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

संख्या/No.: ICE/NERFMTTI, B. Chariali/
12/12/555
माह / Month: December 2025

THIS TEST REPORT IS VALID UPTO 31.12.2032

RIDDHISH IMPORT & EXPORT, MT-KISHAN-001, 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
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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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Type of test : Commercial (Initial)

Period of test : November 2025 to December 2025

Test Report No. : ICE/NERFMTTI, B. Chariali/12/12/555

This Test Report is Valid Up to : 31.12.2032

Month / Year of report release : December 2025

1. The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
2. The data given in the Test Report pertain to the particular machine randomly selected for test by the testing authority.
3. The results presented in this report do not in any way attribute to the durability of the machine.
4. The results should not be reproduced in part or full without the prior permission of the Director, North Eastern Region Farm Machinery Training and Testing Institute, Biswanath Chariali, Dist. - Biswanath (Assam) – 784 176.
5. This test report is valid up to 31.12.2032 as per the Ministry's O.M. No. 13-22/2020-M&T (I&P), dated 12.12.2023.

SELECTED CONVERSIONS

SELECTED CONVERSIONS		
Sr. No.	**Units**	**Conversion Factor**
1	**Force**	
	1 kgf	9.80665 N
		2.20462 lbf
2	**Power**	
	1 hp	1.01387 metric hp (Ps)
		745.7 W
	1 Ps	735.5 W
3	**Pressure**	
	1 psi	6.895 kPa
	1 kgf/cm^2	98.067 kPa = 735.56 mm of Hg
	1 bar	100 kPa = 10 N/cm^2
	1 mm of Hg	1.3332 m-bar

ABBREVIATIONS	
Symbols	**Abbreviations**
apa	As per Applicant
Av.	Average
ha	Hectare
HB	Brinell Hardness
HRC	Rockwell Hardness
Dia.	Diameter
IS	Indian Standard
MS	Mild Steel
NA	Not Available/Not Applicable
NR	Not Recorded
GL	Ground level
rpm	Revolutions per minute
PTO	Power take-off
Min.	Minimum
Max.	Maximum

Type of test	:	Commercial (Initial)
Name of machine	:	Power Weeder
Make	:	RIDDHISH IMPORT & EXPORT
Model	:	MT-KISHAN-001
Type	:	Self propelled, Walk behind
Country of Origin	:	**CHINA**
Name and address of manufacturer	:	M/s. Chongqing Haofa Machinery Manufacturing Co., Ltd. Sanjiao Town, Yongchuan District, Chongqing (Sanjiao Industrial Park, Yongchuan High-Tech Zone, Chongqing), **CHINA**
Website	:	--
E-mail	:	--
Name and address of the applicant	:	M/s. Riddhish Import & Export 85/12, G.T. Road, West Serampore, Ward No-4, Serampore, Hooghly, West Bengal- 712 203.
Website	:	--
E-mail	:	labssb.alwar@gmail.com
Test conducted by	:	**GOVERNMENT OF INDIA** North Eastern Region Farm Machinery Training and Testing Institute, PO: BiswanathChariali, Dist: Biswanath-784 176 (Assam) **(An ISO 9001-2015 Certified Institute)**

ICE/NERFMTTI, B.Chariali/ 12/12/555	RIDDHISH IMPORT & EXPORT, MT-KISHAN-001 POWER WEEDER	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 Hardness and chemical composition
1.7 Field performance
1.8 Wear analysis of rotor blades
1.9 Ease of operation and adjustments
1.10 Defects, breakdowns and repairs

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's site.

Sr. No.	Serial No. of test sample	Remarks
1	MC2507004	Out of 5 samples, Sr. No. 2 sample was randomly selected.
2	**MC2507035**	
3	MC2507010	
4	MC2507001	
5	MC2507006	

3. TEST CODE AND PROCEDURE

There is no Indian standard/test code available for testing of self-propelled power weeder as such. The guidelines, however, have been taken from the following:

IS 9935 : 2002 (Reaffirmed 2022) : Power Tiller - Test code.
IS 9980 : 1988 (Reaffirmed 2019) : Guidelines for field performance and haulage tests of power tillers.
IS 12036 :1995 (Reaffirmed 2019) : Agricultural Tractors- Test procedure-Power Tests for Power Take-Off.
IS 1976 : 1976 (Reaffirmed 2021) : Specification for Rotary paddy weeder, manually operated
IS 6690 : 1981(Reaffirmed 2022) : Specification for Blades for Rotavator for Power Tillers

ICE/NERFMTTI, B.Chariali/ 12/12/555	RIDDHISH IMPORT & EXPORT, MT-KISHAN-001 POWER WEEDER	COMMERCIAL (INITIAL)

