

TARGET: plot Tightening Torque (Mt) Vs Clamping force (FClamping)

CHALLENGE:

to calculate the correct clamping force I need to calculate the CUMULATIVE of INCREMENTAL Screw force (ΔFS) and INCREMENTAL circumferential force (ΔFC)

ΔFS = Fs j – Fs j-1 (“j” = ranking index = tightening torque ranking. For these reasons I need a ranking index)

PROBLEM: the calculation is correct if I plot it over the ranking index and is wrong if I plot it over the tightening torque

WRONG



CORRECT



Formulas are below

“Screw Force” at “j” Torque level where 0 <= j <= 200

$$F\_{Sj}= \frac{2×M\_{tj}}{\left(\frac{p}{π}+ ɸ\_{St}×\frac{μ\_{St}}{\cos(β)}+ɸ\_{Su}×μ\_{Su}\right)}$$

Circumferential Force at “j” Torque

$F\_{Cj}= F\_{Sj}$ Before head contact condition

$F\_{Cj}= F\_{CTj-1}+F\_{S}×HCI$ After head contact condition

Radial Force at “j” Torque

$$F\_{Bj}= 2×F\_{Cj}$$

Clamping force at “j” torque

$$F\_{clamping j}= F\_{NO}= \frac{F\_{Bj}}{2×\tan(\left(^{α}/\_{2}\right))}$$