Table of Contents

E63/64 Body Electrical

Subject **Page**

Initial Print Date: 02/04 Revision Date:

Subject **Page**

Body Electrical

Model: E63/64

Production: Start of Production MY 2004

OBJECTIVES

After completion of this module you will be able to:

- Understand the electrical changes in t he E63/64
- Explain the operation of the sunroof
- Relate ASE changes to E63/E64
- Recognize SGS seat in the E64

Voltage Supply and Bus System

The vehicle electrical system of the E63/64 is essentially based on the electrical system of the E60. This documentation describes the differences in the power supply, bus systems and in the general vehicle electrical system compared to the E60.

In the E60/E63, an energy management function is responsible for the power requirements of the vehicle both while driving as well as when stationary.

The most important integral parts of the energy management system are:

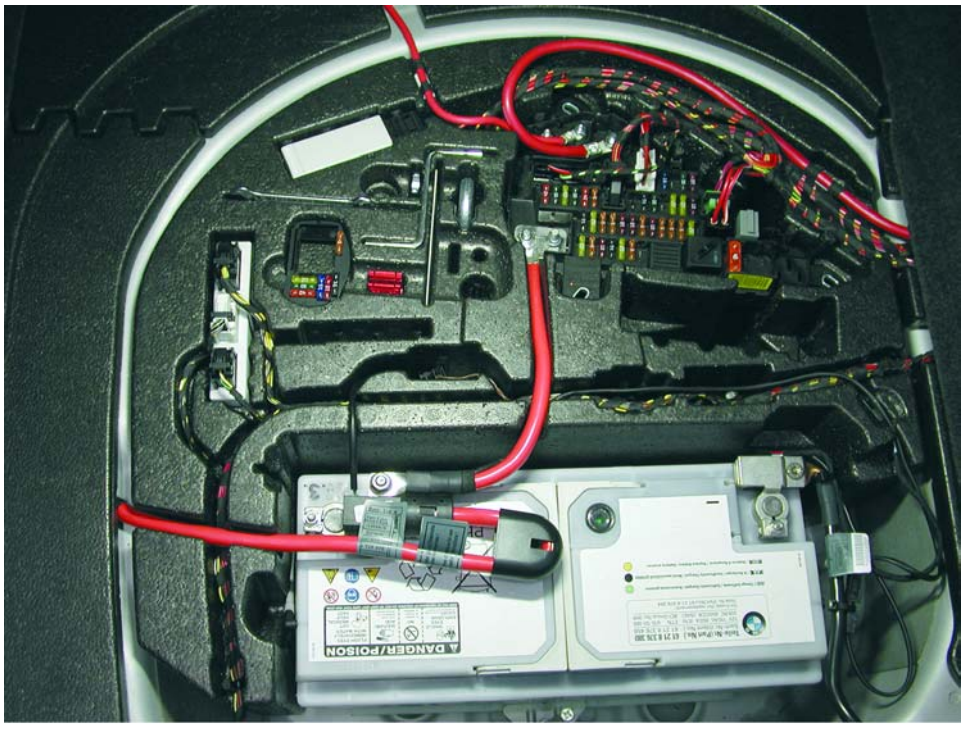
- Intelligent battery sensor IBS
- Power management software in the digital motor electronics DME or digital diesel electronics DDE and in the IBS.

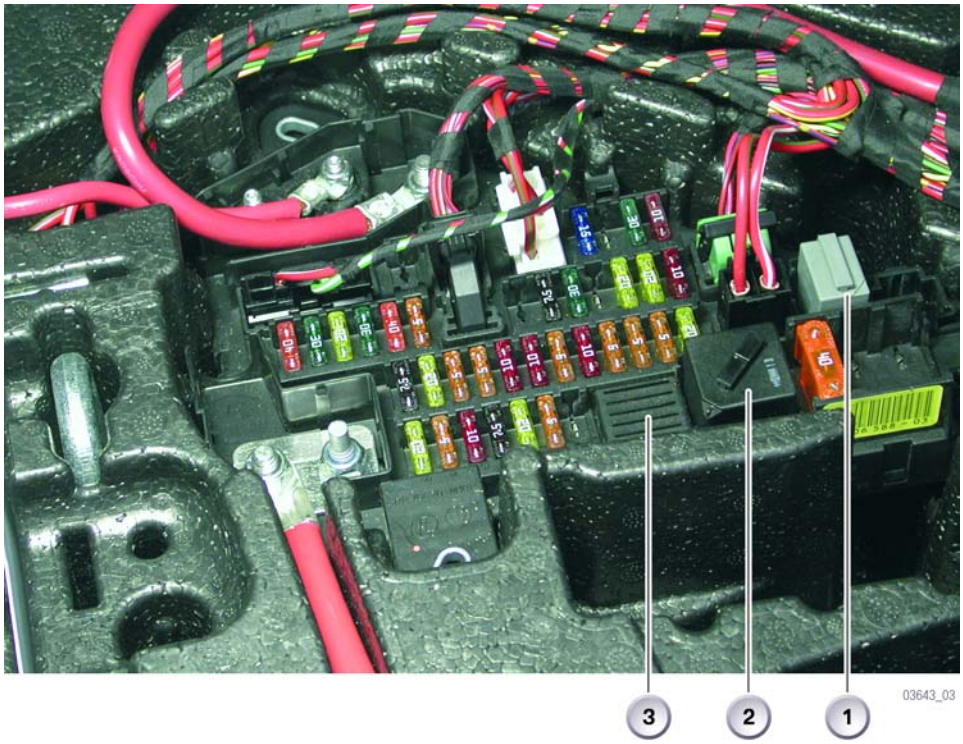
  The power management controls the electric currents in the vehicle
- Terminal 30g relay actuated by the car access system