4. SPECIFICATIONS

4.1 General:

Make	:	RIDDHISH IMPORT & EXPORT
Model	:	MT-KISHAN-001
Name and address of the manufacturer	:	M/s. Chongqing Haofa Machinery Manufacturing Co., Ltd. Sanjiao Town, Yongchuan District, Chongqing (Sanjiao Industrial Park, Yongchuan High-Tech Zone, Chongqing), **CHINA**
Name and address of the applicant	:	M/s. Riddhish Import & Export 85/12, G.T. Road, West Serampore, Ward No-4, Serampore, Hooghly, West Bengal- 712 203
Name of machine	:	Power Weeder
Type of machine	:	Self propelled, Walk behind
Country of origin	:	**CHINA**
Working size of machine (mm)	:	1340
Year of manufacture	:	2025
Serial No. of machine	:	MC2507035

4.2 Details of prime mover:

Make (apa)	:	CHONGQING
Model	:	186FA
Type	:	Four stroke, Single cylinder, Air cooled, Diesel engine.
Year of manufacture	:	2025
Serial number	:	2506100183
Country of origin	:	**CHINA**
Recommended high idle speed (rpm)	:	3600±200
Recommended low idle speed (rpm)	:	1400±100
Recommended rated speed (rpm)	:	3400
Maximum power observed (kW)	:	**6.81**
Maximum power declared (apa) (kW)	:	6.00

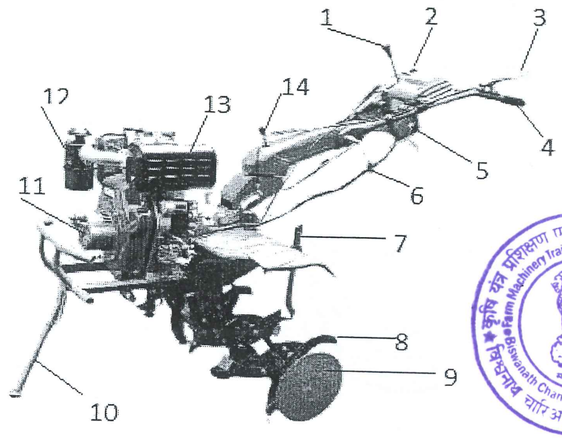

Fig. 1 RIDDHISH IMPORT & EXPORT, MT-KISHAN-001, POWER WEEDER

Keywords:

1 Main gear lever
2 Throttle lever
3 Main clutch lever
4 Handle Bar
5 Battery
6 Handle height adjusting lever
7 Depth control bar
8 Rotary blade
9 Rotar Disc
10 Supporting stand
11 Hand Crank Starter
12 Air cleaner
13 Silencer
14 Handle angle adjusting lever

4.2.1 Cylinder and cylinder head:

Number	:	One
Disposition	:	Vertical
Bore/Stroke (mm)	:	86/72
Capacity (cc)	:	418
Compression ratio	:	20:1
Type of cylinder liner	:	Dry
Arrangement of valve	:	OHV
Valve clearance (mm)		
Inlet	:	0.15
Exhaust	:	0.20
No of compression ring	:	Two
No of oil ring	:	One

4.2.2 Fuel supply system:

Type of fuel feed system	:	Gravity
Material of fuel tank	:	MS Sheet
Capacity of fuel tank (l)	:	4.3
Location of fuel tank	:	On top of the engine
Provision for draining of sediment/water	:	Provided
Provision of strainer inside the fuel tank	:	Provided
Fuel On/Off Provision	:	Provided

4.2.2.1 Fuel Injection Pump:

Make (apa)	:	SP
Type	:	Plunger type
Sl. No.	:	Not Provided
Method of drive	:	Through cam shaft

4.2.2.2 Fuel Injector:

Type	:	Multi hole
Make (apa)	:	SP
Model	:	186FA
Sr. No.	:	24L17

4.2.3 Governor:

Make (apa)	:	CHONGQING
Type	:	Variable speed, Mechanical, Centrifugal

4.2.4 Air-intake system:

4.2.4.1 Pre-cleaner : Not provided

4.2.4.2 Air-cleaner:

Make	:	CHONGQING
Type	:	Wet, Oil bath with foam
Capacity of air cleaner oil (l)	:	0.06
Location of air-cleaner	:	On RHS of engine
Recommended service schedule (apa)	:	Dusty condition-After every 8 to 10 hours of operation. Normal condition-After every 50 hours of operation.

4.2.5 Exhaust:

Type of silencer	:	Updraft with rectangular exhaust outlet
Location of silencer	:	On LHS of engine
Spark arresting device, if any	:	Not Provided
Provision of cover on hot surface of exhaust	:	Provided
Provision of exhaust emission away from operator	:	Provided

4.2.6 Lubrication system:

Type	:	Pressurized and splash
Oil capacity (l)	:	1.2
Oil change period (apa)	:	First change after 50 hours of operation and then after every 150 hours of operation.

