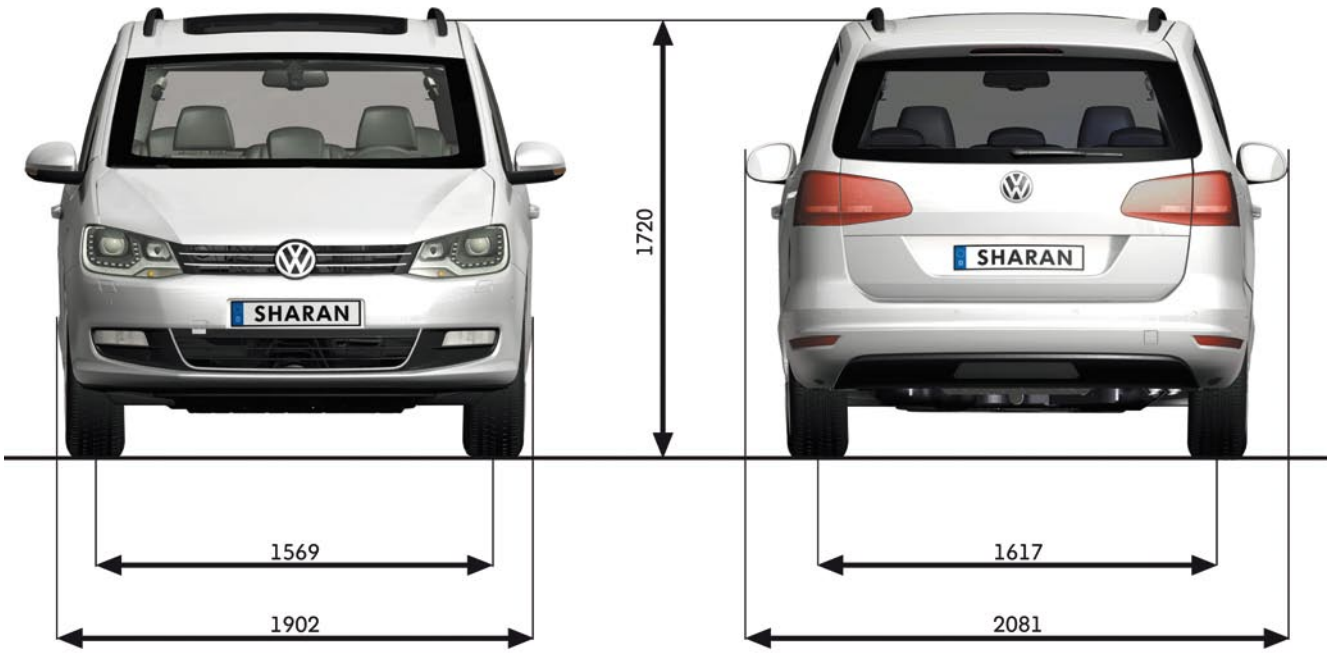

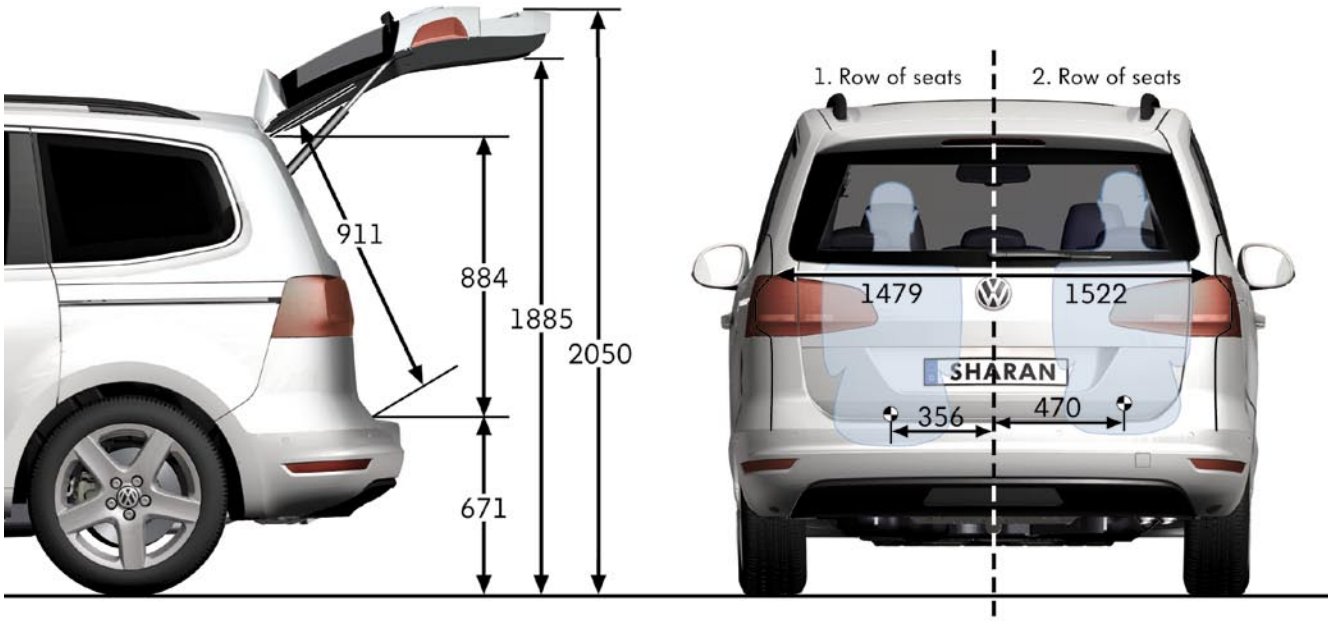

THE CONCEPT OF THE NEW SHARAN

Continuing a successful vehicle concept is a tricky balancing act. It is necessary to take account of customer-related market requirements as well as inner-company specifications. The balancing act has proven successful in the new Sharan.

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CONCEPT IDEA

The focus in developing the new Sharan was placed on the following concept ideas:

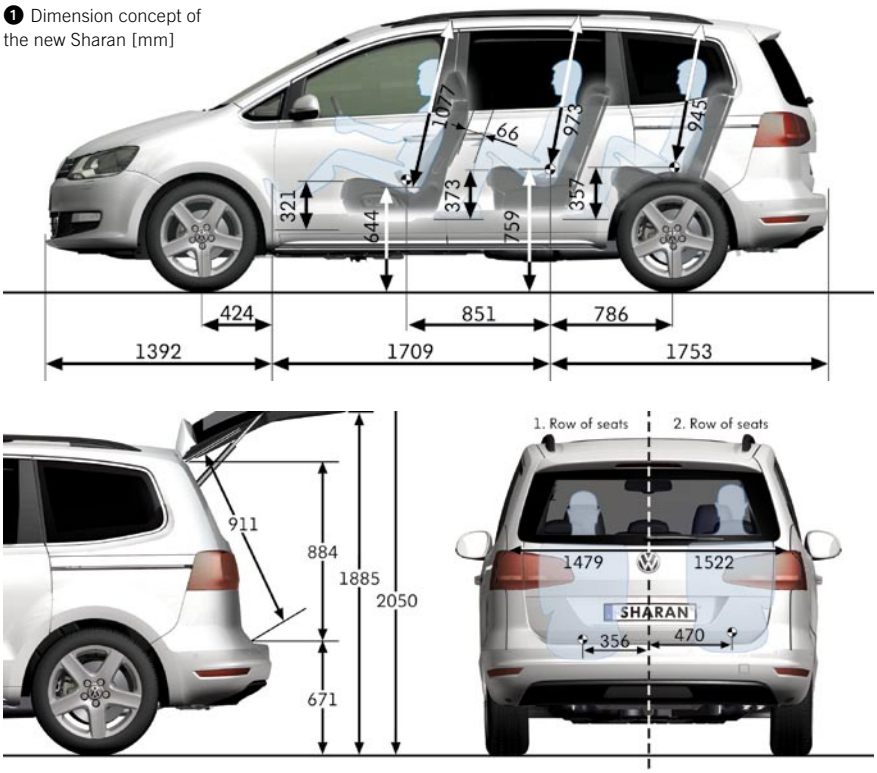
- higher seat position in the first seat row, cinema chair seat position for the second and third seat rows with ideal seat heights and good headroom, also for long journeys
- optimum air conditioning in all seat rows, air-conditioning headlining and additional air conditioner in the rear
- variable interior design with flexible on-board seat systems in the second seat row (EasyFold seat concept) and third seat row (TiltFlat seat) for individual configuration of the seating and loading requirements, with convincing functional operation
- varied loading options because of the flat loadbed when the second and third seat rows are folded down, with optional horizontal folding for the front passenger seat backrest
- demanding ergonomic requirements – met by good entry and alighting conditions, logical operating concept with control elements positioned within easy reach and clearly visible
- convincing concept for storage compartments in the doors, dash panel, centre and roof consoles as well as in the luggage compartment
- easy running sliding doors (optionally with electric drive), electric tailgate opening (optional)
- "Mobility Tyre" for increasing the safety of the vehicle as well as the volume of the luggage compartment
- optional roof opening with large panoramic sliding roof
- 4MOTION (optional) achieved without any reduction in interior space.

