व्यावसायिक परीक्षण रिपोर्ट | संख्या/ **No.: Powerweeder-132/2779/2022**

COMMERCIAL TEST REPORT | माह/**Month: January, 2022**

THIS TEST REPORT VALID UP TO : 31st January, 2027

XTRA POWER, XPW-1150P PLUS
POWER WEEDER

भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation 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

Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

[ISO 9001:2015 CERTIFIED]

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Power weeder-132/2779/2022	XTRA POWER, XPW-1150P PLUS POWER WEEDER (COMMERCIAL)

Type	:	Self Propelled, Walk Behind Type
Make	:	XTRA POWER
Model	:	XPW-1150P Plus
Name and address of Manufacturer (apa)	:	VSM International Pvt. Ltd. Plot-1, Sector-1, Marvel City Chandigarh highway road, 10 km stone, Hisar, 125001, Haryana
Name and address of Applicant (apa)	:	VSM International Pvt. Ltd. Plot-1, Sector-1, Marvel City Chandigarh highway road, 10 km stone, Hisar, 125001, Haryana
Test Conducted at	:	Government of India, Northern Region Farm Machinery Training and Testing Institute, Tractor Nagar, Sirsa Road, Hisar-125 001 (Haryana)

THIS TEST REPORT VALID UP TO : 31st January, 2027

[vide DAC&FW OM No. 13-24/2018- M&T (I&P) dated 19.09.2018]

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

Report No. Power weeder – 132/2779/2022	Month : January	Year : 2022

GOVERNMENT OF INDIA
NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, SIRSA ROAD, HISAR–125001 (HARYANA)
[ISO 9001:2015 CERTIFIED]

Type of Test	:	Commercial
Period of Test	:	September, 2021 to January, 2022
Test Report No.	:	Power weeder – 132/2779/2022
Month and Year	:	January, 2022

i) The results reported in this report are observed values and no corrections have been applied for atmospheric and site conditions.
ii) The data given in this report pertains to the particular machine submitted by the applicant for test.
iii) The results presented in this report do not in any way attribute to durability of the machine.
iv) The report should not be reproduced in part or full without prior permission of the Director, Northern Region Farm Machinery Training & Testing Institute, Hisar-125001.

SELECTED CONVERSIONS

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/sq.cm	=	98.067 kPa = 735.56 mm of Hg
	1 bar	=	100 kPa = 10 N/sq.cm.
	1 mm of Hg	=	1.3333 m-bar

IMPORTANT

This machine named XTRA POWER, XPW-1150P PLUS power weeder was submitted at this institute "to test only with the tilling device attached therewith in the dry land operation, that too, in the broad day light with sufficient visibility".

CONTENTS

1. SCOPE OF TEST

The scope of the test was limited to check and assess the followings :-.

1.1 Specifications and other data furnished by the applicant.
1.2 Engine performance
1.3 Mechanical vibration measurement
1.4 Noise level measurement
1.5 Air cleaner oil pull-over test
1.6 Field performance with rotary tiller
1.7 Operator's comfort and safety
1.8 Ease of operation and handling
1.9 Breakdowns and repairs
1.10 Wear of critical components
1.11 Hardness & chemical analysis of rotor blades

2. METHOD OF SELECTION

The test sample was directly submitted by applicant, hence method of selection is not known. Moreover, the random selection of test sample was exempted vide O.M. No 13-13/2020 M&T (I&P), dated 27th July, 2021, upto September, 2021

