

## Clogged Engine Coolant Air Bleed Restrictors

Marc Haibeck

A clogged air bleed can cause major difficulty when refilling the engine coolant. Normally, if the engine is drained of more than three quarts of coolant, the coolant should fit back into the engine except for about one quart. It's important to collect the drained coolant so that you can make this determination. Install the excess coolant in the white reservoir and it will be drawn into the engine during the next cool down.

When the engine is started after filling the coolant, the surge tank (black tank) cap should be removed within seconds after the engine starts. Coolant should be observed flowing out of the lower hose connection below the cap. If there is no flow the engine is air locked or both of the air bleeds are clogged. If this happens the engine must be shut off within one minute of runtime.

If there is no air bleed coolant flow and more than one quart of coolant won't fit back into the engine. It is likely that the air bleed system is clogged.

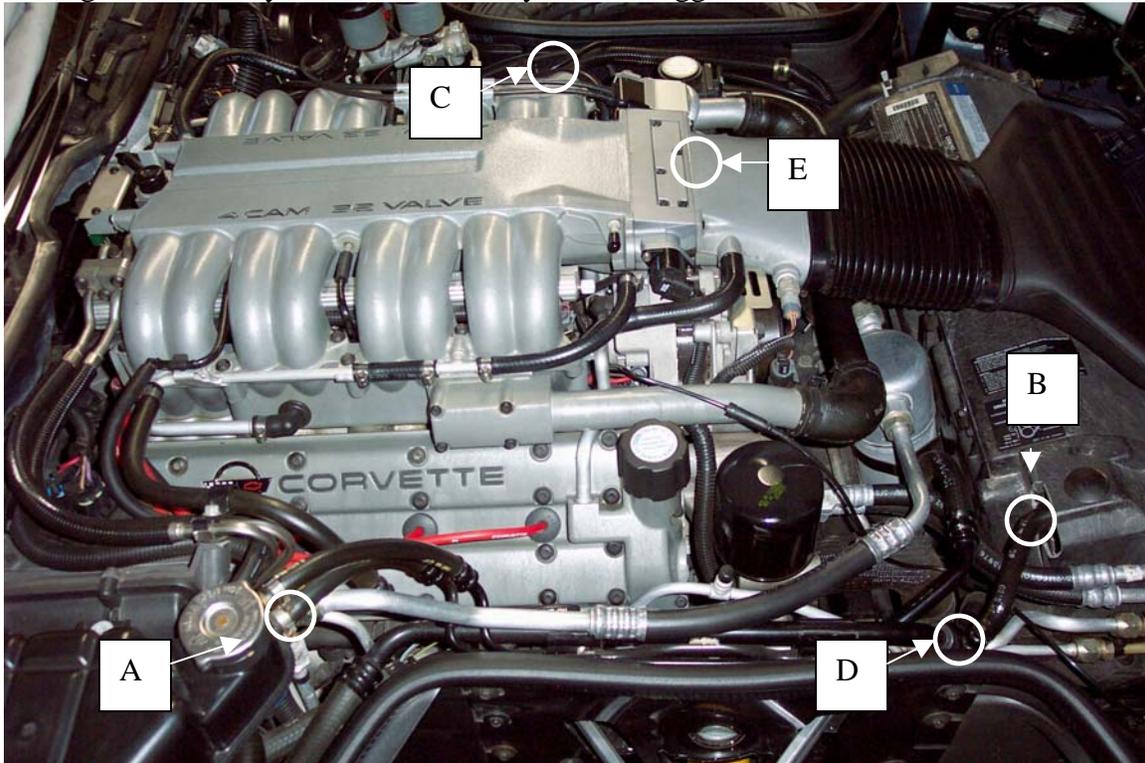
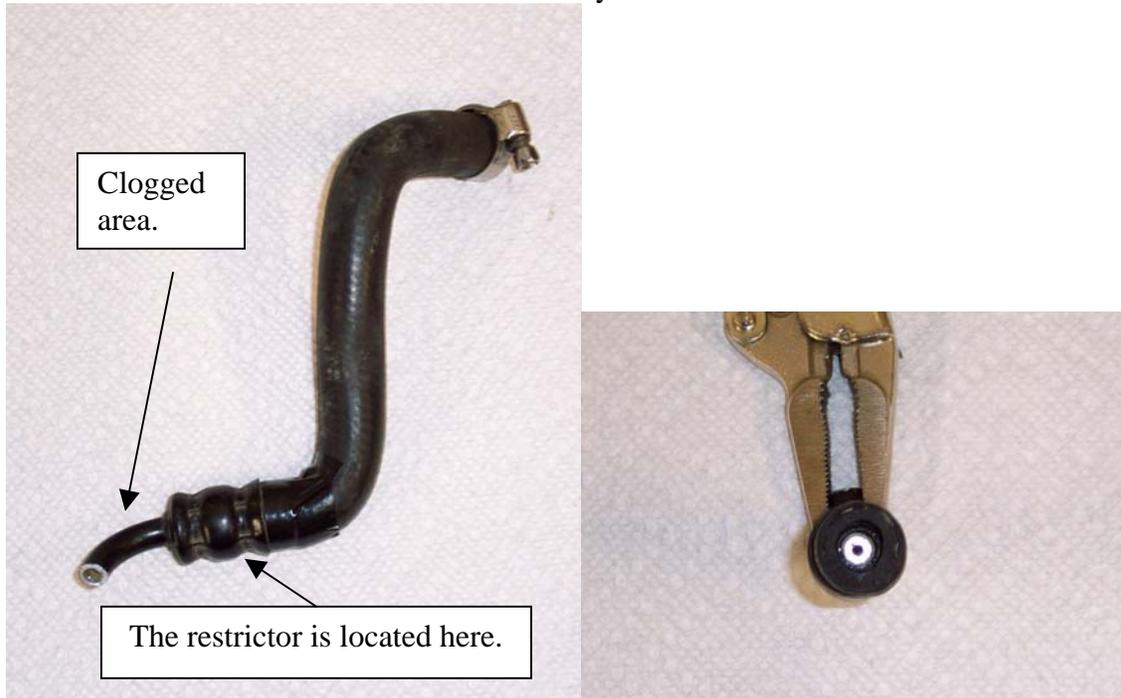


