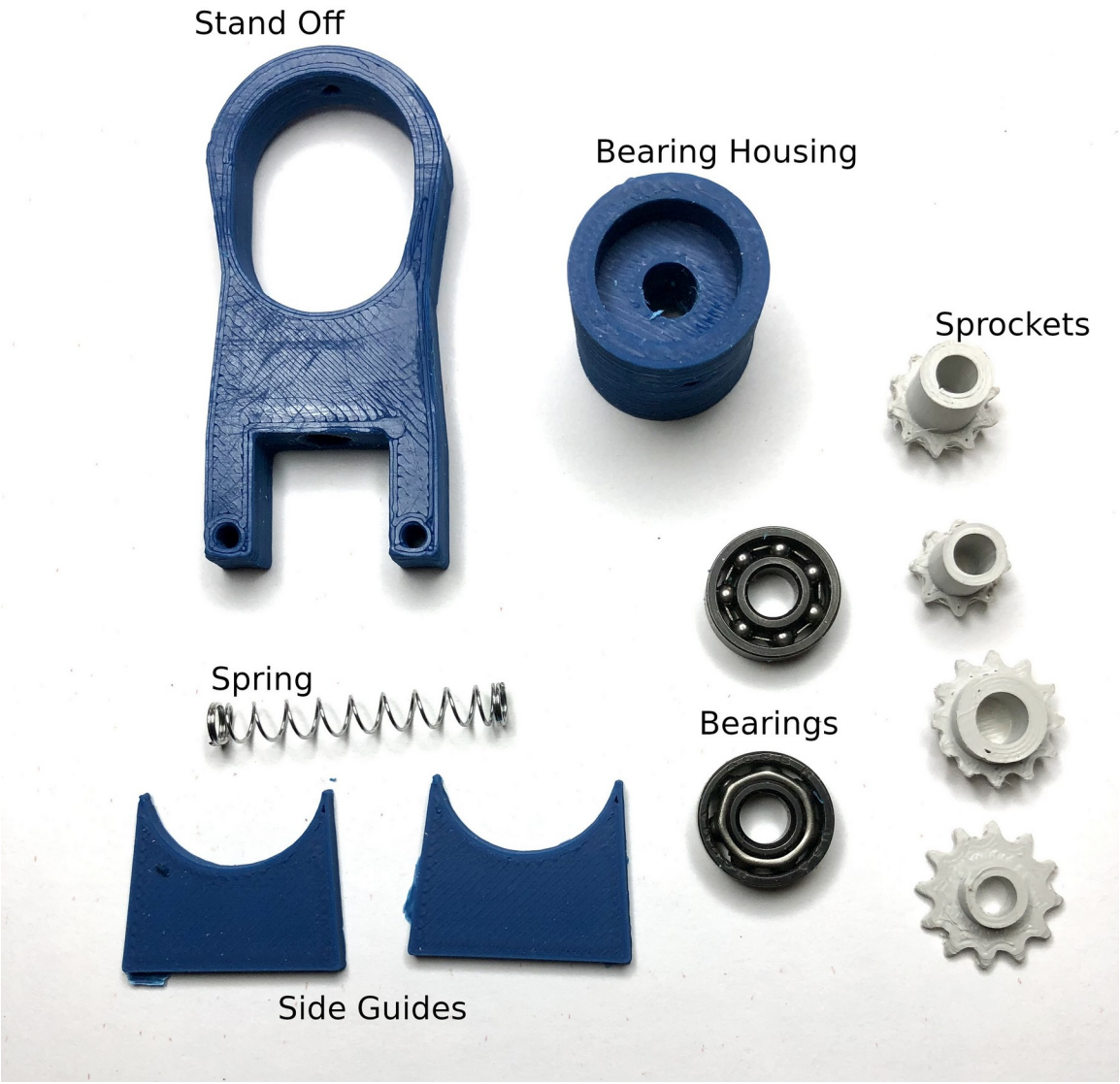
Instructions For:

All Nation’s Weaver Chain Drive Spring Loaded Tensioner Replacement Kit PN#517ANK

This kit is a replacement for the Weaver tower chain drive. The 3D printed tower parts may require cleanup of build material and brim that supports the part on the build plate when printed. This brief set of instructions is meant to complement the instructional video which can be viewed at www.AllNationLine.com under **Instructional Videos.**



The replacement comes in 3 basic, separately 3D Printed parts with a bit of additional engineering to make this a more precise installation.

Part 1 is the drive shaft barrel to house the original 3/16″ diameter drive shaft with 2 heavy duty ball bearings, one on the front and the other on the back to support the shaft.

Part 2 is the standoff, a semi-equivalent of the original that mounts with 2 screws to the gear box housing. The big difference is, a printed solid piece that contains the loaded spring that is essentially the same type of spring found in a ball point pen. The standoff is an elongated loop to house Part 1 allowing for the up and down motion as the spring seats into the bottom of the bearing housing. This implementation makes it easier to install the chain allowing for the vertical adjustment.

Part 3, 2 face plates or guide sides that glue to the bottom of Part 1 on both sides such that they slide against Part 2 maintaining the horizontal position of part 1 in the vertical movement. These 4 parts are printed in ABS. Part 1 can be depressed slightly to install the chain and released so that the spring keeps adequate tension to remove any slack.

