

From My Shop Making a Spoke Jack by Phil Lawrence

This month we want to make sure our wood spoke wheels are in perfect condition. It makes no sense to risk our lives and others' driving on bad wheels when we can possibly fix any problem. First, make an overall visual inspection of your wheels, demountable or non-demountable. Any signs of rot or former shade tree repairs? Now, grab the top of the tire and wheel as mounted on your car and shake the wheel in and out, check all four wheels. Any looseness? Next, when you drive your car, do any of the wheels make any clock-clock sound?

Now that we have inspected the wheels, what do we need to do? If the wheels are sound, that is, no rot indicated anywhere, we're good so far. If you do see rot anywhere, do not continue driving the car. Replace the wheel with a good one or have it re-wooded by a wheelwright.

If shaking your wheel in and out shows any movement, then that will need to be fixed. If loose at the hub, you may be able to tighten the six hub bolts and resolve that issue. If it is possible to tighten the hub bolts remember to re-peen the ends over the nut. Never use lock washers.

Did shaking the wheel show looseness where the spokes enter the felloe? This may indicate that the tenon on the end of the spoke is worn smaller in diameter. Again, replace or re-wood your wheel. On demountable wheels you can visually inspect the spoke tenon by taking the tire and rim off and looking at the end of the tenon where it comes through the felloe. If you are running original wheels, those tenons could be mostly rotted. They must be good and strong. That's what keeps the wheels from collapsing on turns. If you run on non-demountables, those can't be inspected without removing the rim from the felloe, just make sure there is no movement on that end of the spoke.

When shaking your non-demountable wheel, was there side-to-side movement of the felloe? If so, that's bad! You may need to replace the rivets that hold the felloe to the rim. This can be done by drilling out the rivets from the rim side, which of course means unmounting the tire tube and flap if you use one. I will show you how to make a tool to aid the re-riveting process.

When you drive down the road, do your wheels make a clock-clock sound? That would indicate that your spokes are pounded down shorter moving up and down and hammering against the wheels' felloe, creating that sound. This is fairly simple to resolve, but we will first need to make a very simple tool in the shop to help us do the repair. So let's get started making a spoke jack!

Making the Spoke Jack

I made my first spoke jack fifty or so years ago and have made a few since. To make one you will need:

a piece of hardwood 1 1/2" x 1 1/2" --length is optional. The finished piece will be 6" long.

one 1/2" diameter machine bolt, 2 1/2" long (I used a fine thread bolt)

one 1/2 nut to match your bolt thread

one 1/2 washer

galvanized sheet metal, a small piece

Once you have your materials, you want to shape one end of your piece of hardwood into a "V" to fit between spokes where they join at the hub. I trimmed my wood block down to 1 3/8" x 1 3/8" to not be so bulky. The finished length will be 6" as I mentioned earlier.



Layout and mark the other end of the block on center. Take a $\frac{1}{2}$ diameter drill bit (I used a Forstner wood bit) and drill a hole from the end down through the center of the block $1\frac{1}{2}$ " deep. When you're done, some 80 grit sandpaper will make the edges more rounded and smoother.

Next, you will have to take a threading die and add some more threads to your bolt. Run the threads to 2" or more. This should give you enough travel for the adjustment nut to do both non-demountable and demountable wood spoke wheels. If the head of the bolt has any raised markings file or grind the bolt head smooth. Now that the spoke jack is made you will need some spoke shims. I have never had to make any as I have some N.O.S. shims I bought at a swap meet decades ago.



If I need some, this is what I would do. Take your piece of galvanized sheet metal, cut into strips $\frac{3}{4}$ " wide for non-demountables and $1\frac{1}{8}$ " wide for demountables. Make several strips and tape them together so they don't move and using a drill, make some $\frac{5}{8}$ " holes in the center of the strip spaced far enough apart that with hand shears you can cut out $1\frac{1}{8}$ " diameter washers after drilling the center hole. After that is done, you will need to slot one side of your sheet metal washers $\frac{5}{8}$ " and you have your shims.

To use your spoke jack and shims, position the jack in the wheel between two spokes. Place something between the bolt head and the felloe that will protect it from the bolt head. With two wrenches, hold the head with one and slowly turn the adjustment nut clock-wise to spread the jack. You only need enough movement to slip one shim between the spoke and felloe. Do the same operation on the opposite side (180 degrees) of the wheel. Continue to work around the wheel

using only one shim on each spoke (you don't want an oblong wheel).

If your wood felloe is loose, you may try re-riveting it to the rim. Don't try to re-use the old rivets. Drill them out from inside the rim. To do this, center punch the rivet and carefully and slowly drill through the head of the rivet. These rivets are peened down hot into a countersunk hole in the rim and ground flush with the rim. Drive the old rivet through the rim and wood felloe and out. Replace the rivet with a new one. Once the rivet is in place, position the spoke jack so that the head of the bolt rests on the head of the rivet. It will help if you take a drill the size of the rivet head and drill the bolt head slightly to form a recess for the rivet head. This will help hold the spoke jack in place while you're peening the rivet. With a torch, heat the end of the rivet to be peened till its orange and peen the end into the countersink.



In closing, if you aren't sure about your wheels, have someone else look at them. After 100 years those original wheels are all suspect in my opinion. As I said earlier, never

risk your life or anybody else's with questionable wheels. New re-wooded wheels are worth a whole lot less than a life. If you need a recommendation for an excellent wheel maker, call me. Any questions, call me.