



Western Technical College

32412402 Diesel Truck Chassis Systems

Course Outcome Summary

Course Information

Description	This course is a practical study in performing diagnosis and repair of heavy truck chassis systems and components.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Technical Diploma Courses
Total Credits	3
Total Hours	108

Textbooks

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems. 2nd Edition. Copyright 2020. Wright, Gus and Owen C. Duffy. Publisher: Jones & Bartlett Publishers. **ISBN-13**: 978-1-284-15093-3. Required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor**: To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor**: To be discussed in class. Required.

Uniform: Four black/grey shirts with embroidered name. **Vendor**: Campus Shop. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections

2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Develop Resilience
5. Live Responsibly: Embrace Sustainability
6. Live Responsibly: Foster Accountability
7. Refine Professionalism: Act Ethically
8. Refine Professionalism: Improve Critical Thinking
9. Refine Professionalism: Participate Collaboratively
10. Refine Professionalism: Practice Effective Communication

High Impact Practices

1. Learning Community: these courses are designed to enhance your learning experience in which a cohort of peers complete two or more courses that are linked through projects, themes, or program emphasis.

Program Outcomes

1. Diagnose, repair and service brake systems
2. Diagnose, repair and service steering & suspension systems

Course Competencies

1. Investigate steering column.

Assessment Strategies

- 1.1. Written product
- 1.2. Skill demonstration
- 1.3. Written Objective tests

Criteria

You will know you are successful when:

- 1.1. you attend class regularly
- 1.2. you arrive for class on time
- 1.3. you listen attentively during class
- 1.4. you pass written exams at level indicated by the instructor
- 1.5. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc...

Learning Objectives

- 1.a. Check steering wheel operation for free play and binding.
- 1.b. Identify causes of fixed and driver adjustable steering column and shaft noise, looseness, and binding problems; determine needed action.
- 1.c. Inspect and service steering shaft U-joint(s), slip joints, bearings, bushings, and seals; phase shaft.
- 1.d. Check cab mounting and adjust ride height.
- 1.e. Remove the steering wheel (includes steering wheels equipped with electrical/electronic controls and components); install and center the steering wheel. Inspect, test, replace and calibrate steering angle sensor.

2. Perform steering unit and linkage inspection and repair.

Assessment Strategies

- 2.1. Written product

- 2.2. Skill demonstration
- 2.3. Written Objective tests

Criteria

You will know you are successful when:

- 2.1. you wear personal protective equipment
- 2.2. you follow safety procedures
- 2.3. you select the correct tools, equipment, instruments, materials and supplies
- 2.4. you perform critical steps in the right order from start to finish
- 2.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

- 2.a. Identify causes of power steering system noise, steering binding, darting/oversteer, reduced wheel cut, steering wheel kick, pulling, non-recovery, turning effort, looseness, hard steering, overheating, fluid leakage, and fluid aeration problems; determine needed action.
- 2.b. Determine recommended type of power steering fluid; check level and condition; determine needed action.
- 2.c. Flush and refill power steering system; purge air from system.
- 2.d. Perform power steering system pressure, temperature, and flow tests; determine needed action.
- 2.e. Inspect, service, or replace power steering reservoir including filter, seals, and gaskets.
- 2.f. Inspect power steering pump drive gear and coupling; replace as needed.
- 2.g. Inspect, adjust, or replace power steering pump, mountings, and brackets.
- 2.h. Inspect and replace power steering system cooler, lines, hoses, clamps/mountings, hose routings, and fittings.
- 2.i. Inspect, adjust, repair, or replace integral type power steering gear(s) (single and/or dual) and mountings.
- 2.j. Inspect and align pitman arm; replace as needed.
- 2.k. Check and adjust steering (wheel) stops; verify relief pressures.
- 2.l. Inspect and lubricate steering components.

