61 00 ... Battery charging calendar

Battery charging calendar 2016 (PDF file)

Battery charging calendar 2017 (PDF file)

Battery charging calendar 2018 (PDF file)

Battery charging calendar 2019 (PDF file)

Information for the battery charging calendar

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61 20 ... Battery replacement information

A vehicle battery is constructed for the installation location and the individual power requirements of the particular vehicle. These individual power requirements depend on the motorisation and different types of equipment. The individually assigned vehicle battery is the ideal compromise between the power requirements of the vehicle electrical system and the weight and service life of the vehicle battery.

If the vehicle electrical system of electric vehicles is not accessible due to a faulty 12 V battery, proceed as follows:

Battery exchange in electrified vehicles

Vehicles with the automatic engine start-stop function or particular engine types and optional equipment are equipped with a special vehicle battery (AGM battery), since only this battery type can provide elevated power requirements over the extended service life. Installing a different vehicle battery can cause problems with vehicle electronics, can reduce functions or can cause leakage of battery acid.

In the event of an accident where the airbags are deployed in vehicles with a vehicle battery in the luggage compartment, the electrical connection between the vehicle battery and the trigger is automatically disconnected through pyrotechnics. This prevents possible short-circuiting.

Proper operation of all of these safety and convenience functions requires a battery that conforms with specifications and that is properly registered in vehicles with energy management systems (IBS, power module).

Vehicles with energy management systems (IBS, power module): Register battery exchange

The vehicle electrical system is informed about the vehicle battery characteristic data, such as type, size, age and current power capacity. Therefore, there will always be only one work scope provided that is permitted by the current status of information.

If the performance readiness drops below a defined minimum, a Check Control message will be generated to advise the driver that the battery must be replaced.

When installing a new vehicle battery, the battery must be registered and thus must also be registered with the vehicle electrical system.

Note:

Only this registration/logon will ensure that the corresponding Check Control message will go out again.

Diagnosis system:

Register battery exchange

- Service functions
- Body
- Voltage supply
- Register battery exchange

When retrofitting, a more powerful battery may be used. Standard batteries may always be replaced by AGM batteries with the same specifications.

When installing a battery of a different size or a different battery type, this change in vehicle data must be programmed into the vehicle data in accordance with specifications.

Programming system:

- Battery retrofitting

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61 20 908 Carrying out a voltage interruption of the 12-V battery



Important!

Observe safety informations for handling vehicle battery.



There are two ways to carry out a voltage interruption of the 12-V battery:

1. Manually by disconnecting the battery earth lead
2. With the diagnosis system

1. Manually: Carry out the following steps:

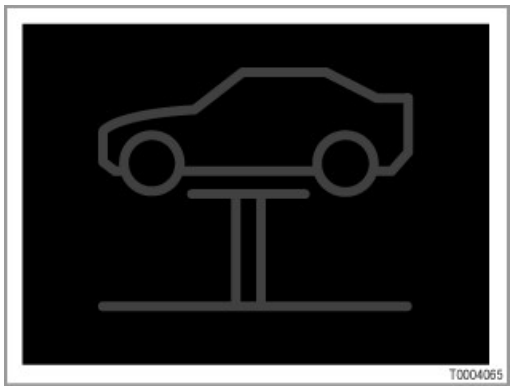
- Switch off and disconnect battery charger
- Turn off ignition.
  For vehicles with ignition key: Ignition key in neutral position
  Vehicles with ID transmitter: Remove ID transmitter from slot
  For vehicles with Comfort Access: Secure terminal 30
- Disconnect negative battery lead
- Reconnect battery earth lead (to ensure bus activity)
- Observe a waiting period of 5–10 s
- Disconnect negative battery lead
- Observe a waiting period of approx. 1 minute
- Connect battery earth lead
  Tightening torque: 61 21 1AZ
- Connect and switch on battery charger
- Switch on ignition.

2. With the diagnosis system:

- 03 Body
- Voltage supply
- Activate rest state
- Power-down command

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61 00 ... Diagnosis for Condition Based Service

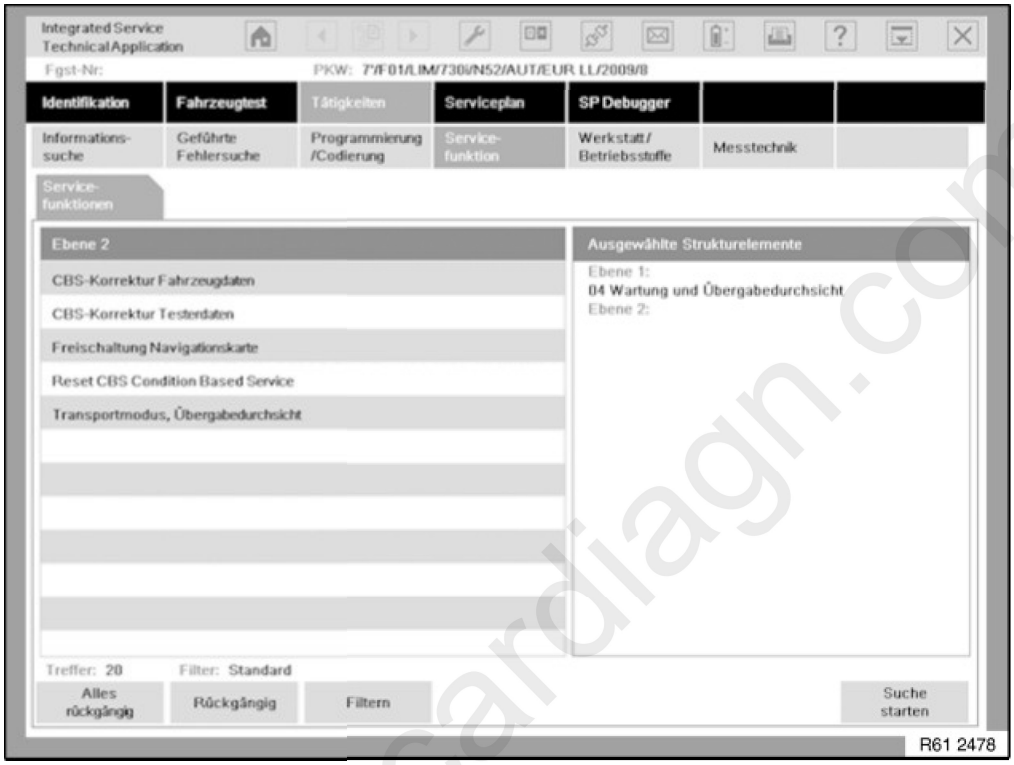


Note: Red symbol for pre-delivery check
The vehicle is coded at the end of line so that the red symbol for the pre-delivery check is shown in the Next Service indicator (same symbol as vehicle check).

The symbol is a reminder to the Service staff that the pre-delivery check has not yet been carried out on this vehicle.

Note: Do not carry out a reset.
Do **not** confuse this function with the ”Vehicle check” scope of maintenance work. Do not run a reset with the KOMBI.

When executing the pre-delivery check with the "Transport mode / Pre-delivery check" service function: The symbol will be suppressed automatically after the service function has been executed.



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4 service functions are available in the BMW diagnosis system for maintenance:

- Transport mode/pre-delivery check
- CBS correction, tester data
- Reset CBS
- CBS vehicle data correction

Service Function: Transport Mode/Pre-delivery check

In order to ensure that a vehicle can be handed over to the customer in proper condition, the ”Transport mode/pre-delivery check” service function must be performed.

The following positions are checked during the pre-delivery check:

- Deactivation of the transport mode.
- To determine the vehicle-specific vehicle performance per week an adaptation process is activated. Transport and immobilisation periods before vehicle delivery to the customer therefore do not have any effect on the customer-specific weekly distance travelled.

  The weekly mileage/kilometrage is used to control escalation from ”green” to ”yellow” (approx. 4 weeks before ”red”) for maintenance scopes with remaining distances. It is the vehicle performance determined over the last 6 weeks which is taken into account.

- Encoding or deletion of the legally-specified intervals for the legally stipulated vehicle inspection and exhaust-gas test.
- Inputting the target dates for the legally stipulated vehicle inspection and exhaust-gas test (automatically or manually).

  Automatically: by date entry of the first registration and the interval

  Manually: by directly entering the target date
- Entry of local, service-related phone numbers, depending on vehicle equipment specification (e.g. BMW Group Mobile Service, BMW Hotline, customer's local dealer).

  The country-specific phone numbers are displayed in the BMW diagnosis system as a note. When asked for input information the phone numbers can simply be read off.
- Information on initialising the TeleServices depending on the vehicle equipment.
- Checking and where necessary adjusting the on-board date for the vehicle.
- Entry of the date of the first registration of the vehicle.
- Clear diagnostic fault entries from fault memory.

Note: Reduction of input effort.
In order to minimise the input effort for the workshop, standardised data is saved on the BMW diagnosis system (for repeat use). The standardised data can be changed with the ”CBS correction, tester data” service function.

Service Function: CBS correction, tester data

With the "Pre-delivery check" service function, data will automatically be stored in the vehicle. The standardised data can be changed with the "CBS correction, tester data" service function.

The following standardised data can be modified:

- Phone numbers:
  - BMW Group Mobile Service
  - BMW Hotline
  - Local dealer

  The country-specific phone numbers are contained in the BMW diagnosis system as a note (to be read off when required for input). The phone numbers must be input with the international dialling code.
- Legally stipulated vehicle inspection (country-specific):
  - Encoding or deletion
  - Interval for calculating the target date

  The target date is calculated on the basis of the date of the first registration.
- Legally stipulated exhaust-gas test (country-specific):
  - Encoding or deletion
  - Interval for calculating the target date

  The target date is calculated on the basis of the date of the first registration.

Note: Automation after installation of the BMW diagnosis system.
If the pre-delivery check is being carried out for the first time, the standardised data will be defined automatically. It is therefore not necessary to enter the data separately.

Service Function: Reset CBS Condition Based Service

The scope of maintenance work can be reset with the ”Reset CBS Condition Based Service” service function. Even when the availability is above 80 %. The reset via the BMW diagnosis system has the advantage that the on-board date is corrected automatically.

The individual maintenance scopes are displayed in the BMW diagnosis system with service counter and availability.

- The service counter is increased by one count on resetting. In new vehicles all service counters are set to ”1”.

  The service counters are used in the Service Acceptance Module (SAM) to control the additional work for specific maintenance operations.
- On resetting the availability is set at 100%. The percentage availability is the wear value for the maintenance operation.

  The greater the availability, the further away the next service.

  0% means that the maintenance measure must be carried out.

Service Function: CBS vehicle data correction

Important! The datas have been exceeded.
After carrying out this service function, it will no longer be possible to restore the previous status.

The service function ”CBS vehicle data correction” is available if resetting has been carried out **unintentionally**. Thus the availability of a maintenance measure can be corrected to a value which corresponds more closely to the actual situation.

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For this correction a date or kilometre reading is entered. This data is processed internally to give a percentage availability. Here, the BMW diagnosis system will only accept a value which is lower that the current status in the control unit. In addition, the service counter of the scope is automatically reduced by one counter during correction.

The entries in the service booklet are used to determine the actual availability. The most recent maintenance measure (kilometre reading and date) allows the reconstruction availability for the specific scope that corresponds more closely to the actual situation. This does not include the correction of the brake pad availability. The remaining brake pad thickness must be measured and entered (in millimetres).

Note: Reference for distance- and time-dependent maintenance scopes
On correction the availability depends on the distance-dependent and time-dependent calculation.

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61 00 ... Encode/program control unit(s)

Note:
Depending on the vehicle and the equipment, programming/encoding has the following flat rate unit position:

- 61 00 710
- 61 00 720
- 61 00 730

Notes:

- In order to avoid incorrect programming procedures and Check Control message, it is essential to always use the most recent version when working with the ISTA/P programming system.
- Battery voltage must not drop below **13.0 V** during programming. Connect battery charger prior to programming.

  Only use battery chargers* recommended by BMW for low voltage vehicle electrical system.

  *Sourcing reference Workshop Equipment Catalogue



Attention!

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.

The high-voltage system will be automatically switched off by the programming system.

Exception:

BMW I01: Observe PuMA measure 55176388!



programming routine via ISTA/P:

- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept action plan with the control units to be programmed/encoded and enabled, if necessary or work through.
- Observe the reworking list!
- If applicable, connect the workshop system to the vehicle, depending on the reworking list. Perform brief test and delete fault memory.

  Note:

  With the integration of the service functions and the "quick clearing" function in ISTA/P, it may not be necessary to change to the workshop system. Check the rework list accordingly!
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.

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61 00 730 Encode/program control unit (s) (After vehicle test)

1 â€“ Encode/program control unit(s)

Prerequisite

Replacement of the control unit.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.

The battery voltage must not fall below 13.0 V during programming.

Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.

The high-voltage system will be automatically switched off by the programming system.

Exception:

BMW I01: Note Product and Measures Management Aftersales measure 55176388.

- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept and fully process the measures plan.
- If applicable, connect the workshop system to the vehicle, depending on the reworking list.
- Carry out vehicle test.
- Delete the fault memory.
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.
- Wait until programming/encoding has been completed.
- Disconnect the programming system from the vehicle.
- Disconnect the battery charger from the vehicle.

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61 12 ... Information on intelligent battery sensor (IBS)

Notice! Do not connect the charger to the 12 V charging socket

The 12 V charging socket is supplied with voltage by the rear power distribution box via relay. This relay drops out after terminal 15 OFF. This means that a trickle charger connected at the 12 V charging socket will be disconnected from the battery. Only charge the battery via the jump start terminal point. Only then can the voltage supply be registered by the vehicle.

Warning! Danger of destruction in event of mechanical strain

- Do not introduce any additional connections at the battery negative terminal.
- Do not modify the grounding cable. The ground cable also serves heat dissipation.
- Do not establish any connection between the IBS and the sensor screw.
- Do not use force when disconnecting the pole shoe from the battery terminal:
  - Do not pull on the ground cable.
  - Do not place any tools under the IBS to lever off the pole shoe.
- Do not use IBS connections as levers.
- Use a torque wrench and set tightening torque in accordance with repair instructions.
- Do not release or tighten down sensor screw (Torx screw).
- Avoid contact between IBS and ground.

Warning! Danger of destruction to IBS and wiring upon battery replacement

- The IBS and wiring can be destroyed by mechanical strain upon battery replacement. Therefore avoid mechanical strain.
- The size (capacity) of the battery required for the car is coded in the Car Access System (CAS).
- Use the battery size (capacity) installed as standard upon battery replacement.
- Recode the Car Access System (CAS) when installing a battery with a different capacity.
- Register battery replacement via Service functions in diagnosis system.
- Delete fault code entries in the Digital Engine Electronics (DME) associated with battery replacement.
- Always proceed in accordance with the repair instructions.

Note: Battery draining possible in spite of the intelligent battery sensor IBS being fault-free.

- A battery can be drained (e.g. with lights or radio switched on) even when the IBS functions perfectly in conjunction with power management.
- **For this reason, only exchange the IBS when there is a corresponding fault code entry!**

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61 00 ... Notes for disconnecting and connecting the vehicle battery

Observe safety informations for handling vehicle battery.

Before disconnecting vehicle battery:

Turn off the ignition and other electrical loads/consumers to prevent sparking when reconnecting.

Note:

If the ignition is not switched off when the vehicle battery is disconnected, fault memories may be set in some control units.

Attention!

- There is a danger of mixing up battery cables: if the positive battery cable and battery earth lead are the same colour and you are in doubt, follow the polarity to the vehicle battery, then mark and cover the leads
- The on-board computer and clock may lose your data.

General notes on disconnecting the vehicle battery:

- Do not disconnect battery leads and leads from alternator and starter motor while engine is running.
- Disconnect terminal of battery earth lead from the battery. Cover battery negative terminal(s) and secure.
- Disconnect both battery earth leads in version with auxiliary battery. Cover battery negative terminal(s) and secure.
- When work is carried out on the electrical system, faults may be caused in the fault memories of some control units when the vehicle battery is connected.
- When installing battery terminal: Tightening torque 61 21 1AZ.

Only lead AGM battery:

- On vehicles with IBS at negative battery terminal:
  Do not under any circumstances pull/lever off pole shoes by force.
  Do not under any circumstances release the hexagon socket screw of the IBS.

Note the following after having connected the vehicle battery:

Attention!

The scope of application of some systems may be restricted after an open circuit.

Personal Profiles may also be lost.

Settings or activations must be carried out, depending on the equipment specification.

For example:

- Activate slide/tilt sunroof, if necessary
- Activate power window, if necessary

Refer to the diagnosis system for further vehicle-specific information.

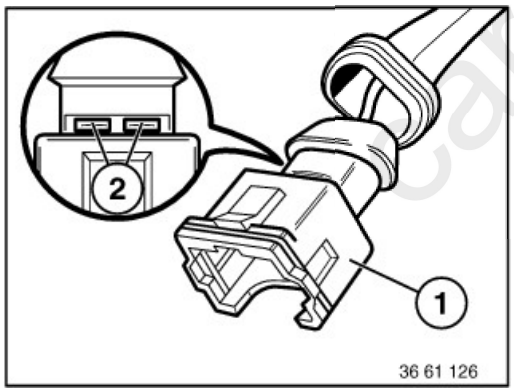
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61 13 ... Notes for opening contacts and locks of different plug contact systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
LSK	Load current contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded connectors (1).

Ultrasonically welded connectors (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool sets:

- Unlocking and pressing-off tool 61 1 150

  is replaced as of 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and pressing-off tool 61 1 100 (engine)

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Repair instructions for opening connector housings and removing contacts of different connector systems:

Connector system D 1.5/D 2.5:

- Circular connectors, 7- or 8-pin, system D 2.5
- Circular connectors, 13-pin, system D 2.5
- Circular connectors, 20-pin, system D 2.5
- Circular connectors, 4-, 7-, 10-, 12- or 25-pin, system D 1.5/D 2.5
- In-line connectors, 15-pin, system D 2.5
- In-line connectors, 8-, 12-pin, system D 2.5
- In-line connectors, 30-pin, system D 2.5
- In-line connectors, 20-pin, system D 2.5

Connector system JPT/MDK/DFK:

- In-line connectors, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3 plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Connector system Elo/Elo Power:

- Inline plugs, 4-, 10-pin, System Elo
- In-line connectors, 6- to 50-pin, System Elo
- Inline plugs, 3-, 6-pin, System Elo-Power 2.8

Connector system LSK:

- Connector housing LSK contact

Connector system MQS/MPQ:

- Inline connectors, 6-, 8-pin, System MQS
- Inline plugs, 2-pin, System MPQ 2.8
- Control unit connectors, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo Power
- In-line connectors, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio connector), Hybrid System MQS/MPQ

For connector contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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61 00 ... Notes on handling optical fibres



Important!

To avoid damage when handling optical fibres, comply with the following points:

- The minimum permitted bending radius is 25 mm
- Do not subject optical fibres to compressive and tensile load
- Protect optical fibres against the effects of heat ≥85 °C (e.g. during welding work, drying work with infrared beams or hot air blower)
- Fibre-optic cables are permitted to show only one junction point (bridge), replace fibre-optic cables if necessary



Note:
The optical fibres are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibre
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibre
- Orange=repair fibre-optic cables

Follow notes for processing cables and optical fibres.

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61 00 ... Notes on handling the high pressure cleaner



Warning!

Only used a high pressure cleaner approved by BMW!

Only specially trained persons of 16 years of age or older may work with the high pressure cleaner.

Check the high pressure cleaner and electrical wiring for visible damage.

Only use at a suitable location.



Attention!

Pay attention to following hazard warnings:

- Danger of injury due to water jet
- Contact with hazardous substances in spray
- Risk of skidding on wet floor
- Risk of stumbling due to hoses and cables
- Comply with notes and instructions on handling cleaning agents !
- Risk of scalding when cleaning with hot water.
- On electric or hybrid cars, the safety instructions for handling with hybrid cars are to be complied with.



Warning!

The following personal protective equipment is to be used:

- Safety goggles/face guard
- Suitable gloves
- Apron
- Rubber boots
- Ear protectors
- Safety shoes



Attention!

Notes on washing a vehicle with a high pressure cleaner:

- Do not wash directly on gaskets and control units during engine washes.
- A minimum distance of 30 cm must be adhered to for tyres and tyre valves.
- A minimum distance of 30 cm must be adhered to for the soft top and painted parts.
- Do not use if engine is still hot.
- Do not exceed maximum water temperature of 60Â degrees.
- Do not spray directly onto cameras/sensors.

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Attention!

- For your own safety, we recommend that you do not wash on the high-voltage components in electric or hybrid vehicles.

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61 00 ... Notes on handling wiring harnesses and cables

The following applies in general:

To avoid damage, observe the following instructions:

- Avoid compressive and tensile loads
- To ensure professional repairs, perform repair work only with BMW-approved or recommended special tools and spare parts
- Make sure cables are laid without kinks or abrasions
- Ensure non-contacting routing at sharp-edged body parts; use edge protection if necessary
- Secure additionally laid cables/leads with cable ties

The following additionally applies:

Shielded lines

Interference radiation and interference resistance can lead to neutral zones at contact points in the shielding. Consequently, distinctions have to be drawn between the following types:

Coaxial lines

- Shielded coaxial cables RTK031 may only be repaired with a special crimping tool.
- For aerial lines only the bushing contact may be repaired.
- RG174 Lines and the bushing contact may not be repaired.

CVBS lines

- CVBS cables may not be repaired.
- CVBS cables must be replaced in their entirety.

HSD lines

- HSD cables may not be repaired.
- HSD cables must be replaced in their entirety.

Optical fibre cable:

Note:
Fibre-optic cables are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibres
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibres
- Orange=repair fibre-optic cables

Attention!

- Optical fibres are permitted to show only one junction point (bridge). Replace optical fibres if necessary
- Smallest permissible bending radius is 25 mm
- Avoid effects of heat ≥ 85 °

Treating cables and fibre-optic cables

FlexRay (twisted cables):

It is possible to repair the FlexRay. In the event of damage, the cables can be joined with conventional butt connectors and heat-shrink tubing.

Note:

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- FlexRay lines may only reveal one separation point (bride); renew complete line if necessary.
- If possible, maintain twisted cable after repair.
- After repairs, twist cables as close as possible to the connector/separation point.
- Twisting must be as symmetrical as possible.

Airbag lines:

Repairing airbag cables

Ribbon cables:

Repairing ribbon cables

Replacing wiring harnesses

Repair wiring harnesses mainly cover the full equipment of the vehicle. If certain optional equipment is not installed in the vehicle, note the following:

- If necessary, secure the remaining connectors.
- If necessary, seal the remaining connectors outside the vehicle interior, for example, with butyl tape in such a way that moisture ingress can be eliminated permanently.
- If necessary, repin the connector of the repair wiring harness.

Note:
Repair wiring harnesses can be equipped with an **additional socket housing** (30-pin, for example), **which was not provided on the previous vehicle-side wiring harness**. This socket housing also cannot be found in the wiring diagram.

Procedure

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **in the vehicle interior** (in the footwell, for example):

- Cut the additional socket housing and connect the lines to the vehicle-side wiring harness using a butt connector.
- Alternatively, a suitable pin housing can be fitted on the vehicle-side wiring harness and connected to the additional socket housing.

  However, this is permitted only if the following conditions are met:
  - Carpets must not protrude visibly or become deformed due to the installation of the additional plug connection.
  - It must be possible to install the adjacent components (for example, trims, trim panels, etc.) correctly after installing the additional plug connection.
  - All the attachment points of the adjacent components (for example, trims, trim panels, etc.) must engage correctly.
  - There must be no rattling noise due to the installation of the additional plug connection.
  - The additional plug connection must not damage the adjacent components/wiring harnesses, etc..

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **outside the vehicle interior** (in the wheel arch, for example):

- Cut the additional socket housing and connect the lines to the vehicle-

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side wiring harness using a butt connector.

- **Using the additional socket housing is not permitted with a separation point outside the vehicle interior.**

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12 00 ... Notes/information on start assistance (jump starting)

Do not start the engine with help of starting sprays.

Preparation:

Conform with the following when starting the engine with a jump starting cable.

- Ensure that the jump starting cable wires are of appropriate cross-section size.
- Only use fuse-protected jump starting cables.
- Check whether the current-supplying battery has 12 V voltage.
- If the engine is started from the battery of another vehicle, ensure that there is no contact between the bodies of both vehicles.

Important!

Never touch electrically live ignition system components: high voltage - danger of injury!

If the battery in the vehicle supplying power is weak, start the engine of this vehicle and let it run at idling speed.

Operation:

It is essential to conform to the procedures so as to avoid injury to persons or damage to parts.

- Automatic transmission: select drive position ”P”, apply parking brake.
- Manual transmission: move gear lever to neutral position, apply parking brake.
- Ensure that the jump leads cannot get caught in rotating parts, e.g. fan.
- First connect both positive poles of the batteries with one jump starting cable (red).
- Use the battery positive terminal in the engine compartment for vehicles with the battery in the luggage compartment.
- Then use the second jump starting cable (black) to connect the negative post of the current-supplying battery with the earth/ground point (not the negative pole or the body) of the vehicle to be started.

Important!

Do not connect the second jump starting cable (black) with the negative pole of the battery in the vehicle to be started. Produced gas could be ignited by sparks.

Risk of explosion!

After the engine of the vehicle to be started has fired, first disconnect the jump starting cable between the negative pole and the earth/ground point. Then remove the starting cable from the positive poles.

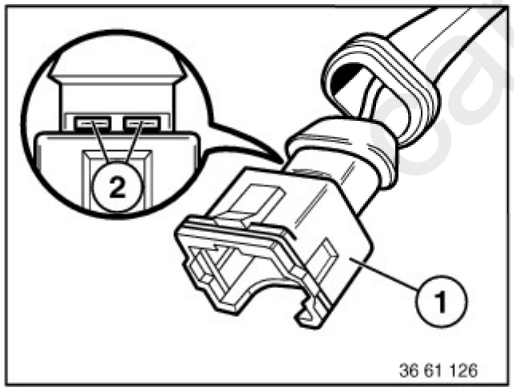
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61 13 ... Opening plug housings and removing contacts of different plug systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100
- 61 1 150

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded plugs (1).

Ultrasonically welded plugs (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool kits:

- Release and press-out tool 61 1 150
  is replaced from 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and press-out tool 61 1 100 (engine)

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Repair instructions for opening plug housings and removing contacts of different plug systems:

Plug system D 1.5/D 2.5:

- Circular plugs, 7-, 8-pin, System D 2.5
- Circular plugs, 13-pin, System D 2.5
- Circular plugs, 20-pin, System D 2.5
- Circular plugs, 4-, 7-, 10-, 12-, 25-pin, System D 1.5/D 2.5
- In-line plugs, 15-pin, System D 2.5
- In-line plugs, 8-, 12-pin, System D 2.5
- In-line plugs, 30-pin, System D 2.5
- In-line plugs, 20-pin, System D 2.5

Plug system JPT/MDK/DFK:

- In-line plugs, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Plug system Elo/Elo-Power:

- In-line plugs, 4-, 10-pin, System Elo
- In-line plugs, 6- to 50-pin, System Elo
- In-line plugs, 3-, 6-pin, System Elo-Power 2.8

Plug system MQS/MPQ:

- In-line plugs, 6-, 8-pin, System MQS
- In-line plugs, 2-pin, System MPQ 2.8
- Control unit plugs, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo-Power
- In-line plugs, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio plug), Hybrid System MQS/MPQ

For plug contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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61 00 ... Repairing airbag cables

Important!

> **Only repair those cables which show visible signs of damage. In the event of visible damage, make sure there is only one cable repair in effect after the repair work. If no visible damage can be identified, the entire cable must be replaced. When carrying out repairs to the airbag wiring harness, you must use the spare parts offered in the Electronic Parts Catalogue (EPC).**

Safety regulations for handling components of airbag system.

Instructions for disconnecting and connecting battery.

In event of non-visible damage to wiring harness:

Disconnect plug connection on airbag module or on adapter plug. It is absolutely vital to disconnect the contacts in succession as there is a risk of mixing up (similar parts)! Cut through one cable after the other at an appropriate position, do not under any circumstances cut through both cables at the same time. Insulate cables remaining in wiring harness with insulating tape. Now disconnect plug connection on airbag control unit. Unpin contacts. Cut through one cable after the other at an appropriate position and insulate with insulating tape, do not under any circumstances cut through both cables at the same time. Pin contacts of repair cable for airbag control unit in control unit plug, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead. Now pin in contacts for airbag control unit or contacts of adapter plug, assignment of repair cables is relevant. Cut off excess length of repair cable in proximity (visible area) of airbag module or of adapter plug. Twist open cables. With the butt connectors and heat-shrink tubings in the Electronic Parts Catalogue (EPC), reconnect the cables with the same cable colours. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using butt connectors.

Installing and removing contacts.

In event of visible damage:

Expose cable at damaged areas. Cut through one cable after the other at an appropriate position and insulate cables no longer required in wiring harness with insulating tape, do not under any circumstances cut through both cables at the same time. Now, depending on the scope of work, unpin contacts either on airbag control unit/airbag module or on adapter plug. Cut off unpinned cables. Insulate cables remaining in wiring harness with insulating tape. Now pin in contacts of repair cable, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead up to separation point. Cut off excess length of repair cable. Twist open cables. Connect cables with butt connectors and heat-shrink tubings in Electronic Parts Catalogue (EPC), assignment of repair cables is relevant. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using connectors.

Installing and removing contacts.

00 Safety information for working on vehicles with automatic engine start-stop function (MSA)



Warning!

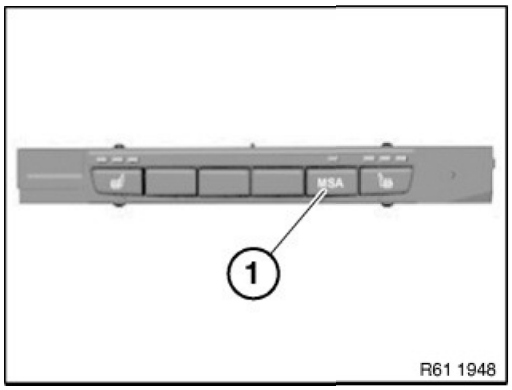
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

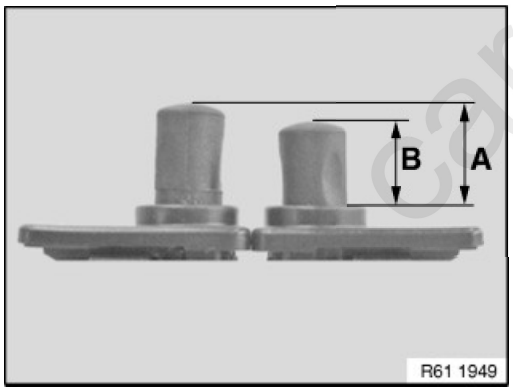
Observe safety precautions when working on MSA vehicles.

Before carrying out practical work on the engine, always ensure that the MSA functionality is deactivated so as to prevent automatic engine starting while work is being carried out in the engine compartment.

MSA function is deactivated by:



- Deactivate MSA by means of button (1) in passenger compartment
- Open seat belt buckle and driver's door



- Open engine bonnet/hood and ensure that engine hood/bonnet contact is not in workshop mode
  - Workshop mode

    A = 10 mm
  - Basic setting (engine hood/bonnet open)

    B = 7 mm

To make sure that the engine hood/bonnet contact is at the basic setting, if necessary press the hood/bonnet contact up to the limit position before starting work and slowly release.



When working with diagnosis tools:

- Observe instructions in diagnosis tool

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Note:
For further information on automatic engine start-stop function (MSA):

- Refer to the Service Information (bulletin) (for manual transmissions) Service Information (bulletin) 61 01 07 335
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) Service Information (bulletin) 61 01 10 629

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61 00 ... Safety information on handling hybrid cars

1. *Qualification:*
   All repair work on high-voltage components may **only be performed by specially trained personnel** (qualification: Work on high-voltage inherently save vehicles) must be performed by qualified technicians. Each hybrid car requires additional vehicle specific training with training achievement controls.
   Required training is offered by the BMW Training Academy.
2. *Identification:*
   Observe **warning notices** on high-voltage components. When replacing individual high-voltage components, check if warning stickers are present. Independently attaching warnings is only allowed on the locations provided for them. Use only approved and appropriately identified original new parts.
3. *Rules of conduct/protective measures:*
   - Note operating instructions for handling high-voltage battery units.
   - Do not under any circumstances touch open high-voltage cables and high-voltage components on damaged vehicle before shutting down the high-voltage electrical system.
   - In the event of damage (mechanical, thermal) transition metal oxides, carbon, electrolyte solvents and their products of decomposition may be released.
     Suitable acid-resistant protective clothing/equipment must therefore be used when handling the vehicle!
     - Hand protection: Gloves
     - Eye protection: Safety goggles

     Damaged high-voltage battery units must be stored in an acid-resistant pan in a location in the open that is protected against the weather (sun, rain) and secured against unauthorised access. Do not inhale escaping gasses.
   - Prevent escaping substances from entering drains, pits and the sewer system.
   - Collect any material that is discharged and have it disposed of according to the work instruction, wear acid-resistant protective clothing when doing so.
   - Notify the fire brigade if fire breaks out, clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger (suitable extinguishant: water and water foam).
   - A cut 2nd emergency separation point must be repaired with a butt connector.
4. *Measures before starting work:*
   - Each job on the vehicle must be assigned by appropriately trained personnel. Before work is started, this electrician must place the vehicle in the operating condition required to perform the relevant activity. The qualified personnel's instructions and directions absolutely must be followed. **No work may be carried out without this qualified personnel being consulted first.**
   - It is **not** permitted to work on the high voltage system or on high voltage components while the engine is running.
   - The readiness to drive must be ended before shutting off the voltage of the high-voltage system. The readiness to drive is ended when the driver is absent only under the following conditions:
     1. seat belt buckle unlocked **and**
     2. the driver's door is open **and**
     3. no brake activated **and**
     4. the accelerator pedal is not activated **and**
     5. speed < 3 km/h (2 mph)
   - Work on live high-voltage components is expressly prohibited. Before each operation on the high-voltage system, the system must be isolated from the power supply by qualified personnel (high-voltage safety connector Off) and secured against unauthorised recommissioning (padlock).
   - After each deactivation of the high-voltage system, it is essential to observe a **waiting period** of at least **10 seconds** prior to further work.
   - Before beginning work, it is mandatory to check that the equipment is de-energised and is protected against being energised again.
     Work is only permitted to begin if:
     1. Corresponding display in the KOMBI **High-voltage system deactivated** or

     When a high-voltage warning is active (indicator light, Check Control, etc.), it is essential to determine and eliminate the cause of this warning via the diagnosis system before continuing with any other work.
     If it cannot be definitively established that the equipment is de-energised, work is not permitted to begin. **Danger to life!** Before work begins, a qualified electrician (1000 V AC) must verify that the system is de-energised using appropriate measuring devices and procedures.
     => In this case, Technical Support must be contacted!
   - Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging

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cable from the vehicle.
Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

5. *Measures during/after activities:*
   - Identifiable mechanical damage to or tampering with high-voltage components must be reported immediately to the qualified personnel in charge.
   - When carrying out any work on the high-voltage system, it is prohibited to drive externally all the drivetrain components (wheels, gearbox, drive shafts, etc.).
   - *E72 only:* When the “Power Electronic Box Cover” is removed, the high-voltage system is not permitted to be activated. The high-voltage service disconnect must only be used when the "Power Electronics Box Cover" is completely installed.
   - High-voltage cables (orange coating) and their connectors and stop parts **may not** be repaired. If damaged, a cable must always be replaced completely.
   - When working in the vicinity of high-voltage components (identified accordingly with warning stickers and orange-coloured coating), protect these components against damage.
   - The specified work steps in the repair instructions must be adhered to exactly.
   - High-voltage components and their holders must be screwed/bolted to the defined tightening torque. Tightening torques and tightening specifications must be observed.
   - Connecting high-voltage components to body ground is crucial to safety for reasons of equipotential bonding. For this reason, it is prohibited to operate any high-voltage components without them being correctly connected to body ground. The measurements (insulation/potential equalisation measurement) are performed automatically by the vehicle. Manual measurement is not therefore necessary.
     For a correct earthing connection, the retaining elements of high-voltage components must not be painted. Follow further painting notes.
   - Removed high-boltage battery units must be stored in a manner that protects them from misuse and damage.
   - Damaged or warning stickers that are no longer legible on high-voltage components must always be replaced.
6. *Potential compensation:*
   Equipotential bonding lines, high-voltage cables and the battery negative lead to the EME are fitted with safety screws.
   - Clean contact faces and have then checked by a second person.
   - Tighten down screws/bolts to specified torque.
   - Have tightening torque checked by a second person.
   - Both persons must document that the work has been carried out correctly in the vehicle records.

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61 00 ... Safety instructions for handling vehicle battery

Do not allow any battery acid to come into contact with the eyes, the skin or clothing. Therefore wear protective clothing, gloves and eye protection.

Do not tilt the battery, acid may emerge from the vent hole.

If acid is splashed into the eyes, rinse them immediately for several minutes with clear water. You must then consult a doctor without delay.

If acid is splashed onto the skin or clothing, neutralise it immediately with a soap solutionand rinse with lots of water.

Seek medical attention immediately if battery acid is accidentally swallowed.

Strictly no flames, sparks, naked light or smoking!

A highly explosive detonating gas is created when batteries are charged. The rooms where charging is carried out must therefore always be well ventilated.

Avoid the formation of sparks when handling cables, wiring and electrical devices.

Turn the ignition lock to the 0 position before disconnecting or connecting the battery.

Do not place tools or any similar object on the battery (danger of short circuit and explosion hazard!).

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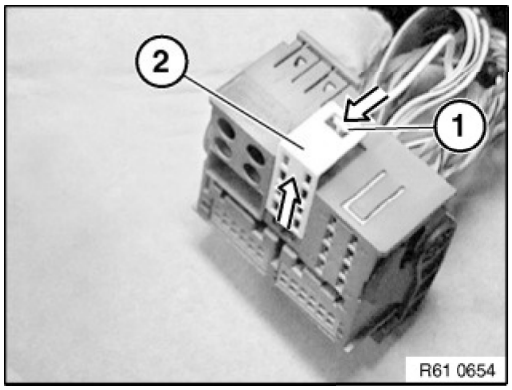
61 13 ... Socket housing (radio connector), Hybrid System MQS/MPQ

Special tools required:

- 61 0 314

Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

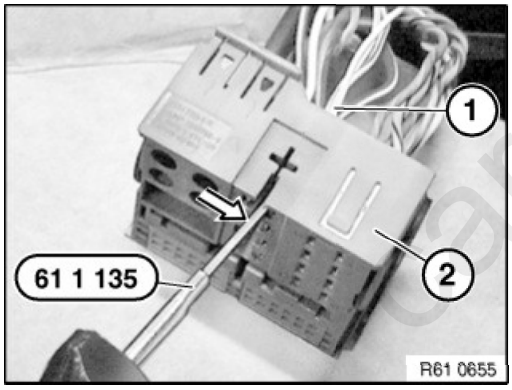
- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



Removing MPQ contacts from radio connector:

Press lock (1) in direction of arrow.

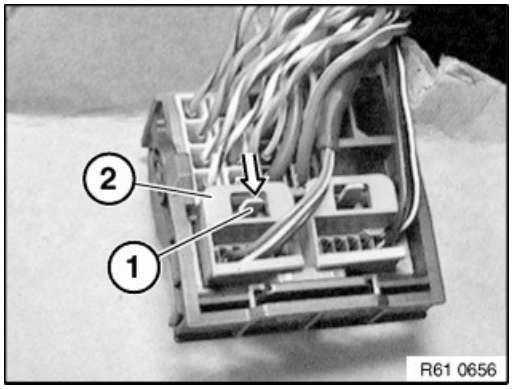
Detach secondary lock (2) from radio plug.



Feed special tool 61 0 314 (61 1 135) past side of contact.

Press special tool 61 0 314 (61 1 135) in direction of arrow.

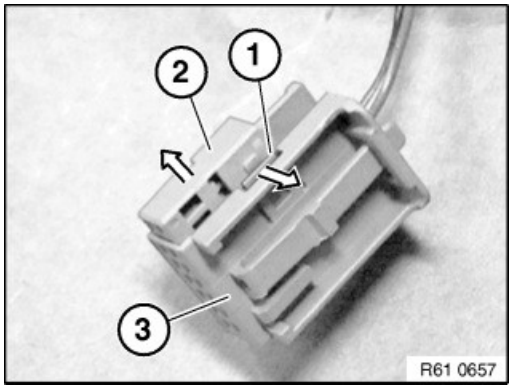
Pull wire (1) with socket contact out of radio connector (2).



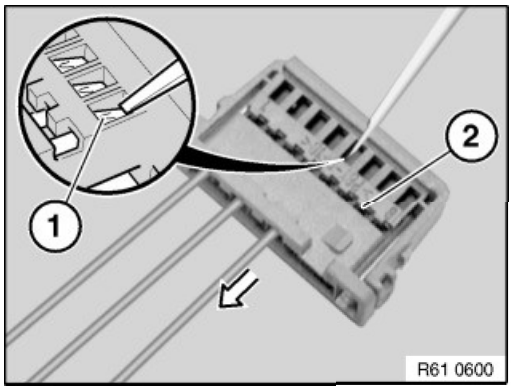
Removing MQS contacts from contact carrier:

Press lock (1) in direction of arrow and pull housing (2) out of radio connector.

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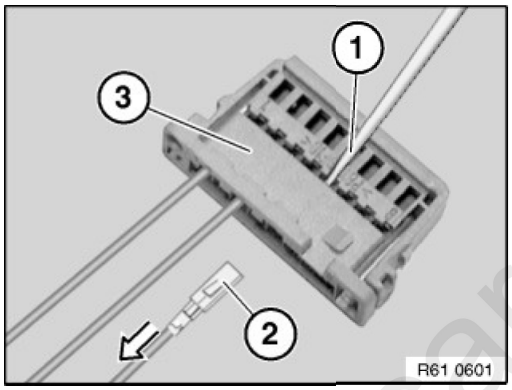
Press lock (1) in direction of arrow. Pull contact carrier (2) out of housing (3).*Note:*
When the contact carrier is pulled out, the secondary locks of the socket contacts are raised.



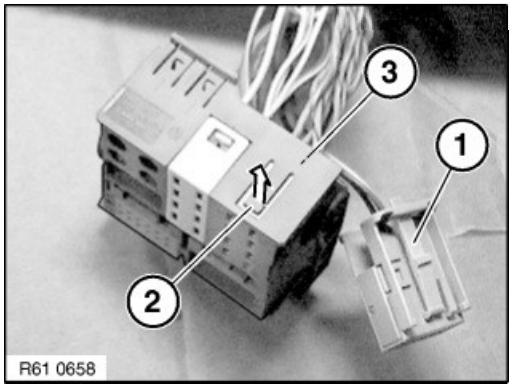
Note:
Schematic diagram shows the 8-pin socket housing by way of example.

Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



Hold down retaining hook in secondary lock (1) again. Pull wire with socket contact (2) out of contact carrier (3).



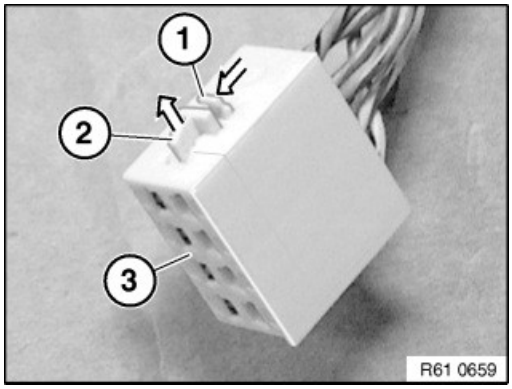
Removing MPQ contacts from contact carrier:

Remove contact carrier (1) with MQS contacts from radio connector.

Raise lock (2) on radio connector.

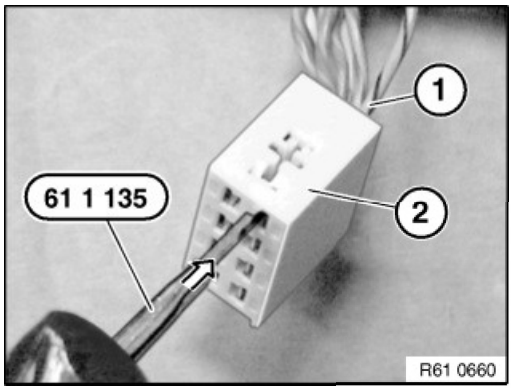
Pull contact carrier (3) out of radio connector.

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Press lock (1) in direction of arrow.

Pull secondary lock (2) in direction of arrow completely out of contact carrier (3).



Press special tool 61 0 314 (61 1 135) on inside of contact into contact carrier (2).

Pull wire with socket contact (1) out of contact carrier (2).

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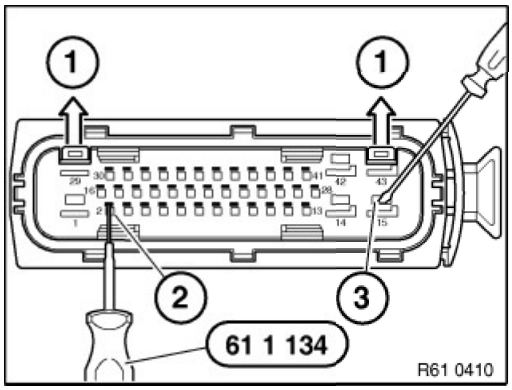
61 13 ... Socket housing 42-, 43-, 46-pin, Hybrid System MQS / MPQ

Special tools required:

- 61 0 312

Manufactured by AMP: The following contact types without strand sealing can be fitted in the socket housings:

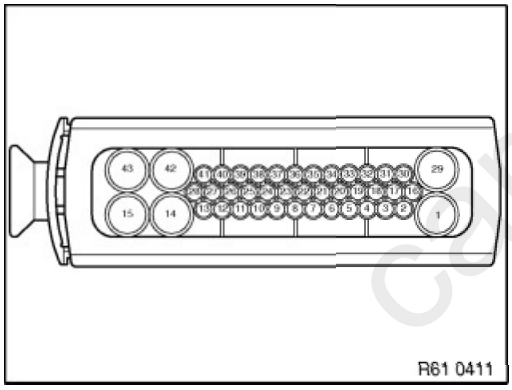
- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



Open secondary locks (1) on socket housing.

Press back retaining hook of MQS contacts (2) with special tool 61 0 312 61 1 134 and pull out cable with contact.

Press back retaining hook of MPQ contacts (3) with screwdriver and pull out cable with contact.



Installation note:
Bend open retaining hook of contacts gently before inserting into connector housing.

For installation of contacts, observe chamber numbers on reverse side of socket housing.

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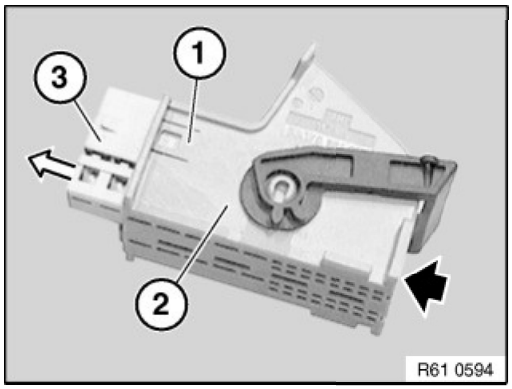
61 13 ... Socket housings, 2x21-, 2x27-pin, Hybrid Systems MQS/MPQ, Elo/Elo Power

Manufactured by AMP: The following contact types without strand sealing can be fitted in the socket housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)

Manufactured by Siemens: The following contact types without strand sealing can be fitted in the socket housings:

- Elo (electrical contact)
- Elo Power 2.8 mm width (electrical contact for heavy loads)
- Elo Power 5.2 mm width (electrical contact for heavy loads)

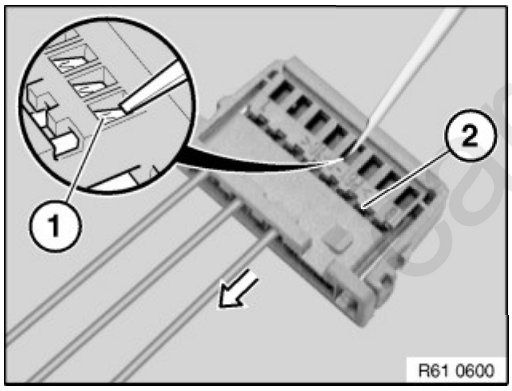


Raise lock (1) on housing (2).

Push contact carrier (3) from rear out of housing.

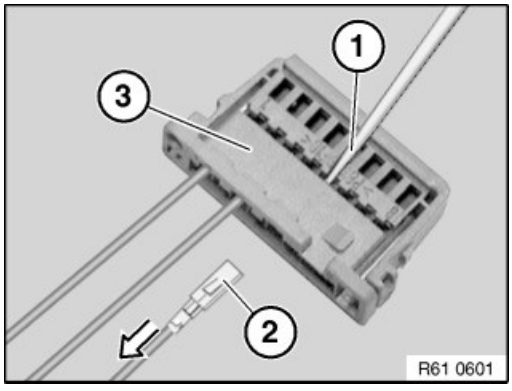
Note:
The second contact carrier is pushed out in the same way.

Pushing out the contact carrier releases the secondary locks of the socket contacts.



Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



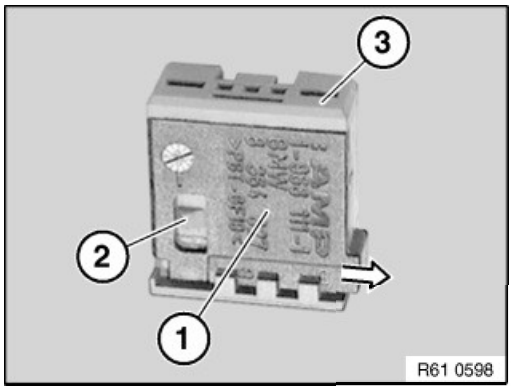
Hold down retaining hook in secondary lock (1) again and pull cable with socket contact (2) completely out of contact carrier (3).

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61 13 ... Socket housings, 5-pin, 8-pin, System MQS/MPQ

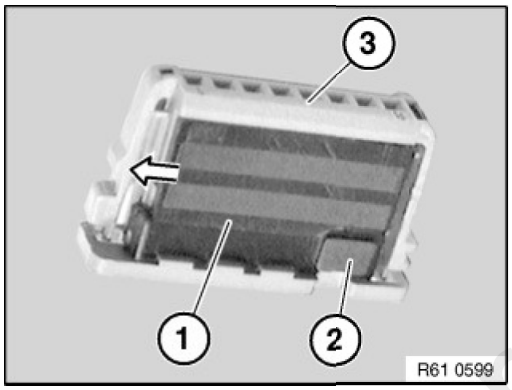
Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



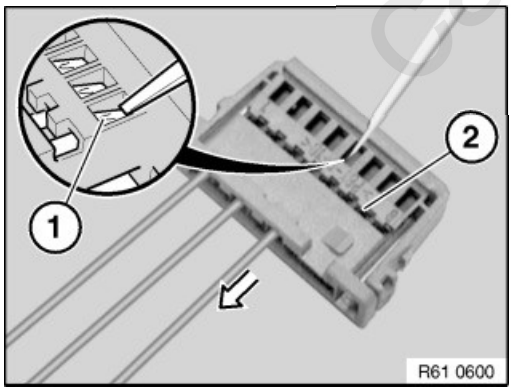
Socket housing, 5-pin (Hybrid System MQS/MPQ)

Raise fastener (1) over retaining lug (2) and pull off from contact carrier (3).



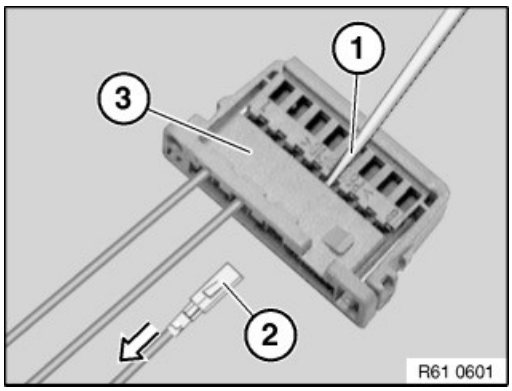
Socket housing, 8-pin (MQS):

Raise fastener (1) over retaining lug (2) and pull off from contact carrier (3).



Hold down retaining hook (1) of contact and pull cable with contact as far as secondary lock (2).

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Hold down retaining hook in secondary lock (1) again and pull cable with contact (2) completely out of contact carrier (3).

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61 13 ... Treating cables and optical fibres

Special tools required:

- 61 4 320
- 61 0 200

Note:
Special tools referred to in the repair instructions below are contained in the following special tool sets:

Repair range for vehicle electrical system	SI 2 04 07 341
Crimping set with pliers for optical fibres, Micro Power Quadlock (MPQ), Micro Quadlock System (MQS) contacts and universal crimping head	61 4 320 61 0 200

Subject of repair instructions

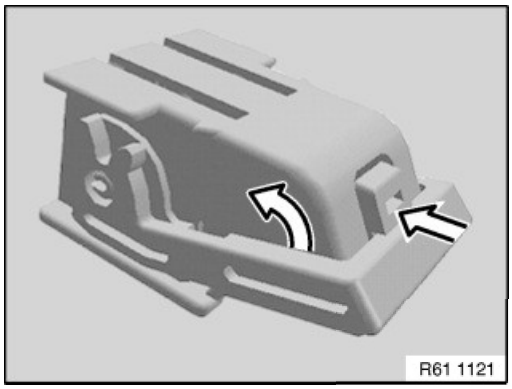
- Special tools for wiring harness repairs
- Cutting cables to length and strip insulation
- Crimping stop parts (contacts)
- Butt connector for repairing a plug connection
- Comb connector for retrofitting/repairs
- Cutting to length and stripping insulation from optical fibres
  Crimping optical fibres

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61 13 ... Unlocking and disconnecting different plug connections

Note:
The document describes unlocking and disconnecting different types of plug connections.

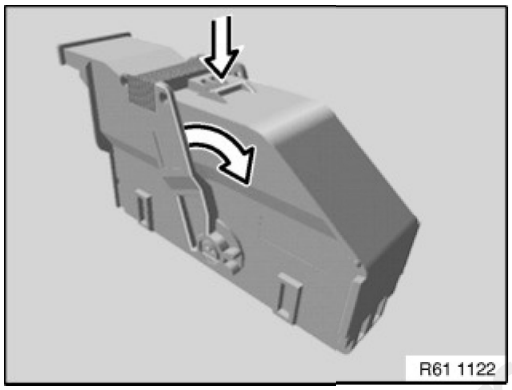
Differences in the details of the size and shape of the plug connections are possible.



1.

Press lock and open release clip in direction of arrow.

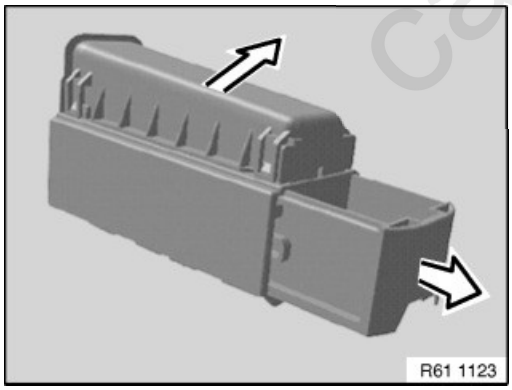
Disconnect plug connection.



2.

Press lock and open release clip in direction of arrow.

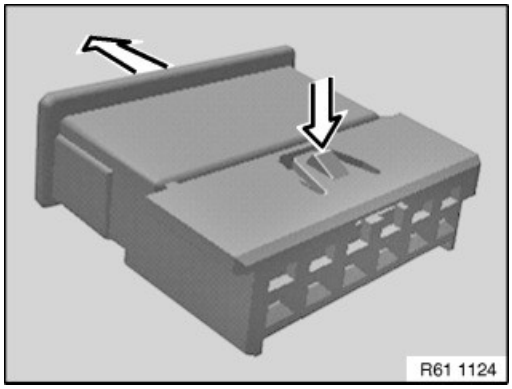
Disconnect plug connection.



3.

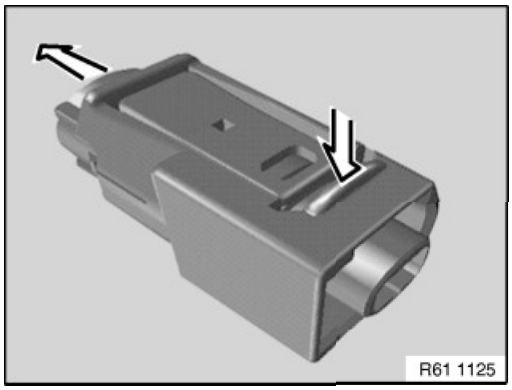
Open release clip in direction of arrow and disconnect plug connection in direction of arrow.

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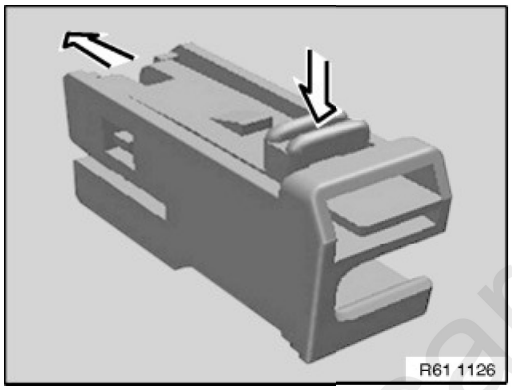
4.

Press lock and disconnect plug connection in direction of arrow.



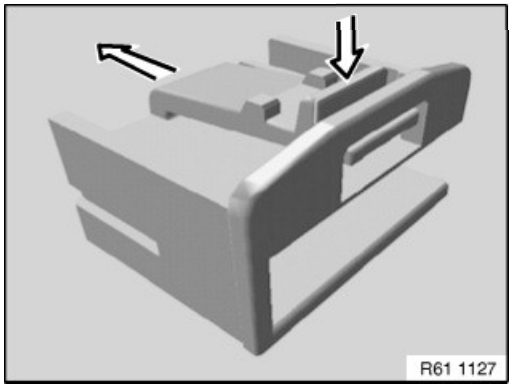
5.

Press lock and disconnect plug connection in direction of arrow.



6.

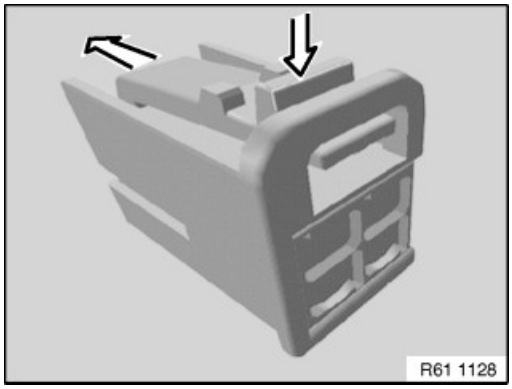
Press lock and disconnect plug connection in direction of arrow.



7.

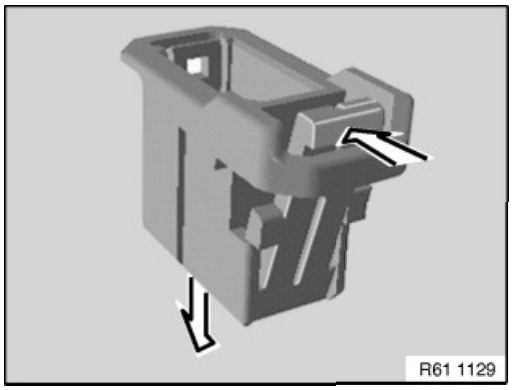
Press lock and disconnect plug connection in direction of arrow.

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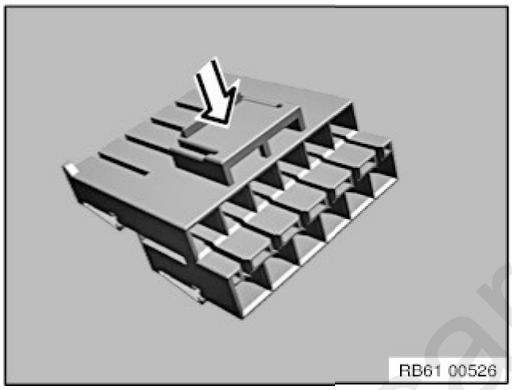
8.

Press lock and disconnect plug connection in direction of arrow.



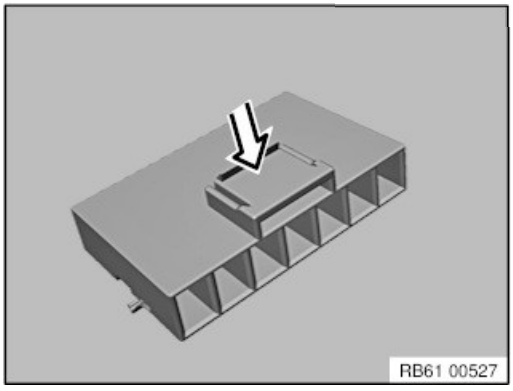
9.

Press lock and disconnect plug connection in direction of arrow.



10.

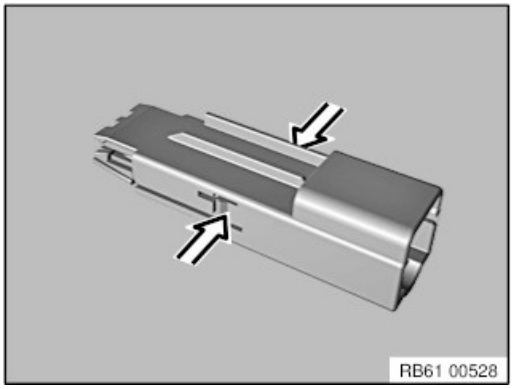
Press the lock and detach plug connection.



11.

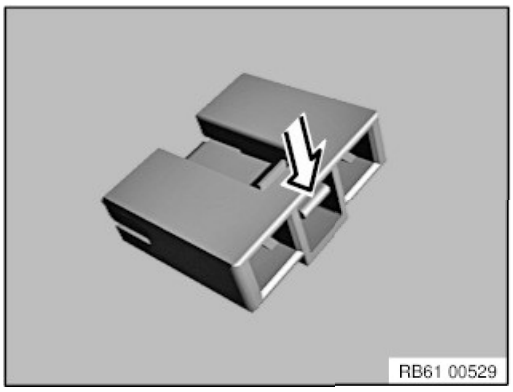
Press the lock and detach plug connection.

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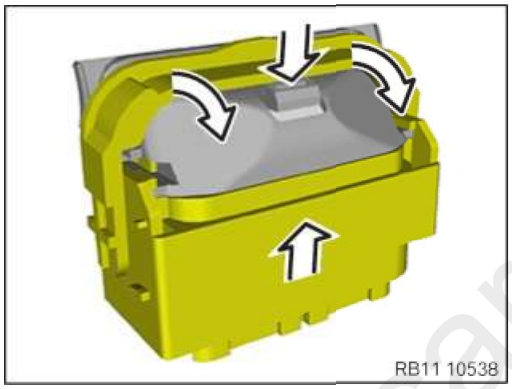
12.

Press the lock on both sides and detach plug connection.



13.

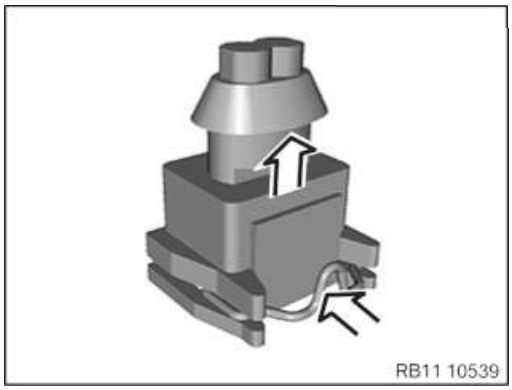
Press the lock and detach plug connection.



14.

Press lock and open release clip in direction of arrow.

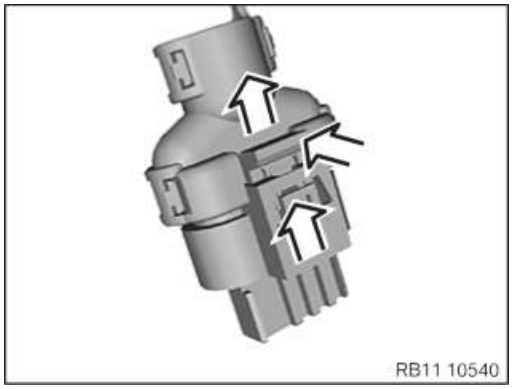
Disconnect plug connection.



15.

Press the lock and detach plug connection.

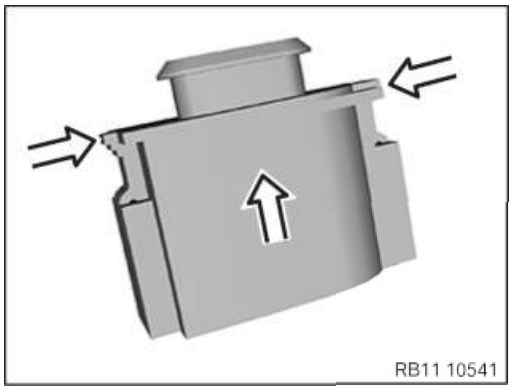
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16.

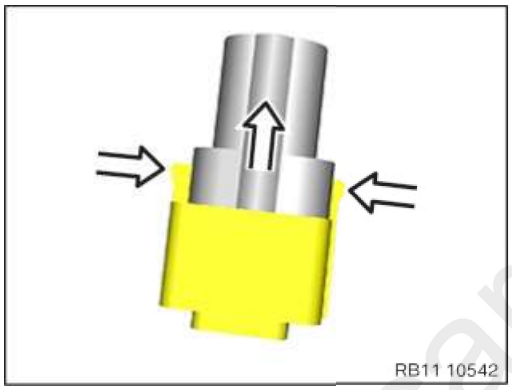
Pull out lock and press.

Disconnect plug connection.



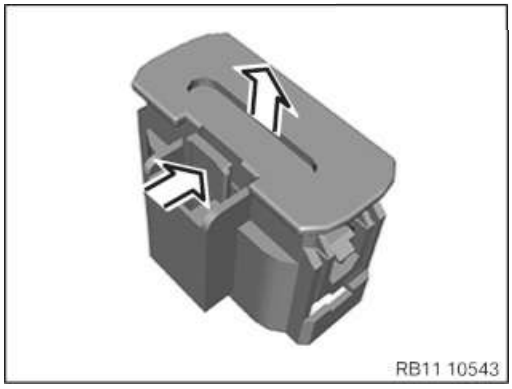
17.

Press the lock and detach plug connection.



18.

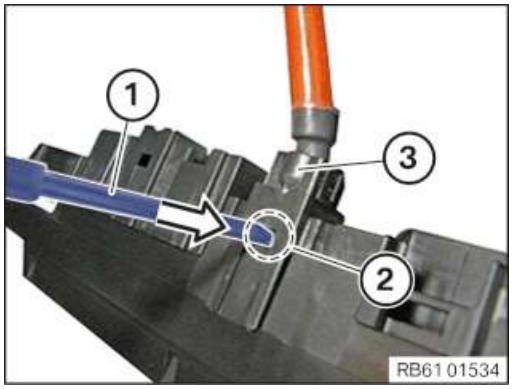
Press the lock and detach plug connection.



19.

Press the lock and detach plug connection.

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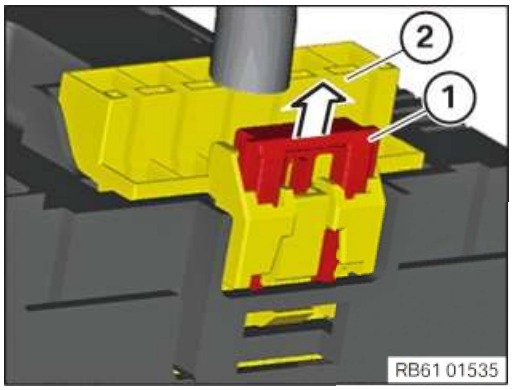


20.

Plug connection, e.g. on the power distribution box:

Press into the opening (2) using a suitable tool (1).

Pull off plug connection (3) upwards.



21.

Plug connection, e.g. on the power distribution box:

Lift lock (1) with a suitable tool.

Pull off plug connection (2) upwards.



22.

Vibration resistant high power engine contacts:

Caution!

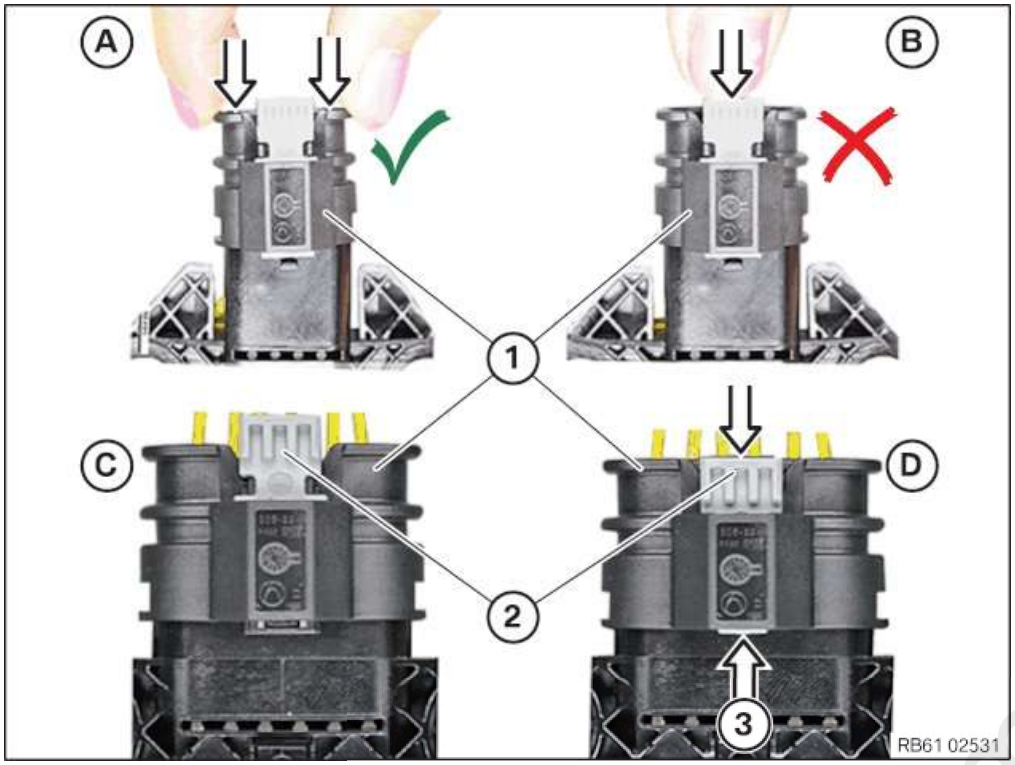
For this connector type, increased forces come into play when disconnecting and closing.

Disconnect:

Pull out lock (1) downward in direction of arrow first.

Then press lock (1) down in direction of arrow and pull off connector.

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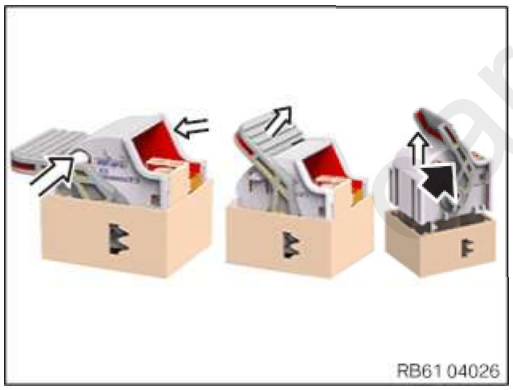


23.

Close:

A. Press the connector (1) down at the points indicated by the arrow **until it reaches the end position**
B. **Do** not press the connector (1) further than the lock
C. Connector (1) is in the end position, but lock (2) is not yet locked
D. Press lock (2) down in the direction of the arrow until the tip of lock (2) is visible at point (3)

Unlock / lock front light combination plug connection & replace housing after damage:

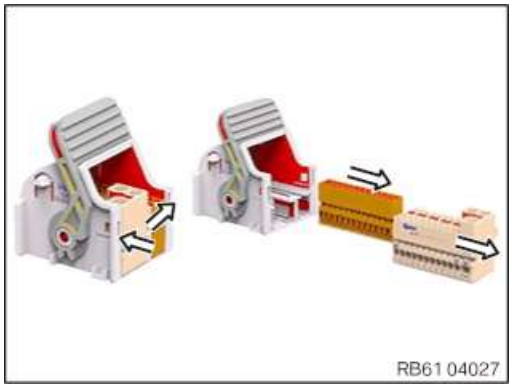


24.

Press in locking lever at both sides until the lever is unlocked and can be moved.

Move lever upwards until it latches into place in the end position.

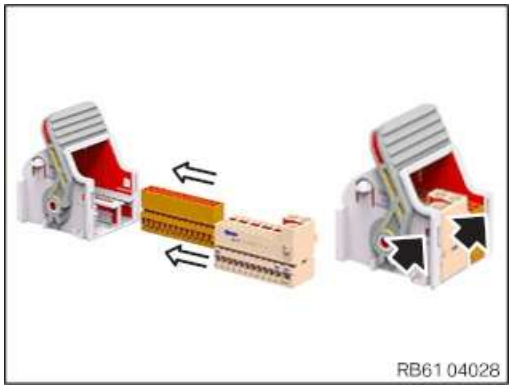
Once the lever is locked in the end position, remove plug connection upwards.



Unlock socket housing by lifting up each of the locking tabs.

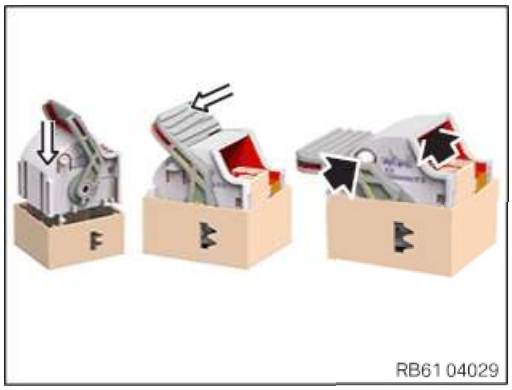
Slide out after unlocking the socket housing.

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Slide in socket housing up to limit position.

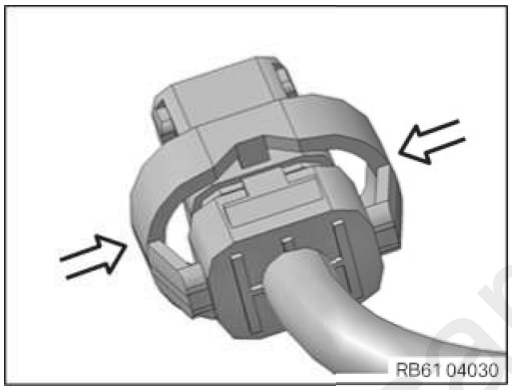
Lock socket housing into place in end position.



Sliding in up to limit position.

Activate plug-inn procedure by moving lever downwards.

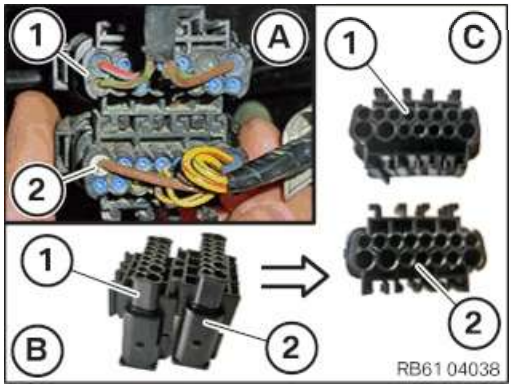
IMPORTANT: the latch mechanism on both sides only works for a completed plug-in procedure.



25.

Rosenberger D4S20G-400A5-Y

Press to unlock on both sides.

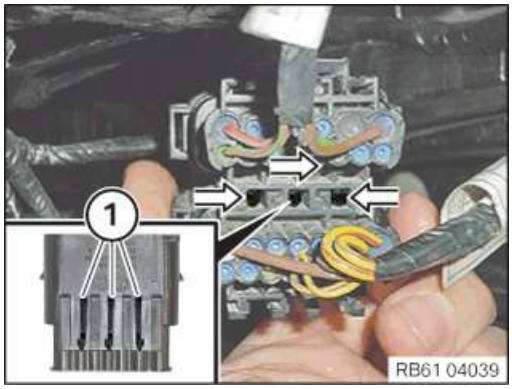


26.

Pin housing, 15-pinMLK1

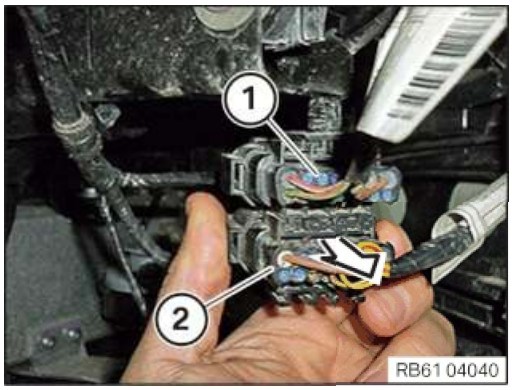
- A & B. To avoid any damage to individual connectors, the given connector assembly consisting of several individual connectors (1) & (2) must be released before disconnecting the plug connection.
- C: released connector assembly

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Disconnecting connector assembly:

Release retaining hooks (1) in direction of arrow (detail image shows retaining hooks of individual connector).



Release connector (2) in direction of arrow from connector (1).

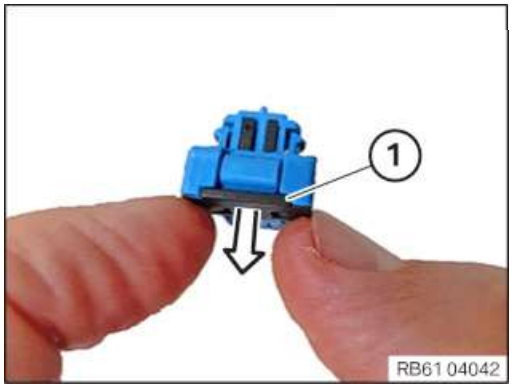


27.

Airbag ignition circuit connector

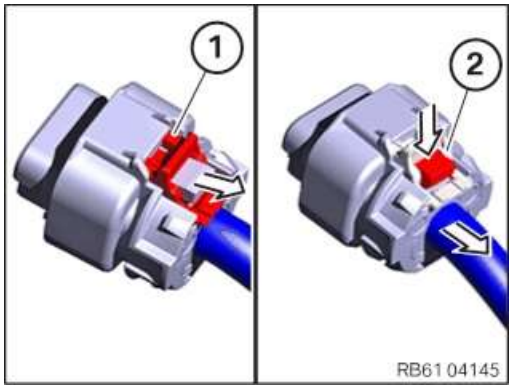
Warning!

Note the safety information for working on vehicles with airbag systems prior to disconnecting the plug connection.



Pull the cap (1) in the direction of the arrow to unlock

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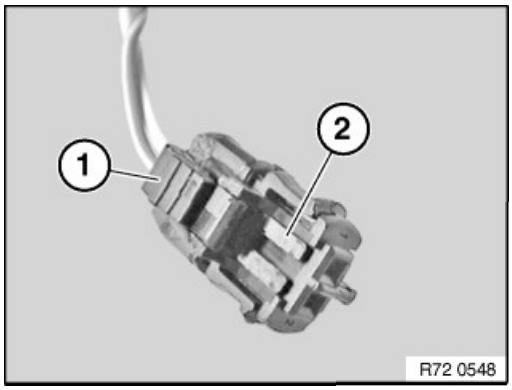


28.

Connector e.g. on front and rear lighting unit

Open safety catch (1) in direction of arrow using appropriate tool.

Push safety catch (2) in direction of arrow and disconnect plug connection.



29.

Plug, e.g. in airbag ignition circuits

Press the lock (1) and pull out the connector (2) up to initial engagement position.

Pull off connector (2).

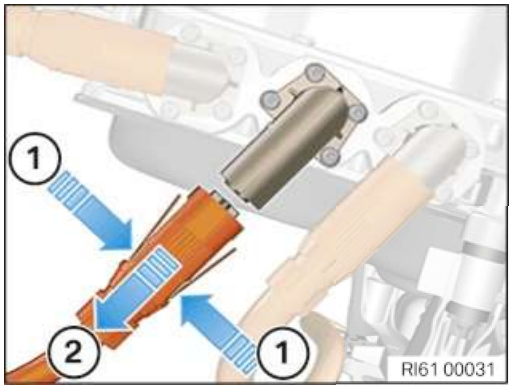
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61 13 ... Unlocking and disconnecting various plug connections in electrical and hybrid vehicles

Attention!

Observe the following instructions for handling high-voltage plug connections:

- Damaged high-voltage plug connections must be replaced completely. Repair is not permitted.
- Dirt contamination must be removed before opening the plug connection.



Disconnect the Hirschmann high-voltage connector:

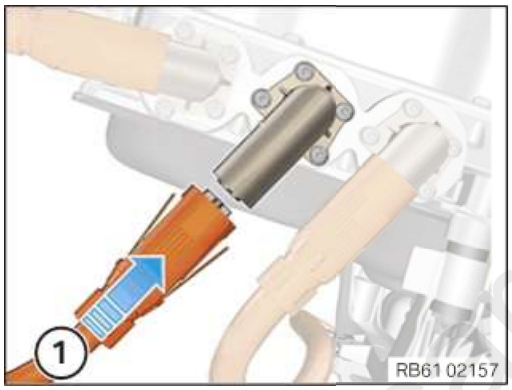
Press the lock (1) on the left and right on the connector in the direction of the arrow.

Pull off connector (2) in direction of arrow.

Attention!

Connector (2) is difficult to pull off.

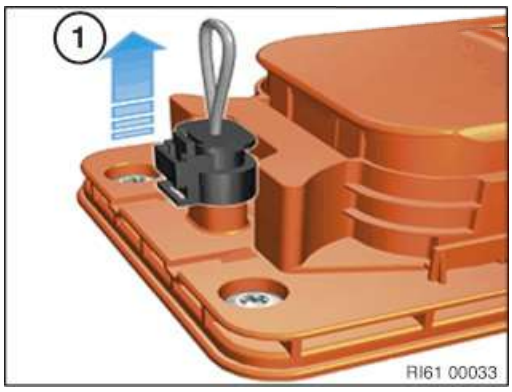
In the event of damage to high-voltage connector (2), the complete high-voltage cable must be replaced!



Connect the Hirschmann high-voltage connectors:

Slide the connector (1) on in the direction of the arrow.

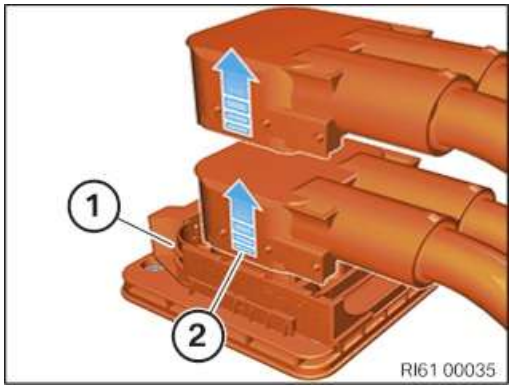
Note:
Connector (2) must lock audibly.



Disconnect the Kostal high-voltage connector:

Unlock and disconnect high-voltage interlock loop (1).

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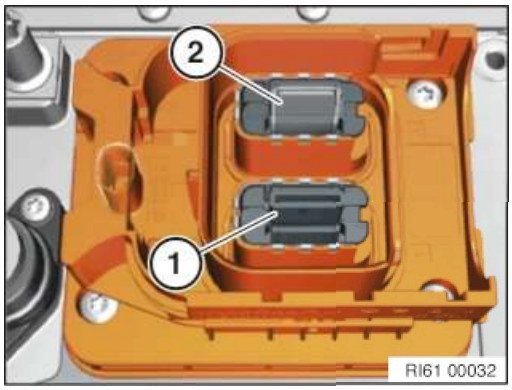
Push the lock (1) fully to the front.

Lift the connector (2) and remove it entirely.

Attention!

Plug connection (3) is difficult to pull off.

The connector (2) must be completely pulled off the opposite housing in one step. Damage may be caused to contact protection if connector is only partly pulled off and then closed again!



Check the Kostal high-voltage connector and connection for damage:

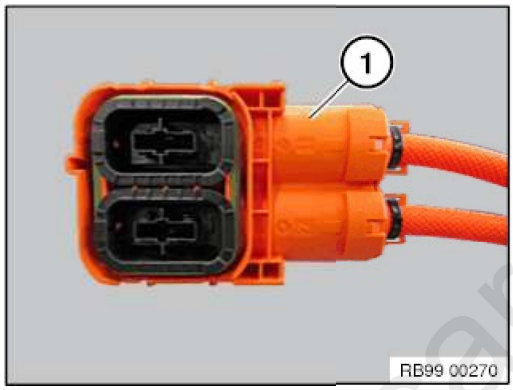
Check the touch protection for damage and correct positioning (1).

Warning!

Do not touch unprotected connector (2)!

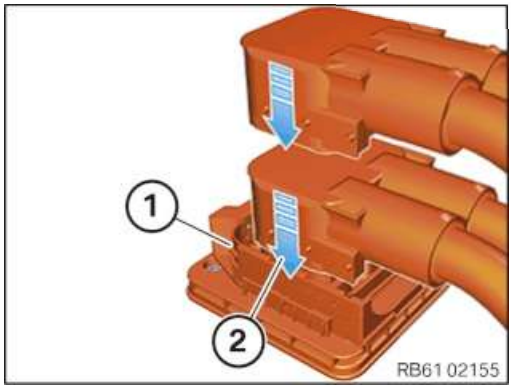
If the contact protection (1) has been pushed to the bottom (2), the high-voltage connector must be refitted.

If contact protection (1) remains in bottom position (2) after reinstallation, the contact protection is faulty and the component must be replaced!



Check the high-voltage connector (1) for damage.**Warning!**

In the event of damage to the high-voltage connector (1), the complete high-voltage cable must be replaced!



Connect the Kostal high-voltage connector:

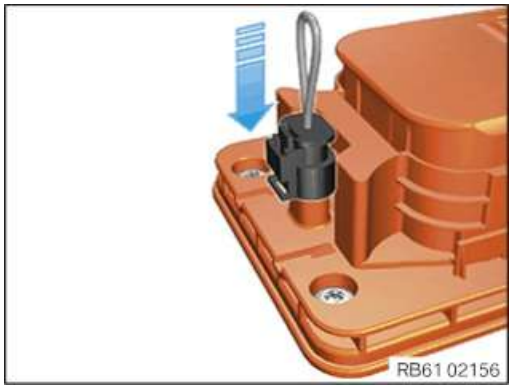
Connect the connector (2) in one single movement to the counter-housing.

Push the lock (1) fully to the rear.

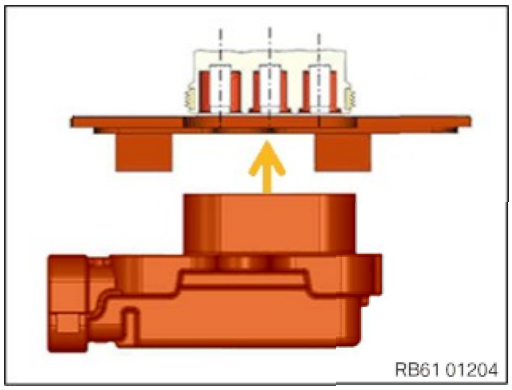
Attention!

Plug connection (3) must be correctly locked by lock (2), otherwise there is a risk of damage.

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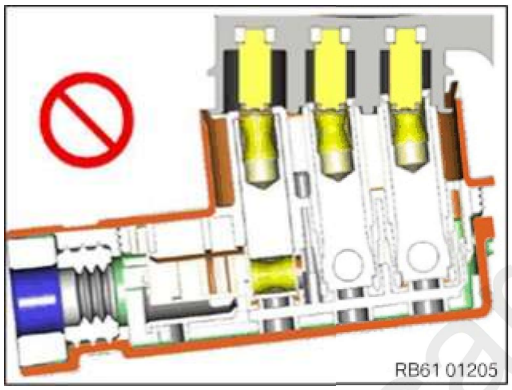


Connect the connector for the high-voltage interlock.



Three-phase high-voltage connector:

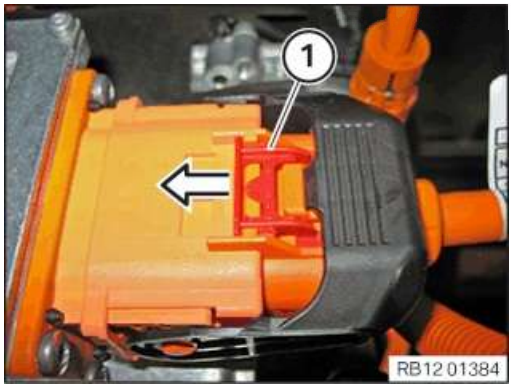
Connect and disconnect the connector straight.



Attention!

The system is designed to only offer limited protection against damage caused by connectors that are inserted at an angle.

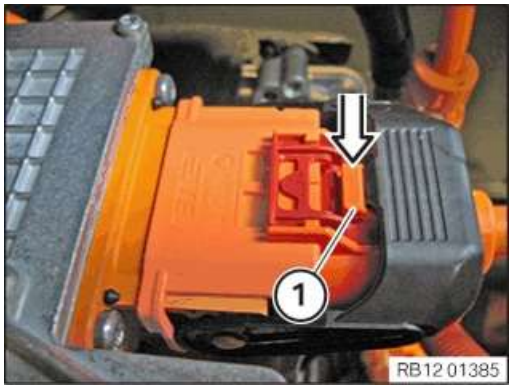
Increased tilted connections will increase the connecting force and the risk of danger.



