

MANDATORY SERVICE BULLETIN**NUMBER:** SB14-10**REVISION:** 00**DATE:** 10/31/2014**SUBJECT:** RUDDER CABLE PASS-THROUGH DOUBLER INSTALLATION**EFFECTIVITY:**

KODIAK® 100 Series Aircraft Serial Numbers: 100-0001 through 100-0135 except with compliance to FSI-097, *Aft Fuselage Skin Doubler Installation*.

SUMMARY:

Quest Aircraft received two reports of cracks forming in the aft cabin top skin at the rudder cable pass-through holes. QUEST® has determined that the area should be inspected on every aircraft as specified below and doublers installed at each pass-through hole. The attached Field Service Instruction provides procedures for inspecting for cracking and installation of doublers to repair existing cracking or prevent cracks from occurring.

COMPLIANCE:

For aircraft with less than 1000 hours, this Service Bulletin must be complied with before the aircraft total time exceeds 1000 hours. For aircraft with greater than 1000 hours, this Service Bulletin must be complied with within the next 100 hours or annual, whichever occurs first.

ATTACHED DOCUMENTS:

Document #:	Document Title:
FSI-104	Rudder Cable Pass-Through Doubler Installation

FAA APPROVAL STATUS:

The resultant alteration to the affected aircraft described in the instructions attached has been shown to comply with the applicable Federal Aviation Regulations and is approved by the Federal Aviation Administration.

SPECIAL INSTRUCTIONS:

N/A.

CREDIT AND WARRANTY INFORMATION:

QUEST® will supply one Service Kit FSI-104 per aircraft at no cost to owner, and for aircraft under factory warranty, reimburse up to 4.5 hours of labor costs associated with FSI-104. Contact Quest Customer Service to order kit, and refer to the QUEST® website for information on submitting invoices for labor reimbursement.

Quest Customer Service**Service Bulletin SB14-10****Phone:** (208)263-1111 **Toll Free:** 1(866)263-1112**Email:** Customerservice@questaircraft.com



FIELD SERVICE INSTRUCTION

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Rudder Cable Pass-Through Doubler Installation

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SUBJECT

This Field Service Instruction provides the procedures for inspecting for skin cracks, and installing a doubler on the inside surface of the top skin on the aft fuselage of the airplane.



Limitations apply for this Field Service Instruction (FSI); ensure that the airplane meets limitations prior to performing maintenance activity.

AFFECTED MANUALS AND PUBLICATIONS

None

INDUSTRY REFERENCES

AC 43-13-1B: *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair*

WEIGHT AND BALANCE

Once installed, the doublers will add less than 0.05 lb, which is considered negligible.

MANPOWER

The estimated man-hours and minimum number of persons required to perform this Field Service Instruction are listed below. The “Minimum Persons” refers only to maintenance personnel or installers, and unless otherwise specified within this instruction does not include additional personnel that may be needed solely to comply with safety requirements (for example, safety observers that are not performing tasks within this instruction). It is the responsibility of maintenance personnel to comply with safety requirements, including having a safety observer available as needed.

Estimated Man-hours: 4.5 hours

Minimum Persons: 1 person

If more than the minimum personnel perform this instruction, the actual man-hours required may be reduced due to increased efficiencies. As appropriate, Quest encourages the use of additional personnel; man-hour estimates are based on the minimum personnel required.

RECORD OF COMPLETION


- Update the appropriate maintenance records.
- Ensure the KODIAK® 100 Pilot's Operating Handbook / Aircraft Flight Manual is up-to-date with the current revision (Rev 15 or later)
- Ensure the KODIAK® 100 Airplane Maintenance Manual is up-to-date with the current revision (Rev 16 or later)

Quest Aircraft Company, LLC
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The instructions / procedures presented herein are based upon the systems and components of the aircraft when it was delivered from the factory, or as modified by Quest Service Bulletins. Third-party modifications that have affected any component, system, or operating characteristic discussed by this document may invalidate the instructions / procedures provided. Before performing the instructions / procedures herein, examine all Supplemental Type Certificate (STC), Supplemental Type Authority (STA), or equivalently authorized modifications to verify that the instructions/procedures presented in this document can be properly completed. If an aircraft has an STC, STA, or equivalently authorized modification that affects any component, system, or operating characteristic also affected by this document, the operator is responsible for obtaining appropriate regulatory approval before performing the instructions / procedures herein. Quest Aircraft Company cannot be responsible for the quality of work performed in accomplishing the requirements of this document.

