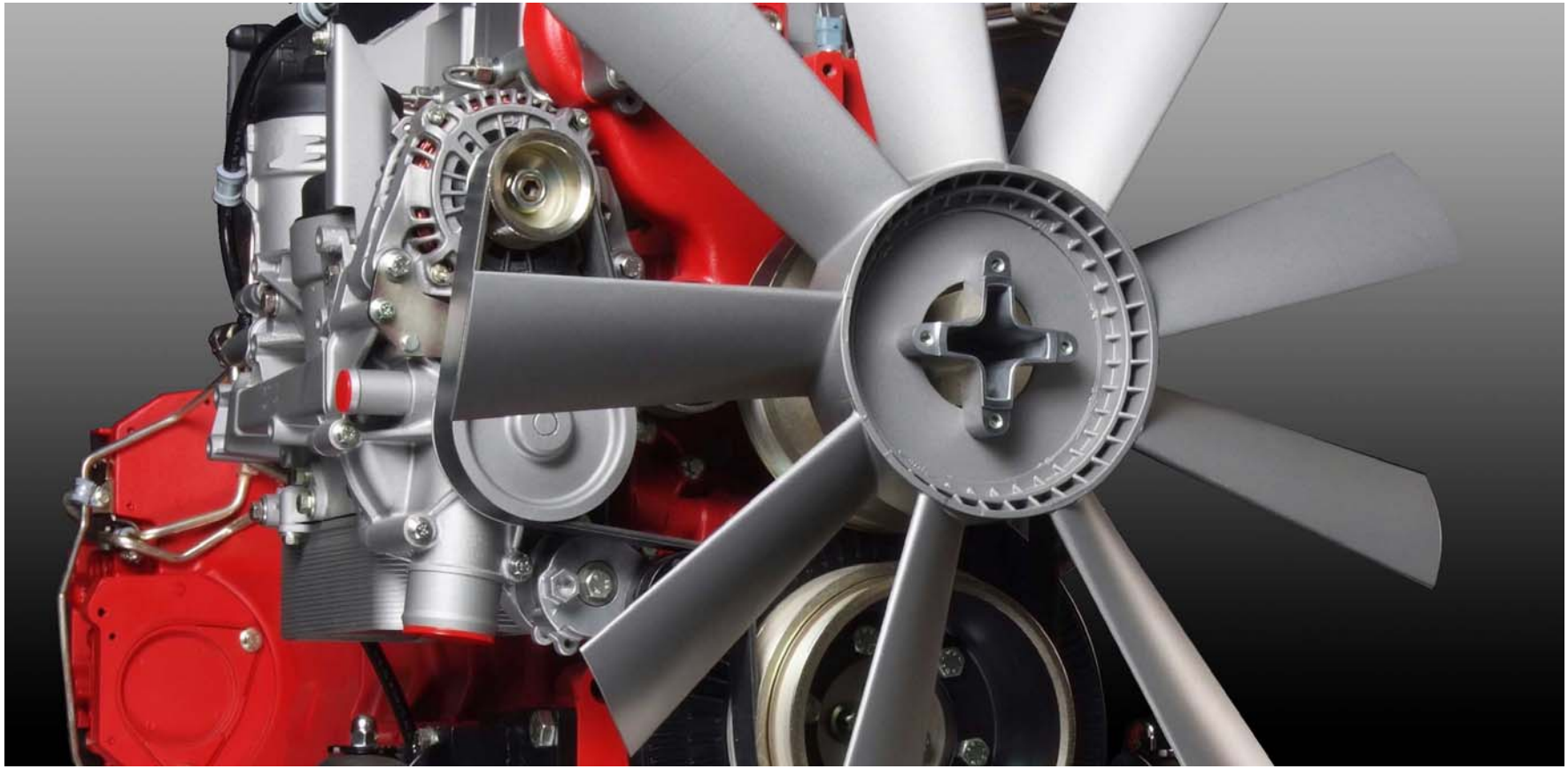


Quality features of genuine oil filters

Oil filter
Filtration performance: Properties

The engine company. DEUTZ

To specify the filtration performance of a filter or a filter media, following key properties are typically used:

- Pressure drop [Δp]

  Resistance between “raw” and “clean” side of a filter.

- Separation efficieny [%]

  States the number (%) of particle which are being separated.