Power Supply

Changes Compared to the E60

The battery is installed in the luggage compartment recess. The power distribution box in the luggage compartment was repositioned from the side panel to the recess in the luggage compartment. The vehicle electrical system is extended with the integrated power supply module IVM if an 8-cylinder engine is installed.

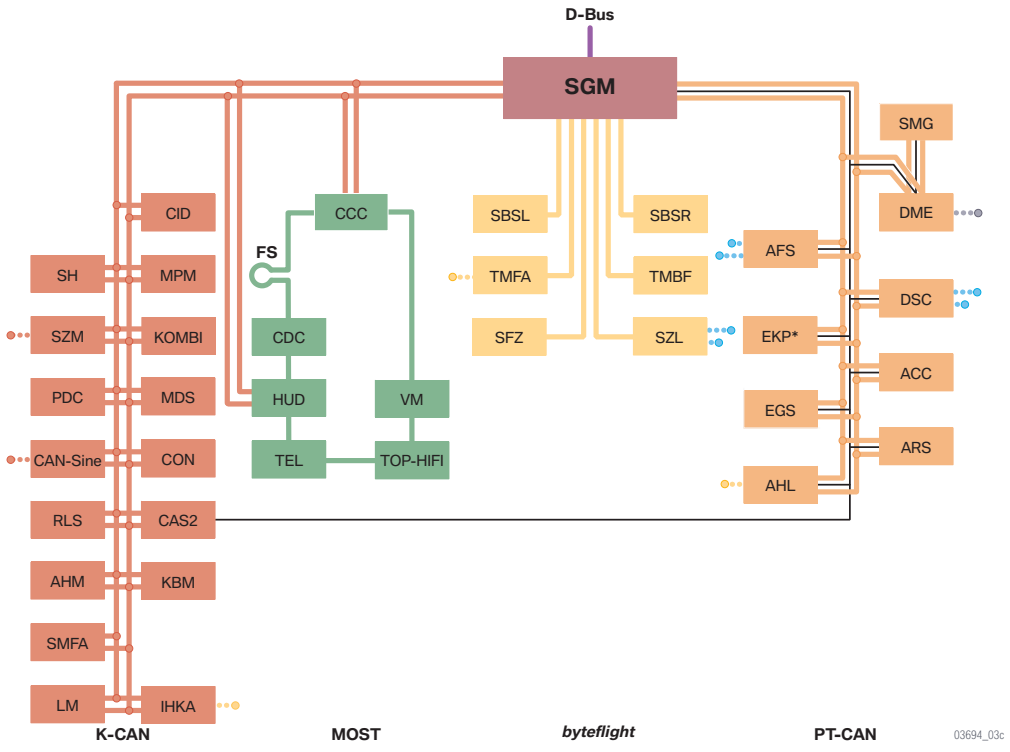




1. Rear window relay
2. Terminal 30g relay
3. Terminal 15 relay, soldered

Bus System Changes

Instead of the control unit for the slide/tilt sunroof SHD the control unit for the glass roof MDS is installed in the E63. There is no passenger's seat module SMBF in the E63.



