TOO COOL FOR SCHOOL

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The radiator in your Commodore is all that stands between nice, sweet cruising and a fried engine – we show you how to look after it

A radiator is a heat exchanger. It extracts the heat from the hot coolant that flows through it via the relatively cool air flowing over its external surfaces or airflow provided by the engine fan and/or thermo fan.

The coolant flows from the inlet to the outlet via many tubes mounted in a parallel arrangement. The fins conduct the heat from the tubes and transfer it to the air flowing through the radiator. The tubes sometimes have a type of fin inserted into them called a turbulator, which increases the turbulence of the fluid flowing through the tubes.

If the fluid flows very smoothly through the tubes, only the fluid actually touching the tubes would be cooled directly. The amount of heat transferred to the tubes from the fluid running through them depends on the difference in temperature between the tube and the fluid touching it.

So, if the fluid that is in contact with the tube cools down quickly, less heat will be transferred. By creating turbulence inside the tube, all of the fluid mixes together, keeping the temperature of the fluid touching the tubes up, so that more heat can be extracted and all of the fluid inside the tube is used effectively.

If the radiator or coolant is in poor condition, solids can build up and begin to clog the cooling tubes, meaning that the radiator cannot do its job properly – eventually leading to a blockage. This is why the factory recommends flushing your radiator every 50,000km or thereabouts. Earlier models may be flushed more often, and this month we bring you a DIY showing how to flush your radiator.

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1 STEP 1
The stuff you will need for the job includes a flat head and a Phillips head screwdriver, a pair of pliers, a hose with appropriate fittings and a bottle of coolant concentrate. You may also find a Gregory's service manual to be of help.

2 STEP 2
Firstly, disconnect the transmission cooler pipes (only applies to automatic cars). Plug the holes with some simple rubber stoppers to ensure that no debris makes its way into the cooling system.

3 STEP 3
Disconnect the overflow tube. Depending upon the type of clamp, you may need to use a screwdriver. This was a simple squeeze type, so pliers did the job.

4 STEP 4
Unscrew the fan shroud at the mountings above the radiator. You will not be able to remove it at this point, but it will allow it to be moved away from the radiator to facilitate removal.

5 STEP 5

Remove the front radiator shroud by levering the clips from their holes. They may break off, so be prepared with a few spares – they are cheap as chips and available at most auto stores.

6 STEP 6

Underneath, unbolt the panel that bolts to the radiator support. This allows the radiator to be drained without making an absolute mess of the engine bay – plus, it allows me to clean up a little!

7 STEP 7

Position a container under the lower hose to catch the coolant as it flows from the radiator. It is illegal to allow any form of chemical to run into the drain, as it pollutes the waterways. You can discard the old coolant at the local council collection point.

8 STEP 8

With the radiator drained, loosen the clamp around the top hose and remove it from the inlet on the top of the radiator.

9 STEP 9

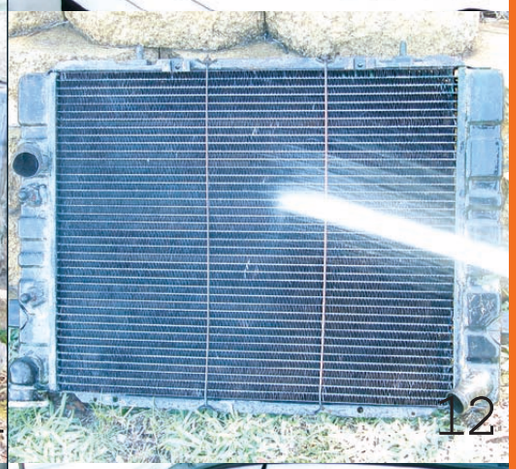
Next, unclip the radiator from its mountings using a pair of pliers on the clips on each side. The clips just pop out from the holes on each side of the bracket when squeezed with the pliers.

10 STEP 10

This leaves the radiator free to remove. It is a simple, lift-out proposition – just grab the radiator on each edge and lift it up and out of the engine bay. Be careful about excess coolant, as there will be some left in the core.

11 STEP 11

Here comes the flushing part. Flip the radiator upside down and rest it against a solid surface, where it is able to stand by itself. Insert the garden hose into the 'bottom' outlet, which is now at the top. Allow the water to flow until it is clean. This is called 'reverse flushing' the system. As you can see, mine was pretty dirty.



12 STEP 12

Rinse the actual core of the radiator as well, as years of road grime and junk will have accumulated between the fins, diminishing the ability of the radiator to cool. Do a good job here, and ensure that the core is clean. Be sure to pay attention to water restrictions in your area, and only do the job on grass. If in doubt, an air compressor will also do the job.

13 STEP 13

Reinstallation is a reverse of the removal process. Ensure that you fill the radiator with quality glycol concentrate and distilled water. Never mix the brands of coolant, as they may contain different additives that will cause havoc when mixed.

14 STEP 14

Here is what the final product should look like – just like the way it started, funnily enough! Provided that the core is in good condition, a flush should help alleviate any overheating problems. Just make sure you check the thermostat and hoses as well.