ALPHA AVIATION

SERVICE BULLETIN

AA-SB-71-004

Engine Mount Inspection and Repair

1. PLANNING INFORMATION

1.1. EFFECTIVITY

R2000 Series aircraft.

1.2. CONCURRENT REQUIREMENTS

Nil

1.3. REASON

Two cases has been reported of cracked engine mount frames. Both occurred in Alpha manufactured R2160 aircraft. The repair scheme is applicable to all models in the R2000 range, if similar cracks are found in other models.

As a safety precaution it is recommended to carry out the checks and inspection detailed in 1.5 below within 10 hours on Alpha manufactured 160A and 160Ai aircraft, and at the next scheduled service for the rest of the R2000 fleet.

1.4. DESCRIPTION

Cracks has been reported in the tubes near the RH upper engine mount bobbin. (See Figure 1).

1.5. COMPLIANCE

Within the next 10 flying hours, carry out a thorough visual inspection of the engine mount frame tubes near the welds. In the reported cases cracks were found in the tubes near the RH upper Dynafocal mount.

- If no cracks are detected the aircraft can remain in service but carry out the inspection in section 2 **Accomplishment Instructions** at every 100 hour routine inspection.
- If a crack is detected: carry out the repair in section 2 **Accomplishment Instructions** before further flight.

Make a log book entry stating compliance with this Service Bulletin. The entry shall identify the action taken to satisfy this Service Bulletin.

1.6. APPROVAL

Alpha Aviation Design Organization DO65180

1.7. WEIGHT AND BALANCE

Nil affect on weight or balance

1.8. REFERENCES

R2000 Service Manual.
Drawing 97-71-041 Issue 0 or latest issue. (Reference to this drawing is essential.)

1.9. OTHER PUBLICATIONS AFFECTED

Nil

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2. ACCOMPLISHMENT INSTRUCTIONS

Inspection: Remove engine cowls in accordance with maintenance manual. Use bright lighting and a mirror to carry out a close visual inspection of the engine mount frame. After an initial inspection, wipe the frame clean to remove any dirt build-up and re-inspect weld areas closely. Use of dye penetrant to aid inspection of suspect areas is recommended.

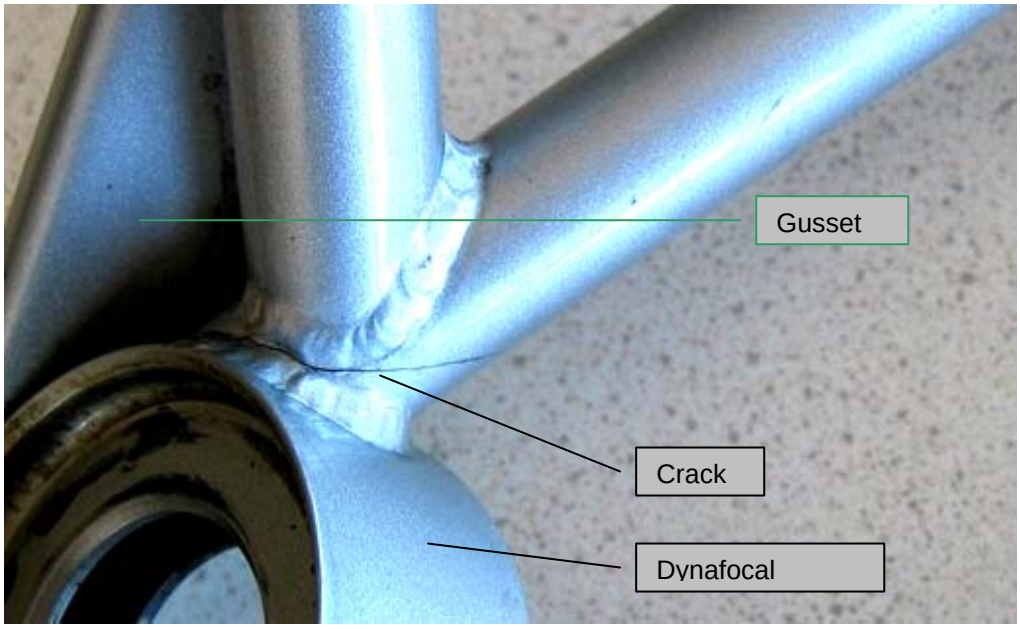

Figure 1: Cracked engine Mount Tube

Repair: (The weld repair must be carried out by a certified weld repair organisation, authorised to carry out weld repairs).

