

# 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 505060, or email [engineering@rotorsport.org](mailto:engineering@rotorsport.org).

**Repair No. and Issue:** SRA-025 Iss1  
Calidus bow attachment repair

**CCAR No.:** None  
**Mod approval No:** None

Repair classification:  
**MAJOR** or  
**MINOR**

**Aircraft type**  
Calidus

**Aircraft serial No.**  
RSUK/CALS/036  
**First application:** G-PPBZ

### Repair problem description & cause of problem if known

The Calidus suspension bow is attached to the aircraft by way of a 'U' shaped bracket that is welded to the mast structure.



Bow

Bracket

Mast

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In one instance the bracket has become partially detached from the mast structure, such that the bracket and bow were displaced rearwards.



View of bow mounting with suspension bow removed.

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### Limitations on implementation

- 1) The weld repair must be made by a CAA or RSUK authorised welder.
- 2) The crack must not have propagated into the mast or keel tube weld. If found such contact 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.

Conventional hand tools and TIG welding equipment only

### Weight and balance.

Not affected

### Manuals affected.

None affected

### Previous modifications affecting this SRA.

None

### List of materials required to complete this SRA:

Weld filler rod only

### List of components required to complete this SRA:

- 1 off 21582 Suspension bow bracket
- 2 off 21288 Oil radiator bracket

### Interchangeability:

Not applicable

### Parts disposition:

Not applicable

### Accomplishment instructions/details of the repair:

- 1) Remove the fuel tanks and protect any adjacent cables by suitable non-flammable covering.
- 2) Jack the aircraft securely so that the suspension bow may be released.
- 3) Drain the engine oil and remove the oil cooler.
- 4) Remove the rudder inner and outer cables. This will require cutting the inner cables, and subsequent replacement.
- 5) Using suitable tools, remove the suspension bow mtg bracket. Grind the welds as flush a practical to the base metal surface. The mast side stays normally pass through the bracket, so material above the tube is left in place to match the corresponding cut in the bracket. Trim the front and rear centre slot in the bracket to match the airframe. See photos. Ensure that the new bracket fits well to the assembly with no more than 1mm gap between the bottom of the mast and the bracket.  
**Care must be taken to prevent damage to adjacent cables and hoses, and to protect sensitive parts from debris.**
- 6) Remove all grinding debris and clean-up with Amberclene LO30.
- 7) Inspect the plate interface and establish that the mast and keel are uncracked or otherwise damaged.