3. TEST CODE/PROCEDURE

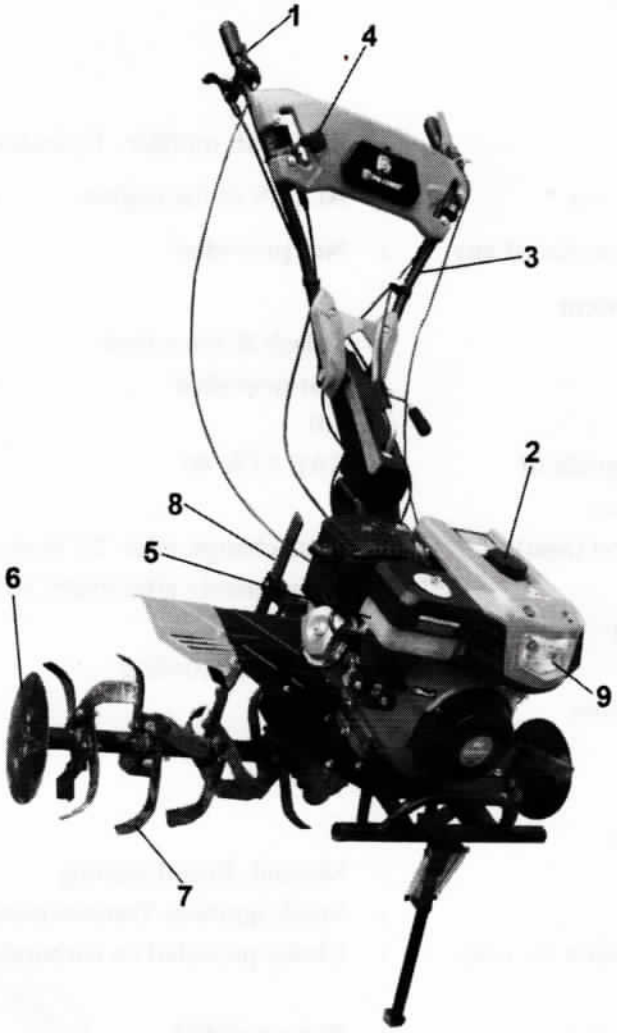
IS : 15925-2012	:	Walk-behind powered rotary tillers — Definitions, safety requirements and test Procedures
IS : 9935-2002	:	Power tiller – Test code
IS: 9980-1988	:	Guidelines for field performance and haulage tests of power tillers
IS: 12036-1995	:	Agricultural Tractors-test Procedures-Power Tests for Power take-off
IS : 6690-1981	:	Specification for Blades for Rotavator for Power Tillers (First revision)
Critical Technical Specifications	:	Critical Technical Specification issued by Ministry, vide letter no. 13-9/2019-M&T (I&P)- Part dated 26.04.2019 and F. No. 9-4/2019 M&T (I&P) dated 20.08.2019.

4. SPECIFICATIONS

4.1 General

Type of machine	:	Self propelled, Walk Behind Type
Make**(apa)**	:	XTRA POWER
Model	:	XPW-1150P Plus
Serial No.	:	210401E0042
Name and address of manufacturer **(apa)**	:	VSM International Pvt. Ltd. Plot-1, Sector-1, Marvel City Chandigarh highway road, 10 km stone, Hisar, 125001, Haryana
Name and address of applicant **(apa)**	:	VSM International Pvt. Ltd. Plot-1, Sector-1, Marvel City Chandigarh highway road, 10 km stone, Hisar, 125001, Haryana
Year of manufacture **(apa)**	:	2021

	Country of origin	:	India
4.2	**Details of prime mover**		
	Name and address of manufacturer **(apa)**	:	VSM International Pvt. Ltd. Plot-1, Sector-1, Marvel City Chandigarh highway road, 10 km stone, Hisar, 125001, Haryana
	Type	:	Air cooled, 4 stroke, single cylinder, Petrol engine
	Make **(apa)**	:	Xtra Power
	Model	:	177F
	Sr. No.	:	2104140520
	Country of origin	:	India
	Year of manufacturer	:	2021
	Engine speed (recommended setting), rpm **(apa)**		
	High idle speed	:	3900
	Low idle speed	:	1500
	Rated speed, rpm	:	3600
	Speed at maximum torque, rpm	:	2500
4.3	**Cylinder & cylinder head**		
	Number	:	One
	Disposition	:	Inclined
	Bore/Stroke, mm **(apa)**	:	77 / 58
	Capacity, cc **(apa)**	:	270
	Type of valve	:	Over head
	Valve clearance, mm **(apa)**		
	Inlet	:	0.10 ±0.05
	Exhaust	:	0.15 ±0.05
	Compression ratio **(apa)**	:	8.2:1
4.4	**Fuel supply system**		
	Type of fuel feed	:	Gravity feed
4.4.1	**Fuel tank**		
	Material	:	Sheet metal
	Capacity of fuel tank, l	:	5.5
	Location of fuel tank	:	On top of engine
	Provision for draining of sediments/ water	:	Sediment bowl is provided on carburetor.
	Fuel filter	:	Provided before fuel cock
	Fuel on/off	:	Provided on carburetor
4.4.2	**Governor**		
	Make **(apa)**	:	CAMEO
	Model **(apa)**	:	C19
	Type	:	Centrifugal, Variable speed type
4.4.3	**Carburetor**		
	Make	:	SPD
	Type	:	Float type



Key Words:

1.	Accelerator lever	2.	Fuel tank
3.	Handle Bar	4.	Gear shifting lever
5.	Air cleaner	6.	Disc
7.	Rotor blade	8.	Depth control Mechanism
9.	Front light		

FIG.1: XTRA POWER, XPW-1150P PLUS POWER WEEDER

4.5	**Air intake system**		
4.5.1	**Pre-cleaner**	:	Provided
4.5.2	**Air cleaner**		
	Type	:	Oil bath
	Make and model **(apa)**	:	CAM
	Location	:	RHS of engine
	Recommended service schedule **(apa)**	:	After 20 hours of operation.

