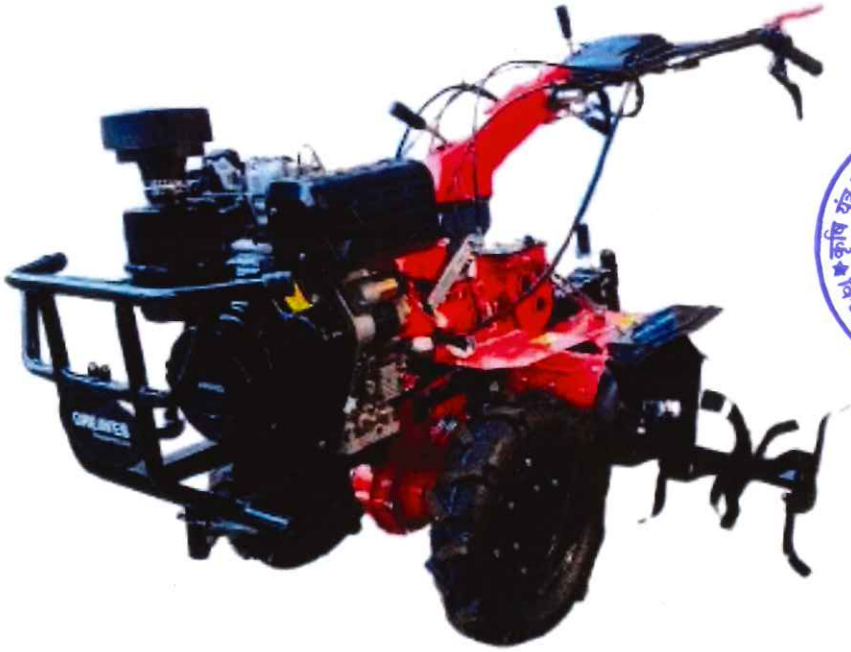
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT
(Initial)

संख्या/No.: ICE/NERFMTTI, B. Chariali/ 11/11/550
माह / Month: October 2025

THIS TEST REPORT IS VALID UPTO 31.10.2032



GREAVES COTTON LTD, GSW 900D, 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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4. SPECIFICATIONS

4.1 General:

Make	:	GREAVES COTTON LTD
Model	:	GSW 900D
Name and address of manufacturer	:	CHONGQING SHINERAY AGRICULTURAL MACHINERY CO. LTD., No. 8. Shineray Road, Hangu Town, Jiulongpo District, Chongqing, CHINA - 401329
Name and address of applicant	:	GREAVES COTTON LTD., F-62 & F-63. SIPCOT Industrial Complex, Gummidipoondi, Tiruvallur District, Tamil Nadu - 601201
Name of machine	:	Power Weeder
Type of machine	:	Self propelled, Walk behind, Back Rotary
Working size of machine (mm)	:	1330
Year of manufacture	:	2025
Serial no. of machine	:	2502404637

4.2 Details of prime mover:

Make (apa)	:	Chongqing Shineray Agricultural Machinery Co. Ltd., **CHINA**
Model	:	G456A
Type	:	Four stroke, Single cylinder, Air cooled, Diesel Engine
Year of manufacture	:	2025
Serial Number	:	G456A2502200466
Country of origin	:	**CHINA**
Recommended high idle speed (rpm)	:	3800±100
Recommended low idle speed (rpm)	:	1500 ±100
Recommended rated speed (rpm)	:	3600
Recommended rated speed for field operation (rpm)	:	3000
Maximum power observed (kW)	:	**7.39**
Maximum power declared (apa) (kW)	:	7.30

12. FIELD PERFORMANCE TEST

The field tests were conducted for 26.29 hours of field operation for testing the said Power Weeder. The field tests were conducted at rated speed of 3000 rpm for field operation. The detailed test results are represented in the Annexure and summarized in the ensuing Table:

Sr. No.	Parameters		Observations
1	Type of soil	:	Light / Medium
2	Soil moisture (%)	:	8.5 to 11.2
3	Bulk density of soil (g/cc)	:	1.70 to 1.95
4	Forward Speed of operation (kmph)	:	1.62 to 1.75
5	Depth of cut (cm)	:	6.70 to 7.60
6	Width of cut (m)	:	1.27 to 1.33
7	Area covered (ha/h)	:	0.170 to 0.183
8	Time required for one ha (h)	:	5.46 to 5.88
9	Field efficiency (%)	:	78.13 to 85.10
10	Weeding efficiency (%)	:	79.80 to 86.84
11	Fuel consumption		
	l/h	:	0.95 to 1.09
	l/ha	:	5.40 to 6.24

12.1 Rate of work:

- Rate of work was recorded as 0.170 to 0.183 ha/h and the forward speed of operation was recorded from 1.62 to 1.75 kmph.
- Time required to cover one hectare was recorded as 5.46 to 5.88 h.

12.2 Quality of work:

- Depth of cut was recorded as 6.70 to 7.60 cm.
- Working width was observed as 1.27 to 1.33 m.
- Field efficiency was found as 78.13 to 85.10 %.
- Weeding efficiency was found as 79.80 to 86.84 %.

