Fuel sensitive driving

A motor in a car is there to transform fuel into movement, into electricity for the electronic devices and for the lights, and when needed into heat or cooling for the passengers.

At the end of the day, the car is most of the time at the same place than the previous morning, not moving, neither heated nor cooled, with the same power in the battery. Used fuel was completely transformed in heat.

Searching for ways to save fuel means to check where heat is produced and to try to reduce that effect.

The first heat production spot is the internal combustion engine. Efficiency is around 1/3, which means that 2/3 of the fuel is directly transformed into heat. An easy way to reduce that waste is to stop the motor each time that the car is not moving, this is always more an automatic feature on new cars. The other easy way to reduce heat production is to limit voluntarily the turns per minute of the motor, situations requiring more than 3000 turn per minutes are really unusual.
When buying a new car, a small motor will heat less than a big one, and an electrical motor almost doesn't heat. Electrical vehicles use typically 20 kWh for 100 km, which is similar to 2 liters of fuel, which is about 1/3 similar vehicle with an internal combustion engine uses, 1/3 being the efficiency of the ICE motor. If the electricity is produced with any kind of solid or liquid fuel, the heat production is displaced from the vehicle to the power plan.

The other major heat producers are the air friction and the tires. Tires will be the major player at low speed, and air friction at high speed.

The heat produced by air friction is real even if it is directly dissipated. Since friction is directly related to the speed of the vehicle, an easy solution is to drive slower. It is quite efficient to remove anything that could reduce the aero dynamics of the car (roof rack...).

Regarding the tires, the right pressure will avoid an excessive fuel consumption and will increase safety. A higher load increase tires' deformation, so a higher pressure is defined for loaded cars. To help the buyer, the European Union defined tire efficiency classes, from A to G. A car with A tires uses about 9% fuel less than one with G tires. Of course, energy efficiency is not the only thing to check when buying tires.

Breaks are the next main heat producers. Breaking means somehow to transform speed into heat. Engine breaking avoids the heating of the breaks, but the heat transformation is still happening. The main way to save energy is to anticipate speed reduction by removing the foot from the accelerator. Electrical vehicle are able to reload the batteries when this happens. An loaded car will produce more heat when breaking, so it makes sense to remove loads that are not required.

On electrical vehicles, heating is also a big consumer, not on ICE cars because the motor produces heat anyway.

The other heat producers are either smal players (the radio) or required for the security (electronics). An important electricity consumption (computers, car refrigerator...) as well as air conditioning also have a big impact, but usually they are only used when needed.

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