

**EM121** Maintain fluid power equipment within an engineered system used in food and drink operations

**SQA Unit Code**

**HD5P 04**

**Level 3**

**SCQF Level 6**

**Credit value 56**

**Unit Summary**

This standard identifies the competences you need to carry out corrective maintenance activities on fluid power equipment within an engineered system used in food and drink operations, in accordance with approved procedures. You will be required to maintain a range of equipment, such as pumps, valves, actuators, sensors, compressors and other fluid power equipment, which are working in an integrated system on mobile or static plant involving two of the following interactive technologies: mechanical, electrical, or process controller. Food and drink operations is a term used in this standard to cover the following sub sectors of Meat, Drinks, Confectionery, Fresh Produce, Bakery, Seafood and Dairy.

You will be expected to isolate and disconnect items and components of the interactive technologies in order to gain access to and remove the fluid power units and components that require replacing or repair. This will involve dismantling and reassembling a variety of different types of assemblies and sub-assemblies which, in some instances, will need to be dismantled to component level.

You will be expected to work with minimal supervision, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

Note: Fluid power is a term describing hydraulics, pneumatics and vacuum technologies

In order to be assessed as competent you must demonstrate to your assessor that you can consistently perform to the requirements set out below. Your performance evidence must include at least one observation by your assessor.

You must be able to:	You need to show:
<p>1. Maintain fluid power equipment within an engineered system used in food and drink operations</p> <p>This means you:</p> <p>Work safely at all times, complying with health and safety, and other relevant food and drink regulations, directives and guidelines</p>	<p>Evidence must be work-based, simulation alone is only allowed where shown in <b><i>bold italics</i></b></p> <p>Evidence of maintaining fluid power equipment within an engineered system used in food and drink operations as part of your role in accordance with workplace procedures and within the limits of your own responsibilities.</p>

<p>Follow the relevant maintenance schedules to carry out the required work</p> <p>Carry out the maintenance activities within the limits of your personal authority</p> <p>Carry out the maintenance activities in the specified sequence and in an agreed timescale</p> <p>Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>Complete relevant maintenance records accurately and pass them on to the appropriate person</p> <p>Dispose of waste materials in accordance with safe working practices and approved procedures</p>	
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You need to know and understand:

Evidence of knowledge and understanding should be collected during observation of performance in the workplace. Where it cannot be collected by observing performance, other assessment methods should be used.

1. the health and safety requirements of the area in which the maintenance activity is to take place, and the responsibility these requirements place on you not to compromise food safety
2. the isolation and lock-off procedure or permit-to-work procedure that applies to the system being worked on, including critical control points
3. the specific health and safety food and drink precautions to be taken during the maintenance activities, and their effects on others
4. the requirements of the British Retail Consortium (BRC) guidelines and standards in relationship to the maintenance activities
5. the specific requirements of your customer/client specifications in relationship to the maintenance activities
6. your responsibilities in relationship to Hazard Analysis and Critical Control Points (HACCP, TACCP, VACCP) during the maintenance activities
7. what constitutes a hazardous voltage and how to recognise victims of electric shock
8. how to reduce the risks of a phase to earth shock (including insulated tools, rubber mating and isolating transformers)
9. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities, and where to obtain it
10. hazards associated with carrying out maintenance activities on an integrated system (including handling fluids, stored pressure/force/temperature, electrical supplies, process controller interface, using damaged or badly maintained tools and

- equipment, not following laid- down maintenance procedures), and how to minimise these and reduce any risks
11. regulations and codes of practice that apply to working with fluid power equipment
  12. how to obtain and interpret drawings, charts, circuit and physical layouts, specifications, manufacturers' manuals, history/maintenance reports, symbols used in fluid power, and other documents needed for the maintenance activities
  13. the basic principles of how the system functions, its operation sequence, the working purpose of individual units/components, and how they interact
  14. the principles of the equipment's design features for safe operation in a food or drink environment such as minimising the chance of contaminants or foreign bodies in the final product
  15. the importance of following the correct de-contamination procedures when pipelines and systems are broken into as part of the maintenance
  16. principles and theories associated with fluid power equipment (including cascading and truth tables, logic/ladder diagrams)
  17. how to construct and apply ladder logic, sequential charts/tables or functional diagrams
  18. dry and lubricated systems and their application
  19. selection, types and characteristics of fluids for the system (as applicable)
  20. the effects of pressure and flow on the performance of the system
  21. the identification of different compressors (including screw piston, rotary vane)
  22. the identification of different hydraulic motors (including piston, gear, vane), as applicable
  23. the effects, and likely symptoms, of contamination in the fluid power system
  24. the different types of pipework, fittings and manifolds, and their application
  25. the identification, application, function and operation of different types of valves (including poppet, spool, piston, disc and slide)
  26. the identification, application function and operation of different types of sensors and actuators (including rotary, linear, mechanical, electrical)
  27. the identification, application function and operation of different types of actuators/cylinders (including single acting, double acting and telescopic)
  28. the identification and application of different types of pumps (positive, gear vane and piston), as applicable
  29. the application and fitting of static and dynamic seals
  30. company policy on repair/replacement of components, and the procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance activities, including safe storage
  31. the sequence to be adopted for the dismantling and reassembling of the equipment, to both sub-assembly and individual component level
  32. the techniques used to dismantle/re-assemble integrated equipment (release of pressures/force, proofmarking to aid assembly, plugging exposed pipe/component openings, dealing with soldered joints, screwed, clamped and crimped connections)
  33. methods of attaching identification marks/labels to removed components or cables, to assist with re-assembly
  34. methods of checking that components are fit for purpose, and the need to replace 'lived' or consumable items (including lubricants, seals, gaskets, filters, pistons, spools and bearings)
  35. how to make adjustments to components/assemblies, to ensure they function correctly
  36. how to check tools and equipment are free from damage or defects, are in a safe and usable condition, and are configured correctly for the intended purpose
  37. the processes in place to segregate the tools and equipment used into high or low

risk areas

38. the checks required to ensure that all tools, materials and components are all accountable before operating the equipment
39. the importance of making 'off-load' checks before applying full pressure
40. the cleaning requirements/policies in place before returning the equipment into full operational production
41. the generation of maintenance documentation and/or reports on completion of the maintenance activity
42. the manufacturer's equipment operating and control procedures to be applied during the maintenance activity
43. how to use lifting and handling equipment in the maintenance activity
44. the problems that can occur during the maintenance activity, and how they can be overcome
45. the organisational procedure to be adopted for the safe disposal of waste of all types of materials including any spoilt food or drink products
46. the extent of your own authority and to whom you should report if you have a problem that you cannot resolve

Evidence of performance may employ examples of the following assessment:

- observation
- written and oral questioning;
- evidence from company systems (e.g. Food Safety Management System)
- reviewing the outcomes of work
- checking any records of documents completed
- checking accounts of work that the candidate or others have written