



Part of the
Enginuity Group

Qualification Specification AUEC2 Unit Summaries

EAL Level 2 Diploma in Advanced Manufacturing and Engineering
(Foundation Competence)
Qualification Number: 601/7179/0

EAL Level 2 Diploma in Engineering Operations
(Skills)
Qualification Number: 603/3220/7

Issue 1



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1.0 About EAL

For over fifty years, EAL has been the specialist awarding organisation for engineering, manufacturing, building services and related sectors. Developed to the highest technical standards, our qualifications reflect ever-changing industry and regulatory needs. We support the providers of our qualifications with an unparalleled level of service to ensure that learners are well prepared to take the next step in their journeys, whether study, an apprenticeship or work.

Through industry partnerships with EAL centres and training providers, decades of experience supporting our core sectors, and our role as part of the Enginuity Group, we have built unrivalled knowledge and understanding of employer skills needs. As a result, EAL's skills solutions, including apprenticeship End-Point Assessment, External Quality Assurance and qualifications are respected and chosen by employers to deliver real lifelong career benefits for all our learners. That's why in the last ten years, 1.2 million people across the UK have taken EAL qualifications.

1.1 Equal Opportunities and Diversity

EAL expects its centres to enable learners to have equal access to training and assessment for qualifications in line with equalities legislation. Further details can be located in the EAL Equal Opportunities and Diversity Policy:

<http://www.eal.org.uk/centre-support/centre-support/policies-and-important-documents>

1.2 Customer Experience and Feedback

Customer Experience is a fundamental part of EAL's commitment to you. EAL aims to ensure that all customers receive a high-quality efficient service. We are always interested in feedback and if you have any comments or feedback on our qualifications, products or services, please contact the Customer Experience team:

EAL Customer Experience

Tel: +44 (0)1923 652 400

Email: Customer.Experience@eal.org.uk

2.0 Unit Summary/Summaries

AUEC2/001

Complying with statutory regulations and organisational safety requirements

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to deal with statutory regulations and organisational safety requirements, in accordance with approved procedures. They will be required to comply with all relevant regulations that apply to their area of work as well as their general responsibilities as defined in the Health and Safety at Work Act. They will also need to be able to identify the relevant qualified first aiders or appointed person, and must know the location of the first aid facilities. They will have an understanding of the procedures to be adopted in the case of accidents involving injury, and in situations where there are dangerous occurrences or hazardous malfunctions of equipment, processes or machinery. They will also need to be fully conversant with the organisation's procedures for fire alerts and the evacuation of premises.

They will be required to identify the hazards and risks that are associated with their job. Typically these will focus on their working environment, the tools and equipment that they use, materials and substances that they use, working practices that do not follow laid-down procedures, and manual lifting and carrying techniques.

Their responsibilities will require them to comply with organisational policy and procedures for the statutory regulations and organisational safety activities undertaken, and to report any problems with the safety activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. Although working under close supervision they must take personal responsibility for their own actions and for the way in which they carry out the required engineering activities.

Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to applying statutory regulations and organisational safety requirements and procedures. They will understand the safety requirements and their application, in adequate depth to provide a sound basis for carrying out the activities safely and correctly.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/002

Working efficiently and effectively in an engineering environment

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to carry out all necessary preparations; within the scope of their responsibility prior to undertaking the engineering activity. This will include preparing the work area and ensuring that it is in a safe condition to carry out the intended activities, obtain the appropriate job documentation, work instructions, tools, equipment and materials required for the work activities undertaken, and to check they are in a safe and usable condition. Planning their work activities before they start them will also form part of this unit.

On completion of the engineering activity, they will be required to return their immediate work area to an acceptable condition before undertaking further work. This may involve placing part-completed or completed work in the correct location, returning and/or storing any tools and equipment in the correct area, removing any waste and/or scrapped materials, and reporting any defects or damage to the tools and equipment used.

In order to be efficient and effective in the workplace, they will also be required to demonstrate that they can create and maintain effective working relationships with colleagues and supervisors. They will be expected to review objectives and targets for their personal development and to contribute to, and communicate any opportunities for, improvements that could be made to working practices and procedures.

Fundamental to this unit is the learners ability to be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment

Their responsibilities will require them to comply with health and safety requirements, environmental and organisational policy and procedures for the activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to working efficiently and effectively in an engineering environment.

They will understand the need to work efficiently and effectively, and will know about the areas they need to consider when preparing and tidying up the work area. They will know how to contribute to improvements, deal with problems, maintain effective working relationships, understand the behaviours that are required in the workplace and agree their development objectives and targets, in adequate depth to provide a sound basis for carrying out the activities safely and correctly.

They will understand the safety precautions required when carrying out the specific engineering activities and will be required to demonstrate safe working practices throughout, and will understand the responsibility that they owe to themselves and others in the workplace.

AUEC2/003

Using and communicating technical information

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Make full use of text, numeric and graphical information, by interpreting and using technical information extracted from a range of documentation such as engineering drawings, technical manuals, technical specifications, reference tables and charts, electronic displays, planning and quality control documentation, which will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or will act as a basis for the development of additional skills and occupational competences in the working environment.

They will be required to extract the necessary data from the various specifications and related documentation, in order to establish and carry out the work requirements, and to make valid decisions about the quality and accuracy of the work carried out. They will also need to be able to communicate and record technical information, using a range of different methods such as producing detailed sketches, preparing work planning documentation, producing technical reports and recording data from testing activities.

Their responsibilities will require them to comply with organisational policy and procedures for obtaining, using and communicating the technical information applicable to the activity. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide a good understanding of the types of documentation available for use, and will provide an informed approach to applying and communicating engineering instructions and procedures. They will be able to read and interpret the documentation available, and will know about the conventions, symbols and abbreviations to the required depth to provide a sound basis for carrying out the activities to the required specification

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/004

Conducting business improvement activities

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to conduct a business improvement activity using a systematic plan, do, check, act approach for an engineering operation or process, which will prepare them for entry into the engineering industry or engineering manufacturing sector, creating a progression between education and employment and acting as a basis for the development of additional skills and occupational competencies in the working environment. They will be expected to adopt a systematic approach to conducting business improvement activities on an engineering/manufacturing operation or process to identify opportunities for the elimination of waste.

They will be required to conduct a 5S/5C audit and identify wasteful or non-added value activities in the operation or process. They will need to produce a new standard operating procedure (SOP) or contribute to improving an existing SOP. These activities will include creating the appropriate visual management systems required, calculating key performance indicators required and the quality control requirements and presenting records of the business improvement activities and how they will meet their aims.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the business improvement activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the business improvement activities and to seek appropriate help and advice in determining and implementing a suitable solution.

They will work under a high level of supervision whilst taking responsibility for their own actions and the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, in order to safely apply appropriate engineering principles to business improvement activities. They will understand the tools and techniques used in business improvement activities and procedures used, and their application, and will know about the process, materials and consumables, to the required depth to provide a sound basis for carrying out the improvement activities and producing project plans that will lead to a successful project outcome.

They will understand the safety precautions required when carrying out the business improvement activities for the agreed operations and processes. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment

AUEC2/005

Producing components using hand fitting techniques

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Prepare for the hand fitting activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required fitting activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the operations to be carried out and the accuracy required.

In producing the components, they will be expected to use appropriate tools and equipment to mark out the material for a range of features to be produced, and then to use hand tools, portable power tools, and shaping and fitting techniques appropriate to the type of material and operations being performed. These activities will include hand sawing, band sawing, filing, drilling, threading, and off- hand grinding. The components produced will have features that include flat, square, parallel and angular faces, radii and curved profiles, drilled holes, internal and external threads, and sliding or mating parts.

During, and on completion of, the fitting operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise fitting defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements.

On completion of the fitting activities, they will be expected to return all tools and equipment to the correct locations, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the fitting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the fitting activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate hand fitting techniques safely. They will understand the hand fitting process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when using hand fitting techniques, and when using hand and power tools. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different fitting operations, at least one of the components produced must be of a significant nature, and must have a minimum of five of the features listed in S6 within the Skills requirements.

AUEC2/006

Maintaining mechanical devices and equipment

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to Prepare for the maintenance activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of mechanical equipment being maintained. This will include equipment such as gearboxes, pumps, machine tools, conveyor systems, workholding arrangements, engines, processing plant and equipment, and other organisation-specific equipment. They will be expected to use a variety of maintenance diagnostic techniques and procedures, such as gathering information from fault reports, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment.

They will then be expected to dismantle, remove and replace/refit or repair any faulty units or components, on a variety of mechanical assemblies and sub-assemblies. This will include components such as shafts, bearings, couplings, gears, pulleys, clutches, brakes, levers and linkages, cams and followers, and other specific mechanical components. They will be expected to cover a range of maintenance activities, such as draining and removing fluids, releasing stored energy, labelling/proof marking to aid reassembly, dismantling components to the required level, dismantling components requiring pressure or expansion/contraction techniques, checking components for serviceability, replacing faulty components and 'lived' items, setting, aligning and adjusting components, tightening fasteners to the required torque and making 'off-load' checks of the maintained equipment.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the mechanical maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate mechanical maintenance techniques and procedures safely. They will understand the maintenance process, and its application, and will know about the mechanical equipment being maintained, the equipment components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the maintenance activities, and when using maintenance tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different maintenance operations, at least one of the maintenance activities must be of a significant nature, and must cover at least seven of the activities listed in S4 plus the removal and replacement/refitting of a minimum of five of the components listed in S5 within the Skills requirements.

AUEC2/007

Assembling and testing fluid power systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

To prepare for the assembly activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required assembly activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the assembly operations to be carried out and the type of fluid power equipment being assembled, which will include hydraulic, pneumatic or vacuum systems.

In carrying out the fluid power assembly operations, they will be required to follow specific assembly techniques in order to assemble the various components, which will include rigid and flexible pipework, hoses, valves, actuators and cylinders, regulators, switches and sensors. The assembly activities will also include making all necessary checks and adjustments to ensure that fluid power components are correctly positioned and aligned are dimensionally accurate and secure; pipework is dimensionally accurate and free from ripples, creases and damage; and joints are checked for security, with threaded devices tightened correctly. They will also be expected to carry out appropriate test procedures (such as leak or pressure) to confirm that the fluid power assembly meets the operational performance required.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the fluid power assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the assembly activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for Their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate fluid power assembly techniques and procedures safely. They will understand the assembly process, and its application, and will know about the fluid power equipment being assembled, the system components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities, and when using assembly tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different fluid power assembly operations, at least one of the fluid power assemblies produced must be of a significant nature, and must contain a minimum of six of the components listed in S3 within the in the Skills requirements.

AUEC2/008

Maintaining fluid power equipment

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Prepare for the maintenance activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of fluid power equipment being maintained, which will include hydraulic, pneumatic or vacuum equipment and circuits.

They will be expected to use a variety of maintenance diagnostic techniques and procedures, such as gathering information from fault reports, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment. They will then be expected to dismantle, remove and replace/refit, or repair any faulty units or components, including pumps, valves, actuators, sensors, intensifiers, regulators, compressors, pipes and hoses, and other specific fluid power equipment.

They will be expected to cover a range of maintenance activities, such as draining and removing fluids, removing stored pressure, labelling/proof marking to aid reassembly, dismantling components to the required level, checking components for serviceability, replacing faulty components and 'lived' items, setting and adjusting components, tightening fasteners to the required torque and making 'off-load' checks, before starting up and testing the maintained equipment, using appropriate techniques and procedures.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the fluid power maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate fluid power maintenance techniques and procedures safely. They will understand the maintenance process, and its application, and will know about the fluid power equipment being maintained, the system components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the maintenance activities, and when using maintenance tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different maintenance operations, at least one of the fluid power maintenance activities must be of a significant nature, and must involve the removal and replacement/refitting of a minimum of five of the components listed in S6 within the Skills requirements.

AUEC2/009

Maintaining electrical equipment/systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to prepare for the electrical maintenance activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of electrical equipment/systems being maintained. This will include electrical equipment that uses single, three-phase or direct current power supplies, and includes equipment such as control systems, motors and starters, switchgear and distribution panels, electrical plant, pumps, fans, alternators, generators, transformers, wiring enclosures and luminaires, portable appliances and other specific electrical equipment. They will be expected to use a variety of maintenance diagnostic techniques and procedures, such as gathering information from fault reports, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment. They will be expected to cover a range of maintenance activities, such as isolating and locking off, disconnecting, removing and reconnecting electrical components, wires and cables, attaching cable identification markers, replacing damaged or defective components, cables and wires, setting and adjusting components, and making 'off-load' checks before testing the equipment, using appropriate techniques and procedures.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the electrical maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electrical maintenance techniques and procedures safely. They will understand the electrical maintenance process, and its application, and will know about the electrical equipment and systems being maintained, the components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the maintenance activities (especially those for ensuring that the equipment is correctly isolated), and when using maintenance tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different electrical maintenance operations, at least one of the electrical maintenance activities carried out must be of a significant nature, and must cover a minimum of eight of the activities listed in S5 within the Skills requirements.

AUEC2/010

Wiring and testing electrical equipment and circuits

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Use and terminate a range of cables, such as single and multicore cables, screened cables, fire resistant and armoured cables. They will be required to make a variety of terminations and to connect a range of electrical components, such as switches/switchgear, distribution panels, motors and starters, control systems, sensors and actuators, safety devices, and luminaires.

They will be required to select the appropriate tools, materials and equipment to use, based on the operations to be performed and the components to be connected. They will be expected to use appropriate tools and techniques for the wiring of the various electrical components and connectors that make up the electrical system/circuit. In addition, they will be expected to make all necessary electrical connections to the switches, relays, sensors/actuators and other devices, as appropriate to the equipment and circuit being produced. The wiring and testing activities will include making all necessary checks and adjustments to the circuit, including continuity, polarity, insulation resistance values, and ensuring that the equipment functions to the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the wiring and testing activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the wiring and testing activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electrical wiring and testing procedures and techniques safely. They will understand the wiring and testing methods and procedures used, and their application, and will know about the various cables and components used to produce the circuits, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the wiring and testing activities, especially those for ensuring the safe isolation of the equipment and circuits produced. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different electrical assembly and wiring activities, at least one of the electrical assemblies produced must be of a significant nature, and must contain a minimum of five of the components listed in S3 plus five of the activities listed in S5 within the Skills requirements.

