4 Undercarriage

4.1 Wheels

All three wheels and tyres are identical, only the hubs differ between the nose wheel and the main wheels, which are fitted with brake discs.

Figure 71; wheel parts.

a) Place an inner tube inside a tyre, Figure 72.

b) Loosely place the tyre onto a wheel half with valve hole, locating the valve through the hole in the wheel half.

Figure 72; tyre and inner tube.

c) Place the other wheel halve onto the first wheel half, so that the tyre and inner tube are positioned between the two wheel halves.

d) Take a hub, put a drop of thread lock into each of the six threaded holes, and position it against the wheel half opposite the valve side, Figure 73. Note that the hub has a machined face with square inside corners one side and a radiused face the other. The machined face should sit against the wheel halves. The **Do not assemble with hub between wheel halves!**

e) Check that the inner tube is not trapped between the wheel halves, and pass all six bolts from the valve side through their washers, both wheel halves, and into the threaded holes on the hub.

f) Tighten the bolts and inflate the tyre to 26psi. If the tyre does not slip easily into position a little squirt of neat washing up liquid around the rim can be used to make it slip more easily.

Figure 73; placing a hub against the wheel halves.

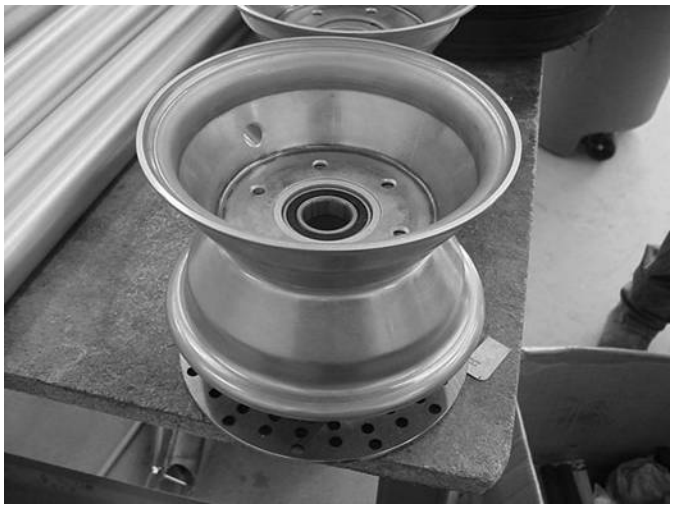


Figure 74; a wheel minus the tyre.

4.2 Main Undercarriage

4.2.1 Brake calliper attachments

a) Check that the callipers are bolted together by the correct bolt to leave the other two holes free to mount the calliper offset slightly to the rear of the undercarriage legs. See Figure 87 for the manner in which the callipers are intended to be mounted.

   It will probably be necessary to swap the bolt holding the one of the callipers together to the other hole. This will result in a handed pair of callipers.

b) If not already done, drill an 8mm diameter hole in each undercarriage leg 18mm above the upper rear stub axle mounting holes, as shown in Figure 75 and visible in Figure 77.

   Mark carefully, and recheck before drilling. *Use a small pilot drill first, and recheck its position. Then drill out to the proper size.*

   Try to drill squarely. It is permissible to allow a little slop in the hole size, to allow the callipers to find their own alignment.

   Take care to make a handed pair. *The callipers and holes for them are to the rear of the undercarriage legs, and at the narrow end of the legs.*

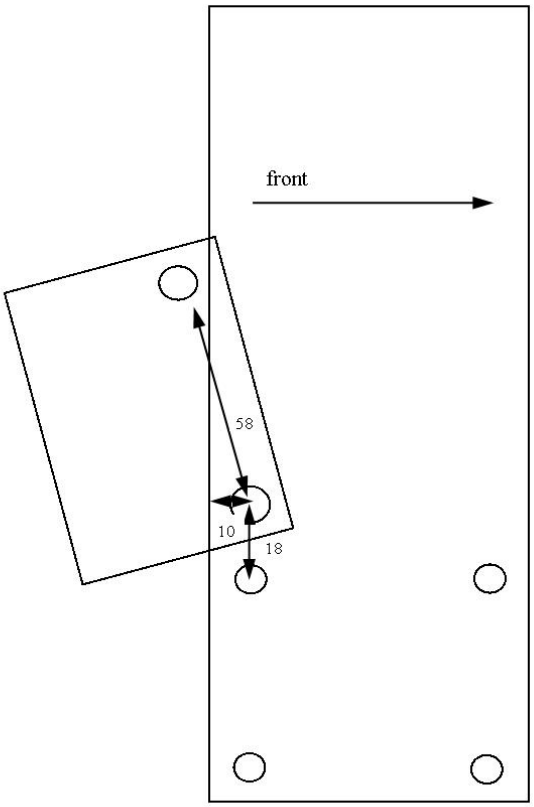


Figure 75; hole for brake calliper mounting.

4.2.2 Undercarriage legs

a) If spats are to be fitted, fit the mounting brackets on the lower pair of stub axle mounting bolts on the wheel side of the stub-axle flange, Figure 77.

Use the longer bolts supplied in the spat kit. Excess bolt threads can be trimmed off.

b) Fit the brake mounting piece to the forward upper stub axle bolt, visible in Figure 87, and tighten the stub axle bolts.

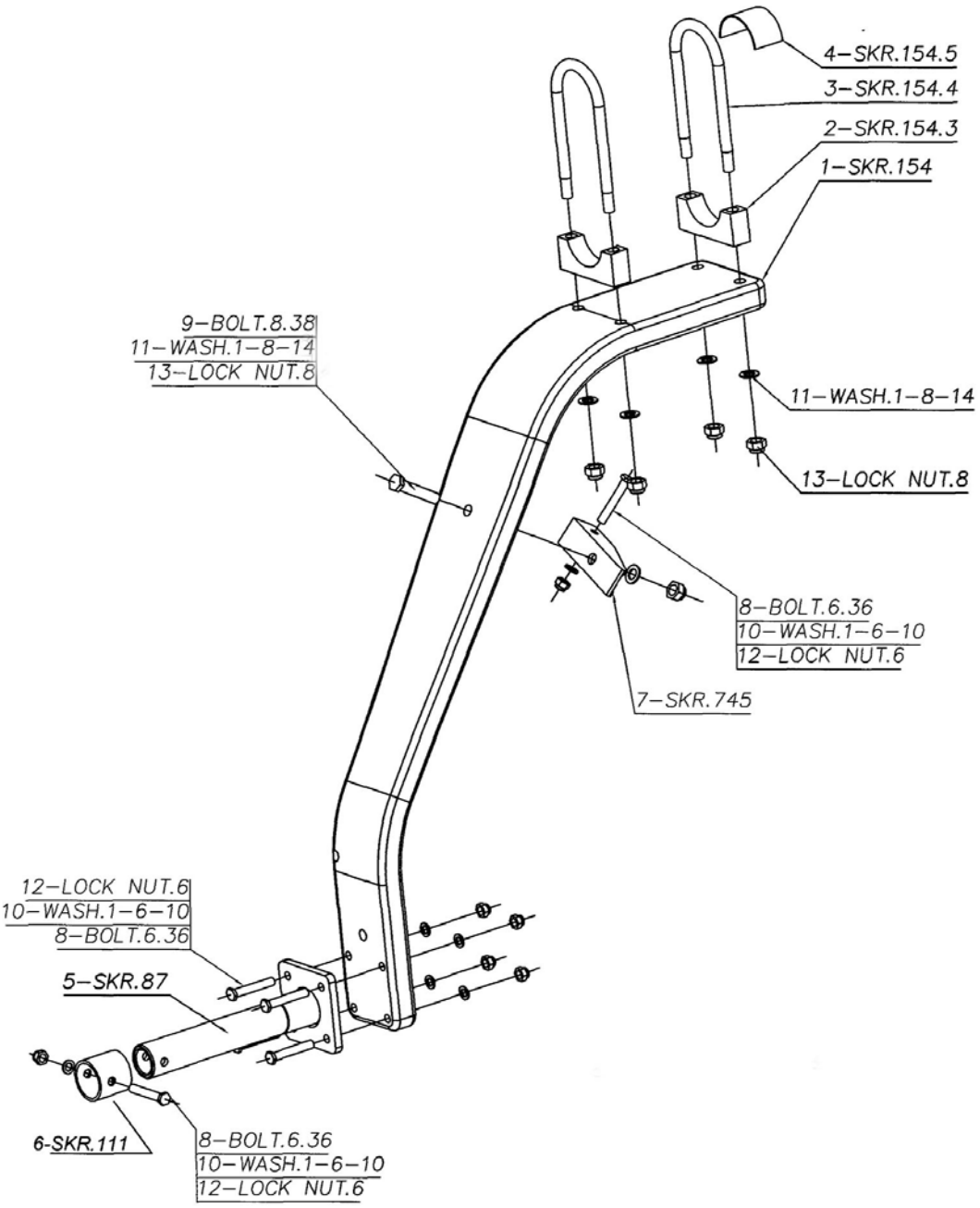


Figure 76; main undercarriage leg.

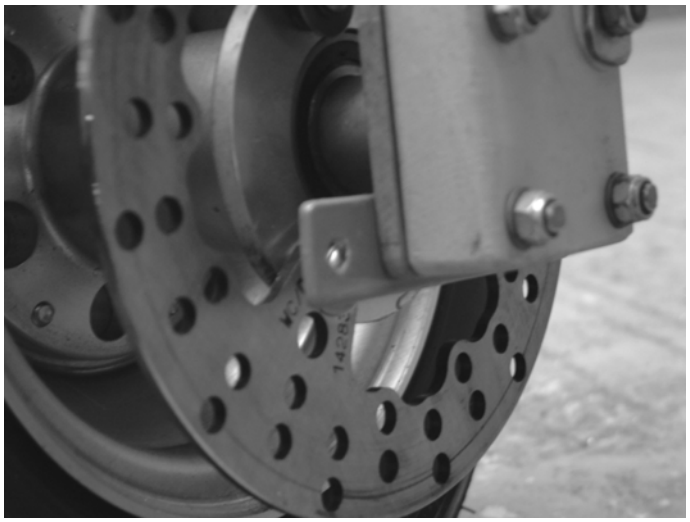


Figure 77; main gear inner spat mount.

c) Fit the undercarriage legs to the main undercarriage cross-beam ***tu9*** using a pair of U-clamps and spacer pieces per side, Figure 78.

Use a piece of thin aluminium sheet between the top side of the inner U-brackets and ***tu9****.*

Make sure that the legs are on the correct sides to place the brake callipers towards the rear!

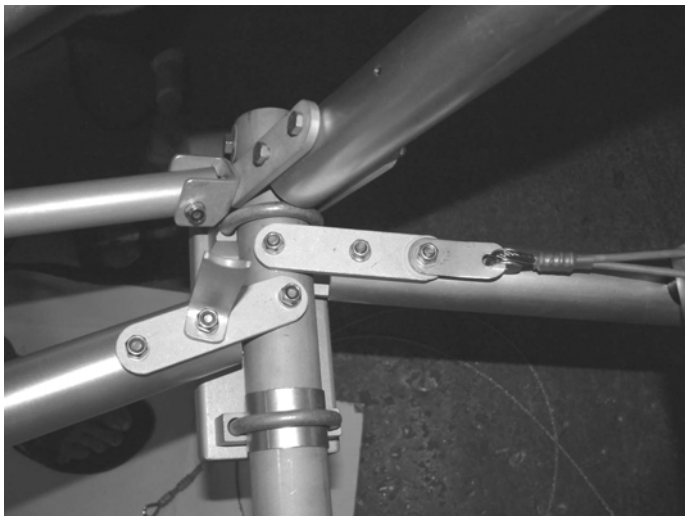


Figure 78; main gear leg mounting.

d) The outer clamp should be positioned as far outboard as possible, against or close to the plates holding the base of the rear cabin uprights ***tu6***.

The position of the clamps along ***tu9*** *is quite restricted due to these plates and other fittings on* ***tu9****. It may be necessary to provide a little extra clearance at the lower inside edge of the rear cabin upright tubes themselves,* ***tu6****, for the outer U-clamp. Clearance may be provided if necessary by filing the tube lower edge.*

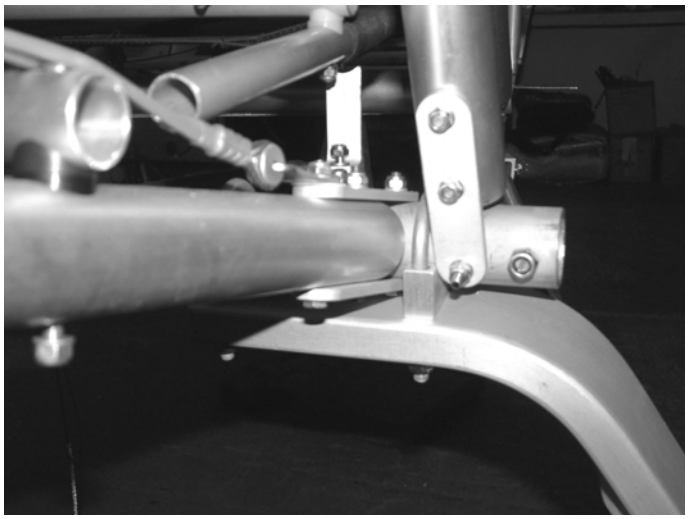


Figure 79; outer U-clamp position.

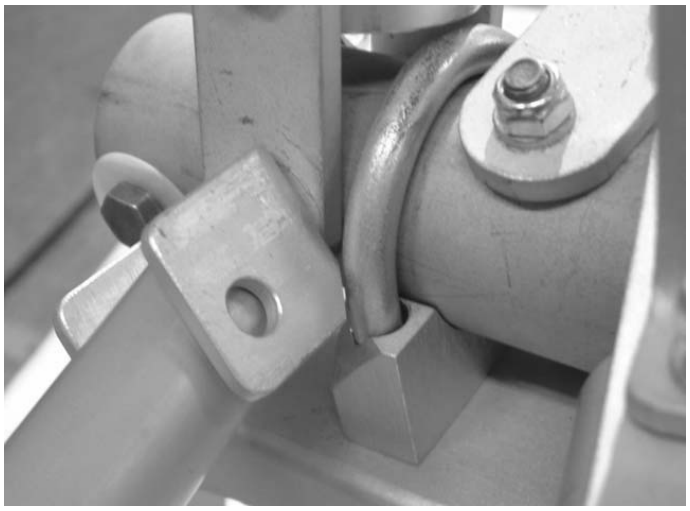


Figure 80; side member attachment bracket and undercarriage leg outer clamp, starboard side.

e) The front outer edge of the outer U-clamp spacer piece may need filing to clear the aluminium U-bracket holding the lower fuselage side member, Figure 80.

The corner of the aluminium bracket itself may also be filed to provide the necessary clearance.

Do not tighten the clamps until the drag links have been fitted.

4.2.3 Lower fuselage side members

a) The lower fuselage side members ***tu16*** should be positioned with the inner-sleeved part towards the rear. Slip the padded covers over the drag link upper braces, visible in figure 82.

b) Passing the bolt downwards, connect the end of the front seat support cross-piece ***tu15*** (including a spacer tube in ***tu15***) to the drag link upper brace ***tu144*** (already attached to the rear cabin uprights), the middle of the lower side members ***tu16***, and the aluminium channel section drag link end fitting.

