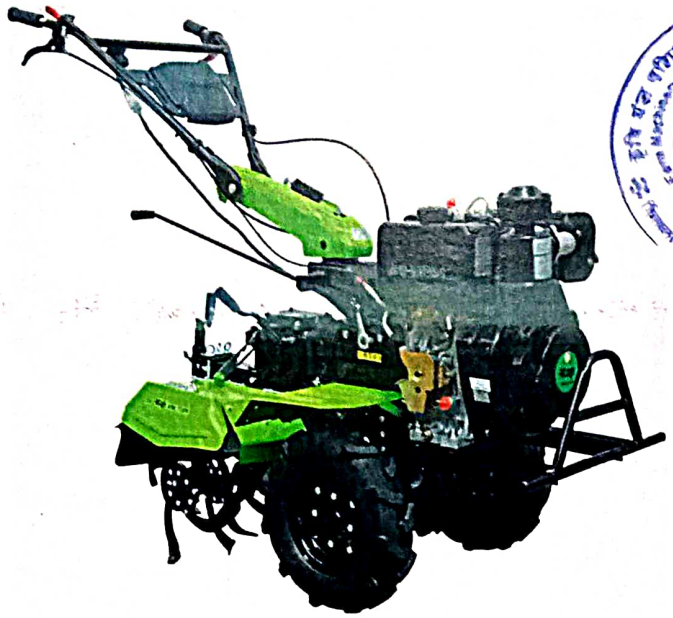
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (INITIAL)

संख्या/No.: Machine 68/439
माह / Month: August 2022

THIS TEST REPORT IS VALID UPTO 31.08.2027



APW-105DM-1 ALAP POWER WEEDER

सत्यमेव जयते

भारत सरकार

GOVT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE & FARMERS WELFARE

उत्तर पूर्व क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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1. SCOPE OF TEST

The scope of test was limited to check and assess the following:

1.1 Specification and other data furnished by the applicant
1.2 Engine performance test
1.3 Amplitude of mechanical vibration
1.4 Noise measurement
1.5 Air cleaner oil pullover
1.6 Hardness & chemical composition of rotor blades
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

As per Govt. of India, OM No. 13-1/2021-M&T (I&P), dated 03.02.2022, the selection of sample for test was exempted. Hence, the machine was directly submitted by the applicant at this institute for test.

3. TEST CODE/TEST 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 2012)	:	Power Tiller - Test code
IS 12036:1995 (Reaffirmed 2004)	:	Agricultural tractors-test procedures-Power tests for power take-off
IS 9980 : 1988 (Reaffirmed 2004)	:	Guidelines for field performance and haulage tests of power tillers
IS 1976 : 1976 (Reaffirmed 1999 2009)	:	Specification for Rotary paddy weeder, manually operated
IS 6690 : 1981 (Reaffirmed 2012)	:	Specification for Blades for Rotavator for Power Tillers

4. SPECIFICATIONS

4.1 General:

Make	:	ALAP
Model	:	APW-105DM-1
Name and address of manufacturer	:	**M/s. Chongqing Shineray Agricultural Machinery Co., Ltd.,**

		No. 8 Shineray Road, Hangu Town, Gaoxin District, Chongqing, **CHINA.**
Name and address of applicant	:	**ALMIGHTY AGROTECH PVT.LTD.** G-1934/35, Lodhika G.I.D.C., Almighty Gate, Kalawad Road , Metoda , Dist. Rajkot, Gujarat
Name of machine	:	Power Weeder
Type of machine	:	Self propelled, Walk behind
Working size of machine (mm)	:	660
Year of manufacture	:	2022
Serial no. of machine	:	DM-1 22 B 1001

4.2 Details of Prime Mover (Engine):

Name and address of manufacturer	:	**Not specified**
Model	:	190 F
Type	:	Single cylinder, four stroke, air cooled, vertical, compression ignition engine.
Year of manufacture	:	**Not specified**
Serial No.	:	2203200372
Recommended high idle speed, rpm (apa)	:	3200 ± 100
Recommended low idle speed, rpm (apa)	:	1400 ± 100
Recommended rated speed, rpm (apa)	:	3000
Recommended rated speed for field operation, rpm (apa)	:	3000
Max. power observed (kW)	:	5.9 @ 2970 rpm
Country of origin	:	**CHINA**

	As per IS 6690:1981 (Reaffirmed 2012)	As observed (HRC)	Remarks
At edge portion	56 ±3 HRC	50.5	**Does not conform**
At shank portion	37 to 45 HRC	50.4	**Does not conform**

11.2 Chemical composition of rotor blades :

The material of rotary blade was got analyzed from Geological and Metallurgical Laboratories, Bangalore for chemical composition. The results of chemical analysis test results are as under:

Constituents	As per IS 6690:1981 (Reaffirmed 2012)		Composition as observed (% of weight)	Remarks
	Carbon Steel (%)	Silico Manganese Steel (%)		
Carbon (C)	0.70 -0.85	0.50-0.60	0.436	**Does not conform**
Silicon (Si)	0.10 -0.40	1.50-2.00	0.526	**Does not conform**
Manganese (Mn)	0.50 -1.0	0.50-1.00	0.865	Conforms
Sulphur (S)	0.05 (max)	0.05 (max)	0.007	Conforms
Phosphorous (P)	0.05 (max)	0.05 (max)	0.014	Conforms

