

Equipment Operation and Maintenance

Power and Technology in the Agricultural Industry **A**

1 The Importance of Agricultural Power and Technology **A.1**

- 1 Describe the emergence of agricultural power and technology **A.1.1**
- 2 Identify areas of the agricultural power and technology industry. **A.1.2**
- 3 Select and use information, resources and systems of operation in agricultural power. **A.1.3**

2 Opportunities in Agricultural Power and Technology **A.2**

- 1 Identify career opportunities **A.2.1**
- 2 Discuss Personal needed education and technical skills **A.2.2**
- 3 Plan and manage a supervised agricultural education experience. **A.2.3**

3 Safety in Agricultural Power and Technology **A.3**

- 1 Identify and describe the major causes of accidents. **A.3.1**
- 2 Discuss methods of accident prevention. **A.3.2**
- 3 Describe appropriate procedures in case of an accident. **A.3.3**
- 4 Select and use personal safety equipment. **A.3.4**

4 Tools used in Equipment Maintenance **A.4**

- 1 Select, Identify and properly use tools utilized in machinery and equipment maintenance. **A.4.1**
- 2 Discuss the use of diagnostic instruments and testers. **A.4.2**
- 3 Identify worn and damaged tools. **A.4.3**

5 Maintenance and storage facilities **A.5**

- 1 Explain the importance of maintenance and storage of equipment. **A.5.1**
- 2 Design a maintenance and storage facility. **A.5.2**
- 3 Discuss the procedures in storing of equipment. **A.5.3**
- 4 Discuss the handling and storing of petroleum products. **A.5.4**

Agricultural Equipment **B**

1 Applying Science Principles and Practices **B.1**

- 1 Explain the importance of physical science in agricultural power equipment. **B.1.1**

- 2 Describe mechanical advantage [B.1.2](#)
 - 3 Explain how changing the state of matter can be used to transfer heat. [B.1.3](#)
 - 4 Explain how chemical energy is converted to electrical energy and then mechanical energy. [B.1.4](#)
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2 Tractors [B.2](#)

- 1 Identify the kinds and uses of agricultural tractors. [B.2.1](#)
 - 2 Demonstrate the use of the equipment operators manual. [B.2.2](#)
 - 3 Demonstrate the safe operation of a tractor. [B.2.3](#)
 - 4 Describe the role of a tractor operator in maintenance. [B.2.4](#)
 - 5 Perform preventive maintenance procedures. [B.2.5](#)
 - 6 Explain the purpose and procedure of keeping proper maintenance records. [B.2.6](#)
 - 7 Explain troubleshooting and how it is used. [B.2.7](#)
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3 Production Equipment [B.3](#)

- 1 Describe the importance of equipment in agricultural production. [B.3.1](#)
 - 2 Identify types and uses of tillage equipment. [B.3.2](#)
 - 3 Identify the types and uses of planting equipment, including calibration. [B.3.3](#)
 - 4 Identify the kinds and uses of application equipment, including calibration. [B.3.4](#)
 - 5 Identify the kinds and uses of harvesting equipment. [B.3.5](#)
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4 Turf and Landscape Equipment [B.4](#)

- 1 Identify the kinds and uses of hand tools in turf and landscaping. [B.4.1](#)
 - 2 Identify the kinds and uses of turf power equipment. [B.4.2](#)
 - 3 Demonstrate mower blade sharpening. [B.4.3](#)
 - 4 Identify the kinds and uses of landscape power equipment. [B.4.4](#)
 - 5 Maintain landscape power equipment. [B.4.5](#)
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5 Specialty Equipment [B.5](#)

- 1 Describe the kinds, uses and maintenance of materials-handling equipment. [B.5.1](#)
 - 2 Describe the uses and safe operation of an all terrain vehicle. [B.5.2](#)
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Power Sources and Operation [C](#)

1 Internal Combustion Engine Systems and Functions [C.1](#)

- 1 Explain the meaning of internal combustion and related engine terms. [C.1.1](#)
 - 2 Describe the operation of a four stroke and two cycle engine. [C.1.2](#)
 - 3 Identify and describe the functions of engine components. [C.1.3](#)
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2 Rebuilding small air-cooled gasoline engines [C.2](#)

- 1 Identify considerations in rebuilding or replacing a small, air-cooled gasoline engine [C.2.1](#)
 - 2 Describe how to use an engine service and repair manual. [C.2.2](#)
 - 3 Read and interpret engine identification numbers. [C.2.3](#)
 - 4 Describe a general method of diagnosing small-engine problems.. [C.2.4](#)
 - 5 Perform and conduct small-engine diagnostic tests. [C.2.5](#)
 - 6 Correctly and safely disassemble a small engine. [C.2.6](#)
 - 7 Clean small engine components [C.2.7](#)
 - 8 Evaluate small-engine components and recondition as appropriate. [C.2.8](#)
 - 9 Reassemble a small engine and make preliminary adjustments.. [C.2.9](#)
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3 Maintaining Diesel Engines [C.3](#)

