

गोपनीय परीक्षण रिपोर्ट  
CONFIDENTIAL TEST REPORT

संख्या / No. : T-1546/2074/2021

माह / Month : June, 2021

व्यावसायिक परीक्षण रिपोर्ट में परिवर्तित  
CONVERTED TO COMMERCIAL TEST REPORT

(यह परीक्षण रिपोर्ट 30/06/2024 तक मान्य है। / THIS TEST REPORT IS VALID UP TO : 30/06/2024)



**VST SHAKTI, MT 171 DI TRACTOR**



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय  
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(Department of Agriculture, Co-operation & Farmers Welfare)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) 466 445

**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**

(An ISO : 9001 - 2015 Certified Institute)

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Initially the applicant had submitted the application of 'VST SHAKTI, MT 171 DI' tractor for confidential test vide letter no. nil dated 28/08/2020. After releasing the draft test report, applicant had submitted a letter no. nil dated 14.06.2021 for conversion of nature of test from confidential to commercial test. The request of the applicant has been examined and in pursuance of clause 9 of IS: 12207-2019, the report is released as a Commercial Test Report.

**Manufacturer** : M/s. VST Tillers Tractors Limited  
Plot No.39, Phase-1, Sipcot Industrial Complex, Mokandapalli, Hosur-635 126, Tamil Nadu, (India).

Test requested by (applicant) : The manufacturer  
Selected for test by : The applicant  
Place of running-in : At applicant's works

**Duration of said running-in (h):**  
- Engine : 12  
- Transmission : 06  
Method of Selection : The tractor was submitted directly by the applicant for test. Hence, method of selection is not known.

### 1. SPECIFICATIONS

**1.1 Tractor:**  
Make : VST SHAKTI  
Model : MT 171 DI  
Brand name : Not applicable  
Type : Four wheeled, Rear wheel driven, unit construction, General purpose, Agricultural tractor.

Month & Year of manufacture : 01 & 20  
Chassis number : BBCTAC000001  
Country of Origin : India

**1.2 Engine:**  
Make : M/s V.S.T. Tillers Tractors Ltd.  
Model : VST 171 DI  
Type : Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine

Serial number : EEAEEC000009

**Engine speed (Manufacturer's recommended production setting), (rpm):**  
- Maximum speed at no load : 2575 to 2625  
- Low idle speed : 900 to 1100  
- Speed at maximum torque : 1500 to 1700

**Rated speed, (rpm):**  
- For PTO use : 2400  
- For drawbar use : 2400

**1.3 Cylinder & Cylinder Head:**  
Number : One  
Disposition : Vertical  
Bore/stroke, (mm) : 102/105  
Capacity as specified by the applicant, (cc) : 857 (apa)  
Compression ratio, (apa) : 17.8 ± 0.3 : 1 (apa)



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| <b>2.</b> | <p>During the transportation of the tractor to the Institute's farm for conducting field operation, wiring harness (battery positive and negative cable) (from battery to starter motor) got burnt.<br/>         Upon the request of the applicant, the following parts have been replaced by new one with same specification.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">S. No.</th> <th style="width: 45%;">Name of Parts</th> <th style="width: 25%;">Parts Number</th> <th style="width: 25%;">Quantity</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1.</td> <td>CODE ASSY (battery +ve cable)</td> <td>BCA29A00010A0</td> <td style="text-align: center;">01</td> </tr> <tr> <td style="text-align: center;">2.</td> <td>MINUS, CABLE (battery -ve cable)</td> <td>BCA29C00040A0</td> <td style="text-align: center;">01</td> </tr> </tbody> </table> <p>Upon this, the electrical system was checked and found working satisfactorily.</p> | S. No.        | Name of Parts | Parts Number | Quantity | 1. | CODE ASSY (battery +ve cable) | BCA29A00010A0 | 01 | 2. | MINUS, CABLE (battery -ve cable) | BCA29C00040A0 | 01 | <b>60.2</b> |
|-----------|--|---------------|---------------|--------------|----------|----|-------------------------------|---------------|----|----|----------------------------------|---------------|----|-------------|
| S. No.    | Name of Parts  | Parts Number  | Quantity      |              |          |    |                               |               |    |    |                                  |               |    |             |
| 1.        | CODE ASSY (battery +ve cable)  | BCA29A00010A0 | 01            |              |          |    |                               |               |    |    |                                  |               |    |             |
| 2.        | MINUS, CABLE (battery -ve cable)   | BCA29C00040A0 | 01            |              |          |    |                               |               |    |    |                                  |               |    |             |

