

JUST FOR DETAILS:

Tire and Wheel Care

by David Bynon, San Diego Region (reprinted from THE WINDBLOWN WITNESS)

History didn't record his name. He may have been a warrior designing a battle chariot. Perhaps he was a stone mason struggling to complete a building, or a mourner providing a smoother ride for a departed loved one. But on that special day, sometime in the fourth millennium BC, in the delta between the Tigris and Euphrates Rivers, this unknown Sumerian changed the history of the world and all mankind. He invented the wheel.

Wheel Care Challenge

Your Porsche's wheels can dramatically enhance the appearance and performance of your automobile. Modern wheels can also present a substantial cleaning challenge as heated dust particles from brake pads bombard the wheel and bake into the finish. If left on the wheel, a phenomenon known as galvanic corrosion sets in, which will eventually destroy the wheel's appearance.



All modern Porsche wheels are painted with the same paint and clear-coat used on the body of the car. While durable, the wheel's clear-coat finish is subject to damage from acid compounds (including acid rain, hydrocarbons, and acidic cleaners). Likewise, older style polished and anodized wheels (not protected by a clear-coat) will react to both alkaline and acidic conditions. Unfortunately, typical car wash soaps and household cleaners are not strong enough to break the bond between brake dust, road tar, road grime and the wheel. To properly clean wheels, the car care industry has developed two groups of wheel cleaners:

1. Acid-based Cleaners — These are widely used by detailers, car dealers and car washes who need to clean wheels in the shortest possible time or with the least amount of effort. Acid-based cleaners are typically 2% solutions of oxalic, phosphoric, and hydrochloric acid. While acid-based cleaners pack the

greatest cleaning punch they can easily etch the surface of your wheel if allowed to dry. Care must be taken not to use acid cleaners on wheels with pitted or chipped surfaces. The acid will migrate into any fissures and accentuate flaking and peeling of surface coatings.

2. Acid-free Cleaners — These are mild solutions of alkaline solvent, usually ethylene glycol, with a wetting agent. These solutions creep under the dirt and brake dust, loosening and lifting surface grime. Non-acidic cleaners usually require some surface agitation (brush or sponge) but are safer to use and will not etch the wheel's finish. P21S is the best known 100% acid-free wheel cleaner.

Tire Care Challenge

Like the wheel itself, your tires also have several formidable enemies: water, formaldehyde, petroleum distillates, ultraviolet light, and ozone. Water washes away the natural oils in rubber that keep it elastic. Formaldehyde and petroleum distillates act as a solvent, eating rubber on contact. When ozone, an odorless gas which is part of the air we breathe, is combined with ultraviolet (UV) light, a reaction occurs that attacks the tire and its polymers (the agents that binds the rubber).

To protect against ozone and UV damage, a stabilizer molecule called a competitive absorber is blended with the tire polymer. Competitive absorbers work by capturing and absorbing UV radiation and converting it to heat which is dissipated harmlessly. All tire manufacturers use the same competitive absorber, called carbon black. This is why all tires are black. These absorbers are sacrificial; they expend themselves in performing their function of converting UV light to heat. However, as carbon black loses its ability to perform, it turns gray. This is one reason why black tires discolor as they age.

To protect from further ozone damage, tire manufacturers add a wax compound to their formulas. Tires flex when they are in motion, causing the wax molecules to migrate to the surface. This forms a protective barrier between the air (ozone and oxygen), water and the tire polymer. In the tire trade this is called blooming. When tires are parked for extended periods, blooming does not occur and ozone quickly attacks the tire polymer. With UV light and ozone working in concert, the degradation is accelerated, resulting in drying, discoloration and cracking.

To combat the negative effects of water, solvents and UV light on tires, the car care industry has created tire dressings. These dressings condition the tire, restoring essential moisture. Tire dressings fall into two groups:

Liquid Silicone Dressings - These penetrating-type silicones form a flexible protective shield on rubber. Liquid silicone seals small openings with a film to prevent penetration of moisture and dirt. Most silicone dressings leave a never-dry gloss film. There are many myths regarding silicone, specifically the negative long-term effects of silicone on rubber and vinyl. The fact is, silicone is an inert material. The benefit of silicone is its ability to easily penetrate the tire's surface and not evaporate. Some silicone-based dressings contain petroleum distillates as a cleaning agent. Petroleum distillates are harmful to rubber and vinyl, and will cause rubber and vinyl to crack. If you decide to

use a silicone tire dressing, make sure it does not contain a cleaner. The only true negative property of silicone is the difficulty of adding UV protection.

