USING THE HUB AND WHEEL FACES TO GAUGE A MOTORCAR

By Wayne Parsons

Getting your motorcar into proper gauge is a simple matter of making the distance between the hub surfaces hit certain numbers. When the hubs are properly spaced, and you mount the wheels, they will be properly gauged. So, what is the proper gauge?

Standard gauge specifications for NARCOA motorcars match the track gauge given in the Fairmont manuals which is 1/8" to 1/4" under 56-1/2". This set up works for Class 1 rail, as well as the track on short lines that is frequently wide in gauge.

Narrow gauge railroads should all be considered as wide in gauge because, they are 36-1/4" to 37" between the rails. Therefore it is best to gauge our narrow cars out to the full 36".

All the dimensions given here are for 16" X 5/16" pressed steel wheels. This article covers adding shims to get the desired hub surface distance. Another article will discuss using a reamer to shave down the insulator cones and thus reduce the hub surface distance; something usually needed for new cones.

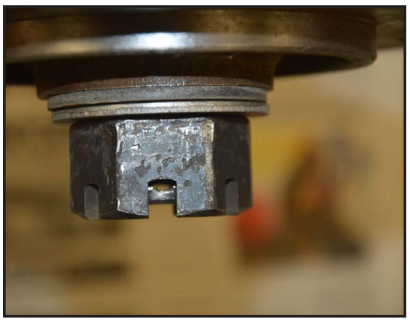
Mount the hubs, tighten them down, and check the distance between the surfaces. After getting the hub surface dimension correct, mount the wheels and measure the outside surface separation through the wheel openings. The final check is to use the clear plastic wheel profiles available from the NARCOA store to measure the wheel gauge. For the best results, be willing to take the wheels and hubs apart several times in your effort to get it "just right."

STANDARD GAUGE	NARROW GAUGE
Distance between hub surfaces:	Distance between hub surfaces:
59-3/4" (+0 to -1/8")	39-1/4" (+0 to -1/8")
Distance between outside wheel surfaces:	Distance between outside wheel surfaces:
62-15/16" (+0 to -1/8")	42-7/16" (+0 to -1/8")
Final wheel gauge will be:	Final wheel gauge will be:
56-1/4" to 56-3/8"	36"

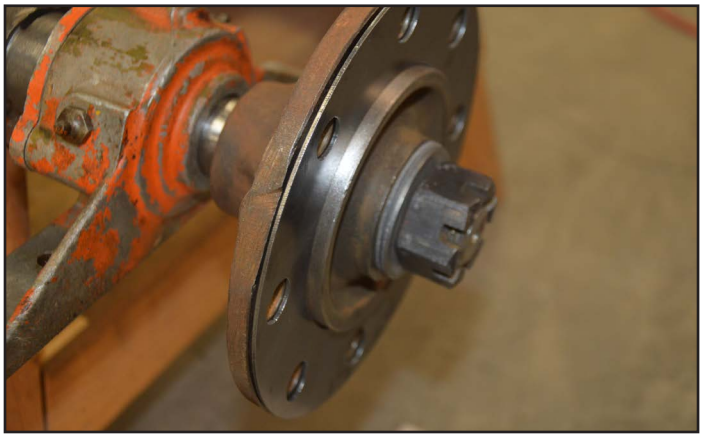
Results are different for different shim material. My experience is that one .004" shim, made from a soda can, will move the hub out by 1/8" or .1250". Alan Wilbur uses a guide for paper shims of .001" shim will move the hub 1/64". Paper is about .004" thick thus and gives a 1/16" move. Trim shims to eliminate any excess near the axle end threads. Measure the thickness of your shim with a micrometer and keep shop records of each adjustment. For movements greater than 1/8", spread the shims evenly between the two hubs.

Left, after assembling the axle, the first hub surface measurement is 59-7/16". Adding one soda can shim under each end brings the hub surfaces out to 59-11/16"; which is right in the middle of our 0 to minus 1/8" target. One quarter inch has been added to the gauge using just .008" of shim.

Usually when the hub surface measurement is right, the castle nut can be tighten down enough to insert a cotter key. If not, try sanding down the insulator washer. Below left is a tan in color NOS Fairmont insulator washer; right is a brown in color fiber washer from Fredericksburgshops.com. When using an impact wrench to tighten the castle nut, remember that the thinnest and weakest part of the axle is between the threads and the axle taper. Take it easy with the impact wrench, especially with the smaller MT-19 axle.



Occasionally a shim is placed between the hub and wheel surfaces. Fredericksburgshops.com has this shim in 1/16" and 1/8" thickness. However, caution should be used for anything above 1/16"or .0625". Any thicker and the wheel may be pushed out beyond the shoulder of the hub. The hub shoulder is where the motorcar weight should ride, not on the bolts. As seen below right, the mounted wheel (with a 1/16" shim) is right at the edge of the hub shoulder.



The source for the hub surface numbers, for standard gauge of 59-3/4" and 39-1/4" for narrow gauge, come from shop notes provided by Dudley Newman and Patrick "Smitty" Smith. I have used these guides to make up both standard and narrow axles and the numbers work. Finally, painting your axles should be avoided; rear drive hub sprockets and front axle sleeves don't easily slide on or off painted axles.

All Photos by Wayne Parsons