

## Car Access System

E60, E61, E63, E64, E70, E81, E87, E90, E91, E92, E93



### Introduction

The Car Access System (CAS) controls access to the vehicle.

The CAS control unit is the master control unit, e.g. for the following systems:

- Electronic immobiliser
- Central locking system
- Comfort Access
- Electronic steering lock
- Power windows

The CAS is constructed differently in the various model series.

> E60, E61, E63, E64 until 09/2005:

The CAS and the ignition starter switch are 2 separate components.

> E60, E61, E63, E64 from 09/2005:

Ignition starter switch and conventional ignition key discontinued. The slot for the remote control and the START/STOP button are new features.

> E70, E81, E87, E90, E91, E92, E93 from start of series production:

Slot and START/STOP button

> E60, E61, E63, E64 until 09/2005: [System overview ...]

> E60, E61, E63, E64 from 09/2005: [System overview ...]

> E70: [System overview ...]

> E81, E87, E90, E91, E92, E93: [System overview ...]

### Brief description of components

The CAS consists of the following components:

- **CAS control unit**

The CAS control unit is the master control unit for a number of systems.

The CAS control unit is connected directly to the K-CAN (Body CAN).

[more ...]

- **Ignition starter switch**

> E60, E61, E63, E64 up to 09/2005

The ignition starter switch switches the individual terminals of the ignition lock.

Four Hall sensors are installed in the ignition starter switch. The Hall sensors read out the terminal status. The signals are forwarded to the CAS control unit.

[more ...]

- **START/STOP button and slot**

The ignition switch has been replaced by the START/STOP button and the slot for the remote control.

[more ...]

- **Electronic steering lock**

The electronic steering lock replaces the conventional mechanical steering lock.

The electronic steering lock is located directly on the steering column.

The electronic steering lock consists of a drive with gearing and locking pin. Electromechanical unlocking and locking is controlled by the CAS.

[more ...]

*Note: Electric steering lock discontinued*

The electric steering lock is discontinued on the following vehicles:

- E90, E91, E92, E93 from 12/2006, only US version with automatic or manual transmission
- E60, E61 from 03/2007 with automatic transmission
- E63, E64 from 09/2007 with automatic transmission
- E70 from start of series production

## System functions

The CAS comprises the following functions:

- terminal control
- Comfort start
- Control of the electronic steering lock
- Remote control for central locking system
- Centralised control of the central locking system
- Centralised control of the power windows
- Centralised control for CA (Comfort Access)
- Waking of the MOST via the K CAN for a telematics service
- Centralised data source for the vehicle order and redundant data storage for vehicle data

## Terminal control

The CAS controls the following terminals via the ignition lock or START/STOP button and slot as follows:

- Terminal R

To maintain the starting capability of the vehicle, the CAS shuts down terminal R automatically. If the driver's door is opened and closed and no seat occupancy is detected, terminal R will be switched off after 16 minutes.

- Terminal 15  
The CAS controls terminal 15 (= active positive) for all electrical systems.
- Terminal 15 wake-up wire  
When terminal 15 is switched on, the control unit on the PT-CAN are activated by the wake-up wire.
- Terminal 50L and 50L\_RS  
During the starting operation, terminal 50L is connected to the starter. Terminal 50R\_LS is connected to the SMG control unit for clutch control.
- Switched terminal 30g  
Some consumers (e.g. SZM, CVM) are now on terminal 30g rather than directly on terminal 30.  
Terminal 30g is switched by the CAS. Shutting down the consumers on terminal 30g reduces the off-load current.

### **Convenient-start system**

> E60, E61, E63, E64 up to 09/2005

The starter is only activated until the engine is running.

If the engine does not start, the starting procedure is aborted after approximately 30 seconds. When the engine is already running, the starter motor is prevented from starting up again (if the ignition key is turned again).

The CAS holds the rolling code for the electronic immobiliser (EWS). This rolling code is transferred between the CAS and the DME control unit or DDE control unit. The DME control unit or DDE control unit does not enable the ignition or fuel injection until a valid rolling code (authorised ignition key) is detected.

> E70, E81, E87, E90, E91, E92, E93 and E60, E61, E63, E64 from 09/2005

The starting procedure begins when the START/STOP button is pressed. The starter is only activated until the engine is running. If the engine does not start, the starting procedure is aborted after approximately 60 seconds. Only the driver's commands are picked up by the START/STOP button. The starting procedure is controlled by the CAS control unit.

The CAS will only carry out an engine start if all start conditions have been met. If a condition ceases to be met during the starting procedure, the starting procedure will be aborted.

### **Control of the electronic steering lock**

> E81, E87, E90, E91, E92, E93 and E60, E61, E63, E64 from 09/2005

After authentication by the CAS, current is applied to the electronic steering lock. Only at this point can the lock be unlocked or locked.

The engine may only be started if the electronic steering lock has been unlocked and secured.

The electronic steering lock can only be locked when the vehicle is stationary and the engine has been stopped.

If no unlocking procedure or locking procedure is carried out, the electronic steering lock is rendered free of current and deadlocked.

#### *Note: Electric steering lock discontinued*

The electric steering lock is discontinued on the following vehicles:

- E90, E91, E92, E93 from 12/2006, only US version with automatic or manual transmission
- E60, E61 from 03/2007 with automatic transmission
- E63, E64 from 09/2007 with automatic transmission
- E70 from start of series production

### **Remote control for central locking system**

The remote control is used to operate the central locking and various additional functions.

