

Winter Camp



COURSE CURRICULUM

AUTOMOBILE & IC ENGINE DESIGN



COURSE CONTENT

Automobile Engine Mechanics

Duration: 20 Hours

SESSION 1

INTRODUCTION

WHAT IS AN AUTOMOBILE?

Brief history.
Changes over the years.
Indian automobile industry.

CHASSIS DESIGN

Brief terminology –
Multi point strut bar.
Fender bar.
Anti-roll bar.
Monocoque.

Types of chassis –
Ladder frame chassis.
Tubular space frame chassis.
Monocoque frame chassis.
Ulsabmonocoque.
Backbone frame chassis.
Aluminium space frame.
Carbon fibremonocoque.

SUSPENSION UNIT

Brief terminology –
Weight Transfer
Jacking forces
Camber and Caster angle
Spring Rate
Travel
McPherson Strut

Types of suspensions –
Dependent suspension
Independent suspension

SESSION 2

STEERING SYSTEM

Ackerman Steering Principle
Steering Mechanisms
Rack and Pinion
Recirculating Ball Type
Worm and Sector

Understeer, Oversteer
Power Steering



TRANSMISSION SYSTEM

Flywheel

Clutch

Single Plate Clutch

Multi Plate Clutch

Cone Clutch

Centrifugal Clutch

Electromagnetic Clutch

Gearbox

Constant mesh type

Synchromesh type

Sliding mesh type

Reverse and its working

Types of Transmission

Manual

Semi-Automatic

Automatic

CVT

Differential

2WD, 4WD, AWD

Tyres

Tyre size notation

Tyre types

Traction Control

SESSION 3

BRAKING UNIT

Disc Brakes

Drum Brakes

Magnetic Brakes

Vacuum Brakes

Anti-lock braking System

4-Channel, 4-Sensor ABS

3-Channel, 3-Sensor ABS

1-Channel, 1-Sensor ABS

Brake Actuators

Cable operated

Solid Bar connection

Single-circuit hydraulic

Dual-circuit hydraulic

Power Brakes

Brake Fluids

FUEL SUPPLY SYSTEM

Fuel Filter

Carburettor

Fuel Injector

Spark Plug



IC ENGINE

Types of IC Engine

4-Stroke Engine

2-Stroke Engine

Engine Layout and working

Valves and Valve Timing

Engine Cooling

Turbochargers

Superchargers

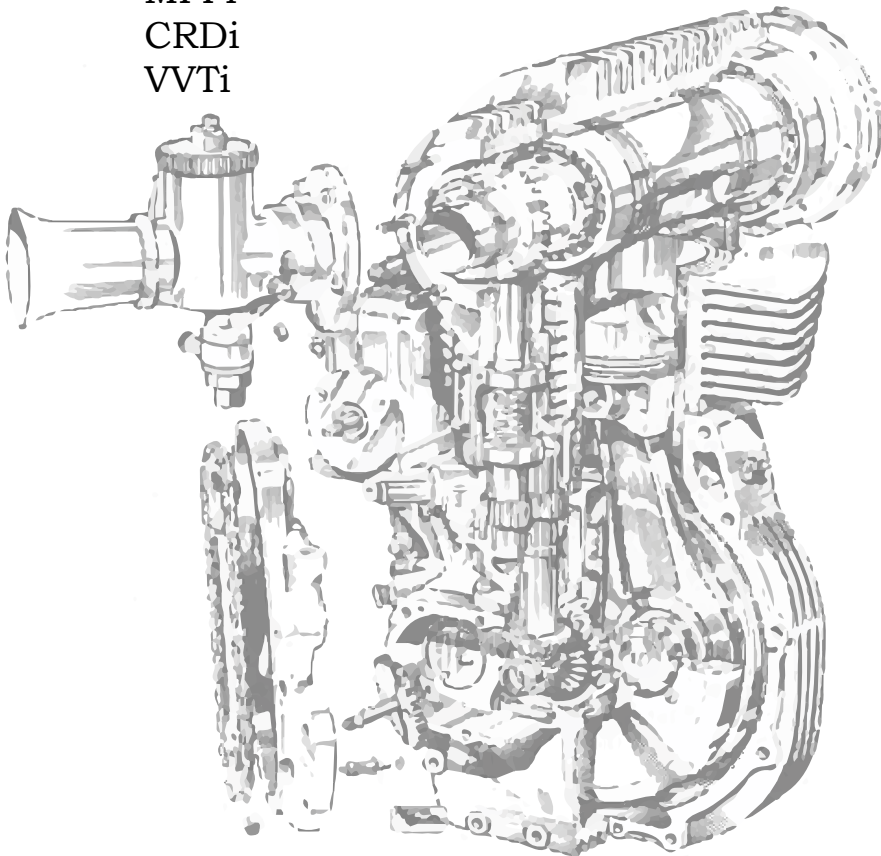
Latest Technologies

PGMFi

MPFi

CRDi

VVTi



SESSION 4

LIVE DEMONSTRATION –

IC Engine Dismantling and Assembling

COMPETITION

After the hand on theory and practical experience from the workshop, a competition will be conducted for the participants.

CERTIFICATE DISTRIBUTION

On behalf of Techtron Technologies Certificate of Merit will be provided to all Zonal Round Winners and Certificate of Participation will be provided to all the Zonal Round Participants (Excluding Merit Participants).