

THIS TEST REPORT IS VALID UPTO 31.01.2032



KASHI, KPW 178FD, POWER WEEDER



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

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)

BISWANATH CHARIALI, DIST- BISWANATH, ASSAM, PIN - 784 176

[AN ISO 9001:2015 CERTIFIED INSTITUTION]

4. SPECIFICATIONS

4.1 General:

Make	:	KASHI
Model	:	KPW 178FD
Name and address of manufacturer	:	M/s. Chongqing Haofa Machinery Manufacturing Co., Ltd., Sanjiao Town, Youngchuan District, Chongquin – 400 050, CHINA
Name and address of applicant	:	M/s. SB AGRO, 204 SDS Chambers, Bhaistan Road, Raipur CG - 492001
Name of machine	:	Power Weeder
Type of machine	:	Self propelled, Walk behind
Working size of machine (mm)	:	1225
Year of manufacture	:	2024
Serial no. of machine	:	20240006

4.2 Details of prime mover:

Make (apa)	:	Chongqing
Model	:	178F
Type	:	4 stroke, Single cylinder, Air cooled, Diesel engine
Year of manufacture	:	2024
Serial Number	:	240117956
Country of origin	:	CHINA
Recommended high idle speed (rpm)	:	3700 ± 100
Recommended low idle speed (rpm)	:	1400 ± 100
Recommended rated speed (rpm)	:	3600
Maximum power observed (kW)	:	4.61
Maximum power declared (apa) (kW)	:	4.50



Sl.No.	Parameters		Observations	
1	Type of soil	:	Light	
2	Soil moisture (%)	:	4.2 to 6.5	
3	Bulk density of soil (g/cc)	:	1.50 to 1.85	
4	Forward Speed of operation (kmph)	:	1.55 to 2.05	
5	Depth of cut (cm)	:	6.0 to 6.5	
6	Width of cut (m)	:	1.19 to 1.24	
7	Area covered (ha/h)	:	0.147 to 0.216	
8	Time required for one ha (h)	:	4.62 to 6.81	
9	Field efficiency (%)	:	78.3 to 85.3	
10	Weeding efficiency (%)	:	72.9 to 81.7	
11	Fuel consumption			
		l/h	:	0.43 to 0.50
		l/ha	:	2.17 to 2.93

12.1 Rate of work:

- Rate of work was recorded as 0.147 to 0.216 ha/h and the forward speed of operation was recorded from 1.55 to 2.05 kmph.
- Time required to cover one hectare was recorded as 4.62 to 6.81 h.

12.2 Quality of work:

- Depth of cut was recorded as 6.0 to 6.5 cm.
- Working width was observed as 1.19 to 1.24 m.
- Field efficiency was found as 78.3 to 85.3 %.
- Weeding efficiency was found as 72.9 to 81.7 %.

12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

12.4 Wear Analysis of rotor blades:

Blade No.	Initial mass(g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 25.53 h	Per hour
L-1	309.47	304.14	5.33	1.72	0.07
L-2	317.7	313.11	4.59	1.44	0.06
L-3	313.84	307.1	6.74	2.15	0.08
L-4	303.46	300.16	3.3	1.09	0.04
R-1	297.49	294.3	3.19	1.07	0.04
R-2	303.9	298.73	5.17	1.70	0.07
R-3	310.03	306.2	3.83	1.24	0.05
R-4	306.15	301.65	4.5	1.47	0.06

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.04 to 0.08%.



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13. EASE OF OPERATION & ADJUSTMENTS

Machine maneuverability while taking turns during field operation was not comfortable.

14. DEFECTS, BREAKDOWNS AND REPAIRS

No defect or breakdown was observed during test.

15. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

15.1 Engine:

The Engine and other assemblies were dismantled after 40.56 hours of operation.

