

Turn Up Your Heater

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It's colder than a witch's belt buckle outside, so you gulp down some hot coffee, dash to the car, start the engine and run inside. Although you know engine idling isn't a great way to warm up an engine, comfort counts most on a cold morning. Once embarked on your morning commute, you turn the heater control up to Hot and flip the blower switch. The effect of the hot coffee has worn off, but you're not getting enough heat from the floor registers to make up for it. In fact, the windows start to frost over.

Your heater system is under-performing. You plan to tear into it as soon as you can get the car into a heated garage.

First step: Confirm the problem by driving long enough to warm up the engine. Turn the heater control to Hot, select the floor mode and set the blower to medium/high speed. Make sure there's strong airflow from the floor registers. Check the temperature with a thermometer inserted into the driver's and passenger's registers. Although many vehicles deliver a toasty 135° to 155°, 115° to 120° is acceptable. If the air temperature is okay but airflow is weak, the problem is the blower or a dashboard ductwork problem.

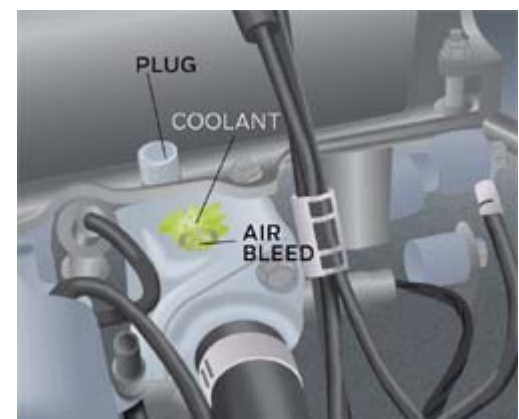
Heater register temperatures not even close to 115° to 120°? Check factory service bulletins to see if there's a known problem (at the vehicle maker's technical service Web site or at www.alldatadiy.com). If nothing applies, do an underhood inspection.

The coolant level in the reservoir (and radiator if it has the pressure cap) should be at specs. The coolant should look clean and have been regularly changed within the specified interval. If it's been neglected, all bets are off.



CLICK TO ENLARGE

Dangle the thermostat in hot water while you monitor the temperature. The 'stat will drop off as the water rises above the 'stat's actual (rather than rated) actuation temp. Too cold, and your engine never properly warms up.



Cabin heat comes from hot coolant, so drive long enough to warm up the engine. The coolant temperature should hit at least 160°, preferably 180° to 220°.

The air conditioner compressor should be disengaged with the climate control selector out of the defrost position. If it's engaged, there's an a/c circuit problem.

If coolant temperature is acceptable, feel both heater hoses, which should be hot. They are? Check the temperature-control flap-door operation in the under-dash heater-a/c case.

If you have automatic temperature control, there may be built-in diagnostics you can access for trouble codes covering the temperature control door. (Refer to a service manual, factory tech service Web site or www.alldatadiy.com.) On many cars you can watch the temperature-door motor and shaft operation by removing an under-dash panel and/or lowering the glovebox. (Here again, you'll have to check a manual or Web site for instructions.) If you don't see and/or feel the motor or flap-door shaft operate as you change the temperature reading, you've pinpointed the problem. In many cases, the flap-door shaft breaks and the assembly must be replaced, but the motor is good and can be reused.

On econocars with manual a/c, the temperature flap may be controlled by a cable from the dashboard lever or knob. Operate it quickly in each direction and listen for a soft slam against a stop. If you feel binding, the cable is kinked or the flap is jammed. Total free play? The cable is loose or disconnected, or the flap is broken.

Nothing's obviously wrong? There may be air pockets in the cooling system--these commonly develop over time. If there's a pressure cap on the radiator or engine and a low coolant level in the radiator, but the level in the reservoir is normal, a defective gasket in the cap is admitting air. Replace the cap.

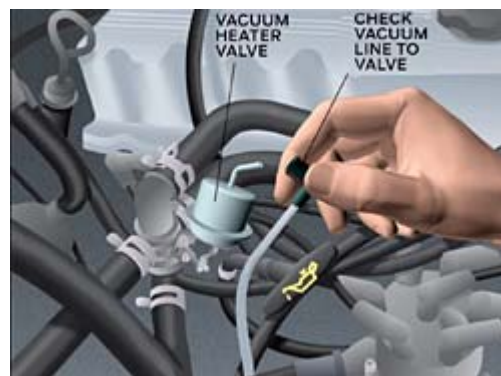
Top up the system and purge air, following the vehicle maker's specific procedure.

As a generic approach, start with the engine cold, all bleed valves open, and the side of the vehicle with the coolant neck jacked up as high as possible. This raises the fill neck to the high point, so air bubbles out. Slowly add a 50/50 antifreeze/water mixture to the fill neck. You'll see some coolant (and perhaps air bubbles) oozing out of the bleeders. Close the bleeders, refit the pressure cap, and run the engine at about 2500 rpm until it's warmed up (or as warm as it will get). Allow the engine to cool down, then repeat the top-up procedure. You may have to repeat this every few days over a

Remove or open any air bleed plugs on the block or heads while refilling the engine to purge any air in the system.