If you have any questions as to the applicability of this document to your specific aircraft, contact Quest Customer Service by telephone at (208) 263-1111, toll-free at (866) 263-1112, or via email at CustomerService@QuestAircraft.com

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REVISION RECORD

REV	PAGE	CHANGE DESCRIPTION
00	All	Initial Release
01	6	Added requirement for doubler installation when no cracking is found. Changed the performance/reporting sequence. Deleted (moved) requirement to complete Attachment A.
	12	Added step 4 requiring completion of Attachment A.
	Attachment A	Changed the wording at Part C to document work on airplanes without cracking.

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1. Special Safety Instructions

1.1 Warnings

Failure to comply with “Warnings” contained in this instruction may result in financial loss, significant delay in the completion time, and/or serious injury to personnel.

1.2 Cautions

Failure to comply with “Cautions” contained in this instruction may result in the destruction of components, unnecessary complications, the need to reverse completed work, and/or delays in the completion time.

1.3 Notes

“Notes” are provided when additional information may lead to an increase in efficiency.

2. Parts, Tools, and Equipment

The following tables describe the parts, tools, and equipment necessary to successfully complete this instruction. Where applicable, reference to drawings provided with this instruction is provided.

Table 2-1: Parts and Tools Included in the Service Kit

Item #	Part No.	Qty	Description	Drawing No.	Dwg Item #
2-1-1	100-240-4143	2	Fuselage Upper Aft Skin Doubler	N/A	N/A
2-1-2	MS20470AD4-4	28	Protruding Head, Solid Rivet	N/A	N/A
2-1-3	CR3213-4-01	28	Protruding Head, Pulled Rivet	N/A	N/A

Table 2-2: Consumables Included in the Service Kit

Item #	Part No.	Qty	Description	Drawing No.	Dwg Item #
2-2-1	N/A	-	N/A	N/A	N/A

Table 2-3: Serial-Number-Specific Parts Included in the Service Kit

Item #	Part No.	Qty	Description	Drawing No.	Dwg Item #
2-3-1	N/A	-	N/A	N/A	N/A

Table 2-4: Parts and Tools NOT Included in the Service Kit

Item #	Part No.	Qty	Description	Drawing No.	Dwg Item #
2-4-1	N/A	AR	Riveting Tools	N/A	N/A
2-4-2	N/A	AR	Drill bits	N/A	N/A
2-4-3	N/A	AR	Aluminum Cutting/Trimming Tools	N/A	N/A
2-4-4	N/A	AR	Deburring Tools	N/A	N/A
2-4-5	N/A	AR	High Quality Epoxy Primer (and supplies)	N/A	N/A
2-4-6	N/A	AR	High Quality Paint (and supplies)	N/A	N/A

3. General

If a crack or other damage is located in the upper aft skin of the fuselage within the region described in **Section 3.1**, then a portion of skin must be trimmed and a doubler installed in accordance with this Field Service Instruction. If cracking is not found, the existing pass-through hole perimeter should be modified and a doubler installed, also in accordance with this Field Service Instruction.

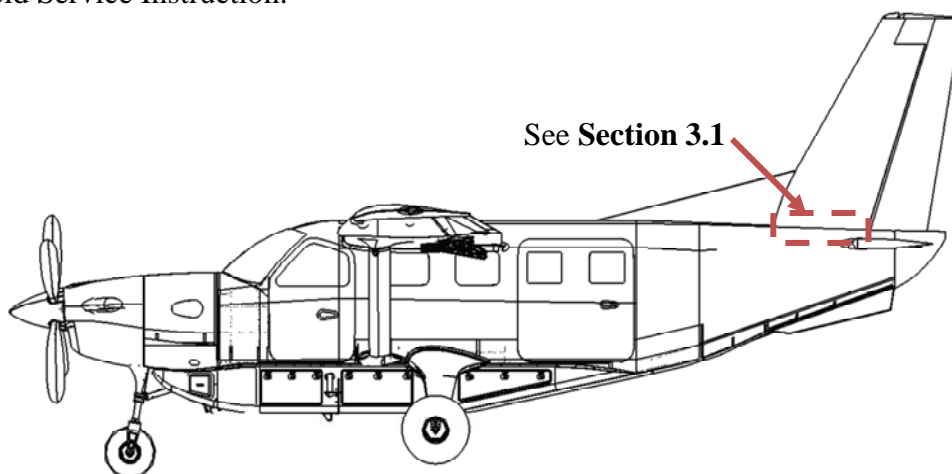


Figure 3-1: Overview

3.1 Limitations

Any damage or cracking found must be completely removed by trimming the section as shown in **Section 5.3**. That trim line matches the inside perimeter of the supplied doublers.

