

KHVT-0100 Safety & Basic Shop Skills

Authors

[Bill Kleman](#), Salt Lake Community College

[Mark Kranendonk](#), Salt Lake Community College

Competencies and Learning Objectives

1. Describe the use of safety equipment in a diesel shop.
 - Identify the basic personal safety equipment required in a diesel shop.
 - Outline the importance of wearing the appropriate clothing and footwear on the shop floor.
 - Explain the importance of using eye protection in the shop environment.
 - Describe two types of hearing protection devices and when to use them.
 - Describe the importance of using power lift equipment whenever possible.
2. Describe safe behavior in a diesel shop.
 - Describe how to lift safely heavy objects including how to identify weight limits for chains and straps.
 - Identify and describe the four fire categories and the fire extinguishers required to put them out.
 - Explain the legislation pertaining to an employee's Right To Know.
 - Describe the emergency and first-aid procedures used in a service garage.
 - Explain the proper procedure for handling and disposing of hazardous fluids.
 - Explain how to create an incident report.
 - Describe safety procedures when around electricity
 - Describe safety procedures when around welding equipment
 - Describe safety procedures when around high-pressure fuel systems
3. Identify and describe the characteristics of safe environments in a diesel shop.
 - Explain the function of OSHA and EPA.
 - Describe MSDS (Material safety data sheet).
 - Identify and describe hazardous environments and apply appropriate risk prevention strategies.
4. Describe the use of basic tools for diesel maintenance.
 - Identify and describe common hand tools used by truck technicians.

- Identify and describe types of air tools and power tools.
 - Identify and describe the precision measuring tools used by the engine and fuel system technician.
 - Identify and describe shop hoisting equipment.
 - Identify and describe Society for Automotive Engineers(SAE) characteristics of fasteners, metric hardware, sizes, and hardness.
 - Recondition a drill bit
 - Identify and describe uses of aerobic and anaerobic sealant
 - Identify and describe uses and properties of lubricants
5. Measure various diesel components.
- Demonstrate how to operate a manual micrometer.
 - Describe how to use a dial indicator.
 - Calculate metric measurement from standard measurement using conversion [formula].

Course Description:

This course is an overview of the equipment and behaviors needed to create safe working environments in a diesel shop. Students will learn how to utilize these elements according to industry standards for the diesel field.

Competencies

Upon completion of the course, you will be rated as MC (Mastered Competency) or NM (Not-Mastered Competency) based on ability to demonstrate the established competencies for the course. You will:

- Describe the use of safety equipment in a diesel shop.
- Describe safe behavior in a diesel shop.
- Identify and describe the characteristics of safe environments in a diesel shop.
- Describe the use of basic tools for diesel maintenance.
- Measure various diesel components.

Assessment

During the course you will be given performance and written exams.

Written Exam 1(Comps 1-3)

Written Exam 2(Comps 4-5)

Lab Final

Lab Final 2

You must pass with at least a score of 80% before you will be rated with an MC as your grade for the course.

Course work

The course work for this class will be available partially online and partially in the classroom. You will need to complete both the online and classroom portions to obtain the all of the course information.

Syllabus and Textbook *(Note: Books and materials required for this course are listed below. Instructor uses instructional materials from the publisher, including presentations, videos, and other learning materials.)*

The expectations for this course are described in detail in the course syllabus.

The textbook for this course is the Fundamentals of Medium/Heavy Duty Diesel Engines, Jones & Bartlett Learning Systems, ISBN 978-1-284-06705-7.

CDX Resources - There are videos, animations, activities and more used throughout this course. You will need to register to get access to the content.

Course Navigation

In the left navigation bar is a Course Tools menu. It provides information about what tools you need for the course, and how to navigate in Canvas. Start the course with the first module below. You can also click on the Modules link in the left navigation bar to navigate through the course.

Modules

Module 1: Safety Equipment for Diesel

Module 1 Overview: Safety Equipment

This course will give you a basic introduction to the safety equipment used by diesel mechanics. In this module you will learn about personal safety equipment. You will have access to learning resources, a homework assignment and a knowledge check.