Simply blocking the radiator can make your car warm up faster in extremely cold weather.



Check for good vacuum supply to the heater's control valve. If it's good, check the valve itself for proper operation.

week to get most of the air out.

Coolant temperature too low? On vehicles with a clutch-type fan on the engine, make sure the clutch is not locked up. Spin it by hand (with the engine off but warmed up). If there's virtually no slippage, the clutch is defective. If it spins two to three times, it's probably okay.

Could someone have removed the thermostat, probably trying to remedy an overheating situation? That's a very bad idea, not to mention the fact that it is illegal to tamper with emissions controls.

No fan operation problem and coolant temperature is very low? If you've neglected your system, the thermostat might be stuck open from debris. If it's really buried, pour in a cooling system cleaner and run the car per the instructions. Then, do a triple drain-and-refill of the radiator and engine block, and go through the air-bleeding top-up process. If coolant temperature remains low, bite the bullet and remove the thermostat for a test.

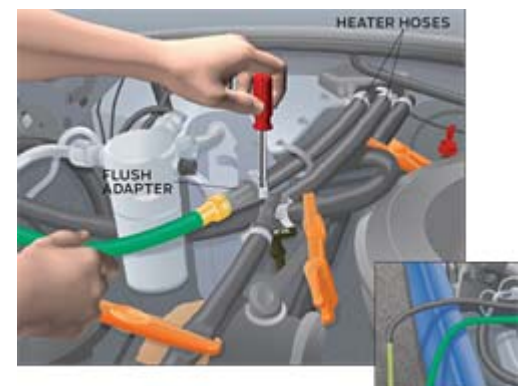
If the access to the 'stat isn't bad, hold off on the drain-and-refill, and pull the 'stat for a look and a test. Clean if necessary, but before putting it back refit the 'stat housing, then run a cleaner through the system. Then do the triple drain-and-refill, and test the thermostat before you decide to reinstall.

Testing: Wedge a 0.002-in. feeler between the closed 'stat valve and its seat, then submerge the 'stat in a pot of water on a stove. Rest a radiator thermometer in the water, heat the water to boiling, and note the temperature at which the thermostat cracks open--it will drop off the feeler at its rated temperature.

Some engines, particularly transverse four-cylinders, radiate so much heat so fast that there's no internal fix for extremely cold weather. It may not be an elegant solution, but put a piece of cardboard against the front of the radiator, blocking about half of the surface area. Trim it back if the engine starts running hot. Remember to remove the cardboard in the spring.

Coolant temperature reading is normal, but one or both hoses are not hot? Refer to a service manual or Web site to identify the heater inlet versus outlet hose.

Neither hose is warm? Many cars have a heater coolant shutoff valve spliced into the heater inlet valve for better a/c performance in summer. If the shutoff valve fails to open fully, the flow to the heater will be restricted. Vacuum operated? Disconnect the hose. If you feel vacuum (with some valves you'll also see the linkage



Flush the heater core with running water if it seems blocked. Drain coolant into a bucket for disposal first--it's toxic.

move), the valve is being held open by a defective vacuum control. Leave the hose disconnected (plug the end with a golf tee) and see if that cures the problem. If it doesn't, the shutoff valve is stuck. Replace it. If the valve is cable controlled, you should see the valve shaft move continuously as the dashboard temperature lever is operated. If it doesn't or if it moves just slightly, the cable needs adjustment. Note: The VW Golf and Jetta have a cable-type valve, but it opens proportionally to the flow of hot coolant as needed--there are no flaps in the dash.

On some other European cars and on the Lincoln LS, the valve works similarly to the VW's, but it's electronically controlled. Quick test: Unplugging the electrically controlled type should force the system to full heat.

If the heater inlet hose is noticeably warmer than the outlet, the heater core is restricted from debris in old coolant or from excessive use of sealer. First, try to reverse-flush the heater core. Do this by either disconnecting both heater hoses from the heater necks on the cowl and attaching spare hoses, or by disconnecting both heater hoses at the engine. (Clamp off the heater hoses if you're using spare hoses; plug the engine hose necks if you're disconnecting there.) Force a garden hose into the heater outlet hose, aim the inlet hose away from the vehicle, and open the bibcock. If the debris flows out and you eventually see a healthy flow of coolant, you may have caught a break. Otherwise, you've got to replace the heater core.

If heater performance during highway operation is all right but it really drops off in low-speed driving, there's a cooling system flow problem. Some systems have a hose restrictor in the inlet hose, and if it gets plugged with debris, that lowers the flow. You should find this by feeling along the inlet hose with the engine idling. (You'll reach a section where the temperature significantly drops.) A few engines (on the Dodge Durango, Lincoln LS and a number of German cars) have auxiliary water pumps to improve coolant flow at low speed/idle. If the pump fails, heater output drops during that operation. Of course, if the cooling system was long neglected, it's possible the engine water pump has eroded internally, reducing coolant flow.

In most cases, poor heater operation can be cured by following the factory top-up procedure with the air bleeds open. Do this several times over the course of a week. Is there a faster fix? A pro with a coolant changer that purges air as it fills the system can give you faster heat.

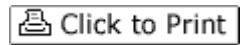
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