

# Level 3 Diploma in Aeronautical Engineering (Survival Equipment Maintenance) (1789-31)

September 2018 version 2.1





## Qualification at a glance

<b>Subject area</b>	<b>Engineering</b>
<b>City &amp; Guilds number</b>	1789
<b>Age group approved</b>	16-18, 19+
<b>Entry requirements</b>	Level 3
<b>Assessment</b>	Portfolio
<b>Fast track</b>	Available
<b>Support materials</b>	Centre handbook
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last dates

<b>Title and level</b>	<b>City &amp; Guilds number</b>	<b>Accreditation number</b>
Level 3 Diploma in Aeronautical Engineering (Survival Equipment Maintenance)	1789-31	600/1575/5

<b>Version and date</b>	<b>Change detail</b>	<b>Section</b>
1.1 November 2012	<ul style="list-style-type: none"> <li>• Formatting (not allowing sentences to split between two pages)</li> <li>• Amended numbering of assessment criteria for learning outcome on e</li> </ul>	<ul style="list-style-type: none"> <li>• Units 001, 403, 404,</li> <li>• Units 599, 600 and 601</li> </ul>
2.0 March 2015	<ul style="list-style-type: none"> <li>• Corrected credit values in structure</li> </ul>	<ul style="list-style-type: none"> <li>• Units 496 &amp; 497</li> </ul>
2.1 September 2018	<ul style="list-style-type: none"> <li>• Changed from a seven to a nine</li> </ul>	<ul style="list-style-type: none"> <li>• Unit 001 assessment criteria 2.3</li> </ul>



# Contents

1	Introduction	4
2	Centre requirements	6
3	Delivering the qualification	10
4	Assessment	11
5	Units	14
Unit 001	Complying with statutory regulations and organisational safety requirements	15
Unit 002	Using and interpreting engineering data and documentation	20
Unit 403	Working efficiently and effectively in engineering	26
Unit 404	Reinstating the work area on completion of activities	32
Unit 494	Carrying out maintenance of aircrew protective helmets and electrical headsets	37
Unit 495	Carrying out maintenance of aircrew protective clothing	43
Unit 496	Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment	49
Unit 497	Carrying out maintenance of aircrew life preserver equipment	55
Unit 498	Carrying out maintenance of aircrew inertia reels and restraint harnesses	61
Unit 499	Carrying out maintenance of aircraft multi-seat life rafts and emergency packs	68
Unit 500	Carrying out maintenance of aircrew oxygen masks	75
Unit 501	Carrying out maintenance of aircrew personal survival packs (PSP)	81
Unit 502	Carrying out maintenance of aircrew quick-release fasteners (QRF)	87
Unit 503	Carrying out maintenance of ejection seat headbox parachute assemblies	93
Unit 598	Carrying out maintenance of free fall parachute assemblies	99
Unit 599	Carrying out maintenance of static line parachute assemblies	105
Unit 600	Carrying out maintenance of brake parachute assemblies	111
Unit 601	Carrying out maintenance of night vision goggles	117
Appendix 1	Relationships to other qualifications	123
Appendix 2	Sources of general information	124



# 1 Introduction

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

Area	Description
Who is the qualification for?	It is for candidates who work or want to work in the engineering sector
What does the qualification cover?	It allows candidates to learn, develop and practise the skills required for employment and/or career progression in the engineering sector.
Is the qualification part of a framework or initiative?	It serves as a technical certificate, in the engineering Apprenticeship framework.

## Structure

To achieve the **Level 3 Diploma in Aeronautical Engineering (Survival Equipment Maintenance)**, learners must achieve **20** credits from the mandatory units and a minimum of **140** credits from the optional units available.

Unit accreditation number	City & Guilds unit	Unit title	Credit value
<b>Mandatory</b>			
A/601/5013	001	Complying with statutory regulations and organisational safety requirements	5
Y/601/5102	002	Using and interpreting engineering drawings and documents	5
K/601/5055	403	Working efficiently and effectively in engineering	5
K/601/4228	404	Reinstating the work area on completion of activities	5
<b>Optional</b>			
L/601/4710	494	Carrying out maintenance of aircrew protective helmets and electrical headsets	28
M/601/4716	495	Carrying out maintenance of aircrew protective clothing	28
F/601/4719	496	Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment	30
F/601/4722	497	Carrying out maintenance of aircrew life preserver equipment	30

<b>Unit accreditation number</b>	<b>City &amp; Guilds unit</b>	<b>Unit title</b>	<b>Credit value</b>
J/601/4723	498	Carrying out maintenance of aircrew inertia reels and restraint harnesses	28
R/601/4725	499	Carrying out maintenance of aircraft multi-seat life rafts and emergency packs	30
D/601/4727	500	Carrying out maintenance of aircrew oxygen masks	30
M/601/4733	501	Carrying out maintenance of aircrew personal survival packs (PSP)	28
T/601/4734	502	Carrying out maintenance of aircrew quick-release fasteners (QRF)	28
A/601/4735	503	Carrying out maintenance of ejection seat headbox parachute assemblies	30
J/601/5175	598	Carrying out maintenance of free fall parachute assemblies	30
R/601/5177	599	Carrying out maintenance of static line parachute assemblies	30
H/601/5183	600	Carrying out maintenance of brake parachute assemblies	30
A/601/5187	601	Carrying out maintenance of night vision goggles	28



## 2 Centre requirements

### Approval

Centres currently offering the City & Guilds NVQ in Aeronautical Engineering (1689) will be automatically approved to run this new qualification.

To offer this qualification 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 qualification before designing a course programme.

### Resource requirements

#### Physical resources and site agreements

Centres can use specially designated areas within a centre to assess, for example, the installation of specialised electrical systems, alignment and setting up of electric motors and driven devices (pumps, compressors and generators). The equipment, systems and machinery must meet industrial standards and be capable of being used under normal working conditions, for example electric motors must have a method of applying sufficient power and not be connected up to show movement.

#### Centre staffing

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

- be occupationally competent or technically knowledgeable in the area 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.

## **Assessors and internal verifier**

### **Assessor requirements to demonstrate effective assessment practice**

Assessment must be carried out by competent Assessors that as a minimum must hold the QCF Level 3 Award in Assessing Competence in the Work Environment. Current and operational assessors that hold units D32 and/or D33 or A1 and/or A2 as appropriate for the assessment requirements set out in this Unit Assessment Strategy. However, they will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date National Occupational Standards (NOS)

### **Assessor technical requirements**

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant QCF unit learning outcomes and associated assessment criteria.

This will be demonstrated either by holding a relevant technical qualification or by proven industrial experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the learner(s) in the units being assessed.

Assessors must also be:

- Fully conversant with the Awarding Organisation's assessment recording documentation used for the QCF NVQ units against which the assessments and verification are to be carried out, other relevant documentation and system and procedures to support the QA process.

### **Verifier requirements (internal and external)**

Internal quality assurance (Internal Verification) must be carried out by competent Verifiers that as a minimum must hold the QCF Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practices. Current and operational Internal Verifiers that hold internal verification units V1 or D34 will not be required to achieve the QCF Level 4 Award as they are still appropriate for the verification requirements set out in this Unit Assessment Strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised Assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External quality assurance (**external verification**) must be carried out by competent External Verifiers that as a minimum must hold the QCF Level 4 Award in the External Quality Assurance of Assessment Processes and Practices. Current and operational External Verifiers that hold external verification units V2 or D35 will not be required to achieve the QCF Level 4 Award as they are still appropriate for the verification requirements set out in this Unit Assessment Strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised Assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External and Internal Verifiers will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace Quality Assurance (verification) of Assessment Processes and Practices to the most up to date National Occupational Standards (NOS) Verifiers, both Internal and External, will also be expected to be fully conversant with the terminology used in the QCF NVQ units against which the assessments and verification are to be carried out, the appropriate Regulatory Body's systems and procedures and the relevant Awarding Organisation's documentation.

### **Continuing professional development (CPD)**

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

### **Candidate 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 so should have the opportunity to gather work based evidence.

The Semta Engineering Manufacture apprenticeship framework suggests that:

Employers would be interested in candidates that:

- Are keen and motivated to work in an engineering environment
- Are willing to undertake a course of training both on-the-job and off-the-job and apply this learning in the workplace
- Have previous work experience or employment in the sector
- Have completed a 14 to 19 Diploma in Engineering or Manufacturing
- Have completed a Young Apprenticeship in Engineering or other related area
- Have GCSEs in English, Maths and Science
- Have completed tests in basic numeracy, literacy and communication skills and have spatial awareness.

As a guide, the Engineering Manufacturing framework is suitable for applicants who have five GCSEs grades D to E in English, Maths and Science. The selection process on behalf of employers may include initial assessment where applicants will be asked if they have any qualifications or experience that can be accredited against the requirements of the apprenticeship. They may also be required to take tests in basic numeracy and literacy, communications skills and spatial awareness. There may also be an interview to ensure applicants have selected the right occupational sector and are motivated to become an apprentice, as undertaking an apprenticeship is a major commitment for both the individual and the employer.'



**Assessment environment** (extract from Semta QCF Unit Assessment Strategy 1 January 2011)

The evidence put forward for this qualification can only be regarded valid, reliable, sufficient and authentic if achieved and obtained in the working environment and be clearly attributable to the learner. However, in certain circumstances, simulation/replication of work activities may be acceptable.

The use of high quality, realistic simulations/replication, which impose pressures which are consistent with workplace expectations, should only be used in relation to the assessment of the following:

- rare or dangerous occurrences, such as those associated with health, safety and the environment issues, emergency scenarios and rare operations at work;
- the response to faults and problems for which no opportunity has presented for the use of naturally occurring workplace evidence of learners competence;
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learners competence.

Simulations/replications will require prior approval from centres City & Guilds external verifier/qualification consultant and should be designed in relation to the following parameters:

- the environment in which simulations take place must be designed to match the characteristics of the working environment
- competencies achieved via simulation/replication must be transferable to the working environment
- simulations which are designed to assess competence in dealing with emergencies, accidents and incidents must be verified as complying with relevant health, safety and environmental legislation by a competent health and safety/environmental control officer before being used
- simulated activities should place learners under the same pressures of time, access to resources and access to information as would be expected if the activity was real
- simulated activities should require learners to demonstrate their competence using plant and/or equipment used in the working environment
- simulated activities which require interaction with colleagues and contacts should require the learner to use the communication media that would be expected at the workplace
- for health and safety reason simulations need not involve the use of genuine substances/materials. Any simulations which require the learner to handle or otherwise deal with materials substances/should ensure that the substitute take the same form as in the workplace.

**Age restrictions**

There is no age restriction for this qualification unless this is a legal requirement of the process or the environment.



### 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 qualification.
- any units they have already completed, or credit they have accumulated which is relevant to the qualification.
- 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, their responsibilities as a candidate, and the responsibilities of the centre. This information can be recorded on a learning contract.

#### Support materials

The following resources are available for this these qualifications

Description	How to access
Personal Learning and Thinking skills (required for apprenticeship)	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a> , 1789 product documentation pages
Centre approval forms	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
Semta QCF Assessment Strategy	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a>
Unit assessment guidance	<a href="http://www.cityandguilds.com">www.cityandguilds.com</a> , 1789 product documentation pages

#### Recording documents

Candidates and centres may decide to use a paper-based or electronic method of recording evidence. City & Guilds endorses several ePortfolio 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](http://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

**Assessment of the qualification** (extract from Semta QCF Unit Assessment Strategy 1 January 2011)

### Carrying out assessments

The NVQ units were specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the learner's choice of 'bulleted items' listed in the unit assessment criteria.

Where the assessment criteria gives a choice of bulleted items (for example 'any three from five'), assessors should note that learners do not need to provide evidence of the other items to complete the unit (in this example, two) items, particularly where these additional items may relate to other activities or methods that are not part of the learners normal workplace activity or area of expertise.

