



**INTERNATIONAL TRACTORS LIMITED,  
SONALIKA INTERNATIONAL DI-750 III SUPER TRACTOR**



भारत सरकार  
कृषि मंत्रालय  
(कृषि एवं सहकारिता विभाग)

GOVERNMENT OF INDIA  
MINISTRY OF AGRICULTURE  
(DEPARTMENT OF AGRICULTURE & CO-OPERATION)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान  
ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५  
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Initially the applicant had submitted the "Sonalika International DI-750 III Super" tractor model for initial commercial test. During PTO performance test, maximum power search, the maximum power was observed as 31.6 kW against the declaration of 34.0 kW, which was 7.1% less than the declared value and not meeting the requirement of IS: 12207-2008. Thereupon, the firm had withdrawn the test sample from test and incomplete commercial test report No. T-734/1241/2010 was released in August, 2010.

Subsequently, the manufacturer has submitted another sample of same tractor model for Initial Commercial testing vide their letter No. R & D/ F-18 dated 16<sup>th</sup> April, 2011. Accordingly, all tests on second sample completed and this test report is released as under.

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|   |   |  |
|---|---|--|
| Manufacturer                            | : | <b>M/s. International Tractors Limited,<br/>Vill. Chack Gujran, P.O. Piplanwala,<br/>Jalandhar Road,<br/>HOSHIARPUR (Punjab) – 146 022</b> |
| Test requested by (applicant)           | : | <b>The Manufacturer</b>  |
| Selected for test by                    | : | <b>The Applicant</b>   |
| Place of running-in                     | : | <b>At manufacturer's works</b>   |
| <b>Duration of said running-in (h):</b> |   |  |
| - Engine                                | : | <b>35</b>  |
| - Transmission                          | : | <b>Nil</b>   |
| <b>Method of Selection</b>              | : | <b>The tractor was submitted directly by the applicant for test. Hence, method of selection is not known.</b>                              |

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**1. SPECIFICATIONS**

|                     |   |  |
|---------------------|---|--|
| <b>1.1 Tractor:</b> |   |  |
| Make                | : | International Tractors Limited   |
| Model               | : | Sonalika International DI-750 III Super  |
| Variant, if any     | : | No variant models declared by the manufacture                                    |
| Type                | : | Four wheeled, Rear wheel driven, standard Agricultural Tractor.                  |
| Year of manufacture | : | 2010   |
| Chassis number      | : | HZZDC 205575/3   |
| Country of Origin   | : | India  |
| <b>1.2 Engine:</b>  |   |  |
| Make                | : | International Tractors Ltd.  |
| Model               | : | 4100 IL  |
| Type                | : | Four stroke, naturally aspirated, water cooled, direct injection, diesel engine. |
| Serial number       | : | 4100IL03F206200  |

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**17. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS**

17.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2008 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

| S. No.        | Characteristic  | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2008  | Values declared by the applicant (D)/ Requirement (R) | As observed    | Whether meets the requirements (Yes/No.) |
|---------------|---|--|---|---|----------------|--|
| 1             | 2   | 3                                      | 4   | 5   | 6              | 7  |
| <b>17.1.1</b> | <b>PTO Performance :</b>  |  |   |   |                |  |
| a)            | Maximum power under 2 h test, (kW) (Natural ambient condition)    | Evaluative                             | Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >35hp. -7.5/+10% for PTO power ≤ 35 hp   | 32.5 (D)  | 31.1           | Yes                                      |
| b)            | Power at rated engine speed, (kW)                                 | Non Evaluative                         | -do-  | 32.5 (D)  | 31.1           | Yes                                      |
| c)            | Specific fuel consumption corresponding to maximum power, (g/kWh) | Non Evaluative                         | + 5%  | 263 (D)   | 261            | Yes                                      |
| d)            | Maximum equivalent crankshaft torque, (Nm)                        | Non Evaluative                         | ± 8%  | 190 (D)   | 182.0          | Yes                                      |
| e)            | Back-up torque, percent   | Non Evaluative                         | 7 percent, min.   | 7 percent, min. (R)                                   | 34.6           | Yes                                      |
| f)            | <b>Maximum operating temperature, (°C)</b>                        |  |   |   |                |  |
|               | 1) Engine oil   | Non Evaluative                         | The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.                           | 132 (D)   | 116            | Yes                                      |
|               | 2) Coolant (water)  | Evaluative                             | The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration. | 118 (D)   | 99             | Yes                                      |
| g)            | Engine oil consumption, (g/kWh)                                   | Evaluative                             | Not exceeding 1% of SFC at max. power under High ambient conditions   | 2.60 (R)  | 0.38           | Yes                                      |
| h)            | Smoke level   | Evaluative                             | Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)   | 3.25 per meter (R)                                    | 0.16 per metre | Yes                                      |

