MOD/162B/004 issue 1

LAA Classification: **A**

LAA Approval ..... L.A.A. DAI/1172/48 1

Issue Date: 18/08/09

Light Aircraft Association

MANDATORY MODIFICATION MOD/162B/004

ZENAIR CH 601 XL

Applicable to aircraft operated in the UK under LAA approval

Index

1 Introduction

A recent serious accident which occurred to a Dutch registered Zenair CH 601 XL aircraft in Holland involved a structural failure and loss of a wing in flight. Other recent incidents have given rise to concern with respect to the structural adequacy of the wing attachments and the possibility of aileron flutter. As a result of these concerns, on the 24th November 2008 the UK CAA issued a Mandatory Permit Directive MPD No. 2008-006, grounding the type pending further investigation and, if applicable, modification action.

Following an investigation of these issues carried out by the Light Aircraft Association (LAA), in conjunction with the UK CAA, this modification defines actions which have been accepted as one means of satisfying the requirements of MPD 2008-006 and returning modified aircraft to service.

It should be noted that some of the work needed requires specialist aircraft fitting and fabrication skills and should not be attempted by persons untrained in these areas.

2 Applicability

This modification is applicable to all Zenair CH 601 XL Aircraft operating on a UK Permit to Fly, administered by the LAA, fitted with piano-hinged ailerons. All aircraft of this type in the UK at the time of introduction of the mod were fitted with piano-hinged ailerons rather than ‘flexible skin’ hinges. The aileron mass balances called for by this modification have not been shown to be suitable for use with ‘flexible skin’ hinged ailerons.

Note that tailwheel undercarriage equipped examples, particularly with fixed pitch propellers, may find the restriction on aft cg limit troublesome and may require special action (eg retro-fitting a heavier variable pitch prop) to bring the empty cg further forward.

3 Modification List

The modifications described in this document fall into four sections which are listed below. Detailed instructions and an inspection checklist are provided elsewhere in this document:

1. Reinforcements of the wing carry-through spar by the addition of bolted and riveted vertical stiffener angles

2. Modification and checks on Aileron and Aileron Controls. This includes:
   a. Addition of mass balance arms to both ailerons.
   b. Inspection of aileron bellcrank mount structure.
   c. Wings re-assembled to fuselage, aileron cable tension reduced to 20 Lbs +/- 5 Lbs

3. Modifications to Elevator and Elevator Trim Systems. This includes:
   a. Elevator trim tab horn modified and trim tab operating pushrod replaced to reduce trim range and reduce trim sensitivity
   b. Trim indicator ‘take off’ position re-marked on instrument panel.
   c. Removal of elevator bias spring and associated bias cable from control system in cockpit.

4. Miscellaneous
   a. Rear cg limit moved forward from 520mm AOD to 455mm AOD. Weight and balance schedule to be amended or re-issued to reflect new limit.
   b. ASI markings to be checked
   c. Maximum loaded weight, excluding fuel and wing baggage, now restricted to 494 Kg. Cockpit placard introduced stating new limitation.
   d. Flight Manual supplement introduced regarding a and b and c above
   e. Logbook entry in airframe logbook stating that modification embodied and alerting need for re-balancing ailerons following any repairs or re-painting of ailerons, annual inspection of mass balance arm via inspection hole.
   f. Permit to Fly ‘Operating Limitations’ document changed to reflect a. and b and c above

To clear aircraft for flight, compliance with all modification listed above is required.
A statement of compliance with the requirements/changes defined within this document is a sufficient log book entry.

4 Instructions

4.1 Reinforcements of Wing Carry-through Spar

This modification requires changes to primary structure and requires advanced fitting skills. It is essential that this work be conducted in an appropriate environment by competent personnel.