Use thin plastic washers between the steel drag link upper brace and the aluminium tubes above and below it, in order to prevent the steel chafing the aluminium.

The bolt should be secured by one or more steel washers with the sides filed flat to fit within the channel section, and an 8mm Nyloc nut. The number of washers should be sufficient to tighten the nut without binding on the thread. The bolt should only be temporarily tightened at this stage, as it will have to be removed again to fit the covering. When it is tightened properly, do not over-tighten the bolt to the point of distorting the tubes!

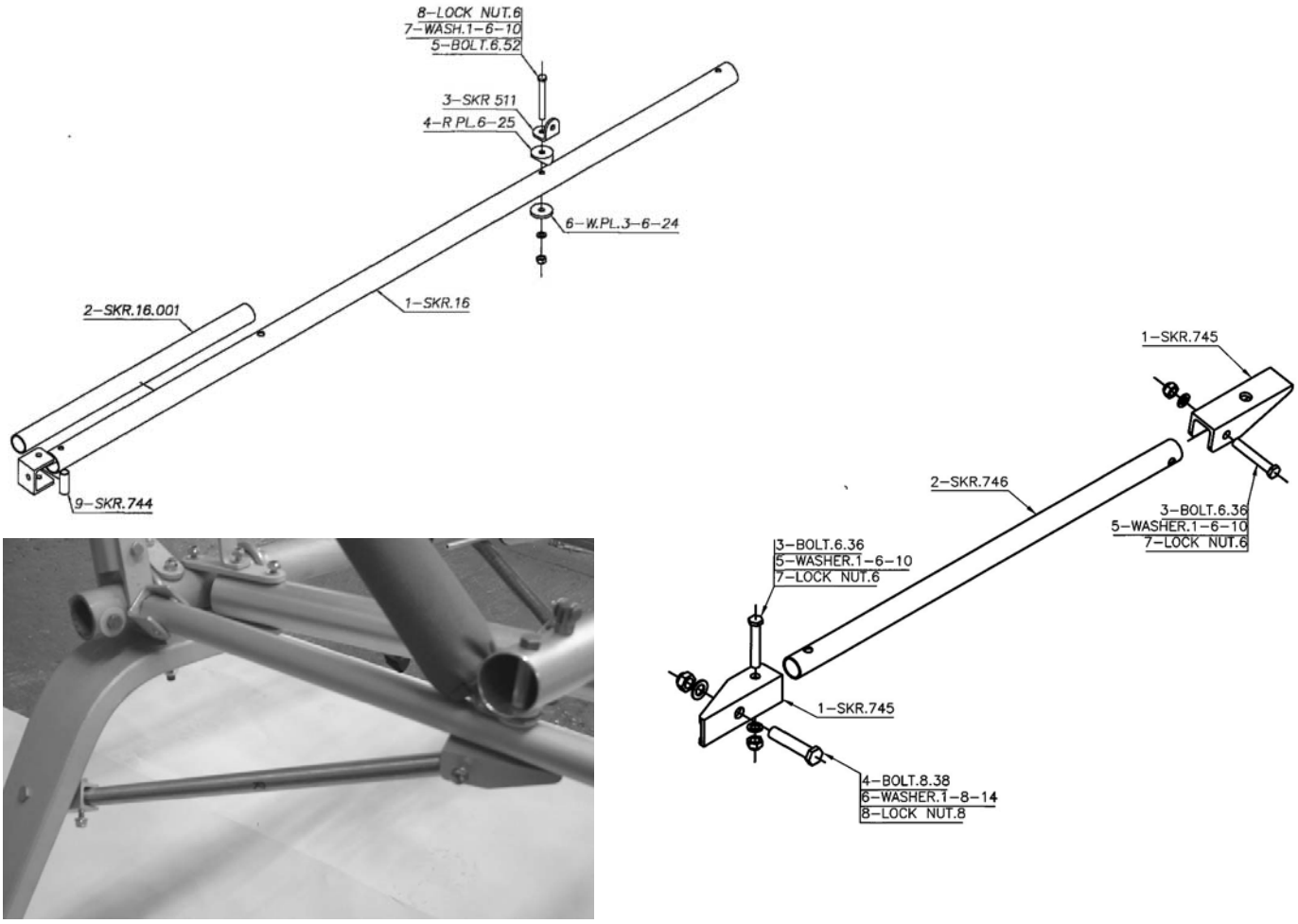


Figure 81; fuselage side member tu16 and UKMOD drag link.

c) Temporarily secure the front of ***tu16*** to the underside of the rudder mounting bar ***tu18***.

The floor will have to be drilled to allow the bolt to pass through it.

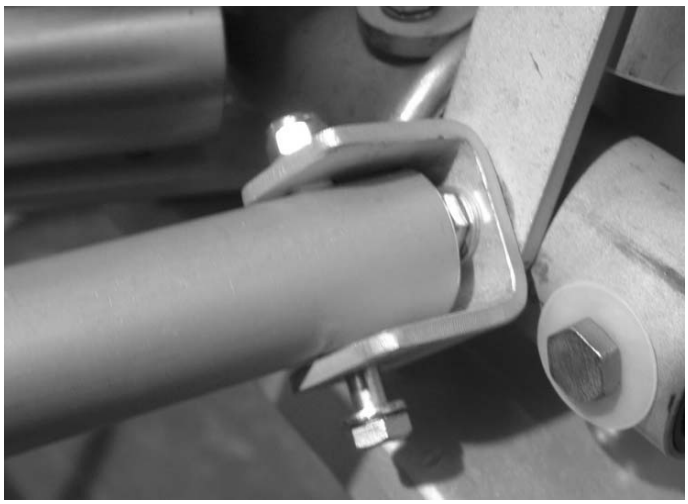


Figure 82; side member attachment bolt, port side looking rearwards.

d) With the side member and U-bracket in position the rear end of the side member tube must be drilled in situ.

The U-brackets are handed and should sit at an approximate angle of 45 degrees, mounted with the single rear fixing hole towards the inner side and the pair of holes in the U-bracket arms in line with the tube.

e) Line the tube up with the bracket and mark the hole centres with a pen, and then use a centre-punch. The hole centres should be directly opposite each other on the tube, not offset to one side or another. The fit of the tubes may require a little force, depending on the fit of the rest of the aircraft and floor etc..

f) If necessary, remove the tube in order to drill it. Starting first with a 4mm bit, drill one side and then the other.

g) Then open out with a 6mm bit applying any necessary bias to adjust the centre to align with the holes in the U-bracket.

h) If not already removed, slip the tube out of the bracket and finish with an 8mm bit run through the tube only.

i) A spacer tube is inserted into the 8mm hole in the tube, which holds the sides of the bracket apart.

If necessary trim the spacer to fit between the sides of the bracket.

j) Secure the bracket and tube with a 6mm bolt.

Do not tighten until the fuselage cover is fitted at a later stage, as the side tubes are removed again to fit the covering.

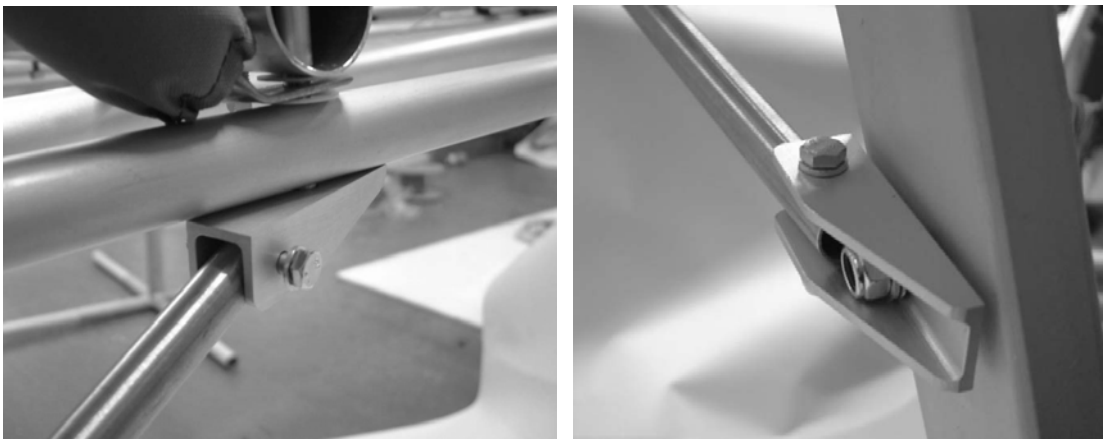


Figure 83; drag link end fittings.

k) Fit the drag link into the end fittings, and attach the lower end fitting to the undercarriage leg with an 8mm bolt and washers filed to fit in the channel section.

The stainless-steel drag link tubes are handed to fit and the end with the angle in one side faces forwards.

It may be necessary to file the corner off the ends of the drag link tubes a little more, to allow them to clear the base of the channel sections.

l) When the drag link tubes have been fitted, the main undercarriage U-clamps may be tightened up.

4.3 Nose Gear

All UK kits come as standard with a reinforcing sleeve. It may be possible to check this by looking through one of the holes, although the usually slightly visible interface between the inner and outer tubes may be obscured by the hole drilling process.

4.3.1 Nose leg

Refer to Figure 85.

a) If no spats are to be fitted apply grease to the inside of the nose wheel lower and upper guides. If spats are to be fitted, then leave this until the noseleg is removed to fit the spat.

   This is to minimise the risk of contaminating the rubber washers with grease. It is best to leave fitting the spats until the end of the build, otherwise they are likely to suffer damage during the rest of the build (yes you will drop that hammer on it!).

b) Slide the nose leg up through the lower guide.

c) Put a large steel washer, then 7 rubber washers, then another large steel washer, onto the nose leg before sliding it up through the upper mount.

   Check the number of washers supplied, you may receive an extra one or two. Use only the specified number.

   It is important that the noseleg should be free to swivel in its guides with little or no perceptible friction.

   If the noseleg is stiff to turn due to a slight misalignment between the upper and lower brackets try turning it around 180°.

   If the nose leg still does not easily align with the upper bracket in a side-to-side manner, slide it clear of the upper bracket and gently apply a tweak to the lower mount using the nose leg itself as a lever. The aim is to achieve good alignment to remove any friction in the rudder controls. If a small tweak does not suffice, the holes securing the lower guide may be elongated slightly, parallel with the nose leg. Do not elongate them in any other direction, as this will introduce slop into the position of the lower guide.

   If the noseleg is still stiff to turn, smooth any protruding weld inside the upper and lower mounts with abrasives. A small file or a flap wheel can be useful.

   Do not get oil or grease onto the rubber or metal washers, as this may cause them to slip over each other in a very heavy landing. This can result in the rudder control circuit feeling stiff or binding, due to misalignment of the nose wheel steering bar.

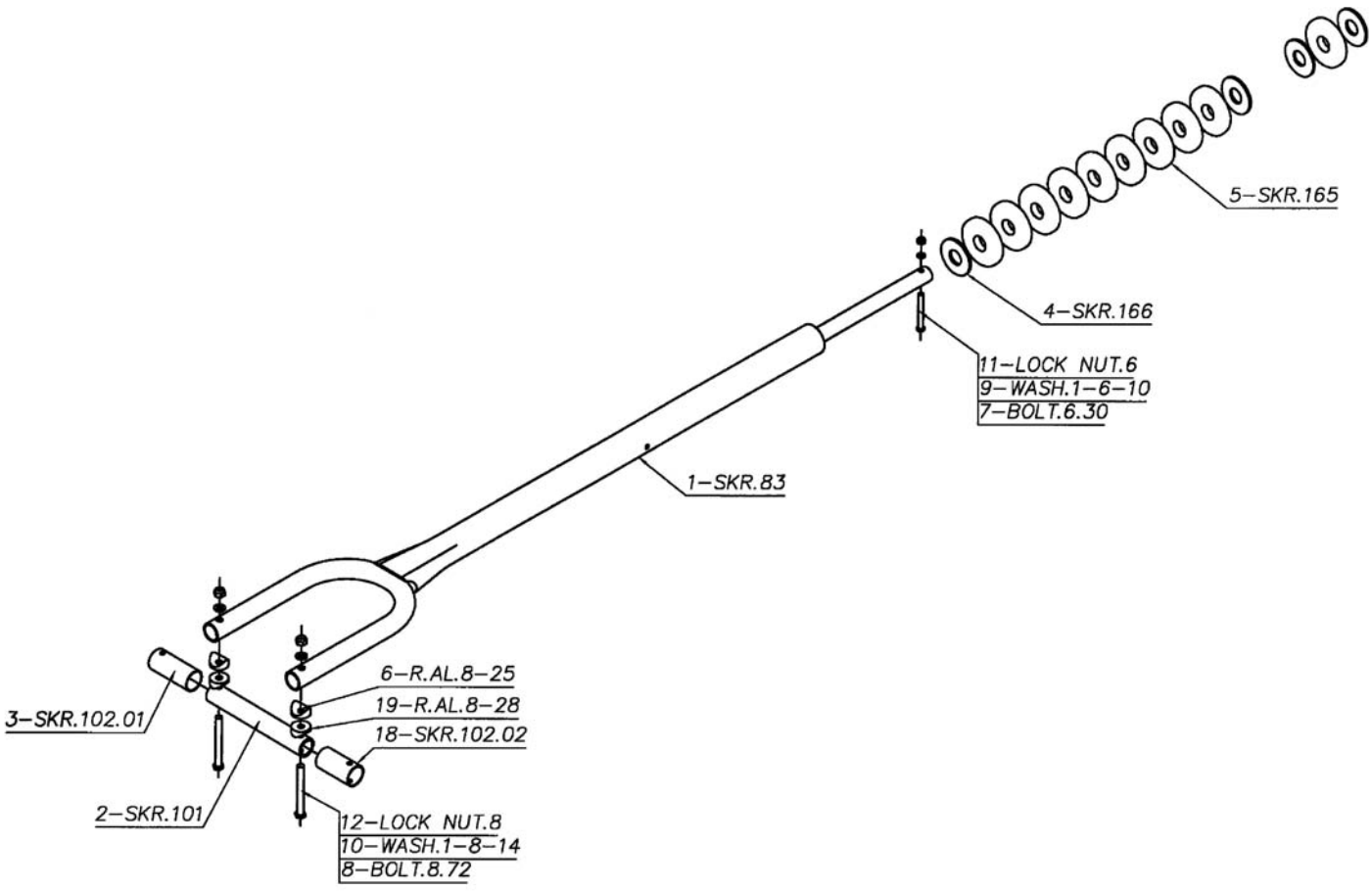


Figure 84; nose leg – use only 7 rubber washers under steel washer, not 9 as shown.

d) Above the upper mount there should be another two large steel washers with one, two, or three rubber washers between them as required, secured by a bolt though the nose-leg.

If a nice fit without excessive vertical play cannot be achieved, make a sleeve to go over the top of the nose-leg, and drill it for the securing bolt at the required position to hold the nose-leg firmly in place. Ensure that the fitting is not squeezing the rubbers, as this will increase friction. A little vertical play is no problem and better than an overly tight fit.

e) Ensure that the lower engine mount triangulation tubes passing either side of the nose leg do not touch it.

