

ब्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: COMB- 232/2683/2021  
माह/Month: March, 2021

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



**DASMESH-726 DLX,  
SELF PROPELLED PADDY COMBINE HARVESTER  
(TRACK TYPE)**



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]

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Wind velocity, (m/s) : 1.3 to 2.5

**TEST DATA:**

S. No.	Gear Used	Travelling speed before acceleration (kmph)	Noise level, dB (A)	
			Silencer facing microphone	Silencer facing away from microphone
1.	Forward	5.72	84	84

**14.2 Noise at operator's ear level**

Date of test : 15.12.2020

Type of track : Concrete

Background noise level, dB(A) : 52.1

Height of microphone from the foot board, mm : 1160

**Atmospheric conditions:**

Temperature, (°C) : 16.8

Pressure, (kPa) : 99.6

Relative humidity, (%) : 56.2

Wind velocity, (m/s) : 1.3 to 2.5

**TEST DATA:**

Maximum noise level observed dB(A) : 96

**15. FIELD TEST**

- 15.1** Combine harvester was operated in field for 52.33 hours (excluding running-in of 1.42 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
1.	Average plant height, cm	83.3 to 108.3
2.	Average number of tillers/m <sup>2</sup>	195 to 260
3.	Average length of ear head, cm	24.0 to 27.3
4.	Average straw/grain ratio	1.3 to 1.6
5.	Average moisture, %	
	- Grain	13.2 to 13.9
	- Straw	65.8 to 72.5

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

## SUMMARY OF LOSSES &amp; 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 (%)	Forward speed (kmph)	Area covered (ha/h)	Fuel consumption		Grain out put (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>												
PR27 P31	2.3	0.3	2.4	98.5	96.5	0.48 to 1.31	2.73 to 2.86	0.358 to 0.399	7.75 to 8.67	21.23 to 23.53	2993.91 to 4674.14	7.05 to 10.95
PR28 P67	2.4	0.1	2.4	98.4	96.9	0.70 to 0.80	2.75 to 2.76	0.348 to 0.356	8.74 to 9.60	24.58 to 27.57	4244.42 to 4250.74	9.92 to 9.99

**15.2 Unloading of grains**

The time to unload the grain tank ranged from 58 to 67 second

**15.3 Time required for daily maintenance**

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

**15.4 Harvesting of any other crop**

Not done, as not recommended

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

No noticeable defect observed during test

**17. INSPECTION AND ASSESSMENT OF WEAR**

	The engine and other assemblies were dismantled after 66.16 hours of engine operation.						
<b>17.1</b>	<b>Engine</b>						
<b>17.1.1</b>	<b>Cylinder bore</b>						
Cylinder No.	Cylinder bore dia. (mm)						Max. permissible wear limit (mm)
	Top position		Middle position		Bottom position		
	Thrust side	Non-thrust side	Thrust side	Non-thrust side	Thrust side	Non-thrust side	
1.	104.01	104.02	104.02	104.00	104.02	104.00	104.02
2.	104.00	104.02	104.02	104.02	104.01	104.02	
3.	104.00	104.00	104.02	104.02	104.01	104.02	
4.	104.00	104.01	104.01	104.00	104.01	104.00	

Sl. No.	Original mass before test (g)	Mass after 52.33 h of test (g)	Percent wear by weight (%)
<b>a)</b>	<b>Peg teeth of threshing cylinder</b>		
1.	240.9	239.6	0.54
2.	235.3	233.8	0.64
3	236.1	235.0	0.47
4	236.7	235.3	0.59
5	242.7	241.3	0.58
6	232.2	230.9	0.56
7.	226.2	224.8	0.62
8.	234.6	233.3	0.55
<b>b)</b>	<b>Peg teeth of concave</b>		
1	252.4	252.0	0.16
2	231.5	231.3	0.09
3	242.6	240.9	0.70
4	236.1	235.2	0.38
5	248.5	247.7	0.32
6	238.7	238.1	0.25

## 18. SUMMARY OF OBSERVATIONS

## 18.1 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>					
54.8	2050	16.02	13.28	0.242	3.42
<b>b) Power at rated engine speed: (2200 rpm)</b>					
53.2	2200	16.85	13.90	0.261	3.16

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>					
52.7	2052	15.43	12.63	0.240	3.41
<b>b) Power at rated engine speed (2200 rpm)</b>					
49.8	2200	16.24	13.30	0.267	3.06

**18.2 Field test****18.2.1 Summary of field tests**

The results of the field test are summarized below:-

S. No	Parameters	Observed range
		Paddy harvesting
1.	Range of average speed of operation (kmph)	2.73 to 2.86
2.	Range of average area covered (ha/h)	0.348 to 0.399
3.	Maximum average fuel consumption: - (l/h) - (l/ha)	7.75 to 9.60 21.23 to 27.57
4.	Range of average crop throughput (tonne/h)	7.05 to 10.95
5.	Maximum average of grain breakage in main grain outlet (%)	1.31
6.	Maximum average of header losses (%)	0.14
7.	Maximum average of total non-collectable losses (%)	0.3
8.	Maximum average of total collectable losses (%) (un threshed + broken from main outlet)	2.4
9.	Maximum average of total processing losses (%)	2.4
10.	Minimum average of threshing efficiency (%)	98.4
11.	Minimum average of cleaning efficiency (%)	96.5

