

Technical Service Bulletin 05T10  
5RP Pulley Bearings Replacement (and shaft coupling removal procedure)

**Warranty Note**

Sawing Systems will not guarantee high speed (over 2000 RPM), open, or spindle bearings if not installed by Sawing Systems. It is recommended that the spindle head be returned to Sawing Systems for pulley bearing replacement. This bulletin is provided to customers who have a sophisticated maintenance capability and who are confident they can do the job themselves.

**Required Tools and Supplies**

- 15/16" open wrench and 1-1/4" or adjustable wrench (to remove rotary union)
- 1/4" flat screwdriver (to remove hose from rotary union)
- 1/8" short hex key (to remove bearing retainer caps)
- 1" wide chisel point blade or sharp edge putty knife (to pry off bearings)
- 5mm hex key (to loosen shaft coupling)
- Magnet pencil (to extract ball bearings, optional)
- Never Seez™ (for coating bearing surfaces)
- Vaseline™ (for spline shaft O'ring)
- Fine flat file and fine emery cloth (400+/- grit) and oil (to dress shaft bearing surfaces)
- Cotton cloth (clean-up)

**Top Bearing**

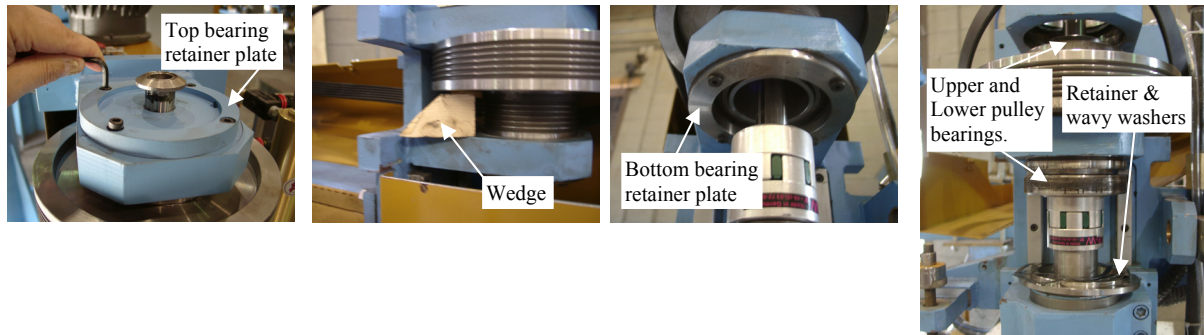
Remove the front spindle guard.  
Open belt guard and release belt tension. (Lever behind motor).

Remove rotary union from spline shaft. This is a left hand thread. Apply wrench to the hex flats just below the bottom of the union. Do not apply a wrench to the spline shaft. Restrain the spline shaft from turning by applying wrench at the bottom of the spindle shaft (near where tools are normally connected.)  
Remove the drive belt.

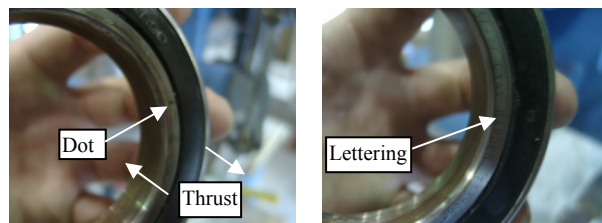


Remove the top bearing retainer plate (cap). Note: Newer machines are equipped with a full-cover type bearing cap and a slinger ring between the rotary union and spline shaft. Older machines have no Slinger Ring and the top cap is open like the bottom cap shown below. If your machine is not equipped like the newer machines, call Technical Service and request Technical service bulletin TSB 05T12 and a retro-fit kit. There is no charge for this kit if your machine is still under warranty.

Put a 1-1/2” wood spacer or other object between the large diameter pulley and bottom bearing mount. Remove the four screws that secure the bottom bearing retainer and drop the retainer and wavy washers. While holding the weight of the pulley assembly, remove the wood spacer and the entire pulley assembly should drop down to reveal the upper and lower bearings.



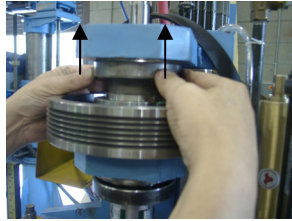
A word of caution before proceeding: These bearings are precision angular contact type bearings and can take high axial thrust in only one direction. Bearings have writing on one side of the inner race and a dot on the opposite side. The bearing can take the thrust applied if you hold the outer race and push on the inner race on the side with the dot. If more than about 10 lbs load is applied in the opposite direction, the races will separate and can't be reassembled. Even if this is a “bad” bearing it must be returned to Sawing Systems for evaluation and must not be destroyed. These bearings cost about \$500 each so treat them with extreme caution.



