Level 2 Aviation Maintenance Mechanic (Competence) (1790-02)

July 2020 Version 1.0

Qualification Handbook

Qualification at a glance

Subject area	**Aeronautical Engineering**
City & Guilds number	1790
Age group approved	16-18, 19+
Assessment	Portfolio of evidence
Approvals	Fast track approval
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	City & Guilds number	Accreditation number
Level 2 Aviation Maintenance Mechanic (competence)	1790-02	603/6236/4

Version and date	Change detail	Section
V1.0 29/07/20	Updated with Accreditation number	

Contents

1 Introduction

This document tells you what you need to do to deliver the qualifications:

Area	Description
Who is the qualification for?	This qualification is aimed at learners who work in the Aerospace and Aviation sector as an aircraft maintenance mechanic.
What do the qualifications cover?	This qualification allows candidates to learn, develop and practise the skills required for employment and/or career progression in the maintenance and ground handling of military and civil aircraft in the Aerospace and Aviation sector.
What opportunities for progression are there?	On successful completion of the standard, learners are able to progress to the Higher Technician Family of Apprenticeships, such as the Engineering Technician.
Who did we develop the qualification with?	This qualification was developed by the Aerospace Engineering Trailblazer Employer Group led by the MOD and BAE systems
Is it part of an apprenticeship framework or initiative?	The qualification is included in the Engineering and Manufacturing route of Apprenticeship standards e.g. Aviation Maintenance Mechanic Standard.

Structure

To achieve the Level 2 Aviation Maintenance Mechanic (Competence) learners must achieve all four mandatory units 201- 204 and any **three** optional units from units 205 – 208

Level 2 Aviation Maintenance Mechanic (Competence)			
City & Guilds unit number	**Unit title**	**GLH**	**TQT**
Learners must achieve all **four** mandatory units and **three** optional units			
Mandatory			
201	Complying with statutory regulations and organisational safety requirements	35	40
202	Working efficiently and effectively in an engineering environment	25	40
203	Using and interpreting engineering data and documentation	25	40
204	Reinstating the work area on completion of activities	25	40
Optional			
205	Carrying out aircraft handling operations	35	100
206	Carrying out aircraft routine servicing	49	100
207	Carrying out maintenance on aircraft mechanical systems by component replacement	126	350
208	Carrying out maintenance on aircraft electrical /electronic systems by component replacement	126	350

Total Qualification Time

Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Title and level	GLH	TQT
Level 2 Aviation Maintenance Mechanic (Competence)	446	1060

2 Centre requirements

Approval

If your Centre is approved to offer the qualification Level 2 Diploma in Aeronautical Engineering (1789-21) then you can apply for the new Level 2 Aviation Maintenance Mechanic (competence) Qualification (1790-02) approval using the fast track approval form, available from the City & Guilds website. Centres should use the fast track form if:

- there have been no changes to the way the qualifications are delivered, and
- they meet all of the approval criteria in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After 12 months, the Centre will have to go through the standard Qualification Approval Process. The centre is responsible for checking that fast track approval is still current at the time of application.

To offer these qualifications, new centres will need to gain both centre and qualification approval. Please refer to the Centre Manual - Supporting Customer Excellence for further information

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Resource requirements

Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be occupationally competent or technically knowledgeable in the area[s] for which they are delivering training and/or have experience of providing training. This knowledge must be to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but cannot internally verify their own assessments.

Learner entry requirements

City & Guilds does not set entry requirements for this qualification. However, centres must ensure that candidates have the potential and opportunity to gain the qualification successfully.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 16 as these qualifications are not approved for under 16s.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each candidate should be made before the start of their programme to identify:

- if the candidate has any specific training needs,
- support and guidance, they may need when working towards their qualifications.
- any units they have already completed, or credit they have accumulated which is relevant to the qualifications.
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the candidate fully understands the requirements of the qualification[s], their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence.

City & Guilds endorses several e-Portfolio systems, including our own, **Learning Assistant**, an easy-to-use and secure online tool to support and evidence learners' progress towards achieving qualifications. Further details are available at: **www.cityandguilds.com/eportfolios**.

City & Guilds has developed a set of *Recording forms* including examples of completed forms, for new and existing centres to use as appropriate. *Recording forms* are available on the City & Guilds website.

Although new centres are expected to use these forms, centres may devise or customise alternative forms, which must be approved for use by the external verifier, before they are used by candidates and assessors at the centre. Amendable (MS Word) versions of the forms are available on the City & Guilds website.

4 Assessment

Summary of assessment methods

Candidates must:

- have a completed portfolio of evidence for each unit

Assessment strategy

Assessment requirements have been developed by employers for the occupational competency units and qualifications for Advanced Manufacturing and Engineering Sector.

These assessment requirements are set out in the relevant Qualification Assessment Strategy available from SEMTA - https://semta.org.uk

Access to assessment

There are no entry requirements required for the Units of Competence unless this is a legal requirement of the process or the environment in which the Apprentice is working in. Assessment is open to any Apprentice who has the potential to reach the assessment requirements set out in the relevant units.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

Carrying out assessments

The Units of Competence have been specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the skills and knowledge required by employer and specified in the Apprentice's Training Plan. The Skills section of the Units of Competence makes reference to a number of optional items listed (for example 'any three from five'). This is the minimum standard set by employers.

Where the unit requirements gives a choice of optional areas, Assessors should note that Apprentices do not need to provide evidence of the other areas to complete the unit, unless specified by the employer (in this example above, two items) particularly where these additional items may relate to other activities or methods that are not part of the Apprentice's normal workplace activities or required by the employer.

Performance evidence requirements

Performance evidence must be the main form of evidence gathered. In order to demonstrate consistent competent performance for a unit, a minimum of three

different examples of performance of the unit activity will be required. Items of performance evidence often contain features that apply to more than one unit and can be used as evidence in any unit where they are suitable.

Performance evidence must be:

- products of the Apprentice's work, such as items that have been produced or worked on, plans, charts, reports, standard operating procedures, documents produced as part of a work activity, records or photographs of the completed activity

  together with:

- evidence of the way the Apprentice carried out the activities, such as witness testimonies, assessor observations or authenticated Apprentice reports of the activity undertaken.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units in the Development Phase contain statements that require the Apprentice to provide evidence that proves they are capable of combining various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and, therefore, will not be acceptable as demonstrating competent performance.
If there is any doubt as to what constitutes suitable evidence the Internal/External Quality Assurer should be consulted.

Assessing knowledge and understanding requirements
Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the Apprentice's knowledge and understanding is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways. It is recommended that oral questioning and practical demonstrations are used perhaps whilst observing the apprentice undertake specific tasks, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the Apprentice has an appropriate level of knowledge and understanding, as required by the unit.

Evidence of knowledge and understanding will **not** be required for those items in the skills section of the Units of Competence that have not been selected by the employer.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the Apprentice's answers.

Witness testimony
Where observation is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria by someone else that is in close contact with the Apprentice. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the Apprentice's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the Apprentice. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the Apprentice's competency are reliable, auditable and technically valid.

Maximising opportunities to use assessment evidence
One of the critical factors required in order to make this Assessment Strategy as efficient and effective as possible and to ease the burden of assessment, is the Assessor's ability and expertise to work in partnership with the apprentice and their employer to provide advice and guidance on how to maximise opportunities to cross reference performance and knowledge evidence to all relevant Units of Competence. For example if a knowledge statement is repeated in a number of separate Units of Competence and the expected evidence/response to that statement is the same including the context, then the same piece of evidence should be cross referenced to the appropriate units.

