



FUNDAMENTALS OF BRAKES

Course Length

1.7 to 2.5 hours

Course Description

This course is designed to give learners the skills to identify, describe, and explain hydraulics, and the different types of brake systems. Users will also study brake subsystems and become proficient in parking-brake mechanisms and power-assisted brakes, as well as braking force-control valves

Course Topics

Brakes Overview

- ◆ Basic principles of braking
- ◆ How hydraulic brake systems work
- ◆ Pascal's Law

Standard Brake System Components

- ◆ Location of brake system components
- ◆ Materials used in brake system components
- ◆ Functions of brake system components

Drum Brakes

- ◆ Components of the drum brake system
- ◆ Position of drum brake components
- ◆ Material used in drum brake components
- ◆ How drum brakes
- ◆ Different types of rear drum brakes

Disc Brakes

- ◆ Disc brake components and function
- ◆ How disc brakes work
- ◆ Types of disc brakes

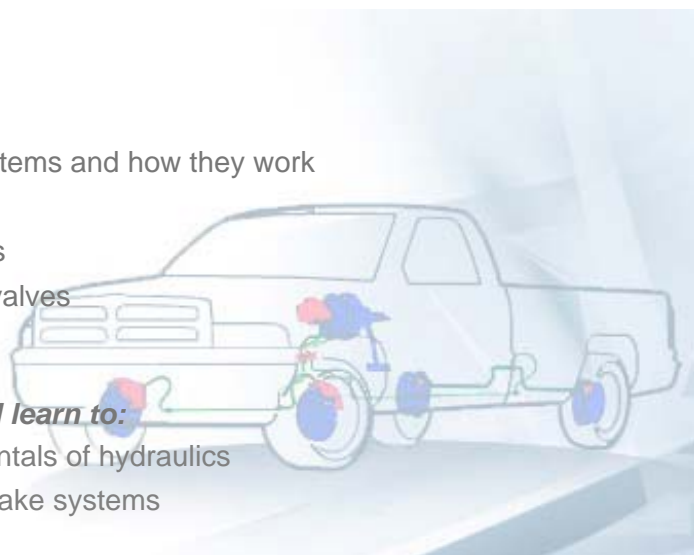
Brake Sub-systems

- ◆ Various brake sub-systems and how they work
- ◆ Parking brakes
- ◆ Power-assisted brakes
- ◆ Braking force-control valves

Course Objectives

In this course, users will learn to:

- ◆ Describe the fundamentals of hydraulics
- ◆ Identify the types of brake systems



- ◆ Identify the standard brake system components
- ◆ Describe how drum brakes and disc brakes work
- ◆ Explain how parking brakes operate
- ◆ Describe how the various power-assisted brakes operate
- ◆ Describe the functions of the braking force-control valves

Course Features

- ◆ Global navigation
- ◆ Practice pages with multiple choice, drag 'n drop, true/false
- ◆ Interactive and animated content pages
- ◆ Glossary and resource links
- ◆ Slide shows
- ◆ Final Assessment

FUNDAMENTALS OF BRAKES

The image displays three overlapping screenshots from the 'Fundamentals of Brakes' courseware, demonstrating its global navigation, instructional graphics, and glossary features.

Top Screenshot: Brake System Components
 This page, titled 'FUNDAMENTALS OF BRAKES', shows a diagram of a car's brake system with numbered callouts (1-9). The text states: 'The components of a brake system are displayed here. Click each component number to learn about it.' A detailed description for '6. Master Cylinder' is provided: 'The master cylinder is the central unit of a hydraulic brake system. The hydraulic pressure is developed inside the master cylinder. When the brake pedal is depressed, the master cylinder piston moves forward and pushes the brake fluid ahead of it. Since the brake lines and wheel cylinders are filled with brake fluid, the piston acts on a solid column of fluid. Master cylinders are made of cast iron or aluminum and are mounted near or on the bulkhead. They are provided with plastic reservoirs for brake fluid. Master cylinder is mounted near or on the bulkhead where it is easy to inspect and repair. The effect of water and dirt is also minimized at this location.'

Middle Screenshot: Glossary
 This page, titled 'Glossary - Microsoft Internet Explorer', features a navigation bar with letters A through Z. A list of terms is shown on the left, including 'Electronic', 'Fuel Pump', 'Galvanized Steel', 'Gap Insurance', 'Gas Filled Shock', 'Absorbers', 'Gear Ratio', 'Generator', 'Glow Plug', 'Glow Plug Resistance-Balance Test', 'Governor', 'Grabbing Brakes', 'Grade Markings', 'Gray Market Vehicle', 'Grease Gun', 'Grease Job', 'Grease Rack', 'Grease Seal', 'Grease HP', 'Group Injection', and 'Grevler'. Definitions are provided for several terms, such as 'Generator: A device that converts mechanical energy into electrical energy. It either AC or DC electricity. In the automobile the generator was re-named in the 1960's. The alternator, technically an AC generator standard terminology for many years. With the adoption of SAE J13 was changed back to generator. Today, the term generator and a both used to describe the same component.'

Bottom Screenshot: Braking Force-Control Valves | Load Proportioning Valve
 This page, titled 'FUNDAMENTALS OF BRAKES', shows a diagram of a load proportioning valve. The text explains: 'The load proportioning valve is attached to the underbody of the vehicle and is controlled by a linkage from the rear axle, or the rear suspension arms. It handles the balancing of pressure on the rear brakes under different loads.' A detailed description for '1. Load Proportioning Valve' is provided: 'When the vehicle is **loaded**, the weight forces the rear of the vehicle down on the springs. This causes the valve to open and supply more hydraulic pressure to the rear brakes. The valve opens fully when the vehicle is heavily loaded. When the vehicle is **unloaded**, the valve partially closes, reducing the hydraulic pressure on the rear brakes. Thus, it prevents the rear wheels from locking and sliding.'

A selection of pages from CTI's **Fundamentals of Brakes** courseware, featuring global navigation, instructional graphics, and glossary of terms