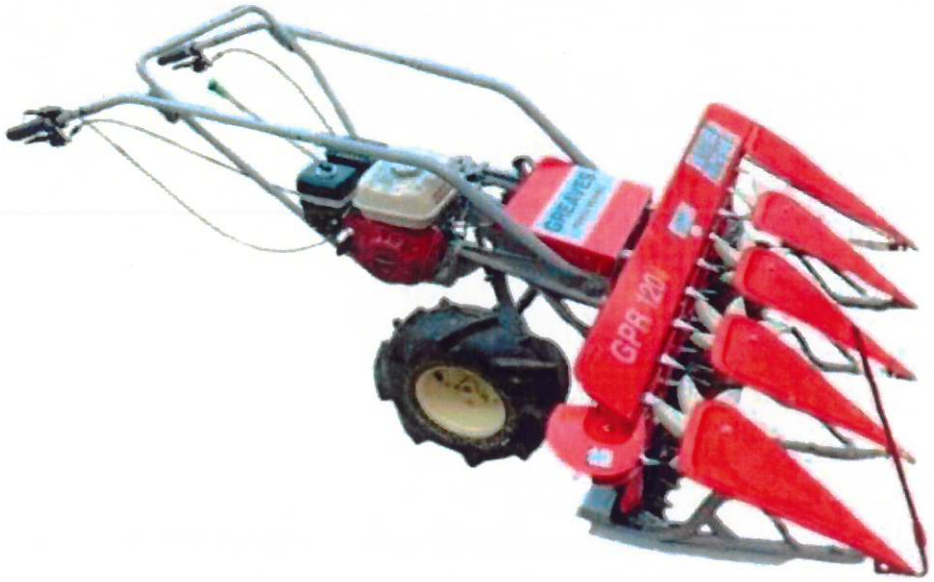
व्यावसायिक परीक्षण रिपोर्ट (प्रारंभिक)
COMMERCIAL TEST REPORT (Initial)

संख्या/No.: Machine 144/518
माह / Month: January 2025

THIS TEST REPORT IS VALID UPTO 31.01.2032



GREAVES COTTON LTD, GPR 120, SELF PROPELLED REAPER

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
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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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4. SPECIFICATIONS

4.1 General:

Name and address of the manufacturer	:	V.S.T. TILLERS & TRACTORS LTD. Plot No-222-224 & 229-232, 3rd. Phase. KIADB Industrial Area, Malur, Kolar District – 563130, Karnataka
Name & address of applicant	:	GREAVES COTTON LTD. F62 & F63. Sipcot Industrial Complex, Gummidipoondi, District – Thiruvallur - 601201, Tamil Nadu
Name of machine	:	Reaper
Type	:	Self Propelled, Walk behind
Make	:	Greaves Cotton Ltd.
Model	:	GPR 120
Year of manufacture	:	2024
Serial number	:	GFJTLG000124
Country of origin	:	**INDIA**
Size of reaper (mm)	:	1175
Name of crop recommended by applicant	:	Paddy
Name of crop in which field test was conducted	:	Paddy

4.2 Details of Prime Mover Used:

Name and address of the manufacturer	:	**Honda Siel Power Products Ltd.** Plot no. 5, Sector -41 (Kasna), Greater Noida Industrial Development Area, Dist. : Gautam Budh Nagar, Uttar Pradesh, Pin - 201310
Make	:	Honda
Model	:	GX160
Type	:	Single cylinder, air cooled, 4 stroke, Petrol Engine
Year of manufacture	:	2024
Serial number	:	1200133
Country of origin	:	India
Recommended high idle speed (rpm)	:	1950 ± 50 (at PTO) 3900 ± 100 (at Engine)
Recommended low idle speed (rpm)	:	700 (+100/-75) (at PTO) 1400 (+200/-150) (at Engine)
Recommended rated speed (rpm)	:	1800 (at PTO) 3600 (at Engine)
Recommended speed for field test (rpm)	:	1500 to 1800 (at PTO)
Engine rated power observed (kW)	:	**2.84**
Engine rated power declared (kW)	:	3.60

