

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: Powerweeder-133/2780/2022

माह/Month: January, 2022

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



**ASPEE, DE105
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]

Website: <http://nrfmtti.gov.in/>

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Type	: Self Propelled, Walk Behind Type
Make	: ASPEE
Model	: DE105
Name and address of Manufacturer (apa)	: Snowball Group Co. Limited Room 2015, Trand Center, 29-31 Cheung Lee Street, Chaiwan, Hongkong, China
Name and address of Applicant (apa)	: American Spring & Pressing works Pvt. Ltd. Off Chikhli Road, Antalia Village Taluka Gandevi, Dist. Navsari, Gujarat-396321
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]

Report No. Power weeder – 133/2780/2022

Month : January

Year : 2022

GOVERNMENT OF INDIA
NORTHERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
TRACTOR NAGAR, SIRSA ROAD, HISAR–125001 (HARYANA)

Type of Test	: Commercial
Period of Test	: September, 2021 to January, 2022
Test Report No.	: Power weeder – 133/2780/2022
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.
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SELECTED CONVERSIONS

1.	<u>Force</u>	
	1 kgf	= 9.80665 N = 2.20462 lbf
2.	<u>Power</u>	
	1 HP	= 1.01387 Metric HP (Ps) = 745.7 W
	1 Ps	= 735.5 W
3.	<u>Pressure</u>	
	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 ASPEE, DE 105 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”.

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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 is 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)	:	ASPEE
Model	:	DE105
Serial No.	:	005
Name and address of manufacturer (apa)	:	Snowball Group Co. Limited Room 2015, Trand Center, 29-31 Cheung Lee Street, Chaiwan, Hongkong, China

Name and address of applicant (apa) : American Spring and Pressing works Pvt. Ltd.
Off Chikhli Road, Antalia Village Taluka
Gandevi, Dist. Navsari, (Gujarat) 396321

Year of manufacture : 2021
Country of origin (apa) : **P.R. of China**

4.2 Details of prime mover

Name and address of manufacturer (apa) : Snowball Group Co. Limited
Room 2015, Trand Center, 29-31
Cheung Lee Street,
Chaiwan, Hongkong, China

Type : Air cooled, 4 stroke, single cylinder, Diesel engine

Make (apa) : ASPEE

Model : 178F

Sr. No. : 210609027

Country of origin (apa) : **P.R. China**

Year of manufacturer : 2021

Engine speed (recommended setting), rpm (apa)

High idle speed : 3500

Low idle speed : 1440±100

Rated speed, rpm (apa) : 3450

No load engine speed for field : 3300

operation, rpm (apa)

Speed at maximum torque, rpm (apa) : 2850-3150

4.3 Cylinder & cylinder head

Number : One

Disposition : Vertical

Bore/Stroke, mm (apa) : 78/62

Capacity, cc (apa) : 296

Type of valve : Over head

Valve clearance, mm (apa)

