Table of Contents

E92 Complete Vehicle

Initial Print Date: 09/06 Revision Date:

E92 Complete Vehicle

Model: 328i, 335i

Production: From Start of Production

OBJECTIVES

After completion of this module you will be able to:

- Describe the distinguishing features of the E92 body construction.
- Explain the operation of the EWS4 immobilizer system.
- Describe the new lighting functions and features found in the E92.
- Explain the operation of the seat belt extender on the E92.
- Describe the Easy-Entry function.
- Identify the changes to the Bus Network.

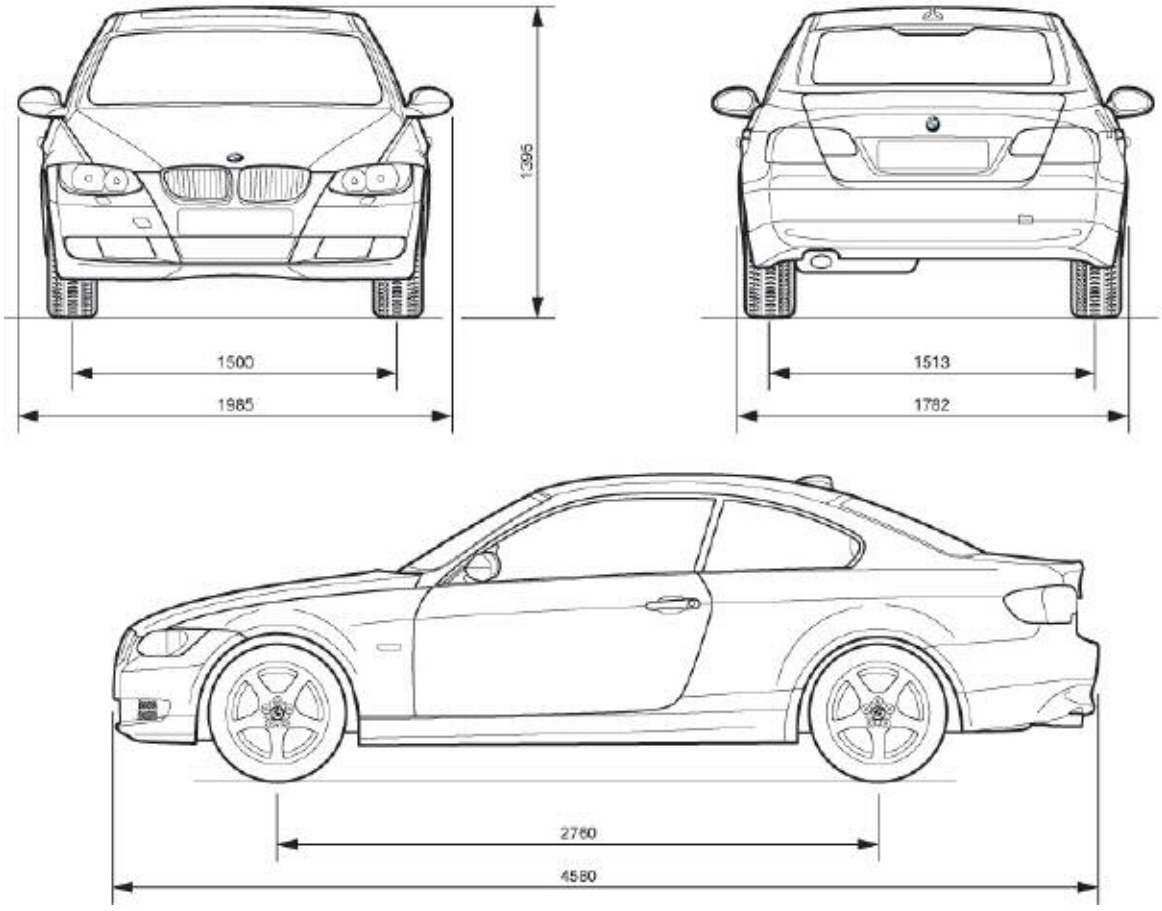
Introduction

The third generation of the 3 Series Coupes is here, developed on the basis of the E90 and honoring the long line of BMW coupes of the past with its sporty new 2 door body styling. The use of lighter and stronger body components, more powerful engines and enhanced features make this coupe stand out among its competition.

The 335i will replace the 330i and it gets the new N54 twin turbo, direct injected engine with 300hp and 300ft/lb. The 328i will replace the 325i and will come with a further developed N52 engine with increased horse power to 230hp and torque to 200ft/lb. There is also a N51 SULEV engine that will be available only with automatic transmission.

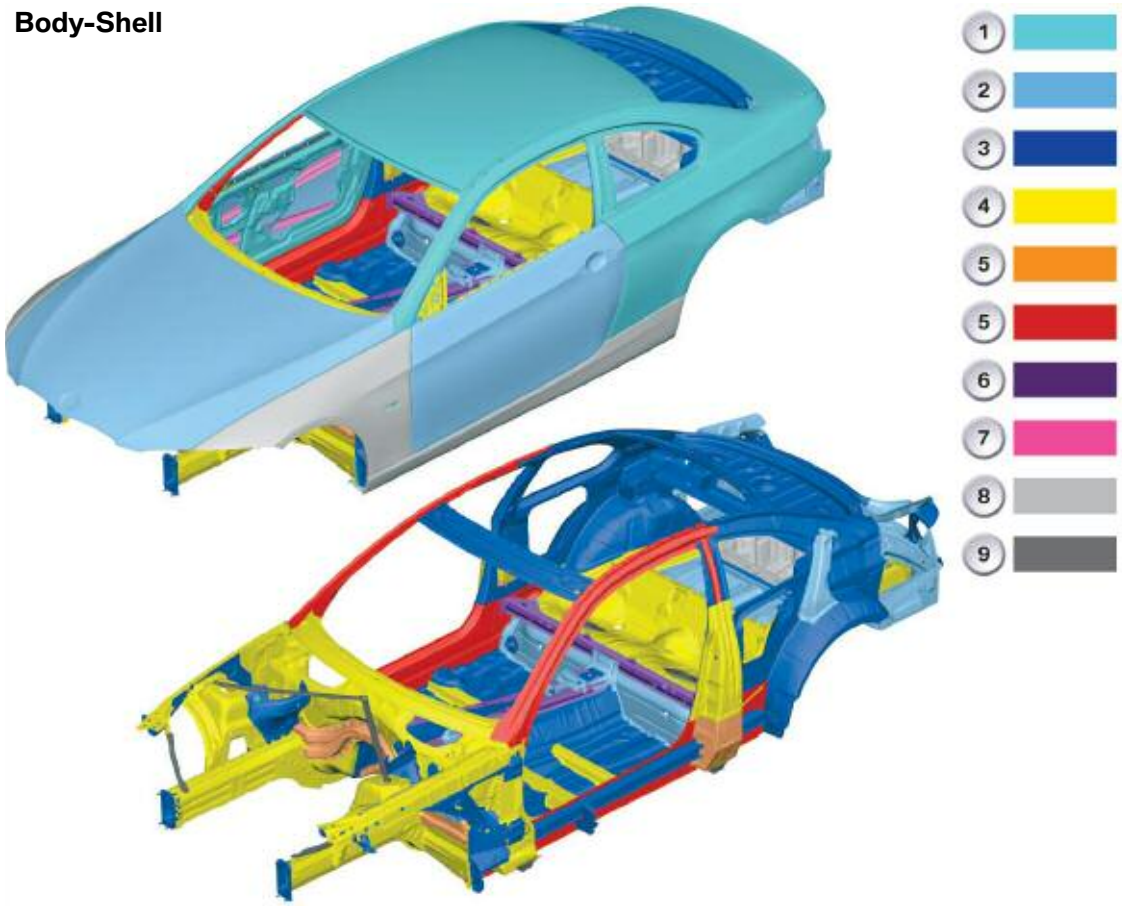
- The front fenders and rocker panel covers are fabricated from Thermo-Plastic material to promote weight distribution
- Upgraded brakes on 335i: front disc diameter increased from 13.0 (330i) to 13.7 in.
- New lighting features like Bi-Xenon headlamps standard the addition of Welcome lights (a BMW first) that greet the driver as the vehicle is opened. Adaptive headlights with Cornering lights help illuminate around the dark corners as well as Daytime running lights with corona rings promote daytime vehicle visibility.
- Vehicle security is enhance with the use of EWS4 immobilizer.
- The use of a Seat Belt Extender and the Easy-Entry (rear compartment) function promote occupant comfort.
- The Tire Pressure Monitoring System Has been updated to comply with the most recent US regulations.

Body



External dimensions (mm)	E92	E46/2
Vehicle length	4580	4448
Overall vehicle width	1782	1757
Vehicle height, unladen	1395	1369
Wheelbase	2760	2725
Overhang front	771	774
Overhang rear	1049	1049
Track width front	1500	1474
Track width rear	1513	1486
Wheels /tires	225/45 R17	205/55 R16

Body-Shell



Index	Explanation	Index	Explanation
1	DX54, DX56 Steel	6	HC600,HD680 Steel
2	HC 180,HX180 Steel	7	Docol 1000,22Mn B5 Steel
3	HC220,HX220 Steel	8	Plastic
4	HC300, HX 300 Steel	9	Other metals materials
5	HC 400 Steel		

Body Structure

A stronger and lighter body is constructed of a combination of different types of materials including many metals of different composition and even Plastic. This increases rigidity and provides more structural support where needed with out scarifying vehicle overall weight. The passive safety principle is based on retaining the passenger cell with dynamic deformation zones.

