

**THIS TEST REPORT VALID UP TO : 31<sup>th</sup> DECEMBER, 2026**



**DIAMOND SUPER SMS, FITTED ON PREET- 987  
SELF PROPELLED COMBINE HARVESTER**



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

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#### 4. ROTOR BALANCING TEST

Date of test	:	11.12.2019
Make and model of Rotor balancing machine	:	PROTEQ and H - 1 K
Mass of the job ( kg)	:	83.7
Service speed of the job rpm	:	2108
ISO balancing grade	:	G 16
Balancing speed rpm	:	2108

S.No.	Particulars	As permissible	As observed	Remark
	Unbalance weight (Left side plane) (g)	36.78	2.06	Balanced
	Unbalance weight (Right side plane) (g)	36.78	23.81	Balanced

Unbalance angle (Left side plane) (degree)	123.43
Unbalance angle (Right side plane) (degree)	38.84

#### 5. FIELD PERFORMANCE TEST

- 5.1** The SMS fitted on Preet- 987 combine harvester was operation in the paddy field for 5.98 hrs, to assess (a) performance of SMS and, (b) performance of combine harvester with SMS.

The crop parameters recorded during the test were as under:-

##### Crop Parameters

Sl. No.	Parameters	Observations
1.	Average plant height, cm	109 to 120
2.	Average number of tillers/m <sup>2</sup>	223 to 255
3.	Average length of ear head, cm	24 to 31
4.	Average straw/grain ratio	1.8
5.	Average moisture, %	
	- Grain	15.1
	- Straw	64.0

The results of field performance test of paddy crop harvesting are summarised in Table and presented in detail in Appendix – II to V.



**Table : SUMMARY OF LOSSES & EFFICIENCIES OBSERVED DURING FIELD PERFORMANCE TEST.**

Crop variety	Collectable losses (%)	Non-collectable losses (%)	Total processing losses (%)	Threshing efficiency (%)	Cleaning efficiency (%)	Grain breakage in main grain tank (%)	Forward speed (kmph)	Area covered (ha/h)	Fuel consumption		Grain output (kg/h)	Crop throughput (t/h)
									(l/h)	(l/ha)		
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>PADDY</b>												
Pussa 44	2.2	1.0	2.7	98.9	97.0	1.11	1.66	0.419	10.93	26.09	5195.81	14.49

**SUMMARY OF FIELD PERFORMANCE OF SMS**

Uniformity of straw spread, CV, (percent)	20.5
Weighted mean size of chopped straw, cm	10.0

**6. DEFECTS, ADJUSTMENTS, BREAKDOWNS AND REPAIRS**

No noticeable defect observed

**7. SUMMARY OF OBSERVATIONS****7.1 Field test**

<b>7.1.1</b>	<b>Performance of SMS with Preet-987 Combine Harvester</b>	
1	Uniformity of straw spread, CV, (percent)	20.5
2	Weighted mean size of chopped strew, cm	10.0

**7.1.2 Performance of Preet-987 combine harvester with Diamond Super SMS**

S. No	Parameters	Observations
1.	Speed of operation (kmph)	1.66
2.	Area covered (ha/h)	0.419
3.	Fuel consumption:	
	- (l/h)	10.93
	- (l/ha)	26.09
4.	Crop throughput (tonne/h)	14.49
5.	Grain breakage in main grain outlet (%)	1.11
6.	Header losses (%)	0.51
7.	Total non-collectable losses (%)	1.0



8.	Total collectable losses (%) (un threshed + broken from main outlet)	2.2
9.	Total processing losses (%)	2.7
10.	Threshing efficiency (%)	98.9
11.	Cleaning efficiency (%)	97.0

**8. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS AS PER  
IS 15806 : 2018**

S. No	Characteristics	Category (Evaluative/ Non evaluative)	Requirement Declaration	Tolerance	Observed	Remarks
1	2	3	4	5	6	7
8.1	Uniformity of straw spread, CV, (percent)	Evaluative	20 Max.	--	20.5	<b>Does not conform</b>
8.2	Weighted mean size of chopped strew, cm	Evaluative	20 Max.	--	10.0	Conforms
8.3	Processing losses in rice (%)	Evaluative	Average 4%	Nil	2.7	Conforms
8.4	Threshing efficiency (%)	Evaluative	≥ 98 %	Nil	98.9	Conforms
8.5	Cleaning efficiency	Evaluative	≥ 96 %	Nil	97.0	Conforms
8.6	Grain Breakage in main grain tank	Evaluative	≤ 2.5 %	Nil	1.11	Conforms
8.7	Non-collectable losses	Evaluative	≤ 2.5 %	Nil	1.0	Conforms

i)	Material of blades for straw management System (SMS)	Non evaluative	<p>The flail and fixed blades shall be manufactured from steel having the following chemical composition or such other composition as shall be agreed to between the supplier and the purchaser.</p> <p>a) Carbon 0.70 to 1.0 percent.</p>	--	<p>Flail blade C- 0.1574 Mn- 0.1987 Cr- 0.0619 Ni- 0.5121</p> <p>Fixed blade C- 0.5407 Mn- 0.2704 Cr- 0.0668 Ni – 0.5045</p>	As the code itself accommodate the variation in chemical composition, there is little scope for declaration of conformity or otherwise
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vi)	Break down (critical, major & minor)				
Sr. No	Category of breakdowns	Category (Evaluative/ Non evaluative)	Requirements as per IS 15806:2018	As observed	Whether meets the requirements (Yes/No)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two	None	Yes
4.	Total breakdown	Evaluative	In no case total no of (major + minor) breakdowns exceed five	None	Yes

