

RotorSport UK Ltd

Service Repair Request and Evaluation/Approval

This form (Part 2 of 2) is the response from RotorSport UK Ltd to a Service Repair and Evaluation/Approval request, which specifies the company authorised repair method. Deviation from this method renders the authorisation ineffective.

Upon completion of the repair the repairer must enter details into the logbook/worksheet with the repair number and sign as normal.

If any problems with carrying out the work authorised, contact RSUK immediately on 44(0)1588 650769, or email info@rotorsport.org.

Repair No.: 016 Iss2, 30.11.18	CCAR No.: CCAR-044 Mod approval No: MC-234	Repair classification: MAJOR or MINOR
Aircraft type: MT-03 and MTOsport (all aftermarket only)	Aircraft serial No. OPEN (first application G-CEHN RSUK/MT03/008	

Repair problem description & cause of problem if known:

It has been found that aircraft used for flight-training and therefore subject to a large number of take-offs, landings and ground movements may be subject to cracks at the base of the mast, these being visible during the required 100hr/Annual inspections. It is believed that high undercarriage loads transmitted through the keel have increased the stresses in the upper keel/mast interface and caused fatigue cracks. No visible cracks in the lower keel/mast interface have been found at this time.

This repair scheme SRA-016 has been developed to enable repair of such damage. It may only be implemented by RotorSport UK Ltd

Approval statement.

The technical content of this document is approved under the authority of the UK CAA Design Organisation Approval Ref: DAI/9917/06.

Tooling required. None.

Weight and balance. There is no effect on the issued AWC for the aircraft.

Manuals affected. There is no effect on the aircraft POH or AMM.

Previous modifications affecting this SRA. MC-070/SB-013 "500kg Suspension bow fitment" and/or MC-115/SRA-004 "Mast Repair" may already have been embodied. There is no conflict with either.

List of components required to complete this SRA: Gusset set RSD1124 Iss1

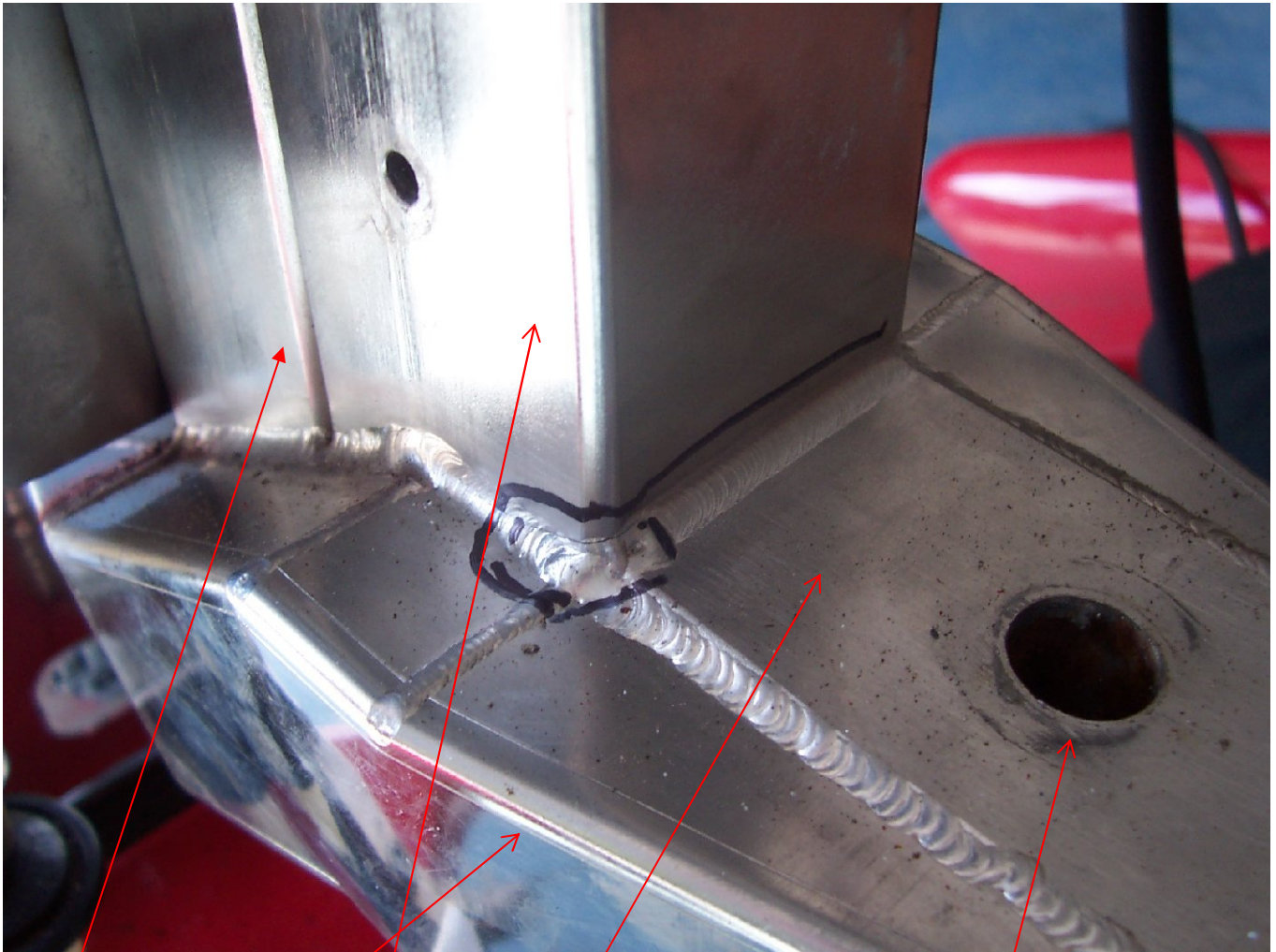
Accomplishment instructions – preliminary inspection/typical crack appearance



