

Spring Gear conversion for Zodiac CH601HDS



Old Factory Gear with wheel pants



With new Grove Spring Gear

Make: Zenair
Model: Ch601HDS
SN: 6-3506
Reg # N56BJ

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Reason for Conversion

There had been several reported main gear tube weld failures on the 601HD and 601HDS models. The original 2 inch gear tube had a factory welded 1/8 inch bottom plate that the wheel fork attached to. This 1/8 plate was not strong enough in some cases and the weld was cracking or the 2 inch tube was cutting thru the thin plate. Zenair has replaced this bottom plate with a stronger 3/16" plate and has recommended that owners remove and replace the older gear with the newer beefed up gear legs.

In my case, I decided to replace my main gear with the newer Grove Aluminum Spring Gear that Zenair is now using on their newer 601XL model. In doing so, the following document shows what was required to do the conversion.

A new Weight & Balance must be completed after this conversion. In my case the new gear and brackets weighed in at 11 pounds more than the old for a new empty weight of 658 pounds.

After the conversion was complete, many high speed taxi test were completed, along with several lift offs and short touch downs with inspections after each. So far the new spring gear is a much better feel with much better braking power than the old factory gear.

Disclaimer:

The following document shows how I converted the factory landing gear to the aluminum Grove Spring Gear. Note: this document is for information purposes only, and is not intended as instructions for anyone else. Your airplane is built and weights in different than mine, so you may need to consider a different mounting system.

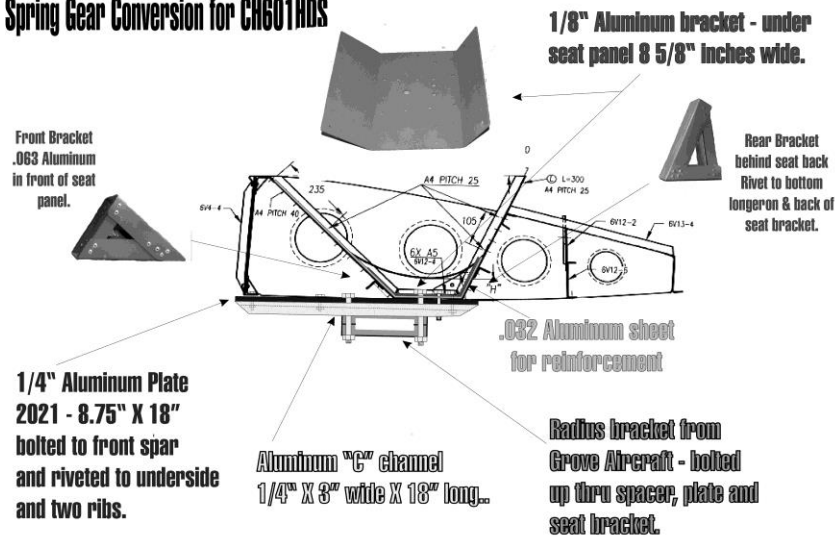
Again, this document shows how the conversion was done on my aircraft, and should only be used for informational purposes only.

Getting Started

You would not necessarily have to remove the wings to make the conversion. It just so happened that I did not have a hanger at the time and had to flat bed my plane home to my garage/workshop. So you could keep the wings on if you have enough room.

The first thing is to get under the seat panel to the floor of the fuselage. Remove the seats and seat backs to get down to the seat panels. I had to drill out the rivets to the seat bottoms, part number 6-V-12-8. This allows access to the bottom of the fuselage in which a bottom 1/8 inch aluminum bracket will be placed to help distribute the force and secure the bottom fuselage bracket under the fuselage. See the drawing on the next page which indicates the location of the reinforcement brackets.

Spring Gear Conversion for CH601HDS



NOTE: DRAWING NOT TO SCALE

Note: When positioning Radius block, the center of axle in new spring gear should be located 26.5 inches back from Leading Edge of Wing Root.

