

# KHVT 0130 Preventative Maintenance: Brakes

## Authors

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## Competencies and Learning Objectives

1. Describe components for proper function of truck air drum brake foundation system.
  - Describe how S-cam brake system applies the drum brake pads
  - Disassemble S-cam components
  - Inspect drum brake components for wear to determine if replacement is needed
  - Assemble S-cam components
  - Adjust drum brakes for proper operation
2. Describe components for proper function of truck air disc brake foundation system.
  - Describe how disc brake system applies the brake pads
  - Disassemble disc brake pad components
  - Inspect disc brake components for wear to determine if replacement is needed
  - Assemble disc brake components
  - Adjust disc brakes for proper brake operation
3. Inspect air generation system for proper function.
  - Identify components of an air generation system.
  - Describe how air generation system components operate together.
  - Evaluate air compressor for proper operation.
  - Evaluate governor for proper operation.
  - Evaluate safety valve for proper operation.
  - Evaluate reservoir and check valve for proper operation.
  - Evaluate dash gauge and low-pressure indicator for proper operation.
  - Evaluate drain valves for proper operation.
  - Evaluate air dryer for proper operation.
4. Inspect service brake system for proper function
  - Identify components for service brake system.

- Describe how service brake system components operate together.
  - Evaluate dual brake valve for proper operation.
  - Evaluate brake chambers and spring brakes for proper operation.
  - Evaluate automatic slack adjuster for proper operation.
  - Evaluate quick release valve for proper operation.
  - Evaluate relay valve for proper operation.
  - Evaluate stop light switch for proper operation.
5. Inspect parking brake system for proper operation.
    - Identify components for park brake system.
    - Describe how park brake system components operate together.
    - Evaluate double check valve for proper operation.
    - Evaluate PP-1 push pull control valve for proper operation.
    - Evaluate parking brake spring brake for proper operation.
    - Evaluate R-14 spring brake relay valve, or QR valve with balance port for proper operation.
    - Evaluate SR-1 spring brake valve for proper operation.
  6. Inspect tractor/trailer brake system for proper operation
    - Identify components for tractor/trailer brake system
    - Describe how tractor/trailer brake system components operate together
    - Evaluate TP-3 tractor protection valve for proper operation
    - Evaluate PP-7 trailer supply valve for proper operation
    - Evaluate DS-2 double check valve and stop light switch for proper operation
    - Evaluate SR-5 trailer spring brake valve for proper operation
  7. Inspect Anti-Lock Brake Systems and ATC, Automatic Traction Control
    - Identify and evaluate the components of anti-lock brake systems
    - Describe proper operation of ABS brakes
    - Diagnose fault codes for ABS brakes
    - Identify and repair ATC components
  8. Inspect hydraulic, and air over hydraulic brake systems
    - Identify the components of hydraulic and air over hydraulic brake systems
    - Evaluate master cylinder for proper operation
    - Evaluate booster power systems for proper operation
    - Evaluate metering and proportioning valves for proper operation.
    - Evaluate drum and disk brake components for proper operation.

- Evaluate park brake components for hydraulic and air over hydraulic brake systems

## Course Description

This course will provide theory and practical experience in air and hydraulic brake maintenance, and servicing on heavy duty trucks and equipment.

## 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 and repair components for proper function of truck air drum brake foundation system.
- Describe and repair components for proper function of truck air disc brake foundation system.
- Inspect and repair air generation system for proper function
- Inspect and repair service brake system for proper function
- Inspect and repair parking brake system for proper operation
- Inspect and repair tractor/trailer brake system for proper operation
- Inspect and repair Anti-lock Brake Systems and ATC, Automatic Traction Control
- Inspect and repair hydraulic, and air over hydraulic brake systems

## Assessment

During the course you be given written and performance exams.

Written Exam 1

Written Exam 2

Written Exam 3

Shop Exam 1

You must pass with at least a score of 80% or higher on each summative assessment to be considered Master Competent and complete the course.

## Course work

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

## Safety

In this course, you are expected to utilize safe behaviors and safety equipment when working around heavy duty vehicles. Safety will be evaluated in all performance exams.

## Flexibility

If you feel that you are ready to do the lab final or exams without completing the course modules, please contact your instructor.

