

Wintriss Application Note: **Using the Wintriss Tonnage Monitor Repeatability Function**

The Repeatability setpoint for the AutoSetPAC tonnage monitor can be a powerful and effective tonnage monitor feature. Yet, it is often misunderstood and under utilized on the shop floor. Repeatability is designed to monitor the allowable variation of tonnage from one stroke to the next stroke. When programmed correctly it allows a very tight operating window. This assists in assuring part quality and also allows the low and high setpoints to be opened up and help eliminate nuisance tonnage faults. Nuisance faults are defined as the press stopping as the result of a tonnage fault that is not an actual problem within the tool or press.

In order to help explain how repeatability can be used effectively let us review how low, high, and repeatability setpoints are programmed and calculated. In our example we will calculate tonnage setpoints on a 400 Ton Press with 4 strain link inputs. Each column of the press is capable of handling 100 Tons. In the tool number each setpoint requires a percentage to be used and one sample period which is the number of strokes used to calculate the actual setpoints. A convenient starting point is 25% for high, 25% for low and 35% for repeatability and a sample period of 15 strokes.

Please note: During the sample period the AutoSetPAC provides 125% of full scale tonnage protection. In our example this would mean that the high setpoint is set to 125 tons per corner during the sample period.

After the 15 stroke sample period the setpoints for each individual input are set based upon the tonnages recorded. The high for each input is calculated by taking the highest load registered during the sample period and setting the maximum allowable load 25% above this reading. The low setpoint is set to 25% below the lowest reading and *repeatability is set 35% above and 35% below* the highest variation recorded during the sample period.

During our 15 stroke sample period the highest load produced is 75 tons, the lowest tonnage reading is 70 tons and the largest variation, or change in tonnage from one stroke to the next is 3 tons on the front left column. Based on these readings the setpoints would be set as follows: high would be 25% above 75 tons which would provide a high setpoint of 94 tons, low is 35% less than 70 tons which equates to 52 tons. Our operating tonnage range is from 52 tons for a minimum and 94 tons for a maximum on the front left column.

This may seem like a very large window and the tendency in the field is to adjust the high and the low to tighten this window and provide a greater degree of control. This is where the ability of the repeatability feature comes into play. The maximum variation in our application is 3 tons the repeatability setpoint of 35% provides a setpoint of 1.1 tons, what this means is the tonnage on the left front input cannot vary more than 1.1 ton above nor 1.1 ton below the previous stroke.

For instance if the first stroke after our sample period on the left front is 74 tons; the very next stroke cannot be more than 1.1 ton above or 1.1 ton below the previous stroke. Thus repeatability provides a very tight limit on the allowable high and low variation based upon on the previous load generated. Repeatability allows gradual increases or decreases in tonnage to take into account changes in material thickness and hardness; it will also allow the load to change slowly as the tool wears over time.

To go back to our example if the next tonnage reading is 75 tons, which is within our limit, the next stroke cannot be more than 1.1 ton above or 1.1 ton below the 75 ton reading. The repeatability percentage can also be adjusted in the run mode if after calculating you find the setpoint to be too tight or too loose for your operation.

As you will come to find setting and using the repeatability setpoint properly will afford you a very potent tool to help you control any variations in the load produced during the job run to help insure quality throughout the coil. The repeatability feature will also afford the luxury of opening up the low and high setpoints which if set to close to one another can result in nuisance shutdowns.

More information pertaining to Wintriss Tonnage/Load monitors can be found here: [Wintriss AutoSet 1500 Tonnage Monitors](#).