- Remove the engine mount frame in accordance with maintenance manual.
- Remove paint and linseed oil residue from the areas to be welded. Remove rivets from vent holes prior to welding. At least one vent hole must remain open during welding per tube. Bolt or clamp firewall ends of frame to a rigid flat surface during welding to limit distortion.
- Prepare any cracked area by filing a V-groove along the crack and weld-repair crack using AMS6458 filler wire. (Weld Filler Wire can be obtained from Alpha Aviation.) Remove the gusset to obtain access to the crack if required.
- Magnetic Particle Crack Check Repaired Crack Area to ASTM E 1444-05.
- Fabricate reinforcing split sleeve doublers from 25CD4S OR AISI 4130 steel tube with Internal Diameter of 20mm, and 1mm (0.040") to 1.6mm (0.063") thick, for each of the four Dynafocal bobbin positions. Fabricate the doubler shapes to coordinate with mating tubes and bobbins. Weld the reinforcing doublers in

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place over any repaired cracks as shown in figure 2.1, figure 2.2 and drawing 97-71-041 making use of AMS6457 of AMS6458 filler wire.

- Form R10 fillets over the 130° nearest to the bobbin, by means of multiple weld runs. See note 4 in figure 2.1 below or note 5 on drawing 97-71-041. Blend out any irregularities and pitting to a smooth finish. All welds near the bobbin must be blended and free from pitting.
- Re-weld the gusset in place. Fabricate a new gusset to replace the original removed gusset from AISI 4130 Steel Sheet, 1.6mm (0.063") thick if the original gusset is not re-usable.
- Flame Normalise the weld heat affected area.
- Magnetic Particle Crack Check Assembly to ASTM E 1444-05.
- Repaint the engine frame, using a good quality 2K paint to match the existing paint on the engine frame.
- Treat tubes internally using boiled linseed oil and plug holes with AD42 rivets.
- Re-install in accordance with the Alpha R2000 series or applicable Service Manual.