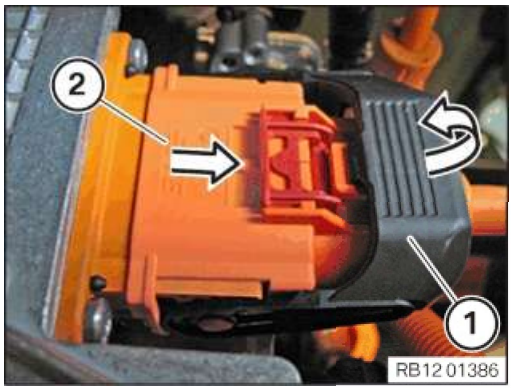
Disconnect the high-voltage connector from the high-voltage connection of the KLE:

Slide lock (1) in direction of arrow up to stop.

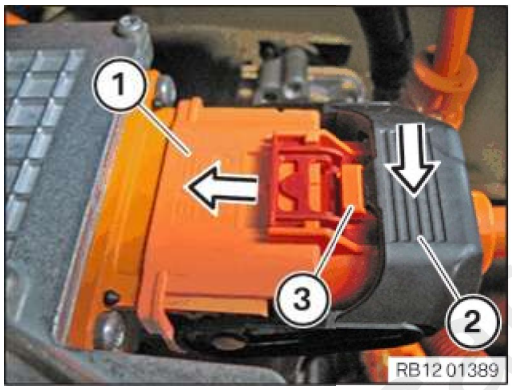
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Press lock (1).



Open the lock (1) completely and disconnect the connector (2).



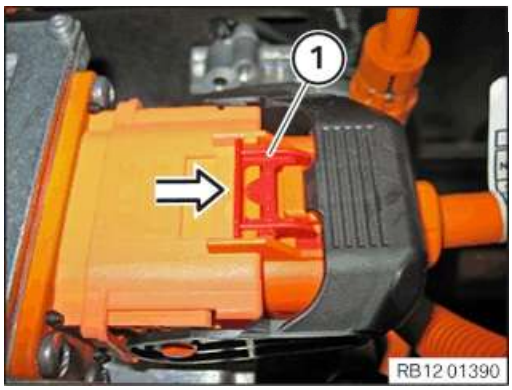
Connect the high-voltage connector to the high-voltage connection of the KLE:

Connect the connector (1) to the limit position and close the lock (2).

Attention!

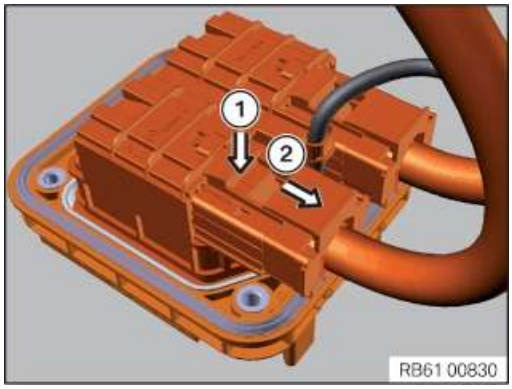
Lock (2) must snap audibly into place.

The retaining lug of the lock (2) must be positioned completely under the lock (2).



Slide the lock (1) on to the stop in the direction of the arrow.

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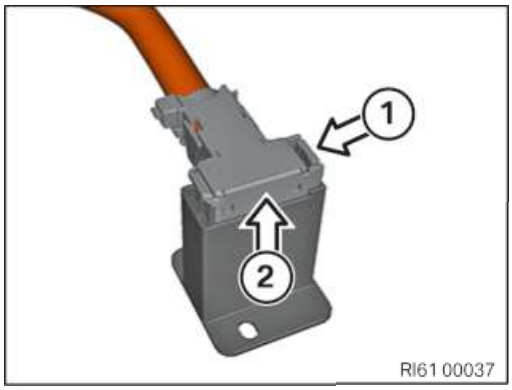
High-voltage connector on the high-voltage connection of the high-voltage battery unit:

Press down unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



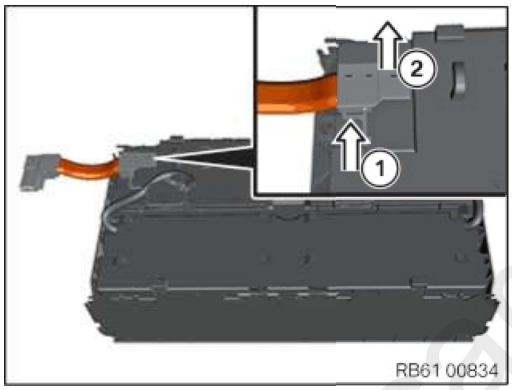
High-voltage connector on the cell module I01:

Press unlocking device (1) together and pull off connector upwards (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



High-voltage connector on the cell module (cell module connecting line):

Press unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.

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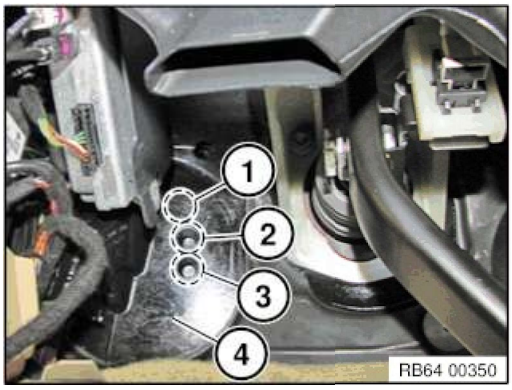
61 11 ... Installing repair cable for left Side View camera

Read and comply with notes on handling wiring harnesses and cables.

Note:
Work is shown on the F30 by way of example. There may be differences in detail in the case of other vehicle types and equipment specifications.

Necessary preliminary work:

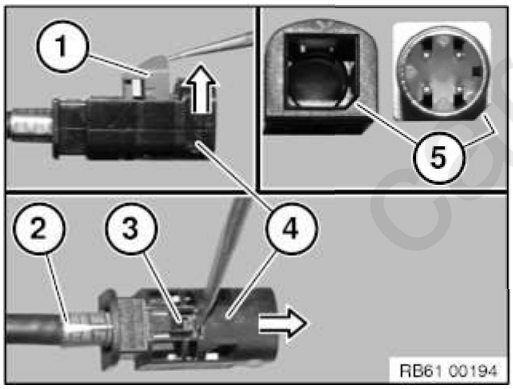
- Remove wheel arch cover front section, front left
- Remove the cover in the left engine compartment
- Remove trim panel for pedal mechanism



Break through the driver's footwell opening (2) in rubber grommet (4) using a suitable tool.

Note:
If the opening (2) is used, use opening (3).

If both openings (2, 3) are used, break through at position (1).



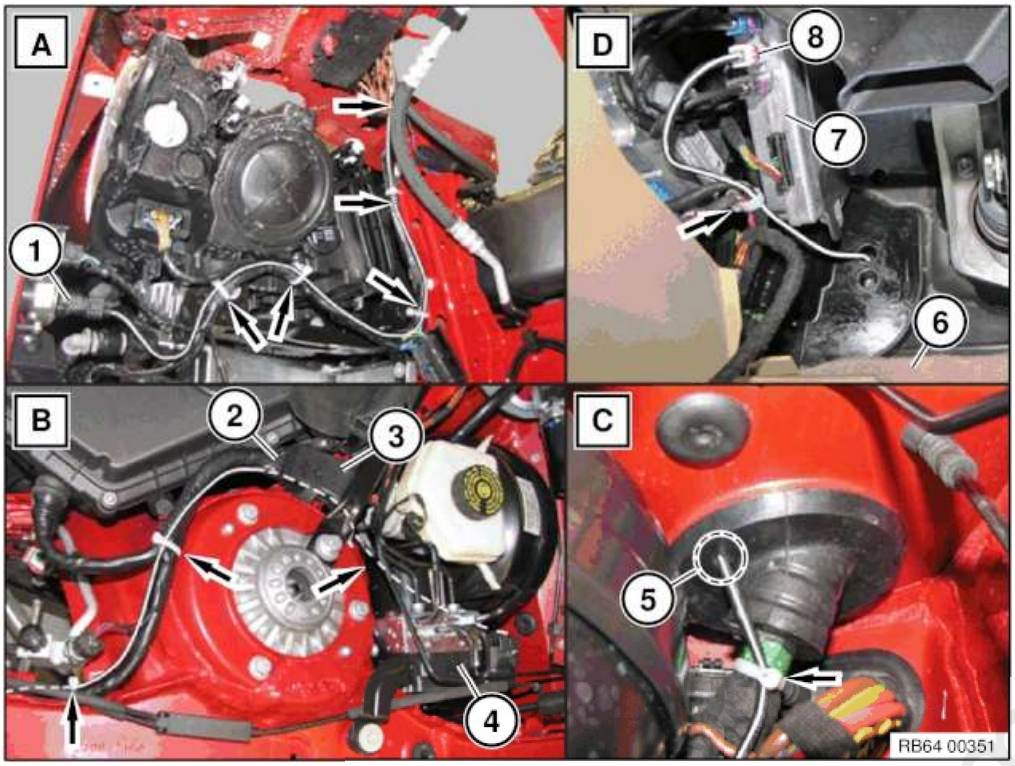
Unlock the lock (1) in direction of arrow with suitable tool.

Important!
Risk of damage!

Unlock the lock (3) carefully with a suitable tool. Pull connector housing (4) of line (2) in direction of arrow.

Installation note:
Pay attention to encoding (5)!

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Connect the repair cable (shown in white) to the Side View camera (1). Leave approx. 10 cm overlength in the area of Side View camera (1) (Figure A).

Route repair cable in direction of arrow along the vehicle wiring harness and attach at locations marked with arrow (Figure A, B, C, D).

Remove adhesive tape in position (2). Feed the repair cable through the cable channel (3) and underneath the DSC hydraulic unit (4) (Figure B).

Feed the repair cable through at point (5) in driver's footwell (Figure C).

Assemble repair cable. Connect repair cable to connector (8) of all-round vision camera control unit (7) (Figure D).

Installation note:
Tape off the point (2) with suitable adhesive tape.

Important!
To prevent moisture from entering the passenger compartment, seal opening (5) on the outside, using suitable means!

Note:
Route any repair cable overlength under the carpet (6).

After successful completion of function check, detach start and end of faulty cable at first mounting point.

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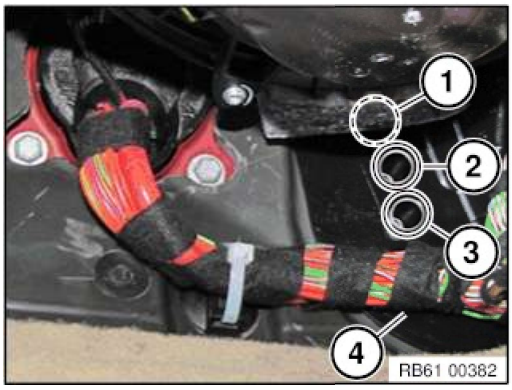
61 11 ... Installing repair cable for right Side View camera

Read and comply with notes on handling wiring harnesses and wiring.

Note:
Work is shown on the F30 by way of example. There may be differences in detail in the case of other vehicle types and equipment specifications.

Necessary preliminary work:

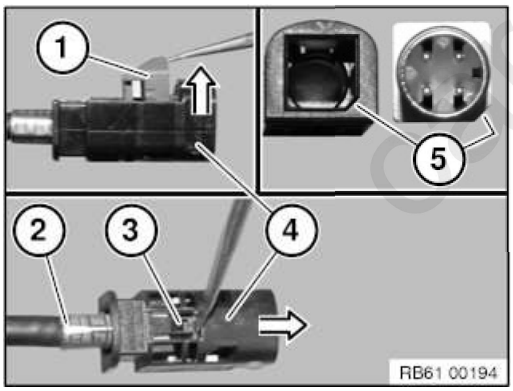
- Remove the front right wheel arch cover front section
- Remove the right cover in the engine compartment
- Remove instrument panel trim, bottom left
- Remove trim panel for pedal assembly



Break through the passenger footwell opening (2) in rubber grommet (4) using a suitable tool.

Note:
If the opening (2) is used, use opening (3).

If both openings (2, 3) are used, break through at position (1).



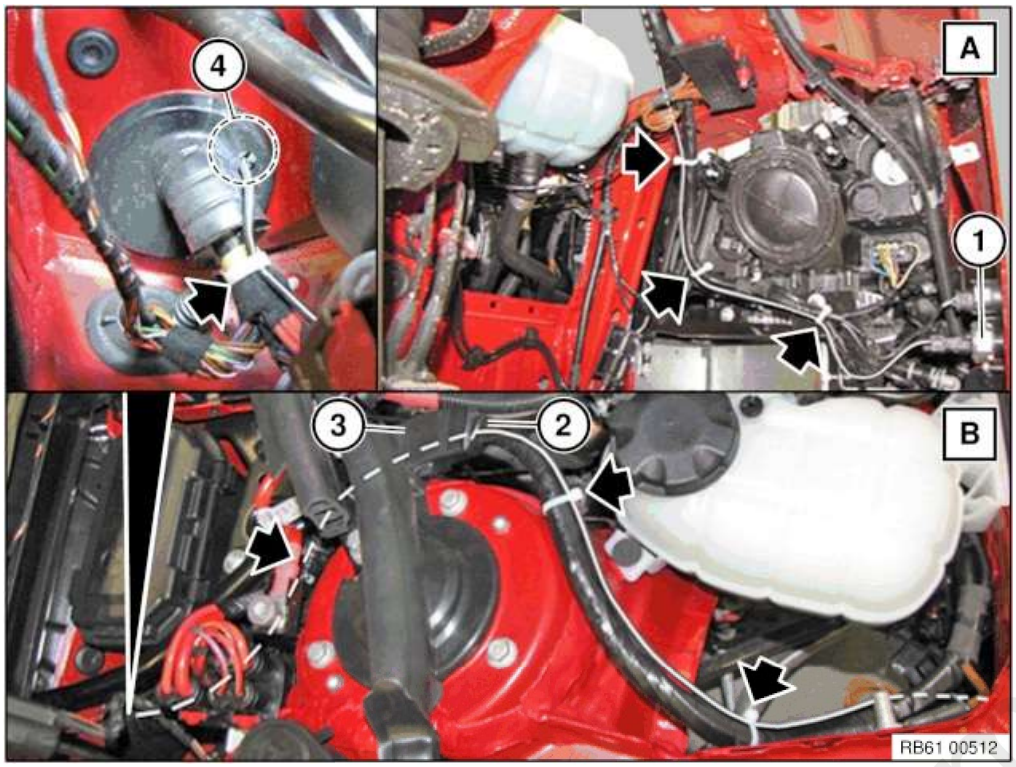
Unlock the lock (1) in direction of arrow with suitable tool.

Important!
Risk of damage!

Unlock the lock (3) carefully with a suitable tool. Pull connector housing (4) of line (2) in direction of arrow.

Installation note:
Pay attention to encoding (5)!

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Connect the repair cable (shown in white) to the Side View camera (1).

Leave approx. 10 cm overlength in the area of Side View camera (1) (Figure A).

Route repair cable in direction of arrow along the vehicle wiring harness and attach at locations marked with arrow (Figure A, B).

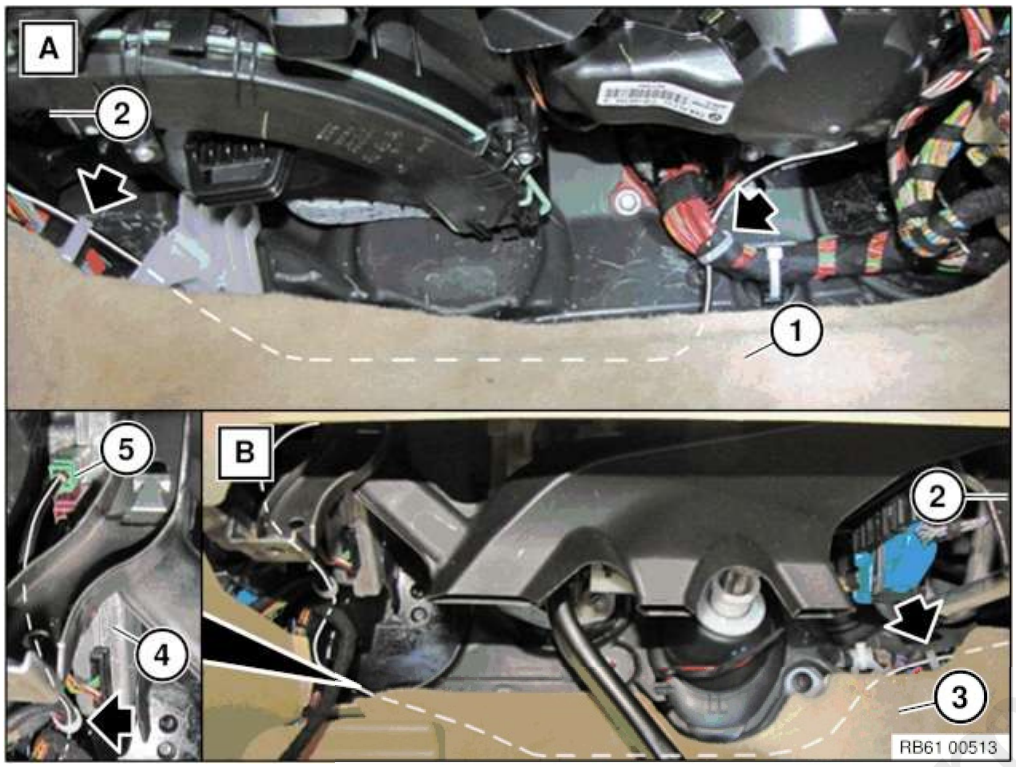
Remove adhesive tape at point (2). Feed through repair cable through cable channel (3) (graphic B).

Feed through repair cable at point (4) in passenger footwell (graphic B).

Installation note:
Tape off the point (2) with suitable adhesive tape.

Important!
To prevent moisture from entering the passenger compartment, seal opening (4) on the outside, using suitable means!

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Route repair cable in passenger footwell (graphic A)/driver's footwell (graphic B) under carpet (1, 3) as illustrated up to TRSCV control unit (4).

Secure repair cable at points marked with an arrow.

Route the repair cable from the passenger footwell under the heating and air-conditioning unit (2) in the driver's footwell (Figure A, B).

Complete the repair cable and connect at slot (5) of the TRSCV control unit (4) (Figure B).

Note:
Route any repair cable overlength under the carpet (3).

After successful completion of function check, detach start and end of faulty cable at first mounting point.

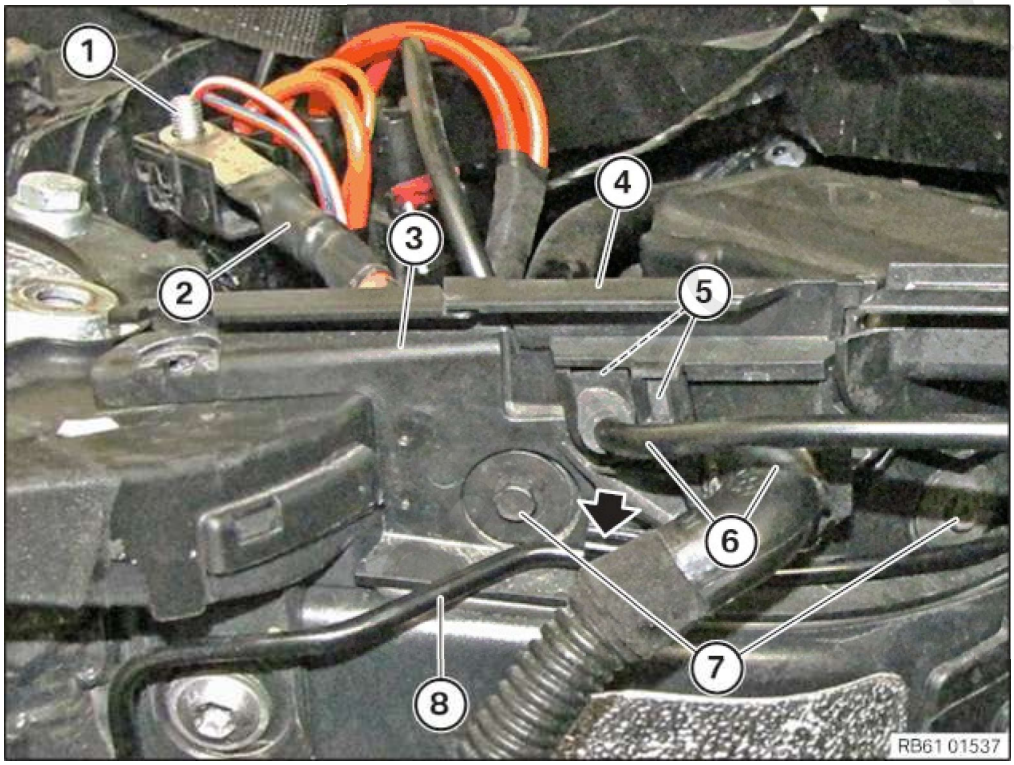
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61 11 ... Installing the EPS repair wiring harness

Note:
The EPS repair wiring harness fits the steering gear manufactured by the ZF and TKP company.

Necessary preliminary work:

- Disconnect negative battery lead
- Remove the sound insulation from the upper bulkhead section
- Remove front underbody protection
- Removing front wheel arch cover (front section), right
- Place the coolant expansion tank to one side:
  - Loosen screws.
  - If necessary unfasten plug connection.
  - Do **not** pull off the coolant connections.



Carefully lift the tabs (5).

Remove the sealing on the upper section of the partition wall (4).

Remove the cable (6) towards the top.

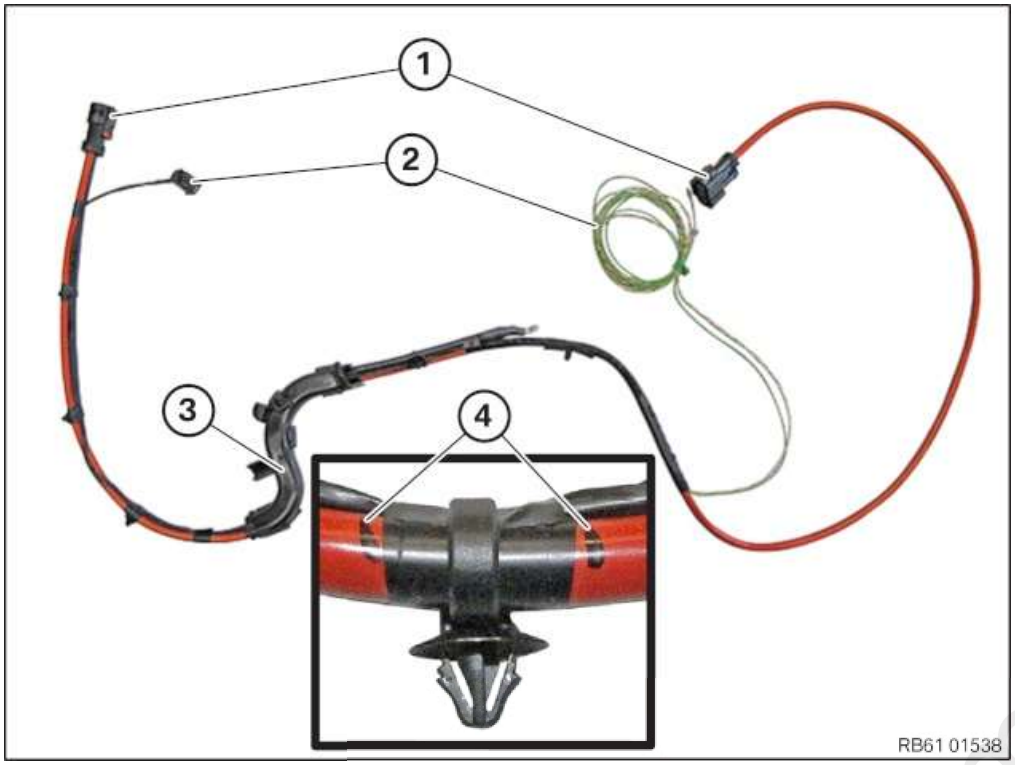
Detach the brake line (8) at the point marked by the arrow.

Release screws (7).

Remove the partition wall sealing (3).

Slacken nut (1).

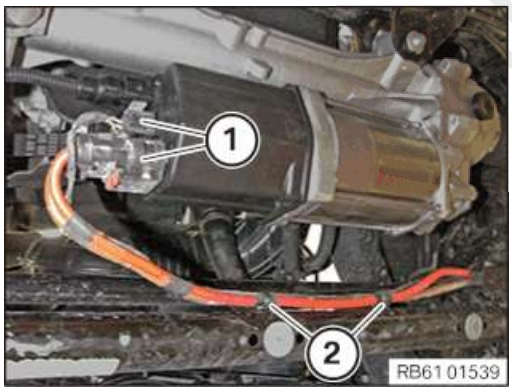
Disconnect positive line (2) and place to one side.



Note:
The line (2) from repair wiring harness (1) will not be required. A line installed in the vehicle will be used.

Removing line (2) from the repair wiring harness (1):

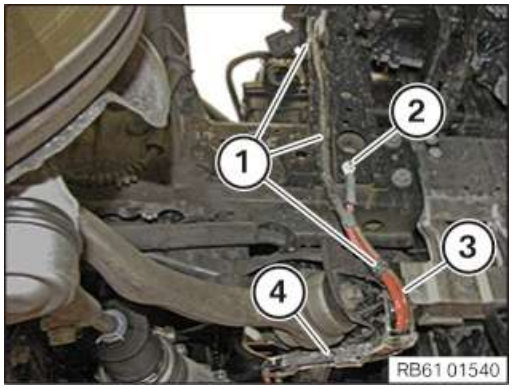
- Mark all the adhesive tape positions as shown (4).
- Remove all cable straps.
- Open cable channel (3).
- Remove all the adhesive tape.
- Remove line (2).



Disconnect plug connection (1).

Release wiring harness retainers (2).

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Release wiring harness retainers (1).

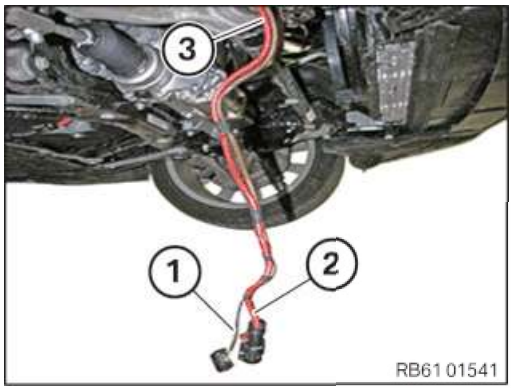
Slacken nut (2).

Remove grounding cable on wiring harness (3) from ground pin.

Release cable channel (4) from front axle support.

Remove cable strap from cable channel (4).

Open cable channel (4) and remove wiring harness (3).



Remove all cable straps in the area shown.

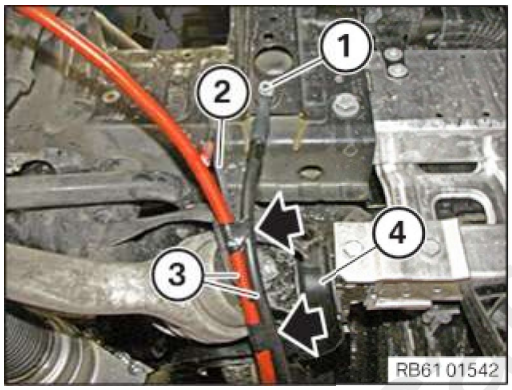
Remove all the adhesive tape in the area shown.

Remove line (1) from wiring harness (2).

Disconnect the positive line from wiring harness (2) at point (3). Do not damage line (1) while doing so.

Remove wiring harness (2) (both **thick** cables).

Wiring harness (2) is no longer needed.



Mount cable channel (4) on front axle support.

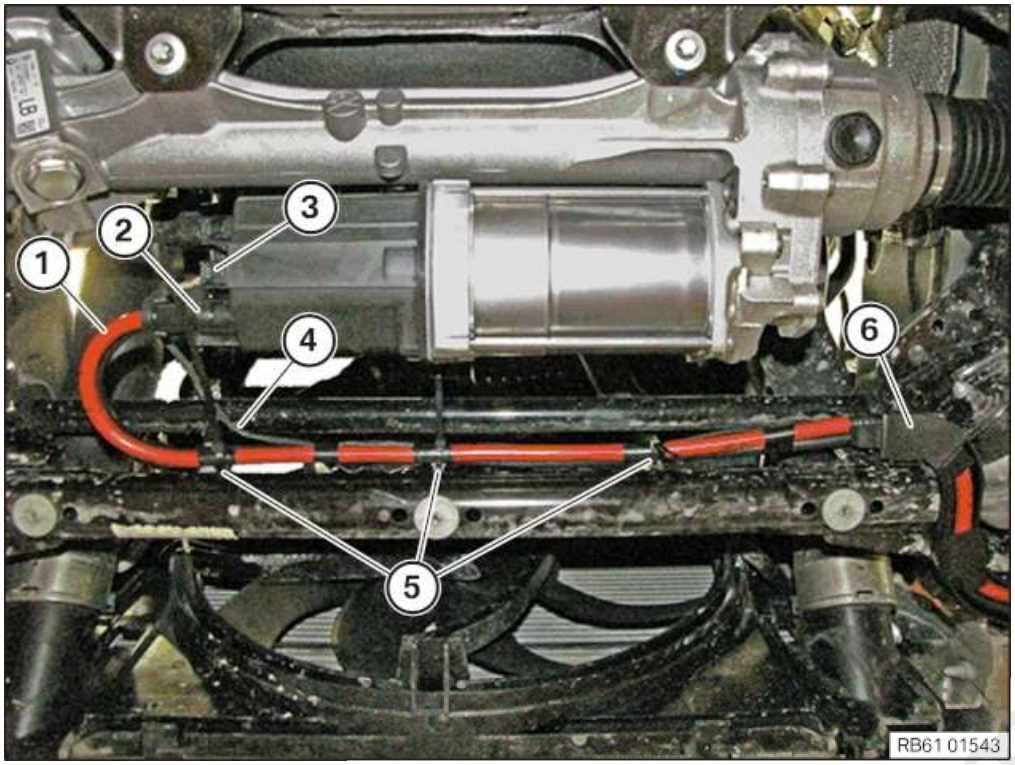
Mount grounding cable from repair wiring harness (3) on ground support point (1).

Tighten nut (1).

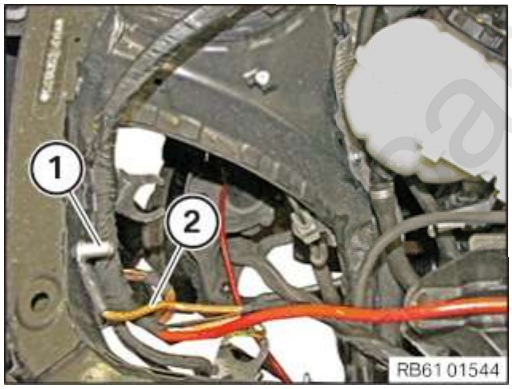
Tightening torque 61 11 1AZ.

Fasten line (2) and repair wiring harness (3) together at the places marked by the arrow using adhesive tape.

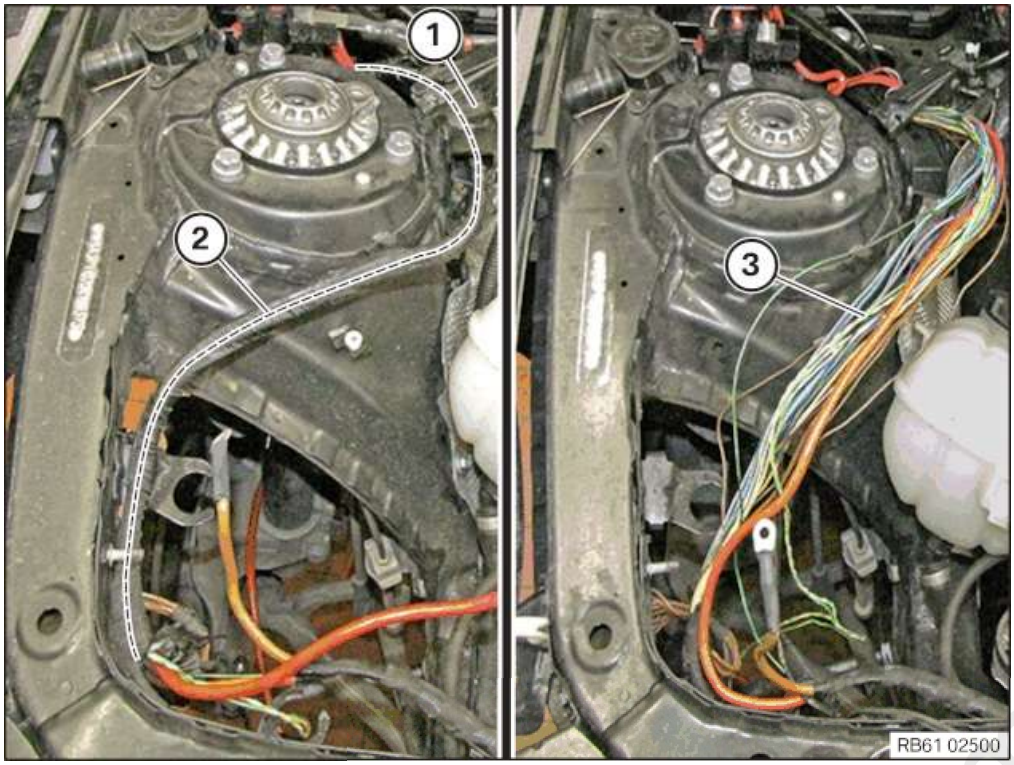
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Connect plug connection (2) of repair wiring harness (1).
Connect plug connection (3) of line (4).
Route repair wiring harness (1) and line (4) as shown.
Fasten line (4) and repair wiring harness (1) together at the places marked as shown, using adhesive tape.
Place repair wiring harness (1) and line (4) in cable channel (6).
Shut cable channel (6).
Position repair wiring harness (1) and line (4) such that the cable straps lie on the adhesive tape.
Fasten repair wiring harness (1) and line (4) at points (5) using cable straps on the front axle support.



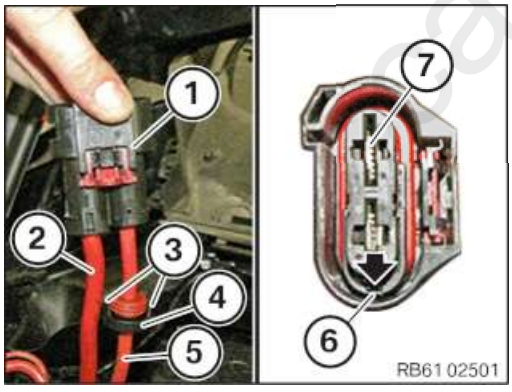
Slacken nut (1).
Remove ground cable (2) and place to one side.



Attention!
Risk of damage!
Do not damage the lines (3) when removing the adhesive tape.

Open cable channel (1).
Remove adhesive tape from wiring harness (2).

Note:
The bonding area is marked by the dotted line.



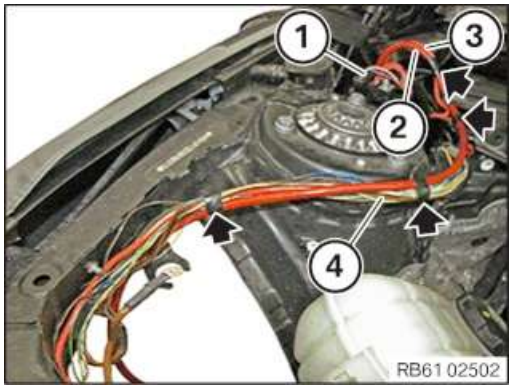
<u>Unpin pin 2 of the positive line (5) from connector (1) that is no longer required:</u>

Lift tabs (3) **carefully**.
Push bach sealing (4).
Open primary locking device (6) in the direction of the arrow.
Unpin pin 2 (7) of the positive line (5) using a suitable tool.
Connector (1) with positive line (2) is no longer required.

<u>Pin positive line (5) in the connector (1) of the repair wiring harness:</u>

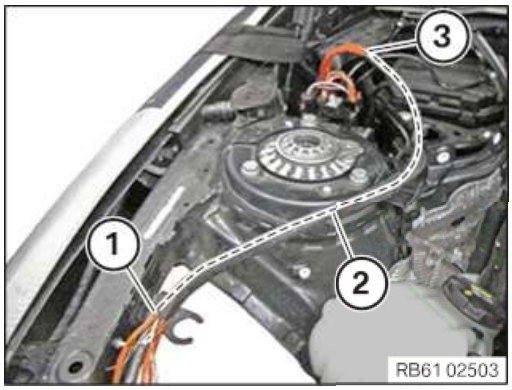
Pin pin 2 (7) of the positive line (5).
Close primary locking device (6) against direction of arrow.
Push sealing (4) upwards and engage correctly on the connector (1).

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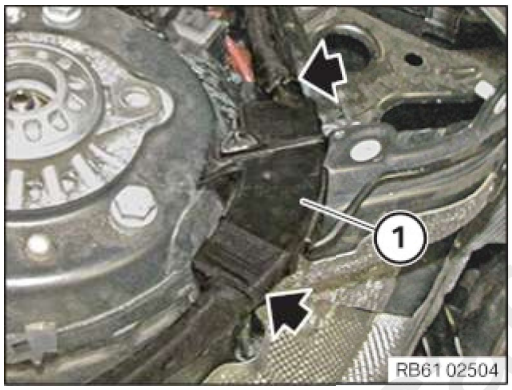
Close connector (1).

Secure repair wiring harness (2), positive line (3) and wiring harness (4) using adhesive tape at the points marked with an arrow as shown in the figure.



Wrap all the wiring harnesses (2) mentioned in the last operation **beginning with (1) and ending with (3)** with adhesive tape.

Note:
The bonding area is marked by the dotted line.

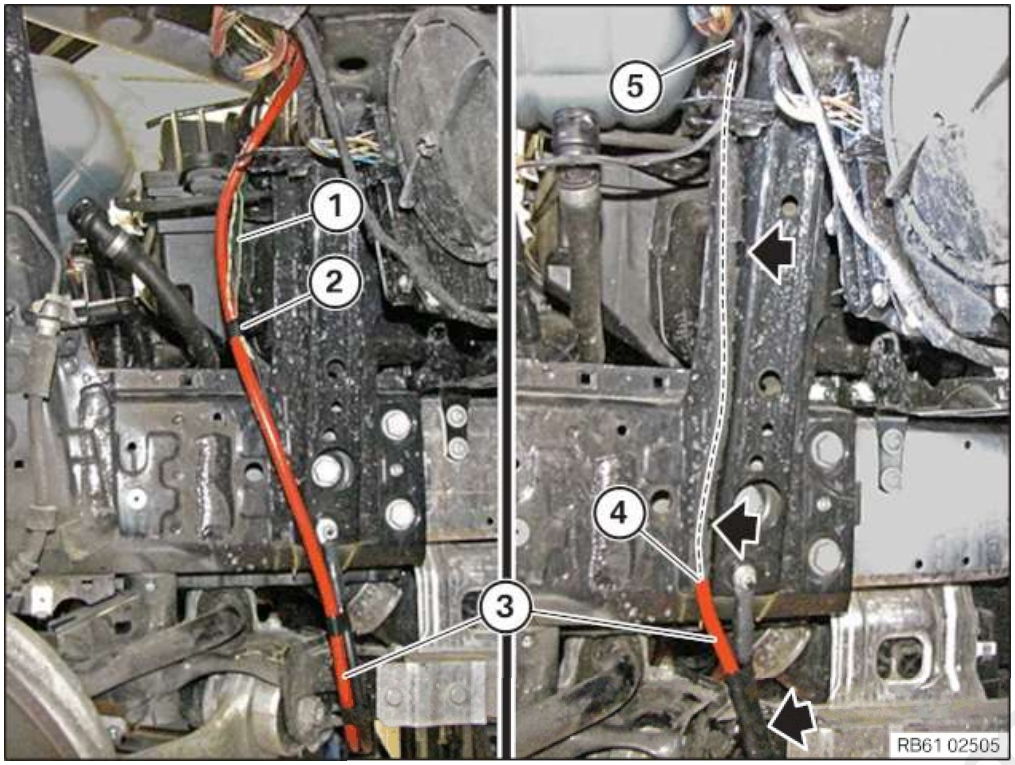


Close cable channel (1).

Secure cable channel (1) at the points marked with an arrow using cable straps.

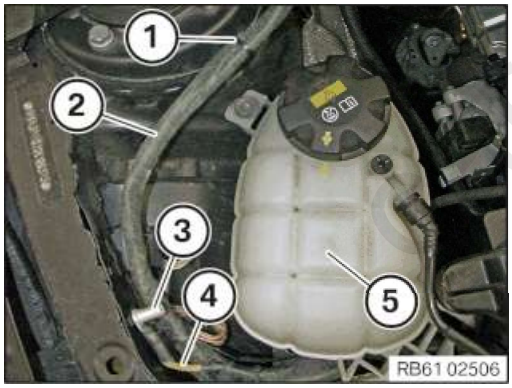
Wrap cable channel (1) with adhesive tape as shown.

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Secure repair wiring harness (3) and line (1) at point (2) with adhesive tape.
Wrap repair wiring harness (3) and line (1) **beginning with (4) and ending with (5)** with adhesive tape.
Wrap mounting elements for wiring harness (3) at the points marked with an arrow, as well.
Secure wiring harness (3) at the points marked with an arrow.

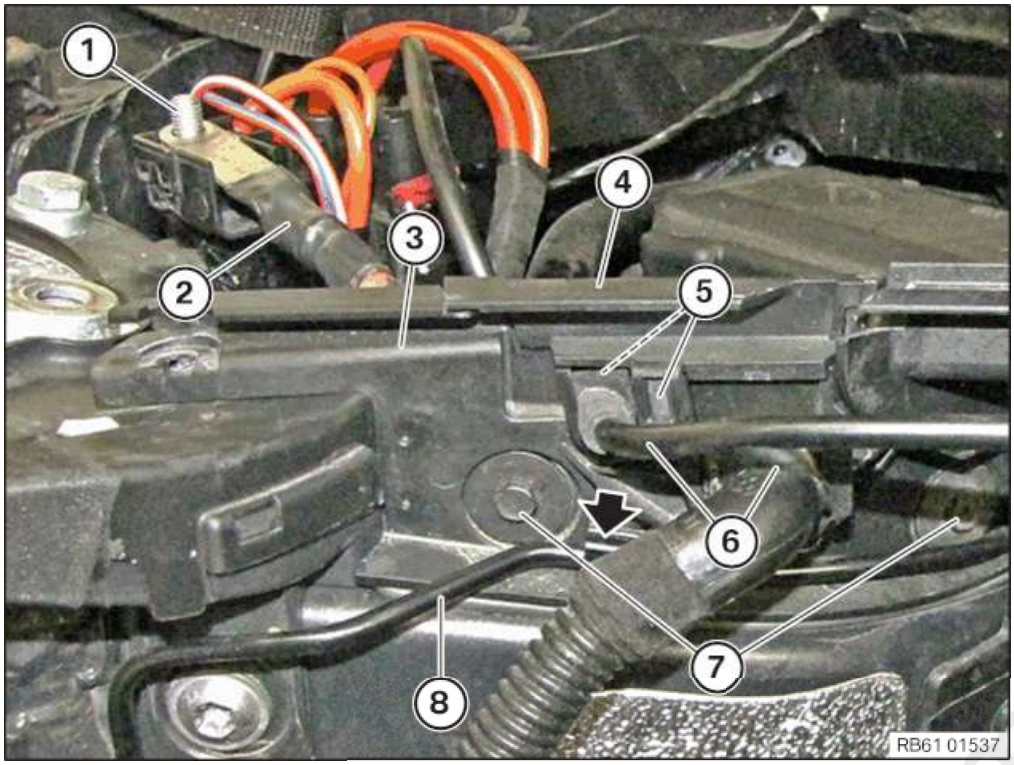
Note:
The bonding area is marked by the dotted line.



Secure wiring harness (2) with a cable strap at point (1).
Fasten grounding cable (4) using the nut (3).
Tightening torque 61 11 1AZ.

Note:
The figure of coolant expansion tank (5) can vary depending on the vehicle and the engine.

Fasten the coolant expansion tank (5).
Close plug connection, if necessary.



Position positive line (2) and fasten with nut (1).
Tightening torque 61 11 2AZ.
Install partition wall sealing (3) and fasten with screws (7).
Tightening torque 61 11 3AZ.
Attach the brake line (8) at the point marked by the arrow.
Install wiring harnesses (6).
Fit upper section of partition wall sealing (4) until tabs (5) engage correctly.

Add final details to vehicle:

- Install centre bulkhead upper part sound insulation
- Connect battery earth lead
- Install front underbody protection
- Installing front wheel arch cover (front section), right

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61 00 ... Notes on handling wiring harnesses and cables

The following applies in general:

To avoid damage, observe the following instructions:

- Avoid compressive and tensile loads
- To ensure professional repairs, perform repair work only with BMW-approved or recommended special tools and spare parts
- Make sure cables are laid without kinks or abrasions
- Ensure non-contacting routing at sharp-edged body parts; use edge protection if necessary
- Secure additionally laid cables/leads with cable ties

The following additionally applies:

Shielded lines

Interference radiation and interference resistance can lead to neutral zones at contact points in the shielding. Consequently, distinctions have to be drawn between the following types:

Coaxial lines

- Shielded coaxial cables RTK031 may only be repaired with a special crimping tool.
- For aerial lines only the bushing contact may be repaired.
- RG174 Lines and the bushing contact may not be repaired.

CVBS lines

- CVBS cables may not be repaired.
- CVBS cables must be replaced in their entirety.

HSD lines

- HSD cables may not be repaired.
- HSD cables must be replaced in their entirety.

Optical fibre cable:

Note:
Fibre-optic cables are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibres
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibres
- Orange=repair fibre-optic cables

Attention!

- Optical fibres are permitted to show only one junction point (bridge). Replace optical fibres if necessary
- Smallest permissible bending radius is 25 mm
- Avoid effects of heat ≥ 85 °

Treating cables and fibre-optic cables

FlexRay (twisted cables):

It is possible to repair the FlexRay. In the event of damage, the cables can be joined with conventional butt connectors and heat-shrink tubing.

Note:

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- FlexRay lines may only reveal one separation point (bride); renew complete line if necessary.
- If possible, maintain twisted cable after repair.
- After repairs, twist cables as close as possible to the connector/separation point.
- Twisting must be as symmetrical as possible.

Airbag lines:

Repairing airbag cables

Ribbon cables:

Repairing ribbon cables

Replacing wiring harnesses

Repair wiring harnesses mainly cover the full equipment of the vehicle. If certain optional equipment is not installed in the vehicle, note the following:

- If necessary, secure the remaining connectors.
- If necessary, seal the remaining connectors outside the vehicle interior, for example, with butyl tape in such a way that moisture ingress can be eliminated permanently.
- If necessary, repin the connector of the repair wiring harness.

Note:
Repair wiring harnesses can be equipped with an **additional socket housing** (30-pin, for example), **which was not provided on the previous vehicle-side wiring harness**. This socket housing also cannot be found in the wiring diagram.

Procedure

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **in the vehicle interior** (in the footwell, for example):

- Cut the additional socket housing and connect the lines to the vehicle-side wiring harness using a butt connector.
- Alternatively, a suitable pin housing can be fitted on the vehicle-side wiring harness and connected to the additional socket housing.

  However, this is permitted only if the following conditions are met:
  - Carpets must not protrude visibly or become deformed due to the installation of the additional plug connection.
  - It must be possible to install the adjacent components (for example, trims, trim panels, etc.) correctly after installing the additional plug connection.
  - All the attachment points of the adjacent components (for example, trims, trim panels, etc.) must engage correctly.
  - There must be no rattling noise due to the installation of the additional plug connection.
  - The additional plug connection must not damage the adjacent components/wiring harnesses, etc..

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **outside the vehicle interior** (in the wheel arch, for example):

- Cut the additional socket housing and connect the lines to the vehicle-

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side wiring harness using a butt connector.

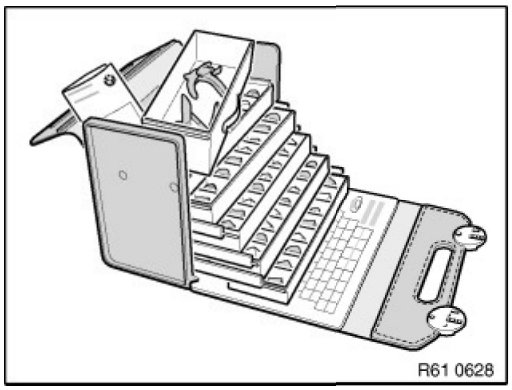
- **Using the additional socket housing is not permitted with a separation point outside the vehicle interior.**

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61 13 ... Special tools for wiring harness repairs

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100
- 61 4 320
- 61 0 200
- 61 0 210
- 61 0 220
- 61 0 230
- 61 0 240



Repair range, vehicle electrical system:

Single parts for wiring harness repairs*

* Sourcing reference: BMW Parts Department

Note:

- Refer to Service Information:
  SI 2 04 07 341

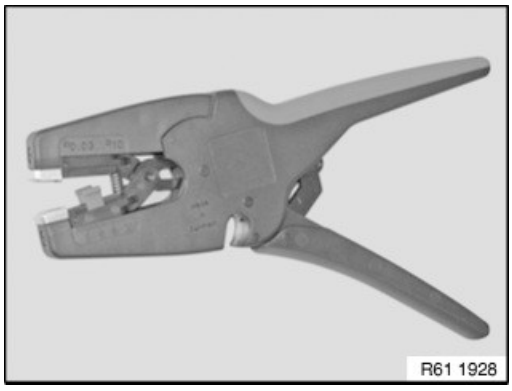


Release and press-out tool:

- Special tool61 0 300
- Special tool 61 0 400 (MINI N12/N14)
- Special tool 61 1 100 (engine)

Handling:

- Notes for opening contacts and locks of different connector contact systems



Cutting to length and stripping insulation from cables:

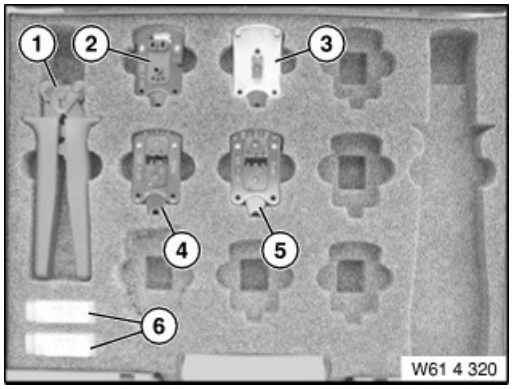
Wire stripper MultiStrip10*

*Sourcing reference BMW Workshop Equipment Catalogue

Handling:

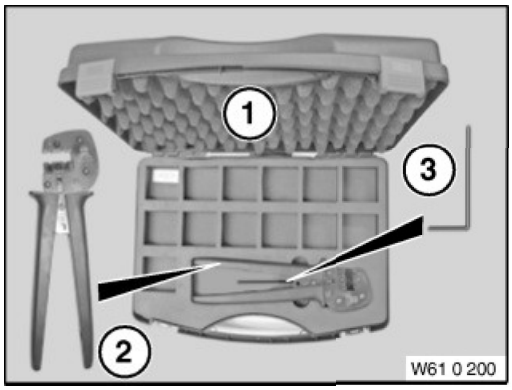
- Cutting cables to length and strip insulation

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Crimping stop parts (small contacts) and butt connectors:

- Special tool61 4 320
  1. Tool without crimping head
  2. Crimping head (stripping insulation and cutting fibre-optic cables to length)
  3. Crimping head (crimping fibre-optic cable contacts)
  4. Crimping head (crimping MQS contacts)
  5. Crimping head (crimping MPQ contacts)
  6. Replacement blade (face-cutting fibre-optic cables)
  7. Replacement blade with tool (insulation stripping unit)
  8. Universal crimping head (SI 2 04 06 293)



Crimping stop parts (large contacts) and butt connectors:

- Special tool 61 0 200 (crimping set)
- Special tool 61 0 210 (matrix set SLK 8)
- Special tool 61 0 220 (matrix set SLK 2.8)
- Special tool 61 0 230 (matrix set MAK 8 / DFK4)
- Special tool 61 0 240 (butt connector 4.0 - 6.0 mm²)

Handling:

- Refer to Service Information:
  SI 2 02 05 194
  SI 2 07 05 233

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61 12 ... Information on intelligent battery sensor (IBS)

Notice! Do not connect the charger to the 12 V charging socket

The 12 V charging socket is supplied with voltage by the rear power distribution box via relay. This relay drops out after terminal 15 OFF. This means that a trickle charger connected at the 12 V charging socket will be disconnected from the battery. Only charge the battery via the jump start terminal point. Only then can the voltage supply be registered by the vehicle.

Warning! Danger of destruction in event of mechanical strain

- Do not introduce any additional connections at the battery negative terminal.
- Do not modify the grounding cable. The ground cable also serves heat dissipation.
- Do not establish any connection between the IBS and the sensor screw.
- Do not use force when disconnecting the pole shoe from the battery terminal:
  - Do not pull on the ground cable.
  - Do not place any tools under the IBS to lever off the pole shoe.
- Do not use IBS connections as levers.
- Use a torque wrench and set tightening torque in accordance with repair instructions.
- Do not release or tighten down sensor screw (Torx screw).
- Avoid contact between IBS and ground.

Warning! Danger of destruction to IBS and wiring upon battery replacement

- The IBS and wiring can be destroyed by mechanical strain upon battery replacement. Therefore avoid mechanical strain.
- The size (capacity) of the battery required for the car is coded in the Car Access System (CAS).
- Use the battery size (capacity) installed as standard upon battery replacement.
- Recode the Car Access System (CAS) when installing a battery with a different capacity.
- Register battery replacement via Service functions in diagnosis system.
- Delete fault code entries in the Digital Engine Electronics (DME) associated with battery replacement.
- Always proceed in accordance with the repair instructions.

Note: Battery draining possible in spite of the intelligent battery sensor IBS being fault-free.

- A battery can be drained (e.g. with lights or radio switched on) even when the IBS functions perfectly in conjunction with power management.
- **For this reason, only exchange the IBS when there is a corresponding fault code entry!**

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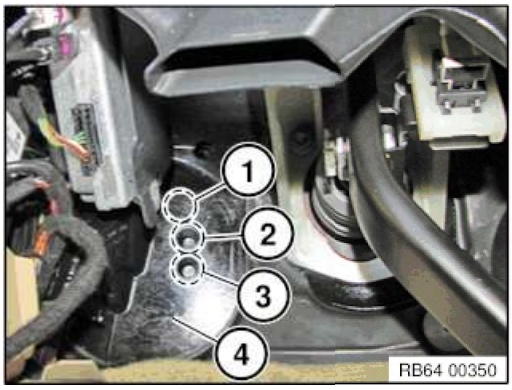
61 11 ... Installing repair cable for left Side View camera

Read and comply with notes on handling wiring harnesses and cables.

Note:
Work is shown on the F30 by way of example. There may be differences in detail in the case of other vehicle types and equipment specifications.

Necessary preliminary work:

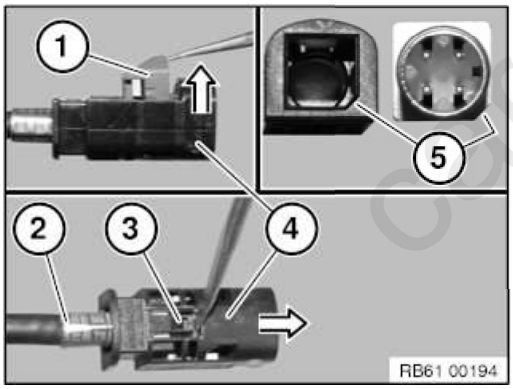
- Remove wheel arch cover front section, front left
- Remove the cover in the left engine compartment
- Remove trim panel for pedal mechanism



Break through the driver's footwell opening (2) in rubber grommet (4) using a suitable tool.

Note:
If the opening (2) is used, use opening (3).

If both openings (2, 3) are used, break through at position (1).



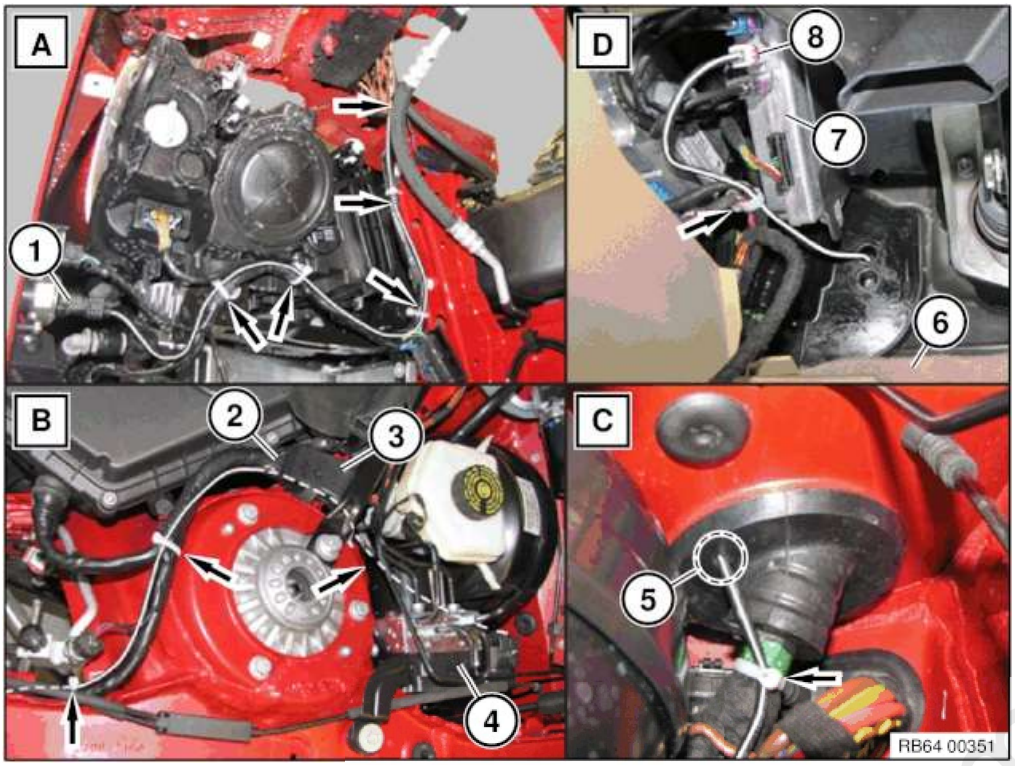
Unlock the lock (1) in direction of arrow with suitable tool.

Important!
Risk of damage!

Unlock the lock (3) carefully with a suitable tool. Pull connector housing (4) of line (2) in direction of arrow.

Installation note:
Pay attention to encoding (5)!

obdiagn.com



Connect the repair cable (shown in white) to the Side View camera (1). Leave approx. 10 cm overlength in the area of Side View camera (1) (Figure A).

Route repair cable in direction of arrow along the vehicle wiring harness and attach at locations marked with arrow (Figure A, B, C, D).

Remove adhesive tape in position (2). Feed the repair cable through the cable channel (3) and underneath the DSC hydraulic unit (4) (Figure B).

Feed the repair cable through at point (5) in driver's footwell (Figure C).

Assemble repair cable. Connect repair cable to connector (8) of all-round vision camera control unit (7) (Figure D).

Installation note:
Tape off the point (2) with suitable adhesive tape.

Important!
To prevent moisture from entering the passenger compartment, seal opening (5) on the outside, using suitable means!

Note:
Route any repair cable overlength under the carpet (6).

After successful completion of function check, detach start and end of faulty cable at first mounting point.

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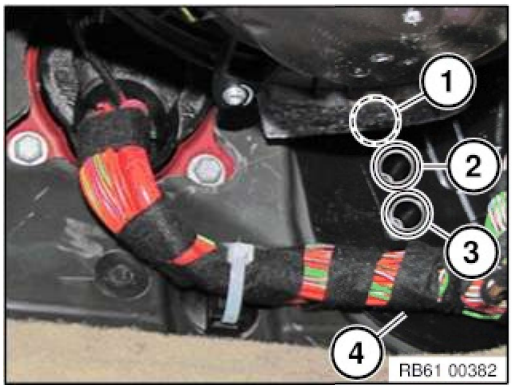
61 11 ... Installing repair cable for right Side View camera

Read and comply with notes on handling wiring harnesses and wiring.

Note:
Work is shown on the F30 by way of example. There may be differences in detail in the case of other vehicle types and equipment specifications.

Necessary preliminary work:

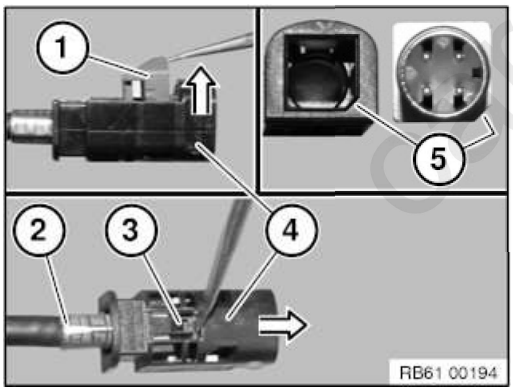
- Remove the front right wheel arch cover front section
- Remove the right cover in the engine compartment
- Remove instrument panel trim, bottom left
- Remove trim panel for pedal assembly



Break through the passenger footwell opening (2) in rubber grommet (4) using a suitable tool.

Note:
If the opening (2) is used, use opening (3).

If both openings (2, 3) are used, break through at position (1).



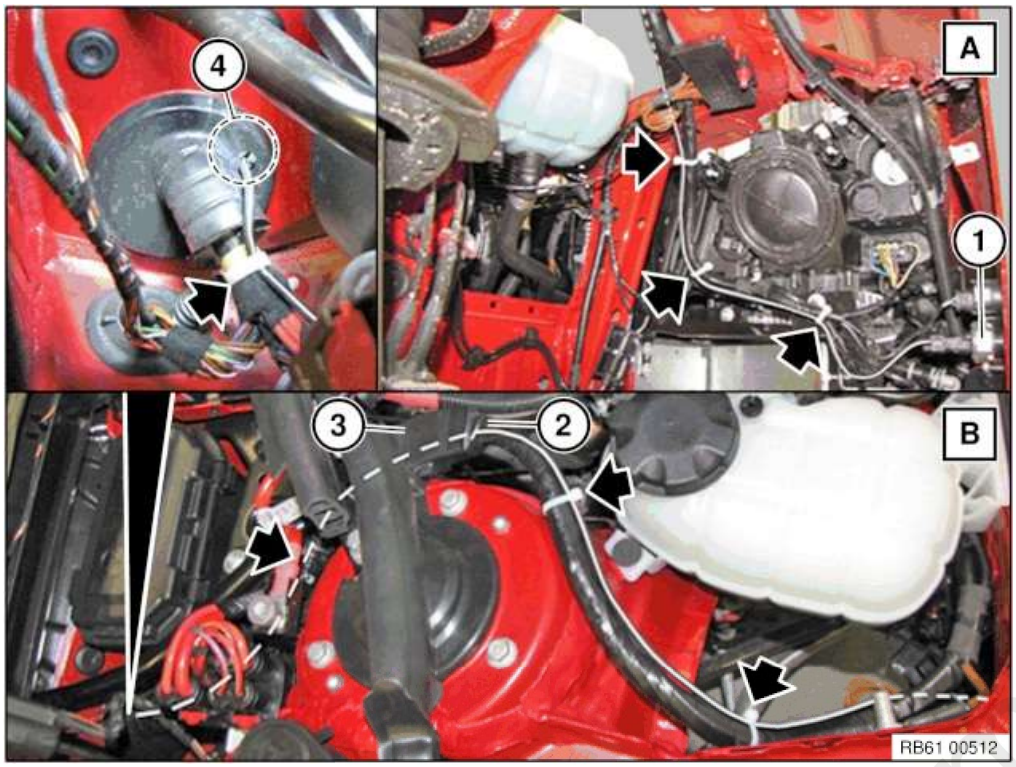
Unlock the lock (1) in direction of arrow with suitable tool.

Important!
Risk of damage!

Unlock the lock (3) carefully with a suitable tool. Pull connector housing (4) of line (2) in direction of arrow.

Installation note:
Pay attention to encoding (5)!

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Connect the repair cable (shown in white) to the Side View camera (1).

Leave approx. 10 cm overlength in the area of Side View camera (1) (Figure A).

Route repair cable in direction of arrow along the vehicle wiring harness and attach at locations marked with arrow (Figure A, B).

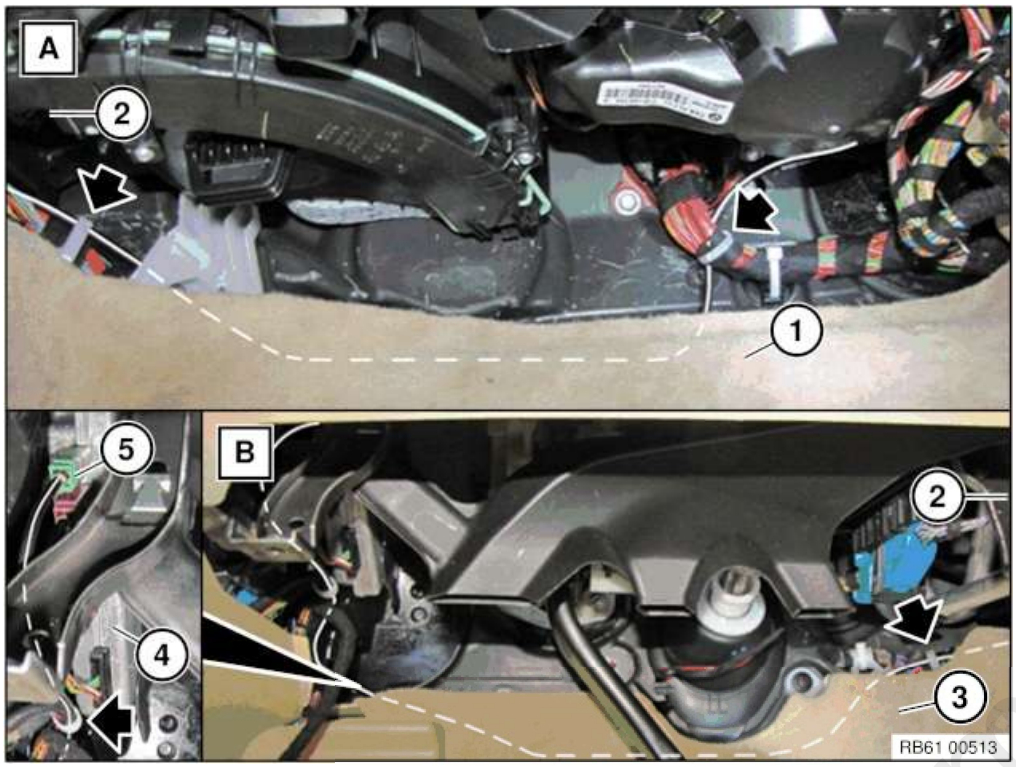
Remove adhesive tape at point (2). Feed through repair cable through cable channel (3) (graphic B).

Feed through repair cable at point (4) in passenger footwell (graphic B).

Installation note:
Tape off the point (2) with suitable adhesive tape.

Important!
To prevent moisture from entering the passenger compartment, seal opening (4) on the outside, using suitable means!

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Route repair cable in passenger footwell (graphic A)/driver's footwell (graphic B) under carpet (1, 3) as illustrated up to TRSCV control unit (4).

Secure repair cable at points marked with an arrow.

Route the repair cable from the passenger footwell under the heating and air-conditioning unit (2) in the driver's footwell (Figure A, B).

Complete the repair cable and connect at slot (5) of the TRSCV control unit (4) (Figure B).

Note:
Route any repair cable overlength under the carpet (3).

After successful completion of function check, detach start and end of faulty cable at first mounting point.

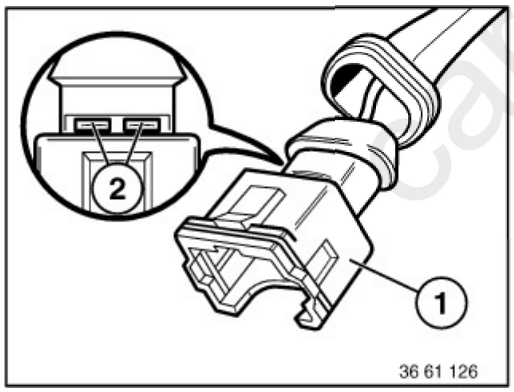
cardiagn.com

61 13 ... Notes for opening contacts and locks of different plug contact systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
LSK	Load current contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded connectors (1).

Ultrasonically welded connectors (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool sets:

- Unlocking and pressing-off tool 61 1 150

  is replaced as of 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and pressing-off tool 61 1 100 (engine)

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Repair instructions for opening connector housings and removing contacts of different connector systems:

Connector system D 1.5/D 2.5:

- Circular connectors, 7- or 8-pin, system D 2.5
- Circular connectors, 13-pin, system D 2.5
- Circular connectors, 20-pin, system D 2.5
- Circular connectors, 4-, 7-, 10-, 12- or 25-pin, system D 1.5/D 2.5
- In-line connectors, 15-pin, system D 2.5
- In-line connectors, 8-, 12-pin, system D 2.5
- In-line connectors, 30-pin, system D 2.5
- In-line connectors, 20-pin, system D 2.5

Connector system JPT/MDK/DFK:

- In-line connectors, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3 plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Connector system Elo/Elo Power:

- Inline plugs, 4-, 10-pin, System Elo
- In-line connectors, 6- to 50-pin, System Elo
- Inline plugs, 3-, 6-pin, System Elo-Power 2.8

Connector system LSK:

- Connector housing LSK contact

Connector system MQS/MPQ:

- Inline connectors, 6-, 8-pin, System MQS
- Inline plugs, 2-pin, System MPQ 2.8
- Control unit connectors, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo Power
- In-line connectors, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio connector), Hybrid System MQS/MPQ

For connector contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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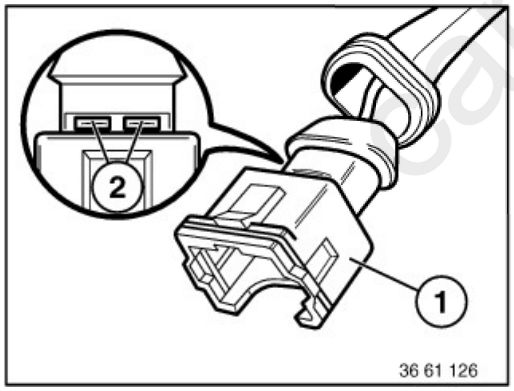
cardiagn.com

61 13 ... Opening plug housings and removing contacts of different plug systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100
- 61 1 150

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded plugs (1).

Ultrasonically welded plugs (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool kits:

- Release and press-out tool 61 1 150
  is replaced from 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and press-out tool 61 1 100 (engine)

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Repair instructions for opening plug housings and removing contacts of different plug systems:

Plug system D 1.5/D 2.5:

- Circular plugs, 7-, 8-pin, System D 2.5
- Circular plugs, 13-pin, System D 2.5
- Circular plugs, 20-pin, System D 2.5
- Circular plugs, 4-, 7-, 10-, 12-, 25-pin, System D 1.5/D 2.5
- In-line plugs, 15-pin, System D 2.5
- In-line plugs, 8-, 12-pin, System D 2.5
- In-line plugs, 30-pin, System D 2.5
- In-line plugs, 20-pin, System D 2.5

Plug system JPT/MDK/DFK:

- In-line plugs, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Plug system Elo/Elo-Power:

- In-line plugs, 4-, 10-pin, System Elo
- In-line plugs, 6- to 50-pin, System Elo
- In-line plugs, 3-, 6-pin, System Elo-Power 2.8

Plug system MQS/MPQ:

- In-line plugs, 6-, 8-pin, System MQS
- In-line plugs, 2-pin, System MPQ 2.8
- Control unit plugs, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo-Power
- In-line plugs, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio plug), Hybrid System MQS/MPQ

For plug contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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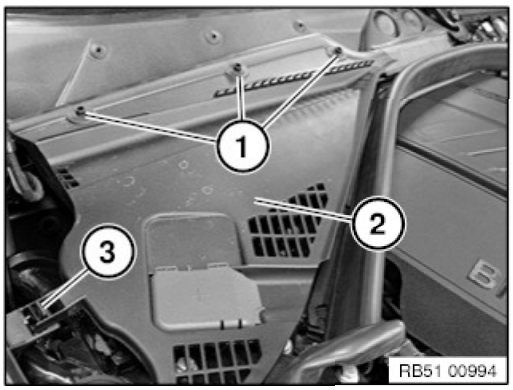
61 12 ... Removing and installing / replacing positive battery cable at partition seal (engine compartment)

Warning!

Observe safety informations for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

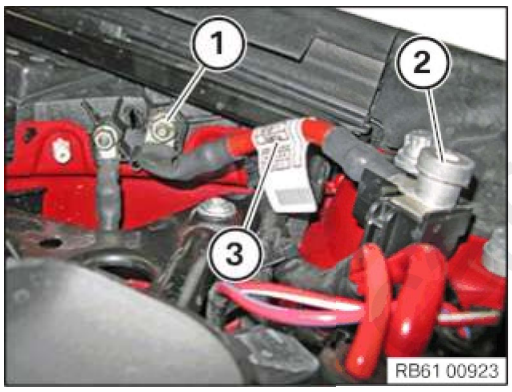


Note:
Graphics shown on the F20 by way of example, deviations in detail are possible in other models.

Turn locks (1) 90° counterclockwise.

Unlock catch (3).

Remove cover (2).



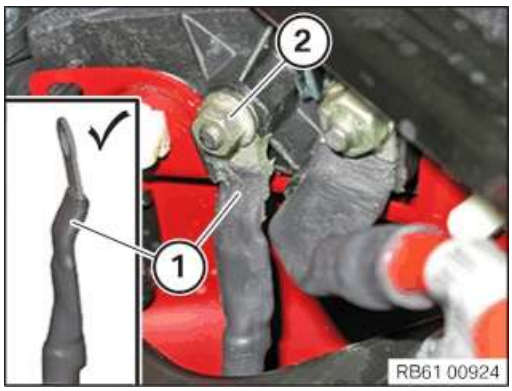
Slacken nut (1).

Tightening torque 61 21 4AZ.

Slacken nut (2).

Tightening torque 61 21 4AZ.

Remove positive battery cable (3).



Check that the positive battery cable subsurface (1) is correctly positioned.

Positive battery cable subsurface (1) must face away from partition seal as shown.

In case of incorrect installation position:

Release nut (2) and correct installation position of positive battery cable subsurface (1).

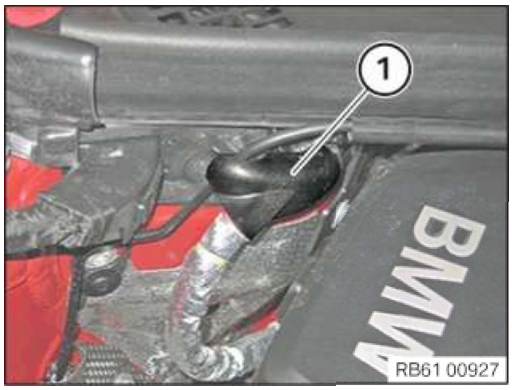
Tightening torque 61 21 7AZ.



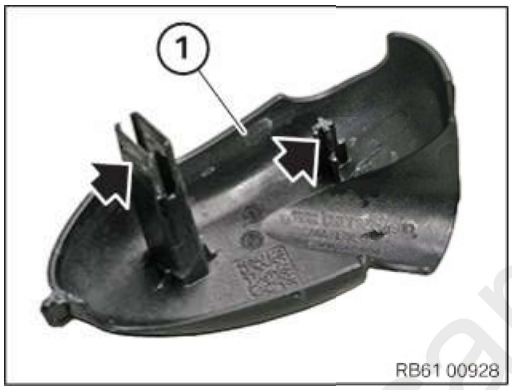
Installation note:
Coat positive battery cables (1) at partition seal with contact protection grease.

(Contact protection grease BMW part number 83 19 2 295 229.)

Use a standard flat brush with a width of approx. 2.5 cm to apply the grease.



Unclip cover (1).



Installation note:
Guide and retaining lugs on cover (1) must not be damaged or missing.



Installation note:
Coat positive battery cables (1) at partition seal with contact protection grease.

(Contact protection grease BMW part number 83 19 2 295 229.)

Use a standard flat brush with a width of approx. 2.5 cm to apply the grease.

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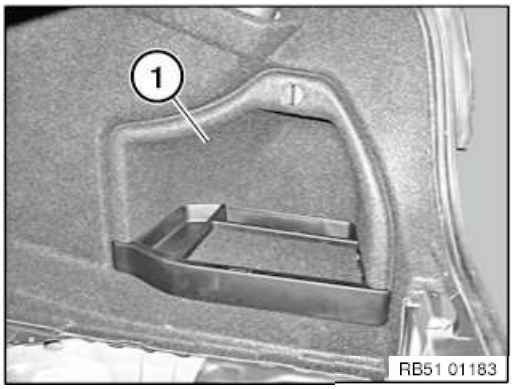
61 12 013 Replacing negative battery lead



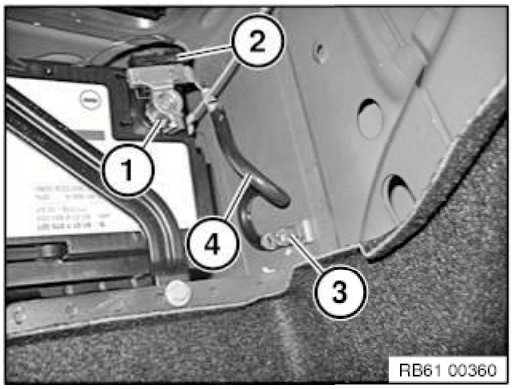
Warning!

Observe safety information for handling vehicle battery.

Read and comply with notes and notes on intelligent battery sensor.



Remove flap (1).



Slacken nut (1) on negative battery terminal.

Tightening torque 61 21 1AZ.

Important!

Do not under any circumstances use force to pull off negative terminal.

Detach battery earth lead with intelligent battery sensor (IBS) in upward direction, lay to one side and secure.

Disconnect plug connection (2).

Release nut (3) and battery earth lead (4).

Tightening torque 61 21 6AZ.

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61 12 002 Replacing positive battery cable (from battery to luggage compartment cable connector)

Warning!

Observe safety instructions for handling vehicle battery.

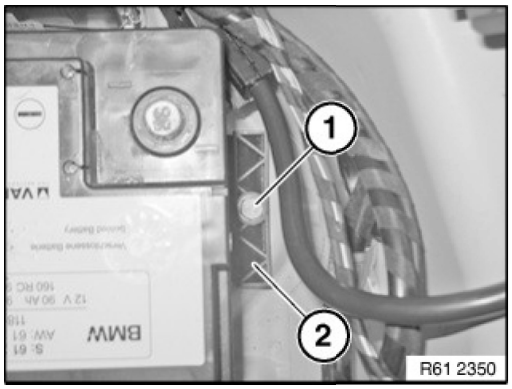
Follow instructions on intelligent battery sensor (IBS).

Important!

Do not under any circumstances use force to pull or lever off safety battery terminal.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point



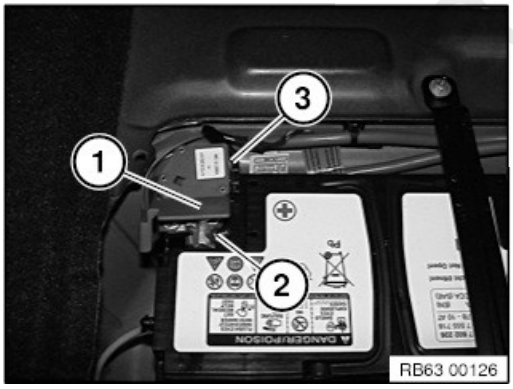
Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Release screw (1) and remove holder (2).

Tightening torque 61 21 5AZ.

Slide battery fully towards rear.

Installation note:
Make sure battery is correctly fitted.



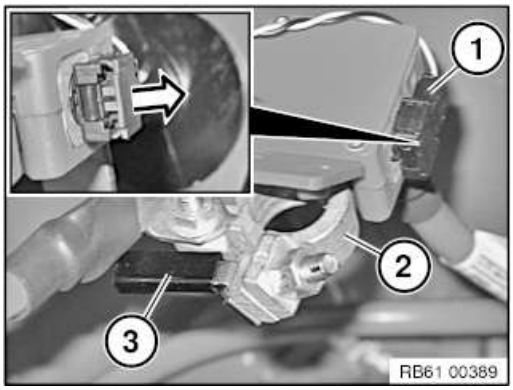
Open cover (1) and release nut (2) below it.

Tightening torque 61 21 1AZ.

Important!

Do not under any circumstances pull or lever off safety battery terminal (3) by force.

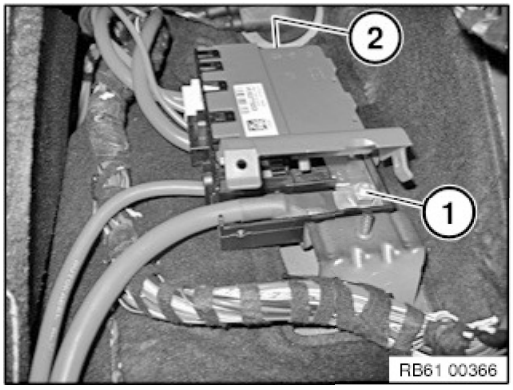
Remove safety battery terminal (3) towards top.



Release lock of plug connection (1) in direction of arrow with a suitable tool.

Remove plug connection (1) from safety battery terminal (2) in direction of arrow.

Pull off plug connection (3) from safety battery terminal (2).



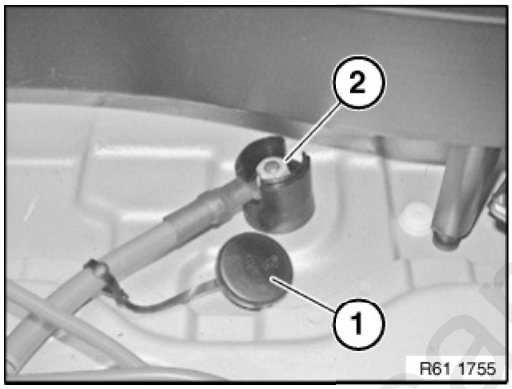
Open cover on power distribution box (2) and release nut (1) underneath.

Tightening torque 61 21 4AZ.

Remove positive battery cable from power distribution box (2).

Installation note:
Risk of short circuits!

Make sure positive battery cable is correctly fitted.



Remove cover (1) and release nut (2) below it.

Tightening torque 61 21 4AZ.

Remove complete positive battery cable from vehicle.

Installation note:
Risk of short circuits!

Make sure positive battery cable is correctly fitted.

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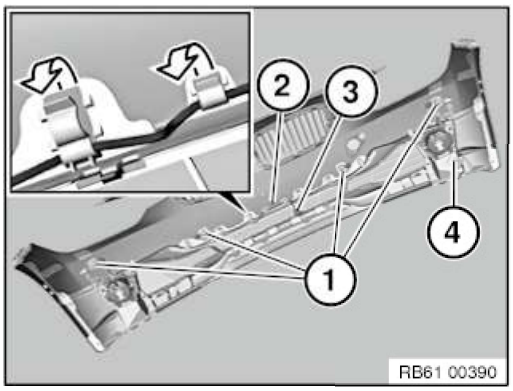
61 12 062 Replacing wiring harness on front bumper

Important!

Read and comply with notes on handling wiring harnesses and cables.

Necessary preliminary tasks:

- Remove front bumper panel



Note:
Graphic shows the F30 by way of example, deviations in detail are possible in other models.

Depending on equipment specifications following sensors can be installed:

(1) Ultrasonic sensors.

(2) Pedestrian protection sensor.

(3) ACC sensor.

Unlock associated plug connections and disconnect.

Unclip wiring harness from bumper panel in direction of arrow.

Release central connector (4) from latch mechanism and remove wiring harness.

Installation note:
Make sure wiring harness is correctly laid.

Make sure central connector is fitted correctly (4) on bumper panel.

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61 12 265 Replacing wiring harness on left or right front seat

NOTICE

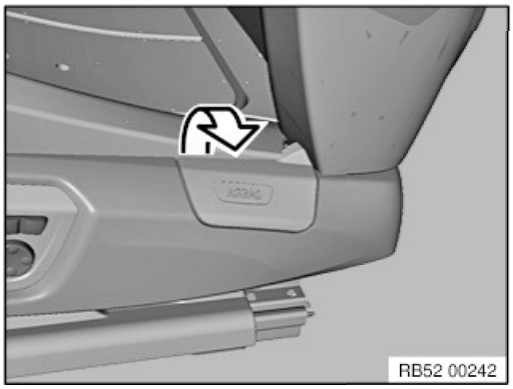
Schematic diagram is for example purposes. Some parts may differ in certain details.

NOTICE

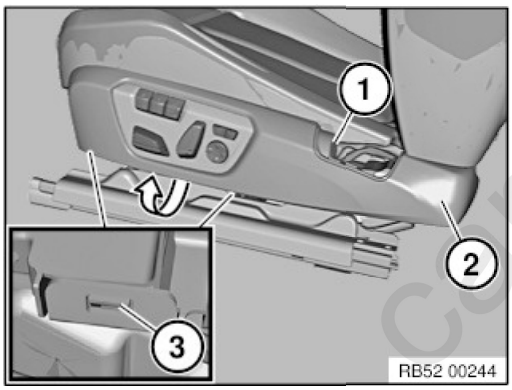
Description is for left component only. Procedure on the right side is identical.

PRELIMINARY WORK

1 – Remove outer cover on front seat



- Move backrest to full rearward position.
- Grip end fitting cover centrally between seat belt strap and cover and unclip in direction of arrow.



- Loosen screw (1).
- Lever latch mechanism (3) of the cover (2) out of seat mechanism.
- Remove cover (2) in direction of arrow from seat mechanism.
- Unlock associated plug connections of the operating unit and disconnect.

2 – Partially remove the front seat

WARNING

Airbag unit.

Danger! Life-threatening injuries!

- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

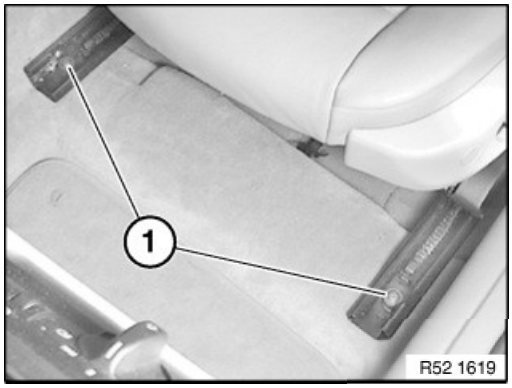
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RISK OF DAMAGE

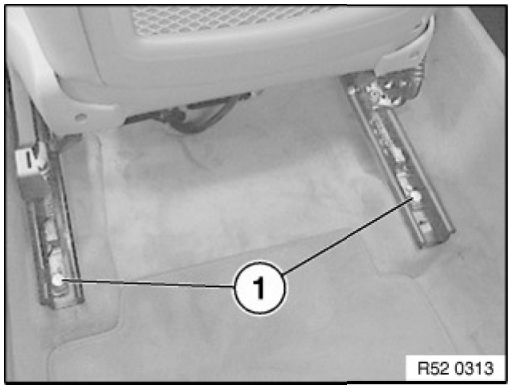
Scratches.

Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.



- Move seat to upper back position.
- Loosen screws (1).

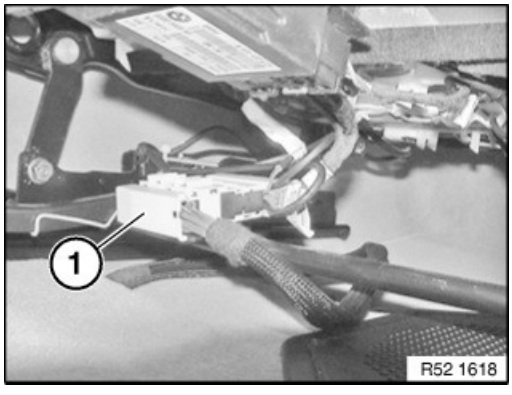


- Adjust the seat to the front top.
- Loosen screws (1).

► **Disconnecting all battery earth leads**



- See additional information.



- Place the front seat to the rear.
- Unlock plug connection (1) and disconnect.