General Vehicle Electrical System

Power Windows

Changes Compared to the E60

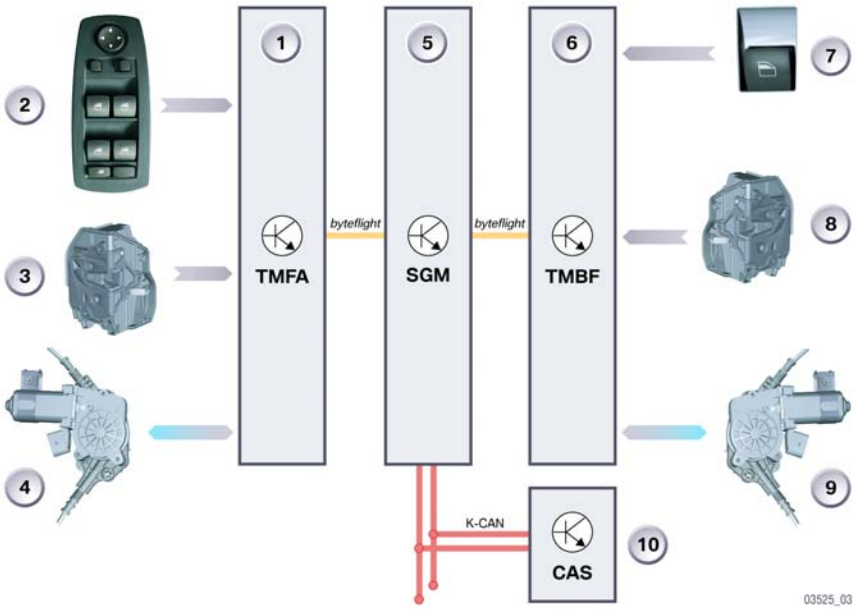
The function of the power windows correspond to those of the E60. The rear windows are fixed. The pins of the KBM for the rear windows are not used.

The following components are not installed in the E63:

- Switches, rear driver's door, rear passenger's door
- Power window motors with incremental sensor, rear driver's and passenger's side

1. Driver's door module (TMFA)
2. Switch block on driver's door
3. Door contact, driver's door, front
4. Power window regulator, driver's door, front
5. Safety and gateway module (SGM)
6. Passenger's door module (TMBF)
7. Power-window switch, passenger, front
8. Door contact, passenger door, front
9. Power window regulator passenger door, front
10. Car access system (CAS)
11. Basic body module (KBM)
12. Power-window switch, driver, rear

K-CAN	Bodyshell CAN
byteflight	byteflight



E63 Glass Tilt Sunroof

Changes Compared to the E60

Instead of the slide/tilt sunroof, the E63 features a glass tilt sunroof. The sunroof visor is two-piece. Two motors are installed for operating the glass tilt sunroof.

System Components

The following components relating to the glass tilt sunroof are fitted in the vehicle:

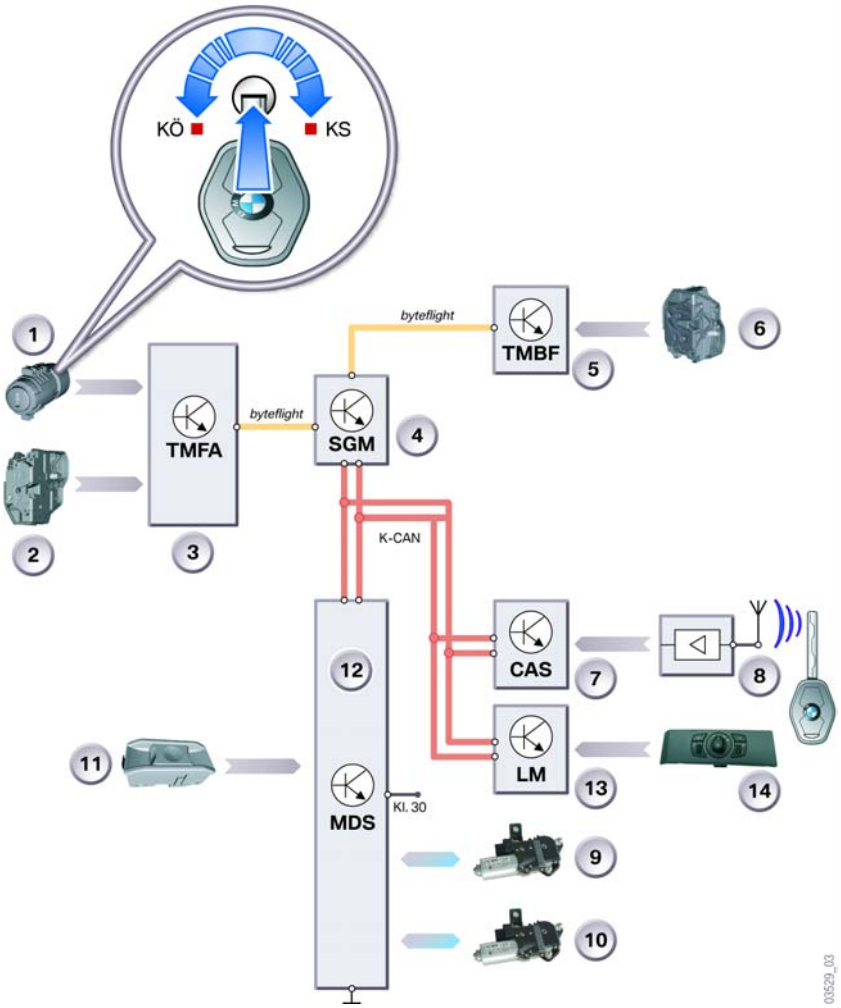
- Control button for glass tilt sunroof
- Control unit, multi-drive sunroof MDS, for glass tilt sunroof

- Motor for glass tilt sunroof
- Motor for sunroof visor

Communication with other users in the vehicle, such as the car access system CAS takes place via the K-CAN.

