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61 Electrical System

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61 Electrical System

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GENERAL INFORMATION

Important When Disconnecting Battery!

Location: two batteries in trunk, one each behind left and right wheel housings. Disconnection will erase the fault memories of control units, so that fault memories must be read and, if applicable, faults printed first.
Always disconnect both ground leads to prevent short circuits!

Important After Reconnecting Battery!

Re-initiate front power windows: shut doors, raise windows with switches, hold switches pressed at least 3 seconds.

Re-initiate power sun roof: close sun roof with switch, hold switch pressed at least 3 seconds.

Checking initiation: automatic tipping in closing direction must work. If not, repeat the procedures.

Important With Connected Battery!

Working on components, wire connections, etc. could cause faults in the fault memories of concerned control units.
If repairing instructions specify disconnection of the battery, this is absolutely necessary in the interest of safety.

Windshield Wipers (Wiper Motor)

Intermittent wiping and wipe speed 1 are switched off by an interlock in case of disturbance.
This interlock remains effective even after elimination of the fault.
Switch off the ignition (terminals 15 and R) for 3 minutes to cancel interlocking.

Instructions for Removal and Installation of Electronic Control Units

Important!
Disconnecting the car battery will erase fault memories of the control units.
Consequently always interrogate fault memories and, if applicable, print faults with the printer of a BMW SERVICE TESTER before disconnecting the car battery.
The ignition must always be switched off before control unit plugs are disconnected or connected.
Faults could be stored in the fault memories of control units with self diagnosis by removing and installing components, relays, fuses, etc..
Consequently always interrogate fault memories after working on the electric system. Investigate and erase stored faults.

BATTERY CARE AND MAINTENANCE

The electrolyte level of present low-maintenance batteries should be checked at least once annually and corrected to the max. mark specified by the battery supplier with distilled water when necessary. Discharging by the power consumption of control units even in standby mode is added to the natural self-discharging of a battery due to the increasing number of control units used in cars today. The batteries of cars in storage should be recharged at the latest every 6 weeks to maintain the service life and avoid excessive discharging (refer to the battery charging schedule). The time for self-discharging depends on the car model and equipment.

Charging Battery:
If a standard or fast charger (e.g. Bosch SL 2490)* is used to charge a battery, the battery must be disconnected from the electric system and removed in order to avoid damage to paint finish and upholstery by the escaping gas.
Excessively discharged batteries could be damaged or destroyed by the very high initial current (high temperature).
The battery can remain connected when using an electronic charger (e.g. Siemens VB 80).
The electronics does not permit critical peak voltage.
An electronic charger also charges an excessively discharged battery with reduced current until a certain basic voltage is reached.
Should there be doubt about the suitability of a battery charger used in the workshop, refer to Service Information 61 08 88.
Important!
First measure the rest potential before charging a battery installed in the car. If the voltage is 10 V or less, it cannot be excluded that one or more of the cells are faulty or the battery on a whole had already been damaged. In this case the battery must always be removed, as escaping gas could damage inside equipment while charging. Attempt to regenerate the faulty cells with low charging current. Take off caps on the individual cells in the interest of safety.
Refer to page 61-21/1.

Testing Battery:

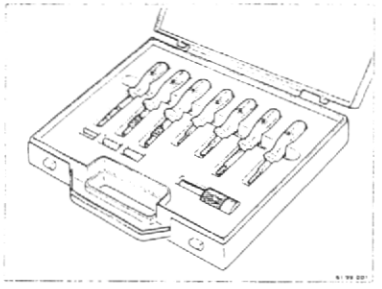
An objective statement on the charged condition of a battery is only possible by way of a load test with cold testing current. This test can be carried out with a battery tester, e.g.

Bosch T 12 200 * or preferrably with
Bosch T 12 200*.

Additional information on load tests is contained in the pertinent operating instructions (see page 61-20/1).

The acid density of a battery can also be used to determine the charged condition. This test, however, is not as positive due to the design-orientated dispersion range of acid density (e.g. charged standard battery version = acid density 1.28 kg/ltr. - tropic version = acid density 1.23 kg/ltr.).
Another interferring factor is the acid layer immediately after filling with distilled water as well as battery wear with partially sulphated and/or strongly contaminated plates.

* Source of Supply: HWB

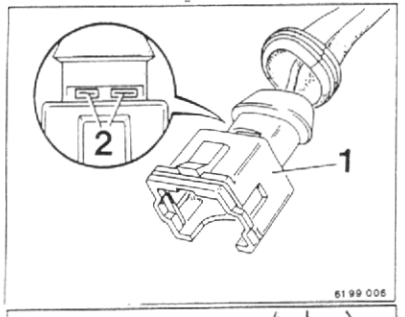


61 13 . . . REMOVING AND INSTALLING WIRE PINS IN PLUG RECEPTACLES

Use Special Tool 61 1 130 for this work.

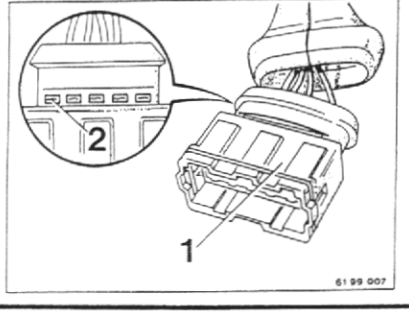
Application Instructions

Only plugs with an additional receptacle lock are described in these instructions. The contacts of plugs not described here can be pressed out direct with the corresponding pressing-out tool. After repairing plugs it is important to make sure that the locks of plugs have engaged again.

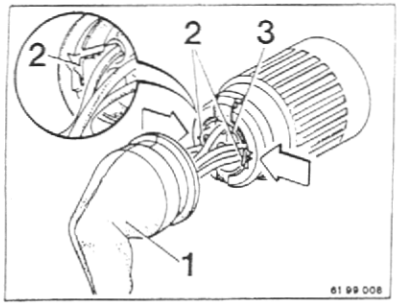


Ultrasonic Bonded Plugs

Contacts of plug (1) are ultrasonically bonded and can not be replaced. This can be recognized on the bonding (2) along the side of the plug.

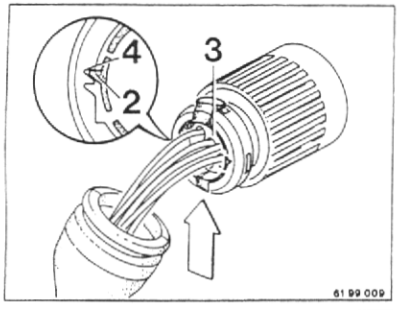


Contacts of plug (1) are ultrasonically bonded and can not be replaced. This can be recognized on the bonding (2) along the side of the plug.

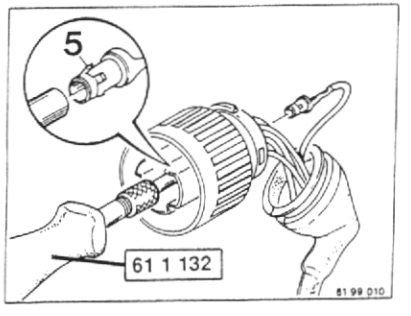


7 and 8 Pin Round Plugs

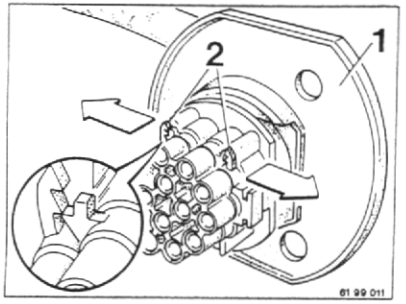
Pull off rubber grommet (1) carefully. Push back retaining tabs (2) of inside plug (3) carefully.



Slide inside plug (3) in direction of the arrow until retaining tabs (2) engage in unlocking groove (4).

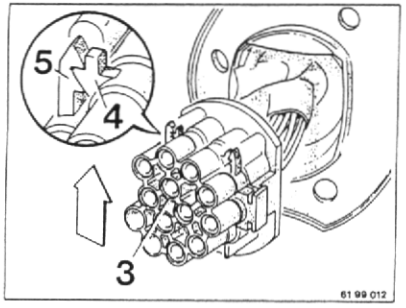


Push back spring steel locks (5) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

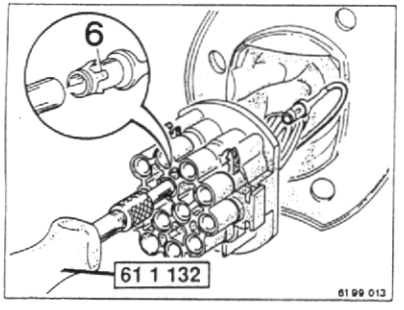


13 Pin Round Plugs

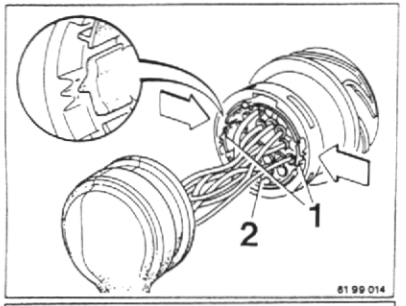
Pull off rubber grommet (1).
Pull out lock (2) in direction of the arrow carefully.



Slide lower plug section (3) in direction of the arrow far enough that retaining tabs (4) engage in unlocking groove (5).

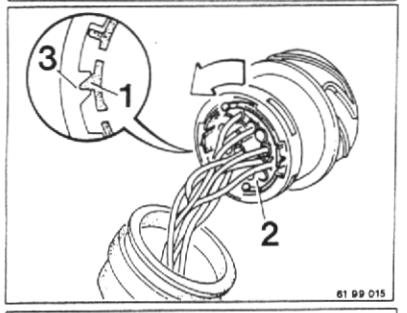


Push back spring steel locks (6) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

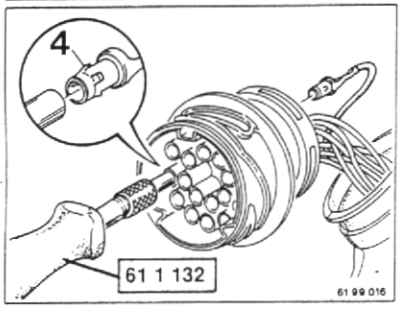


20 Pin Round Plugs

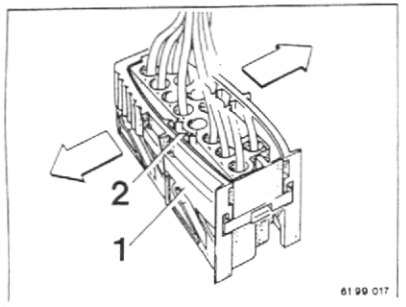
Push back retaining tabs (1) of inside plug (2) carefully.



Turn inside plug (2) far enough that retaining tabs (1) engage in unlocking groove (3).

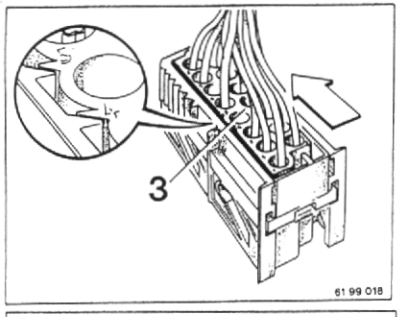


Push back spring steel locks (4) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

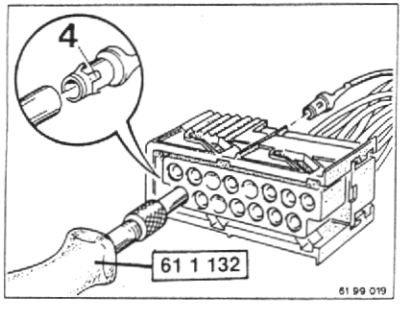


15 Pin Plugs

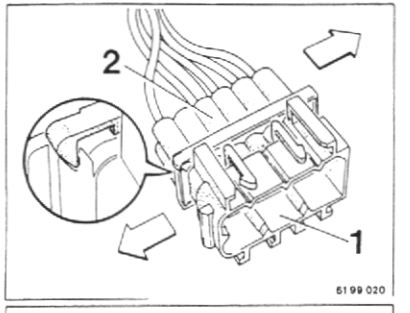
Pry outside plug (1) apart slightly and carefully in area of retaining tabs (2).



Pull inside plug (3) in direction of the arrow against the stop.

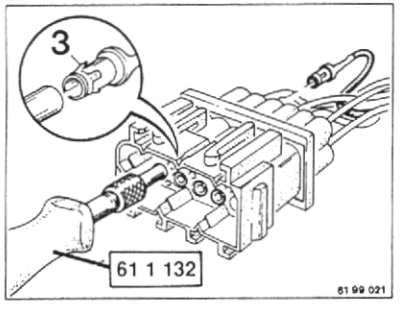


Push back spring steel locks (4) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

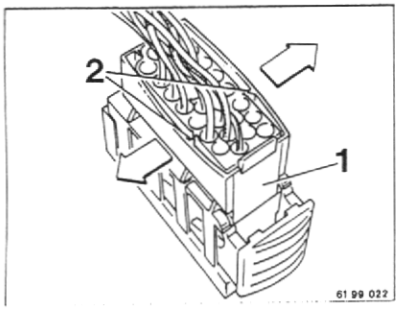


8 and 12 Pin Plugs

Slide upper plug section (1) and lower plug section (2) in direction of the arrow toward each other.

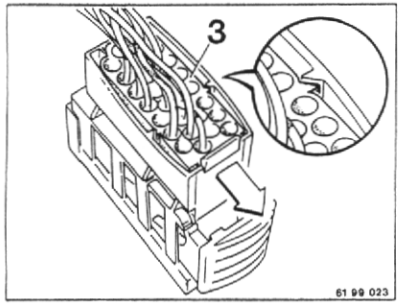


Push back spring steel locks (3) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

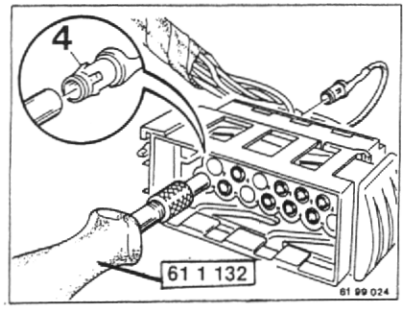


30 Pin Plugs

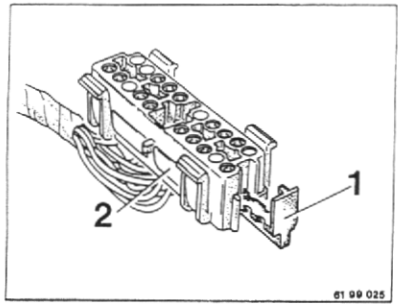
Pry outside plug (1) apart slightly and carefully in area of retaining tabs (2).



Pull inside plug (3) in direction of the arrow against the stop.

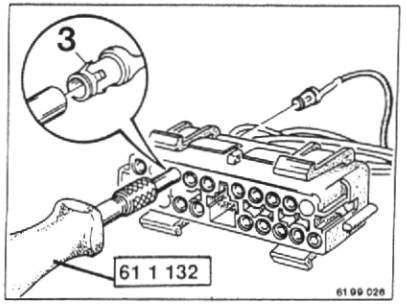


Push back spring steel locks (4) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

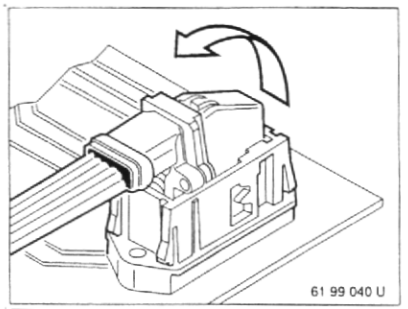


20 Pin Relay Modul Plug

Pull locking slide (1) out of plug (2).

