

Fuel Quantity Comparative Measurements

These are supplementary notes to comparative measurements of fuel flow rates at the injector pipe ports of a KE-Jetronic FD (fuel distributor) according to document 07.3-160, as requested by forum member liviu165.

In that document there is an idle speed flow rate of 4 cm³/min, a part load flow rate of 30 cm³/min and a full load flow rate of 100 cm³/min listed. These flow rates do not really refer to specific engine speeds or specific positions of the AFM (air flow meter) though. For these measurements you just deflect & lock the AFM to the positions which lead to these flow rates. Additionally to these positions you can also do comparative measurements at any other AFM position, for instance at a position that leads to a flow rate of 70 cm³/min. These measurements are just what they are called in the document ... "comparative measurements". They show how (un)equal the flow rates are at the FD's injector pipe ports in relation to each other with the AFM deflected to three different positions. They do not show if the FD is quantitatively correctly calibrated !

Before you do these measurements, make sure that the fuel pressures (system pressure & lower chamber pressure) and the fuel flow rate at the outlet port of the fuel pressure regulator are within specification.

This is how the measurements described in that document are meant to be done:

- Remove the FPR (fuel pump relay), respectively the MAS (Motoragregatesteuergerät), which ever the car is equipped with, in order to let the fuel pumps run in the next steps by bridging socket terminals 7 & 8 (in case of FPR), respectively terminals 1 & 2 (in case of MAS).
- Remove all injector pipes from the FD and connect the flow meter to the FD's injector pipe ports. If you don't have a flow meter, you can also use self-made test pipes/hoses with stop valves, via which you let the fuel flow into measuring glasses/cylinders. Do not do measurements on one injector pipe port while the other injector pipes are connected to the other ports, because that would extremely flood the engine.
- Deflect & lock the AFM plate to the position where you measure about 4 cm³/min at one injector pipe port with the fuel pumps running. Then measure the flow rates at the other ports one at a time.
- Then deflect & lock the AFM plate to the position where you measure about 30 cm³/min at one port with the fuel pumps running. Then measure the flow rates at the other ports one at a time.
- Then deflect & lock the AFM plate to the position where you measure about 100 cm³/min at one port with the fuel pumps running. Then measure the flow rates at the other ports one at a time.

Make sure that the battery provides sufficient power to the fuel pumps during the complete test.

The flow rates among all ports should not differ by more than 10% at any of the measurements. The smaller the difference the better.

Flow rate adjustments on individual FD ports are done via the respective lower chamber spring preload adjustment screws that are located behind plug screws in the bottom of the FD. CW turns of the spring preload adjustment screws reduce the flow rate on the respective injector pipe port and CCW turns increase it. ... **However**, mind that, since these measurements do not show whether the FD is quantitatively correctly calibrated, they do **not** show which port's flow rate(s), respectively which lower chamber spring preload adjustment screw(s), should be adjusted in case of too big flow rate differences between the ports. They do not even show whether **any** port's flow rate is correctly adjusted.

Flow rate differences bigger than 10% between injector pipe ports, however, show that there is either an FD problem that calls for FD cleaning/refurbishment/replacement or that the lower chamber spring preload adjustment screws have been fiddled around with. ... For thorough & proper maintenance, it is generally better to fix problems instead of masking them via KE-Jetronic adjustment screw(s).

Deflecting & locking the AFM in any position can be done, for instance, with a long screw and a threaded hole (best M5) in the metal beam on top of the AFM funnel. But make sure that no metal chips fall into the intake system. You better remove the beam from the AFM to drill the threaded hole into it.

H.D.