

Shopsmith Headstock Rebuilding Checklist

09/15/2012

- ☐ 01. Remove Upper and Lower Drive Hubs from shafts protruding through Belt Cover. Ensure power cord is unplugged.
- ☐ 02. Remove two screws holding Belt Cover and remove cover. Clean cover. If interior is rusty, prime with Rustoleum Rust Reformer paint.
- ☐ 03. Turn Speed Control Handle to Fast setting.
- ☐ 04. Remove Sawdust Port Cover (aka Logo Plate).
- ☐ 05. Remove On-Off Switch nut and push On-Off Switch into headstock.
- ☐ 06. Remove Drive Belt from Floating Sheave.
- ☐ 07. Provide support then remove 5 screws securing Motor Pan. Remove Motor Pan from headstock. Use caution, as motor is heavy and still connected to On-Off Switch.
- ☐ 08. Remove the four #3 Phillips screws securing Motor to Motor Pan and separate.
- ☐ 09. Clean Motor Pan including removing any foreign objects (I've found nails, screws, clips, etc!). If interior is rusty, prime with Rustoleum Rust Reformer paint.
- ☐ 10. Visually inspect motor windings for impacted sawdust/crud. Use pressurized air to blow/remove sawdust/crud from motor. Be sure to use eye protection for flying debris.
- ☐ 11. Test On-Off switch using ohmmeter. Replace any 15 Amp switch with 20 Amp switch if using the 1 1/8 HP motor.
- ☐ 12. Inspect Power Cord wires. If deteriorated insulation is found, replace Power Cord and terminate wires with new insulated female terminals.
- ☐  3. Bench test motor. I do this at my motor test station.

- 14. Replace the motor bearings if motor shaft continues to turn for more than 20 sec after power is removed or motor shaft stops in less than 2 seconds after power is removed.
- 15. Recondition the Fan and Floating Sheaves.
- 16. Install the Fan Sheave and check that the Fan Sheave Set Screw is tight. I use LocTite on the setscrew.
- 17. Remount Motor in Motor Pan with 1/4" X 1/2" stainless steel screws and lock washers.
- 18. Connect the power and motor wires to the switch male terminals. Use at least 3 cable ties to secure wires together. Test the operation of the motor and On-Off switch. I do this on the bench at my motor test station.
- 19. Remove, clean and inspect Speed Control Handle gear. Replace Speed Control Handle if there are any missing or worn tooth/teeth. Remove Spring behind Speed Control Dial.
- 20. Remove, clean, inspect, and lubricate Speed Control Assembly and gears. Replace if required.
- 21. Clean and inspect Speed Control Dial gears and install new Allen set screw in handle.
- 22. Remove the Control and Idler Sheaves from the Idler Shaft. Recondition the Control and Idler sheaves. Check the Control Sheave Bearing. Replace if required.
- 23. Lube Control Sheave Bearing by placing bearing end down and place a dozen drops of turbine oil into the sleeve. Let set until oil seeps through the bearing. Rotate bearing.
- 24. Remove and clean Eccentric Bushing.
- 25. Remove, clean, and check Idler Shaft and Bearing. Replace, if needed.
- 26. Remove, disassemble, and check bearing(s) on quill. Inspect Quill Shaft. Replace Quill Shaft if bent. Note: Most quill bearings need replacement. Replace with a higher quality (ABEC3/C1) bearing(s), as required.

