

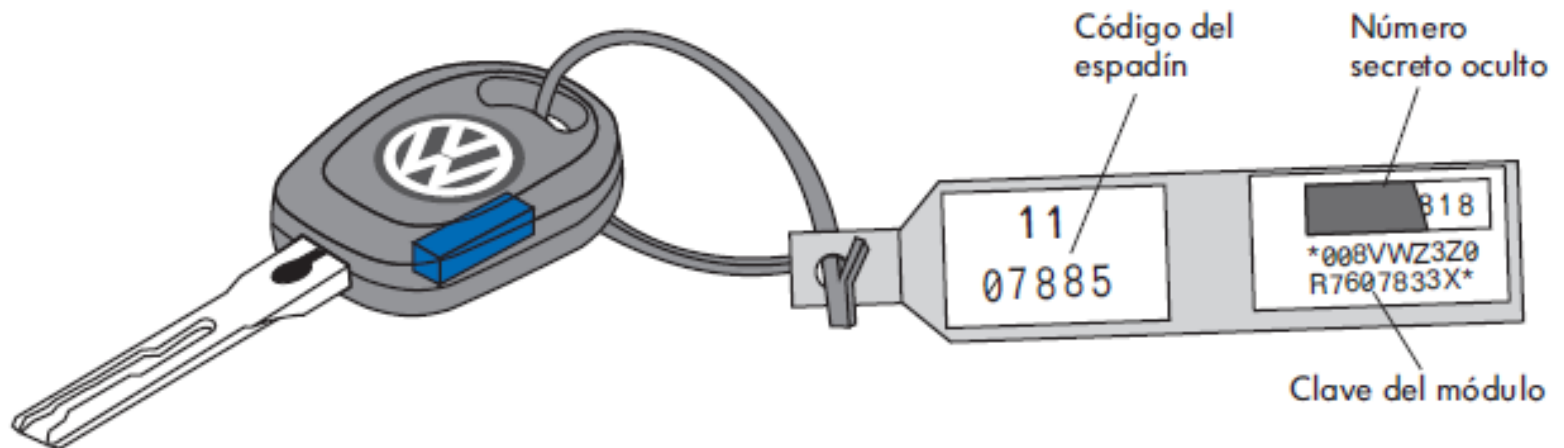


Immobilizer

# Introduction

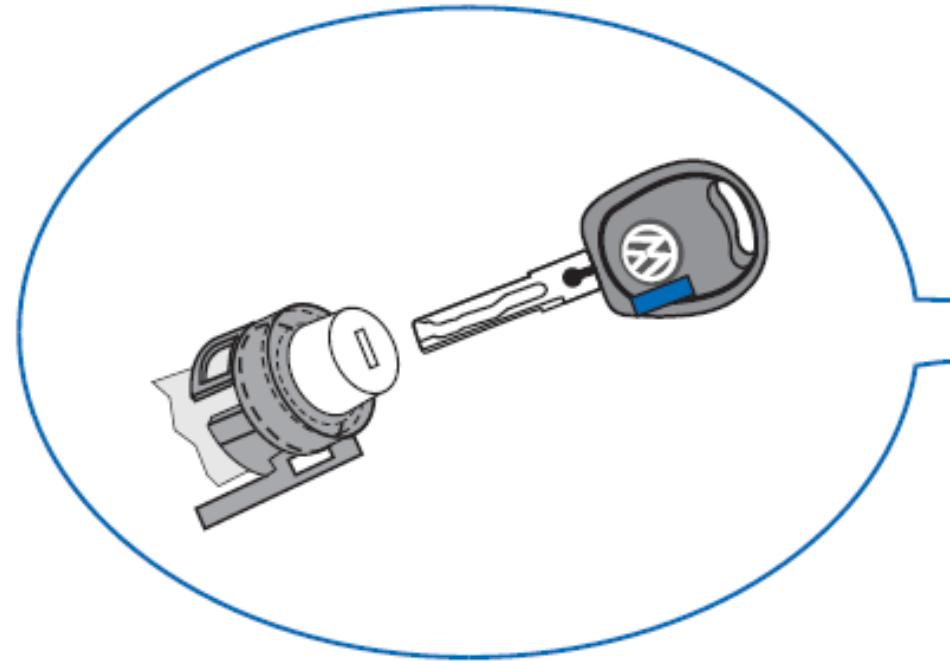
- This system immobilizes the vehicle by blocking the engine control unit (injection and ignition).

