

Application Reference No. 28/2022-23/69

(यह परीक्षण रिपोर्ट 31/07/2028 तक वैध है / THIS TEST REPORT IS VALID UPTO 31/07/2028)



**Make of Agricultural Tractor** : VST  
**Model** : VST SHAKTI 9054 DI VIRAAJ Xp  
**Manufactured by** : M/s. V.S.T. Tillers Tractors Ltd  
Plot No 39, Phase I, SIPCOT Industrial Complex,  
Mookandapalli, Hosur-635126 (T.N.).



भारत सरकार

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

**GOVERNMENT OF INDIA**  
**MINISTRY OF AGRICULTURE AND FARMERS WELFARE**  
(DEPARTMENT OF AGRICULTURE & FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान  
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**CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE**  
TRACTOR NAGAR, BUDNI (M.P.) 466 445  
(An ISO 9001:2015 Certified Institute)

T-1752/2283/2023	VST SHAKTI 9054 DI VIRAAJ Xp TRACTOR - INITIAL COMMERCIAL TEST
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## IMPORTANT INFORMATION

The Government of India, Ministry of Agriculture and Farmers' Welfare has directed, vide a OM No. 13-17/2021-M&T(I&P) dated 28.07.2022, that since 15<sup>th</sup> August, 2022, only mandatory tests will be carried out on a tractor unless applicant has expressly requested for optional tests as well, mentioned in the above captioned OM.

In the instant case, there is no request from the applicant to carry out the optional tests hence only Mandatory Tests, as given below, have been conducted and reported in this report:-

1. PTO performance
2. Hydraulic performance
3. Drawbar performance
4. Brake performance

Month: July	Test Report No.: T-1752/2283/2023	Year: 2023
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[C]	Tractor manufacturer's name and address	:	<b>M/s. V.S.T. Tillers Tractors Ltd Plot No 39, Phase I, SIPCOT Industrial Complex, Mookandapalli, Hosur-635126 (T.N.).</b>
[D]	Location of tractor assembly	:	<b>M/s. V.S.T. Tillers Tractors Ltd Plot No 39, Phase I, SIPCOT Industrial Complex, Mookandapalli, Hosur-635126 (T.N.).</b>
[C]	Submitted for test by (Applicant)	:	The Manufacturer
[C]	Selected for test by	:	The Ministry vide OM No. 13-17/2021 - M&T (I&P) dated 28.07.2022, has allowed the applicant to submit the test sample directly to the Institute without requiring any random selection for Initial Commercial Testing. Thus, the applicant directly submitted the test sample to the Institute for test.
[D]	Place of running-in	:	At manufacturer's works
[D]	Duration of running-in, (h):	:	
	-Engine	:	12
	-Transmission	:	08
[C]	Location of test	:	Government of India, Central Farm Machinery Training and Testing Institute, P.O. - Tractor Nagar, BUDNI – 466445 (M.P.), INDIA

## 1. SPECIFICATIONS OF TRACTOR

### 1.1 Identification:

#### 1.1.1 Denomination

[C]	Make of tractor	:	VST
[C]	Model (trade name)	:	VST SHAKTI 9054 DI VIRAAJ Xp
[C]	Type	:	Rear Wheel Driven, Standard Agricultural Tractor.
[C]	Month & year of manufacture	:	07 & 2022
[D]	Country of origin	:	India

#### 1.1.2 Numbers:

[D]	1 <sup>st</sup> Serial No. of prototype	:	BLJTDB000090
[C]	Serial No.	:	BMATGE001507

### 1.2 Engine:

[D]	Manufacturer's address	:	M/s. Kirloskar Oil Engines Limited Laxman Rao Kirloskar Road, Khadki, Pune-411003
[C]	Make	:	Kirloskar
[C]	Model	:	3R1040
[C]	Type	:	Four stroke, naturally aspirated, liquid cooled, direct injection, diesel engine
[C]	Serial No.	:	3H.2123/2220273

