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17.9 Wear of the peg teeth:
The wear of the peg teeth of the threshing cylinder and concave was measured. The percentage wear on mass basis was computed and the results are given below:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Peg teeth of threshing cylinder:</th>
<th>Peg teeth of concave:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original mass before test (g)</td>
<td>Mass after 25.63 h of test (g)</td>
</tr>
<tr>
<td>a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>210.7</td>
<td>209.5</td>
</tr>
<tr>
<td>2.</td>
<td>215.7</td>
<td>214.1</td>
</tr>
<tr>
<td>3</td>
<td>223.4</td>
<td>221.4</td>
</tr>
<tr>
<td>4</td>
<td>219.4</td>
<td>217.4</td>
</tr>
<tr>
<td>5</td>
<td>215.3</td>
<td>213.4</td>
</tr>
<tr>
<td>6</td>
<td>213.4</td>
<td>214.5</td>
</tr>
<tr>
<td>7</td>
<td>223.6</td>
<td>222.0</td>
</tr>
<tr>
<td>8</td>
<td>220.4</td>
<td>219.1</td>
</tr>
<tr>
<td>b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>220.0</td>
<td>218.4</td>
</tr>
<tr>
<td>2</td>
<td>220.7</td>
<td>218.0</td>
</tr>
<tr>
<td>3</td>
<td>220.4</td>
<td>218.4</td>
</tr>
<tr>
<td>4</td>
<td>220.5</td>
<td>219.1</td>
</tr>
<tr>
<td>5</td>
<td>219.4</td>
<td>218.2</td>
</tr>
<tr>
<td>6</td>
<td>222.4</td>
<td>220.7</td>
</tr>
<tr>
<td>7</td>
<td>223.0</td>
<td>221.5</td>
</tr>
<tr>
<td>8</td>
<td>219.4</td>
<td>218.4</td>
</tr>
</tbody>
</table>

18. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

18.1 Engine performance test:

<table>
<thead>
<tr>
<th>Engine Brake power, kW</th>
<th>Engine speed (rpm)</th>
<th>Hourly fuel consumption kg/h (l/h)</th>
<th>Specific fuel consumption kg/kwh</th>
<th>Specific energy, kWh/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Maximum power - 2 hours test:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70.7</td>
<td>2200</td>
<td>20.51 (24.82)</td>
<td>0.290</td>
<td>2.848</td>
</tr>
<tr>
<td>52.6</td>
<td>1500</td>
<td>12.65 (15.25)</td>
<td>0.240</td>
<td>3.453**</td>
</tr>
<tr>
<td>ii) Power at rated engine speed (2200 rpm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>70.95</td>
<td>2200</td>
<td>20.53 (24.70)</td>
<td>0.289</td>
<td>2.872</td>
</tr>
<tr>
<td>69.61</td>
<td>2200</td>
<td>20.16 (24.55)</td>
<td>0.290</td>
<td>2.835*</td>
</tr>
<tr>
<td>iii) Maximum torque:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>54.01</td>
<td>1400</td>
<td>12.81 (15.45)</td>
<td>0.237</td>
<td>3.496</td>
</tr>
<tr>
<td>51.45</td>
<td>1400</td>
<td>12.44 (15.13)</td>
<td>0.242</td>
<td>3.401*</td>
</tr>
<tr>
<td>48.75</td>
<td>1300</td>
<td>11.38 (13.71)</td>
<td>0.233</td>
<td>3.556**</td>
</tr>
<tr>
<td>iv) Five hour rating test:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Engine loaded to 90% of maximum power:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65.0</td>
<td>2282</td>
<td>20.0 (24.39)</td>
<td>0.308</td>
<td>2.667*</td>
</tr>
<tr>
<td>b) Maximum power:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>69.5</td>
<td>2200</td>
<td>20.32 (24.78)</td>
<td>0.292</td>
<td>2.805*</td>
</tr>
</tbody>
</table>