Use additional washers to space out the lower ends of the triangulation tubes if necessary.

4.3.2 Nose wheel

a) Assemble the wheel on its axle ***tu101*** with a spacer tube ***tu102*** on each side.

The spacer tubes are cut to different lengths to centre the wheel on the axle, as the wheel is not symmetrical about the hub.

b) The axle should be attached behind and below the forks.

Check that the tyre does not rub against the side of the forks.

4.3.3 Nose wheel steering

a) The nose leg fits to the steering bar between the two 90 degree brackets.

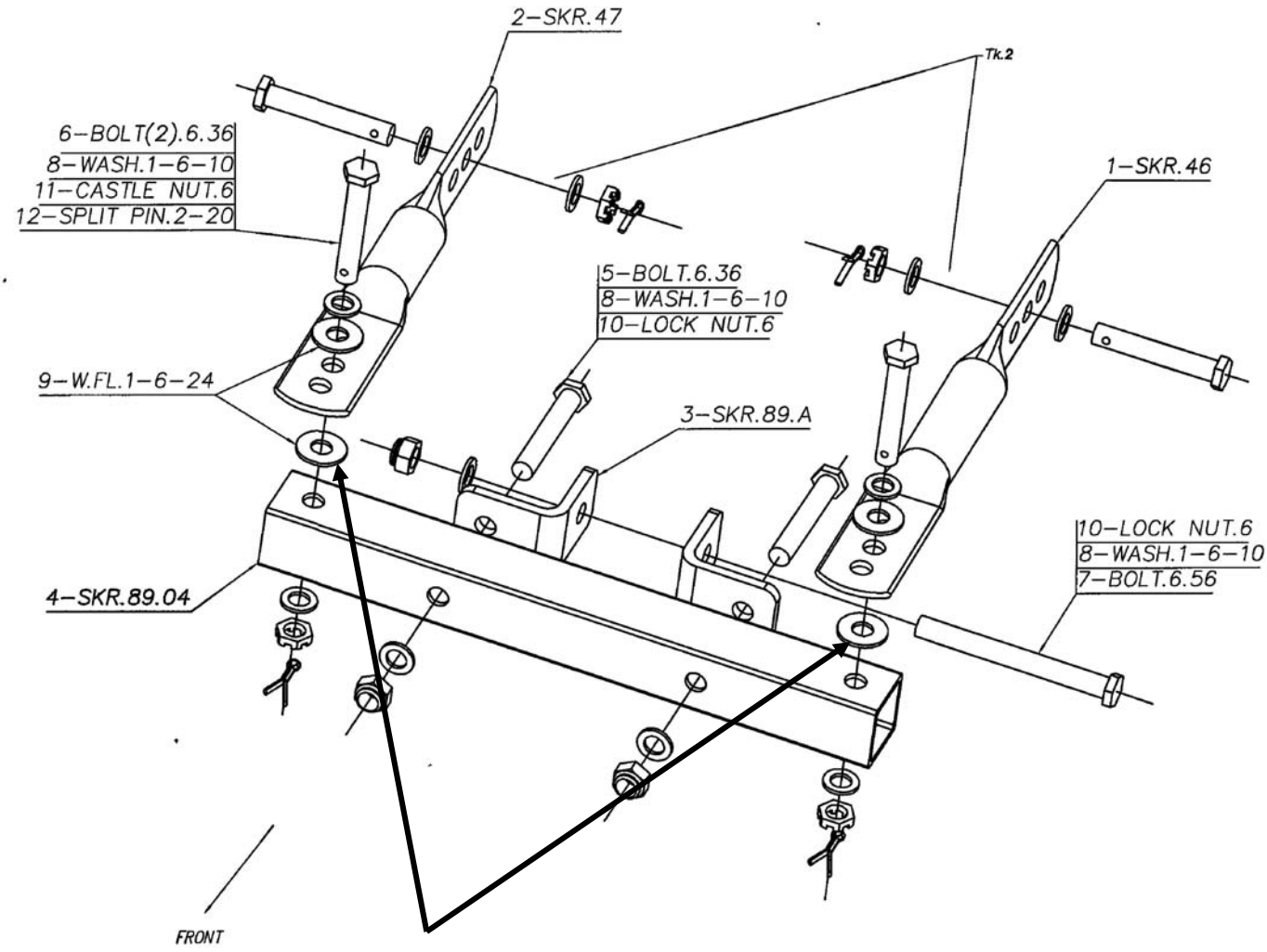


Figure 85; Nose wheel steering.

b) Temporarily fit the two small steel pushrods ***tu44*** and ***tu45*** linking the steering bar to the rudder pedals. Use the middle holes at this stage.

   One pushrod is longer than the other to account for the offset of the rudder pedal pivot bars.

c) UKMOD: Rubber grommets must be fitted between the box section and steering pushrods and between the pushrods and the pedals to facilitate angle change at steering extremes.

   Ensure that you have fitted these, as otherwise the steering will not operate properly.

   Do not tighten the bolts so much that you completely squash the rubber grommets!

d) Temporarily fit the pushrods to the rudder pedals, using the middle holes on the pushrods and the second hole from the top of the pedals. The choice of holes on the pushrods is used to set the rudder cable tension later.

e) Note the bolts used at both ends of the pushrods should be fitted with split-pins once adjustments are finalised.

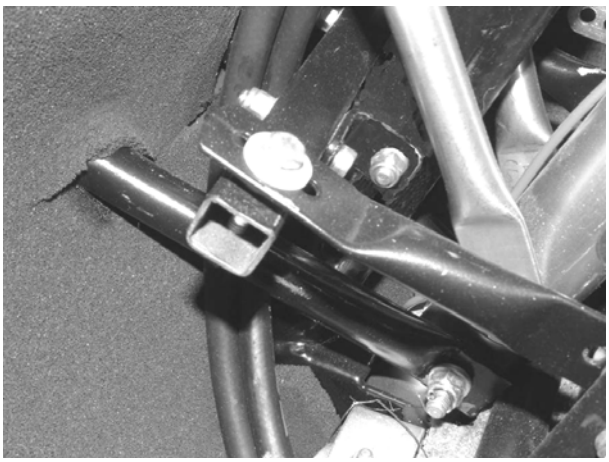


Figure 86; nose wheel steering bar, with rubber grommets between pushrods and box section.

4.4 Brakes

4.4.1 Brake brackets

a) Slide the main wheels into place on the stub-axles. Use a smear of grease.

Sometimes the wheels are a tight fit on the stub axles. If the wheel cannot be slid on and off easily use some fine glasspaper and smooth the exterior of the stub axle, then assemble with a little grease.

b) Slide the callipers over the brake discs, Figure 87.

The callipers must be handed to sit behind the undercarriage legs by swapping the bolt which holds the calliper halves together to the other hole on one of the callipers.

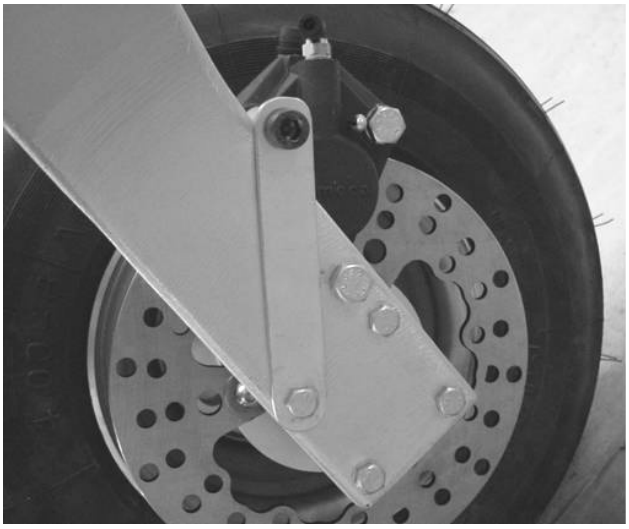


Figure 87; brake calliper mounting. Note bolts are usually the other way round, heads towards the wheel which keeps the threads away from the axle flange.

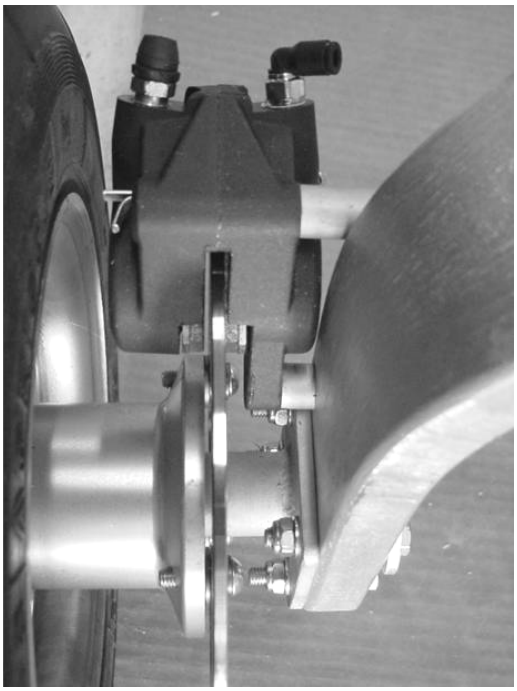


Figure 88; spacers on brake mounts.

c) Bolt the callipers to the undercarriage legs, using spacers as required to centre the callipers on the discs, Figure 88.

The parts to mount the callipers are in the UKMODs kit.

Note there is movement of the wheel available, but the position used should be with the wheel as close to the undercarriage leg as possible.

If the hole through the undercarriage leg is not square, the calliper will not sit correctly. Open out the hole diameter a little to allow the calliper to find its own alignment.

d) Fix the wheels in place with lengths of aluminium tube ***tu111*** slipped over the axle and drilled to allow a bolt to secure them to the axle.

If spats are to be fitted, fit the 80mm extension tube from the spat kit.

4.4.2 Hydraulics

a) Mount the brake lever on the front of the control stick.

It will be necessary to quite considerably open out the inside of the mounting bracket to fit over the tube. A piece of glasspaper wrapped around a slightly smaller tube than the stick is a good method.

b) If the brake lever fouls the instrument panel, when this is fitted, it will be necessary to put a small stop in front of the lever to limit its forward movement.

This may be a small bolt, chopped off and screwed into place, or some other chocking device. An alternative is to saw off the end of the brake lever to remove the 'bobble'.

c) Use Teflon tape or an appropriate thread sealant on the threads of the end fittings at the callipers and the brake lever, to help seal the fittings to the callipers and lever.

The threads on the bleed nipples themselves should not require any tape.

d) Assemble the hydraulic tubes from each brake to the splitter piece at the brake handle.

The connectors are a firm push-fit on the tubes. Give the tubes a tug to check they are seated properly.

Leave a little slack to allow for movement of the control stick.

Check that there are no high points between the brakes and the lever, as this could trap air bubbles and give a spongy feel to the brakes.

e) Bleed the brake system until the brakes become effective at preventing the plane being pushed. The lever does not have to be very hard to achieve this.

   Ensure that no brake fluid is spilt on anything. *If any is spilt, wash off with copious amounts of water. Use containers / oven trays etc. to catch any fluid dripping off the reservoir or running down the stick. Beware of spurts of fluid out of the reservoir filler or the bleed nipples.*

   Fill the system from the bottom up through the calliper bleed nipples, using the syringe supplied or a pressurised bottle available from Halfords or similar. This seems the most reliable method and should be used. To get firm brakes it will be necessary to push enough fluid upwards in one go to fill the calliper and the brake lines and flood fluid out of the master cylinder (use plenty of rags and a catch tray to prevent fluid spilling on the airframe). A 'stop start' approach will result in bubbles of air being trapped.

   If the conventional approach to bleeding brakes is preferred, filling from the handle end and bleeding the callipers through their bleed nipples, it may be necessary to repeat the bleeding procedure a number of times until all the air is expelled from the system. Tricks include: putting a bleed nipple in the lever reservoir to connect another bigger reservoir whilst pumping the brakes with the lever; removing the callipers from the undercarriage legs to allow them to be moved around to clear any trapped air; replacing the reservoir Allen screw with one drilled with a hole and fitted to the end of a filler supplied with some makes of EP90 gear oil to form another reservoir. Take care that when pumping fluid through bleed nipples that you don't draw in any air as you close them. It is best to close them before you finish your pump.

f) If the brakes leak fluid they will require more sealant tape on the threads.

   It may appear that the brake callipers are leaking from the seal between the two halves. This is unlikely to be the case: typically some fluid from a leak on the bleed nipple gets between the calliper halves, and can then be seen as a line when the brakes are squeezed and the callipers flex slightly.

   The hydraulic fittings on the brake callipers may need to be tightened up quite a lot to prevent weeping of fluid.

g) Run-in the brakes on the ground before flight testing commences.

5 Tail Surfaces

5.1 Tensioning the Rear Fuselage

a) Ensure that the front of the vertical fin is not yet fixed to its mount.

b) Check that the rear fuselage is sitting approximately squarely, then tighten the bolts around the rear fuselage, remembering to use threadlock.

> *If there is some "set" in the rear fuselage, get a helper to twist it straight whilst you do the bolts up. This will help when the cables are used to correct the "set" as detailed below.*

c) Lift the back end of the forward fuselage off the ground by picking up on the rear of the fuselage under the vertical stabilizer tube.

d) Fit the turnbuckles to the forward ends of the upper cables and tighten firmly.

e) Allow the fuselage to sit on the ground normally again.

f) To check the tension on the cables you can hang a 3kg weight from the centre of the cables with the turnbuckles: it should hang down around 2cm give or take 3mm or so. This is quite tight!

g) Check that the vertical stabilizer is straight up and down relative to the rest of the fuselage. If it is not you can adjust it with the turnbuckle tension, loosening one slightly whilst tightening the other a little.

> *If small adjustments of the cable tension are not sufficient to correct the symmetry of the rear fuselage, the fixed length cables can be adjusted. To do this, disconnect the slackest of the fixed length cables and give it a couple of twists in the direction of the lay of the wire (twisting it up, not untwisting it). Reconnect the cable and repeat the tensioning and adjustments of the turnbuckles.*

h) Once correctly tightened the turnbuckles should be wire-locked.

i) Check the positions of the plastic anti-chafe sleeves (made of slit fuel tubing if none are already fitted), where the cables cross and optionally where the cables pass the bracing frame, and secure with a small cable tie, Figure 89.

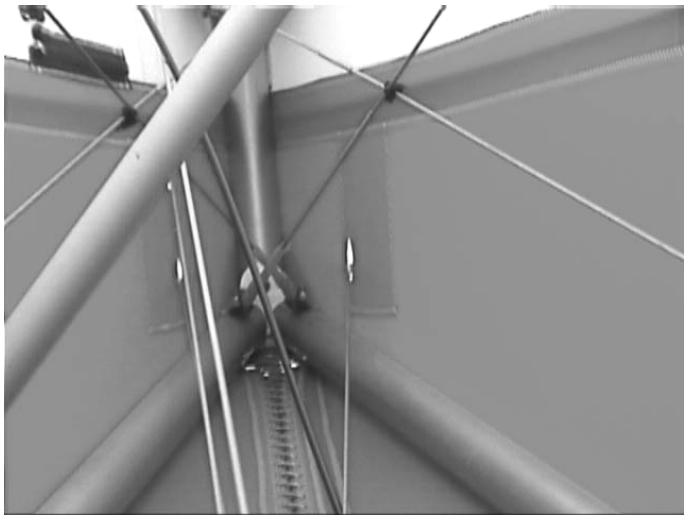


Figure 89; crossed cables and cable ties.