4.2.7 Cooling system:

Type	:	Air cooled

4.2.7.1 Flywheel details:

Material	:	Cast Iron
Dia. of flywheel (mm)	:	270
Width of flywheel (mm)	:	40.8
Thickness (mm)	:	26.7

4.2.7.2 Details of fan:

Material	:	Cast Iron
Width of fins (mm)	:	30.2
Height of fins (mm)	:	30.4
No. of fins	:	27
Thickness of fins (mm)	:	5.3

4.2.8 Starting system:

Type	:	Manual, Hand crank starter/12V, DC, Electrical self starter
Ignition system	:	Compression ignition
Aid for cold starting	:	De-compression lever was provided
Any other provision for easy starting	:	No

4.2.8.1 Battery:

Make	:	YONGBA
Type	:	Lithium Battery
Capacity and rating	:	12V, 5V/2A
Location	:	Above transmission housing

4.2.8.2 Starter:

Make	:	RF
Model	:	Not Provided
Type	:	Pre-engaging solenoid operated
Capacity and rating	:	12V, 0.9 kW
Serial Number	:	Not Provided

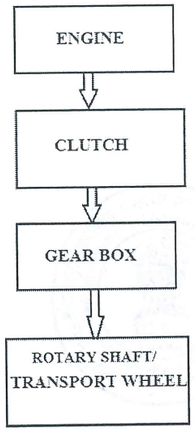

Fig. 2 Schematic power flow diagram

4.3 Power transmission system:

4.3.1 Clutch

Make (apa)	:	CHONGQING
Sr. No.	:	Not specified
Type of clutch	:	Wet type, friction multi plate
Dia. of clutch plate (mm)	:	118.9
No. of friction plates	:	05
No. of pressure plates	:	06
Material of lining	:	Ceramic
No. of coil springs	:	04
Location of clutch	:	Inside the gear box

4.3.2 Primary (Main) gear box:

Make (apa)	:	CHONGQING
Sr. No.	:	Not Provided
Type	:	Sliding mesh
No. of speeds	:	03 (02 - forward and 01 - reverse)
Oil capacity (l)	:	2.2
Oil changing period (apa)	:	First after 50 hours of operation and subsequently after every 250 hours of operation.

Gears	:	1st	2nd	Reverse	
No. of teeth on drive gear	:	14	25	14	15
No. of teeth on driven gear	:	39	40	20	39
Reduction ratio	:	1: 0.36	1:0.63	1:0.27	
No. and size of bearing	:	04 Nos., (01 ball bearing 6204, 01 thrust bearing 51104 and 02 needle bearings).			

4.3.3 Secondary reduction box for rotary:

Make (apa)	:	CHONGQING	
Type	:	Bevel & pinion	
No. of teeth on drive gear	:	10	10
No. of teeth on driven gear	:	43	36
Reduction ratio	:	1:0.23	1:0.28
No. of bearing	:	04 Nos., (3 nos. of tapper roller bearings 30204, 30206 & 32009 and 01 No. ball bearing No. 6009)	

4.4 Rotary unit:

Make (apa) : CHONGQING

4.4.1 Rotary cover:

Material	:	MS sheet
No. & Size (mm)	:	02 Nos., 414 x 375
Thickness of sheet (mm)	:	1.12
Method of fixing	:	Bolted to the chassis with the help of 04 nos. of bolt & nuts of size 16.18 mm x 7.59 Ø mm.

4.4.2 Rotary shaft:

Type of rotor axle	:	Hexagonal
Length of hollow pipe on which flanges are welded (mm)	:	595 on each side
No. of flanges	:	5+5= 10
Type of flanges	:	Square
Size of flange (mm)	:	96 x 96
Thickness of flanges (mm)	:	3.70
No. of blades on each flange	:	4
Method of mounting blades on flanges	:	Bolted
Distance between two flanges (mm)	:	122.1
Dia. of rotor with blades (mm)	:	350

4.4.3 Rotary blades:

Numbers	:	40
Trade mark	:	Not Provided

Type	:	'J' shaped
Thickness (mm)	:	5.63
Width of beveled edge (mm)	:	7.24 to 9.35
No. & size of holes on each blade for fixing it to the flanges (mm)	:	Two, 10.93 Ø
Arrangement of blades on the axle	:	Alternately at LHS & RHS

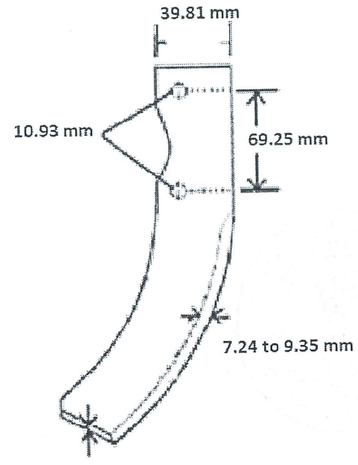

Fig. 3 Rotary blade

4.5 Details of transport wheel:

Make	:	Not specified
Number & Type	:	Two, Pneumatic
Size& PR	:	5.00-12
Method of fixing	:	Fixed with round cotter pin to the rotary shaft axle.