Diagram of the air bleed system. This engine has a throttle body coolant bypass line. Normally the hoses connect to the right and left of the plenum where the tubes are capped in the picture.

Test the flow of the air bleed system by applying air pressure at point A. Remove the hose from the surge tank and blow air into the hose. Verify that air flows to points B and C when the hoses at points B and C are disconnected. Point B is at the top of the radiator. Point C is the hose connection on the 90 degree fitting on the left side of the plenum.

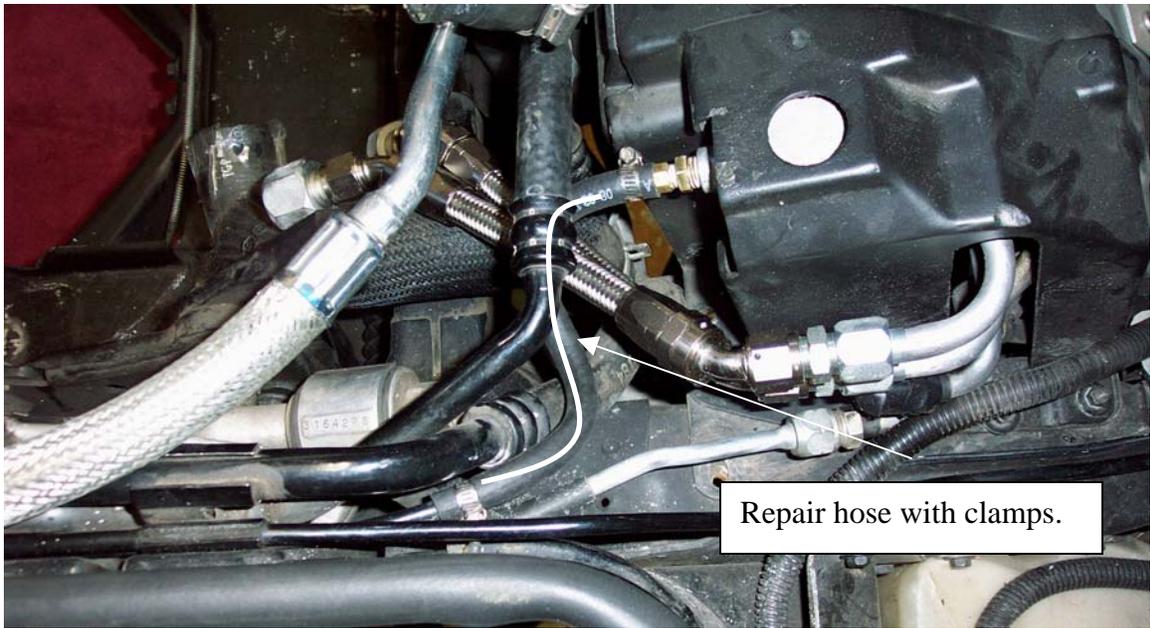
If there is no airflow, the problem could be a clogged air bleed restrictor. The restrictors are shown at locations D and E in the picture. The restrictor orifice is .080 inch at point D and .060 inch at point E. They can become clogged. The air bleed flow restrictors are not documented in the GM service manual.

