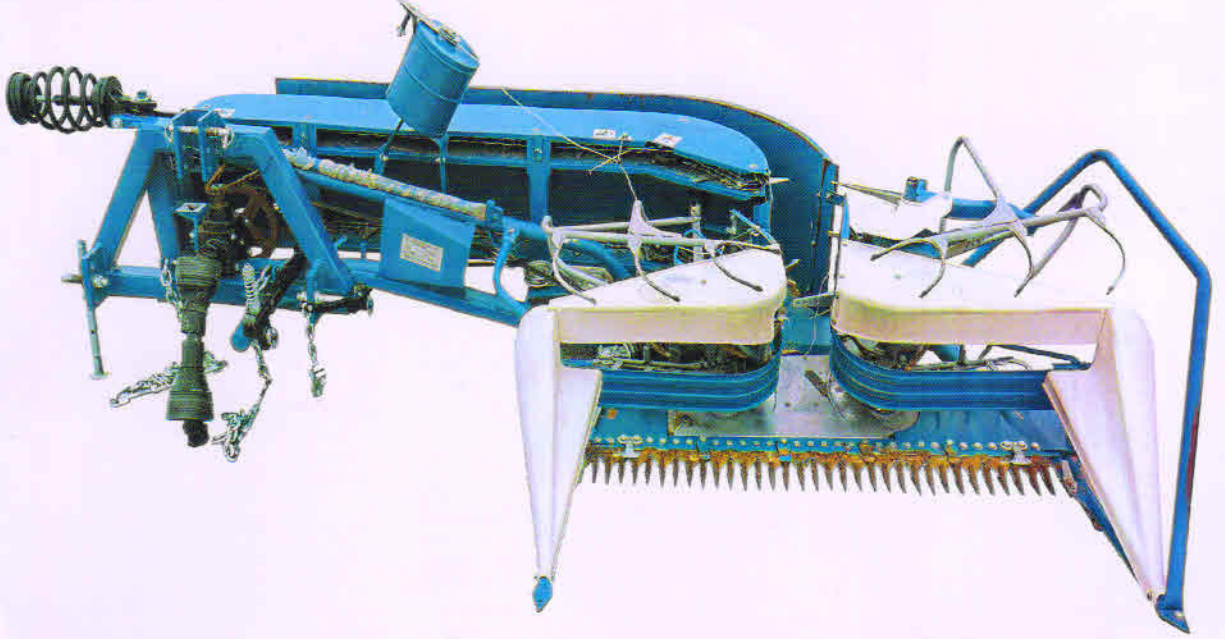


व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: REAPER.B -09/2706/2021  
माह/ Month: June, 2021

THIS TEST REPORT VALID UP TO : 30<sup>th</sup> June, 2028



**BCS, 211 RB TRACTOR MOUNTED  
REAPER CUM BINDER**



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

ट्रैक्टर नगर, सिरसा रोड, हिसार, (हरियाणा) - 125 001

Tractor Nagar, Sirsa Road, HISAR (Haryana)-125 001

[ISO 9001:2015 CERTIFIED]

Website: <http://nrfmtti.gov.in/>

E-mail: [fmti-nr@nic.in](mailto:fmti-nr@nic.in)

Tele./FAX: 01662-276984

## 3.3.18.2 Labeling plate

: The labeling plate is riveted on machine with following information

Make	BCS India Private Limited		
Type	TMRB-REAR		
G.B. No.	IN2021T313	Model	211-RB
P.M. No. (kW)	Above 25	Year	2020-21
PTO rpm	540	Wt.	450 (Kgs)
	MFG. By	(Made in India)	
	BCS INDIA PRIVATE LIMITED		
	VILL. Mangarh, P.O Kohara, Machiwara Road Ludhiana, Punjab (India) 141112		

## 4. TURNING ABILITY TEST WITH TRACTOR (In field working condition)

Items	Diameter of turning circle (m):		Diameter of turning space (m):	
	LHS	RHS	LHS	RHS
Without brake	7.23	7.23	8.10	10.88
With brake*	5.81	6.43	6.67	9.93

## 5. FIELD TEST

The reaper binder was operated in field for 29.92 hours (including running in 3.75 hours) only in wheat harvesting.

