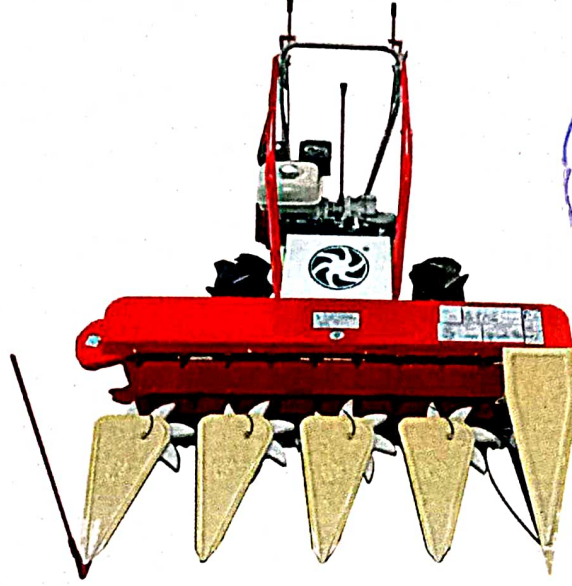




THIS TEST REPORT IS VALID UPTO 31.07.2027



VST SHAKTI 5PR-HW SELF PROPELLED REAPER



सत्यमेव जयते

भारत सरकार

GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE & FARMERS WELFARE

उत्तर पूर्व क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

बिश्वनाथ चरियाली: बिश्वनाथ: असम, पिन-784 176

BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094

Website: <http://nerfmtti.nic.in>

Fax No: 03715-230358

E-Mail: fmti-ner@nic.in

1. SCOPE OF TEST

The scope of test was limited to check and assess the following:

- 1.1 Specification and other data furnished by the applicant.
- 1.2 Engine Performance test
- 1.3 Vibration measurement
- 1.4 Noise measurement
- 1.5 Air cleaner oil pull over test
- 1.6 Tuning Ability
- 1.7 Wear analysis of critical components (Cutter Bar knife section)
- 1.8 Hardness and chemical analysis (Cutter Bar knife section)
- 1.9 Field performance
- 1.10 Ease of operation and adjustments
- 1.11 Defects, breakdowns and repair

**2. METHOD OF SELECTION**

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this Institute for test.

3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of reaper as such. The guidelines, however, have been taken from the following:

1. IS: 11467:1985 (Reaffirmed 2012) : Test code for cereal harvesting machines.
2. IS: 6025:1982 (Reaffirmed 1999) : Specification for knife sections for harvesting machine.
3. IS: 10378:1982 (Reaffirmed 2001) : Specification for knife back for harvesting machine.
4. IS: 7347:1974 (Amended 2011) : Specification for Performance of Small Size Spark Ignition Engines.

4. SPECIFICATIONS**4.1 General:**

- | | | |
|--------------------------------------|---|--|
| Name and address of the manufacturer | : | VST TILLERS TRACTORS LTD,
Plot No -1, Dyavasandra Industrial Layout,
Whitefield Road, Mahadevapura Post,
Bengaluru, Karnataka- 560 048 |
| Name & address of applicant | : | VST TILLERS TRACTORS LTD,
Plot No 222-224 & 229-232, 3 rd Phase,
KIADB Industrial Area, Malur, Kolar
District,
Karnataka- 563 130 |
| Name of machine | : | Reaper |
| Type | : | Self Propelled, Walk behind |
| Make | : | VST SHAKTI |

Model : 5PR-HW
 Year of manufacture : 2022
 Serial Number : AAKTEE002921
 Country of origin : INDIA
 Size of reaper (mm) : 1170
 Name of crop recommended by applicant : Paddy
 Name of crop in which the test was conducted : Paddy

4.2 Details of Prime Mover Used:

Name and address of the manufacturer : M/s Honda Siel Power Products Ltd.,
 Plot No -5, Sector-41(Kasna) Greater Noida
 Industrial Development Area, Dist. Gautam
 Budh Nagar, Uttar Pradesh 201310

 Make : Honda
 Model : GX 160
 Type : 4 stroke Petrol Engine, Single cylinder, Air cooled
 Year of manufacture : 2022
 Serial Number : GCAED 1015405
 Country of origin : INDIA
 Recommended high idle speed (rpm) : 1950 ± 50 (at PTO)
 3900 ± 100 (at Engine)
 Recommended low idle speed (rpm) : 700(+100/-75) (at PTO)
 1400(+200/-150 (at Engine)
 Recommended rated speed (rpm) : 1800 (at PTO)
 3600 (at Engine)
 Recommended speed for field test : 1500-1800 (at PTO)
 (rpm) 3000-3600 (at Engine)
 Rated power observed (kW) : 2.9

13. FIELD PERFORMANCE TEST

The machine was tested for 25.56 hours during harvesting Paddy crop. The performance of the machine was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The detailed test results have been given in Annexure-I & II and summarized in Table 1 & 2 below.

