

ACCESSORIES AND EQUIPMENT**General electrical system - Repair Instructions****TROUBLESHOOTING****12 00... INSTRUCTIONS FOR WELDING WORK (OVERLOAD PROTECTION OF CONTROL UNITS)**

Follow instructions for body repairs.

When performing welding work on installed control units, to avoid any defects in the electronic control units, observe the following steps:

- **OBSERVE INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY .**
- Detach terminal of battery negative lead from car battery and second battery if fitted. Cover negative terminal posts.
- If welding is to be performed near the battery/batteries, first remove battery/batteries from vehicle (flying sparks - combustion of explosive gas).
- Fit return clamp on welding unit as close as possible to welding point (maximum distance approx. 1 m).
- Never connect return clamp to ground pin on body which has ground wires attached!

61 00. VERSION WITH AFS: SETTING STEERING ANGLE (AFTER RECONNECTING VEHICLE BATTERY)

NOTE: **Version with AFS:**

After RECONNECTING the vehicle battery, carry out the following procedure for setting the steering angle:

- **Start engine.**
- **Turn steering wheel left to full lock.**
- **Turn steering wheel right to full lock.**
- **Turn steering wheel to central position.**
- **Turn off engine.**
- **Turn on ignition (terminal 15), AFS telltale and Check Control message go out.**

NOTE: **Entry in the fault memory remains unaffected by this procedure, therefore if necessary**

- **Connect diagnosis system**
- **Clear fault memory**

61 00... BATTERY

NOTE: Important notes and instructions for handling batteries can be found in:

- **DISCONNECTING BATTERY**
- **BATTERY CHARGING**
- **WELDING WORK**
- **EXTERNAL JUMP-STARTING AID**

Battery care and maintenance

In low-maintenance batteries, check the acid level at least once a year. If necessary, top up with distilled water up to the top marking.

The increasing number of electronic control units in the car reduces the self-discharging time of the battery (even in standby mode). To maintain the battery service life and to avoid exhaustive discharging, recharge laid-up vehicles every 6 weeks at the latest. The time for self-discharging depends on vehicle type and equipment specification.

Battery test

The battery acid density can be used to measure the charge state. However this test produces uncertainty caused by a design related range of variation. The acid density e.g. for a charged battery is 1.28 kg/l (in the tropical version the acid density is 1.23 kg/l).

Another interference factor is the acid lamination immediately after filling with distilled water.

Battery wear with partially sulfated and/or heavily contaminated plates will also lead to incorrect acid density test results.

61 00... DIAGNOSIS FOR CONDITION BASED SERVICE

NOTE: *Red symbol for pre-delivery check*

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

The symbol is a reminder to the Service staff that the predelivery check has not yet been carried out on this car.

NOTE: *Do not carry out a reset.*

Do not confuse this function with the "Vehicle check" maintenance scope.

Do not carry out a reset via the instrument cluster.

When carrying out the pre-delivery check with the "Transport Mode/Pre-delivery check" service function:

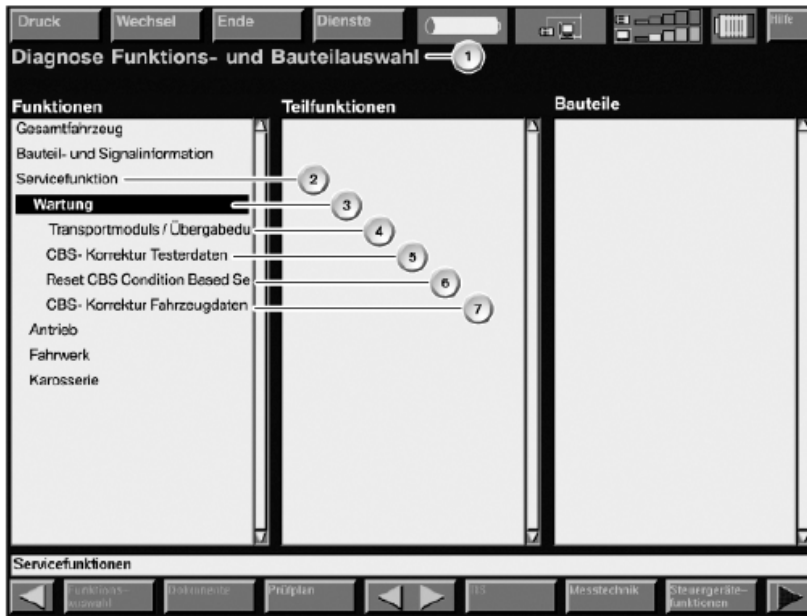
The symbol is automatically removed from the display after the service function has been executed.



T6004065

Fig. 1: Pre-Delivery Check Display

Courtesy of BMW OF NORTH AMERICA, INC.



T0004064

Key	Explanation	Key	Explanation
1	Function and component selection	2	Service functions
3	Maintenance	4	Transport Mode/Pre-delivery check
5	CBS Correction Tester Data	6	Reset CBS Condition Based Service
7	CBS Correction Vehicle Data		

Fig. 2: Display Diagnosis Functions

Courtesy of BMW OF NORTH AMERICA, INC.