Control Unit MDS

The MDS is installed in the carrier in the glove compartment.



1. Lock cylinder, driver's door
2. Door contact, driver's door
3. Driver's door module (TMFA)
4. Safety and gateway module (SGM)
5. Passenger door module (TMBF) sunroof (MDS)
6. Door contact, passenger's door
7. Car access system (CAS)
8. Remote control
9. Motor for glass tilt sunroof
10. Motor, sunroof visor
11. Glass roof control button
12. Control unit for glass tilt (MDS)
13. Light module
14. Light module control switch

Functions

Control Button

The button functions are described in the Owner's Handbook.

Glass Tilt Sunroof

The functions of the glass tilt sunroof are based on the tilt functions of the E60 slide/tilt sunroof.

Sunroof Visor

The functions of the sunroof visor are based on the functions of the sunroof visor for the panoramic glass sunroof.

Service Information

Initialization

Initialization of the glass tilt sunroof is based on that of the E60. The glass tilt sunroof can be initialized either via the control button or the tester.

Only full initialization will ensure complete operability of the glass roof.

Manual Initialization with Control Button

The characteristic curve is relearned during every new or reinitialization of the glass tilt sunroof.

Preconditions

The glass sunroof must be clean and be at room temperature. Terminal 15 ON must be applied. When the glass tilt sunroof is subsequently initialized using the control button, this button must remain pressed until the initialization procedure is concluded.

The control button is pressed and held in the lift sunroof direction. The initialization run starts up approx.15 seconds after pressing the control button.

Glass Tilt Sunroof

The glass tilt sunroof can be replaced only together with the sunroof visor.

The motors and the control unit can be replaced individually. The glass tilt sunroof must be encoded and initialized after replacing the control unit.

Alarm System

The alarm system detects and warns of any attempts to break in or tamper with the vehicle. The system is installed in various types of vehicles in different country-specific versions.

The anti-theft alarm system, integrated in the CAN-Sine, communicates with the components via the K-CAN or via the DWA bus. The DWA of the E63 is equipped with multiplex microwave sensors, the CAN-Sine and the DWA LED.

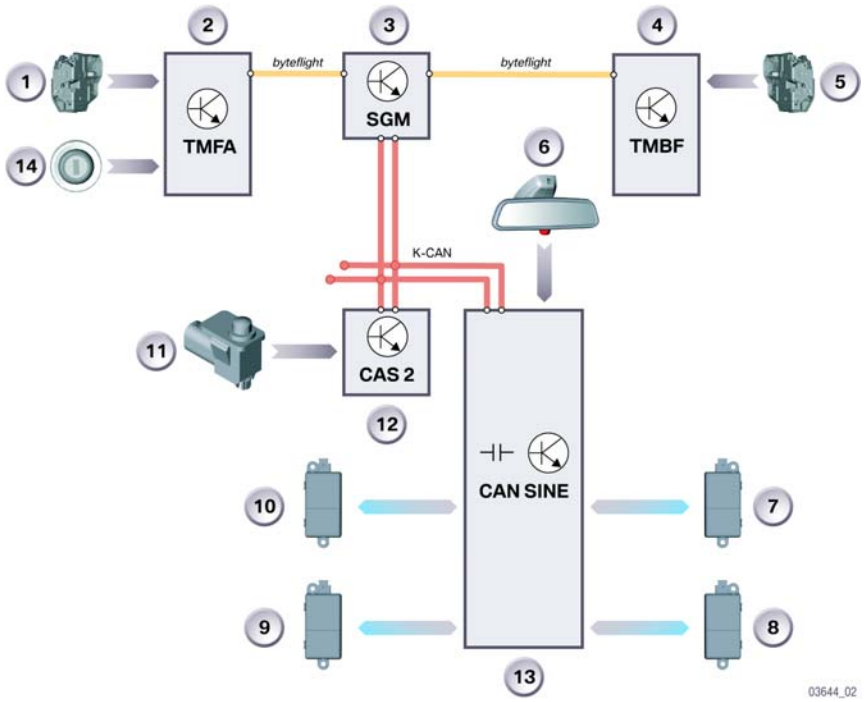
For the first time at BMW, MuW (multiplex microwave sensors) sensors are fitted in the E63.

The advantages of these MuW sensors are:

- Interior protection
- Effective MuW sensor detection during interior monitoring
- No false alarms triggered by MuW sensors during interior monitoring

The processor in the CAN-Sine features diagnostic capabilities and can be encoded. The MuW sensors assume the secondary functions and the CAN-Sine the main control unit function.

The E63 is not equipped with the Ultrasonic interior movement detector USIS. The DWA logic and the emergency current siren with integrated tilt alarm sensor have been combined to form one unit, i.e. the CAN-Sine.



