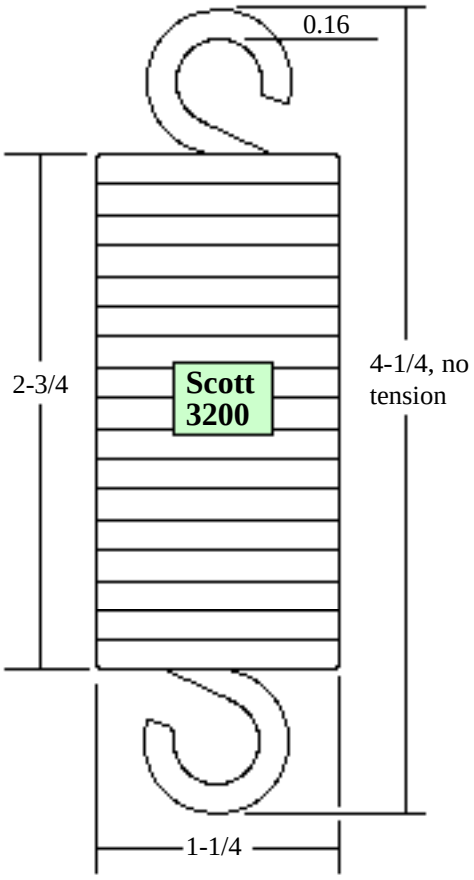
Tailwheel Steering Springs for the Scott 3200 and the Scott 3-24B = 2000

There is a lot of confusion as to which steering spring set is to be used along with which Scott tailwheel. These pictures and measured numbers will assist defining them.

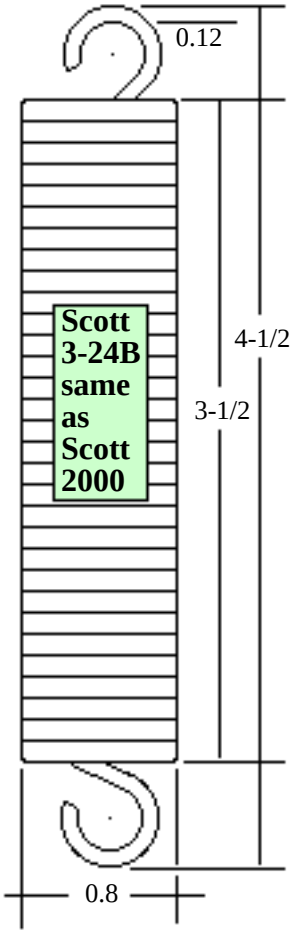
The Scott 3-24B, now identified as the Scott 2000 model, was a six inch hard rubber-tired unit which should have the smaller steering set as illustrated here, and the steering spring set for the 8-inch pneumatic-tired Scott 3200 is also illustrated side by side with the smaller set so that the differences are more real than projected by a tiny image in a catalog.

This sketch is an approximation of the correct steering spring for the Scott 3200 tailwheel. The dims noted are confirmed by a comparison with the white card, the three inch side of the 3 X 5 inch card held next to the spring. The wire diameter of the correct steering springs is 0.158" for the 3200. The main body of the spring is 2-3/4, not stretched, with the attachment loops extending from that.

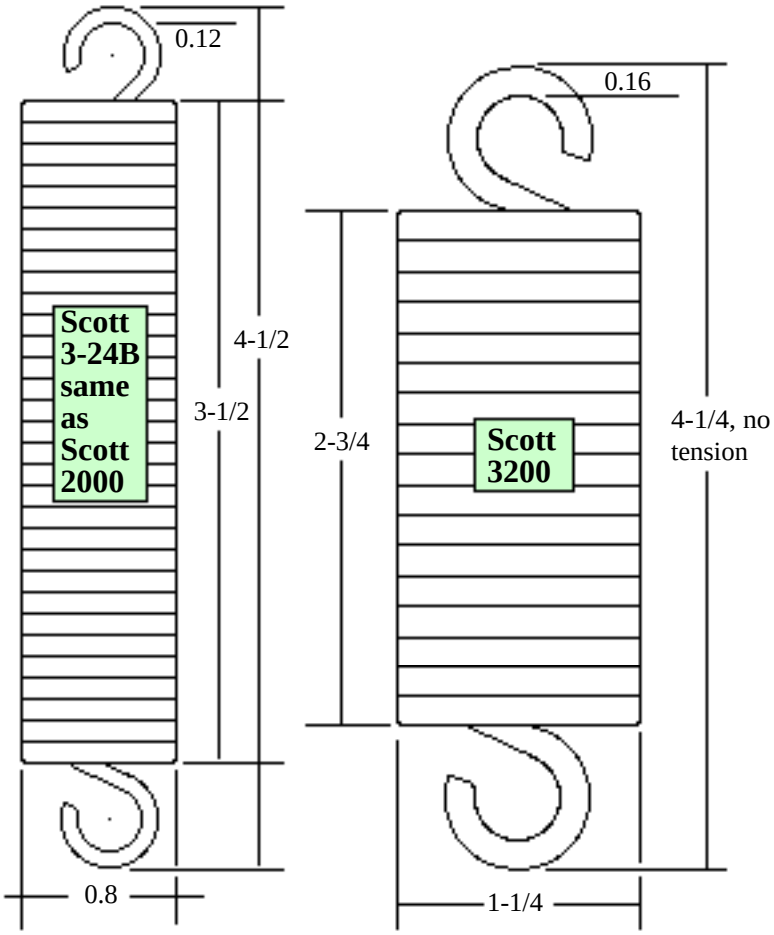


On the last page are pictures of other springs used with the Scott 3200 on other airplanes. It is suggestive of the esteem in which the Scott 3200 tailwheel is held to see them mounted on a fairly new Maule airplane. The Maule asymmetrical steering springs pictures are there, too.

