

Got a question for John? E-mail him at ceeditor@amosautomotive.com

CAP TRAP

PUTTING A STOP TO ALL THE DROPS

READER'S QUESTION: I HAVE A 1980 L-82 THAT I PURCHASED THREE YEARS AGO. IT HAD BEEN PARKED FOR FOUR OR FIVE YEARS BEFORE THAT. SHORTLY BEFORE IT WAS PARKED, IT HAD A NEW FOUR CORE ALUMINUM RADIATOR INSTALLED. WHILE CLEANING AND DETAILING THE ENGINE LAST YEAR, I HAD A NEW WATER PUMP, THERMOSTAT AND HOSE INSTALLED. AT THAT TIME, THE MECHANIC SAID THE RADIATOR LOOKED FINE. I ONLY DRIVE IT A LITTLE EVERY MONTH OR SO. I NOTICED IT WAS LEAKING COOLANT, AND ON CHECKING I FOUND IT WAS COMING FROM THE RADIATOR CAP. I REPLACED IT WITH A NEW "PRESSURE RELEASE" CAP. IT CONTINUED LEAKING, SO I TRIED A STOCK CAP, BUT IT STILL DOES IT. THE GAUGE DOESN'T SHOW IT TO BE RUNNING HOT, BUT AS SOON AS IT WARMS UP IT STARTS HISSING AND LEAKING COOLANT. ANY SUGGESTIONS ON THE CAUSE OR CURE WOULD BE GREATLY APPRECIATED.

JAY TRUEHEART
VICTORIA, TEXAS

RESPONSE: Hi, Jay -

Andy Bolig forwarded your note to me.

If the coolant hissing/leaking is coming from under the cap, it isn't sealing properly to the radiator filler neck, so you need to isolate which sealing surface is at fault.

Take both caps to an auto parts store and have them use their cap pressure tester to verify the integrity of the cap seals; they should hold their rated pressure. If the caps hold their rated pressure, the problem is in the radiator filler neck.

If the caps test OK, check both sealing surfaces on the radiator filler neck. The top surface of the neck seals against the metal gasket in the top of the cap, and

must be smooth and free of nicks. The other seal surface is down about 1/2-inch inside the filler neck, and it seals against the rubber gasket on the spring-loaded portion of the cap; this is the primary pressure seal for the cooling system, and the mating metal seal surface on the filler neck must be perfectly smooth, with no nicks or dents.

The images below from the Chassis Service Manual shows how the pressure/vacuum-relief radiator cap works. With a hot engine, in pressure relief mode, if the system pressure exceeds the cap's rating, the pressure on the bottom of the cap exceeds the strength of the large coil spring, and the rubber primary cap seal lifts off the lower seal surface in the filler neck, allowing coolant to

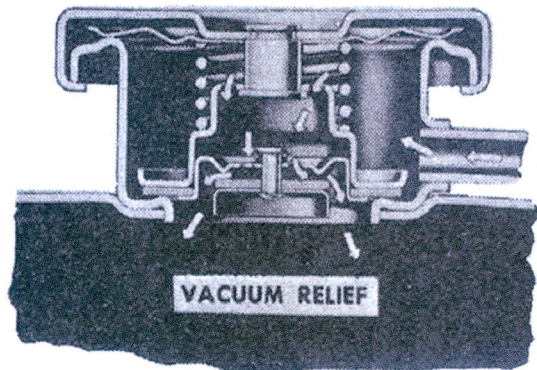
escape through the overflow nipple to the coolant recovery bottle. When this occurs, the metal gasket in the top of the cap prevents any coolant from leaking out from under the cap.

When the engine is shut off and the system cools down, the cap is in vacuum relief mode. A slight vacuum is created in the cooling system as the coolant contracts; that vacuum opens the small circular vacuum valve in the center of the bottom of the cap, and the vacuum pulls the expelled coolant from the coolant recovery bottle back into the radiator. If the other seal between the metal gasket in the top of the cap and the top of the filler neck isn't effective, it becomes a vacuum leak, and air is drawn into the radiator instead of coolant from the bottle.

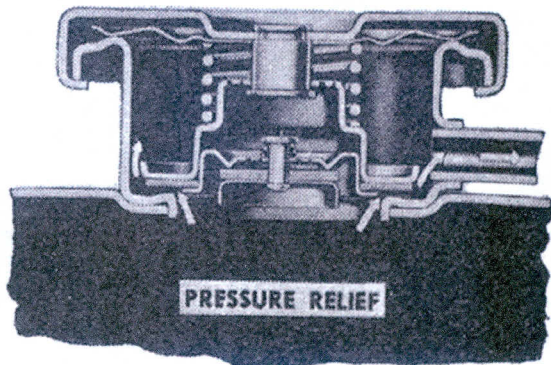
On Corvettes prior to 1973, there was no coolant recovery system - any coolant expelled through the overflow nipple in the filler neck simply dribbled on the ground from the end of the overflow hose, and air was pulled into the radiator as the system cooled down.

If the caps test OK, I think you'll find the problem in the lower sealing surface inside the filler neck.

Regards,
John Hinckley
Vintage Technical Editor
Corvette Enthusiast Magazine



VACUUM RELIEF



PRESSURE RELIEF