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

**16.1** On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluation (Non-mandatory) parameter applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of Indian standard: **12207-2019** for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

| Sl. No.       | Characteristic  | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2019   | Values declared by the applicant (D)/ Requirement (R) | As observed | Whether meets the requirements (Yes/No) |
|---------------|---|--|--|---|-------------|---|
| 1             | 2   | 3                                      | 4  | 5   | 6           | 7                                       |
| <b>16.1.1</b> | <b>PTO Performance :</b>  |  |  |   |             |   |
| <b>a)</b>     | Maximum power under 2 h test, (kW) (Natural ambient condition)    | Evaluative                             | Declared value to be achieved with a tolerance of: $\pm 5\%$ for PTO power and or Engine power $>26$ kW, $\pm 10\%$ for PTO power and or engine $\leq 26$ kW | 9.69 (D)  | 10.0        | Yes                                     |
| <b>b)</b>     | Power at rated engine speed, (kW)                                 | Non Evaluative                         | -do-   | 9.69 (D)  | 10.0        | Yes                                     |
| <b>c)</b>     | Specific fuel consumption corresponding to maximum power, (g/kWh) | Evaluative                             | $+ 10\%$ maximum   | 360 (D)   | 327         | Yes                                     |
| <b>d)</b>     | Maximum equivalent crankshaft torque, (Nm)                        | Non Evaluative                         | $\pm 8\%$  | 45.0 (D)  | 46.0        | Yes                                     |
| <b>e)</b>     | Back-up torque, percent   | Evaluative                             | 12 percent, min.   | 12 (R) percent, min.                                  | 15.6        | Yes                                     |

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| 1                                   | 2   | 3              | 4   | 5   | 6            | 7              |
|-------------------------------------|---|----------------|---|---|--------------|----------------|
| f)                                  | Maximum operating temperature, ( $^{\circ}\text{C}$ )   |                |   |   |              |                |
| 1)                                  | Engine oil  | 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.   | 135 (D)   | 108          | Yes            |
| 2)                                  | Coolant   | 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.   | 120 (D)   | 95           | Yes            |
| g)                                  | Engine oil consumption, (g/kWh)   | Evaluative     | Not exceeding 1% of SFC at max. power under High ambient conditions   | 3.27 (R)<br>3.60 (D)  | 2.12         | Yes            |
| h)                                  | Smoke level, $\text{m}^{-1}$  | Evaluative     | Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value   | 3.25 per meter (R)  | 0.55         | Yes            |
| <b>16.1.2 Drawbar performance :</b> |   |                |   |   |              |                |
| a)                                  | Max. drawbar pull with ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN)                             | Non Evaluative | Minimum 70% of static mass with ballast   | Manufacturer has not recommended any ballast mass, therefore this test was not conducted. | Not provided | Not applicable |
| b)                                  | Max. drawbar pull without ballast or with standard ballast corresponding to 15 percent wheel slip or 7 percent track slip, (kN) | Evaluative     | Minimum 70% of static mass of tractor without ballast or with standard ballast, as the case may be  | 6.0 (D)<br>5.63 (R)<br>Minimum  | 5.88         | Yes            |
| c)                                  | Maximum drawbar power without ballast, or with standard ballast as in case may be, kW   | Evaluative     | Minimum 80 % of PTO power as referred in SI No. 1) a) of PTO performance in case of tractors having total static mass > 1500 kg<br>Minimum 75 % of PTO power as referred in SI No. 2) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor<br>Minimum 75 % of the engine power as referred in SI No. 1) a) of engine performance in case of tractors which do not have a PTO shaft. | 7.5 (D)<br>7.5 (R)<br>Minimum   | 9.2          | Yes            |



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|----|--|------------|--|----------------|----------------|----------------|
| d) | For the tractors fitted with air conditioned /heated cabin<br>Maximum drawbar power without ballast, or with standard ballast as the case may be, kW | Evaluative | Minimum 70 % of PTO power as referred in Sl No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg. | Not applicable | Not applicable | Not applicable |
| e) | Maximum transmission oil temperature, (°C)   | Evaluative | To be declared by the manufacturer.  | 121 (D)        | 77             | Yes            |

