

# Truck Detailing

ISSUE 68

## NEW AGAIN: MACHINE POLISHING FOR MORTALS

by Doug Leno

Six years ago, when I took delivery of my 2004 Turbo Diesel, my service manager pulled me aside and admonished, “Doug, I didn’t realize you had special-ordered black clear coat. You’re going to need a good carnauba wax...”

This comment propelled me into the emotional world of retail detailing products. Following the service manager’s advice, I consulted as many forums and blogs as time allowed, just to get a feel for what people were actually using and why. I also consulted TDR Issue 43 (page 70) where member Don Mallinson presented “Confessions of a Detailing Fanatic,” a comprehensive article filled with instructional tips from his own professional experience. As a three-time national concours champion and owner of his own detailing supplies business, Don is well qualified to speak about this subject, and his article should be considered required reading.

My initial research in 2004 produced a small investment in wash, clay, wax, and hand polishing products from various manufacturers, even some with funny sounding names. Most of these have proven effective. As a bonus, I found the emotion in various marketing campaigns and internet posts to be quite entertaining. As the Editor noted in Issue 43 (page 77):

...I can tell you that wax choice ranks right alongside lube oil as emotional, enthusiast-crazed owners verbally spar on the topic. Perhaps both of these subjects are analogous to discussions on religion—you can talk about the topic until you are blue in the face, but seldom will you effect a change of devotion or mind.

I found that the above applies to just about every detailing product known to man, but especially polishes and glazes, detail sprays, and wash products. Phrases like “bringing out the emotion in the paint” and references to car wash soap as “shampoo” are among my personal favorites. In fairness to enthusiastic loyalists, however, I’ll point out that part of the above-mentioned devotion comes from regular use. Most of us are comfortable with what we have purchased, know, and use regularly whether the product has a funny sounding name or not. The rest, however, is just marketing.

### The Results of Neglect

I learned early on that regular hand polishing was more work than I could keep up with and, sadly, I have accepted less and less paint perfection in exchange for saving my elbow grease over the years. The battle scars of work and the road have accumulated, on top of the swirl marks that originated from the factory and from dealer prep work, plus a few that I caused myself. Under the right lighting conditions, the result of this neglect is painfully obvious, as shown in figure 1: Direct sunlight is very unforgiving!



Figure 1: Scratches and swirls are obvious on black paint in direct sunlight.

Water spots have also been a problem for me, in spite of using soft water for every wash. The effects of roadside sprinklers, rain, infrequent waxing, and washing the truck in the hot sun have produced a substantial accumulation on the glass as well as the paint. Figure 2 is a macro photograph of my passenger-side door panel, showing severe water spotting. The photo is a little closer and more dramatic than what the naked eye can see, but not by much.

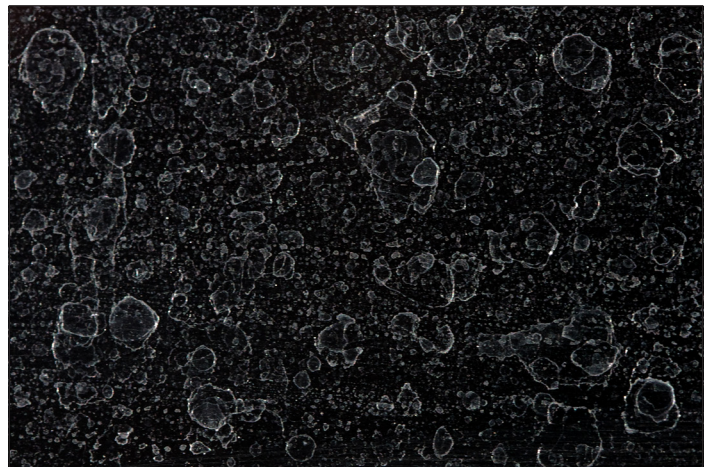


Figure 2: This macro photograph of water-spotting on my Turbo Diesel is only a little more dramatic than what can be seen with the naked eye. Black shows everything!