Location of Upper keel/mast interface and Lower keel/mast interface

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Typical Upper mast/keel interface (from above)



Double-section mast

Fishplates each side

Mast

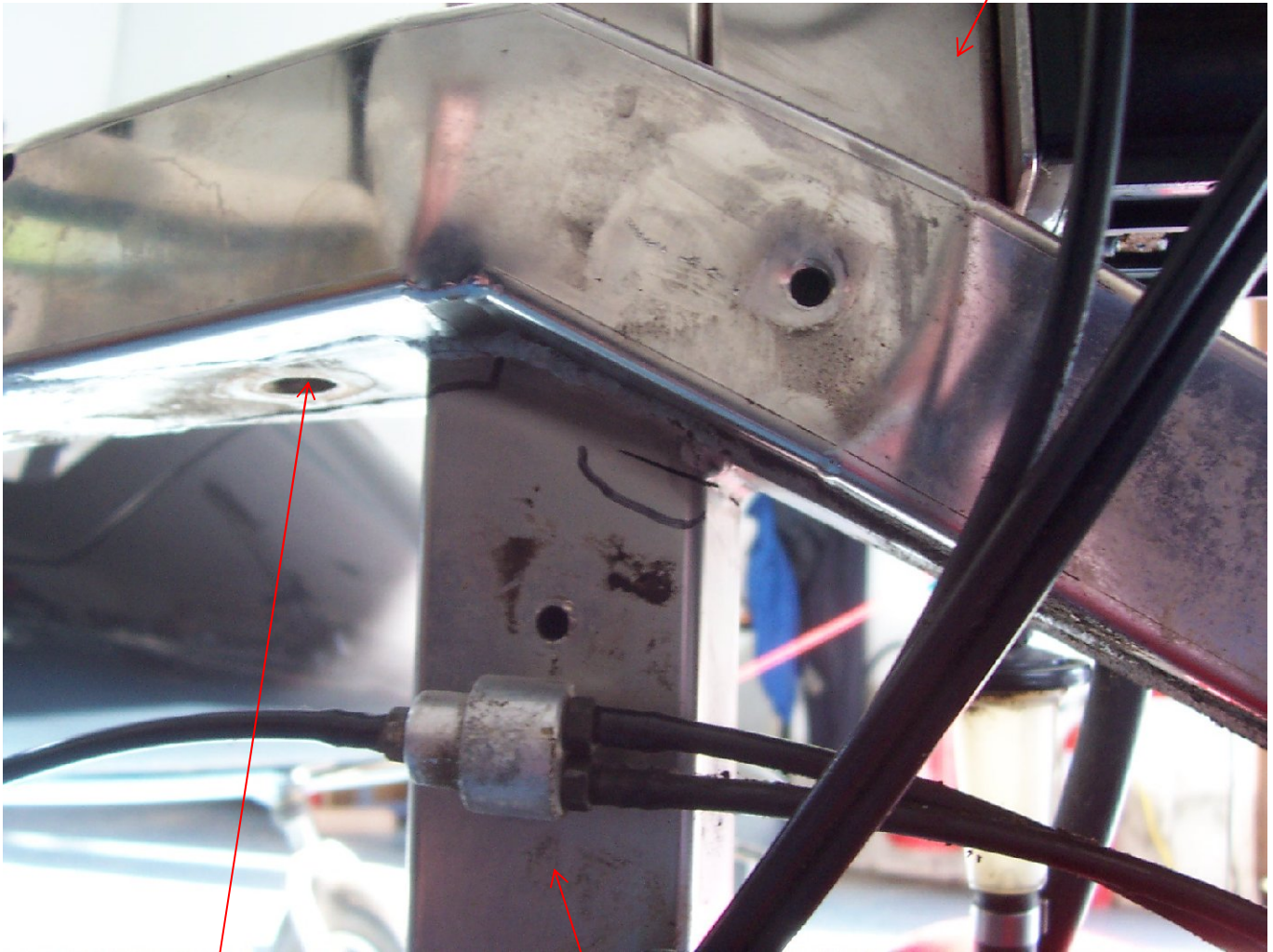
Upper keel tube

controls mounting fwd of mast

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Typical Upper mast/keel interface (from below)

