

De-Gunking

Choosing and using a **Parts Washer** to clean your old car parts

By Bruce Smith

If you're thinking about a parts washer for your home garage, there are a few options to consider. Commercial shops usually use large drum or tank versions sold by companies dedicated to servicing them and handling the disposal and replacement of cleaning solvents. For a home garage, there are choices that might be better suited. Matching the washer and chemistry to your needs requires the comparison of the equipment available as well as the handling and safety of the chemicals used. I recently bought a new drum parts washer and spent some time learning how practices have changed from decades ago. Here are a few things to consider if you're thinking about adding a new parts washer to your garage.

Cleaning Chemicals

Before deciding on the style of parts washer to get, it's probably good to think about the type of cleaning fluids you'd like to use. These generally fall into two categories: organic (aka hydrocarbon) solvents and water-based degreasers. A variety of organic solvents have been used throughout the years, and some folks have favorites that they swear by. Examples include mineral spirits (also called Stoddard solvent, naphtha, or Varsol), kerosene, acetone, toluene, MEK, and gasoline. Some of these (like acetone, MEK, and gasoline) are highly volatile, most of them are highly flammable, and all of them are toxic when absorbed or inhaled. Trichloroethylene deserves a special mention all its own. It is an organic solvent but the chlorine also makes it a halocarbon. It's a terrific cleaner but also very toxic and banned in many states for most uses. Other solvent chemistries are around, often under trade names that can be confusing without some digging to find out what they're made of. Safety-Kleen is one of the leaders in parts cleaning. They sell a variety of blended organic solvents that purport to be safe and effective but only list ingredients as 'hydrotreated petroleum distillates'. Sorta like the Colonel's eleven secret herbs and spices but probably mostly mineral spirits.

Water-based degreasers are formulas of a variety of chemicals. Many degreasers contain butyl cellulose (aka butoxyethanol) or other glycol ethers used as surfactants to break down grease and oil. No surprise that prolonged exposure to these chemicals can cause severe health issues. Short term contact with the skin, nose, mouth, and eyes can also cause severe irritation. This stuff isn't just soap. Other chemicals used in water-based cleaners are phosphates, acids, ethers, and alcohols – each with their own abilities and health risks. The solubility of these chemicals in water should not make you any less cautious about handling them. It's a general rule that the better something is at removing grease and oil, the worse it is for your well-being.

In addition to the health concerns, choosing the right chemistry needs to take into account environmental hazards. No organic solvent should be poured down the drain, nor should water-based degreasers in any large volume. Spent degreasers are even worse since they carry all of the grime that they've dissolved. The most appropriate way to dispose of any of these is to return them to their original containers and take them to a disposal facility.

Fire hazards are also a big concern when handling organic solvents. The most volatile solvents (MEK, acetone, and gasoline for example) shouldn't be used for parts cleaning as their liquids and vapors have a very low flash point. A compound's flash point is the temperature at which it gives off sufficient vapor to ignite in air. MEK has a flashpoint of +22°F, acetone is -4°F, and gasoline is -45°F. Kerosene and mineral spirits are also

flammable but are often used for parts cleaning because of their relatively high flash points. Kerosene and mineral spirit vapors can ignite but with flash points in the range of 100 to 150°F, depending on their grade.

The Best Cleaner?

So what are the best choices? This might be a tough call. Water-based degreasers are sometimes the sole recommendation from a parts washer manufacturer. But this isn't necessarily because these degreasers would work best, and indeed they may only work very well when heated. Adding a heating option to a parts washer creates another level of complexity and cost. Used at room temperature, or worse in a cold garage, these chemicals may be disappointing. But with no concerns of volatile vapors or fire, fewer related precautions need to be taken. From the manufacturer's standpoint, there is also reduced liability if they can recommend against using solvents. If you choose to go water-based, many of the commercial degreasers you'll find in the cleaning aisle of your local big-box store could work fine. But not all degreasers are created equal. Some trial and error might be needed to choose the right one based on what you'll be cleaning. Grease, grime, and oil aren't the same thing nor are steel, aluminum, and zinc. The ingredients and pH of a degreaser will have a big impact on its effectiveness. Degreasers specifically made for parts washers can be found in concentrate or ready-to-use form. General purpose green, purple, or orange degreasers can also do the job and you may find one that you like better than the rest. All degreasers will need a water rinse after cleaning. Without the luxury of a sink in your shop, this may require a trip to the backyard hose or basement laundry tub. Also keep in mind that these cleaners will break down with use and their lifetimes will depend on what and how much you clean with them.