Water-Based Dressings - The water-based dressings do not contain silicone oils, petroleum distillates, waxes, or other dangerous solvents that can harm and dull the surface of rubber and vinyl over time. Most water-based dressings use a combination of natural oils (such as shea butter or cocoa butter) to offer a non-greasy, satin finish. Likewise, most of these products contain UV blocking agents to help keep tires from cracking, fading and hardening. Additionally, most water-based dressings are biodegradable, silicone is not.

Proper Tire and Wheel Cleaning

To properly clean your tires and wheels, you will need a 3-5 gallon bucket, a soft tire and wheel scrub brush, a sponge or wash cloth, a water hose and nozzle, car shampoo, and a spray wheel cleaner. Here are some step-by-step tips to make cleaning easier:

1. Clean one wheel at a time.
2. Clean your tires and wheels first before washing the rest of the car. This prevents splattering cleaners, dirt and brake dust on already cleaned panels. Your car is also less prone to getting water spots from drying while you wash your wheels.
3. Do not clean your wheels if they are still hot from driving. Let them cool, or thoroughly hose them down.
4. Mix a bucket of soapy water with your favorite car shampoo. Mix double the recommended strength.
5. Thoroughly rinse the tire and wheel with water using a hose and spray nozzle. If exposed, rinse the brake caliper to flush away loose brake dust. Finally, rinse up into the wheel well to wash away road grunge, road kill, mud and other debris.
6. If your tires and wheels have a heavy coating of brake dust or road grime, spray them down with your wheel cleaner. Allow the cleaner to soak for 30 seconds (minimum) to 3 minutes (maximum).
7. Use your tire and wheel scrub brush and your soapy water to agitate the tire and wheel surface. Use plenty of soapy water. The soap acts as a lubricant to gently lift dirt and grit away from your wheels. Follow-up with your sponge or wash-cloth to wash the remaining dirt from the tire and wheel. If your wheels have large open areas use the sponge to get behind them. Make sure the tires are scrubbed. Many people put layer upon layer of dressings on their tires but never clean them. The result is a brown or yellow discoloration. Note: I do not recommend using tire cleaners containing bleach. Bleaches are used in many tire cleaners to brighten white wall tires, but they can turn tires a dull gray and stain alloy wheels.
8. Use your wheel brush and soapy water to scrub the accessible areas of the wheel well, too. This small detail keeps your car looking fresh and new.

9. Thoroughly rinse the tire, wheel and wheel well. Use plenty of water. You need to ensure that all traces of the wheel cleaner (and your neighbor's cat) are gone.

10. After washing your car, remember to dry your tires and wheels using a 100% cotton terrycloth towel.

Proper Tire & Wheel Conditioning

After you clean your tires and wheels, you need to protect them. Tire dressings accent the appearance of your tires and protect against cracking and fading. Likewise, waxing your wheels protects their finish from brake dust, and makes them easier to keep clean. Your wheels should be waxed, at a minimum, each time you wax your car. You can significantly reduce wheel cleaning and waxing efforts by coating your wheels with high quality acrylic (one that is proven to be heat resistant and will not yellow).

To apply tire dressing:

Use a small foam sponge or a foam wax applicator to apply tire dressing (foam provides even distribution and wastes far less product than a cloth). To avoid getting tire dressing on your car, apply the dressing to the foam applicator, not directly to the tire. Unless you go through a set of tires every year, it is best to use a water-based dressing containing a UV inhibitor. Allow dressings to penetrate the tire before wiping off the excess. Five to ten minutes is okay, but 30 minutes is better.

If your wheel wells have a black plastic liner, wipe the wheel well liner with dressing, too. This simple detailing step makes a big difference.

