

Bill Coons FAA Aviation Safety Counselor....Great lakes Region.

On March 20 1990, I installed spacers in my Ercoupe and applied for a field approval. It was approved immediately. A no brainer, they said. The FAA inspector that signed off on the 337 had rebuilt several Coupes and agreed that it was indeed an improvement in safety. That was 17 years ago, and hundreds of Coupe owners have installed them with immediate success.

When the Ercoupes started switching to dual forks on the nose wheel, the wheel size was larger and when the nose went up, the tail went down. Simple logic. When that happened, the apparent specifications changed also. No more was the aircraft sitting level on the ground with the tail 75 inches above the ground. It looked rather anemic.

Worse, the ground handling qualities suffered. With the tail low, the Coupe would try to take off prematurely, and would, if you didn't shove the yoke forward. With the spacers to raise the tail to slightly over 75 inches, you could roll down the runway at any speed, with the yoke at neutral and rotate only when you wanted to. Also, the view over the nose was enhanced.

Landing, especially in a cross wind was improved considerably. When the main wheels touched and the nose was lowered to the ground, the wings took on a very slight negative angle of attack and the Coupe stayed on the ground at any landing speed, refusing to become airborne again, and all this with the yoke in the neutral position. The upwind wing would also stay on the ground better. This has been hashed over in the past so I will not dwell on it, only to say that published techniques apply and the crosswind landings are greatly improved. I might add here, and this is VERY important. The donuts and air pressure in the tires MUST be up to specs or you will be wasting your time, and possibly have it do it all over again at another time..

The spacers are available at Skyport. I had specified 7/16 and that will solve the majority of the cases. You will also receive a copy of the 337.

I know that some are not receptive to using spacers and that is ok. If you have learned to fly your Coupe like that, then so be it, but consider this. On the take off roll the position of the yoke should be neutral. This gives the pilot a full range of up and down available. With a low tail, the resulting down elevator correction, it establishes a new neutral position, and leaves very little, if any, down elevator left for emergencies. Also with the tail low, you are required to hold down elevator just to stay on the ground. Who knows how much??? If you are willing to go to those extremes to make it behave properly then it is up to you. All I can ask is WHY???

The addition of spacers to bring the airplane back to level does nothing to change the specs of the airplane. It only puts the Coupe back in to the original design specifications.

NOTICE

The 337 included was prepared and passed by the FAA in 1990. Almost 17 years ago. It was not a perfect solution but I did the best I could with what information I had. It has been widely accepted for all this time, and you will not have a problem getting it approved for your coupe. It is the legal way to proceed. Be wary of the 10 rise with a 7/16 spacer. It will not be that much, and make sure that the fuselage is level, not negative AOT.

After reading the contents of this packet you will be on your way to having a much safer airplane. Hundreds upon hundreds of coupers have used the formula to bring the tail height up to where it is supposed to be. That is 75 inches or more, depending on whether you have the single or dual fork.

Be advised that if you have the dual fork it will be somewhat higher than 75 inches, probably several inches depending on your airplane.

Take note. If you raise the nose by 1 ½ inches, due to tire size, you just can't automatically raise the tail by that amount. If the wheels were exactly between the nose wheel and the tail, that would be true. But they aren't. If you raised the nose by 1 ½ inches, the tail would drop much more, almost 4 inches

IN ALL CASES, I WOULD RECOMMEND THIS !.

The only way to be absolutely sure of the spacer size is to raise the tail manually so that the strip directly under the window is perfectly level. Make sure that the Coupe is on a perfectly level surface.. Then measure the distance from the tip of the rudder to the ground. Note this figure and substitute it for OTH (optimum or desired tail height) in the formula. This procedure will work for any coupe regardless of wheel size. Complete the formula using this figure and you will have the correct spacer size.

Remember, Your Coupe must be standard and with correct tire pressure. If you have modified it or your donuts are not up to specs, all bets are off because when you eventually replace the donuts, the tail height will be off. Check the donuts first.

This procedure does nothing to the flying characteristics of the aircraft. It merely put the Coupe back into the original design specifications and improves the ground handling capabilities significantly

Good luck

Bill Coons
FAA Safety Counselor

ercoupefly@sbcglobal.net

Ok. Now something has been added to further increase the safety factor.

A formula to calculate the exact width of the spacer for any deviation of tail height.

