

McFarlane Aviation, Inc. Replacement Hinge Bushings and Bearings for Cessna Single Engine Aircraft

Installation Instructions and Continued Airworthiness Instructions

The McFarlane Aviation, Inc. control hinge bushings and bearings are FAA-PMA approved for installation on Cessna single engine aircraft listed on the McFarlane Aviation, Inc. eligibility chart, drawing 6157, dated July 10, 2009 or later revision.

To ensure proper operation and the longest service life possible two differently sized bushings (Nominal and Oversized) are provided for a selective fit.

Note: The McFarlane control hinge bushings are designed to fit most Cessna single engine aircraft, however it is the responsibility of the installer to ensure that installation of components provides full travel of the control surface and does not interfere with any other installed systems on the aircraft. The installation must not interfere with the compliance of any FAA Airworthiness Directive(s), Aircraft Manufacturer's Service information, or pre-existing aircraft alteration(s).

Caution: Do NOT use impact force or excessive pressure to remove or install any bearing and bushing component; application of these forces can damage supporting structures and lead to control surface failure.

1. Disconnect control cables from the control surface and remove attachment hardware.
2. Remove control surface from aircraft.
3. Remove and discard existing control hinge bushings and bearings.
4. Inspect each hinge assembly for cracks, missing rivets, and/or other damage. Repair damage if found.
5. Install hinge bearings. Follow industry best practices for installation of new bronze bearings. Make sure not to damage bearing mounting hole and/or hinge assembly.
6. Locate, identify, and separate the nominal and oversized control hinge bushings. Oversized bushings are identified by notch cut into the edge of bushing, see figure below.
7. Attempt to fit the oversized bushing into the bearing; a properly fitting bushing will:
 - Be a slip fit inside bearing
 - Freely rotate when installed
 - Slide unhindered in and out of bearing
8. If oversized bushing does not fit, discard and fit nominal bushing.
9. After selection, remove bushing and apply lubricant, as per the published Cessna service information, to all surfaces of the bushing and the installed bearing.
10. Re-install bushing. To ensure that the bushings in the vertical position are retained until completion of installation, a wax string may be used to tie the bushing into the control hinge.
11. Repeat steps 7 to 10 for each remaining hinge.
12. Re-install control surface as per manufacturer's instructions. Remove wax string, if used, prior to full installation of the control surface and attachment bolts.
13. Torque hinge bolts, refer to published Cessna service information for recommended torque.
14. Verify that hinge bushing is secured between hinge tabs. There should be no rotation between these components; loose fit between tabs and bushing will erode the hinge bracket.
15. Cycle control surface through full travel several times to assure free movement. Investigate and correct any restrictions to full travel movement. Any resistance to rotation, or roughness of control operation, indicates improper function.
16. Reconnect control cables, or control actuators, and hardware disconnected per step 1 above.
17. Check control operation for proper travel, rigging, and direction of movement per published Cessna service information.

CONTROL HINGE BUSHING IDENTIFICATION



CHECKED BY:
TSW

B	10/5/2020	ADDED SECOND PAGE
A	6/6/2019	LANGUAGE REVISION
~	7/10/2009	ORIGINAL

"X": Bold letter indicates revision level.

REVISION

Project Engineer: <i>Craig Comstock</i>	Quality Manager: <i>Diana Jewell</i>
Date: 10/5/2020	Date: 10-8-2020
Engineering Manager: <i>Steve B...</i>	Manufacturing Manager: <i>Dave McFarlane</i>
Date: 10/7/2020	Date: 10-8-2020

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

Drawing List:
HINGE BUSHING INSTALLATION

Size: A	Scale: NA	Drawn: CC	Sheet: 1 of 2
Drawing Number: 6068			REVISION

CONFIDENTIAL: Proprietary information of McFarlane Aviation, Inc. Reproduction, dissemination, and disclosure is STRICTLY FORBIDDEN without the expressed written permission of McFarlane Aviation, Inc. All Rights Reserved. Copyright McFarlane Aviation, Inc. (unpublished)

B

McFarlane Aviation, Inc. Replacement Hinge Bushings and Bearings for Cessna Single Engine Aircraft

Installation Instructions and Continued Airworthiness Instructions

The McFarlane Aviation, Inc. control hinge bushings and bearings are FAA-PMA approved for installation on Cessna single engine aircraft listed on the McFarlane Aviation, Inc. eligibility chart, drawing 6157, dated July 10, 2009 or later revision.

To ensure proper operation and the longest service life possible two differently sized bushings (Nominal and Oversized) are provided for a selective fit.

Note: The McFarlane control hinge bushings are designed to fit most Cessna single engine aircraft, however it is the responsibility of the installer to ensure that installation of components provides full travel of the control surface and does not interfere with any other installed systems on the aircraft. The installation must not interfere with the compliance of any FAA Airworthiness Directive(s), Aircraft Manufacturer's Service information, or pre-existing aircraft alteration(s).