The course work in this module, combined with class sessions should prepare you to:

1. Identify the basic personal safety equipment required in a truck service environment.
2. Outline the importance of wearing the appropriate clothing and footwear on the shop floor.
3. Explain the importance of using eye protection in the shop environment.
4. Describe two methods used to protect hearing.
5. Recognize the importance of using power lift equipment whenever possible.

Module 1: Readings (Note: If you use the book, there is a ebook that can be made available to students.)

Reading Assignment

The purpose of these learning resources is to introduce you to safety information for diesel technicians. While you are reviewing these materials, think about how using safety equipment properly can reduce your chances of accident or injury. Your goal is to learn which equipment is required for diesel technicians in different situations. Safety should be your first priority in a diesel shop.

You can complete the readings for this module in your textbook on pages 90-96. You can also access a digital copy of the text using the link below.

Module 1: Videos (Note: The videos are part of the student resources made available through the publisher for this course.)

Videos

Watch the videos below for more on injury prevention, hand protection, hearing protection and eye protection.

1. Basic Injury Prevention (1min)
2. Hand Protection (3.5min)
3. Hearing Protection (3.5min)
4. Eye Protection (4min)

Click on the links to view the videos.

Module 1: Homework

Now that you have reviewed the learning resources, you can continue your learning by completing the homework assignment described below.

You are the Technician: What to Wear

Read the scenarios below and decide which types of safety equipment would be best for the task described.

1. When cleaning engine parts with solvent, which safety equipment would you want to use?
2. When cleaning engine parts with solvent, which safety equipment would you want to use?
3. When grinding rust off an engine block, which safety equipment would you want to use?
4. When grinding rust off an engine block, which safety equipment would you want to use?
5. When cutting a broken engine bolt with a torch, which safety equipment would you want to use?
6. When cutting a broken engine bolt with a torch, which safety equipment would you want to use?
7. When disposing of used oil, which safety equipment would you want to use?

8. When disposing of used oil, which safety equipment would you want to use?

Module 1 Knowledge Check

Knowledge Check

Once you have reviewed the learning resources and activities for this module, take the module knowledge check to see what you have learned.

Now that you have completed Module 1, check in with your instructor for more on diesel safety equipment.

Module 1: Check in

Now that you have completed Module 1, check in with your instructor if you have questions. If not, move on to Module 2.

Module 2: Safe Behavior for Diesel

Module 2 Overview: Safe Behavior

This course will give you an overview of safety measures used by diesel mechanics. In this module you will learn about safe behaviors. You will have access to learning resources, homework assignments and a quiz.

The course work in this module, combined with class sessions should prepare you to:

1. Describe how to lift safely heavy objects including how to identify weight limits for chains and straps.
2. Identify and describe the four fire categories and the fire extinguishers required to put them out.
3. Explain the legislation pertaining to an employee's Right To Know.
4. Describe the emergency and first-aid procedures used in a service garage.
5. Explain the proper procedure for handling and disposing of hazardous fluids.
6. Explain how to create an incident report.
7. Describe safety procedures when around electricity.
8. Describe safety procedures when around welding equipment.
9. Describe safety procedures when around high pressure fuel systems.

Module 2: Readings

Reading Assignment

The purpose of these learning resources is to introduce you to safety information for diesel technicians. While you are reading, think about how using the behaviors described can reduce the chances of accident or injury. Your goal is to learn how to use them properly. Safety should be the primary concern in a diesel shop.

You can complete the readings for this module in your textbook on pages pg 77-80, 95-100. You can also access a digital copy of the text using the link below.

Module 2: Videos

Videos

Watch these videos for an introduction to the basic safety equipment used to protect your ears and for information about hazards in a diesel shop.

1. Action in an Emergency (3.5min)
2. Treating Burns (1.5min)
3. High Pressure Fuel Systems

Click the links to view the videos.

Module 2: Homework 1 *(Note: There are interactive online activities are part of the student resources made available through the publisher for this course.)*

Now that you have reviewed the learning resources, you can continue your learning by completing one or more of the homework assignments.