Inlet : 0.20

Exhaust : 0.25

Compression ratio(apa) : 20:1

4.4 Fuel supply system

Type of fuel feed : Gravity feed

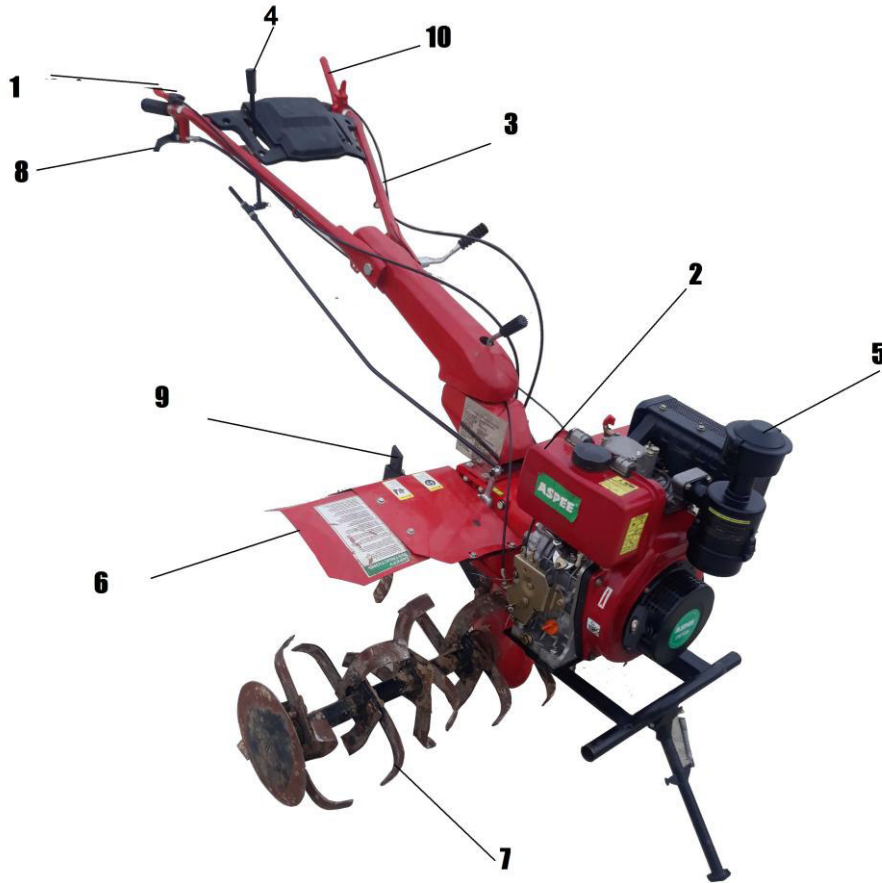
4.4.2 Fuel injection pump

Make (apa) : ASPEE

Model (apa) : DE105-FFP01

Type : Plunger

	Method of drive	: Through the lobe of a camshaft
4.4.3	Fuel Injector	
	Make (apa)	: ASPEE
	Model/Part No. (apa)	: DE105-FIN01
	Sr. No.	: Not specified
	Type	: Multi hole
	Injection pressure, Mpa (apa)	: 21±5
4.4.4	Fuel tank	
	Material	: Sheet metal
	Capacity of fuel tank, l	: 3.5
	Location of fuel tank	: RHS of engine
	Provision for draining of sediments/ water	: Provided
	Fuel filter	: Provided inside the fuel tank
	Fuel on/off	: Provided
4.5	Air intake system	
4.5.1	Pre-cleaner	: Provided
4.5.2	Air cleaner	
	Type	: Oil bath
	Make and model (apa)	: ASPEE DE105-ACL01
	Location	: At Center of engine
	Recommended service schedule (apa)	: First after 20 hours/then after 50 hours
	Recommended grade of oil (apa)	: SAE 20W40
4.4.6	Governor	
	Make (apa)	: ASPEE
	Model (apa)	: DE105-GOV01
	Type	: Mechanical & Centrifugal

**Key Words:**

- | | | | |
|----|-------------------------|-----|---------------------|
| 1. | Throttle lever | 2. | Fuel tank |
| 3. | Handle Bar | 4. | Gear shifting lever |
| 5. | Air cleaner | 6. | Rotor cover |
| 7. | Rotor blade | 8. | Clutch lever |
| 9. | Depth control mechanism | 10. | Engine stop lever |

FIG.1: POWER WEEDER ASPEE, DE105**4.6 Exhaust**

- | | | |
|--------------------------------|---|-----------------------|
| Type of silencer | : | Rectangular |
| Location of silencer | : | At LHS of the engine. |
| Spark arresting device, if any | : | None |

4.7 Lubrication system

- | | | |
|--|---|---|
| Type | : | Splash & Force Feed |
| Oil filter | : | Provided |
| Oil capacity (l) | : | 01 |
| Recommended grade of lubricant oil (apa) | : | SAE 20W40 |
| Oil change period (apa) | : | First change after 20 hours, second at 50 hours of operation & subsequently after 100 hours of operation. |

4.8 Cooling system

Type	: Forced air cooling
Dia. of blower, mm	: 227
No. of vanes	: 24

4.9 Starting system

Type	: Manual, Recoil starting
Aid for cold starting	: None
Any other provision for easy starting	: Decompression lever provided

4.10 Power Transmission system

Type	: Engine power is transmitted to gear input shaft through clutch. A hand lever with lock is provided at left handle bar to control the clutch.
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4.10.1 Clutch

Make (apa)	: ASPEE
Type of clutch	: Wet, friction, Multi plate
Dia. of friction plate	: 119
Thickness	: 2.5
Number of Plates , mm	: 5
Method of operation	: One hand lever provided at LHS handle bar
Location of clutch	: In between engine and transmission system

