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SERVICE LETTER / NOTIFICATION – FEB 18 2020

Issue Date
FEB 18 2020, Rev. 1

Subject/Purpose
Nose gear bungee upgrade to Shock Suspension System

Affected Models
Chris Heintz (CH) STOL CH750 SLSA, CH601/CH650 SLSA, CH750 Cruzer, CH750 SD.
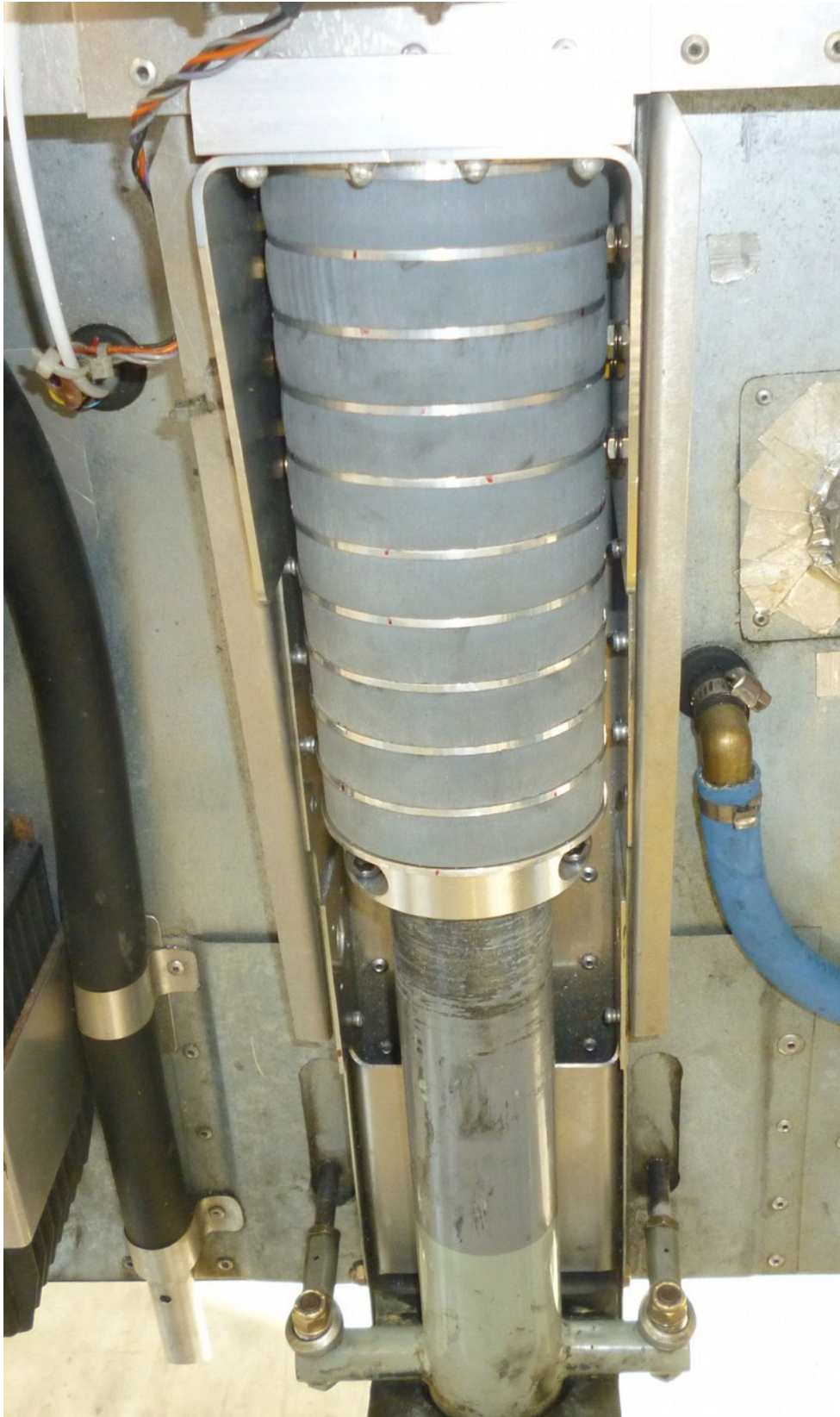
Compliance Time
No Specific time

Inspection Frequency
Annual (on-going)

