

HEAVY EQUIPMENT OPERATOR CORE PROFILE OF TRAINING MASTERY

Instructor _____

Date _____

Program _____

Grade _____ School _____

Name _____ Soc. Sec. No. _____

Address _____ Phone _____

In Case of Emergency, Contact _____

Address _____ Phone _____

Allergies/Disabilities that might require special accommodation for training (please specify) _____

The above information can be used for school records and/or to ensure safety of students. This confidential information is not to be released to employers or the general public.

Date of Enrollment ____ - ____ - ____ Total Class Hours _____ Total Hours Absent _____

Date of Withdrawal ____ - ____ - ____ Total On-the-Job Training Hours _____ Total Hours Tardy _____

Date of Completion ____ - ____ - ____ Total Lab Hours _____

ON-THE-JOB TRAINING/WORK EXPERIENCE

Duration of Employment	Job Title	Supervisor's Name
Address of Employer	Phone	

Duration of Employment	Job Title	Supervisor's Name
Address of Employer	Phone	

Use of This Document

This document can be used to record information about the student and skills mastered. This information is useful in documenting student progress during training and in providing information about the student's qualifications to potential employers and/or for entry into advanced training programs. Instructors using these materials are authorized to reproduce this document as required for use in their training programs.



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SPECIFIC JOB COMPETENCIES

Instructor: As each competency is mastered, place your initials and the date in the blank on the left. This will verify that the student can perform the skill with a minimum of supervision.

Date/Initials

Date/Initials

UNIT 1 — INDUSTRY ORIENTATION

- _____ 1. Choose significant points about the heavy equipment industry.
- _____ 2. Select characteristics of a good equipment operator.
- _____ 3. Select major skills involved in operating heavy equipment.
- _____ 4. Identify basic types of equipment and their uses.

UNIT 2 — WORKPLACE SAFETY AND HEALTH

- _____ 1. Explain the importance of working safely.
- _____ 2. Identify sources of safe work practices in the heavy equipment industry.
- _____ 3. State the responsibilities of employees according to OSHA.
- _____ 4. State guidelines for personal safety.
- _____ 5. State rules for working safely.
- _____ 6. Interpret the safety color code.
- _____ 7. Properly lift an object. (Job Sheet 1)
- _____ 8. Describe ways of extinguishing a fire.
- _____ 9. Distinguish among the basic classes of fire.
- _____ 10. Use a fire extinguisher. (Job Sheet 2)
- _____ 11. List characteristics of hazardous material.
- _____ 12. Recognize the dangers from toxic substances on the job.
- _____ 13. Interpret the hazard warning system used to classify hazards.
- _____ 14. State guidelines for working with flammable materials and toxic substances.
- _____ 15. Select common injuries and their causes for heavy equipment operators.
- _____ 16. Select recommendations for proper heavy equipment operator safety.
- _____ 17. Use a material safety data sheet (MSDS). (Assignment Sheet 1)
- _____ 18. Identify sources of accidents and possible injuries in the workplace.
- _____ 19. Identify types of injuries caused by accidents.
- _____ 20. State guidelines for responding to accidents and emergencies.
- _____ 21. Explain the legal aspects of first aid.
- _____ 22. Complete statements about first aid kits.
- _____ 23. Select guidelines to reduce disease transmission when providing first aid.
- _____ 24. Select guidelines for providing first aid for cuts.
- _____ 25. Select guidelines for providing first aid for an eye injury.
- _____ 26. Distinguish among signs and symptoms of sprains and fractures.
- _____ 27. Select guidelines for providing first aid in response to a poisonous or chemical substance.
- _____ 28. Identify signs and symptoms of a heart attack.
- _____ 29. Analyze work situations to determine correct first aid responses. (Assignment Sheet 3)