Double section mast

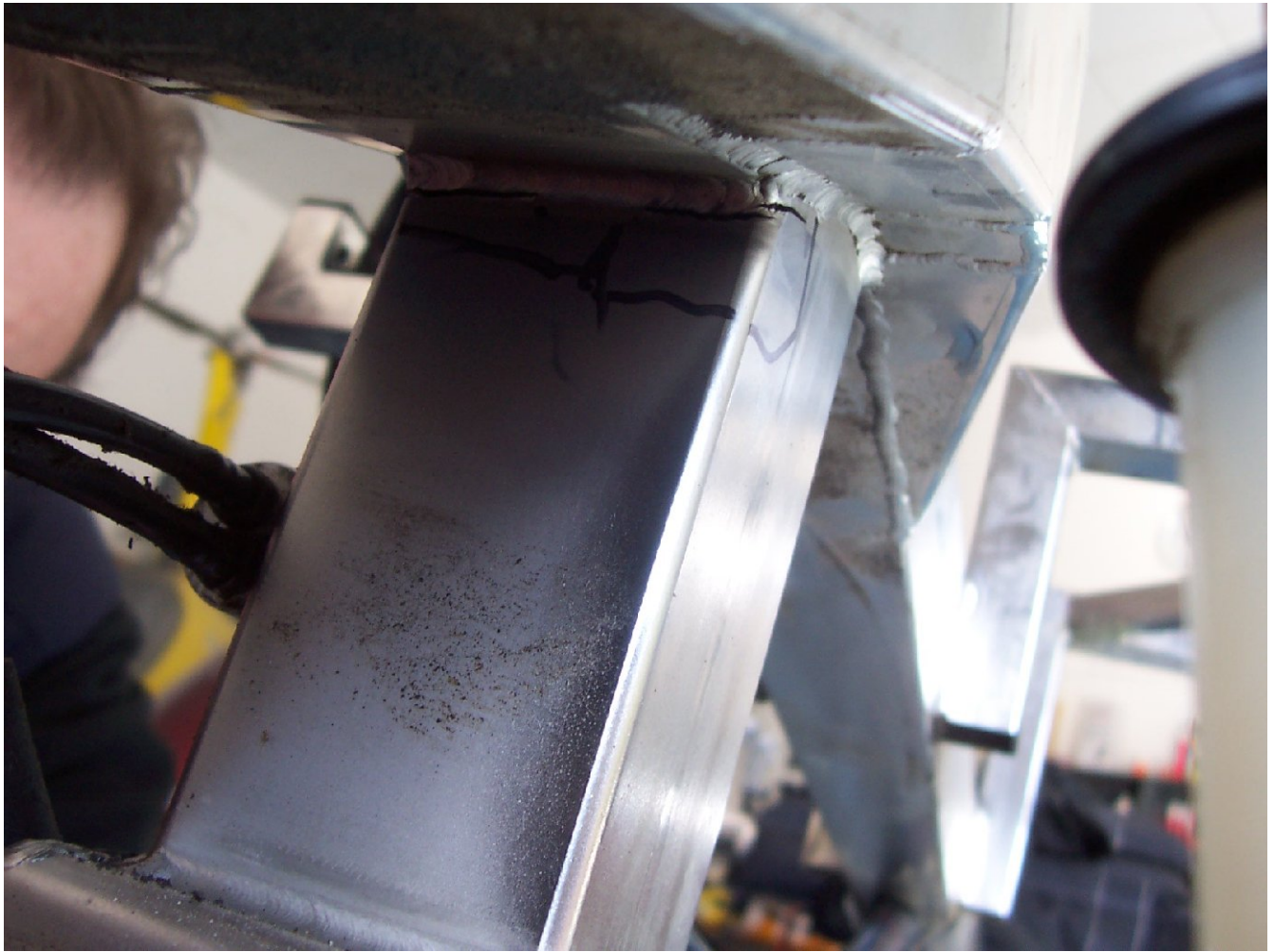


Controls mounting fwd of mast

Lower mast section

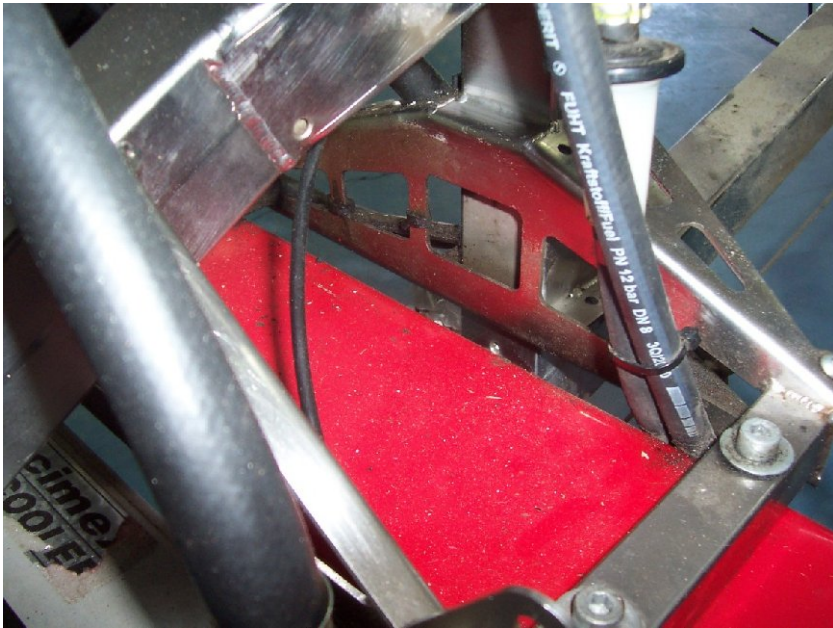