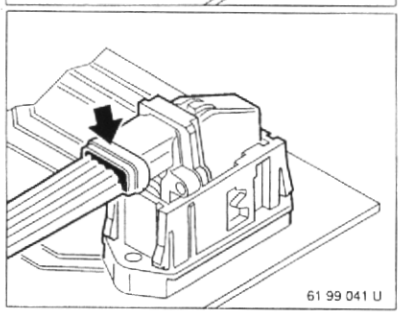


Push back spring steel locks (3) of the pertinent contact with Special Tool 61 1 132 and pull out the lead.

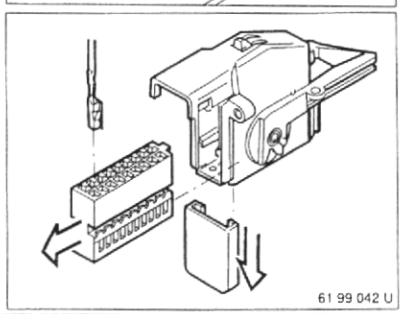


20 Pin Elo Plugs

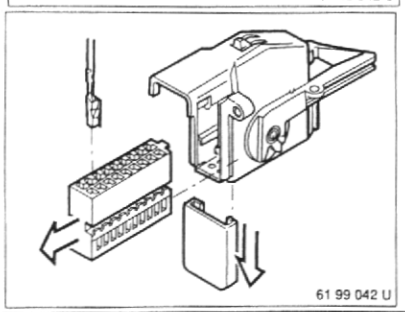
Unlock.



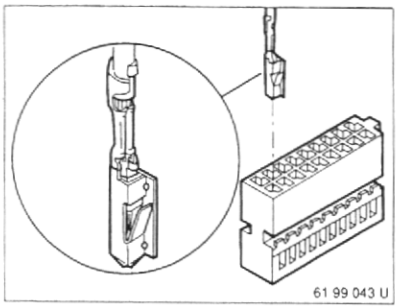
Loosen wire strap.



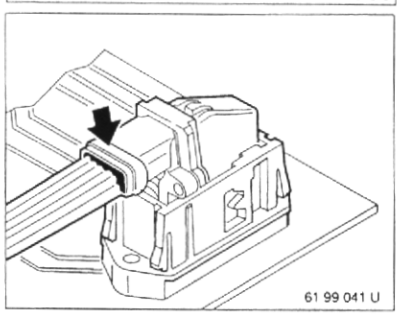
Pull off lock.



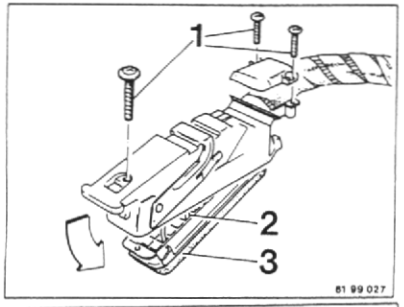
Pull out contact carrier.



Unlock contact.

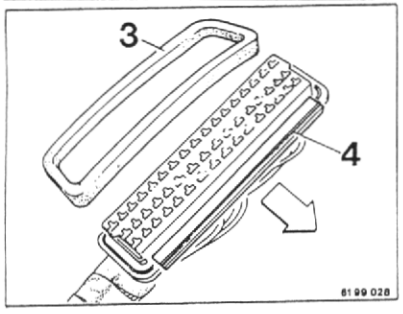


Important!
Always reinstall wire strap.

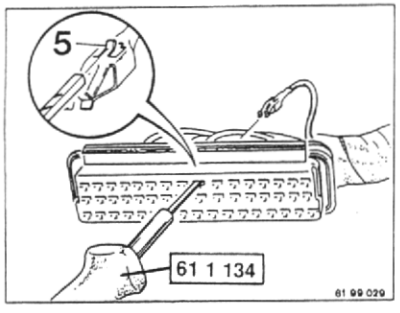


25, 35 and 55 Pin Control Unit Plugs

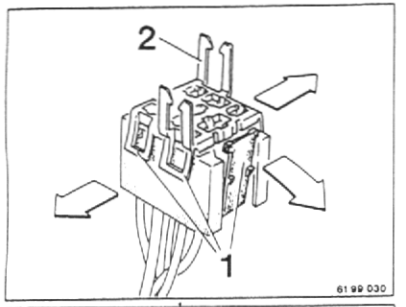
Unscrew phillip head screws (1).
Pry out contact sender (2) with seal (3) in direction of the arrow.



Pull off seal (3).
Pull out receptacle lock (4) in direction of the arrow and unlock.

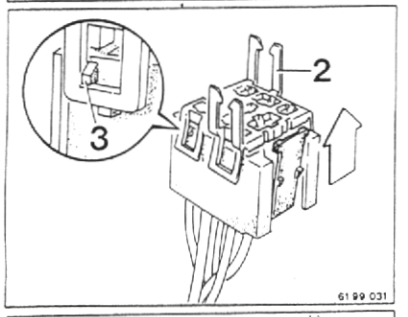


Push back spring steel lock (5) of the pertinent contact with Special Tool 61 1 134 and pull out the lead.

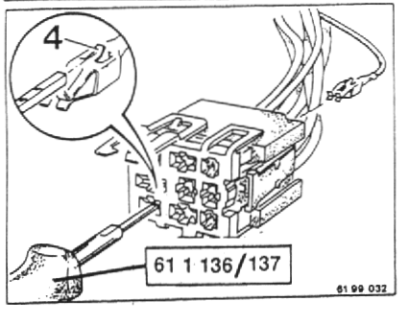


Relay Carrier

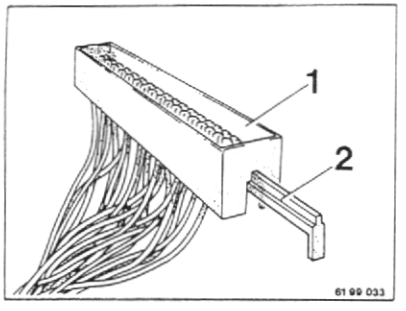
Pull lock (1) of relay holder (2) in direction of the arrow carefully.



Pull relay holder (2) in direction of the arrow into the first catch (3).

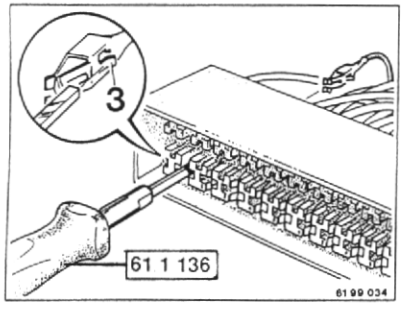


Push back spring steel lock (4) of the pertinent contact and pull out the lead.
Press out size 6.8 double flat spring contacts with Special Tool 61 1 136.
Press out size 2.8 double flat spring contacts with Special Tool 61 1 137.

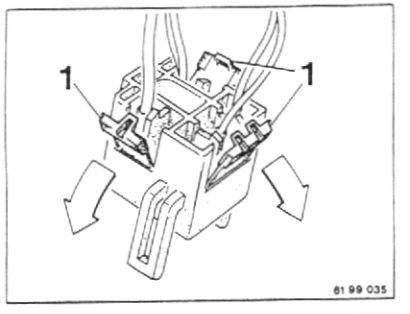


Fuse Plate

Pull pertinent fuse out of fuse plate (1). (Mark positions when removing all of the fuses.)
Pull locking slide (2) out of fuse plate (1) against the stop.

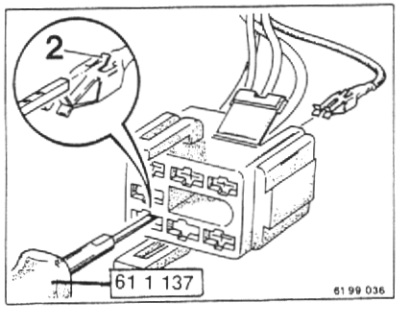


Push back spring steel locks (3) of the pertinent contact with Special Tool 61 1 136 and pull out the lead.

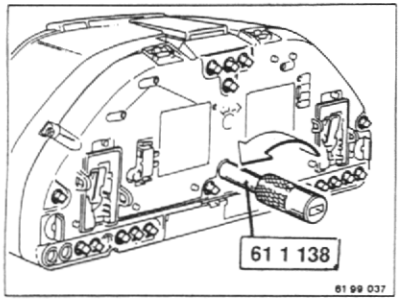


Master Relay Plug of DME

Open locking flap (1) of the pertinent lead.



Push back spring steel locks (2) of the pertinent contact with Special Tool 61 1 137 and pull out the lead.

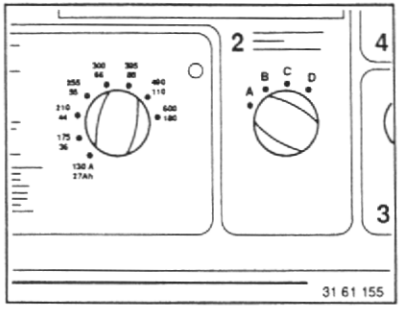


Display Lamps

Apply Special Tool 61 1 138 on the pertinent display lamp, turn 90° in counterclockwise direction (direction of arrow) and remove the display lamp.

61 20 001 BATTERY HIGH CURRENT TEST

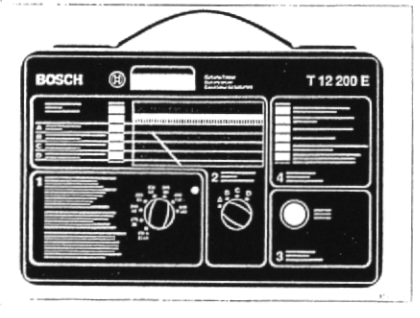
Perform test with Bosch 12 200E* tester.



Connect battery tester and adjust the cold testing current/rated capacity according to battery specifications.

Loading is accomplished with a high current of approx. 200 A, with electronic evaluation of voltage behavior during and after loading.
This test is presently the most reliable method of being able to evaluate the charged condition and physical battery condition (such as cell insulation and sulphation).

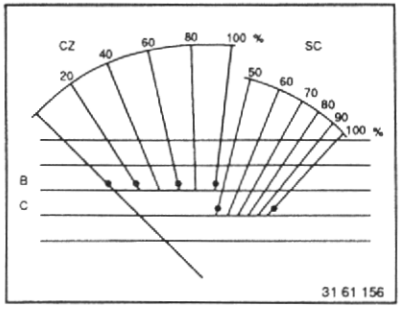
Start the test as described in the operating instructions.



Test Procedures:

Disconnect batteries from car.
Test batteries separately of each other.

Connect battery tester.



Only scales B and C are used for evaluation of the batteries.

* Source of Supply: HWB

LIMITS FOR EVALUATION OF ALL BATTERIES
(Excluding Telephone Batteries)

Charged State [1]	Starting Power [1]	Test Results		
		Okay	Charge	Faulty
Test Step 1 – Before Charging Battery				
not testable or less than 50 % [2]			X	
more than 50 %	less than 75 % [4]		X	
more than 50 %	more than 75 %	X	X	
more than 80 %	more than 75 %	X		

[1] Charged state and starting power must always be evaluated combined.

[2] Test charging — More than 5 hours with Gossen CG32 and Siemens/Gossen VB 801 charger

[3] Full charging — More than 80 %

[4] Test charge and recheck in the interest of safety when in doubt.

Charged State [1]	Starting Power [1]	Test Results		
		Okay	Charge	Faulty
Test Step 2 – After Charging Battery				
not testable or less than 50 %	less than 75 %			X
more than 50 %	more than 75 % [3]	X	X	

1) Charged state and starting power must always be evaluated combined.

2) Test charging — More than 5 hours with Gossen CG32 and Siemens/Gossen VB 801 charger

3) Full charging — More than 80 %

Make two test runs after charging and then recheck the battery.

Note:
Perform test direct on the battery in the interest of safety, if the battery had been tested on the positive connection point in the engine compartment and was negative.

61 20 . . . BATTERY STATIC CURRENT TEST

If the battery is recognized as being okay after the high current test, excessive static current consumption could cause discharging of the battery.

Before Static Current Test:
Switch off all power consuming equipment such as ignition, inside lights, reading lamps, seat heating, parked car heating, parked car ventilating and telephone. Shut glove box, trunk lid and engine hood.

Proceed as foolows to prevent failure of any possibly sticking relays.

Connection of Ammeter:
Positive lead of ammeter on unscrewed ground connection.
Ground connection of ammeter on body ground.

Remove the shrink-fit hose on the body end of the battery ground lead on the batteries. Clip on a cable with an alligator clip at this point (Hirschmann AK 2 S clip together with test leads, red = Order No. 61 1 472 and black = Order No. 61 1 474).
Clip a second cable on body ground. Close, lock and arrest (double-lock) the driver's door and front passenger's.
The trunk lid remains open.
Disconnect the battery ground lead with connected alligator clip on the ground connection point carefully 5 minutes after the locking step and bend it away.
Static current now flows only via the multimeter.

Simulation of the closed car by pressing the trunk light switch on the striker.
Read static current value on the multimeter.

If the static current is more than

50 mA,

it can be assumed that a hidden consumer is loading the battery.
The hidden consumer can be pinpointed by pulling off fuses, possibly relays and control units one after the other.

When testing and possibly troubleshooting have been concluded, the multimeter must be removed in reverse order of installation so that the memories of the radio, on-board computer and various control units are not cancelled.

Static Current Test in Cars with Burglar Alarm:

In order to be able to measure the actual static current, the trunk contact must be pressed 5 minutes after the locking step.

The trunk contact must not be released immediately after reading the static cur- rent, because then the burglar alarm horn would be active. This excessive cur- rent for the selected measuring range of the multimeter could destroy the in- strument, but at least the installed fuse.

The ground lead must always be reconnected in reverse order of disconnection, in order to be able to deactivate and unlock the car correctly.

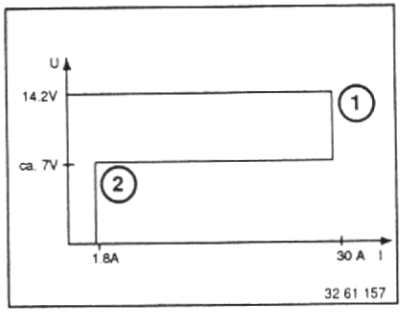
61 21 011 REPLACING BATTERY

Always conform with the following points in the case of cars with two batteries.
Check condition of batteries in a high current test.
Always check the second battery when replacing a faulty battery.
When replacing both batteries, make sure that both batteries are of the same make.

Note:
If both batteries are not replaced together, the older battery could damage the other battery due to the different degree of sulphatation. In other words the batteries would discharge on their own to a certain degree.

61 21 030 CHARGING BATTERY (BATTERIES)

Disconnect batteries in car and charge separately.
Mutual charging must be avoided as batteries reach their gassing voltage at different times.



Voltage / Induction Charging Curve Shows:

1. Charging with minimum current up to gassing limit voltage of 14.2 V, whereby charging in range of about 13.2 to 14.2 V could last relatively long, because in this limit range charging is with very low current.
2. Charging of strongly discharged batteries with an initial current of approx. 2 A up to a terminal voltage of approx. 7 V, at which maximum charging current cuts in.

Only chargers with the following properties are suitable for charging a battery in the car with connected power supply.

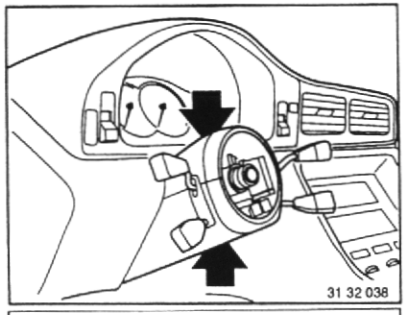
- Current limitation for strongly discharged batteries (regeneration of slightly predamaged batteries).
- Switchover or shutoff after reaching 14.4 V gassing voltage.
- Direct current voltage with harmonic wave less than 1 V.

Battery chargers without these properties lead to damage in the car.
The battery must be disconnected from the car power supply system when using any other chargers.
Take battery out of the car when charging with non-regulated chargers (see Operating Instructions).

