Level 3 Diploma in Aviation Maintenance (Military Development Competence) (4608-60) - Survival Equipment Maintenance

Version 2 (July 2019)

Unit Pack

Qualification at a glance

Subject area	Mechanical
City & Guilds number	4608
Age group approved	16-19, 19+
Entry requirements	None
Assessment types	Portfolio
Approvals	Automatic approval
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	GLH	TQT	City & Guilds qualification number	Ofqual accreditation number
Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Survival Equipment Maintenance	370	1510	4608-60	603/2068/0

This unit pack must be read in conjunction with the main qualification handbook.

Version and date	Change detail	Section
Version 2 July 2019	GLH and TQT added. Formatting of units.	Qualifications at a Glance

Contents

1 Introduction

Level 3 Diploma in Aviation Maintenance (Military Development Competence) - Survival Equipment Maintenance

Structure

Learners must complete (301,302, 304, 455) plus five from (441 - 454)

City & Guilds unit number	Unit title	GLH
Mandatory		
301	Complying with statutory regulations and organisational safety requirements	35
302	Using and interpreting engineering data and documentation	25
304	Reinstating the work area on completion of activities	25
455	Working efficiently and effectively in engineering	25
Optional		
441	Carrying out maintenance of aircrew protective helmets and electrical headsets	52
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Optional

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452	Carrying out maintenance of static line parachute assemblies	52
453	Carrying out maintenance of brake parachute assemblies	52
454	Carrying out maintenance of night vision goggles	52

2 Units

Structure of the units

These units each have the following:

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

Centres must deliver the full breadth of the range. Specialist equipment or commodities may not be available to all centres, so centres should ensure that their delivery covers their use. This may be covered by a practical demonstration (e.g. video). For the practical assessments for this qualification, centres should ensure that there are sufficient resources to complete the task but are not required to use all the equipment or commodities in the range.

Please refer to the main qualification handbook for full information on the qualification and the shared mandatory units.

Unit 441 Carrying out maintenance of aircrew protective helmets and electrical headsets

GLH:	52
Unit aim:	Overview This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew protective helmets and electrical headsets, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning 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. They will understand the helmets and headsets 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. They will understand the safety precautions required when carrying out the protective helmet and headset maintenance operations. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the aircrew protective helmets and electrical headsets:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any power isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of oxygen mask, visor cover and fabric covers)
2.2 cleaning the equipment (such as visor, protective shell and headsets), using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections (such as friction settings, tuning and adjusting microphones)
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the helmet and headset, to include checking **all** of the following:

3.1 the protective shell for damage and softness of shell
3.2 all protective shell screws/fasteners for security
3.3 visors for scratches, abrasions and cracks
3.4 visor hinge mechanism for corrosion, damage, security, and adjust friction settings, as required
3.5 ear capsules for damage, wear, hardening, discoloration and security
3.6 'Mic/Tel' leads for deterioration or fraying, damage to pin connectors
3.7 chin and neck strap for wear, damage, fraying and deterioration
3.8 oxygen mask connectors for damage, security and bending/distortion
3.9 electrical headsets for signs of damage and deterioration
3.10 ear pads and headbands for hardening or cracking
3.11 the ear shells move freely in their stirrups
3.12 the microphone switch moves freely, and adjustable parts move freely without undue slackness (If applicable)
3.13 boom microphone (where fitted) for looseness and damage.

Learning outcome

The learner will:

4 replace components, to include **six** of the following:

4.1 visor (clear or tinted)
4.2 pads (crown, brow or neck)
4.3 side arm (outer and inner)
4.4 elastic straps
4.5 base assembly oxygen mask
4.6 ear capsule tensioning webbing
4.7 strap assembly cable retaining
4.8 transducer
4.9 strap assembly (chin or neck)
4.10 microphone switch
4.11 headset electrica
4.12 microphone boom
4.13 ear capsule
4.14 earphone
4.15 down lead assembly
4.16 fabric cover
4.17 lining assembly (brow or neck)
4.18 headband
4.19 visor cover assembly
4.20 earphone shell
4.21 'Mic/Tel' lead (down lead and jack plug connector)
4.22 other specific helmet or headset component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew protective helmets and headsets (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircrew protective helmets and electrical headsets and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew protective helmets and electrical sets.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the protective helmets and headsets, and their method of replacement.

K11 how to identify the components to be used for the various types of protective helmets and headsets being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the protective helmets and headsets and how these can be overcome.

K15 the importance of the correct securing and locking of connections

Unit 441 Carrying out maintenance of aircrew protective helmets and electrical headsets

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 442 Carrying out maintenance of aircrew protective clothing

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew protective clothing, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to aircrew clothing. They 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. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the aircrew protective clothing:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out maintenance activities on **three** of the following types of aircrew protective clothing:

2.1 aircrew coverall/ fly suit
2.2 coverall immersion inner
2.3 immersion coverall
2.4 anti-G trousers
2.5 combat survival waistcoat
2.6 temperate jacket
2.7 integrated protective garment
2.8 other specific aircrew clothing.