4.10.2 Transmission system

Type	: Sliding mesh gear box
Make (apa)	: ASPEE
Model (apa)	: DE/GB711
No. of speed	: 3 (2 forward & 1 reverse)
Grade of oil (apa)	: SAE 90
Oil capacity, (l)	: 1.5
Oil change period (apa)	: First change after 50 hours of operation & subsequently after every 100 hours of operation

4.10.2.1 Rotary gear box

Type	: Crown and pinion
No. of teeth on pinion	: 10
No. of teeth on crown	: 43
Reduction ratio	: 4.3:1
Oil capacity, l	: 1.5

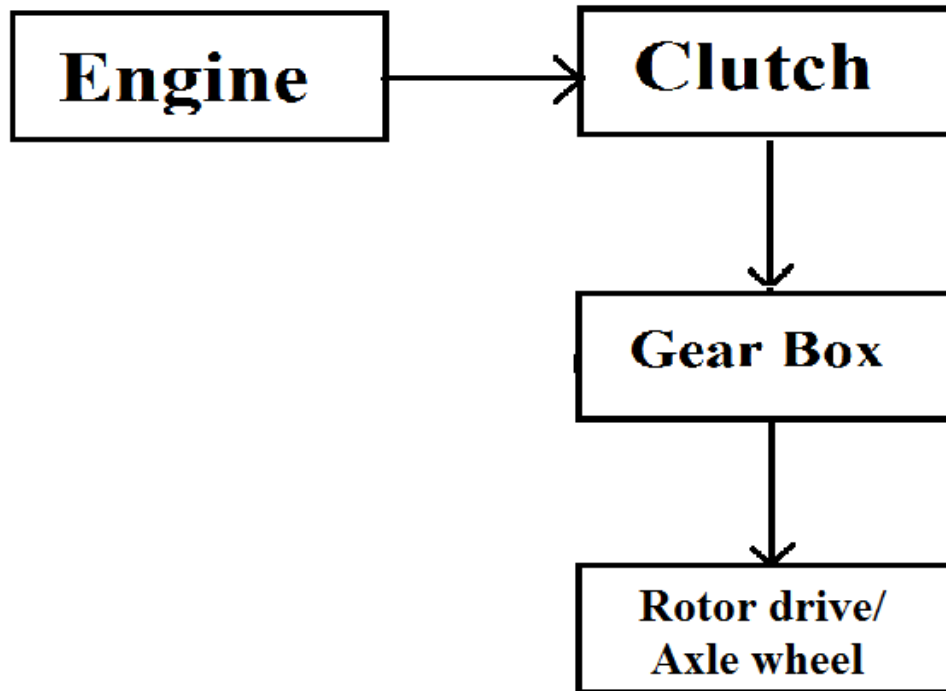


FIG. 2 : SCHEMATIC POWER TRANSMISSION DIAGRAM

4.12 Rotor**4.12.1 Rotor cover**

Material (apa) : M.S. Sheet

Size, mm

Length : 810

Width : 730

Thickness : 1.20

Method of fixing : Bolted to gear box

4.12.2 Rotor shaft

Material (apa) : Mild Steel

Type of rotor axle : Hexagonal

Size of shaft, mm Dia : 45.61

Length of shaft, mm : 530

No. of flanges : 4+4

Type of flanges : Square

Size of flanges, mm : 100 × 100

Thickness of flange, mm : 3.76

Distance between two flanges, mm : 140

No. of blades on each flange : 04

Overall length of rotor, mm : 505/220

Diameter of rotor with blades, mm : 340

Method of fixing of blade : By nuts & bolts (M8×35)

4.12.3 Rotor blades

Number : 32

Type	: 'J' shape
Marking if any	: NA
Thickness, mm	: 5.0
Width of beveled edge, mm	: 14.36 to 16.60
No. and size of hole on each blade for fixing it to the flanges, mm	: 02 and 11.22
Arrangement of blades on flange	: LHS & RHS mounted curve blade alternately