- Carrier structures with a high load bearing capacity
- Optimum utilization of deformation ranges
- Extremely rigid passenger cell
- Effective restraint systems

Fenders and Rocker Panel Covers

Like the 6 Series, Thermo Plastic is used in the construction of the two front fenders and rocker panels covers, to promote weight distribution.

This plastic injection method of fabricating parts allows for more freedom of design than ever possible with the stamping method. The resulting components are not only lighter they are less expensive to produce.

This plastic compound has been enhanced to support the refinishing process, in that it doesn't need to rest before we paint it for it retains its shape better and the mounting holes are slotted to compensate for possible expansion.

Note: The use of these components results in a 20 lb overall reduction of the vehicle body weight, that enhances fuel economy and performance.

Door Construction

Doors

The doors are longer than a 6 Series, but lighter than the E46. This was achieved by the use of Tailored Blanks in their construction.

With its shell construction the weight of the frameless steel door of the E92 has been reduced by 2.5 kg compared to the predecessor model (E46 Coupe) despite product-specific improvements.

- Stiffer hinge design layout minimizes the lowering effect of the door in response to force application.
- Holding forces of the door retainer that prevent the door swinging back when opened have been increased in the two arrest positions, i.e. initial and main arrest positions.
- The dent rigidity of the outer skin panel has been increased compared to that on the E46 Coupe.
- Two side impact carriers in each door reduce intrusion in the event of side impact so that the occupants are protected from serious injuries in the area of the legs, pelvis and torso.

The lighter weight of the E92 doors compared to those of the E46 Coupe were achieved primarily by the use of tailor blanks in the inner door panel. (Metal plates of different thicknesses are joined by laser welding to achieve a lighter and stronger component)

The high rigidity of the door and the passive safety for the occupants are achieved by 2 side impact carriers, of which the upper carrier has a double groove section and the lower carrier a single groove section to provide higher strength levels. In addition, a crash pad in the E92 (Europe version) reduces the load in the pelvic area in the vent of side impact. Expanded foam on the side impact carriers additionally increases the dent rigidity of the door outer skin panel.

Car Access System 3 with EWS4

With the launch of the E92, a new electronic vehicle immobilizer. The EWS4 features an ultramodern encryption method with a 124 bit secrete key. Start enable involves a special check procedure. A random number is generated in the DME and sent to the CAS. The CAS calculates the result from the random number and the secrete key and sends it back to the DME. The DME performs the same calculations and therefore already knows the result. Start enable takes place when both results are identical.

The car access system 3 with the new generation of electronic vehicle immobilizer EWS4 was introduced in E92 vehicles with the N52/N54 gasoline engine.

The vehicle immobilizer consists of the ID transmitter which is identical for the vehicle and therefore to CAS3. CAS3 exchanges data with the DME via the CAS-bus and cancels the vehicle immobilization function.

The EWS4 is a new development and uses a new, modern encryption method. A 128 bit long secret key is assigned to each vehicle and stored in the BMW database.

This secrete key is known only to BMW. The secrete key is programmed and locked in the CAS and in the DME control unit. Once entered in the control unit, the secrete key can no longer be changed or deleted. This therefore means that each control unit is assigned to a specific vehicle.

One control unit in the system sends an encrypted code to another control unit for the purpose of checking the authorization. In turn, this control unit sends back a corresponding code.

Replacement of Control Units

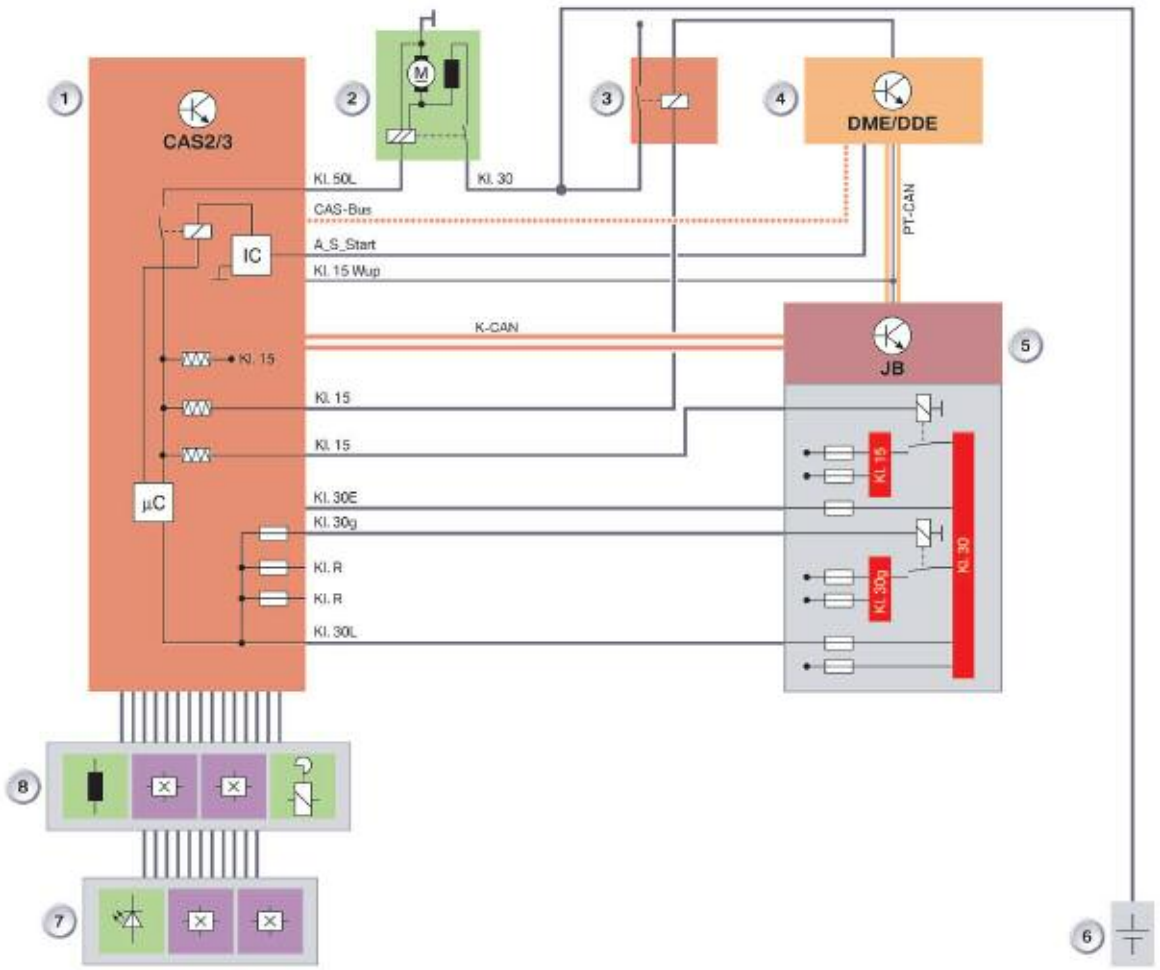
The procedure described below must be followed in order to replace a defective control unit (CAS/DME). The required control unit is ordered together with the necessary vehicle data (VIN) from the Parts Department.

A new "blank" control unit is programmed with the corresponding program data for the vehicle and the secrete key from the BMW database, locked and sent to the dealer.

The new control unit is installed in the vehicle and started.

Note: No alignment procedure is necessary as in earlier EWS systems. Since the control units are assigned to the specific vehicle, replacement with a unit from another vehicle is not possible.