AUEC2/011

Wiring and testing programmable controller based systems

This unit of Competence has been developed by employers in the Automotive Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Prepare for the programmable controller wiring and testing activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how you intend to carry out the activities and the sequence of operations they intend to use. It involves connecting and wiring up the equipment and the development, editing, inputting, testing and de-bugging of simple programs.

They will be expected to connect peripheral components and communication links, and to load/download process controller programs, check them for errors, and create back-up copies of completed programs.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the programmable controller maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution.

They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply safely the appropriate wiring and connection techniques and procedures for programmable controller equipment. They will understand the programmable controller wiring and testing process, and its application, and will know about the controller and peripherals being wired and tested, and the tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the wiring and testing activities (especially those for ensuring the equipment is correctly isolated), and when using the various tools and test equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different wiring and testing operations, at least one of the PLC systems worked on must be of a significant nature, and must cover a minimum of five of the items listed in S3 within the Skills requirements.

AUEC2/012

Producing mechanical assemblies

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Prepare for the assembly activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required assembly activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the operations to be carried out and the type of components to be assembled.

In carrying out the assembly operations, they will be required to follow specified assembly techniques, in order to produce the required mechanical assembly. The assembly activities will also include making all necessary checks and adjustments, to ensure that components are correctly orientated, positioned and aligned, that moving parts have the correct working clearances, that all fasteners are tightened to the correct torque, and that the assembled parts are checked for completeness and they function as per the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the assembly activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate assembly techniques safely. They will understand the assembly process, and its application, and will know about the mechanical equipment being assembled, the components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities, and when using assembly tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different assembly operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of six of the components listed in S3 within the Skills requirements.

AUEC2/013

Preparing and using lathes for turning operations

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to carry out turning operations on machines such as centre lathes, capstan or turret lathes, automatic or other specific turning machines. They will be expected to prepare for the turning activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required turning activities and the sequence of operations they intend to use.

They will be required to prepare for the turning activities by mounting, positioning and correctly setting a range of workholding devices, to mount the workpiece and cutting tools and to set and use cutting feeds/speeds and techniques appropriate to the type of material, tooling, workpiece rigidity and operations being performed. They will be expected to produce components that combine a number of different features, such as parallel, stepped and tapered diameters, drilled, bored and reamed holes, internal and external threads, and special forms/profiles.

During, and on completion of, the turning operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise turning defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements. On completion of the turning activities, they will be expected to remove all cutting tools and workholding devices, and to leave the machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the turning activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the turning activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate turning techniques safely. They will understand the turning process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the lathe, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different turning operations, at least one of the machined components produced must be of a significant nature, and must have a minimum of six of the features listed in S5 within the Skills requirements.

AUEC2/014

Preparing and using milling machines

This unit of Competence has been developed by employers in the Automotive Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to carry out the milling operations on horizontal, vertical or universal milling machines. They will be expected to prepare for the machining activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required milling activities and the sequence of operations they intend to use.

They will be required to prepare for the milling activities by mounting, positioning and correctly setting a range of workholding devices, to mount the workpiece and cutting tools and to set and use cutting feeds/speeds and techniques appropriate to the type of material, tooling, workpiece rigidity and operations being performed. They will be expected to produce components that combine a number of different features, such as flat faces, parallel faces, faces square to each other, angular faces, steps, open and enclosed slots, drilled, bored and reamed holes, internal threads, and special forms/profiles.

During, and on completion of, the milling operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise milling defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements.

On completion of the machining activities, they will be expected to remove cutters and workholding devices, and to leave the milling machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the milling activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the milling activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for Their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate milling techniques safely. They will understand the milling process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the milling machine, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different milling features, at least one of the components produced must be of a significant nature, and must have a minimum of five of the features listed in S5 within the Skills requirements.

AUEC2/015

Preparing and using semi-automatic MIG, MAG and flux cored arc welding equipment

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector. This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Prepare the welding equipment and to ensure that all leads/cables, shielding gas system, hoses and wire feed mechanisms are securely connected and free from damage. They will also need to obtain and check that all the workholding equipment is in a safe and usable condition. In preparing to weld, they will need to set and adjust the welding conditions, in line with instructions and/or the welding procedure specification. They must operate the equipment safely and correctly, and make any necessary adjustments to settings in line with their permitted authority, in order to produce the welded joints to the required specification.

On completion of the welding operations, they will be expected to check the quality of the welds using measuring equipment, visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the welding activities, they will be expected to return all tools, equipment and workholding devices to their designated location, and to leave the welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the welding activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for Their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate semi-automatic MIG, MAG or flux cored-wire welding techniques safely. They will understand the welding process, and its application, and will know about the equipment, materials and consumables to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with the MIG, MAG or flux cored-wire welding equipment, and with the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

Welded joints must be at least 150mm long, using single or multi-run welds (as appropriate), with at least one stop and start included.

AUEC2/016

Assembling and testing electronic circuits

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Carry out the assembly of a range of electronic components such as resistors (fixed and variable), capacitors (fixed and variable), diodes, transistors and other semiconductor devices, integrated circuits (analogue and digital), miniature transformers, switches, indicators, wire links and a range of connectors, spacers and brackets to form various types of circuits. This will involve using a range of tools and equipment along with soldering techniques and anti-static protection techniques.

The assembly activities will include making all necessary checks and adjustments to the circuits, including continuity checks, voltage, current and resistance values, waveform and ensuring that the circuit functions to the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the electronic assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the assembly and wiring activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electronic assembly, wiring and testing procedures and techniques safely.

They will understand the assembly methods and procedures used, and their application, and will know about the various components used to produce the circuits, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the electronic component assembly activities, and with using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different electronic assembly and testing activities, at least one of the electronic assemblies produced must be of a significant nature, and must contain a minimum of ten of the components listed in S5 within the Skills requirements.

AUEC2/017

Maintaining electronic equipment/systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This EUC identifies the training and development required in order that the learner can demonstrate that they are competent in being able to prepare for the electronic maintenance activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of electronic equipment or systems being maintained. This will include power supplies, motor control systems, alarm and protection circuits, sensors and actuator circuits, digital circuits and systems, analogue circuits and systems, and hybrid circuits and systems.

They will be expected to use a variety of maintenance diagnostic techniques and procedures, such as gathering information from fault reports, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment.

They will be expected to apply a range of dismantling and reassembly methods and techniques at circuit board and component level, such as soldering, de-soldering, crimping, harnessing, securing cables and components, replacing damaged or defective components, cables and wires, setting and adjusting components, and making de-energised checks before testing the equipment, using appropriate techniques and procedures. They will be expected to take care that they do not cause further damage to the equipment/circuit during the repair activities and, therefore, the application of electrostatic discharge (ESD) procedures will be a critical part of their role.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the electronic maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electronic maintenance techniques and procedures safely. They will understand the electronic maintenance process, and its application, and will know about the electronic equipment and systems being maintained, the equipment components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the repair activities, especially those for isolating the equipment, and for taking the necessary safeguards to protect themselves, and others, against direct and indirect electric shock. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different electronic maintenance operations, at least one of the electronic maintenance activities carried out must be of a significant nature, and must cover a minimum of five of the activities listed in S4 plus the removal and replacement/refitting of seven of the components identified in S5 within the Skills requirements.

AUEC2/018

Preparing and using industrial robots

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to produce, load and prove programs on industrial robot controllers, and which will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to produce the control programs and check/prove the program. They will also be required to adjust/edit the robot program, following proving/editing procedures to achieve the control specification. They must ensure that any edited programs are saved and backed up safely and correctly.

In preparing the robot, they will be expected to select the appropriate workholding devices, and to mount and secure them in the appropriate location. They will also be required to select the appropriate tools or accessories, and to mount and secure them to the robot arm. They will need to ensure that all the tools/accessories have been allocated a relevant tool number, and that the relevant data on their co-ordinates and datum positions is entered into the robot's operating program.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for preparing and using industrial robots. They will need to take account of any potential difficulties or problems that may arise with the robot related activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate robot programming and operating techniques safely. They will understand the robotic process, and its application, and will know about the sensors and actuators used in the process, the programming, editing and proving process, workholding devices, tooling/accessories and setting-up procedures, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with industrial robots, and with associated tools and equipment. They will be required to demonstrate safe working practices for any robotic cell they are working on, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different processes and operations, at least one of the activities carried out must be of a significant nature, and must cover a minimum of four of the activities listed in S6 plus five of the operations identified in S8 within the Skills requirements.

AUEC2/019

General turning, milling and welding applications

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to undertake a broad range of basic turning, milling and welding activities that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to carry out a range of practical skills tasks in order to gain an understanding of how these machining and welding activities are undertaken, the types of equipment used, the manufacturing techniques, and the operating and safety procedures that are required.

In carrying out the activities, they will use appropriate tools, equipment, methods and techniques appropriate to the operations being performed. These activities will include turning, milling and welding operations.

During, and on completion of, the operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise when the activities/outputs are not meeting the required specification, and to discuss/determine what action needs to be taken to remedy any faults that occur, in order to ensure that the finished workpiece is within the specification requirements. On completion of the activities, they will be expected to return all tools and equipment that they have used to the correct location, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of your work, and will enable them to apply appropriate machining, fitting and assembly techniques and procedures safely. They will understand the turning, milling and welding processes, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the various turning, milling and welding techniques, and when using any hand tools and machinery. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Standard Requirements

Turning

In order to prove their ability to combine different turning operations, at least one of the machined components produced must be of a significant nature, and must have a minimum of nine of the features listed in S4 within the Skills requirements.

Milling

In order to prove their ability to combine different milling features, at least one of the components produced must be of a significant nature, and must have a minimum of eight of the features listed in S5 within the Skills requirements.

Welding

Welded joints must be at least 150mm long, using single or multi-run welds (as appropriate).

AUEC2/020

Forming and assembling pipework systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic pipe fitting competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the pipe fitting activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required pipe fitting activities and the sequence of operations they intend to use. They will be expected to select the appropriate equipment to use, based on the operations to be carried out and the accuracy required.

In producing the pipework systems, they will be expected to select and use a range of hand tools, pipe bending and forming equipment and pipe assembly techniques, appropriate to the type of material and operations being performed. Activities will include cutting the pipes to the required lengths using hand saws, power saws or pipe cutters; bending pipes using hand bending machines, springs, fillers or heating techniques; and the use of templates or set wires to check bend profiles which will include angular bends, offsets, bridge sets and expansion loops. They will then be expected to assemble the pipes, using a range of different connectors such as straight connectors, elbows, tee pieces, reducers, tank connectors and valves.

During, and on completion of, the pipe fitting operations, they will be expected to check the quality of the work, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise pipe bending and fitting defects, to take appropriate action to remedy any faults that occur and to ensure that the finished system is within the drawing requirements. On completion of the pipe fitting activities, they will be expected to return all tools and equipment to the correct locations, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the pipe bending, forming and fitting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate pipe bending, forming and fitting techniques safely. They will understand the pipe bending, forming and fitting equipment and techniques, and their



application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the pipe bending, forming and fitting activities, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different pipe assembly operations, at least one of the pipe assemblies produced must be of a significant nature, and must have a minimum of five of the fittings listed in S9.

AUEC2/021

Preparing and proving CNC machine tool programs

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic computer numerical control (CNC) programming competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competencies in the working environment.

They will be required to produce the component program, using manual data input or by use of a remote computer, saving the prepared program on to a storage device or by downloading it into the machine controller from the computer.

They will be expected to prepare part programs, using operational sequences and machining techniques that avoid unnecessary tool/cutter movements or tool changes, and to use repetitive programs and canned cycles, to reduce program size and input time. They will prepare component programs that combine a number of different operations, such as parallel, stepped and tapered diameters, drilled, bored and reamed holes, internal and external threads, flat, square and parallel faces, angular faces, slots and recesses, special forms and profiles.

They will need to check the program using single block run and program edit facilities. They will also be required to adjust the machine tool equipment and program, following proving/editing procedures, to achieve component specification. They must ensure that any edited programs are saved safely and correctly.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the programming activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the programming activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for Their own actions and for the quality and accuracy of the work that They produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC programming and proving techniques safely. They will understand the CNC programming process, and its application, and will know about the machine operating programs and setting-up procedures, to the required depth to provide a sound basis for carrying out the programming activities to the required specification.

They will understand the safety precautions required when working with the CNC machines, and with their associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to produce programs that combine different features, at least one of the programs produced must be of a significant nature, and must cover a minimum of five of the features listed S5.

AUEC2/022

Producing sheet metal components and assemblies

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic sheet (up to and including 3 mm) metalworking competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will prepare for the sheet metalworking activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required cutting, forming and assembly activities, and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the type and thickness of material, the operations to be carried out and the accuracy to be achieved. In carrying out the cutting and shaping activities, they will need to use a range of hand tools, portable power tools and simple machines to produce a variety of shapes, profiles and forms. They will also be expected to produce simple sheet metal assemblies, using self-secured joints, thermal methods or mechanical fastening devices.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the sheet metalworking activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate sheet metalworking techniques and procedures safely. They will understand the cutting, forming and assembly process, and its application, and will know about the tools and equipment used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out sheet metalworking activities, and when using the various tools and equipment, especially with the use of guillotines and bending/forming equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different sheet metal cutting and forming operations, at least one of the jobs produced must be of a significant nature, and must contain a minimum of three of the features listed in S7 plus three of the features listed in S9.

AUEC2/023

Maintaining and testing process instrumentation and control devices

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

A broad range of competences covering the maintenance of process instrumentation and control devices. These competences will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or they will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the instrumentation and control maintenance activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of instrumentation and control equipment being maintained, such as pressure, flow, level and temperature instruments, fiscal monitoring equipment, fire and gas detection and alarm systems, industrial weighing systems, speed measurement and control systems, vibration monitoring equipment, nucleonics and radiation measurement, telemetry systems and emergency shutdown systems.