With a few simple measurements, you will come up with the thickness of the spacer for you own airplane.

SPACER FORMULA.....ADDITION TO 337 FOR RAISING THE TAIL TO 75 INCHES>>>>

B= Dist. (horizontal) from knuckle joint to shock strut attachment.

A= Dist. (horizontal) from knuckle joint to axle.

N= Dist. From nose wheel to main gear.

T= Dist. From main gear to tail.

TH= Tail height.

OTH= Optimum tail height.

Measure the above. A and B are non critical. + or - 1/8 inch.

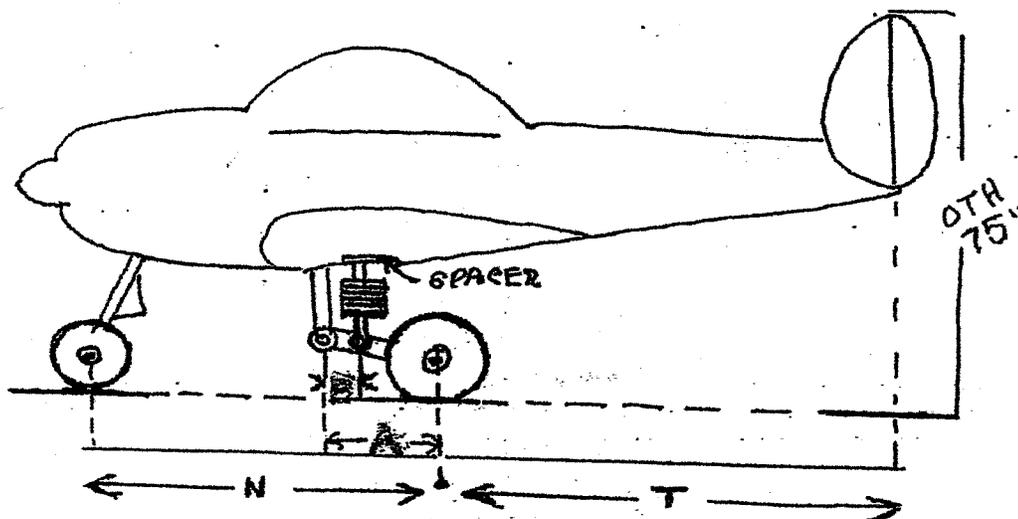
N and T to within 1 inch or so.

Axle moves up and down $\frac{A}{B}$ times as much as the attachment point of the shock strut.

Tail (TH) moves up and down $\frac{N+T}{N}$ times as much as the wheel does.

FORMULA.....

$$\text{SPACER WIDTH } W = \frac{\text{OTH} - \text{TH}}{\frac{A}{B} \times \frac{N+T}{N}}$$



RAISE TAIL (DUAL FORK) SPACERS MLG 2117-87-1
 SS33226-1/-15

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)	Form Approved Budget Bureau No. 04-R060.1
	FOR FAA USE ONLY
	OFFICE IDENTIFICATION

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form.

1. AIRCRAFT	MAKE 1946 ERCOUPF	MODEL 415-D
	SERIAL NO. 2445	NATIONALITY AND REGISTRATION MARK N99822
2. DYKER	NAME (As shown on registration certificate) WILLIAM D. COONS	ADDRESS (As shown on registration certificate) 102 E SUNSET LOMBARD LL 60148

3. FOR FAA USE ONLY

The data identified herein complies with applicable airworthiness requirements and is approved only for the above described aircraft subject to conformity inspection by a person authorized in FAR 43.7.

3-2-90 *Richard D. Mullen*
 Date FAA INSPECTOR AGI--GADO-S

SAMPLE

4. UNIT IDENTIFICATION

UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE	
				REPAIR	ALTERATION
AIRFRAME	***** (As described in item 1 above) *****				✓
POWERPLANT					
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				

6. CONFORMITY STATEMENT

A. AGENCY'S NAME AND ADDRESS STEVEN HUTCHISON 4001 TSPAR KENNESAW, VA 53140	B. KIND OF AGENCY		C. CERTIFICATE NO. 467112034
	<input checked="" type="checkbox"/>	U.S. CERTIFICATED MECHANIC	
	<input type="checkbox"/>	FOREIGN CERTIFICATED MECHANIC	
	<input type="checkbox"/>	CERTIFICATED REPAIR STATION	
<input type="checkbox"/> MANUFACTURER			