### Minimum 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 3 different examples of performance must be provided, and must be sufficient to show that the assessment criteria have been achieved to the prescribed standards. It is possible that some of the bulleted items in the assessment criteria may be covered more than once. The assessor and learner need to devise an assessment plan to ensure that performance evidence is sufficient to cover all the specified assessment criteria and which maximises the opportunities to gather evidence. Where applicable, performance evidence may be used for more than one unit.

The most effective way of assessing competence, is through direct observation of the learner. Assessors must make sure that the evidence provided reflects the learner's competence and not just the achievement of a training programme.

Evidence that has been produced from team activities, for example, maintenance or installation activities is only valid when it clearly relates to the learners specific and individual contribution to the activity, and not to the general outcome(s).

Each example of performance evidence will often contain features that apply to more than one unit, and can be used as evidence in any unit where appropriate.

Performance evidence must be a combination of:

- outputs of the learner's work, such as items that have been manufactured, installed, maintained, designed, planned or quality assured, and documents produced as part of a work activity together with:
- evidence of the way the learner carried out the activities such as witness testimonies, assessor observations or authenticated learner reports, records or photographs of the work/activity carried out, etc.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units contain statements that require the learner to provide evidence that proves they are capable of combining the various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and will not, therefore, be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes valid, authentic and reliable evidence, the internal and/or external verifier (qualifications consultant) should be consulted.

### **Assessing knowledge and understanding**

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 learner's knowledge and understanding (and the handling of contingency situations) 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. Semta (the Sector Skills Council) expects oral questioning and practical demonstrations to be used, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the learner has an appropriate level of knowledge and understanding, as required by the unit.

Evidence of knowledge and understanding will **not** be required for those bulleted items in the assessment criteria that have not been selected by the learner.

The achievement of the specific knowledge and understanding requirements of the units cannot simply be inferred by the results of tests or assignments from other units, qualifications or training programmes. Where evidence is submitted from these sources, the assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the learner, and meets the full knowledge and understanding requirements of the unit. Where oral questioning is used the assessor must retain a record of the questions asked, together with the learner'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 learner. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the learner'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 learner. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the learner's competency are reliable, auditable and technically valid.

## **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.

RPL is allowed and is also sector specific.



## 5 Units

### Availability of units

Below is a list of the learning outcomes for all the units. If you want to download a complete set of units, go to **[www.cityandguilds.com](http://www.cityandguilds.com)**

### Structure of units

These units each have the following:

- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- unit aim
- relationship to NOS, other qualifications and frameworks
- endorsement by a sector or other appropriate body
- information on assessment
- learning outcomes which are comprised of a number of assessment criteria
- notes for guidance.

## Unit 001

# Complying with statutory regulations and organisational safety requirements

<b>UAN:</b>	<b>A/601/5013</b>
<b>Level:</b>	2
<b>Credit value:</b>	5
<b>GLH:</b>	35
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard: Complying with statutory regulations and organisational safety requirements (Suite 2).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>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.</p> <p>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.</p> <p>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.</p>

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.

<b>Learning outcome</b>
The learner will: 1. Be able to comply with statutory regulations and organisational safety requirements
<b>Assessment criteria</b>
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: <ul style="list-style-type: none"> <li>• applying in principle their duties and responsibilities as an individual under the Health and Safety at Work Act</li> <li>• identifying, within their organisation, appropriate sources of information and guidance on health and safety issues, such as: <ul style="list-style-type: none"> <li>o eye protection and personal protective equipment (PPE)</li> <li>o COSHH regulations</li> <li>o Risk assessments</li> </ul> </li> <li>• identifying the warning signs and labels of the main groups of hazardous or dangerous substances</li> <li>• complying with the appropriate statutory regulations at all times</li> </ul> 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: <ul style="list-style-type: none"> <li>• identifying the appropriate qualified first aiders and the location of first aid facilities</li> <li>• identifying the procedures to be followed in the event of injury to themselves or others</li> <li>• following organisational procedures in the event of fire and the</li> </ul>



	<ul style="list-style-type: none"> <li>evacuation of premises</li> <li>identifying the procedures to be followed in the event of dangerous occurrences or hazardous malfunctions of equipment</li> </ul>
1.6	recognise and control hazards in the workplace
1.7	Identify the hazards and risks that are associated with the following: <ul style="list-style-type: none"> <li>their working environment</li> <li>the equipment that they use</li> <li>materials and substances (where appropriate) that they use</li> <li>working practices that do not follow laid-down procedures</li> </ul>
1.8	use correct manual lifting and carrying techniques
1.9	demonstrate one of the following methods of manual lifting and carrying: <ul style="list-style-type: none"> <li>lifting alone</li> <li>with assistance of others</li> <li>with mechanical assistance</li> </ul>
1.10	apply safe working practices and procedures to include: <ul style="list-style-type: none"> <li>maintaining a tidy workplace, with exits and gangways free from obstruction</li> <li>using equipment safely and only for the purpose intended</li> <li>observing organisational safety rules, signs and hazard warnings</li> <li>taking measures to protect others from any harm resulting from the work that they are carrying out.</li> </ul>

<b>Learning outcome</b>	
The learner will:	
2.	Know how to comply with statutory regulations and organisational safety requirements
<b>Assessment criteria</b>	
The learner can:	
2.1	describe the roles and responsibilities of themselves and others under the Health and Safety at Work Act, and other current legislation
2.2	describe the specific regulations and safe working practices and procedures that apply to their work activities
2.3	describe the warning signs for the nine main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations
2.4	explain how to locate relevant health and safety information for their tasks, and the sources of expert assistance when help is needed
2.5	explain what constitutes a hazard in the workplace
2.6	describe their responsibilities for identifying and dealing with hazards and reducing risks in the workplace
2.7	describe the risks associated with their working environment
2.8	describe the processes and procedures that are used to identify and rate the level of risk
2.9	describe 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

- 2.10 explain what constitute dangerous occurrences and hazardous malfunctions, and why these must be reported even if no-one is injured
- 2.11 describe the 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
- 2.12 describe the organisational policy with regard to fire fighting procedures; the common causes of fire and what they can do to help prevent them
- 2.13 describe the protective clothing and equipment that is available for their areas of activity
- 2.14 explain how to safely lift and carry loads, and the manual and mechanical aids available
- 2.15 explain how to prepare and maintain safe working areas; the standards and procedures to ensure good housekeeping
- 2.16 describe the importance of safe storage of tools, equipment, materials and products
- 2.17 describe the extent of their own authority, and to whom they should report in the event of problems that they cannot resolve.

# **Unit 001                    Complying with statutory regulations and organisational safety requirements**

## Supporting information

### **Guidance**

2.1 (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)

2.5 (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)

2.7 (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)

2.8 (such as safety inspections, the use of hazard checklists, carrying out risk assessments, COSHH assessments)

## Unit 002

## Using and interpreting engineering data and documentation

<b>UAN:</b>	<b>Y/601/5102</b>
<b>Level:</b>	2
<b>Credit value:</b>	5
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard: Using and interpreting engineering data and documentation (Suite 2).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required 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. The learner 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.</p> <p>The learner's 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 if necessary, 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.</p> <p>The learner's underpinning knowledge will provide a good understanding of the types of documentation used, and will provide an</p>

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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.

<b>Learning outcome</b>
The learner will: 1. Be able to use and interpret engineering data and documentation
<b>Assessment criteria</b>
The learner can: 1.1 use the approved source to obtain the required data and documentation 1.2 use the data and documentation and carry out all of the following: <ul style="list-style-type: none"><li>• check the currency and validity of the data and documentation used</li><li>• exercise care and control over the documents at all times</li><li>• correctly extract all necessary data in order to carry out the required tasks</li><li>• seek out additional information where there are gaps or deficiencies in the information obtained</li><li>• deal with or report any problems found with the data and documentation</li><li>• make valid decisions based on the evaluation of the engineering information extracted from the documents</li><li>• return all documents to the approved location on completion of the work</li><li>• complete all necessary work related documentation such as production documentation, installation documentation, maintenance documentation, planning documentation</li></ul> 1.3 correctly identify, interpret and extract the required information 1.4 extract information that includes three of the following: <ul style="list-style-type: none"><li>• materials or components required</li><li>• dimensions</li><li>• tolerances</li><li>• build quality</li><li>• installation requirements</li><li>• customer requirements</li><li>• time scales</li><li>• financial information</li><li>• operating parameters</li><li>• surface texture requirements</li><li>• location/orientation of parts</li><li>• process or treatments required</li><li>• dismantling/assembly sequence</li><li>• inspection/testing requirements</li><li>• number/volumes required</li></ul>

- repair/service methods
  - method of manufacture
  - weld type and size
  - operations required
  - connections to be made
  - surface finish required
  - shape or profiles
  - fault finding procedures
  - safety/risk factors
  - environmental controls
  - specific data (such as component data, maintenance data, electrical data, fluid data)
  - resources (such as tools, equipment, personnel)
  - utility supply details (such as electricity, water, gas, air)
  - location of services, including standby and emergency backup systems
  - circuit characteristics (such as pressure, flow, current, voltage, speed)
  - protective arrangements and equipment (such as containment, environmental controls, warning and evacuation systems and equipment)
  - other specific related information
- 1.5 use the information obtained to ensure that work output meets the specification
- 1.6 use information extracted from documents to include one from the following:
- drawings (such as component drawings, assembly drawings, modification drawings, repair drawings, welding/fabrication drawings, distribution and installation drawings)
  - diagrams (such as schematic, fluid power diagrams, piping, wiring/circuit diagrams)
  - manufacturers manuals/drawings
  - approved sketches
  - technical illustrations
  - photographic representations
  - visual display screen information
  - technical sales/marketing documentation
  - contractual documentation
  - other specific drawings/documents
- 1.7 use information extracted from related documentation, to include two from the following:
- instructions (such as job instructions, drawing instructions, manufacturers instructions)
  - specifications (such as material, finish, process, contractual, calibration)
  - reference materials (such as manuals, tables, charts, guides, notes)
  - schedules

	<ul style="list-style-type: none"> <li>• operation sheets</li> <li>• service/test information</li> <li>• planning documentation</li> <li>• quality control documents</li> <li>• company specific technical instructions</li> <li>• national, international and organisational standards</li> <li>• health and safety standards relating to the activity (such as COSHH)</li> <li>• other specific related documentation</li> </ul>
1.8	deal promptly and effectively with any problems within their control and report those which cannot be solved
1.9	report any inaccuracies or discrepancies in documentation and specifications.

<b>Learning outcome</b>	
The learner will:	
2. Know how to use and interpret engineering data and documentation	
<b>Assessment criteria</b>	
The learner can:	
2.1	explain what information sources are used for the data and documentation that they use in their work activities
2.2	explain how documents are obtained, and how to check that they are current and valid
2.3	explain the basic principles of confidentiality (including what information should be available and to whom)
2.4	describe the different ways/formats that data and documentation can be presented
2.5	explain how to use other sources of information to support the data
2.6	describe the importance of differentiating fact from opinion when reviewing data and documentation
2.7	describe the importance of analysing all available data and documentation before decisions are made
2.8	describe the different ways of storing and organising data and documentation to ensure easy access
2.9	describe the procedures for reporting discrepancies in the data or documentation, and for reporting lost or damaged documents
2.10	describe the importance of keeping all data and documentation up to date during the work activity, and the implications of this not being done
2.11	explain the care and control procedures for the documents, and how damage or graffiti on documents can lead to scrapped work
2.12	explain the importance of returning documents to the designated location on completion of the work activities
2.13	explain what 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)
2.14	explain what types of documentation are used and how they interrelate
2.15	explain the imperial and metric systems of measurement; tolerancing and fixed reference points

- 2.16 describe the meaning of the different symbols and abbreviations found on the documents that they use
- 2.17 describe 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 002            Using and interpreting engineering data and documentation**

### Supporting information

#### **Guidance**

2.4 (such as such as drawings, job instructions product data sheets, manufacturers' manuals, financial spreadsheets, production schedules, inspection and calibration requirements, customer information)

2.5 (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)

2.14 (such as production drawings, assembly drawings, circuit and wiring diagrams, block and schematic diagrams)

2.16 (such as surface finish, electronic components, weld symbols, linear and geometric tolerances, pressure and flow characteristics)

## Unit 403

## Working efficiently and effectively in engineering

<b>UAN:</b>	<b>K/601/5055</b>
<b>Level:</b>	3
<b>Credit value:</b>	5
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard: working efficiently and effectively in engineering (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>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.</p> <p>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.</p> <p>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</p>

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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.

