DC Motors

SERIES SPECIFICATIONS & COURSE OUTLINE

CONTENT
This electrical maintenance series is designed to help participants understand the fundamentals of DC motors and their application. It gives information on motor basics, parts of a DC motor, how DC motors operate, and the different types of DC motors. In addition, the field construction of the DC motor and the various elements of the commutator are detailed as well as interpreting wiring diagrams and troubleshooting DC motor problems.

AUDIENCE
The DC Motors series is designed for maintenance technicians, engineers, or anyone requiring a basic understanding of DC motors and the internal parts that make them work. All the terms used are explained or defined throughout the courses, so participants are not required to have an extensive technical vocabulary to understand the content.

LEARNER EXPECTATIONS
This series is intended to be used as an essential component in your electrical/electronics maintenance curriculum. It is designed to provide the background knowledge necessary to develop an in-depth understanding of DC motors. Each lesson has specific objectives that identify the anticipated level of understanding associated with the information presented. Our experience indicates that those who complete the training are likely to accomplish the stated objectives. Furthermore, if these lessons are built into a total curriculum which includes practice in the working environment, it will help provide participants with the knowledge necessary to master the subject.
**DCM001 Basics & Internal Parts**

**Purpose:** This course familiarizes participants with the internal parts of the DC motor, how they fit together, and the applications for these motors. It discusses several types of DC motors and how they work and examines the field construction of a DC motor, the armature, and commutator.

**Lesson 1 Objectives:** Identify and locate the basic parts of a DC motor; explain the functions of these basic parts; and identify some applications of DC motors.

**Lesson 2 Objectives:** Explain a magnetic field; describe the effects magnetic fields have on the armature of a motor; define the righthand rule; and describe the effects of force and motion on a motor.

**Lesson 3 Objectives:** Explain the physical differences between the various DC motors; describe the different uses of the various types of DC motors; and select the proper DC motor for a specific task.

**Lesson 4 Objectives:** Describe the internal construction of a field coil; locate the poles in a DC motor field; and explain the function of an interpole.

**Lesson 5 Objectives:** Describe the types of windings used in the armature coil; describe the interaction between coils and other parts of the DC motor; and identify the types of armature construction.

**Lesson 6 Objectives:** Identify the elements of the commutator segment; describe how connections are made to other parts of the motor; list the types of insulation material used in commutators; and describe how brushes interact with the commutator.

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**DCM002 Maintenance & Troubleshooting**

**Purpose:** This course explains the fundamentals of DC motor maintenance, including proper lubrication, brush replacement, inspection, and the correct troubleshooting techniques.

**Lesson 1 Objectives:** Read and understand motor wiring diagrams; connect a motor properly and identify connection errors; and select the proper terminal identifiers and define their uses.

**Lesson 2 Objectives:** Locate the lubrication ports on a DC motor; designate the proper lubricant for the DC motor; identify a bad brush and describe how to replace it; and detect problems within a DC motor using the correct inspection methods.