1. Hall sensor, driver's door
2. Driver's door module (TMFA)
3. Safety and gateway module (SGM)
4. Passenger door module (TMBF)
5. Hall sensor, passenger's door
6. DWA LED
7. Multiplex microwave sensor, passenger's door
8. Multiplex microwave sensor, rear passenger's side door
9. Multiplex microwave sensor, rear driver's side door
10. Multiplex microwave sensor, driver's door
11. Bonnet contact
12. CAN-Sine tilt alarm sensor with integrated emergency current siren
13. Car access system 2 (CAS 2)
14. Lock, driver's door

Exterior Lights

Changes Compared to the E60

The E63/64 features 2 lamp bulbs in each directional indicator for the front direction indicator function.

The marker light of the E63 is fed from below into the light guide. The hotspot is located at the feed point of the light guide.

The front side markers are equipped with lamp bulbs. LEDs are used for the tail lights/brake lights.

Brake Force Display

The BFD can currently be used only in the US country-specific version. The upper LEDs of the rail light are used as the BFD as of a deceleration of 6 m/s2.

E63 Seats

The seats in the E63 have been adapted from the E46/2.

All seats feature a manual head restraint adjustment facility in up and down direction. The sports seat additionally features a seat depth adjustment.

The seat functions have been adopted from the E46/2.

Steering Column Memory

The memory positions for the steering column are stored and managed in the center console switch center.

Seat Heating

The seat heating is activated and controlled from the SZM. The seat heating is supplied with a clocked voltage. The heating output control that is required in order to regulate the temperature is achieved by pulse width modulation of the heating current. The clocking frequency is 25 Hz.

E63 Advanced Safety Electronics

The advanced safety electronics ASE is the electronic safety system for the 6 Series Coupe. In principle the ASE is the same as the system in the E60. The ASE has been correspondingly adapted for the E63

The changes to the ASE system on the E63 have been made in the following areas:

- B-pillar satellites
- AITS I (head airbag)
- Active knee protector (US)

Note:
This Workshop Manual is only a supplement to the E60 Training Reference manual. Only the changes compared to the E60 are described.

B-Pillar Satellites

The following changes have been made on the E63 to the B-pillar satellites:

- No ignition circuits for the active head restraints
- No ignition circuits for the rear side airbags
- No ignition circuits for the rear seat belt tensioners

The SBSL still controls and monitors the following trigger circuits:

- Head airbag (AITS I) left
- Seat belt tensioner, left

The SBSR still controls and monitors the following trigger circuits:

- Front airbag, passenger
- Head airbag (AITS I) right
- Seat belt tensioner, right

AITS I (Head Airbag)

The advanced inflatable tubular structure (AITS I) is used on the E63. The difference compared to the AITS II of the E60 is the length adaptation to the body of the 6 Series Coupe. The AITS I is the head airbag for the driver and passenger side. The AITS I extends from the A-pillar back to the B-pillar and covers the entire side area of the driver/passenger.

