SAFETY ALERT SA0009 Rev B

Cub Crafters, Inc. Considers Compliance Mandatory 12/20/2013

This Safety Alert is issued per the requirements of ASTM F2295-06. It is a SAFETY DIRECTIVE for the purposes of compliance with 14 CFR 91.327(b)(4)

EFFECTIVE DATE: This revision of SAFETY ALERT/SAFETY DIRECTIVE is effective **December 20, 2013.**

SUBJECT: CC11 TAIL WIRE MODIFICATION

MODELS AFFECTED: CC11-100 AND CC11-160 S/N 0001 THROUGH 00302. S/N 00095 EXEMPT. (This service alert supersedes SA0006)

COMPLIANCE TIME: BEFORE NEXT FLIGHT AND MODIFICATION TO BE INSTALLED WITHIN NEXT 10 FLYING HOURS.

PURPOSE: Cub Crafters has learned of cases where tail wires have failed in service. This Safety Alert requires installation of a modification to prevent these failures and REPLACEMENT OF TAIL WIRES.

WARRANTY: Aircraft within the one-year warranty period at date of document release will be provided parts at no cost and receive up to three hours of labor if work is performed at a Cub Crafters Authorized Service Center. Please contact CubCrafters Customer Support for assistance.

Aircraft outside the one-year warranty period should contact CubCrafters Parts Sales when parts are available following a revision to this document.

PARTS LIST:

PART	DESCRIPTION	QTY
AN23-11	CLEVIS BOLT	6
AN315-5R	JAM NUT	6
AN320-3	CASTELLATED SHEAR LOCKNUT	6
AN365-1032A	NYLON LOCK NUT	2
AN380-2-2	COTTER PIN	9
AN960-10	WASHER, THICK	2
AN960-10L	WASHER, THIN	6
TL0009-101	STRAIGHT EDGE	1
TL0010-101	PROTECTIVE ALUMINUM	1
SC81009-D01-001	TAIL BRACE WIRE, UPPER	2

PARTS CONT.:

SC81009-D01-003	TAIL BRACE WIRE, LOWER	2
SC81015-001	TAIL WIRE BRACKET, HORIZONTAL	2
SC81015-003	TAIL WIRE BRACKET, VERTICAL	1
XC80011-005	CLEVIS	6
XC80012-001	BRASS NIPPLE	6
XC80013-001	SQUARE WASHER	6

TOOLS LIST:

SAWHORSE (ROUGHLY 36” HIGH)

VICE GRIPS

DIAGONAL CUTTERS

DUCKBILL OR NEEDLE NOSE PLIERS

OPEN ENDED WRENCHES: $^{1}/_{2}$ IN, $^{3}/_{8}$ IN, $^{9}/_{32}$ IN, $^{1}/_{4}$ IN

FLAT SCREWDRIVER OR $^{3}/_{16}$ IN PIN PUNCH

SMALL HAMMER

BUBBLE LEVEL (36 IN PREFERED)

12 IN COMBINATION SQUARE (OPTIONAL)

CALIBRATED SPRING/FISH SCALE

TORQUE WRENCH (12 AND 70-80 IN-LBS)

$^{1}/_{2}$ IN CROW’S FOOT

$^{3}/_{8}$ INCH SOCKET

FLASHLIGHT

2 SPRING CLAMPS

TAPE (MASKING PREFERED)

Cub Crafters, Inc. Considers Compliance Mandatory 12/20/2013

INSTRUCTIONS:

The aircraft should not be operated unless there is need to ferry it to a facility where the relevant modification can be carried out. Under no circumstances should this time be extended beyond 10 hours. If it is necessary to operate the aircraft, ensure it is in smooth air.

REMOVAL OF TAIL WIRES:

1. Read and understand all instructions before attempting any modification to the aircraft.
2. Elevate tail of aircraft and support on the forward tailwheel spring bolt as shown in Figure 1.

Figure 1: Tail Support

3. Set trim to takeoff position as described in section 4.4.1.1 of the Aircraft Flight Manual (SSC10000AFM)
4. Remove cotter pins and inboard washers from outboard elevator hinge pins.
5. Remove cotter pin and bottom washer from upper rudder hinge pin.
6. Remove round inspection cover on fuselage under the left horizontal tail surface.
7. Loosen jam nuts at the top end of the lower wires and both ends of upper wires on both sides. The jam nuts at the top end of the upper wire have left hand threads.

