



Instructions for Continued Airworthiness
McFarlane Aviation, LLC. FAA-PMA Part Number MC0431148-1 Vertical Fin Fitting.
FAA PMA Number: PQ3732CE

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Revisions

Revision	Author	Date	Summary
Original	VRYJ	08/18/2022	Original release
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INTRODUCTION

This document is intended to provide instructions for the continued airworthiness of McFarlane Aviation, LLC. PMA replacement vertical fin fittings (P/N MC0431148-1) eligible for installation on Cessna 150 and 152 aircraft. The vertical fin fitting attaches to the vertical and horizontal stabilizers. Part number MC0431148-1 supersedes part numbers 0431009-1, 0431009-2, and 0431009-3. For all items not related to the installation of the McFarlane Aviation, LLC. MC0431148-1, refer to the basic Cessna service and parts manuals.

SYSTEM DESCRIPTION

Two vertical fin fittings (Figure 1) are required for each aircraft. One vertical fin fitting is installed on each side of the vertical fin with the base of the part attaching to the horizontal stabilizer (Figure 2). The fasteners required for the installation of a single vertical fin are detailed in the Parts List in Figure 3. The vertical fin fittings are prone to cracking along the outer leg-base interface due to their subjection to cyclic loading and high stress concentrations that occur at the aft outer leg-base interface.