Active Knee Protection

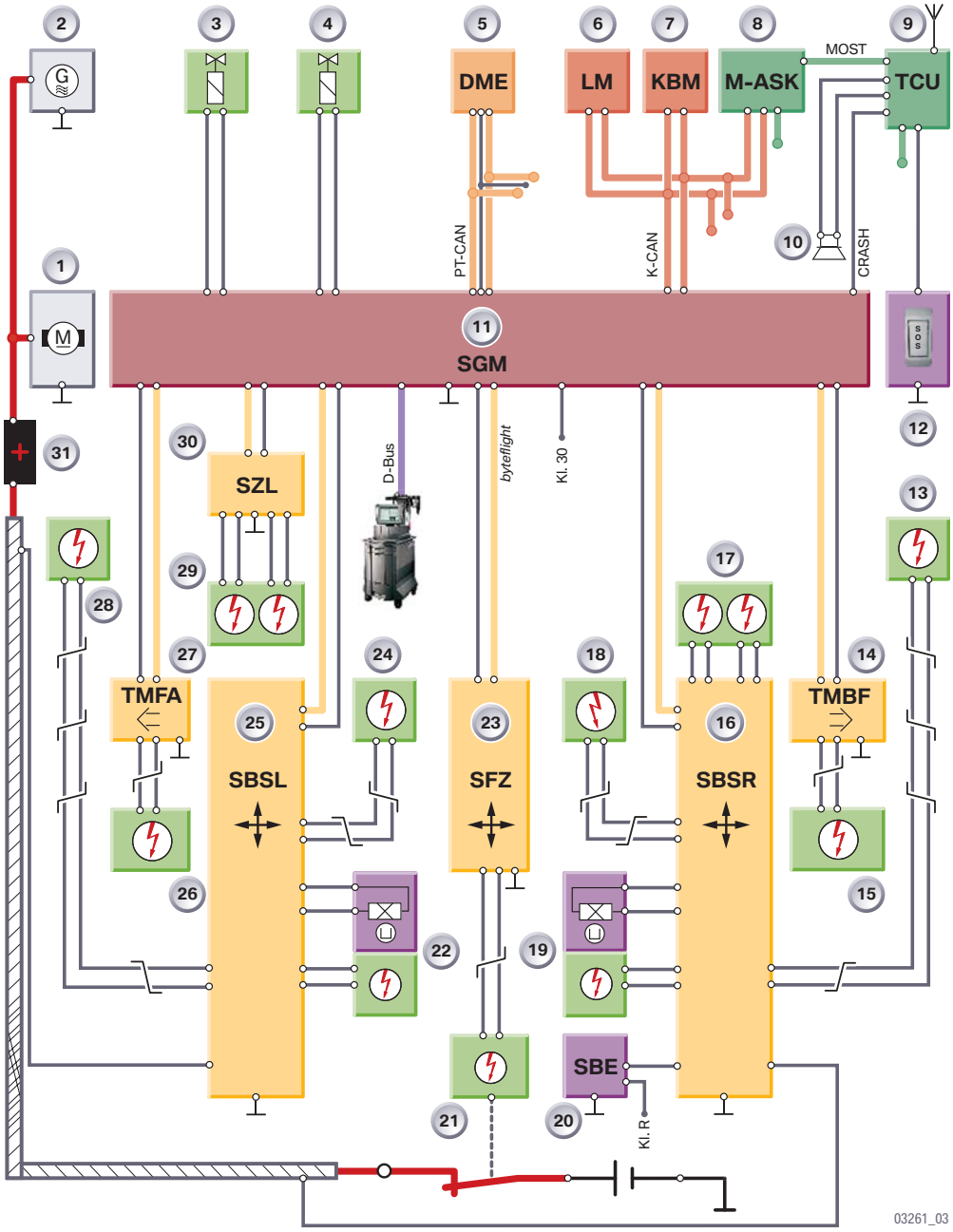
The E63 US features knee airbags on the driver's side and passenger's side.

In the event of a crash, the knee airbag adds additional support for the knees. This initiates a controlled forward shift of the upper body, which is cushioned by the relevant airbag.

The knee airbag on the driver's side is located behind a cover under the steering column.

The knee airbag on the passenger's side is located behind a cover in the flap of the glove compartment.

E63 ASE Schematic



1. Starter
2. Generator
3. ECO valve (AFS Only)
4. Servotronic Valve (optional)
5. DME
6. Light Module
7. KBM
8. MASK
9. TCU
10. Emergency speaker
11. SGM
12. Emergency Call Button
13. Head Airbag AITS II, R/S
14. Door Module Passenger Door
15. Side Airbag, Passenger Door
16. B-pillar satellite, R/S
17. Front Airbag, Passenger
18. Knee Airbag, Passenger
19. Seat Belt switch/tensioner, Pass
20. OC3
21. BST
22. Seat Belt switch/tensioner, Driver
23. Vehicle Center Satellite
24. Knee Airbag, Driver
25. B-Pillar Satellite L/S
26. Side Airbag Driver
27. Door Module Driver Door
28. Head Airbag AITS II, L/S
29. Front Airbag, Driver
30. Steering column switch cluster
31. Main adapter point, eng. com.

E64 Advance Safety Electronics

E64 Advance Safety Electronics are based on the systems of the E60/E63.

Changes to E64 ASE

The following charges have been made to the E64 ASE compared to the E60/E63:

- AITS head protection is eliminated
- New rollover protection system URSS added
- Seat-integrated belt system SGS
- New vehicle center satellite, SFZ-R, with Rollover and acceleration sensors
- Updated SGM to include actuators for Rollover protection system

Rollover Protection System

The Rollover protection system for the E64 consists of the following:

- ***byteflight,*** the optical bus system
- SGM
- SBSL with acceleration sensors
- SBSR with acceleration sensors
- TMFA with door pressure sensor
- TMBF with door pressure sensor
- SFZ-R with Rollover sensor and Acceleration Sensors
- satellite switching center steering column SZL
- URSS unit

SFZ-R

The SFZ-R of the E64 includes the additional sensors for rollover protection system activation. Sensor data is sent via ***byteflight*** to the SGM. The SFZ-R is mounted on the transmission tunnel.