1. Drain fuel tanks, disconnect battery, support rear end of the fuselage with trestle.
2. Disconnect aileron cables at wing bellcrank end, attach lengths of string to cables to be left in wing to help when drawing cables back into place later.
3. Disconnect fuel pipe connections, pitot/static pipes and electrical wiring to wings. Blank off open pipe ends to prevent dirt ingress.
4. Support wing tips, remove wing attachment bolts (seven per wing) and remove wings from fuselage.
5. *First inspection. With the wings removed, the projecting ends of the main and rear spars, at the wing root, and the mating components at the end of the fuselage carry-through spars and rear pick-up brackets must be thoroughly inspected to check that they do not include oversize holes, cracking, fretting, scratches, corrosion or other sign of distress. In the event of any of these defects being found, contact LAA Engineering for advice before proceeding.*
6. To gain access to the spar centre-section carry-through, both left and right seat pans must be removed by drilling out the rivets attaching them to the structure. This will involve first removing any associated upholstery.
7. Very carefully remove existing rivets and bolts from centre section spar in locations marked in figure 1, to accept 12 additional aluminium alloy stiffening angles (10 angles if 'dual stick' option is fitted). Open up eight rivet holes through spar flanges to 4.8mm diameter to accept AN3-6A bolts as marked on figure 1, dimensions 309mm and 349mm from centreline refer.
8. Take care that bushes inside spar do not become misplaced when bolts are removed. To ensure bushes do not fall out of place, as each bolt is removed 'back it up' with a short piece of temporary locking wire or similar, pushed in from the opposite side.
9. The additional stiffening angles are manufactured per figure 2. Note that the stiffeners are handed. Drill bottom bolt holes only in each angle. Upper bolt holes in angles must be very carefully drilled pilot sized on assembly to match existing upper holes in structure, using temporary drill bushes to centre the pilot drill on the existing holes in the structure. ¼", 3/16" and 5/16" outside diameter drill bushes will be required for the inboard, mid-span and outboard pairs of stiffeners respectively.
10. Once satisfied with the pilot hole positions, open up bolt holes in stiffeners to final size on the bench. Take great care as all bolt holes must be round and of the correct size. Oversize, ovalled or figure-eight holes are not acceptable either in the stiffening angles or the structure. DO NOT ATTEMPT TO DRILL STIFFENERS FINAL SIZE THROUGH THE BOLT HOLES IN THE STRUCTURE AS THIS MAY DAMAGE THE HOLES IN THE STRUCTURE. OUT OF ROUND OR OVERSIZED HOLES IN THE STRUCTURE MAY MEAN REPLACING THE WHOLE CARRY THROUGH SPAR.
11. Trial fit the stiffening angles to the front and rear faces of the carry through spar, in accordance with Figure 1. Drill rivet holes in stiffeners to dimensions on Figure 3, then transfer drill to structure. If rivet holes are already existing in structure at outboard stiffener location, transfer drill rivet holes from holes in structure to stiffeners.
12. *Second Inspection. Have the assembly inspected prior to bolting and riveting, your inspector will need to check the quality, fit and conformity with the mod drawings.*
13. Dismantle, de-burr, etch prime and zinc chromate all aluminium components
14. Finally assemble angle stiffeners to structure using assembly compound such as JC5A or Duralac and new hardware, ensuring bolts passing right through spar also pass through bushes inside spar, and using additional washers if necessary to ensure nuts are not threadbound. Note longer bolts fitted to ensure threads do not bear on structure or on newly-introduced angle stiffeners.
15. Fitting the washers and nuts to the short bolts, where the washers and nuts are located inside the carry-through spar, calls for an element of key-hole surgery, working through the vertical slots formed by the open ends of the carry-through spar. You will probably need to make a temporary extension to an open-ended spanner (eg by taping on a piece of stick) and then use a small piece of tape to hold the nut in the spanner slot while the nut is offered up to the bolt. The washers can be 'stuck' to the nut with a smear of assembly compound. Have a magnetic screwdriver handy to extract any nuts and washers that fall off in your first attempts. The outboard angle stiffeners can be riveted in place at this stage but note the outboard stiffener bolts cannot be finally fitted until wings are replaced later.
16. *Third inspection. Check completed reinforcement of carry-through spar prior to re-fitting seat pans*
17. Make good paintwork and replace seat pans using Avex A4 and A5 rivets as called for in CH601 XL drawings.

