



Turbocharger damage in PSA motors

1.6 HDi (9HX) and 1.6 HDi (9HY/9HZ)

An inadequate supply of oil often damages the turbocharger in 1.6 HDi-motors. This is caused by a high level of soiling to the engine lubricating system, i.e. when soot deposits and metal abrasion are carried there.

Complaint

- suboptimal performance
- begins to smoke heavily
- turbocharger noisier than usual when in operation

Damage symptoms and causes

- **Rotor shaft is jammed or blocked.**

Cause: Inadequate oil supply due to the shaft bearing obstructing the oil system (ill. 3).

- **Shaft nut loose or removed on the compressor side.**

Cause: Delays, i.e., blocked rotor shaft.

Result: Shaft nut leaves impact marks in the funnel of the compressor casing or on the compressor wheel.

Caution: To avoid follow-on damage, make very sure that the shaft nut is still there! Inspect the entire intake system for foreign particles.

- **Turbine casing and compressor wheel are damaged symmetrically (ill.4).**

Cause: Greatly increased level of bearing clearance leads to friction on the casing of both the compressor impeller and the turbine wheel. High level of wear & tear to the bearing components from impure lubricating oil. In extreme cases, the maximum level of admissible bearing clearance may be exceeded.

Diagnostics and recommendations

Before renewing the turbocharger, find out why it has malfunctioned.

1. Testing oil pressure on the turbocharger's supply pipes.

- Check oil level.
- Remove the hollow screw from the oil pressure pipe.
- Check the strainer, and clean or replace as necessary.
- Mount adapter for checking oil pressure.

Measure the oil pressure for at least 10 minutes at approx. 2,000 revs per minute. Average system pressure: at least 2 bar.



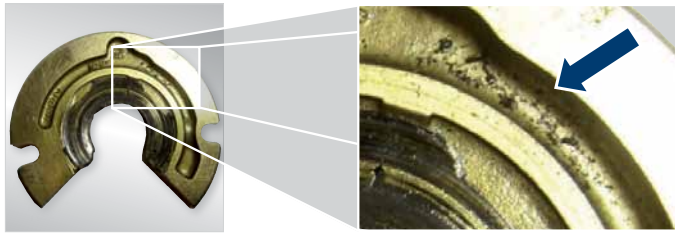
2. Checking for sludge and clots of oil.

- Disassemble the valve cover and oil pan.
- Inspect the valve train for major oil sedimentation and clean as required.
- Check the oil pan for heavy soiling. Clean or replace as necessary.
- Make sure the intake screen and pump suction tube of the oil pump are cleaned or replaced.
- We recommend flushing the oil circuit.

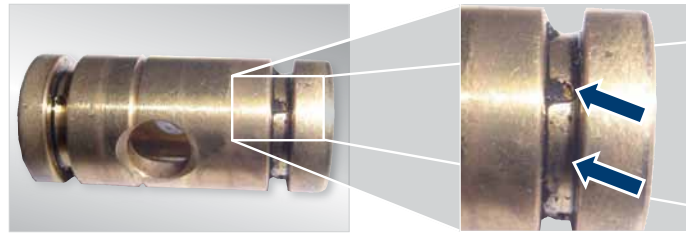
3. Checking for soiling in the intake system and air charging system.

- Remove the intake hose from the compressor opening.
- Dark, sooty sediments around the compressor are a sign that the fresh air intake system and the air charging system are probably heavily soiled by sooty deposits as a result of the crankcase ventilation construction.

