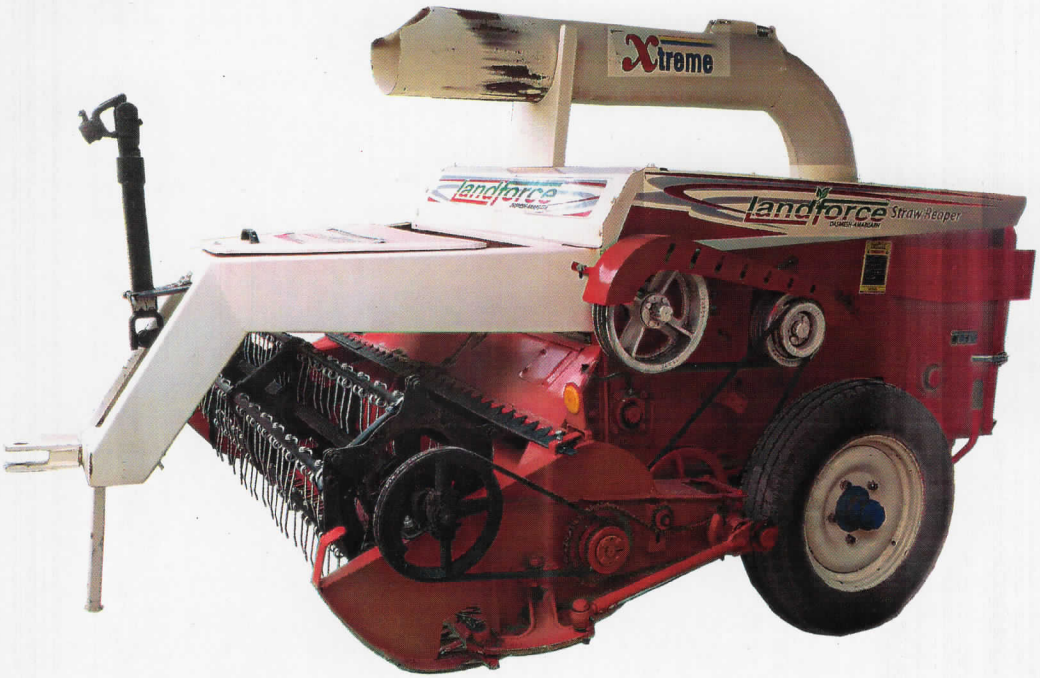
व्यावसायिक परीक्षण रिपोर्ट: संख्या/ No.: SR. Comb-145/2427/2020

COMMERCIAL TEST REPORT माह/Month : January, 2020

THIS TEST REPORT VALID UP TO : 31st JANUARY, 2027



LANDFORCE, LFSR 56 TRACTOR OPERATED STRAW REAPER COMBINE

सत्यमेव जयते

भारत सरकार
Government of India
कृषि एवं किसान कल्याण मंत्रालय
Ministry of Agriculture and Farmers Welfare
कृषि, सहकारिता एवं किसान कल्याण विभाग
Department of Agriculture, Cooperation and Farmers Welfare
उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान
Northern Region Farm Machinery Training and Testing Institute
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Table-4: Chemical analysis of critical components

S. No.	Component	Primary element(%) by weight				
		Carbon	Manganese	Silicon	Phosphorous	Sulphur
1	Knife blade	0.9203	0.3489	0.2633	0.0252	0.0983
2	Knife guard	0.6840	0.7112	0.3336	0.0258	0.0883
3	Knife back	0.1487	0.5013	0.5542	0.0384	0.0977
4	Chopping cylinder blade	0.0000	0.2410	3.0430	0.0179	0.3167
5	Concave blade	0.0000	0.1839	0.0000	0.0117	0.2542

6. FIELD TEST

The straw reaper combine was operated with John Deere 5055 E tractor at engine throttle setting corresponding to 540 PTO rpm was tested in the field for 38.31 (including running-in 1.00) hours for reaping of left over straw & stubbles after wheat harvesting by grain combine harvester. During tests field performance of straw reaper was assessed with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop parameters, atmospheric conditions and performance parameters as observed during field tests are also given in **Annexure-I & II** and summarized in Table-5 & 6.

Table-5 : Summary of field crop conditions

S. No.	Parameters	Range of parameters
1.	No. of tillers, m^2	345 to 368
2.	Manually recovered straw, g/m^2 (Stubbles only)	161.6 to 320.0
3.	Moisture content of straw, %	11.6 to 16.4
4.	Loose straw, g/m^2	227.0 to 485.0
5.	Height of stubbles before harvesting, mm	23.9 to 28.7
6.	Height of stubbles after harvesting, mm	5.5 to 8.3

Table -6 : Summary of field performance test

S. No.	Observations	Range of observations
1.	Speed of operation, kmph	1.43 to 1.54
2.	Width of cut, m	1.94 to 2.03
3.	Overlap,%	1.93 to 6.28
4.	Rate of work, ha/h	0.219 to 0.262
5.	Fuel consumption l/h l/ha l/t	 5.50 to 7.67 24.12 to 32.34 5.24 to 10.14
6.	PTO power consumption, kW	
7.	Average length of straw, mm	12.0 to 15.4
8.	Straw split,%	93.0 to 97.1
9.	Straw recovery,%	73.0 to 89.4
10.	Grain recovery,%	30.1 to 45.8

6.1 Ease of operation

No noticeable problem was observed during operation of straw reaper.