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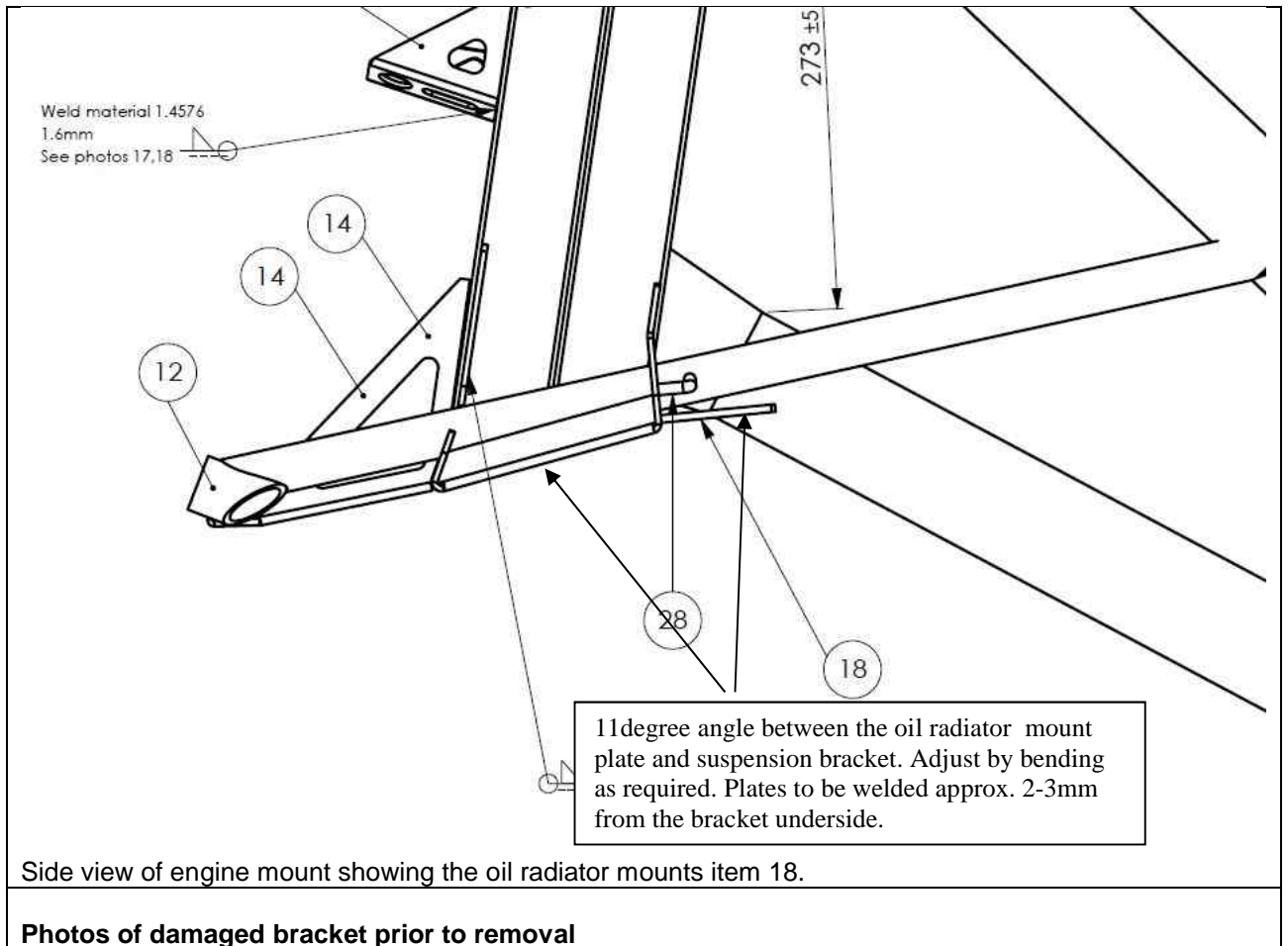
- 8) Before welding the bracket to the aircraft, first weld the oil cooler mounting plates to the bracket. The easiest way is to attach these to an oil cooler to ensure the centre position is correct, and then tack them onto the bracket at the correct angle and position. See sketch. They are welded for the full plate circumference.
- 9) Position the bracket onto the airframe with a jack under the bracket to hold it firmly in position, Ensure the bracket is as in line as possible with the airframe and tack the bracket in place.
- 10) Weld the centre portion to the airframe as per photos.  
  
Note, when welding, take great care to avoid excessive heat build up – and therefore distortion or risk of fire, or heat damage.
- 11) With a jack under the side area, weld one side, then the other. The jack is there to ensure the bracket is engaged as much as possible into the brace tubes.
- 12) Inspect the resulting welds (see below)
- 13) Clean-up and re-assemble the aircraft using new fasteners and new inner rudder cables.

### **Welding requirements (to be carried-out by CAA authorised welder only)**

1. Final preparation of weld area (immediately before welding)  
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  
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 a continuous fillet weld 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.  
Do not dress the weld by grinding, leave the visible fillet intact.
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 the run are of uniform shape.



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Left side

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Right side



New bracket.  
Oil cooler mounting plate shown lying on top.  
The wireforms shown are not required.  
New bracket fitted, ready to clean up and weld



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**Note how the area where the tube passes through the bracket is slotted to allow assembly. The bracket material above the tube at the bracket rear is retained and welded back to the new bracket.**