4.2 Modifications and Checks on Ailerons and Aileron Control System

1. For this mod. the wings need to be supported upside down on trestles, it is recommended that the wing is laid upon an 8' x 4' board and old carpet or similar is used to protect the wing skin.
2. Check that the flaps are fitted with flap up stops per standard Zenair drawing 6-S-3 (as also called for by per Zenair Service letter ZE-2009-01). If not fitted, these must be fitted before further work.
3. With the flap pressed against the flap up stop, lightly clamp the aileron to the flap to set the aileron in a neutral position, using 'G' clamps and short wood strips.
4. De-rivet and remove the wing tip and aileron tip for access.
5. The mass balance arm is supported by two new aileron ribs which must be fitted into the outer ends of the ailerons, see Figure 4. Using masking tape on the aileron and a fine felt tip pen, mark on the aileron upper and lower surfaces the centreline of the mass balance arm. Note that the mass balance arm is to be installed parallel to the other wing ribs, it is NOT perpendicular to the aileron leading edge. Continue this line around the leading edge of the aileron.
6. Mark the rivet lines for the inboard and outboard support ribs on the aileron upper and lower surfaces, using masking tape to protect the wing skin, this also stops the drill skating. These lines must be exactly 20mm inboard and outboard of the centreline for the mass balance arm. Mark out the rivet positions on these lines by following the rivet spacing of the other aileron ribs. Careful measurement is required here to ensure that the mass balance arm ends up as a snug fit between the aileron ribs.
7. Mark out the 22mm x 22mm square hole in the face of the aileron leading edge, centred spanwise on the mass balance arm centreline and vertically on the centreline of the aileron's forward face. Note this is intended to provide a 1 mm clearance all around the 20 mm box section mass balance arm.
8. When you are satisfied that all is correct with the measuring and marking out then cut out the square hole in the front face of the aileron. Remember the golden rule 'measure twice – cut once'. When cutting the hole, avoid sharp corners or blemishes which could cause stress raisers in the aileron front face. Now drill the aileron skin for the rib rivet holes pilot size.
9. Project the mass balance arm centreline forward from the aileron onto the wing and drop a perpendicular line from this line down the rear face of the wing rear spar. Mark out the mass balance arm slot in the rear spar, centred on the mass balance arm centreline. This slot should be 27mm wide and you should leave 30mm of material at the top and 25mm at the bottom, these dimensions are to the inside of the rear spar channel. Remember the wing is upside at this point – in other words bottom of wing is currently uppermost. Cut out this slot. Avoid sharp corners and blemishes which could cause stress raisers in the spar.
10. With a felt pen, mark the rivet lines on the flanges of the aileron ribs, exactly 10mm from face of rib web, do not drill. Mark out and pilot drill the three bolt holes in the web of the outboard aileron ribs only.
11. Insert the inboard rib into the end of the aileron, push it in and square it up so that the rivet line on the rib flanges appears central in the inboard set of rivet holes in the skin. Transfer drill the rivet holes through the rib flanges pilot size. Fit the inboard support rib using grip pins (Cleco/Avdell). Trial fit the mass balance arm through the slots and against the inner aileron rib, trial fit the outboard aileron rib, square up the outboard rib while pressed against the mass balance arm so that the rivet line marked on the rib appears central in the pilot holes in the aileron skin. When all is snug and centred, transfer drill the rivet holes into the outer ribs pilot size and Cleco the outer rib in place.
12. On one face of the mass balance arm, mark out a transverse line 36mm from the end and another intersecting lengthwise line along the centerline of the 20mm wide face. This represents the centre hole for the middle bolt of the group of three which will attach it to the ribs.
13. Fit the mass balance arm between the two ribs and locate it so the intersection of the lines just drawn on the arm appears centred on the central pilot hole of the group of three in the web of the outermost aileron rib. Adjust the angle of the arm so that the front end of the arm is exactly halfway between the upper and lower wing skins – failing to do this will prevent the aileron having sufficient movement.
14. When you are happy with the position of the arm, (check twice...) drill pilot size through the three pilot holes in the web of the aileron ribs, through the outer face only of the box section mass balance arm. A tip here is to place a spare pilot drill bit in the first hole as you drill the second and third hole, to prevent the arm's position wandering.
15. Slide the mass balance arm out forwards and out of the wing, then, using a pillar drill, extend the holes perpendicularly pilot size right through the arm. Relocate the arm in the aileron, and then extend the pilot holes right through the inboard ribs, ensuring that front end of arm remains equispaced between upper and lower wing skins.

16. *Fourth inspection. Check position and alignment of mass balance arm and ribs, position and quality of slots, bolt and rivet holes*
17. Disassemble all the components from the aileron and open up the three bolt holes to 4.8mm
18. Fit anchor nuts to the inner rib.
19. Clean up/de-burr, etch prime and paint as necessary. Reassemble using JC5A, Duralac or similar jointing compound and bolt and rivet into place.
20. Remove clamp between ailerons and flaps
21. *Fifth inspection. Check assembly of mass balance arm and ribs to aileron, free movement of aileron and at least 12 degrees aileron deflection available up and down*
22. Make good paintwork and refit aileron tip
23. Drill mass balance arm 4.8mm diameter two places to suit bolts attaching mass balance weights, which must be fitted so that the front end of the weights are flush with the front end of the arm. Trial fit balance weights to arm for balancing, using AN3-13A bolts, stiffnuts and thick washers.
24. Adjust balance weights to achieve 100% static balance. This means that with the wings level and the aileron free, the aileron should hang level and the trailing edge not tend to rise or fall of its own accord. Nudging the aileron either way from neutral should result in equal 'overshoot'. To achieve this, balance weight can be ground away or additional weight added as required, with one or more additional rectangular steel plate 'shims' sandwiched between existing weight and mass balance arm, substituting for additional packing washer. Additional balance weight will be required if aileron is fitted with optional aileron trim system and aileron trim servo. In this case a 16mm x 16mm x 100mm long mild steel bar, suitably painted for corrosion proofing and inserted within the front end of the tubular mass balance arm has been found to provide the required extra weight. It must be assembled with JC5A, Duralac or similar corrosion-preventative assembly compound and held in place by the existing through-bolts.
25. Prime and paint aileron mass balance weights, final fit aileron balance weights using JC5A, Duralac or similar corrosion-preventative assembly compound.
26. Make up four skin protection plates 100 mm square from 0.025" aluminium, prime and paint, and rivet to wing skins directly above and below mass balance weights, using an Avex A4 rivet in each corner. These plates are to protect skin from denting or fretting in the event of contact from mass balance weights in service.
27. *Sixth inspection. Check 100% aileron mass balance has been achieved, fitting of mass balance weight and skin protection plates. To check accuracy of 100% mass balancing check that when a one pound coin is placed on the aileron trailing edge, the aileron trailing edge tends to fall, and that with the pound coin repositioned on the front end of the mass balance arm, the trailing edge tends to rise.*
28. Using a tank cutter, or similar, make round inspection hole 1 ½" diameter in wing tip rib, centred approximately 300mm forward of wing rear spar and half way between upper and lower flanges. Inspection hole can be filled with plastic bung, (eg 'Barrel plug' p/n VP59 from Component Force, tel 01634 245999) or similar.
29. Re-rivet wing tip in place using Avex A4 rivets. Make good paintwork to scheme.
30. *Seventh inspection. Remove access panels at aileron bellcrank position in lower wing skin, check that there is no sign of cracking, loose or pulled rivets in the aileron rib or associated bellcrank mounting structure visible beneath, in particular at rivets attaching vertical channels 6-W-6-10 to rib (see Zenair drawing 6-W-6).*
31. Refit wings to fuselage per Zenair drawings except using longer AN5-20A bolts at outboard bolt positions on mainspar connection to accommodate additional thickness of stiffener angles introduced at this point. Reconnect flaps, aileron cables, pitot-static, fuel and electrical connections.
32. Set aileron cable tension to 20 Lbs +/- 5 Lbs, measured in the cockpit in the balance cable. It should be noted here that the cable tension should be measured on the balance cable as control stick asymmetry causes a variance of tension between the LHS and RHS drive cables. When satisfied, wire lock aileron cable turnbuckles.
33. Re-connect aircraft battery.
34. *Eighth inspection. With the aileron circuit rigged it is now possible to inspect the whole system for operation, ensure that there is no undue friction in the system, the ailerons are correctly centred and have a minimum of 12 degrees up and down travel, governed by the primary stops. The aileron mass balances are not intended to act as primary stops, but may act as secondary stops. Ensure that there is positive clearance between the mass balance and the wing skin at full deflection. Check cable tension, flap drive connection, re-fitting of seat pans, correct fitting of wings to fuselage, pitot-static, fuel and electrical connections.*

