



# To Flush or Not to Flush?

By Tom Burgess, Owner, Christian Brothers Automotive, Cumming GA

***“That hole in the engine was caused by coolant with too high a pH,” said the Master certified mechanic, pointing at the back of Honda Odyssey’s engine with only 117,000 miles on it. What I thought was a bolt hole in the engine’s rear aluminum cover was damage caused by coolant!***



## **Your car engine’s cooling system needs to be in tip top shape and functioning well during the summer to avoid overheating.**

But that’s not the only job of your coolant, and over the past few years of owning a repair shop I’ve been amazed to see the damage coolant can cause.

Everyone knows to change their engine oil, and most folks are very good about keeping up with this service, but most folks forget that every fluid in your vehicle has a lifespan, and once that time is up, the same fluid that was designed to protect your components is often causing damage. Many people know to check the level of their coolant but have no idea when it should be changed.

The primary purpose of the coolant is to remove engine heat (and prevent freezing in the winter) so having the correct ratio of anti-freeze to water is paramount, but what I hate to see is easily prevented expensive repairs caused by coolant with too high of a pH. Years ago, engines were cast iron and steel, and a high pH coolant had little impact. As manufacturers work to reduce weight and improve gas mileage, today’s engines and heater cores are made from aluminum or at a minimum have many aluminum components, and the aluminum is very susceptible to corrosion caused by acidic anti-freeze.

Today, the pH (acidity) of our coolant can be just as important as its specific gravity (freeze level). Coolant pH naturally drops over time, and when it

drops below 9.0, it creates a textbook battery. The resulting transfer of electrons can wreak havoc on your water pump, engine block, cylinder heads, head gaskets, heater core, heater control valve, radiator, and every other aluminum component. Your ideal pH range is between 9.8 and 10.2, and a system below 9.0 pH can cause extensive damage in as little as thirty days. The pictures show a water pump we removed with the vanes eaten away by electrolysis, another shows a water pump with a steel impellor – the vanes are OK, but the aluminum housing has been carved out by electrolysis to the point where it is not flowing water effectively. Both cars overheated because the water pump could no longer push the water through the engine. Another shows a leaking water pump caused by a worn out 5-cent O-ring in the pump. That O-ring deterioration was caused by contamination in the coolant wearing it away. The heater core (picture 4) should last the lifetime, but it will not if the coolant inside eats away at the extremely thin aluminum cooling vanes. Changing a heater core on most vehicles is very expensive, involving the removal of most of the dash. The last two pictures show what is involved in changing the heater core of a ‘relatively easy’ Jeep Wrangler – everything must come out just to get to it!

Regularly changing your vehicle’s coolant can help avoid many of these problems. You can check the owner’s manual to see when the manufacturer recommends changing it but be

aware most mechanics flush their coolant about every 40,000 miles to remove contaminants. They know those contaminants can cause gaskets to leak, and an excessive buildup of scale and corrosion in the system can clog small passages in the radiator, water pump, and the engine’s water jackets, and can even begin to build up in the heater core.

What’s involved in a coolant flush? This correct procedure is to add a cleaner to the cooling system to suspend sediment or rust, the engine is then run, and the system is then flushed thoroughly with a machine while new antifreeze and a conditioner to protect against corrosion are added. This is different from just draining and refilling the radiator, because harmful contaminants are flushed out of the cooling system completely while new, clean fluid is added.

Flushing your coolant is the only way to maintain that system and, unfortunately, we notice on most vehicles it is a service rarely practiced at the right time. So, have a qualified shop test your cooling system’s pH level at least once a year, it should be free of charge and can save you a lot of money. Don’t wait for a leak to occur or the car to overheat before becoming interested in your vehicle’s coolant; that’s like waiting for your engine to fail before thinking about changing the oil. Once the damage has occurred, it’s too late. So, the answer to the question is – save money by flushing when needed! ■