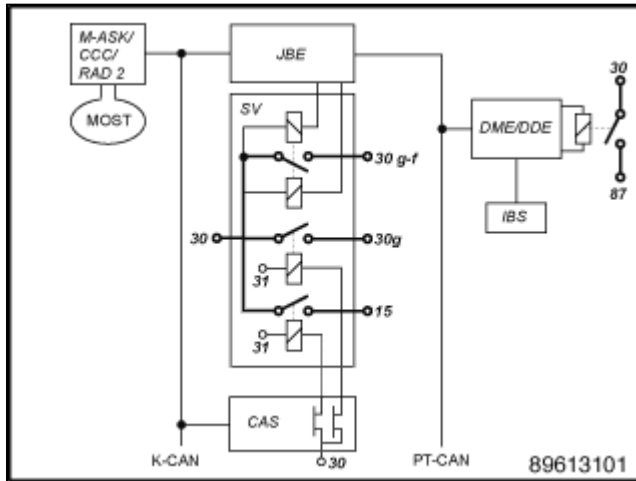


Energy diagnosis: Terminal control

The terminal control is distributed across various control units. The following block diagram provides an overview of the control units involved and the integration in the vehicle electrical system.



JBE	Junction Box Electronics
SV	Distribution box from the Junction box
CAS	Car Access System
RAD2	Radio 2 (depends on level of equipment)
M-ASK	Multi Audio System Controller (depends on level of equipment)
CCC	Car Communication Computer (depends on level of equipment)
DME	Digital Engine Electronics
DDE	Digital Diesel Electronics
IBS	Intelligent battery sensor (depends on level of equipment)
K-CAN SYSTEM	Bus system for body functions
MOST	Bus system in the area of audio and communication

	(depends on level of equipment)
PT-CAN	Bus system for power train and chassis functions

There are the following terminals:

Terminal 30:

Terminal 30 is routed from the battery terminal via the safety battery terminal to the front distribution box. As soon as the battery is connected to the terminals, terminal 30 is live. Terminal 30 is at approx. 40 fuses of the distribution box.

Control units supplied by terminal 30:

AL	Active steering (up to model year 03/2005)
AHM	Trailer module (up to model year 03/2007)
CA	Comfort Access (up to model year 09/2006)
CAS	Car Access System
CDC	CD changer (up to model year 09/2004)
DME	Digital Engine Electronics
DDE	Digital Diesel Electronics
DWA	Antitheft Alarm System
EGS	Gearbox control (up to model year 03/2005)
EPS	electromechanical power steering
EKP	Electric fuel pump (up to model year 03/2005)
FRM	Footwell module
FZD	Roof Function Centre
JBE	Junction Box Electronics
KOMBI	Instrument cluster (up to model year 03/2007)
MRS5	Multiple restraint system

SH	Independent heating (up to model year 03/2005)
SMBF	Passenger seat module (up to model year 09/2006)
SMFA	Driver seat module (up to model year 09/2006)
SMG	Sequential manual gearbox (up to model year 03/2005)
SZL	steering column switch cluster

Terminal 30g:

Terminal 30g is controlled by the CAS. When the overall vehicle is wakened by an operation of the user, terminal 30g is switched on. Terminal 30g is automatically switched off after a codable after-run time (e.g. 30 minutes). The after-run time starts with the event terminal R Off. As in the case of terminal 15, a relay in the distribution box is activated by the CAS via a semiconductor switch. The relay of terminal 30g switches the battery voltage to approx. 18 fuses in the distribution box.

Control units supplied by terminal 30g:

ACC	Active cruise control
AL	Active steering (as of model year 09/2005)
AMP	Amplifiers
CDC	CD changer (as of model year 12/2004)
CID	Central Information Display
CON	Controller
CVM	Convertible top module
DSC	Dynamic Stability Control
DAB	Digital tuner
EGS	Gearbox control (as of model year 09/2005)
EKP	Electric fuel pump (as of model year 09/2005)
IHKA	Integrated automatic heating and air conditioning system

Terminal 30g-f:

Terminal 30g-f is a terminal 30 that is only switched off if faults are detected.

Terminal 30g-f only exists if a bistable relay is fitted. The relay is not visibly arranged in the distribution box. As a rule, the bistable relay is only fitted together with the IBS.

On vehicles with CCC, M-ASK or independent heating, a relay of this kind is fitted. On some equipment variants with TCU, a bistable relay is also fitted.