UNIT 3 — MATH

- _____ 1. Match terms associated with basic math to their correct definitions.
- _____ 2. Label place values of a whole number.
- _____ 3. Add whole numbers. (Assignment Sheet 1)
- _____ 4. Subtract whole numbers. (Assignment Sheet 2)
- _____ 5. Multiply whole numbers. (Assignment Sheet 3)
- _____ 6. Divide whole numbers. (Assignment Sheet 4)
- _____ 7. Distinguish among types of fractions. (Assignment Sheet 5)
- _____ 8. Reduce fractions to lowest terms. (Assignment Sheet 6)
- _____ 9. Convert mixed numbers to improper fractions. (Assignment Sheet 7)
- _____ 10. Convert improper fractions to mixed numbers. (Assignment Sheet 8)
- _____ 11. Add fractions. (Assignment Sheet 9)
- _____ 12. Subtract fractions. (Assignment Sheet 10)
- _____ 13. Multiply fractions. (Assignment Sheet 11)
- _____ 14. Label the place values of a decimal number.
- _____ 15. Add decimal numbers. (Assignment Sheet 12)
- _____ 16. Subtract decimal numbers. (Assignment Sheet 13)
- _____ 17. Multiply decimal numbers. (Assignment Sheet 14)
- _____ 18. Divide decimal numbers. (Assignment Sheet 15)
- _____ 19. Convert decimal fractions to common fractions.

- _____ 20. Convert common fractions to decimal numbers and percentages. (Assignment Sheet 16)
- _____ 21. Identify decimal and fractional equivalents.
- _____ 22. Convert percentages to fractions and decimal numbers.
- _____ 23. Solve percentage problems. (Assignment Sheet 17)
- _____ 24. Match terms used in geometry to their correct descriptions.
- _____ 25. Match types of geometric figures to their correct descriptions.
- _____ 26. Match units of measure to their correct equivalents.
- _____ 27. Calculate the area of geometric figures. (Assignment Sheet 18)
- _____ 28. Calculate volume of solid figures. (Assignment Sheet 19)
- _____ 29. Solve basic ratio and proportion problems. (Assignment Sheet 20)
- _____ 30. Review useful shop formulas.

UNIT 4 — GRADE WORK

- _____ 1. Match terms associated with grade work to the correct definitions.
- _____ 2. Select the purposes of stakes and information given on stakes.
- _____ 3. Select the correct uses for types of stakes.
- _____ 4. Identify equipment used to check stakes.
- _____ 5. Identify parts of a hand level.
- _____ 6. Select reasons for using slope stakes.
- _____ 7. Select the meaning of slope ratio.
- _____ 8. Identify parts of a roadbed.
- _____ 9. Select features of a good road design.
- _____ 10. Arrange in order procedures for laying in a roadbed.
- _____ 11. Review the procedure to read an engineer's rule.
- _____ 12. Read an engineer's rule. (Assignment Sheet)
- _____ 13. Check a cut and fill. (Job Sheet 1)
- _____ 14. Check grades. (Job Sheet 2)
- _____ 15. Transfer elevations. (Job Sheet 3)
- _____ 16. Use a hand level to find height of a hill. (Job Sheet 4)

UNIT 5 — SOILS

- _____ 1. Match terms associated with soil to the correct definitions.
- _____ 2. Distinguish between the physical properties of soil.
- _____ 3. Distinguish between the basic classifications and types of soils.
- _____ 4. Select methods of stabilizing soil.
- _____ 5. Select methods of applying energy to soil to attain compaction.
- _____ 6. Distinguish between soil that is too wet, too dry, and at optimum levels.
- _____ 7. Identify types of compacting equipment and their uses.
- _____ 8. Stabilize high clay content soil with hydrated lime.
- _____ 9. Field test soil.

UNIT 6 — LOAD, LASH, AND UNLOAD EQUIPMENT

- _____ 1. Match terms associated with loading, lashing, and unloading heavy equipment to the correct definitions.
- _____ 2. Select safety precautions for loading and moving equipment.
- _____ 3. Select types of equipment used to move heavy equipment.
- _____ 4. Select devices used to load equipment.
- _____ 5. Select reasons for side loading equipment and precautions to take when side loading.
- _____ 6. Choose reasons why pavement should be protected and ways to protect it.
- _____ 7. Order the steps for lashing (securing) equipment.
- _____ 8. Load a bulldozer from the rear. (Job Sheet 1)
- _____ 9. Unload a bulldozer from the rear. (Job Sheet 2)

Student ratings on specific competencies evaluated during the course are available upon student's written request and/or by calling the instructor. Parent's or guardian's signature is necessary if student is under 18 years of age.

