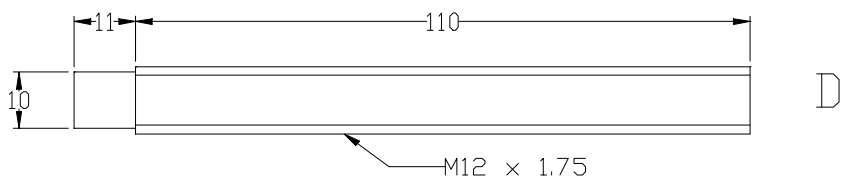


BEAUDESERT STATE HIGH SCHOOL

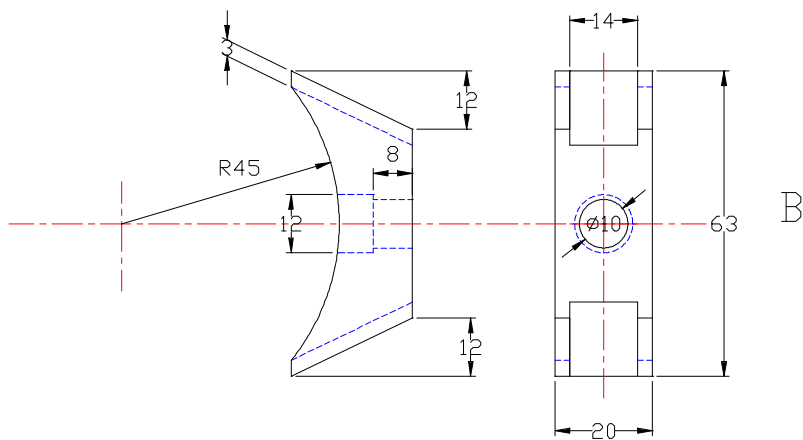
ENGINEERING WORK BOOK

OIL FILTER REMOVER

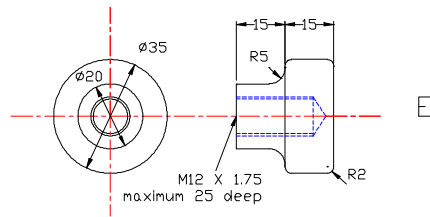
Time allowed – 11 weeks



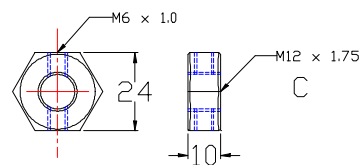
SPINDLE



FILTER JAW



SPINDLE KNOB



SPINDLE NUT

Procedure for making the Oil Filter Remover

Spindle

1. Cut a piece of M12 x 1.75 booker rod to 125 mm long on the cold saw.
2. Place a piece of aluminium strip around the circumference of the bar and hold in the lathe to face off both ends in the centre lathe to 121 mm long.
3. Turn the 10 diameter x 11 long spigot.

Spindle Nut

1. Cut a piece of 24 AF hexagonal bright mild steel bar to 14 long using the cold saw.
2. Hold in the 3 jaw chuck and ensure that the diameter is running true, before facing off one end to and while set up chamfer at 45 degrees.
3. Centre drill, and then drill right through at 10.5 diameter.
4. Counter sink the hole x 2 mm.
5. Reverse in the lathe and make sure that the hole and the diameter is running true.
6. Face off to 10 mm long, then chamfer at 45 degrees and countersink the hole x 2 mm.

7. Set up the M12 x 1.75 tap in the tee tap holder, and using the live centre in the end of the tap holder start the thread in the lathe, turning the chuck by hand – tap right through.
8. Mark out the position of the M6 x 1.0 hole, and centre punch.
9. Drill at 5 diameter using the pedestal drill with the work held in the vice and then tap the hole.

Spindle Knob

1. Cut a piece of 35 diameter bright mild steel to 34 long using the cold saw.
2. Hold by approximately 10 mm, face off the end and turn the 20 diameter x 15 long spigot, radius the near side of the 35 diameter knob.
3. Centre drill and then drill right through at diameter.
4. Countersink the hole x 2 mm.
5. Reverse in the lathe hold by approximately 10 mm and face off to 30 mm long.
6. Radius the other side of the 35 diameter knob.
7. Countersink the hole x 2 mm.
8. Set up the M12 x 1.75 tap in the tee tap holder, and using the live centre in the end of the tap holder start the thread in the lathe, turning the chuck by hand – tap right through.
- 9.

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	
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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.	
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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Unit 18.1A Use hand tools

Element – 18.1A.1 Use hand tools

18.1A	1.1	Appropriate hand tools selected according the task requirements.	
18.1A	1.2	Hand tools are used to produce required outcomes to job specifications which may include finish, tension, size or shape.	
18.1A	1.3	All safety requirements are adhered to before during and after use.	
18.1A	1.4	Unsafe or faulty tools are identified and marked for repair, according to designated procedures, before, during, and after use.	
18.1A	1.5	Routine maintenance of tools, including hand sharpening undertaken according to standard operational procedures, principles, and techniques.	
18.1A	1.6	Hand tools are stored safely in an appropriate location, according to standard operational procedures, and manufacturers' recommendations.	

Unit 18.2A Use power tools/hand held operations

Element – 18.2A Use power tools

18.2A	1.1	Appropriate power tools selected according to the task requirements.	
18.2A	1.2	Power tools used following a determined sequence of operation, which may include, clamping, alignment and adjustment to produce desired outcomes to job specifications which may include finish, size or shape.	
18.2A	1.3	All safety requirements are adhered to before during and after use.	
18.2A	1.4	Unsafe or faulty tools are identified and marked for repair, according	

		to designated procedures, before, during, and after use.	
18.2A	1.5	Operational maintenance of tools , including hand sharpening undertaken according to standard operational procedures, principles, and techniques.	
18.2A	1.6	Power tools are stored safely in an appropriate location, according to standard workshop procedure, and manufacturers' recommendations	

Machinery and equipment used

300 mm rules, scribes, centre punches, hammers, pedestal drill, pedestal grinder, hacksaw, metal work vice, cold cutting saw, centre lathe, HSS tool bit and straight or right hand tool holder, centre drill, live centre, stock and die, tap wrench, oxy acetylene cutter and heating torch, angle grinder, hand files, tinsnips.

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.