On vehicles without terminal 30g-f, the corresponding fuses are supplied with terminal 30g.

The JBE controls terminal 30g-f via a bistable relay in the distribution box. The bistable relay can be switched off or on. As a rule, the bistable relay is always switched on. The bistable relay has two relay coils and it always remains in the last state activated (switched on or switched off).

The following three faults exist in which terminal 30g-f is switched off:

- **Up to model year 09/2006:**

1. As of approx. 60 minutes terminal R off, the DME/DDE starts a closed-circuit current measurement using the IBS. When the DME/DDE determines a closed-circuit current fault, this wakes up the vehicle and sends a message for cutoff of terminal 30g-f. The JBE receives the message and switches the bistable relay off.
Increased closed-circuit current due a switched-on auxiliary consumer unit is not a closed-circuit current fault for the DME/DDE. Nonetheless, terminal 30g-f is switched off even if the starting capability limit is reached. The command for cutoff of terminal 30g-f is also issued in this case by the DME/DDE.
2. As of terminal R off, the JBE monitors whether the vehicle is able to go into the idle state. The vehicle can only enter the idle state when all the control units are ready for this. If not all control units have signalled this readiness approx. 30 minutes, the JBE switches terminal 30g-f off. The JBE also stores all the control units in the energy history memory that have not signalled readiness for the idle state.
3. A few minutes after terminal R off, the vehicle has normally switched into the idle state. As of the idle state, the JBE counts how often the vehicle is wakened. The JBE switches terminal 30g-f off when a vehicle has been wakened unexpectedly more than 30 times with terminal R off. The JBE also stores the maximum number of waking events in the energy history memory.

- **As of model year 03/2007:**

1. If an IBS is fitted, the power management in the DME/DDE monitors the closed-circuit current and the battery status. If the battery charge state is close to the starting capability limit, the vehicle is wakened and a message to reset or shut down terminal 30g-f is sent. The JBE regulates the bi-stable relay accordingly.
2. If the vehicle is wakened too often after shutdown of terminal 30g, the JBE switches terminal 30g-f off for approx. 10 seconds (reset). If the vehicle is still wakened after the reset, terminal 30g-f is switched off permanently until the next terminal change (shutdown).
3. If the vehicle does not go to sleep after shutdown of terminal 30g, the JBE switches terminal 30g-f off for approx. 10 seconds (reset). If the vehicle still does not go to sleep after the reset, terminal 30g-f is switched off permanently until the next terminal change (shutdown).

In all cases of cutoff, a fault is entered in the JBE. The cutoff of terminal 30g-f is independent of what triggered the detected fault. The cutoff is only an attempt to remedy the fault in the vehicle and prevent it from not starting. The cutoff of terminal 30g-f does not necessarily mean that there was a fault in a consumer unit of terminal 30g-f.

The switch-on condition for terminal 30g-f is switching on terminal R. For this reason, with terminal R or terminal 15, terminal 30g-f is always switched on.

Control units supplied by terminal 30g-f:

AHM	Trailer module (as of model year 09/2007)
CA	Comfort Access (as of model year 03/2007)
CCC	Car Communication Computer
CNAV	Navigation system China
JNAV	Japan navigation system
KNAV	Navigation system Korea
KOMBI	Instrument cluster (as of model year 09/2007)
M-ASK	Multi Audio System Controller
TCU	Telematic Control Unit (only US version)

Terminal 15:

Control of terminal 15 is by the CAS depending on operation of the start/stop button (with the key inserted in the key slot).

The gearshift mechanism of terminal 15 is switched in the CAS via semiconductor switch. A relay in the distribution box is activated via the output of a semiconductor switch. The relay switches the voltage of the battery to approx. 7 fuses in the distribution box. The consumer units of terminal 15 are essentially supplied from here.

Control unit supplied by terminal 15:

FLA	High beam headlight assistant
PDC	Park distance control

For safety reasons, some control units have a terminal 15 line directly from CAS, e.g. the FRM (footwell module).

Terminal 87:

The DME/DDE controls terminal 87 via a relay in the E-box. Terminal 87 is switched on as soon as terminal 15 is switched on. After terminal 15 has been switched off, terminal 87 is switched off by the DME/DDE with a slight delay.

No control units are supplied by terminal 87.

Terminal R:

Terminal R is not present as a hardware terminal. The status of terminal R is only communicated from CAS via

the bus systems.