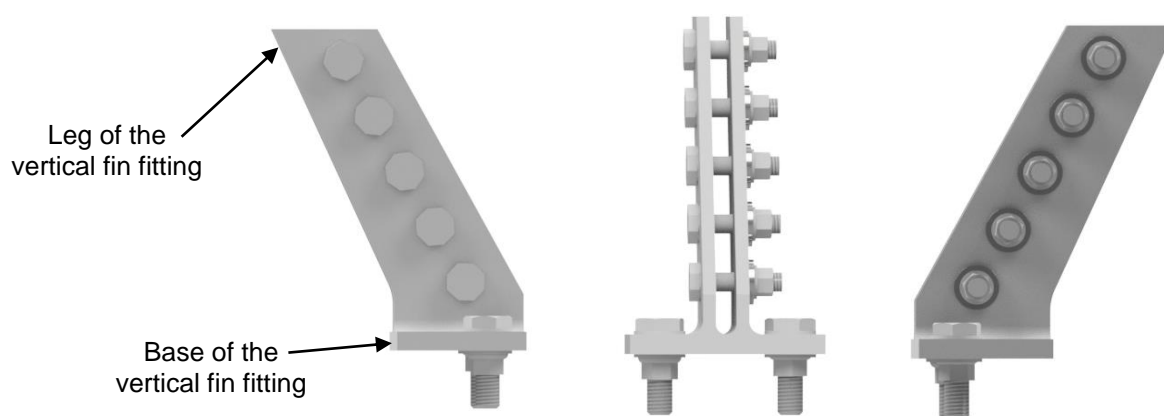


Figure 1: Vertical Fin Fitting

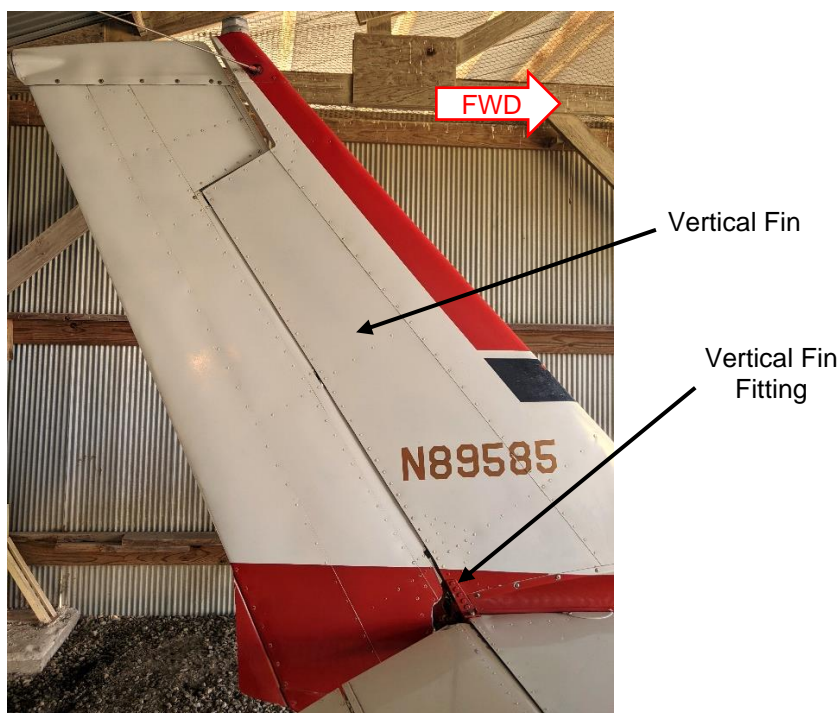
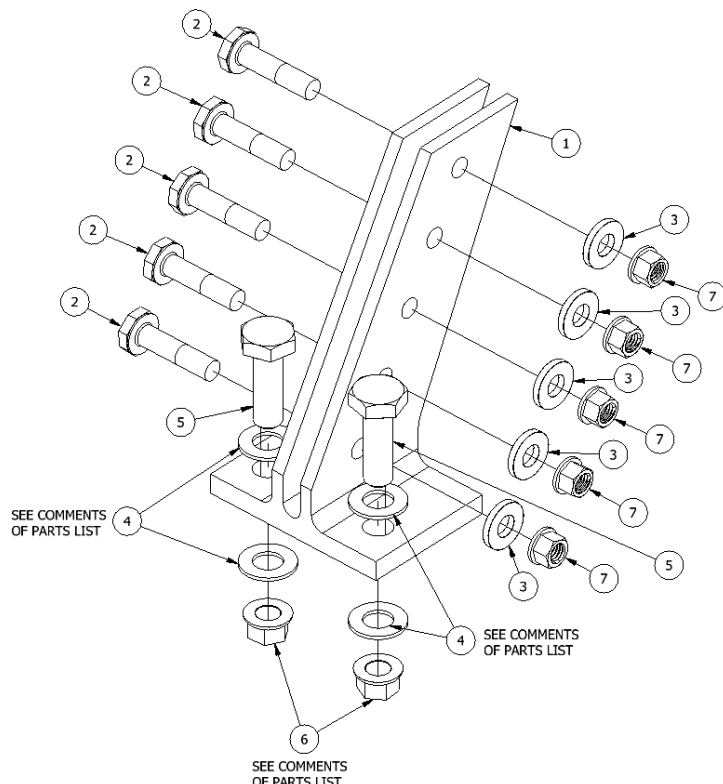


Figure 2: Cessna 152 Vertical Fin with Vertical Fin Fitting

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PARTS LIST			
ITEM	QTY	PART NUMBER	COMMENTS
1	1	MC0431148-1	
2	5	NAS464P3A7	
3	5	AN960-10	
4	4	AN960-416L	Item 4 is applicable to serial number ranges: 15075505 thru 15075579, F15001134 thru F15001203, A1500479 thru A1500480, and FA1500262 thru FA1500291.
5	2	AN4-6A	
6	2	MS21042L4	If nutplates are found during Step 3, then these nuts (Item 6) are not necessary for installation.
7	5	MS21043-3	

Figure 3: Fasteners required for the installation of a single vertical fin fitting (fitting on right side shown)

SPECIAL OPERATING INFORMATION

Special operating information is not required with the installation of the vertical fin fittings. See applicable Cessna Service Manual for the operational control of this system.

PART REMOVAL, REPLACEMENT, AND SERVICE INFORMATION

The vertical fin fitting must be installed by an A&P mechanic with structural sheet metal and match drilling experience. All drilling/reaming operations must comply with AC 43.13 Chapter 3, Section 7 (Bolts).

The revised attachment to service letter SE78-62 details the replacement procedure for the vertical fin fitting. The replacement procedure provided in this document will match closely but provide more detail to that of the Cessna service document SE78-62.

McFarlane Aviation, LLC. recommends the replacement of both vertical fin fittings if it is determined that one needs to be replaced. This is due to both vertical fin fittings being exposed to cyclic loading, limiting the life of the parts.

