Robart Strut Modification

By:
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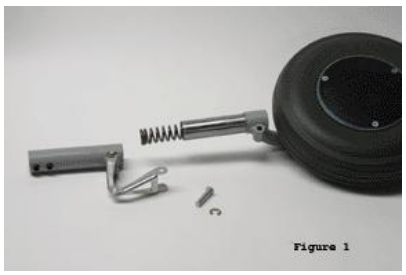
Robart shock absorbing struts are a nice addition to scale airplanes that need that little extra cushion upon landing to protect the structure of the airframe. Besides, Robart makes struts that are scale replicas for most military and civilian aircraft that are popular kits today. One notable example is the Dynaflite PT-19, large (approximate) scale model of a WW II Primary Trainer which was a popular kit before it was discontinued a year or so ago.

I built a PT-19 a couple years back, and I have not been able to make a decent three-point landing without a severe bounce.... until recently. The cause of the 'ground avoiding' airplane was stiff legs; Robart shock-absorbing landing gear struts that didn't absorb shock, and hard foam wheels, which offered little help.

The first step to a cure for this was the installation of DuBro pneumatic wheels to replace the hard foam ones originally installed. In subsequent flights, a respectable three-point landing could be made with just a slight tendency to bounce if the main wheels touched first. Then I discovered with the help of Eric Swaney , that the Robart struts could be modified simply to reduce their stiffness. This involves disassembling the strut to get at and shorten the spring inside which provides the shock absorbing medium.

First, you need to determine how stiff the strut should be for a particular airplane. Then by trial and error, remove part of the spring, a little at a time, until the desired stiffness is achieved. A bathroom scale comes in handy for this, and here's how.



Take the total weight of the airplane, and multiply by 1.5. That's how much each strut should support when fully collapsed. Determine that by pressing the wheel against the bathroom scale and noting the reading when the strut reaches full compression. This permits a 1.5 G landing on one wheel with one gear taking the full burden.

Now, looking at the pictures, figure 1 shows where to remove the clip ring to release the strut pin and open the strut.

Above: Robart struts mounted to Jim Taylor's PT-17

Left: Robart strut (PT-19 model) modified and ready for assembly

Next, the spring exposed at full length is removed, and a small section is cut off with a Dremel cut-off disk (figure 2) . Reassemble the strut, and test on the scale again. Save the pieces removed, say, one ring of the spring at a time. If more spring needs to be

removed, repeat the process until the depression force equals 1.5 times the airplane weight.

When you reach the correct spring length, disassemble the second strut and remove exactly the same amount of spring, and reassemble it. Now both struts will support a 3 G landing and still give some cushioning. Removing more spring just allows the strut to bottom on a softer landing, and may be desirable in some cases; we leave that choice to you.

The addition of DuBro pneumatic version of wheels and the strut modification made the whole difference in allowing scale-like three-point landings without a dangerous bounce at stall speed near the ground. Give it a try, if you are using Robart struts, and we think you will be pleased. Obviously, Robart designs their struts with enough spring-rate to handle the heaviest airplane which might use that strut, so modification is not an unusual option.