

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: COMB-224/2642/2021
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THIS TEST REPORT VALID UP TO : 31st January, 2028



**PREET-7049M,
SELF PROPELLED MAIZE 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 51.9 hours for maize harvesting. During the test, available variety of crop was 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. The crop parameters recorded during the test for all crops are as under:-

Crop Parameters

Sl. No.	Parameters	Observations
1.	Average plant height, cm	196 to 293
2.	Average number of plants/m ²	9 to 10
3.	Average length of cob, cm	13 to 19
4.	Average straw/grain ratio	0.3:1 to 0.5:1
5.	Average moisture, %	
	- Grain	18 to 26
	- Straw	20 to 34

The results of field performance test of maize crop 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	Collectable losses (%) (Max.)	Non-collectable losses (%) (Max.)	Total processing losses (%) (Max.)	Threshing efficiency (%) (Min.)	Cleaning efficiency (%) (Min.)	Grain breakage in main grain tank (Max.) (%)	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
MAIZE												
DKC 9108	2.5	0.7	2.8	99.9	96.3	2.48	1.59 to 1.86	0.467 to 0.503	8.41 to 10.87	16.84 to 22.31	6465.79 to 8768.88	9.11 to 11.79

14.2 Unloading of grains

The time to unload the grain tank ranged from 68 to 89 second in maize harvesting operation.

14.3 Time required for daily maintenance

The average labour required for daily maintenance was approximately two man hours.

14.4 Harvesting of any other crop

Not done , as not recommended

16.1.6 Valves and valve guides		Observation
Any marked sign of overheating of valves	:	None
Pitting of seat/faces of valves	:	None
Spring stiffness, N/mm (kgf/mm)	:	20.21 to 20.72 (2.06 to 2.11)
Inlet valve spring	:	19.92 to 20.61 (2.03 to 2.10)
Exhaust valve spring	:	19.92 to 20.61 (2.03 to 2.10)
Clearance between valve guide and valve stem(mm):		Observations
- Inlet valve	:	0.08 to 0.09
- Exhaust valve	:	0.09 to 0.11
		Discard limit
		Not Specified

16.2 Steering system

Visual condition of the components of complete steering assembly : No noticeable defect observed.

16.3 Chains, sprockets and belts

Visual condition of the components of complete assembly : No noticeable defect observed.

16.4 Bearings

Visual condition of the components of complete assembly : No noticeable defect observed.

16.5 Wear of rasp bar

Sr. No.	Mass of rasp bar before test (g)	Mass of rasp bar after 25.97 h test (g)	Wear (%) by weight
1	5915.5	5885.8	0.50
2	5946.1	5916.3	0.50
3	5803.3	5773.9	0.51
4	5923.3	5894.1	0.49

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)
a) Maximum power – 2 hours test					
73.8	2299	21.87	18.05	0.245	3.37
70.3	1649	18.73	15.53	0.221	3.75*
b) Power at rated engine speed: (2200 rpm)					
73.1	2199	21.87	18.04	0.247	3.34

*High idle at no load was 1750 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)
a) Maximum power -					
71.6	2299	21.92	17.93	0.250	3.27
b) Power at rated engine speed (2200 rpm)					
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
		Maize Harvesting
1.	Range of average speed of operation (kmph)	1.59 to 1.86
2.	Range of average area covered (ha/h)	0.467 to 0.503
3.	Maximum average fuel consumption: - (l/h) - (l/ha)	10.87 22.31
4.	Range of average crop throughput (tonne/h)	9.11 to 11.79
5.	Average of maximum grain breakage in main grain outlet (%)	2.48
6.	Average of maximum header losses (%)	0.27
7.	Average of maximum total non-collectable losses (%)	0.7
8.	Average of maximum total collectable losses (%) (un threshed + broken from main outlet)	2.5
9.	Average of maximum total processing losses (%)	2.8
10.	Average of minimum threshing efficiency (%)	99.9
11.	Average of minimum cleaning efficiency (%)	96.3

17.3 Conformity to Indian Standard

- (i) IS: 6283 (Part I & Part II)-2007(Reaffirmed 2014)- Tractors and machinery for agriculture and forestry- symbol for operator controls and other displays. : Conforms
- (ii) IS: 8133-1983 (Reaffirmed 2014)-Guidelines for location & operation of operator controls on agricultural tractors and machinery. : Does not conform in toto
- (iii) IS: 15806-2018 (Combine Harvester recommendation on selected performance and other characteristics) : Does not conform in toto



19. COMMENTS AND RECOMMENDATIONS

19.1	<p>Mechanical vibration</p> <p>The amplitude of mechanical vibration of components marked as (*) in chapter 12 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.</p>
19.2	Provision for varying oscillation of sieve is not provided. It MUST be provided.
19.3	There is no drive safety for grain unloading auger. It should be provided
19.4	Safety against the accidental start of engine is not provided on combine harvester. It MUST be provided.
19.5	For the clearance between engine valve and valve guide the discard limit is not specified. It MUST be specified.
19.6	<p>Field performance test</p> <p>The lever for controlling the air blast of blower fan is not provided. It should be provided.</p>
19.7	<p>Ease of operation and safety provision</p> <p>Slip clutch at Gain and tailing elevator drive is not provided. It MUST be provided as per the requirement of IS 15806 : 2018</p>
19.8	Height of rear reflector does not meet the requirement of CMVR. It MUST be looked into.
19.9	Height of Slow moving vehicle emblem does not meet the requirement of CMVR. It MUST be looked into.



19.10 Literature supplied with the machine

The following literature was supplied by the applicant during the test

- i) Operator's manual of combine harvester
- ii) Combine harvester parts catalogue

The following literature should be provided

- i) Engine operator's manual
- ii) Engine service manual

The operator's manual should be updated as per IS: 8132-1999

TESTING AUTHORITY

R. K. NEMA SENIOR AGRICULTURAL ENGINEER	<i>R. K. Nema</i>
P. K. PANDEY DIRECTOR	<i>P. K. Pandey</i>

20. APPLICANT'S COMMENTS

Para No.	Our Reference	Remarks
20.1	19.1	Mechanical vibration will be improved for the operational comfort and service life of various components & Sub-assemblies will be implemented in our regular production.
20.2	19.2	We will provide the same as per recommendations
20.3	19.4	Safety against the accidental starts of Engine will be provided in our regular production.
20.4	19.5	The discard limit of clearance between engine valve and valve guide is 0.15mm
20.5	19.7 & 19.3	Ease of operation and safety provision will be implemented during our regular production as per requirement of IS 15806:2018.
20.6	19.8 & 19.9	Height of rear reflector and slow moving vehicle emblem, will provided the same as per recommendations.