

# How to Loosen Nuts & Bolts

by [Larry Carley](#) copyright 2019 AA1Car.com



Frozen fasteners can make any automotive repair job much more difficult than it needs to be. So here are some suggestions on how to loosen and remove stubborn nuts and bolts without breaking them.

## Use the Correct Wrench

Use SAE wrenches and sockets on standard nuts and bolts, and metric wrenches and sockets on metric fasteners. Although some SAE and metric sizes are very close, they may differ enough to round off the head on a hex head fastener.

If you don't know the fastener type (SAE or metric), try several different sizes to see which fits best. Asian and European vehicles use metric fasteners while most late model American vehicles also use metric fasteners. Older American cars and trucks (1980s and older) use SAE fasteners. However, some 1980s and 1990s vintage American vehicles use a mixture of SAE and metric fasteners on different components.

## Use Penetrating Oil

The threads on a nut or bolt create friction that locks the fastener in place. Over time, threads can corrode and make it very difficult to loosen a nut or bolt. If you don't have to

disassemble a part right away, spray penetrating oil, WD-40 (or a similar product), or a 50/50 mixture of acetone and automatic transmission fluid (ATF) on the frozen fasteners and let it soak overnight. Penetrating oil takes time to slowly seep into the tiny gaps between the threads on the fastener. Given enough time (several hours at least), it can loosen the rust and corrosion that is binding the fastener, allowing you to loosen the stubborn nut or bolt without damaging it.



### **Use Heat to Loosen a Frozen or Rusted Nut or Bolt**

Use a propane torch to apply heat to a frozen fastener (30 to 40 seconds is usually enough). An acetylene torch can also be used to heat a fastener, but be careful because an acetylene torch applies a LOT more heat than a propane torch.

**CAUTION:** If a fastener is part of a high strength heat-treated component (like an axle spindle, steering knuckle, etc.), too much heat may temper and weaken the steel in the component.

Heat causes metal to expand. This may break the threads loose, or cause enough distortion in the fastener that it will break loose when torque is applied.

**CAUTION:** Be very careful when applying heat on parts near hoses, wires, plastic parts or rubber seals because the heat and flame from a propane torch can burn or damage nearby rubber or plastic parts. Also, make sure there are no fuel leaks nearby because the flame from the torch could start a fire!

Heat works well in combination with penetrating oil. Apply heat, remove the torch and spray on some penetrating oil. Let it soak in for a few minutes, then try to loosen the fastener. If the fastener still won't budge, apply more heat, remove the torch again and apply more penetrating oil. Repeat as needed until you can loosen the fastener.

**CAUTION:** Heating a fastener that has been sprayed with penetrating oil will usually burn off or ignite the penetrating oil.

Another trick is to heat the fastener, remove the torch then immediately press a candle down on the fastener while it is still hot. The heat will melt the candle wax and draw the wax into the threads where it acts as a lubricant.

## Use an Impact Wrench

A pneumatic, corded or cordless electric impact wrench can apply a considerable amount of torque to a fastener., from 200 to over 500 ft. lbs. of torque depending on the tool. The rapid hammer-like blows of a pneumatic or electric impact wrench vibrate the fastener at a frequency that loosens the threads. Be sure to use a 6-point impact socket, not an ordinary 12-point socket, because the latter may crack or slip and round off the bolt head or nut.

An impact wrench also works well with penetrating oil and heat. Spray some penetrating oil on the fasteners, let it soak in for a few hours, then apply heat with a propane torch for 30 to 40 seconds. Now use your impact wrench to loosen and remove the fastener.



*A torque stick limits peak torque applied to a lug nut with an impact wrench.*

An impact wrench works great for removing frozen lug nuts on wheels. But an impact wrench should NOT be used to install and tighten lug nuts UNLESS you are using a TORQUE STICK that limits the amount of torque applied to the lug nut. The applied torque from an impact wrench is too uneven if you are not using a torque stick. The best

advice is to always use a torque wrench to final tighten lug nuts, axle nuts, head bolts and other fasteners that require a specific load.

## **Use Vibration**

Another trick for breaking loose a frozen fastener is to put a blunt tool into an air hammer and use it to vibrate the head of the fastener. Vibrating for 20 to 30 seconds should loosen the threads. This technique also works well with heat and penetrating oil.

## **Use a Longer Handle Wrench, a Breaker Bar or a Cheater Bar**

Sometimes you can't apply enough torque to loosen a nut or bolt with a hand wrench or a ratchet wrench - especially if the nut or bolt was installed with a considerable amount of torque (like an axle hub nut that may have been torqued to several hundred lb-ft.). To break it loose, use a 6-point impact socket (which is much stronger than an ordinary 12-point socket) with a 1/2-inch or 3/4-inch breaker bar. The breaker bar is usually quite a bit longer than a ratchet wrench and gives you more leverage.

Remember, the longer the handle on the wrench or breaker bar, the more leverage it gives you and the more force you can apply to the fastener.

**CAUTION:** Applying more leverage also increases the risk of twisting off and breaking the fastener. Proceed cautiously and don't overdo it.

If even more leverage is needed on a large fastener, you can use a "cheater bar" - a long piece of sturdy iron pipe slipped over the breaker bar to extend the length of the handle. This trick works well when loosening axle hub nuts. You may need a pipe three or four feet long to get enough leverage to loosen the nut.

**CAUTION:** If you use a cheater bar that is too long, you may apply so much force that you end up bending or breaking your tool. Using a cheater bar on a ratchet or ordinary hand wrench is NOT recommended as this may overload and damage your tool.

## **How To Reduce the Risk of Rounding Off a Fastener**

Open end wrenches, adjustable wrenches, 12-point box end wrenches and 12-point sockets do not grip a hex head fastener as well as a 6-point socket wrench, box wrench or flare nut wrench. So there is a greater chance of the wrench or socket slipping and rounding off the hex head bolt or nut.

DO NOT use Vice Grips, locking pliers, adjustable pliers, regular pliers or a pipe wrench to remove a hex head fastener. These tools can damage the head making it impossible to remove later with an ordinary wrench or socket.

## How To Loosen a Damaged Fastener

If a hex head nut or bolt has been rounded off, or is so badly corroded you can't get an ordinary wrench or socket on the fastener, then you can use Vice Grips, locking pliers, adjustable pliers or a pipe wrench to grab the head on the bolt or the nut so you can loosen it.

Also, use penetrating oil, heat and/or vibration to help loosen the threads.

If you can't get enough grip on the fastener with Vice Grips, locking pliers or a pipe wrench, you have several options:

1. Use a nut cracker tool or a chisel to break off a damaged or frozen nut.



2. If you have a welder, weld or braze a new head to the top of a broken bolt, then use a wrench on the new head to loosen it.

3. Drill a pilot hole in the center of the damaged bolt, then use an EZ-Out tool to loosen and back it out. The reverse flutes on the EZ-Out tool bite into the hole so you can apply enough torque to loosen the damaged bolt. Turn the EZ-Out tool counterclockwise to loosen the bolt.

If the hole that the bolt screwed into has damaged threads, you may have to drill out the hole and install a thread repair insert or retap the hole with a thread tap.

**CAUTION:** Take it slow and easy when using an EZ-Out tool or a thread tap. If the EZ-Out tool or thread tap breaks off in the hole, you're screwed because the tap is made from hardened steel and will be a bitch to drill or grind out.

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