Learning outcome

The learner will:

3 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

3.1 dismantling equipment to component or sub-assembly level (such as removal of cutter)
3.2 cleaning the equipment using appropriate solutions (such as removal of soiling, oil stains, salt water)
3.3 examining the condition/deterioration of components
3.4 replacing all damaged or defective components
3.5 reassembling the equipment
3.6 carrying out any required modifications to the equipment
3.7 carrying out adjustments to components and connections
3.8 checking equipment operation and performance
3.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

4 carry out a thorough examination of the aircrew clothing, to include checking/ examining **all** of the following:

4.1 the fabric for damage or deterioration
4.2 sliding fasteners, eyelets and closure flaps for security of attachment
4.3 securing straps, webbing and touch-and-close tape check for security
4.4 emergency cutter (if fitted), examine for damage, check release mechanism and ensure correct operation

4.5 fabric patch, cleat and lanyard for damage, fraying of the cord and security of attachment

4.6 snap fasteners for damage and security of attachment (where fitted)

4.7 neck, wrist and supply seals (if fitted) for deterioration, damage and security of attachment

4.8 pull-tab retainer, pen pocket and chinagraph pencil attachment loop, for damage and security of attachment

4.9 boots and socks, external and internal tapes and urination sleeve, for deterioration and damage.

Learning outcome

The learner will:

5 replace components, to include **six** of the following:

5.1 pockets

5.2 front entry sliding fastener pull-tab assembly

5.3 sliding fasteners

5.4 socks

5.5 renewal of broken stitching

5.6 boots

5.7 cleat

5.8 blanking plugs

5.9 nylon cord

5.10 tapes

5.11 split-ring

5.12 hose assembly

5.13 urination sliding fastener panel

5.14 stainless tab washer

5.15 pull-tab back gusset

5.16 fastener snap nylon

5.17 back gusset sliding fastener

5.18 fabric base

5.19 back gusset

5.20 neck seal

5.21 patches

5.22 wrist seal

5.23 kneeboard

5.24 other specific aircrew protective clothing component.

Learning outcome

The learner will:

6 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

6.1 Urgent Technical Instructions (UTI)
6.2 Routine Technical Instructions (RTI)
6.3 Maintenance Instructions (MI)
6.4 Preliminary Warning Instructions (PWI)
6.5 Modification
6.6 Air Publications
6.7 Digital Air Publications (DAP)
6.8 other specific instruction.

Learning outcome

The learner will:

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

7.1 Military Aviation Authority (MAA)
7.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
7.3 BS, ISO or BSEN standards and procedures
7.4 Aerospace Quality Management Standards (AS)
7.5 specific system requirements
7.6 Federal Aviation Authority (FAA)
7.7 organisation standards and procedures
7.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

8 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

8.1 job cards
8.2 computer records
8.3 aircraft service/flight log
8.4 aircraft log
8.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew protective clothing (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircrew protective clothing and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew protective clothing.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the protective clothing, and their method of replacement.

K11 how to identify the components to be used for the various types of protective clothing being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the protective clothing and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 442 Carrying out maintenance of aircrew protective clothing

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 443 Carrying out maintenance of nuclear, biological and chemical (NBC) respirators and equipment

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew nuclear, biological and chemical (NBC) respirators and equipment, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning 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. They 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. They will understand the safety precautions required when carrying out the aircrew NBC equipment maintenance operations. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the aircrew NBC equipment:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of velveteen cover and valves, ice guard, cover and filtration canisters)
2.2 cleaning the equipment (such as respirator assembly and valves, drinking facility), using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the aircrew respirator/portable ventilator, to include checking **all** of the following:

3.1 mask support and deflector plate, mask face-piece and mask tubing, for damage deterioration and security of attachment
3.2 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
3.3 all screws, nuts and fasteners for security of attachment
3.4 nose occluder assembly, drinking facility for damage, puncture, cut or abrasion or deterioration of rubber
3.5 chain toggle harness and chain harness - examine all links for damage and security of attachment
3.6 inspiratory valve, ice guard filter, stepped expiratory valve, for deterioration and damage
3.7 apron, neck seal, bellows and cowl for damage, deterioration and security of bonded joints
3.8 manifold assembly, hoses and connectors for wear, damage, deterioration and security of attachment
3.9 microphone lead assembly for damage, deterioration or fraying
3.10 microphone switch for free movement without slackness

3.11 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

3.12 canisters, canister mount seals, emergency inlet valve and pressure relief valve for damage, deterioration, freedom of movement and security of attachment.

Learning outcome

The learner will:

4 replace a range of NBC components, to include **six** of the following:

4.1 ice guard
4.2 hood outlet and shut-off valve
4.3 protective sleeves
4.4 inspiratory valve
4.5 hood inlet adapter
4.6 canister
4.7 compensated expiratory valve
4.8 angled inlet adapter
4.9 canister mount seals
4.10 stepped expiratory valve
4.11 hood tube
4.12 battery
4.13 velveteen cover
4.14 mask tube
4.15 case
4.16 microphone lead assembly
4.17 chain toggle harness
4.18 cover
4.19 mask
4.20 manifold
4.21 nut connecting cover
4.22 other specific NBC component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)

5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

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

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

K3 the hazards associated with maintaining aircrew NBC equipment and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew NBC equipment.

K9 how to determine when components require adjustment, repair or replacement

K10 the components to be replaced in the NBC equipment, and their method of replacement.

K11 how to identify the components to be used for the various types of NBC equipment being maintained.

K1.2 the quality control procedures to be followed during the maintenance procedures

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the NBC equipment and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 443 Carrying out maintenance of nuclear, biological and chemical (NBC) respirators and equipment

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment Strategy.