4.3 Modifications to Elevator and Elevator Trim Systems

1. Disconnect short elevator trim servo pushrod from servo and from horn on elevator trim tab, remove pushrod. Unscrew plastic fork end fittings from threaded rod.
2. Drill out four 1/8" rivets attaching elevator trim tab horn to elevator tab, remove horn from tab. Fill redundant holes in tab with Avex A4 rivets.
3. Turn horn through 180 degrees and re-fit so that horn projects below tab, ensure horn is relocated at same spanwise position on tab as previously ie aligned with slot in elevator for tab pushrod. See figure 5. When satisfied with location, drill tab for 1/8" rivets and rivet horn to tab with A4 rivets, using JC5A, Duralac or similar corrosive-preventative assembly compound.
4. Motor elevator trim servo to fully 'nose down' position, fit pushrod ends to new longer threaded rod and make up new pushrod to position trim tab 2 degrees 'up' when servo is in fully 'nose down'. With servo motored to fully 'nose up' position, tab should be at 26-32 degrees 'down'.
5. The new servo pushrod may need to be slightly bent for clearance with the slot in the trim tab skin, You may find it helpful to use the old pushrod, or a piece of coat hanger wire to experiment with the shape before bending the new one.
6. The trim tab horn may need to be relieved slightly around the front edge for clearance with the rear plastic fork on the pushrod, see figure 5. Ensure at least 8mm edge distance preserved from centre of 1/8" diameter hole to front edge of horn.
7. With elevator tab at neutral ie in line with elevator, note which LED element of the trim position indicator bar is illuminated on the instrument panel. Mark this position as 'Take Off' position using suitable placard.
8. Once satisfied with operation and fit, make good paintwork, finally install pushrod and lock nuts.
9. Working inside cockpit, remove trim bias spring and associated cable which is attached to lever arm on flap torque tube and control system lever immediately to rear of control column, drawing 6-BO-4-CZ refers.
10. *Ninth inspection. Check elevator trim tab horn and pushrod installation, range of travel 2 degrees 'up' (nose down) to 26-32 degrees 'down' (nose up). Check 'take off' position on cockpit indicator corresponds with elevator tab being in line with elevator. Check elevator bias spring and associated cable has been disconnected from lever arm on flap torque tube and from elevator control system, and has been removed.*

4 Miscellaneous

1. Rear centre of gravity limit changed from 520 mm aft of datum to 455 mm aft of datum. A new weight and balance schedule must be created, reflecting the new weight and empty cg post modification, stating the aft cg limit as 455 mm AOD and with the aft cg case in the 'sample loaded' example being consistent with the new 455 mm limit. LAA inspector to sign up weight and balance schedule. Submit a copy of the new weight and balance schedule to LAA Engineering for checking. It must be possible to carry two crew of 86 Kg each without exceeding the aft cg limit, with minimum fuel in the tanks.

2. It must be checked that the coloured bands on the ASI are correct. The upper end of the yellow arc must be at 140 knots (Vne). The lower end of the yellow arc must be at 90 knots (Vno).

3. A cockpit placard must be fitted stating as follows, in full view of the pilot:

PAYLOAD LIMITATION
MAXIMUM LOADED WEIGHT OF AIRCRAFT, EXCLUDING FUEL AND WING BAGGAGE: 494 Kg
MAXIMUM LOADED WEIGHT OF AIRCRAFT, INCLUDING FUEL AND WING BAGGAGE: 560 Kg

4. A Flight Manual supplement must be introduced into the CZAW Flight Manual titled 'Flight Manual for Airplane Zenair CH 601 XL Zodiac Experimental', as shown in Section 5 of this modification.

