

**April 2015**



Here's a question that most people are curious about: What is decorating your "man cave"? I'm not talking tools, parts on shelves, or even parts hanging on the walls. I'm talking about the cool stuff that you actually hung there to show off. This goes for inside your home's office, den, or that stuff on your mantle. I know we have some guys with trophies from drag racing, car shows, or autocross racing. I'm sure there's some sort of cherished photos with your car, or maybe a shot from back in the day as a kid behind the wheel of dad's car. I'm sure there's some other cool collectables out there too, though some have more sentimental value than resale value. We all have things we display to show off, but oddly enough, they are where most other people never get to see them. I bet each piece has a story too...here's one of mine:

My most recent (and the most sentimental) addition is a basketball presented to me last week. Why? I spent this past winter coaching my older daughter's traveling basketball team. I didn't plan to be a coach, but it all changed at tryouts. When the team was announced, a coach's daughter didn't make the team. Since I usually stayed for the practices, I was asked to help. My vast basketball knowledge up until then included little more than knowing who the majority of the Olympic "dream team" were, going to a couple Timberwolves games, and knowing the Bulls' intro theme was *Sirius* by Atlanta Rhythm Section. It was a cram session just to learn the main rules and all the plays this team had accrued over several years of playing together.

Sure, I could have shown up, stood off to the side and be an extra player during drills or just shagged the occasional missed shot. That's about the extent of the last guy, but they deserved more. This was their last year before going to high school. This was the last year before they got broken up into underclass, Junior Varsity, or Varsity teams based on their skill levels. For some girls, this was their last year playing. They weren't going to continue basketball at all. I promised them I was going to do my best to make each and every one of them better at their positions and as a team. These girls worked hard. Their record was not great, but these girls saw themselves progress over the season and reaching goals they had set. The few wins they had were celebrated with a sigh of relief and acknowledgement of a well-played game. Their many losses often had the same results, but they saw progress.

At the year-end banquet, the outgoing team gets to dress up and give a speech which can get quite emotional. As coaches, we presented the players with certificates honoring each one with their individual achievements. As a gift, they presented both of us with really cool autographed basketballs. To me this is better than any award; I will cherish it forever, and feature it in my man cave.



## Tech 101 – Thread restoration and workarounds on existing hardware by Jim O'Clair

There are many times when disassembling old parts that you end up stripping a bolt or nut and ruining your whole day. New shiny replacement hardware is often available, but looks 50 years newer than the piece you are attaching it to, and a lot of original hardware items are no longer made. Using re-threading tools to restore existing hardware can be a viable alternative to new parts or when replacements are not readily available to complete the task. Re-using the original hardware is also preferred during restorations in order to keep the car's patina earned over years of driving.



There are several ways to restore threads on original hardware, most obviously through the use of taps and dies. The taps most consumers buy to restore stripped nuts or holes in metals are nut or plug taps. A “nut tap” actually takes the place of two separate or serial taps that are used when the hole or nut is first threaded. The thread cutting surfaces on these taps create a progressively better-threaded hole to receive the bolt of corresponding size and thread pitch.

The first of these serial taps that are used is an “entering tap”; the majority of the aggressively chamfered threads on this first tap do about 60 percent of the thread cutting in the hole. Once the bottom of the tap has done the cutting, upper threads on the tap are designed as a following thread that keeps the tap centered in the hole as the lower cutting threads set the thread pitch. A second plug tap is then run in after the first; the plug tap has less-chamfered threads and more following threads, and does about 30 percent more of the cutting. The design of the plug tap continues the thread pattern further down into the hole. The final tap used is a “bottoming” or “finishing” tap that has very few chamfered edges at the bottom of the tap, and a majority of the tap has following threads. Bottoming taps are used to finish the lower end of the hole.

Nut taps can be used in place of both the entering tap and plug tap to finish holes that are drilled all the way through; however, bottoming taps are recommended for holes that stop inside the material. Nut taps have a tapered, pointed end, while bottoming taps are flat, and the wider chamfered threads start at the flat base.

It is recommended you purchase one of each or a set that contains both types for each thread size. Your taps will be found with several different tops on them. The standard configuration is a four-sided head. In this case, the set should include a T-shaped tap handle, designed to hold the tap by its square head. The handle enables you to keep the tap at 90 degrees from the hole, ensuring a straighter thread once cut. T-handles can also be used to multiply the force needed to cut into the unthreaded hole.

Other taps will have a hex-shaped head that can be turned using a wrench or socket on a ratchet. Several custom thread taps for spark plugs can also be found with a 3/8-drive square hole for a ratchet.

Most taps will also indicate on the stock which size drill bit is recommended to make the hole wide enough to allow the tap to do its jobs without breaking. It is important when using a tap that you do so gradually, turning the tap into the hole a few turns, then backing the tap back out to allow the cut material to travel up the threads and out of the hole. One of the toughest removal jobs you can encounter during any repair is removing a broken tap. They are very stubborn to twist out once they break and very difficult to drill out. Cutting oil is also recommended to keep the tool from overheating or dulling. The cutting oil will also help grab onto the metal chips that are produced during cutting, and help carry them up the threads and out of the hole.

