



ATU Audi Technical Updates

Audi PQA 4.0T Presentation

V8 TFSI Features

- ▶ Displacement : 3993 cm³
- ▶ Performance : 300 – 404 kW, 550 – 700 Nm, 2 levels (different hardware)
 - ▶ Engine control : 1 ECU, MED 17, UDS
 - ▶ Transmission : DL501-7Q (7 gear), AL551-8Q (8 gear)
- ▶ 2 twin scroll turbo chargers inside V, manifolds outside V
 - ▶ Load calculation by manifold pressure sensor
 - ▶ High pressure fuel system bank 1 / bank 2 separated
 - ▶ Thermal-Management
 - ▶ Cylinder management, half engine mode
 - ▶ Secondary Air System : 1 pump, 1 pressure sensor
 - ▶ Tank density check : NVLD (Audi), LDP (Bentley)

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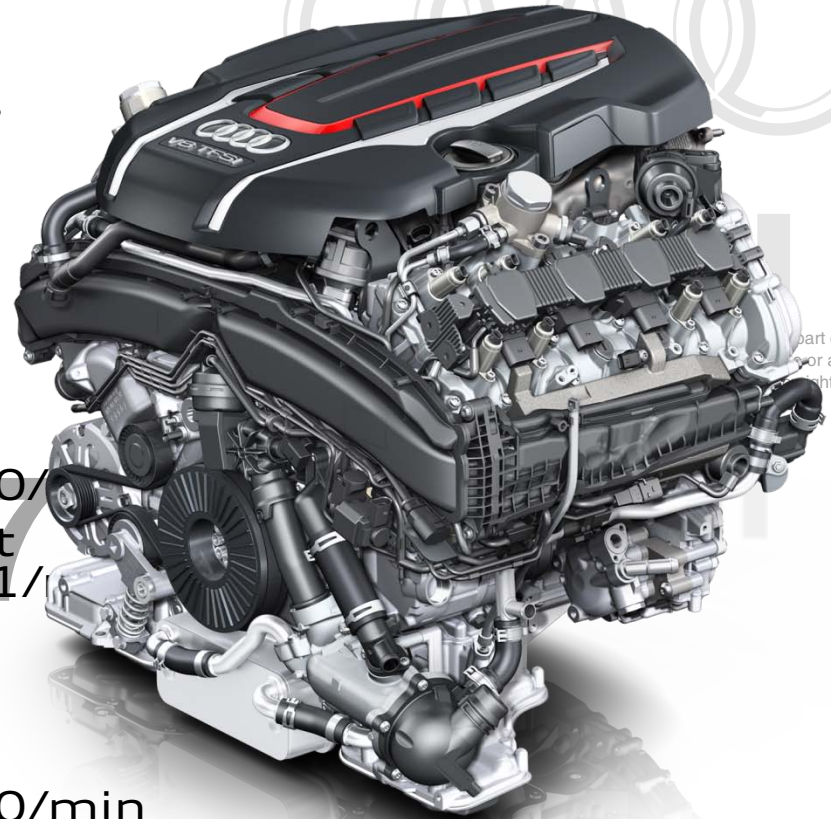
The new V8 TFSI-engines

characteristics S6/S7 vs. S8

displacement : 3993 cm³
Stroke : 89,0 mm
Bore : 84,5 mm
Engine length : 497 mm

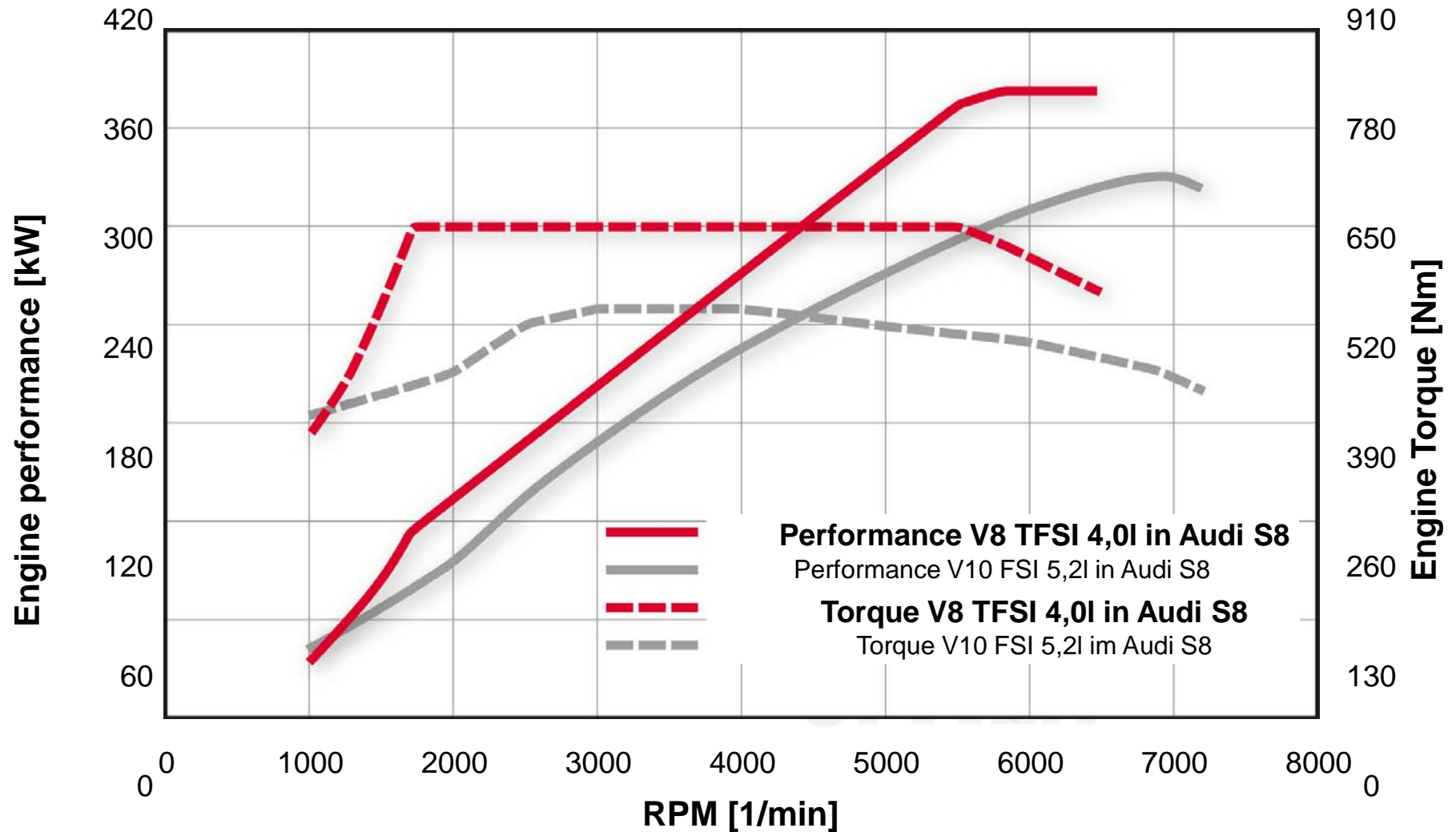
Compression : 10,1
Performance: 309 kW at 5500/min
Torque : 550 Nm at
1.400 – 5.200 1/min

Compression: 9,3
Performance: 382 kW at 5800/min
Torque : 650 Nm at
1.700 – 5.500 1/min

