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

संख्या/No.: H&TH/NERFMTTI, B. Chariali/
01/01/557
माह / Month: January 2026

THIS TEST REPORT IS VALID UPTO 31.01.2033

RANCHER, RX131, 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
NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE
बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)
BISWANATH CHARIALI, DIST- BISWANATH, ASSAM, PIN - 784 176
[AN ISO 9001:2015 CERTIFIED INSTITUTION]

Ph. No. 03715-222094 Website: https://nerfmtti.nic.in E-mail: fmti-ner@nic.in

4. SPECIFICATIONS

4.1 General:

Name and address of the manufacturer	:	RANCHER AGRI EQUIPMENTS PRIVATE LIMITED, Kotda Sangani Road, Narnaka Rajkot, Plot No.1 to 4, Survey No 86 P3, Naranka Chokadi, Kotda Sangani, Rajkot, Gujarat, Pin Code 360030
Name and address of the applicant	:	RANCHER AGRI EQUIPMENTS PRIVATE LIMITED, Kotda Sangani Road, Narnaka Rajkot, Plot No.1 to 4, Survey No 86 P3, Naranka Chokadi, Kotda Sangani, Rajkot, Gujarat, Pin Code 360030
Name of machine	:	Self-propelled Reaper
Type	:	Self-propelled, Walk behind
Make	:	RANCHER
Model	:	RX131
Year of manufacture	:	2024
Serial Number	:	PR112400003
Country of origin	:	INDIA
Size of reaper (mm)	:	1200
Name of crop recommended by the applicant	:	Paddy
Name of the crop in which test was conducted	:	Paddy

4.2 Details of prime mover used:

Name and address of the manufacturer (apa)	:	M/s Honda Siel Power Products Ltd, Plot No-5, Sector-41 (Kasna) Greater Noida Industrial development Area, Dist. Gautam Budh Nagar, Uttar Pradesh -201 310
Make	:	HONDA
Model	:	GX160
Type	:	4-stroke petrol engine, Single cylinder, Air cooled
Year of manufacture	:	2024
Serial Number	:	GCAED-1192140
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)

13. FIELD PERFORMANCE TEST

The machine was tested for total of 25.11 hours for harvesting paddy crop. The performance of the machine was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction. The detailed test results have been given in Annexure-I & II and summarized in Table 1 & 2 below.

SUMMARY OF CROP PARAMETERS

Table-1

Sr. No.	Parameters	Range
1	Variety of crop	Paddy (Bismoti)
2	Straw moisture content (%)	22.7 to 39.1
3	Grain moisture content (%)	10.8 to 17.8
4	Plant height (mm)	814 to 1334
5	Length of ear head (mm)	187.0 to 247.0
6	Number of grains per ear head	118 to 266
7	Number of hills per m^2	26 to 33
8	Number of tillers per hill	7 to 11
9	Straw-grain ratio	1.63:1 to 2.76:1

SUMMARY OF FIELD PERFOMANCE TEST

Table-2

Sr. No.	Parameters	Range
1	Forward speed (kmph)	3.34 to 3.47
2	Width of cut (cm)	102 to 116
3	Stubble height (mm)	100 to 208
4	Losses (Percentage of total grain yield)	
	-Pre-harvest loss	0.14
	-Post harvest loss (Cutter bar)	0.05 to 0.21
	-Conveyor loss/shattering loss	0.33 to 0.99
5	Area harvested (ha/h)	0.26 to 0.34
6	Field efficiency (%)	76.45 to 85.00
7	Time required for one hectare (h)	2.94 to 3.85
8	Fuel consumption	
	- l/h	0.97 to 0.99
	- l/ha	2.90 to 3.70

13.1 Field performance during paddy harvesting

13.1.1 Rate of work

- The forward speed of machine was observed as3.34 to 3.47 kmph.
- The area harvested by the machine was recorded as 0.26 to 0.34 ha/h.

13.1.2 Quality of work

- Field efficiency was observed as 76.45 to 85.00%.
- The post-harvest loss (cutter bar) was observed as 0.05 to 0.21 % of total grain yield.
- The conveyor loss/shattering loss was observed as 0.33 to 0.99 % of total grain yield.
- The stubble height was recorded as 100 to 208 mm.
- Machine leaves the harvested crop in windrows.

13.3 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.

13.4 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.

14. EASE OF OPERATION AND ADJUSTMENTS

No noticeable difficulties were observed in operation and adjustment during the field test.

15. DEFECTS, BREAKDOWNS AND REPAIR

a) During field performance test it was observed that chain lock of upper conveyor chain was broken five times and it was replaced with new one.

b) During field performance test it was observed that shaft through which power is transmitted from main gearbox to final drive was broken and it was replaced with new one.

16. COMPONENTS / ASSEMBLY INSPECTION AND ASSESSMENT OF WEAR

16.1 Engine:

The engine and other assemblies were dismantled after 39.19 hours of operation.

