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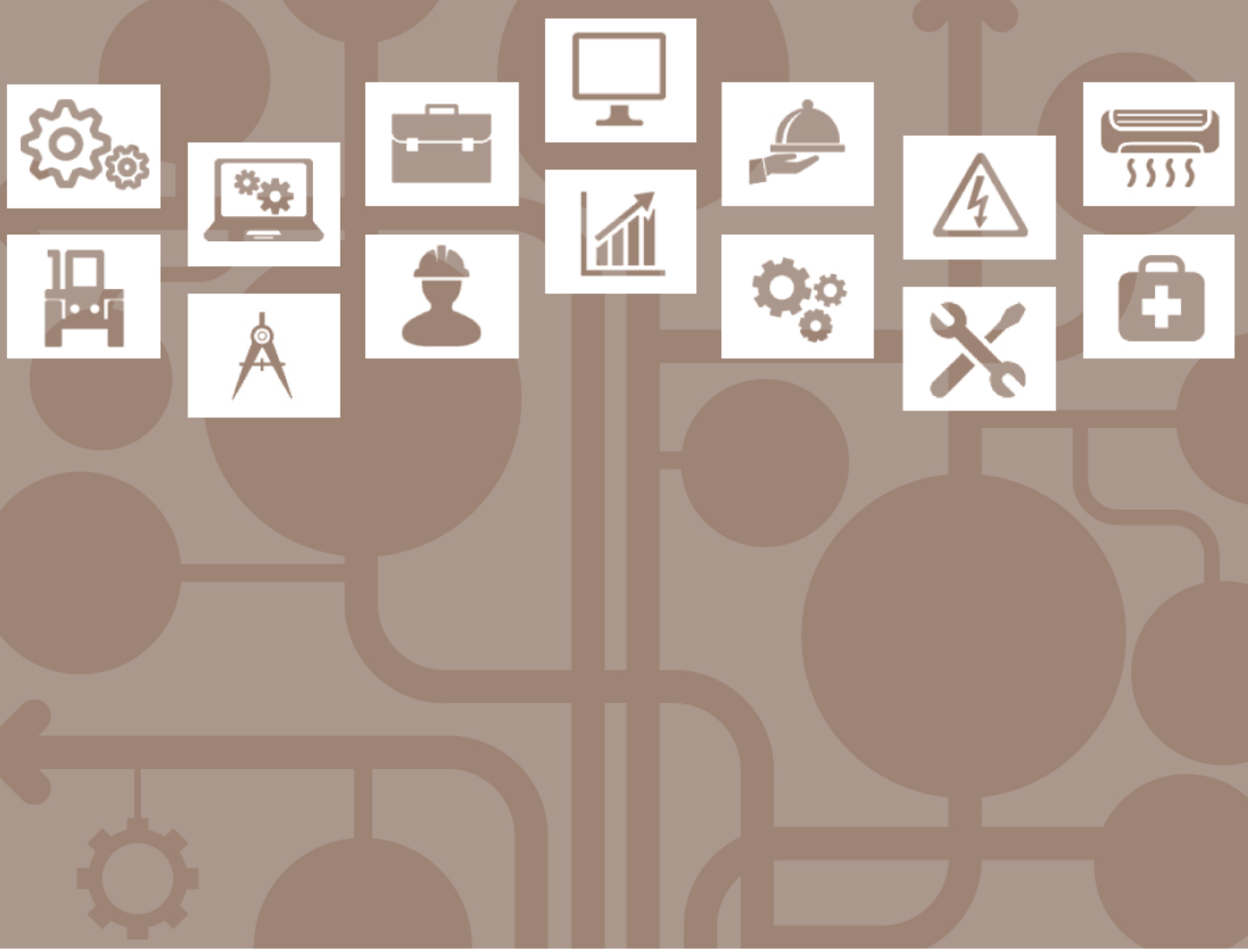
Entry Level Assessment Blueprint

Heavy Equipment Maintenance and Repair



Test Code: 3046 / Version: 01

Specific Competencies and Skills Tested in this Assessment:

Maintain and Repair Engine

- Change oil and filters
- Maintain fuel system
- Apply knowledge of 4-stroke engines
- Maintain cooling system
- Maintain intake and exhaust systems

