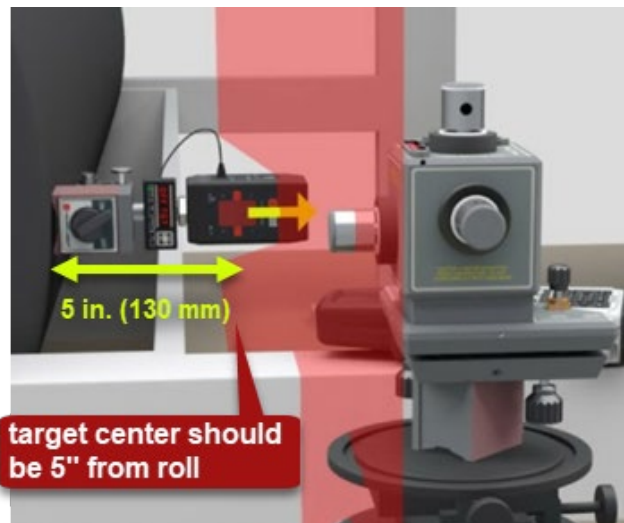
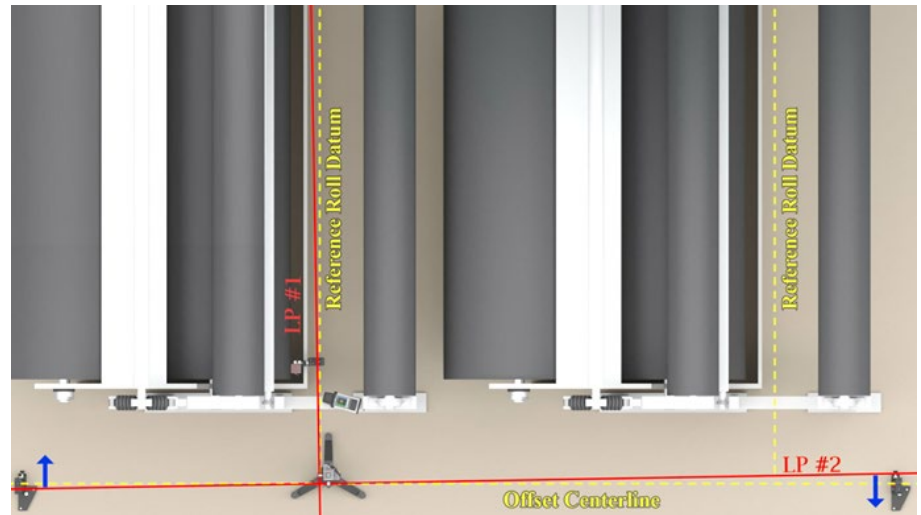


