



DRB 2015-SA-76-037-A

## Repair Doubler on RHS Center Firewall

<h1 style="margin: 0;">DESIGN RECORD BOOK</h1>		Record NO: <span style="border: 1px solid black; padding: 2px 20px;"> </span>
Prepared by <span style="border: 1px solid black; padding: 2px 50px;">Ari Adeniyi</span>		DRB No: <span style="border: 1px solid black; padding: 2px 50px;">2016-SA-76-037-A</span>
Title <span style="border: 1px solid black; padding: 2px 100px;">Repair Doubler on RHS Center Firewall</span>		
Start Date: <span style="border: 1px solid black; padding: 2px 20px;">4/03/17</span>	Detail Dwg <span style="border: 1px solid black; padding: 2px 20px;"> </span>	
End Date: <span style="border: 1px solid black; padding: 2px 20px;">4/03/17</span>	Assy Dwg <span style="border: 1px solid black; padding: 2px 20px;">X</span>	
No. Pages: <span style="border: 1px solid black; padding: 2px 20px;"> </span>	Related Documents: (1) <span style="border: 1px solid black; padding: 2px 20px;"> </span> (3) <span style="border: 1px solid black; padding: 2px 20px;"> </span> (2) <span style="border: 1px solid black; padding: 2px 20px;"> </span> (4) <span style="border: 1px solid black; padding: 2px 20px;"> </span>	
Model: <span style="border: 1px solid black; padding: 2px 20px;">S-76D</span>		Hours: <span style="border: 1px solid black; padding: 2px 20px;"> </span>
Keyword: (1) <span style="border: 1px solid black; padding: 2px 20px;">Firewall</span> (2) <span style="border: 1px solid black; padding: 2px 20px;">Y-Tube</span>		Model Effectivity: <span style="border: 1px solid black; padding: 2px 20px;">All</span>
(3) <span style="border: 1px solid black; padding: 2px 20px;">Crack</span>		FEM Analysis: <span style="border: 1px solid black; padding: 2px 20px;"> </span>
Supersedes: <span style="border: 1px solid black; padding: 2px 20px;"> </span>		Charge No: <span style="border: 1px solid black; padding: 2px 20px;"> </span>
Analysis Type <span style="border: 1px solid black; padding: 2px 20px;">Repair</span>		Superseded By: <span style="border: 1px solid black; padding: 2px 20px;"> </span>
Reason for Analysis <span style="border: 1px solid black; padding: 2px 20px;">Field Support</span>		
<b>Description:</b> <div style="border: 1px solid black; padding: 10px; margin-top: 5px;"> <p>While removing both engines to perform an unrelated airframe repair, cracks were discovered on the engine center firewall attachment areas for the engine bleed air lines and "Y" tube.</p> <p>The L/H side panel P/N 76202-77003-130 is cracked on the panel skin and the #1 engine bleed air line attachment flange. The R/H side firewall skin and # 2 engine bleed air line attachment flange are cracked also (R/H side attachment area differs from the L/H side, as the R/H side firewall does not have a removable panel at the bleed airline attachment flange). See attached photos for reference. Customer reports the flanges on the P/N 7435-1 "Y" pipe are cracked as well (photos have not been provided as of yet. FTR will be updates with "Y" tube photos when available).</p> <p><u>Rev-A</u>            This DRB is being adjusted for the addition of heater system deactivation per AMM Subtask 21-40-00-610-002. The Doubler will now act as the Closeout for the Deactivation.</p> </div>		
<b>Results:</b> <div style="border: 1px solid black; padding: 10px; margin-top: 5px;"> <p>The recommended repair procedure for the right hand side is to stop-drill the crack and install a repair doubler as shown in Figure 5. The removable panel on the left hand side will be replaced with a new panel.</p> <p>The repair procedure is outlined in this DRB. For FAA purposes, this repair is considered "minor".</p> </div>		
Assigned: <span style="border: 1px solid black; padding: 2px 20px;">A. Adeniyi</span>	Approval: <span style="border: 1px solid black; padding: 2px 50px;">John W Scheib</span>	Approve Date: <span style="border: 1px solid black; padding: 2px 20px;">4/4/17</span>

Lockheed Martin Proprietary/Export Controlled Information

PREPARED BY A. Adeniyi

CHECKED BY J Scheib

DATE 04/03/2017



DRB 2015-SA-76-037-A

**Repair Doubler on RHS Center Firewall****Background**

While removing both engines to perform an unrelated airframe repair, cracks were discovered on the engine center firewall attachment areas for the engine bleed air lines and "Y" tube.

The L/H side panel P/N 76202-77003-130 is cracked on the panel skin and the #1 engine bleed air line attachment flange. The R/H side firewall skin and # 2 engine bleed air line attachment flange are cracked also (R/H side attachment area differs from the L/H side, as the R/H side firewall does not have a removable panel at the bleed air line attachment flange). See attached photos for reference. Customer reports the flanges on the P/N 7435-1 "Y" pipe are cracked as well (photos have not been provided as of yet. FTR will be updates with "Y" tube photos when available).