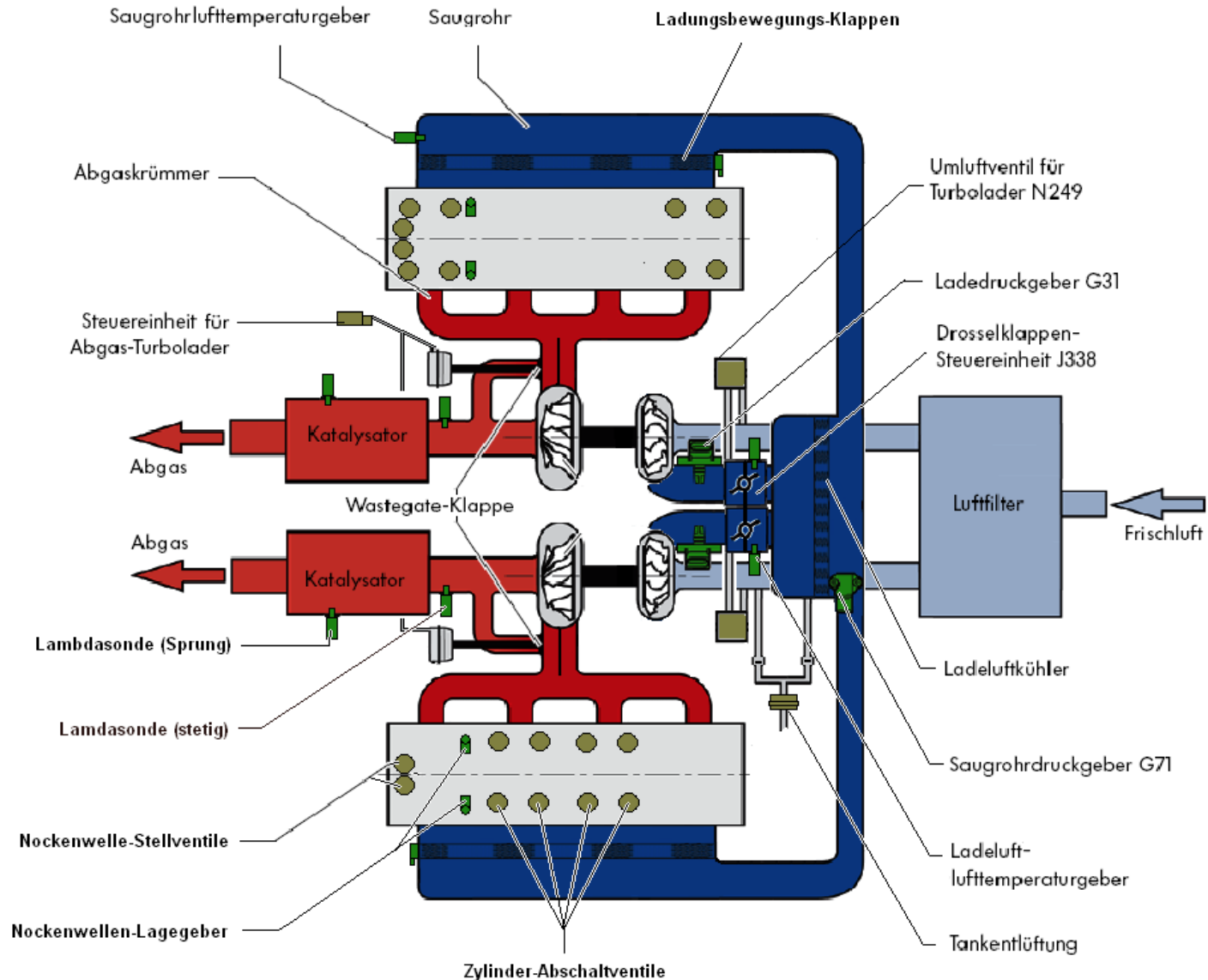


Performance / Torque characteristics Audi S8

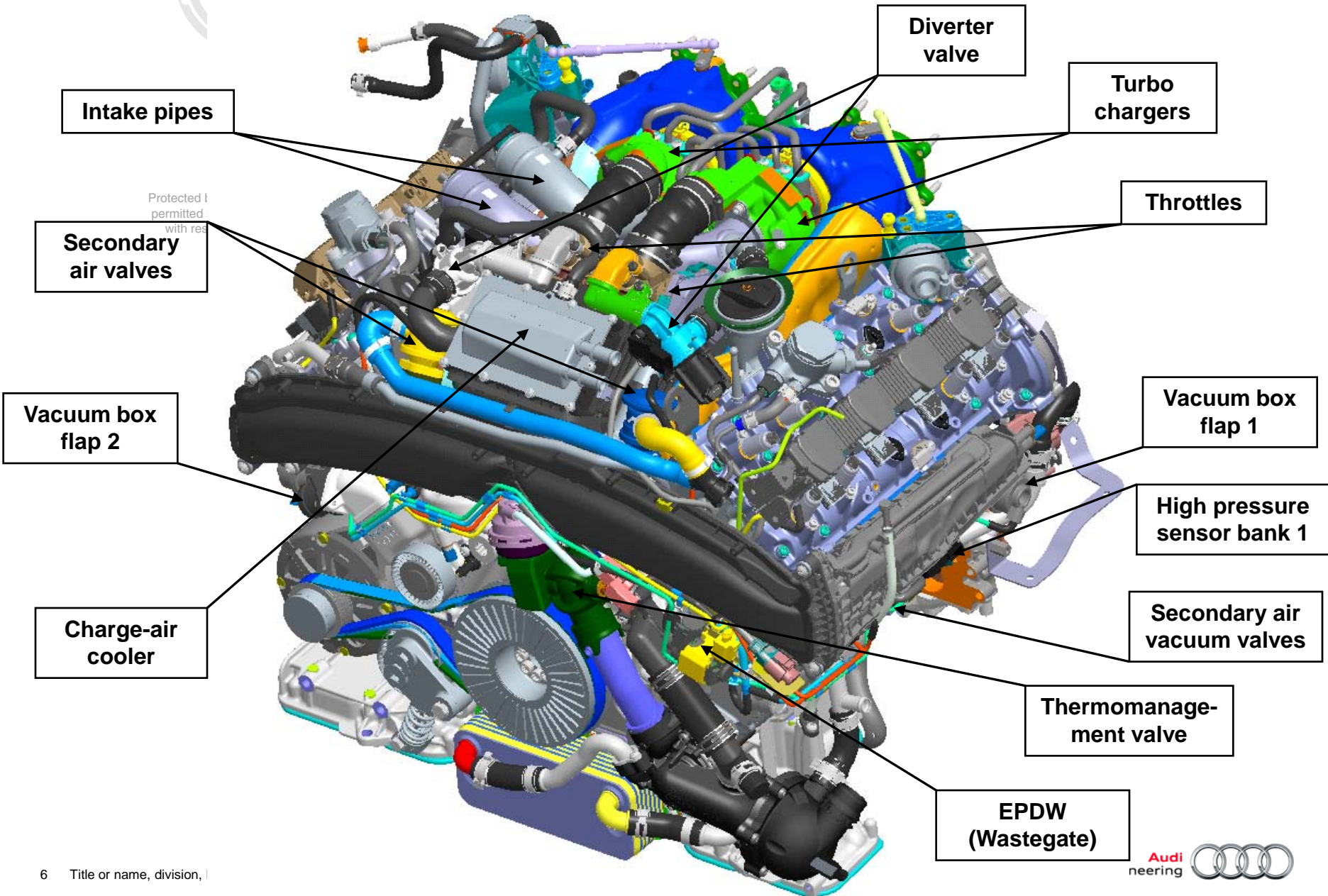
Comparison V10 FSI and V8 TFSI



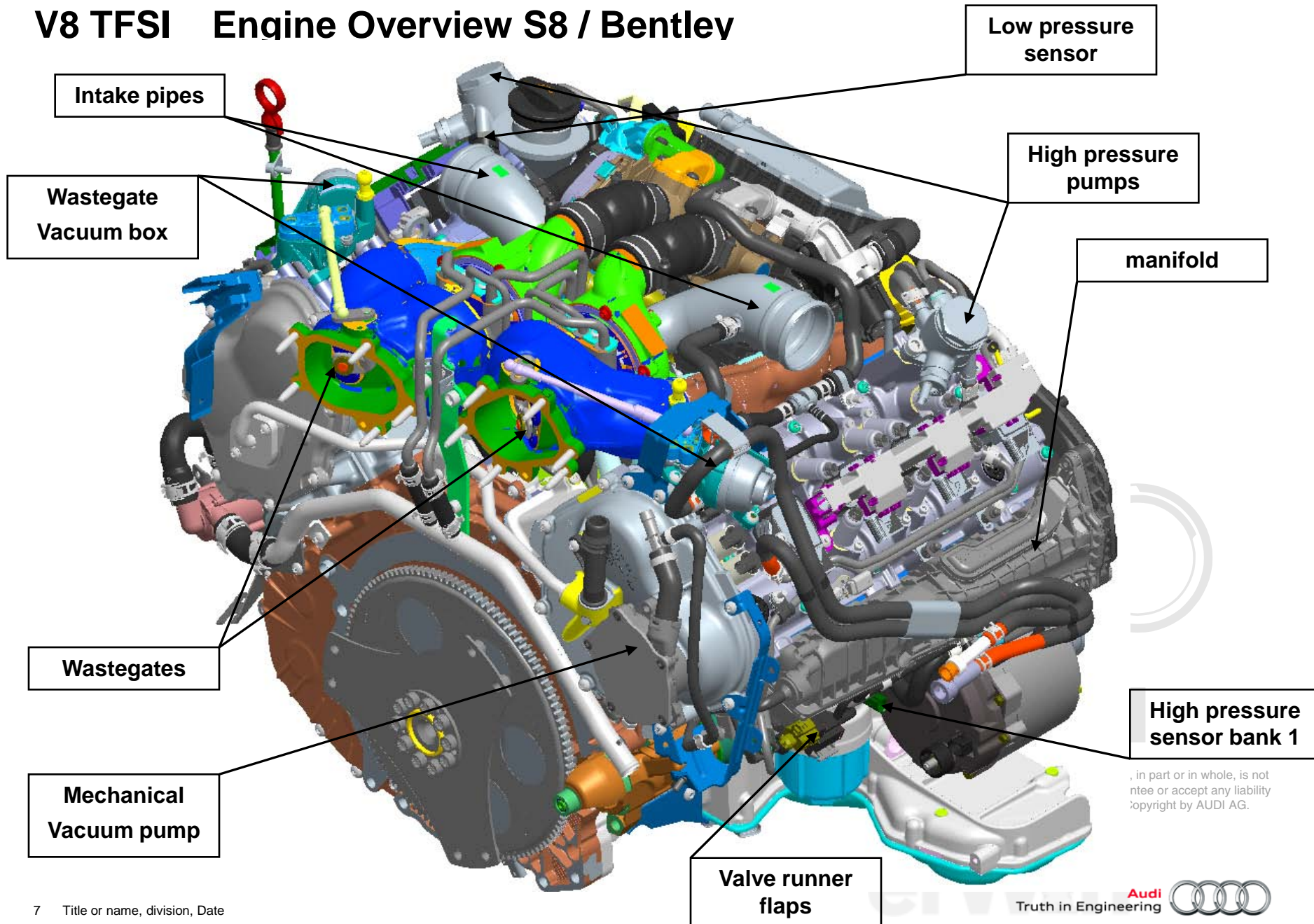
V8 TFSI Principal Overview



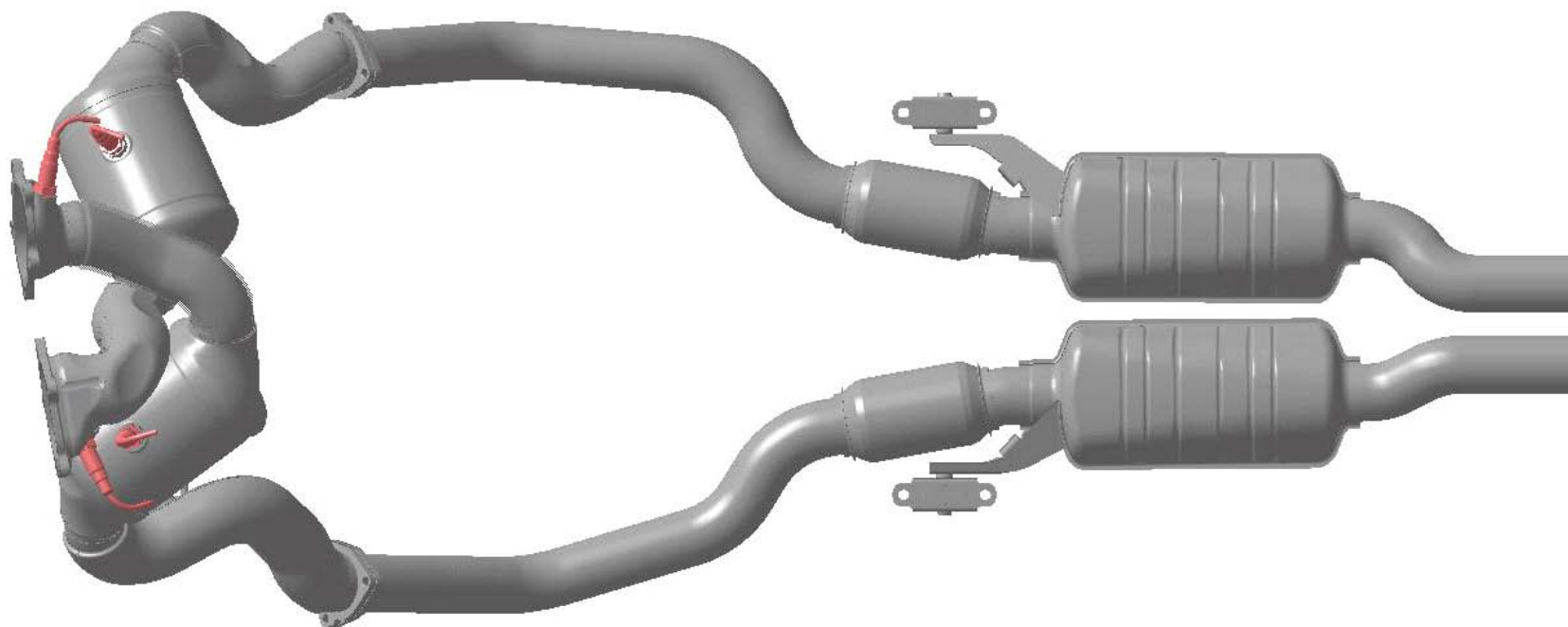
V8 TFSI Engine Overview S6/S7/D4LC



V8 TFSI Engine Overview S8 / Bentley