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

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

Unit 444 Carrying out maintenance of aircrew life preserver equipment

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew life preserver equipment, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to aircrew life preserver equipment. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircrew life preserver equipment. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 Carry out **all** of the following during the servicing and maintenance of the aircrew life preserver equipment:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of personal locator beacon (PLB) and CO2 cylinder)
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out any adjustments to components and connections (where required)
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the life preserver, to include checking **all** of the following:

3.1 waistcoat front closure plate or zip for damage, wear and insecurity
3.2 waist adjustment straps and buckles for damage and correct locking action
3.3 all internal and external stowage pockets for damage, wear and security
3.4 inflation valve and oral tube for damage and deterioration
3.5 stole pouch and peripheral slide fastener for damage and wear - check the operation
3.6 all fasteners and eyelets for damage, wear and insecurity
3.7 webbing tape hinges and tape touch-and-close for damage, wear and security
3.8 stole lacing loops, webbing loops and lifting beckets for damage, wear and security
3.9 life line and toggle, whistle and lanyard, survival aids - examine for correct length and security of knots
3.10 water activated battery and lamp assembly, for damage, length of lanyard and security of knots
3.11 pyrotechnic signal kit for damage and integrity of seals
3.12 'Mic/Tel' flap and D-ring for damage and wear
3.13 CO2 cylinder for corrosion, dents, damage and integrity of gas seal and screw threads (where required).

Learning outcome

The learner will:

4 replace a range of life preserver equipment components, to include **six** of the following:

4.1 inflatable stole
4.2 waistcoat
4.3 personal locator beacon (PLB)
4.4 pyrotechnic signal kit
4.5 personal locator beacon battery
4.6 drinking water
4.7 personal locator beacon aerial
4.8 heliograph
4.9 CO2 cylinder
4.10 automatic life preserver inflation unit (ALPIU)
4.11 water activated battery and lamp
4.12 manual inflator
4.13 first aid kit
4.14 foil blanket
4.15 light marker distress
4.16 arm restraint extension line (AREL)
4.17 rescue streamer
4.18 other specific life preserver equipment component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew life preserver equipment (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).
K2 the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities and the responsibility these requirements place on them.
K3 the hazards associated with maintaining aircrew life preserver equipment and with the tools and equipment used and how to minimise them and reduce any risks.
K4 the importance of applying the appropriate behaviours in the workplace and the implications for both the apprentice and the organisation if these are not adhered to.
K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew life preserver equipment.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the life preserver equipment, and their method of replacement.

K11 how to identify the components to be used for the various types of life preserver equipment being maintained.

K12 the quality control procedures to be followed during the maintenance procedures

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the life preserver equipment and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 444 Carrying out maintenance of aircrew life preserver equipment

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 445 Carrying out maintenance of aircrew inertia reels and restraint harnesses

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew inertia reels, restraint harnesses and equipment, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning 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. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircrew inertia reels and restraint harness equipment. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the aircrew inertia reels and restraint harness equipment:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment (such as inertia reels, shoulder harness, operator unit and quick-release fasteners) in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the inertia reel and restraint harness, to include checking **all** of the following:

3.1 casing and operating lever for corrosion, damage and deterioration
3.2 cable conduit for fraying and cable for damage and security of swaged end
3.3 inertia reel torsion spring, mounting collar washers, damper assembly, shims and drive shaft bearing, for corrosion, damage and deterioration
3.4 brake and inertia plates for damage and wear
3.5 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
3.6 restraint harness for damage, wear, security of all fastenings and correct operation of all parts.

Learning outcome

The learner will:

4 replace a range of inertia reel and restraint harness components, to include **six** of the following:

4.1 flexible cable
4.2 thrust plates
4.3 cover cap screws
4.4 ball holder

4.5 retaining nut
4.6 guide discs
4.7 cover cap
4.8 steel ball
4.9 retaining plate
4.10 drive shaft
4.11 guide pin
4.12 operating knob
4.13 torsion spring
4.14 bearing
4.15 spacer tubes
4.16 knob cover plate
4.17 mounting collar
4.18 end cap
4.19 moving plunger springs
4.20 knob cover plate screws
4.21 end plug
4.22 body
4.23 moving plungers
4.24 thumb catch assembly
4.25 screws
4.26 brake plate
4.27 anti-G-pins
4.28 thumb catch spring
4.29 adaptor
4.30 inertia plate
4.31 anti-G collar
4.32 thumb catch anchor plate
4.33 damper assembly
4.34 locking washer screws
4.35 cam plate
4.36 damper spring
4.37 locking washer
4.38 cam spindle
4.39 shims
4.40 stud
4.41 other specific inertia reel or restraint harness component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment
7.6 job cards
7.7 computer records.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew inertia reels and restraint harness equipment (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircrew inertia reels and restraint harness equipment and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew inertia reels and restraint harness equipment.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the inertia reels and restraint harness equipment, and their method of replacement.

