

# SEMMME2-28 - SQA Unit Code H2AF 04

## Assembling Fluid Power Components to Mechanical Equipment



### Overview

This unit identifies the competences you need to assemble and fit fluid power components (such as pneumatic, hydraulic, or vacuum) to mechanical equipment, in accordance with approved procedures. You will be required to check the specified components are available and fit for purpose, to obtain all relevant and current documentation, to obtain the tools and equipment required for the assembly operations and to check that they are in a safe and usable condition. In carrying out the fitting and assembly operations, you will be required to follow company procedures and specified assembly techniques, in order to assemble the required components.

The assembly activities will also include making all necessary checks and adjustments, to ensure the fluid power components are correctly positioned and aligned, that moving parts have the correct working clearances, all fasteners are tightened to the correct torque and that the assembled parts are checked for completeness.

Your responsibilities will require you to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a good understanding of your work, and will provide an informed approach to applying fluid power assembly techniques and procedures. You will understand the mechanical product being assembled, and its application, and will know about the equipment, relevant components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the assembly activities. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

### Performance criteria

*You must be able to:*

- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
- P2 follow the relevant instructions, assembly drawings and any other specifications
- P3 ensure that the specified components are available and that they are in a usable condition
- P4 use the appropriate methods and techniques to assemble the components in their correct positions
- P5 secure the components using the specified connectors and securing devices
- P6 check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
- P7 deal promptly and effectively with problems within your control and report those that cannot be solved

### Knowledge and understanding

*You need to know and understand:*

- K1 the specific safety precautions to be taken while carrying out the fluid power assembly (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
- K2 the health and safety requirements of the work area in which you are carrying out the assembly activities, and the responsibility these requirements place on you
- K3 COSHH regulations with regard to the substances used in the fluid power assembly process
- K4 the hazards associated with assembling fluid power system components, and how to minimise them and reduce any risks
- K5 the personal protective equipment and clothing to be worn during the assembly activities
- K6 how to extract and use information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS, ISO or BSEN standards) in relation to work undertaken
- K7 the general principles of fluid power, and the purpose and function of the components and materials used
- K8 preparations to be undertaken on the components prior to fitting them onto the assembly
- K9 the fitting and assembly methods and procedures to be used, and the importance of adhering to these procedures
- K10 how the components are to be aligned, adjusted and positioned prior to securing, and the tools and equipment that are used
- K11 the importance of using the specified components for the assembly, and why you must not use substitutes
- K12 the quality control procedures to be followed during the assembly operations
- K13 how to detect assembly defects/faults (such as ineffective joining techniques, foreign objects, component damage), and what to do to rectify them
- K14 the methods and equipment used to transport, lift and handle components and assemblies
- K15 how to check that the tools and equipment to be used are in a safe and serviceable condition
- K16 the importance of ensuring that all tools are used correctly and within their permitted operating range
- K17 the things that can go wrong with the assembly operations, and what to do if they occur
- K18 the extent of your own authority and to whom you should report if you have problems that you cannot resolve

### Additional Information

#### Scope/range related to performance criteria

*You must be able to:*

1. carry out **all** of the following during the assembly activities:
  - 1.1 obtain and use the appropriate documentation (such as job instructions, drawings, quality control documentation)
  - 1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
  - 1.3 check that tools and measuring instruments to be used are fit for service
  - 1.4 ensure that components and pipes used are free from damage, foreign objects, dirt or other contamination
  - 1.5 use appropriate and approved fitting and assembly techniques at all times
  - 1.6 leave the work area in a safe and appropriate condition on completion of the activities
2. assemble and fit components for **one** of the following types of fluid power systems:
  - 2.1 pneumatic
  - 2.2 vacuum
  - 2.3 hydraulic
  - 2.4 electro-fluid power systems
3. prepare and fit **four** of the following fluid power components and materials to mechanical equipment:
  - 3.1 power generation components (such as motors, pumps, compressors, intensifiers)
  - 3.2 fluid conditioning components (such as filters, lubricators, separation units, heaters/driers, cooler units)
  - 3.3 storage devices (such as reservoirs, accumulators)
  - 3.4 monitoring components (such as sensors, meters, gauges and indicators)
  - 3.5 pipe work (such as rigid pipe, flexible pipe, hoses)
  - 3.6 connection devices (such as manifolds, couplings, cables and wires)
  - 3.7 control components (such as valves, actuators/cylinders, regulators)
4. carry out the quality checks using appropriate equipment, to include **four** of the following:
  - 4.1 dimensions
  - 4.2 correct direction and flow
  - 4.3 electrical continuity
  - 4.4 positional accuracy
  - 4.5 leak or pressure tests

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- 4.6 completeness
- 4.7 alignment
- 4.8 component security
- 4.9 function
- 4.10 pipe work (free from ripple and creases)
- 5. produce fluid power assemblies which comply with **one** of the following quality and accuracy standards:
  - 5.1 BS, ISO or BSEN standards and procedures
  - 5.2 customer standards and requirements
  - 5.3 company standards and procedures
  - 5.4 specific system requirements

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