System Configuration



Index	Explanation	Index	Explanation
1	Car access system with EWS4	5	Junction box
2	Starter	6	Battery
3	Injection relay	7	Start/Stop button
4	Digital motor electronics MSV80/MSV80	8	Holder

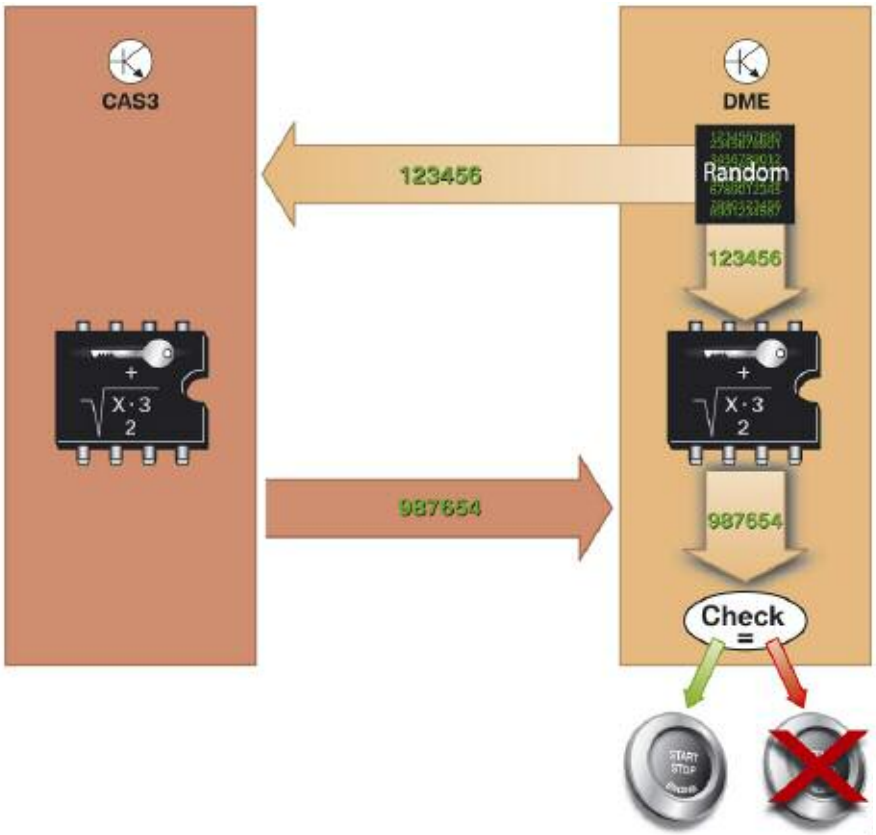
The electronic vehicle immobilizer consists of several components. In the E92 these components are the CAS3 and the DME MSV80/MSD80.

The CAS3 contains the software for the EWS4 and, with corresponding identification of the ID transmitter, the enable of terminal R, 15 and 50 for the starter. The enable for the ignition and fuel injection systems is done by the DME.

Both control units are connected by the K-CAN, the junction box serving as the gateway and the PT-CAN. Data is also exchanged on the CAS-bus. The data is always transmitted parallel via both bus systems.The signals that arrive first are used.

The DME activates the fuel injection relay for the power supply of the fuel injectors. The DME features a direct line to the starter relay in the CAS in order to initiate the start procedure and, if necessary, to terminate it, in the event of a PT-CAN fault or a faulty signal, like no engine speed signal.

EWS4 Immobilizer



Start Enable

The start procedure is enabled by means of a special request and response procedure known as challenge-response. The DME generates a random number in a random generator and sends it as the challenge to the CAS. The CAS and the DME contain the same secrete key and both control units use the same calculation algorithm. The CAS now calculates the result from the received random number, the secrete key and the algorithm. The result is sent as the CAS response to the DME. During this time, the DME now calculates the same random number with the secrete key and the algorithm and already knows the result. The response of the CAS is compared with the result of the DME. Start is enabled if the result is identical.

Time-based Query

As from terminal R or terminal 15 ON, a query (challenge-response) is performed as long as the engine is not yet running. A fault code is entered in the CAS if no DME response is received approx. 10 seconds after the start of the query or if the response deviates.

Key Memory Expansion in CAS3

The data memory of the remote key in vehicles equipped with CAS3 is increased from 256 bytes to 512 bytes.

The benefit of this key memory expansion for the customer is that more accurate information on the time and scope of the workshop visit can be provided as part of the service acceptance procedure.

The following system network information can be read out from the identification transmitter with the key reader in the service workshop.

Data	Previous	New	Remark
Mileage reading	X		Current mileage (km) reading of vehicle
Vehicle Identification (VIN)	X		
Key number	X		Number of identification transmitter
Service- relevant CC message	X		
DTC Information (fault code memory)	X		As from SAM 25, the DTC data is indicated and linked to possible measures in PUMA
NAVI-DVD version		X	Data status of NAVI-DVD
Engine oil		X	Information on topping up or draining the engine oil (overfilling)
Battery condition		X	Change status of the battery in the vehicle
Integration stages		X	I-stage that left the factory, I-stage last programmed and I-stage currently available in the dealership network

Comfort Access

Electric steering column adjustment ELV dropped on US vehicles with manual transmission.

Legal Requirements

The US regulation (FMVSS114) requires that vehicles must be equipped with a key-based locking system that prevents either steering or forward propulsion under the vehicle's own power or both. This requirement can be met either by a steering wheel lock ELV or by an electronic vehicle immobilizer EWS.

In addition, the regulation also states that on vehicles with automatic transmission and a park position, the ignition key or ID generator can only be removed when the selector lever is locked in the park position (Interlock).

Emergency release of the selector lever in the case of an electrical defect, is permitted on vehicles without ELV only if the emergency release facility is operated with the key.

Emergency Release on Automatic Vehicles

Manual Transmission Vehicles

Based on the specified legal requirements, an electronic vehicle immobilizer EWS is sufficient on manual transmission vehicles and the ELV can be dropped.

Automatic Transmission Vehicles

The ELV cannot be dropped on automatic transmission vehicles as these vehicles do not feature an emergency release facility for the selector lever with the key.

In the case of failure of the vehicle electrical system, the selector lever on automatic transmission vehicles can be released by operating the emergency release facility. The emergency release is accessible after removing the selector lever cover. The selector lever is released by pressing the pawl (1).

Exterior Lighting

Compared to the E90, several changes have been made in the exterior lighting system of the E92:

- The E92 is equipped with standard bi-xenon headlights.
- Adaptive headlights with cornering lights are available as an option.
- Standard daytime running light function, realized by the parking light corona rings.

Welcome Lights

The welcome lights are also a new function. The interior lights are activated for 20 sec. when the vehicle is unlocked but also the parking light corona rings, the tail lights, license plate lights, the door handle area lights and side markers.

Note: The welcome lights operate only in automatic and are not activated when the light switch is in the 0 position.This provides the customer with the option of deactivating the system if he/she does not want this function.

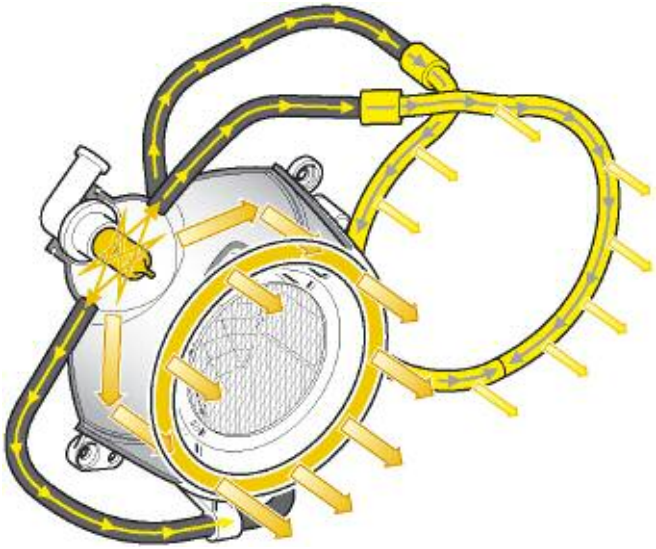
Daytime Running Lights

The E92 is equipped with bi-xenon headlights as standard. The daytime running lights function is introduced in connection with the bi-xenon headlights.The daytime running lights serve as an additional safety feature as the vehicle can be better seen.

The daytime running lights function is realized by the two corona rings in the headlights and activation of the tail lights and license plate lights.

The corona rings light brighter during the day to realize the daytime running lights function.The brightness of the corona rings is reduced to that of the side lights when the low beam headlight is switched on by the rain/light sensor or by switch position 2.

The corona rings are always switched on at terminal 15 ON. The corona rings are activated pulse width-modulated. The pulse width modulation ensures the daytime running lights and parking light function can be realized with one lamp bulb.



Note: In the event of a defective bulb in the tail lights, after removal, the bulb carrier must be fitted in the tail light housing otherwise the function of the new bulb cannot be checked due to the lack of ground connection.

Light distribution in headlight for daytime running light function
The daytime running light uses the same corona rings as the side lights. Both corona rings feature a common H8 bulb. The H8 lamp bulb is activated differently depending on the side light or daytime running light function. The inner ring is illuminated from the rear by reflectors. The outer rings around the headlight are supplied via fiber optic glass rods. The light from the H8 bulb is directed by mirrors into the fiber optic glass rods.

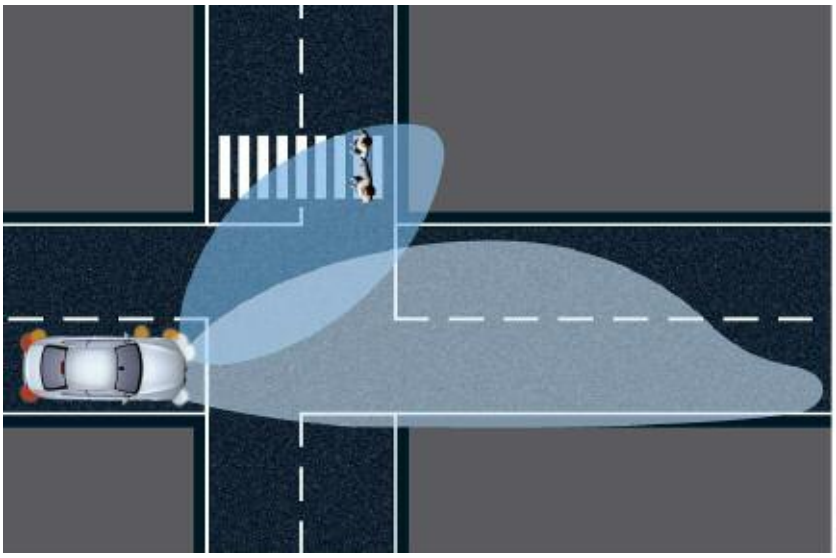
Deactivating the daytime running lights function
The function can be deactivated if required by the customer. On vehicles equipped with a central information display, the function can be deactivated in the "Light settings" menu.The function is deactivated in the instrument cluster on vehicles with no CID.