The radio signals from the remote control are received by the remote control receiver and transferred to the CAS control unit.

Radio transmission of the remote control commands is encoded using a rolling code. This encoding rules out any possibility of manipulation.

The CAS manages the rolling codes of up to 10 remote controls.

During the vehicle unlocking procedure, the rolling code stored in the remote control is sent to the CAS. The CAS assigns a personal ID code to every remote control.

The CAS can assign up to 4 personal ID codes. If there are more than 4 remote controls, personal ID codes are assigned more than once. Which personal ID code is assigned to which remote control can be chosen at will.

The personalisation number controls the defaults encoded in the key memory. The CAS transfers the personalisation number to the control units on the data buses. The settings for the key memory are stored in the relevant control units.

### **Centralised control of the central locking system**

The CAS control unit is the master control unit for the central locking system.

Depending on the control request, the CAS decides whether the central locking should be unlocked, locked or deadlocked.

> E60, E61, E63, E64 up to 09/2005

The central locking system for the front doors is controlled by the door modules (driver's side door module and passenger's side door module). TMFA stands for driver's door module. TMBF stands for front-passenger door module.

The central locking of the rear doors, the tailgate, the rear window (E61 only) and the fuel filler cap is actuated by the body basic module (KBM). The appropriate commands are delivered on the data buses.

> E60, E61, E63, E64 from 09/2005

The central locking of the front doors is controlled by the body gateway module (KGM). The door modules and the **byteflight** are discontinued.

The central locking of the rear doors, the tailgate, the rear window (E61 only) and the fuel filler cap is actuated by the body basic module (KBM). The appropriate commands are delivered on the data buses.

> E70, E81, E87, E90, E91, E92, E93

The central locking of the doors, the tailgate, the rear window (E91 only) and the fuel filler flap is actuated by the junction box electronics (JBE) and by the footwell module (FRM).

### **Centralised control of the power windows**

The CAS is the master control unit for the power windows.

Because of the various national versions, the functions of the power windows are heavily dependent on the encoding.

> E60, E61, E63, E64 up to 09/2005

The power windows in the front doors are actuated by the door modules (TMFA and TMBF).

The window lifters for the rear doors are actuated by the body basic module (KBM). The appropriate commands are delivered on the data buses.

> E60, E61, E63, E64 from 09/2005

The power windows in the front doors are controlled by the body gateway module (KGM). The door modules and the **byteflight** are discontinued.

The window lifters for the rear doors are actuated by the body basic module (KBM). The appropriate commands are delivered on the data buses.

> E70, E81, E87, E90, E91, E92, E93

The power windows in the doors are actuated by the junction box electronics (JBE) and by the footwell module (FRM).

## **Centralised control for CA (Comfort Access)**

With Comfort Access, an ID transmitter is needed instead of the usual remote control.

The ID transmitter also performs standard remote control functions.

Comfort Access can be used to carry out the following functions:

- **Passive Entry**  
Opening the vehicle or luggage compartment without actively using the ID transmitter
- **Passive Go**  
Engine start without actively using the ID transmitter
- **Passive Exit**  
Closing the vehicle without actively using the ID transmitter

The CAS control unit is the master control unit for all functions carried out via Comfort Access. Vehicles with Comfort Access are fitted with a CA control unit.

## **Waking of the MOST via the K CAN for a telematics service**

The telephone control unit wakes up cyclically in order to check for receipt of a new request from the telematics (e.g. an SMS text message to switch on the auxiliary heating).

The MOST network is a closed ring only. For it to work, all bus participants in the MOST network must be "awake".

As a control unit in the MOST network, the telephone control unit is not able to wake the MOST.

The CAS sends the trigger signal from the telephone control unit via the K-CAN to wake the multi-audio system controller (M-ASK). The M-ASK then wakes the MOST. Only now can the telephone control unit check whether a telematics service needs to be executed.

## **Centralised data source for the vehicle order and redundant data storage for vehicle data**

The vehicle order is stored in the CAS. The vehicle order describes the vehicle model, the national version and the items of optional equipment.

The following data is stored in the CAS redundantly with the instrument cluster (see also Notes for service staff):

- Vehicle identification number
- Odometer status
- Data for Condition Based Service (CBS)

The vehicle identification number and odometer are used to prevent manipulation. CBS data are important for regular servicing. CBS data must not be lost.

CBS data are updated in the ignition key or remote control within a driving cycle.

A driving cycle is defined by:

- First updating carried out if:
  - Terminal 15 ON
  - and speed above 50 km/h at least once and  
from 09/2005: once over 41 km/h
  - and speed drops back to below 30 km/h  
from 09/2005: below 39 km/h
- The data is updated again if:
  - Distance driven exceeds 10 km
  - and speed above 50 km/h at least once and  
from 09/2005: once over 41 km/h
  - and speed drops back to below 30 km/h  
from 09/2005: below 39 km/h

In addition, a concealed service function can be used to update the CBS data on the ignition key or remote control:

- Insert remote control -> Press and hold down central locking button -> Switch terminal 15 on

### **Notes for service staff**

The following information is provided for service staff:

- General note: [more ...]
- Diagnosis: [more ...]
- Encoding/programming:[more ...]

Subject to change.