SFZ-R Sensors

Included in SFZ-R are the following sensors:

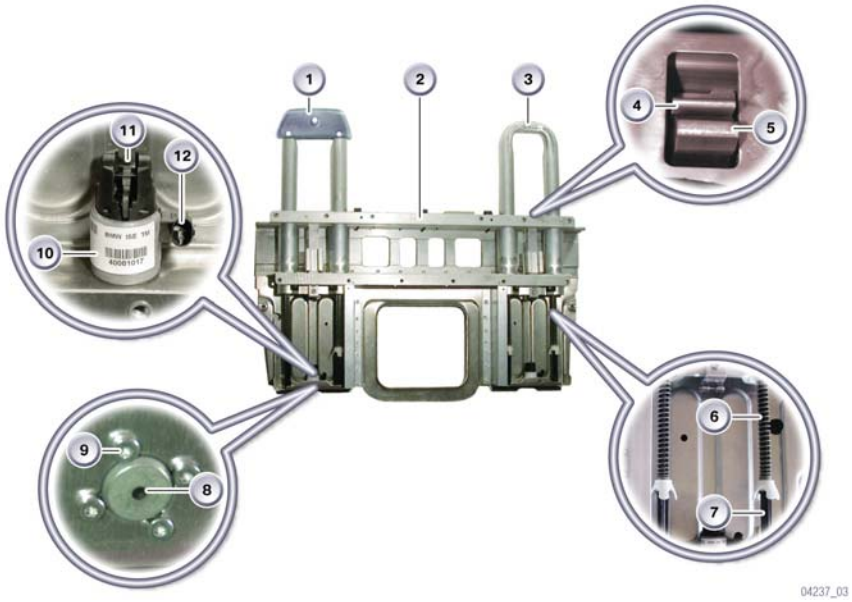
- Longitudinal acceleration sensor (x axis)
- Transverse acceleration sensor (y axis)
- Low g sensor (Rollover sensor) (Z-axis)
- Turning rate sensor (turn in the x axis)

Function Mode

The SFZ-R contains two processors, the main processor and the auxiliary processor. The main processor computes an estimated angle of the vehicle based on data received from the ASE system sensors and information from the Rollover sensor and the turning rate sensor. The auxiliary processor computes estimated vehicle angle based on data received for the transverse acceleration sensors, the Rollover sensor and the turning rate sensor.

Information from both the main and auxiliary processors is constantly compared. If the processors determine the angle of the vehicle exceeds a fixed threshold the following sequence is initiated:

- The main processor advises the SGM the vehicle has exceeded threshold limits vi the ***byteflight***
- The auxiliary processor activates the arming line (New to the E64) to the SGM
- The SGM evaluated information received from both processors
- The SGM activates both Rollover protection devices and they are driven up by spring pressure



1. Cover Rollover Bar
2. Rollover protection carrier
3. Rollover bar
4. Pawl
5. Locking Lever
6. Activation Spring
7. Guide Rod
8. Opening for emergency release
9. Attaching bolts for actuator
10. Actuator
11. Holding device
12. Electrical Connection