Cornering Lights

Cornering lights will be introduced for the first time with the launch of the E92.They represent an expansion of the functions of the adaptive headlights. In addition to the adaptive headlight, the cornering light illuminates the area in front of and to the side the vehicle. The cornering light is integrated in the headlight where the previous high beam lamp was located The light beam is reflected to the side by the special shape of the deflector and the position of the H3 bulb. The cornering light cannot be ordered as a separate option as it is an added function of Adaptive Headlights (SA 524).

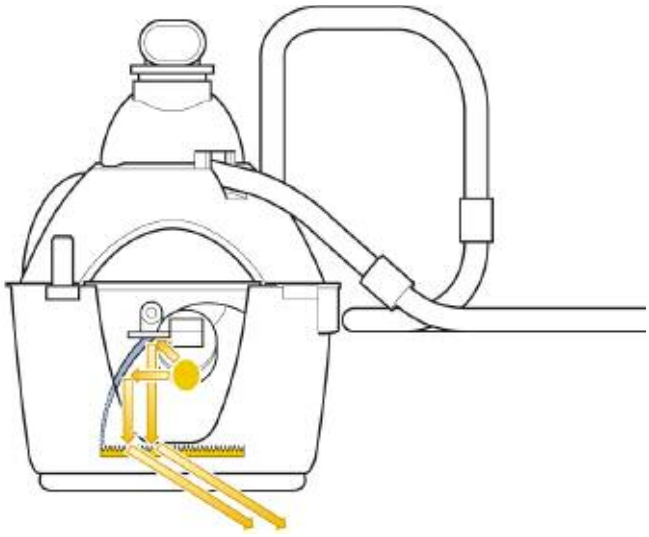
Advantages of the Cornering Light

The cornering light makes it possible to recognize people or traffic situations earlier in the turning area. As the following example shows, pedestrians are recognized before the vehicle actually turns . This function represents a considerable increase in safety for the driver and other road users.



The special arrangement of the mirror surface in the reflector and the special shape of the lens deflect the light beams to the side while preventing forward dazzle.

The cornering lights illuminate when the respective turn signal is operated and or the steering angle sensor indicates a turn below **40mph.**

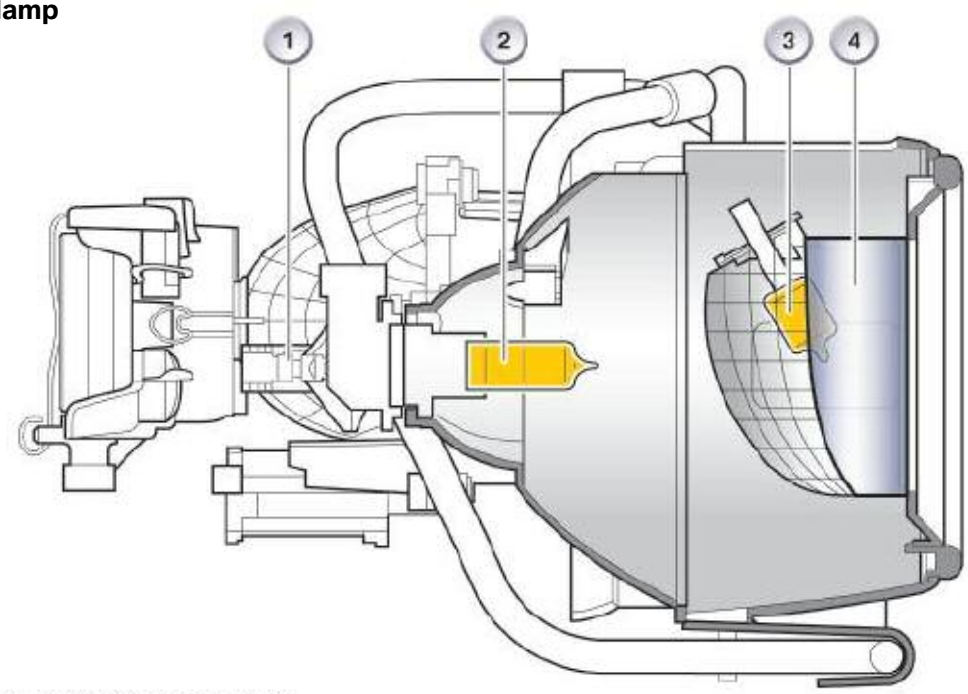


The angle of the steering wheel to activate the cornering light differs depending on the type of steering system used (power steering or active steering), steering gear and steering gear ratio. The steering wheel lock to activate the cornering light when the vehicle is **stationary** is between approximately 40° and 75° depending on the type of steering.

Flash to pass does not affect the cornering light nor does the hazard function activate it.

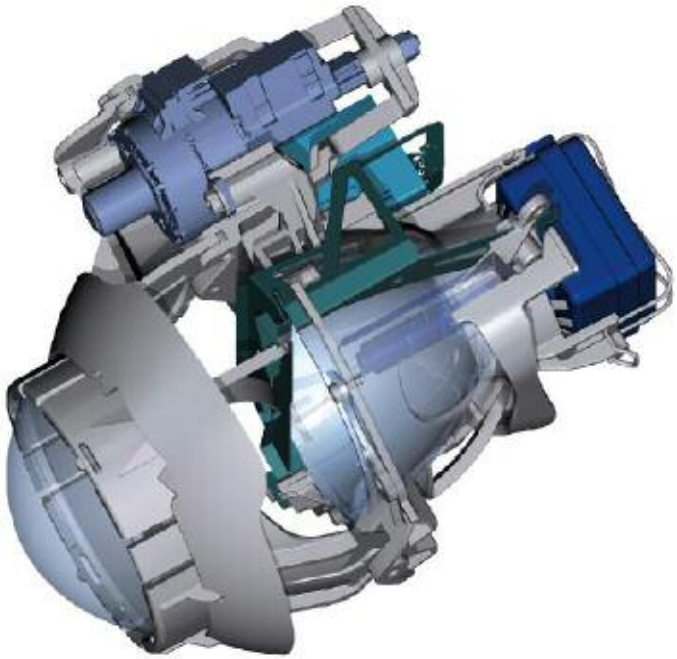
Note: Both cornering lights come on when the reverse gear is selected to help illuminate the way.