* Under high ambient condition.
** Specified for field work.
Remarks:

i) The maximum power output of the engine was observed as 70.7 kW & 52.6 kW at 2200 rpm and 1500 rpm of engine at full throttle and setting recommend for field operation respectively.

ii) The specific fuel consumption corresponding to maximum power at full throttle and setting recommended for field operation was measured as 0.290 & 0.240 Kg/kwh.

iii) The back-up torque of the engine was measured as 19.6% under natural ambient at full throttle.

iv) The maximum smoke density was recorded as 3.12 (Bosch No.) which is within permissible limit.

v) The maximum temperature of engine oil, coolant(water) and exhaust gas was observed as 117.4, 102.0 and 501°C respectively.

vi) The lubricating oil & coolant consumption during five hours rating test were measured as 0.334 g/kWh and 1.90% of total coolant capacity respectively.

18.2 Turning ability:
The diameter of turning circle at LHS and RHS was observed satisfactory.

18.3 Visibility:
The visibility around the cutter bar from operator's seat in normal sitting position is satisfactory.

18.4 Braking performance:
i) The minimum stopping distance and pedal force corresponding to deceleration of 2.5 m/sec² were observed as 6.19m and 351N respectively. The performance is in line with the IS: 12207-2008.

ii) The performance of parking brake was found satisfactory.

18.5 Mechanical vibration:
The amplitude of mechanical vibration of components marked as (*) in chapter 13 of this report are 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.

18.6 Noise measurement:
The ambient noise emitted by the machine at bystander and driver's ear level were measured as 93 & 101 dB (a) respectively. The noise at operator's ear level exceeds the limit of 98 dB(A) specified by IS:15806-2007.

18.7 Field test:
18.7.1 Summary of field tests:
The results of the field test are summarized below:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Parameters</th>
<th>Range of parameters</th>
<th>Average of parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wheat Harvesting</td>
<td>Paddy Harvesting</td>
</tr>
<tr>
<td>1.</td>
<td>Speed of operation (kmph)</td>
<td>2.96 to 3.10</td>
<td>2.15 to 2.98</td>
</tr>
<tr>
<td>2.</td>
<td>Area covered (ha/h)</td>
<td>0.913 to 1.09</td>
<td>0.63 to 0.796</td>
</tr>
<tr>
<td>3.</td>
<td>Fuel consumption:</td>
<td>7.790 to 8.246</td>
<td>7.33 to 8.95</td>
</tr>
<tr>
<td></td>
<td>- (l/h)</td>
<td>7.284 to 8.687</td>
<td>10.40 to 12.286</td>
</tr>
</tbody>
</table>
**Table:**

<table>
<thead>
<tr>
<th></th>
<th>Crop throughput (tonne/h)</th>
<th>6.57 to 14.40</th>
<th>15.29 to 17.59</th>
<th>11.66</th>
<th>16.065</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Grain breakage in main grain outlet (%)</td>
<td>0.301 to 0.631</td>
<td>0.297 to 0.509</td>
<td>0.443</td>
<td>0.401</td>
</tr>
<tr>
<td>6.</td>
<td>Header losses (%)</td>
<td>0.118 to 0.273</td>
<td>0.088 to 1.246</td>
<td>0.166</td>
<td>0.678</td>
</tr>
<tr>
<td>7.</td>
<td>Total non-collectable losses (%)</td>
<td>0.160 to 0.332</td>
<td>0.118 to 1.402</td>
<td>0.218</td>
<td>0.792</td>
</tr>
<tr>
<td>8.</td>
<td>Total collectable losses (%)</td>
<td>0.331 to 0.773</td>
<td>Nil to 0.507</td>
<td>0.496</td>
<td>0.470</td>
</tr>
<tr>
<td>9.</td>
<td>Total processing losses (%)</td>
<td>0.678 to 1.157</td>
<td>0.325 to 1.428</td>
<td>0.990</td>
<td>0.798</td>
</tr>
<tr>
<td>10.</td>
<td>Threshing efficiency (%)</td>
<td>99.22 to 99.66</td>
<td>99.5 to 99.9</td>
<td>99.49</td>
<td>99.68</td>
</tr>
<tr>
<td>11.</td>
<td>Cleaning efficiency (%)</td>
<td>98.43 to 99.00</td>
<td>97.2 to 99.4</td>
<td>98.72</td>
<td>98.34</td>
</tr>
</tbody>
</table>