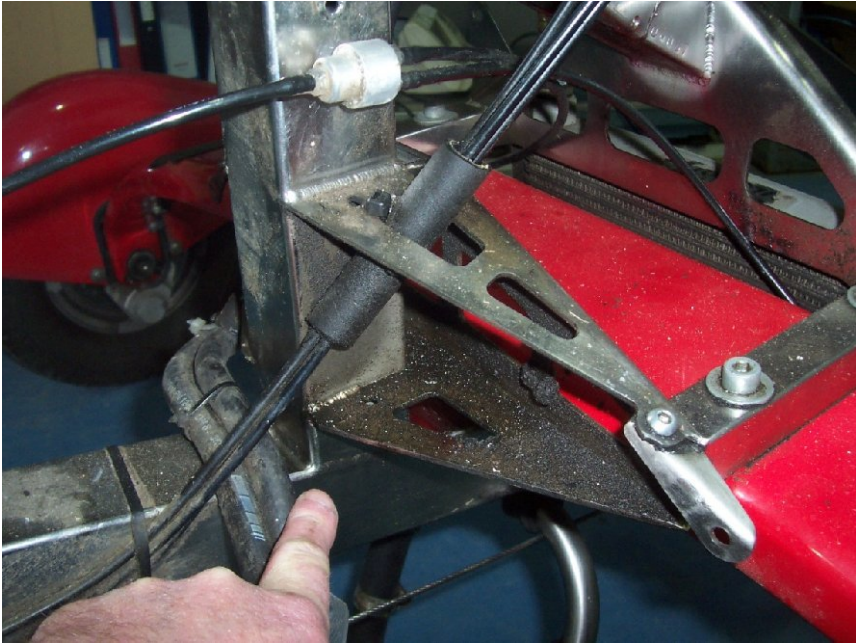
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Typical Upper mast/keel interface (from below)