## Contact and Assistance

If you need additional assistance with course material, you may consult with your instructor during open lab times.

If you have questions about coursework outside of lab hours you may contact your instructor via text/voice or email.

If you have technical issues with Internet access, computer labs, applications, BruinMail, Printing, or software navigate to

If you have technical issues with Canvas, navigate to

**Syllabus** *(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 -If you took KHVT-0100 course, you have already registered for access to the resources.

### CDX Support

If you experience any difficulties or technical issues, call Customer Support Team at 1-844-273-7537 or send an email to [cdxsupport@partnerinpublishing.com](mailto:cdxsupport@partnerinpublishing.com) to submit an issue to Technical Support Team.

**Course Navigation** *(Note: Instructions for the learning management system)*

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: Air Drum Brakes

### Module 1: Overview

Introduction to Module 1: This module will cover truck air drum brake foundation systems. You will have access to learning materials including reading assignments, videos, and a PowerPoint presentation. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 1 at the end of Module 3, and a performance exam at the end of Module 8.

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

Describe and repair components for proper function of truck air drum brake foundation system.

1. Describe how S cam brake system applies the drum brake pads
2. Disassemble S cam components
3. Inspect drum brake components for wear to determine if replacement is needed
4. Assemble S cam components
5. Adjust drum brakes for proper operation

**Module 1: Readings** (Note: All readings are from the book listed in the syllabus and includes an electronic copy for students to use.)

### Reading Assignment

The purpose of these learning resources is to introduce you to air drum brake foundation systems. While you are reading, think about how S cam brakes work. You also want to know what parts need to be inspected for repair, and how air brake automatic slack adjusters (ASA) should be adjusted for proper operation. Your goal is to learn how all of these components work together to safely stop a truck.

You can complete the readings for this module in your textbook CDXCV: Chap 29 pages 882 - 914, Chap 31 pages 972-975 and pages 1012-1028. You can also access a digital copy of the text using the link below.

**Module 1: PowerPoint** (Note: Instructor uses resources from the publisher.)

The PowerPoint presentation below, will give you a summary of chapters 29 and 31 on S cam drum brakes, with additional notes from your instructor. It may be helpful to do the module readings in the Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 29 31 S cam

## Module 1: Videos

Watch the videos about foundation drum brake repair.

1. Replacing drum brake pads and measuring S cam bushing wear.  
[https://www.youtube.com/watch?v= MfaDypEAEM](https://www.youtube.com/watch?v=MfaDypEAEM)
2. Installing seals and bearings in axle hub, and set axle end play to .001 to .005 TMC procedure. Part 1. <https://www.youtube.com/watch?v=A8-XL4E4m7o>
3. Part 2. [https://www.youtube.com/watch?v=fsxXhb\\_KDGU](https://www.youtube.com/watch?v=fsxXhb_KDGU)
4. Part 3. <https://www.youtube.com/watch?v=C27YAt2P2G8>
5. Checking an ASA Automatic Slack Adjuster to make sure it works as designed.  
[https://www.youtube.com/watch?v=60ZLWU-8e\\_U](https://www.youtube.com/watch?v=60ZLWU-8e_U)
6. Setting up a Haldex ASA automatic slack adjuster.  
<https://www.youtube.com/watch?v=u3HRWoof0XM>

## Module 1: Homework 1 *(Note: All interactivities are provided by the publisher.)*

Anatomy of a Truck: Braking Fundamentals

After you have reviewed the learning materials about s cam brake systems, complete the assignment.

First Aid Anatomy of a Truck: Fundamentals

## Module 1: Shop Activity 1

Now that you have completed the learning materials and knowledge check for Module 1, check in with your instructor for information about Shop Activity 1- Disassembly/Assembly of Drum Brakes.

## Module 1: Shop Activity 2 *(Note: Many of the documents are used with permission by the manufactures.)*

Now that you have completed the learning materials and knowledge check for Module 1, check in with your instructor for information about Shop Activity 2- S Cam Repair. The documents below will be used in this activity.

1. S Cam repair worksheet
2. STEMCO Hub Bearing Adjust Form

Note: If you do not feel you are ready for this shop activity, you may review the videos for 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: Air Disc Brakes

### Module 2: Overview

Introduction to Module 2: This module will cover truck air disc brake foundation systems. You will have access to learning materials including reading assignments, and a video. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 1 at the end of Module 3, and a performance exam at the end of Module 8.