	Recommended grade of oil **(apa)**	:	SAE 15W40
4.6	**Exhaust**		
	Type of silencer	:	Side draft muffler , Cylindrical
	Location of silencer	:	At LHS of the engine.
	Spark arresting device, if any	:	**Not provided**
4.7	**Lubrication system**		
	Type	:	Splash & force feed
	Oil filter	:	**Not provided**
	Oil capacity, l	:	1.0
	Recommended grade of lubricant oil **(apa)**	:	SAE 15W 40
	Oil change period **(apa)**	:	First change after 20 hours of operation and subsequently after every 50 hrs of operation.
4.8	**Cooling system**		
	Type	:	Forced air cooling
	Dia. of blower, mm	:	197
	No. of vanes	:	24
4.9	**Starting system**		
	Type	:	Manual, Recoil starting
	Ignition system	:	Spark ignition, Transistorized magneto
	Any other provision for easy starting	:	Choke provided on carburetor
	Aid for cold starting	:	**Not provided**
4.10	**Spark plug**		
	Make	:	NGK
	Model	:	BPR6ES
	Spark plug electrode gap, mm	:	0.8
4.11	**Power Transmission system**		
	Type	:	Engine power is transmitted to gear input shaft through clutch. Two hand levers viz. working clutch lever and walking clutch engaging levers are provided at left handle bar.
4.11.1	**Clutch**		
	Make	:	Xtra Power
	Type of clutch	:	Multi, friction, Wet type plate
	Number of friction plate	:	5.0
	Dia of friction Plate, mm	:	110
	Thickness, mm	:	3.0
	Method of operation	:	One hand lever is provided at LHS handle bar
	Location of clutch	:	In between engine and transmission system

4.11.2 Primary (Main) Gear Box

Type	:	Sliding mesh gear box
Make (**apa**)	:	Xtra Power
Model (**apa**)	:	XP1213
No. of speed	:	3 (2 forward & 1 reverse)
Grade of oil (**apa**)	:	SAE 90
Oil capacity, l	:	2.3
Oil change period (**apa**)	:	After 150 hours of operation.

4.11.2.1 Secondary (to rotor shaft) gear box

Type	:	Chain and sprocket
No. of teeth on drive sprocket	:	10
No. of teeth on driven sprocket	:	36
Reduction ratio	:	3.6:1
Chain details		
Length, mm	:	930
Dia. of roller, mm	:	10
Pitch, mm	:	16.74
No. of roller	:	56
No. of engine revolution in one revolution of rotor shaft	:	
Gear – 1	:	14
Gear – 2	:	25
Reverse gear	:	20

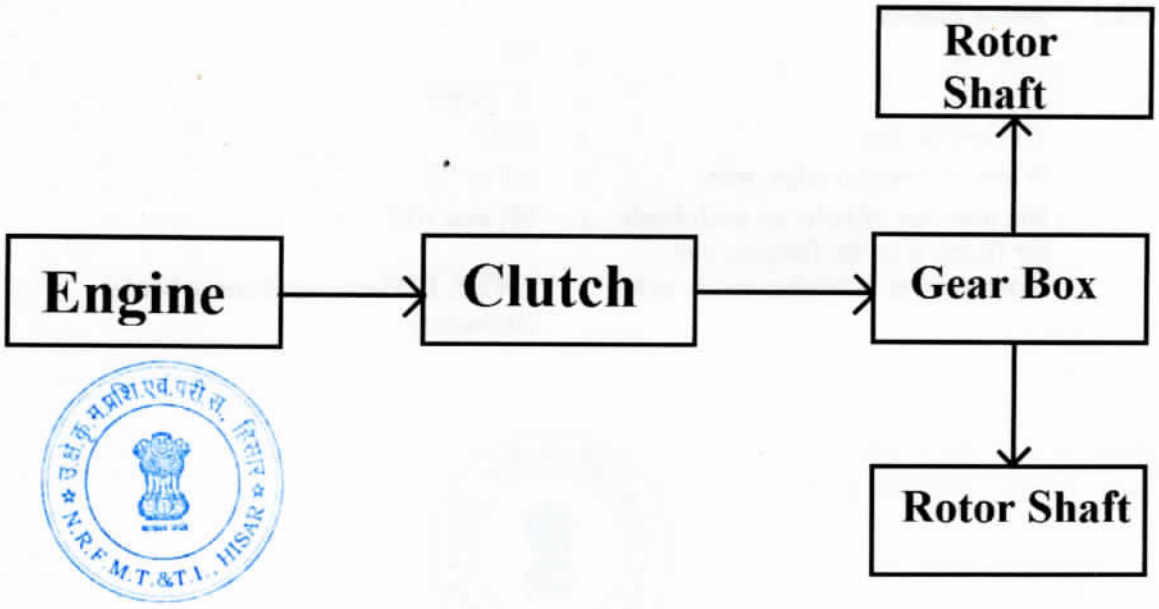


FIG. 2 : SCHEMATIC POWER TRANSMISSION DIAGRAM

4.12 Rotor

4.12.1 Rotor cover

Material		:	MS sheet
Size, mm			
	Length	:	880
	Width	:	615
	Thickness	:	1.8
Method of fixing		:	Bolted to main frame.

