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

Installation Instructions and Continued Airworthiness

The McFarlane Aviation, Inc. control hinge bushings and bearings are FAA-PMA approved for installation on Cessna single engine aircraft as 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 Manufactures Service information, or pre-existing aircraft alteration(s).

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

CONTROL HINGE BUSHING IDENTIFICATION



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.
7. Attempt to fit the oversized bushing into the bearing; a properly fitting bushing will:
   - Hand fit with little or no application of force.
   - 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.

Information from drawing 6068 Rev Org 07/10/2009.

McFarlane Aviation Products

Elevator Bushing Kit Components

EBC-KT-1
2 ea MCS1003-65A Bearing
2 ea MC0432003-1K Bushing†
2 ea AN3-7A Bolt
2 ea NAS1149F0363P Washer

EBC-KT-2
2 ea MCS1003-65A Bearing
2 ea MC0432003-1K Bushing†
2 ea AN3-7A Bolt
2 ea NAS1149F0363P Washer
2 ea AN310-3 Nut
2 ea MS24665-132 Pin

EBC-KT-3
2 ea MCS1003-65A Bearing
2 ea MC0432003-1K Bushing†
2 ea AN3-7A Bolt
2 ea NAS1149F0363P Washer
2 ea MS21044N3 Nut

EBC-KT-4
2 ea MCS1003-28A Bearing
2 ea MC0432173-3K Bushing†
2 ea AN4-7A Bolt
2 ea NAS1149F0463P Washer
2 ea MS21042L4 Nut

EBC-KT-5
4 ea MCS1003-29A Bearing
4 ea MC0532104K Bushing†
4 ea AN4-11A Bolt
4 ea NAS1149F0463P Washer
4 ea MS21042L4 Nut

Rudder Bushing Kit Components

RBC-KT-1
1 ea MCS1003-65A Bearing
1 ea MC0432003-1K Bushing†
1 ea AN3-7A Bolt
1 ea NAS1149F0363P Washer

RBC-KT-2
3 ea MCS1004-42A Bearing
3 ea MC0532104K Bushing†
3 ea AN4-11A Bolt
3 ea NAS1149F0463P Washer
3 ea MS21042L4 Nut

RBC-KT-3
3 ea MCS1004-42A Bearing
3 ea MC0532104K Bushing†
3 ea AN4-10A Bolt
3 ea NAS1149F0463P Washer
3 ea MS21042L4 Nut

RBC-KT-4
3 ea MCS1003-29A Bearing
3 ea MC0532104K Bushing†
3 ea AN4-11A Bolt
2 ea NAS1149F0463P** Washer
2 ea MS21042L4** Nut

RBC-KT-5
2 ea MCS1003-29A Bearing
1 ea MCS1004-42A* Bearing
3 ea MC0532104K Bushing†
3 ea AN4-11A Bolt
3 ea NAS1149F0463P Washer
3 ea MS21042L4 Nut

RBC-KT-6
2 ea MCS1003-29A Bearing
1 ea MCS1004-42A* Bearing
3 ea MC0532104K Bushing†
3 ea AN4-11A Bolt
2 ea NAS1149F0463P** Washer
2 ea MS21042L4** Nut

RBC-KT-7
2 ea MCS1003-29A Bearing
1 ea MCS1004-42A* Bearing
3 ea MC0532104K Bushing†
3 ea AN4-11A Bolt
2 ea NAS1149F0432P** Washer
2 ea MS21042L4** Nut

* Lower Hinge Only
**Center and Lower Hinge Only

†Bushing part numbers MC0431119K, MC0432003-1K, MC0432173-3K and MC0532104K include a nominal bushing (with no "K" suffix), an oversized bushing (with a "P1" suffix), and selective fit instructions.
Example: MC0432003-1K includes nominal bushing MC0432003-1 and oversized bushing MC0432003-1P1.

Information derived from drawing 6232 Rev Org 07/10/09.

