

Diesel Engines

Course Design

2006-2007

Course Information

Organization	Eastern Arizona College
Division	Industrial Technology Education
Course Number	AUT 108
Title	Diesel Engines
Credits	4
Developed by	Brian Coppola
Lecture/Lab Ratio	2 Lecture/6 Lab
Transfer Status	Non-transferable
Activity Course	No
CIP Code	47.0605
Assessment Mode	Pre/Post Test (50 Questions/100 Points)
Semester Taught	Fall
GE Category	None
Separate Lab	No
Awareness Course	No
Intensive Writing Course	No

Prerequisites

None

Educational Value

This course is designed to reinforce and apply information, processes, and ideas gained in other courses. The major intent of this course is to enhance the individual's abilities to work with and diagnosis the automotive internal combustion engine.

Description

Provides theory, diagnosis and service common to all diesel engines. Includes engine rebuilding and performance testing. This course prepares students for the ASE Certification test on Medium / Heavy Truck Diesel Engines.

Textbooks

Sean Bennett. *Medium / Heavy Duty Truck Engines, Fuels, Computerized Management*. ISBN 1-4018-1499-9 Edition: Newest Edition. Publisher: Thomson / Delmar Learning. Year: Newest Version, currently 2004. Required

Competencies and Performance Standards

1. Apply proper safety procedures and processes.

Learning objectives

What you will learn as you master the competency:

- a. Acquaint self with shop environment and hazards.
- b. Acquaint self with emergency procedures and policy.
- c. Accept responsibility for personal well being and practice / follow safety guidelines.
- d. Acquaint self with material safety data sheets and chemicals used in the shop environment.

Performance Standards

Competence will be demonstrated:

- o when learner completes safety assignments and written exam at a satisfactory level.

Performance will be satisfactory when:

- o learner observes and practices safety procedures.

2. Diagnose mechanical condition on diesel engine.

Learning objectives

What you will learn as you master the competency:

- a. Determine mechanical condition of engine assembly and its internal components.
- b. Interpret engine performance diagnostic test results.
- c. Determine the causes of oil leaks and unusual noises on a diesel engine.
- d. Determine the causes of unusual orders and exhaust color coming from running diesel engine.

Performance Standards

Competence will be demonstrated:

- O When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- O When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

Criteria - Performance will be satisfactory when:

- o learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- o learner provides acceptable oral and / or written responses to questions and / or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- o learner actively participates in the task requirements listed in the related learning plan.
- o learner attends required class and lab sessions and shows up on time.

3. Perform repair procedures on engine block components/assembly.

Learning objectives

What you will learn as you master the competency:

- a. Rebuild short block engine assembly according to manufacture requirements.
- b. Identify worn and / or out-of-specification engine block assembly and components.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

Criteria - Performance will be satisfactory when:

- o learner is productive, works safely and in a professional manner while working on task requirements listed in related learning plan.
- o learner provides acceptable oral and / or written responses to questions and / or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- o learner actively participates in the task requirements listed in the related learning plan.
- o learner attends required class and lab sessions and shows up on time.

4. Perform repair procedures on cylinder head and valve train components/assembly.

Learning objectives

What you will learn as you master the competency:

- a. Rebuild cylinder head according to manufacture requirements.
- b. Identify worn and/or out of specification cylinder head assembly and components.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

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- o learner actively participates in the task requirements listed in the related learning plan.
- o learner attends required class and lab sessions and shows up on time.

5. Perform engine cooling system service.

Learning objectives

What you will learn as you master the competency:

- a. Determine PM service schedule related to the vehicle's cooling system.
- b. Demonstrate cooling system service as recommended by vehicle manufacturer.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

Criteria - Performance will be satisfactory when:

- o learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- o learner provides acceptable oral and / or written responses to questions and / or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- o learner actively participates in the task requirements listed in the related learning plan.
- o learner attends required class and lab sessions and shows up on time.

6. Perform engine lubrication/preventative maintenance service.

Learning objectives

What you will learn as you master the competency:

- a. Determine service schedule related to vehicle's lubrication intervals.
- b. Demonstrate lubrication system service as recommended by vehicle's manufacturer.
- c. Analyze oil sample results taken from diesel engine oil.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

Criteria - Performance will be satisfactory when:

- o learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- o learner provides acceptable oral and / or written responses to questions and / or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- o learner actively participates in the task requirements listed in the related learning plan.

- o learner attends required class and lab sessions and shows up on time.

7. Diagnose engine cooling system to determine needed repair.

Learning objectives

What you will learn as you master the competency:

- a. Determine repairs needed on engine's cooling system and its components.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

Criteria - Performance will be satisfactory when:

- o learner is productive, works safely, and in a professional manner while working on task requirements listed in related learning plan.
- o learner provides acceptable oral and / or written responses to questions and / or situations asked by the instructor, while working on the task requirements listed in related learning plan.
- o learner actively participates in the task requirements listed in the related learning plan.
- o learner attends required class and lab sessions and shows up on time.

8. Diagnose engine lubrication system to determine needed repair.

Learning objectives

What you will learn as you master the competency:

- a. Determine needed repairs on engine's lubrication system and its components.

Performance Standards

Competence will be demonstrated:

- o When learner completes aligned assignment and job sheets listed in the related learning plan. (The assignment and job sheets must be completed at a satisfactory level to the instructor).
- o When the learner performs the priority tasks listed in the related learning plan. (The tasks must be completed with limited supervision - entry level).

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Types of Instruction

Classroom Presentation

Lab

Simulated or Actual Work Experience

Computer-based instruction

Group activities / cooperative learning

Grading Information

Grading Rationale

Grading Weights

Lab=45%

Class (Includes Test and Assignments)=45%

Final Exam (Post Test is the final)=10%

Grading Methods

Class score calculation -

Quizzes, assignments and job sheet points shall be added and carry a weight equal to one test score.

All exam shall have equal weight (test scores averaged) and used in class score calculations. Except the final (post test) will be worth at least 10% of the overall final grade calculation.

Lab score calculation

Instructor should evaluate each student's work habits using lab time card. Each student should be evaluated on productivity & progress on task requirements, working in a professional manner, clean-up and safe work habits.

Instructor is also required to evaluate each student's skill level in achieving the task requirements outlined in the various learning plans.

Instructors are encouraged to reward students for showing up on time and attending each class & lab session.

This can be done by requiring students to make arrangement with the instructor to make-up any lost time prior to missed day. All students need to notify the instructor of sick days through voice mail, etc. on the day of sickness. Instructors should not allow for any work to be turned in late or any test made up with out some type of deduction for late assignments / test. Suggested deduction 50% of original score.

Grading Scale

A	90-100%
B	80-89.9%
C	70-79.9%
D	60-69.9%
F	0-59.9%

Pass/Fail A non-major student may choose to have a grade of P or F rather than a letter grade. A grade of P will require that the student receive a percentage grade of at least 68%. A grade less than this will result in a grade of F.