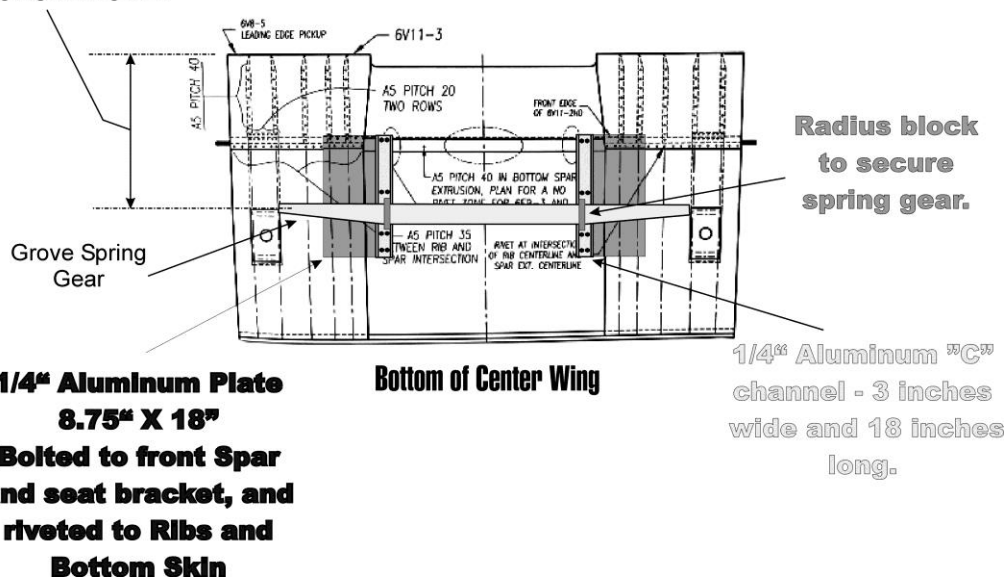
Under the fuselage I used a ¼ inch (2024) aluminum plate 8 ¾ inches wide by 18 inches long. The purpose of the plate was to help distribute the landing force outward across the seat floor, wing spar, and the first two inboard ribs on the bottom of the Center Wing.

Then I attached a ¼ inch thick by 3 inches wide “C” channel (6061) Aluminum that was also bolted up thru the ¼ inch plate. I cut the flanges down on the “C” channel to clear the Grove Radius gear mounting blocks.

Spring Gear conversion for CH601HDS

Note: Drawing not to scale

Note: When positioning center line of axle, it should be 26.5 inches back from Leading Edge of Wing Root.



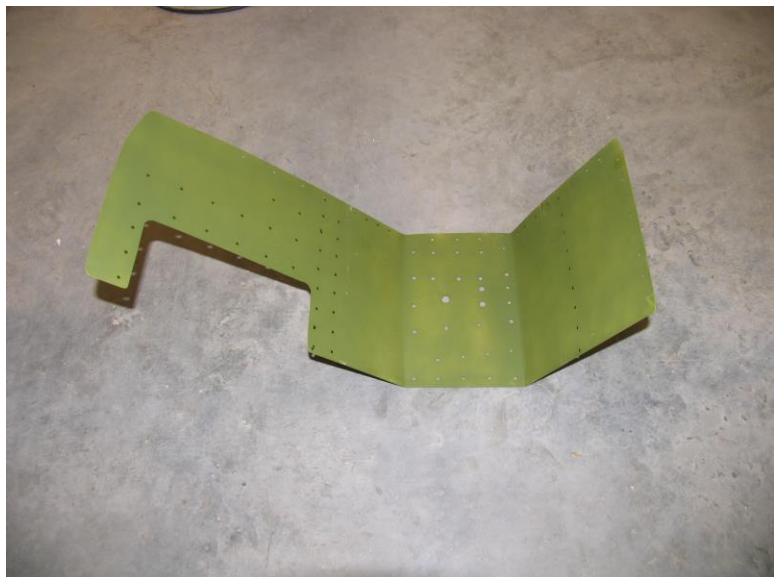


This photo shows the ¼ inch aluminum (2024) plate and the ¼" x 3 inch wide "C" channel, and how the Grove radius blocks are attached. The radius blocks are supplied by Grove Aircraft for proper mounting of the spring gear. This radius block allows the aluminum gear to have more spring movement.

