

# MODIFYING AND MAINTAINING OIL ENGINES TO GAS ENGINE

## MCE048

### COURSE DESCRIPTION

This training course deals with an important issue related to use of natural gas as fuel for automotive engines. The course focuses on clarifying the aim of conversion of diesel engines to work with natural gas, the advantages and disadvantages of conversion, the methods of conversion, variation in performance of converted engines, and the impact of conversion on engine durability.

### COURSE GOAL

To enhance the participants' knowledge, skills and abilities related to diesel engines characteristics, design feature, combustion in diesel engines, and methods of conversion of diesel engines into gas engines.

### COURSE OBJECTIVES

By the end of this course, participant will be able to:

- Diesel engines design features and performance.
- Diesel fuel types and characteristics.
- How combustion occurs in diesel engines.
- Pollution from diesel engines.
- Types and components of diesel engines' fuel systems.
- Control of injected fuel quantity and timing.
- EDC (electronic control in diesel engines).
- Natural gas constituents and characteristics.
- Impact of using natural gas in diesel engines on performance and thermal efficiency.
- Pollution from natural gas engines.
- Conversion of petrol and diesel engines into gas engines.
- Components of natural gas fuel systems.
- Methods of conversion of diesel engines to natural gas engines.
- International standards related to the subject (American, British, Egyptian).

### WHO SHOULD ATTEND

- Engineer equipment support.
- Engineer - Mechanical Maintenance.
- Foreman - Mechanical Maintenance.
- Senior Foreman - Mechanical Maintenance.

## **COURSE DURATION**

10 Working Days

## **COURSE OUTLINES**

### **1. Introduction to Diesel Engines**

- Diesel engines design features and performance
- Diesel fuel types and characteristics
- Combustion processes in diesel engines
- Pollution considerations from diesel engines

### **2. Diesel Engine Fuel Systems**

- Types and components of diesel engines' fuel systems
- Principles of operation of diesel fuel systems
- Control of injected fuel quantity and timing
- Electronic control in diesel engines (EDC)

### **3. Natural Gas Characteristics**

- Constituents of natural gas
- Comparison of natural gas against other fuels
- Economy of utilization of natural gas

### **4. Impact of Using Natural Gas in Engines**

- Effects on engine performance
- Thermal efficiency considerations
- Diesel knock analysis
- Pollution implications from using natural gas

### **5. Types of Natural Gas Engines**

- Dual fuel engines
- Bi-fuel engines
- Dedicated natural gas engines
- Converted natural gas engines

### **6. Components of Natural Gas Fuel System**

- Basic components of natural gas fuel systems
- Specific components related to the conversion process

## 7. Methods of Conversion

- Conversion of petrol engines to gas engines
- Conversion of diesel engines to gas engines
- In-depth exploration of various conversion methods

## 8. International Standards

- Overview of American standards related to natural gas engines
- British standards in the context of engine conversion
- Egyptian standards pertinent to the subject

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