MAIN WORK

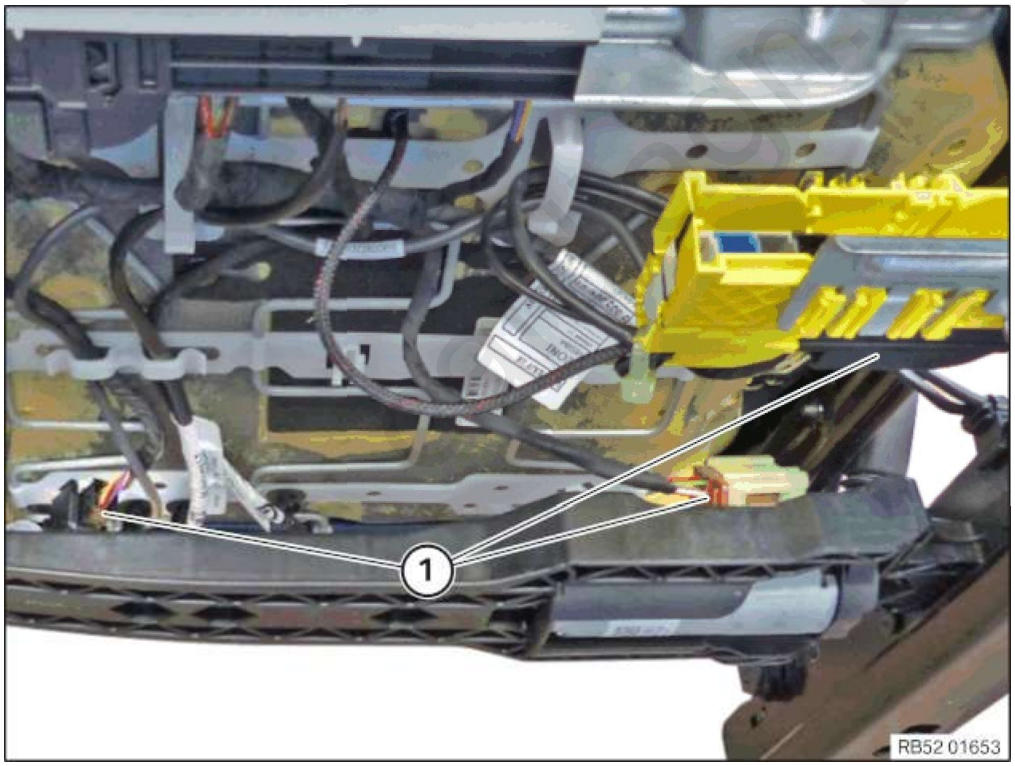
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3 – Replacing wiring harness for front seat

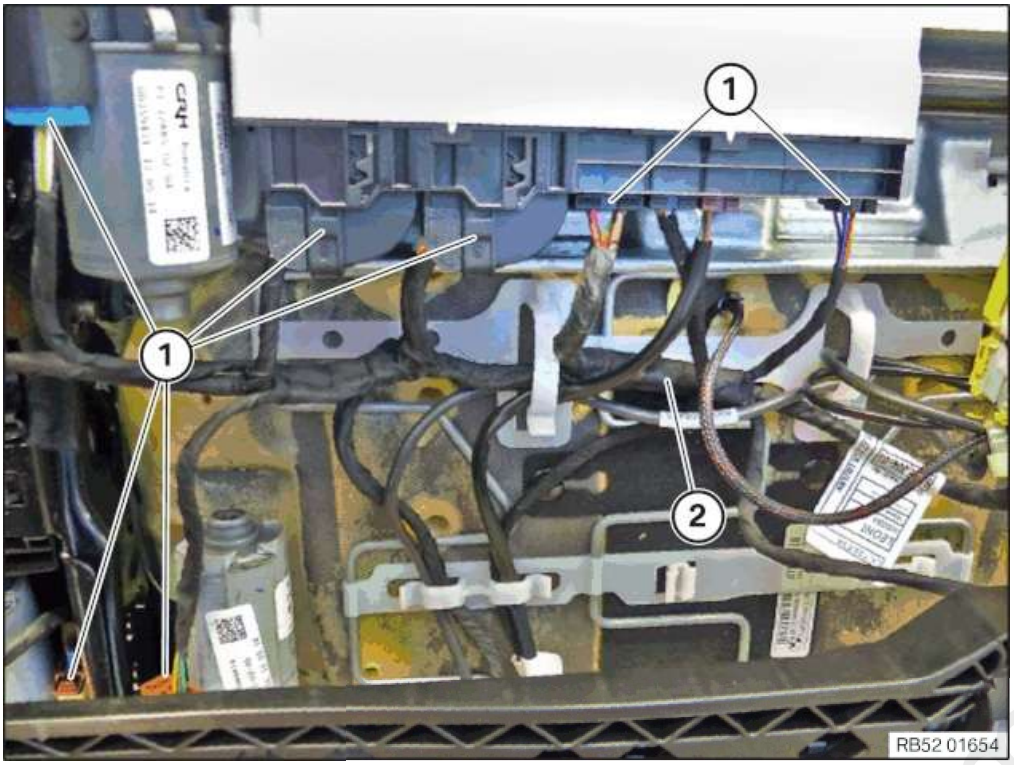
Overview of seat wiring harness



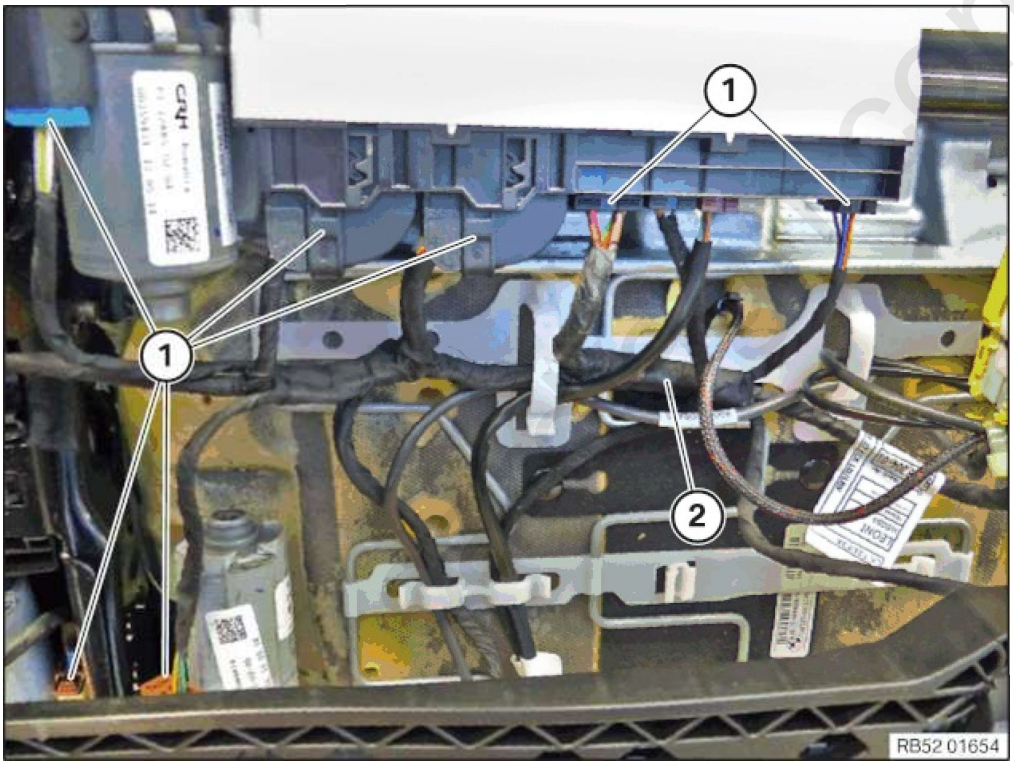
1 Seat wiring harness



- Unlock and disconnect connector (1).

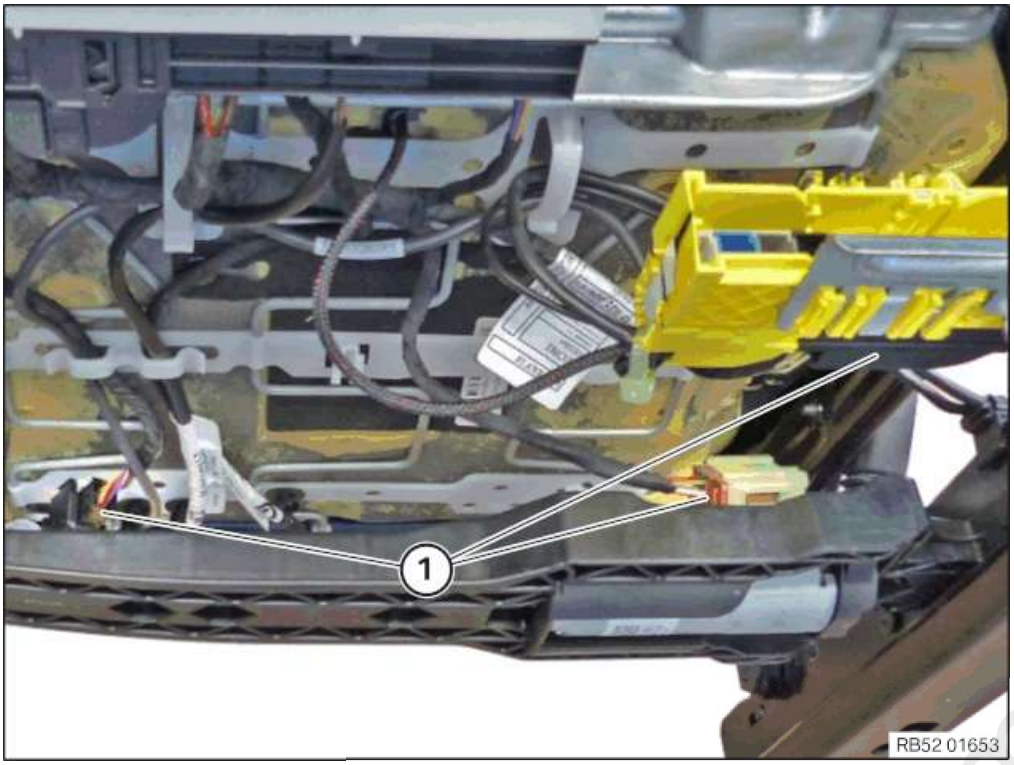


- Unlock and disconnect connector (1).
- Remove the wiring harness (2).



- Replace wiring harness (2).

  Parts: Wiring harness
- Insert the wiring harness (2).
- Connect connectors (1) and lock.



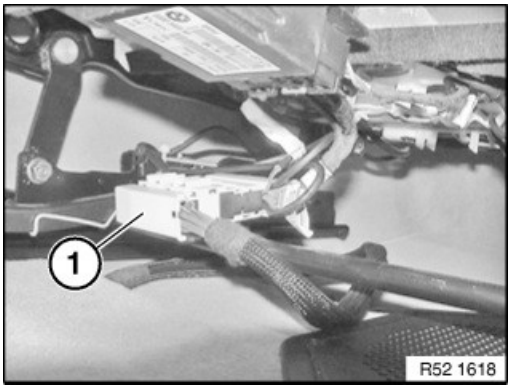
- Connect connectors (1) and lock.



- Check if the wiring harness (1) and the cable are correctly fed into the marked areas.

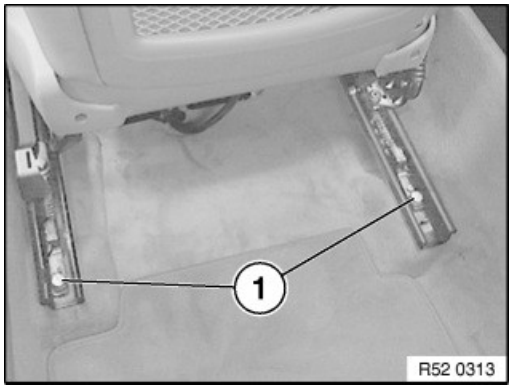
POSTPROCESSES

4 – Install front seat (partially removed)



- Connect connectors (1) and lock.
- Position front seat.

  The seat rails must be in direct contact with the floor panel.



- Renew screws (1).

  Parts: Bolts

- Tighten the screws (1).

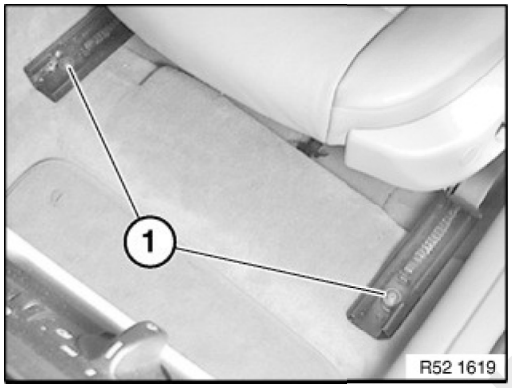
Front seat to body

Screw	Renew screw.	Tightening torque	42 Nm

▶ **Disconnecting all battery earth leads**



- See additional information.



- Move seat to upper back position.
- Renew screws (1).

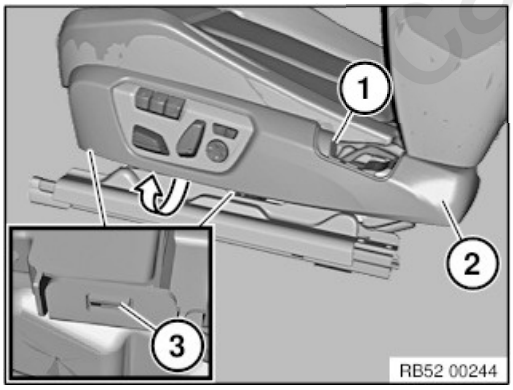
  Parts: Bolts

- Tighten the screws (1).

Front seat to body

Screw	Renew screw.	Tightening torque	42 Nm

5 – Installing the outer cover on the front seat

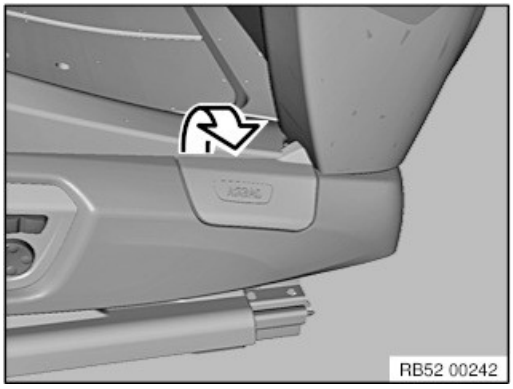


- Check cover (2) for damage and replace if required.
- Connect associated plug connections of the operating unit.
- Install the cover (2).
- Tighten down screw (1).

Outer cover to front seat

Screw		Tightening torque	1,5 Nm

- Check whether the latch mechanism (3) of the cover (2) is engaged correctly on the seat mechanism.



- Clip in the trim end fitting.

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6 – Delete fault memory



- Delete the fault memory.

Additional Information

Overview of Tightening Torques

Front seat to body			Used in step 4
Screw	Renew screw.	Tightening torque	42 Nm

Outer cover to front seat			Used in step 5
Screw		Tightening torque	1,5 Nm

Links

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	2

Repair instructions	Used in step
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2 4
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2 4
61 20 900 Disconnect and connect battery earth lead (Plug-in Hybrid Electric Vehicle)	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
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61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4
61 20 900 Disconnecting and connecting battery earth lead	2 4

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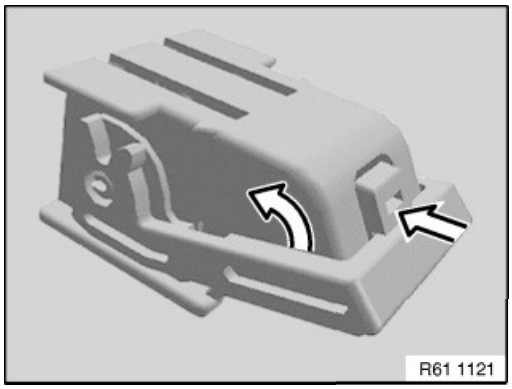
61 20 900 Disconnecting and connecting battery earth lead 2 4
61 20 900 Disconnecting and connecting battery earth lead 2 4
61 20 900 Disconnecting and connecting battery earth lead 2 4
61 20 900 Disconnecting and connecting battery earth lead 2 4

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61 13 ... Unlocking and disconnecting different plug connections

Note:
The document describes unlocking and disconnecting different types of plug connections.

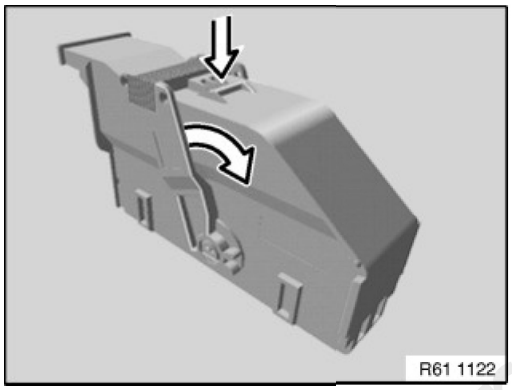
Differences in the details of the size and shape of the plug connections are possible.



1.

Press lock and open release clip in direction of arrow.

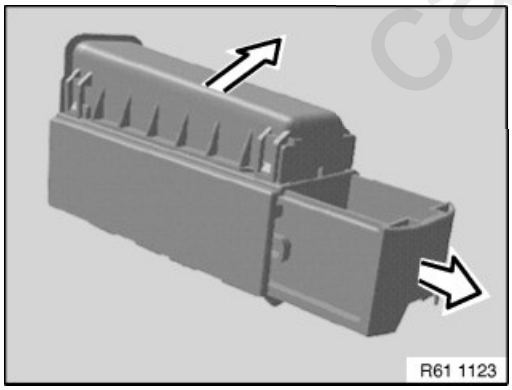
Disconnect plug connection.



2.

Press lock and open release clip in direction of arrow.

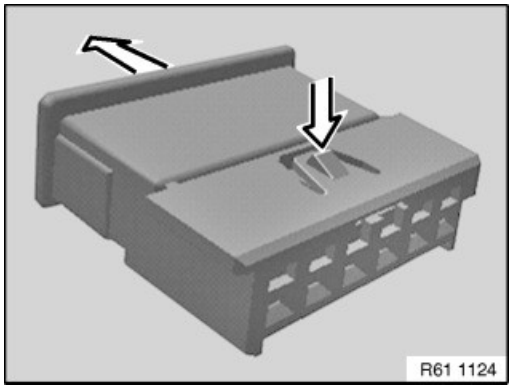
Disconnect plug connection.



3.

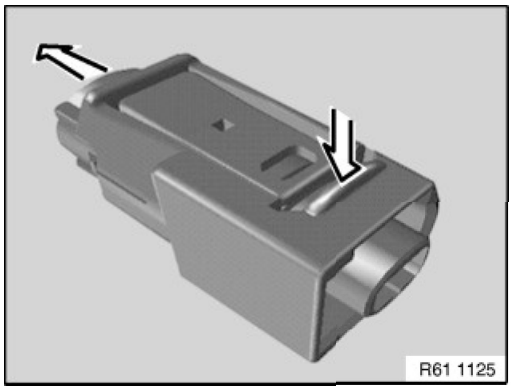
Open release clip in direction of arrow and disconnect plug connection in direction of arrow.

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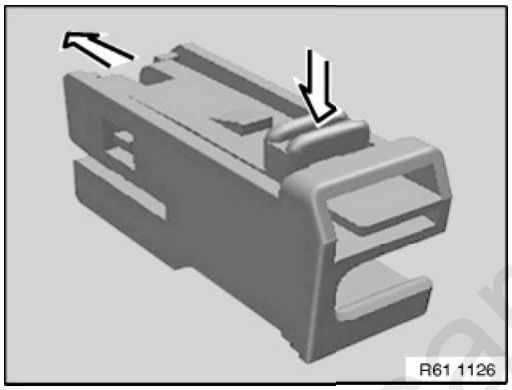
4.

Press lock and disconnect plug connection in direction of arrow.



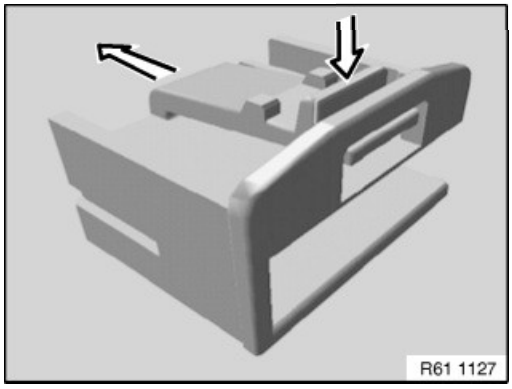
5.

Press lock and disconnect plug connection in direction of arrow.



6.

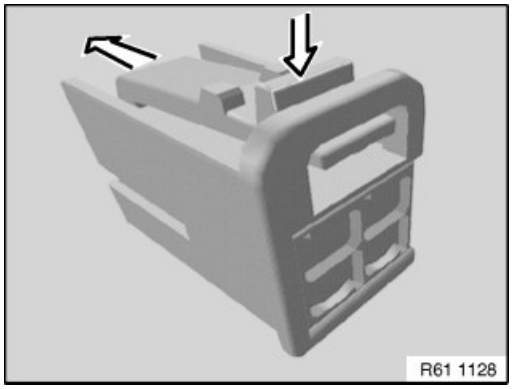
Press lock and disconnect plug connection in direction of arrow.



7.

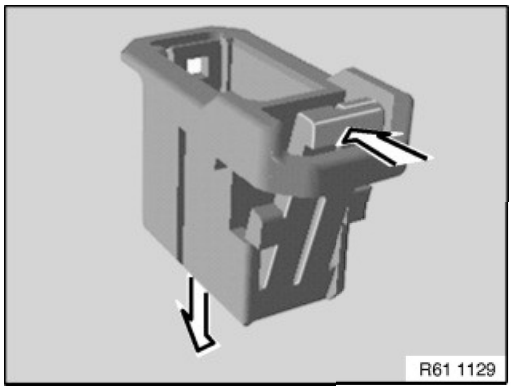
Press lock and disconnect plug connection in direction of arrow.

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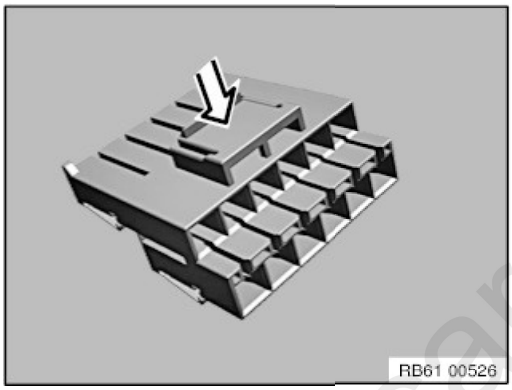
8.

Press lock and disconnect plug connection in direction of arrow.



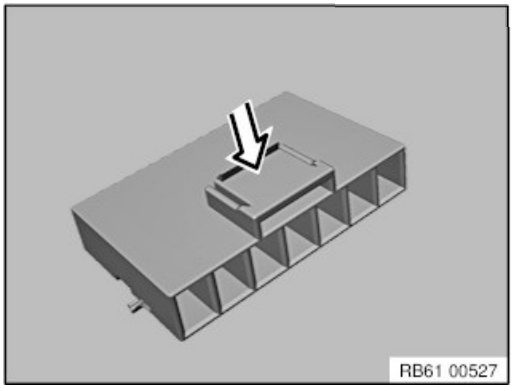
9.

Press lock and disconnect plug connection in direction of arrow.



10.

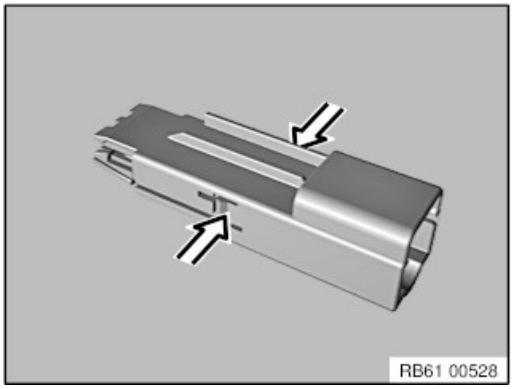
Press the lock and detach plug connection.



11.

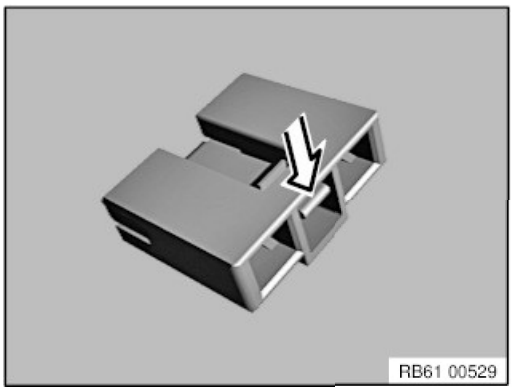
Press the lock and detach plug connection.

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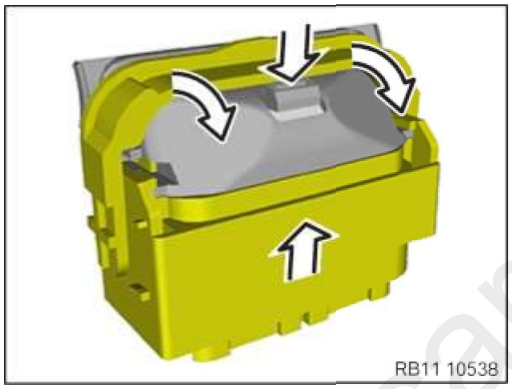
12.

Press the lock on both sides and detach plug connection.



13.

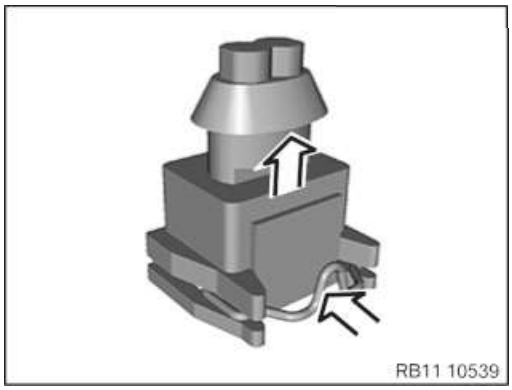
Press the lock and detach plug connection.



14.

Press lock and open release clip in direction of arrow.

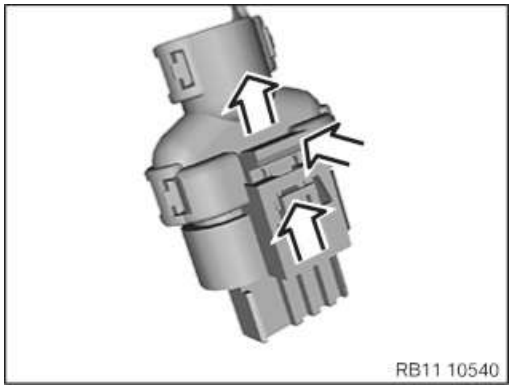
Disconnect plug connection.



15.

Press the lock and detach plug connection.

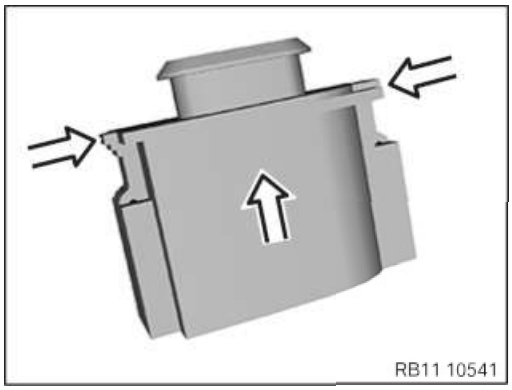
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16.

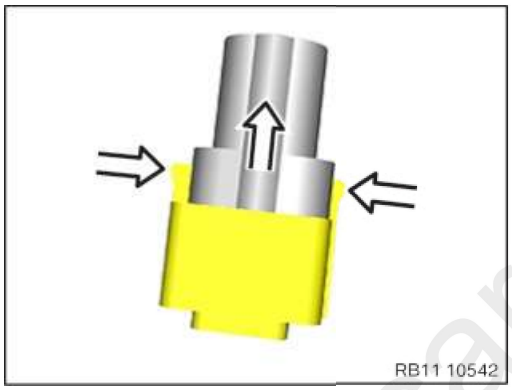
Pull out lock and press.

Disconnect plug connection.



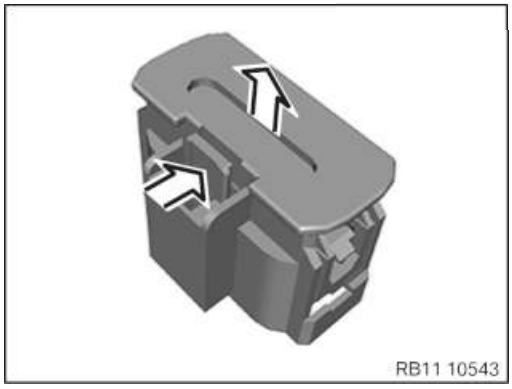
17.

Press the lock and detach plug connection.



18.

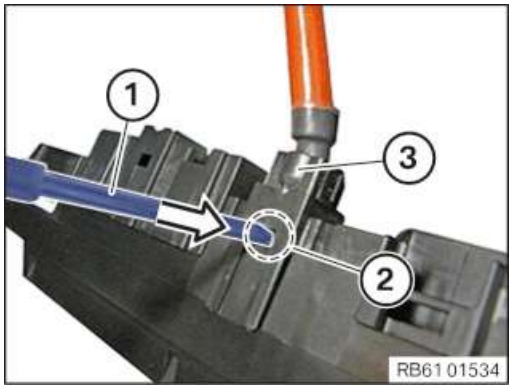
Press the lock and detach plug connection.



19.

Press the lock and detach plug connection.

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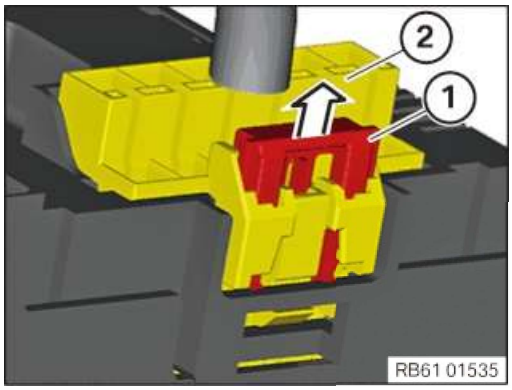


20.

Plug connection, e.g. on the power distribution box:

Press into the opening (2) using a suitable tool (1).

Pull off plug connection (3) upwards.



21.

Plug connection, e.g. on the power distribution box:

Lift lock (1) with a suitable tool.

Pull off plug connection (2) upwards.



22.

Vibration resistant high power engine contacts:

Caution!

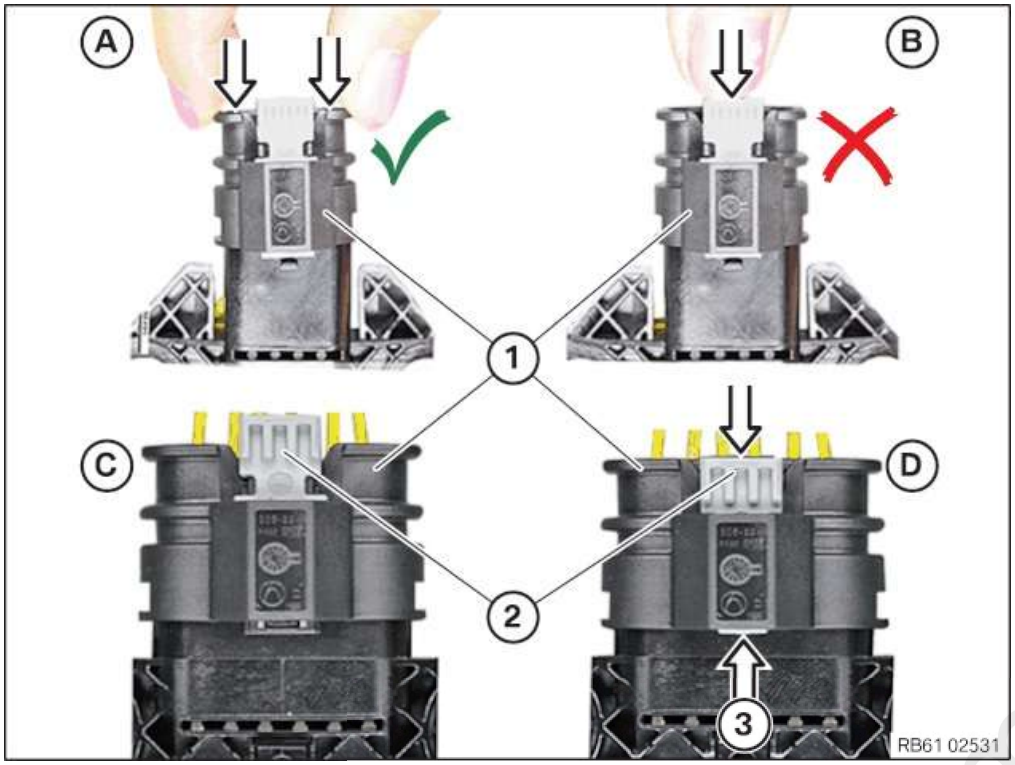
For this connector type, increased forces come into play when disconnecting and closing.

Disconnect:

Pull out lock (1) downward in direction of arrow first.

Then press lock (1) down in direction of arrow and pull off connector.

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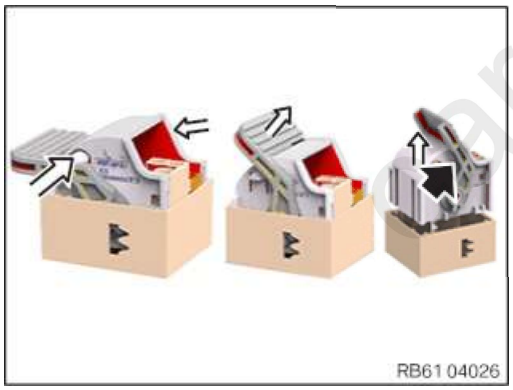


23.

Close:

A. Press the connector (1) down at the points indicated by the arrow **until it reaches the end position**
B. **Do** not press the connector (1) further than the lock
C. Connector (1) is in the end position, but lock (2) is not yet locked
D. Press lock (2) down in the direction of the arrow until the tip of lock (2) is visible at point (3)

Unlock / lock front light combination plug connection & replace housing after damage:

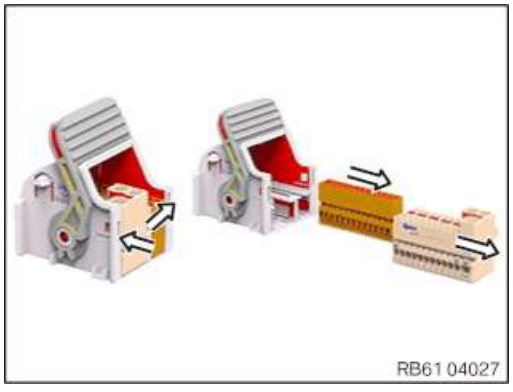


24.

Press in locking lever at both sides until the lever is unlocked and can be moved.

Move lever upwards until it latches into place in the end position.

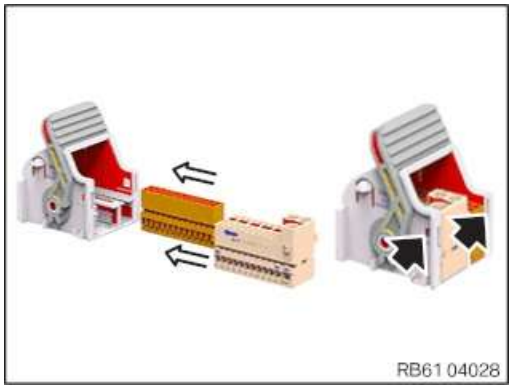
Once the lever is locked in the end position, remove plug connection upwards.



Unlock socket housing by lifting up each of the locking tabs.

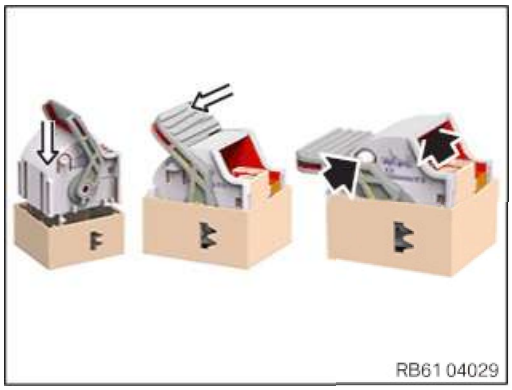
Slide out after unlocking the socket housing.

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Slide in socket housing up to limit position.

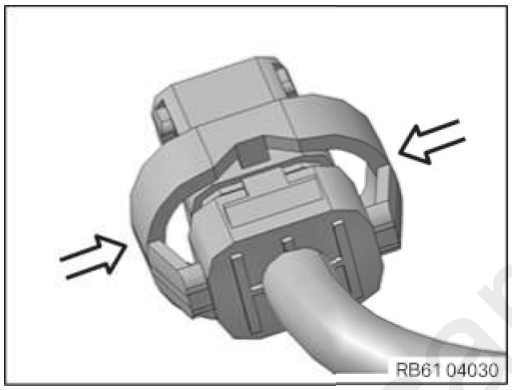
Lock socket housing into place in end position.



Sliding in up to limit position.

Activate plug-inn procedure by moving lever downwards.

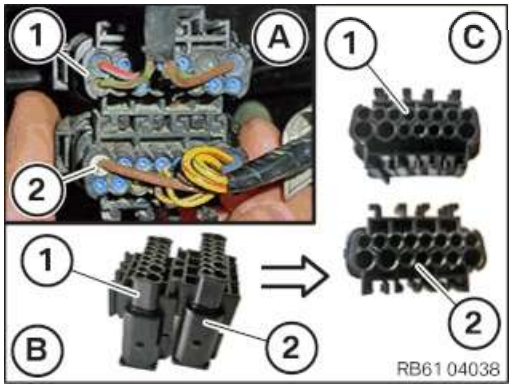
IMPORTANT: the latch mechanism on both sides only works for a completed plug-in procedure.



25.

Rosenberger D4S20G-400A5-Y

Press to unlock on both sides.

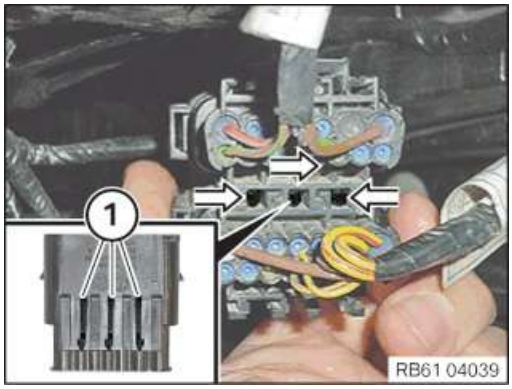


26.

Pin housing, 15-pinMLK1

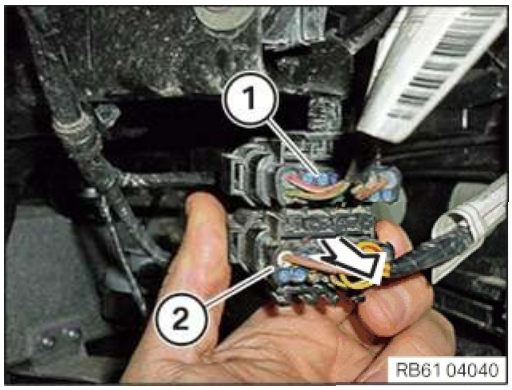
- A & B. To avoid any damage to individual connectors, the given connector assembly consisting of several individual connectors (1) & (2) must be released before disconnecting the plug connection.
- C: released connector assembly

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Disconnecting connector assembly:

Release retaining hooks (1) in direction of arrow (detail image shows retaining hooks of individual connector).



Release connector (2) in direction of arrow from connector (1).

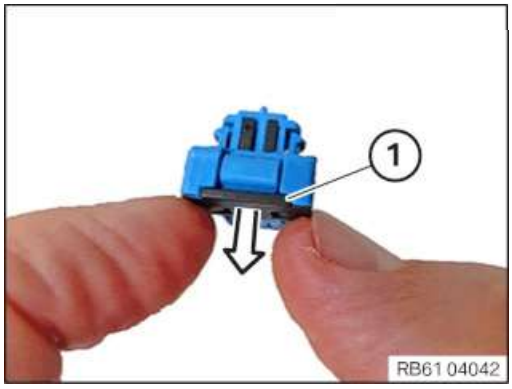


27.

Airbag ignition circuit connector

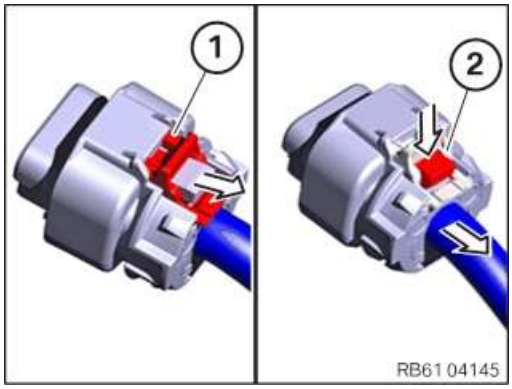
Warning!

Note the safety information for working on vehicles with airbag systems prior to disconnecting the plug connection.



Pull the cap (1) in the direction of the arrow to unlock

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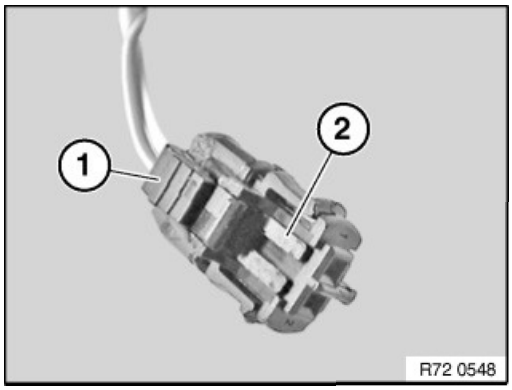


28.

Connector e.g. on front and rear lighting unit

Open safety catch (1) in direction of arrow using appropriate tool.

Push safety catch (2) in direction of arrow and disconnect plug connection.



29.

Plug, e.g. in airbag ignition circuits

Press the lock (1) and pull out the connector (2) up to initial engagement position.

Pull off connector (2).

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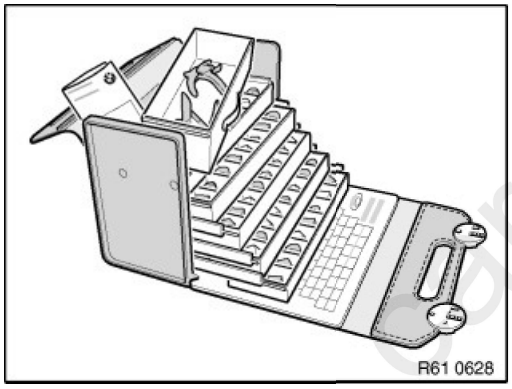
61 13 ... Butt connector for repairing a plug connection

Special tools required:

- 61 0 300
- 61 4 340
- 61 0 240

Important!

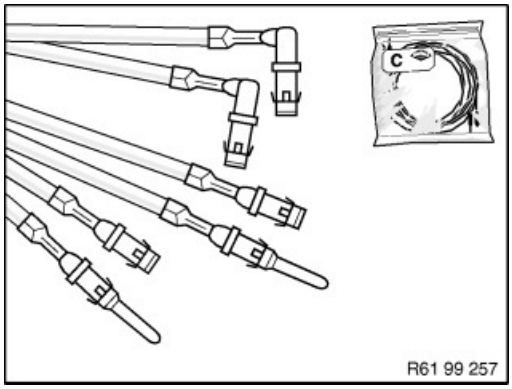
1. Identify cause of damage (e.g. sharp-edged body components, faulty electrical loads, jammed mechanisms, corrosion caused by ingress of water, etc.).
2. Read out fault memory
3. Eliminate cause of damage.
4. Disconnect battery negative terminal
5. Make sure that no safety-related system according to circuit diagram (e.g. antilock braking system, active rear-axle kinematics, airbags, etc.) are influenced. Otherwise replace faulty wiring harness or use repair cable (sourcing reference: BMW Parts Department)
6. Carry out function test and read out fault memories again
7. Eliminate new faults if applicable and clear fault memories



Note:
The repair range IV for vehicle electrical system contained the required special tools and individual parts for retrofitting and repair work with the aid of fan connectors.

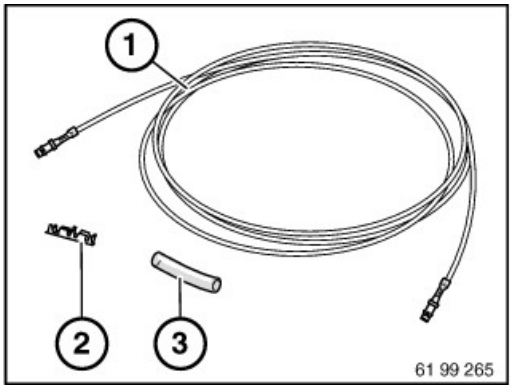
The case can no longer be ordered. Order individual parts for wiring harness repair through BMW Parts Department.

- Refer to Service Information:
  SI 02 04 07 341



Choose repair kit.

Example: Repair kit, circular connector system D 2.5.

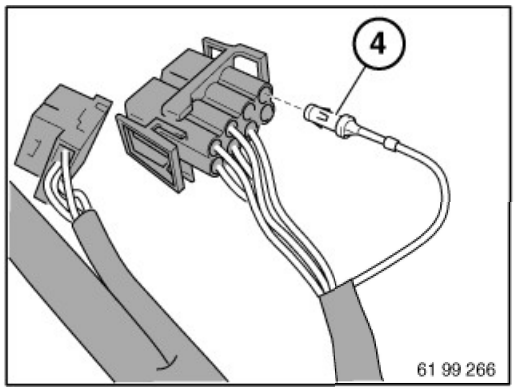


Remove following parts:

(1) Pre-packaged end of cable with requisite wire cross-section

(2) Crimp connector for selected wire cross-section

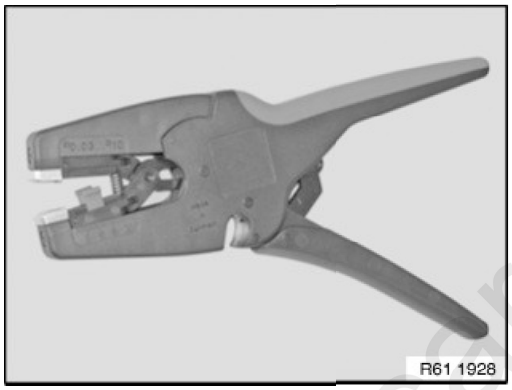
(3) Shrink-fit hose



Open secondary lock on housing.

Mark damaged contact (4) with socket number of housing and press it out of housing using appropriate special tool contained in special tool set 61 0 300).

See repair instructions
Notes for opening contacts and locks of different plug contact systems.



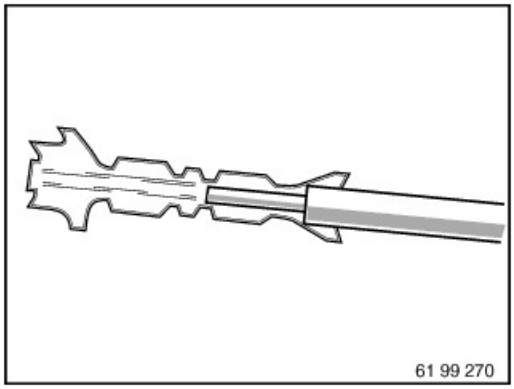
Important!

- Check maximum length of repair cable
- If more than one wire is to be repaired, the individual interfaces must be offset so that the wiring harness is not too thick at the repaired point.

Adhere to following procedure:

- Cut off wire with faulty contact at point which is easily accessible
- Strip insulation from end of wire at wiring harness end
- Cut preassembled wire end to length and strip insulation

Refer also to repair instruction:
Cutting to length and stripping insulation from cables



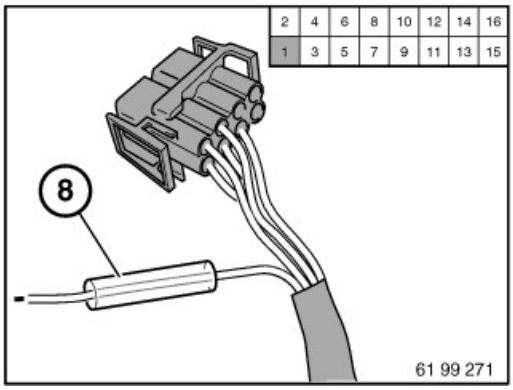
Crimp butt connector on preassembled wire end.

Special tools:

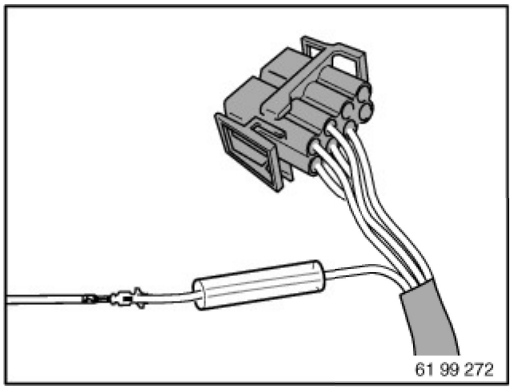
- 61 4 340 (0.35 - 2.5 sq mm)
- 61 0 240 (4.0 - 6.0 sq mm)

See repair instructions
Crimping on stop parts

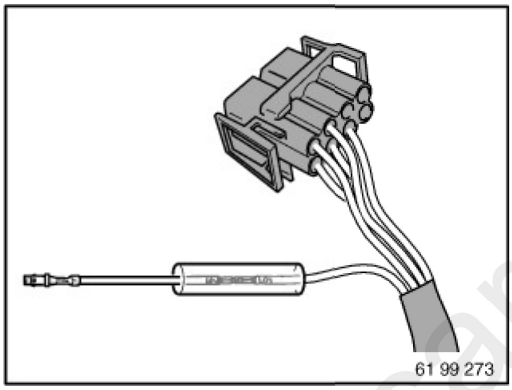
cardiagn.com



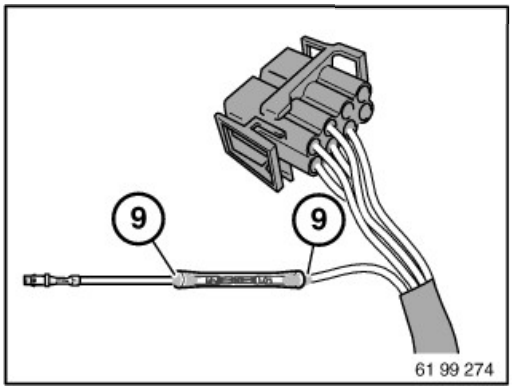
Push shrink-fit hose (8) onto free wire end.



Crimp unused wire end to butt connector.



Pull shrink-on sleeve over butt connector.



Important!

Do not burn shrink-on sleeve.

With hot air blower, shrink the shrink-on sleeve on both sides (9) of shrink-fit hose until glue emerges uniformly all round.

Insert contact in housing.

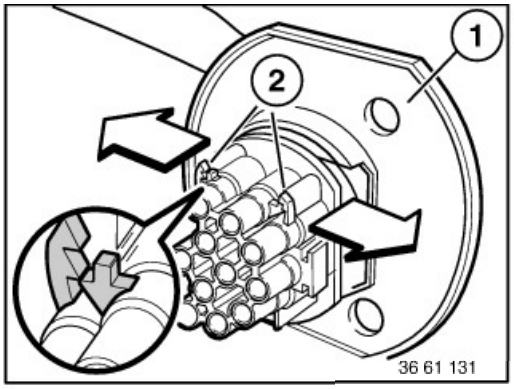
Close secondary lock on housing.

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61 13 ... Circular connector, 13-pin, system D2.5

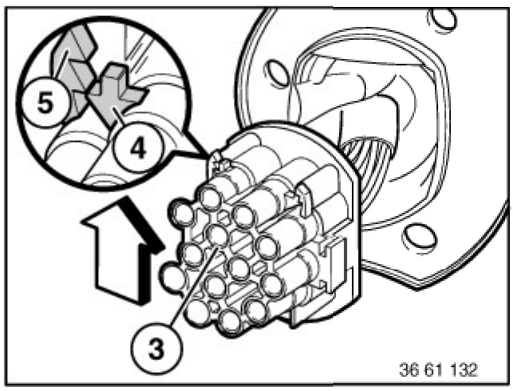
Special tools required:

- 61 0 303

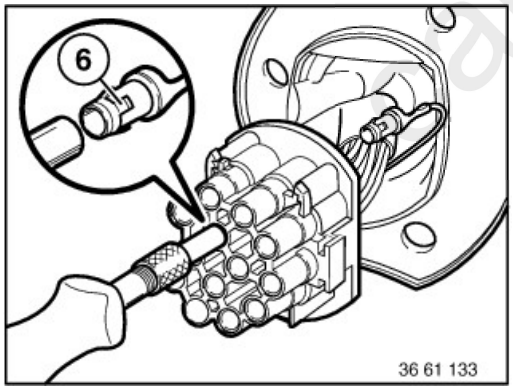


Pull off rubber grommet (1).

Carefully pull out lock (2) in direction of arrow.



Move lower section of connector (3) in direction of arrow until retaining lugs (4) snap into release groove (5).



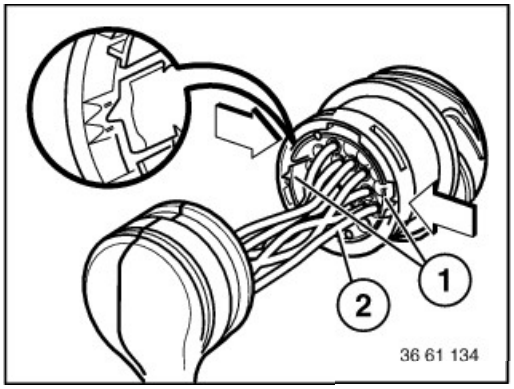
With special tool 61 0 303 , press down retaining lugs (6) of corresponding contact and pull out cable.

cardiagn.com

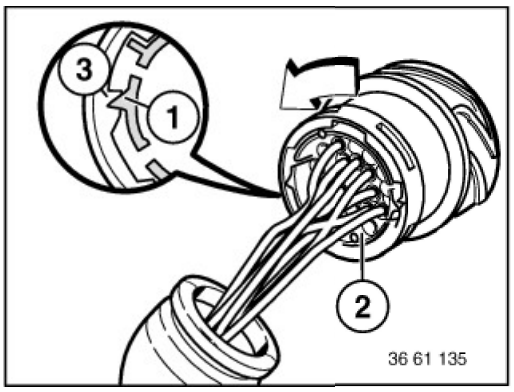
61 13 ... Circular connector, 20-pin, system D2.5

Special tools required:

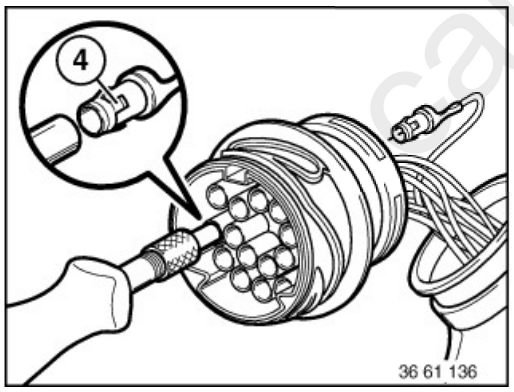
- 61 0 303



Carefully press back retaining tabs (1) of internal connector (2).



Turn internal connector (2) until retaining lugs (1) snap into release groove (3).



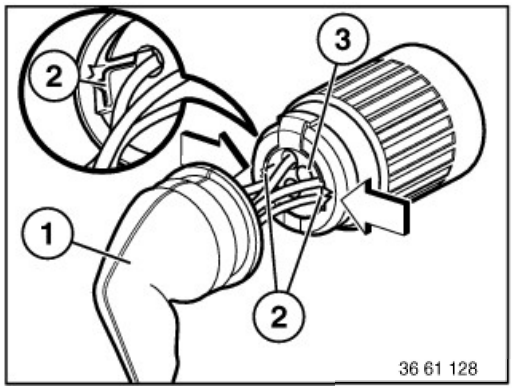
With special tool 61 0 303 press down retaining hook (4) of corresponding contact and pull out cable.

cardiagn.com

61 13 ... Circular connector, 7-pin, 8-pin, system D2.5

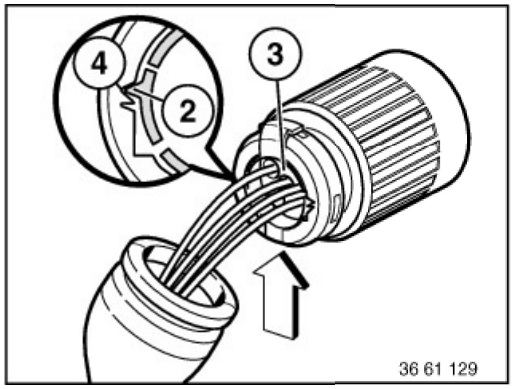
Special tools required:

- 61 0 303

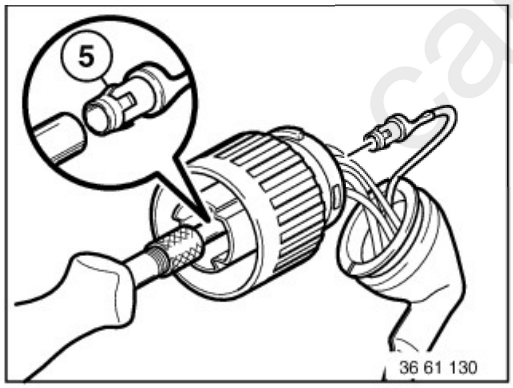


Carefully pull off rubber grommet (1).

Carefully press back retaining tabs (2) of internal connector (3).



Slide internal connector (3) in direction of arrow until retaining tabs (2) lock into locking groove (4).



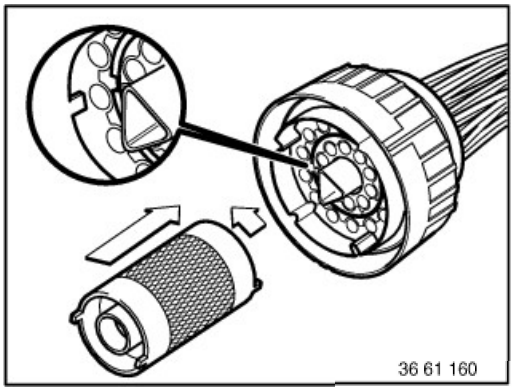
Use special tool 61 0 303 (61 1 132) to press back retaining hook (5) of corresponding contact and pull out cable with contact.

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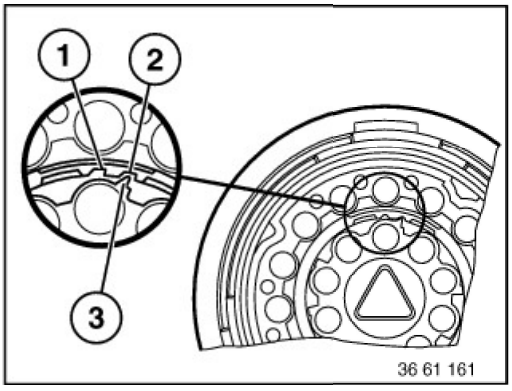
61 13 ... Circular plugs, 4-, 7-, 10- 12-, 25-pin, System D1.5/D2.5

Special tools required:

- 61 0 303

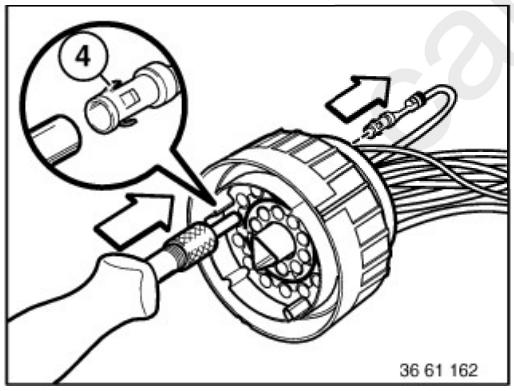


Insert special tool with suitable connection side in connector and twist approx. 3° anticlockwise.



The connector is locked down if retaining lug (3) is located in locking groove (2).

1. Unlocking groove
2. Locking groove
3. Retaining lug



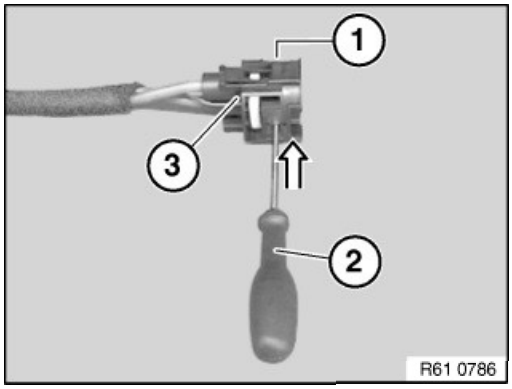
With special tool 61 0 303 press back retaining hook(4) of corresponding contact and pull out cable with contact.

cardiagn.com

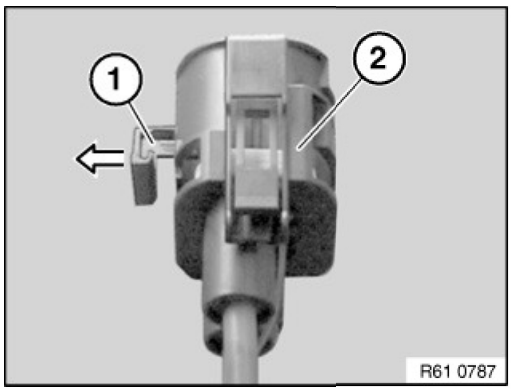
61 13 ... Connector housing, LCC contact (load current contact)

Special tools required:

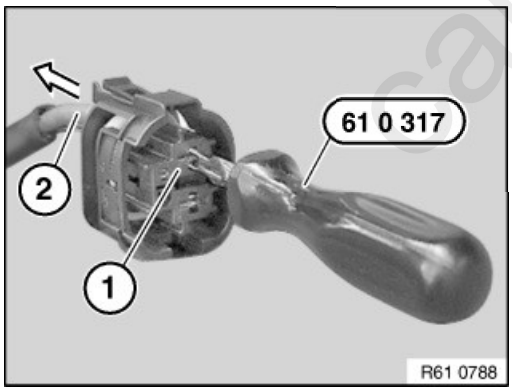
- 61 0 317



Socket housing:
Press lock (1) with suitable tool (2) in direction of arrow out of socket housing (3).

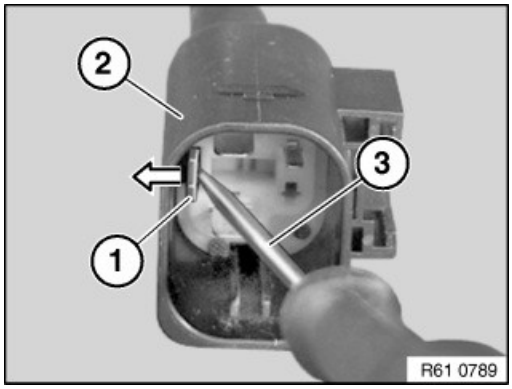


Pull lock (1) out of socket housing (2).

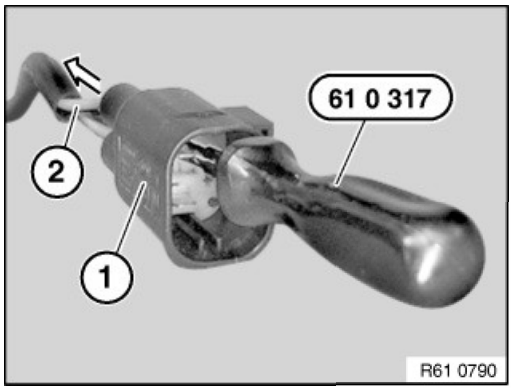


Insert special tool 61 0 317 into socket housing (1) and pull out wiring with LCC contact (2) in direction of arrow.

carDiagn.com



Pin housing:
Unlock locking slide (1) of pin housing (2) with suitable tool (3) in direction of arrow.



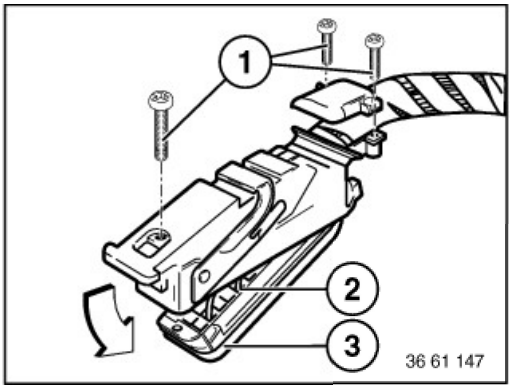
Insert special tool 61 0 317 into pin housing (1) and pull out wiring with LCC contact (2) in direction of arrow.

cardiagn.com

61 13 ... Control unit plugs, 25-, 35-, 55-, 83-, 88-pin

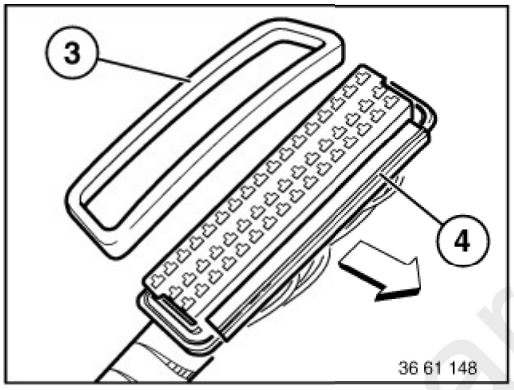
Special tools required:

- 61 0 312
- 61 0 314
- 61 0 315
- 61 0 323



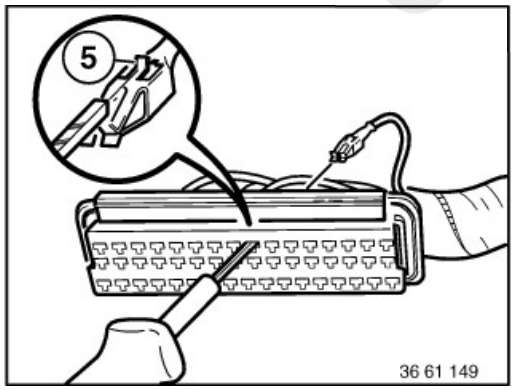
Release screws (1).

Lever out pin sensor (2) with gasket (3) in direction of arrow.



Remove gasket (3).

Pull out housing lock (4) in direction of arrow and unlock.

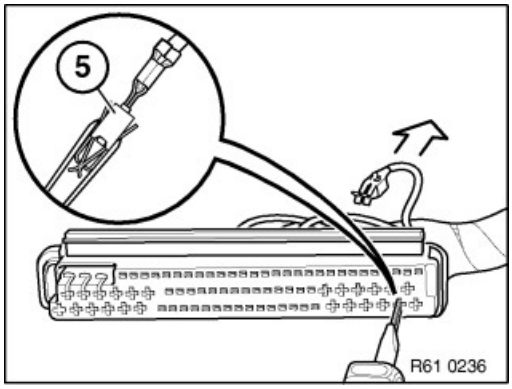


Press down retaining hook (5) of corresponding contact and pull out cable with contact.

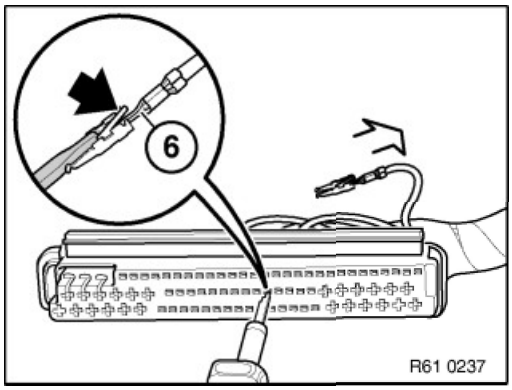
Special tool 61 0 312 (61 1 134) for mini flat spring contacts.

Special tool 61 0 314 (61 1 135) for mini flat spring contacts.

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Special tool 61 0 315 (61 1 151) for double flat spring contacts (dual retaining hooks).



Special tool 61 0 323 (61 1 152) for double flat spring contacts (special retaining hook).

cardiagn.com

61 13 ... Crimping annular contacts



Special tools required:

- 61 4 320



Crimping annular contacts:

Special tool61 4 320

Handling:

Refer to Service Information:

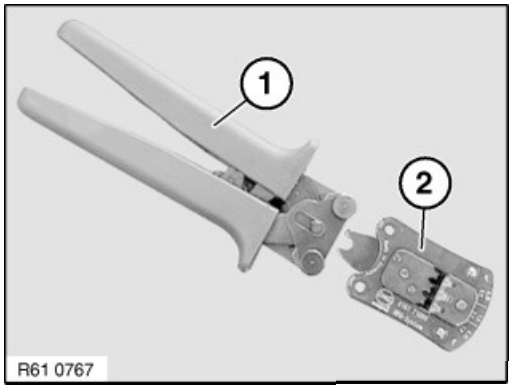
- SI 2 04 06 2939

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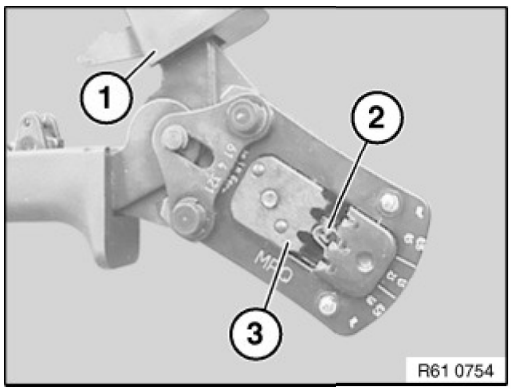
61 13 ... Crimping Micro Power Quadlock contacts (MPQ)

Special tools required:

- 61 4 320



To crimp MPQ contacts, use hand pliers 61 4 321 (1) in conjunction with crimping head 61 4 325 (2) from crimping set 61 4 320 .*Note:*
Hand pliers (1) open automatically until limit position when handles are pressed together.

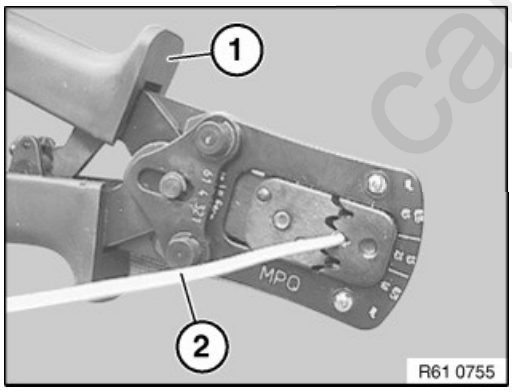


Open hand pliers (1).

Note:
Place contact (2) with utmost care in designated nest (observe line cross-section) in crimping head (3). Make sure it is exactly positioned.

Place MPQ contact (2) in crimping head (3).

Close hand pliers (1) one notch.



Note:
Follow procedure for cutting and stripping insulation from cables.

Insert stripped cable (2).

Close hand pliers (1) fully.

Open hand pliers (1) and remove cable (2).

Important!

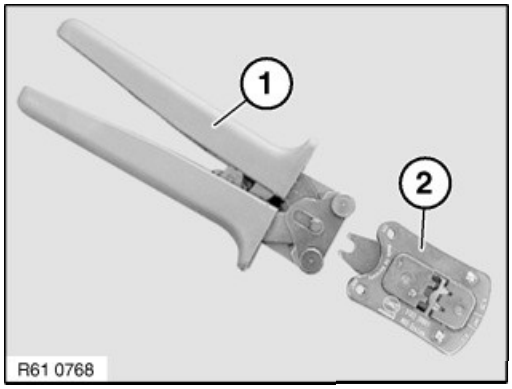
Check contact for correct crimping.

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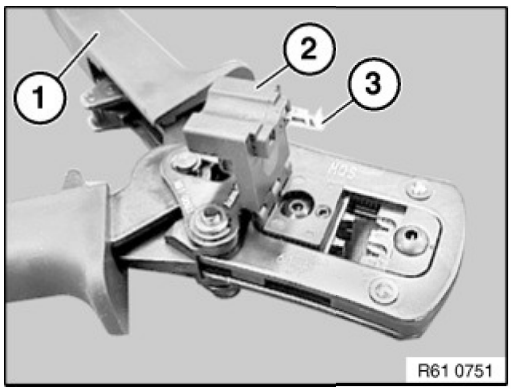
61 13 ... Crimping Micro Quadlock System contacts (MQS)

Special tools required:

- 61 4 320



To crimp MPQ contacts, use hand pliers 61 4 321 (1) in conjunction with crimping head 61 4 324 (2) from crimping set 61 4 320 .*Note:*
Hand pliers (1) open automatically until limit position when handles are pressed together.

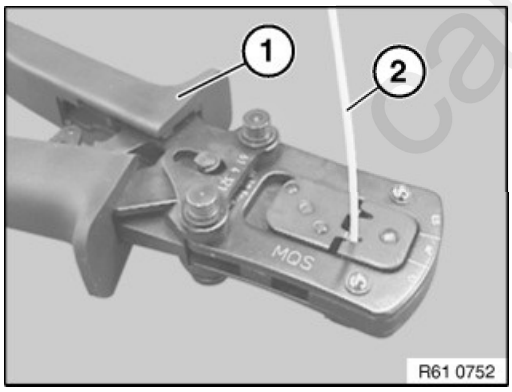


Open hand pliers (1).

Fold up contact carrier (2).

Insert MQS contact (3) in contact carrier (2).

Fold back contact carrier (2).



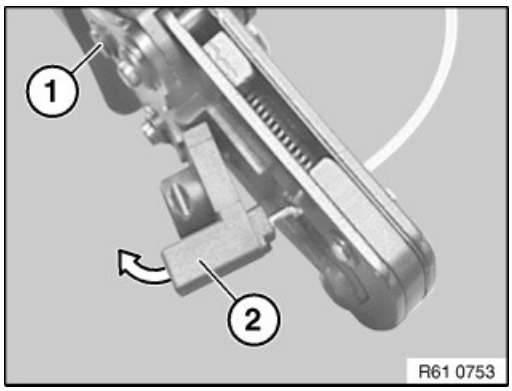
Note:
Follow procedure for cutting and stripping insulation from cables.

Close hand pliers (1) one notch.

Insert stripped cable (2).

Close hand pliers (1) fully.

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Open hand pliers (1).

Open contact carrier (2) gently and carefully remove MQS contact.

Important!

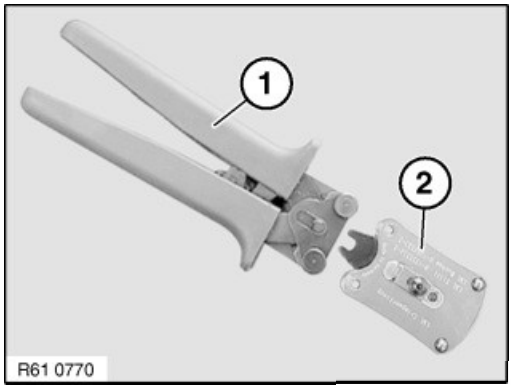
Check contact for correct crimping.

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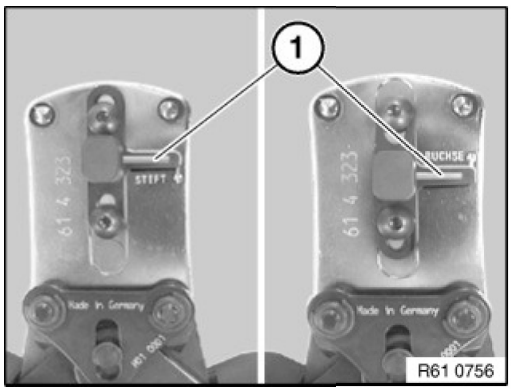
61 13 ... Crimping optical fibres

Special tools required:

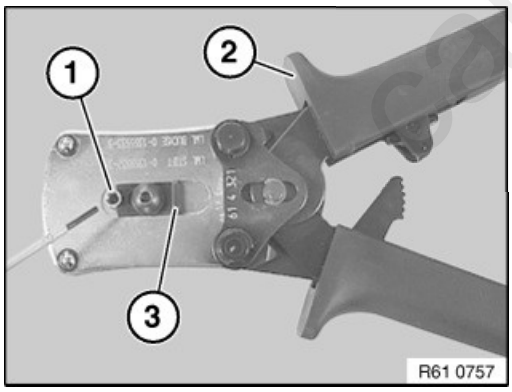
- 61 4 320



To crimp optical fibres, use hand pliers 61 4 321 (1) in conjunction with crimping head 61 4 323 (2) from crimping set 61 4 320 .*Note:*
Hand pliers (1) open automatically until limit position when handles are pressed together.



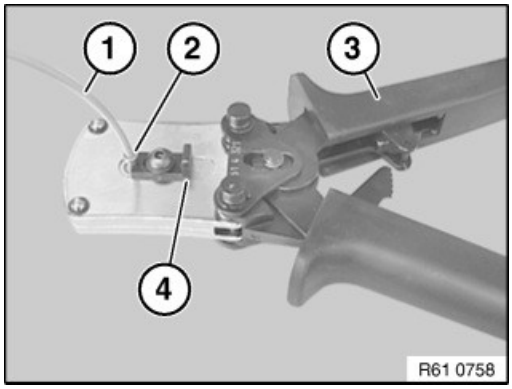
Move contact guide by means of stop lever (1) into corresponding position (pin contact or jack).



Open hand pliers (2).

Place pin contact or jack (1) in crimping head and secure with locking lever (3).

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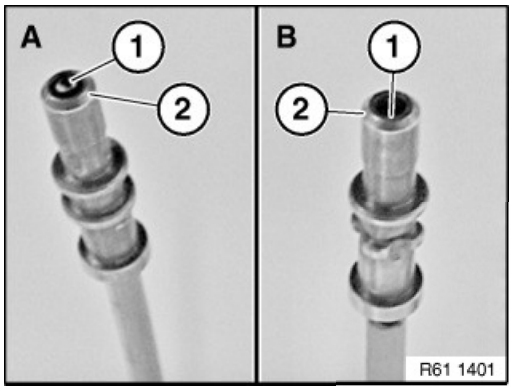
Note:
Follow procedure for cutting and stripping insulation from optical fibres.

Insert stripped optical fibre(1) until limit position into pin contact or jack (2).

Close hand pliers (3) fully.

Open hand pliers (3) and locking lever (4).

Remove optical fibre (1).



Attention!

Make sure optical fibre is correctly seated in jack.

Right (A)

End of optical fibre (1) must be flush with tip of pin contact (2).

Wrong (B)

End of optical fibre (1) is not flush with tip of pin contact (2).

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61 13 ... Crimping stop parts

Special tools required:

- 12 1 080
- 12 1 081
- 12 1 083

Spare parts for in-car electronics (housing and contacts):

Refer to Service Information:

SI 2 04 07 341

1. Crimping butt connectors and contact sleeves for comb connectors up to 2.5 mm

Refer to Service Information:

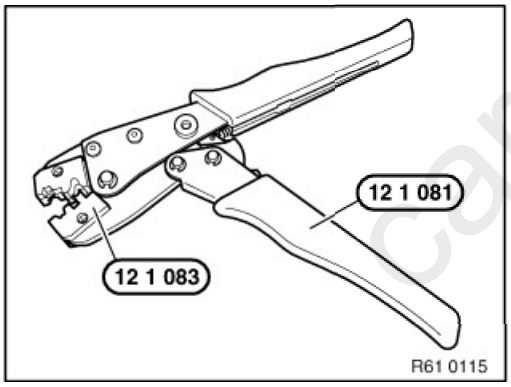
SI 2 04 06 293

2. Crimping butt connectors and contact sleeves for comb connectors larger than 2.5 mm ^{2}

Refer to Service Information:

SI 2 02 05 194

SI 2 07 05 233

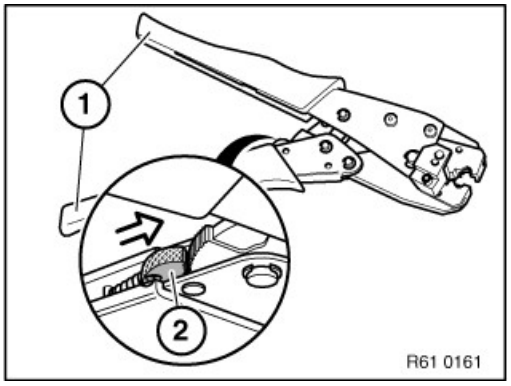


3. Crimping contact sleeves for 4 mm^2 comb connectors and ignition cable contacts

Use special tool kit 12 1 080 to attach ignition cable contacts and crimp 4 mm^2 contact sleeves for comb connectors.

- 12 1 081 (hand pliers)
- 12 1 083 (nest)

See repair instructions
Special tools for wiring harness repairs.



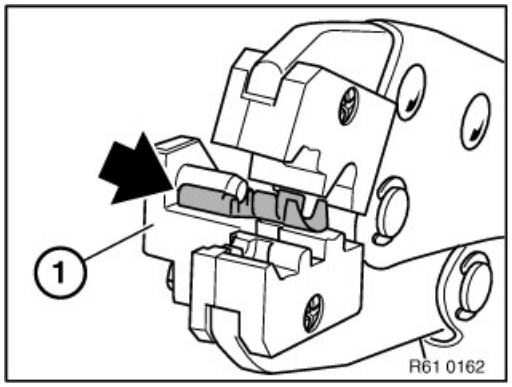
Release special tool 12 1 081 :

Squeeze grips (1) lightly and push release lever (2) in direction of arrow.

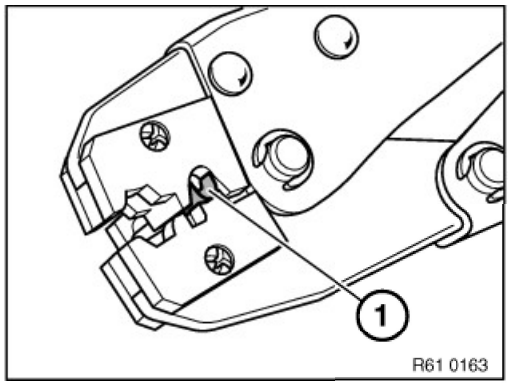
Or:

Compress handles until limit position, hand pliers unlock automatically.

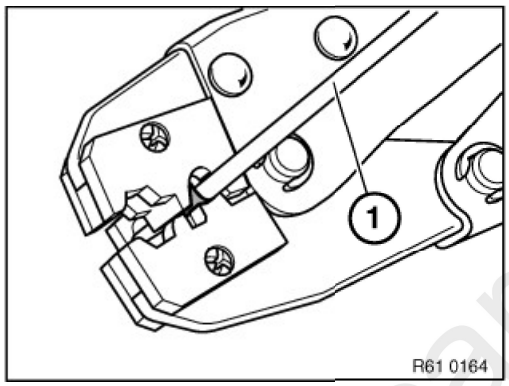
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Place 4 mm^2 contact sleeve in nest with anti-twist safeguard (1) as far as possible.



Preload contact by squeezing matrix in crimping tool. Grip contact (1) firmly only, do not crimp.



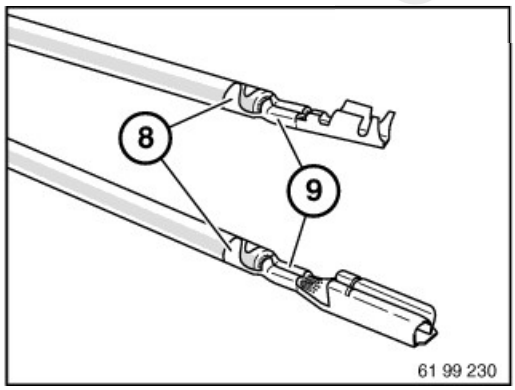
Note:
Follow procedure for cutting and stripping insulation from cables.

Insert stripped end of wire (7) in the contact. Ensure insulation and stripped wire end are correctly laid in contact.

Compress crimping tool to limit position.

Crimping tool unlocks automatically.

Take contact out of crimping tool.

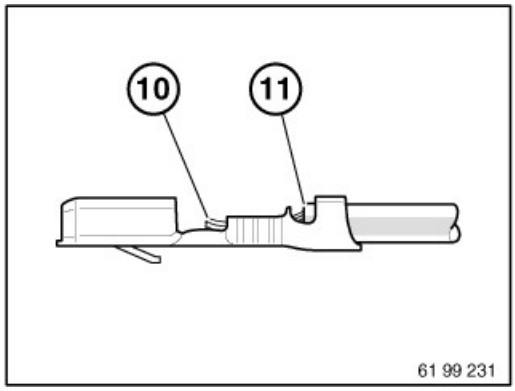


4. Checking crimping

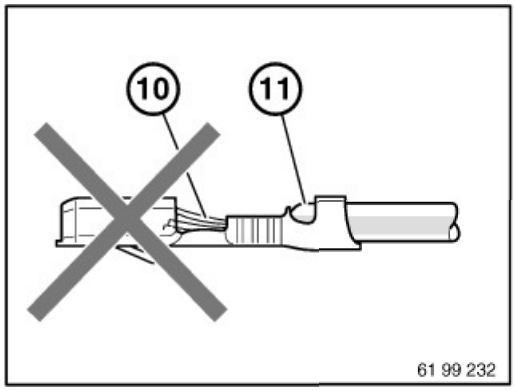
Check insulation crimping (8) and wire crimp (9) against following illustrations to ensure crimps are correctly located.

Note:
Illustration shows butt connectors and contact sleeves for comb connectors knocked on one side. The crimping procedure is identical here.

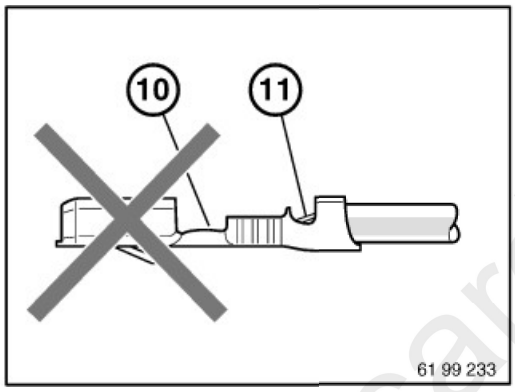
cardiagn.com



Correct crimping:
Visible conductor end (10).
Visible insulation end (11).



Incorrect crimping:
Conductor end (10) inserted too far.
Insulation end (11) in wire crimp.
If necessary, repeat crimping with a new contact.



Incorrect crimping:
Conductor end (10) not visible.
Insulation end (11) not visible.
If necessary, repeat crimping with a new contact.

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61 13 ... Crimping stop parts



Special tools required:

- 0 494 159
- 0 496 849
- 0 496 833
- 2 407 379
- 61 4 320
- 61 4 340
- 61 0 210
- 61 0 220
- 61 0 230



Necessary preliminary work:

- Notes for opening contacts and locks of different connector systems.
- Cutting cables to length and strip insulation

Special tools for wiring harness repair.

New part for vehicle electrical system (stops and housing):

- Sourcing reference: BMW Group Parts
- Refer to Service Information SI 2 04 07 341



1. Crimping of NanoMQS stops (only G11; G12)

Crimping of NanoMQS contacts (MQS).

- Special tool handle 0 494 159 or 0 496 849
- Special tool (die-plate) 0 496 833
- Stripping tool2 407 379



2. Crimping of stops up to 2.5 mm ^{2}

Crimping Micro Quadlock System contacts (MQS).

- Special tool61 4 320

Crimping Micro Power Quadlock contacts (MPQ).

- Special tool61 4 320

Crimping miscellaneous stop parts up to 2.5 mm^2

- Special tool 61 4 340 (up to 03/2010 SWZ 61 4 328)

Refer to Service Information SI 2 04 06 293

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3. Crimping of stops above 2.5 mm ^{2}

Crimping load current contacts (LSK 8).

- Special tool61 0 210

Crimping SLK 2.8.

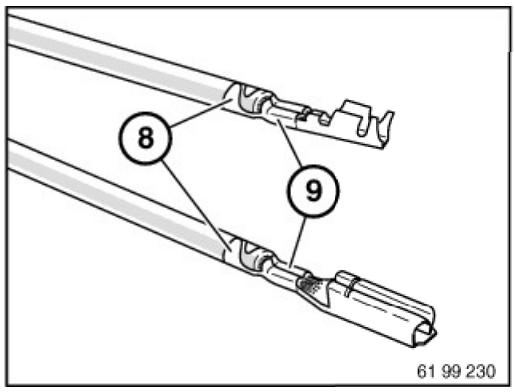
- Special tool61 0 220

Refer to Service Information SI 2 02 05 194

Crimping double spring contact (DFK 40)

Crimping MAK 8

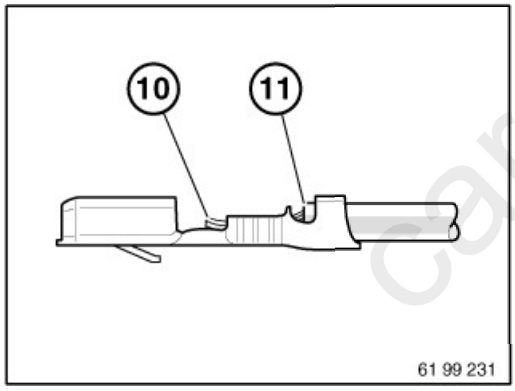
- Special tool61 0 230
- Refer to Service Information SI 2 07 05 233



Checking crimping

Check insulation crimping (8) and wire crimp (9) against following illustrations to ensure crimps are correctly located.

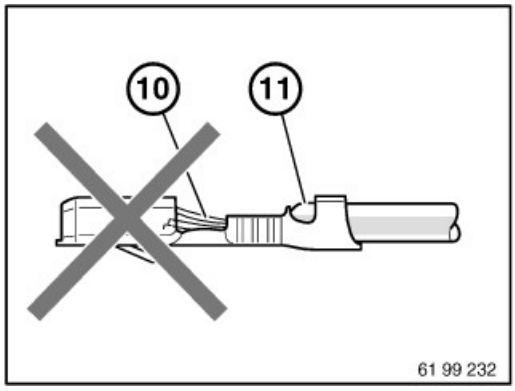
Note:
Illustration shows butt connectors and contact sleeves for comb connectors knocked on one side. The crimping procedure is identical here.



Correct crimping:

Visible conductor end (10).

Visible insulation end (11).



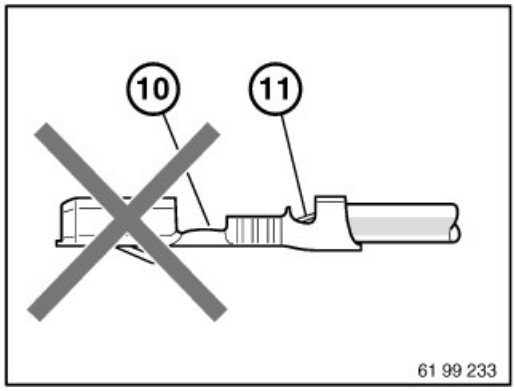
Incorrect crimping:

Conductor end (10) inserted too far.

Insulation end (11) in wire crimp.

If necessary, repeat crimping with a new contact.

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Incorrect crimping:

Conductor end (10) not visible.

Insulation end (11) not visible.