4.6 Depth control bar:

Number	:	01
Size of flat (mm)		
Curved length	:	452
Width	:	36.7
Thickness	:	11.6
Provision for depth adjustment	:	08 Nos. of circular holes of size 10.86Ø mm were provided.

4.7 Steering handle bar:

No. of steering handle : One

Material	:	MS Pipe
Dia. of pipe (OD) (mm)	:	25.3
No. of hand grip	:	Two
Material of grip	:	Rubber
Length of grip (mm)	:	110.3
Dia. of grip (mm)	:	36.3
Height of handle grip from ground level (mm)	:	Adjustable, 1150/1300 (min. / max.)
Provision for handle height and angle adjustment	:	Provided

4.8 Controls:

i. Main clutch lever was provided on LHS of handle bar.
ii. Accelerator lever was provided on RHS of handle bar.
iii. Handle height and angle adjustment lever was provided.
iv. Main gear shifting lever was provided on RHS of handle bar.
v. Reverse gear engaging and disengaging lever was provided on RHS of handle bar.
vi. Starter switch was provided.

4.9 Marking/Labeling of Machine:

Metallic labeling plate was riveted on the main handle frame with the following information.

RIDDHISH IMPORT & EXPORT	
Machine Model :-	MT-KISHAN-001
Rated Power(HP):-	8 HP
Rated Engine Speed:-	3600(R/Min)
Manufacturer:-	RIE
Engine No:-	2506100183
Chassis No:-	MC2507035
Date of Manufacture:-	2025-26

4.10 Safety wears : Not Provided

ICE/NERFMTTI, B.Chariali/ 12/12/555	RIDDHISH IMPORT & EXPORT, MT-KISHAN-001 POWER WEEDER	COMMERCIAL (INITIAL)

4.11 Overall dimensions of the machine (mm):

Length	:	2040
Width	:	1340 (with rotary unit)
Height	:	1300 Std., 1150/1300 (min./max.)

4.12 Mass of machine (kg):
(With all liquid reservoirs full and with transport wheel and rotor unit) : 147.5

4.13 Colour of machine:

Engine	:	Silver
Chassis	:	Grey
Transmission housing	:	Red
Rotary cover	:	Red andGrey
Fuel tank	:	Grey
Handle bar	:	Grey

5. FUEL AND LUBRICANTS

5.1 Fuel : Diesel

5.2 Lubricants:

Sr. No.	Particulars	As recommended by the manufacturer	As used during the test
1	Engine	SAE 15W40	SAE 15W40
2	Air cleaner	SAE 20W40	SAE 20W40
3	Gear box	SAE 90	SAE 90

6. RUNNING-IN

As recommended by the applicant, machine was run-in for 1 hour at rated engine speed in actual field condition before commencement of test of machine.

7. ENGINE PERFORMANCE TEST

Date of test : 13.11.2025 and 14.11.2025
Type of dynamometer : Eddy current
Model of dynamometer : SAJ AG-10

Power (kW)	Crank shaft speed (rpm)	Fuel consumption (l/h)	(kg/h)	Specific fuel consumption (kg/kWh)	Specific energy (kWh/l)
Maximum power - 2 hours test:					
6.81	3382	2.46	2.05	0.302	2.77
6.46	3254	2.30	1.92	0.297	3.37*
Power at rated engine speed:					
5.95	3400	2.05	1.72	0.288	2.90
5.20	3400	1.84	1.53	0.295	2.83*
Maximum torque:					
5.66	2305	3.54	2.96	0.523	1.60
5.19	2192	3.31	2.76	0.532	1.57*
Part loads:					
i) Torque corresponding to maximum power available at rated engine speed:					
5.95	3400	2.05	1.72	0.288	2.90
ii) 85% of the torque obtained in (i)					
5.35	3599	1.55	1.29	0.241	3.46
iii) 75% of the torque defined in (ii)					
4.06	3644	1.18	0.99	0.244	3.43
iv) 50% of the torque defined in (ii)					
2.71	3649	0.90	0.75	0.277	3.01
v) 25% of the torque defined in (ii)					
1.37	3671	0.76	0.64	0.466	1.79
vi) Unloaded					
0.13	3715	0.75	0.63	4.829	0.17

***Under High ambient conditions**

ICE/NERFMTTI, B.Chariali/ 12/12/555	RIDDHISH IMPORT & EXPORT, MT-KISHAN-001 POWER WEEDER	COMMERCIAL (INITIAL)