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a)

b)

c)

d)

17.1.3

a)

b)

17.1.4

a)

b)

c)

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| 1             | 2  | 3              | 4  | 5                                 | 6          | 7   |
|---------------|--|----------------|--|-----------------------------------|------------|-----|
| <b>17.1.2</b> | <b>Drawbar performance :</b>   |                |  |                                   |            |     |
| a)            | Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)  | Non Evaluative | Minimum 65% of static mass with ballast  | 19.58 (D)<br>19.44 (R)<br>Minimum | 26.18      | Yes |
| b)            | Max. drawbar pull without ballast corresponding to 15 percent wheel slip, (kN)   | Evaluative     | Minimum 65% of static mass of tractor without ballast  | 15.32 (D)<br>15.17 (R)<br>Minimum | 18.88      | Yes |
| c)            | Maximum drawbar power without ballast, (kW).   | Evaluative     | Min. 80% of PTO power as referred in 16.1.1 (a) of PTO performance   | 26.0 (D)<br>24.9 (R)<br>Minimum   | 28.2       | Yes |
| d)            | Max. transmission oil temperature (°C)   | Non Evaluative | The declared value should not exceed the maximum value specified by oil company  | 130 (D)                           | 78         | Yes |
| <b>17.1.3</b> | <b>Power lift and hydraulic pump performance :</b>   |                |  |                                   |            |     |
| a)            | Maximum lifting capacity throughout the range of lift, (kN):   |                |  |                                   |            |     |
| 1)            | At hitch points  | Non Evaluative | [Tolerance of minus 10%]   | 14.00 (D)                         | 16.84      | Yes |
| 2)            | With the standard frame  | Evaluative     | The lift capacity should at least be 18 kg/PTO hp. And it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft | 10.00 (D)<br>7.36 (R)<br>Minimum  | 12.18      | Yes |
| b)            | Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 Minutes, (mm) | Non Evaluative | [Tolerance of plus 5 mm]   | 50 (D)                            | 10         | Yes |
| <b>17.1.4</b> | <b>Brake performance at 25 kmph:</b>   |                |  |                                   |            |     |
| a)            | Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):                                   |                |  |                                   |            |     |
| 1)            | Cold brake   | Evaluative     | 10   | 10 (R)                            | 6.95       | Yes |
| 2)            | Hot brake  | Evaluative     | 10   | 10 (R)                            | 7.80       | Yes |
| b)            | Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)   | Evaluative     | 600  | 600 (R)                           | 290 to 380 | Yes |
| c)            | Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever   | Evaluative     | Yes / No   | Yes (R)                           | Yes        | Yes |



