



HM Government

T-LEVELS

T Level Technical Qualification in Engineering, Manufacturing, Process and Control (Level 3)

Machining and Toolmaking Technologies Occupational Specialism (8713-332)

Practical Assignment Candidate Pack (Sample)

September 2025 Version 2.0

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V2.0 September 2025	Refinement of layout and formatting Removal of any duplicated information	All

1. Assessment

This assessment is for the Machining and Toolmaking Technologies Occupational Specialism component of the Technical Qualification. This pack consists of a practical assignment brief, including drawings and diagrams as necessary, that you will need to use to complete your assessment tasks.

2. Candidate guidance

General guidance

This is a formal assessment that you will be marked and graded on. You will be marked on the quality and accuracy of the work you produce. It is therefore important that you carry your work out to the highest standard you can.

Health and safety

You must always work safely, in particular while you are carrying out practical tasks.

You must always follow any relevant health and safety regulations, risk assessments and codes of practice in line with centre requirements.

If your assessor sees you working in a way that is unsafe for yourself or others, they will highlight the issue and ask you to stop the task immediately.

Plagiarism

Plagiarism is the failure to acknowledge sources properly and/or the submission of another person's work as if it were your own. Plagiarism is not allowed in this assignment.

This assignment is an assessment of your abilities, so the work submitted must be all your own and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the assignment. Your assessor is allowed to give you general advice, such as, clarification of the task instructions. However, general advice will not include:

- any specific advice on how to improve work to meet the required standard
- feedback on anything missing from your work
- any intervention that improves the standard or presentation of work

If there is a need to provide more than general advice your assessor will need to record the advice, they have given and take it into account when marking the submitted work.

Where research is allowed, your assessor must be able to identify which parts of the work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge the sources you used and clearly reference any information taken from them (e.g. providing as a minimum a list of web addresses, books, articles etc that you used).

Use of Artificial Intelligence (AI)

AI may only be used as a source where the use of the internet is allowed for a research task. Where you use AI, you must acknowledge its use and show clearly how you have used it. Please be aware that how you have decided to use it may impact on the overall mark you are allocated.

Guidance and feedback

There are some rules around how much guidance and feedback your assessor can provide as part of completing the assignment. Your assessor is allowed to give you some help in understanding the task instructions if necessary. However, if significant clarification and guidance is provided by your assessor this will be recorded and considered as part of the marking process and may reduce your mark. Your assessor will make it clear if any guidance given may reduce your mark before it is given, so that you understand this when asking for guidance.

Timings and planning

You are advised to study the details of the assessment before starting.

You should check with your assessor that you have all the relevant materials, equipment and information/data sources that you need before starting the assessment.

You should take care when planning to make sure you have appropriately divided the time available between parts of the assignment tasks. Timings for tasks are provided within this pack to support with planning and time allocation.

If you have a good reason for needing more time, you will need to explain the reasons to your assessor and agree a new time for the assessment to take place. Any changes will be at the discretion of the assessor and agreed to by City & Guilds.

Word counts

Typical word counts, where indicated, are to be used as approximates for guidance to support the production of sufficient evidence. The marking will relate to the quality of the evidence produced and not whether the word count has been met.

Submission of evidence

Your work will be submitted as final at the end of each assessment session. You will not have an opportunity to rework any of your evidence once the assessment session ends. However, if through other tasks within the project, you develop your ideas or build on earlier tasks, then you should continue to build on these and should use your evaluation to outline the reasons why this happened.

Presentation of work

The presentation of your work must be neat, legible and appropriate to the task and evidence required for submission.

You should make sure that each piece of evidence, including any forms, are clearly labelled with your name and the task reference.

All electronic files must be given a clear file name that allows your assessor to identify it as your work.

Written work may be digital or handwritten unless stated otherwise.

All sketches and drawings should be neat, tidy and annotated.

Calculations should be set out clearly, showing all working and any assumptions you made. You should use appropriate units at all times, consistent with the requirements of the assignment.