16.1.1 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	68.03	68.02	68.03	68.02	68.03	68.02	68.165

16.1.2 Piston:

Piston no.	Piston dia (mm)				Piston liner side clearance observed (mm)	Max. Permissible wear limit (mm)
	At top		At skirt			
	Thrust side	Non Thrust side	Thrust side	Non Thrust side		
1	67.86	67.88	67.97	NA	0.06	67.845

16.1.3 Ring Side clearance

Piston Rings	Ring Side clearance (mm)	Max. permissible wear limit (mm)
1st Compression ring	0.06	0.15
2nd compression ring	0.05	0.15
Oil ring	NA	--

16.1.4 Ring end gap clearance

Ring No.	Ring End gap (mm)			Max. permissible wear limit (mm)
	At top	At middle	At bottom	
1st compression ring	0.55	0.50	0.50	1.00
2nd compression ring	0.12	0.12	0.12	1.00
Oil ring	NA	NA	NA	1.00

16.1.5 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	30.12	30.05	0.07	0.45	0.12	1.10

Condition of bearing: Normal

16.1.6 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	0.35	NA	1.0
2.	Ball bearing			

16.1.7 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
5.46	5.43	5.44	5.41	0.02	0.02	0.10	0.12

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

17. 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.	Type of machine	Walk-behind type	Walk-behind type	Conforms
2.	Effective width of cutter bar (mm)	1100(Min.)	1257	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	2.87	Conforms
10.	Material of knife section	High Carbon steel EN42J or above	High Carbon steel	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	High Carbon steel	Conforms
13.	Hardness of knife section HRC	38 (Min)	63	Conforms
14.	Hardness of ledger plate	45 (Min.)	58	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	Provided	Conforms
17.	Spark arrester in engine exhaust	Must be provided	Provided	Conforms
18.	Location and direction of exhaust 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)	Provided	Conforms
23.	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

18. COMMENTS AND RECOMMENDATIONS

18.1 During field performance test it was observed that chain lock of upper conveyor chain was broken five times and shaft through which power is transmitted from main gearbox to final drive was broken. This should be looked into for improvement in quality.

18.2 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.

18.3 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.

18.4 Specification of knife sections of the cutter bar does not conform to IS 6025:2024 and it should be looked into for corrective action.

18.5 Specification of knife section back of the machine does not conform to IS 10378-2024 and it should be looked into for corrective action.

18.6 The hardness of knife section (movable) and chemical composition of knife section (both movable and stationary) did not conform to the requirement of IS 6025-2024. It should be looked into for improvement.

18.7 The mentioned value of rated power as 3.6 kW on the labeling plate of the machine was not matching with the observed value during engine test. This may be looked into for correction.

18.8 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 - **Sh. D. Deori, Technical Assistant**

19. APPLICANT'S COMMENTS

We will do necessary action for our future products as per the comments and recommendations in the test report.

ANNEXURE-I

CROP PARAMETERS

Place of test: Village- Jamuguri, Dist- Sonitpur, Assam
Name of the crop in which field test conducted: Paddy

Sr. No.	Parameters	I	II	III	IV	V
1	Date of test	25.11.25	26.11.25	27.11.25	28.11.25	29.11.25
2	Av. moisture content (%)					
	- Grain	10.8	16.2	17.8	15.5	16.9
	- Straw	22.7	37.5	39.1	38.0	38.7
3	Variety of crop	Paddy (Bismoti)				
4	Av. plant height (mm)	908	814	859	1334	1144
5	Av. length of ear head(mm)	207.0	187.0	201.4	247.0	222.4
6	Av. no. of grains per ear head	178	118	126	266	207
7	No. of hills per m^2	30	26	32	33	29
8	No. of tillers per hill	9	7	8	7	11
9	Straw- grain ratio	2.76:1	2.55:1	2.02:1	1.63:1	2.00:1
10	Atmospheric conditions					
	Av. Temperature (^{0}C)	34.6	31.2	30.0	29.0	31.0
	Av. Humidity (%)	64.5	65.0	63.0	65.0	65.0
	Av. Pressure (kPa)	99.7	100.2	97.0	98.1	98.0

ANNEXURE-II

FIELD PERFORMANCE RESULTS

Place of test: Village- Jamuguri, Dist- Sonitpur, Assam
Name of the crop in which field test conducted: Paddy

Sr. No.	Parameters	I	II	III	IV	V
1	Variety of crop	Paddy (Bismoti)				
2	Date of test	25.11.25	26.11.25	27.11.25	28.11.25	29.11.25
3	Net test duration (h)	6.00	4.45	5.83	4.50	4.33
4	Forward speed (kmph)	3.36	3.45	3.47	3.44	3.34
5	Av. width of cut (cm)	102	112	116	114	111
6	Av. stubble height (mm)	100	136	157	208	162
7	Losses (% of total gain yield)					
	- Pre harvest loss	0.14	NIL	NIL	NIL	NIL
	- Post harvest loss (cutter bar + uncut)	0.21	0.05	0.18	0.05	0.08
	- Conveyor loss/shattering loss	0.33	0.61	0.60	0.98	0.99
8	Av. mass of crop per m^2 (g)	1638.0	1462.6	1464.0	1226.2	1122.6
9	Area harvested (ha/h)	0.26	0.32	0.34	0.31	0.31
10	Field efficiency (%)	76.45	82.05	85.00	79.49	83.78
11	Time required for one ha (h)	3.85	3.13	2.94	3.23	3.23
12	Fuel consumption					
	- l/h	0.97	0.98	0.98	0.99	0.97
	- l/ha	3.70	3.07	2.90	3.23	3.13