



2141 ICON Way Suite 100, Vacaville, CA 95688 - Tel: 707.564.4000 – www.iconaircraft.com

SERVICE BULLETIN

SB-072823-A

ID NUMBER & REVISION: SB-072823-A
SUBJECT: Water Rudder Pivot Flange Disbond
RELEASE DATE: 20 November 2023
EFFECTIVE DATE: 20 November 2023
SUPERSEDES NOTICE: N/A
AIRCRAFT AFFECTED: **MAKE & MODEL:** ICON A5
SERIAL NUMBERS: 00001-00148, 00150-00161, 00163-00168, 00170-00192
REQUIRED ACTION: Perform push/pull test of water rudder pivot flange; if bond fails, replace parts.
TIME OF COMPLIANCE: At next service interval
REVISION HISTORY: A Initial Release

LEVEL OF CERTIFICATION ☐ Pilot/Owner ☒ A & P
REQUIRED (any level checked ☐ LSA Repairman – Inspection ☒ Certified Repair Station
can perform task): ☒ LSA Repairman – Maintenance ☒ Manufacturer

PURPOSE:

It has been discovered that there may be insufficient bond prep of the End Fitting and/or Tube Body, creating a potential for disbond of the water rudder pivot flange. A precautionary inspection is recommended to ensure it has been properly bonded.

WARNING: In the event the water rudder fails prior to service (identified by a sudden loss of maneuverability in the water), abort water operations and return to a service provider.

CONSUMABLES/PARTS (Inspection):

PART NUMBER	DESCRIPTION	QUANTITY	ALTERNATE	
			PART NUMBER	DESCRIPTION
N/A	Powder-Free Nitrile Gloves	As Needed	N/A	Powder-Free Latex Gloves
TT-I-735A	Isopropyl Alcohol	As Needed	Or Equivalent	
Sharpie, Fine Point	Permanent Marking Pen	As Needed	Sharpie, Ultra Fine Point	Permanent Marking Pen
F4TAPEBLACK	TAPE, SELF-FUSING, SILICONE, .02 IN THK, 1 IN WIDE	As Needed		

ADDITIONAL PARTS (If Repair is Necessary):

PART NUMBER	DESCRIPTION	QUANTITY	ALTERNATE	
			PART NUMBER	DESCRIPTION
ME000881	PAINTED, WATER RUDDER PIVOT FLANGE	1		
ME001135	PRIMED AND PAINTED WATER RUDDER	1, If Needed		



2141 ICON Way Suite 100, Vacaville, CA 95688 - Tel: 707.564.4000 – www.iconaircraft.com

SERVICE BULLETIN

SB-072823-A

M81934/2-05C012	BEARING	1		
ICA012033	Water Rudder Cable	1		
AN100C-3	CABLE THIMBLE	2		
MS51844-22	SLEEVE	2		
MS21256-1	TURNBUCKLE CLIPS	4		
MS21255-C3RS	Rod End	2		
ICA012078	Tef-Gel	As Needed		
Loctite 609	RETAINING COMPOUND, CYLINDRICAL BONDING	As Needed	Loctite 603	RETAINING COMPOUND, CYLINDRICAL BONDING
Loctite 7471	ACTIVATOR FOR LOCTITE	As Needed		
Loctite 243	THREADLOCKER, MEDIUM STRENGTH, BLUE	As Needed		
ICA012218	Sikaflex 295UV	As Needed		
SIL-POXY	Sil-Poxy Adhesive	As Needed		
8634K41	Economical Abrasion-Resistant SBR Rubber, Black Sheet, 12" x 12", 1/16" Thick	As Needed		
8634K42	Economical Abrasion-Resistant SBR Rubber, Black Sheet, 12" x 12", 1/8" Thick	As Needed		
8634K43	Economical Abrasion-Resistant SBR Rubber, Black Sheet, 12" x 12", 3/16" Thick	As Needed		
8634K44	Economical Abrasion-Resistant SBR Rubber, Black Sheet, 12" x 12", 1/4" Thick	As Needed		

IF APPLICABLE, SERVICE KITS:

KIT NUMBER	CONTENT PARTS	DESCRIPTION	QUANTITY
N/A			

SPECIAL TOOLS NEEDED:

1. Push/pull gauge.

INSPECTION INSTRUCTIONS:

It is permissible to disassemble the aircraft as required to permit accessibility, inspection, adjustment, maintenance, and repair in accordance with the latest release of the online ICON Aircraft Maintenance Manual, ICA000833.

1. Use tape to protect the water rudder. Mark the location 12" from the hinge line on the water rudder where the load will be applied.



2141 ICON Way Suite 100, Vacaville, CA 95688 - Tel: 707.564.4000 – www.iconaircraft.com

SERVICE BULLETIN

SB-072823-A



Figure 1. Load location, as measured from hinge line.

2. Apply F4TAPE to the end of the push/pull gauge.
3. With a second technician in the pilot's seat holding the right rudder pedal from moving, apply a load of 40.15lbs to the 12" mark on the water rudder using a push/pull gauge.
 - a. If only one technician is performing the inspection, it may be necessary to pin the Yaw Forward Bell crank with a rig pin to accomplish this step. (Reference Aircraft Maintenance Manual, section 100556.)