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

- Transport Mode/Pre-delivery check

- CBS Correction Tester Data
- Reset CBS
- CBS Correction Vehicle Data

Service function: Transport Mode/Pre-delivery check

To be able to hand over a vehicle to the customer in proper working order, it is essential to execute the "Transport Mode/Predelivery check" service function.

The following items are worked through during the pre-delivery check:

- Deactivation of transport mode.
- An adaptation process must be activated in order to determine the vehicle-specific mileage/kilometrage per week. Transport and immobilization periods before the vehicle is delivered to the customer therefore have no effect on the customer-specific weekly mileage/kilometrage.

The weekly mileage/kilometrage is used to control escalation from "green" to "yellow" (approx. 4 weeks before "red") for maintenance scopes with remaining distances. The averaged mileage/kilometrage of the last 6 weeks is taken into account here.

- Coding or blanking out of the legally prescribed intervals for the statutory vehicle inspection and statutory exhaust emissions test.
- Input of the target dates for the statutory vehicle inspection and the statutory exhaust emissions test (automatic or manual).

Automatic: By input of the date of first registration and of the time interval

Manual: By direct input of the target date

- Entry of local, service-related phone numbers, depending on vehicle equipment specification .

The country-specific phone numbers are displayed in the BMW diagnosis system as a reference text. The phone numbers can simply be read off during the input prompt.

- Reference to initialization of TeleService, depending on vehicle equipment specification.
- Checking and if necessary setting of the on-board date for the vehicle.
- Entry of the date for first registration of the vehicle.
- Now clear the fault memory.

NOTE: *Reducing input expenditure.*

Standardized data are stored in the BMW diagnosis system (for repeated use) in the interests of minimizing the time spent on making inputs in the garage/workshop. The standardized data can be changed with the "CBS

Correction Tester Data" service function.**Service function: CBS Correction Tester Data**

Data are automatically stored in the vehicle with the "Pre-delivery check" service function.

The standardized data can be changed with the "CBS Correction Tester Data" service function.

The following standardized data can be changed:

- Phone numbers:
 - BMW Group Mobile Service
 - BMW Hotline
 - Customer's home dealer

The country-specific phone numbers are contained as reference texts in the BMW diagnosis system (read off during the input prompt). The phone numbers must be input with the international dialling code.

- Legally prescribed vehicle inspection (country-specific):
 - Coding or blanking out
 - Interval for calculating the target date

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

- Legally prescribed exhaust emissions test (country-specific):
 - Coding or blanking out
 - Interval for calculating the target date

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

NOTE: ***Automatic function after installation of the BMW diagnosis system.***

The standardized data are automatically established when the pre-delivery check is carried out for the first time. It is therefore not necessary to input the data separately.

Service function: Reset CBS Condition Based Service

A maintenance scope can be reset with the "Reset CBS Condition Based Service" service function. Even when availability is over 80 %.

The benefit of reset via the BMW diagnosis system is 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 reset by one counter on resetting. All service counters are set to "1" on new vehicles.

The service counters are used in the Service Acceptance/Reception Module (SAM) on a scope-specific basis for controlling additional work.

- Availability is set to 100 % on resetting. Availability in % is the wear value of the maintenance scope.

The greater the availability, the longer it is to the next maintenance scope.

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

Service function: CBS Correction Vehicle Data

IMPORTANT: The data are overwritten.

Once this service function has been executed, it is no longer possible to reconstruct the previous status.

The "CBS Correction Vehicle Data" service function is available if a reset has been carried out **erroneously** . In this way, the availability of a maintenance scope can be corrected to a realistic value.

A data or a mileage/kilometer reading is entered for correction. These data are converted internally into an availability in %. In so doing, the BMW diagnosis system only accepts a smaller value as the current reading in the control unit. In addition, the service counter of the scope is automatically reduced by one counter.

The inputs are used in the Service Booklet to determine the realistic availability. A realistic availability can be reconstructed on a scope-specific basis by means of the last maintenance measure (with mileage/km reading and date).

This does not include correcting the availability for brake pads. The brake pad residual thickness must be measured and input (in millimeters).

NOTE: ***Reference for distance- and time-dependent maintenance scopes***
For a correction, the availability is referred to the distance- and time-dependent calculation.

61 00... PROGRAM / ENCODE THE CONTROL UNIT(S)

- In order to avoid incorrect programming procedures and fault messages, it is essential when working with the ISTA/P programming system always to use the version.
- Battery voltage must not drop below 13.0 V during programming.

Connect battery charger prior to programming. *Sourcing reference BMW Workshop Equipment

Catalogue

IMPORTANT: Prior to programming / encoding hybrid and electric vehicles disconnect the high-voltage system!

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 rework list, run the brief test and delete the fault memory.

NOTE: A switch to the workshop system may not necessarily be required with the integration of the service functions and the "Delete fault memory" function in ISTA/P. Check the rework list accordingly!

- Compliance with the information about programming in workshop systems and the corresponding notes in the user documentation is required.

61 00... NOTES ON HANDLING OPTICAL FIBERS

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

- The minimum permitted bending radius is 25 mm
- Do not subject optical fibers to compressive and tensile load
- Protect optical fibers against the effects of heat $> \text{ or } = 85^{\circ}\text{C}$ (e.g. during welding work, drying work with infrared heater or hot air blower)
- Optical fibers are permitted to show only one junction point (bridge), replace optical fibers if necessary

NOTE: The optical fibers are colored differently as follows:

- Green= MOST (Media Oriented Systems Transport) optical fibers
- Yellow = ISIS (Intelligent Safety and Integration System) optical fibers
- Orange = repair optical fibers

Follow instructions for **PROCESSING CABLES AND OPTICAL FIBERS**.