Sample Chargers:
Siemens/Gossen VB 801
Gossen CG 32

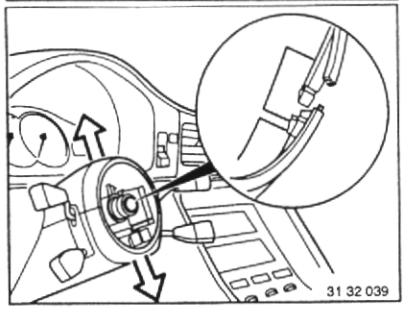
Refer to "Voltage/Induction Charging Curve".

Refer to Service Information 61 08 88 (900) for additional information.



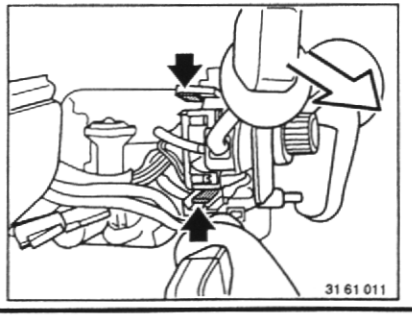
61 31 016 REPLACING TURN SIGNAL/ HEADLIGHT DIMMER SWITCH

Turn steering wheel to straight ahead.
Remove dashboard trim panel at bottom left – see 51 45 180.
Unscrew screw and take off lower section of the steering column casing.



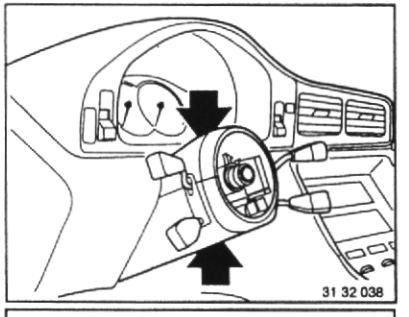
Unscrew screw and take off upper section of the steering column casing.

Disconnect plugs.



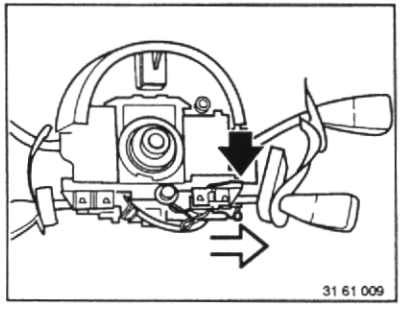
Push in retainers on both sides and pull out switch.
Disconnect plugs.

Installation:
Be careful not to damage the self-cancelling cam of the turn signal switch.
Mount turn signal switch after first setting it to middle position.

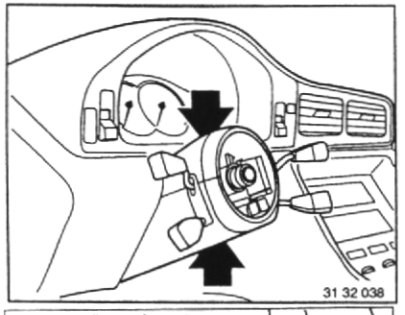


61 31 018 REPLACING SELECTOR SWITCH FOR CRUISE CONTROL

Remove dashboard trim panel at bottom left – see 51 45 180.
Unscrew screw and take off lower section of the steering column casing.

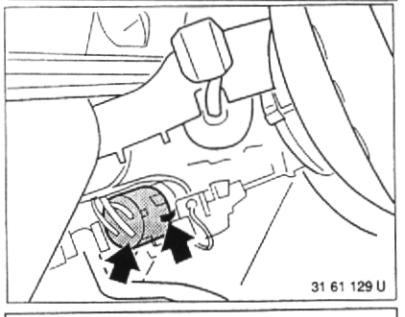


Press down on retaining hook and pull out switch.
Disconnect plug.

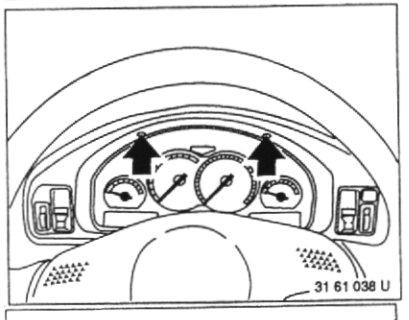


61 31 020 REPLACING IGNITION SWITCH

Remove dashboard trim panel at bottom left – see 51 45 180.
Unscrew screw and take off lower section of the steering column casing.

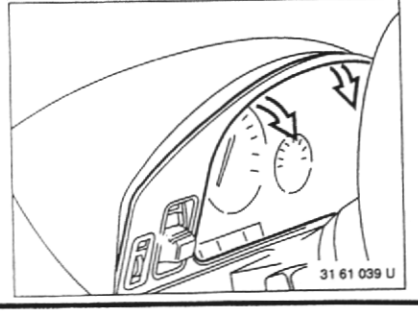


Unscrew setscrews on both sides.
Pull out switch.
Disconnect plug.

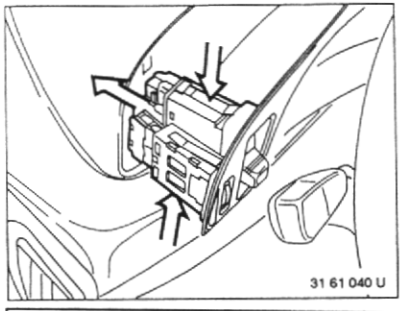


61 31 028 REPLACING LIGHT SWITCH

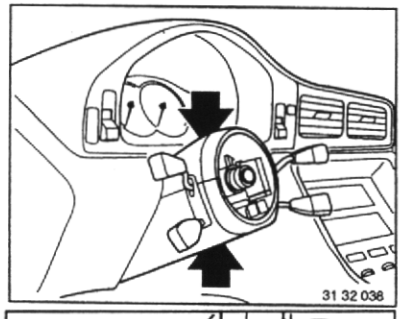
Unscrew screws.



Fold down ornamental frame at top.
Remove ornamental frame.

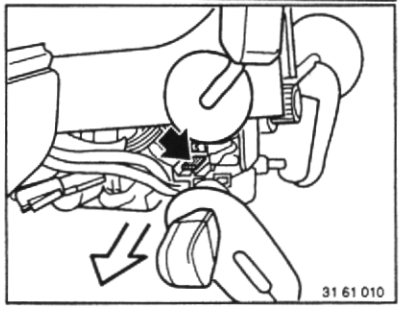


Disconnect plugs.
Push in retaining hook and press switch out of the ornamental frame.

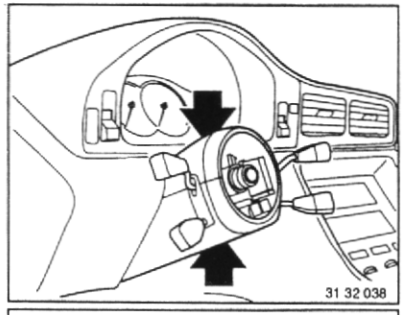


61 31 035 REPLACING STEERING COLUMN CONTROL SWITCH

Remove dashboard trim panel at bottom left – see 51 45 180.
Unscrew screw and take off lower section of the steering column casing.

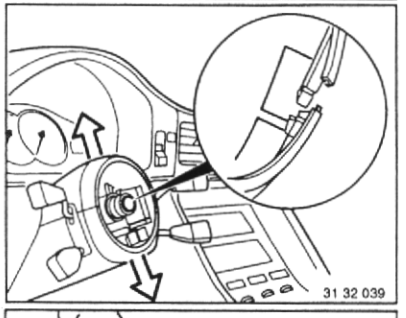


Press down on retaining hook and pull out switch.
Disconnect plug.

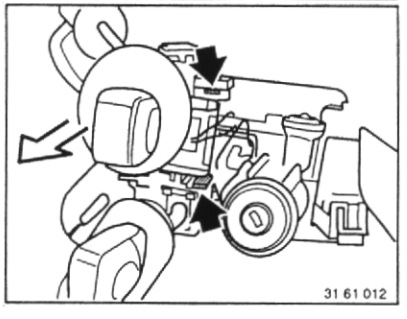


61 31 040 REPLACING WINDSHIELD WIPER SWITCH

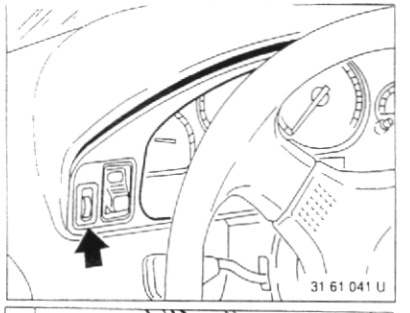
Remove dashboard trim panel at bottom left – see 51 45 180.
Unscrew screw and take off lower section of the steering column casing.



Unscrew screw and take off upper section of the steering column casing.

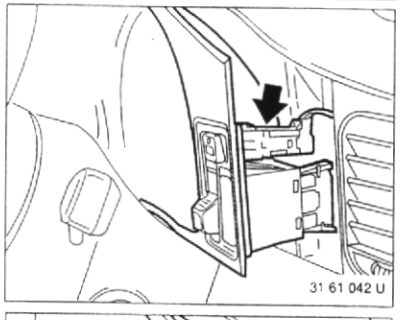


Press in retaining hooks on both sides.
Pull out switch.
Disconnect plug.



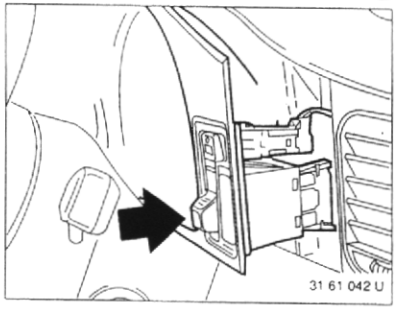
61 31 045 REPLACING INSTRUMENT LIGHT DIMMER SWITCH

See "Replacing Light Switch" in 61 31 028.



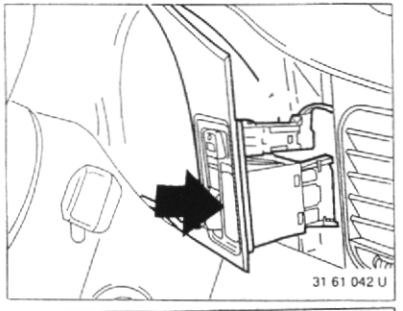
61 31 060 REPLACING REAR WINDOW DEFOGGER SWITCH

See "Replacing Light Switch" in 61 31 028.



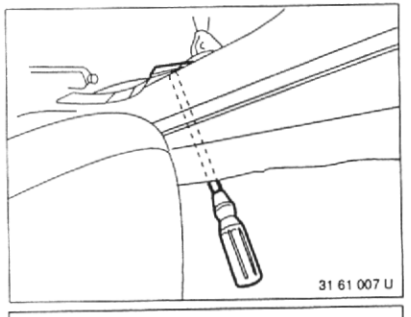
61 31 070 REPLACING FRONT FOG LAMP SWITCH

See "Replacing Light Switch" in 61 31 028.



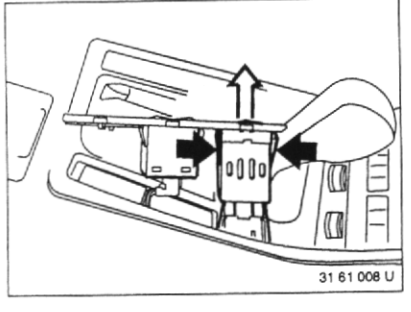
61 31 072 REPLACING VERTICAL HEADLIGHT AIM CONTROL SWITCH

See "Replacing Light Switch" in 61 31 028.

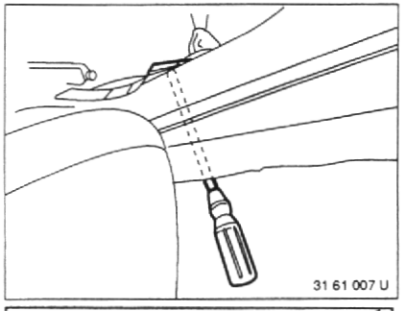


61 31 ... REPLACING SWITCH IN CENTER CONSOLE

Press out switch frame in center console carefully from underneath with a screwdriver.

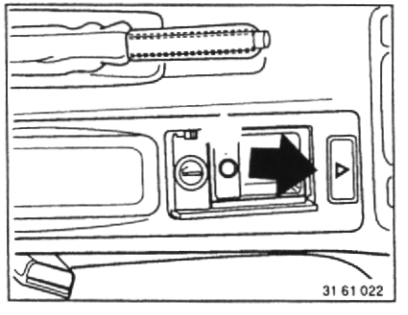


Pull off plug.
Press in retaining hook and press switch forward out of the trim panel.



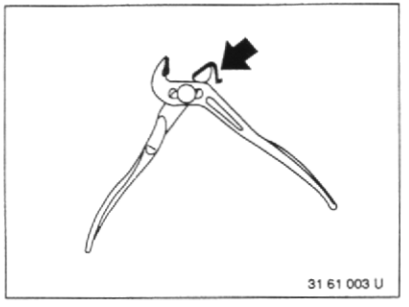
61 31 080 REPLACING HAZARD WARNING LIGHT SWITCH

Press out switch frame in center console carefully from underneath with a screwdriver.



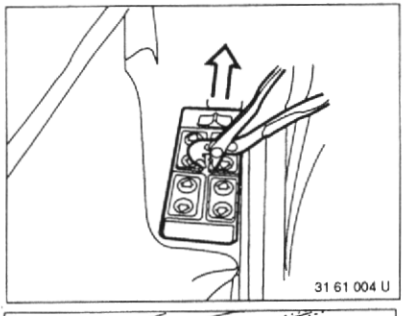
Press out hazard warning light switch from underneath.

Disconnect plug.

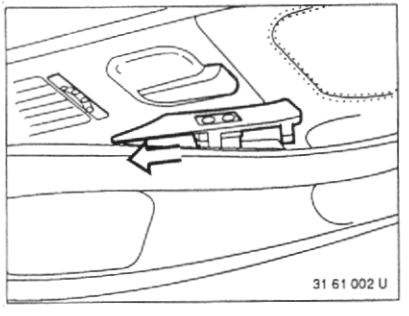


61 31 115 REPLACING SIDE WINDOW CONTROL SWITCH

Driver's Side:
Wrap adhesive tape around a pliers.
Apply pliers on center web at left and right sides to pull out the switch and pull up on left and right sides separately.

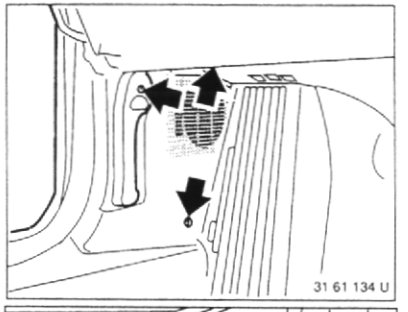


Pull back ornamental frame carefully to avoid breaking off the front holding tab.



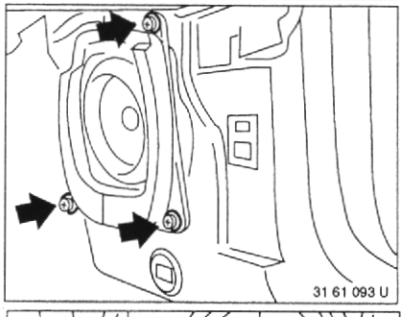
Passenger's Side:
Slide switch frame forward.
Insert approx. 1 mm (0.039") thick feeler gage blade behind and pry off frame from behind carefully.
Pull out frame toward rear.

Disconnect plug.
Remove switch.