By combining these concept ideas, it has been possible to achieve an almost ideal compromise between the dynamic driving experience, family practicality, environmental compatibility and a high utilisation value.

PACKAGE AND ERGONOMICS

The new Sharan is longer and wider than its predecessor. The length is 220 mm longer at 4854 mm, while the width is 92 mm wider at 1902 mm. The height has been reduced by 12 mm to 1720 mm. The track width at the front is 39 mm wider at 1569 mm, whilst the track width at the rear is 93 mm wider at 1617 mm. The wheelbase has been lengthened by 75 mm to 2919 mm. This means the occupants

❶ Dimension concept of the new Sharan [mm]

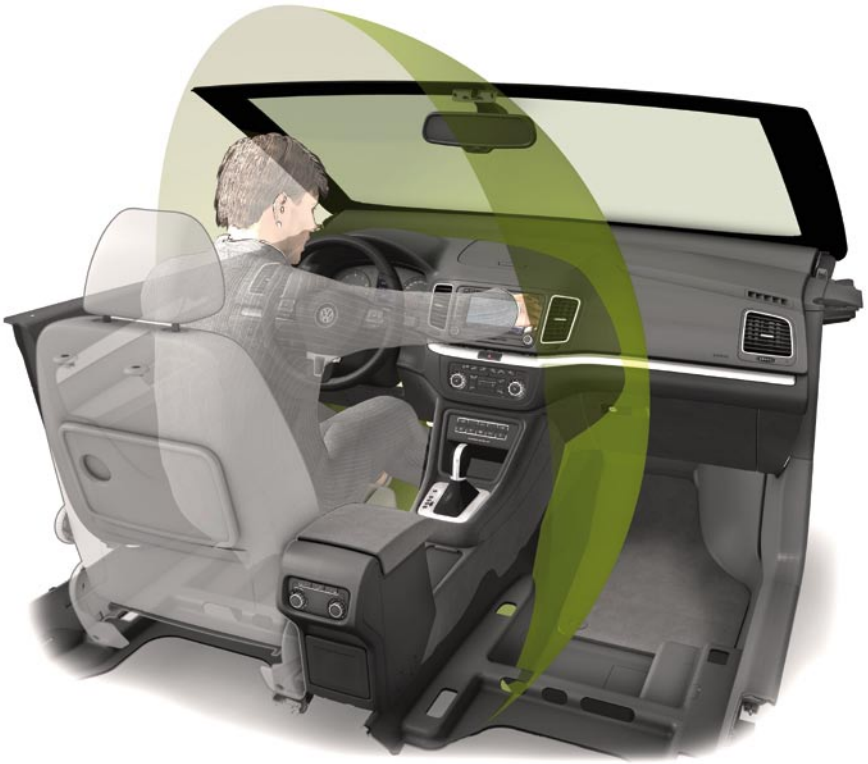


have more space available in the interior, ❶. Three full-size seat rows are provided with an ergonomically improved seat height, at a lower height relative to the road surface. These changes deliver benefits in particular in terms of headroom and entry comfort. The seat position at the front, above all, with its reduced steering wheel rake angle and lower seat height more than meets the requirements for a dynamically oriented MPV.

Additional manual adjustments for the driver's seat together with optimised positioning of the selector lever have permitted ideal seat positions even for users with demanding requirements. The driver assistance functions can be controlled using a central display with touchscreen, where they are clearly visible and within easy reach, ❷.

Numerous storage compartments are located throughout the interior. The ability to accommodate bottles in all doors is particularly practical (1.5 l in the front doors, 1.0 l in the sliding doors). Cup holders are provided both in the centre console, in the folding tables at the back of the front seat backrests as well as in the armrests of the third seat row, all of which are within easy reach.

The harmonious look-and-feel of the entire interior shows that great emphasis was placed on easy and standardised functions in the vehicle throughout its development: optimum sizes as well as matching force/travel profiles were planned and implemented for all control elements.