FAA-PMA Approved Eligibility for McFarlane Aviation, Inc. Control Hinge Bearings and Bushings for Installation on Cessna Aircraft.

Model	Elevator Bushing Kit	Rudder Bushing Kit
120,140,140A (Bushing)	MC0422215	MC0431119K
120,140,140A (Bearing)		MCS1003-11A
150,150A,B,C,D,E	EBC-KT-1	RBC-KT-1
150F,G,H,J	EBC-KT-1	RBC-KT-2
150K*, A150K* *Note 1*	EBC-KT-1	RBC-KT-3
150K*,L,M, A150K*,L,M *Note 2*	EBC-KT-2	RBC-KT-3
A-150L, A-A150L	EBC-KT-2	RBC-KT-3
F150F,G,H,J	EBC-KT-1	RBC-KT-2
F150K,L*, FA150K* *Note 3*	EBC-KT-1	RBC-KT-3
F150L*,M, FA150K*,L,M *Note 4*	EBC-KT-2	RBC-KT-3
FRA150L,M	EBC-KT-2	RBC-KT-3
152*, A152* *Note 5*	EBC-KT-3	RBC-KT-3
152*, A152* *Note 6*	EBC-KT-4	RBC-KT-3
F152*, FA152* *Note 7*	EBC-KT-3	RBC-KT-3
F152*, FA152* *Note 8*	EBC-KT-4	RBC-KT-3
172, 175	EBC-KT-5	RBC-KT-4
172A,B,C*, 175A,B,C* *Note 9*	EBC-KT-5	RBC-KT-5
172C*, 175C* *Note 10*	EBC-KT-5	RBC-KT-6
172D,E,F,G,H,I,K,L,M,N,P* *Note 11*	EBC-KT-5	RBC-KT-6
172P*,Q,R,S *Note 12*	EBC-KT-5	RBC-KT-7
172RG, P172D, R172K	EBC-KT-5	RBC-KT-6
F172D,E,F,G,H,K,L,M,N,P* *Note 13*	EBC-KT-5	RBC-KT-6
F172P* *Note 14*	EBC-KT-5	RBC-KT-7
FP172, FR172E,F,G,H,J,K	EBC-KT-5	RBC-KT-6
177,177A,B,177RG,F177RG		MC0532104K

*Partial Model Eligibility

Unless otherwise noted, approval is for all serial numbers for each model listed. The eligibility for the kits also applies to the component bushings and bearings. "MC" prefix denotes McFarlane Aviation, Inc. manufacture

Eligibility Notes:
1. 150K S/N 15071129 thru 15071621
   A150K S/N A1500001 thru A1500129
2. 150K S/N 15071622 thru 15072003
   A150K S/N A1500130 thru A1500226
3. F150L S/N F15000659 thru F15000699
   FA150K S/N FA1500001 thru FA1500039
4. F150L S/N F15000700 thru F15001143
   FA150K S/N FA1500040 thru FA1500081
5. 152 S/N 15279406 thru 15285833
   A152 S/N A1520735 thru A1521025
6. 152 S/N 15285834 thru 15286033
   A152 S/N A1521026 thru A1521049
7. F152 S/N F15201429 thru F15201943
   FA152 S/N FA1520337 thru FA1520387
8. F152 S/N F15201944 thru F15201980
   FA152 S/N FA1520388 thru FA1520425
9. 172C S/N 17248735 thru 17249085
   175C S/N 17557003 thru 17557064
10. 172C S/N 17249086 thru 17249544
    175C S/N 17557065 thru 17557119
11. 172P S/N 17274010 thru 17275963
12. 172P S/N 17275964 thru 17276654
13. F172P S/N F17202040 thru F17202208
14. F172P S/N F17202209 thru F17202254

Information derived from FAA-PMA eligibility drawing 6157 Rev Org 07/10/09. Go to www.mcfarlaneaviation.com/eligibility to view the official drawing.

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