12.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

12.4 Wear Analysis of rotor blades:

Blade No.	Initial mass(g)	Final mass(g)	Loss of mass (g)	Percentage wear of rotor blades	
				After 26.29 h	Per hour
L-1	286.77	272.22	14.55	5.07	0.19
L-2	294.38	288.37	06.01	2.04	0.08
L-3	290.26	281.74	08.52	2.94	0.11
L-4	284.97	275.79	09.18	3.22	0.12
L-5	297.31	283.22	14.09	4.74	0.18

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R-1	284.10	273.13	10.97	3.86	0.15
R-2	284.23	272.73	11.50	4.05	0.15
R-3	286.10	273.79	12.31	4.30	0.16
R-4	287.32	277.50	09.82	3.42	0.13
R-5	293.16	277.29	15.87	5.41	0.21

The hourly rate of wear of blade on mass basis after field operations was recorded as 0.08 to 0.21%.

13. EASE OF OPERATION & ADJUSTMENTS

Machine maneuverability while turning during field operation was not comfortable.

14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable 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 40.95 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	88.06	88.03	88.06	88.03	88.06	88.03	88.15

15.1.2 Piston:

Piston no.	Piston dia (mm)				Clearance between piston & cylinder liner at the skirt of the piston (mm)	Max. Permissible wear limit (mm)
	At top		At skirt			
	Thrust side	Non Thrust side	Thrust side	Non Thrust side		
1	87.40	87.40	87.91	NA	0.15	0.45

15.1.3 Ring Side clearance

Piston Rings	Ring Side clearance (mm)	Max. Permissible wear limit (mm)
1st Compression ring	0.05	0.10
2nd compression ring	0.04	0.08
Oil ring	0.03	0.06

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	0.25	0.25	0.20	0.50
2nd Compression ring	0.45	0.45	0.45	0.50
Oil ring	0.40	0.40	0.40	0.50

15.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permissible wear limit (mm)	
			Dimetrical	Axial	Dimetrical	Axial
1	40.14	40.11	0.03	0.40	0.025	0.038

Condition of bearing: Normal

15.1.6 Main bearing: One No. of ball bearing 6308 was used.

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit,(mm)	
			Diametrical clearance	Crankshaft end float
Bush bearing	0.03	0.05	Not specified	0.023

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
6.99	7.00	6.95	6.95	0.04	0.05	0.02	0.02

Valve, guide and timing gear:-

Any marked sign of overheating of valves	:	None
Pitting of seat/faces of valves	:	Normal
Any visual damage to teeth of timing gears	:	None
Condition of ignition coil & magneto	:	Normal

15.2 Clutch: No noticeable defect was observed.

15.3 Transmission gears: No noticeable defect was observed.

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

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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	1330	Conforms
3.	Type of engine	Compression ignition / Spark ignition	Compression ignition	Conforms
4.	Starting method	Manual / recoil /self-starting	Recoil 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	Mn65 (apa)	**Does not conform**
9.	No. of flanges	4 - 10	10	Conforms
10.	Type of flanges	Square / circular/ rectangular	Square	Conforms
11.	Distance between consecutive flanges (mm)	80 to150	130 to 136	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.)	5.05	Conforms
15.	Material of blade	Boron (28Mn Cr B5) / High Carbon Steel EN42j	High Carbon Steel	Conforms
16.	Hardness of Blade, HRC	38 (Min.)	33	**Does not conform**
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

1	2	3	4	5
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 / labelling of machine	The labelling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacture, Serial number, Engine number, Engine HP, rated rpm & SFC.	Name and address of manufacturer and Country of origin 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 During wear assessment, it was observed that valve guide clearance for both inlet and exhaust valves was exceeded the maximum permissible wear limit. This should be look into for improvement in future production.

17.3 Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by 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 & safety.

17.4 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 component in view of above this deserves to be given top priority for corrective action.

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

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

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

17.8 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: 8132-1999.

TESTING AUTHORITY

(M.R. PATIL)
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)
DIRECTOR

Draft test report compiled by - Shri D. Deori, Technical Assistant

18. APPLICANT'S COMMENTS

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

ANNEXURE

FIELD PERFORMANCE RESULTS

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

Sr. No.	Parameters	I	II	III	IV
1	Date of test	25.09.25	26.09.25	27.09.25	30.09.25
2	Net test duration (h)	6.92	5.50	6.87	7.00
3	Furrow length (m)	38.5	39.5	40.5	33.5
4	Type of soil	Light	Medium	Light	
5	Bulk density (g/cc)	1.95	1.70	1.80	1.70
6	Soil moisture (%)	8.5	9.2	10.4	11.2
7	Previous treatment	Nil			
8	Forward speed (kmph)	1.62	1.63	1.75	1.67
9	Av. depth of cut (cm)	7.50	7.10	6.70	7.60
10	Av. width of cut (m)	1.33	1.30	1.28	1.27
11	Area covered (ha/h)	0.183	0.175	0.175	0.170
12	Time required for one ha (h)	5.46	5.70	5.72	5.88
13	Field efficiency (%)	85.10	82.77	78.13	80.28
14	Av. height of weeds (cm)	15.8	11.6	21.2	13.0
15	Av. number of weeds per m^2 (Before operation)	121	114	203	140
16	Av. number of weeds per m^2 (After operation)	21	15	41	22
17	Weeding efficiency (%)	82.64	86.84	79.80	84.29
18	Fuel Consumption				
	- l/h	1.08	0.95	1.09	1.03
	- l/ha	5.91	5.40	6.24	6.04