#### 1.2.1 Cylinders:

[C]	Number/disposition	:	Three, vertical, in-line
[D]	Bore / Stroke, (mm)	:	105 / 120

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## 6. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

6.1 On the basis of test conducted the performance results have been summarized as evaluative (mandatory) / Non-evaluative (Non-mandatory) parameters applicable for Qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2022 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: 12207-2022	Values declared by the applicant/ (D) Requirement (R)	As observed	Whether meets the requirements (Yes/No)
1	2	3	4	5	6	7
<b>MANDATORY TESTS: (As per Ministry's Office Memorandum No. 13-17/2021-M&amp;T (I&amp;P) dated 28<sup>th</sup> of July, 2022).</b>						
<b>6.1.1 PTO Performance:</b>						
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of $\pm 5$ per cent for PTO Power & or engine power $> 26$ kW, $\pm 10$ per cent for PTO Power & or engine $\leq 26$ kW.	33.6 (D)	33.0	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	33.6 (D)	33.0	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Evaluative	Should not be more than 10% of declared value	265 (D)	260	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	$\pm 8\%$	180 (D)	172.9	Yes
e)	Back-up torque, percent	Evaluative	Should be Min 12 %	12 (D) 12 (R)	20.49	Yes
f)	Maximum operating temperature, ( $^{\circ}$ C):					
	1) Engine oil	Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under natural ambient/high ambient condition should not exceed the declaration.	135(D)	116	Yes
	2) Coolant	Evaluative	The observed value should not exceed the declared value or boiling point of coolant at radiator cap pressure whichever is lower. The boiling point of the coolant at radiator pressure shall be provided by the applicant.	120(D)	100	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at max. Power under natural ambient conditions.	2.60 Maximum (R)	0.563	Yes
h)	Smoke level, $m^{-1}$	Evaluative	Maximum light absorption coefficient of 3.25 per meter or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR).	3.25 per meter Maximum (R)	0.16	Yes

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1	2	3	4	5	6	7	
<b>6.1.2</b>	<b>Drawbar performance:</b>						
a)	Max. drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 70% of static mass with ballast	Ballast not recommended		Not applicable	
b)	Max. drawbar pull without ballast or standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	In case of tractors having total static mass $\geq$ 1500 kg, Min 70% of static mass of tractor without ballast or with standard ballast, as the case may be. In case of light weight tractors having $\leq$ 1500 kg total static mass of tractor, Min. 65% of static mass of tractor without ballast or with standard ballast, as the case may be.	18.8 (D) 16.1 (R) Minimum	17.72	Yes	
c)	Maximum drawbar power without ballast or with standard ballast, as the case may be (kW).	Evaluative	Minimum 80 % of PTO power as referred in Sl. No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg. Minimum 75 % of PTO power as referred in Sl. No. i) a) of PTO performance in case of light weight tractors having $\leq$ 1500 kg total static mass of tractor. Minimum 75 % of the engine power as referred in Sl No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	28.0 (D) 26.4 (R) Minimum	27.4	Yes	
d)	Maximum transmission oil temperature, ( $^{\circ}$ C)	Evaluative	The declared value should not exceed the recommendation by the oil manufacturer. The observed value should not exceed the declared value throughout the drawbar test.	135 (D)	80	Yes	
Applicant vide letter no. NIL dated 27.06.2023 has requested not to conduct the ballasted drawbar performance test & ten-hour drawbar test which was allowed as per the additional guidelines for testing of tractors as per new regime of testing of tractors vide an OM No. 13-32/2023-M&T(I&P) (FTS-125476) dated 16.05.2023. Accordingly, drawbar performance test under unballasted condition was conducted only.							
<b>6.1.3</b>	<b>Power lift and hydraulic pump performance:</b>						
a)	Maximum lifting capacity throughout the range of lift, (kN):						
	1)	At hitch points	Evaluative	Should not be less than 90% of declared value.	16.0 (D) 14.4 (R) Minimum	22.3	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.	12.0 (D) 7.77 (R) Minimum	14.87	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	The observed value should not exceed 50 mm	50 (D) Maximum	20	Yes
<b>6.1.4</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 standard ballast, (m):						
	1)	Cold brake	Evaluative	10	10 (R)	8.08	Yes
	2)	Hot brake	Evaluative	10	10 (R)	8.30	Yes

