

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



संख्या/No.: ICE/NERFMTTI, B. Chariali/  
14/14/566  
माह / Month: March 2026

THIS TEST REPORT IS VALID UPTO 31.03.2033



DHARMATECH INDUSTRIES, DI-RTD-7D, 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

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)

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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

ICE/NERFMTTI, B. Chariali/ 14/14/566	DHARMATECH INDUSTRIES, DI-RTD-7D POWER WEEDER	COMMERCIAL (INITIAL)
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#### 4. SPECIFICATIONS

##### 4.1 General:

Make	: DHARMATECH INDUSTRIES
Model	: DI-RTD-7D
Name and address of the manufacturer	: Chongqing Haofa Machinery Manufacturing Co. Ltd., Sanjiao Industrial Park, Yongchuan District, Chongqing City, CHINA
Name and address of the applicant	: Dharmatech Industries 23/2, Parishikhar Industrial Estate, S.P. Ring Road, Ramol, Ahmedabad, Gujarat – 382449
Name of machine	: Power Weeder
Type of machine	: Self-propelled, Walk behind
Country of origin	: CHINA
Working size of machine (mm)	: 1050
Year of manufacture	: 2025
Serial no. of machine	: 105

##### 4.2 Details of prime mover:

Make (apa)	: Dharmatech Industries
Model	: HF 173 FA
Type	: 4 stroke, single cylinder, air cooled, diesel engine
Year of manufacture	: 2025
Serial number	: HF173FA1525060700
Country of origin	: CHINA
Recommended high idle speed (rpm)	: 3400 ± 200
Recommended low idle speed (rpm)	: 1400 ± 100
Recommended rated speed (rpm)	: 3100
Speed at maximum torque (rpm)	: 3000
Maximum power observed (kW)	: 2.90
Maximum power declared (apa) (kW)	: 4.10

ICE/NERFMTTI, B. Chariali/ 14/14/566	DHARMATECH INDUSTRIES, DI-RTD-7D POWER WEEDER	COMMERCIAL (INITIAL)
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Sr. No.	Parameters		Observations
1	Type of soil	:	Medium
2	Soil moisture (%)	:	10.40 to 12.50
3	Bulk density of soil (g/cc)	:	1.85 to 1.95
4	Forward Speed of operation (kmph)	:	0.756 to 0.758
5	Depth of cut (cm)	:	6.52 to 6.70
6	Width of cut (m)	:	1.08 to 1.12
7	Area covered (ha/h)	:	0.064 to 0.070
8	Time required for one ha (h)	:	14.29 to 15.63
9	Field efficiency (%)	:	78.05 to 85.37
10	Weeding efficiency (%)	:	81.03 to 84.03
11	Fuel consumption		
		l/h	: 0.49 to 0.52
		l/ha	: 7.00 to 8.13

#### 12.1 Rate of work

- Rate of work was recorded as 0.064 to 0.070 ha/h and the forward speed of operation varied from 0.756 to 0.758 kmph.
- Time required to cover one hectare was recorded as 14.29 to 15.63 h.

#### 12.2 Quality of work:

- Depth of cut was recorded as 6.52 to 6.70 cm.
- Working width was observed as 1.08 to 1.12 m.
- Field efficiency was found as 78.05 to 85.37 %.
- Weeding efficiency was recorded as 81.03 to 84.03 %.

#### 12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

#### 12.4 Wear Analysis of rotor blades:

Sr. No.	Initial mass (g)	Final mass (g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 25.45 h	Per hour
L-1	357.30	353.55	3.75	1.05	0.04
L-2	358.84	350.97	7.87	2.19	0.09
L-3	354.17	345.95	8.22	2.32	0.09
L-4	358.27	351.94	6.33	1.77	0.07
R-1	354.13	348.25	5.88	1.66	0.07
R-2	357.70	349.05	8.65	2.42	0.10
R-3	356.15	350.02	6.13	1.72	0.07
R-4	348.98	344.13	4.85	1.39	0.05

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.04 to 0.10 %.

### 13. EASE OF OPERATION AND 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 37.44 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	73.01	73.01	73.00	73.00	73.00	72.99	73.30

#### 15.1.2 Piston:

Piston dia., mm				Max. permissible wear limit at skirt (mm)	Clearance between piston & cylinder liner at the skirt of the piston, mm	
Top (above top compression ring)		At skirt			As observed	Max. permissible limit, (mm)
Thrust side	Non-thrust side	Thrust side	Non-thrust side			
72.49	72.48	72.90	*	71.90	0.10	0.30

\*Not recorded due to piston design constraints.