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

DATE 3-2-90	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>Steven Hutchison</i> AIP 467112034
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7. APPROVAL FOR RETURN TO SERVICE

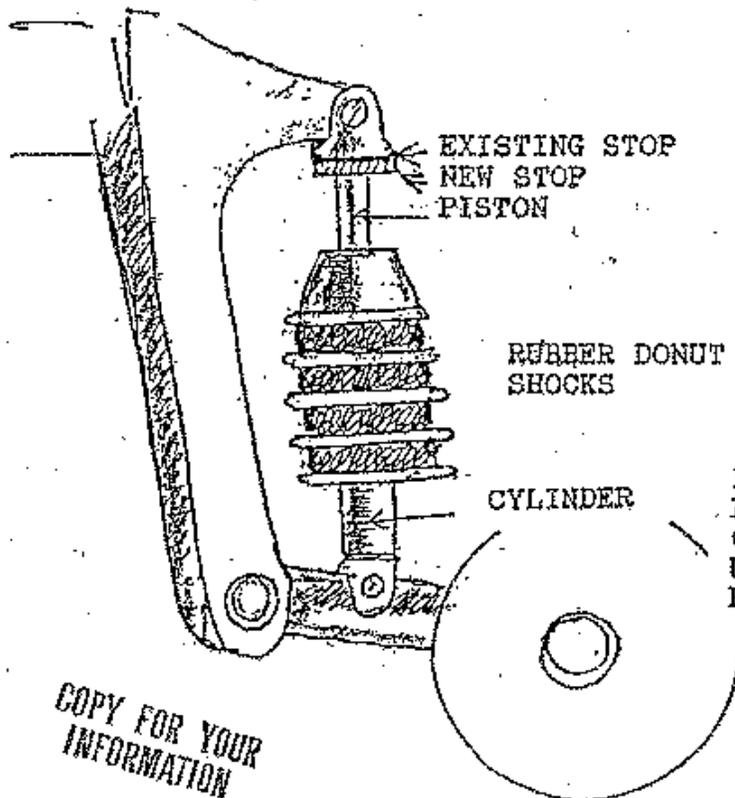
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is APPROVED REJECTED

BY	FAA REP. STANDARDS INSPECTOR	MANUFACTURER	<input checked="" type="checkbox"/>	INSPECTION AUTHORIZATION	OTHER (Specify)
	FAA DESIGNEE	REPAIR STATION	<input type="checkbox"/>	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT	
DATE OF APPROVAL OR REJECTION 3-2-90	CERTIFICATE OR DESIGNATION NO. 387426742	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>Jerry E. Mohlhoff</i> AIP 387426742 IA			

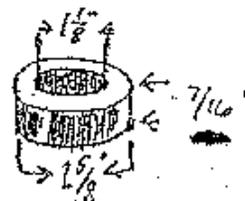
NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED (If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)



THE NEW STOP IS A 7/16
STEEL BUSHING...



REMOVE SHOCK ASSEMBLY AND
PULL THE PISTON OUT OF THE
CYLINDER. SLIDE THE BUSHING
UP OVER THE PISTON AND
REASSEMBLE THE SHOCKS..

1946 ERCOUCPE MODEL-D

MAIN LANDING GEAR....

COPY FOR YOUR
INFORMATION

ERCOUCPE THAT HAVE A DUAL NOSE FORK NOSE GEAR SUFFER FROM A TAIL LOW CONFIGURATION AND THE AIRPLANE SITS ON THE GROUND AT A POSITIVE ANGLE OF ATTACK. THE TAIL SHOULD BE RAISED SO THAT IT IS AT A NEGATIVE ANGLE OF ATTACK. THE ADDITION OF A 7/16 INCH BUSHING AROUND THE PISTON CREATES A NEW STOP WHICH WILL RAISE THE TAIL BY 10 INCHES. THIS ENHANCES THE GROUND HANDLING QUALITIES OF THE AIRPLANE AND PUTS THE ERCOUCPE BACK INTO DESIGN SPECIFICATIONS, AND RESTORES ALL OF THE SAFETY FEATURES THAT THE ERCOUCPE IS FAMOUS FOR. THIS ONLY MODIFIES THE GROUND HANDLING QUALITIES AND DOES NOTHING TO THE FLYING CHARACTERISTICS.