They will be expected to use a variety of maintenance diagnostic techniques and procedures, such as gathering information from fault reports, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment. They will also be expected to cover a range of maintenance activities, such as isolating and locking off, disconnecting, removing and reconnecting instruments and faulty peripheral components, setting and adjusting components, and testing the equipment, using appropriate techniques and procedures.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the instrumentation maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply safely the appropriate maintenance techniques and procedures for process instrumentation and control equipment. They will understand the instrumentation maintenance process, and its application, and will know about the instrumentation and systems being maintained, and the tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.



They will understand the safety precautions required when carrying out the maintenance activities, (especially those for ensuring that the equipment is correctly isolated), and when using maintenance tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different process instrumentation and control maintenance operations, at least one of the instrumentation maintenance activities carried out must be of a significant nature, and must cover a minimum of eight of the activities listed in S4.

AUEC2/024

Producing components by rapid prototyping techniques

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic competences that they need to produce components by rapid prototyping techniques. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the rapid prototyping activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use.

They will be expected to prepare the equipment in readiness for the required operations, to start a pre-prepared build and to have an understanding of imported stereo lithography (STL) files required for the build. In producing the components, they will need to set up the machine operating functions, parameters and safety devices, and to produce the components using safe and correct operating procedures.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for using the rapid prototyping software and for operating the rapid prototyping equipment. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to operate rapid prototyping machines safely. They will understand the rapid prototyping equipment used, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with the rapid prototyping equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/025

Wiring and testing vehicle electrical equipment and circuits

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to use and terminate a range of cables, such as single and multicore cables, screened cables, fire resistant and armoured cables. They will be required to make a variety of terminations and to connect a range of electrical components, such as starter motors, control devices, lighting systems, relays and instruments.

They will be required to select the appropriate tools, materials and equipment to use, based on the operations to be performed and the components to be connected. They will be expected to use appropriate tools and techniques for the wiring of the various electrical components and connectors that make up the electrical system/circuit. In addition, they will be expected to make all necessary electrical connections to the switches, relays, sensors/actuators and other devices, as appropriate to the equipment and circuit being produced. The wiring and testing activities will include making all necessary checks and adjustments to the circuit, including continuity, polarity, insulation resistance values, and ensuring that the equipment functions to the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the wiring and testing activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the wiring and testing activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electrical wiring and testing procedures and techniques safely. They will understand the wiring and testing methods and procedures used, and their application, and will know about the various cables and components used to produce the circuits, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the wiring and testing activities, especially those for ensuring the safe isolation of the equipment and circuits produced. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.



Specific standard requirements

In order to prove their ability to combine different electrical assembly and wiring activities, at least one of the electrical assemblies produced must be of a significant nature, and must contain a minimum of five of the components listed in S3 plus five of the activities listed in S5 within the skills requirements.

AUEC2/026

Maintaining vehicle electrical equipment/systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to carry out maintenance activities on vehicle electrical systems, in accordance with approved procedures.

The activities will involve dismantling, removing and replacing or repairing faulty components, in line with company procedures, on electrical equipment that uses battery, alternating current generators, or direct current power supplies. This includes equipment such as control systems, switches and solenoids, starter motors, wiring harnesses and instrumentation panel, wiring enclosures and warning lights, vehicle lighting systems, data acquisition systems and other specific electrical equipment.

They will be expected to apply a range of maintenance techniques and procedures, such as selection of raw materials, attaching connectors, shielding, testing, isolating, disconnecting, removing and reconnecting electrical components and looms, attaching cable identification markers, replacing damaged or defective electrical components and looms, setting and adjusting components, and making continuity checks before testing and starting up the equipment.

Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution.

They will be expected to work with either a high level of supervision or as a member of a team.

Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the maintenance activities, and return them to their recognised storage area ready for further use.

Their underpinning knowledge will be sufficient to provide a broad understanding of their work, and will enable you to apply the appropriate electrical maintenance procedures. They will know how the electrical equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the maintenance, repair or adjustment activities, and to ensure that the equipment functions to the required specification. In addition, they will have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications.



They will understand the safety precautions required when carrying out the maintenance activities, especially those for isolating the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/027

Diagnosing and rectifying faults on vehicle systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to diagnose and rectify faults on vehicle systems.

The activities will involve the application of a range of fault diagnostic techniques, tools and equipment, and the diagnosis and location of the faults to their unit and/or component parts, on a range of systems such as engine, transmission, chassis, wheel braking, suspension, steering, fuel, lubrication, cooling and electrical. They will be expected to remove the relevant components, to inspect the parts for wear or damage, to determine which (if any) parts need replacing and then to reassemble them for further use.

The removal and replacement activities will include carrying out all necessary safety activities, to lift and support the vehicle and its components, lifting and removing engine and transmission systems, breaking into hydraulic and fuel system circuits, removing and replacing faulty equipment at component or unit level, replenishing fluids, and setting and adjusting the completed system. They will also be expected to carry out routine testing and functional checks of the rebuilt components to determine that the equipment performs to the specified requirements.

Their responsibilities will require them to comply with recognised procedures for the fault diagnosis and removal and replacement activities undertaken, to take account of any potential difficulties or problems that may arise, and seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

They must ensure that they remove all tools and equipment from the vehicle and work area on completion of the activities, complete all necessary job/task documentation accurately and legibly, and maintain the work area to the requirements of the standard.

Their underpinning knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate fault diagnosis and rectification techniques and procedures.

They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the fault diagnostic activities, correct faults and ensure that the equipment is replaced and functions to the required standard.

They will understand the safety precautions required when carrying out the fault diagnosis, adjustments and the component removal and replacement activities, especially those for lifting and supporting the equipment. They will be required to demonstrate safe working



practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/028

Stripping and rebuilding vehicle engines

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to re-build an engine in a recognised sequence and to a high standard.

The activities will involve the dismantling and removal of components, inspection and checking for faults, excessive wear and potential problems, replacement of components, and rebuilding the engine using hand tools, specialist tools and test equipment, in accordance with approved procedures.

The stripping and re-building activities will include carrying out all necessary safety activities, to lift and support the engine and its ancillary components. They will need to lift and remove the engine from any transportation containers and place it onto an approved holding device, ready for removing all ancillary components and the stripping and rebuilding of the engine. They will need to ensure that all removed components are stored safely, prior to inspection and re-building. They will also be expected to use recognised methods for crack testing ferrous and non-ferrous materials/components, and to be able to inspect an engine within the organisation's guidelines.

Their responsibilities will require them to comply with recognised procedures for the stripping and rebuilding activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution.

They will be expected to work with either a high level of supervision or as a member of a team.

Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the stripping and rebuilding activities, and return them to their recognised storage area ready for further use.

Their underpinning knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate stripping, inspection and rebuilding procedures.

They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the stripping and rebuilding activities, correct faults and to ensure that the equipment is replaced to the required standard. They will also have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications.



They will understand the safety precautions required when carrying out the stripping and rebuilding activities, especially those for lifting and supporting the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/029

Using computer software packages to assist with engineering activities

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic competences that they need, to operate a computer and use a variety of software packages to assist with engineering activities, such as report writing, stock/stores control, costing activities and electronic mail. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The types of software package used will include the computer operating system, word processing, databases, spread sheets, graphics packages and electronic mail.

They will be expected to check that all power leads and peripheral connecting leads from their workstation are correctly and securely connected to the appropriate terminations, and that they are safely routed so as not to cause a trip hazard. They will use the correct procedure to power up and operate the computer and peripheral hardware, to access the appropriate software packages and to create and maintain suitable work folders and files. On completion of the activities, they will be expected to shut down the software and computer system, using the correct procedures, to return all documentation, reference manuals or specifications to the designated location, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for working with the computer equipment. They will need to take account of any potential difficulties or problems that may arise with the computer hardware, software or activities undertaken, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate computer operating procedures and techniques safely. They will understand the computer system and software packages used, and their application, and will know about the various tools and techniques used to carry out the various activities, to the required depth to provide a sound basis for carrying out the activities correctly.

They will understand the safety precautions required when working with the computer system.

They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/030

Producing CAD models (drawings) using a CAD system

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic competences that they need, to set up and operate a computer aided drawing (CAD) system to produce detailed three-dimensional models for engineering activities. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be given a specific `model' brief or a request for a change/modification to a model, and they will be required to access these requirements and to extract all necessary information in order to carry out the modelling operations. They will need to select the appropriate equipment and modelling software to use, based on the type and complexity of the drawing functions to be carried out. They will be expected to produce models in a 3D modelling environment, and to print 2D and 3D prints or plots.

On completion of the modelling activities, they will be expected to return all documentation, reference manuals or specifications to the designated location, to shut down the CAD system correctly, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for working with the CAD equipment. They will need to take account of any potential difficulties or problems that may arise with the computer hardware, software or drawing procedures, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate computer aided drawing procedures and techniques for 3D modelling and conventional mechanical and production engineering drawings. They will understand the modelling CAD system and software used, and its application, and will know about the various tools and techniques used to produce the models and drawings, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the computer modelling/drawing system. They will be required to demonstrate safe working practices throughout, and will understand the responsibility They owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different 3D modelling features, at least one of the models/drawings produced must be of a significant nature. It must involve a minimum of five of the operations listed in S7, and must include a minimum of seven of the features listed in S8.

AUEC2/031

Producing electrical or electronic engineering drawings using a CAD system

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to: Cover a broad range of basic competences that they need to set up and operate a computer aided drawing (CAD) system to produce detailed drawings for electrical or electronic engineering activities. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The types of drawing produced will include circuit and wiring diagrams, block diagrams, schematics, electrical cabling/routing, installation, assembly of panels and sub-assemblies and system design/modification.

They will be given a specific drawing brief or a request for change/modification to an existing design, and they will be required to access these requirements and to extract all necessary information in order to carry out the drawing operations. They will need to select the appropriate equipment and drawing software to use, based on the type and complexity of the drawing functions to be carried out.

They will be expected to use current British, European, International and company standards to produce a drawing template for a range of paper sizes, and must include the drawing title, scale used, date of drawing, and other relevant information.

They will then be expected to produce fully detailed drawings to enable the electrical or electronic circuits to be assembled, installed, maintained, commissioned or modified. On completion of the drawing activities, they will be expected to return all documentation, reference manuals or specifications to the designated location, to shut down the CAD system correctly and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for working with the CAD equipment. They will need to take account of any potential difficulties or problems that may arise with the computer hardware, software or drawing procedures, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply safely the appropriate computer aided drawing procedures and techniques for electrical or electronic engineering drawings. They will understand the computer system and software used, and its application, and will know about the various tools and techniques used to produce the drawings, to the required depth to provide a sound basis for carrying out the activities to the required specification.



They will understand the safety precautions required when working with the computer drawing system. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different electrical/electronic drawing features, at least one of the drawings produced must be of a significant nature, and must have a minimum of seven of the features listed in S6.

AUEC2/032

Producing engineering project plans

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to:

Cover a broad range of basic competences that they need to produce detailed plans for an engineering project. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the project planning activity by obtaining all necessary information, drawings, specifications and documentation.

In producing the project plan, they will need to clearly identify what has to be done, the processes required to achieve this, the materials, component or consumables required, detailed instructions/operation sequence required, the estimated timescales and costs involved, the quality control requirements, and how they will evaluate and prove that the finished project has met its aims.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the project planning activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the project planning activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate engineering project planning principles. They will understand the project planning techniques and procedures used, and their application, and will know about the engineering equipment, materials and consumables that will be required, to the required depth to provide a sound basis for carrying out the activities and producing project plans that will lead to a successful project outcome.

They will understand the safety precautions required when carrying out the project planning operations. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/033

Preparing and using grinding machines

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to cover a broad range of basic grinding competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

The grinding operations may be carried out on horizontal or vertical surface grinding machines, cylindrical or universal grinding machines. They will be expected to prepare for the grinding activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required grinding activities and the sequence of operations they intend to use.

They will be required to prepare for the grinding activities by mounting, positioning and correctly setting a range of workholding devices, to mount the workpiece and use grinding techniques appropriate to the type of material, type of grinding wheel, workpiece rigidity and operations being performed.

They will be expected to grind components that combine a number of different features, such as flat faces, parallel faces, faces square to each other, angular faces, steps and slots or parallel, stepped and tapered diameters, faces, bores and special forms/profiles.

During, and on completion of, the grinding operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise grinding defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements.

On completion of the grinding activities, they will be expected to remove the workholding devices and to leave the machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the grinding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the grinding activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate grinding techniques safely. They will understand the grinding process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the grinding machine, and with its associated tools and equipment. They will be required to demonstrate



safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different grinding operations, at least one of the machined components produced must be of a significant nature, and must have a minimum of three of the features listed in S5 in the skills requirements section.

AUEC2/034

Preparing and using CNC turning machines

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able prepare and use CNC turning machines, that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

In preparing the machine, they will be expected to select the appropriate workholding devices, and to mount and secure them to the machine spindle. They will be required to select the appropriate cutting tools, to mount and secure them to the appropriate tool holding devices, and to place the cutting tools in the relevant positions within the tool posts, turrets, slides or tool change magazine/carousel, where this is applicable.

They will need to ensure that all the tools have been allocated a relevant tool number, and that the relevant data on their co-ordinates and datum positions are entered into the operating program and machine. This will involve loading and checking component programs, checking for errors/faults, and editing and saving program changes. They will also be required to adjust the machine tool equipment and program, following editing procedures, to achieve component specification. They will be expected to produce components that combine a number of different features, such as parallel, stepped and tapered diameters, drilled, bored and reamed holes, internal and external threads, and special forms/profiles.

During, and on completion of, the turning operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. On completion of the turning activities, they will be expected to remove appropriate cutting tools and workholding devices, and to leave the machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the CNC turning activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the turning activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC setting and turning techniques safely. They will understand the CNC turning process, and its application, and will know about the equipment, workholding devices, tooling, and machine operating programs and setting-up procedures, to the required depth to provide a sound basis for carrying out the turning activities to the required specification.



