

Laboratory **Mahindra & Mahindra Ltd., Powertrain Development Center,  
89, MIDC, Satpur, Nashik, Maharashtra**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-6866**

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Validity **07.02.2018 to 06.02.2020**

Last Amended on **03.09.2019**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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**CHEMICAL TESTING**

I.	<b>ATMOSPHERIC POLLUTION</b>				
<b>1.</b>	<b>Complete vehicle on Chassis dynamometer (Emission of pollutant from Positive and compression engine powered vehicle)</b>	Tail Pipe Emissions (Type-I Test)	MoRTH/CMVR/TAP-115-116 Issue 4, Part 1,2,7,11,13,14 (except Type 4 & 5 test)  GSR 686 (E), GSR 284 (E), GSR 788 (E), GSR 84 (E), GSR 277 (E), GSR 103 (E)  R83, Revision 5, 0 (except Type 4, 5 & 6 tests)  R-101 Rev 3,  EEC 70/220 as amended by 98/69/EC and 2003/76/EC (except Type 4, 5 & 6 tests)		
		Carbon Monoxide (CO)			0.1 ppm to 5000 ppm (0.001 g/km to 193.6g/km)
		Hydrocarbons (HC)			0.1 ppm to 500 ppm (0.001 g/km to 9.6 g/km)
		Nitrogen Oxide (NO <sub>x</sub> )			0.1 ppm to 1000 ppm (0.001 g/km to 61.7 g/km)
		Carbon Dioxide (CO <sub>2</sub> )			0.1 % to 20 % (0.001 g/km to 12177.3 g/km)
		Particulate Mass (PM)			PM 0.1µg to 2g (0.001g/km to 0.395g/km)
		<b>Type -II Test</b>			
		Idling CO and HC			10 ppm to 150000 ppm 1 ppm to 30000 ppm 400 RPM to 6000 RPM 1 Lambda to 9.999 Lambda
		Free acceleration smoke			0.1 % to 100 % 1 °C to 150 °C 400 RPM to 6000 RPM
Crankcase emission	(-) 500 mm H <sub>2</sub> O to 500 mm of H <sub>2</sub> O				

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2.	Internal Combustion Engine	Power	MoRTH/CMVR/TAP-115-116 Issue 4, Part 4, 80/1269/EEC as amended 199/99/EC MoRTH/CMVR/TAP-115-116 Issue 4, Part 4, 70/306/EEC - Annexure III  MoRTH/CMVR/TAP-115-116 Issue 4, Part 7, Part 15, Dir 88/77/EC as amended by Dir 99/96/EC, 2005/55/EC, 2005/78/EC & 2006/51/EC. and ECE R49	1 kW to 330 kW	
		Smoke		0.0025 m <sup>-1</sup> to 10 m <sup>-1</sup>	
		ESC (European Steady state Cycle) and ETC (European transient Cycle)		CO: 0.1 ppm to 5000 ppm (0.001 g/kW-h to 74598.6 g/kW-h) HC: 0.1 ppm to 500 ppm (0.001 g/kW-h to 3907.7 g/kW-h) NO <sub>x</sub> : 0.1 ppm to 10000 ppm (0.001 g/kW-h to 246785.9 g/kW-h) PM: 0.1 µg to 2 g (0.001 g/kW-h to 133333.3 g/kW-h)	
		ELR (European Load Response)		0.0025 m <sup>-1</sup> to 10 m <sup>-1</sup>	
3.	Test on Vehicles (Emission of Pollutant from Positive & Compression Engine Powered Vehicle)	Tail Pipe Emissions (Type –I Test)	GSR 889 (E), BSVI AIS 137 (Part 2, Part 3) & AIS 137 (Part 5) (Except Type IV test)	0.1 ppm to 5000 ppm (0.001 to 193.6 g/km)	
		CO			
		HC			0.1 ppm to 500 ppm (0.001 to 9.6 g/km)
		NO <sub>x</sub>			0.1 ppm to 1000 ppm (0.001 to 61.7 g/km)
		CO <sub>2</sub>			0.1 % to 20 % ppm (0.001 to 12177.3 g/km)
		CH <sub>4</sub>			0.1 ppm to 500 ppm (0.001 to 9.6 g/km)
		Particulate Mass			0.1 µg to 2g (0.001 to 0.395 g/km)
		Particulate Number			23 nm to 2.5 µm (1.1 E+04 to 2.67E+15) (1.2 Numbers/km)