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1	2	3	4	5	6	7		
<b>b)</b>	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	Yes	Yes		
<b>*Applicant has not recommended ballast during the brake test. Hence, the brake test was conducted in standard ballasted condition.</b>								
<b>6.1.5</b>	<b>OPTIONAL TESTS: As the applicant has not applied for any optional tests, therefore no optional tests was conducted.</b>							
<b>6.1.6</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 (Part2)]	Meets the requirement	Yes			
<b>b)</b>	Lighting arrangement	Evaluative	As per CMVR	Meets the requirement	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)	<b>Does not meet the requirement</b>	<b>No</b>			
<b>d)</b>	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS: 4931 (As amended from time to time)	Meets the requirement	Yes			
<b>e)</b>	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS: 4468 (Part-I) (As amended from time to time)	<b>Does not meet the requirement</b>	<b>No</b>			
<b>f)</b>	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS: 12953 (As amended from time to time)	Meets the requirement	Yes			
<b>g)</b>	Swinging drawbar (wherever fitted)	Non Evaluative	Should meet the requirement of IS: 12362 (Part 3) (As amended from time to time)	Not provided	Not applicable			
<b>h)</b>	Audible warning signal on tractor	Evaluative	If tractor travel speed in reverse gear exceeds 20 kmph, an audible warning signal on tractor shall get activated. A sticker to the effect that "operating the tractor beyond 20 kmph speed in reverse gear is not safe" should be prominently displayed.	Not fitted (Max. travel speed in reverse gear is 11.96 kmph)	Not applicable			
<b>6.1.7</b>	<b>Labelling of tractors (Provision of labeling plate):</b>							
	1) Make	Evaluative	Should conform to the requirements of CMVR along with maximum PTO Power in kW and year of manufacture in numerical form. <table border="1" style="margin-left: 20px;"> <tr> <td>MM</td> <td>YY</td> </tr> </table> Digit 01 – 12 in box No.1 for MM will represent the months and next two digits in box No.2 for YY will represent the year of Manufacturing.	MM	YY	VST	Yes	
MM	YY							
	2) Model	Evaluative		VST Shakti 9054 DI Virraaj Xp	Yes			
	3) Month & Year of manufacture	Evaluative		07 & 22	Yes			
	4) Engine number	Evaluative		3H.2123/2220273	Yes			
	5) Chassis number	Evaluative		BMATGE001507	Yes			
	6) Maximum PTO power, (kW)	Evaluative		33.6	Yes			
	7) Specific fuel consumption, g/kWh	Evaluative	265	Yes				

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1	2	3	4	5	6	7
<b>6.1.8</b>	<b>Literature (Submission to test agency):</b>					
<b>(a)</b>	Operator manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
<b>(b)</b>	Parts Catalogue	Evaluative	Provided / Not Provided	Provided	Provided	Yes
<b>(c)</b>	Workshop/ Service manual	Evaluative	Provided / Not Provided	Provided	Provided	Yes
<b>6.1.9</b>	<b>Fitment of Roll Over Protective Structures (ROPS):</b>					
	For tractor having more than 1150 mm rear track width	Evaluative if fitted	ROPS should meet the requirement of IS:11821 or OECD code or equivalent International Standard		Not fitted	Not applicable
<b>6.1.10</b>	Standard Accessories	Evaluative	Trailer hitch, front tow hook, linkage drawbar should be provided with tractor		Provided	Yes
<b>6.1.11</b>	Accessories (optional)	Non Evaluative	Ballast weight, if fitted, should meet the requirement of CMVR		Not fitted	Not applicable