They will understand the safety precautions required when working with the CNC lathe, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different turning operations, at least one of the machined components produced must be of a significant nature, and must have a minimum of five of the features listed in S5 in the skills requirement section.

AUEC2/035

Preparing and using CNC milling machines

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to prepare and use CNC milling machines, that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

In preparing the milling machine, they will be expected to select the appropriate workholding devices, and to mount and secure them to the machine table. They will be required to select the appropriate milling cutters/cutting tools, to mount and secure them to the appropriate tool holding devices and machine spindle, or to place the cutting tools in the relevant positions within the turrets, slides or tool change magazine/carousel, where this is applicable.

They will need to ensure that all the tools have been allocated a relevant tool number, and that the relevant data on their co-ordinates and datum positions are entered into the operating program and machine. This will involve loading and checking component programs, checking for errors/faults, and editing and saving program changes. They will also be required to adjust the machine tool equipment and program, following editing procedures, to achieve component specification. They will be expected to produce components that combine a number of different features, such as flat faces, parallel faces, faces square to each other faces at an angle, steps/shoulders, open and enclosed slots, drilled, bored and reamed holes, internal threads, and special forms/profiles.

During, and on completion of, the milling operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. On completion of the milling activities, they will be expected to remove appropriate cutting tools and workholding devices, and to leave the machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the CNC milling activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the milling activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC setting and milling techniques safely. They will understand the CNC milling process, and its application, and will know about the equipment, workholding devices, tooling, and machine operating programs and setting-up procedures, to the required depth to provide a sound basis for carrying out the milling activities to the required specification.

They will understand the safety precautions required when working with the CNC milling machine, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different milling operations, at least one of the machined components produced must be of a significant nature, and must have a minimum of five of the features listed in S5 in the skills requirement section.

AUEC2/036

Preparing and using CNC machining centres

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to select the appropriate workholding devices, and to mount and secure them to the machine. They will also be required to select the appropriate cutting tools, to mount and secure them to the appropriate tool holding devices, and to place the cutting tools in the relevant positions within the tool posts, turrets, slides or tool change magazine/carousel, where this is applicable.

They will need to ensure that all the tools have been allocated a relevant tool number, and that the relevant data on their co-ordinates and datum positions are entered into the operating program and machine. This will involve loading and checking component programs, checking for errors/faults, and editing and saving program changes. They will also be required to adjust the machine tool equipment and program, following editing procedures, to achieve component specification. They will be expected to produce components that combine a number of different features, such as parallel, stepped and tapered diameters, drilled, bored and reamed holes, internal and external threads, and special forms/profiles.

During, and on completion of, the machining operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. On completion of the machining activities, they will be expected to remove appropriate cutting tools and workholding devices, and to leave the machine and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the CNC machining activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the machining activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC setting and machining techniques safely. They will understand the CNC machining centre process, and its application, and will know about the equipment, workholding devices, tooling, machine operating programs and setting-up procedures, to the required depth to provide a sound basis for carrying out the machining activities to the required specification.

They will understand the safety precautions required when working with the CNC machining centre, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different features, at least one of the machined components produced must be of a significant nature, and must have a minimum of six of the features listed in S5 in the skills requirement section.

AUEC2/037

Carrying out heat treatment of engineering materials

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to apply specified heat treatment processes to engineering materials/components. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the heat treatment activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required heat treatment activities.

They will be required to prepare the appropriate equipment to use, based on the heat treatment process and materials to be treated. They will be expected to use the specified or appropriate techniques to prepare the materials and equipment in readiness for the application of the treatments.

The heat treatment activities will include the application of treatments such as flame hardening, case hardening, carburising, tempering, annealing and normalising, as applicable to the task.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the heat treatment activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, materials and equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate heat treatment techniques and procedures safely. They will understand the heat treatment techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the heat treatment operations, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/038

Producing mechanical engineering drawings using a CAD system

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to set up and operate a computer aided drawing (CAD) system to produce detailed drawings for mechanical engineering activities. The type of drawings produced could include detail component drawings for manufacturing, assembly and sub-assembly drawings, installation drawings, fault location aids such as flow diagrams, and modification drawings.

They will be given a specific drawing brief or a request for a change/modification to a drawing, and they will be required to access these requirements and extract all necessary information in order to carry out the drawing operations. They will need to select the appropriate equipment and drawing software to use, based on the type and complexity of the drawing functions to be carried out. They will be expected to use current British, European and International and company standards to produce a drawing template for a range of paper sizes that must include the drawing title, scale used, date of drawing, material to be used and other relevant information. They will then be expected to produce fully detailed drawings to enable the manufacture, assembly, installation or modification of the product to take place. On completion of the drawing activities, they will be expected to return all documentation, reference manuals or specifications to the designated location, to shut down the CAD system correctly and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for working with the CAD equipment. They will need to take account of any potential difficulties or problems that may arise with the computer hardware, software or drawing procedures, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate computer aided drawing procedures and techniques for generating mechanical engineering drawings. They will understand the computer system and software used, and its application, and will know about the various tools and techniques used to produce the drawings, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the computer drawing system. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment



Specific Unit Requirements

In order to prove their ability to combine different drawing features, at least one of the drawings produced must be of a significant nature, and must have a minimum of seven of the features listed in S7 in the skills requirement section.

AUEC2/039

Assembling, wiring and testing electrical panels/components mounted in enclosures

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to assemble, wire and test electrical panels and components mounted in enclosures. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The activities will include the assembly of a range of electrical components such as component panels, isolator switches, fuses and circuit breakers, contactors and relays, bases for plug-in devices, rail-mounted terminal blocks, trunking, earthing bonding, and sub-assemblies such as power supplies, card racks, and process controller units.

This will involve using a range of tools and equipment along with soldering techniques and anti-static protection techniques. The assembly activities will also include making all necessary checks and adjustments to ensure that components are free from damage, correctly positioned and secured, are terminated correctly and pass the required insulation and resistance checks.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the electrical component assembly and wiring activities undertaken.

They will need to take account of any potential difficulties or problems that may arise with the assembly and wiring activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electrical assembly, wiring and testing procedures and techniques safely.

They will understand the assembly methods and procedures used, and their application, and will know about the various components used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when mounting electrical components in enclosures, and with using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different electrical panel assembly and wiring operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of eight of the components listed in S2 plus six of the activities listed in S5.

AUEC2/040

Forming and assembling electrical cable enclosure and support systems

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to form and assemble metallic and non-metallic systems, and will cover the selection of the appropriate materials, cutting and bending/forming the appropriate pieces that make up the enclosure. They will need to assemble the prepared pieces, using a range of connection devices and to position, align and secure them in the correct locations, using the specified/appropriate techniques, wall/screen penetration and fastening devices.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the cable enclosure forming and assembly activities undertaken.

They will need to take account of any potential difficulties or problems that may arise with the activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate cutting, bending forming and installation techniques and procedures safely.

They will understand the forming and assembly methods and procedures used, and their application, and will know about the various enclosure systems and components used to produce the assemblies, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly and installation activities, especially those for handling long lengths of conduit or trunking. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different cable enclosure forming and assembly operations, at least one of the cable enclosure and support systems produced must be of a significant nature, and must contain a minimum of four of the features listed in S4 within the skills requirement.

AUEC2/041

Preparing and using electro-discharge machines

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to prepare and use electro-discharge machines, such as spark erosion and wire erosion machines (manual or CNC), in accordance with approved procedures. This involves selecting the appropriate work holding devices, mounting and positioning them to the machine in the correct location for the type of operation being carried out. They will be expected to select the appropriate electrodes or wires to use, check them for defects, and mount and secure them to the relevant parts of the machine. They will then check that the machine is ready for the operations to be performed, and that the required components, consumables and measuring equipment are available. They will be expected to produce a range of component shapes, such as internal and external profiles, that have flat, square, parallel, and tapered faces, square/rectangular forms, concave and convex forms, holes, slots, radii/arcs, cavities and special forms.

They must operate the machine in line with safe working practices and approved procedures, and continuously monitor the erosion operations, making any necessary adjustments to settings in order to ensure that the work output is to the required quality and accuracy.

Their responsibilities will require them to comply with organisational policy and procedures for the machining activities undertaken, and to report any problems with the machining activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will enable them to adopt an informed approach to applying procedures for electro-discharge machining.

They will have an understanding of the electro-discharge 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.

They will understand the safety precautions required when setting and working with the machine, its associated tools, and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as a strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment.

AUEC2/042

Preparing and using manual TIG or plasma-arc welding equipment

This unit of Competence has been developed by employers in the Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the learner can demonstrate that they are competent in being able to prepare and use manual tungsten inert gas (TIG) or plasma-arc welding equipment, that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare the welding equipment and to ensure that all the leads/cables, hoses and torches are securely connected and free from damage. They will also need to obtain and check that all the workholding equipment is in a safe and usable condition.

In preparing to weld, they will need to set and adjust the welding conditions in line with instructions and/or the welding procedure specification. They must operate the equipment safely and correctly, and make any necessary adjustments to settings in line with their permitted authority, in order to produce the welded joints to the required specification.

On completion of the welding operations, they will be expected to check the quality of the welds using measuring equipment, visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the welding activities, they will be expected to return all tools, equipment and workholding devices to their designated location and to leave the welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the welding activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate manual TIG or plasma-arc welding techniques safely. They will understand the welding process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with the TIG or plasma-arc welding equipment, and with the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation and commitment

Specific Unit Requirements

Welded joints must be at least 150mm long, using single or multi-run welds (as appropriate), with at least one stop and start included.

AUEC2/043

Preparing and using CNC fabrication equipment

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to prepare and use CNC fabrication equipment, including machines such as shearing, punching, forming and bending; plasma, laser and gas cutting. They will be expected to select the appropriate workholding devices, and to mount and secure them to the machine.

They will also be required to select the appropriate cutting heads or forming tools, to mount and secure them to the appropriate tool holding devices, and to place the cutting/forming tools in the relevant positions within the tool-posts, slides or tool change magazine/carousel, where this is applicable.

They will need to ensure that all the tools have been allocated a relevant tool number, and that the relevant data on their co-ordinates and datum positions are entered into the operating program and machine. This will involve loading and checking component programs, checking for errors/faults, and editing and saving program changes. They will also be required to adjust the machine tool equipment and program, following editing procedures, to achieve component specification. They will be expected to produce components that combine a number of different features, such as straight cuts, square and rectangular profiles, curved profiles, internal profiles, louvers, swages, holes radially and linearly pitched, bends of various angles and curved plates.

During, and on completion of, the machining operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. On completion of the machining activities, they will be expected to remove appropriate tools and workholding devices, and to leave the machine and work area in a safe and tidy condition.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the CNC fabrication machining activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the machining activities, and to seek appropriate help and advice in determining and implementing a suitable solution.

They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC fabrication machine setting and operating techniques safely. They will understand the CNC machining process, and its application, and will know about



the equipment, workholding devices, tooling, machine operating programs and setting-up procedures, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when working with the CNC fabrication machines, and with its associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/044

General welding applications

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to prepare the welding equipment and to ensure that all the leads/cables, electrode holder, hoses, torches shielding gas system, hoses, wire feed mechanisms and workpiece earthing arrangements are securely connected and free from damage (where applicable). They will also need to obtain and check that all the work holding equipment and manipulating devices are in a safe and usable condition.

In preparing to weld, they will need to set and adjust the welding conditions in line with instructions and/or the welding procedure specification. They must operate the equipment safely and correctly, and make any necessary adjustments to settings in line with their permitted authority, in order to produce the welded joints to the required specification.

On completion of the welding operations, they will be expected to check the quality of the welds using visual examination, as appropriate to the aspects being checked. They will need to be able to recognise welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the welding activities, they will be expected to return all tools, equipment and workholding devices to their designated location and to leave the welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate welding techniques and procedures safely. They will understand the welding processes, and their application, and will know about the equipment, materials, consumables and destructive/ non-destructive tests, to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with welding equipment, and with the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



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They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/045

Producing tool and die assemblies

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to prepare for the assembly activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required assembly activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the operations to be carried out and the type of components to be assembled.

In carrying out the assembly operations, they will be required to follow specified assembly techniques, in order to produce the required assemblies. The assembly activities will also include making all necessary checks and adjustments, to ensure that components are correctly orientated, positioned and aligned, that moving parts have the correct working clearances, that all fasteners are tightened to the correct torque, and that the assembled parts are checked for completeness and they function as per the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the assembly activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate assembly techniques safely. They will understand the assembly process, and its application, and will know about the tool and die equipment being assembled, the components, tools and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities, and when using assembly tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different assembly operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of seven of the components listed in in the Skills Section S3.

AUEC2/046

Producing Composite Mouldings using Pre-Preg Techniques

This unit of competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to produce composite mouldings using pre-preg techniques, which will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the pre-preg laminating activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use.

They will be expected to prepare the tooling, apply release agents and prepare the composite materials. They will produce composite mouldings, which will incorporate a range of features, using a range of application methods. Mouldings produced will include laminates and sandwich structures, using suitable resin, fibre and core materials. The activities will also include making all necessary visual and dimensional checks, to ensure that the mouldings meet the required specification and have an appropriate cosmetic appearance.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the pre-preg laminating activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate composite moulding pre-preg laminating techniques and procedures safely. They will understand the moulding/laminating procedure, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the pre-preg laminating activities, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different pre-preg laminating operations, at least one of the components produced must be of a significant nature, and must have a minimum of three of the features listed in the skills section S6.

AUEC2/047

Carrying out repairs on composite mouldings

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out repairs on composite mouldings, which will prepare them for entry into the engineering or manufacturing sector, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competencies in the working environment.

They will need to repair composite mouldings (such as cured panels, moulds, components and jigs), in accordance with approved procedures. They will be required to use appropriate drawings, specifications and documentation to repair composites materials, using the approved techniques.

They will repair a range of composite mouldings with various defects using a range of methods. Mouldings repaired will include a range of resin and fibre materials.

