

The AHOOGAH HORN

Volume 27 Issue 04

Watchung Valley Region of the Model "A" Restorers Club

April 2007

THE NUTS AND BOLTS OF FASTENERS

Beyond lock washers and locking nuts

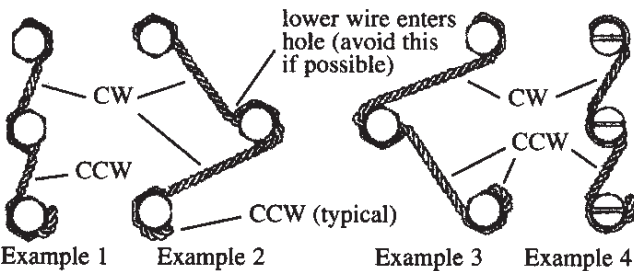
In this issue we will look at safety wiring, the proper use of cotter pins and that nifty stuff called Loctite.

Lets start with safety wiring. There is no better way to secure a bolt then to safety wire it and secure it so that it cannot rotate. Most wire used is 302-grade stainless steel wire. It usually comes in

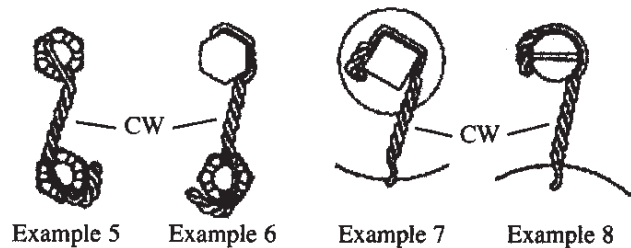
three or four thickness. The most common is 0.031 in. diameter. If you are not going to use a lot of safety wire buy the 0.031. Drill the bolt head and also drill a near by stationary location to secure the other end of the wire. Drilling the head of the bolt sounds easy. I wasted three valuable hours last Saturday drilling my oil pan drain plug.

It had one 3/32-inch hole in the head but I really needed two more to make it possible to secure the bolt from any position. Problem is that when I started drilling the second hole, it had to pass through the first hole in the center of the bolt head. As it reached the halfway point the drill bit snapped. Not a good situation. Ever try to remove a very

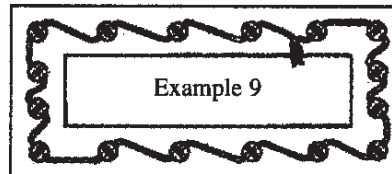
- Methods:**
- The double-twist method is most common (see examples 1 through 8 below).
 - The single-wire method is used on fasteners in a closely spaced or closed pattern, as in example 9.
- Wire Size:**
- Use .032 or larger for the double-twist method on parts drilled .045 inch or larger.
 - A double strand of .020 wire can be used on parts drilled .045 to .062 inch if the spacing between parts is less than two inches. This will give greater flexibility during installation.
 - Use the largest diameter wire possible with the single-wire method.
- Do:**
- Install the safety wire so that it will tend to tighten the fastener.
 - Try to install the safety wire closely around the head of the fastener rather than over it. **The upper wire should enter the hole if possible** (see examples 1 thru 4).
 - Pull safety wire tight when twisting; it should maintain a light tension when secured.
 - Wire should have 6-8 twists per inch.
 - Leave at least 4-6 complete twists on the free end.
 - Bend free end under itself or place a small drop of silicone on the end to prevent sharp ends from causing a safety hazard.
- Don't:**
- Nick, kink, or mutilate the wire.
 - **Don't** overstress the wire or twist it too tightly.
 - **Don't** over-torque or loosen a fastener to align safety wire holes. Note: Drilled bolts do not need safety wire when installed with self-locking nuts.



Examples 1 thru 4 are wired so that loosening any part is counteracted by tightening of another part. The direction of twist from the 2nd to the 3rd unit is CCW in examples 1, 3 and 4 to keep the loop in position against the head of the bolt. The direction of twist from the 2nd to the 3rd bolt in example 2 is CW to keep the wire in position around the 2nd bolt. The wire entering the hole in the 3rd bolt will be the lower wire (except example 2) but by making a CCW twist after it leaves the hole, the loop will be secured in place around the head of the 3rd bolt or screw.



These examples show methods for wiring various standard items. Wire may be wrapped over rather than around when wiring castellated nuts or on other items when there is a clearance problem.



Example 9 shows the correct application of single wire to a closely spaced multiple group.

Check out our web site at www.heavenlymud.net/AhoogahHornWeb

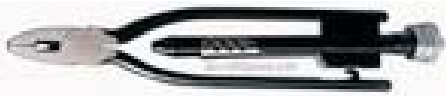
The Ahoogah Horn is a publication of the Watchung Valley Region of the Model "A" Restorers Club, a non-profit organization established in 1980, and is dedicated to expanding and maintaining interest in the Model A Ford.

