

## Diesel Fundamentals

This five-day course is designed to provide students with a thorough knowledge of diesel mechanics. Topics include engine design, classification, construction, operation, and maintenance.

### I. Introduction

- Diesel Applications
- Types of Engines
- Advantages of Diesels
- Diesel Performance

### II. Basic Types of Engines

- External Combustion Engine
- Four-Stroke
- Two-Stroke
- Basic Engine Components
- Engine Valves
- Crankshaft
- Valve Operating Mechanism
- Block
- Construction and Basic Design

### III. Basic Measurements

- Heat-Energy
- Temperature
- Heat Transfer
- Work

### IV. Diesel Fuels

- Production
- Properties of Diesel Fuel
- Heat Value
- Specific Gravity
- Flash Point and Fire Point
- Viscosity
- Volatility
- Cetane

- Commercial Diesel Fuel
- Smoke and Pollution Control

### V. Combustion Chamber Types

- Open Combustion Chambers
- Turbulence Chamber
- Precombustion Chamber
- Energy Cell

### VI. Classification of Diesel Engines

- Power
- Arrangement of Cylinders
- Fuel Usage

### VII. Fuel Injectors & Injection System

- Air Injection
- Mechanical Injection
- Common Rail System
- Pump Control (Jerk Pump)
- Unit Injection System
- Distribution
- Atomizing Fuel

### VIII. Scavenging, Supercharging, and Turbocharging

- Method of Scavenging
- Port Direct
- Valve Uniflow Scavenging
- Opposed Engine Scavenging

- Crankcase Scavenging
- Blowers
- Turbocharger

## **IX. Details of Engine Parts**

- Block, Cylinder, and Piston
- Valves and Valve Seat
- Camshaft and Crankshafts