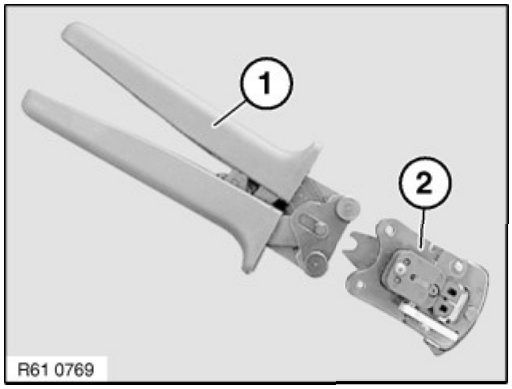
If necessary, repeat crimping with a new contact.

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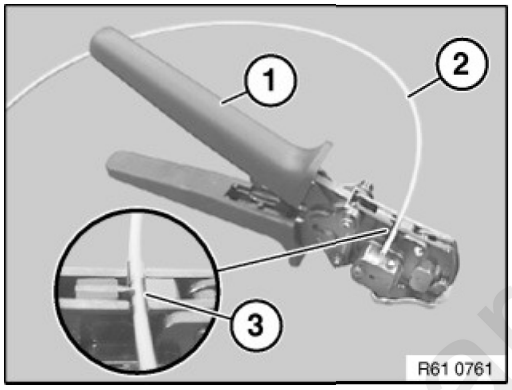
61 13 ... Cutting off, stripping insulation and cutting optical fibres to length

Special tools required:

- 61 4 321
- 61 4 329
- 61 4 320
- 61 4 323



The hand pliers 61 4 321 (1) in connection with the crimping head 61 4 329 (2) from crimp kit 61 4 320 are used for cutting, strip insulation and cutting optical fibres to size.*Note:*
Hand pliers (1) open automatically until limit position when handles are pressed together.

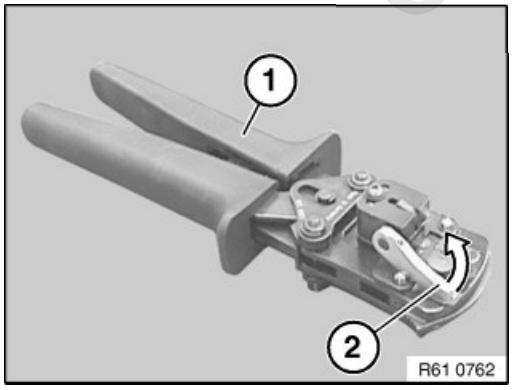


Cutting optical fibre

Open hand pliers (1).

Place optical fibre (2) in cutting device (3).

Close pliers (1) and remove optical fibre (2).

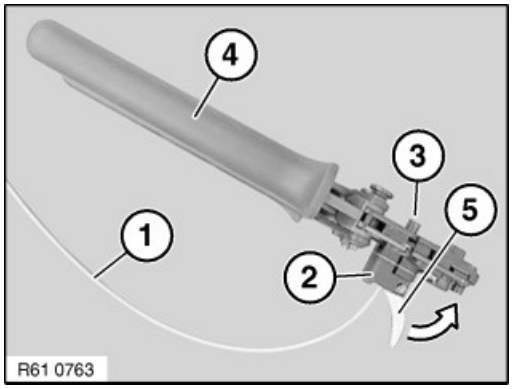


Stripping insulation from optical fibre

Open hand pliers (1).

Open lever (2) in direction of arrow.

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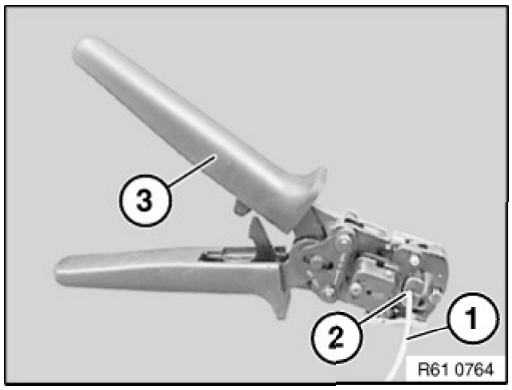
Push the optical fibre (1) into the strip insulation equipment (2) until it is flush in this area (3).

Close hand pliers (4) fully.

Close the operating lever (5) in the direction of the arrow.

Open hand pliers (4) by one tooth notch.

Re-open the operating lever (5) against the direction of the arrow and remove the optical fibre (1).



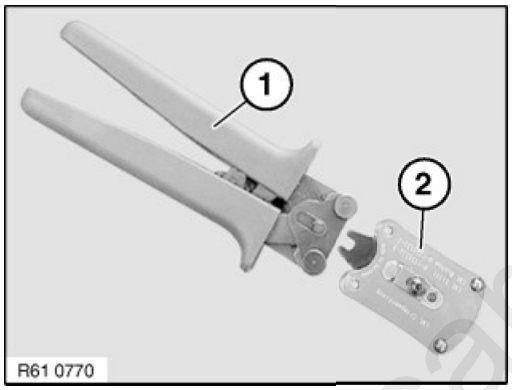
Cutting optical fibre to length

Open hand pliers (3).

Push the optical fibre (1) into the cutting equipment (2) until the insulation of the optical fibre (1) comes into contact with the clamping fixture.

Close hand pliers (3) fully and keep closed.

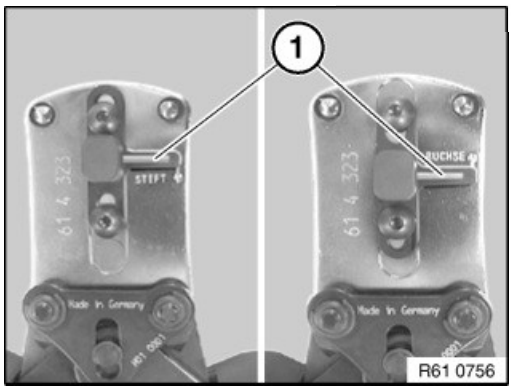
Remove optical fibre (1).



Crimp optical fibre

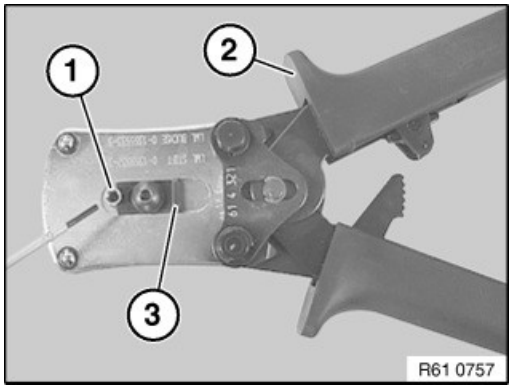
The hand pliers 61 4 321 (1) in connection with the crimping head 61 4 323 (2) from crimping kit 61 4 320 are used for crimping the optical fibres to size.

Note:
Hand pliers (1) open automatically until limit position when handles are pressed together.



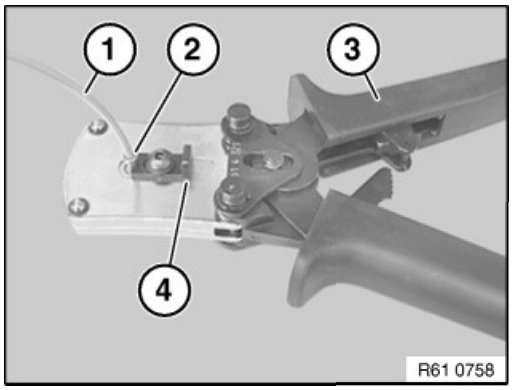
Move contact guide by means of stop lever (1) into corresponding position (pin contact or jack).

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Open hand pliers (2).

Place pin contact or jack (1) in crimping head and secure with locking lever (3).

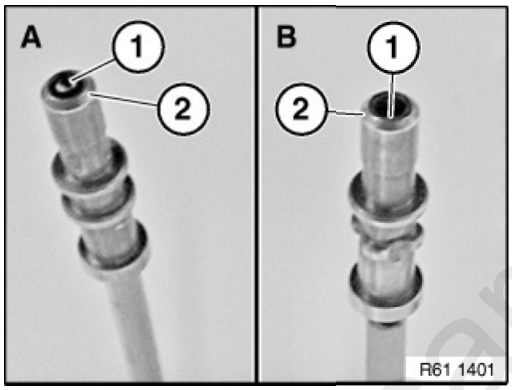


Insert stripped optical fibre(1) until limit position into pin contact or jack (2).

Close hand pliers (3) fully.

Open hand pliers (3) and locking lever (4).

Remove optical fibre (1).



Caution!

Make sure optical fibre is correctly seated in jack.

Right (A)

End of optical fibre (1) must be flush with tip of pin contact (2).

Wrong (B)

End of optical fibre (1) is not flush with tip of pin contact (2).

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61 13 ... Cutting to length and stripping insulation from cables

For cutting cables to length and stripping insulation, refer to Service Information:

SI 2 07 11 721

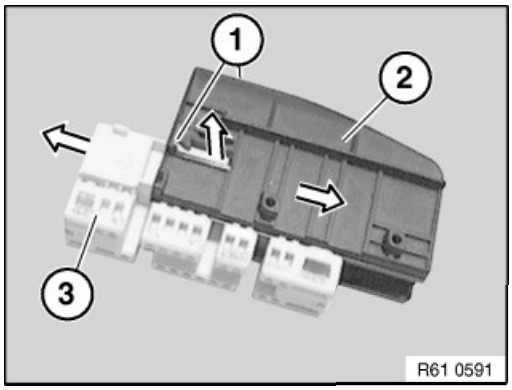
Stripped length:

Wire cross-section (mm2)	Stripped length (mm)
0,35 ... 0,50	4,0
0,75 ... 1,00	4,5
1,00 ... 2,50	5,0

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Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)

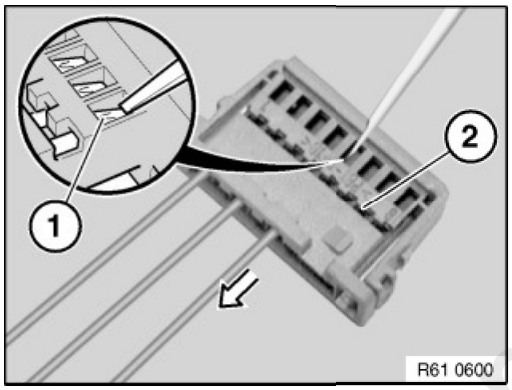


Socket housing:

Press locks (1) on protective cap (2) upwards on both sides.

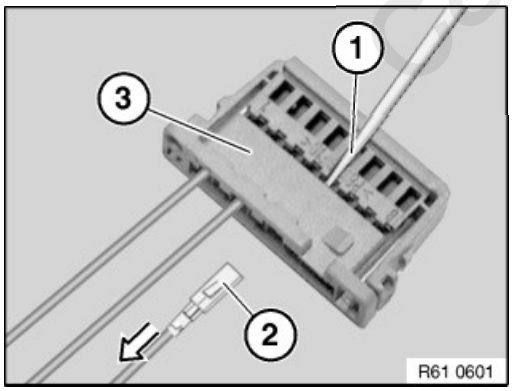
Detach protective cap from contact carrier (3).

Note:
Detaching the protective cap releases the secondary locks of the socket contacts.



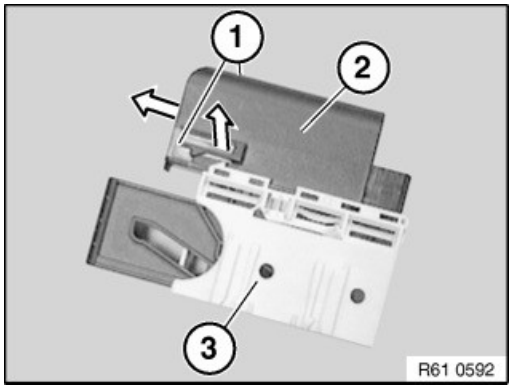
Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



Hold down retaining hook in secondary lock (1) again and pull cable with socket contact (2) completely out of contact carrier (3).

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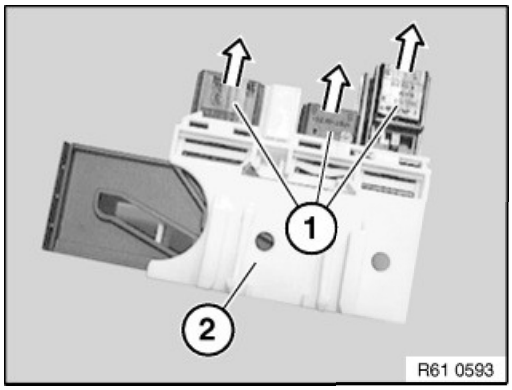


Pin housing:

Press locks (1) on protective cap (2) upwards on both sides.

Detach protective cap from housing carrier (3).

Note:
Detaching the protective cap releases the secondary locks of the pin contacts in the contact carriers.



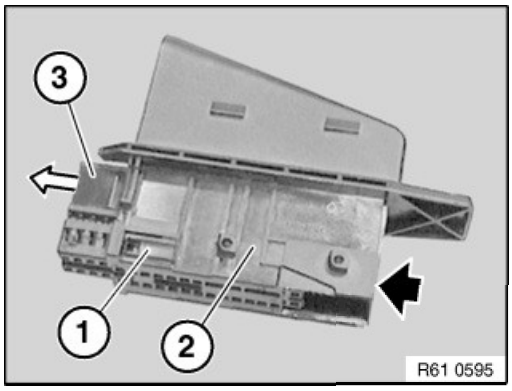
Pull contact carrier (1) out of housing carrier (2).

The pin contacts are pulled out of a contact carrier as described under ”Socket housing”.

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Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)

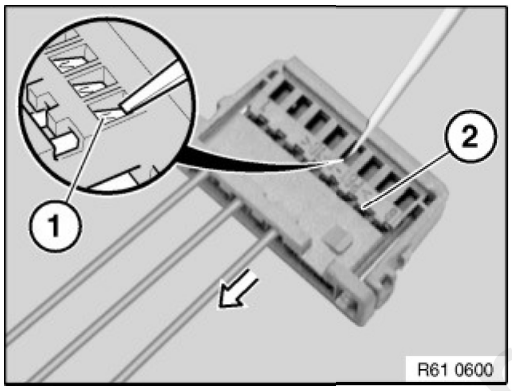


Socket housing:

Raise lock (1) on housing (2).

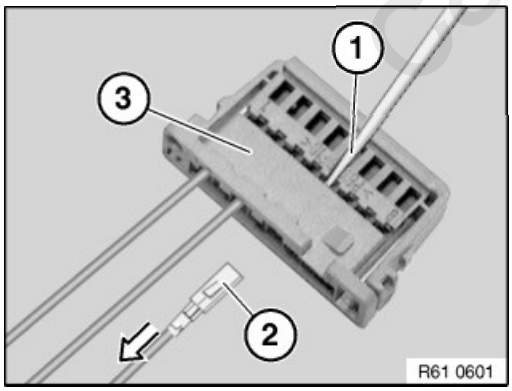
Push contact carrier (3) out of housing (2).

Note:
Pushing out the contact carrier releases the secondary locks of the socket contacts.



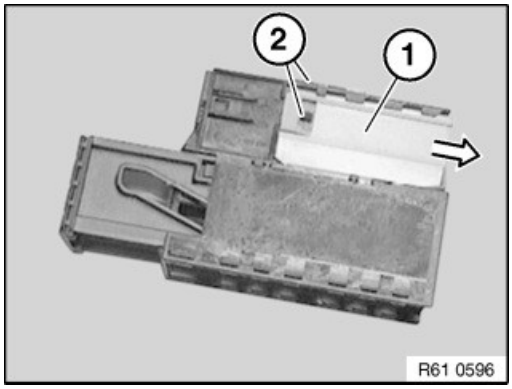
Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



Hold down retaining hook in secondary lock (1) again and pull cable with socket contact (2) completely out of contact carrier (3).

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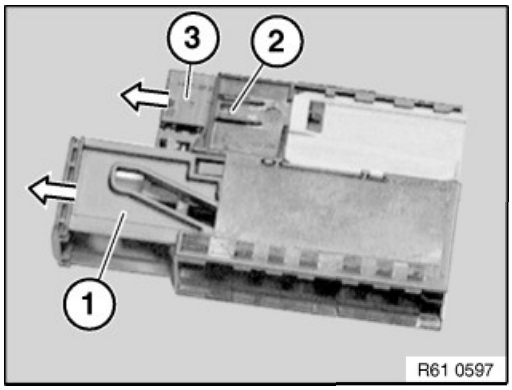


Pin housing:

Contacts 1 ... 13 and 19 ... 27:

Raise locking slide (1) on both sides (2) of housing and detach.

Note:
Detaching the locking slide releases the secondary locks of the pin contacts.



Contacts 14 ... 18 and 28 ... 30:

Pull slide (1) outwards completely.

Raise lock (2) on housing.

Pull contact carrier (3) out of housing.

Note:
Pulling out the contact carrier releases the secondary locks of the pin contacts.

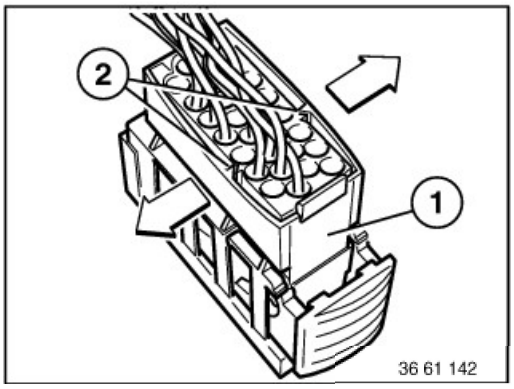
The pin contacts are pulled out of a contact carrier as described under ”Socket housing”.

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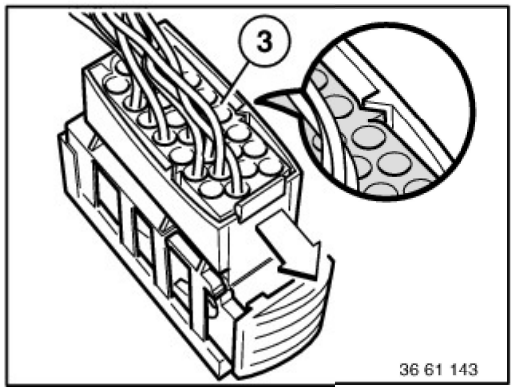
61 13 ... In-line connectors, 30-pin, System D2.5

Special tools required:

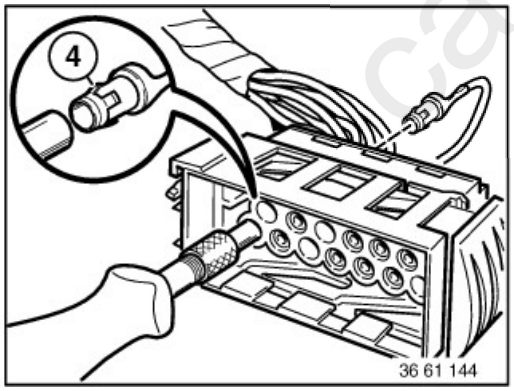
- 61 0 303



Carefully pull external connector (1) in area of retaining lugs (2) apart slightly.



Pull internal connector (3) until limit position in direction of arrow.



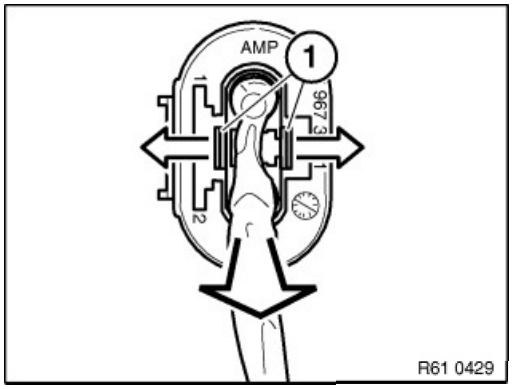
With special tool 61 0 303 press back retaining hook(4) of corresponding contact and pull out cable with contact.

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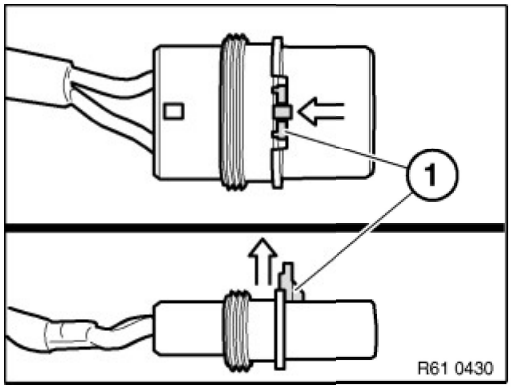
61 13 ... In-line plugs, 2-pin, System JPT ELA

Special tools required:

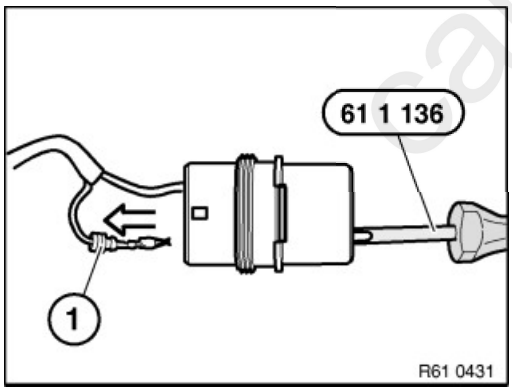
- 61 0 316



Press lock (1) in direction of arrow and slide connector forward.



Press lock (1) downward and slide out to one side.



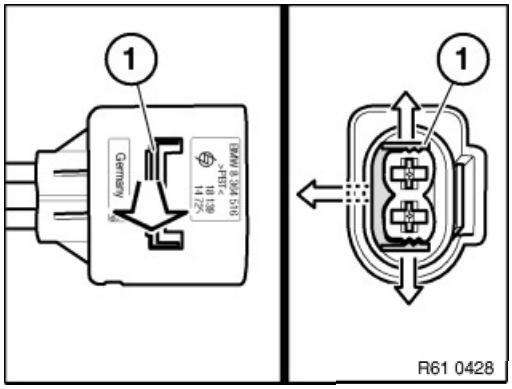
With special tool 61 0 316 (61 1 136), unlock contact and pull out cable with contact (1) towards rear.

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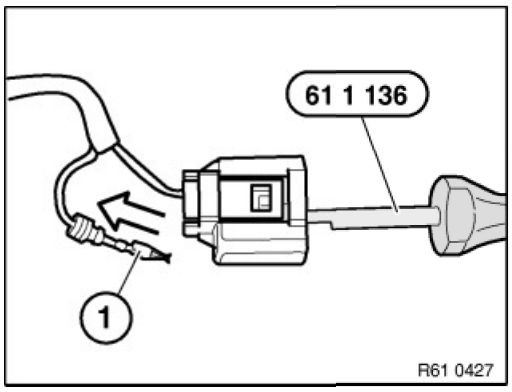
61 13 ... In-line plugs, 2-pin, System MDK 3 plus 2.8

Special tools required:

- 61 0 316



Unlock lock (1) on outside at retaining hook and slide out lock (1) to side.



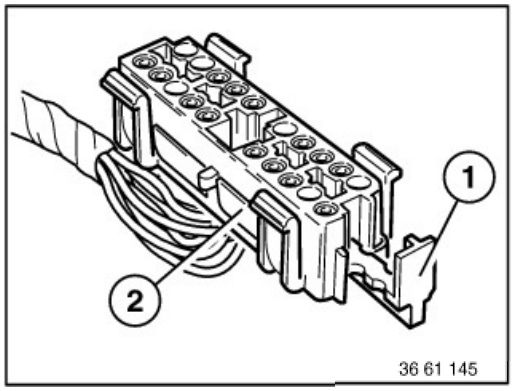
With special tool 61 0 316 (61 1 136), unlock contact and pull out cable with contact (1) towards rear.

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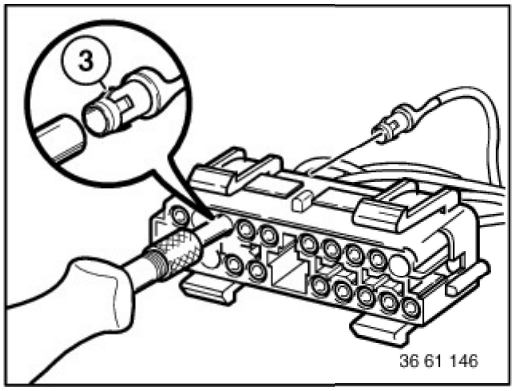
61 13 ... In-line plugs, 20-pin, System D2.5

Special tools required:

- 61 0 303



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



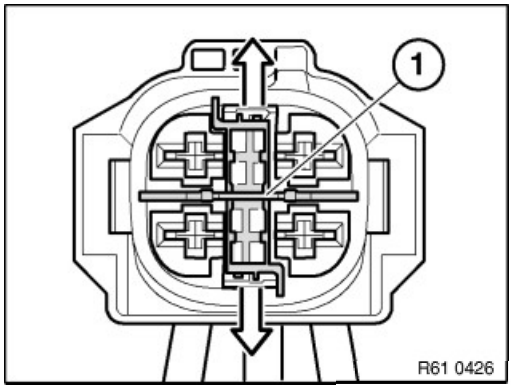
With special tool 61 0 303 , press down retaining hook (3) of corresponding contact and pull out cable with contact.

cardiagn.com

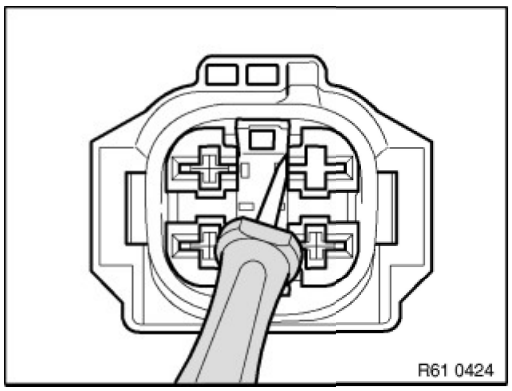
61 13 ... In-line plugs, 4-pin, System DFK ELA

Special tools required:

- 61 0 316

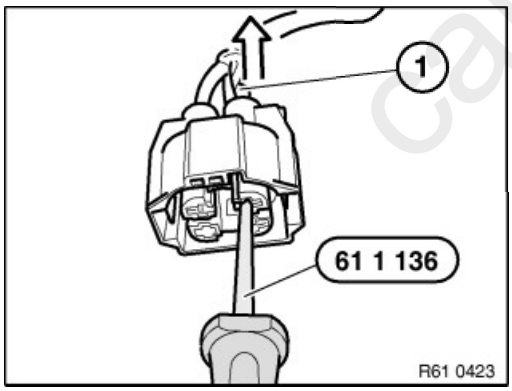


Press retaining hook in direction of arrow and remove lock (1).



Installation notes:

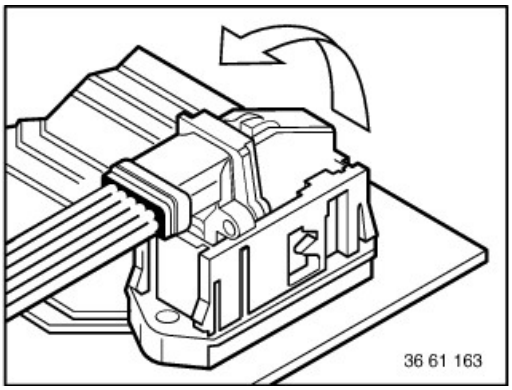
If necessary, side lock must also be unlocked with screwdriver.



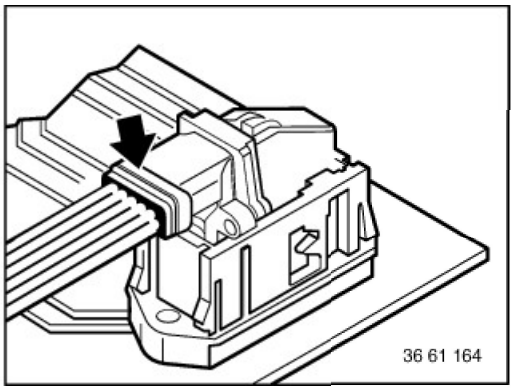
With special tool 61 0 316 (61 1 136), unlock contact and pull out cable with contact (1) towards rear.

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61 13 ... In-line plugs, 6- to 50-pin, System Elo

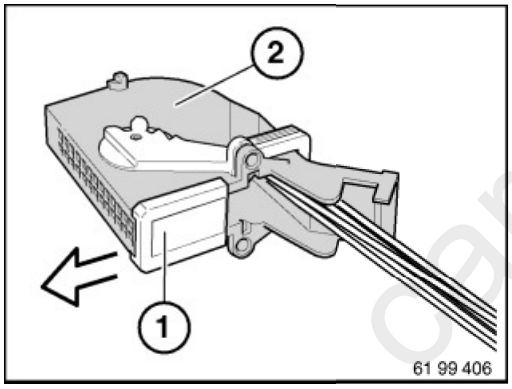


Open lock.

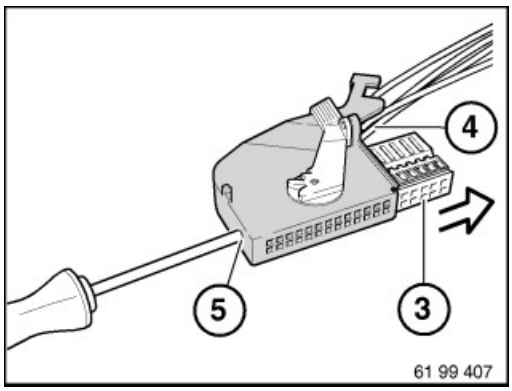


Detach cable strap.

Installation note:
Cable strap must be reinstalled.

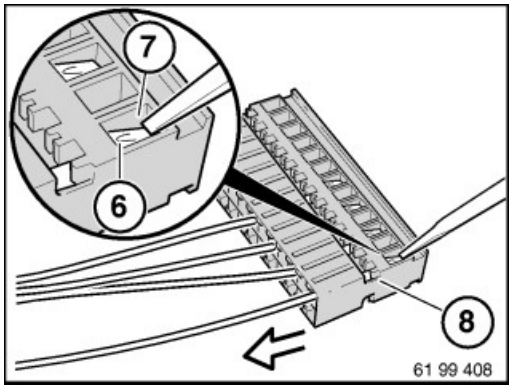


Detach catch (1) from connector housing (2).

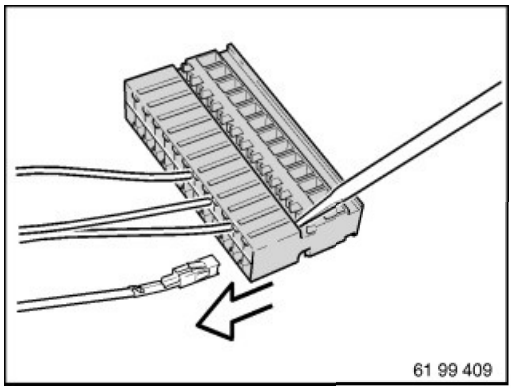


Press out contact carrier (3) with wiring harness (4) through opening (5).

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Hold down retaining hook (6) of defective contact and pull cable and contact up to secondary lock (8).



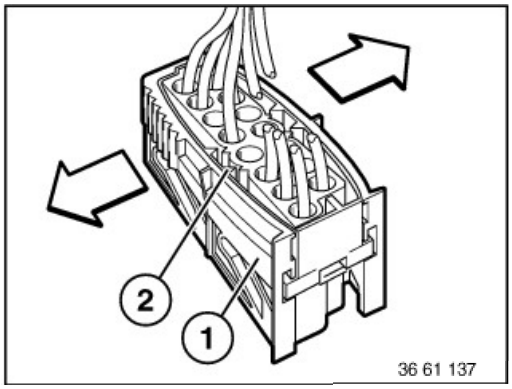
Hold down retaining hook once again in secondary lock (8) and pull cable and contact completely out of contact carrier.

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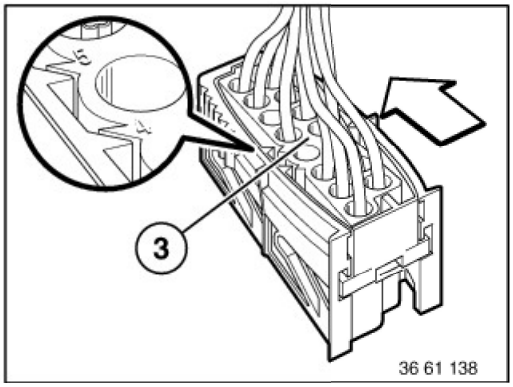
61 13 ... Inline connectors, 15-pin, System D2.5

Special tools required:

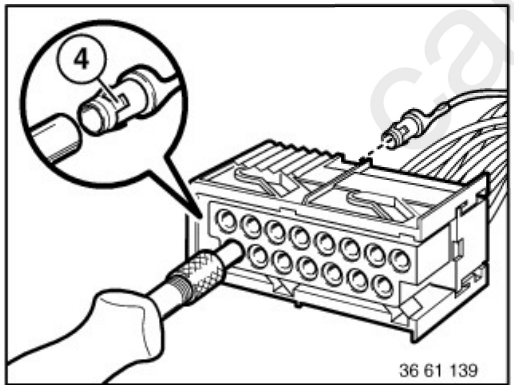
- 61 0 303



Carefully pull external connector (1) in area of retaining lugs (2) apart slightly.



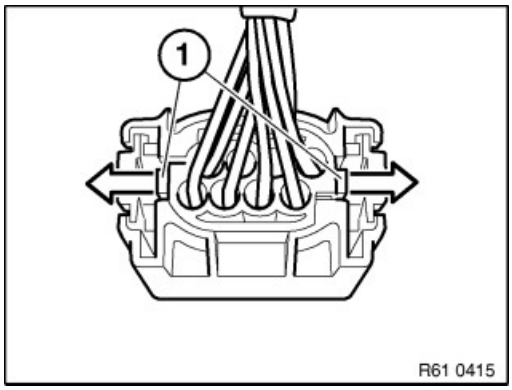
Pull internal connector (3) until limit position in direction of arrow.



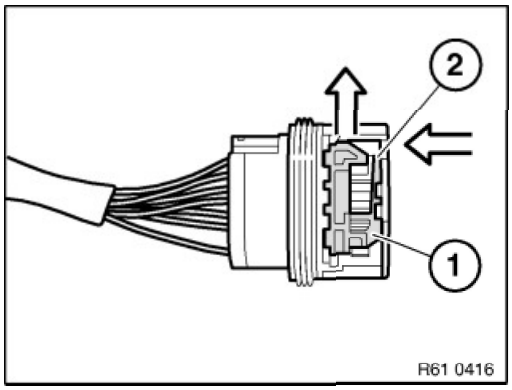
With special tool 61 0 303 press back retaining hook(4) of corresponding contact and pull out cable with contact.

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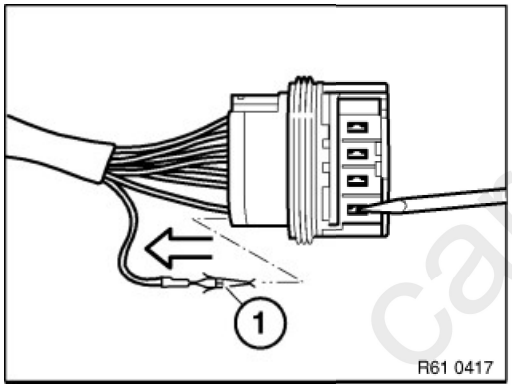
61 13 ... Inline connectors, 6-, 8-pin, System MQS



Press lock (1) in direction of arrow and slide connector forward.



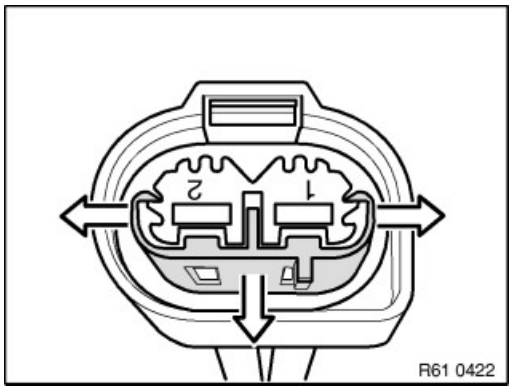
Press locking hook (2) downward and slide lock (1) out.



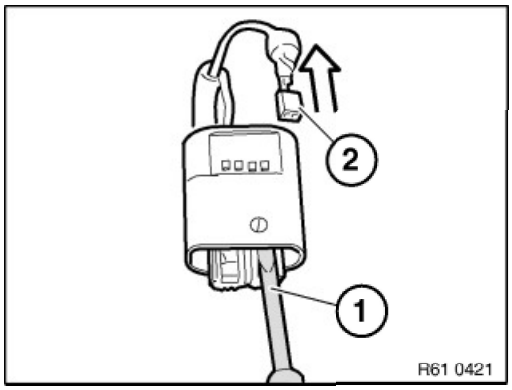
Press down retaining hook (1) with screwdriver and pull out cable with contact towards rear.

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61 13 ... Inline plugs, 2-pin, System MPQ 2.8



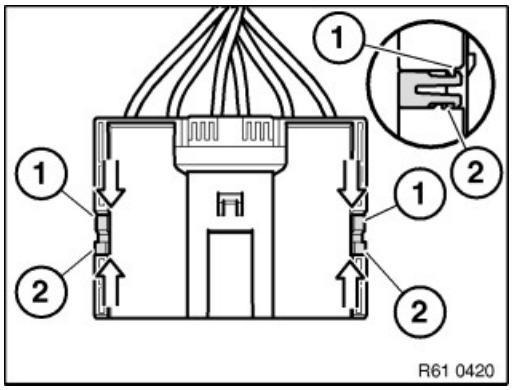
Press catch on outside in direction of arrow and remove towards top.



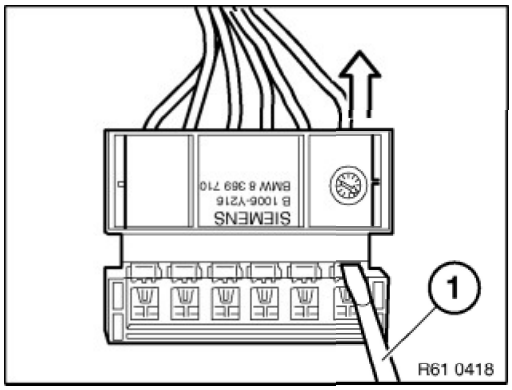
Press down retaining hook (1) with screwdriver and pull out cable and contact (2) towards rear.

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61 13 ... Inline plugs, 3-, 6-pin, System Elo-Power 2.8



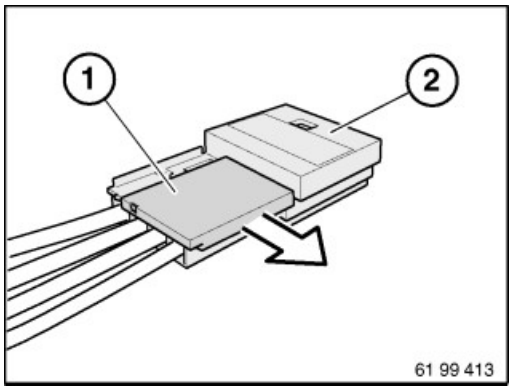
Press locking hook (1) in direction of arrow and disengage. Then unlock locking hook (2) and remove lock.



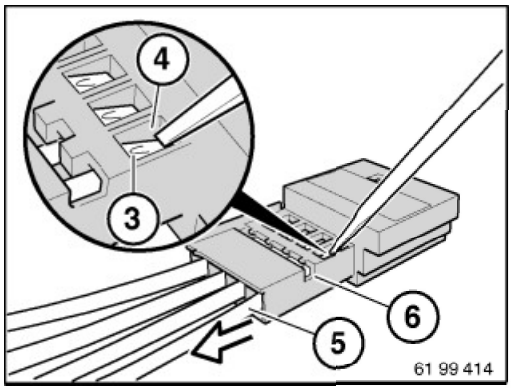
Press down retaining hook with screwdriver (1) and pull out cable with contact towards rear.

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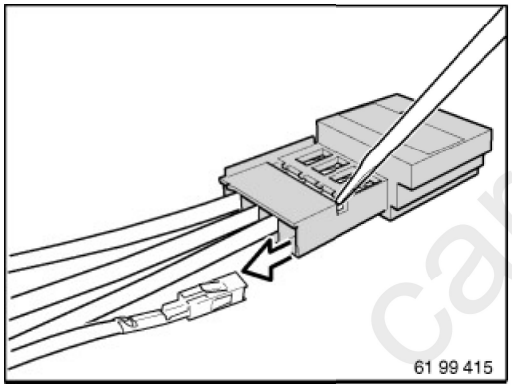
61 13 ... Inline plugs, 4-, 10-pin, System Elo



Detach fastener (1) from contact carrier (2).



Hold down retaining hook (3) of defective contact and pull cable and contact up to secondary lock (6).



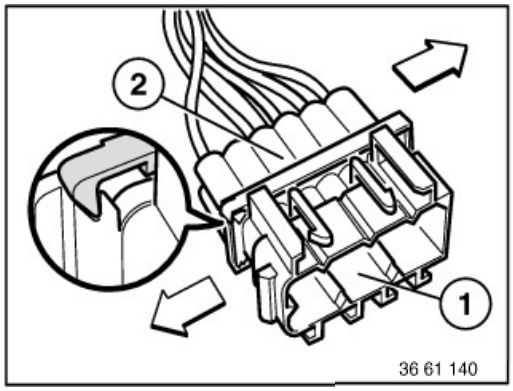
Hold down retaining hook once again in secondary lock and pull cable and contact completely out of contact carrier.

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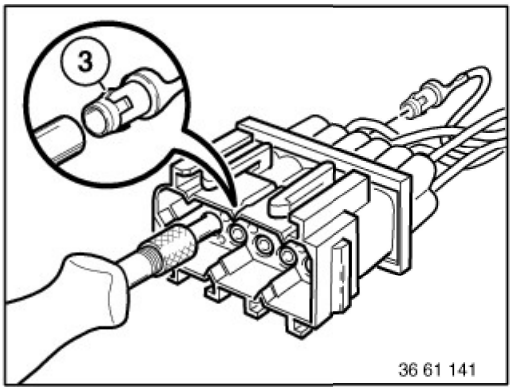
61 13 ... Inline plugs, 8-, 12-pin, System D2.5

Special tools required:

- 61 0 303



Move upper section of connector (1) and lower section of connector (2) against each other in direction of arrow.



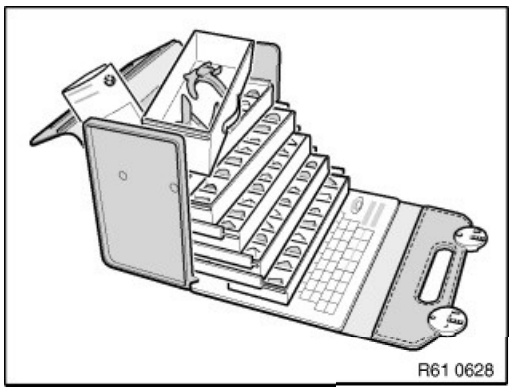
With special tool 61 0 303 , press down retaining hook (3) of corresponding contact and pull out cable with contact.

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61 13 ... Installing comb connector for retrofitting/repairs

Special tools required:

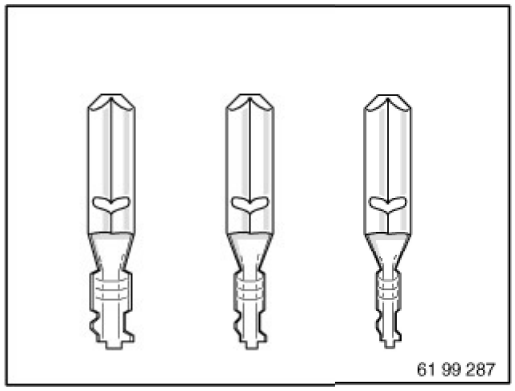
- 61 9 041
- 61 9 042



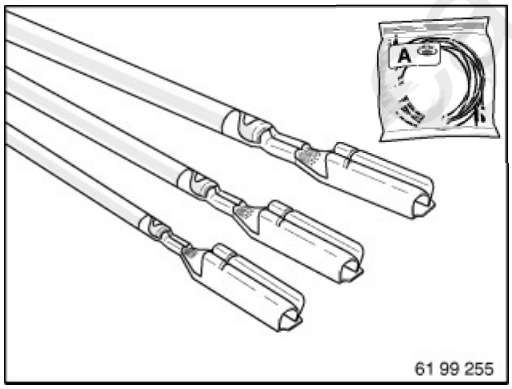
Note:
The repair range IV for vehicle electrical system contained the required special tools and individual parts for retrofitting and repair work with the aid of fan connectors.

The case can no longer be ordered. Order individual parts for wiring harness repair through BMW Parts Department.

- Refer to Service Information:
  SI 02 04 07 341



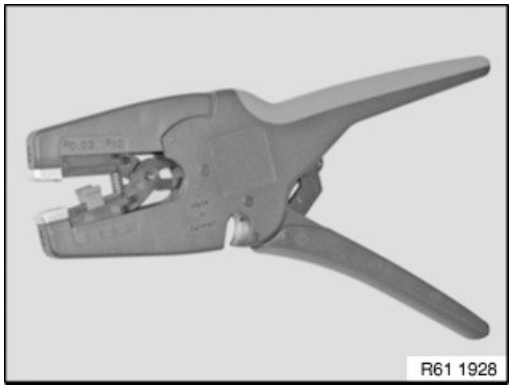
Choose contact sleeve (up to 4 mm^2) in accordance with wire cross-section.



Alternatively:

Choose contact sleeves (up to 2.5 mm^2) or comb connectors.

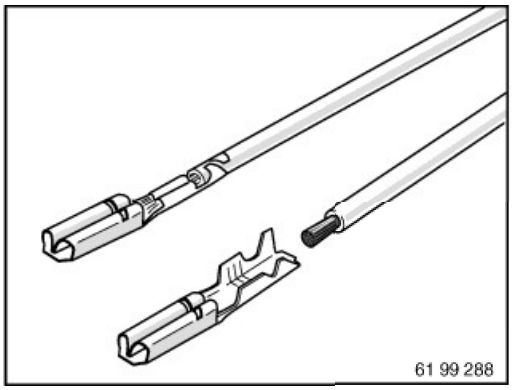
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Cut through wire loop in wiring harness at established point.

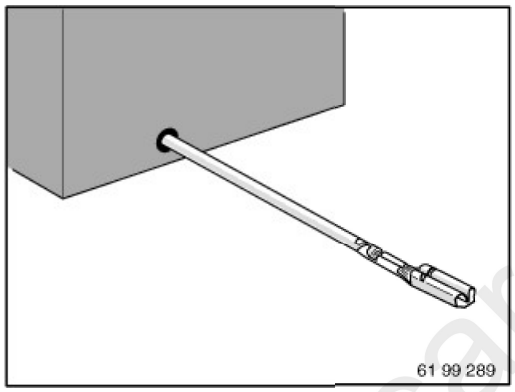
Strip insulation from both wire ends.

See repair instructions
Cutting to length and stripping insulation from cables

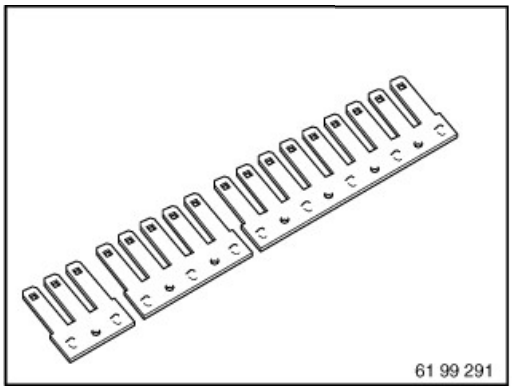


Crimp contact sleeves on both wire ends.*See repair instructions*
Crimping on stop parts

Note:
If using repair kit for contact sleeves, refer to repair instructions:
Butt connector for repairing a plug connection.

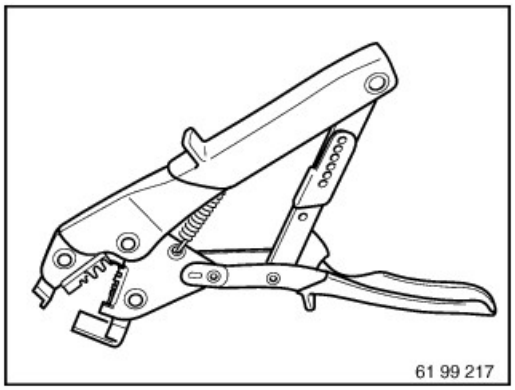


Crimp connecting cable for retrofitting likewise with contact sleeve.

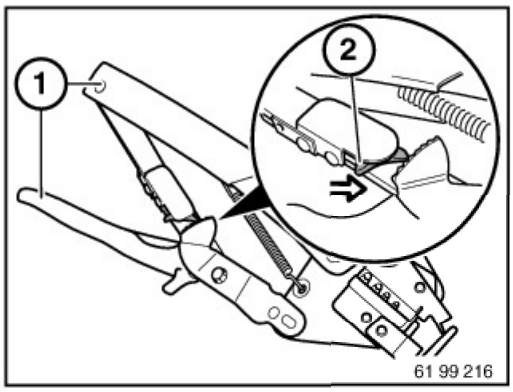


Cut required number of poles to length for comb connectors.

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Special tool 61 9 041 (hand pliers) in conjunction with 61 9 042 (matrix) are used for pushing contact sleeves onto comb connectors.*See repair instructions*
Special tools for wiring harness repairs.

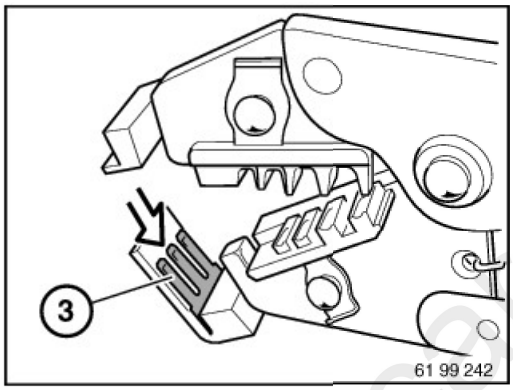


Unlock special tool 61 9 041 :

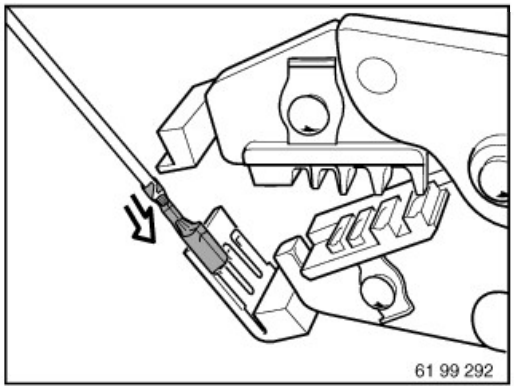
Squeeze grips (1) lightly and push release lever (2) in direction of arrow.

Or:

Compress handles until limit position, hand pliers unlock automatically.

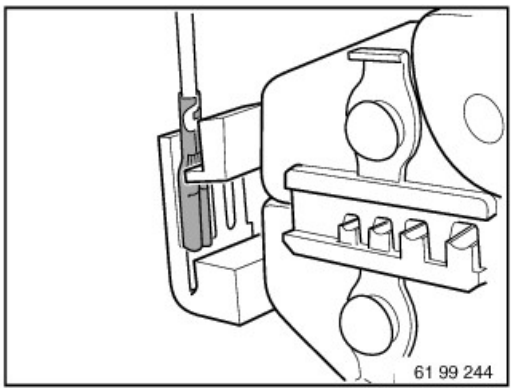


Insert prepared comb connectors (3) in special tool 61 9 041 / 61 9 042 .

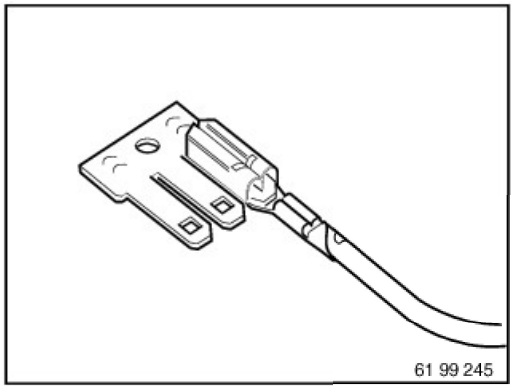


Attach wire with contact sleeve to comb connector.

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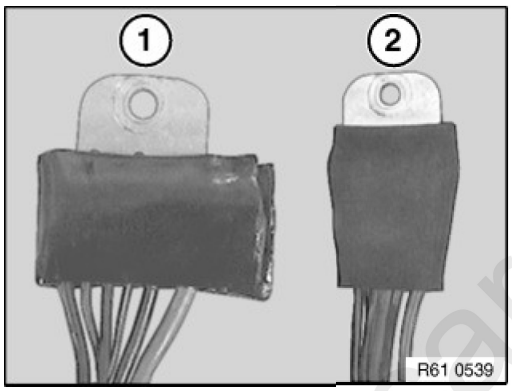
Press hand pliers together and slide on contact sleeve until limit position.



Attention!

Once contact sleeves have been pushed on, they should not be detached again from the comb connector or reused.

Push on further contact sleeves for potential branching.



Installation in wet area (engine compartment, wheel arch):

Apply sealing compound on both sides and press into contacts (1).

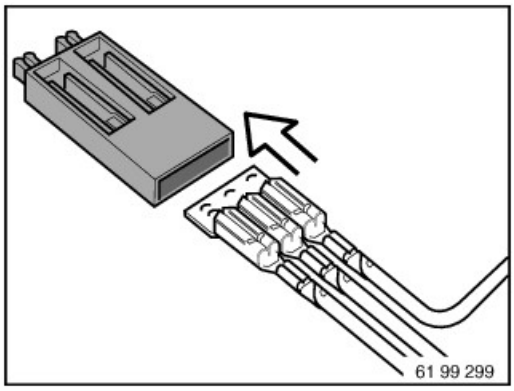
Fit heat-shrink tubing and heat up with hot air blower (2) (approx. 250 °C).

Note:
Ensure that comb connector has sufficient contact surface on attachment point.

Do not heat-shrink tubing on edges of comb connector too strongly, risk of cracking.

Allow heat-shrink tubing to cool down until hand-warm. Then press sealing material again into contacts and onto edges of comb connector.

If necessary, carefully heat-shrink tubing again.



Installation in dry area (interior, luggage compartment):

Slide assembled comb connector into insulation housing until it locks into place.

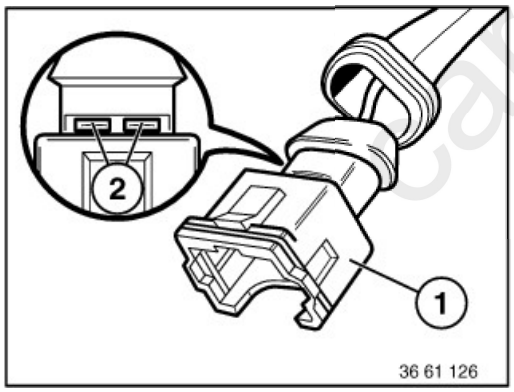
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61 13 ... Notes for opening contacts and locks of different plug contact systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
LSK	Load current contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded connectors (1).

Ultrasonically welded connectors (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool sets:

- Unlocking and pressing-off tool 61 1 150

  is replaced as of 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and pressing-off tool 61 1 100 (engine)

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Repair instructions for opening connector housings and removing contacts of different connector systems:

Connector system D 1.5/D 2.5:

- Circular connectors, 7- or 8-pin, system D 2.5
- Circular connectors, 13-pin, system D 2.5
- Circular connectors, 20-pin, system D 2.5
- Circular connectors, 4-, 7-, 10-, 12- or 25-pin, system D 1.5/D 2.5
- In-line connectors, 15-pin, system D 2.5
- In-line connectors, 8-, 12-pin, system D 2.5
- In-line connectors, 30-pin, system D 2.5
- In-line connectors, 20-pin, system D 2.5

Connector system JPT/MDK/DFK:

- In-line connectors, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3 plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Connector system Elo/Elo Power:

- Inline plugs, 4-, 10-pin, System Elo
- In-line connectors, 6- to 50-pin, System Elo
- Inline plugs, 3-, 6-pin, System Elo-Power 2.8

Connector system LSK:

- Connector housing LSK contact

Connector system MQS/MPQ:

- Inline connectors, 6-, 8-pin, System MQS
- Inline plugs, 2-pin, System MPQ 2.8
- Control unit connectors, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo Power
- In-line connectors, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio connector), Hybrid System MQS/MPQ

For connector contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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61 00 ... Notes on handling optical fibres



Important!

To avoid damage when handling optical fibres, comply with the following points:

- The minimum permitted bending radius is 25 mm
- Do not subject optical fibres to compressive and tensile load
- Protect optical fibres against the effects of heat ≥85 °C (e.g. during welding work, drying work with infrared beams or hot air blower)
- Fibre-optic cables are permitted to show only one junction point (bridge), replace fibre-optic cables if necessary



Note:
The optical fibres are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibre
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibre
- Orange=repair fibre-optic cables

Follow notes for processing cables and optical fibres.

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61 00 ... Notes on handling wiring harnesses and cables

The following applies in general:

To avoid damage, observe the following instructions:

- Avoid compressive and tensile loads
- To ensure professional repairs, perform repair work only with BMW-approved or recommended special tools and spare parts
- Make sure cables are laid without kinks or abrasions
- Ensure non-contacting routing at sharp-edged body parts; use edge protection if necessary
- Secure additionally laid cables/leads with cable ties

The following additionally applies:

Shielded lines

Interference radiation and interference resistance can lead to neutral zones at contact points in the shielding. Consequently, distinctions have to be drawn between the following types:

Coaxial lines

- Shielded coaxial cables RTK031 may only be repaired with a special crimping tool.
- For aerial lines only the bushing contact may be repaired.
- RG174 Lines and the bushing contact may not be repaired.

CVBS lines

- CVBS cables may not be repaired.
- CVBS cables must be replaced in their entirety.

HSD lines

- HSD cables may not be repaired.
- HSD cables must be replaced in their entirety.

Optical fibre cable:

Note:
Fibre-optic cables are coloured differently as follows:

- Green = **MOST** (**M**edia **O**riented **S**ystems **T**ransport) optical fibres
- Yellow = **ISIS** (**I**ntelligent **S**afety and **I**ntegration **S**ystem) optical fibres
- Orange=repair fibre-optic cables

Attention!

- Optical fibres are permitted to show only one junction point (bridge). Replace optical fibres if necessary
- Smallest permissible bending radius is 25 mm
- Avoid effects of heat ≥ 85 °

Treating cables and fibre-optic cables

FlexRay (twisted cables):

It is possible to repair the FlexRay. In the event of damage, the cables can be joined with conventional butt connectors and heat-shrink tubing.

Note:

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- FlexRay lines may only reveal one separation point (bride); renew complete line if necessary.
- If possible, maintain twisted cable after repair.
- After repairs, twist cables as close as possible to the connector/separation point.
- Twisting must be as symmetrical as possible.

Airbag lines:

Repairing airbag cables

Ribbon cables:

Repairing ribbon cables

Replacing wiring harnesses

Repair wiring harnesses mainly cover the full equipment of the vehicle. If certain optional equipment is not installed in the vehicle, note the following:

- If necessary, secure the remaining connectors.
- If necessary, seal the remaining connectors outside the vehicle interior, for example, with butyl tape in such a way that moisture ingress can be eliminated permanently.
- If necessary, repin the connector of the repair wiring harness.

Note:
Repair wiring harnesses can be equipped with an **additional socket housing** (30-pin, for example), **which was not provided on the previous vehicle-side wiring harness**. This socket housing also cannot be found in the wiring diagram.

Procedure

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **in the vehicle interior** (in the footwell, for example):

- Cut the additional socket housing and connect the lines to the vehicle-side wiring harness using a butt connector.
- Alternatively, a suitable pin housing can be fitted on the vehicle-side wiring harness and connected to the additional socket housing.

  However, this is permitted only if the following conditions are met:
  - Carpets must not protrude visibly or become deformed due to the installation of the additional plug connection.
  - It must be possible to install the adjacent components (for example, trims, trim panels, etc.) correctly after installing the additional plug connection.
  - All the attachment points of the adjacent components (for example, trims, trim panels, etc.) must engage correctly.
  - There must be no rattling noise due to the installation of the additional plug connection.
  - The additional plug connection must not damage the adjacent components/wiring harnesses, etc..

The separation point between the vehicle-side wiring harness and the repair wiring harness is located **outside the vehicle interior** (in the wheel arch, for example):

- Cut the additional socket housing and connect the lines to the vehicle-

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side wiring harness using a butt connector.

- **Using the additional socket housing is not permitted with a separation point outside the vehicle interior.**

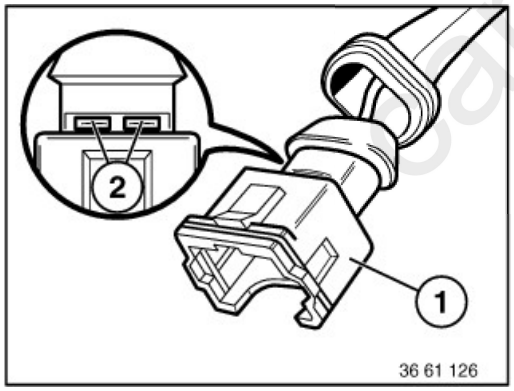
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61 13 ... Opening plug housings and removing contacts of different plug systems

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100
- 61 1 150

Abbreviations of contacts and what they mean:	
ELA	**Strand seal**
D 1.5 / 2.5 / 3.5	**Round contacts with 1.5 mm, 2.5 mm or 3.5 mm diameter**
MDK	**Miniature double flat spring contact**
JPT	Junior Power timer
DFK	Double flat spring contacts
Elo	Electronic contacts
Elo Power	Electronic contacts for heavy load
MQS	Micro Quadlock system
MPQ	Micro Power Quadlock
MLK	Mini laminated contact
SLK	Sensor laminated contact
MLK	Mini laminated contact
Mcon	Multi contact



Important!

The contacts can be changed on ultrasonically welded plugs (1).

Ultrasonically welded plugs (1) must be replaced completely.

Ultrasonic-welded connectors (1) can be identified by the welds (2) on their longitudinal side.

Note:

Special tools referred to in the repair instructions below are contained in the following special tool kits:

- Release and press-out tool 61 1 150
  is replaced from 09/2005 by 61 0 300 (BMW) and 61 0 400 (MINI)
- Release and press-out tool 61 1 100 (engine)

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Repair instructions for opening plug housings and removing contacts of different plug systems:

Plug system D 1.5/D 2.5:

- Circular plugs, 7-, 8-pin, System D 2.5
- Circular plugs, 13-pin, System D 2.5
- Circular plugs, 20-pin, System D 2.5
- Circular plugs, 4-, 7-, 10-, 12-, 25-pin, System D 1.5/D 2.5
- In-line plugs, 15-pin, System D 2.5
- In-line plugs, 8-, 12-pin, System D 2.5
- In-line plugs, 30-pin, System D 2.5
- In-line plugs, 20-pin, System D 2.5

Plug system JPT/MDK/DFK:

- In-line plugs, 2-pin, System JPT ELA
- In-line plugs, 2-pin, System MDK 3plus 2.8
- In-line plugs, 4-pin, System DFK ELA

Plug system Elo/Elo-Power:

- In-line plugs, 4-, 10-pin, System Elo
- In-line plugs, 6- to 50-pin, System Elo
- In-line plugs, 3-, 6-pin, System Elo-Power 2.8

Plug system MQS/MPQ:

- In-line plugs, 6-, 8-pin, System MQS
- In-line plugs, 2-pin, System MPQ 2.8
- Control unit plugs, 25-, 35-, 55-, 83-, 88-pin
- In-line plugs, 24-pin, Hybrid System MQS/MPQ
- Socket housing 42-, 43-pin, Hybrid System MQS / MPQ
- Socket housings 2x21-, 2x27-pin, Hybrid System MQS/MPQ, Elo/Elo-Power
- In-line plugs, 30-pin, Hybrid System MQS/MPQ
- Socket housings, 5-, 8-pin, System MQS/MPQ
- Socket housing (radio plug), Hybrid System MQS/MPQ

For plug contact systems not listed, refer to Service Information:

SI 2 05 05 217

SI 2 05 06 294

SI 2 03 08 440

SI 2 08 06 312

SI 2 02 08 439

SI 2 01 08 438

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61 42 ... Removing and installing control unit holder

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Necessary preliminary tasks:

For F30; F32; F35; F80; F82:

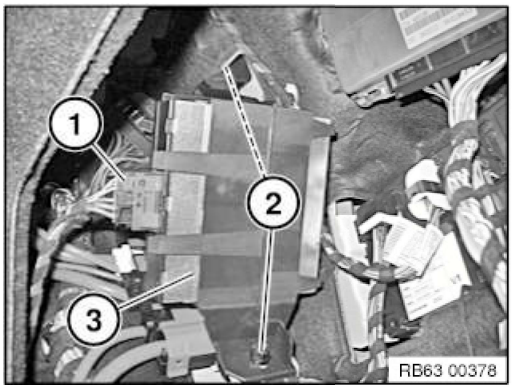
- Open flap in luggage compartment panel on right

F31For:

- Remove battery cover

For F34; F36:

- Remove luggage compartment trim on side panel on right



Release plug connections (1) on all control units.

Release nuts (2) and remove control unit holder (3).

Installation note:
Ensure that the plug connections (1) are correctly seated.

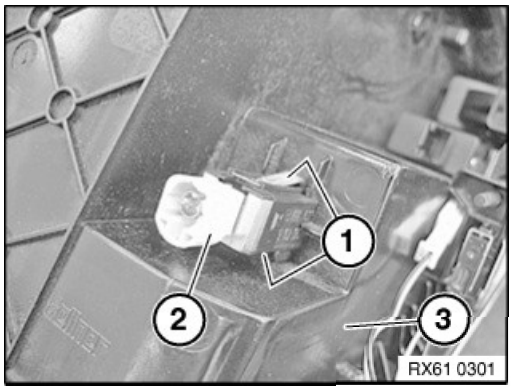
Ensure that the control unit holder (3) is correctly seated.

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61 31 137 Removing and installing/renewing USB interface connecting socket

Necessary preliminary tasks:

- Remove glove box with housing



Note:
Similar to graphic.

Release retaining clamps (1).

Push USB interface connecting socket (2) to the front from glove box (3).

Installation note:
Retaining clips (1) must not be damaged.

Make sure USB interface connecting socket (2) is correctly seated.

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61 14 005 Removing and installing/replacing distribution box (front)

Special tools required:

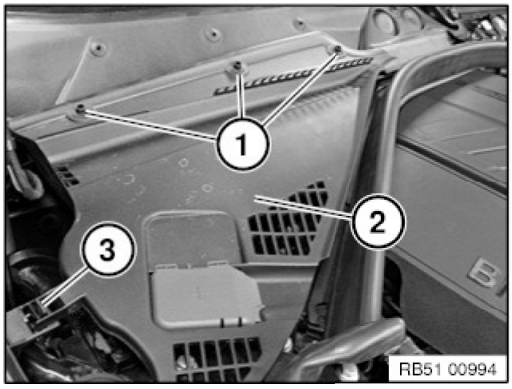
- 00 9 325

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

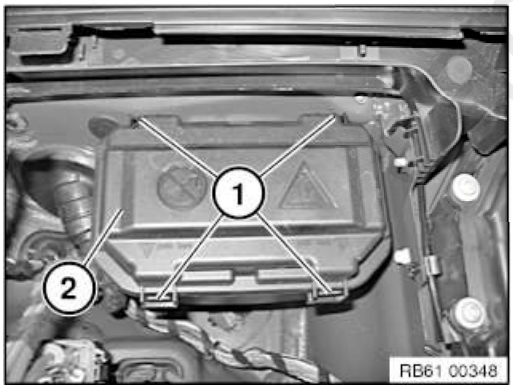


Note:
Work shown on the F20 by way of example, deviations in detail are possible in other models.

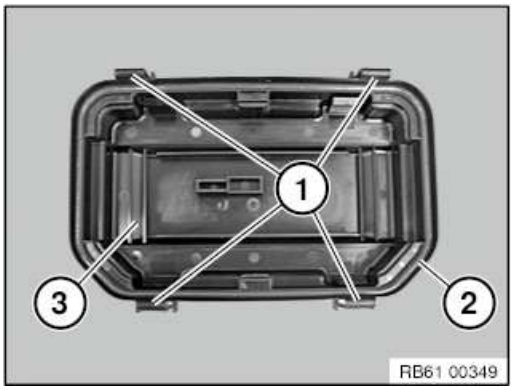
Turn locks (1) 90° counterclockwise.

Unlock catch (3).

Remove cover (2).

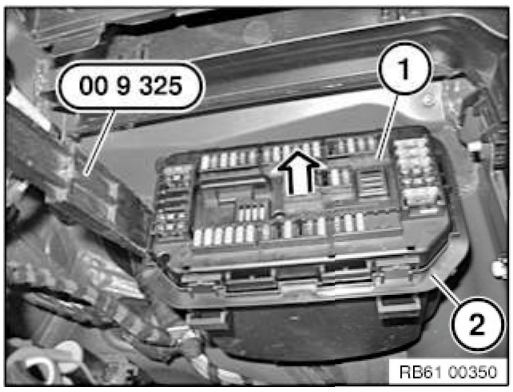


Release latch mechanisms (1) and remove lid (2).*Installation note:*
Make sure cover (2) is correctly locked.

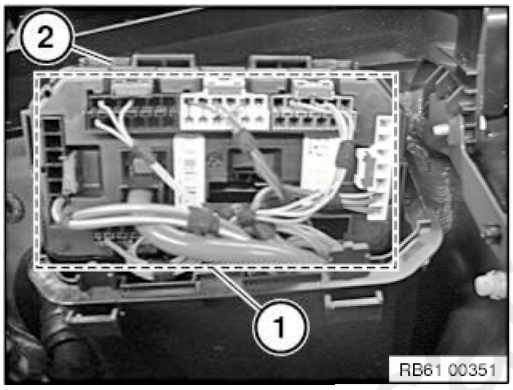


Installation note:
Latch mechanisms (1) and gasket (2) on lid (3) must not be damaged or missing.

Make sure gasket (2) is correctly seated in lid (3).



Release power distribution box (1) with special tool 00 9 325 from lower section (2) and pull power distribution box (1) upward.



Release and disconnect all plug connections in area (1).

Remove power distribution box (2).

Installation note:
Make sure all plug connections are correctly locked.

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61 13 ... Removing and installing/replacing fuse box (right engine compartment)



Operation is described in:

Removing and installing/replacing distribution box (front)

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61 00 ... Repairing airbag cables

Important!

> **Only repair those cables which show visible signs of damage. In the event of visible damage, make sure there is only one cable repair in effect after the repair work. If no visible damage can be identified, the entire cable must be replaced. When carrying out repairs to the airbag wiring harness, you must use the spare parts offered in the Electronic Parts Catalogue (EPC).**

Safety regulations for handling components of airbag system.

Instructions for disconnecting and connecting battery.

In event of non-visible damage to wiring harness:

Disconnect plug connection on airbag module or on adapter plug. It is absolutely vital to disconnect the contacts in succession as there is a risk of mixing up (similar parts)! Cut through one cable after the other at an appropriate position, do not under any circumstances cut through both cables at the same time. Insulate cables remaining in wiring harness with insulating tape. Now disconnect plug connection on airbag control unit. Unpin contacts. Cut through one cable after the other at an appropriate position and insulate with insulating tape, do not under any circumstances cut through both cables at the same time. Pin contacts of repair cable for airbag control unit in control unit plug, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead. Now pin in contacts for airbag control unit or contacts of adapter plug, assignment of repair cables is relevant. Cut off excess length of repair cable in proximity (visible area) of airbag module or of adapter plug. Twist open cables. With the butt connectors and heat-shrink tubings in the Electronic Parts Catalogue (EPC), reconnect the cables with the same cable colours. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using butt connectors.

Installing and removing contacts.

In event of visible damage:

Expose cable at damaged areas. Cut through one cable after the other at an appropriate position and insulate cables no longer required in wiring harness with insulating tape, do not under any circumstances cut through both cables at the same time. Now, depending on the scope of work, unpin contacts either on airbag control unit/airbag module or on adapter plug. Cut off unpinned cables. Insulate cables remaining in wiring harness with insulating tape. Now pin in contacts of repair cable, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead up to separation point. Cut off excess length of repair cable. Twist open cables. Connect cables with butt connectors and heat-shrink tubings in Electronic Parts Catalogue (EPC), assignment of repair cables is relevant. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using connectors.

Installing and removing contacts.

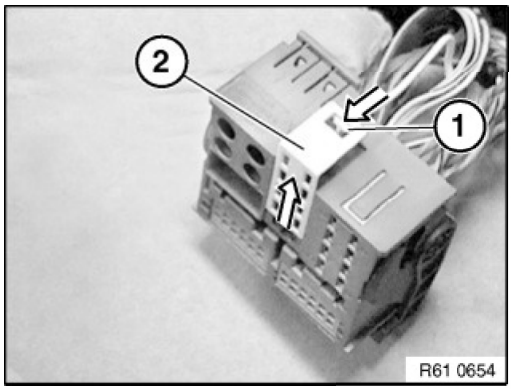
61 13 ... Socket housing (radio connector), Hybrid System MQS/MPQ

Special tools required:

- 61 0 314

Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

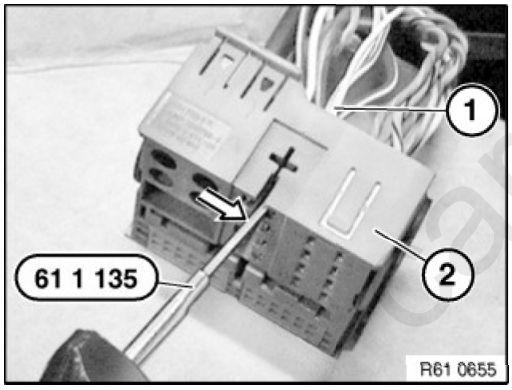
- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



Removing MPQ contacts from radio connector:

Press lock (1) in direction of arrow.

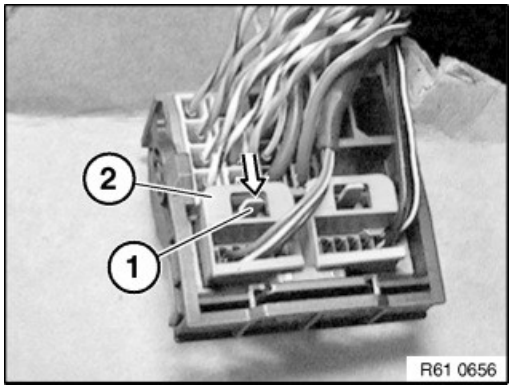
Detach secondary lock (2) from radio plug.



Feed special tool 61 0 314 (61 1 135) past side of contact.

Press special tool 61 0 314 (61 1 135) in direction of arrow.

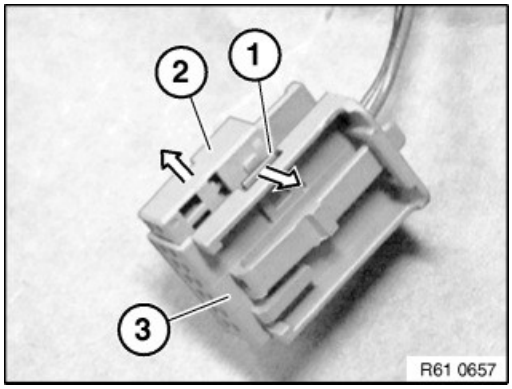
Pull wire (1) with socket contact out of radio connector (2).



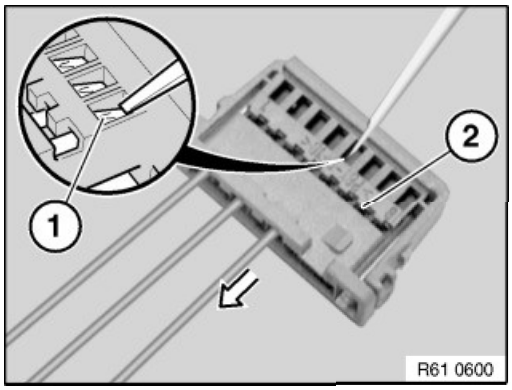
Removing MQS contacts from contact carrier:

Press lock (1) in direction of arrow and pull housing (2) out of radio connector.

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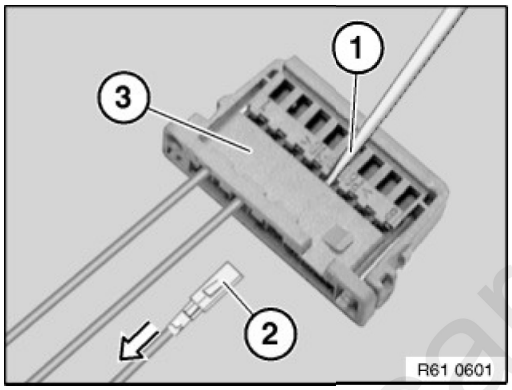
Press lock (1) in direction of arrow. Pull contact carrier (2) out of housing (3).*Note:*
When the contact carrier is pulled out, the secondary locks of the socket contacts are raised.



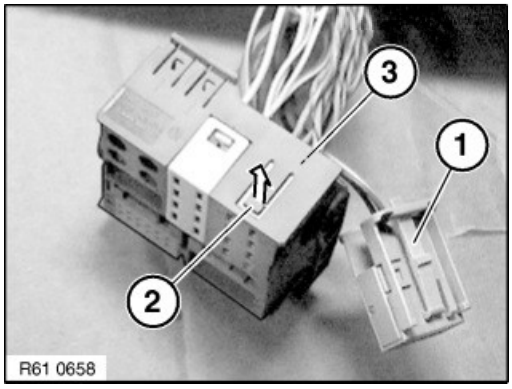
Note:
Schematic diagram shows the 8-pin socket housing by way of example.

Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



Hold down retaining hook in secondary lock (1) again. Pull wire with socket contact (2) out of contact carrier (3).



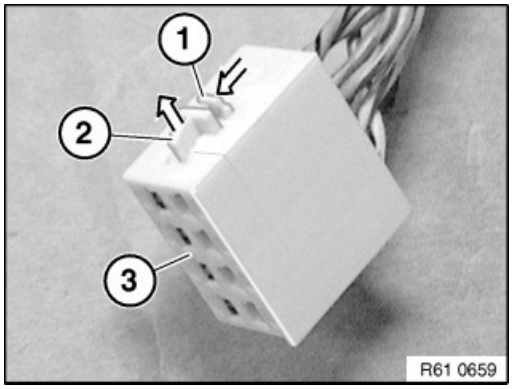
Removing MPQ contacts from contact carrier:

Remove contact carrier (1) with MQS contacts from radio connector.

Raise lock (2) on radio connector.

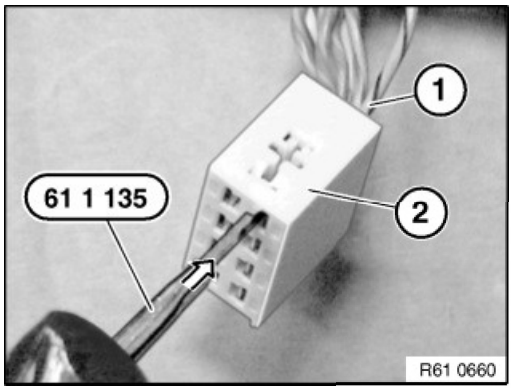
Pull contact carrier (3) out of radio connector.

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Press lock (1) in direction of arrow.

Pull secondary lock (2) in direction of arrow completely out of contact carrier (3).



Press special tool 61 0 314 (61 1 135) on inside of contact into contact carrier (2).

Pull wire with socket contact (1) out of contact carrier (2).

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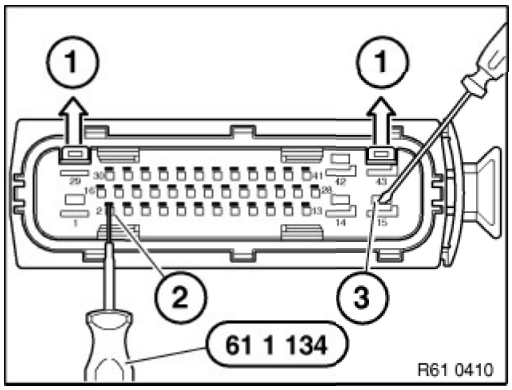
61 13 ... Socket housing 42-, 43-, 46-pin, Hybrid System MQS / MPQ

Special tools required:

- 61 0 312

Manufactured by AMP: The following contact types without strand sealing can be fitted in the socket housings:

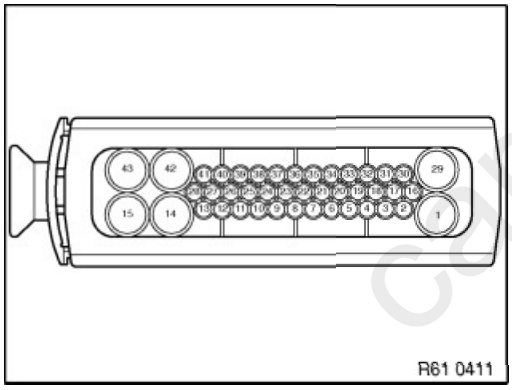
- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



Open secondary locks (1) on socket housing.

Press back retaining hook of MQS contacts (2) with special tool 61 0 312 61 1 134 and pull out cable with contact.

Press back retaining hook of MPQ contacts (3) with screwdriver and pull out cable with contact.



Installation note:
Bend open retaining hook of contacts gently before inserting into connector housing.

For installation of contacts, observe chamber numbers on reverse side of socket housing.

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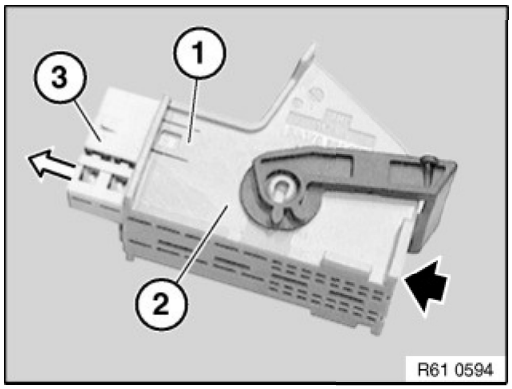
61 13 ... Socket housings, 2x21-, 2x27-pin, Hybrid Systems MQS/MPQ, Elo/Elo Power

Manufactured by AMP: The following contact types without strand sealing can be fitted in the socket housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)

Manufactured by Siemens: The following contact types without strand sealing can be fitted in the socket housings:

- Elo (electrical contact)
- Elo Power 2.8 mm width (electrical contact for heavy loads)
- Elo Power 5.2 mm width (electrical contact for heavy loads)

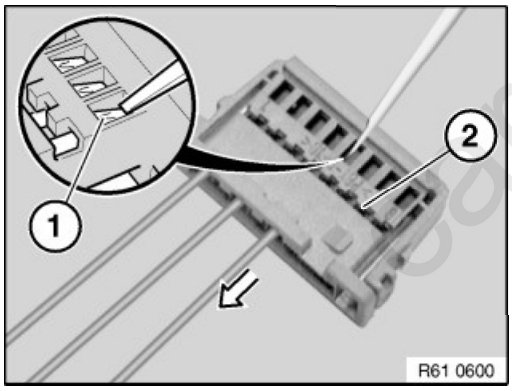


Raise lock (1) on housing (2).

Push contact carrier (3) from rear out of housing.

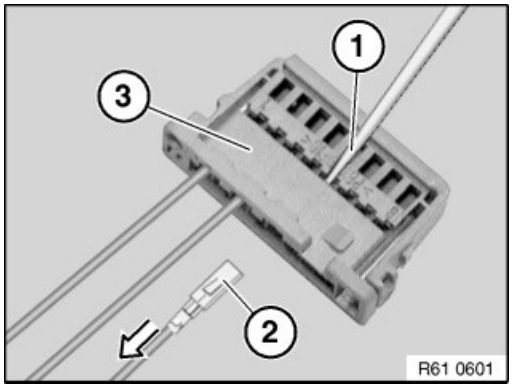
Note:
The second contact carrier is pushed out in the same way.

Pushing out the contact carrier releases the secondary locks of the socket contacts.



Hold down retaining hook (1) of socket contact in opening of contact carrier with a small screwdriver.

Pull wire with socket contact in direction of arrow as far as secondary lock (2).



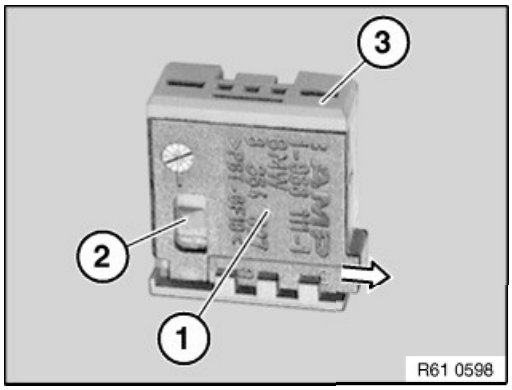
Hold down retaining hook in secondary lock (1) again and pull cable with socket contact (2) completely out of contact carrier (3).

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61 13 ... Socket housings, 5-pin, 8-pin, System MQS/MPQ

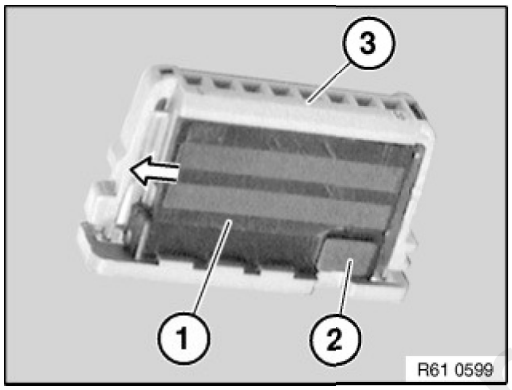
Manufactured by AMP: The following contact types without strand sealing can be fitted in the connector housings:

- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)



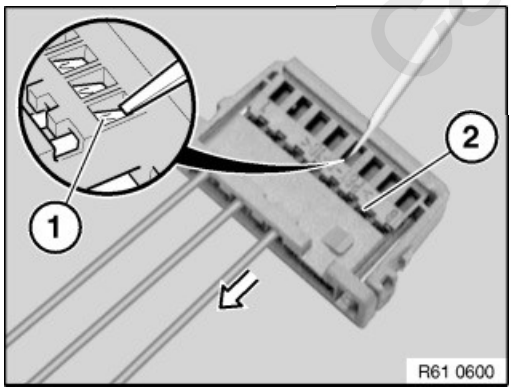
Socket housing, 5-pin (Hybrid System MQS/MPQ)

Raise fastener (1) over retaining lug (2) and pull off from contact carrier (3).



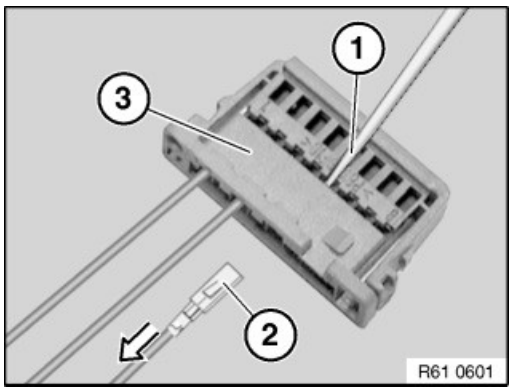
Socket housing, 8-pin (MQS):

Raise fastener (1) over retaining lug (2) and pull off from contact carrier (3).



Hold down retaining hook (1) of contact and pull cable with contact as far as secondary lock (2).

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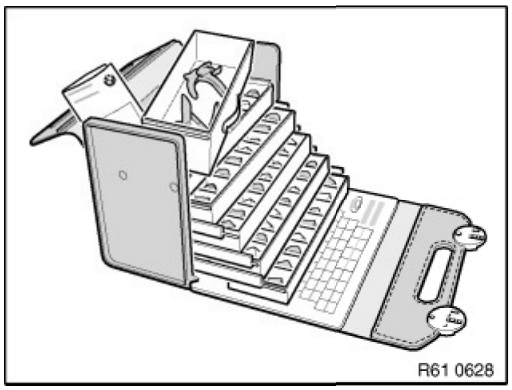
Hold down retaining hook in secondary lock (1) again and pull cable with contact (2) completely out of contact carrier (3).