**16.1.3 Power lift and hydraulic pump performance :**

| a) Maximum lifting capacity throughout the range of lift, (kN): |                            |            |  |                       |      |     |
|---|----------------------------|------------|--|-----------------------|------|-----|
|   | 1) At hitch points         | Evaluative | Tolerance of ± 10%   | 6.50 (D)              | 5.91 | Yes |
|   | 2) With the standard frame | Evaluative | The lift capacity should at least be 24 kg/PTO kW, and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft | 4.00 (D)              | 3.20 | Yes |
|   |                            |            |  | 2.35 (R)<br>(Minimum) |      |     |

|    |  |                |  |                             |    |     |
|----|--|----------------|--|-----------------------------|----|-----|
| 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 | The observed value should not exceed 50 mm | 25 (D)<br>50 (R)<br>Maximum | 00 | Yes |
|----|--|----------------|--|-----------------------------|----|-----|

**16.1.4 Brake performance at 25 kmph:**

| 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 m     | 10 (R)             | 6.10             | Yes |
|   | 2) Hot brake   | Evaluative | 10 m     | 10 (R)             | 7.25             | Yes |
| b)  | Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s <sup>2</sup> (N)     | Evaluative | 600 N    | 600 (R)<br>Maximum | 120<br>to<br>160 | Yes |
| c)  | Whether parking brake is effective at a force of 600 N at foot pedal (s) or 400 N at hand lever, N | Evaluative | Yes / No | Yes                | Yes              | Yes |

**16.1.5 Noise measurement :**

|    |  |            |   |             |    |     |
|----|--|------------|---|-------------|----|-----|
| a) | Maximum ambient noise emitted by the tractor dB(A) | Evaluative | 88 dB (A) for >1.5 tonne GVW and 85 db (A) for <1.5 tonne GVW (as per CMVR) | As per CMVR | 83 | Yes |
| b) | Maximum noise at operator's ear level dB(A)        | Evaluative | 96 (as per CMVR)  | As per CMVR | 96 | Yes |

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| 1             | 2  | 3                 | 4                                | 5                             | 6              | 7              |
|---------------|--|-------------------|----------------------------------|-------------------------------|----------------|----------------|
| <b>16.1.6</b> | <b>Amplitude of mechanical vibrations at:</b>                  |                   |                                  |                               |                |                |
| 1)            | Left foot rest   | Non<br>Evaluative | 100 microns<br>(max)             | 100 (R)                       | 173            | No             |
| 2)            | Right foot rest  |                   |                                  | 100 (R)                       | 381            | No             |
| 3)            | Seat (with driver seated)                                      |                   |                                  | 100 (R)                       | 66             | Yes            |
| 4)            | Steering wheel   |                   |                                  | 100 (R)                       | 290            | No             |
| <b>16.1.7</b> | <b>Air cleaner oil pull over test :</b>                        |                   |                                  |                               |                |                |
|               | Maximum air cleaner pull over, (%)                             | Evaluative        | 0.25% (Max)                      | Dry type air cleaner provided |                | Not applicable |
| <b>16.1.8</b> | <b>Haulage requirements :</b>                                  |                   |                                  |                               |                |                |
| <b>a)</b>     | <b>Gross mass of the trailers, (tonne):</b>                    |                   |                                  |                               |                |                |
| 1)            | Two wheel  | Non<br>Evaluative | As specified by the manufacturer | 3.0 (D)                       | 3.0            | Yes            |
| 2)            | Four wheel   |                   |                                  | 3.0 (D)                       | 3.0            | Yes            |
| <b>b)</b>     | <b>Distance travelled / litre of fuel consumption, (km/l):</b> |                   |                                  |                               |                |                |
| 1)            | Two wheel  | Non<br>Evaluative | As specified by the manufacturer | 9 to 11 (D)                   | 9.40 to 9.73   | Yes            |
| 2)            | Four wheel   |                   |                                  | Not recommended               | Not applicable | --             |
| <b>c)</b>     | <b>Fuel consumption (ml/km/tonne):</b>                         |                   |                                  |                               |                |                |
| 1)            | Two wheel  | Non<br>Evaluative | As specified by the manufacturer | 34 to 37 (D)                  | 34.25 to 35.46 | Yes            |
| 2)            | Four wheel   |                   |                                  | Not recommended               | Not applicable | --             |

