



## **DEM208 Basic EMD Mechanical**

**Credit Hours: 3**

### **Description:**

This is the first in a series of four courses in Locomotive Mechanics. This course is designed to introduce the student to the basic operation, maintenance, repair requirements and trouble shooting for EMD diesel engines and support systems.

### **Supplies:**

Please check with the instructor for details about any supplies that may be required.

### **Objectives:**

1. Identify engine components from a diagram.
2. Describe and list components of the two-stroke engine theory.
3. Explain and distinguish problems with the fuel system.
4. Explain and distinguish problems with the lubricating oil system.
5. Identify the purpose and parts of the cooling system.
6. List the components of the engine protection system.
7. Identify the parts of the crankcase ventilation system.
8. Explain the operation of the equipment air system.
9. Locate flaws in the crankcase, air box, and top deck.
10. Interpret and apply the proper procedure for installation and adjusting the power assembly system.

### **Content Outline and Competencies:**

#### **I. EMD Locomotive and Engine Component Identification**

- A. Identify engine components from a diagram.
- B. Describe engine components.

#### **II. Two-stroke cycle theory**

- A. Identify the firing sequence of a single cylinder, on a two-stroke engine.
- B. Select proper air supplier for combustion.
- C. Explain the operation of exhaust valves and intake ports.

### III. Fuel system operation

- A. Identify fuel system components.
- B. Describe fuel system component operation.

### IV. Lubricating oil system operation and troubleshooting

- A. Identify components of the lubricating oil system.
- B. Explain the purpose of the lubricating oil system.

### V. Cooling system operation and troubleshooting

- A. Explain the purpose of the cooling system.
- B. Select the sub-systems found in the system.

### VI. Engine protection system

- A. List the components of the engine protection system.
- B. Identify failed components from given scenarios.

### VII. Crankcase ventilation system

- A. Identify the parts of the crankcase ventilation system.
- B. Identify and apply proper technique to use a manometer to check crankcase pressure.

### VIII. Equipment air system

- A. Explain the operation of the equipment air system.
- B. Identify component failures within the equipment air system.

### IX. Crankcase, air box, and top deck inspection

- A. Identify flaws in crankcase, air box, and top deck.
- B. Select proper remedies from different scenarios.

### X. Power Assembly

- A. Apply proper procedures for removal and replacement of the power assembly.
- B. Apply proper procedures to adjust engines to correct settings.
- C. Explain basic governor operation.

## **Guidelines for Success:**

**Assessment Plan** – Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution's technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

## **Grading Criteria:**

- 90-100%      A
- 80-89%      B
- 70-79%      C
- Below 70%    Failing
  
- Labs            Pass/Fail

Instruction includes 50% lecture and 50% laboratory exercises.

## **Attendance:**

Classroom attendance is required. Class attendance requirement is 90%.

## **Disability:**

The Americans with Disabilities Act (ADA) Office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Institute of Technology for persons with disabilities. Qualified students with disabilities **MUST** self-identify by completing an application. In addition students must provide appropriate medical documentation to the ADA coordinator to be eligible for accommodations. New requests for accommodations should be submitted at least two months or more prior to the date the accommodations are needed. However, please contact the ADA office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of accommodations. The ADA Office coordinates and assists in arranging accommodations it deems appropriate for eligible students on a case-by-case basis.

If you are a student with a disability that may substantially limit your ability to participate in any of our classes and you believe that you will need accommodations, it is your responsibility to contact:

**ADA Coordinator**

**Phone: 785-228-6356**

**Email: [gloria.christian@washburn.edu](mailto:gloria.christian@washburn.edu)**

