Functional description of bus systems

The **bus system** is a group signal line system on which the exchange of data or messages takes place. A bus makes it possible to connect a central module (master) with a large number of independent control units. All units are connected in parallel to the bus line.

The **diagnosis bus(D-bus, TXD link)** transmits data between the DIS and a control unit. The control unit to be subject to diagnosis is selected by sending a diagnosis telegram to the control unit address. In this way, on request of the tester, the control unit can convey status information and the contents of the fault code memory or activate a control unit output.

The data flow of the indicator instruments and audio system mainly takes place via the **instrumentation bus (I-bus)** . For instance, the data for the check control module, on-board computer, IKE display, multi-information display, navigation, radio and the telephone are transmitted on this bus.

The **body bus (K-bus)** is responsible for the data exchange of telegrams that are required throughout the system. For instance, the ZKE and the IHK are connected to the K-bus. The K-bus is technically identical to the I-bus.

The general module is the central module of the **peripherals bus (P-bus)** . Peripheral modules interconnected by means of the P-bus are installed in locations where the scope of wiring is particularly extensive, e.g. doors. The functions of the ZKE (power windows, central locking, etc.) are controlled via the P-bus. The data are sent from the ZKE via the P-bus to the corresponding peripheral module from which the individual components are activated.

The IHK stepper motors are controlled via the **motor bus (M-bus)** . The IHK sends telegrams that activate the stepper motor with the corresponding address.

Addressing conditions of control units

In principle, all control units in the vehicle can be addressed via the diagnosis function when the ignition is switched on.

The busses are capable of exchanging information among each other via the **IKE control unit (instrument cluster electronics)** . It contains the electronic control for the entire signal conditioning function and calculating the data from the instrument cluster and on-board computer. The IKE is the bus master for the I-bus/K-bus. It serves as a **gateway** for the D-bus that converts the telegram format of the I/K-bus to the format of the D-bus. It transmits and receives data from all modules and control units connected to the IKE via the bus systems. If, for example, the independent park ventilation function is activated at the MID, this telegram must be routed via the I-bus, IKE and K-bus to the IHK that then carries out the corresponding function. In this case, only data are allowed to pass through that, according to the address, are designated for the other bus.