<b>Learning outcome</b>
The learner will: 1. Be able to work efficiently and effectively in engineering
<b>Assessment criteria</b>
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: <ul style="list-style-type: none"><li>• the work area is free from hazards and is suitably prepared for the activities to be undertaken</li><li>• any required safety procedures are implemented</li><li>• any necessary personal protection equipment is obtained and is in a usable condition</li></ul>

- 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 that 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:
- completing all necessary documentation accurately and legibly
  - returning tools and equipment
  - returning drawings and work instructions
  - identifying, where appropriate, any unusable tools, equipment or components
  - arranging for 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 and communicate opportunities for improvement to working practices and procedures
- 1.11 make recommendations for improving to two of the following:
- working practices
  - working methods
  - quality
  - safety
  - tools and equipment
  - supplier relationships
  - internal communication
  - customer service
  - training and development
  - teamwork
  - other

- 1.12 maintain effective working relationships with colleagues to include two of the following:
- colleagues within own working group
  - colleagues outside normal working group
  - line management
  - external contacts
- 1.13 review personal training and development as appropriate to the job role
- 1.14 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.

<b>Learning outcome</b>
The learner will: 2. Know how to work efficiently and effectively in engineering
<b>Assessment criteria</b>
The learner can: 2.1 describe the safe working practices and procedures to be followed whilst preparing and tidying up their work area 2.2 describe the correct use of any equipment used to protect the health and safety of themselves and their colleagues 2.3 describe the procedure for ensuring that all documentation relating to the work being carried out is available and current, prior to starting the activity 2.4 describe the action that should be taken if documentation received is incomplete and/or incorrect 2.5 describe the procedure for ensuring that all tools and equipment are available prior to undertaking the activity 2.6 describe the checks to be carried out to ensure that tools and equipment are in full working order, prior to undertaking the activity 2.7 describe the action that should be taken if tools and equipment are not in full working order 2.8 describe the checks to be carried out to ensure that all materials required are correct and complete, prior to undertaking the activity 2.9 describe the action that should be taken if materials do not meet the requirements of the activity 2.10 explain whom to inform when the work activity has been completed 2.11 describe the information and/or documentation required to confirm that the activity has been completed 2.12 explain what materials, equipment and tools can be reused 2.13 explain how any waste materials and/or products are transferred, stored and disposed of 2.14 explain where tools and equipment should be stored and located

- 2.15 describe the importance of making recommendations for improving working practices
- 2.16 describe the procedure and format for making suggestions for improvements
- 2.17 describe the benefits to organisations if improvements can be identified
- 2.18 describe the importance of maintaining effective working relationships within the workplace
- 2.19 describe the procedures to deal with and report any problems that can affect working relationships
- 2.20 describe the difficulties that can occur in working relationships
- 2.21 describe the regulations that affect how they should be treated at work
- 2.22 describe the benefits of continuous personal development
- 2.23 describe the training opportunities that are available in the workplace
- 2.24 describe the importance of reviewing their training and development
- 2.25 explain with whom to discuss training and development issues
- 2.26 describe the extent of their own responsibility and to whom they should report if they have any problems that they cannot resolve.

# **Unit 403            Working efficiently and effectively in engineering**

Supporting information

## **Guidance**

2.21 (such as Equal Opportunities Act, Race and Sex Discrimination, working Time Directive)

## Unit 404

## Reinstating the work area on completion of activities

<b>UAN:</b>	<b>K/601/4228</b>
<b>Level:</b>	3
<b>Credit value:</b>	5
<b>GLH:</b>	25
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard aeronautical engineering Unit 004: Reinstating the work Area on completion of activities (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to reinstate the work area, in accordance with approved procedures. The learner will be required to follow the correct procedures for the safe storage of finished products and surplus materials, and to correctly identify and separate all waste materials and ensure that they are removed to their designated locations. The learner will also need to ensure that all tools, equipment and documents used are accounted for and returned to the appropriate places. Tidying of the work area will be of prime importance and includes office and clean working area environments, workshops, staging and platforms, internal areas of aircraft such as wings, tanks and fuselage sections, and areas that are airside. The learner's responsibilities will require them to comply with organisational policy and procedures for the activities undertaken, and to report any problems with the reinstatement activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality of the work they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and provide an informed approach to applying the required procedures. The learner will understand the need for reinstating the work areas, and will</p>



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.

The learner will understand the safety precautions required when reinstating the work area. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to reinstate the work area on completion of activities
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following activities during reinstatement of the work area: <ul style="list-style-type: none"> <li>• work to current schedules</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• report any loss or damage to equipment</li> <li>• report any identified hazards within the work area</li> <li>• return all consumables and materials to their correct location</li> <li>• complete any documentation as required</li> </ul> 1.3 separate equipment, components, and materials for re-use from waste items and materials 1.4 store reusable materials and equipment in an appropriate location 1.5 correctly label and store four the following resources: <ul style="list-style-type: none"> <li>• finished products/components</li> <li>• components requiring overhaul/repair</li> <li>• surplus materials/components</li> <li>• tooling, jigs, fixtures or other equipment used</li> <li>• drawings requiring actioning/adjusting</li> <li>• scrap components</li> <li>• measuring and test instruments</li> <li>• finished drawings</li> <li>• finished documentation</li> <li>• documentation requiring actioning/adjusting</li> </ul> 1.6 dispose of waste materials in line with organisational and environmental safe procedures

1.7	deal with waste materials, in line with company and environmental regulations, to include two of the following: <ul style="list-style-type: none"> <li>• correctly segregating waste materials</li> <li>• correctly dispose of waste materials</li> <li>• disposing of joining compounds, sealants and adhesives</li> <li>• disposing of other chemical products</li> <li>• removing non-hazardous materials</li> <li>• disposing of fluid waste (such as oil, hydraulic fluids, fuel)</li> </ul>
1.8	restore the work areas to a safe condition in accordance with agreed requirements and schedules
1.9	carry out reinstatement activities on two work areas from: <ul style="list-style-type: none"> <li>• workshops/hangers</li> <li>• airside</li> <li>• areas at height (such as platforms, staging, lifts)</li> <li>• internal areas of aircraft (such as wings, tanks, fuselage sections)</li> <li>• office environment</li> <li>• computer aided design (CAD) environment</li> <li>• technical/clean room environment</li> <li>• other appropriate environment</li> </ul>
1.10	deal promptly and effectively with problems within their control and report those that cannot be solved.

<b>Learning outcome</b>	
The learner will:	
2.	Know how to reinstate the work area on completion of activities
<b>Assessment criteria</b>	
The learner can:	
2.1	explain the specific safety practices and procedures they need to observe when reinstating the work area
2.2	explain the health and safety requirements of the work area where they are carrying out the activities, and the responsibility these requirements place on them
2.3	describe the hazards associated with reinstating the work area, and explain how to minimise them and reduce any risks
2.4	explain the safe working practices and procedures to be followed when carrying out the various activities
2.5	explain what personal protective clothing and equipment needs to be worn, and where this can be obtained
2.6	explain why work areas need to be restored to a set standard, and what these requirements are
2.7	describe the types of work area that will need to be restored
2.8	Explain the importance of tool and equipment control, and why this is critical within the aerospace industry
2.9	explain the meaning of 'foreign object debris', and why it is vital to ensure that this does not occur or is removed
2.10	describe the stores procedures for tools and equipment, documentation and surplus or waste materials
2.11	explain what materials will need to be stored and disposed of, and why they need to be segregated, correctly identified and labelled

- 2.12 explain how the various disposal bins can be identified
- 2.13 explain the procedures for disposing of hazardous materials
- 2.14 explain what documentation needs to be used on completion of the reinstatement activities
- 2.15 describe the extent of their own responsibility and explain to whom they should report if they have problems that they cannot resolve.

# **Unit 404            Reinstating the work area on completion of activities**

## Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations/codes of practice for the activities, equipment or materials)

2.4 (such as lifting and handling techniques)

2.7 (such as office environments, computer aided design (CAD) environment, technical/clean room environment, workshops, test areas, stages and platforms and aircraft areas such as wing, tank, fuselage, airside section areas)

2.12 (such as colour coded, labelled)

2.13 (such as chemicals, adhesives, oil, hydraulic fluids, fuel)

## Unit 494

# Carrying out maintenance of aircrew protective helmets and electrical headsets

<b>UAN:</b>	<b>L/601/4710</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 094: Carrying out maintenance of aircrew protective helmets and electrical headsets (Suite 3)
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew protective helmets and electrical headsets, in accordance with approved procedures. The learner 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. The maintenance activities to be carried out will involve dismantling the helmet, cleaning the various parts using suitable solutions, carrying out a thorough examination of the protective shell and associated parts in line with the relevant schedule, testing and final reassembly of the helmet and headset.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew protective helmets and electrical headsets. The learner will understand the helmets and headsets being maintained, and their application, and will know about the various components, in adequate depth</p>

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to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out the protective helmet and headset maintenance operations. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew protective helmets and electrical headsets
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew protective helmets and electrical headsets: <ul style="list-style-type: none"><li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li><li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li><li>• provide and maintain a safe working environment for the maintenance activities</li><li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li><li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li><li>• use approved servicing and maintenance techniques at all times</li><li>• return all tools and equipment to the correct location on completion of the activities</li><li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li></ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction: <ul style="list-style-type: none"><li>• Urgent Technical Instructions (UTI)</li><li>• Routine Technical Instructions (RTI)</li><li>• maintenance Instructions (MI)</li><li>• Preliminary Warning Instructions (PWI)</li></ul>

- Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
  - 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
  - 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
    - dismantling equipment to component or sub-assembly level (such as removal of oxygen mask, visor cover and fabric covers)
    - cleaning the equipment (such as visor, protective shell and headsets), using appropriate solutions
    - monitoring the condition/deterioration of components
    - replacing all damaged or defective components
    - reassembling the equipment
    - carrying out any required modifications to the equipment
    - carrying out adjustments to components and connections (such as friction settings, tuning and adjusting microphones)
    - checking equipment operation and performance
    - testing equipment in accordance with the relevant air publication (AP)
  - 1.8 carry out a thorough examination of the helmet and headset, to include checking all of the following:
    - the protective shell for damage and softness of shell
    - all protective shell screws/fasteners for security
    - visors for scratches, abrasions and cracks
    - visor hinge mechanism for corrosion, damage, security, and adjust friction settings, as required
    - ear capsules for damage, wear, hardening, discoloration and security
    - 'Mic/Tel' leads for deterioration or fraying
    - chin and neck strap for wear, damage, fraying and deterioration
    - oxygen mask hooks for damage, security and bending/distortion
    - electrical headsets for signs of damage and deterioration
    - ear pads and headbands for hardening or cracking
    - the ear shells move freely in their stirrups
    - the microphone switch moves freely, and adjustable parts move freely without undue slackness
    - boom microphone (if fitted) for looseness and damage
  - 1.9 replace a range of components, to include six of the following:
    - visor (clear or tinted)
    - side arm (outer and inner)
    - base assembly oxygen mask hook
    - strap assembly cable retaining
    - strap assembly (chin or neck)
    - headset electrical
    - ear capsule

