



## Automobile Mechanics & IC Engine Design

**Eager to learn Automobile and IC Engine Mechanics!!!** Automobile and IC Engine Mechanics Workshop mainly focuses from Basics to Advanced concepts in Automobile Engineering. It covers chassis design, working of Suspension unit, Steering System, Braking unit, Transmission, Fuel Supply System, IC Engine and Advanced Technologies like ABS, EBD, PGMFi, DTS-Fi, MPFI, VVTI. All the concepts are explained in detail with the Help of Theory and With Specially Designed Animations which would help students to visualize Things before practically working on it.

### Topics to be covered in Workshop

#### Introduction

What is an automobile?

Brief history

- o Changes over the years
- o Indian automobile industry
- o Sigma ratings

#### Types of locomotive vehicles

#### Chassis design

Brief terminology

1. MULTI POINT STRUT BAR
2. FENDER BAR
3. ANTI ROLL BAR
4. MONOCOQUE
5. TUBULAR SPACE
6. LONGERON RH,LH

#### Types of chassis

1. LADDER FRAME CHASSIS
2. TUBULAR SPACE FRAME CHASSIS
3. MONOCOQUE FRAME CHASSIS
4. ULSAB MONOCOQUE
5. BACKBONE FRAME CHASSIS
6. ALUMINIUM SPACE FRAME
7. CARBON FIBRE MONOCOQUE



All these will be explained with their current applications and the advantages & disadvantages in various applications.

### **Suspension Unit**

#### **Brief terminology**

1. Weight transfer (sprung and unsprung)
2. Jacking forces
3. Camber and caster angle
4. Anti dive & anti squat
5. Spring Rate
6. Travel

#### **Types of suspensions**

1. Dependent suspension
2. Independent suspension

#### **Front Independent Suspensions**

1. McPherson Strut
2. Double wishbone
3. Coil Spring type1
4. Coil spring type2
5. Multi link type
6. Trailing arm suspension
7. I beam suspension

#### **Rear suspension - dependant systems**

1. Solid-axle, leaf-spring
2. Solid-axle, coil-spring
3. Beam Axle

#### **Hydragas Suspension**

Hydropneumatic Suspension

Progressively wound springs

Torsion bars Braking Unit

#### **Disc brakes**

1. Self adjusting nature
2. Disc damage modes
3. Servicing your disc

#### **Drum brakes Anti-lock braking system**

1. Four-channel, four-sensor ABS
2. Three-channel, three-sensor ABS



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3. One-channel, one-sensor ABS

**Brake Actuators**

1. Cable-operated
2. Solid bar connection
3. Single-circuit hydraulic
4. Dual-circuit hydraulic
5. Brake-by-wire

**Power Brakes and master cylinders**

**Brake fluids**

**Special Queries Session**

**Benefits**

- Participants will get firsthand experience of the working principles for IC Engine Design.
- By dismantling a real IC Engine into components, participants can explore the engineering involved in an automotive engine system.
- Participation Certificate from Wissenaire, IIT Bhubaneswar and Organizing Partner.

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