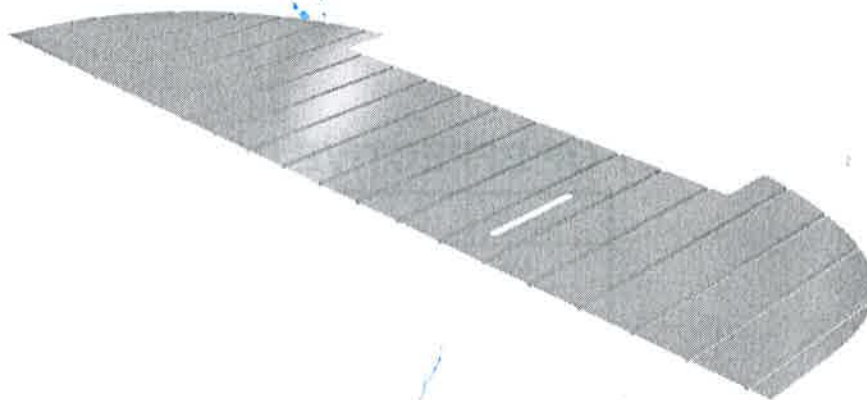




McFarlane Aviation Products




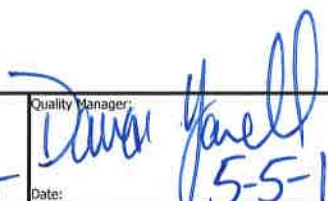


Installation Instructions for Corrugated Control Skins

McFarlane Aviation, Inc. part numbers: MC0333116, MC0424000-10, MC0424000-20, MC0425000-10, MC0425000-20, MC0426900-2, MC0426900-4, MC0433000-30, MC0433000-40, MC0433127, MC0523900-10, MC0523900-20, MC0525000-10, MC0525000-20, MC0434135-10, MC0434135-11, MC0434135-15, MC0434135-16, MC0434141-1, MC0434140-2, MC0434142-3, MC0434134-4

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McFarlane Aviation, Inc.
696 East 1700 Road
Baldwin City, KS 66006

Project Engineer: 	Quality Manager: 
Date: 05-11-15	Date: 5-5-15
Engineering Manager: 	Manufacturing Manager: 
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REVISIONS

Revision	Date	Summary
ORIGINAL	07-Jan-2014	Original Release

LIST OF EFFECTIVE PAGES

Page	Rev Date
ALL	07-Jan-2014

INTRODUCTION

This document is intended to provide installation instructions for the McFarlane Aviation, Inc. corrugated skins eligible for installation on Cessna 120, 140, 140A, 170, 170A, 190, and 195 aircraft. The part numbers are MC0424000-10, -20; MC0425000-10, -20; MC0525000-10, -20; MC0523900-10, -20; MC0426900-2, -4; MC0433000-10, -20; MC0433127, MC0333116, MC0434135-10, -11; MC0434135-15, -16; MC0434141-1, MC0434140-2, MC0434142-3, and MC0434134-4. These parts are fabricated from corrugated 2024-T3 Alclad Aluminum that is manufactured to specific dimensions. For all items not related to the installation of the McFarlane Aviation Inc., skins refer to the applicable airplane model service and parts manuals.

SYSTEM DESCRIPTION

Applicable aircraft include the Cessna Model 120, 140, 140A, 170, 170A, 190, and 195. The following table identifies the appropriate McFarlane Aviation part numbers to be used for each aircraft model. Please note that many aircraft do not have a specific skin part number identified in each respective IPC so this table provides a means of identifying the appropriate replacement part numbers.

Table 1 - APPLICABLE ELIGIBILITY BASED ON PART NUMBER

Aircraft	Aileron	Flap	Elevator	Elevator Tab	Rudder	Rudder Tab
Cessna 120	MC0424000-10 MC0424000-20		MC0434141-1 MC0434140-2 MC0434142-3 MC0434134-4	MC0434135-10 MC0434135-11	MC0433000-30 MC0433000-40	MC0433127
Cessna 140	MC0424000-10 MC0424000-20	MC0425000-10 MC0425000-20	MC0434141-1 MC0434140-2 MC0434142-3 MC0434134-4	MC0434135-10 MC0434135-11	MC0433000-30 MC0433000-40	MC0433127
Cessna 140A		MC0426900-2 MC0426900-4	MC0434141-1 MC0434140-2 MC0434142-3 MC0434134-4	MC0434135-15 MC0434135-16	MC0433000-30 MC0433000-40	MC0433127
Cessna 170	MC0424000-10 MC0424000-20	MC0525000-10 MC0525000-20				MC0333116
Cessna 170A		MC0523900-10 MC0523900-20				MC0333116
Cessna 190						MC0333116
Cessna 195, 195A, 195B						MC0333116

SPECIAL OPERATING INFORMATION

The control and operation of the next level assembly does not change with the installation of the McFarlane skin; see applicable Cessna Model Illustrated parts manual for the operational control of this system.

