

Coefficients of friction for wheel studs and threaded connections with spigot mountings.

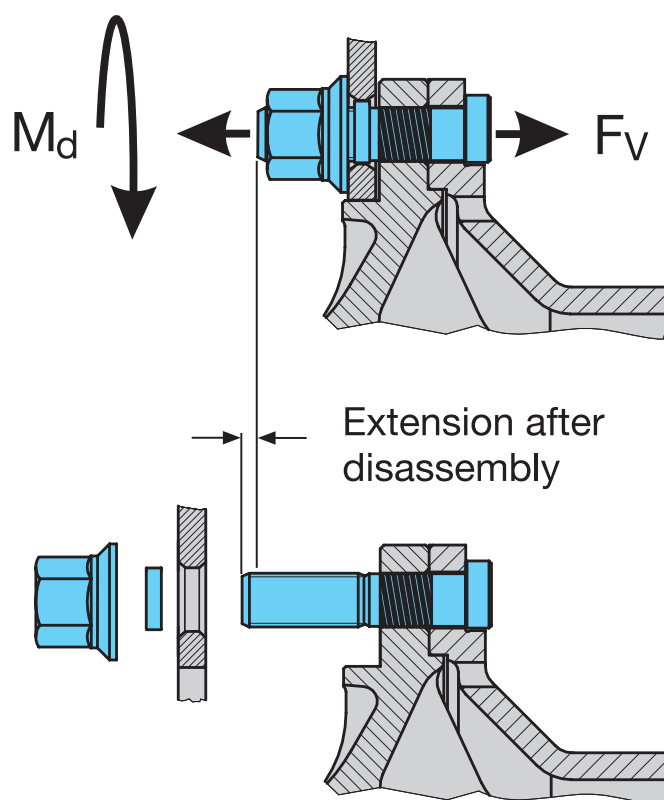
With threaded connections, there is a direct relationship between the coefficient of friction, the tightening torque (M_d) and the preload force (F_v). **The coefficient of friction can be affected by several factors** which include the **thread type**, the type of **material** used, the **surface condition and/or treatment**, and any **lubrication** used.

There are a large number of factors that can influence the final tightening torque:

- ⦿ Lubrication on the threads
- ⦿ Rust on the threads
- ⦿ Dirty or damaged threads
- ⦿ Mismatched components
- ⦿ Paint on wheel stud threads, or mating faces of wheel nuts

With the following effects:

- ⦿ Lubricating the threads will result in a **reduced coefficient of friction** and will produce **higher preload forces** in the threaded connection. If this force is greater than the maximum allowable force, it **will stretch the bolt to the point of plastic deformation** and then distort the thread. BPW's tests have shown that lubricating the wheel stud threads can result in over tightening of the threaded connections by 20 to 30% more than with clean dry threads, and sometimes by as much as 60%.
- ⦿ The tightening torque and **resultant coefficient of friction, when tightening threaded connections that are not clean**, eg. a rusted or painted surface, will result in a **lower preload force**. In these cases, **there is a risk that the residual clamping force may no longer be sufficient and, in extreme cases, the threaded connection may become loose.**



In conclusion, it should be noted that when refitting wheel nuts to wheels studs, the threads are NOT to be lubricated and are to be dry and clean so that the required coefficient of friction can be achieved, **otherwise the safety risk and potential for damage is high!**

BPW Transpec can only guarantee the correct coefficient of friction with threaded connections when **genuine parts** are used.

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