The procedure below details the steps required to replace a single vertical fin fitting. This procedure should be completed in its entirety for a single vertical fin fitting prior to the initiation of the replacement of a second vertical fin fitting, if applicable.

1. Secure aircraft for maintenance.
2. For the following procedure, evaluate if proper clearances for the elevator and rudder are needed in order to remove the vertical fin fitting. It is recommended that the **control surfaces not be removed**, however, proper tool clearance and safety of the surfaces involved should be considered.
3. Using the access holes, identify the hardware used to fasten the base of the vertical fin fitting. If nutplates are found, then the MS21042L4 nuts are not necessary for installation (Figure 3).

Note: Cessna Service Letter SE79-49 Revision #1 details nutplate inspection instructions and, if needed, replacement instructions. It is recommended that this inspection be completed when replacing the Vertical Fin Fitting. These nutplates can be replaced with nuts; see Service Letter SE79-49 Revision #1 for guidance.

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4. Remove the fasteners from along the leg of the vertical fin fitting (part numbers NAS464P3A7, AN960-10, and MS21043-3).
5. Remove the fasteners from the base of the vertical fin fitting (part numbers AN4-6A, AN960-416L, and MS21042L4).
6. Remove vertical fin fitting from aircraft.
7. Visually inspect the attachment and the contact sites of the vertical fin fitting on the horizontal and vertical stabilizers for corrosion and other defects. If corrosion or other defects are found, consult the Cessna maintenance manual for further instructions.
8. Prepare the part for the drilling procedure in Step 9.

Note: It is recommended that the old hardware be utilized for temporarily holding the fitting in position while enlarging the fitting holes.

Note: McFarlane Aviation recommends using the Alignment Bushings included in the kit to aid in the drilling procedure. These bushings are to be inserted into the vertical stabilizer prior to Steps 8a and 8b (Figure 4).

- a. Use the required bolts, nuts and washers to lightly fasten the base of the vertical fin fitting to the horizontal stabilizer (part numbers AN4-6A, AN960-416L, and MS21042L4). It is recommended that the AN4-6A bolts be torqued to 50% of the final torque value (35 lb. inches) to ensure the base of the fitting is fully clamped to the horizontal stabilizer.
- b. Clamp the vertical fin fitting to the vertical stabilizer to secure the part in its position. This can be achieved by using #8 screws and hex nuts or other clamping methods (Figure 5).

Note: Some of the Cessna 150 models utilized smaller diameter hardware and incorporated screws instead of bolts along the leg of the vertical fin fitting. In these instances, the vertical stabilizer holes would also need to be enlarged. Aircraft that were produced with the enlarged holes should either require light reaming or no hole enlargement for installation.

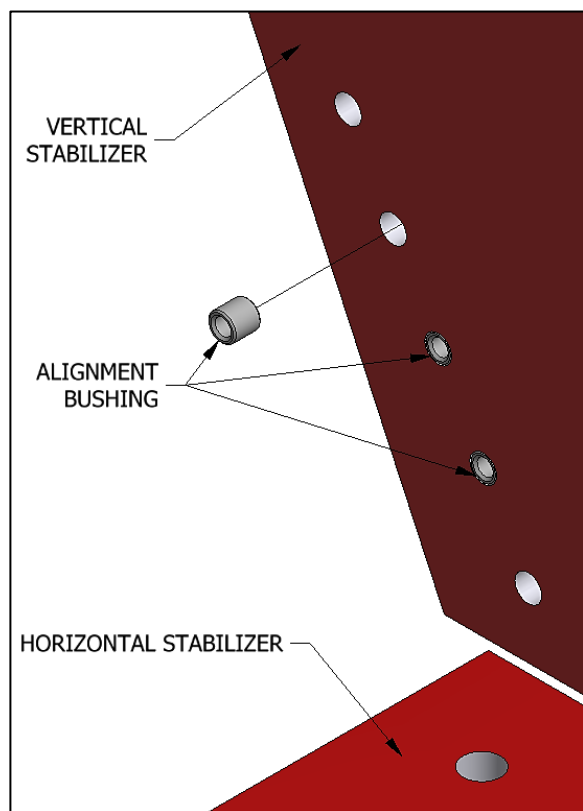


Figure 4: Example of alignment bushings in vertical stabilizer (Step 8).