## Research and Scope of the Project

It was time to renew my enthusiasm for paint care, this time with the additional investments as required to correct the scratches, swirls and water spots that hand polishing could not correct, along with a resolve to lighten the workload with a machine-based system. I was immediately faced with a bewildering array of choices: Should I use polish #5432 or perhaps the medium-fine compound #2 followed by the amazing super-glaze? Should I get the dimpled blue polishing pad or the smooth orange one? Would I need to use the purple or gray pads, or would the red and white ones do? Should I use foam, wool or sheepskin? I started looking for a simple system that wouldn't require a cheat sheet or memorization work, and one that I didn't have to design myself.

In the matter of choosing a polisher, the Issue 43 article proved quite useful in its endorsement of random orbital machines. Unlike the circular polishers that produced the swirls I was trying to get rid of, today's orbital polishers offer a much safer mechanical action (described later) which vastly reduces the chances of damaging the paint. Issue 43 speaks highly of a particular machine, the dual-head Cyclo model 5, but for the \$300 price tag I wondered if I might find two single-head polishers, one for larger areas and one for smaller areas.

Further research into polishing machines revealed a few reasonably-priced alternatives, some of which were rebadged orbital sanders. I discovered a whole subculture of detailing enthusiasts dedicated to certain variations of a popular machine known as the Porter Cable 7424. This machine has a loyal following, and has spawned an aftermarket industry of its own for such things as custom backing plates and counterweights. The 7424 is available in various forms from a wide variety of sources.

For this project, I turned to Griot's Garage, the folks that send out those great little tips mentioned back in Issue 43. I had been using some of their products since my truck was new, and decided to check out their machine polishing system. I discovered the simplicity I was after: There is only one (orange foam) polishing pad, and a set of polishes with sensible names: Machine Polish 1 (most aggressive), Machine Polish 2 (medium aggressive), and Machine Polish 3 (least aggressive/final polish). Moreover, I was able to understand Griot's terminology without consulting a glossary: No need to define words such as "glaze" or "buffing" because these terms are not used. One simply applies the polish with a pad, and removes the same with a suitable cloth. Simple.

I decided to invest in the Griot's machine polishing system for my Turbo Diesel, but at the same time look into a few unanswered questions I had. For example:

1. While the Griot's system offered a simple polish system using one pad, I was surprised at the number of micro-fiber cloths they offered, each of a different color. Are they all necessary?
2. Costco sells micro-fiber cloths at a very attractive price. Are these okay to use on my paint?
3. Would the Griot's 3" random orbital (\$90) together with their 6" random orbital (\$130) be a suitable alternative to the \$300 Cyclo polisher?
4. Would the polishing system also remove water spots on glass?
5. Would I be able to add anything to the debate over using dish soap for the wash step?

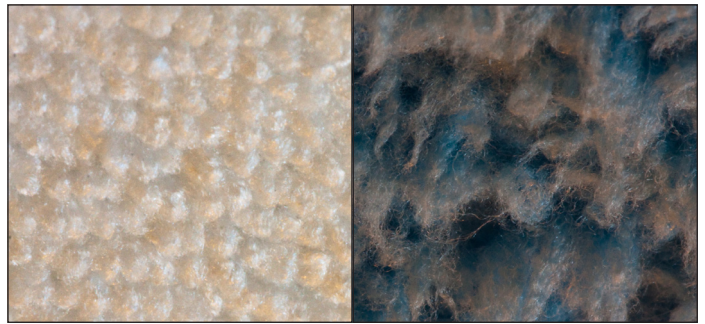
Question number 5 above has remained unsettled in my mind, mostly because qualified experts have lined up on both sides of the issue. You can blame my analytical nature, but I haven't "seen the data," if you will, so I constructed an experiment to answer the question myself and will share the results later in this article.