ADDITIONAL SHEETS ARE ATTACHED



US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make Erco	Model 415 C
	Serial No. 959	Nationality and Registration Mark N93636
2. Owner	Name (As shown on registration certificate) Bjorklund Jon T Woelk Cody	Address (As shown on registration certificate) P.O. Box 655 Tribune, Ks. 67879-0655

3. For FAA Use Only

The Data/Information identified herein complies with applicable airworthiness requirements and is approved only for the above described aircraft subject to conformity inspection by a person authorized by FAR 43.7.
 Date: 14 APR 2004
 Signature: *[Signature]*
 FAA Approving Inspector
 ACE-FSDO-07
 Wichita, KS

4. Unit Identification

Unit	Make	Model	Serial No.	5. Type	
				Repair	Alteration
AIRFRAME	(As described in item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

6. Conformity Statement

A. Agency's Name and Address Arnie W. Aeschliman R.R. 1 Box 6b Tribune, Ks. 67879	B. Kind of Agency	C. Certificate No. 513-66-9867
	<input checked="" type="checkbox"/> U.S. Certified Mechanic	
	<input type="checkbox"/> Foreign Certified Mechanic	
	<input type="checkbox"/> Certified Repair Station	
<input type="checkbox"/> Manufacturer		

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Date <u>APR 21, 2004</u>	Signature of Authorized Individual <i>[Signature]</i>
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7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is APPROVED REJECTED

BY	FAA Fit Standards Inspector	Manufacturer	<input checked="" type="checkbox"/> Inspection Authorization	Other (Specify)
	FAA Designee	Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection <u>APR 21 2004</u>	Certificate or Designation No. <u>513-66-9867</u>	Signature of Authorized Individual <i>[Signature]</i>		

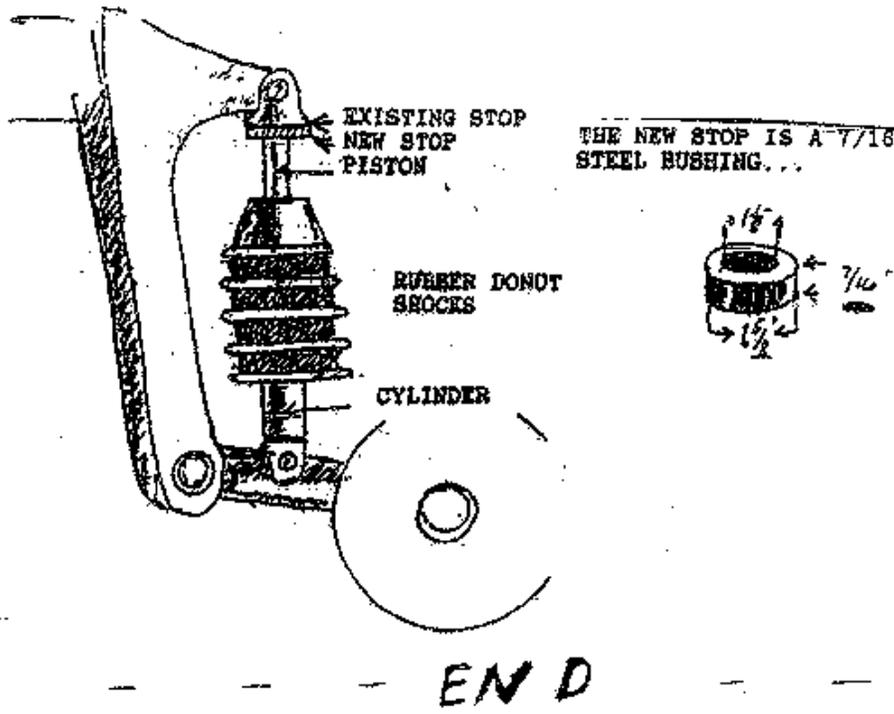
NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

3. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Installed spacers on both left and right main landing gears. Skyport kit smk-84-1 to lift the tail in order to achieve a negative angle of attack as per original Ercoupe design. Work completed in accordance with Skyport installation instructions. Continued airworthiness as per Erco service manual. Weight and balance changed and entered in appropriate aircraft records.



Additional Sheets Are Attached