RICE TRANSPLANTER
KUBOTA, SPV 6MD

GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE & FARMERS WELFARE
(DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE)

NORTHERN REGION FARM MACHINERY TRAINING AND TESTING INSTITUTE
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### Engine Performance Test

<table>
<thead>
<tr>
<th>Brake power kW</th>
<th>Crank shaft torque Nm</th>
<th>Crank shaft speed (rpm)</th>
<th>Specific fuel consumption kg/kWh</th>
<th>Specific energy kWh/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum power two hours test</td>
<td>12.9</td>
<td>38.40</td>
<td>3212</td>
<td>0.285</td>
</tr>
<tr>
<td>Power at rated engine speed (3200 rpm)</td>
<td>12.9</td>
<td>38.40</td>
<td>3200</td>
<td>0.285</td>
</tr>
<tr>
<td></td>
<td>12.4</td>
<td>36.99</td>
<td>3200</td>
<td>0.281</td>
</tr>
<tr>
<td>Maximum torque</td>
<td>10.9</td>
<td>46.36</td>
<td>2246</td>
<td>0.267</td>
</tr>
<tr>
<td></td>
<td>11.1</td>
<td>45.18</td>
<td>2350</td>
<td>0.64</td>
</tr>
</tbody>
</table>

- The maximum power of engine was recorded as 12.92 kW at 3212 rpm against manufacturer’s declaration of 14.4 kW.
- The specific fuel consumption corresponding to maximum power was recorded as 0.285 kg/kWh.
- The maximum torque of the engine was recorded as 46.36 Nm.
- The back up torque of engine was recorded as 20.7% in natural ambient condition which is normal.
- The maximum lubricating oil temperature was recorded as 110°C which is within the manufacturer declared limit of 120°C.

#### 15.2 Noise Level
Noise level at operator’s ear level was recorded as 90 dB(A), which is within the danger limit of 90 dB(A) & more than warning limit of 85 dB(A), specified for continuous exposure of 8 hours. It should be looked into.

#### 15.3 Mechanical Vibration
The amplitude of mechanical vibration on the controls and components marked as (*) are more than 100 microns. It should be looked into for dampening down the vibration to improve service life of components & operators comfort.

#### 15.4 Field Test
15.4.1 The transplanter was operated in varying field conditions for a total period of 36.4 hours for transplanting ‘PR-121’ variety of paddy seedlings. The results are summarized as under.
- The average depth of transplanting was recorded as 2.95 to 3.6 cm.
- The spacing between row to row was recorded as 28.5 to 30.0 cm.
- The average number of plants per hill was recorded as 3 to 4.
- The average spacing between hills was recorded as 15.65 to 16.60 cm.
- The average total number of hill in 1 m² was recorded as 27.4 to 31.80.
- The missing hills was recorded as 1.19% to 12.14%.
- The floating seedlings was recorded as Nil to 8.33%.
- The buried seedlings was recorded in as Nil.
- The total transplanting faults was recorded as 2.38% to 20.47%.
- The hourly fuel consumption was recorded as 1.97 to 3.29 l/h and fuel required for planting of one hectare area was recorded as 0.199 to 0.362 ha/h.
- Time required to cover one hectare 2.76 to 5.03 h/ha.
15.4.2 The quality of work was observed as satisfactory during entire transplanting operation. Overall performance of the machine was found satisfactory.

15.5 Components/assembly inspection
15.5.1 The engine was dismantled after 53.74 hours of operation and wear of critical components were observed to be within the limits and in normal condition.

15.6 Safety Provisions
The machine has the following safety provisions.
- Drive & moving parts adequately protected.
- A slip clutch (torque limiter) at planting arm is provided to protect the planter drive mechanism.
- Warning and caution notices are provided on machine.

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.
- No noticeable difficulty was observed during handling of machine.
- The planting depth, hill spacing and number of seedling per hill can be adjusted.
- The seedling carriers are provided on both side (i.e. LHS & RHS) of operator for holding nursery trays.
- Main shift lever & differential lock pedal is not labeled.

15.8 Labour requirement
A trained operator is required for efficient operation of the machine. One helper is required for handling and loading of mats.

15.9 Literature
The manufacturer had provided following literature with the machine for reference during test.
1) Operator’s manual, SPV 6MD (English)
2) Workshop manual, SPV 6MD (English)
3) Illustrated parts list, SPV 6MD (English)
The literature provided are found adequate however, it is recommended to develop the literature in Hindi as well as other regional languages for users.

TESTING AUTHORITY

<table>
<thead>
<tr>
<th>G.R. AMBALKAR</th>
<th>R.K. NEMA</th>
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<tbody>
<tr>
<td>Agricultural Engineer</td>
<td>Senior Agricultural Engineer</td>
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</table>

Test report compiled by Sh. Maan Singh, Sr. Tech. Assistant

16. APPLICANT’S COMMENTS

No specific comments received from applicant.