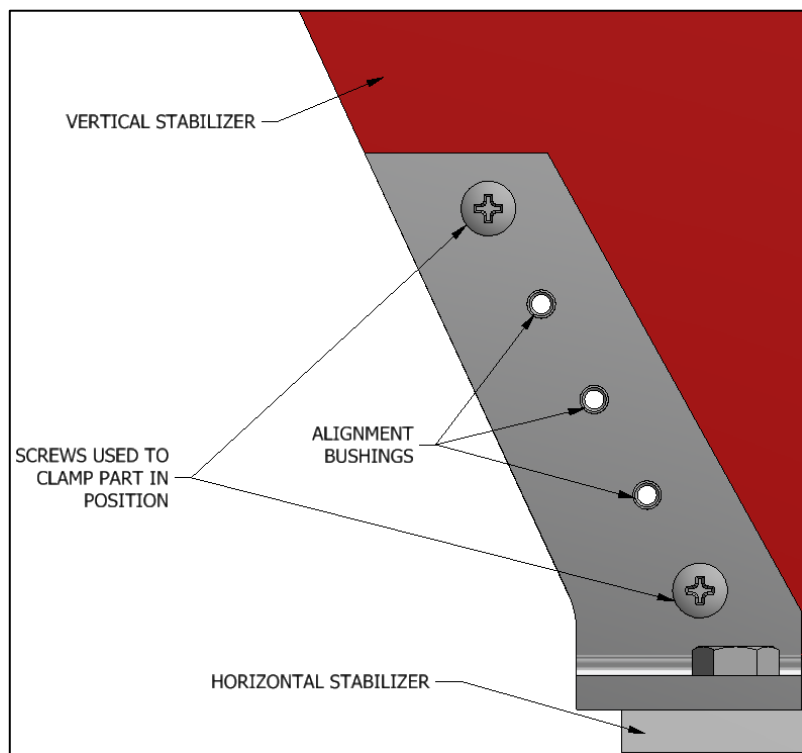


Figure 5: Example of using screws to clamp the part to the vertical stabilizer for drilling out procedure (Step 8). Alignment bushings inserted in vertical stabilizer visible.

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9. The pilot holes along the legs of the vertical fin fitting need to be back drilled and reamed to 0.191 inches per AC 43.13. This drilling procedure allows installers to achieve the best fit of the vertical fin fitting on their aircraft. It is recommended that each hole initially be enlarged with a #13 drill bit, followed by a reamer to achieve the necessary hole size. Ensure that the vertical stabilizer is perpendicular to the horizontal stabilizer prior to enlarging the holes of the vertical fin fitting. Use diagonal measurements or angle measuring equipment.

Note: It is recommended that the old hardware be utilized for temporarily holding the fitting in position while enlarging the fitting holes.

Note: The recommended procedure using the Alignment Bushings is shown in Figure 6 through Figure 9. When enlarging the vertical fin fitting holes, the Alignment Bushings aid in keeping the holes aligned by guiding the cutting tool.

- a. Start by drilling out the middle hole on the leg. Once this hole has been drilled, use the bolt and nut (part numbers NAS464P3A7 and MS21043-3) to lightly fasten the leg of the vertical fin fitting to the vertical stabilizer. This increases stability and holds the part in position as you continue to drill and ream, while allowing for some movement if necessary to achieve the best fit.
- b. Repeat this drilling and reaming process for all holes on the leg, moving progressively outward from the middle hole position and alternating between holes located above and below the middle hole.