UNIT 7 — OXYACETYLENE CUTTING

- _____ 1. 1. Select advantages of oxyacetylene cutting.
- _____ 2. Select statements about safety requirements for oxyacetylene cutting.
- _____ 3. Select statements about safety rules for the oxyacetylene workplace.
- _____ 4. Select solutions for personal safety requirements.
- _____ 5. Solve problems about pressure regulating valves.
- _____ 6. Differentiate between hoses and their characteristics.
- _____ 7. Identify parts of an oxyacetylene cutting torch.
- _____ 8. Solve problems about types of mixers and their purposes.
- _____ 9. Solve basic problems about basic safety rules of oxyacetylene cylinders and gases.
- _____ 10. Select oxyacetylene flame characteristics and uses.
- _____ 11. Select guidelines for flame adjustment.
- _____ 12. Select characteristics and causes of backfire and flashback.
- _____ 13. Arrange in order the steps in setting up cylinders and regulators.
- _____ 14. Select statements about steps in purging oxygen and fuel gas regulators.
- _____ 15. Select correct procedures for final steps in setting up oxy-fuel equipment.
- _____ 16. Select guidelines for cutting tip selection.
- _____ 17. Select true statements about guidelines for cleaning cutting tips.
- _____ 18. Match tip cleaning tools with their uses.
- _____ 19. Arrange in order the steps for properly starting a cut.
- _____ 20. Select techniques for restarting a cut.
- _____ 21. Select techniques for cutting straight lines.
- _____ 22. Select techniques for controlling kerf and drag.
- _____ 23. Select elements of a good cut.
- _____ 24. Select causes for characteristics of poor cuts.
- _____ 25. Set up, adjust cutting flame, and shut down oxyacetylene cutting equipment (Job Sheet 1)
- _____ 26. Make 90° cuts and restart a cut on mild steel. (Job Sheet 2)
- _____ 27. Make a flame-beveled cut on mild steel plate. (Job Sheet 3)
- _____ 28. Cut holes in mild steel. (Job Sheet 4)

UNIT 8 — BASIC ENGINE PRINCIPLES

- _____ 1. Match terms related to basic engine principles with their definitions.
- _____ 2. Choose the functions of basic engine systems.
- _____ 3. Distinguish between characteristics of gasoline and diesel engines.
- _____ 4. Identify basic parts of diesel and gasoline engines and their functions.
- _____ 5. Identify the strokes in a two-stroke and four-stroke engine.
- _____ 6. Identify the components of a cooling system.
- _____ 7. Choose the operation of a thermostat.
- _____ 8. Select preventive maintenance procedures for the cooling system.
- _____ 9. Identify fuel system components for gasoline and diesel engines.
- _____ 10. Select types of air cleaners.
- _____ 11. Identify types of electrical circuits.
- _____ 12. Select factors affecting resistance in a conductor.
- _____ 13. Choose the definition of Ohm's law.
- _____ 14. Select the laws of series and parallel circuits.
- _____ 15. Distinguish between direct current (DC) and alternating current (AC).
- _____ 16. Choose the functions and working principles of batteries in vehicles.
- _____ 17. Select dangers associated with batteries and safety rules pertaining to care and maintenance of batteries.
- _____ 18. Select steps to follow when servicing batteries.
- _____ 19. Identify components of the starting system.
- _____ 20. Select the functions of various parts of the starting circuit.
- _____ 21. Identify the major components of an ignition system.
- _____ 22. Follow the operation of the ignition system through one complete cycle.
- _____ 23. Identify major components of an electronic ignition system and their functions.
- _____ 24. Select the purpose of the air intake and exhaust systems.
- _____ 25. Select methods of scavenging the cylinders on a two-stroke cycle engine.
- _____ 26. Distinguish between port and valve scavenging on a two-stroke cycle engine.
- _____ 27. Select types of superchargers.
- _____ 28. Select advantages of a turbocharged engine.
- _____ 29. Select the purposes of engine lubrication systems.
- _____ 30. Select characteristics of good engine oil, factors to consider when choosing engine oil, and oil contaminants.