5. The aircraft's airframe logbook must have an entry made stating:

   - the modification MOD/162B/004 has been incorporated
   - drawing attention to the fact that the ailerons must be re-balanced to 100% static balance following any repairs or re-painting of the ailerons
   - stating that the aileron cable tension must be set to 20 Lbs +/- 5 Lbs, measured at the centre of the balance cable
   - the aileron mass balance arms must be inspected for condition annually via the access hole provided in the wing tip.

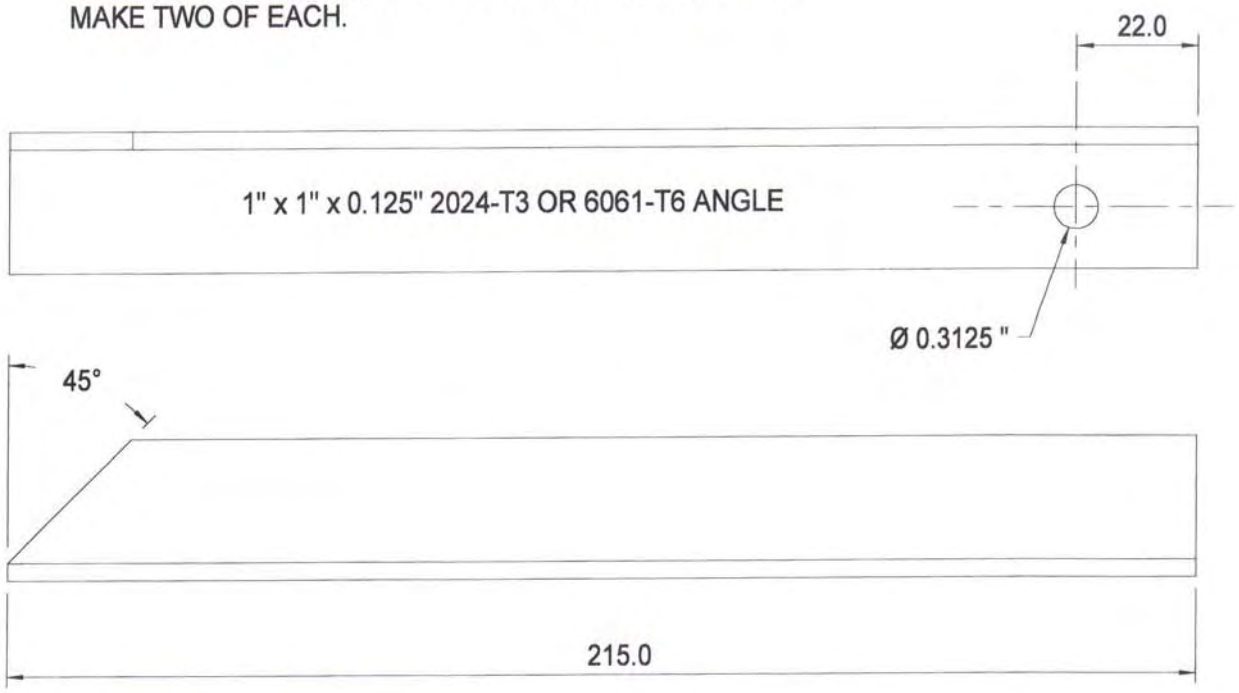
6. The aircraft's Permit to Fly 'Operating Limitations' document must be returned to LAA to incorporate changes as described in 1, 2 and 3 above.

7. *Tenth inspection. Check amended/re-issued weight and balance schedule, coloured bands on ASI, cockpit placard about payload limitation, special logbook entry in airframe logbook and Flight Manual supplement in Flight Manual.*