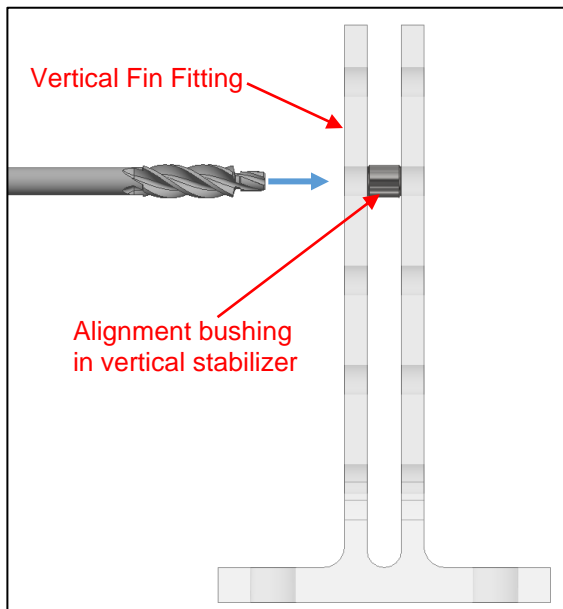


Figure 6: Alignment Bushing and Solid Pilot Counterbore used to enlarge hole to a #13 drill size

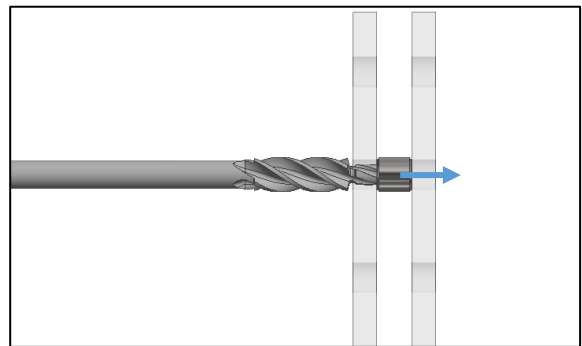


Figure 7: Alignment Bushing used to guide the Pilot of the Counterbore

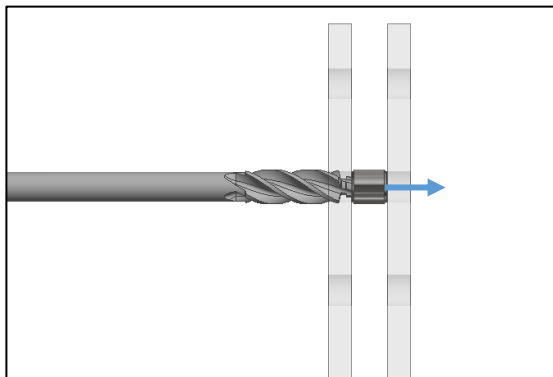


Figure 8: As the hole is enlarged in the vertical fin fitting, the Pilot continues to travel through the Alignment Bushing

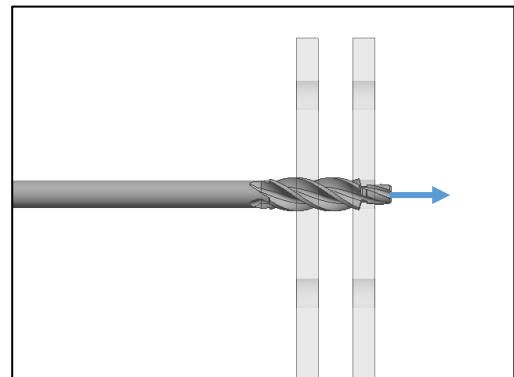


Figure 9: Remove the bushing and drill through the other leg of the vertical fin fitting

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10. After holes have been drilled, remove the fasteners from along the leg of the vertical fin fitting (part numbers NAS464P3A7 and MS21043-3).
11. Remove the fasteners from the base of the vertical fin fitting (part numbers AN4-6A, AN960-416L, and MS21042L4).
12. Remove the vertical fin fitting from the aircraft.
13. Debur the holes along the legs of the vertical fin fitting and stabilizer.

Note: The McFarlane vertical fin fitting has a different profile than the OEM part, which may result in exposed unpainted metal on the vertical and horizontal stabilizer (example shown in Figure 10). It is recommended that this metal be painted per the applicable Cessna Service Manual.

14. Apply corrosion-resistant primer to the holes along the legs of the vertical fin fitting.
15. Remove any debris/swarf that resulted from the machining process in Step 9 from the aircraft.
16. Place the vertical fin fitting back into position on the aircraft.

Note: It is recommended that the vertical stabilizer skin be minimally trimmed if it is contacting the inner radius of the slot of the vertical fin fitting.