18.7.1  **Wheat harvesting**
- The grain breakage in all the varieties tested was measured as 0.301 to 0.631 percent.
- The total non-collectable losses ranged from 0.160 to 0.332 percent.
- The total processing losses ranged from 0.678 to 1.157 percent.
- The threshing efficiency ranged from 99.22 to 99.66 percent.
- The cleaning efficiency ranged from 98.43 to 99.00 percent.

18.7.2  **Paddy harvesting**
- The grain breakage ranged from 0.297 to 0.509 percent.
- The total non-collectable losses ranged from 0.118 to 1.402 percent.
- The total processing losses ranged from 0.325 to 1.428 percent.
- The threshing efficiency ranged from 99.5 to 99.9 percent.
- The cleaning efficiency ranged from 97.2 to 99.4 percent.

18.7.3  **Harvesting of any other crops**
The performance of combine to harvest wheat, paddy crops was evaluated as the same were recommended by the applicant.

**Ease of operation and safety provision**
- The controls provided around the operator are within easy reach, but not labelled with symbols as per Indian standard. Therefore it is recommended that the symbols as per the requirement of IS-6283-1998 may be provided.
- The design of stone trap need to be modified for easy cleaning without removing header unit.
- Slip clutch should be provided at bottom grain auger & tailing elevator and at undershot conveyor.
- The mechanical arrangement for adjusting the reel speed though provided, needs to be modified such that the same could be controlled from operator's position.
- The grain tank needs to be provided with suitable grain fill indicator device.
- A dust blower is provided below operator control panel to throw away the dust coming to operator front side.
18.7.4 Assessment of wear
i) The wear of engine components i.e. cylinder liners, piston, piston rings, valves, valve guides, springs, big-end bearings and main bearings were observed within the permissible limit.
ii) The transmission gears and components were found in normal working condition.
iii) The timing gears, clutch lining, release bearing were found in normal working condition.
iv) The condition of the components of brake, hydraulic system and steering system was observed to be normal.
v) The condition of the bearing, chains, sprockets and belts was observed to be normal.
vi) The components of starter motor and alternator were found in normal working condition.
vii) The rate of wear of rasp bar and peg teeth of threshing cylinder & concave were observed as normal.
viii) The maximum noise level at bistandard position and at operator’s ear level was observed as 93 dB(A) & 101 dB(A) respectively. Which is high. Hazard warning with recommendation to wear ear protection to operator & distance warning for bistandard should be provided.
ix) Appropriate labels to advice to read the operator’s manual before operation and safety warning notices/pictorials should be provided on machine.

18.8 Hardness and chemical composition
18.8.1 Hardness of knife blade at remainder zone and hardened zone it does not conform to the limit as specified in relevant code IS:6025-2004.

18.8.2 Hardness of knife guard conforms to their relevant code.

18.8.3 Chemical composition of knife blade conforms to their relevant code.

18.8.4 Carbon content of knife back is lower then the limit as specified in IS:10378-2006. This should be looked into in future at regular production level.

18.5 Labelling of combine harvester
The labelling plate as per IS: 10273-1999 is provided on the combine harvester. Labelling of controls, safety & hazard warning needs to be provided.