K11 how to identify the components to be used for the various types of inertia reels and restraint harness equipment being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the inertia reels and restraint harness equipment and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 445 Carrying out maintenance of aircrew inertia reels and restraint harnesses

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 446 Carrying out maintenance of aircraft multi-seat life rafts and emergency packs

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircraft multi-seat life rafts and emergency packs, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to aircraft multi-seat life rafts and emergency packs. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircraft multi-seat life rafts and emergency packs. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of multi-seat life rafts and emergency packs:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of the operating head, CO2 cylinder and survival aids)
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment (such as life raft, flashing beacon, CO2 cylinder, operating head, sea light and batteries) in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the life raft and emergency pack, to include checking **all** of the following:

3.1 life raft container for contamination, damage, cracks and soft spots
3.2 fabric containers, painter operating cord for contamination, deterioration and fraying
3.3 survival aids for damage, deterioration, illegibility and life expiry date of consumables
3.4 operating head and inflation equipment for corrosion, damage and security of attachment
3.5 buoyancy chamber, floor, and canopy and entrance covers, for deterioration, chafing and damage
3.6 inflation valves for damage and deterioration
3.7 boarding handles, handling loops, water pockets and cylinder sleeve, for damage and security of attachment
3.8 leak stoppers and harness for wear, damage and security of attachment
3.9 CO2 cylinders for stowage, security of attachments and life expiry date
3.10 all ancillary equipment for damage and security
3.11 sea anchor for security and lines for wear or damage
3.12 emergency pack - all contents for expiry date, damage and warranty life
3.13 life raft flashing beacon assembly for damage and security
3.14 sea light and batteries for damage and warranty life
3.15 other specific liferaft or emergency pack component.

Learning outcome

The learner will:

4 replace a range of multi-seat life raft and emergency pack components, to include **six** of the following:

4.1 CO2 cylinder
4.2 operating head
4.3 sponge
4.4 first aid kit
4.5 operating cable
4.6 deflation plug
4.7 sea sickness tablets container
4.8 Y-hose assembly
4.9 batteries (sea water)
4.10 survival aids container
4.11 bellows
4.12 batteries (lithium)
4.13 painter line
4.14 water bags
4.15 drogue
4.16 gas inlet
4.17 water carrier
4.18 snap hook
4.19 handles
4.20 fishing kit
4.21 compass
4.22 fabric cover/closure flaps
4.23 ground air emergency label
4.24 lifed items (such as rations)
4.25 reverse osmosis pump (ROP)
4.26 signal distress day/night.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification

5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircraft multi-seat life rafts and emergency packs (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircraft multi-seat life rafts and emergency packs and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircraft multi-seat life rafts and emergency packs.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the aircraft multi-seat life rafts and emergency packs, and their method of replacement.

K11 how to identify the components to be used for the various types of aircraft multi-seat life rafts and emergency packs being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the aircraft multi-seat life rafts and emergency packs and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 446 Carrying out maintenance of aircraft multi-seat life rafts and emergency packs

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 447 Carrying out maintenance of aircrew oxygen masks

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew oxygen masks, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning 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. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircrew oxygen masks. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of aircrew oxygen masks:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of microphone, toggle harness and valves)
2.2 cleaning the equipment (such as face-piece and valves) using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing the equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the aircrew oxygen masks, to include checking **all** of the following:

Assessment criteria

The learner can:

3.1 the face-piece and mask tubing for damage, deterioration and surface crazing
3.2 all screws and fasteners for security
3.3 toggle harness assembly for cracking and surface damage
3.4 microphone lead assembly for damage, deterioration or fraying
3.5 microphone switch for free movement without slackness
3.6 wire and chain adjusters for stiffness and damage
3.7 inspiratory valve, ice guard filter, expiratory valve and anti-suffocation valve (if fitted) for damage

Learning outcome

The learner will:

4 replace a range of aircrew oxygen mask components, to include **six** of the following:

4.1 microphone
4.2 inspiratory valve
4.3 anti-suffocation valve

4.4 face-piece
4.5 air inlet (inspiratory valve if fitted)
4.6 mask tube
4.7 toggle harness assembly
4.8 expiratory valve
4.9 ice guard filter
4.10 other specific oxygen mask component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew oxygen masks (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircrew oxygen masks and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the oxygen masks.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the oxygen masks, and their method of replacement.

K11 how to identify the components to be used for the various types of aircrew oxygen masks being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the aircrew oxygen masks and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 447 Carrying out maintenance of aircrew oxygen masks

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 448 Carrying out maintenance of aircrew personal survival packs (PSP)

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew personal survival packs (PSP), in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to aircrew personal survival packs. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircrew personal survival packs. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Carrying out maintenance of aircrew personal survival packs (PSP)

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of aircrew personal survival packs:

Assessment criteria

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of the operating head, CO2 cylinder and survival aids)
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections (such as torque setting)
2.8 checking equipment operation and performance
2.9 testing the equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the aircrew personal survival packs, to include checking **all** of the following:

3.1 the rigid shell and protective strips for damage, cracks and security of attached items
3.2 fabric container, cushion, lowering line and single-handed release system, for contamination, deterioration, wear and broken stitching
3.3 survival aids, for damage, deterioration, illegibility and life expiry date of consumables
3.4 automatic life-raft inflation unit (ALIU), automatic deflation unit (ADU) cables for corrosion, damage and security of attachment
3.5 buoyancy chamber, floor and canopy for deterioration, chafing and damage
3.6 oral inflation valves for damage and deterioration
3.7 boarding handles, handling loops, water pockets and cylinder sleeve, for damage and security of attachment
3.8 leak stoppers and harness, for wear, damage and security of attachment
3.9 CO2 cylinders for stowage, security of attachments and life expiry date
3.10 all ancillary equipment for damage and security
3.11 emergency pack - all contents for expiry date, damage and warranty life
3.12 batteries and signalling devices (where fitted) for damage/warranty life.