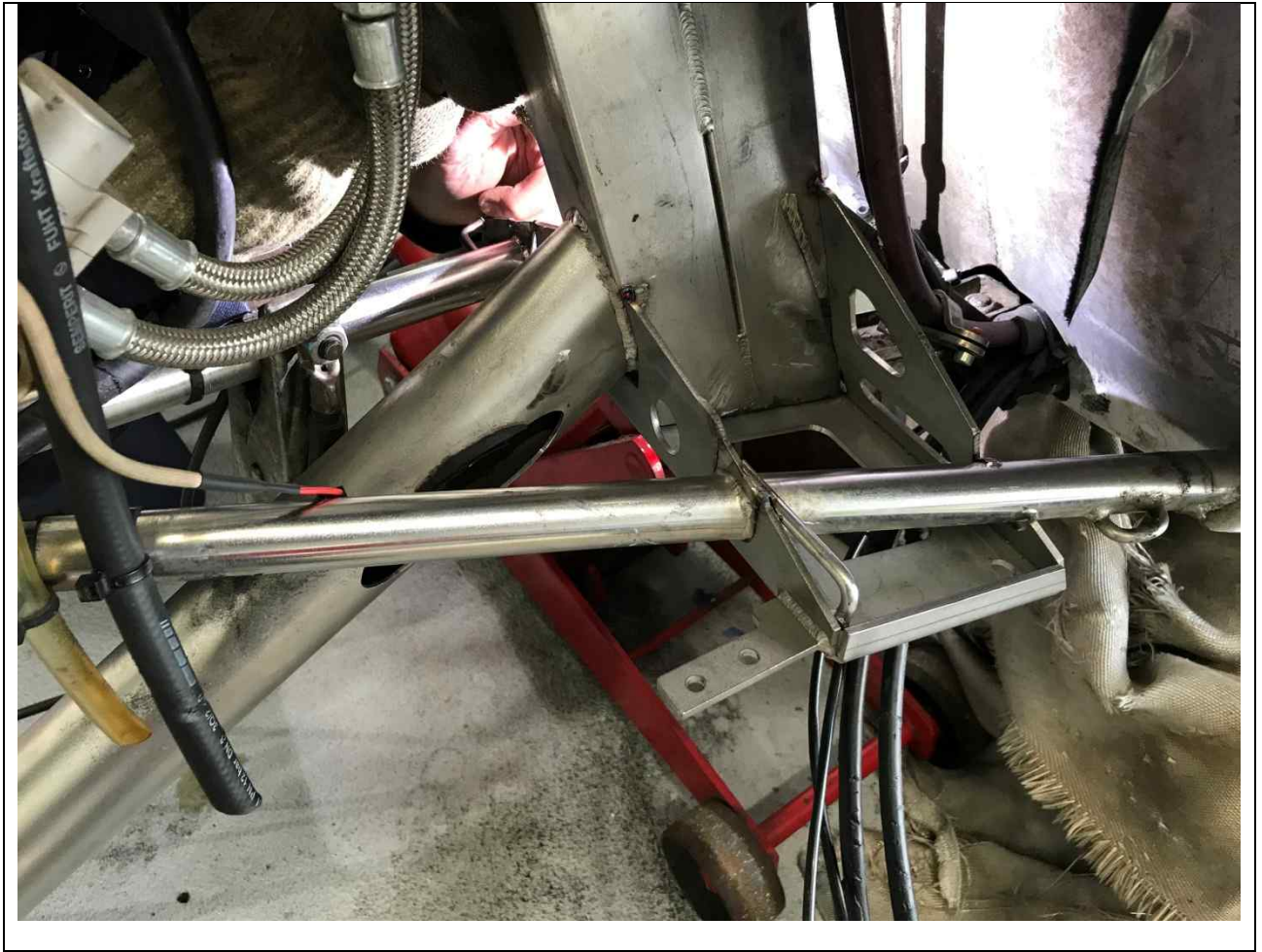
**The tank strap stay (the formed wire) is retained and welded back into place.**

**Note that this later generation bracket is welded to the edge of the mast tubes rather than the middle, and welded both sides.**



