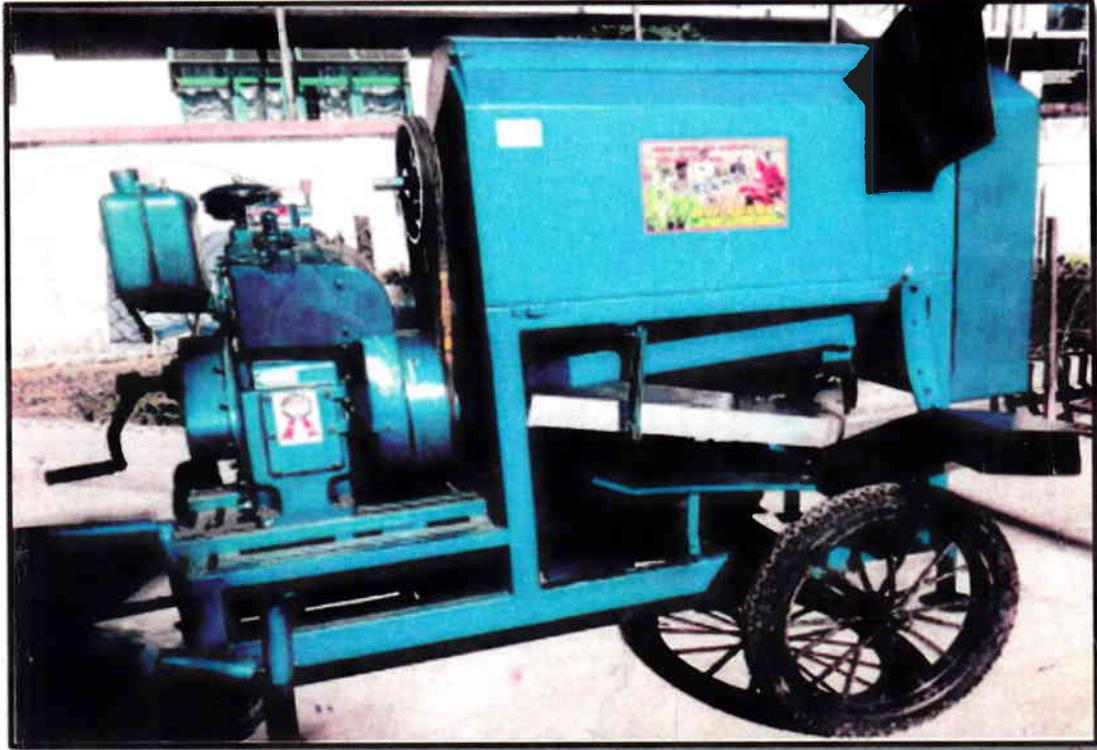


व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या / No.: Th-02/228
माह / Month: July, 2015



RONGMON, VICTOR-III PADDY THRESHER

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सत्यमेव जयते

भारत सरकार
GOVT OF INDIA

कृषि मन्त्रालय

MINISTRY OF AGRICULTURE

कृषि एवं सहकारिता विभाग

DEPARTMENT OF AGRICULTURE AND COOPERATION

उत्तर पूर्वी 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 to check and assess the following: -

- Specifications and other data furnished by the applicant
- Material of construction, visual observation and provision for adjustment
- Engine performance
- Rate and quality of work
- Labour requirement and power consumption
- Wear assessment
- Ease of operation and adjustment
- Safety provisions

2. METHOD OF SELECTION

The machine was directly submitted by the applicant for test at this Institute. Hence, the method of selection is not known.

