Unit 2: Brakes

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **2-3 weeks**
Status: **Published**

Summary

Students will begin this unit with a review of basic brake operations covered in Automotive Technology-1. After review students will increase their knowledge of the automotive brake system through hands-on activities, group discussions, visual aids, and text and workbook assignments. Students will learn how to diagnose and repair common brake concerns. These concerns include different methods of bleeding a hydraulic system, resurfacing of rotors and drums, and rebuilding and replacing of brake system components. At the end of this unit students will be able to diagnose and repair common brake problems. Emphasis will be placed on safety and proper use of shop equipment.

July 2024

Essential Questions/Enduring Understandings

Essential Questions:

- Why is it important to understand how the brakes operate when diagnosing a brake-related problem?
- Why is Pascal Law crucial for understanding and diagnosing brake system-related problems why is it important?

Enduring Understandings:

- knowledge of an automotive brake system is essential to be able to diagnose and repair it and these skills and procedures will benefit them when attempting to fix a specific problem.
- the automotive brake system is one of the most important systems in the automobile and it is important to keep it in good working condition.
- continuing their education is imperative in the ever-changing automotive field

Objectives

Students Will be Skilled At:

- diagnosing and repairing brake-related problems
- repairing brake lines and hoses
- replacement of components
- bleeding the hydraulic system

Students Will Know:

- the safety precautions and procedures to follow when servicing a brake system.
- Pascal’s law and how it pertains to a modern brake system.
- how air affects the brake system and common problems that can occur.
- the names and operation of the hydraulic and mechanical components of an automotive brake system.
- the difference in operation between drum and disc brake assemblies.

- how to inspect, diagnose, and repair common brake problems.
- the different methods of bleeding a brake hydraulic system.

Learning Plan

- Preview the essential questions and connect to learning throughout the unit.
- Teacher presentation and student research into brake functions, wear, maintenance, and repair.
- Modern Automotive Technology text and workbook assignments
- Hands-on job sheet on brake repair and maintenance.
- Writing prompt on brake safety.
- Written test on brakes.
- Use of a cooperative learning technique to evaluate unit mastery.
- Closing discussion.

Assessment

- **Formative Assessment**

- answer the essential questions.

- participate in research and discussions regarding brake theory and operation
- perform hands-on tasks of drum and disc brake assemblies including but not limited to:• inspect a brake system for leaks and make necessary repairs. • diagnose and determine repair for a malfunctioning hydraulic system (i.e. bleeding). • fabricate brake lines (double flare and ISO types). • perform a drum brake job, includes, removal, cleaning, inspection, of return springs brake levers and related hardware, and reassembly of components. • remove a brake caliper clean and, inspect for leaks or damage and determine the repair procedure. • remove, refinish, and reinstall a rotor and drum and check the parking brake system.
- demonstrate safe work habits.
- demonstrate the proper use of tools.
- **Summative Assessment**
- complete a writing prompt on brake safety.
- complete a written test on brakes.
- **Alternative Assessment**
- Presentation on brake systems
- **Benchmark Assessment**
- Mid-Term/Final Exam

Materials

Modern Automotive Technology Text and Workbook

Corresponding Job Sheets
Brake systems, hydraulic systems, rotors, drums
Automotive Data System

Standards

F.BF.A.1	Write a function that describes a relationship between two quantities.
9.2.12.CAP.2	Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
8.1.12.CS.3	Compare the functions of application software, system software, and hardware.
9.2.12.CAP.4	Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
L.KL.9–10.2	Apply knowledge of language to make effective choices for meaning, or style, and to comprehend more fully when reading, writing, speaking or listening.
8.1.12.CS.4	Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.
9.2.12.CAP.5	Assess and modify a personal plan to support current interests and post-secondary plans.
L.KL.9–10.2.A	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level.
L.KL.9–10.2.C	Demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
8.2.12.EC.1	Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.

Integrated Accommodations and Modifications

Modifications and Accommodations