Their responsibilities will require them to comply with organisational policy and procedures for the repair activities undertaken and to report any problems with the repair activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions under supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying composite moulding repair procedures. They will understand the repair techniques used and their application, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the repair activities and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/048

General machining, fitting and assembly applications

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out practical exercises in order to gain an understanding of how these machining, fitting and assembly activities are undertaken, the types of equipment used, the manufacturing techniques, and the operating and safety procedures that are required.

In carrying out the activities, they will use appropriate tools and equipment to mark out the material for the features to be produced, and then to use hand tools, portable power tools, machine tools and shaping, fitting and assembly techniques appropriate to the operations being performed. These activities will include sawing, filing, drilling, turning, milling and assembly.

During, and on completion of, the operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise when the activities are not meeting the required specification, and to discuss/determine what action needs to be taken to remedy any faults that occur, in order to ensure that the finished workpiece is within the specification requirements. On completion of the activities, they will be expected to return all tools and equipment that they have used to the correct location, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate machining, fitting and assembly techniques and procedures safely. They will understand the machining, fitting and assembly processes, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the various machining, fitting and assembly techniques, and when using hand tools and machinery. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/049

General fabrication and welding applications

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out practical exercises in order to gain an understanding of how these fabrication, assembly and welding activities are undertaken, the type of equipment used and the manufacturing techniques and operating and safety procedures that are required.

In carrying out the activities, they will use appropriate tools and equipment, based on the type and thickness of material and the operations to be carried out. They will need to mark out the material for the features to be produced, and then to use hand tools, portable power tools and machines to produce a variety of shapes, profiles and forms. They will also be expected to produce fabrication assemblies using mechanical fastening devices; self-secured joints, and thermal joining methods.

During, and on completion of, the operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise when the activities are not meeting the required specification, and to discuss/determine what action needs to be taken to remedy any faults that occur, in order to ensure that the finished workpiece is within the specification requirements. On completion of the activities, they will be expected to return all tools and equipment that they have used to the correct location, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the fabrication, assembly and welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate fabrication, assembly and welding techniques and procedures safely. They will understand the cutting, forming, assembly and welding processes, and their application, and will know about the tools and equipment used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the fabrication activities, and when using the various tools and equipment, especially those involved in using guillotines and bending/forming equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



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AUEC2/050

General electrical and electronic engineering applications

This unit of competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to apply basic electrical and electronic engineering principles, which will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The electrical and electronic engineering activities will include the wiring and termination of a range of wire/cables, electrical components, circuit boards and electronic components. This will involve using a range of tools and equipment, along with soldering techniques and anti-static protection techniques.

They will be required to select the appropriate tools, materials and equipment to use, based on the operations to be performed and the components/circuits to be connected. They will be expected to use appropriate tools and techniques for the assembly and wiring of the various electrical and electronic components and connectors that make up the circuit. The wiring and testing activities will include making all necessary checks and adjustments to the circuit (such as continuity, polarity, insulation resistance, current, voltage and waveform values), and ensuring that the circuit functions to the specification.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the electrical and electronic wiring and testing activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the wiring and testing activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate electrical and electronic wiring and testing procedures and techniques safely. They will understand the wiring and testing methods and procedures used, and their application, and will know about the various cables and components used to produce the circuits, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the wiring and testing activities, especially those for ensuring the safe isolation of the equipment and circuits produced. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/051

General Maintenance Engineering Applications

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to prepare for the maintenance activities by obtaining all necessary information, documentation, tools and equipment, and to plan how they intend to carry out the required maintenance activities and the sequence of operations they intend to use. They will be required to select the appropriate equipment to use, based on the maintenance operations to be carried out and the type of equipment being maintained.

The maintenance activities will involve the application of fault finding techniques to identify and locate faults on mechanical, electrical/electronic, fluid power and process controller equipment. They will be expected to use a variety of fault location methods and procedures, such as gathering information from the person who reported the fault, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment.

They will then be expected to dismantle, remove and replace or repair the faulty units or components, on a variety of engineering systems or equipment. They will be expected to cover a range of maintenance activities, such as draining and removing fluids, isolating equipment, releasing stored energy, labelling/proof marking to aid reassembly, dismantling components to the required level, checking components for serviceability, replacing faulty components and 'lived' items, setting and adjusting components, tightening fasteners to the required torque, and making 'off-load' checks of the maintained equipment.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the maintenance activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the maintenance activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate maintenance techniques and procedures safely. They will understand the maintenance process, and its application, and will know about the equipment being maintained, the equipment components, tools and consumables used, to the appropriate depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the maintenance activities, and when using maintenance tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



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They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/052

Carrying out aircraft detail fitting activities

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out aircraft detail fitting assemblies, that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the detail fitting activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required detail fitting activities and the sequence of operations they intend to use. They will be expected to select the appropriate equipment to use, based on the operations to be carried out and the accuracy required.

They will be expected to use a range of different materials, ensuring efficient use of them and, when applicable, to ensure that grain flow is taken into account. In carrying out the detail fitting activities, they will need to use a range of hand tools, portable power tools and simple machines to produce a variety of shapes and profiles.

During, and on completion of, the detail fitting operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and tolerances to be achieved. They will need to be able to recognise fitting defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements. On completion of the detail fitting activities, they will be expected to return all tools and equipment used to its correct location and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the detail fitting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the detail fitting activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate aircraft detail fitting techniques safely. They will understand the aircraft detail fitting process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when using aircraft detail fitting techniques, and when using hand tools, power tools and machines. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment

Specific Unit Requirements

In order to prove their ability to combine different aircraft detail fitting operations, at least one of the components produced must be of a significant nature, and must contain a minimum of five of the features listed in the skills section S8.

AUEC2/053

Installing aircraft mechanical fasteners

This unit of Competence has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector.

This unit identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to install aircraft mechanical fasteners, which will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the installation activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required installation activities and the sequence of operations they intend to use. They will be expected to select the appropriate equipment to use, based on the types of fastener to be installed and the accuracy required.

The mechanical fasteners to be installed will include devices such as hollow and solid rivets, threaded fasteners, anchor nuts, pins and other locking devices. They will need to use a range of different techniques to prepare, install and check that the mechanical fasteners are installed to the required specification.

During, and on completion of, the installation operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and tolerances to be achieved. They will need to be able to recognise installation defects, to take appropriate action to remedy any faults that occur and to ensure that the finished installation meets the drawing requirements. On completion of the installation activities, they will be expected to return all tools and equipment used to the correct locations, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the installation activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the installation activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate techniques, for the installation of the aircraft mechanical fasteners, safely. They will understand the fastener installation process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when using aircraft mechanical fastener installation techniques, and when using hand and power tools. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Unit Requirements

In order to prove their ability to combine different aircraft fastener installation operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of four types of the fasteners listed in the skills section S2.

AUEC2/054

Restoring Mechanical Components to Usable Condition by Repair

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to restore mechanical components to usable condition by repair, in accordance with approved procedures. They will be required to restore a range of mechanical components and equipment to operational condition, by repairing assemblies/sub-assemblies and components, by reworking the surface, re-cutting threads, or by the replacement of worn parts. They will also be required to select the appropriate equipment to use, based on the nature of the repair, the operations that will need to be carried out and the accuracy to be achieved.

In producing the components, they will be expected to use a range of hand tools, machine tools, portable power tools, and shaping and fitting techniques, appropriate to the type of material and repair being performed. These activities will include such processes as sawing (hand, band), drilling, reaming, grinding (hand or pedestal), filing, scraping or lapping, threading (internal or external), machining (turning, milling) and thermal processes.

Their responsibilities will require them to comply with organisational policy and procedures for the repairing activities undertaken, and to report any problems with these activities or with the tools, equipment or materials used, that they cannot personally resolve or are outside your permitted authority, to the relevant people. They will be expected to work to instructions, alone or in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will provide an informed approach to applying component repair procedures. They will have an understanding of the function and operating conditions of the components being repaired, in sufficient depth to determine if a suitable repair can be made and to ensure that the repairs carried out are safe and practical in operation. They will also understand the organisational policy on repairing components, and its application.

They will understand the safety precautions required when carrying out the repairing activities, especially those for isolating the equipment. They will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/055

Assembling Fluid Power Components to Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to assemble and fit fluid power components (such as pneumatic, hydraulic, or vacuum) to mechanical equipment, in accordance with approved procedures. They will be required to check the specified components are available and fit for purpose, to obtain all relevant and current documentation, to obtain the tools and equipment required for the assembly operations and to check that they are in a safe and usable condition. In carrying out the fitting and assembly operations, they will be required to follow company procedures and specified assembly techniques, in order to assemble the required components.

Their assembly activities will also include making all necessary checks and adjustments, to ensure the fluid power components are correctly positioned and aligned, that moving parts have the correct working clearances, all fasteners are tightened to the correct torque and that the assembled parts are checked for completeness.

Their responsibilities will require them to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying fluid power assembly techniques and procedures. They will understand the mechanical product being assembled, and its application, and will know about the equipment, relevant components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/056

Assembling Electrical or Electronic Components to Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to assemble electrical or electronic components to mechanical equipment, in accordance with approved procedures. They will be required to check that specified components are available and fit for purpose, to obtain all relevant and current documentation, to obtain the tools and equipment required for the assembly operations and to check that they are in a safe and usable condition. In carrying out the assembly operations, they will be required to follow company procedures and specified assembly techniques, in order to fit the electrical or electronic components to the mechanical assembly.

The assembly activities will also include making all necessary checks and adjustments, to ensure that the electrical or electronic components are correctly orientated, positioned and secured correctly. They must also check that any cables and wires are routed correctly and are tidy in appearance, and that connections are mechanically sound and checked for electrical continuity.

Their responsibilities will require them to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that they cannot personally resolve, or are outside your permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying electrical or electronic fitting and assembly techniques and procedures.

They will have an understanding of the product being assembled and its application, and will know about the equipment, relevant components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/057

Assembling Pipework Components to Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to assemble and fit pipework components to mechanical equipment, in accordance with approved procedures. They will be required to check that specified components are available and fit for purpose, to obtain all relevant and current documentation, to obtain the tools and equipment required for the assembly operations and to check that they are in a safe and usable condition. In carrying out the assembly operations, they will be required to follow company procedures and specified assembly techniques, in order to assemble the pipework and components and to fit them to the mechanical equipment.

Their assembly activities will also include making all necessary checks and adjustments to ensure that the pipework and components are correctly orientated, positioned and aligned and that all fasteners are tightened to the correct torque and the assembled parts are checked for completeness.

Their responsibilities will require them to comply with organisational policy and procedures for the assembly activities undertaken, and to report any problems with the assembly activities, materials or equipment that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying pipework fitting and assembly techniques and procedures. They will have an understanding of the mechanical product being assembled, and its application, and will know about the equipment, relevant components and joining techniques, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly activities. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/058

Producing Composite Mouldings using Wet Lay-Up Techniques

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences they need to produce composite mouldings using wet lay-up laminating techniques. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the wet lay-up moulding activities by obtaining all necessary information, documentation, materials, tools and equipment required, and to plan how they intend to carry out the moulding/laying up activities and the sequence of operations they intend to use.

They will be expected to prepare the tooling, apply release agents and prepare the composite materials. They will produce composite mouldings, which will incorporate a range of features, using a range of application methods. Mouldings produced will include laminates and sandwich structures, using suitable resin, fibre and core materials. The activities will also include making all necessary visual and dimensional checks, to ensure that the mouldings meet the required specification and have an appropriate cosmetic appearance.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the wet lay-up production activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate composite moulding wet lay-up techniques and procedures safely. They will understand the moulding/laying-up procedure, and its application, and will know about the equipment, materials and consumables, to the required depth to provide the basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the wet lay-up moulding activities, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different wet lay -up operations, at least one of the components produced must be of a significant nature, and must have a minimum of three of the features listed in scope 7.

AUEC2/059

Producing Components by Acrylic Moulding

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to produce components by acrylic moulding, in accordance with approved procedures. They will be required to follow the appropriate instructions, drawings, specifications and documentation to produce the various types of components. They will be expected to produce the acrylic components using the specified moulding process and techniques. This will involve using equipment such as air circulating ovens, presses, trimming and automated cutting equipment. The products produced will include deep drawn, double curvature, convex and concave shapes.

Their responsibilities will require them to comply with organisational policy and procedures for the acrylic moulding activities undertaken, and to report any problems with the moulding activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying acrylic moulding techniques and procedures. They will have an understanding of the production techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, recognising faults, and ensuring the work output is to the required specification.

They will understand the safety precautions required when carrying out the acrylic moulding activities and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/060

Vacuum Forming Composite Materials

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to vacuum form components, in accordance with approved procedures. They will be required to follow the appropriate instructions, drawings and specifications, to produce the various types of components from thermoplastic sheet, fibre reinforced thermoplastic sheet and structural foam. This will require them to use a range of air circulating ovens, vacuum forming machines, trimming equipment and various types of tooling. The components produced will have a range of features, including male shapes, female shapes, double curvatures and stiffened mouldings.

Their responsibilities will require them to comply with organisational policy and procedures for the vacuum forming activities undertaken, and to report any problems with the vacuum forming activities, equipment, materials or consumables that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide an understanding of their work, and will provide an informed approach to applying vacuum forming procedures. They will have an understanding of the vacuum forming procedures used, and their application, and will know about the vacuum forming techniques, materials, tooling and consumables used, in adequate depth to provide a sound basis for carrying out the activities, recognising faults and ensuring the work output is to the required specification.

They will understand the safety precautions required when carrying out the vacuum forming operations and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/061

Trimming Composite Mouldings using Hand Tools

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to trim composite mouldings using hand tools, in accordance with approved procedures. They will be required to follow the appropriate instructions, drawings, specifications and documentation to trim various composite mouldings, using the correct trimming techniques.

They will be expected to select and use the correct tools and equipment for the trimming activity. They will trim a range of composite mouldings, incorporating a variety of features, by using cutting, sanding, drilling and polishing techniques and processes. Mouldings to be trimmed will include a range of resin and fibre materials.