Customer is requesting guidance regarding availability of replacement parts, or possible repair action.

The recommended repair procedure for the right hand side is to stop-drill the crack and install a repair doubler as shown in Figure. The removable panel on the left hand side that is cracked will be removed and replaced with a new panel.

The repair procedure is outlined in this DRB. For FAA purposes, this repair is considered "minor".

**Rev-A**

This DRB is being adjusted for the addition of heater system deactivation per AMM Subtask 21-40-00-610-002. The Doubler will now act as the Closeout for the Deactivation.

This document was initially prepared in response to damage reported in CRM Log 77153. The procedures specified herein shall not be used for disposition of similar conditions, or referenced as the basis of substantiation, in whole or in part, for other forms of approved technical data, without further approval from SAC Engineering.



DRB 2015-SA-76-037-A

### Repair Doubler on RHS Center Firewall

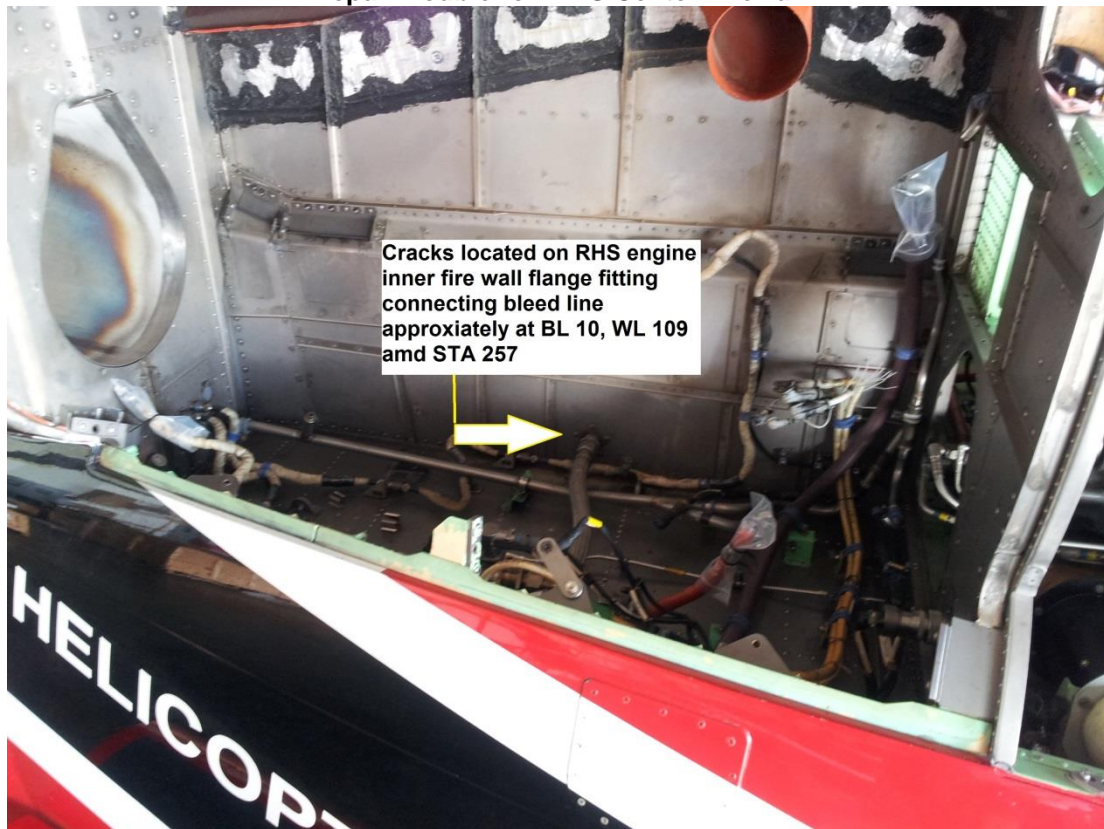


Figure 1 Crack on RHS Center Firewall At Y-tube Flange



DRB 2015-SA-76-037-A

Repair Doubler on RHS Center Firewall



Figure 2 Crack in Firewall at Y-Tube Flange





DRB 2015-SA-76-037-A

Repair Doubler on RHS Center Firewall



Figure 3 Tank Panel Damage



DRB 2015-SA-76-037-A

## Repair Doubler on RHS Center Firewall

Repair Procedure

1. Prepare the helicopter for ground maintenance.
2. Mask off area to be repaired on the outboard side of the panel.
3. Remove LHS access panel and Y-tube to gain access to area of the firewall panel to be repaired.
4. Remove lower cap fasteners that will be picked up as shown in Figure
5. Abrade the firewall panel in the repair area to clean titanium substrate, using scotch-brite abrasive mat, MIL-A-9962.
6. Stop drill crack tip using a 0.098" diameter drill. Be careful not to damage any additional structure, wiring, hoses, etc. in this area. Deburr the holes. Vacuum the area to remove loose particles.
7. Degrease the repair area by wiping with a low-lint cleaning cloth (conforming to A-A-59323, Type II) using acetone (conforming to ASTM D329) or ethyl alcohol (conforming to A-A-51693). Wash with clean water to a water-break free condition.