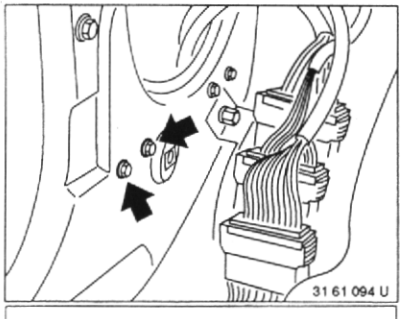


61 31 205 REPLACING IMPACT SWITCH FOR CENTRAL LOCKS

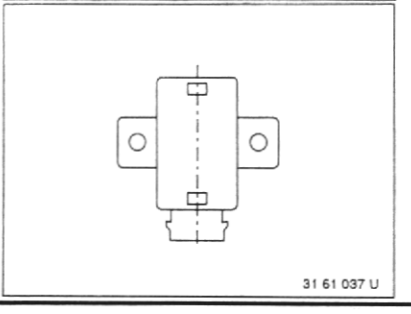
Remove A-pillar trim at bottom right.
Remove dashboard trim panel at bottom right.
Remove trim panel for pedal assembly.



Remove loudspeaker box.
Disconnect plug connector.

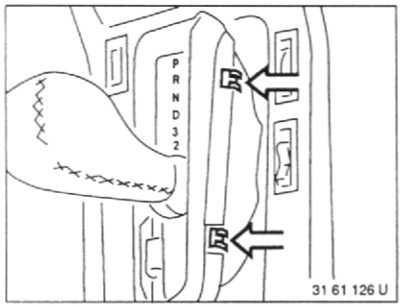


Unscrew screws.
Work impact switch out of body cavity.

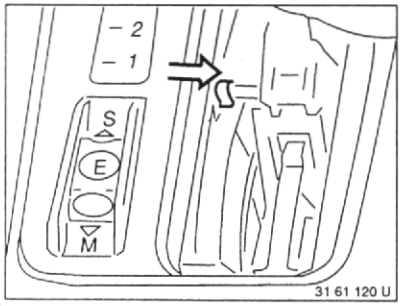


Installation:
Always check for correct installed position!

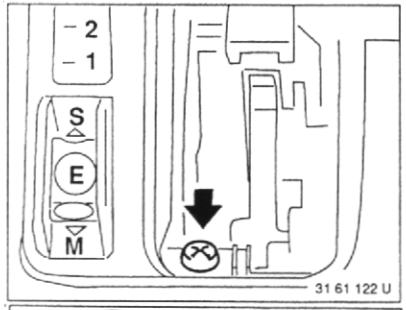
61 31 260 REPLACING TRANSMISSION SWITCH



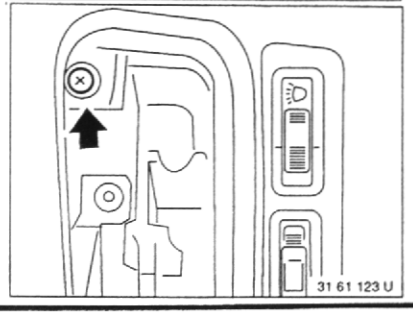
Push up dust cover of the selector lever.



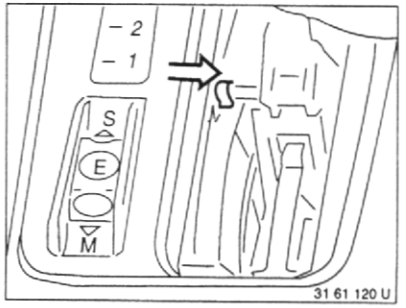
Pull off selector lever grip from above.



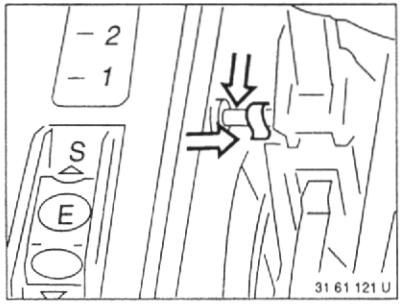
Move selector lever into "P".
Unscrew screw.



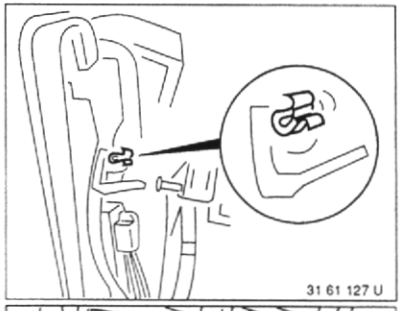
Move selector lever to range "1".
Unscrew screw.



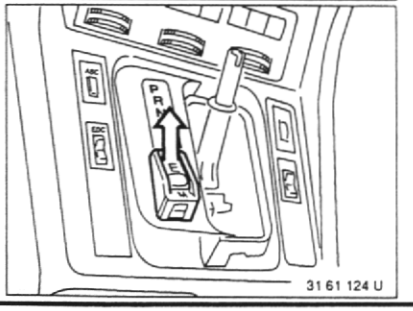
Move selector lever into "P".
Pry out drive for range indicator carefully with a screwdriver.



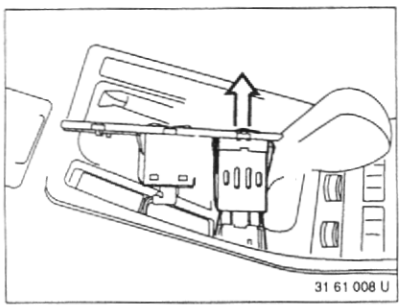
Press retainer aside and unclip drive pin carefully.



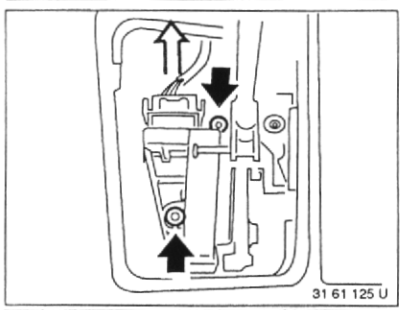
Picture shows retainer.



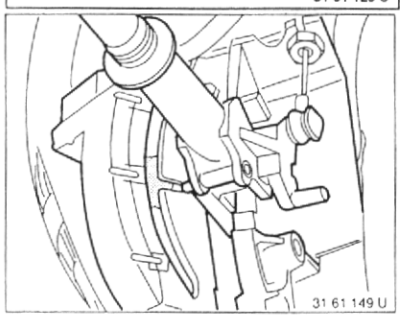
Remove console.



Disconnect plug.

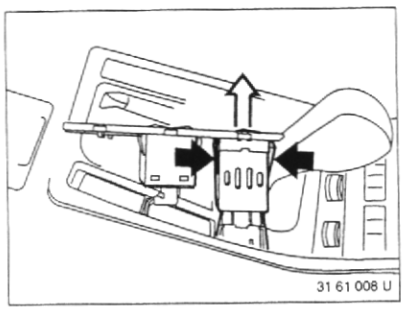


Unscrew screws.



Position selector lever in such a manner that the switch can be taken out through the slot.

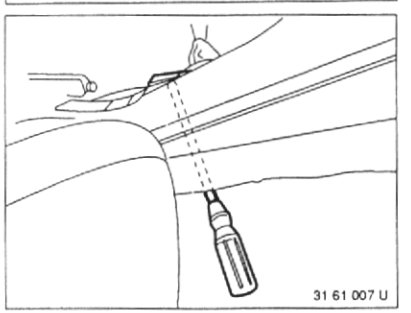
Installation:
Screws are microencapsulated and must be replaced.
Tightening torque*.
Install the range indicator's drive pin with the selector lever in "P", before installing the retainer.



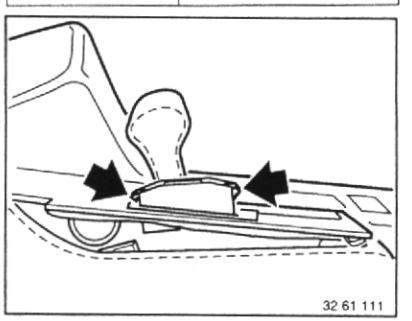
61 31 265 REPLACING PROGRAM SWITCH FOR "EH" TRANSMISSION CONTROL

Test – see BMW Test Plan in Group 24.

Checking:
Program switch must be in position "E" after switching on the ignition.



Press out trim panel upward carefully with a screwdriver.

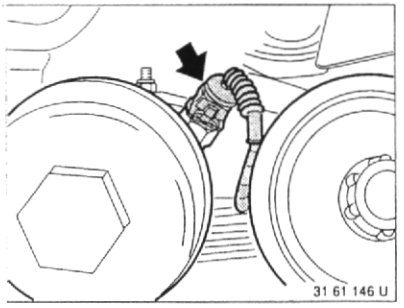


Push back retaining hooks and press switch out of trim panel from underneath.

* See Specifications

61 31 280 REPLACING OIL PRESSURE SWITCH

Oil pressure switch is on base of the oil filter.
Unscrew oil filter cover to have oil in the oil filter run back into the oil pan.
Disconnect plug.

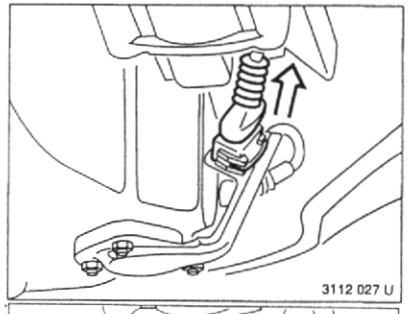


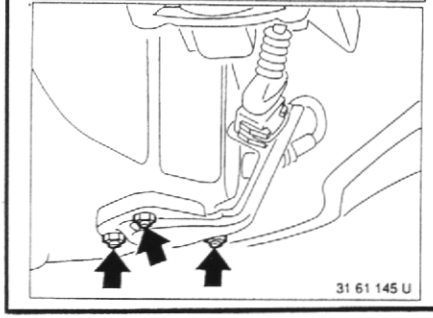
Unscrew switch.

Installation:
Tighten oil filter cover.
Install switch.
Check oil level.

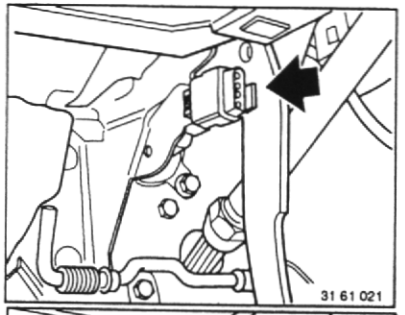
61 31 282 REPLACING ENGINE OIL LEVEL SWITCH

Drain engine oil.
Disconnect plug on engine carrier.



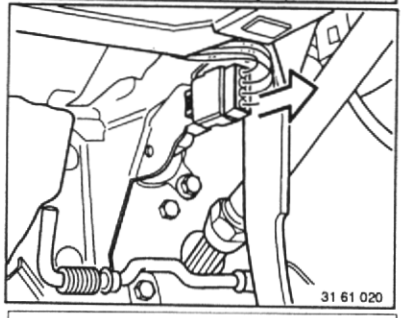


Unscrew screws.
Remove switch.
Pour in engine oil.



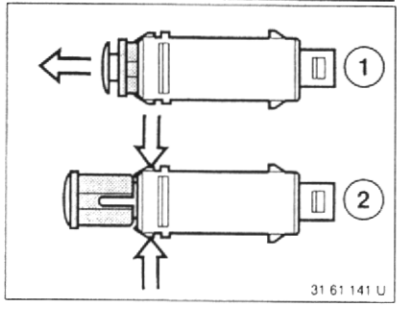
61 31 300 REPLACING STOP LIGHT TEST SWITCH

Stop light test switch is installed in the same housing of the stop light switch.
Remove and adjust – see stop light switch.
Identification:
4-pin plug.



61 31 310 REPLACING STOP LIGHT SWITCH

Remove dashboard trim panel at bottom left.
Remove trim panel for pedal assembly.
Disconnect plug.



Press down on brake pedal.

1: Pull plunger and sleeve forward the complete distance.

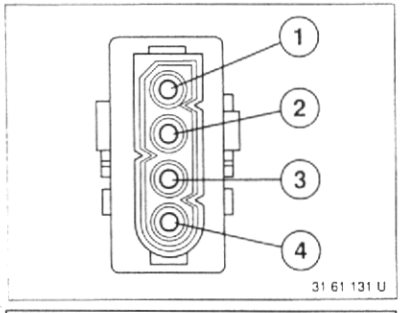
2: Press in retainers and pull back switch.

Installation:
Insert switch as shown in 2.
Adjusting takes place automatically.
Release pedal to neutral position slowly.

Important!
A rebounding brake pedal could change the adjustment of the switch.
Check function.

61 31 320 REPLACING PARKING BRAKE CONTROL LAMP SWITCH

Unclip trim panel.



Plug Connections of Stop Light Switch and Stop Light Test Switch:

1 and 2 for stop light switch

3 and 4 for stop light test switch

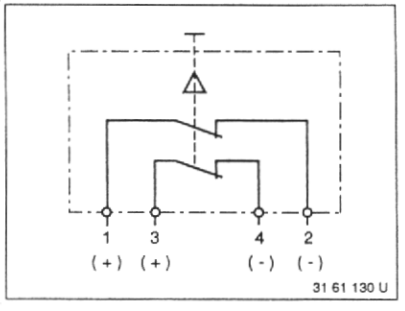
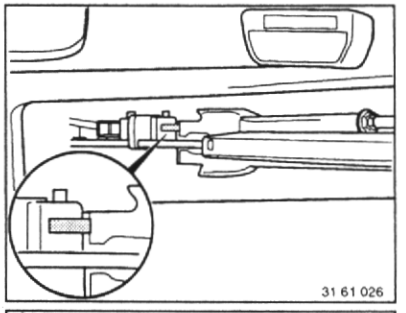
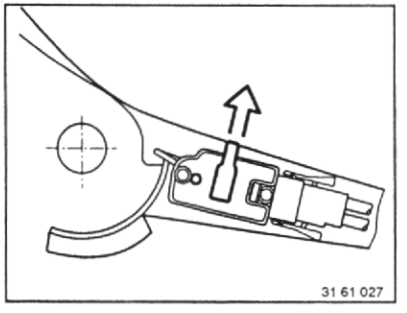


Diagram of Stop Light Test Switch and Stop Light Switch

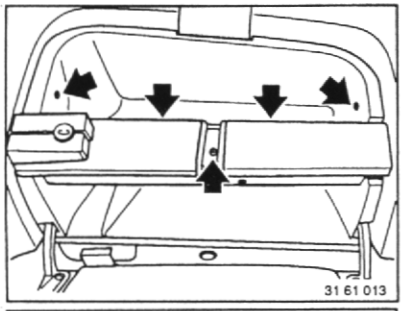


Pry out holder.
Disconnect plug.
Remove switch.



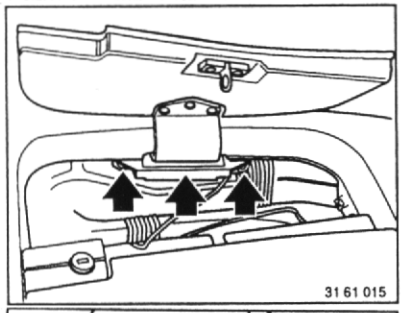
Adjusting:
Switch must work between the first and second catches.

Important!
Following test must always be carried out after replacing the stop light test switch or stop light switch.
Check safety path of electronic engine power control – see 12 70 500 for procedures.

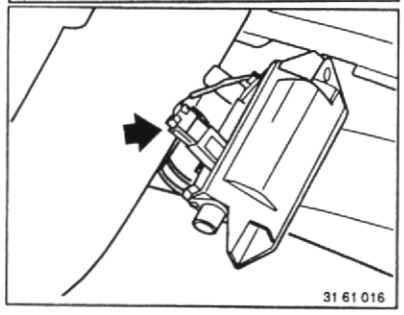


61 31 331 REPLACING UPPER GLOVE BOX LIGHT SWITCH

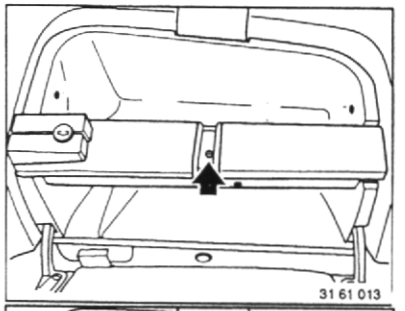
Unscrew screws.
Remove trim panel.