SERVICE BULLETIN

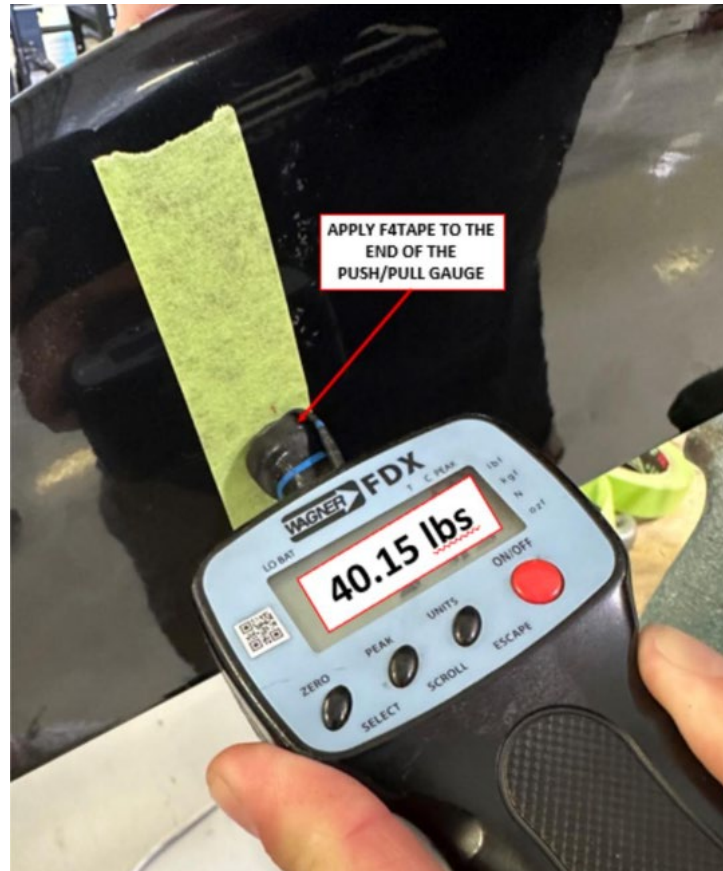
SB-072823-A

Figure 2. Load test setup

4. Verify that the pivot flange bond does not fail during the load test.
 - a. If the bond holds – PASS. Skip to Logbook Entry.
 - b. If the bond breaks free – FAIL. Continue to Repair.
5. Remove tape and clean parts as necessary with Isopropyl Alcohol.

REPAIR INSTRUCTIONS:

1. Remove water rudder cables (and separate rudder from pivot flange) as follows:
 - a. Remove Aft Bulkhead Baggage Panel (Aircraft Maintenance Manual Section 100223) to allow access to the water rudder actuator, extension spring, and connected cables.
 - b. Use adhesive tape to attach a piece of string, about 8 ft long, to each water rudder cable, just aft of the swage sleeves. These strings will be used to pull the new cables through the correct path. Label the string connected to the actuator “A” and string connected to the spring end “S”.
 - c. Remove turnbuckle clips from turnbuckles connecting the spring side and actuator side cables. Extend water rudder actuator (With landing gear down and key removed from ignition, turn master power on, flip water rudder switch to down position), removing tension from spring side of cable. Loosen turnbuckle until rod end is free (may need to



2141 ICON Way Suite 100, Vacaville, CA 95688 - Tel: 707.564.4000 – www.iconaircraft.com

SERVICE BULLETIN

SB-072823-A

- use one hand to hold cable side rod end while unwinding to avoid twisting the cable). Retract water rudder actuator and turn off master power.
- d. On actuator side, loosen turnbuckle until rod end is free (may need to use one hand to hold cable side rod end while unwinding to avoid twisting the cable).
 - e. Use a cable cutter to cleanly cut the two water rudder actuation cables at a point just aft of the swaged sleeves.
 - f. Remove any FOD from cutting cable, including any loose turnbuckles and associated parts. Retain turnbuckles.
 - g. Remove the water rudder inspection panel.
 - h. Remove the two MS24694C56 screws that hold the bottom water rudder hinge tang to the hull.
 - i. Pry the hinge tang free and pull the water rudder assembly down and out of the hull. Doing so will also pull the actuation cables, so be careful and guide the cables and strings aft and through the pulleys above the water rudder bellcrank. Once the strings are through and aft of the pulleys, remove them from the cables and secure them with tape to the internal structure for use during cable installation.
 - j. Pull the cables the rest of the way through the hull fitting and free of the aircraft.
 - k. Remove the binding post hardware at the extension pivot of the water rudder and separate the rudder from the pivot flange assembly (the carbon yoke piece that holds the rudder).
 - l. Withdraw the cable from the pivot flange assembly.
 - m. Remove the ICA008934 Pivot Bushing from the water rudder.
 - n. Remove the two flush-head MS24694C53 screws that attach the cable puck to the water rudder, then remove two M81934/2-05C012 bearings from either side of water rudder.
 - i. To remove bearings, use a tapered punch inserted from inbd side to remove bearing from outbd side. Apply gentle heat (I think we have a blurb about this...) as needed to loosen retaining compound. Use a non-tapered punch to remove the inbd bearing.
 - ii. If water rudder is damaged during bearing removal, water rudder (ME001135) will need to be replaced.
 - o. Pull the puck and cable from the rudder.
 - p. Only if necessary, using a punch, remove the cable retaining pin 97855A510 from puck.
 - q. Remove the cable from the puck by disengaging the swaged bull from the notch in the puck.
 - r. Discard the old cable and clean all parts.
2. Discard disbonded pivot flange.
 3. Re-assemble the water rudder with a new pivot flange assembly and install the water rudder cables in accordance with the following:
 - a. Route a new cable (ICA012033) around the groove in the ICA008933 Water Rudder Puck, engaging the swaged ball on the cable in the mating recess in the puck. **(Figure 3)**