5.2 Trim Tabs

5.2.1 Cable outers

The action is transmitted from the trim lever via Bowden cables to the trim tab.

a) Fit the threaded cable adjusters into the forward cable outer termination bracket.

The bracket was fitted earlier to the rear of the starboard upper cabin triangle tube. If this was missed, take care not to lose the internal spacer when fitting the bracket: push the bolt out with another bolt, then push this one out with the bolt holding the bracket.

b) Secure the cable outers running along the starboard upper rear fuselage tube ***tu2*** back to the support for the forward tailplane attachment.

White or grey insulation tape is recommended for this purpose. Whilst cable ties could be used, they will visibly distort the fabric covering.

Figure 90; forward end of trimmer cables.

The rest of the cable fitment will be done after the fuselage covering is fitted.

5.2.2 Elevator trim tab

a) If desired, paint the elevator trim tab.

b) Tap the elevator trim tab hinge pin out about 10mm, and cut this off. Tap the pin back into place.

c) Drill a tiny hole, lockwire size, at each end of the hinge, either side of the hinge pin but not through the hinge pin.

d) Wirelock these holes, to prevent any chance of the hinge pin falling out as it wears over time.

e) Rivet the elevator trim tab hinge to the trim tab and to the lower side of the trailing edge of the starboard elevator half, Figure 91.

Elevator halves are handed, choose the correct one to place the slots for the eyebolt nuts to the underside.

Align the tapered part of the trim tab with the tapered part of the elevator.

Use between five and ten 3.2mm diameter steel rivets, rather than anything larger due to the small diameter of the trailing edge tube.

If desired, leave the actual riveting on of the tab until the elevator halves are mounted on the aircraft, to keep the tab out of the way. However, it is worth drilling all the holes at this stage.

Figure 91; trim tab and horns position.

f) Attach the rear cable bracket to the lower forward edge of the elevator leading edge spar.

Drill the 5mm diameter hole 230mm from the inboard end of the elevator leading edge.

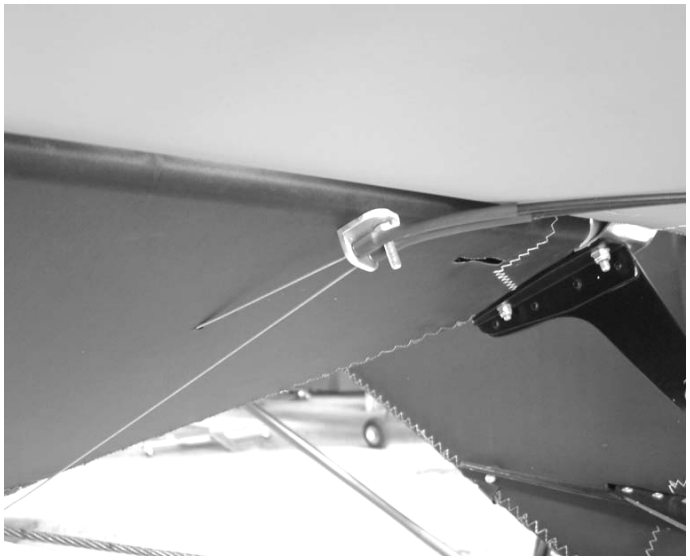


Figure 92; trimmer rear cable bracket.

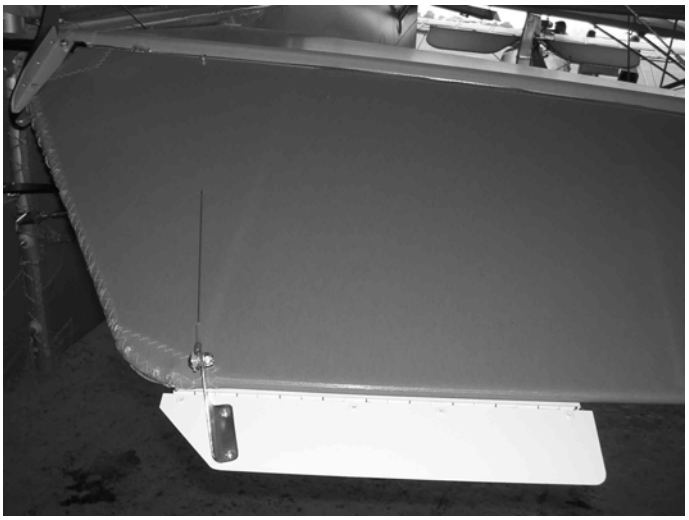
g) Attach the control horns to the trim tab.

The horns should be towards the inboard end of the tab, with the flanges for bolting to the tab towards the outboard end.

They should be positioned in the vicinity of the inboard end of the straight section of the tab trailing edge as per the photographs.

Align the horns to point at the rear cable bracket, and to place the cable attachment holes at the ends of the horn in line with, and erring towards slightly in front of, the trim tab hinge.

Use two short 4mm diameter bolts, cut down to length if necessary.



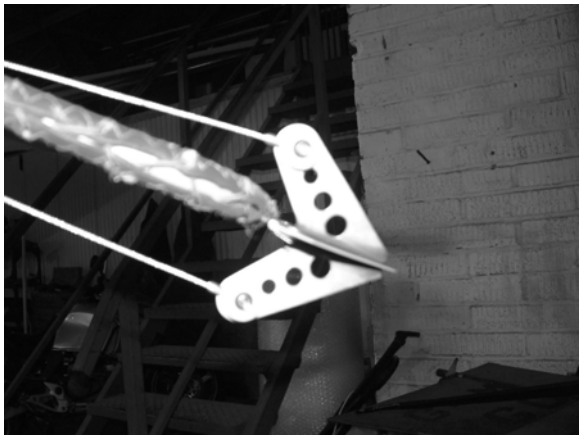


Figure 93; trim tab horns, aligned with cable bracket and hinge pin.

5.2.3 Rudder trim tab

a) Do not fit a rudder trim tab until the aircraft has been test-flown, as it may not require one.

The rudder centring bungee can be used to trim the rudder instead and is normally sufficient.

b) Cut out the fixed rudder trim tab from an off-cut of the firewall, using the pattern provided.

c) Rivet the fixed trim tab to the port side of the rudder trailing edge, Figure 94.

Align the bulge in the tab with the upper internal cross-member inside the rudder, and fix one rivet through this member close to the front of the tab.

Use four more 3.2mm diameter steel rivets to secure the tab to the trailing edge.

Figure 94; rudder fixed trim tab.

d) Similar tabs can be fitted to the ailerons or the elevator to trim the aircraft.

Although the aircraft has an adjustable trim tab on one elevator, a fixed tab on the other may be used to provide more bias for low or high speed operation.

A tab on one aileron can be used to precisely trim the aircraft for single or two-person operation, or a compromise in between.

5.3 Tailplane

5.3.1 Horizontal stabiliser

a) Select the four short cables, which brace the tail surfaces.

Figure 95; tail surfaces and bracing cables.

b) Attach the upper cables to the back of the vertical stabiliser.

These are the cables without turnbuckles.

c) To make access to the nuts securing the tailplane halves use a soldering iron to cut-out small areas on the underside of the covering, Figure 96.

This may be done at both the front and rear bolt locations. Those with particularly nimble fingers may not need to cut these holes.

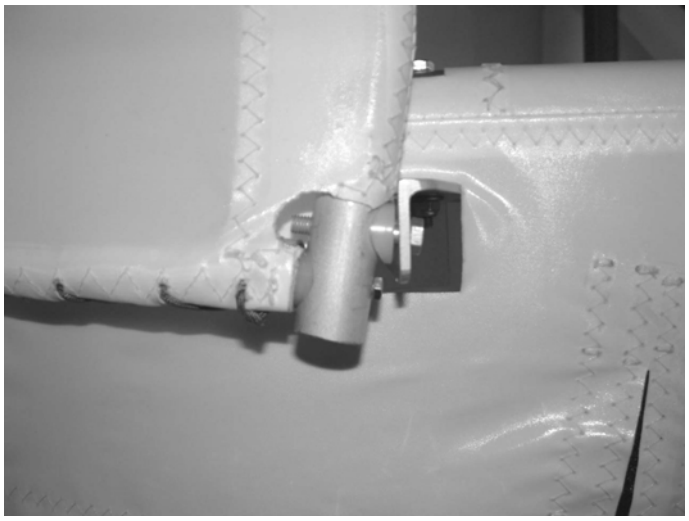


Figure 96; melted holes for access to tailplane forward mounting bolts.

d) Mount the horizontal stabilisers to the forward and rear mounts on the rear fuselage, Figure 97 and Figure 98.

The nut securing the front of the tailplane halves may be tight against the structure of the tailplane. If so, hold it flat against the structure and turn the bolt to tighten it up.

If it is still too close for this to work, try loosening the lacing holding the fabric as this may allow the tubes to spring out of the way.

The forward mounting should be left fairly loose to allow the halves to pivot, and will have to be undone later when the covering is fitted, so do not threadlock it at this stage.

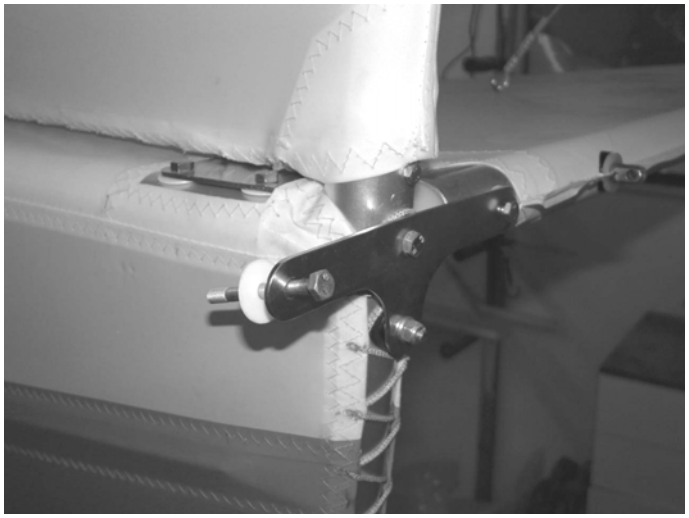


Figure 97; horizontal stabiliser rear mountings.

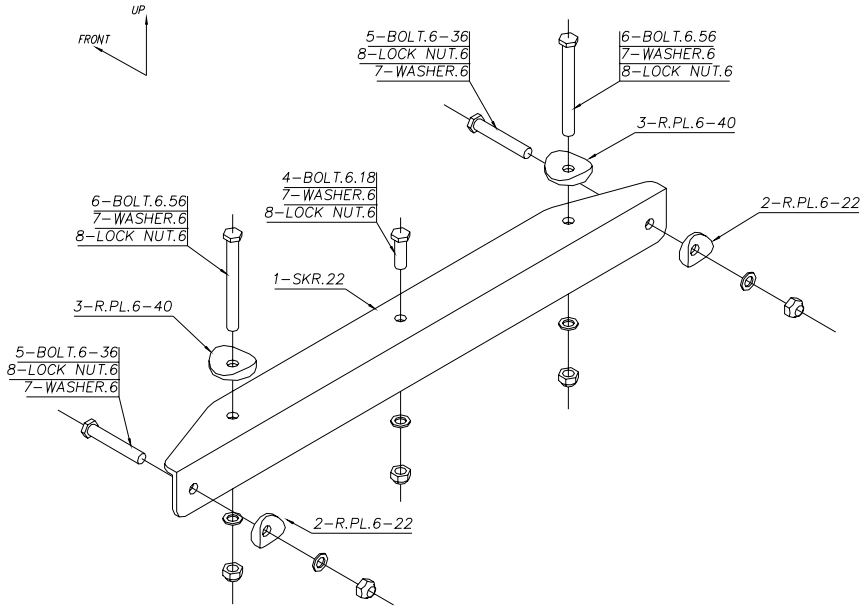


Figure 98; vertical and horizontal stabiliser front mounting.

e) Attach the lower and upper cables to the back edge of the horizontal stabilisers at the outer eyebolt, Figure 95.

The upper cables should go on first, against the tailplane trailing edge tube.

The turnbuckles should be at the inboard, lower ends of the lower cables, where they can be attached to the tangs already fitted to the lower rudder eyebolt. Tighten evenly by hand. The eyebolts along the trailing edge of the tailplane halves should all line up when sighted through.

Make sure the inner eyebolt on the horizontal stabilizer has a saddle washer and one plastic spacer behind it, to match the spacing of the outer eyebolts where the bracing cable tangs attach. There are no saddle washers used on the outer eyebolts.

The trick of using either sticky tape or blue-tack to hold washers and nuts to spanners is worth remembering here.

5.3.2 Elevators

a) Slide on the stainless-steel elevator joiner to each elevator half in turn and mark the fabric around its edge.

Use a soldering iron to trim the fabric slightly inside your marked line so that the joiner can slide on nearly fully without fouling, Figure 99. The joiner may not have to slide on quite all the way, depending on the spacing of the elevator halves, that is why you should leave a little spare material at this stage. Note: later kits are manufactured for UK mod status and will not require trimming.

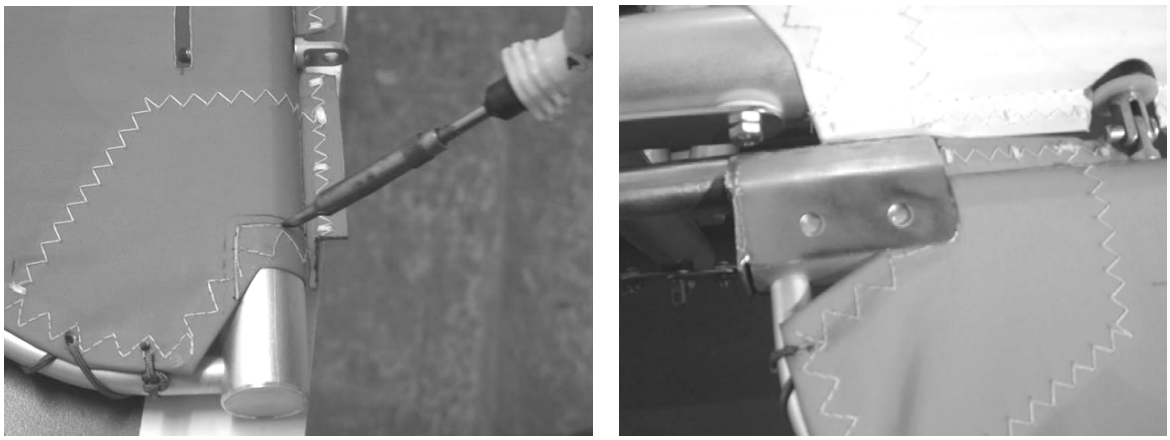


Figure 99; cutting the fabric for the elevator joiner.

b) Put the port elevator into place and secure with a pivot-pin through each eyebolt.