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61 13 ... Special tools for wiring harness repairs

Special tools required:

- 61 0 300
- 61 0 400
- 61 1 100
- 61 4 320
- 61 0 200
- 61 0 210
- 61 0 220
- 61 0 230
- 61 0 240



Repair range, vehicle electrical system:

Single parts for wiring harness repairs*

* Sourcing reference: BMW Parts Department

Note:

- Refer to Service Information:
  SI 2 04 07 341

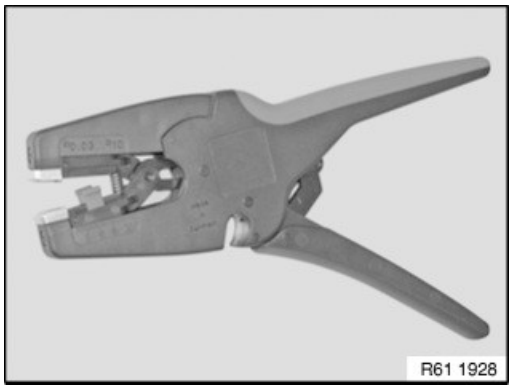


Release and press-out tool:

- Special tool61 0 300
- Special tool 61 0 400 (MINI N12/N14)
- Special tool 61 1 100 (engine)

Handling:

- Notes for opening contacts and locks of different connector contact systems



Cutting to length and stripping insulation from cables:

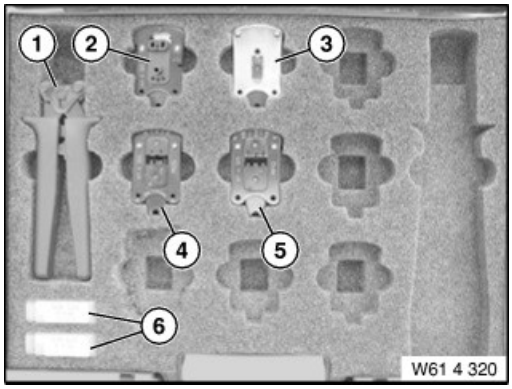
Wire stripper MultiStrip10*

*Sourcing reference BMW Workshop Equipment Catalogue

Handling:

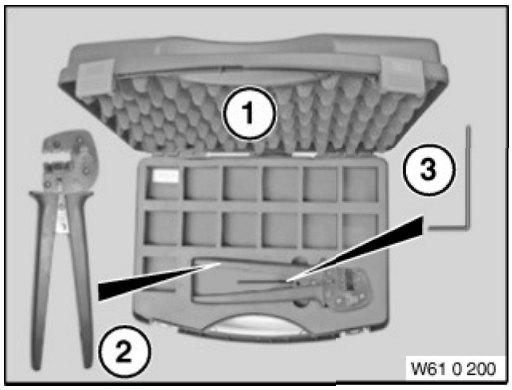
- Cutting cables to length and strip insulation

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Crimping stop parts (small contacts) and butt connectors:

- Special tool61 4 320
  1. Tool without crimping head
  2. Crimping head (stripping insulation and cutting fibre-optic cables to length)
  3. Crimping head (crimping fibre-optic cable contacts)
  4. Crimping head (crimping MQS contacts)
  5. Crimping head (crimping MPQ contacts)
  6. Replacement blade (face-cutting fibre-optic cables)
  7. Replacement blade with tool (insulation stripping unit)
  8. Universal crimping head (SI 2 04 06 293)



Crimping stop parts (large contacts) and butt connectors:

- Special tool 61 0 200 (crimping set)
- Special tool 61 0 210 (matrix set SLK 8)
- Special tool 61 0 220 (matrix set SLK 2.8)
- Special tool 61 0 230 (matrix set MAK 8 / DFK4)
- Special tool 61 0 240 (butt connector 4.0 - 6.0 mm²)

Handling:

- Refer to Service Information:
  SI 2 02 05 194
  SI 2 07 05 233

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61 13 ... Treating cables and optical fibres

Special tools required:

- 61 4 320
- 61 0 200

Note:
Special tools referred to in the repair instructions below are contained in the following special tool sets:

Repair range for vehicle electrical system	SI 2 04 07 341
Crimping set with pliers for optical fibres, Micro Power Quadlock (MPQ), Micro Quadlock System (MQS) contacts and universal crimping head	61 4 320 61 0 200

Subject of repair instructions

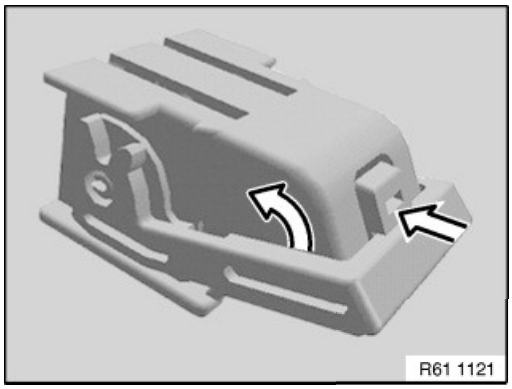
- Special tools for wiring harness repairs
- Cutting cables to length and strip insulation
- Crimping stop parts (contacts)
- Butt connector for repairing a plug connection
- Comb connector for retrofitting/repairs
- Cutting to length and stripping insulation from optical fibres
  Crimping optical fibres

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61 13 ... Unlocking and disconnecting different plug connections

Note:
The document describes unlocking and disconnecting different types of plug connections.

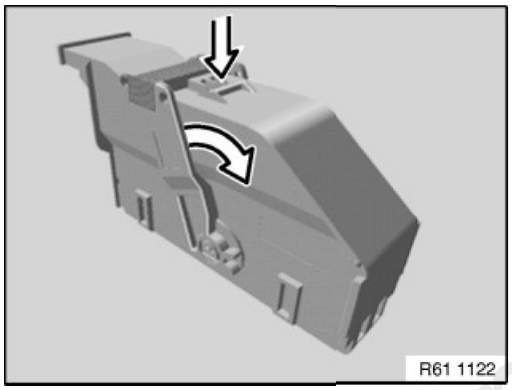
Differences in the details of the size and shape of the plug connections are possible.



1.

Press lock and open release clip in direction of arrow.

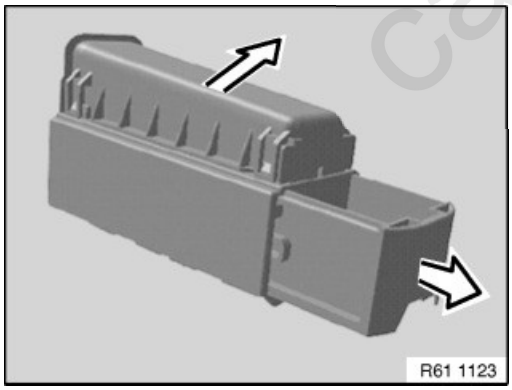
Disconnect plug connection.



2.

Press lock and open release clip in direction of arrow.

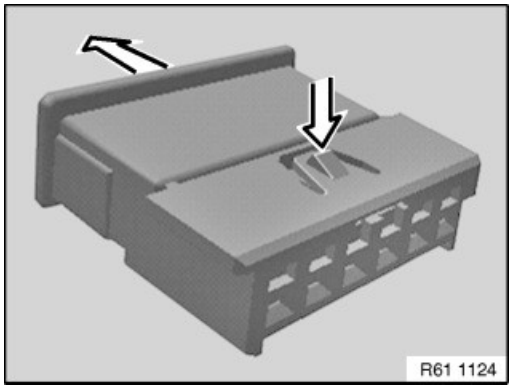
Disconnect plug connection.



3.

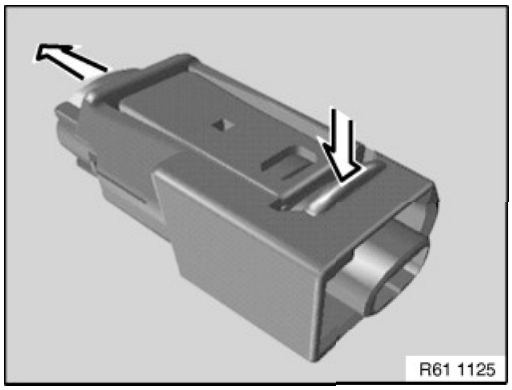
Open release clip in direction of arrow and disconnect plug connection in direction of arrow.

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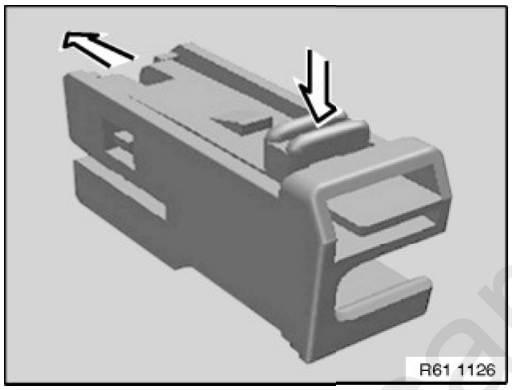
4.

Press lock and disconnect plug connection in direction of arrow.



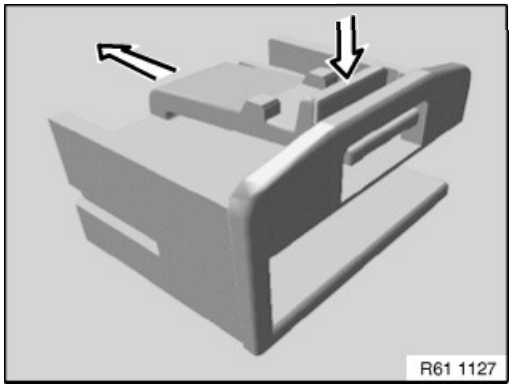
5.

Press lock and disconnect plug connection in direction of arrow.



6.

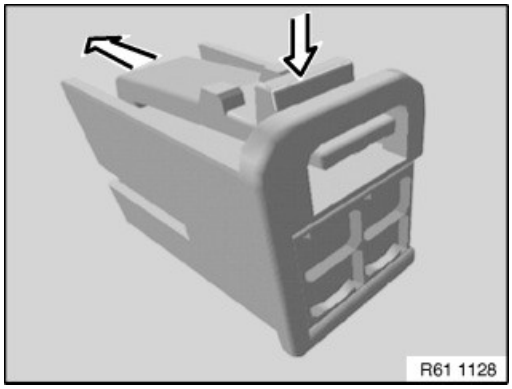
Press lock and disconnect plug connection in direction of arrow.



7.

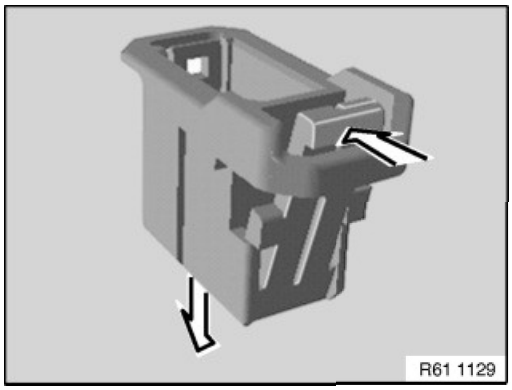
Press lock and disconnect plug connection in direction of arrow.

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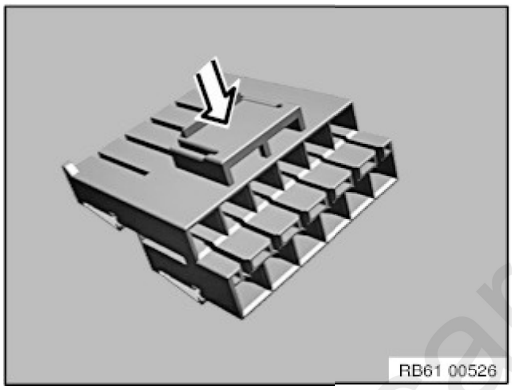
8.

Press lock and disconnect plug connection in direction of arrow.



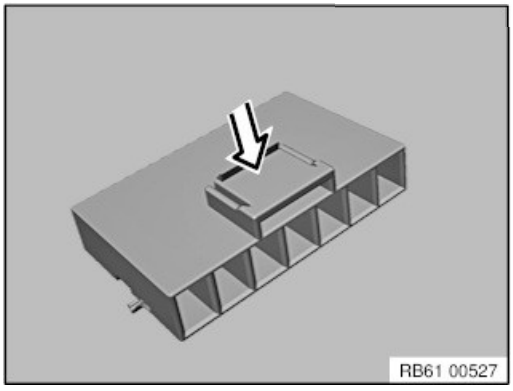
9.

Press lock and disconnect plug connection in direction of arrow.



10.

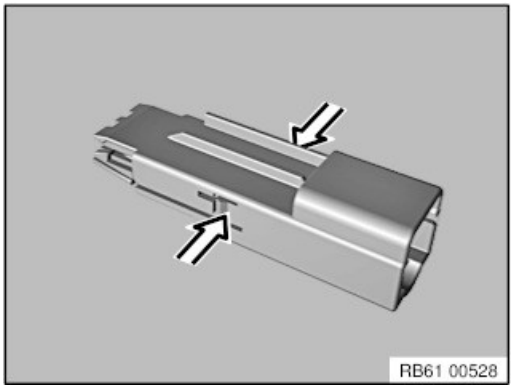
Press the lock and detach plug connection.



11.

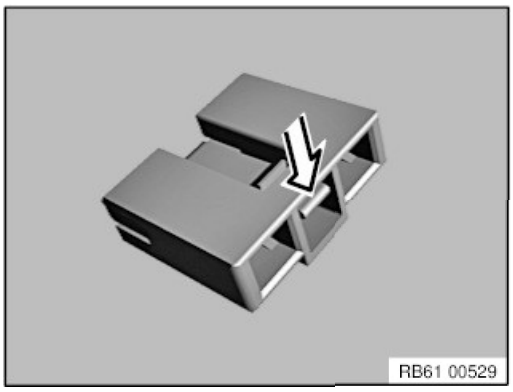
Press the lock and detach plug connection.

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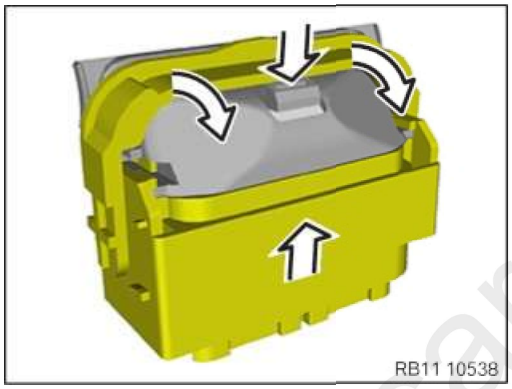
12.

Press the lock on both sides and detach plug connection.



13.

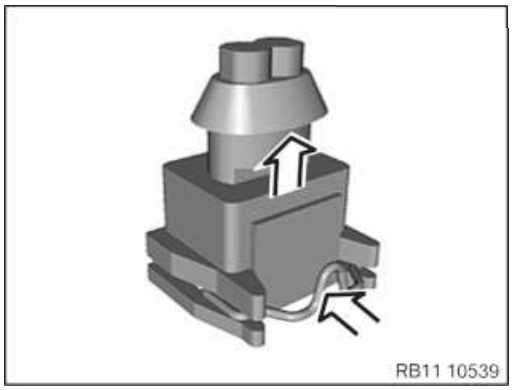
Press the lock and detach plug connection.



14.

Press lock and open release clip in direction of arrow.

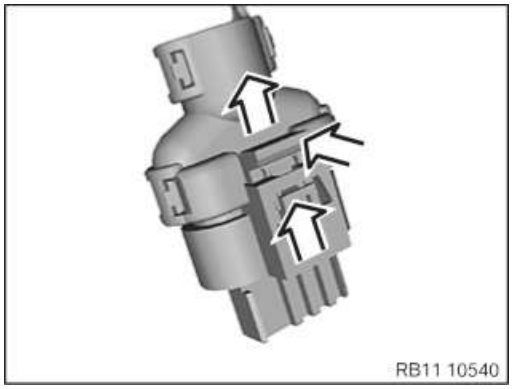
Disconnect plug connection.



15.

Press the lock and detach plug connection.

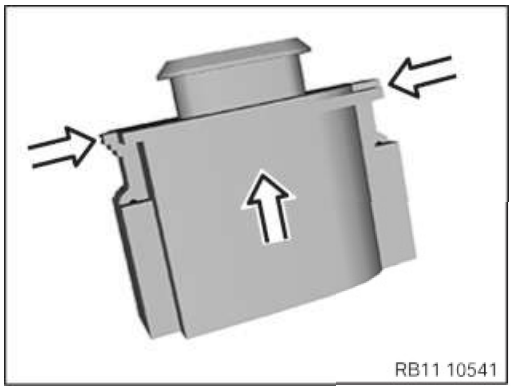
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16.

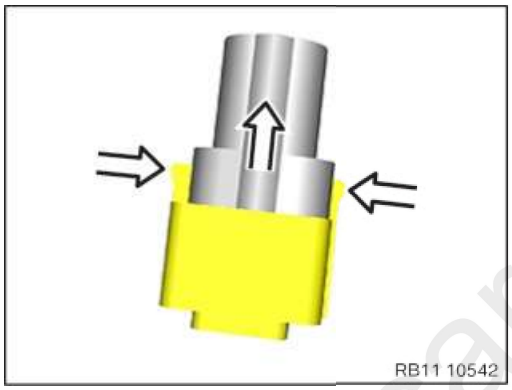
Pull out lock and press.

Disconnect plug connection.



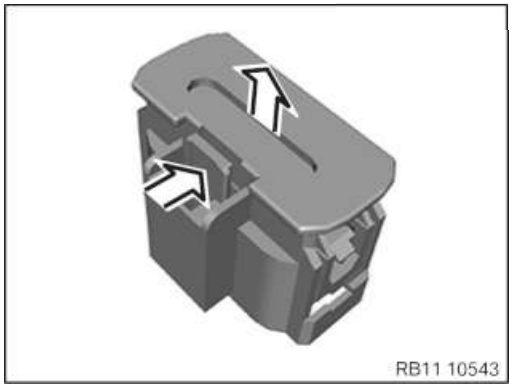
17.

Press the lock and detach plug connection.



18.

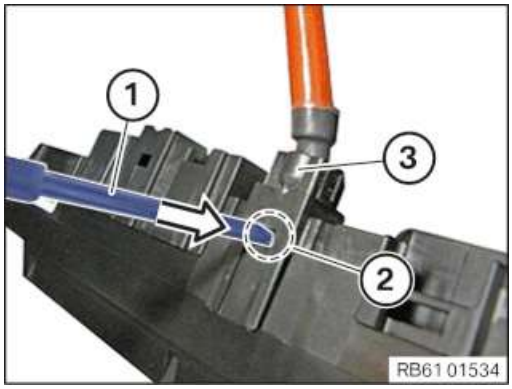
Press the lock and detach plug connection.



19.

Press the lock and detach plug connection.

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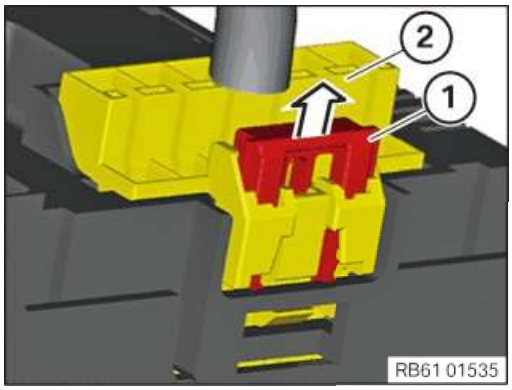


20.

Plug connection, e.g. on the power distribution box:

Press into the opening (2) using a suitable tool (1).

Pull off plug connection (3) upwards.



21.

Plug connection, e.g. on the power distribution box:

Lift lock (1) with a suitable tool.

Pull off plug connection (2) upwards.



22.

Vibration resistant high power engine contacts:

Caution!

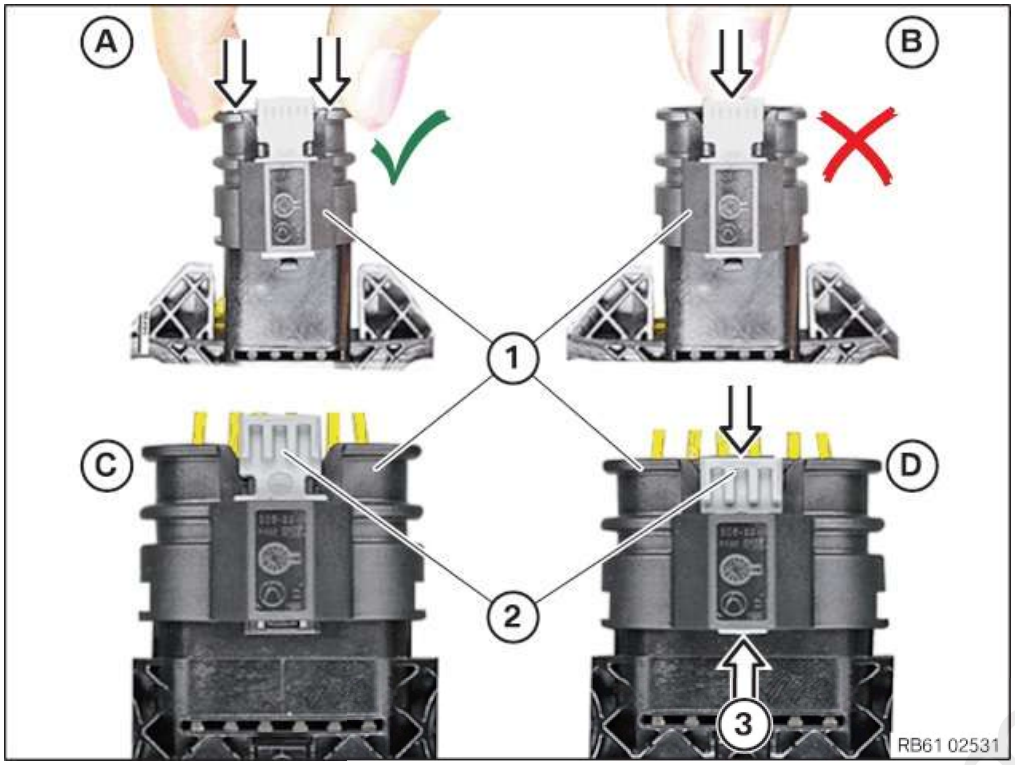
For this connector type, increased forces come into play when disconnecting and closing.

Disconnect:

Pull out lock (1) downward in direction of arrow first.

Then press lock (1) down in direction of arrow and pull off connector.

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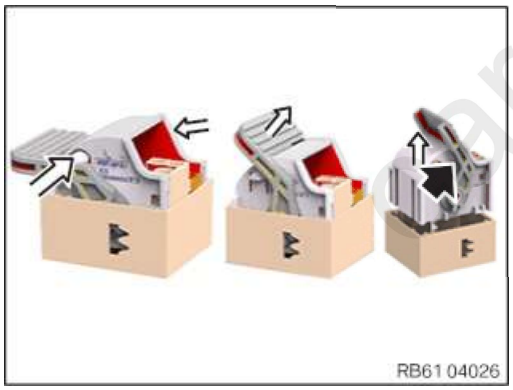


23.

Close:

A. Press the connector (1) down at the points indicated by the arrow **until it reaches the end position**
B. **Do** not press the connector (1) further than the lock
C. Connector (1) is in the end position, but lock (2) is not yet locked
D. Press lock (2) down in the direction of the arrow until the tip of lock (2) is visible at point (3)

Unlock / lock front light combination plug connection & replace housing after damage:

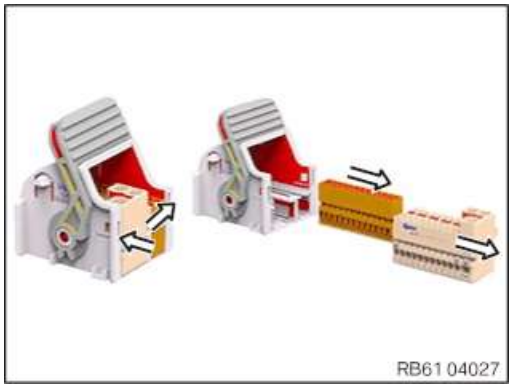


24.

Press in locking lever at both sides until the lever is unlocked and can be moved.

Move lever upwards until it latches into place in the end position.

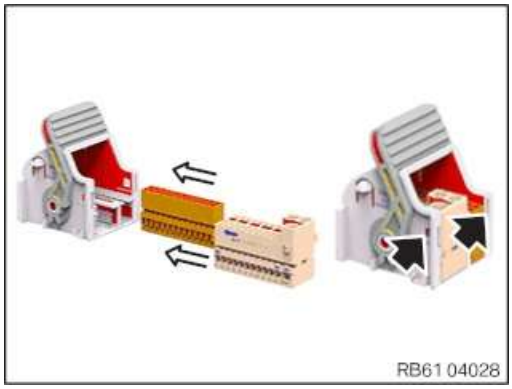
Once the lever is locked in the end position, remove plug connection upwards.



Unlock socket housing by lifting up each of the locking tabs.

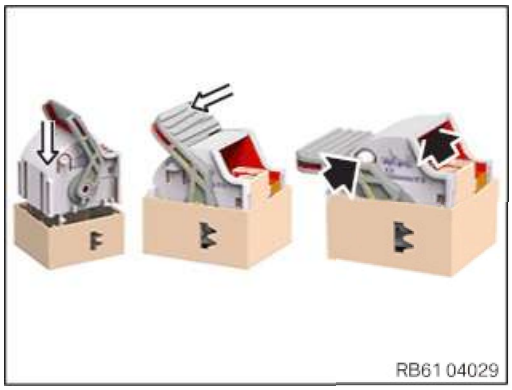
Slide out after unlocking the socket housing.

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Slide in socket housing up to limit position.

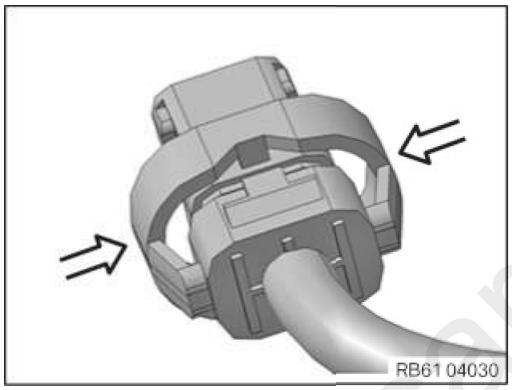
Lock socket housing into place in end position.



Sliding in up to limit position.

Activate plug-inn procedure by moving lever downwards.

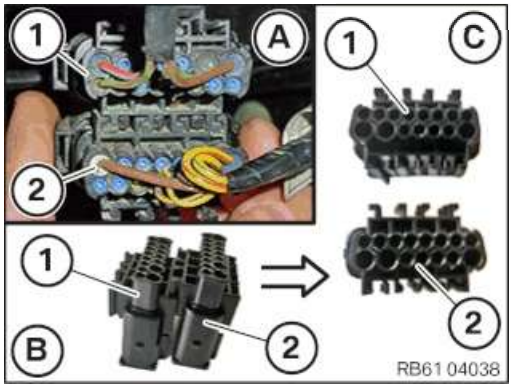
IMPORTANT: the latch mechanism on both sides only works for a completed plug-in procedure.



25.

Rosenberger D4S20G-400A5-Y

Press to unlock on both sides.

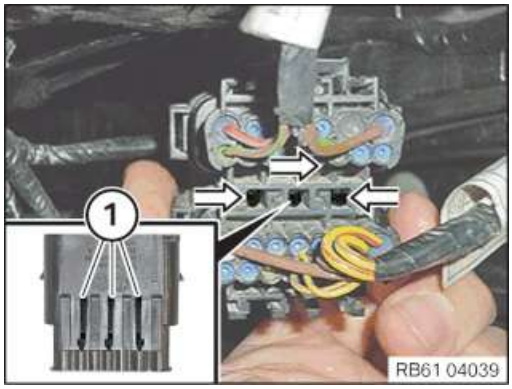


26.

Pin housing, 15-pinMLK1

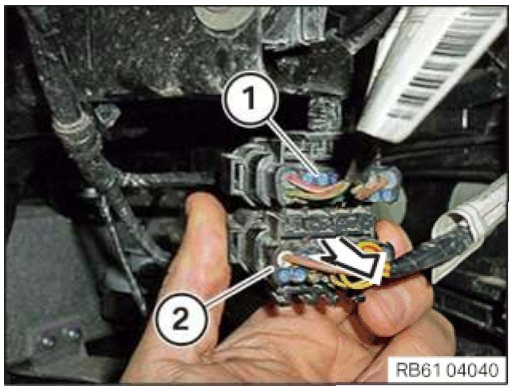
- A & B. To avoid any damage to individual connectors, the given connector assembly consisting of several individual connectors (1) & (2) must be released before disconnecting the plug connection.
- C: released connector assembly

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Disconnecting connector assembly:

Release retaining hooks (1) in direction of arrow (detail image shows retaining hooks of individual connector).



Release connector (2) in direction of arrow from connector (1).

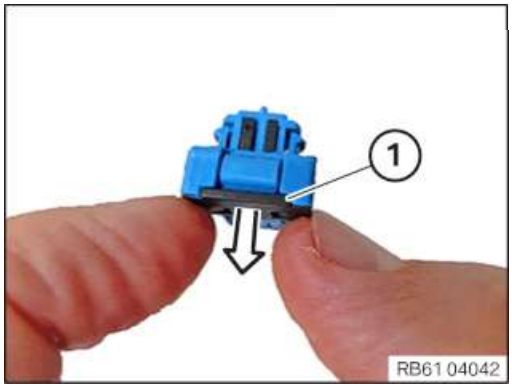


27.

Airbag ignition circuit connector

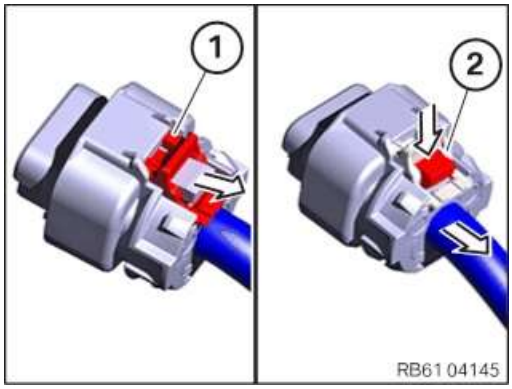
Warning!

Note the safety information for working on vehicles with airbag systems prior to disconnecting the plug connection.



Pull the cap (1) in the direction of the arrow to unlock

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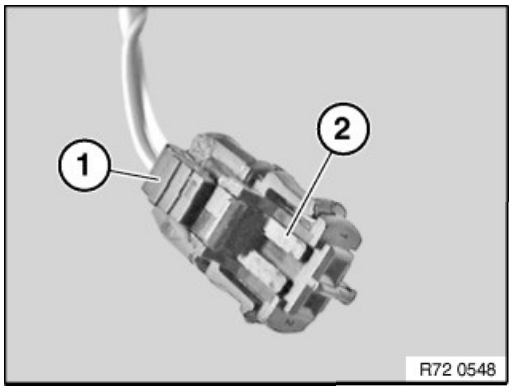


28.

Connector e.g. on front and rear lighting unit

Open safety catch (1) in direction of arrow using appropriate tool.

Push safety catch (2) in direction of arrow and disconnect plug connection.



29.

Plug, e.g. in airbag ignition circuits

Press the lock (1) and pull out the connector (2) up to initial engagement position.

Pull off connector (2).

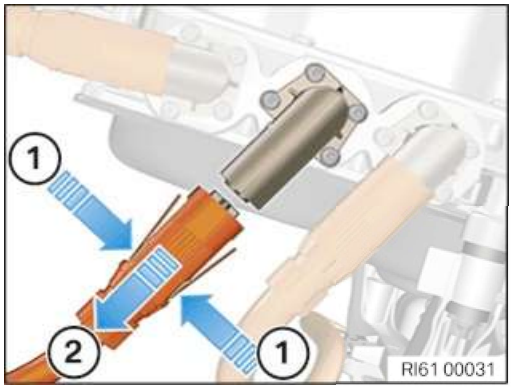
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61 13 ... Unlocking and disconnecting various plug connections in electrical and hybrid vehicles

Attention!

Observe the following instructions for handling high-voltage plug connections:

- Damaged high-voltage plug connections must be replaced completely. Repair is not permitted.
- Dirt contamination must be removed before opening the plug connection.



Disconnect the Hirschmann high-voltage connector:

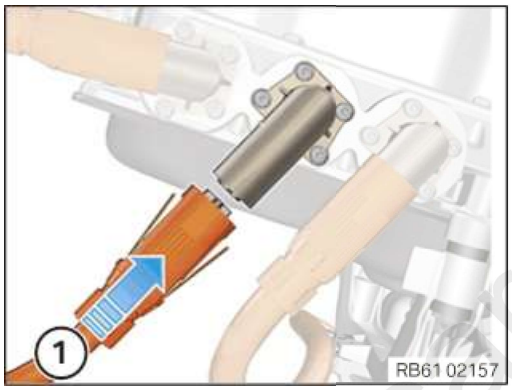
Press the lock (1) on the left and right on the connector in the direction of the arrow.

Pull off connector (2) in direction of arrow.

Attention!

Connector (2) is difficult to pull off.

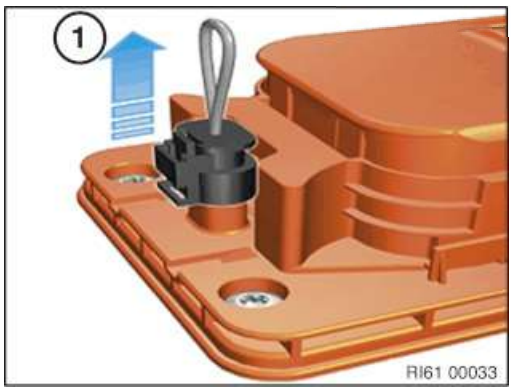
In the event of damage to high-voltage connector (2), the complete high-voltage cable must be replaced!



Connect the Hirschmann high-voltage connectors:

Slide the connector (1) on in the direction of the arrow.

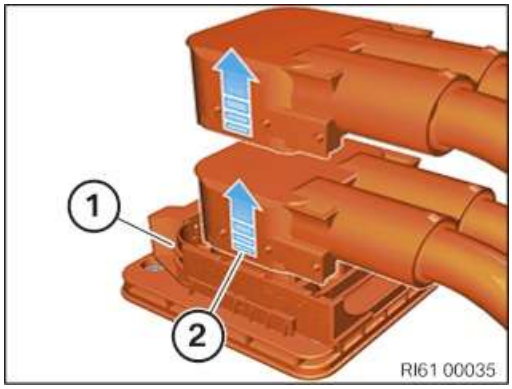
Note:
Connector (2) must lock audibly.



Disconnect the Kostal high-voltage connector:

Unlock and disconnect high-voltage interlock loop (1).

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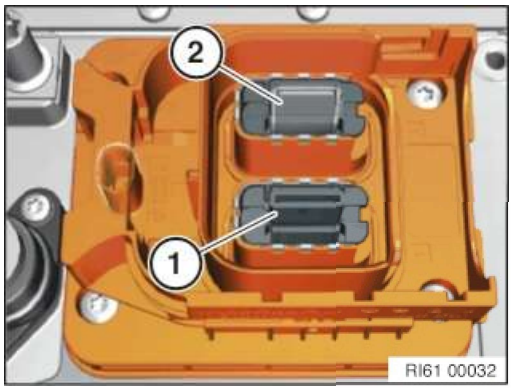
Push the lock (1) fully to the front.

Lift the connector (2) and remove it entirely.

Attention!

Plug connection (3) is difficult to pull off.

The connector (2) must be completely pulled off the opposite housing in one step. Damage may be caused to contact protection if connector is only partly pulled off and then closed again!



Check the Kostal high-voltage connector and connection for damage:

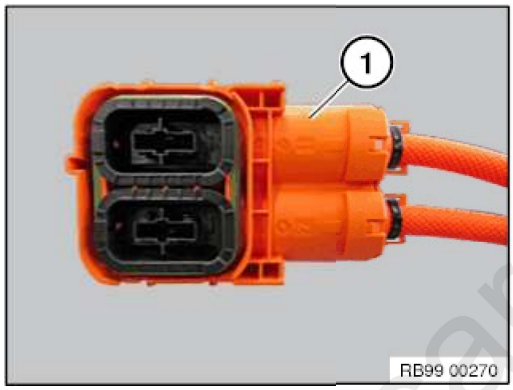
Check the touch protection for damage and correct positioning (1).

Warning!

Do not touch unprotected connector (2)!

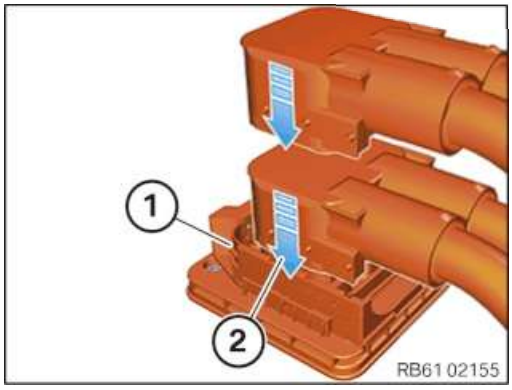
If the contact protection (1) has been pushed to the bottom (2), the high-voltage connector must be refitted.

If contact protection (1) remains in bottom position (2) after reinstallation, the contact protection is faulty and the component must be replaced!



Check the high-voltage connector (1) for damage.**Warning!**

In the event of damage to the high-voltage connector (1), the complete high-voltage cable must be replaced!



Connect the Kostal high-voltage connector:

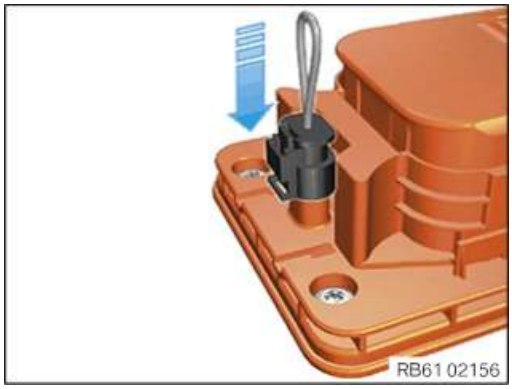
Connect the connector (2) in one single movement to the counter-housing.

Push the lock (1) fully to the rear.

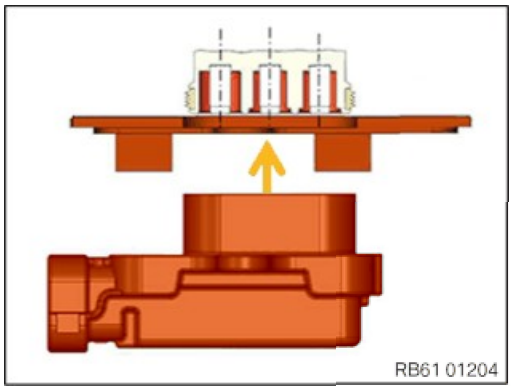
Attention!

Plug connection (3) must be correctly locked by lock (2), otherwise there is a risk of damage.

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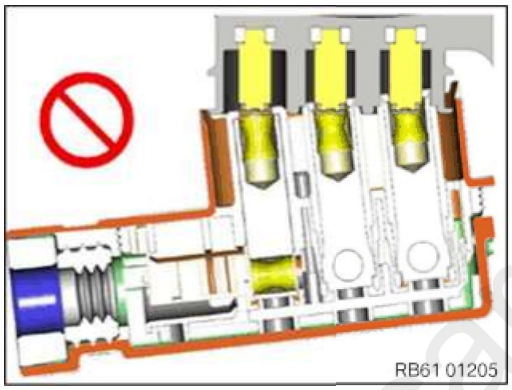


Connect the connector for the high-voltage interlock.



Three-phase high-voltage connector:

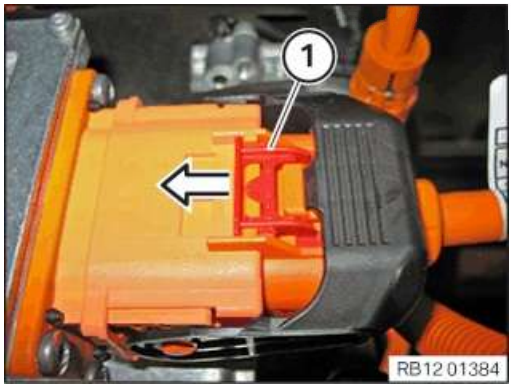
Connect and disconnect the connector straight.



Attention!

The system is designed to only offer limited protection against damage caused by connectors that are inserted at an angle.

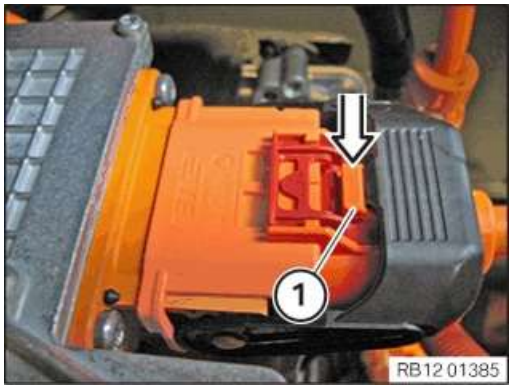
Increased tilted connections will increase the connecting force and the risk of danger.



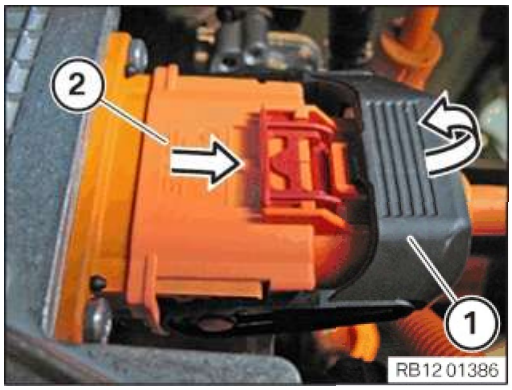
Disconnect the high-voltage connector from the high-voltage connection of the KLE:

Slide lock (1) in direction of arrow up to stop.

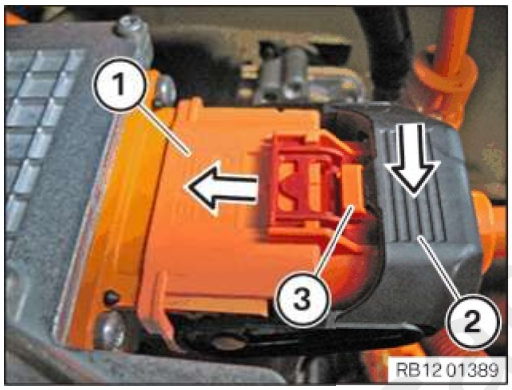
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Press lock (1).



Open the lock (1) completely and disconnect the connector (2).



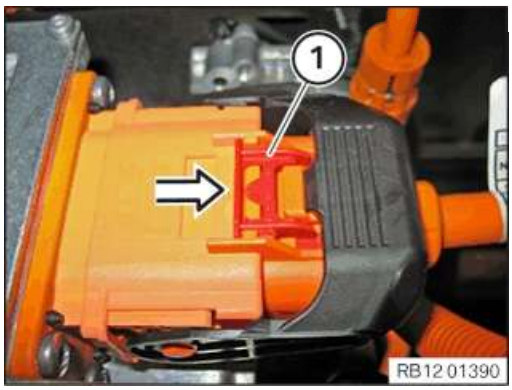
Connect the high-voltage connector to the high-voltage connection of the KLE:

Connect the connector (1) to the limit position and close the lock (2).

Attention!

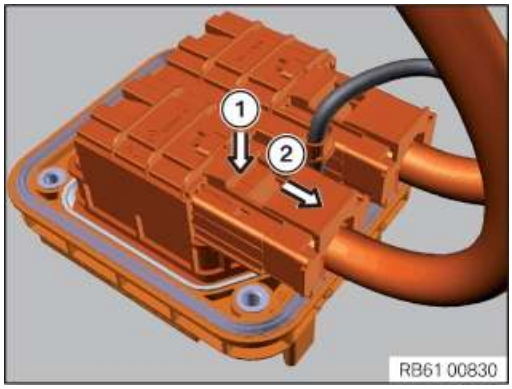
Lock (2) must snap audibly into place.

The retaining lug of the lock (2) must be positioned completely under the lock (2).



Slide the lock (1) on to the stop in the direction of the arrow.

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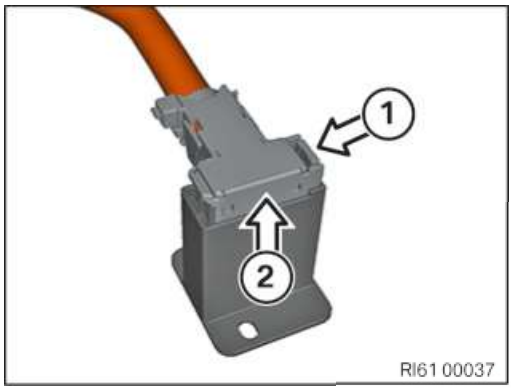
High-voltage connector on the high-voltage connection of the high-voltage battery unit:

Press down unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



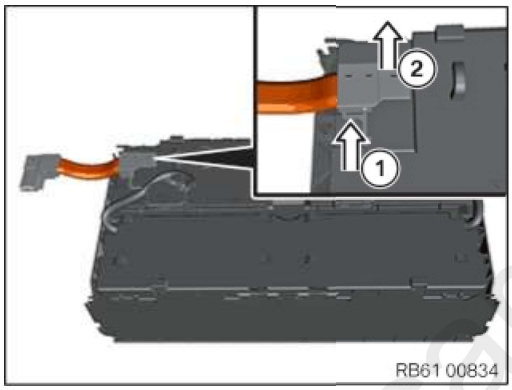
High-voltage connector on the cell module I01:

Press unlocking device (1) together and pull off connector upwards (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



High-voltage connector on the cell module (cell module connecting line):

Press unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.

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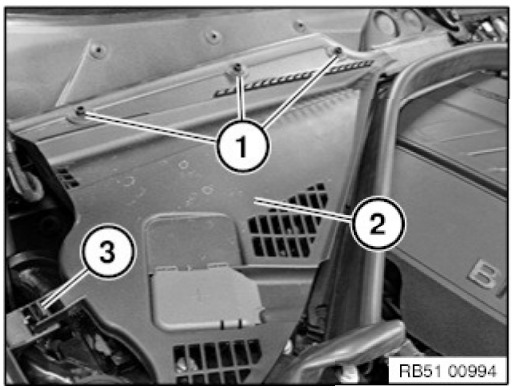
61 14 035 Rem.& install/replace power distribution box front positive battery cable

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

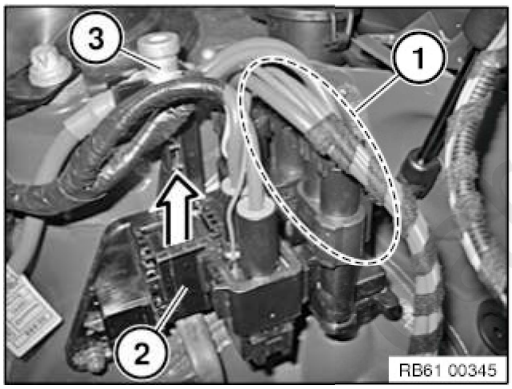


Note:
Graphics shown on the F20 by way of example, deviations in detail are possible in other models.

Turn locks (1) 90° counterclockwise.

Unlock catch (3).

Remove cover (2).



Release and disconnect all plug connections in area (1).

Disengage cover (2) in direction of arrow and take off.

Release nut from positive wire (3) and remove retaining bracket (3).

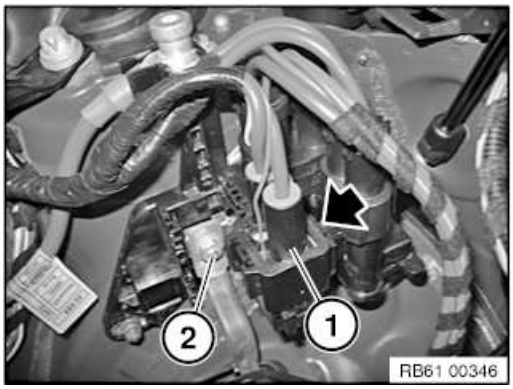
Tightening torque 61 21 4AZ

Installation note:
Make sure all plug connections are correctly latched.

Make sure cover (2) is correctly locked.

Risk of short circuits!

Ensure positive wire (3) is correctly seated.



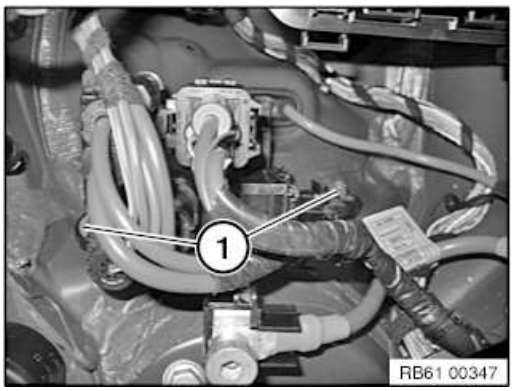
Release latch mechanism (arrow) and pull relay carrier (1) up and out of power distribution box.

Release nut from flat positive terminal wire (2) and remove flat positive terminal wire (2).

Tightening torque 61 21 4AZ.

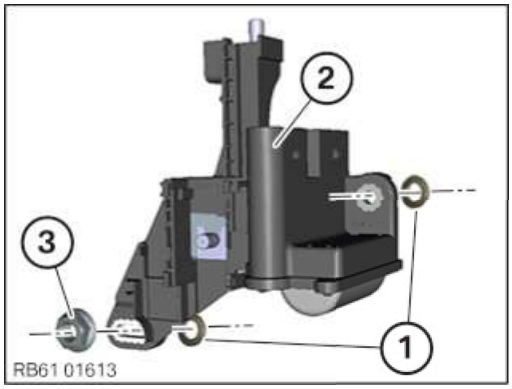
Installation note:
Risk of short circuits!

Make sure flat positive terminal wire (2) is correctly seated.



Release nuts (1) and remove power distribution box.

Tightening torque 61 21 2AZ.



Installation note:
Install power distribution box (2) as displayed in diagram with washers (1) and new nut (3).

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61 14 035 Remove and install/replace power distribution box of positive battery cable (from 02/13)

Warning!

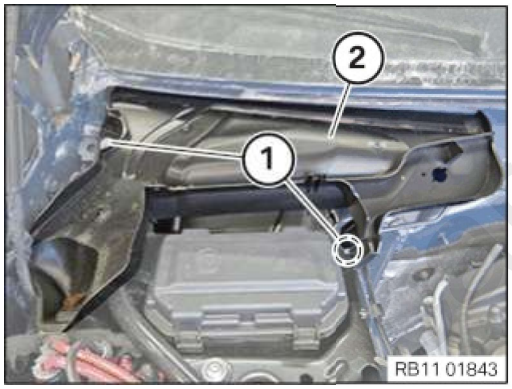
Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point
- Remove cowl panel cover

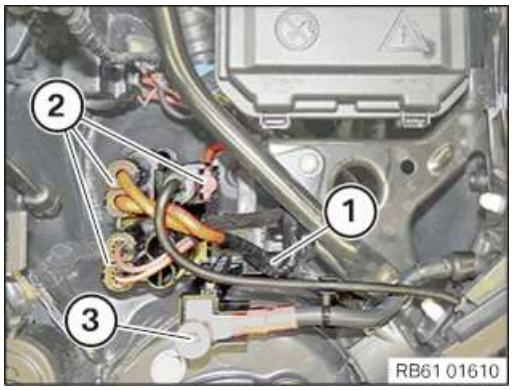
Note:
Removal and installation are described separately.

Removal:



Release screws (1).

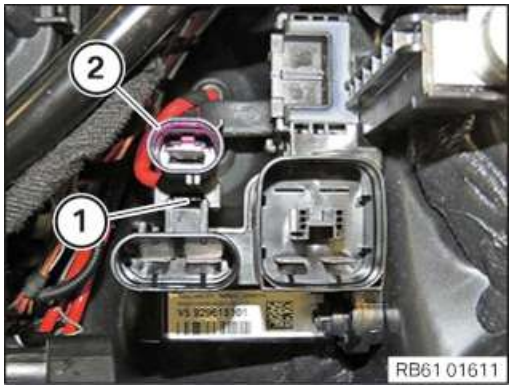
Remove attachment part of partition wall (2).



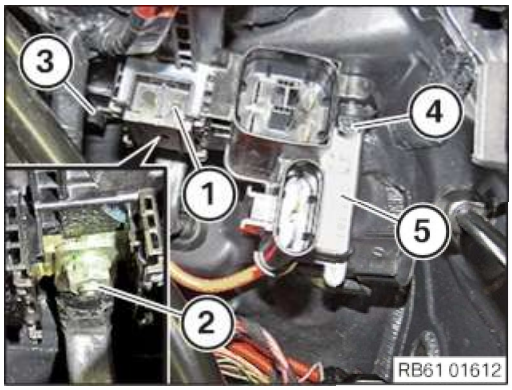
Release cable strap (1).

Unlock and disconnect connector (2).

Loosen the nut from positive wire (3) and remove positive wire (3).



Loosen latch mechanism (1) and pull off socket (2) upwards.



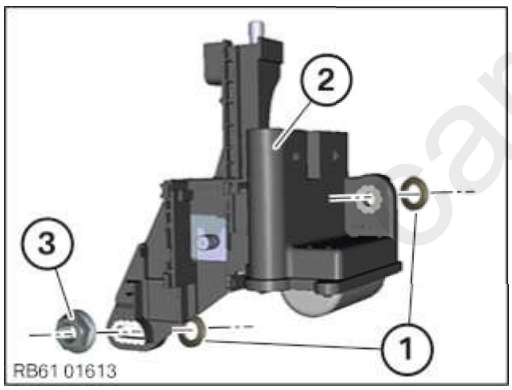
Loosen and remove cover (1) upwards.

Loosen the nut (2) and unthread positive wire.

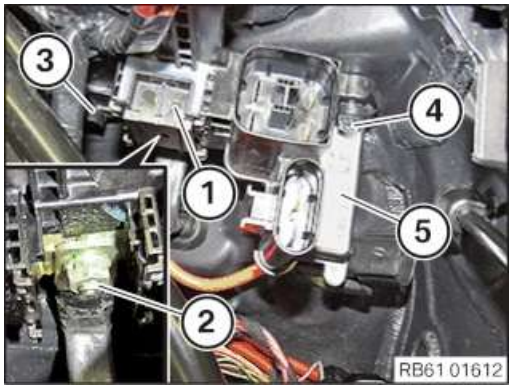
Release nuts (3 and 4).

Pull out the power distribution box (5).

Installation:



Installation note:
Install power distribution box (2) as displayed in diagram with washers (1) and new nut (3).



Installation note:
Ensure that the washers are on threaded bolt.

Insert power distribution box (5).

Tighten nut (4).

Tightening torque 61 21 2AZ.

Tighten new nut (3).

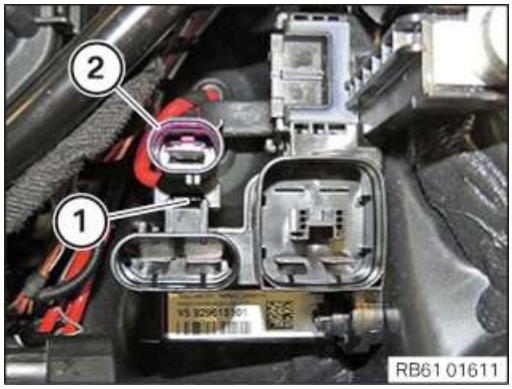
Tightening torque 61 21 2AZ.

Thread positive wire and tighten with nut (2).

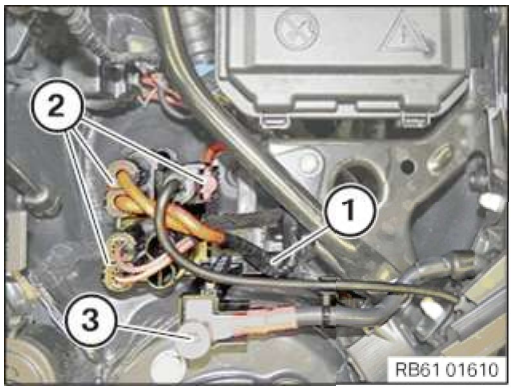
Tightening torque 61 21 4AZ.

Insert and close cover.

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Connect socket (2) from top to power distribution box.*Installation note:*
Ensure correct latch mechanism (1).



Connect all connectors (2).

Tighten positive wire (3) using nut.

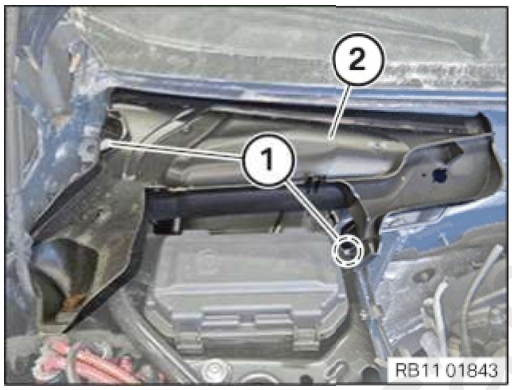
Tightening torque 61 21 4AZ

Replace cable tie (1).

Installation note:
Pay attention to correct latch mechanism of all connectors.

Risk of short circuits!

Ensure positive wire (3) is correctly seated.



Remove attachment part of partition wall (2).

Tighten down screws (1).

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61 14 005 Removing and installing/replacing distribution box (front)

Special tools required:

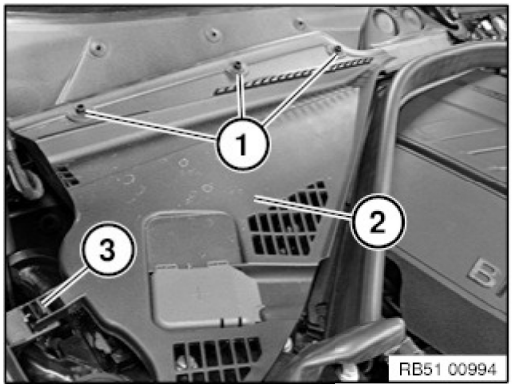
- 00 9 325

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

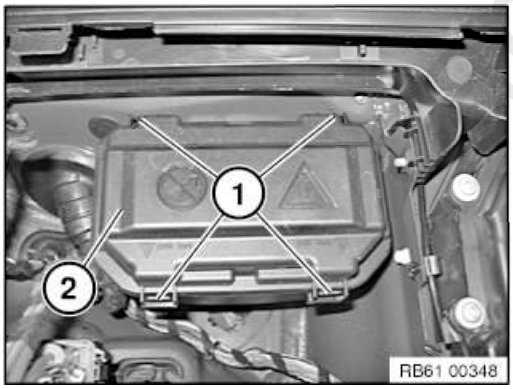


Note:
Work shown on the F20 by way of example, deviations in detail are possible in other models.

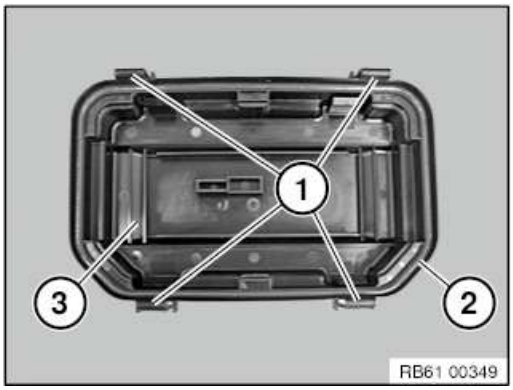
Turn locks (1) 90° counterclockwise.

Unlock catch (3).

Remove cover (2).

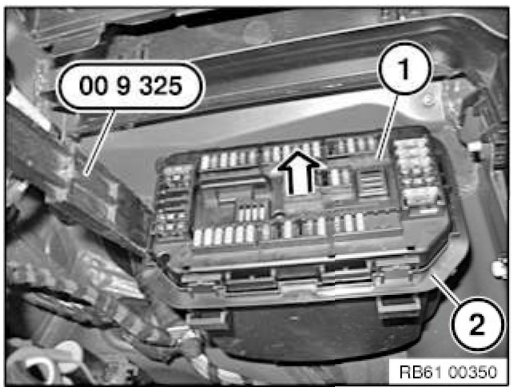


Release latch mechanisms (1) and remove lid (2).*Installation note:*
Make sure cover (2) is correctly locked.

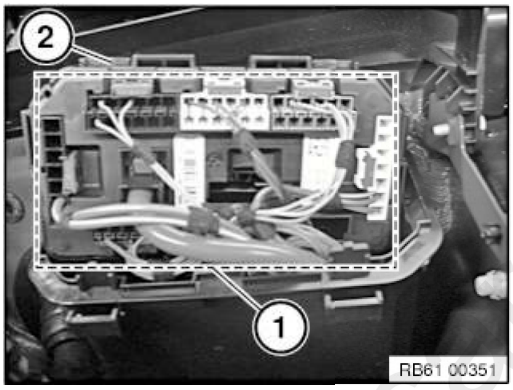


Installation note:
Latch mechanisms (1) and gasket (2) on lid (3) must not be damaged or missing.

Make sure gasket (2) is correctly seated in lid (3).



Release power distribution box (1) with special tool 00 9 325 from lower section (2) and pull power distribution box (1) upward.



Release and disconnect all plug connections in area (1).

Remove power distribution box (2).

Installation note:
Make sure all plug connections are correctly locked.

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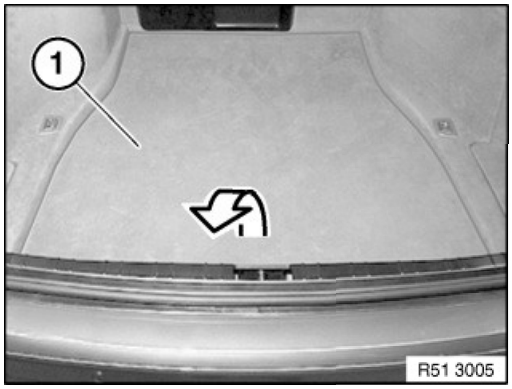
61 14 010 Removing and installing/replacing distribution box (rear)

Warning!

Observe safety information for handling vehicle battery.

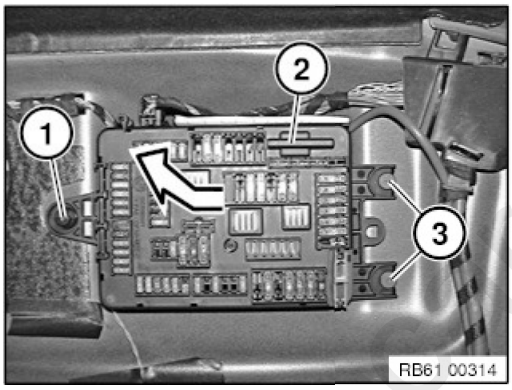
Necessary preliminary tasks:

- Clamp off battery lead from negative connection point



Note:
Graphics shown on the F20 by way of example, deviations in detail are possible in other models.

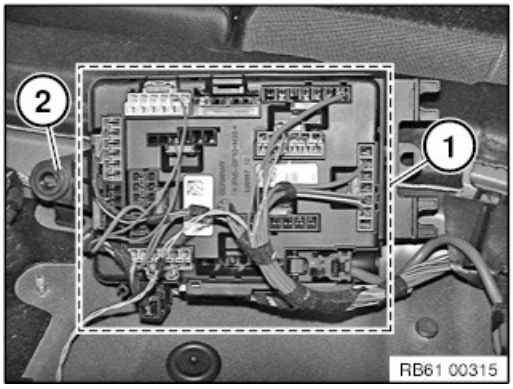
Remove luggage compartment floor trim panel (1) in direction of arrow.



Slacken nut (1).

Tightening torque 61 35 8AZ.

Remove power distribution box (2) from guide (3) in direction of arrow.



Release and disconnect all plug connections in area (1).

Remove power distribution box (2)

Installation note:
Make sure all plug connections are correctly locked.

61 13 ... Removing and installing/replacing fuse box (right engine compartment)



Operation is described in:

Removing and installing/replacing distribution box (front)

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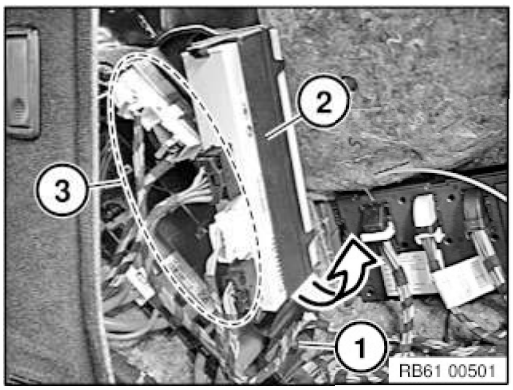
61 14 040 Removing and installing/replacing rear positive battery cable distributor

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point



If the control unit holder (2) is not installed, continue with the next operation.

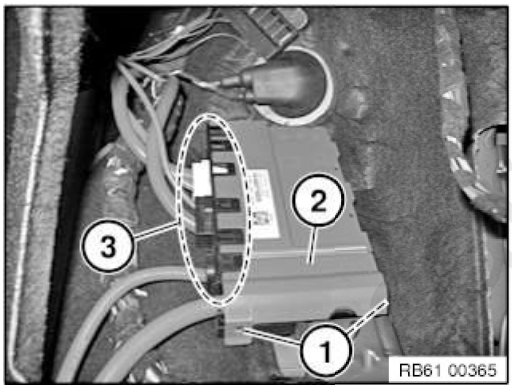
Release the nut (1) and swivel the control unit holder (2) in the direction of arrow.

Tightening torque 61 35 8AZ.

If necessary, unlock associated plug connections (3) and disconnect.

Installation note:
Ensure that the control unit holder (2) is correctly seated.

Ensure the correct locking of the plug connections (3).

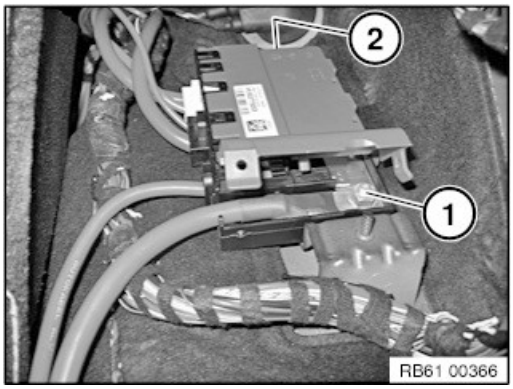


Release latches (1) and open cover (2).

Release and disconnect all plug connections in area (3).

Installation note:
Latches (1) on cover (2) must not be missing or damaged.

Make sure plug connections are correctly locked.



Release nut (1) and disconnect positive wire.

Tightening torque 61 21 4AZ.

Release nut (2) and remove power distribution box (3).

Tightening torque 61 21 2AZ.

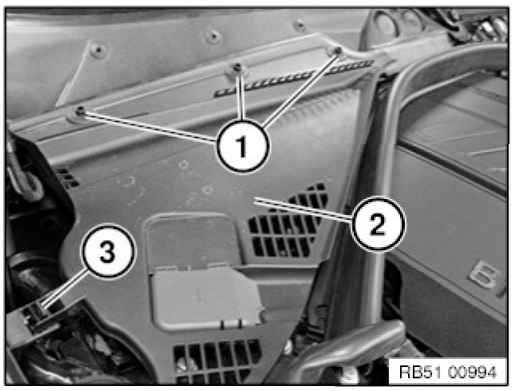
61 36 605 Removing and installing/replacing relay for fan control

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

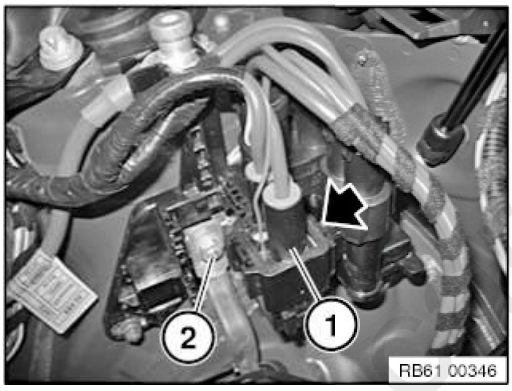


Note:
Graphics shown on the F20 by way of example, deviations in detail are possible in other models.

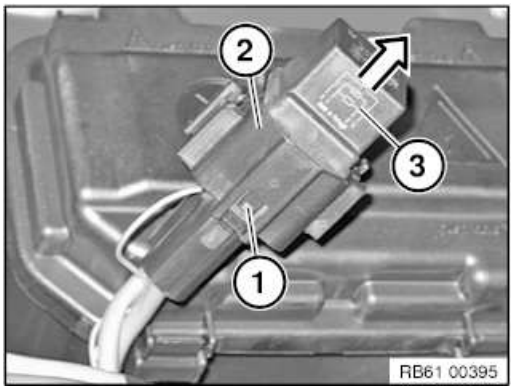
Turn locks (1) 90° counterclockwise.

Unlock catch (3).

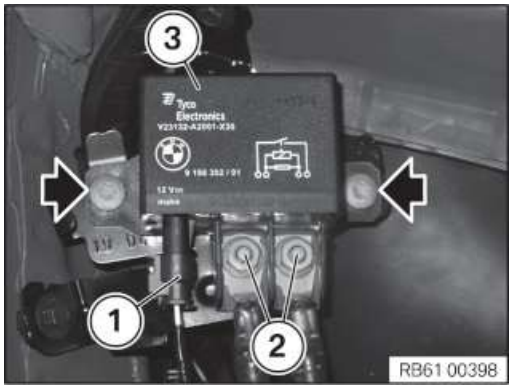
Remove cover (2).



Release latch mechanism (arrow) and pull relay carrier (1) up and out of power distribution box (2).



Release latch mechanism (1) from relay carrier (2) and pull relay (3) off of relay carrier (2).*Installation note:*
Ensure that relay carrier (2) and relay (3) are properly engaged.



For hot-climate version:

Unfasten plug connection (1) and disconnect.

Release nuts (2) and attach cable to the side.

Tightening torque 61 21 1AZ.

Loosen screws on relay (3) and remove relay.

Tightening torque 61 36 1AZ.

Installation note:
Ensure that cable (2) and relay (3) are screwed on properly.

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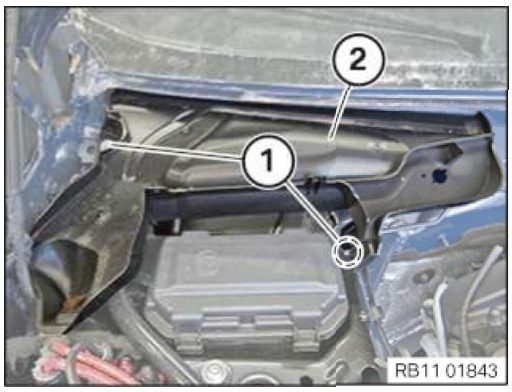
61 36 605 Removing and installing/replacing relay for fan control

Warning!

Observe safety information for handling vehicle battery.

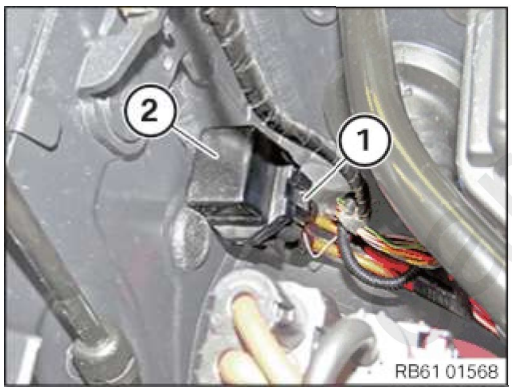
Necessary preliminary tasks:

- Remove cowl panel cover
- Clamp off battery lead from negative connection point

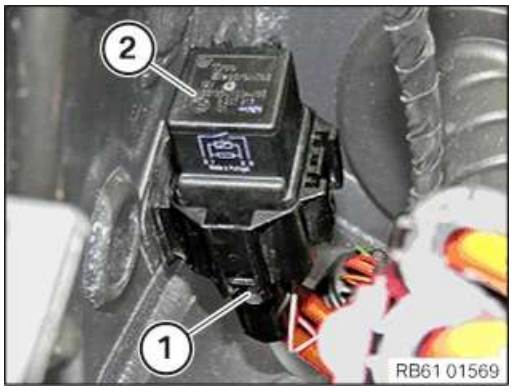


Release screws (1).

Remove attachment part of partition wall (2).



Release latch mechanism (1) and pull off intake port (2) towards top.



Remove latch mechanism (1) from the relay carrier.

Pull off the relay (2) upwards from the relay carrier.

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61 00 ... Battery charging calendar

Battery charging calendar 2016 (PDF file)

Battery charging calendar 2017 (PDF file)

Battery charging calendar 2018 (PDF file)

Battery charging calendar 2019 (PDF file)

Information for the battery charging calendar

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61 20 ... Battery replacement information

A vehicle battery is constructed for the installation location and the individual power requirements of the particular vehicle. These individual power requirements depend on the motorisation and different types of equipment. The individually assigned vehicle battery is the ideal compromise between the power requirements of the vehicle electrical system and the weight and service life of the vehicle battery.

If the vehicle electrical system of electric vehicles is not accessible due to a faulty 12 V battery, proceed as follows:

Battery exchange in electrified vehicles

Vehicles with the automatic engine start-stop function or particular engine types and optional equipment are equipped with a special vehicle battery (AGM battery), since only this battery type can provide elevated power requirements over the extended service life. Installing a different vehicle battery can cause problems with vehicle electronics, can reduce functions or can cause leakage of battery acid.

In the event of an accident where the airbags are deployed in vehicles with a vehicle battery in the luggage compartment, the electrical connection between the vehicle battery and the trigger is automatically disconnected through pyrotechnics. This prevents possible short-circuiting.

Proper operation of all of these safety and convenience functions requires a battery that conforms with specifications and that is properly registered in vehicles with energy management systems (IBS, power module).

Vehicles with energy management systems (IBS, power module): Register battery exchange

The vehicle electrical system is informed about the vehicle battery characteristic data, such as type, size, age and current power capacity. Therefore, there will always be only one work scope provided that is permitted by the current status of information.

If the performance readiness drops below a defined minimum, a Check Control message will be generated to advise the driver that the battery must be replaced.

When installing a new vehicle battery, the battery must be registered and thus must also be registered with the vehicle electrical system.

Note:

Only this registration/logon will ensure that the corresponding Check Control message will go out again.

Diagnosis system:

Register battery exchange

- Service functions
- Body
- Voltage supply
- Register battery exchange

When retrofitting, a more powerful battery may be used. Standard batteries may always be replaced by AGM batteries with the same specifications.

When installing a battery of a different size or a different battery type, this change in vehicle data must be programmed into the vehicle data in accordance with specifications.

Programming system:

- Battery retrofitting

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61 20 908 Carrying out a voltage interruption of the 12-V battery



Important!

Observe safety informations for handling vehicle battery.



There are two ways to carry out a voltage interruption of the 12-V battery:

1. Manually by disconnecting the battery earth lead
2. With the diagnosis system

1. Manually: Carry out the following steps:

- Switch off and disconnect battery charger
- Turn off ignition.
  For vehicles with ignition key: Ignition key in neutral position
  Vehicles with ID transmitter: Remove ID transmitter from slot
  For vehicles with Comfort Access: Secure terminal 30
- Disconnect negative battery lead
- Reconnect battery earth lead (to ensure bus activity)
- Observe a waiting period of 5–10 s
- Disconnect negative battery lead
- Observe a waiting period of approx. 1 minute
- Connect battery earth lead
  Tightening torque: 61 21 1AZ
- Connect and switch on battery charger
- Switch on ignition.

2. With the diagnosis system:

- 03 Body
- Voltage supply
- Activate rest state
- Power-down command

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61 20 900 Disconnecting and connecting battery earth lead

Warning!

Observe the safety informations for handling the battery!

Follow instructions for disconnecting and connecting battery!

Observe notes on power supply / on intelligent battery sensor (IBS).

Necessary preliminary tasks:

For F20; F21; F22; F23; F87:

- Lift luggage compartment floor

For F30; F32; F35; F80; F82:

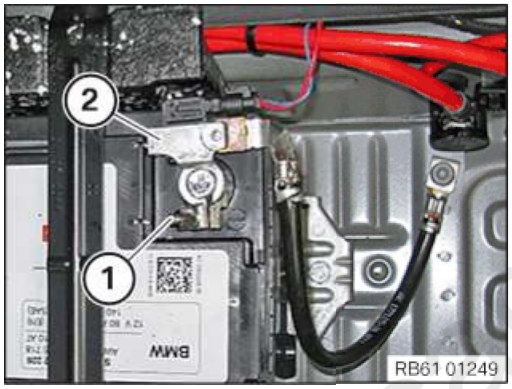
- Open flap in luggage compartment panel on right

F31For:

- Remove battery cover

For F33; F34; F36; F83:

- Remove luggage compartment trim on side panel on right



Note:
With lead-acid battery (F2x; F87 only).

Loosen nut (1).

Tightening torque 61 21 1AZ.

Important!

Do not under any circumstances use force to pull off negative terminal.

Pull off battery earth lead (2) and IBS in an upward direction, place to one side and secure.



Note:
With lead-acid battery (F3x only).

Loosen nut (1).

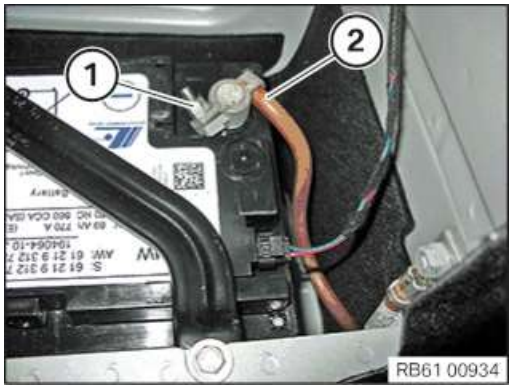
Tightening torque 61 21 1AZ.

Important!

Do not under any circumstances use force to pull off negative terminal.

Pull off battery negative lead and IBS (2) in an upward direction, place to one side and secure.

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Note:
For lithium ion battery (only F8x).

Loosen nut (1).

Tightening torque 61 21 1AZ.

Important!

Do not under any circumstances use force to pull off negative terminal.

Pull negative battery cable (2) up and off, place to one side and secure.

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61 12 ... Information on intelligent battery sensor (IBS)

Notice! Do not connect the charger to the 12 V charging socket

The 12 V charging socket is supplied with voltage by the rear power distribution box via relay. This relay drops out after terminal 15 OFF. This means that a trickle charger connected at the 12 V charging socket will be disconnected from the battery. Only charge the battery via the jump start terminal point. Only then can the voltage supply be registered by the vehicle.

Warning! Danger of destruction in event of mechanical strain

- Do not introduce any additional connections at the battery negative terminal.
- Do not modify the grounding cable. The ground cable also serves heat dissipation.
- Do not establish any connection between the IBS and the sensor screw.
- Do not use force when disconnecting the pole shoe from the battery terminal:
  - Do not pull on the ground cable.
  - Do not place any tools under the IBS to lever off the pole shoe.
- Do not use IBS connections as levers.
- Use a torque wrench and set tightening torque in accordance with repair instructions.
- Do not release or tighten down sensor screw (Torx screw).
- Avoid contact between IBS and ground.

Warning! Danger of destruction to IBS and wiring upon battery replacement

- The IBS and wiring can be destroyed by mechanical strain upon battery replacement. Therefore avoid mechanical strain.
- The size (capacity) of the battery required for the car is coded in the Car Access System (CAS).
- Use the battery size (capacity) installed as standard upon battery replacement.
- Recode the Car Access System (CAS) when installing a battery with a different capacity.
- Register battery replacement via Service functions in diagnosis system.
- Delete fault code entries in the Digital Engine Electronics (DME) associated with battery replacement.
- Always proceed in accordance with the repair instructions.

Note: Battery draining possible in spite of the intelligent battery sensor IBS being fault-free.

- A battery can be drained (e.g. with lights or radio switched on) even when the IBS functions perfectly in conjunction with power management.
- **For this reason, only exchange the IBS when there is a corresponding fault code entry!**

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61 00 ... Notes for disconnecting and connecting the vehicle battery

Observe safety informations for handling vehicle battery.

Before disconnecting vehicle battery:

Turn off the ignition and other electrical loads/consumers to prevent sparking when reconnecting.

Note:

If the ignition is not switched off when the vehicle battery is disconnected, fault memories may be set in some control units.

Attention!

- There is a danger of mixing up battery cables: if the positive battery cable and battery earth lead are the same colour and you are in doubt, follow the polarity to the vehicle battery, then mark and cover the leads
- The on-board computer and clock may lose your data.

General notes on disconnecting the vehicle battery:

- Do not disconnect battery leads and leads from alternator and starter motor while engine is running.
- Disconnect terminal of battery earth lead from the battery. Cover battery negative terminal(s) and secure.
- Disconnect both battery earth leads in version with auxiliary battery. Cover battery negative terminal(s) and secure.
- When work is carried out on the electrical system, faults may be caused in the fault memories of some control units when the vehicle battery is connected.
- When installing battery terminal: Tightening torque 61 21 1AZ.

Only lead AGM battery:

- On vehicles with IBS at negative battery terminal:
  Do not under any circumstances pull/lever off pole shoes by force.
  Do not under any circumstances release the hexagon socket screw of the IBS.

Note the following after having connected the vehicle battery:

Attention!

The scope of application of some systems may be restricted after an open circuit.

Personal Profiles may also be lost.

Settings or activations must be carried out, depending on the equipment specification.

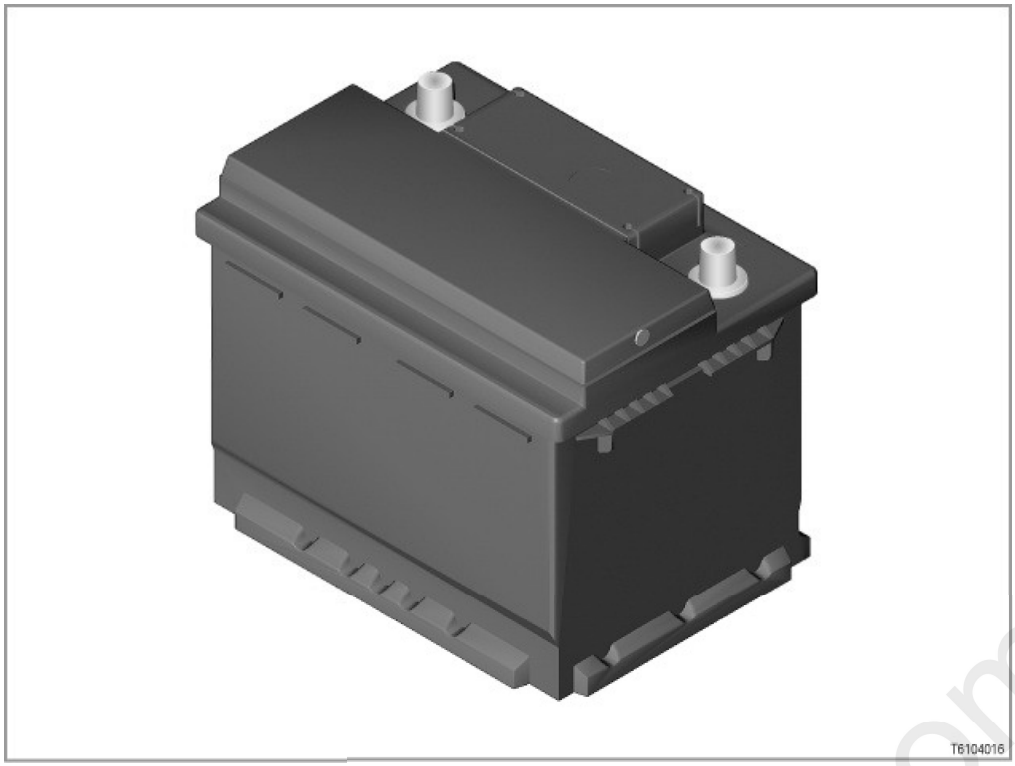
For example:

- Activate slide/tilt sunroof, if necessary
- Activate power window, if necessary

Refer to the diagnosis system for further vehicle-specific information.

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61 20 ... Notes on AGM battery



Introduction

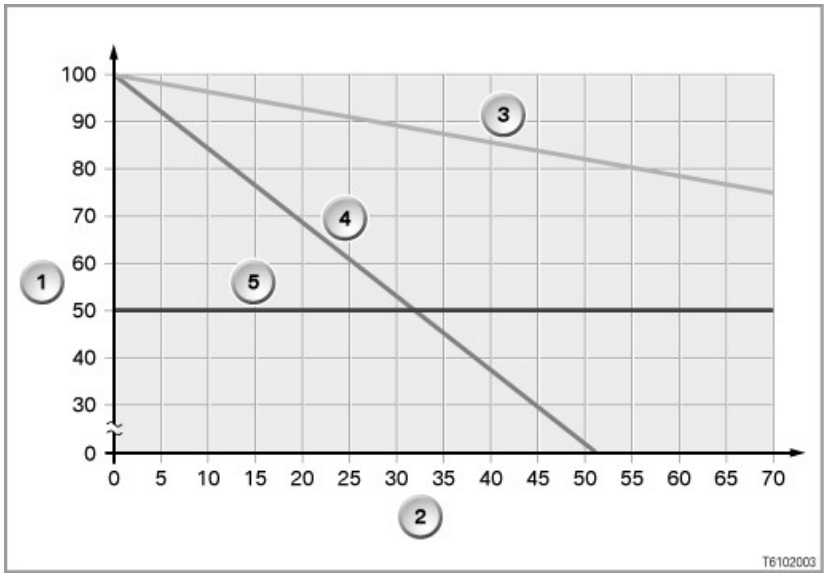
In September 2002, the first so-called VRLA batteries, better known as **AGM batteries** came into use. (VRLA stands for **V**alve **R**egulated **L**ead **A**cid, i.e. lead-acid battery with pressure relief valve; **AGM stands for A**bsorbent **G**lass **M**at, i.e. absorbent glass-fibre fleece).

The constantly increasing energy demand of modern vehicle electrical systems calls for ever more powerful battery solutions. A modern luxury-class vehicle has some 100 actuator motors that have to be fed with electrical current. Added to these are safety, environmental and comfort elements which are increasingly becoming standard features, such as e.g. Antilock Brake System (ABS), Dynamic Stability Control (DSC), steering assistance (EPS), electronic chassis and suspension control, air conditioning and navigation system. Current consumption is considerable even when the vehicle is not in use.

The somewhat higher price compared with a battery of similar size is fully balanced by the following benefits:

- greatly longer service life
- improved starting reliability at low temperatures
- reliable starting of engines with high starting current requirements, e.g. high-performance diesel engines
- 100 % freedom from maintenance
- low risk in the event of an accident (reduced environmental risk)

Service life of AGM batteries

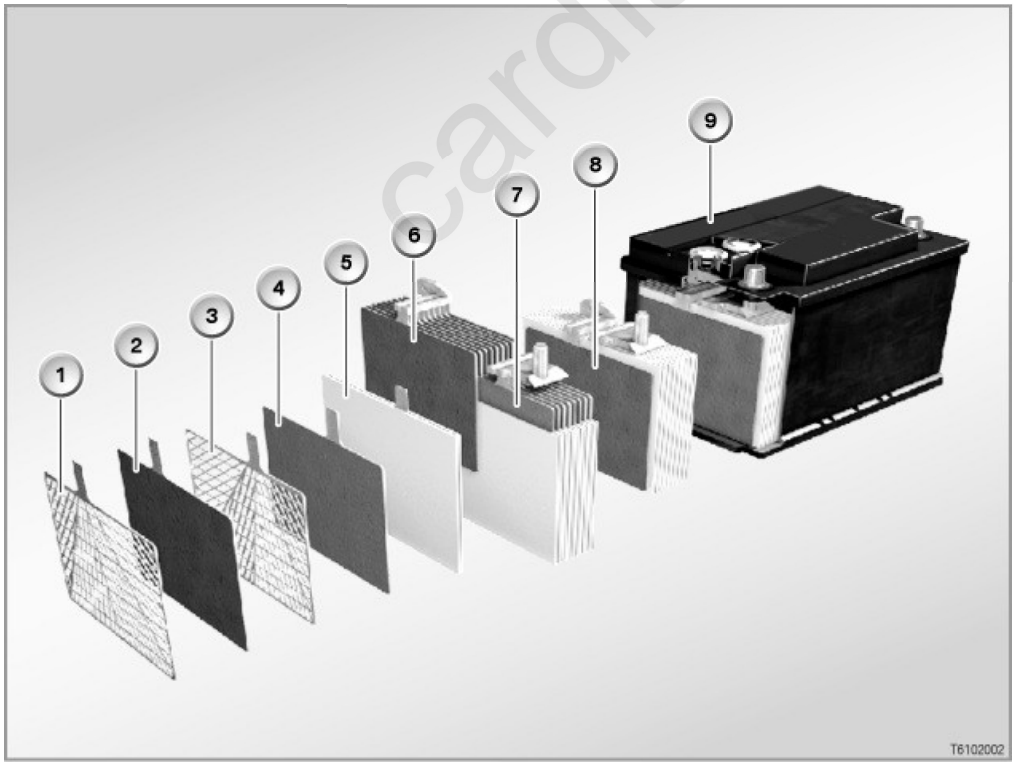


Item	Explanation	Item	Explanation
1	Available capacity [%]	2	Mileage [thousand km]
3	AGM battery	4	Lead-calcium battery
5	50 % capacity limit		

In contrast to conventional lead-calcium batteries, the sulphuric acid in a battery with fleece technology is not held freely in the battery housing. Rather, 100% of the sulphuric acid is bound into the mats of the glass-fibre fleece (separators). For this reason, no battery acid can escape if the battery housing is damaged. In addition, the AGM battery is sealed to be airtight. This is possible because the gases are converted back into water by the permeability of the separators.

Brief component description

The AGM battery has a black housing and the so-called "Magic Eye" is missing.



Item	Explanation	Item	Explanation

1	Positive grille with silver alloy	2	Positive plate
3	Negative grille	4	Negative plate
5	Separator made of glass-fibre fleece	6	Set of positive plates
7	Set of negative plates	8	Block of plates
9	Block box with base strips		

Construction

The AGM battery differs from the conventional lead calcium battery as follows:

- larger plates: Larger plates allow a 25% larger power density.
- Separators made of glass-fibre fleece: These can cause an up to 3-times higher cycle stability to be reached. This improves the cold starting capability, the power consumption and service life.
- Airtight housing with pressure relief valve (please refer to ”How it works”):
  The inspection plugs are sealed and can not be opened.
- Battery acid bound in glass-fibre fleece: Battery acid is not found free in the housing as before, but is rather bound 100% in the glass-fibre fleece. This gives increased security against the acid escaping and thus reduces the environmental risk.

Howit works

The AGM battery differs from conventional batteries in its non-polluting and substance-retaining behaviour during charging.

When a battery is charged, the electrolysis process emits the gases oxygen and hydrogen.

- In a conventional wet lead calcium battery, the two gases hydrogen and oxygen are dissipated into the atmosphere.
- In an AGM battery, the two gases are converted back into water: The oxygen which is created at the positive electrode during charging passes through the permeable glass fibre fleece to the negative electrode. At the negative electrode the oxygen reacts with the arriving hydrogen ions in the electrolyte to form water (oxygen cycle).

In this manner, the gas and thus also the electrolyte are not lost.