Learning outcome

The learner will:

4 replace a range of aircrew personal survival packs components, to include **six** of the following:

4.1 CO2 cylinder
4.2 cushion assembly
4.3 signal distress day/night
4.4 first aid kit
4.5 retaining lanyard
4.6 deflation plug
4.7 sea sickness tablets
4.8 operating head
4.9 battery
4.10 shell
4.11 automatic life-raft inflation unit (ALIU)
4.12 closure flaps
4.13 survival aids container
4.14 operating cable
4.15 drogue
4.16 lowering line
4.17 automatic deflation unit (ADU)
4.18 disk bushing
4.19 gas inlet
4.20 polyacetal washer
4.21 special nut
4.22 handles
4.23 bellows
4.24 compass
4.25 fabric cover/closure flaps
4.26 sponge
4.27 lifed items (such as rations)
4.28 other specific PSP components.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)

5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew personal survival packs (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).
K2 the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities and the responsibility these requirements place on them.

K3 the hazards associated with maintaining aircrew personal survival packs and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the aircrew personal survival packs.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the aircrew personal survival packs, and their method of replacement.

K11 how to identify the components to be used for the various types of aircrew personal survival packs being maintained.

K12 the quality control procedures to be followed during the maintenance procedures

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the aircrew personal survival packs and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 448 Carrying out maintenance of aircrew personal survival packs (PSP)

Supporting Information

Unit Range Description

Evidence requirements

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 449 Carrying out maintenance of aircrew quick-release fasteners (QRF)

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on aircrew quick- release fasteners (QRF), in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to aircrew quick-release fasteners. They 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. They will understand the safety precautions required when carrying out maintenance operations on aircrew quick- release fasteners. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

The learner will:

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the aircrew quick-release fasteners:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the aircrew quick-release fasteners, to include checking **all** of the following:

3.1 the body assembly for damage and deterioration
3.2 the anti-G plate for date of manufacture, profile and freedom from damage
3.3 operating knob for security of label and freedom from burring or chipping
3.4 the torque setting of the operating knob (if required)
3.5 locking plungers, locking plunger springs and guide bush, for damage, deterioration and corrosion
3.6 operating plunger for chips, burrs, corrosion and damage
3.7 springs for correct length
3.8 cover plate assembly, for security of bearing block and catch lever spring
3.9 shoulder bolts and driving arms for wear or damage (if applicable)
3.10 adapter plate for wear, damage or distortion and security of screws.

Learning outcome

The learner will:

4 replace a range of quick-release fastener components, to include **six** of the following:

4.1 adapter plate
4.2 shoulder bolt
4.3 anti-G plate
4.4 knob locking ring

4.5 adapter plate screw
4.6 driving arm
4.7 lock wire
4.8 cover plate
4.9 locking plunger
4.10 torsion spring
4.11 locking pin
4.12 operating plunger
4.13 plunger spring
4.14 operating knob
4.15 locking pin spring
4.16 body assembly
4.17 guide bush split pin
4.18 operating screw
4.19 locking pin screw
4.20 locking nuts
4.21 other specific QRF component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)

6.7 organisation standards and procedures

6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards

7.2 computer records

7.3 aircraft service/flight log

7.4 aircraft log

7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the aircrew quick-release fasteners (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining aircrew quick-release fasteners and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the quick-release fasteners.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the quick-release fasteners, and their method of replacement.

K11 how to identify the components to be used for the various types of quick-release fasteners being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the quick-release fasteners and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 449 Carrying out maintenance of aircrew quick-release fasteners (QRF)

Supporting Information

Unit Range Description

Evidence requirements

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 450 Carrying out maintenance of ejection seat headbox parachute assemblies

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on ejection seat headbox parachute assemblies, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work and will provide an informed approach to applying maintenance techniques and procedures to parachute assemblies. They 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. They will understand the safety precautions required when carrying out maintenance operations on parachute assemblies. They will be required to demonstrate safe working practices throughout and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the parachute assemblies:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of harness, pack elastics)
2.2 cleaning the equipment (such as rigid pack, metallic components) using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections.

Learning outcome

The learner will:

3 carry out a thorough examination of the parachute assemblies, to include checking **all** of the following:

3.1 the parachute canopy, rigging lines, vent control lines, for correct sequence of attachment, damage, deterioration, contamination and security of attachment
3.2 main and controller drogue - all rigging lines, anti-squid line and connecting strop for damage, security of attachment and assembled in the correct sequence
3.3 harness assembly for damage, deterioration and correct assembly
3.4 PSP connector, screws and fasteners, for correct operation and security of attachment
3.5 rigid pack and containers for damage, dents, cracks, freedom from loose articles, burrs and sharp edges
3.6 mechanical lock and metallic labels for damage, corrosion, security of attachment
3.7 inner and outer closure flaps, stowage trays, for damage and security of attachment
3.8 drogue withdrawal line for damage and 'in-use life'
3.9 all grommets, screws and fasteners for security of attachment
3.10 all shackles and screwed couplings, for damage and security of attachment.