#### 15.1.3 Ring side clearance:

Piston rings	Ring side clearance (mm)	Max. permissible wear limit (mm)
1st Compression ring	0.02	0.30
2nd compression ring	0.04	0.30
Oil ring	NA	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	0.35	1.00
2nd compression ring	0.45	0.45	0.45	1.50
Oil ring	0.25	0.25	0.25	1.20

#### 15.1.5 Big end bearing:

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. permissible wear limit (mm)	
			Diametrical	Axial	Diametrical	Axial
1	32.14	31.94	0.11	0.45	0.25	0.80

#### 15.1.6 Main bearing: One No. of ball bearing 6308 and brush bearing were used.

Bearing No.	Diametrical clearance (mm)	Crankshaft end float (mm)	Max. permissible clearance limit(mm)	
			Diametrical clearance	Crankshaft end float
1	0.11	0.05	0.20	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
5.49	5.49	5.42	5.42	0.07	0.07	0.15	0.20

#### 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

#### 15.2 Clutch: No noticeable defects were observed.

#### 15.3 Transmission gears: No noticeable defects were observed.

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

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

Sr. No.	Parameters	Specifications	Observation	Remarks
1	2	3	4	5
1.	Type	Self-propelled, walk behind	Self-propelled, walk behind	Conforms
2.	Working width (mm)	300 -1500	1130	Conforms
3.	Type of engine	Compression ignition / Spark ignition	Compression ignition	Conforms
4.	Starting method	Manual / recoil /self-starting	Manual / 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	Gear type	Conforms
8.	Material for rotor shaft	SAE1045 (CRS) / EN8 / EN9	65 Mn (apa)	<b>Does not conform</b>
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	126.43	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.)	5.04	Conforms
15.	Material of blade	Boron (28Mn Cr B5) / High Carbon Steel EN42j	Boron (28Mn Cr B5)	Conforms
16.	Hardness of Blade, HRC	38 (Min.)	44.5	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	<b>Does not conform</b>
20.	Provision for emergency stop of engine	Must be provided	Not Provided	<b>Does not conform</b>
21.	Provision for easy start of engine	Must be provided	Not Provided	<b>Does not conform</b>
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

1	2	3	4	5
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 & applicant, country of origin, Engine number and SFC were not provided.	<b>Does not conform</b>
28.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

**17. COMMENTS AND RECOMMENDATIONS**

- 17.1 The average maximum engine power was observed as 2.90 kW against declared value of 4.10 kW by the applicant/manufacturer. This should 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. This should be looked into for corrective action.
- 17.3 Name and address of manufacturer and applicant, country of origin, engine number and SFC were not provided on the labeling plate of the machine. This should be looked into for corrective action.
- 17.4 Material for rotor shaft, provision for handle rotation, provision for emergency stop of engine, provision for easy start of engine and marking /labeling of machine was not conformed to critical technical specifications vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019. This should be looked into for corrective action.
- 17.5 Machine maneuverability while taking turns during field operation was not comfortable. It shall be looked into for ease of operation for the operator.

- 17.6 The hardness and chemical composition of rotary blades did not conform to the requirement of IS 6690:1981 (Reaffirmed 2022). This may be looked into for corrective action.
- 17.7 Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by the International Labor Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operator's comfort and safety.
- 17.8 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 affecting the useful life of machine components. In view of above, this deserves to be given top priority for corrective action.
- 17.9 **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 D. Deori, Technical Assistant

**18. APPLICANT'S COMMENTS**

We will take necessary action as per comments and recommendations in the test report for our future products.

ANNEXURE

**FIELD PERFORMANCE RESULTS**

- Places of Test:** 1. Village: Panibharal, Dist.: Biswanath, Assam  
2. Village: Dagaon, Dist.: Biswanath, Assam  
3. Village: Chalia Chapari, Dist.: Biswanath, Assam

Sr. No.	Parameters	I	II	III	IV
1	Date of test	09.02.26	10.02.26	11.02.26	12.02.26
2	Net test duration (h)	6.50	6.75	6.70	5.50
3	Field length (m)	35.20	38.20	27.80	25.70
4	Type of soil	Medium			
5	Bulk density (g/cc)	1.90	1.93	1.85	1.95
6	Soil moisture (%)	11.87	12.30	10.40	12.50
7	Previous treatment	Nil			
8	Forward speed (kmph)	0.758	0.756	0.758	0.757
9	Av. depth of cut (cm)	6.52	6.68	6.58	6.70
10	Av. width of cut (m)	1.08	1.11	1.08	1.12
11	Area covered (ha/h)	0.070	0.069	0.064	0.069
12	Time required for one ha (h)	14.29	14.49	15.63	14.49
13	Field efficiency (%)	85.37	82.14	78.05	82.14
14	Av. height of weeds (cm)	173.2	176.0	146.0	166.0
15	Av. number of weeds per m <sup>2</sup> (before operation)	220	197	210	159
16	Av. number of weeds per m <sup>2</sup> (after operation)	35	33	34	30
17	Weeding efficiency (%)	84.03	83.33	83.81	81.03
18	Fuel Consumption				
	- l/h	0.49	0.50	0.52	0.51
	- l/ha	7.00	7.25	8.13	7.39