## The Micro-Fiber Question

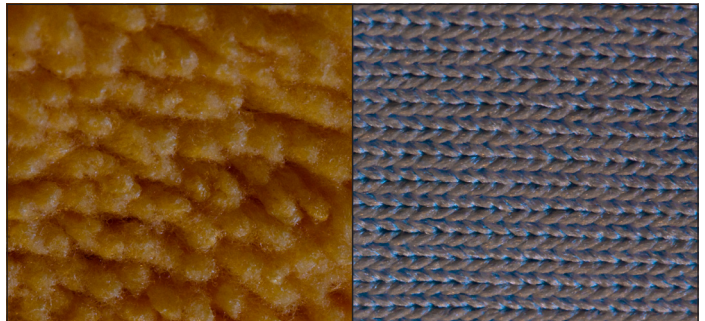
When the Griot's system arrived, the first thing I did was to examine the different micro-fiber cloths and compare them with what I bought at Costco. Griot's included the following;

1. White cloths with short fibers for removing wax
2. Blue cloths with very long fibers for removing "Speed Shine" detail spray
3. Yellow cloths with medium-length fibers for removing polish
4. Blue cloths with a very tight weave for cleaning glass
5. Yellow waffle pattern cloths for drying

The following five photographs, all taken at the same magnification factor, illustrate the fiber and weave differences between each of the Griot's micro-fiber cloths.



**White: short fiber is used in wax removal.  
Blue: a very long fiber is used for Speed Shine detailing spray.**



**Yellow: a medium long fiber for polish removal.  
Blue: this very tight weave avoids streaking on glass.**



**Yellow waffle: long fibers in waffle pattern holds more water.**



At first I was skeptical that so many different fiber lengths and weave designs were really necessary, and I was even reluctant to accept the need for five different cloths. However, I soon discovered that each weave pattern is designed for and (loosely) color coded to match the product for which they are intended. I maintain great respect for those who prefer the same type of cloth for multiple applications; I just came to appreciate how well the Griot's cloths were matched to their respective tasks.

What about the Costco microfiber cloths? The folks at Griot's acknowledged that the vast majority of micro fiber cloths are manufactured in China, including some of theirs, but insisted that not all cloths are created equal. I decided to test that theory with my camera's macro lens, and discovered an interesting distinction shown in figures 3 and 4: The Costco cloth tended to come apart more easily at the edges and exposed a hard (melted) component that I thought might even scratch my paint. While setting up to take these photos, I also noticed that the Costco cloth shed some fibers onto my dark backdrop. Other than those two details, the yellow Costco cloth I tested was similar to the Griot's white cloth used for removing wax. Your mileage may vary, of course, but I decided not to use the Costco cloths on my black paint. They're great for interior work like cleaning the dash or the carpet, however.



**Figure 3: Costco cloth edge weave. A hard, melted portion on the corner (circled) has separated from the cloth, introducing some risk of scratching the paint. This cloth also shed some fibers when I shook it, unlike the Griot's cloth.**



**Figure 4: Griot's white wax-removing cloth has a well-controlled edge weave, and did not shed any fibers. There is a melted portion to keep things from unraveling but it is tightly contained.**

## Speed Shine?

Griot's "Speed Shine" is an interesting product, especially considering Don's advice in Issue 43:

Speed shine or spray shine products can be very bad for the health of your paint! I recommend using these products only to remove fingerprints or in an emergency at a show...

This is sensible advice, especially for detail sprays with insufficient lubricity and used with short-fiber cloths. I was glad to find that Griot's does not promote the use of Speed Shine for general cleaning, but they do promote it for removing light dust and road dirt in between washes. I found its lubricity and optical properties to be quite good, and that it can lift small quantities of dirt from the surface. The Griot's matched blue Speed Shine cloth has the longest fibers of any I have seen in the automotive microfiber world, and traps dirt extraordinarily well. Due to the combination of Speed Shine's lubricity and the very deep, high-loft fiber design of the blue cloth, I've been able to use Speed Shine to remove small amounts of dirt without introducing any additional scratches or inner emotional conflict. It contains no silicones, and is compatible with carnauba-based waxes and Griot's own paint sealant (a polymer-based alternative to carnauba). While it is no substitute for wax, I found that Speed Shine does extend the interval between wax jobs, just as Griot's claims.

## The Work Begins

The Griot's polishing system is designed around clay-based abrasives that break down under continuous use. This makes the system safe for non-professionals because there is virtually no danger of damaging the paint. I found no learning curve either: Within the first minute of use, I was comfortable. Some experimentation was needed to learn how much product to apply to the pad (to avoid making a mess), but that skill came very quickly as well. I made good use of the blue, 3M masking tape to cover the trim.