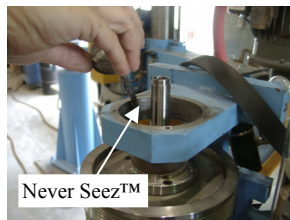
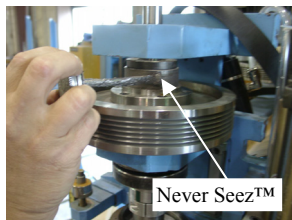
Both bearings are mounted on the pulley shaft with the dot toward the pulley, i.e. the dot of the top bearing faces down and the dot of the bottom bearing faces up. You may gently pull on the outer race to pull the bearing off the shaft but only with about 10 lbs force because the bearing will not take much thrust in this direction. The shaft is sized for a close sliding fit to the bearing but the bearing must be lifted evenly. If it is slightly cocked, it will not slide. If it is stuck, push the bearing back to the shoulder and start over. It may be necessary to break the inner race free to get it started. On later machines the shaft has screwdriver reliefs in the shoulder at 180°. On earlier models, gently drive a sharp-edge putty knife or chisel between shaft shoulder and inner race of bearing to wedge the bearing off the shoulder. Be careful to avoid dinging or deforming the shaft or shoulder. Rotate the assembly and gently drive the wedge into the opposite side to uncock the bearing. With the bearing free and uncocked, you should be able to ease it off the shaft by applying even finger pressure on both sides of the outer race. If not, use a progressively wider tool to wedge the inner race up off the pulley shaft.



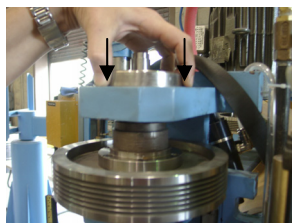
Once the bearing is off the shaft, raise it up through the upper bearing housing. The housings are sized for a free-sliding fit. You may push or pull up on the inner race as the bearing is made to take thrust in this direction. You may of course also pull up on the outer race once the inner race is free.



It is critical to remove any burrs or dents on the shaft or shoulder caused by the wedging action. The new bearing must run absolutely true on the shaft or it will overheat. Clean the shaft with emery cloth if there is any sign of corrosion. Clean the bearing housing and apply Never Seez™ compound to the shaft and housing bore.

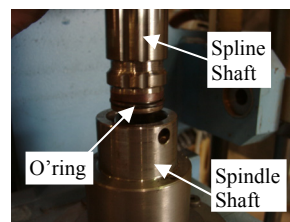
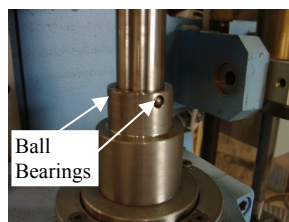
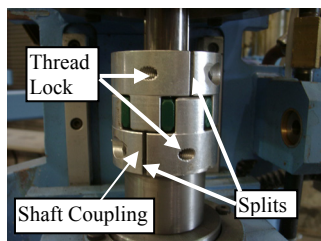


Insert the new top bearing through the bearing housing with the dot down (writing up). You may confidently press on the outer race to push the bearing down as the bearing can take thrust in this direction.



### **Bottom Bearing**

First read the instructions for the Top Bearing replacement. If only the bottom bearing must be replaced, it is not necessary to remove the rotary union. It is also not necessary to remove the top bearing retainer plate, but it will be necessary to nearly remove the four retaining screws that hold the top plate before a proper reassembly can be done.



Pull/wedge the bottom bearing off its shaft end. Be sure to observe the same techniques and cautions for the top bearing. Slide the shaft coupling up the spline shaft. To do so, loosen both halves of the coupling. Note: This is a precision, high speed balanced coupling. There is no need to separate the halves, but if you do be sure to note and mark the orientation of the halves and reassemble the same way.

Slowly slide the coupling up until the two ball bearings are revealed in the spindle shaft. Use a magnet to extract the balls. Pull the spline shaft up out of the spindle shaft.

Remove the old bearing. Examine the O'ring on the end of the spline shaft and replace it if damaged. Lubricate the O'ring with Vaseline™ or Never Seez™. Insert the spline shaft into the spindle shaft with a slight twisting motion to help seat the O'ring. Reinstall the ball bearings in the spline shaft. A little Never-Seez™ or Vaseline™ on the balls will help stick them in place.

Dress, clean and lubricate the pulley shaft for the new bearing. Install the new bearing with the 'dot' toward the pulley (facing up).

### **Reassembly**

By holding the outer race of the lower bearing, lift the entire pulley assembly up to insert the upper and lower bearings into their respective bearing housings. If you push on the pulley shaft instead of the outer race of the lower bearing, do not force the lower bearing into the housing. Remember, the orientation of the dot is such that you cannot exert thrust on the lower bearing in this direction. Insert the wood wedge between the large pulley and lower bearing housing to hold the assembly up. Insert the wavy washers (qty 2) up against the lower bearing followed by the bottom retainer plate. Tighten the bottom retainer plate FIRST, then tighten the top bearing retainer plate. The top bearing should have 3 wavy washers between the top bearing and top plate.

Reinstall the rotary union and/or drain tube and hose. Note the proper drain tube slope in the photo on page 1. Reinstall the belt in high speed position. Reinstall the belt guard.

### **Break-In and Start-Up**

New bearings require a break in procedure. Run up the spindle speed in 2000 RPM increments for about 5 minutes each up to 10,000 RPM. Pause for 10 minutes between each increment to allow the bearings to cool. Bearings should run smooth and quiet. Feel the bearing housing area. The housing may get warm but should not get hot to the touch.

If bearings get hot it is recommended that you return the entire spindle head to Sawing Systems for a complete analysis and repair. See TSB 05T12 for instructions on spindle head removal. For machines still under warranty, there is no charge for this service other than shipping. The factory repair includes a bearing break-in procedure.

After the machine has been allowed to cool down overnight, it is good practice to run the spindle for 5 minutes at 2500 RPM before taking the speed any higher in order to warm up the bearings.