

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: COMB-222/2640/2021  
माह/Month: January, 2021

**THIS TEST REPORT VALID UP TO : 31<sup>st</sup> January, 2028**



**MALKIT-897 DELUXE  
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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## 14. FIELD TEST

14.1 Combine harvester was operated in field for 28.08 and 26.24 hours for wheat and paddy harvesting respectively. During the test, available varieties of crop were harvested to assess the field performance of combine with regard to quality of work, rate of work, fuel consumption, safety and soundness of construction etc. The crop and atmospheric conditions during field test are given in Appendix - II & IV respectively.

The crop parameters recorded during the test for all crops are as under:-

## Crop Parameters

Sl. No.	Parameters		Observations	
			Wheat	Paddy
1.	Average plant height, cm	:	91 to 109	70 to 121
2.	Average number of tillers/m <sup>2</sup>	:	231 to 424	190 to 340
3.	Average length of ear head, cm	:	9 to 11	24 to 34
4.	Average straw/grain ratio	:	1.0 to 1.3	1.6 to 2.1
5.	Average moisture, %			
	- Grain	:	7.5 to 9.2	14.3 to 15.8
	- Straw	:	8.8 to 9.3	50.0 to 63.2

The results of field performance test of wheat and paddy crops harvesting are summarised in Table - 5 and presented in detail in Appendix - II to V.

**Table- 5 : SUMMARY OF LOSSES & EFFICIENCIES OBSERVED DURING FIELD PERFORMANCE TEST.**

Crop variety	Collect able losses (%) (Max.)	Non-collect able losses (%) (Max.)	Total process ing losses (%) (Max.)	Threshi ng efficien cy (%) (Min.)	Cleanin g efficien cy (%) (Min.)	Grain breakag e in main grain tank (Max.) (%)	Forwar d speed (kmph)	Area cover ed (ha/h)	Fuel consumption		Grain out put (kg/h)	Crop throug h-put (t/h)
									(l/h)	(l/ha)		
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>WHEAT</b>												
PVW-725	2.3	1.9	2.5	99.7	97.1	2.13	3.62 to 3.72	0.401 to 0.478	5.64 to 6.34	12.48 to 15.76	1233.03 to 3509.37	4.49 to 7.87
<b>PADDY</b>												
PB-150P	3.1	0.4	3.1	98.9	96.00	2.05	3.54 to 3.61	0.376 to 0.528	4.19 to 5.77	9.21 to 15.35	1682.63 to 2290.00	4.39 to 6.66

## 17. SUMMARY OF OBSERVATIONS

## 17.1 ENGINE PERFORMANCE TEST

Table-1 : ENGINE PERFORMANCE TEST (NATURAL AMBIENT)

Brake Power kW	Engine speed (rpm)	Fuel consumption			Specific energy, kWh/l
		l/h	kg/h	Specific, kg/ kWh	
(1)	(2)	(3)	(4)	(5)	(6)
<b>a) Maximum power – 2 hours test</b>					
73.8	2299	21.87	18.05	0.245	3.37
<b>b) Power at rated engine speed: (2200 rpm)</b>					
73.1	2199	21.87	18.04	0.247	3.34

\*High idle at no load was 1650 rpm recommended for field operation.

Table-2 : ENGINE TEST (HIGH AMBIENT)

Brake power (kW)	Engine speed (rpm)	Fuel consumption			Specific energy, kWh/l
		l/h	kg/h	Specific, kg/kWh	
(1)	(2)	(3)	(4)	(5)	(6)
<b>a) Maximum power -</b>					
71.6	2299	21.92	17.93	0.250	3.27
<b>b) Power at rated engine speed (2200 rpm)</b>					
71.2	2199	21.51	17.62	0.247	3.31

## 17.2 Field test

## 17.2.1 Summary of field tests

The results of the field test are summarized below:-

S. No	Parameters	Observed range	
		Wheat harvesting	Paddy harvesting
1.	Range of average speed of operation (kmph)	3.62 to 3.72	3.54 to 3.61
2.	Range of average area covered (ha/h)	0.401 to 0.478	0.376 to 0.528
3.	Maximum average fuel consumption: - (l/h) - (l/ha)	5.64 to 6.34 12.48 to 15.76	4.19 to 5.77 9.21 to 15.35
4.	Range of average crop throughput (tonne/h)	4.49 to 7.87	4.39 to 6.66
5.	Average of maximum grain breakage in main grain outlet (%)	2.13	2.05
6.	Average of maximum header losses (%)	1.50	0.27
7.	Average of maximum total non-collectable losses (%)	1.9	3.1
8.	Average of maximum total collectable losses (%) (un threshed + broken from main outlet)	2.3	0.4
9.	Average of maximum total processing losses (%)	2.5	3.1
10.	Average of minimum threshing efficiency (%)	99.7	98.9
11.	Average of minimum cleaning efficiency (%)	97.1	96.0