As the elevator is likely to be removed for transportation etc., the pivot-pins should not be split-pinned at this stage.

c) Slide the joiner into place onto the port elevator and fit the starboard elevator.

d) Make sure that the joiner is fully pressed back onto the elevator tubes and fits snugly.

e) Align the elevators with the tailplane, using two wing under-surface battens or similar straight edge and some bungee cord to hold them level, Figure 100.

Figure 100; elevator joiner and alignment.

f) Make a final check of alignment!

g) Ensure that the holes in the elevator joiner are perpendicular to the elevator halves so that the joiner is properly centred, then using the joiner as a jig drill through the tube, Figure 101, in the following sequence.

h) Drill the top side first then underside.

i) Do one hole first in one elevator half, and pop in a bolt.

j) Recheck the alignment!

k) Next drill a hole on the other elevator half, and again pop in a bolt.

l) Do another, very final check of alignment and then drill the remaining two holes, one in each elevator half.

m) Secure the bolts holding the port side of the joiner.

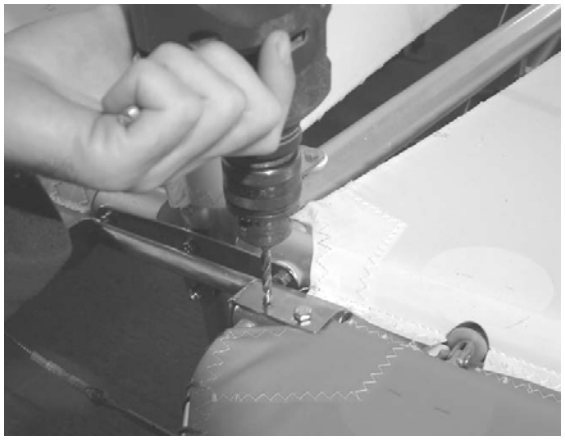


Figure 101; drilling the elevator halves.

5.3.3 Elevator horn

a) Dry fit the elevator horn assembly, Figure 102 and Figure 103, and verify that everything aligns and fits.

It may be necessary to file the horn a little to ensure a snug fit.

Note the longer, forward raked arm goes uppermost.

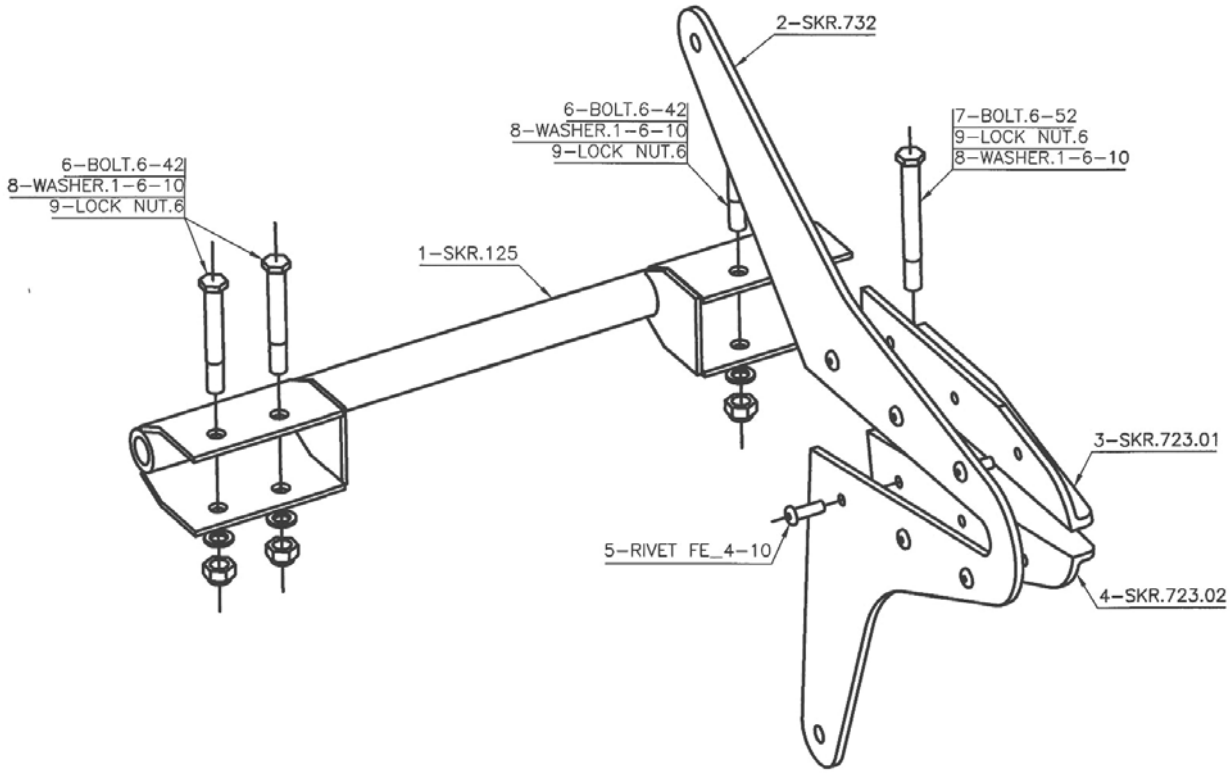


Figure 102; elevator horn.

b) Now rivet the angles to the horn, using the 4 X 10mm steel rivets. Take care to have the correct orientation of angles to horn.

It may be necessary to ease the holes slightly with a round file to fit all the rivets. It is preferable to ease a few holes a little than one hole a lot.

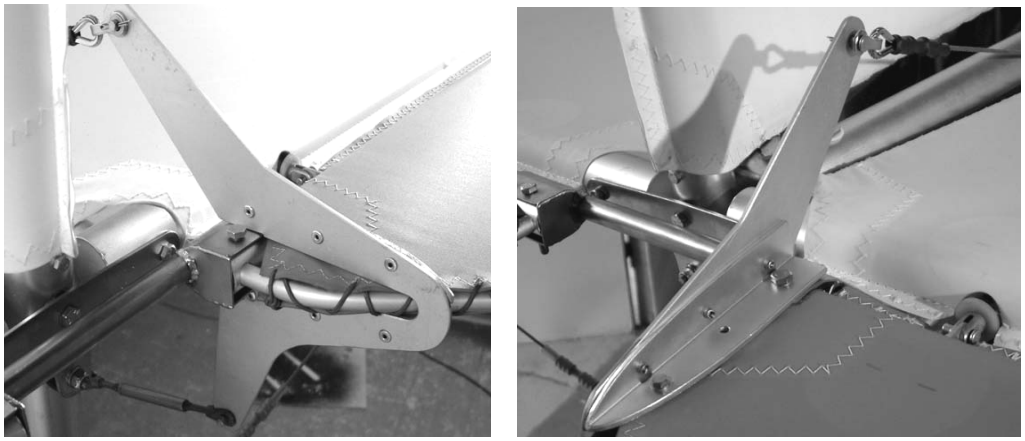


Figure 103; elevator horn braces.

c) Slide the horn into place on the elevator. Verify alignment of the fixing holes, ease if necessary with 6mm reamer or drill.

d) Insert the 6mm securing bolt. This should have one washer under the nut.

e) Melt a hole through the fabric at the rear fixing hole.

The horn should sit at a very slight angle inwards to the fuselage so that it aims towards the centre of the aircraft in the cabin area. The bolt should pass to the side of the elevator framework, not through it.

f) Insert the 4mm bolt and tighten it and the other bolt.

5.4 Rudder

5.4.1 Rudder horn assembly

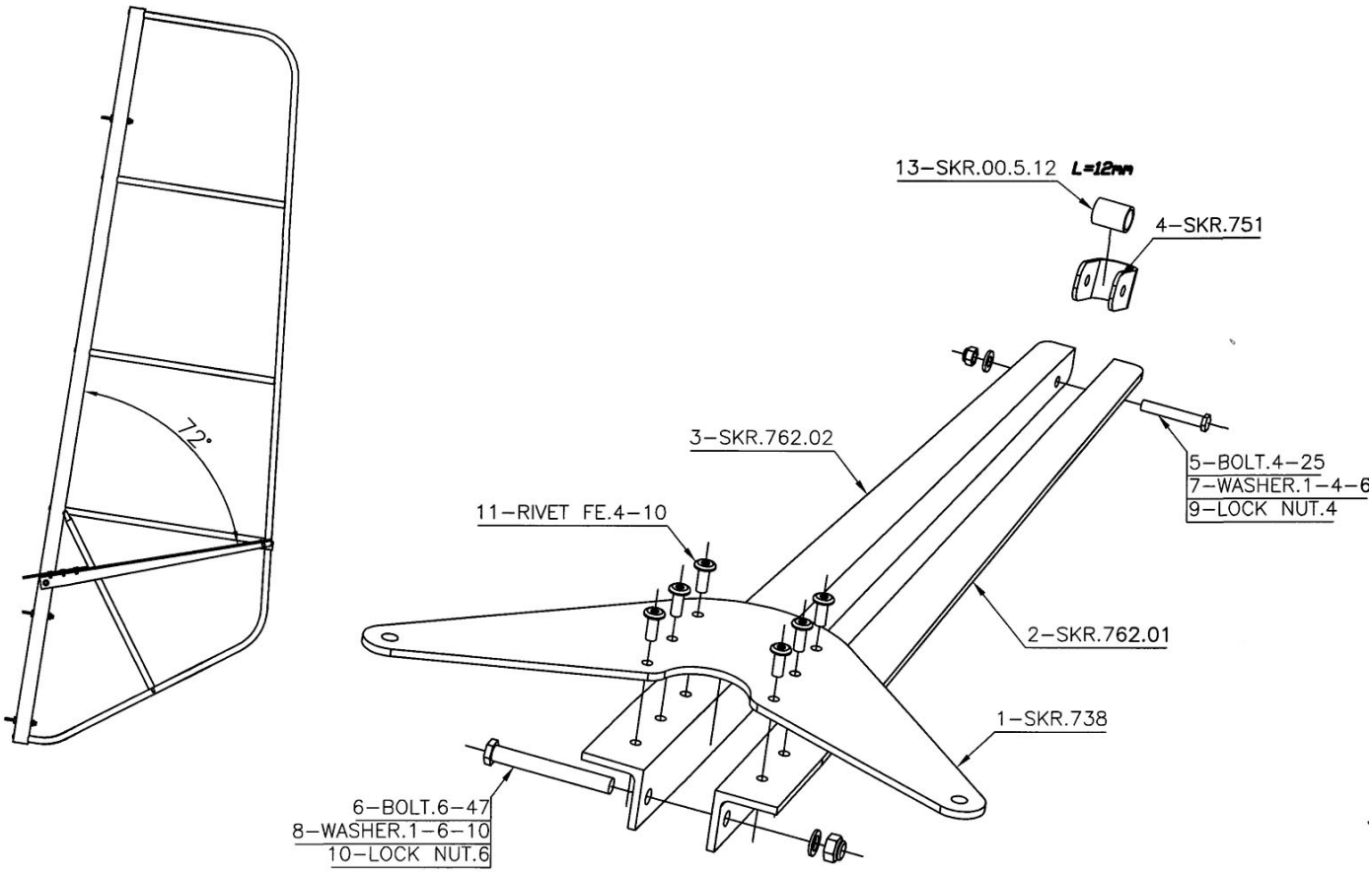


Figure 104; rudder horn assembly.

a) Remove the fabric over the 6mm holes in the rudder leading edge spar with a soldering iron.

These holes can be felt through the covering, located 300mm from the bottom of the tube.

b) Put in place the bracing angles and secure them lightly with a 6mm diameter, 35mm plain shank length bolt through the hole.

c) Position the angles so that the rear 4mm hole is just in front of the rear tube.

This will be on the trailing edge of the rudder.

d) Burn a hole both sides of the fabric to accept the 4mm securing bolt.

e) Bolt this end together complete with the sheet U-brace between the aluminium braces and the rudder covering.

f) Temporarily tighten the 4mm rear bolt and the 6mm front bolt.

g) Take the soldering iron and burn a slot in the fabric above the braces to accept the rudder horn.

These slots should extend back approximately 80mm measured from the centre of the tube. Use the edge of the braces as a guide and keep the slots tight to their edges, Figure 105.

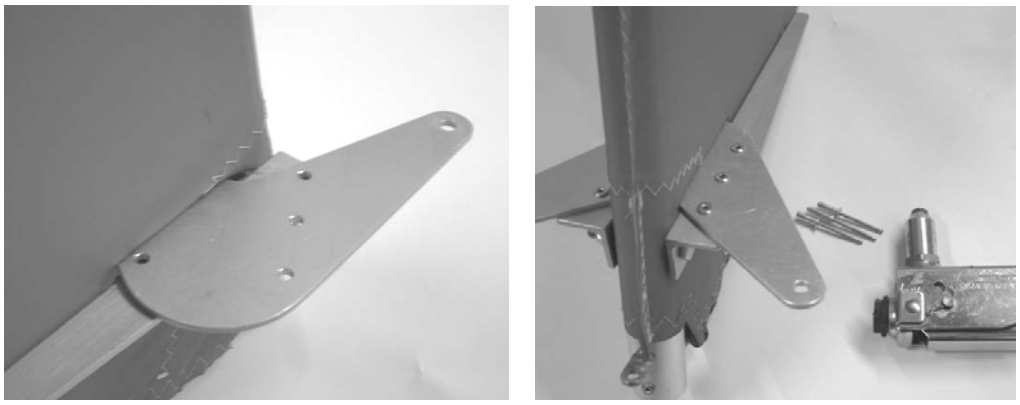


Figure 105; rudder horn fixing.

h) Next insert the horn into position and check the alignment of the rivet holes.

i) Ease the holes with a 4mm drill or reamer if necessary to ensure all rivets fit.

Check for excessive tightness or looseness of the securing bolts if alignment is not easy.

If the holes are well out, it may be necessary to file away some material from the central part of the horn, where it presses against the rudder leading edge tube, to allow it to be positioned slightly further forwards.

j) Rivet the horn in position with 4mm diameter steel rivets.

Take care to ensure that the head of the rivet gun is flat in relation to the horn. If your gun is too wide the fabric will prevent this and the rivets will not seat correctly – get a narrower gun if this is the case.

k) Finally tighten the bolts, remembering to use a small dab of threadlock. Don't get it on the covering!

5.4.2 Mounting the rudder

a) Attach the rudder to the vertical stabilizer using the top two eyebolts on the rudder, Figure 106.

The third, lower, eyebolt is attached to the ventral fin which will be fitted later.

The eyebolts fitted to the rudder itself should have two steel washers under their heads to stand off the rudder a little. ***Saddle washers should not be used in this position.***

Figure 106; rudder mounting.

Figure 107; lower end of rudder.

b) Make sure that the rudder is not touching the stainless-steel elevator joiner tube when it is deflected from side to side (±25° or so) and the elevators are moved up and down (±25° or so).

If it is touching you will need to put an additional spacer washer under the lower two eyebolts on the rudder.

5.5 Control Cables

5.5.1 Cables

a) Identify the rudder and elevator cable pairs.

The rudder cables are longer than the elevator cables and are not fitted with turnbuckles, but are fitted with long tangs with a number of mounting holes.

The elevator cables are fitted with turnbuckles, one at the rear end and one in the middle, and tangs with a single mounting hole..

Note that the cables will have to be disconnected later when the covering is fitted, so do not bend the split-pins over at this stage.