If you like your tires to be shiny, do a final wipe down with your foam applicator. If you prefer a satin finish, buff the tires down with a terrycloth towel.

Concours Tires & Wheels

Have you ever noticed how show cars look so fresh and clean? Beyond just shiny, they are bright. This effect comes from the smallest details. A great place to start is your tires and wheels.

Concours winning show cars are clean enough to pass a white glove test. This includes the tires and wheels (front and back) and the wheel wells. Removing your wheels to detail them might seem a little fanatical, but it has several benefits, including:

- Inspecting your tires for proper wear and damage.
- Inspecting your brakes.
- Inspecting your suspension.

In the course of completing this article, I used my 1995 BMW M3 (sorry, but my Boxster never gets dirty enough to make this demonstration). While the wheels were off, I found two maintenance problems. The first was a big hole in my front wheel well liner. Obviously something hard got tossed up in there by the wheel. The second was a bad bushing on the sway bar. So, beyond just cleaning and maintaining, this was a valuable maintenance exercise.

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To properly concourse detail your tires and wheels, you will need a jack, jack stands, bucket, tire and wheel brush, sponge, water hose and nozzle, car shampoo, spray wheel cleaner, tar remover (mineral spirits), wax, tire dressing, foam wax applicators and plenty of terrycloth towels. If you are not familiar with the procedure for jacking your car and removing the wheels, see your car owner's guide.

Here is the step-by-step procedure to clean your tires, wheels and wheel wells:

1. Remove and clean one wheel at a time. Slightly loosen the lug nuts on one wheel and jack one end of your Porsche off the ground (preferably the end with the wheel you want to remove). Before fully loosening the lug nuts and removing the wheel, place a jack stand under an appropriate point of the chassis or suspension.
2. Mix a bucket of soapy water with your favorite car shampoo. Mix double the recommended strength.
3. Clean the backside of the wheel first. Spray the backside of the wheel and tire with a generous coat of wheel cleaner. Allow it to soak for 3-5 minutes.
4. Using your tire and wheel brush, scrub the backside of the tire and wheel with soapy water. The grunge will be very gritty, so use plenty of soapy water and keep your brush rinsed.
5. Rinse thoroughly and repeat. If your wheels have small crevices, you may need to use an old toothbrush.
6. When the wheel's backside is as clean as you can get it, repeat on the front. Make sure you rinse both sides really well when you're done.
7. While the wheel is dripping dry, spray the wheel well, brake caliper and suspension components with cleaner. Allow it to soak for five minutes. Take this time to dry your wheel with a cotton terrycloth towel.

8. Use the remaining soapy water and your wheel brush to scrub the wheel well, brake caliper and suspension parts. You don't need to make it perfect unless you really do plan to show your car. Make it clean enough to inspect. Let parts air dry.

Once everything is clean, you can turn your attention to protection and beautification:

Spray the underside of your wheel well and any plastic parts with a generous coat of silicon tire and rubber dressing. Allow it to soak in. If you live in an area where it snows, this will prevent the snow from accumulating in your wheel wells (no more snow bunnies!). It also makes future cleanings much easier. Wipe off the excess dressing with a towel, and buff to a nice luster. Be careful not to get over spray on the body of your car.

Wipe your tire down with a generous coat of tire dressing and allow it to penetrate. While the dressing penetrates, inspect the wheel for tar spots. Quite often, large tar spots will accumulate on the backside of the wheel. Use tar remover and a rag to remove the tar. If your wheel has a lot of spots, wipe down the whole wheel.

Inspect your wheel for surface scratches. If you find any, now is the time to buff them out with a light polishing compound. If you don't have a polishing compound, use a little dab of toothpaste. Wax your wheel front and back. An acrylic sealant will last the longest and provide the best protection, but good-old paste wax works just fine. Buff to a high luster.

Finally, buff down the tire and apply a second coat of tire dressing. When satisfied with the finish, put the wheel back on the car.

About the Author

David Bynon is Vice President of Information Systems for Sony Pictures Entertainment. A long time Porsche owner and enthusiast, David enjoys detailing cars for show and relaxation. He can be reached through his web: site at www.autopia-carcare.com

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