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

Describe and repair components for proper function of truck air disc brake foundation system.

1. Describe how disc brake system applies the brake pads
2. Identify components of air disc brake foundation systems
3. Disassemble disc brake pad components
4. Inspect disc brake components for wear to determine if replacement is needed
5. Assemble disc brake components
6. Adjust disc brakes for proper brake operation

### Module 2: Readings

#### Reading Assignment

The purpose of these learning resources is to introduce you to air disc brake foundation systems. While you are reading, think about how disc brakes operate differently from S cam brakes. Your goal is to learn which brake components require repair, and how those repairs should be completed.

You can complete the readings for this module in your textbook CDXCV: Chap 29, pages 915-918; Chap 31, pages 1029-1031. You can also access a digital copy of the text using the link below.

### Module 2: Video *(Note: Instructor received permission to stream Bendix videos.)*

Watch the videos about foundation disc brake repair. (Only Bendix brand disc brakes are shown in the videos; however, repair for Meritor Wabco is very similar)

1. Bendix ADB 22X Air Disc Brake
2. Bendix Inspection Procedures
3. Bendix Replace Brake Pads
4. Bendix Tappet and Boot Assembly
5. Bendix Tappet Caliper Guide Pins Servicing

## **Module 2: Homework**

### Homework

Once you have reviewed the learning resources for this modules 1 and 2, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource, CDXCV: Chap 29, pages 915-918; Chap 31, pages 1029-1031.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

## **Module 2: Shop Activity 3**

Now that you have completed the learning materials and knowledge check for Module 2, check in with your instructor for information about Shop Activity 3- Disassembly/Assembly of Disc Brake Calipers.

## **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: Air Generation Systems

### **Module 3: Overview**

Introduction to Module 3: This module will cover truck air generation systems. You will have access to learning materials including reading assignments and a video. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 1 at the end this module, and a performance exam at the end of Module 8.

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

Inspect and repair service brake system for proper function.

1. Identify components for service brake system
2. Describe how service brake system components operate together
3. Evaluate dual brake valve for proper operation
4. Evaluate brake chambers and spring brakes for proper operation
5. Evaluate automatic slack adjuster for proper operation
6. Evaluate quick release valve for proper operation
7. Evaluate relay valve for proper operation
8. Evaluate stop light switch for proper operation



### **Module 3: Readings**

#### Reading Assignment

The purpose of these learning resources is to introduce you to air generation systems. While you are reading, think about how the components relate, and work with each other to supply air to the primary and secondary air system. Your goal is to learn how each of the components operate, which items within each component require repair, and how to complete repairs.

You can complete the readings for this module in your textbook CDXCV Chap 30 pages 926 - 943 and Chap 31 Pages 976-982, 1006-1009. You can also access a digital copy of the text using the link below.

### **Module 3: PowerPoint**

The PowerPoint presentation below, will give you a summary of chapters 30 on air generation systems, with additional notes from your instructor. It may be helpful to do the module readings in your Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 30 pt 1

### **Module 3: Workbook & Video**

Watch the video about air generation systems.

1. Workbook Part 1 - Download and print this workbook. You will fill it out as you watch the video. Ask your instructor to review your work.
2. Bendix Video Part 1

### **Module 3: Homework**

#### Homework

Once you have reviewed the learning resources for this module, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 3: Shop Activity 4**

Now that you have completed the learning materials and knowledge check for Module 3, check in with your instructor for information about Shop Activity 4- Airboard Demo 1.

### **Module 3: Shop Activity 5**

Now that you have completed the learning materials and knowledge check for Module 3, check in with your instructor for information about Shop Activity 5- Disassemble top of Air Compressor.

### **Module 3: Knowledge Check**

#### Knowledge Check

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

The quiz includes ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 3: Written Exam 1**

Once you have reviewed the learning resources for Modules 1, 2 and 3, take the written exam.

Testing Procedures:

1. Click Take this Quiz
2. Read each question and choose the best answer(s).
3. When you have answered all the questions, click the Submit You will be shown your score.
4. Check-in with your instructor to discuss the results of your exam.

### **Module 3: Check in**

Now that you have completed Module 3, check in with your instructor to discuss exam results.