***WARNING!** – when fitting the cables do not have the battery installed. Otherwise there is a risk that the cables may make a connection across the terminals and melt the cable or set fire to the aircraft!*

5.5.2 Pulleys

a) Assemble the single pulley onto the outside of the port central cabin tube ***tu19,*** Figure 108.

If the port seat is uncomfortably close to the pulley (trial fit a seat now, or check this later) then the saddle washer between the pulley side plate and the central cabin tube may be replaced by a thin plastic washer. If still too close, and the side plates holding the pulley are the same height as those on the central pulleys, then contact Skyranger UK for shorter side plates.

Pass a rudder cable (either one) through the pulley with the tang with lots of holes towards the front before tightening the bolt.

A single metal washer should be in position on both sides of each pulley to provide a small amount of clearance from the side plate, not more than 1mm. A spacer tube should be in position on the pivot bolt to keep the side plates parallel.

*Don't forget the flap detent lever retaining plate and its spacer tubes mounted on both the port rudder pulley mounting bolt and the main pulleys mounting bolt, shown on the left side of the rightmost, port, central cabin tube **tu19** tube in Figure 108.*

b) Assemble the three central pulleys onto their long 6mm pivot bolt.

Each pulley wheel sits between a supporting side plate to prevent the cables from falling off the pulley and jamming.

A single metal washer should be in position on both sides of each pulley to provide a small amount of clearance from the side plate, not more than 1mm.

Spacer tubes are used on the lower mounting bolt to keep the side plates parallel. The spacers may be filed to fit, or padded with additional washers as required.

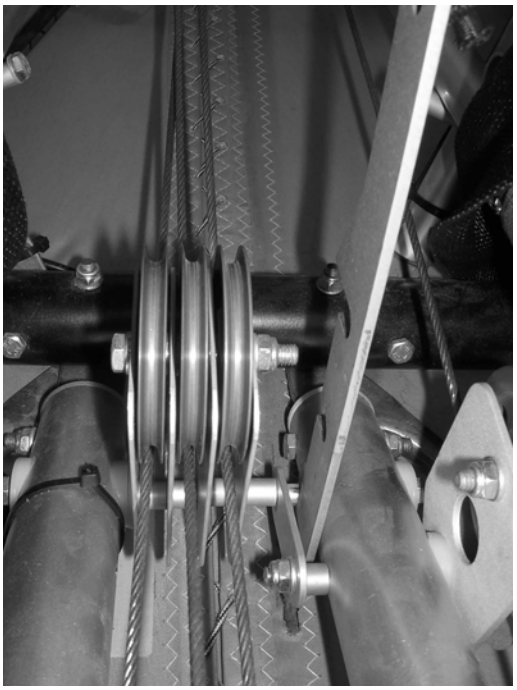


Figure 108; rudder and elevator pulleys. Rudder pulleys furthest left and right, elevator pulleys second and third from left.

c) Pass the other rudder cable through the first, most starboard, pulley with the multi-hole tang to the front.

d) Pass the elevator cable with the turnbuckle at the back end through the second pulley, tang to the front.

e) Pass the short part of the other elevator cable through the third pulley, the one on the port side of the group of three pulleys, with the tang to the front. The turnbuckle will then be closer to the cockpit than the tail.

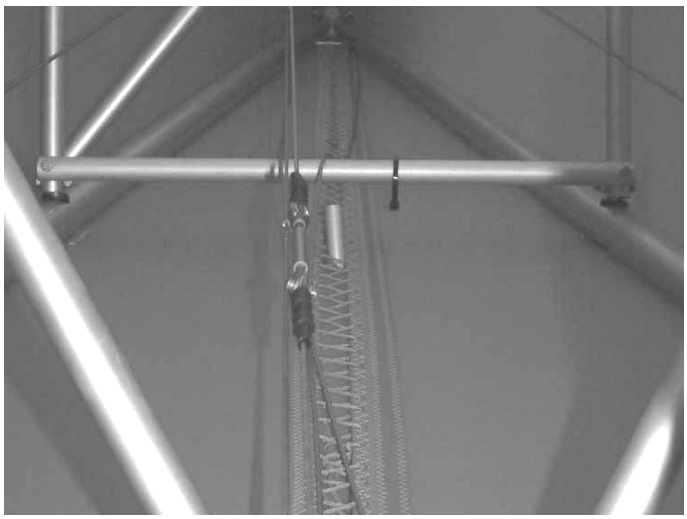


Figure 109; upper elevator cable middle turnbuckle.

f) Tighten up the bolt passing through the pulley bearings to help hold the assembly together for the next step.

g) Carefully slide the pivot bolt out of the pulleys, keeping all the spacers etc. in place.

h) Insert the pivot bolt right through the central cabin tubes ***tu19*** including the pulley assembly between them, using the second hole from the rear of the central cabin tubes ***tu19***.

5.5.3 Elevator control cables

a) Attach the elevator cable passing through the port-most pulley of the three pulleys to the lower attachment hole on the port side of the joy stick.

Use washers to take up any slack in the bolt.

b) Attach the other end to the upper attachment on the elevator control horn. The cable is routed between the horizontal stabiliser and the rear fuselage.

c) The cables route past and over the flap handle as shown in Figure 110, looking rearwards. The rudder cables are the lowest, with the elevator cables passing above them.

The cables pass close over the top of the tubes. Check the clearance with some tension in the controls, rather than just slack.

If the cables rub on the flap actuating rod, check that the lever is fitted as per the instructions, particularly on its position to starboard and the spacing of the detent lever. If this does not cure the problem, space the starboard spacer tube at the rear end of the flap handle out with washers and shorten the port spacer tube.

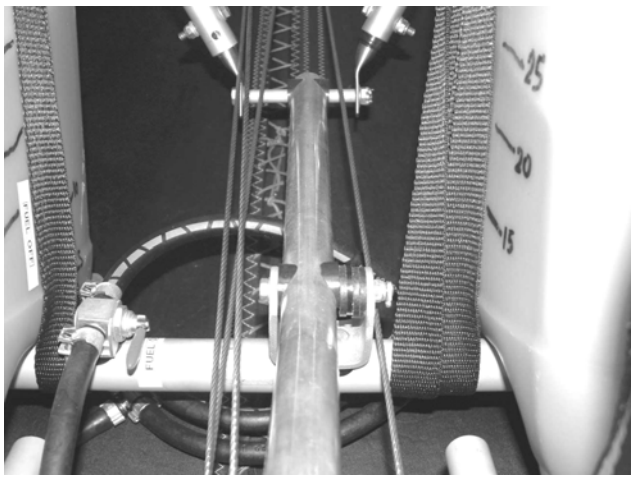


Figure 110; cable routing past flap handle.

d) Attach the other elevator cable from the top hole on the starboard side of the joy stick, through the pulley second from the starboard side, to the lower attachment on the elevator control horn, again via a turnbuckle.

e) Check that the elevator deflects upward when you pull the stick back toward the rear of the aircraft.

f) Tension the turnbuckles by hand, keeping the elevator central when the stick is at 90° to the cabin central tubes ***tu19*** (not vertically upwards).

g) Check the elevator moves smoothly, without binding.

   It is not necessary to have a lot of tension in the cables.

   The upper elevator horn may need a single, small tweak to align it to allow free movement of the cable between the horizontal stabiliser and the rear fuselage. ***Do not bend it back and forth repeatedly!*** *The cable should just touch the horizontal stabiliser at full up-elevator, which should stop it touching at any other position. In case of difficulty, check that the correct pulley has been used and that the elevator horn has been fitted correctly.*

h) Check that the rubber stop-rings on the joy stick act against the edges of the stick pivot, forming the control stops.

   When moving the stick forward or backward you should have around 25° of deflection in the elevator each way. If necessary, adjust this by filing the top and bottom edges of the stick pivot piece where the stop-rings bear. These are somewhat flexible, so set the deflection with some pressure on the stick.

i) Secure the stop-rings with adhesive such as epoxy or silicone.

5.5.4 Rudder cables

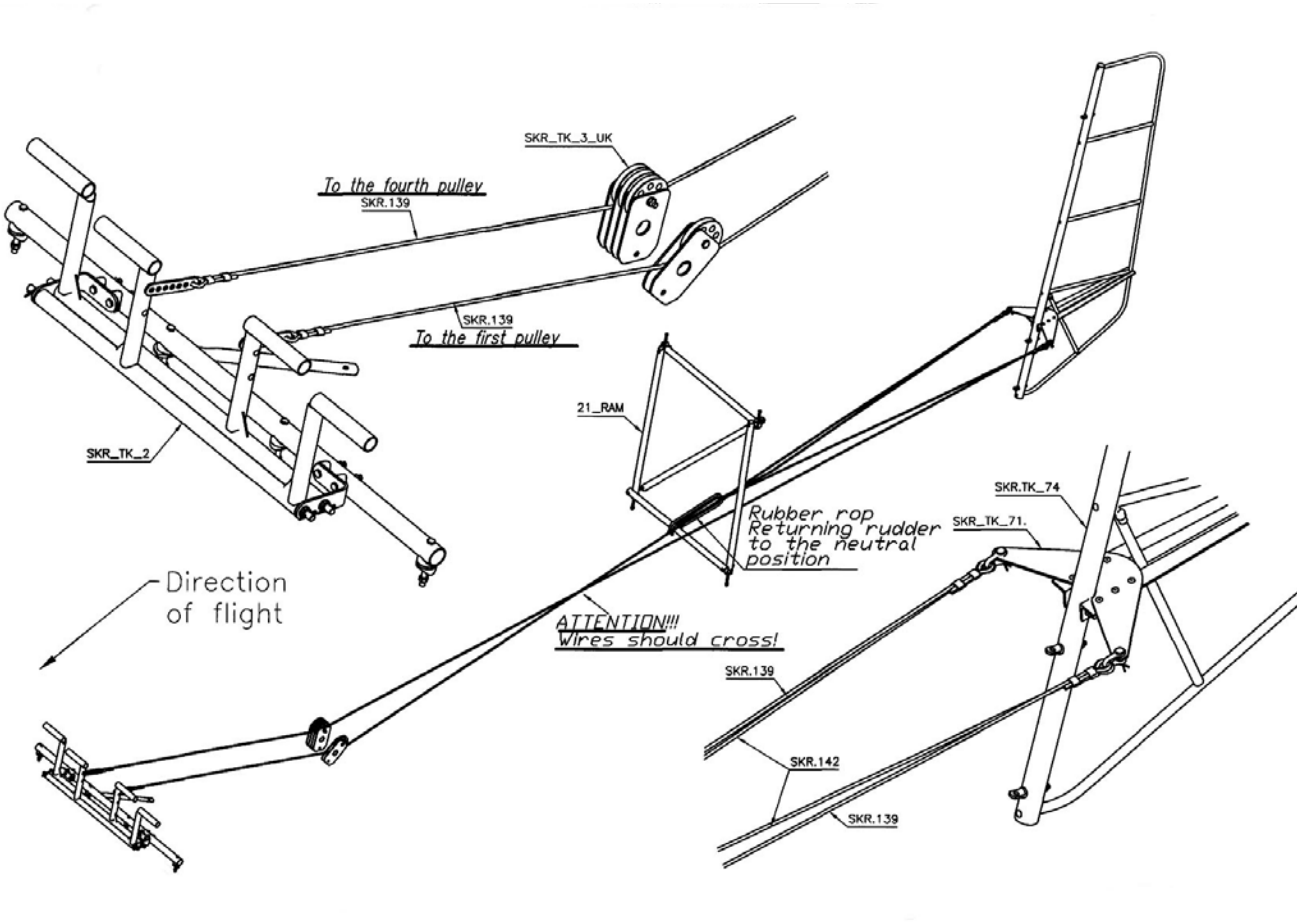


Figure 112; Rudder system schematic

a) Attach the rudder cables to the pedals, using the stainless tangs that have several adjustment holes in them.

   The cable from the starboard-side pedal is the one which passes through the starboard-most pulley in the group of three. The cable from the port-side pedal passes through the separate pulley on the port side. Note the cable routing for the starboard cable shown in Figure 114.

b) Make sure the rudder cables pass over the flap handle mount and over the flap linkage at the rear end of the flap handle, Figure 110.

   If they pass beneath the linkage the flap handle will push the cables downwards when you deflect the flaps.

c) Attach the rudder cables to the rudder horn, crossing them on the way back in the rear fuselage so that the starboard cable at the pedals attaches to the port rudder horn and vice-versa.

   The port pulley is slightly higher than the starboard pulley, so ensure that the port rudder cable passes over the starboard rudder cable where they cross.

d) Connect the rudder centring cables, a pair of steel cables connected together at one end, to the shackles on the rudder horn using the other ends, **Error! Reference source not found.**.

e) Check to make sure that the rudder moves to the left when you push on the left pedals, and to the right when the right pedals are pushed.

f) The tension in the rudder cables is adjusted using the selection of holes in the rudder cable attachment tangs and in the nose leg steering pushrods.

Try a range of combinations until you achieve a centred nose wheel and a centred rudder together, with just enough cable tension to remove any slack in the cables and prevent them lying against any tubes.

The resulting positions are likely to be asymmetric due to the offset in the rudder pedal pivots.

Fine adjustments can be made by twisting up the cables in the same manner as was used for tensioning the rear fuselage.

The positions of the rudder pedals fore-and-aft can be adjusted together at this stage to bias the aircraft for tall or short pilots if desired. The seats can also be adjusted to suit.

g) Connect the bungee between the centring cable single end and the middle of the rear fuselage bracing frame.

Use three loops of bungee around the tube. Offset the bungee by about 5cm (to port 912 / jabiru engines, starboard 582 engines) of the centreline. Apply a gentle amount of tension, as a starting value. This will be adjusted on flight test.

5.5.5 Rudder stops

h) Fit the rudder stop cables to the rudder pedals.

The forward ends of the cables have a tang with a bend in it. This picks up on the same bolt as the rudder cable tang, fitted outside the rudder cable tang (closest to the centreline of the aircraft), with the bend angled towards the centre of the cockpit, Figure 111..

Figure 111; rudder stop cable tang fitted over rudder cable tang.

i) The other end should be fitted to the bolts supporting the rear stick pivot, Figure 112, with the cables crossing: the cable fitted to port side pair of pedals should fit on the starboard side of the rear stick pivot, and vice-versa.

A thin nylon washer should be placed between the tang and the rear stick pivot support, and a saddle washer between the tang and the central cabin tubes ***tu19****.*

It is not essential to fit the cables between the tube and the rear stick pivot, they can be attached to the other side of the pivot piece (i.e. on the same bolt, but the other side of the metal). However, further spacers will be required to avoid pinching the two central cabin tubes together, and longer bolts may be required.

