

Electronics at the wheel

## 2 km of wiring weighing 42 kg – the neurons and arteries of the SEAT Ateca

- / The interior of a vehicle contains more than 1,350 wires that work like the central nervous and circulatory systems of the human body
- / Wires ranging from one millimetre to one centimetre in thickness are behind the car's lighting, sound system or driving assistants like the blind spot detector
- / Up to 100 sensors and control units interact with each other whenever a vehicle function is activated

**Martorell, 14/02/2019.** – A complex arrangement of wires more than 2.2 km long flows through the SEAT Ateca like the set of arteries, veins and capillaries of a human body. These electronics enable our vehicle to respond in a fraction of a second when we activate any of its functions. Below we take a look at a car's nervous and circulatory systems:

- **An electrical grid that shapes its silhouette:** Models such as the SEAT Ateca contain more than 1,350 wires which, when laid out in a straight line, would stretch more than 2,200 metres in length, similar to an airport runway. They branch off into more than 30 circuits that **“ensure the operation of nearly every car function and transfer power from location to another, just like blood flowing through an organism”**, says Pedro Manonelles, an engineer at the SEAT Technical Centre. Most of the wiring is concentrated in the area of the front instrument panel, where over 200 wires form strands of more than 4 centimetres in thickness.

- **Up to 100 sensors and control units:** These devices interact with each other in the same way as the human body. In the same way as the brain sends an instruction signal to move your hand and it obeys, this system **“activates functions such as the stability control, the guided parking, driving modes, the sound system or the blind spot detector”**, the expert explains.

- **Like copper arteries:** All the wiring on a car such as the SEAT Ateca weighs slightly more than 40 kg. **“Copper is the most widely used metal for electrical conduction, but its high density, which is greater than that of iron, makes us optimise its use in order to achieve the biggest possible weight reduction”**, says Pedro. The thickness of each wire is also a factor, and they range between one millimetre and a little over one centimetre thick.

- **Three years of development:** This is how long it takes a team of 20 engineers to define the routing of the wires, the power distribution and the data transmission among control units and sensors. **“We work together with the designers, from the initial sketches to the start of production. The challenge is not to compromise the design or the functionality of the electrical system”**, comments the expert.



- **Wires that protect:** Assistants such as the blind spot detector are an example of how the car's electronic system works. When the driver activates the left turning indicator, a signal travels from the main control unit to the rear mounted radars in a fraction of a second. If there is a car in the blind spot that the driver cannot see, the radars will detect it and activate and send a warning light to the door mirror. Thanks to this alert, the driver knows whether it is safe to change lanes.

The 90s was a key decade in the development of consumer electronic systems and cars also evolved with increasingly complex circuits. In some of today's SEAT models there are more than 12,000 unique wiring combinations, and this figure could increase in the future.

**SEAT** es la única compañía que diseña, desarrolla, fabrica y comercializa automóviles en España. Integrada en el Grupo Volkswagen, la multinacional, con sede en Martorell (Barcelona), exporta el 80% de sus vehículos y está presente en más de 80 países de los cinco continentes. En 2018, SEAT vendió 517.600 coches, la mayor cifra en los 68 años de historia de la marca.

El Grupo SEAT cuenta con más de 15.000 profesionales y tiene tres centros de producción: Barcelona, El Prat de Llobregat y Martorell, donde fabrica el Ibiza, el Arona y el León. Además, la compañía produce el Ateca y el Toledo en la República Checa, el Tarraco en Alemania, el Alhambra en Portugal y el Mii en Eslovaquia.

La multinacional cuenta con un Centro Técnico que se configura como un hub del conocimiento que acoge a 1.000 ingenieros orientados a desarrollar la innovación del primer inversor industrial en I+D de España. SEAT ya ofrece la última tecnología en conectividad en su gama de vehículos y está inmersa en un proceso de digitalización global de la compañía para impulsar la movilidad del futuro.

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