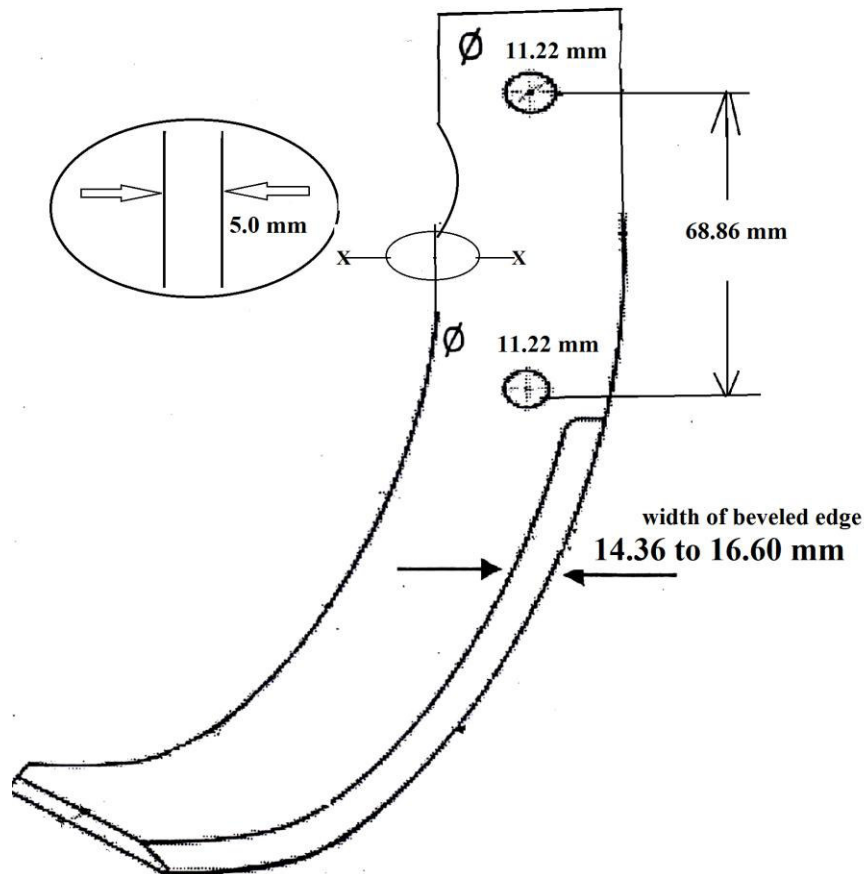


FIG. 3 : ROTOR BLADE

4.13 Depth control mechanism

Type	: M.S. flat
No. of flat	: 01
Material	: Mild steel
Size of flat, mm	
- length	: 460
- Size	: 38.53 × 11.73
Provision for depth adjustment	: 8 holes of size 11 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	: 25.06
No. of hand grips	: Two
Length of grip, mm	: 112.97
Material of grip	: Rubber
Dia. of grip, mm	: 33.24
Provision for handle height adjustment	: Provided
Height of handle bar from ground level, mm	: Maximum : 1390 Minimum : 700
Provision for angle adjustment	: Provided

4.15 Stand : Provided, whereas tail wheel provided serves as a stand.

4.16 Transport wheel

Type	: Pneumatic
Make	: Valkor
Number	: 2
size, mm	: 4.00 – 8, 4PR
Recommended Pressure at 255 kPa load, PSI	: 330 kPa max load 300 kg

4.17 Controls**At LHS**

- i) Clutch lever
- ii) Handle height adjustment lever
- iii) Engine stop lever

At RHS

- i) Accelerator lever
- ii) Main gear shifting lever
- iii) Reverse gear shifting lever
- iv) Handle angle adjustment lever

4.18 Overall dimensions, mm

Length	: 1685
Width	: 1220
Height	: 1390

4.19 Mass, kg : 130

4.20 Color of machine

Engine	: Silver, Black & Red
Main drive cover & transmission system	: Red
Rotary drive cover	: Red
Fuel tank	: Red

Handle bar : Red

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

ASPEE Hara Bhara India	
Type of machine	: Power Weeder
Product model	: DE105
Equipment serial no.	: 005
Month & year of manufacturer	: April 2021
Engine power	: 4.4 kW/6HP
Engine Sr. No.	: 210609027
Rated, RPM	: 3450 RPM
Engine type	: 4- stroke diesel engine
Engine model	: 178 F
SFC of Engine	: 302 g/kWh
Country of Origin	: China
Name & address of applicant	: American Spring & Pressing works Pvt. Ltd. Off Chikhli Road, Antalia Village Taluka Gandevi, Dist. Navsari (Gujarat)
Manufacturer's name and address	: Snowball Group Co. limited Room 2015, Trand Center, 29-31 Cheung Lee Street, Chaiwan, Hongkong China

