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ii) The welding of various parts shall be free from blow holes, exposed porosity, exposed inclusions unfilled crate and un fused welds.

The welding of various parts are free from blow holes, exposed porosity, exposed inclusions unfilled crate and un fused welds.

Conforms

iii) The exposed metallic parts shall be free from rust and shall have a protective coating.

The exposed metallic parts are free from rust and shall have a protective coating.

Conforms

5.13 Marking and packing:

Marking- each laser leveller shall be marked with:

a) Manufacturer’s name and trade-mark, if any.

b) Size; and
c) Batch or code number

These particulars shall be stamped, embossed or engraved on metallic plate and rigidly fitted on a non-wearing part of terrace.

Sticker provided at RHS of machine on mould board frame (For details, refer Para 4.10).

Does not conform

6. FIELD TEST

The field tests of 21.09 hours with 4 replications were conducted. The each replication was of minimum 3.92 hour. The field performance observation are given in annexure II.

The summary of field performance test is given in Table VIII.

TABLE-VIII: Summary of field performance

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Parameters</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Tractor used</td>
<td>Swaraj-855 FE</td>
</tr>
<tr>
<td>ii)</td>
<td>Gear used</td>
<td>H-1</td>
</tr>
<tr>
<td>iii)</td>
<td>Type of soil</td>
<td>Sandy loam</td>
</tr>
<tr>
<td>iv)</td>
<td>Av. soil moisture, %</td>
<td>0.7 to 18.2</td>
</tr>
<tr>
<td>v)</td>
<td>Bulk density of soil, g/cc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before operation(Undisturbed soil)</td>
<td>1.505 to 1.777</td>
</tr>
<tr>
<td></td>
<td>After operation(Disturbed soil)</td>
<td>1.360 to 1.574</td>
</tr>
<tr>
<td>vi)</td>
<td>Av. Depth of cut, mm</td>
<td>14 to 34</td>
</tr>
<tr>
<td>vii)</td>
<td>Av. Working width, m</td>
<td>1.950 to 2.094</td>
</tr>
<tr>
<td>viii)</td>
<td>Av. speed of operation, kmph</td>
<td>6.09 to 6.42</td>
</tr>
<tr>
<td>ix)</td>
<td># Wheel slippage, %</td>
<td>11.01 to 14.93</td>
</tr>
<tr>
<td>x)</td>
<td>* Area covered, ha/h</td>
<td>0.050 to 0.184</td>
</tr>
<tr>
<td>xi)</td>
<td>Time required for one hectare, h</td>
<td>5.42 to 20.20</td>
</tr>
<tr>
<td>xii)</td>
<td>Fuel consumption</td>
<td></td>
</tr>
<tr>
<td>xiii)</td>
<td>- l/h</td>
<td>3.67 to 4.29</td>
</tr>
<tr>
<td></td>
<td>- l/ha</td>
<td>19.88 to 83.05</td>
</tr>
<tr>
<td>xiv)</td>
<td>Draft requirement, kg</td>
<td>579 to 949 (745)</td>
</tr>
<tr>
<td>xv)</td>
<td>Range dia. of laser beam, m</td>
<td>710</td>
</tr>
<tr>
<td>xvi)</td>
<td>Land slope before operation , %</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lengthwise</td>
<td>0.067 to 1.015</td>
</tr>
<tr>
<td></td>
<td>Widthwise</td>
<td>0.138 to 0.487</td>
</tr>
<tr>
<td>xvii)</td>
<td>Land slope after operation, %</td>
<td>Lengthwise Widthwise</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.007 to 0.255</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.029 to 0.109</td>
</tr>
<tr>
<td>xviii)</td>
<td>Blade bucket capacity, kg (Approx)</td>
<td>629.33 to 728.36</td>
</tr>
<tr>
<td>xix)</td>
<td>Coefficient of variation of leveling after leveling</td>
<td>0.003 to 0.024</td>
</tr>
<tr>
<td>x)</td>
<td>Evenness in leveling, %</td>
<td>97.6 to 99.7</td>
</tr>
</tbody>
</table>

# Vary with depth of cut of blade
* Vary with land slope & depth of cut

6.1 Rate of work

6.1.1 The rate of work in sandy loam soil was recorded as 0.050 to 0.184 ha/h and the forward speed as 6.09 to 6.42 kmph.

6.1.2 The time required to cover one hectare area was recorded as 5.42 to 20.20 h.

6.1.3 Fuel consumption of tractor varies from 3.67 to 4.29 l/h whereas fuel consumption per hectare varies from 19.88 to 83.05 l/ha.

6.2 Quality of work

6.2.1 Depth of cut of soil cutting blade was varies from 14 to 34 mm.

6.2.2 Slope of land across its length & width after laser leveler operation was observed as 0.007% to 0.255 % & 0.029 % to 0.109 % respectively.

6.2.3 Coefficient of variation & evenness of the operation of leveling after operation were observed as 0.003 % to 0.024 % and from 97.6 % to 99.7 % respectively.

6.2.4 Working diameter of laser beam was recorded 710 m.

7. EASE OF OPERATION, ADJUSTMENTS & SAFETY

7.1 Depth of cut of soil cutting blade can be adjusted by raising/lowering the receiver height from operator seat.

7.2 Maneuverability of the laser leveler unit during field operation was satisfactory.

8. SOUNDNESS OF CONSTRUCTION

No breakdown occurred during 21.09 hrs. of operation field operation

9. COMMENTS & RECOMMENDATIONS

9.1 Quality of field leveling was satisfactory.

9.2 Deflection of laser beam before & after the field test was within the limit & the deflection was also normal after the temperature gradient & vibration test.
9.3 No leakage of hydraulic oil from hydraulic circuits observed during field & lab test.

9.4 No mist or water vapour were observed inside emitter prism glass when tested as per IP 65 for water resistance test.

9.5 Hardness, carbon content & dimensions of soil cutting blade does not conform to the limit specified in IS:9813:2002 therefore it should be looked into at regular production level.

9.6 Draft requirement varies from 579 to 949 kg, where as the average draft requirement was observed as 745 kg.

9.7 Identification plate/marking provide on the implement is blank and does not conform the requirement specified as per IS: 9813:2002. It should be provided with make, model, serial No. etc. as per IS.

9.8 Only two reflectors are provided on at rear of mould board frame on LHS & RHS. Safety signs and hazard warnings pictorials are not provided on the implement. It should be provided for safety and detail safety instructions should also be included in operator’s manual.

10. LITERATURE:
A literature of service manual was supplied by manufacturer. The literature as operator’s manual and part catalogue should be updated & brought out as per IS: 8132:1999 in Hindi, English & other regional languages for the guidance of users and technical personnel.

TESTING AUTHORITY

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

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

11. APPLICANT’S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant’s Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1</td>
<td>9.5</td>
<td>We will comply during our regular production.</td>
</tr>
<tr>
<td>11.2</td>
<td>5.11 (iii), (v), (vi) &amp; (ix)</td>
<td>We will comply during regular production.</td>
</tr>
<tr>
<td>11.3</td>
<td>5.13 &amp; 9.7</td>
<td>Embossed metallic plate will be use in our regular production with serial number, name etc.</td>
</tr>
</tbody>
</table>