12. FIELD PERFORMANCE TEST

The field tests were conducted for 25.36 hours of field operation for testing the said Power weeder. The field tests were conducted at rated rpm. The detailed test results are represented in the Annexure and summarized in the ensuing table:

Sl .No.	Parameters		Observations
1	Type of soil	:	Light
2	Soil moisture (%)	:	7.0 to 10.4
3	Bulk density of soil (g/cc)	:	1.71 to 1.82
4	Speed of operation (kmph)	:	1.75 to 2.32
5	Depth of cut (cm)	:	6.86 to 8.13
6	Width of cut (cm)	:	59.0 to 64.0
7	Area covered (ha/h)	:	0.088 to 0.106
8	Time required for one ha (h)	:	9.40 to 11.36
9	Field efficiency (%)	:	71.63 to 84.46
10	Weeding efficiency (%)	:	85.85 to 89.44
11	Fuel consumption		
	- l/h	:	0.859 to 0.987
	- l/ha	:	8.68 to 10.13

Big end bearing:

Bearing No.	Clearance (mm)		Max. permissible clearance limit.(mm)	
	Diametrical	Axial	Diametrical	Axial
1.	0.08	0.45	0.025	0.038

Valve guide clearance:

Valve guide dia (mm)		Valve stem dia (mm)		Valve guide clearance (mm)		Max, permissible wear limit (mm)	
Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust	Inlet	Exhaust
6.98	6.94	6.94	6.90	0.04	0.04	**Not specified**	**Not specified**

Valve, guides and timing gears:		**Observation**
Any marked sign of overheating of valves	:	None
Pitting of seat/faces of valves	:	None
Any visual damage to the teeth of timing gears	:	None

15.2 Clutch:

Any marked wear in clutch friction plate	:	No
Condition of clutch release bearing	:	Normal
Condition of pilot bearing	:	Normal
Condition of pressure plate	:	Normal

15.3 Transmission gears:

All the gears of the transmission system were found in normal working condition.

15.4 Rotary drive unit:

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

16. COMMENTS & RECOMMENDATIONS

16.1 Specific fuel consumption of engine corresponding to maximum power as observed during test was 271.0 g/kWh against the declared value of 220 g/kWh. This shall be looked into for corrective action.

16.2 The maximum power and rated power of engine were observed as 5.9 kW and 5.8 kW, respectively against declared values of 7.0 kW and 6.2 kW, respectively. This shall be looked into for corrective action.

16.3 During the varying speed test, the engine could not sustain the load beyond 2286 rpm in natural ambient conditions and beyond 2343 rpm in high ambient conditions and on further loading, the engine speed dropped suddenly and stopped thereafter. This shall be looked into.

16.4 During air cleaner oil pull over test, percentage of oil pull over (mass basis) was observed as much as 44.83 % against the specified limit of 0.25 % as per IS 13539:2008. It is on much higher side. It should be looked into for corrective action.

16.5 The amplitude of mechanical vibration marked as (*) is on drastically higher side and is directly concerned with operator's health, safety and comfort. Besides, it is also adversely affect the useful life of the machine components. In view of the above, it should be looked into for corrective action.

16.6 Noise at operator's ear level was observed higher than danger limit of 90 dB (A) as specified by ILO for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operator's comfort & safety.

16.7 As per manufacturer's recommendation the engine oil change period was 8 to10 hours in dusty condition. However, requirement of changing engine oil just after 8 to10 hours is not desirable from user's point of view. This shall be looked into for improvement.

16.8 It was observed that end float of crankshaft and big end bearing axial clearance exceeded the maximum permissible limit as declared by the manufacturer. This shall be looked into for corrective action.

16.9 Machine maneuverability while taking turns during field operation was not comfortable. It shall be looked into to improve ease of operation for the operator.

16.10 Country of origin was not mentioned on the labeling plate of the machine. This shall be looked into for corrective action to comply with Indian Standard.

16.11 Rated power was mentioned as 9 hp i.e. 6.7 kW on labeling plate of the machine. However, during engine test it was observed as 5.8 kW. This shall be looked into for corrective action.

16.12 Some of important parameters like rated rpm, working width, cutting depth and weight of the machine as mentioned on the labeling plate were not matching with the observed values. This shall be looked into for corrective action.

16.13 The information regarding name and address of manufacturer and rated speed was not mentioned on the labeling plate of the engine. This shall be looked into for corrective action.

16.14 The hardness and chemical composition of rotary blade does not conform to the requirement of IS 6690:1981 (Reaffirmed 2012). This shall be looked into for corrective action.

16.15 **Technical literature:**
Operator's manual, service manual and parts catalogue of the machine were supplied with the test sample for reference during the test. It is however, recommended that same may be revised and brought out in Hindi & other regional languages as per IS 8132:1999 (Reaffirmed 2004) for the sake of user & technical personnel.

TESTING AUTHORITY

(M.R. PATIL)
AGRICULTURAL ENGINEER

(S.G. PAWAR)
AGRICULTURAL ENGINEER

(Dr. P.P. RAO)
DIRECTOR

17. APPLICANT'S COMMENTS

Clause No.	Applicant's Comments
16.1 to 16.15	With immediate Effects, we will inform to our Production Department to take care the Corrective Actions before dispatching material from the factory to sales unit.