



DRB 2015-SA-76-037

## Repair Doubler on RHS Center Firewall

SIKORSKY  
AIRCRAFT

## DESIGN RECORD BOOK

Record NO: 

Prepared by	A. Schloemer	DRB No:	2015-SA-76-037
Title	Repair Doubler on RHS Center Firewall		
Start Date:	08/29/2015	Detail Dwg	<input type="text"/>
End Date:	08/29/2015	Assy Dwg	<input type="text"/>
No. Pages:		Related Documents:	(1) <input type="text"/> (3) <input type="text"/> (2) <input type="text"/> (4) <input type="text"/>
Model:	S-76D	Hours:	<input type="text"/>
Keyword: (1)	Firewall	Model Effectivity:	<input type="text"/>
(2)	Y-tube	FEM Analysis:	<input type="text"/>
(3)	Crack	Charge No:	<input type="text"/>
Supersedes:		Superseded By:	<input type="text"/>
Analysis Type	Repair		
Reason for Analysis	Field Support		

## Description:

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 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 updated with "Y" tube photos when available).

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

## Results:

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.

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

Assigned:  J. ScheibApproval:  John W. Scheib

Approve Date: 08/29/2015

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DATE 08/29/2015



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## 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 updated 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 5. 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".

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.



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

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Figure 2 Crack in Firewall at Y-Tube Flange

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Figure 3 Tank Panel Damage

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## 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
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 ring doubler from cracked access panel approximately as shown in Figure 4. Reorient as necessary to avoid crack and existing fastener holes. The doubler will be centered on the Y-tube pass through hole on the outboard side of the RHS firewall as shown in Figure 5. 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 arc 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 5.
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 per SS8630 Type 2 using AMS 3347 firewall sealant. Remove sealant squeeze-out and flash after application. Wet install fasteners with AMS 3374 per SS8630 Type 2.

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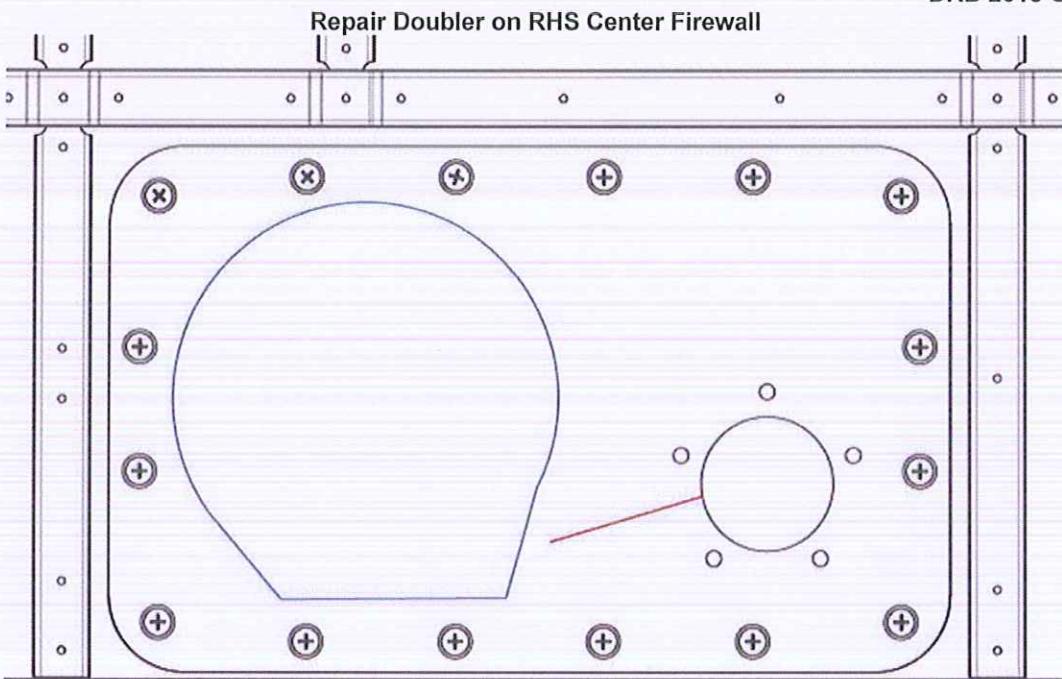


Figure 4: Doubler Fabricated from Cracked Access Cover

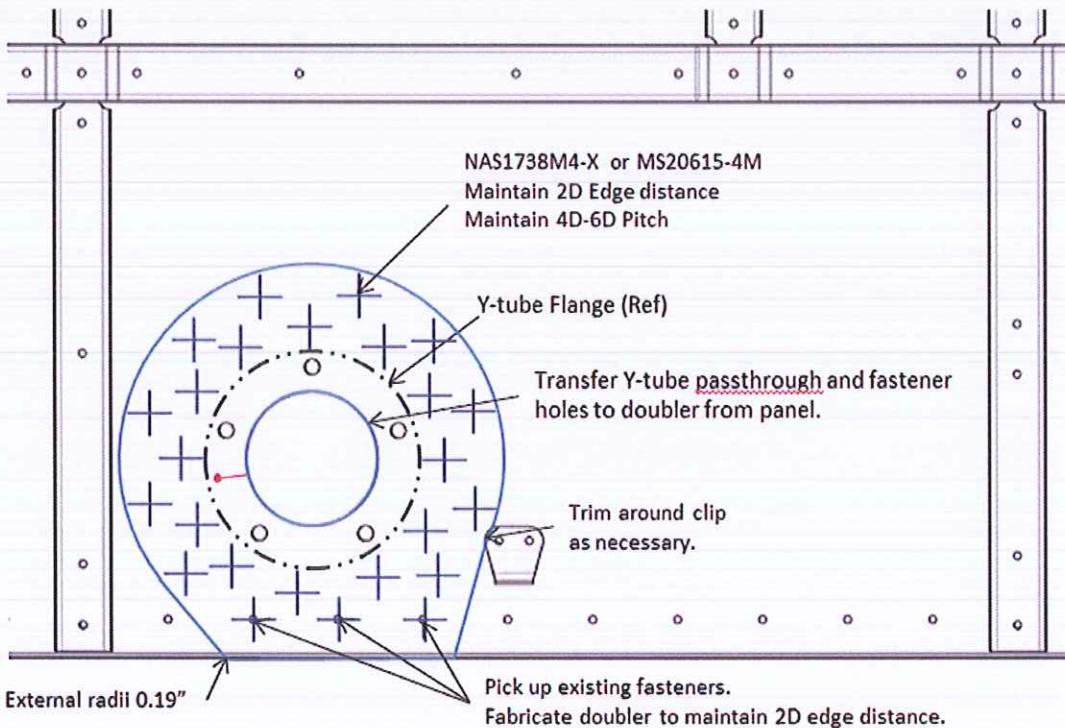


Figure 5: Doubler Installed Around RHS Y-Tube Pass Through