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Typical Lower mast/keel interface (from above)



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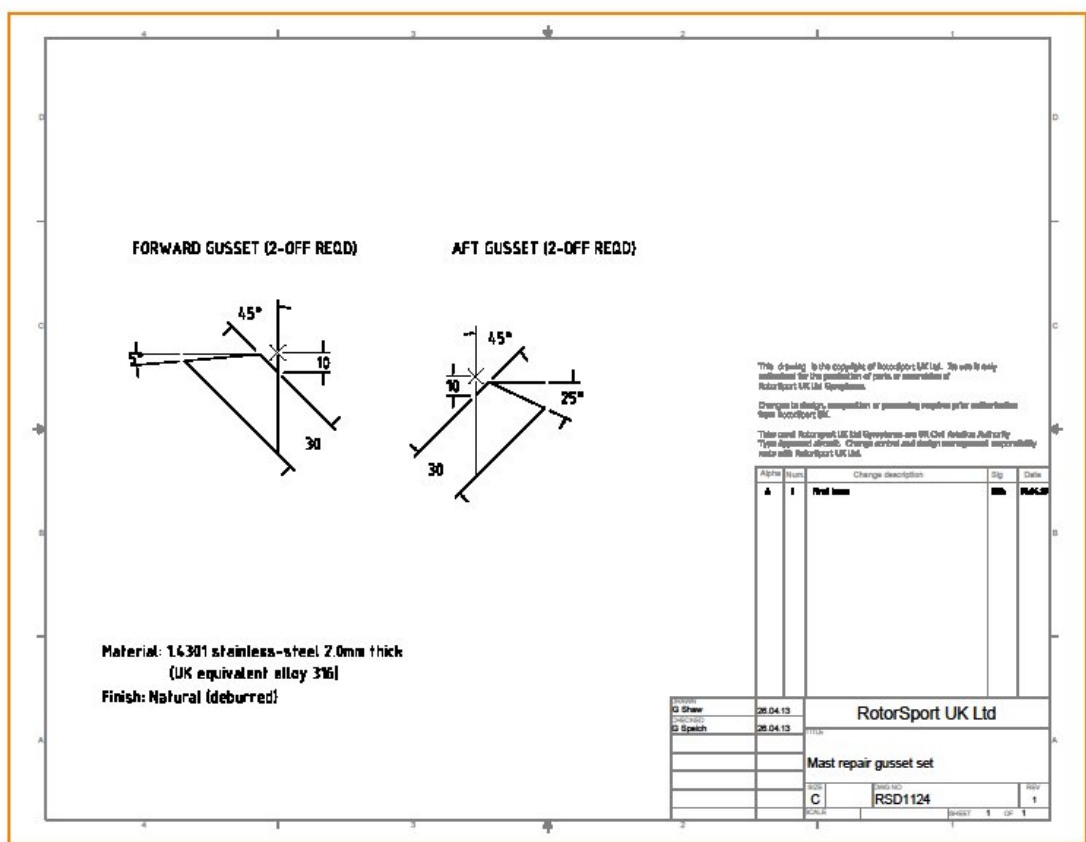
Details of the repair

This is carried-out in three stages. The aircraft must be mostly dismantled to expose the airframe

(i) Make good the cracks and add reinforcing gussets at the lower mast/keel interface