4.12.2 Rotor shaft

Material **(apa)**	:	High carbon steel
Type of rotor axle	:	Hexagonal
Width across flat of rotor axle, mm	:	32
Length of shaft, mm	:	175
Length of extension shaft, mm	:	130
No. of flanges	:	8 (4+4)
Type of flanges	:	Square
Size of flanges, mm	:	101 × 101
Thickness of flange , mm	:	4.5
Distance between two flanges, mm	:	133
No. of blades on each flange	:	04
Overall length of rotor, mm	:	1140
Diameter of rotor with blades, mm	:	360
Method of fixing of blade	:	By nuts & bolts.
No. of disc	:	02
Diameter of disc, mm	:	243

4.12.3 Rotor blades

Number	:	32
Type	:	'J' shape
Thickness, mm	:	5.30
Width of beveled edge, mm	:	6.6 to 9.6
No. and size of hole on each blade for fixing it to the flanges, mm	:	02, and 10.7
Arrangement of blades on the axle	:	LHS & RHS mounted curve blade alternately

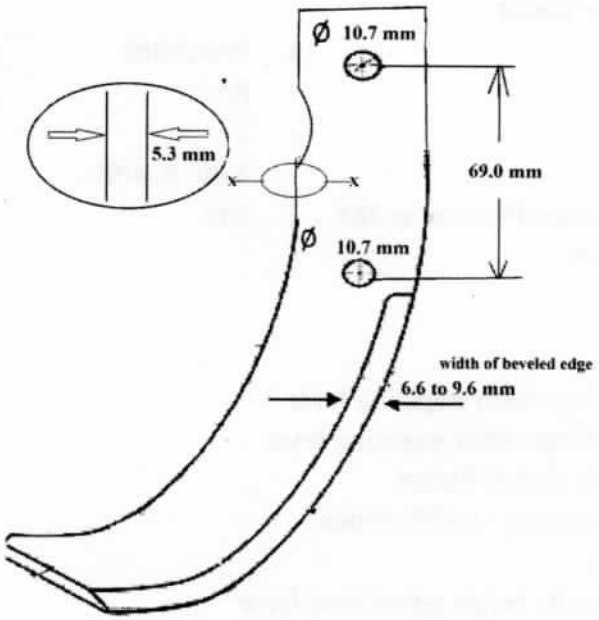


FIG. 3 : ROTOR BLADE

4.13 Depth control mechanism

Type	:	M.S flat
No. of flat	:	01
Material	:	Mild steel
Size of flat, mm		
- length	:	500
- Width	:	40
- Thickness	:	12
Provision for depth adjustment	:	8 holes of size 10.80 mm diameter at distance of 40 mm are provided on M.S flat for depth adjustment.

4.14 Steering handle bar

Material	:	M.S. pipe
Dia. of pipe, mm	:	25.50
No. of hand grips	:	Two
Length of grip, mm	:	116
Material of grip	:	Rubber
Dia. of grip, mm	:	37
Provision for handle height adjustment	:	Provided
Height of handle bar from ground level, mm	:	Maximum : 1520 Minimum : 270
Provision for angle adjustment	:	Provided

4.15 Stand : Provided

4.16 Transport wheel

Type	:	Pneumatic
Make	:	RSC
Number	:	2
size, mm	:	4.00 -8, 4PR
Recommended Pressure at 265 kg load, kPa	:	280

4.17 Controls

At LHS

i) Tilling clutch engaging lever.
ii) Walking clutch engaging lever
iii) Light On/off Button
iv) Emergency On/Off switch

At Centre

i) Handle height adjustment lever

At RHS

i) Accelerator lever
ii) Engine On/off Switch

4.18 Overall dimensions, mm

Length	:	1710
Width	:	880
Height	:	1520
Mass, kg	:	127

4.19 Color of machine

Engine	:	Silver
Main drive cover & transmission system	:	Orange
Rotary drive cover	:	Orange/Black
Fuel tank	:	Black
Handle bar	:	Black

4.20 Labeling /Identification plate : Labeling plate is riveted on the machine with following information.

Model	:	XPW-1150P PLUS
Engine type	:	GASOLINE
Gear Shifting	:	2 FORWARD/1REVERSE
Tilling depth	:	≥100 mm
Tilling width	:	1050 mm
Ex. Factory Number	:	210401E0042
Manufacture Date	:	2021.04
VSM INTERNATIONAL PRIVATE LIMITED 65-RED SQUARE MARKET, HISAR 125001 (INDIA)		

	5. FUEL & LUBRICANTS		
5.1	**Fuel**	:	Petrol
5.2	**LUBRICANTS**		

S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine sump	SAE 15 W 40 grade SJ or Higher	Oil originally filled in the machine was not changed.
2.	Gear box	SAE 90	