5. FUEL & LUBRICANTS

5.1	Fuel	Diesel	
5.2	LUBRICANTS		
S. No.	Particulars	As recommended by the manufacturer	As used during the test
1.	Engine sump	SAE 20W40	Oil originally filled in the machine was not changed.
2.	Gear box	SAE 90	

6. ENGINE PERFORMANCE TEST

Applicant has submitted copy of the test report No.-**20210018 dated-31/08/2021** on, 178F engine issued by NSIC Technical service centre, Rajkot, A unit of the National Small Industries Corporation LTD (A Government of India enterprise, Rajkot.) Hence the engine is not tested at this institute. However, for the sake of information of reader, the experts from the test results of rating test and fuel consumption test is give from said report without correction.

1 URL NO. TC 754421100000018F

2 IS CODE NO.- 11170-1985

A. Engine rating test

S NO.	Time in hours-minutes after starting	Barometer Reading (kPa)	Temperature		Relative Humidity (d) %	Observed Speed (rpm)	Brake Load (Nm)	Power (kW)	Fuel consumption		
			Dry bulb (°K)	Air Intake (°K)					Time for 41 gm. (s)	g/h	S.F.C (g/kWh)
1	7.00	98.5	301	305	77	3450	11.56	4.17	117	1262	302.2
2	8.00	98.5	301	305	77	3450	11.56	4.17	117	1262	302.2
3	9.00	98.5	302	306	78	3450	11.48	4.14	118	1251	301.8
4	10.00	98.5	303	307	72	3450	11.48	4.14	118	1251	301.8
5	11.00	98.5	304	308	66	3450	11.46	4.14	118	1251	302.3
6	12.00	98.5	305	309	67	3450	11.38	4.11	119	1240	301.9
7	13.00	98.4	306	310	62	3450	11.35	4.10	119	1240	302.7
8	14.00	98.4	307	311	62	3450	11.30	4.08	119	1240	304.0
9	15.00	98.4	307	311	62	3450	11.30	4.08	119	1240	304.0
10	16.00	98.4	307	311	62	3450	11.30	4.08	119	1240	304.0
11	17.00	98.3	306	310	68	3450	11.29	4.08	119	1240	304.3
12	18.00	98.3	306	310	62	3435	12.53	4.50	106	1392	309.1
Average						3449	16.50	4.15	117.33	1259.08	303.35

Power weeder-133/2780/2022	ASPEE, DE105 POWER WEEDER (COMMERCIAL)
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B. Fuel consumption test											
1	19.00	98.3	305	309	67	3615	0.00	0.00	461	320	--
2	19.30	98.3	304	308	72	3592	2.44	0.92	302	489	532.8
3	20.00	98.3	303	307	72	3564	4.89	1.82	222	665	364.5
4	20.30	98.3	303	307	72	3516	7.33	2.70	172	858	318.2
5	21.00	98.3	302	306	71	3480	9.77	3.56	136	1085	305.0
6	21.30	98.3	301	305	77	3450	11.54	4.17	117	1262	302.8
7	22.00	98.3	301	305	70	3435	12.78	4.59	104	1419	308.9

C. Governing Test:

Sr. No.	Parameter	Observed value
1	Momentary speed change in percentage of rated speed :	7.19
2	Permanent speed change in percentage of rated speed :	4.87

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. The amplitude of vibration was measured in horizontal and vertical position of the accelerometer and the results are represented in Table -3.

Table 3: Vibration Measurement

S. No	Location	Horizontal Direction (x) (μ)	Vertical Direction (y) (μ)
1	Handle Left Right	242 *	256*
		370*	670*
2	Throttle lever	770*	650*
3	Clutch lever	505*	578*
4	Gear shifting lever	860*	775*
5	Fuel tank top lid	630*	740*
6	Air cleaner top	565*	540*
7	Handle height adjustment lever	504*	390*
8	Reverse lever	645*	550*

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

8. NOISE LEVEL MEASUREMENT**8.1 Noise at By-stander's position**

Date of test	: 14.12.2021
Type of track	: Soil surface
Background noise level, dB (A)	: 49.5
Atmospheric conditions:	
Temperature ($^{\circ}$ 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)	: 81.7

