

In this month's addition of *Technically Speaking* we will discuss cooling systems. Why discuss cooling systems in the middle of the winter? Because they seem to be the "Achilles Heal" of most current model BMWs. Also, cooling system failures are not just a warm weather problem.....they fail all of the time. In this article we will review common cooling system failures, worst-case scenarios, the positive effects of maintenance, and strategies for minimizing repair bills. Although this is intended to address BMWs in general, it applies to most/all cars.



Starting with common components and failures we will review the basics of your BMW cooling system. Starting with the radiator, this is the device that is responsible for reducing the temperature of your engine's coolant. Attached to the radiator in some fashion will be a coolant reservoir. The reservoir acts as a storage device for coolant. All cooling systems require a water pump to circulate the coolant through the engine and radiator. In addition, a thermostat controls the path of coolant flow through the engine and radiator, based on coolant temperature. Add a reservoir/radiator cap which is responsible for maintaining proper pressure in the system. These basic components need to work **ALL** the time, and they cannot leak. In our beloved BMWs it seems like every car gets a water pump, a reservoir, and usually more than one radiator. In addition to these main components, most BMWs have two fans, an auxiliary water pump, a heater core and heater valve, and all the hoses and pipes required to connect everything. From a failure perspective, all of these components can develop leaks, and leaks are fatal to the cooling system. A water pump may leak, may break a bearing, or it may break an impellor. For a while BMW was using a plastic impellor on many water pumps. These proved to be very unreliable, although we still see them from time to time on higher mileage cars. In the fan department, we usually see to different failures. The fan that is mounted to the engine on most BMWs spins via a fan clutch, which is controlled by temperature. When the clutch fails the fan will usually not "lock up" to pull air through the radiator. Sometimes it permanently locks, this is just as bad. The auxiliary fan is electrically operated and controlled. This fan typically supplements the other fan and always works when the AC is on. Even though it is called an auxiliary fan, it is required for your car's cooling system to operate. When a heater valve fails, a customer will often have a situation where the heat does not work, or it comes and goes.

Now that you have reviewed all of the miscellaneous items that can and will sooner or later fail, its time to talk about maintaining your cooling system. The first two suggestions are the easiest and the least expensive maintenance you can get. The first item is to have routine oil services done on your car. But, have the oil services done by a BMW specialist that is willing and qualified to look your car over while it is on the hoist. If there is any evidence of any cooling system component leaking, replace it before it breaks. It will not fix itself. I guarantee it will break at the most inopportune time possible. The second maintenance item is a coolant flush. The antifreeze/coolant in the engine is intended to protect your car from freezing and corrosion. Corrosion causes leaks and leaks cause failures. If a leak is suspected but not readily seen, a system pressure check is required. Consult with your BMW specialist of choice on your specific needs. Even with our best attempts to preempt problems, it is possible to have a failure.



It is worth spending a little time discussing worst-case scenarios in cooling systems. We always want to try to minimize the end result of a cooling system failure. The driver can often control this. First, if the car overheats it needs to be seen by your BMW service specialist. They never fix themselves. However, sometimes the temperature gauge will go back to normal after all of the engine coolant is gone from the system. The car is still overheating, but the temperature gauge is not functioning correctly. Significant damage can result to the engine from driving in this condition. If the coolant leaks out, have the car towed. If you start hearing a noise from the engine compartment have it checked immediately. We have seen cars that had a water pump going bad (it was making noise) and would have been an easy, inexpensive repair. Since the customer waited until the pump broke, the fan hit the radiator, the belts broke the radiator shroud, and the end bill was over \$1000. Since cooling systems generate heat and heat generates pressure, driving a car that is overheating can cause multiple failures to other components from pressure build-up. The common failure would be a hose or the coolant reservoir. A more expensive failure would be a heater core that requires the entire dash to be removed to repair. When an engine is excessively or repeatedly overheated, we will commonly see a cylinder head that has cracked. Needless to say this often-preventable repair is very expensive.

Once again, if the car is overheating or even showing signs of overheating, get it to the BMW service specialist of your choice. When a cooling system does have a failure, the ultimate damage (repair bill) can often be influenced by the driver. If it is overheating, do not drive it...have it towed. You will minimize additional damage. If the car has a recurring problem in certain conditions (in traffic, hot days, etc.) do not procrastinate. Get it looked at before additional damage is done. Finally, when dealing with a cooling system issue, please understand that it often is not a black and white repair. The sooner it is looked at the better off you are. When symptoms occur over a longer period of time we often see cases where there is more than one problem. This situation will often require multiple repairs.

In closing, your "Ultimate Driving Machine" may be a great car, but it does need maintenance. Your BMW's cooling system is one area where we have found a higher than normal incidence of repairs. Have the car looked at regularly and enjoy driving your BMW.

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