SUMMARY OF CROP PARAMETERS

Table-1

S. No.	Parameters	Paddy
1	Variety of crop	Ranjit
2	Straw moisture content (%)	29 to 39
3	Grain moisture content (%)	10.2 to 11.9
4	Plant height (cm)	100.2 to 120.8
5	Length of ear head (mm)	159 to 184
6	Number of grains per ear head	86 to 144
7	Number of hills per square meter	21 to 34
8	Number of tillers per hill	12 to 14
9	Straw-grain ratio	2.90:1 to 3.52:1

SUMMARY OF FIELD PERFOMANCE

Table-2

S. No.	Parameters/operations	Paddy
1	Forward speed (kmph)	2.88 to 2.92
2	Width of cut (cm)	102 to 108
3	Stubble height (mm)	154 to 186
4	Losses (Percentage of total grain yield)	
	-Pre-harvest loss	0.08 to 0.13
	-Post harvest loss (Cutter bar)	0.20 to 0.51
	-Conveyor loss/shattering loss	0.24 to 0.41
5	Area harvested (ha/h)	0.212 to 0.231
6	Field efficiency (%)	70.25 to 75.57
7	Time required for one hectare (h)	4.33 to 4.72
8	Fuel consumption	
	- l/h	0.54 to 0.68
	- l/ha	2.34 to 3.11

12.1 Rate of work

The forward speed of machine was observed as 2.88 to 2.92 kmph.

The area harvested by the machine was recorded as 0.212 to 0.231 ha/h.

12.2 Quality of work

Field efficiency was observed as 70.25 to 75.57 %.

The post-harvest loss (cutter bar) was observed as 0.20 to 0.51 % of total grain yield.

The conveyor loss/shattering loss was observed as 0.24 to 0.41 % of total grain yield.

The stubble height was recorded as 154 to 186 mm.

Machine leaves the harvested crop in windrows.

12.3 Labour requirement

One unskilled labour is required for cutting the crop manually at corner and side of each field.

Two skilled labours are required for operating the machine continuously.

12.4 Operator's comfort, safety and ease of operation

All the controls were within the easy reach of the operator.

The machine was provided with main clutch for stopping forward motion of the machine and cutter bar operation at same time.

13. EASE OF OPERATION AND ADJUSTMENT

Machine maneuverability while taking turns 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 39.60 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	68.02	68.01	68.01	68.00	68.01	68.00	68.165

15.1.2 Piston:

Piston no.	Piston dia (mm)				Max. Permissible wear limit at skirt (mm)	Piston to cylinder liner clearance at top, (mm)	
	At top		At skirt			As observed	Max. permissible limit, (mm)
	Thrust side	Non Thrust side	Thrust side	Non Thrust side			
1	67.70	67.70	67.95	*	67.845	0.32	0.12

*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	0.08	0.15
2nd compression ring	0.07	
Oil ring	*	

*Not recorded due to ring design constraints

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	0.20	0.20	1.0
2nd compression ring	0.45	0.40	04	1.0
Oil ring	*	*	*	1.0

*Not recorded due to ring design constraints

15.1.5 Big end bearing

Bearing no.	Dia of bearing (mm)	Dia of Crank pin (mm)	Clearance (mm)		Max. Permmissible wear limit (mm)	
			Dimetrical	Axial	Dimetrical	Axial
1	30.05	29.98	0.07	NA	0.12	1.10

Condition of bearing: Normal

15.1.6 Main bearing: Two Nos. of ball bearing 6205 were used

Bearing No.	Diametrical clearance, (mm)	Crankshaft end float, (mm)	Max. permissible clearance limit,(mm)	
			Diametrical clearance	Crankshaft end float
1.	Ball bearing	0.10	NA	1.0
2.	Ball bearing			

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
5.49	5.48	5.47	5.42	0.02	0.06	0.1	0.1