6. ENGINE RATING TEST AND FUEL CONSUMPTION TEST

Date of test : 24.09.2021
Type of dynamometer : Eddy current
Model of dynamometer : Electrodyne AG-10
Dynamometer constant : 9549.305

Sr. No	Hours of the day	Load (%)	Load (Nm)	Engine Speed (rpm)	Power (kW)	Fuel consumption			Specific energy (kWh/l)
						kg/h	l/h	Specific g/kWh	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1.	10:25	Test started							
2.	12:16	100	13.84	3603	5.22	2.057	2.765	393.92	1.89
3.	13:16	100	13.88	3602	5.24	2.054	2.760	392.32	1.90
4.	14:16	100	13.89	3603	5.24	2.032	2.731	397.73	1.91
5.	15:16	100	13.85	3402	5.22	2.023	2.719	387.29	1.92
6.	16:16	100	13.84	3603	5.22	2.031	2.730	388.94	1.91
7.	17:16	100	13.87	3602	5.23	2.011	2.703	384.38	1.94
8.	18:16	100	13.85	3601	5.22	2.041	2.744	390.79	1.90
9.	18:16	100	13.84	3602	5.22	2.041	2.744	390.96	1.90
Avg.				3191	5.23	1.89	2.541	371.71	2.00
10		Loaded to 110% load							
	19.16	110	15.25	3191	5.09	20.36	2.541	371.71	2.00
11.		Loaded to 75% load							
	19.26	75	10.39	3809	4.14	1.09	2.591	465.59	1.60
12.		Loaded to 50 % load							
	19.36	50	6.92	3844	2.8	1.928	2.192	582.38	1.23
13.		Loaded to 25 % load							
	19.46	25	3.47	3881	1.41	1.631	1.718	906.42	0.82
14.		Unloaded							
	19.56	00	0.01	3915	0	0.848	1.139	0	0

Governing test:

Sr. No.	Parameter	:	Observed value
1.	Momentary speed change in percentage of rated speed	:	9.94
2.	Permanent speed change in percentage of rated speed	:	8.75