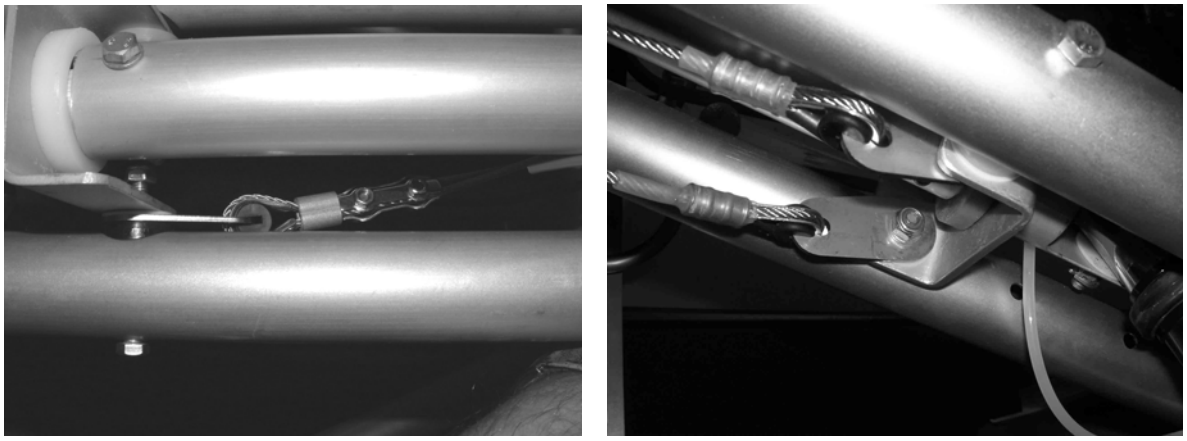


Figure 112; rudder stop cables attached to rear stick pivot, standard and optional arrangements.

j) Ensure that rigging the rudder cables and setting up the correct tension/ nose leg alignment etc. has been done before adjusting the rudder stop cables.

k) Deflect the rudder until the required maximum deflection is achieved (see current HADS), and then adjust the stop cable to match.

This is done by lightly clamping the cable with the stainless steel wire clamp supplied. Leave it loose enough so that the cable will slide through when the spare end is pulled firmly with pliers/grips. Pull the stop cable until it will go tight to match the rudder deflection. Ensure that the wire grip is slid up tight enough to push the cable ferrule against the cable thimble (the cable 'eye'), Figure 113.

Figure 113; rudder stop cable adjustment.

l) When happy with the adjustment, clamp up the wire grip to hold the correct position.

Do not do this up too tight as it will distort the cable.

m) If you have access to a Nicopress swaging tool crimp the ferrule, remove the wire clamp and trim the excess cable. Use a hot air gun to shrink the piece of heat shrink supplied in position over the ferrule and cable end for neatness.

If you could please return the clamps at your leisure they can be reused to keep costs to a minimum.

n) If you do not have access to a Nicopress swaging tool then remove the stop cables, send them back to us and we will crimp them for you.

Leave the clamps in position so we will know where to crimp them!

o) The bolt securing the rear tang can be done up tight, but do not crush the tube.

p) The bolt on the pedal end should be loose enough to allow rotation as the pedal is deflected.

q) Secure the middle of the stop cables with a short length of light Bungee looped over the control stick torque-tube just out of sight under the instrument panel, to pull the cables up and prevent sag towards the battery.

5.5.6 Rubbing cables

a) Check both the rudder and elevator cables to make sure they are not rubbing on any tubes.

Apply some typical tension to the cables, such as feet against the rudder pedals, as this will give a better indication of any problem areas.

b) Fine adjustments to the pulley positions can be made. The pulleys have to be carefully shimmed with thin washers between the starboard central cabin tube ***tu19*** and the first pulley plate to ensure that the rudder cable just avoids rubbing on the tube where it runs from the pedal to the pulley, Figure 114.

*1mm washer thickness on the starboard side is a good starting point, filing the same off the port-most spacer tube to maintain the **tu19** spacing.*

*The cable should not quite touch the tube with weight on the rudder pedals. If it is too close for comfort a piece of prop tape can be placed on the tube to act as a fairlead. If it touches the starboard central cabin brace piece this may be shimmed out with plastic washers between it and the **tu19** tube, up to 3mm if necessary. This limit is due to the elevator cable rubbing the central brace at full left aileron.*

*Any shimming of the pulleys must not be over-done or the elevator cable on the lower end of the stick will rub on the central cabin brace, attached to the port central cabin tube **tu19**, on full right aileron. Wait until the aileron movements are set up later before worrying too much, you may have to adjust the stops to reduce the movement to the correct amount.*

Adjustment of the cables and the pulleys will require some fiddling to achieve nice clean cable runs which do not rub, so don't tighten the bolts up until this is achieved.

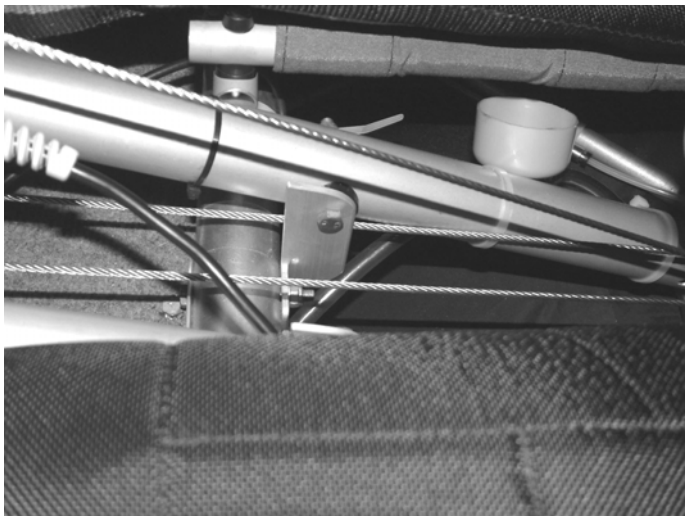


Figure 114; starboard rudder cable routing past central braces.

c) Pieces of prop-tape or off-cuts of Lexan from the screen can be used to provide additional protection to the tubes if the cables only rattle against the tubes with vibration.

They should not be relied on if the cables apply any constant pressure to any tubes they pass over.

The brace in the middle of the rear fuselage is a good place to apply such protection.

d) With the controls centred and the cables properly tensioned, including foot weight on the pedals, the elevator cables will be close to, but not touching, the rudder cables, and there should be 5mm or more between the rudder cables where they cross. With the rudder deflected the rudder cables may touch one another where they cross, but this is acceptable.

6 Covering the Fuselage

Do not cover the fuselage until it has been inspected!

See the inspection schedule in your BMAA paperwork.

Important: Before covering the fuselage, make sure the cables bracing the rear fuselage have been tightened and the turnbuckles have been safety wired.

6.1 Covering

Figure 115; covering the fuselage.

a) Apply a layer of clear, thin, lightweight self-adhesive plastic film, such as Fablon, to the leading and trailing edge tubes and wing tip tubes where they touch the covering.

   Do not skip this step! *This prevents vibration from abrading the anodising, which can then cause unsightly stains visible through the covering.*

   To save weight, just apply the film where the cloth can touch the tubes. If desired to increase resistance to corrosion it may be applied to the whole circumference of every tube, which will protect these difficult to clean areas.

   Do not use thick, heavy tape, such as prop tape or gaffer tape, as this adds too much weight, is too grippy, and can look horrible!

b) Disconnect the rudder and elevator cables at the control surfaces.

c) The flap detent lever and the flap lever itself will need to be moved out of the way whilst the covering is put on, as the lever will bear on the covering at its rear end, and the detent lever needs to have a hole cut for it in the fabric when it is in place and tensioned.

d) Lay the covering over the top of the fuselage.

Figure 116; begin by loosely lacing the rear of the covering.

e) Unbolt the front mounting bolts on the horizontal stabiliser, and make sure the mounts to attach the horizontal stabilizer are sticking through the holes in the fabric. Reattach the horizontal stabiliser.

Alternatively remove it entirely for now.

f) Only loosely lace the string through the holes in the rear part of the fuselage covering, just behind the vertical tube of the vertical stabilizer, Figure 116.

Do not apply any tension yet!

Lacing the covering is best done with a single string (rather than two strings shoelace-style) in a simple zig-zag pattern, Figure 121. Settle on a consistent pattern to make the job look neat: out of one hole, into the next is simple and effective.

g) Insert the long straight batten on the top of the fuselage.

h) Insert the side fuselage battens.

*Do not slide the batten too far back: the plastic fitting at the front of the batten should sit against the outside of the rear cabin uprights **tu6** to maintain a smooth curve in the rear fuselage covering.*

i) Rivet or use self-tapping screws to secure the covering in place to the front of the rear cabin uprights ***tu6***.

j) Slip the seat belt shoulder harnesses over the top cabin cross-tube, Figure 117, and then rivet or self-tap the top fabric in place.

Use at least 4 rivets along the top cabin cross-tube. Additional holes should be melted in the covering, through the reinforcing strip, if required. The two holes already in the covering do not usually line up with any of the holes in the tube, and may be ignored or the tube drilled to match them as desired.

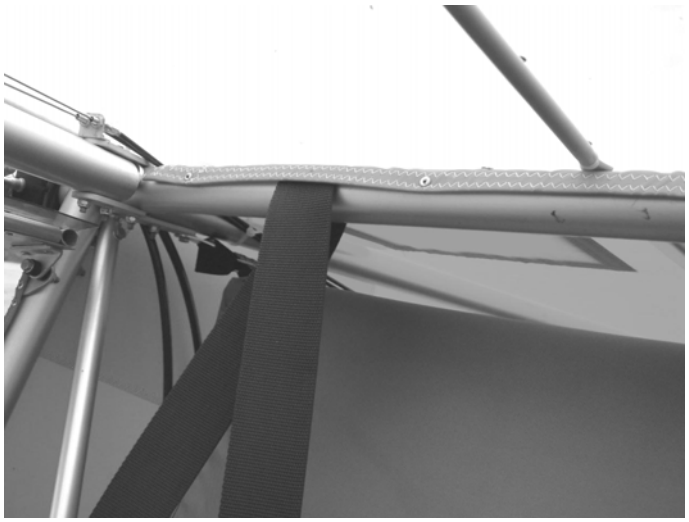


Figure 117; top of seatbelt.

Figure 118; fuselage lower side members.

k) Remove the lower fuselage side members ***tu16***, insert them into the pockets in the covering, and reattach them to the frame, Figure 118.

l) Insert the battens into the covering below the fuselage.

Two run fore-and-aft, with a third crossing below the front of the cockpit.

m) Lace the string from the front without tightening it at this point. Lace at least 3 feet of the front of the fuselage at this time, Figure 119.

Make sure the covering is not caught on any protruding bolts or fittings as it is tensioned.

Figure 119; under the cabin.

n) Stretch the front lower batten over the bolts sticking down under the front of the fuselage. Use screwdriver to pry the batten over the bolts, Figure 120. The front ends of the other two battens should clip onto this batten, through holes on the inside only.

Ensure the covering is not caught on the undercarriage legs or trapped by the drag link attachment brackets.

The holes for the bolts may need slotting laterally to allow the covering to pass over them and then to be tightened up. The coverings may be tightened up somewhat at the front before they are prised over these bolts.

If the alignment of the holes for the lacing falls out of step, causing the two sides to be pulled in a distorted manner, then either miss a hole or melt a new hole with a soldering iron to re-establish the alignment.

The seam located just behind the main undercarriage cross-beam tu9 is a good guide to the alignment between the two sides of the covering. If they are not well aligned wrinkles will result!

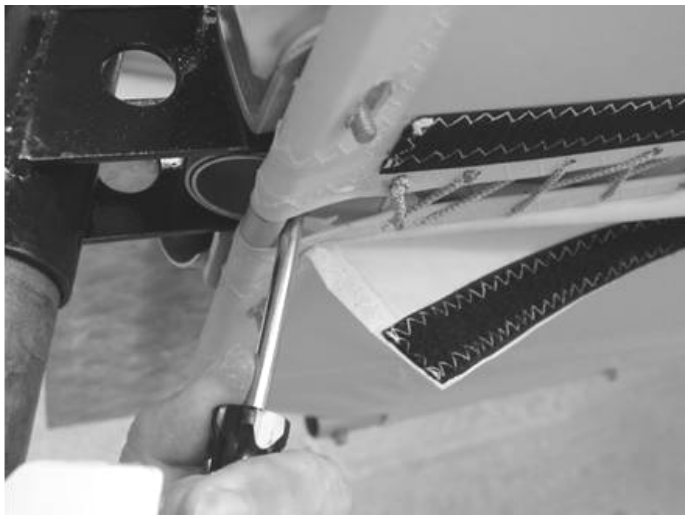


Figure 120; pulling the covering tight under the cabin.

o) Tighten the rear part of the fuselage just behind the vertical tube of the vertical stabilizer.

This is the rear part of the fuselage that you already laced.

Make sure the covering is not caught on any protruding bolts or fittings as it is tensioned. Adjust the coverings until the holes for the bolts line up with the bolts.

It may be necessary to make small "ramps" out of bits of plastic or similar to ease the fabric over the bolts securing the lower parts of the rear fuselage brace.

Work the lacing to pull the fuselage covering rearwards. This will require a few repeat tensionings. Failure to do this enough will result in vertical wrinkles down the fuselage sides when the main lacing is tightened under the fuselage.

Figure 121; tighten the lacing.

p) Lace the rest of the fuselage starting from the rear and tightening as you move to the front, Figure 121.

It can be useful to snug-up the covering a little by attaching cable ties through the lacing holes every foot or so before starting to lace properly.

Poke the rudder, elevator and trimmer cables loosely through their holes in the fabric whilst you can still reach them. The trimmer outer cables should pass out through the hole for the tailplane forward mounts.

q) Tighten the entire fuselage up several times to make sure it is very tight.

Use the Velcro gap seal as a guide to the final position of the covering.

It looks impossible at first, but work steadily and it will get there!

The string may seem too short, but as you tighten the covering it magically gets longer!

r) After the covering has been left to settle for a few days, any small wrinkles left in the fuselage can be taken out, carefully, with a heat gun. If there are large

wrinkles, there is something wrong and you need to examine the fuselage very carefully to find the problem.

s) It will be necessary to cut new the slots in the fabric for the rudder and elevator cables using a soldering iron, to allow for the UKMOD elevator control horn.

The elevator cable slots are located 7cm forwards of the standard ones. The upper elevator cable slot is positioned almost between the tailplane half and the fuselage.. The cable should just touch the tailplane half at full up-elevator.

The rudder cable slots are located 9cm forwards of the standard ones.

Hole in fabric moved forwards 7cm (note upper elevator cable has guide tube in this position)

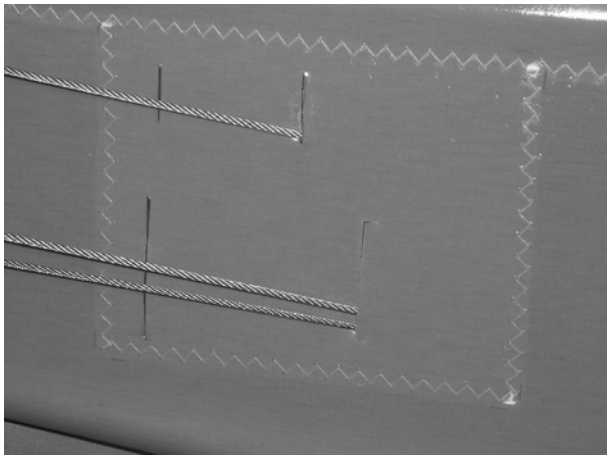


Figure 122; cable exits.

t) Remount the cables for rudder and elevator. Secure them permanently at this time, unless they are to be removed for transportation.

u) Melt a hole in the fabric for the flap detent lever to pass out of the bottom of the fuselage between the seats. Do not worry that the flap lever itself touches the fabric of the rear fuselage, as this will alter when the fuel tanks are installed.

v) Secure the front of the vertical fin to its mount with spacers to prevent pre-stressing the fin.

