

## **Filling the LT5 With Coolant**

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Sometimes even a simple thing like refilling the engine with coolant can become a huge problem. I have found that about half of the time, there can be some difficulty refilling the engine if over three quarts of coolant are removed for service. This is a serious situation because the engine can become very hot although the temperature gauge shows that the engine is somewhat cool. This is because the coolant sensor cannot measure the overall temperature of the engine if coolant does not flow past the sensor.

The engine holds about 15 quarts of coolant. This includes the heater and the black surge tank. It does not include the overflow reservoir under the right headlamp. In general it is a good practice to collect and measure the coolant that is removed from the engine. This way the refilling can be monitored and one will know if there is a going to be difficulty before the engine is started. As the coolant is poured in, the air vent tube located just below the filler cap should bubble with air as the engine fills. Install the cap, start the engine, and within a few seconds remove the cap and add coolant until the surge tank is full. The air vent should be streaming coolant. A complete refill is about 14 quarts. The remaining quart is then added to the overflow reservoir and then the engine will draw in the final amount that it needs on the next cool-down cycle. If this happens, you should be thankful for having a lucky day.

If the engine accepts only 12 quarts or less, this is usually the first sign of a refilling problem. If the air vent tube does not bubble as the coolant is added, this is another sign that you are heading for trouble. Install the cap, start the engine, and within a few seconds remove the cap and add coolant until the surge tank is full. If the air vent tube is not steaming coolant when the engine is running, the system is air locked. This can be very stressful for the engine. At the same time, one can observe that the temperature gauge is not moving. It can also be observed that the left camshaft cover is becoming very hot, often over 125 degrees, too hot to touch, but the left water manifold tube going to the radiator is nearly cold. This is why the temperature gauge is reading low, there is no coolant flow. The engine block is building heat quickly, and there is no coolant flow. The engine should not be allowed to run for over three minutes with this condition present.

In this situation, it will often be found that the engine is filled to the top of the injector housings. This can be verified by removing a throttle body coolant hose and coolant will be found at the fitting. How can the engine be filled to the top, but two or more quarts of coolant are missing from the fill? The problem is that there is an air bubble in the engine. Where? The tip-off is the fact that coolant is not flowing from the vent tube. The problem is that the water pump is air locked. Then the pump cannot move the coolant.

In the past, I have used a procedure that I wrote about in the October '05 issue of the newsletter. I have found that it sometimes helps, but some engine still won't completely fill with my previous procedure.

I have found a new method that has never failed to fill an engine. The solution is simple; lift the right side of the car to allow the air to rise up to and flow out of the right side of the engine.



When the height of the right side of the car reaches the critical point, the air vent tube will begin to bubble and the engine will accept more coolant. Place the car back in the level position. Install the cap, start the engine, and within a few seconds remove the cap. You will be glad to see that the vent tube is streaming coolant. This means that the pump is circulating the coolant. Add coolant until the surge tank is full. Install the cap. Fill the overflow reservoir about three-quarters full. On the next cool down, the last quart will be drawn into the engine.