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| 1             | 2   | 3                     | 4  | 5  | 6   | 7   |
|---------------|---|-----------------------|--|--|---|-----|
| <b>17.1.5</b> | <b>Noise measurement :</b>                              |                       |  |  |   |     |
| a)            | Maximum ambient noise emitted by the tractor dB(A)      | Evaluative            | As per CMVR  | 88 (R)   | 85  | Yes |
| b)            | Maximum noise at operator's ear level dB(A)             | Evaluative            | As per CMVR  | 98 (R)   | 96  | Yes |
| <b>17.1.6</b> | <b>Amplitude of mechanical vibrations at :</b>          |                       |  |  |   |     |
| 1)            | Left foot rest  | <b>Non Evaluative</b> | <b>100 microns (max)</b>   | 100 (R)  | 240   | No  |
| 2)            | Right foot rest   |                       |  | 100 (R)  | 600   | No  |
| 3)            | Seat (with driver seated)                               |                       |  | 100 (R)  | 90  | Yes |
| 4)            | Steering wheel  |                       |  | 100 (R)  | 300   | No  |
| <b>17.1.7</b> | <b>Haulage requirements :</b>                           |                       |  |  |   |     |
| a)            | Gross mass of the trailers, (tones):                    |                       |  |  |   |     |
| 1)            | Two wheel   | Non                   | --   | 5.0 (D)  | 5.0   | Yes |
| 2)            | Four wheel  | Evaluative            | --   | <b>6.5 (D)</b>                                     | 6.5   | Yes |
| b)            | Distance travelled / litre of fuel consumption, (km/l): |                       |  |  |   |     |
| 1)            | Two wheel   | Non                   | --   | 4.5 to 6.0 (D)                                     | 5.61 to 5.86  | Yes |
| 2)            | Four wheel  | Evaluative            | --   | 4.5 to 6.0 (D)                                     | 5.29 to 5.42  | Yes |
| c)            | Fuel consumption (ml/km/tonne):                         |                       |  |  |   |     |
| 1)            | Two wheel   | Non                   | --   | 30 to 40 (D)                                       | 34.2 to 35.7  | Yes |
| 2)            | Four wheel  | Evaluative            | --   | 30 to 40 (D)                                       | 28.4 to 29.1  | Yes |
| <b>17.1.8</b> | <b>Wetland cultivation :</b>                            |                       |  |  |   |     |
|               | Sealing for the following assemblies:                   | Evaluative            | The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2.<br>If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only. | There should be no ingress of water and/or mud (R) | Ingress of mud and / or water in the RHS king pin and LHS stub axle assemblies was observed | No  |
| 1)            | Clutch assembly   | -do-                  |  |  |   |     |
| 2)            | Brake housings  | -do-                  |  |  |   |     |
| 3)            | Front axle hubs   | -do-                  |  |  |   |     |
|               |   |                       |  |  | No ingress of mud and / or water was observed after supplementary test                      | Yes |
| <b>17.1.9</b> | <b>Safety features :</b>                                |                       |  |  |   |     |
| a)            | Guards against moving and hot parts                     | Evaluative            | As per CMVR  | At present no requirements                         | Provided  | Yes |
| b)            | Lighting arrangement                                    | Evaluative            | As per CMVR  | --   | Provided  | Yes |

