

Engine and Wheels™

Number 24

A publication covering the hobby of designing,
building and showing
— Small Motorized Vehicles —

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— Wheels, Tires and Tubes —

In issue No. 22 we hinted that we were investigating a new source of wheels, tires and tubes. The company is Workman Cycles, a New York firm that, for over a 100 years, has been in the business of manufacturing heavy duty bicycles for industrial applications.

They manufacture wheels in either 20, 24 or 26 inch with 2.125 tires. They sell, not only wheels, but, also, Kevlar belted tires and



Just take the wheel assembly from carton and slip onto your 3/4 dia axle with 3/16 keyway! All machining & welding is done!

thorn resistant tubes.

In order to be able to judge — hands on, I



With it's 36 - .120" dia, adjustable, spokes, this 20 x 2.125 rear wheel assembly is ready for a 3/4 scale CDO.

ordered some 20 inch wheels/tires for a future CDO project. I, also, ordered some 26 inch Kevlar belted, tires and HD tubes for my Quadricycle, that has become famous for it's flat tires!

For the few of you who have never heard of Kevlar. It is a registered trademark of the Dupont Company. It was developed a few decades ago to serve as belting in automobile tires. However, it was soon leading a double life in bullet resistant body armor for police and military use.

While several times stronger than steel, Kevlar is many times lighter.

Worksman wheels have hubs that are built by welding steel flanges to a steel tube. For the front or free turning wheels, the tube is 1-3/8 ID, a perfect fit for 3/4 ID x 1-3/8 OD flanged, ball bearings.

While they appear to be the same, they are a far cry from the garden cart bearing to which we have become accustomed. They are much more precision, with little to any play.

Another feature of the free-turning hubs is that they have three, 1/4 in. Dia holes equally-spaced on a 2-5/32" Dia bolt circle. Worksman uses these to engage driving pins



The photo above shows the heads of the adjustable spoke nipples. Another feature of their heavy duty rims is the clincher feature for a superior grip on the tire beads.

on a flange welded to the rear axle of a tricycle. We can use these for sprocket mounting.

On the previous page we displayed the rear or driving hubs. Worksman's application for these is to put pedal power to one rear wheel of a tricycle. This trike has a rear bed to haul material in an industrial environment.

The hubs are designed to fit a 3/4" Dia shaft containing a 3/16" keyway. This is achieved by welding a 3/4" thick insert into one side of the hub. This insert has a 3/4 Dia



In the above photo we see the cross lacing of the heavy duty spokes. They are 11 gauge (.120 Dia) and are secured by adjustable nipples.

We, also, see the three 1/4" Dia holes in each flange - a perfect place to attach a sprocket, if desired.

hole, broached for the 3/16 keyway. On the opposite side there's a 1/4" thick insert welded that contains a 3/4" Dia clearance hole.

The only area of concern I have with these hubs is their 3/4 inch of keyway to transfer driving torque. Worksman is transferring 1 horsepower to one wheel. We'll be transferring several horsepower to both rear wheels.

However, I am willing to give them a chance to prove themselves. It will be a while before I have any machine on which to put them. So, I'm counting on some of you brave souls to try them!

I, almost forgot to mention — the hubs we have described are the same, whether the wheel be a 20 inch or 26 inch.

Worksman have another hub that contains expanding brake shoes. However, it is intended to be fork mounted and I couldn't see a practical application for our requirements.

On the following page we have two drawings shown, one for each of the described hubs. We attempted to give a few dimensions to aid in fitting them to our applications.



These heavy duty tires feature a clincher bead for secure attachment to rim. The recommended inflation pressure indicated on the sidewall is 50 psi. To distinguish them from regular tires, the words “Kevlar Belt” is printed on the sidewall.

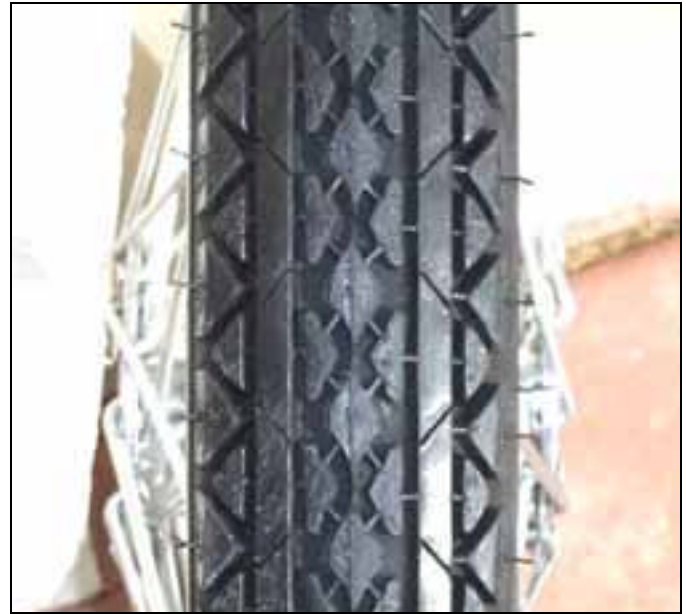
You will note on the following price sheet, that Worksman will sell the wheels as complete assemblies with tire, tube and rim strip installed or simply, the wheel only.