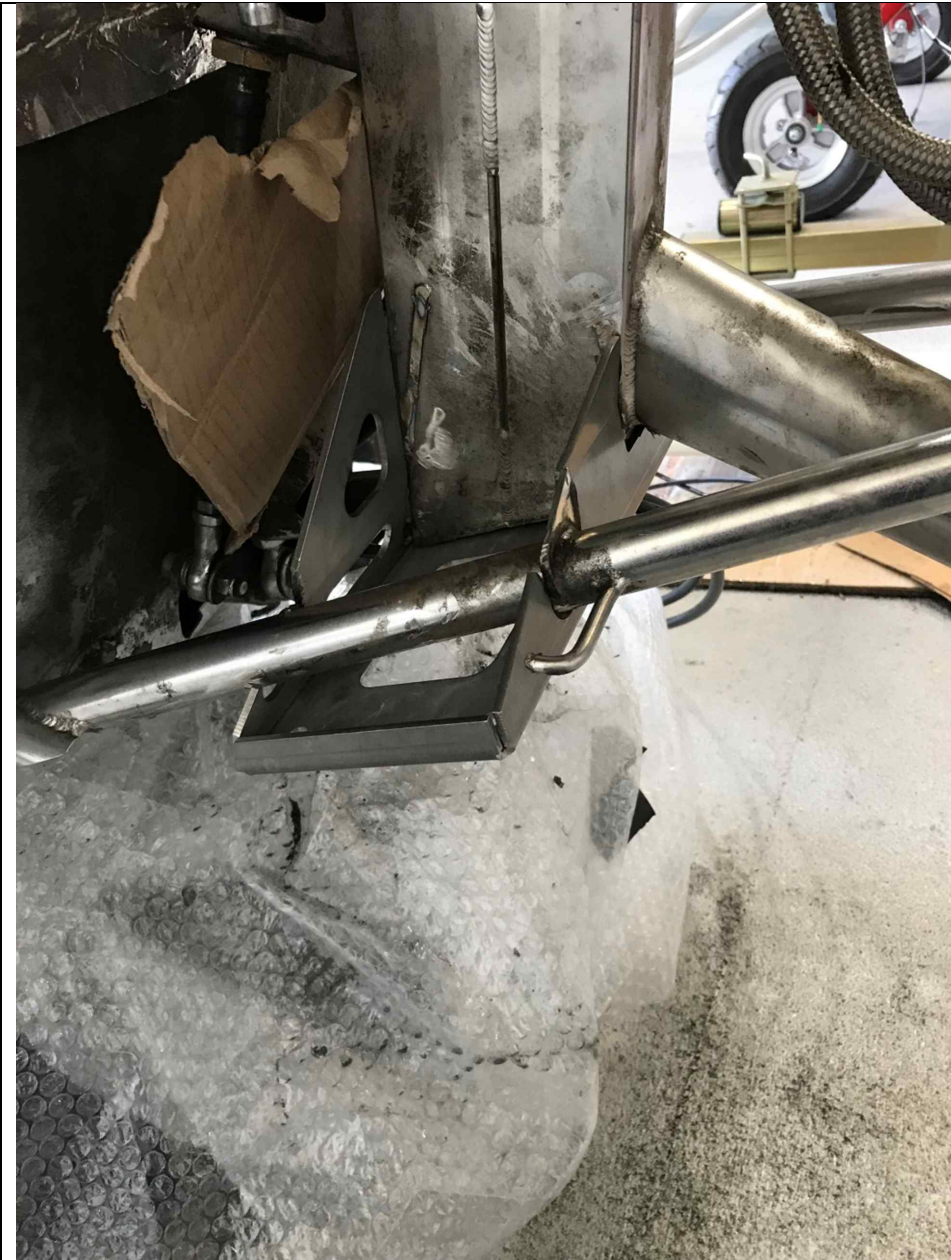
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**New bracket finished, ready for re-assembly**