Maintain and Repair Power Train

- Demonstrate knowledge of hydrostatic power train
- Service and repair final drives
- Service power shift transmissions
- Service and inspect drive lines
- Service and maintain mechanical transmissions

Maintain and Repair Electrical System

- Maintain/repair electronic controls
- Service and test starting system
- Service and test charging system
- Service and test battery
- Maintain basic electrical system (lighting accessories)

Maintain and Repair Brake System

- Inspect air brake systems
- Apply knowledge of wet brake systems
- Apply knowledge of hydraulic brake systems
- Identify brake components

***Specific Competencies and Skills continued*:**

Welding

- Identify various types and components of metals
- Apply knowledge of shielded metal arc welding
- Demonstrate safe use of welding and fabrication tools

Preventive Maintenance

- Inspect and maintain tire performance
- Monitor gauges and warning lights
- Inspect hydraulic system
- Adhere to maintenance schedules and manage record keeping
- Measure and maintain oil and fluid levels
- Perform oil sampling

Maintain and Repair Hydraulic System

- Identify basic hydraulic system components
- Describe operation of various hydraulic pumps
- Service and troubleshoot hydraulic system, valves, and pressure controls
- Apply knowledge of hydraulic schematic symbols
- Apply knowledge of hydraulic circuits
- Service and rebuild hydraulic cylinders

General Shop Practices

- Identify personal protection equipment (PPEs)
- Select proper fasteners
- Select and use sealants properly
- Perform drilling and tapping operations
- Describe proper use of hand tools
- Demonstrate safe use of jacks and lifting equipment

Specific Competencies and Skills continued:

Air Conditioning

- Identify air conditioning components
- Maintain air conditioning system
- Recover and recharge air conditioning systems
- Troubleshoot air conditioning malfunctions