- The immobilizer does not require manual activation, being automatically activated when the ignition is switched off the engine, ie the vehicle is immobilized being virtually impossible to run the engine for those who have not programmed key.



- Activation, deactivation as immobilizer system is fully automatic, without the driver appreciates its connection or disconnection in any witness or component.

- Deactivation of the immobilizer system, occurs only when the key in the ignition switch is one of the keys programmed to the vehicle.



- Identifying the correct key is performed by the reading unit located in the ignition switch and connected to the immobilizer module.

- The immobilizer system for safety, performs a process of recognition of the locking of the motor (the control unit or the fuel cut solenoid valve), it being necessary to allow permanent start up the engine.

- The process is performed by a data transmission via an electrical connection between the locking element and the immobilizer module.



- Once you identified the two elements, unlock the immobilizer system engine start, being able to drive the vehicle.

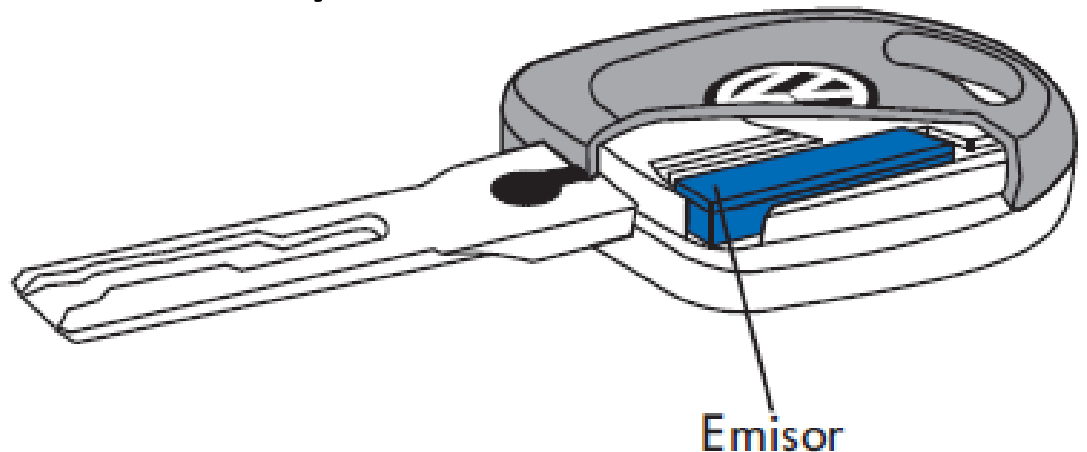
- System crash occurs when the immobilizer module does not recognize any of the two components.

- Blocking is done about 2 seconds after giving the starting time during which the engine start-up is possible, but stopping automatically once after that time, being unable circulation of the vehicle.