Bi-xenon lamp

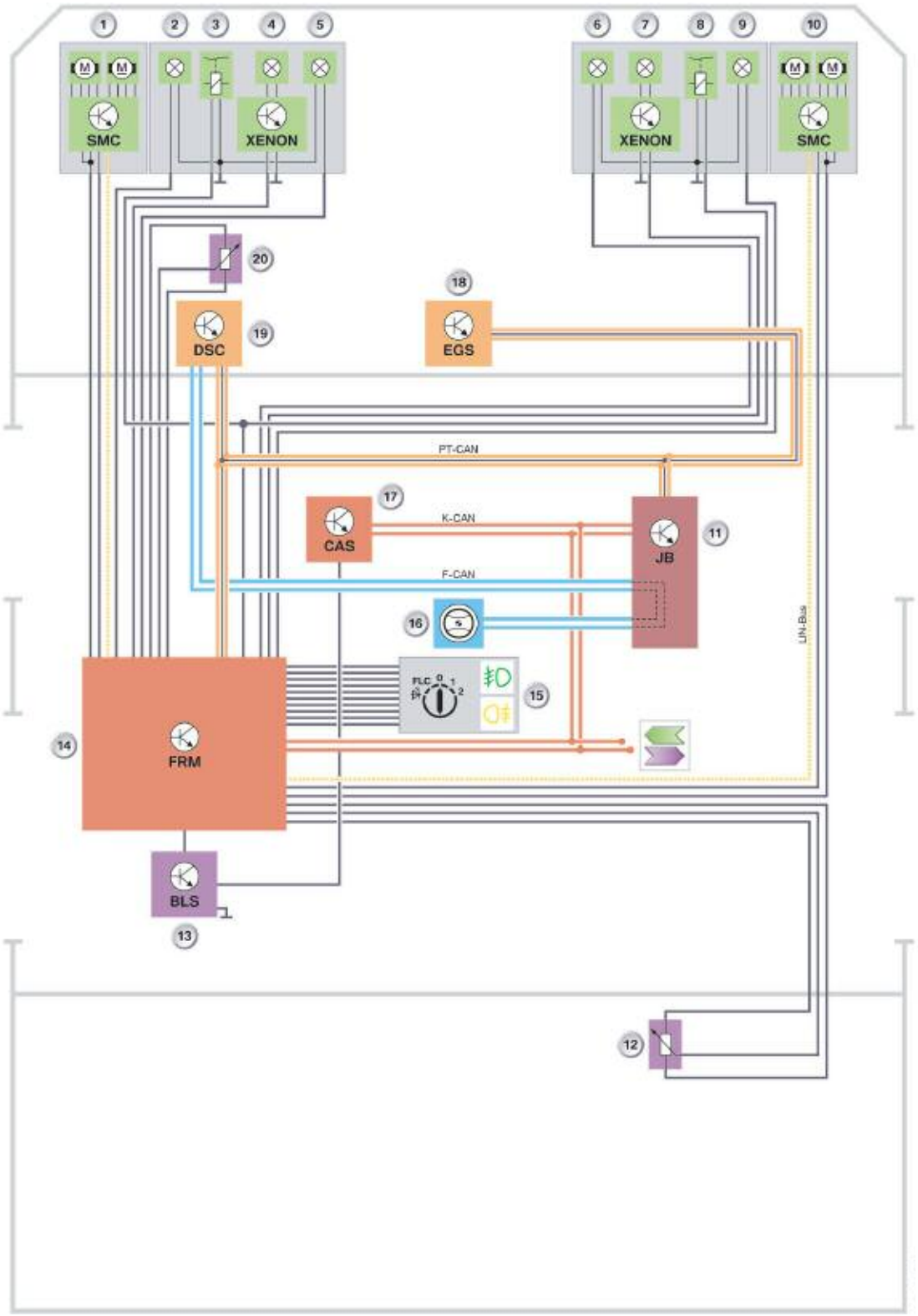


19- Components of the main headlight E92

Index	Explanation	Index	Explanation
1	Bi-xenon lamp	3	H3 bulb for cornering light
2	H8 bulb for side light and Daytime running light	4	Mirror for cornering light



Headlamp Circuit Diagram



Index	Explanation	Index	Explanation
1	Left controller with stepper motor	11	Junction Box
2	Side light/daytime running light	12	Ride-height sensor, rear
3	High beam shutter	13	Brake light switch
4	Bi-xenon light bulb, left	14	Footwell module
5	Cornering light left	15	Light switch cluster
6	Cornering light right	16	Steering column switch cluster
7	Bi-xenon light bulb, right	17	Car access system
8	High beam shutter right	18	Electronic transmission control unit
9	Side light/Daytime running light, right	19	Dynamic stability control
10	Right controller with stepper motor	20	Ride-height sensor, front

Switch-on conditions for the cornering lights

The corresponding cornering lights will illuminate depending on the following criteria:

- The selection of the turn signal below 65kph/40mph
- Steering angle input while driving below 65kph/40mph
- With vehicle stationary and engine running a steering angle of 40° to 70° depending on the steering system
- With reverse gear engaged both cornering light will illuminate

Switch-off conditions for the cornering light

The cornering light switches off in the following conditions:

- Adaptive headlight off
- Direction indicator off
- Directional constantly on above 40kph/25mph
- Steering angle is reduced (by 5°-10° after switch-on condition with vehicle stationary)
- Steering angle increased while driving above 70kph/43mph
- While drifting (Steering lock and yaw rate in opposite directions)
- While turning at a traffic light there is a 4 sec time out
- Headlight temperature too high (headlight protection)
- Reverse gear disengaged

Interior and Lighting

The interior lights package of the E92 has been expanded by two functions.

The E92 has two rear compartment footwell lights that facilitate entry in the rear compartment. The E92 also features ambient linear lighting in the doors and side trim panels.

The door and side trim panels are illuminated indirectly by fiber optic cables from the strip.

An LED provides the light source for the fiber optic cables. The fiber optic cable is made of plastic with small notches from which the light emits. The length of the fiber optic cable and the number of notches provide area lighting over the door and side trim panel.

The interior differs from that of the E90 and the E46 in that the E92 is a four passenger vehicle.

Like the E46 convertible the E92 also incorporates the easy-entry feature that facilitates the entry and exit of the rear of the vehicle by using an electric motor to move the seats forward and back on its rails.

The most distinctive feature is the addition of driver and passenger side electric seat belt extenders, making the seat belts more accessible to the occupants due to the larger door and the position of the B-pillar, which makes reaching the seat belt difficult.

Seat Belt Extender

In line with its concept and design, the E92 Coupe features large doors. As a result, the B-pillar with the reversal point for the seat belt is located further towards the rear relative to the seat position. This makes the seat belt difficult to reach for the driver or front passenger.

For this reason, an electrically operated seat belt extender is installed on the E92. The seat belt extender extends and moves the seat belt out of its rest position at the B-pillar by approximately 25 cm in the direction of the driver and front passenger. This makes it considerably easier and more convenient for the driver and front passenger to fasten the seat belt.

System Function

The seat belt extender system essentially consists of the footwell module with the master functionality and the two seat belt extender controllers connected via the LIN-BUS.

The footwell module receives the terminal status from the car access system via the K-CAN. The footwell module receives further important information from the airbag control unit via the K-CAN. The information contains the status of the seat belt contacts and of the seat occupancy detection facility on the front passenger seat.

The footwell module evaluates this information together with the determined status of the door contacts and decides whether the seat belt extenders are extended or retracted.

The footwell module informs the seat belt controllers of this decision via the LIN-bus.

The corresponding seat belt controller activates the seat belt extender motor and extends or retracts the toothed rack of the seat belt extender. The seat belt controller evaluates the Hall signals for the speed and end position and informs the footwell module of the position.

The functions of the seat belt extender are uniform throughout the world. Only a difference is made between the driver and front passenger in terms of functionality.

The driver and passenger doors must be closed the key in the ignition or the ignition on for the seat belt extenders to operate.

System Components

The system consists of the following components:

- Controller for driver's seat belt extender GBFA
- Controller for passenger's seat belt extender GBBF
- Driver's seat belt extender
  - Seat belt extender motor
  - Hall sensor
  - End position sensor
- Front passenger's seat belt extender
  - Seat belt extender motor
  - Hall sensor
  - End position sensor
- Footwell module with sensors and LIN-bus connection
- Junction box for power supply
- Airbag control unit for sensor information

Seat Belt Extender Controller

The universal control unit that is also used in other systems is used as the controller for the seat belt extender.

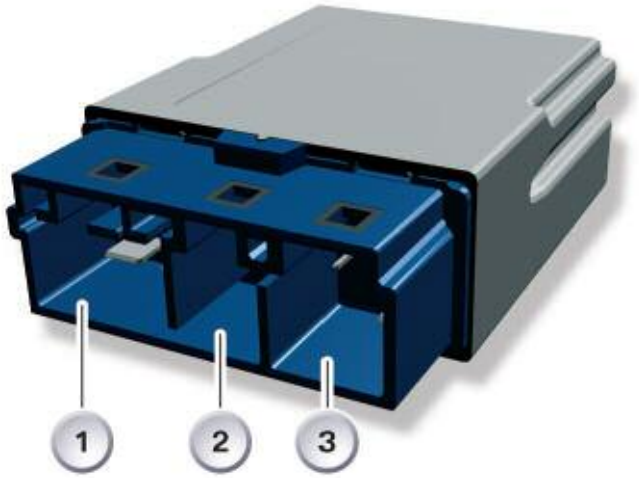
The controller for the seat belt extenders is connected via the LIN-bus to the footwell module. This LIN-bus has a data rate of 19.2 Kbit/s.

The controllers for the driver/passenger seat belt extenders are identical and differ in terms of their ground coding.

The control unit is connected by means of three plugs. Plug connector (1) is used for the power supply and ground coding. This plug connector also features the LIN-bus connection.

Plug connector (2) connects the end position sensor. Plug connector (3) connects the motor and the speed Hall sensor. (See graphic on the following page.)

