



INTAKE & EXHAUST SYSTEM



SYSTEM STATE OF HEALTH BASICS

Turbo Actuator

- **Function:** Controls turbo boost
- **Impact:** Over/under-boost working conditions
- **Risk:** Turbo or engine failure



NOx Sensor, Upstream

- **Function:** Measures NOx before SCR
- **Impact:** Wrong air-fuel ratio → poor combustion, ↑ DPF soot
- **Risk:** Fuel waste + DPF clogging



AdBlue Dosing Valve

- **Function:** Injects DEF into SCR system
- **Impact:** Over/under-dosing → SCR failure
- **Risk:** Legal penalties / SCR repair



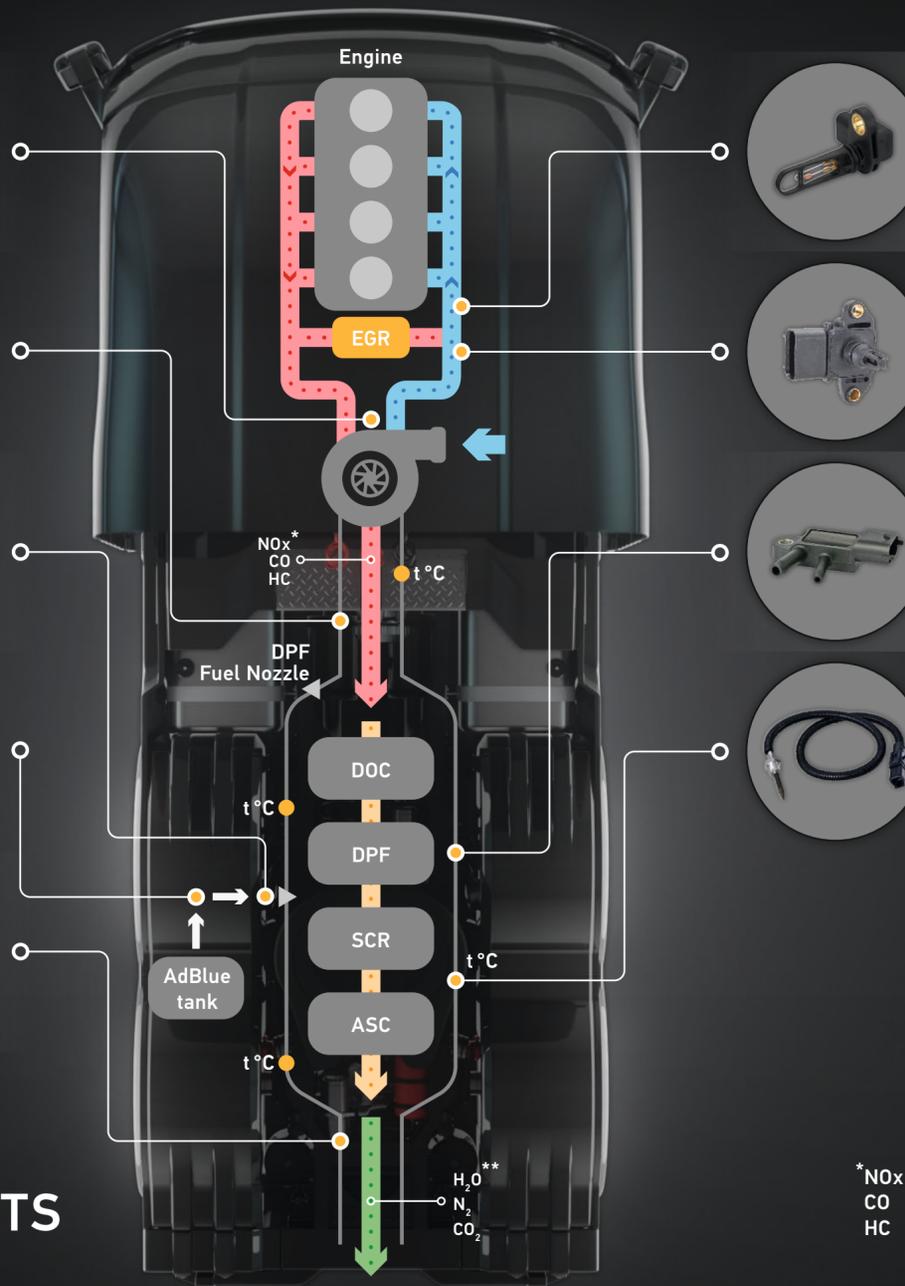
AdBlue Pump

- **Function:** Feeds DEF to SCR system
- **Impact:** ↑ NOx → SCR failure → Legally non-compliant
- **Risk:** Vehicle stop / SCR ageing



NOx Sensor, Downstream

- **Function:** Determines NOx reducing efficiency of SCR
- **Impact:** False readings → failed emissions test
- **Risk:** Miss-diagnosed replacement of SCR



Temperature Sensor

- **Function:** Monitors intake air temperature
- **Impact:** Vehicle limp mode
- **Risk:** Can cause catalyst & DPF damage



Pressure Sensor

- **Function:** Measures intake air pressure
- **Impact:** Power loss → turbo & DPF damage
- **Risk:** Premature DPF/turbo replacement



Exhaust Gas Pressure Sensor

- **Function:** Monitors pressure across DPF
- **Impact:** Failed regeneration attempts → DPF damage
- **Risk:** DPF premature ageing



Exhaust Gas Temperature Sensor

- **Function:** Monitors gas temperature across exhaust system
- **Impact:** Failed regeneration attempts → DPF damage
- **Risk:** DPF premature ageing

CRUCIAL COMPONENTS & DOMINO EFFECTS



Turbocharger:

- **Function:** Boosts intake air pressure
- **Impact:** Failure affects power & emissions
- **Cost:** €1000+



DPF:

- **Function:** Traps & burns excessive soot
- **Impact:** Clogging leads to backpressure & turbo damage
- **Cost:** €1000+

*NOx (nitrogen oxides)
CO (carbon monoxide)
HC (un-combusted hydrocarbons)

**H₂O (water)
N₂ (nitrogen)
CO₂ (carbon dioxide)

Warning! Driving a vehicle outside of emissions regulations can result in significant financial legal penalties.



Excessive Smoke



High Fuel Consumption



Check Engine Light



Reduce Engine Power