The tires, tubes and rim strips are, also, available to upgrade your existing wheels, as I am doing with my fleet of vehicles.

While Worksman’s tires have a pronounced clincher bead, the Northern rims have a sufficient roll-under to accept this bead with no problem.

If you plan on retro-fitting your Northern wheels, be sure and replace the rim strips with ones from Worksman. While you have your rims stripped down, feel the peened ends of the spokes. I found enough small, sharp burrs to warrant going over them with a small flat file and smoothing them up a bit.

You will find the Worksman rim strips to be at least 1/8” wider and much thicker than those that come with the Northern wheel. When I dis-assembled a Northern wheel for the first time, I found the strip not covering many spoke ends. Hardly worth the effort of having it to begin with!

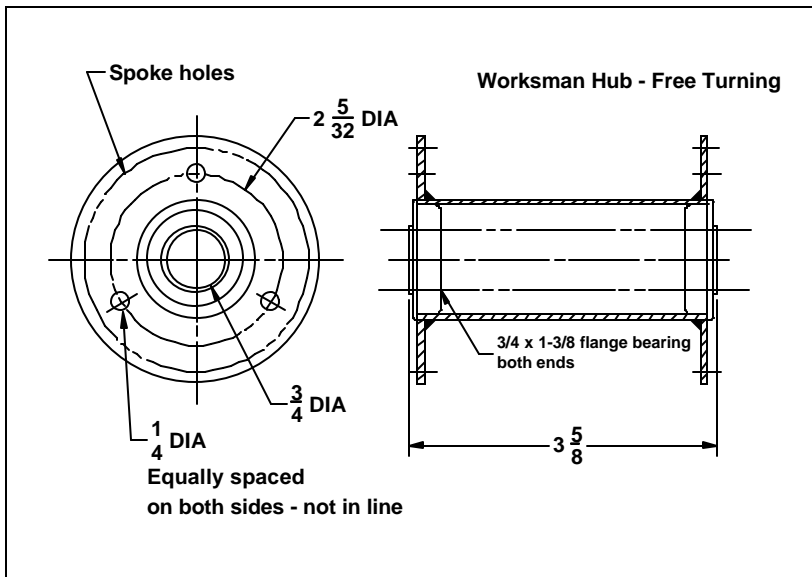


A deep diamond pattern gives these tires an “old fashioned” look, just right for our horseless carriages. Both the 20 inch and 26 inch tires have identical tread.

I don’t really mean to cloud up and rain on the Northern, garden cart wheel/tires that have, almost, become universal with horseless carriage builders. They have served the beginning, poor-boy, builder with an inexpensive source of wheels. I, personally, have been running ten of them for 2 years — with the original bearings and tires. My only problem has been with the cheap, thin, tires and tubes being vulnerable to punctures & flats! I tried to help the situation with the addition of Slime sealant in the tubes. I have even advised others to do the same.

However, under a lot of actual usage, I found that even Slime has its limitations. On larger tires, Slime has time enough to seal before much air is lost. But, with bicycle size tires, you don’t have to lose much air to be 1/2 flat! OK, you can still run — until — that second thorn makes its entry into the tube. By the time Slime seals this second hole, you’re almost running on the rim!

Aside from the Worksman products, there’s some other products you should be aware of. Namely, tire liners, designed to be installed between the tube and tire, under the tread area. The apparent, top of the line is a brand by the name of “SpinSkins.” They



We have, illustrated above, a cut-away drawing of the free-turning hub. The dimensions were measured from an actual hub. The one inspected had three, 1/4" Dia holes in each flange. They appear to be a way to easily attach a spacer and sprocket (if desired) with 1/4" hardware.

feature a tightly-woven belt of Kevlar! Another one is "Mr Tuffy" liners. Constructed of tough, plastic material, they are advertised as the answer to your flat problems. The most inexpensive liners are made by Slime. They, like Mr. Tuffy's, are made from a tough plastic material.

On my Quadricycle, I will be installing a set of Kevlar belted tires and heavy duty tubes from Worksman. I will, also, install a set of SpinSkin Kevlar liners between the tire and tube. However, I will not be adding Slime to the tubes.