I used the standard wash ➔ clay ➔ polish ➔ wax routine, which, as you might notice, is absent a "glaze" step, considered important by many in the industry. However, every time the term comes up it needs definition, and I was determined to carry out this project without a glossary so I didn't use a "glaze." Or did I? I will credit Griot's Garage with one additional simplification of the polish process: Machine Polish 4. Call it a polish or call it a glaze; it contains the mildest abrasive of any polish in the Griot's system. Used prior to waxing, it is necessary only to achieve that last bit of perfection, especially in competition and/or for dark colors before applying a carnauba-based wax. I decided to use it on my black paint.

## Clay

I used Speed Shine as the lubricant for the clay. It's not that expensive, has the right lubricity, and works well. I could have used a light concentration of Ivory Liquid, as Don's article suggests, but truth be told the Speed Shine was convenient and I didn't want to deal with yet another chemical solution or spray bottle. I credit Griot's Garage for not introducing a separate lubricant with a fancy

name just for clay: After all, they could have re-packaged Speed Shine with a slightly different color and called it “enhanced clay lubricant” or something.



Figure 5. Griot's Clay bar and Speed Shine.

### Polish

Because this was my first machine polishing experience, I followed Griot's conservative advice and started with their “Machine Polish 3”, their least aggressive polish, which is often used as the final polishing step prior to wax for light colors and daily drivers. I did this to get a feel for the machine itself, how much material to apply, and the overall effectiveness on my paint. I soon discovered that this polish was no match for my scratches and water spots! Being the conservative analytic that I am, I tried the next aggressive product, Machine Polish 2. That didn't work either, which meant that I had to start with their most aggressive product, Machine Polish 1, and work my way back through the numbers.



Figure 6. Machine polishing with Griot' orange polishing pad and “Machine Polish 3”.

Note that a polish removal step is necessary in between polish steps, to avoid cross-contamination: You don't want residue from a more aggressive polish left over while you are trying to produce a perfect shine. This step is also where I learned not to put too

much polish on the pad! If you haven't applied too much, this step is easy using the orange polish-removal cloths. I have to admit I used a little water spray from time to time to help me cut through the polish residue.

Separate orange polishing pads are used for each polish type, for the same reason. I simply marked each one on the side with a Sharpie pen to make sure that each pad was always used with the same polish. After use, I washed them in clear, warm water and stored them in the cabinet.

I have concluded that the four-step Griot's polishing system was designed for those who want professional looking results, but don't want to become professionals. Yeah, that's me. I like the Griot's polish numbering system because it tells me what I need to know without making me consult a glossary to pick the right abrasive, and it doesn't require a spreadsheet for me to pick the right polishing pad.

### The Griot's Random Orbital Machine Polisher

In a direct-drive circular polisher, the polishing pad simply spins around a shaft like a grinding wheel, which means that the outer portion of the pad does more work than the inner portion. Considerable skill is required of the operator to guarantee even coverage and to avoid burning the paint.

To visualize the action of a random orbital machine, imagine grasping a round polishing pad in one hand and waving it around in small, circular motions (orbits). In addition, imagine that you could slowly rotate the pad in your hand at the same time. Not many of us have that kind of dexterity, but this is exactly what a random orbital polisher does, only at nearly 7,000 orbits per minute. Under the power of the motor, the entire backing plate vibrates or oscillates in small circles (instead of spinning), thus moving the entire pad instead of just rotating it. A suitably-placed counter-weight insures that the machine doesn't jump out of your hand. The backing plate itself is free to spin around its shaft, and this allows the pad to rotate slowly at the same time. The Griot's detailing handbook (available as a free download from their web site) contains a good illustration of this complex motion, which I have reproduced with permission in Figure 7.

