

Appendix K

MANUFACTURING YOUTH APPRENTICESHIP

ASSEMBLY & PACKAGING (UNIT 4)

Unit 4: Production Pathway

Assemble & Package a product

Competency

1. Identify set up for assembly

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner locates and reviews applicable technical drawings, work orders, and/or procedures for assembly processing
- Learner plans sequencing, tools, and equipment needed for assembly
- Learner identifies set up needed
- Learner consults with worksite professional to verify assembly schedule, deadlines, and timeframes

Learning Objectives

- Describe how an assembly plan is developed from a technical drawing for process, equipment, tools, and holders
- Explain how product design and the assembly are related
- Identify terminology related to assembly and packaging
- List characteristics of major types of assembly systems

Comments:

Unit 4: Production Pathway

Assemble & Package a product

Competency

2. Select tools and materials

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner selects tools and assembly equipment to be used
- Learner checks assembly pieces needed against work order
- Learner verifies assembly pieces and materials meet specifications
- Learner gathers all resources needed at the workstation
- Learner notifies worksite professional of any discrepancies

Learning Objectives

- List the various tools and equipment used in assembly and packaging at your worksite
- Outline applications of each tool and equipment
- Describe and demonstrate the safety requirements and safeguards for each tool and equipment
- Explain the importance of pieces and materials meeting specifications prior to assembly

Comments:

Unit 4: Production Pathway

Assemble & Package a product

Competency

3. Check safety parameters

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner reviews assembly procedure to be used
- Learner reviews safety requirements of assembly procedure
- Learner verifies safety equipment and any Personal Protective Equipment (PPE) needed for assembly process
- Learner inspects tools and work area for safety considerations
- Learner examines assembly equipment labeling and safeguarding

Learning Objectives

- List the types of labeling used on tools and equipment at your facility to indicate whether a tool or piece of equipment is functional and safe to use
- List the situations which require you to obtain help to resolve problems with equipment or production

Comments:

Unit 4: Production Pathway

Assemble & Package a product

Competency

4. Perform assembly set up

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner assembles and adjust tools and assembly equipment as required
- Learner verifies assembly equipment is available for use and in working order
- Learner verifies assembly equipment is current for preventative maintenance and/or calibration
- Learner sets assembly equipment parameters as required for the procedure
- Learner stages pieces and materials for assembly

Learning Objectives

- List the types of labeling used on tools and equipment at your facility to indicate whether a tool or piece of equipment is functional and safe to use
- Explain the purpose and importance of preventative maintenance and calibration
- List the situations which require you to obtain help to resolve problems with equipment or production

Comments:

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Assemble & Package a product

Competency

5. Verify assembly set up

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner verifies set up meets assembly requirements and product specifications
- Learner examines first assembled final product for visual and/or dimensional specification
- Learner makes adjustments to ensure final product meets specification if needed
- Learner verifies repeatability of set up if applicable
- Learner documents assembly set up procedure for repeatability if applicable
- Learner documents start up/set up procedure if required

Learning Objectives

- Define repeatability
- Describe the importance of repeatability in manufacturing

Comments:

Unit 4: Production Pathway

Assemble & Package a product

Competency

6. Perform assembly

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner operates assembly equipment safely in the manner required for the job task
- Learner operates assembly equipment according to machine requirements
- Learner wears the required Personal Protective Equipment (PPE) at all times as required for the operation of the equipment
- Learner monitors equipment for safe operation while operating
- Learner inspects final assembled product
- Learner makes adjustments to ensure assembled product meets specification if needed
- Learner documents assembly procedure

Learning Objectives

- Describe the assembly procedure
- Describe advantages and limitations of automated assembly
- List the safety rules associated with automated production and assembly systems
- List the situations which require you to obtain help to resolve problems with equipment or production

Comments:

Unit 4: Production Pathway

Assemble & Package a product

Competency

7. Perform quality checks

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner tests assembled product for function
- Learner labels assembled products for compliance or non-compliance
- Learner documents quality control checks

Learning Objectives

- Describe the uses of assembly and packaging data
- List the quality checks performed as part of the assembly and packaging process
- Explain why products are tested for quality and function
- Explain why labeling and documentation are part of the quality check

Comments:

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Assemble & Package a product

Competency

8. Build packaging

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner verifies testing of assembled product(s) is complete
- Learner identifies package needed
- Learner assembles package
- Learner inspects package
- Learner stages finished package

