

General

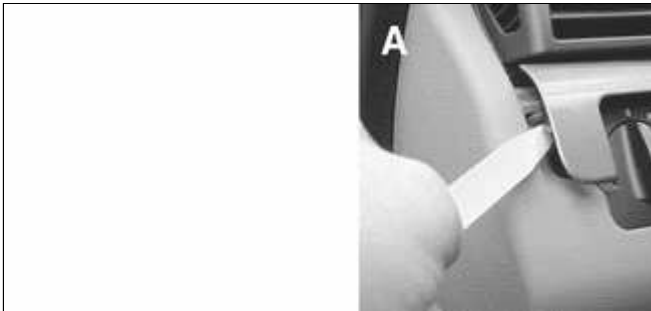
This repair group covers interior and exterior lighting, including repairs to the light switch assembly.

Special tools

Some special tools may be necessary to install or adjust lights and light fixtures.

✦ Plastic trim prying tool BMW 00 9 321

✦ Foglight/headlight adjusting tool 4 mm/6 mm Allen



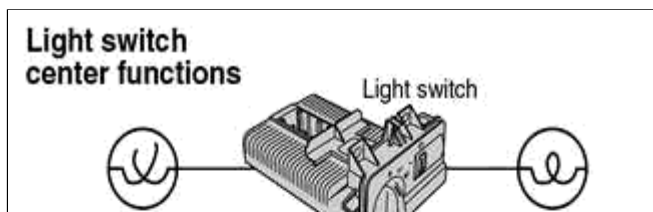
Bulb applications

For convenience, the bulb applications for E46 cars are listed in ⇒ [Table a.](#)

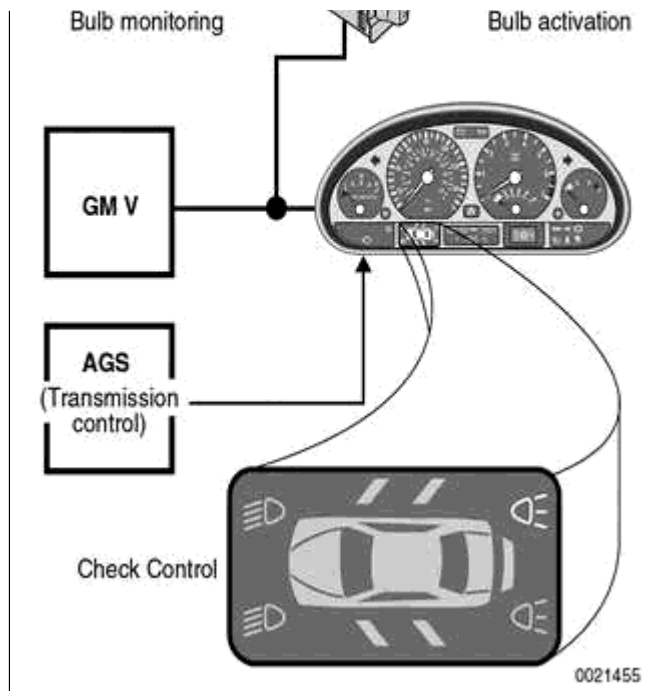
Table a. E46 bulb applications	
Location	Type & rating
Headlights	
High beam	H7 12V 55W
Low beam (Halogen)	H7 12 V 55 W

Table a. E46 bulb applications	
Location	Type & rating
Low beam (Xenon)	D2-S
Foglights	
Front	HB4
Rear (Euro only)	12V 21W
Turn signal and taillight	
Back-up	12V 21W
Brake	12V 21W
Brake/taillight	12V 21/4W
Licence plate	12V 5W
Side turn signal	W5W
Third brake light	LED
Turn signal (front or rear)	12V 21W
Interior lights	
Footwell	Softlite 5W
Glove compartment	Softlite 5 W
Passenger compartment, front or rear	Softlite 5W
Reading, front or rear	6W
Trunk or tailgate	Softlite 10W
Visor vanity	Softlite 10W

Light switch center (LSZ)



The light switch center (LSZ), mounted in the left side of the dashboard, consists of the following components:



- ◆ Headlight/taillight/running light control switch
- ◆ Foglight switch
- ◆ Instrument dimmer control
- ◆ Light control module

In addition to normal light control, the LSZ provides the following functions:

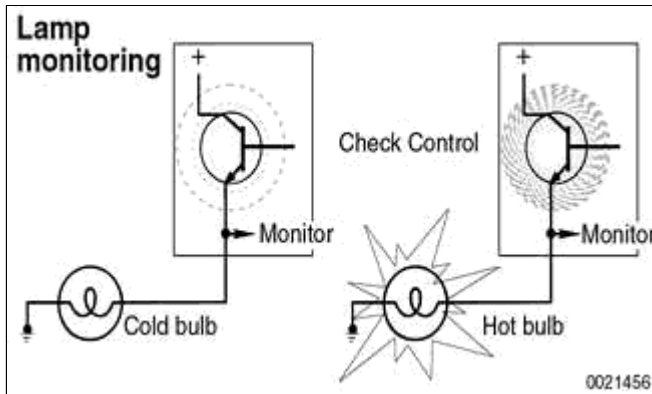
- ◆ Hot and cold monitoring of the exterior bulbs
- ◆ Emergency lighting function
- ◆ Short circuit protection
- ◆ Redundant storage of mileage and service interval data
- ◆ Automatic headlight adjustment (LWR) programmed control (if equipped)

Bulb monitoring

The light control module monitors the following bulbs in both hot and cold states:

- ◆ High/low beams
- ◆ Brake lights
- ◆ Turn signal lights
- ◆ Taillights

- ◆ Parking lights
- ◆ Side marker lights
- ◆ License plate lights

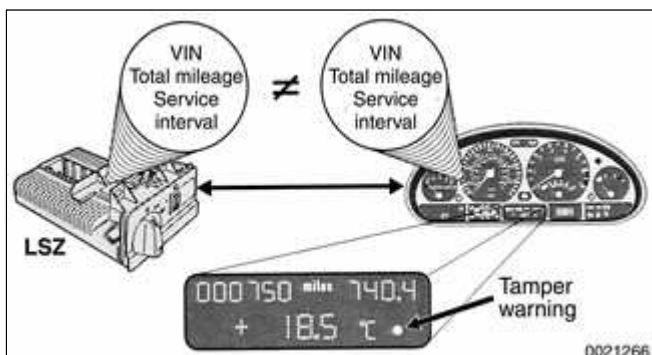


- ✦ Hot and cold monitoring of light bulbs allows the LSZ to detect defective bulbs. Hot monitoring checks the continuity of circuits while the lights are switched on. Cold monitoring consists of a brief pulse of current which is too short for the lights to illuminate. If the module detects a defective bulb, a signal is sent to the instrument cluster and Check Control is illuminated with the appropriate warning.