Unscrew screws.
Take out hinge at an angle past the air duct.

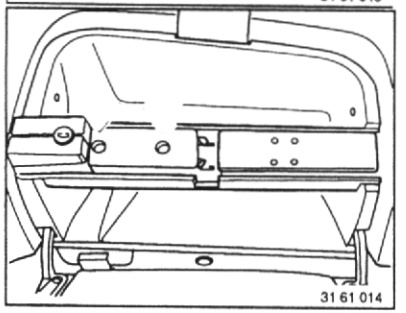


Installation:
Make sure switch does not slide out of the holder while installing.
Close lid slowly and check through gap whether the light goes out.

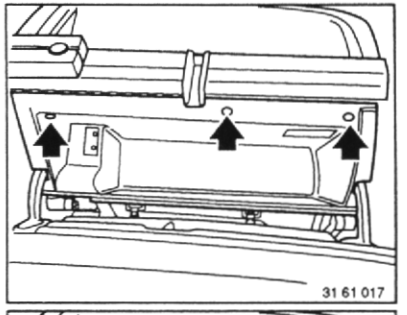


61 31 332 REPLACING LOWER GLOVE BOX LIGHT SWITCH:

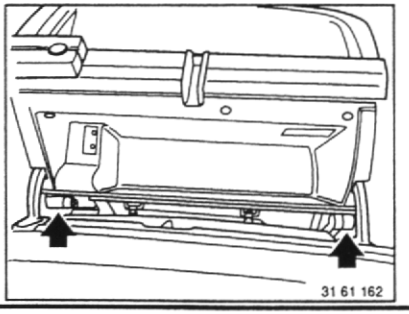
Unscrew screw.
Remove trim panel.



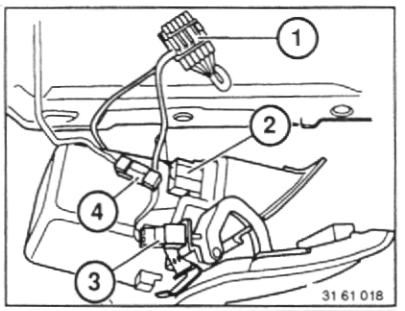
Unscrew screws.



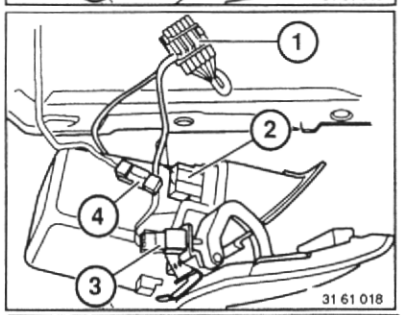
Unscrew screws.



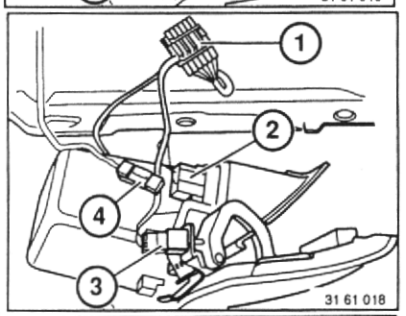
Unscrew screws.



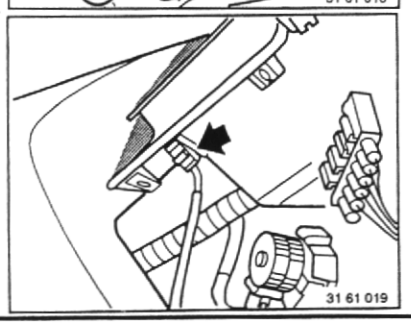
Remove switch (3).
Disconnect plug.



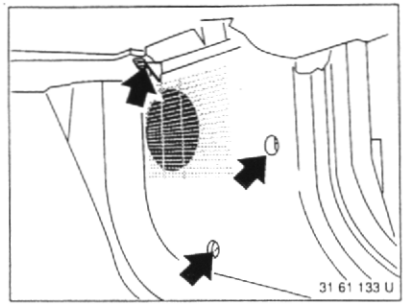
1 = Glove box light plug



2 = Flashlight charging socket
4 = Plug for microswitch of glove box lock cylinder

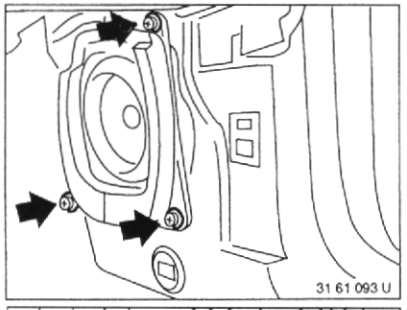


Plug for microswitch of glove box lock cylinder

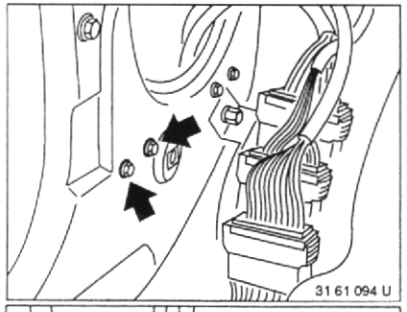


61 35 ... **REMOVING AND INSTALLING CONTROL UNITS IN A-PILLAR**

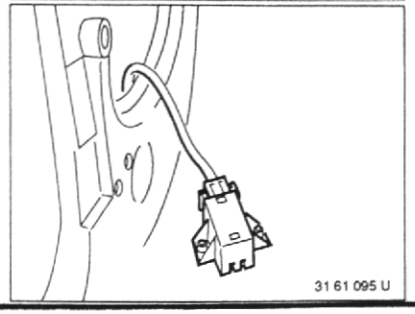
Turn screws 90° and remove trim panel.



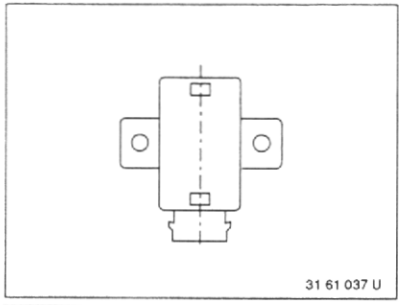
Remove loudspeaker.



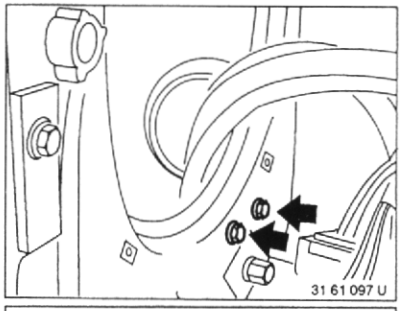
Control Units on Driver's Side:



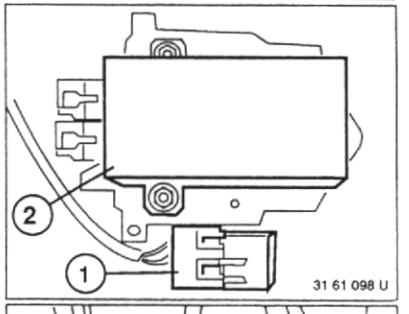
Remove impact switch.



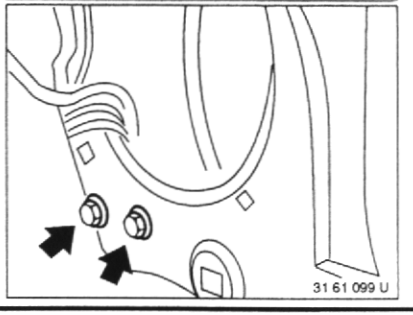
Installation:
Always check whether the installed position is correct – plug faces down!



Unscrew screws.

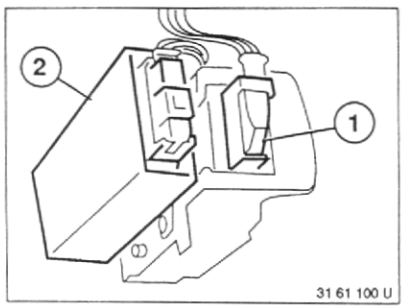


1 = Inside light relay
2 = Control unit for A/C lock sensor



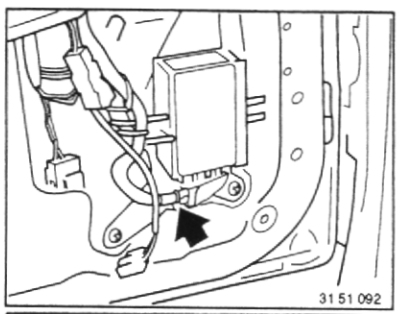
Control Units on Passenger's Side:

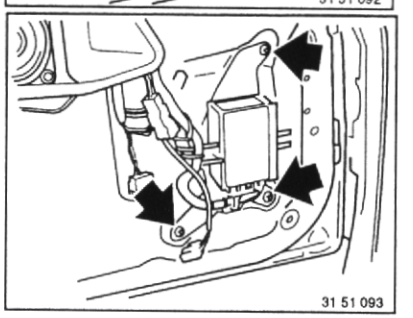
Unscrew screws.



1 =Control unit for infrared remote control

2 =Control unit for automatic recirculating air control (AUC)





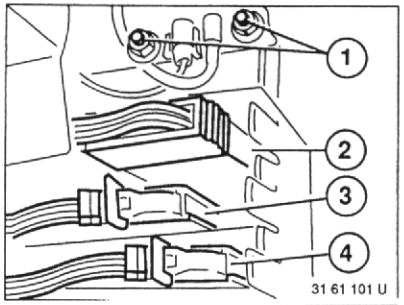
61 35 ... REPLACING LEFT OR RIGHT DOOR MODULE

Remove door trim panel – see Gr. 51.

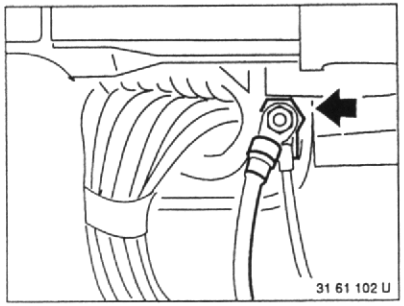
Disconnect plug.
Unscrew screws.

61 35 ... REPLACING CONTROL UNITS UNDERNEATH DASH-BOARD ON LEFT SIDE

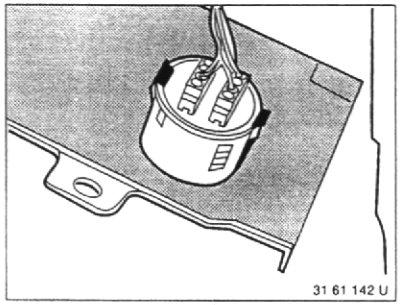
Remove trim panel at bottom left.
Turn screws 90°.



1 =Windshield antenna connection
2 =Lamp control module
3 =General module
4 =Electronic body module

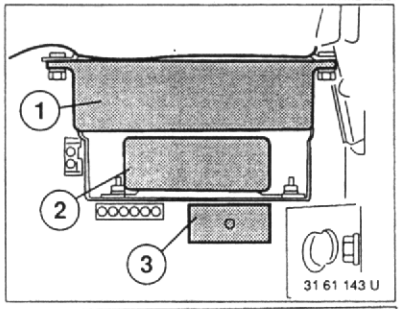


Firewall positive connection point.

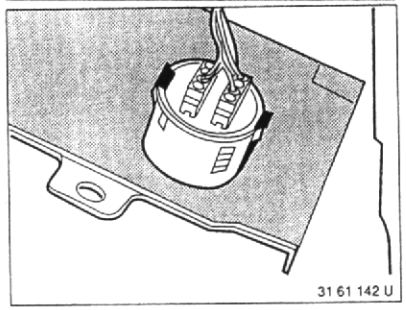


61 35 ... REPLACING CONTROL UNITS UNDERNEATH DASH-BOARD ON RIGHT SIDE

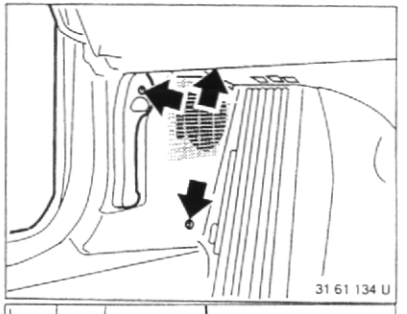
Remove trim panel at bottom left.
Turn screws 90°.



1 =Control unit for airbag
2 =Control unit for extra heater
3 =Heater relay box

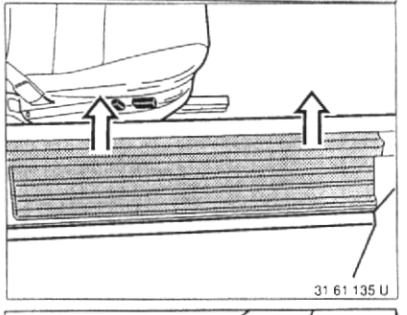


Take gong out of trim panel.
Disconnect plug.

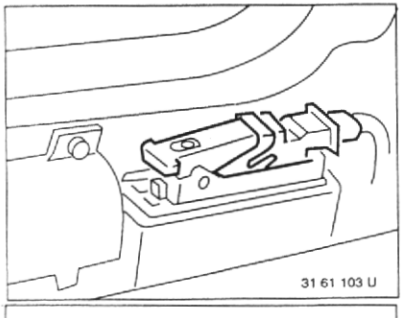


61 35 ... REMOVING AND INSTALLING CONTROL UNITS IN DOOR MEMBERS ON DRIVER'S SIDE

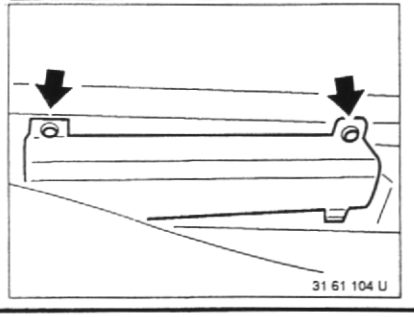
Unscrew hood release lever.
Take off loudspeaker cover.



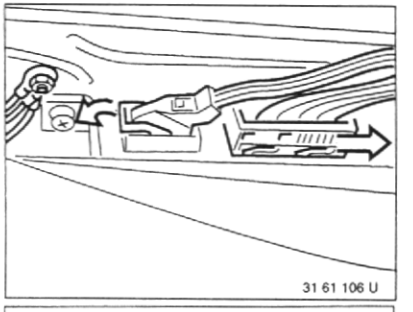
Unclip side member strip.
Fold back carpet.



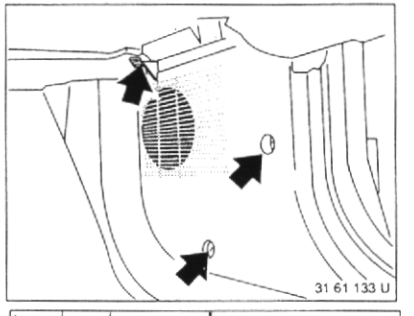
ABS control unit – see Group 34 for procedures when replacing.



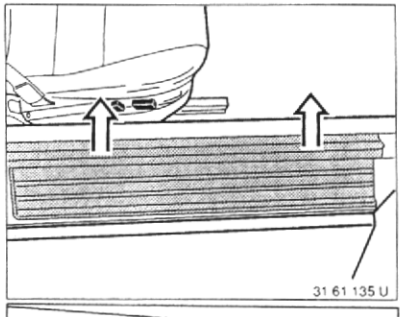
Loosen clips.
Remove trim panel.



