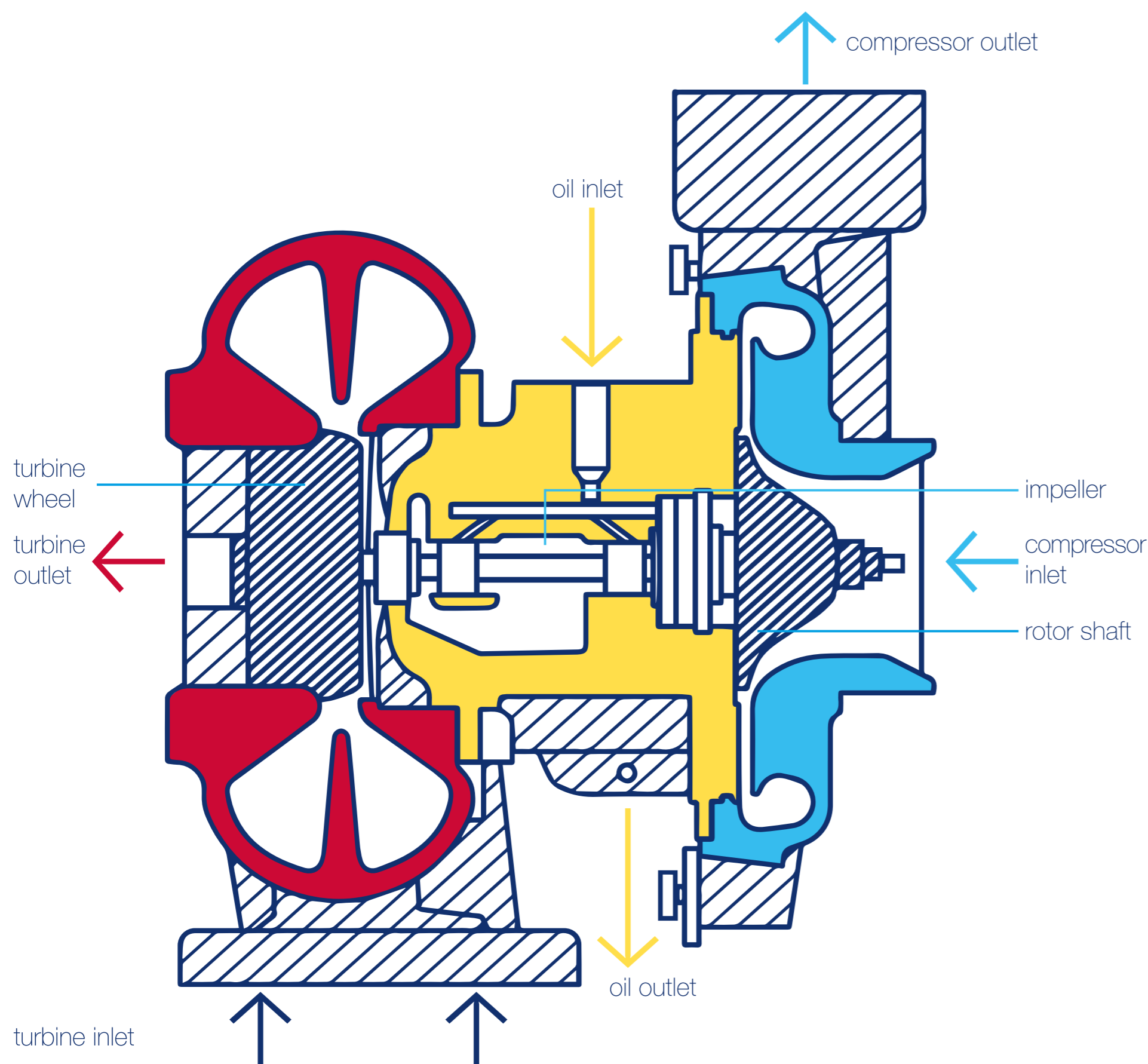


# The MAHLE turbo check



## Before installation

- Diagnose and eliminate the cause of failure of the old turbocharger (possibly defects in the engine and engine area)
- Compare the turbocharger model number with the engine specifications and/or the model number of the turbocharger manufacturer
- Make sure the engine ventilation is working properly
- Ensure the oil supply and that the oil can flow back freely from the turbocharger to the crankcase
- Intake, charge air, and exhaust gas areas:
  - Check in working order
  - Eliminate any contamination due to foreign objects or liquids
- Ensure the absolute cleanliness and integrity of the air lines connected to the turbocharger
- For liquid-cooled turbochargers: ensure ventilation and the coolant supply
- Check whether the housing needs to be repositioned
- Observe assembly torques as per the engine and/or vehicle manufacturer specifications
- Make sure that the flange and thread are free of damage and wear
- Only use brand-new sealing elements that are an exact fit
- Replace the engine oil and oil filters as per the engine or vehicle manufacturer specifications

## During installation

- Before mounting the oil feed line: fill the turbocharger with fresh engine oil through the oil feeder hole, while slightly turning the rotor by hand
- Change the boost pressure if necessary
- Ensure proper handling

## After installation

- After starting the engine: idle for approx. 120 seconds
- While the engine is idling: check all connections (air, exhaust gas, water, and oil) are properly secured and leaktight, possibly use soapy water to test for gastightness
- When the oil pressure builds up, rev and run the engine
- After 20 operating hours or 1,000 km: check that all of the relevant connections are properly secured and leaktight

## Diagnosis Matrix

This matrix enables you to quickly localise the root causes of damage to or malfunction of a turbocharger.

**Important:** Do not disassemble the old turbocharger until the root cause for the damage or malfunction is eliminated. This is the only way to ensure the long-lasting and flawless operation of the new charger.

Possible cause	Fault type								
	Air compressor/turbine wheel defective	Lack of power/boost pressure too low	Boost pressure too high	Black smoke	Blue smoke	Turbocharger makes noises	High oil consumption	Oil leak on compressor	Oil leak on turbine
Air-filter system soiled		■		■	■		■	■	
Intake/pressure line deformed or leaky		■		■		■			
Exhaust-gas system has excessively high flow resistance/leaks in the turbine		■		■	■	■	■	■	
Oil supply and drain lines blocked and/or deformed					■		■	■	■
Crankcase breather blocked and/or deformed					■		■	■	■
Charger housing of turbocharger coked or silted up					■		■	■	■
Fuel delivery system/fuel injection system defective or incorrectly adjusted		■	■	■					
Valve guide, piston rings, engine, or cylinder liners worn/increased blow-by		■		■	■		■	■	■
Compressor or charge-air cooler soiled		■		■	■	■	■	■	
Wastegate/valve fails to close		■		■					
Wastegate/valve fails to open			■						
Control line to regulating flap/valve defective		■	■						
Piston ring seal defective					■		■	■	■
Turbocharger bearing damage		■	■	■	■	■	■	■	■
Foreign body damage to compressor and turbine		■	■	■			■		
Exhaust gas leak between turbine outlet and exhaust pipe							■		
Engine air plenum chamber cracked, missing/loose seal		■		■			■		
Turbine housing/flap damaged		■	■	■		■			
Lack of oil supply to turbocharger		■	■	■		■			



### Important information for workshops

Turbochargers must only be installed by trained technicians. Improper installation, use, operation, or modification of a turbocharger may cause damage to the turbocharger or engine. Observe the manufacturer specifications and the installation and commissioning instructions. Liability for material defects is excluded if a turbocharger that does not comply with the engine specification is installed or if the installation or assembly instructions are not observed. Obvious defects must be reported immediately.

# MAHLE