### 9. CRITICAL TECHNICAL SPECIFICATIONS

(Vide Ministry's communication F. No 9-1/2019 M&T (I &P) dated 20.08.2019)

Sl No.	Parameters	Specification	Observation	Remarks
<b>Rotor</b>				
1.	Rotor diameter, mm	165-170	165	Conforms
2.	No. of lugs on rotor in row	6	6	Conforms
3.	No. of rows in periphery	4	4	Conforms
4.	Length of pivotal flail, mm	170-180	179.8	Conforms
5.	Width of flail, mm	50 ± 1	50.1	Conforms
6.	Thickness of flail, mm	5.0 (Min.)	5.0	Conforms
7.	No of flails in one set	2	2	Conforms
8.	Spacing between flails of one set, mm	35 (Max)	43.1	<b>Does not conform</b>
9.	Distance between adjacent flails units, mm	200±10	205	Conforms
10.	No of rows/blades of serrated blades	1	1	Conforms
11.	No of serrated blades in row	20 (Min.)	24	Conforms
12.	Spacing between serrated blades, mm	50 (Max.)	49.5	Conforms
13.	Overlapping of pivotal blade on serrated blade, mm	60 (Min.) (adjustable)	88	Conforms
<b>Spreader</b>				
14.	Total no of flaps	6 + 2 ( side )	6+2	Conforms
15.	Length of flaps, cm	38 (Min.)	38.5	Conforms
16.	Distance between flaps ( left to right)	Adjustable	Adjustable	Conforms



17.	Spreader angle with horizontal, degree	Adjustable preferably downwards	Adjustable	Conforms
18.	Spreader angle with line of travel, degree	15 (Min.) (adjustable)	26° Max	Conforms
19.	Spreader sheet thickness, mm	2.5-3.0	2.9	Conforms
20.	SMS sheet thickness, mm	5.0 (Min.) for outer	5.0	Conforms
21.	Rotor balancing	Should be dynamically balanced	Balanced	Conforms
22.	Rotor rpm	Min. 1600	2108	Conforms
23.	Fitting of SMS on combine harvester	Rigidly fixed to the combine chassis	Rigidly fixed	Conforms
24.	Fitting of power transmission system on combine harvester	Rigidly fixed to the combine chassis	Rigidly fixed	Conforms
25.	Marking/labelling of machine	Labelling plate should be riveted on the body of machine having Name and address of manufacturer, Country of origin, Make, Model, Year of manufacturer, Serial number, Type, Size, required size of prime mover (kW), Weight of the machine (Kgs)	Type, Size, requirement size of Prime mover (kW) Weight of the machine (Kgs) are not specified on the labelling plate	<b>Does not conform in toto</b>
26.	Literature	Operator manual, Service manual and Parts catalogue should be provided	Provided but only for name sake	Conforms

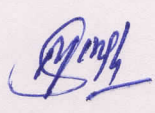
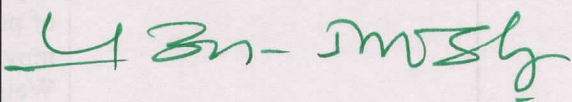




**10. COMMENTS AND RECOMMENDATIONS**

- 10.1** **Uniformity of straw spread, Coefficient of Variation, (percent)** of Straw management system (SMS) **does not meet the requirement** of Indian standard. IS 15806-2018. Since it is "Evaluative" parameter, **it must be looked into.**
- 10.2** Spacing between flails of one set **does not meet the requirement of critical technical specification. It must be looked into.**
- 10.3** Marking/labelling of machine **does not meet the requirement of critical technical specification. It must be looked into.**
- 10.4** Material of SMS blades and Bushes are not specified. It should be specified.
- 10.5** Applicant has recommended Preet-987 combine harvester for SMS field testing. This is vital information and therefore the same must be inscribed in labelling plate also for the guidance of users.
- 10.6** **Ease of operation and safety provision**  
No noticeable difficulties observed during operation of SMS.
- 10.7** **Hardness**  
**The harness of fixed & flail blade of SMS does not conform to the requirement of IS 15806:2018. It MUST be looked into as it is evaluative requirement**
- 10.8** **Literature supplied with the machine**  
There was one document entitle "Operator manual cum Service manual cum Parts catalogue" was supplied. However, it could be anything but the operator manual, as it lacks the relevant information on operation, adjustments and safety etc.  
Therefore the Operator manual/ Service manual/ Parts catalogue need to be brought out as per IS 8132: 1999.

**TESTING AUTHORITY**

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

Test report compiled by C.Veeranjaneyulu, Senior Technician

11. APPLICANT'S COMMENTS

Para No	Our reference	Applicants comment's
11.1	10.1	This issue will not create further pieces. This will according to Indian Standard IS: 15806-2018
11.2	10.2	There will not issue regarding spacing in future pieces of SMS. Further will be according to M&T guidelines.
11.3	10.3	Further it not be created
11.4	10.7	We will fixed Flails according to Indian Standard IS: 15806-2018