3. TEST PROCEDURE

- i) IS: 6284 – 1985 (Reaffirmed 2009) : Test Code for Power Thresher for Cereals
- ii) IS: 9020 -2002 (Reaffirmed 2012) : Power threshers — Safety Requirements

4. SPECIFICATIONS**4.1 General:**

Name and address of manufacturer	: M/s. HVF Agency, Kushal Nagar, Moranhat, At Road, Near MMC, PIN-785670, Dist.-Dibrugarh, Assam
Name of machine	: Rongmon Paddy Thresher
Make	: Rongmon (apa)
Model	: VICTOR-III (apa)
Type	: Power operated, tangential flow
Size of thresher (mm)(width x dia of cylinder)	: 755 x 445 Φ
Serial number	: Not specified
Year of manufacture	: Not specified

4.2 Design suitability:

Main crop recommended	: Paddy
Other crops recommended	: None
Thresher evaluated for	: Paddy only

4.3 Power Unit:

Type of prime-mover : Diesel engine
Power requirement (kW) : 5.9

4.3.1 Details of prime-mover used

Type : Four stroke cycle, single cylinder, vertical, air-cooled, diesel engine.
Make : Kirloskar
Model : CAF8
Serial Number : 20.1101/1400570
Type of drive : Through V-belt & pulley
Prime-mover mounting : Mounted on the slotted frame fabricated by welding angle irons.

4.4 Constructional details (Refer Fig. 1)**4.4.1 Main frame:**

Constructional details : It was fabricated by welding MS box in rectangular shape. One MS sheet of thickness 1.4 mm was welded on the top of the frame. The MS sheet was fabricated by making an outlet to pass the threshed materials and fall on the sieve. On the rectangular frame threshing drum was mounted.

Type : Rectangular
Size of MS box (mm) : 595 x 1016
Material : MS box and MS sheet
Size of Rectangular box (mm) : 600 x 1020 x 755

4.4.1.1 Prime-mover mounting frame:

Constructional details : Two MS angles were welded face-to-face so that the gap between two angles can be used as a slot for the longitudinal adjustment of prime-mover. For the lateral adjustment also, two MS angles were welded in the same way on the frame.

Material : MS angle iron
Size of angle iron (mm) : 35 x 35 x 5.7
Provision for belt tensioning : Mounting frame was provided with slot of size 570 x 14.5 mm for tightening the belts.

1	2	3	4
8.6	<p>Minimum cautionary notices – Each thresher shall be fitted with a label/plate containing following cautionary notices written in vernacular language and their pictorial representation. The size of the pictures and the typography of the letters shall be selected according to the size of the label or poster and the distance at which these have to be seen or read. The minimum size for picture shall be 40 mm.</p> <p>The colour of symbols should be black for "pictorial representation" and red for "Not to Do":(Refer IS: 9020-2002 (Reaffirmed 2012))</p>		
(a)	Do not put or take-off belt while pulley is running	Not provided	Does not conform
(b)	Do not stand on thresher during operation or transportation	- do -	- do -
(c)	Do not smoke and light fire near threshing yard and thresher	- do -	- do -
(d)	Do not feed ear-heads by hand	- do -	- do -
(e)	Children and aged persons should be discouraged for feeding the crop	- do -	- do -
(f)	Do not cross over the belts	- do -	- do -
(g)	Do not wear loose dress, bangle, watch, etc. while working	- do -	- do -
(h)	Don't walk under the influence of intoxicants like liquor, opium, etc. while working	- do -	- do -
(i)	Do not work when tired	- do -	- do -
(j)	Do not make adjustment when thresher is working	- do -	- do -

9. DEFECTS, BREAKDOWNS AND REPAIRS

9.1 No major breakdown occurred during entire course of test in both the prime mover and the thresher.

10. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

10.1 Engine Performance Test

Power (kW)	Crankshaft torque (Nm)	Crankshaft speed (rpm)	Fuel consumption			Specific energy (kWh/l)
			Hourly		Specific	
			l/h	Kg/h	g/kWh	
1	2	3	4	5	6	7
Maximum Power						
5.06	33.8	1430	1.32	1.10	218	3.83

10.1.1 The maximum power of engine was recorded as 5.06 kW at 1430 rpm against the engine manufacturer's declaration of 5.9 kW at 1500 rpm, which is 14% less.

10.1.2 The specific fuel consumption corresponding to maximum power was recorded as 218 g/kWh against manufacturer's declaration of 202+5% g/kWh.

10.1.3 During the varying speed test, heavy black smoke was noticed after 1460 rpm of engine. The engine performance characteristics curve (fig. 4) shows the constant speed behavior of governor, despite the need of varying speed governor for such application.