15.1.1 Cylinder:

Cylinder	Cylinder bore dia (mm)						Max. Permissible wear limit (mm)
	Top position		Middle position		Bottom position		
	Thrust side	Non Thrust side	Thrust side	Non Thrust side	Thrust side	Non Thrust side	
1	78.03	78.02	78.02	78.01	78.03	78.01	78.20

15.1.2 Piston:

Piston no.	Piston dia (mm)				Max. Permissible wear limit at skirt (mm)	Piston to cylinder liner clearance at top, (mm)	
	At top		At skirt			As observed	Max. permissible limit, (mm)
	Thrust side	Non Thrust side	Thrust side	Non Thrust side			
1	77.47	77.49	77.87	*	77.20	0.16	Not specified

15.1.3 Ring Side clearance:

Piston Rings	Ring Side clearance (mm)	Max. Permissible wear limit (mm)
1st Compression ring	0.08	0.30
2nd compression ring	0.05	0.30
Oil ring	0.05	0.15

15.1.4 Ring end gap clearance

Ring No.	Ring End gap (mm)			Max. Permissible wear limit (mm)
	At top	At middle	At bottom	
1st Compression ring	0.35	0.35	0.30	1.0
2nd Compression ring	0.35	0.40	0.40	1.5
Oil ring	0.30	0.30	0.30	1.2

15.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permissible wear limit (mm)	
			Dimetrical	Axial	Dimetrical	Axial
1	38.04	37.96	0.08	0.45	0.25	0.80

Condition of bearing: Normal

15.1.6 Main bearing: One No. of ball bearing 6307 was used.

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit,(mm)	
			Diametrical clearance	Crankshaft end float
Bush bearing	0.10	0.05	Not specified	0.30

15.1.7 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
6.00	6.01	5.96	5.93	0.04	0.08	0.15	0.15

Valve, guide and timing gear:-

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



15.2 Clutch: No noticeable defect was observed.

15.3 Transmission gears: No noticeable defect was observed.

15.4 Rotary drive unit:

The rotary drive unit was dismantled and all the components were found in normal condition.



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16. CRITICAL TECHNICAL SPECIFICATIONS
(Vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019)

Sl. No.	Parameters	Specifications	Observation	Remarks
1.	Type	Self-propelled, walk behind	Self-propelled, walk behind	Conforms
2.	Working width (mm)	300 –1500	1225	Conforms
3.	Type of engine	Compression ignition / Spark ignition	Compression ignition	Conforms
4.	Starting method	Manual / recoil /self-starting	Recoil starting	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	Gear type	Conforms
8.	Material for rotor shaft	SAE1045 (CRS) / EN8 / EN9	Mild steel (apa)	Does not conform
9.	No. of flanges	4 - 10	8	Conforms
10.	Type of flanges	Square / circular/ rectangular	Square	Conforms
11.	Distance between consecutive flanges (mm)	80 to 150	145	Conforms
12.	No. of blades in each flange	3 - 6	4	Conforms
13.	No. of rotor blade	12 (Min.)	32	Conforms
14.	Thickness of rotor blade (mm)	5 (min.)	4.0	Does not conform
15.	Material of blade	Boron (28Mn Cr B5) / High Carbon Steel EN42j	65 Mn (apa)	Does not conform
16.	Hardness of Blade, HRC	38 (Min.)	41	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	Must be provided	Not Provided	Does not conform
20.	Provision for emergency stop of engine	Must be provided	Provided	Conforms
21.	Provision for easy start of engine	Must be provided	Not Provided	Does not conform

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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	Must be provided	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 of 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.	Name and address of manufacturer and country of origin were not provided.	Does not conform
28.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms



17. COMMENTS & RECOMMENDATIONS

- 17.1 The specific fuel consumption (SFC) of engine corresponding to rated power was recorded as 394 g/kWh under natural ambient condition against the declared value of 310 g/kWh by the manufacturer. This shall be looked into for corrective action.
- 17.2 During air cleaner oil pull over test, percentage of oil pull over was observed on higher side. It should be looked into for corrective action.
- 17.3 Working width of the machine, type of engine (Petrol/Diesel), manufacturer's name and address and country of origin should be provided on the labeling plate of the machine. This should be looked into for corrective action.
- 17.4 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.**

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- 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 corrective action.
- 17.6 The hardness and chemical composition of rotary blades does not conform to the requirement of IS 6690:1981 (Reaffirmed 2022). This may be looked into for corrective action.
- 17.7 Machine maneuverability while taking turns during field operation was not comfortable. It shall be looked into for ease of operation for the operator.
- 17.8 **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: 8132-2023.

TESTING AUTHORITY


(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER




(P. KAMALABAI)
DIRECTOR

Draft test report compiled by - **Shri Vithato Keyho, Sr. Technical Assistant.**

18. APPLICANT'S COMMENTS

Para No	Our Reference	Applicant's Comments
18.1	17.1 to 17.8	We have noticed Comments & Recommendations. We will take appropriate action on this in future products.