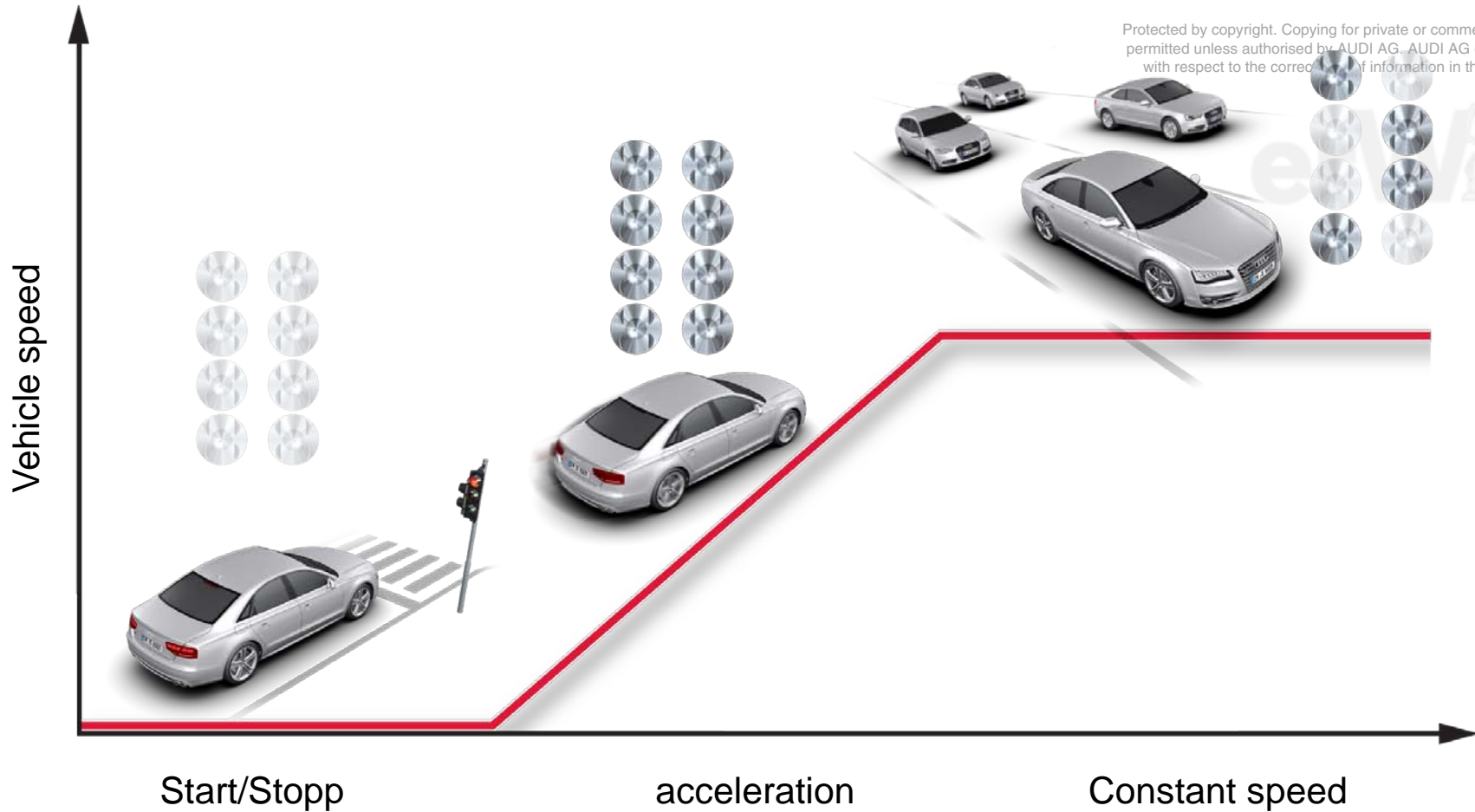


V8 TFSI Catalyst System



Cylinder On Demand

basic principle

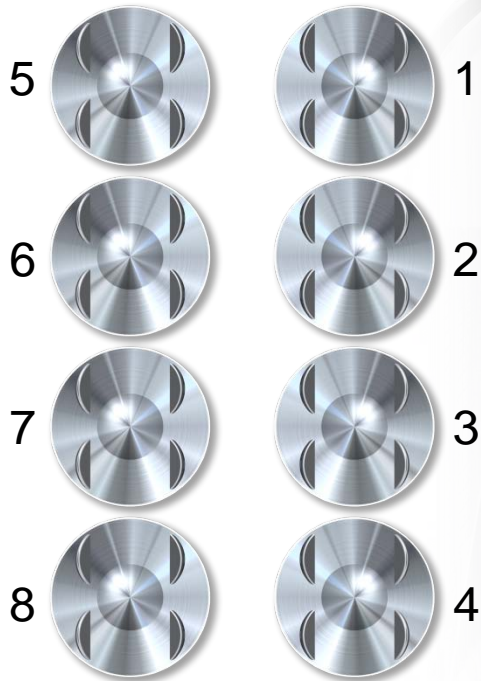


Cylinder on Demand

Cylinder shift principle

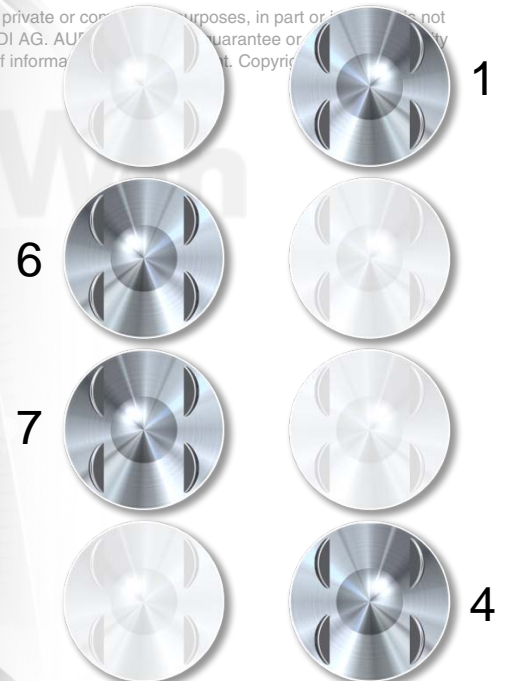
8-Cylinder-Mode

1 ▶ 5 ▶ 4 ▶ 8 ▶ 6 ▶ 3 ▶ 7 ▶ 2



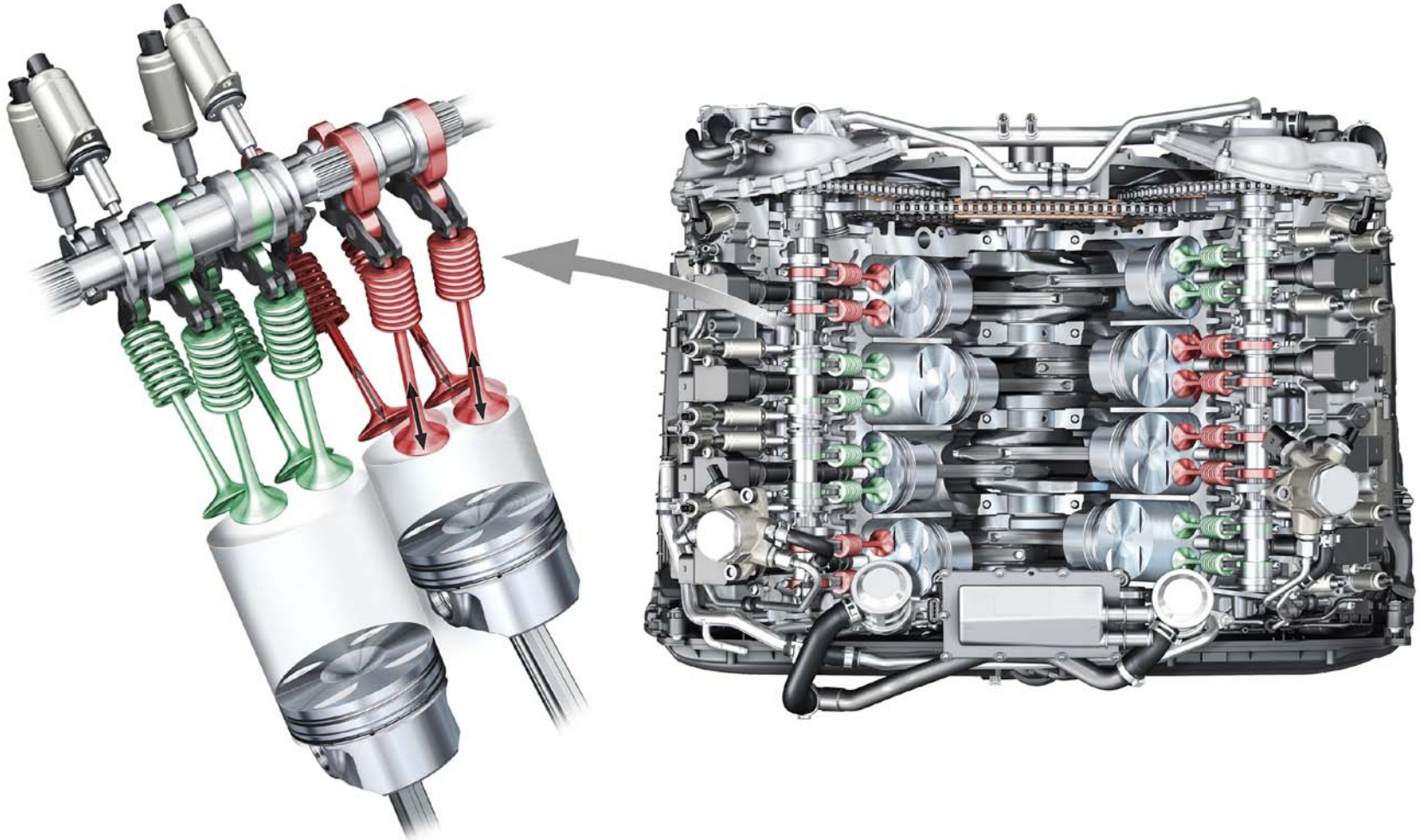
4-Cylinder-Mode

1 ▶ 5 ▶ 4 ▶ 8 ▶ 6 ▶ 3 ▶ 7 ▶ 2