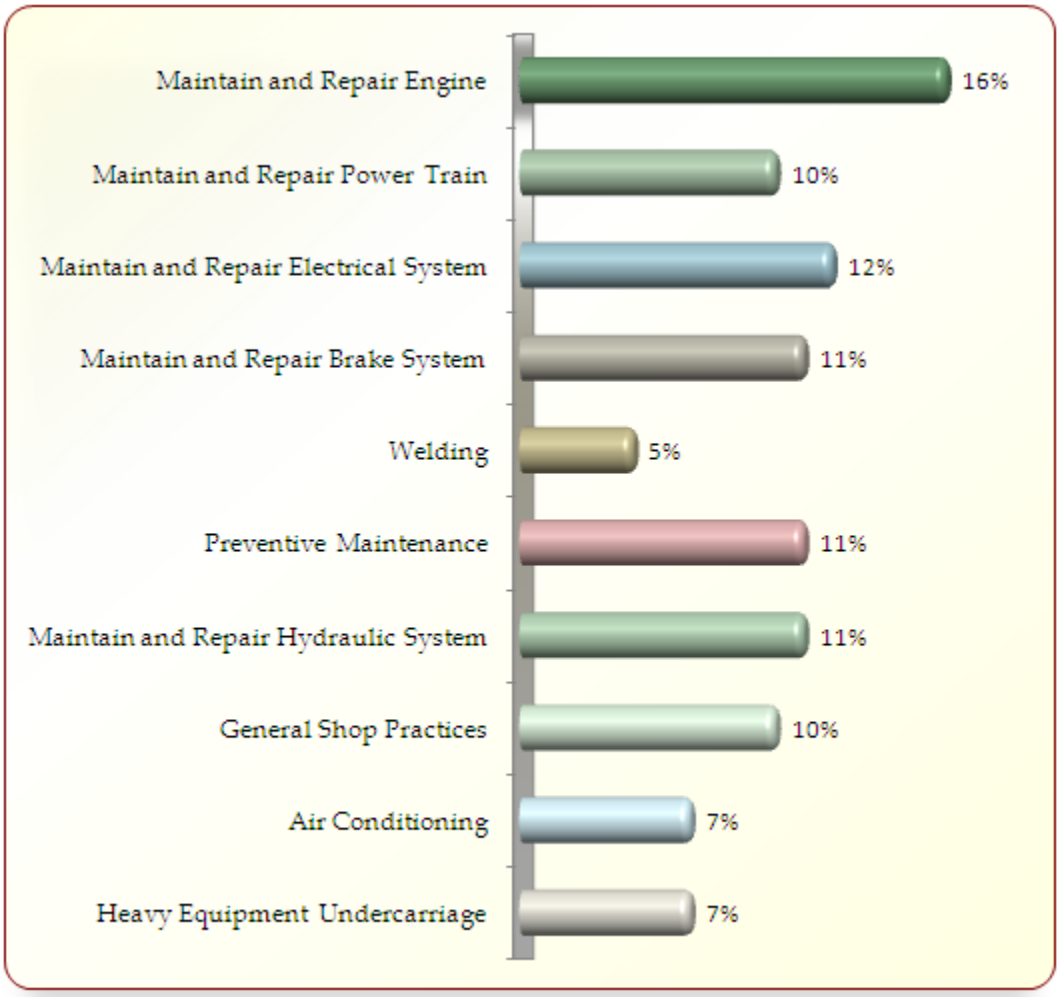
Heavy Equipment Undercarriage

- Inspect undercarriage and components
- Demonstrate appropriate use of ground engaging equipment
- Perform track tension adjustments
- Demonstrate appropriate blocking/cribbing techniques

Written Assessment:

Administration Time: 3 hours
Number of Questions: 174

Areas Covered:



Sample Questions:

Insufficient valve clearance can cause
- A. coolant leakage
- B. a burnt valve
- C. worn valve guides
- D. oil leakage

Spur gears have teeth that are
- A. curved
- B. straight
- C. herringboned
- D. beveled

The electrolyte in a battery is a solution of water and
- A. sulfuric acid
- B. baking soda
- C. viscous oil
- D. hydrogen sulfide

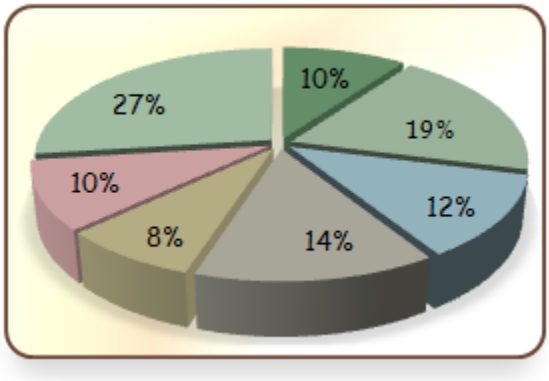
One sign of a defective hydraulic brake system is
- A. low gas mileage
- B. uneven tire wear
- C. non-operational stoplights
- D. low brake fluid level

The resistance of a liquid to flow is
- A. viscosity
- B. velocity
- C. reciprocity
- D. density

Performance Assessment:

Administration Time: 2 hours and 25 minutes
Number of Jobs: 7

Areas Covered:



10% **Test Cooling System**
Perform a cap pressure test, diagnose system pressure loss, document leaks in system, and time to complete job 1.

19% **Electrical Testing**
Perform a battery discharge test, a starter draw test, an alternator maximum output test, and time to complete job 2.

12% **Adjust Valve Clearance**
Demonstrate accuracy of specifications, accuracy of positioning engine for valve adjustment, accuracy of initial measurement for valve clearance, accuracy of final measurement for valve clearance, and time to complete job 3.

14% **Set Carrier Bearing Ring and Pinion Backlash**
Set carrier ring and pinion backlash, measure and record backlash, and time to complete job 4.

8% **Identify Brake Components**
Identify various brake components, and time to complete job 5.

10% **Measure and Adjust Track**
Lock-out/tag-out, record specifications, measure and record track measurement, circle corrective action needed, adjust track and record adjusted measurement, remove lock-out/tag-out, and time to complete job 6.

27% **Cut and Weld Steel**
Setup and operation of oxyacetylene cutting, welder set-up, accuracy of cut, accuracy of weld, penetration, appearance of weld, quality of cut edges, and time to complete job 7.

Sample Job: Cut and Weld Steel

Maximum Time: 20 minutes

Participant Activity: The participant will use the proper tools and equipment to cut steel using the pattern provided. Attach the cut piece as shown in the drawing provided using a butt weld.