|               |   |            |  |  |   |                |
|---------------|---|------------|--|--|---|----------------|
| <b>16.1.9</b> | <b>Wetland cultivation (Pudding Operation):</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. | There should be no ingress of water and / or mud (R) | The manufacturer has recommended that the tractor is not suitable for wetland cultivation (pudding operation) | Not Applicable |
| 1)            | Clutch assembly                                 | -do-       |  |  |   |                |
| 2)            | Brake housings                                  | -do-       |  |  |   |                |
| 3)            | Front axle hubs                                 | -do-       |  |  |   |                |
| 4)            | Engine oil                                      | -do-       |  |  |   |                |
| 5)            | Transmission oil                                | -do-       |  |  |   |                |

|                |   |                |   |    |                               |                |
|----------------|---|----------------|---|----|-------------------------------|----------------|
| <b>16.1.10</b> | <b>Safety features :</b>  |                |   |    |                               |                |
| <b>a)</b>      | Guards against moving and hot parts                                       | Evaluative     | Belt drives, pulleys, silencer, hydraulic pipes (As per IS: 12239 (Part-2)) | -- | Meets the requirements        | Yes            |
| <b>b)</b>      | Lighting arrangement  | Evaluative     | As per CMVR   | -- | Meets the requirements        | Yes            |
| <b>c)</b>      | Seating requirements (Tractors having more than 1150 mm rear track width) | Non Evaluative | Should meet the requirements of IS: 12343 (As amended from time to time)    | -- | Does not meet the requirement | Not applicable |
| <b>d)</b>      | Technical requirements for PTO shaft                                      | Evaluative     | Should meet the requirements of IS: 4931 (As amended from time to time)     | -- | Meets the requirements        | Yes            |



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|----|--|----------------|---|----|------------------------------------|----------------|
| e) | Dimensions of three point linkage                                      | Non Evaluative | Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)  | -- | Meets the requirements             | Yes            |
| f) | Specifications of linkage drawbar                                      | Evaluative     | Should meet the requirements of IS 12953 (As amended from time to time)   | -- | Meets the requirements             | Yes            |
| g) | Swinging drawbar (wherever fitted)                                     | Evaluative     | Should meet the requirements of IS 12362 (Part 3) (As amended from time to time)  | -- | Not provided                       | Not applicable |
| h) | 1) Maximum traveling speed at rated engine speed in reverse gear, kmph | Evaluative     | Should not exceed 20.00 kmph  |    | 11.40 kmph (Meets the requirement) | Yes            |
|    | 2) Audible warning signal on tractor                                   | Evaluative     | As soon as the traveling speed in reverse gear reaches to 20 kmph, an audible warning signal on tractor be activated. The safety aspects about the operation of shuttle technology shall be brought in operation and manufacturer/dealer shall ensure the training on this aspect to operator before the delivery of tractor. |    | Not applicable                     | Not applicable |

**16.1.11 Labelling of tractors (Provision of labelling plate):**

|    |                                 |            |  |              |     |
|----|---------------------------------|------------|--|--------------|-----|
| 1) | Make                            | Evaluative | Should conform to the requirements of CMVR along-with maximum PTO power in kW and year of manufacture in numerical form<br><br>MM YY Digit 01-12 in box No.1 for MM will represent the months & next two digits in box No.2 for YY will represent the year of manufacturing. | VST SHAKTI   | Yes |
| 2) | Model                           | Evaluative |  | MT 171 DI    | Yes |
| 3) | Month & Year of manufacture     | Evaluative |  | 01 & 20      | Yes |
| 4) | Engine number                   | Evaluative |  | EEAEEC000009 | Yes |
| 5) | Chassis number                  | Evaluative |  | BBCTAC000001 | Yes |
| 6) | Declaration of PTO power, kW    | Evaluative |  | 9.69         | Yes |
| 7) | Specific Fuel Consumption g/kWh | Evaluative |  | 360          | Yes |

