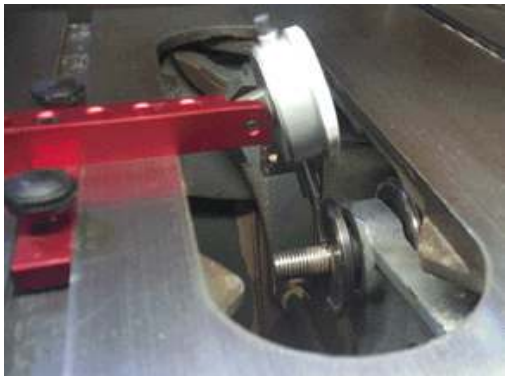
A-LINE-IT™ Table Saw Test #1 Checking Arbor Shaft Run-out and Bearing Play

What is run-out? Run-out is a wobble that is caused by something that is not running perfectly true. On a table saw, most people have seen a blade wobble to a stop, and wondered what is wrong. This may be caused by one (or a combination) of 3 things:

- The arbor shaft may be bent.
- The face of the flange on the arbor shaft may not be perfectly square to the arbor shaft.
- The saw blade may not be perfectly flat.

Of the 5 table saws in my shop, which range from 2 (30 year old) Sears contractor saws to my 5HP Delta Unisaw and a 5 HP Powermatic 66, none of them had more than a half thousandth of an inch (.0005") of "*detectable run out"* in the arbor shaft of the saw until a really bad kick back problem bent the arbor shaft on the Unisaw (which was no fun to correct). A bad arbor is obviously something that would need to be corrected immediately, and the hardest of the problems to correct. It would also be the first thing that I would recommend you check before performing any other table saw tests. After all, *if the arbor is bent, nothing will work properly.*



Before checking the arbor, make sure there is no dirt, contamination, or rust on the shaft that may cause inaccurate readings.

In the Illustration above, the A-Line-It has been assembled with the miter groove bar (Smart bar) in the miter groove of the table saw. *The Smart bar set screws or spring plungers* (depending on which A-Line-It you own), should be pushing the bar toward the saw blade side of the miter groove on the saw. *On a right-tilt saw (as shown above)*, the smart bar should be positioned in the left miter groove of the saw. *On a left-tilt saw*, the Smart bar should be positioned in the right miter groove of the saw.

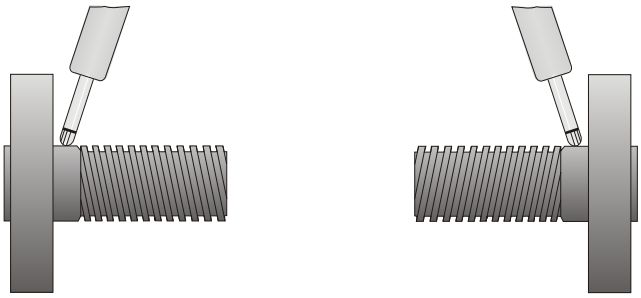
With the arbor lowered, the dial indicator should be pivoted downward, somewhere around the angle shown in the Illustration in Column 1.

The Mounting bar would then be slid to position one of the countersunk holes directly above the threaded hole in the notch in the Smart bar. The 3/4" long socket head cap screw should then be installed and tightened to hold the A-Line-It bars together. Adjust the leveling knobs on the Smart bar.

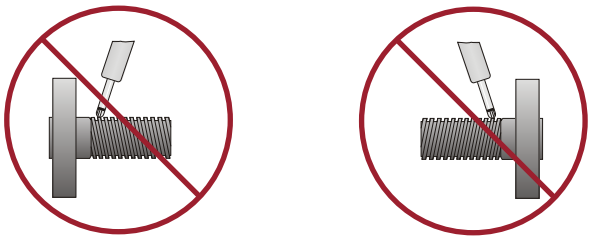
At this point, you should adjust the arbor height and A-Line-It position (front-to-back) in the saw miter groove to position the tip of the dial indicator on the arbor shaft, *as shown in the Illustration below*.

Note that the tip of the indicator is on the smooth area of the arbor where the blade is positioned.

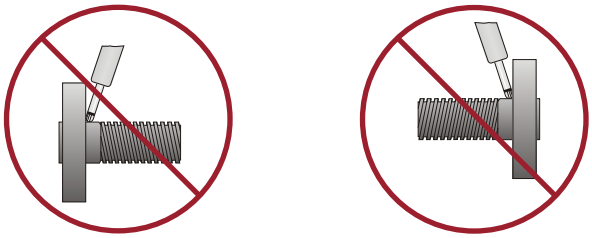
LEFT-TILT SAW *RIGHT-TILT SAW*



The tip MUST NOT be on the arbor threads, as shown in the Illustrations below.