SERVICE BULLETIN

SB-072823-A

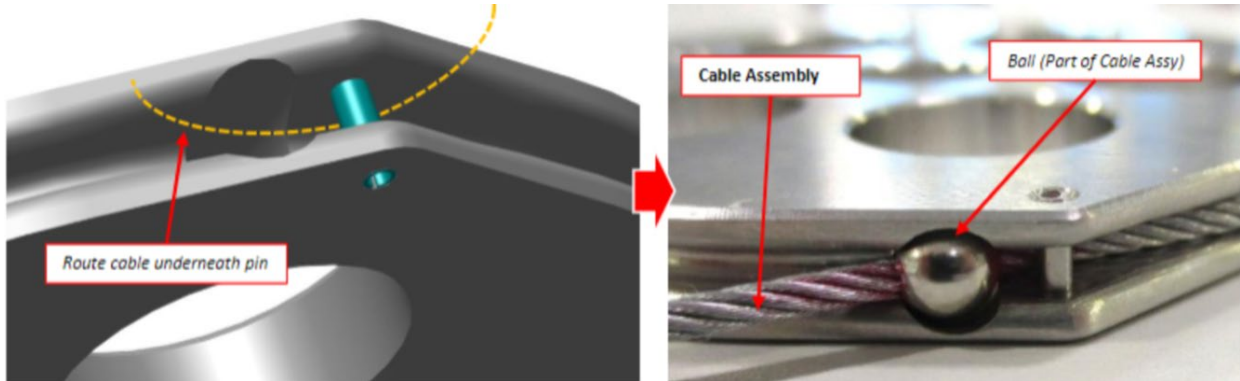


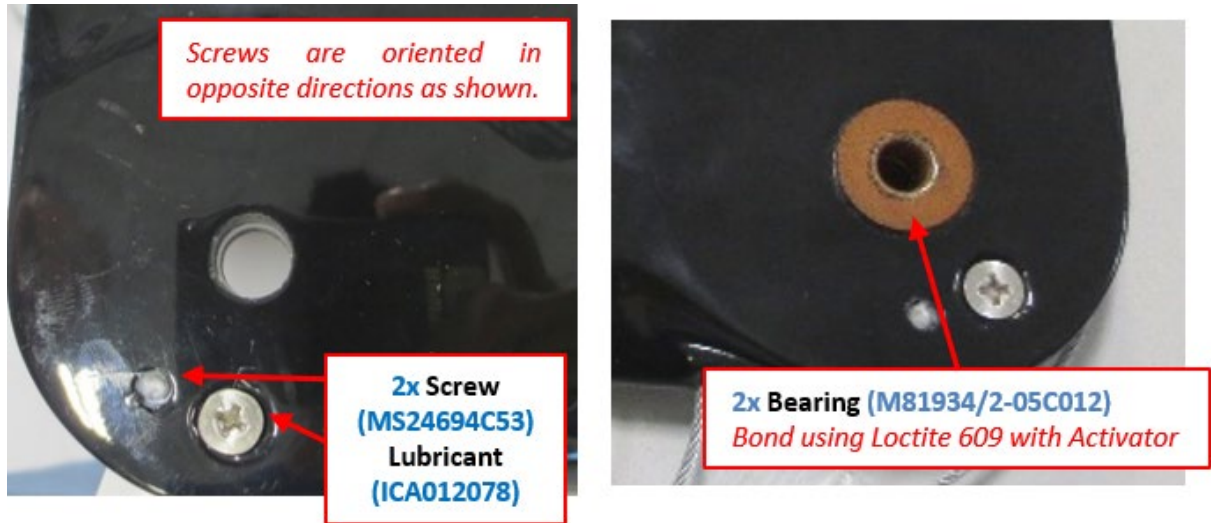
Figure 3. Cable Routing

- b. If previously removed, install a new retaining pin 97855A510 into puck.
- c. Coat the sides of the puck, hardware, and cable that will be hidden, with a light coat of ICA012078 (Tef-Gel) to help minimize water intrusion.
- d. Slide the puck into the water rudder (**Figure 4**). The puck is properly oriented when the two mating screw holes align and the swaged ball faces aircraft aft when rudder is in the retracted position.



Figure 4. Puck

- e. Coat two MS24694C53 screws with ICA012078 (Tef-Gel) and install them through the water rudder, attaching it to the puck inside. Note that one screw installs from the left and one from the right. Torque these screws to 20 in-lb. (**Figure 5**)
- f. Clean bonding surfaces of two M81934/2-05C012 bearings and interior water rudder pivot hole with Isopropyl Alcohol. Install bearings in water rudder using LOCTITE 609 or LOCTITE 603.
 - i. Ensure all excess squeezeout is cleaned out of inner pivot bore to prevent seizing.

SERVICE BULLETIN**SB-072823-A***Figure 5. Water Rudder Screws*

- g. Slide an ICA008934 Pivot Bushing into the pivot bore in the water rudder. (**Figure 6**)

*Figure 6. Pivot Bushing*

- h. Verify that nylon tubes are still bonded to pivot flange and secure. Run cable through each one to make sure the cables slides through freely. If either inspection fails, the nylon tubing will need to be replaced and rebonded.
- i. Insert the cable ends into the Nylon tubes in the aft face of the pivot flange. The cable coming off the top of the puck inserts into the top tube, bottom into the bottom.

SERVICE BULLETIN

SB-072823-A

- j. Pull the cable ends out through the top of the pivot flange while guiding the rudder into position with pivot bores aligned. Pay special attention as to not kink the cable. **(Figure 7)**

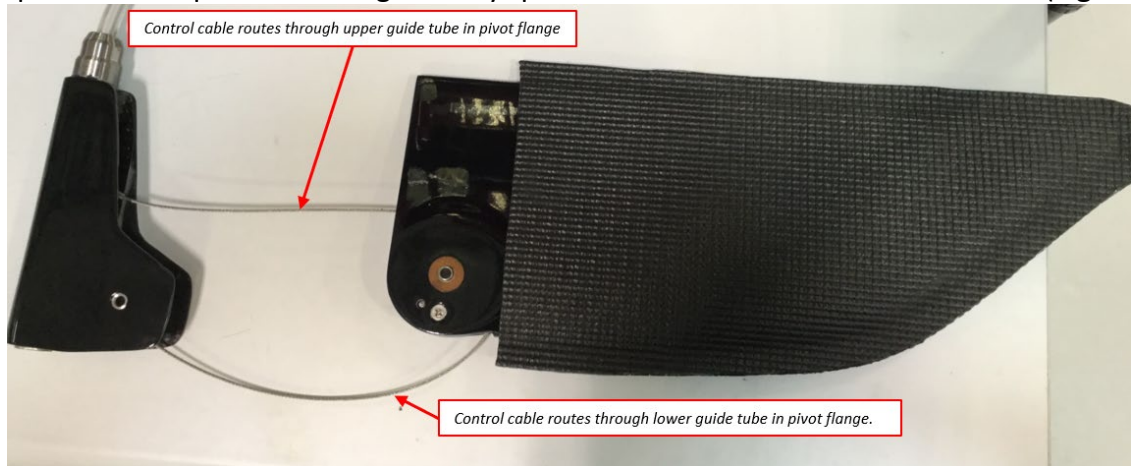


Figure 7. Control Cable Routed around Puck

- k. Connect the water rudder to the pivot flange with a 97851A104 Binding Post, with a 91950A029 Washer under each head. Use LOCTITE 243 on the threads and torque to 20 in-lb. **(Figure 8)**

