

## APPLY WORKSHOP TECHNOLOGY PRINCIPLES

UNIT CODE: ENG/OS/AUT/CC/4 /06

### UNIT DESCRIPTION

This unit describes the competencies required by an automotive technician in order to apply a wide range of workshop technology skills in their work. It involves use of different methods to produce work pieces using basic tools while observing occupational safety and health legislations, regulations and safe working practices, interpret working drawings, select appropriate techniques for a given task to achieve specified results as well as perform housekeeping.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the key outcomes which make up workplace function	<b>PERFORMANCE CRITERIA</b> These are assessable statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Use technical drawing to plan work operations	1.1 Technical drawings and geometric symbols are read and interpreted as per <i><b>drawing standards</b></i> . 1.2 <i><b>Operation Plan</b></i> is produced as per the technical drawings. 1.3 Technical drawings are produced <i><b>as</b></i> per drawing Standards.
2. Choose appropriate tools and materials	2.1 Working tools, equipment and materials are selected for the task. 2.2 The work areas are tidied up as per organization policy.

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3. Measure and mark out dimensions on workpieces	3.1 Measuring tools suitable for the work are selected 3.2 Measuring tools are inspected and calibrated if required 3.3 Dimensions are marked on the workpiece as per the working drawing.
4. Use hand tools to cut and file parts	4.1 <i><b>Hand tools</b></i> are selected based on operation plan 4.2 Workpiece is cut to specification 4.3 Workpiece is filed to specification 4.4 Part are produced to <i><b>specifications</b></i>
5. Use drills to make holes	5.1 Hole centers are marked and center punched as per operation plan. 5.2 Drill bits are selected and mounted 5.3 Workpiece is mounted and clamped 5.4 <i><b>Hole is drilled</b></i> to specification 5.5 Holes inspected to <i><b>specification</b></i>
6. Thread using taps and dies	6.1 Taps and dies selected based on operation plan. 6.2 Taps and dies are set up on the work piece 6.3 <i><b>Threads are</b></i> cut to specification

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7. Produce components using a lathe machine	7.1 Workpieces are turned to specification
8. Assemble metal parts and sub-assemblies	8.1 Parts joined, fitted and assembled 8.2 Final assembly inspected as per specification
9. Polish finished work	9.1 <b>Polishing</b> material are selected 9.2 Finished work is cleaned 9.3 Finished work is polished to specification
10. Perform housekeeping	10.1 Waste is segregated and disposed as per disposal guidelines. 10.2 Housekeeping is carried out as per workplace requirement
11. Inspect finished work for accuracy and quality	11.1 Inspection tools and methods selected as per operation plan 11.2 Finished work is inspected as per specification 11.3 Adjustments are made based on inspections results
12. Maintenance of tools and equipment	12.1 Machines and tools are inspected 12.2 Machines and tools are lubricated 12.3 Tools are ground to specification 12.4 Faults on machines and tools are identified and reported 12.5 Store tools and equipment

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

<b>VARIABLE</b>	<b>RANGE</b>
1. Measuring tools may include but is not limited to:	1.1 Steel rule 1.2 Vernier calliper 1.3 Micrometre screw gauge 1.4 Vernier height gauge 1.5 Combination set 1.6 Bevels
2. Drawing Standards tools may include but is not limited to:	2.1 ISO 2.2 BS 2.3 ANSI
3. Operation Plan tools may include but is not limited to:	3.1 Sequence of operations 3.2 Measuring tools 3.3 Hand tools 3.4 Cutting tools 3.5 Inspection tools
4. Marking out tools may include but is not limited to:	4.1 Scribes 4.2 Dividers 4.3 Dot punch 4.4 Centre punch 4.5 Engineers square 4.6 Straight edge 4.7 Surface plate
5. Work holding devices may include but is not limited to:	5.1 Bench vice 5.2 V-Block 5.3 Angle plate 5.4 G-clamp

<b>VARIABLE</b>	<b>RANGE</b>
	5.5 Jigs and fixtures 5.6 Hand vice
6. Hand tools may include but is not limited to:	6.1 Files 6.2 Saws 6.3 Hammers 6.4 Chisels 6.5 Taps and dies
7. Machine tools may include but is not limited to:	7.1 Drilling machines 7.2 Lathe machine 7.3 Grinding machine
8. Threads tools may include but is not limited to:	8.1 Internal and external threads 8.2 V-profile threads
9. Polishing tools may include but is not limited to:	9.1 Emery cloth 9.2 Polishing and burnishing machine 9.3 Filing
10. Hole drilled tools may include but is not limited to:	10.1 Location 10.2 Counter sinking 10.3 Counter boring 10.4 Reaming 10.5 Boring
11. Joining tools may include but is not limited to:	11.1 Riveting 11.2 Fastening 11.3 Soldering 11.4 Brazing 11.5 Welding
12. Specifications tools may include but is not limited to:	12.1 Dimensions 12.2 Tolerances 12.3 Geometry 12.4 Surface finish

VARIABLE	RANGE
	12.5 Functionality

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

- Technical drawing
- Using measuring and inspection tools
- Using hand tools
- Using portable and bench drilling machines
- Soldering and brazing
- Riveting and fastening
- Basic use of the lathe machine
- Using grinding machine

### Required Knowledge

The individual needs to demonstrate knowledge and understanding of:

- Occupational Health and Safety Act of Kenya laws 2007 with focus on personal safety, machine safety and workplace
- National Environment Management Authority Act, Kenya 2004
- OSH act
- Equipment manuals
- Basic technical drawing complying to ISO, ANSI & BS standards
- ISO 1101 Geometrical tolerance and where to use the norm
- Work Planning and documentation
- Measuring tools
- Hand tools

- Bench work
- Portable and bench drilling machines
- Lathe machine
- Grinding machine
- Inspection and quality control
- Preventive maintenance of machine tools
- Metal cutting technology
- Materials and metallurgy
- WIBA act (2007)
- Report writing

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the learner:</p> <ul style="list-style-type: none"> <li>1.1 Observed rules and procedures in the workshop</li> <li>1.2 Interpreted technical drawing</li> <li>1.3 Produced operation plan</li> <li>1.4 Produced holes on a workpiece</li> <li>1.5 Threaded using taps and dies</li> <li>1.6 Assembled metal parts</li> <li>1.7 Polished finished work</li> <li>1.8 Maintained tools and equipment</li> <li>1.9 Did housekeeping before, during and after operations</li> </ul>
<p>2. Resource Implications</p>	<ul style="list-style-type: none"> <li>1.1 Hand measuring tools</li> <li>1.2 Hand marking tools</li> <li>1.3 Hand tools</li> <li>1.4 Inspection tools and equipment</li> <li>1.5 Hand drilling machine</li> </ul>

	<ul style="list-style-type: none"> <li>1.6 Bench Drilling machine</li> <li>1.7 Lathe machine</li> <li>1.8 Grinding machine</li> <li>1.9 Work benches</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>1.1 Observing the behaviour of the learner</li> <li>1.2 Oral presentations</li> <li>1.3 Inspection of written operation procedures</li> <li>1.4 Inspection of finished product</li> <li>1.5 Observing housekeeping of the work area and/or machine tool</li> </ul>
4. Context of Assessment	<p>Competency may be assessed individually in the actual workplace or through accredited institution</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>