<b>6.2 CATEGORY OF BREAKDOWNS/DEFECTS ( As per clause 5.0 of IS:12207-2022):</b>					
S. No.	Category of breakdowns	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2022	As observed	Whether meets the Requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be of repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and neither of them should be of repetitive in nature	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

**6.3 Conformity with following IS:**

- |              |  |   |                         |
|--------------|--|---|-------------------------|
| <b>i)</b>    | Guidelines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS:10273 -1987 (Reaffirmed Year 2019)]             | : | Conforms                |
| <b>ii)</b>   | Agricultural tractors - Rear mounted power take-off - Types 1, 2 and 3 (third revision) [IS:4931-1995 (Reaffirmed Year 2019)]  | : | Conforms                |
| <b>iii)</b>  | Agricultural wheeled tractors – Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS:4468(Part-I) – 1997 (Reaffirmed in 2022)]              | : | <b>Does not conform</b> |
| <b>iv)</b>   | Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed Year 2022)]   | : | Conforms                |
| <b>v)</b>    | Agricultural tractors- Operator's seat technical requirement [IS12343 - 2021]  | : | <b>Does not conform</b> |
| <b>vi)</b>   | Guide for safety & comfort of operator of agricultural tractors:Part 1 General requirements (first revision):[IS 12239 (Part 1) - 2018]                                      | : | <b>Does not conform</b> |
| <b>vii)</b>  | Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (Part 2) 1999) (Reaffirmed Year 2019)] | : | <b>Does not conform</b> |
| <b>viii)</b> | Guide lines for location and operation of operator controls on agricultural tractors and machinery [IS: 8133 - 2021]   | : | <b>Does not conform</b> |

- ix) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment - Symbols for operator controls and other displays Part2 Symbols for agricultural tractors and machinery [IS: 6283(Part-1) - 2006 (Reaffirmed Year 2019) and IS: 6283 (Part-2) – 2007 (Reaffirmed Year 2019)] : **Does not conform**
- x) Agricultural Tractors and Machinery-Lighting device for travel on public roads (IS:14683-1999) (Reaffirmed Year 2019)] : **Conforms**

#### 6.4 Salient Observations:

##### 6.4.1 Laboratory tests:

##### 6.4.1.1 Hydraulic performance test:

- i) The sustained pressure of relief valve was observed as 15.5 MPa, against the declaration of 20.0 by the applicant.

##### 6.4.1.2 Operator's seat:

The following parameters does not meet the requirement of IS: 12343 - 2021

- i) Vertical adjustment upward and downward from the mid position of the seat is not provided.
- ii) Provision for adjustment of driver's mass has been specified as 50 to 120 kg against the requirement of 40 to 100 kg.
- iii) The vertical distance from SIP to centre of accelerator pedal has been measured as 555 mm against the requirement of 230 to 460 mm.
- iv) The vertical distance from SIP to centre of steering control wheel has been measured as 195 mm against the requirement of 265 to 325 mm.
- v) The vertical distance of SIP from foot rest has been measured as 635 mm against the requirement of 450 to 520 mm.
- This should be looked into for necessary corrective action.

##### 6.4.1.3 Operator's work place:

The following parameters does not meet the requirement of IS: 12239 (Part-I) 2018.

- i) Vertical retainers on inner side of clutch is not provided.
- ii) Width of step.
- iii) Spark arresting device has not been provided in the exhaust system.
- The following parameter does not meet the requirement of IS: 12239 (Part-II) 1999.
- i) Provision of shield of Power take Off is not provided.

This should be looked into for necessary corrective action.

##### 6.4.1.4 Three point linkage:

The dimension viz. lateral distance from lower hitch point to centre line of tractor does not meet the requirements of IS:4468 (Part-I) – 1997.This should be looked into for necessary corrective action.

##### 6.4.1.5 Constructional requirement with regard to safety:

Meets the requirements of IS: 12239 (Part-II)-1996 (Re-affirmed in January, 2019), except the following:

- i) PTO master shield has not been provided.
- ii) Working clearance in between draft control position control lever has been measured as 40 mm against the minimum requirement of 70 mm.
- iii) Differential lock has not been provided.