Learning outcome

The learner will:

4 replace a range of parachute assembly components, to include **six** of the following:

4.1 back pad assembly
4.2 mechanical lock assembly
4.3 rigid pack outer closure flaps
4.4 padded apron

4.5 drogue withdrawal line
4.6 rigid pack inner closure flaps
4.7 canopy withdrawal line
4.8 controller drogue anti-squid line
4.9 split pin
4.10 quick-release connector
4.11 drogue connecting strop
4.12 castellated nut
4.13 lap strap sub-assembly
4.14 extender strap
4.15 auxiliary parachute
4.16 harness yoke
4.17 drogue-to-parachute attachment line
4.18 rigging lines and stowage flap
4.19 front lift webs
4.20 parachute withdrawal line (seat portion)
4.21 attachment gaiter
4.22 rivets
4.23 head support panel grommets
4.24 strap and pack sub-assembly
4.25 rubber band
4.26 auxiliary parachute connecting strop
4.27 assembly pin, transit and flag
4.28 rigid pack
4.29 container
4.30 rigging line links
4.31 drogue parachute
4.32 pitot covers
4.33 aero surface plate
4.34 shoulder pads
4.35 shoulder straps
4.36 main canopy
4.37 other specific ejection seat headbox parachute assembly components.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)

5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

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

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

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

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

K3 the hazards associated with maintaining parachute assemblies and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the parachute assemblies.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the parachute assemblies, and their method of replacement.

K11 how to identify the components to be used for the various types of parachute assemblies being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the parachute assemblies and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 450 Carrying out maintenance of ejection seat headbox parachute assemblies

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 451 Carrying out maintenance of free fall parachute assemblies

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on free fall parachute assemblies, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning 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. They 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. They will understand the safety precautions required when carrying out maintenance operations on free fall parachute assemblies. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the free fall parachute assemblies:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of harness, pack elastics)
2.2 cleaning the equipment (such as container, metallic components) using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the free fall parachute assemblies, to include checking **all** of the following:

3.1 the parachute canopy, drogues, throwaways, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
3.2 cybernetic parachute release system (CYPRES) for correct function and fitting
3.3 all rigging lines for freedom from defects and correct sequence of connection
3.4 all control lines, slider control lines, slider inhibiting devices for freedom from defects and correctly connected
3.5 pack/container, harness assembly, for freedom from damage, deterioration and correct assembly
3.6 risers, rapide links, three-ring attachment point, for freedom from damage, deterioration and security of attachment
3.7 main and reserve canopy for condition and record of usage
3.8 all grommets, screws and fasteners for security of attachment
3.9 the parachute canopy, drogues, throwaways, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
3.10 cybernetic parachute release system (CYPRES) for correct function and fitting.

Learning outcome

The learner will:

4 replace a range of free fall parachute assembly components, to include **one** of the following:

4.1 main parachute canopy
4.2 pack/harness assembly
4.3 reserve parachute canopy
4.4 cybernetic parachute release system (CYPRES) unit
4.5 rapide link connectors

plus **two** of the following:

4.6 control lines
4.7 harness buckles
4.8 slider control lines
4.9 control/steering handles
4.10 anaconda housing harness buckles
4.11 equipment strap
4.12 closure loop
4.13 throwaway/auxiliary

plus **four** of the following:

4.14 elastic bands/tube stows
4.15 pop top
4.16 reserve spring
4.17 main/reserve handles
4.18 main spring
4.19 main cutaway handle
4.20 bridle line
4.21 CYPRES battery
4.22 free bag
4.23 deployment/lift-off bag
4.24 other specific free fall parachute assembly component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)

5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the free fall parachute assemblies (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining free fall parachute assemblies and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the free fall parachute assemblies.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the free fall parachute assemblies, and their method of replacement.

K11 how to identify the components to be used for the various types of free fall parachute assemblies being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the free fall parachute assemblies and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 451 Carrying out maintenance of free fall parachute assemblies

Supporting Information

Unit Range Description

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

Evidence requirements

Unit guidance

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

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

Unit 452 Carrying out maintenance of static line parachute assemblies

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on static line parachute assemblies, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures on static line parachutes. They 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. They will understand the safety precautions required when carrying out maintenance operations on static line parachute assemblies. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the static line parachute assemblies:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation).

1.2 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.

1.3 provide and maintain a safe working environment for the maintenance activities.

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date.

1.5 obtain clearance to work on the equipment and observe any isolation procedures.

1.6 use approved servicing and maintenance techniques at all times.

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out all of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level (such as removal of harness, pack elastics)

2.2 cleaning the equipment (such as container, metallic components) using appropriate solutions

2.3 examining the condition/deterioration of components

2.4 replacing all damaged or defective components

2.5 reassembling the equipment

2.6 carrying out any required modifications to the equipment

2.7 carrying out adjustments to components and connections

2.8 checking equipment operation and performance

2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the static line parachute assemblies, to include checking **all** of the following:

3.1 the parachute canopy, drogues, throwaways, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment

3.2 all rigging lines for freedom from defects and correct sequence of connection

3.3 all control lines, slider control lines, slider inhibiting devices for freedom from defects and correctly connected

3.4 pack/container, harness assembly, for freedom from damage, deterioration and correct assembly

3.5 risers, rapide links, three-ring attachment point, for freedom from damage, deterioration and security of attachment

3.6 main and reserve canopy for condition and record of usage

3.7 all grommets, screws and fasteners for security of attachment

3.8 primary and secondary bags for freedom from damage and deterioration

3.9 reserve static line for correct attachment.