17. Use part numbers AN4-6A, AN960-416L, and MS21042L4 to fasten the base of the vertical fin fitting to the horizontal stabilizer. Torque bolts AN4-6A to 70-100 lb. inches per Cessna Service Letter SE79-49 Revision #1 and Model 152 Series 1978 Thru 1985 Service Manual.
18. Use part numbers NAS464P3A7, AN960-10, and MS21043-3 to fasten the legs of the vertical fin fitting to the vertical stabilizer. Torque nuts MS21043-3 to 46 lb. inches.
19. Repeat Steps 4-18 for the other vertical fin fitting, if applicable.

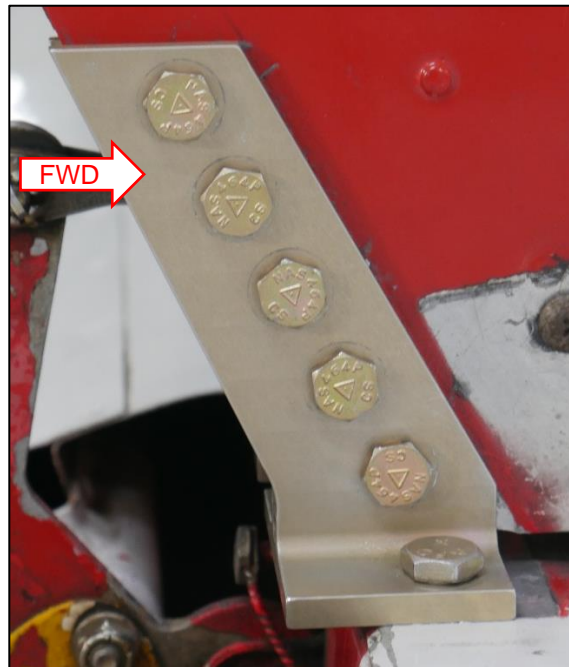


Figure 10: Example of unpainted metal in front of the base of the fitting on the horizontal stabilizer, and near the bottom edge of the vertical stabilizer

TROUBLESHOOTING

Refer to the applicable Cessna Model Service Manuals (see Data Section below for listings) and AC 43.13 for troubleshooting instructions.

PLACARDS

None applicable.

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DATA

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

- Relevant Cessna Model Service Manuals.
 - Service Letter, SE78-62
 - Service Letter, SE79-49 Revision #1
 - MODEL 100 SERIES SERVICE MANUAL (1963 Thru 1968), D637-1-13
 - MODEL 150 SERIES 1969 THRU 1976 SERVICE MANUAL, D971-3-13
 - MODEL 150 SERIES 1977 SERVICE MANUAL, D2011-1-13
 - MODEL 152 SERIES 1978 THRU 1985 SERVICE MANUAL, D2064-1-13
- Relevant Cessna Model Illustrated Parts Catalog.
 - MODEL 150 PARTS CATALOG (1959 THRU 1969), P438-12
 - MODEL 150 PARTS CATALOG (1970 THRU 1977), P691-12
 - MODEL 152 PARTS CATALOG (1978 THRU 1985), P692-13

INSPECTION

The Cessna Service Manuals require frequent inspection of the vertical fin fittings. All inspections should continue to be performed as instructed in the Cessna Service Manuals. This includes but is not limited to:

- Supplemental Inspection Number: 55-11-03 Vertical Stabilizer Attach Bracket and Horizontal Stabilizer Rear Spar Attachment Inspection – Model 150
- Supplemental Inspection Number: 55-11-03 Vertical Fin Attach Bracket Inspection
- Supplemental Inspection Number: 55-10-01 Horizontal Stabilizer, Elevators and Attachments Inspection
- Supplemental Inspection Number: 55-30-01 Vertical Stabilizer, Rudder and Attachments Inspection
- Supplemental Inspection Number: 55-11-02 Vertical Stabilizer Attach Bracket and Horizontal Stabilizer Rear Spar Attachment Inspection

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 & REVISIONS

ICA revisions shall be made available on the McFarlane website, www.mcfarlaneaviation.com/ICA. For questions or assistance regarding these Instructions for Continued Airworthiness (ICA), 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.