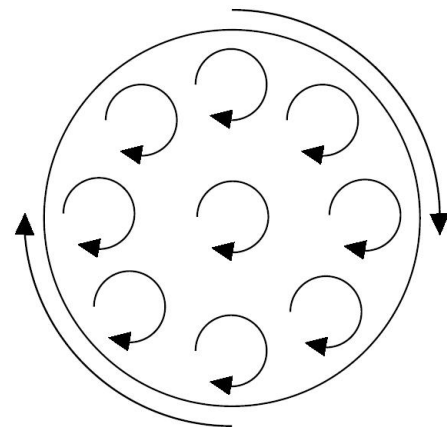


Figure 7: The mechanical action of a random orbital polisher combines pad oscillation (small circles) with pad rotation (large circle). Used with permission.



To ensure even coverage using a random orbital machine, Griot's recommends simple back-and-forth, up-and-down motions, as I did in figure 6. Also, to avoid splattering polish all over the place, be sure to start and stop the machine with the pad resting on the paint!

Typical in the industry for random orbital (sometimes called "dual action") polishers is a 5/16" (or so) orbit diameter which determines the polish area that the motor has to work against. According to my measurements, the Griot's machine falls in line with the rest of the industry, but its 850-watt (approximately 7 amp) motor appears to be substantially more powerful. Accustomed to 4.5 Amp (or so) motors for other machines such as the Porter Cable, I wondered if this would translate to additional power "to the paint," so I experimented by bearing down on the polisher in an attempt to stall it. This takes an impressive amount of force! By the time I got the polish pad to stop rotating, I was afraid of damaging the steel body panels themselves, so I stopped the experiment. At that point, the pad was still orbiting (but not rotating) and the motor itself never stalled. From this I concluded that there is substantially more power available in this polisher than necessary for the job.

### Final Wax, and Results

Having always applied wax by hand, I was intrigued with the idea of applying wax by machine. This requires a different pad of course—one that is very soft and has the right foam structure to transfer wax to your paint instead of just absorbing it. Griot's red foam wax pad works well for this, and I am now a convert to machine waxing. Here again, some experimentation is required to determine how much product to use without making a mess; the more you put on, the more you have to remove! As with polish, there are certain areas where a machine can't go, but with the combination of the 6" polisher and the 3" polisher I covered a lot of territory by machine. For those really hard-to-reach areas, I took the pad off of the machine, attached it to a Velcro adapter, and applied the wax by hand.

The results I obtained are best illustrated photographically, as words do not do justice to the improvements I obtained. Figure 8 shows the clarity and shine in the reflection of my wife's chrysanthemums in the rear, passenger-side door.



Figure 8: Paint perfection achieved with 4-step machine polish followed by "Best of Show" wax.

Figure 9 shows my success in a dramatic close-up photo. I will point out that I took this in direct morning sunlight which greatly exaggerated the swirl marks and scratches, but the photo is fair to both sides of the line! To obtain this result, I put a strip of blue 3M masking tape down the passenger-side rear quarter panel of my truck (the same panel shown in figure 1), providing a clean separation between what I polished and what I didn't. The area in the left side of the photograph has been washed, clayed, washed again, and then treated with Speed Shine. The right side of the photograph represents the following steps:

- Wash
- Clay
- Machine polish 1 (most aggressive)
- Machine polish 2
- Machine polish 3
- Machine polish 4 (least aggressive)
- Best-of-Show wax
- Speed Shine

As you can see, there is orange peel inherent in the factory paint, but there's nothing I could do about that!

**Editor's Note: Yes, you could address the orange peel, but removing orange peel by wet-sanding the paint with 1000/1500/2000 grit paper and then starting the 1/2/3/4 process requires there to be a confidence in the thickness of the clear coat. Removing orange peel on a factory paint job is sometimes tricky. Too much effort and the clear coat is gone...ask me how I know.**

