Western Technical College

32412400 Diesel Truck Preventive Maintenance

Course Outcome Summary

Course Information

Description	This course is a practical study in performing heavy truck preventive maintenance inspections as well as Department of Transportation annual vehicle inspections.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Technical Diploma Courses
Total Credits	1
Total Hours	36

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.

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
3. Diagnose, repair and service electrical/electronic systems
4. Diagnose, repair and service HVAC systems
5. Diagnose, repair and service drive train systems
6. Diagnose, repair and service hydraulic systems
7. Diagnose, repair and service diesel engines

Course Competencies

1. Explore preventive maintenance intervals.

Assessment Strategies

1.1. Written Product
1.2. Skill Demonstration
1.3. Written Objective Test

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, and case studies.

Learning Objectives

1.a. Define preventive maintenance intervals.
1.b. Discuss application of preventive maintenance intervals.
1.c. Describe consequences of inadequate preventive maintenance intervals.

2. Perform engine compartment inspection.

Assessment Strategies

2.1. Written Product
2.2. Skill Demonstration
2.3. Written Objective Test

Criteria

Performance will be satisfactory 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. Check engine starting/operation (including unusual noises, vibrations, exhaust smoke, etc.); record idle and governed rpm.
2.b. Inspect vibration damper.
2.c. Inspect belts, tensioners, and pulleys; check and adjust belt tension; check belt alignment.
2.d. Check engine oil level and condition; check dipstick seal.

2.e. Inspect engine mounts for looseness and deterioration.
2.f. Check engine for oil, coolant, air, fuel, and exhaust leaks (Engine Off and Running).
2.g. Check engine compartment wiring harnesses, connectors, and seals for damage and proper routing.

3. Perform fuel system inspection.

Assessment Strategies

3.1. Written Product
3.2. Skill Demonstration
3.3. Written Objective Test

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 fuel tanks, vents, caps, mounts, valves, screens, crossover system, supply and return lines, and fittings; determine needed action.
3.b. Check fuel level and condition; determine needed action.
3.c. Drain water from fuel system.
3.d. Service water separator/fuel heater; replace fuel filter(s); prime and bleed fuel system.

4. Perform air induction and exhaust system inspection.

Assessment Strategies

4.1. Written Product
4.2. Skill Demonstration
4.3. Written Objective Test

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. Check exhaust system mountings for looseness and damage.
4.b. Check engine exhaust system for leaks, proper routing, and damaged or missing components to include exhaust gas recirculation (EGR) system and after treatment devices, if equipped.
4.c. Check air induction system: piping, charge air cooler, hoses, clamps, and mountings; check for air restrictions and leaks.
4.d. Inspect turbocharger for leaks; check mountings and connections.
4.e. Check operation of engine compression/exhaust brake.
4.f. Service or replace air filter as needed; check and reset air filter restriction indicator.
4.g. Inspect and service crankcase ventilation system.
4.h. Inspect diesel exhaust fluid (DEF) system, to include tanks, lines, gauge pump, and filter.
4.i. Inspect selective catalyst reduction (SCR) system; including diesel exhaust fluid (DEF) for proper levels, leaks, mounting and connections.

5. Perform cooling system inspection.

Assessment Strategies

5.1. Written Product
5.2. Skill Demonstration
5.3. Written Objective Test

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 and reinstall/replace pulleys, tensioners, and drive belts; adjust drive belts and check alignment.
5.b. Inspect coolant conditioner/filter assembly for leaks; inspect valves, lines, and fittings; replace as needed.
5.c. Check operation of fan clutch.
5.d. Inspect radiator (including air flow restriction, leaks, and damage) and mountings.
5.e. Inspect fan assembly and shroud.
5.f. Pressure test cooling system and radiator cap.
5.g. Inspect coolant hoses and clamps.
5.h. Inspect coolant recovery system.
5.i. Check coolant for contamination, additive package concentration, aeration, and protection level (freeze point).
5.j. Service coolant filter.
5.k. Inspect water pump.
5.l. Inspect thermostatic cooling fan system (hydraulic, pneumatic, and electronic) and fan shroud; replace as needed.

6. Investigate lubrication system maintenance, service and procedures.

Assessment Strategies

6.1. Written Product
6.2. Skill Demonstration
6.3. Written Objective Test

Criteria

You will know you are successful when:

6.1. you attend class regularly.
6.2. you arrive for class on time.
6.3. you listen attentively during class.
6.4. you pass written exams at level indicated by the instructor.
6.5. you meet criteria for successful completion of written products, lab sheets, presentations, and case studies.

Learning Objectives

6.a. Change engine oil and filters; visually check oil for coolant or fuel contamination; inspect and clean magnetic drain plugs.
6.b. Take an engine oil sample for analysis.

7. Perform instruments and controls inspection.

Assessment Strategies

7.1. Written Product
7.2. Skill Demonstration
7.3. Written Objective Test

Criteria

You will know you are successful when:

7.1. you wear personal protective equipment.
7.2. you follow safety procedures.
7.3. you select the correct tools, equipment, instruments, materials, and supplies.
7.4. you perform critical steps in the right order from start to finish.
7.5. you are able to verbalize sound reasoning for the decisions made throughout the process.

Learning Objectives

7.a. Inspect key condition and operation of ignition switch.
7.b. Check warning indicators.
7.c. Check instruments; record oil pressure and system voltage.
7.d. Check operation of electronic power take off (PTO) and engine idle speed controls (if applicable).
7.e. Check HVAC controls.
7.f. Check operation of all accessories.
7.g. Using electronic service tool(s) or on-board diagnostic system; retrieve engine monitoring information; check and record diagnostic codes and trip/operational data (including engine, transmission, ABS, and other systems).