<ul style="list-style-type: none"> <li>• down lead assembly</li> <li>• lining assembly (brow or neck)</li> <li>• visor cover assembly</li> <li>• 'Mic/Tel' lead (down lead and jack plug connector)</li> <li>• pads (crown, brow or neck)</li> <li>• elastic straps</li> <li>• ear capsule tensioning webbing</li> <li>• transducer</li> <li>• microphone switch</li> <li>• microphone boom</li> <li>• earphone</li> <li>• fabric cover</li> <li>• headband</li> <li>• earphone shell</li> </ul> <p>1.10 carry out maintenance work in compliance with one of the following standards:</p> <ul style="list-style-type: none"> <li>• Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)</li> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul> <p>1.11 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of aircrew protective helmets and electrical headsets
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew protective helmets and headsets 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining aircrew



- protective helmets and electrical headsets, and with the tools and equipment used, and explain how to minimise them and reduce any risks
- 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
  - 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
  - 2.6 explain the types of fault, defect or wear characteristic that are likely to occur with the aircrew protective helmets and electrical sets
  - 2.7 explain how to determine when components require adjustment, repair or replacement
  - 2.8 explain what components may need to be replaced in the protective helmets and headsets, and their method of replacement
  - 2.9 explain how to identify the components to be used for the various types of protective helmets and headsets being maintained
  - 2.10 describe the quality control procedures to be followed during the maintenance procedures
  - 2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification
  - 2.12 describe the problems that can occur with the maintenance of the protective helmets and headsets, and explain how these can be overcome
  - 2.13 explain the importance of the correct securing and locking of connections
  - 2.14 explain the importance of tool control, and the organisational tool control procedures
  - 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
  - 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
  - 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
  - 2.18 describe the problems that may occur with the maintenance procedures, and explain the importance of informing appropriate people of defects
  - 2.19 explain what recording documentation needs 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
  - 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 494                    Carrying out maintenance of aircrew protective helmets and electrical headsets**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 495

## Carrying out maintenance of aircrew protective clothing

<b>UAN:</b>	<b>M/601/4716</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 095: Carrying out maintenance of aircrew protective clothing (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities of aircrew protective clothing, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve removing attachments from clothing, cleaning the various parts of the clothing and equipment using suitable solutions, carrying out a thorough examination of the clothing and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, and checking equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew clothing.</p>

The learner will understand the clothing being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the clothing is maintained to the required specification.

The learner will understand the safety precautions required when carrying out the aircrew clothing maintenance operations. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew protective clothing
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew protective clothing: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements in accordance with two of the following types of instruction: <ul style="list-style-type: none"> <li>• Urgent Technical Instructions (UTI)</li> <li>• Routine Technical Instructions (RTI)</li> </ul>

- maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out maintenance activities on three of the following types of aircrew protective clothing:
- aircrew coverall
  - immersion coverall
  - coverall immersion inner
  - anti-G trousers
- 1.8 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
- dismantle the equipment to component or sub-assembly level (such as removal of knife)
  - clean the equipment using appropriate solutions (such as removal of soiling, oil stains, salt water)
  - monitor the condition/deterioration of components
  - replace all damaged or defective components
  - reassemble the equipment
  - carry out any required modifications to the equipment
  - carry out adjustments to components and connections
  - check equipment operation and performance
  - test equipment in accordance with the relevant air publication (AP)
- 1.9 carry out a thorough examination of the aircrew clothing, to include checking/examining all of the following:
- the fabric for damage or deterioration
  - sliding fasteners, eyelets and closure flaps for security of attachment
  - securing straps, webbing and touch-and-close tape check for security
  - emergency knife (if fitted), examine for damage, check release mechanism and ensure correct operation
  - fabric patch, cleat and lanyard for damage, fraying of the cord and security of attachment
  - snap fasteners for damage and security of attachment
  - neck, wrist and supply seals (if fitted) for deterioration, damage and security of attachment
  - pull-tab retainer, pen pocket and chinagraph pencil attachment loop, for damage and security of attachment
  - boots and socks, external and internal tapes and urination sleeve, for deterioration and damage
  - bladder cover/waistband for rupture of the fabric weave, contamination and broken stitching
  - hose and hose connector for perishing, fraying, protrusion of reinforcing wire, distortion and damage

- lacing for fraying, security of knots, and attachment
- 1.10 replace a range of protective clothing components, to include six of the following:
- pockets
  - sliding fasteners
  - renewal of broken stitching
  - cleat
  - nylon cord
  - split-ring split
  - stainless tab washer
  - fastener snap nylon
  - fabric base
  - neck seal
  - wrist seal
  - front entry sliding fastener pull-tab assembly
  - socks
  - boots
  - blanking plugs
  - tapes
  - urination sliding fastener panel
  - pull-tab back gusset
  - back gusset sliding fastener
  - back gusset
  - patches
- 1.11 carry out maintenance work in compliance with one of the following standards:
- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
  - Ministry of Defence (MoD)
  - Federal Aviation Authority (FAA)
  - BS, ISO or BSEN procedures
  - customer standards and requirements
  - company standards and procedures
- 1.12 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
- 1.13 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:
- maintenance schedule/log
  - job cards
  - aircraft service/flight log
- 1.14 dispose of waste materials in accordance with safe working practices and approved procedures

<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of aircrew protective clothing
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew protective clothing 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining aircrew protective clothing and equipment, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risks 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents 2.6 explain what types of faults, defects or wear characteristics that are likely to occur with the protective clothing 2.7 explain how to determine when components require adjustment, repair or replacement 2.8 explain what components may need to be replaced in the aircrew protective clothing, and the method of replacement 2.9 explain how to identify the components to be used for the various types of aircrew protective clothing being maintained 2.10 describe the quality control procedures to be followed during the maintenance procedures 2.11 explain how to conduct any necessary checks to ensure that the protective clothing and equipment functions to specification 2.12 describe the problems that can occur with the maintenance of the aircrew protective clothing, and explain how these can be overcome 2.13 explain the importance of the correct securing and locking of connections 2.14 explain the importance of tool control, and the organisational tool control procedures 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt and foreign objects 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL) 2.18 describe the problems that can occur with the maintenance procedures, and explain the importance of informing appropriate people of defects 2.19 explain what recording documentation needs 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 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 495**                    **Carrying out maintenance of aircrew protective clothing**

## Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)



## Unit 496

# Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment

<b>UAN:</b>	<b>F/601/4719</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 096: Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew nuclear, biological and chemical (NBC) respirators and equipment, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the NBC equipment and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p>

The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew NBC equipment. The learner will understand the NBC equipment being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out the aircrew NBC equipment maintenance operations. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew NBC equipment: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work

- 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions:
  - Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling equipment to component or sub-assembly level (such as removal of velveteen cover and valves, ice guard, cover and filtration canisters)
  - cleaning the equipment (such as respirator assembly and valves, drinking facility), using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing equipment in accordance with the relevant air publication (AP)
- 1.8 examine thoroughly the aircrew respirator/portable ventilator, to include checking all of the following:
  - mask support and deflector plate, mask face-piece and mask tubing, for damage deterioration and security of attachment
  - faceplate for abrasion, crazing at ports and housings, optical areas for blemish, faceplate sealing for security of bonding, and faceplate rip facility for bonded joints and security of rip release toggle
  - all screws, nuts and fasteners for security of attachment
  - nose occluder assembly, drinking facility for damage, puncture, cut or abrasion or deterioration of rubber
  - chain toggle harness and chain harness - examine all links for damage and security of attachment
  - inspiratory valve, ice guard filter, stepped expiratory valve, for deterioration and damage
  - apron, neck seal, bellows and cowl for damage, deterioration and security of bonded joints
  - manifold assembly, hoses and connectors for wear, damage, deterioration and security of attachment
  - microphone lead assembly for damage, deterioration or fraying
  - microphone switch for free movement without slackness
  - portable ventilator case, cover, carrying strap and hose socket, for damage, wear and security of attachment, and electrical wiring for overheating, dry/broken soldered joints and

- condition of battery
- canisters, canister mount seals, emergency inlet valve, and pressure relief valve for damage, deterioration, freedom of movement and security of attachment
- 1.9 replace a range of NBC equipment components, to include six of the following:
  - ice guard
  - inspiratory valve
  - compensated expiratory valve
  - stepped expiratory valve
  - velveteen cover
  - microphone lead assembly
  - mask
  - hood outlet and shut-off valve
  - hood inlet adapter
  - angled inlet adapter
  - hood tube
  - mask tube
  - chain toggle harness
  - manifold
  - protective sleeves
  - canister
  - canister mount seals
  - battery
  - case
  - cover
  - nut connecting cover
- 1.10 carry out maintenance work in compliance with one of the following standards:
  - Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
  - Ministry of Defence (MoD)
  - Federal Aviation Authority (FAA)
  - BS, ISO or BSEN procedures
  - customer standards and requirements
  - company standards and procedures
- 1.11 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
- 1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:
  - maintenance schedule/log
  - job cards
  - aircraft service/flight log
- 1.13 dispose of waste materials in accordance with safe working practices and approved procedures

<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew NBC equipment 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining aircrew NBC equipment, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risks 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents 2.6 explain what types of fault, defect or wear characteristic that are likely to occur with the NBC equipment 2.7 explain how to determine when components require adjustment, repair or replacement 2.8 explain what components may need to be replaced in the NBC equipment, and the method of replacement 2.9 explain how to identify the components to be used for the NBC equipment being maintained 2.10 describe the quality control procedures to be followed during the maintenance procedures 2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification 2.12 describe the problems that can occur with the maintenance of the NBC equipment, and explain how these can be overcome 2.13 explain the importance of the correct securing and locking of connections 2.14 explain the importance of tool control, and the organisational tool control procedures 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL) 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects 2.19 explain what recording documentation needs 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 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 496**

## **Carrying out maintenance of aircrew nuclear, biological and chemical (NBC) respirators and equipment**

Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 497

# Carrying out maintenance of aircrew life preserver equipment

<b>UAN:</b>	<b>F/601/4722</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 097: Carrying out maintenance of aircrew life preserver equipment (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew life preserver equipment, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the life preserver equipment and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good</p>

understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew life preserver equipment. The learner will understand the life preserver equipment being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircrew life preserver equipment. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew life preserver equipment
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew life preserver equipment: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work



- 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions:
  - Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling equipment to component or sub-assembly level (such as removal of personal locator beacon (PLB) and CO2 cylinder)
  - cleaning the equipment using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the life preserver, to include checking all of the following:
  - waistcoat front closure plate for damage, wear and insecurity
  - waist adjustment straps and buckles for damage and correct locking action
  - all internal and external stowage pockets for damage, wear and security
  - 'Halkey Roberts' inflation valve and oral tube for damage and deterioration
  - stole pouch and peripheral slide fastener for damage and wear - check the operation
  - cylinder pocket and operating knob housing for security of water ingress, eyelets and snap fasteners
  - all fasteners and eyelets for damage, wear and insecurity
  - webbing tape hinges and tape touch-and-close for damage, wear and security
  - stole lacing loops, webbing loops and lifting beackets for damage, wear and security
  - life line and toggle, whistle and lanyard, heliograph - examine for correct length and security of knots
  - water activated battery and lamp assembly, for damage, length of lanyard and security of knots
  - pyrotechnic signal kit for damage and integrity of seals
  - 'Mic/Tel' flap and D-ring for damage and wear

	<ul style="list-style-type: none"> <li>• CO2 cylinder for corrosion, dents, damage and integrity of gas seal and screw threads</li> </ul>
1.9	<p>replace a range of life preserver equipment components, to include six of the following:</p> <ul style="list-style-type: none"> <li>• inflatable stole</li> <li>• personal locator beacon (PLB)</li> <li>• personal locator beacon battery</li> <li>• personal locator beacon aerial</li> <li>• CO2 cylinder</li> <li>• water activated battery and lamp</li> <li>• first aid kit</li> <li>• waistcoat</li> <li>• pyrotechnic signal kit</li> <li>• drinking water</li> <li>• heliograph</li> <li>• automatic life preserver inflation unit (ALPIU)</li> <li>• 'Halkey Roberts' manual inflator</li> </ul>
1.10	<p>carry out maintenance work in compliance with one of the following standards:</p> <ul style="list-style-type: none"> <li>• Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)</li> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul>
1.11	<p>report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p>
1.12	<p>complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul>
1.13	<p>dispose of waste materials in accordance with safe working practices and approved procedures</p>

