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Dealer: -/-
Model: 740Li
Development code: G12
Model code: 7E23
Lead type: 7E23

Functional description

Closed current monitoring

FUB-FUB-FB-610009-K15 - V.8

Closed current monitoring

The power management with the intelligent battery sensor (IBS) monitors the standby current of the vehicle in rest state. If a standby current violation is detected, various measures take effect. These measures are intended to prevent the state of charge from reaching the startability limit.

The "flexible energy management and power management" function can be housed in different control units:

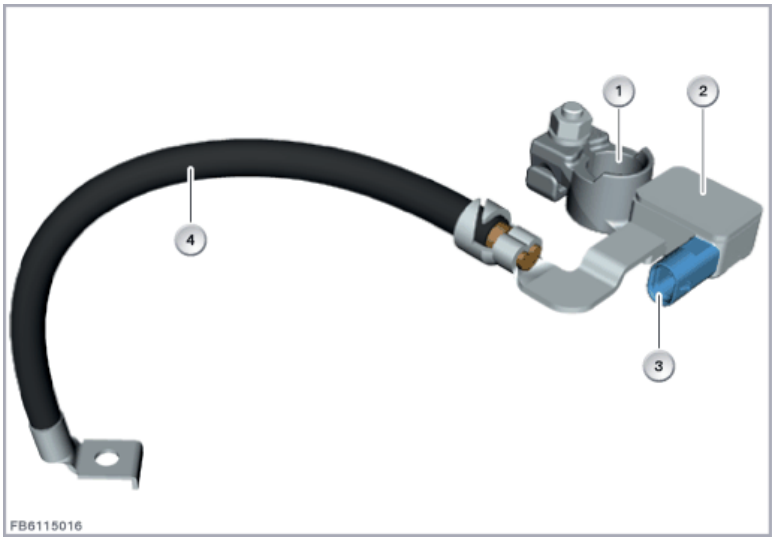
- SP2015SP2018: Digital Motor Electronics (DME), Digital Diesel Electronics (DDE) or Electrical Digital Motor Electronics (EDME)
- SP2018 Battery Electric Vehicle: Body Domain Controller (BDC)
- SP2021: Basic Central Platform (BCP)

Brief component description

IBS: Intelligent battery sensor

The intelligent battery sensor (IBS) is a mechatronic component with its own microprocessor for monitoring the battery condition. The IBS continuously measures the following values on the battery:

- Terminal voltage
- Charge current and discharge current
- Battery temperature



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	terminal		sensor
3	2-pin plug connection	4	Terminal 31L

The IBS is connected via a LIN bus for example, to the engine control (DME, DDE, EDME) for data transfers.

Example engine control: Digital Motor Electronics (DME), Digital Diesel Electronics (DDE) and Electrical Digital Motor Electronics (EDME)

The power management is carried out by the engine control unit. The power management uses the information from the IBS. Refer to following functional description: Power management

Terminal control

The terminal control controls the bi-stable relays of terminal 30F on request from the intelligent battery sensor (IBS) for standby current violation or reaching the startability limit.

System functions

The following system functions of power management with intelligent battery sensor (IBS) are described:

- Closed current monitoring

Closed current monitoring

A distinction is made between the following two cases for closed current monitoring:

- Rest state without auxiliary energy consumer units
- Rest state with logged on auxiliary energy consumers

The IBS starts the closed current monitoring 60 minutes after the idle state on the bus.

Rest state without auxiliary energy consumer units

After the start of closed current monitoring, the intelligent battery sensor measures the standby current. If the threshold value of 80 mA is exceeded, the IBS registers a standby current violation.

If the resulting electrostatic discharge of the battery is higher than 2 Ah (1 Ah for i vehicles), the following measures are carried out one after the other as long as there is a standby current violation:

- Reset of terminal 30F:

  The IBS reports a standby current violation and requests a reset of terminal 30F (brief change to PWF status "Park").

- Switch-off of terminal 30F: If there is still a standby current violation after resetting terminal 30F and reaching the idle state again, the intelligent battery sensor requests switch-off of terminal 30F (change to PWF status “Park”).

The power management saves a corresponding fault memory entry in the engine control. After turning the terminal 15 on again, the following Check Control message is displayed:

- Start engine. Energy management. (ID415)

The results of the last 12 closed current monitoring functions (value range of the standby current value and measures taken) are saved in the engine electronics:

- Standby current value with requested measure:
  - 0 to 80 mA (standard standby current in rest state)

    No measure (no standby current violation or caused discharge less than 2 AH)
  - 80 to 200 mA

    Action: Reset of terminal 30F
  - 200 to 1000 mA

Action: Switch-off of terminal 30F

- Over 1000 mA

  No measure but renewed standby current violation with terminal 30F switched off

Rest state with logged on auxiliary energy consumers

An auxiliary energy consumer is a consumer which can also be activated in the vehicle rest state and hence can have a standby current consumption outside the nominal range:

- Telematics control unit: active telecommunications, active telematics service, active emergency request
- Integrated automatic heating and climate system: stationary ventilation function, auxiliary heater function or residual heat function, blower interior temperature sensor coastdown
- Terminal control: lighting function (e.g. parking lights or parking lights). The lighting function is a legally required consumer.

All auxiliary energy consumers must log in with the power management if they want to perform a function in the idle state that requires a standby current consumption higher than the setpoint. This is necessary to avoid misinterpretation in the closed current monitoring. After the function is ended, a deactivation must take place.

If at least one auxiliary energy consumer unit is logged on, there is no closed current monitoring. In the rest state, the intelligent battery sensor then only monitors the battery state of charge. Depending on the battery state of charge, the power management performs the following measures:

- When the upper startability limit is reached: All auxiliary energy consumers except for the lighting function (safety-related) are requested to switch off. The power management also requests a switch-off of terminal 30B, if it is still active.
- Reaching the lower startability limit:
  - If no lighting function is active, the power management requests a switch-off of terminal 30F
  - If the parking lights or parking lights are active, there is no switch-off of terminal 30F. The parking lights or parking lights are then switched off after a period of 12 h has elapsed after PWF state "Park".
  - If the hazard warning lights function is active, terminal 30F and the hazard warning lights function are not switched off.

Notes for service

General notes

Note!

Troubleshooting only in the event of a standby current violation

In the event of a problem with increased standby current, first check whether additional retrofitted power consumers (e.g. hands-free system, navigation device, device for enabling the TV function during driving, cooler box, rodent repellent device, etc.) are connected to terminal 30, terminal 30F or directly to the battery.

If necessary, ask the customer if components have been retrofitted. Then perform an external standby current measurement and identify possible causes (control units connected to terminal 30 or terminal 30F) as follows: locate the power distribution and successively pull out fuses or disconnect the corresponding control units.