**16.1.12 Discard limit for:**

|     |  |                |                                 |         |                    |     |
|-----|--|----------------|---------------------------------|---------|--------------------|-----|
| (a) | Cylinder bore diameter, (mm)                             | Evaluative     | To be specified by Manufacturer | 102.90  | 101.992 to 102.025 | Yes |
|     |  |                |                                 | 1.50    |                    |     |
|     |  |                |                                 | 101.0   |                    |     |
| (b) | Clearance between piston & cylinder liner at skirt, (mm) | Non Evaluative |                                 | 0.250   | Yes                |     |
| (c) | Piston diameter at skirt, mm                             | Non Evaluative |                                 | 101.775 | Yes                |     |

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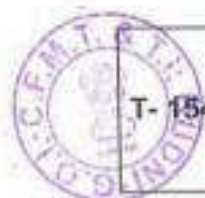
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|-----|--|-----------------------------|------------|------|--------------|-------------------------------|----------------|
| (d) | <b>Ring end gap (mm):</b>                    |                             |            |      |              |                               |                |
|     | -  | Top comp. ring.             | Evaluative | -do- | 2.0          | 0.35 to 0.40                  | Yes            |
|     | -  | 2 <sup>nd</sup> comp. ring. |            | -do- | 2.0          | 0.40                          | Yes            |
|     | -  | 3 <sup>rd</sup> comp. ring. |            | -do- | 2.0          | 0.40 to 0.45                  | Yes            |
| -   | Oil ring.                                    | -do-                        |            | 2.0  | 0.35 to 0.45 | Yes                           |                |
| (e) | <b>Ring groove clearance (mm):</b>           |                             |            |      |              |                               |                |
|     | -  | Top comp. ring.             | Evaluative | -do- | 0.50         | 0.014                         | Yes            |
|     | -  | 2 <sup>nd</sup> comp. ring. | -do-       | -do- | 0.50         | 0.015                         | Yes            |
|     | -  | 3 <sup>rd</sup> comp. ring. | -do-       | -do- | 0.50         | 0.015                         | Yes            |
| -   | Oil ring.                                    | -do-                        | -do-       | 0.50 | 0.015        | Yes                           |                |
| (f) | <b>Clearance of main end bearings, (mm):</b> |                             |            |      |              |                               |                |
|     | -  | Diametrical                 | Evaluative | -do- | NA           | Ball & roller bearing provide | Not applicable |
| -   | Crank shaft end float                        | Evaluative                  | -do-       | 1.50 | 0.18         | Yes                           |                |
| (g) | <b>Clearance of big end bearings, (mm):</b>  |                             |            |      |              |                               |                |
|     | -  | Diametrical                 | Evaluative | -do- | 0.50         | 0.07 to 0.09                  | Yes            |
| -   | Axial  | Evaluative                  | -do-       | 0.80 | 0.15         | Yes                           |                |
| (h) | Clearance between king pin and bush,(mm)     | Non Evaluative              | -do-       | 1.50 | 0.04 to 0.93 | Yes                           |                |
| (i) | Clearance between center pin and bush,(mm)   | Non Evaluative              | -do-       | 1.50 | 0.24 to 0.62 | Yes                           |                |

| <b>16.1.13 Literature (Submission to test agency):</b> |  |                |  |              |                |                |
|--|--|----------------|--|--------------|----------------|----------------|
| (a)  | Operator manual  | Evaluative     | Provided / Not Provided  | Provided     | Provided       | Yes            |
| (b)  | Parts Catalogue  | Evaluative     | Provided / Not Provided  | Provided     | Provided       | Yes            |
| (c)  | Workshop/ Service manual   | Evaluative     | Provided / Not Provided  | Provided     | Provided       | Yes            |
| 16.1.14  | Fitment of Roll Over Protective Structure (ROPS); for tractors having more than 1150 mm rear track width | Evaluative     | ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard | Not provided | Not fitted     | Not applicable |
| 16.1.15  | Standard accessories   | Evaluative     | Trailer hitch, front tow hook, linkage drawbar should be provided with tractor                 | Provided     | Provided       | Yes            |
| 16.1.16  | Accessories (Optional)   | Non Evaluative | Ballast weights if fitted should meet the requirement of CMVR.                                 | Provided     | Not applicable | --             |