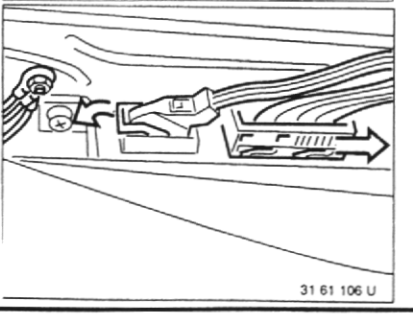
Relay Module:
Disconnect plugs.



Control Units on Passenger's Side:
Take off loudspeaker cover on A-pillar.



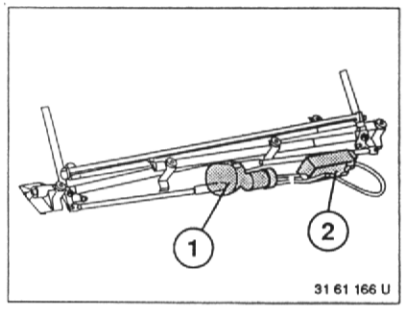
Unclip side member strip.
Fold back carpet.



DWA Control Unit
(burglar alarm)

61 35 ... REPLACING CONTROL UNIT FOR ELECTRIC SUN SHADE

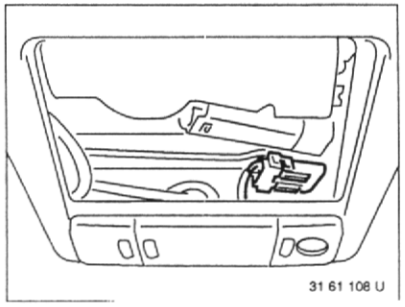
Remove hatrack – see Group 51.



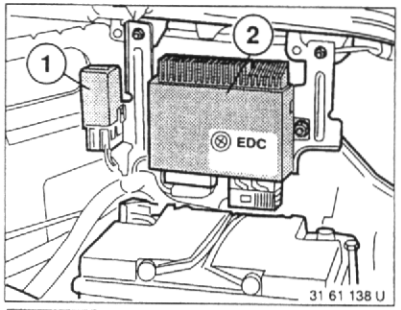
Control unit is underneath the hatrack.
Troubleshoot – see Electric/Electronic Test Plan.

61 35 ... REPLACING CONTROL UNIT FOR POWER SUN ROOF

Unclip trim panel.
Remove sun roof motor – see Gr. 54.



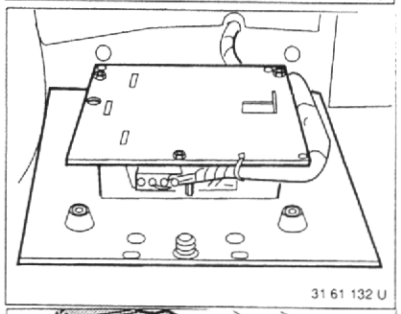
61 35 ... REMOVING AND INSTALLING CONTROL UNITS IN TRUNK



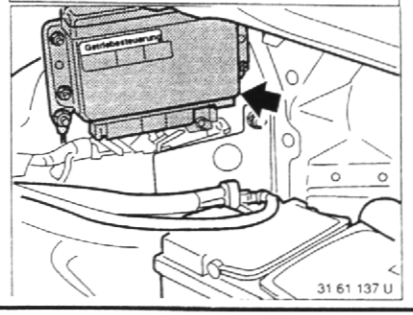
EDC control unit – see Group 37 for other instructions.

1 =Power saving relay
2 =EDC control unit

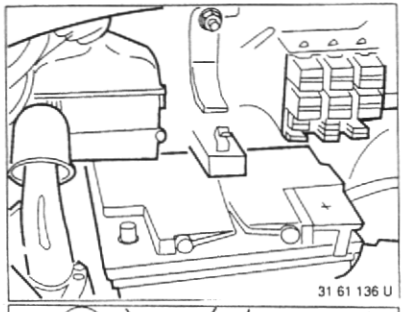
EDC = electronic absorber control



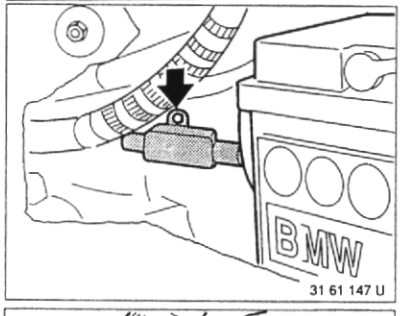
Audio amplifier



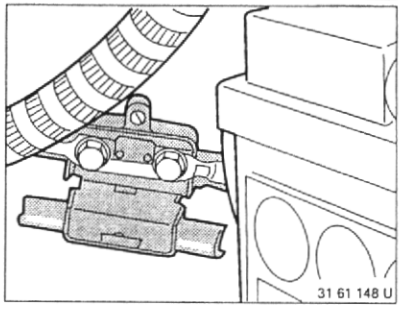
Control unit for electronic transmission control



Trailer module



Safety fuse 80 A

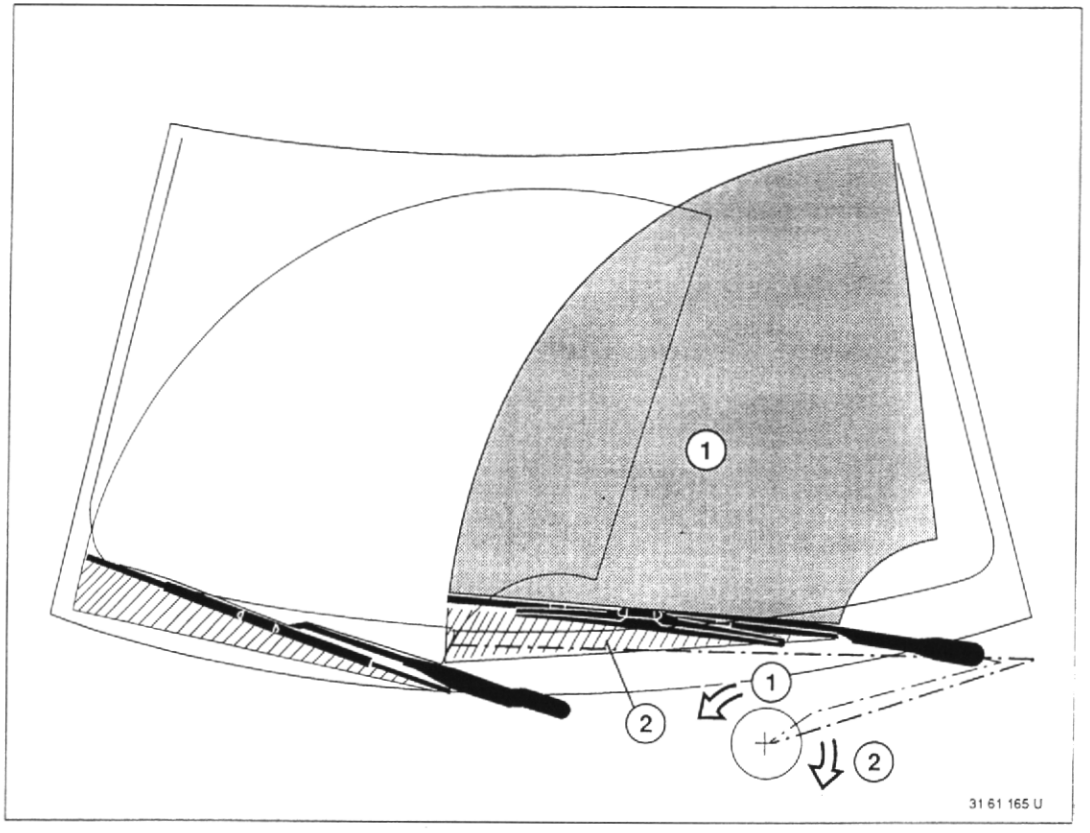


CONTROL UNIT LOCATION SURVEY

Description	Location	Other information
ABS control unit	In front section of door member on driver's side	Group 34
AEGS control unit (independent electronic transmission control)	In trunk on wheel house at passenger's side	Group 24
Trailer module	In trunk behind wheel house on driver's side	Group 72
Airbag control unit	Underneath dashboard on passenger's side	Group 32 (conform with safety precautions!)
AUC sensor	On radiator	Group 64
AUC control unit (autom. circulating air control)	In A-pillar behind loudspeaker on passenger's side	Group 64
Audi amplifier	In trunk behind trunk compartment wall	Group 65
Batteries	In trunk behind wheel housings	Group 61
DME control units	In electronic box in engine compartment	Group 12
DWA control unit (burglar alarm)	In fron section of door member on passenger's side	Electric/Electronic Test Plan
EDC control unit (electronic absorber control)	In trunk behind wheel house on passenger's side	Group 37
EKM module (electronic body module)	Underneath dashboard on driver's side	Electric/Electronic Test Plan
EML control unit (electronic engine power control)	In electronic box in engine compartment	Group 12
General module	Underneath dashboard on driver's side	Electric/Electronic Test Plan
Control unit for infrared remote control	In A-pillar of passenger's side behind loudspeaker	Electric/Electronic Test Plan
Inside light relay	In A-pillar of driver's side behind loudspeaker	Electric/Electronic Test Plan
Steering column memory	On heater behind middle outlet nozzle of ventilating system	Group 32
Lamp control module (LKM)	Underneath dashboard on driver's side	Electric/Electronic Test Plan
Lock sensor control unit	In A-pillar of driver's side behind loudspeaker	Group 64

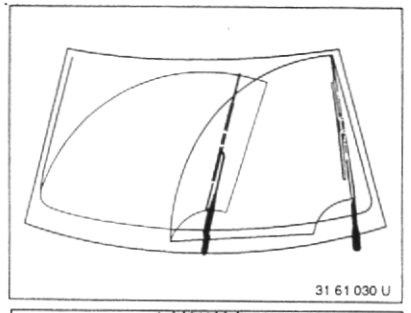
Description	Location	Other information
Relay module	In front section of door member on driver's side	Electric/Electronic Test Plan
Relays	In relay/fuse box in engine compartment In trunk	Electric/Electronic Test Plan
Relay box for extra heater	Underneath dashboard on passenger's side	Electric/Electronic Test Plan
Sun roof control unit	In roof, bolted on drive	Electric/Electronic Test Plan
Fuses	In fuse/relay box in engine compartment In trunk	Electric/Electronic Test Plan
Sun shade control unit	Underneath hatrack	Electric/Electronic Test Plan
Seat/mirror memory control unit	Underneath driver's seat	Electric/Electronic Test Plan
Seat heating control unit	Underneath passenger's seat	Electric/Electronic Test Plan
Parked car heating control unit	Underneath dashboard on passenger's side	Electric/Electronic Test Plan
Parked car ventilating control unit	Underneath dashboard on passenger's side	Electric/Electronic Test Plan
Door module	In concerned door	Electric/Electronic Test Plan
Central lock crash sensor	In A-pillar on driver's side behind loudspeaker	Electric/Electronic Test Plan

61 61 ... DESCRIPTION OF WINDSHIELD WIPERS



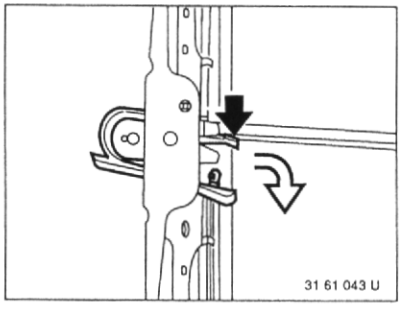
1 **Wiper Operation**
Windshield wiper motor running clockwise produces a normal wiped field.

2 **Parked Position**
Windshield wiper motor running anticlockwise; wiped field is larger in zone 2. Drive lever is lengthened via the sliding gate; wipers run to parked position.

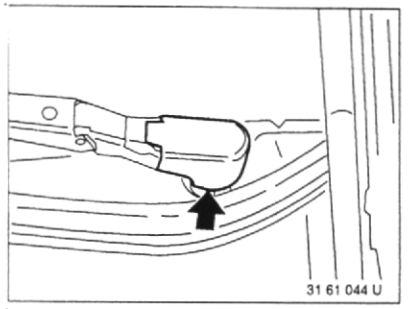


61 61 041 REPLACING BOTH WINDSHIELD WIPER BLADES

Move windshield wipers to shown position by switching on the ignition, operating wiper switch in intermittent mode and switching off the ignition.
Wiper runs to shown position at A-pillar and remains there.

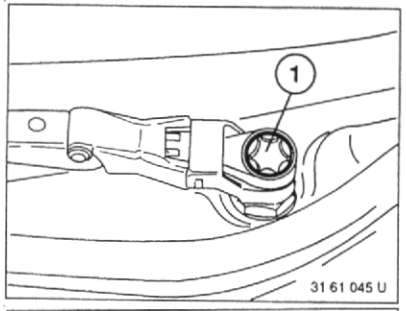


Press in retainer.
Slide wiper blade forward.

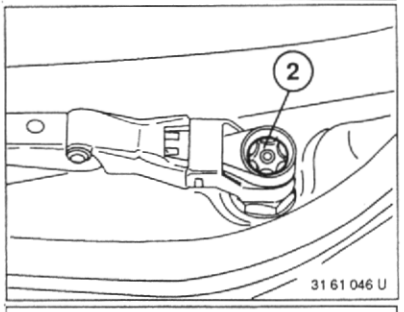


61 61 100 REPLACING BOTH WIND-SHIELD WIPER ARMS

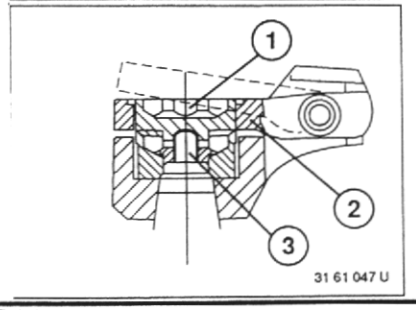
Remove cover.



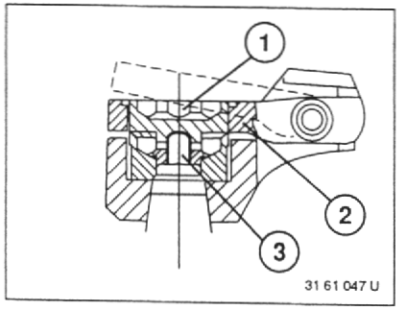
Driver's Side:
Unscrew nut (1) with Special Tool 61 6 010.



Unscrew nut (2) with Special Tool 61 6 010.

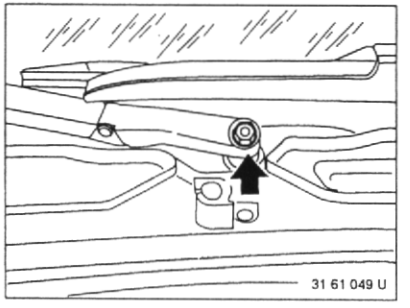


Installation:
Clean threads to remove Loctite.
Nut (1) must be locked with Loctite.



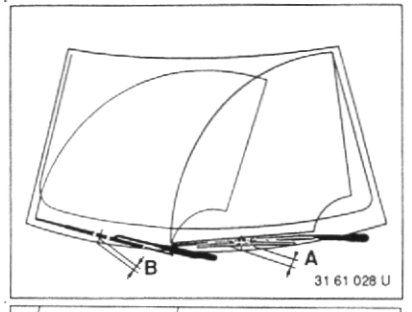
Screw on nut (1) until there is no play between nut (2) of the contact force control lever and plunger (3). Tightening torque*.

Installation:
Press wiper arm against windshield lightly so that it will be easier to install the nut.

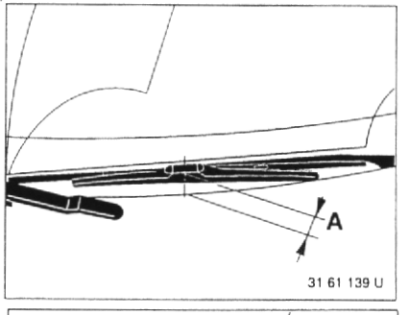


Passenger's Side:
Take off cover.
Unscrew nut.
Tightening torque*.