61 00... NOTES ON HANDLING WIRING HARNESSES AND CABLES**In general:**

To avoid damage, observe the following instructions:

- Avoid compressive and tensile loads
- Make sure cables are laid without kinks or abrasions
- Ensure non-contacting routing at sharp-edged body parts; use muckets if necessary
- Secure additionally laid cables/leads with cable ties

In addition:

Shielded lines

Joins in the shield can cause problems with regard to noise radiation and interference immunity. Consequently, distinctions have to be drawn between the following types:

Coaxial lines

- Shielded RTK031 coaxial lines may only be repaired with special crimping tools.

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 colored differently as follows:**

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

IMPORTANT:

- **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 > or = 85 °

TREATING CABLES AND FIBRE-OPTIC CABLES

FlexRay:

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:

- FlexRay lines may only reveal one separation point (bride); renew complete line if necessary
- The cable is a twisted cable. If possible, maintain twisted cable after repair

Airbag cables:

REPAIRING AIRBAG CABLES

Ribbon cables:

REPAIRING RIBBON CABLES

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:

Safety regulations for HANDLING COMPONENTS OF AIRBAG SYSTEM .

INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY .

Procedure for cable repair

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 them being mixed up! 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 car 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 connectors and shrink-fit hoses in the Electronic Parts Catalogue (EPC), reconnect the cables with the same cable colors. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (shrink-fit hoses) 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.

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 lead in car parallel to existing airbag lead up to cutting point. Cut off excess length of repair lead. Twist open cables. Connect cables with connectors and shrink-fit hoses in Electronic Parts Catalogue (EPC), assignment of repair cables is relevant. Twist cables again, open length (twist) must not exceed 40 mm. Secure interface (shrink-fit hoses) with insulating tape to prevent cables from twisting open.

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

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61 00... SAFETY INSTRUCTIONS FOR HANDLING VEHICLE BATTERY

Battery acid is highly corrosive:

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

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

In event of contact with acid:

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, neutralize it immediately with a soapy solution and rinse with lots of water.

Seek medical attention immediately if battery acid is accidentally swallowed.

Explosion hazard:

Strictly no flames, sparks, naked light or smoking!

A highly explosive mixture of electrolytic 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-circuiting and explosion!).

AUXILIARY CABLE

61 12... GENERAL INFORMATION ON INTELLIGENT BATTERY SENSOR (IBS)

NOTE: *Do not connect continuous trickle charger to the cigarette lighter.*
The cigarette lighter is powered by the rear distribution box via a relay. This relay drops out after terminal 15 OFF. This means that a continuous trickle charger connected to the cigarette lighter is disconnected from the battery. Charge the battery via the jump-start connection points. Only then can the power 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 grounding cable also serves to dissipate heat.

- 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 grounding 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 (screw with Torx head).
- Avoid contact between IBS and ground.

WARNING: Danger of destruction to IBS and cables when battery is replaced

- The IBS and the cables can be destroyed by mechanical strain when the battery is replaced. 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 when replacing the battery.
- Register battery change via Service Function (Progman or DIS).
- Delete fault 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 replace the IBS when a corresponding fault is entered in the DME or DDE.

61 12 002 REPLACING POSITIVE BATTERY CABLE (FROM BATTERY TO LUGGAGE COMPARTMENT CONNECTOR)

WARNING: Observe SAFETY INSTRUCTIONS for handling vehicle battery.

Necessary preliminary tasks:

- Remove LEFT LUGGAGE COMPARTMENT WHEEL ARCH TRIM
- Remove RIGHT LUGGAGE COMPARTMENT WHEEL ARCH TRIM
- Disconnect battery negative lead

Security version:

- Remove protective cover from distribution box/battery positive terminal (luggage compartment)

Lever out clips (1).

Release plastic nuts (2).

Remove underlay for luggage compartment floor panel (3).

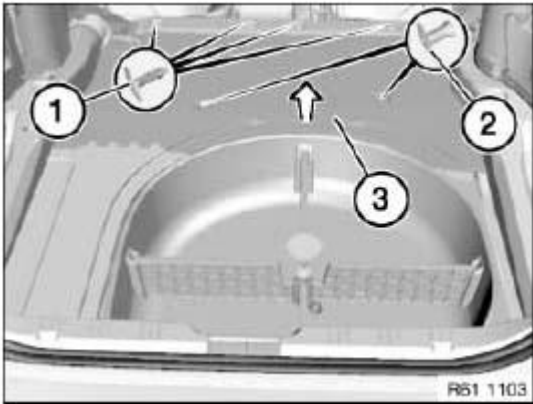


Fig. 3: Identifying Luggage Compartment Floor Panel And Plastic Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Disconnect plug connection (3) of IBS cable.

Unlock cable lug mounting and fold back.

Unscrew nut (2).

Tightening torque **61 21 4AZ** .

Remove positive battery cable.

Unscrew nut (5).

Tightening torque **61 21 1AZ** .