Only in the event of an excessively heavy build-up of gas, i.e. excessively high pressure build-up (20 to 200 mbar), does the pressure relief valve discharge the gas. In this process, the pressure relief valve does not allow any oxygen in the air to enter. Because the pressure in the battery is regulated by a valve, the AGM battery is also known as the VRLA battery (valve-regulated lead acid).

Notes for Service department

It is necessary when handling an AGM battery to observe some particular points pertaining to battery changing and installation location.

Charging

Warning! Do not charge the AGM battery with > 14.8 V. Do not use rapid-charging programs!

> When charging removed batteries (so-called stand-alone batteries), do not exceed the maximum charging voltage of 14.8 V at room temperature. Also, for charging via the external start connection point, the maximum charging voltage of 14.8 V at room temperature must not be exceeded. The battery can be damaged even if the AGM battery is only briefly charged with a charging voltage higher than 14.8 V. A charging voltage of more than 14.8 V is usually used in quick-charging routines.

Installation location

Warning! Do not install the AGM battery in the engine compartment.

> The AGM battery must not be installed in the engine compartment on account of the high spatial temperature differences, otherwise its service life will be significantly shortened.

Housing

Warning! Do not open AGM batteries.

On no account may AGM batteries be opened, as the ingress of oxygen from the atmosphere would cause the battery to lose its chemical balance, rendering it unserviceable.

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12 00 ... Notes/information on start assistance (jump starting)

Do not start the engine with help of starting sprays.

Preparation:

Conform with the following when starting the engine with a jump starting cable.

- Ensure that the jump starting cable wires are of appropriate cross-section size.
- Only use fuse-protected jump starting cables.
- Check whether the current-supplying battery has 12 V voltage.
- If the engine is started from the battery of another vehicle, ensure that there is no contact between the bodies of both vehicles.

Important!

Never touch electrically live ignition system components: high voltage - danger of injury!

If the battery in the vehicle supplying power is weak, start the engine of this vehicle and let it run at idling speed.

Operation:

It is essential to conform to the procedures so as to avoid injury to persons or damage to parts.

- Automatic transmission: select drive position ”P”, apply parking brake.
- Manual transmission: move gear lever to neutral position, apply parking brake.
- Ensure that the jump leads cannot get caught in rotating parts, e.g. fan.
- First connect both positive poles of the batteries with one jump starting cable (red).
- Use the battery positive terminal in the engine compartment for vehicles with the battery in the luggage compartment.
- Then use the second jump starting cable (black) to connect the negative post of the current-supplying battery with the earth/ground point (not the negative pole or the body) of the vehicle to be started.

Important!

Do not connect the second jump starting cable (black) with the negative pole of the battery in the vehicle to be started. Produced gas could be ignited by sparks.

Risk of explosion!

After the engine of the vehicle to be started has fired, first disconnect the jump starting cable between the negative pole and the earth/ground point. Then remove the starting cable from the positive poles.

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61 00 ... Repairing airbag cables

Important!

> **Only repair those cables which show visible signs of damage. In the event of visible damage, make sure there is only one cable repair in effect after the repair work. If no visible damage can be identified, the entire cable must be replaced. When carrying out repairs to the airbag wiring harness, you must use the spare parts offered in the Electronic Parts Catalogue (EPC).**

Safety regulations for handling components of airbag system.

Instructions for disconnecting and connecting battery.

In event of non-visible damage to wiring harness:

Disconnect plug connection on airbag module or on adapter plug. It is absolutely vital to disconnect the contacts in succession as there is a risk of mixing up (similar parts)! Cut through one cable after the other at an appropriate position, do not under any circumstances cut through both cables at the same time. Insulate cables remaining in wiring harness with insulating tape. Now disconnect plug connection on airbag control unit. Unpin contacts. Cut through one cable after the other at an appropriate position and insulate with insulating tape, do not under any circumstances cut through both cables at the same time. Pin contacts of repair cable for airbag control unit in control unit plug, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead. Now pin in contacts for airbag control unit or contacts of adapter plug, assignment of repair cables is relevant. Cut off excess length of repair cable in proximity (visible area) of airbag module or of adapter plug. Twist open cables. With the butt connectors and heat-shrink tubings in the Electronic Parts Catalogue (EPC), reconnect the cables with the same cable colours. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using butt connectors.

Installing and removing contacts.

In event of visible damage:

Expose cable at damaged areas. Cut through one cable after the other at an appropriate position and insulate cables no longer required in wiring harness with insulating tape, do not under any circumstances cut through both cables at the same time. Now, depending on the scope of work, unpin contacts either on airbag control unit/airbag module or on adapter plug. Cut off unpinned cables. Insulate cables remaining in wiring harness with insulating tape. Now pin in contacts of repair cable, assignment of repair cables is relevant. Lay repair cable in vehicle parallel to existing airbag lead up to separation point. Cut off excess length of repair cable. Twist open cables. Connect cables with butt connectors and heat-shrink tubings in Electronic Parts Catalogue (EPC), assignment of repair cables is relevant. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (heat-shrink tubing) with insulating tape to prevent cables from twisting open.

Instructions for cutting off, insulating, crimping cables, installing and removing contacts:

Cutting off and insulating cables.

Repairing a plug connection using connectors.

Installing and removing contacts.

61 00 ... Safety information on handling hybrid cars

1. *Qualification:*
   All repair work on high-voltage components may **only be performed by specially trained personnel** (qualification: Work on high-voltage inherently save vehicles) must be performed by qualified technicians. Each hybrid car requires additional vehicle specific training with training achievement controls.
   Required training is offered by the BMW Training Academy.
2. *Identification:*
   Observe **warning notices** on high-voltage components. When replacing individual high-voltage components, check if warning stickers are present. Independently attaching warnings is only allowed on the locations provided for them. Use only approved and appropriately identified original new parts.
3. *Rules of conduct/protective measures:*
   - Note operating instructions for handling high-voltage battery units.
   - Do not under any circumstances touch open high-voltage cables and high-voltage components on damaged vehicle before shutting down the high-voltage electrical system.
   - In the event of damage (mechanical, thermal) transition metal oxides, carbon, electrolyte solvents and their products of decomposition may be released.
     Suitable acid-resistant protective clothing/equipment must therefore be used when handling the vehicle!
     - Hand protection: Gloves
     - Eye protection: Safety goggles

     Damaged high-voltage battery units must be stored in an acid-resistant pan in a location in the open that is protected against the weather (sun, rain) and secured against unauthorised access. Do not inhale escaping gasses.
   - Prevent escaping substances from entering drains, pits and the sewer system.
   - Collect any material that is discharged and have it disposed of according to the work instruction, wear acid-resistant protective clothing when doing so.
   - Notify the fire brigade if fire breaks out, clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger (suitable extinguishant: water and water foam).
   - A cut 2nd emergency separation point must be repaired with a butt connector.
4. *Measures before starting work:*
   - Each job on the vehicle must be assigned by appropriately trained personnel. Before work is started, this electrician must place the vehicle in the operating condition required to perform the relevant activity. The qualified personnel's instructions and directions absolutely must be followed. **No work may be carried out without this qualified personnel being consulted first.**
   - It is **not** permitted to work on the high voltage system or on high voltage components while the engine is running.
   - The readiness to drive must be ended before shutting off the voltage of the high-voltage system. The readiness to drive is ended when the driver is absent only under the following conditions:
     1. seat belt buckle unlocked **and**
     2. the driver's door is open **and**
     3. no brake activated **and**
     4. the accelerator pedal is not activated **and**
     5. speed < 3 km/h (2 mph)
   - Work on live high-voltage components is expressly prohibited. Before each operation on the high-voltage system, the system must be isolated from the power supply by qualified personnel (high-voltage safety connector Off) and secured against unauthorised recommissioning (padlock).
   - After each deactivation of the high-voltage system, it is essential to observe a **waiting period** of at least **10 seconds** prior to further work.
   - Before beginning work, it is mandatory to check that the equipment is de-energised and is protected against being energised again.
     Work is only permitted to begin if:
     1. Corresponding display in the KOMBI **High-voltage system deactivated** or

     When a high-voltage warning is active (indicator light, Check Control, etc.), it is essential to determine and eliminate the cause of this warning via the diagnosis system before continuing with any other work.
     If it cannot be definitively established that the equipment is de-energised, work is not permitted to begin. **Danger to life!** Before work begins, a qualified electrician (1000 V AC) must verify that the system is de-energised using appropriate measuring devices and procedures.
     => In this case, Technical Support must be contacted!
   - Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging

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cable from the vehicle.
Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

5. *Measures during/after activities:*
   - Identifiable mechanical damage to or tampering with high-voltage components must be reported immediately to the qualified personnel in charge.
   - When carrying out any work on the high-voltage system, it is prohibited to drive externally all the drivetrain components (wheels, gearbox, drive shafts, etc.).
   - *E72 only:* When the “Power Electronic Box Cover” is removed, the high-voltage system is not permitted to be activated. The high-voltage service disconnect must only be used when the "Power Electronics Box Cover" is completely installed.
   - High-voltage cables (orange coating) and their connectors and stop parts **may not** be repaired. If damaged, a cable must always be replaced completely.
   - When working in the vicinity of high-voltage components (identified accordingly with warning stickers and orange-coloured coating), protect these components against damage.
   - The specified work steps in the repair instructions must be adhered to exactly.
   - High-voltage components and their holders must be screwed/bolted to the defined tightening torque. Tightening torques and tightening specifications must be observed.
   - Connecting high-voltage components to body ground is crucial to safety for reasons of equipotential bonding. For this reason, it is prohibited to operate any high-voltage components without them being correctly connected to body ground. The measurements (insulation/potential equalisation measurement) are performed automatically by the vehicle. Manual measurement is not therefore necessary.
     For a correct earthing connection, the retaining elements of high-voltage components must not be painted. Follow further painting notes.
   - Removed high-boltage battery units must be stored in a manner that protects them from misuse and damage.
   - Damaged or warning stickers that are no longer legible on high-voltage components must always be replaced.
6. *Potential compensation:*
   Equipotential bonding lines, high-voltage cables and the battery negative lead to the EME are fitted with safety screws.
   - Clean contact faces and have then checked by a second person.
   - Tighten down screws/bolts to specified torque.
   - Have tightening torque checked by a second person.
   - Both persons must document that the work has been carried out correctly in the vehicle records.

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61 00 ... Safety instructions for handling vehicle battery

Do not allow any battery acid to come into contact with the eyes, the skin or clothing. Therefore wear protective clothing, gloves and eye protection.

Do not tilt the battery, acid may emerge from the vent hole.

If acid is splashed into the eyes, rinse them immediately for several minutes with clear water. You must then consult a doctor without delay.

If acid is splashed onto the skin or clothing, neutralise it immediately with a soap solutionand rinse with lots of water.

Seek medical attention immediately if battery acid is accidentally swallowed.

Strictly no flames, sparks, naked light or smoking!

A highly explosive detonating gas is created when batteries are charged. The rooms where charging is carried out must therefore always be well ventilated.

Avoid the formation of sparks when handling cables, wiring and electrical devices.

Turn the ignition lock to the 0 position before disconnecting or connecting the battery.

Do not place tools or any similar object on the battery (danger of short circuit and explosion hazard!).

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61 20 503 Vehicle battery - closed-circuit current monitoring

Necessary preliminary tasks:

To access the battery earth lead, perform the necessary preliminary work described in the document Disconnecting battery earth lead.

Do not disconnect the battery earth lead!

Note:
If several 12 V batteries are installed in the vehicle:

Closed-circuit current check is possible **on the vehicle battery only**.



Connect diagnosis system.

Connect the clip-on probe to the battery earth lead of the vehicle battery. The arrow on the clip-on probe must point towards the vehicle battery.

Measure closed-circuit current.

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61 00 ... Battery charging calendar

Battery charging calendar 2016 (PDF file)

Battery charging calendar 2017 (PDF file)

Battery charging calendar 2018 (PDF file)

Battery charging calendar 2019 (PDF file)

Information for the battery charging calendar

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61 20 908 Carrying out a voltage interruption of the 12-V battery



Important!

Observe safety informations for handling vehicle battery.



There are two ways to carry out a voltage interruption of the 12-V battery:

1. Manually by disconnecting the battery earth lead
2. With the diagnosis system

1. Manually: Carry out the following steps:

- Switch off and disconnect battery charger
- Turn off ignition.
  For vehicles with ignition key: Ignition key in neutral position
  Vehicles with ID transmitter: Remove ID transmitter from slot
  For vehicles with Comfort Access: Secure terminal 30
- Disconnect negative battery lead
- Reconnect battery earth lead (to ensure bus activity)
- Observe a waiting period of 5–10 s
- Disconnect negative battery lead
- Observe a waiting period of approx. 1 minute
- Connect battery earth lead
  Tightening torque: 61 21 1AZ
- Connect and switch on battery charger
- Switch on ignition.

2. With the diagnosis system:

- 03 Body
- Voltage supply
- Activate rest state
- Power-down command

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61 21 028 Charging battery



Warning!

Read and comply with safety informations pertaining to vehicle battery.



Attention!

Lead-acid battery, AGM battery:

To prevent the intelligent battery sensor from malfunctioning, use the charging points in the engine compartment.

Observe instructions on intelligent battery sensor/battery electronics.



Note:
Use BMW-recommended charging computers* to charge the battery.

*Sourcing reference BMWÂ Workshop Equipment Catalogue



Pay attention when charging the lithium ion battery!

The charging voltage generated by existing chargers designed for the lead-acid or AGM batteries is **too high** for the lithium-ion battery.

In the event of excessive charging voltage, the Li-ion battery isolating switch can open, generating among things a ccm message in the cluster.

Before charging a lithium ion battery, adjust the charging voltage of existing charger adapters once.

Follow notes on lithium ion battery.

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61 21 028 Recharge vehicle battery

1 – Charging battery

TECHNICAL INFORMATION

Observe the notes on handling the vehicle battery.
For additional information see:
61 00 ... Safety information on handling the vehicle battery
61 00 / 12 00 ... Notes on disconnecting and connecting the vehicle battery
61 12 ... Notes on the intelligent battery sensor (IBS)

▶ **Charging lead-acid batteries and AGM batteries**

- Connect to a charger approved by BMW.
- If the battery is charged while it is still installed: always connect the charger to the jump start terminal point in the engine compartment.
- Fully charge the battery.

  The battery is fully loaded once the charge current drops below a certain value:

Battery temperature	Charge current
15° C - 25° C	<2.5 A
< 15°C	<1.5 A

- Disconnect the charger after having completed charging.

▶ **Charging the lithium ion battery**

TECHNICAL INFORMATION

Comply with notes on handling lithium ion batteries.
For more information see:
08 08 14 (094) Charging parameters for lithium ion batteries
61 12 ... Notes regarding intelligent battery electronics (lithium ion battery)

- Adapt the charging voltage on the charger to the lithium ion batteries.

  Too high charging voltage can lead to opening of the electronic disconnect switch.
- Connect to a charger approved by BMW.
- Fully charge the battery.
- Disconnect the charger after having completed charging.

Additional Information

Links

General repair instructions	Used in step
61 20 ... Notes on AGM battery	1
61 20 ... Notes regarding the lithium ion battery	1
61 12 ... Notes on intelligent battery sensor (IBS)	1

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61 12 ... Notes regarding the battery electronics (lithium ion battery) 1

Special tool service information	Used in step
Description of the manual Li parameter setting for DEUTRONIC DBL800/1200/1600	1
Description of the manual Li parameter setting for ELEKTRON HS-1000	1
Description of the manual Li parameter setting for ELTEK MultiCharger 750/900/1500	1

Special tool service information	Used in step
Charging parameters for lithium ion batteries	1
Note for the workshop equipment catalogue BMW, MINI	1

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61 21 010 Remove and install or replace battery

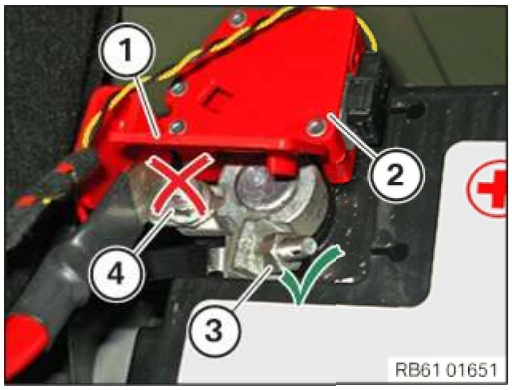
Warning!

Observe safety informations for handling vehicle battery.

To ensure the correct safety and convenience functions, install only the original battery (battery size and type) stored in the vehicle order. Observe note on battery replacement.

Necessary preliminary work:

- Clamp off battery cable from negative terminal



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Fold up cover (1) on safety battery terminal (2).

Loosen nut (3).

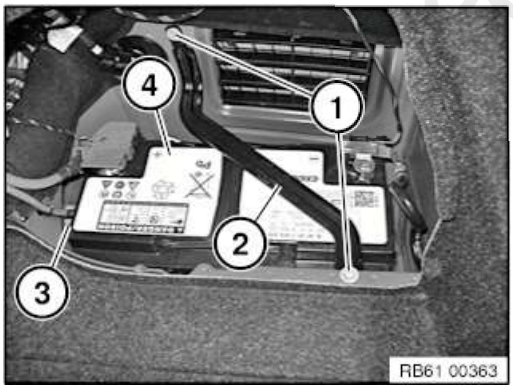
Tightening torque 61 21 1AZ.

Caution!

Nut (4) must not be loosened or released.

Do not under any circumstances pull/lever off safety battery terminal (2) by force.

Pull off safety battery terminal (2) towards top, lay to one side and secure.

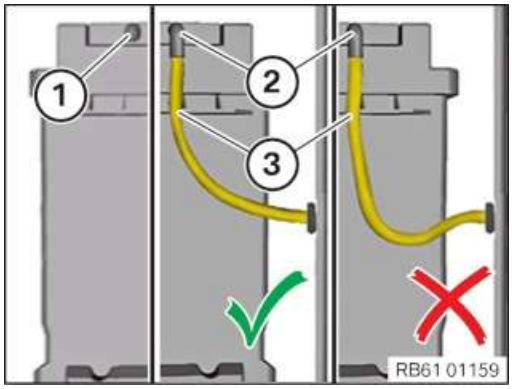


Release screws (1).

Tightening torque 61 21 5AZ.

Remove retaining brackets (2).

Detach vent hose (3) from vehicle battery (4).



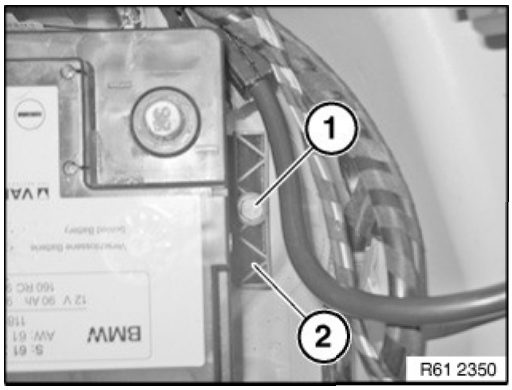
Caution!
Danger due to released gases!

Installation note:
The battery has two vent holes:

- One vent hole (1) must be closed correctly with a dummy plug.
- The vent hose (3) must be connected correctly at the other vent hole (2) .

Always install the vent hose (3) with a downhill gradient to the outside!

No siphon formation!



Release screw (1) and remove battery holder (2).

Tightening torque 61 21 5AZ

Remove battery.

Installation note:
Make sure battery is correctly seated in mounting.



Replacement:

- Register battery exchange

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61 42 ... Removing and installing control unit holder

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Necessary preliminary tasks:

For F30; F32; F35; F80; F82:

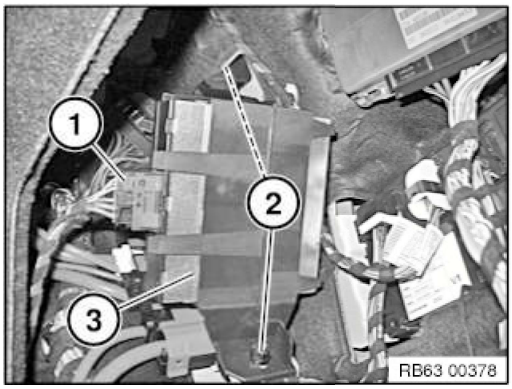
- Open flap in luggage compartment panel on right

F31For:

- Remove battery cover

For F34; F36:

- Remove luggage compartment trim on side panel on right



Release plug connections (1) on all control units.

Release nuts (2) and remove control unit holder (3).

Installation note:
Ensure that the plug connections (1) are correctly seated.

Ensure that the control unit holder (3) is correctly seated.

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61 00 ... Safety information on handling hybrid cars

1. *Qualification:*
   All repair work on high-voltage components may **only be performed by specially trained personnel** (qualification: Work on high-voltage inherently save vehicles) must be performed by qualified technicians. Each hybrid car requires additional vehicle specific training with training achievement controls.
   Required training is offered by the BMW Training Academy.
2. *Identification:*
   Observe **warning notices** on high-voltage components. When replacing individual high-voltage components, check if warning stickers are present. Independently attaching warnings is only allowed on the locations provided for them. Use only approved and appropriately identified original new parts.
3. *Rules of conduct/protective measures:*
   - Note operating instructions for handling high-voltage battery units.
   - Do not under any circumstances touch open high-voltage cables and high-voltage components on damaged vehicle before shutting down the high-voltage electrical system.
   - In the event of damage (mechanical, thermal) transition metal oxides, carbon, electrolyte solvents and their products of decomposition may be released.
     Suitable acid-resistant protective clothing/equipment must therefore be used when handling the vehicle!
     - Hand protection: Gloves
     - Eye protection: Safety goggles

     Damaged high-voltage battery units must be stored in an acid-resistant pan in a location in the open that is protected against the weather (sun, rain) and secured against unauthorised access. Do not inhale escaping gasses.
   - Prevent escaping substances from entering drains, pits and the sewer system.
   - Collect any material that is discharged and have it disposed of according to the work instruction, wear acid-resistant protective clothing when doing so.
   - Notify the fire brigade if fire breaks out, clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger (suitable extinguishant: water and water foam).
   - A cut 2nd emergency separation point must be repaired with a butt connector.
4. *Measures before starting work:*
   - Each job on the vehicle must be assigned by appropriately trained personnel. Before work is started, this electrician must place the vehicle in the operating condition required to perform the relevant activity. The qualified personnel's instructions and directions absolutely must be followed. **No work may be carried out without this qualified personnel being consulted first.**
   - It is **not** permitted to work on the high voltage system or on high voltage components while the engine is running.
   - The readiness to drive must be ended before shutting off the voltage of the high-voltage system. The readiness to drive is ended when the driver is absent only under the following conditions:
     1. seat belt buckle unlocked **and**
     2. the driver's door is open **and**
     3. no brake activated **and**
     4. the accelerator pedal is not activated **and**
     5. speed < 3 km/h (2 mph)
   - Work on live high-voltage components is expressly prohibited. Before each operation on the high-voltage system, the system must be isolated from the power supply by qualified personnel (high-voltage safety connector Off) and secured against unauthorised recommissioning (padlock).
   - After each deactivation of the high-voltage system, it is essential to observe a **waiting period** of at least **10 seconds** prior to further work.
   - Before beginning work, it is mandatory to check that the equipment is de-energised and is protected against being energised again.
     Work is only permitted to begin if:
     1. Corresponding display in the KOMBI **High-voltage system deactivated** or

     When a high-voltage warning is active (indicator light, Check Control, etc.), it is essential to determine and eliminate the cause of this warning via the diagnosis system before continuing with any other work.
     If it cannot be definitively established that the equipment is de-energised, work is not permitted to begin. **Danger to life!** Before work begins, a qualified electrician (1000 V AC) must verify that the system is de-energised using appropriate measuring devices and procedures.
     => In this case, Technical Support must be contacted!
   - Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging

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cable from the vehicle.
Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

5. *Measures during/after activities:*
   - Identifiable mechanical damage to or tampering with high-voltage components must be reported immediately to the qualified personnel in charge.
   - When carrying out any work on the high-voltage system, it is prohibited to drive externally all the drivetrain components (wheels, gearbox, drive shafts, etc.).
   - *E72 only:* When the “Power Electronic Box Cover” is removed, the high-voltage system is not permitted to be activated. The high-voltage service disconnect must only be used when the "Power Electronics Box Cover" is completely installed.
   - High-voltage cables (orange coating) and their connectors and stop parts **may not** be repaired. If damaged, a cable must always be replaced completely.
   - When working in the vicinity of high-voltage components (identified accordingly with warning stickers and orange-coloured coating), protect these components against damage.
   - The specified work steps in the repair instructions must be adhered to exactly.
   - High-voltage components and their holders must be screwed/bolted to the defined tightening torque. Tightening torques and tightening specifications must be observed.
   - Connecting high-voltage components to body ground is crucial to safety for reasons of equipotential bonding. For this reason, it is prohibited to operate any high-voltage components without them being correctly connected to body ground. The measurements (insulation/potential equalisation measurement) are performed automatically by the vehicle. Manual measurement is not therefore necessary.
     For a correct earthing connection, the retaining elements of high-voltage components must not be painted. Follow further painting notes.
   - Removed high-boltage battery units must be stored in a manner that protects them from misuse and damage.
   - Damaged or warning stickers that are no longer legible on high-voltage components must always be replaced.
6. *Potential compensation:*
   Equipotential bonding lines, high-voltage cables and the battery negative lead to the EME are fitted with safety screws.
   - Clean contact faces and have then checked by a second person.
   - Tighten down screws/bolts to specified torque.
   - Have tightening torque checked by a second person.
   - Both persons must document that the work has been carried out correctly in the vehicle records.

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61 25 ... Assessing the transport capability of cell block in service workshops



Warning!

High-voltage system - danger to life!

The following points must be strictly observed **prior to starting work**:

- Safety information for handling electric / hybrid vehicles.
- Visual check of the high-voltage battery unit following an accident

Initiating:

For analysis and disposal purposes, it is necessary to transport an already used cell module. These lithium-ion based cell blocks are to be classified as hazardous material according to UN 38.3, and may only be transported under particular prerequisites.

Obtaining the certified transportability between the assessment and delivery of the cell block to the disposal / transportation company is the responsibility of a qualified person. For shipping one also needs to take into account the influence of the storage requirements and other possible occurring events for the determined transportability.

The transport in the sense of the hazardous goods legislation is organised in three areas:

1. Assessment of the transportability
2. Transport preparation
3. Performing the transport

This document contains all the necessary information in order to assess the transportability of a used cell block. The transport preparation and execution is **not** an element of this document.

Further information on this can be found in the information bulletin in the ASAP.

It will be explained which measures are necessary in order to assess the transportability. How these measures are to be performed individually depends on the particular situation at the location and is not an element of this document. These procedures are to be defined according to the local regulations / laws and recorded as valid local work instructions.

Prerequisites from a security perspective:

The analysis and assessment of the cell block is to be performed by an "expert for working on HV intrinsically safe vehicles".

The certificate of the transportability is the responsibility of the qualified person.

The following specifications for work safety must also be observed:

Storage of cell blocks

For dual-cell modules, the module connector should be disconnected.

The information for this can be found in the information bulletin in the ASAP.

Note: This document must be printed out and archived with the vehicle data.

Assessment cell block

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NAME	Date	Serial no.	VIN

Signature: ----------

The electrical assessment of the cell module takes place via the **diagnosis and test module**.

The de-energised state of the high-voltage battery unit is to be determined **before** it is removed from the vehicle.

De-energise the high-voltage system.

Transport preventing faults according to the diagnosis or the test module	Yes	No

Visual assessment:

Smoke	Yes	No
Evidence of fire damage	Yes	No
Heat development	Yes	No
Crack or opening on the housing	Yes	No
Dents on the housing, deformation, damage	Yes	No
Loose connections, loose or damaged	Yes	No
Serial number not readable	Yes	No
Suspected water damage	Yes	No

Cell module, transport capable	**No**	**Yes**

The serial number must be clearly legible. If the serial number can no longer be read, the housing of the cell block must be clearly marked with the serial number.

The electrical and visual assessment must be set down in writing!

If one or more points is/are answered with yes the following procedure must be clarified with technical support! Furthermore, the high-voltage battery unit that has been removed must be blocked off with high-voltage barrier tape. If the high-voltage battery unit is still in the vehicle, the vehicle must be made inaccessible and blocked off.

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61 00 ... Battery charging calendar

Battery charging calendar 2016 (PDF file)

Battery charging calendar 2017 (PDF file)

Battery charging calendar 2018 (PDF file)

Battery charging calendar 2019 (PDF file)

Information for the battery charging calendar

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61 25 ... Notes on repair of high-voltage battery unit

1. Prerequisite

Various organisational prerequisites need to be fulfilled before the repair of a high-voltage battery unit is permitted and can be carried out in an expedient way. These prerequisites concern both, the commercial company and the service employee.

The repair of a high-voltage battery unit is intended to be carried out exclusively by commercial companies featuring the service format BMW i Service Extended Battery or BMW i Service Full.

A commercial company featuring the service format BMW i Service Basic is able to remove and install a high-voltage battery unit but cannot perform any repair work on or in the high-voltage battery unit. If a repair is required according to the test schedule in the diagnosis system, the vehicle or the high-voltage battery unit must be transported to a commercial company featuring the service format BMW i Service Extended Battery or BMW i Service Full. The repair is to be carried out in such a workshop.

The commercial company must make available the required special tools and a suitable workbay for the repair.

The most important special tools are the following:

- Mobile lift table MHT 1200 + set of adapters to remove and install the high-voltage battery unit
- Charger for cell blocks of high-voltage battery unit
- Diagnosis system for the repaired high-voltage battery unit
- Lifting tackle to remove and install cell blocks
- Panel wedges made of plastic to remove clips within the high-voltage battery unit
- Lifting traverse for the complete high-voltage battery unit
- High-voltage barrier tape
- Yellow cones relating to high-voltage recommended

Sourcing reference:

See Aftersales Assistance Portal (ASAP) - Service/Technical - Workshop Equipment (Start BMW) - Shop Workshop Equipment or at www.bmwgroup.com

Only service employees being qualified for the repair of the high-voltage battery unit may carry out this procedure.

This includes training for "experts for work on high-voltage-intrinsically safe vehicles".

Before removing and opening the high-voltage battery unit, troubleshooting is to be carried out by means of the relative diagnosis system. Only if determined by the test schedule and if the prerequisite „no mechanical damage on the outside“ is satisfied, the high-voltage battery unit may be opened and the faulty component identified by the test schedule can be replaced. No other repair work relating to the high-voltage battery unit than the replacement of faulty components is planned.

It is essential to observe the operational steps specified in the repair instructions very precisely in order to carry out the replacement of a faulty component. The use of the special tools listed therein is absolutely essential as well.

2. Safety rules

- The first step after opening the housing cover to repair the high-voltage battery unit is a visual inspection for mechanical damage.
- A thorough visual inspection of the components inside the working area is required during and/or before and after every operation. When removing one component, all other involved components being accessible need to be checked for damages. If the housing or other internal high-voltage components are damaged, a qualified electrician or Technical Support must be contacted. All repair works relating to the high-voltage battery unit must be stopped immediately for safety reasons
- Check the correct latch mechanism of the connector of the insulation monitoring line at the control unit of the high-voltage battery unit. If this is not fully locked, an isolation fault may not have been detected.
- The separation of the high-voltage cable between the two cell modules mounted on the inside of the housing (across from the connection side of the high-voltage battery unit) is to be always carried out before working on the opened high-voltage battery unit. This procedure ensures the interrupt of the series connection (additional safety)
- The workbay required for the repair of the high-voltage battery unit must be clean (free of grease, dirt and swarf), dry (no leaking fluid) and free of flying sparks. Therefore, avoid close vicinity to areas intended for cleaning of vehicles and to workbays intended for repair work relating to the body. Use movable walls for separation, if needed

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- High-voltage barrier tape is required to secure the workbay against unauthorised access (insufficient qualification, customers, visitors, etc.). It is also required in case the high-voltage intrinsic safety is not established or the status is not determined yet. Placing yellow cones with lightning bolt to indicate high-voltage when leaving the working area is recommended
- Do not use tools or other objects with pointed and sharp blades/edges when working on high-voltage components or high-voltage cables and/or in their close vicinity. Diagonal cutting pliers, knives etc. are prohibited. Cable straps inside the low-voltage wiring harness may be opened by means of diagonal cutting pliers
  Allowed: Plastic wedges
- Cable straps relating to high-voltage cable may not be cut open. Damaged clips remain on the high-voltage cable. The remaining, damaged clip must be pushed to a position on the high-voltage line where the clip can not rub. A new clip must then be installed
- Defective or damaged high-voltage cables must be made unusable to ensure they are not reused
- No tools must be forgotten inside the high-voltage battery unit. Check whether all tools are present in the tool box before closing the housing cover
- It is absolutely essential to remove all small parts/screws that fell into the high-voltage battery unit. The use of magnetized screws is generally recommended in order not to lose any screws in the high-voltage battery unit during the repair
- When interruptions of work occur: Secure housing cover against unintended opening by screwing in several screws. Enclose the working area by means of high-voltage barrier tape
- Due to the very slim construction of the radiator, the risk of damage during disassembly and installation is high. Careful handling is absolutely necessary as the cooling of the cell blocks may not be guaranteed when the radiator is damaged (bent, dented). The consequence is a major loss of the electrical range and of the power of the vehicle. In extreme cases, even a breakdown may occur
- Very careful handling is necessary when disconnecting and connecting the insulation detector line at the control unit of the high-voltage battery unit (safety box coming) since high-voltage is present in the thin orange lines. Do not pull on the lines (e.g. to unplug the connector etc.)! The connector must be locked securely when plugged in
- Make sure the plastic lids of the modules are not removed when working on the cell modules (loosing screws, raising and lifting, …). The live cell contacting system is located thereunder. Continuing to work with the lid being removed is not permitted. A qualified electrician or Technical Support must be contacted
- A schematic diagram with limiting sample examples in the training is necessary to get to know the limits. These show when the further work for the "experts for intrinsically safe vehicles" is no longer possible due to absent intrinsic safety, and the Technical Support or a qualified electrician must be contacted
- Remove residual moisture and coarse contamination around the lid of the high-voltage battery unit before beginning the disassembly
- Clean gaskets and sealing surfaces (venting unit, high-voltage connector, signal connector, radiator connection) with a specified cleaning agent before reassembly
- If contamination is present in the high-voltage battery unit, check the cause and carefully clean the affected areas
  Approved cleaning agent:
  - Spirit
  - Windscreen cleaner
  - Glass cleaner
  - Distilled water
  - Vacuum cleaner with plastic top
- Visual inspection for contamination and damage of housing as well as of connections and degassing unit when installed (underfloor). A damaged diaphragm within the venting unit may indicate damaged storage cells. In this case, special carefulness is required when checking and opening the high-voltage battery unit
- Electrolyte
  The majority of the electrolyte is a mixture of lithium-nickel-manganese-cobalt oxide in bound state The quantity of free electrolyte in the high-voltage battery unit is very small. It is a noxious and irritant fluid. Absolutely avoid direct contact of skin with leaking fluid as acid burns may occur. In case of contact with eyes or skin, flush with plenty of clear water and consult a doctor immediately. Burning or evaporating electrolyte is also hazardous. CAREFUL: do not inhale! Ensure sufficient fresh air supply. If breathing ceases, apply artificial respiration and immediately consult a doctor. Notify fire brigade in case of fire. Clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger and use suitable extinguishant, e.g. water

3. Repairing removed high-voltage battery units

- The high-voltage battery unit is a component of large dimensions and heavy weight. Only the combination of the housing and the cell blocks mounted therein provides the high-voltage battery unit with complete stability (rigidity), as required for driving. Therefore, it is necessary to ensure that the housing is positioned on the

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relative mounting/adapter of the lifting table during replacement and fixation of cell blocks. In this way, one can prevent the housing from bracing during the repair work and ensure the high-voltage battery unit is not installed in the BMW I01 in this condition

- It is extremely important to enter the serial numbers and the installation positions of the replaced components in the SME via the testing device, as well as to carry out the transmission into the diagnosis system. Otherwise, the new installation position will be assigned automatically by the SME. The consequence is an incorrect location data, as the SME does not set correct positions. For a renewed repair of the high-voltage battery unit, the diagnosed faults for the incorrect installation position will be displayed. The consequence is that replacement is done at the wrong location
- In diagnosis, it is not possible to enter the serial numbers of the cell supervision circuits. The serial numbers are transmitted from the cell supervision circuit to the SME using the CAN bus. The SME then sets a corresponding position assignment. This assignment is not always fault-free. That is why the serial number and installation position of the exchanged cell supervision circuit must be checked in the diagnosis after completed repair. If the positions do not match, a position change can be performed with diagnosis. A new serial number of a cell supervision circuit is not entered
- Attention: Do not use powered wrenches as the screws/threads located in the high-voltage battery unit may break due to the low torques!
- The seal must be renewed every time the housing cover is removed to guarantee tightness of the high-voltage battery unit
- The screws are thread-tapping, so pre-insert them manually before tightening them with a tool. Otherwise, the threads of the lower housing section may be damaged!

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61 00 ... Safety information on handling hybrid cars

1. *Qualification:*
   All repair work on high-voltage components may **only be performed by specially trained personnel** (qualification: Work on high-voltage inherently save vehicles) must be performed by qualified technicians. Each hybrid car requires additional vehicle specific training with training achievement controls.
   Required training is offered by the BMW Training Academy.
2. *Identification:*
   Observe **warning notices** on high-voltage components. When replacing individual high-voltage components, check if warning stickers are present. Independently attaching warnings is only allowed on the locations provided for them. Use only approved and appropriately identified original new parts.
3. *Rules of conduct/protective measures:*
   - Note operating instructions for handling high-voltage battery units.
   - Do not under any circumstances touch open high-voltage cables and high-voltage components on damaged vehicle before shutting down the high-voltage electrical system.
   - In the event of damage (mechanical, thermal) transition metal oxides, carbon, electrolyte solvents and their products of decomposition may be released.
     Suitable acid-resistant protective clothing/equipment must therefore be used when handling the vehicle!
     - Hand protection: Gloves
     - Eye protection: Safety goggles

     Damaged high-voltage battery units must be stored in an acid-resistant pan in a location in the open that is protected against the weather (sun, rain) and secured against unauthorised access. Do not inhale escaping gasses.
   - Prevent escaping substances from entering drains, pits and the sewer system.
   - Collect any material that is discharged and have it disposed of according to the work instruction, wear acid-resistant protective clothing when doing so.
   - Notify the fire brigade if fire breaks out, clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger (suitable extinguishant: water and water foam).
   - A cut 2nd emergency separation point must be repaired with a butt connector.
4. *Measures before starting work:*
   - Each job on the vehicle must be assigned by appropriately trained personnel. Before work is started, this electrician must place the vehicle in the operating condition required to perform the relevant activity. The qualified personnel's instructions and directions absolutely must be followed. **No work may be carried out without this qualified personnel being consulted first.**
   - It is **not** permitted to work on the high voltage system or on high voltage components while the engine is running.
   - The readiness to drive must be ended before shutting off the voltage of the high-voltage system. The readiness to drive is ended when the driver is absent only under the following conditions:
     1. seat belt buckle unlocked **and**
     2. the driver's door is open **and**
     3. no brake activated **and**
     4. the accelerator pedal is not activated **and**
     5. speed < 3 km/h (2 mph)
   - Work on live high-voltage components is expressly prohibited. Before each operation on the high-voltage system, the system must be isolated from the power supply by qualified personnel (high-voltage safety connector Off) and secured against unauthorised recommissioning (padlock).
   - After each deactivation of the high-voltage system, it is essential to observe a **waiting period** of at least **10 seconds** prior to further work.
   - Before beginning work, it is mandatory to check that the equipment is de-energised and is protected against being energised again.
     Work is only permitted to begin if:
     1. Corresponding display in the KOMBI **High-voltage system deactivated** or

     When a high-voltage warning is active (indicator light, Check Control, etc.), it is essential to determine and eliminate the cause of this warning via the diagnosis system before continuing with any other work.
     If it cannot be definitively established that the equipment is de-energised, work is not permitted to begin. **Danger to life!** Before work begins, a qualified electrician (1000 V AC) must verify that the system is de-energised using appropriate measuring devices and procedures.
     => In this case, Technical Support must be contacted!
   - Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging

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cable from the vehicle.
Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

5. *Measures during/after activities:*
   - Identifiable mechanical damage to or tampering with high-voltage components must be reported immediately to the qualified personnel in charge.
   - When carrying out any work on the high-voltage system, it is prohibited to drive externally all the drivetrain components (wheels, gearbox, drive shafts, etc.).
   - *E72 only:* When the “Power Electronic Box Cover” is removed, the high-voltage system is not permitted to be activated. The high-voltage service disconnect must only be used when the "Power Electronics Box Cover" is completely installed.
   - High-voltage cables (orange coating) and their connectors and stop parts **may not** be repaired. If damaged, a cable must always be replaced completely.
   - When working in the vicinity of high-voltage components (identified accordingly with warning stickers and orange-coloured coating), protect these components against damage.
   - The specified work steps in the repair instructions must be adhered to exactly.
   - High-voltage components and their holders must be screwed/bolted to the defined tightening torque. Tightening torques and tightening specifications must be observed.
   - Connecting high-voltage components to body ground is crucial to safety for reasons of equipotential bonding. For this reason, it is prohibited to operate any high-voltage components without them being correctly connected to body ground. The measurements (insulation/potential equalisation measurement) are performed automatically by the vehicle. Manual measurement is not therefore necessary.
     For a correct earthing connection, the retaining elements of high-voltage components must not be painted. Follow further painting notes.
   - Removed high-boltage battery units must be stored in a manner that protects them from misuse and damage.
   - Damaged or warning stickers that are no longer legible on high-voltage components must always be replaced.
6. *Potential compensation:*
   Equipotential bonding lines, high-voltage cables and the battery negative lead to the EME are fitted with safety screws.
   - Clean contact faces and have then checked by a second person.
   - Tighten down screws/bolts to specified torque.
   - Have tightening torque checked by a second person.
   - Both persons must document that the work has been carried out correctly in the vehicle records.

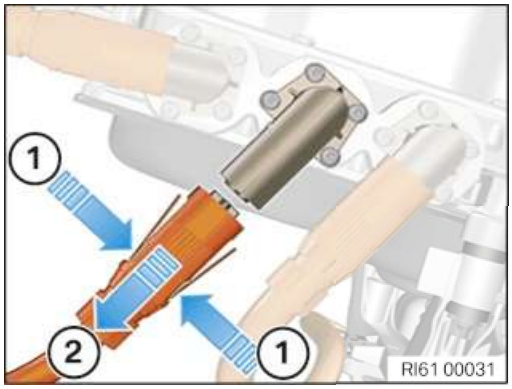
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61 13 ... Unlocking and disconnecting various plug connections in electrical and hybrid vehicles

Attention!

Observe the following instructions for handling high-voltage plug connections:

- Damaged high-voltage plug connections must be replaced completely. Repair is not permitted.
- Dirt contamination must be removed before opening the plug connection.



Disconnect the Hirschmann high-voltage connector:

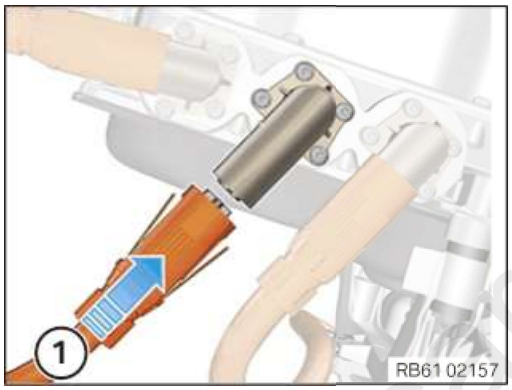
Press the lock (1) on the left and right on the connector in the direction of the arrow.

Pull off connector (2) in direction of arrow.

Attention!

Connector (2) is difficult to pull off.

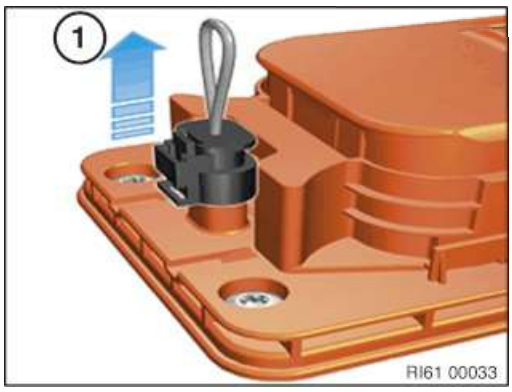
In the event of damage to high-voltage connector (2), the complete high-voltage cable must be replaced!



Connect the Hirschmann high-voltage connectors:

Slide the connector (1) on in the direction of the arrow.

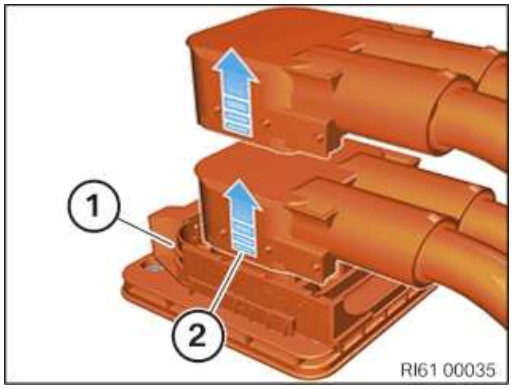
Note:
Connector (2) must lock audibly.



Disconnect the Kostal high-voltage connector:

Unlock and disconnect high-voltage interlock loop (1).

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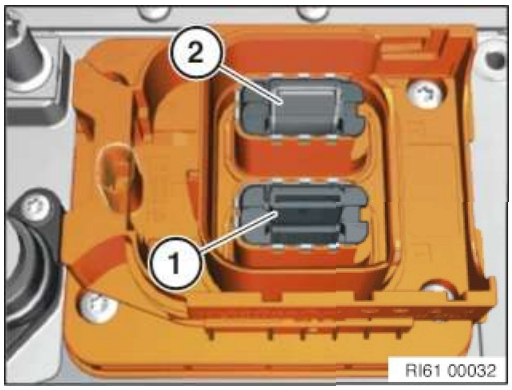
Push the lock (1) fully to the front.

Lift the connector (2) and remove it entirely.

Attention!

Plug connection (3) is difficult to pull off.

The connector (2) must be completely pulled off the opposite housing in one step. Damage may be caused to contact protection if connector is only partly pulled off and then closed again!



Check the Kostal high-voltage connector and connection for damage:

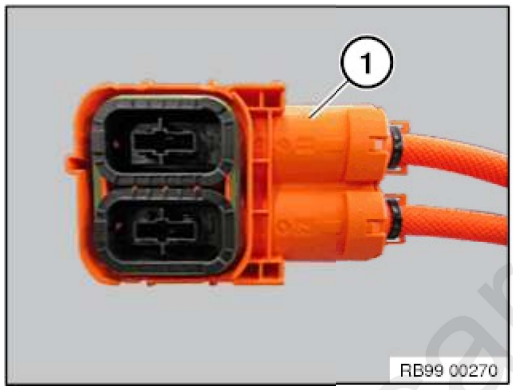
Check the touch protection for damage and correct positioning (1).

Warning!

Do not touch unprotected connector (2)!

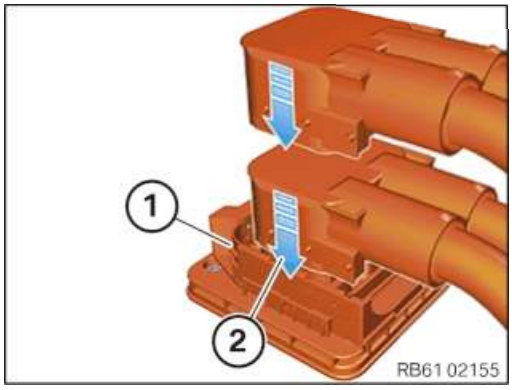
If the contact protection (1) has been pushed to the bottom (2), the high-voltage connector must be refitted.

If contact protection (1) remains in bottom position (2) after reinstallation, the contact protection is faulty and the component must be replaced!



Check the high-voltage connector (1) for damage.**Warning!**

In the event of damage to the high-voltage connector (1), the complete high-voltage cable must be replaced!



Connect the Kostal high-voltage connector:

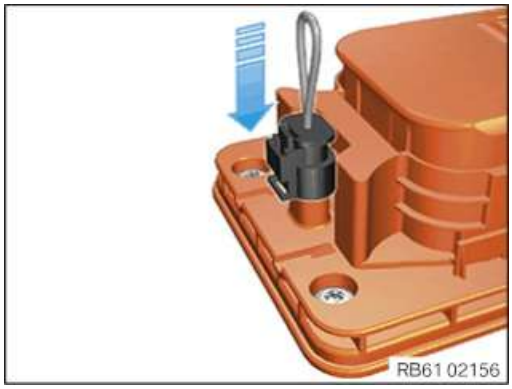
Connect the connector (2) in one single movement to the counter-housing.

Push the lock (1) fully to the rear.

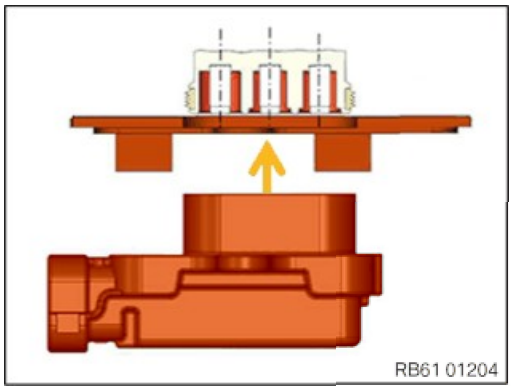
Attention!

Plug connection (3) must be correctly locked by lock (2), otherwise there is a risk of damage.

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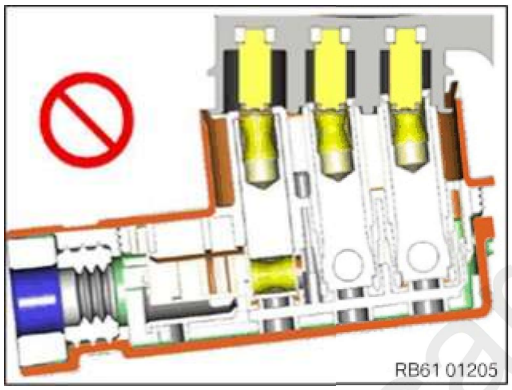


Connect the connector for the high-voltage interlock.



Three-phase high-voltage connector:

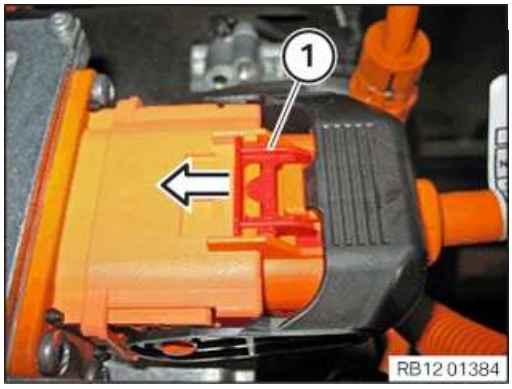
Connect and disconnect the connector straight.



Attention!

The system is designed to only offer limited protection against damage caused by connectors that are inserted at an angle.

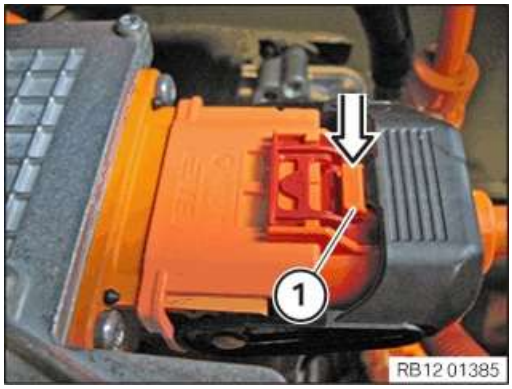
Increased tilted connections will increase the connecting force and the risk of danger.



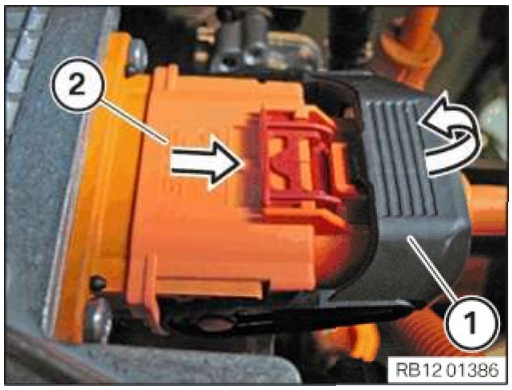
Disconnect the high-voltage connector from the high-voltage connection of the KLE:

Slide lock (1) in direction of arrow up to stop.

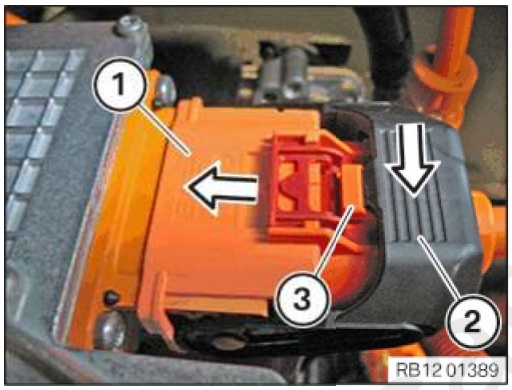
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Press lock (1).



Open the lock (1) completely and disconnect the connector (2).



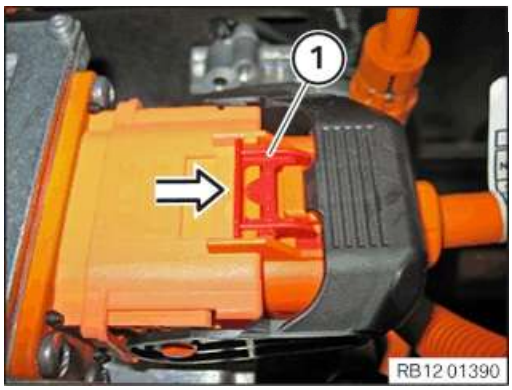
Connect the high-voltage connector to the high-voltage connection of the KLE:

Connect the connector (1) to the limit position and close the lock (2).

Attention!

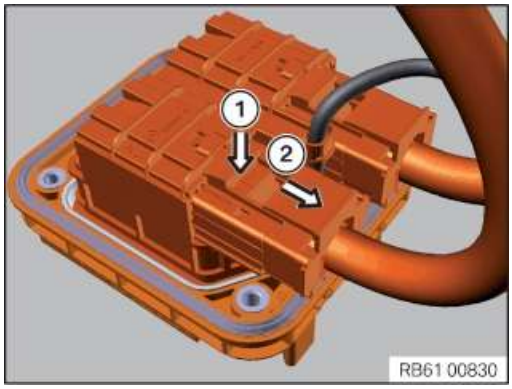
Lock (2) must snap audibly into place.

The retaining lug of the lock (2) must be positioned completely under the lock (2).



Slide the lock (1) on to the stop in the direction of the arrow.

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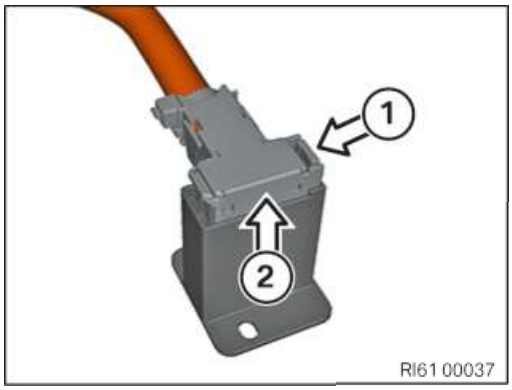
High-voltage connector on the high-voltage connection of the high-voltage battery unit:

Press down unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



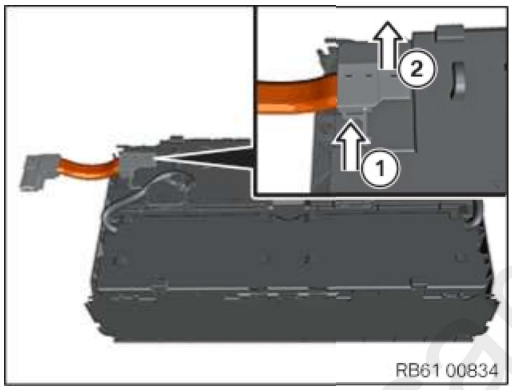
High-voltage connector on the cell module I01:

Press unlocking device (1) together and pull off connector upwards (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.



High-voltage connector on the cell module (cell module connecting line):

Press unlocking (1) in direction of arrow and pull off connector in direction of arrow (2).

Attention!

Contact protection is no longer provided in the event of a damaged connector housing.

In this case, contact technical support.

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61 35 679 Initialise the rain-light-solar-condensation sensor

Note:
Initialisation is necessary:

- after replacing the windscreen
- after replacing the rain-light-solar-condensation sensor
- after removing and installing the rain-light-solar-condensation sensor

Note:

- Connect BMW diagnosis system
- Initialise the rain-light-solar-condensation sensor

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61 35 679 Initializing rain/light sensor

Note:
Initialisation is necessary:

- after replacing the windscreen
- after replacing the rain-light sensor
- after removing and installing the rain-light sensor

Note:

- Connect BMW diagnosis system
- Initializing rain/light sensor

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61 31 ... Moving receiver radio remote control

Note:
Repairs can be carried out only in the case of fault pattern "Wheel electronics: no reception".

Repairs may only be carried out according to the instructions of the test module.

Before carrying out repairs, run the test module over the following path:

- Driver assistance
- Tyre pressure control
- Wheel electronics: No reception

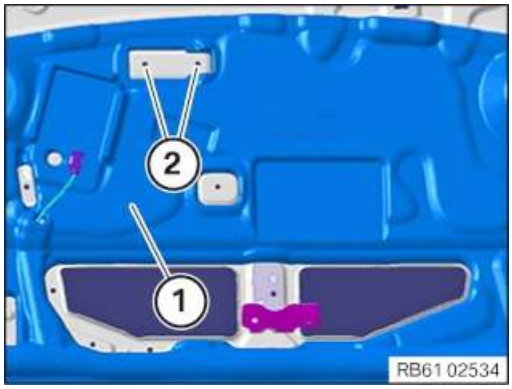
Parts required:

Parts	Part number	Number
Radio receiver	6 806 871	1
Holder	6 992 153	1
Sheet metal screws (holder to body)	6 801 211	2
Expanding rivet (radio receiver to holder)	1 908 077	1
Wiring harness adapter with 4 clips	6 991 308	1
Sound insulation	7 284 983	1
Felt	2 697 913	1
Seal plug (for closing the openings at the previous installation location)	7 221 349	2

Necessary preliminary work:

- Remove radio remote control receiver
- Remove emergency GSM aerial

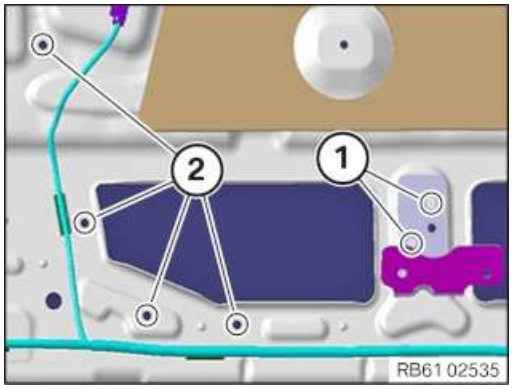
Read and comply with notes on handling wiring harnesses and wiring.



Remove and dispose of sound insulation (1).

Seal holes (2) of the original installation location of the radio receiver using seal plugs.

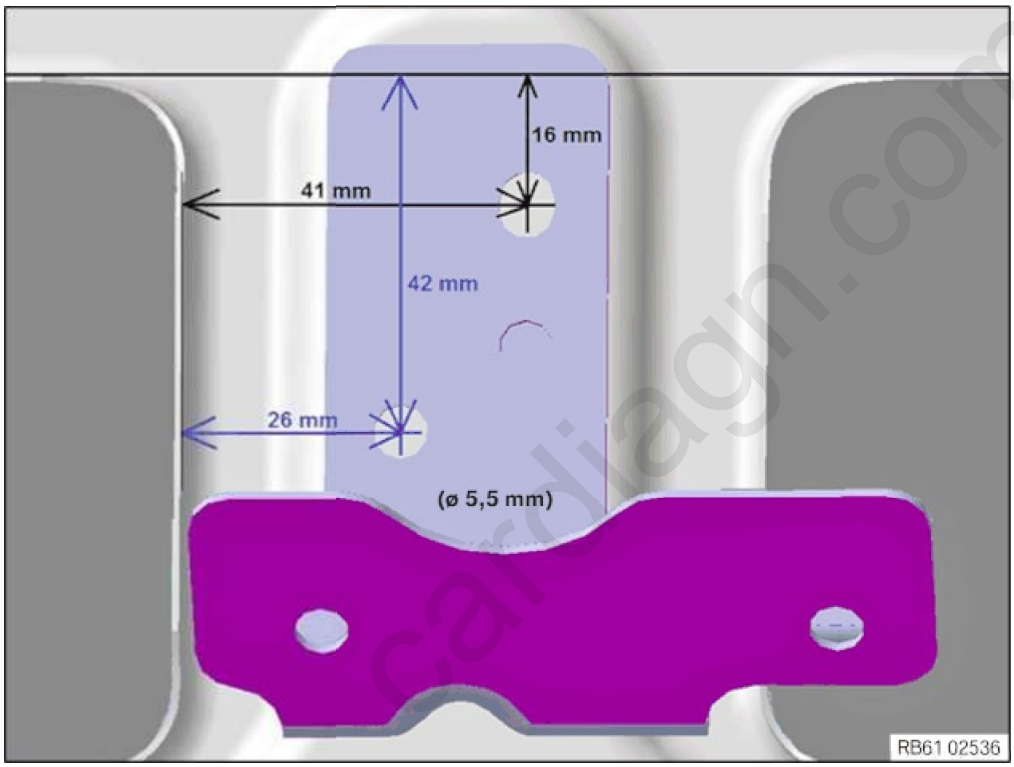
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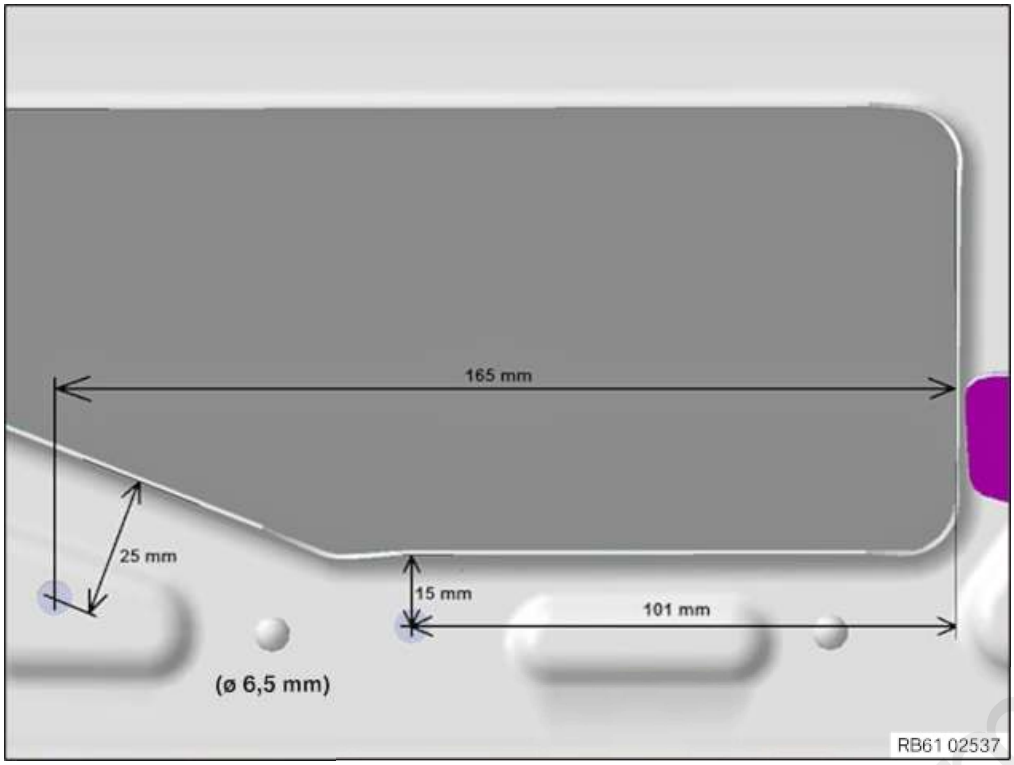
Overview of holes to be drilled:

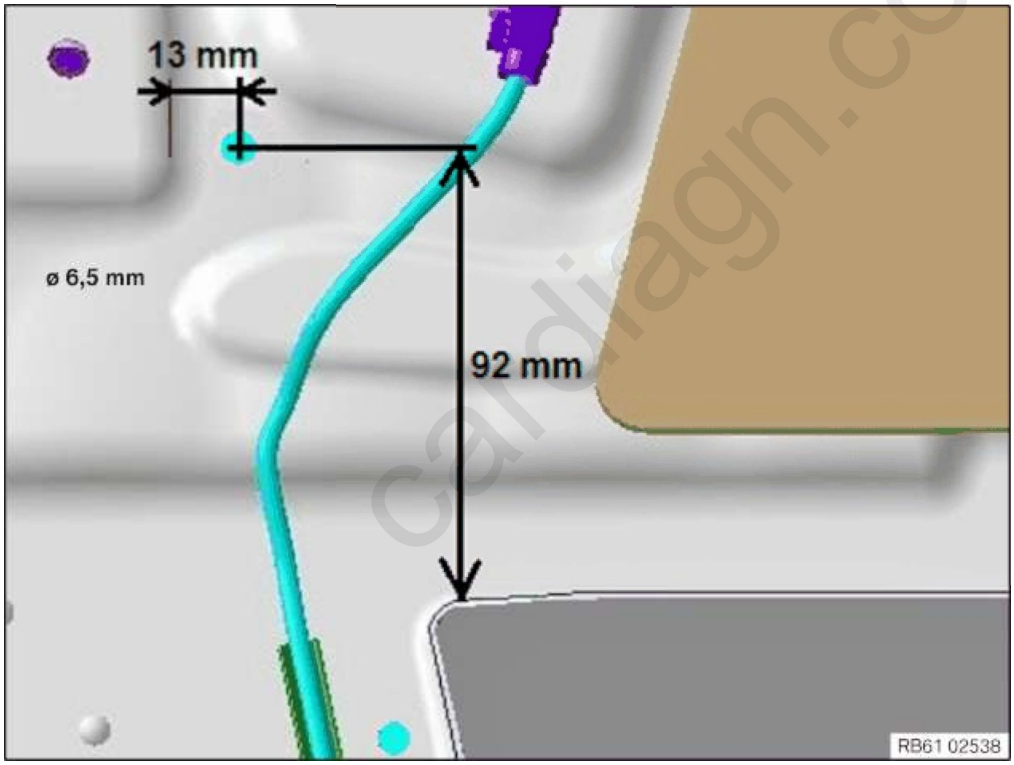
- Holes (1) for the holder (dia. 5.5 mm)
- Holes (2) for the clips of the wiring harness mounting (dia. 6.5 mm)

On the basis of the following four illustrations, mark the centre points of the holes to be drilled.*Note:*
All dimensions in mm.

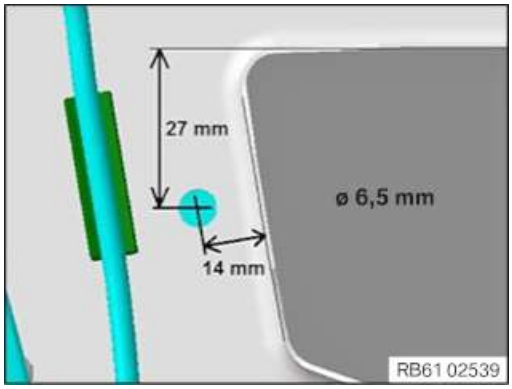


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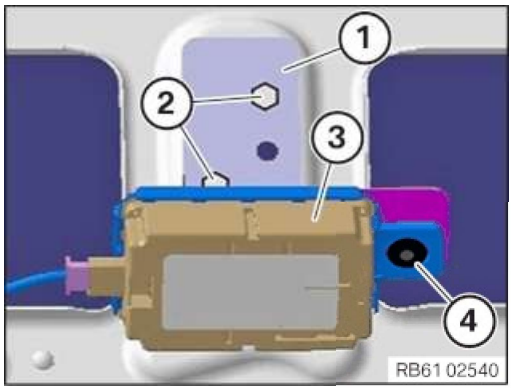


Mark centre of the indicated holes.

Drill two holes of the holder with dia. 5.5 mm and deburr.

Drill the remaining four holes with dia. 6.5 mm and deburr.

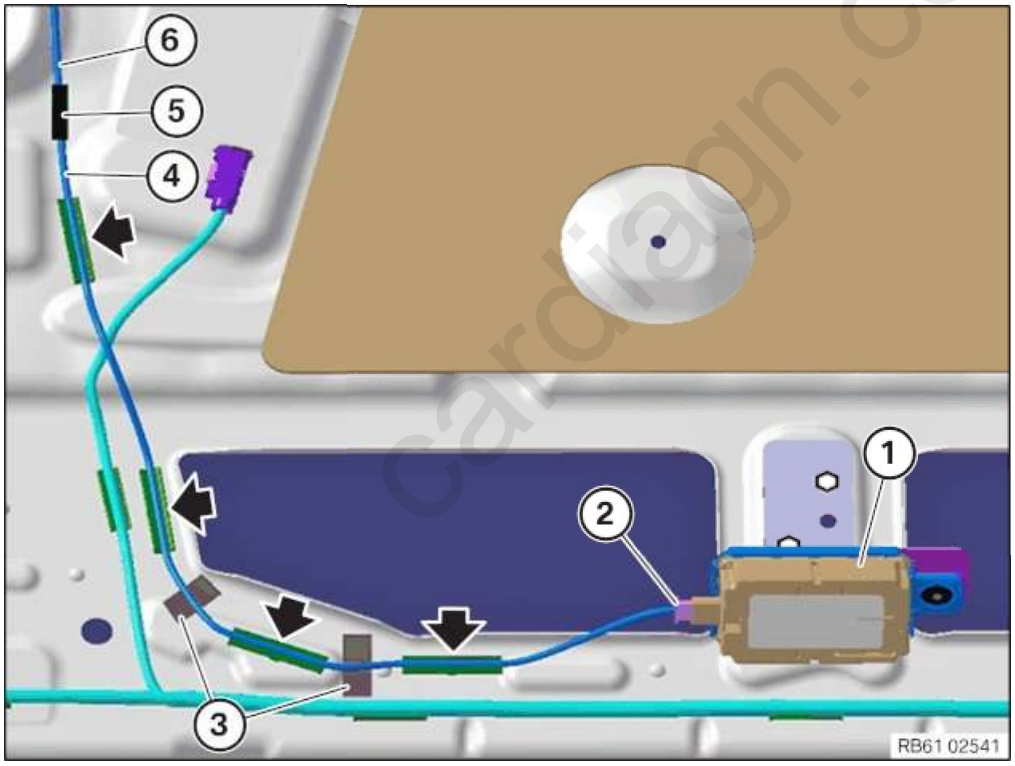
Install new sound insulation.



Mount holder (1) using sheet metal screws (2).

Tightening torque: 8 Nm

Secure new radio receiver (3) on holder (1) by means of expanding rivet (4).



Note:

For the purposes of clearer representation, illustration without the already installed sound insulation.

Cut two felt pieces (3) to size 3x4 cm.

Bond the two felt pieces (3) as shown.

Connect plug connection (2) from the wiring harness adapter (4) at the radio receiver (1).

Secure wiring harness adapter (4) at the points marked with an arrow.

Connect wiring harness adapter (4) with the vehicle wiring harness (6) by means of plug connection (5).

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Required follow-up work:

- Install emergency GSM aerial

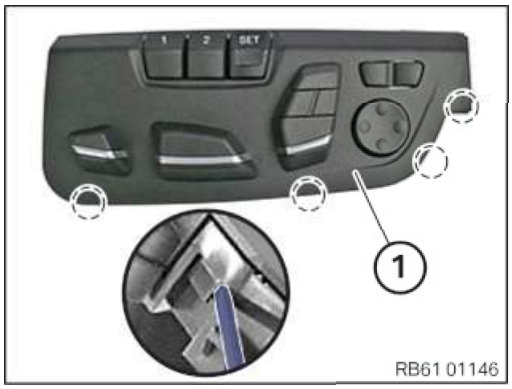
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61 31 ... Remount operating unit for additional seat function (clipped version)

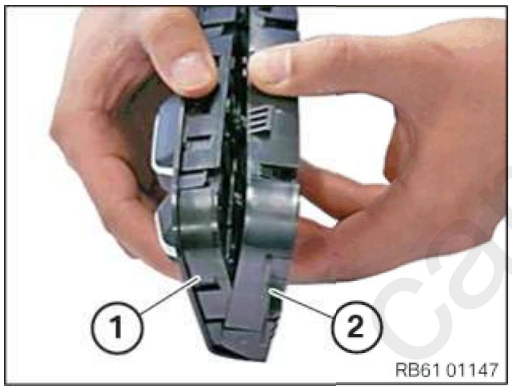
Necessary preliminary tasks:

- Remove operating unit of additional seat function

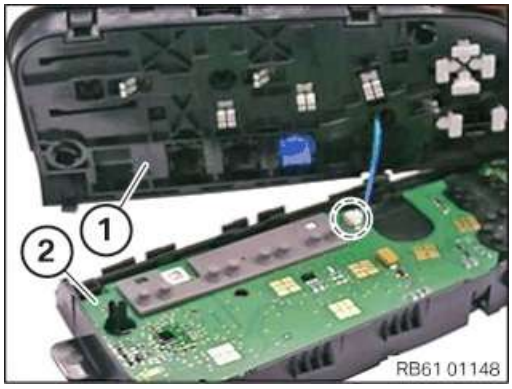
Removal:



Release all latch mechanisms on the operating unit (1) using screwdriver (3-mm blade).

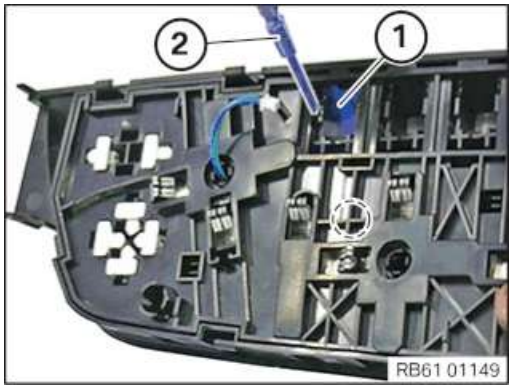


Feed out the operating unit (1) from the rear panel (2).



Disconnect the connector from the printed circuit board (2) and remove the operating unit (1).

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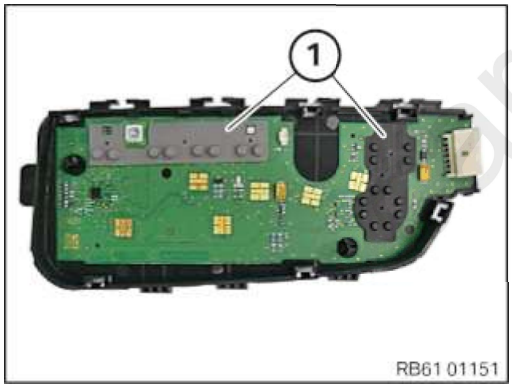


Unclip the button (1) using screwdriver (2) and pull out forwards.

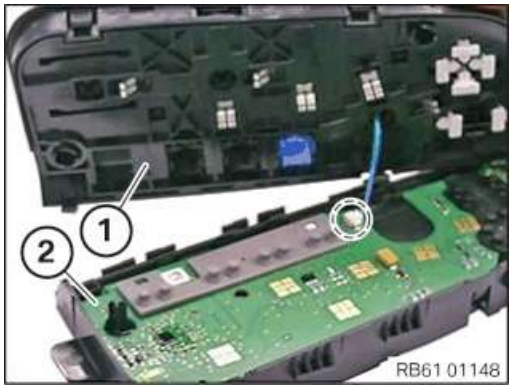
Installation:



Fit the memory button to the operating unit and press to lock into place.



Installation note:
Ensure keypads (1) are seated correctly.



Disconnect the connector from the printed circuit board (2) and remove the operating unit (1).

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Fit the operating unit (1) to the rear panel (2) and press to lock into place.**Important!**

Pay attention to the freedom of movement and function of the remounted button!

Required follow-up work:

- Remove operating unit of additional seat function

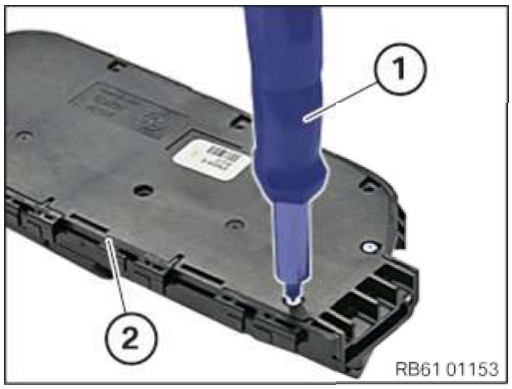
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61 31 ... Remount operating unit of the additional seat function (screwed version)

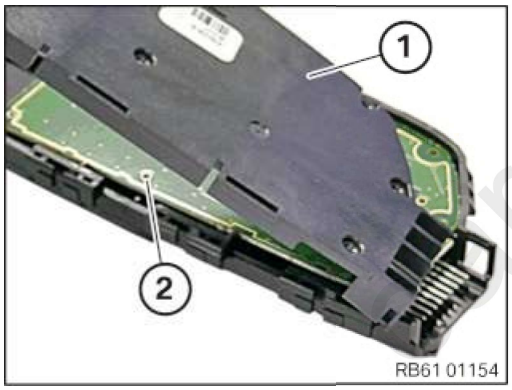
Necessary preliminary tasks:

- Remove operating unit of additional seat function

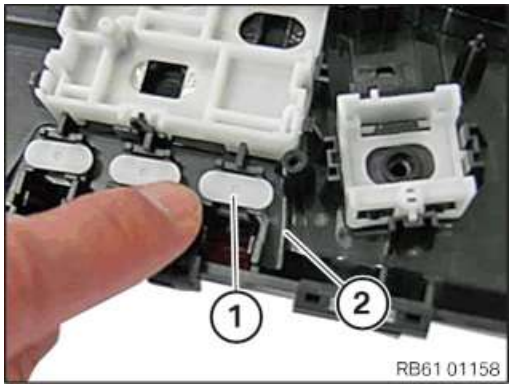
Removal:



Release all screws by means of screwdriver (1) on the operating unit (2).

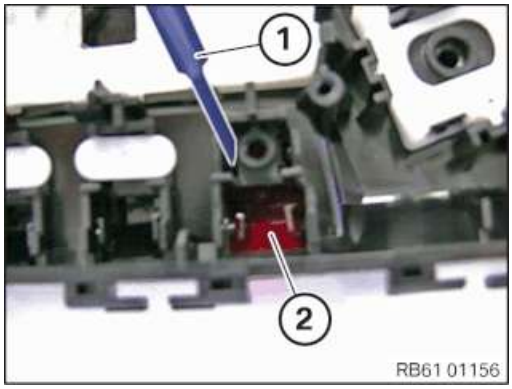


Remove the rear panel (1) and feed out the printed circuit board (2).



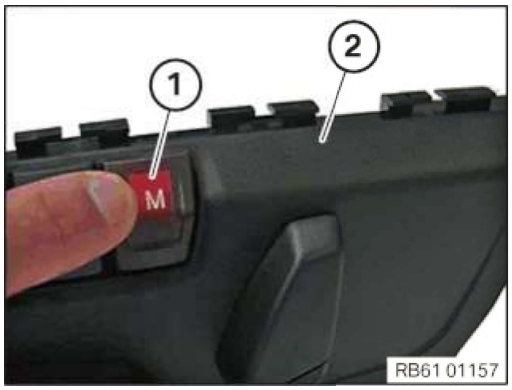
Take out the pressure pin (1) from the operating unit (2).

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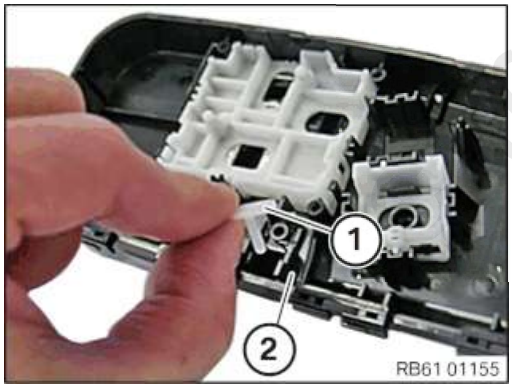


Unclip button (2) with the help of screwdriver (1) and remove.

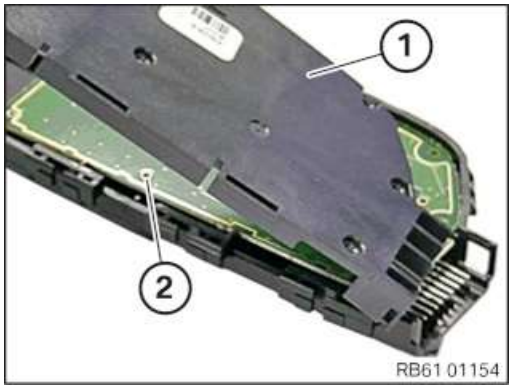
Installation:



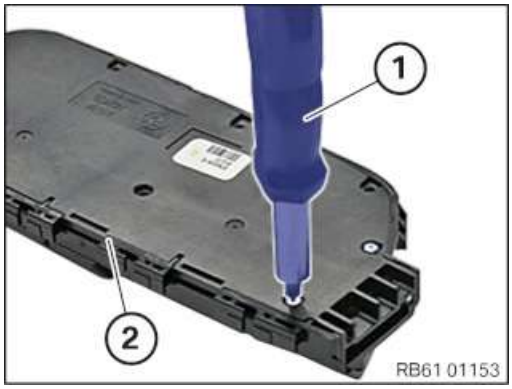
Add the button (1) to the operating unit (2) and lock using pressure.



Add pressure pin (1) to the operating unit (2).



Add the printed circuit board (2) and then the rear panel (2) to the operating unit.



Tighten all screws on the operating unit (2) with the help of screwdriver (1).**Important!**

Pay attention to the freedom of movement and function of the remounted button!

Required follow-up work:

- Remove operating unit of additional seat function

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61 35 177 Removing and installing (replacing) rain/light sensor



Operation is described in:

Removing solar rain/light sensor and condensation sensor

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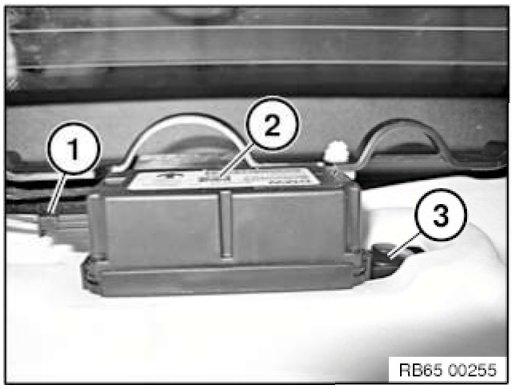
61 31 362 Removing and installing (replacing) receiver for radio remote control

Caution!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary work:

- Remove trim panel for storage shelf (parcel shelf)



Unlock plug connection (1) and disconnect.

Lift out expanding rivet (3).

Remove the receiver (2).

Installation note:
Position the receiver (2) so that the positioning pin on the rear side engages in the associated bore hole.

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61 31 008 Removing and installing (replacing) steering column switch cluster

Important!

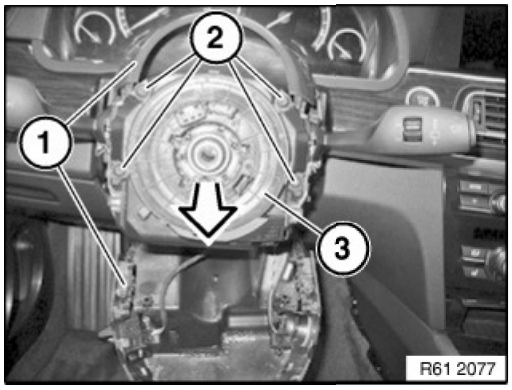
Move wheels into straight-ahead position and do not alter this position during the repair work.

Do not under any circumstances turn the steering column switch cluster when the steering wheel is removed.

Make sure the anti-twist lock locks during removal, the clock spring must not twist until installation.

Necessary preliminary tasks:

- Remove steering wheel



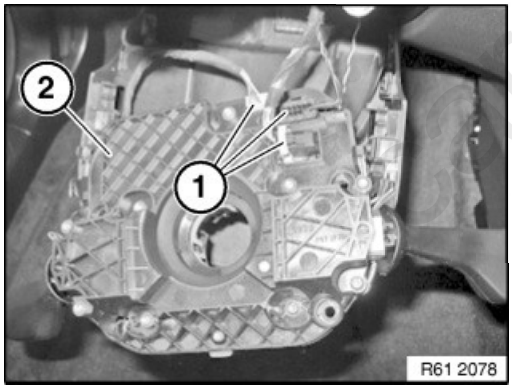
Unclip steering column shroud upper section and lower section (1).

Unfasten screws (2).

Tightening torque 61 31 3AZ.

Remove steering column switch cluster (3) in direction of arrow.

Installation note:
Make sure during installation that the anti-twist lock is positioned correctly on the coil spring cassette.



Disconnect plug connection (1).

Remove steering column switch cluster (2).

61 31 041 Removing and installing operating element for assist system

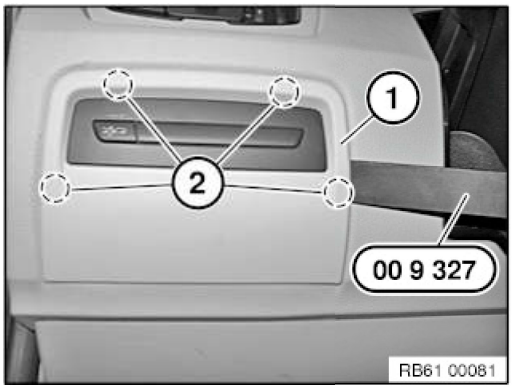
Special tools required:

- 00 9 327

When working on trim panel components, make sure that visible surfaces are not scratched or damaged (e.g. by sharp-edged tools).

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

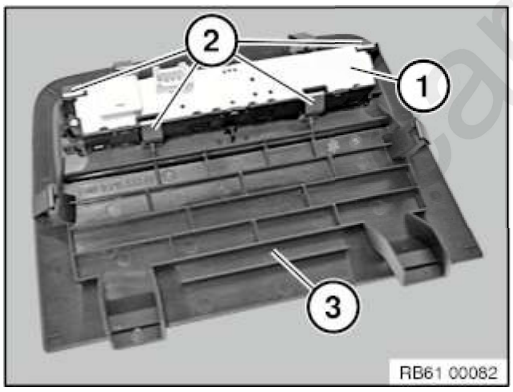


Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Carefully release cover (1) from clamps (2) with special tool 00 9 327 .

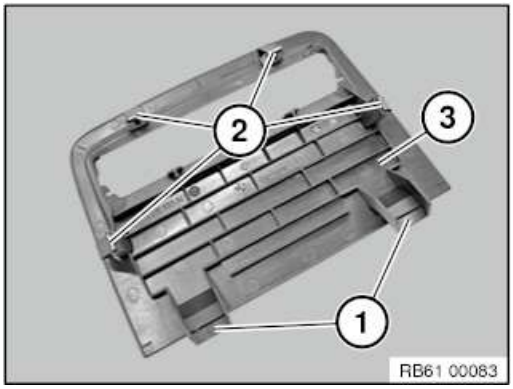
Disconnect associated plug connection and remove cover (1).

Installation note:
Make sure cover (1) is correctly seated.



Remove operating element (1) by releasing retaining clips (2) from cover (3).*Installation note:*
Make sure operating element (1) is correctly seated in cover (2).

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Installation note:
Guides (1) and clamps (2) on cover (3) must not be damaged or missing.

cardiagn.com

61 31 197 Removing and installing operating facility for centre console \PREMIUM

RISK OF DAMAGE

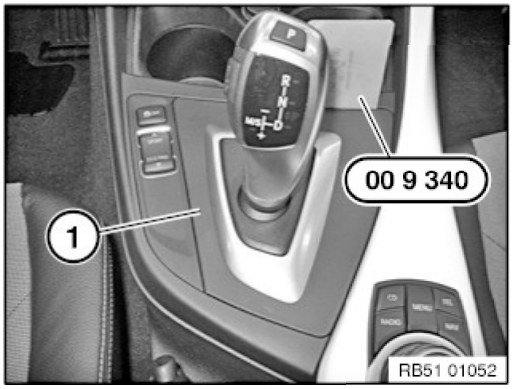
Scratches.

Tools and sharp-edged components can cause scratches.

- Protect working area.
- Handle tools and components carefully.

PRELIMINARY WORK

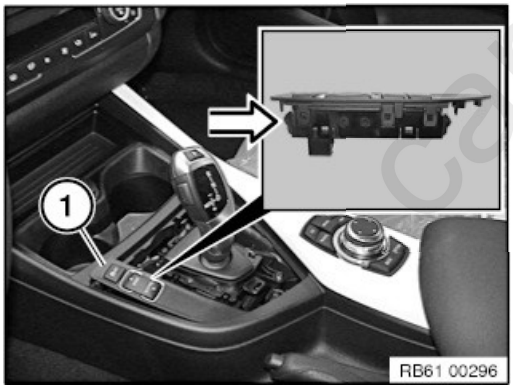
1 – Remove trim for selector lever



- Partially fit special tool **0 493 687 (00 9 340)** as pictured.
- Lift trim for selector lever (1) all around and remove upwards.
- If necessary, unlock associated plug connection and disconnect.

