



BKE, PTO-6 PADDY THRESHER

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कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION AND FARMERS WELFARE

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. B. K. Engineering Workshop, Nagaon Road, Lanka, P.O+ PS - Lanka, Dist.-Nagoan, Assam
Name of machine	: Paddy Thresher
Make	: BKE,
Model	: PTO-6
Type	: Power operated, tangential flow
Size of thresher (mm)(Threshing length x dia. of cylinder without spikes/ at the tip of spikes)	: 760 x 315 Φ / 470 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

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 Frequent chocking of threshing cylinder with paddy straw was observed during both the short and long run test of the thresher.
- 9.2 Prime mover to threshing cylinder belt got loosened after 5.2 h and 6.03 h of operation.

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 g/kWh	
			l/h	Kg/h		
1	2	3	4	5	6	7
Maximum Power						
5.6	37.2	1426	2.16	1.82	326.81	2.57

- 10.1.1** The maximum power of engine was recorded as 5.6 kW at 1426 rpm against the engine manufacturer's declaration of 5.9 kW at 1500 rpm, which is 5% less.
- 10.1.2** The specific fuel consumption corresponding to maximum power was recorded as 327 g/kWh.
- 10.1.3** During the varying speed test, heavy black smoke was noticed after 1426 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 0.85 kWh, which is 48% 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- I & 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			Blown	Cleaning
	Kg/h	Kg/kWh	Kg/h	Kg/kWh			
Paddy	417	253	139	84	7.432	89.9	98.5

10.3.1 Rate of work


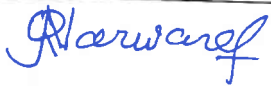
The capacity of machine depends upon the skill of feeder. The optimum input capacity & grain output of the thresher were recorded as 417 & 139 kg/h respectively. Input & output capacity per unit power consumption was recorded as 253 & 84 kg/kWh respectively.

10.3.2 Quality of work

- The percentage of blown grain was recorded as 7.432, which is at higher side.
- The threshing efficiency of the machine was recorded as 98.5%.
- The cleaning efficiency was recorded as 89.9%, which is considered on lower side.
- No major effect on performance of thresher was observed in threshing of Paddy crop due to variation of threshing cylinder speed.

- 10.13 Labeling of the Thresher:** the labeling plate provided on the thresher should indicate **Make**, Model, Manufacturer's name and recognized trade-mark (if any), Batch/code or **Serial** Number, year of manufacture, power rating (kW), revolution per minute of threshing drum and its direction of rotation.
- 10.14 Adequacy of literature:**
An Operational Manual, Parts catalogue, service and repair manual should be brought out in English and other vernacular languages.

TESTING AUTHORITY

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

Test conducted and report compiled by: Mr. K. Bora, TA

11. APPLICANT'S COMMENTS

We have gone through the report and we will modify the machine in the future production as per the recommendations. We assure to provide the minimum cautionary notices on the machine. As stated that there were frequent chocking of threshing cylinder with paddy straw during the test, we will look into this problem and resolve it.