Cylinder on Demand

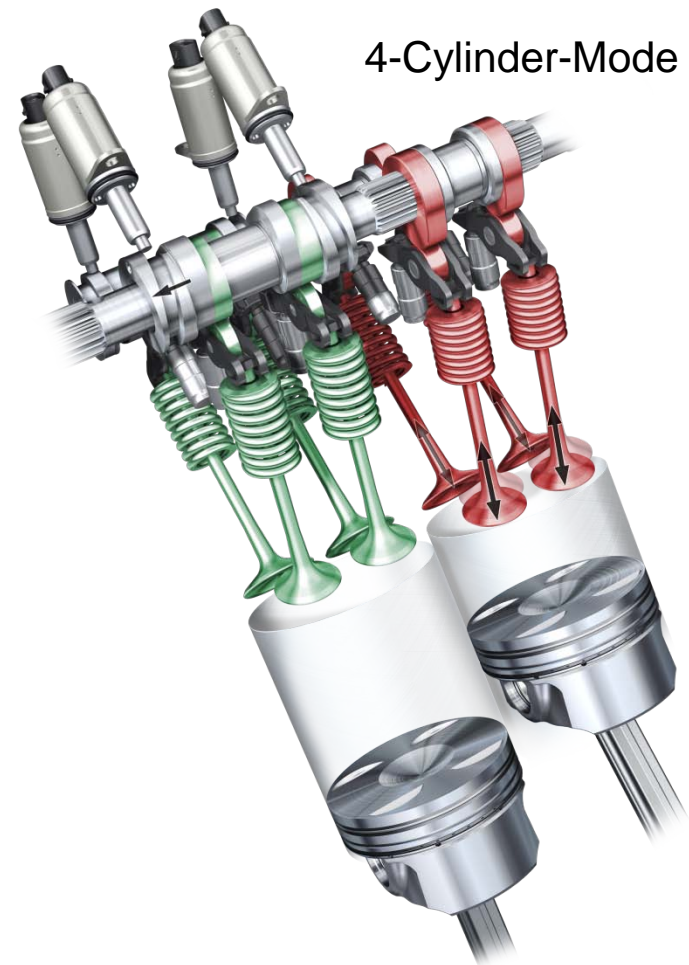
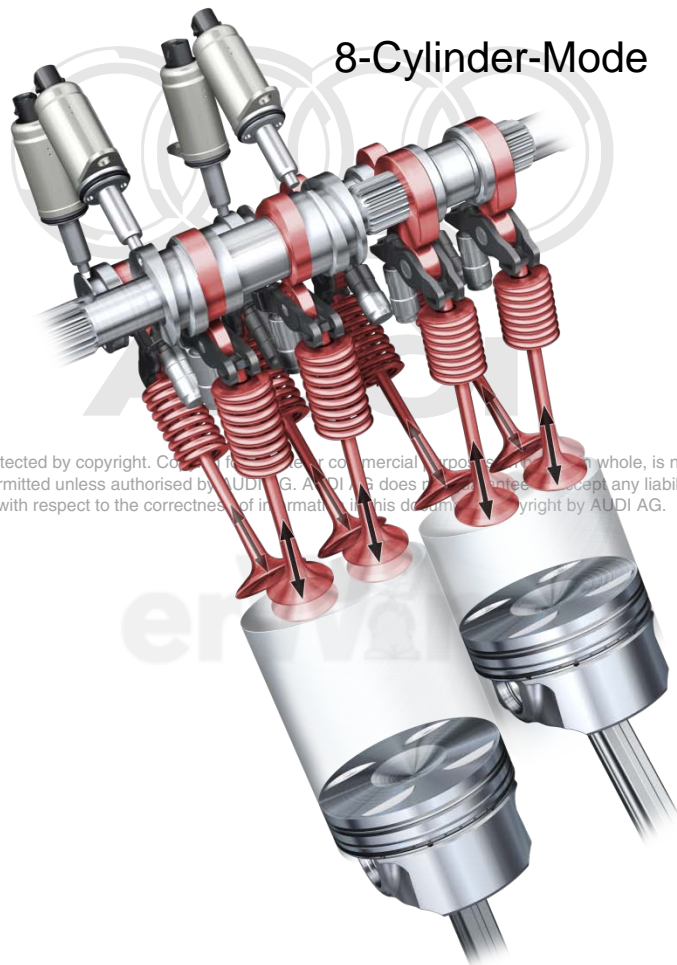
Cylinder shift with Audi Valve Lift System (AVS)



Heiko Huber, N/EA-322, Fleetmeeting V8 / V10 FSI
infos, 24. November 2010

Cylinder on Demand

Cylinder shift with Audi Valve Lift System (AVS)



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Cylinder on Demand Measures

Cylinder shift in minimal possible time



Finetuning Calibration, Fresh air inclusion in cylinder

Avoiding of short stages of cylinder fade out



Driver prediction: Analysis of current driving behavior on
Gaspedal movement, Brake pedal activation, steering angle,
acceleration / deceleration of steering angle