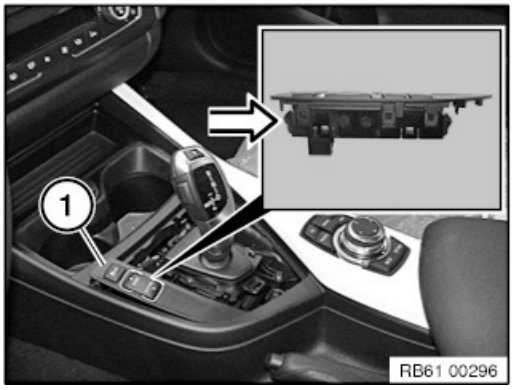
MAIN WORK

2 – Remove the operating facility in the centre console



- Reach under the front section of the operating facility in the centre console (1).
- Push the front latch mechanism in the direction of the arrow and simultaneously raise the operating facility in the centre console (1).
- Disconnect the associated plug connection and remove the operating facility in the centre console (1).

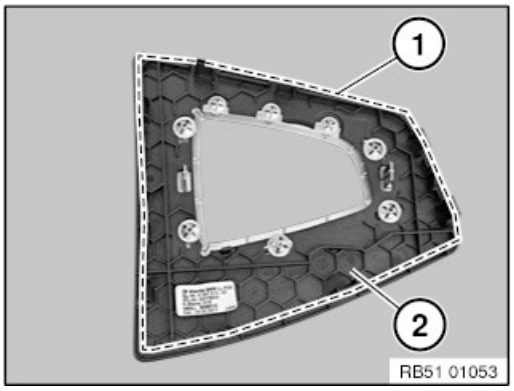
3 – Install the operating facility in the centre console



- Clip in the operating facility in the centre console.

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4 – Install trim for selector lever



TECHNICAL INFORMATION

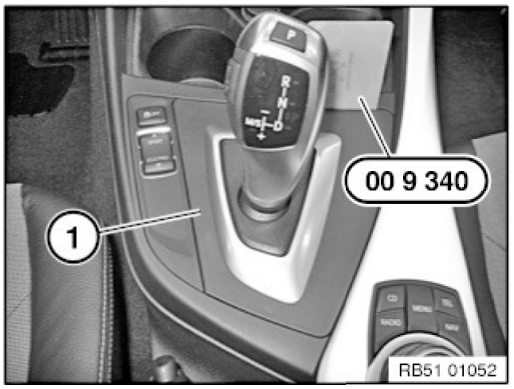
Latch mechanisms, guides and mounting elements must not be damaged or missing.

TECHNICAL INFORMATION

Remount the Drivelogic button when replacing the trim for the selector lever in F80/F82/F83.

For more information see: 61 31 ... Removing and installing/replacing Drivelogic button

- Check latch mechanisms for damage, if necessary replace trim for selector lever.

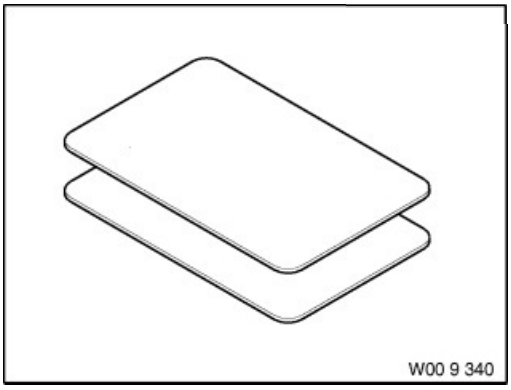


- Clip in trim for selector lever (1).

Additional Information

Overview of Special Tools

0 493 687 (00 9 340) Removal aid



Common	Used in step 1
Usage	(Removal aid (2 x)) For levering out switch block on driver's door.
Included in the tool or work	
Storage location	C2
Replaced by	
In connection with	
SI-Number	01 15 99 (483)

Consisting of

Pos	BMW Order number	Replaced by	Designation	In Connection with
1	0 496 289 (00 9 341)		**Removal aid** Only available as a set (2 tools) under 00 9 340 (= 83 30 0 493 687).	

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Links

Repair instructions	Used in step
61 31 ... Removing and installing/replacing Drivelogic button	4

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61 31 321 Removing and installing radio and A/C control panel

Special tools required:

- 00 9 340

Attention!
Risk of damage!

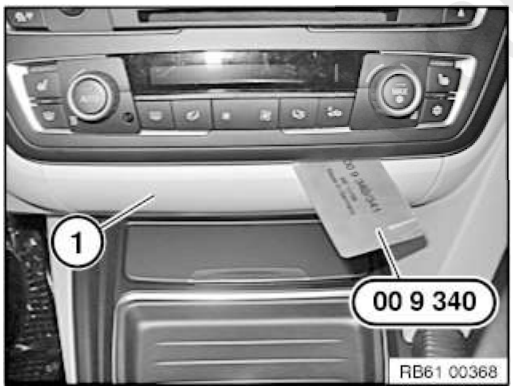
A hard disk is installed in the Car Information Computer (CIC).
Carry out mechanical work on the CIC and adjacent components with care.
Avoid subjecting the CIC to vibration/shocks.

Attention!
Read and comply with notes on protection against electrostatic damage (ESD protection).

Attention!
Carry out installation in a dust-free workshop area only.
To avoid damage, do not touch or dirty the display area.

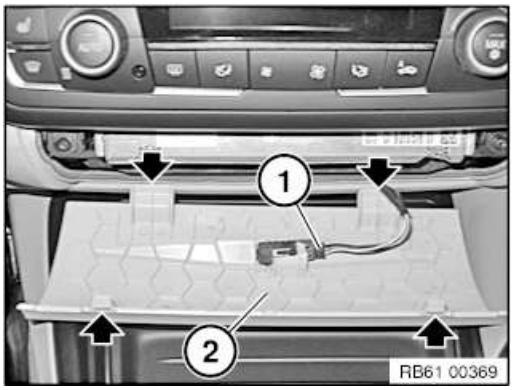
Necessary preliminary tasks:

- Remove decorative strip on dashboard in middle



Insert special tool 00 9 340 as illustrated.
Carefully lever out trim (1) towards front and unclip.

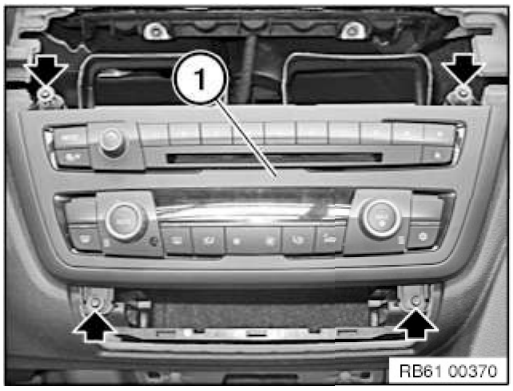
rdiagn.com



Unfasten plug connection (1) and disconnect.

Remove cover (2).

Installation note:
Retaining lugs and guides must not be missing or damaged.



Release all screws (arrow).

Pull control panel (1) forwards slightly.

Unlock associated plug connections and disconnect.

Remove the control panel (1).

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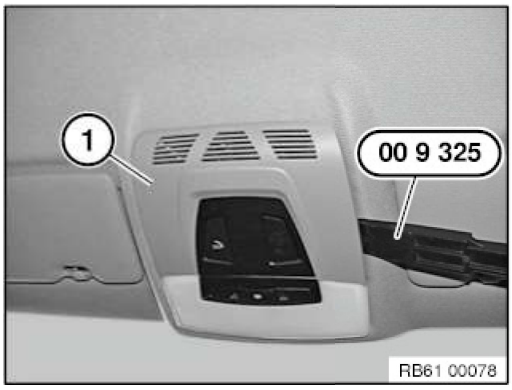
61 31 043 Removing and installing roof switch cluster (front)

Special tools required:

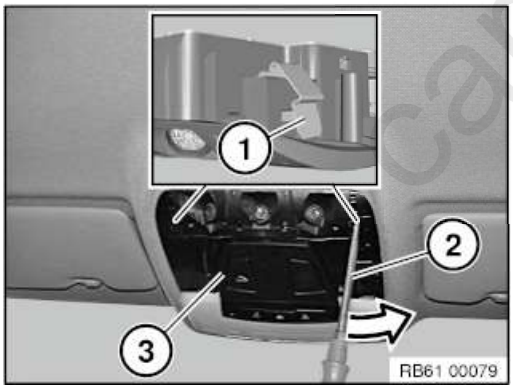
- 00 9 325

Important!
Follow notes for handling light bulbs (interior lighting).

Important!
Read and comply with notes on protection against electrostatic damage (ESD protection).



Carefully unclip cover (1) with special tool 00 9 325 and remove.*Installation note:*
Ensure cover (1) is correctly seated.



Unlock left/right retaining lugs (1) with screwdriver (2) in direction of arrow.

Remove roof switch cluster (3).

Unlock plug connections underneath and disconnect.

Installation note:
Retaining lugs (1) must not be damaged.

Make sure roof switch cluster (3) is correctly fitted.

If necessary, initialise slide/tilt sunroof.

Important!
Disconnecting the plug connection for the SOS emergency call button results in fault entries in the telephone control unit (restriction in the emergency call system).

After installation, read out fault memory and if necessary delete fault code entry.

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61 31 229 Removing and installing/renewing both switches on sports steering wheel

Operation is described in:

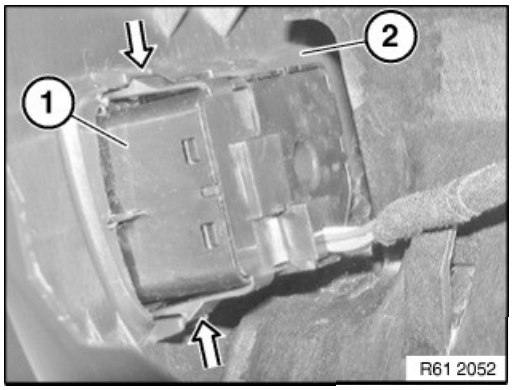
Removing both multifunction steering wheel switches.

cardiagn.com

61 31 062 Removing and installing/renewing button for steering wheel heating

Necessary preliminary work:

- Remove lower section of steering column shroud.



Note:
Similar to graphic.

Unlock associated plug connection and disconnect.

Unlock switch (1) on both sides and press out from steering column shroud (2).

Installation note:
Make sure switch (1) is correctly seated in steering column shroud (2).

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61 31 197 Removing and installing/renewing centre console operating facility

Necessary preliminary tasks:

Version with manual gearbox only:

- Partially remove gearshift lever gaiter

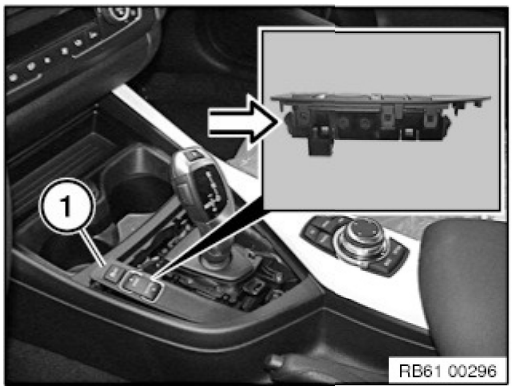
Version with automatic transmissions only:

- Remove cover for selector lever

Important!

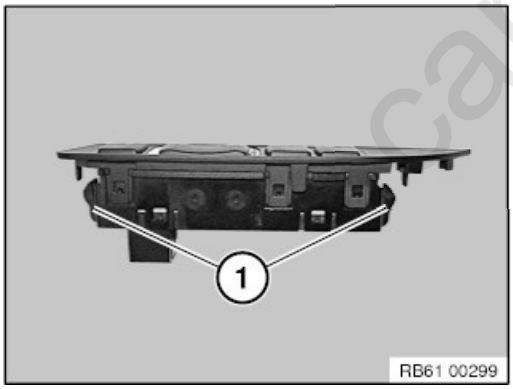
Risk of damage!

Centre console operating facility must not be pried out from the outside.



Note:
Graphic shows example of F20 with automatic transmission.

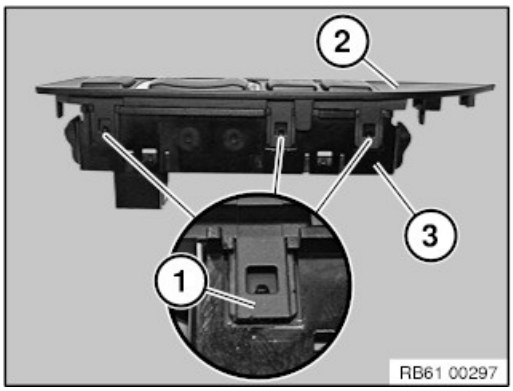
1. Reach under front section of operating facility (1).
2. Press front latch mechanism in direction of arrow and simultaneously raise operating facility (1) towards top.
3. Disconnect associated plug connection and remove operating facility (1).



Installation note:
Latch mechanisms (1) must not be damaged or missing.

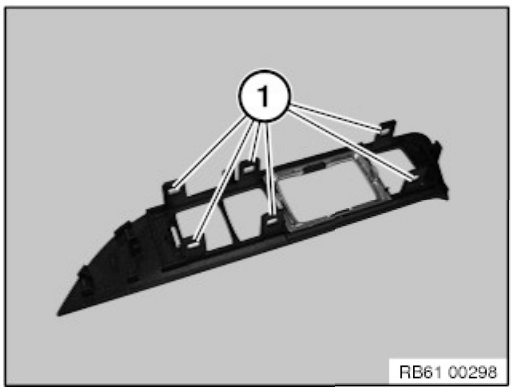
Make sure operating facility is correctly fitted in centre console.

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In case of replacement, remount operating unit cover:

Release latch mechanism (1) and remount cover (2), depending on equipment.



Installation note:
Latch mechanisms (1) must not be damaged or missing.

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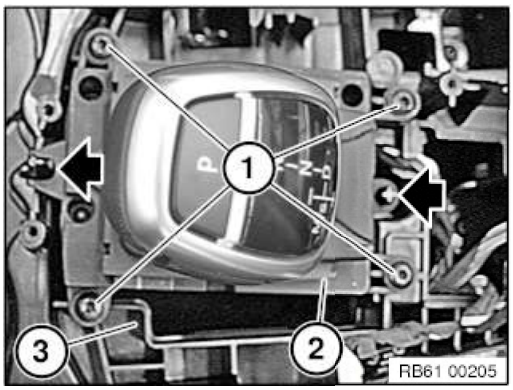
61 31 342 Removing and installing/renewing gear selector switch

Attention!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary work:

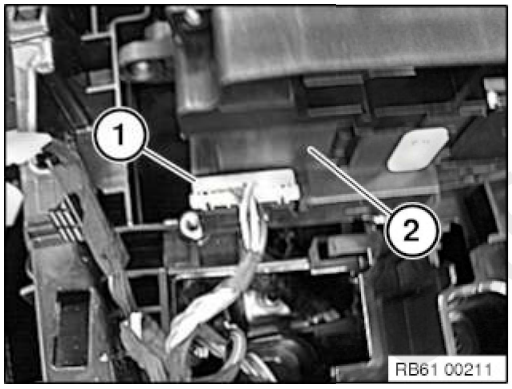
- Clamp off battery lead from negative connection point
- Remove the centre console trim



Release screws (1).

Tightening torque 61 31 1AZ.

Installation note:
Insert gear selector switch (2) correctly in front and rear fixation of centre console support (3).



Lift gear selector switch (2) and unlock plug connection (1) at gear selector switch (2) and disconnect.

Replacement:

Carry out vehicle programming/coding.

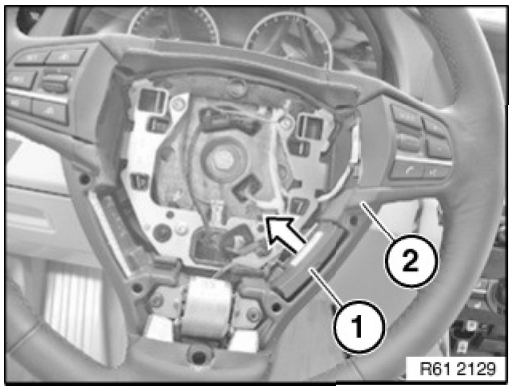
61 31 231 Removing and installing/renewing steering wheel module control unit

Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).

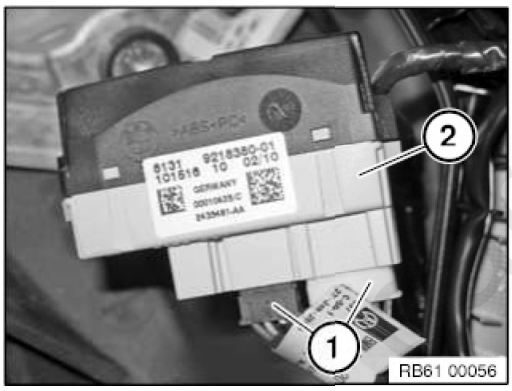
Necessary preliminary tasks:

- Remove airbag unit



Note:
Steering wheel cover is shown removed for purposes of clarity.

Remove control unit for steering wheel module (1) from steering wheel (2) in direction of arrow.



Disconnect plug connection (1).

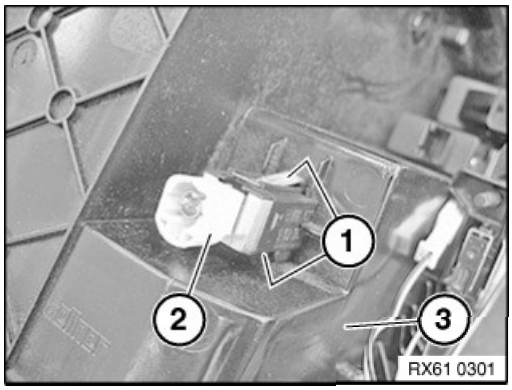
Remove steering wheel electronics control unit (2).

Installation note:
Make sure electronic steering wheel module (2) is fitted correctly.

61 31 137 Removing and installing/renewing USB interface connecting socket

Necessary preliminary tasks:

- Remove glove box with housing



Note:
Similar to graphic.

Release retaining clamps (1).

Push USB interface connecting socket (2) to the front from glove box (3).

Installation note:
Retaining clips (1) must not be damaged.

Make sure USB interface connecting socket (2) is correctly seated.

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61 31 133 Removing and installing/replacing A/V connecting socket

Note:
Operation is described in:

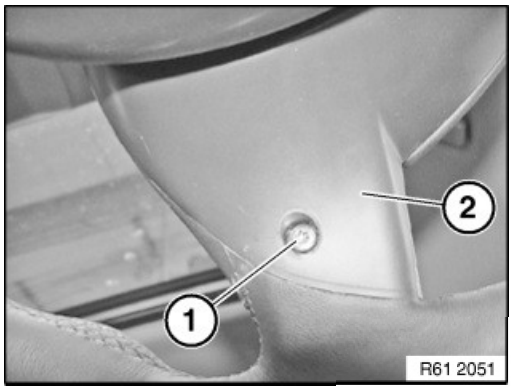
Remove USB audio interface connecting socket.

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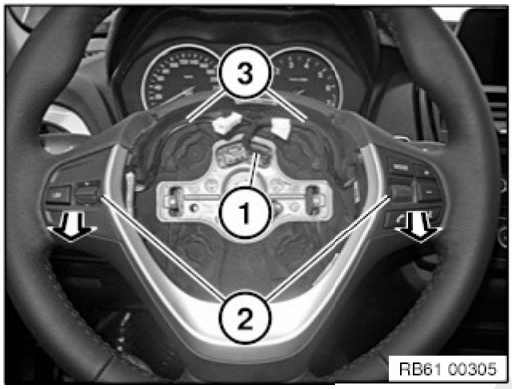
61 31 221 Removing and installing/replacing both multifunction steering wheel switches

Necessary preliminary tasks:

- Remove airbag unit



Release screws (1) on left/right on back of steering wheel (2).

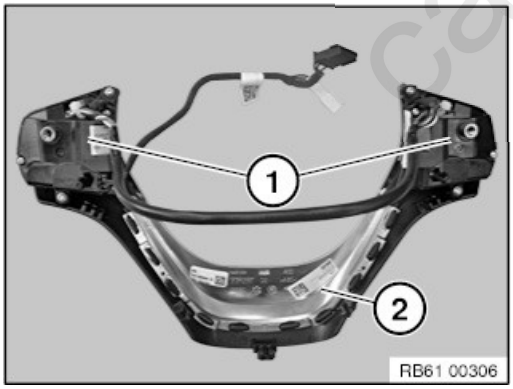


Disconnect plug connection (1).

Remove both multifunction steering wheel switches (2) together with cover from steering wheel in direction of arrow.

Installation note:
Make sure multifunction steering wheel switch (2) is fitted correctly.

Make sure electrical wiring (3) is correctly routed.



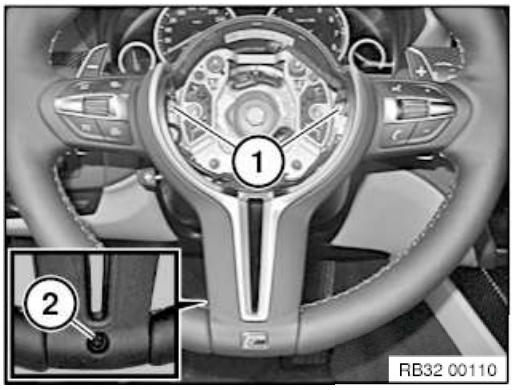
Remove switch of multifunction steering wheel (1) from cover (2).*Installation note:*
Make sure electrical wiring is correctly routed.

carDiag.com

61 31 221 Removing and installing/replacing both multifunction steering wheel switches (M sports steering wheel)

Necessary preliminary tasks:

- Remove airbag unit

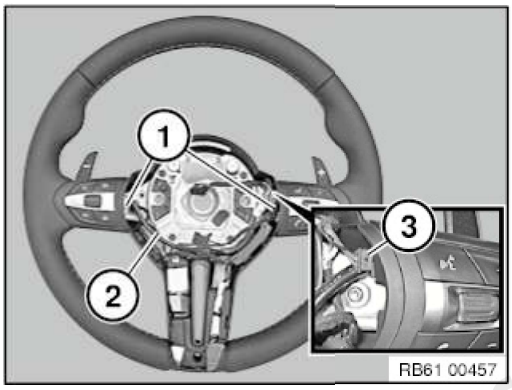


Release screws (1) on steering wheel.

Release screw (2) on rear side of steering wheel.

Remove design cover.

Installation note:
Make sure design cover is correctly seated.



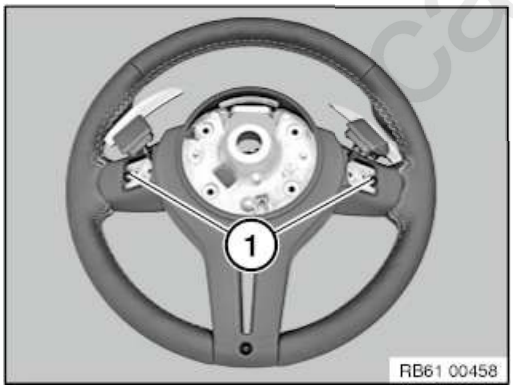
Note:
Steering wheel is shown removed for purposes of clarity.

Both multifunction steering wheel switches are connected to each other by wiring harness (2).

Release screws (1) for shift paddles.

Feed out wiring harness (2) and disconnect plug connection (3).

Installation note:
Make sure electrical wiring is correctly routed.



Note:
Steering wheel is shown removed for purposes of clarity.

Lift off shift paddles and release screws (1) on rear side of steering wheel.

Remove both multifunction steering wheel switches with wiring harness on front side of steering wheel.

Installation note:
Make sure electrical wiring is correctly routed.

Make sure shift paddles are correctly seated.

Make sure multifunction steering wheel switches are correctly seated.

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61 31 195 Removing and installing/replacing controller

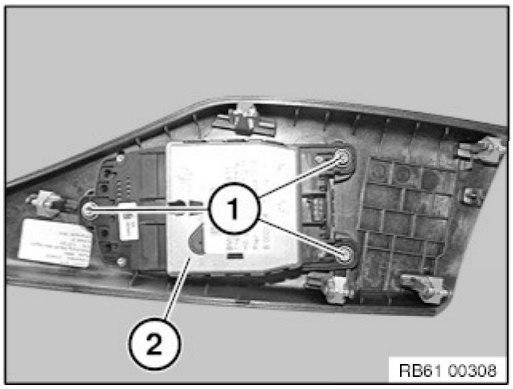
Attention!

Risk of damage!

The button for the controller must not be removed!

Necessary preliminary tasks:

- Remove decorative trim on centre console



Release screws (1).

Tightening torque 61 31 2AZ.

Remove controller (2).

Replacement:

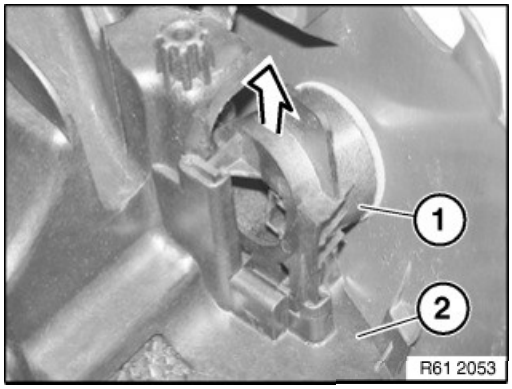
Carry out programming/encoding.

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61 31 021 Removing and installing/replacing emergency starting coil

Necessary preliminary tasks:

- Remove steering column shroud lower section



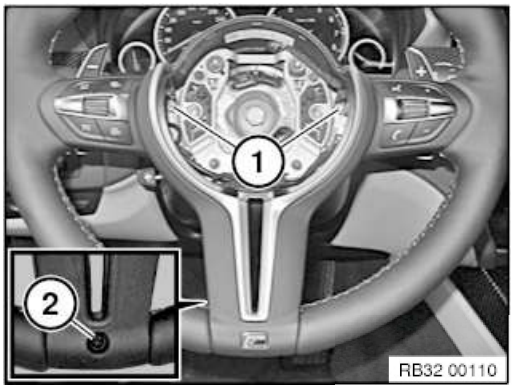
Release emergency starting coil (1) and pull in direction of arrow out of steering column shroud (2).*Installation note:*
Make sure emergency starting coil (1) is correctly seated.

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61 31 233 Removing and installing/replacing engine electrical system for lane departure warning (M sports steering wheel)

Necessary preliminary tasks:

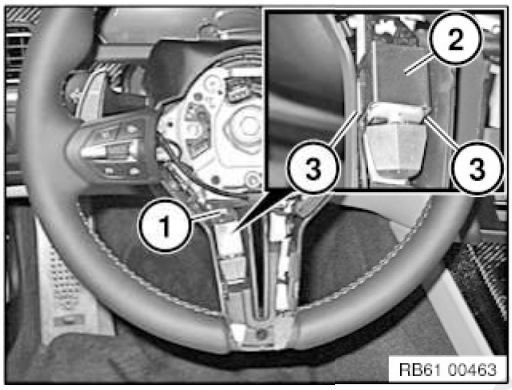
- Remove airbag unit



Release screws (1) on steering wheel.

Release screw (2) on rear side of steering wheel.

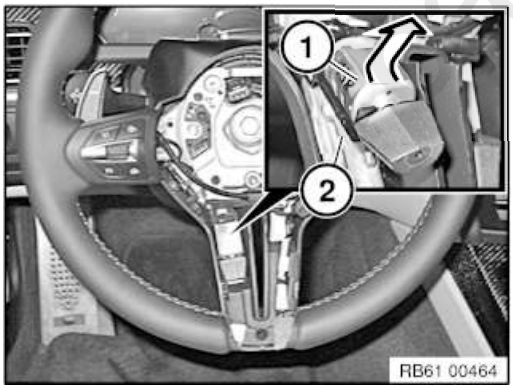
Remove design cover.



Disconnect plug connection (1).

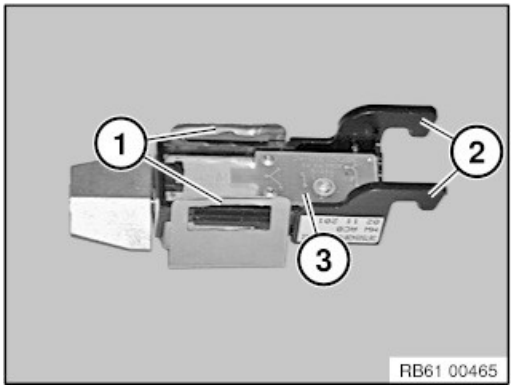
Carefully unlock retaining clip (2) on latch mechanisms (3) with suitable tool (e. g. screwdriver with 3-mm blade).

Note:
The unlocking procedure is simplified by pressing down the retaining clip (2).

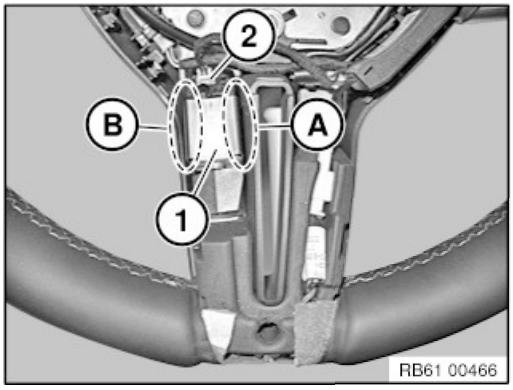


Remove engine electrical system of Lane Departure Warning (1) from steering wheel (2) in direction of arrow.

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Installation note:
Retaining clip (2) and guides (1) on engine electrical system of Lane Departure Warning (3) must not be damaged or missing.



Installation note:
First press down retaining clip (1) in area (A) until it engages. Then press down in area (B) until it engages.

Make sure engine electrical system of Lane Departure Warning is correctly seated.

Make sure plug connection (2) is correctly locked.



Replacement:

From version 03/2009 onwards, the engine electrical system must be adjusted.

For the adjustment, the resonance frequency stamped on the actuator is required. Note the resonance frequency of the new part.

Carry out service function under following path:

- Driver assistance
- Camera-based driver assistance systems
- Actuator comparison

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61 31 334 Removing and installing/replacing grip trim for gear selector switch

Special tools required:

- 00 9 327



Note:
Symbol plate (1) is glued on.

Mount special tool 00 9 327 as illustrated.

Detach symbol plate (1) from upper shell (2) in direction of arrow.

Important!

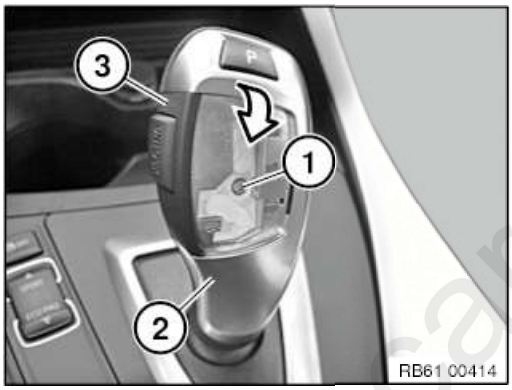
Risk of damage!

Do not leverage side panel (3) out of upper shell (2).

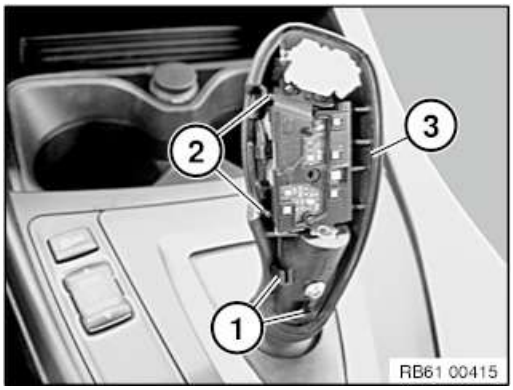
Installation note:
Remove any adhesive residue.

Remove the protective film from the back of the symbol plate before installing.

Make sure symbol plate (1) is correctly seated on upper shell (2).

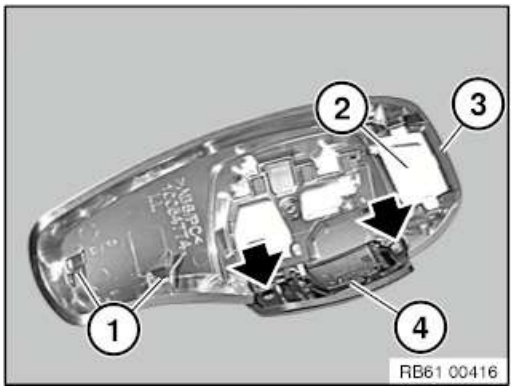


Release screw (1) and remove upper shell (2) with side panel (3) in direction of arrow.



Installation note:
Fixtures (1) and guide pins (2) on gear selector switch (3) must not be damaged or missing.

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Installation note:
Guides (1) and P-button (2) must not be damaged or missing.

Make sure P-button (2) is correctly seated in upper shell (3).

Make sure side panel (4) is correctly seated in upper shell (3)!

For better installation, secure UNLOCK button outside on the side panel (4) using adhesive tape.

Feed in upper shell with side panel into fixtures and guide pins on gear selector switch.

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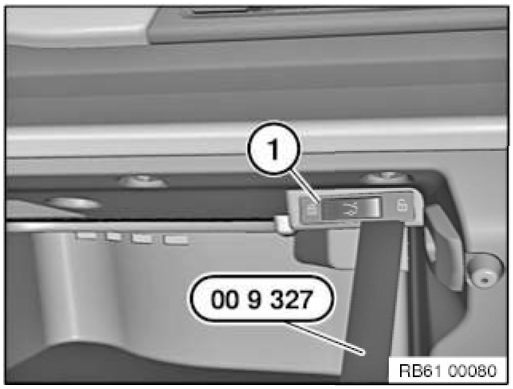
61 31 066 Removing and installing/replacing hotel position switch

Special tools required:

- 00 9 327

Necessary preliminary tasks:

- Open glove box.



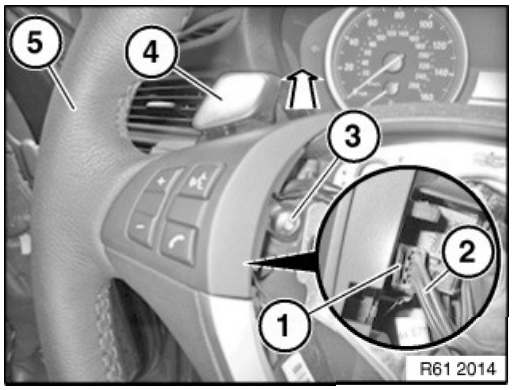
Lift out hotel position switch (1) with special tool 00 9 327 toward the front.
Disconnect associated plug connection and remove hotel position switch (1).

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61 31 112 Removing and installing/replacing left or right shift paddle for automatic transmission

Necessary preliminary tasks:

- Remove airbag unit



Disconnect plug connectionÂ (1).

Release screw (3).

Feed out wiring harness (2) and remove shift paddle for automatic transmission (4) in direction of arrow from steering wheel (5).

Installation note:
Make sure shift paddle for automatic transmission (4) is correctly seated on steering wheel (5)

Make sure wiring harness (2) is laid exactly.

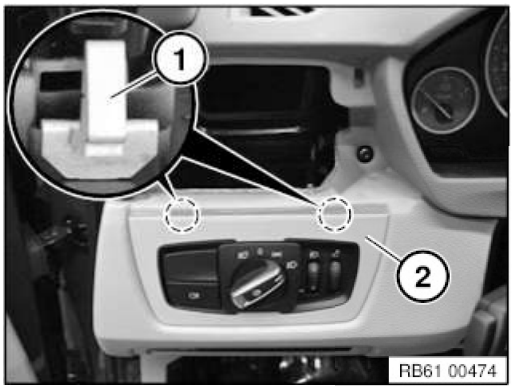
cardiagn.com

61 31 037 Removing and installing/replacing light control unit

Note:
When working on trim panel components, make sure that the sensitive surfaces are not scratched or damaged.

Necessary preliminary tasks:

- Remove decorative strip on dashboard on left

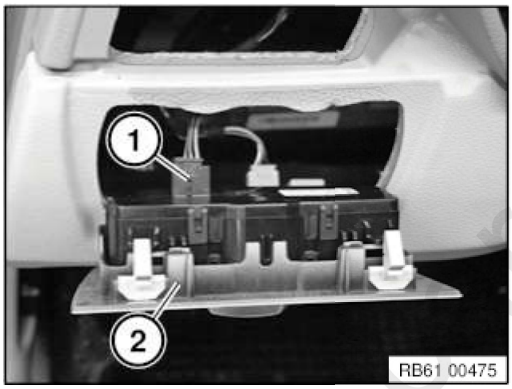


Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Reach behind the opening.

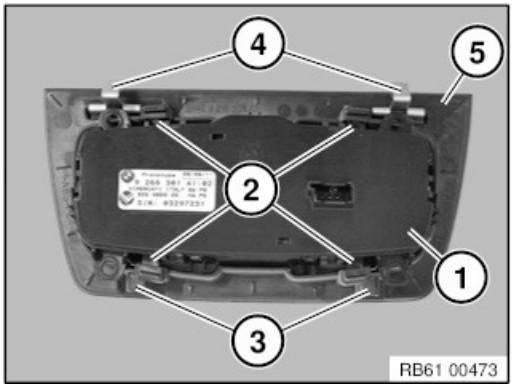
Unlock retaining clips (1) by pushing down.

Fold cover with light control unit (2) out of instrument panel.



Unfasten plug connection (1) and disconnect.

Remove cover with light control unit (2).



Replacement:

Remove light control unit (1) from latch mechanism (2) and remove from trim (5).

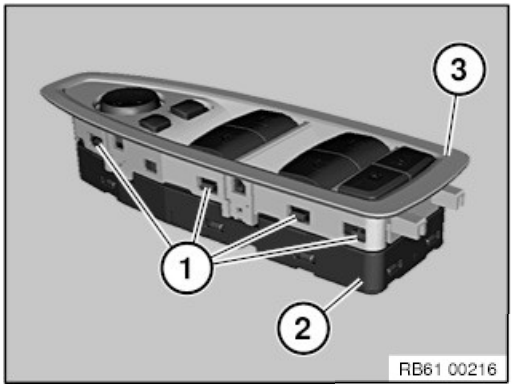
Installation note:
Ensure the light control unit (1) is latched correctly in the trim (5).

Guides (3) and clamps (4) on cover (5) must not be damaged or missing.

61 31 117 Removing and installing/replacing power window switch (driver's side)

Necessary preliminary tasks:

- Remove switch cover on front door trim panel



Release catches (1) on both sides.

Remove switch (2) from cover (3).

Installation note:
Latch mechanisms (1) must not be damaged or missing.

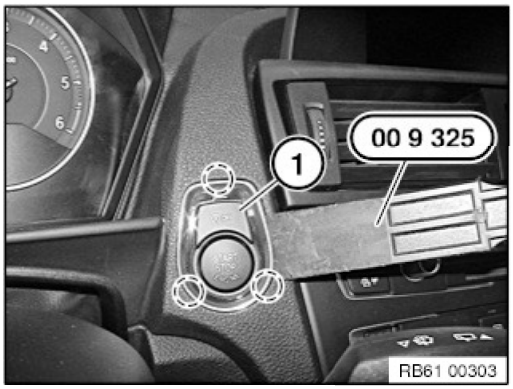
cardiagn.com

61 31 014 Removing and installing/replacing Start/Stop switch

Special tools required:

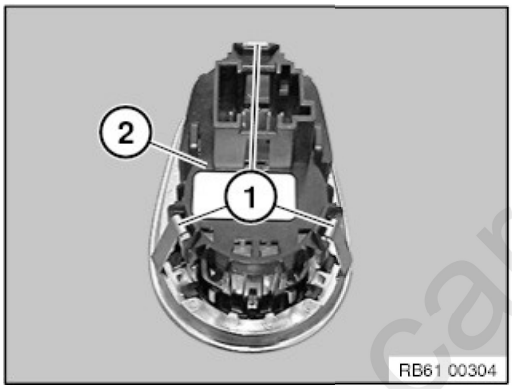
- 00 9 325

Note:
When working on trim panel components, make sure that the sensitive surfaces are not scratched or damaged.



Pry out Start/Stop switch (1) at the marked retaining points using special tool 00 9 325 .

Disconnect associated plug connection and remove Start/Stop switch (1).



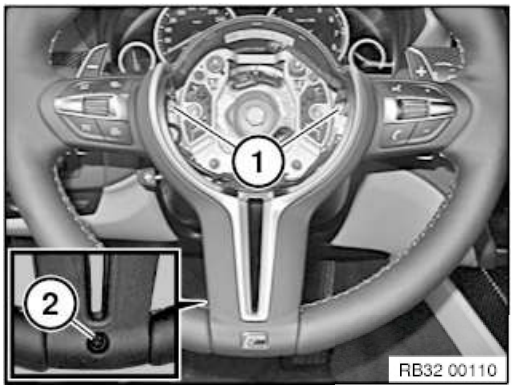
Installation note:
Retaining clips (1) on Start/Stop switch (2) must not be bent or damaged.

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61 31 231 Removing and installing/replacing steering wheel module (M sports steering wheel)

Necessary preliminary tasks:

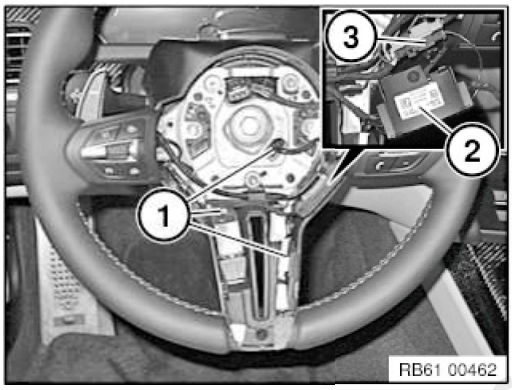
- Remove airbag unit



Release screws (1) on steering wheel.

Release screw (2) on rear side of steering wheel.

Remove design cover.



Disconnect plug connection (1).

Release steering wheel module (2) from bracket.

Release underlying plug connector (3) from bracket and disconnect.

Remove steering wheel module (2).

Installation note:
Make sure cables are correctly routed.

Make sure the plug connections (1; 3) are correctly locked.

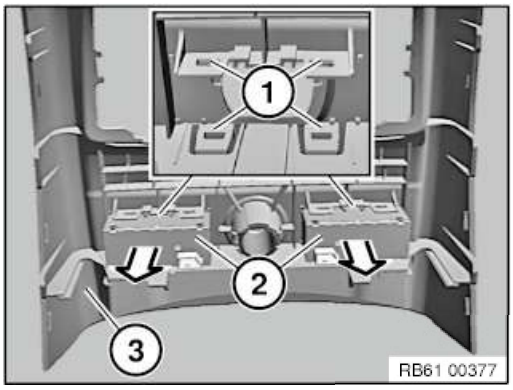
Make sure steering wheel module (2) and plug connection (3) are correctly seated in bracket.

cardiagn.com

61 31 091 Removing and installing/replacing switch for (rear) left or right seat heating

Necessary preliminary tasks:

- Remove rear centre console trim



Use a suitable tool to release latch mechanisms (1) on left/right switch (2).
Remove switch (2) from cover (3) in direction of arrow.

Installation note:
Latch mechanisms (1) on cover (3) must not be missing or damaged.
Make sure switch (2) is correctly fitted in cover (3).

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61 31 038 Removing and installing/replacing switch for front passenger airbag deactivation

Special tools required:

- 00 9 323

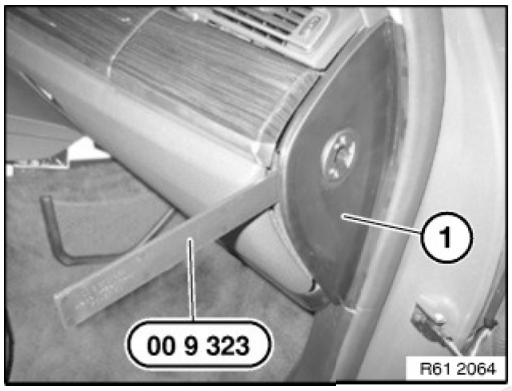
Warning!

Read and comply with safety regulations for handling airbag modules and pyrotechnical belt tensioners.

Incorrect handling can activate airbag and cause injury.

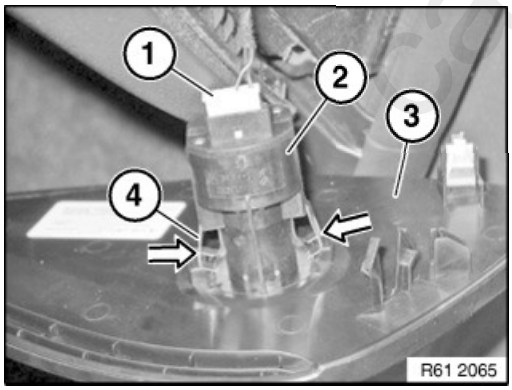
Necessary preliminary tasks:

- Disconnect battery earth lead



Note:
Work shown on the F20 by way of example, deviations in detail are possible in other models.

Carefully lever out side cover (1) with special tool 00 9 323 .



Disconnect plug connection (1).

Unlock latch mechanisms (4) in direction of arrow.

Feed switch for front passenger airbag deactivation (2) out of side cover (3).

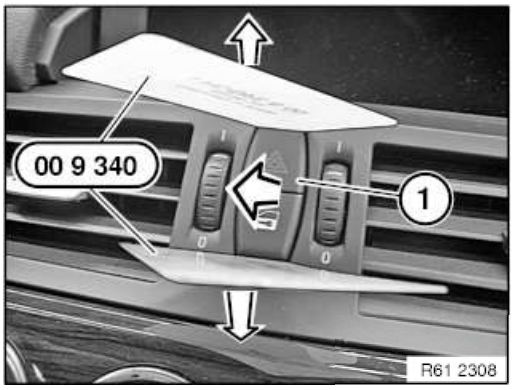
Installation note:
Make sure switch for passenger airbag deactivation (2) is correctly seated in side cover (3).

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61 31 079 Removing and installing/replacing switch for hazard warning flashers/central locking

Special tools required:

- 00 9 340



Carefully lever out switch for hazard warning system/central locking (1) with special tool 00 9 340 in direction of arrow.

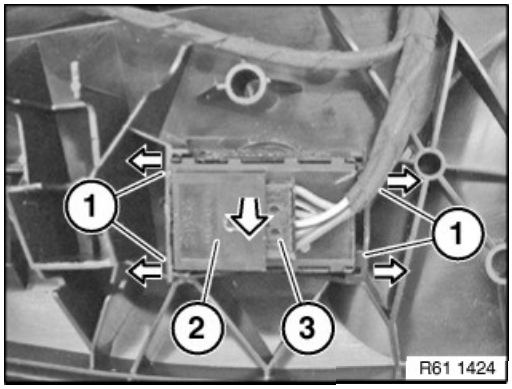
Remove switch for hazard warning system/central locking (1) in direction of arrow and disconnect plug connection behind.

cardiagn.com

61 31 208 Removing and installing/replacing switch for lumbar support

Necessary preliminary tasks:

- Remove outer cover on front seat



Disconnect plug connectionÂ (3).

Unlock latch mechanisms (1).

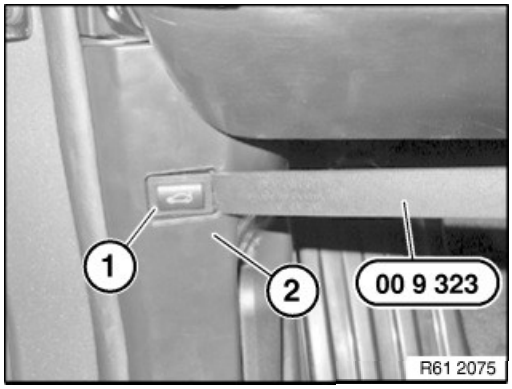
Remove switch for lumbar support (2) in direction of arrow.

cardiagn.com

61 31 083 Removing and installing/replacing switch for unlocking tailgate

Special tools required:

- 00 9 323



Note:
Graphic similar!

Lever switch for tailgate unlocking (1) sideways out of A-pillar trim panel (2) using special tool00 9 323 .

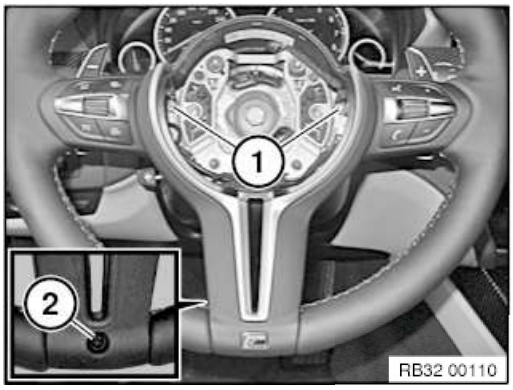
Disconnect associated plug connection and remove switch for unlocking rear lid (1).

cardiagn.com

61 31 132 Removing and installing/replacing the shift paddles for the transmission (M sports steering wheel)

Necessary preliminary tasks:

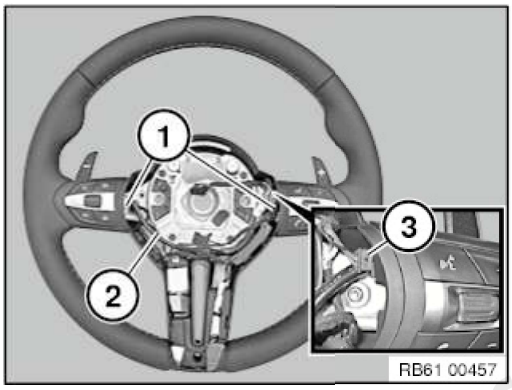
- Remove airbag unit



Release screws (1) on steering wheel.

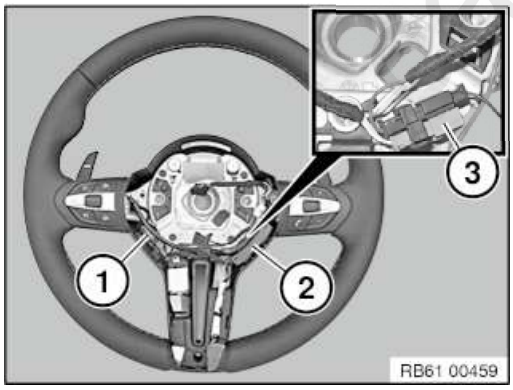
Release screw (2) on rear side of steering wheel.

Remove design cover.



Note:
Steering wheel is shown removed for purposes of clarity.

Release the screws (1) and feed out the wiring harness (2).



Note:
Steering wheel is shown removed for purposes of clarity.

Pull the steering wheel module (2) out of the steering wheel.

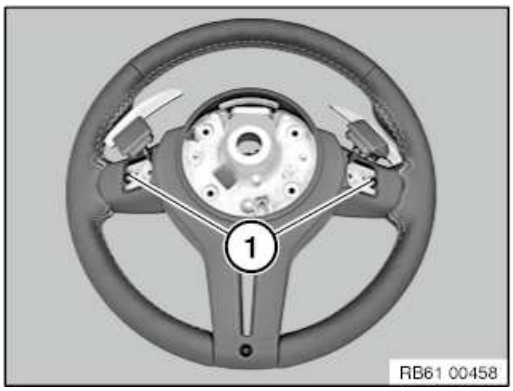
Release the plug connections (1, 3) from the steering wheel and disconnect.

Installation note:
Make sure electrical wiring is correctly routed.

Make sure the plug connections (1, 3) are correctly seated.

Ensure that the steering wheel module (2) is correctly seated.

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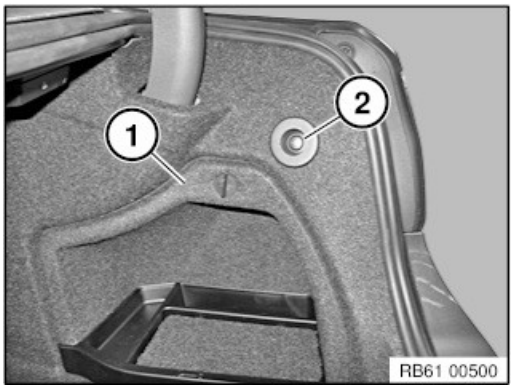
Note:
Steering wheel is shown removed for purposes of clarity.

Feed out the cable though the steering wheel spokes (1) and take off the shift paddles.*Installation note:*
Make sure electrical wiring is correctly routed.

Ensure that the shift paddles are correctly seated.

cardiagn.com

61 31 122 Removing and installing/replacing trailer tow hitch switch



Open flap (1).

Grip behind trim panel.

Press trailer tow hitch (1) out of trim panel, releasing the catch.

Disconnect plug connection behind.

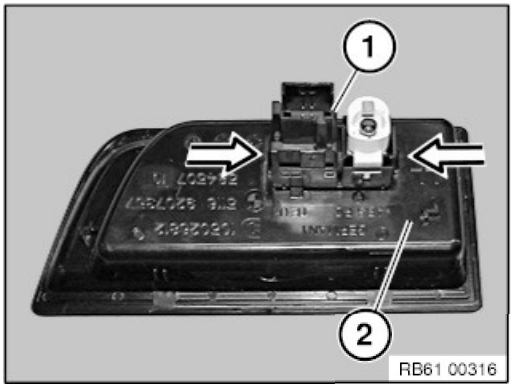
Installation note:
Make sure trailer tow hitch switch (2) is correctly fitted.

cardiagn.com

61 31 134 Removing and installing/replacing USB audio interface connecting socket

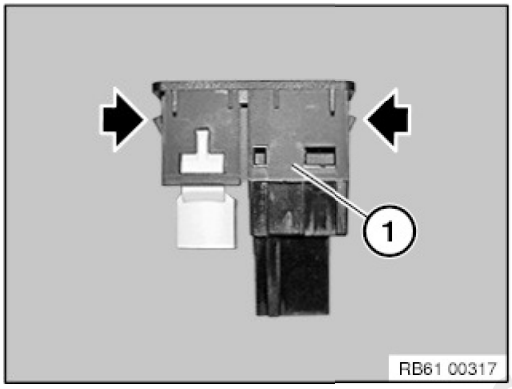
Necessary preliminary tasks:

- Remove insert in centre armrest storage compartment



Release connecting socket (1) from latch mechanism on both sides.

Remove connecting socket from storage compartment (2).



Installation note:

- Connecting socket latch mechanisms (1) must not be damaged or missing
- Make sure connecting socket (1) is correctly fitted in storage compartment

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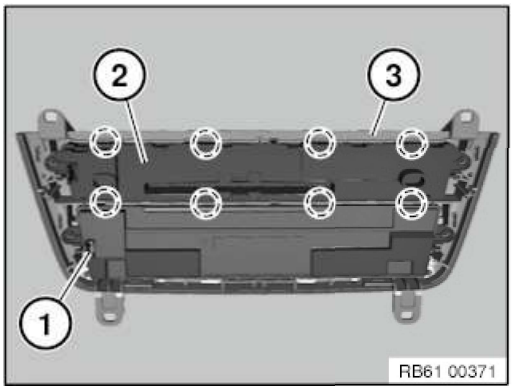
61 31 823 Replace ACP (for vehicles equipped with CID)

Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary tasks:

- Remove radio and IHKA controls



Disconnect plug connection (1).

Unclip audio operating unit (2) at the marked points using a suitable tool (such as a screwdriver - 3 mm blade).

Remove the audio operating unit (2) from the cover (3) toward the rear.

Installation note:
Audio control unit (2) must noticeably and audibly snap into cover (3).

cardiagn.com

61 31 198 Replace controller chrome ring

Special tools required:

- 00 9 340



Lever out "OPTION", "BACK", "MENU" buttons with special tool 00 9 340 .



Lever out chrome ring (1) from latch mechanisms with special tool 00 9 340 and remove upwards.*Installation note:*
Retaining lugs on controller must not be damaged.

Check function of the controller.

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61 35 179 Replacing and installing (replacing) the solar rain/light sensor and condensation sensor

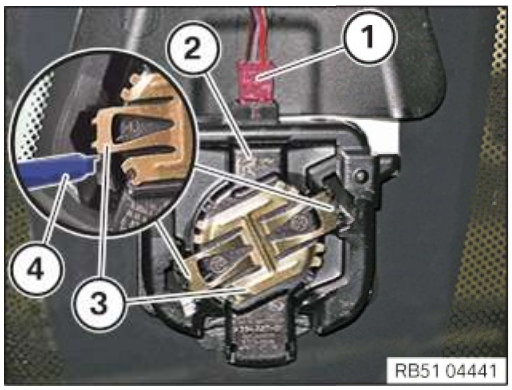
Caution!

Observe the information on protection from electrostatic discharge.

Necessary preliminary work:

- Remove inside mirror

Removal:



Disconnect connector (1).

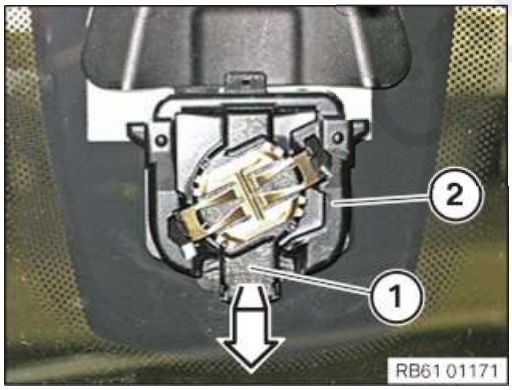
Unlock rain/light/solar and condensation sensor (2) at metal spring (3).

For this purpose, press both sides of the metal spring (3), insert the screwdriver (4) on the side and raise the latch mechanism.

Caution!

Risk of damage!

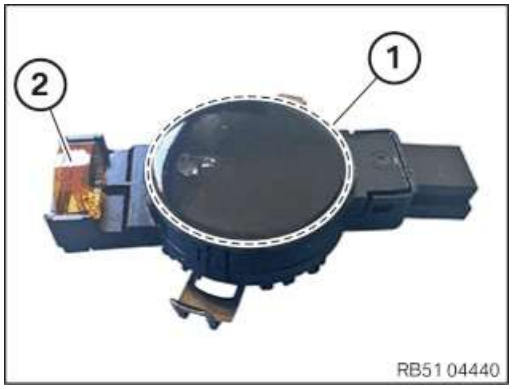
After loosening lock, wait approx. 30 min. at 20 °C for silicone surface to relax.



Pull the rain/light/solar and condensation sensor (1) slowly from holder (2) in direction of arrow.*Note:*
When replacing the windscreen, only remount the rain/light/solar and condensation sensor (1) after disassembly of the windscreen.

Pull off the rain/light/solar and condensation sensor (1) slowly while observing from outside the release of the silicone surface.

The silicone surface must evenly loosen from the windscreen, if applicable, pull off slower.



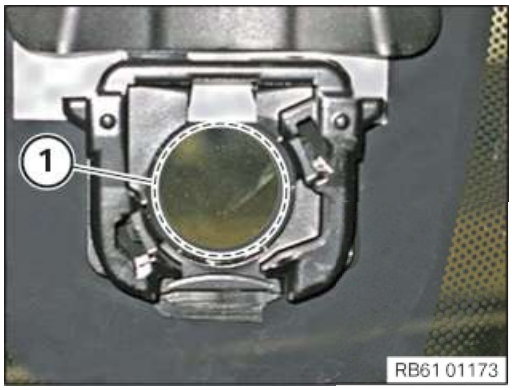
Caution!

Risk of damage!

The silicone-coated surface (1) and the printed circuit board (2) on the rain/light/solar and condensation sensor must not be touched or damaged!

Replace damaged gel pad.

When replacing the windscreen, immediately install the rain/light/solar and condensation sensor into the new windscreen following removal.



Caution!

Risk of damage!

The area (1) on the windscreen must not be touched or damaged!

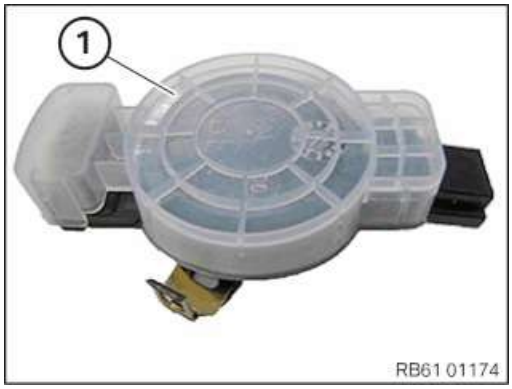
The area (1) may have remnants of the separation oil of the rain/light/solar and condensation sensor that are easy to remove. This does not indicate that the rain/light/solar and condensation sensor is damaged.

Remove all separating oil residue within and outside of the area (1).

Replacement:

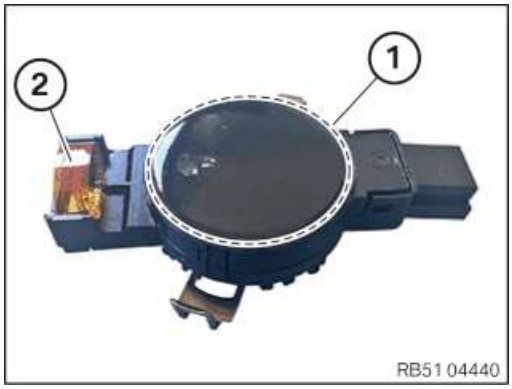


Carefully clean the windscreen at the contact area (1) with the rain/light/solar and condensation sensor! All silicone and separation oil residue must be removed!



Remove protective cover (1) from new rain/light/solar and condensation sensor.

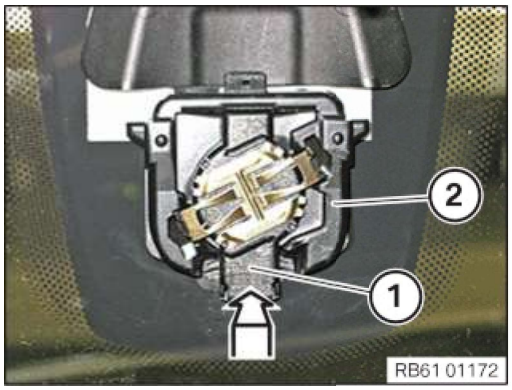
cardiagn.com



Caution!

The silicone-coated surface (1) and the printed circuit board (2) on the rain/light/solar and condensation sensor must not be touched or damaged!

Installation:

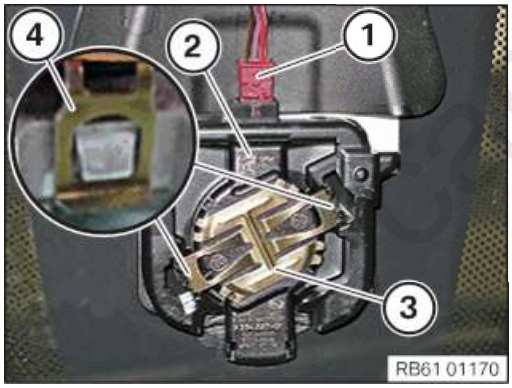


Caution!

Risk of damage!

The silicone-coated surface on the rain/light/solar and condensation sensor must not be touched or damaged.

Feed the rain/light/solar and condensation sensor (1) into holder (2) in direction of arrow.

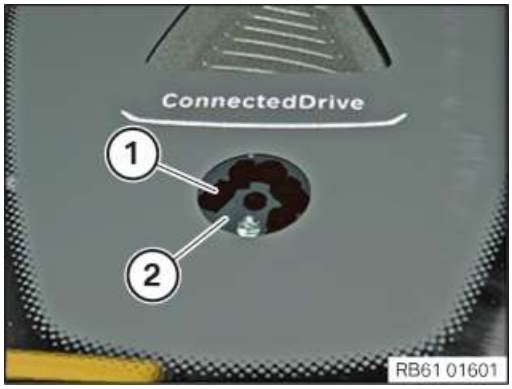


Installation note:
Connect connector (1) only after the rain/light/solar and condensation sensor has been locked.

Press on the rain/light/solar and condensation sensor (2) at the metal spring (3) in a centred position.

To lock, consecutively press down both sheet metal tabs (4) on each side.

Connect connector (1) with the rain/light/solar and condensation sensor (2).



Installation note:
Visible shades (1 and 2) do not have any air pockets, but show the optical element of the sensor.

Visible shades (1 and 2) do not represent any functional limitation.

bmwdiagn.com



For vehicles up to 03/2014:

Initialise sensor.

Note:

- For F2x; (not F25/F26); F3x and F80/F82/F83 the encoding is **automatically** implemented by **JBBFE**.
- For F25/F26 the encoding is implemented **automatically** with a terminal change (terminal 15) using the **junction box**.

For vehicles built after 03/2014 (except F25 / F26):

Initialisation and encoding are performed **automatically** by BDC control unit.



Required follow-up work:

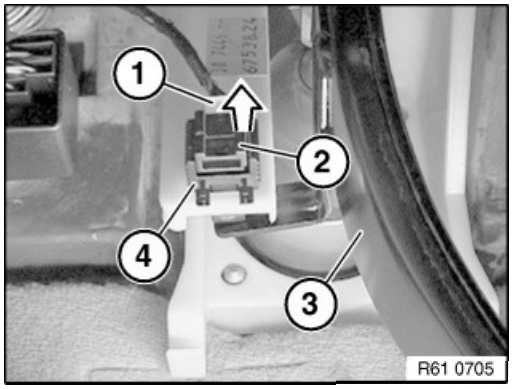
- Install interior mirror

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61 31 310 Replacing brake light switch

Necessary preliminary tasks:

- Remove trim panel for pedal mechanism.

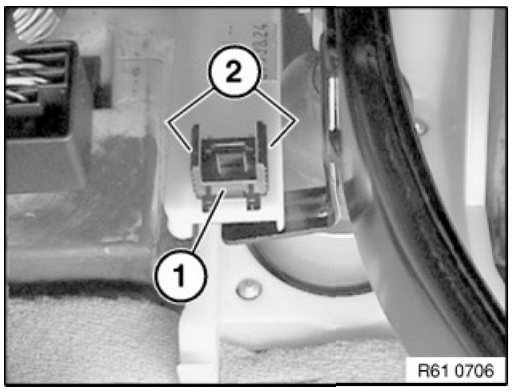


Disconnect plug connection (1).

Pull brake light switch (2) in direction of arrow out of brake light switch holder (4).

Installation note:

- Press brake pedal (3) to floor.
- Push brake light switch (2) as far as it will go into brake light switch holder (4).
- Counter hold brake light switch (4) holder, slowly return brake pedal (3) to initial position and tighten to stop.



Note:
Removing brake light switch holder (1):

Press brake pedal.

Unclip brake light switch holder (1) at shanks (2) and remove towards rear.

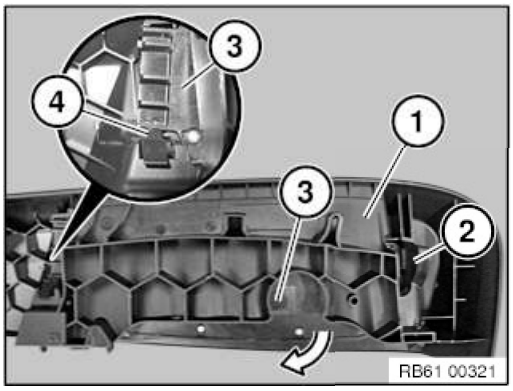
cardiagn.com

61 31 204 Replacing operating unit for seat adjustment

Important!
Observe the information on protection from electrostatic discharge.

Necessary preliminary tasks:

- Remove cover from front seat



Unlock catch (2).

Unscrew the operating unit (3) in the direction of arrow from front seat cover (1).

Installation note:
Operating unit (3) must be fitted correctly under the latch mechanism (4).

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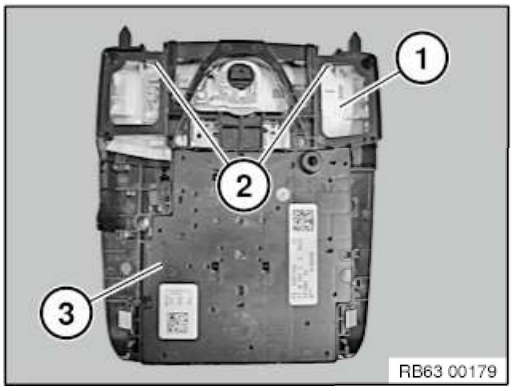
61 31 544 Replacing roof switch cluster (front)

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Necessary preliminary tasks:

- Remove roof switch cluster



Release interior roof light (1) at clamps (2) and feed out of roof switch cluster (3).*Installation note:*
Clips (2) must not be missing or damaged.

Make sure interior roof light (1) is correctly seated in roof switch cluster (3).

High-spec roof function centre only:

Carry out vehicle programming/coding.

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61 31 255 Replacing switch for exterior mirror



Operation is described in:

Removing power window switch (driver's side).

cardiagn.com

61 31 118 Replacing the power windows regulator on the passenger's side



Operation is described in:

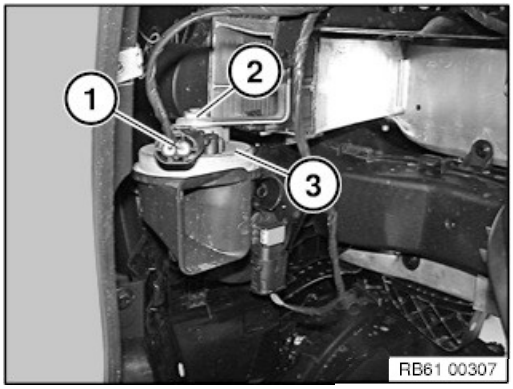
Remove/install/replace switch for power window on driver's side.

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61 33 050 Removing and installing/replacing left or right fanfare

Necessary preliminary tasks:

- Release front wheel arch cover at front area



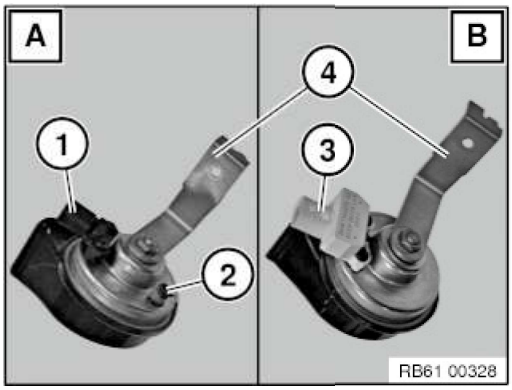
Note:
Graphic displays F20, deviations in detail possible in other models.

Unfasten plug connection (1) and disconnect.

The nut (2) must not be released.

Bore out the blind rivet on the holder of the fanfare with the aid of a suitable drill (e.g. 8 mm).

Remove the fanfare (3) including the holder.



Note:
Electromechanical fanfare is installed as standard. The electronic fanfare is only installed in China, India, Russia, South Africa and Gulf states as of 01/2011.

A: Electromechanical fanfare

B: Electronic fanfare

Distinguishing features:

- Electromechanical fanfare has a black connector (1)
- Electronic fanfare has a white connector (3)
- Only the electromechanical fanfare has no adjusting screw (2)
- Holder (4) is vehicle-specific and may deviate from the graphic.

Attention!

In vehicles with a production data before 01/2011, both fanfares must be replaced in the countries listed above.

The electronic fanfare has a different sound pattern.

Combining the mechanical and electronic fanfares is not permissible.

The connector position may vary slightly.

Pay particular attention to ensuring that the holder is securely seated on the vehicle and that the fanfare is securely seated on the holder! This greatly influences the tone!

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61 34 ... Removing and installing/replacing 12-V power socket

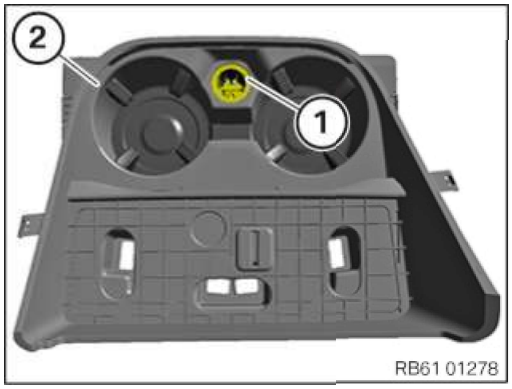
Special tools required:

- 61 0 250

Necessary preliminary tasks:

- Remove centre console cover
- Remove rear centre console cover
- Remove luggage compartment wheel arch panel on left.

Check the equipment dependent sockets that are available.

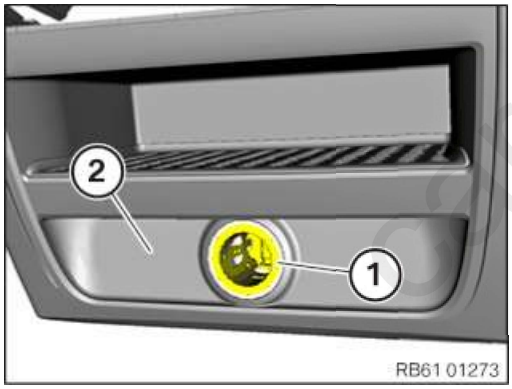


Cup holder:

Unclip connector (1) and feed through under centre console to power socket (2).

Remove power socket (2) using special tool 61 0 250 .

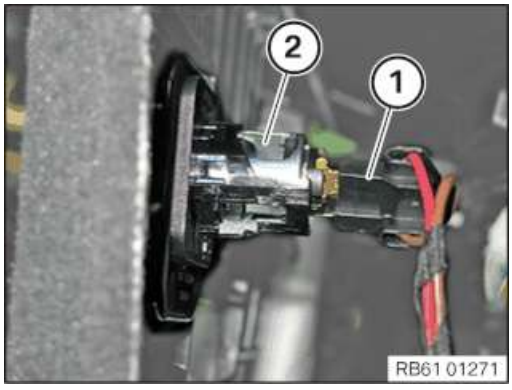
See last operation.



Rear centre console trim:

Remove socket (1) from the centre console trim using special tool 61 0 250 2.

See last operation.



Luggage compartment:

Hold the left luggage compartment wheel arch panel from behind and disconnect the connector (1) from the power socket (2).

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Luggage compartment:

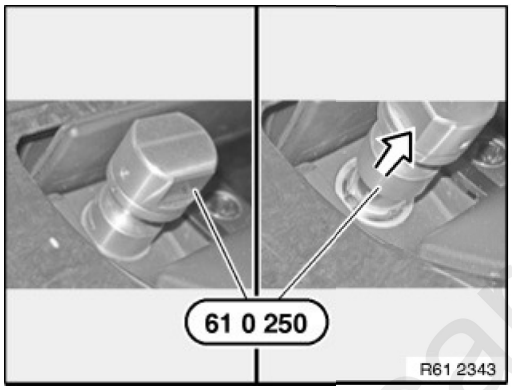
Fold up the protective cap over power socket (1).



Luggage compartment:

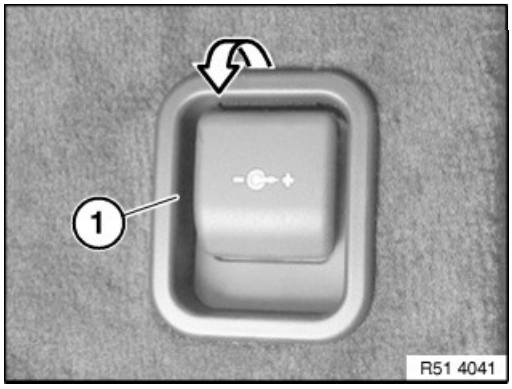
Remove socket (1) using special tool 61 0 250 .

See last operation.



Pull out 12-V power socket from housing with special tool 61 0 250 until connector is at bottom of light ring.

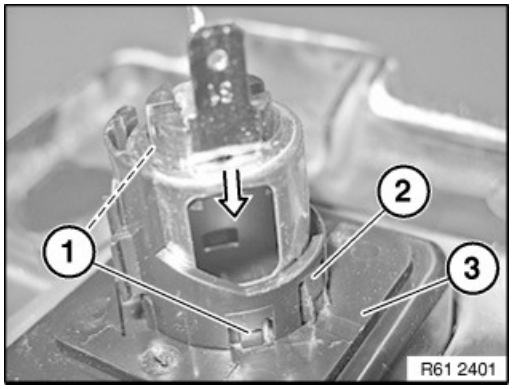
For further information, see Service Information SI 01 08 09 (531)



Note:
Graphic similar

Lever out power socket (1) in direction of arrow with a suitable tool.

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Release latch mechanisms (1) with a suitable tool.

Press power socket mounting (2) in direction of arrow out of power socket frame (3).

Installation note:
Latch mechanisms (1) at socket mounting (2) must not be damaged. Make sure socket mounting (2) is fitted correctly in socket frame (3).

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61 00 ... Encode/program control unit(s)

Note:
Depending on the vehicle and the equipment, programming/encoding has the following flat rate unit position:

- 61 00 710
- 61 00 720
- 61 00 730

Notes:

- In order to avoid incorrect programming procedures and Check Control message, it is essential to always use the most recent version when working with the ISTA/P programming system.
- Battery voltage must not drop below **13.0 V** during programming. Connect battery charger prior to programming.

  Only use battery chargers* recommended by BMW for low voltage vehicle electrical system.

  *Sourcing reference Workshop Equipment Catalogue



Attention!

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.

The high-voltage system will be automatically switched off by the programming system.

Exception:

BMW I01: Observe PuMA measure 55176388!



programming routine via ISTA/P:

- Connect the battery charger to the vehicle.
- Connect the programming system with the vehicle.
- Determine the action plan.
- Accept action plan with the control units to be programmed/encoded and enabled, if necessary or work through.
- Observe the reworking list!
- If applicable, connect the workshop system to the vehicle, depending on the reworking list. Perform brief test and delete fault memory.

  Note:

  With the integration of the service functions and the "quick clearing" function in ISTA/P, it may not be necessary to change to the workshop system. Check the rework list accordingly!
- The information about programming the workshop system and the corresponding notes in the user documentation must be observed.

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61 35 679 Initialise the rain-light-solar-condensation sensor

Note:
Initialisation is necessary:

- after replacing the windscreen
- after replacing the rain-light-solar-condensation sensor
- after removing and installing the rain-light-solar-condensation sensor

Note:

- Connect BMW diagnosis system
- Initialise the rain-light-solar-condensation sensor

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61 35 679 Initializing rain/light sensor

Note:
Initialisation is necessary:

- after replacing the windscreen
- after replacing the rain-light sensor
- after removing and installing the rain-light sensor

Note:

- Connect BMW diagnosis system
- Initializing rain/light sensor

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61 35 ... Notes on ESD protection (Electro Static Discharge)

Special tools required:

- 12 7 060

Note:
Electrical components which are particularly sensitive to electrostatic discharge (electronic control units, sensors, etc.) are marked with the ESD warning symbol.

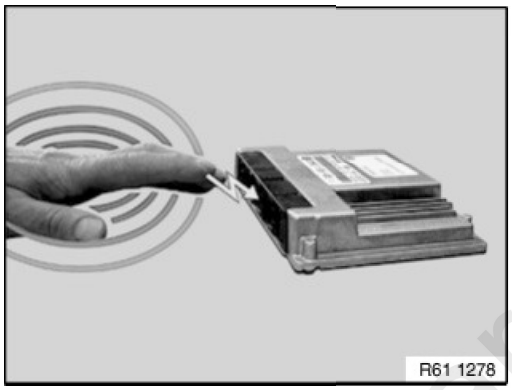
E-Electro

S-Static

D-Discharge

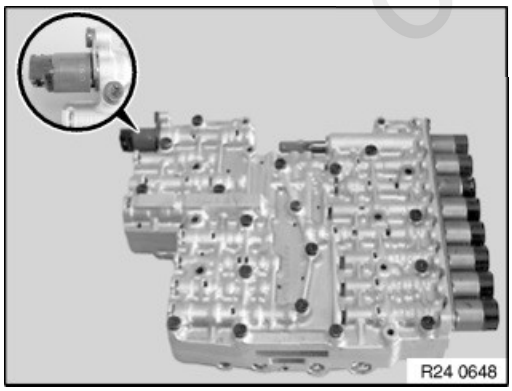
Important!

Read and comply without fail with the notes on this subject from Service Information **2 06 04 128**.



Statically charged persons can discharge themselves when they touch electrical components.*Note:*
Humans can only detect a discharge starting from a level of approx. 3000 V.

The danger threshold for electrical components already starts from a level of approx. 100 V.



Example:

Mechatronic control unit.

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Important!
Do not touch pins and multi-pin connectors directly!

Touch electrical components by their housings only.



Important!

To avoid damaging or destroying electrical components as a result of electrostatic discharge, it is absolutely essential to observe the following instructions:

- When replacing electrical components, leave the replacement components in their original packaging until immediately before they are to be installed
- If necessary, always return a removed component in its original packaging (always pack the component away immediately)
- Read and comply with user information on using the associated special tool 12 7 060



Personal protective equipment:

Electrically conducting clothing (high wool content, antistatic shoes required).

These can primarily be identified by the logo on the side.

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61 35 ... Overview of additional work for the removal and installation or replacement of electronic components in the body area/windscreen

Component	**Removal and installation** Calibration/Initialisation required **(diagnosis system must be connected)**	**Removal and installation** Use of the Special tool necessary	**Replacement** Programming/encoding Calibration/Initialisation required **(diagnosis system must be connected)**	**Replacement** Use of the Special tool necessary	Remarks
Front section: (including bumper panel)					
ACC sensor	Yes	Yes	Yes	Yes	
PDC ultrasonic sensor	No	No	No	No	
PMA ultrasonic sensor	No	No	No	No	
Side View camera	No	No	Yes	No	
Side section:					
Top view camera (in the exterior mirror)	No	No	Yes	No	
Rear area: (including bumper panel):					
reversing camera	No	No	Yes	No	
PDC ultrasonic sensor	No	No	No	No	
Sensor, lane change warning	no*	No	Yes	No	*Required after a body repair in the surrounding area of the sensor. **Comply with the regulations for repainting!**
Windscreen:					
Camera-based driver support systems camera	no*	No	no*	No	*Necessary after **replacement of the windscreen**
Rain sensor (separate document)					

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61 35 ... Overview, rain sensor (additional work when replacing the windscreen / sensor replacement)

- **1-Series:** E8x
- **3-Series:** E9x
- **5-Series:** E6x
- **6-Series:** E6x
- **X1:** E84
- **Z4:** E89

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor/ Programming/encoding necessary	When replacing the sensor/ Initialisation required	Connecting the diagnosis system required
Condensation sensor square 30 x 20 mm	Yes	No	No	No

- **5-Series:** E6x
- **6-Series:** E6x
- **7-Series:** E6x

Sensor type/ Sensor shape	With windscreen replacement replacement **sensor** required	When replacing **the sensor** Programming/encoding necessary	When replacing **substitute visuals** Programming/encoding necessary	When replacing **the sensor/** **substitute visuals** Initialisation required	Connecting the diagnosis system required
all types square 60 x 40 mm	No	Yes	-	Yes	Yes
RLS approximately ø 50 mm	No (new **substitute visuals** required, refer to Electronic Parts Catalogue)	-	No	Yes	Yes

- **X5:** E70
- **X6**: E7x

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Sensor type/ Sensor shape	With windscreen replacement replacement **sensor** required	When replacing **the sensor** Programming/encoding necessary	When replacing **substitute visuals** Programming/encoding necessary	When replacing **the sensor/** **substitute visuals** Initialisation required	Connecting the diagnosis system required
RLPSS (Rain, light and precipitation solar sensor) (Designation is located on the back of the sensor) approximately ø 50 mm	Yes	Yes	-	Yes	Yes
RLS (vehicle **with no HUD**) (Designation is located on the back of the sensor) approximately ø 50 mm	No (new **substitute visuals** required, refer to Electronic Parts Catalogue)	-	No	Yes	Yes
RLSS (vehicle **with HUD**) (Designation is located on the back of the sensor) approximately ø 50 mm	Yes	Yes	-	Yes	Yes

- **1-Series:** E8x
- **3-Series:** E9x
- **X1:** E84
- **X3:** E83
- **Z4:** E89

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types square 60 x 40 mm	No	Yes	Yes	Yes

- **5-Series:** F1x
- **5 Series GT:** F07
- **6-Series:** F06, F1x
- **7-Series:** F0x

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- **X3:** F25
- **X4:** F26

Sensor type/ Sensor shape	With windscreen replacement replacement **sensor** required	When replacing **the sensor** Programming/encoding necessary	When replacing **substitute visuals** Programming/encoding necessary	When replacing **the sensor/ substitute visuals** Initialisation required	Connecting the diagnosis system required
all types approximately ø 35 mm	No	No	-	Yes	Yes
all types approximately ø 50 mm	Yes	Yes	-	Yes	Yes
Only for F25 : RLS approximately ø 50 mm	No (new **substitute visuals** required, refer to Electronic Parts Catalogue)	-	No	Yes	Yes

- **X5:** F15, F85
- **X6:** F16, F86

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types approximately ø 35 mm	No	No	No	No

- **1-Series:** F2x
- **2-Series:** F2x
- **3-Series:** F3x, F8x
- **3 Series GT:** F34
- **4-Series:** F3x, F8x

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all **up to 03/2014** except SBS (01) (Designation is located on the back of the sensor) approximately ø 35 mm	No	No	Yes	Yes

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SBS (01) (Designation is located on the back of the sensor) approximately ø 35 mm	No	No	No	No
All **as from 03/2014** approximately ø 35 mm	No	No	No	No

- **2-Series:** F4x

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types	No	No	No	No

BMW i:

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types approximately ø 35 mm	No	No	No	No

BMW from **G series**

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types	No	No	No	No

MINI (all):

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types square 60 x 40 mm	No	Yes	Yes	Yes
all types approximately ø 35 mm	No	No	No	No

Rolls-Royce:

- RR1
- RR2

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- RR3
- RR4
- RR5
- RR6

Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encoding necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types square 60 x 40 mm	No	Yes	Yes	Yes
all types approximately ø 35 mm	No	No	Yes	Yes
all types approximately ø 50 mm	Yes	Yes	Yes	Yes

Rolls-Royce:

- RR11
- RR12

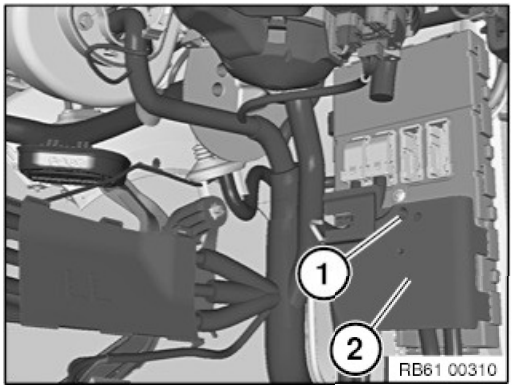
Sensor type/ Sensor shape	With windscreen replacement replacement sensor required	When replacing the sensor Programming/encod ng necessary	When replacing the sensor Initialisation required	Connecting the diagnosis system required
all types approximately ø 35 mm	No	No	No	No

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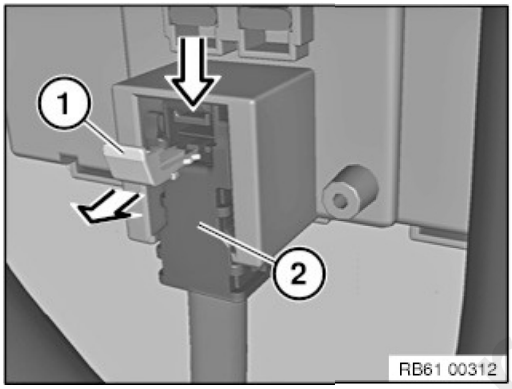
61 35 270 Remove and install (replace) control unit Front Electronic Module (FEM)

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point
- Remove side trim panel from footwell on right A-pillar



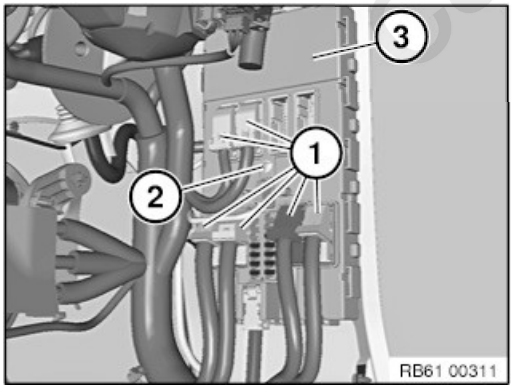
Release screw (1) and remove cover (2).



Attention!
Risk of damage to positive battery cable connector!

Unlock the positive battery cable connector:

1. Loosen lock (1) in direction of arrow.
2. Unlock top positive battery cable connector (2) in direction of arrow.
3. Disconnect battery positive lead (2).



Unlock plug connections·(1) and disconnect.

Release bolt (2) and remove control unit (3).

Tightening torque 61 35 5AZ.

Installation note:
Make sure all plug connections are correctly latched.

Replacement:

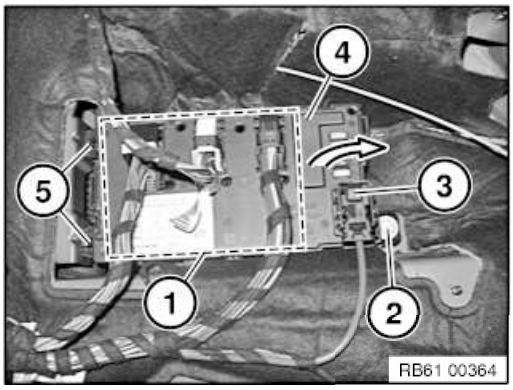
Carry out programming/encoding.

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61 35 275 Remove and install (replace) control unit Rear Electronic Module (REM)

Necessary preliminary tasks:

- Disconnect the negative battery cable



Unlock and disconnect all plug connections in area (1).

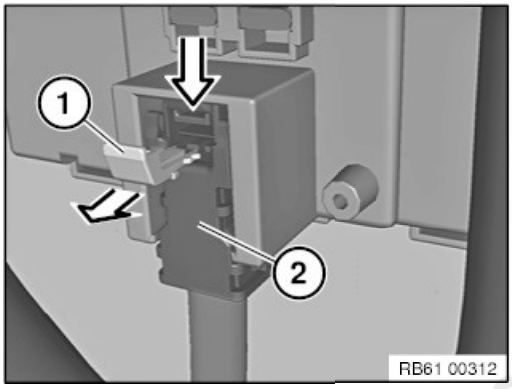
Unlock and disconnect positive battery cable (3). (Note removal instructions below)

Release screw (2).