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| <b>16.2 CATEGORY OF BREAKDOWNS / DEFECTS (As per Clause 5.0 of IS:12207-2019):</b> |                        |  |   |             |  |
|--|------------------------|--|---|-------------|--|
| S. No.   | Category of breakdowns | Category (Evaluative / Non Evaluative) | Requirements as per IS: 12207-2019  | As observed | Whether meets the Requirements (Yes/No.) |
| 1.   | Critical               | Evaluative                             | No critical breakdown   | None        | Yes                                      |
| 2.   | Major                  | Evaluative                             | Not more than two major breakdowns and neither of them of repetitive nature   | None        | Yes                                      |
| 3.   | Minor                  | Evaluative                             | Not more than five and frequency of each should not be more than two.   | None        | Yes                                      |
| 4.   | Total breakdowns       | Evaluative                             | In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or (1 major + 4 minor) or 5 minor breakdowns. | None        | Yes                                      |

**16.3 Salient Observations:****16.3.1 Laboratory tests:****16.3.1.1 PTO Performance:**

- i) The maximum PTO power was observed as **10.0 kW** against the declaration of **9.69 kW**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- ii) The specific fuel consumption corresponding to maximum power was recorded as **327 g/kWh** against the declaration of **360 g/kWh**, which meets the requirement of IS: 12207-2019 with regard to tolerance limit.
- iii) The backup torque is **15.6 %**, which meets the evaluative requirement of IS: 12207-2019.

**16.3.1.2 Mechanical Vibration:**

The amplitude of mechanical vibration on various assemblies marked as (\*) in Chapter-8 of this test report is on higher side. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

**16.3.1.3 Three point linkage:**

Some of the parameters conform to Cat. I and some of them conform to Cat. I N Keeping in view the spirit of standardization, necessary improvement may be incorporated.

**16.3.1.4 Operator's Seat:**

The width of seat and vertical distance from seat index point to centre of steering control wheel does not meet the requirement of IS: 12343-1998. This should be looked into for necessary corrective action.

**16.3.1.5 Operator's work place:**

Operator's work place meets the requirements of IS: 12239 (Part-I) 1996, **except the following:**

- i) Provision of hand holds for easy mounting & dismounting of the operator's.
- ii) Vertical retainness at inner side of clutch pedal.
- iii) Provision of spark arresting device in the exhaust system.



- 16.3.1.6 Constructional requirement with regard to safety:**  
 Meets the requirements of IS: 12239 (Part-II)-1996, **except the following:**
- i) PTO master shield has not been provided.
  - ii) Working clearance in between position control and draft control lever is 55 mm which is less than the requirement of test code.
- 16.3.1.7 Location of operator's controls with regard to safety:**  
 Location of operator's controls with regard to safety meets the requirements of IS: 8133-1983(Reaffirmed 2014), **except the following:**
- i) Fuel shut-off knob does not remain in stop position.
  - ii) Provision of differential lock in the tractor.
- 16.3.2 Field performance test:**
- i) During the field test with two bottom (reversible) MB plough, the engine oil leakage near crankshaft pulley was observed after five hours of operation and for the same, the applicant submit a letter no. nil dated 20.04.2021 and requested to continue the field test without rectification of the issue of engine oil seepage.
  - ii) Due to seepage of engine oil near crankshaft pulley, it was observed that engine oil consumption was '3.52 to 22.2 ml/h' during field test which was considered on higher side. This should be looked into for necessary corrective action.
- 16.3.2.1 Wet land cultivation (Puddling operation):**  
 The manufacturer has recommended that the tractor is not suitable for wet land cultivation (puddling operation). Therefore, the wet land cultivation (puddling and water proof) test has not been conducted. Hence tractor is not suitable for wet land cultivation as per as per the manufacturer.
- 16.3.3 Component / Assembly Inspection:**  
 During the final assessment components / assembly, it was observed that the secondary filter element dry type air cleaner got deformed and its felt cloth got washed away. This should be looked into for necessary corrective action.
- 16.4 Maintenance / Service Problems:**  
 No noticeable maintenance or service problem was observed during the test.
- 16.5 Recommendation with regard to safety on tractor:**  
 The following requirements, inter-alia, may be considered for incorporation on the tractor:
- i) Width of operator's seat should be as per relevant Indian standard.
  - ii) Provision for spark arresting device in exhaust system.
  - iii) Vertical distance from seat index point to centre of steering control wheel should be provided as per the requirement of relevant Indian Standard.
  - iv) Hand holds for easy mounting and dismounting of operator.
  - v) Vertical retainness at both sides of clutch pedals should be provided as per relevant Indian standard.
  - vi) Fuel shut-off knob should remain in 'STOP' position
  - vii) The working clearance between draft control lever and position control lever should be as per the minimum requirements of relevant Indian Standard for easy operating the lever.
  - viii) PTO shaft master shield should be provided to avoid the accident.
  - ix) Provision of differential lock in the tractor.
  - x) Stopper lever (compression ignition) should be automatically remained in the stop position after operating.