Instructions for this assignment

Ensure you read all the provided assessment information issued by the assessor

You must work independently and not share your work with any other candidates in these supervised assessment sessions.

Your work will be kept secure during any supervised breaks that are taken.

Internet access is **not** allowed, unless otherwise stated in the task.

You will not be permitted any additional notes, such as printed resources and textbooks, unless otherwise stated in the conditions for assessment.

You must complete all the tasks and present all evidence that is detailed in each task.

This assessment booklet contains the assignment brief.

The tasks have been separated into individual documents which will be handed to you at the start of each task.

Any additional documents/templates needed for the task will be provided to you by the assessor.

Within each task you will find the following:

- **Conditions of assessment:** This will tell you the duration and rules you must follow when completing a task.
- **Controlled conditions:** This will tell you the rules you must follow when completing each task. For example, you must not share or discuss your work with other candidates.
- **What must be produced for marking:** This describes the evidence you must submit when the task is completed. Be aware that failure to submit any evidence requested can adversely affect your overall mark for the assessment.
- **Additional evidence for this task:** This describes other forms of evidence that will be collected by the assessor to support the marking of your performance. This will often include but is not limited to, photographic and video evidence.
- **Resources:** Provides a list of equipment, documents or tools that you will have access to, to complete the task/sub task.

3. Assignment brief

You are employed within the research and development department of a local engineering company which produces a range of products to the engineering sector.

You have been asked to produce a bearing assembly to be used to in a roller assembly of a bespoke conveyor system.

The bearing assembly is to be manufactured from low carbon mild steel and nylon, produced using the lathe and milling machines you have within your facility.

The design office has provided technical drawings.

You are required to:

- create a new bearing assembly
- use manual and pre-programmed CNC machines to manufacture the components
- carry out in-production checks, make adjustments to the components, as required, to ensure the fit conforms to the specification
- quality check the completed bearing assembly
- finish all components with an anti-corrosion product prior to handover
- evaluate the processes and procedures used to produce the finished bearing assembly
- present your completed work and your findings to your supervisor at a handover meeting.

This assignment has a time allocation of **25 hours and 15 minutes**.