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| 1              | 2  | 3              | 4  | 5           | 6                                       | 7              |
|----------------|--|----------------|--|-------------|---|----------------|
| <b>17.1.10</b> | <b>Labelling of tractors (Provision of labelling plate):</b> |                |  |             |   |                |
| 1)             | Make   | Evaluative     | Should conform to the requirements of CMVR along-with declared value of PTO HP | --          | International Tractors Ltd.             | Yes            |
| 2)             | Model  | Evaluative     |  | --          | Sonalika International DI-750 III Super | Yes            |
| 3)             | Year of manufacture  | Evaluative     |  | --          | 2010                                    | Yes            |
| 4)             | Engine number  | Evaluative     |  | --          | 4100IL03F206200                         | Yes            |
| 5)             | Chassis number   | Evaluative     |  | --          | HZZDC205575/3                           | Yes            |
| 6)             | Declaration of PTO power, (kW)                               | Evaluative     |  | --          | 32.5                                    | Yes            |
| <b>7.1.11</b>  | <b>Discard limit for:</b>                                    |                |  |             |   |                |
| <b>(a)</b>     | Cylinder bore diameter, (mm)                                 | Evaluative     | To be specified by the manufacturer  | 100.30      | 100.03 to 100.04                        | Yes            |
| <b>(b)</b>     | Clearance between piston & cylinder liner at skirt, (mm)     | Non Evaluative |  | 0.35        | 0.158 to 0.162                          | Yes            |
| <b>(c)</b>     | <b>Ring end gap (mm):</b>                                    |                |  |             |   |                |
|                | - Top comp. ring.  | Evaluative     | -do-   | <b>2.00</b> | <b>0.60 to 0.65</b>                     | Yes            |
|                | - 2 <sup>nd</sup> comp. ring.                                |                | -do-   | 2.00        | 1.00 to 1.05                            | Yes            |
|                | - Oil ring.  |                | -do-   | 2.00        | 0.65 to 0.75                            | Yes            |
| <b>(d)</b>     | <b>Ring groove clearance (mm):</b>                           |                |  |             |   |                |
|                | - Top comp. ring.  | Evaluative     | -do-   | 0.15        | Taper rings                             | Not applicable |
|                | - 2 <sup>nd</sup> comp. ring.                                |                | -do-   | 0.14        | 0.088 to 0.099                          | Yes            |
|                | - Oil ring.  |                | -do-   | 0.13        | 0.052 to 0.068                          | Yes            |
| <b>(e)</b>     | <b>Clearance of main bearings (mm):</b>                      |                |  |             |   |                |
|                | - Diametrical clearance                                      | Evaluative     | -do-   | 0.40        | 0.076 to 0.122                          | Yes            |
|                | - Crankshaft end float                                       | Evaluative     | -do-   | 0.60        | 0.20                                    | Yes            |
| <b>(f)</b>     | <b>Clearance of big end bearings, (mm):</b>                  |                |  |             |   |                |
|                | - Diametrical  | Evaluative     | -do-   | 0.31        | 0.079 to 0.109                          | Yes            |
|                | - Axial  | Evaluative     | -do-   | 1.00        | 0.30 to 0.40                            | Yes            |
| <b>(g)</b>     | Clearance between king pin and bush, (mm)                    | Non Evaluative | -do-   | 1.00        | 0.07 to 0.09                            | Yes            |
| <b>(h)</b>     | Clearance between centre pin and bush, (mm)                  | Non Evaluative | -do-   | 1.00        | 0.14 to 0.17                            | Yes            |



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| 17.1.12 CATEGORY OF BREAKDOWNS / DEFECTS : |                        |  |  |             |  |
|--|------------------------|--|--|-------------|--|
| S. No.                                     | Category of breakdowns | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2008   | As observed | Whether meets the requirements (Yes/No.) |
| 1.   | Critical               | Evaluative                             | No critical breakdown  | <b>None</b> | Yes                                      |
| 2.   | Major                  | Evaluative                             | Not more than two and neither of them should be repetitive in nature   | <b>None</b> | Yes                                      |
| 3.   | Minor                  | Evaluative                             | Not more than five and frequency of each should not be more than two.  | <b>None</b> | Yes                                      |
| 4.   | Total breakdowns       | Evaluative                             | In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns. | <b>None</b> | Yes                                      |

| 17.2 Optional requirements as per Clause-4 (Table-2) of IS:12207-2008: |   |   |                               |  |
|--|---|---|-------------------------------|--|
| S. No.   | Characteristic                                    | Requirements as per IS: 12207-2008                              | As observed                   | Whether meets the requirements (Yes/No.) |
| 1  | 2   | 3   | 4                             | 5  |
| 1  | Air cleaner oil pull over, max. Oil pull over (%) | 0.25% (max.)  | 0.14                          | Yes                                      |
| 2.   | Seating requirements                              | Should meet the requirements of IS: 12343-1998                  | Does not meet the requirement | <b>No</b>                                |
| 3.   | Fitment of ROPS                                   | With a provision for fitment of ROPS.                           | Not provided                  | <b>No</b>                                |
|  |   | If ROPS fitted it should meet the requirement of IS: 11821-1992 | ROPS not fitted               | <b>Not applicable</b>                    |
| 4.   | Technical requirements for PTO shaft              | Should meet the requirements of IS: 4931 -1995                  | Meets the requirement         | Yes                                      |
| 5.   | Dimensions of three point linkage                 | Should meet the requirements of IS: 4468 (Part-I)-1997          | Does not meet the requirement | <b>No</b>                                |
| 6.   | Specifications of linkage drawbar                 | <b>Should meet the requirements of IS: 12953-1990.</b>          | Meets the requirement         | Yes                                      |
|  | Specification of swinging drawbar                 | Should meet the requirements of IS: 12362 Part 3-1994.          | Not provided                  | <b>Not applicable</b>                    |
| 7.   | Accessories                                       | Trailer hitch, front tow hook, linkage drawbar may be provided. | Provided                      | Yes                                      |