Audi

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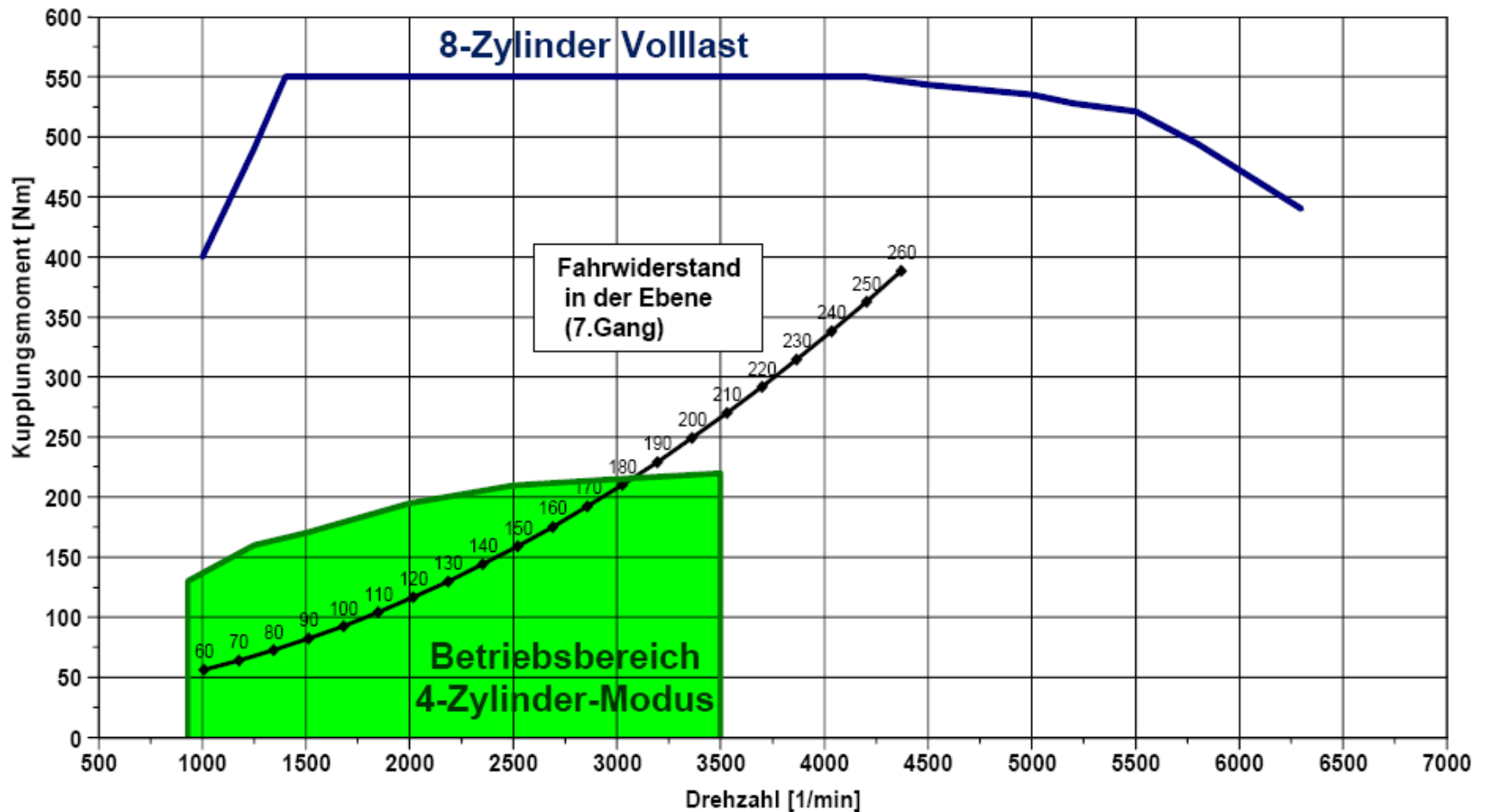
Cylinder on Demand

Characteristics

- 4 Cylinder Drive cycle depending on required engine torque if:
 - Engine speed between 930 and 3.500 rpm
 - Vehicle speed > 25 km/h
 - transmission: starting from 3rd gear
- Fadeout of cylinder 2,3,5 and 8 results in a balanced firing order(V4)
- Intake and exhaust valve stay closed in 4 Cylinder mode => closed cylinder work as a gas spring
- active noise cancellation and active engine mount => no customer relevant impact
- reduction of fuel consumption and CO2 emissions

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Cylinder on Demand Characteristics



