



Technical Report #22

Cleaning and maintenance of the cooling system

Informe Técnico

Purpose

Introduce proper maintenance of the cooling system in order to avoid damage caused by a wrong status of it.

Introduction

The engine cooling system is responsible for dissipating heat generated due to explosion of combustions to the outside.

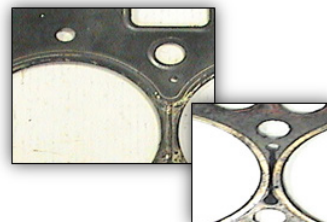
In air cooling systems there is no liquid element, but the movement itself of the vehicle generates an air stream which is passed through vanes arranged in the cylinder head and/or block to help reduce engine temperature by the passage of air. This system is not common in current vehicles being unsettled and inadequate in many applications.

In liquid cooling systems, the most used in the automotive industry, the air continues to play an important role but another element comes into play, the coolant. This traverses a closed and sealed encircled, driven by a fan pump which is driven by rotation of the engine itself, runs along the internal block and cylinder head where there is an exchange of thermal gradients, so the liquid acquire part of that heat, and dropped through the hoses to the radiator which, thanks to its design and the air passing through it, there is another heat exchanger and the refrigerant lowers its temperature before returning to the inside of the engine again. The air to the radiator is generated by the movement of the vehicle itself or a fan for the time when the flow is not enough.

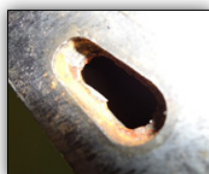
The circuit requires maintenance; the coolant worsens its anti-corrosion characteristics over time, losing efficiency, getting dirtier with solid and rusting remains at risk of narrow cooling water holes that could become clogged, which leads to cooling problems which the engine may become overheated damaging the head gasket and other engine parts. Furthermore, problems are common in other elements together and caused by corrosion.



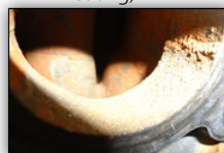
Corrosion



Burned head gasket (overheating)



Narrowing of holes



Oxidation

Recomendations

The coolant/antifreeze has anticorrosion properties, solidifies at temperatures lower than water and the boiling point is higher, so it is not advisable to fill the refrigerant circuit with water. Replacement intervals of the coolant liquid is specified by each the manufacturer.

- *To emptying the circuit, open the expansion bottle with the engine off and cold, loosen the radiator drain plug, if the vehicle does not have it, can be emptied by releasing the hose to the radiator at the bottom. Use a tray for collecting the liquid.*
- *If the fluid is very dirty, put water in the bottle without closing the circuit to drag dirt, or use a specific cleaner following the instructions of it and making sure to remove product residue that may remain in the circuit at the end.*
- *Close the circuit and fill with coolant/antifreeze with the characteristics specified by the manufacturer until the level is between the MAX-MIN of the bottle.*
- *Bleed the circuit by opening the bleeders. These are often found in upper hoses or in thermostat housing, always in the upper part of the engine as the air ascends to be displaced by the liquid in the circuit. Let them open until the liquid begins to flow without bubbles constantly monitoring the level in the bottle, avoiding it to be below the minimum in any case.*
- *Close the bleeders. Reviewing the level is correct, close the bottle and put the engine running until they fan start working. Note that the control of temperature does not exceed 90 ° position.*
- *Turn off the engine. Check level again (wait for it to cool and then open cap slowly to relieve pressure, risk of burns) and if necessary fill with coolant to the marks.*

