

FIGURE 4
TENSION SENSOR WITH
3 ROLLER FACE PLATE

In the figure above the tension sensor has a 3 roller face plate with 2 fixed guide rollers, 1 on either side of the strain gaged tension sensor roller. The 2 fixed rollers create a fixed angle for the wire as it moves over the sensor roller. The fixed angles creates a force that can be measured by the sensor. Because angles a_1 and a_2 are fixed there is a constant relationship between the tension in the wire and the created downward force. These 2 fixed points are required to create an accurate and repeatable tension sensor system.

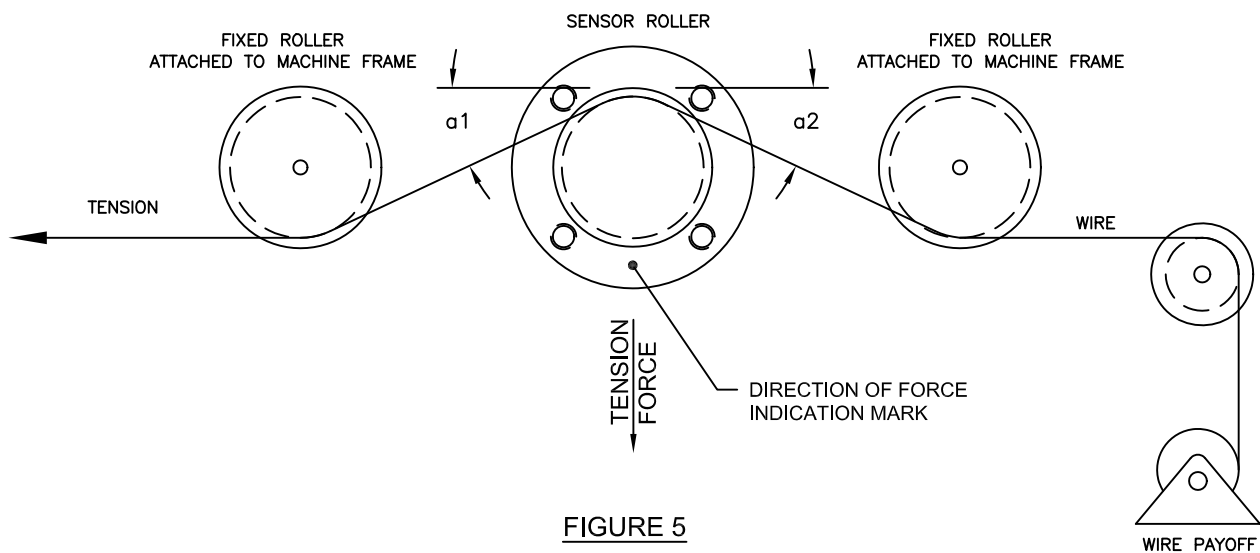


FIGURE 5
SINGLE ROLLER
TENSION SENSOR

In figure 5 above the tension sensor does not have a face plate. A single roller is attached to the sensor. The 2 fixed rollers shown are attached to the machine frame. They can be spaced at any distance from the sensor and may be a much larger diameter than what would fit on a face plate. The placement of the 2 fixed rollers must however stay within specified angles of deflection (a_1 and a_2). As the angles a_1 and a_2 increase the force or load on the sensor also increases. TMI will specify a sensor tension range based on the force created by these angles. Also note the direction of force indicator mark. This mark identifies the placement of the sensor when mounting on your machine frame. Angles a_1 and a_2 should be approximately equal ideally however many sensors can be designed for unequal angles. When ordering a single roller sensor our application engineers will need to know your intended material path angles.

The sensor may be mounted in any position or orientation as long as the direction of force is maintained.