Tightening torque 61 35 4AZ.

Remove control unit (4) from guides (5) in direction of arrow.

Installation note:
Make sure all plug connections are correctly latched.



Important!
Risk of damage to positive battery cable connector!

Unlock the positive battery cable connector:

1. Loosen lock (1) in direction of arrow.
2. Unlock top positive battery cable connector (2) in direction of arrow.
3. Disconnect battery positive lead (2).

Replacement:

Carry out vehicle programming/coding.

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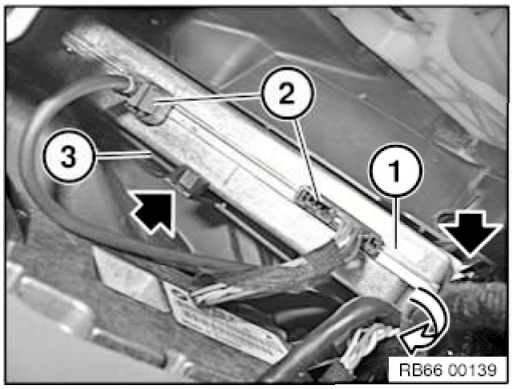
66 53 180 Removing and installing (replacing) control unit for reversing camera

Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary tasks:

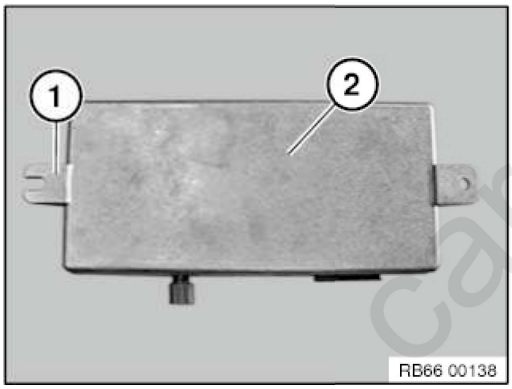
- Remove trim panel for pedal mechanism



Unlock plug connections (2) and disconnect.

Unlock latches at marked points.

Remove control unit (1) from holder (3) in direction of arrow.



Installation note:

Guide (1) on control unitÂ (2) must be inserted in corresponding recess on counter support.

Make sure control unit (2) is securely seated.

Replacement:

- Carry out programming/encoding.
- Calibrate reversing camera

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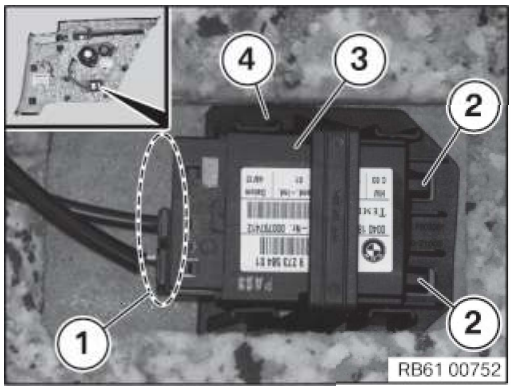
61 35 201 Removing and installing (replacing) power amplifier (LCPA) (left or right)

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

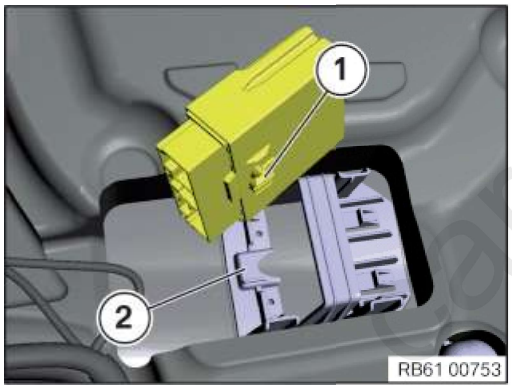
Necessary preliminary tasks:

- Remove rear side trim panel



Unlock plug connections (1) and disconnect.

Unlock latch mechanism (2) and pull power amplifier (3) towards the rear out of holder.



Installation note:
Make sure guide (1) of power amplifier (2) correctly fits in holder.

Replacement:

Carry out vehicle programming/encoding.

Note:
Encoding of the power amplifier is carried out using the (FEM).

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61 35 177 Removing and installing (replacing) rain/light sensor



Operation is described in:

Removing solar rain/light sensor and condensation sensor

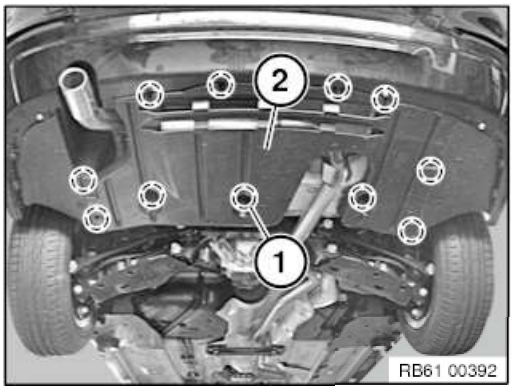
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61 35 245 Removing and installing (replacing) Smart Opener bottom sensor line (non-contact rear lid opening)



Important!

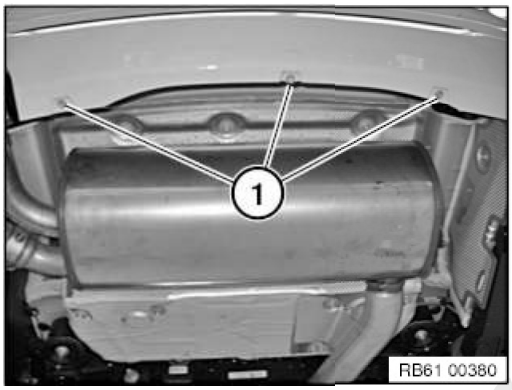
Read and comply with notes on protection against electrostatic discharge (ESD protection).



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

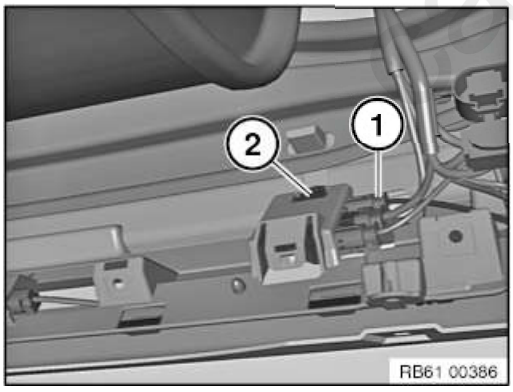
Depending on the engine version:

If necessary, release screws (1) on cover (2) and remove cover (2).



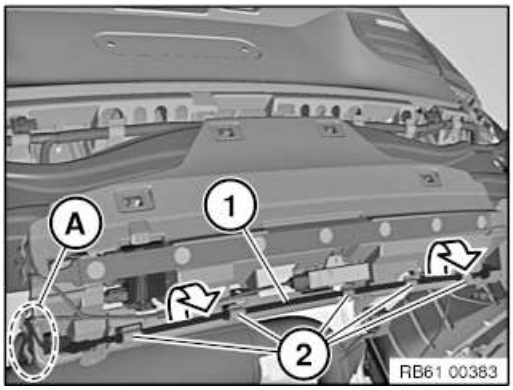
Note:
Control unit and sensor strip are located on reinforcement of rear bumper panel.

Release screws (1) on bumper panel at bottom rear.



Unlock associated plug connection (1) on control unit (2) and disconnect.*Installation note:*
Make sure plug connection (1) is correctly seated.

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Note:
Shown with bumper panel removed for purposes of clarity.

Important!
Risk of damage, do not kink sensor line!

Feed out associated connecting line in area (A).

Reach between reinforcement and bumper panel.

Release sensor line (1) from holder (2) in direction of arrow and feed out.

Installation note:
Make sure sensor line (1) is correctly fitted.

Holders (2) must not be missing or damaged.

Make sure connecting line is correctly laid.

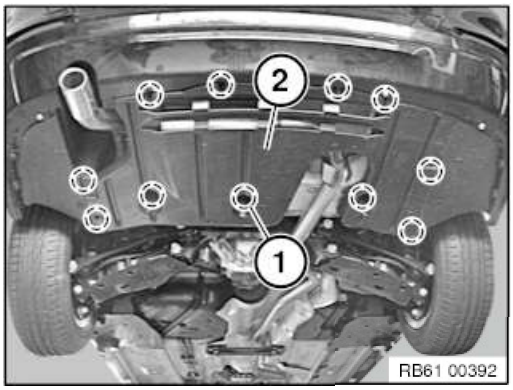
cardiagn.com

61 35 240 Removing and installing (replacing) Smart Opener control unit (non-contact rear lid opening)



Important!

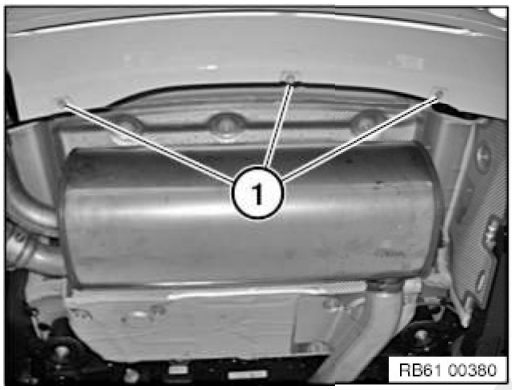
Read and comply with notes on protection against electrostatic discharge (ESD protection).



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

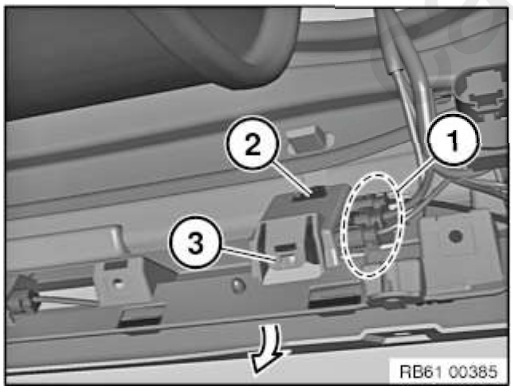
Depending on the engine version:

If necessary, release screws (1) on cover (2) and remove cover (2).



Note:
Control unit is located on rear reinforcement of bumper panel.

Release screws (1) on bumper panel at bottom rear.



Unlock plug connections·(1) and disconnect.

Reach between reinforcement and bumper panel.

Release control unit (2) at latch mechanism (3) and feed out in direction of arrow.

Installation note:
Make sure all plug connections (1) are correctly seated.

Make sure control unit (2) is correctly seated on latch mechanism (3).

Make sure connecting lines are correctly routed.

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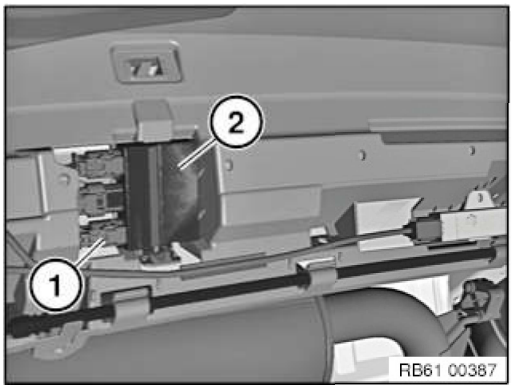
61 35 243 Removing and installing (replacing) Smart Opener top sensor line (non-contact rear lid opening)

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Necessary preliminary tasks:

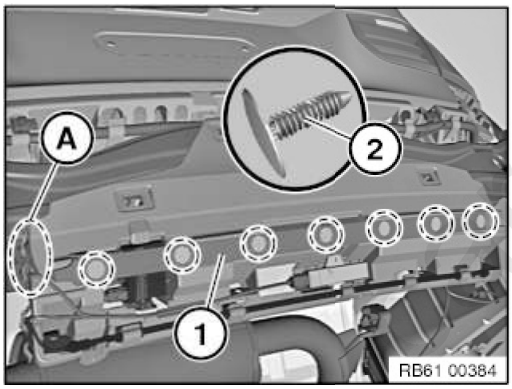
- Remove rear bumper trim



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Unlock associated plug connection (1) on control unit (2) and disconnect.*Installation note:*
Make sure plug connection (1) and control unit (2) are correctly fitted.

Make sure connecting line is correctly laid.



Important!

Risk of damage, do not kink sensor line!

Feed out associated connecting line in area A.

Release sensor line (1) at clips (2) and remove.

Installation note:
Make sure sensor line (1) is correctly fitted.

Make sure connecting line is correctly laid.

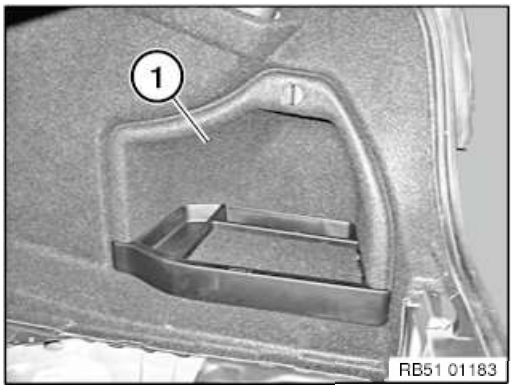
Clips (2) must not be missing or damaged.

61 35 001 Removing and installing (replacing) trailer module

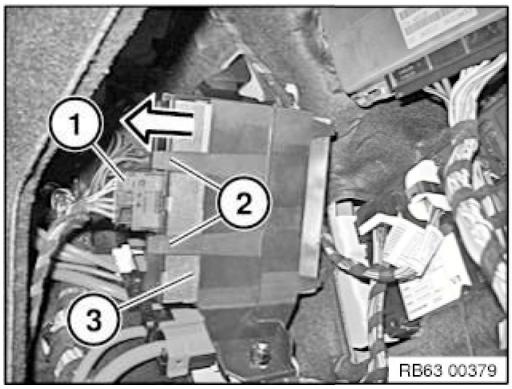


Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).



Remove flap (1).*Installation note:*
Make sure flap (1) is correctly seated.



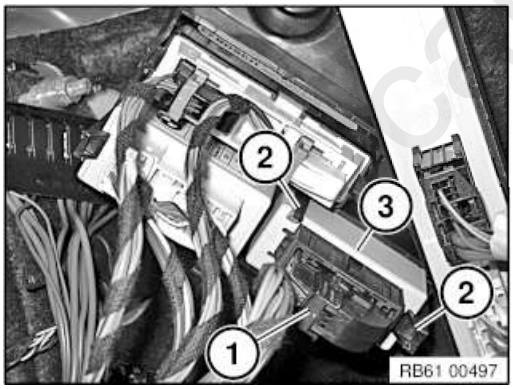
Version with voltage transformer:

Disconnect plug connection (1).

Lever out latches (2) and pull voltage transformer (3) out of bracket.

Installation note:
Make sure plug connection (1) is correctly seated.

Make sure voltage transformer (3) is correctly seated in bracket.



Unfasten plug connection (1) and disconnect.

Unlock retaining lugs (2).

Pull trailer module (3) out of holder.

Installation note:
Make sure trailer module (3) is correctly engaged in holder.



Replacement:

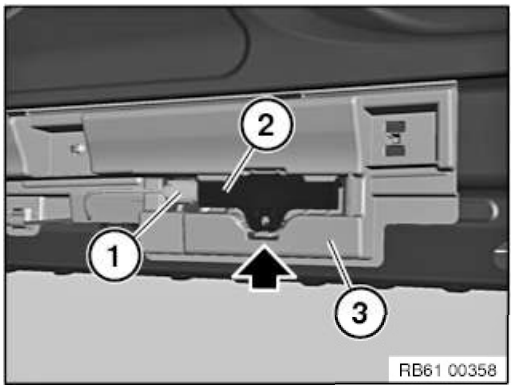
Carry out vehicle programming/encoding.

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61 35 980 Removing and installing/replacing aerial for Comfort Access on left or right

Necessary preliminary tasks:

- Remove trim panel for cover on side member



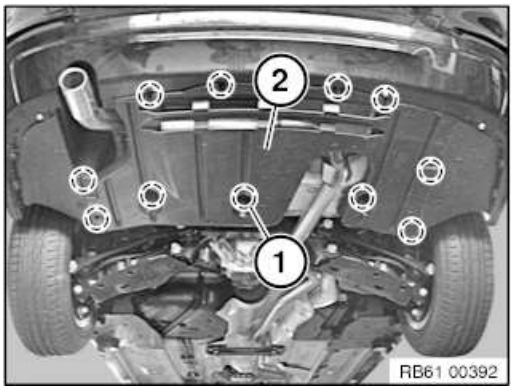
Disconnect plug connection (1).

Unlock and remove aerial for Comfort Access (2) from bracket (3).

Installation note:
Make sure aerial for Comfort Access (2) is correctly seated on bracket (3).

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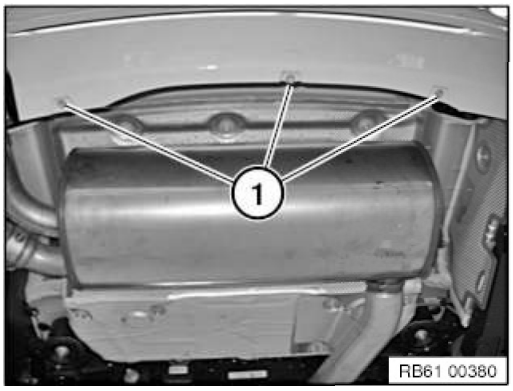
61 35 975 Removing and installing/replacing bumper aerial for Comfort Access



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

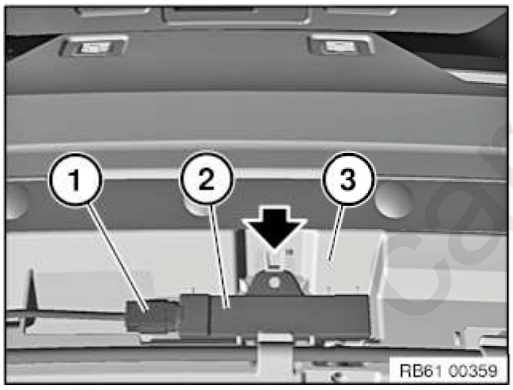
Depending on the engine version:

If necessary, release screws (1) on cover (2) and remove cover (2).



Note:
Bumper aerial is located on reinforcement of rear bumper panel.

Release screws (1) on bumper panel at bottom rear.



Note:
Shown with bumper panel removed for purposes of clarity.

Disconnect plug connection (1).

Reach between reinforcement and bumper panel.

Release latch mechanism (arrow) on reinforcement (3) and feed out bumper aerial (2).

Installation note:
Make sure bumper aerial (2) is correctly fitted on reinforcement (3).

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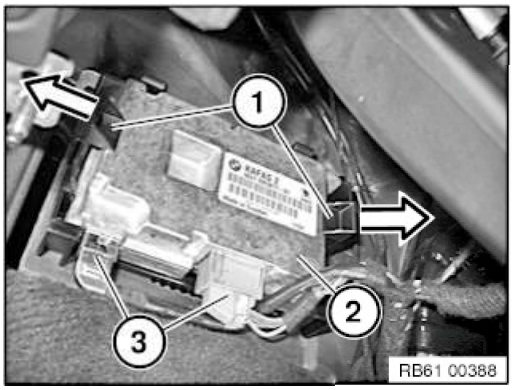
61 35 360 Removing and installing/replacing control unit for camera-based driver support systems (KAFAS)

Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point
- Remove trim panel for pedal mechanism



Note:
For purposes of clarity, schematic diagram shows footwell side trim panel removed.

Release latch mechanisms on equipment holder (1) in direction of arrow.

Feed out control unit (2) from equipment holder towards top.

Disconnect plug connections (3) and remove control unit (2).

Installation note:
Make sure control unit (2) is correctly installed in equipment holder.

Replacement:

Carry out programming/coding.

Carry out calibration:

- Service function
- Body
- Display and information functions
- Camera-based driver support systems
- Calibration of lane departure warning

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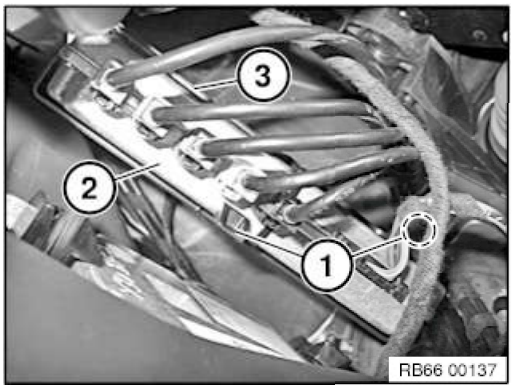
66 53 170 Removing and installing/replacing control unit for Top-/Rear-/Side-View Camera

Important!

Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary tasks:

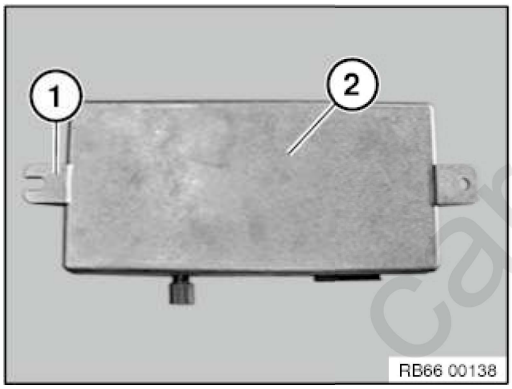
- Remove trim panel for pedal mechanism



Unlock all plug connections and disconnect.

Unlock latch mechanisms (1).

Remove control unit (2) from holder (3) downwards.



Installation note:

Guide (1) on control unitÂ (2) must be correctly inserted in corresponding recess on counter support.

Make sure control unit (2) is securely seated.

Replacement:

- Carry out programming/encoding.
- Calibrate reversing camera

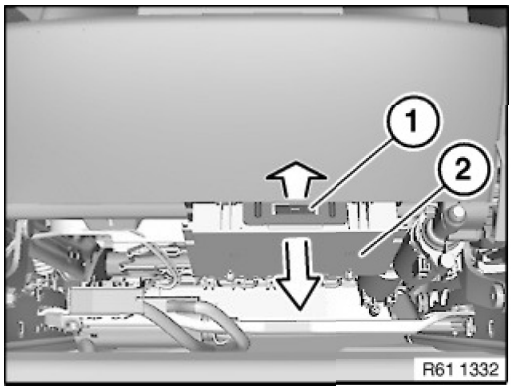
cardiagn.com

61 35 080 Removing and installing/replacing control unit/module for left or right seat adjustment

Important!

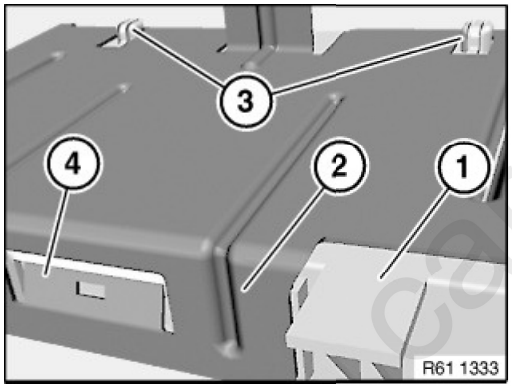
Observe notes on protection from electrostatic discharge.

Note:
To facilitate installation/removal of control unit, move seat upwards and to the rear fully.



Unlock metal tab (1) towards front and remove control unit for seat adjustment (2) towards bottom.

Unlock and disconnect all associated plug connections.



Installation note:
Make sure control unit for seat adjustment (1) is correctly seated in bracket (2).

Guides (3) and metal tab (4) must not be damaged.

Replacement:

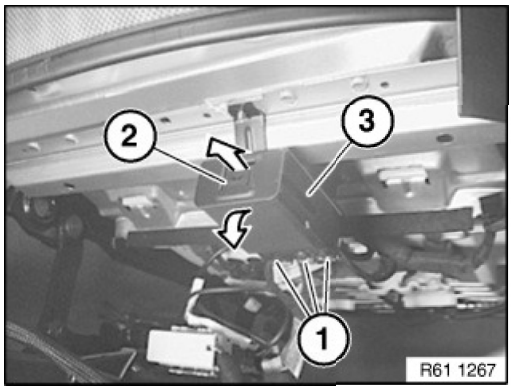
Carry out programming/encoding.

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61 35 095 Removing and installing/replacing control unit/module for seat heating

Important!
Follow notes on protection from electrostatic discharge!

Note:
To facilitate installation/removal of control unit, move seat upwards and to the rear fully.



Disconnect plug connection (1).

Open lock (2) in direction of arrow.

Remove control unit/module for seat heating (3) downwards.

Installation note:
Make sure control unit/module for seat heating (3) is correctly engaged.

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61 35 953 Removing and installing/replacing interior aerial for Comfort Access (front storage compartment)

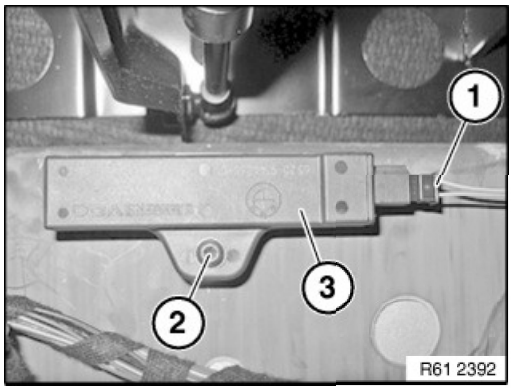
Necessary preliminary tasks:

For version with automatic transmission:

- Remove centre console trim

For version with manual gearbox:

- Partially remove gearshift lever gaiter



Note:
Similar to graphic.

Disconnect plug connection (1).

Release screw (2).

Remove interior aerial (3).

Installation note:
Make sure interior aerial (3) is correctly fitted.

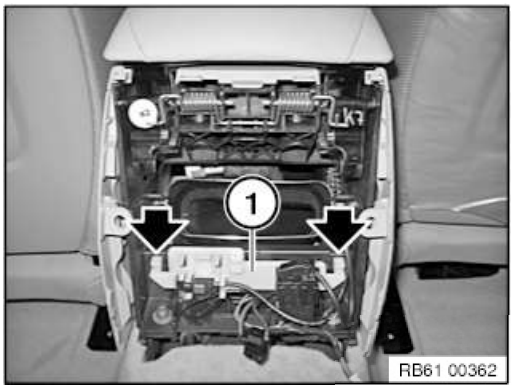
Make sure plug connection (1) is correctly seated.

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61 35 954 Removing and installing/replacing interior aerial for Comfort Access (rear centre console)

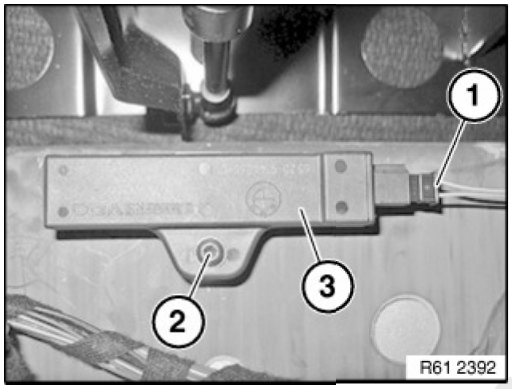
Necessary preliminary tasks:

- Remove rear centre console trim



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Depending on the equipment specification, if necessary release cable clips (1) at latches (arrow) and set down.*Installation note:*
Make sure cable clip (1) is correctly seated.



Note:
Similar to graphic.

Unfasten plug connection (1) and disconnect.

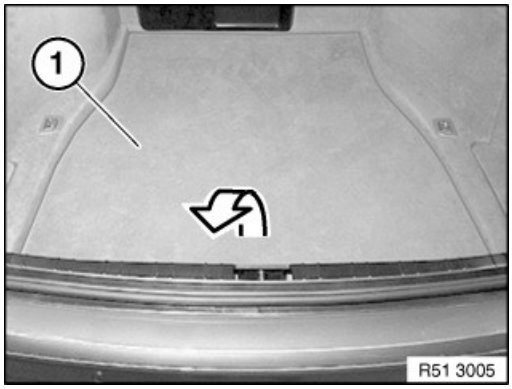
Release screw (2) and remove interior aerial (3).

Tightening torque 61 35 7AZ.

Installation note:
Make sure plug connection (1) and interior aerial (3) are correctly seated.

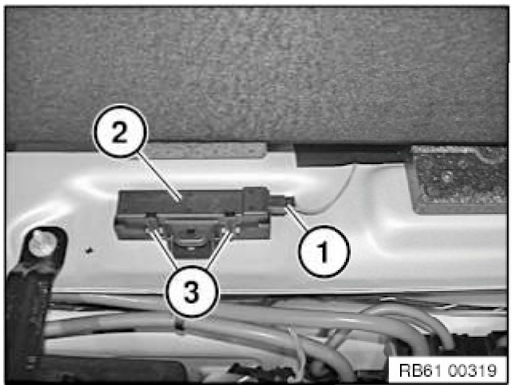
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61 35 970 Removing and installing/replacing luggage compartment aerial for Comfort Access



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

Remove luggage compartment floor trim panel (1) in direction of arrow.



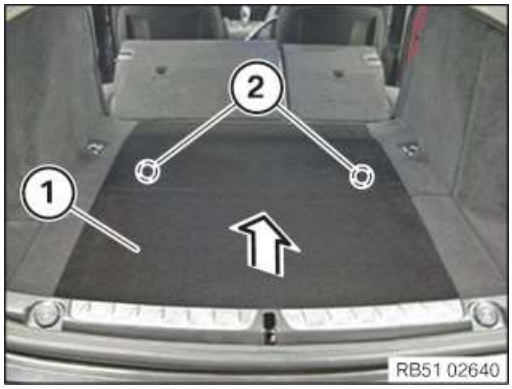
Disconnect plug connection (1).

Unlock and remove luggage compartment aerial (2) from bracket (3).

Installation note:
Make sure luggage compartment aerial (2) is seated correctly in bracket (3).

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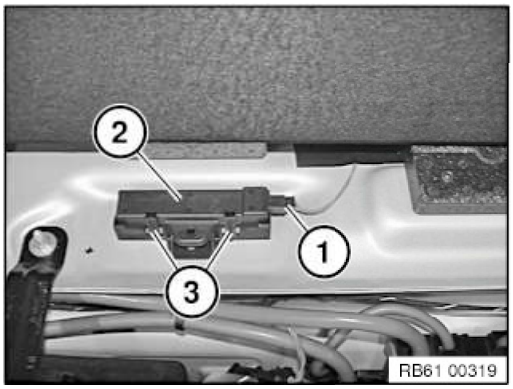
61 35 970 Removing and installing/replacing luggage compartment aerial for Comfort Access



Raise luggage compartment floor trim panel (1) at rear in direction of arrow.

Raise and release Velcro fasteners (2).

Remove luggage compartment floor trim panel (1) to rear.



Disconnect plug connection (1).

Unlock and remove luggage compartment aerial (2) from bracket (3).

Installation note:
Make sure luggage compartment aerial (2) is seated correctly in bracket (3).

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61 35 181 Removing and installing/replacing solar and condensation sensors



Operation is described in:

Removing solar rain/light sensor and condensation sensor

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61 35 179 Replacing and installing (replacing) the solar rain/light sensor and condensation sensor

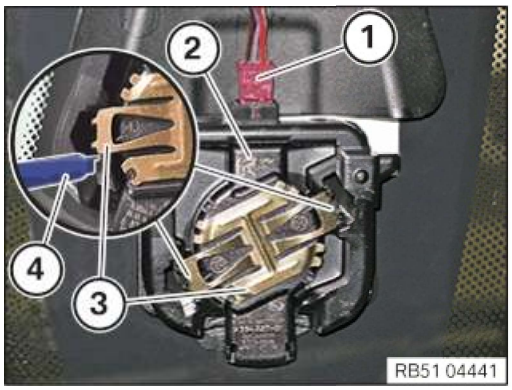
Caution!

Observe the information on protection from electrostatic discharge.

Necessary preliminary work:

- Remove inside mirror

Removal:



Disconnect connector (1).

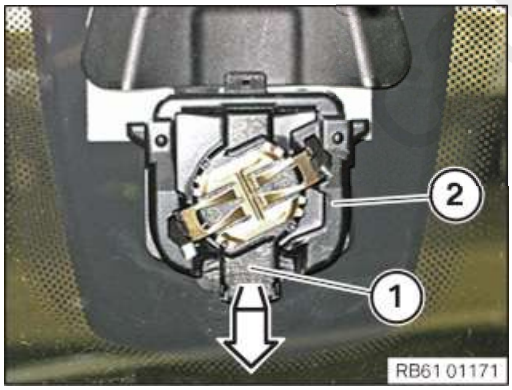
Unlock rain/light/solar and condensation sensor (2) at metal spring (3).

For this purpose, press both sides of the metal spring (3), insert the screwdriver (4) on the side and raise the latch mechanism.

Caution!

Risk of damage!

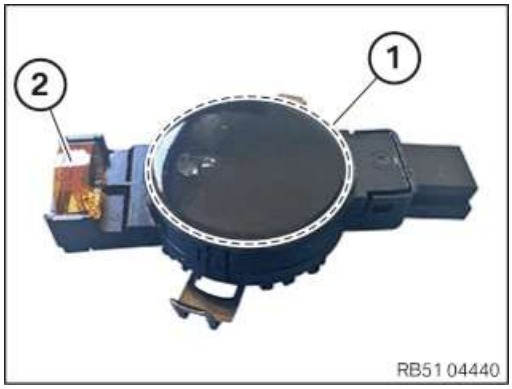
After loosening lock, wait approx. 30 min. at 20 °C for silicone surface to relax.



Pull the rain/light/solar and condensation sensor (1) slowly from holder (2) in direction of arrow.*Note:*
When replacing the windscreen, only remount the rain/light/solar and condensation sensor (1) after disassembly of the windscreen.

Pull off the rain/light/solar and condensation sensor (1) slowly while observing from outside the release of the silicone surface.

The silicone surface must evenly loosen from the windscreen, if applicable, pull off slower.



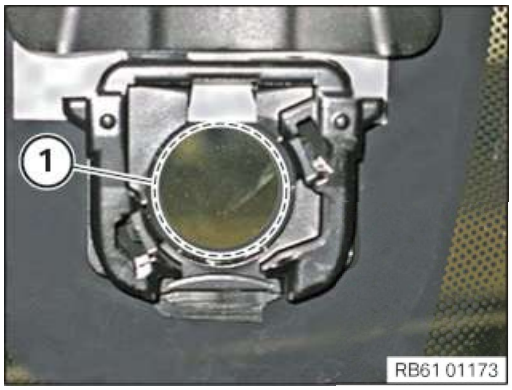
Caution!

Risk of damage!

The silicone-coated surface (1) and the printed circuit board (2) on the rain/light/solar and condensation sensor must not be touched or damaged!

Replace damaged gel pad.

When replacing the windscreen, immediately install the rain/light/solar and condensation sensor into the new windscreen following removal.



Caution!

Risk of damage!

The area (1) on the windscreen must not be touched or damaged!

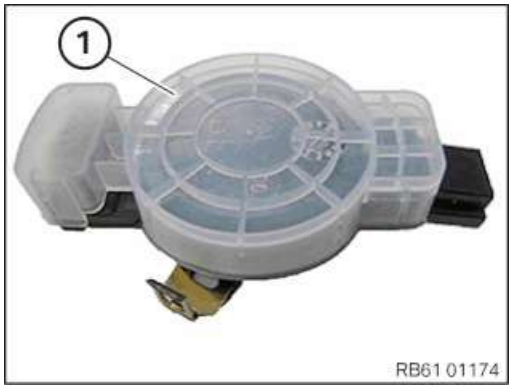
The area (1) may have remnants of the separation oil of the rain/light/solar and condensation sensor that are easy to remove. This does not indicate that the rain/light/solar and condensation sensor is damaged.

Remove all separating oil residue within and outside of the area (1).

Replacement:

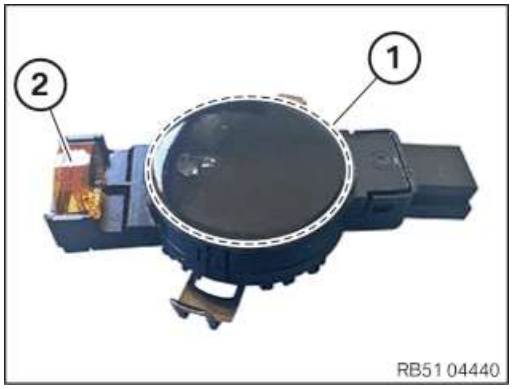


Carefully clean the windscreen at the contact area (1) with the rain/light/solar and condensation sensor! All silicone and separation oil residue must be removed!



Remove protective cover (1) from new rain/light/solar and condensation sensor.

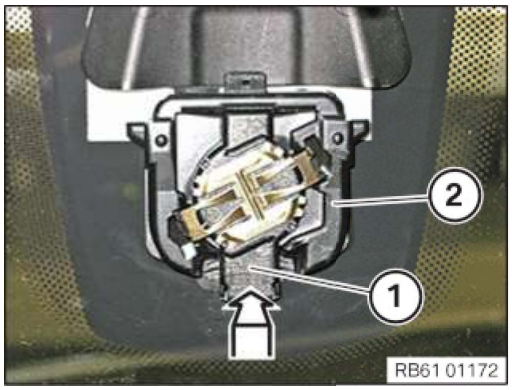
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Caution!

The silicone-coated surface (1) and the printed circuit board (2) on the rain/light/solar and condensation sensor must not be touched or damaged!

Installation:

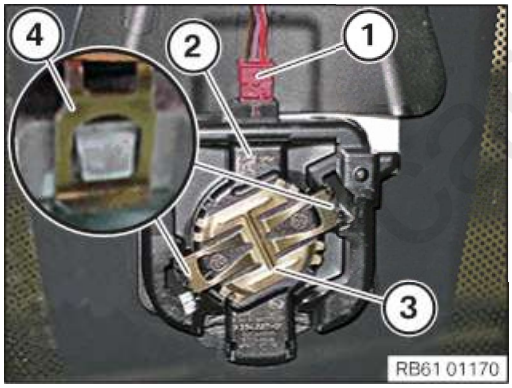


Caution!

Risk of damage!

The silicone-coated surface on the rain/light/solar and condensation sensor must not be touched or damaged.

Feed the rain/light/solar and condensation sensor (1) into holder (2) in direction of arrow.

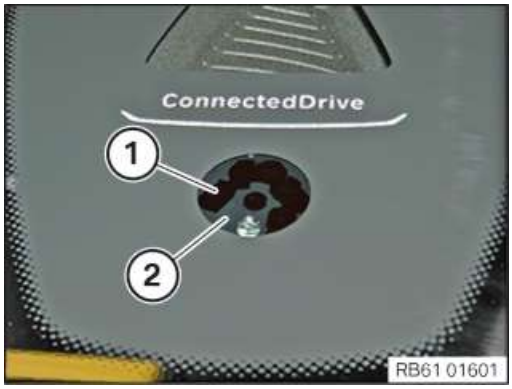


Installation note:
Connect connector (1) only after the rain/light/solar and condensation sensor has been locked.

Press on the rain/light/solar and condensation sensor (2) at the metal spring (3) in a centred position.

To lock, consecutively press down both sheet metal tabs (4) on each side.

Connect connector (1) with the rain/light/solar and condensation sensor (2).



Installation note:
Visible shades (1 and 2) do not have any air pockets, but show the optical element of the sensor.

Visible shades (1 and 2) do not represent any functional limitation.

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For vehicles up to 03/2014:

Initialise sensor.

Note:

- For F2x; (not F25/F26); F3x and F80/F82/F83 the encoding is **automatically** implemented by **JBBFE**.
- For F25/F26 the encoding is implemented **automatically** with a terminal change (terminal 15) using the **junction box**.

For vehicles built after 03/2014 (except F25 / F26):

Initialisation and encoding are performed **automatically** by BDC control unit.



Required follow-up work:

- Install interior mirror

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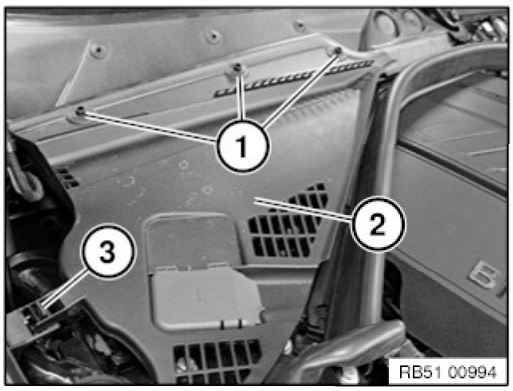
61 36 605 Removing and installing/replacing relay for fan control

Warning!

Observe safety information for handling vehicle battery.

Necessary preliminary tasks:

- Clamp off battery lead from negative connection point

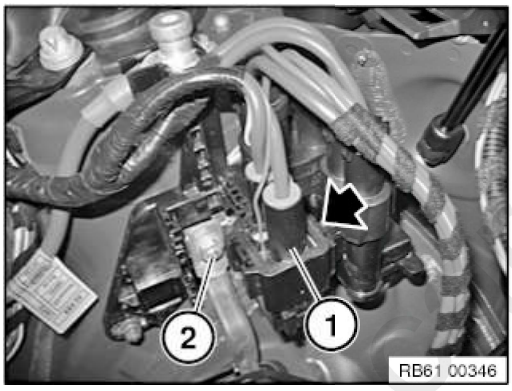


Note:
Graphics shown on the F20 by way of example, deviations in detail are possible in other models.

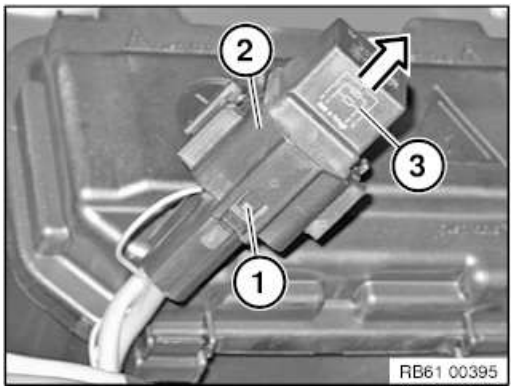
Turn locks (1) 90° counterclockwise.

Unlock catch (3).

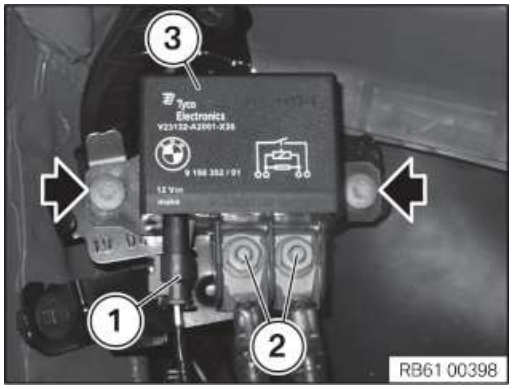
Remove cover (2).



Release latch mechanism (arrow) and pull relay carrier (1) up and out of power distribution box (2).



Release latch mechanism (1) from relay carrier (2) and pull relay (3) off of relay carrier (2).*Installation note:*
Ensure that relay carrier (2) and relay (3) are properly engaged.



For hot-climate version:

Unfasten plug connection (1) and disconnect.

Release nuts (2) and attach cable to the side.

Tightening torque 61 21 1AZ.

Loosen screws on relay (3) and remove relay.

Tightening torque 61 36 1AZ.

Installation note:
Ensure that cable (2) and relay (3) are screwed on properly.

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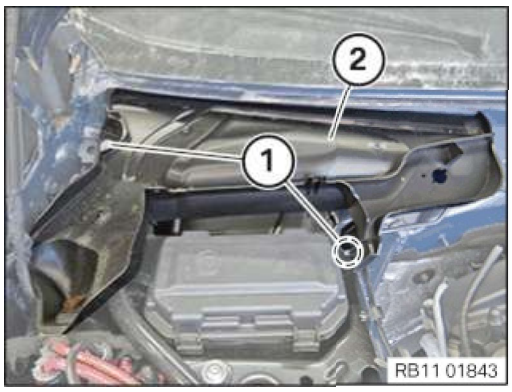
61 36 605 Removing and installing/replacing relay for fan control

Warning!

Observe safety information for handling vehicle battery.

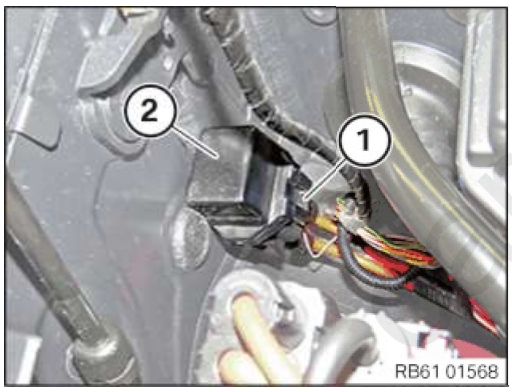
Necessary preliminary tasks:

- Remove cowl panel cover
- Clamp off battery lead from negative connection point

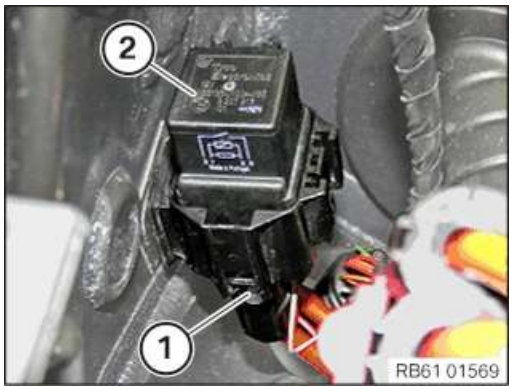


Release screws (1).

Remove attachment part of partition wall (2).



Release latch mechanism (1) and pull off intake port (2) towards top.



Remove latch mechanism (1) from the relay carrier.

Pull off the relay (2) upwards from the relay carrier.

diagn.com

61 42 ... Removing and installing control unit holder

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Necessary preliminary tasks:

For F30; F32; F35; F80; F82:

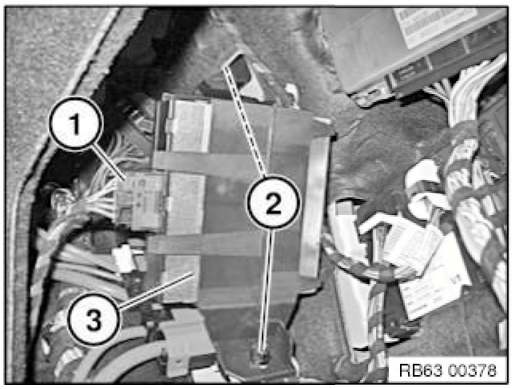
- Open flap in luggage compartment panel on right

F31For:

- Remove battery cover

For F34; F36:

- Remove luggage compartment trim on side panel on right



Release plug connections (1) on all control units.

Release nuts (2) and remove control unit holder (3).

Installation note:
Ensure that the plug connections (1) are correctly seated.

Ensure that the control unit holder (3) is correctly seated.

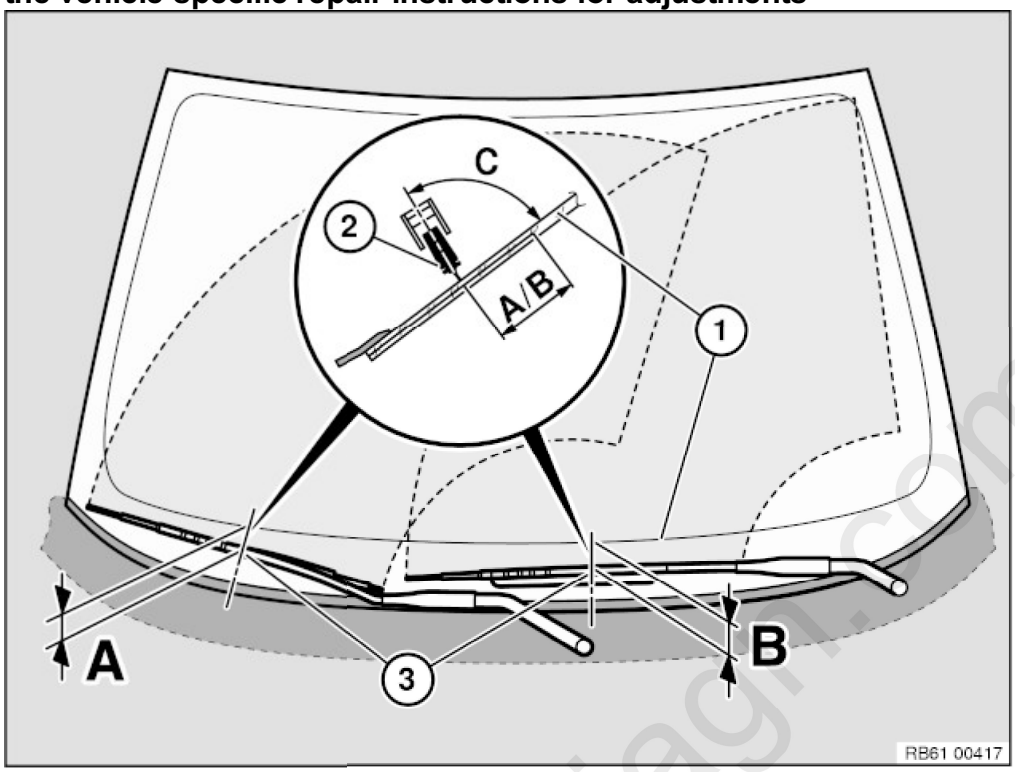
cardiagn.com

61 61 ... Checking contact angle of wiper on left or right (series P L7)

Special tools required:

- 61 6 100

A correctly adjusted contact angle of the wiper arms is important for the wiping quality. Consult the vehicle-specific repair instructions for adjustments



A/B = Distance between black print edge (1) and wiper blade (2).
Note: Measurement is done at the height of the fixture (3) of the wiper blades.

C= Contact angle between wiper blade centre plane and windscreen

When using special tool 61 6 100 , check the scale value according to the following table.

For right hand drive vehicles, change the preceding sign of the scale values.

- Left hand drive vehicle scale range 0 to -10
- Right hand drive vehicle scale range 0 to +10

Model	Contact angle (C) on windscreen wiper arm		Scale value on the special tool (left hand drive vehicle)		Setting dimension (A, B) on windscreen wiper arm	
	Front front passenger side	Driver's side	Front front passenger side	Driver's side	Front front passenger side	Driver's side
F20 / F21 / F22 / F23	85.0 ° ±2 °	85,6 ° ±2 °	-5 ±3	-5 ±3	36 mm ±3 mm	34 mm ±3 mm
F30 / F31 / F35 / F80	85,5 ° ±2 °	85,5 ° ±2 °	-5 ±3	-5 ±3	35 mm ±3 mm	45 mm ±3 mm

F32 / F36 / F33 / F82 / F83	85,8 ° ±2 °	85,6 ° ±2 °	-5 ±3	-5 ±3	49 mm ±3 mm	64 mm ±3 mm
F34	84,0 ° ±2 °	84,0 ° ±2 °	-5 ±3	-5 ±3	40 mm ±3 mm	32 mm ±3 mm

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61 61 010 Checking/adjusting contact angle of windscreen wiper arms on windscreen

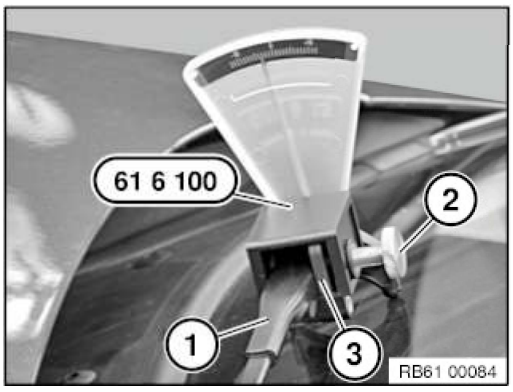
Special tools required:

- 61 6 100
- 00 9 220

Note:

The wipe quality is improved by precise adjustment of the contact angle of the wiper arms.

The contact angle can be tested with special tool 61 6 100 .



Note:
Graphics show left hand drive vehicle.

Remove wiper blade.

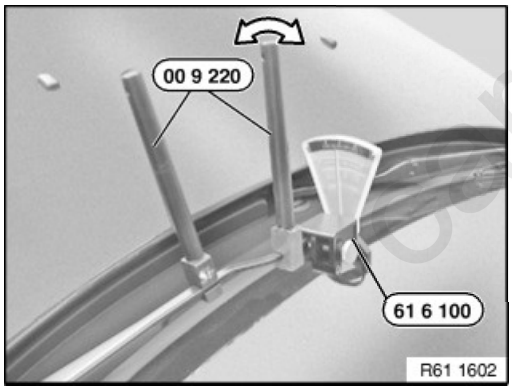
Insert wiper arm (1) into special tool 61 6 100 as shown.

Secure the wiper arm (1) with screw (2) and pressure plate (3) and place onto the windscreen.

Read the scale value and adjust the wiper arm, if necessary.

Note:

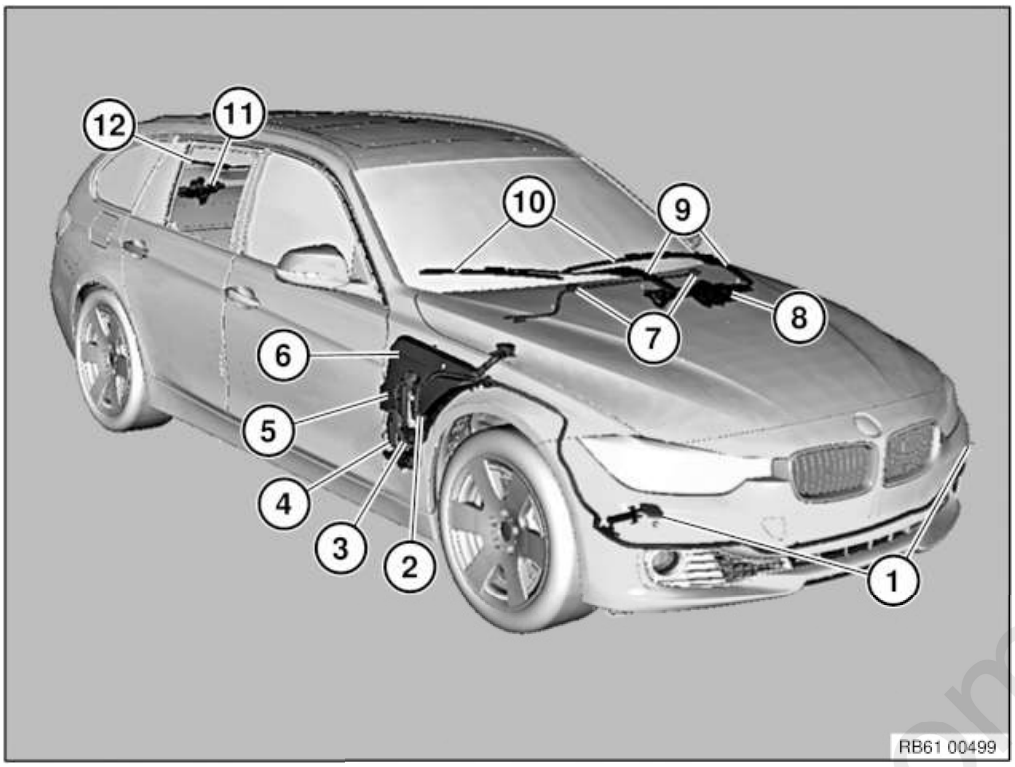
The wiper arm (1) must be placed correctly along the lower and side contact surface of special tool 61 6 100 .



Note:
Tape off the wiper arm with yellow plastic adhesive tape to prevent damage.

Press special tools 00 9 220 into the corresponding direction until the correct contact angle is reached.

61 61 .. Overview of windscreen wiper and cleaning system



1 High-pressure nozzle for headlight cleaning system

2 Washer pump for headlight cleaning system

3 Rear washer pump (only F31)

4 Windscreen washer pump

5 Washer fluid level switch (integrated in washer fluid reservoir)

6 Washer fluid reservoir

7 Washer jet for window washer system

8 Windscreen wiper console

9 Windscreen wiper arms

10 Windscreen wiper blades

11 Rear wiper motor

(F31 only)

12 Rear window wiper arm and rear window wiper blade (only F31)

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61 61 270 Removing and installing or replacing console for windscreen washer system complete with motor

Important!

Read and comply with notes on protection against electrostatic discharge (ESD protection).

Important!

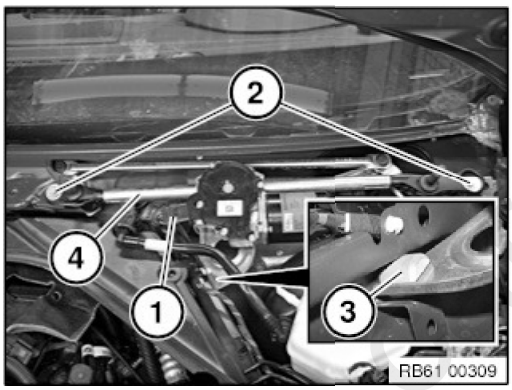
Before installing the wiper arms, allow wiper motor to run into rest position.

Warning!

Danger of injury from emergency operation, disconnect battery negative terminal!

Necessary preliminary tasks:

- Remove cowl panel cover



Unlock and disconnect plug connection (1).

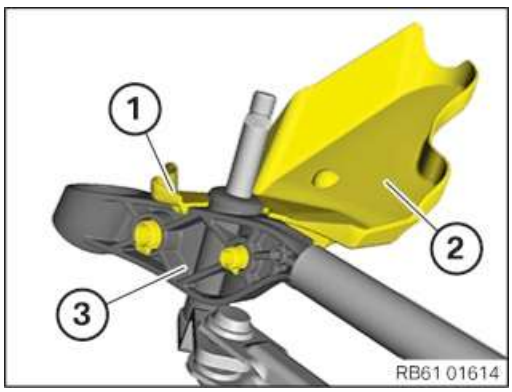
Unfasten screws (2).

Tightening torque 61 61 1AZ.

Pull console for windscreen wiper (4) out of guide (3) and remove.

Note:
On a right hand drive vehicle also release position at position (3).

Installation note:
Ensure guide (3) is correctly installed.



For replacement from 07/13:

Release latch mechanism (1) and pull out the water drain (2) from the wiper console.

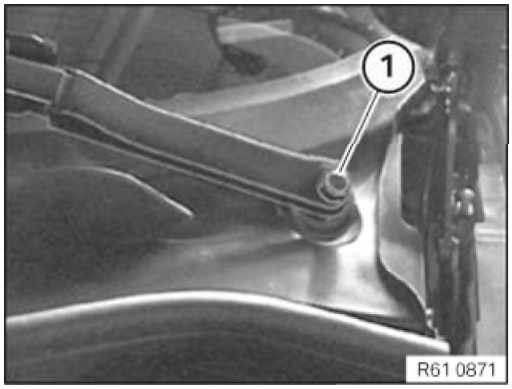
61 61 100 Removing and installing/replacing both windscreen wiper arms

Special tools required:

- 61 6 060

Important!

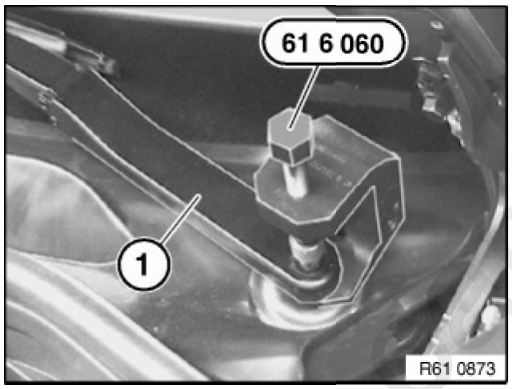
After installation check setting dimension and contact angle of the wiper arm.



Remove protective cap (1).

Release nut underneath.

Tightening torque 61 61 2AZ.



Important!

Risk of breakage!

Do not bend wiper arm when removing.

Detach windscreen wiper arm with special tool 61 6 060 .

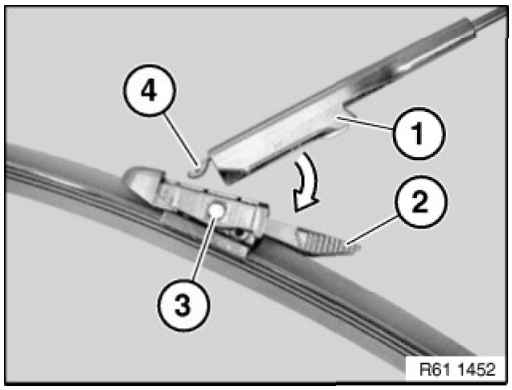
carsdiagn.com

61 61 041 Replacing both windscreen wiper blades

Important!

Make sure the wiper arm does not contact the windscreen without its wiper blade.

Note:
In the event of a **customer complaint** regarding the cleaning or wiping performance or noise build-up (juddering, squeaking noise) by the wiper blades, proceed as follows: **First check** whether the complaint is caused by dirt (preservation wax on new vehicles, resins or other environmental influences) on the windscreen; if necessary, **clean the windscreen thoroughly!** Replace the wiper blades only if cleaning the windscreen fails to remedy the situation.



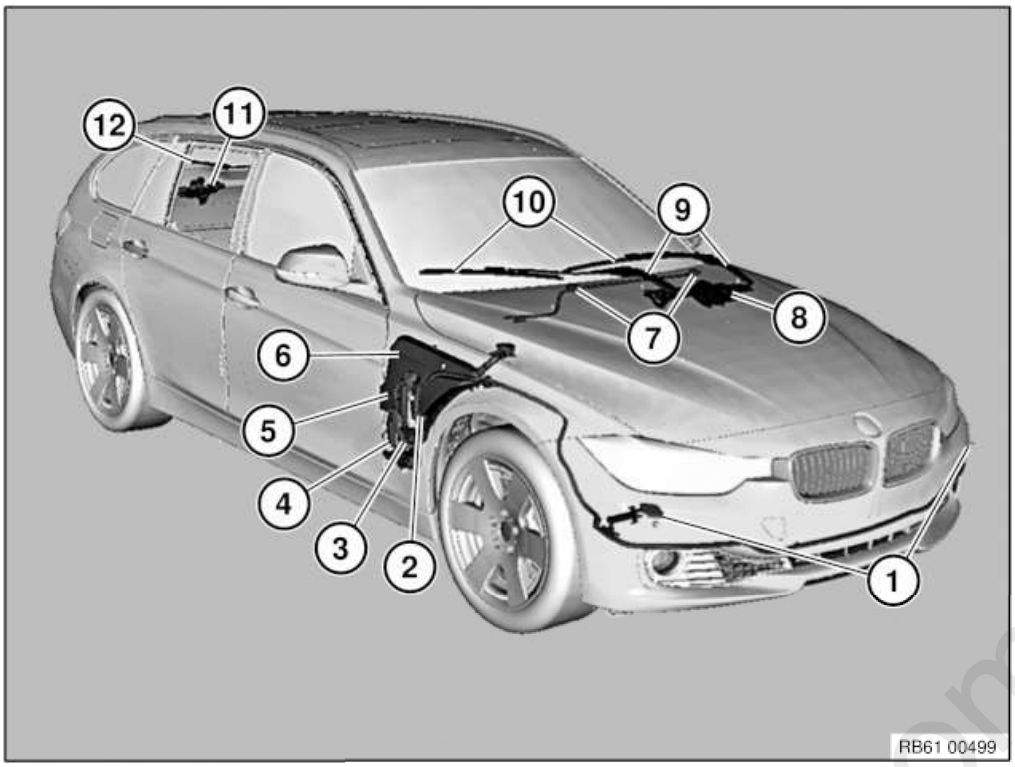
Fold wiper arm (1) away from windscreen.

Press lock (2) and remove wiper blade (3) in direction of arrow.

Installation note:
Make sure guide (4) is correctly seated in wiper blade (3).

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61 61 .. Overview of windscreen wiper and cleaning system



1 High-pressure nozzle for headlight cleaning system

2 Washer pump for headlight cleaning system

3 Rear washer pump (only F31)

4 Windscreen washer pump

5 Washer fluid level switch (integrated in washer fluid reservoir)

6 Washer fluid reservoir

7 Washer jet for window washer system

8 Windscreen wiper console

9 Windscreen wiper arms

10 Windscreen wiper blades

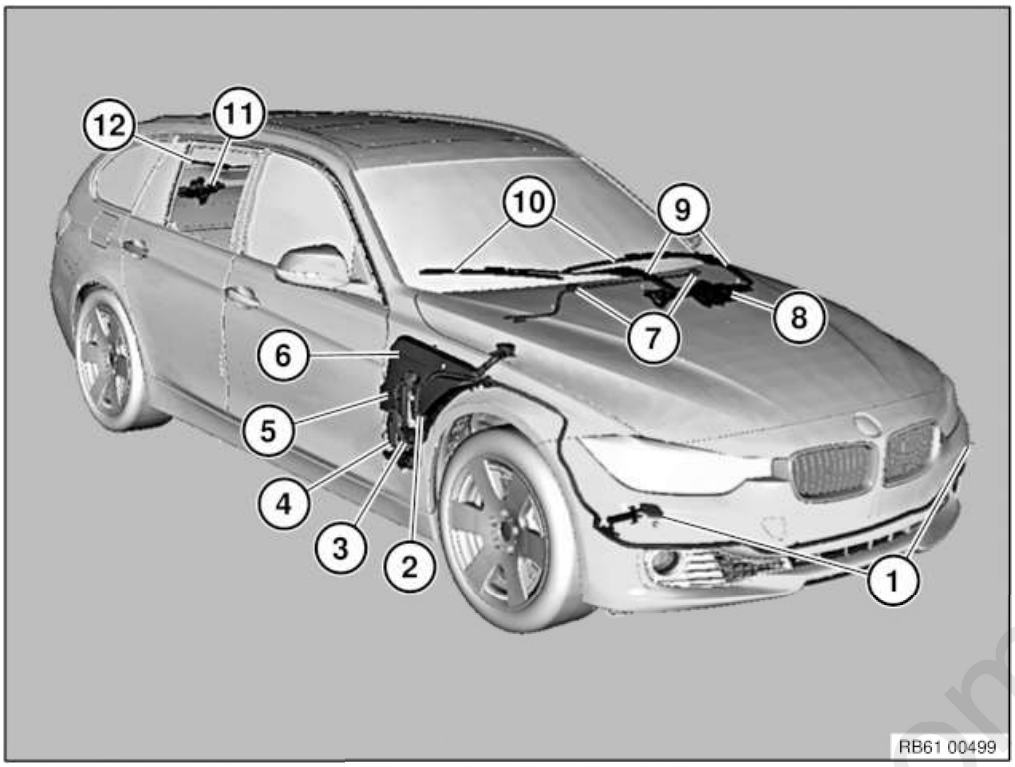
11 Rear wiper motor

(F31 only)

12 Rear window wiper arm and rear window wiper blade (only F31)

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61 61 .. Overview of windscreen wiper and cleaning system



1 High-pressure nozzle for headlight cleaning system

2 Washer pump for headlight cleaning system

3 Rear washer pump (only F31)

4 Windscreen washer pump

5 Washer fluid level switch (integrated in washer fluid reservoir)

6 Washer fluid reservoir

7 Washer jet for window washer system

8 Windscreen wiper console

9 Windscreen wiper arms

10 Windscreen wiper blades

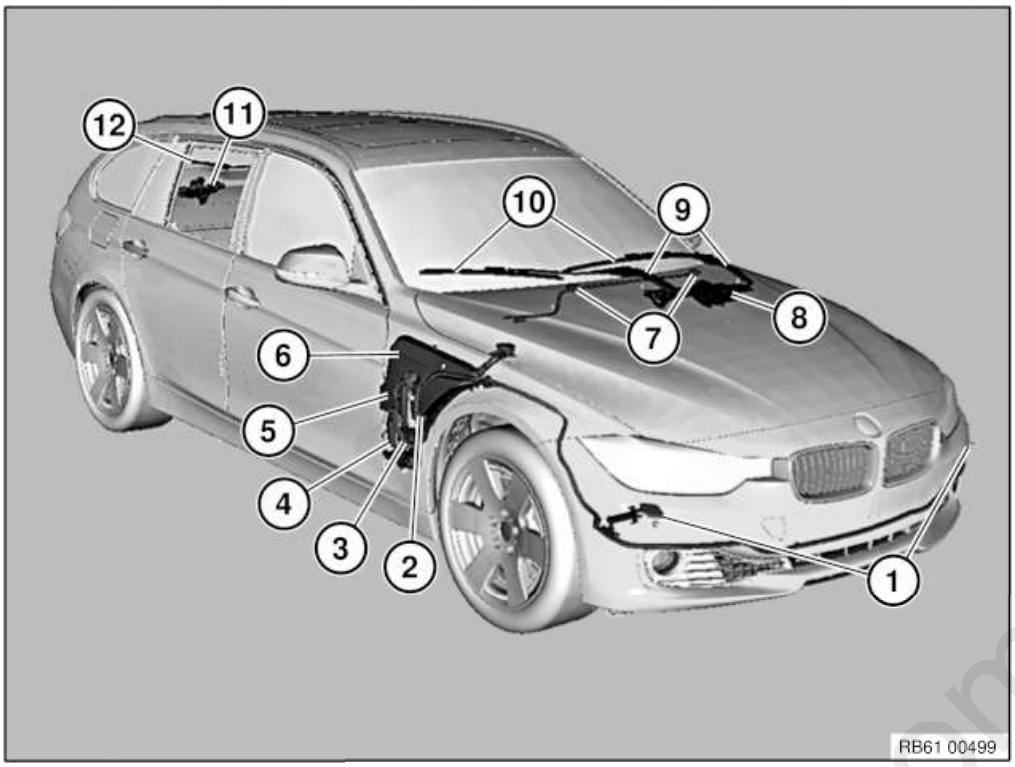
11 Rear wiper motor

(F31 only)

12 Rear window wiper arm and rear window wiper blade (only F31)

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61 61 .. Overview of windscreen wiper and cleaning system



1 High-pressure nozzle for headlight cleaning system

2 Washer pump for headlight cleaning system

3 Rear washer pump (only F31)

4 Windscreen washer pump

5 Washer fluid level switch (integrated in washer fluid reservoir)

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8 Windscreen wiper console

9 Windscreen wiper arms

10 Windscreen wiper blades

11 Rear wiper motor

(F31 only)

12 Rear window wiper arm and rear window wiper blade (only F31)

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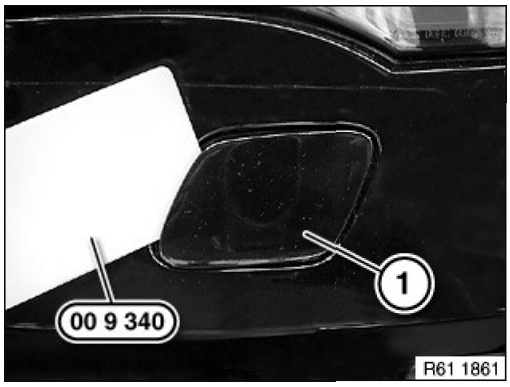
61 67 100 Removing and installing/replacing high-pressure nozzle of headlight cleaning system on left (or right)

Special tools required:

- 00 9 340

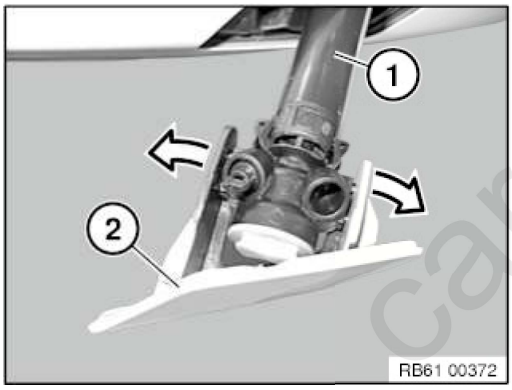
Necessary preliminary tasks:

- Remove front wheel arch cover



Note:
Work shown on the F30 by way of example, deviations in detail are possible in other models.

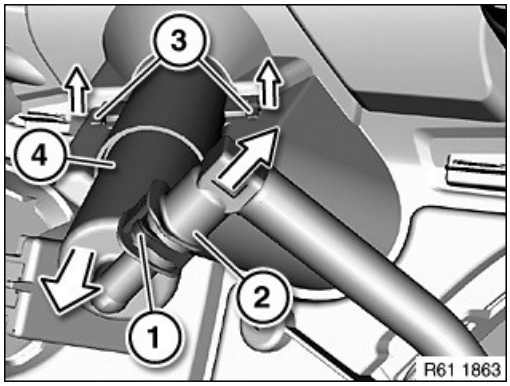
Use special tool 00 9 340 to lift the cover (1).



Slowly pull out high-pressure nozzle of headlight washer system (1) at cover (2).

Unclip cover (2) in direction of arrow and remove.

Allow high-pressure nozzle of headlight washer system (1) to slide back slowly.



Unlock safety coupling (1) of high-pressure line (2) and detach high-pressure line (2) in direction of arrow.

Lift retaining lugs (3) in direction of arrow and feed high-pressure nozzle (4) towards rear out of bumper panel.

Installation note:
Keep hose connection for high-pressure nozzle (4) and high-pressure line (2) clean and free from grease.

Make sure high-pressure line (2) is correctly engaged on high-pressure nozzle (4).

Make sure high-pressure nozzle (4) is correctly engaged on front bumper panel.

Carry out a function check before fitting bumper panel.

If necessary, top up washer fluid.

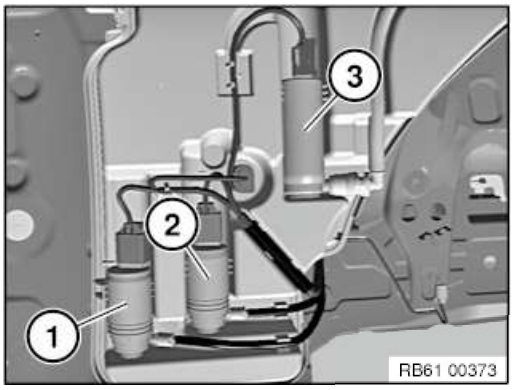
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61 67 010 Removing and installing/replacing washer pump for headlight cleaning system

Necessary preliminary tasks:

- Detach washer fluid reservoir and pull forwards

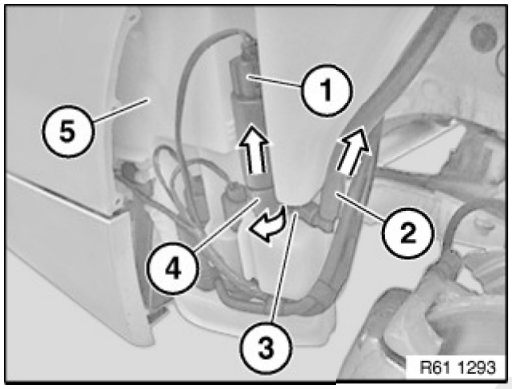


Overview of washer pumps:

(1) Windscreen washer pump of window washer system.

(2) Windscreen washer pump of window washer system (F20, F21, F31 only).

(3) Washer pump for headlight cleaning system.



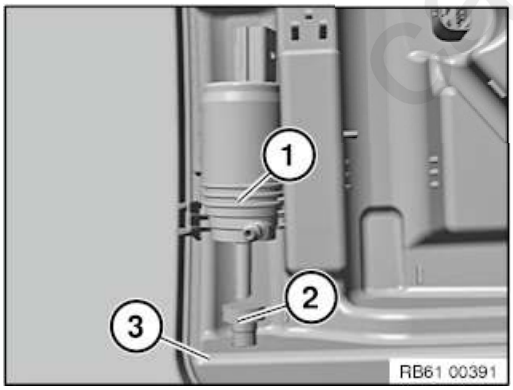
Note:
Graphic shows by way of example the washer pump for the headlight cleaning system!

Catch any escaping washer fluid if necessary.

Unfasten plug connection (1) and disconnect.

Unlock latch (3) and detach hose pipe (2) from washer pump (4).

Turn washer pump (4) if necessary and pull out of washer fluid reservoir (5).



Note:
Graphic shows an example of the strainer for windscreen washer pump.

Remove and replace strainer (2) of windscreen washer pump (1) or washer fluid reservoir (3).

Installation note:

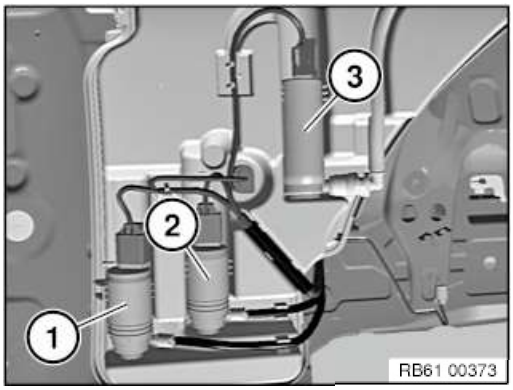
- Coat sealing ring of washer pump with lubricant
- Lay hose pipe of washer pump without kinks
- Topping up washer fluid

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61 71 100 Removing and installing/replacing windscreen washer pump

Necessary preliminary tasks:

- Detach washer fluid reservoir and pull forwards

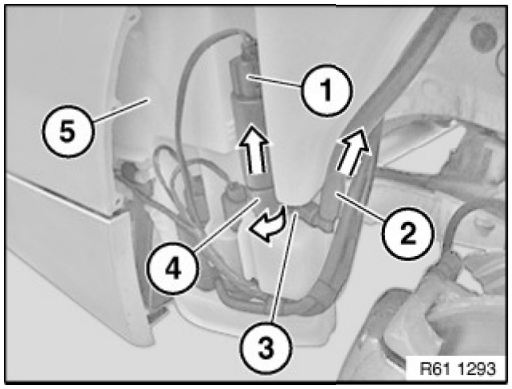


Overview of washer pumps:

(1) Windscreen washer pump of window washer system.

(2) Windscreen washer pump of window washer system (F20, F21, F31 only).

(3) Washer pump for headlight cleaning system.



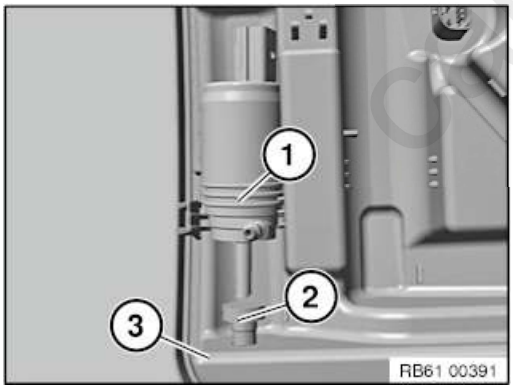
Note:
Graphic shows by way of example the washer pump for the headlight cleaning system!

Catch any escaping washer fluid if necessary.

Unfasten plug connection (1) and disconnect.

Unlock latch (3) and detach hose pipe (2) from washer pump (4).

Turn washer pump (4) if necessary and pull out of washer fluid reservoir (5).



Note:
Graphic shows an example of the strainer for windscreen washer pump.

Remove and replace strainer (2) of windscreen washer pump (1) or washer fluid reservoir (3).

Installation note:

- Coat sealing ring of washer pump with lubricant
- Lay hose pipe of washer pump without kinks
- Topping up washer fluid

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61 71 115 Replacing the strainer for washer pump

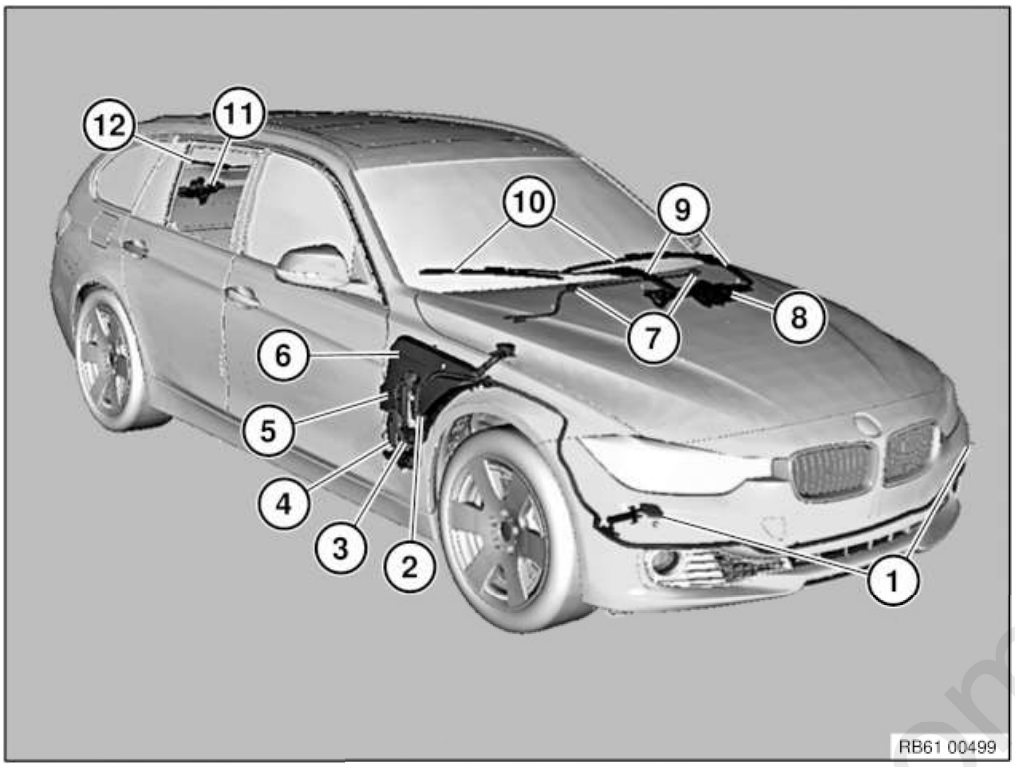


Operation is described in:

Remove windscreen washer pump.

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61 61 .. Overview of windscreen wiper and cleaning system



1 High-pressure nozzle for headlight cleaning system

2 Washer pump for headlight cleaning system

3 Rear washer pump (only F31)

4 Windscreen washer pump

5 Washer fluid level switch (integrated in washer fluid reservoir)

6 Washer fluid reservoir

7 Washer jet for window washer system

8 Windscreen wiper console

9 Windscreen wiper arms

10 Windscreen wiper blades

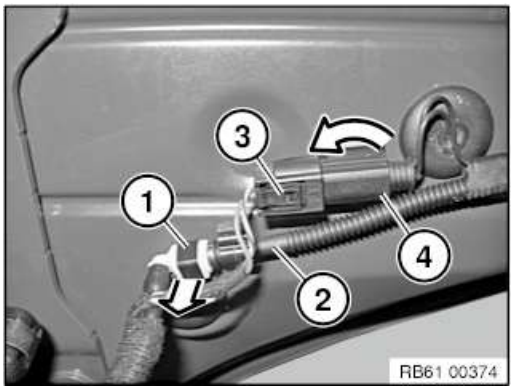
11 Rear wiper motor

(F31 only)

12 Rear window wiper arm and rear window wiper blade (only F31)

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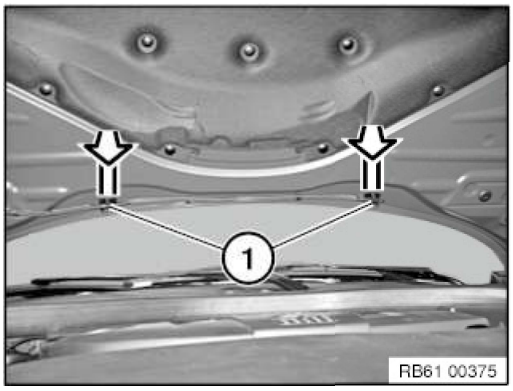
61 71 030 Removing and installing/renewing all washer jets of windscreen washer system



Unlock hose coupling (1) in direction of arrow and detach washer fluid line (2).

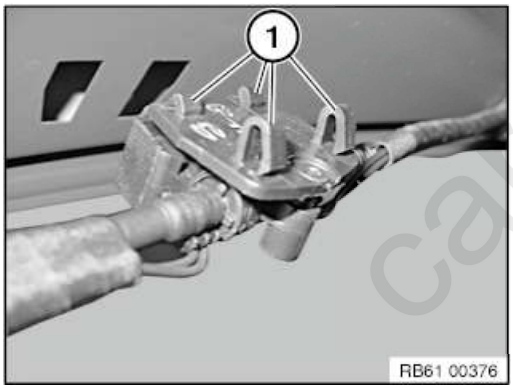
Unfasten plug connection (3) and disconnect.

Turn connector with holder (4) counterclockwise slightly and remove in downward direction.



Press all washer jets (1) in direction of arrow upwards and remove.

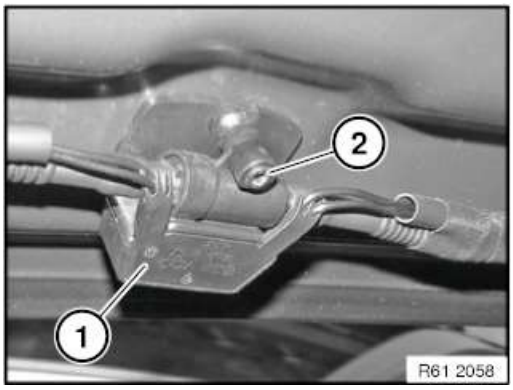
Open all brackets and remove washer fluid line.



Installation note:
Retaining lugs (1) must not be missing or damaged.

Check washer jet setting.

Top up window washer system.



Note:
Washer jets are preset by the manufacturer, do not change this setting if possible.

Setting can be changed in a specific case for a customer complaint.

Changes in the setting must take into account the possible driving situations (high/low speed; with/without washing additive) and must be performed with care.

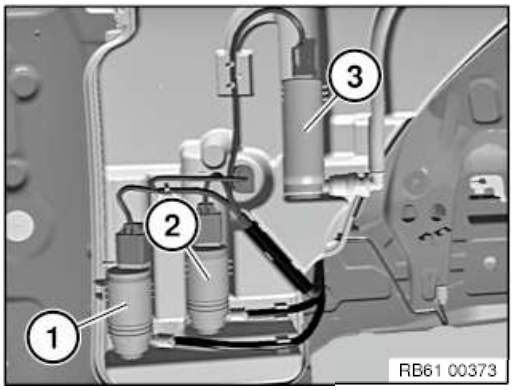
If necessary, adjust left/right washer jet (1) by using screw (2).

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61 71 100 Removing and installing/replacing windscreen washer pump

Necessary preliminary tasks:

- Detach washer fluid reservoir and pull forwards

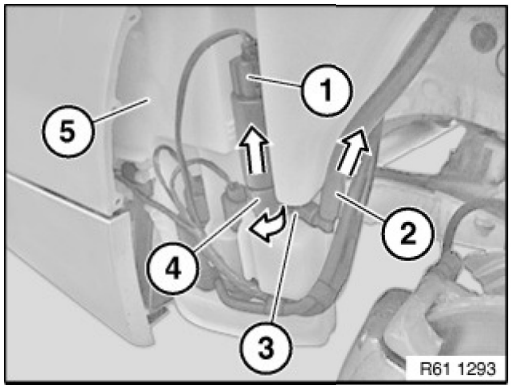


Overview of washer pumps:

(1) Windscreen washer pump of window washer system.

(2) Windscreen washer pump of window washer system (F20, F21, F31 only).

(3) Washer pump for headlight cleaning system.



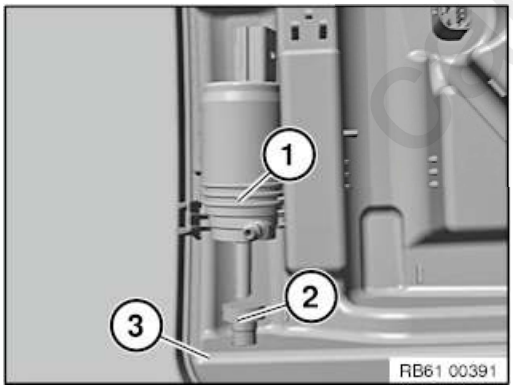
Note:
Graphic shows by way of example the washer pump for the headlight cleaning system!

Catch any escaping washer fluid if necessary.

Unfasten plug connection (1) and disconnect.

Unlock latch (3) and detach hose pipe (2) from washer pump (4).

Turn washer pump (4) if necessary and pull out of washer fluid reservoir (5).



Note:
Graphic shows an example of the strainer for windscreen washer pump.

Remove and replace strainer (2) of windscreen washer pump (1) or washer fluid reservoir (3).

Installation note:

- Coat sealing ring of washer pump with lubricant
- Lay hose pipe of washer pump without kinks
- Topping up washer fluid

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61 71 115 Replacing the strainer for washer pump



Operation is described in:

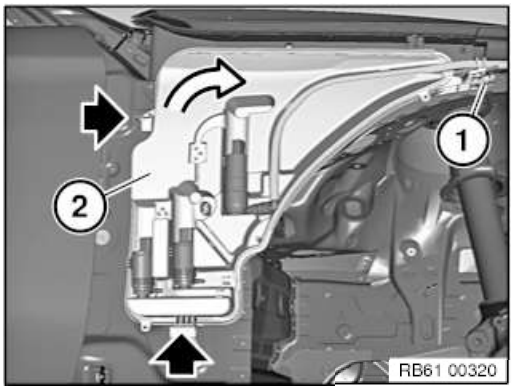
Remove windscreen washer pump.

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61 71 061 Replacing washer fluid reservoir for windscreen washer system

Necessary preliminary tasks:

- Remove front right wheel arch cover



Note:
Shown with side wall removed for purposes of clarity.

Release screw (1).

Tightening torque 61 66 1AZ.

Pull the washer fluid reservoir (2) out of the guides (arrow) in the direction of the arrow).

Unlock and disconnect all plug connections.

Unlock filler hose and pull it off the fitting on the washer fluid reservoir.

Note:
Catch any escaping washer fluid if necessary.

Replacement:

- Modify all windscreen washer pumps

Installation note:

- Replace strainers on washer pumps
- Coat sealing rings of washer pumps with lubricant.
- Lay hose pipes of washer pumps without kinks and clip into holders on washer fluid reservoir
- Top up the washer fluid reservoir

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