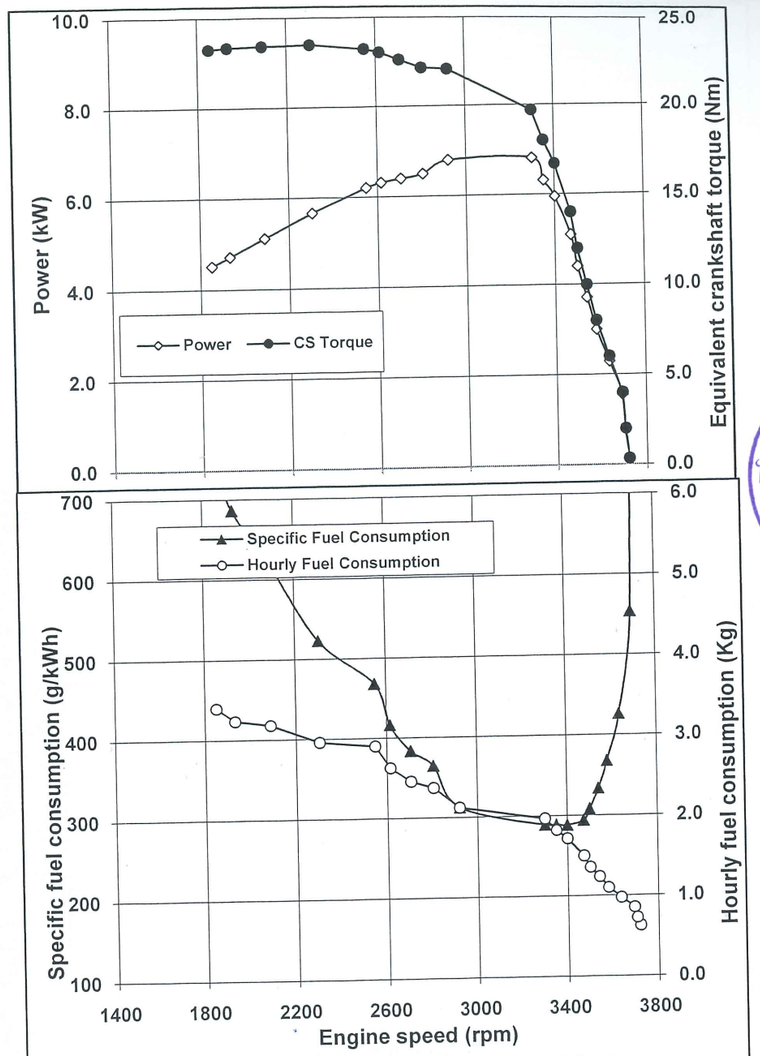

Fig. 4 :ENGINE PERFORMANCE CHARACTERISTICS
(Natural ambient)

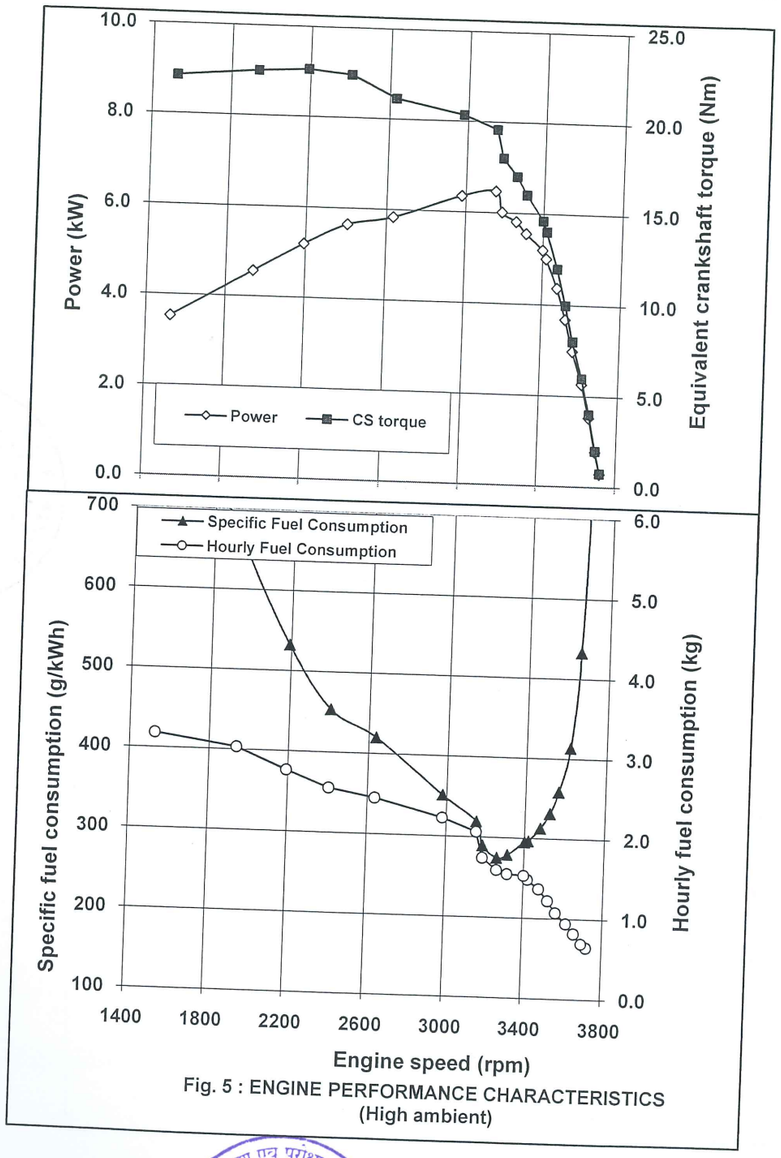

Fig. 5 : ENGINE PERFORMANCE CHARACTERISTICS
(High ambient)

