

SYLLABUS

DATE OF LAST REVIEW: 4/23/2020
CIP CODE: 47.0613
SEMESTER: Departmental Syllabus
COURSE TITLE: Air and Disc Drum Brakes
COURSE NUMBER: DEVT 0145
CREDIT HOURS: 2
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
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KCKCC-issued email accounts are the official means for electronically communicating with our students.

PREREQUISITES: None

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, <http://www.kckccbookstore.com> for the required text for your particular class.

COURSE DESCRIPTION: This is a hands-on course focusing on work that includes common light, medium and heavy truck hydraulic and air brake systems and components. Basic operating theory is covered at the level required to understand or perform the operation, maintenance, inspection, diagnosis, wear pattern, interpretation, failure analysis, reconditioning, disassembly, re-assembly of systems.

METHOD OF INSTRUCTION: A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

I. Brakes

- A. Use appropriate electronic service tool(s) and procedures to diagnose problems.
- B. Check, record and clear diagnostic codes and digital multimeter (DMM) readings

II. Air Brakes: Air Supply and Service Systems

- A. Inspect, test, repair and/or replace air supply system components.
 - B. Test gauge operation and readings.
 - C. Demonstrate understanding of air supply and service system components and operations.
 - D. Inspect air compressor drive gear components.
 - E. Inspect air compressor inlet, oil supply and coolant lines and related components.
 - F. Inspect and test valves.
 - G. Inspect and clean air drier systems and related components.
 - H. Inspect and test brake application (foot/treadle) valve and related components.
- III. Air Brakes: Mechanical/Foundation Brake System
- A. Inspect, test, repair, and/or replace service brake chambers and related components.
 - B. Identify and inspect slack adjusters.
 - C. Check camshafts (S-cam) and related components.
 - D. Inspect rotor and mounting surface and measure rotor thickness.
 - E. Inspect, clean, and adjust air disc brake caliper assemblies, brake pads and hardware.
 - F. Remove, clean, inspect and measure brake drum and mounting surface.
 - G. Diagnose concerns related to the mechanical/foundation brake system.
- IV. Air Brakes: Parking Brake System
- A. Inspect, test and/or replace parking (spring) brake chamber.
 - B. Inspect, test, and/or replace parking (spring) brake check valves and components.
 - C. Inspect, test, and/or replace parking (spring) brake application and release valve.
 - D. Manually release (cage) and reset (uncage) parking (spring) brakes.
 - E. Identify and test anti-compounding brake function.
- V. Power Assist Systems
- A. Observe antilock brake system (ABS) warning light operation.
 - B. Observe automatic traction control (ATC) and electronic stability control (ETC) warning light operation.
 - C. Identify stopping concerns related to the vehicle dynamic brake systems.
 - D. Diagnose problems in the vehicle dynamic brake control systems.
 - E. Check and test operation of vehicle dynamic brake system mechanical and electrical components.
 - F. Test, adjust, repair and/or replace vehicle/wheel speed sensors and circuits.
 - G. Bleed ABS hydraulic circuits.
 - H. Verify power line carrier (PLC) operation.

EXPECTED LEARNER OUTCOMES:

- A. The student will be able to demonstrate knowledge about brake and related problems.
- B. The student will be able to describe the air supply and service system functions of air brakes.
- C. The student will be able to describe the mechanical/foundation brake system of air brakes.
- D. The student will be able to describe the parking brake system of air brakes.
- E. The student will be able to describe power assist systems.
- F. The student will be able to diagnose issues in power assist systems.

COURSE COMPETENCIES:

Upon successful completion of this course:

The student will be able to demonstrate knowledge about brake and related problems.

1. The student will be able to diagnose brake issues.
2. The student will be able to demonstrate knowledge of diagnostic codes and digital multimeter readings.

The student will be able to describe the air supply and service system functions of air brakes.

3. The student will be able to inspect air supply and service system functions.

The student will be able to describe the mechanical/foundation brake system of air brakes.

4. The student will be able to demonstrate knowledge of mechanical/foundation brake systems of air brakes.
5. The student will be able to repair mechanical/foundation brake system of air brakes and related components.

The student will be able to describe the parking brake system of air brakes.

6. The student will be able to replace components of parking brake system of air brakes.
7. The student will be able to demonstrate knowledge of the parking brake system of air brakes.

The student will be able to describe power assist systems.

8. The student will be able to demonstrate knowledge of warning light operations.

The student will be able to diagnose issues in power assist systems.

9. The student will be able to test operation of dynamic and electrical brake systems.
10. The student will be able to replace wheel speed sensors and circuits.

ASSESSMENT OF LEARNER OUTCOMES: Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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