Home lighting

This convenience feature provides lighting for the driver and passengers to leave the vehicle and enter their house. The feature is switched on by activating the headlight flasher switch after the lights and ignition are switched OFF. The feature is switched off after the coded time delay or by switching the ignition ON.

Redundant data storage



- ✦ The light control module serves as the redundant storage module in parallel with the instrument cluster. This includes all data used for vehicle identification, encoded on the assembly line. In addition the total mileage and service interval data are also stored in the light control module. If either the instrument cluster or light control module has to be replaced, the data is taken from the remaining

module and transferred to the replacement unit.

Emergency (fail safe) lighting

The light control module provides emergency lighting in the event of an electronic module failure. Back up hardware allows the following lighting circuits to function:

- ◆ Low beam headlights
- ◆ Taillights
- ◆ Brake lights

The headlights and taillights come on as soon as the ignition is switched ON. The brake light operates when the brake pedal is pressed.

WARNING!

When working on electrical systems, remove the fuse protecting the circuit under repair. See ⇒ [610 Electrical Component Locations](#).

CAUTION!

- ◆ ***The headlight and foglight assemblies use halogen bulbs. To ensure the longevity of halogen bulbs, the bulb glass should not be handled. Dirt and skin oils may cause a bulb to fail prematurely. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.***
- ◆ ***Use only original equipment replacement bulbs. Non-original equipment bulbs may cause false failure readings on the***

Check Control display.

- ♦ ***To avoid marring car paint or trim, work with plastic prying tools or wrap the tips of tools with tape.***

Light Switch

Light switch assembly, removing and installing



- Pry gently at left dashboard trim to remove.

CAUTION!

To avoid marring interior trim, work with a plastic prying tool.



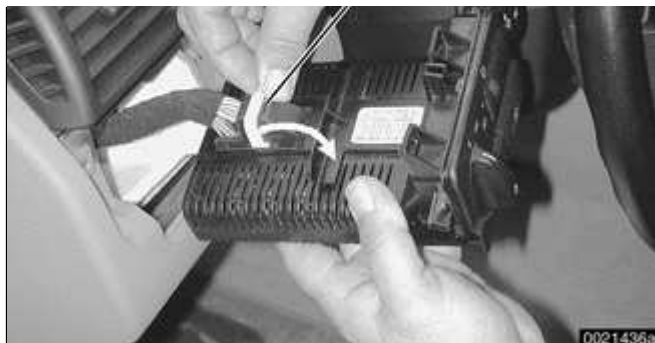
- Remove light switch mounting screws (arrows).
- Lift switch slightly and withdraw from dashboard.

Note:

- ◆ If the vehicle is equipped with a left side glove compartment, remove the compartment for improved access to the back of the headlight switch and its electrical harness.
- ◆ Remove the left side footwell trim (above the pedals) for better access to the headlight switch electrical harness. See ⇒ [513 Interior Trim](#).



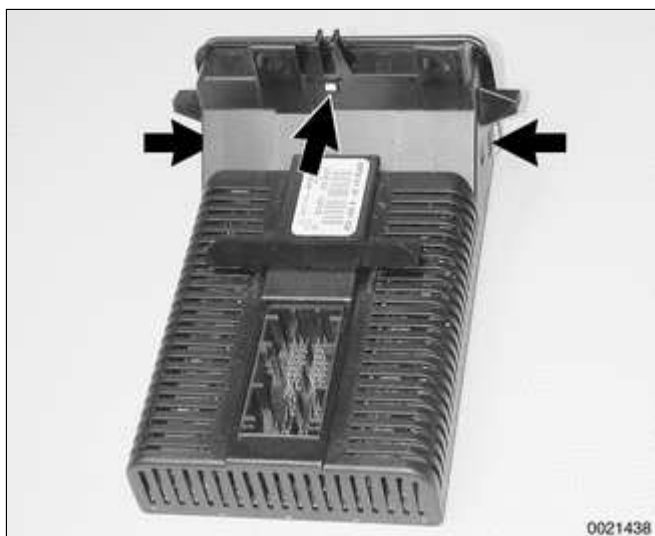
- To release harness connector latch:



- ◆ Swing latch backward (**arrow**).
- ◆ Pull electrical harness connector off switch assembly.
- Installation is reverse of removal.

Light control module, separating

- Remove light switch assembly as described earlier.



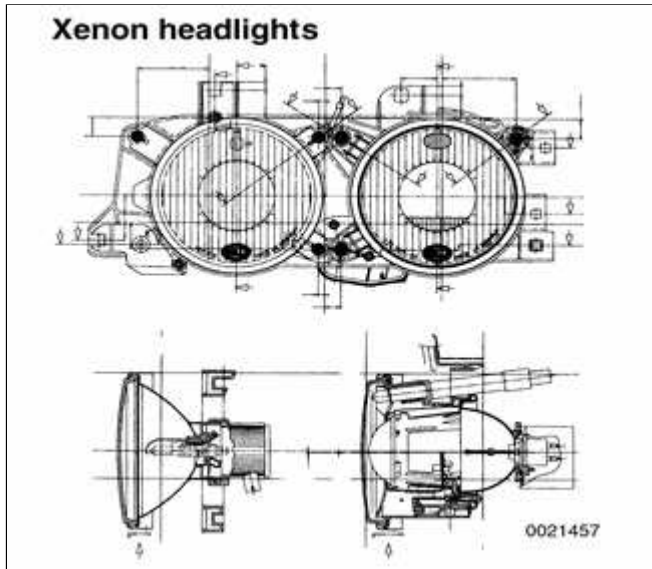
- ✦ Press in on tabs (**arrows**) in light switch assembly to separate light switch from light control module.



- ✦ Gently wiggle harness connector to remove from switch.

Headlights

E46 cars are equipped with Halogen headlights as standard equipment. Halogen bulb replacement is performed from the back (engine) side of the headlight assembly. The front face of each headlight assembly is a removable plastic cover.