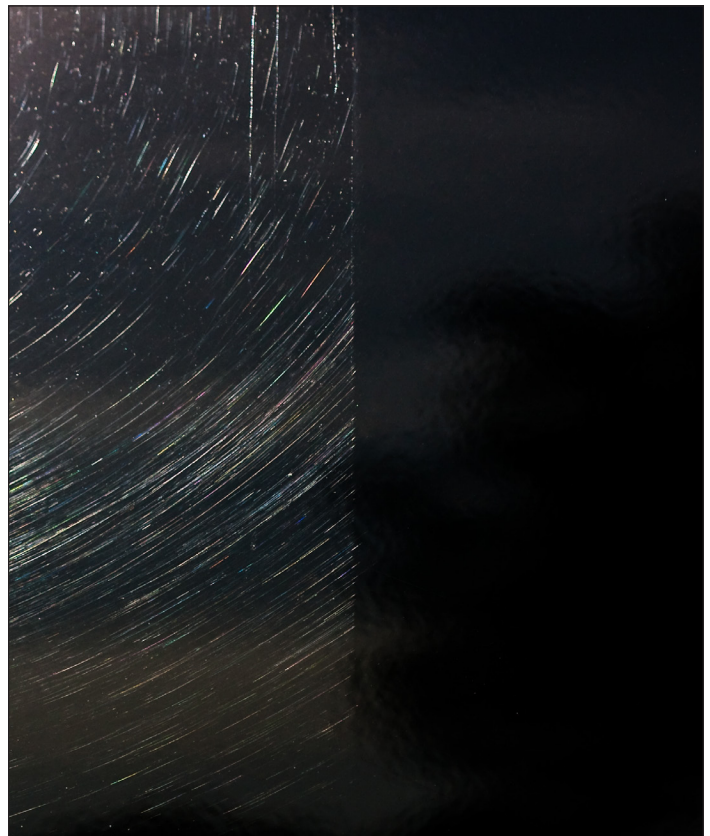


Figure 9: The right side has been machine polished, while the left side has not.

## Glass, Trim, and the 3" Random Orbital

I mentioned earlier that water spots had accumulated on my glass surfaces, and that hand polishing was ineffective against them as well. My rear window was particularly awful because the canopy shell I installed prevented any attempts at cleaning it. I decided to remove the shell and polish the glass.

Outfitted with a (white) glass polishing pad and Griot's glass polish, I attacked the rear window with Griot's 3" orbital, as shown in Figure 10. The results, shown in figure 11, are spectacular; the top portion of the photograph has been polished, but the lower portion has not. The reason that the line between "polished" and "unpolished" is not very straight is because I had not yet thought of the blue 3M tape trick!



Figure 10: Polishing glass using the 3" random orbital, the white glass polishing pad, and Griot's glass polish.



Figure 11: My rear window after polishing. The upper part of the photo used to look like the lower portion.

Another use for the 3" orbital is for cleaning trim. Over the years, my truck has endured the sacrifice of a great many small, winged creatures, and without prompt and regular attention this residue is very difficult to remove from textured trim. The solution? Griot's yellow scrubbing pad for the 3" random orbital. Using the blue 3M tape trick mentioned earlier, I isolated the left side of the mirror from the right to show the effectiveness of the orbital, as opposed to hand scrubbing with the same pad. I had to pull out every trick in the Griot's arsenal to get things clean: The entire mirror was first treated with Griot's Rubber Prep (a strong detergent/surfactant) and then cleaned with Griot's Rubber Cleaner using the 3" yellow scrubbing pad. Finally, I used Griot's Vinyl and Rubber Dressing on the whole surface to restore the black appearance. If you look closely at figure 12, you can see that the right-hand side of the mirror is just not clean: That's where I took the yellow pad off of the 3" orbital and scrubbed by hand as best I could.



Figure 12: Rearview mirror after using Griot's 3" random orbital fitted with the yellow scrubbing pad (left side). The right side was cleaned with the same pad, only by hand.

