



DIESEL ENGINE OVERHAUL II — HCEM 1246

A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 1.00
- **Lab Hours/Week:** 2.00
- **OJT Hours/Week:** 0
- **Prerequisites:** None
- **Corequisites:** None
- **MnTC Goals:** None

This course teaches engine tear down, failure analysis, cylinder head repair and major overhaul, and use of proper precision measuring instruments on engines used in the heavy equipment field such as Cat, John Deere, Perkins, Case, Ford, Cummins and Detroit Diesel. This course also includes basic fundamentals of diesel engine design, including the study of cylinder heads and blocks, lubrication, air intake, exhaust, electrical, cooling, and fuel systems. Major tear down and measuring are included along with mastery of preventive maintenance and major repair, tune-up and testing on mobile and stationary diesel engines used in the heavy equipment industry. Safety and troubleshooting are stressed. Prerequisites: HCEM1101 and HCEM1140.

B. Course Effective Dates: 8/21/03 – Present

C. Outline of Major Content Areas

As noted on course syllabus

D. Learning Outcomes

1. analyze cylinder bore measurements
2. analyze cylinder head failures
3. demonstrate ability to estimate cost of repairs
4. demonstrate professionalism
5. demonstrate proper torque guidelines
6. demonstrate removal of pistons, rods and rings
7. demonstrate shop safety
8. demonstrate use of correct service manuals and software
9. demonstrate use of specialized tooling and equipment
10. demonstrate use of valve grinding equipment
11. evaluate crankshaft and bearings
12. evaluate cylinder head(s)

13. explain dry sleeve removal and installation techniques
14. explain wet sleeve removal and installation techniques
15. identify engine types
16. perform visual inspection of engine and components
17. use safe work habits
18. write service report(s)

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

F. Learner Outcomes Assessment

As noted on course syllabus

G. Special Information

None noted