

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



संख्या/No.: Imp 316/413
माह / Month: January 2022

THIS TEST REPORT IS VALID UPTO 31/01/2029



SHAKTIMAN ROTARY HAY RAKE Model: SRHR-3.7/11
(TRACTOR MOUNTED)



सत्यमेव जयते

भारत सरकार
GOVT OF INDIA

कृषि एवं किसान कल्याण मन्त्रालय

MINISTRY OF AGRICULTURE & FARMERS WELFARE

कृषि, सहकारिता एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

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[AN ISO 9001:2015 CERTIFIED INSTITUTION]

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1. SCOPE OF TEST

The scope of test was limited to check and assess the following;

- 1.1 Laboratory test :**
- Checking the specification and other data furnished by the applicant
- 1.2 Field test :**
- Rate of work
 - Quality of work
 - Output

2. TEST CODE/ PROCEDURE

There is no Indian standard / Test Code available for testing of rake as such. The guideline, however, have been taken from the Following:

- | | | |
|---|--|---|
| 1 | IS 4468 (part-1); 1997(reaffirms 2012) | : Agricultural wheeled tractor- Rear mounted three point linkage. |
| 2 | IS 4931;1995 (reaffirms 2009) | : Agricultural tractor-rear mounted power take off types 1,2 and 3 |
| 3 | IS: 8265: 1996(reaffirmed 2012) - | : Guard for power take off drive shaft. |
| 4 | ISO 4254-10:2009 | : Agricultural Machinery- safety-part 10: Rotary tedders and rakes. |
| 5 | IS 2259;1978(reaffirms 2009) | : Specification of Garden rake. |

3. METHOD FOR SELECTION

Initially the applicant has submitted this test sample under confidential testing but vide request letter received dated 17/01/2022, the applicant has requested to convert the report from Confidential to Commercial. Hence method of selection is not known.

4. SPECIFICATIONS

4.1 BRIEF DESCRIPTION OF MACHINE:

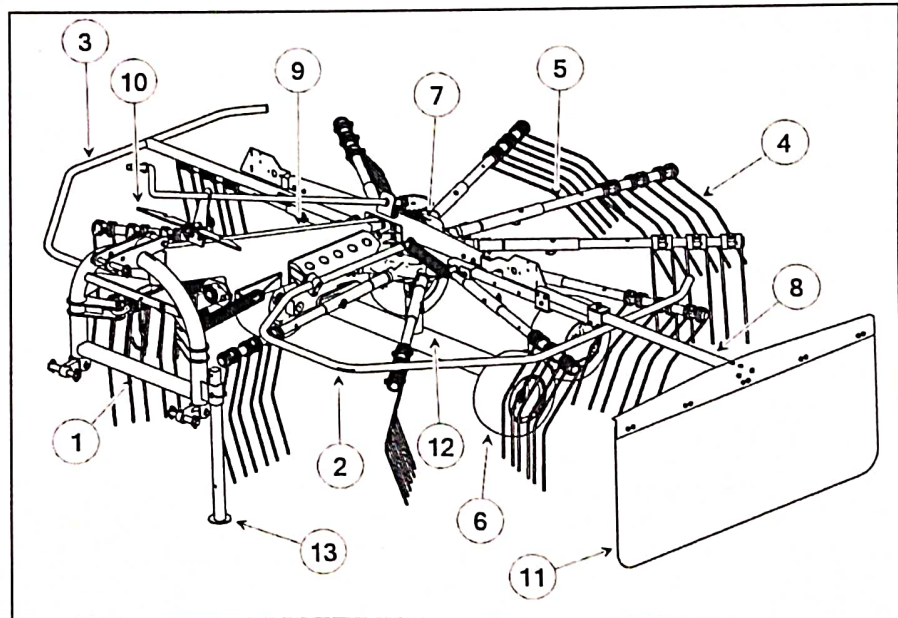


Fig.1: SCHEMATIC VIEW OF SHAKTIMAN ROTARY HAY RAKE

KEYWORDS:

- | | | |
|------------------------|--------------------|------------------------|
| 1. Three Point Linkage | 5. Tyne Arm | 9. Drawbar |
| 2. L.H. Guard | 6. Wheel Unit | 10. Ratchet |
| 3. R.H. Guard | 7. Gear Box | 11. Swathing Deflector |
| 4. Tyne | 8. Telescopic Tube | 12. Axle |
| 13. Parking Stand | | |

The Shaktiman rotary Hay Rake is an agriculture equipment / machinery use to collect cut hay or straw into windrow for further collection by the baler, etc. It is also designed to fluff up the hay and turn it over so that it may dry. This is forage and straw management machinery useful for dairy farming and straw based industry etc. The machine submitted for test is tractor mounted machine having 11 rotating tyne arm with 6 line (3 pair) on each arm. This rotating arm driven by PTO shaft (through gear box) collects the shaft in windows. The machine is supported on 2 nos. Front tires and 02 nos. rear tires.