8. Inspect the firewall in the repair area using dye penetrant. If any further cracks exist, contact Sikorsky Aircraft for further instructions.
9. Again degrease by wiping above areas with a low-lint cleaning cloth (conforming to A-A-59323, Type II) using acetone (conforming to ASTM D329) or ethyl alcohol (conforming to A-A-51693). Wash with clean water to a water-break free condition.
10. Fabricate a reinforcement doubler panel approximately as shown in Figure 4. **Do not** cutout center hole as this doubler will act as the deactivation closeout. The doubler will be made of 0.020 TI 6AL-4V or 0.025 301 ¼ HD SS as available. Reorient as necessary to avoid crack and existing fastener holes. The doubler will cover the Y-tube pass through hole on the outboard side of the RHS firewall as shown in Figure 4. The doubler shall be sized to allow a staggered row of 1/8" fasteners, maintaining 2D edge distance and a minimum of 4D pitch on the fasteners. Corner radii shall be 0.190" minimum. Deburr the edges of the doubler. Avoid Crack and existing fastener holes.
11. Temporarily locate the doubler in place. Back drill any removed fastener locations that would be common to the doubler. Transfer pass through hole and flange mounting holes to doubler from firewall as shown in Figure.
12. Remove the doubler and pilot drill fastener holes. Form two rows maintaining 2D edge distance and a minimum of 4D pitch on the fasteners. Again temporarily locate the doubler in place and use the pilot holes to mark the fastener locations on the original skin panel.
13. Open all holes in the doublers and skin panel to full size for 1/8" rivets. Deburr all holes. Clean the doublers and repair area per step 7 of this procedure.
14. Faying surface seal the doubler using AMS 3347 firewall sealant. Remove sealant squeeze-out and flash after application. Wet install fasteners with AMS 3374.

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DRB 2015-SA-76-037-A

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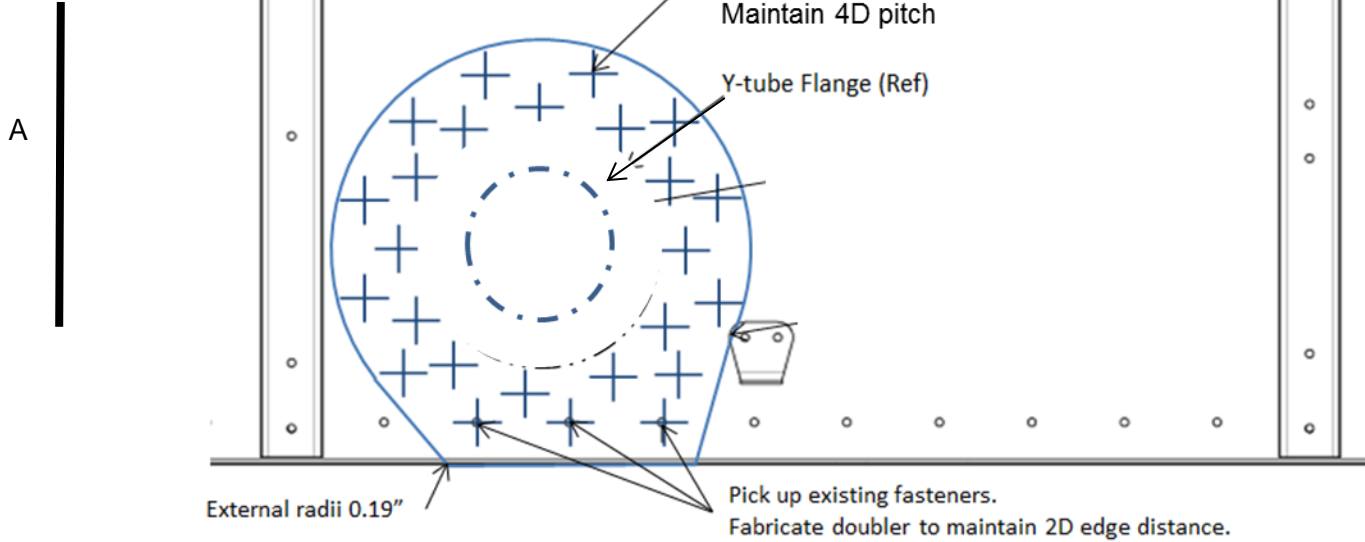


Figure 4: Doubler Installed Over RHS Y-Tube Pass Through