Externally-threaded bolts, spindles and studs can be restored using dies. Thread dies restore the original pitch using chamfered cutting threads with following threads at the back to help guide the tap perpendicular to the stock being threaded. Dies are usually easier to use and more accurate when held in a die holder with twin handles that allow the application of additional force where necessary. In the case of damaged threads on a spindle or wheel stud, larger re-threading dies are available for these operations, and they function in the same way.



Thread files and thread chasers can often be used in cases where just a few threads on a bolt or nut are damaged. A thread file is a square file with teeth cut in various thread pitches on each side of the flat surface. Usually double ended, a thread file can contain eight different thread pitches and are offered in both metric and standard thread pitches.

Line the thread file up using the remaining threads that are still good and draw through the bad threads as you would a regular file to straighten the bad threads or re-establish the thread pitch that will allow the nut to continue onto the lower or inner threads.

Thread chasers are used in a similar manner to a tap, but are more like a hardened bolt that you use to force internal damaged threads back in line with the other threads in the hole.

Should you encounter a hole that is damaged beyond the point of re-threading, there are a few other alternatives at your disposal.

A Heli-Coil kit uses a drill bit, oversize tap, thread insert and inserting tool that allows you to re-establish the thread hole. The taps contained in the kit are matched to the size of the external threads on the inserts; the internal threads of the inserts are the same size and thread pitch as the original hole. Once the hole is drilled out, the tap then cuts new oversized threads. The insert is installed into the inserting tool, and both pieces are screwed into the newly threaded hole. Once the insert has bottomed out, the inserting tool is then removed, and the hole is ready for a new bolt.

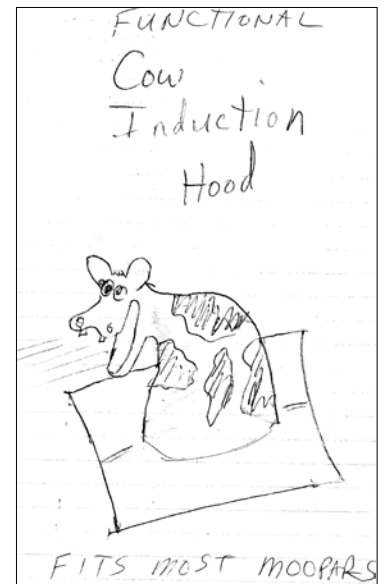


Another trick that can be used when original threads are too damaged to repair, is to rethread in another size. Often, U.S. threaded holes can be oversized using a metric tap (and matching bolt) of a slightly larger size and vice versa. Five-sixteenths-inch diameter threads can be tapped to 8 mm, 3/8-inch threads can be oversized to 10 mm, 5/8-inch bolts can be tapped to 16 mm, etc. This doesn't apply to all U.S. sizes. For example, it would be difficult to find 13 mm hardware to replace a 1/2-inch bolt, but there are close equivalents that allow this switching between continents to be successful when repairing some threads.

Thread holes in thin metals can be repaired using poly nuts. A poly nut is a rivet that is popped into the hole using a special rivet gun that has new internal threads for a bolt or stud. Poly nuts are available in many sizes and thread pitches but are usually used in holes smaller than 3/8-inch.

Whenever replacing new or used hardware, it is recommended that a thread lock product be used to ensure the bolt or nut does not vibrate loose or back out. The use of a thread locker will also preserve the threads from damage, should the connection have to come apart at a later date.

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These are just some of the pictures I come across or take myself. The “cow induction hood” drawing had been pinned to a bulletin board at work for about a decade. I don't even remember where it came from. Look for more oddball stuff like this to pepper the rest of this year's newsletters.

## **Top Ten Pet Peeves - - - Annoying facts of life in the auto biz** by Gonzo

Every day at the repair shop there's another challenge to overcome. When things go smoothly the day glides by without notice. One day passes to the next, so on and so on. But, there are those occasions when one of life's little obstinate reminders comes along to let you know that every day can't be perfect. Usually, just to irk even the best mechanic off for no reason at all, except to be a royal inconvenience. You know, it's those daily activities and tasks that create their own obstacles just to rub your wrenches the wrong way. They make you want to flip your pressure gauges into the next service bay.

I know for a fact that there's not enough morning coffee to ease the frustration when you are in the midst of working all day and some little insignificant problem comes along that isn't part of the big picture you're trying to solve. It just adds to the challenge of the day. You've already got to deal with the cars, the owners, the tools, the weather, and the usual soap opera stuff in the shop. Now you gotta throw this into the mix. It's just one of those tasks that shouldn't be an issue but certainly can add to a tension headache and a darn good chance for a swift kick to the offending item. Hey, let's face it, nothing's perfect, but it sure would be nice when the simple things in the shop just stayed simple. Yea... like that's going to happen.