5 Inspection checklist Zenair CH601 XL Registration G- Serial number...

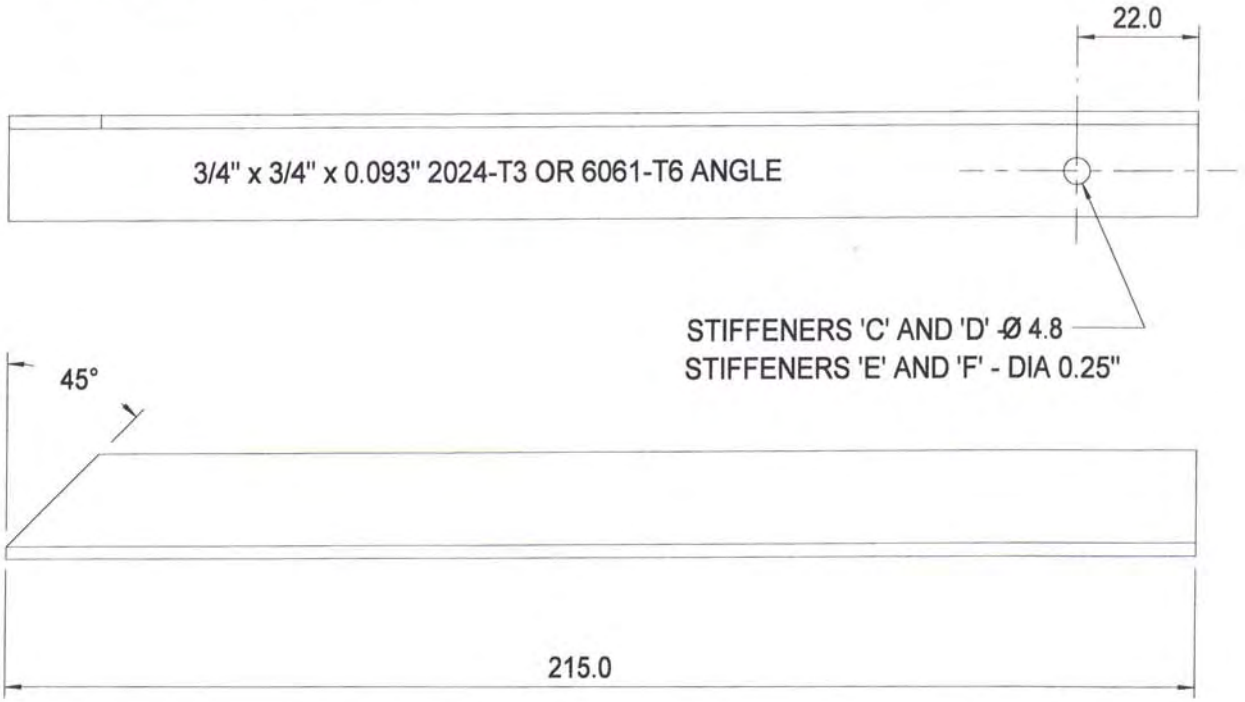
Item No	Inspection check	LAA Insp	Date
1	With the wings removed, the projecting ends of the main and rear spars, at the wing root, and the mating components at the end of the fuselage carry-through spars and rear pick-up brackets must be thoroughly inspected to check they do not contain oversize holes, cracking, fretting, scratches, corrosion or other sign of distress. In the event of any such defects being found, contact LAA Engineering for advice before proceeding.		
2	Assembly inspected prior to bolting and riveting, your inspector will need to check the quality, fit and conformity with the mod drawings.		
3	Check completed reinforcement of carry-through spar prior to re-fitting seat pans		
4	Check position and alignment of mass balance arm and ribs, position and quality of slots, bolt and rivet holes		
5	Check assembly of mass balance arm and ribs to aileron, free movement of aileron and at least 12 degrees aileron deflection available up and down		
6	Check 100% aileron mass balance has been achieved, fitting of mass balance weight and skin protection plates. To check accuracy of 100% mass balancing check that when a one pound coin is placed on the aileron trailing edge, the aileron trailing edge tends to fall, and that with the pound coin repositioned on the front end of the mass balance arm, the trailing edge tends to rise.		
7	Remove access panels at aileron bellcrank position in lower wing skin, check that there is no sign of cracking, loose or pulled rivets in the aileron rib or associated bellcrank mounting structure visible beneath, in particular at rivets attaching vertical channels 6-W-6-10 to rib (see Zenair drawing 6-W-6).		
8	With the aileron circuit rigged it is now possible to inspect the whole system for operation, ensure that there is no undue friction in the system, the ailerons are correctly centred and have a minimum of 12 degrees up and down travel, governed by the primary stops. The aileron mass balances are not intended to act as primary stops, but may act as secondary stops. Ensure that there is positive clearance between the mass balance and the wing skin at full deflection. Check cable tension, flap drive connection, re-fitting of seat pans, correct fitting of wings to fuselage, pitot-static, fuel and electrical connections.		
9	Check elevator trim tab horn and pushrod installation, range of travel 2 degrees ‘up’ (nose down) to 26-32 degrees ‘down’ (nose up). Check ‘take off’ position on cockpit indicator corresponds with elevator tab being in line with elevator. Check elevator bias spring and associated cable has been disconnected from lever arm on flap torque tube and from elevator control system, and has been removed.		
10	Check amended/re-issued weight and balance schedule, coloured bands on ASI, cockpit placard about payload limitation, special entry in airframe logbook and Flight Manual supplement in Flight Manual		
11	Final Inspection, aircraft modification work complete, aircraft free of loose swarf, tools, rags etc, ready for flight pending LAA Engineering approval. Complete a *PMR (Permit Maintenance Release)*.		

STIFFENER 'A' SHOWN, STIFFENER 'B' OPPOSITE HAND.
MAKE TWO OF EACH.



STIFFENER 'C' SHOWN, STIFFENER 'D' OPPOSITE HAND.
MAKE TWO OF EACH - (NOTE: MAKE ONLY ONE EACH FOR TWO STICK VERSION.)