- Dust capacity [G]

  States the mass of solid particulate which are accumulated on the filter until the final restriction is reached.

Oil filter
Quality features and risks

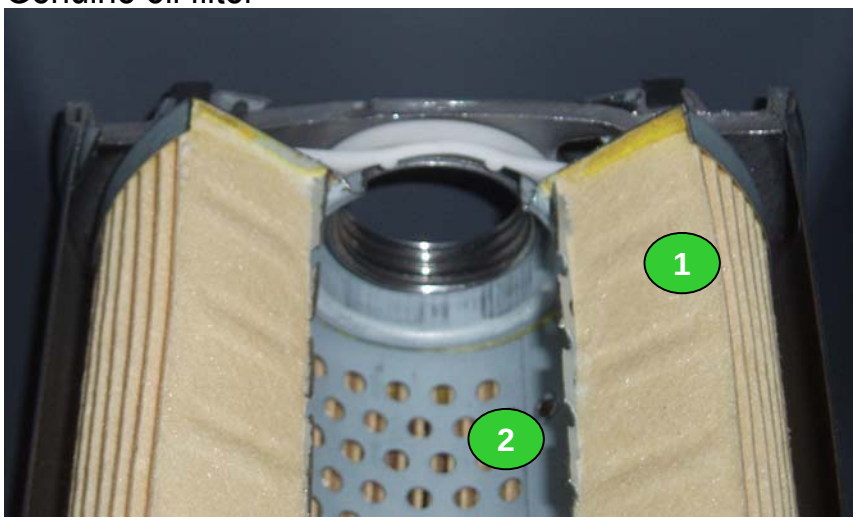
The engine company. DEUTZ

Quality features		Risks
Filter Media		
• Dirt Retention Capacity	→	Filter is blocked too quickly. Consequence: Reduced supply of filtered oil.
• Separation Efficiency	→	Filter allows harmful particles into the lubrication system.
• Impregnation of Media	→	Effectiveness of the filtering medium diminishes with humidity.
Filter Housing		
• Pressure Resistance (static + dynamic)	→	A housing damaged by impact or corrosion reduces the reliability of the filter.
• Resistance against Corrosion		
Gasket		
• Material, Dimensional Accuracy	→	Leakages occur mostly unnoticed, are annoying and poisonous to the environment.
• Chem. + thermal Integrity		
Valves		
• Correct opening pressure	→	Unfiltered oil or insufficient lubrication endangers the engine
Cleanliness		
• Clean, free of swarf	→	Residue from the filter manufacturing dispersed into the engine