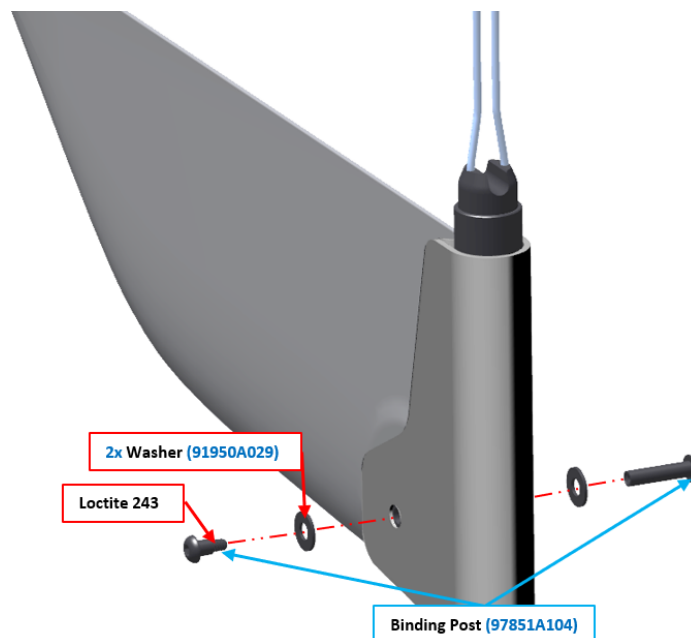


Figure 8. Binding Post

- l. Measure each cable from the top face of the pivot flange torque tube and mark with a paint marker. The cable on aircraft right-hand side gets a mark at 71-9/16" from the top face. The cable on aircraft left-hand side gets a mark at 70-1/4" from the top face.

SERVICE BULLETIN

SB-072823-A

- m. Insert the two cable ends up through the water rudder bellcrank assembly in the hull. There is a key in the bore of the water rudder bellcrank, visible from the bottom. The rudder right-side cable must pass to the right of the key and the left cable to the left of it. **(Figure 9)**

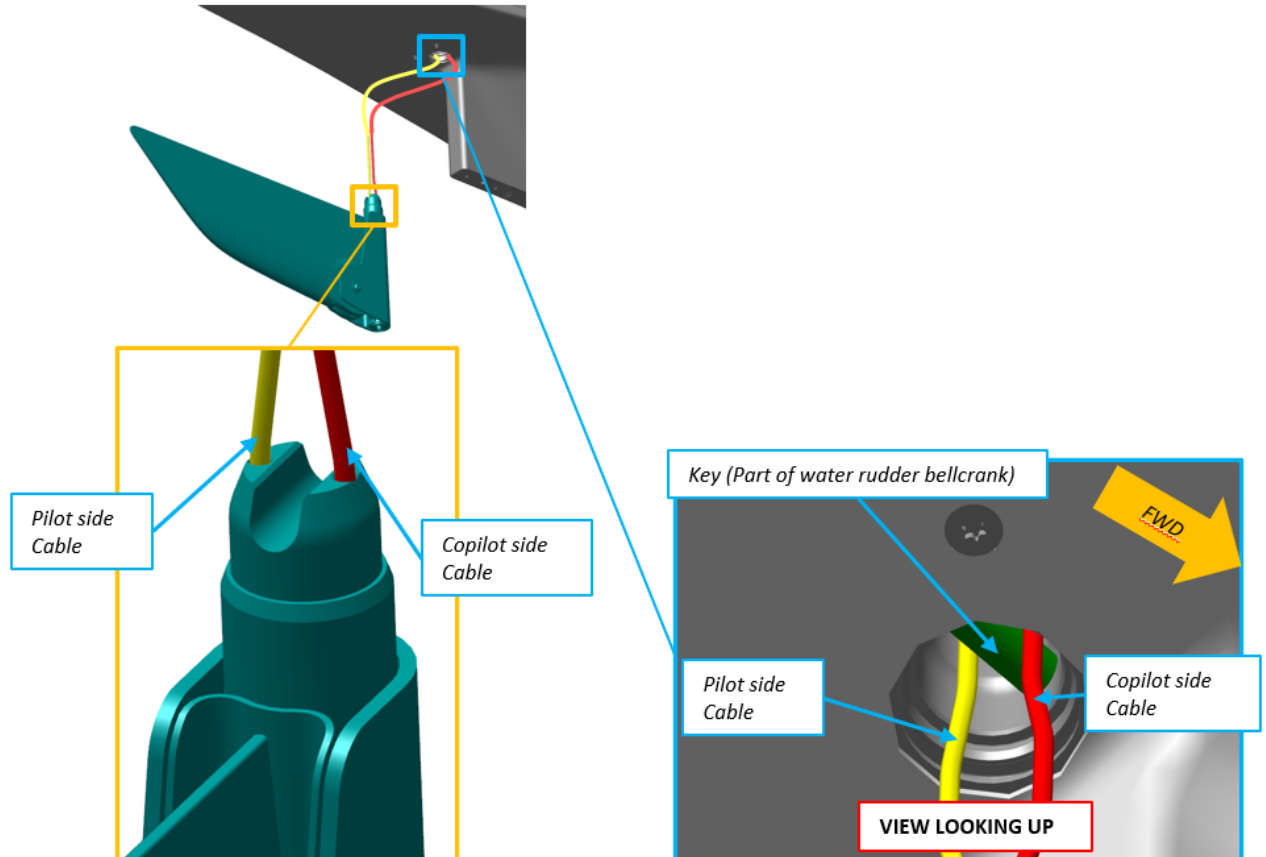


Figure 9. Water rudder cables, key

- n. Gently pull on the forward ends of the leader cords to pull the control cables up through the water rudder bellcrank, under the cable keeper pin, and around the pulleys located directly above the water rudder bellcrank. Once the control cables are routed up and through the pulleys, pull the ends of the control cable out through the water rudder access cutout to be swaged. **(Figure 10)**

