Test

15.4.1 The transplanter was operated in varying field conditions for a total period of 35.11 hours for transplanting 'PBW-1121 and PS-5' variety of paddy seedlings. The results are summarized as under.

- The average depth of transplanting was recorded as 5.8 to 9.60 cm.
- The coefficient of variation in average depth of transplanting was recorded as 8.75 to 15.16%.
- The spacing between rows was recorded as 29.80 to 30.60 cm.
- The coefficient of variation in row spacing was observed as 1.89 to 4.13%.
- The average number of plants per hill was recorded as 1 to 6.
- The average spacing between hills was recorded as 18.15 to 20.60 cm.
- The coefficient of variation of spacing between hills was recorded as 2.69 to 6.67%.
- The average total number of hill in 1 m row was recorded as 3.9 to 4.7.
- The evenness of total number of hill in 1 m row was recorded as 69.23 to 90.0%.
- The evenness was on lower side where the depth of the standing water was more than 4 cm.
- The average number of missing hills was recorded in 1 m as 7.50 to 16.88%.
- The average number of floating seedlings was recorded in 1 m² as 2.50 to 10.0%.
- The average number of buried seedlings was recorded in 1 m² as NIL.
- The average number of damaged seedlings was recorded in 1 m² as NIL to 5.0%.
- The total transplanting faults was recorded in 1 m² as 10.63 to 30.87%.
- The hourly fuel consumption was recorded as 2.671 to 4.041 l/h and fuel required for planting of one hectare area was recorded as 7.863 to 10.057 l/ha.
- The average number of fault seedling was on higher side on the field when the depth of standing water was ≥ 4 cm.
- Average area covered was recorded as 0.296 to 0.435 ha/h.
- Time required to cover one hectare 2.30 to 3.38 h/ha.

15.4.2 During the entire field operation, no overloading of the engine was noticed.
15.4.3 The quality of Puddling, Uniformity in leveling of the field, depth of standing water, Puddling index, Uniformity in density of the nursery mats and presence of weeds remains in the puddle soil affect the performance of the planter to a great extent.

15.4.4 The number of missing hills per square meter area is attributed mainly attributed to the non uniform germination of nursery mat, and depth of standing water observed to 4 cm.

15.4.5 The quality of work was observed to be smooth during entire transplanting operation and overall performance of the machine was found satisfactory.

15.5 Components / assembly inspection
15.5.1 The engine was dismantled after 56.38 hours of operation and wear of critical components were observed to be within the limits.

15.6 Safety Provisions
The machine has the following safety provisions.
- A front bumper, and side floating bumper.
- Front bonnet above the engine and gear box.
- Drive belt protective covers.
- A slip clutch (torque limiter) at planting arm is provided to protect the planter drive mechanism.
- Two clutch levers to engage or disengaged for power supply.
- Parking brake is provided for safety.

15.7 Ease of operation and adjustments
- All the controls, which are required to be used frequently are within the easy reach of the operator.
- There was no problem was observed to maneuvering of Rice transplanter on field on road.
- The planting depth, hill spacing and number of seedling per hill can be adjusted quickly.
- The seedling carrier is provided just above the engine for holding nursery trays. If the carrier is loaded fully with mat trays operator’s vision is obstructed.
- No other operational difficulty was noticed during the operation of the transplanter even in the smaller fields.
- One touch hydraulic swing system is provided to enable the operator to cross over the bunds and while turning the machine (even with full load) in the field.
- Four wheel drive is provided for field work.
- Power steering is provided for easy working of operator.
15.8 Labour requirement
A trained operator is required for efficient operation of the machine. One helper is required for safe handling and loading of mats.

16 Literature

The manufacturer had provided operator’s manual & parts catalogue with the machine in English language. The literature provided is found to be adequate for guidance of the users and services personnel. However, it is recommended to develop this literature in other Indian regional language to meet the regional requirement.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>(J.P/MANDAL) AGRICULTURAL ENGINEER</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P. K. CHOPRA) SENIOR AGRICULTURAL ENGINEER</td>
</tr>
<tr>
<td>(HIMAT SINGH) - DIRECTOR-</td>
</tr>
</tbody>
</table>

: Test report compiled by Sh. S.A.Hinge, (Senior Tech. Asstt.).

APPLICANTS COMMENTS

1. All the applicants comments are received and recorded in a final test report.

<table>
<thead>
<tr>
<th>Clause</th>
<th>Item</th>
<th>Applicant Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.4.1</td>
<td>1.5</td>
<td>Coefficient of variation in depth of transplanting and percentage of evenness of hill are attributed to land preparation and leveling factor of the field.</td>
</tr>
<tr>
<td>15.4.1</td>
<td>7</td>
<td>Missing hills are attributed to field and nursery conditions.</td>
</tr>
</tbody>
</table>