3. Perform suspension inspection and repair.

Assessment Strategies

- 3.1. Written product
- 3.2. Skill demonstration
- 3.3. Written Objective tests

Criteria

You will know you are successful when:

- 3.1. you wear personal protective equipment
- 3.2. you follow safety procedures
- 3.3. you select the correct tools, equipment, instruments, materials and supplies
- 3.4. you perform critical steps in the right order from start to finish
- 3.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

- 3.a. Inspect front axles and attaching hardware; determine needed action.
- 3.b. Inspect and service kingpins, steering knuckle bushings, locks, bearings, seals, and covers; determine needed action.
- 3.c. Inspect shock absorbers, bushings, brackets, and mounts; replace as needed.
- 3.d. Inspect leaf springs, center bolts, clips, pins and bushings, shackles, U-bolts, insulators, brackets, and mounts; determine needed action.
- 3.e. Inspect axle aligning devices such as radius rods, track bars, stabilizer bars, torque arms, related bushings, mounts, shims, and cams; determine needed action.
- 3.f. Inspect and test air suspension pressure regulator and height control valves, lines, hoses, dump valves, and fittings; adjust, repair or replace as needed.
- 3.g. Inspect air springs, mounting plates, springs, suspension arms, and bushings; replace as needed.
- 3.h. Measure and adjust ride height; determine needed action.
- 3.i. Identify rough ride problems; determine needed action.

4. Perform wheel alignment inspection, adjustment and repair.

Assessment Strategies

- 4.1. Written product
- 4.2. Skill demonstration
- 4.3. Written Objective tests

Criteria

You will know you are successful when:

- 4.1. you wear personal protective equipment
- 4.2. you follow safety procedures
- 4.3. you select the correct tools, equipment, instruments, materials and supplies
- 4.4. you perform critical steps in the right order from start to finish
- 4.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

- 4.a. Identify causes of vehicle wandering, pulling, shimmy, hard steering, and off-center steering wheel problems; adjust or repair as needed.
- 4.b. Check camber; determine needed action.
- 4.c. Check caster; adjust as needed.
- 4.d. Check and adjust toe settings.
- 4.e. Check rear axle(s) alignment (thrustline/centerline) and tracking; adjust or repair as needed.
- 4.f. Identify turning/Ackerman angle (toe-out-on-turns) problems; determine needed action.
- 4.g. Check front axle alignment (centerline); adjust or repair as needed.
- 4.h. Identify tire wear patterns; check tread depth and pressure determine needed action.
- 4.i. Identify wheel/tire vibration, shimmy, pounding, hop (tramp) problems; determine needed action.
- 4.j. Remove and install steering and drive axle wheel/tire assemblies; torque mounting hardware to specifications with torque wrench.
- 4.k. Inspect tire for proper application, (size, load range, position, and tread design); determine needed action.
- 4.l. Inspect wheel/rims for proper application, load range, size, and design; determine needed action.
- 4.m. Check operation of tire pressure monitoring system (TPMS); determine needed action if applicable.
- 4.n. Inspect tires for cuts, cracks, bulges, and sidewall damage.
- 4.o. Inspect valve caps and stems; determine needed action.
- 4.p. Measure and record tread depth; probe for imbedded debris.
- 4.q. Check wheel mounting hardware; determine needed action.
- 4.r. Inspect wheels for cracks, damage and proper hand hold alignment.
- 4.s. Check tire matching (diameter and tread) on single and dual tire applications.

5. Perform frame and coupling devices inspection and repair.

Assessment Strategies

- 5.1. Written product
- 5.2. Skill demonstration
- 5.3. Written Objective tests

Criteria

You will know you are successful when:

- 5.1. you wear personal protective equipment
- 5.2. you follow safety procedures
- 5.3. you select the correct tools, equipment, instruments, materials and supplies
- 5.4. you perform critical steps in the right order from start to finish
- 5.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

- 5.a. Inspect, service, and/or adjust fifth wheel, pivot pins, bushings, locking mechanisms, and mounting hardware.
- 5.b. Inspect and service sliding fifth wheel, tracks, stops, locking systems, air cylinders, springs, lines, hoses, and controls.
- 5.c. Inspect frame and frame members for cracks, breaks, corrosion, distortion, elongated holes, looseness, and damage; determine needed repairs.
- 5.d. Check quarter fenders, mud flaps, and brackets.

5.e. Check pintle hook assembly and mounting, if applicable.