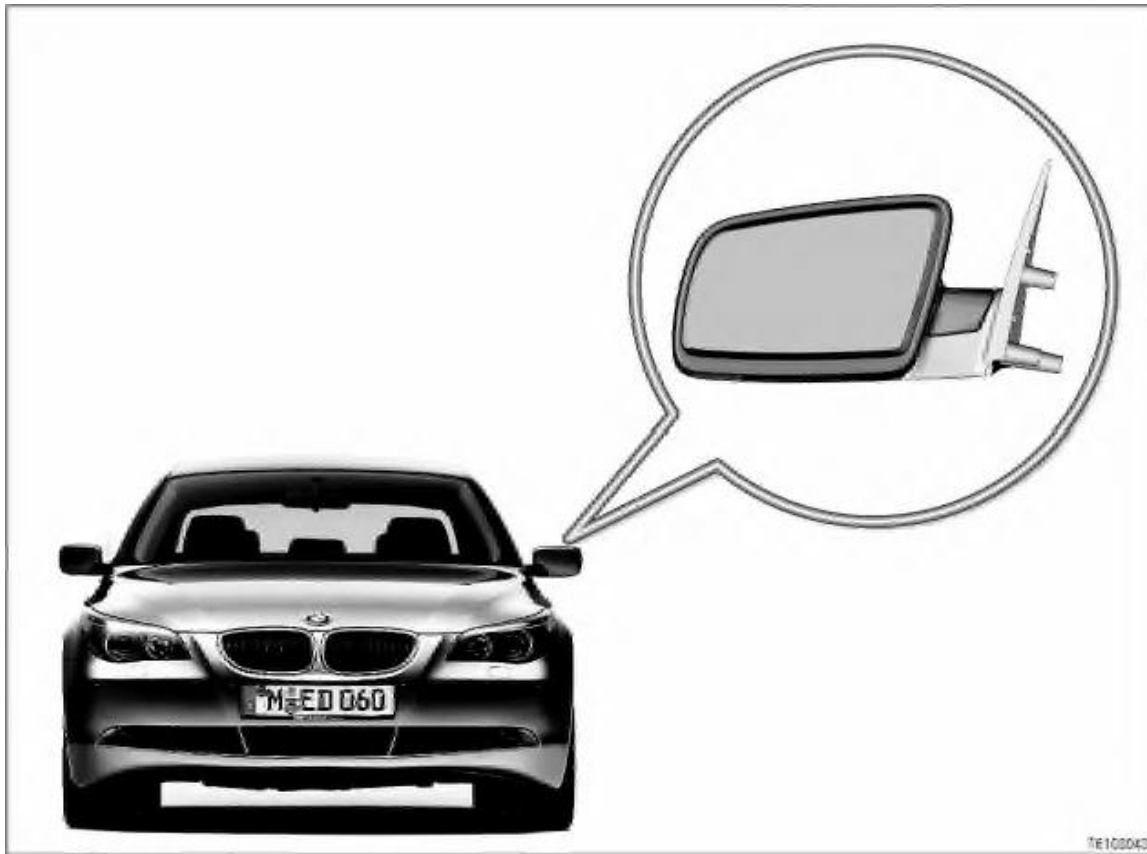


Door mirrors

E60



Introduction

Exterior mirrors are fitted as standard to the driver's and front-passenger door.

The door mirrors are controlled by the driver's door module TMFA or the front-passenger door module TMBF. The door modules communicate with each other on the **byteflight**. The door mirrors are adjusted centrally from the switch block in the driver's door. [System overview ...]

The following special equipments are available:

- Electrochromic rear-view mirror and electrochromic door mirrors (option 430)
- Door mirror memory in conjunction with seat memory (option 459)
- Lights package with courtesy lighting in the door mirrors (option 563)

The door mirror memory is controlled by the driver's seat module SMFA.

Brief description of components

The following components deliver an input signal for the electrical adjustment of the door mirrors:

- **Driver's door switch block**

The two door mirrors are operated from the driver's door switch block. The switch block is connected to the driver's door module TMFA by an LIN bus (LIN = Local Interconnect Network). [more ...]

- **Position potentiometer in door mirror**

The mirror glass is adjusted horizontally and vertically by separate motors. The position of the motors is detected by potentiometers. The position is sent to the relevant door module.

The following control units contribute to the operation of the door mirrors:

- **Driver's door module TMFA and front-passenger door module TMBF**

The door modules control the door mirrors. The driver's door module TMFA receives the request to operate the door mirrors sent from the switch block in the driver's door. [more ...]

- **Safety and gateway module SGM**

The safety and gateway module forms the gateway between the K CAN and **byteflight**.

- **Driver's seat module SMFA**

The driver's seat module SMFA activates the seat memory and the door mirror memory. The message is sent to the door modules on the K CAN.

- **Independent heating SH**

The independent heating control unit SH uses the K CAN to report independent heater operation. Door mirror heating is activated during independent heater operation.

The following information is also required:

- **Electronic transmission control EGS (with automatic transmission) or light module LM (with manual transmission)**

The reverse-gear signal is delivered by the transmission control (PT CAN) or the light module (K CAN). The reverse-gear signal is required for the automatic parking function.

- **Trailer module AHM**

The trailer module sends a signal indicating whether or not the vehicle is towing a trailer. The automatic parking function is deactivated if a trailer is detected.

The following motors are controlled to provide the door mirror functions:

- **Motors for adjusting the mirror glass horizontally and vertically**

One motor adjusts the mirror glass horizontally, another adjusts the mirror glass vertically. The mirror is adjusted by reversing the motor's direction of rotation.

- **Motor for folding in the mirrors**

The door mirror consists of a mirror base and mirror body. The motor for folding the mirror body in and out is fitted in the mirror base. The mirror is folded in and out by reversing the motor's direction of rotation.