**17.3 Conformity with following IS:**

- i) Guidelines for declaration of power and specific fuel consumption and labelling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : **Conforms**
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)] : **Conforms**

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| iii)  | Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468(Part-I):1997 (Reaffirmed in March, 2007) / ISO 730-1:1994]   | : | Does not conform |
| iv)   | Drawbar for agricultural tractors - Link type [IS 12953:1990 (Reaffirmed in March, 2009)]   | : | Conforms         |
| v)    | Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Reaffirmed in March, 2009)]   | : | Does not conform |
| vi)   | Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1) 1996 (Reaffirmed in March, 2007) /ISO 4254-1:1989]   | : | Does not Conform |
| vii)  | Tractors and machinery for agriculture and forestry - Technical means for ensuring safety Part 2: Tractors (first revision) (IS: 12239 (Part-2) 1999) (Reaffirmed in March, 2009)]  | : | Does not conform |
| viii) | Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays [IS: 6283 (Part-1) - 2006 (Reaffirmed in March, 2009) and IS: 6283 (Part-2)-2007 (Reaffirmed in March, 2009)] | : | Does not conform |
| ix)   | Guidelines for location and operation of operator controls on agricultural tractors and machinery (first revision) IS: 8133-1983 (Reaffirmed in March, 2009)]   | : | Does not conform |
| x)    | Agricultural Tractors and Machinery - Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)]  | : | Conforms         |

**17.4 Salient Observations:**

**17.4.1 Laboratory tests:**

**17.4.1.1 PTO Performance:**

- i) The backup torque is **34.6%**.
- ii) The specific fuel consumption corresponding to maximum power was measured as **261 g/kWh** against the declaration of **263 g/kWh**, which meets the requirement of IS: 12207-2008 with regard to tolerance.
- iii) During the PTO performance test, the maximum PTO power was recorded as **32.6 kW**, but after completion of maximum power two hours, varying speed and varying loads at rated engine speed, the maximum PTO power was dropped to **31.5 kW**. Thereafter, maximum power was again searched and complete PTO performance test under natural ambient condition was repeated for confirmation and during which maximum PTO power was recorded as **31.1 kW**. The drop in maximum PTO power was recorded as **4.6%** which indicates an abnormal behavior of the fuel governing system of the tractor. This should be looked into at production level.





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**17.4.1.2 Mechanical Vibration:**

The amplitude of mechanical vibration on various assemblies marked as (\*) in Chapter-9 of this test report are on higher side, especially at steering control wheel & foot rests. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

**17.4.1.3 Three point linkage:**

- i) The lateral distance from lower hitch point to centre line of tractor does not meets the requirement of IS: 4468 (Part-1)-1997. This should be looked into for necessary corrective action.
- ii) Some of the parameters of the three point linkage conform to Cat. I and some of them conform to Cat.II. Keeping in view of the spirit of standardization, the necessary improvements may be incorporated.

**17.4.1.4 Linkage drawbar:**

Some of the parameters of linkage drawbar conform to Cat.I and some of them conform to Cat.II. In view of the spirit of standardization, necessary improvements may be incorporated.

**17.4.1.5 Operator's Seat:**

Length of seat does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.