Recognition of prior learning (RPL) Recognition of prior learning means using a person's previous experience, or qualifications which have already been achieved, to contribute to a new qualification. For this qualification, sector specific RPL is allowed

5 Units

Structure of the units

These units each have the following:

- City & Guilds reference number
- Title
- Level
- Guided learning hours (GLH)
- Learning outcomes, which are comprised of a number of assessment criteria

Centres must deliver the full breadth of the range. Specialist equipment or commodities may not be available to all centres, so centres should ensure that their delivery covers their use. This may be covered by a practical demonstration e.g. video

For the practical assessments for this qualification, centres should ensure that there are sufficient resources to complete the task but are not required to use all the equipment or commodities in the range

Unit 201 Complying with statutory regulations and organisational safety requirements

Level:	Level 2
GLH:	35
Relationship to NOS:	This unit has been derived from National Occupational Standards complying with statutory regulations and organisational safety requirements (Suite 2)
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This unit covers the skills and knowledge needed to prove the competences required to deal with statutory regulations and organisational safety requirements. It does not deal with specific safety regulations or detailed requirements, it does, however, cover the more general health and safety requirements that apply to working in an industrial environment. The learner will be expected 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. The learner will need to be able to identify the relevant qualified first aiders and know the location of the first aid facilities. The learner will have a knowledge and 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. The learner will also need to be fully conversant with their organisation's procedures for fire alerts and the evacuation of premises. The learner will also 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, the materials and substances that they use, any working practices that do not follow laid-down procedures, and manual lifting and carrying techniques. The learner's responsibilities will require them to comply with all relevant statutory and organisational policy and procedures for health and safety in the workplace. The

	learner must act in a responsible and safe manner at all times, and present themselves in the workplace suitably prepared for the activities to be undertaken. The learner will be expected to report any problems with health and safety issues, to the relevant authority. The learner's knowledge will provide a good understanding of the relevant statutory regulations and organisational requirements associated with their work, and will provide an informed approach to the procedures used. The learner will need to understand their organisation's health and safety requirements and their application, in adequate depth to provide a sound basis for carrying out their activities in a safe and competent manner

Learning outcome

S1 Comply with statutory regulations and organisational safety requirements

Assessment criteria

The learner can:

1.1 comply with their duties and obligations as defined in the Health and Safety at Work Act

1.2 demonstrate their understanding of their duties and obligations to health and safety by:

- applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act
- identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as:
    - eye protection and personal protective equipment (PPE)
    - COSHH regulations
    - Risk assessments
- identifying the warning signs and labels of the main groups of hazardous or dangerous substances
- complying with the appropriate statutory regulations at all times

1.3 present themselves in the workplace suitably prepared for the activities to be undertaken

1.4 follow organisational accident and emergency procedures

1.5 comply with emergency requirements, to include:

- identifying the appropriate qualified first aiders and the location of first aid facilities
- evacuation of premises
- identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment

1.6 Recognise and control hazards in the workplace
1.7 Identify the hazards and risks that are associated with the following:
- their working environment
- the equipment that they use
- materials and substances (where appropriate) that they use
- working practices that do not follow laid-down procedure

1.8 use correct manual lifting and carrying techniques
1.9 demonstrate one of the following methods of manual lifting and carrying:
- lifting alone
- with assistance of others
- with mechanical assistance

1.10 apply safe working practices and procedures to include:
- maintaining a tidy workplace, with exits and gangways free from obstruction
- using equipment safely and only for the purpose intended
- observing organisational safety rules, signs and hazard warnings
- taking measures to protect others from any harm resulting from the work that they are carrying out

Learning outcome

K Knowledge and understanding

Assessment criteria

The learner knows:

K1 the roles and responsibilities of themselves and others under the Health and Safety at Work Act, and other current legislation

K2 the specific regulations and safe working practices and procedures that apply to their work activities

K3 the warning signs for the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations

K4 how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed

K5 what constitutes a hazard in the workplace

K6 their responsibilities for identifying and dealing with hazards and reducing risks in the workplace

K6 the risks associated with their working environment

K7 the processes and procedures that are used to identify and rate the level of risk

K8 the first aid facilities that exist within their work area and within the organisation in general; the procedures to be followed in the case of accidents involving injury
K9what constitutes dangerous occurrences and hazardous malfunction and why these must be reported even if no-one is injured
K10the procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report their presence at the appropriate assembly point
K11 the organisational policy with regard to firefighting procedures; the common causes of fire and what they can do to help prevent them
K12 the protective clothing and equipment that is available for their areas of activity
K13 how to safely lift and carry loads, and the manual and mechanical aids available
K14 how to prepare and maintain safe working areas; the standards and procedures to ensure good housekeeping
K15 the importance of safe storage of tools, equipment, materials and products
K16 the extent of their own authority and to whom they should report in the event of problems that they cannot resolve

Unit 201 Complying with statutory regulations and organisational safety requirements

Supporting Information

Guidance

K1 such as The Management of Health and Safety at Work Regulations, Workplace Health and Safety and Welfare Regulations, Personal Protective Equipment at Work Regulations, Manual Handling Operations Regulations, Provision and Use of Work Equipment Regulations, Display Screen at Work Regulations, Reporting of Injuries, Diseases and Dangerous Occurrences Regulations

K5 such as moving parts of machinery, electricity, slippery and uneven surfaces, poorly placed equipment, dust and fumes, handling and transporting, contaminants and irritants, material ejection, fire, working at height, environment, pressure/stored energy systems, volatile, flammable or toxic materials, unshielded processes, working in confined spaces

K7 such as the tools, materials and equipment that they use, spillages of oil, chemicals and other substances, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures

K8 such as safety inspections, the use of hazard checklists, carrying out risk assessments, COSHH assessments

Unit 202 Working efficiently and effectively in engineering

Level:	Level 2
GLH:	25
Relationship to NOS:	This unit has been derived from National Occupational Standards working efficiently and effectively in engineering (Suite 2)
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This unit covers the skills and knowledge needed to prove the competences required to work efficiently and effectively in the workplace, in accordance with approved procedures and practices. Prior to undertaking the engineering activity, the learner will be required to carry out all necessary preparations within the scope of their responsibility. This may include preparing the work area and ensuring that it is in a safe condition to carry out the intended activities, ensuring they have the appropriate job specifications and instructions and that any tools, equipment, materials and other resources required are available and in a safe and usable condition. On completion of the engineering activity, the learner will be required to return their immediate work area to an acceptable condition before recommencing further work requirements. This may involve placing completed work in the correct location, returning and/or storing any tools and equipment in the correct area, identifying any waste and/or scrapped materials and arranging for their disposal, and reporting any defects or damage to tools and equipment used. In order to be efficient and effective in the workplace, the learner will also be required to demonstrate that they can create and maintain effective working relationships with colleagues and line management. The learner will also be expected to review objectives and targets for their personal development and make recommendations to, and communicate any opportunities for, improvements that could be made to working practices and procedures.