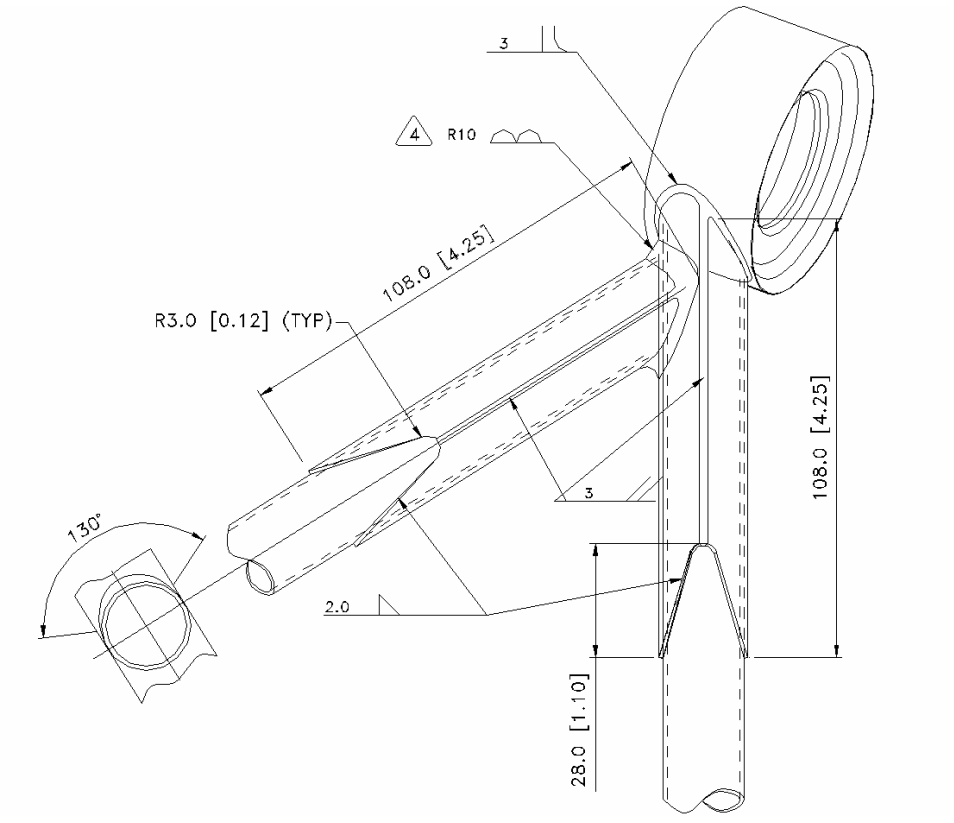

Figure 2.1: Outer Split Sleeve Repair welded over cracked area.

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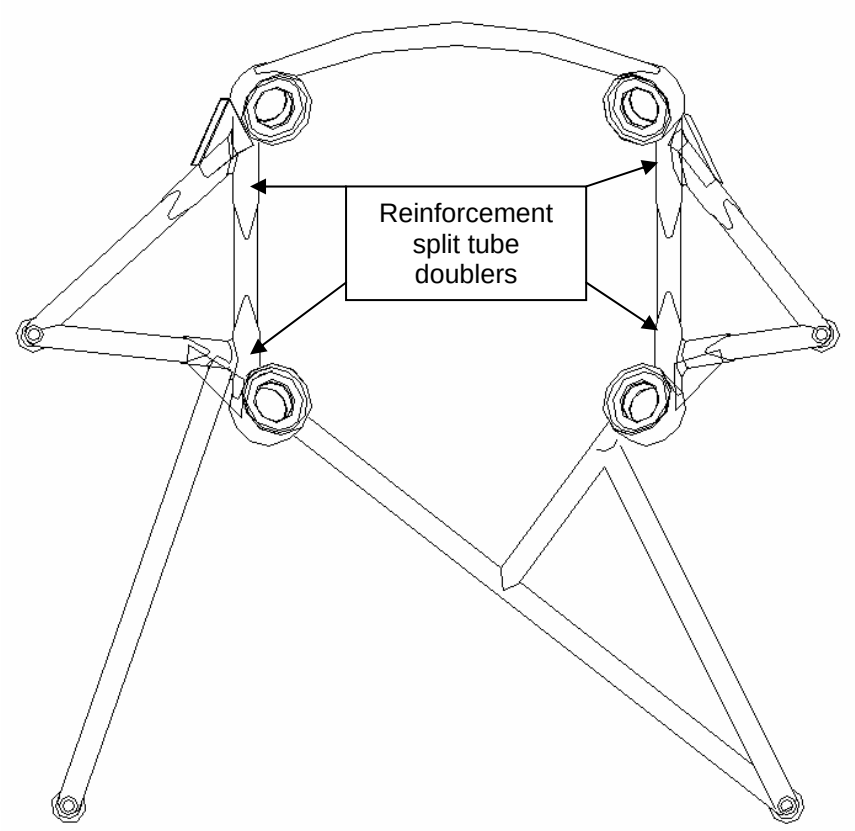

Figure 2.2: Four reinforcement locations.

3. FEED BACK

Maintenance organisations are requested to provide feedback on the results of the inspection. Please use Alpha form DES 22 (Design Feedback Form) for this purpose. A copy of the form and mailing details can be found in the Service Manual or on the Alpha Aviation Web Site..