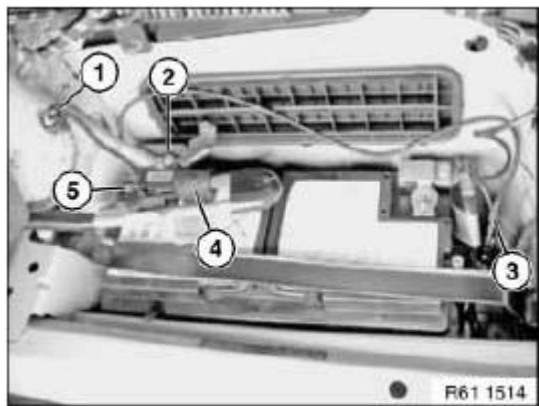


Fig. 4: Identifying IBS Cable Plug Connection And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not under any circumstances pull/lever safety battery terminal (4) off by force.

Pull safety battery terminal (4) upwards and remove.

Open cable lug mounting (1).

Release screw (2).

Tightening torque **61 12 3AZ** .

Unclip and remove positive battery cable (3).

WARNING: Risk of short circuits!

During installation, make sure that

- Cable lug mounting (1) is correctly seated on positive battery cable (3)
- Screw is properly connected.

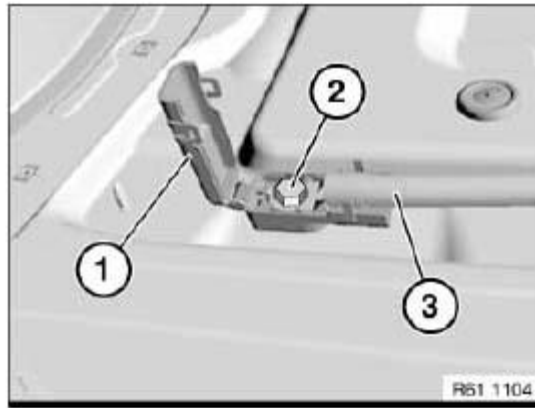


Fig. 5: Identifying Cable Lug Mounting, Screw And Battery Cable
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip positive battery cable (1) from cable guides (2) and remove.

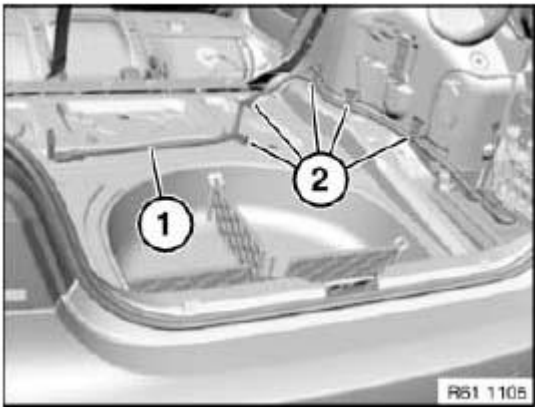


Fig. 6: Identifying Positive Battery Cable And Cable Guides
Courtesy of BMW OF NORTH AMERICA, INC.

61 12 013 REPLACING BATTERY NEGATIVE LEAD

WARNING: Observe SAFETY INSTRUCTIONS for handling vehicle battery.
Read and comply with notes and instructions on INTELLIGENT BATTERY SENSOR.

Necessary preliminary tasks:

- Remove LUGGAGE COMPARTMENT TRIM ON SIDE PANEL ON RIGHT

Security version:

- Remove luggage compartment equipment carrier

Slacken nut (1) on negative battery terminal.

Tightening torque **61 21 1AZ** .

IMPORTANT: Do not under any circumstances use force to pull off pole shoe.
Do not under any circumstances release socket-head cap screw of IBS.

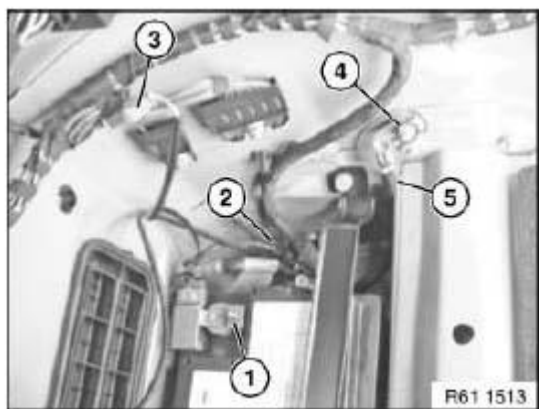


Fig. 7: Identifying Plug Connection, Battery Negative Lead And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Detach negative battery lead with intelligent battery sensor (IBS) in upward direction.

Disconnect plug connection (2).

Disconnect plug connection (3).

Release nut (4) and battery negative lead (5).

Tightening torque **61 21 2AZ** .

61 12 065 REPLACING WIRING HARNESS FOR FRONT BUMPER

IMPORTANT: Read and comply with notes on **HANDLING WIRING HARNESSES AND CABLES**.

Necessary preliminary tasks:

- Remove **FRONT BUMPER TRIM** .

NOTE: Operation is shown by way of example on the E63 (build date up to 09/2007).
There may be differences in detail in the case of other vehicle models.

Disconnect plug connections (1) on four ultrasonic transducers.

Unclip wiring harness (2) from bumper trim.