	The learner's responsibilities will require them to comply with organisational policy and procedures for the engineering activities undertaken, and to report any problems with the activities, or the tools and equipment that are used that they cannot personally resolve, or are outside their permitted authority, to the relevant people. The learner will be expected to take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out. The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to working efficiently and effectively in an engineering environment. The learner 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, how to contribute to improvements, deal with problems, maintain effective working relationships and agree their development objectives and targets, in adequate depth to provide a sound basis for carrying out the activities safely and correctly. The learner will understand the safety precautions required when carrying out engineering activities. The learner will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace.

Learning outcome

S1 Work efficiently and effectively in engineering

Assessment criteria

The learner can:

1.1 Work safely at all times, complying with health and safety and other relevant regulations and guidelines

1.2 Prepare the work area to carry out the engineering activity

1.3 Prepare to carry out the engineering activity, taking into consideration all of the following, as applicable to the work to be undertaken:

- the work area is free from hazards and suitably prepared for the activities to be undertaken
- any required safety procedures are implemented
- any necessary personal protection equipment is obtained and is in a usable condition

- tools and equipment required are obtained and checked that they are in a safe and useable condition
- all necessary drawings, specifications and associated documentation is obtained
- job instructions are obtained and understood
- the correct materials or components are obtained
- storage arrangements for work are appropriate
- appropriate authorisation to carry out the work is obtained

1.4 Check that there are sufficient supplies of materials and/or consumables and that they meet work requirements

1.5 Ensure completed products or resources are stored in the appropriate location on completion of the activities

1.6 Complete work activities, to include all of the following:

- returning tools and equipment
- returning drawings and work instructions
- completing all necessary documentation accurately and legibly
- identifying, where appropriate, any unusable tools, equipment and components
- arranging for the safe disposal of waste materials

1.7 Tidy up the work area on completion of the engineering activity

1.8 Deal promptly and effectively with problems within their control and report those that cannot be resolved

1.9 Deal with problems affecting the engineering process, to include two of the following:

- materials
- tools and equipment
- drawings
- job specification
- quality
- people
- timescales
- safety
- activities or procedures

1.10 Contribute to organisational procedures for identifying opportunities for improvement to one of the following:

- working practices
- working methods
- quality
- safety
- tools and equipment
- supplier relationships
- internal communication
- customer service
- training and development

- teamwork
- other

1.11 Maintain effective working relationships with colleagues to include two of the following:
- colleagues within their own working group
- people outside their normal working group
- line management
- external contacts

1.12 Review personal training and development as appropriate to the job role

1.13 Review personal development objectives and targets to include one of the following:
- dual or multi-skilling
- training on new equipment/technology
- increased responsibility
- understanding of company working practices, procedures, plans and policies
- other specific requirements

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the safe working practices and procedures to be followed whilst preparing and tidying up their work environment

K2 the correct use of any equipment to protect the health and safety of themselves and their colleagues

K3 the procedure for ensuring that all documentation relating to the work being carried out is available and current, prior to starting the activity

K4 the action that should be taken if documentation received is incomplete and/or incorrect

K5 the procedure for ensuring that all tools and equipment are available prior to undertaking the activity

K6 the checks to be carried out to ensure that tools and equipment are in full working order, prior to undertaking the activity

K7 the action that should be taken if tools and equipment are not in full working order

K8 the checks to be carried out to ensure that all required materials are correct and complete, prior to undertaking the activity

K9 the action that should be taken if materials do not meet the requirements of the activity

K10 whom to inform when the work activity has been completed

K11 the information and/or documentation that others will require to confirm that the activity has been completed

K12 what materials, equipment and tools can be re-used

K13 how any waste materials and/or products are transferred, stored and disposed of

K14 where tools and equipment should be stored and located

K15 the importance of maintaining effective working relationships within the workplace

K16 the procedures for dealing with and reporting any problems that can affect working relationships

K17 the importance of making a contribution to improving working practices

K18 the procedure and format for making suggestions for improvements

K19 the benefits for the work area if improvements can be identified

K20 the difficulties that can occur in working relationships

K21 the regulations that affect how they should be treated at work such as Equal Opportunities Act, Race and Sex Discrimination, Working Time Directive

K22 the benefits of continuous personal development

K23 the training opportunities that are available in the workplace

K24 the importance of reviewing their training and development

K25 with whom to discuss training and development issues

K26 the extent of their own authority and to whom they should report if they have any problems that they cannot resolve

Unit 203 Using and Interpreting Engineering Data and Documentation

Level:	Level 2
GLH:	25
Relationship to NOS:	EUCL2F-003
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	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 make effective use of text, numeric and graphical information, by interpreting and using technical information extracted from documents such as engineering drawings, technical manuals, reference tables, specifications, technical sales/marketing documentation, charts or electronic displays, in accordance with approved procedures. They will be required to extract the necessary information from the various documents, in order to establish and carry out the work requirements, and to make valid decisions about the work activities based on the information extracted. Their responsibilities will require them to comply with organisational policy and procedures for obtaining and using the documentation applicable to the activity. They will be expected to report any problems with the use and interpretation of the documents that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work to instructions, with an appropriate level of supervision or as a member of a team, and 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 a good understanding of the types of documentation used, and will provide an informed approach to applying instructions and procedures. They will be able to read and interpret the documentation used and will know about the conventions, symbols and abbreviations, in adequate depth to provide a sound basis for carrying out the activities to the required specification. They will be able to apply the occupational behaviours required in the workplace to meet the job profile and overall objectives of the organisation, 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

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

P1 demonstrate the required occupational behaviours in line with the job role and the objectives of the organization
P2 use the approved source to obtain the required data and documentation
P3 correctly identify, interpret and extract the required information
P4 use the information obtained to ensure that work output meets the specification
P5 deal promptly and effectively with any problems within their control and report those which cannot be solved
P6 report any inaccuracies or discrepancies in documentation and specifications

Learning outcome

S1 Use the data and documentation and carry out **all** of the following:

Assessment criteria

The learner can:

1.1 check the currency and validity of the data and documentation used
1.2 exercise care and control over the documents at all times
1.3 correctly extract all necessary data in order to carry out the required tasks
1.4 deal with or report any problems found with the data and documentation
1.5 make valid decisions based on the evaluation of the engineering information

1.6 return all documents to the approved location on completion of the work
1.7 complete all necessary work related documentation such as production documentation, installation documentation, maintenance documentation, planning documentation

2 Learning outcome

S2 Extract information that includes **three** of the following:

Assessment criteria

The learner can:

2.1 materials or components required
2.2 dimensions
2.3 tolerances
2.4 installation requirements
2.5 customer requirements
2.6 time scales
2.7 operating parameters
2.8 location/orientation of parts
2.9 dismantling/assembly sequence
2.10 inspection/testing requirements
2.11 number/volumes required
2.12 repair/service methods
2.13 operations required
2.14 connections to be made
2.15 surface finish required
2.16 fault finding procedures
2.17 safety/risk factors
2.18 environmental controls
2.19 specific data (such as component data, maintenance data, electrical data, fluid data)
2.20 resources (such as tools, equipment, personnel)
2.21 utility supply details (such as electricity, water, gas, air)
2.22 location of services, including standby and emergency backup systems
2.23 circuit characteristics (such as pressure, flow, current, voltage, speed)
2.24 protective arrangements and equipment (such as containment, environmental controls, warning and evacuation systems and equipment)
2.25 other specific related information

