

Automobile Mechanics & IC Engines Technology

Day 1

(Session I)

Basic Automobile & Designing Session:

(Expected Session Duration: 1.5- 2.0 hours with Presentations, Demonstrations etc)

1. Introduction to Automobile Mechanics
2. Locomotive Vehicles
3. Chassis design

Brief terminology

1. Multipoint Strut Bar
2. Fenderbar
3. Anti Roll Bar
4. Monocoque
5. Tubular Space
6. Longerons 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

Day 1

(Session II)

Suspension Session

(Expected Session Duration: 1.5- 2.5 hours with Presentations, Demonstrations etc)

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

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

Day 1

(Session III)

Braking Unit Session

(Expected Session Duration: 1- 1.5 hours with Presentations, Demonstrations etc)

Braking Unit

Disc brakes

1. Self adjusting nature

2. Disc damage modes

3. Servicing your disc

Drum brakes

Anti-lock braking system

Brake Actuators

Day 1

(Session IV)

Transmission Session

(Expected Session Duration: 2- 2.5 hours with Presentations, Demonstrations etc)

Transmission system

Manual transmission

1. Gear ratio

2. Different types of gear

3. Clutch & its components

4. Reverse & its working

Automatic transmission

1. Planetary gearsets
2. DSG / DCT Gearboxes

Torque Converters

1. Semi automatic Transmission
2. Continuously variable transmission

Day 2

(Session V)

Differential & Traction Session

(Expected Session Duration: 2- 2.5 hours with Presentations, Demonstrations etc)

Differentials

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

Practical Demonstration on Bike Engine Dis-Assembling

Day 2

(Session VI)

IC Engine Session

(Expected Session Duration: 3- 3.5 hours with Presentations, Demonstrations etc)

IC Engines Types

- Compression ignition
- Spark ignition

Layout

Engine balancing

Spark plug

Carburettor

Fuel injector

Valves & valve timing

Valve trains
Engine cooling
Turbochargers
Superchargers
Air/Fuel ratios
Wankel Engine (6 stroke)

Day 2
(Session VII)

Bike Engine Hands Dirty Session

(Expected Session Duration: 15 minutes per group with proper hands-on)

1. A group of 7-8 participants will be formed from workshop participants and every group will be called to perform an activity on engine whether its full or partial dis-assembly of the engine.
2. Engine Sub-Systems Identification

Day 2
(Session VIII)

Latest Technology Session

(Expected Session Duration: 1 – 1.5 hours)

Latest Technologies

- PGMFi
- DTS-Fi
- MPFI
- CRDI
- RTR
- VVTi
- i-Vtec &TDI
- Airbags & steering System