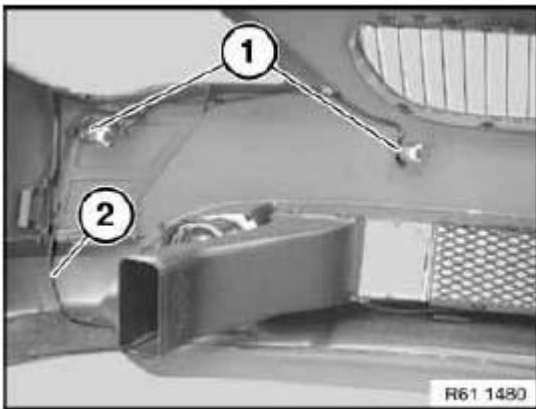


Fig. 8: Identifying Plug Connections And Wiring Harness
Courtesy of BMW OF NORTH AMERICA, INC.

Turn plug (1) in direction of arrow and feed out of bumper trim.

Remove wiring harness (2).

Installation:

Make sure wiring harness (2) is laid correctly.

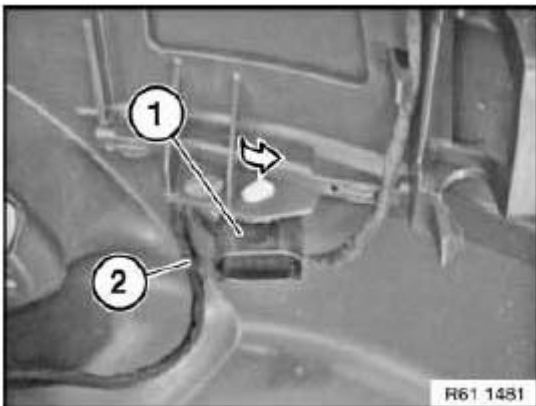


Fig. 9: Identifying Wiring Harness And Plug
Courtesy of BMW OF NORTH AMERICA, INC.

61 12 067 REPLACING WIRING HARNESS FOR REAR BUMPER

Operation is described in:

Replacing **REAR BUMPER TRIM** .

61 12 200 REPLACING WIRING HARNESS IN LEFT OR RIGHT FRONT DOOR

Necessary preliminary tasks:

- Close front side window completely.
- Remove **FRONT DOOR TRIM PANEL** .

IMPORTANT: Follow instructions for **HANDLING OPTICAL FIBRES**.

Unlock plug connections (1) and disconnect.

Release door wiring harness (2) at point (3).

Unclip door wiring harness (2) at points (4).

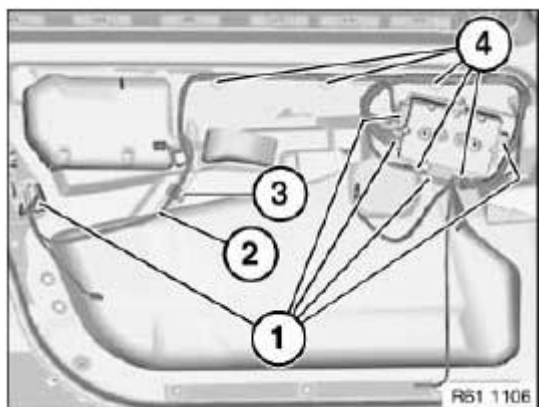


Fig. 10: Identifying Door Wiring Harness And Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Detach **SOUNDPROOFING** on front door in working area.

Unfasten plug connection (1) and disconnect.

Cut through cable ties (2).

Disconnect door wiring harness (3) at retainer (4).

Unclip door wiring harness (3) in area of front window guide.

Installation:

Make sure door wiring harness (3) is correctly laid.

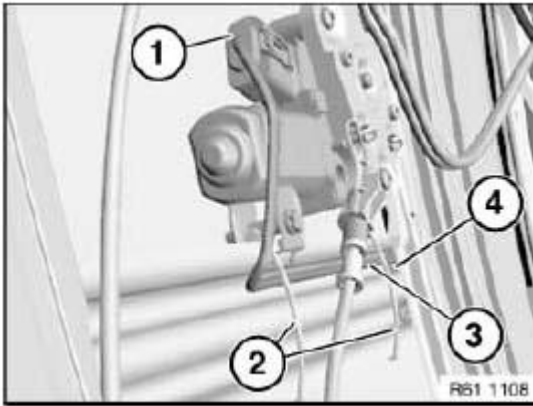


Fig. 11: Identifying Door Wiring Harness And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Front side panel shown removed for purposes of clarity.

Release screw (1), fold door wiring harness plug on A-pillar (2) downwards slightly and remove.

Unlock plug connection behind and disconnect.

Pull rubber grommet (3) in direction of arrow out of front door (4).

Feed out door wiring harness towards front to A-pillar and remove.

