SECTION 7.1 AIRCRAFT REPAIRS

7.1.1 INTRODUCTION

This section describes the following matters:

a) Repairs to CAO 95.10, 95.32 & 95.55 amateur built aircraft

b) Repairs to CAO 95.32 & 95.55 factory built aircraft (non-LSA)

c) Repairs to CAO 95.32 & 95.55 aircraft (LSA)

d) Repairs to CAO 95.32 & 95.55 aircraft (E-LSA)

7.1.2 GENERAL

The repair of aeronautical structures or systems requires specialist advice for what to do and good workmanship practices to complete the repair. Specialist advice may be available from the manufacturer or from a qualified and experienced professional (for example, L2, L4, a CASA approved welder or a CASR Part 21 subpart M approved person).

The extent of repairs may be defined in manufacturers or designer's repair manuals. However, where this is not the case and the repair is designed to return the structure or system to its originally specified state, FAA AC 43.13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair can be used (except for LSA) as authoritative repair method reference.

Where the repair does not return the structure or system to its originally specified state, then this may be classified as a modification. Refer to Section 6.1 of this manual.

7.1.3 MAJOR REPAIR CLASSIFICATION

A major repair is a repair that might appreciably affect mass, balance, structural strength, performance, power-plant operation, flight characteristics, or other qualities affecting airworthiness. A repair in this category requires some form of engineering analysis or assessment. The applicant must evaluate the technical merit of a repair design proposal and establish a clear understanding of the intended or consequential effect on the affected product. For example, it may not be appropriate to approve a repair that is purposely designed to be much stronger than the structure being repaired because the effect may be an undesirable change in the original structural load distribution. Refer also to subsections 6.1 and 6.2 above.

Airframe

Repairs to the following parts of an airframe and repairs of the following types, involving the strengthening, reinforcing, splicing, and manufacturing of primary structural members or their replacement, when replacement is by fabrication such as riveting or welding, are major repairs (this list is not exhaustive).

a) Box beams.

b) Monocoque or semi-monocoque wings or control surfaces.

c) Wing stringers or chord members.

d) Spars.

e) Spar flanges.

f) Members of truss-type beams.

g) Thin sheet webs of beams.

h) Keel and chine members of boat hulls or floats.

i) Corrugated sheet compression members which act as flange material of wings or tail surfaces.

j) Wing main ribs and compression members.

k) Wing or tail surface brace struts.
l) Engine mounts.
m) Fuselage longerons.
n) Members of the side truss, horizontal truss, or bulkheads.
o) Main seat support braces and brackets.
p) Landing gear brace struts.
q) Axles and wheel rims.
r) Parts of the control system such as control columns, pedals, shafts, brackets, or horns.
s) Repairs involving the substitution of material.
t) The repair of damaged areas in metal or plywood stressed covering exceeding six inches in any direction.
u) The repair of portions of skin sheets by making additional seams.
v) The splicing of skin sheets.
w) The repair of three or more adjacent wing or control surface ribs or the leading edge of wings and control surfaces, between such adjacent ribs.
x) Repair of fabric covering involving an area greater than that required to repair two adjacent ribs.
y) Replacement of fabric on fabric covered parts such as wings, fuselages, stabilizers, and control surfaces.
z) Repairing of integral fuel tanks and oil tanks.

Power plant
Repairs of the following parts of an engine and repairs of the following types, are major repairs: (this list is not exhaustive).

a) Separation or disassembly of a crankcase or crankshaft of a reciprocating engine equipped with an integral supercharger.
b) Separation or disassembly of a crankcase or crankshaft of a reciprocating engine equipped with other than spur-type propeller reduction gearing.
c) Special repairs to structural engine parts by welding, plating, metalizing, or other methods.

Propeller
Repairs of the following types are major repairs: (this list is not exhaustive)

a) Repairing or machining of steel hubs.
b) Shortening of blades.
c) Replacement of outer laminations on fixed pitch wood propellers.
d) Repairing elongated bolt holes in the hub of fixed pitch wood propellers.
e) Inlay work on wood blades.
f) Repairs to composite blades.
g) Replacement of tip fabric.
h) Replacement of plastic covering.
i) Repair of propeller governors.
j) Overhaul of controllable pitch propellers.
k) Repairs to deep dents, cuts, scars, nicks, etc., and straightening of aluminium blades.
l) The repair or replacement of internal elements of blades.

7.1.4 REPAIRS TO AMATEUR BUILT AIRCRAFT (Excluding E-LSA and Group G Lightweight aeroplanes) CAO 95.10, 95.32 & 95.55

Repairs to privately operated amateur built aircraft, excluding E-LSA and Group G Lightweight aeroplanes (LWA) may be conducted by the holder of a Level One Maintenance Authority (or higher), using firstly, the kit manufacturer or designer's repair procedures, or secondarily, in accordance with repair methods and techniques detailed in **FAA AC 43.13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair**.

Appropriate maintenance logbook entries must be made detailing the work performed, who performed it, their name, signature, membership number, maintenance authority level and the date. A copy of (or specific reference to) any aircraft or equipment manufacturer's approval document must also be included.

Any repairs which affect the weight and balance of the aircraft (see Notes below) must be carried out in accordance with Section 10 of this manual.