# Transmitter and receiver

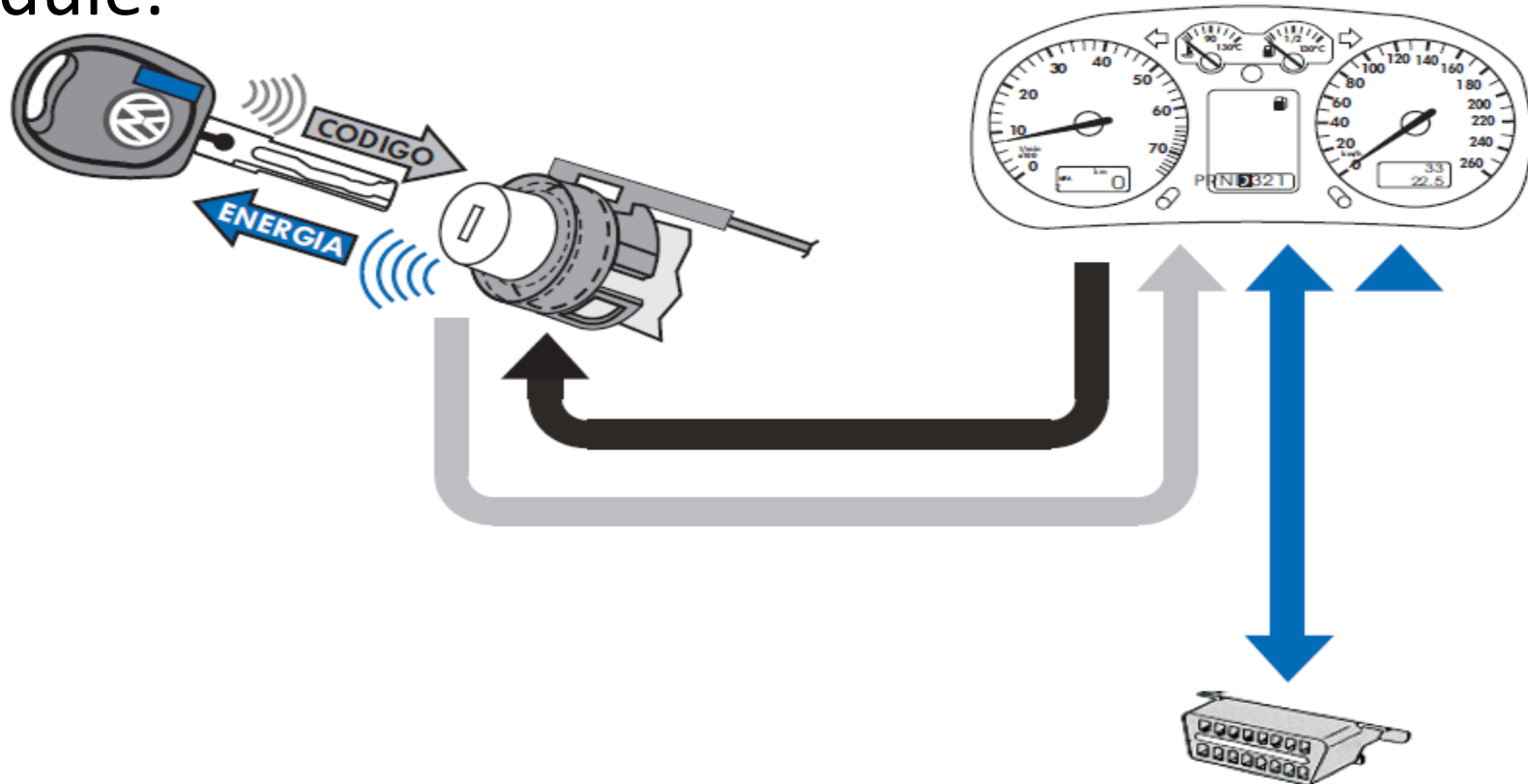
## Key

- The vehicle leaves the factory with two or three keys, these being the only ones that allow the implementation of the engine permanently, thanks to the emitter circuit that allows recognition of it by the immobilizer module.



- The transmitter circuit has no internal power supply for power approaches the magnetic field generated by the coil, which is integrated into the reading unit.

- Once powered, the transmitter circuit emits a radio frequency signal, which is picked up by the reading unit, being transformed into an electrical signal toward the immobilizer module.



- • The encoding with the inner keys can not be modified, however possessing code can be entered into memory of any immobilizer module, thus allowing deactivation system.
- To make this process is necessary the secret number, which is solely in the hands of the customer.

- In case of failure of the key, the immobilizer system will not allow the setting up of the engine permanently, because the module does not receive any code.