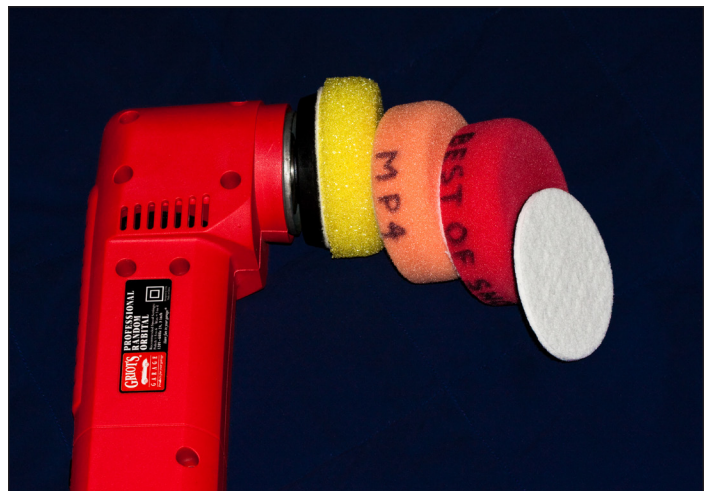


Figure 13. Griot's 3" random orbital with a versatile collection of pads. From left to right: yellow scrubbing pad (installed), orange polishing pad dedicated to "machine polish 4", red waxing pad dedicated to "best of show" wax, and finally the white, glass polishing pad.



## Dish Soap Shoot-Out

I left the washing phase of this project until last in order to address the question of using dish soap on waxed paint. I'll acknowledge up front that my results are going to please some while others will shake their heads, but all I can say is that what I present here are plain, honest results. The photographs I took have not been altered to benefit any particular result! For this experiment, I purchased bottles of Ivory liquid and Palmolive dish soap to complement the bottle of Dawn that was already under the kitchen sink.



Figure 14. Ivory, Palmolive, and Dawn dish soaps pitted against Griot's Car Wash.

With my truck freshly waxed with Griot's "Best of Show" wax, I got out the blue 3M tape again and put a stripe down the middle of that section of the paint showing off my wife's chrysanthemums. I prepared two wash buckets and separate, freshly-washed mitts. I filled one bucket with the recommended concentration of Griot's Car wash and the other with a sudsy solution of Dawn. I tested both solutions by hand to sample the suds and the lubricity.

On the left side of the tape, I took the mitt from the bucket containing Dawn, then washed and rinsed the area five times (to simulate five washings), with the motions I normally use. On the right side of the tape, I took the mitt from the Griot's Car Wash bucket, and washed that area five times, just as I had done to the left. After removing the tape, I sprayed a fine mist of water onto the entire panel and grabbed my camera. The water beaded up astonishingly well on the right side (after washing five times with Griot's Car Wash), and not at all on the left (after washing five times with Dawn).

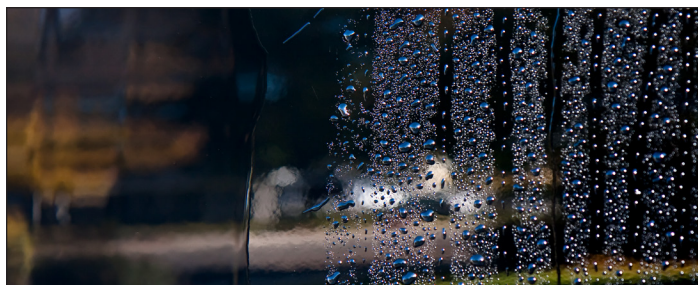


Figure 15: A solution of Dawn dish soap (left) does not allow the same water beading performance as Griot's Car Wash (right) after washing five times. Liquid soaps from Ivory and Palmolive were tested as well, with similar results.

I then took the dish soap mitt inside and rinsed it thoroughly (in soft water) to eliminate cross contamination before changing soaps. I polished again with Machine Polish 4 (the least aggressive compound) and re-waxed with Griot's "best of show" before repeating the experiment with Ivory liquid. Finally, I repeated the same procedure with Palmolive. The photograph in figure 15 shows the first result I tested, which represents the use of Dawn, but both the Ivory and the Palmolive produced the same result, with Ivory only slightly out-performing the other two. Incidentally, the fine water spray I used for the experiment was "soft" water, meaning it had been treated with an ordinary ion-exchange water softener, and this may have influenced the result. Due to its lower surface tension, softened water has a tendency to "sheet" more and to "bead" less.

My conclusion? Consistent with Don's assessment, I found the lubricity and suds performance of the Ivory liquid I purchased to be better than Dawn or Palmolive. However, as a practical matter I found it to be no better than Griot's Car Wash. To be sure, Ivory is the only dish soap I would recommend for washing a vehicle, assuming of course that their formula stays the same and that the flavor I tested is available in your area. However, if you really want to maximize the interval between wax jobs, consider a product like Griot's Car Wash. Its lubricity and suds performance is excellent and the data show that it is by far the easiest on carnauba-based waxes like Griot's "Best of Show."