Their responsibilities will require them to comply with organisational policy and procedures for the trimming activities undertaken, and to report any problems with the trimming activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying composite moulding trimming techniques and procedures. They will have an understanding of the trimming techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, recognising faults and ensuring the trimmed mouldings are to the required specification.

They will understand the safety precautions required when carrying out the trimming activities and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/062

Identifying Defects in Composite Mouldings

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to identify and deal with defects in composite mouldings (such as moulds, panels, components, jigs), in accordance with approved procedures. They will be required to follow appropriate drawings, specifications and documentation to identify and deal with defects in composites mouldings.

They will be able to identify a range of defects in composite mouldings, using various methods and techniques. Defects will be identified in a range of mouldings with a variety of resin and fibre materials.

Their responsibilities will require them to comply with organisational policy and procedures for the activities undertaken, and to report any problems with the activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to identifying defects in composite mouldings. They will have an understanding of composite materials, and their application, and will know about the associated defects, in adequate depth to provide a sound basis for identifying the defects in line with organisation practice and procedures.

They will understand the safety precautions required when working with the composite mouldings and when using associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/063

Applying Surface Finishes to Composite Mouldings

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to apply surface finishes to composite mouldings (such as moulds, panels and components), in accordance with approved procedures. They will be required to use appropriate drawings, specifications and documentation to apply surface finishes, using the correct techniques.

They will apply finishes to composite mouldings using a range of techniques and processes. A variety of surface finishes will be applied to a range of resin and fibre materials.

Their responsibilities will require them to comply with organisational policy and procedures for the finishing activities undertaken, and to report any problems with the finishing activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying finishing techniques and procedures to composite mouldings. They will have an understanding of the finishing techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, recognising faults and ensuring the work output is to the required specification.

They will understand the safety precautions required when carrying out the finishing operations and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/064

Bonding Composite Mouldings

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to bond composite mouldings (such as cured panels, moulds, components and jigs), in accordance with approved procedures. They will be required to follow the appropriate instructions, drawings, specifications and documentation to bond composite materials, using the correct approved production techniques.

They will produce a range of bonded composite mouldings, incorporating a variety of features and using a range of techniques and processes. Bonded mouldings produced will include a range of resin, fibre and adhesive materials.

Their responsibilities will require them to comply with organisational policy and procedures for the composite bonding activities undertaken, and to report any problems with the bonding activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying composite bonding techniques and procedures. They will have an understanding of the bonding techniques used, and their application, in adequate depth to provide a sound basis for carrying out the activities, recognising faults, and ensuring the work output is to the required specification.

They will understand the safety precautions required when carrying out the bonding activities and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/065

Producing Composite Assemblies

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to bond composite mouldings (such as cured panels, moulds, components and jigs), in accordance with approved procedures. They will be required to follow the appropriate instructions, drawings, specifications and documentation to bond composite materials, using the correct approved production techniques.

They will be required to prepare for the composite assembly activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use. In carrying out the assembly operations, they will be required to use appropriate or specified assembly and joining techniques and methods for the composite components to be assembled. This will include a range of features such as loose and close fit tolerances, permanent and non-permanent fixing, shape location, staggered, return and overlap joins.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the composite assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate composite assembly techniques and procedures safely. They will understand the composite assembly techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the composite assembly activities, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different assembly operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of three of the components listed in scopes 7 and 8.

AUEC2/066

Carrying Out Inspection Activities on Optical Components

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out optical inspection operations, in accordance with approved procedures, using optical inspection techniques and equipment. They will be expected to check components made from a range of optical materials, using a mixture of inspection equipment, as appropriate. They will be required to inspect a range of components that combine a number of different features, such as centre-thickness, diameters, generated blanks, optical lens form and power, angles, profiles, and with cosmetic defects.

They will be required to operate the equipment in line with safe working practices and approved procedures, and to continuously monitor the equipment operations, making any necessary minor adjustments or seek help in making the adjustments, in order to ensure that the work output is to the required quality and accuracy.

Their responsibilities will require them to comply with organisational policy and procedures for the optical inspection activities undertaken, and to report any problems with the optical inspection activities, equipment or materials that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding of their work, and will enable them to adopt an informed approach to applying optical inspection procedures. They will understand the optical inspection procedures used, and their application, and know about the equipment, materials and consumables, in adequate depth to provide a sound basis for carrying out the activities, identifying out-of-specification components, and ensuring accepted components meet the required specification.

They will understand the safety precautions required when working with the inspection equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/067

Preparing and Using Manual Metal Arc Welding Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to covers a broad range of basic manual metal arc (MMA) welding competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare the welding equipment and to ensure that all the leads/cables, electrode holder and workpiece earthing arrangements are securely connected and free from damage. They will also need to obtain and check that all the workholding equipment and manipulating devices are in a safe and usable condition In preparing to weld, they will need to set and adjust the welding conditions in line with instructions and/or the welding procedure specification. They must operate the equipment safely and correctly, and make any necessary adjustments to settings in line with their permitted authority, in order to produce the welded joints to the required specification.

On completion of the welding operations, they will be expected to check the quality of the welds using measuring equipment, visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements.

On completion of the welding activities, they will be expected to return the workholding devices to their designated location, and to leave the welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the welding activities, or with the tools and equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply, appropriate manual metal arc welding techniques safely. They will understand the welding process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required.

They will understand the safety precautions required when carrying out the wiring and testing activities, especially those for ensuring the safe isolation of the equipment and



circuits produced. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

Welded joints must be at least 150mm long, using single or multi-run welds (as appropriate), with at least one stop and start included.

AUEC2/068

Preparing and Using Manual Oxy/fuel Gas Welding Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic oxy/fuel gas welding equipment competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to select the appropriate tools, materials and equipment to use, based on the operations to be performed and the components to be connected. They will be expected to prepare the welding equipment to ensure that the regulators, hoses, check valves, flashback arrestor and welding torch are securely connected and are free from leaks or damage. They will also need to obtain and check that all the workholding equipment is in a safe and usable condition.

In preparing to weld, they will need to set and adjust the gas pressures/welding conditions, in line with instructions and/or the welding procedure specification. They must operate the equipment safely and correctly, and make any necessary adjustments to settings, in line with their permitted authority, in order to produce the welded joints to the required specification.

On completion of the welding operations, they will be expected to check the quality of the welds using measuring equipment, visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the welding activities, you will be expected to return all tools, equipment and workholding devices to their designated location, and to leave the welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the welding activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate oxy/fuel gas welding techniques safely. They will understand the gas welding process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with the oxy-fuel gas welding equipment, and with its associated tools and



equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will understand the safety precautions required when carrying out the wiring and testing activities, especially those for ensuring the safe isolation of the equipment and circuits produced. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

Welded joints must be at least 150mm long, using single or multi-run welds (as appropriate), with at least one stop and start included.

AUEC2/069

Preparing and Using Manual Flame Brazing and Braze Welding Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic manual flame brazing and braze welding competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare the manual flame brazing or braze welding equipment, and to check that all hoses and equipment are correctly connected, free from leaks or damage, and are ready for use. They will also need to obtain and check that all the workholding equipment required is in a safe and usable condition.

They must operate the equipment safely and correctly, and set and adjust the brazing or braze welding conditions, in line with instructions and safe operating procedures. They will be expected to check the quality of the brazed or braze welded joints by visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise brazing or braze welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the brazing or braze welding activities, they will be expected to return all tools, equipment and workholding devices to their designated location, and to leave the brazing or braze welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the brazing or braze welding activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the brazing or braze welding activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate manual flame brazing or braze welding techniques safely. They will understand the brazing or braze welding process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification. They will understand the safety precautions required when working with the manual flame brazing or braze welding equipment, and with the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

Brazed or braze welded joints must be at least 100mm long (except for joints in pipe or tube).

AUEC2/070

Producing Aircraft Detail Assemblies

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to assemble components to produce aircraft detail assemblies, and which will prepare them for entry into the engineering or manufacturing sector, creating a progression between education and employment, or will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the assembly activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required assembly activities and the sequence of operations they intend to use. They will be expected to select the appropriate equipment to use, based on the assembly operations to be carried out and the accuracy required.

In carrying out the assembly operations, they will be required to follow laid-down procedures and specific assembly techniques, in order to assemble the various components into detail assemblies. They will need to produce a range of assemblies, which could include stringers, frames, panels, trays, skins, ribs, tanks and other small assemblies, as appropriate.

During, and on completion of, the assembly operations, they will be expected to check the quality of the assembly, using measuring equipment appropriate to the aspects being checked and tolerances to be achieved. They will need to be able to recognise assembly defects, to take appropriate action to remedy any faults that occur and to ensure that the finished assembly is within the drawing requirements. On completion of the assembly activities, they will be expected to return all tools and equipment used to the correct locations, and to leave the work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the aircraft detail assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the assembly activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate aircraft detail assembly techniques safely. They will understand the aircraft detail assembly process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when using aircraft detail assembly techniques, and when using hand tools, power tools and machines. They will be required to



demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different aircraft detail assembly operations, at least one of the assemblies produced must be of a significant nature, and must contain a minimum of four of the components listed in scope 2.

AUEC2/071

Producing Platework Components and Assemblies

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic heavy platework (above 3 mm) competences that will prepare you for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the plateworking activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required cutting, forming and assembly activities, and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the type and thickness of material, the operations to be carried out and the accuracy to be achieved. In carrying out the cutting and shaping activities, they will need to use a range of hand tools, portable power tools and machines to produce a variety of shapes, profiles and forms. They will also be expected to produce simple platework assemblies, using mechanical fastening devices and tack welding.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the plate working activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate plateworking techniques and procedures safely. They will understand the cutting, forming and assembly process, and its application, and will know about the tools and equipment used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out plateworking activities, and when using the various tools and equipment, especially those involved in using guillotines and bending/forming equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different platework cutting and forming operations, at least one of the assemblies produced must be of a significant nature, and must contain components with a minimum of three of the features listed in scope 6 plus three of the features listed in scope 8.

AUEC2/072

Cutting and Shaping Materials using Thermal Cutting Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences they need for cutting and shaping plate (3mm thickness and above), rolled sections, pipe and tube using thermal cutting equipment. This will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to select the appropriate tools, materials and equipment to use, such as hand-held oxy-fuel gas cutting equipment, plasma cutting equipment, simple portable machines running on tracks, and fixed bench cutting machines. They will be expected to prepare for the cutting activities by obtaining all necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the required cutting operations.

They will be required to assemble and set up the appropriate equipment for the material and thickness to be cut, the type of operation to be carried out and the accuracy to be achieved. Materials to be cut and shaped may include mild steel, stainless steel, special steels and other appropriate materials, and the work will include guided cuts, vertical cuts, overhead cuts, external curved contours, round and square holes, as appropriate.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the thermal cutting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate thermal cutting techniques and procedures safely. They will understand the cutting process, and its application, and will know about the tools, equipment, materials and consumables used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the thermal cutting activities, and when using the various tools and equipment, especially with regard to fire and potential explosion, and the necessary safeguards for undertaking the activities safely and correctly. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability combine different thermal cutting operations, at least one of the components produced must be of a significant nature, and must involve a minimum of four of the operations listed in scope 3.

AUEC2/073

Preparing and Proving CNC Fabrication Machine Tool Programs

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic computer numerical control (CNC) fabrication machine tool programming competences, that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

The fabrication machinery to be programmed will include machines such as shearing, punching, forming and bending; plasma, laser and gas cutting. They will be required to produce the component program, using manual data input or by use of a remote computer, saving the prepared program or by downloading it into the machine controller from the computer.

They will be required to prepare part programs, using operational sequences and machining techniques that avoid unnecessary tool movements or tool changes, and to use repetitive programs and canned cycles, to reduce program size and input time. They will prepare component programs that combine a number of different operations, such as cutting, punching, profiling, bending and forming.

They will need to check the program using single block run and program edit facilities. They will also be required to adjust the machine tool equipment and program, following proving/editing procedures, to achieve component specification. They must ensure that any edited programs are saved safely and correctly.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the programming activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the programming activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they produce.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate CNC fabrication machine programming and proving techniques safely. They will understand the CNC programming process, and its application, and will know about the machine operating programmes and setting-up procedures, to the required depth to provide a sound basis for carrying out the programming activities to the required specification.

They will understand the safety precautions required when working with the CNC fabrication machines, and with the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



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They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/074

Using Wood for Pattern, Modelmaking and Other Engineering Applications

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic hand and wood machining competences that will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the pattern, modelmaking or engineering woodworking activities by obtaining all the necessary information, documentation, tools and equipment required, and to plan how they intend to carry out the cutting and shaping activities and the sequence of operations they intend to use. They will be required to select the appropriate hand tools and machinery, based on the operations to be carried out and the accuracy to be achieved.

The production of the components will involve roughing out the components using fixed or portable machine tools, and finishing them using hand tools. The components produced will be used to produce patterns for sand castings, moulds for composite manufacture, full size and scale models, frames, cases, storage units, furniture and other structures.

During, and on completion of, the cutting and shaping operations, they will be expected to check the quality of the workpiece, using measuring equipment appropriate to the aspects being checked and the tolerances to be achieved. They will need to be able to recognise material and cutting and shaping defects, to take appropriate action to remedy any faults that occur and to ensure that the finished workpiece is within the drawing requirements. On completion of the activities, they will be expected to return all tools and equipment to the correct locations, and to leave the work area in a safe and tidy condition.

They must operate the equipment safely and correctly, and set and adjust the brazing or braze welding conditions, in line with instructions and safe operating procedures. They will be expected to check the quality of the brazed or braze welded joints by visual examination and destructive testing techniques, as appropriate to the aspects being checked. They will need to be able to recognise brazing or braze welding defects, to take appropriate action to limit any faults that occur and to ensure that the finished workpiece is within the specification requirements. On completion of the brazing or braze welding activities, they will be expected to return all tools, equipment and workholding devices to their designated location, and to leave the brazing or braze welding equipment and work area in a safe and tidy condition.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the woodworking activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate hand and wood machining techniques safely. They will understand the cutting and shaping process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the cutting and shaping activities, especially those for using woodworking machines and portable power tools. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity motivation, and commitment.