Background
The original STOL CH750 uses a bungee system for the nose gear strut. Aircraft owners have the option of upgrading to the latest nose gear Shock Suspension System design.
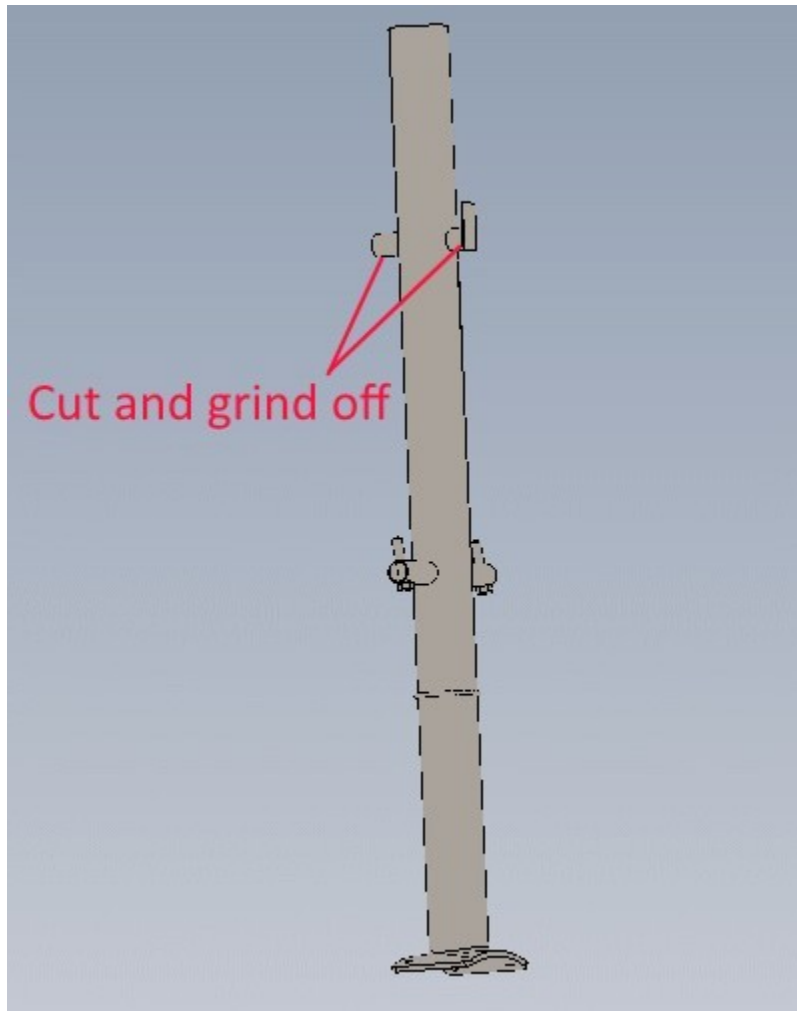
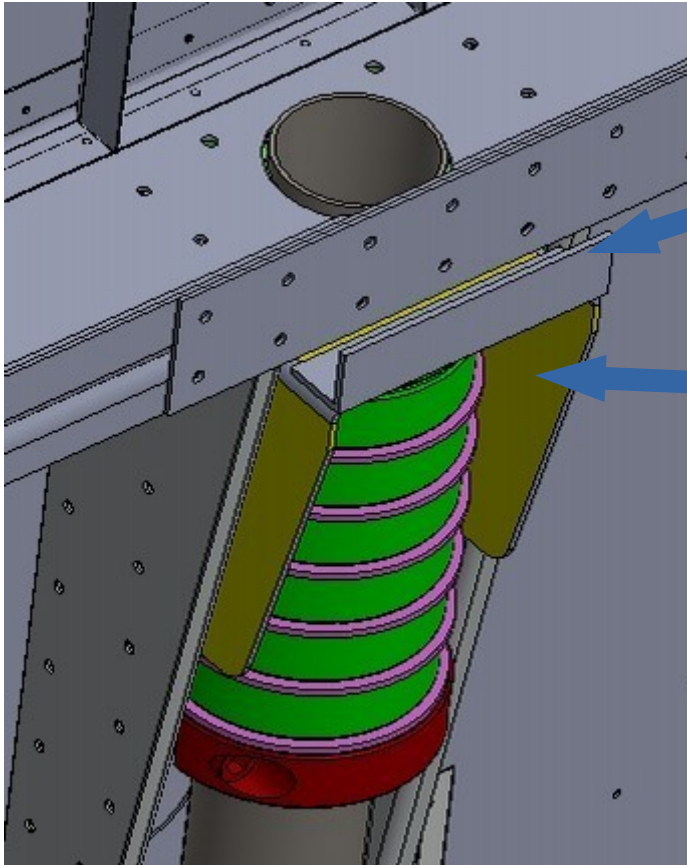Above photo shows a typical installation

