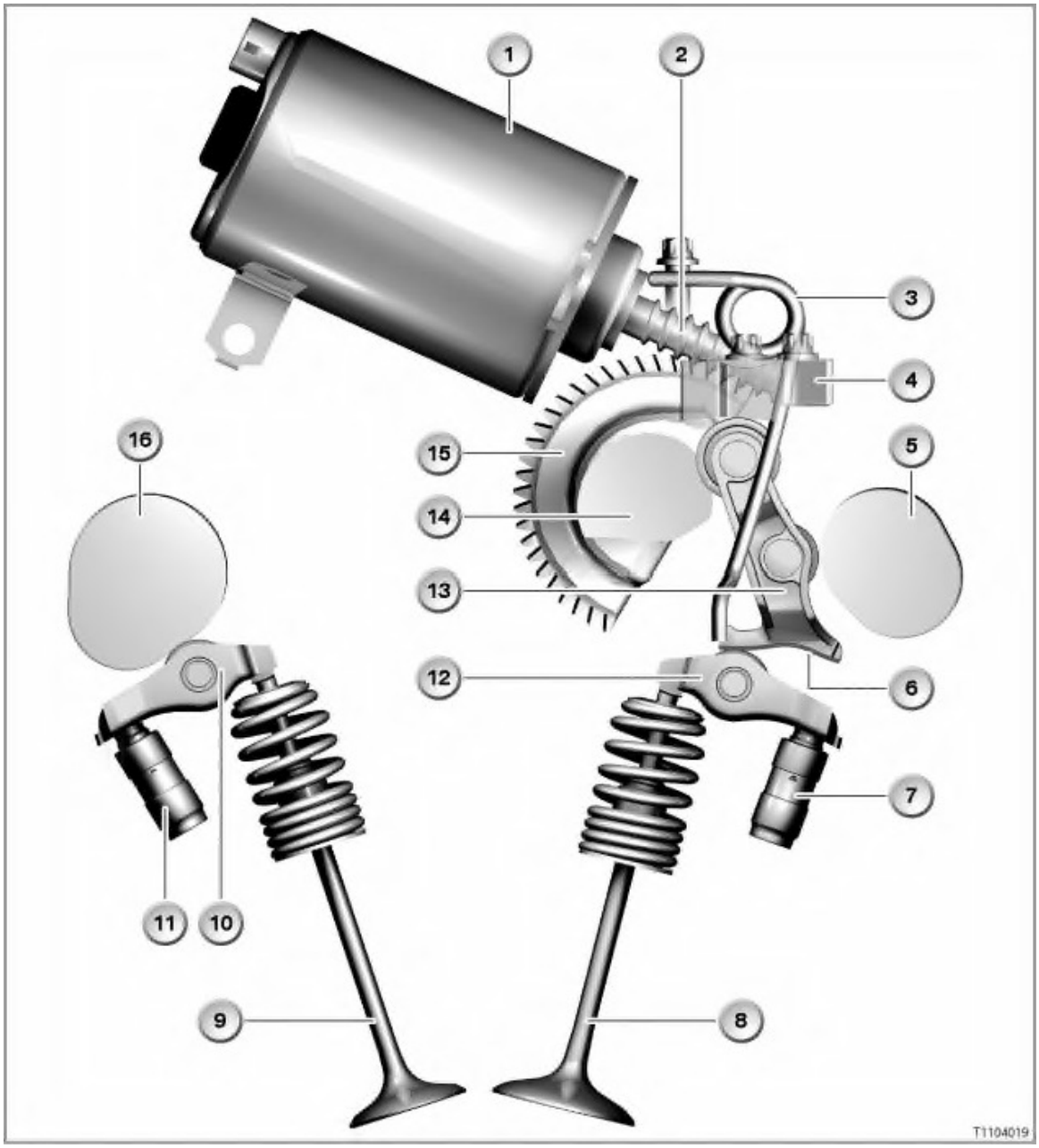
The Valvetronic consists of fully variable control of the valve lift combined with the variable camshaft control unit (VANOS).

As of the N52 engine, the 6-cylinder petrol engine is equipped with Valvetronic. The advantages this technology are:

- Enhancement of engine dynamics
- Improvement in the emissions values

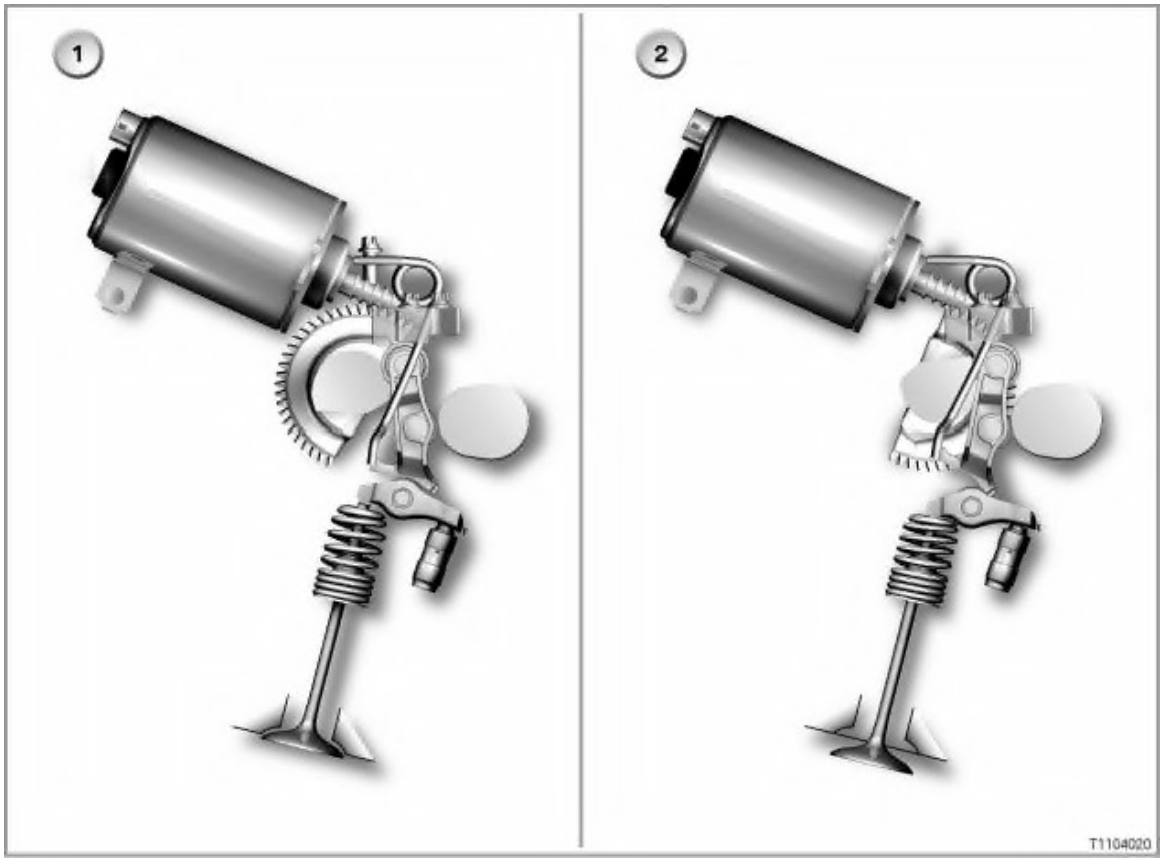
Construction



Item	Description	Item	Description
1	Electric servomotor	2	Worm shaft
3	Return spring	4	Gate block
5	Inlet camshaft	6	Ramp
7	Hydraulic valve clearance adjustment for inlet valve	8	Inlet valve
9	Outlet valve	10	Roller cam follower, exhaust valve

11	Hydraulic valve clearance adjustment for exhaust valve	12	Roller cam follower, inlet valve
13	Intermediate lever	14	Eccentric shaft
15	Worm wheel	16	Exhaust camshaft

The fully variable valve timing



Item	Description	Item	Description
1	Setting for minimum valve lift	2	Setting for maximum valve lift

The fully variable valve lift timing is implemented with the following components:

- Electric servomotor
- Eccentric shaft
- Intermediate lever
- Return spring
- Roller cam follower

The actuator motor is fitted above the camshafts in the cylinder head. The actuator motor adjusts the eccentric shaft. The worm shaft of the electric motor engages in the work gear attached to the eccentric shaft. After adjustment, the eccentric shaft does not have to be locked in any special way, as the worm gear has an adequate self-regulation system. The eccentric shaft adjusts the valve lift on the inlet side. The intermediate lever changes the transmission coefficient between the camshaft and roller cam follower. In the full load position, the valve lift and opening duration are at the maximum. In the idle position, the valve lift and opening duration are at the minimum. The roller cam followers and associated intermediate levers are split into 4 groups. To this end, an ID code is stamped in the components. Each pair always has the same class. The assignment of the roller cam followers and intermediate levers ensures that the cylinders are evenly filled, even with minimum lift.

Advance

In the lower range of motion of the valves, the possibility for harmonisation by means of so-called advance is supported.
The inlet valves of a cylinder are opened synchronously up to a lift of 0.2 mm. As of this lift, valve 1 begins to advance. Valve 2 opens with a slight delay a little later. Valve 2 catches up with valve 1 with a stroke of approx. 6 mm. From then on, they open synchronously. These response characteristics favour the gas mixture flowing into the cylinders. The cross section of the inlet valve openings has been kept small to achieve a significantly higher flow rate with the intake volume remaining the same. This flow rate is used for better mixing of the intake mixture.