Automotive Chassis Systems 7e

Chapter 3 Braking System Components & Performance Standards

Opening Your Class

KEY ELEMENT	EXAMPLES
Introduce Content	This course or class covers operation and service of **Automotive Chassis Systems.** It correlates material to task lists specified by ASE and NATEF.
Motivate Learners	Explain how the knowledge of how something works translates into the ability to use that knowledge to figure why the engine does not work correctly and how this saves diagnosis time, which translates into more money.
State the learning objectives for the chapter or course you are about to cover and explain this is what they should be able to do as a result of attending this session or class.	Explain the chapter learning objectives to the students. 1. Describe the fundamentals of brake systems. 2. Describe brake design requirements. 3. List the six brake system categories. 4. State the purpose of an antilock brake system. 5. Discuss federal brake standards.
Establish the Mood or Climate	Provide a *WELCOME,* Avoid put downs and bad jokes.
Complete Essentials	Restrooms, breaks, registration, tests, etc.
Clarify and Establish Knowledge Base	Do a round robin of the class by going around the room and having each student give their backgrounds, years of experience, family, hobbies, career goals, or anything they want to share.

NOTE: This lesson plan is based on Automotive Chassis Systems 7th Edition Chapter Images found on Jim's web site @ www.jameshalderman.com

LINK CHP 3: Chapter Images

ICONS	Ch03 Braking System Components and Performance Standards
	**1. SLIDE 1 BRAKING SYSTEM COMPONENTS**
	**Check for ADDITIONAL VIDEOS & ANIMATIONS @ http://www.jameshalderman.com/** **WEB SITE IS CONSTANTLY UPDATED** **Videos**
	**At the beginning of this class, you can download the crossword puzzle & Word Search from the links below to familiarize your class with the terms in this chapter & then discuss them**
	**Crossword Puzzle (Microsoft Word) (PDF)** **Word Search Puzzle (Microsoft Word) (PDF)**
	2. **SLIDE 2 EXPLAIN FIGURE 3-1** Typical vehicle brake system showing all typical components. 3. **SLIDE 3 EXPLAIN FIGURE 3-2** drum brake assembly 4. **SLIDE 4 EXPLAIN FIGURE 3-3** disc brake assembly
	**DISCUSSION: ASK STUDENTS TO TALK ABOUT HOW BRAKING SYSTEMS WORK TO REDUCE SPEED AND TO STOP VEHICLES. HAVE STUDENTS DESCRIBE THE HYDRAULIC SYSTEM THAT ACTIVATES THE BRAKES ON EACH WHEEL.**
	**DEMONSTRATION: SHOW STUDENTS AN EXAMPLE OF A DRUM BRAKE AND DISCUSS HOW IT WORKS. WHY HAVE THESE BEEN SUPERSEDED BY DISC BRAKES ON THE FRONT WHEELS OF MOST VEHICLES TODAY?**
	**DISCUSSION: ASK STUDENTS TO DISCUSS ALL THE BASIC COMPONENTS THAT MAKE UP A VEHICLE BRAKING SYSTEM.**
	**DEMONSTRATION: SHOW STUDENTS AN EXAMPLE OF A DISC BRAKE AND DISCUSS HOW IT WORKS. ASK STUDENTS TO COMPARE THE SERVICING ISSUES FOR DRUM AND DISC BRAKES.**

ICONS	Ch03 Braking System Components and Performance Standards
	**DISCUSSION:** ASK STUDENTS TO DISCUSS HOW ALL TYPES OF VEHICLE BRAKING SYSTEMS MUST BE DESIGNED TO STOP VEHICLES SAFELY.
	5. **SLIDE 5** EXPLAIN **Figure 3-4** typical brake system components.
	**Brake Pedal Force (View) (Download)** **Brake Pedal Travel (View) (Download)** **Brake Swept Area (View) (Download)** **Coeficient of Friction (View) (Download)** **Pascal's Law, Area (View) (Download)** **Pascal's Law, Force (View) (Download)** **PASCAL'S LAW, PRESSURE (VIEW) (DOWNLOAD)**
	**DISCUSSION:** ASK STUDENTS TO TALK ABOUT 6 SUBSYSTEM CATEGORIES OF BRAKE-SYSTEM COMPONENTS. HOW DOES EACH SYSTEM WORK, WHAT COMPONENTS MAKE UP EACH SUBSYSTEM, AND WHAT IS ITS FUNCTION AS PART OF THE ENTIRE BRAKING SYSTEM?
	6. **SLIDE 6** EXPLAIN **Figure 3-5** red brake warning light will remain on after a bulb test if there is a fault with the hydraulic part of the brake system.
	**DISCUSSION:** HAVE STUDENTS TALK ABOUT THE DIFFERENCE BETWEEN A RED LIGHT ON THE DASH AS COMPARED TO AN AMBER LIGHT
	**DEMONSTRATION:** ON A LAB VEHICLE DEMO THE BULB CHECK SHOWING THE 2 LIGHTS
	7. **SLIDE 7** EXPLAIN **FIGURE 3–6** ABS warning light is amber 8. **SLIDE 8** EXPLAIN **FIGURE 3–7** typical adjustable pedal assembly. Both the accelerator and the brake pedal can be moved forward and rearward by using the adjustable pedal position switch. 9. **SLIDE 9** EXPLAIN **Figure 3-8** Typical components of an antilock braking system (ABS) used on a rear-wheel-drive vehicle.

ICONS	Ch03 Braking System Components and Performance Standards
	**DEMONSTRATION:** SHOW COMPONENTS OF ANTILOCK BRAKING SYSTEM (ABS). DISCUSS HOW THEY WORK TO PREVENT BRAKES FROM LOCKING DURING A SKID. WHAT IS INDICATED BY BRAKE-PEDAL PULSATIONS EXHIBITED BY ABS SYSTEMS?
	**DISCUSSION:** ASK STUDENTS TO DISCUSS HOW THE FEDERAL MOTOR VEHICLE SAFETY STANDARDS (FMVSS) ESTABLISHED REGULATIONS FOR AUTOMOTIVE BRAKING SYSTEMS. WHY ARE SUCH SAFETY STANDARDS IMPORTANT AND NECESSARY?
	**DISCUSSION:** ASK STUDENTS TO DISCUSS FMVSS 135 STANDARD FOR BRAKE SYSTEM SAFETY AND PERFORMANCE REQUIREMENTS. WHAT PARTS OF THE BRAKING SYSTEM FALL UNDER THE FMVSS 135 REGULATIONS?
	10. **SLIDE 10 EXPLAIN FIGURE 3.9** A typical Service Parts Identification (RPO) sticker is located on the inside of the trunk lid of a GM vehicle.
	**DISCUSSION:** ASK STUDENTS TO DISCUSS THE ISSUE OF TECHNICIAN LIABILITY FOR DAMAGE AND INJURIES RESULTING FROM BADLY PERFORMED REPAIRS TO CRITICAL SYSTEMS SUCH AS BRAKES AND STEERING CONTROLS. WHAT IS THE GOAL OF ALL REPAIRS?