SUMMARY OF CROP PARAMETERS

Table-1

S. No.	Parameters	Range
1	Variety of crop	Jaya and Sona Masoori
2	Straw moisture content (%)	38 to 43.5
3	Grain moisture content (%)	12.8 to 15.7
4	Plant height (cm)	92 to 96
5	Length of ear head (mm)	190 to 218
6	Number of grains per ear head	168 to 202
7	Number of hills per square meter	31 to 33
8	Number of tillers per hill	13 to 17
9	Straw-grain ratio	2.56:1 to 3.50:1

SUMMARY OF FIELD PERFORMANCE

Table-2

S. No.	Parameters/operations	Range
1	Forward speed (kmph)	2.82 to 2.95
2	Width of cut (cm)	115 to 116
3	Stubble height (mm)	108 to 142
4	Losses (Percentage of total grain yield)	
	-Pre-harvested loss	0.001 to 0.01
	-Post harvest loss (Cutter bar)	0.71 to 0.99
	-Conveyor loss/shattering loss	0.29 to 0.35
5	Area harvested (ha/h)	0.238 to 0.243
6	Field efficiency (%)	71.11 to 73.61
7	Time required for one hectare (h)	4.12 to 4.21
8	Fuel consumption	
	- l/h	0.923 to 0.968
	- l/ha	3.89 to 4.06

13.1 Rate of work

- The forward speed of machine was observed as 2.82 to 2.95 kmph.
- The area harvested by the machine was recorded as 0.238 to 0.243 ha/h.

16.1.7 Valve guide clearance

Valve guide diameter (mm)		Valve stem diameter (mm)		Valve guide clearance (mm)		Max. Permissible wear limit (mm)	
Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
5.47	5.46	5.40	5.40	0.07	0.06	Not specified	Not specified

Valve, guide and timing gear:-

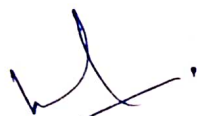
Any marked sign of overheating of valves	: None
Pitting of seat/faces of valves	: Normal
Any visual damage of teeth of timing gears	: None
Condition of ignition coil & magneto	: Normal

17. COMMENTS AND RECOMMENDATIONS

- 17.1 Rated power of the engine was observed as 2.9 kW against declared value of 3.60 kW by the manufacturer. It should be looked into for corrective action.
- 17.2 The amplitude of mechanical vibration marked as (*) was on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of the component. In view of above, this deserves to be given top priority for corrective action.
- 17.3 Noise at operator's ear level was observed on higher side against warning limit of 85 dB (A) as specified by ILO for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operator's comfort & safety.
- 17.4 Specification of knife sections of the cutter bar does not conform to IS 6025:1982 (Reaffirmed 1999) and it should be looked into for corrective action.
- 17.5 Specification of knife section back of the machine does not conform to IS 10378-1982 (Reaffirmed 2001) and it should be looked into for corrective action.
- 17.6 The hardness and chemical composition of knife sections (both movable and stationary) does not conform to the requirement of IS 6025-1982 (Reaffirmed 1999). It should be looked into for improvement.
- 17.7 The mentioned value of Rated power (3.6 kW) of engine on the marking /labeling plate of the machine was not matching with the observed value during engine test. This may be looked into.
- 17.8 Provision for main gearbox oil level check was not provided. It should be looked into for corrective action.

17.9 Technical literature:

Operator cum Service Manual & Parts Catalogue was provided along with the machine during the course of testing. It is further recommended to bring out these manuals in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY


(M.R. PATIL)
AGRICULTURAL ENGINEER



(S.G. PAWAR)
AGRICULTURAL ENGINEER



(DR. P.P. RAO)
DIRECTOR

18. APPLICANT'S COMMENTS

Sr. No.	Page No./Clause No.	Applicant's Comments
1.	Page No. 25/17.1, 17.2, 17.4, 17.5, 17.8	The necessary corrective action will be taken and will be incorporated in further production models.
2.	Page No. 25/17.3, 17.6, 17.7 Page No. 26/17.9	Suggestion and recommendation will be incorporated for the quality of product and necessary corrective action will be taken. This will be implemented immediately.

