

210 ELEVATOR. . .

Hello Tom,

Still around flying N9533Y. I need to do something about corrosion in the foam filled trim tab area. Over the past 15 years I have seen numerous communications on the subject but cannot find anything now that I really need it.

Please advise about what to do and where to find the replacement parts. I vaguely remember that Cessna had a replacement kit for this?

Thanks, Guy Charbonnier  
Belgium

Hello Guy,

There is no kit to replace the elevator trailing edge parts and there is no real way to stop the corrosion from progressing without weakening the structure of the elevators. Since the corrosion is on the internal surface of the elevator and trim tab and the foam is bonded to those internal surfaces and is what gives them their strength, removing the foam to remove the corrosion is not really an option.

Replacing the parts is the only way to go to deal with the foam trapping the moisture issue once and for all. By painting the inside of the new trailing edges before they are installed, the corrosion issue in the trailing edges would be something you would not have to worry about again.

You would order the parts individually and the old part numbers will supersede to the rolled trailing edge configuration. For your 1982 T210N the right hand elevator outboard trailing edge is part number 1234660-4, the inboard section is part number 1234660-12. The left hand trailing edge is part number 1234660-3. The trim tab part number is 1234628-1, which was the original number and then was superseded to a 1234665-10 and now is back to the original number again. The way to tell the non-foam filled part is to look at the trailing edge, a riveted trailing edge is foam filled while the rolled edge is the new style.

Once the old elevator trailing edge is removed, installation is done using cherry max rivets. It is not a difficult procedure and should take about 3 hours to do the left elevator and about 2 hours to do the right inboard and outboard small surfaces. About .75 hours to replace the tab. Painting would be additional. When the old trailing edges are removed and new ones installed, the alignment of the trailing edges has to be held as original or flight problems can result. This is standard A&P stuff so if your mechanic does not have sheet metal experience then you should find one who does.

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CLARIFICATION ON ATIS ARTICLE--210 ELEVATOR REPAIR. . .

In the CPA ATIS Vol. 7, Issue 46, Thursday, November 18, 2004 there was question about changing the foam filled trailing edge skins on the elevators on a 210. In my reply was the following statement:

Once the old elevator trailing edge is removed, installation is done using cherry max rivets. It is not a difficult procedure and should take about 3 hours to do the left elevator and about 2 hours to do the right inboard and outboard small surfaces. About .75 hours to replace the tab. Painting would be additional.

I have been contacted by several shops and CPA member who disagree with the times mentioned so I feel clarification is needed. The 3 hours mentioned to replace the left elevator trailing edge and the 2 hours to

do the right elevator trailing edges are good numbers ONCE the old trailing edges are removed. These are not total labor times to complete the job since there are several variables that need to be worked out between the owner of the elevator and the A&P doing the job. Is the plastic elevator tip going to be reused or replaced with the preferred fiberglass unit? Is the fairing end rib still in good shape to accept the fairing or will it need to be replaced due to the Swiss cheese effect from previous fairing installations? Is the elevator attachment hardware being reused or is new hardware being installed? What is the condition of the bonding jumpers and how many static wicks and what type are being replaced? These are some of the details that go into this job along with some others I will mention later that the owner and A&P need to resolve.

For those that have asked to have a more thorough answer on the labor to do that job I checked with several shops and came up with the following rate schedule.

>From the Cessna Labor Allowance Manual, based on new aircraft;  
Elevator, R&R only (each)----- .5 MH, manhour  
Elevator, Replace and Paint----- 3.0 MH  
Elevator, Tip (each) ----- 1.8 MH

>From the real world;  
Elevator R&R----- .8 to 1.5 MH the higher number would be using new hardware and replacing bushings in pivot points.  
Elevator, Replace and Paint----- 3.0 MH is pretty close for standard paint, will be higher for blending of new paint to old paint.  
Elevator, Tip----- 1.0 MH for reusing a good tip with the holes in the rib still in good shape, add .5 to 1.0 MH to fit new tip with good holes in original rib.

Left elevator trailing edge, remove and fit new skin and install with Cherry-max rivets----- 4 MH, installing with solid rivets can be done and looks like original but can increase the labor 3X-4X.

Right elevator trailing edge, inboard section remove and fit----- 2 MH, outboard section remove and fit----- 1 MH  
Trim tab replacement----- .75 MH good hinge pin that slides out, damaged or frozen in place pin increases time.

Check balance of control 2 MH this is required and must be done.

So, start to finish expect to spend at least 10 man hours per elevator. An experienced shop can probably beat those times. Someone doing their first one could take considerably longer. Any extra work for corrosion removal on the interior of the elevator would also be additional man hours. The man hours listed in the Cessna manual are for new aircraft. A 25 year old 1979 210 may need some more man hours during that job to get it back to a good airworthy condition again. Before any work is done ask what will be done and get an estimate. Ask to be advised when additional work is needed that will exceed the original estimate.

Tom Carr, CPA Tech Rep <mailto:tom.carr@cessna.org>

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KIRBY FOAM TABS. . .

Dear Tom,

In reference to your note in the CPA newsletter 11/18/04 about foam filled trim tab area in 210's. We own a 1976 T210L (333GK). How critical is it to change out the foam filled area if it appears stable. The foam does appear a little brittle.

I took the 210 course several years ago and am coming back in January

with my partner in the plane for his first time and as a refresher for me.

Thanks for your great help.  
Bill Kirby CPA member #41062

Bill,

The issue with the foam filled controls is internal corrosion, not the actual condition of the foam. The foam was added in place of metal ribs to give the surface the rigidity needed to hold its shape during flight loads. Breaks in the foam to skin contact allows moisture to collect and that starts the corrosion process. The elevator trailing edge top and bottoms will show signs of what appears to be paint bubbling. When you scrap away the bubble with your thumbnail you see a small hole in the skin. That hole is the corrosion process working from the inside of the skin. The trailing edge skins can tolerate some corrosion, the trim tab cannot. The bracket the actuator attaches to is riveted to the bottom of the elevator trim tab. Those rivets go all the way through the tab, top skin to lower skin. When the center section of the rivets corrode away, the tab bracket pulls away from the tab and it is pretty much a bad day event from that point on if the aircraft is in flight.

On the preflight, that is assuming the pilot looks at the tab and bracket, the heads of the rivets and the bucked ends of the rivets may look fine. With the internal corrosion weakening the rivets, the bracket attachment is compromised. A simple test would be to take a common flat bladed screwdriver and check the rivets for security. By placing the flat edge of the screwdriver blade against the junction point of the rivet head and skin surface and hitting the handle end with the palm of your hand, the rivet integrity can be checked. If you are hurting your hand when you hit the screwdriver handle, you are using more force than necessary. A tap is all that is required. Any movement of the rivet means the structure has be compromised and it is time for a replacement tab. The screwdriver test should be done on the bucked side of the rivet as well. You may chip the paint around the rivets while doing this test but with the foam filled tab, you are on borrowed time anyways since more sooner that later the tab will have to be replaced. With a foam filled tab I would recommend checking the rivets before the first flight on the first of the month time line. Corrosion is not a flight hour accumulation issue but a calendar time issue. Finding the bad rivets on the ground is a lot better than having them fail in flight.  
Tom Carr, CPA Tech Rep <mailto:tom.carr@cessna.org>

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