ICE/NERFMTTI, B.Chariali/ 12/12/555	RIDDHISH IMPORT & EXPORT, MT-KISHAN-001 POWER WEEDER	COMMERCIAL (INITIAL)

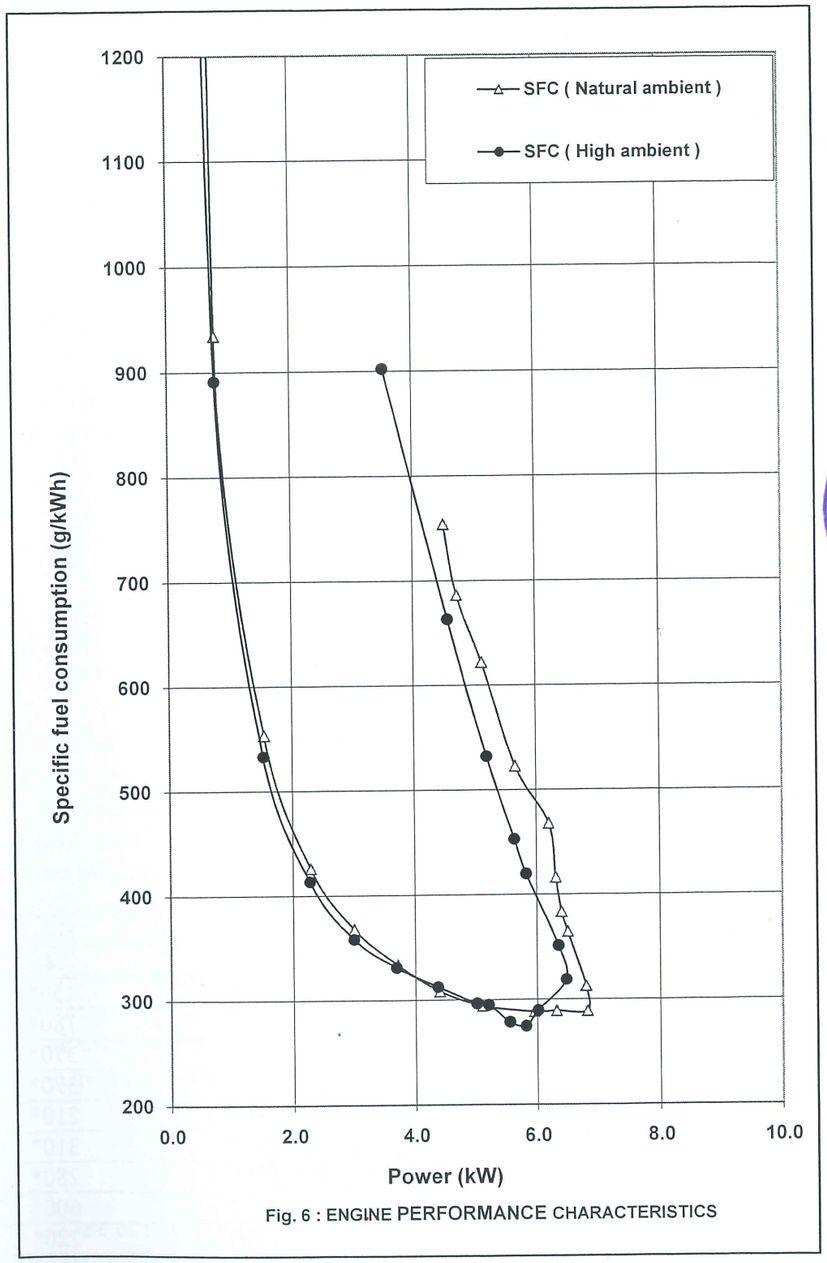

Fig. 6 : ENGINE PERFORMANCE CHARACTERISTICS

Parameter		As observed	
		Natural Ambient	High Ambient
No load max. engine speed (rpm)	:	3720	3721
Crankshaft torque at max. Power (Nm)	:	19.22	19.59
Crankshaft torque at rated Power (Nm)	:	16.71	14.61
Maximum equivalent crank shaft torque (Nm)	:	23.47	22.61
Engine speed at max. crankshaft torque (rpm)	:	2305	2192
Back-up torque (%)	:	22.11	15.41
Range of atmospheric conditions:			
Temperature (°C)	:	27.8 to 30.5	41.1 to 44.0
Pressure (kPa)	:	99.8 to 100.9	100.0 to 101.1
Relative humidity (%)	:	52.2 to 60.3	73.7 to 78.8
Max. temperatures (°C):			
Engine oil	:	111	119
Fuel	:	27.5	38.3
Intake air	:	29.8	45.7
Consumptions:			
Lub oil (g/kWh)	:	--	2.96

8. VIBRATION MEASUREMENT

Date of test : 12.11.2025
Type of test surface : Concrete
Type of instrument used : MMF & VM-30
Test condition : At rated engine speed without load and all components are in working position.