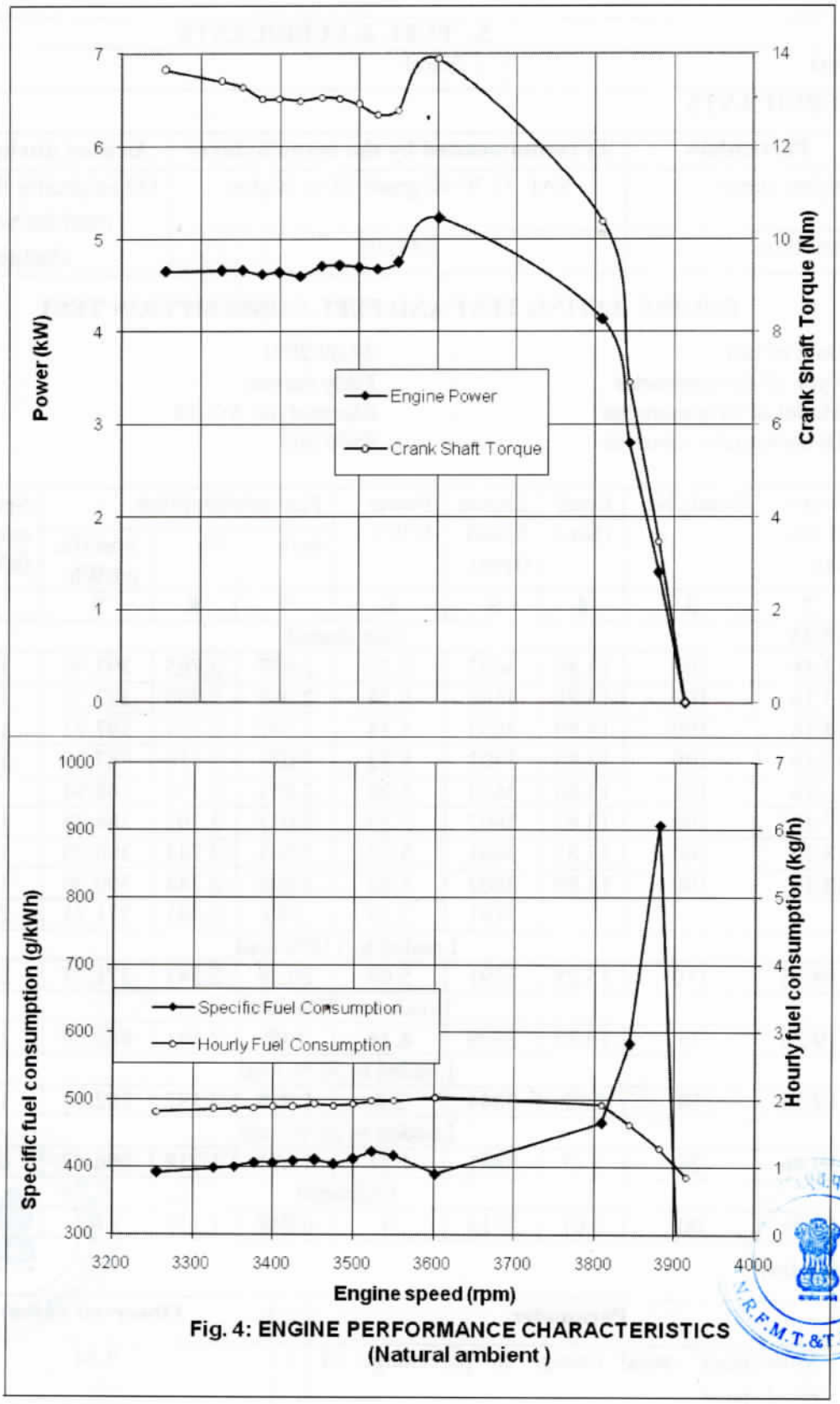


Fig. 4: ENGINE PERFORMANCE CHARACTERISTICS
(Natural ambient)

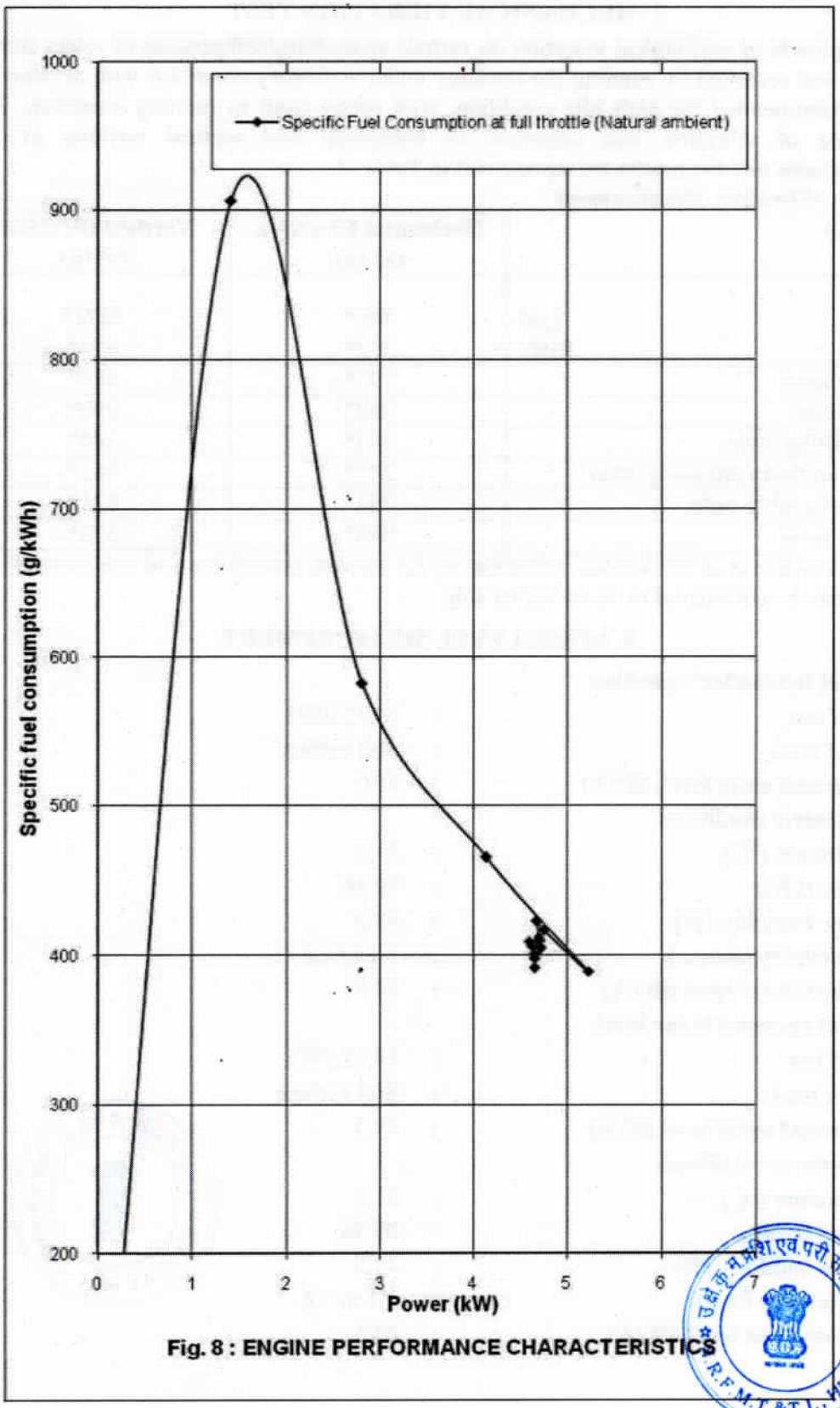


Fig. 8 : ENGINE PERFORMANCE CHARACTERISTICS

7. MECHANICAL VIBRATION TEST

The amplitude of mechanical vibration on various assemblies/components of rotary power weeder was recorded by running the machine under stationary condition with accelerator lever recommended for high idle condition, with rotary shaft in running condition. The amplitude of vibration was measured in horizontal and vertical position of the accelerometer and the results are represented in Table -1.

