# Diesel & Heavy Equipment Technology III Course No. 40239 Credit: 1.0

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| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes: **Vehicle Maintenance & Repair (47.0600)**

Course Description: A comprehensive, application-level course designed to provide students with knowledge in the theory of operation, the equipment, and the skills necessary for employment in the field of heavy equipment technician, to include over the road trucks, mining/construction and agriculture equipment.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

**Prerequisite:** Diesel & Heavy Equipment Technology II (40238)

## Benchmark 1: Shop Operations and Safety

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Evaluate shop environment for proper safety procedures |  |
| 1.2 | Locate, understand and utilize technical service bulletins |  |
| 1.3 | Maintain shop records, work orders, and service scheduling. |  |
| 1.4 | Identify and follow OSHA, MSHA and local safety guidelines |  |

## Benchmark 2: Diesel Engine

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Perform engine diagnostic tests |  |
| 2.2 | Perform emissions diagnostic tests |  |
| 2.3 | Perform engine component diagnostics and replacement procedures  |  |
| 2.4 | Recognize failures of engine systems and identify symptoms associated with those failures |  |
| 2.5 | Demonstrate an understanding of an in frame rebuild |  |
| 2.6 | Perform engine tune up procedures according to manufacturer specifications |  |

## Benchmark 3: Hydraulic, Pneumatic and HVAC

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Demonstrate pressure testing hydraulic circuits |  |
| 3.2 | Removal, Inspection and Reassemble various hydraulic pumps |  |
| 3.3 | Removal, Inspection and Reassemble hydraulic cylinders, control valves and components |  |
| 3.4 | Removal, Inspection, and Installation of air compressor  |  |
| 3.5 | Service air system  |  |
| 3.6 | Demonstrate recovering the HVAC system, replacing faulty components, and recharge |  |

## Benchmark 4: electrical

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | Describe CAN bus systems and troubleshooting  |  |
| 4.2 | Demonstrate testing faulty sensors, and electrical components |  |
| 4.3 | Interpret scan data and trouble codes |  |

## Benchmark 5: Drivetrain

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | Diagnose drivetrain faults, and recognize symptoms  |  |
| 5.2 | Removal and inspection for axle shafts and axle components |  |
| 5.3 | Disassemble and reassemble manual transmission |  |
| 5.4 | Disassemble and reassemble automatic transmission |  |

## Benchmark 6: Brakes

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | Demonstrate knowledge of ABS principles  |  |
| 6.2 | Service rotors and drums to manufacture specs |  |
| 6.3 | Inspect and service park brake components  |  |
| 6.4 | Diagnose and repair brake caliper |  |
| 6.5 | Inspect and repair s cam brake components |  |

## Benchmark 7: Suspension and Steering

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | Demonstrate knowledge of component replacement |  |
| 7.2 | Demonstrate knowledge of principles of steering geometry  |  |
| 7.3 | Inspect and repair cab suspension components  |  |
| 7.4 | Inspect frame for serviceability and alignment |  |

## Benchmark 8: Welding, Cutting and Heating

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 8.1 | Explain the processes of plasma cutting and proper the techniques involved |  |
| 8.2 | Demonstrate plasma cutting techniques |  |
| 8.3 | Demonstrate basic metal fabrication skill needed for heavy equipment repair |  |
| 8.4 | Explain the process of TIG welding and proper techniques |  |
| 8.5 | Demonstrate TIG welding  |  |

## Benchmark 9: Personal Skill and Employability

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 9.1 | Demonstrate personal communication skills with customers and co workers |  |
| 9.2 | Demonstrate written skills through work order summaries and inspection process |  |
| 9.3 | Demonstrate and discuss CDL pre trip procedures, and inspection |  |
| 9.4 | Discuss CDL classroom and theory-based procedures |  |
| 9.5 | Perform mock interviews  |  |
| 9.6 | Discuss continued education and benefits for growth in the career field  |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

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