Specific Standard Requirements

In order to prove their ability to combine different pattern, model or woodworking operations, at least one of the components produced must be of a significant nature, and must have a minimum of seven of the features listed in scop

AUEC2/075

Assembling Pattern, Model and Engineering Woodwork Components

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to covers a broad range of basic competences, that they need to assemble pattern, model or engineering woodwork components. These will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or they will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the pattern, model or engineering woodworking, assembly activities by obtaining all the necessary information, documentation, components, tools and equipment required, and to plan how they intend to carry out the assembly activities and the sequence of operations they intend to use.

They will be required to assemble pattern, model or engineering woodwork components, using mechanical fixing devices and adhesives. The assemblies produced will include such items as patterns for sand casting, moulds/formers for composite manufacture, furniture units, doors and door frames, transportation units, jigs/fixtures and other engineering structures/assemblies.

They will be required to select the appropriate assembly tools and equipment to use, based on the operations to be performed and the types of component to be assembled, and to check that they are in a safe and serviceable condition. They will also be expected to align the components correctly, and to assemble them in the correct order, using the appropriate fixing devices and adhesives.

They will need to identify and/or create any datums that will be required to locate the components during the assembly process. The assembly activities will also include making all necessary visual and dimensional checks, to ensure that the assembly meets the required specification, that fasteners are securely tightened, and that the completed assembly is free from damage and has an appropriate cosmetic appearance.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the woodwork assembly activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate woodwork assembly techniques safely. They will understand the assembly process, and its application, and will know about the equipment, materials and

consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the assembly operations, especially those involved in the use of adhesives. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to demonstrate their ability to combine different pattern, model or woodwork assembly operations, at least one of the assemblies produced must be of a significant nature, and must cover a minimum of six of the activities listed in scope 3.

AUEC2/076

Producing Composite Mouldings using Resin Flow Infusion Techniques

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences that they need to produce composite mouldings using resin flow infusion techniques. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the resin flow infusion activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use.

They will be expected to prepare the tooling, apply release agents and to prepare the composite materials. They will produce composite mouldings, which will incorporate a range of features. The activities will also include making all necessary visual and dimensional checks, to ensure that the mouldings meet the required specification and have an appropriate cosmetic appearance.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the resin flow infusion activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate composite moulding resin flow infusion techniques and procedures safely. They will understand the moulding procedure, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the resin flow infusion activities, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



Specific Standard Requirements

In order to prove their ability to combine different resin flow infusion operations, at least one of the components produced must be of a significant nature, and must have a minimum of three of the features listed in scope 6.

AUEC2/077

Producing and Preparing Sand Moulds and Cores for Casting

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to covers a broad range of basic competences they need to produce and prepare sand moulds and cores for casting. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the production of the moulds and cores by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use.

They will be required to select the appropriate equipment to use, based on the type and size of the pattern, the moulding method employed, and the material to be cast. They will be expected to prepare the sand and produce the moulds using either greensand, chemically bonded gas activated sand, chemically bonded resin/catalyst activated sand or resin bonded heat activated sand. The patterns used will be loose or boarded, circular, square or irregular in shape, and will have projections and internal cavities. The moulds will be produced either in boxes or boxless, as appropriate.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the production and preparation of the sand moulds and cores. They will need to take account of any potential difficulties or problems that may arise with the patterns, sand, additives or equipment used, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate manual sand moulding and core making techniques safely. They will understand the manual sand moulding and core making process, and its application, and will know about the equipment, materials, consumables and tests that are used to confirm that the sand is fit for purpose, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the sand moulding activities, and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout. They will also understand your responsibilities for safety, and the importance of taking the necessary safeguards to protect yourself and others in the workplace.



They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different moulding techniques and procedures, at least one of the moulds produced must be of a significant nature, and must contain a minimum of one core.

AUEC2/078

Producing and Preparing Molten Materials for Casting

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences that they need to prepare and process the materials used in the production of molten materials, to produce cast components using moulds and shells. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the melting activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required activities and the sequence of operations they intend to use.

They will be required to prepare the appropriate equipment to use, based on the type and amount of molten material needed. This includes ferrous and non-ferrous alloys, plastic/polymers and liquid ceramics. They will prepare the base material for insertion into the melting furnace, and will start up the furnace, and charge the base material plus any other specified materials or additions into the melting vessel at the specified time. They will also adjust the furnace operating conditions to suit the molten material requirements. They will be expected to discharge the molten material into the receiving vessel or to other holding furnaces, as appropriate.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the preparation and control of the melting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the base materials, additives or equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate preparation and control procedures safely for the production of molten materials for casting. They will understand the melting techniques used, and their application, and will know about the equipment, materials, consumables and tests that are used to confirm that the process is under control, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out melting operations, and when using the associated tools and equipment, especially those involved in handling and pouring the molten material. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.



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They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/079

Producing Cast Components by Manual Means

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to covers a broad range of basic competences that they need to prepare and safely cast molten materials into prepared moulds, dies, or shells, manually. It will prepare them for entry into the engineering or manufacturing sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the casting activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required casting activities. They will be required to select the appropriate equipment to use, based on the type and amount of molten material to be cast. Both single and double pours, with ferrous or non-ferrous alloys, plastic polymers and liquid ceramics are included in this standard.

They will check that the moulds/dies/shells to be cast are positioned correctly, and are bushed up and secure. They must ensure that the casting ladles and any supporting or carrying frames are free from defects that could affect the safe operation of carrying and pouring the molten material. They will confirm that the molten material is at the required temperature and to the correct specification. They will collect the molten material from the source vessel or furnace, and skim or apply coagulant to the molten material to remove/contain impurities from the surface. They will then cast the moulds or dies in a safe manner, at the correct speed, and in the correct order. On completion of the casting activity, any surplus molten material will be disposed of safely and correctly in accordance with company procedures.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the casting activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the casting activities, materials and equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate molten material pouring and casting procedures safely. They will understand the casting techniques used, and their application, and will know about the equipment, materials, consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the manual casting activities,



especially those for transporting and pouring molten materials. They will be required to demonstrate safe working practices throughout. They will also understand your responsibilities for safety, and the importance of taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different casting techniques and procedures, at least one of the components produced must be of a significant nature, and must contain two of the features listed in scope 8.

AUEC2/080

Fettling, Finishing and Checking Cast Components

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to covers a broad range of basic competences that they need, to fettle and finish cast components produced from sand moulds, metal moulds/dies, ceramic moulds or investment shells using hand and power tools. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be expected to prepare for the fettling and finishing activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required fettling, finishing and checking activities.

They will be required to select the appropriate equipment to use, based on the shape and size of the components and the material from which they are cast. They will be expected to carry out checks on the tools and equipment, to ensure that they are in a safe and usable condition and that the abrasive wheels /discs to be used during the fettling operation are suitable for the material and operations to be carried out.

The cast components could be circular, square or irregular in shape, and may have projections and internal cavities. They will remove the runners and risers/feeders, using manual or mechanical means. Other surplus material present, on both external and internal surfaces (such as joint line and core print flash) must also be removed. On completion of the fettling activities, they will be expected to check the castings for a range of visual and geometric defects.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the fettling, finishing and checking activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, materials and equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate fettling, finishing and checking procedures safely to cast components. They will understand the fettling, finishing and checking techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the fettling and finishing activities, and when using the associated tools and equipment. They will be



required to demonstrate safe working practices throughout. They will also understand their responsibilities for safety, and the importance of taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

In order to prove their ability to combine different casting fettling techniques and procedures, at least one of the components fettled must be of a significant nature, and must contain four of the features listed in scope 5.

AUEC2/081

Finishing Surfaces by Applying Coatings or Coverings

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences that they need, to apply specified surface finishes by the application of coatings or coverings. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the finishing activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required finishing activities.

They will be required to select the appropriate equipment to use, based on the finishing materials to be applied and the surface area to be covered. They will be expected to use the specified or appropriate techniques to prepare the surfaces in readiness for the application of the coatings or coverings. The finishing activities will include the application of sealers and primers, paints, varnish, stain, wax or polish, sheet roll, block or tile materials, using hand tools, brushes, rollers, pads, cloths, or spray equipment, as applicable to the task.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the preparation and finishing activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the activities, materials and equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate preparation and hand finishing techniques and procedures safely. They will understand the preparation and finishing techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the finishing operations, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the occupational behaviours required in the workplace to meet the job profile and overall company objectives, including being able to demonstrate; personal responsibility and resilience, working effectively in teams, effective communication and interpersonal skills, focus on quality and problem solving and continuous development.



Specific Standard Requirements

In order to prove their ability to combine different surface preparation and finishing activities, at least one of the finishing activities must be of a significant nature, and must cover five of the activities listed in scope 2

AUEC2/082

Finishing Surfaces by Applying Treatments

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to cover a broad range of basic competences that they need, to apply specified surface treatments on components. It will prepare them for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

They will be required to prepare for the finishing activities by obtaining all necessary information, documentation, materials, tools and equipment, and to plan how they intend to carry out the required finishing activities.

They will be required to prepare the appropriate equipment to use, based on the surface treatment process and materials to be applied, and the surface area to be covered. They will be expected to use the specified or appropriate techniques to prepare the surfaces in readiness for the application of the treatments. The surface treatment activities will include the application of plating, anodising, powder coating, hot dip treatments and chemical treatments, as applicable to the task.

Their responsibilities will require them to comply with health and safety requirements and organisational policy and procedures for the preparation and surface treatment activities undertaken. They will need to take account of any potential difficulties or problems that may arise with the surface treatment activities, materials and equipment, and to seek appropriate help and advice in determining and implementing a suitable solution. They will work under a high level of supervision, whilst taking responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply appropriate preparation and surface treatment techniques and procedures safely. They will understand the preparation and treatment techniques used, and their application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

They will understand the safety precautions required when carrying out the surface treatment operations, and when using the associated tools and equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/083

Preparing and Manoeuvring Armoured Fighting Vehicles AFVs for Maintenance and Transportation

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out preparation and manoeuvring activities on military Armoured Fighting Vehicles (AFVs) in accordance with approved procedures including the Army Equipment Support Publications (AESPs). They will be required to select the appropriate tools and equipment to use, based on the activities to be carried out, and to check that they are in a safe and serviceable condition. They will be required to prepare and manoeuvre the AFV to the appropriate location, and to prepare the vehicle for maintenance operations or recovery. The manoeuvring activities will involve assisting in vehicle towing, vehicle marshalling, loading onto transport, parking and securing.

Their responsibilities as the Deputy Vehicle Commander will require them to comply with organisational policy and procedures for the activities undertaken, and to report any problems that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work with a minimum of supervision and as part of a team, communicating using hand signals and other communication devices. They must demonstrate a significant personal contribution during the team activities, in order to satisfy the requirements of this standard, and competency in all the areas required by the standard must be demonstrated. They will be expected to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will provide an understanding of their work, and will enable them to apply an informed approach to applying AFV preparation and manoeuvring techniques and procedures. They will have an understanding of the preparations to be carried out on the AFV, prior to moving and to have an in-depth understanding and knowledge to provide a sound basis for carrying out the activities safely and correctly.

They will understand the safety precautions required when carrying out the preparation and manoeuvring operations. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Specific Standard Requirements

- The candidate must hold a full category H Driving Licence.
- The candidate must be a fully qualified AFV crewman.

AUEC2/084

Handing Over and Confirming Completion of Maintenance or Installation Activities

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to hand over maintained and/or installed equipment, and to confirm that the equipment is now ready to run. Following the maintenance and/or installation activity, they will be required to ensure that the equipment is in a safe and operable condition. This will involve checking that all guards/covers and safety devices have been fitted, and that the equipment functions to the required specification.

On handing over the equipment, they will be expected to highlight any new, current or changed operating features of the equipment, and to inform the appropriate person of any future maintenance requirements.

They must also ensure that they receive confirmation that everyone involved in the handover accepts that the maintained and/or installed equipment functions to the agreed specification.

Their responsibilities will require them to comply with organisational policy and procedures for the handover activities undertaken, and to report any problems with the handing over procedure that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, alone or in conjunction with others, taking full responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound understanding of their work, and will provide an informed approach to applying maintenance and/or installation handover procedures. They will understand the equipment being handed over, and its application, and will know about the operating procedures and potential problems, in adequate depth to provide a sound basis for carrying out the activities safely and correctly.

They will understand the safety precautions to be observed when handing over the maintained and/or installed equipment. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace/area.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/085

Carrying Out Fault Location on Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to locate faults on mechanical equipment, in accordance with approved procedures. They will be required to locate faults on equipment such as machine tools, gearboxes, portable tools, engines, pumps, process control valves, compressors, process plant, conveyers and elevators, lifting and handling devices, transfer equipment, mechanical structures, workholding devices and other company-specific equipment. They will be expected to use a variety of fault location methods and procedures, such as gathering information from the person who reported the fault, using recognised fault finding techniques and diagnostic aids, measuring, inspecting and operating the equipment.

Their responsibilities will require them to comply with organisational policy and procedures for the fault location activities undertaken, and to report any problems with these activities, or with the tools and equipment used, that they cannot personally resolve or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, alone or in conjunction with others, taking full responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will provide an informed approach to applying fault location procedures on mechanical equipment. They will have an understanding of the basic fault location methods and techniques used, and their application. They will also know how to interpret information obtained from fault finding aids and equipment, in adequate depth to provide a sound basis for carrying out the activities.

They will understand the safety precautions required when carrying out the fault location activities, especially those for isolating the equipment. They will also understand their responsibilities for safety, and the importance of taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/086

Carrying Out Maintenance Activities on Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out corrective maintenance activities on mechanical equipment, in accordance with approved procedures. This will involve dismantling, removing and replacing or repairing faulty components, in line with company procedures, on a variety of different types of mechanical equipment such as machine tools, gearboxes, portable tools, engines, pumps, process control valves, compressors, process plant, conveyers and elevators, lifting and handling devices, transfer equipment, mechanical structures, workholding devices and other company-specific equipment.