Seat Belt Extender Controller



Index	Explanation
1	Plug connection to vehicle system network
2	Plug connection to end position switch
3	Plug connection to drive unit

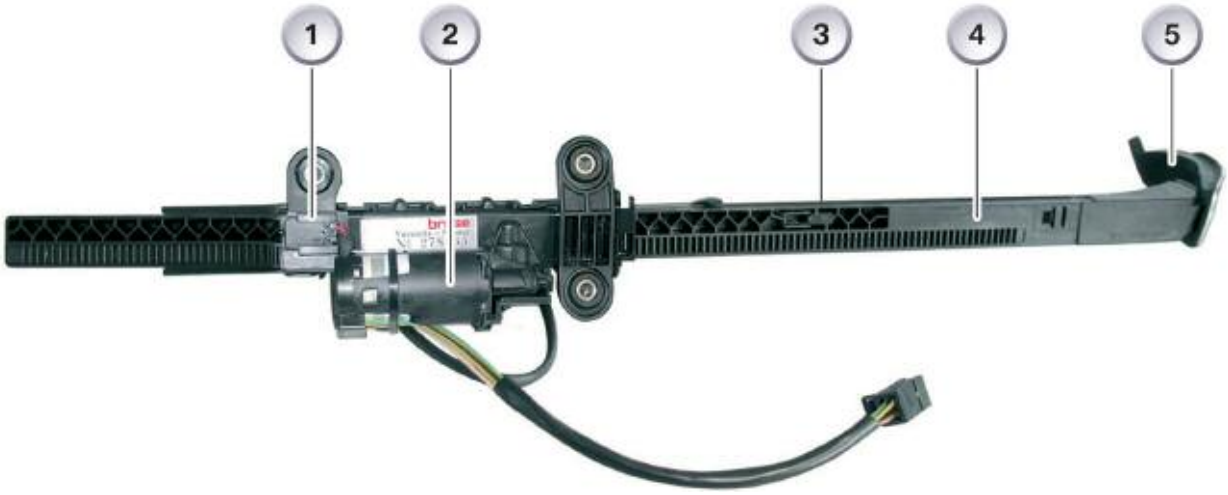
The controller is located behind the side trim panel along with the seat belt extender. The controller is constantly monitoring the extension and retraction of the seat belt extender and it's designed to shut down in the event of over voltage (16V) or under voltage (9V) condition.

Seat Belt Extender

The driver/passenger seat belt extenders are identical in terms of design but is supplied as a left-hand and right-hand variant for mounting purposes.

The seat belt extender consists of the following components:

- Seat belt extender motor with gear unit
- Hall sensor, motor
- End position sensor
- Toothed rack
- Belt guide
- Chrome cover



Index	Explanation	Index	Explanation
1	End position sensor	4	Toothed rack
2	Electric motor	5	Seat belt guide with chrome cover
3	Magnet for end position sensor		

Seat Belt Extender Motor

The seat belt extender motor is a DC motor. The motor is connected to the toothed rack by means of a step-down gear mechanism. A Hall sensor, mounted on the seat belt extender motor measures motor's speed.

A Hall signal is generated for each revolution of the motor. Based on the number of Hall signals, the control unit always knows the exact position of the seat belt extender. The Hall pulses are added as the seat belt extender extends and the motor is switched off on reaching the maximum number of pulses. This represents the "extended" end position.

When the seat belt extender is retracted, power is applied to the motor until the magnet in the toothed rack reaches the end position sensor. The system is initialized by reaching the end position. Initialization is performed every time the seat belt is retracted.

Note: Only the chrome cover or the complete seat belt extender can be replaced for repair purposes.

Blocking Detection

If, during extension, the Hall signals are not received for 250ms, this situation is interpreted as blocking of the extender and the motor is switched off. The seat belt extender motor is reversed and the toothed rack retracted.

The motor is driven for 1 second if the toothed rack is blocked. This procedure is repeated up to three times. The motor is then no longer activated.

A renewed attempt to drive the motor is made only on reactivation of the system (door contact and terminal R). The system must be checked by a BMW dealer workshop if the system is actually blocked mechanically.

Extender Operating Criteria

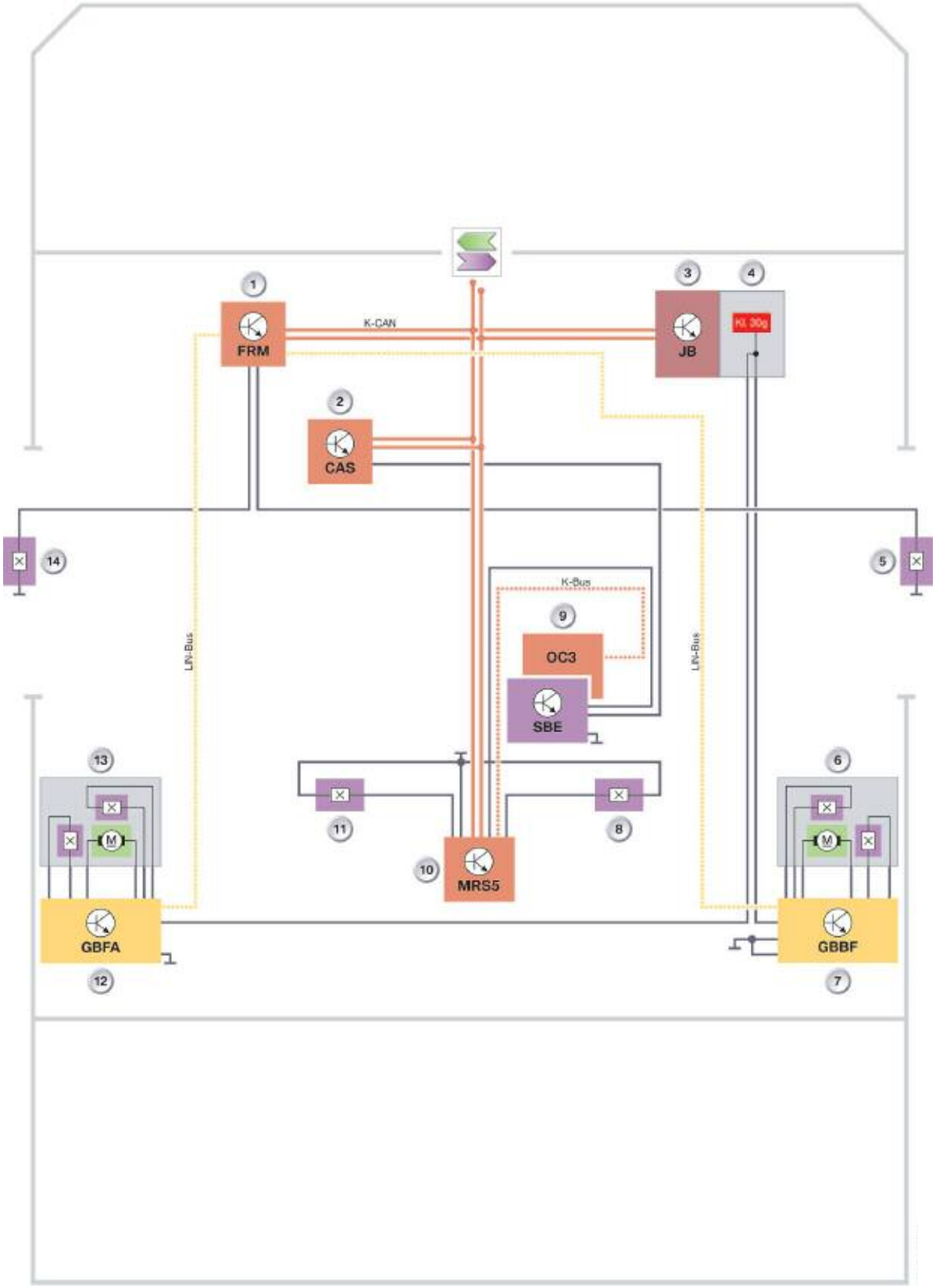
Extend Conditions	Driver's Extender	Passenger's Extender
Terminal R*	X	X
Terminal 15*	X	X
Seat belt contact open	X	X
Door contact detects closed state	X	X
Seat occupancy**		X
ID transmitter in the vehicle with comfort access	X	X

* Depending on when the door was closed.
** The passenger seat belt extender extends at terminal R after 10 seconds regardless of whether the seat is occupied or not.

Retract Conditions	Driver's Extender	Passenger's Extender
Seat belt contact closed	X	X
Door contact detects opened state	X	X
Driving speeds above 7kph	X	X
Seat belt extender extended longer that 60 sec.	X	X
Seat detected as not occupied		X
30 sec. after switching from terminal R	X	X
Mechanical blocking	X	X

NOTES PAGE

System Schematic Circuit Diagram



Index	Explanation	Index	Explanation
1	Footwell module	8	Passenger seat belt contact
2	Car access system	9	Seat occupancy detection system
3	Junction box electronics	10	Airbag control unit
4	Power distribution box, junction box	11	Driver seat belt contact
5	Door contact, passenger's side	12	Controller for driver seat belt extender
6	Seat belt extender motor with Hall switch for speed and end position, passenger's side.	13	Seat belt extender motor with Hall switch for speed and end position, driver's side.
7	Controller for passenger seat belt extender	14	Door contact, driver's side

Diagnosis

Diagnosis of the controller for the seat belt extender or of the seat belt extender itself takes place through the footwell module. If there is a fault, e.g. a defective Hall sensor, the controller of the seat belt extender sends this status via the LIN-bus to the footwell module. The footwell module stores the fault code and communicates with the diagnosis tool.

Coding

After replacing the controller for the seat belt extender it must be encoded by the footwell module via the LIN-bus. It is not possible to address the LIN-bus control units direct.

Easy-Entry Function

The electrically adjustable seats (comfort and sport) installed in the E92 are equipped with a rear compartment easy-entry function to facilitate entry in the rear compartment. For this purpose, an adjustment switch is provided on the upper end of the backrest in order to move the seat forward and backward at double the speed of the regular seat forward/ backward adjustment function. By mechanically releasing the seat backrest, it can be additionally tilted forward to create sufficient space for convenient entry.