Installation

Use the Zenair drawings and the Zenair Construction Standards Manual and or FAA 43.13-2A (Aircraft Inspection and Repair).
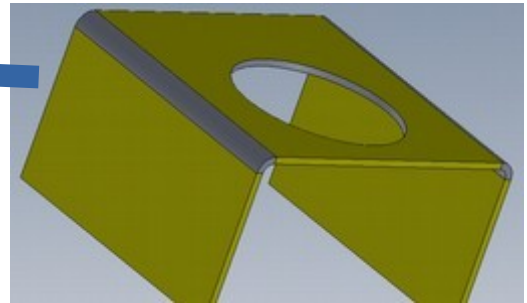
Remove the nose gear strut.
Cut off the Bungee support arms on the gear strut as shown. Grind for a smooth finish, flush with the tube.

Update the firewall with the U channel and other parts

3/4" x 3/4" x 0.090 Extrusion 6061-T6.

BOLT or rivet (A6) the extrusion to the U channel. Bolt the U channel to the existing firewall angles. Use AN bolts and existing holes.

No parts are taken away from the existing assembly. The extrusion and U channel are added .

Install the Zenair supplied rubber shock disk. Add Zenair supplied washers between each.

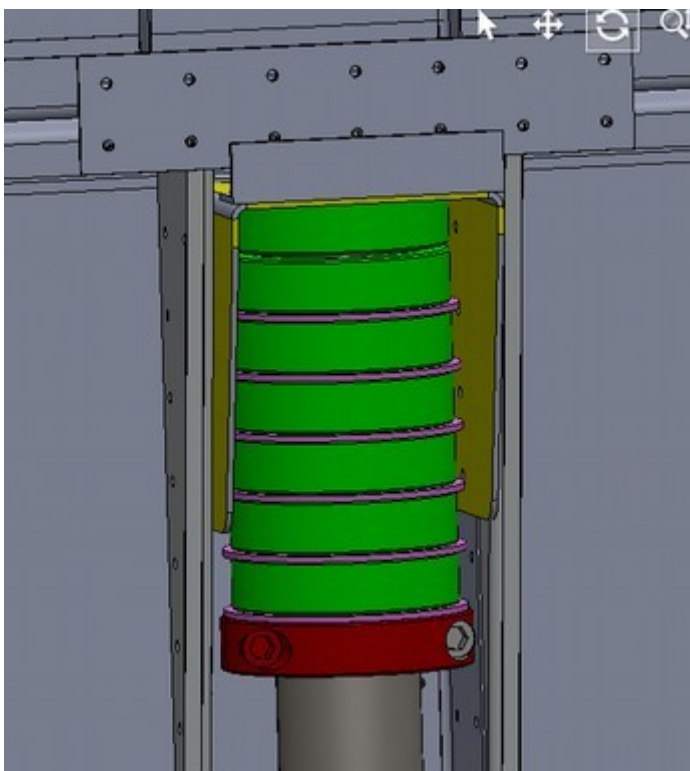Add Zenair supplied clamp to the bottom with washer on top.

Re-install the nose gear strut.

