



INCOMPLETE REPORT



55 DLX-CW VST SELF PROPELLED REAPER



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- शोणितपुर (असम)

BISWANATH CHARIALI: SONITPUR: ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Machine 89/460	(INCOMPLETE REPORT) 55 DLX-CW VST SELF PROPELLED REAPER	COMMERCIAL (INITIAL)
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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
- 1.3 Vibration measurement
- 1.4 Noise measurement
- 1.5 Air cleaner oil pull over
- 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 2014) : 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, Mahadevpura post,
Bengaluru Urban, 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 |

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Make : VST
 Model : 55 DLX-CW
 Year of manufacture : 2022
 Serial Number : AAKTDE002898
 Country of origin : INDIA
 Size of reaper (mm) : 1195
 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 Champ Energy Venture Pvt Ltd., Plot No. 7, Gat No. 399/2-3 B, Village Bhare, Taluka- Mulshi, Pune, Pin Code- 412115

Make : CHAMP
 Model : CH195
 Type : 4 Stroke Petrol Engine, Single cylinder, Air cooled

Year of manufacture : 2022
 Serial Number : 22201105
 Country of origin : INDIA

Recommended high idle speed (rpm) : 1900 \pm 50 (at PTO)
3800 \pm 100 (at Engine)

Recommended low idle speed (rpm) : 900 \pm 75 (at PTO)
1800 \pm 150 (at Engine)

Recommended rated speed (rpm) : 1800 (at PTO)
3600 (at Engine)

Recommended speed for field test (rpm) : 1500-1800 (at PTO)
3000 -3600 (at Engine)

Rated power observed (kW) : As requested by the applicant, machine was withdrawn from testing & hence engine test was not conducted.

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13. FIELD PERFORMANCE TEST

The machine was tested for 25.20 hours for harvesting the 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/operations	Range
1	Variety of crop	Jaya
2	Straw moisture content (wb) (%)	41.7 to 45.1
3	Grain moisture content (wb) (%)	16.9 to 18.6
4	Plant height (cm)	86.2 to 95.2
5	Length of ear head (mm)	156.0 to 180.8
6	Number of grains per ear head	175 to 202
7	Number of hills per square meter	24 to 30
8	Number of tillers per hill	14 to 22
9	Straw-grain ratio	2.88:1 to 3.26:1

SUMMARY OF FIELD PERFORMANCE

Table-2

S. No.	Parameters/operations	Range
1	Forward speed (kmph)	2.76 to 2.79
2	Width of cut (cm)	110 to 112
3	Stubble height (mm)	60.2 to 66.6
4	Losses (Percentage of total grain yield)	
	-Pre-harvest loss	Nil
	-Post harvest loss (Cutter bar)	0.01 to 0.29
	- Conveyor loss/shattering loss	0.28 to 0.45
5	Area harvested (ha/h)	0.226 to 0.241
6	Field efficiency (%)	73.65 to 78.06
7	Time required for one hectare (h)	4.15 to 4.43
8	Fuel consumption	
	- l/h	0.921 to 0.931
	- l/ha	3.87 to 4.08

13.1 Rate of work

- The forward speed of machine was observed as 2.76 to 2.79 kmph.
- The area harvested by the machine was recorded as 0.226 to 0.241 ha/h.

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13.2 Quality of work

- Field efficiency was observed as 73.65 to 78.06 %.
- The post-harvest loss (cutter bar) was observed as 0.01 to 0.29 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.28 to 0.45 % of total grain yield.
- The stubble height was recorded as 60.2 to 66.6 mm.
- Machine leaves the harvested crop in windrows.

13.3 Labour requirement

- Two skilled labours were required for operating the machine continuously.
- Two unskilled labours were required for cutting the crop manually at corner and sides of each plot.

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 the same time.

14. EASE OF OPERATION AND ADJUSTMENTS

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

15. DEFECTS, BREAKDOWNS AND REPAIRS

1. Play was observed in PTO shaft of the engine. On request of the applicant PTO shaft was changed.
2. During engine performance test, it was observed that at full load, engine rpm was not stable at rated speed. (engine speed fluctuation of ± 50 rpm was observed)
3. Clogging of crop at star wheel and cutter bar was observed several times during field performance tests which resulted in breakage of safety pin.

16. COMMENTS AND RECOMMENDATIONS

16.1 The machine was withdrawn by the applicant from testing. Accordingly as per request of the applicant incomplete test report is released.

16.2 Play was observed in PTO shaft of the engine after completion of the field tests. It should be looked into for improvement.

16.3 During engine performance test, it was observed that at full load, engine rpm was not stable at rated speed. This shall be looked into for corrective action.

16.4 Clogging of crops at cutter bar was observed several times which resulted in breakage of safety pin. This shall be looked into for improvement.

16.5 The amplitude of mechanical vibration marked as (*) is 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.

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- 16.6 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 operational comfort and safety.
- 16.7 Specifications of knife sections of the cutter bar does not conform to IS 6025:1982 (Reaffirmed 2019) and it should be looked into for corrective action.
- 16.8 Specifications of knife back of the machine does not conform to IS 10378-1982 (Reaffirmed 2021) and it should be looked into for corrective action.
- 16.9 The hardness and chemical composition of knife sections (both movable and stationary) does not conform to the requirement of IS 6025-1982 (Reaffirmed 2019). It should be looked into for improvement.

16.10 Technical 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. PATIL)
AGRICULTURAL ENGINEER

(S.G. PAWAR)
AGRICULTURAL ENGINEER

(Dr. R.P. RAO)
DIRECTOR

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