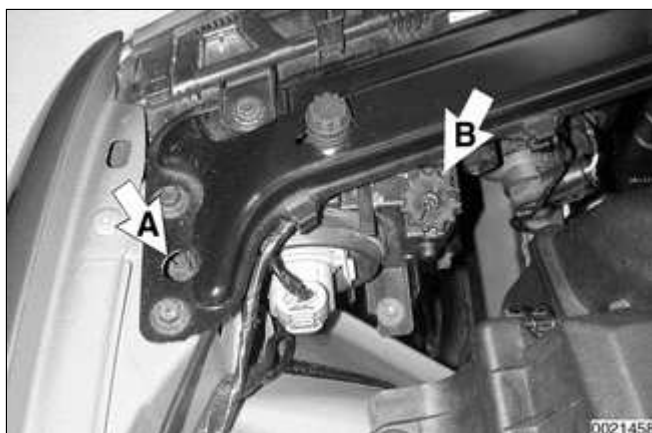
- ✦ Optional Xenon low-beam headlights illuminate the road ahead and to the sides in greater detail than conventional headlights. Sometimes referred to as High Intensity Discharge (HID) lights, Xenon lights use less energy and last longer than other headlight bulbs.

Cars equipped with Xenon headlights also feature automatic headlight adjustment control (LWR) for varying passenger and cargo loads.

Components of the headlight system can be purchased from BMW. Use illustrations on the following pages to identify components.

Headlight aim, adjusting

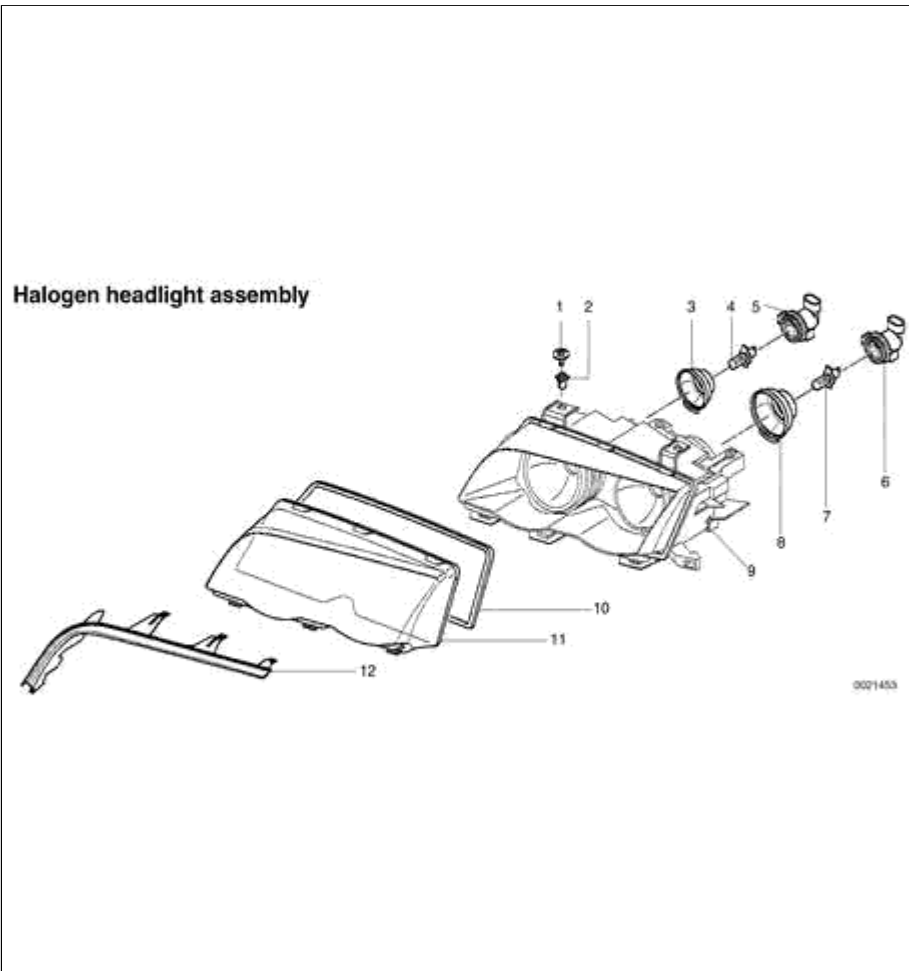
Adjust headlight aim with correct tire pressures, fuel tank full, and weight of one person (approx. 75 Kg/200 lb) in driver seat.



- ✦ Use 6 mm Allen wrench, phillips head screwdriver, or hand to adjust headlight by turning adjusting knobs.
 - ◆ **A** is primarily for lateral adjustment.
 - ◆ **B** is primarily for vertical adjustment.

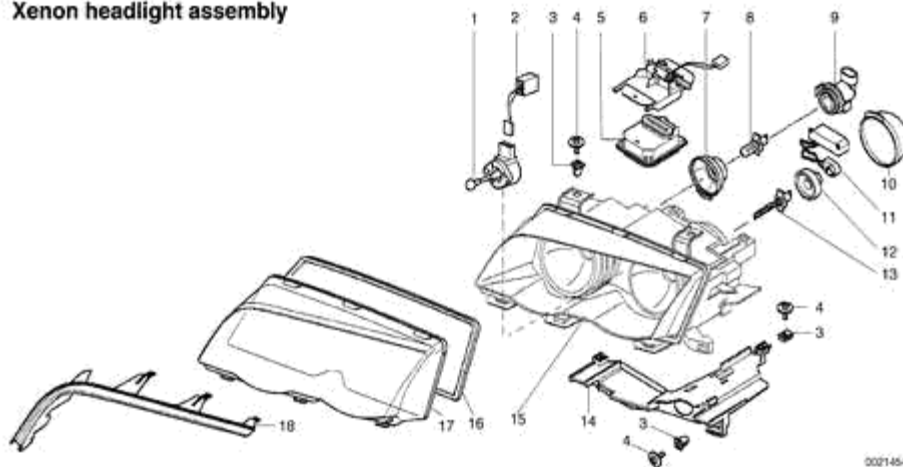
Note:

When adjusting headlights with automatic adjuster system (LWR), wait at least 30 seconds for the LWR to cycle and adjust to its calculated position.

