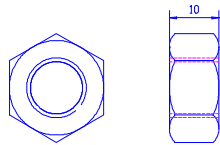


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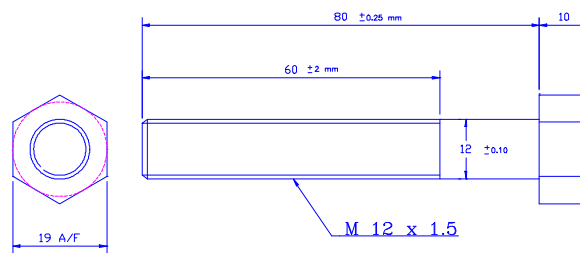
ENGINEERING WORK BOOK

Nut and Bolt

Time allowed – 2 weeks



NUT – MATERIAL BRIGHT MILD STEEL



BOLT – MATERIAL BRIGHT MILD STEEL

Procedure for making the Nut and Bolt

Bolt

1. Cut hexagonal material to length, with allowance for facing.
2. Face one end in the Centre Lathe to 90 mm length overall.
3. Centre Drill one end for the live centre.
4. Hold the hexagonal bar in the 3 jaw chuck by around 5-8 mm with the other end held by the live centre.
5. Turn the 12 mm diameter for the thread x 80 mm long – measure with the micrometer, size to finish at 12 mm minus 0.05 – 0.10.
6. Adjust the tool and clean up the corner for the head of the bolt.
7. Chamfer the 12 diameter end at 45 degrees x 2 mm.
8. Hold the 12 diameter in the chuck and chamfer the head at 45 degrees.

9. Hold by the 12 diameter and start the thread using the Stock and Die with the tailstock ensuring that the axis is square to the die - use cutting compound.
10. When sufficient has been cut to ensure the trueness of the thread, take it out of the lathe and finish the tread depth to 60 mm in the metal working vice.

Nut

1. Cut hexagonal material to length, with allowance for facing.
2. Face the ends in the Centre Lathe to 10 mm length overall, ensure that the bar runs true.
3. Centre drill the end for the drill.
4. Drill at 10.5 diameter.
5. Counter sink each face and chamfer each at 45 degrees.
6. Use Tee tap wrench to cut internal thread. Set up in the lathe with the live centre in the end of the tap wrench.

Competencies covered

Unit 1.1F.1 Undertake interactive workplace communication.

Element – 1.1F.1 Communicate information about tasks, processes, events, or skills.

Criteria		Met
1.1F 1.1	An appropriate choice of communication techniques are used.	
1.1F 1.2	Multiple operations involving several topics are communicated.	
1.1F 1.3	Listening is done without continuous interruptions of the speaker.	
1.1F 1.4	Questions are asked to gain extra information	
1.1F 1.5	Correct sources of information are identified	
1.1F 1.6	Information is selected and sequenced appropriately	
1.1F 1.7	Verbal reporting and written reporting done where required	
1.1F 1.8	Communication is demonstrated in unfamiliar situations	

Element - 1.1F.2 Take part in group discussion to achieve appropriate work outcomes.

1.1F 2.1	Responses sought and provided from others in the group	
1.1F 2.2	Constructive contributions are made towards the production processes involved.	
1.1F 2.3	Goals and aims are communicated.	

Element - 1.1F 3 Represent the views of the group to others.

1.1F 3.1	Views and opinions of others are understood and reflected accurately.	
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Unit 1.2F Apply principles of occupational health and safety (OH&S) in work.

Element – 1.2F.1 Follow safe work practices

1.2F	1.1	Work is carried out safely to school standards and legislative requirements.	
1.2F	1.2	Housekeeping is undertaken to school standards.	
1.2F	1.3	Responsibilities and duties of students are understood and demonstrated.	
1.2F	1.4	Personal protective equipment is worn and stored to school standards.	
1.2F	1.5	All equipment and safety devices are used to legislative requirements and school standards.	
1.2F	1.6	Safety signs are identified and followed as per instruction.	
1.2F	1.7	All manual handling is carried out to legal requirements and school standards.	
1.2F	1.8	Emergency equipment identified and used as appropriate.	

Element – 1.2F.2 Report workplace hazards

1.2F	2.1	Workplace hazards identified and reported to teacher.	
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Element – 1.2F.3 Follow emergency procedures

1.2F	3.1	Identifies the means of contacting appropriate personnel in the event of an accident	
1.2F	3.2	Emergency and evacuation procedure understood and carried out.	
1.2F	3.3	School evacuation procedures followed	

Unit 1.3F Apply quality procedures

Element - 1.3F.1 Take responsibility for own quality

1.3F	1.1	Concept of supplying product or service to meet customer needs or requirements understood and applied.	
1.3F	1.2	Accepts the “right first time” concept as a personal responsibility	

Element – 1.3F.2 Apply standard procedures of workplace quality to own job

1.3F	2.1	Quality system procedures followed.	
1.3F	2.2	Conformance to specifications ensured.	

Unit 1.4F Plan to undertake a routine task

Element – 1.4F.1 Identify task requirements

1.4F	1.1	Instructions for procedures are obtained, understood and if necessary, clarified.	
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1.4F	1.2	Relevant specifications for task outcomes are obtained, understood, and if necessary, clarified.	
1.4F	1.3	Task outcomes are identified	
1.4F	1.4	Task requirements, such as completion time and quality measures are identified.	

Element – 1.4F.2 Plan steps required to complete task

1.4F	2.1	Based on specifications and instructions provided, the individual steps or activities required to undertake the task are understood, and if necessary, clarified.	
1.4F	2.2	Sequence of activities required to be completed are identified in plan.	
1.4F	2.3	Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.	

Element – 1.4F.3 Review plan

1.4F	3.1	Outcomes are identified and compared with (planned) objectives, task instructions, specifications, and task requirements.	
1.4F	3.2	If necessary, plan is revised, to better meet objectives and task requirements.	

Unit 2.5C11 Measure with graduated devices

Element – 2.5C11.1 Use graduated devices to check dimensions or variables

2.5C11	1.1	Selects appropriate device or equipment to achieve required outcome.	
2.5C11	1.2	The correct and appropriate measurement technique used.	
2.5C11	1.3	Measures accurately to the finest graduation of the instrument.	

Element – 2.5C11.2 Maintain graduated devices

2.5C11	2.1	Routine care and storage of devices undertaken to manufacturers specification or standard operating procedure.	
2.5C11	2.2	Checks and maintains routine adjustments to devices e.g. zeroing.	

Unit 7.32A Use workshop machines for basic operations

Element – 7.32A.1 Determine job requirements

7.32A	1.1	Job requirements interpreted.	
7.32A	1.2	Appropriate machine selected to meet requirements.	

Element – 7.32A.2 Set up machine

7.32A	2.1	Tools are selected where appropriate.	
7.32A	2.2	Cutting tools are sharpened as required.	
7.32A	2.3	Tools are correctly installed using standard operating procedures.	
7.32A	2.4	Appropriate guards are set and adjusted as required.	

Element – 7.32A.3 Operate machine

7.32A	3.1	Material to be machined is positioned and secured.	
7.32A	3.2	Machine is operated appropriately to suit job and material requirements.	

Element – 7.32A.4 Check finished component

7.32A	4.1	Machined component checked against requirements and predetermined finish.	
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Machinery and equipment used

Cold cutting saw, centre lathe, pedestal grinder, HSS tool bit and straight or right hand tool holder, centre drill, live centre, stock and die, metal work vice.

Record keeping

All criteria which have been successfully met by each student, must be recorded on the students **Engineering Competencies Student Booklet** as soon as possible, but no less often than at the end of each semester.