L-732/L-742 Dual Scan® Roll Alignment Laser System

Procedure for Using Benchmark Prick Marks as Roll Alignment Reference

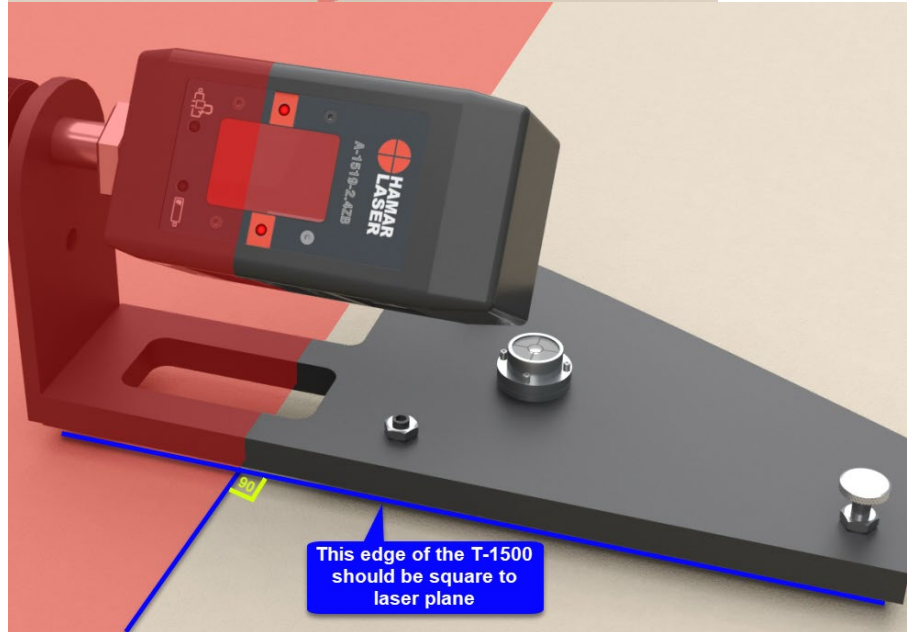
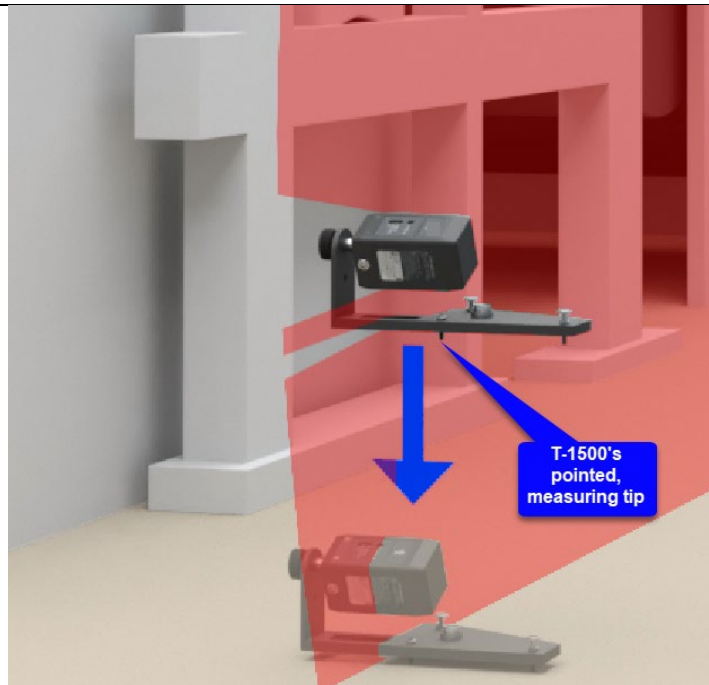
1. The L-742 is placed on the L-106 stand outside the machine near the roll you want to measure and in line with the floor benchmarks (prick marks). The L-742's Laser Plane #1 (LP#1) should be about 5" (127 mm) from the side of the roll you want to measure to allow space for the A-1519-2.4ZB Targets to get the measurement.



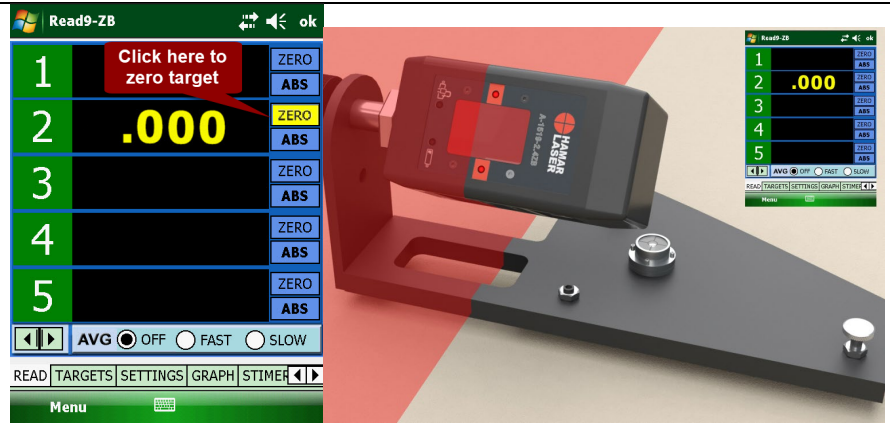
2. A-1519-2.4ZB Target #2 is placed in the T-1500 Floor Fixture and placed in the closest benchmark, making sure the pointed tip is inserted into prick mark in the floor. The T-1500 should be leveled and the fixture squared up to the laser plane – make sure the nut on the pointed tip is tightened on the fixture to hold that measuring tip rigidly. Place your hand on the fixture to hold it firmly on the floor and rotate the T-1519-2.4ZB Target so it's pointed to the laser.