**Halogen headlight assembly**

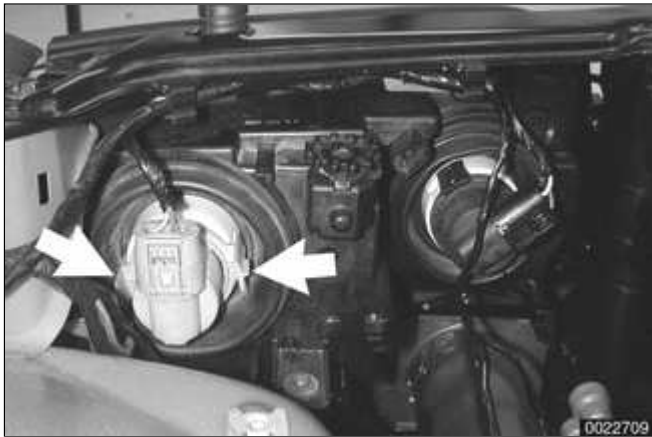
- 1 - Mounting screw
- 2 - Expanding nut
- 3 - High beam cover
- 4 - High beam bulb
- 5 - High beam bulb socket
- 6 - Low beam bulb socket
- 7 - Low beam bulb
- 8 - Low beam cover
- 9 - Headlight housing
- 10 - Sealing gasket
- 11 - Cover
- 12 - Cover lock strip

Xenon headlight assembly

Xenon headlight assembly

- 1 - Automatic headlight adjustment (LWR) stepper motor
- 2 - Electrical harness connector
- 3 - Expanding nut
- 4 - Mounting screw
- 5 - Xenon bulb control module
- 6 - Control module bracket
- 7 - High beam cover
- 8 - High beam bulb
- 9 - High beam bulb socket
- 10 - Low beam cover
- 11 - Xenon bulb ignition element
- 12 - Supporting ring
- 13 - Xenon low beam bulb
- 14 - Headlight assembly carrier plate
- 15 - Headlight housing
- 16 - Sealing gasket
- 17 - Cover

18 - Cover lock strip

**Headlight bulb (Halogen),
replacing**

◀ Working in back of headlight assembly:

- ◆ Rotate headlight bulb retaining ring (**arrows**) counterclockwise.
- ◆ Pull bulb socket and bulb out of headlight assembly.
- ◆ Disconnect harness connector from socket.
- ◆ Gently wiggle bulb and pull straight out of socket.
- ◆ Replace bulb by pushing firmly into socket. Headlight bulb applications are listed below.
- ◆ Installation is reverse of removal.

Note:

To remove left side high beam bulb, remove air filter housing cover. See ⇒ [020 Maintenance](#).

CAUTION!

Do not touch halogen bulbs with your bare hands. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.

Headlight bulb (Xenon),

replacing

- Working in back of headlight assembly:
- ◆ Remove low beam (Xenon) cover.
- ◆ Twist Xenon ignition element counterclockwise and remove.
- ◆ Rotate headlight bulb retaining ring counterclockwise. Pull bulb out of headlight assembly.
- ◆ Installation is reverse of removal. Headlight bulb applications are listed below.

CAUTION!

Do not touch bulbs with your bare hands. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.

Headlight bulb application	
Low beam (Halogen)	H7 12V 55W
Low beam (Xenon)	D2-S
High beam	H7 12V 55W

Headlight assembly, removing and installing

CAUTION!

Following headlight assembly work, headlight beam aim must be adjusted using special equipment.

- Disconnect harness connectors

from headlight assembly.

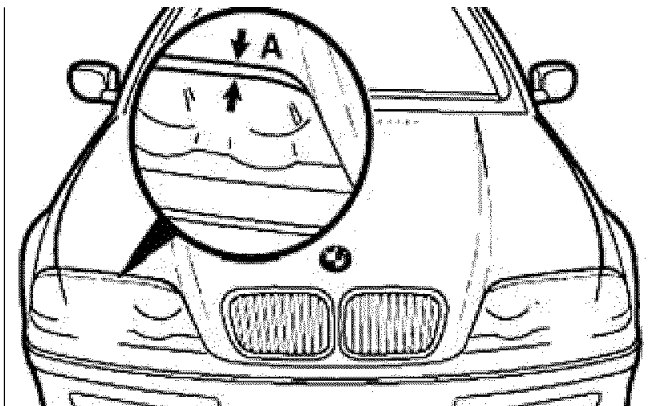
- If necessary, remove headlight washer spray nozzles. See ⇒ [611 Wipers and Washers](#).
- Remove front turn signal assembly as described later in this repair group.



- ◀ Use plastic prying tool to detach and remove trim piece below headlight assembly.



- ◀ Remove headlight mounting screws (**arrows**). Lift headlight assembly forward and out of car.



- ◀ During reassembly:
 - ◆ Install top mounting screws hand tight.
 - ◆ Pull headlight assembly toward front of car.



- ◆ Close engine hood and check to make sure that gap between hood and headlight assembly (**A**) is correct. See specification below.
- ◆ Open hood and tighten down mounting screws.
- ◆ Remainder of assembly is reverse of removal.

Headlight to hood gap	
Dimension A	5.0 ± 1.0 mm (0.2 0.± 04 in.)

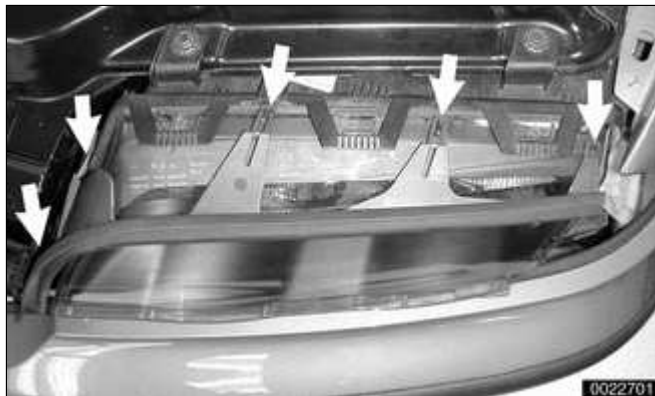
- Adjust headlight aim as described earlier.