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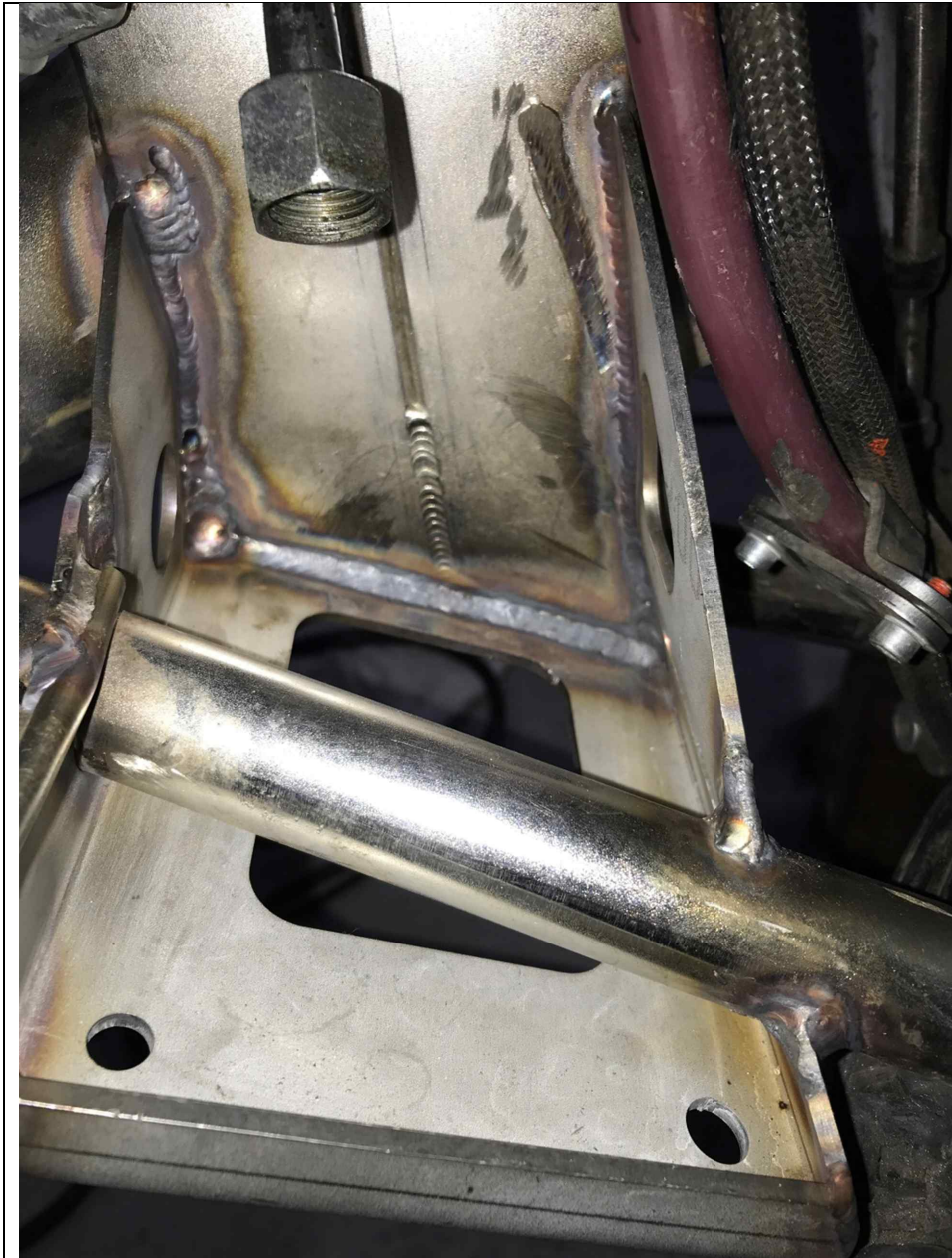
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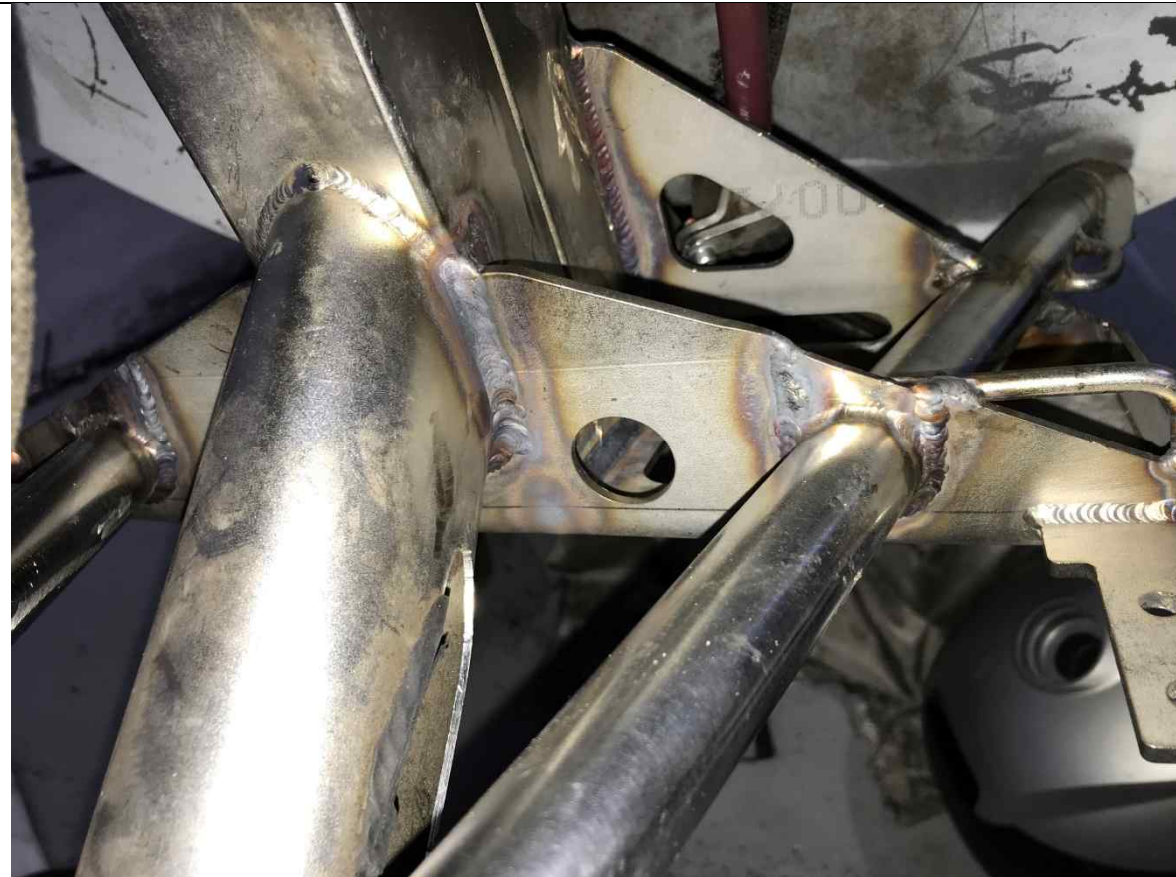
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View showing the original bracket remains welded to the new bracket