18.6 Literature supplied with the machine:
Following literature were supplied by the manufacturer
1. Operator manual in English
2. Parts catalogue in Hindi, English & Punjabi
The literature operator manual & service book needs to update & modified as per IS: 8132-1999. It may also be brought out in Hindi & other regional languages to guide to users and operator of combine harvester.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Characteristics</th>
<th>Requirement</th>
<th>Declared</th>
<th>Observed</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prime mover performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i)</td>
<td>Max. Power (absolute) Average max. power observed during 2 hrs. max. power test in natural ambient condition, kW</td>
<td>It should not be less than 5% of the declared value.</td>
<td>74.3</td>
<td>70.7</td>
<td>Conforms</td>
</tr>
<tr>
<td>ii)</td>
<td>Max. power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW</td>
<td>Max. power observed must not be less than 5% of declared value.</td>
<td>55.0</td>
<td>52.6</td>
<td>Conforms</td>
</tr>
<tr>
<td>iii)</td>
<td>Power at rated engine speed, kW</td>
<td>The observed value must not be less than 5% of the declared value by the applicant.</td>
<td>74.3</td>
<td>70.95</td>
<td>Conforms</td>
</tr>
<tr>
<td>iv)</td>
<td>Specific fuel consumption g/kWh.</td>
<td>The average observed value during 2 hr. max. power test must be within ±5% of the declared value by applicant/manufacturer.</td>
<td>238±5</td>
<td>290</td>
<td>Does not conform</td>
</tr>
<tr>
<td>v)</td>
<td>Max. smoke density (bosch no.) at 80% load between the speed at max. power &amp; 55% of speed at max. or 1000 rpm which ever is higher, should be observed as per CMVR rule</td>
<td>For tractor :- 5.2 bosch no. or 75 hartridge For engine :- Free deceleration or natural aspirated or turbo charges - 65 hartridge</td>
<td>--</td>
<td>3.12</td>
<td>Conforms</td>
</tr>
<tr>
<td></td>
<td>Max. crank shaft torque, (N·m) observed during the test after no load engine speed is adjusted as per manufacture’s recommendation for field work</td>
<td>It must not be less than 8% of declare value by manufacturer.</td>
<td>350</td>
<td>358</td>
<td>Conforms</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>vi)</td>
<td>Back up torque, %</td>
<td>7% min.</td>
<td>--</td>
<td>19.6</td>
<td>Conforms</td>
</tr>
<tr>
<td>vii)</td>
<td>Max. operating temp. To be declared by manufacturer.°C</td>
<td>i) engine oil</td>
<td>120</td>
<td>117.4</td>
<td>Conforms</td>
</tr>
<tr>
<td>viii)</td>
<td>ii) Coolant</td>
<td>108</td>
<td>102</td>
<td>Conforms</td>
<td></td>
</tr>
<tr>
<td>ix)</td>
<td>Lubrication oil consumption, g/kWh</td>
<td>1% of SFC at 5hr. max. power test during high ambient condition</td>
<td>2.92+10%</td>
<td>0.334</td>
<td>Conforms</td>
</tr>
</tbody>
</table>

2. **Brake performance**

| i) | Max. stopping distance at a force equal to or less than 600 N on break pedal, m | 10 m or $S \leq 0.15V + V^2/130$ V=speed corresponding to 80% of design max. speed, kmph | -- | 6.19 | Conforms |
| ii) | Max. force exerted on brake pedal to achieve a deceleration of 2.5 m/sec². | $\leq 600N.$ | -- | 351 | Conforms |
| iii) | Whether parking brake is effective at a force of 600 N at foot pedal or 400 N at Hand and lever | Yes or No | -- | Yes | Conforms |

3. **Mechanical vibration**

| i) | Operator’s platform | 120 µm max. | -- | 100 | Conforms |
| ii) | Steering wheel | 150 µm max. | -- | 130 | Conforms |
| iii) | Seat with driver seated | 120 µm max. | -- | 130 | Does not conform |
## 4. Air cleaner oil pull over

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Max. oil pull over in % age when tested in accordance with IS: 8122 pt. (II)-2000</td>
<td>0.25% max.</td>
<td>NA</td>
</tr>
</tbody>
</table>

Machine is provided with dry type air cleaner hence test is not applicable.