SERVICE BULLETIN

SB-072823-A

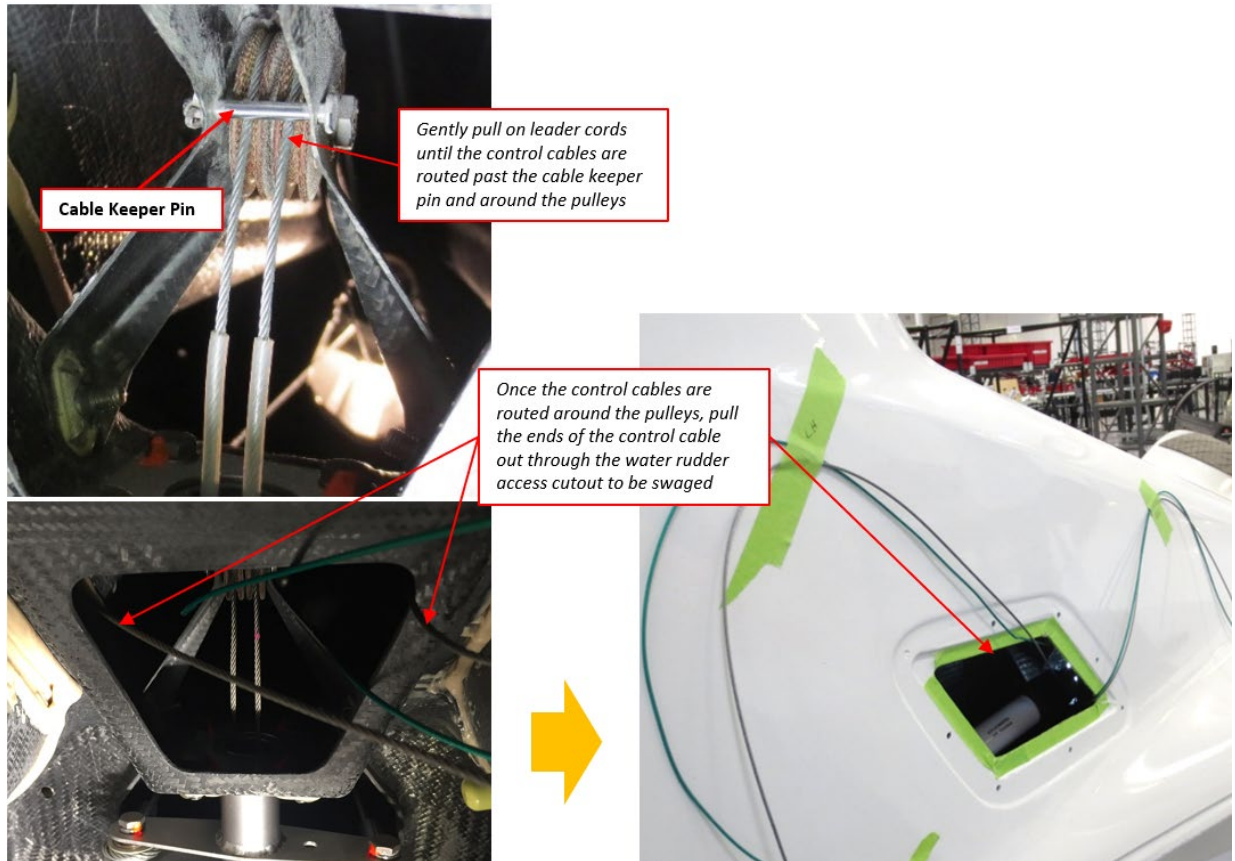


Figure 10. Route Cables

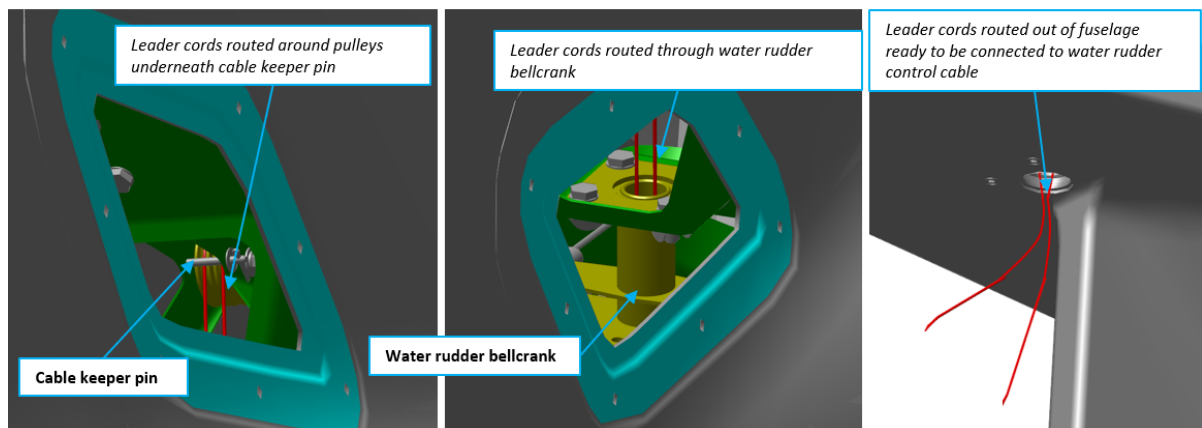


Figure 11. Routing Cables

- o. With the help of a second technician, pull cable ends out through the water rudder access panel and keep pulling while guiding the water rudder assembly into position, pushing its

SERVICE BULLETIN

SB-072823-A

steering shaft up into the water rudder bellcrank assembly. Use caution to not damage the shaft seal.

- p. Prepare the surface of the pivot tang (ICA009078) that mates with the fuselage skin, as well as the corresponding fuselage skin surface, for potting by doing the following (**Figure 12**):
 - i. Apply carnauba wax (ICA013211) onto mating surfaces on pivot tang and fuselage and on threads of screws retained from removal steps.
 - ii. Wipe carnauba wax off using a lint free cloth.
 - iii. Allow 5 minutes for the wax to flash off.
 - iv. Repeat the previous steps 3x.

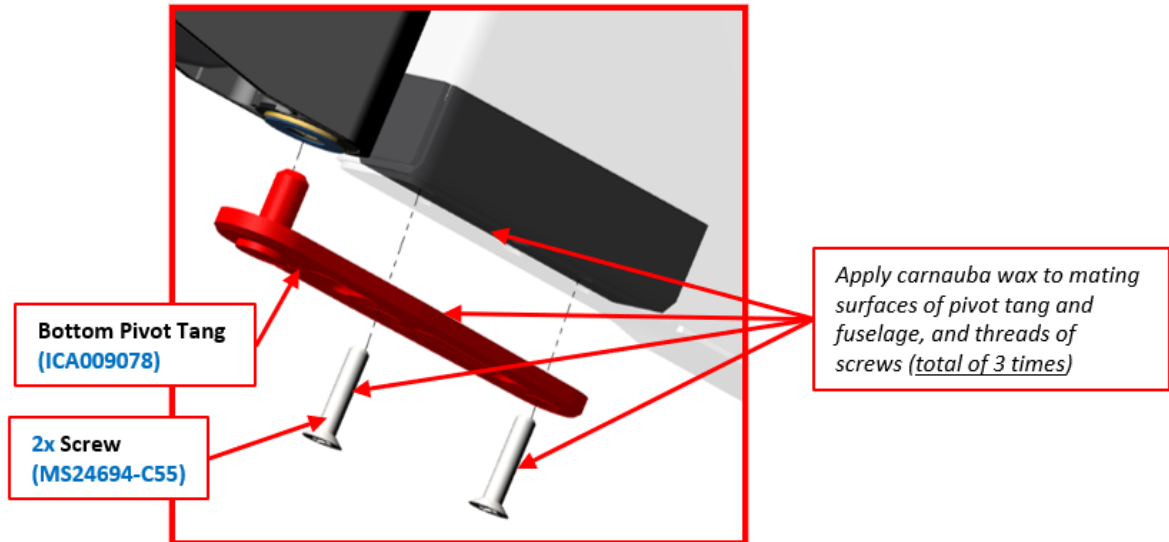


Figure 12. Pivot Tang Wax

- q. Using ICA012218 (Sikaflex) sealant, apply a thin void-free layer to the mating surfaces of the pivot tang, the fuselage, and both screws. (**Figure 13**)

