

Mechatronics 2 (8555)

Applying Basic Safety Standards for Mechanics M2.1

- 1 Comply with federal, state, and local safety requirements. M2.1.1
- 2 Demonstrate lockout-tagout procedures. M2.1.2
- 3 Maintain a safe working environment. M2.1.3
- 4 Explain safe working practices around electrical hazards. M2.1.4
- 5 Identify emergency first-aid procedures. M2.1.5
- 6 Identify the types of fires and the methods used to extinguish them. M2.1.6
- 7 (Optional) Demonstrate the use of a fire extinguisher. M2.1.7
- 8 Identify personal protective equipment (PPE) requirements. M2.1.8
- 9 Inspect hand and power tools to ensure safety and usability. M2.1.9
- 10 Demonstrate lifting and carrying techniques. M2.1.10
- 11 Report injuries. M2.1.11
- 12 Report personal, environmental, and equipment safety violations to the appropriate authority. M2.1.12
- 13 Pass the safety exam. M2.1.13

Understanding Electrical Components in a Mechatronic System M2.2

- 1 Trace the flow of electrical and mechanical energy in a mechatronic system. M2.2.1
- 2 Explain the specific roles of electrical components within a typical circuit schematic. M2.2.2
- 3 Compute wire and fuse sizes based on the load required by the motor. M2.2.3
- 4 Analyze basic direct current (DC) circuits to predict and verify circuit behavior. M2.2.4
- 5 Analyze circuits to predict and verify the behavior of series circuits vs. parallel DC circuits or resistances. M2.2.5

6 Explain the physical operation of electromagnetic components in a mechatronic system. M2.2.6

7 Evaluate circuits to predict and verify the behavior of the electrical and physical properties of components. M2.2.7

Understanding Mechanical Components in a Mechanical System M2.3

1 Explain the role of various mechanical components within a given system or module. M2.3.1

2 Describe the basic physical properties of mechanical components. M2.3.2

3 Identify mechanical components of systems prescribed by drawings. M2.3.3

4 Calculate gear ratios and horsepower. M2.3.4

5 Distinguish between various AC motors and DC motors. M2.3.5

6 Describe power transmission components. M2.3.6

7 Maintain a mechatronic system. M2.3.7

8 Assemble the mechanical components in a mechatronic system. M2.3.8

Understanding Fluid Power (Hydraulics and Pneumatics) M2.4

1 Demonstrate fluid-power system safety. M2.4.1

2 Explain the principles of fluid power. M2.4.2

3 Differentiate between hydraulic and pneumatic fluid power. M2.4.3

4 Identify fluid power components. M2.4.4

5 Read fluid power circuit diagrams. M2.4.5

6 Explain fluid-power systems. M2.4.6

7 Identify types of fluid power pumps or compressors. M2.4.7

8 Identify types of fluid power actuators. M2.4.8

9 Examine the physical characteristics and compressibility of gases. M2.4.9

10 Describe the flow of energy in a fluid system. M2.4.10

11 Construct fluid-power systems from components and symbols. M2.4.11

12 (Optional) Explain fluid-power system maintenance. M2.4.12

Exploring Computer Applications M2.5

1 Demonstrate a working knowledge of the personal computer (PC). M2.5.1

2 Discuss software and hardware. M2.5.2

3 Explain the function of the Internet and manufacturing networks. M2.5.3

**Exploring Digital Circuit
Fundamentals** M2.6

1 Describe logic gates. M2.6.1

2 Examine simple logic circuits using a variety of logic gates. M2.6.2

**Using Technical
Documents** M2.7

1 Consult technical documents to assess a mechatronic system and troubleshoot malfunctions in electrical components. M2.7.1

2 Verify the parts, relationships, and behavior depicted by the technical data sheets for components within a mechatronic system. M2.7.2

3 Create a document describing the operation of a mechatronic system. M2.7.3
