Stud Removal with Double Nuts, Version 1.1

By R. G. Sparber

Removing a stud by using two nuts is a tried and true technique: for a right-hand thread, spin on two nuts, tighten them together, and then turn the bottom nut counterclockwise. The top nut should not turn.

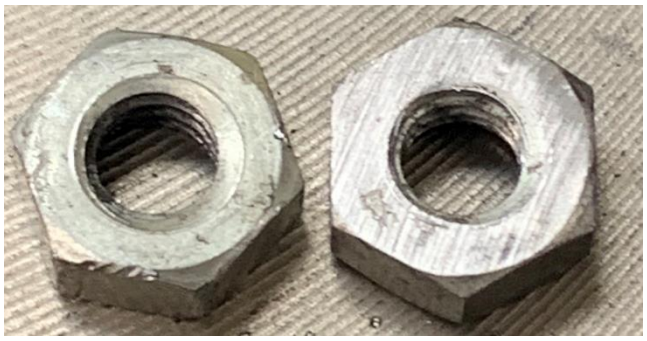
I have been successful with pairs of nuts solidly locked in place on studs greater than ¼ inch in diameter. However, on ¼-20 studs and nuts, slippage occurs at about 100 inch pounds.

Why the slippage?

After some thinking and experiments, I realized that the contact areas on the nuts are the key.

I coated one face of a ¼ -20 nut with red Dykem.

After locking two nuts together, you can see that very little of the Dykem has worn off.



The slightly used nut on the left is my reference. I ground down the nut on the right on my disk sander[2]. The surface is now flatter, smoother, and slightly larger.

I again coated the face with Dykem.

Not much of the face escaped contact with the other nut.

With two such modified nuts, I locked onto a ¼-20 stud with no slippage.

"Toolmaker51" on homemadetools.net suggested using a closed end wrench plus a washer between the nuts. For stud removal, put the wrench on first, then the nut, then the washer, and the top nut. The washer stabilizes the wrench, especially in areas where there's insufficient room to swing a full circle.

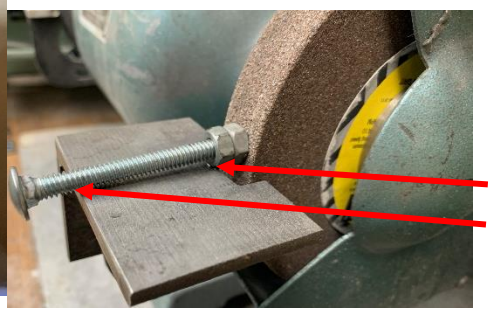
[2] I threaded two nuts onto a bolt, locked them together, and then used the bolt as a handle. My fingers were far away from that spinning disk.

A Bad Idea that Led to a Good Idea

It was not a straight line from slipping to locked nuts. Along the way, I experimented with using cam nuts.

The idea was to reduce the effective threads per inch of the nuts. Without the slope in the contact surface, as I turn the lower nut counterclockwise, it would tend to turn the top nut in the same direction and move vertically the same distance.

With the slope, the bottom nut pushes up on the top nut more than the nut move due to the threads, causing the nuts to jam together.



I achieved reasonably close angles on the two nuts with this arrangement. The edge of the locking nut and the body of the carriage bolt resting on the table defined my slope angle.

However, my simple cam did nasty things to the stud. The section between the nuts bent and eventually tore off as I tightened the nuts. Here you see the two pieces with the nuts still attached.

I could have solved this bending problem but making these sloped surfaces helical. This would have kept the two nuts perpendicular to the stud.

I think the helical surface could be cut on my lathe using the thread-cutting feature and face-cutting rather than using a thread-cutting tool. As I thought about how hard this would be to get right, I thought about the far more straightforward method of facing each nut to increase the contact area. Sometimes an idea has to become more complex before it can become simpler.

Acknowledgements

Thanks to “ductape” of homemadetools.net for getting me to think about contact area. Using Dykem to see this phnominon was the logical next step. Thanks to “Toolmaker51” of homemadetools.net for suggesting the washer and closed end wrench.

I welcome your comments and questions.

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