Headlight lens, removing and installing

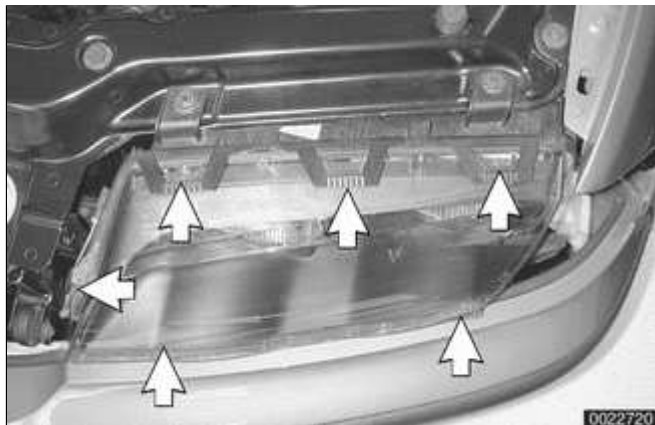
- If necessary, remove headlight washer spray nozzles. See ⇒ [611 Wipers and Washers](#).
- Remove front turn signal assembly as described later in this repair group.



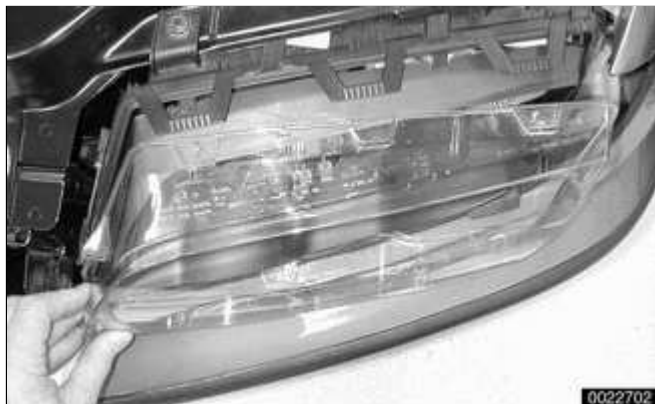
- ◀ Use plastic prying tool to detach and remove trim piece below headlight assembly.



- ✦ Unclip sealing gasket (**arrows**) and remove.



- ✦ Release clips (**arrows**) retaining front lens.



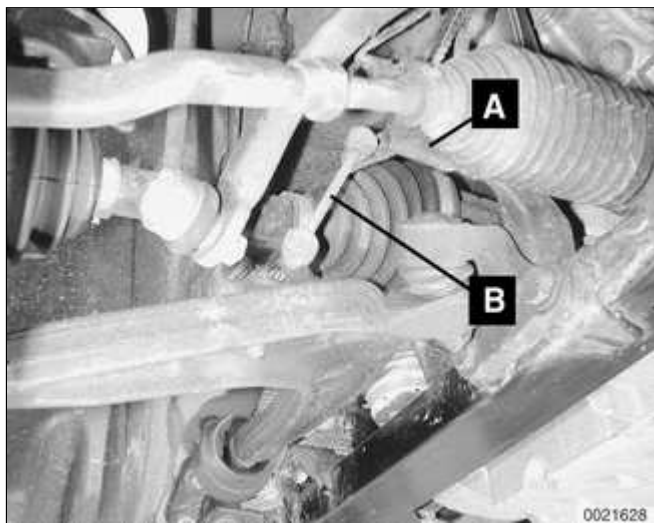
- ✦ Pull lens forward to remove.
 - Installation is reverse of removal. Replace gasket between lens and body of light if necessary.

Automatic headlight adjustment (LWR)

Vehicles equipped with the optional Xenon low-beam headlight bulbs also feature automatic headlight adjustment (LWR). This system automatically adjusts the vertical positioning of the headlights to maintain optimum headlight beam angle for maximum driving visibility and to prevent undue glare for oncoming motorists. The system compensates for vehicle load

angle changes.

LWR monitors vehicle load via two hall effect sensors mounted to the front and rear suspension members. When an adjustment to the angle of the headlight beams is necessary, LWR simultaneously activates two stepper motors (one in each headlight assembly). The stepper motors drive a threaded rod that moves the lower edge of the headlight carrier plates. The pivoting movement adjusts the vertical position of the headlight beams.

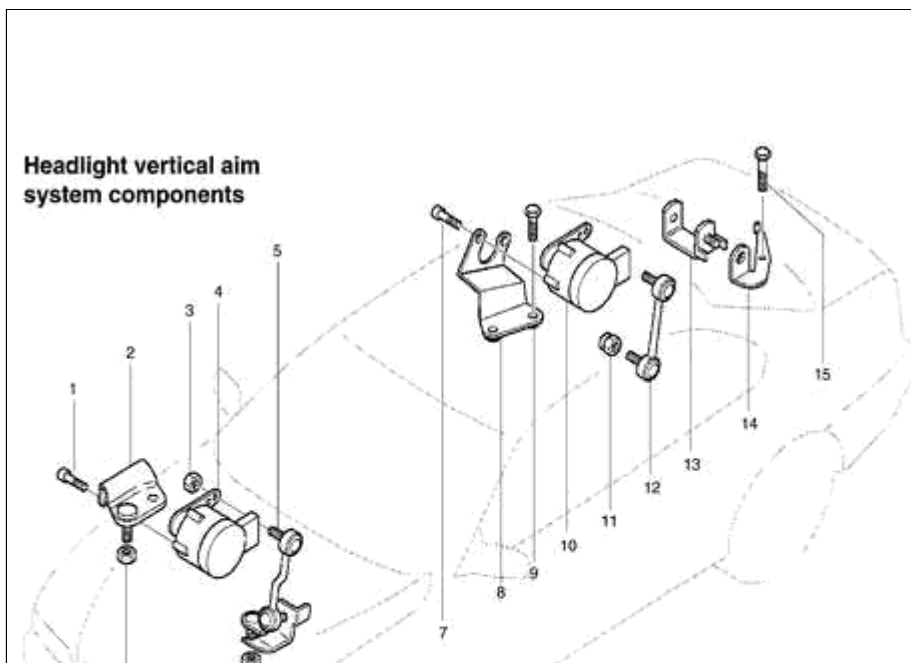


- At each axle of the vehicle, the LWR sensor (A) is mounted to a fixed point on the suspension subframe. A lever (B) is connected to the moving suspension member. The sensor output voltage changes as the suspension moves up and down.

All LWR diagnosis is accessed through the light control module.

Note:

LWR is not available with standard halogen headlights.