**17.4.2 Field performance test:**

**17.4.2.1 Dryland Operation:**

- i) The average area covered in disc ploughing operation with recommended size of plough was recorded in the range of 0.134 to 0.169 ha/h. Keeping in view the PTO power of the tractor, the area coverage is considered less, hence the recommended size of the plough may be reviewed.
- ii) The average fuel required to cover one hectare area was recorded in the range of 23.85 to 41.57 liters/ha; during disc ploughing operation with recommended size of plough. The fuel consumed in ploughing operation is considered very high and calls for necessary corrective action.

**17.4.2.2 Wetland cultivation (puddling operation):**

- i) During the Initial test on wet land cultivation, (puddling operation) ingress of mud and water was observed in RHS king pin assemblies and LHS stub axle due to absence of felt ring (Part No. 10002668AA) in respective assemblies. Therefore, the tractor was not meeting the requirements or suitability for wetland cultivation (Puddling operation).
- ii) Thereafter, the firm had requested for fitment of the additional parts that is felt rings (Part No. 10002668AA) at king pins & stub axle of front axle and also replaced the following parts having same specifications to rectifying the problem.

| S. No. | Part Name | Existing parts | Quantity | Replaced Parts | Quantity |
|--------|-----------|----------------|----------|----------------|----------|
| 1.     | Wear ring | 10002664 AB    | 2        | 10002664 AB    | 2        |
| 2.     | Mud Block | 20003513 AB    | 4        | 20003513 AB    | 4        |

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- iii) The supplementary wetland cultivation (Puddling operation) test was conducted and no ingress of water and/or mud was observed in various assemblies / components. The tractor was found suitable for wetland cultivation (Puddling operation) and meets the requirements of IS: 11082-1984. ( Technical requirements of agricultural tractors for wetland operations).

**It is therefore, recommended that, the felt rings (Part No. 10002668AA) at king pins & stub axle of front axle should also be fitted in regular production of the tractor. In addition to this, stringent quality control measures should also be introduced at production line**

- iv) Mud block (Part No. 20003513 AB) of LHS stub axle was found burned. It was replaced with new one before conduction of supplementary wetland cultivation (Puddling operation) test. This breakdown is considered as a pre-mature and calls for necessary improvements in quality of the material used.

**17.5 Maintenance / Service Problems:**

No noticeable maintenance or service problem was observed during the test.

**17.6 Recommendation with regard to safety on tractor:**

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Provision of safety against accidental start of the engine.
- ii) Provision for spark arresting device in exhaust system.
- iii) Provision for retaining the fuel shut-off lever in "STOP" position.
- iv) The working clearance between the draft control lever and mudguard may be provided as per IS: 12239 (Part-2) – 1999.
- v) Provision of PTO shaft master shield.
- vi) Provision of adequate guards for hydraulic pipe line, alternator and its drive belt.

**17.7 Adequacy of Literature supplied with machine:**

**17.7.1** No literature was supplied during the course of testing for reference. However, the following literature has been supplied by the applicant during the preparation of test report.

- i) Operator's manual
- ii) Service manual
- iii) Spare part's catalogue

**17.7.2** Details of all variant models and their features at a glance should be included in the operator's manual of the tractor.



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- 17.7.3 The following discrepancies were noticed in the part catalogue and specifications submitted to this Institute.
- The part number for felt rings of king pins & stub axle were not matching with the specified part number. Beside this, the felt rings were not fitted on the said assembly of the selected test sample.
  - Mud block (Part No. 20003513 AB) of stub axle was not illustrated in the supplied part catalogue of the tractor. In place of mud block oil seal (Part No. 04070155080) was illustrated. This may be re-examined and corrective action should be taken.