NOTE: Ensure no sealant is applied to the portion of the pivot tang that interfaces with the water rudder.
- r. Fasten the prepped pivot tang to the fuselage with wet-installed screws. Torque the screws to 25-28 in-lbs.
- s. Remove any sealant that may have been squeezed out from around the pivot tang and/or around the fasteners to create a clean fillet around the entire perimeter.

NOTE: Ensure no squeeze out is present that will interfere with the operation of the water rudder.

SERVICE BULLETIN

SB-072823-A

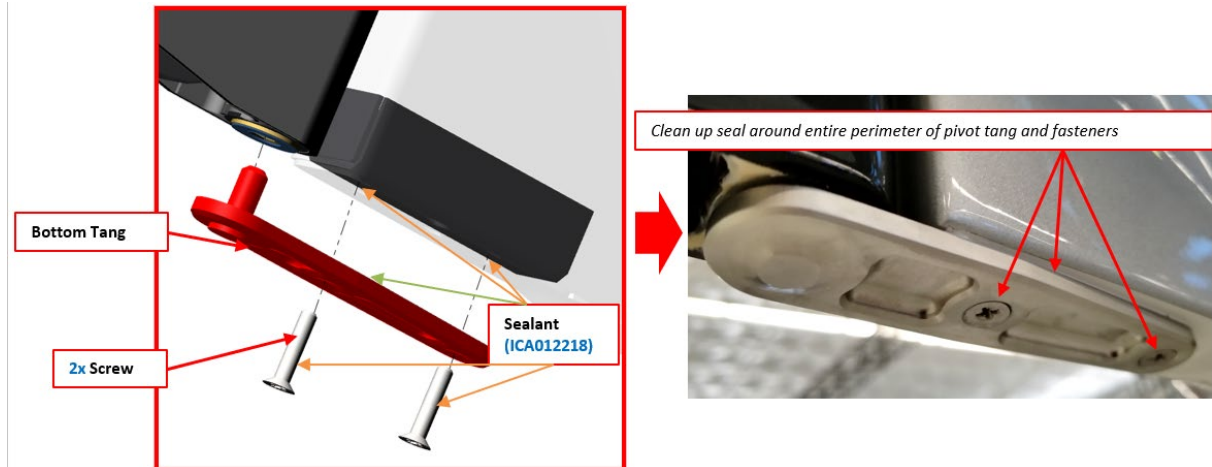


Figure 13. Pivot Tang Installation

- t. Tape the cable that comes off the top of the water rudder puck to the previously installed “A” string and the cable end that comes off the bottom of the puck to the “S” string. Use the strings to pull the cable ends under the pulley cable guard bolt, over the water rudder retraction pulleys, and once around the pulleys, pull the cable ends out through the water rudder access panel. Remove the string from the cable ends temporarily (keep them marked).

NOTE: It helps to pull one cable at a time through the pulley, swage it, then go to the actuator bay and connect it before doing the other. This prevents any accidental crossing of cables.

- u. Terminate the two cable ends as follows:
 - i. Spread open an AN100C-3 cable thimble just enough to slide it through the aft cable eye of the retraction turnbuckle assembly. Repeat this with the aft cable eye of the extension turnbuckle assembly. (Figure 14)

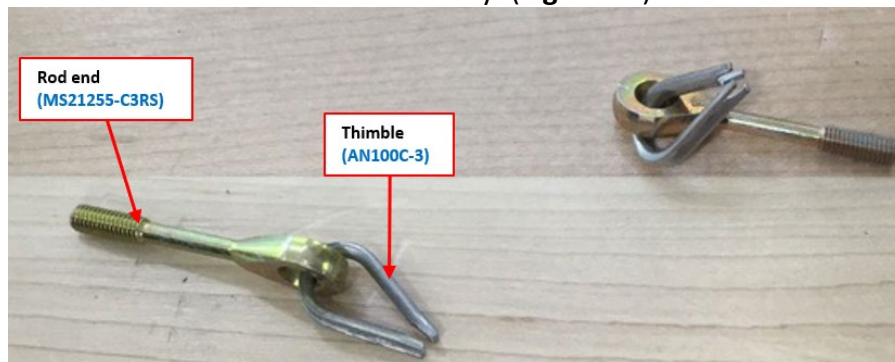


Figure 14. Rod End and Thimble

- ii. Feed the end of the retraction cable first through one side of an MS51844-22 sleeve then through the retraction turnbuckle eye from the previous step, then

SERVICE BULLETIN

SB-072823-A

back around through the other end of the sleeve. Repeat this for the extension end of the cable and its turnbuckle.

- iii. Find the swage location mark on the retraction cable end. Position the cable so that the center mark is located at the center point of the thimble of the retraction turnbuckle assembly and tighten the cable by drawing the free end through the sleeve and running the sleeve up against the thimble.
- iv. Verify that the cable is tight around the thimble, the sleeve is hard against the thimble and the mark on the cable is located on the center apex of the thimble, then use a swaging tool to swage the sleeve. Use a go-no-go gauge to verify a correct swage.
- v. The length of the free end of the cable beyond the edge of the swage fitting should be .125-.250" when finished. **(Figure 15)**