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

16. CRITICAL TECHNICAL SPECIFICATIONS

(Vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019)

Sl. No.	Parameters	Specifications	Observation	Remarks
1.	Type of machine	Walk-behind type	Walk-behind type	Conforms
2.	Effective width of cutter bar (mm)	1100(Min.)	1255	Conforms
3.	Number of crop dividers	5(Min.)	5	Conforms
4.	Type of knife section	Serrated	Serrated	Conforms
5.	Number of knife sections on cutter bar	24 (Min.)	24	Conforms
6.	Type of crop conveyor	Chain/Belt	Chain	Conforms
7.	Numbers and type of wheel equipment	Two/Pneumatic or Iron	Two pneumatic	Conforms
8.	Type of prime mover	Diesel/Petrol/Kerosene/Petrol start kerosene run IC engines.	Petrol	Conforms
9.	Minimum power of prime mover (kW)	2.0 to 4.5	2.84	Conforms
10.	Material of knife section	High Carbon steel EN42J or above	EN42J (apa)	Conforms
11.	Material of knife back	High Carbon steel EN42J or above	EN42J (apa)	Conforms
12.	Material of ledger plate	High Carbon steel EN44 above	EN42J (apa)	**Does not conform**
13.	Hardness of knife section HRC	38(Min)	44	Conforms
14.	Hardness of ledger plate	45 (Min.)	63	Conforms
15.	Provision for adjusting the height of cutter bar	Must be provided	Provided	Conforms
16.	Guards against all moving parts/drives and hot parts	Must be provided	Not provided	**Does not conform**
17.	Spark arrester in engine exhaust	Must be provided	Not provided	**Does not conform**
18.	Location and direction of emission to be away from the operator and machine for satisfactory operation	Must be provided	Provided	Conforms
19.	Slip clutch/safety pins at cutter bar drive	Must be provided	Provided	Conforms
20.	Slip clutch/safety pins at conveyor drive	Must be provided	Provided	Conforms

21.	Provision of row marker/crop guide	Must be provided	Provided	Conforms
22.	Marking/labeling of machine	The labeling plate should be riveted on the body of machine having Name and address of manufacturer, Country of origin, Make, Model, Year of manufacturer, Serial number, Type, size, Size of prime mover (kW)	Name and address of manufacturer not provided.	**Does not conform**
23.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

17. COMMENTS AND RECOMMENDATIONS

17.1 The average rated power in rating test of engine was observed as 2.84 kW against declared value of 3.6 kW by the applicant/manufacturer. This should be looked into for corrective action.

17.2 The specific fuel consumption (SFC) in rating test of engine was observed as 395 g/kWh against declared value of 248 g/kWh by the manufacturer which exceeded by more than 5 percent of that declared by the manufacturer and does not fulfill the requirement of IS 7347-1974 (Reaffimed 2021). This should be looked into for corrective action.

17.3 The amplitude of mechanical vibration marked as (*) was 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.

17.4 Noise at operator's ear level was observed on higher side against warning limit of 85 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.

17.5 Piston to cylinder liner clearance at top was measured as 0.32 mm against the discard limit of 0.12 mm. This should be looked into for corrective action.

17.6 The hardness of knife sections (both movable and stationary) does not conform to the requirement of IS 6025-2024. It should be looked into for improvement.

17.7 Specifications of knife section of cutter bar does not conform to IS 6025:2024 and Specifications of knife section back does not conform to IS 10378-2024. It should be looked into for corrective action.

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

17.9 Spark arresting device has not been provided in the exhaust manifold and it should be provided.

17.10 Provision for handle height adjustment was made for handle bar height with four holes. However, with the handle bar set in upper most three positions, main gear lever get stuck and unable to shift the gear. This should be looked into for corrective action.

17.11 Provision for checking oil level of main gearbox was not provided. It should be looked into for corrective action.

17.12 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 Vithato Keyho, Senior Technical Assistant**