

Ask Dr. Spoke

Dear Dr. Spoke,

What are the benefits of using wax on bicycle chains?

Lucy Nichols



In last month's newsletter, Dr. Spoke described most of the pros and cons of using conventional chain lubes vs. wax for lubrication. This month, Dr. Spoke presents the basic steps for cleaning and waxing a bike chain.

1. Remove the chain either by partly pushing a pin out of any link or disconnecting the speed/super link. Removing either the pin or the speed link is best done with a special tool designed for the task.
2. Obtain a small crock pot. Don't ever use a pot or double boiler on a stove because wax is inflammable. Dedicate this crock pot for chain waxing work because it would be difficult to adequately clean for food use.
3. Purchase a box of paraffin for canning from a grocery store.
4. Drop a block of paraffin into the empty crock pot and turn it on.
5. Remove the dirty stuff from the chain with a solvent such as mineral spirits or Simple Green by soaking in a bowl. Simple Green can be diluted with water.
6. Rinse and dry a couple times with paper towels or clean rag.
7. Remove the organic film from the solvent with isopropyl alcohol (IPA), which also removes any water if present.
8. Quickly wipe clean and dry in the sun (bare metal easily rusts). You now have a very clean chain.
9. Bend the end of an old spoke into hook and a stiff bare wire will work too. Have a needle-nose plier handy in case the chain slips off the hook.
10. Roll the clean and dry chain into a flat ring small enough to fit within the crock pot.
11. With your hook slowly drop the chain into the molten wax until it's completely covered. Let it remain until the bubbles, if any cease.
12. Be sure to have an unobstructed place in which to hang the chain because hot wax will drip off for a while. Remove the chain from the pot with your hook and hang to dry.
13. With a stiff brush, clean all the cassette cogs, chain rings, rear derailleur, jockey wheels and cage plates with solvent and a rag.

This completes the cleaning and waxing process. Replace the chain and spin the cranks until loose wax breaks off and shifting is smooth.

For a more detailed description of the cleaning and waxing process, with photos, see the following pages.

This concludes Dr. Spoke's response to the issue of "To Wax or Not to Wax." Now he encourages YOU to wax your chains and cadence forth with quiet brilliance in the great outdoors of the Church of Revolutions.

If you have a question for Dr. Spoke, send an email to "DrSpoke@nmts.org" and watch for a response in a future newsletter.

How to thoroughly clean and wax a bicycle chain

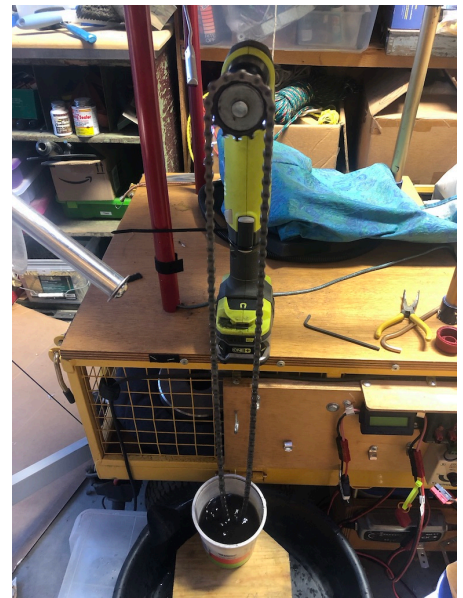


These instructions describe an ultimate cleaning process for waxing. The simpler method described in the Freewheel is perfectly adequate but if you want to extend the wax lifetime a more vigorous cleaning will get you there.

This is what a waxed chain looks like before cleaning. This one had about 700 miles on it. For many cyclists, this condition might be considered a clean chain especially if it isn't squeaking. However, it's not truly clean!

Safety First! Wearing nitrile gloves and eye protection is recommended for all solvent and waxing steps. First, get the real dirty stuff off by wiping with paper towel or rag soaked with mineral spirits. Cleaning chains by shaking with solvent in covered containers can get tiresome. You can fashion yourself an Autocleaner to do the tedious work. The Autocleaner is a right-angle drill to which is fastened an old cog. The trigger is held in the "on" position with a zip tie and the chain slowly cycled through the solvent.

Let it run for minutes to hours and it will continue to work out the tiniest of metal particles from the pins and bushings. The longer the better. You can do other useful things while your chain cleans itself!



When finished, filter the black liquid through a coffee filter and save because it's still useful. The resulting amber liquid is used for this first "dirty clean" step for subsequent chains to be cleaned.

The coffee filters will clog, and it usually takes two or three to get the job done but they're cheap and disposable.

