

## E-Type Cooling and Overheating

As every Jaguar enthusiast and owner knows, the marque has earned multiple reputations over the years. One of them is for cooling systems that weren't always up to the rigors of American driving conditions. Coupled with the fact that the youngest of E-Types left the factory in 1974, it seems we're destined for a boil over. Let's consider a few factors and solutions to E-Type cooling woes.

**The Basics:** Before spending any money, ensure that your E-Type is in proper tune. Set the timing and carburetor mixture and ensure the ignition system is in good order. Pay particular attention to your distributor's advance mechanism – we sometimes see them stuck at full advance. A thorough cleaning and judicious lubrication should put things right. Also check that all the air cleaner seals and gaskets are not leaking. (XKs Unlimited manufactures all of these bits should you need them.)

**Correct Thermostat:** It's essential that you have the correct thermostat, as it regulates coolant flow for optimal warm-up and heat transfer. But let's back up a bit. Jaguar engines have two coolant "circuits" – one for when the engine is cold and one for when the engine is up to operating temperature. When the engine is cold, coolant bypasses the radiator so it will reach operating temperature as quickly as possible. But once the engine is warm, the thermostat opens and allows coolant to enter the radiator and dissipate heat. But only the correct thermostat will completely block the bypass port when things get warm and ensure that *all* the coolant passes through the radiator. When a cooling system is marginal, or the engine has age-related deficiencies, this is extremely important.

These days, most vintage Jaguars are given time to warm up properly and are then driven for relatively long periods, meaning the bypass circuit is little-used. So why not block the bypass port and do without a thermostat? Doing so can work well in some hot-weather situations, but it requires removal of the thermostat to ensure that coolant moved by the water pump has somewhere to go. But running without a thermostat can actually be counterproductive; if coolant runs through the radiator too rapidly it cannot sufficiently dissipate heat. Bottom line: for most situations, stick with the standard configuration and the correct thermostat. (Race cars are a different story in that they almost always benefit from blocking the bypass, but they still require a restrictor plate to regulate coolant flow.)

**Correct Header Tank:** Years ago, there were some pretty awful-looking reproduction header tanks available and we still see them occasionally. On 3.8-liter cars, other than the looks, this was not particularly critical because hot water simply flows from the intake manifold, passes through the tank and into the hot (left) side of the radiator. The 4.2 Series I tank differs, however. A steel tube bridges two of the hose nipples. Holes in this tube let air in the system escape and provide a "sample point" for the fan switch. The third hose connection on the tank accepts expanded water from the radiator.

Some aftermarket Series I tanks are simply an empty container with three hose nipples. This can result in hot water exiting the manifold and getting drawn into the cool side of the radiator via the expansion line and right back to the engine – without being cooled! So, if you're experiencing cooling problems and your car has one of the old aftermarket header tanks, the correct tank might work wonders.

**Fans:** The Series I “lawnmower blade” cooling fan is downright comical. We offer a 17” 2800 CFM fan that fits neatly into the original shroud. It would be an understatement to say that it’s a colossal improvement over the original. Series II and III E-Types used two fans with the Series III employing the much improved round Lucas cooling fan motor. This motor is easily adapted to the Series I and II cars. XKs Unlimited manufactures a replica of the adaptor bracket used for this purpose back in the day and also has excellent pricing on the round motors. (This motor and bracket can also be used on a Series I car with the original fan blade.) Alternatively, we also offer smaller versions of the “swirl” fans that fit within the standard Series II and III shrouds. While these do not offer as dramatic an improvement as with a Series I car, it is still substantial.

Finally, make sure the fans are actually working and oriented correctly. They should pull air through the radiator toward the engine.

**Bad Radiator:** All the dissimilar metals in a Jaguar engine can literally plate themselves onto the inside of the radiator if neglected, drastically reducing its ability to dissipate heat. The only real cure is replacement. You can go the original route or upgrade to an increased-capacity alloy radiator, with or without a high-performance factory mounted electric fan. The alloy radiators we stock are beautifully made in the USA and the fans mount to brackets on the radiator frame – not through the radiator core where inevitable vibration can eventually damage the fragile tubes. We cannot recommend these radiators highly enough.

**System Leaks:** Jaguar’s heating/cooling system engineers must have been paid by the hose clamp count. A 4.2 Series I E-Type, for instance, has 28 of them and each is a potential leak point for the pressurized cooling system. An easy test is to loosen a clamp after the car has reached operating temperature (be careful not to burn yourself). The temperature gauge should begin to climb almost immediately. Because pressurized water boils at a higher temperature than non-pressurized water, a loss of pressure can mean localized boiling within the engine and a total loss of ability to absorb heat.

In the process of checking the hoses and clamps, be sure to inspect the heater core and all cylinder head and engine block core plugs as even a seeping plug can cause a loss of system pressure.

If you’re unsure of the age of your hoses and pressure cap, it would be wise to replace them. XKs Unlimited offers convenient cooling hose kits and all the other components required to maintain your cooling system.

**Plugged Block and/or Corroded Cylinder Head:** Because of the age of E-Types, this is now a real possibility for engines that have never been rebuilt. We’ve seen blocks and heads that are totally plugged with sludge and corrosion. Unfortunately, while we’d love to sell you a new radiator, there is no solution for this problem other than an engine rebuild. Unless you have X-ray vision, it’s difficult to determine if your engine is full of gunk without exploratory surgery. Sometimes a single core plug can be removed for a window into your engine’s soul, but that only tells part of the story.

A bad head gasket will usually allow oil into the cooling system (a chocolate milkshake-like coating on the underside of the oil filler cap is the telltale here) and/or coolant into a combustion chamber. White

smoke (well, steam, actually) out the tailpipes is a dead giveaway of escaping coolant. Both will result in an overheating engine. But we've also seen a more insidious culprit: a cracked steel head gasket that allows hot combustion gases into the coolant but that somehow still keeps water and oil in their respective systems. These gases are so hot that they can overwhelm the cooling system's ability to dissipate the heat. In addition, the gases form corrosive acids within the coolant. Most auto parts stores sell test kits that will detect combustion gases in the coolant, among other ills. NAPA's part number BK7001006 is a good choice.

Finally, we wonder if some Jaguar cylinder head castings are better than others and allow for better coolant flow. Have an opinion on this?