

## Automobile Engine Mechanics Course Content

### Day 1 (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

## Day 1 (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
  1. Tyres
  2. Tyre size notations

### 3. Tyre types

- Traction Control

## Day 2 (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

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- o PGMFi
- 
- o MPFi o CRDi o VVTi

## **Day 2 (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).