

MTRK 164: MEDIUM AND HEAVY TRUCK CHASSIS SERVICE, DIAGNOSIS AND REPAIR

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2023
Credits:	6
Total Contact Hours:	184
Lecture Hours :	72
Lab Hours:	112
Hours Arranged:	0
Outside of Class Hours:	144
Prerequisite:	MTRK 101 or MTRK 148, or by department consent based upon individual's experience or ASE certifications or manufacturer certification.
Transferable to CSU:	Yes
Transferable to UC:	No
Grading Method:	Standard Letter, Pass/No Pass

Catalog Course Description

Intended for those seeking a career in the medium and heavy duty truck service and repair industry, this course covers essential chassis system theory, along with inspection, diagnosis, service & repair of the following systems: brake, steering, suspension, alignment, wheel/tire, and ABS. Course prepares students for ASE Suspension and Steering (T4) and ASE Brakes (T5) certification. 72 lecture hours, 112 lab hours.

Course Objectives

- complete ninety-five percent (95%) of Priority 1 (P-1), seventy percent (70%) of Priority 2 (P-2) twenty-five percent (25%) of the Priority 3 (P-3) required National Automotive Technician Education Foundation (NATEF) objectives for Suspension & Steering and Brakes (T4 and T5). Please see attached NATEF objectives (pages 50-58) or www.natef.org for the most current objectives.
- Identify causes of abnormal tire wear and corrective measures needed
- Perform large truck tire dismounting and mounting using hand tools and using a large truck tire machine
- Perform tractor and trailer alignment using mechanical alignment means and using an electronic aligner.
- Identify causes of suspension system faults and failures
- Perform hub and kingpin removal and reinstallation using recommended industry procedure
- Perform heavy truck brake inspection and replacement
- Identify air brake system maintenance and repair procedures
- Identify hydraulic brake maintenance and repair procedures
- Perform ABS and Traction Control System inspection and diagnostics

Major Course Content

1. Safety Specific to the Chassis Systems
2. Fasteners, Gaskets and Seals Specific to the Chassis System
3. Brake System Principles
 - a. Pascal's law and hydraulics
 - b. Energy
 - c. Mechanical
 - d. Brake fade
 - e. Lining Composition
4. Theory, Service, Diagnosis and Repair of the following brake subsystems
 - a. Hydraulic systems
 - i. front/rear split, diagonal split, quick take-up master cylinders
 - ii. valves and switches
 - iii. lines and hoses
 - iv. bleeding and flushing
 - b. Drum
 - c. Disc
 - d. Parking Brake
 - e. Power assist systems
 - f. ABS, Traction and Stability control
 - i. Electronic Brake Distribution (EBD)
 - ii. Active safety systems
 - iii. Brake-by-wire
 - g. Wheel Bearings
 - h. Air Brakes
5. Tire and Wheel
 - a. Construction and sizing
 - b. Ratings
 - c. Theory, service, Diagnosis, and repair of the following
 - i. Runout
 - ii. Imbalance
 - iii. Low Tire Pressure Monitoring Systems
6. Theory, Service, Diagnosis and repair of Suspension systems
7. Theory, Service, Diagnosis and repair of Steering systems and subsystems
8. Steering and Suspension Geometry
 - a. Basic alignment theory, service, diagnosis and repair
 - i. Caster, Camber, and Toe (individual and total)
 - b. Advanced alignment theory, service, diagnosis and repair
 - i. SAI, IA, Ackerman, setback, frame angle, weight distribution
 - ii. Determining structure damage
9. Trailer chassis and frame inspection and repair
 - a. Frame inspection and repair or replacement of components
 - b. Wheel and chassis inspection and repair
10. Service Literature Specific to the Chassis
11. Repair Order Documentation specific to the Chassis

Lab Content

1. Service, Diagnosis, and Repair of the following Chassis Systems
 - a. Hydraulic Brake Systems
 - i. Disc
 - ii. Drum
 - iii. Parking Brake

- iv. Power Assist
- v. ABS and Traction Control
- b. Air Brake System
 - i. Air supply
 - ii. Primary and secondary air circuits
 - iii. Trailer brake circuits
- c. Air Over Hydraulic Brake System
- d. Wheel Bearings
- e. Tires and Wheels (including tire monitoring systems)
 - i. Suspension
 - ii. Steering
- f. Alignment (suspension and steering geometry)

Suggested Reading Other Than Required Textbook

Medium and Heavy Duty Truck periodicals. Other professional journals

Examples of Required Writing Assignments

Write short summaries of trade journal articles. Complete repair order and documentation.

Examples of Outside Assignments

Complete weekly ASE preparation exam homework questions. Complete post lab critical thinking questions.

Examples:

On the air brake system given, what should the brake chamber push-rod stroke be in inches?

What are three possible reasons for the stroke to be greater than the specification?

Instruction Type(s)

Lab, Lecture, Online Education Lecture