Figure 1 – Bearing assembly

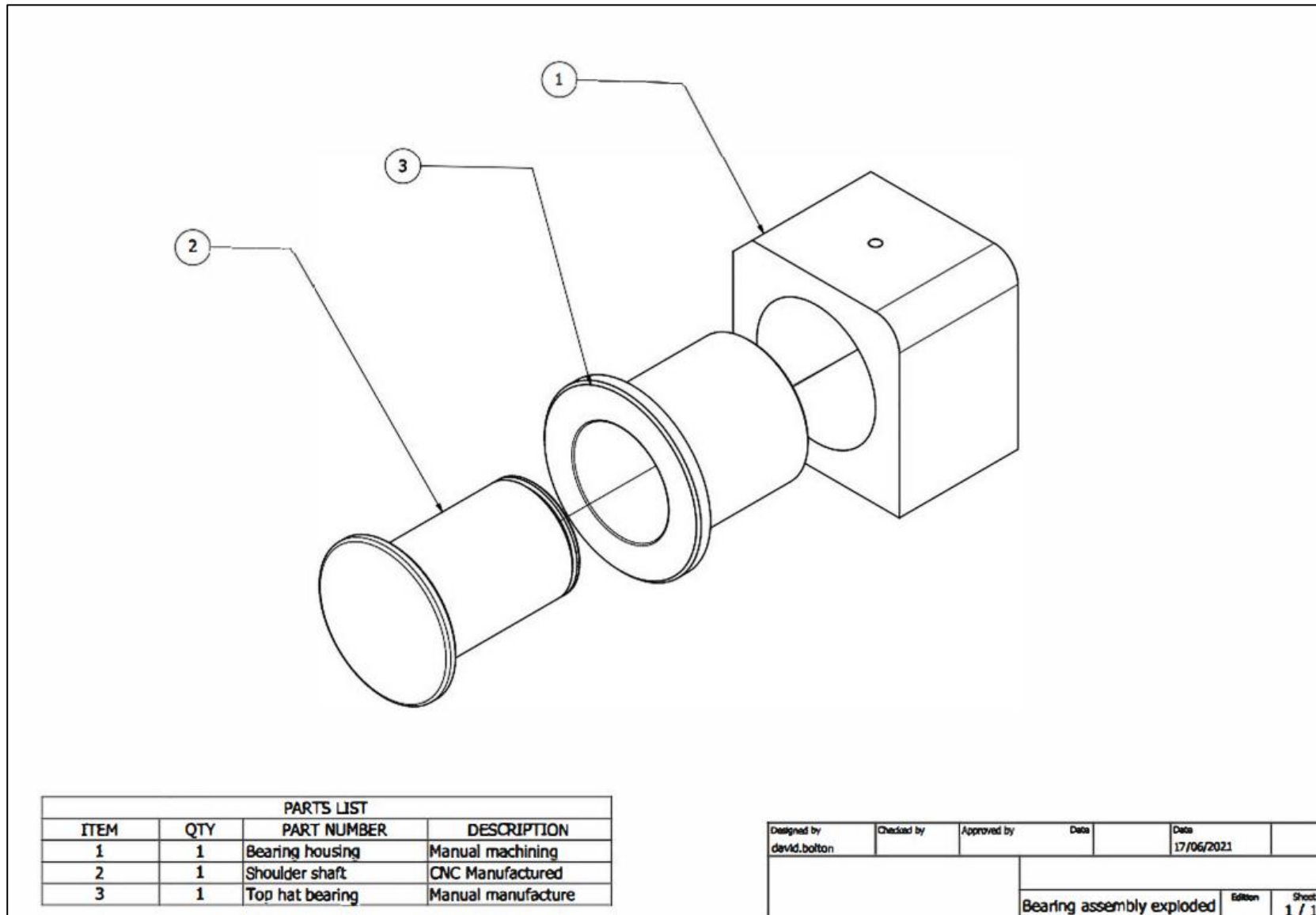


Figure 2 – Bearing housing

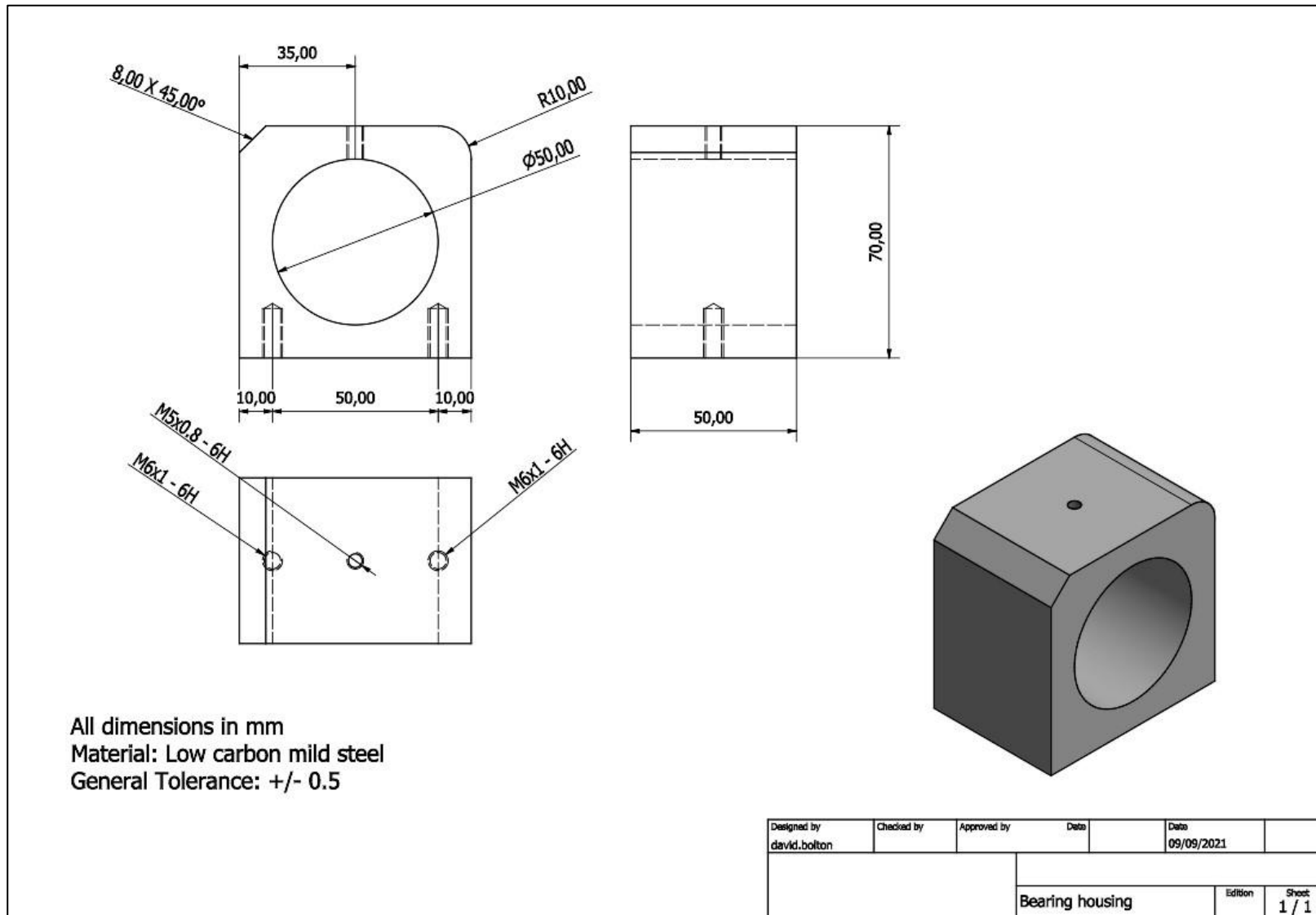


Figure 3 – Top hat bearing

