

Small Engine Repair (8082 - 36 weeks)

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A Demonstrating Personal Qualities and Abilities SER.1

- 1 Demonstrate creativity and innovation. SER.1.1
 - 2 Demonstrate critical thinking and problem solving. SER.1.2
 - 3 Demonstrate initiative and self-direction. SER.1.3
 - 4 Demonstrate integrity. SER.1.4
 - 5 Demonstrate work ethic. SER.1.5
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B Demonstrating Interpersonal Skills SER.2

- 6 Demonstrate conflict-resolution skills. SER.2.6
 - 7 Demonstrate listening and speaking skills. SER.2.7
 - 8 Demonstrate respect for diversity. SER.2.8
 - 9 Demonstrate customer service skills. SER.2.9
 - 10 Collaborate with team members. SER.2.10
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C Demonstrating Professional Competencies SER.3

- 11 Demonstrate big-picture thinking. SER.3.11
- 12 Demonstrate career- and life-management skills. SER.3.12
- 13 Demonstrate continuous learning and adaptability. SER.3.13
- 14 Manage time and resources. SER.3.14
- 15 Demonstrate information-literacy skills. SER.3.15
- 16 Demonstrate an understanding of information security. SER.3.16
- 17 Maintain working knowledge of current information-technology (IT) systems. SER.3.17
- 18 Demonstrate proficiency with technologies, tools, and machines common to a specific occupation. SER.3.18
- 19 Apply mathematical skills to job-specific tasks. SER.3.19
- 20 Demonstrate professionalism. SER.3.20
- 21 Demonstrate reading and writing skills. SER.3.21
- 22 Demonstrate workplace safety. SER.3.22

D Examining All Aspects of an Industry SER. 4

- 23 Examine aspects of planning within an industry/organization. SER. 4. 23
- 24 Examine aspects of management within an industry/organization. SER. 4. 24
- 25 Examine aspects of financial responsibility within an industry/organization. SER. 4. 25
- 26 Examine technical and production skills required of workers within an industry/organization. SER. 4. 26
- 27 Examine principles of technology that underlie an industry/organization. SER. 4. 27
- 28 Examine labor issues related to an industry/organization. SER. 4. 28
- 29 Examine community issues related to an industry/organization. SER. 4. 29
- 30 Examine health, safety, and environmental issues related to an industry/organization. SER. 4. 30

E Addressing Elements of Student Life SER. 5

- 31 Identify the purposes and goals of the student organization. SER. 5. 31
- 32 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult. SER. 5. 32
- 33 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects. SER. 5. 33
- 34 Identify Internet safety issues and procedures for complying with acceptable use standards. SER. 5. 34

F Exploring Work-Based Learning SER. 6

- 35 Identify the types of work-based learning (WBL) opportunities. SER. 6. 35
- 36 Reflect on lessons learned during the WBL experience. SER. 6. 36
- 37 Explore career opportunities related to the WBL experience. SER. 6. 37
- 38 Participate in a WBL experience, when appropriate. SER. 6. 38

G Exploring Leadership Opportunities through FFA SER. 7

- 39 Identify the role of supervised agricultural experiences (SAEs) in agricultural education. SER. 7. 39
- 40 Participate in an SAE. SER. 7. 40
- 41 Identify the benefits and responsibilities of FFA membership. SER. 7. 41
- 42 Describe leadership characteristics and opportunities as they relate to agriculture and FFA. SER. 7. 42
- 43 Apply for an FFA degree and/or an agricultural proficiency award. SER. 7. 43

H Applying Safety Practices in the Small Engine Lab SER.8

- 44 Demonstrate safety practices in the small engine lab. SER.8.44
- 45 Explain methods for mitigating risks and accidents related to small engine work. SER.8.45
- 46 Follow federal, state, and local code, regulations, and recommended guidelines. SER.8.46
- 47 Demonstrate the use of personal protective equipment (PPE). SER.8.47
- 48 Use safety shields and guards on all equipment. SER.8.48
- 49 Demonstrate safety practices for flammable materials and hazardous waste. SER.8.49
- 50 Identify safety procedures when operating small engine equipment. SER.8.50
- 51 Identify marked safety zones and nonskid areas. SER.8.51
- 52 Identify the location and use of eyewash stations. SER.8.52
- 53 Identify the location of posted evacuation routes. SER.8.53
- 54 Demonstrate knowledge of safety data sheets (SDS). SER.8.54
- 55 Demonstrate precautions in the use, storage, and disposal of chemicals and hazardous wastes. SER.8.55
- 56 Describe the use of standard and metric hand tools. SER.8.56
- 57 Describe the use of power tools. SER.8.57
- 58 Describe the use of standard and metric precision measuring and other specialty tools. SER.8.58
- 59 Explain the types and use of fire protection equipment. SER.8.59

I Describing the Operation of an Internal Combustion Engine SER.9

- 60 Identify the five engine events. SER.9.60
- 61 Explain the operation of a four-stroke engine. SER.9.61
- 62 Explain the operation of a two-stroke engine. SER.9.62
- 63 Explain the interrelationship of parts during each stroke for an internal combustion engine. SER.9.63