This should be looked into for necessary corrective action.

#### 6.5 Specification of Tractor:

- i) Discrepancies in the specification between the Specification sheet and Operator's manual are as under:

S. No.	Description	As per Specification Sheet	As per Operator's manual
a)	Max power, kW	33.6	36.6 (Page No. 36)

- ii) Though the common reservoirs for gear box, differential, final drive, hydraulic, steering and brakes are provided, but oil and filter change period are specified at different intervals in the specification sheet. This should be looked into for corrective action.



**6.6 Maintenance / Service Problems:**

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

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

- i) The engine stop control does not remain in stop position as per the requirement of IS: 8133-2021.
  - ii) Identification of hand controls by colour code has not been provided for engine speed control, transmission control, parking brake & PTO engage lever as per the requirement as laid down in Table – 5 of IS: 8133-2021.
  - iii) The hand accelerator lever, when moved away from the operator (i.e. forward) decreases the engine speed, which does not meet the requirement as laid down in Table – 1 of IS: 8133-2021.
  - iv) Working clearance in between draft control lever and position control lever has been measured as 40 mm against the requirement of 70 mm minimum as per IS: 12239 (Part-2) – 2019, for easy operating the lever.
  - v) There should be provision of differential lock.
  - vi) Master shield on PTO shaft should be provided.
- Above parameters should be looked into for necessary corrective action.

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

**6.8.1** The following literatures were supplied with the test tractor for reference during the test: -

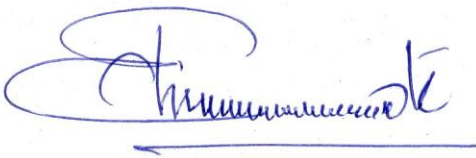

- a) Operator manual for "VST Shakti 9054 DI Viraaaj Xp" tractor model.
- b) Parts catalogue for "VST Shakti 9054 DI Viraaaj Xp" tractor model.
- c) Service manual for "VST Shakti 9054 DI Viraaaj Xp" tractor model.

**6.8.2** The operator manual may be brought out for the guidance of users and service personnel as per IS: 8132-1999 incorporating, inter alia, the following:

- i) Safe hitch height of the trailer.
- ii) Recommended ballast masses for different operations.

**TEST CARRIED OUT AT C.F.M.T. & T.I., BUDNI (M.P.), INDIA**

**TESTING AUTHORITY**

<p><b>C. V. CHIMOTE</b> TEST ENGINEER</p>	
<p><b>A. K. UPADHYAY</b> DIRECTOR(I/C)</p>	

Draft Test Report compiled by: **B. N. Dixit**, Agricultural Engineer.

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### 6. APPLICANT'S COMMENTS

Para no.	Our reference	Applicant comments
7.1	6.4.1.1 (i), 6.4.1.2 (i), (ii), (ii), (iv), (v), 6.4.1.3 (i), (ii), (iii), (iv), 6.4.1.4,6.4.1.5 (i), (ii), (iii), 6.5(i), (ii), 6.7 (i), (ii), (iii), (iv), (v), (vi) & 6.8.2 (i), (ii)	Observations will be studied & necessary corrective action will be taken for quality improvement in products. Parameters will be studied and necessary corrective action will be initiated.

### ANNEXURE-I

#### TRACTOR RUN HOURS DURING TEST

A.	LABORATORY AND TRACK TESTS:	HOURS
1.	Running-in	Applicant has declared it to be conducted on their work place.
2.	PTO performance test	12.07
3.	Power lift and hydraulic pump performance test	3.58
4.	Drawbar performance test	3.68
5.	Brake performance test	1.25
6.	Nominal speed test	1.00
<b>B.</b>	Miscellaneous test and other run hours including idle run, transportation, trials and preparation for test	0.25
<b>TOTAL:</b>		<b>21.83</b>