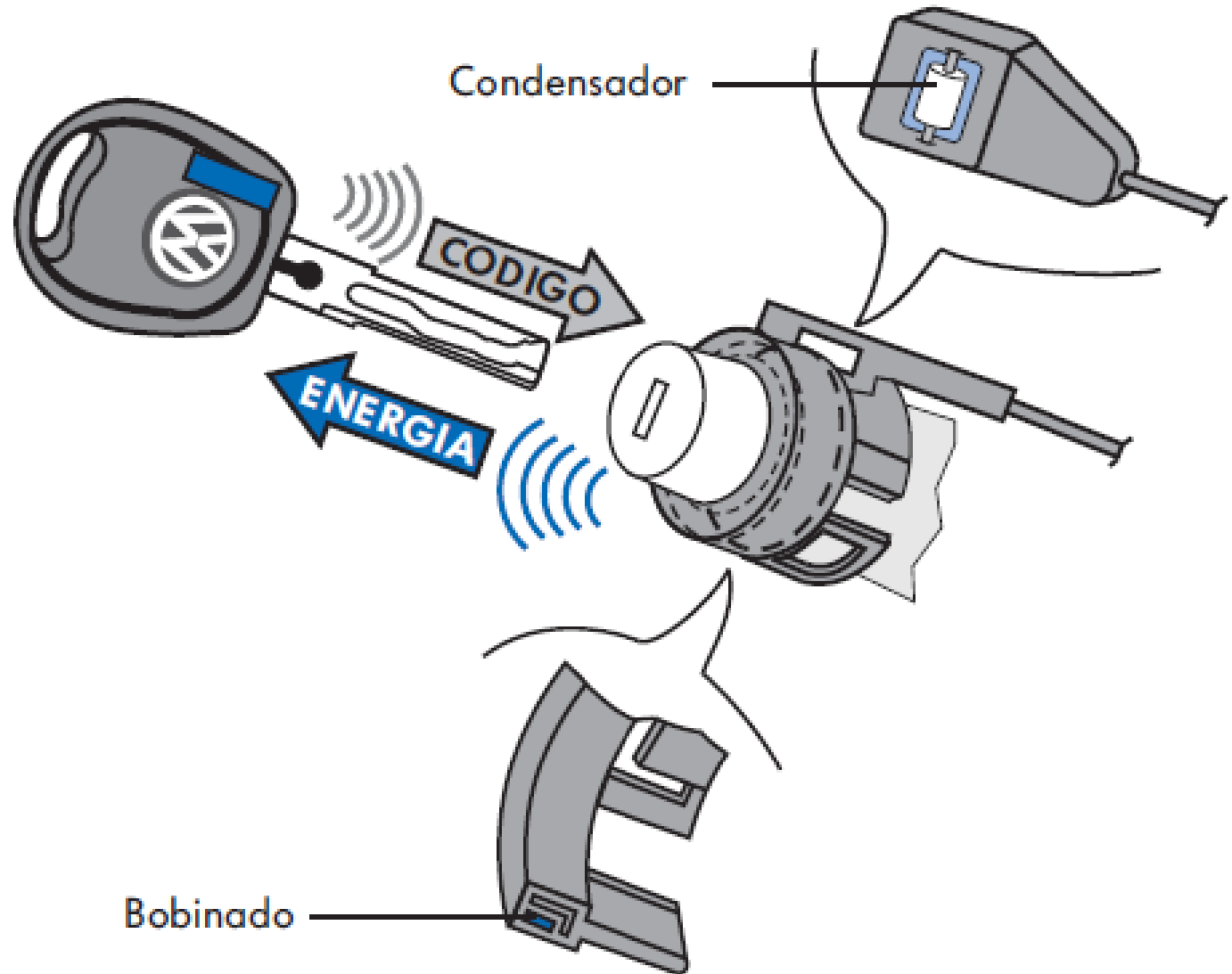
- Vehicle start may be paid by any other authorized keys to deactivate the immobilizer system.

- The signal emitted by the key is interpreted by the immobilizer module as a code.
- The receipt of this code by the immobilizer module is one of the necessary conditions for the release becomes effective engine.

- The reading unit is located next to the ignition switch, enveloping the same bowler.
- The mission of the reading unit is to feed the key with tension and collect the code emitted by it.

- To do this, the unit contains a winding, and a capacitor charged with performing both functions.
- The coil receives power supply immobilizer module, generating a variable magnetic field which will feed the key in the ignition switch.