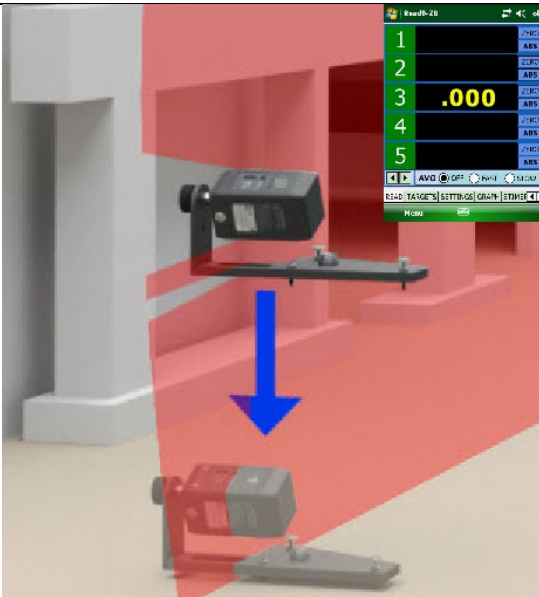
Important: make sure the benchmark targets+fixtures are always pointed in the same direction.



3. Zero Target #2 in Read16.



4. A-1519-2.4ZB Target #3 is placed in the T-1500 Floor Fixture and placed in the **SAME** benchmark prick mark, making sure the pointed tip is inserted into prick mark in the floor. Again make sure the T-1500 is leveled and squared up to the laser plane. As before, place your hand on the fixture to hold it firmly on the floor and rotate the T-1519-2.4ZB Target so it's pointed to the laser.



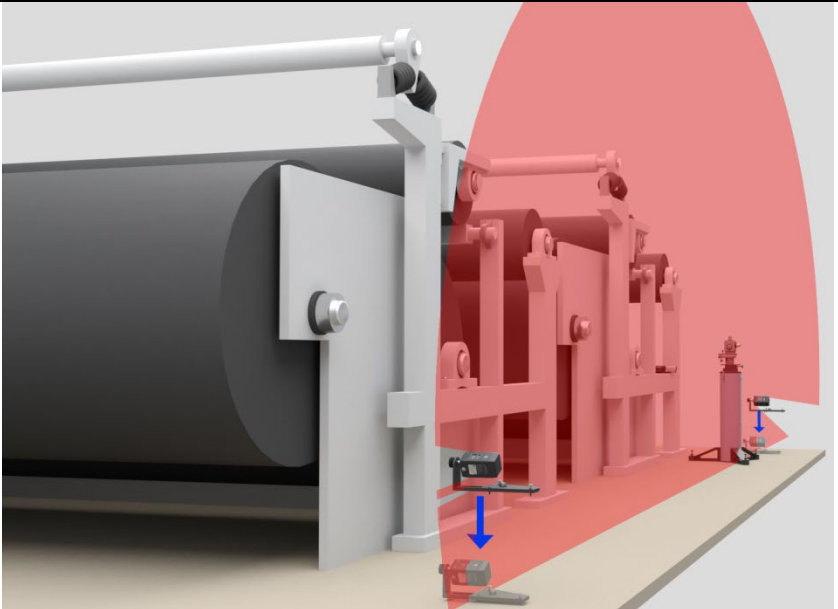
Zero Target #3 in Read16.

Important: make sure the benchmark targets+fixtures are always pointed in the same direction.

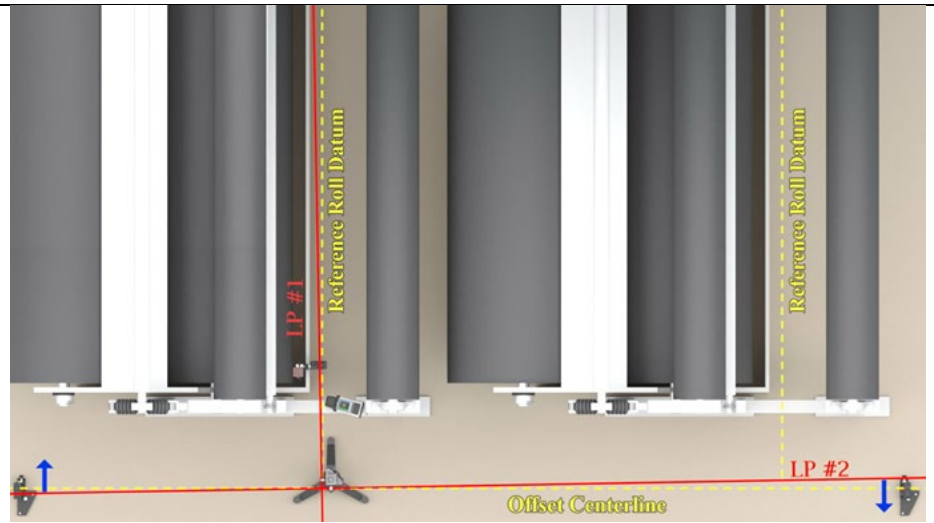
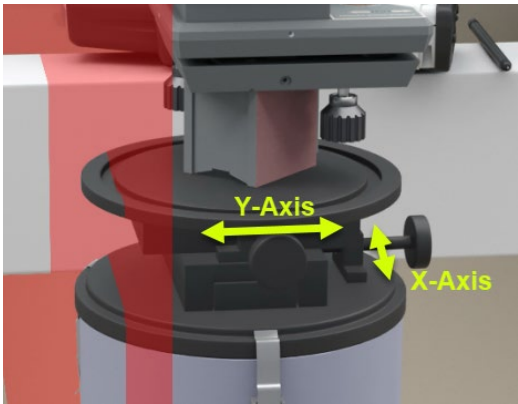
5. Move the T-1500/Target #2 into a different benchmark prick mark, making sure it's level and squared up to the laser line. Again, place your hand on the T-1500 fixture and rotate the target to point it to the laser.

