UNDERSTANDING SHORT AND LONG TERM FUEL TRIMS

Short Term Fuel Trim (STFT) sometimes called Multiplicative fuel trim operates at part load (off idle) conditions. When the engine operates at normal or higher load or at higher engine speeds, larger volumes of fuel and air are needed.

In order to maintain a Lambda = 1 in these conditions, the ECU monitors the O2 sensor and calculated load and compares the values against the optimal value for the fuel injection pulse width stored in the drive map plus the adaptation value of the Long Term Fuel Trim (LTFT). If the resulting total fuel injection pulse width value does not yield a Lambda = 1 at the O2 sensor for the measured air mass, the computer increases or decreases the total pulse width by a percentage (%).

This percentages is computed by the engineers at the factory from extensive dynamometer testing and are stored in a in the drive maps.

When the STFT reaches the limit of its adjustment it will cause corresponding decrease or increase to the Long Term Fuel Trim.

As an example for a 1997 6 cyl VW VR6 engine if the correction to the base value exceeds +25% or -25% it increases the LTFT up or down by 0.01ms. If it makes corrections to the LTFT for longer than 10 seconds a DTC is set for rich or lean stop for STFT.