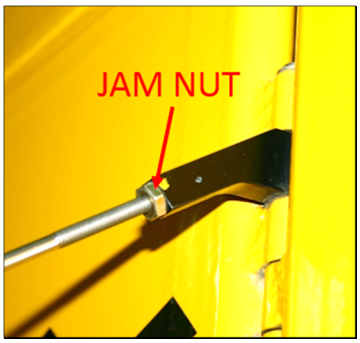

Figure 2: Jam Nut

8. Grip the lower wire with vice grips and remove the nut and washer inside the fuselage with a $^3/_8$ inch wrench. It may be helpful to rotate the wire back and forth with the vice grips while holding onto the nut inside the fuselage. Repeat for the opposite side.
9. Unscrew the lower wires from the fittings at the outboard elevator hinges and remove from the aircraft. It may be necessary to twist the wire some to remove it from its bushing in the fuselage.
10. Note the spacer washer locations on the hinge pins as it will be necessary to reinstall them later. Remove outboard elevator hinge pins one at a time and remove outboard tail brace wire brackets with the upper wire attached. Push hinge pins back into place after removing brackets to support the elevator.

NOTE
Inspect hinge pins for wear and corrosion. Replace if necessary.

11. Unthread wires from the bracket on the vertical fin. Note the threads are left handed.
12. Remove and inspect the top rudder hinge pin and remove the tail brace wire bracket from the vertical tail.

    At this point all original wires and wire brackets should be removed from the aircraft.

INSTALLATION OF NEW TAIL WIRES:

13. Install new horizontal tail brackets (SC81015-001) from the SA00009 kit onto the hinge pin as shown in Figure 3 and reinstall the hinge pin and spacer washers. Install new cotter pins on the elevator hinge pins.

NOTE
The flat side of the horizontal tail bracket should face the front of the aircraft

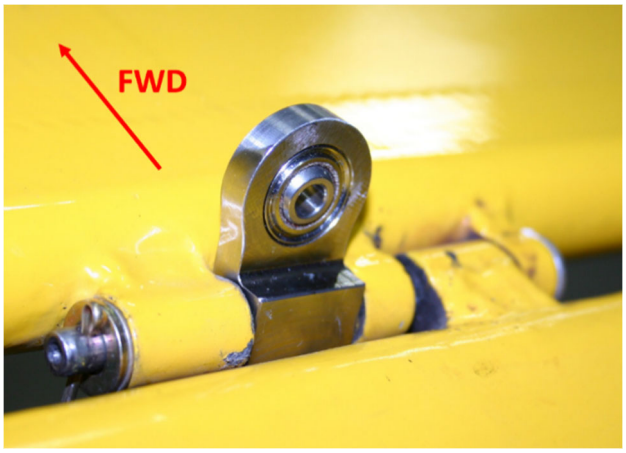

Figure 3: Horizontal Tail Bracket

14. Install the new vertical tail bracket (SC81015-003) from the SA0009 kit onto the hinge pin as shown in Figure 4 with the lugs angled toward the front of the aircraft. Again, take note of the spacer washer positions before removing the hinge pin and re-install them after installing the bracket. Install a new cotter pin on the rudder hinge pin after the washers and bracket have been installed.

NOTE
The vertical tail bracket's lugs should be angled toward the front of the aircraft.

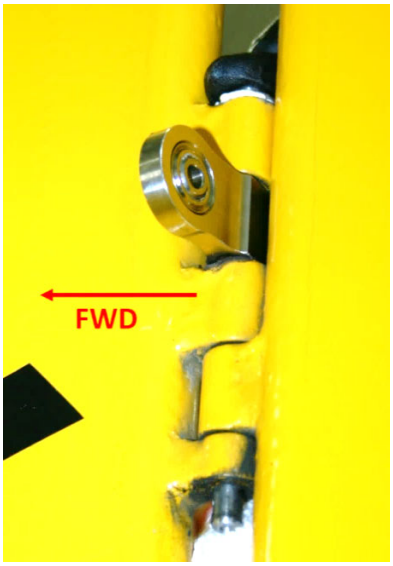

Figure 4: Vertical Tail Bracket

15. Assemble the clevis assembly onto new wires as shown in Figure 5. The longer wires are the upper wires and require a clevis assembly on each end. **Take note of the orientation of the square washer. It is very important that the rounded edge of the washer be seated inside the bends of the clevis.** The shorter wires are the lower wires and require only one clevis assembly. The clevis assembly attaches to the end of the lower wire with a full 1-$^1/_2$ inch of threads. The end with the shorter threads will be inserted into the fuselage. Thread the wire into the brass nipple until the end of the wire is flush with the end of the brass nipple inside the clevis. This is the longest the wire assembly can be and still provide sufficient thread engagement. **Do not tighten the nuts on the brass nipples at this time.**

    The clevis assemblies are identical and interchangeable between wires.