Underside view showing the weld to the keel tube.



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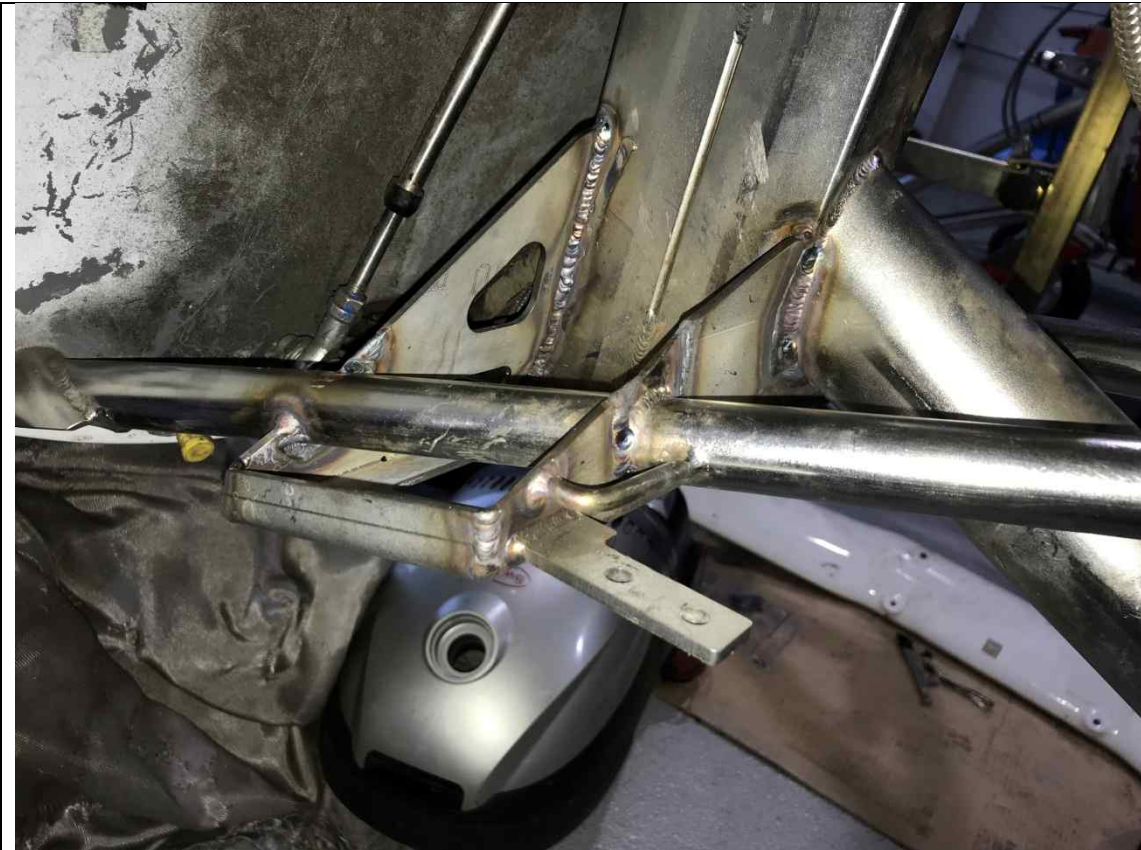
Underside view of the bracket weld to the front control stay