## 5. Noise measurement

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Max. ambient noise emitted by combine dB (A)</td>
<td>88 dB (A) as per CMVR</td>
<td>93</td>
</tr>
<tr>
<td>ii)</td>
<td>Max. noise at operator's ear level dB (A)</td>
<td>98 dB (A) as per CMVR</td>
<td>101</td>
</tr>
</tbody>
</table>

## 6. Discard limit

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Cylinder bore diameter, mm</td>
<td>Should not exceed the values declared by the manufacture</td>
<td>104.15</td>
</tr>
<tr>
<td>ii)</td>
<td>Piston diameter</td>
<td>--do--</td>
<td>103.25</td>
</tr>
<tr>
<td>iii)</td>
<td>Ring end gap</td>
<td>--do--</td>
<td>1.2</td>
</tr>
<tr>
<td>iv)</td>
<td>Ring groove clearance</td>
<td>--do--</td>
<td>Top-0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Second-0.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oil ring-0.1</td>
</tr>
<tr>
<td>v)</td>
<td>Diametrical and axial clearance of big end bearing</td>
<td>--do--</td>
<td>Diametrical-0.12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Axial-0.60</td>
</tr>
<tr>
<td>vi)</td>
<td>Diametrical and axial clearance of main bearings</td>
<td>--do--</td>
<td>Diametrical-0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Axial-0.40</td>
</tr>
<tr>
<td>vii)</td>
<td>Thickness of brake lining</td>
<td>--do--</td>
<td>--</td>
</tr>
<tr>
<td>viii)</td>
<td>Thickness of clutch plate</td>
<td>--do--</td>
<td>--</td>
</tr>
</tbody>
</table>

## 7. Field performance

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Suitability for crops</td>
<td>Wheat &amp; paddy essential</td>
<td>Wheat &amp; paddy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≤ 2.5%</td>
<td>Conforms</td>
</tr>
<tr>
<td>ii)</td>
<td>Grain breakage in grain tank</td>
<td>(0.301 to 0.631%)</td>
<td>Wheat (0.301 to 0.631%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Av.=0.442%</td>
<td>Av.=0.401%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.297 to 0.509%)</td>
<td>Paddy (0.297 to 0.509%)</td>
</tr>
</tbody>
</table>
### SELF PROPELLED COMBINE HARVESTER

**G. S. J. 955**, COMMERCIAL (ICT)

<table>
<thead>
<tr>
<th></th>
<th>Non collectable losses</th>
<th></th>
<th>Wheat (0.16 to 0.332%)</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 2.5% for wheat, paddy &amp; gram ≤ 4.0% for soybean</td>
<td></td>
<td>Av.=0.218% Paddy (0.118 to 1.402%) Av.=0.792%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Threshing efficiency</th>
<th></th>
<th>Wheat (99.22 to 99.68%)</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥ 98% wheat &amp; paddy</td>
<td></td>
<td>Av.=99.49% Paddy (99.5 to 99.9%) Av.=99.68%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cleaning efficiency</th>
<th></th>
<th>Wheat (98.43 to 99.0%)</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥ 96 % wheat &amp; paddy</td>
<td></td>
<td>Av.=98.72% Paddy (97.2 to 99.4%) Av.=98.34%</td>
<td></td>
</tr>
</tbody>
</table>