## Module 4: Service Brake System

### **Module 4 : Overview**

Introduction to Module 4: This module will cover truck service brake systems. You will have access to learning materials including reading assignments and a video. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 2 at the end of Module 5, and a performance exam at the end of Module 8.

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

Inspect and repair service brake system for proper function.

1. Identify components for service brake system
2. Describe how service brake system components operate together
3. Evaluate dual brake valve for proper operation
4. Evaluate brake chambers and spring brakes for proper operation
5. Evaluate automatic slack adjuster for proper operation
6. Evaluate quick release valve for proper operation
7. Evaluate relay valve for proper operation
8. Evaluate stop light switch for proper operation

## **Module 4: Workbook & Video**

Watch the video about service brake systems.

1. Workbook Part 2 - Download and print this workbook. You will fill it out as you watch the video. Ask your instructor to review your work.
2. Bendix Video Part 2

## **Module 4: Readings**

### Reading Assignment

The purpose of these learning resources is to introduce you to service brake systems. While you are reading, distinguish between the primary and secondary braking systems. Your goal is to learn how the different components are used within the primary and secondary systems.

You can complete the readings for this module in your textbook CDXCV: Chap 30, pages 944-955; Chap 31, pages 982-998. You can also access a digital copy of the text using the link below.

## **Module 4: PowerPoint**

The PowerPoint presentation below, will give you a summary of chapter 30 on foundation brakes, with additional notes from your instructor. It may be helpful to do the module readings in your Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 30 pt 2

## **Module 4: Homework**

### Anatomy of a Truck: Air Brake Circuits

After you have reviewed the learning materials about service brake systems, complete the assignment, CDXCV: Chap 30, pages 944-955; Chap 31, pages 982-998.

### First Aid Anatomy of a Truck: Air Brake Circuits

## **Module 4: Homework**

### Homework

Once you have reviewed the learning resources for this module, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

## **Module 4: Shop Activity 6**

Now that you have completed the learning materials and knowledge check for Module 4, check in with your instructor for information about Shop Activity 6- Identify Components.

## **Module 4: Shop Activity 7**

Now that you have completed the learning materials and knowledge check for Module 4, check in with your instructor for information about Shop Activity 9- Airline Connectivity.

## **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: Parking Brakes

### **Module 5: Overview**

Introduction to Module 5: This module will cover truck parking brake systems (shown in orange). You will have access to learning materials including reading assignments, videos, and a PowerPoint presentation. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 2 at the end of this module, and a performance exam at the end of Module 8.

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

Inspect and repair parking brake system for proper operation

1. Identify components for park brake system
2. Describe how park brake system components operate together
3. Evaluate double check valve for proper operation
4. Evaluate PP-1 push pull control valve for proper operation
5. Evaluate parking brake spring brake for proper operation
6. Evaluate R-14 spring brake relay valve, or QR valve with balance port for proper operation
7. Evaluate SR-1 spring brake valve for proper operation

## **Module 5: Readings**

### Reading Assignment

The purpose of these learning resources is to introduce you to truck parking brake systems. While you are reading, think about how the air park brake system applies and releases the brakes in a parking application. Your goal is to learn how the various valves operate to apply and release the park brake.

You can complete the readings for this module in your textbook CDXCV: Chap 29 pages 882 - 914, Chap 31 pages 972-975 and pages 1012-1028. You can also access a digital copy of the text using the link below.

## **Module 5: PowerPoint**

The PowerPoint presentation below, will give you a summary of chapters 30 on parking brakes, with additional notes from your instructor. It may be helpful to do the module readings in your Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 30 pt 3

## **Module 5: Workbook & Video**

Watch the video about truck parking brake systems.

1. Workbook Part 3 - Download and print this workbook. You will fill it out as you watch the video. Ask your instructor to review your work.
2. Bendix Video Part 3

Click this link to view the video.

## **Module 5: Shop Activity 13**

Now that you have completed the learning materials and knowledge check for Module 5, check in with your instructor for information about Shop Activity 13- Airboard Demo 3

## **Module 5: Shop Activity 9**

Now that you have completed the learning materials and knowledge check for Module 5, check in with your instructor for information about Shop Activity 9- Disassemble Double Air Can (service brake side only).