STIFFENER 'E' SHOWN (BUT WITH 0.25" DIA HOLE), STIFFENER 'F' OPPOSITE HAND.
MAKE TWO OF EACH



THIRD ANGLE PROJECTION
ALL DIMENSIONS MM UNLESS OTHERWISE STATED

FIGURE 2. ANGLE STIFFENERS FOR ZENAIR CH 601XL CENTRE SECTION SPAR

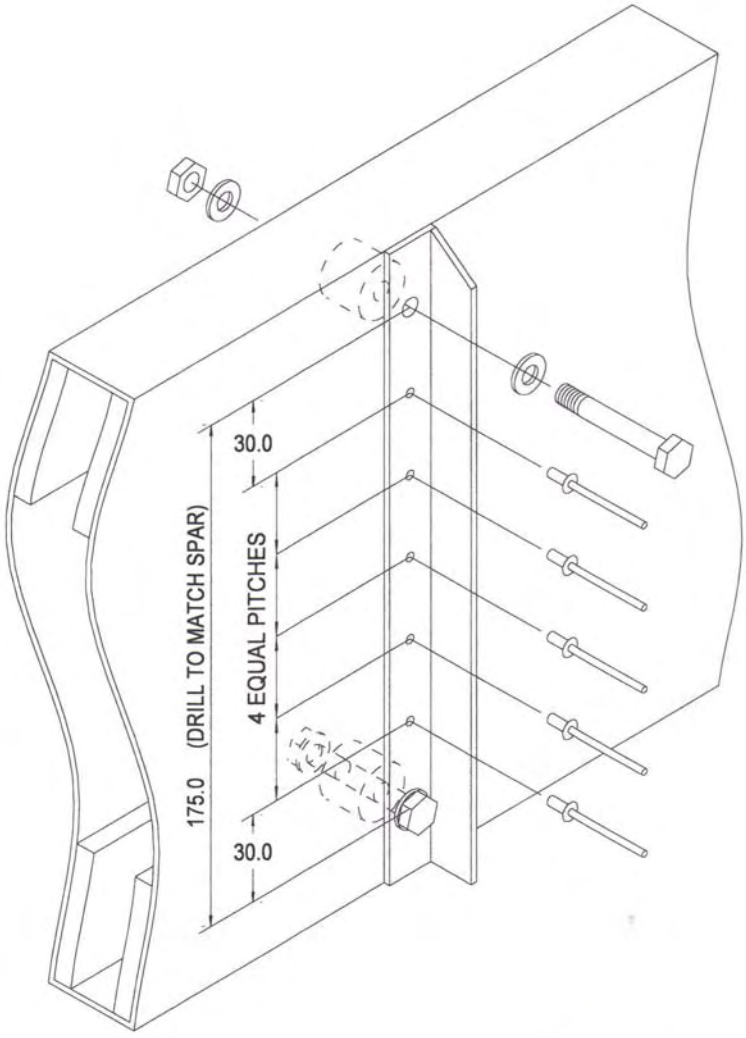


FIGURE 3. SECTION OF SPAR SHOWING TYPICAL HOLE CENTRE DIMENSIONS

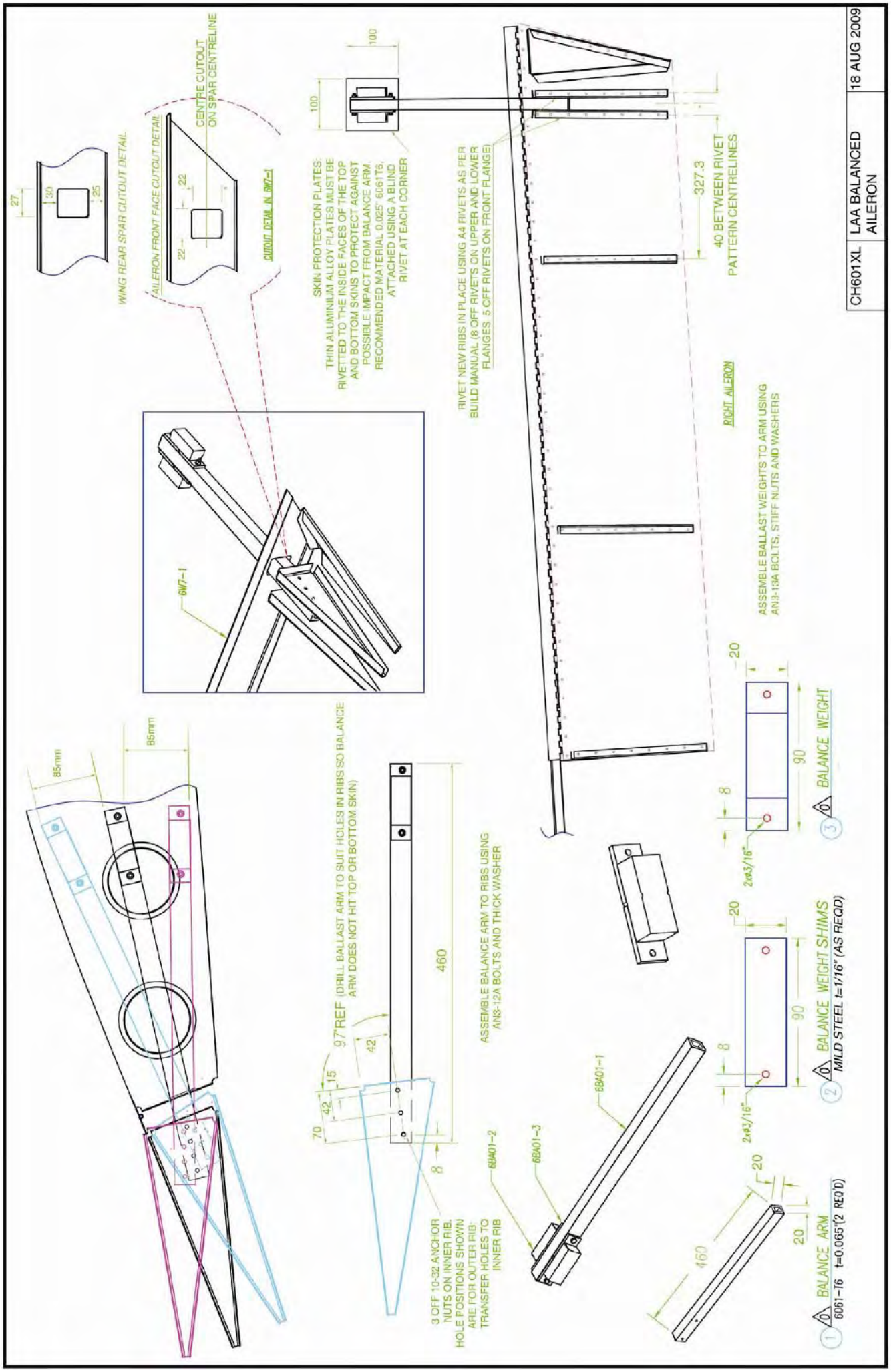

CH601XL
LAA BALANCED AILERON
18 AUG 2009
WING REAR SPAR CUTOUT DETAIL
AILERON FRONT FACE CUTOUT DETAIL
CENTRE CUTOUT ON SPAR CENTRELINE
CUTOUT DETAIL IN 6W7-1
6W7-1
SKIN PROTECTION PLATES:
THIN ALUMINIUM ALLOY PLATES MUST BE RIVETTED TO THE INSIDE FACES OF THE TOP AND BOTTOM SKINS TO PROTECT AGAINST POSSIBLE IMPACT FROM BALANCE ARM. RECOMMENDED MATERIAL 0.025" 6061T6. ATTACHED USING A BLIND RIVET AT EACH CORNER
RIVET NEW RIBS IN PLACE USING A4 RIVETS AS PER BUILD MANUAL (8 OFF RIVETS ON UPPER AND LOWER FLANGES 5 OFF RIVETS ON FRONT FLANGE)
327.3
40 BETWEEN RIVET PATTERN CENTRELINES
RIGHT AILERON
ASSEMBLE BALLAST WEIGHTS TO ARM USING AN3-13A BOLTS, STIFF NUTS AND WASHERS
85mm
85mm
97 REF (DRILL BALLAST ARM TO SUIT HOLES IN RIBS SO BALANCE ARM DOES NOT HIT TOP OR BOTTOM SKIN)
460
ASSEMBLE BALANCE ARM TO RIBS USING AN3-12A BOLTS AND THICK WASHER
3 OFF 10-32 ANCHOR NUTS ON INNER RIB. HOLE POSITIONS SHOWN ARE FOR OUTER RIB. TRANSFER HOLES TO INNER RIB
6BA01-1
6BA01-2
6BA01-3
2x ø3/16"
2x ø3/16"
BALANCE WEIGHT
BALANCE WEIGHT SHIMS
MILD STEEL t=1/16" (AS REQD)
BALANCE ARM
6061-T6 t=0.063"(2 REQ'D)

FIGURE 4

Trim Tab Horn rotated through 180º, new holes drilled and refitted. Note that the redundant holes must be filled with rivets.

Fig. 5. The re-positioned Elevator Trim Horn.

7. Flight Manual Supplement

Ref. LAA Mod/162B/004 Issue 1