4. Preparation

▲ NOTE ▲

All work described in this Field Service Instruction can be performed from inside the aft fuselage tailcone, but the limited work space may make it more efficient to work from outside the aircraft.

1. Ensure that the tail stand is securely installed, and that the aft fuselage is supported to prevent the aircraft from tipping backwards.
2. Protect all systems and structure in the tailcone from incidental damage during implementation of these instructions.
3. Remove the aft cabin bulkhead panel.
4. Disconnect the rudder cables by loosening the turnbuckles.
5. Appropriately protect or move the rudder cables so they will not be damaged when modifying the pass-through holes.
6. If working from outside the aircraft, remove the Vertical Stabilizer in accordance with the latest version of the *KODIAK® 100 Maintenance Manual*, Chapter 55, "Stabilizers."



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5. Instructions

The following instructions provide procedures for inspecting for damage, marking and cutting the new rudder cable pass-through hole perimeter, deburring and finishing the new edge, installing the supplied doublers, and performing final assembly.

5.1 Rivet Installation

For the following instructions, the rivets defined in **Table 5-1** apply.

Table 5-1: Rivet Installation

Typical Rivet Callout	Nominal Size	Prepared Hole Diameter [in]		Standard Drill	Minimum Edge Distance [in]
		Min	Max		
MS20470AD4	4	0.128	0.134	30	0.25
CR3213-4-01	4	0.129	0.132	30	0.25

5.2 Inspect for Cracking

Using the following procedure based on AC43.13-1B, Section 2, visually inspect for cracking around the perimeter of the rudder cable pass-through holes as indicated in **Figure 5-1**.

1. Provide adequate lighting to illuminate the edges of the rudder-cable pass-through holes and surrounding areas.
2. Clean the areas to be inspected. Remove any contaminants that might hinder the discovery of existing surface indications. Do not remove the protective finish from the part or area prior to inspection.
3. Paying particular attention to the radii at the ends of the pass-through slots, carefully inspect the area for discontinuities, using optical aids as required. An inspector should have available, at minimum, a flashlight and a mirror.
4. Determine the extent of any cracks found by directing the light beam at right angles to the crack and tracing its length. Use a 10-power magnifying glass to confirm the existence of a suspected crack.
5. If cracks are found, determine the maximum extent of the cracking and check to ensure that the complete extent of the crack can be removed when the perimeter of the rudder-cable pass-through holes is reshaped as described in **Section 5.3**.
 - a. If all cracks can be completely removed by the trimming procedure described in **Section 5.3**, proceed to **Section 5.3** of this Field Service Instruction.
 - b. If all cracks cannot be completely removed by the trimming procedure described in **Section 5.3**, then notify Quest Customer Service of the existence of the cracking and request additional instructions.
 - c. If no cracks are found, proceed to **Section 5.3** of this Field Service Instruction.



