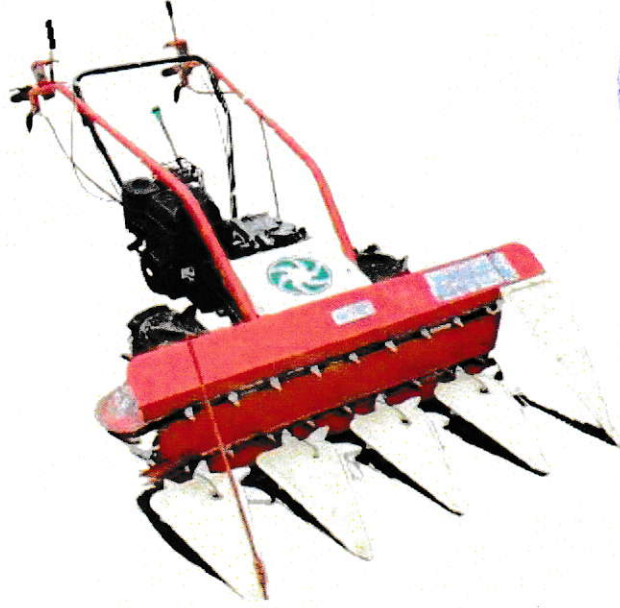




THIS TEST REPORT IS VALID UPTO 28.02.2031



**VST 55DLX-BSW MULTI CROP  
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 AND FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

विश्वनाथ चारिआलि, जिला-विश्वनाथ (असम)

BISWANATH CHARIALI: BISWANATH: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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### 1. SCOPE OF TEST

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

- 1.1 Specifications 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

The test sample was selected by the testing authority through random selection. The following test samples were presented by the applicant during the random selection at Applicant site.

Sl. No	Serial no of test sample	Remarks
1	AAKTEF004005	Out of 5 samples, S. No. 2 has been randomly selected.
2	AAKTEF004006	
3	AAKTEF004007	
4	AAKTEF004008	
5	AAKTEF004009	

### 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



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Name & address of applicant : **VST TILLERS TRACTORS LTD**  
Plot No 222-224 & 229-232, 3<sup>rd</sup> Phase,  
KIADB Industrial Area, Malur, Kolar  
District, Karnataka- 563 130

Name of machine : Reaper  
Type : Self Propelled, Walk behind  
Make : VST  
Model : 55 DLX-BSW  
Year of manufacture : 2022  
Serial Number : AAKTEF004006  
Country of origin : **INDIA**  
Size of reaper (mm) : 1175

Name of crop recommended by applicant : Paddy, wheat, ragi, soybean  
Name of crop in which the test was conducted : Paddy & soybean



#### 4.2 Details of Prime Mover Used:

Name and address of the manufacturer : **M/s Briggs & Stratton LLC,**  
Briggs & Stratton (Chongqing) engine Co.,  
Ltd., No. 10, Road 3, Economic &  
Technological Development Industrial Park  
Yubei District, Chongqing- 401122, China

Make : Briggs & Stratton  
Model : 130G 62024201  
Type : 4 stroke Petrol Engine, Single cylinder, Air  
cooled

Year of manufacture : **2022**  
Serial Number : 2110128685331  
Country of origin : **CHINA**  
Recommended high idle speed (rpm) : 1930 ± 50 (at PTO)  
3860 ± 100 (at Engine)  
Recommended low idle speed (rpm) : 725 (+100/-75) ( at PTO )  
1450 (+200/-150) (at Engine)  
Recommended rated speed (rpm) : 1800 (at PTO)  
3600 (at Engine)  
Recommended speed for field test : 1500-1800 (at PTO)  
(rpm)  
Rated power observed (kW) : **3.23**

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### FIELD PERFORMANCE TEST

The machine was tested for total of 26.3 hours for harvesting Paddy & Soybean 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	
		Paddy	Soybean
1	Variety of crop	Jaya	Ruchi 2001
2	Straw moisture content (%)	40.1 to 42.2	NA
3	Grain moisture content (%)	13.6 to 16.8	7.3 to 10.5
4	Plant height (cm)	90.9 to 107.2	59.8 to 61.0
5	Length of ear head (mm)	190 to 245	NA
6	Number of grains per ear head	149 to 305	NA
7	Number of hills per square meter	26 to 29	NA
8	Number of tillers per hill	14 to 19	NA
9	Straw-grain ratio	2.90:1 to 4.26:1	NA
10	Av. No of pods per bunch	NA	5
11	No. of plants per m <sup>2</sup>	NA	56 to 61
12	Nos. of pod bunch per plant	NA	6.0