View of left bracket side. Note the original fuel tank strap bracket welded back into place

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Left side bracket. Note all four bracket corners are welded too.



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Rear view looking forward showing weld around the brace tubes (4 places) and the oil cooler mounting bracket.

**Reference to other documentation:**

No modification has been raised as it is considered that this repair reinstates the bracket to the original specification.

**Test and inspection records:**

Complete attached worksheet

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

No special tools or components required





**Quality Inspection requirements after repair:**

Visual inspection required as described above



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## Service Repair Request and Evaluation/Approval

<b>Flight test requirements after repair:</b>				
No flight test required				
<b>Documentation completion:</b>				
<ol style="list-style-type: none"> <li>1. Complete the SRA worksheet attached</li> <li>2. After embodiment of this repair SRA-024 the authorised engineer/welder must make an entry in the airframe logbook white pages stating that the repair has been embodied.</li> <li>3. Add an inspection requirement after 50hrs in service to check for any weld cracks.</li> </ol>				
<b>Service repair authorised by: (name, signature, and date of signature)</b>				
<b>Quality Control Manager</b>   <small>G. Speich Dec 21 2018 12:15 PM</small>  <small>DocuSign</small>	<b>Engineering Manager</b>   <small>G. Speich Dec 21 2018 12:15 PM</small>  <small>DocuSign</small>	<b>Chief Test Pilot (where an effect on flight performance or safety)</b>  None required	<b>CVE</b>   <small>Mr David E Starkey Dec 21 2018 2:37 PM</small>  <small>DocuSign</small>	<b>Head of Airworthiness</b>   21 Dec 2018
<b>Document effectivity date:</b>				
19.12.2018				

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**Flight test requirements after repair:**

No flight test required

**Documentation completion:**

1. Complete the SRA worksheet attached
2. After embodiment of this repair SRA-024 the authorised engineer/welder must make an entry in the airframe logbook white pages stating that the repair has been embodied.
3. Add an inspection requirement after 50hrs in service to check for any weld cracks.

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

Quality Control Manager	Engineering Manager	Chief Test Pilot (where an effect on flight performance or safety)  None required	CVE	Head of Airworthiness
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**Document effectivity date:**

19.12.2018

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## Service Repair Request and Evaluation/Approval

Aircraft serial no.  Registration G-	<b>Service Repair Implementation Worksheet</b>	Date raised:  Raised by:	
Purpose – record service repair implementation actions taken, then to inspect aircraft and return to service.		Document reference: SRA-025 iss1	
Maintenance manual referred to and issue level/date:			
Note; attach any secondary sheets to this document			
<b>Task</b>	Notes	Eng'r check/date	Inspector check/date
Remove cowlings and fuel tanks and suitably protect the welding environment on the aircraft			
Primary clean-up and inspection satisfactory			
Weld satisfactory			
Final clean-up completed			
Remove protective materials			
Re-assemble aircraft, replacing fuel tanks and cowlings, etc.			
Confirm no tools or equipment left in aircraft			
Welder name:			
CAA Authorisation code:			
Weld crack inspection requirement put in the airframe logbook for 50hrs post this repair			
	Intentionally blank		
Customer acceptance: Name:  Signature/date:		Aircraft Hobbs meter reading:  Confirm logbooks annotated:	
<b>Permit Maintenance Release: The work recorded above has been completed to my satisfaction and in that respect the aircraft is considered fit for flight.</b>			
Engineer/Inspector signature   Name: CAA or CAMO Authorisation code :		Date of work   Location where work completed:	