Learning outcome

The learner will:

4 Replace a range of static line parachute assembly components, to include **one** of the following:

4.1 main parachute canopy

4.2 rapide link connectors

4.3 closure loop

4.4 reserve parachute canopy
4.5 pack/harness assembly
4.6 closure pin
4.7 auxiliary/pilot chute

plus **two** of the following

4.8 control lines
4.9 anaconda housing
4.10 rivets
4.11 slider control lines
4.12 interconnecting line
4.13 canopy withdrawal line
4.14 control/steering handles
4.15 harness buckles
4.16 primary/secondary bag

plus **four** of the following

4.17 elastic bands/tube stows
4.18 equipment strap
4.19 reserve spring
4.20 pop top
4.21 main spring
4.22 reserve handle
4.23 bridle line
4.24 main cutaway handle
4.25 reserve static line
4.26 deployment/lift-off bag
4.27 shroud line links
4.28 other specific static line assembly component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)

5.8 other specific instruction.

Learning outcome

The learner will:

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

Assessment criteria

The learner can:

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the static line parachute assemblies (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).
K2 the health and safety requirements of the work area in which they are carrying out the servicing/maintenance activities and the responsibility these requirements place on them.

K3 the hazards associated with maintaining static line parachute assemblies and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the static line parachute assemblies.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the static line parachute assemblies, and their method of replacement.

K11 how to identify the components to be used for the various types of static line parachute assemblies being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the static line parachute assemblies and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 452 Carrying out maintenance of static line parachute assemblies

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 453 Carrying out maintenance of brake parachute assemblies

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on brake parachute assemblies, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to brake parachute assemblies. They 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. They will understand the safety precautions required when carrying out maintenance operations on brake parachute assemblies. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the brake parachute assemblies:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation)

1.2 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

1.3 provide and maintain a safe working environment for the maintenance activities

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level
2.2 cleaning the equipment (such as container, metallic components) using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out any adjustments to components and connections.

Learning outcome

The learner will:

3 carry out a thorough examination of the brake parachute assemblies, to include checking **all** of the following:

3.1 the parachute canopy, drogues, pilot chutes, for correct sequence of attachment, freedom from defects, deterioration, contamination and security of attachment
3.2 all rigging lines for freedom of defects and correct sequence of connection
3.3 pack/container assembly, for freedom from damage, deterioration, contamination and correct assembly
3.4 links, attachment points, for freedom from damage, deterioration and security of attachment
3.5 canopy for condition and record of usage
3.6 all grommets, screws and fasteners for security of attachment.

Learning outcome

The learner will:

4 replace a range of brake parachute assembly components, to include one of the following:

4.1 main parachute canopy
4.2 connectors
4.3 pack/container assembly
4 plus two of the following:
4.4 auxiliary parachute
4.5 gaiters
4.6 rigging line
4.7 canopy withdrawal line

4.8 retaining strop/flap
4 plus four of the following:
4.9 elastic bands
4.10 main connector link
4.11 split pins
4.12 links
4.13 fasteners
4.14 grommets
4.15 other specific brake parachute component.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the brake parachute assemblies (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining brake parachute assemblies and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the brake parachute assemblies.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the brake parachute assemblies, and their method of replacement.

K11 how to identify the components to be used for the various types of brake parachute assemblies being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the brake parachute assemblies and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 453 Carrying out maintenance of brake parachute assemblies

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Unit 454 Carrying out maintenance of night vision goggles

GLH	52
Unit aim:	This Employer Unit of Competence (EUC) has been developed by employers in the Aerospace and Aviation Sector and is part of an overall development programme designed to meet the requirements of the Sector, the published Apprenticeship Standard and Employer Occupational Brief. This EUC identifies the training and development required in order that the apprentice can demonstrate that they are competent in being able to carry out servicing and maintenance activities on night vision goggles (NVG) assemblies, in accordance with approved procedures. They will be required to select the appropriate tools and equipment to use, based on the maintenance activities to be carried out, and to check that they are in a safe and serviceable condition. 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. Their responsibilities will require them to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities that they cannot personally resolve, or that are outside their permitted authority, to the relevant people. They 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. Their underpinning knowledge will provide a good understanding of their work, and will provide an informed approach to applying maintenance techniques and procedures to night vision goggles. They 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. They will understand the safety precautions required when carrying out maintenance operations on night vision goggles. They will be required to demonstrate safe working practices throughout, and will understand the responsibility they owe to themselves and others in the workplace. They will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall objectives of the organisation, such as strong work ethic, positive attitude, team player, dependability, responsibility, honesty, integrity, motivation and commitment.

Learning outcome

Performance Requirements

Assessment criteria

The learner can:

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

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

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

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

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

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

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

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

Learning outcome

The learner will:

1 carry out **all** of the following during the servicing and maintenance of the night vision goggles:

1.1 obtain and use the appropriate documentation (such as job instructions, servicing or maintenance schedule, specifications, material data sheets and other relevant documentation).

1.2 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.

1.3 provide and maintain a safe working environment for the maintenance activities.

1.4 obtain the correct tools and equipment for the activity and check that they are in a safe, tested and usable condition and within current certification/calibration date.

1.5 obtain clearance to work on the equipment and observe any isolation procedures

1.6 use approved servicing and maintenance techniques at all times

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

1.8 leave the work area, and equipment in a safe and appropriate condition, free from foreign object debris on completion of the activities.