## **Module 5: Knowledge Check**

### Knowledge Check

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

The quiz includes ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then

evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 5: Written Exam 2**

Now that you have completed Modules 4-5, check in with your instructor to discuss your Exam results.

### **Module 5: Check in**

Now that you have completed Module 5, check in with your instructor to discuss exam results.

## Module 6: Tractor/Trailer Brake Systems

### **Module 6: Overview**

Introduction to Module 6: This module will cover truck tractor trailer brake systems. You will have access to learning materials including reading assignments, videos, and a PowerPoint presentation. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 3, and a performance exam at the end of Module 8.

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

Inspect and repair parking brake system for proper operation.

1. Identify components for tractor/trailer brake system
2. Describe how tractor/trailer brake system components operate together
3. Evaluate TP-3 tractor protection valve for proper operation
4. Evaluate PP-7 trailer supply valve for proper operation
5. Evaluate DS-2 double check valve and stop light switch for proper operation
6. Evaluate SR-5 trailer spring brake valve for proper operation

### **Module 6: Readings**

#### Reading Assignment

The purpose of these learning resources is to introduce you to tractor/trailer brake systems. While you are reading, think about how the trailer receives air from the truck, how the park brakes are released, and how service brakes are applied. Your goal is to learn how the various components are utilized within the tractor/trailer brake system to apply the trailer brakes.

You can complete the readings for this module in your textbook CDXCV:

Chap 30, pages 957-996. You can also access a digital copy of the text using the link below.

### **Module 6: PowerPoint**

The PowerPoint presentation below, will give you a summary of chapters 30 on tractor/trailer brake systems, with additional notes from your instructor. It may be helpful to do the module

readings in your Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 30 pt 4

### **Module 6: Workbook & Video**

Watch the video about tractor/trailer brake systems.

1. Workbook Part 4 - Download and print this workbook. You will fill it out as you watch the video. Ask your instructor to review your work.
2. Bendix Video Part 4

### **Module 6: Homework**

Once you have reviewed the learning resources for this module, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource, CDXCV: Chap 29 pages 882 - 914, Chap 31 pages 972-975 pages 1012-1028, and Chap 30, pages 957-996.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 6: Shop Activity 10**

Now that you have completed the learning materials and knowledge check for Module 6, check in with your instructor for information about Shop Activity 10- Airboard Demo 4

### **Module 6: Check in**

Now that you have completed Module 6, check in with your instructor to discuss exam results.

## Module 7: Anti-lock Brake Systems

### **Module 7: Overview**

Introduction to Module 7: This module will cover truck anti-lock brake systems. You will have access to learning materials including reading assignments, videos, and a PowerPoint presentation. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Written Exam 3, and a performance exam at the end of Module 8.

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

Inspect and repair Anti-Lock Brake Systems ABS and ATC.

1. Identify the components of anti-lock brake systems
2. Describe proper operation of ABS brakes
3. Diagnose fault codes for ABS brakes

4. Repair ABS brakes components
5. Identify and repair ATC (automatic traction control) components

### **Module 7: Readings**

#### Reading Assignment

The purpose of these learning resources is to introduce you to Anti-lock Brake Systems ABS and ATCs. While you are reading, think about how the anti-lock brake system (ABS) and the automatic traction control (ATC) interacts with the air brake system to prevent wheel lock up. Your goal is to learn how the ABS and ATC components interact with the air brake system, and how to diagnose problems with these components.

You can complete the readings for this module in your textbook CDXCV: Chap 32. You can also access a digital copy of the text using the link below.

### **Module 7: PowerPoint**

The PowerPoint presentation below, will give you a summary of Chapter 32 on ABS and ATC brakes, with additional notes from your instructor. It may be helpful to do the module readings in Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 32 ABS and ATC

### **Module 7: Videos**

Watch the videos about anti-lock brake systems.

1. Bendix diagnostics, not using computer software  
<https://www.youtube.com/watch?v=Kz1SvOeFR8s>
2. Wabco ABS J1708 Toolbox diagnostics  
<https://www.youtube.com/watch?v=oXxK8u5HTZw>
3. Bendix ABS linked to ESP, Electronic Stability  
<https://www.youtube.com/watch?v=fZ0lcdTtZu8>

### **Module 7: Workbook & Videos** *(Note: Instructor received permission to use the workbook in the course.)*

Watch the video about anti-lock brake systems.