6.2 Quality of wheat straw: Satisfactory for animal feed.

6.3 Labor requirements

One man hour was required for daily maintenance of tractor and straw reaper. One skilled operator is needed to operate tractor with straw reaper.

7. WEAR OF CRITICAL COMPONENTS

The wear of serrated blades of cutter bar, chopping cylinder and concave was measured after completion of 38.31 hours of wheat straw harvesting.

Percentage wear on mass basis were computed and the results are given below in Table - 7

Table-7: Wear assessment of blades on mass basis

7.1 Concave blade

Sr. No.	Concave		
	Mass before test (g)	Mass after test (g)	Wear (%)
1	100.1	99.8	0.30
2	100.2	99.9	0.30
3	99.3	99.0	0.30
4	99.1	98.9	0.30
5	100.9	100.5	0.40
6	99.3	99.1	0.20

7.2 Chopping cylinder

Sr. No.	Chopping cylinder		
	Mass before test (g)	Mass after test (g)	Wear (%)
1	69.3	69.0	0.43
2	70.2	70.0	0.28
3	69.2	68.9	0.43
4	71.0	70.8	0.28
5	69.7	69.4	0.43
6	70.4	70.0	0.57
7	69.4	69.1	0.43
8	70.4	70.2	0.28
9	68.8	68.6	0.29
10	69.2	69.0	0.29
11	69.4	69.2	0.29
12	69.4	69.1	0.43
13	68.8	68.6	0.29
14	69.1	68.8	0.43
15	69.1	68.9	0.29
16	70.2	69.8	0.29

Wear of concave & chopping cylinder blade on mass basis has ranged from 0.20 to 0.40 % and 0.28 to 0.57 % respectively.

17.	Marking/labelling of machine	The labelling plate should be riveted on the body of machine having name & address of manufacturer, country of origin, make, model, year of manufacture, serial number, size, required size of prime mover (kW/HP)	Provided	Conforms
18.	Literature	Operator manual, service manual & parts catalogue should be provided	Provided	Conforms

10. COMMENTS & RECOMMENDATIONS

10.1 PTO drive shaft (Safety against over load & Guard in shaft) **does not meet the requirement of critical technical specification. It must looked into.**

10.2 Safety cover in all drive **does not meet the requirement of critical technical specification. It must looked into.**

10.3 The material blade is not specified. **This is critical parameter and therefore, it must be specified.**

10.4 Safety device in feeding platform auger drive is not provided. It **MUST** be provided.

10.5 Drive safety clutch for cutter bar, chopping cylinder and power take off drive shaft is not provided. It **MUST** be provided.

10.6 The construction of PIC and PIC shaft does not meet the requirement of IS:4931-1995. It **MUST** be looked into for corrective action.

10.7 Safety signs, symbols and hazard notices are not provided on machine. It **MUST** be provided in safety point of view.

10.8 **Visual observations and provision for adjustments**

i) Marking on inlet and outlet is not provided. It should be provided.

ii) Marking of direction of rotation on chopping drum, blower unit, beater unit and reel unit is not provided. It should be provided.

iii) Proper registration of cutter bar knife section is not provided. It should be looked into.

iv) The provision for following adjustment on straw reaper is not provided. It should be provided.

a) Adjustment of speed of chopping cylinder, blower, reel & cutter bar.

b) Adjustment of air displacement.

11. TECHNICAL LITERATURE

The following manuals provided during the test:

i) Operator cum service manual.
ii) Parts catalogue

The operator cum service manual of machine should be updated as per IS: 8132-1999.

TESTING AUTHORITY

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY **DIRECTOR**	

Test report is compiled by: C. Veeranjaneyulu, Senior Technician

12. APPLICANT'S COMMENTS

Para No	Our reference	Applicants comment's
12.1	10.1	Safety bolt yoke will be provide in PTO drive shaft for ensuring extra safety against over load & shaft will be guarded.
12.2	10.2	Safety cover in some other remaining drives, where ever possible will be provided accordance to guidelines issued by the Ministry.
12.3	10.3	We are using following two types of blades, both the blades are of C-80 grade steel c) Classic type, Mark B d) Mark M, type A
12.4	10.4 to 10.7	Apart from above all other non conformities will be sorted out according to the BIS standard.