**18.3 Conformity to Indian Standard**

- (i) IS: 6025-1982 (Reaffirmed 2014)-Specification for knife section for harvesting machine. : **Does not conform in toto**
- (ii) IS: 10378-1982 (Reaffirmed 2016)-Specification of knife back for harvesting machine. : **Does not conform in toto**
- (iii) IS: 6283 (Part 1 & Part 2)-2007(Reaffirmed 2014)-Tractors and machinery for agriculture and forestry-symbol for operator controls and other displays. : **Does not conform**
- (iv) IS: 8133-1983 (Reaffirmed 2014)-Guidelines for location & operation of operator controls on agricultural tractors and machinery. : **Does not conform in toto**
- (v) IS: 15806-2018 (Combine Harvester recommendation on selected performance and other characteristics). : **Does not conform in toto**

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XVII. 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

## 20. CRITICAL TECHNICAL SPECIFICATION

Differed till 31.03.2021 Vide Ministry O.M No. 13-13/2020 M&T (I&P) dated 22.12.2020

## 21. COMMENTS AND RECOMMENDATIONS

### 21.1 Prime mover performance:

- i) The observed max. Power during 2 hrs max. Power test does not meet the evaluative requirement of IS: 15806-2018.
- ii) Max. Power observed after adjusting no load engine speed as per recommendation of the manufacturer for field work, does not meet the requirement of evaluative requirement of IS: 15806-2018.
- iii) The observed Max. Crank shaft torque after adjusting no load engine speed as per recommendation of the manufacturer for field work, does not meet the evaluative requirement of IS: 15806-2018.
- iv) The observed Max. temperature of coolant does not meet the evaluative requirement of IS: 15806-2018.
- v) The observed Axial clearance of big end bearing does not meet the evaluative requirement of IS: 15806-2018.

21.2 The observed Power at rated engine speed does not meet the requirement of IS 15806-2018.

### 21.3 Mechanical vibration

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.



**21.4 Field performance test**

No noticeable defect observed during field test.

**21.5 Ease of operation and safety provision**

- i) No noticeable difficulties observed during operation of combine harvester.
- ii) Slip clutch at cutting platform is not provided, which is the essential requirement. It **MUST** be looked into for necessary action.
- iii) Slip clutch at Gain and tailing elevator is not provided.

21.6 Grain tank cover is not provided.

21.7 Rear view mirror is not provided.

21.8 The labelling of controls, gauges and operating controls are not provided.

21.9 The first aid box is not provided on machine.

21.10 The model name of the engine indicated in the specification sheet is different from the one inscribed in the labelling plate of the engine. This **MUST** be looked into for necessary action

**21.11 Hardness and Chemical composition**

**Hardness & Chemical composition of knife blade, is not within the limits specified in their respective IS: 6025-1982. It should be looked into for corrective action at regular production level.**

21.12 Crank shaft end float is not specified. It **MUST** be specified.

21.13 The discard limit of clearance between engine valve guide and valve stem is not specified. It **MUST** be specified.

21.14 The discard limit of spring stiffness of inlet and exhaust valve spring is not specified. It **MUST** be specified.

21.15 Engine cylinder bore compression ratio is not specified. It **MUST** be specified.

21.16 Inlet and exhaust valve clearance in cold are not specified. It **MUST** be specified.

21.17 Fuel injector injection timing is not specified. It **MUST** be specified.

21.18 Air cleaner service schedule is not specified. It **MUST** be specified.

21.19 Lubrication oil relief valve pressure and minimum permissible pressure are not specified. It **MUST** be specified.



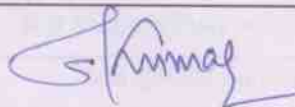
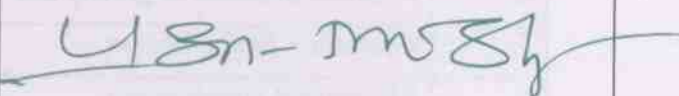
**21.20 Literature supplied with the machine**

The following literature was submitted by applicant during testing.

- i) Operator's manual.
- ii) Service booklet
- iii) Spare part's catalogue.

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

**TESTING AUTHORITY**

SANJAY KUMAR AGRICULTURAL ENGINEER	
P. K. PANDEY DIRECTOR	

Draft test report compiled by: Abhishek Verma ( B. Tech. Agri. Engg.)

**22. APPLICANT'S COMMENTS**

No comments received from the applicant.

