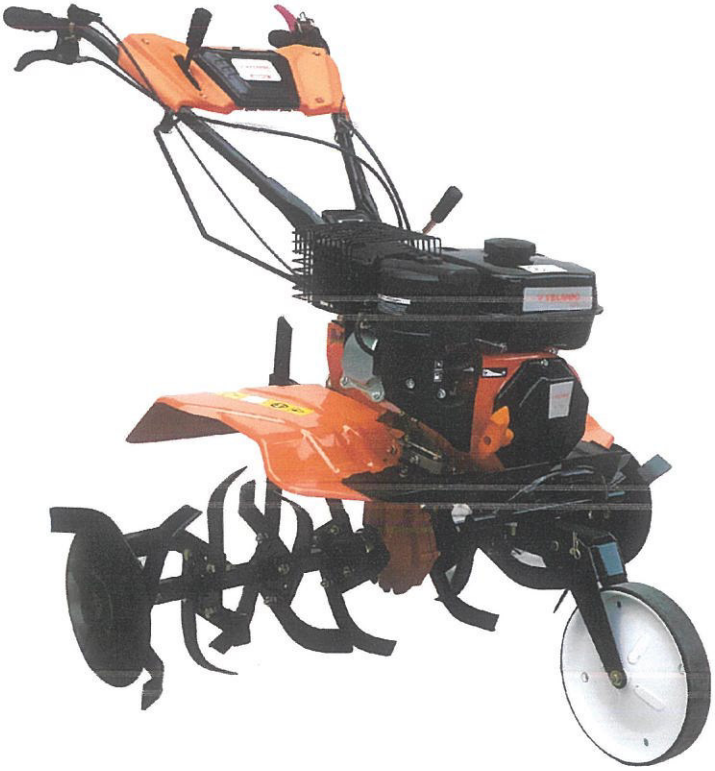
व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ **No.: Power weeder-185/3098/2023**
माह/**Month: October, 2023**

THIS TEST REPORT VALID UP TO : 31st October, 2028



VELMOC AGRO, CW 750PT
POWER WEEDER

सत्यमेव जयते

भारत सरकार
Government of India
कृषि एवं किसान कल्याण मंत्रालय
Ministry of Agriculture and Farmers Welfare
कृषि एवं किसान कल्याण विभाग
Department of Agriculture and Farmers Welfare
उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
Northern Region Farm Machinery Training and Testing Institute
ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001
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11. RUNING - IN

The power weeder was run-in for 0.57 hour before field performance test. All the fasteners were checked and tightened thereafter.

12. FIELD TEST

The field tests under dry land condition were conducted for 26.12 h. The field tests were conducted at the rated 3600 rpm. In all, 6 tests trials were conducted in sandy loam soil at NRFMTTI farm, Hisar. The summary of the field test for dry land operation is given in table-4.

Crop parameters

i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 16 to 37

Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sr. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Soil moisture, %	:	6.70 to 7.40
iii)	Bulk density of soil, g/cc	:	1.20 to 1.25
iv)	Speed of operation, kmph	:	1.23 to 1.65
v)	Depth of cut, cm	:	5.93 to 6.33
vi)	Width of cut, m	:	0.97 to 1.04
vii)	Area covered, ha/h	:	0.099 to 0.131
viii)	Time required for one ha	:	7.63 to 10.10
ix)	Fuel consumption		
	l/h	:	1.20 to 1.35
	l/ha	:	9.92 to 13.64
x)	Weeding efficiency, %	:	87.23 to 89.66
xi)	Field efficiency, %	:	77.44 to 81.88

13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable defect/breakdown observed during test.

14. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

14.1	Engine :					
	The Engine and other assemblies were dismantled after 39.36 hours of engine operation.					
14.1.1	Cylinder :					
Cylinder bore diameter, mm						
Top Position		Middle position		Bottom Position		Max. permissible wear limit
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
70.02	70.01	70.03	70.01	70.03	70.01	70.20

14.1.2 Piston:

Piston diameter, mm

Top position		At skirt			Max. permissible wear limit, mm	
Thrust side	Non-thrust side	Thrust side	Non-thrust side	Piston to cylinder clearance, mm	Piston dia. at skirt	Piston to cylinder clearance
69.36	69.39	69.97	Not measured due to piston design constraint	0.06	69.80	1.00

14.1.3 Piston rings end gap:

Ring no.	Ring end gap, mm			Max. permissible wear limit, mm
	At top	At middle	At bottom	
1st compression ring	0.30	0.30	0.30	1.00
2nd compression ring	0.40	0.50	0.50	1.00
Oil ring	**Not measured due to piston design constraint**			

14.1.4 Big end bearing:

Dia. of crank pin, mm	Dia. of bearing, mm	Clearance, mm		Max. permissible wear limit, mm	
		Diametrical	Axial	Diametrical	Axial
29.98	30.02	0.04	0.80	0.10	1.00

14.1.5 Main bearing of crank shaft:

Sr. No.	Dia. of main journal, mm	Dia. of main bearing, mm	Diametrical clearance of main bearing	End float of crank shaft	Max. permissible wear limit, mm	
					Diametrical	End float of crank shaft
Ball bearing is provided at both side, hence not applicable						