Here's a list of my top ten pet peeves of the auto shop.

**10#** - You drive a car onto the lift, set 3 of the 4 legs, but the last one won't line up or get past the tire, unless you hop back in the car and move it just a bit more. (I've figured it out... 9 out of 10 cars don't fit the first time. So, 1 out of 10 cars is going to give me fits in a different way.)

**9#** - How come the air hose is always 6 inches too short to reach that last bolt? (It doesn't matter how much extra hose you sling off the reel, it's still 6 inches short.)

**8#** - Tool borrowers who borrow tools and don't bring them back. Tool borrowers who bring them back...broken. Tool borrowers who don't wipe the grease off of my tools after they're done with them. (Ok...in general... "tool borrowers".)

**7#** - Small cars with gym equipment, boxes full of random stuff, and or a pile of clothes behind the driver's seat. When I try to move the seat back, so I can drive it into the shop ... it won't move....! (I don't think I can slip between the wheel and the seat in some of these cars, even if I went on a diet... ain't enough room, people! ! !)

**6#** - Pocket screwdrivers with extra strong magnets on the tip. Magnets are good, but not when you lean over an engine and the screwdriver attaches itself to the nearest piece of metal... every time! (The last one that did this is in my tool box... safely away from being the next projectile across the shop.)

**5#** - The last guy to use the oil drain/recovery tank filled it up with the last oil change, and didn't bother to empty it. (There's a price on that guy's head. He doesn't know it, but he's a marked man....)

**4#** - Service writers who don't ask questions, but will write down anything the customer tells them, even if it makes absolutely no sense at all. "The car sounds like a ballerina with a sore foot." This is NOT a good explanation of a faulty suspension component! (Let's face it, I ain't no ballerina, haven't a clue what it would be like to have a sore foot as one.)

**3#** - Drop a car off, explain (in over abundant detail) about the problem they are having, but fail to mention the outside door handle is broken, and that I have to crawl in from the passenger side. (So, you want me to perform some Olympic gymnastics feat to fix your car? 'Fraid not... fix the fX%#& door!)

**2#** - You ask if I'm a mechanic, then proceed to tell me how brilliant you are at my profession. Later on in the conversation I find out the cars you've worked on are all for relatives of yours... most of which don't speak to you anymore after you've done your "magic" under the hood. (Oh I know, everybody is a mechanic. Might as well fess up... but I don't need to brag about what I do... my work speaks for itself.)

**1#** - Engineered disasters, poor designs, and unbelievably impossible to get to bolts or components that only an idiot would have designed that way in the first place. Then show zero labor time to remove said part, which only makes it worse when I bid the job out to what it "really" is going to take. Then... as usual... the customer calls another shop, who uses the book time (only) never having done this particular job before, and ends up with the repair. Then, a few days later the same car is back with "other" problems related to somebody trying to get to those hard to reach bolts or components and has damaged something along the way. AND, of course... it's all my fault don't ya know..... (The battle was lost even before I started. Should've been a ballerina...)

### **Bonus Pet Peeve**

Start an electrical short trace from one end of a circuit and 9 chances out of 10 the problem is on the opposite end. And it doesn't matter if you try to "out think" it by starting on the other end ... it's still going to be on the opposite end. (Murphy's Law... it's a done fact...)

I think I should have started this list as the top 100 instead of the top ten, because there's a lot more of them out there. It's just the kind of thing that makes you want to split your sockets sometimes. I don't know about you, but for me, it's those little things that accumulate as the day goes by that makes you want to snap off your Snap On ratchets. The mere thought of another half-cracked-silly issue that shouldn't be an issue showing up makes locking up the tool box and try it all again tomorrow rather tempting. But, you know you'll stick it out, you'll get it done, grumble a bit of course, and as anybody in the business will tell you... it's just another day and a part of this crazy world of auto repair.

Yep, it's just another one of those quirks that life throws at you now and then. Best thing to do is to shake it all off and deal with it. Go on about your merry way, and try to keep from bending another pry bar into a pretzel. Tomorrow's another day. Yes, there's always a tomorrow... and I'm sure there will always be another pet peeve just waiting to be a part of your productive day. Happy wrenchin'!-Gonzo

### **Cool Tool:** Tite-Reach Extension

#### **3/8" PRO:**

Our 3/8" professional wrench is where the concept started. The 3/8" pro is specially designed to handle the rigors of everyday use on the farm and in the shop. Designed to be used with your own sockets and socket wrenches all

of our wrenches have the versatility to work from either side. With 10" inches of reach our 3/8" pro will extend your reach away from what you are working on saving you time and saving your knuckles. If you would like to get the job done quicker you can also couple our wrench with your impact driver saving you more time and making that awkward nut or bolt easy work on. This wrench is also coupled with a lifetime warranty to ensure your satisfaction.



Tite-Reach is available in 3/8 Pro, 1/4 Pro, and 3/8 DIY see [www.tite-reach.com](http://www.tite-reach.com) for more information.