Contact Information:

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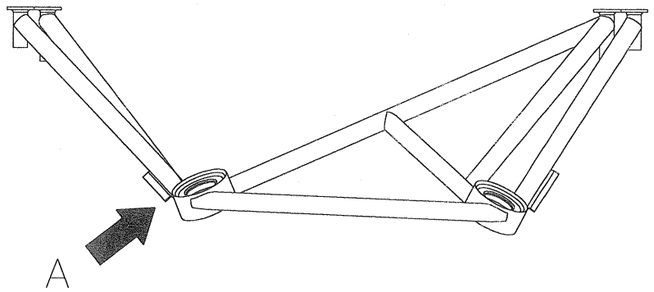
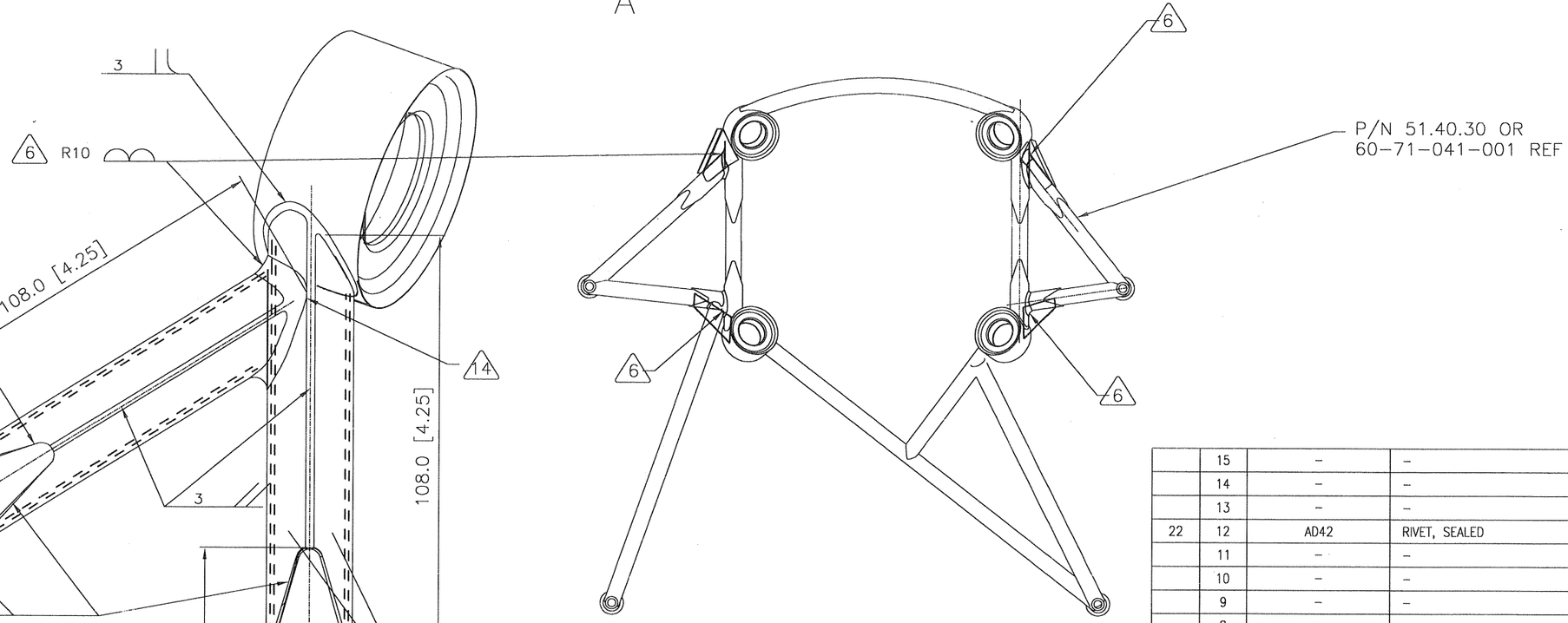
NOTES