Manufacturer	Model	Motor	Motor codes
Ford	Focus II (DA_, DAW_, C-MAX), Fiesta V/ Fusion (JH_,JD_JU) Focus II (DA_, DAW_, C-MAX)	1.6 Duratorq-TDCi (66kW)	HHDA, HHDB, HHJA, HHJB
		1.6 Duratorq-TDCi (80kW)	G8DA, G8DB
Citroën	C4 (LA_,LC), Xsara Picasso (N68), C3 (FC_), Citroën Berlingo (MF) C3 (FC_), C4 (LA_, LC_, UA_, DU_), C5 (RC_, RE_)	1.6 HDi (66kW)	9HX (DV6ATED4)
		1.6 HDi (80kW)	9 HY/HZ (DV6TED4)
Peugeot	207 (WA_, WC_), 307 (3A7C, 3E), Partner (5, 5F) 206 (2D, 2A/C, 2E/K), 207 (WA_, WC_, WD_), 307 (3A/C,3E/H)	1.6 HDi (66kW)	9HX (DV6ATED4)
		1.6 HDi (80kW)	9 HY/HZ (DV6TED4)
Volvo	S40 (MS), V50 (MW), C30	1.6 D (80kW)	D4164T
BMW / Mini	Mini Cooper D (R56), Mini Clubmann (R55)	1.6 D (80kW)	9HZ (DV6TED4)
Mazda	Mazda 3 (BK12/14)	1.6 DI Turbo (80kW)	Y 601



ill. 1: Oil deposits and dirt deposits on the axial bearing



ill. 2: Soot and dirt deposits on the radial bearing

- Inspect intake manifold just beyond the mouth area of the crankcase ventilation and clean if necessary.
- Disassemble the charge-air cooler, empty out oil, wash out thoroughly.

Repairing the damage

1. Check the dipstick construction:

- Black, plastic dipsticks with yellow handles: must be replaced.
- Current construction: White composite with orange handle (ref. No. 1174E6*)

Carry out the following additional inspections and repairs for vehicles with mileage exceeding 60,000 km:

2. Clean oil cooler/ oil filter unit.

Dismount filter unit, empty and discard filter inlay. Disassemble oil cooler. Clean thoroughly with brake cleaner and compressed air. Remount entire group of components with new filter cartridge. Renew oil return flow lines and all seals as necessary.

3. Clean vacuum pump on braking system.

Dismount and disassemble pump. Clean thoroughly with brake cleaner and compressed air. Remount pump. Replace all seals as necessary.

4. Check the outlet line on the turbocharger

Date of manufacture 05/2006 or earlier: crack formation possible. In such cases, replace outlet line.

5. Check intake line and outlet line of air filter.

Check components for restricted air pas-

sage and soiling. Clean thoroughly or replace as necessary.

Fitting a new turbocharger

Do not replace turbocharger until all checks and repairs listed above have been carried out. Oil flow lines and return lines and connecting elements must be replaced.

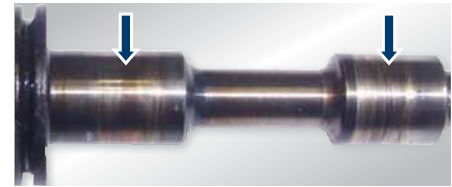
Please ensure all the manufacturer's fitting instructions are followed when replacing the turbocharger.

Flow measurement:

- Mount all air hoses.
- Affix the oil flow line to the turbocharger. Instead of a return line, fix a tube to the turbocharger's return flange, and lead the other end of this tube into an oil collector.
- Fill the motor with motor oil. Oil should not fall below the minimum level during the measuring process.
- Run the motor for 60 seconds in neutral.
- Measure the volume of oil in the oil collecting pan:
- Amount > 0.3 l oil: oil flow is alright.
- **Repeat this test at least 2 or 3 times!**
- Then remove the measuring tube and replace with oil return line.

Carry out extensive test drive.

Towards the end, drive briefly in full-load conditions. Car manufacturers recommend replacing motor oil and the oil filter cartridge.



ill. 3: Turbocharger shaft damaged by insufficient oil



ill. 4: Casing of compressor wheel (left) and turbine wheel (right) damaged symmetrically as a result of friction on the casings



Further information (see www.ms-motor-service.de)

- Fitting instructions for turbochargers / Diagnostic tool
- Pierburg Service Information SI0089: see turbocharger surroundings on our homepage at www.ms-motor-service.de/turbolader

Subject to alterations. Pictures may differ. Classification and spare parts, see most recent catalogue, TecDoc-CD or systems based on TecDoc-data.
*) The reference numbers are for comparison purposes only and may not appear on invoices for customers.