Headlight vertical aim system components

- 1 - Bolt M5
- 2 - Right front ride height sensor mounting bracket
- 3 - Self-locking nut M6
- 4 - Front ride height sensor



- 5 - Front ride height sensor link
- 6 - Self-locking nut M8
- 7 - Bolt M5
- 8 - Right rear ride height sensor mounting bracket
- 9 - Bolt M6
- 10 - Rear ride height sensor
- 11 - Self-locking nut M6
- 12 - Rear ride height sensor link
- 13 - Extension
- 14 - Bracket
- 15 - Bolt M6

Front Foglights

Foglight aim, adjusting



- ⚡ Sedan or Sport Wagon: Use 4 mm Allen wrench to turn plastic adjuster (**arrow**) on outer edge of foglight.



- ⚡ Coupe or Convertible: Use adjuster (**arrow**) on inside upper edge of foglight.



- ⚡ 2001 models:
 - ◆ Using plastic pry tool, pry off foglight cover at slot (**arrow**).
 - ◆ Adjust using 6 mm Allen on outside upper corner of foglight.



Foglight assembly, removing and installing

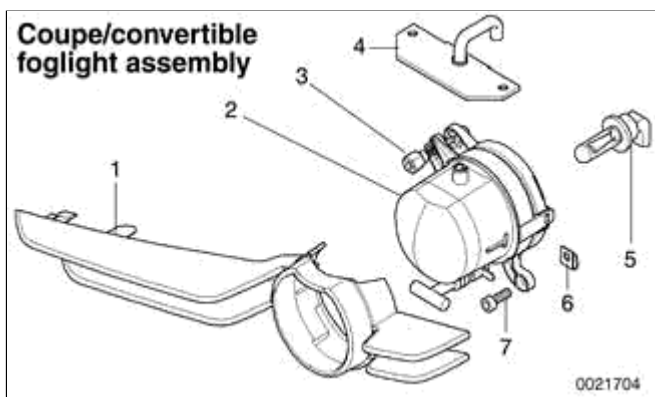


✦ Sedan or Sport Wagon:

- ◆ Use plastic prying tool to lever out foglight assembly.
- ◆ Detach electrical harness connector.

- Coupe or Convertible:

- ◆ Gently remove lower bumper trim.
- ◆ Working at foglight, detach grille and loosen mounting screws.
- ◆ Remove foglight assembly with grille attached.
- ◆ Detach electrical harness connector.



✦ Unclip grille from foglight.

- 1 - Grille
- 2 - Foglight
- 3 - Adjuster
- 4 - Support with grommet
- 5 - Foglight bulb
- 6 - Body nut
- 7 - Self-tapping screw

- Installation is reverse of removal, noting the following:
- ◆ Sedan/Sport Wagon: Foglight must be snapped firmly into bumper retainers.
- ◆ Coupe/Convertible: Keep ventilation grommets unkinked and firmly seated.
- ◆ Adjust foglight aim as described earlier.

Foglight bulb, replacing

- Remove foglight assembly as described earlier.
- ◆ Twist and remove bulb from rear of foglight assembly.

CAUTION!

Do not touch halogen bulbs with your bare hands. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.

- ◆ Installation is reverse of removal. Check electrical connector for corrosion. Spray with contact cleaner, if necessary.

Foglight application	
Front foglight bulb	HB4

630-5

Turn Signals, Taillights

Front turn signal assembly, removing and installing

The procedure below also includes turn signal bulb replacement.



- ✦ With engine hood open, use a screwdriver to press turn signal assembly retaining clip down to disengage from retaining tab on headlight assembly frame.



- ✦ Screwdriver must reach into fender hole a minimum of 3 in. to reach the retaining tab.
 - Push turn signal forward. Light slides straight out.
 - Detach electrical harness connector.
 - Twist and remove bulb from rear of turn signal assembly.

CAUTION!

Do not touch bulb with your bare hands. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.

Note:

Before reinstalling, make sure rubber seal on wrap-around trim (underneath headlights) is firmly glued to trim. Reglue if necessary.

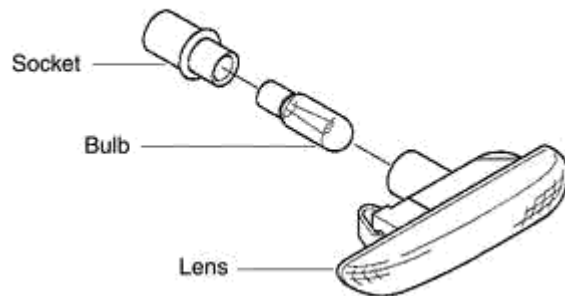
Front turn signal	
Turn signal bulb	12V 21W

Side turn signal assembly

- ✦ The yellow marker lights on the sides of the front fenders are turn signals. Use plastic prying tool to gently lever assembly out of fender.

Side turn signal	
Side light bulb	12V 5W

Side turn signal assembly

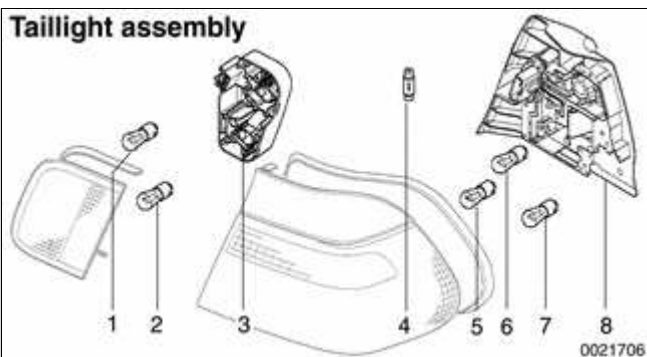


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Taillight assembly, removing and installing

- ✦ Taillight assembly
- 1 - Backup light bulb 12V 21W
 - 2 - Rear foglight bulb (Euro only) 12V 21W
 - 3 - Trunk lid/tailgate bulb carrier
 - 4 - Trunk light bulb 12V 10W
 - 5 - Taillight/brake light bulb 12V 21/4W
 - 6 - Turn signal bulb 12V 21W
 - 7 - Brake light bulb 12V 21W
 - 8 - Corner bulb carrier

Taillight assembly



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In E46 cars, taillight functions are split. The corner bulb carrier on each side contains:

- ◆ Taillight bulb
- ◆ Turn signal bulb
- ◆ Brake light bulb
- ◆ Trunk light bulb

The bulb carrier on each side of the trunk or tailgate contains:

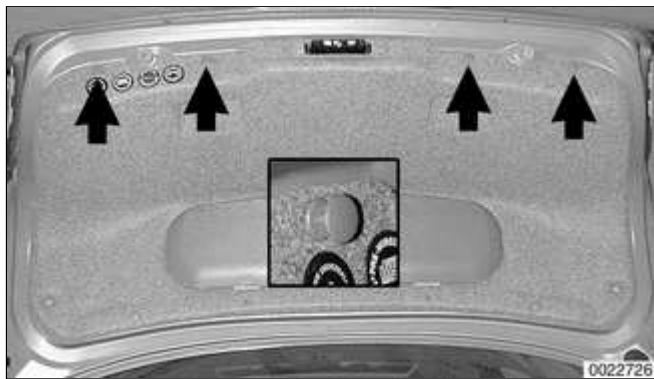
- ◆ Back-up light
- ◆ Rear foglight (European models only)
- To access taillight bulbs carriers, open trunk lid or tailgate.