When entering the rear compartment, the customer can move the seat forward with the adjustment switch. By mechanically releasing the seat backrest, it can be additionally tilted forward to create sufficient space for convenient entry.

After entering the vehicle, the seat backrest is tilted back and the seat can be moved back using the adjustment switch. The seat moves back and assumes the previous position. The previous position is determined by means of a Hall sensor on the seat forward/backward adjustment motor. The signals are read into the driver/passenger seat module and correspondingly evaluated.

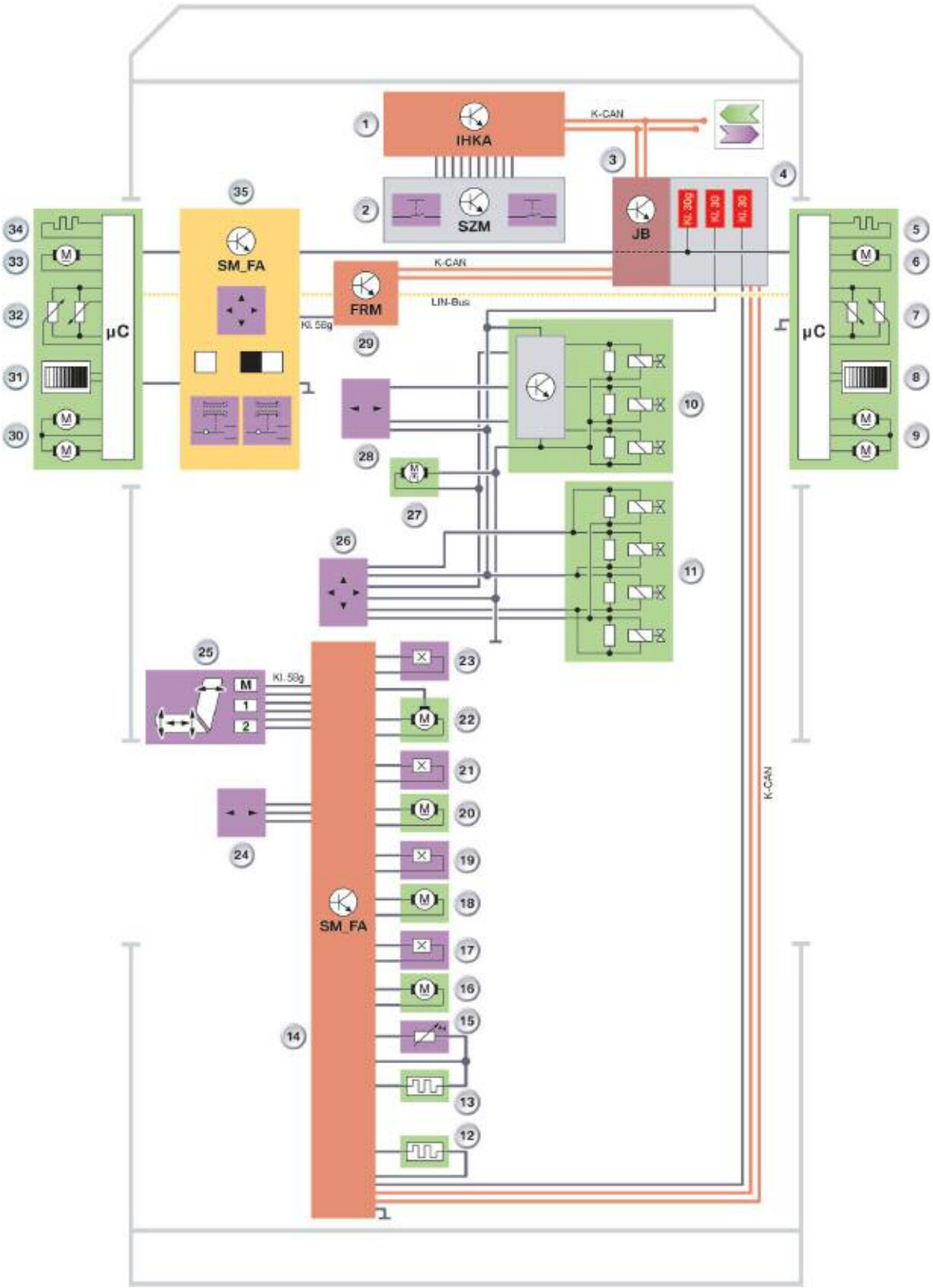
For this reason, a front passenger seat module is installed on vehicles equipped with electrically adjustable seats. The front passenger seat module has no memory function.

Easy-Entry Function

Front Seats

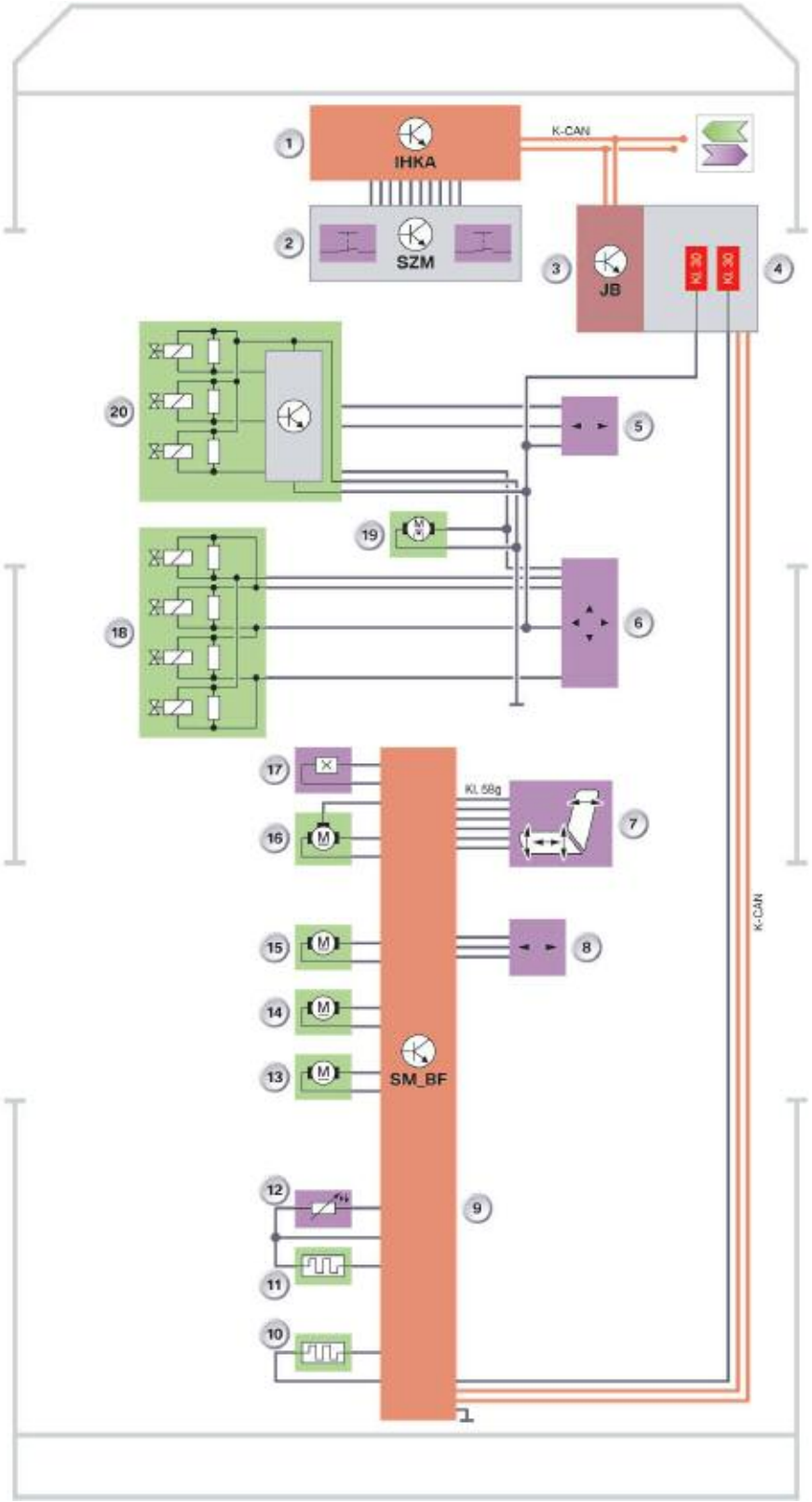
The seat mechanism is designed such as to allow the customer to fold the backrest forward and push the seat in forward direction when accessing the rear seat. The backrest then remains locked in the frontmost position. When the seat is pushed back, it returns exactly to its original position and releases the backrest in this position. The electrically adjustable seat is moved forward by means of a switch located above the grip handle for moving the backrest forward. The seat moves at double the normal speed of the seat forward/backward adjustment.