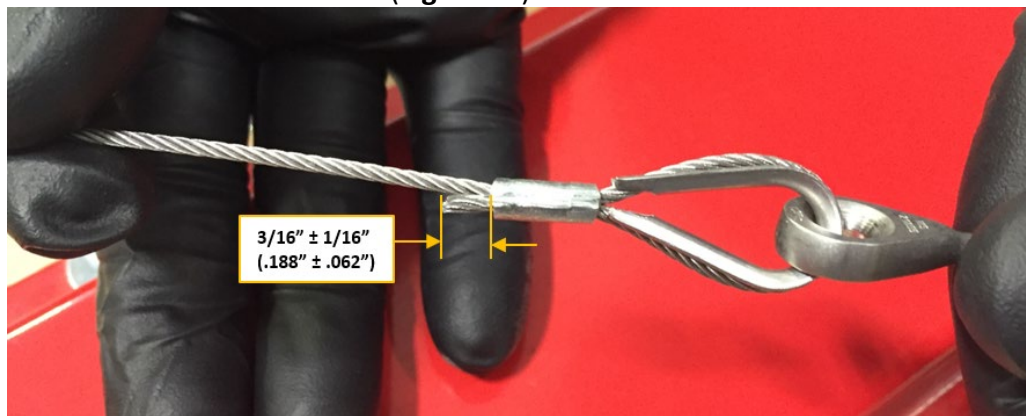


Figure 15. Swaging

- vi. Repeat with the extension end of the cable.
- v. Use adhesive tape to attach cable end to the appropriate string used earlier and use these strings to pull the cable ends up to the retraction actuator and spring. **(Figure 16)**

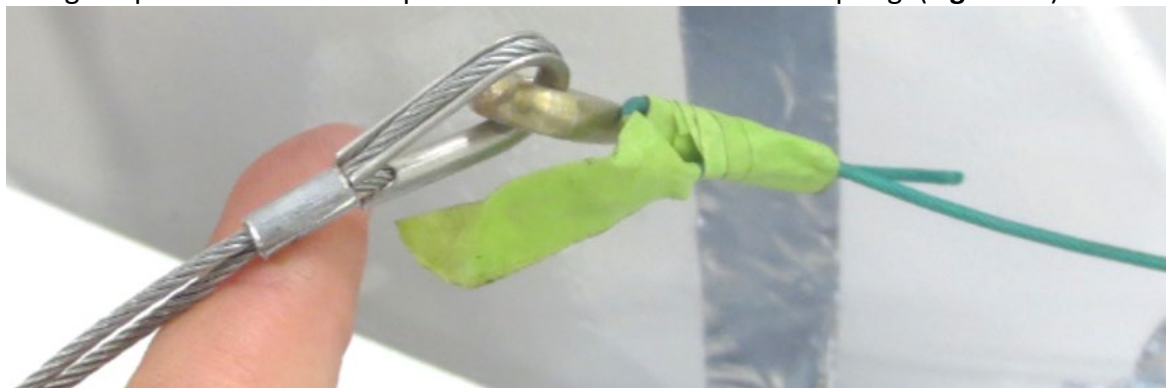


Figure 16. String on Cable End

SERVICE BULLETIN

SB-072823-A

- w. Ensure that the cables do not cross over one another as they are pulled through the fuselage. Ensure the cables are not twisted and that the “retraction” end will connect to the water rudder actuator and the “extension” end to the extension spring.
- x. Attach turnbuckle to rod end on actuator and actuator cable. Note: Attempt to install on both rod ends simultaneously. Tighten turnbuckle 2 full turns while holding cable and rod end as to not twist or bind cable. **(Figure 17)**
- y. Extend water rudder actuator (With landing gear down and key removed from ignition, turn master power on, flip water rudder switch to down position).
- z. Attach turnbuckle to rod end on spring and spring cable. Note: Attempt to install on both rod ends simultaneously. Tighten turnbuckle 2 full turns while holding cable and rod end as to not twist or bind cable.
- aa. Remove any leader strings, labels, or other potential FOD.

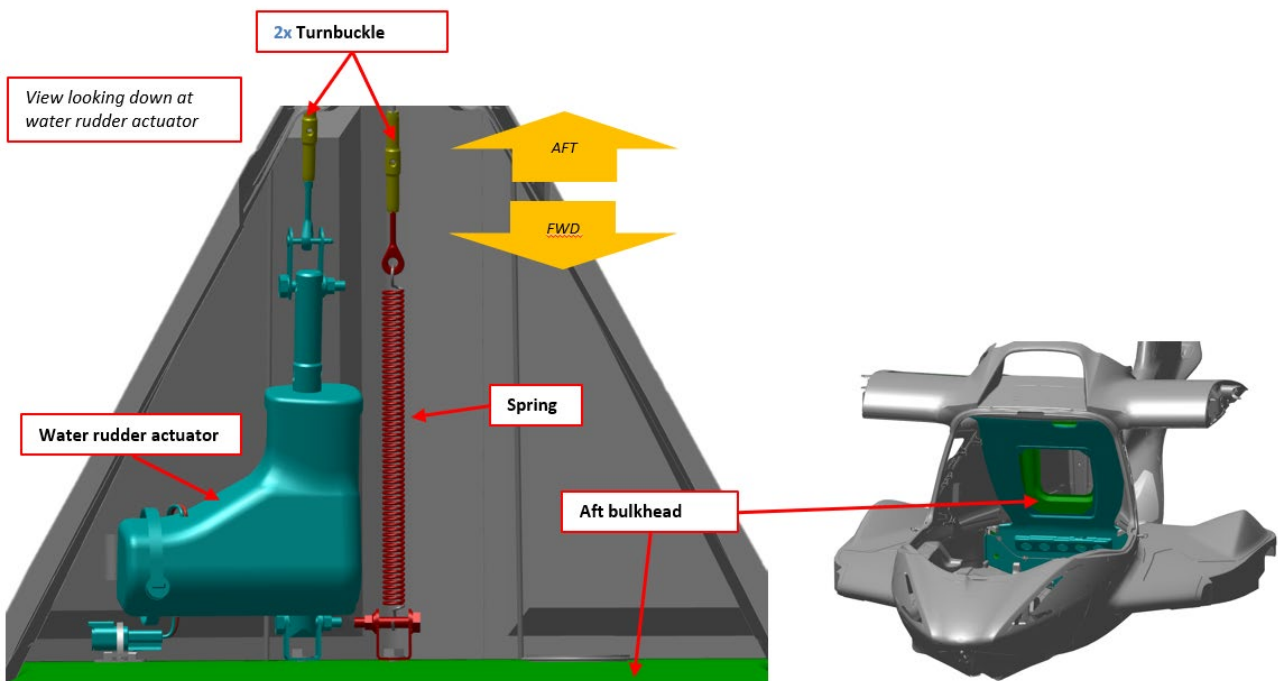


Figure 17. Install Turnbuckles

4. Adjust the turnbuckles per rigging procedure **(Figure 18)**:
 - a. With landing gear down and key removed from ignition, turn master power on, flip water rudder switch to up position.
 - b. Adjust the turnbuckles on both the spring side and water rudder actuator side until there is a reasonable amount of tension in the system.
 - c. Adjust the turnbuckle connected to the water rudder actuator to achieve a .250" \pm .060" gap between water rudder top surface and fuselage bottom surface while rudder is in retracted position.
 - i. If water rudder contacts fuselage, choose appropriate thickness of rubber sheet

