

MTRK 160: MEDIUM AND HEAVY TRUCK HYDRAULICS

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2022
Credits:	3.5
Total Contact Hours:	81
Lecture Hours :	54
Lab Hours:	27
Hours Arranged:	0
Outside of Class Hours:	108
Prerequisite:	MTRK 156A or AUTO 156 or by department consent based upon individual's experience or ASE certifications or manufacturer certification.
Strongly Recommended:	MATH 144.
Transferable to CSU:	Yes
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

Intended for diesel technology majors, this course takes a practical approach to the understanding of fluid power and hydraulic systems. This course focuses on mobile vehicle hydraulic systems that require maintenance or troubleshooting. Coverage includes a study of terminology, industrial standards, symbols and basic circuitry design as related to hydraulic systems. Course will focus on heavy truck, earth-moving, and agricultural equipment. 54 lecture hours, 27 lab hours.

Course Objectives

- identify components and servicing techniques on mobile vehicle hydraulic systems.
- demonstrate knowledge of scientific principles present in hydraulic systems.
- demonstrate knowledge of safe practices used in servicing hydraulic systems.
- perform pressure tests on various points throughout a hydraulic system
- perform hydraulic system pressure line removal and installations
- perform hydraulic cylinder removal, inspections and rebuilds
- identify hydraulic control malfunctions and perform necessary repairs

Major Course Content

1. Hydraulic systems overview
2. Cylinder and motor hydraulic circuits
3. Mathematical calculations associated with hydraulics
4. Reading hydraulic schematics
5. Oils and fluids
6. Tubing, piping and hoses
7. Fittings and couplers
8. Controls

9. Maintenance
10. Diagnostics

Lab Content

1. Hydraulic system component identification
2. Pressure test hydraulic circuits
3. Flow test hydraulic circuits and pumps
4. Remove and install hydraulic line
5. Remove and install hydraulic pump
6. Demonstrate safe practices while working a hydraulic systems
7. Repair system leaks
8. Diagnose causes for low/high hydraulic pressures

Suggested Reading Other Than Required Textbook

Technical articles—both peer-reviewed and other—published in periodicals and electronically.

Examples of Required Writing Assignments

Examples: Using Pascal's principle, calculate the weight the output piston can lift in a simple two piston hydraulic system if the input piston has a 2 sq. in. area, the output piston has a 10 sq. in. area and 200 lbs. of force is applied to the input piston?

Describe two advantages and two disadvantages of using hydraulic vs. pneumatic systems for lifting purposes.

Examples of Outside Assignments

Weekly review questions (objective) Weekly article summaries & analyses (subjective) Using Pascal's principle, calculate the weight the output piston can lift in a simple two piston hydraulic system if the input piston has a 2 sq. in. area, the output piston has a 10 sq. in. area and 200 lbs. of force is applied to the input piston?

Describe two advantages and two disadvantages of using hydraulic vs. pneumatic systems for lifting purposes.

Instruction Type(s)

Lecture, Lab, Online Education Lecture