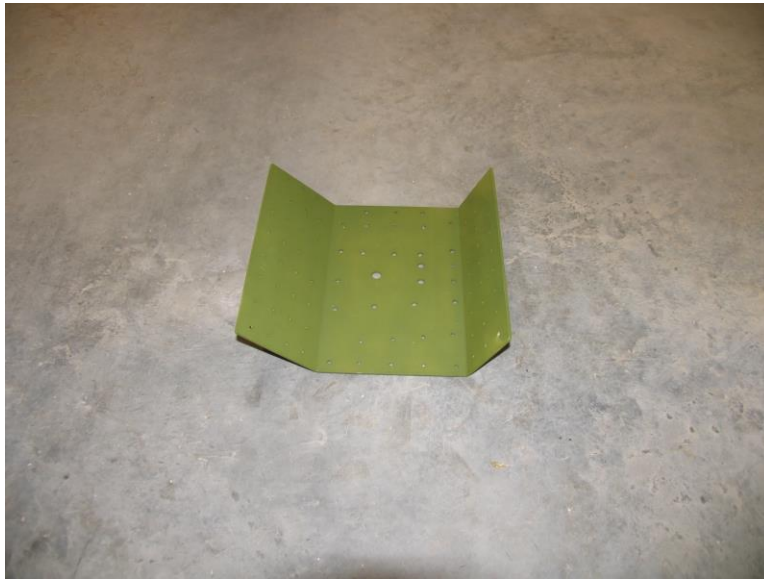
Note: the ¼ "plate is riveted thru the first two inboard ribs of the center wing and spar. Also the plate and the "C" channel is bolted up thru the bottom into the mounting brackets under the seats. The rivets are both Avex 3/16 inch and Cherry Max. Note: when using the Cherry Max rivets, you must use a Cherry Max rivet gauge to make sure you have the right size (length) rivet. You will be using different length rivets because you will be going up thru the two ribs and other times up thru the reinforcement brackets, so there is different thickness.

Under Seat Brackets

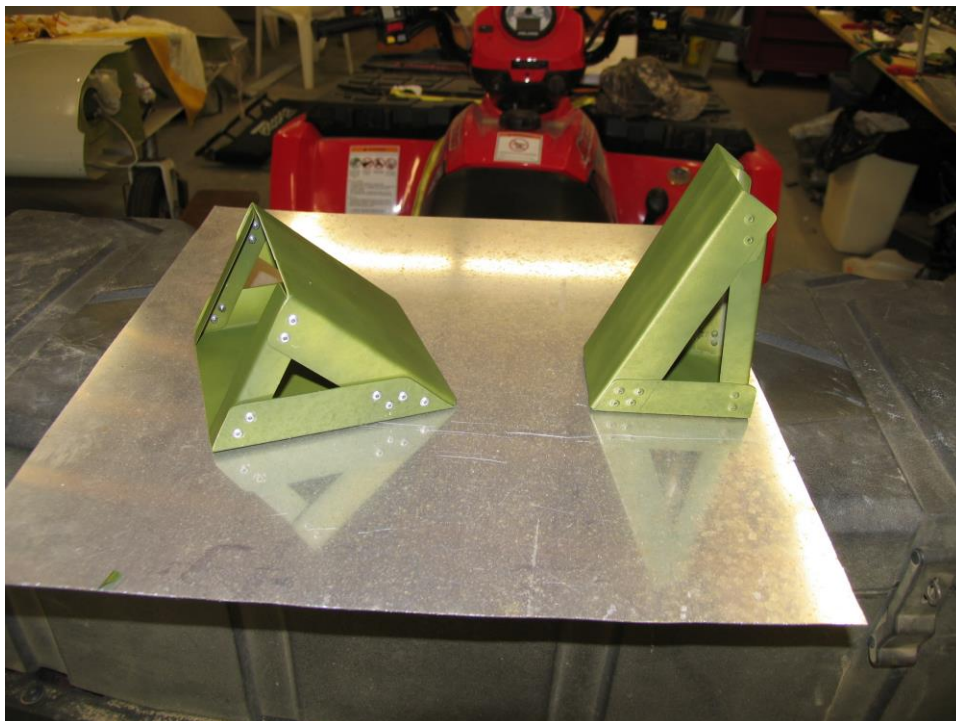
I first bent and formed a sheet of .032 Aluminum to match the angles underneath where the seat pan is located.. This was to add a little more strength. Note the cut out for access to front part under seat. This access is also for my fuel lines and transfer pump.