The Watchung Valley Region of the Model "A" Restorers Club is an affiliate of the Model "A" Restorers Club. Membership in the club is open to all. Ownership of a Model A Ford is not a condition of membership.

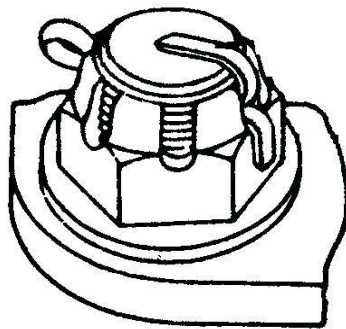
small diameter cobalt bit? It can't be done. I tried to drill it form the top. No good. I tried drilling it out form the opposite side. Still no good. I tried to use a punch, a nail, an awl; nothing could move it. OK, so just buy a new drain plug. Off to the local auto store for a new bolt. I tried it at the store and the drain bolt felt OK. Lucky for me it was SAE thread. When I got home I tried the bolt and it fit but it was a sloppy fit. I guess I was not so lucky.. Bought two more and several new drill bits. The lesson learned is to always use a sharp drill bit, lots of oil and drill ever so slowly. A dull bit will always snap off in the wrong places. Back to the subject at hand.



and insert the cotter pin through the new hole in the bolt. Give the rounded end of the cotter pin a tap to seat it in position. Did you know there is a correct and an incorrect way to bend the ends of the cotter pin? I usually just bend the two ends around the bolt shank. WRONG!



Once the bolt is drilled the next step is to properly tighten it in place and install the safety wire. This is done by first inserting the wire through the head of the bolt. Then loop it **around the head** in such a way that the bolt cannot spin in the direction that will un-tighten the bolt. Do not put the safety wire over the top of the bolt head. It won't do anything. Now twist the wire tightly but don't kink the wire. If you nick the wire it could break. And don't ever think of reusing the wire. That is why you bought so much. Another very secure way to lock a bolt in position is to use a cotter pin to prevent the nut from coming off of a bolt shank. This is done by first installing the nut and bolt. Use a crown nut with slots already cut in for the cotter pin if possible. Then mark the location of the required hole with a punch. Remove the bolt and place it in a V-block to drill it. If you have access to a drill press use it so that the hole is level and square. Install the nut and bolt again



The correct way to secure a cotter pin is to cut one leg short and bend it toward the bolt head. The other end should be bent over the top of the bolt. This assumes you have used the correct length bolt. No matter how desperate you are don't ever use a cotter pin a second time. You know, like on the front wheel bearing of your Model "A". You must use new cotter pins every time. There is a common theme here. When a bolt is scratched, scarred or rusted replace it. When safety wire is kinked replace it. When a cotter pin is scratched or bent replace it. All of these examples

Upcoming Meetings!



Meetings: 8:00pm
Greenbrook Manor Nursing Home
303 Rock Ave
Green Brook, NJ

May 8 th	August 14 th	November 13 th	January 8 th
June 12 th	September 11 th	December 11 th	February 12 th
July 10 th	October 9 th	2008	March 11 th

represent fatigue points in metal. Fasteners are cheap by comparison so plan to use new ones when ever possible.

Finally, let's take a quick look at using chemistry rather than physics to secure a fastener. The very first product for this purpose was Loctite. It was developed in 1959 and has had an excellent track record ever since. There are other brands today but why bother? Loctite comes in several different formulations. Threadlocker #242 blue is designed to resist vibration. It is ideal for nuts and bolts between 1/4" to 3/4". There is also Threadlocker #290 green formulated to be applied to already assembled fasteners. It has a penetrating quality. Typically used on smaller fasteners form #2 to 1/2" in diameter. The third Threadlocker is the red # 271. This one was developed for bolts under 1" and is a high strength product for heavy-duty applications. It is harder to remove but heat will help. Loctite is not expensive so keep all three in your toolbox.



Watchung Valley Region of the Model "A" Restorers Club / 2007 Officers

Director:	Lou Della Vecchia	973-476-4619
Vice President:	Tom Fritz	908-580-0502
Treasurer:	Larry Littman	908-276-8346
Secretary / Editor:	Dick Bettle	973-966-2947
Membership:	John Bedner	732-388-0894

Club meetings are held on the **second Tuesday** of every month at 8:00pm

Greenbrook Manor Nursing Home
303 Rock Ave
Green Brook, NJ

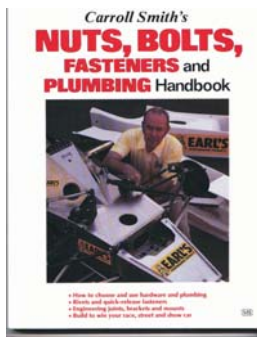
The Ahoogah Horn is the official newsletter of the Watchung Valley Region of the Model "A" Restorers Club. It is published monthly and is provided to officers and editors of other car clubs upon request. The Ahoogah Horn solicits articles and other contributions of material from members and other sources, and welcomes other club newsletters to reprint its articles, giving credit to both the author and the publication. News concerning club activities, membership and other information may be sent typed or PC form to the following address:

Dick Bettle, Editor
170 Crescent Road
Florham Park, NJ 07932-2234
973-966-2947

Email: AhoogahHorn@heavenlymud.net

Submissions must arrive by the 15th of the month to assure publication in the next issue.