3 Learning outcome

S3. Use information extracted from documents to include **one** from the following:

Assessment criteria

The learner can:

3.1 drawings (such as component drawings, assembly drawings, modification drawings, repair drawings, welding/fabrication drawings, distribution and installation drawings)

3.2 diagrams (such as schematic, fluid power diagrams, piping, wiring/circuit diagrams)

3.3 manufacturers manuals/drawings

3.4 technical illustrations

3.5 photographic representations

3.6 visual display screen information

3.7 other specific drawings/documents

4 Learning outcome

S4. Use information extracted from related documentation, to include **two** from the following:

Assessment criteria

The learner can:

4.1 instructions (such as job instructions, drawing instructions, manufacturer's instructions)

4.2 specifications (such as material, finish, process, contractual, calibration)

4.3 reference materials (such as manuals, tables, charts, guides, notes)

4.4 schedules

4.5 operation sheets

4.6 service/test information

4.7 planning documentation

4.8 quality control documents

4.9 organisation specific technical instructions

4.10 national, international and organisational standards

4.11 health and safety standards relating to the activity (such as COSHH)

4.12 other specific related documentation

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the importance of applying the appropriate occupational behaviours in the workplace and the implications for both the apprentice and the business if these are not adhered to

K2 the information sources are used for the data and documentation that they use in their work activities

K3 how documents are obtained, and how to check that they are current and valid

K4 the basic principles of confidentiality (including what information should be available and to whom)

K5 the different ways/formats that data and documentation can be presented (such as such as drawings, job instructions product data sheets, manufacturers' manuals, financial spreadsheets, production schedules, inspection and calibration requirements, customer information)

K6 how to use other sources of information to support the data (such as electronic component pin configuration specifications, reference charts, standards, bend allowances required for material thickness, electrical conditions required for specific welding rods, mixing ratios for bonding and finishing materials, metal specifications and inspection requirements, health and safety documentation)

K7 the importance of differentiating fact from opinion when reviewing data and documentation

K8 the importance of analysing all available data and documentation before decisions are made

K9 the different ways of storing and organising data and documentation to ensure easy access

K10 the procedures for reporting discrepancies in the data or documentation, and for reporting lost or damaged documents

K11 the importance of keeping all data and documentation up to date during the work activity, and the implications of this not being done

K12 the care and control procedures for the documents, and how damage or graffiti on documents can lead to scrapped work

K13 the importance of returning documents to the designated location on completion of the work activities

K14 the basic drawing conventions are used and why there needs to be different types of drawings (such as isometric and orthographic, first and third angle, assembly drawings, circuit and wiring diagrams, block and schematic diagrams

K15 the types of documentation are used and how they interrelate (such as production drawings, assembly drawings, circuit and wiring diagrams, block and schematic diagrams)

K16 the imperial and metric systems of measurement; tolerancing and fixed reference points

K17 the meaning of the different symbols and abbreviations found on the documents that they use (such as surface finish, electronic components, weld symbols, linear and geometric tolerances, pressure and flow characteristics)

K18 the extent of their own responsibility, when to act on their own initiative to find, clarify and evaluate information, and to whom they should report if they have problems that they cannot resolve

Unit 203 Using and Interpreting Engineering Data and Documentation

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems. This will allow each organisation to develop their own specific and tailored apprentice training programme that meets their own business requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers

Unit 204 Reinstating the Work Area on Completion of Activities

Level:	Level 2
GLH:	25
Relationship to NOS:	SEMAER2-04
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation 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 reinstate the work area, in accordance with approved procedures. They will be required to follow the correct procedures for the safe storage of finished products and surplus materials, and to correctly identify, separate and ensure that all waste materials are removed to their designated locations. They will also need to ensure that all tools, equipment and documents used are accounted for and returned to the appropriate places. Tidying up of the work area will be of prime importance, and this includes workshops, staging and platforms, internal areas of aircraft such as wings, tanks and fuselage sections, and areas that are airside. Their responsibilities will require them to comply with organisational policy and procedures for the reinstatement activities undertaken, and to report any problems with these activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work either with

a high level of supervision or as a member of a team, and 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 be sufficient to provide a good understanding of their work, and will provide an informed approach to applying the required procedures. They will understand the need for reinstating the work areas, and will know about the storage requirements of the products, equipment, materials, documentation and consumables, in adequate depth to provide a sound basis for carrying out the activities to the required standard and ensuring that the work area is reinstated satisfactorily.

They will understand the safety precautions required when reinstating the work area. 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 objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines

P2 demonstrate the required behaviours in line with the job role and organisational objectives

P3 separate equipment, components, and materials for re-use from waste items and materials

P4 store reusable materials and equipment in an appropriate location

P5 dispose of waste materials in line with organisational and environmentally safe procedures

P6 restore the work areas to a safe condition in accordance with agreed requirements and schedules.

P7 deal promptly and effectively with problems within their control and report those that cannot be solved

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1 Learning outcome

S1. Carry out **all** of the following during work area reinstatement activities

Assessment criteria

The learner can:

1.1 work to current schedules

1.2 use copies of relevant COSHH sheets and risk assessment standards

1.3 report any loss or damage to equipment

1.4 report any identified hazards within the work area

1.5 return all consumables and materials to their correct location

1.6 complete any required documentation

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2 Learning outcome

S2. Carry out reinstatement activities on **two** work areas from:

Assessment criteria

The learner can:

2.1 workshops

2.2 airside

2.3 areas at height (such as platforms, staging, lifts)

2.4 internal areas of aircraft (such as wings, tanks, fuselage sections)

2.5 other specific work area

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3 Learning outcome

S3. Correctly label and store **four** of the following:

Assessment criteria

The learner can:

3.1 removed/maintained components

3.2 surplus materials (such as consumables, locking devices, mechanical fasteners)

3.3 tooling

3.4 measuring and test instruments

3.5 drawings and documentation

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4 Learning outcome

S4. Deal with waste materials, in line with company and environmental regulations, to include **all** the following:

Assessment criteria

The learner can:

4.1 correctly segregating waste materials

4.2 disposing of hazardous materials

4.3 removing non-hazardous materials

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the specific safety practices and procedures that they need to observe when reinstating the work area (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)

K2 the health and safety requirements of the work area where they are carrying out the activities, and the responsibility these requirements place on them

K3 the hazards associated with reinstating the work area, and how they can be minimised

K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to

K5 the safe working practices and procedures to be followed when carrying out the various activities (such as lifting and handling techniques)

K6 the personal protective clothing and equipment to be worn, and where this can be obtained

K7 why work areas need to be restored to a set standard, and what these requirements are

K8 the types of work area that will need to be restored (such as workshops, test areas, stages and platforms, aircraft areas such as wing, tank, fuselage and airside section areas)

K9 the importance of tool control, and why this is critical within the aerospace industry

K10 the meaning of `foreign object debris', and why it is vital to ensure that this does not occur or is removed

K11 the stores procedures for tools and equipment, documentation and surplus or waste materials

K12 the materials that will need to be stored and disposed of, and why they need to be segregated, correctly identified and labelled

K13 how the various disposal bins can be identified (such as colour coded, labelled)

K14 the procedures for disposing of hazardous materials (such as chemicals and adhesives)