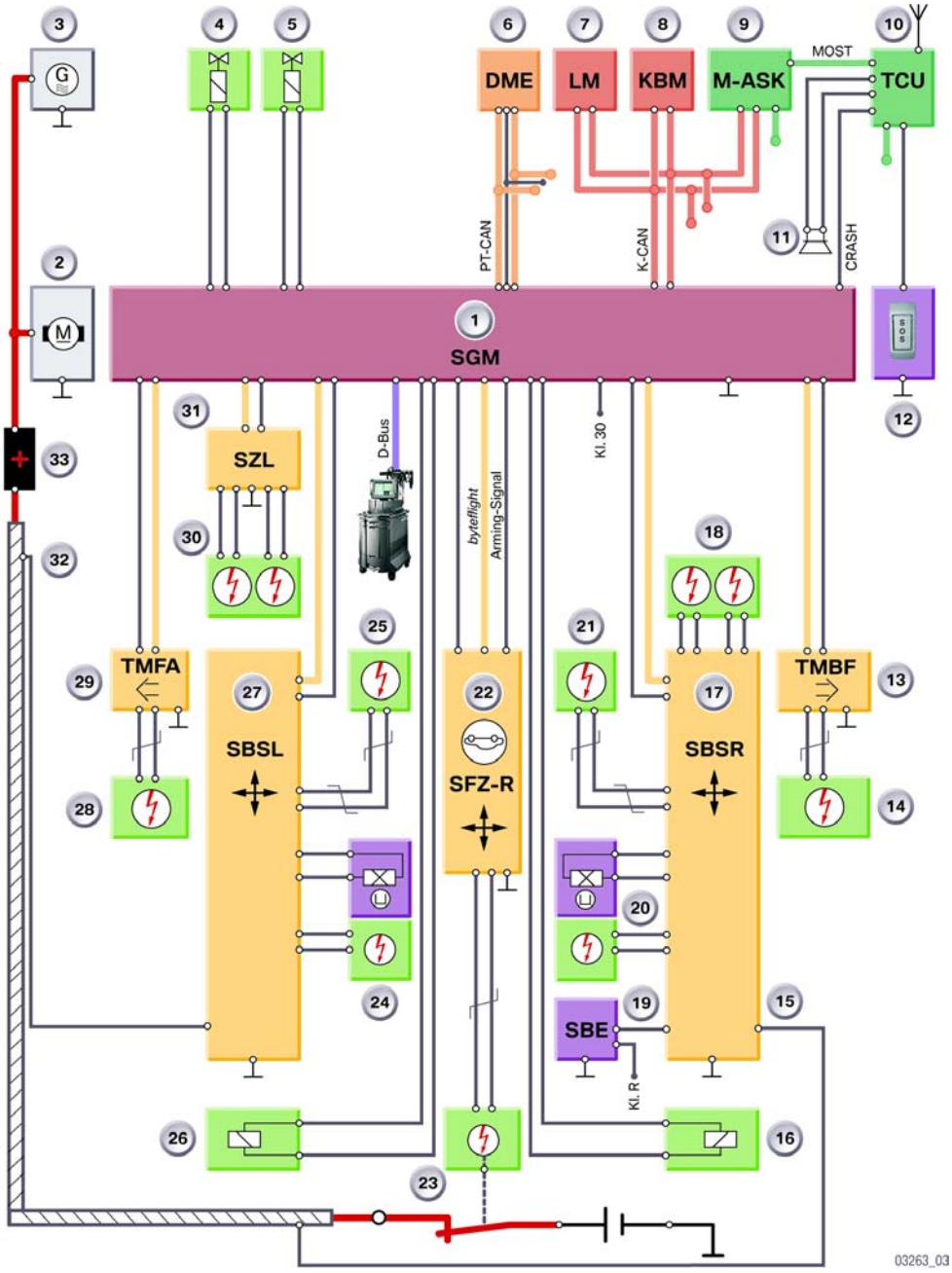
SBSL

Since there are no Head Airbag AITS devices in the E64, the SBSL is only responsible for the activation of the driver side knee airbag and seat belt tensioner.

SBSR

The SBSR is responsible for the activation of the passenger front airbag, knee airbag and seat belt tensioner.

Rollover System Schematic



1. SGM
2. Starter
3. Generator
4. ECO valve (AFS Only)
5. Servotronic
6. DME
7. Light Module
8. KBM
9. MASK
10. TCU
11. Emergency speaker
12. Emergency Call Button
13. Door Module Passenger Door
14. Side Airbag, Passenger
15. Not Used
16. Rollover protection system R/S
17. B-Pillar Satellite, R/S
18. Front Airbag, Passenger
19. OC3
20. Seat Belt switch/tensioner, Pass
21. Knee Airbag Passenger
22. Vehicle Center Satellite
23. BST
24. Seat Belt switch/tensioner, Driver
25. Knee Airbag, Driver
26. Rollover Protection L/S
27. B-Pillar Satellite L/S
28. Side Airbag, Driver
29. Door Module Driver Door
30. Front Airbag, Driver
31. Steering Column Switch cluster
32. Battery Cable Monitor
33. Main adapter point, eng. com

URSS Service Information

Activation of the rollover protection devices is possible through a Test Plan of the DISplus or GT1.

During Test plan activation observe the following safety precautions:

- The convertible top MUST be in the down position (Top Open)
- DO NOT stand over or near the rollover protection devices prior to or during deployment

Mechanical Deployment (For Service)

Prior to servicing, repairing or removing the URSS the rollbars must be deployed. If it is not possible to activate the system with the DISplus or GT1, the emergency mechanical release should be used.

1. Open the Convertible top
2. Trunk open
3. Remove the baggage compartment floor mat and bulkhead cover
4. Insert a hook device into the opening of the crossmember until you reach the actuator
5. Insert the hook into the hole in the actuator and pull the release lever

E64 Seat Belts SGS

The seat and SGS system of the E64 are identical to those of the E46 Convertible.

Workshop Exercise - URSS Deployment

Mechanical Deployment

Prior to servicing, repairing or removing the URSS the rollbars, they must be deployed. If it is not possible to activate the system with the DISplus or GT1, the emergency mechanical release should be used.

With the Instructor's assistance:

1. *Open the Convertible Top.*
2. *Trunk open.*
3. *Remove the luggage compartment floor mat and bulkhead cover.*
4. *Insert an "L" shaped device (allen key) into the opening of the bulkhead cross member until you reach the actuator.*

Note: DO NOT stand over or near the rollover protection devices prior to or during deployment.

5. *Insert the tool into the base of the actuator (hole) and push up.*

To Reset:

6. *Slide the release latch (under the deployed bar) and slowly compress the bar (approximately half way) remove your hand and fully down seat the bar until it latches.*

DISplus/GT1 Deployment

Activation of the rollover protection devices is possible through Service Functions > Test Plan in the DISplus or GT1.

During Test plan activation observe the following safety precautions:

1. *The convertible top MUST be in the down position (Top Open).*

Note: DO NOT stand over or near the rollover protection devices prior to or during deployment.

2. *Slide the release latch (under the deployed bar) and slowly compress the bar (approximately half way) remove your hand and fully down seat the bar until it latches.*