#### 8. Safety requirement

<table>
<thead>
<tr>
<th></th>
<th>Guards against all moving parts</th>
<th>Essential</th>
<th>Provided</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Lighting arrangement</th>
<th>Essential as per CMVR</th>
<th>Provided</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii)</td>
<td>a) Head light b) Parking light c) Indication d) Reverse gear e) Brake f) Number plate</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Grain tank cover</th>
<th>Essential</th>
<th>Not provided</th>
<th>Does not conform</th>
</tr>
</thead>
<tbody>
<tr>
<td>iii)</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Spark arrester in engine’s exhaust</th>
<th>Essential</th>
<th>Not provided</th>
<th>However turbo charger eliminates the turbo charger requirement of spark arrester</th>
</tr>
</thead>
<tbody>
<tr>
<td>iv)</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Stone trap before concave</th>
<th>Essential</th>
<th>Provided</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>v)</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Rear view mirror</th>
<th>Essential</th>
<th>Provided</th>
<th>Conforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>vi)</td>
<td></td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| vii) | Slip clutch at following drives –  
  a) Cutting platform auger  
  b) Under shot conveyor drive  
  c) Grain & tailing elevator | Essential | -- | Not provided | Does not conform |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provided</td>
<td>Provided</td>
<td>Conforms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii)</td>
<td>Anti slip surfaces at operator platform &amp; ladder &amp; proper gripping for the control levers</td>
<td>Essential</td>
<td>--</td>
<td>Provided</td>
<td>Conforms</td>
</tr>
<tr>
<td>ix)</td>
<td>Working clearance around the controls</td>
<td>Essential</td>
<td>70 mm, min.</td>
<td>--</td>
<td>Provided</td>
</tr>
<tr>
<td>x)</td>
<td>Labelling of control and gauges</td>
<td>Essential</td>
<td>--</td>
<td>Provided</td>
<td>Conforms</td>
</tr>
</tbody>
</table>

9. **Material of construction:**

i) Knife guard should conforms to **IS: 6024 -2004**  
The guard (except ledger plate) shall be manufactured from malleable iron casting (IS: 2108-1977), steel casting (IS: 1030-1974) or steel forging (IS: 2004-1978)  
| -- | Uncertainable as the relevant code does not specify the content limits. | -- |

ii) Knife blade As per **IS :6025 -2004**  
It must have Chemical composition as  
C= 0.70-0.95 %  
Mn =0.30-0.50 %  
| -- | C= 0.7327%  
Mn= 0.4192% | Conforms |

iii) Knife back  
Must meet the requirement of **IS:10378-2006**  
The knife back shall be manufactured from Carbon Steel having minimum carbon content of 0.35 %  
| -- | C= 0.2216% | Does not conform |
### 10. Labelling of combine harvester

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category of breakdowns</th>
<th>Category (evaluative/ Non evaluative)</th>
<th>Requirements as per IS: 15806-2008</th>
<th>As observed</th>
<th>Whether meets the requirements (Yes/No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Critical</td>
<td>Evaluative</td>
<td>No critical breakdown</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Major</td>
<td>Evaluative</td>
<td>Not more than three and neither of them should be repetitive in nature</td>
<td>One</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Minor</td>
<td>Evaluative</td>
<td>Not more than five and frequency of each should not be more than three</td>
<td>None</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### 11. Break down (critical, major & minor)

**Sr. No.**

**Category of breakdowns**

**Category (evaluative/ Non evaluative)**

**Requirements as per IS: 15806-2008**

**As observed**

**Whether meets the requirements (Yes/No.)**

---

### TESTING AUTHORITY

**G.R. AMBALKAR**  
Agricultural Engineer

**R.K. NEMA**  
Senior Agricultural Engineer

**HIMAT SINGH**  
Director

Test report compiled by: Sh. S.A. Hinge, Sr. Tech. Assistant

---

### APPLICANT'S COMMENTS

<table>
<thead>
<tr>
<th>Para No.</th>
<th>Our Reference</th>
<th>Applicant's Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.1</td>
<td>16</td>
<td>The defect occurred due to lodged crop high moisture and choking of combine however we will use better quality shaft during regular production.</td>
</tr>
<tr>
<td>20.2</td>
<td>19 (8 (iii))</td>
<td>Now we have started providing grain tank cover in our regular production.</td>
</tr>
</tbody>
</table>