SEMMME2-05 - SQA Unit Code H2AH 04
Operating Centre Lathes

Overview

This unit identifies the competences you need for carrying out turning operations on a centre lathe, in accordance with approved procedures. You will confirm with the machine setter that the machine is ready for the operations to be performed and that all the required components, materials and consumables are available. You will be expected to produce a range of components that combine a number of different features, such as parallel, stepped and tapered diameters, drilled, bored and reamed holes, internal and external threads.

You will be required to operate the machine in line with safe working practices and approved procedures, to continuously monitor the machining operations and, where necessary, make minor adjustments or seek the help of the setter to make the adjustments, in order to ensure that the work output is to the required quality and accuracy. Meeting production targets will be an important issue, and your production records must show consistent and satisfactory performance.

Your responsibilities will require you to comply with organisational policy and procedures for the machining activities undertaken, and to report any problems with the machining activities 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 actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will enable you to adopt an informed approach to applying centre lathe machining procedures. You will have an understanding of the centre lathe turning process, and its application, and will know about the equipment, materials and consumables, in adequate depth to provide a sound background for carrying out the activities to the required specification.

You will understand the safety precautions required when working with the machine and its associated tools and 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.

Setting up of the machine, its tooling and associated workholding devices, is the subject of another unit and is the responsibility of the machine-tool setter.

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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 confirm that the machine is set up and ready for the machining activities to be carried out

P3 manipulate the machine tool controls safely and correctly in line with operational procedures

P4 produce components to the required quality and within the specified dimensional accuracy

P5 carry out quality sampling checks at suitable intervals

P6 deal promptly and effectively with problems within your control and report those that cannot be solved

P7 shut down the equipment to a safe condition on conclusion of the machining activities

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Knowledge and understanding

You need to know and understand:

K1 the safe working practices and procedures to be followed whilst operating centre lathes

K2 the safety mechanisms on the machine, and the procedure for checking that they function correctly

K3 operation of the machine controls in both hand and power modes

K4 how to stop the machine in both normal and emergency situations, and the procedure for restarting after an emergency

K5 the personal protective equipment to be worn, and where this can be obtained

K6 the hazards associated with operating centre lathes and carrying out the turning operations, and how to minimise them and reduce any risks

K7 the importance of keeping the work area clean and tidy

K8 where to obtain the component drawings, specifications and/or job instructions required for the components to be machined

K9 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)

K10 how to use imperial and metric systems of measurement

K11 the main features of the centre lathes and the accessories that can be used (such as saddle, compound slide, tailstock, taper turning attachments, profile attachments, fixed and travelling steadies)

K12 the various turning operations that can be performed, and the methods and equipment used

K13 the effects of backlash in machine slides and screws, and how this can be overcome

K14 the application of roughing and finishing cuts, and the effect on tool life, surface finish and dimensional accuracy

K15 the application of cutting fluids with regard to a range of different materials

K16 the effects of clamping the work piece in a chuck/work holding device, and how this can cause distortion in the finished components

K17 how to recognise machining faults and how to identify when tools need re-sharpening

K18 the quality control procedures used, inspection checks to be carried out, and the equipment that will need to be used

K19 the problems that can occur with the turning activities, and how these can be overcome

K20 the extent of your own authority and to whom you should report if you have problems that you cannot resolve

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Additional Information

Scope/range related to performance criteria

You must be able to:

1. apply **all** of the following during the machining 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 confirm with the machine setter that the machine is ready for production
   - 1.4 where appropriate, seek any necessary instruction/training on the operation of the machine
   - 1.5 ensure that machine guards are in place and are correctly adjusted
   - 1.6 hold components securely, without distortion
   - 1.7 follow the defined operating procedures and apply safe working practices and procedures at all times
   - 1.8 ensure that machine settings are adjusted as and when required (either by yourself or the setter) to maintain the required accuracy
   - 1.9 ensure that the components produced meet the required specification for quality and accuracy
   - 1.10 leave the work area and machine in a safe and appropriate condition on completion of the activities
2. produce machined components which combine different operations and cover **six** of the following:
   - 2.1 flat faces
   - 2.2 drilled holes
   - 2.3 internal threads
   - 2.4 chamfers
   - 2.5 parallel diameters
   - 2.6 bored holes
   - 2.7 external threads
   - 2.8 knurls or special finishes
   - 2.9 stepped diameters
   - 2.10 reamed holes
   - 2.11 eccentric features
   - 2.12 grooves
   - 2.13 tapered diameters
   - 2.14 profile forms
   - 2.15 parting off
   - 2.16 undercuts
3. machine components made from **one** of the following types of material:
   - 3.1 ferrous
   - 3.2 non-ferrous

3.3 non-metallic

4. produce components with dimensional accuracy, form and surface texture within **all** of the following quality and accuracy standards, as is applicable to the operations performed:
   - 4.1 components to be free from false tool cuts, burrs and sharp edges
   - 4.2 dimensional tolerance equivalent to BS 4500 or BS 1916 Grade 7
   - 4.3 surface finish 63 µin or 1.6 µm
   - 4.4 reamed or bored holes within H8
   - 4.5 screw threads BS medium fit
   - 4.6 angles within +/- 1degree
5. use appropriate gauges or instruments to carry out the necessary checks, during production, for accuracy of **four** of the following:
   - 5.1 diameters
   - 5.2 thread fit
   - 5.3 hole size/fit
   - 5.4 lengths
   - 5.5 surface finish
   - 5.6 depths
   - 5.7 angle/taper
   - 5.8 grooves/undercut

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