The crop parameters recorded during the test with wheat crop are as given in Annexure-I and summarized in Table -2

Table-2 : Crop parameter

Parameter	Wheat
Variety	HD 343, HD 2968 and HD 3086
Plant height ( cm)	72 to 98
Plant population (No of tillers per m <sup>2</sup> )	326 to 520
Straw grain ratio	1.70 to 2.15
Moisture (%)	
Grain	9.6 to 14.23
Straw	8.3 to 12.2

The results of field performance test are given in Annexure – II and are summarized in Table-3



Table 3 : Summary of field Test:

S. No.	Observation	Wheat harvesting
1	Tractor used	MF 245 DI
2	Speed of operation, kmph	2.20 to 2.39
3	Area covered, ha/h	0.209 to 0.241
4	Width of cut, m	1.24 to 1.27
5	Fuel consumption	
	l/h	0.97 to 1.53
	l/ha	4.64 to 6.47
6	Losses	
	a) Pre harvest losses (kg/ha)	18.0 to 36.2
	b) Uncut crop by cutter bar (kg/ha)	1.42 to 2.19
	c) Grain loss due to shattering by cutter bar unit, conveyor unit and handling unit (kg/ha)	17.22 to 49.88
	d) Post harvest loss (kg/ha) (b+c)	18.64 to 51.75
7	Stubble height after harvesting, (cm)	7 to 10
8	Time required to cover 1 ha. area (h)	4.15 to 4.78
9	Field efficiency (%)	71.82 to 84.59
10	Average weight of bundle, kg	2.43 to 2.71
11	No. of bundles per hours	1007 to 1270
12	Percentage of unknotted bundles	Nil

**5.1 Rate of work :**

- i) During the tests the rate of work varied from 0.209 to 0.241 ha/h in wheat harvesting.
- ii) The fuel consumption varied from 0.97 to 1.53 l/h in wheat harvesting.
- iii) The fuel consumption per unit area harvested varied from 4.64 to 6.47 l/ha in wheat harvesting.

**5.2 Quality of work :**

- i) During wheat harvesting, cutter bar losses varied from 1.42 to 2.19 kg/ha.
- ii) Stubble height after harvesting was observed from 7 to 10 cm.
- iii) Percentage of unknotted bundles was observed as nil

**5.3 Time required for daily maintenance :**

About 15 minutes are required for daily servicing and maintenance of reaper binder with one person only.

**5.4 Labour requirement:**

Two persons including driver are required for smooth operation of the machine in the field. Additional labours are required for collection of the sheaves (bundles).



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5.5 **Twine consumption :**  
About one bundle of twine is required for one acre field.

5.6 **Harvesting any other crop:**  
Not done as not recommended

#### 6. DEFECTS, ADJUSTMENT, BREAKDOWN & REPAIRS

No noticeable defect or breakdown was observed during test.

#### 7. INSPECTION & ASSESSMENT OF WEAR OF CRITICAL COMPONENTS

After completion of field test in wheat crop, the machine was dismantled, no ingress of dust/straw was noticed inside the sub assemblies. The sealings provided have been found effective.

#### 8. EASE OF OPERATION & ADJUSTMENT

The general maneuverability of the machine during field operation was found satisfactory.

#### 9. LABOUR REQUIREMENT

Two persons including driver are required for smooth operation of the machine in the field. Additional labour is required for collection of the sheaves (bundles).

#### 10. CRITICAL TECHNICAL SPECIFICATION (TRACTOR OPERATED REAPER - CUM - BINDER)

(Vide Ministry's communication No 13-9/2019 M & T (I&P) dated 26.04.2019)

Si. No	Parameters	Specification	Observed	Remarks
1.	Effective width of cutter bar (mm)	1200	1300	Conforms
2.	Type of crop dividers	Shoes	Shoes	Conforms
	Number of crop dividers	Two	Two	Conforms
3.	Type of knife section	Serrated	Serrated	Conforms
4.	Number of knife sections on cutter bar	As per design	Provided (17 Nos.)	Conforms
5.	Length of ledger plate (mm)	As per design	64.30 mm	Conforms
6.	Type of crop conveyor	Chain type/belt type	Chain type	Conforms
7.	Material of knife section	High carbon steel EN42 J and above	EN 42J (As declared by applicant)	Conforms
8.	Material of ledger plate	High carbon steel EN44 and above	EN44 (As declared by applicant)	Conforms
9.	Hardness of knife section, HRC	38 (min)	58	Conforms
10.	Hardness of ledger plate, HRC	45 (min)	53.37	Conforms
<b>Crop Collecting Unit</b>				
11.	Type	Forks with fingers	Forks with fingers	Conforms
12.	No. of forks	6	6	Conforms