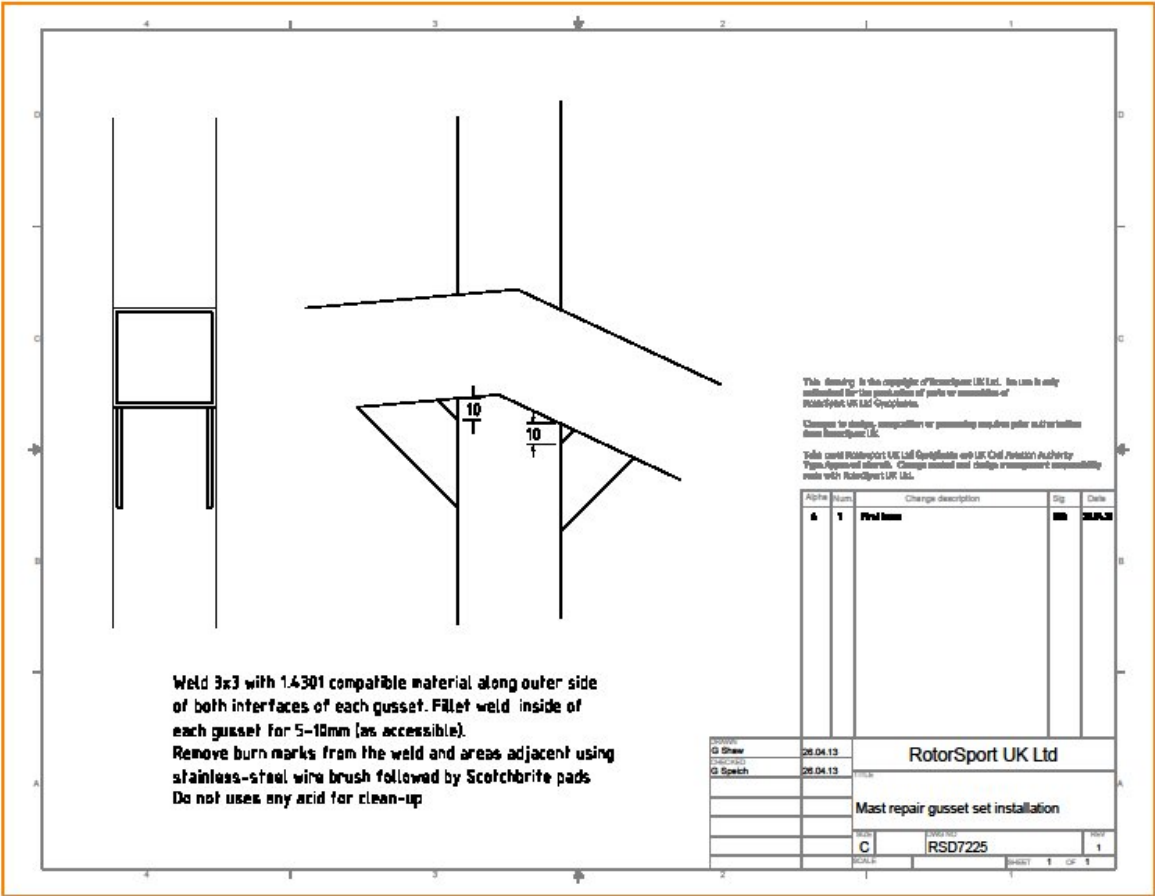
With the suspension bow removed thoroughly clean the intended weld area with Amberclene LO30 solvent (RSD4655) and 180 grit "Scotchbrite" abrasive pad. Using a small power-tool (e.g. Dremmel) grind-out the length of the crack with an abrasive disk 0.75mm thick then remove all grinding debris. Weld-up each prepared crack in one continuous pass (see 1.3. below for welding set-up)

Clamp in place the four gusset pieces of RSD1124 and fillet weld the joint interfaces in accordance with RSD7225.



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Photographs of finished repair



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(ii) Check the mast alignment (and adjust if necessary), then make good the crack and add the reinforcing gusset at the upper mast/keel interface (by the method previously approved under MC-115/SRA-004).

The mast alignment is determined by the centre-line of the fore-aft keel and an angle to the keel of 5 degrees (MT-03) or 6.5 degrees (MTOsport). The technique for straightening is defined and previously approved in MC-115, associated compliance statement RSUK0165 Iss2, and Service Repair SRA-004.

The gusset is manufactured by hand from a section of 2mm wall thickness 50mm square box-section stainless-steel 1.4301 and is welded in place with compatible filler wire (see Welding requirements below)