The restrictor for the radiator line at location D is the most likely to clog. When it does it will be difficult to fill the radiator over halfway.



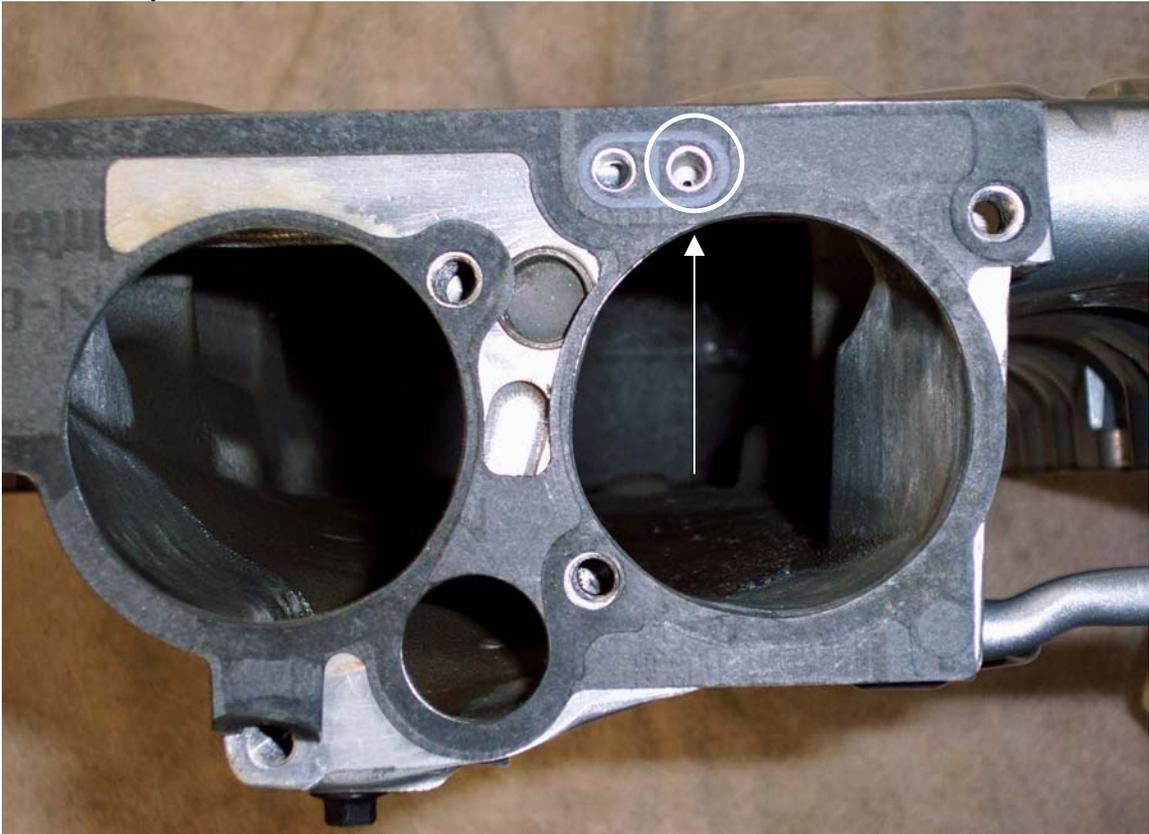
The radiator air bleed flow restrictor. Left, the hose after being cut from the tube. Right, the restrictor after cutting the hose. This hose would not flow with 90 psi of air pressure applied.

When a clog that can't be blown out occurs, I cut the line before the hose and repair it with a 5/16 inch ID hose. LT1 and LT4 engines also have a flow restrictor in this location. Those engines can also have the problem.



One way to repair a clogged radiator air bleed.

If the air bleed hose on the left side of the engine is blocked (location C in the picture), the air bleed restrictor on the plenum may be clogged. It is accessed by removing the throttle body.



The throttle body air bleed flow restrictor.

In our cooling system service experience we have had many situations involving coolant that was difficult to install in the engine. Having learned from our experience we always test the air bleed system for flow before we refill the engine coolant.

After establishing that the air bleed system is flowing, continue to be cautious. After the engine has been running for two minutes feel the temperature of the right and left water manifold tubes. They should be warming. Feel the camshaft cover. If the camshaft cover gets too hot to touch but the water manifold is barely warm or cold, there is no coolant flow from the water pump. Shut the engine down immediately. Running the engine for more than a few minutes without coolant flow will crush the head gaskets.