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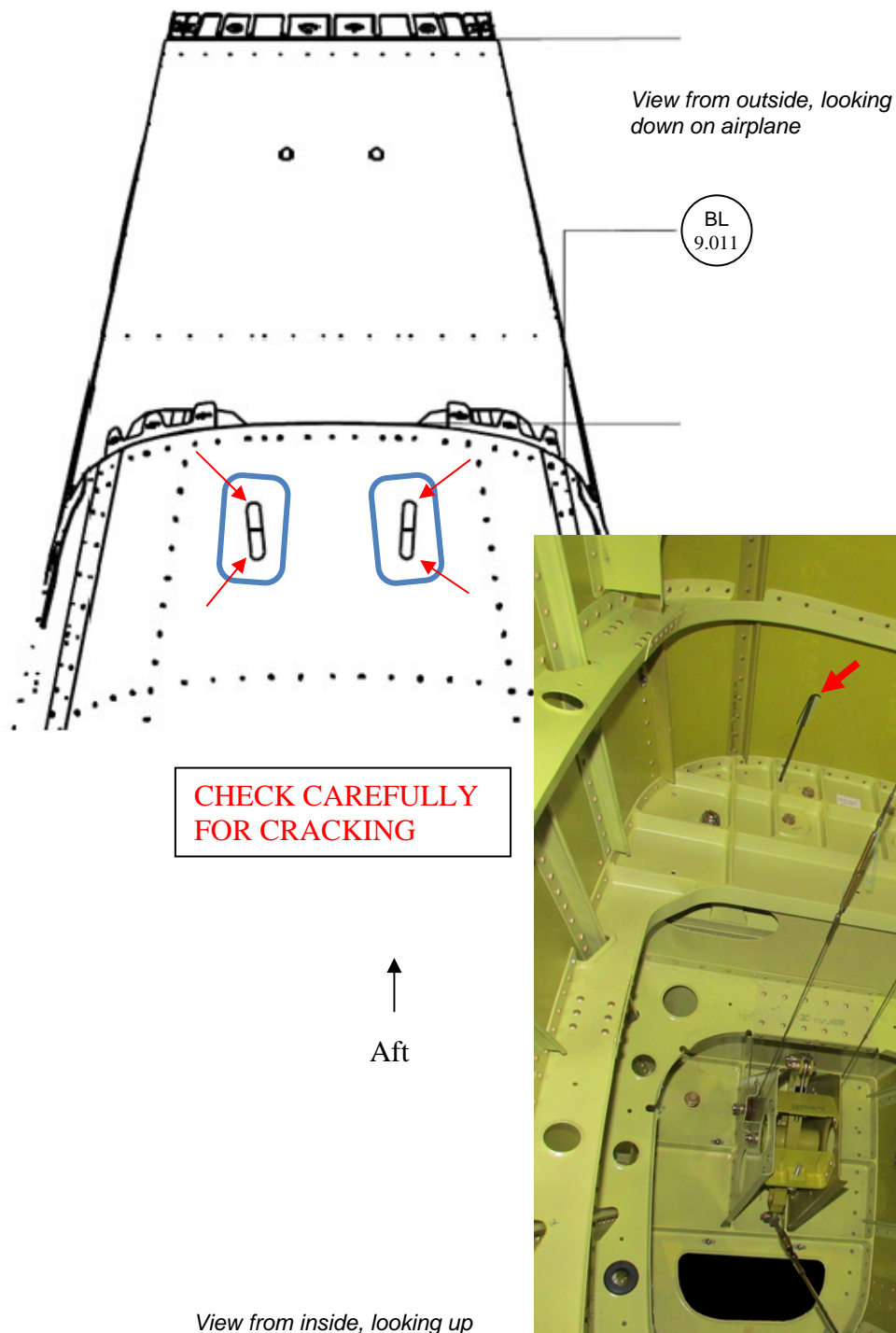


Figure 5-1: Rudder Cable Pass-Through Hole Perimeter Crack Check



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5.3 Locate Doublers and Trim New Slot Perimeter

Refer to **Figure 5-2**.

1. Center the doubler over the hole as shown in **Figure 5-2 (A)**.

▲ NOTE ▲

Center the doubler both longitudinally and laterally.

2. Drill two (2) pilot holes through the skin on opposite sides of the doubler (fore and aft) and cleco in place.
3. Mark the new slot perimeter.
4. Remove the doubler.
5. Trim the new outside perimeter, matching the inside perimeter of the doubler $\pm 1/32$ inch.