Crop binding mechanism				
13.	Type	Knotting	Knotting	Conforms
14.	Type of ropes	Nylon/Jute/PP Rope	Nylon	Conforms
15.	Provision of leveling the cutter bar	Must be provided	Provided	Conforms
16.	Provision of changing the crop bundle size	Must be provided	Provided	Conforms
17.	Guards against all moving parts/ drives and hot parts	Must be provided	Provided	Conforms
18.	Slip clutch/safety pins at cutter bar drive	Must be provided	Provided	Conforms
19.	Slip clutch/safety pins at conveyor drive	Must be provided	Provided	Conforms
20.	Guard over propeller shaft	Must be provided	Provided	Conforms
21.	Provision of safety clutch/ device (shear bolt) in PTO drive shaft	Must be provided	Not provided	<b>Does not conform</b>
22.	Provision of stand for storage/parking	Must be provided	Provided	Conforms
23.	Marking/labeling of machine	The labeling plate should be riveted on the body of machine having Name and Address of manufacture, Country of origin, Make, Model, Year of manufacture, Serial number, Type, required size of prime mover (kW)	Provided	Conforms
24.	Literature	Operator manual, Service manual and Parts catalogue should be provided	Provided	Conforms

## 11. SUMMARY OF OBSERVATION, COMMENTS AND RECOMMENDATION

### 11.1 Field performance

- (i) The field efficiency varied from 71.82 to 84.59 % for wheat harvesting only.
- (ii) Quality of bundle was observed to be satisfactory.
- (iii) Percentage of unknotted bundle was observed as 'NIL'
- (iv) During wheat harvesting, cutter bar losses varied from 1.42 to 2.19 kg/ha, which is considered normal.
- (v) Avg. weight of bundle was observed as 2.43 to 2.71 kg wheat crop. Variation in weight is dependent mostly on straw moisture.
- (vi) At the first pass, during operation, the tractor tires move on the standing crop which causes some losses. In subsequent passes no such problem is there. To overcome this problem, the farmer has to do the manual harvesting to accommodate the width of tractor and machine combination during first pass, across the length and width of the field. It may be looked into for improvement / any solution

- 11.2 Dimensions of splined end of power input shaft does not conform to the IS: 4931-1995, this should be looked into for corrective action.
- 11.3 Dimensions of three point linkage does not conform to the IS : 4468-(Part-I)-1997 (Cat-II), this should be looked into for corrective action.
- 11.4 The dimension of knife section does not conform to the IS: 6025-1982, this should be looked into for corrective action.
- 11.5 The dimension of ledger plate does not conform to the IS: 6024-1983, this should be looked into for corrective action.
- 11.6 The dimension of knife back does not conform to the IS: 10378-1982, this should be looked into for corrective action.
- 11.7 The chemical composition of knife blade does not conform to the IS: 6025-1982, this should be looked into for corrective action.
- 11.8 The chemical composition of knife back does not conform to the IS: 10378-1982, It **MUST** be as per IS.
- 11.9 The dimension of knife guard does not conform to the IS: 6024-1983, It **MUST** be as per IS.
- 11.10 Provision of safety clutch/device (shear bolt) in PTO drive shaft is not provided. It **MUST** be provided.

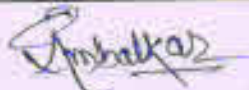

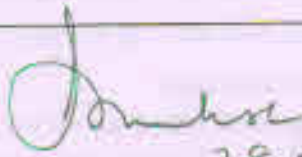
### 12. TECHNICAL LITERATURE

The following literature was supplied with the machine during the course of test.

- i Owner's Manual cum parts catalogue
- ii Parts catalogue

The owner's manual cum parts catalogue needs to be updated as per IS:8132-1999.

### TESTING AUTHORITY

Er. G. R. AMBALKAR AGRICULTURAL ENGINEER	
Er. R.K NEMA SENIOR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 28.06.2021

### 13. APPLICANT'S COMMENTS

Para No.	Our Reference	Applicant's Comment
13.1	11.8 & 11.9	We are informing same to our vendor to correct the technical details as per requirements.
13.2	11.10	In all future supply we will provide the PTO shaft as required with safety shear bolt.