Learning Objectives

- Identify the federal agencies that regulate packaging
- Identify the basic aspects of packaging regulated by federal agencies
- Explain why it is important to inspect the package after construction
- Explain how product design and the packaging are related
- List the situations which require you to obtain help to resolve problems with equipment or production

Comments:

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Assemble & Package a product

Competency

9. Package product

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner verifies proper packaging procedure
- Learner retrieves packaging
- Learner uses protective packaging materials as required
- Learner uses packaging methods that keep returns and claims for damaged and improperly packaged goods to a minimum
- Learner places final compliant product in packaging
- Learner seals package
- Learner inspects sealed packaging for all relevant information against the work order
- Learner handles package as required to prevent damage
- Package labeling meets regulatory and safety regulations
- Package meets package and shipping specifications

Learning Objectives

- Explain how customer shipping instructions determine packing requirements
- Explain how packing materials determine packing requirements
- Compare packing materials to determine the safest and most cost-effective method of shipping
- List the situations which require you to obtain help to resolve problems with equipment or production

Comments:

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Assemble & Package a product

Competency

10. Process packaging documentation

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner verifies packaging documentation such as manuals, packing slips, warranties, inspection labels, start up instructions, are included and match the final packaged product as required
- Learner applies all required documentation such as shipping tags as required
- Learner handles package as required to prevent damage
- Learner communicates package availability to proper parties in a timely manner
- Documentation is legible
- Documentation is complete
- Documentation is in appropriate format
- Documentation is stored or forwarded as required
- Package is correctly stored or staged

Learning Objectives

- Describe the importance of documenting the packaging process
- State the purpose of an inspection label

Comments:

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Assemble & Package a product

Competency

11. Clean up

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner selects appropriate cleaning tools and equipment
- Learner cleans production tools/equipment as required
- Learner cleans work area as required
- Learner stores tools in proper location
- Learner stores materials in safe manner
- Learner identifies unsafe conditions and reports them promptly
- Learner takes corrective action to correct unsafe conditions
- Learner ensures that workstation is clean and clear of safety hazards
- Learner ensures workstation is organized for efficiency
- Learner disposes of waste appropriately as required by the facility

Learning Objectives

- Describe the cleaning procedures and materials used for the specific processes you perform

Comments:

Unit 4: Production Pathway

Assemble & Package a product- Maintenance & Repair

Competency

1. Monitor equipment for correct operation

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner reviews equipment quality measures for trends and problems as required
- Learner compares current equipment performance to optimal equipment operations on a regular basis
- Learner reports any noted deviations from expected performance
- Learner assists worksite professional to investigate abnormal equipment conditions in a timely manner
- Learner assists worksite professional to follow up on repaired equipment to ensure that that corrective action solved the problem
- Learner documents all monitoring activities
- Learner assures that repair history is complete, current and accurate

Learning Objectives

- Identify basic approaches to maintenance
- Explain how to read and review repair history records
- Describe how trends for malfunctioning equipment might appear in production records
- List the tools and equipment at your facility that must be monitored and maintained
- Define Total Productive Maintenance (TPM)
- Describe how monitoring and diagnostic device are used to find out which equipment is operating correctly

Comments:

Unit 4: Production Pathway

Assemble & Package a product- Maintenance & Repair

Competency

2. Assist with the identification and diagnosis of equipment problems

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting worksite professional

Performance Standard Criteria

- Learner ensures that equipment is properly labeled and pulled from production use
- Learner locates and interprets technical drawings for the equipment and process that is under investigation
- Learner locates the equipment reference materials and manuals
- Learner reviews previous preventative maintenance and repair history records on the equipment under investigation
- Learner assists worksite professional to identify the components to be checked for proper operation
- Learner ensures that appropriate safety devices and personal protective equipment are in place prior to diagnosis
- Learner ensures that all labeling and Lock Out/Tag Out procedures are in place prior to diagnosis
- Learner follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Learner assists the worksite professional to take appropriate readings using meters and testing equipment
- Learner assists the worksite professional in locating and determining the cause of the problems reported
- Learner assists worksite professional to match suggested remedies with problems for the inoperative systems
- Learner documents testing and evaluation
- Learner ensures that equipment is properly labeled and pulled from production use until repair