8. Perform safety equipment inspection.

Assessment Strategies

8.1. Written product
8.2. Skill demonstration
8.3. Written Objective tests

Criteria

Performance will be satisfactory when:

8.1. you wear personal protective equipment
8.2. you follow safety procedures
8.3. you select the correct tools, equipment, instruments, materials and supplies
8.4. you perform critical steps in the right order from start to finish
8.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

8.a. Check operation of electric/air horns and reverse warning devices.
8.b. Check condition of spare fuses, safety triangles, fire extinguisher, and all required decals.
8.c. Inspect seat belts and sleeper restraints.
8.d. Inspect wiper blades and arms.

9. Perform cab, hood, and body inspection.

Assessment Strategies

9.1. Written product
9.2. Skill demonstration
9.3. Written Objective tests

Criteria

Performance will be satisfactory when:

9.1. you wear personal protective equipment
9.2. you follow safety procedures
9.3. you select the correct tools, equipment, instruments, materials and supplies
9.4. you perform critical steps in the right order from start to finish
9.5. you are able to verbalize sound reasoning for the decisions made throughout the process

Learning Objectives

9.a. Check operation of wiper and washer.
9.b. Inspect windshield glass for cracks or discoloration; check sun visor.
9.c. Check seat condition, operation, and mounting.
9.d. Check door glass and window operation.
9.e. Inspect steps and grab handles.
9.f. Inspect mirrors, mountings, brackets, and glass.
9.g. Record all observed physical damage.
9.h. Lubricate all cab and hood grease fittings.
9.i. Inspect and lubricate door and hood hinges, latches, strikers, lock cylinders, safety latches, linkages, and cables.
9.j. Inspect cab mountings, hinges, latches, linkages, and ride height; service as needed.

10. Perform heating, ventilation and air conditioning system inspection.

Assessment Strategies

10.1. Written Product
10.2. Skill Demonstration
10.3. Written Objective Test

Criteria

You will know you are successful when:

10.1. you wear personal protective equipment.
10.2. you follow safety procedures.
10.3. you select the correct tools, equipment, instruments, materials, and supplies.
10.4. you perform critical steps in the right order from start to finish.
10.5. you are able to verbalize sound reasoning for the decisions made throughout the process.

Learning Objectives

10.a. Inspect A/C condenser and lines for condition and visible leaks; check mountings.
10.b. Inspect A/C compressor and lines for condition and visible leaks; check mountings.
10.c. Check A/C system condition and operation; check A/C monitoring system, if applicable.
10.d. Check HVAC air inlet filters and ducts; service as needed.

11. Perform electrical system inspection.

Assessment Strategies

11.1. Written Product
11.2. Skill Demonstration
11.3. Written Objective Test

Criteria

You will know you are successful when:

11.1. you wear personal protective equipment.
11.2. you follow safety procedures.
11.3. you select the correct tools, equipment, instruments, materials, and supplies.
11.4. you perform critical steps in the right order from start to finish.
11.5. you are able to verbalize sound reasoning for the decisions made throughout the process.

Learning Objectives

11.a. Inspect battery box(es), cover(s), and mountings.
11.b. Inspect battery hold-downs, connections, cables, and cable routing; service as needed.
11.c. Engage starter; check for unusual noises, starter drag, and starting difficulty.
11.d. Inspect alternator, mountings, cable, wiring, and wiring routing; determine needed action.
11.e. Check operation of interior lights; determine needed action.
11.f. Check all exterior lights, lenses, reflectors, and conspicuity tape; check headlight alignment; determine needed action.
11.g. Inspect and test tractor-to-trailer multi-wire connector(s), cable(s), and holder(s); determine needed action.

12. Investigate Department of Transportation regulations.

Assessment Strategies

12.1. Written Product
12.2. Skill Demonstration
12.3. Written Objective Test

Criteria

You will know you are successful when:

12.1. you will list criteria that indicate a heavy truck needs an annual DOT inspection.
12.2. you will identify from given scenarios vehicles that need an annual DOT inspection.
12.3. you will list criteria that indicates a vehicle needs a US DOT number.
12.4. you will list criteria needed to perform annual DOT inspections.
12.5. you will list out of service criteria for components associated with a heavy truck.
12.6. you attend class regularly.
12.7. you arrive for class on time.

12.8. you listen attentively during class.
12.9. you pass written exams at level indicated by the instructor.
12.10. you meet criteria for successful completion of written products; lab sheets, presentations, and case studies.

Learning Objectives

12.a. Determine what heavy trucks need annual DOT inspections.
12.b. Determine what heavy trucks need US DOT numbers.
12.c. Identify criteria that indicates a person can perform DOT inspections.
12.d. Identify Out Of Service Criteria for DOT inspections.

13. Perform brake system inspection.

Assessment Strategies

13.1. Written Product
13.2. Skill Demonstration
13.3. Written Objective Test

Criteria

Performance will be satisfactory when:

13.1. you wear personal protective equipment.
13.2. you follow safety procedures.
13.3. you select the correct tools, equipment, instruments, materials, and supplies.
13.4. you perform critical steps in the right order from start to finish.
13.5. you are able to verbalize sound reasoning for the decisions made throughout the process.

Learning Objectives

13.a. Analyze components of a brake system.
13.b. Break down the key steps in a brake inspection.