Cylinder on Demand Display Concept

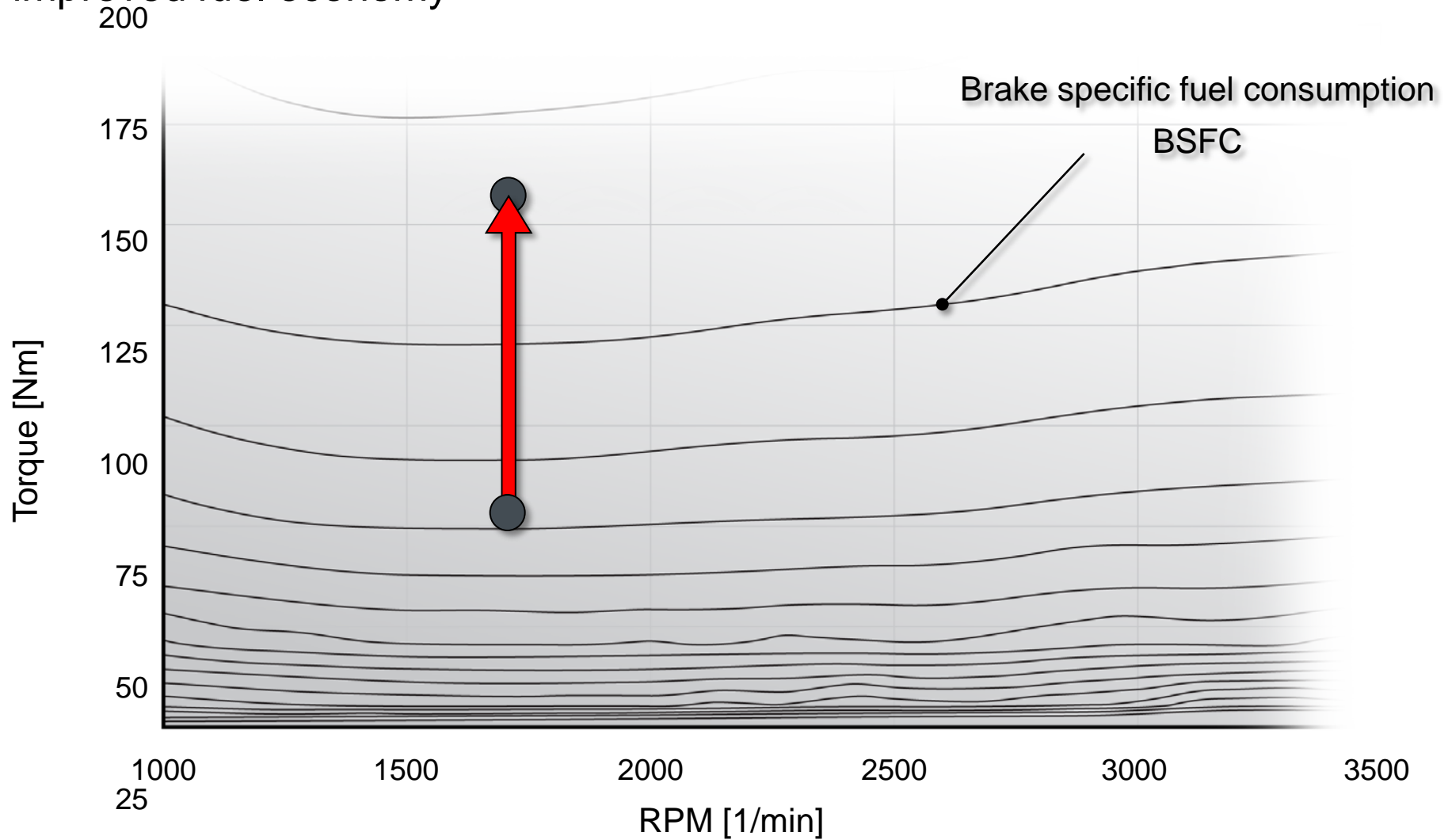


Cylinder on Demand Display Concept



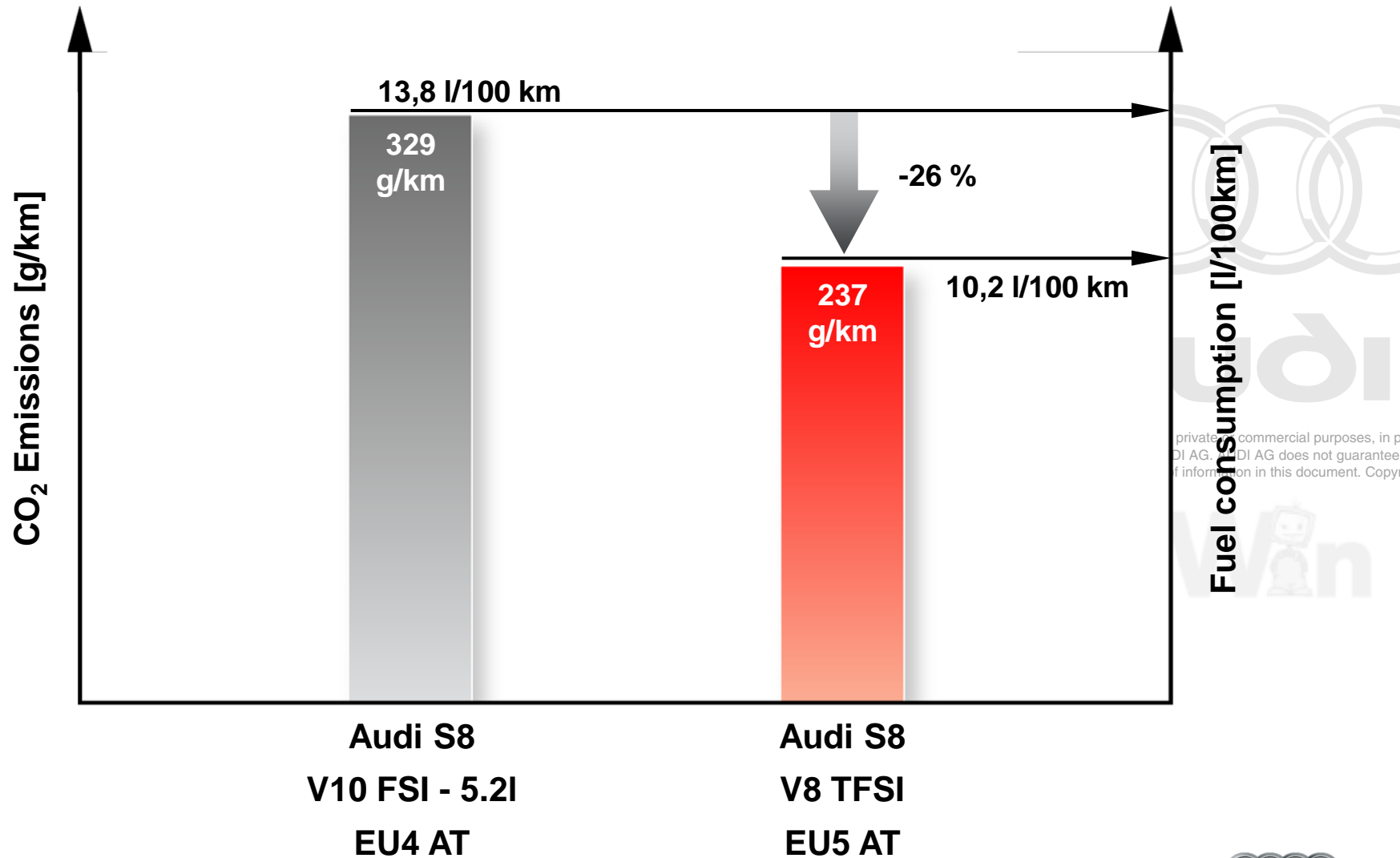
Cylinder on Demand

improved fuel economy



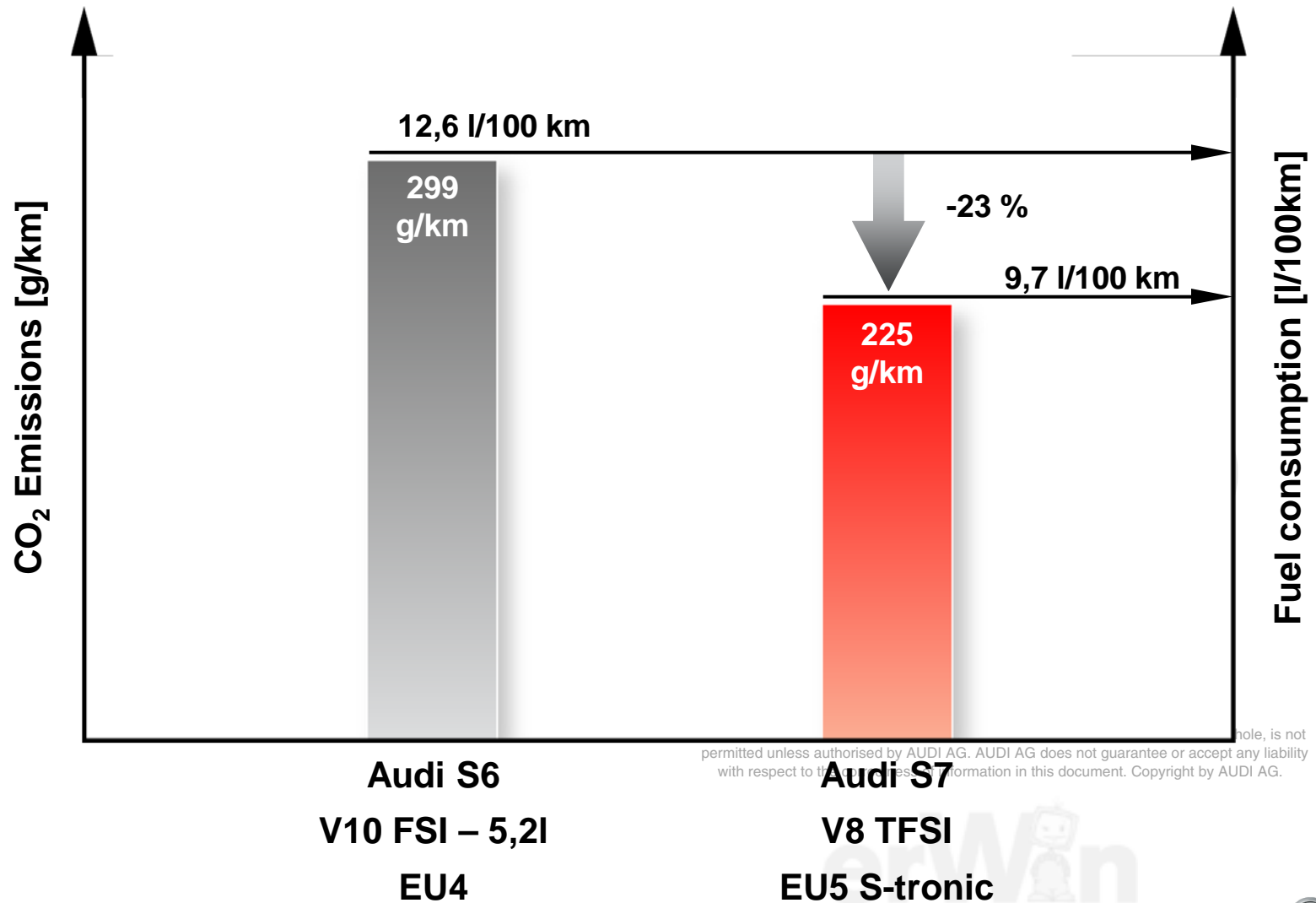
The new Generation of V8 TFSI Audi Engines

Fuel efficiency of Audi S8 (NEFZ)