4.2 General:

Name of machine : Rotary Hay rake

Type : Tractor PTO Operated, Rear mounted

Make : SHAKTIMAN

Model : SRHR-3.7/11

Test requested by (Applicant) : **M/s TIRTH AGRO TECHNOLOGY PRIVATE LIMITED**
 SHAKTIMAN" Survey No-108/1 Plot No-B. NH-27, Nr. Bharudi Toll Plaza, Bhunava (Village), Taluka: Gondal, Dist:Rajkot, State:Gujarat INDIA, PIN-360 311,
 Ph. +91(02827) 234567, 270537
 Fax: +91(02827) 270457

Name and address of the Manufacturer : **M/s TIRTH AGRO TECHNOLOGY PRIVATE LIMITED**
 SHAKTIMAN" Survey No-108/1 Plot No-B. NH-27, Nr. Bharudi Toll Plaza, Bhunava (Village), Taluka: Gondal, Dist:Rajkot, State:Gujarat INDIA, PIN-360 311,
 Ph. +91(02827) 234567, 270537
 Fax: +91(02827) 270457

Serial No./product identification no. : AICB121100046

Year of manufacture : 2021-22

Country of origin : India

Recommended Tractor power, kW/hp : 30/40 & Above

Recommended for crop : Paddy ,Wheat Straw, Green part

Recommended traveling speed, kmph : Not provided

Working width of Machine, (m) : 3.19



4.3 Prime mover used :

Type : Four wheeled, Rear wheel drive standard agricultural tractor

Make & Model : John Deere 5050D | New Holland 3600-2 AR PLUS+

6. FIELD PERFORMANCE TEST

The field test was conducted in the paddy straw field the rake was operated by John Deere 5050 D & New Holland 3600-2 AR Plus+ for 25.32 hours to assess the performance of machine with regard to quality of work, rate of work, fuel consumption etc at PTO speed 540 rpm. The performance of machine is reported in **Annexure-I**

Summary of Field Performance Test

Sl. No	Parameters/operations	Range of observed value
		Paddy
1	Type of straw	4.75 to 5.63
2	Average speed of operation, (kmph)	1.246 to 1.474
3	Area covered, ha/h	0.679 to 0.802
4	Time required for one hectare, h	3.18 to 3.19
5	Width of cut (m)	74.0 to 85.52
6	Field efficiency , %	18.10 to 20.50
7	Overlap (%)	95.82 to 97.79
8	Straw collection efficiency (%)	
9	Hay collection in windrow	
	- t/h	6.24 to 14.65
	- t/l	2.78 to 4.725
10	Fuel consumption	
	- l/h	2.053 to 3.145
	- l/ha	1.61 to 2.325
	- l/t	0.211 to 0360.

6.1 Rate of work and fuel consumption

- a) The rate of work was recorded as 1.246 to 1.474 ha/h, at forward speed of 4.75 to 5.63 km/h.
- b) The time required to cover one hectare was recorded as 0.679 to 0.802 h.
- c) The fuel consumption was recorded as 2.053 to 3.145 l/h and 1.61 to 2.325 l/ha.

6.2 Quality of work

- a) Field efficiency and straw collection efficiency was observed as 74.0 to 85.52 % and 95.82 to 97.79 %.

6.3 Adequacy of power of prime mover:

The power of prime mover was found adequate.

6.4 Labour Requirements

One skilled operator is required with the tractor to operate the machine.



7. EASY OF OPERATION AND ADJUSTMENTS

No noticeable difficulty was observed during 25.32 hours of operation of the machine.

8. DEFECTS, BREAKDOWNS AND REPAIRS

During testing of the machine, after completion of 25.32 hours no noticeable breakdown was observed during the field test.

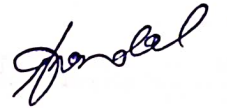
9. WORKMENSHP AND FINISHING

The metallic parts of the Rake are painted by good quality anticorrosive rust preventing paint. The welding are free from pits, burrs and other defects, well finished, smooth, free from sharp edge and satisfactory in all respect. The machine is handy in operation by the Three point linkage system and tractor PTO, attachment & detachment is easy, service & maintenance is trouble-free.

10. COMMENTS AND RECOMMENDATIONS

- 10.1 Dimensions of PIC and PIC yoke bore of machine dose not conform to IS: 4931-1995 and therefore, it should be looked into for corrective action.
- 10.2 The dimension of three point linkage (hitch pyramid) of the implement does not conform to IS: 4468-1997. This should be looked into for corrective action for standardization.
- 10.3 The machine should be provided with minimum cautionary notices as per BIS, written in vernacular language legibly and prominently on the main body of the machine for guidance as well as ensure safety.
- 10.4 **Technical literature:**
Operator cum Service Manual & Parts Catalogue was provided along with the machine during the course of testing. It is recommended to bring out manuals in Hindi and other vernacular languages as per IS: 8132-1999.

TESTING AUTHORITY

S. G. PAWAR**AGRICULTURAL ENGINEER**

J.P. MANDAL**SENIOR AGRICULTURAL ENGINEER**

K.K. NAGLE**DIRECTOR**


Report compiled by - Shri Pankaj Sethi (Technical Assistant)

11. APPLICANT'S COMMENTS

<u>Para No.</u>	<u>Our Reference No.</u>	<u>Applicant Comment</u>
11.1	10.1	The Dimension of PIC & PIC Yoke bore of machine will be modified to conform IS 4931-1995
11.2	10.2	The dimension of three point hitch of machine will be modified to confirm IS 4468-1997
11.3	10.3	We will take in consideration soon
11.4	10.4	We will take in consideration soon