

Question

Why do some cars blow out exhaust clouds in winter and others don't?

Answer

The cars that blow out exhaust clouds have been started recently and the engine has not yet reached its operating temperature.

Exhaust cloud Exhaust clouds mainly consist of condensed water vapor. They are white colored and have nothing in common with those black clouds from the days when there were neither catalyzers nor soot filters.

Cold start Right after starting the engine the exhaust pipe is still cold and consequently the emitted gases are being cooled. This leads to condensation and visible clouds.

Operating temperature After some minutes the exhaust pipe has arrived at its working temperature and hot exhaust gas is being blown out. It takes more time for the gas to cool down to the condensation temperature. During this delay the exhaust gases are diluted by the ambient air. As a consequence there is no more condensation and no more clouds.

Wet and Cold If the temperature of the ambient air is only a little above the dew point temperature, in other words it is not far away from the critical temperature where we get fog, diluted exhaust gases condensate as well and in this case all vehicles blow out exhaust clouds.