Learning outcome

The learner will:

2 carry out **all** of the following repair/maintenance activities, where appropriate, using authorised methods and techniques:

2.1 dismantling equipment to component or sub-assembly level
2.2 cleaning the equipment using appropriate solutions
2.3 examining the condition/deterioration of components
2.4 replacing all damaged or defective components
2.5 reassembling the equipment
2.6 carrying out any required modifications to the equipment
2.7 carrying out adjustments to components and connections
2.8 checking equipment operation and performance
2.9 testing equipment in accordance with the relevant air publication (AP)/ maintenance procedure.

Learning outcome

The learner will:

3 carry out a thorough examination of the night vision goggles, to include checking **all** of the following:

3.1 the objective lens assembly and eyepiece lens assembly for freedom from cracking and integrity of assembly
3.2 all function switches for operation and security of attachment
3.3 image intensifier tube assembly, for freedom from damage and deterioration
3.4 sealing and retaining rings, for freedom from damage, deterioration and security of attachment
3.5 switch assembly, switch strap and switch release lever for freedom from damage.

Learning outcome

The learner will:

4 replace a range of night vision goggles components, to include **one** of the following:

4.1 image intensifier tube (IIT)
4.2 eyepiece lens assembly
4.3 objective lens assembly
4.4 mounting assembly
4.5 tilt & stow assembly

plus **two** of the following:

4.6 sealing ring

4.7 light absorbing filter
4.8 straight head pin
4.9 retaining ring
4.10 threaded shaft
4.11 objective locking ring

plus **three** of the following:

4.12 screws
4.13 grommets
4.14 switches/switch straps
4.15 washers
4.16 shims/bushings
4.17 ocular sub-assembly
4.18 Cir-clip
4.19 nut, self-locking.

Learning outcome

The learner will:

5 carry out maintenance requirements, in accordance with **one** of the following types of instruction:

5.1 Urgent Technical Instructions (UTI)
5.2 Routine Technical Instructions (RTI)
5.3 Maintenance Instructions (MI)
5.4 Preliminary Warning Instructions (PWI)
5.5 Modification
5.6 Air Publications
5.7 Digital Air Publications (DAP)
5.8 other specific instruction.

Learning outcome

The learner will:

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

6.1 Military Aviation Authority (MAA)
6.2 Civil Aviation Authority (CAA)/European Aviation Safety Agency (EASA)
6.3 BS, ISO or BSEN standards and procedures
6.4 Aerospace Quality Management Standards (AS)
6.5 specific system requirements
6.6 Federal Aviation Authority (FAA)
6.7 organisation standards and procedures
6.8 manufacturers' standards and procedures.

Learning outcome

The learner will:

7 complete the relevant documentation, to include **one** from the following and pass it to the appropriate people:

7.1 job cards
7.2 computer records
7.3 aircraft service/flight log
7.4 aircraft log
7.5 permit to work/formal risk assessment.

Learning outcome

Knowledge and understanding

Assessment criteria

The learner must know and understand:

K1 the specific safety precautions and procedures to be observed whilst carrying out the maintenance of the night vision goggles (such as any specific legislation, regulations or codes of practice relating to the activities, equipment or materials).

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

K3 the hazards associated with maintaining night vision goggles and with the tools and equipment used and how to minimise them and reduce any risks.

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

K5 the requirements and importance of understanding and applying human factors as defined by the regulatory requirements and the potential impact if these are not adhered to.

K6 the personal protective equipment (PPE) that they need to use during the maintenance activities and where it can be obtained.

K7 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 (to include Urgent Technical Instructions (UTI), Routine Technical Instructions (RTI), Maintenance Instructions (MI), Preliminary Warning Instructions (PWI) and Serious Defect Signals).

K8 the types of fault, defect or wear characteristic that are likely to occur with the night vision goggles.

K9 how to determine when components require adjustment, repair or replacement.

K10 the components to be replaced in the night vision goggles, and their method of replacement.

K11 how to identify the components to be used for the various types of night vision goggles being maintained.

K12 the quality control procedures to be followed during the maintenance procedures.

K13 how to conduct any necessary checks to ensure that the equipment functions to specification.

K14 the problems that can occur with the maintenance of the night vision goggles and how these can be overcome.

K15 the importance of the correct securing and locking of connections.

K16 the importance of tool control and the organisational tool control procedures.

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

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

K19 the disposal methods for waste and petrol, oil and lubricants (POL).

K20 the problems that can occur with the maintenance procedures and the importance of informing appropriate people of defects.

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

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

Unit 454 Carrying out maintenance of night vision goggles

Supporting Information

Unit guidance

Assessment requirements for this have been developed by employers for the occupational competency units and qualifications for the Aerospace and Aviation Sector. These assessment requirements are set down in the Aerospace Engineering Employer Occupational Unit Assessment.

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

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

Appendix 1 Useful contacts

UK learners General qualification information	**E: learnersupport@cityandguilds.com**
International learners General qualification information	F: +44 (0)20 7294 2413 **E: intcg@cityandguilds.com**
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	F: +44 (0)20 7294 2413 **E: centresupport@cityandguilds.com**
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	F: +44 (0)20 7294 2413 F: +44 (0)20 7294 2404 (BB forms) **E: singlesubjects@cityandguilds.com**
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	F: +44 (0)20 7294 2413 **E: intops@cityandguilds.com**
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	F: +44 (0)20 7294 2413 **E: walledgarden@cityandguilds.com**
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	T: +44 (0)121 503 8993 **E: business@cityandguilds.com**
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