Do **NOT** rezero the target!

Important: make sure the targets+T-1500 are always pointed in the same direction.

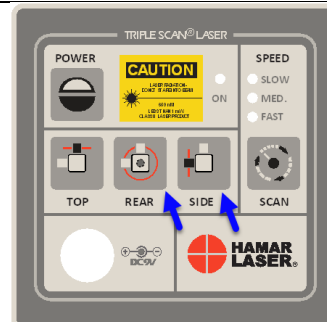


6. Rotate the laser turret (spindle) by hand back and forth to see where the laser beam is hitting on both targets. Adjust the Yaw Adjustments until the laser is hitting the same spot on both targets. If needed, use the L-106 X-Y Slide on the L-106 Stand to translate the beam to be well within the window on both targets. The goal is to have the laser beam hitting roughly the same spot on both target when rotating it by hand.

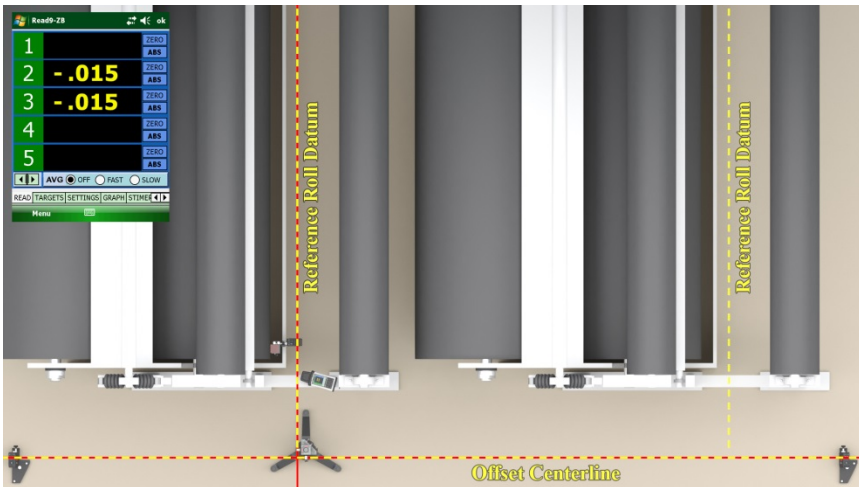
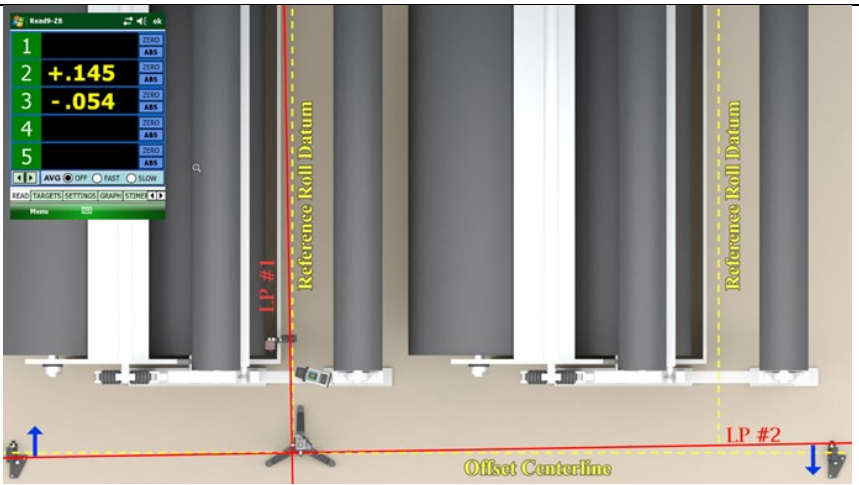