<b>Learning outcome</b>	
The learner will:	
2. Know how to carry out maintenance of aircrew life preserver equipment	
<b>Assessment criteria</b>	
The learner can:	
2.1	explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew life preserver equipment
2.2	explain the health and safety requirements of the work area in

- which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them
- 2.3 describe the hazards associated with maintaining aircrew life preserver equipment, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risks
  - 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
  - 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
  - 2.6 explain what types of fault, defect or wear characteristic that are likely to occur with the aircrew life preserver equipment
  - 2.7 explain how to determine when components require adjustment, repair or replacement
  - 2.8 explain what components may need to be replaced in the aircrew life preserver equipment, and the method of replacement
  - 2.9 explain how to identify the components to be used for the life preserver equipment being maintained
  - 2.10 describe the quality control procedures to be followed during the maintenance procedures
  - 2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification
  - 2.12 describe the problems that can occur with the maintenance of the life preserver equipment, and explain how these can be overcome
  - 2.13 explain the importance of correct securing and locking of connections
  - 2.14 explain the importance of tool control, and the organisational tool control procedures
  - 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
  - 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
  - 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
  - 2.18 describe the problems that can occur with the maintenance procedures, and explain the importance of informing appropriate people of defects
  - 2.19 explain what recording documentation needs 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
  - 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 497                    Carrying out maintenance of aircrew life preserver equipment**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 498

# Carrying out maintenance of aircrew inertia reels and restraint harnesses

<b>UAN:</b>	<b>J/601/4723</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 098: Carrying out maintenance of aircrew inertia reels and restraint harnesses (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew inertia reels, restraint harnesses and equipment, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the inertia reels, restraint harnesses and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p>

The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew inertia reels and restraint harness equipment. The learner will understand the equipment being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircrew inertia reels and restraint harness equipment. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew inertia reels and restraint harnesses
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew inertia reels and restraint harness equipment: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul>

- 1.3 follow the relevant maintenance schedules to carry out the required work
- 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions:
  - Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling equipment to component or sub-assembly level
  - cleaning the equipment using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - applying lubrication to relevant parts
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment (such as inertia reels, shoulder harness, operator unit and quick-release fasteners), in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the inertia reel and restraint harness, to include checking all of the following:
  - casing and operating lever for corrosion, damage and deterioration
  - cable conduit for fraying, and cable for damage and security of swaged end
  - inertia reel torsion spring, mounting collar washers, damper assembly, shims and drive shaft bearing, for corrosion, damage and deterioration
  - brake and inertia plates for damage and wear
  - quick-release fastener locking plungers, moving plungers, locking plunger springs, anti-G pins and collar, cam plate and spindle, and thumb catch assembly, for damage, deterioration and corrosion
  - restraint harness for damage, wear, security of all fastenings, and correct operation of all parts
- 1.9 replace a range of inertia reel and restraint harness components, to include six of the following:
  - flexible cable
  - retaining nut
  - retaining plate
  - torsion spring

- mounting collar
- end plug
- screws
- adaptor
- damper assembly
- damper spring
- shims
- thrust plates
- guide discs
- drive shaft
- bearing
- end cap
- body
- brake plate
- inertia plate
- locking washer screws
- locking washer
- stud
- cover cap screws
- cover cap
- guide pin
- spacer tubes
- moving plunger springs
- moving plungers
- anti-G-pins
- anti-G collar
- cam plate
- cam spindle
- ball holder
- steel ball
- operating knob
- knob cover plate
- knob cover plate screws
- thumb catch assembly
- thumb catch spring
- thumb catch anchor plate

1.10 carry out maintenance work in compliance with one of the following standards:

- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- Ministry of Defence (MoD)
- Federal Aviation Authority (FAA)
- BS, ISO or BSEN procedures
- customer standards and requirements
- company standards and procedures

1.11 report any instances where the maintenance activities cannot be



<p>fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<p><b>Learning outcome</b></p> <p>The learner will:</p> <p>2. Know how to carry out maintenance of aircrew inertia reels and restraint harnesses</p>
<p><b>Assessment criteria</b></p> <p>The learner can:</p> <p>2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew inertia reels and restraint harness equipment</p> <p>2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them</p> <p>2.3 describe the hazards associated with maintaining aircrew inertia reels and restraint harness equipment, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risks</p> <p>2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained</p> <p>2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents</p> <p>2.6 explain what types of fault, defect or wear characteristic that are likely to occur with the aircrew inertia reels and restraint harness equipment</p> <p>2.7 explain how to determine when components require adjustment, repair or replacement</p> <p>2.8 explain what components may need to be replaced in the aircrew inertia reels and restraint harness equipment, and the method of replacement</p> <p>2.9 explain how to identify the components to be used for the inertia reels and restraint harness equipment being maintained</p> <p>2.10 describe the quality control procedures to be followed during the maintenance procedures</p> <p>2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification</p> <p>2.12 describe the problems that can occur with the maintenance of the inertia reels and restraint harness equipment, and explain how these can be overcome</p> <p>2.13 explain the importance of correct securing and locking of connections</p> <p>2.14 explain the importance of tool control, and the organisational tool</p>

control procedures used

- 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures.
- 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
- 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
- 2.18 describe the problems that can occur with the maintenance procedures, and explain the importance of informing appropriate people of defects
- 2.19 explain what recording documentation needs 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
- 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 498                    Carrying out maintenance of aircrew inertia reels and restraint harnesses**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 499

# Carrying out maintenance of aircraft multi-seat life rafts and emergency packs

<b>UAN:</b>	<b>R/601/4725</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 099: Carrying out maintenance of aircraft multi-seat life rafts and emergency packs (Suite 3)
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircraft multi-seat life rafts and emergency packs, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the multi-seat life rafts and emergency packs in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an</p>

informed approach to applying maintenance techniques and procedures to aircraft multi-seat life rafts and emergency packs. The learner will understand the aircraft multi-seat life rafts and emergency packs being maintained, and their application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircraft multi-seat life rafts and emergency packs. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircraft multi-seat life rafts and emergency packs
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of multi-seat life rafts and emergency packs: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work

- 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions:
  - Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling equipment to component or sub-assembly level (such as removal of the operating head, CO2 cylinder and survival aids)
  - cleaning the equipment using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment in accordance with the relevant air publication (AP) (such as life raft, flashing beacon, CO2 cylinder, operating head, sea light and batteries)
- 1.8 carry out a thorough examination of the life raft and emergency pack, to include checking all of the following:
  - life raft container for contamination, damage, cracks and soft spots
  - fabric containers, painter operating cord for contamination, deterioration and fraying
  - survival aids for damage, deterioration, illegibility and life expiry date of consumables
  - operating head and inflation equipment for corrosion, damage and security of attachment
  - buoyancy chamber, floor, and canopy and entrance covers, for deterioration, chafing and damage
  - inflation valves for damage and deterioration
  - boarding handles, handling loops, water pockets and cylinder sleeve, for damage and security of attachment
  - leak stoppers and harness for wear, damage and security of attachment
  - CO2 cylinders for stowage, security of attachments and life expiry date
  - all ancillary equipment for damage and security
  - sea anchor for security, and lines for wear or damage
  - emergency pack - all contents for expiry date, damage and warranty life
  - life raft flashing beacon assembly for damage and security

- sea light and batteries for damage and warranty life
- 1.9 replace a range of multi-seat life raft and emergency pack components, to include eight of the following:
- CO2 cylinder
  - first aid kit
  - sea sickness tablets container
  - survival aids container
  - painter line
  - gas inlet
  - handles
  - fabric cover/closure flaps
  - reverse osmosis pump (ROP)
  - operating head
  - operating cable
  - Y-hose assembly
  - bellows
  - water bags
  - water carrier
  - fishing kit
  - ground air emergency label
  - signal distress day/night
  - sponge
  - deflation plug
  - batteries (sea water)
  - batteries (lithium)
  - drogue
  - snap hook
  - compass
  - lifed items (such as rations)
- 1.10 carry out maintenance work in compliance with one of the following standards:
- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
  - Ministry of Defence (MoD)
  - Federal Aviation Authority (FAA)
  - BS, ISO or BSEN procedures
  - customer standards and requirements
  - company standards and procedures
- 1.11 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
- 1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:
- maintenance schedule/log
  - job cards
  - aircraft service/flight log

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

### **Learning outcome**

The learner will:

2. Know how to carry out maintenance of aircraft multi-seat life rafts and emergency packs

### **Assessment criteria**

The learner can:

- 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircraft multi-seat life rafts and emergency packs
- 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them
- 2.3 describe the hazards associated with maintaining aircraft multi-seat life rafts and emergency packs, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risk
- 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
- 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
- 2.6 explain what types of fault, defect or wear characteristic that are likely to occur with the multi-seat life rafts and emergency packs
- 2.7 explain how to determine when components require adjustment, repair or replacement
- 2.8 explain what components may need to be replaced in the multi-seat life rafts and emergency packs, and the method of replacement
- 2.9 explain how to identify the components to be used for the multi-seat life rafts and emergency packs being maintained
- 2.10 describe the quality control procedures to be followed during the maintenance procedures
- 2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification
- 2.12 describe the problems that can occur with the maintenance of the aircraft multi-seat life rafts and emergency packs, and explain how these can be overcome
- 2.13 explain the importance of correct securing and locking of connections
- 2.14 explain the importance of tool control, and the organisational tool control procedures used
- 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
- 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
- 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
- 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects



- 2.19 explain what recording documentation needs 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
- 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 499**                    **Carrying out maintenance of aircraft multi-seat life rafts and emergency packs**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 500

## Carrying out maintenance of aircrew oxygen masks

<b>UAN:</b>	<b>D/601/4727</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 100: Carrying out maintenance of aircrew oxygen masks (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew oxygen masks, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the oxygen mask and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew oxygen masks. The learner will understand the</p>

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equipment being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircrew oxygen masks. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew oxygen masks
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew oxygen masks: <ul style="list-style-type: none"><li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li><li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li><li>• provide and maintain a safe working environment for the maintenance activities</li><li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li><li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li><li>• use approved servicing and maintenance techniques at all times</li><li>• return all tools and equipment to the correct location on completion of the activities</li><li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li></ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions: <ul style="list-style-type: none"><li>• Urgent Technical Instructions (UTI)</li></ul>

- Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
- dismantling equipment to component or sub-assembly level (such as removal of microphone, toggle harness and valves)
  - cleaning the equipment (such as face-piece and valves) using the appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the oxygen mask, to include checking all of the following:
- the face-piece and mask tubing for damage, deterioration and surface crazing
  - all screws and fasteners for security
  - toggle harness assembly for cracking and surface damage
  - microphone lead assembly for damage, deterioration or fraying
  - microphone switch for free movement without slackness
  - wire and chain adjusters for stiffness and damage
  - inspiratory valve, ice guard filter, expiratory valve and anti-suffocation valve (if fitted) for damage
- 1.9 replace a range of oxygen mask components, to include five of the following:
- microphone
  - face-piece
  - toggle harness assembly
  - ice guard filter
  - inspiratory valve
  - air inlet (inspiratory valve if fitted)
  - expiratory valve
  - anti-suffocation valve
  - mask tube
- 1.10 carry out maintenance work in compliance with one of the following standards:
- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)