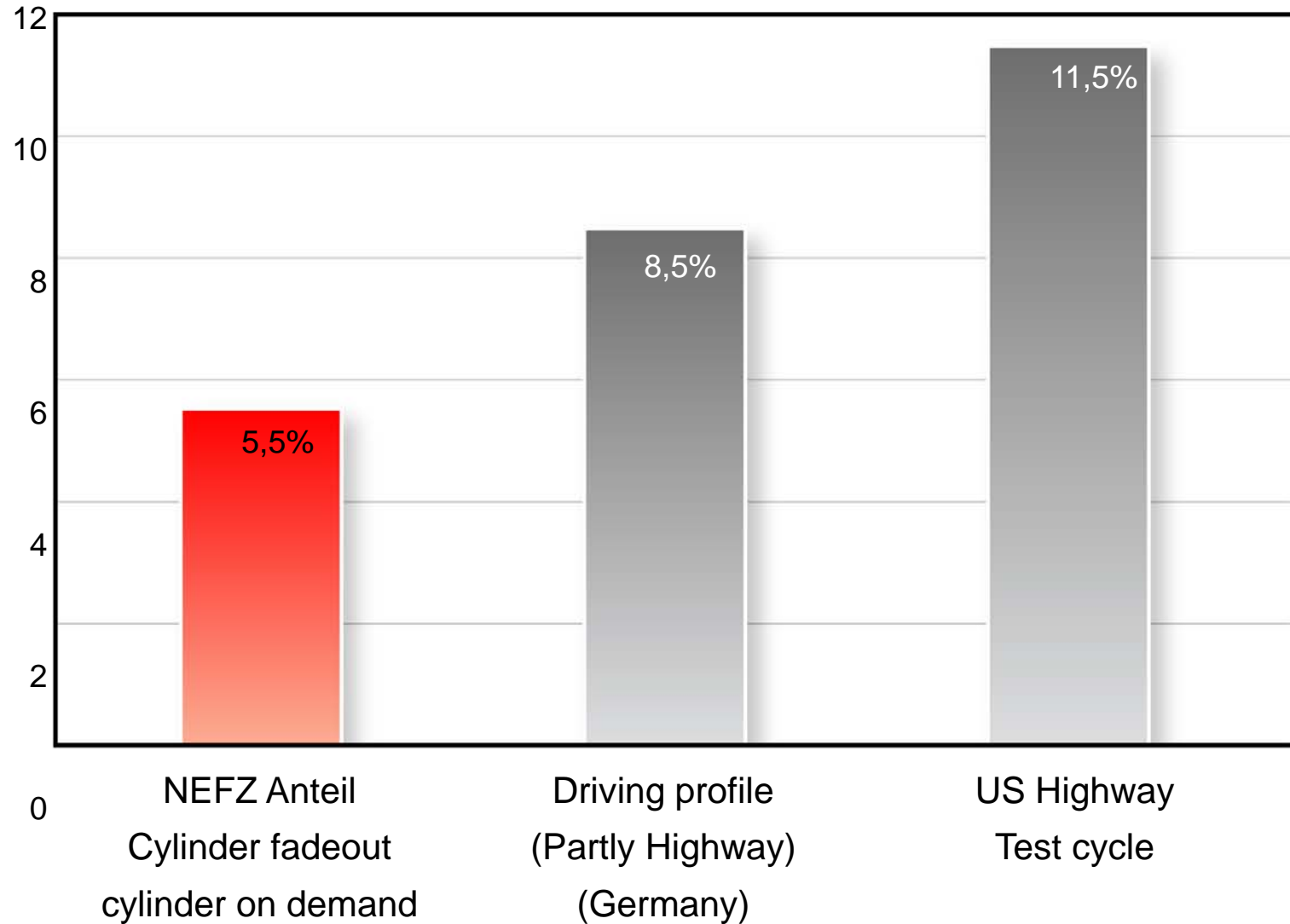
The new Generation of V8 TFSI Audi Engines

Fuel efficiency of Audi S6/S7 (NEFZ)

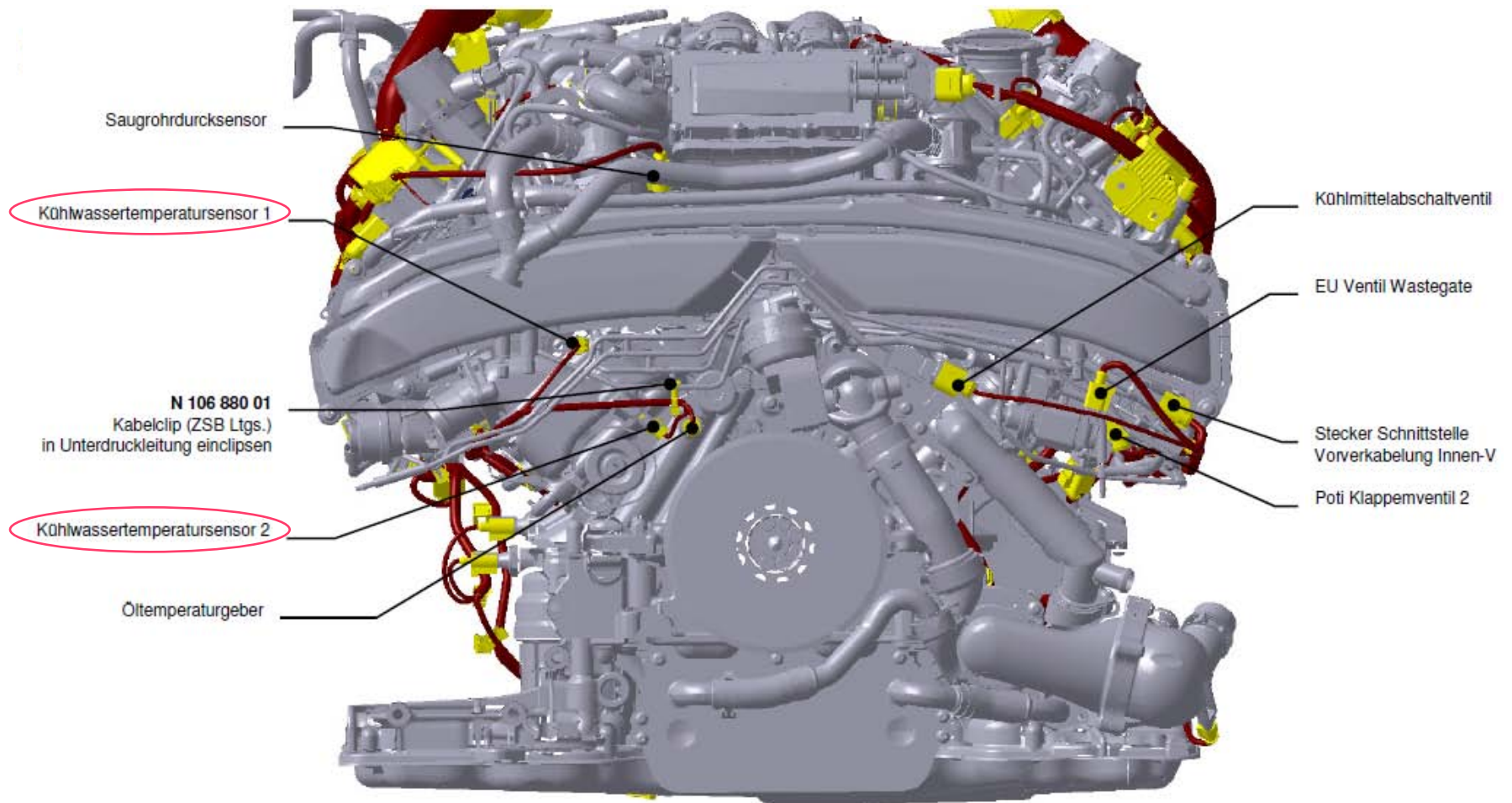


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Improved fuel efficiency via Cylinder fadeout on different driving profiles



V8T - Temperaturübersicht





Thank you.

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Audi retailer or other qualified shop. We especially urge you to consult an authorized Audi retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Audi.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Audi is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only. Always check with your authorized Audi retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the VAG 1551 Scan Tool (ST). Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by AUDI AG.
- **Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose.** Do not support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it.
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid. Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing, or jewelry were to get caught in the machinery, severe injury could result.

Cautions & Warnings

- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts, washers, circlips and cotter pins. Always follow the recommendations in this manual - replace these fasteners with new parts where indicated, and any other time it is deemed necessary by inspection.
- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the instructions thoroughly, do not attempt shortcuts. Use tools that are appropriate to the work and use only replacement parts meeting Audi specifications. Makeshift tools, parts and procedures will not make good repairs.
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Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.

Cautions & Warnings

- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device. Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal injury. To guard against personal injury or airbag system failure, only trained Audi Service technicians should test, disassemble or service the airbag system.
- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Audi Service technicians using the VAG 1551 Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

I have read and I understand these Cautions and Warnings.

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