- _____ 31. Select oil additives and their functions.
- _____ 32. Test thermostat action. (Job Sheet 1)
- _____ 33. Test for exhaust gas leakage and air in cooling system. (Job Sheet 2)
- _____ 34. Test antifreeze solution. (Job Sheet 3)
- _____ 35. Service an air cleaner. (Job Sheet 4)
- _____ 36. Clean and service and remove and replace a battery. (Job Sheet 5)
- _____ 37. Measure battery electrolyte with a hydrometer. (Job Sheet 6)
- _____ 38. Start and engine using a negative-ground booster battery. (Job Sheet 7)
- _____ 39. Use a 24-volt battery booster system to start a vehicle with a 12-volt system. (Job Sheet 8)
- _____ 40. Remove and replace contact points and condenser. (Job Sheet 9)
- _____ 41. Adjust dwell on an externally adjustable distributor. (Job Sheet 10)
- _____ 42. Check and set ignition timing. (Job Sheet 11)
- _____ 43. Remove, service, and replace spark plugs. (Job Sheet 12)
- _____ 44. Change oil and oil filter. (Job Sheet 13)

UNIT 9 — DRIVE TRAIN

- _____ 1. 1. Match terms associated with drive trains to the correct definitions.
- _____ 2. Match the basic components of a drive train to their functions.
- _____ 3. Identify the components of a basic clutch assembly.
- _____ 4. Identify the components of a double plate clutch.
- _____ 5. Select the operating principles of a clutch.
- _____ 6. Match clutch malfunctions with probably causes.
- _____ 7. Select conditions to look for during clutch inspection.
- _____ 8. Identify the purpose and various parts of a transmission.
- _____ 9. Identify parts of a synchronizer.
- _____ 10. Select steps for shifting gears when the equipment is moving.
- _____ 11. Identify components of planetary gear sets.
- _____ 12. Select true statements about planetary gear system characteristics and operations.
- _____ 13. Select planetary gear directional functions.
- _____ 14. Identify planetary gear set controls and components used in automatic transmissions.
- _____ 15. Identify components of a sun gear set found in a differential.
- _____ 16. Identify components of an axle housing and final drive.
- _____ 17. Identify components of a propeller shaft.
- _____ 18. Identify types of U-joints.
- _____ 19. Identify major components of a four-wheel drive vehicle.
- _____ 20. Identify the basic components of torque converters and select their purposes.
- _____ 21. Select principles of torque multiplication.
- _____ 22. Select causes of overheating in a torque converter.
- _____ 23. Select characteristics of hydraulics, types of hydraulic systems, and functions of hydraulic systems.
- _____ 24. Identify the components of a basic hydraulic system.
- _____ 25. Select types of hydraulic control valves.
- _____ 26. Adjust clutch linkage free travel. (Job Sheet 1)
- _____ 27. Shift a power shift transmission. (Job Sheet 2)

UNIT 10 — PREVENTIVE MAINTENANCE

- _____ 1. 1. Match terms associated with preventive maintenance to the correct definitions.
- _____ 2. Select factors that should be included in preventive maintenance.
- _____ 3. Select types of preventive maintenance inspections.
- _____ 4. Select items that should be checked in visual inspection.
- _____ 5. Select items that should be checked on a daily (or shift) checklist.
- _____ 6. Select safe service positions.
- _____ 7. Identify types of grease guns, pumps, and fittings.
- _____ 8. Complete daily (or shift) preventive maintenance inspection. (Job Sheet 1)
- _____ 9. Complete a 50-hour preventive maintenance inspection. (Job Sheet 2)
- _____ 10. Complete a 250-hour preventive maintenance inspection. (Job Sheet 3)
- _____ 11. Complete a 1000-hour preventive maintenance inspection. (Job Sheet 4)
- _____ 12. Lubricate a backhoe. (Job Sheet 5)
- _____ 13. Lubricate a bulldozer. (Job Sheet 6)
- _____ 14. Lubricate an excavator. (Job Sheet 7)