Learning Objectives

- Describe the most common causes of tool/equipment failure in your facility
- Explain the meaning of common alarms on equipment at your facility
- Compare what equipment and equipment material are recyclable and what is not at your facility
- Describe the purpose, function, and components of diagnostic testing equipment used in your facility
- Describe electrical systems reliability issues including power supply connections, operations, series & parallel circuit function, circuit breaker function, electric motor control, and power overload
- Describe pneumatic system reliability issues including pressure gage readings, conductors, connectors, seals, gaskets, packing, quick-connect fittings, pneumatic cylinder and motor operations, air muffler operations, actuator power output, and pressure regulator operations
- Describe hydraulic system reliability issues including seals, gaskets, packing, and hydraulic fluids
- Describe automated machine reliability issues including computerized control processes, logic control circuits, solenoid-operated fluid power valves, electromechanical limit switches, time delay devices, manual controls, and interlock circuits
- Describe proper function of bearings and couplings and their reliability issues including functioning of transmission equipment, and bearings, shafts, & couplings functions
- Explain how to match bearing number nomenclature to bearing type
- Describe proper functioning of belts and chains and their reliability issues including belt drive, chain drive and roller chain drive functions

Comments:

Unit 4: Production Pathway

Assemble & Package a product- Maintenance & Repair

Competency

3. Perform routine preventative maintenance

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

- Learner performs preventative maintenance (PM) according to facility schedule
- Learner communicates PM to production
- Learner assures that alternative equipment is available if needed by production
- Learner gathers supplies to perform PM
- Learner ensures that equipment is properly labeled and pulled from production use
- Learner follows appropriate Lock Out/Tag Out procedures prior to performing PM
- Learner follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Learner performs all required housekeeping tasks to maintain production schedule
- Learner assists worksite professional to follow PM schedule to calibrate and maintain equipment, tools and workstations
- Learner lubricates machine tools
- Learner checks machine guards
- Learner re-qualifies equipment for operation
- Learner documents preventative actions taken

Learning Objectives

- Describe the different types of lubricants, their uses, storage, and disposal requirements
- Discuss how to use a viscosimeter and grease gun
- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine the schedule and process for PM
- Explain how to analyze bearings as to type and application
- Discuss the need to prevent contamination of fluids and bearings

Comments:

Unit 4: Production Pathway

Assemble & Package a product- Maintenance & Repair

Competency

4. Assist with routine repair maintenance

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting worksite professional

Performance Standard Criteria

- Learner identifies equipment problems through malfunction or production or quality indicators
- Learner communicates repair needs to applicable parties
- Learner assures that alternative equipment is available if needed by production
- Learner consults worksite professionals, maintenance manuals, and equipment history to diagnose possible equipment problems
- Learner gathers supplies to perform repair
- Learner ensures that equipment is properly labeled and pulled from production use
- Learner follows appropriate Lock Out/Tag Out procedures prior to performing repair
- Learner follows all safety requirements and wears appropriate Personal Protective Equipment (PPE) as required
- Learner assists worksite professional to isolate system and component failure and to repair equipment problems
- Learner assists worksite professional to identify root cause of problem and develop corrective action plan
- Learner replaces bearings and/or couplings as needed
- Learner replaces belts and/or chains as needed
- Learner assists worksite professional to re-qualify equipment for operation
- Learner documents repairs completed
- Learner evaluates repair work through follow up

Learning Objectives

- Describe how diagrams schematics, equipment manuals, and equipment specifications to determine repair
- Discuss the need to prevent contamination of fluids and bearings

Comments:

Unit 4: Production Pathway

Assemble & Package a product- Maintenance & Repair

Competency

5. Assist with maintenance communication

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting worksite professional

Performance Standard Criteria

- Learner verifies all internal and external communication with appropriate parties in a timely manner
- Learner communicates maintenance and repair needs clearly
- Learner uses the correct reporting formats for communication
- Learner documents maintenance and repair activities accurately
- Learner reports back and documents any maintenance and repair issues in a timely manner
- Investigations are complete, timely, and include indication of root cause
- Maintenance communication is timely and accurate
- Maintenance communication is documented

Learning Objectives

- Discuss how to schedule repair and maintenance functions with respect to production requirements and production levels
- Explain how communication for repair and maintenance issues demonstrates a knowledge of customer and business needs
- List the parties that need to be involved of repair and maintenance issues
- Describe the importance of documenting communications

Comments: