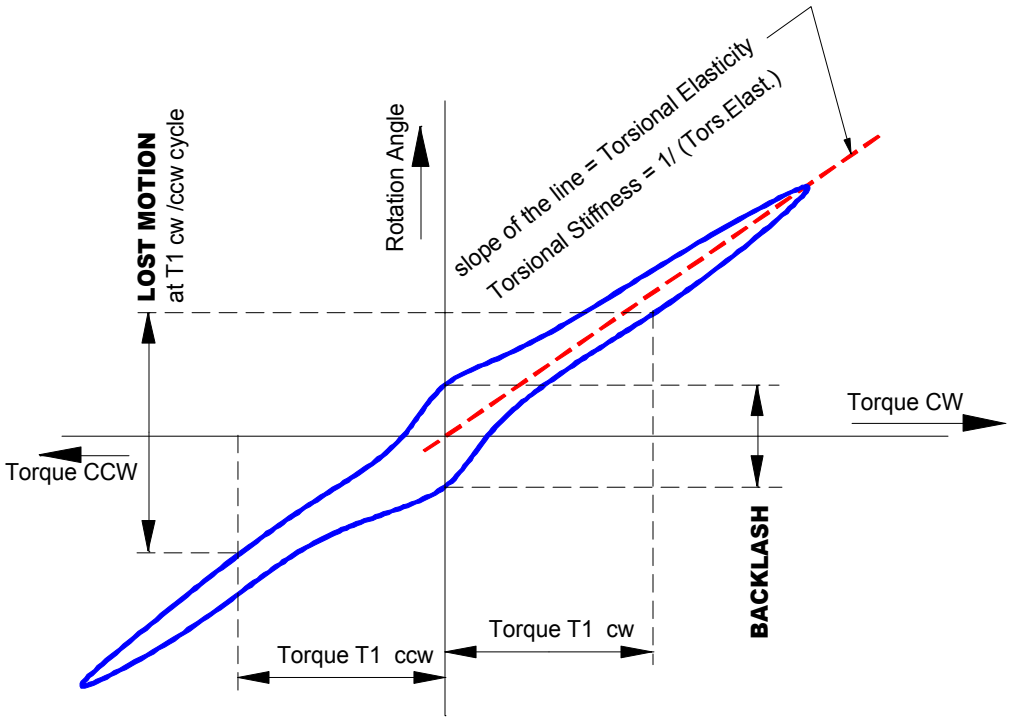
## Torsional Stiffness and Elasticity

Stiffness (or it's reciprocal value the elasticity) is the measure of "windup", ("elastic rotational deflection" ) experienced at the output shaft under load, due to elastic deformation of the gear components. The stiffness and elasticity is determined from the measured Deflection / Load relationship of the gearbox. See Figure.




**Stiffness** tells how much torque is required for a unit of rotational deflection. The commonly used units for stiffness are :Nm/radian; Nm/ang.min.; Nm/ang.degree; lbin/ang.min. etc.

**Elasticity** tells how much deflection a unit of torque creates
The commonly used units for stiffness are : radian/Nm; ang.min./Nm …etc.

A large part of the **lost motion** is due to the elasticity of the gearbox. For high positioning accuracy and repeatability under fluctuating loads the effect of stiffness cannot be neglected. Increased torsional stiffness (which is the same as reduced torsional elasticity) results in reduction of the magnitude of the lost motion.