Where's the Heat?

The cruise control was set for 80, the passing lane belonged to the XC90, and the pulsating exhaust of the tuned Yamaha V8 was satisfying; backing off the throttle dropped speed to 80. Occasionally, the radar jammer squawked as it did its job. Virginia flew by, followed by West VA and Maryland in quick succession. Exiting Pennsylvania, the XC90 shot toward Racquet Lake where I was to attend a class in fiber optic splicing and ODTR fiber optic cable troubleshooting training session the next morning. Rain, then snow began to fall, then tragedy.

No heat! Tepid air blew from the floor vent. Driving bundled, the Finger Lakes fell by the wayside, and snow swirled in the glare of the 6000K light bar. It was dark. Upstate New York can be pretty dark and cold. I was thankful for the 10,000 lumen light bar in the grill; it lit the 2 lane road like the noon day sun; the occasional deer grazing on the grassy shoulder ran for cover.

It was late, fiddling with the climate control system yielded blasts of cold air. Yet, a hint of warm air sneaked into the cabin to maintain a frosty 45 degrees. My associate, Peter, had layered up and could have doubled as the Michelin Man. We drove with minimal heat to Racquet Lake where it was really C O L D.

Three days later, Fiber Optic Tech certification in hand, I launched the '90 toward Albany and then to Raleigh, where it was undeniably warmer. The next morning I dove into the "no heat" puzzle. This appeared to be a recurrence of a problem the XC90 had two years earlier when the damper door motors did not function. Access to the damper motors is gained by removing the glove box. Two damper motors plus a side vent door motor had failed. A quick trip to the LKQ salvage yard resulted in 6 working units. The faulty units were replaced and the system recalibrated by super master technician Everett Long at Volvo of Cary.

This time the vent motors were working, I cycled them and each waggled a flap open or closed. At the time of the damper door repair, I'd removed the radiator core and flushed it. I also verified the auxiliary electric hot water pump kicked on at 40 degrees. The temperature sensor for the auxiliary coolant pump is on the passenger side review mirror. I wrapped a plastic bag filled with ice around the mirror and listened for the motor whine. The electric coolant pump motor is located beneath the driver side headlamp assembly. Remove the headlight assembly to service the auxiliary water pump.

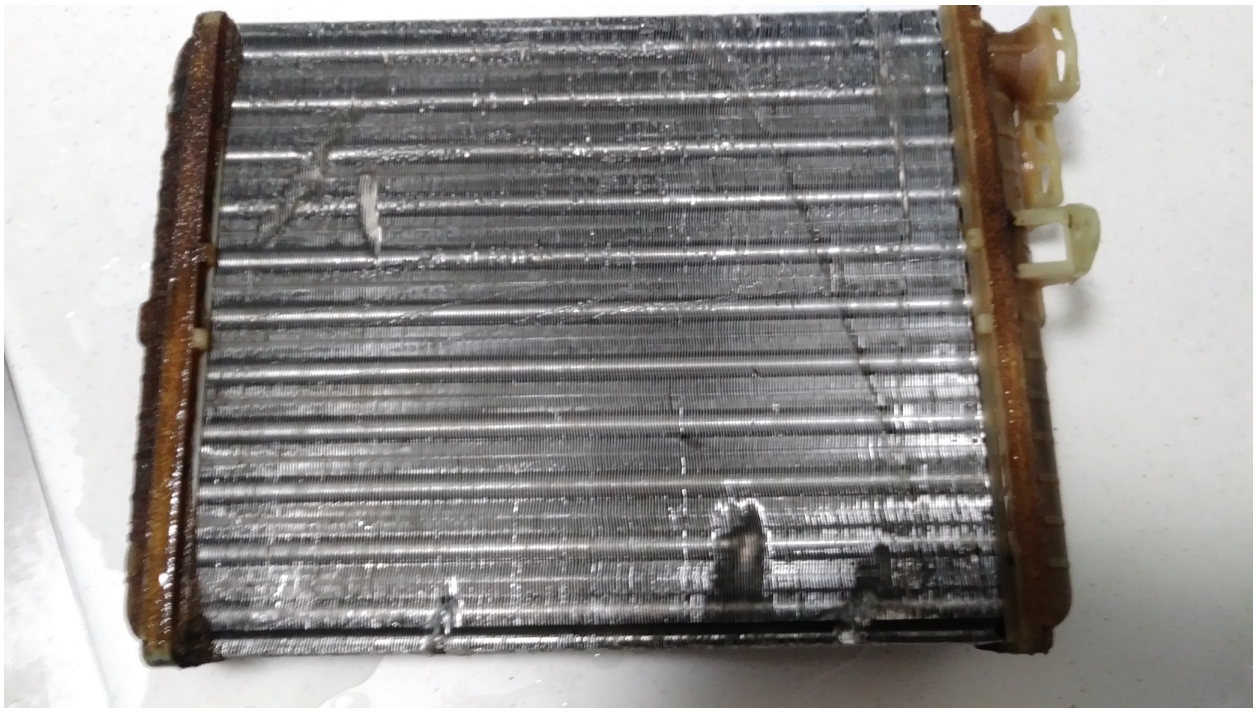
I suspected a clogged heater core caused the no heat phenomenon. Heater core access is secured by removing the plastic kick plate below the dash and above the brake and gas pedals. With the motor running, I pointed an infrared thermometer at the inlet and outlet sides of the aluminum supply lines leading to the core. They were both the same temperature, 180 degrees. (Thermostat was working.) Hummm? This seemed okay, but maybe not! Access to the other heater core end cap is via the passenger side. The infrared temperature probe revealed the

