



# Industry 4.0 Equipment Maintenance - Automation, Maintenance and Troubleshooting

## Description

The purpose of the Industry 4.0 Equipment Repair - Automation, Maintenance and Troubleshooting training is to prepare technicians who install, operate, support, upgrade, and maintain the automated material handling equipment and systems which support industry. MSSC CT-SCA-EM certificate to be received upon successfully passing of the examination.

## Key Learning Objectives

- Implement and remove equipment/system safety protocols
- Identify and operate major automated equipment/systems
- Monitor machine/system operation
- Ensure key parts and components are available in inventory
- Implement preventive maintenance
- Perform preventive maintenance
- Establish monitoring and maintenance schedule for equipment/lubricant condition
- Safely use hand tools to maintain equipment
- Communicate with co-workers to promote productivity
- Perform technical and administrative duties

## Course Content

Introduction to Supply Chain Automation  
Machine Safety  
Caliper Measurement  
Hand Tools 1  
Power Efficiency  
Chain Drives  
Grease Lubrication  
Electrical Voltage and Current Concepts  
Power in Electrical Circuits  
Combination Circuits  
Introduction to Electronic Sensors  
Pneumatic Power  
Basic Hydraulic Cylinder Circuits  
Total Productive Maintenance (TPM)

Practicing Safety in the Workplace  
Operating Supply Chain Automation  
Micrometer Measurement  
Mechanical Power  
Mechanical Power  
Belt Drives  
Conveyors  
Voltage and Current Measurement  
Inductance  
Voltage Dividers  
Electronic Sensors 2  
Basic Cylinder Circuits  
Fluid Power Speed Control

Types of PPE  
Dimensional Measurement  
Equipment and Workplace Safety  
Basic Mechanical Elements  
Transmission Gear Drives  
Oil Lubrication  
Basic Electrical Circuits  
Electrical Resistance Measurement  
Capacitance  
Transformers  
Introduction to Fluid Power  
Hydraulic Power  
Fluid Force and Friction

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# Supply Chain Automation Equipment Maintenance

## Equipment Maintenance Skills

- Skill 1** Install electrical and pneumatic lockout/tagout
- Skill 2** Perform a pre-start up safety inspection
- Skill 3** Put a guard in place for safe machine operation
- Skill 4** Identify sortation system components
- Skill 5** Power up and manually operate a sortation system
- Skill 6** Operate a sortation system in automatic mode
- Skill 7** Perform an emergency stop
- Skill 8** Reset an alarm and restart system
- Skill 9** Use warehouse control software to track orders
- Skill 10** Use a tape measure to measure machine dimensions
- Skill 11** Use a machinist's rule to measure part dimensions
- Skill 12** Use a dial caliper to measure parts
- Skill 13** Use a micrometer to measure parts
- Skill 14** Identify types of threaded fasteners
- Skill 15** Use combination wrenches to assemble fasteners
- Skill 16** Use hex key wrenches to assemble fasteners
- Skill 17** Use socket wrenches to assemble fasteners.
- Skill 18** Use a flat head screwdriver to assemble fasteners
- Skill 19** Use Phillips screwdriver to assemble fasteners
- Skill 20** Use a torque wrench to tighten a fastener
- Skill 21** Identify mechanical components on a sortation system.
- Skill 22** Align and adjust a chain drive
- Skill 23** Align and adjust a belt drive
- Skill 24** Locate and interpret safety data sheets for lubricants
- Skill 25** Interpret GHS labeling on lubricant refill containers
- Skill 26** Handle and store lubricants
- Skill 27** Lubricate a flange mount bearing using a grease gun
- Skill 28** Tension a belt conveyor
- Skill 29** Identify electrical components on a sortation system.
- Skill 30** Measure DC voltage, current, and resistance with a digital multimeter
- Skill 31** Reset a circuit breaker
- Skill 32** Adjust a limit switch
- Skill 33** Adjust an inductive proximity sensor
- Skill 34** Adjust a magnetic reed sensor switch.
- Skill 35** Clean and adjust a photoelectric sensor
- Skill 36** Drain an air filter
- Skill 37** Replace an air filter element
- Skill 38** Connect a main air supply and set pressure
- Skill 39** Identify pneumatic components on a sortation system
- Skill 40** Adjust vacuum cup pressure
- Skill 41** Adjust speed of actuators with flow control valves
- Skill 42** Adjust stroke position of pneumatic actuators
- Skill 43** Clean and adjust a barcode scanner

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