Oil filter
Risks on use of non-genuine oil filters

The engine company. DEUTZ

Genuine oil filter

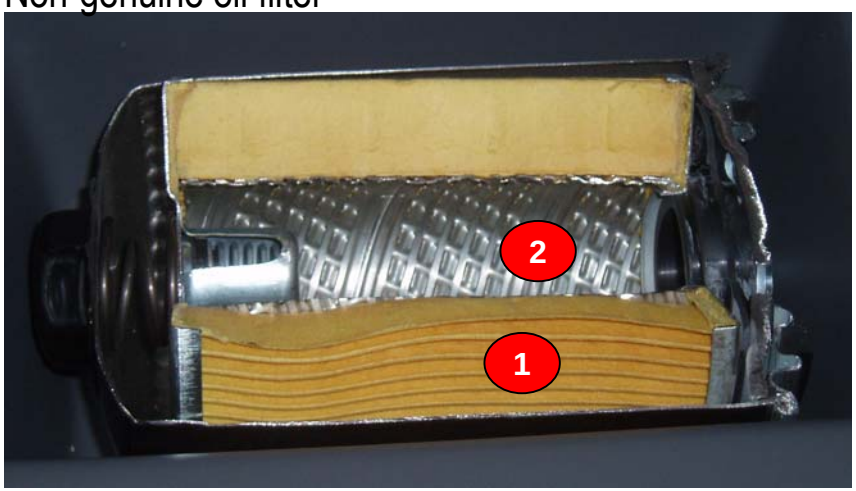


1 The genuine oil filter has a reliable pleat stability and an approx. 15% larger filter area.

2 The press cut of the middle pipe of the genuine oil filter is perfect.

Optimum pleat geometry → high dirt holding capacity

Non-genuine oil filter



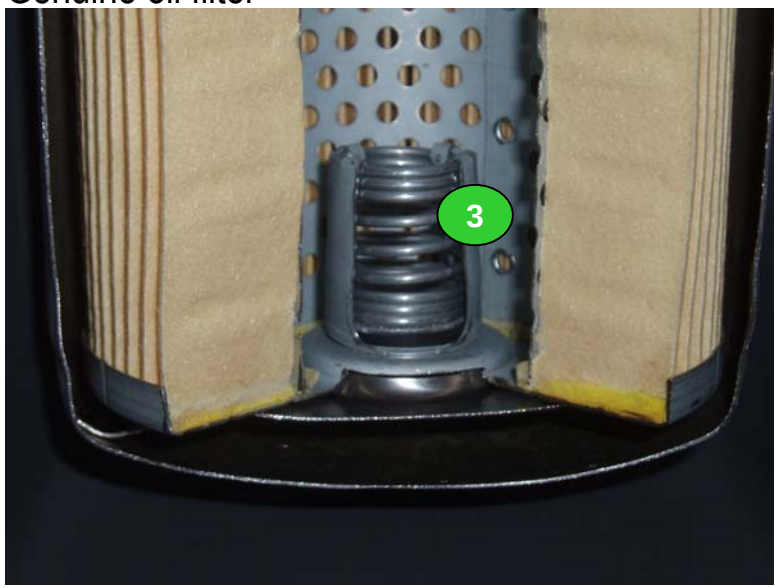
1 The S-impact in the filter paper and smaller filter surface of the non-genuine oil filter leads to smaller dirt retention capacity.

2 The centra pipe is constructed from diagonally wound sheet metal. Due to the unfinished edges the filter paper can be sliced.

Oil filter
Risks on use of non-genuine oil filters

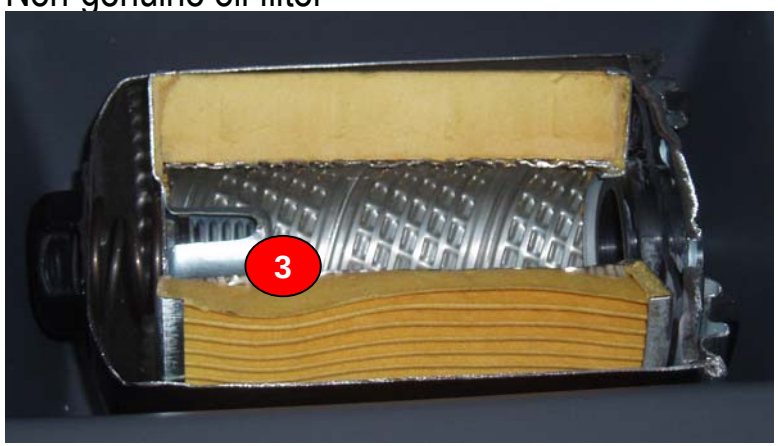
The engine company. DEUTZ

Genuine oil filter



3 The opening pressure of the bypass valve of genuine oil filters is correct.

Non-genuine oil filter



3 The bypass valve of the non-genuine oil filter opens too readily, the opening pressure is around 12% under that of the genuine DEUTZ oil filter.

Consequence:

→ More unstrained oil circulates

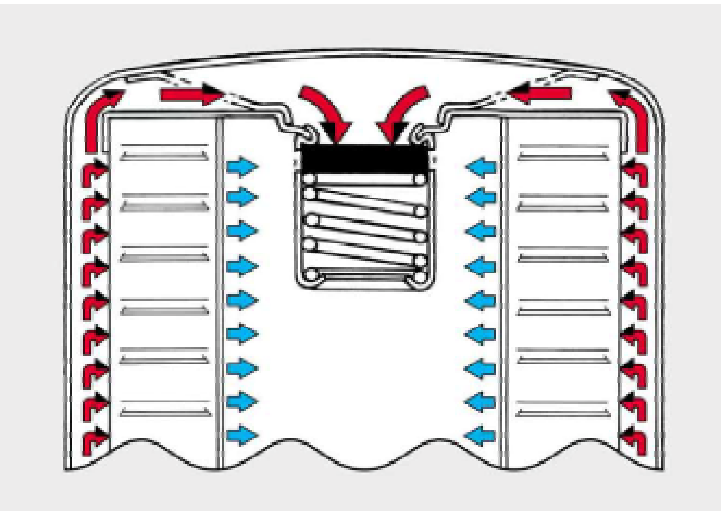
→ Unfiltered oil or insufficient lubrication endanges the engine.