### SUMMARY OF FIELD PERFORMANCE

Table-2

S. No.	Parameters/operations	Range	
		Paddy	Soyabeen
1	Forward speed (kmph)	3.05 to 3.28	2.97 to 3.03
2	Width of cut (cm)	113 to 114	114 to 115
3	Stubble height (mm)	72.1 to 75.8	65.0 to 71.7
4	Losses (Percentage of total grain yield)		
	-Pre-harvest loss	0.004 to 0.03	Nil
	-Post harvest loss (Cutter bar)	0.18 to 0.23	0.06 to 0.24
	-Conveyor loss/shattering loss	0.29 to 0.33	0.75 to 0.77
5	Area harvested (ha/h)	0.258 to 0.273	0.241 to 0.246
6	Field efficiency (%)	70.68 to 75.57	70.47 to 71.30
7	Time required for one hectare (h)	3.66 to 3.88	4.07 to 4.15
8	Fuel consumption		
	- l/h	1.17 to 1.22	1.01 to 1.03
	- l/ha	4.32 to 4.64	4.19 to 4.20



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### 13.1 For Paddy Harvesting

#### 13.1.1 Rate of work

- The forward speed of machine was observed as 3.05 to 3.28 kmph.
- The area harvested by the machine was recorded as 0.258 to 0.273 ha/h.

#### 13.1.2 Quality of work

- Field efficiency was observed as 70.68 to 75.57 %.
- The post-harvest loss (cutter bar) was observed as 0.18 to 0.23 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.29 to 0.33 % of total grain yield.
- The stubble height was recorded as 72.1 to 75.8 mm.
- Machine leaves the harvested crop in windrows.



### 13.2 For Soybean Harvesting

#### 13.2.1 Rate of work

- The forward speed of machine was observed as 2.97 to 3.03 kmph.
- The area harvested by the machine was recorded as 0.241 to 0.246 ha/h.

#### 13.2.2 Quality of work

- Field efficiency was observed as 70.47 to 71.30 %.
- The post-harvest loss (cutter bar) was observed as 0.06 to 0.24 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.75 to 0.77 % of total grain yield.
- The stubble height was recorded as 65.0 to 71.7 mm.
- Machine leaves the harvested crop in windrows.

#### 13.3 Labour requirement

- One unskilled labour is required for cutting the crop manually at corner and side of each field.
- Two skilled labours are required for operating the machine continuously.

#### 13.4 Operator's comfort, safety and ease of operation

- All the controls were within the easy reach of the operator.
- The machine was provided with main clutch for stopping forward motion of the machine and cutter bar operation at same time.

### 13. EASE OF OPERATION AND ADJUSTMENT

No noticeable difficulties were observed in operation and adjustment during the field test.

### 14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during test.

## 16. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

### 16.1 Engine:

The Engine and other assemblies were dismantled after 39.63 hours of operation.

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#### 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
5.46	5.46	5.42	5.42	0.04	0.04	Not specified	Not specified



#### Valve, guide and timing gear:-

Any marked sign of overheating of valves	: None
Pitting of seat/faces of valves	: None
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 3.23 kW against declared value of 4.0 kW by the manufacturer. This shall be looked into for corrective action.
- 17.2** The specific fuel consumption (SFC) in rating test of engine was observed as 359 g/kWh against declared value of 400 g/kWh by the manufacturer which exceeded by more than 5 percent of that declared by the manufacture and does not fulfill the requirement of IS 7347-1974 (reaffirmed 2006). This should be looked into for corrective action.
- 17.3** It was observed that during engine performance test, at full Load, engine rpm was not stable at rated speed. This shall be looked into for corrective action.
- 17.4** 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 machine components. In view of above, this deserves to be given top priority for corrective action.
- 17.5** Noise at operator's ear level was observed on higher side against danger limit of 90 dB (A) as specified by International labour Organization (ILO) for continuous exposure of 8 hours per day. **This calls for reduction in noise level to improve the operator's comfort & safety.**
- 17.6** 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.
- 17.7** 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.
- 17.8** 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.



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- 17.9 The mentioned value of Rated power 4.0 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.
- 17.10 Provision for checking oil level of main gearbox was not provided. It should be looked into for corrective action.
- 17.11 **Adequacy of Literature**  
The following literature in English language was provided for reference during testing:  
  - Operator's/ Service manual
  - Parts catalogue
It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-1999.

**TESTING AUTHORITY**



(M.R. PATIL)  
AGRICULTURAL ENGINEER



(DR. P.P. RAO)  
DIRECTOR

Draft test report compiled by - **Shri Khagendra Bora**  
Sr. Technical Assistant

**18. APPLICANT'S COMMENTS**

Sr. No.	Clause No.	Applicant's Comments
18.1	17.1 to 17.11	Observation will be studied and necessary corrective action will be taken for quality improvement in products.