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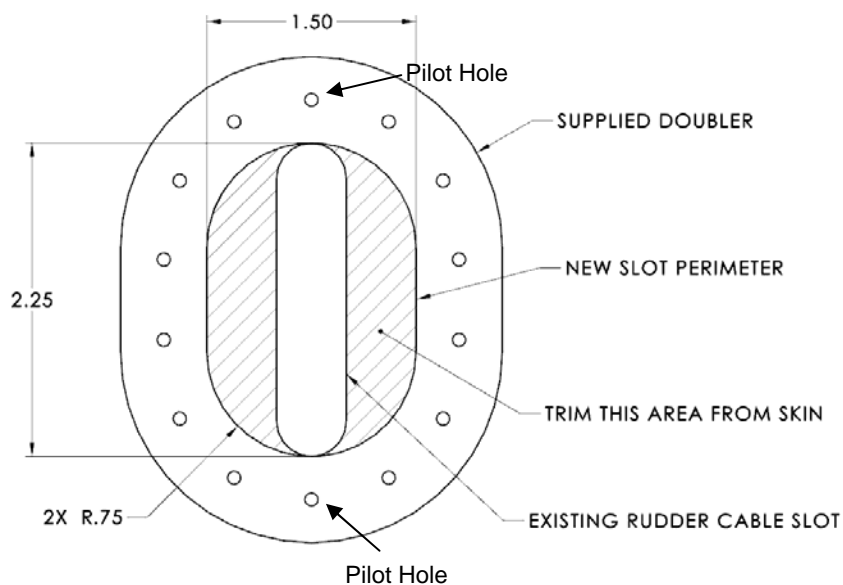
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A



View from inside, looking up

B

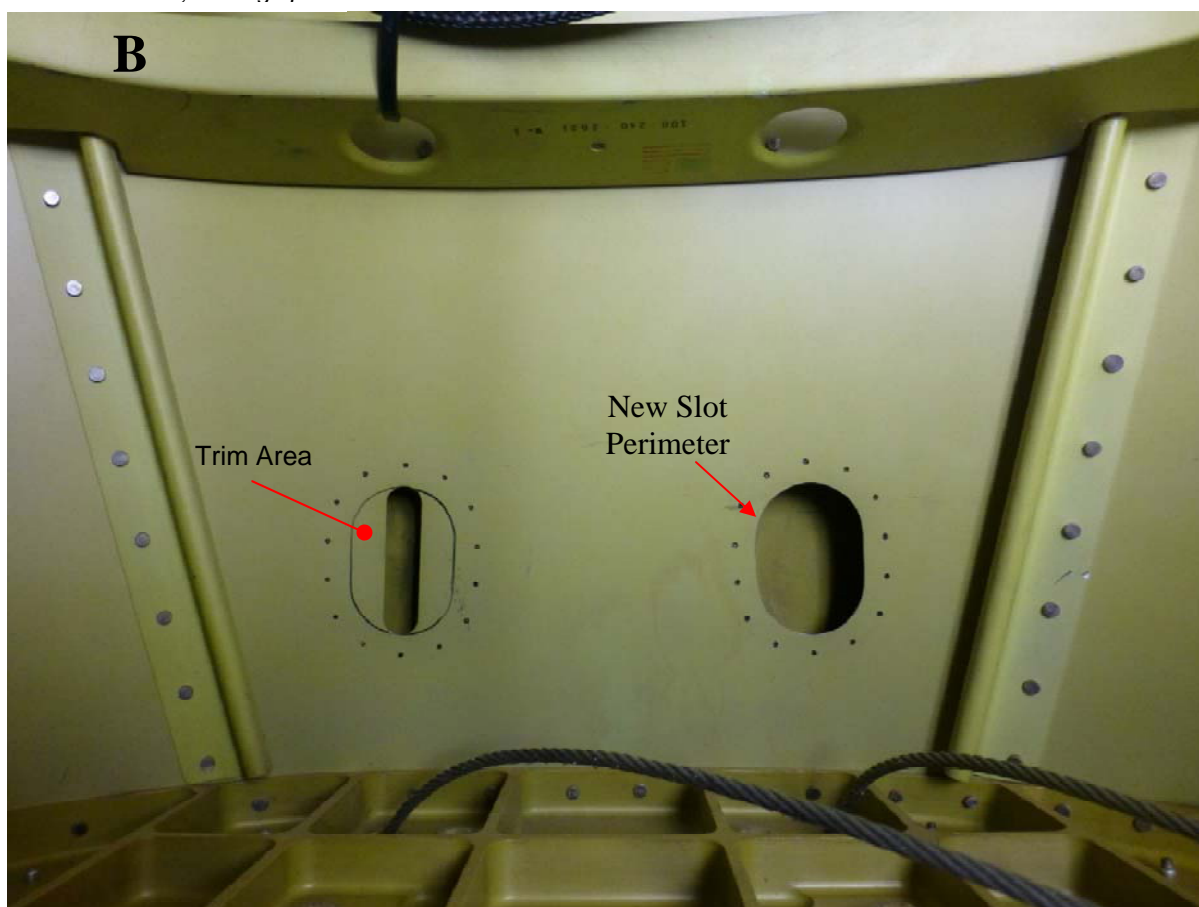


Figure 5-2: Trim Area

6. De-burr the raw edges of the hole and smooth to a polished finish using 200 grit or finer sandpaper, Scotch-Brite, or emory cloth.
7. If cracking was found during the inspection in **Section 5.2**, inspect the new edge carefully to ensure that all traces of the cracking have been completely removed.
8. Alodine and prime the new edge using acceptable industry standards in accordance with AC43.13, *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair*.