- ✦ To access corner bulbs:
 - ◆ Sport Wagon: Remove cargo area side trim. See ⇒ [513 Interior Trim](#).
 - ◆ Unlatch bulb carrier retainer (**arrow**), then pull carrier off taillight assembly.
 - Detach electrical harness connector.
 - Replace bulbs as necessary.

CAUTION!

Do not touch bulb with your bare hands. If necessary wipe bulb using



- ✦ To access trunk lid taillight bulbs: Partially remove trunk lid trim panel by removing plastic expansion rivets (**arrows**). Expansion rivets are released by prying upper portion out (**inset**), then pulling off trunk lid.

- To access tailgate taillight bulbs: Remove tailgate inside trim panel. See ⇒ [412 Trunk Lid, Tailgate](#).



- ✦ Unlatch bulb carrier retainer (**arrow**), then pull carrier off.

- Detach electrical harness connector.
- Replace bulb(s) as necessary.

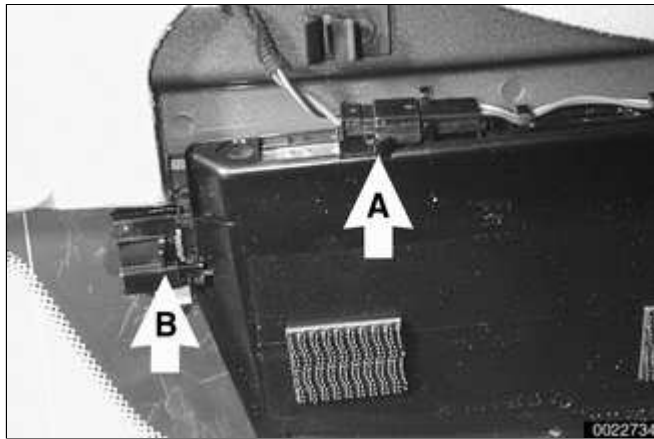
CAUTION!

Do not touch bulb with your bare hands. If necessary wipe bulb using a clean cloth dampened with rubbing alcohol.

- Installation of either bulb carrier is reverse of removal.

Taillight applications	
Backup light bulb	12V 21W
Brake light bulb	12V 21W
Brake light/taillight bulb	12V 21/4W
Rear foglight (European only)	12V 21W
Turn signal bulb	12 V 21W

Center brake light



✦ **Sedan or Coupe:** Working from rear seat in passenger compartment, gently pull off trim cover over third brake light (at top of rear glass).

- ◆ Detach electrical harness connector (**A**).
- ◆ Remove retaining clips (**B**) on either side and remove assembly.

- **Convertible:** Remove inner trunk lid trim adjacent to license plate light assembly.

- ◆ Detach electrical harness connector

- ◆ Push center brake light out.



✦ **Sport Wagon:** Open rear window.

- ◆ Carefully detach rear window hinge cover.
- ◆ Remove rear spoiler mounting bolts (**arrows**).
- ◆ Detach electrical harness connector and rear washer hose from spoiler.
- ◆ Remove mounting screws and remove third brake light assembly from spoiler.
- ◆ When installing, be sure electrical harness and rear window washer

hose are not damaged or kinked.

Note:

Replace sealing plastic and grommets as necessary during reassembly.

Tightening torque	
Rear spoiler to rear glass	6 Nm (4 ft-lb)

License plate light, removing and installing



- ✦ Using a flat tipped screw driver, pry gently on right side of license plate light assembly (**arrow**). Lift off lens.

CAUTION!

To avoid marring trim, wrap the screwdriver tip with tape.

- Remove bulb.

Note:

Inspect bulb contact springs for damage and corrosion. Replace socket assembly if necessary.

License plate light application	
License plate bulb	12V 5W

- Installation is reverse of removal.

Interior Lights

The ZKE V general module (GM V) controls the interior lighting automatically using input from several monitors. The lighting can also be manually controlled.

Each door lock actuator contains a hall effect sensor for the purpose of monitoring door open/closed status. The hall effect sensor is located directly behind the rotary latch plate encased in the lock actuator. The sensor is activated by the rotary latch plate position.

- ◆ Door closed: Rotary latch plate in latched position. Current flow through hall sensor <5 mA.
- ◆ Door open: Rotary latch plate in open position. Current flow through hall sensor >12 mA.

A change in current flow informs the GM V when a door is opened or closed.

The overhead front seat interior/map light unit contains a single main interior light. The light is controlled by the GM V automatically or by momentarily pressing the interior light switch located on the light assembly. The switch provides a momentary ground signal that the GM V recognizes as a request to either turn the light on (if off) or turn the light off (if on).