- 27. Inspect Quill Spring. Ensure spring is not broken or unhooked. Remove the Quill Spring Housing. Replace and/or hook Quill Spring and reinstall if required. Dry lube the spring. Clean and dry lube the Quill Feed Pinion Gear teeth. Insure that the flat side of the Spherical Washer is on outside and facing the casing ear that clamps the quill housing if Quill Spring Assembly is being installed.
- 28. Remove Drive Sleeve Assembly and replace both bearings. Replace with high quality ABEC-3 bearings.
- 29. Check the Drive Sleeve Pulley Setscrew aligns with the flat at the end of the shaft. Loosen the setscrew and realign set screw with flat, if required.
- 30. Check torque on Drive Sleeve Pulley Setscrew and tighten if needed.
- 31. Test the Gilmer clutch for 10-20 ft. lbs. of torque; rebuild, if needed.
- 32. Clean and inspect Poly-V or Gilmer belt for distortions, cracks, or fraying by turning the belt inside out and squeezing between 2 fingers. Replace as required.
- 33. Clean interior of headstock casting, including removing impacted grease/dust in quill advance mechanism and use an abrasive cleaner to remove wax, sawdust & dust (crud) from way tube holes. If necessary, very lightly sand way tube holes with fine (150) sandpaper to insure good contact with way tubes.
- 34. Carefully inspect Headstock Housing Assembly for cracks or breaks.
- 35. Clean & check Headstock Lock Assembly & dry lube the Lock Rod. File the Wedge Lock angle or replace Wedge Locks, if needed.
- 36. Ensure Quill set screw has a flat bottom. This is a special guide screw that is tightened and backed off 1/8 turn. Install Quill and check quill return tension and set to factory specs (2-2 1/2 turns).
- 37. Place Poly-V/Gilmer Belt in Headstock and install Drive Sleeve Assembly.
- 38. Install Idler Shaft Assembly and Idler Sheave and adjust belt tension. If the belt tension is too tight, the Headstock Housing will become quite warm. If this happens, try loosening the belt tension.
- 39. Replace the Motor Drive Belt with a new belt.

- 40. Replace any missing clips, screws, springs, bolts, etc.
- 41. Replace all #8 steel screws with #10 stainless-steel screws.
- 42. I normally line up the back of the Speed Control Worm Control Shaft with the back of the last quadrant tooth valley as a starting point for the High Speed Adjustment (HSA).
- 43. Set the HSA so the Speed Control Assembly Worm Shaft indent is around 11:00-11:30 position and turning the HSA screw against the quadrant then lock the screw nut.
- 44. Replace Spring behind and install Speed Control Dial along with the Speed Control Assembly. Set the Speed Control Dial to Fast. Install the Speed Control Handle.
- 45. Make sure the Headstock Casing has 4 clip-on Tinnerman Clips for the Motor Pan and 2 Tinnerman Clips for the Belt Cover.
- 46. Install the Motor Pan and On-Off Switch. Loop the motor-to-switch wires over the Headstock Lock Rod. Install five Motor Pan screws with new #10 stainless-steel screws.
- 47. Connect Motor Drive Belt.
- 48. Test operation of headstock.
- 49. Reset Speed Dial settings if needed so Slow = approx. 700 RPM and high = approx. 5200 RPM. See Note below.
- 50. Install Belt Cover and secure with two #10 stainless-steel screws.
- 51. Clean exterior of reassembled unit. Exercise the Quill. Fill the quill and quill feed set screw holes with putty.
- 52. Reinstall Upper and Lower Drive Hubs on shafts protruding through Belt Cover.

NOTE: Any time you replace the motor belt, any sheaves and/or the Speed Control Assembly quadrant, you may have difficulty reaching the SLOW speed control position or have a full speed range from SLOW to HIGH.

With the belt replacement, it should get harder as you move the speed toward the lower end of the speed range. So, I try to limit the low end speed at "C" at the low end until you get some hours on the belt. Do not force the handle toward SLOW. Take your time when going from FAST to SLOW (1/4 the speed then going to HIGH). You also have to break-in the meshing of the speed control quadrant and worm gear.

If you are unable to get a full speed range from SLOW to FAST after a break-in period, you will need to increase the HIGH Speed Adjustment until you obtain the full range of speeds. Always manually rotate the quill after any HIGH Speed Adjustment before applying power to insure the Control Sheave is not hitting the Speed Control Assembly body.

Please contact Bill Mayo at
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if you have any questions.