❷ Driver's station showing length of hand reach

The cinema seat arrangement of the seat rows in rising height ensures good all-round visibility and forward view, even from the rear seats. Furthermore, the feeling of spaciousness is boosted by the panoramic sliding roof which reaches far for-

❸ Entry to the third seat row

❹ Luggage compartment

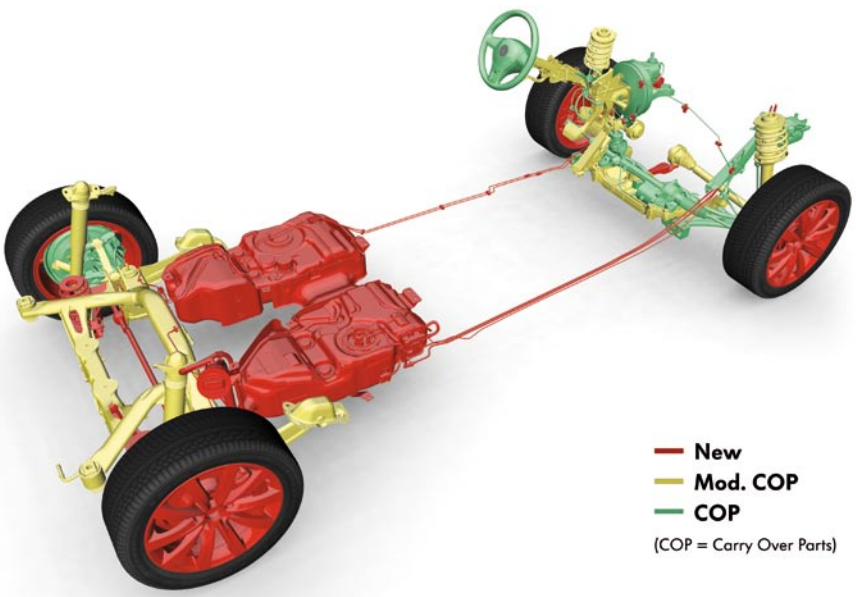
wards, providing more light for the first seat row as well.

With its sliding doors wide open, the new Sharan is easy to enter in the second and third rows, even in narrow parking spaces. The seats of the second seat row can be moved individually by 160 mm each, and folded down with one hand on the backrest of the first seat row (EasyPackage).

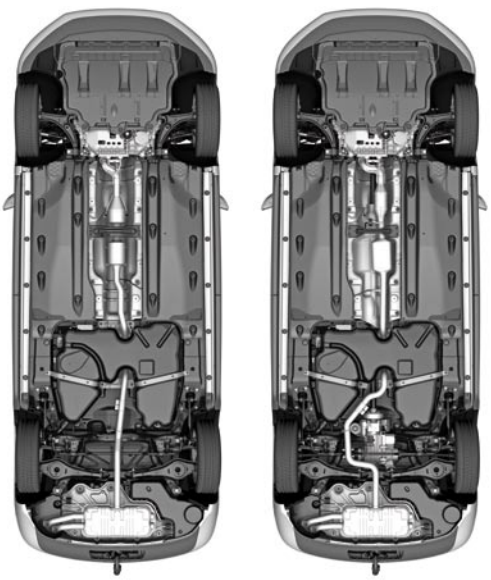
In conjunction with the opening width of the sliding door, it has been possible to create an entry that sets new standards in this vehicle class, ❸. The sliding door can be electrically operated as an option. Comfort is provided by the armrest in the sliding door trim. A sunblind can be integrated in the door trim as an option. The elbow width has been increased by 57 mm to 1578 mm.

LUGGAGE COMPARTMENT

The second and third seat rows remain in the vehicle at all times. They can easily be folded flat (TiltFlat seat), thereby forming a flat loadbed 2137 mm long behind the front seats. If the front passenger seat is also folded down then items with a length of up to 2.95 m can be transported, ❹. The through-load width is 1088 mm, with a load volume amounting to 2430 l available behind the first seat row when the other seat rows are folded down. If only the third seat row is folded down then the load volume is up to 1339 l. In the configuration with 7 seats, there is storage space of 300 l behind the third seat row, measured up to the height of the top of the backrest. The new concept of the tailgate trim provides for a standing height of 1885 mm under the opened tailgate. The garage dimension of 2050 mm is not exceeded in this case.