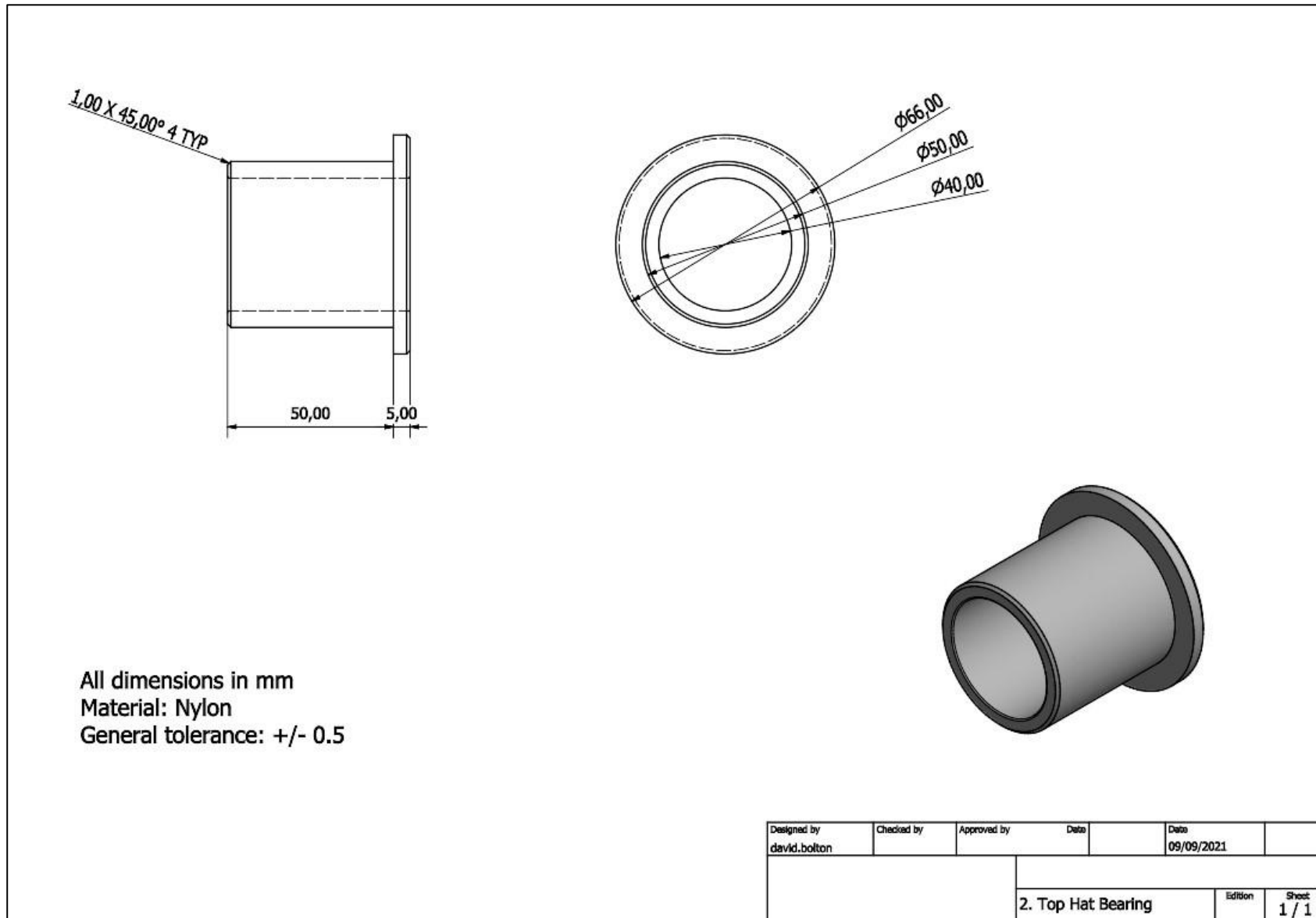
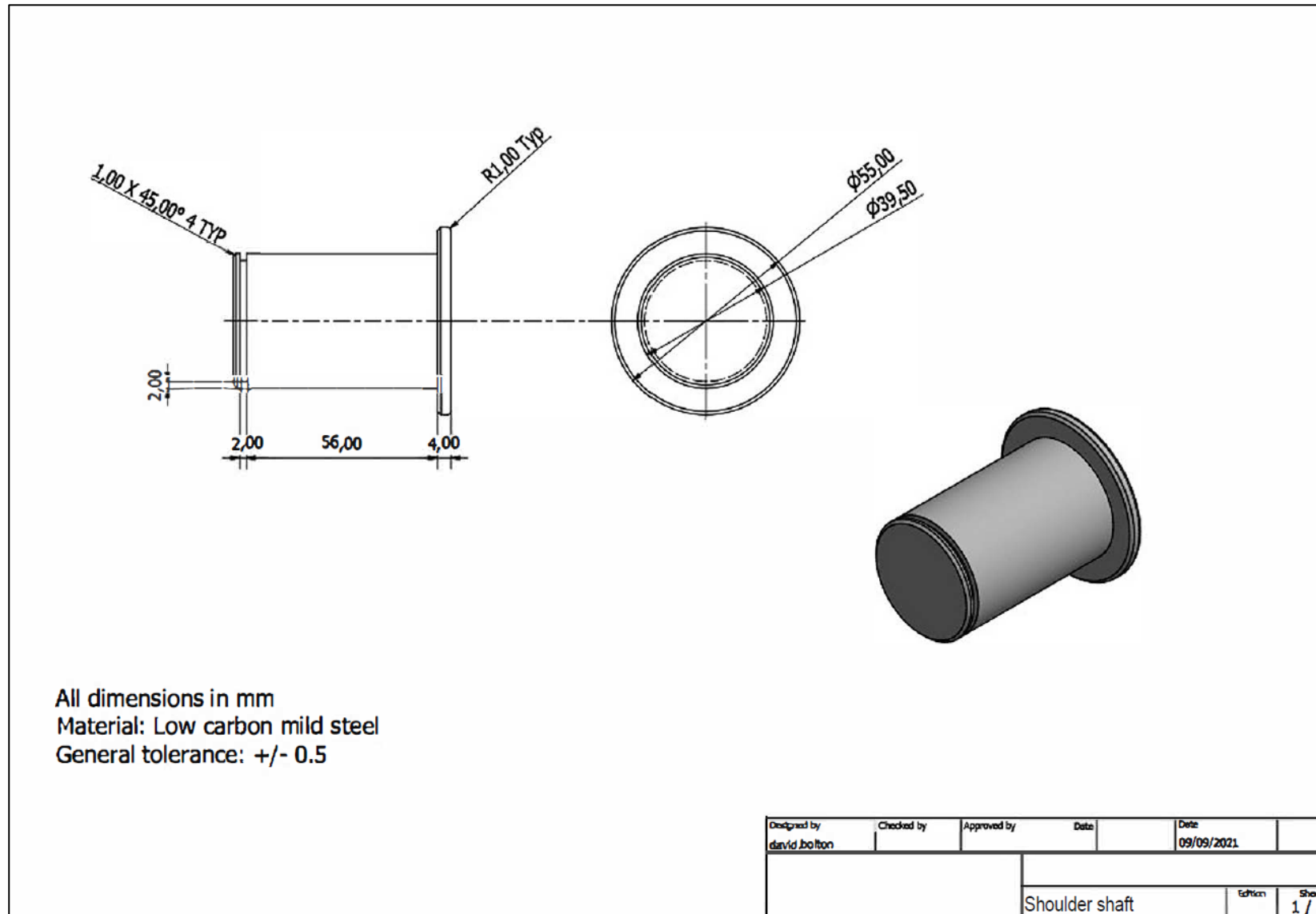


