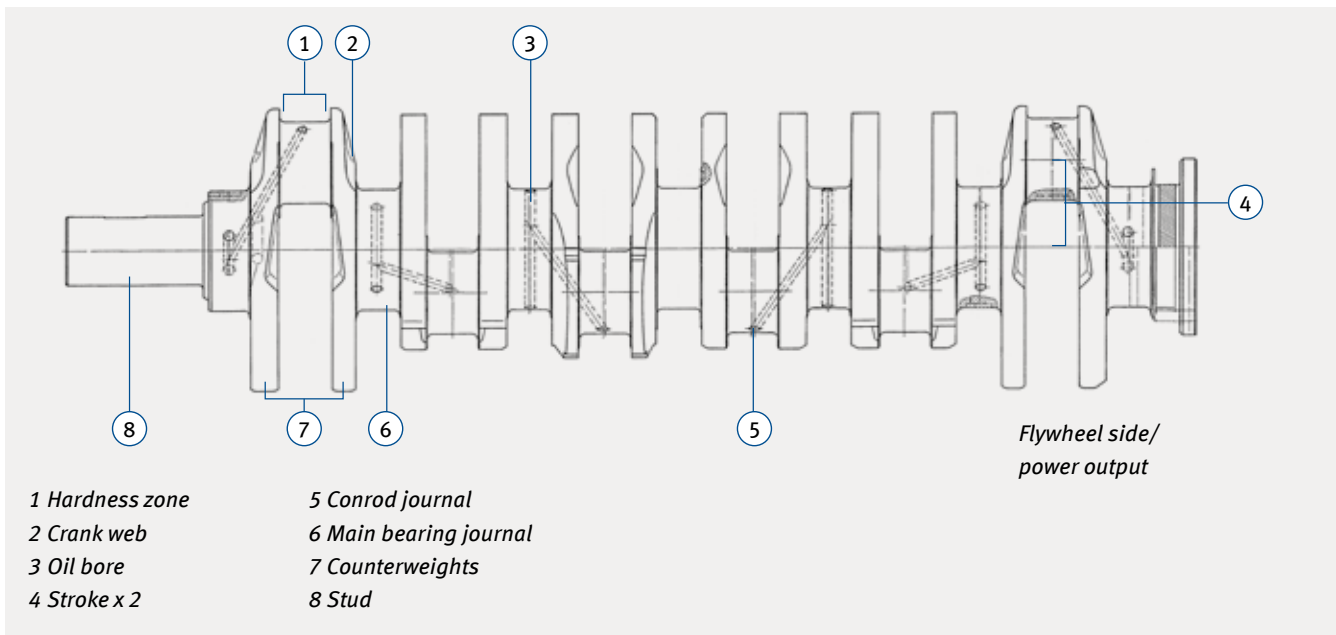




Damage to crankshafts ...

... Causes and their prevention



Preparations for an extended crankshaft service life begin at installation

- Correctly remedy any pre-existing damage on the main bearing centre line and on the connecting rods.
- Insert the crankcase bearing shells and the bearing cap. Always bear in mind the continuity and cleanliness of the oil bores as well as the diameters of the main bearing and conrod journals.
- Thoroughly clean the oil ducts in the crankcase using compressed air.
- Thoroughly oil the sliding surfaces of the bearing shells with approved oil.
- Fit the main bearing caps. Always note the numbering of the main bearing caps. Slightly oil the main bearing screws and tighten to the prescribed tightening torques.
- Check that the crankshaft runs free. Check the axial play of the crankshaft and adjust if necessary.





The cause of broken crankshafts is rarely material fatigue brought about by extended use.

Far more frequently, broken crankshafts can be attributed to:

- Mechanical overload of the crankshaft through abnormal combustion, water hammers, etc.
- Sudden jamming of the engine due to a faulty gearbox, loose counterweights, etc.
- Excessive rotary oscillation, e.g. faulty vibration dampers, faulty flywheels or couplings.
- Material weakening due to previous bearing damage or annealed bearing journals, etc.
- Unreliable modification work to the crankshaft bearing.
- Mechanical damage to the shaft before installation.



Installation faults and wear are the most common causes of damage to the crankshaft and crankshaft bearings

- Softening of the bearing journals due to previous bearing damage or improper modification work, e.g. excessive regrinding.
- Use of incorrect bearing shells, e.g. normal three-component bearings instead of sputter bearings, incorrect or missing oil bores.
- The prescribed bearing clearance was not adhered to. Causes: worn or warped crankcase, oversized or undersized bearing journals or errors in geometry such as conical or spherical bearing journals.
- Lubricating oil deficiency on commissioning as the oil system was not filled with oil and compressed beforehand.
- Following bearing damage, swarf was left in the engine-oil circuit.
- The oil cooler, engine oil and oil filter were not replaced.
- The bore diameters of the crankshaft bearings in the crankcase were not checked or repaired following pre-existing damage.
- Main bearing/conrod bearing cap were mixed up or installed twisted.
- Incorrect tightening torques and/or old bearing cap screws were used.
- The manufacturer's specifications were not followed on engine commissioning.

Tips and tricks for extending the service life of your crankshaft

- Adequate oil quantity in the engine (in accordance with manufacturer's specifications).
- Correct oil specification, do not use contaminated or old oil.
- Avoid contaminating the engine oil with coolant or fuel.
- Prevent faults in the oil circuit that could lead to oil-pressure problems (e.g. faulty oil pump, faulty oil pressure relief valve, faulty injector nozzles or oil filter housing, blocked lines and ducts, etc.).
- Prevent high engine-oil temperatures as these may cause the lubricating film to rupture.

