

व्यावसायिक परीक्षण रिपोर्ट
COMMERCIAL TEST REPORT

संख्या/ No.: E-132/3054/2023
माह/Month: July, 2023

THIS TEST REPORT VALID UP TO : 31st July, 2028



ENGINE PERFORMANCE TEST
'P.M. DIESELS PVT. LTD, FMA12' ENGINE



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि एवं किसान कल्याण विभाग

Department of Agriculture and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

Northern Region Farm Machinery Training and Testing Institute

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Spring stiffness, N/mm:

	Observations, N/mm	Discard limit
Inlet valve spring	14.21	14
Exhaust valve spring	13.99	

Clearance between valve guide and valve stem, mm:

	Observations	Discard limit
Inlet valve	0.04	0.10
Exhaust valve	0.04	

9. SUMMARY OF OBSERVATIONS, COMMENTS AND RECOMMENDATIONS

9.1 Engine Performance Test:

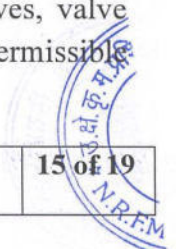
Engine power, kW	Crankshaft torque, Nm	Engine speed, rpm	Hourly fuel consumption		Specific fuel consumption kg/kWh	Specific energy, kWh/l
			kg/h	l/h		
i) Maximum power - 2 hours test:						
7.38	24.31	2902	2.66	2.23	0.302	2.78
7.12	23.45	2900	2.56	2.15	0.301	2.79*
ii) Power at rated engine speed (3000 rpm)						
6.39	20.36	2999	2.38	2.0	0.313	2.68
6.12	19.44	2995	2.05	1.72	0.281	2.99*

* Under high ambient conditions

- i) The maximum power output of the engine was observed as 7.38 kW at 2902 rpm of engine at full throttle, under natural ambient conditions during 2 hours maximum power test.
- ii) The specific fuel consumption corresponding to maximum power at full throttle was measured as 0.302 kg/kWh, under natural ambient conditions during 2 hours maximum power test.
- iii) The max. back-up torque of the engine was observed as 13.70 % in natural ambient condition whereas under the high ambient, the backup torque was 15.82%
- iv) The maximum smoke density was recorded as 0.72 m⁻¹ (Bosch No.) which is within permissible limit.
- v) The maximum temperature of engine oil and exhaust gas was observed as 112 and 633 °C respectively, during test which is within the maximum operating temperature declared by the applicant.
- vi) The lubricating oil consumption during two hours max. power test was measured as 1.35 g/kWh.

9.2 Assessment of wear:

The wear of engine components i.e., cylinder liners, piston, piston rings, valves, valve guides, springs, big-end bearings and main bearings were observed within the permissible limit, after 8.98 hours of operation at this institute.



9.3 Maintenance/service problems:

No noticeable maintenance/service problem was observed during the course of entire engine test.

9.4 Defects & Breakdowns:

No break down occurred during the entire engine test.

10. SELECTED PERFORMANCE AND OTHER CHARACTERISTICS**10.1: Acceptance Criteria for Performance Characteristics as per clause/Para 4.1 of IS: 13539-2018.**

Sr. No	Characteristics	Category (Evaluative/ Non evaluative)	Requirement (R) / Declaration (D)	Tolerance	Observed	Remarks
1	2	3	4	5	6	7
I.	Engine performance:					
a)	Max. power under 2 hours test (natural ambient condition), kW	Evaluative	7.35 (D)	±10% of declared value	7.38	Conforms
b)	Power at rated engine speed, kW (under natural ambient condition)	Non-evaluative	6.7 (D)	±5% of declared value	6.39	Conforms
c)	Specific fuel consumption corresponding to maximum power (under natural ambient condition), g/kWh.	Evaluative	290 (D)	+5% of declared value	302	Conforms
e)	Max. equivalent crank shaft torque, (Nm)	Evaluative	25 (D)	±10%	27.64	Conforms




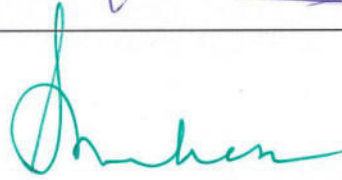
11. LITERATURE SUPPLIED WITH THE MACHINE:

The following literature were supplied by the applicant during the test

- i) Maintenance manual
- ii) Spare parts catalogue

However, the manuals need to be updated as per IS:8132-1999 in Hindi, English & other regional languages for guidance of users and technical personnel.

TESTING AUTHORITY

Er. SANJAY KUMAR AGRICULTURAL ENGINEER	
Dr. MUKESH JAIN DIRECTOR	 10.07.2023

12. APPLICANT'S COMMENTS

No specific comments received from the applicant

