



### REPAIRING DAMAGED WHEEL STUDS

We've all seen them, restored tractors and working tractors with missing lug nuts and stubs of broken wheel studs. Sometimes we see studs of different lengths or lug nuts of different sizes, the result of incorrect replacement parts.

When wheels, particularly those with ballast filled tires, are removed or installed, they are often dragged over the studs, crushing the threads so the lug nuts will not thread easily onto the wheel studs.

Repairing or replacing damaged wheel studs is relatively easy and inexpensive, if you know what to do.

Threads on wheel studs can often be restored with a thread chaser. Thread chasers look like a nut with segments of the inside threads missing, similar to a die. Thread chasers can be purchased in sets and individually at most automotive supply stores, from tool suppliers like Snap-On and MAC and at Sears stores or the Sears tool catalog. Once you use a set you'll find that they are a handy tool for tractor repair and restoration. You'll need a 1/2" NF thread chaser for the front wheels and a 9/16" NF thread chaser for the rear wheels. Most sets contain both sizes.

#### Using the Thread Chaser to Repair Studs

To repair a stud it is best to remove the wheel from the tractor so the chaser can be threaded all the way down on the threads. Begin by using a flat file to chamfer the end of the stud. The objective is to reduce the outer diameter of the end of the stud by creating a bevel 45-60 degrees around the outer edge. This will allow the thread chaser and the nut to start on the threads properly. When there is severe damage the chamfer may have to be a bit wider than normal. Once chamfered, the thread chaser should thread onto the stud. The inside diameter of the thread chaser is larger at one end. Place the large end of the chaser on the stud. Put a few drops of oil on the stud to aid in reshaping the threads. Try to start the chaser with your fingers and then use a wrench or socket. Use the chaser like a die, turning it clockwise a bit and then counterclockwise. Repeat this motion until you reach the end of the threads. You may want to do this several times until the chaser threads easily on and off the stud.

When you are finished, remove the chaser and clean the threads with solvent to remove any debris and examine the threads. If they appear to be okay, try threading a new nut on the stud. I usually recommend using a new nut on restored threads because the deep, sharp threads in a new nut will often compensate for any reduction in thread height caused by the original damage. While the wheel is off, you may want to run the chaser on all the studs to clean them up. Install the wheel and lug nuts with a bit of grease on the threads. If you can torque the nut on the repaired stud to the original specification, your re-

pair is complete.

If a significant portion of the original threads are missing after the repair or you cannot torque the nut to specification, you will have to replace the stud. The torque specifications are: front wheel nuts 65-75 foot pounds and rear wheel nuts 80-90 foot pounds.

#### Thread Repair File

Threads can also be repaired with a special thread repair file that has rows of teeth in various widths and pitches. The spacing between the rows corresponds to the number of threads per inch used on different size bolts with either fine or coarse threads. Typically these files have eight different thread dimensions, four at each end. After determining the correct thread spacing and pitch on the bolt or stud you are restoring, the file is drawn across the damaged area to restore the threads. The result is not as nice as a thread chaser, but it is an alternative method of repairing threads. These files are available from the same sources as thread chasers.

#### Replacing Damaged Studs

Replacing a wheel stud is a relatively simple process. The old stud must be driven or pressed out of the hub and the new stud pressed in. When a wheel hub has been removed to make other repairs like replacing a bearing race, the damaged stud can be removed by pressing it out on a hydraulic press. However, a stud can also be replaced without removing the hub from the tractor.

To remove a damaged stud from a front or rear wheel hub, the wheel of the affected hub must be removed. Securely block the wheels and raise the tractor with an appropriate jack. Place sufficient blocking under the axle or axle housing to hold the tractor and lower the jack so the tractor rests on the blocking.

***Because you will be placing side forces on the tractor to remove the stud, blocking must be substantial enough to withstand those forces without the tractor sliding or falling off the blocking.***

#### Replacing Front wheel Studs

For front wheel studs, the damaged stud can be removed by driving it out from the front of the hub, through the back. If you are fortunate enough to have an air chisel or small air hammer, there is a mushroom shaped tool made for this purpose. The mushroom end is placed on the end of the stud and the air chisel or hammer activated to drive the stud out the back of the hub. Otherwise, a hammer and a large diameter (3/4" or more) brass or steel drift can be used to drive the stud out. In all cases, eye protection should be worn and precautions taken to avoid striking other studs, as well as your hands, arms, etc. Once the stud starts to push out, less force will be needed to complete the removal.