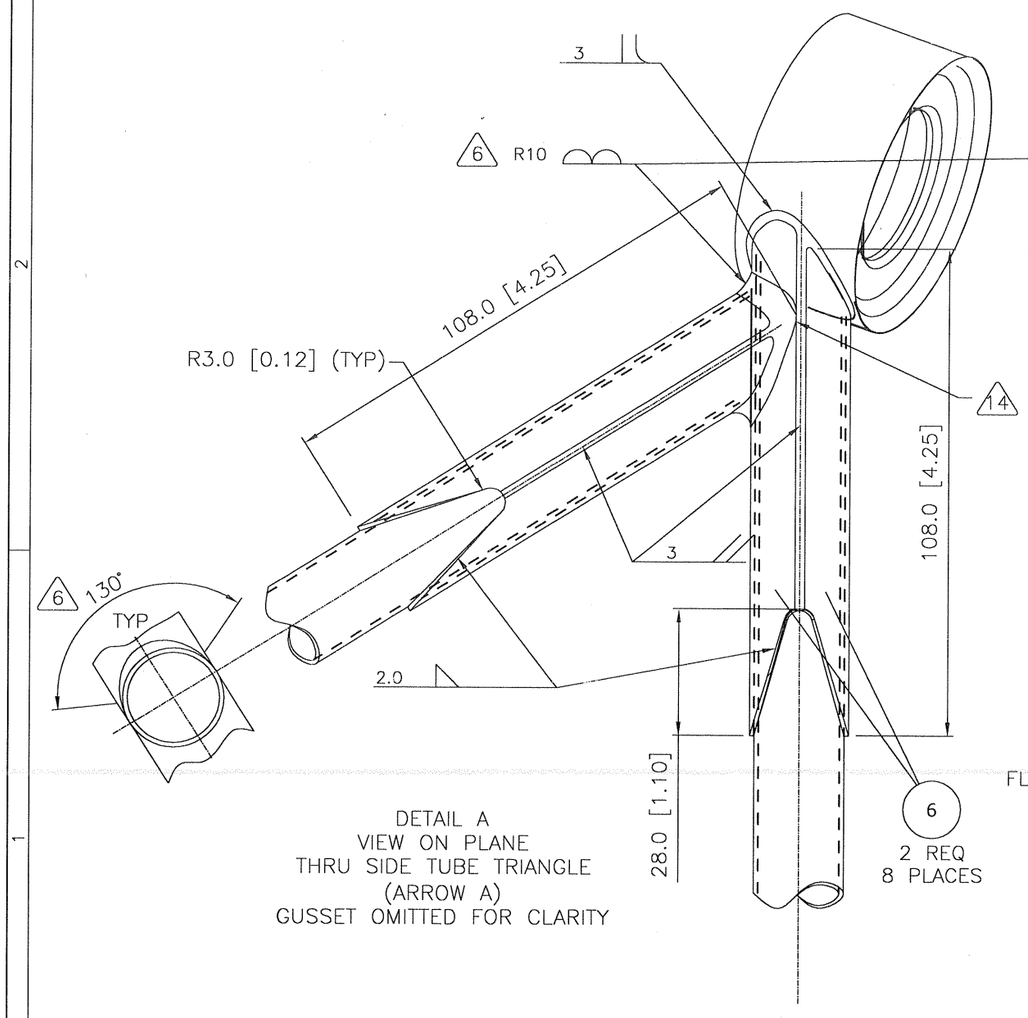
1 REPAIR IN ACCORDANCE WITH AC43–13B REFER FIG 4–38. FABRICATE TO CO–ORD WITH MATING PARTS.
2 DETAIL A SHOWS REPAIR AND REINFORCEMENT OF THE TUBES ATTACHING TO THE UPPER RH DYNAFOCAL BOBBIN. THIS REPAIR IS SUITABLE FOR ALL OF THE FOUR DYNAFOCAL POSITIONS.
3 REINFORCEMENT MUST BE APPLIED TO ALL FOUR POSITIONS WHERE VERTICAL SIDE TUBES ATTACHES TO DYNAFOCAL BOBBINS ADITIONAL TO REPAIR AT LOCATION OF CRACK.
4 PREPARE FOR WELDING: REMOVE PAINT IN WELD AREAS AND CLEAN. REMOVE GUSSET. PREPARE CRACK AREA AND WELD CRACK. (SEE DEAIL B.)
5 ALL WELDS: TIG WELD IAW MIL–STD–2219A USING AMS 6457 OR AMS 6458 FILLER WIRE.
△6 BUILD UP A R10 FILLET USING MULTIPLE WELD RUNS. BRIDGE FILLET ONTO BOBBIN WHERE WELD COMES CLOSE TO BOBBIN. BLEND OUT ALL PITTING AND DEFECTS TO A SMOOTH POLISHED SURFACE OVER AREA SHOWN.
7 RE–WELD GUSSET IN PLACE. (FABRICATE A NEW GUSSET FROM AISI 4130N STEEL SHEET 0.063" THICK IF ORIGINAL GUSSET IS DESTROYED BY REMOVING.)
8 FLAME NORMALISE ALL NEW WELDS.
9 MAGNETIC PARTICLE CHECK ASSEMBLY TO ASTM E 1444–05
10 TREAT TUBES INTERNALLY WITH BOILED LINSEED OIL AND PLUG HOLES WITH ITEM 12.
11 DO NOT RE–DRILL ANY VENT HOLES COVERED BY THE REPAIR.
12 RE–PAINT USING HIGH QUALITY 2K PAINT WHITE OR SILVER TO MATCH EXISTING PAINT FINISH.
13 SPLIT HALF SLEEVES MAY BE FABRICATED USING STEEL TUBE AISI 4130 OR 25CD4S, 1 TO 1.6 WALL THICKNESS. TRIM AS REQUIRED TO CO–ORD WITH MATING TUBES.
△14 SPLIT ITEM 6 IN TWO PIECES TO FIT AROUND INTERSECTING TUBE WHERE REQUIRED.