Oil filter
Risks on use of non-genuine oil filters

The engine company. DEUTZ

Normal operation:

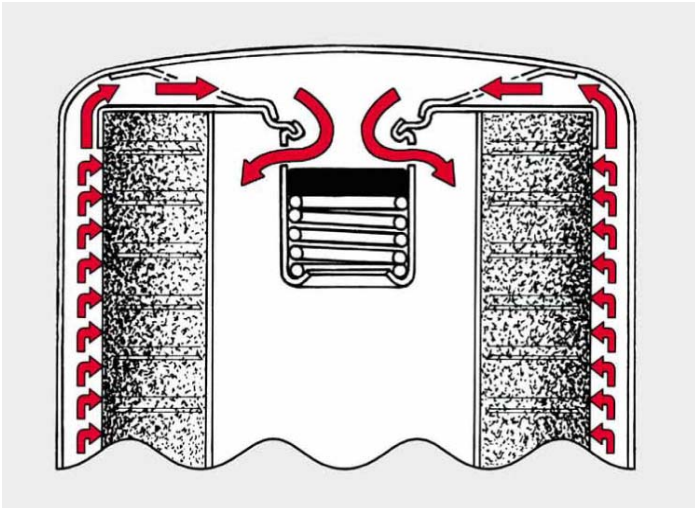
Bypass valve closed



- All of the dirt oil passes through the filter media and is cleaned thoroughly.
- Lubrication with cleaned oil

Exceptional conditions:

Bypass valve open



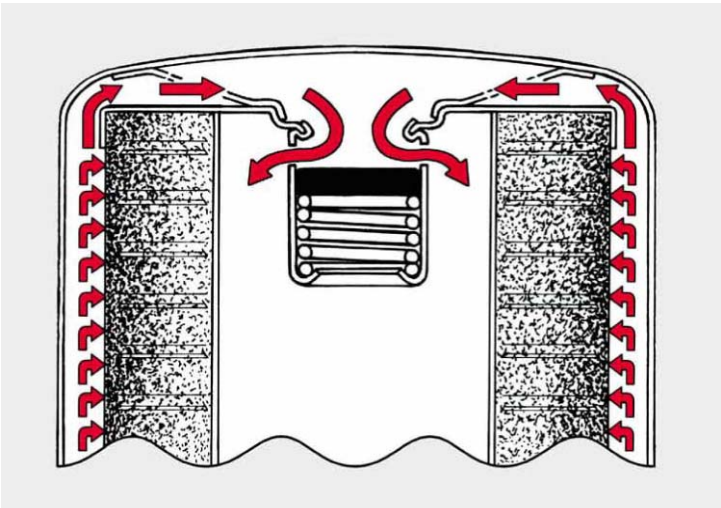
- Bypass valve remains permanently open
- The bypass valve is opened for short periods

Oil filter
Risks on use of non-genuine oil filters

The engine company. DEUTZ

Exceptional conditions:

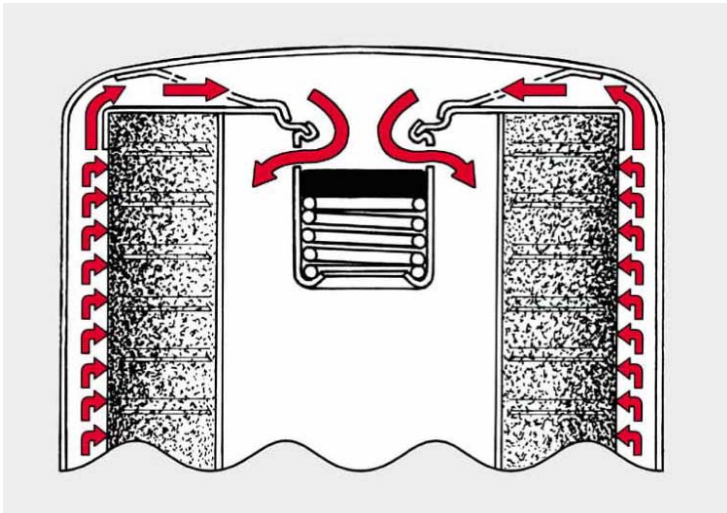
Bypass valve permanently open



- The filter is underserviced, the filter media is clogged
- Unfiltered oil flows into the engine via the bypass valve