Figure 4 – Shoulder shaft (CNC production)



4. Tasks

Task 1 – Planning

You must:

- a) analyse the brief and technical information to produce a resources list needed for the production of the bearing assembly, with justifications for your selections
- b) produce a risk assessment for the activities needed to produce the bearing assembly to specification
- c) produce a method statement with justifications
- d) produce a quality check sheet
- e) carry out calibration checks on measurement equipment, with the results recorded on your resources list.

Conditions of assessment:

- the time allocated for this task is **3 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- resources list with justifications, and measuring equipment calibration check recorded
- risk assessment
- method statement with justifications
- quality check sheet.

Resources:

- technical information (including drawings)
- writing materials
- measuring equipment (with calibration certificate (if applicable)) (e.g. callipers, go-no-go gauges, DTI clock gauge, rules, tape)
- generic risk assessment generic template
- non-programmable calculator.

Task 2 – Production

You must:

- a) prepare the work area
- b) produce the bearing assembly components using both manual and pre-programmed computer numerical control (CNC) machinery to specification
- c) apply a suitable surface treatment to the finished components
- d) reinstate the work area following the production of the bearing assembly.

Conditions of assessment:

- the time allocated for this task is **18 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- bearing assembly consisting of:
 - bearing housing
 - top hat bearing
 - shoulder shaft.

Additional evidence for this task:

- assessor observation to include:
 - set up and use of manual and pre-programmed CNC workshop machinery
 - the production of the individual bearing assembly components
 - preparation, application and use of tools and equipment
 - checks carried out before, during and after production
 - work area prior to, during and on completion of tasks.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be submitted as supporting evidence for each candidate.

Photographic evidence which shows:

- the construction of the bearing assembly, with consideration of
 - the prepared work area
 - marking out of materials
 - setting up and application of machinery to remove material
 - final finish removal of material and result of tool section for accuracy and the finish of the component parts

- application of the surface treatment to component parts
- completed bearing assembly.