Therefore it is recommended that the engine should be provided with varying speed governor before commercial production/sale of the machine.

10.2 No Load power requirement:

No load power requirement was recorded as 2.25 kWh, which is 47% of the power requirement at optimum input capacity, against the requirement of 15%.

10.3 Performance of the thresher:

The detailed performance results of machine are given in **Annexure- II** and are summarized in **Table-2**. The performance of machine is also represented graphically in **Fig. 5**. The performance of the machine at optimum capacity is summarized below.

PERFORMANCE AT OPTIMUM INPUT CAPACITY

Crop	Optimum Capacity				Grain losses (%)	Efficiencies (%)	
	Input		Output			Broken	Cleaning
	Kg/h	Kg/kWh	Kg/h	Kg/kWh			
Paddy	1460	344	552	130	Nil	99.40	100

10.3.1 Rate of work

The capacity of machine depends upon the skill of feeder. The optimum input capacity & grain output of the thresher were recorded as 1460 & 552 kg/h respectively. Input & output capacity per unit power consumption was recorded as 344 & 130 kg/kWh respectively.

10.3.2 Quality of work

- The percentage of broken grain was recorded as nil.
- The percentage of sieve loss was recorded as 0.149%.
- The threshing efficiency of the machine was recorded as 100%.
- The cleaning efficiency was recorded as 99.40 %.
- No major effect on performance of thresher was observed in threshing of Paddy crop due to variation of threshing cylinder speed.

10.3.3 Power requirement

The input power requirement of the thresher during short run tests was recorded as 3.25 to 4.80 kWh and at optimum capacity was recorded as 4.25 kWh.

The installed prime-mover has developed 5.06 kWh during engine performance test and the power utilization was observed as 84%.

10.3.4 Labour requirement

Manpower requirement for threshing Paddy crop was assessed as 4 numbers. During continuous operation of the machine, labour engaged for feeding the Paddy crop had to be replaced after every 2 hours of operation.

10.3.5 The percentage wear of threshing drum spikes on mass basis were recorded as 0.03% to 0.09%, which is normal.

10.4 The specification of feeding chute does not conform to the IS: 9020-2002 (Reaffirmed 2012). It should be provided as per the specification laid down in the said code.

10.5 The height of feeding chute from ground level is recorded as 1235 mm, which considered as normal for feeder.

10.6 Drive belt tensioning arrangement for blower drive shall be provided.

10.7 Provision was given for adjusting the clearance by varying the height of spikes.

10.8 A suitable protective guard/ cover around the prime mover shall be provided to protect it from dust or crop falling on it and ensure feeder's safety.

10.9 The engine was mounted as a prime-mover on thresher. Hence, it must be provided with spark arrester to avoid fire hazards.

10.10 As per the requirement of Indian Standard, all moving parts of the thresher should be adequately guarded to prevent hazards.

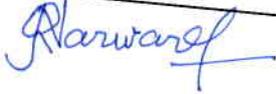
10.11 The machine should be provided with minimum cautionary notices as per IS: 9020-2002 (Reaffirmed 2012) and as recommended at **Para 8.6** of this report, for guidance as well as ensure safety of feeder & labour.

10.12 An engraved plate with following information should be provided on the machine.

- Recommended lubricants and lubricating schedule.
- Recommended speeds and settings of various systems

- 10.13 **Labeling of the Thresher:** A labeling plate should be provided on the thresher wherein the manufacturer's name and recognized trade-mark (if any), Make, Model, Batch/code, Serial Number, year of manufacture, power rating (kW), revolution per minute of threshing drum and its direction of rotation should be included.
- 10.14 **Adequacy of literature:**
An Operational Manual in English & Assamese and a Parts Catalogue was provided with the machine. However, these literatures should also be brought in National and other regional languages.

TESTING AUTHORITY

S. G. PAWAR AGRICULTURAL ENGINEER	
J.J.R. NARWARE DIRECTOR	

Test conducted by : Mr. A. Pandey, STA (Inst.) and report compiled by : Mr. P. C. Dihigia, STA

11. APPLICANT'S COMMENTS

The copy of the draft test report was made available to applicant, but no comments made by the applicant.