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- 16.6 Adequacy of Literature supplied with machine:**
- 16.6.1** The following literature was supplied with the tractor for reference during the test:
- i) Tractor Operator's Manual of VST SHAKTI, MT 171 DI tractor.
  - ii) Parts Catalogue of VST SHAKTI, MT 171 DI tractor.
  - iii) Service Manual of VST SHAKTI, MT 171 DI tractor.
- 16.6.2**
- i) The printed literature supplied with the test sample is in English. However, these literatures should be brought out in other vernacular languages of India for guidance of users.
  - ii) Part number of Operator's manual should be mentioned in the parts catalogue.

**TESTING AUTHORITY:**

|  |  |
|--|--|
| <b>C.V.CHIMOTE</b><br>TEST ENGINEER              |  |
| <b>Y. K. RAO</b><br>SENIOR AGRICULTURAL ENGINEER |  |
| <b>P. K. PANDEY</b><br>DIRECTOR                  |  |

The draft test report compiled by: **Shivkumar Sharma**, Senior Technical Assistant

**17. APPLICANT'S COMMENTS**

| Para No.    | Our Reference   | Applicant's comments   |
|-------------|---|--|
| <b>17.1</b> | 16.3.1.2, 16.3.1.3, 16.3.1.4, 16.3.1.5 (i), (ii), (iii), 16.3.1.6 (i), (ii), 16.3.1.7 (i), (ii), 16.3.2 (i), (ii), 16.3.3 | Necessary corrective action will be taken and implemented immediately. |
| <b>17.2</b> | 16.5 (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), (ix), (x) & 16.6.2 (i), (ii)                                       | Recommendations will be incorporated and implemented immediately.      |

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

| S.No | Parameters                       | Rotavator    | Reversible MB Plough |
|------|----------------------------------|--------------|----------------------|
| 1.   | Make                             | VST SHAKTI   | VST SHAKTI           |
| 2.   | Type                             | Mounted      | Mounted              |
| 3.   | No. of Disc/blades               | 28           | Two                  |
| 4.   | Type of Disc/blades              | Hatchet      | General purpose      |
| 5.   | Size of bottoms/blades, (mm)     | 210 x 40 x 5 | 170                  |
| 6.   | Spacing of bottoms/flanges, (mm) | 80           | 200                  |
| 7.   | Lower hitch point span, (mm)     | 260          | 490                  |
| 8.   | Mast height, (mm)                | 220          | 400                  |
| 9.   | Over all dimensions:             |              |                      |
|      | - Length                         | 1200         | 1260                 |
|      | - Width                          | 1550         | 670                  |
|      | - Height                         | 800          | 915                  |
| 10.  | Gross mass, (kg)                 | 140          | 140                  |

**ANNEXURE- II****TRACTOR RUN HOURS DURING TEST**

| A.  | LABORATORY AND TRACK TESTS:   | HOURS       |
|-----|---|-------------|
| 1.  | Running-in  | --          |
| 2.  | PTO performance test  | 12.4        |
| 3.  | Power lift and hydraulic pump performance test  | 1.8         |
| 4.  | Drawbar performance test  | 12.8        |
| 5.  | Turning ability   | 0.5         |
| 6.  | Location of centre of gravity   | 0.5         |
| 7.  | Brake test  | 1.5         |
| 9.  | Noise measurement   | 1.3         |
| 10. | Mechanical vibration test   | 0.9         |
| 11. | Nominal speed test  | 0.9         |
| B.  | FIELD TEST:   |             |
| 1.  | MB ploughing  | 15.7        |
| 2.  | Rotavation  | 21.2        |
| C.  | Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test. | 19.3        |
|     | <b>TOTAL:</b>   | <b>88.8</b> |