J Demonstrating the Use of Tools SER.10

- 64 Demonstrate the use of basic hand tools and commonly used power tools in small engine repair. SER.10.64
- 65 Identify fasteners, adhesives, sealants, and gaskets used on small engines. SER.10.65
- 66 Demonstrate torque technique for threaded fasteners. SER.10.66
- 67 Demonstrate use of measuring and testing devices. SER.10.67
- 68 Repair threaded holes. SER.10.68

K Understanding Engine Nomenclature and Selecting Repair Parts SER.11

- 69 Explain nomenclature used in the small engine industry. SER.11.69
- 70 Identify the manufacturer, model number, serial number, specification number, and other unique equipment numbers. SER.11.70
- 71 Use service, repair, and operating manuals for equipment. SER.11.71
- 72 Locate replacement part numbers. SER.11.72

L Exploring the Fundamentals of Electricity, Magnetism, and Electronics SER.12

- 73 Explain Ohm's law and how electricity is produced and used in small engines. SER.12.73
- 74 Explain magnetism and its role in the way electricity is produced and utilized in small engine applications. SER.12.74
- 75 Identify electrical test equipment used in small engine diagnostics. SER.12.75

M Repairing Manual Starters SER.13

- 76 Identify the components of a manual starter. SER.13.76
- 77 Repair a manual starter. SER.13.77

N Identifying Electric Starters SER.14

- 78 Identify the components of an electric starter. SER.14.78
- 79 Repair an electric starter. SER.14.79

O Servicing Spark Plugs SER.15

- 80 Identify the components of a spark plug. SER.15.80
- 81 Evaluate the spark plug. SER.15.81
- 82 Set the spark plug electrode gap. SER.15.82

P Repairing Ignition Systems SER.16

- 83 Identify ignition systems components and their functions. SER.16.83
- 84 Identify types of ignition systems used in small engines. SER.16.84
- 85 Identify parts used in repairing the ignition circuit. SER.16.85
- 86 Service ignition parts. SER.16.86

Q Evaluating Battery Systems SER.17

- 87 Describe the safety hazards associated with battery systems. SER.17.87
- 88 Evaluate system operation. SER.17.88
- 89 Install a battery. SER.17.89
- 90 Test a battery. SER.17.90

R Examining Functions and Types of Fuel Systems SER.18

- 91 Explain the principles of a fuel delivery system. SER.18.91
- 92 Identify the types of fuel delivery systems, system components, and fuel types. SER.18.92
- 93 Service the fuel system. SER.18.93

S Repairing Carburetors and/or Fuel Injection Systems SER.19

- 94 Identify types of carburetors and fuel injection systems. SER.19.94
- 95 Explain the operation of a carburetor and a fuel injection system. SER.19.95
- 96 Evaluate the operation of a carburetor. SER.19.96
- 97 Service a carburetor and/or fuel injection system. SER.19.97
- 98 Determine the replacement vs. repair of a carburetor and/or a fuel injection system. SER.19.98
- 99 Replace a carburetor. SER.19.99

T Repairing Governors SER.20

- 100 Identify types of governors. SER.20.100
- 101 Explain the operation of a governor. SER.20.101
- 102 Evaluate operation of a governor. SER.20.102
- 103 Adjust the governor. SER.20.103

U Servicing Valves on Four-Stroke Engines SER.21

- 104 Describe the operation of intake and exhaust valves. SER.21.104
- 105 Describe the differences between the OVH and L-head valve design. SER.21.105
- 106 Evaluate valve clearance. SER.21.106
- 107 Evaluate valves and accessories for defects. SER.21.107
- 108 Demonstrate valve adjustment and installation. SER.21.108
- 109 Replace the cylinder head. SER.21.109

V Repairing Valves on Two-Stroke Engines SER.22

- 110 Identify types of valves. SER.22.110
- 111 Explain how valves work. SER.22.111
- 112 Evaluate the reed valve for proper operation. SER.22.112
- 113 Replace the reed valve assembly. SER.22.113

W Examining Internal Engine Parts SER.23

- 114 Identify internal engine parts. SER.23.114
- 115 Explain how pistons and the compression system work. SER.23.115
- 116 Explain how various piston rings work. SER.23.116
- 117 Remove internal engine parts. SER.23.117
- 118 Inspect the cylinders for wear. SER.23.118
- 119 Analyze the camshaft assembly for defects. SER.23.119
- 120 Evaluate a crankshaft. SER.23.120

X Understanding Principles of Engine Cooling and Servicing Air Filters SER.24

- 121 Explain the principles of engine cooling. SER.24.121
- 122 Describe the types of cooling systems. SER.24.122
- 123 Identify types of air filters. SER.24.123
- 124 Service air filters. SER.24.124

Y Servicing the Lubrication System SER.25

- 125 Explain the principles of lubrication in a small engine. SER.25.125
- 126 Select engine oil. SER.25.126
- 127 Change the engine oil. SER.25.127
- 128 Change the oil filter. SER.25.128
- 129 Inspect the breather. SER.25.129