

Torque Wrench – Using with Extensions

MODEL 1997 MY-ON
XK8 Range
VIN
001001-ON

Issue:

Some workshop procedures require the use of an extension on a torque wrench to allow access for tightening a fastener. Using an extension in line with the handle of the torque wrench increases the leverage and therefore the torque applied to the fastener over the setting of the torque wrench.

When an extension is used that changes the distance from the center of the handle to center of the fastener (dimension A), a correction must be made to the torque wrench setting. The three types of extensions with the corresponding dimension for the increased length (dimension B) are shown in Illustration 1.

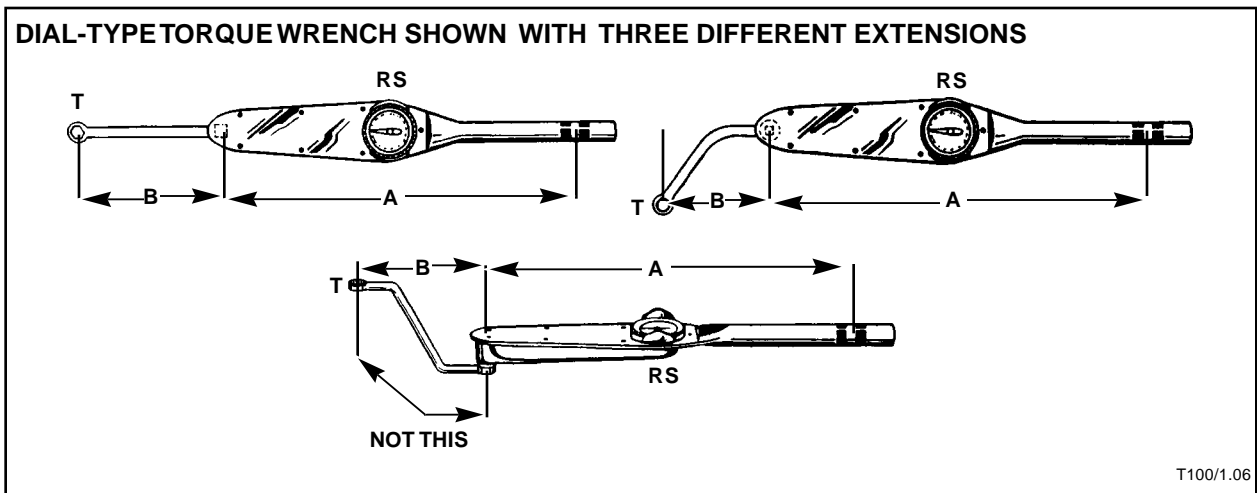


ILLUSTRATION 1

The formula for determining the torque setting when an extension is used is as follows:

$$\text{DIAL READING OR PRESET TORQUE} = \frac{\text{TORQUE WRENCH LENGTH} \times \text{TORQUE DESIRED}}{\text{TORQUE WRENCH LENGTH} + \text{EXTENSION LENGTH}}$$

OR, MORE SIMPLY: $RS = (A \times T) \div (A + B)$ WHEN:

RS = DIAL READING OR TORQUE SETTING OF THE TORQUE WRENCH

A = DISTANCE FROM THE CENTER OF THE SQUARE DRIVE OF THE TORQUE WRENCH TO THE CENTER OF THE HANDLE GRIP

B = LENGTH OF THE EXTENSION FROM THE CENTER OF THE SQUARE DRIVE TO THE CENTER OF THE NUT OR BOLT, USE ONLY THE LENGTH WHICH IS PARALLEL TO THE HANDLE.

T = TORQUE DESIRED. THIS IS THE ACTUAL TORQUE APPLIED TO THE FASTENER.

EXAMPLE:

The torque wrench length is 500 mm. The extension length is 100 mm. The desired torque is 60 Nm.

$$A = 500 \text{ mm}$$

$$B = 100 \text{ mm}$$

$$T = 60 \text{ Nm}$$

$$\frac{500 \times 60}{500 + 100} = 50 \text{ Nm}$$

or:

$$(500 \times 60) \div (500 + 100) = 50 \text{ Nm}$$

When using an extension of 100 mm length with this torque wrench, set the wrench to 50 Nm to apply an actual torque of 60 Nm at the bolt or nut.

A socket extension does not require a correction, since no change in length is made (Illustration 2.)

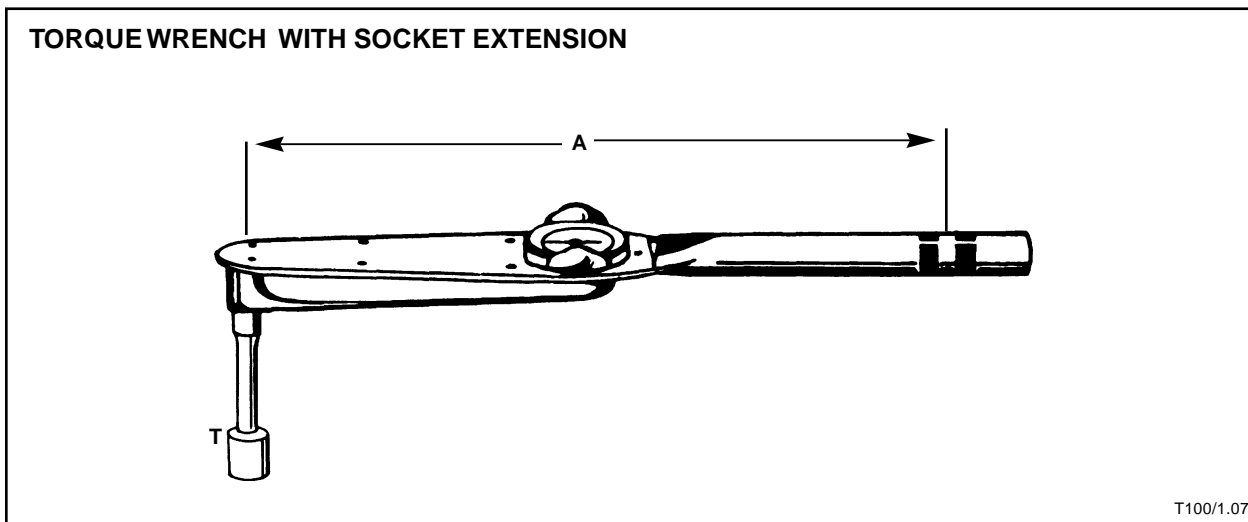


ILLUSTRATION 2