

# Z AXIS STIFFENER PLATES

**This is an upgrade that can be used on all machines from 1996 to 2014. (early machines without the quill bracket will require you to buy the bracket and new seal plate) Adding the steel plates top and bottom effectively doubles the strength of the quill bracket and reduces flex and backlash.**

- 1. Remove the quill bracket from the machine.**



- 2. Clamp the 2 stiffeners to the quill bracket and hold them in place with a bolt through the ball screw hole. Align the outside diameters of the plates and the inner diameters also and adjust the assembly so it is equally spaced around the outside of the original bracket. This can be done by eye and / or by measuring with a caliper. It is not necessary to be super precise, but if you prefer you could turn a simple stepped spacer that fits the original bracket ID as well as the ID of the 2 new plates.**



3. Once the assembly is aligned, tighten the bolt in the ball screw hole and add a vise grip to the other end to keep every thing aligned.



4. **Clamp the assembly in your vise and using a 6mm drill, go through the 6 original holes in the bracket just enough to create a dimple in the stiffener plate.**





5. Now change to a 4.5 MM drill and drill all the way through both stiffener plates. At the same time drill 2 holes- one on each side of the bolt.



- 6. Now make a reference mark on each part so you know where they fit together vertically.**
- 7. Take the assembly apart, and on the stiffener with the large diameter center hole, drill all the holes out to 6 MM.**
- 8. On the stiffener with the small diameter center hole, tap the holes to 5 MM X .8**
- 9. Now remove the quill from your machine and discard the original threaded clamp plate. Place the stiffener plate with tapped holes down over the quill keeping your vertical mark up.**
- 10. Place the original bracket around the bottom of the quill followed by the stiffener plate with large diameter center hole- making note of it's vertical mark as well.**
- 11. Install the 6 5 MM allen bolts through the plates and thread them into the upper stiffener- also put 2 more allens through the plates on either side of the ball screw hole. Leave the bolts finger tight for now and put the quill back into the machine.**
- 12. On later machines with a ball screw with threaded end, you will need to remove the ball screw, cut off the threaded portion and drill and tap the the ball screw to accept a longer bolt to fit through the original bracket and both stiffener plates.**
- 13. Bring the quill all the way up into the casting and align the hole to the ball screw. Tighten the ball screw bolt, then finishing tightening all the allen bolts holding the bracket and stiffener plates together.**
- 14. Test the motion up and down.**