Once removed, compare the stud with the new replacement. The length and diameters should be the same. Original Ferguson studs often have a rounded or crowned end but replacements usually have a flat end. If desired, you can recreate the crowned head by holding the end against a grinding wheel while turning the stud. Use a wire wheel to polish the end to a smooth finish and

then use a flat file to chamfer the end of the threads. This can also be accomplished on a lathe. Of course, there is nothing wrong with leaving the end of the stud flat as they are currently made. Place a bit of oil on the serrations or knurled shank of the new stud and in the hole in the hub. Start the new stud in the hole, and try to align the raised sections on the stud with the grooves in the hub. Place a flat washer on the face of the hub and use a lug nut to draw the stud into the hub. Place the lug nut on the stud with the flat side facing the washer, the reverse of the normal position. Use a wrench or socket to draw the stud in until the head is seated on the back of the hub. Once seated, remove the nut and washer, clean the area of any debris, and install the wheel. Put a dab of grease on the threads, install the lug nuts and tighten them to the specified torque.

***This same procedure can be used to replace studs on implement wheels.***

If the new stud does not fit tightly in the hub or turns when the nut is installed, you will have to remove the stud and use a prick punch to raise the knurled grooves on the base of the stud and inside the hub. Use the punch and a hammer to create a series of indentations in and around the knurling which will raise the area around the indentations reducing the diameter of the hole in the hub and increasing the diameter of the stud. You can also use a "Loctite" product, *Loctite Press Fit Repair 660* for securing bearings and studs in worn mountings, to secure the stud.

## Replacing Rear Wheel Studs

For rear wheel studs the procedure is much the same; however, the brake drum must be removed to gain access to the hub. The brake drums on Ferguson tractors are secured with two flat head screws. Remove these screws to remove the brake drum. Sometimes these screws are difficult to remove. Penetrating oil will help but be sure to remove any that gets on the brake linings with spray brake cleaning solvent. The usual methods used to remove rusty bolts may have to be employed including carefully applied heat, a chisel or punch if the slot is damaged and in the most extreme cases, drilling out the center.

Once the screws are removed, the brake drum can be removed. Removing the brake drum may require the use of a hammer to free it up and break it loose from the hub. ***Wear a dust mask to avoid inhaling the dust which may contain asbestos! Do not use air pressure to blow out the dust! Use brake cleaning solvent spray to remove any debris and dust!*** Before beginning to drive out the damaged stud, rotate the hub until the damaged stud is at the top. This should provide sufficient clearance to remove the stud without removing the brake shoes. You may have to rotate the hub a bit to find maximum clearance.

Remove the stud just as you would on a front wheel. Once the new stud is installed, reinstall the brake drum and screws. Applying a bit of anti-seize compound to the screw threads will make removal easier in the future. Install the wheel and you are done. Lug nuts should be tightened to 80-90 foot pounds of torque.

## Finding the Correct Replacement Parts

Getting the right replacement parts is always important to preserve the original look of your tractor. All Ferguson models, TE-20 to F-40, the Massey Harris 50 and early Massey Ferguson models like the MF-35 and MF-50, use the same lug nuts and studs. Original style wheel studs, lug nuts and drum screws are still available from AGCO/Massey Ferguson. They are also available from several after-market parts suppliers. However, many of the after-market suppliers substitute generic "will fit" parts that do not look like the originals. Here is what to look for:

The front wheel stud is MF part # 181 328 M1, which has an overall length of approximately 1 1/2". Aftermarket suppliers like Yesterdays Tractors have exact replacements. Some suppliers service this part with a Ford style stud that has an overall length of approximately 1 3/4" which is too long. If you want the original look, get the 1 1/2" stud.

The front lug nut is MF part # 195 490 M1, which measures 1 1/16" across the flats. Exact replacements are also available from aftermarket suppliers like Yesterdays Tractors. Again, some suppliers service this part with a smaller Ford style lug nut that measures less than 1 1/8" across the flats. To maintain the original look, get the 1 1/8" nut.

The rear wheel stud is MF part # 185 400 M1, which has an overall length of approximately 2 1/8", and 9/16" NF threads. Exact replacements are available from aftermarket suppliers like Yesterdays Tractors. Again, there are suppliers who service this part with a longer stud and some that incorrectly list the 8N Ford style stud as a replacement. The 8N Ford style stud is a larger size and will not work.

The rear lug nut is MF part # 180 004 M1, and measures 1 1/16" across the flats. Exact replacements are available from aftermarket suppliers like Yesterdays Tractors. However, some suppliers service this part with a nut that is less than the 1 1/16" dimension and some incorrectly substitute the Ford 8N style nut as a replacement. Again, get replacement parts that match the original dimensions to maintain the original look.

The flat head screws that hold the brake drum in place are MF part # 182 278 M1. These are available from AGCO/MF and aftermarket suppliers and dealers selling Sparex parts.

## Summary

Missing studs and lug nuts detract from the appearance of a tractor and put a strain on the wheel and remaining studs. Repairing or replacing wheel studs is a relatively simple, inexpensive project that will significantly improve the look of your tractor.

As always, if you have a question you want answered or a topic you would like covered in this segment, email me at [r\\_sybrandy@yahoo.com](mailto:r_sybrandy@yahoo.com) or write to me at:

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