Date: Tue, 12 Feb 2008 10:55:08 -0800
From: billderou@yahoo.com
Subject: RE: RV10-List: alternate elevator trim settings or twisted tail
To: rv10-list@matronics.com

John-

Talking about nose up/down and elevator trim up/down could be causing the confusion since they move opposite to one another. Its also important to recognize when the positioning is created by the servo end travel or the trim trailing edge.

Another problem causing confusion is communicating in degrees. I do not believe that when Van says "-35 degrees" that this setting can be accurately repeated for X hundred aircraft, nor do I believe that Vans two factory RV-10's are set to -35 degrees. All of my settings and conclusions were drawn from doing the Trig and cutting out accurate triangles. This is also why I specified a vertical 3" of measurement to eliminate the errors.

So - lets take another run at it:

1. Run the trim servo to its end point where the right (starboard) elevator trim tab is full down. Full down is determined by the servo stopping and not the trim tab jamming.

2. Set the trim tab trailing edge to 3" vertically below and normal to the elevator trailing edge.

3. Get someone else to run the trim servo switch and have them slowly raise the right elevator trim tab until it exactly aligns with the elevator trailing edge. This is not the end of the servo run - it is determined by the trailing edges matching.

4. Set the left (port) elevator trim tab trailing edge to align with the elevator trailing edge.

Its very simple and much easier than working with the -35 degree spec for each surface.

I did communicate and was supported by Vans engineering on this subject. However, I believe the priority of the RV-12 got in the way of following this issue to its conclusion.

Bill

John Gonzalez <indigoonlatigo@msn.com> wrote:

> .ExternalClass .EC_hmmessage P {padding:0px;} .ExternalClass EC_body.hmmessage {font-size:10pt;font-family:Tahoma;} Bill,
>
> Thank you for bringing this to my attention. I must have missed the original post,

but from what you have explained, this topic in my opinion is an extremely important one. I will do a personal archive on this.

How many defferent people at Vans did you speak with? "Or was it a simple, well it flys doesn't it, my suggestion, keep flying."

I am not fully understanding your setting suggestions. You say run the right servo to full nose up(Back). Then re-set the tab to 3" below trail. Then you say run the right servo to trail and set the left tab to trail. I ask the question..."If we have run the right servo to full up(Back), then reset the tab 3" below trail, where do we get the movement to run the tab back to trail if we have already gone to full up(servo arm Back) for the initial setting.

Do we need more clarification on which structure we wnat up, down, nose up or nose down??

Thanks,

JOhn G. 409

Date: Mon, 11 Feb 2008 19:51:52 -0800
From: billderou@yahoo.com
Subject: RV10-List: alternate elevator trim settings or twisted tail
To: rv10-list@matronics.com

All:

I have had several requests to repost my elevator trim investigation from December 2006.

Four or five builders have called since the original post asking about my confidence level and other questions and they all said they would follow the measurements below. As I received no feedback my assumption is that all is well. Additionally, the two RV-10's at WVI use the following settings with no issues.

The key idea is load the plane with light people in the rear seats, add approximately 60 lbs of baggage, run the plane up to cruise and look for the twisted condition. Keep this problem as a possibility in your mind until you rule it out.

Bill

I went through this issue with Vans couple of months ago hoping for a plans revision
or service bulletin but those folks seem to be busy in other areas - but
I believe it to be important and want to share my findings.

I setup my elevator tabs per the instructions with both left and right 35 degrees below trail position when the servo is at the full up position. It is possible to meet this spec by making adjustments at the servo end of the cable.

During my first cross country I happened to look back at the tail and saw it was twisted. The elevator counter weight was above the horizontal stablizer on
one side and below on the other. This bothered me more than a little as the forces
would need to be high to cause this twist. I had not noticed this during my test flights because I now had luggage in the back and needed more down trim.
After a lot of measurements I determined that the problem was I followed the instructions. If you begin with both elevator trim surfaces down at exactly 35 degrees the port side will never rise to trail position do to the cam action of the two actuators. Yet, the starboard will rise .75 inch above trail causing the twist.

At a minimum effort, all flying RV-10s should check for this condition. The fix
is easy.

Highly recommend that you set the trim as follows:
1. Run the trim servo to full nose up.
2. Set the starboard trim tab trailing edge to 3 inches below elevator trailing edge.
3. Run the starboard trim tab to trail.
4. Set the port trim tab to trail.

Using these settings you will be able to trim out all pitch forces during final with the CG forward.

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