> **NOTE**
> The rounded edge of the square washer must be seated inside the bends of the clevis.

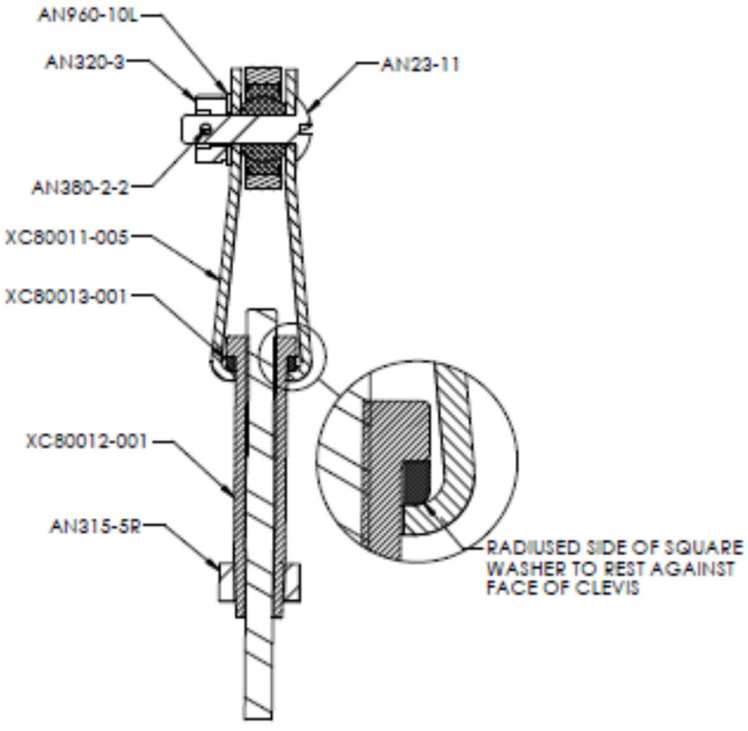

Figure 5: Clevis Assembly

16. Install the upper wires to the new brackets adjusting wire length as necessary. Align the clevis holes with the holes in the bracket's spherical bearings and insert an AN23-11 clevis bolt. The head of the clevis bolt should be on the AFT side of the bracket. Install an AN960-10L thin washer and AN320-3 castellated shear nut on the FORWARD side of the bracket. Tighten the nut 12 in-lbs then beyond 12 in-lbs up to one nut flat until a cotter pin can be inserted. The clevis should pivot freely on the bracket. Install cotter pin to lock castle nut in place. Repeat for the other side.

NOTE

Ensure an equal amount of threaded wire is extending beyond the brass nipple into the clevis on each end of the wire. The wire must extend through the brass nipple and be visible from the clevis side in order to keep the brass nipple from clamping on the wire's threads when the lock nut is tightened. Threads should not show on the wire by the jam nut