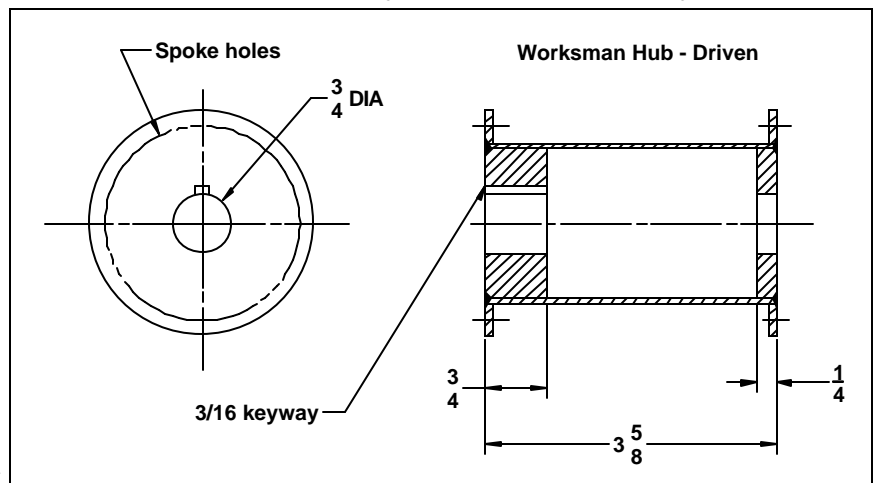
On my Briggs & Stratton Cycle car, I will be installing regular new tires with a thick, knobby tread. The tubes will be Bell FlatBlocker inner tubes that are advertised as being 300% thicker "where it counts." In addition they come pre-filled with Slime! Wal-Mart Super Centers have these at less than \$10 each. In addition to these tubes, I will be installing SpinSkin Kevlar tire liners for additional protection.

On my parade trailer, I will be installing 2 regular new tires with a traditional diamond pattern. These will have 2 more Bell, FlatBlocker with Slime tubes and Mr. Tuffy tire liners.

By testing all these combinations, I hope to be able to arrive at an optimum tire/tube/liner set-up. At least I hope to solve my own, Bullhead thorn curse that has plagued me through 2 parade seasons.

In the illustrations on this page, we have dissected each Worksman hub to help you understand the construction. The dimensions were measured from actual hubs and are approximate.

On the next page, we have provided a list of Worksman part numbers and the current prices. The phone number goes directly to their order desk, where you can order direct with your credit card. If you prefer to



This illustration shows a cut-away drawing of the driven hub. They are designed to go onto a 3/4" Dia shaft with a standard 3/16 keyway. Note that a key would have to go through and contact the inside of the 1/4" insert.

send a check or money order, they will give you the total with directions on mailing it.

Tell them you read about their products in Engine and Wheels, a newsletter published by the old man in Arizona.

— HEAVYDUTY CARRIAGE WHEELS —

Workman Trading Corp — Workman Cycles Industrial Park
94 -15 100th Street - Ozone Park New York 11416 USA
Sales 1-888-394-3353 — credit cards accepted
cycles@workman.com

20 x 2.125 wheel

With 3/4 Id Ball bearings - 3.5 wide hub

Part No. 326A (w/out tire & tube). . \$49.33

Part No. 173 3/4 x 1-3/8 replacement
flange bearing \$3.28

With 3/4 bore w/3/16 keyway - 3.5 hub
Complete with Kevlar tire and PR tube.

P/N M14023KVPR. \$99.26

20 x 2.125 Tires & Tubes

Kevlar, Diamond Tread, Heavy Duty, Tire

P/N 4922KV. \$19.00

Heavy Duty Puncture Resistant Tube

P/N 6023 \$12.16

Rim Strips (covers spokes)

P/N 1017A. \$0.88

26 x 2.125 wheel

With 3/4 Id Ball Bearings - 3.5 wide hub

Part No 329A (w/out tire/tube) . . . \$52.34

Part No. 173 3/4 x 1-3/8 replacement
flange bearing \$3.28

With 3/4 Bore w/3/16 keyway - 3.5 hub
Complete with Kevlar tire and PR tube.

P/N M14032KVPR. \$102.60

26 x 2.125 Tires & Tubes

Kevlar Diamond Tread Heavy Duty Tire

P/N 4922AKV. \$22.00

Heavy Duty Puncture Resistant Tube

P/N 6023A. \$12.69

Rim Strips (covers spokes)

P/N 1017. \$0.88

Note: Workman Cycles has been in business for years, manufacturing commercial grade bicycles for industrial use. The wheels they manufacture are of much higher quality than the import wheels we have been using. The free-turning wheels are equipped with much better bearings and have 11 ga (.120 dia) spokes cross laced with adjustable nipples. Their power driven wheels come equipped with hubs, featuring a 3/4 dia bore with 3/16 keyway.

In addition to the 20 and 26 inch wheels, etc shown on the above list, they have 24 inch wheels, also, available. Their tires are available in white-wall, however they are not Kevlar belted.