The spring intended for the Scott 3-24B which is the same today as the Scott 2000. On the small springs which should be on the 2000 tailwheel, the wire diameter is very close to 0.12, the main coil diameter is 0.8, and the body of the spring is 3.5 inches long. 4-1/2 end to end. The 3-24B tailwheel is supposed to have a tension of about 25 lbs by stretching the spring an inch. This one has only a tiny tension.



On the next page, the two different springs are presented side by side. If printed, the images will be quite close to actual.



Steering Spring Sets for the 3200 and 2000 (3-24B) Tailwheels

The proper tension-type steering springs for the Scott 2000 wheels (originally the Scott 3-24B set) are the Scott 2134 part number, and those are part of the 2151 "universal" (that word gets us in more trouble because it is so often misused, as here) kit from Scott. The 2151 kit contains the 2134 springs, the 2133 links and chain. Here is what the original Scott I-115 bulletin from Scott says about the hard rubber tired six inch 3-24B/2000 set: cut off enough chain links from each connector chain to stretch the spring (the correct one!!!) about an inch and that will produce a tension of approximately 25 to 30 pounds. Make sure the length/tension is the same on both sides. Spruce, in 2005, lists the 2151 kit, but they do so on the Maule page, not on the Scott page, and do not note that they are for the Scott 2000. This smaller spring set should NOT be used with the Scott 3200 system.

Every issue of the catalogs seems different so use caution. Spruce left out the correct springs for the Scott 3200 tailwheel for a couple years but now list the 3239 kit (includes chain and ends) in 2005 in the Cessna section.

Catalogs also list the "compression" type springs with the inference that they will make shimmying less likely. Maybe they do for the Maule, but Scott tailwheels should not be used with them, both because they are weaker than the recommended size for the 3200 and because the two springs of the compression spring sets have different spring force ratios. In

the air, the stronger of the two gives you an off-center tailwheel, creating “a secondary trim tab” which will make you think the plane is mis-rigged. The Model 2000 tailwheels should have the tension noted in its installation notes and the Model 3200 is to have no tension on the steering springs/chain, just take up the slack. The spring set meant for the pneumatic 8 inch 3200 tailwheel should not be used on the hard rubber 2000 tailwheel.

Use the Scott part numbers when you order, not the hype and go elsewhere if the seller does not explicitly state the Scott part numbers.

Neal Nov ‘05 filed as Tailwheel steering springs

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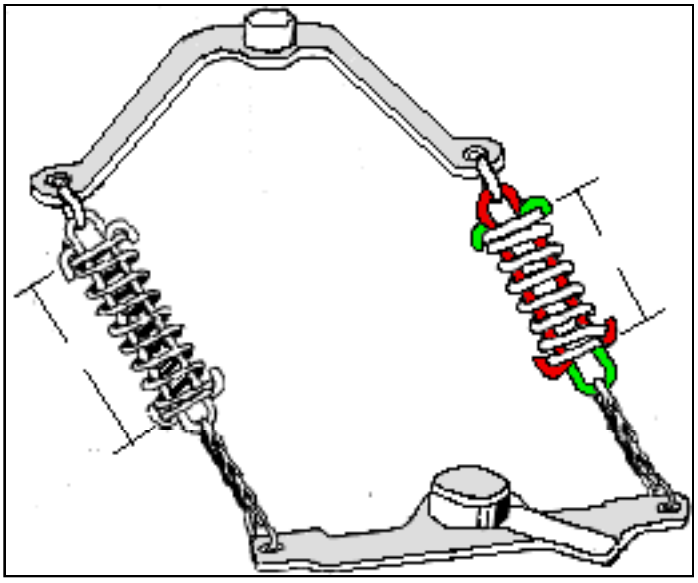
Do NOT use the springs for the Maule. They are asymmetrical in strength and will give weird results, including a second rudder trim tab effect. They are often misrepresented as to their attributes and capabilities. What no one states is that compression springs are the same as tension springs with respect to the force created up until the compression springs become “solids” when compressed to the point that each spring loop hits the next loop. This means that after a relatively short compression movement, the now “solid” non-springs are putting direct, not spring, tension on the rudder horn and on the chain and tethers and the rudder cable. Restated: the tension type springs lengthen as they transfer tension to the tailwheel; compression type springs apply tension to the tailwheel until the compression springs become “solid” and stress the rudder horn and the tailwheel.



Maule installation of compressible springs on a Maule plane. The left is a little longer and the right is made of wire of greater diameter. The asymmetry of the strengths of the springs is to upset the natural frequency of the combination which leads to shimmying. The red indicates that the pull up compresses the bottom end of the spring and the pull on the green compresses the top end of the spring. Note that, once the loops of the spring come together, the compressed spring is a solid and the forces on the arm and tailwheel arm are direct.

Citabria with a Scott 3200 tailwheel.

Maule with a Scott 3200 and Maule compressible type steering springs. In this picture, it is easier to see that the two compressing elements pass through the center of the spring at about 90 degrees from each other. Barely perceptible is that the wire of one spring is slightly larger than the other.