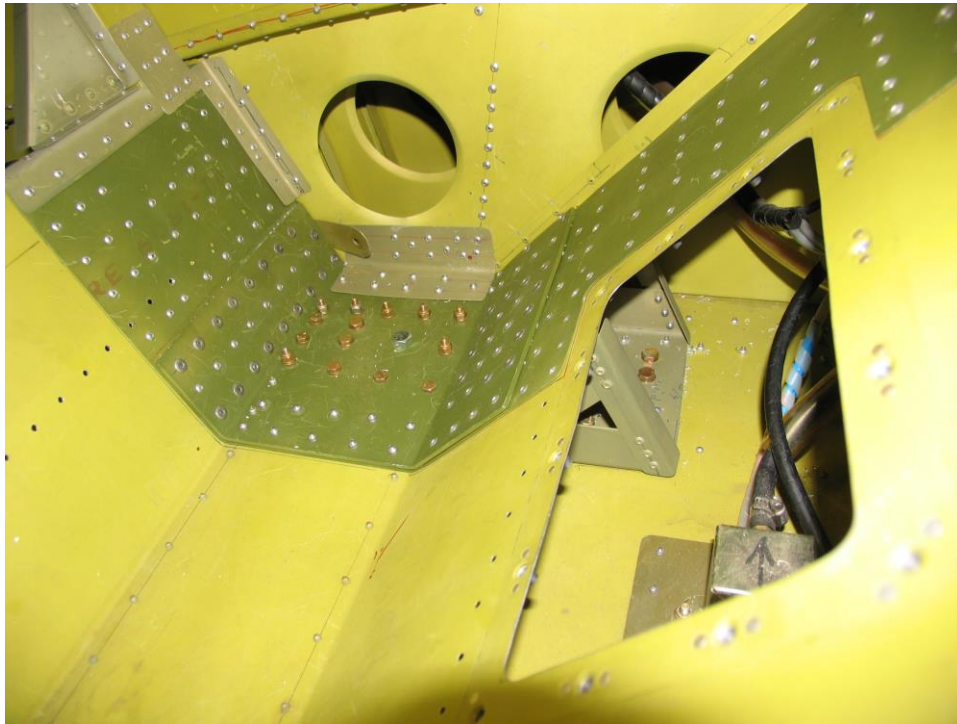
On top of the .032 Aluminum sheet bracket went the 1/8 inch (6061) Aluminum. This took a couple of tries with the bending brake to get the perfect angles and the proper fit. This 1/8" plate was 12" X 12". Reference your plans page 6-V-12-1 that indicates the approximate bend angles for the seat panel.



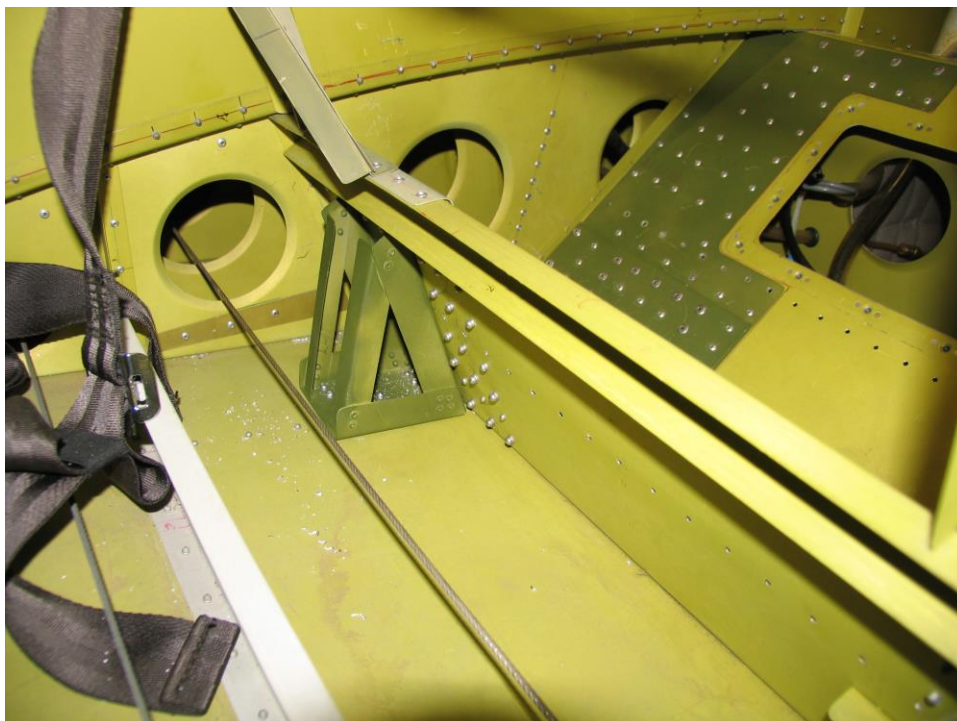
I also made two reinforcement brackets out of .063 Aluminum. One went under front of seat (just behind the spare) and one behind the seat back. Both brackets were attached to the bottom longeron and riveted into the 1/8 inch bracket.



