

# SEMPEO1-10 - SQA Unit Code H027 04

## Carrying out routine servicing of mechanical equipment



### Overview

This standard covers a range of basic mechanical equipment servicing/scheduled maintenance competences, that will prepare you for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

You will be expected to prepare for the mechanical equipment servicing/scheduled maintenance activities by obtaining all the necessary job instructions, materials, tools, equipment and any documentation that may be required.

You will be required to carry out the servicing/scheduled maintenance tasks on a range of mechanical equipment, such as machine tools, gearboxes, portable tools, engines, pumps, process control valves, compressors, process plant, conveyers and elevators, lifting and handling devices, transfer equipment, workholding devices and other company- specific equipment. On completion of the servicing/scheduled maintenance activities, you will be expected to leave the equipment and work area in a safe and tidy condition.

Your responsibilities will require you to comply with health and safety requirements and organisational policy and procedures for the servicing activities undertaken. You will need to report any difficulties or problems that may arise, and to carry out any agreed actions. You will work under a high level of supervision, whilst taking responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide an understanding of your work, and will enable you to apply appropriate servicing techniques and procedures safely, to mechanical equipment. You will understand the process of implementing routine servicing/scheduled maintenance tasks, the importance of carrying them out at specific times, and of recording their outcomes and actions taken, and will know about the equipment, materials and consumables used, to the required 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 servicing/scheduled maintenance tasks, especially those for isolating the equipment. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

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#### **Specific Standard Requirements**

At least one of the servicing activities must include a combination of servicing and adjustment activities, for example: removal of dirt and grease around bearing grease nipples, replenishing grease using a grease gun, topping up oil levels to sight glass or other relevant sighting levels, adjusting tension on belt drives, and checking and adjusting operating mechanisms.

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### Performance criteria

- You must be able to:*
- P1 work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines
  - P2 obtain and prepare the appropriate materials, tools and equipment
  - P3 prepare the equipment for the servicing operations
  - P4 carry out the servicing activities, in accordance with instructions and the appropriate maintenance schedule
  - P5 check and replace all limited life components, as appropriate
  - P6 ensure that all connections are free from damage or malfunctions
  - P7 report any difficulties or problems that may arise with the servicing activities, and carry out any agreed actions
  - P8 complete the relevant servicing/maintenance records accurately, and pass them on to the appropriate person
  - P9 dispose of waste materials, in accordance with safe working practices and approved procedures

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### Knowledge and understanding

*You need to know and understand:*

- K1 the health and safety requirements of the area in which the servicing/scheduled maintenance tasks are to take place, and the responsibility these requirements place on you
- K2 the isolation procedures or permit-to-work procedure that applies to the equipment being maintained
- K3 the specific health and safety precautions to be applied during the servicing/scheduled maintenance tasks, and their effects on others
- K4 the importance of wearing appropriate protective clothing and equipment (PPE), and keeping the work area safe and tidy
- K5 hazards associated with carrying out servicing/scheduled maintenance tasks on mechanical equipment (such as handling oils/greases, stored pressure/force, misuse of tools), and how they can be minimised
- K6 how to obtain and interpret information from job instructions and other documentation used in the servicing activities (such as drawings, specifications, manufacturers' manuals, servicing schedules, symbols and terminology)
- K7 how to clean the equipment to remove all excess dirt and lubricants, and the cleaning agents that are to be used
- K8 the various checks to be carried out during the servicing/scheduled maintenance procedure
- K9 the procedure for obtaining consumables to be used during the servicing/scheduled maintenance activity
- K10 methods of checking that components are fit for purpose, and the need to replace 'lived' items (such as checking for damage or wear on belts, leaking seals, contaminated lubricants)
- K11 how to make adjustments to components/assemblies to ensure that they function to specification (such as adjusting working clearances, setting belt or chain drive tensions, setting operating mechanisms like levers and linkages, setting air line pressures)
- K12 how to check and top up fluid and/or lubrication systems (such as checking sight glasses or dip sticks, using grease guns, topping up oil, hydraulic fluid or coolant levels)
- K13 making checks on critical fastening devices and connections (such as making torque load checks on bolts, checking that pipe joints and connectors are tight and free from damage)
- K14 how to complete checks to ensure that the equipment has been correctly serviced and is in a satisfactory operational order
- K15 how to complete servicing/scheduled maintenance records/logs/reports, in accordance with company policy and procedures
- K16 the equipment operating and control procedures, and how to apply them in order to carry out the servicing/scheduled maintenance

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- K17 the problems that can occur whilst carrying out the servicing/scheduled maintenance tasks, and how they can be avoided
- K18 when to act on your own initiative and when to seek help and advice from others
- K19 the importance of leaving the equipment in a clean and safe condition on completion of the servicing activities (such as correctly isolated, cleaning up and excess or spilled oils, grease or fluids, removing and disposing of waste)

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### Additional Information

#### Scope/range related to performance criteria

- You must be able to:*
1. Carry out **all** of the following during the servicing/scheduled maintenance tasks:
    - 1.1 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment (PPE) and other relevant safety regulations
    - 1.2 confirm that the equipment is ready for carrying out the scheduled maintenance activity
    - 1.3 ensure the safe isolation of equipment (such as mechanical, electricity, gas, air or fluids)
    - 1.4 ensure that safe access and working arrangements have been provided for the maintenance area
    - 1.5 carry out the scheduled maintenance tasks, using safe and appropriate techniques and procedures
    - 1.6 leave the equipment and work area in a clean and safe condition
  
  2. Carry out servicing/scheduled maintenance activities on **one** of the following:
    - 2.1 gearboxes
    - 2.2 engines
    - 2.3 workholding devices
    - 2.4 machine tools
    - 2.5 pumps
    - 2.6 fluid power equipment
    - 2.7 lifting and handling devices
    - 2.8 transfer equipment
    - 2.9 heating equipment
    - 2.10 process plant
    - 2.11 process control valves
    - 2.12 ventilating equipment
    - 2.13 portable tools
    - 2.14 compressors
    - 2.15 refrigeration
    - 2.16 drive and control mechanisms
    - 2.17 conveyers and elevators
    - 2.18 other company-specific equipment
  
  3. Carry out **eight** of the following servicing/scheduled maintenance

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activities:

- 3.1 removing excess dirt and grime
  - 3.2 checking equipment for leaks
  - 3.3 routine lubrication of moving parts
  - 3.4 replacing 'lived' and non-serviceable components (such as belts, filters, gaskets, seals, hoses)
  - 3.5 monitoring the condition/deterioration of components (such as bearings, chains, gears, cams, couplings)
  - 3.6 repairing leaks to fluid or air systems
  - 3.7 setting and adjusting operating mechanisms (such as levers, cams, chain and belt drives)
  - 3.8 checking that any safety equipment or controls are operating correctly
  - 3.9 checking the operation of instrumentation (such as gauges, sensors and indicators)
  - 3.10 checking/tightening fastenings to the required torque
  - 3.11 replacing fluids (such as oil, greases, coolants, hydraulic fluids)
4. Carry out **all** of the following checks on completion of the servicing/scheduled maintenance activities:
- 4.1 all servicing operations have been completed
  - 4.2 all guards and covers have been replaced
  - 4.3 there are no oil, air or fluid leaks
  - 4.4 excess grease or spilled oil/fluids have been cleaned up
5. Complete **one** of the following servicing/scheduled maintenance records, and pass it to the appropriate person:
- 5.1 job cards
  - 5.2 specific company documentation
  - 5.3 permit to work/formal risk assessment

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