Sr. No.	Location		X (μ)	Y (μ)
1	2		3	4
1	Steering handle	Right	130*	150*
		Left	190*	180*
2	Accelerator lever/knob		220*	370*
3	Fuel tank cap		260*	370*
4	Fuel tank		140*	210*
5	Reverse gear lever		200*	310*
6	Air cleaner		370*	280*
7	Engine mounting base		500*	600*
8	Silencer cover / Muffler		120*	220*
9	Gear shifting lever		140*	200*
10	Handle bar		130*	240*
11	Main clutch lever		430*	590*

1	2		3	4
12	Rotary shield cover	Right	300*	240*
		Left	180*	240*
13	Starting Switch		370*	110*
14	Handle height adjusting lever	Up / Down	370*	310*
		Left / Right	220*	600*

* The amplitude of mechanical vibration is on higher side.

9. NOISE LEVEL MEASUREMENT

9.1 Noise at bystander's position

Date of test : 12.11.2025
Type of sound level meter : Class-I, Make- Casella, Model-CEL-633C

Atmospheric conditions

Temperature (°C) : 28.4
Pressure (kPa) : 99.4
Relative humidity (%) : 65.2
Wind velocity (m/s) : 0.5
Background noise level dB(A) : 49.4
Observed noise level dB(A) : 84.3

9.2 Noise at operator's ear level

Date of test : 12.11.2025
Type of sound level meter : Class-I, Make- Casella, model- CEL-633C

Atmospheric conditions

Temperature (°C) : 28.2
Pressure (kPa) : 99.5
Relative humidity (%) : 65.8
Wind velocity (m/s) : 0.7
Background noise level, dB(A) : 55.1
Observed noise level, dB(A) : 95.0

10. AIR CLEANER OIL PULL-OVER TEST

Date of test : 11.11.2025

Range of atmospheric conditions:

Temperature (°C) : 24.5 to 25.8
Pressure (kPa) : 100.2
Relative humidity (%) : 75.7 to 77.8

Mass of oil before test (g) : 49.24

Sr. No.	Position of the machine	Loss of oil (g)	Oil pull-over (%)
1	Parked on level ground	2.8	5.69
2	Tilted to 15° laterally with RHS up	3.1	6.30
3	Tilted to 15° laterally with LHS up	14.4	29.24
4	Tilted to 15° longitudinally with front end up	4.2	8.53
5	Tilted to 15° longitudinally with rear end up	6.8	13.80

11. HARDNESS AND CHEMICAL COMPOSITION OF ROTOR BLADE

11.1 Hardness of rotor blades:

The surface hardness of blade was recorded as under:

	As per IS 6690:1981 (Reaffirmed 2022)	As observed (HRC)	Remarks
At edge portion	56 ±3 HRC	46	**Does not conform**
At shank portion	37 to 45 HRC	46	**Does not conform**

11.2 Chemical composition of rotor blades:

Constituents	As per IS 6690:1981 (Reaffirmed 2022)		Composition as observed (% by weight)	Remarks
	Carbon Steel (%)	Silicon Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.238	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.379	Conforms
Manganese (Mn)	0.50 -1.0	0.50-1.00	1.219	**Does not conform**
Sulphur (S)	0.05(max)	0.05(max)	0.020	Conforms
Phosphorous (P)	0.05(max)	0.05(max)	0.019	Conforms

12. FIELD PERFORMANCE TEST

The field tests were conducted for total 25.28 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated speed of 3400 rpm. The detailed test results are represented in the Annexure and summarized in the ensuing Table:

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Sr. No.	Parameters		Observations
1	Type of soil	:	Medium
2	Soil moisture (%)	:	9.63 to 10.30
3	Bulk density of soil (g/cc)	:	1.81 to 1.91
4	Forward Speed of operation (kmph)	:	0.80 to 0.94
5	Depth of cut (cm)	:	6.02 to 6.48
6	Width of cut (m)	:	1.22 to 1.34
7	Area covered (ha/h)	:	0.087 to 0.137
8	Time required for one ha (h)	:	5.56 to 9.26
9	Field efficiency (%)	:	81.3 to 90.9
10	Weeding efficiency (%)	:	74.8 to 85.5
11	Fuel consumption		
	l/h	:	0.92 to 0.96
	l/ha	:	5.34 to 9.13

12.1 Rate of work

- Rate of work was recorded as 0.087 to 0.137 ha/h and the forward speed of operation varied from 0.80 to 0.94 kmph.
- Time required to cover one hectare was recorded as 5.56 to 9.26 h.