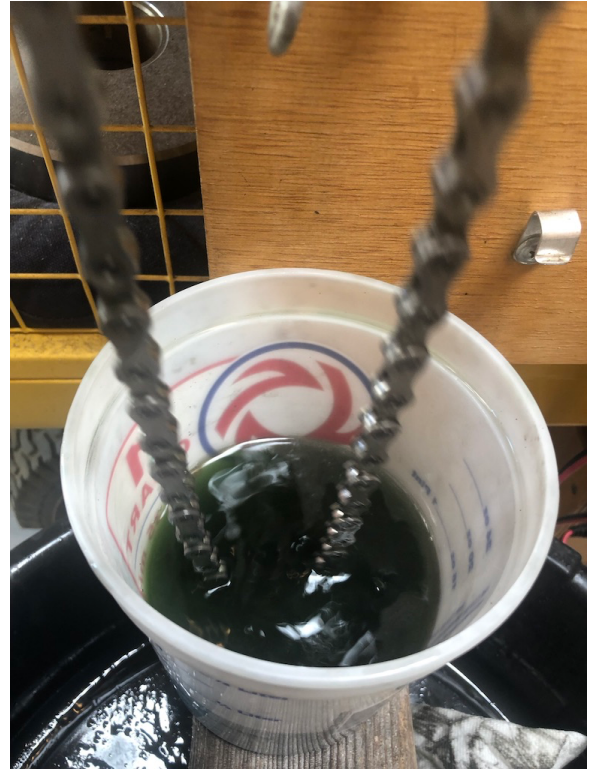
For a dirty chain you can repeat this step with fresh solvent.

Bare metal is essential for the wax to adhere properly. The organic solvent leaves a film on the chain which needs to be removed to increase longevity of the wax.

Next, repeat the above but with a 50/50 mix of Simple Green and water. Again let the chain rotate for at least an hour and more is okay. Do something else, a watched chain never cleans!

Wipe down with a cloth. The goal is to remove all of the black residue, which is comprised of microscopic metal particles that cause friction and chain wear. When you're satisfied you must remove any Simple Green residue and water on your chain. Gotta get that off before applying wax.

Note: Consider filtering and reusing the Simple Green mix for future waxing.



The final “clean” step is with isopropyl alcohol (IPA). This will remove any remaining Simple Green film as well as entrained water. This step doesn't have to take a long time. In fact it's very important to do the Simple Green step and this one in quick succession. If water is left on the bare steel for a day or two the chain will rust.

Use plain cheap 70% IPA rather than the more expensive 90%. As you can see almost all the black particles are gone and you only see a slight coloration from the Simple Green residue.

Wipe with paper towel. You should only see faint black markings. Dry in the sun. You now have a perfectly clean chain ready for waxing!

A couple hours prior to this step you should have been heating your crock pot and melting the wax. Paraffin wax used for canning can be purchased at any grocery store. A couple blocks in the mini crock pot is plenty and will last seemingly forever.

For an ultimate waxing job you can consider using something like Molten Speed Wax that includes extra friction fighting pixie dust entrained in the wax.



Use an old bicycle spoke bent and threaded through the chain to aid with insertion and removal into and out of the crock pot. Bare wire works too. If it slips off, needle nose pliers works in a pinch.

Roll the clean and dry chain into a flat circle small enough to fit within the crock pot.

Here is another reminder to use gloves and eye protection during the waxing step! Slowly drop the chain into the melted wax until it's completely covered.



In this picture, the totally clean chain is immersed in the molten wax. Let it remain there until all the bubbles (if any) escape. Swirl the chain around to ensure the wax gets into all the nooks and crannies.

Before you remove the chain be sure to have an unobstructed place in which to hang it because hot wax will drip off for awhile.



Take time to clean the drive train too. Remove the cassette so that you soak, clean and dry the individual cogs. You'll do well to use a brush like the one shown on the right side of the picture. Use water-diluted Simple Green in a spray bottle. Rinse with plain water and dry.

Repeat for the chainrings. Don't forget to clean and scrape off any gunk from the jockey wheels and cage plates on both derailleurs. If there is any grease or grime on the chain stay be sure to remove that too.

By now you're pretty much done with cleaning!



When you pull your chain out of the hot wax hold it over the pot to let most of the excess drip off. The chain will be HOT so put it on a couple paper towels until it's cool enough to handle.

Next, drape it over a nail [and hang](#) until cold and ready to install. A waxed new chain will be so stiff that you can hold it out like a sword. Older chains will be somewhat looser but still too stiff to work easily. Just wiggle the links to break the wax which has coated the pins and bushings inside of the links. Thread the chain back onto the bike and attach the quick link (or press the pin back into the adjoining link). Rotate the crank to further break the wax. Brush off any wax flakes that fall off onto the chain stay.

Your first few miles may seem “rough” or noisier than expected. This will stop after a few miles and soon you will be gliding effortlessly. A freshly waxed chain is a joy to have on a ride because your bike will be quieter and pedaling will feel smoother with no oiling required!

When you start to hear your chain it will be time to re-wax. Depending on your riding environment and style, about 350 miles minimum (wet winter months) to a max of 1300 miles can be expected before re-waxing is needed. The average could be 700 miles for optimum performance and chain life. Your mileage will vary.

This may seem like a lot of work but it only takes about an hour of actual effort while the majority of the time the chain is soaking in solvent or on the Autocleaner. People who ride a lot of miles should consider using two chains in rotation, so you always have a freshly waxed chain ready to install. If you ride less, you may only have to do this operation once or twice a year.

Also know that some people dispense with the cleaning step altogether and just put the “dirty” chain directly into the wax. The wax coating will **not** last nearly as long but a chain can be re-waxed very quickly this way.

If you don't like waxing you can always go back to frequently applying messy liquids to your chain and dealing with blackened, oily hands anytime you touch your drivetrain. Most people like waxed chains after they try it. No more chainring tattoos on your right shin! But most of all you will enjoy the feel that a clean, well lubricated drivetrain delivers.