DRAWING ISSUE STATUS

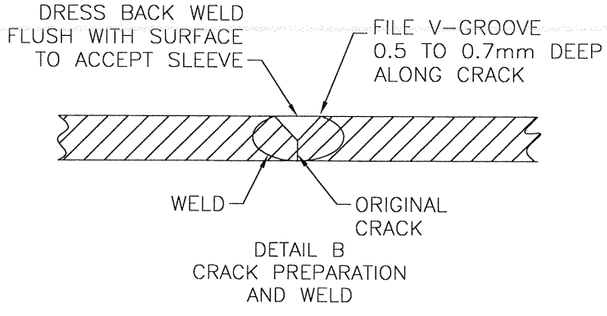
ISSUE	DRAWN INITIALS	CHECKED INITIALS	APPROVED FOR MANUFACTURE SIGNATURE	DATE	APPROVED FOR AIRWORTHINESS SIGNATURE	DATE	SOC/DCN	REASON FOR CHANGE
0	DAR			23/4/09		24/4/09	1038	







DETAIL A
VIEW ON PLANE
THRU SIDE TUBE TRIANGLE
(ARROW A)
GUSSET OMITTED FOR CLARITY



DETAIL B
CRACK PREPARATION
AND WELD

QTY	ITEM	PART No	DESCRIPTION	SUPPLIER/COMMENT
	15	–	–	
	14	–	–	
	13	–	–	
22	12	AD42	RIVET, SEALED	
	11	–	–	
	10	–	–	
	9	–	–	
	8	–	–	
	7	–	–	
16	6	97–71–041–006	SPLIT SLEEVE HALF, AISI 4130 TUBE ID20.0 X 1–1.6mm thk	
	5	–	–	
	4	–	–	
	3	–	–	
	2	–	–	
✓	1	97–71–041–001	ENGINE MOUNT FRAME – REPAIRED	

DIMENSIONS MILLIMETERS [INCHES] — X. ±0.75 [X.X"±0.03"] X.X ±0.3 [X.XX±0.010"] X° ±.5° [X° ±.5°] UNLESS OTHER WISE STATED

TREATMENT FINISH: 2K PAINT | SCALE: NTS | SHEET No: 1 OF 1

TITLE: REPAIR AND REINFORCEMENT FRAME, ENGINE MOUNT

ALPHA AVIATION HAMILTON AIRPORT, NEW ZEALAND

DWG No: 97–71–041

THIRD ANGLE PROJECTION