14.1.6 Piston rings groove clearance:

Ring no.	Ring groove clearance, mm	Max. permissible wear limit, mm
1st compression ring	0.04	1.00
2nd compression ring	0.03	1.00
Oil ring	**Not measured due to piston design constraint**	

14.1.7 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
5.50	5.50	5.47	5.46	0.03	0.04	0.40	0.40

14.2 Valve guides and valve springs

Valve spring stiffness, Kgf/mm : **Discard limit**

Inlet valve : 0.47 **Not specified**

Exhaust valve : 0.47

14.3 Timing gears : No noticeable defect observed.

14.4 Transmission : No noticeable defect observed.

14.5 Rotary drive unit : No noticeable defect observed.

14.6 Wear of blades:

14.6.1 Mass basis:

The wear of the rotary weeder blades was measured after 26.69 hrs. of field operation and the observations are as under:

Sr. No.	Initial mass, g	Mass after 26.69 hrs., g	Loss of mass, g	Percent wear, %	Percent wear per hour
1	301.3	299.5	1.80	0.60	0.02
2	303.4	302.2	1.20	0.40	0.02
3	299.0	295.4	3.60	1.20	0.04
4	290.2	288.9	1.30	0.45	0.02
5	301.7	299.8	1.90	0.63	0.02
6	315.7	314.1	1.80	0.60	0.02
7	302.4	300.7	1.70	0.56	0.02
8	296.7	295.1	1.60	0.54	0.02

15. CRITICAL TECHNICAL SPECIFICATIONS
(Vide Ministry's communication F. No. 9-1/2019-M&T (I&P) Dated 20.08.2019)

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300 - 1500	1045	Conforms
3.	Type of engine	Compression/Spark ignition	Spark ignition	Conforms
4.	Starting method	Manual/recoil/self-starting	Recoil	Conforms
5.	Type of clutch	Dry/Wet	Wet	Conforms
6.	Type of primary gear box	Sliding/Constant mesh or combination of both	Sliding mesh	Conforms
7.	Type of secondary gear box	Gear type, chain & sprocket type	Gear type	Conforms
8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	EN9	Conforms
9.	No. of flanges	4 - 10	8	Conforms
10.	Types of flanges	Square/circular/rectangular	Square	Conforms
11.	Distance between consecutive flanges, mm	80 to 150	117	Conforms
12.	No. of blades in each flange	3 - 6	04	Conforms
13.	No. of rotor blade	12 (Min.)	32	Conforms
14.	Thickness of rotor blade, mm	5 (Min.)	5.0	Conforms

15.	Material of blade	Boron (28MnCrB5) / High carbon steel of Grade EN42J	High carbon steel	Conforms
16.	Hardness of blade, HRC	38 (Min.)	53.5 (Average)	Conforms
17.	Shape of rotor blade	C / J shape	J shape	Conforms
18.	Provision for handle height adjustment	Must be provided	Provided	Conforms
19.	Provision for handle rotation	Optional	Movement of the machine in only one direction	--
20.	Provision for emergency stop of engine	Must be provided	Provided	Conforms
21.	Provision for easy start of engine	Must be provided	Provided	Conforms
22.	Provision for shield/cover to prevent flying of mud & stone from rotor	Must be provided	Provided	Conforms
23.	Depth control mechanism	Must be provided	Provided	Conforms
24.	Provision for transport wheels	Optional	Provided	Conforms
25.	Provision for cover on exhaust	Must be provided	Provided	Conforms
26.	Direction of exhaust emission away from operator	Must be provided	Provided	Conforms
27.	Marking/labeling machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacturer, Serial number, Engine number, Engine HP, rated rpm & SFC.	Provided	Conforms
28.	Literature	Operator manual, service manual and Parts catalogue should be provided.	Provided	Conforms

16. COMMENTS & RECOMMENDATIONS

16.1 Engine rating test

i) The average rated power in rating test of engine was observed as 4.58 kW against manufacturer declared power of 4.80 kW at 3600 rpm.

ii) Specific fuel consumption (SFC) at average rated power in rating test was observed as 336 g/kWh. The manufacturer has not declared specific fuel consumption. It must be declared.

16.2 Mechanical vibration

The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on drastically higher side. It is not just directly concerned with operator's health, safety and comfort, but also adversely affects the useful life of the components. In view of above, this deserved to be given top priority for corrective action.

16.3 Country of origin and Year of manufacture are not mentioned on labeling plate. It **MUST** be mentioned.

16.4 The spark arresting device on exhaust system of engine is not provided. It **MUST** be looked into.

17. TECHNICAL LITERATURE

The following literatures were provided by the applicant.

i) Operator manual
ii) Parts catalogue
iii) Service manual

However, the manual needs to be updated as per IS: 8132–1999

TESTING AUTHORITY

Er. SANJAY KUMAR **AGRICULTURAL ENGINEER**	
Dr. MUKESH JAIN **DIRECTOR**	17.10.2023

The test report is compiled by Sh. Deny Hasnu, Senior Technician

18. APPLICANT'S COMMENTS

We will carefully deliberate upon your recommendations and implement appropriate actions accordingly.

N.R.F.M.T.&T.I., HISAR