plastic end cap to be cold. Yup, hot fluid was marginally circulating through the heater core, hence no heat.

Two clips hold the inlet and outlet tubes to the heater core (driver side). Remove those and pop the inlet and outlet tubes off, C A R E F U L L Y push aside to gain clearance and the slide the heater core out past the brake pedal. About a pint of coolant will leak out; cover the area beneath the gas pedal with towels to absorb the fluid.

On the trip to harvest damper motors, I also retrieved a heater core ($10). The donor heater core installation was completed in short order, fluids topped off, engine started and heat poured into the cabin. Success!

Hint: At U-Pull-It salvage yards, always acquire parts that you may use one day, but not need at the moment. Having the spare heater core allowed me to resolve the no heat problem the same day.



Although the fins are crumpled, this is a good working donor unit. The fins are groomed and restored by using a dull single edge razor blade to separate vanes. This is necessary to maximize air flow, heat transfer, through the heater core.

Thermometer shows the cabin air temperature post heater core swap.

Trivia Question: The owner's manual states, "Transmission fluid is lifetime, no service interval." How is "lifetime" defined? Keep reading to find the answer.

Anatomy of a failed heater core.

To test a heater core, fill core with clean water and slowly drain onto a white dinner plate. If you see grit, discard the core (see picture). Salvage yard donor cores should be tested to avoid replacing a failed core with one about to fail.

Tube inspection

Slowly pour water into one of the two heater core openings, if water fills one side and not the other, the core is plugged (see picture). If you shine a light into the core, you may see the scale inside the tubes. Through either opening, thread a fine stiff stainless steel wire into a tube to determine whether it is clogged. If obstructed, sediment will be dislodged and emptied into the plate with drain water. If both plastic core end caps are not nearly the same temperature while the motor is running, the core is seriously obstructed.

Coolant chemistry.

Water has a pH of 7 (neutral) and antifreeze has a pH of 10.5, a 50-50 mix has a pH of 8.75. The pH of a cooling system must be around 10 (highly alkaline) to protect dissimilar metals and to prevent scale build up in the radiator and heater core. If pH value falls below 7, the cooling system, because of dissimilar metals, becomes a battery and electrolysis will dissolve head gaskets and compromise internal aluminum and steel components as well.

I use pH test strips, (available at Amazon or auto parts stores) to monitor coolant pH. If you intend to keep a vehicle, it is imperative to maintain a high cooling system pH by changing antifreeze/coolant biannually or add a pH modifier to the existing fluid to increase the pH; thus extending coolant life, saving money and insuring the cooling/heating system remains trouble free.

Test strips and pH modifiers are available at automotive parts stores or on-line. No garage or DYIer should be without pH test strips and a pH modifier. BTW, check the coolant's freeze temperature. I maintain my vehicles at -30 degrees, but I live in the South.

The life expectancy of an aluminum heater core is 100K miles or 10 years. My XC90 is 12 years old and has been driven 218,000 miles.

Can someone at Volvo tell me what happened to those Volvo 100K, 200K and 300K mileage badges? Perhaps the answer lies in the following paragraphs.

Trivia Question: The owner's manual states, "Transmission fluid is lifetime, no service interval." How is "lifetime" defined by the manufacturer?

Answer: Lifetime is the period of the driveline warranty. If the warranty is 100K miles, you'd best have the fluid changed at 50K-70K miles, should it be your intention to drive a trouble free vehicle beyond its "lifetime."

This definition applies to any consumer product that carries a lifetime warranty. Understand that "lifetime warranty" is a marketing term implying quality and value are intrinsic to the product without regard to manufacturing, care or service requirements.

Years ago, I purchased an alternator with a lifetime warranty. Three alternators and 500K miles later, the manufacturer advised that I'd exhausted the lifetime warranty. No more free replacement alternators. The '90 is on its third "free" lifetime serpentine belt and third set of "free" lifetime brake pads. Hurrah!

Idea! If you have interest in learning how to negotiate salvage yards, I'm willing to organize a Saturday fieldtrip for Volvo enthusiasts. You can save money and bask in the glow of the satisfaction of performing simple repairs, like replacing a broken tail light assembly on your Volvo with a working unit from a donor vehicle.

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