Adjusting Fadal Spindle Tram

Prior to checking and adjusting spindle tram the following actions must be performed first.

1) Level machine.
2) Check/adjust squareness.
3) Adjust all gibs and straps.

First, shut off the chiller pump by disconnecting the plug.

Clean thoroughly around the area where the spindle and casting mate.

Next, drain the remaining chiller fluid into an approved container by removing the 3/8 quick disconnect fitting located on the lower right hand side of the spindle.

Stone and clean the table thoroughly.

Using a SVT-0225 tram tool, .0001" indicator, and a gauge block as pictured in Figure 1, mark six locations on the table with a marker in line with each socket head bolt of the spindle on a 12" diameter.

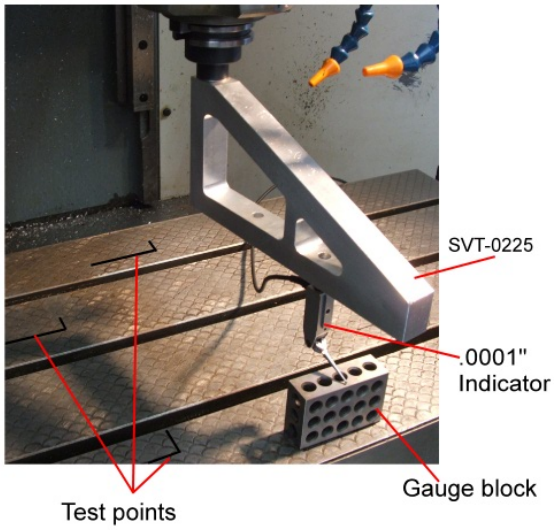
In command mode Use the SETX and SETY command at this location.

To begin properly, we are going to first check the table flatness, then tram to the table with flatness considered.

Command an M19 in MDI mode to orient the spindle and lock it in place.

Jog the table to the negative Y axis position and zero your indicator on the gauge block at the marked position.

Figure 1



Jog the table to each one of the other five marked positions noting any changes due to table wear (You are not rotating the spindle at all, so the indicator is held firmly in place with no movement at this stage). These values will be used to calculate your spindle tram by subtracting a positive error or adding a negative error to the indicated tram values.

Example: You zero your indicator at the 12 o' clock position. You move the table to 3 o' clock and measure zero from the zero reference position (without rotating the spindle. We are

checking table flatness). At 6 o' clock you measure -.001" then at 9 o'clock you measure zero again from reference zero (This tells us the table is closer to the spindle nose by .001" at the 6 o'clock position). Write all this down on the table.

Press the spindle on/off button to release the orientation arm.

Jog the X and Y axis back to the zero position.

Rotate the spindle to the negative Y axis location and zero the indicator.

Rotate the spindle to each of the other five marked locations and note the error with the wear compensation added. The tram should be within .001" from any point to one another.

Example: If the tram measures zero in the back zero reference position, zero at 3 & 9 o'clock but .002" at 6 o'clock, you will need to shim the back of the spindle theoretically .003" to get it back to the -.001 written on the table at the front. Remember, the spindle is CLOSER to the table if you measure -.001" in front, so you cannot shim the front in this case. In reality, a much smaller shim will yield .003" due the trigonometry between the spindle, spindle collar and table.

If tram is out further than .001" loosen all six socket head bolts. Use the TOOL IN/OUT button to drop the spindle to the bolt heads. This will give you plenty of room to place the shimstock. Tighten them back down using a torque wrench set for 25 ft/lbs starting with the bolt near the most positive error and working toward the most negative. Tighten in this pattern one more time with the torque wrench set to 55 ft/lbs. Continue this process until your greatest error is less than .001".

If you have tried this method about three or four times and the error is not less than .001" but is fairly consistent you may have to shim the spindle.

To shim the spindle loosen the bolts and then press the Tool in/out button to break the seal.

Cut a piece of shim stock to fit and insert it between the spindle and the casting on the side with the most negative accumulated error considering both table flatness and tram values. Ensure there is no debris in the mating surfaces and retighten as described above.

Repeat these steps until your tram is within .001" on a 12" diameter. Our technicians generally tram spindles to within .0005" or less.

You are now ready to cut chips.