Gusset prepared

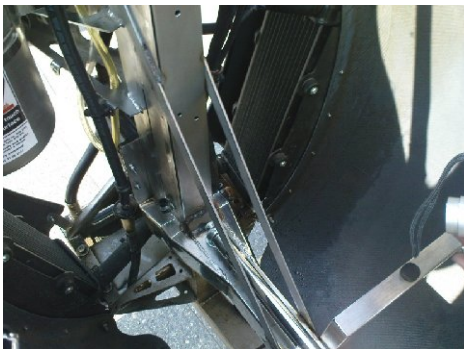


in position at base of mast



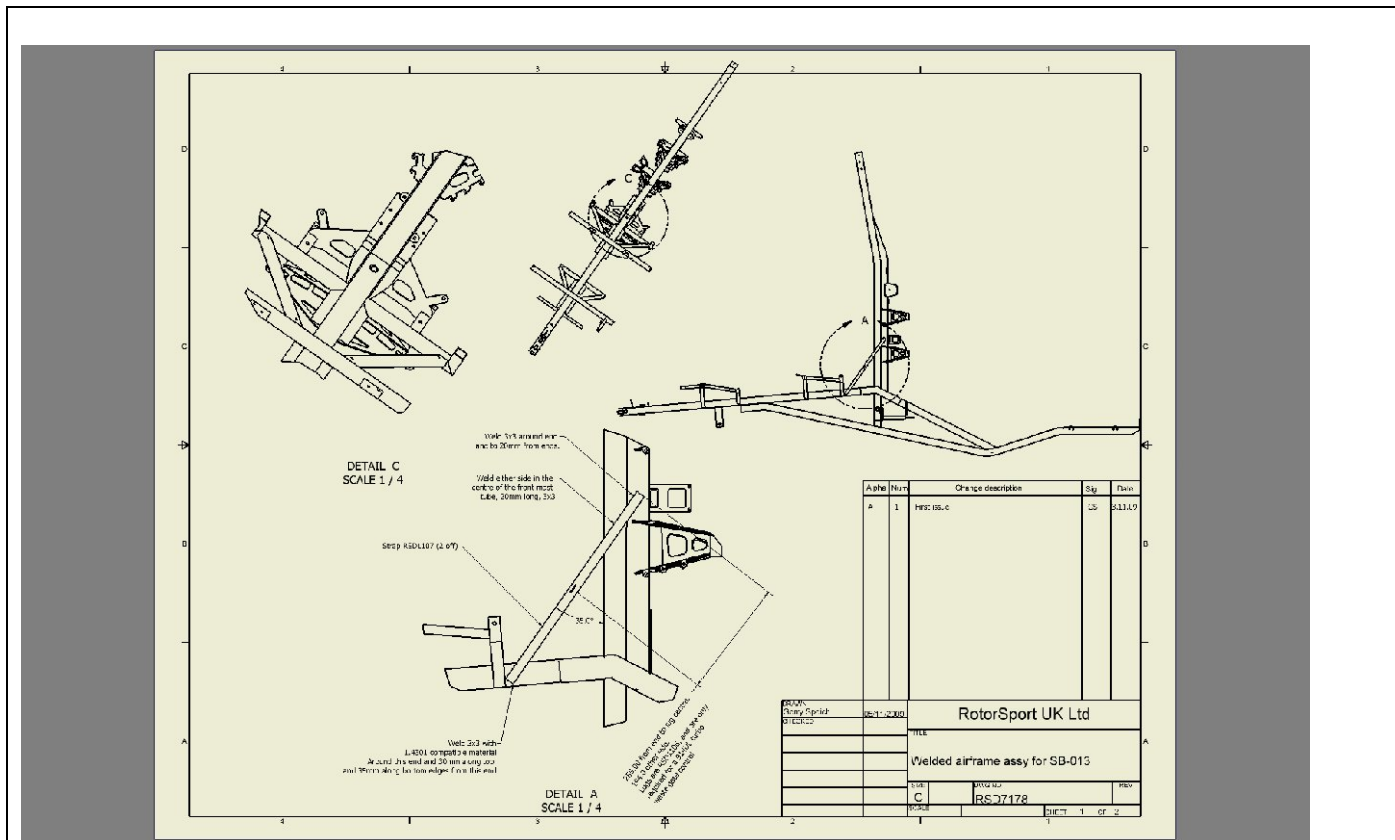
gusset welded

(iii) Add the reinforcing straps between the mast and keel (by the method previously approved under MC-115/SRA-004, also forming part of the upgrade from 450kg to 500kg MTOW approved under MC-070). Detail instructions are given in the drawing RSD7178 below



View of straps welded in place The straps are welded at 35 degrees to the mast, as detailed in RSD7178.

