Tata Dicor 2.2 L Setup

Important features of SUV diesel engine (Tata; Safari DICOR 2.2 L) include common rail direct injection (CRDI) fuel injection equipment (FIE), exhaust gas recirculation (EGR) and variable Nozzle Turbine (VNT) turbocharger. The engine uses a high-pressure fuel pump and a common rail for supplying high-pressure fuel to all cylinders using electronically controlled solenoid fuel injectors. Detailed specification of the engine is shown in Table 1. The engine is coupled with an eddy current dynamometer (Dynomerk; EC300) for controlling the engine speed and loading it. For evaluating the performance, combustion, emissions and particle size-number distribution it is instrumented. Fuel consumption was measured by volumetric fuel flow meter. Regulated gaseous emissions such as CO, CO_2, HC and NO_X, in the engine exhaust is measured using raw exhaust gas emission analyser (Horiba; EXSA-1500) and unregulated emissions such as alkanes, aldehydes, BTX, alcohols etc. is measured by the Fourier transform infrared spectrometry (FTIR) Motor Exhaust Gas Analyser (Horiba; MEXA-6000FT-E). Smoke opacity of the exhaust is measured by the smoke opacimeter (AVL; 437). Cylinder pressure is measured using a piezoelectric pressure transducer (AVL; GH13P) and signal is amplified by a charge amplifier (Kistler; 5015). For synchronizing the cylinder pressure signals with the crank shaft, a high precision incremental optical shaft encoder (BEI; XH25D-SS-3600-ABZC-28V/V-SM18) is installed on to the engine crank shaft. Schematic is shown in Figures 1.

Particulars	Specifications
Make/Model	Tata/ DICOR 2.2 L (BS-IV)
Bore/Stroke	85 mm x 96 mm
Cubic Capacity	2179 cc
Max. Power Output	103 kW @ 4000 rpm
Compression ratio	17.5
Firing Order	1-3-4-2
Fuel Filter	Single Stage
Timing and Governing	ECU Controlled
Maximum FIP	1600 bar