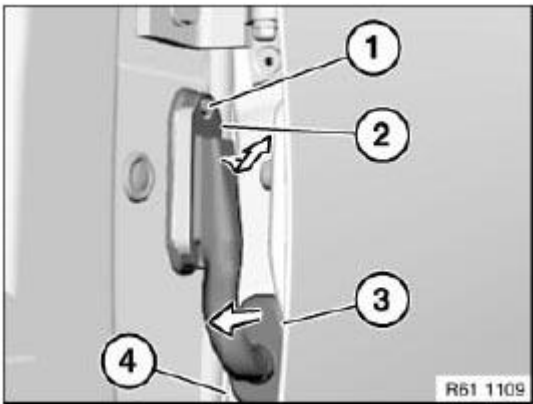


Fig. 12: Identifying Door Wiring Harness Plug On A-Pillar, Rubber Grommet And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

61 12 200 REPLACING WIRING HARNESS IN LEFT OR RIGHT FRONT DOOR (LONG VERSION)

Necessary preliminary tasks:

- Close front side window completely

- Disconnect battery negative lead
- Remove **FRONT DOOR TRIM PANEL**
- Remove **SOUND INSULATION IN FRONT DOOR**

Release cable (1) from door wiring harness (2).

Disconnect plug connection (3).

Release door wiring harness (2) at point (4).

Installation:

Make sure door wiring harness (2) is correctly laid.

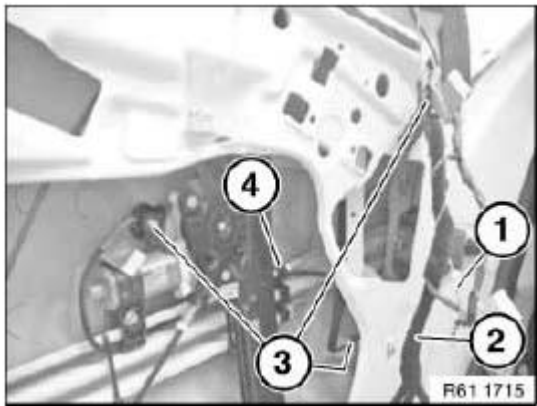


Fig. 13: Identifying Door Wiring Harness And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Front side panel shown removed for purposes of clarity.

Release screw (1), fold door wiring harness plug on A-pillar (2) downwards slightly and remove.

Unlock plug connection behind and disconnect.

Pull rubber grommet (3) in direction of arrow out of front door (4).

Feed out door wiring harness towards front to A-pillar and remove.

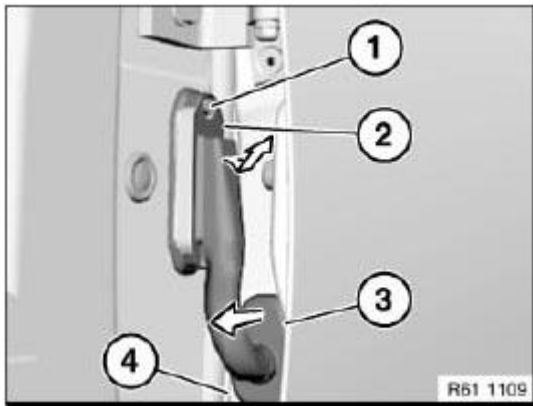


Fig. 14: Identifying Door Wiring Harness Plug On A-Pillar, Rubber Grommet And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

61 12 210 REPLACING WIRING HARNESS IN LEFT OR RIGHT REAR DOOR

Necessary preliminary tasks:

- Close rear side window completely.
- Remove **REAR DOOR TRIM PANEL** .

IMPORTANT: Follow instructions for **HANDLING OPTICAL FIBERS**.

Unfasten plug connection (1) and disconnect.

Release door wiring harness (2) at point (3).

Unclip door wiring harness (2) at points (4).

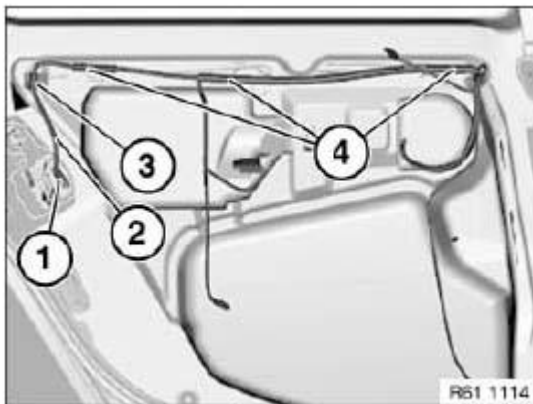


Fig. 15: Identifying Plug Connection And Door Wiring Harness
 Courtesy of BMW OF NORTH AMERICA, INC.

Detach **SOUNDPROOFING** on rear door in working area.

Unfasten plug connection (1) and disconnect.

Disconnect door wiring harness (2) at retainer (3).

Unclip door wiring harness (2) at points (4).

Installation:

Make sure door wiring harness (2) is correctly laid.

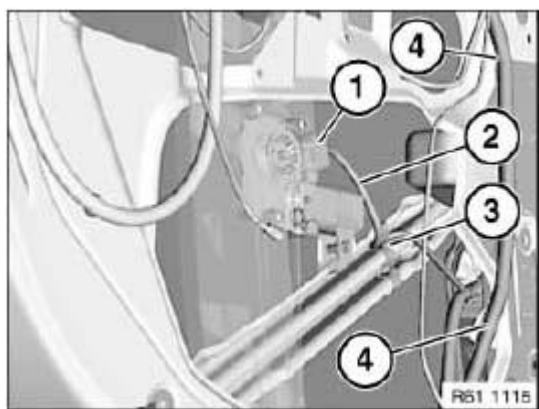


Fig. 16: Identifying Plug Connection And Door Wiring Harness
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For clearer illustration, shown with front door removed.

