



TM

autoMOB Workshop

(A Two days workshop on Automobile Mechanics & IC Engine design)

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Course Content

Introduction

- What is an automobile?
- Brief history
- Changes over the years
- Indian automobile industry
- 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

Suspension Unit

- Brief terminology
 1. Weight transfer (sprung and un sprung)
 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

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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
 - Hydra gas Suspension
 - Hydro pneumatic 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
 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 fluid

Designing Using Software- Basics of AutoCAD & CATIA V5 (150 minutes session)

Transmission system

- Types of Transmission system
 1. Manual transmission
 - Gear ratio
 - Different types of gear
 - Clutch & its components
 - Reverse & its working
 2. Automatic transmission
 - Planetary gearsets
 - DSG / DCT Gearboxes
 - Torque Converters
 3. Semi automatic Transmission

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- 4. Continuously variable transmission
 - Differentials
 - Open Differentials
 - Limited-slip differentials
 - Locking differentials
 - 2WD, 4WD, AWD

Tyres and Traction Control

- Tyre size notations
- Tyre types for passenger cars
- Tyre constructions
 - Cross-ply construction
 - Radial construction
- Tyre tread
- Traction & its control

IC Engines

- Types
 - Compression ignition
 - Spark ignition
- Layout
- Engine balancing
- Spark plug
- Carburetor
- Fuel injector
- Valves & valve timing
- Valve trains
- Engine cooling
- Turbochargers
- Superchargers
- Air/Fuel ratios
- Wankel Engine (6 stroke)
- Latest technologies
 - PGMFi
 - DTS-Fi
 - MPFI
 - CRDI
 - RTR
 - VVTi
 - i-Vtec
 - TDI
- Air Bags & Steering System.



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