- **Mirror heating**

The mirror heating defrosts the mirror glass in the door mirrors.

System functions

The door mirrors have the following functions:

- Horizontal and vertical adjustment
- Folding in and out
- Mirror heating
- Automatic parking aid
- Door mirror memory
- Safety functions
- Electrochromic door mirror (directly controlled by the electrochromic rear-view mirror, not by the door modules)

Horizontal and vertical adjustment of the door mirrors

It is possible to adjust the door mirrors from terminal R ON. Other conditions are: Door module active (no sleep mode), consumer shutdown not active.

The door mirrors can be adjusted in the horizontal and the vertical from a button pad (4 arrows = 4 directions). The button pad is located in the switch block in the driver's door. A slide switch switches between the driver's side and the front-passenger side.

It is only possible to adjust the mirror in either the horizontal or the vertical at any one time. No diagonal adjustment is possible.

No adjustment is possible with the door mirrors folded in.

The door mirror is moved as far as the mechanical stop while the button pad is pressed down in a certain direction.

The adjustment time is limited to a maximum of 10 seconds to protect the motors and the mechanisms. Once the maximum adjustment time has elapsed, it is not possible to adjust the door mirrors for another 10 seconds.

Folding in and out

The mirror bodies are folded in to the side window and pivoted upwards to reduce the width of the vehicle.

It is possible to fold the door mirrors when terminal R ON. Other conditions are: Door module active (no sleep mode), consumer shutdown not active.

It is not possible to fold the mirrors at speeds above 20 km/h.

Mirror folding is initiated by pressing a button in the switch block in the driver's door (for driver and front-passenger side). Pressing the button again after the mirror has folded in or out folds it back again in the opposite direction. An anti-repeat device has been integrated to prevent frequent folding of the mirrors (see Safety functions).

If the mirror body has been disengaged from the mirror base by an external force, the next time the button is pressed, each mirror body is moved in the "fold in" direction. The motor of the disengaged mirror body is controlled by lock detection until the mirror body engages in the mirror base. It is then necessary to press the button once or twice for synchronisation purposes (position of mirror body and position of mirror folding motor). The door mirrors are folded out again the next time the button is pressed.

Mirror heating

The heat output (percentage switch-on time) is controlled automatically. The heat output is dependent on ambient temperature and wiper intensity. If the wipers are operating, the heat output is increased to ensure reliable defrosting of the mirror glass.

Mirror heating is operational from terminal 15 ON.

Mirror heating is deactivated under the following conditions:

- Terminal 50 ON (load cut-off)
- Supply voltage below 10.8 V (switch-on at 11.6 V)
- Activation of a door mirror memory position

With the independent heating option:

The door mirrors are also heated when the independent heating is switched on even if terminal 15 is off.

Signal path:

Independent heating control unit => K CAN => Safety and gateway module SGM => **byteflight** => Door modules => Door mirrors.

Automatic parking function

The automatic parking function is only available in conjunction with the door mirror memory option.

To improve the view of the kerb, the mirror glass of the door mirror on the front-passenger side is folded downwards.

This function can only be performed under the following conditions:

- Slide switch for controlling the door mirrors set to the "driver's door" position
- No trailer coupled to the vehicle

The automatic parking function is activated:

- If terminal 15 ON
- 1 second after reverse gear is engaged

The automatic parking function is deactivated (mirror glass reverts to original position):

- If terminal 15 OFF
- If the slide switch for controlling the door mirrors is set to the "front-passenger door" position
- When reverse gear is disengaged

Manual control of the door mirrors is inhibited when the automatic parking aid is activated. The automatic parking function works regardless of whether the driver's door is open or closed.

Door mirror memory

The door mirror memory is an option and is part of the seat memory/steering column memory system.

The current positions of the door mirror on the driver's side and the front-passenger side are stored by:

- Memory buttons on the driver's seat control panel
- Ignition key (= remote control) with Key Memory

Each time the vehicle is locked, the current mirror position is stored in the memory of the active ignition key. This means that the mirrors are always adjusted to the last position when the vehicle is unlocked (depending on the ignition key used).

Pressing a memory button interrupts an adjustment activated by Key Memory.

Manual adjustment using the button pad in the driver's door switch block interrupts any adjustment initiated by a memory function.

The mirror memory function is independent of the terminal status.

Safety functions

- Block detection for mirror folding function:
Each door module has lock detection to protect the motors from overload.
If the drive is obstructed, the current in the motor increases. The door modules compare the starting current in normal operating mode with the current in the obstructed drive. An obstruction is detected by any difference in the current. The motor is no longer driven.
- Anti-repeat device:
To provide overheating protection for the motor, the mirror folding function is inhibited after a maximum running time of 45 seconds.
If the anti-repeat device is active, the door mirrors can be folded out again.
- Under-voltage shutdown:
The power supply to the door mirrors is monitored in the door module. All door mirror functions are locked if the voltage drops below 8.5 V. The functions are available again when the voltage rises above 9 V.

Electrochromic door mirrors

Electrochromic door mirrors automatically dim the mirror glass if a source of light from the rear is detected.

The electrochromic door mirrors are directly controlled by the electrochromic rear-view mirror.

The electrochromic rear-view mirror has 2 sensors that measure incident light from the front and the rear. A voltage signal is output (the strength of which depends on the difference in intensity between the light from the front and the rear) if the light from the rear is more intense. The greater the voltage signal, the more the mirror glass is dimmed.

Notes for service staff

Service staff should note the following points:

- General note: ---
- Diagnosis: ---
- Encoding/programming: ---
- Car and Key Memory: [more ...]

Subject to amendment arising from misprints, errors and technical modifications.