First Aid Crossword: After reviewing the sections on first aid, read the clues and enter your answers in the boxes for across or down. Click on the row or column to highlight the clue you want to answer. You will type your answer in the popup text box. Do not leave spaces between words.

First Aid Crossword

Module 2: Homework 2

First Aid Anatomy of a Truck

The anatomy of a truck is made up of different types of materials. Different symbols are used to mark these variations and show diesel technicians what kinds of fire hazards exist. After reviewing the sections on fire safety and fire extinguishing equipment, view the Anatomy of a Truck assignment and match the labels to the correct symbols. Once you have completed the page, press the submit button to see how you did.

First Aid Anatomy of a Truck (Types of fire extinguishers)

Module 2 Knowledge Check

Knowledge Check

Once you have reviewed the learning resources and activities for this module, take the module quiz to see what you have learned.

Now that you have completed Module 2, check in with your instructor for more on diesel safety behaviors.

Module 2: Check in

Now that you have completed Module 2, check in with your instructor if you have questions. If not, move on to Module 3.

Module 3: Safe Environments

Module 3 Overview: Safe Environments for Diesel

This course will give you an overview of safety measures used by diesel mechanics. In this module you will learn about safe work environments. You will have access to learning resources, homework assignments and a quiz.

The course work in this module, combined with class sessions should prepare you to:

1. Explain the function of OSHA.
2. Describe MSDS (Material safety data sheet).
3. Identify and describe hazardous environments and apply appropriate risk prevention strategies.
4. Explain how the shop layout contributes to efficiency and safety.
5. Describe how to maintain a safe level of air quality in the workplace
6. Safely clean and dispose of brake dust

Module 3: Readings

The purpose of these learning resources is to introduce you to safety information for diesel technicians. While you are reviewing these materials, think about how using appropriate risk prevention measures can affect work environments. Your goal is to learn how to promote a safe environment for yourself and others in your workplace. Safety should be the primary concern in a diesel shop.

You can complete the readings for this module in your textbook on pages 70-96. You can also access a digital copy of the text using the link below.

Module 3: Videos

Video

Watch these videos for an introduction to the basic safety practices in a diesel shop.

1. Emergency Evacuation
2. Truck Safety Equipment
3. MSDS Forms
4. Basic Injury Prevention
5. Extraction Fan
6. Fall Protection

Click the links to view the videos.

Module 3: Homework

Now that you have reviewed the learning resources, you can continue your learning by completing one or all of the homework assignments listed below.

Ch. 3 Safety, Personal Protection Equipment, and First Aid Task Sheets (located in the First Aid Study Tools)

Diesel technicians use task sheets to help make sure they are in compliance with industry standards. Review the task sheets for Shop Safety and Personal Safety, for a chance to practice your knowledge of safe environments.

You may choose to complete as many or few of the sheets as you would like. They will need to be completed at the school shop. You should make arrangements with your instructor to provide an evaluation, especially if you are planning to do several sheets.

Module 3 Knowledge Check

Knowledge Check

Once you have reviewed the learning resources and activities for this module, take the module quiz to see what you have learned.

Module 3: Written Exam

Review the learning materials, activities, and quizzes for modules 1-3. When you feel you are ready, contact your instructor to set up your Written Exam in the computer lab.

Module 3: Check in

Now that you have completed Module 1-3, check in with your instructor for exam results.

Module 4: Basic Tools

Module 4 Overview: Basic Tools for Diesel

This module will give you an overview of the basic tools used by diesel mechanics. In this module you will learn about hand tools, air tools and measuring tools. You will have access to learning resources, homework assignments and a Knowledge check.

The course work in this module, combined with class sessions should prepare you to:

Describe the use of basic tools for diesel maintenance.