K15 the documentation to be used on completion of the reinstatement activities

K16 the extent of their own responsibility, and whom they should report to if they have problems that they cannot resolve

Unit 204 Reinstating the Work Area on Completion of Activities

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit 205 Carrying Out Aircraft Handling Operations

Level:	Level 2
GLH:	35
Relationship to NOS:	EUC SEMAER2-05
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation 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 aircraft handling operations on commercial, military or light aircraft, both fixed wing and rotary, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the handling activities to be carried out, and to check that they are in safe and serviceable condition. They will be required to assist in manoeuvring the aircraft to the appropriate location, and to prepare the aircraft for flight operations or post-flight recovery. The handling activities will involve assisting in aircraft towing, preparation for flight, starter crew, aircraft marshalling, recovery from flight, marshalling and parking. Their responsibilities 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, their contribution to the team, and for the quality and accuracy of the work that they carry out. The apprentice's knowledge will be sufficient to provide a sound basis for their work, and will provide an informed approach to applying aircraft handling techniques and procedures. They will have an understanding of the preparations to be carried out on the aircraft, prior to moving it, 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 aircraft handling 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

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines

P2 demonstrate the required behaviours in line with the job role and organisational objectives

P3 prepare the aircraft and work area for the handling activities to be undertaken

P4 carry out the activities within the limits of their personal authority

P5 carry out the activities in the specified sequence and in an agreed timescale

P6 report any instances where the activities cannot be fully met or where defects are identified

P7 ensure the aircraft and work area are left in a safe and secure condition on completion of the activities

1 Learning outcome:

S1 Carry out **all** of the following during aircraft handling activities

Assessment criteria

The learner can:

1.1 ensure that appropriate authorisation to carry out the work is obtained

1.2 check that the work area is free from hazards and suitably prepared for the activities to be undertaken

1.3 ensure that any required safety procedures are implemented

1.4 obtain appropriate personal protection equipment and emergency equipment, and check that it is in a usable condition

1.5 obtain any support equipment required, and check that it is in a safe and useable condition

1.6 return all tools and equipment to the correct storage location

1.7 leave the work area and the aircraft in a safe condition

2 Learning outcome:

S2 Prepare the aircraft for towing, by carrying out **four** of the following

Assessment criteria

The learner can:

2.1 ensure the aircraft is in safe condition to move, by checking aircraft documentation

2.2 check/set brake pressure

2.3 make cockpit checks and apply internal power, as required

2.4 check/fit required safety locks/pins

2.5 check/remove electrical bonding (where appropriate)

3 Learning outcome:

S3 During aircraft towing, complete aircraft moves, including **two** of the following:

Assessment criteria

The learner can:

3.1 hangar to flight line/deck

3.2 parking bay to parking bay

3.3 to/from hardened aircraft shelter operations

3.4 flight line to hangar/deck

3.5 to test/inspection area

Plus undertake **three** roles from the following:

3.6 brake man

3.7 wing tip man

3.8 tractor/steering operator

3.9 blade man

3.10 tail safety man

3.11 towing supervisor

3.12 safety chock man

4 Learning outcome:

S4 Assist in carrying out **all** of the following during the preparation for flight operations

Assessment criteria

The learner can:

4.1 remove all blanks, bungs and locking/safety devices

4.2 carry out cockpit checks and apply ground power

4.3 carry out engine starter crew activities (using headset operations and/or hand signals)

4.4 carry out pre-flight checks

4.5 marshalling

5 Learning outcome:

S5 Carry out **all** of the following during flight recovery operations:

Assessment criteria

The learner can:

5.1 marshalling

5.2 parking of aircraft, to include chocking and where appropriate earthing

5.3 fitting blanks, bungs and locking/safety devices

6 Learning outcome:

S6 Carry out aircraft handling operations, which comply with **one** or more of the following standards:

Assessment criteria

The learner can:

6.1 Civil Aviation Authority (CAA) / European Aviation Safety Agency (EASA)

6.2 Military Aviation Authority (MAA)

6.3 Federal Aviation Authority (FAA)

6.4 BS, ISO or BSEN procedures

6.5 customer standards and requirements

6.6 organisation standards and procedures

6.7 manufacturer standards and procedures

Learning outcome

K Knowledge and understanding

Assessment criteria

The learner knows:

K1 the specific safety precautions and procedures to be observed whilst carrying out the aircraft handling operations (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

K2 the health and safety requirements of the work area in which they are carrying out the activities, and the responsibility these requirements place on them

K3 the authorisation they require to commence work on the aircraft

K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to

K5 the hazards associated with towing, marshalling, parking, securing the aircraft (including airfield hazards and procedures), and how they can be minimised

K6 the hazards associated with engine start and running, and how they can be minimised

K7 the importance of aircraft husbandry and of ensuring that, throughout the activity, the aircraft and area are free from foreign objects

K8 the protective equipment that they need to use for both personal protection and protection of the aircraft

K9 the specifications used during aircraft handling, and the importance of following the procedures listed in these documents

K10 the process and procedures for preparing an aircraft for flight operations (including engine start and `see off')

K11 the process and procedures for recovering an aircraft from flight operations (`see in')

K12 the standard signals used when marshalling and handling aircraft

K13 the importance of correct electrical bonding specifications

K14 the quality standards that they must work to during the activities

K15 the problems that can occur with the aircraft handling activities, and how these can be overcome

K16 the importance of correct securing of the aircraft, and of fitting blanks, bungs and locking/safety devices

K17 the importance of tool control, and company tool control procedures

K18 the methods and equipment used to manoeuvre aircraft, and how to check that the equipment is in a usable condition

K19 the tools and equipment used in the aircraft handling activities, and any calibration/care and control procedures

K20 how to deal with problems with aircraft handling process or procedures, and the importance of informing appropriate people of defects

K21 the extent of their own responsibility, and whom they should report to if they have problems that they cannot resolve

Unit 205 Carrying Out Aircraft Handling Operations

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit 206 Carrying Out Aircraft Routine Servicing

Level:	Level 2
GLH:	49
Relationship to NOS:	EUC-SEMAER2-06
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation 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 routine servicing of commercial, military or light aircraft, fixed wing and rotary, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the servicing activities to be carried out, and to check that they are in a safe and serviceable condition. The servicing activities will involve assisting in de-fuelling, refuelling and replenishing gaseous systems, replenishing oil systems, checking undercarriages and wheels/skids, and completing servicing records. Their responsibilities will require them to comply with organisational policy and procedures for the servicing activities undertaken, and to report any problems with these activities that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work either with a high level of supervision or as a member of a team, and they will take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out. 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.

