Calculations - Draft

$$Distance\ between\ lugs\ (1x\ Repeat\ or\ 1x\ Carton) = 10.5"\ or\ 0.2667M$$

$$Maximum\ required\ speed = 450\ Cartons/Minute$$

$$Linear\ Chain\ Speed = 450\ x\ 0.2667 = 120M/Minute\ or\ 2\ M/S$$

$$Chain\ path\ pitch\ circle\ around\ tension\ arm = 1.73"\ Radius$$

$$Arc\ length\ of\ 1.73"\ R\ @\ 90\ degrees = 2.72"\ or\ 69mm$$

$$Time\ taken\ for\ chain\ to\ pass\ 90\ degrees\ of\ 1.73"\ R\ = \frac{69}{2000} = 0.0345\ Seconds$$

$$Speed\ of\ chain\ around\ 1.73"\ R\ = 2M/S$$

$$Arc\ length\ of\ 8"\ R\ @\ 90\ degrees = 12.57"\ or\ 319mm$$

$$Time\ taken\ for\ chain\ to\ pass\ 90\ degrees\ of\ 8"\ R\ = 0.0345\ Seconds$$

$$Speed\ of\ tip\ of\ lug\ around\ 8"\ radius\ = \frac{0.319}{0.0345} = 9.25M/S$$

$$The\ tip\ of\ the\ lug\ travels\ around\ the\ 90\ degree\ bend\ 462.5\%\ faster\ than\ the\ chain$$