Maruti Wagon R Engine

Experimental Setup

An experimental arrangement consisting of Maruti Wagon R engine was made for investigating the effects of alcohol-gasoline fuels blending in different proportions over its performance, combustion and emissions measurement. Engine was mounted on the concrete test bed with mild steel structures laid over the bed. Vibration absorbers are used for dampening the vibrations from the engine to the bed. Engine is coupled with eddy current dynamometer and it is controlled with the help of dynamometer controller. Water cooling is provided for cooling of engine and dynamometer. Necessary instrumentation like laminar flow element for measuring air flow rate, spark plug pressure sensor for pressure measurement, encoder for crank angle position determination and thermocouples for finding temperature are fitted as per the requirement. In addition to above, combustion analyzer for analyzing combustion parameters, EEPS for particulate size measurement and emission analyzers for identifying different regulated and unregulated species concentration are used along with the engine setup.

Dynamometer Specifications:

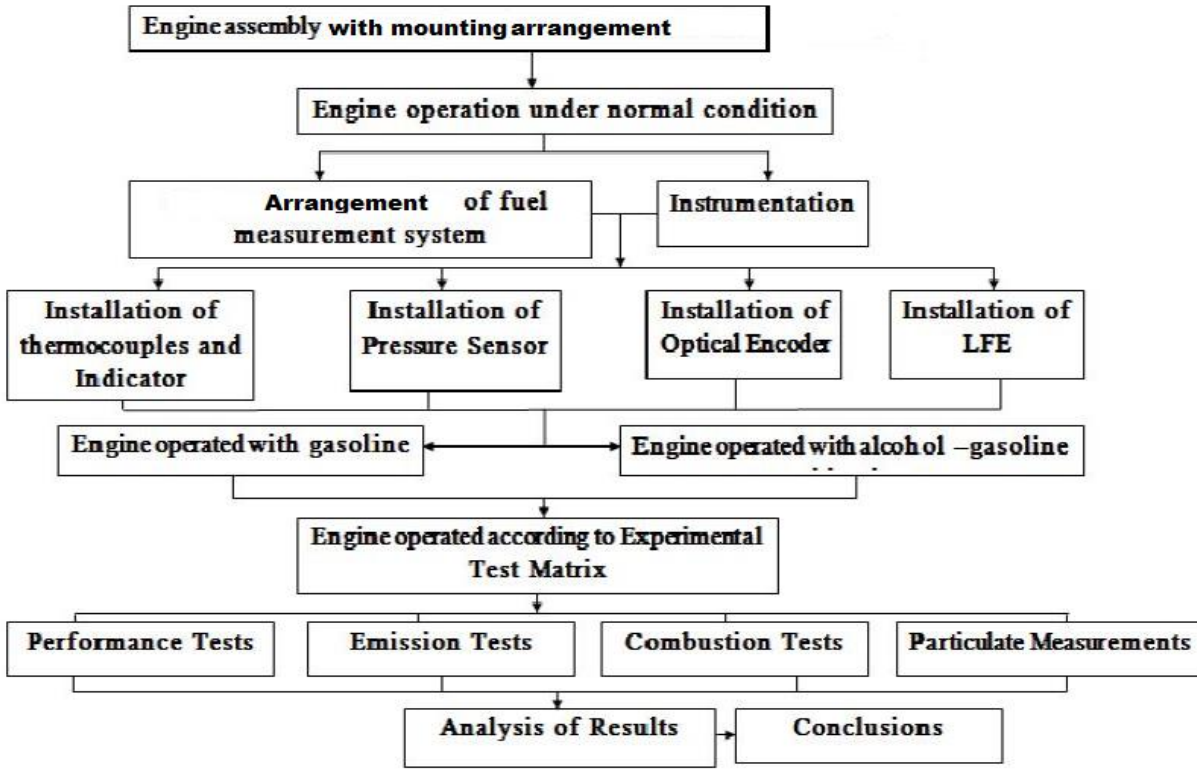
Characteristics	**Specifications**
Model/Make	ECB-120 / Dynalec Controls, Pune
Type	Eddy Current Dynamometer
Maximum Torque	235 Nm @ 1500-3500 RPM
Maximum Power	120 HP @ 3500-10000 RPM
Maximum allowable error in measurement	0.25% of maximum torque i.e. 1.05 Nm
Weight	350 kg

Engine Details:

Characteristics	**Specifications**
Engine Name	Maruti Suzuki Wagon R
Engine Model	K10B Model
Engine Type	MPFI, DOFC, Petrol
Displacement	998 cc
No. of strokes	4
No. of Cylinders	3

Bore/Stroke(mm)	73/79.5
Compression ratio	10:1
Valve train	4 valves/cylinder
Rated Torque (Nm)	90 Nm @ 3500 RPM
Rated Power (HP)	67.07 BHP@ 6200 RPM
Cooling System	Water Cooled
Aspiration System	Naturally aspirated

Methodology and Research plan:



Present research and future scope:

The present research is based upon investigating the different characteristics of engine in different methanol blends M10,M20,M30 and M 40 at various loads .It can be extended to other alcohol blends ,mixture of two alcohol blending with gasoline, making some changes in engine hardware and can also run on higher proportion of methanol blends by tuning electronic control module in the future. Since alcohol have higher octane number thus it can also be used in an experiment with higher compression ratio.