



Mota-Bars
TOWBAR SPECIALISTS

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Fasteners (towbar nuts and bolts) explained

Can I use an air driven wrench to tighten bolts and nuts?

Yes, but it must have a torque control to avoid over tightening – especially when tightening the relatively small M8 and M10 fasteners. It is also recommended that the final tightening is carried out with a hand torque wrench.

How do I identify the 'grade' of a bolt or nut?

On the top face of the head of a bolt there will be a number which is the grade of the bolt e.g. '8.8' or '10.9'.

How far should the thread protrude past the nut?

There is no standard that stipulates this value, but a general guide is at least one fully formed thread should protrude past the surface of a standard nut.

Is the chromium environmentally safe?

In line with recycling standards, most of our fasteners are changing from 'hexavalent' chromium to a more environmentally friendly 'tri-valent' chromium, which meets all EC and EU requirements. This process of change has started, and there will be no visible difference in the appearance, properties or behaviour of the fasteners.

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Should I apply grease or lubricant to the bolts or nuts?

No. Absolutely not!

If grease or a lubricant is applied to the bolt or nuts the tensile load that can be applied to a bolt is often doubled for the same tightening torque.

A difficult one to grasp, so try this! Get an M10 bolt (1.5mm pitch) add a few flat washers to ensure that the nut is within the threaded section of the bolt and slowly tighten. Most bolts (with dry, clean threads and without grease) will typically shear at typically twice the recommended torque setting e.g. 100 Nm or more.

Repeat the same test with an identical bolt and nut with a good high pressure lubricant in the threads and under the head of the bolt and it is likely that the bolt threads will strip at a torque level around that of the recommended torque setting! The bolt is no weaker, but the grease has allowed a much higher force to be applied for the same torque.

Should I reuse bolts or nuts?

No. It is good practise to always use new fasteners if there is a need to remove, adjust or replace a component. In the case of Nyloc nuts it is essential that these are not reused.

Should I use a thread locking compound?

The use of a thread locking compound can be of considerable benefit in preventing loosening (and loss of clamping force) due to vibration or impact loading of the joint. However, it is essential to read and follow the guidelines of the management.

Should I use a torque wrench for tightening all bolts?

Yes. It is impossible to accurately and consistently estimate the applied forces

using hand tools without any form of torque measurement.

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What 'grade' of bolt or nut should I use?

Unless otherwise specified on the installation instructions all Witter towbars use Grade 8.8 high tensile bolts and nuts. (Sometimes an even higher grade 10.9 is used).

What are the other markings or letters on the head of the bolt?

In addition to the 'grade' marking the bolt manufacturer stamps their identification on the head of the bolt. E.g. until recently all Witter Towbar bolts would have had a '3F' marking, but more recently this has changed to 'DF' and then to 'Iib'.

Note: This list is not exhaustive as on occasions it may be necessary to obtain from alternative sources.

What does 'torque' mean?

Torque is a measure of the force applied to rotate the bolt (or nut) to tighten the fasteners and create a pre-load in the bolt. This used to be measured in 'ft lbs', and now more commonly in the metric equivalent of 'Nm'. The 'ft lbs' is perhaps easier to understand and relate to its definitions as it is simply the value in 'lbs' forces applied '1 foot' from the centre of the axis of the fasteners. Note: most torque wrenches have scales in both 'ft lbs' and 'Nm'.

What is the 'thread pitch'?

The thread pitch is the spacing of the threads of the fastener and is usually measured in mm. This can be measured using a thread gauge, or, by using an accurate ruler e.g. measure a convenient number of threads along the bolt, count the number of threads and divide them into distance.

For M10 bolts/nuts the standard pitch is 1.5mm and for M12 bolts/nuts it is 1.75mm. It is essential to not mix different pitch bolts and nuts. To do so would permanently damage the fastener.

What is the finish on the bolts and nuts?

The standard finish for Witter towbar fasteners is an 8 micron zinc electroplate coating that has been 'chromium passivated' to increase the corrosion resistance and is a golden yellow finish.

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What should I do if the fixed fastener threads on car or towbars have debris, paint or a coating that prevents the bolt from being freely inserted?

It is essential to clean out the threads using a tap of the correct thread diameter and pitch. To continue to tighten the bolt would either result in too low a clamping force for the applied torque, or, even damage or strip the threads of the fasteners.

What torque settings should I use?

The majority of installation instructions produced over the past 10 years have the recommended torque settings for the fasteners which are usually as per the list below. However, if in doubt check the installation instructions.

When should I check the 'tightness' of the bolts (and nuts)?

It is quite normal for towbar components to 'bed in' after initial use e.g. any small surface irregularities flatten, and therefore it is recommended that the tightness of all fasteners is checked after the first 500 miles of use, and thereafter every year (as per our warranty statement).

Why are the holes in the towbar components much larger than the diameter of the bolt?

The holes are larger than the diameter of the bolts to accommodate anticipated normal variations on vehicle-to-towbar tolerances and help ease of alignment. Our bolted joints are designs one of the 'friction grip' type arrangement, which relies on the pre-load applied to the bolt to hold the component forces together using

the friction between the components.

Why are there different pitches?

Different vehicle manufacturers use different pitch threaded fasteners on the towbar to vehicle fixtures. Witter Towbars supply fasteners to match these fixtures and often together with fasteners of a standard pitch for towbar-to-towbar connections.

The finer the pitch (lower the distance between threads) the greater the resistance to loosening under vibration and greater the strength of the bolt/nut connection. However, the finer pitch is also more sensitive to damage and binding due to contaminants such as dust and debris.

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