The peak or highest position is set so that the vertical center distance of the top and bottom drive shaft is 33mm and the original chain measures 4″ long when laid out linear on the bench. The original sprockets were 8 teeth on the top and 12 on the bottom. Now those can be changed if one wants a 1:1 ratio we include a 12 tooth sprockets top and bottom or a 10 tooth sprocket for the top. Note that the diameter of the bottom drive shaft is larger than the top. Obviously, if one goes with different sprockets, the length of the chain will vary.

When installing the replacement, the top of the loop on Part 2 has a small hole as well as the bearing housing for alignment purposes. However, the modeler may elect to use a 0-90 for alignment and an 0-80 or 2-56 screw, tap the bearing housing not only for alignment but also for securing it once it naturally takes up the correct tension on the chain. If desired, a stronger spring may be substituted or the spring can be further compressed by plugging the hole from the bottom forcing it against the bearing housing with more compression. The vertical travel allowed by the spring is about 6mm and ideally on my model I removed 1 link in the chain and used the 2-56 screw to draw it ever so slightly taut.

Helpful Hints

Ball Bearing Housing

The housing for the ball bearings on the one end may be filled with support material that will need to be cleaned out before inserting the bearing into the housing. This end of the housing should be facing the end of the upper drive shaft that has the snap ring. The snap ring does not need to be removed for this installation.

Ball Bearings

The bearings are a very close fit, tolerance wise, and should be snug enough so as not to require gluing. However, sometimes printed parts may shrink slightly after printing, thus do not be surprised if you need to take a small stone in your Dremel to burnish out the inside diameter.

Disassembling Old Weaver Tower

When disassembling the old weaver tower, the tower can be discarded; however, you will want to reuse the other parts such as the drive shafts. The upper drive shaft has a knurl on the end that has been press fit to the universal coming from the motor shaft. Once the knurl is pulled off and you have the drive shaft in hand, check for any burs. In fact, you may want to polish it with some oiled wet/dry sand paper of fine grit.

Ball Bearings and the Shaft

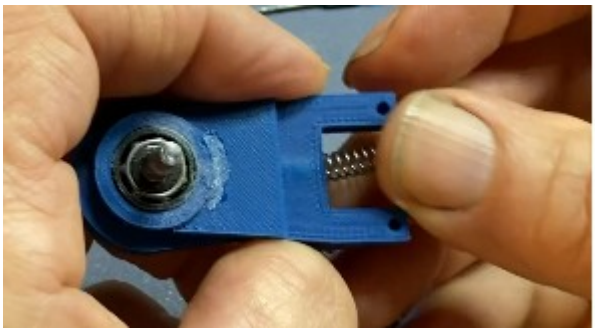
Test that the ball bearings slide onto the shaft. The shaft measures 3/16” for which the ball bearing Inside Dimension (ID) of the inner ring ideally should engage the shaft and not rotate on the shaft. The bearings in the cage should rotate in the race. Note however, that both the inner ring and the shaft tolerances may be +/– 1 or 2 thousand from one model to the next, which is not within our control. Consequently, the modeler will have to feel their way and test for optional fit.

In any case, put the first bearing on the shaft and then insert it into the housing. Place the 2nd bearing on the shaft and insert into the other side of the housing. It is crucial that these are seated and that the shaft does not bind between the 2 bearings.

Testing the Bearing

At this point, test by turning the drive shaft. It should be relatively stiff until you put a tiny drop of oil on both bearings to break it in. To make it easier you can mount the shaft to your small battery operated hand drill and run it for a few minutes or until it becomes smooth running and easy to turn with your fingers.

Spring Insertion/Tension
Once the the ball bearings are in the stand off and the guides are in place, the spring may be inserted as you complete the installation. If the spring tension is not enough, it can be compressed by plugging the hole from the bottom or by using a stiffer spring. Once the housing is fit to the tower, the sides should be glued to the bearing housing but not to the tower. They are suppose to support the housing and slide on the face of the tower up and down for adjustment. If needed, a link in the chain can be removed or if a link has been broken, the housing will simply sit lower on the tower. The spring can be inserted into the Stand Off before mounting it to the gearbox.



Chain Installation
Once the tower has been mounted to the gear box with the spring in and housing approximately in place, the chain can be installed and the slack taken out. The modeler has the option of using a 2-56 screw from the top of the housing tapped into the housing for stability of position. When the screw is removed the bearing can be lubricated by using a syringe to put a few drops into the housing from the top.

Sprockets
The sprockets enclosed with this kit also have very tight inside diameters and likely will not press onto the shafts without some burnishing using an appropriately small round file. The purpose, of course, of the burnishing is that you do not want a sloppy fit on the shaft. Ideally, you will want to ream them just enough to get a nice press fit.

These sprockets also may come with printer build plate support material. Removal and clean is required. We even suggest using a small triangular file to clean up any threads or to smooth out the teeth on the sprockets. The sprockets are printed with Polycarbonate and sometimes PC/ABS. An easy way to know if the sprockets teeth are good to go is to simply lay or wrap the chain around the teeth of the sprocket.

The original top sprocket was 8 teeth and 12 teeth on the bottom. We include 2 extra sprockets for the upper shaft as an option for the modeler. The 12 top and bottom would be a 1:1 ratio.

Before installing the sprockets, degrease the shafts. Even though you obtain an optimal press fit on the shaft, you may still want to use some Loctite or CA on the sprockets on the shaft and on the face of the hub.

Installation in Your Model

You may have to cut a small notch in the floor to easily install as per our instructions above since this product is significantly more robust in dimension to contain the bearing housing. Alternatively, mounting the stand-off to the gear box first and then placing the floor is more difficult to finish the installation, but it can be done.