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Section 6 AIRFRAME METAL

THIS MODULE CONTAINS A BASIC KNOWLEDGE SELF STUDY GUIDE AND SUGGESTED MAINTENANCE TASKS

Module 6L – AIRFRAME METAL BASIC THEORETICAL KNOWLEDGE (self study guide)
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See Section 1 Instructions for use

Module 6L.1 Airframe metal (Level 2)	Completed,
Metallic materials and semi-finished products, machining methods Applications for various metals and fabrication methods and processes Metal component manufacture and repair by fabrication. List of allowable components. Fabrication process, cutting, bending, drilling, rolling, shrinking and stretching, deburring and sharp edges Importance of surface finish and protection whilst working on metals Fatigue strength and crack test Awareness of different metals and susceptibility to fatigue and indications of fatigue Assembly of metal-construction components, riveted joints, adhesive joints Applications for different joints Identification of damage to overstressed components, effects of corrosion. Health and safety, and fire protection	

Module 6L2 Material (Level 2)	Completed,
Steel and its alloys Awareness of the different types of steel and applications (mild steel, chromium-molybdenum steel, stainless steel). Heat treatments. Light metals and their light alloys Awareness of different types of aluminium alloy (Duralumin, Al-Clad, magnesium alloy) and applications Heat treatment and states of temper for aluminium alloys. Awareness of age and work hardening Rivet materials Awareness and recognition of different rivet types (solid, POP, cherry, flush, universal/dome/snap head, sealed and open) and different materials and applications Allowable rivet substitution Heat treatments/hardness state and applications for solid rivet types Riveting techniques and errors. Types of tooling Plastics Uses, applications Colours and paints	

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Various paint systems and application (pre-treatments, primers, fillers, top coats)

Metal adhesives

Types and uses

Types of corrosion

Recognition of each type (surface corrosion, intergranular corrosion, galvanic (dissimilar metal) corrosion, fretting corrosion)

Treatment of corrosion, what can be treated and what cannot

Corrosion prevention methods and treatments

Covering materials and technologies (natural and synthetic)

Awareness of various materials and applications

Module 6L.3 Identifying damage (Level 3)

Completed,

Overstressed metal airframes, levelling, measurement of symmetry

Inspections following various incidents both in flight and on ground

Load transfers

Secondary damage resulting from overload/impact, indications of underlying damage

Fatigue strength and crack test

Understand how fatigue works and critical areas of the aircraft. Various types of NDT crack testing available

Identifying loose riveted joints

Visible signs of loose or "working" rivets. Repair options

Module 6L.4 Assembly of metal and composite-construction airframes (Level 2)

Completed,

Skins

Identification of skin types (stressed, un-stressed), methods of attachment

Frames and ribs

Their function and layout

Stringers and longerons

Their function and layout. Methods of attachment to frames, ribs and skins

Frame construction

General make up of various type of ribs

Problems in multiple-material systems

Dissimilar material concerns and processes for eliminating issues

Module 6L.5 Fasteners (Level 2)

Completed,

Classification of fits and clearances

Understanding of different fits (interference, transition, close tolerance, clearance) and applicable fasteners and applications

Metric and imperial measuring systems

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Understanding various systems, (Unified (course/fine), small UNF/UNC number threads, British Association, Whitworth, BSF, Metric course/fine, BSP and NPT)

General

Oversize bolt identification and application, standard bolts identification by head markings for both imperial and metric hardware

Applications that may require special fasteners

Identify different fastener materials and compatibility

Identify different types of fasteners (solid rivets, blind rivets, hi-lock, Jo-bolts, Dzus, Camloc, Southco)

Rivet identification using head marking

Module 6L.6 Performance of practical activities (Level 2)	Completed,
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Cables

Thimble splice

Nicopress and Talurit repairs

Repairs

Repair of coverings, surface damage, stop drilling techniques

Repair of transparencies

Cutting of sheet metals (aluminium and light alloys, steel, steel alloys)

Folding, bending, edging, beating, smoothening, beading establishing bend radii,

Repair riveting of metal airframes according to repair instructions or drawings

Evaluation and rectification methods of rivet errors

General

Understanding Aircraft rigging. Calculation of control surface mass balance and range of movement of the control surfaces, measurement of operating forces and free play check

Locking of pins, screws, castellated nuts, turnbuckles

Understanding the requirements and Performance of 50hr/100hr/annual inspection on a metal airframe

**Module 6L – AIRFRAME METAL
SUGGESTED MAINTENANCE TASKS**

Registration & date	Maintenance task performed	Confirmed by Licence no.
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General activities

	Bonding of structures; check bonding of engine frame to metal fuselage	
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	Jack and trestle aircraft	
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	Weigh aircraft and determine weight and balance using manual method (without use of computer programme)	
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	Produce weight and balance schedule	
	Carry out flying control deflections and cable tensions check. Use temperature correction	
	Crack testing; Carry out crack test using colour contrast method	
Metal repairs		
	Carry out skin repair external patch method	
	Carry out rib or frame repair	
	Replace damaged skin section	
	Replace damaged stringer section	
	Drilling cracks; stop drill small crack in skin panel	
	Establish rivet grip length for Cherryloc/Cherrymax rivet and install	
	Riveting jobs; carry out solid rivet repair, establish edge spacing, rivet pitch, rivet size/length and hole size	
	Remove sheared or deformed rivet and replace	
	Countersink panel and install countersink rivets	
	Dimple skin for rivet installation	
	Repair of coverings; carry out insertion skin repair	
	Anti-corrosion treatment; apply anti-corrosion treatment to new repair patch	
	Repair of fairings; repair wing to fuselage or tail to fuselage fairing	
	Corroded skin panel; remove paint, remove and treat corrosion, assess damage, apply corrosion prevention measures, prime and paint	
	Apply internal cavity corrosion prevention measures	
	Inspect internal wing structure following incident	
	Inspect internal fuselage following incident	

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	Repair/replace flying control hinge	
	Replace sheared solid rivets	
	Replace quick release fasteners and receptacle	
	Replace Cherryloc/Cherrymax rivet	
	Inspect landing gear mounting structure and landing gear after rough landing or incident	
Painting and finishing		
	Paint preparation and use of pre-painting treatments for aluminium and steel	
	Paint removal	
	Application of Alocrom, etch and epoxy primers	
	Application of finish paint scheme	
	Application of registration letters	
	Application of internal corrosion prevention measures	
Module 6L AIRFRAME METAL ADDITIONAL MAINTENANCE TASKS		