7. Turn on the rotation of LP#2 – either the Rear or Side plane on switch panel, depending on which way it's oriented.

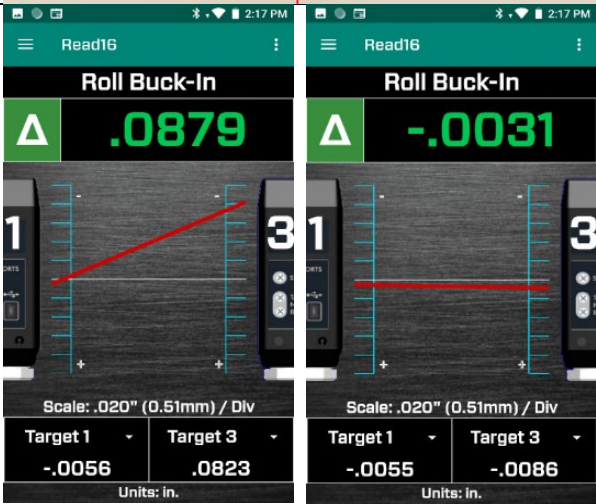
Note: always use the laser with the switch panel facing in the same direction with each setup.



8. Adjust the Yaw Adjustments until you get the same reading on both targets. The laser is now bucked-in to the benchmark prick marks and ready to measure the roll



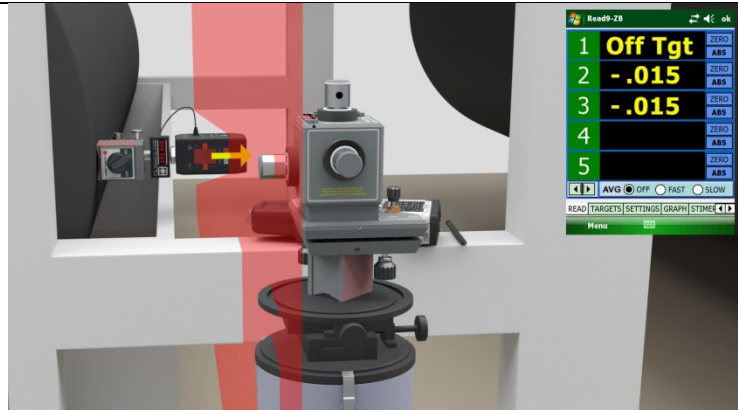
9. Alternatively use the Roll Buck-In Tab and turn the Yaw Adjustments so until the display reading is zero or near zero. The laser is now bucked-in to the benchmark prick marks and ready to measure the roll.



10. Now to measure one of the rolls for parallelism, Target #1 is placed horizontally on the roll closest to the laser and the post is adjusted so the laser plane is near the center of the target. The roll is rotated (or magnetic base is moved up/down the roll) until the bubble is level.

Turn on the laser rotation. Then Zero Target #1 in Read15/16.

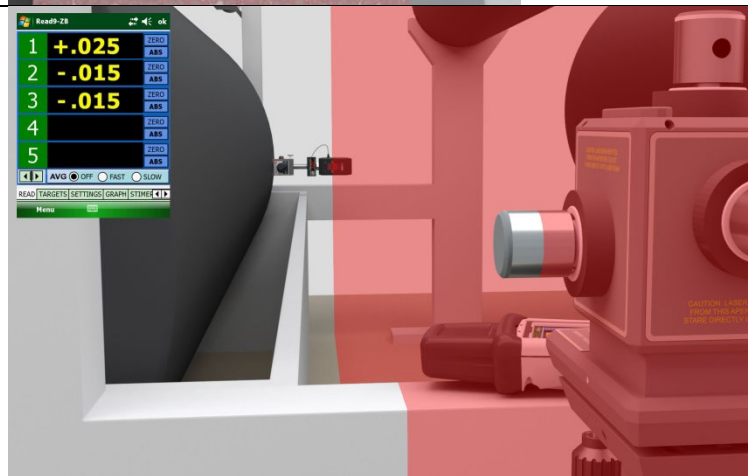
Alternatively, if using the R-1308 Readout, zero it by *pressing and holding* the ABS/REL button.