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 ($^{\circ}$ 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)	: 91.2

9. AIR CLEANER OIL PULL OVER TEST

Date : 15.12.2021
 Range of atmospheric condition
 Temperature , °C : 22 to 26.3
 RH, % : 39.6 to 49.3
 Pressure, Kpa : 97.74 to 97.81
 Mass of oil in the air cleaner assemblies : 246.16
 when filled with recommended grade of
 oil 5% in excess than mark level, g

Sl. No.	Position	Slope (°)	Loss of oil (g)	Oil pull over (%)	Remarks if any
1	Horizontal	0 ⁰	0.00	0.00	--
2	Tilt longitudinally with front end up	15 ⁰	0.07	0.07	
3	Tilt longitudinally with rear end up	15 ⁰	0.09	0.09	
4	Tilt laterally with right hand side up	15 ⁰	0.15	0.15	
5	Tilt laterally with left hand side end up	15 ⁰	0.13	0.13	

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 as given in Table 4 & 5.

10.1 Table 4 : Hardness of blades

	Requirement as per IS: 6690-1981 (HRC)	Hardness (HRC) as observed	Remarks
At edge portion	56±3	44.3 (Average)	Does not conform
At shank portion	37 to 45	43.57 (Average)	Conforms

10.2 Table 5 : Chemical analysis of rotary blade

Elements	Requirements as per IS: 6690-1981 (%)	As observed (%)	Remarks
Carbon	0.50 to 0.60	0.29	Does not conform
Manganese	0.50 to 1.00	1.86	Does not conform
Silicon	1.50 to 2.00	0.20	Does not conform
Phosphorous	0.05 (Max.)	0.02	Conforms
Sulphur	0.05 (Max.)	0.04	Conforms

11. RUNNING IN

The Power weeder was run-in for 1.08 hour before field performance test as recommended by the applicant. All the fasteners were checked & tightened thereafter.

12. FIELD TEST

The field test under dry land condition was conducted for 27.21 h. The field performance tests were conducted at the rated 3300 rpm. In all, 5 tests trials were conducted in sandy loam soil at the NRFMTTI farm, Hisar. The results of the field test for dry land operation is summarized in Table-6

Crop parameters

- i) Type of weed - Seasonal weeds
ii) Height of weed, cm - 4 to 15

Table 6: SUMMARY OF FIELD PERFORMANCE TEST

Sl. No.	Parameter		Range
i)	Type of soil	:	Sandy loam
ii)	Average Soil moisture, %	:	12.30 to 15.93
iii)	Average Bulk density of soil, g/cc	:	1.63 to 1.65
iv)	Average Speed of operation, kmph	:	1.56 to 1.82
v)	Average depth of cut, cm	:	5.60 to 7.26
vi)	Average Width of cut, m	:	1.02 to 1.08
vii)	Average Area covered, ha/h	:	0.112 to 0.152
viii)	Average Time required for one ha	:	6.62 to 8.93
ix)	Average Fuel consumption		
		l/h :	0.70 to 0.85
		l/ha :	5.42 to 6.25
x)	Average Weeding efficiency, %	:	68.42 to 77.33
xi)	Average Field efficiency, %	:	67.06 to 77.46

13. ADJUSTMENT, DEFECTS, BREAKDOWNS & REPAIR

No noticeable breakdown occurred during test.

14. COMPONENTS/ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR**14.1 Engine :**

The Engine and other assemblies were dismantled after 32.80 hours of 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	
78.04	78.04	78.03	78.03	78.04	78.03	78.5

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
77.5	77.52	77.85	Not measured due to piston design constraint	0.19	Not measured due to piston design constraint	--

14.1.3 Piston Rings end gap:

Ring No.	Ring end gap (mm)			Max. permissible wear limit (mm)
	At top	At middle	At bottom	
1 st compression ring	0.50	0.55	0.60	0.30
2 nd compression ring	1.20	1.20	1.30	0.30
Oil ring	0.55	0.60	0.65	0.40

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
35.23	36.14	0.21	0.40	0.15	0.50

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
1	34.99	35.11	0.12	One side ball bearing	--	0.50