It would be good to point out that pampering your wax may not be the objective of every wash. For example, if you are going to clay and polish anyway, then you surely don't care about extending the interval between wax jobs, and in these situations why not reach for the Ivory? Moreover, if you already have a clean solution of Ivory available, I see no reason to avoid using it for clay lubricant as well, as Don suggests. It's just a matter of personal preference, and how many different chemical preparations you want to deal with. For example, I already have Griot's Car Wash and Speed Shine ready to go in my garage, and it's just not worth the hassle for me to add something else to my arsenal.

While we're on the subject of washing, here are my thoughts about car wash places: In my experience, the automatic, drive-through car washes are either ineffective or too destructive, so I try to avoid them. On the one occasion when an automatic car wash successfully cleaned my truck, the heated dryers at the end of the tunnel were so powerful they ripped the bug deflector off! I stay completely away from the ones that touch: you never know what kind of grit was left behind by the vehicle in front of you. I do like the spray-it-yourself places, however. I've even been known to bring my wash bucket, mitts and cloths with me, but the owners generally frown on that, even if there is no one waiting behind you. Be careful with the high pressure sprays, however—they can inject water under the chrome plate on trim pieces if you spray too close.

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## Machine Polish 4 for New Water Spots

I mentioned before that the Griot's numbering system helps me decide which polish to use, depending on the condition I am out to correct. After finishing this project I noticed water spots again, apparently from rain and road spray, which had accumulated over several days. Washing and following with Speed Shine didn't work, so I reached for Machine Polish 4 which did the trick. Figure 16 is a photograph of the gap between the cab and the bed on the passenger side—the left side of the photo shows the water spot accumulation that washing and Speed Shine could not correct. The right side shows the effectiveness of Machine Polish 4.



Figure 16: Machine Polish 4 (right side) takes care of new water spots that washing and Speed Shine could not.

### Next Steps, Conclusions and Tips

I have used Griot's products throughout this project, mostly because I learned to trust them over the years, but this writer understands that "your mileage may vary" and that a great many other solutions and preferences are in use today. The main objective of this project was to illustrate my own experience in finding the right polish system that works for me. I like Griot's simple product naming approach, and the bottom line is that I get good results. The system is very safe and provides instant success for non-professionals like me. Like other random orbital based systems, however, it won't correct badly damaged paint with very deep scratches or chips that penetrate through to the primer, all of which require a professional paint job. On the other hand, there are other paint-correcting opportunities still ahead of me, such as severe (but not complete) damage to the clear coat, but these will have to wait until I'm ready to learn wet sanding.

One important lesson learned during this project: Even with a machine polisher, maintaining a black paint job is a lot of work! Here are some additional conclusions:

- Like the experts say, fluorescent lighting is great for inspecting paint, but if you really want to show swirls and scratches in dark paint, catch the evening or morning (low-angle) direct sun!
- Ivory Liquid dish soap is a good alternative for wash if you don't mind waxing more often. Otherwise, use a high-lubricity, high-suds product like Griot's Car Wash.

- Micro fiber cloths can be very useful, if the weave matches the task. For example, Griot's blue cloths for glass have such a tight weave they are closer to newsprint (often used for glass) than any other cloth I've seen.
- The judicious use of Speed Shine detail spray works wonders, especially right after a wash because it has the right optical properties and the right lubricity. It can also be used as a clay lubricant, and even for small amounts of dust in between washings.
- I see no problem using a solution of Ivory liquid for clay lubricant, but if you already have Speed Shine around, it may not be worth the trouble.
- Make sure to put a grate in the bottom of your wash bucket so that your wash mitt doesn't pick up the dirt you already removed from your truck

**Doug Leno**  
TDR Writer

For more information on the products mentioned in this article, contact:

**Griot's Garage**  
[www.griotsgarage.com](http://www.griotsgarage.com)