Release screw (1), fold door wiring harness plug on B-pillar (2) downwards slightly and remove.

Unlock plug connection behind and disconnect.

Pull rubber grommet (3) in direction of arrow out of rear door (4).

Feed out door wiring harness towards front to B-pillar and remove.

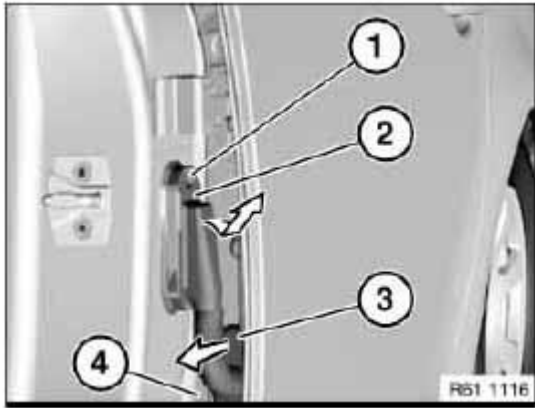


Fig. 17: Identifying Door Wiring Harness Plug On B-Pillar, Rubber Grommet And Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

61 12 210 REPLACING WIRING HARNESS IN LEFT OR RIGHT REAR DOOR (LONG VERSION)

Necessary preliminary tasks:

- Close rear side window completely
- Disconnect battery negative lead
- Remove **REAR DOOR TRIM PANEL**
- Remove **SOUND INSULATION IN REAR DOOR**

Disconnect plug connection (1).

Disconnect door wiring harness (2) at retainer (3).

Installation:

Make sure door wiring harness (2) is correctly laid.

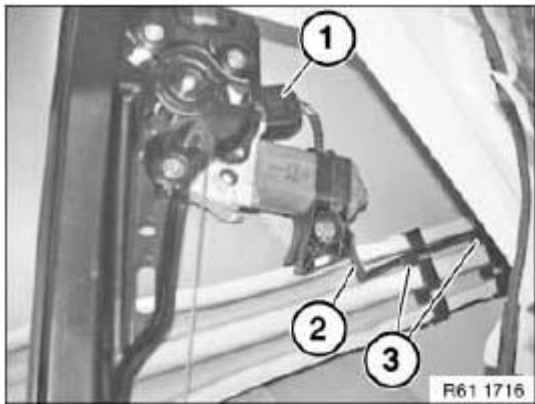


Fig. 18: Identifying Door Wiring Harness And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For clearer illustration, shown with front door removed.

Release screw (1), fold door wiring harness plug on B-pillar (2) downwards slightly and remove.

Unlock plug connection behind and disconnect.

Pull rubber grommet (3) in direction of arrow out of rear door (4).

Feed out door wiring harness towards front to B-pillar and remove.

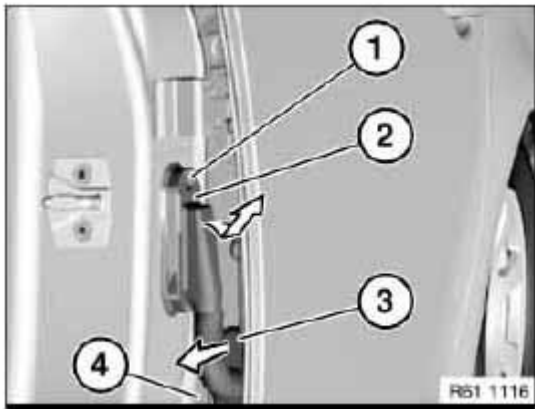


Fig. 19: Identifying Door Wiring Harness Plug On B-Pillar, Rubber Grommet And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

61 12 265 REPLACING WIRING HARNESS ON LEFT OR RIGHT FRONT SEAT

Operation is described in:

Replacing WIRING HARNESS ON LEFT OR RIGHT FRONT SEAT (COMFORT).

61 12 270 REPLACING WIRING HARNESS ON LEFT OR RIGHT FRONT SEAT (COMFORT SEAT)

Necessary preliminary tasks:

- Remove FRONT HEAD RESTRAINT .
- Remove OUTER COVER on front seat.
- Remove FRONT SEAT
- Remove INNER COVER ON FRONT SEAT
- Remove REAR PANEL on front seat backrest.

Disconnect all plug connections (1).

Release cable tie (2).

Removing wiring harness.

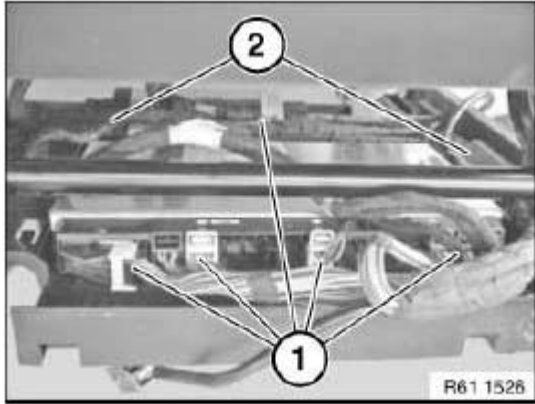


Fig. 20: Identifying Plug Connections And Cable Tie
Courtesy of BMW OF NORTH AMERICA, INC.

Unhook seat fabric at retaining points (1).

