

Variable camshaft timing control (VANOS)

With the 1999 model-year measures, the M62TU engine is fitted with a controlled VANOS system on the inlet side. The VANOS system serves the purpose of increasing torque in the lower and medium engine speed ranges. Reduced valve overlap results in lower residual-gas quantities during idling. Nitrous oxide components are reduced by internal exhaust-gas recirculation in the partial load range. This achieves faster heating of the catalytic converters, lower untreated emissions after cold starting and reduced fuel consumption.

The total adjustment range is 40 degrees crankshaft angle and 20 degrees camshaft angle. This range results in spread of the inlet camshaft from 84 degrees crankshaft angle to 124 degrees crankshaft angle.

Spread of the exhaust camshaft is constantly -97 degrees crankshaft angle for the M62B35 and -104 degrees crankshaft angle for the M62B44.

Design and function

The VANOS system of the M62TU consists of the following components for each cylinder bank:

- Inlet camshaft
- VANOS gear unit with sprockets
- Oil distributor intermediate flange
- Solenoid valve
- Non-return valve
- Pulse-generator gear for camshaft sensor

The required position of the inlet camshaft is calculated from the engine speed, the load signal and further measured engine variables. The VANOS adjustment unit is steplessly activated accordingly by the DME control unit. For this purpose, the VANOS system is pressurized directly by engine oil pressure. A solenoid valve clocked by the DME control unit releases the oil channels for advance or retard adjustment of the inlet camshaft. The inlet camshaft is infinitely adjustable within its maximum adjustment range. As soon as the relevant optimum camshaft position is reached, the solenoid valves maintain a constant oil volume in the adjustment cylinder on both sides of the chamber. In this way, the camshaft remains in the corresponding position.

When the engine is started, the inlet camshaft is in the "retard" limit position.

Diagnosis

The VANOS system features complete diagnostic capabilities. A corresponding fault code is entered in the DME fault memory if a fault occurs during engine operation. An engine limp-home program is nevertheless still possible if the VANOS system can no longer be activated in the event of damage.

For the purpose of checking operation and troubleshooting, the diagnostic program offers the option of a VANOS test procedure initiated by the Tester.