SERVICE BULLETIN

SB-072823-A

(8634K41 or similar) and cut a piece approximately 0.5" in width and 1.25" in length (**Figure 19**). Trim accordingly to allow proper fitment and water rudder gap. Select size so that retracted position is $.250" \pm .060"$ gap. Using Sil-Poxy adhesive, bond the rubber piece to the water rudder pivot flange, ensuring rubber is bonded within 5 minutes of adhesive application. Apply sufficient amount of adhesive to achieve even, adequate squeezeout. Clean up squeezeout, leaving a small fillet around the perimeter of the rubber piece and allow to cure 1 hour to handle.

- d. With landing gear down and key removed from ignition, turn master power on, flip water rudder switch to down position. Adjust the turnbuckle connected to the water rudder actuator to achieve a $90^\circ \pm 5^\circ$ position (relative to retracted position) while rudder is in extended position.

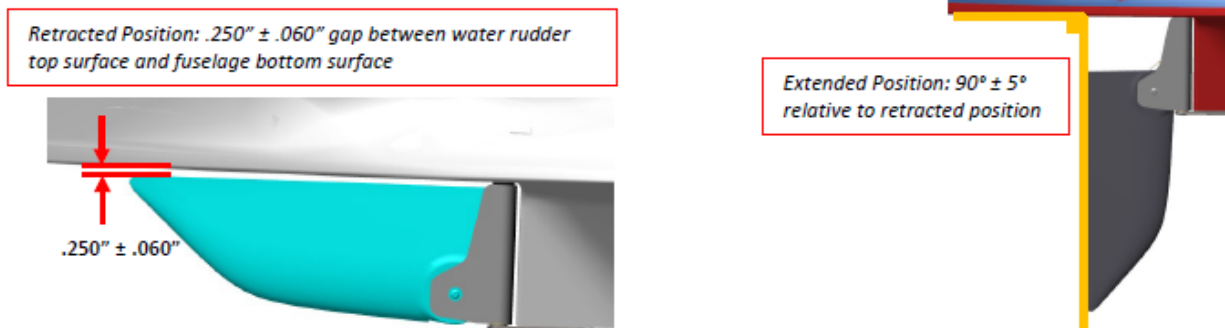


Figure 18. Water Rudder Rigging

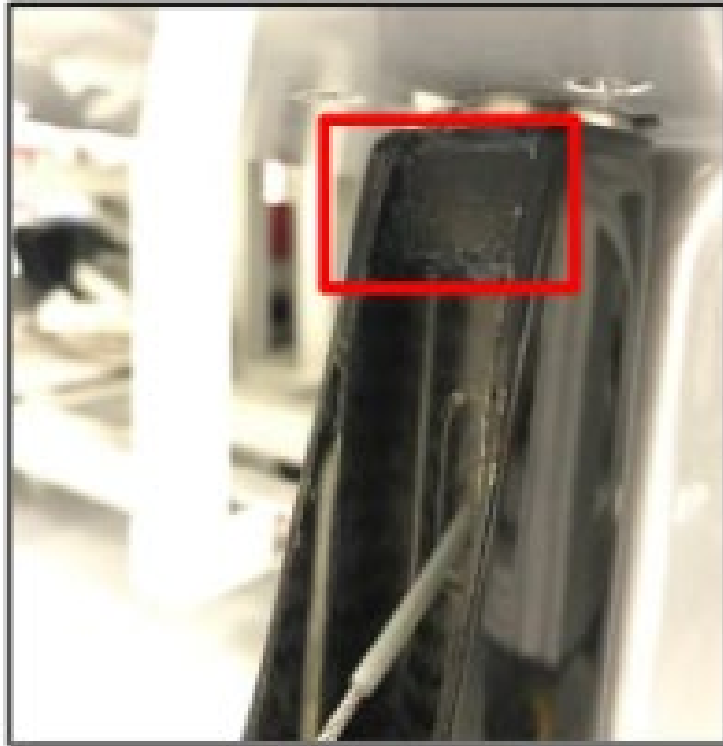
SERVICE BULLETIN**SB-072823-A**

Figure 19. Rubber Piece

5. Temporarily install 2x turnbuckle clips in each turnbuckle.
6. Complete VERIFICATION steps below. If rig adjustment is required, remove turnbuckle clips and repeat rigging steps.
7. Fully install turnbuckle clips into turnbuckles to lock adjustment.

VERIFICATION:

1. Verify that the water rudder rotates horizontally $40\pm5^\circ$ in both directions when the corresponding full rudder input is applied.
2. Verify that the water rudder rotates vertically $90\pm5^\circ$ when extended.
3. Verify water rudder does not rub nor make noise when extended/retracted.
4. Verify water rudder returns to approximately parallel to bottom of fuselage when retracted.
5. Ensure there is no vertical freeplay an top of water rudder/pivot flange is not contacting fuselage.



2141 ICON Way Suite 100, Vacaville, CA 95688 - Tel: 707.564.4000 – www.iconaircraft.com

SERVICE BULLETIN

SB-072823-A

Make the following logbook entry:

“The corrective action of Service Bulletin (SB-072823-A – Water Rudder Pivot Flange Disbond) has been complied with (ref. FAA Exemption 10829C).”

OR, for 650 Edition aircraft,

“The corrective action of Service Bulletin (SB-072823-A – Water Rudder Pivot Flange Disbond) has been complied with.”

If you have questions, comments, or concerns about this Service Bulletin and/or if you are no longer owner/operator of this aircraft, please forward this information to the present owner/operator and notify ICON Aircraft at:

ICON Aircraft
2141 ICON Way Suite 100
Vacaville, CA 95688
(855) FLY-ICON or (707) 564-4000
support@iconaircraft.com

Please include the aircraft registration number, serial number, your name, and if known the contact information of the new owner/operator.