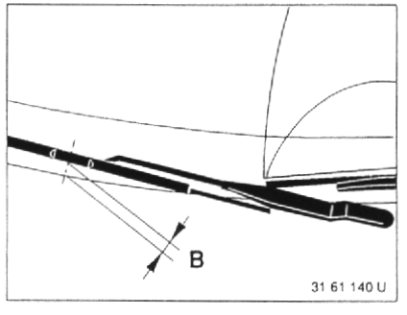
* See Specifications



Adjsutment Distances in Parked Position:
A = 35 + 3 mm (1.378 + 0.118")
B = 23 + 3 mm (0.906 + 0.118")



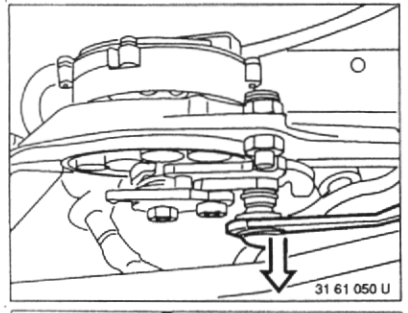
Adjusting distance A = 35 + 3 mm (1.378 + 0.118").



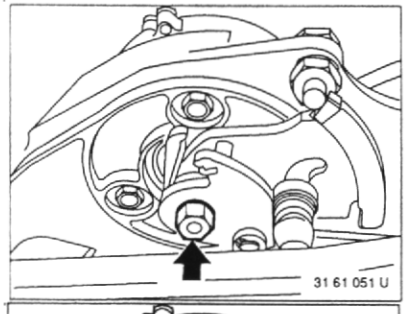
Adjusting distance B = 23 + 3 mm (0.906 + 0.118").

61 61 250 REPLACING WINDSHIELD WIPER MOTOR

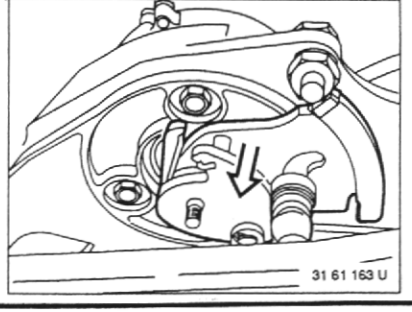
Remove complete wiper console – see 61 61 271.
Run wiper motor to parked position before removal.



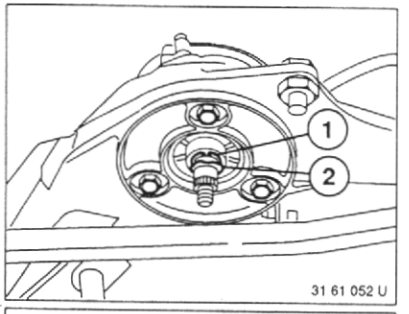
Pry out drive rod.



Unscrew screw.

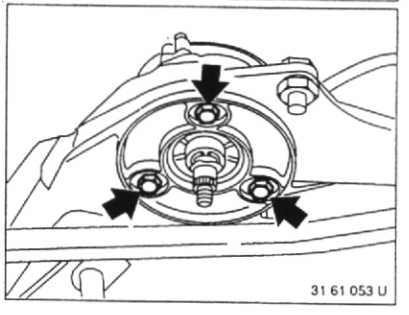


Pry off motor crank.



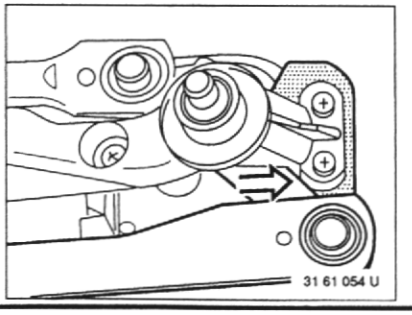
View of Wiper Motor Output Shaft

1 = Circlip
2 = Corrugated washer



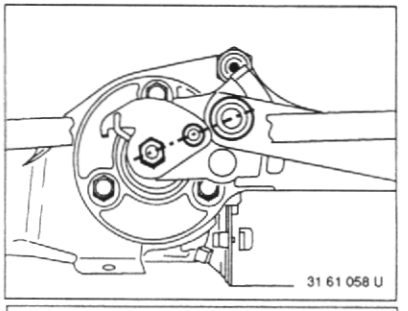
Unscrew screws.

Assembling Wiper Motor:

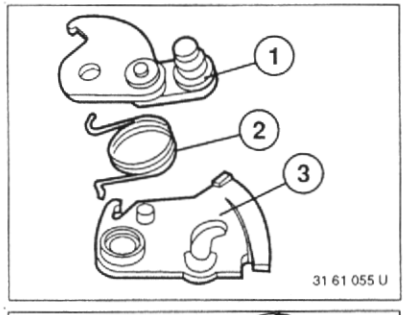


Run wiper linkage to parked position (bearing on stop).

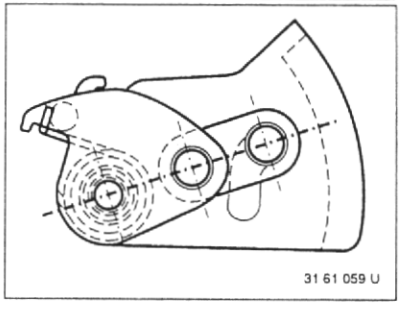
Connect plug on motor and run to parked position.
Screw motor on console.
Tightening torque*.



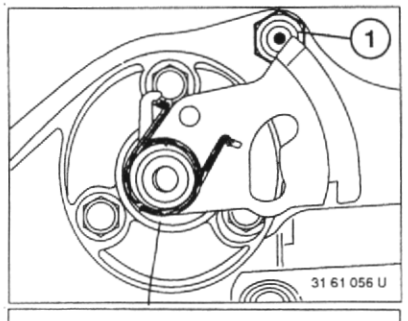
Make sure that center lines of fulcrums for motor crank, drive pin in gate and output pins for the drive rod are in one line.



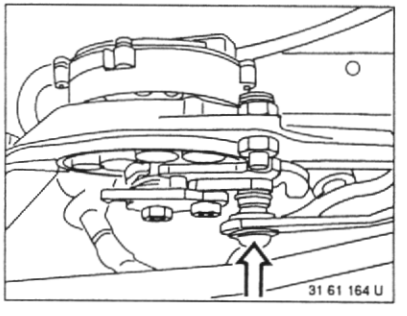
1 = Motor crank
2 = Spring
3 = Sliding gate for park position



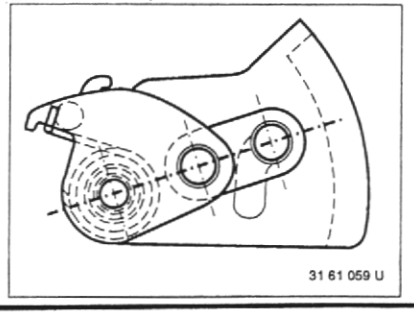
Tighten motor crank.
Tightening torque*.
Connect motor plug and run to parked position.
Check whether axles are lined up.



Move sliding gate of drive crank against stop (1).
Attach spring.



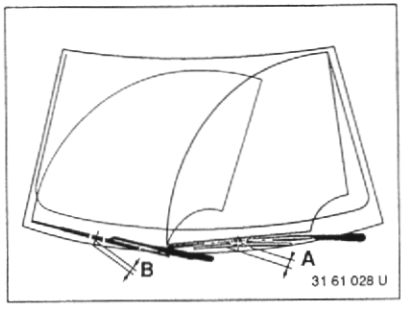
Install drive rod.



Install motor crank in gate.

* See Specifications

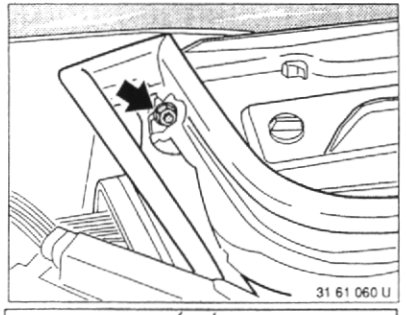
* See Specifications



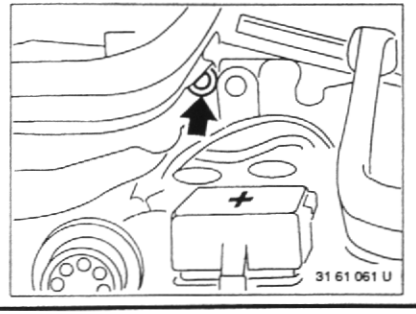
61 61 271 REMOVING AND INSTALLING WIPER CONSOLE ASSY.

Run wipers to parked position.
Remove windshield wiper arms – see 61 61 100.

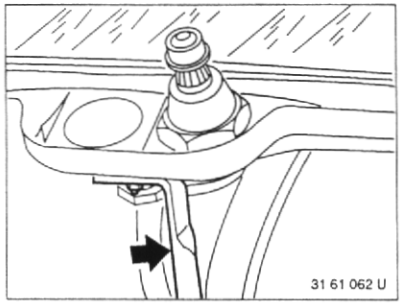
Important!
Set air volume control wheel to zero and switch ignition on and off before disconnecting the cable, so that the drive motor closes the air flaps.
Disconnect battery ground leads.
Refer to information on page 61-00.



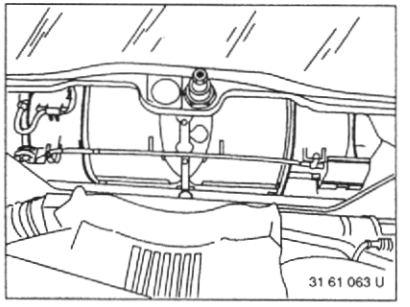
Unscrew bolt.
Take off air box cover.



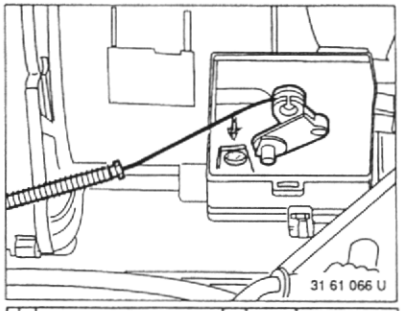
Unscrew bolt.
Pull out air box from above.



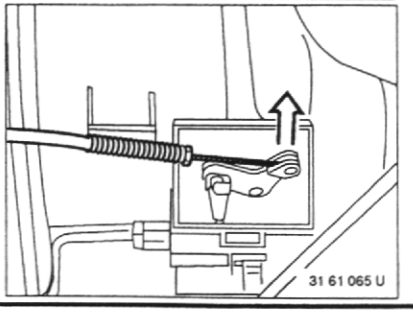
Remove prop.



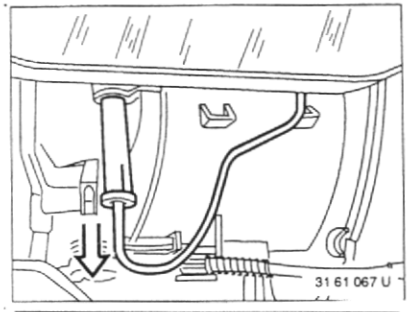
Disconnect cables fully.



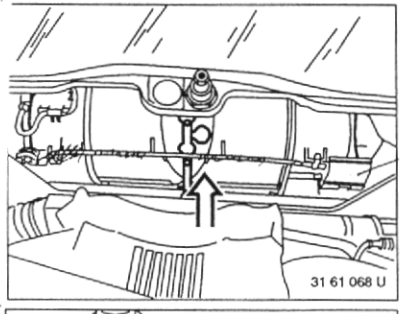
Disconnect linkage.



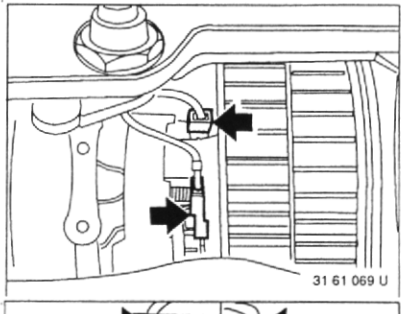
Disconnect cable.



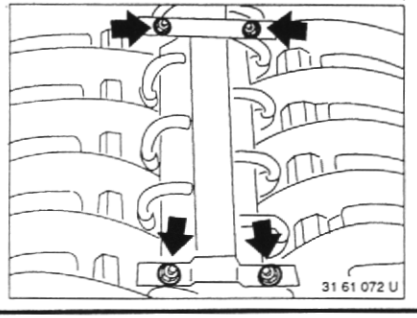
Pull temperature sensor out of eyelet.



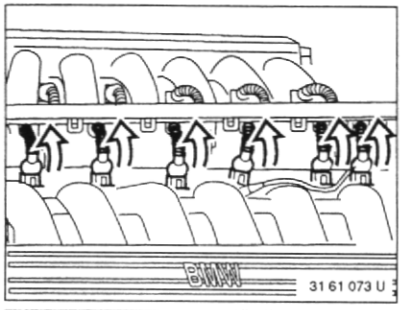
Remove retaining strap.



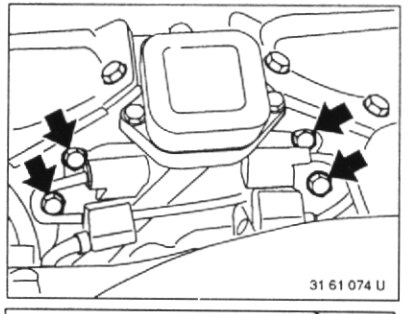
Take off cover.
Pull plug off of blower.
Remove fuel injector cover.



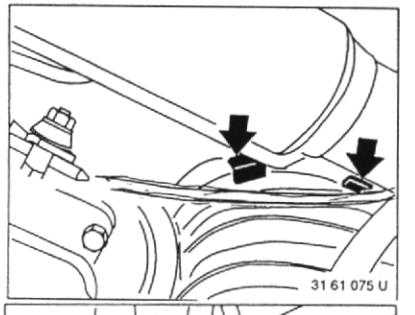
Unscrew electric lead tray of fuel injectors.
Unscrew screws.



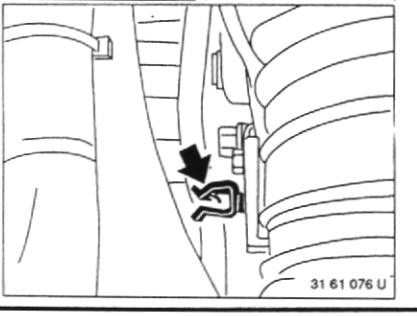
Disconnect leads of injection plate on right side.



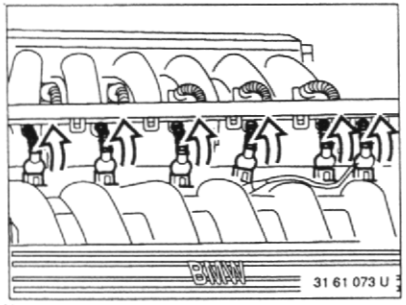
Disconnect pulse and TDC senders.
Unscrew bracket.



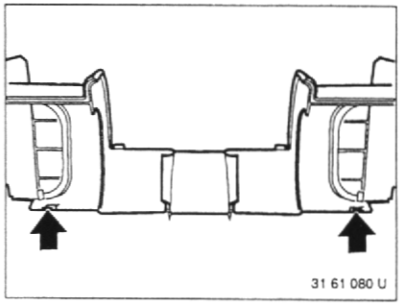
Unclip leads for oxygen sensors in holders underneath the transmission bell housing.



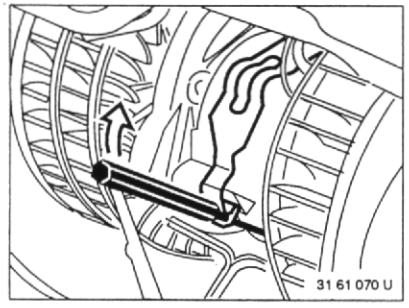
Unclip leads on firewall.
Clips are located underneath electronic box electric lead duct to the fuel injectors.