1. Identify and describe common hand tools used by truck technicians.
2. Identify and describe types of air tools and power tools.
3. Identify and describe the precision measuring tools used by the engine and fuel system technician.
4. Identify and describe shop hoisting equipment.
5. Identify and describe Society for Automotive Engineers(SAE) characteristics of fasteners, metric hardware, sizes, and hardness.
6. Recondition a drill bit.
7. Identify and describe uses of aerobic and anaerobic sealant.
8. Identify and describe uses and properties of lubricants.

Module 4: Readings

Reading Assignment

The purpose of these learning resources is to introduce you to the basic tools for diesel technicians. Your goal is to learn how to use them properly.

You can complete the readings for this module in your textbook on pages pg 88-161. You can also access a digital copy of the text using the link below.

Module 4: Videos

Watch the videos listed below. These videos will give you an introduction to the basic tools used in a diesel shop.

Click this link to view the video.

1. Hand Tools
2. Video
3. Video

Module 4: Homework 1

Now that you have reviewed the learning resources, you can continue your learning by completing one or more of the homework assignments.

First Aid Crossword: After reviewing the sections on basic tools, read the clues and enter your answers in the boxes for across or down. Click on the row or column to highlight the clue you want to answer. You will type your answer in the popup text box. Do not leave spaces between words.

Basic Tools and Lubricants Crossword

Module 4: Homework 2

Now that you have reviewed the learning resources, you can continue your learning by trying out the Hand Tools-- interactive tool box.

Diesel Interactive Tool Box

Module 4: Knowledge Check

Knowledge Check

Once you have reviewed the learning resources and activities for this module, take the module knowledge check to see what you have learned. You may take the quiz as many times as you want. If you are struggling with the material on this quiz, you may refer back to the text pages 88-106, modules videos, and module assignments or speak to your instructor.

Module 4: Shop Activity 1 Check in

Now that you have completed the learning material and activities for Module 4, check in with your instructor for Shop Activity 1: Basic tools.

Module 4: Shop Activity 2 Check in

Now that you have completed the learning material and activities, and Shop Activity 1 for Module 4, check in with your instructor for Shop Activity 2: Sharpening a Drill Bit.

Module 4: Check-in

Now that you have completed Module 4, check in with your instructor if you have questions. If not, move on to module 5.

Module 5 Overview: Measuring Diesel Components

Module 5 Overview: Measuring Diesel Components

This module will give you an overview of the measuring tools and practices used by diesel mechanics. You will have access to learning resources, homework assignments and a quiz.

The course work in this module, combined with class sessions should prepare you to:

Measure various diesel components.

1. Demonstrate how to operate a manual micrometer.
2. Describe how to use a dial indicator.
3. Calculate metric measurement from standard measurement using conversion [formula].

Module 5: Readings

Reading Assignment

The purpose of these learning resources is to introduce you to measuring equipment for diesel technicians. Your goal is to learn how to use them properly.

You can complete the readings for this module in your textbook on pages pg 112-117. You can also access a digital copy of the text using the link below.

Module 5: Homework 1

The learning activity below will give you some instruction on how read micrometers. It contains learning material and a practice activity.

Click on the links below to get started.

1. Reading a micrometer <https://www.wisc-online.com/learn/career-clusters/manufacturing/mtl1902/reading-a-micrometer> (Note: OER item from University of Wisconsin)

Quiz: Module 5 Knowledge Check

Knowledge Check

Once you have reviewed the learning resources and activities for this module, take the module quiz to see what you have learned.

Module 5: Written Exam

Review the learning materials, activities, and quizzes for modules 4 & 5. When you feel you are ready, contact your instructor to set up your Written Exam in the computer lab.

Module 5: Measuring Lab and Performance Exam

This lab final will be performed in the diesel shop under the supervision of your instructor. It covers the ability to make precision measurements using a micrometer. You will measure small objects with a micrometer accurate within ____ inch. (*Note: Instructor will provide the tolerance level.*)

To pass, the submission must score at least 8 out of 10 points (80%). If the submission does not pass on the first attempt, you will have the opportunity to take an alternative form of the lab final after meeting with your instructor and practicing.

Module 5: Check in Course Completion

Now that you have completed Module 1-5, check in with your instructor for exam results and completion of the course.