**17.3 Conformity to Indian Standard**

- (i) IS: 6025-1982 (Reaffirmed 2014)-Specification for : **Does not conform in toto**  
knife section for harvesting machine.
- (ii) IS: 6024-1983 (Reaffirmed 2014)-Specification for : **Does not conform in toto**  
guards for harvesting machines.
- (iii) IS: 10378-1982 (Reaffirmed 2016)-Specification of : **Does not conform in toto**  
knife back for harvesting machine.
- (iv) IS: 6283 (Part I & Part II)-2007(Reaffirmed 2014)- : **Does not conform in toto**  
Tractors and machinery for agriculture and forestry-  
symbol for operator controls and other displays.
- (v) IS: 8133-1983 (Reaffirmed 2014)-Guidelines for : **Does not conform in toto**  
location & operation of operator controls on agricultural  
tractors and machinery.
- (vi) IS: 15806-2018 (Combine Harvester recommendation : **Does not conform in toto**  
on selected performance and other characteristics).

**18. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS**

S. No	Characteristics	Category (Evaluative/ Non evaluative)	Requirement Declaration	Tolerance	Observed	Remarks
1	2	3	4	5	6	7
<b>I. Prime mover performance</b>						
a)	Max. Power (absolute) Average max. Power observed during 2 hrs. Max. Power test in natural ambient condition, kW	Evaluative	71.7	±5% of declared value	73.8	Conforms
b)	Max. Power observed during test after adjusting the no load engine speed as per recommendation of the manufacturer for field work, kW	Evaluative	68.0	±5% of declared value	68.8	Conforms
c)	Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	72.0	±5% of declared value	73.1	Conforms
d)	Specific fuel consumption corresponding to average maximum power under 2 h maximum power test, g/kWh.	Evaluative	240	+5% (max)	245	Conforms

## 20. COMMENTS AND RECOMMENDATIONS

- 20.1 Mechanical vibration**  
The amplitude of mechanical vibration of components marked as (\*) in chapter 13 of this report are observed on higher side. This calls for providing suitable remedial measures to dampen the vibration in order to improve the operational comfort and service life of various components & sub-assemblies.
- 20.2 Field performance test**  
No noticeable defect observed during field test.
- 20.3 During the brake test. The RHS brake drum was broken. It MUST be looked into.**
- 20.4 Ease of operation and safety provision**  
i) Slip clutch at cutting platform auger, grain & tailing elevator is not provided. It MUST be provided as per the requirement of IS: 15806-2018.  
ii) The first aid box is not provided on machine. It MUST be provided.
- 20.5** The grain tank cover is not provided. It MUST be provided as per the requirement of IS: 15806-2018.
- 20.6** Fire extinguisher is not provided. It MUST be provided as per the requirement of IS: 15806-2018.
- 20.7 Hardness and chemical composition**  
**Hardness & chemical composition of knife blade, knife guard and knife back is not within the limits specified in the relevant standards. It should be looked into for corrective action at regular production level.**
- 20.8** The recommended grade of engine oil, Hydraulic oil, Transmission and final drive housing oil are not specified. It MUST be specified for guidance of users.
- 20.9** Safety against the accidental start of engine is not provided on combine harvester. It MUST be provided.
- 20.10** The labelling of control gauges and all operating controls does not conform, in toto, to the requirement of IS: 15806-2018. It MUST be looked into for corrective action.
- 20.11** Individual brake pedals for LHS & RHS brake is not provided. It may be considered for providing.
- 20.12** The discard limit of clearance between engine valve and valve guide is not specified. It MUST be specified.
- 20.13** Spring stiffness of inlet and exhaust valve discard limit is not specified. It MUST be specified.
- 20.14** Height of Slow moving vehicle emblem does not meet the requirement of CMVR. It MUST be looked into.


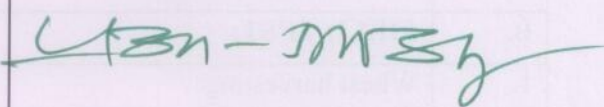
**20.15 Literature supplied with the machine**

No Technical literature provided by the applicant during the test

The following literature **MUST** be provided as per IS: 8132-1999 for guidance of users.

- i) Operator's manual of Combine Harvester
- ii) Service manual of Combine Harvester
- iii) Combine harvester parts catalogue of Combine Harvester
- iv) Operator manual for engine
- v) operator's manual of SMS
- vi) Service manual of SMS
- vii) part's catalogue of SMS

**TESTING AUTHORITY**

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft test report compiled by Manoj Sharma, B.tech (Agri.Engg.)

**21. APPLICANT'S COMMENTS**

We will take corrective action in future production