5.4 Match-Drill Skin, and Install Doublers

1. Cleco the doubler in place.
2. From the doubler, match drill the remaining holes into the skin using a #40 drill bit and clecos as appropriate.

▲ NOTE ▲

If working from the inside, use a drill-stop to ensure that the vertical stabilizer structure above the skin is not damaged during drilling.

View from inside, looking up



Figure 5-3: Cleco Doubler in Place

3. With the doubler temporarily installed on the inside surface of the fuselage skin, upsize the #40 pilot holes using a #30 drill bit.
4. De-burr all fastener holes and permanently install the doublers on the inside surface of the skin using any of the fasteners defined in **Table 5-1**.

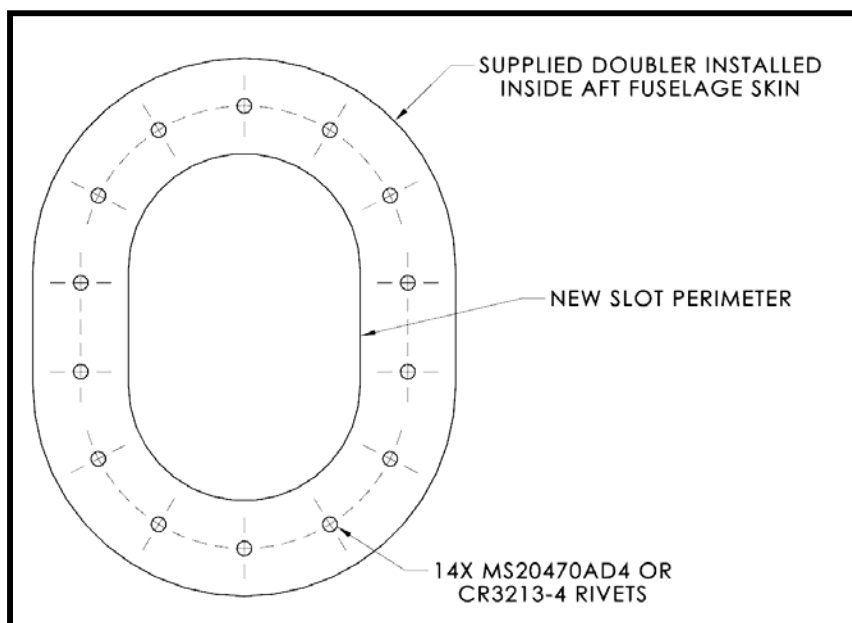


Figure 5-4: Final Configuration



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6. Completion

1. Reinstall the vertical stabilizer (if previously removed) in accordance with the latest version of the *KODIAK[®] 100 Maintenance Manual*, Chapter 55, "Stabilizers."
2. Re-connect and re-rig the rudder cables in accordance with the latest version of the *KODIAK[®] 100 Maintenance Manual*, Chapter 27, "Flight Controls."
3. Record work performed in the appropriate maintenance records.
4. Complete Attachment A of this Field Service Instruction and submit to Quest Aircraft in accordance with the instructions on the form.

---END---



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Attachment A INSPECTION FOR SKIN CRACKS

Part A

Date: _____

Aircraft Serial Number: _____

Aircraft Total Time: _____

Part B

☐ I have inspected for cracking around the perimeter of the rudder cable pass-through holes as shown in Quest Field Service Instruction FSI-104, determined that cracking is present, and performed modifications in accordance with FSI-104.

Name (print): _____

Name (sign): _____

Airframe and Power Plant Mechanic

Part C

☐ I have inspected for cracking around the perimeter of the rudder cable pass-through holes as shown in Quest Field Service Instruction FSI-104, determined that cracking is **NOT** present, and performed modifications in accordance with FSI-104.

Name (print): _____

Name (sign): _____

Airframe and Power Plant Mechanic

Notes

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