With regard to organic solvents, the best (and smartest) choice is going to be mineral spirits or kerosene. As mentioned, mineral spirits can go by many names but there are some differences in their composition. When comparing, most will be categorized as 'medium aliphatic naphtha solvents'. Look for the flashpoint, which should be close to or higher than about 140°F. If you can find the MSDS (material safety data sheet), this will also list such things as odor, auto ignition temperature, vapor pressure, volatile organic compounds (VOC), and hazardous air pollutants. For mineral spirits, all of these are within a reasonable range for handling without too much concern in your garage. Kerosene can also be used but will vary widely based on grade. Some grades will have a flashpoint as low as 100°F. Some low odor grades may be 125°F or higher. But these are things that can be hard to figure out, especially if you're using pump-kerosene. You'll probably find the price for kerosene is lower than for the mineral spirits you'd buy by the quart or gallon at the hardware store. But prices can be comparable if you find mineral spirits in larger quantities. I'm using a variety sold under the name PSC-1000 in five gallon drums, as pictured here. I've put the four empty drums in the attic to pour the spent solvent into once it's time



A blended 140°F flashpoint naphtha (mineral spirits) parts cleaning solvent available in five gallon drums.

to change it out. Unlike water-based degreasers, these solvents don't break down as much as they will become dirty and absorb water over time. Low grade kerosene is more likely to change color and smell a bit but its solubility properties won't change very much. Filtering can extend a solvent's lifetime and it isn't uncommon for them to last years in a parts washer before needing replacement. An additional upside to using solvents is that there is no need to rinse parts, as there is with water-based degreasers.

Washer Types for the Home Garage

There are several styles of manual and automatic parts washers. Let's assume your volume isn't so large that you're considering automation – otherwise you're probably best working with a company that specializes in commercial cleaners. For DIY applications, manual washers can be categorized as drum style and tub style. You'll find the most affordable are the tub style, available through auto parts stores, tools suppliers, or discount parts stores for a hundred bucks or so. An example is pictured below and most others look similar. Some are available on wheels, which might be handy at times. Some of these washers will come with a seller's recommendation that only water-based cleaners be used. Instructions to 'fill with water or household detergents only' may be followed by language like 'solvents are highly flammable. . .do not smoke during use'. This is a strange warning if you are only going to use the recommended water. The pumps in these washers can indeed handle organic solvents as they are the same ones supplied in other washers just for that purpose. Again, probably a liability thing. But there is an accessory part which will be needed for sol-



A tub style washer for smaller parts cleaning.

vents that may not be provided with the washer - a fusible link for the lid. In the event that a fire occurs, a fuse in the lid holder will melt and slam it shut, extinguishing the flames. In a water-based cleaner, this option may have been left off. Could you still use it to pump mineral spirits? It's your call, but you'd be best off having this safety feature. Tub style washers have their pump set in the bottom portion of the tub with the inlet submersed in the liquid. A gooseneck is attached to the pump outlet for washing parts with an optional brush attachment for scrubbing. Fluid capacity is normally about 10-12 gallons and the pump output is a couple of gallons per minute. The main drawbacks of these washers are size and volume. With a rather small tub and limited solvent volume, these basic washers are good for occasional use with small parts. If you're going to use it more often or need to clean larger parts like an engine case, heads, rockers, etc. you'll probably soon encounter the limits of these smaller tub-style washers.

Larger washers should provide more room to accommodate parts together with more capacity to hold fluids. Commercial shops often use washers made with large drums and a wash basin set on top. This design remains simple and can be scaled up use drums 30 gallon and even larger (to accommodate half or more of their volume in cleaning solvent, or 20+

gallons). A submersible solvent-compatible pump with an epoxy encapsulated motor is submerged below the solvent level inside the drum. The impermeable motor and wiring is electrically connected to an external switch box. With the solvent and pump separate from the cleaning basin (unlike the tub style washer), more space is available to clean parts. An example of a drum style parts washer is shown below. This is the type I went with. The basin is a single piece with a welded ring that sets into the drum. The pump is kept clean by suspending it sufficiently above the bottom of the drum, covering it with a sieve bag filter, and a using filter screen in the basin drain. Although this style of parts washer can be used for water-based cleaners, it is most often used with solvents having flash points well above 100°F. A fusible chain or link is normally built into the lid mechanism to close in case of a fire and temperatures above about 165°F. This washer uses a flow-through brush attachment at the end of the flexible wash hose, like the one pictured below.



A drum style washer capable of larger solvent volumes and parts. This 30 gallon system is from TP tools and is similar to those sold by Safety Kleen and others.

Below: A flow-through brush attachment for the outlet nozzle of a parts washer.



Once you've made choices for the washer and chemistry, there are some things to consider regarding how you clean your parts. A multi-stage cleaning process is good, wiping parts clean of as much grease and oil before putting them into the washer. Since soaking will probably be necessary for grime that has built up for years, it can help to initially wet down parts in the washer and keep them under the closed lid if you're not in a hurry. Then by using a separate stiff brush or a brush attachment, most of the remaining grime can be removed.

Don't expect age old stains or baked on crud to come off easily though as these may need more aggressive wire brushing, blasting or the like. A drip rack inside the washer is handy to drain off the remaining solvent, followed by wiping with a clean rag if desired. When cleaning steel parts, any rust protection that the old oil and grease provided will be removed, leaving the parts susceptible to flash rusting. In these cases, parts can be sprayed with WD-40 once they are dry of cleaning solvent. Now the final hurdle - finding room for one of these in your garage!

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