- 1 Explain the operation of a diesel engine. [C.3.1](#)
 - 2 Identify the importance of fuel-injection systems. [C.3.2](#)
 - 3 Identify the maintenance practice for with diesel engines. [C.3.3](#)
 - 4 Troubleshoot a diesel engine. [C.3.4](#)
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4 Engine Power and Efficiency [C.4](#)

- 1 Define and calculate work, torque, power and horsepower using correct units. [C.4.1](#)
 - 2 Explain types of power ratings. [C.4.2](#)
 - 3 Describe the measurement of engine and tractor power and use the findings to improve efficiency. [C.4.3](#)
 - 4 Discuss the meaning of efficiency. [C.4.4](#)
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5 Power Trains [C.5](#)

- 1 Explain the meaning and components of a power train. [C.5.1](#)
 - 2 Describe how to maintain a transmission and drive system. [C.5.2](#)
 - 3 Differentiate types of transmission fluid. [C.5.3](#)
 - 4 Describe how to service a power train. [C.5.4](#)
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6 Precision Technology [C.6](#)

- 1 Define precision technology and explain its role in agriculture. [C.6.1](#)
 - 2 Explain the use of Global Positioning System in precision agriculture.. [C.6.2](#)
 - 3 Explain the use of a geographic information system in precision agriculture. [C.6.3](#)
 - 4 Discuss the advantages and disadvantages of precision technology. [C.6.4](#)
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Supervised Experience in Agriculture [D](#)

1 Keeping and Using SAE Records [D.1](#)

- 1 Explain how SAE records are organized. [D.1.1](#)

2 Identify the procedures to making entries in the SAE records. [D.1.2](#)

3 Explain how to summarize and analyze the SAE records. [D.1.3](#)

2 Making Long Range Plans for Expanding SAE Programs [D.2](#)

1 Identify the factors that should be considered in expanding an SAE program. [D.2.1](#)

2 Explain how placement and ownership SAE programs may be expanded. [D.2.2](#)

Developing Leadership Skills in Agriculture [E](#)

1 Planning and Organizing an FFA Meeting [E.1](#)

1 Explain how to plan a meeting and develop the order of business. [E.1.1](#)

2 Describe how to set up the meeting room. [E.1.2](#)

3 Explain the parliamentary procedure used in an FFA meeting. [E.1.3](#)

2 Developing an Awareness for Your Community [E.2](#)

1 Describe the meaning and importance of community service. [E.2.1](#)

2 List and identify community service organizations. [E.2.2](#)

3 Explain how FFA members can be involved with community improvement and development. [E.2.3](#)

3 State FFA Degree [E.3](#)

1 List the requirements for the State FFA Degree. [E.3.1](#)

2 Explain how a FFA member can obtain the State FFA Degree. [E.3.2](#)

Developing Communication Skills [F](#)

1 Introduction to Communication [F.1](#)

1 Define communication and explain its purpose. [F.1.1](#)

2 Identify the components of the communication process. [F.1.2](#)

3 Identify the five different levels of communication. [F.1.3](#)

4 Explain the barriers of successful communication. [F.1.4](#)

5 Explain the relationship between communication and leadership. [F.1.5](#)

2 Organizing and Presenting a Persuasive Message [F.2](#)

1 Explain the steps in preparing a persuasive message. [F.2.1](#)

2 Describe delivery techniques in a persuasive message. [F.2.2](#)

3 Using Communication Skills In Appropriate Situations [F.3](#)

1 Understand the role of communication skills in the workplace. [F.3.1](#)

2 Understand how to present a problem to a supervisor. [F.3.2](#)

3 Identify the techniques used in requesting information from a supervisor. [F.3.3](#)

4 Explain the role of written communication in an agribusiness. [F.3.4](#)

Gaining Employment G

1 Developing Goals G.1

- 1 Explain the process of goal setting. G.1.1
 - 2 Describe the terms and types of goals. G.1.2
 - 3 Explain some aspects of effective goals. G.1.3
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2 Finding a Job G.2

- 1 Describe information sources for job opportunities. G.2.1
 - 2 Develop a system to evaluate job openings. G.2.2
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3 Applying for a Job G.3

- 1 Explain how to research a job opportunity. G.3.1
 - 2 Describe two methods of applying for a job. G.3.2
 - 3 Identify the common types of information requested on a job application form.. G.3.3
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4 Writing a Résumé and Letter of Application G.4

- 1 Explain the purpose of a résumé. G.4.1
- 2 List the main items that should be included in a résumé. G.4.2
- 3 Describe the purpose of a letter of application and its primary elements. G.4.3