PART REMOVAL, REPLACEMENT, AND SERVICE INFORMATION

Remove the old skins and install the McFarlane skins per these installation instructions. The techniques and best practices required for installation are described in FAA AC65-15A Airframe and Powerplant Mechanics Airframe Handbook and AC43.13-1B Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair; these documents should be referenced as needed to complete installation of the McFarlane skins. The applicable Cessna 100 Series 1962 and Prior Model Service Manual should also be referenced for general guidance.

NOTE: It is mandatory upon first installation of McFarlane skins onto the control assembly that all applicable control skins (top and bottom, left and right, or applicable tab skins) be replaced at the same time

The following instructions, specific to the McFarlane parts, apply:

NOTE: Only a qualified aircraft mechanic, per 14 CFR 43, is authorized to accomplish this process. Additionally, extensive experience in sheet metal work is a necessity, due to the difficulty in accomplishing the installation of control skins.

INSTRUCTIONS - Removal of Damaged Skin

1. Before removing control surface from the aircraft, observe the fit of the assembly to the wing. Measure and note the outboard lofting required for the proper alignment of the control surface and wing tip trailing edge. Make a lofting template.
2. Place the damaged control assembly on a flat work surface
3. Mark the leading edge of the old corrugated skin, and the center of the most inboard corrugation, on the spar with a permanent felt tip marker
 - a. Mark both sides of control spar
 - b. This marked line will facilitate the alignment of the McFarlane skin in subsequent steps
 - c. DO NOT use a scribe, or any tool that gouges/scratches spar material.
4. Remove any rivets holding skin to structure
 - a. Refer to AC65-15A and/or AC43.13-1B for proper removal of rivets procedures
5. Drill out any spot welds fastening the corrugated skin to control surface spar
 - a. Refer to AC65-15A and/or AC43.13-1B for proper hole drilling procedures
 - b. All spot welds must be drilled with the smallest drill size that will permit removal of the old skin
 - c. Spot weld locations are to be utilized as rivet holes for installation of McFarlane skin
 - d. #30 drill bit diameter will be the MINIMUM acceptable diameter of rivet hole for replacing previous spot welded locations with rivets
 - e. #30 diameter rivet hole must be concentric and undamaged. If not, increase the diameter of the hole with a #21 drill bit
 - f. #21 diameter rivet hole must be concentric and undamaged. If not, hole cannot be resized. Control surface spar must be repaired or replaced, as per AC43.13-1B spar repair or replacement procedures
6. Carefully remove old skins, avoid damaging any of the control sub structure
 - a. Set damage skin aside for quick reference to the general orientation of the McFarlane skins onto the sub structure
7. With skins removed, inspect control structure for damage or corrosion
 - a. Repair structure if damage or corrosion is found.
 - b. An aircraft maintenance logbook entry shall be made for the inspections and repairs (if done) of the control structure

INSTRUCTIONS - Skin Installation

8. Verify that the longitudinal edge distance between the rivet holes drilled into the control surface spar and the leading edge mark (see step 3) adheres to AC65-15A and/or AC43.13-1B for proper rivet spacing edge distance requirements.
 - a. Verify all holes on both sides of spar
 - b. If spacing is NOT acceptable
 - i. Make slight adjustments to skin leading edge location to increase edge to hole distance
 - ii. Remark positioning line, as required
9. Using the lines marked in step 3, align the top McFarlane skin longitudinally and laterally to the control surface spar. Clamp skin to structure when aligned.
10. Inspect skin placement; verify that no rivet head will contact any part of any of the corrugations.
 - a. If spacing is NOT acceptable
 - i. Make slight lateral adjustments to skin position to increase edge to hole distances and re-clamp.
 - ii. Repair or replace control surface spar if adjustments are greater than .13 inches
11. Match drill all mounting holes in the leading edge of McFarlane skin.
 - a. Refer to AC65-15A and/or AC43.13-1B for proper match drilling procedures
 - b. Match drill all appropriate rivet holes with an appropriate diameter drill bit
 - c. Attach properly sized cleco into newly drilled rivet hole before proceeding to match drilling of a successive rivet hole; leave clecos installed. **Note: Continuously check for control surface flatness and proper lofting of the trailing edge of the aileron.**
12. Mate and Install sub structure ribs to McFarlane skin
 - a. Square the sub structure ribs to the control spar and the McFarlane skin
 - b. Clamp skin and rib together and match drill.
 - c. After each hole is drilled, attach cleco and leave installed