They will be expected to cover a range of maintenance activities, such as labelling/proof marking to aid reassembly, dismantling components to the required level, setting, aligning and adjusting components, replacing 'lived' items, replenishing oils, greases or other fluids, torque loading components and making 'off-load' checks before testing and starting up the maintained equipment, using appropriate techniques and procedures.

Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities, or with the tools and equipment used, that they cannot personally resolve or are outside their permitted authority, to the relevant people. They must ensure that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the activities, and that all necessary job/task documentation is completed accurately and legibly. They will be expected to work to instructions, alone or in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will enable them to adopt an informed approach to applying mechanical maintenance procedures. They will have an understanding of dismantling and reassembly methods and procedures, and their application. They will know how the equipment functions and the purpose of individual components, in adequate depth to provide a sound basis for carrying out any maintenance, repair or adjustment. In addition, they will have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications, thus providing a sound basis for carrying out reassembly.

They will understand the safety precautions required when carrying out the maintenance activities, especially those for isolating the equipment. They will also understand their responsibilities for safety, and the importance of taking the necessary safeguards to protect themselves and others in the workplace.



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They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/087

Carrying Out Scheduled Maintenance Activities on Mechanical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out scheduled maintenance activities on mechanical equipment, in accordance with approved procedures. They will be required to carry out scheduled maintenance on a range of mechanical equipment such as machine tools, gearboxes, portable tools, engines, pumps, process control valves, compressors, process plant, conveyers and elevators, lifting and handling devices, transfer equipment, mechanical structures, workholding devices and other company-specific equipment, in order to minimise downtime and ensure that equipment performs at the optimal level and functions to specification.

Their responsibilities will require them to comply with organisational policy and procedures for the maintenance tasks undertaken, and to report any problems with the maintenance process, tools or equipment used that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They must ensure that all tools, equipment and materials used in the maintenance activities are removed from the work area on completion of the activities, and that all necessary job/task documentation is completed accurately and legibly. They will be expected to work to instructions, alone or in conjunction with others, taking personal responsibility for their own actions, and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will enable them to adopt an informed approach to applying scheduled maintenance procedures to mechanical equipment. They will have an understanding of the process of implementing scheduled maintenance tasks, the importance of carrying them out at specific times, and of recording the outcomes and actions taken. In addition, they will be expected to report where the outcomes identify the need for further investigation or maintenance work.

They will understand the safety precautions required when carrying out the maintenance tasks, especially those for isolating the equipment. They will also understand their responsibilities for safety, and the importance of taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/088

Slinging, lifting and moving materials and components

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the skills required to move loads by slinging and lifting, in accordance with approved procedures. They will be required to use correctly specified items of lifting gear, which will include hand, and/or power operated cranes and winches, and associated lifting accessories. They must check that the lifting equipment is within current authorisation dates, is undamaged and within the permitted safe working load (SWL or working load limit (WLL)). They will be expected to correctly estimate the weight of the load to be moved, and attach the appropriate slings to suitable or designated lifting points on the load in order to achieve a safe and balanced lift. They must check the area that the load will move through, to ensure that it is free from obstructions and is safe for the load to be moved. They will also be expected to give the correct hand and verbal signals during the lifting activities.

Their responsibilities will require them to comply with organisational policy and procedures for the slinging, signalling and lifting activities undertaken, and to report any problems with the slinging and lifting equipment or the lifting activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work with minimum supervision, taking personal responsibility for their own actions and for the safety and integrity of the materials being moved.

Their knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying slinging, signalling and lifting procedures. They will have an understanding of the slinging, signalling and lifting techniques used, and their application, and will know about the lifting equipment and accessories for lifting, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

They will need to understand the safety precautions required when slinging and lifting components, and the safeguards that are necessary for undertaking the activities. They will be required to demonstrate safe working practices throughout, and will understand the responsibilities they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/089

Stripping and Rebuilding Motorsport Vehicles Pre-Competition

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to prepare a motorsport vehicle, in a recognised sequence and to a high standard, prior to a competition. It will prepare them for entry into the motorsport sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competencies in the working environment.

The activities will involve the dismantling and removal of components, inspection and checking for faults and excessive wear and potential problems, replacement of components, and rebuilding the vehicles using hand tools, specialist tools and test equipment, in accordance with approved procedures. It covers motorsport vehicles such as single seat, rally cars, sports cars, karts, historic vehicles, motor cycles and other specific approved competition vehicles, and covers a range of equipment such as chassis and suspension, engine and transmission, steering and wheel braking systems, fuel and lubrication, electrical and other specific equipment.

The preparation activities will include carrying out all necessary safety activities to lift and support the vehicle and its components, lifting and removing engine and transmission systems, breaking into hydraulic and fuel system circuits, removing springs under compression, removing and replacing faulty equipment at component or unit level, replenishing fluids, and setting and adjusting the completed system in readiness for testing. They will also be expected to use recognised methods for crack testing ferrous and non-ferrous materials/components, and to be able to inspect a motorsport vehicle within the team's guidelines.

Their responsibilities will require them to comply with recognised procedures for the stripping and rebuilding activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the dismantling and inspection activities, and return them to their recognised storage area ready for further use.

Their knowledge will provide an understanding of their work, and will enable them to apply the appropriate dismantling, inspection and rebuilding procedures safely. They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the removal and replacement activities, correct faults and ensure that the equipment is replaced to the required standard. They will also have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications.



They will understand the safety precautions required when carrying out the stripping and rebuilding activities, especially those for lifting and supporting the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/090

Inspecting a Motorsport Vehicle during a Competition

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to inspect a motorsport vehicle, in a recognised sequence, and to a high standard, during a race meeting or competition. It will prepare them for entry into the motorsport sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The activities will involve inspecting a motorsport vehicle immediately before it enters the competition, and checking the vehicle for system leaks, low fluid levels, loose fastenings and fixings, arming of the fire extinguisher system, checking driver/rider safety equipment, and checking correct fuel levels, correct cold tyre and damper pressures and other potential problem areas. It covers motorsport vehicles such as single seat, rally cars, sports cars, karts, historic vehicles, motor cycles and other specific approved competition vehicles.

In carrying out the activities, they will be required to use a range of inspection techniques, tools and equipment. They must be able to use recognised methods of checking components for wear, chafing, damage and 'play', within the team's guidelines. They will be expected to follow the team's procedures for inspecting the motorsport vehicle during a competition. They must also understand and use the correct coolants, oils, fluids and agents for the system being inspected.

Their responsibilities will require them to comply with recognised procedures for the inspection activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the inspection activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the inspection activities, and return them to their recognised storage area ready for further use.

Their knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate inspection procedures during a motorsport event or competition. They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the inspection activities, identify and correct faults and ensure that the vehicle is to the required standard.



They will understand the safety precautions required when carrying out motorsport inspection activities, especially those for lifting and supporting vehicles. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/091

Diagnosing and Rectifying Faults on Motorsport Vehicle Systems During Competition

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to diagnose and rectify motorsport vehicle system faults, in a fast and efficient manner, during a race meeting or competition. It will prepare them for entry into the motorsport sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The activities will involve the application of a range of fault diagnostic techniques, tools and equipment, and the diagnosis and location of the faults to their unit and/or component parts, on a range of systems such as engine, transmission, chassis, wheel braking, suspension, steering, fuel, lubrication, cooling and electrical. They will be expected to remove the relevant components, to inspect the parts for wear or damage, to determine which (if any) parts need replacing and then to reassemble them for further use.

The removal and replacement activities will include carrying out all necessary safety activities, to lift and support the vehicle and its components, lifting and removing engine and transmission systems, breaking into hydraulic and fuel system circuits, removing and replacing faulty equipment at component or unit level, replenishing fluids, and setting and adjusting the completed system. They will also be expected to carry out routine testing and functional checks of the rebuilt components to determine that the equipment performs to the specified requirements.

Their responsibilities will require them to comply with recognised procedures for the fault diagnosis and removal and replacement activities undertaken, to take account of any potential difficulties or problems that may arise, and seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

They must ensure that they remove all tools and equipment from the vehicle and work area on completion of the activities, complete all necessary job/task documentation accurately and legibly, and maintain the work area to a standard that will reflect the professional image of the team.

Their knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate fault diagnosis and rectification techniques and procedures. They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the fault diagnostic activities, correct faults and ensure that the equipment is replaced and functions to the required standard.



They will understand the safety precautions required when carrying out the fault diagnosis, adjustments and the component removal and replacement activities, especially those for lifting and supporting the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

AUEC2/092

Carrying Out Maintenance Activities on Motorsport Vehicle Electrical Equipment

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to carry out maintenance activities on motorsport vehicle electrical systems, in accordance with approved procedures. It will prepare them for entry into the motorsport sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The activities will involve dismantling, removing and replacing or repairing faulty components, in line with company procedures, on electrical equipment that uses battery, alternating current generators, or direct current power supplies. This includes equipment such as control systems, switches and solenoids, starter motors, wiring harnesses and instrumentation panel, wiring enclosures and warning lights, vehicle lighting systems, data acquisition systems and other specific electrical equipment.

They will be expected to apply a range of maintenance techniques and procedures, such as selection of raw materials, attaching connectors, shielding, testing, isolating, disconnecting, removing and reconnecting electrical components and looms, attaching cable identification markers, replacing damaged or defective electrical components and looms, setting and adjusting components, and making continuity checks before testing and starting up the equipment.

Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the maintenance activities, and return them to their recognised storage area ready for further use.

Their knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate electrical maintenance procedures. They will know how the motorsport electrical equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the maintenance, repair or adjustment activities, and to ensure that the equipment functions to the required specification. In addition, they will have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications.



They will understand the safety precautions required when carrying out the maintenance activities, especially those for isolating the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

AUEC2/093

Stripping and Rebuilding Motorsport Engines Pre-Competition

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to re-build a motorsport engine in a recognised sequence and to a high standard, prior to a competition. It will prepare them for entry into the motorsport sector, creating a progression between education and employment, or it will provide a basis for the development of additional skills and occupational competences in the working environment.

The activities will involve the dismantling and removal of components, inspection and checking for faults, excessive wear and potential problems, replacement of components, and rebuilding the engine using hand tools, specialist tools and test equipment, in accordance with approved procedures. It covers motorsport engines fitted into motorsport vehicles such as single seater, rally cars, sports cars, karts, historic vehicles, motorcycles and other specific approved competition vehicles.

The stripping and re-building activities will include carrying out all necessary safety activities, to lift and support the engine and its ancillary components. They will need to lift and remove the engine from any transportation containers and place it onto an approved holding device, ready for removing all ancillary components and the stripping and rebuilding of the engine. They will need to ensure that all removed components are stored safely, prior to inspection and re-building. They will also be expected to use recognised methods for crack testing ferrous and non-ferrous materials/components, and to be able to inspect a motorsport engine within the team's or organisation's guidelines.

Their responsibilities will require them to comply with recognised procedures for the stripping and rebuilding activities undertaken, to take account of any potential difficulties or problems that may arise, and to seek appropriate help and advice in determining and implementing a suitable solution. They will be expected to work with either a high level of supervision or as a member of a team. Where team working is involved, they must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard, and competence in all the areas required by the standard must be demonstrated.

On completion of the activities, they must show that they can competently clean the work area that they are responsible for, including tidying up bays or garages to a standard that will reflect the professional image of the team. They must show that they can use and maintain the tools and equipment needed for the stripping and rebuilding activities, and return them to their recognised storage area ready for further use.

Their knowledge will be sufficient to provide a broad understanding of their work, and will enable them to apply the appropriate stripping, inspection and rebuilding procedures. They will know how the equipment functions, the common faults that can occur, the purpose of the individual components and associated defects, in adequate depth to carry out the stripping and rebuilding activities, correct faults and to ensure that the equipment is replaced to the



required standard. They will also have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications.

They will understand the safety precautions required when carrying out the stripping and rebuilding activities, especially those for lifting and supporting the equipment. They will be required to demonstrate safe working practices throughout, and will understand their responsibility for taking the necessary safeguards to protect themselves and others in the workplace.

AUEC2/094

Assisting in obtaining resources for engineering activities

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences they need to support colleagues in obtaining resources (such as materials, drawings, people, equipment and documentation) for the implementation of engineering activities, in accordance with approved procedures. They will be required to apply appropriate methods and approaches for specifying and obtaining the resources. They will also be required to highlight any deviations from agreed schedules, to the relevant people.

Their responsibilities will require them to comply with organisational policy and procedures for obtaining the resources for the engineering activities, and to report any problems that they cannot personally resolve, or that are outside your permitted authority, to the relevant people. They will be expected to work to instructions, either alone or in conjunction with others, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a sound basis for their work, and will enable them to adopt an informed approach to obtaining resources for the specified engineering activities. They will have an understanding of the engineering activities for which the resources are required, in sufficient detail to enable them to carry out the activities to the required standards.

They will be aware of any health, safety and environmental requirements applicable to the engineering activities for which the resources are being obtained. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

AUEC2/095

Developing and maintaining effective customer relationships

This Employer Unit of Competence (EUC) has been developed by employers in the Advanced Manufacturing and Engineering Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief.

This EUC identifies the skills and knowledge needed to prove the competences required to be positive and constructive in dealings with customers, especially when dealing with any disagreements. They will be expected to keep customers informed about work plans and activities which affect them, and to seek and obtain information from others when necessary, in a polite and courteous manner. They will respond in a timely and positive way when asked to provide help or information to customers.

Their responsibilities will require them to comply with any policies of their organisation in respect of developing and maintaining positive working relationships with clients and customers. They will be expected to work within the general policies of their organisation, and to know when to seek guidance and instructions from others. They will be expected to work to instructions, either alone or in conjunction with others, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.

Their underpinning knowledge will be sufficient to provide a good understanding for developing and maintaining positive working relationships with customers, and will provide an informed approach to their attitude and behaviour toward the feelings and expectations of customers, and for effective communications.

They will understand the safety and environmental precautions required when carrying out their duties and they will bear these things in mind when dealing with other people. They will also understand their responsibilities for health and safety in their place of work, and the importance of taking the necessary safeguards to protect themselves and others when they are working.

They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.



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