This single-page supplement is to be included at the front of the Flight Manuals for CH601 XL aircraft operating under LAA approval. Make hand-written entries on each of the affected pages of the manual, alerting the reader to the need to refer to the supplement.

1. Centre of gravity range amended to 300-455 mm aft of datum (20-30 % MAC) on page 2-6
(was 300-520mm aft of datum, 20-35% MAC)

2. Maximum loaded weight minus weight of fuel and wing baggage introduced of 494 Kg (page 2-5)

3. Airspeed Indicator Markings (page 2-2) to be amended as below:

green arc to be 38-90 KIAS (was 38-113 KIAS)
yellow arc to be 90-140 KIAS (was 113 to 140 KIAS)

4. Additional warning regarding danger of misloading on page 2-6, as follows:

WARNING

To avoid exceeding aft centre of gravity limit of 455 mm AOD, particularly when flown with two crew, minimum weight of baggage may be carried in rear baggage compartment, typically less than 5 Kg.
Heavy baggage must be carried in wing baggage lockers.

5. Manoeuvring load factors reduced from +4, -2g to +3.8, -1.8g (page 2-7)

6. Additional placard must be fitted stating maximum loaded weight minus fuel and wing baggage (page 2-9)

7. Additional warning regarding descending flight (page 4-6), as follows:

WARNING

The aircraft demonstrates a strong nose-down pitch when the flaps are lowered, which the elevator trimmer is not powerful enough to trim out. With full flaps, it may be necessary to hold a rearward stick force of approximately 6-10 Lbs to maintain the desired attitude & speed.

Additional warning regarding manoeuvring flight (page 4-6), as follows:

WARNING

This aircraft has light stick forces in pitch and particular care is required to avoid inadvertently overstressing it when manoeuvring at airspeeds above Va (86 KIAS)