Table 1: Vibration Measurement

S. No	Location	Horizontal Direction (x) (μ)	Vertical Direction (y) (μ)
1	Handle Left Right	 765* 352*	 1478* 654*
2	Throttle lever	297*	488*
3	Clutch lever	280*	280*
4	Gear shifting lever	592*	144*
5	Handle up/down adjusting lever	247*	362*
6	Fender assembly right	758*	621*
7	Reverse lever	960*	570*

Remarks: The amplitude of mechanical vibration on the various assemblies and sub assemblies as marked (*) may be considered to be on higher side.

8. NOISE LEVEL MEASUREMENT

8.1 Noise at bystander's position

Date of test	:	14.12.2021
Type of track	:	Soil surface
Background noise level, dB(A)	:	49.5
Atmospheric conditions:		
Temperature (°C)	:	21.2
Pressure (kPa)	:	99.36
Relative humidity (%)	:	47.2
Wind velocity (m/sec.)	:	1.1 to 1.6
Observed Noise level dB (A)	:	74.9

8.2 Noise at operator's ear level

Date of test	:	14.12.2021
Type of track	:	Soil surface
Background noise level dB(A)	:	49.5
Atmospheric conditions		
Temperature (°C)	:	21.2
Pressure (kPa)	:	99.36
Relative humidity (%)	:	47.2
Wind velocity (m/s)	:	1.1 to 1.6
Observed noise level dB (A)	:	85.5

9. AIR CLEANER OIL PULL OVER TEST

Date : 15.12.2021

Range of atmospheric condition

Temperature : 22.5 to 29.9

Relative humidity, % : 31.6 to 38.2

Pressure, Kpa : 98.85 to 99.25

Mass of oil in the air cleaner assemblies when filled with recommended grade of oil 5% in excess then mark level (g) : 387.76

Sl. No.	Position	Slope (°)	Loss of oil (g)	Oil pull over (%)	Remarks if any
1	Horizontal	0^0	0.03	0.04	None
2	Tilt longitudinally with front end up	15^0	0.04	0.05	
3	Tilt longitudinally with rear up	15^0	0.03	0.04	
4	Tilt laterally with right side up	15^0	0.09	0.06	
5	Tilt laterally with left side end up	15^0	0.06	0.08	

10. HARDNESS & CHEMICAL COMPOSITION OF BLADES: Hardness & chemical analysis of primary element of the blade were carried out as per IS: 6690 -1981. The details of same is given in table 2 & 3.

10.1 Table 2 : Hardness of blades

	Requirement as per IS: 6690-1981 (HRC)	Hardness (HRC) as observed	Remarks
At edge portion	56±3	45.66 (Average)	**Does not conform**
At shank portion	37 to 45	43.96 (Average)	Conforms

10.2 Table 3 : Chemical analysis of rotary blade

Elements	Requirements as per IS: 6690-1981 (%)	As observed (%)	Remarks
1.	2.	3.	4.
Carbon	0.50 to 0.60	0.47	**Does not conform**
Manganese	0.50 to 1.00	3.40	**Does not conform**
Silicon	1.50 to 2.00	0.07	**Does not conform**
Phosphorous	0.05 (Max.)	0.01	Conforms
Sulphur	0.05 (Max.)	0.03	Conforms

11. RUNING - IN

The Power weeder was run-in for 1.0 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 27.11 h. The field tests were conducted at the rated 3600 rpm. In all, 5 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 - 6.5 to 14.2

Table 4: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average Soil moisture, %	:	13.17 to 15.80
iii)	Average Bulk density of soil, g/cc	:	1.49 to 1.65
iv)	Average Speed of operation, kmph	:	1.98 to 2.35
v)	Average depth of cut (cm)	:	6.3 to 7.0
vi)	Average Width of cut, m	:	1.11 to 1.13
vii)	Average Area covered, ha/h	:	0.157 to 0.213
viii)	Average Time required for one ha	:	4.69 to 6.37
ix)	Average Fuel consumption		
	l/h	:	1.27 to 1.39
	l/ha	:	5.96 to 8.73
x)	Average Weeding efficiency, %	:	75.26 to 82.14
xi)	Average Field efficiency, %	:	71.36 to 80.68

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 33 hours of engine operation.

