Balance shafts

In every reciprocating engine, inertial forces and moments of inertia develop due to the oscillating motion of the pistons and connecting rods and the transmission behavior of the crankshaft drive. In some engine configurations, such as the V12 with 60 degrees of crankshaft rotation, these forces balance one another out and thus have no effect on normal driving. In an inline four-cylinder engine, however, free second-order forces of inertia detract from engine smoothness.

In the Audi four-cylinder TDI and the larger four-cylinder gasoline engines, these free second-order inertial forces are eliminated by two balance shafts. Located in the crankcase, they carry counterweights and counter-rotate at twice the speed of the crankshaft. At work in each Audi V6 engine with its 90-degree cylinder angle is a single balance shaft, arranged inside the V.

Status: 2011

Source: www.audi-technology-portal.com
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