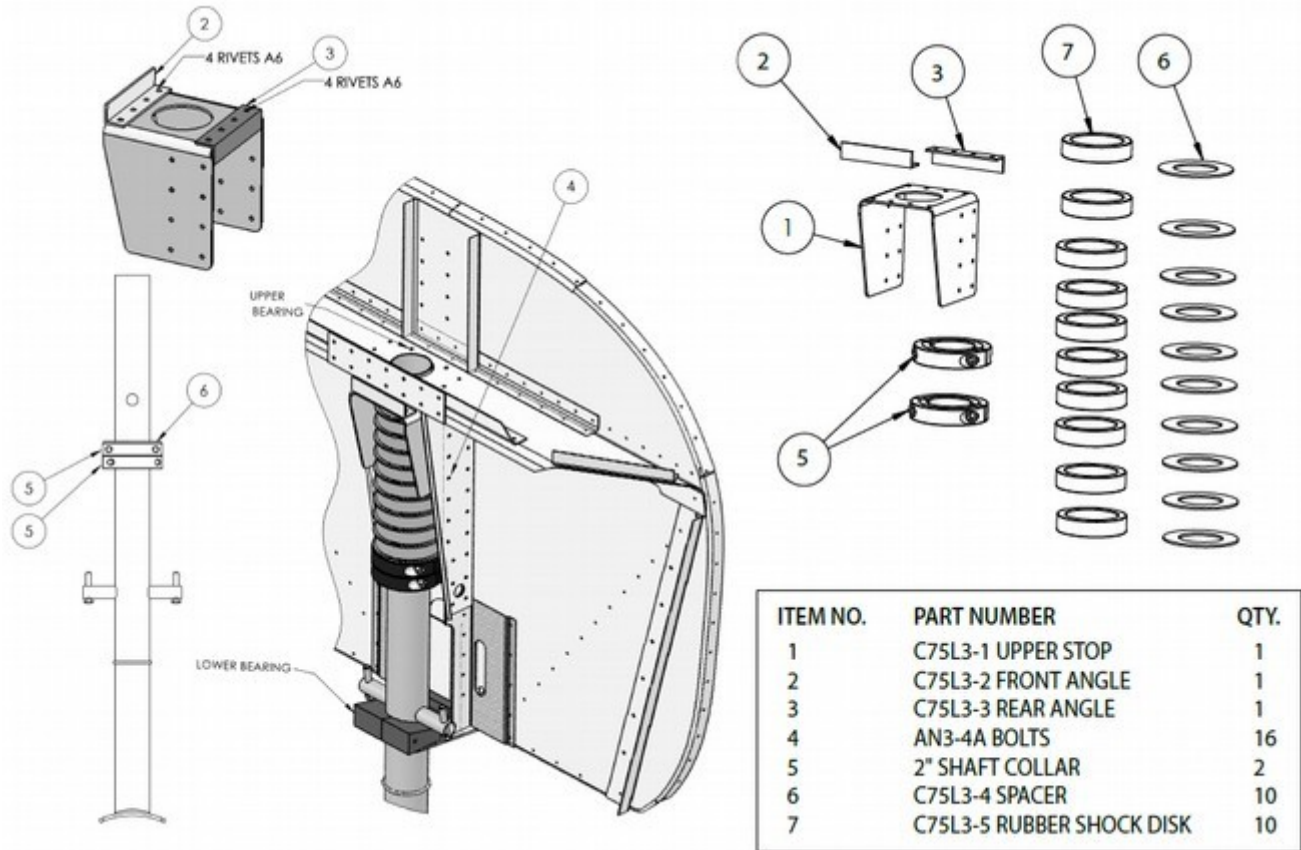Push up on the clamp until the nose gear self centres itself.

Do a detailed inspection of the controls and installation.

View the video for proper installation of the nose gear strut.

Nosewheel-Strut-and-Bungee-Installation
https://youtu.be/bP06iXIa_G8

Parts needed for the upgrade:

ITEM NO.	PART NUMBER	QTY.
1	C75L3-1 UPPER STOP	1
2	C75L3-2 FRONT ANGLE	1
3	C75L3-3 REAR ANGLE	1
4	AN3-4A BOLTS	16
5	2" SHAFT COLLAR	2
6	C75L3-4 SPACER	10
7	C75L3-5 RUBBER SHOCK DISK	10

When installing, use the aircraft assembly blue prints, Design Standards Manual and FAR 43.13-1B & 2B.

 Remember to check www.newplane.com for all the latest service documentation.
For additional information contact Zenair Ltd.

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•**Posted by** John Austin **on September 23, 2018 at 3:05pm in** Open Discussion Forums (non model specific)

Zenith "Donut" Nose Gear Suspension Installation and Testing

At Airventure, I expressed interest in the new Zenith "Donut" nose gear suspension system and Roger recently provided me with a kit to retrofit my STOL 750 so I could provide an early evaluation and testing (Zenith has been testing this in-house for a year). This system will also be available for the Cruzer and the 601/650. The 701 system will follow, but apparently it will need some modifications from this design.

The original bungee system works well, but it does have a single-point failure potential (the bungee!) and apparently the last few years the production process has changed and bungee failures are occurring more frequently. In addition, the bungee is non-adjustable for pre-load and induces some torsional resistance when the nose gear rotates.