14.1.1 Cylinder :

Cylinder bore dia. (mm)						
Top Position		Middle position		Bottom Position		Max. permissible wear limit
Thrust	Non-thrust	Thrust	Non-thrust	Thrust	Non-thrust	
76.96	76.96	76.96	76.95	76.96	76.95	77.35

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
76.51	76.47	76.94	Not measured due to piston design constraint	0.25	--	0.25

14.1.3 Piston Rings end gap:

Ring No.	Ring end gap (mm)			Max. permissible wear limit
	At top	At middle	At bottom	
1st compression ring	0.25	0.20	0.20	0.40
2nd compression ring	0.35	0.35	0.35	0.40
Oil ring	Not measured due to ring 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
32.65	32.89	0.04	0.15	0.10	1.20

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	0.03	0.40
2nd compression ring	0.01	0.50
Oil ring	Not measured due to ring 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
6.61	6.60	6.56	6.56	0.05	0.04	0.10	0.10

14.2 Valve guides and valve springs

Valve spring stiffness, Kgf/mm :

		Discard limit
Inlet valve	: 1.25	1.00 (Kgf/mm)
Exhaust valve	: 1.27	1.00 (Kgf/mm)

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 28.11 hrs. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	Mass after 28.11 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	341.67	337.41	4.26	1.24	0.04
2	342.30	338.40	3.90	1.13	0.04
3	344.16	341.15	3.61	0.87	0.03
4	342.84	336.68	6.16	1.80	0.06
5	351.92	348.10	3.82	1.08	0.03
6	352.01	347.50	4.88	1.40	0.04
7	356.64	350.13	6.51	1.82	0.06
8	355.43	351.22	4.21	1.18	0.04

15. CRITICAL TECHNICAL SPECIFICATIONS

Vide Ministry O.M. No. 13-9/2019-M&T (I&P) dated 26.04.2019.

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300-1500	1140	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	chain & sprocket type	Conforms
8.	Material for rotor shaft	SAE 1045 (CRS) / EN8 / EN9	High Carbon Steel	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	133	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.)	5.3	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	High carbon steel	Conforms
16.	Hardness of Blade, HRC	38 (min.)	45.60 (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	Must be provided	Provided	Conforms
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	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 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 5.23 kW against manufacturer declared power as 5.70 kW at 3300 rpm.

ii) Specific fuel consumption at average rated power in rating test was observed as 371.71 g/kWh against declared value of 393.00 g/kWh

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 affect the useful life of the components. In view of above, this deserved to be given top priority for corrective action.

16.3 The chemical composition of blades does not conform in toto, to the requirements of IS: 6690-1981. This needs to be looked into for corrective action.

16.4 Rated rpm & SFC are not mentioned on labeling plate. It **MUST** be specified.

17. TECHNICAL LITERATURE

The following literatures are provided by the applicant.

i) Operator Manual

ii) Part's Catalogue

iii) Service manual

iv) Owner's Manual of engine

TESTING AUTHORITY

SANJAY KUMAR AGRICULTURAL ENGINEER	
DR. MUKESH JAIN **DIRECTOR**	19.01.2022

Test report compiled by Er. Dharmendra Kumar, Technical Assistant

18. APPLICANT'S COMMENTS

All modifications/improvement as per directions by authority will be made to meet the non-complementary

Power weeder-132/2779/2022	XTRA POWER, XPW-1150P PLUS POWER WEEDER (COMMERCIAL)

ANNEXURE – I

Place: NRFMTTI Farm, Hisar

FIELD DATA SHEET OF ROTARY POWER WEEDER

Test No.	Date	Duration of test	Speed of operation (kmph)	Avg. width of cut (m)	Avg. depth of cut (cm)	Type of soil	Avg. soil moisture (%)	Bulk density (g/c.c)	Fuel consumption		Area covered	Time required for one hectare	Field efficiency (%)	Weeding Eff. (%)
									l/hr	l/ha	ha/h	h/ha		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	08.12.2021	3.25	1.98	1.11	7.0	Sandy Loam	13.43	1.49	1.37	8.73	0.157	6.37	71.36	76.34
2	09.12.2021	6.67	2.34	1.13	6.5	Sandy Loam	15.17	1.57	1.35	6.33	0.213	4.69	80.68	77.89
3	10.12.2021	6.78	2.16	1.11	6.6	Sandy Loam	14.13	1.63	1.39	7.39	0.188	5.32	78.33	82.14
4	11.12.2021	5.41	2.08	1.13	6.8	Sandy Loam	15.80	1.65	1.32	7.38	0.179	5.59	76.17	78.37
5	13.12.2021	5.00	2.35	1.12	6.3	Sandy Loam	13.17	1.59	1.27	5.96	0.212	4.69	80.61	75.26