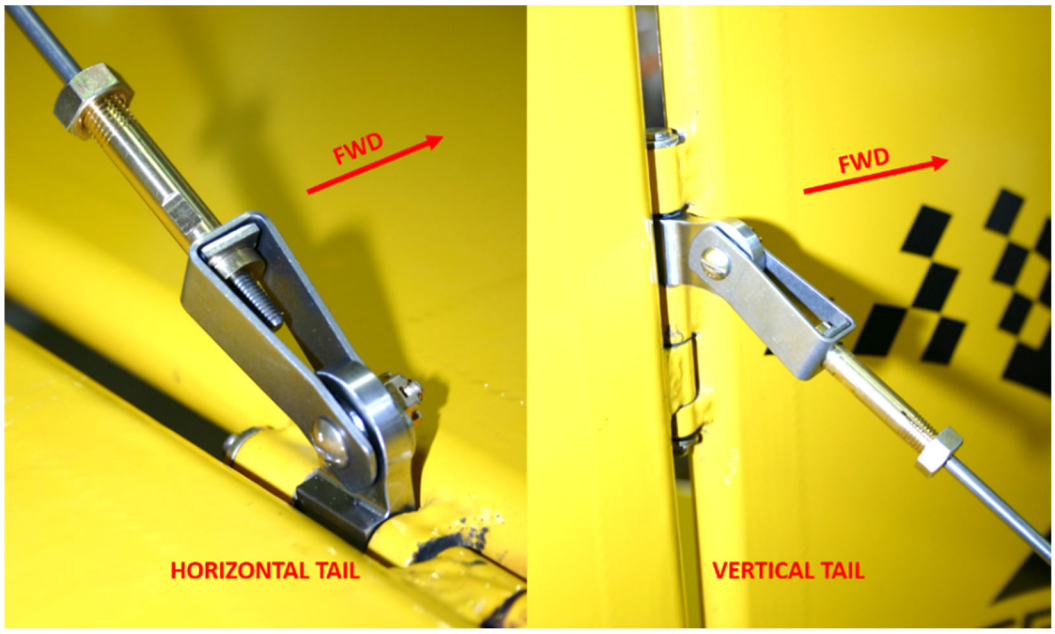

Figure 6: Upper Wire Installation

NOTE

The AN23-11 bolt heads attaching the upper wire to the brackets must be on the aft side of the bracket with the nut on the forward side. This is opposite standard convention.

17. Slip the bottom end of the lower wires (the end without the clevis) into the bushings in the fuselage where the previous wires were attached. Attach the upper end (with the clevis assembly) to the bottom of the bracket on the elevator hinge pin. Align the clevis holes with the holes in the bracket's spherical bearing and insert an AN23-11 clevis bolt. The head of the clevis bolt should be on the FORWARD side of the bracket. Install an AN960-10L thin washer and AN320-3 castellated shear nut on the AFT side of the bracket. Tighten the nut to 12 in-lbs then beyond 12 in-lbs up to one nut flat until a cotter pin can be inserted. The clevis should pivot freely on the bracket. Install a cotter pin to lock castle nut in place. Repeat for the other side.

NOTE
The AN23-11 clevis bolts on the lower wires should be facing opposite the bolts installed on the upper wires. The bolt heads should be on the forward side of the bracket with the nut on the aft side of the bracket. This follows standard convention.

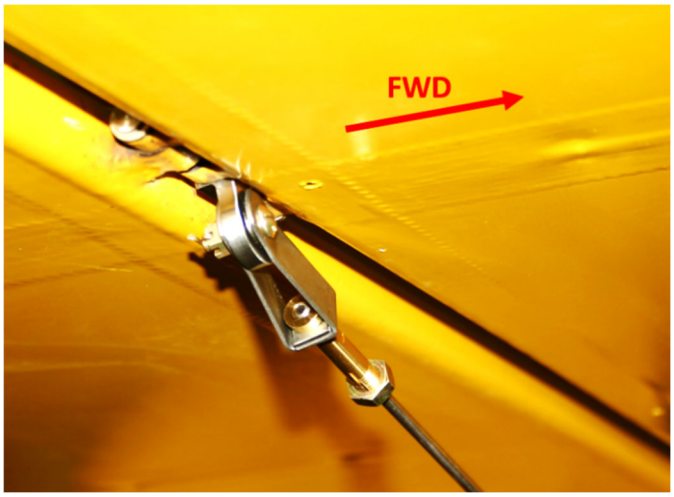

Figure 7: Lower Wire Installation

18. Install an AN960-10 thick washer and AN365-1032A nylon lock nut onto the bottom ends of the lower wires inside the fuselage. There should be 1-$^1/_2$ to 3 threads protruding through the nut. Hold the wire with vice grips, protecting the wire with the included piece of aluminum as shown in Figure 8.

CAUTION
Do not mark the wire with vice grips. Be sure to protect the wire from any tools with the included protective aluminum. Any tool marks on the wire greatly reduce their ability to handle high loads and make the aircraft un-airworthy. Use just enough clamping force to sufficiently grip the wires without slipping. Too much force could also damage the wires.

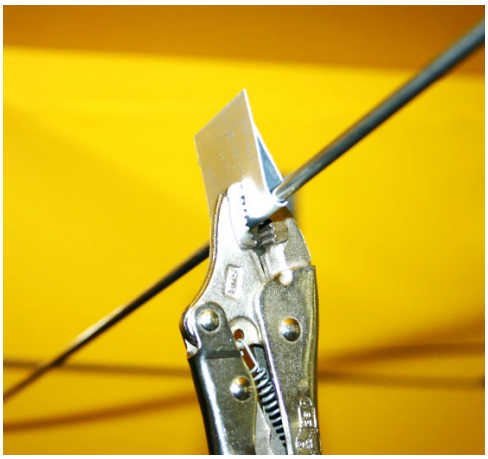

Figure 8: Protected Wire

19. Verify elevator trim is in the center of the takeoff position.
20. Level the aircraft laterally by placing a level on the upper forward cross tube located in the cabin just behind the windshield, as shown in Figure 9. Center the bubble to level the wings. It is not necessary to level the aircraft longitudinally. Reference section 6.3.2 of the Aircraft Flight Manual (SSC10000AFM) for detailed leveling instructions.