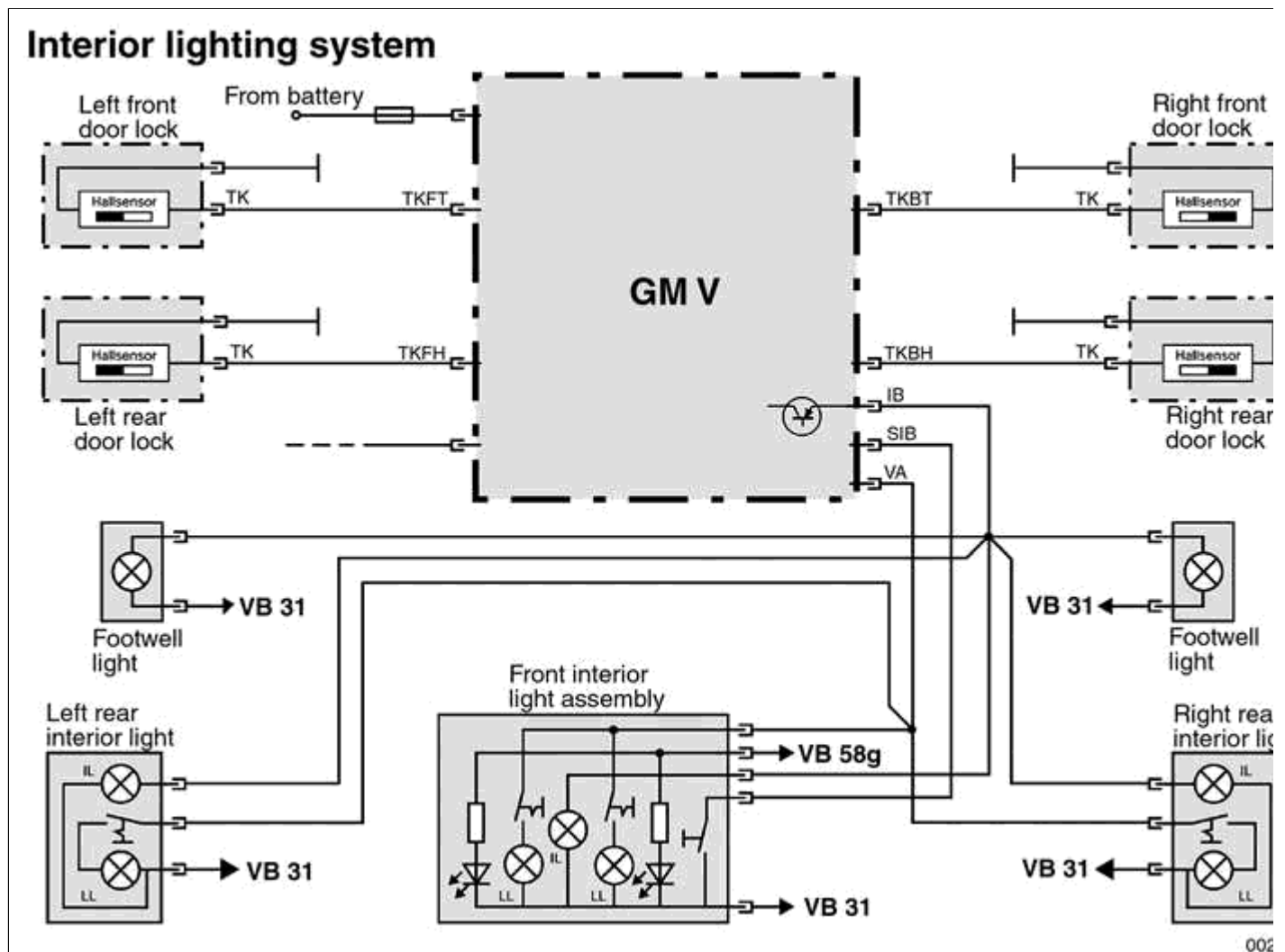
If the switch is held for more than 3 seconds, the GM V interprets the continuous ground signal as a request to turn the interior light circuit off (workshop mode). Workshop mode is stored in memory: Even if the GM V is removed from the power supply and reconnected, the lights do not come

back on unless the switch is pressed again.

There are two reading/map lights located in the front interior light assembly. Each is mechanically controlled by depressing the corresponding switch. The power supply for the map lights is supplied by the GM V.

There is a courtesy light in each front footwell. These lights are only operated when the GM V provides power to the interior lighting circuit.

Interior lighting system



Interior light automatic controls

The GM V provides 12 volts to the interior lighting circuit when the status of one of the following input signals changes:

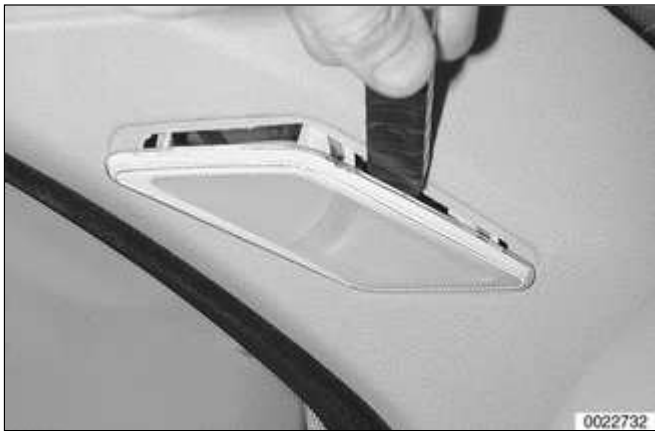
- ◆ Door contact hall sensor active (door open)
- ◆ "Unlock" request received from driver door key lock hall sensor (ignition switch OFF)
- ◆ "Unlock" request from FZV keyless entry system received via K bus (ignition switch OFF)
- ◆ Vehicle exterior lights on for minimum of 2 minutes when ignition switch is OFF
- ◆ Active crash signal from MRS II control module
- ◆ Lock button of FZV key pressed with vehicle already locked (interior search function)
- ◆ Immediately after ignition switch is turned to "radio" position with driver door closed.
- ◆ When vehicle is locked (single or double) with door contacts closed.
- ◆ When vehicle door contacts are closed. Lights remain on for 20 seconds, then go to soft off.
- ◆ After interior search function is

activated, lights automatically turn off (soft off) after 8 seconds.

- ◆ After 16 minutes with door contact active (open door) and key off, lights are switched off (consumer cutoff function).

The component activation function of DIS also has the ability to switch the lights.

Interior light, footwell light, or cargo compartment light (Sport Wagon), replacing bulb



- ◀ Pry interior light fixture gently to remove.
- ◆ Detach electrical harness connector.
- ◆ Remove bulb and replace.

CAUTION!

When replacing bulbs, do not touch glass of bulb with fingers. Only touch bulb with clean cloth or bulb packaging.

- Installation is reverse of removal. Bulb types and specifications for various interior lamps are listed below.

Interior light applications	
Footwell light bulb	Softlite 5W
Glove compartment light bulb	Softlite 5W
Passenger compartment bulb,	Softlite 5W

Interior light applications	
front or rear	
Reading bulb, front or rear	6W
Tailgate courtesy light bulb	Softlite 10W
Visor vanity light bulb	Softlite 10W

Trunk light bulb, replacing

The trunk lights are integrated with the taillight assembly.



◀ Pry trunk light cover (**arrow**) gently to remove from taillight corner bulb carrier.

◆ Remove bulb and replace.

◆ Installation is reverse of removal.

Trunk light application	
Trunk light bulb	Softlite 10W