6.2 Ventral Fin

Figure 123; ventral fin.

a) Offer up the ventral fin alongside the rudder post to determine the point where the front mounting tube will pass through the lacing holding the fuselage covering together.

The aim is to eventually fit the fin tightly against the fuselage underside.

b) Cut a slit in the Velcro flap which covers the fuselage lacing to allow fin tube to pass through the fabric. Push the tube roughly into position, Figure 125.

c) Slide the rear mount into the base of the vertical tube supporting the rudder.

The ventral fin has an eyebolt to match the one on the rudder. Turn these with the slot vertical to allow them to match up, then rotate them back to the horizontal to allow the rudder to pivot.

Ensure that the ventral fin is pushed snugly against the fuselage covering.

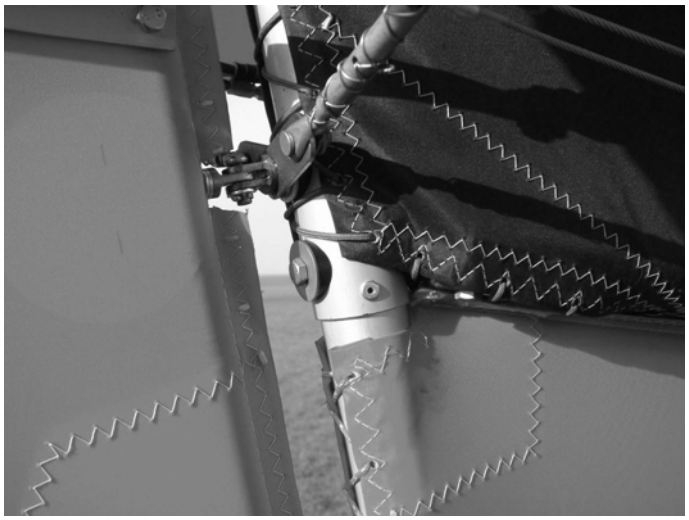


Figure 124; ventral fin rear mounting.

d) Use a pair of 4mm steel pop rivets, one each side, to secure the fin, Figure 124.

e) Position the front tube of the ventral fin against the lower cross-piece of the rear fuselage brace.

Again ensure that the ventral fin is pushed snugly against the fuselage covering.

Spacer washers may be used between the fin and the fuselage brace.

f) Drill a 6mm hole through the fin tube and the centre of tube ***tu39c***, angled to pass through the ventral fin tube at 90°.

The ventral fin tube curves almost vertically upwards, requiring a horizontal hole.

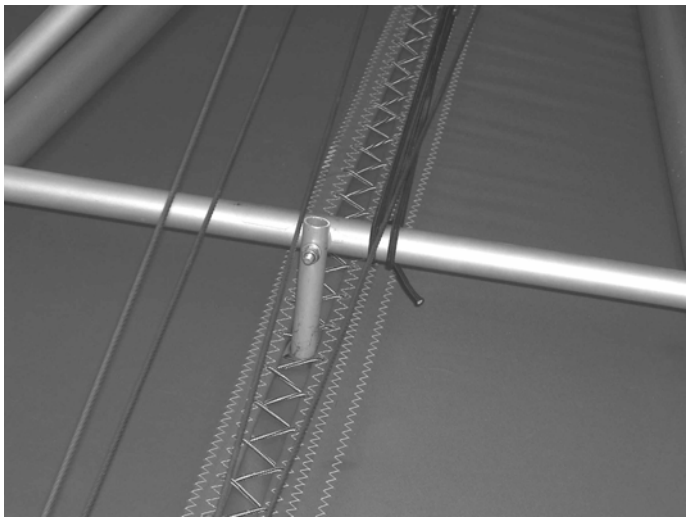


Figure 125; ventral fin front mounting.

g) Secure the front of the fin with a bolt, Figure 125, using spacer washers if required.

h) Check that all the rudder hinges align and that the rudder will move freely with no residual friction. If friction is present it may be necessary to align the hinges by adjusting the spacers where the lower hinge attaches to the Ventral fin, or in the case of vertical misalignment, filing the holes in the fin tube where the eyebolts fix.

6.3 Trimmer

6.3.1 Trimmer cables

a) Pass the trimmer cable outers through the hole in the covering at the starboard tailplane forward attachment.

b) Cable tie the outers to the horizontal stabiliser lacing, allowing enough slack for the elevator movement and keeping a smooth curve, Figure 126.

Figure 126; trim tab cables.

c) Determine which cable outer is the innermost one at the cabin end. This one must be the outermost one at the elevator end.

Trial fit a cable if necessary to work this out.

d) To hold the cable ends into their thimbles on the rear cable bracket on the elevator leading edge, cover the cable ends and their thimbles with a piece of heat shrink tubing over each cable/thimble combination.

Take care not to melt the coverings! Direct the heat away from them, and check they don't get hot.

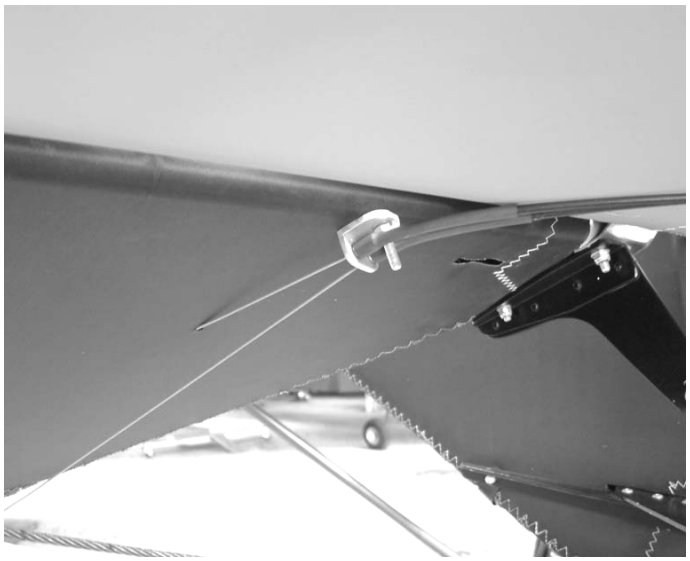


Figure 127; aft end of trimmer cables.

e) Melt a hole in the upper surface of the elevator fabric for the upper cable, 230mm forwards of the trailing edge and 130mm away from the tapered edge of the elevator, both distances measured at 90° to the respective edge, Figure 128.

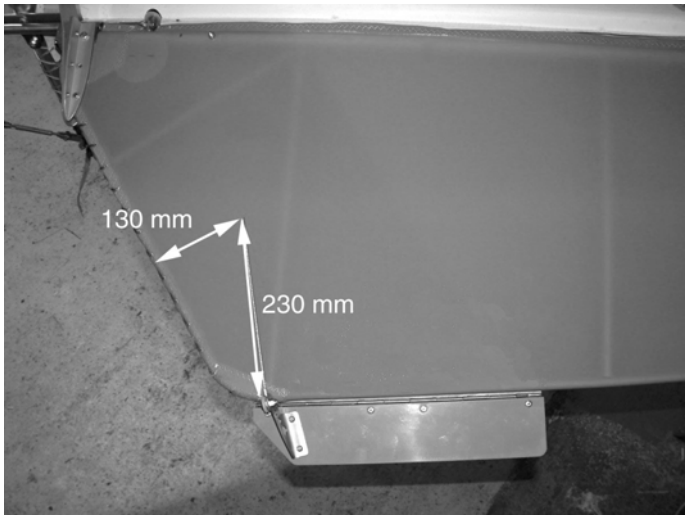


Figure 128; position of hole in top elevator surface.

f) Melt a hole in the lower surface of the elevator fabric for the upper cable, 140mm rearwards of the centre of the leading edge and 170mm away from the tapered edge of the elevator, both distances measured at 90° to the respective edge.

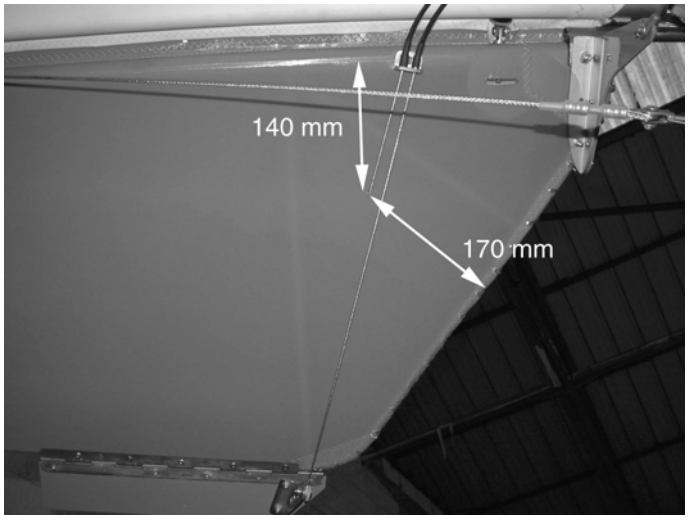


Figure 129; position of hole in lower elevator surface.

g) Attach the loops at the end of the trimmer cables to the trim tab control horn with bolts and plastic spacer pieces.

The cables go on the inboard side of the horn.

The plastic washer part with the seat for the cable should go on the side of the cable away from the horn. The other plastic washer is only needed if the cable interferes with the horn.

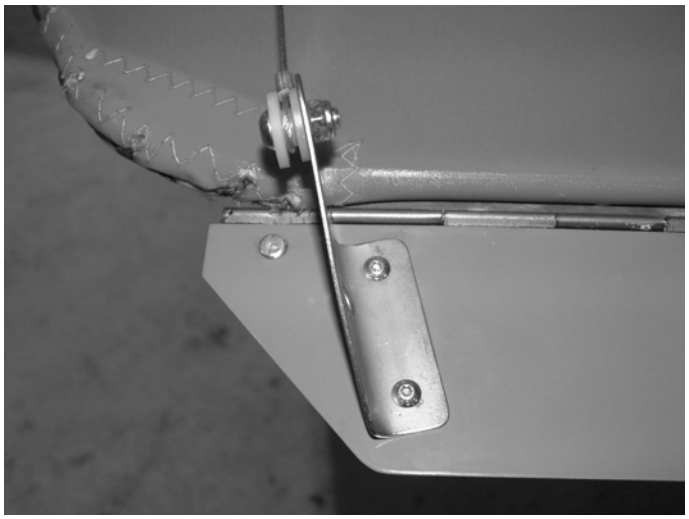


Figure 130; cable attachment on trim tab horn.

h) Thread the upper cable through the elevator coverings and then into the outboard-most of the cable outers, and up to the cabin.

i) Thread the lower cable into the inboard cable outer, and up to the cabin.

6.3.2 Trim lever

a) If not already done at the cabin assembly stage, a 6mm hole must be drilled for the lever 350mm rearwards from the centre of the forward fixing bolt for the starboard side ***tu10***.

> *This hole should be vertical in relation to the cabin structure and perpendicular to the tube. To do this, use a straight edge across the tops and bottoms of the upper cabin triangle tubes to mark the hole positions onto the top and bottom of the tubes. Measure the location for the top hole and use a piece of paper wrapped squarely around the tube to mark the position of the bottom hole.*

b) If the wing fold kit is to be fitted, slip a 25cm length of heat-shrink tube over each of the exposed inner cables before connecting them to the trim lever pulley wheel.

c) Loosen the cable adjusters to almost fully slack and thread the cables through the hole in the pulley wheel.

> *The hole in the pulley wheel may need opening out to 5 or 6mm to get the wires through, depending upon your patience and dexterity!*

Figure 131; trim lever.

d) Fit the pulley wheel and trim lever onto their pivot bolt.

The lever points to port, and is held on to the pulley with a short steel rivet or screw.

Wrap the cables in opposite directions around the pulley wheel so that each cable runs from the hole positioned towards the rear, around the front of the pulley, then back to the cable adjusters.

*The trimmer lever is bent down at its end, and this provides a full deflection stop as it touches tube **tu10** at either extreme.*

*The sequence along the pivot bolt, inserted from the bottom, is bolt-head, metal washer, saddle washer, **tu10**, saddle washer, thin plastic washer, trimmer handle, trimmer wheel, thin plastic washer, steel washer, nut, lock nut , and split-ring.*

e) Adjust the trim lever friction with the first nut, and lock it with the second nut.

Movement should be smooth, but tight enough to prevent the lever slipping due to the trim tab loads. This can be checked on flight test.

f) Adjust the neutral position to give the correct movement.

With the trimmer lever at 90° to the upper cabin triangle tube upon which it is mounted, the tab should be level with the lower surface of the elevator.

g) Join the cable ends together with a solderless nipple, tightening the screw firmly.

h) Adjust the cable tension to achieve a smooth, slop-free action.

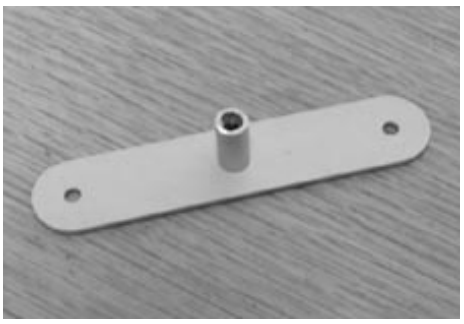
i) **Ensure that the trimmer works in the correct sense!** Trim lever forwards, trim tab deflects upwards, pushes elevator downwards, tail goes up, nose goes down.

6.3.3 Fuselage transverse batten

A batten is fitted inside the fuselage pushing outwards on the fuselage side battens to produce a curve in the fuselage sides.

a) Fit the batten brackets in the fuselage side battens so that its central spigot is 405mm along the battens measured from the rear face of the rear cabin uprights TU6.

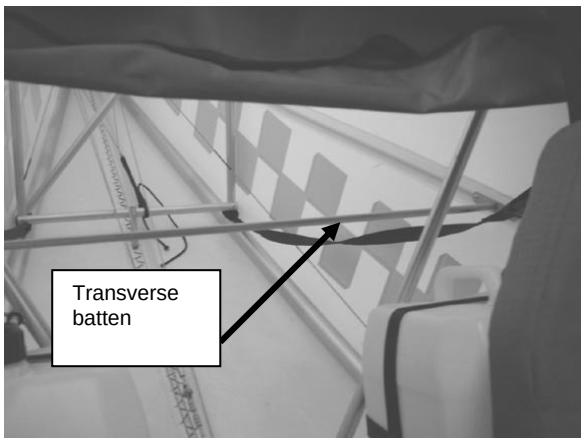
   Drill and fix with 2 x 4mm aluminium rivets. Take care when drilling the battens as it is easy to slip off and make an annoying small hole in the covering!



Batten bracket

b) With the brackets in position fit the battten.

   Insert diagonally over a spigot on one bracket. Push sideways to spring the side batten outwards and spring it into position over teh spigot on the other bracket.



Transverse batten and curve produced in side of fuselage