The apprentice's knowledge will be sufficient to provide a good understanding of their work, and will provide an informed approach to applying the appropriate aircraft servicing techniques and procedures. They will understand the systems being serviced, and their application, and will know about the replenishment equipment and fastening devices, 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 aircraft servicing 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

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines

P2 demonstrate the required behaviours in line with the job role and organisational objectives

P3 follow the relevant maintenance schedules to carry out the required work

P4 carry out the maintenance activities within the limits of their personal authority

P5 carry out the maintenance activities in the specified sequence and in an agreed timescale

P6 report any instances where the servicing or maintenance activities cannot be fully met or where there are identified defects outside the planned schedule

P7 complete relevant maintenance records accurately and pass them on to the appropriate person

P8 dispose of waste materials in accordance with safe working practices and approved procedures

1 Learning outcome

S1 Carry out **all** of the following during the aircraft servicing activities:

Assessment criteria

The learner can:

1.1 use the correct issue of the servicing or maintenance schedule

1.2 use copies of relevant COSHH sheets, risk assessment and aircraft standards

1.3 check the calibration dates of tools to be used

1.4 obtain clearance to work on the aircraft, and observe the power isolation and safety procedures

1.5 use appropriate and approved maintenance techniques at all times

1.6 return all tools and equipment to the correct location

1.7 leave the work area in a safe and tidy condition

2 Learning outcome

S2 Assist in the re-fuelling or de-fuelling of the aircraft, to include carrying out **three** of the following:

Assessment criteria

The learner can:

2.1 remove and refit access panels and structures

2.2 check fuel filter indicators

2.3 clean/replace fuel filters

2.4 check the security and continuity of fuel equipment bonding

2.5 re-fuel or de-fuel to the correct fuel load and distribution

3 Learning outcome

S3 Carry out **all** of the following during replenishment of gaseous systems:

Assessment criteria

The learner can:

3.1 apply appropriate safety precautions to prevent oil or grease contamination

3.2 ensure the electrical earth bonding of gaseous supply equipment

3.3 monitor flow rates and storage pressures during the replenishment

4 Learning outcome

S4 Carry out **both** of the following during replenishment of oil/hydraulic systems:

Assessment criteria

The learner can:

4.1 check/replace filters

4.2 drain and replace oil, or top up oil reservoirs, as appropriate

5 Learning outcome

S5 Visually inspect undercarriages and wheels/skids, by carrying out **five** of the following checks:

Assessment criteria

The learner can:

5.1 tyre impact damage

5.2 corrosion

5.3 fastener security

5.4 tyre inflation pressures

5.5 hydraulic leaks

5.6 split-pin security

5.7 tyre creep

5.8 shock absorber extension

5.9 skid damage

5.10 floatation gear security

6 Learning outcome

S6 Carry out servicing work, which complies with **one** or more of the following standards:

Assessment criteria

The learner can:

6.1 Civil Aviation Authority (CAA) / European Aviation Safety Agency (EASA)

6.2 Military Aviation Authority (MAA)

6.3 Federal Aviation Authority (FAA)

6.4 BS, ISO or BSEN procedures

6.5 customer standards and requirements

6.6 organisation standards and procedures

6.7 manufacturer standards and procedures

7 Learning outcome

S7 Complete the relevant paperwork, to include **one** from the following, and pass it to the appropriate people:

Assessment criteria

The learner can:

7.1 service schedule/log

7.2 job cards

7.3 aircraft service/flight log

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the specific safety precautions and procedures to be observed whilst carrying out the aircraft servicing (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

K2 the health and safety requirements of the work area in which they are carrying out the aircraft servicing activities, and the responsibility these requirements place on them

K3 the authorisation they require to commence work on the aircraft

K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to

K5 the hazards associated with servicing the aircraft, and how they can be minimised

K6 the hazards associated with working on and replenishing aircraft systems (such as fuel, gaseous systems and oils), and how they can be minimised

K7 the protective equipment that they need to use for both personal protection and protection of the aircraft

K8 the maintenance schedules and servicing specifications that are used during the servicing activities, and the importance of following the procedures listed in these documents

K9 the replenishments to be made, and the methods of replenishment

K10 electrical bonding specifications, and their importance

K11 how to identify the fuels, lubricants and gases to be used, and how to ensure that systems are not contaminated

K12 the procedures for checking undercarriages and wheels

K13 the quality control procedures to be followed during the servicing procedures

K14 how to conduct any necessary checks to ensure the system integrity and functionality

K15 the problems that can occur with the servicing and maintenance activities, and how these can be overcome

K16 the importance of correct securing and locking of connections

K17 the importance of tool control, and company tool control procedures

K18 how replenishment equipment is cared for, connected, operated and controlled

K19 the methods and equipment used to replenish aircraft systems, and how to check that the equipment is within its current certification dates

K20 the tools and equipment used in the servicing activities, and their calibration/care and control procedures

K21 the importance of ensuring that, when the servicing is completed, the aircraft is free from dirt, swarf and foreign objects

K22 the disposal methods for waste oil, fuel, other liquids and waste

K23 Problems with the servicing procedures, and the importance of informing appropriate people of defects

K24 the recording documentation to be completed for the activities undertaken and, where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation

K25 the extent of their own responsibility, and whom they should report to if they have problems that they cannot resolve

Unit 206 Carrying Out Aircraft Routine Servicing

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit 207 Carrying Out Maintenance on Aircraft Mechanical Systems by Component Replacement

Level:	Level 2
GLH:	126
Relationship to NOS:	EUC SEMAER2-07
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation 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 mechanical component replacement on commercial, military and light aircraft, both fixed wing and rotary, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. They will be required prepare the aircraft for work, and this will involve obtaining permission to work on the aircraft, ensuring that all safety pins and warning notices are in place, and ensuring that the relevant systems are in a suitable condition for work to be undertaken. The maintenance activities to be carried out will involve the replacement of aircraft mechanical system components, which will include components from the following systems: undercarriage, brakes, hydraulics, pneumatics, fuel/oil, air/oxygen, environmental, de-icing, flying control and engine change units. 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 that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work either with

a high level of supervision or as a member of a team, and they will take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out. 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.

The apprentice's knowledge will be sufficient to provide a sound basis for their work, and will provide an informed approach to applying the appropriate mechanical maintenance techniques and procedures. They will have a basic understanding of the systems being maintained, and their application, and will know about the maintenance equipment and fastening devices, 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 aircraft maintenance operations, especially those for isolating and depressurising equipment, and for protecting themselves and others from injury. 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

Learning outcome

P Performance requirements

Assessment criteria

The learner can:

P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines

P2 demonstrate the required behaviours in line with the job role and organisational objectives

P3 follow the relevant maintenance schedules to carry out the required work

P4 carry out the maintenance activities within the limits of their personal authority

P5 carry out the maintenance activities in the specified sequence and in an agreed timescale

P6 report any instances where the servicing or maintenance activities cannot be fully met or where there are identified defects outside the planned schedule

P7 complete relevant maintenance records accurately and pass them on to the appropriate person

P8 dispose of waste materials in accordance with safe working practices and approved procedures

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1 Learning outcome

S1 Carry out **all** of the following during the aircraft maintenance activities:

Assessment criteria

The learner can:

1.1. use the correct issue of the aircraft servicing or maintenance schedule

1.2. use copies of relevant COSHH sheets, risk assessment and aircraft standards

1.3. check the calibration dates of tools and equipment to be used

1.4. return all tools and equipment to the correct location on completion of the activities

1.5. leave the work area in a safe and tidy condition

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2 Learning outcome

S2 Prepare the aircraft for work, by carrying out **all** of the following:

Assessment criteria

The learner can:

2.1 obtain clearance to work on the aircraft, and observe the power isolation and safety procedures

2.2 identify defects for maintenance and ensure the aircraft is fit for maintenance from the aircraft documentation

2.3 ensure that relevant safety warnings are in place

2.4 ensure that appropriate safety locks/pins are in place

2.5 check that the relevant systems are in a condition for work and for component replacement to take place