<ul style="list-style-type: none"> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN standards and procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul> <p>1.11 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one from the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<b>Learning outcome</b>
The learner will:
2. Know how to carry out maintenance of aircrew oxygen masks
<b>Assessment criteria</b>
The learner can:
2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew oxygen masks
2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them
2.3 describe the hazards associated with maintaining aircrew oxygen masks, and with the tools, materials and equipment used, and explain how to minimise them and reduce any risks
2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
2.6 explain what types of fault, defect or wear characteristic that are likely to occur with the oxygen masks
2.7 explain how to determine when components require adjustment, repair or replacement
2.8 explain what components may need to be replaced in the oxygen masks, and the method of replacement
2.9 explain how to identify the components to be used for the oxygen masks being maintained
2.10 describe the quality control procedures to be followed during the maintenance procedures
2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification
2.12 describe the problems that can occur with the maintenance of the oxygen masks, and explain how these can be overcome
2.13 explain the importance of correct securing and locking of

connections

- 2.14 explain the importance of tool control, and the organisational tool control procedures used
- 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
- 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
- 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
- 2.18 describe the problems that can occur with the maintenance procedures, and explain the importance of informing appropriate people of defects
- 2.19 explain what recording documentation needs 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
- 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 500                    Carrying out maintenance of aircrew oxygen masks**

## Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)



## Unit 501

## Carrying out maintenance of aircrew personal survival packs (PSP)

<b>UAN:</b>	<b>M/601/4733</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 101: Carrying out maintenance of aircrew personal survival packs (PSP) (Suite 3)
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on aircrew personal survival packs (PSP), in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the personal survival packs in line with the relevant schedule, replacing any damaged, defective or out-of-life parts/equipment, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an</p>

informed approach to applying maintenance techniques and procedures to aircrew personal survival packs. The learner will understand the aircrew survival packs being maintained, and their application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircrew personal survival packs. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew personal survival packs (PSP)
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew personal survival packs: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction:

- Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
- dismantling equipment to component or sub-assembly level (such as removal of the operating head, CO2 cylinder and survival aids)
  - cleaning the equipment using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections (such as torque setting)
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the life raft and emergency pack, to include checking all of the following:
- the rigid shell and protective strips for damage, cracks and security of attached items
  - fabric container, cushion, lowering line and single-handed release system, for contamination, deterioration, wear and broken stitching
  - survival aids, for damage, deterioration, illegibility, and life expiry date of consumables
  - automatic life-raft inflation unit (ALIU), automatic deflation unit (ADU) cables for corrosion, damage, and security of attachment
  - buoyancy chamber, floor, and canopy for deterioration, chafing and damage
  - oral inflation valves for damage and deterioration
  - boarding handles, handling loops, water pockets, and cylinder sleeve, for damage and security of attachment
  - leak stoppers and harness, for wear, damage and security of attachment
  - CO2 cylinders for stowage, security of attachments and life expiry date
  - all ancillary equipment for damage and security
  - emergency pack - all contents for expiry date, damage and warranty life
  - batteries and signalling devices for damage/warranty life
- 1.9 replace a range of personal survival pack components, to include six of the following:

- CO2 cylinder
- first aid kit
- sea sickness tablets
- shell
- survival aids container
- lowering line
- gas inlet
- handles
- fabric cover/closure flaps
- cushion assembly
- retaining lanyard
- operating head
- automatic life-raft inflation unit (ALIU)
- operating cable
- automatic deflation unit (ADU)
- polyacetal washer
- bellows
- sponge
- signal distress day/night
- deflation plug
- battery
- closure flaps
- drogue
- disk bushing
- special nut
- compass
- lifed items (such as rations)

1.10 carry out maintenance work in compliance with one of the following standards:

- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- Ministry of Defence (MoD)
- Federal Aviation Authority (FAA)
- BS, ISO or BSEN standards and procedures
- customer standards and requirements
- company standards and procedures

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

1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:

- maintenance schedule/log
- job cards
- aircraft service/flight log

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

<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of aircrew personal survival packs (PSP)
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew personal survival packs 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining aircrew personal survival packs, and with the tools, materials and equipment used, and explain how to minimise them and reduce e any risk 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents 2.6 explain the types of fault, defect or wear characteristic that are likely to occur with the aircrew personal survival packs 2.7 explain how to determine when components require adjustment, repair or replacement 2.8 explain what components may need to be replaced in the aircrew personal survival packs, and the method of replacement 2.9 explain how to identify the components to be used for the aircrew personal survival packs being maintained 2.10 describe the quality control procedures to be followed during the maintenance procedures 2.11 explain how to conduct any necessary checks to ensure that the equipment functions to specification 2.12 describe the problems that can occur with the maintenance of the aircrew personal survival packs, and explain how these can be overcome 2.13 explain the importance of correct securing and locking of connections 2.14 explain the importance of tool control, and the organisational tool control procedures used 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL) 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects 2.19 explain what recording documentation needs 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 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 501                    Carrying out maintenance of aircrew personal survival packs (PSP)**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 502

## Carrying out maintenance of aircrew quick-release fasteners (QRF)

<b>UAN:</b>	<b>T/601/4734</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 102: Carrying out maintenance of aircrew quick-release fasteners (QRF) (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities of aircrew quick-release fasteners (QRF), in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the quick-release fastener and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good</p>

understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to aircrew quick-release fasteners. The learner will understand the quick-release fasteners being maintained, and their application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on aircrew quick-release fasteners. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of aircrew quick-release fasteners (QRF)
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the aircrew quick-release fasteners: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current certification/calibration date</li> <li>• obtain clearance to work on the aircraft, and observe any power isolation procedures</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work



- 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction:
  - Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling the equipment to component or sub-assembly level
  - cleaning the equipment, using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the quick-release fasteners, to include checking/examining all of the following:
  - the body assembly for damage and deterioration
  - the anti-G plate for date of manufacture, profile and freedom from damage
  - operating knob for security of label, and freedom from burring or chipping
  - the torque setting of the operating knob
  - locking plungers, locking plunger springs and guide bush, for damage, deterioration and corrosion
  - operating plunger for chips, burrs, corrosion and damage
  - springs for correct length
  - cover plate assembly, for security of bearing block and catch lever spring
  - shoulder bolts and driving arms for wear or damage
  - adapter plate for wear, damage or distortion, and security of screws
- 1.9 replace a range of quick-release fastener components, to include six of the following:
  - adapter plate
  - adapter plate screw
  - locking plunger
  - plunger spring
  - guide bush split pin
  - shoulder bolt

<ul style="list-style-type: none"> <li>• driving arm</li> <li>• torsion spring</li> <li>• operating knob</li> <li>• operating screw</li> <li>• anti-G plate</li> <li>• lock wire</li> <li>• locking pin</li> <li>• locking pin spring</li> <li>• locking pin screw</li> <li>• knob locking ring</li> <li>• cover plate</li> <li>• operating plunger</li> <li>• body assembly</li> <li>• locking nuts</li> </ul> <p>1.10 carry out maintenance work in compliance with one of the following standards:</p> <ul style="list-style-type: none"> <li>• Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)</li> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN standards and procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul> <p>1.11 report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of aircrew quick-release fasteners (QRF)
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew quick-release fasteners 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining aircrew quick-release fasteners, and with the materials, tools and equipment

- used, and explain how to minimise them and reduce any risks
- 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
  - 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
  - 2.6 explain the types of fault, defect or wear characteristic that are likely to occur with the aircrew quick-release fasteners
  - 2.7 explain how to determine when components require adjustment, repair or replacement
  - 2.8 explain what components may need to be replaced in the aircrew quick-release fasteners, and the method of replacement
  - 2.9 explain how to identify the components to be used for the various types of aircrew quick-release fasteners being maintained
  - 2.10 describe the quality control procedures to be followed during the maintenance procedures
  - 2.11 explain how to conduct any necessary checks to ensure the quick-release fasteners function to specification
  - 2.12 describe the problems that can occur with the maintenance of the aircrew quick-release fasteners, and explain how these can be overcome
  - 2.13 explain the importance of correct securing and locking of connections
  - 2.14 explain the importance of tool control, and the organisational tool control procedures used
  - 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
  - 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt and foreign objects
  - 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL)
  - 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects
  - 2.19 explain what recording documentation needs 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
  - 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

## **Unit 502                    Carrying out maintenance of aircrew quick-release fasteners (QRF)**

Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 503

# Carrying out maintenance of ejection seat headbox parachute assemblies

<b>UAN:</b>	<b>A/601/4735</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 103: Carrying out maintenance of ejection seat headbox parachute assemblies (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on ejection seat headbox parachute assemblies, in accordance with approved procedures. The learner 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.</p> <p>The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the parachute and associated parts in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an</p>

informed approach to applying maintenance techniques and procedures to parachute assemblies. The learner will understand the type of parachute being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on parachute assemblies. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of ejection seat headbox parachute assemblies
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the parachute assemblies: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, technical instructions and specifications)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration date</li> <li>• use approved servicing and maintenance techniques at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• dispose of waste materials in accordance with approved procedures</li> <li>• leave the work area and assembly in a safe and appropriate condition, free from damage or foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the

following types of instruction:

- Urgent Technical Instructions (UTI)
- Routine Technical Instructions (RTI)
- maintenance Instructions (MI)
- Preliminary Warning Instructions (PWI)
- Serious Defect Signals

- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out the maintenance activities in the specified sequence and in an agreed timescale
- 1.7 carry out all of the following repair/maintenance activities, using appropriate methods and techniques:
  - dismantling the equipment to component or sub-assembly level (such as removal of harness, pack elastics)
  - cleaning the equipment (such as rigid pack, metallic components) using appropriate solutions
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)
- 1.8 carry out a thorough examination of the parachute, to include checking/examining all of the following:
  - the parachute canopy, rigging lines, vent control lines, for correct sequence of attachment, damage, deterioration, contamination and security of attachment
  - main and controller drogue - all rigging lines, anti-squid line and connecting strop for damage, security of attachment, and assembled in the correct sequence
  - harness assembly for damage, deterioration and correct assembly
  - PSP connector, screws and fasteners, for correct operation and security of attachment
  - rigid pack and containers for damage, dents, cracks, freedom from loose articles, burrs and sharp edges
  - mechanical lock and metallic labels for damage, corrosion, security of attachment
  - inner and outer closure flaps, stowage trays, for damage and security of attachment
  - drogue withdrawal line for damage and 'in-use life'
  - all grommets, screws and fasteners for security of attachment
  - all shackles and screwed couplings, for damage and security of attachment
- 1.9 replace a range of parachute components, to include six of the following:
  - back pad assembly
  - padded apron

- canopy withdrawal line
- quick-release connector
- lap strap sub-assembly
- harness yoke
- front lift webs
- rivets
- rubber band
- rigid pack
- mechanical lock assembly
- drogue withdrawal line
- controller drogue anti-squid line
- drogue connecting strop
- extender strap
- drogue-to-parachute attachment line
- parachute withdrawal line (seat portion)
- head support panel grommets
- auxiliary parachute connecting strop
- rigid pack outer closure flaps
- rigid pack inner closure flaps
- split pin
- castellated nut
- auxiliary parachute
- rigging lines and stowage flap
- attachment gaiter
- strap and pack sub-assembly
- assembly pin, transit and flag
- container

1.10 carry out maintenance work in compliance with one of the following standards:

- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- Ministry of Defence (MoD)
- Federal Aviation Authority (FAA)
- BS, ISO or BSEN standards and procedures
- customer standards and requirements
- company standards and procedures

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

1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:

- maintenance schedule/log
- job cards
- aircraft service/flight log

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



<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of ejection seat headbox parachute assemblies
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the parachute assemblies 2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them 2.3 describe the hazards associated with maintaining parachute assemblies, and with the materials, tools and equipment used, and explain how to minimise them and reduce any risk 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained 2.5 describe the maintenance schedules and servicing specifications that are used during the servicing and maintenance, and the importance of following the procedures listed in these documents 2.6 explain the types of fault, defect or wear characteristic that are likely to occur with the parachute assemblies 2.7 explain how to determine when components require adjustment, repair or replacement 2.8 explain what components may need to be replaced in the parachute assemblies, and explain the method of replacement 2.9 explain how to identify the components to be used for the various types of parachute assemblies being maintained 2.10 describe the quality control procedures to be followed during the maintenance procedures 2.11 explain how to conduct any necessary checks to ensure that the parachute assemblies function to specification 2.12 describe the problems that can occur with the maintenance of parachute assemblies, and explain how these can be overcome 2.13 explain the importance of correct securing and locking of connections 2.14 explain the importance of tool control, and the organisational tool control procedures used 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures 2.16 explain the importance of ensuring that, when the maintenance is completed, the parachute assembly is free from dirt and foreign objects 2.17 describe the disposal methods for waste and petrol, oil and lubricants (POL) 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects 2.19 explain what recording documentation needs 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 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 503**

## **Carrying out maintenance of ejection seat headbox parachute assemblies**

Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 598

## Carrying out maintenance of free fall parachute assemblies

<b>UAN:</b>	<b>J/601/5175</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 198: Carrying out maintenance of free fall parachute assemblies (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on free fall parachute assemblies, in accordance with approved procedures. The learner 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. The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the parachute and associated parts, in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to free fall parachutes. The learner will understand the type</p>

of parachute being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on free fall parachute assemblies. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of free fall parachute assemblies
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the free fall parachute assemblies: <ul style="list-style-type: none"><li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, technical instructions and specifications)</li><li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li><li>• provide and maintain a safe working environment for the maintenance activities</li><li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration date</li><li>• use appropriate and approved servicing and maintenance techniques and procedures at all times</li><li>• return all tools and equipment to the correct location on completion of the activities</li><li>• dispose of waste materials in accordance with approved procedures</li><li>• leave the work area and parachute assembly in a safe and appropriate condition, free from damage or foreign object debris on completion of the activities</li></ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction: <ul style="list-style-type: none"><li>• Urgent Technical Instructions (UTI)</li><li>• Routine Technical Instructions (RTI)</li><li>• maintenance Instructions (MI)</li></ul>

- Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
  - Service Modifications
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out all of the following repair/maintenance methods and techniques:
- dismantling the equipment to component or sub-assembly level (such as removal of harness, pack elastics)
  - cleaning the equipment (such as container, metallic components) using appropriate methods
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment, where applicable
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)/maintenance procedure
- 1.7 carry out a thorough examination of the parachute to include all of the following:
- the parachute canopy, drogues, throwaways, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
  - cybernetic parachute release system (CYPRES) for correct function and fitting
  - all rigging lines for freedom from defects and correct sequence of connection
  - all control lines, slider control lines, slider inhibiting devices for freedom from defects and correctly connected
  - pack/container, harness assembly, for freedom from damage, deterioration and correct assembly
  - risers, rapide links, three-ring attachment point, for freedom from damage, deterioration and security of attachment
  - main and reserve canopy for condition and record of usage
  - all grommets, screws and fasteners for security of attachment
- 1.8 replace a range of components as detailed below:
- 1.9 replace one of the following:
- main parachute canopy
  - reserve parachute canopy
  - rapide link connectors
  - pack/harness assembly
  - cybernetic parachute release system (CYPRES) unit
- plus two of the following:
- control lines
  - slider control lines
  - control/steering handles
  - anaconda housing

- harness buckles
- equipment strap
- closure loop
- throwaway/auxiliary

plus four of the following:

- elastic bands/tube stows
- reserve spring
- main spring
- bridle line
- free bag
- pop top
- main/reserve handles
- main cutaway handle
- CYPRES battery
- deployment/lift-off bag

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

1.11 carry out maintenance work in compliance with one of the following:

- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- Ministry of Defence (MoD)
- Federal Aviation Authority (FAA)
- BS, ISO or BSEN standards and procedures
- customer standards and requirements
- company standards and procedures

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

1.13 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:

- maintenance schedule/log
- job cards
- aircraft service/flight log

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

### **Learning outcome**

The learner will:

2. Know how to carry out maintenance of free fall parachute assemblies

### **Assessment criteria**

The learner can:

2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the free fall parachute assemblies

2.2 explain 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

- 2.3 describe the hazards associated with maintaining the parachute assemblies, and explain how to minimise them and reduce any risks
- 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
- 2.5 explain what documentation, specifications and schedules are used during the servicing/maintenance activities, and the importance of following the procedures listed in these documents
- 2.6 describe the types of fault, defect or wear characteristic that are likely to occur with the free fall parachute assemblies
- 2.7 explain how to determine when components require adjustment, repair or replacement
- 2.8 describe the components to be replaced in the free fall parachute assemblies, and explain the method of replacement
- 2.9 explain how to identify the components to be used for the various types of parachute assembly being maintained
- 2.10 describe the quality control procedures to be followed during the maintenance procedures
- 2.11 explain how to conduct any necessary checks to ensure that the parachute assemblies function to specification
- 2.12 describe the problems that can occur with the maintenance of the parachute assemblies, and explain how these can be overcome
- 2.13 explain the importance of the correct securing and locking of connections
- 2.14 explain the importance of tool control, and the organisational tool control procedures used
- 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
- 2.16 explain the importance of ensuring that, when the maintenance is completed, the parachute assembly is free from dirt and foreign objects
- 2.17 explain the disposal methods for waste and petrol, oil and lubricants (POL)
- 2.18 describe the problems with the maintenance procedures, and explain the importance of informing appropriate people of defects
- 2.19 explain what recording documentation needs 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
- 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 598**                    **Carrying out maintenance of free fall parachute assemblies**

## Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)



## Unit 599

# Carrying out maintenance of static line parachute assemblies

<b>UAN:</b>	<b>R/601/5177</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 199: Carrying out maintenance of static line parachute assemblies (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on static line parachute assemblies, in accordance with approved procedures. The learner 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. The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the parachute and associated parts, in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures on static line</p>

parachutes. The learner will understand the type of parachute being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification. The learner will understand the safety precautions required when carrying out maintenance operations on static line parachute assemblies. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of static line parachute assemblies
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the static line parachute assemblies: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, technical instructions and specifications)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration date</li> <li>• use appropriate and approved servicing and maintenance techniques and procedures at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• dispose of waste materials in accordance with approved procedures</li> <li>• leave the work area and parachute assembly in a safe and appropriate condition, free from damage or foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction: <ul style="list-style-type: none"> <li>• Urgent Technical Instructions (UTI)</li> <li>• Routine Technical Instructions (RTI)</li> <li>• maintenance Instructions (MI)</li> </ul>

- Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
  - Service Modifications
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out all of the following repair/maintenance methods and techniques:
- dismantling the equipment to component or sub-assembly level (such as removal of harness, pack elastics)
  - cleaning the equipment (such as container, metallic components) using appropriate methods
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment, where applicable
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)/maintenance procedure
- 1.7 carry out a thorough examination of the parachute to include all of the following:
- the parachute canopy, drogues, pilot chutes, static line, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
  - all rigging lines for freedom from defects and correct sequence of connection
  - all control lines, slider control lines, slider inhibiting devices for freedom from defects and correct connection
  - pack/container, harness assembly, for freedom from damage, deterioration and correct assembly
  - risers, rapide links, three-ring attachment point, for freedom from damage, deterioration and security of attachment
  - main and reserve canopy for condition and record of usage
  - all grommets, screws and fasteners for security of attachment
  - primary and secondary bags for freedom from damage and deterioration
  - reserve static line for correct attachment
- 1.8 replace a range of components as detailed below:  
replace one of the following:
- main parachute canopy
  - reserve parachute canopy
  - auxiliary/pilot chute
  - rapide link connectors
  - pack/harness assembly
  - closure loop
  - closure pin
- plus two of the following:
- control lines

- slider control lines
- control/steering handles
- anaconda housing
- interconnecting line
- harness buckles
- rivets
- canopy withdrawal line
- primary/secondary bag

plus four of the following:

- elastic bands/tube stows
- reserve spring
- main spring
- bridle line
- reserve static line
- shroud line links
- equipment strap
- pop top
- reserve handle
- main cutaway handle
- deployment/lift-off bag

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

1.10 carry out maintenance work in compliance with one of the following:

- Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
- Ministry of Defence (MoD)
- Federal Aviation Authority (FAA)
- BS, ISO or BSEN standards and procedures
- customer standards and requirements
- company standards and procedures

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

1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:

- maintenance schedule/log
- job cards
- aircraft service/flight log

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

<b>Learning outcome</b>
The learner will: 2. Know how to carry out maintenance of static line parachute assemblies
<b>Assessment criteria</b>
The learner can: 2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the static line parachute assemblies 2.2 explain 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 2.3 describe the hazards associated with maintaining the parachute assemblies, and explain how to minimise them and reduce any risks 2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained 2.5 explain what documentation, specifications and schedules are used during the servicing/maintenance activities, and the importance of following the procedures listed in these documents 2.6 describe the types of fault, defect or wear characteristic that are likely to occur with the static line parachute assemblies 2.7 explain how to determine when components require adjustment, repair or replacement 2.8 describe the components to be replaced in the static line parachute assemblies, and explain the method of replacement 2.9 explain how to identify the components to be used for the various types of parachute assembly being maintained 2.10 describe the quality control procedures to be followed during the maintenance procedures 2.11 explain how to conduct any necessary checks to ensure that the parachute assemblies function to specification 2.12 describe the problems that can occur with the maintenance of the parachute assemblies, and explain how these can be overcome 2.13 explain the importance of the correct securing and locking of connections 2.14 explain the importance of tool control, and the organisational tool control procedures used 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures 2.16 explain the importance of ensuring that, when the maintenance is completed, the parachute assembly is free from dirt and foreign objects 2.17 explain the disposal methods for waste and petrol, oil and lubricants (POL) 2.18 describe the problems with the maintenance procedures, and the importance of informing appropriate people of defects 2.19 explain what recording documentation needs 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 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 599**

## **Carrying out maintenance of static line parachute assemblies**

Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 600

## Carrying out maintenance of brake parachute assemblies

<b>UAN:</b>	<b>H/601/5183</b>
<b>Level:</b>	3
<b>Credit value:</b>	30
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 200: Carrying out maintenance of brake parachute assemblies (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on brake parachute assemblies, in accordance with approved procedures. The learner 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. The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the parachute and associated parts, in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to brake parachutes. The learner will understand the type of</p>

parachute being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on brake parachute assemblies. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of brake parachute assemblies
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the brake parachute assemblies: <ul style="list-style-type: none"><li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, technical instructions and specifications)</li><li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li><li>• provide and maintain a safe working environment for the maintenance activities</li><li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration date</li><li>• use appropriate and approved servicing and maintenance techniques and procedures at all times</li><li>• return all tools and equipment to the correct location on completion of the activities</li><li>• dispose of waste materials in accordance with approved procedures</li><li>• leave the work area and parachute assembly in a safe and appropriate condition, free from damage or foreign object debris on completion of the activities</li></ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instructions: <ul style="list-style-type: none"><li>• Urgent Technical Instructions (UTI)</li><li>• Routine Technical Instructions (RTI)</li><li>• maintenance Instructions (MI)</li></ul>



- Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
  - Service Modifications
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out all of the following repair/maintenance methods and techniques:
- dismantling the equipment to component or sub-assembly level
  - cleaning the equipment (such as container, metallic components) using appropriate methods
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment, where applicable
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)/maintenance procedure
- 1.7 carry out a thorough examination of the parachute, to include all of the following:
- the parachute canopy, drogues, pilot chutes, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
  - all rigging lines for freedom from defects and correct sequence of connection
  - pack/container assembly, for freedom from damage, deterioration, contamination and correct assembly
  - links, attachment points, for freedom from damage, deterioration and security of attachment
  - canopy for condition and record of usage
  - all grommets, screws and fasteners for security of attachment
- 1.8 replace a range of components as detailed below
- replace one of the following:
- main parachute canopy
  - reserve parachute canopy
  - connectors
  - pack/container assembly
- plus two of the following:
- auxiliary parachute
  - canopy withdrawal line
  - gaiters
  - retaining strop/flap
  - rigging line stowage
- plus four of the following:
- elastic bands
  - links