Tie electric lead duct for fuel injectors aside.

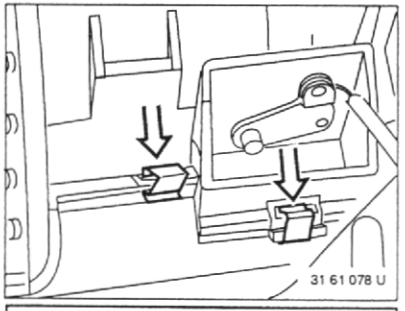


Remove retainers on inside.
Shown removed in this picture.

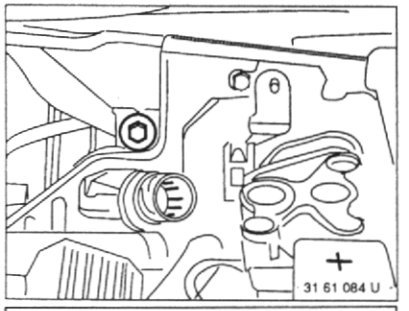


Remove blower.
Insert an approx. 2 mm (0.079") thick mandrel in the retaining strap of the blower motor and pry out the retaining strap.

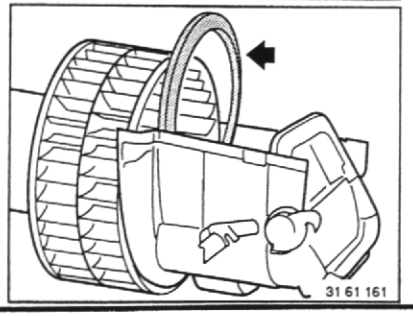
Remove cover.



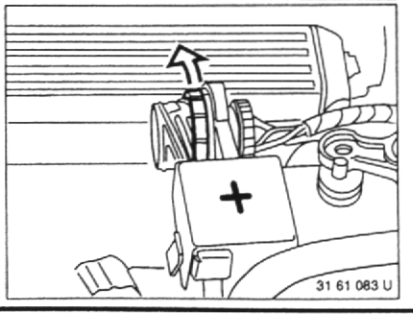
Lift off retainers.



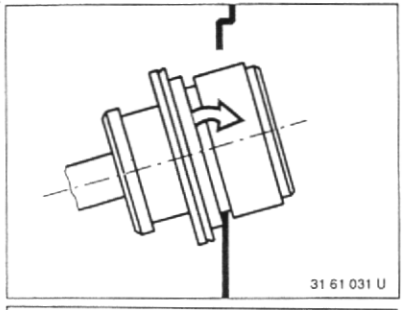
Remove rubber grommet from electric lead opening in firewall.
Remove holder.



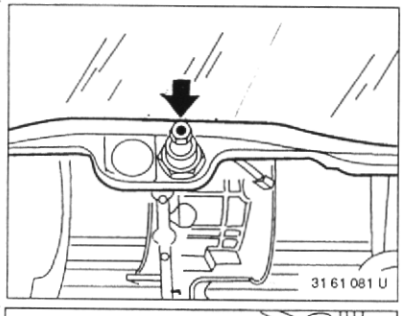
Remove inlet cowl.



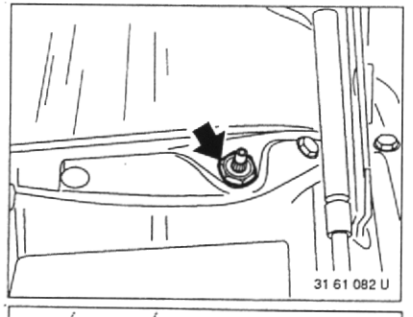
Take plug out of holder.
Loosen wire strap.



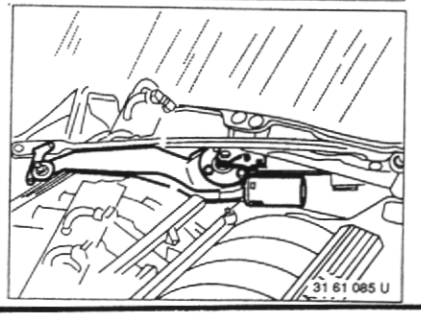
Remove plug through opening in firewall.



Unscrew nut on cowl panel.



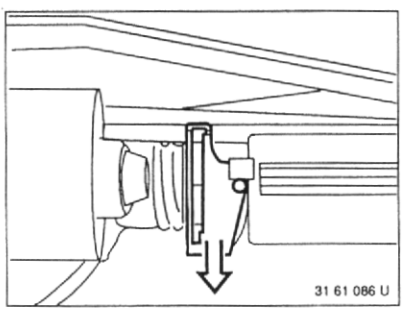
Unscrew nut on cowl panel.



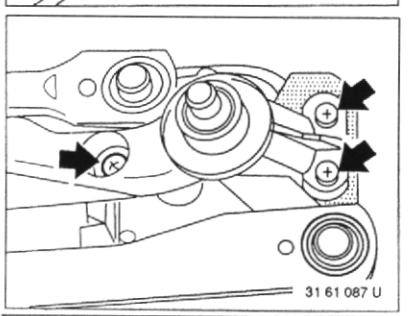
Take wiper console out of the firewall.

61 61 285 REPLACING CONTACT FORCE CONTROL MOTOR

Remove complete wiper console – see 61 61 271.

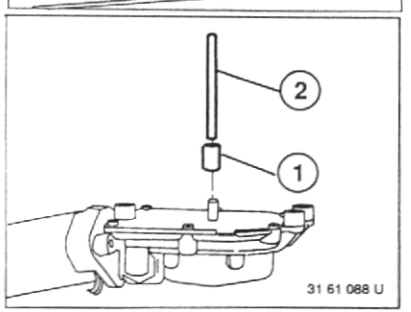


Disconnect plug.



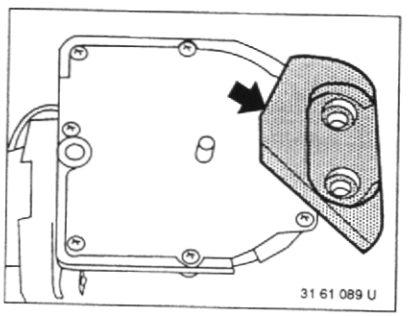
Unscrew screws.

Installation:
Tightening torque*.



Prevent sleeve (1) and plunger (2) from falling out.

Installation:
Lubricate sleeve and plunger prior to installation.



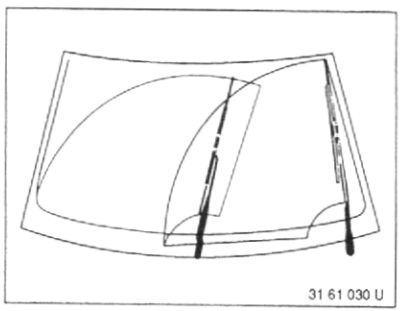
Installation:
Mount stop for wiper linkage.

* See Specifications

61 61 ... REPLACING STOP (FOR PARKED POSITION)

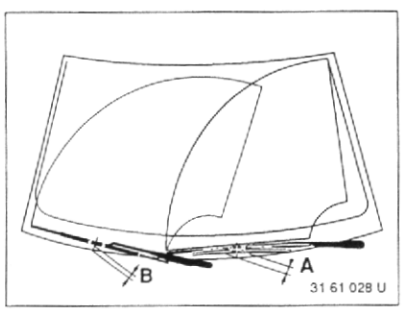
A faulty stop will be noticed when wipers do not return to parked position from neutral position after wiping. Wiper motor turns inversed so that wipers can get to parked position from the neutral position.

While running backwards the cam remains stuck on the stop and the wipers move below the engine hood at a certain angle.

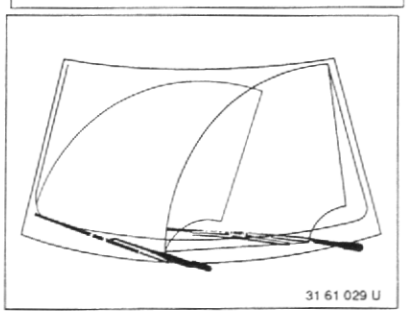


Raised position

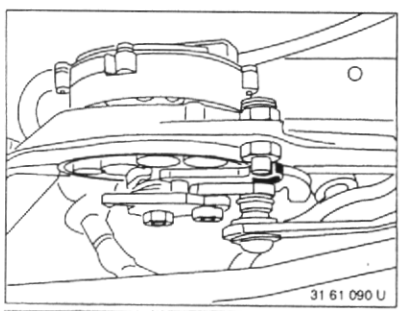
Remove complete wiper console – see 61 61 271.



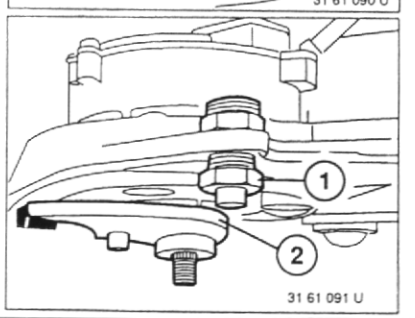
Parked position



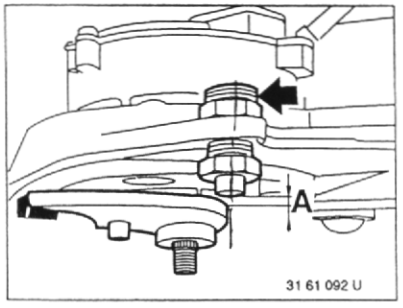
Neutral position



Stop in parked position



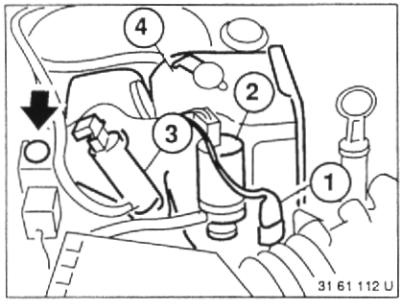
1 = Stop
2 = Cam



Unscrew locknut.
Unscrew stop.
Adjust height of stop to distance A =
1.5 ... 2 mm (0.059 ... 0.079").

61 31 492 REPLACING LEVEL SWITCH

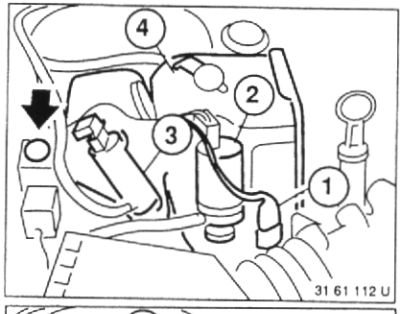
Empty tank.
Pull wires off of level switch.
Lift out switch.



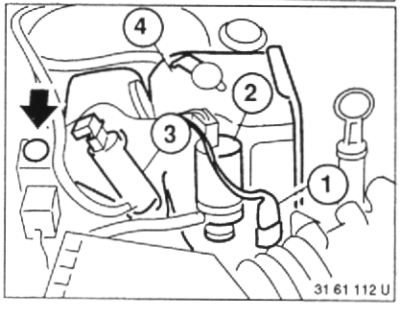
Installation:
Check for correct position of switch.

61 67 065 REPLACING WASHING FLUID AND INTENSIVE CLEANING FLUID TANKS

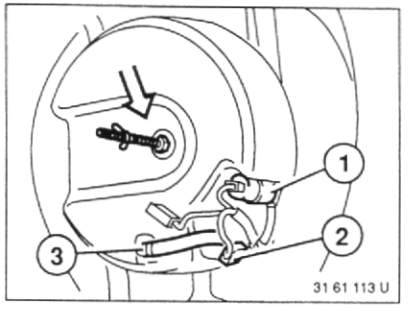
Empty tanks.
Lift out pumps with hoses.



1 =Level switch
2 =Pump for windshield washing fluid
3 =Pump for windshield intensive cleaning fluid
4 =Pump for headlight washing fluid



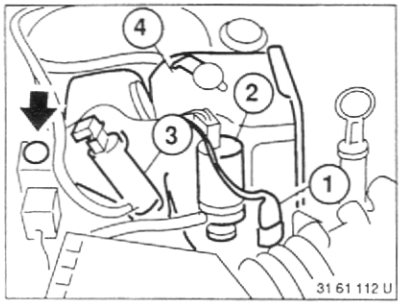
Unscrew screw and lift tank.
Pull wires off of level switch and lift out tank.



61 71 061 REPLACING WINDSHIELD WASHING FLUID TANK (REFILLING TANK IN TRUNK)

1 =Delivery pump for refilling front tank; switched on and off by level switch in front tank
2 =Level switch
3 =Water feed from tail panel

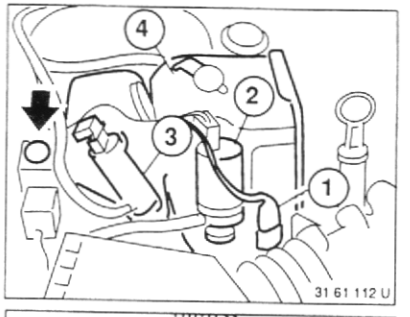
Empty tank.
Remove pump, level switch and water feed.



61 67 010 REPLACING WASHING FLUID PUMP FOR HEADLIGHT CLEANERS

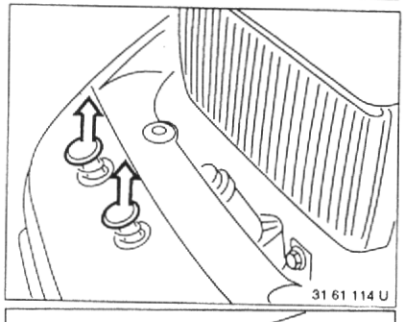
Empty tank.
Unscrew mounting screw.
Remove pump (3).
Loosen hose clamp.
Pull off hose.

Important!
Hoses must not be bent while installing.

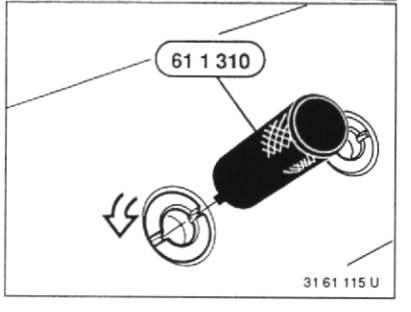


61 67 060 REPLACING NOZZLES FOR HEADLIGHT CLEANERS

Disconnect hose on washing fluid pump (4).



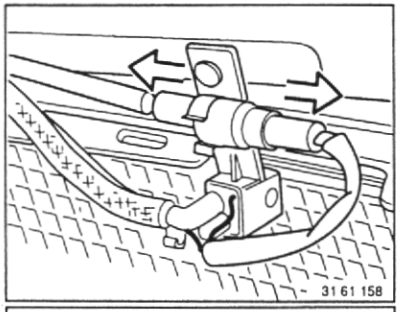
Important!
Pressure applied on nozzles must not exceed 5 bar (70 psi), as higher pressure would damage them.



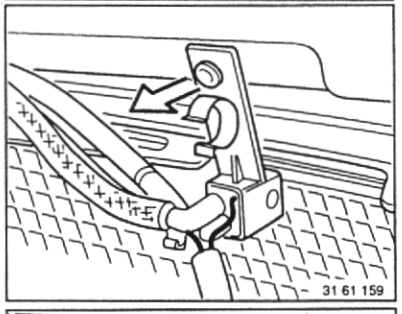
Supply max. 5 bar (70 psi) pressure in the disconnected hose to move the nozzles out.
Unclip caps.

Remove bumper – see Group 51.
Unscrew nuts with Special Tool 61 1 310.

Installation:
Nozzles are aimed and do not have to be corrected.



61 71 010 REMOVING AND INSTALLING OR REPLACING LEFT OR RIGHT WINDSHIELD SPRAY NOZZLE



Pull out lockpin of clip.
Loosen hose clamps.
Pull off hoses.
Pull off plug.