12.2 Quality of work:

- Depth of cut was recorded as 6.02 to 6.48 cm.
- Working width was observed as 1.22 to 1.34 m.
- Field efficiency was found as 81.3 to 90.9 %.
- Weeding efficiency was recorded as 74.8 to 85.5 %.

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 25.28 h	Per hour
L-1	280.52	277.38	3.14	1.12	0.04
L-2	292.07	289.67	2.4	0.82	0.03
L-3	288.88	286.52	2.36	0.81	0.03
L-4	309.29	306.82	2.47	0.80	0.03
L-5	301.63	298.70	2.93	0.97	0.04
R-1	299.21	295.73	3.48	1.16	0.05
R-2	290.45	287.82	2.63	0.91	0.04
R-3	303.01	300.36	2.65	0.87	0.03
R-4	299.87	297.07	2.8	0.93	0.04
R-5	279.40	276.94	2.46	0.88	0.03

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.03 to 0.05 %.

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 positon		Bottom position		
	Thrust side	Non Thrust side	Thrust side	Non Thrust side	Thrust side	Non Thrust side	
1	86.02	86.01	86.02	86.01	86.02	86.01	86.30

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				
Thrust side	Non-thrust side	Thrust side	Non-thrust side		As observed	Max. permissible limit, (mm)
85.33	85.35	85.95	*	0.50	0.07	1.00

*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	0.04	0.30
2nd compression ring	0.03	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	0.20	0.25	0.25	1.00
2nd compression ring	0.45	0.45	0.45	1.50
Oil ring	0.35	0.35	0.35	1.20

15.1.5 Big end bearing:

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. permmissible wear limit (mm)	
			Diametrical	Axial	Diametrical	Axial
1	41.66	41.64	0.02	0.05	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	0.06	0.04	0.50	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
6.95	6.95	6.90	6.89	0.05	0.06	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	1340	Conforms
3.	Type of engine	Compression ignition / Spark ignition	Compression ignition	Conforms
4.	Starting method	Manual / recoil /self-starting	Recoil & self-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	EN8 (apa)	Conforms
9.	No. of flanges	4 - 10	10	Conforms
10.	Type of flanges	Square / circular/ rectangular	Square	Conforms
11.	Distance between consecutive flanges (mm)	80 to 150	122.1	Conforms
12.	No. of blades in each flange	3 - 6	4	Conforms
13.	No .of rotor blade	12 (Min.)	40	Conforms
14.	Thickness of rotor blade (mm)	5 (min.)	5.63	Conforms
15.	Material of blade	Boron (28Mn Cr B5) / High Carbon Steel EN42j	MS	**Does not conform**
16.	Hardness of Blade, HRC	38 (Min.)	46	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	Provided	Conforms
20.	Provision for emergency stop of engine	Must be provided	Not Provided	**Does not conform**
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

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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, Make, and SFC were not provided.	**Does not conform**
28.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

17. COMMENTS AND RECOMMENDATIONS

17.1 During air cleaner oil pull over test, percentace of oil pull over was observed on higher side. This should be looked into for corrective action.

17.2 Name and address of manufacturer and applicant, country of origin, Make and SFC were not provided on the labeling plate of the machine. This should be looked into for corrective action.

17.3 Material of blade 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.

17.4 Provision for emergency stop of engine was not provided. 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 does 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 Labour 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 affect 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 have received your comments and recommendations; we will do the corrective action in future products.

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ANNEXURE

FIELD PERFORMANCE RESULTS

Place of Test: NERFMTTI Farm, Biswanath Chariali, Biswanath, Assam

Sr. No.	Parameters	I	II	III	IV
1	Date of test	02.12.2025	08.12.2025	09.12.2025	10.12.2025
2	Net test duration (h)	6.33	6.45	6.50	6.00
3	Field length (m)	24.5	30.1	32.5	30.9
4	Type of soil	Medium			
5	Bulk density (g/cc)	1.91	1.82	1.85	1.81
6	Soil moisture (%)	10.30	10.13	9.63	10.17
7	Previous treatment	Nil			
8	Forward speed (kmph)	0.80	0.89	0.94	0.91
9	Av. depth of cut (cm)	6.02	6.48	6.04	6.06
10	Av. width of cut (m)	1.34	1.30	1.22	1.34
11	Area covered (ha/h)	0.087	0.137	0.121	0.108
12	Time required for one ha (h)	5.56	7.30	8.26	9.26
13	Field efficiency (%)	81.3	87.8	90.9	88.5
14	Av. height of weeds (cm)	16.7	27.0	24.8	19.5
15	Av. number of weeds per m^2 (before operation)	123	164	221	205
16	Av. number of weeds per m^2 (after operation)	31	28	32	33
17	Weeding efficiency (%)	74.8	82.9	85.5	83.9
18	Fuel Consumption				
	- l/h	0.96	0.92	0.94	0.95
	- l/ha	5.34	9.08	9.13	8.80