Driver's Seat Easy-Entry System Schematic



Index	Explanation	Index	Explanation
1	Integrated automatic climate control	19	Seat tilt position
2	Center console switch cluster	20	Motor for seat backrest angle adjustment
3	Junction box electronics	21	Backrest tilt position
4	Power distribution box, junction box	22	2-stage motor for seat forward/backward adjustment
5	Outside mirror heater, passenger's side	23	Position, seat forward/backward adjustment
6	Mirror folding motor, passenger's side	24	Rear compartment easy-entry switch
7	Potentiometer for outside mirror position memory, passenger's side	25	Seat adjustment switch with memory buttons
8	Electrochromatic outside mirror	26	Lumbar support button
9	Outside mirror Adjustment motors	27	Motor for lumbar support and back rest width adjustment
10	Pressure valves for backrest width adjustment	28	Backrest width adjustment button
11	Pressure control valves for lumbar support adjustment	29	Footwell module
12	Backrest heating	30	Outside mirror adjustment motors
13	Seat cushion heating	31	Electronchromatic outside mirrors
14	Driver's seat module	32	Potentiometer for outside mirror position memory, driver's side
15	Seat heating temperature sensor	33	Mirror folding motor, driver's side
16	Motor for seat height adjustment	34	outside mirror heating, driver's side
17	Position, seat height adjustment	35	Driver's switch cluster
18	Motor for seat angle adjustment		

Passenger's Seat Easy-Entry System Schematic



Index	Explanation	Index	Explanation
1	Integrated automatic climate control	11	Backrest heating
2	Center console switch cluster	12	Seat heating temperature sensor
3	Junction box electronics	13	Motor for seat height adjustment
4	Power distribution box, junction box	14	Motor for seat angle adjustment
5	Backrest width adjustment button	15	Motor for seat backrest angle adjustment
6	Lumbar support button	16	2-stage motor for seat forward/backward adjustment
7	Switch for seat settings	17	Position, seat forward/backward adjustment
8	Rear compartment easy-entry switch	18	Pressure control valves for lumbar support adjustment
9	Passenger's seat module	19	Motor for lumbar support and backrest width adjustment
10	Seat cushion heating	20	Pressure valves for backrest width adjustment

NOTES PAGE

Changes to the BUS Network

With the adoption of the vehicle systems network from the E90 with the junction box as the gateway and the footwell module as a further control unit with many functions, the system overviews of the vehicle systems network are, to a large extent identical.

The E90/E92 vehicle systems networks differ only slightly by the addition of new control units. The following changes have been made in the various bus systems:

Changes in PT-CAN
The transfer case control unit is installed in vehicles equipped with the xDrive all-wheel drive system option. The DSC is replaced by the DXC. The DXC performs the functions of the DSC and has been expanded to include additional all-wheel drive functions.

Changes in MOST
IBOC In-Band On-Channel, a terrestrial digital radio, has been newly added.

Changes in K-CAN
Further exterior lighting functions have been implemented in the footwell module. These functions include :

- Daytime driving lights
- Welcome light
- Cornering light on vehicles with active headlight

The tire pressure monitoring system TPMS replaces the tire failure indicator RPA to conform to US legal requirements.

The EWS 4 has been implemented in the CAS 3 on petrol engine vehicles.

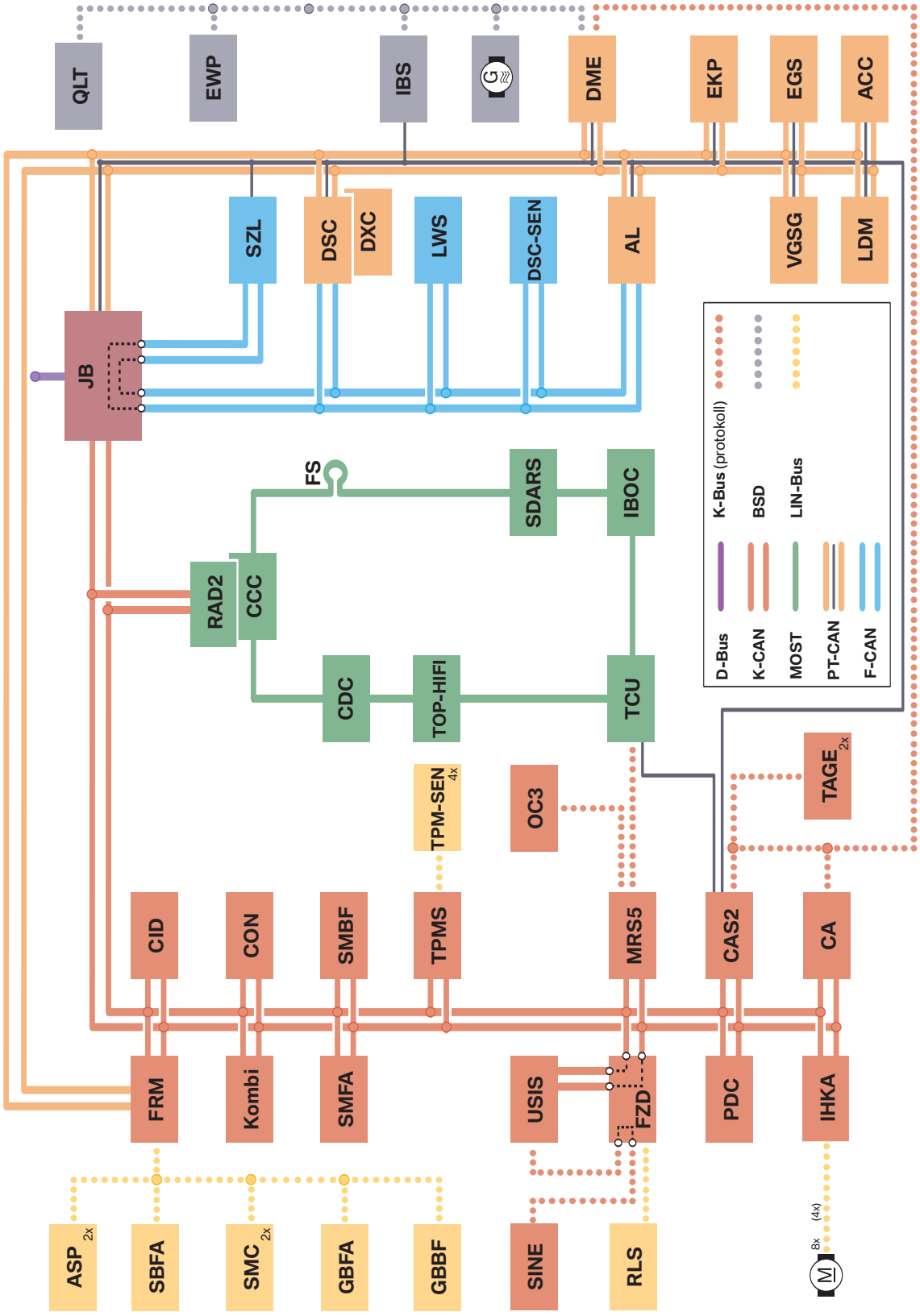
A 4-channel PDC for the rear is offered in the E92. There is no PDC button in the center console.

A new addition is the front passenger seat module SMBF for evaluating the Hall sensor of the seat forward/backward adjustment facility on vehicles with electrically adjustable seats for the rear compartment easy entry function.

Changes in LIN-bus
New features in the LIN-bus include the two control units for the driver and front passenger seat belt extender.

Note: There are no changes in the F-CAN system nor the Bit-serial Data interface (BSD).

E92 Bus System Overview



Index	Explanation	Index	Explanation
ACC	Active cruise control	JB	Junction box
AL	Active steering system	KOMBI	Instrument cluster
ASP	Outside mirror	LDM	Longitudinal dynamic management
CA	Comfort access	LWS	Steering angle sensor
CAS	Car access system	M-ASK	Multi-audio system controller
CCC	Car communication computer	MRS	Multiple restraint system
CDC	CD changer	OC3	Seat occupancy detection mat
CID	Central information display	PDC	Park distance control
CON	Controller	QLT	Quality,level,temp,oil sensor
DME	Digital motor electronics	RAD	Radio 1, radio 2
DSC	Dynamic stability control	RLS	Rain/driving light sensor
DSC-Sen	DSC Sensor	SBFA	Driver's door switch cluster
DWA	Anti-theft alarm system	SDARS	Satellite tuner
DXC	Dynamic traction control	SINE	Emergency current siren w/ tilt alarm sensor
EGS	Electronic transmission control unit	SMBF	Passenger's seat module
EKP	Electric fuel pump control unit	SMC	Stepper motor controller
ELV	Electric steering lock	SMFA	Driver's seat module
EWP	Electric water pump	TONS	Temperature, oil level sensor
FRM	Footwell module	Top-HiFi	Top-HiFi Amplifier
FS	Most direct access	TPMS	Tire pressure Monitoring System
FZD	Roof function center	TPM-sen	TPMS Sensors X4
GBBF	Passenger's seat belt extender module	ULF	Universal charging and hands-free facility
GBFA	Driver's seat belt extender module	USIS	Ultrasonic passenger compartment protection
IBOC	In band on channel (digital radio)	VGSG	Transfer box control unit
IBS	Intelligent battery sensor	ZH	Electric auxiliary heater based on PTC principle
IHKA	Automatic climate control	SZL	Steering column switch cluster
TCU	Telematics control unit	TAGE	Electric outer door handle module