13. Flip control structure over, and align trailing edge of lower skin to upper skin.
 - a. While keeping trailing edges aligned, align the corrugations of the lower skin to the upper skin.
 - b. Clamp both skins together; Take care not to damage or buckle skins when clamping.
 - c. If installing skin with cutout for tab, verify alignment of cutouts.
14. Drill skin trailing edges between corrugations
 - a. Drill three rivet holes between each parallel corrugation
 - i. Refer to AC65-15A and/or AC43.13-1B for proper rivet spacing edge distance requirements
 - ii. No holes will be drilled into any corrugation
 - iii. #40 drill bit diameter will be the MINIMUM acceptable diameter of rivet hole along the trailing edge
 - b. Attach properly sized cleco into newly drilled rivet hole before proceeding to next successive rivet hole; leave clecos installed
15. Drill spar mounting holes in the leading edge of lower skin
 - a. Match drill all appropriate rivet holes with an appropriate diameter drill bit
 - i. Refer to AC65-15A and/or AC43.13-1B for proper match drilling procedures
 - b. Attach properly sized cleco into newly drilled rivet hole before proceeding to match drilling of a successive rivet hole; leave clecos installed
16. For rudder assembly only, drill for rudder tab installation
 - a. Place appropriate rudder tab in correct orientation and location along the trailing edge
 - b. Clamp in position; Take care not to damage, or buckle, skins when clamping.
 - c. Drill appropriate holes with a #40 drill bit diameter
 - i. Refer to AC65-15A and/or AC43.13-1B for proper hole drilling
 - d. Attach properly sized cleco into newly drilled rivet hole before proceeding to match drilling of a successive rivet hole; leave clecos installed
17. For Elevator with trim tab only, drill for elevator tab installation
 - a. Place appropriate elevator tab in correct orientation and location along the trailing edge
 - b. Clamp in position; Take care not to damage, or buckle, skins when clamping.
 - c. Drill appropriate holes with a #40 drill bit diameter
 - i. Refer to AC65-15A and/or AC43.13-1B for proper hole drilling
 - d. Attach properly sized cleco into newly drilled rivet hole before proceeding to match drilling of a successive rivet hole; leave clecos installed
18. Disassemble the control assembly
 - a. Remove all clecos
 - b. Remove McFarlane skins and deburr all holes created, per procedures stated in AC65-15A for proper drilled hole procedures
19. Reassemble the control assembly
 - a. Place McFarlane skins back in the appropriate location and orientation on the sub structure
 - b. Reattach all appropriate clecos
20. Rivet Control assembly together
 - a. Use appropriate sized MS20470AD rivets
 - i. Refer to AC65-15A and/or AC43.13-1B for proper rivet shank length requirements
 - b. Refer to AC65-15A and/or AC43.13-1B for proper riveting procedures
21. Finish control surface as required to match aircraft
 - a. Follow finish instructions provided by aircraft manufacturer in the appropriate maintenance manual
 - b. Refer to the Refer to AC65-15A and/or AC43.13-1B for additional information on proper aircraft painting and finishing procedures
22. Balance control surface, as required, by the Cessna published instructions
 - a. Refer to Cessna Service Newsletter SNL 86-44 and/or applicable maintenance manual for proper control surface balancing data and procedures

TROUBLE SHOOTING

Refer to the applicable Cessna 100 Series 1962 and Prior Model Service Manual for general guidance only troubleshooting instructions and the applicable Cessna Illustrated Parts Catalog for component part numbers.

PLACARDS

None applicable

DATA

All information to support the continued airworthiness of this replacement part is as defined herein and contained in:

- Relevant Cessna Model Illustrated Parts Catalog
- Relevant AC65-15A Airframe and Powerplant Mechanics Airframe Handbook
- Relevant AC43.13-1B Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair
- Relevant FAA Regulations
- Relevant Cessna 100 Series 1962 and Prior Model Service Manual (general guidance only)

INSPECTION

Installation of McFarlane skins does not alter the existing inspection requirements or intervals, as stated by current FAA regulations.

RECOMMENDED OVERHAUL PERIODS

No additional overhaul time limitations exist with the use of these parts.

AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is FAA approved and specifies maintenance required under Sec. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved. No additional airworthiness limitations exist.

ASSISTANCE AND REVISIONS

Revisions to these instructions shall be made available on the McFarlane website, www.mcfarlaneaviation.com/Reference. For questions or assistance regarding these instructions, contact McFarlane Aviation, Inc via email or phone.

Email: engineering@mcfarlaneaviation.com Phone: 1-800-544-8594 (within the US) or 1-785-594-2741.