Figure 9: Leveling the Aircraft

21. Place a level on the rear spar of each horizontal tail. Adjust the wire lengths by turning the brass nipples at either end of the top wires and upper ends of lower wires until both horizontal tail surfaces are level laterally and the vertical fin is vertical. It will be necessary to turn the brass nipples with a $^{9}/_{32}$" wrench on the wrench flats. Check that the vertical fin is perpendicular to the horizontal tail using a level.

NOTE

No threads should show on the wire by the jam nut. Make sure the same amount of threads extend into the clevis on opposite ends of the same wire. Also, be sure the clevises are positioned so that there is an equal gap between either side of the bracket and the clevis and ensure the spherical bearing can pivot freely.

Figure 10: Leveling Horizontal Tail

22. Check that wire tensions are within specifications. Start by attaching a 6” ruler to the center of the included straight edge. Clamp the straight edge to the wire clevises on one of the top wires as shown in Figure 11.

Figure 11: Straight Edge Attachment

23. Measure the wire tension by pulling in the center of the wire with a calibrated fish scale. The deflection of the wire should be between $^{7}/_{16}$ inch and $^{9}/_{16}$ inch when the scale reads 10 lbs (±0.5 lbs) as shown in Figure 12. Adjust the wire tension by grasping the wire with vice grips and rotating the brass nipples on the wire. Be sure to protect the wire from the vice grips with the included protective aluminum.

Figure 12: Wire Tension Measurement

24. Once wire tension is set re-check that the tail is still level and true. If the tail is no longer level and true, re-adjust the wires and re-tension. Tighten the jam nuts on the brass nipples. Carefully hold the nipple with a $^{9}/_{32}$ inch wrench while tightening the jam nut to 70-80 inch-lbs with a $^{1}/_{2}$ inch wrench.
25. Verify that no tools were left inside the fuselage and that 1-$^{1}/_{2}$ to 3 wire threads are visible through the nuts inside the fuselage before reinstalling round inspection cover.
26. Verify that all 6 AN320-3 castellated shear nuts are tight and cotter pins have been installed and that the clevis can pivot freely on each bracket. Also, verify the clevises are positioned so that an equal gap exists between the clevis on the forward and aft side of the bracket.
27. Ensure there is no twist in the wire by wiggling each wire and checking that the clevises are not twisted and touching the bracket on both sides. For example, if the clevis is twisted such that the top of the clevis on the top wire is touching the aft side of the horizontal bracket, and the bottom of the clevis is touching the front of the horizontal bracket while the clevis on the other end of the wire is doing the opposite the wire is likely twisted. To correct this twist simply rotate the brass nipple on one end with a 9/32 inch wrench to un-twist the wire. If after wiggling the wire at least one clevis does not come in contact with the bracket the wire is likely not twisted.
28. Verify that all 6 brass nipples have jam nuts that have been tightened to the proper specifications and that no wire threads are exposed along the wire past the jam nut on the brass nipple. It is acceptable for some threads to extend through the brass nipple into the clevis. The threads that do extend through the nipple into the clevis should extend approximately the same amount on opposite ends of the same wire. The wire must extend through the brass nipple and be visible from the clevis side in order to keep the brass nipple from clamping on the wire's threads when the lock nut is tightened.

Figure 13: Acceptable Threading

29. Verify all 4 elevator and 2 rudder hinge pins have cotter pins installed. Move elevators and rudder to ensure they have full, un-obstructed, travel. Ensure the control surfaces do not contact any part of the tail brace wires, clevis, bolts, or brackets.
30. Make an entry in the aircraft's airframe logbook to note compliance with SA0009. This modification has a negligible effect on weight and balance.

CAUTION
When maneuvering the aircraft on the ground, under no circumstances should it be steered or pushed from the tail wires or their attachments.

If you are no longer in possession of this aircraft, please forward this information to the present owner/operator and notify Cub Crafters, Inc. of the address of the current owner to:

Cub Crafters, Inc.

1918 S. 16th Avenue

Yakima, WA 98903

Toll Free Number: (877) 484-7865

or e-mail support@cubcrafters.com

Please include the aircraft registration number, serial number, and the name and address of the current owner/operator.