The photo below shows the brackets in place. Note that the Grove Spring Gear mounting bolts, has one 3/8 inch bolt up thru and into the front angle bracket, and the rear mounting bolt comes up thru the bottom seat bracket. I also used “L” angles to help reinforce the side rib and where it attaches to the brackets, along with installing a “L” angle on the back side of the 1st inside rib.

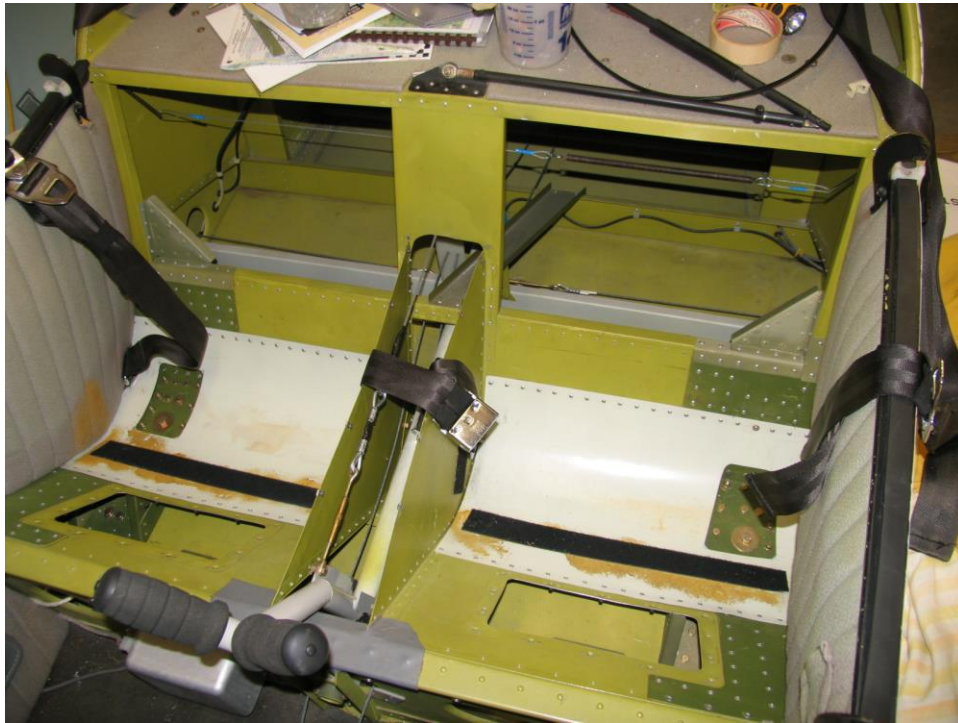


This photo shows the rear angle bracket behind the seat back. Again, both these angle brackets are riveted into the bottom seat brackets and bolted or riveted into the bottom longeron.



Note: Before riveting all these brackets, you should already have the underside bottom plates installed and then install the bolts to help draw up any tension. After tighten the bolts then all the rivet lines can be drilled and riveted. I used a combination of Avex 3/8 inch rivets and Cherry Max rivets thru the brackets.

Once the gear is bolted up thru brackets, the seat bottom 6-V-12-8 can be re-installed. Note I cut out access holes to access the mounting bolts.



The photo below is N56BJ setting on its new spring gear.