14.1.6 Piston Rings groove clearance:

Ring No.	Ring groove clearance (mm)	Max. permissible wear limit, mm
1 st compression ring	0.17	0.15
2 nd compression ring	0.05	0.15
Oil ring	0.04	0.15

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
5.99	5.98	5.97	5.95	0.02	0.03	0.12	0.12

14.2 Valve guides and valve springs

Valve spring stiffness, Kgf/mm :

Discard limit

Inlet valve : 1.68

0.5 (Kgf/mm)

Exhaust valve : 1.31

- 14.3 Timing gears** : No noticeable defect observed
- 14.4 Clutch** : No noticeable defect observed
- 14.5 Transmission** : No noticeable defect observed
- 14.6 Rotary drive unit** : No noticeable defect observed

14.7 Wear of blades:**14.7.1 Mass basis:**

The wear of the rotary weeder blades was measured after 28.29 h. of field operation and the observations are as under:

Sl. No.	Initial mass (g)	Mass after 28.29 hrs.(g)	Loss of mass (g)	Percent wear (%)	Percent wear per hour
1	296.59	290.48	6.11	2.06	0.07
2	304.61	299.73	4.89	1.60	0.05
3	307.01	298.17	8.84	2.87	0.10
4	298.88	293.31	5.57	1.86	0.06
5	293.68	290.00	3.68	1.25	0.04
6	303.67	296.87	6.8	2.22	0.08
7	305.03	30034	4.69	1.54	0.05
8	303.36	297.00	6.36	2.08	0.07

15. CRITICAL TECHNICAL SPECIFICATIONS

Vide ministry's 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.

Sr. No.	Parameters	Specifications	Observed	Remarks
1.	Type	Self-propelled, walk behind	Self propelled, walk behind type	Conforms
2.	Working width, mm	300-1500	1170	Conforms
3.	Type of engine	Compression/Spark ignition	Compression	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	EN8	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	140	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.)	05	Conforms
15.	Material of blade	Boron (28MnCrB5) / High carbon steel EN 42j	Carbon steel	Does not conform
16.	Hardness of Blade, HRC	38 (min.)	43.3	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. Mechanical vibration**

The amplitude of mechanical vibration marked as (*) on the relevant chapter, are on 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 deserves to be given top priority for corrective action.

16.2 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.

16.3 The hardness 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 Material of blade does not conforms in toto. This need to be looked into for corrective action.

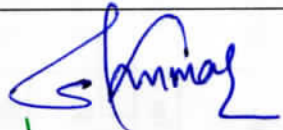
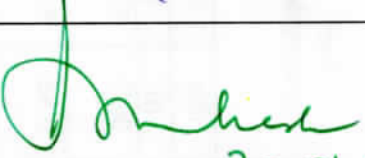
17. TECHNICAL LITERATURE

The following literatures are provided by the applicant during the test.

- Operation manual
- Part's catalogue
- Service manual

However, these manuals need to be updated as per IS: 8132-1999.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 20.01.2022

Draft test report compiled by Er. Dharmendra Kumar, Technical Assistant

18. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comments
18	16.1, 16.2, 16.3 & 16.4	Noted the same & will improve.



Power weeder-133/2780/2022	ASPEE, DE105 POWER WEEDER (COMMERCIAL)
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ANNEXURE – I

Place: NRFMTTI Farm, Hisar

FIELD DATA SHEET OF ROTARY POWER WEEDER

Test No.	Date	Duration of test (h)	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 (ha/h)	Time required for one hectare (h/ha)	Field efficiency (%)	Weeding Eff. (%)
									l/hr	l/ha				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	08.12.2021	3.17	1.77	1.02	7.26	Sandy Loam	15.93	1.65	0.73	5.42	0.134	7.42	74.33	77.33
2	09.12.2021	6.79	1.82	1.07	6.66	Sandy Loam	15.10	1.65	0.85	5.63	0.152	6.62	77.45	68.42
3	10.12.2021	6.91	1.63	1.08	6.40	Sandy Loam	12.30	1.65	0.80	6.15	0.130	7.69	73.86	76.67
4	11.12.2021	5.67	1.56	1.07	5.60	Sandy Loam	13.23	1.65	0.70	6.25	0.112	8.93	67.06	72.22
5	13.12.2021	4.67	1.60	1.08	6.20	Sandy Loam	14.10	1.63	0.70	5.88	0.119	8.40	69.19	70.40