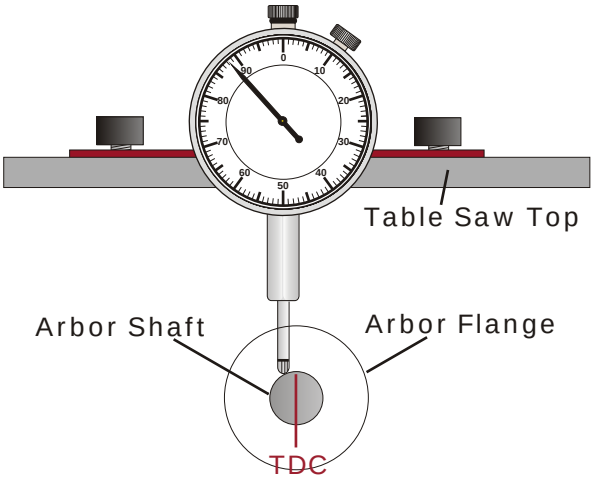


The tip MUST NOT be up against the arbor flange, as shown in the Illustrations below.

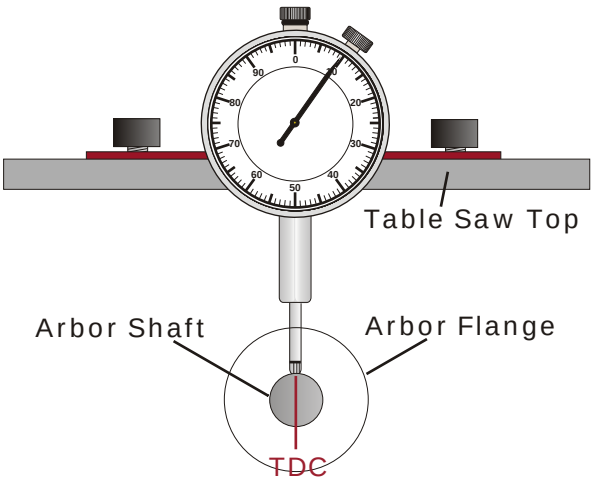


In the Illustrations below, we are trying to show you a view of the indicator from inside the table saw. You are looking at the tip of the indicator on the arbor through the arbor flange.

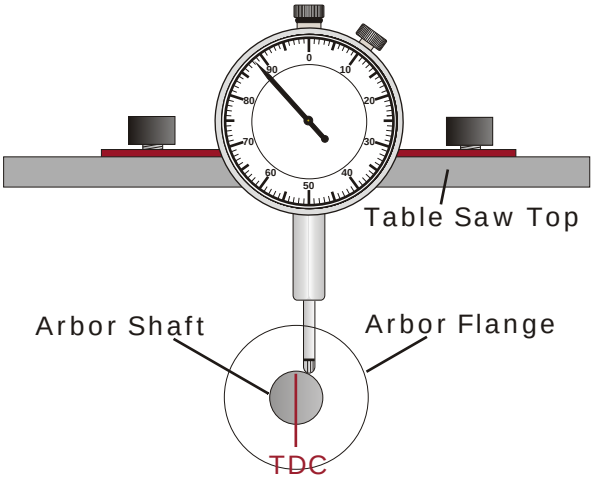
In the Illustration below, the indicator is to the left of top-dead-center (TDC) which is also the center line of the arbor. *Note the position on the pointer*.



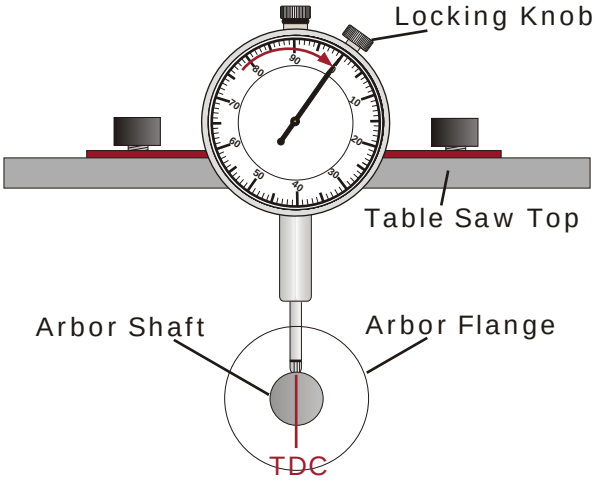
In the Illustration below, the A-Line-It has been moved to the right, and the tip of the indicator has been positioned at TDC on the shaft. *Note the position on the pointer*. As you can see, it moved upward, well over the zero on the dial indicator.



In the next Illustration, the A-Line-It has been moved further to the right, past TDC. *Note the position of the pointer*. As you can see, it moved downward, and is at the same point as it was on the front side of the arbor shaft. Since the arbor shaft is perfectly round, this would be expected.



To establish your "zero" to test arbor run-out, slide the A-Line-It back to the left until the pointer is at the highest reading. Loosen the locking knob on the dial indicator, and rotate the dial to set the "0" (zero) on the pointer, *as shown in the Illustration below*. Re-tighten the locking knob.



To test arbor run-out, slowly rotate the arbor shaft, and watch the dial indicator. Unless you have some serious problems, you should see less than one thousandth of an inch (.001") of deflection on the pointer of the dial indicator. If you do, re-check the arbor shaft to see it there is anything on the arbor shaft that could possibly cause the readings to fluctuate. *You need to remember that a thousandth of an inch is about 1/3 the thickness of a human hair, and a small nick in the arbor can cause this much deflection*.

To test bearing play, grasp the arbor shaft with your hand, and try to "wiggle" it. You may see a few thousandths of an inch of play on this test, but I wouldn't get overly concerned at this point. *We have more detailed tests in Test # 2 on testing the arbor for run-out.*