<ul style="list-style-type: none"> <li>• main connector link</li> <li>• nuts</li> <li>• split pins</li> <li>• grommets</li> </ul> <p>1.9 carry out the maintenance activities in the specified sequence and in an agreed timescale</p> <p>1.10 carry out maintenance work in compliance with one of the following:</p> <ul style="list-style-type: none"> <li>• Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)</li> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN standards and procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul> <p>1.11 report any instances where the servicing or maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<b>Learning outcome</b>
The learner will:
2. Know how to carry out maintenance of brake parachute assemblies
<b>Assessment criteria</b>
The learner can:
2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the brake parachute assemblies
2.2 explain 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
2.3 describe the hazards associated with maintaining the parachute assemblies, and explain how to minimise them and reduce any risks
2.4 explain what personal protective equipment that they need to use during the maintenance activities, and where it can be obtained
2.5 explain what documentation, specifications and schedules are used during the servicing/maintenance activities, and the importance of following the procedures listed in these documents
2.6 describe the types of fault, defect or wear characteristic that are likely to occur with the brake parachute assemblies
2.7 explain how to determine when components require adjustment, repair or replacement
2.8 describe the components to be replaced in the brake parachute assemblies, and explain the method of replacement

- 2.9 explain how to identify the components to be used for the various types of parachute assembly being maintained
- 2.10 describe the quality control procedures to be followed during the maintenance procedures
- 2.11 explain how to conduct any necessary checks to ensure that the parachute assemblies function to specification
- 2.12 describe the problems that can occur with the maintenance of the parachute assemblies, and explain how these can be overcome
- 2.13 explain the importance of correct securing and locking of connections
- 2.14 explain the importance of tool control, and the organisational tool control procedures used
- 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
- 2.16 explain the importance of ensuring that, when the maintenance is completed, the parachute assembly is free from dirt and foreign objects
- 2.17 explain the disposal methods for waste and petrol, oil and lubricants (POL)
- 2.18 describe the problems with the maintenance procedures, and the importance of informing appropriate people of defects
- 2.19 explain what recording documentation needs 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
- 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 600                      Carrying out maintenance of brake parachute assemblies**

## Supporting information

### **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)

## Unit 601

## Carrying out maintenance of night vision goggles

<b>UAN:</b>	<b>A/601/5187</b>
<b>Level:</b>	3
<b>Credit value:</b>	28
<b>GLH:</b>	52
<b>Relationship to NOS:</b>	This unit has been derived from national occupational standard Aeronautical Engineering Unit 201: Carrying out maintenance of night vision goggles (Suite 3).
<b>Endorsement by a sector or regulatory body:</b>	This unit is endorsed by Semta, the Sector Skills Council for science, engineering and manufacturing
<b>Aim:</b>	<p>This unit covers the skills and knowledge needed to prove the competences required to carry out servicing and maintenance activities on night vision goggle (NVG) assemblies, in accordance with approved procedures. The learner 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. The maintenance activities will involve dismantling the equipment, cleaning the various parts using suitable solutions, carrying out a thorough examination of the night vision goggles and associated parts, in line with the relevant schedule, replacing any damaged or defective parts, carrying out any required modifications, making any required adjustments, checking and testing equipment operation and performance.</p> <p>The learner's 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 that are outside their permitted authority, to the relevant people. The learner will be expected to work with a minimum of supervision, taking personal responsibility for their own actions and for the quality and accuracy of the work that they carry out.</p> <p>The learner's knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance</p>

techniques and procedures to night vision goggles. The learner will understand the type of night vision goggle being maintained, and its application, and will know about the various components, in adequate depth to provide a sound basis for carrying out the activities, identifying and correcting faults, and ensuring that the equipment is maintained to the required specification.

The learner will understand the safety precautions required when carrying out maintenance operations on night vision goggles. 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.

<b>Learning outcome</b>
The learner will: 1. Be able to carry out maintenance of night vision goggles
<b>Assessment criteria</b>
The learner can: 1.1 work safely at all times, complying with health and safety and other relevant regulations and guidelines 1.2 carry out all of the following during the servicing and maintenance of the night vision goggles: <ul style="list-style-type: none"> <li>• obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, technical instructions and specifications)</li> <li>• adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work</li> <li>• provide and maintain a safe working environment for the maintenance activities</li> <li>• obtain the correct tools and equipment for the activity, and check that they are in a safe and usable condition and within current calibration dates</li> <li>• use appropriate and approved servicing and maintenance techniques and procedures at all times</li> <li>• return all tools and equipment to the correct location on completion of the activities</li> <li>• dispose of waste materials in accordance with approved procedures</li> <li>• leave the work area and goggle assembly in a safe and appropriate condition, free from damage or foreign object debris on completion of the activities</li> </ul> 1.3 follow the relevant maintenance schedules to carry out the required work 1.4 carry out maintenance requirements, in accordance with two of the following types of instruction:

- Urgent Technical Instructions (UTI)
  - Routine Technical Instructions (RTI)
  - maintenance Instructions (MI)
  - Preliminary Warning Instructions (PWI)
  - Serious Defect Signals
  - Service Modifications
- 1.5 carry out the maintenance activities within the limits of their personal authority
- 1.6 carry out all of the following repair/maintenance methods and techniques:
- dismantling equipment to component or sub-assembly level
  - cleaning the equipment/components using the appropriate methods
  - monitoring the condition/deterioration of components
  - replacing all damaged or defective components
  - reassembling the equipment
  - carrying out any required modifications to the equipment
  - carrying out adjustments to components and connections
  - checking equipment operation and performance
  - testing the equipment, in accordance with the relevant air publication (AP)/maintenance procedure
- 1.7 carry out a thorough examination of the night vision goggles, to include all of the following:
- the objective lens assembly and eyepiece lens assembly for freedom from cracking and integrity of assembly
  - all function switches for operation and security of attachment
  - image intensifier tube assembly, for freedom from damage and deterioration
  - sealing and retaining rings, for freedom from damage, deterioration and security of attachment
  - switch assembly, switch strap and switch release lever for freedom from damage
- 1.8 replace a range of components, as detailed below:
- replace one of the following:
- image intensifier tube (IIT)
  - eyepiece lens assembly
  - objective lens assembly
- plus two of the following:
- sealing ring
  - retaining ring
  - light absorbing filter
  - threaded shaft
  - straight head pin
  - objective locking ring
- plus three of the following:
- screws
  - washers
  - grommets

<ul style="list-style-type: none"> <li>• shims/bushings</li> <li>• switches/switch straps</li> <li>• ocular sub-assembly</li> </ul> <p>1.9 carry out the maintenance activities in the specified sequence and in an agreed timescale</p> <p>1.10 carry out maintenance work in compliance with one of the following:</p> <ul style="list-style-type: none"> <li>• Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)</li> <li>• Ministry of Defence (MoD)</li> <li>• Federal Aviation Authority (FAA)</li> <li>• BS, ISO or BSEN standards and procedures</li> <li>• customer standards and requirements</li> <li>• company standards and procedures</li> </ul> <p>1.11 report any instances where the servicing or maintenance activities cannot be fully met or where there are identified defects outside the planned schedule</p> <p>1.12 complete the relevant maintenance records accurately and pass them on to the appropriate person, to include one of the following:</p> <ul style="list-style-type: none"> <li>• maintenance schedule/log</li> <li>• job cards</li> <li>• aircraft service/flight log</li> </ul> <p>1.13 dispose of waste materials in accordance with safe working practices and approved procedures</p>
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<b>Learning outcome</b>
The learner will:
2. Know how to carry out maintenance of night vision goggles
<b>Assessment criteria</b>
The learner can:
2.1 explain the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the night vision goggles
2.2 explain the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities, and the responsibility these requirements place on them
2.3 describe the hazards associated with maintaining night vision goggles, and explain how to minimise them and reduce any risks
2.4 explain what personal protective equipment they need to use during the maintenance activities, and where it can be obtained
2.5 explain what maintenance schedules and servicing specifications are used during the servicing and maintenance, and the importance of following the procedures listed in these documents
2.6 describe the types of fault, defect or wear characteristic that are likely to occur with the night vision goggles
2.7 explain how to determine when components require adjustment, repair or replacement
2.8 describe the components to be replaced in the night vision goggles, and explain the method of replacement
2.9 explain how to identify the components to be used for the various



- types of night vision goggle assembly being maintained
- 2.10 describe the quality control procedures to be followed during the maintenance procedures
  - 2.11 explain how to conduct any necessary checks to ensure that the night vision goggles function to specification
  - 2.12 describe the problems that can occur with the maintenance of the night vision goggles, and explain how these can be overcome
  - 2.13 explain the importance of correct securing and locking of connections
  - 2.14 explain the importance of tool control, and the organisational tool control procedures used
  - 2.15 describe the tools and equipment used in the maintenance activities, and explain their calibration/care and control procedures
  - 2.16 explain the importance of ensuring that, when the maintenance is completed, the equipment is free from dirt, swarf and foreign objects
  - 2.17 explain the disposal methods for waste and petrol, oil and lubricants (POL)
  - 2.18 describe the problems with the maintenance procedures, and the importance of informing appropriate people of defects
  - 2.19 explain what recording documentation needs 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
  - 2.20 describe the extent of their own responsibility, and explain to whom they should report if they have problems that they cannot resolve

# **Unit 601                    Carrying out maintenance of night vision goggles**

Supporting information

## **Guidance**

2.1 (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

2.5 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals)



## Appendix 1 Relationships to other qualifications

### Literacy, language, numeracy and ICT skills development

This qualification can develop skills that can be used in the following qualifications:

- Functional Skills (England) – see [www.cityandguilds.com/functionalskills](http://www.cityandguilds.com/functionalskills)
- Essential Skills (Northern Ireland) – see [www.cityandguilds.com/essentialskillsni](http://www.cityandguilds.com/essentialskillsni)
- Essential Skills Wales – see [www.cityandguilds.com/esw](http://www.cityandguilds.com/esw).



## Appendix 2 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](http://www.cityandguilds.com).

**Centre Manual - Supporting Customer Excellence** 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 such on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Qualifications and Credit Framework (QCF):** general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
- **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.

City & Guilds  
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[www.cityandguilds.com](http://www.cityandguilds.com)

## Useful contacts

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### UK learners

#### General qualification information

T: +44 (0)844 543 0033

E: [learnersupport@cityandguilds.com](mailto:learnersupport@cityandguilds.com)

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### International learners

General qualification information

T: +44 (0)844 543 0033

F: +44 (0)20 7294 2413

E: [intcg@cityandguilds.com](mailto:intcg@cityandguilds.com)

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### Centres

Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [centresupport@cityandguilds.com](mailto:centresupport@cityandguilds.com)

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### 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

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

F: +44 (0)20 7294 2404 (BB forms)

E: [singlesubjects@cityandguilds.com](mailto:singlesubjects@cityandguilds.com)

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### International awards

Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [intops@cityandguilds.com](mailto:intops@cityandguilds.com)

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### Walled Garden

Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: [walledgarden@cityandguilds.com](mailto:walledgarden@cityandguilds.com)

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### Employer

Employer solutions, Mapping, Accreditation, Development Skills, Consultancy

T: +44 (0)121 503 8993

E: [business@cityandguilds.com](mailto:business@cityandguilds.com)

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### Publications

Logbooks, Centre documents, Forms, free literature

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

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If you have a complaint, or any suggestions for improvement about any of the services that we provide, email: [feedbackandcomplaints@cityandguilds.com](mailto: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 operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio).

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