3 Learning outcome

S3 Carry out component replacements on **three** of the following aircraft systems:

Assessment criteria

The learner can:

3.1 engine change unit

3.2 fuel/oil

3.3 oxygen supply

3.4 transmission

3.5 undercarriage

3.6 flying control surfaces

3.7 hydraulic

3.8 mechanical controls

3.9 pneumatic

3.10 environmental control

3.11 de-icing

4 Learning outcome

S4 Carry out **ten** of the following maintenance techniques, as applicable to the equipment being maintained:

Assessment criteria

The learner can:

4.1 removing excessive dirt and grime

4.2 re-assembling the equipment/system

4.3 isolating and/or de-pressurising system

4.4 making all required pipe connections

4.5 draining system fluids

4.6 carrying out leak checks on all connections

4.7 dismantling equipment to unit/sub-assembly level

4.8 setting and adjusting replaced components
4.9 dismantling units to component level
4.10 re-connecting electrical connections
4.11 monitoring component condition/deterioration
4.12 tightening fastenings to the required torque
4.13 proof-marking/labelling of components/units
4.14 applying gaskets and sealant/adhesives
4.15 replacing 'lifed' items (such as seals, bearings, gaskets)
4.16 replenishing system fluids
4.17 replacing all damaged or defective units/components
4.18 replenishing oils and greases
4.19 securing components using mechanical fasteners and threaded devices
4.20 applying bolt locking methods (such as split pins, wire locking, lock nuts, stiff nuts, swage nuts)
4.21 making static, functional or operational checks of the completed system

5 Learning outcome

S5 Replace a range of components, involving the disconnection and reconnection of **eight** of the following:

Assessment criteria

The learner can:

5.1 mechanical units
5.2 actuating mechanisms
5.3 valves
5.4 brake units
5.5 clamps
5.6 microswitches and stops
5.7 quick release fasteners
5.8 springs
5.9 control rods
5.10 pipes and unions
5.11 chains and sprockets
5.12 free electrical connectors
5.13 panels
5.14 cables and pulleys
5.15 cylinders/actuators

5.16 filters
5.17 levers and linkages
5.18 seals and gaskets
5.19 threaded fastners
5.20 shims and packing
5.21 other specific components

6 Learning outcome

S6 Carry out maintenance work which complies with **one** or more of the following standards:

Assessment criteria

The learner can:

6.1 Civil Aviation Authority (CAA) / European Aviation Safety Agency (EASA)
6.2 Military Aviation Authority (MAA)
6.3 Federal Aviation Authority (FAA)
6.4 BS, ISO or BSEN procedures
6.5 customer standards and requirements
6.6 organisation standards and procedures
6.7 manufacturer standards and procedures

7 Learning outcome

S7 Complete the relevant paperwork, to include **one** from the following, and pass it to the appropriate people:

Assessment criteria

The learner can:

7.1 maintenance schedule/log
7.2 job cards
7.3 aircraft service/flight log

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the specific safety precautions and procedures to be observed whilst carrying out the aircraft maintenance (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

K2 the health and safety requirements of the work area in which they are carrying out the aircraft maintenance activities, and the responsibility these requirements place on them

K3 the authorisation they require to commence work on the aircraft

K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to

K5 the hazards associated with working on aircraft systems (such as fuel, oxygen and oils), and how they can be minimised

K6 the protective equipment that they need to use for both personal protection and protection of the aircraft

K7 the maintenance schedules and servicing specifications that are used during servicing and maintenance, and the importance of following the procedures listed in these documents

K8 the components to be replaced, and the method of replacement

K9 electrical bonding specifications, and their importance

K10 how to identify the components to be used, and how to ensure that systems are not contaminated

K11 the quality control procedures to be followed during the maintenance procedures

K12 how to conduct any necessary checks to ensure the system integrity and functionality

K13 the problems that can occur with the aircraft maintenance activities, and how these can be overcome

K14 the importance of correct securing and locking of connections

K15 the importance of tool control, and company tool control procedures

K16 the methods and equipment used to maintain aircraft systems

K17 the tools and equipment used in the maintenance activities, and their calibration/care and control procedures

K18 the importance of ensuring that, when the maintenance is completed, the aircraft is free from dirt, swarf and foreign objects

K19 the disposal methods for waste oil, fuel, other liquids and waste

K20 problems with the maintenance procedures, and the importance of informing appropriate people of defects

K21 the recording documentation to be completed for the activities undertaken and, where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation

K22 the extent of their own responsibility, and whom they should report to if they have problems that they cannot resolve

Unit 207 Carrying Out Maintenance on Aircraft Mechanical Systems by Component Replacement

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

This will allow each organisation to develop their own specific and tailored apprentice training programme whilst meeting their own requirements whilst at the same time ensuring that the overall generic content is to a high standard in terms of depth and breadth to enable progression and/or transferability to other employers.

Unit 208 Carrying Out Maintenance on Aircraft Electrical/Electronic Systems by Component Replacement

Level:	Level 2
GLH:	126
Relationship to NOS:	EUC SEMAER2-08
Endorsement by a sector or regulatory body:	This unit is endorsed by SEMTA
Aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation 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 electronic component replacement on commercial, military or light aircraft, both fixed wing and rotary, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. They will be required to prepare the aircraft for work, and this will involve obtaining permission to work on the aircraft, ensuring that all safety pins and warning notices are in place, and ensuring that the relevant systems are in a suitable condition for work to be undertaken. The maintenance activities will involve the replacement of a number of electrical, electronic or avionic modules or components from the following systems: power and distribution, lighting, engine control and indication, flight control, Pitot static, radar equipment, navigational equipment, communication equipment, defensive aids, undercarriage, and cabin equipment such as for catering and entertainment.

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 that they cannot personally resolve, or are outside their permitted authority, to the relevant people. They will be expected to work either with a high level of supervision or as a member of a team, and they will take personal responsibility for their own actions and for the quality and accuracy of the work that they carry out. 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.

The apprentice's knowledge will be sufficient to provide a sound basis for their work, and will provide an informed approach to applying the appropriate maintenance techniques and procedures. They will have a basic understanding of the systems being maintained, and their application, and will know about the maintenance equipment and fastening devices, 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 aircraft maintenance operations, especially those for isolating and depressurising equipment, and for protecting themselves and others from injury. 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.