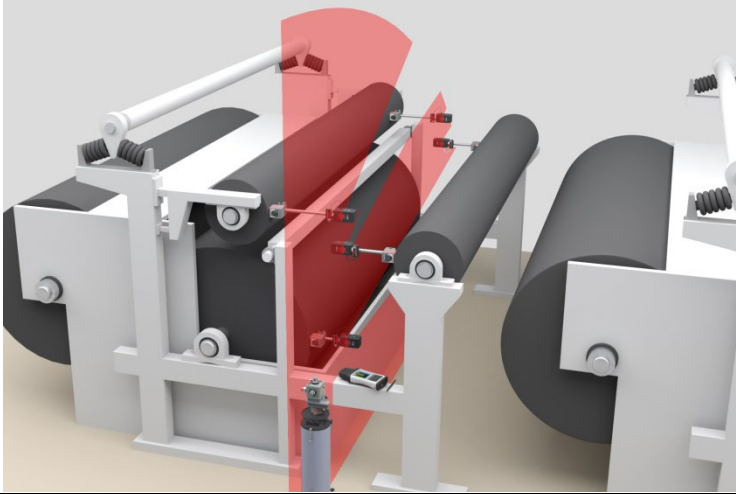


11. Target #1 is then moved to the *far* end of the roll and resulting value is the alignment of the parallelism of this roll relative to the benchmarks (or the reference roll). In this case, a “+” reading means the far end of the roll is pointing to the right by .025 in. (0.64 mm).

To align it, adjust the roll until the readout shows zero, which means the roll is aligned and parallel to the reference roll.

Make sure to double check the alignment by checking the *near* position to make sure it still reads zero.



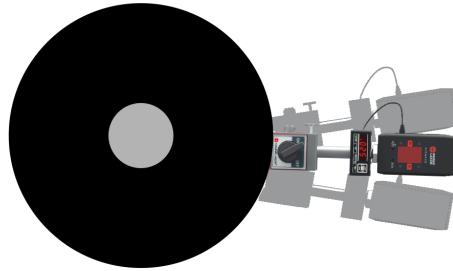
12.	<p>Now since the laser generates a plane, rolls at any elevation in that section that are within 1.5 feet (460 mm) horizontally of the laser plane can be measured for parallelism without changing the setup of the laser.</p>	 A 3D CAD model of a mill stand, showing two large horizontal rollers supported by a white frame. A red semi-transparent plane is shown intersecting the rollers, representing a laser-generated plane. The plane is positioned between the two rollers, and the rollers are shown in a dark grey color. The background is a light grey.
13.	<p>For those “hard to reach” rolls that are farther than 1.5 ft. (460 mm) from the laser or where the roll radius is greater than 1.5 ft., they can still be measured but the Top Dead Center Method must be used to get accurate results (see below)/</p>	

Arc Measurement Method - Sweeping Through the Arc

For hard-to-reach rolls that are farther than 2 ft. (610 mm) from the laser, or where the roll radius is greater than 2 ft., the Arc Measurement Method must be used to get accurate results. In this method, instead of using the bullseye level, the target is swept through an arc to find the Top Dead Center (TDC), or the highest point on the arc that is tangent to the laser plane. To do this, the target is attached to the roll and it is slowly rotated (or slid around it) until the highest value is determined (see procedure below).

Arc Measurement Sweeping Through the Arc

Slowly rotate the roll (or slide the V-block mag base or T-1600 Fixture around the roll) and watch the display on the R-1356 Readout. The highest number (most +) will be at TDC and this is the measurement value to record



When readings on the R-1356 stay the same as you rotate, you are at TDC

Arc Measurement Method Procedure

1. Set up the A-1519-2.4ZB Target magnetic base (or use the T-1600 as described below). Ensure that the level on the magnetic base or fixture is centered, indicating you are fairly close to TDC.
2. Slowly slide (or rotate the roll) the target magnetic base (or T-1600 fixture) around the roll in one direction while watching the Read16 display. If you see the target reading *decreasing* in value, stop and rotate in the opposite direction. You will then see the target value *increasing*. As you continue to sweep through the arc, you will notice the value stops increasing for a short time, and if you continue to rotate in the same direction, then you will notice the value will start to decrease again.
3. The highest reading (most positive) occurs when the target is at the TDC. This is the value to record as the measurement for that point.
4. This method should work for roll diameters or target rod lengths up to 6 ft. or 2 m.

