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An Extended Note On Saw Tune-Up

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· Fix the miter gauge groove: Often on older saws, the miter gauge slot is worn from use into something of a football shape along its length. For perfect accuracy you can very carefully file the slot straight again using a 24" long machinist's straightedge and a digital caliper to check for straightness and width. ***Keep Straight! Not too loose. Use the annealed Starrett tool steel bar 36 x 3/4 x 1/4 that you will use as your sled guide bar as a reference for fit.***

· Fix the saw arbor: On a 10" saw, the face of the arbor plate is often not a plane running perfectly square to the axis of arbor rotation. *This is runout.* Arbor plate runout combined with bad arbor bearings and a warped blade makes for a wobbly and rough cut. If the bearings are making a grinding noise, replace them. If the arbor shaft is worn, replace it at the same time. Replace the drive belts while you have everything apart. If you have a good arbor and bearings, the arbor plate itself may have runout. Check it with a dial indicator.

To fix the arbor plate, remove the saw blade. Use an india oilstone clamped to a 2x4 blocked armature to true the rotating arbor plate. Basically, the stone is dangled inside the saw case with its long edge parallel to the arbor plate. You oil the stone and use the blade raising and lowering mechanism with the saw on to grind the face of the arbor plate. Do it several times, moving the stone in its clamped armature toward the arbor plate. While unorthodox (you are machining steel at a higher RPM than normal), this is safe if you machine gently and wear a face shield. You can take .014" of arbor plate runout down to .001 or so.

· True the plane of the blade at 90˚ with the planes of the vertical faces of the miter gauge groove.

· Make parallel the axis of rotation of the tilting arbor of the saw to the line formed by the vertical face of the miter gauge groove's intersection with the plane of the tablesaw top.

Method:

1. Fix the miter gauge slot as necessary & described above. Fix the arbor.

2. True the vertical plane of the left hand miter gauge slot with the plane of the saw blade at 90˚. Delta Unisaws, General 350 and Powermatic 66 saws all allow for easy table adjustment so that the blade at 90˚ can be made parallel to the miter gauge slots. **See: Duginske, Mark, *Mastering Woodworking Machines,* Newtown, Connecticut, Taunton Press, 1992, pp. 24-26.** Personally, I wouldn't use a miter gauge for paralleling, since the gauge bar is sloppy in the groove. I'd use a Starrett Combination square with the stock held tight in the miter gauge slot and the blade reaching to the right, toward the blade tooth and angled slightly downward, consistently, where the ruler touches the table and the blade is swung past the ruler touching the same part of the end of the ruler.. You need to loosen three of the top attachment bolts and rotate the table using the fourth tight bolt as a pivot, making the miter gauge slot parallel to the blade.

Install a good blade snug in the arbor. Pick a tooth and mark it with a *Sharpie.* Raise the blade to full height and square it to the table. Where the picked tooth enters the table on the operator's side, set the Starrett to that distance. The stock of the square is held in the miter gauge slot and the locked ruler just kisses the blade. The blade is angled slightly downward and the end just touches the throatplate near the blade. The Starrett is placed so that the saw blade touches the ruler in the same place when you are checking both the front and the back distance to the sawblade. ***See photo.*** Swing the blade so the picked tooth is about to enter the back of the saw table and check that distance with the locked Starrett. If the blade is parallel to the miter gauge slot, the tooth will kiss the Starrett in the same way, front and back: it will look, sound and feel the same as it moves past the end of the Starrett ruler. The picked carbide tooth makes the same light, quiet scraping/ ringing sound as it contacts the ruler, both fore and aft.

If the Starrett is too loose at the back then the table needs to rotate clockwise pivoting from the front left table attachment bolt Loosen the other 3 bolts and use a rubber mallet on the right edge of the table at the back and tap the table so that the miter slot gauge is made parallel. Gently lock the other 3 bolts and check with the Starrett. Loosen the three 3 bolts and keep pivoting the table until the blade and the miter gauge slot is dead parallel

If the Starrett is too tight to the blade at the back, then the table needs to rotate slightly counter-clockwise pivoting from the locked front left bolt. Bop the left edge of the saw table at the back with a rubber hammer. Lock the 3 bolts, check and fix as in the paragraph above.

3. Make the saw cut miters parallel to both the miter gauge slot and also to the rip fence. Make parallel the axis of rotation of the saw's tilting arbor mechanism to the line formed by the vertical face of the miter gauge groove's intersection with the plane of the tablesaw top.

Shimming under the table at the 4 bolts can make the axis of the tilting trunnion mechanism rotation parallel to the miter gauge slot. You can use U-shaped coke can and machinist's shim stock shims to notch around the table attachment bolts to raise each corner of the saw to just the right height. For both of this adjustment, you can use your 12" Starrett Combination Square extending as before to the same picked and *Sharpie* marked tooth, with the blade tilted to 45˚.

The blade is at full height but tilted to 45˚. Set the tooth at the table surface at the front of its swing. Set the Starrett to that distance. Swing the blade back to where the picked and marked tooth just emerges from the saw table at the back of the throat plate. Move the Starrett and check the distance. If the tooth gaps the from the ruler's end then the front of the saw table needs to be shimmed up. If the Starrett to blade distance is too tight then the rear of the table must come up. Loosen the appropriate bolts, the front pair or the rear pair respectively, pry the table casting up in the air gently with a screwdriver and insert U-shaped shims around the bolts. Tighten the bolts and check with a Starrett. Keep adding shims until the Starrett reads the same at the front and back of the picked tooth's swing. Check the miter gauge slot for parallel back at 90˚. Fix as necessary and then check again at 45˚. This process is fussy, nuanced, reflective observation and correction.