Caution: Do **NOT** use impact force or excessive pressure to remove or install any bearing and bushing component; application of these forces can damage supporting structures and lead to control surface failure.

1. Disconnect control cables from the control surface and remove attachment hardware.
2. Remove control surface from aircraft.
3. Remove and discard existing control hinge bushings and bearings.
4. Inspect each hinge assembly for cracks, missing rivets, and/or other damage. Repair damage if found.
5. Install hinge bearings. Follow industry best practices for installation of new bronze bearings. Make sure not to damage bearing mounting hole and/or hinge assembly.
6. Locate, identify, and separate the nominal and oversized control hinge bushings. Oversized bushings are identified by notch cut into the edge of bushing, see figure below.
7. Attempt to fit the oversized bushing into the bearing; a properly fitting bushing will:

- Be a slip fit inside bearing
- Freely rotate when installed
- Slide unhindered in and out of bearing

8. If oversized bushing does not fit, discard and fit nominal bushing.
9. After selection, remove bushing and apply lubricant, as per the published Cessna service information, to all surfaces of the bushing and the installed bearing.
10. Re-install bushing. To ensure that the bushings in the vertical position are retained until completion of installation, a wax string may be used to tie the bushing into the control hinge.
11. Repeat steps 7 to 10 for each remaining hinge.
12. Re-install control surface as per manufacturer's instructions. Remove wax string, if used, prior to full installation of the control surface and attachment bolts.
13. Torque hinge bolts, refer to published Cessna service information for recommended torque.
14. Verify that hinge bushing is secured between hinge tabs. There should be no rotation between these components; loose fit between tabs and bushing will erode the hinge bracket.
15. Cycle control surface through full travel several times to assure free movement. Investigate and correct any restrictions to full travel movement. Any resistance to rotation, or roughness of control operation, indicates improper function.
16. Reconnect control cables, or control actuators, and hardware disconnected per step 1 above.
17. Check control operation for proper travel, rigging, and direction of movement per published Cessna service information.



McFarlane Aviation, Inc. Replacement Hinge Bushings and Bearings for Cessna Single Engine Aircraft

Installation Instructions and Continued Airworthiness Instructions

The McFarlane Aviation, Inc. control hinge bushings and bearings are FAA-PMA approved for installation on Cessna single engine aircraft listed on the McFarlane Aviation, Inc. eligibility chart, drawing 6157, dated July 10, 2009 or later revision.

To ensure proper operation and the longest service life possible two differently sized bushings (Nominal and Oversized) are provided for a selective fit.

Note: The McFarlane control hinge bushings are designed to fit most Cessna single engine aircraft, however it is the responsibility of the installer to ensure that installation of components provides full travel of the control surface and does not interfere with any other installed systems on the aircraft. The installation must not interfere with the compliance of any FAA Airworthiness Directive(s), Aircraft Manufacturer's Service information, or pre-existing aircraft alteration(s).

Caution: Do **NOT** use impact force or excessive pressure to remove or install any bearing and bushing component; application of these forces can damage supporting structures and lead to control surface failure.

1. Disconnect control cables from the control surface and remove attachment hardware.
2. Remove control surface from aircraft.
3. Remove and discard existing control hinge bushings and bearings.
4. Inspect each hinge assembly for cracks, missing rivets, and/or other damage. Repair damage if found.
5. Install hinge bearings. Follow industry best practices for installation of new bronze bearings. Make sure not to damage bearing mounting hole and/or hinge assembly.
6. Locate, identify, and separate the nominal and oversized control hinge bushings. Oversized bushings are identified by notch cut into the edge of bushing, see figure below.
7. Attempt to fit the oversized bushing into the bearing; a properly fitting bushing will:

- Be a slip fit inside bearing
- Freely rotate when installed
- Slide unhindered in and out of bearing

8. If oversized bushing does not fit, discard and fit nominal bushing.
9. After selection, remove bushing and apply lubricant, as per the published Cessna service information, to all surfaces of the bushing and the installed bearing.
10. Re-install bushing. To ensure that the bushings in the vertical position are retained until completion of installation, a wax string may be used to tie the bushing into the control hinge.
11. Repeat steps 7 to 10 for each remaining hinge.
12. Re-install control surface as per manufacturer's instructions. Remove wax string, if used, prior to full installation of the control surface and attachment bolts.
13. Torque hinge bolts, refer to published Cessna service information for recommended torque.
14. Verify that hinge bushing is secured between hinge tabs. There should be no rotation between these components; loose fit between tabs and bushing will erode the hinge bracket.
15. Cycle control surface through full travel several times to assure free movement. Investigate and correct any restrictions to full travel movement. Any resistance to rotation, or roughness of control operation, indicates improper function.
16. Reconnect control cables, or control actuators, and hardware disconnected per step 1 above.
17. Check control operation for proper travel, rigging, and direction of movement per published Cessna service information.