Exceptional conditions:

Bypass valve open for short periods



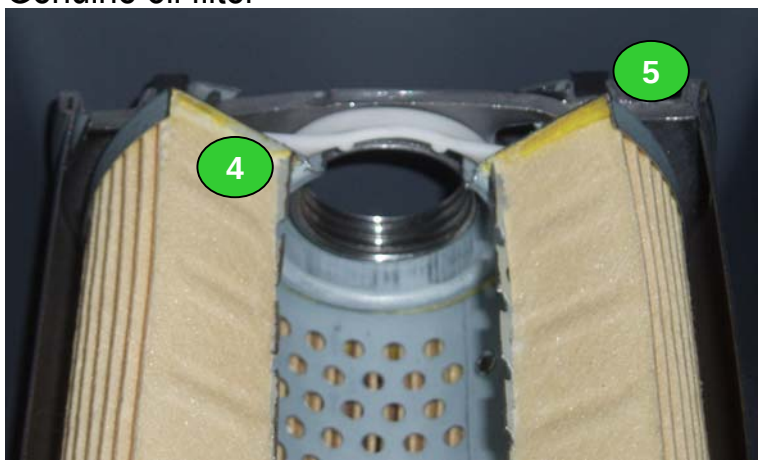
- With viscous oil (cold starts, low external temperatures)
- With high volume flow, as the full oil charge cannot pass through the fine pores of the filter media (differential pressure on the filter media is greater than the opening pressure at the valve)

⇨ Frequent cold starts lead to an increase in engine wear and shorter service intervals.

Oil filter
Risks on use of non-genuine oil filters

The engine company. DEUTZ

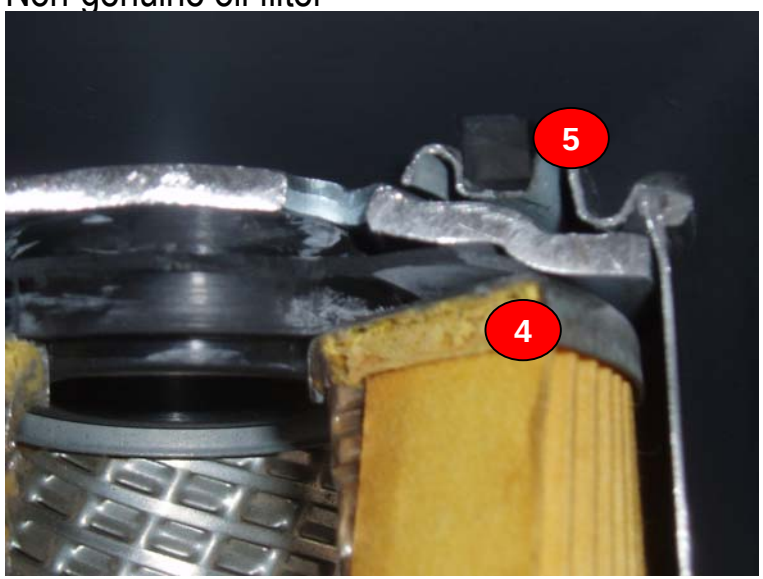
Genuine oil filter



4 The adhesive film of the genuine oil filter has a good thermosetting.

5 The seal retainer of the genuine oil filter is secured.

Non-genuine oil filter



4 The adhesive film of the non-genuine oil filter has blisters. The temperature and speed in the manufacturing are too high.

5 The seal of the non-genuine oil filter is loose.

Consequence:

→ No safe sealing outward

Oil filter
Difference between genuine and non-genuine oil filters

The engine company. DEUTZ

- The result of the comparative test in the laboratory shows:

Difference	Genuine	Non-Genuine	Comment
Stability of pulsation	30.894 alternation of load	10.200 alternation of load	ISO 4548-6 / 0-14 bar; 0,6 Hz
Multipass	$\eta_{50\%}$ = 20 µm	$\eta_{50\%}$ = 22 µm	ISO 4548-12
Filter area	3108 cm²	2673 cm²	
Dirt retention capacity	30 g	22 g	
Opening pressure	2,5 bar	2,2 bar	see marking „2“