NOTES:

a) If the empty weight has changed by more than 0.5% of the MTOW; or

b) If the empty weight CG has changed by more than 2% of the maximum permissible centre of gravity range or 5 mm, whichever is the greater.

c) A repair **IS NOT** a modification.

7.1.5 REPAIRS TO FACTORY BUILT AIRCRAFT - NON LSA (excluding Group G Lightweight aeroplanes) CAO 95.32 & CAO 95.55

Repairs to privately operated aircraft, excluding Group G Lightweight aeroplanes may be conducted by the holder of a Level One Maintenance Authority (or higher), using firstly, the manufacturer or designer's repair procedures, or secondarily, in accordance with repair methods and techniques detailed in FAA AC43.13-1B.

Repairs to aircraft used for hire and/or flying training must be undertaken by a person holding an RAAus Level Two or higher Maintenance Authority, using firstly, the aircraft manufacturer or designer's repair procedures, or secondarily, in accordance with repair methods and techniques detailed in FAA AC43.13-1B.

Appropriate maintenance logbook entries must be made detailing the work performed, who performed it, their name, signature, membership number, maintenance authority level, or licence category and number, and the date. A copy of (or specific reference to) any aircraft or equipment manufacturer's approval document must also be included.

Any repairs to RAAus aircraft which may affect the weight and balance of the aircraft (see Note below) must be carried out in accordance with Section 10 of this manual.

NOTES:

a) If the empty weight has changed by more than 0.5% of the MTOW; or

b) If the empty weight CG has changed by more than 2% of the maximum permissible centre of gravity range or 5 mm, whichever is the greater.

c) A repair **IS NOT** a modification.

Any repairs to be performed outside of manufacturer or designer's approvals must be done in accordance with the MODIFICATION AND REPAIR APPROVAL PROCESS (MARAP) described in Section 6.1 of this manual or the modification has been approved by:

a) CASA or an authorised person, under CASR Part 21 subpart M, as the provision was in force from time to time before its repeal; or

b) CASA, under regulation 21.435 of CASR; or

c) an authorised person or approved design organisation, under regulation 21.437 of CASR.

7.1.6 REPAIRS TO LIGHT SPORT AIRCRAFT (LSA) CAO 95.32 & 95.55

For a Light Sport Aircraft to remain operating on a Special Certificate of Airworthiness, all repairs must be in accordance with the manufacturer's approved repair procedures and this manual.

Repairs to privately operated aircraft may be conducted only by persons stipulated by the manufacturer and this manual.

Repairs to aircraft used for hire and/or flying training may be conducted only by persons stipulated by the manufacturer and this manual.

Appropriate maintenance logbook entries must be made detailing the work performed, who performed it, their name, signature, membership number, maintenance authority level and the date. A copy of (or specific reference to) the aircraft manufacturer's approval document must also be included.

An RAAus registered LSA must be weighed, and a W&B report produced after major repairs have been carried out to the aircraft as approved by the manufacturer including the painting of the aircraft, that may affect the W&B of the aircraft in accordance with Section 10 of this manual.

Any repairs **not approved** by the aircraft manufacturer will render the Special Certificate of Airworthiness not to be in force (refer to CASR 21.181(4). If those repairs are to be conducted, an Experimental Certificate must be sought from a CASA or a CASA Authorised Person before further flight is conducted. The aircraft can no longer be used for flight training or hire.

7.1.7 REPAIRS TO EXPERIMENTAL LIGHT SPORT AIRCRAFT (E-LSA) CAO 95.32 & 95.55

For kit built LSA Aircraft, all repairs must be done in accordance with the manufacturers approved repair procedures.

Non-conforming production E-LSA aircraft:

All repairs should be performed in accordance with the aircraft manufacturer's approved repair procedures. Where the manufacturer no longer supports the aircraft, and CASA has not assigned an organisation to oversight continued airworthiness, then E-LSA aircraft should have repairs carried out in accordance with FAA AC 43.13 Acceptable Methods for Aircraft Construction and Repair.

Appropriate maintenance logbook entries must be made detailing the work performed, who performed it, their name, signature, membership number, maintenance authority level and the date. A copy of (or specific reference to) any aircraft or equipment manufacturer's approval document must also be included.

An RAAus registered E-LSA must be weighed, and a W&B report produced after major repairs have been carried out to the aircraft including the painting of the aircraft, that may affect the W&B of the aircraft in accordance with Section 10 of this manual.

Where the repair does not return the structure or system to its originally specified state, the aircraft will be deemed to have been modified. The aircraft owner must now contact CASA or an Authorised Person to discuss the need for the issue of an amended Experimental Certificate before further flights are undertaken. If no amended Experimental CoA is required to be issued by CASA or an Authorised Person, a written copy of that notification from CASA or the Authorised Person must be stored with or entered in the aircraft logbook.

7.1.8 REPAIRS TO LIGHTWEIGHT AEROPLANES

A lightweight aeroplane must be maintained in accordance with Part 4A of CAR. Part 4A of Civil Aviation Regulations (CAR) sets out when CASA can give directions relating to the maintenance of Australian aircraft and who can conduct maintenance. Refer to Section 15.8 for details.