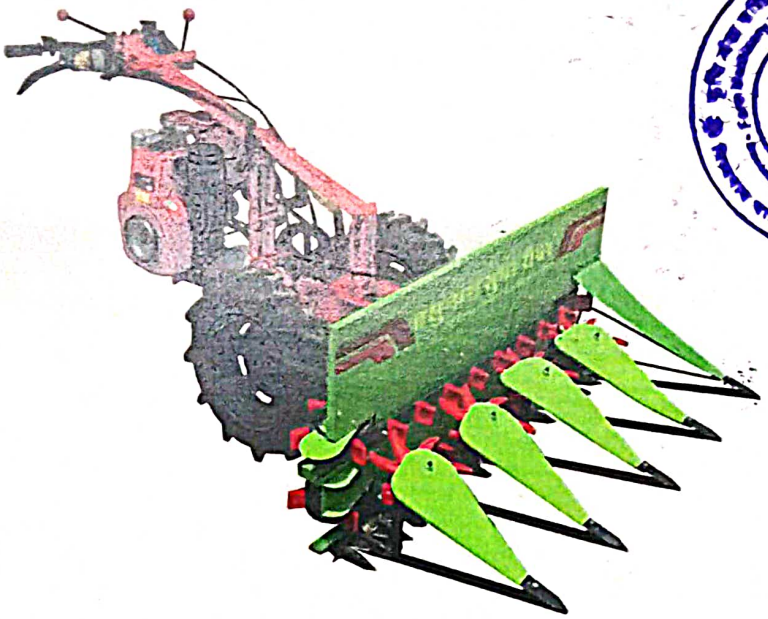
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

संख्या/No.: Machine 61/429
माह / Month: March 2022

THIS TEST REPORT IS VALID UPTO 31.03.2027



VASUNDHARA
SELF PROPELLED REAPER, MODEL: VKY-SVCR-2D

सत्यमेव जयते

भारत सरकार
GOVT OF INDIA
कृषि एवं किसान कल्याण मंत्रालय
MINISTRY OF AGRICULTURE & FARMERS WELFARE
कृषि, सहकारिता एवं किसान कल्याण विभाग
DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
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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 Tuning Ability
1.6 Wear analysis of critical components (Cutter Bar blade)
1.7 Hardness and chemical analysis (Cutter Bar blade)
1.8 Field performance
1.9 Ease of operation and adjustments
1.10 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	1001	Out of 5 samples, S. No. 2 has been randomly selected.
2	**1002**	
3	1003	
4	1004	
5	1005	

3. TEST CODE/PROCEDURE

There is no Indian Standard Test Code available for testing of self-propelled vertical conveyor 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: 12036:1995 (Reaffirmed 2004) : Agricultural Tractors- Test procedure-Power Tests for Power Take-Off.
5. IS:6024:1983 : Specification for Guard for harvesting machine.

4. SPECIFICATIONS

4.1 General:

Name and address of the manufacturer	:	**M/s Vasundhara Krishi Yantra, Plot No-4, Lamba kheda, Berasia Road, Bhopal, Madhya Pradesh - 462038**
Name & Address of Applicant	:	**Bhanu Pratap Singh Thakur. Plot No-4, Lamba kheda, Berasia Road, Bhopal, Madhya Pradesh-462038**
Name of machine	:	Reaper
Type	:	Self-Propelled, Walk Behind
Make	:	Vasundhara
Model	:	VKY-SVCR-2D
Year of manufacture	:	2021

Serial Number	:	1002
Country of origin	:	India
Size of reaper, mm	:	1200
Name of crop recommended (apa)	:	Paddy, wheat.
Name of crop in which the test was conducted	:	Wheat.

4.2 Details of Prime Mover Used:

Name and address of the manufacturer	:	Greaves Cotton Limited, Plot J2 M. I. D C Chikalthana Aurangabad (Maharashtra) Made in India
Make	:	Greaves
Model	:	5520
Type	:	Single Cylinder 4 Stroke, Air cooled Diesel Engine.
Year of manufacture	:	NP
Serial Number	:	AOJ1424475
Country of origin	:	India
Recommended high idle speed (rpm)	:	3700 ± 50
Recommended low idle speed (rpm)	:	1300 ± 100
Recommended rated speed (rpm)	:	3600
Recommended rated speed for field test (rpm)	:	2500

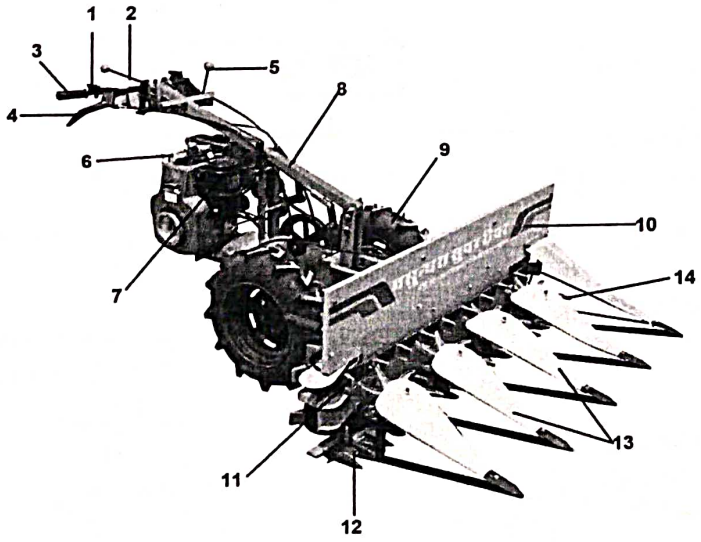

Fig.1: Self-Propelled Reaper

KEYWORDS:

1. Accelerator
2. Cutter bar engaging lever
3. Handle grip
4. Side clutch
5. Main gear shifting lever
6. Silencer
7. Air cleaner
8. Main frame
9. Transport wheel
10. Reaper frame
11. Conveyor Belt
12. Cutter bar
13. Crop divider
14. Star wheel

4.3. Cylinder and cylinder head:

Number	:	One
Disposition	:	Vertical

13. FIELD PERFORMANCE TEST

The reaper was operated for 25.50 hours for harvesting the wheat crop. During the test variety of wheat harvested was wheat 1837 to assess the performance of machine with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The crop parameter and Field performance test are given in Annexure-I &II and summarized in table 1 & 2.

SUMMARY OF CROP PARAMETERS

Table-1

S. No.	Parameters/operations	Range
1	Variety of crop	Wheat 1837
2	Straw moisture content (%)	7.0 to 16.0
3	Grain moisture content (%)	8.20 to 16.10
4	Plant height (cm)	70.7 to 88.2
5	Length of ear head (mm)	62.0 to 67.6
6	Number of grains per ear head	29.4 to 40.2
7	No. of hill per m^2	39.0 to 75.0
8	Number of tillers per m^2	327 to 411.6
9	Straw-grain ratio	1.10:1 to 1.50:1
9	Atmospheric Conditions	
	- Temperature ^0C	36.0 to 38.0
	- Humidity (%)	12.0 to 16.0
	- Pressure (kPa)	95.5 to 95.6

SUMMARY OF FIELD PERFOMANCE

Table-2

S. No.	Parameters/operations	Range
1	Av. forward speed (kmph)	2.09 to 2.14
2	Width of cut (cm)	114 to 117
3	Stubble height (mm)	105 to 117.5
4	Losses (% of total grain yield)	
	- Pre-harvested loss	0.00 to 0.26
	- Post-harvest loss(Cutter bar + Uncut)	0.33 to 0.51
	- Conveyor loss/shattering loss	0.14 to 0.26
5	Area harvested (ha/h)	0.1760 to 0.1840
6	Field Efficiency, %	72.1 to 74.87
7	Time required for one hectare (h)	5.43 to 5.68
8	Fuel consumption	
	- l/h	0.53 to 0.58
	- l/ha	2.95 to 3.18

13.1 Rate of work

- Av. speed of harvesting ranged between 2.09 to 2.14 kmph
- The area harvested the machine was recorded as 0.1760 to 0.1840 ha/h.

13.2 Quality of work

- Field efficiency was observed as 72.1 to 74.87 %.
- The post-harvestloss was observed as 0.00 to 0.26 %.
- The conveyor loss/Shattering loss was observed as 0.14 to 0.26 %.
- The stubble height was recorded as 105 to 117.5 mm.
- Machine leaves the harvested crop in windrows

16.1.4 Ring end gap clearance

Ring No.	Ring End gap (mm)			Max. Permissible wear limit (mm)
	At top	At middle	At bottom	
1st Compression ring	0.05	0.07	0.07	1.00
2nd compression ring	0.07	0.07	0.07	2.00
3rd compression ring	0.07	0.07	0.07	NA
Oil ring	0.07	0.07	0.07	1.20

16.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permmissible wear limit (mm)	
			Dimentrical	Axial	Dimentrical	Axial
1	40.15	40.04	0.11	0.20	0.25	0.80

Condition of bearing: Normal

16.1.6 Main bearing

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit,(mm)	
			Diametrical clearance	Crankshaft end float
Bush Bearing	0.04	0.18	NA	0.30

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
6.97	6.96	6.93	6.93	0.04	0.03	**Not Specified**	**Not Specified**

16.2 Valve guide and springs

Valve, guide and timing gear:-

-Pitting of seat/faces of valves : Normal
-Any visual damage of teeth of timing gears : None
- Condition of ingnition coil & magneto : Normal

17. COMMENTS AND RECOMMENDATIONS

17.1 Rated power of the engine has been observed as 3.61 kW @ 3600 rpm as against declaration of 3.68 kW @ 3600 rpm by the applicant/manufacturer.

17.2 The characteristics curve of the engine performance shows that there is no power and torque drop in the vicinity of rated engine speed, it indicates that the behavior of governor seems is a constant speed governor. Therefore it is recommended that the engine may be provided with the variable speed governor for agricultural purpose.

17.3 Specific fuel consumption of Rated engine speed as observed during test 300 g/kWh against 430 g/kWh of that declared by the applicant/manufacturer.

17.4 The hardness and chemical composition of Knife blades does not conform to the requirement of IS 6025-1982. It should be looked into corrective action.

17.5 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

17.6 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.**

17.7 A Safety pin on conveyor chain for cutter bar is not provided to take care of overloading of cutter bar. it needs to be provided at suitable place

17.8 Specification for knife sections for harvesting machine does not conform to IS 6025:1982 and it should be looked into for corrective action.

17.9 Specification for knife back for harvesting machine does not conform to IS 10378-1982 and it should be looked into for corrective action.

17.10 **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

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AGRICULTURAL ENGINEER

(J.P. MANDAL)
SENIOR AGRICULTURAL ENGINEER

(K.K. NAGLE)
DIRECTOR

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