**TESTING AUTHORITY:**

**J.J.R. NARWARE**  
SENIOR AGRICULTURAL ENGINEER

**V.N. KALE**  
DIRECTOR

Test report compiled by Shri. Sanjay Kumar Senior Technical Assistant

**18. APPLICANT'S COMMENTS**

| Para No. | Our Reference                               | Applicant's comments  |
|----------|---|---|
| 18.1     | Clause No. 17.1.6-1,2,4                     | We will take necessary action on it.  |
| 18.2     | Clause No. 17.3 –<br>(III),V),VI),VIII),IX) | We will look into for necessary improvements.   |
| 18.3     | Clause No. 17.4.2.1-I),II)                  | We will take necessary action on it.  |
| 18.4     | Clause No. 17.3-VII),17.6                   | We will look into these safety features and will take necessary action.                   |
| 18.5     | Clause No. 17.4.2.2-iii)                    | We will take necessary action to implement stringent quality measures at production line. |
| 18.6     | Clause No. 17.4.2.2-iv)                     | We will take necessary improvement in quality of material used.                           |
| 18.7     | Clause No. 17.7.3                           | These discrepancies will be corrected in the spare part's catalogue.                      |

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**ANNEXURE - I****BRIEF SPECIFICATION OF IMPLEMENTS USED DURING FIELD TEST**

| S. No. | Item                             | Disc Plough   | Rotavator       |
|--------|----------------------------------|---------------|-----------------|
| 1.     | Make                             | M & M         | Howard          |
| 2.     | Type                             | Mounted       | Mounted         |
| 3.     | No. of discs/blades              | Three         | 36, in 7 flange |
| 4.     | Type of discs/blades             | Plain concave | Hatchet         |
| 5.     | Size of discs/blades, (mm)       | 625           | 225 x 50 x 10   |
| 6.     | Spacing of discs/flanges, (mm)   | 455           | 250             |
| 7.     | Lower hitch point span, (mm)     | 690           | 720             |
| 8.     | Mast height, (mm)                | 455           | 481             |
| 9.     | <b>Overall dimensions, (mm):</b> |               |                 |
|        | - Length                         | 1610          | 1750            |
|        | - Width                          | 850           | 1000            |
|        | - Height                         | 1080          | 980             |
| 10.    | Gross mass, (kg)                 | 370           | 345             |

**ANNEXURE - II****BRIEF SPECIFICATION OF HALF CAGE WHEEL**

| S. No. | Items                           | Specification  |
|--------|---------------------------------|--|
| 1.     | Type                            | Full cage wheel  |
| 2.     | Dia, (mm)                       | 1116   |
| 3.     | Width, (mm)                     | 845  |
| 4.     | No. and types of lugs           | 24, straight lugs made of MS angle section, welded to angle iron frame |
| 5.     | Size of angle section, (mm)     | 50 x 50 x 6  |
| 6.     | Length of lugs, (mm)            | 430  |
| 7.     | Spacing of lugs, (mm)           | 310  |
| 8.     | Weight of each cage wheels (kg) | 135  |



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ANNEXURE – IIITRACTOR RUN HOURS DURING TEST

| <b>A.</b> | <b>LABORATORY AND TRACK TESTS:</b>   | <b>HOURS</b> |
|-----------|--|--------------|
| 1.        | Running-in   | --           |
| 2.        | PTO performance test   | 19.2         |
| 3.        | Drawbar performance test   | 15.2         |
| 4.        | Power lift and hydraulic pump performance test   | 3.8          |
| 5.        | Turning ability  | 0.2          |
| 6.        | Location of centre of gravity  | 0.2          |
| 7.        | Operator's field of vision   | 0.2          |
| 8.        | Brake test   | 2.2          |
| 9.        | Noise measurement  | 1.5          |
| 10.       | Mechanical vibration test  | 1.0          |
| 11.       | Theoretical speed test   | 0.5          |
| 12.       | Air cleaner oil pull over test   | 3.5          |
| <b>B.</b> | <b>FIELD TEST:</b>   |              |
| 1.        | Disc ploughing   | 13.2         |
| 2.        | Rotavation   | 10.5         |
| 3.        | Puddling (including five hours water proof test)   | 30.6         |
| <b>C.</b> | <b>HAULAGE TEST:</b>   | 9.4          |
| <b>D.</b> | Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test | 8.0          |
|           | <b>TOTAL:</b>  | <b>119.2</b> |