Learning outcome:

P Performance requirements:

Assessment criteria

The learner can:

P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines

P2 demonstrate the required behaviours in line with the job role and organisational objectives

P3 follow the relevant maintenance schedules to carry out the required work

P4 carry out the maintenance activities within the limits of their personal authority

P5 carry out the maintenance activities in the specified sequence and in an agreed time scale

P6 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule

P7 complete relevant maintenance records accurately and pass them on to the appropriate person

P8 dispose of waste materials in accordance with safe working practices and approved procedures

1 Learning outcome

S1 Carry out **all** of the following during the aircraft electrical, electronic or avionic maintenance activities:

Assessment criteria

The learner can:

1.1 use the correct issue of the aircraft servicing or maintenance schedule

1.2 use copies of relevant COSHH sheets, risk assessment and aircraft standards

1.3 check the calibration dates of tools and equipment to be used

1.4 return all tools and equipment to the correct location

1.5 leave the work area in a safe and tidy condition

2 Learning outcome

S2 Prepare the aircraft for work by carrying out **all** of the following:

Assessment criteria

The learner can:

2.1 obtain clearance to work on the aircraft, and observe the power isolation and safety procedures

2.2 identify defects for maintenance and ensure the aircraft is fit for maintenance from the aircraft documentation

2.3 ensure that relevant safety warnings are in place

2.4 ensure that appropriate safety locks/pins are in place

2.5 check that the relevant systems are in a condition for work, and for component replacement to take place

3 Learning outcome

S3 Carry out component replacements on **three** of the following aircraft electrical, electronic or avionic systems:

Assessment criteria

The learner can:

3.1 aircraft power and distribution

3.2 radar

3.3 lighting

3.4 navigation

3.5 engine control and indication

3.6 communication

3.7 flight control

3.8 defensive aids

3.9 Pitot static

3.10 undercarriage

3.11 cabin equipment (such as catering, entertainment)

4 Learning outcome

S4 Carry out **ten** of the following maintenance techniques, as applicable to the equipment being maintained:

Assessment criteria

The learner can:

4.1 isolating power
4.2 removing excessive dirt and grime
4.3 dismantling equipment to unit/component level
4.4 use of special-to-type tools
4.5 proof-marking/labelling of components/units
4.6 de-pressurisation of the system
4.7 replacing all damaged or defective units/components
4.8 reassembly of the equipment/system
4.9 replacing damaged wires or cables
4.10 reconnecting electrical connections
4.11 replacing damaged or defective connectors
4.12 making fluid connections to components
4.13 checking the integrity of all connections
4.14 looming
4.15 checking the integrity and security of earth bonding
4.16 inspecting and cleaning sensors
4.17 tuning or making routine adjustments to components
4.18 servicing battery systems
4.19 securing components using mechanical fasteners and applying bolt locking methods
4.20 making electrical connections (such as soldering, splicing and crimping)
4.21 making static or functional checks of completed systems

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5 Learning outcome

S5 Replace a range of electrical, electronic or avionic modules/components, involving the disconnection and reconnection of **eight** of the following:

Assessment criteria

The learner can:

5.1 mechanical units
5.2 quick release fasteners
5.3 electrical connectors (such as terminal blocks, male to female plug-in connectors)
5.4 backplate connectors

5.5 Pitot/static connectors
5.6 radio frequency (RF) connectors
5.7 fluid system connectors (such as pipes, unions, hoses)
5.8 switches (such as micro, pressure)
5.9 avionic units
5.10 earth and bonding leads
5.11 mechanical controls (such as actuating mechanisms, brackets)
5.12 other specific components

6 Learning outcome

S6 Carry out maintenance work which complies with **one** or more of the following standards

Assessment criteria

The learner can:

6.1 Civil Aviation Authority (CAA) / European Aviation Safety Agency (EASA)
6.2 Military Aviation Authority (MAA)
6.3 Federal Aviation Authority (FAA)
6.4 BS, ISO or BSEN procedures
6.5 customer standards and requirements
6.6 organisation standards and procedures
6.7 manufacturer standards and procedures

7 Learning outcome

S7 Complete the relevant paperwork, to include **one** from the following, and pass it to the appropriate people:

Assessment criteria

The learner can:

7.1 maintenance schedule/log
7.2 job cards
7.3 aircraft service/flight log

Learning outcome

K Knowledge and understanding.

Assessment criteria

The learner knows:

K1 the specific safety precautions and procedures to be observed whilst carrying out the aircraft maintenance activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

K2 the health and safety requirements of the work area in which they are carrying out the maintenance activities, and the responsibility these requirements place on them

K3 the authorisation they require to commence work on the aircraft

K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to

K5 the hazards associated with working on aircraft systems (such as electrical power, release of stored pressure, oil and fuel, gaseous substances), and how they can be minimised

K6 the protective equipment that they need to use for both personal protection and protection of the aircraft

K7 the maintenance schedules and servicing specifications that are used during servicing and maintenance, and the importance of following the procedures listed in these documents

K8 the basic principle of operation of the equipment/circuits being maintained, and the purpose of individual components within the circuit

K9 the electrical components to be replaced, and the methods of replacement

K10 electrical bonding specifications, and their importance

K11 the application and use of a range of electrical components (such as module blocks, terminal blocks, multi-pin plugs/sockets, tray-mounted sockets, earth bonding points)

K12 the adjustments/corrections/tuning required to the components that have been removed/replaced

K13 how to check that the replacement components meet the required specification/operating conditions

K14 how to identify the components to be used, and how to ensure that systems are not contaminated

K15 the quality control procedures to be followed during the maintenance procedures

K16 how to conduct any necessary checks to ensure the system integrity and functionality

K17 the problems that can occur with the servicing and maintenance activities, and how these can be overcome

K18 the importance of correct securing and locking of connections

K19 the importance of tool control, and company tool control procedures

K20 the methods and equipment used to maintain aircraft systems, and how to check that the equipment is within its current certification dates

K21 the tools and equipment used in the maintenance activities, and their calibration/care and control procedures

K22 the importance of ensuring that, when the maintenance is completed, the aircraft is free from dirt, swarf and foreign objects

K23 the disposal methods for waste oil, fuel, other liquids and waste

K24 problems with the maintenance procedures, and the importance of informing appropriate people of defects

K25 the recording documentation to be completed for the activities undertaken and, where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation

K26 the extent of their own responsibility, and whom they should report to if they have problems that they cannot resolve

Unit 208 Carrying Out Maintenance on Aircraft Electrical/Electronic Systems by Component Replacement

Supporting Information

Guidance

Although all of the content and assessment requirements must be met in full employers can tailor the training outcomes to ensure that the content of the programme is specific to their requirements in terms of products, processes, procedures, tools, equipment, materials, documentation and information systems.

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Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

City & Guilds Centre Manual contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)
- NVQ Code of Practice (2006)

and sets out the criteria that centres should adhere to pre and post centre and qualification approval.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information on such things as:

- **Walled Garden**: how to register and certificate candidates on line
- **Events**: dates and information on the latest Centre events
- **Online assessment**: how to register for e-assessments.

Centre Guide – Delivering International Qualifications contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Linking to this document from web pages

We regularly update the name of documents on our website, therefore in order to prevent broken links we recommend that you link to our web page that the document resides upon, rather than linking to the document itself.

Useful contacts

UK learners General qualification information	**E: learnersupport@cityandguilds.com**
International learners General qualification information	**E: intcg@cityandguilds.com**
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	**E: centresupport@cityandguilds.com**
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	**E: singlesubjects@cityandguilds.com**
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	**E: intops@cityandguilds.com**
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	**E: walledgarden@cityandguilds.com**
Employer Employer solutions including, Employer Recognition: Endorsement, Accreditation and Quality Mark, Consultancy, Mapping and Specialist Training Delivery	**E: business@cityandguilds.com**

If you have a complaint, or any suggestions for improvement about any of the services that we provide, email: **feedbackandcomplaints@cityandguilds.com**

About City & Guilds

As the UK's leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

City & Guilds Group

The City & Guilds Group is a leader in global skills development. Our purpose is to help people and organisations to develop their skills for personal and economic growth. Made up of City & Guilds, City & Guilds Kineo, The Oxford Group and ILM, we work with education providers, businesses and governments in over 100 countries.

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