1. TP9738 Workbook- Download and print this workbook. You will fill it out as you watch the videos. Ask your instructor to review your answers.
2. Meritor Wabco video

### **Module 7: Animations**

Try out the animations from your CDX text related to brakes.

1. ABSsystem
2. ABSsystem Fault Codes



3. AT6 Valve
4. M30 modulator Valve
5. TCsystem
6. Wheel Speed Sensors

### **Module 7: Homework**

#### Homework

Once you have reviewed the learning resources for this module, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource, CDXCV: Chap 32.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 7: Shop Activity 11**

Now that you have completed the learning materials and knowledge check for Module 7, check in with your instructor for information about Shop Activity 11- ABS/ATC Components.

### **Module 7: Shop Activity 12**

Now that you have completed the learning materials and knowledge check for Module 7, check in with your instructor for information about Shop Activity 12- Meritor Wabco and Bendix Diagnostics.

### **Module 7: Check in**

Now that you have completed Module 7, check in with your instructor if you have questions. If not, move on to module 8.

## Module 8: Hydraulic Brake Systems

### **Module 8: Overview**

Introduction to Module 8: This module will cover truck hydraulic, and air over hydraulic brake systems. You will have access to learning materials including reading assignments and a PowerPoint presentation. You will also complete activities online and in the shop. Assessment of competencies in this module will take place in Exam 3 and a performance exam at the end of this module.

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

Inspect and repair hydraulic, and air over hydraulic brake systems.

1. Identify the components of hydraulic and air over hydraulic brake systems
2. Evaluate master cylinder for proper operation
3. Evaluate booster power systems for proper operation

4. Evaluate metering and proportioning valves for proper operation.
5. Evaluate drum and disk brake components for proper operation.
6. Evaluate park brake components for hydraulic and air over hydraulic brake systems

## **Module 8: Readings**

### Reading Assignment

The purpose of these learning resources is to introduce you to hydraulic and air over hydraulic brake systems. While you are reading, think about how hydraulic and air over hydraulic brakes operate. Your goal is to learn how the various components are used within a hydraulic and air over hydraulic brake system.

You can complete the readings for this module in your textbook CDXCV: Chap 33. You can also access a digital copy of the text using the link below.

## **Module 8: PowerPoint**

The PowerPoint presentation below, will give you a summary of Chapter 33 on hydraulic and air over hydraulic brake systems, with additional notes from your instructor. It may be helpful to do the module readings in your Medium/Heavy Duty Commercial Vehicle Systems book as you view the PowerPoint presentation.

Click the link to get started.

1. Presentation: Chap 33 Hyd Air Over Hyd Brakes

## **Module 8: Homework**

Once you have reviewed the learning resources for this module, do the module homework questions. You may answer the questions as many times as you want. You may also use your book as a resource, CDXCV: Chap 33.

The homework questions include ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

## **Module 8: Shop Activity 14**

Now that you have completed the learning materials and knowledge check for Module 8, check in with your instructor for information about Shop Activity 14- How to Bleed Hydraulic Brakes.

## **Module 8: (Optional) Shop Activity 14**

Now that you have completed the learning materials and knowledge check for Module 8, check in with your instructor for information about (optional) Shop Activity 14- Brake Repair on a Personal Vehicle with Hydraulic Brakes.

### **Module 8: Knowledge Check**

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

The quiz includes ASE style questions, which consist of two true/false style statements. To answer the question, evaluate technician A's statement alone to determine if it is correct, then evaluate technician B's statement alone to determine if it is correct, then make your selection based on your conclusion.

### **Module 8: Written Exam 3**

Once you have reviewed the learning resources and activities for Modules 6, 7 and 8, take the written exam.

Testing Procedures:

Click Take this Quiz

1. Read each question and choose the best answer(s).
2. When you have answered all the questions, click the Submit You will be shown your score.
3. Check-in with your instructor to discuss the results of your exam.

### **Module 8: Shop Exam 1**

Now that you have completed the learning materials, knowledge check and shop activities for Module 8, check in with your instructor for information about Shop Exam 1- Complete Brake System Inspection.

### **Module 8: Check in**

Now that you have completed Module 8, check in with your instructor to discuss exam results and completion of the course.