Resources:

- access to a conventional/manual milling machine
- access to the associated tooling required to produce the components
- access to manual and CNC centre lathes
- access to the associated tooling/holding devices required to aid with the production of the components
- measuring equipment (with calibration certificate (if applicable) (e.g. callipers, go-no-go gauges, DTI clock gauge, rules, tape)
- anti-corrosion surface treatment (e.g. degreaser, lubricant, rust protection spray, light tool oil)
- appropriate Personal Protective Equipment (PPE) (as per resources list)
- technical drawings
- copies of completed documentation from Task 1.
- Materials:
 - low carbon mild steel billet with appropriate diameter to the shoulder shaft
 - low carbon mild steel billet at appropriate dimensions to allow machining of bearing housing
 - nylon rod billet with appropriate diameter to allow machining of top hat bearing.

Task 3a – Quality review

You must:

- a) carry out a full quality inspection of the completed bearing assembly.
- b) record findings using the quality check sheet.

Conditions of assessment:

- the time allocated for this task is **1 hour**
- you must carry out the task on your own, under **controlled conditions** while being observed.

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor.
- you must not share or discuss your work with other candidates.
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- completed quality check sheet.

Additional evidence for this task:

- completed bearing assembly.
- assessor observation to include:
 - use of measuring equipment
 - checks for tolerances and accuracy.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be submitted as supporting evidence for each candidate.

Photographic evidence which shows:

- the quality review being undertaken, with consideration of
 - checking of tolerances and application and use of appropriate measuring tools and equipment
- bearing assembly components and fully assembled bearing assembly.

Video evidence which shows:

- demonstration showing the fit of the components to form the bearing assembly.

Resources:

- selection of measuring equipment (with calibration certificate (if applicable)) (e.g. callipers, go-no-go gauges, DTI clock gauge, rules, tape)
- writing materials
- copies of completed documentation from Task 1
- quality check sheet from Task 1
- completed bearing assembly from Task 2.

Task 3b – Evaluation and recording

You must:

- a) produce a quality inspection report evaluating the production of your finished bearing assembly. The report should typically be 800 words.

This must include:

- finished sizes of components and confirmation the bearing assembly conforms to the dimensional requirements of the specification
- an explanation of the quality checks undertaken and the reasons for their use
- an evaluation of the fitness for purpose of the finished bearing assembly and method of production used with reasoning and justifications
- a concessions list for every facet of the bearing assembly that does not conform to the specification, reasons for occurrence and how to prevent reoccurrence
- any improvements or adaptations required to the bearing assembly, including any reasoning and justifications if adaptations or improvements are not required.

Conditions of assessment:

- the time allocated for this task is **3 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidenced produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- quality inspection report.

Additional evidence for this task:

- completed bearing assembly.

Resources:

- writing materials
- access to a computer to write report
- copies of completed documentation from Tasks 1 and 3A
- completed bearing assembly.

Task 3c – Handover

You must:

- a) hold a meeting with your supervisor to complete handover procedures, including:
 - confirmation of work completed
 - overview of finding in quality inspection report
 - suggested improvements to design or production process
 - handover of completed bearing assembly and quality inspection report.

Conditions of assessment:

- the time allocated for this task is **15 minutes**
- you must carry out the task on your own, under **controlled conditions** while being observed
- you must carry out the handover meeting, with the assessor (or another staff member) taking the part of the supervisor
- there will be no interaction required or permitted by your assessor as part of the handover.

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidenced produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- assessor observation:
 - handover meeting.

Additional evidence for this task:

- handover materials consisting of:
 - quality inspection report
 - the completed bearing assembly.

To support the comments made within the Practical Observation the assessor must capture the following video that must be submitted as supporting evidence for each candidate.

Video evidence which shows:

- handover meeting.

Resources:

- quality inspection report
- completed bearing assembly from Task 2.

End of assessment

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