



# Dousing the FLAMES

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## How a Cooling System Service Helps Your Car Beat the Heat

**T**here's a furnace in your car. Don't believe me? Consider your car's engine, its multiple cylinders undergoing many thousands of combustion cycles—basically controlled explosions—each minute as your car cruises down the highway or even idles at the stoplight.

These fiery combustion events generate tremendous heat, heat that would easily destroy even the heartiest engine if not for that helpful mixture of water and alcohol called coolant (or antifreeze). This mixture circulates through your engine, absorbing that harmful heat and transferring it to your car's radiator, where—true to its name—the heat is “radiated” out of the car and into the ambient air.

But what happens when you mix metal and liquid? In a word, corrosion. That's why a properly formulated and blended coolant/antifreeze mixture has excellent anti-boil and anticorrosive properties. (The alcohol in the mixture keeps the coolant from freezing in very cold temperatures, something that can cause major damage to a radiator or even an engine.)

According to the Car Care Council, the most common formulation of antifreeze is green in color and uses ethylene glycol (an alcohol) as a base with anti-corrosion additives mixed in. However, beginning with 1995 models, General Motors began filling its vehicles with an orange extended-life antifreeze, and many other automakers have followed suit, though generally using coolants that are yellow in color. If that's not confusing enough, many Asian automakers use silicate-free antifreeze formulations in their vehicles (dyeing the coolant red or purple in many cases), while European cars use phosphate-free formulations.

“Green coolant, a phosphate and silicate formula, is typically considered the traditional fluid present in most vehicles. It is usually

recommended to drain, flush and replace green coolant every two years or 30,000 miles,” said Sarkis Aroyan, a senior engineer with Penray. “Orange coolant, a phosphate- and silicate-free formula often referred to as Dex-Cool or organic acid coolant, is considered an extended-life coolant and is found in most GM vehicles. There is an abundance of other colors—like fuchsia, red, blue and yellow—that are variations of different formulas and often designed for specific applications. With all the different colors and chemistries available, it is more important than ever to maintain the cooling system.”

Because the additives in coolant break down over time, it's important to have the cooling system flushed at regular intervals, a process that involves forcing a new coolant/antifreeze mixture through the entire cooling system, forcing or “flushing” old fluid out and leaving your car's coolant/antifreeze in like-new condition. Plus, even “extended-life” coolant may break down far sooner than the service interval recommended in your owners manual (or become contaminated), which is why experts recommend that drivers ask their auto service technician to check the color, clarity, freeze point and chemical protection of their coolant

at every maintenance interval. These few simple tests can indicate whether the coolant is providing adequate levels of protection. If it is not, the cooling system can either be flushed and new coolant added, or additives can be mixed with the existing coolant to restore its effectiveness.

“Because the coolant affects so many parts of a vehicle, a properly maintained cooling system significantly decreases the possibility of vehicle downtime,” Aroyan said.

So keep that blast furnace lurking beneath your car's hood under control by having your cooling system inspected and maintained on a regular basis. +

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