

Agriculture Small Engine Repair (2025)

PROFESSIONAL ORGANIZATIONS AND LEADERSHIP 1.0

1 Student Leadership in Career Technical Student Organizations (CTSO) and Professional Associations 1.1

- 1 Explore the role of professional organizations and/or associations in the ag small engine repair industry. 1.1.1
- 2 Define the value, role, and opportunities provided through career technical student organizations. 1.1.2
- 3 Engage in career exploration and leadership development. 1.1.3

2 Supervised Agricultural Experiences 1.2

- 1 Maintain SAE record books. 1.2.1
- 2 Describe the proficiency award areas related to the SAE program area. 1.2.2
- 3 Describe necessary steps to receive higher degrees in FFA. 1.2.3

SAFETY 2.0

1 Workplace Safety 2.1

- 1 Describe general shop safety rules and procedures. 2.1.1
- 2 Describe safe procedures for handling tools and equipment. 2.1.2
- 3 Describe ventilation requirements and related hazards when working within the lab/shop area. 2.1.3
- 4 Describe marked safety areas and related safety requirements. 2.1.4
- 5 Identify the location and the types of fire extinguishers and other fire safety equipment. 2.1.5
- 6 Describe procedures for using fire extinguishers and other safety equipment. 2.1.6
- 7 Describe the location and use of eye wash stations. 2.1.7
- 8 Describe the location and need for posted evacuation routes. 2.1.8
- 9 Describe requirements for personal protective equipment (e.g., safety glasses, ear protection, gloves, footwear) when working in the lab/shop. 2.1.9
- 10 Describe clothing requirements when working safely in the lab/shop. 2.1.10
- 11 Describe the location and contents of safety data sheets (SDS). 2.1.11
- 12 Describe requirements for handling, storage, and disposal of hazardous and flammable waste and materials. 2.1.12

TOOLS AND FASTENERS

3.0

1 Basic Tools 3.1

- 1 Identify the correct tool for a specific application or repair. 3.1.1
 - 2 Identify whether a tool or repair uses standard or metric designation. 3.1.2
 - 3 Demonstrate safe handling and use of tools. 3.1.3
 - 4 Describe the need for cleaning, storing, maintaining, and removing (i.e., lockout/tagout) tools and equipment. 3.1.4
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2 Fasteners 3.2

- 1 Define fastener terms. 3.2.1
 - 2 Identify threaded and non-threaded fasteners and their intended applications. 3.2.2
 - 3 Select correct fasteners for a repair. 3.2.3
 - 4 Rethread tapped holes and damaged fasteners. 3.2.4
 - 5 Describe seized nut and bolt removal methods. 3.2.5
 - 6 Describe seized nut and bolt removal methods. 3.2.6
 - 7 Demonstrate torque methods. 3.2.7
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3 Precision Measuring Instruments 3.3

- 1 Define measurement terms. 3.3.1
 - 2 Identify measuring instruments. 3.3.2
 - 3 Demonstrate precision measuring techniques, including using precision measuring equipment. 3.3.3
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BASIC ELECTRICAL 4.0

1 Basic Electrical Theory and System 4.1

- 1 Interpret common electrical schematic symbols 4.1.1
 - 2 Identify components of a basic electrical system. 4.1.2
 - 3 Describe basic electrical theory. 4.1.3
 - 4 Describe basic electrical circuits and their applications. 4.1.4
 - 5 Demonstrate procedures for using a multimeter. 4.1.5
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ENGINES 5.0

1 Basic Engine Principles and Design 5.1

- 1 Identify engine type and application. 5.1.1
- 2 Interpret various engine model codes. 5.1.2
- 3 Define horsepower, torque, and displacement. 5.1.3

2 Operation of a 2-Stroke Engine 5.2

- 1 Define 2-stroke engine theory of operation. 5.2.1
- 2 Identify 2-stroke engine components and their functions. 5.2.2
- 3 Describe 2-stroke engine operation. 5.2.3
- 4 Diagnose and repair a 2-stroke engine. 5.2.4
- 5 Diagnose 2-stroke engine problems. 5.2.5
- 6 Describe 2-stroke engine rebuild procedures. 5.2.6
- 7 Perform a 2-stroke engine failure analysis. 5.2.7
- 8 Disassemble a 2-stroke engine, inspecting condition of components. 5.2.8

3 Operation of a 4-Stroke Engine 5.3

- 1 Define 4-stroke engine theory of operation. 5.3.1
- 2 Identify 4-stroke engine components and their functions. 5.3.2
- 3 Describe 4-stroke engine operation. 5.3.3
- 4 Diagnose and repair a 4-stroke engine. 5.3.4
- 5 Diagnose 4-stroke engine problems. 5.3.5
- 6 Describe 4-stroke engine rebuild procedures. 5.3.6
- 7 Perform a 4-stroke engine failure analysis. 5.3.7
- 8 Disassemble a 4-stroke engine, inspecting condition of components. 5.3.8

4 Cooling and Lubrication Systems 5.4

- 1 Identify types of cooling and lubrication systems. 5.4.1
- 2 Identify the components and function of a cooling system. 5.4.2
- 3 Identify the components and function of a lubrication system. 5.4.3
- 4 Identify types of oils and their applications. 5.4.4

5 Fuel Systems 5.5

- 1 Define types of fuel systems. 5.5.1
- 2 Describe fuel system theory. 5.5.2
- 3 Identify fuel system components and their functions. 5.5.3
- 4 Service fuel systems components. 5.5.4
- 5 Diagnose and repair fuel system malfunctions. 5.5.5

6 Governor Systems 5.6

- 1 Identify types of governor systems and their components. 5.6.1
- 2 Describe governor system theory, operation, and adjustments. 5.6.2
- 3 Diagnose and repair governor system malfunctions. 5.6.3

7 Ignition Systems 5.7

- 1 Identify common types of ignition systems and theory of operation. 5.7.1
 - 2 Identify components and functions of an ignition system. 5.7.2
 - 3 Diagnose and repair ignition system malfunctions. 5.7.3
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8 Charging Systems 5.8

- 1 Identify common types of charging systems and theory of operation. 5.8.1
 - 2 Identify components and functions of a charging system. 5.8.2
 - 3 Diagnose and repair charging system malfunctions. 5.8.3
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9 Starting Systems 5.9

- 1 Identify common types of starting systems and theory of operation. 5.9.1
 - 2 Identify components and functions of a starting system. 5.9.2
 - 3 Diagnose and repair starting system malfunctions. 5.9.3
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MAINTENANCE 6.0

1 Maintenance Programs 6.1

- 1 Describe a periodic engine maintenance program. 6.1.1
 - 2 Describe a periodic equipment maintenance program (e.g., blade sharpening, belts, chains, cables). 6.1.2
 - 3 Research owner's manuals, service schedules, and manufacturer's data to perform periodic maintenance. 6.1.3
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PARTS AND SERVICE MANAGEMENT 7.0

1 Parts and Service Operation 7.1

- 1 Access and locate parts information. 7.1.1
- 2 Complete a work order/invoice. 7.1.2
- 3 Describe methods for providing customer service. 7.1.3