- Receiving the signal emitted by the key, it is performed by an integrated reading antenna unit.



- The electrical interconnection of the capacitor with the winding forming the antenna, this transforms the signal emitted by the key into an electrical signal toward the immobilizer module.
- The reading unit can be replaced without any additional programming work.

- The RF signal received by the reading unit, and transmitted to the immobilizer module is transformed by the same code.
  
- Recognition of this code is one of the necessary steps to enable commissioning permanent engine running conditions.

- In case of failure of the reading unit, the system will be completely blocked from being impossible start up the engine permanent inability to read the code of the key.
- Replacing the engine control unit carries additional programming work in the immobilizer module.



# System Operation

- The immobilizer system can distinguish three phases of operation, since the connection ignition occurs until the release of the system. These phases are as follows:
  - Recognition of the locking element
  - Recognition of the key.
  - Unlocking the engine.

# Recognition of the locking element

- The process begins when the motor locking element emits a signal by the "W" line to the immobilizer module, showing their readiness for the start of transmission of the locking code. This signal is emitted when the control unit detects the rotation of the motor.

- Once this signal received by the immobilizer module, it emits a signal towards the locking element, which confirms its willingness to receive from said code element.

- The locking element then begins with the issuance of the code, which will be compared in the immobilizer module with the code in its memory.

# Recognition of the key

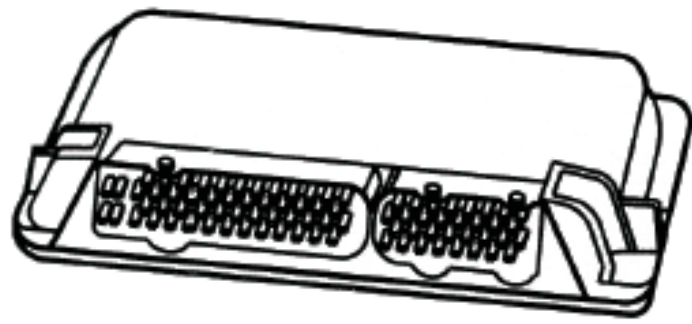
- The key in the ignition switch and contact position, emits a code via a radio frequency transmitter; this code is received by the reading unit and transmitted through an electrical junction towards the immobilizer module.

- The signal is interpreted by the module becoming a code, and verify that it is contained in the memory module.

# Unlock Engine

- The release for the launch of the engine occurs once have been recognized both codes, the key and the engine locking

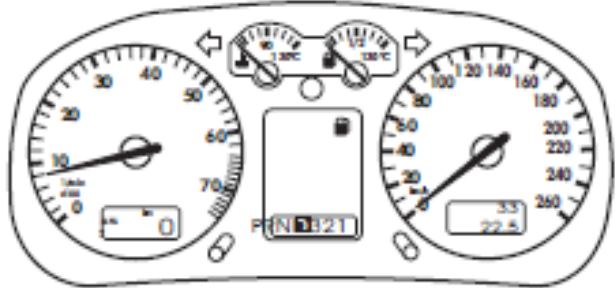
• The immobilizer module then sends an unlocking signal for diagnostic line "W" being the



Unidad de mando



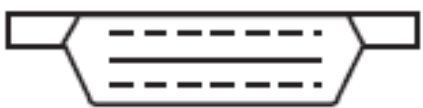
CABLE W



Cuadro de instrumentos



CABLE K



Conector de diagnóstico

locking element from in readiness for operation of the engine.



- If this final transmission is not made, being one of the wrong code or a fault in the immobilizer system, the engine will stop to spend about 2 seconds from the start of the transmission; this time is needed to perform the entire data transmission.

- From this moment the system will be locked being impossible to start the engine.

# Autodiagnóstico

- El módulo del sistema inmovilizador dispone de un completo sistema de autodiagnóstico, que vigila los diferentes componentes que forman parte del sistema y la transmisión de datos existente entre los mismos.

- If malfunctions occur in the components or data transmission, they are stored in permanent memory fault immobilizer module.
- Thanks to the self-diagnosis is possible rapid analytical assessment of the entire immobilizer system, with the support of measuring equipment.