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So there you have it. The best source for information on high performance fasteners is Carroll Smith's book called "Nuts, Bolts, Fasteners and Plumbing Handbook" published by MBI Publishing Company in 1990. This book is the bible on fasteners. When I first purchased the book, it was quite overwhelming. I found far too much information on metallurgy, rivets technology and steel braided hoses. After a bit of reading I put the book aside assuming it would be there as a reference book. Two years later I picked it up to see if I could find the difference in holding strength of the different types of lock nuts. When I spent time reading the fastener section of the book it became clear how and when to select different types of fasteners. I hope you found this synopsis helpful. It certainly dispelled a number of misconceptions I had and it is my hope it will help you make the best choices.

Remember to choose fasteners like your life depended on it. Use only quality bolts. Tighten them properly rather than relying on lock washers to do the job. Use lock nuts wherever possible. And most importantly, always use two forms of locking devices to keep that bolt exactly where you put it.

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Minutes of the meeting

Following Vince's video on the 20,000,000th Ford's history, there was a short break for goodies. Lou then opened the 324th meeting at 9:00 p.m.

Upcoming Events

Automatic Switch AACA Show, 05/06/07, Hanover Rd, Florham Park, NJ. Contact Phone: Anne Klutkowski at 732-388-3029.

Millburn Classic Car Show, 05/20/07, Millburn NJ.

American Truck Historical Society Metro Jersey Chapter Show, 06/03/07, Automatic Switch Hanover Rd, Florham Park, NJ. Contact Phone: Tom at 973-539-7145.

Das Awkscht Fescht, 8/03/07 to 8/05/07, Macungie Memorial Park, Main Street, Macungie, PA . You must register by 07/01/07. Contact Phone: 610-967-2317 . The Club will be going on Saturday August 4, 2007. Meet at the diner on Rt. 22 at 8:30. Call Lou for info 973-476-4619.

4th Annual Club Picnic, NEW LOCATION 09/09/07, 10:00am to 6:00pm at The Bedners's, 82 Ravine Drive, Colonia, NJ 07067. Contact Phone: John Bedner at 732-388-0894. The club will supply dogs, burgers and soft drinks, bring something to share.

New England Model A Ford Meet, 09/14/07 to 09/16/07, Sturbridge Host Hotel, Sturbridge, MA. Contact Phone: Jo Johnson 978-807-9081.



Treasurer's Report

Larry reported an ending balance of \$2103.81.

Secretary's Report

Check to see when your program is due. Also, check out the new regalia section on the Ahoogah Horn Website. There are many items for sale with the clubs logo on them. I want to thank Steve Schultz of the MG Car Club - Central Jersey Centre for his interesting article on painting parts and components. I have also printed one of his articles in this issue.

Membership

John said all members were paid up!

Old Business

Lou said there was no news yet on what the nursing home would like for their 2006 gift.

New Business

We picked September 9th as the date for the Annual Club Picnic.



Technical

Teddy is looking for black butt connectors. Vince is looking for one band ear for his Model "T" transmission

Programs:

- May: Lou Della Vecchia August: George Harbt**
- June: Tom Fritz September: Bill Koeth**
- July: Art Hall October: Jack LeCarl**

The member giving the presentation is responsible for bringing the refreshments.

50/50

George Shoremount won \$7.00 in the 50/50.



Adjournment

Lou adjourned the meeting at 9:40 pm

ADS ARE FREE FOR MEMBERS AND WILL RUN UNTIL YOU CALL TO CANCEL. SEND TYPED OR CLEARLY WRITTEN COPY TO:

DICK BETTLE, 170 CRESCENT ROAD, FLORHAM PARK, NJ 07932-2234.
YOU CAN ALSO E-MAIL ME AT AHOOGAHHORN@HEAVENLYMUD.NET

The Ahoogah Horn

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170 Crescent Road
Florham Park, NJ 07932-2234



Address Corrections Requested
Forwarding Service Requested

Next Meeting:

May 8th

8:00 p.m.

Greenbrook Manor Nursing Home

303 Rock Ave

Green Brook, NJ

May Meeting:

Lou Della Vecchia