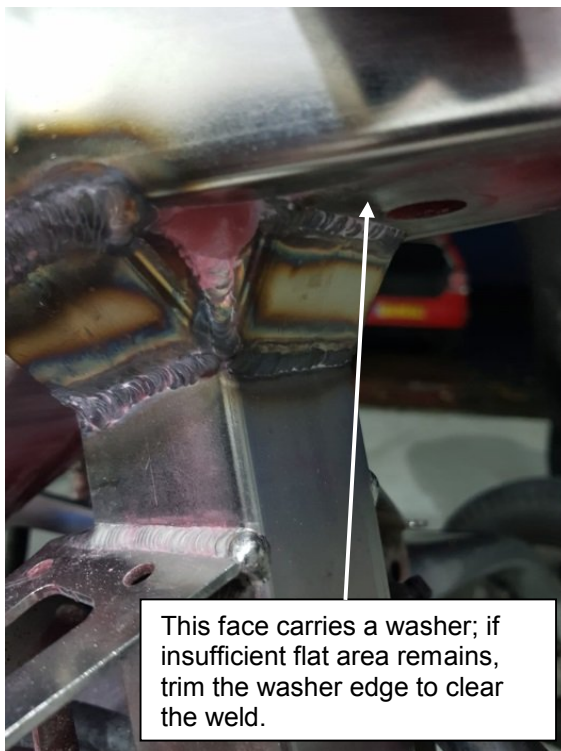
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Issue 2 content - alternative lower gusset arrangement when a native MTOS airframe is under repair.

The MTOS airframe (which is approved for 500kg MTOW with the uprated suspension bow) already has the reinforcing straps between the keel tube and main mast section. It is therefore permissible to delete the requirement for items (ii) and (iii) above provided there are no cracks at the base of the mast (i.e. where the upper gusset would be placed). In this case a stronger arrangement of four lower gussets is used, changing the detail of item (i). The gusset set used is RSD1139 "Mast repair alternative lower gusset set". These are triangular pieces cut from a section of 50 x 50 x 2mm stainless-steel box section (same as the mast section, alloy 1.4301) as shown on page 9 and when in place surround the lower mast/keel-tube interface, as can be seen in the photos below. Adjust the length to clear the weld, and shape to suit the area to be welded. The gusset vertical angle should be 30-45deg.

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The other requirements of embodiment under this SRA-016 remain unchanged.

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Welding requirements (NB: welding must be carried-out by a welder approved by RSUK or CAA):

1. Final preparation of weld area

Remove any deposits by cleaning with a lint-free cloth and halogen-free solvent (Amberclene LO30).
Remove any surface debris by brushing with a stainless-steel wire-brush.

2. Welding

Position and clamp the parts in place

Set the TIG welder for job +ve, electrode -ve.

Using an electrode 2.4mm diameter, filler metal 316 stainless steel and heat-setting 60-70amps produce continuous fillet welds in a single run.

Ensure that filler metal is present in the whole welded length so that a joint "fused only" is not created.

3. Clean-up

Remove burn marks from the weld and areas adjacent using a stainless-steel wire-brush followed by Scotchbrite pads or rubbing blocks if required.

Do not use any acid treatment for clean-up

4. Inspection

Using a magnifying glass at least 4x and good illumination inspect the weld to ensure that there is a high build for the whole length of the weld with no inclusions or voids present and that the start and end of each run are of uniform shape.

Special tools & Health and Safety requirements, and/or components required for repair:

None

Document completion and Quality Inspection requirements after repair:

After embodiment of this repair SRA-016 the authorised engineer must make an entry in the airframe logbook white pages stating that the repair has been embodied. There must also be an entry in the logbook pink pages (Repetitive Requirements) requiring the following inspection:

Continued in-service inspection requirement every 50 flight hours:

1. Using hot water and detergent wash / dry the lower mast/keel interface area to remove any mud, grass, etc.
2. Use Amberclene LO30, a soft bristle brush then a clean cloth to remove any lubricant deposits
3. Using either a borescope or a magnifying glass at least 4x and good illumination examine all mast-to-keel welds and the areas adjacent to confirm NO cracks evident.
4. Make entry of this inspection in the log-book pink pages

*The technical content of this document is approved under the authority of the UK CAA
Design Organisation Approval Ref: **DAI/9917/06***

Service repair authorised by: (name, signature, and date of signature)

Quality Conformance Manager	Engineering Manager	Chief Test Pilot (where an effect on flight performance or safety) Not required	CVE	Head of Airworthiness
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Document completion date:	Issued to:	When	Issuer name	Signature
	Internal			
	CAA			
	Owners			
	PFA/BMAA Inspectorate			