My kit arrived Friday and was very complete - the only additional material needed was some white lithium grease to lubricate the area where the donuts are located. A detailed drawing and step-by-step instructions were included (note correction on Page 2 about spacer above last puck). The total weight of the installed parts was 3.5 lbs (this is with one steel collar - the second collar is removed after pre-load adjustment). The bungee and bungee pin removed were 0.5 lbs for a net weight of 3 lbs. Here's what's in the box:

I removed the nose gear by cutting the bungee and detaching the steering rods and lower bearing. I had the stubs that hold the bungee on the upper end of the nose gear cut off and the resultant holes welded shut. (You can modify your own nose gear, send

it to Zenith for modification, or purchase a new nose gear.) I powder coated the lower, exposed portion of the nose gear (not required, but something I had wanted to do the next time the nose gear was off!), painted the area from the steering arms up to 10" from the end of the upper gear leg, and ground and profiled the welds to provide a smooth surface.

I polished the upper exposed 10" with a #80 aluminum oxide abrasive disc backed by a foam pad (so as to conform better to the curvature of the tube). It is important to polish the tube and profile the welds so the donuts can slide smoothly.

The kit includes 10 spacers and 10 rubber "donuts" or pucks that are stacked above the 2 steel shaft collars. I found the spacers and donuts to be a tight fit, so I opened them up slightly with an oscillating spindle sander. The sander removed very little material from the donuts, but easily opened up the spacers so they could slide on the tube without binding. The spacers and donuts are then stacked on the nose gear (start

with a spacer, then a donut, and alternate, finishing with a donut). The rubber donuts fit snugly, but will slide with a little lithium white grease for lubrication (recommended by Roger). I then drilled and riveted the front and rear angles to the upper stop.


These 8 rivets were drilled out in the forward firewall gusset on each side and opened up to #12 holes with the upper stop cleco'd in place.

After deburring and Cortec application, the upper stop is bolted in place with 16 AN-3 bolts - heads inboard and nuts outboard. The nose gear is then reinstalled and the stack is pre-loaded by tightening the lower shaft collar, prying up the upper collar with screwdrivers on each side, and then tightening the upper collar. I then loosened the lower collar, moved it up, and repeated the process for a total compression of between 3/8"-1/2". Some pre-load is necessary to permit the self-centering of the nose gear in the lower bearing.
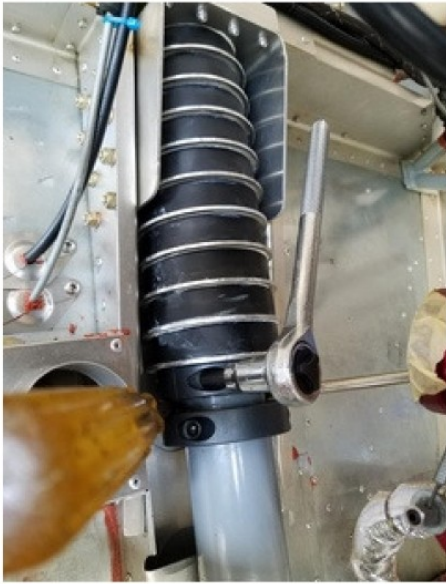
Apparently I got the pre-load about right - when the aircraft sat back down on the nose gear, the steering arms rode approximately 5-6 mm above the bearing block, allowing for easy ground steering. As I mentioned earlier, once the pre-load is adjusted, the second steel collar can be removed. (One is sufficient and they weigh 1/2 lb each!) Zenith will eventually have an adjustable tool to adjust the pre-load and the second collar will no longer be necessary at all. With one shaft collar, Roger recommends Loctite on the securing machine screws.

My original bungee system worked great. It was smooth and I couldn't even detect the self-centering "notch" as I swung the rudder from one side to the other. (IMHO, most rudder smoothness problems are due to over-tensioning the cables.) However, I was amazed at the difference after installing the new "donut" system! The suspension feels more compliant and is quieter. Steering effort on the ground was reduced and in the air, the rudder pedals were extremely light. However, when the rudder was centered, it seemed to hold it's position well. The best way I can explain the

difference in "feel" is it is similar to the difference between manual steering and power steering - it feels like the nose gear is turning on ball bearings - there is absolutely *no* torsional resistance! I always felt my finger-tip dual stick forces were much lighter than my rudder, and now they are equally light. After flight testing and bumping along on a turf strip, I checked the bearing marks on the grease on the strut below the bearing and it appears the gear was deflecting about an inch during landing and taxi, which is fairly similar to what I saw with the bungee.

About the only negative is the additional weight over the bungee, but that's a small penalty to pay for eliminating the potential single-point failure of the bungee and eliminating regular bungee replacements. It was a fairly easy retrofit since the Jabiru is a light engine and there is plenty of working room between the engine and firewall. I understand Zenith is going to make this system standard with new kits.

John

N750A

(Disclaimer: No business or financial affiliation with Zenith Aircraft.)