Idaho CTE

Agriculture Mechanics and Power Systems (2017)

OCCUPATIONAL SAFETY AND HEALTH IN AG MECHANICS 1.0

1 Safety Practices 1.1

1. Explain the importance of safety of agricultural mechanics. 1.1.1
2. Identify and differentiate between safe and unsafe work practices. 1.1.2
3. Describe the methods utilized to implement safe work practices. 1.1.3
4. Identify and explain the purpose of signals and symbols in agricultural safety. 1.1.4
5. Explain the importance and function of safety training. 1.1.5
6. Evaluate the importance of occupational safety and health in agriculture mechanics. 1.1.6
7. Identify and explain the role that various agencies play in regulating safety. 1.1.7
8. Identify and demonstrate the proper use of personal protection equipment (PPE). 1.1.8
9. Locate and demonstrate the proper uses of the first aid and emergency equipment. 1.1.9
10. Maintain a general safe working environment. 1.1.10
11. Demonstrate the proper disposal of hazardous waste. 1.1.11
12. Read and understand safety data sheets (SDS). 1.1.12

TOOLS AND HARDWARE 2.0

1 Safe and Proper Use of Tools 2.1

1. Determine which hand tool, power tool and measuring and marking devices are most appropriate for a job. 2.1.1
2. Identify and safely use hand and power tools utilized in agricultural mechanics. 2.1.2
3. Identify and properly use measuring and marking tools. 2.1.3
4. Measure and apply metric to standard measurement conversions. 2.1.4
5. Inspect and maintain tools. 2.1.5

2 Hardware and Fasteners 2.2

Identify and select proper common hardware and fasteners. 2.2.1

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METAL TECHNOLOGY 3.0

1 Welding 3.1

1. Demonstrate proper safety practices working with metal technology. 3.1.1
2. Determine uses of metal. 3.1.2
3. Identify types of metal and the proper welding technique. 3.1.3
4. Recognize properties of metal. 3.1.4
5. Properly select and use oxy-fuel equipment. 3.1.5
6. Properly select and use shielded metal arc welding equipment. 3.1.6
7. Properly select and use gas metal arc welding equipment. 3.1.7
8. Properly select and use gas tungsten arc welding equipment. 3.1.8
9. Properly select and use plasma cutting equipment. 3.1.9
10. Properly select welding consumables (i.e., wire, electrode, gas and filler rod). 3.1.10

2 Cold Metal Work 3.2

1. Read metal working plans. 3.2.1
2. Properly cut threads with a tap and die. 3.2.2
3. Join metal by riveting. 3.2.3
4. Properly thread steel pipe. 3.2.4
5. Lay out holes and drill holes using a twist drill. 3.2.5
6. Bend sheet and strap metal to angles and/or shapes. 3.2.6

POWER SYSTEMS 4.0

1 Engines Technology 4.1

1. Identify the operating principles of internal combustion engines. 4.1.1
2. Explain the function and operating principles of the fuel, lubrication, governor, and ignition systems. 4.1.2
3. Locate technical information in electronic and print form. 4.1.3
4. Troubleshoot and maintain engines. 4.1.4

2 Electric Motors 4.2

1. Select motors based on type of application. 4.2.1

3 Agricultural Machinery 4.3

1. Identify and perform basic equipment maintenance on agricultural machinery. 4.3.1
2. Use mathematics to solve equipment calibration problems. 4.3.2
3. Demonstrate converting common units of measure found in agriculture. 4.3.3

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Iydraulics 4.4

1. Identify the parts and functions of the hydraulic systems. 4.4.1

2 Identify the applications of hydraulics in agriculture. 4.4.2

ELECTRICITY 5.0

1 **Basic Electrical Principles** 5.1

1 Demonstrate proper safety practices when working with electricity. 5.1.1

2 Define basic electrical terminology; identify and explain the basic principles of electricity. 5.1.2

3 Recognize electrical code requirements for wiring. 5.1.3

4 Plan and install an electrical circuit. 5.1.4

5 Measure electrical circuits for voltage, current flow, resistance, and wattage. 5.1.5

6 Trouble-shoot electrical circuits. 5.1.6

7 Describe the relationship of volts, amps, and ohms in terms of Ohm's Law. 5.1.7

MATHEMATICAL APPLICATIONS 6.0

1 **Mathematical Applications in Agriculture Mechanics & Power Systems** 6.1

1 Perform mathematical operations for whole numbers, fractions, decimals, ratios, percentages, and rounding (significant figures). 6.1.1

2 Demonstrate converting common units of measure found in agriculture. 6.1.2

3 Explain the meaning of accuracy verses precision. 6.1.3

4 Use mathematics to solve equipment calibration problems. 6.1.4

INSULATION 7.0

1 **Insulation** 7.1

1 Explain the importance of insulation. 7.1.1

2 Explain the theory behind insulation. 7.1.2

3 Identify and select insulation materials. 7.1.3

EMERGING TECHNOLOGIES 8.0

1 **Emerging Technologies in Ag Systems** 8.1

1 Identify uses of precision and emerging technology in agriculture. 8.1.1

2 Understand the potential applications of new technology in agriculture. 8.1.2

CAREERS 9.0

1 **Careers in Ag Mechanics** 9.1

1 Research potential careers in ag mechanics. 9.1.1

2 Demonstrate employability skills for a career in ag mechanics industry. 9.1.2

3 Research additional industry certifications available. 9.1.3

LEADERSHIP TRAINING THROUGH AGRICULTURAL ED

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1 **Effective Leadership and Leadership Training** 10.1

1 Expand leadership experience by participating in a chapter activity. 10.1.1

Participate in a career development event at the local level or above. 10.1.2

Exhibit leadership skills by demonstrating proper parliamentary procedure. 10.1.3

4 Participate in a speech or presentation activity. 10.1.4

2 School and Community Awareness 10.2

1 Participate in a school improvement or community development project. 10.2.1

SUPERVISED AGRICULTURAL EXPERIENCE 11.0

1 Maintain a Supervised Agricultural Experience 11.1

1 Accurately maintain SAE record books. 11.1.1

2 Investigate the proficiency award areas related to SAE program area. 11.1.2

3 Actively pursue necessary steps to receive higher degrees in FFA. 11.1.3