❺ Carry over parts used in the chassis from the Tiguan modular system



❻ Unitary body, front-wheel drive variant on the left, four-wheel drive variant (4MOTION) on the right

❼ Calculation of airflow around the vehicle

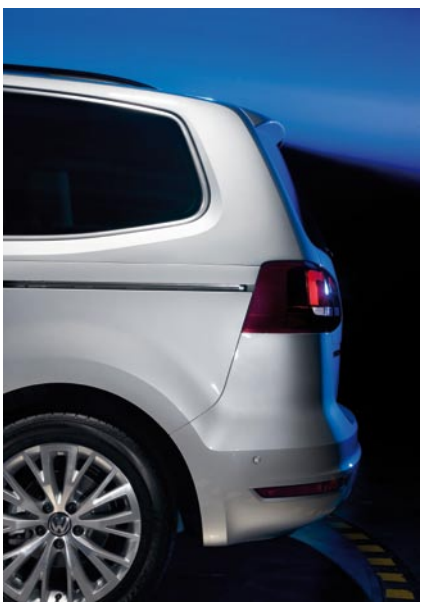
MODULAR SYSTEM

The new Sharan is derived from the modular system used in the Tiguan, and integrates numerous components in the front-end area. For example, the engine, gearbox, radiator and intercooler, subframe, front axle, steering, gearshift mechanism, important parts of the exhaust system as well as the rear axle have been taken from the Tiguan, with or without modifications, ❺. As far as the body is concerned, in the front end it has been possible to retain the chassis rails, wheelhouses, bulkhead frame and tunnel with a cut in the rear area. It is a special feature of this vehicle in the MPV segment that the unitary body, ❻, has allowed the front and four-wheel drive variants (4MOTION) to be implemented without any customer-relevant restrictions in the interior.

AERODYNAMICS

Intensive investigations were required in order to achieve a low air resistance or drag coefficient (c_d), and these were carried out from an early stage of development. At Volkswagen, aerodynamic optimisation starts with the airflow calculation, ❼. Numerical investigations of different design drafts allowed their aerodynamic properties to be evaluated without the need to produce physical models. Details that did not actually exist at this early stage were taken into account. In addition, by use of computers it was relatively straightforward to undertake wide-ranging variations and potential studies, which would have led to delays in the development process, had it been

❽ Measurement in the wind tunnel



❾ Aerodynamic-optimized rear part

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necessary to try them out on design models in the wind tunnel. The numerical aerodynamics are particular suitable for optimising the basic shape due to these properties.

As soon as the large number of design drafts had been pared down and the development status achieved in this phase then calculations were supplemented by measurements in the wind tunnel, ❽. A wind tunnel model with a 1:1 scale was produced especially for this purpose and also included details such as the radiator, engine compartment and underbody. This made it possible to achieve precise modelling as well as rapid and reliable assessment of details. Once the outer shape had been largely defined in cooperation between the design and aerodynamic teams, the next step was to move onto details. In this way, the coefficient of air resistance of the new Sharan was able to be reduced by 5 % compared to its predecessor, achieving a drag coefficient of $c_d = 0.299$. This puts it in the lead with comparable competitors in this segment, ❾.

The shape of the A-pillars with optimised water-catching profile in the new Sharan means that the airflow is deflected from the windscreen to the side windows with little loss, ❿. By rendering the airflow visible, it becomes apparent that even a small A-pillar eddy such as generated by the Sharan can be tracked back as far as the trailing area behind the complete vehicle. The A-pillar in the Sharan therefore contributes to low air resistance, low wind noise levels and good visibility to the exterior windows when driving in the rain. The A-pillars designed with aerodynamics in mind influence the airflow onto the exterior mirrors, therefore the vehicle and mirror aerodynamics had to be optimised in parallel.

Exterior mirrors were developed in order to reduce air resistance and wind noise, as well as being largely unsusceptible to contamination build-up. The shape achieved not only provides a smaller drag coefficient (c_d), but also reduces the amount of raindrops on the side windows when driving in the rain. Furthermore, the shape of the mirror base matches the floor plan in order to reduce the wind noise. As shown in ⓫, the mirror has been shaped so there is no fanning out of the trailing airflow behind the housing. The trailing airflow tapers relatively quickly, as can be seen by its light grey core which ends in a point, something that is a characteristic of low additional resistance.

The design of the sills also offers aerodynamic advantages. They make it possible to get into and out of the vehicle comfortably. As far as their basic shape is concerned, they also control the airflow onto the rear wheels, thereby reducing the air resistance of those wheels. Spoilers and trims on the underside of the vehicle have been designed to guide the airflow under the Sharan with little loss, thereby reducing air resistance at the same time as cooling the powertrain and the brakes. The test results achieved indicate that the Sharan offers wind noise levels which are also well below those of its predecessor.

❿ A-pillar with low-loss flow deflection

⓫ Design of the exterior mirror