Lever out clip (2).

Fold back seat fabric.

Unhook backrest fabric at retaining points (3).

Fold back backrest fabric.

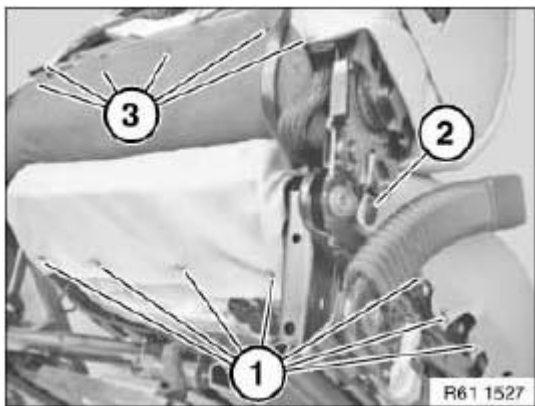


Fig. 21: Identifying Retaining Points
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect all plug connections (1).

Release cable tie (2).

Removing wiring harness.

Installation:

Make sure wiring harness is correctly laid.

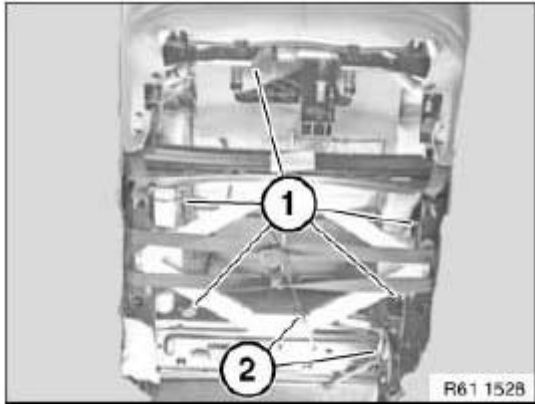


Fig. 22: Identifying Plug Connections And Cable Tie
Courtesy of BMW OF NORTH AMERICA, INC.

CONNECTORS, TERMINALS, FUSE BOX

61 13... MAIN RELAY CONNECTOR FOR DME

Unlock locking flap (1) of corresponding cable.

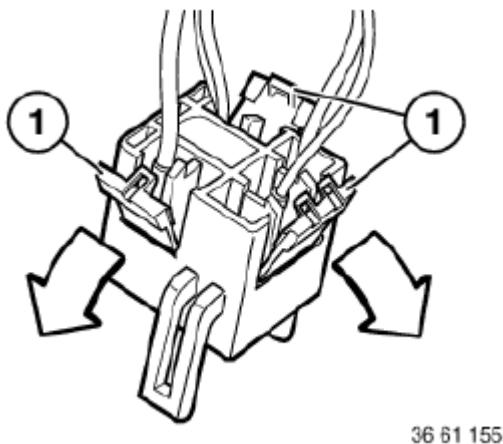


Fig. 23: Unlocking Locking Flap
Courtesy of BMW OF NORTH AMERICA, INC.

With special tool **61 1 136** or **61 1 137** (ejector), press back arrester hook (2) of appropriate contact and pull out

cable.

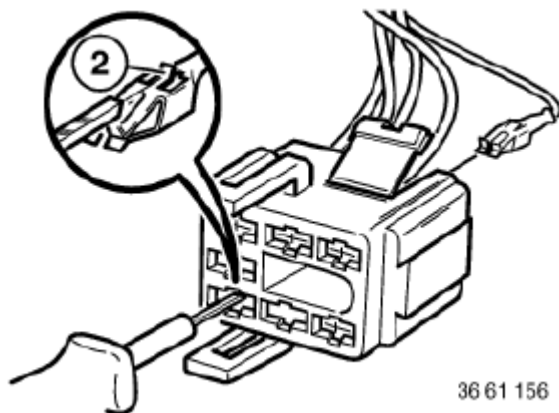


Fig. 24: Pressing Back Arrester Hook

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... REMOVING AND INSTALLING/REPLACING FIBRE-OPTIC CABLE CONNECTOR

IMPORTANT: Comply with notes and instructions on handling FIBRE-OPTIC CABLES.

Necessary preliminary tasks:

E60:

- Remove LUGGAGE COMPARTMENT TRIM ON LEFT SIDE PANEL

E61:

- Remove luggage compartment wheel arch trim on left.

Insert a small screwdriver into openings (1).

Expand catches of cover (2) and remove cover (2) in direction of arrow.

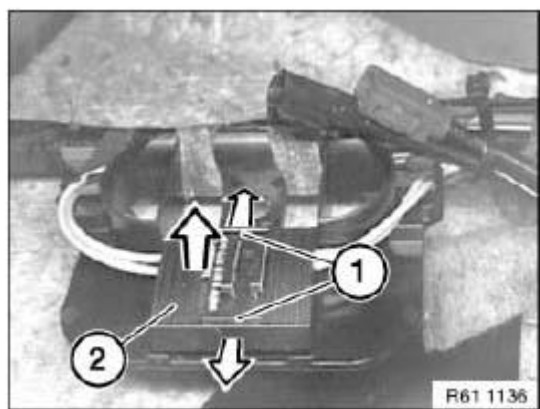


Fig. 25: Expanding Catches Of Cover

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Fibre-optic cables with locks at top can be removed directly.
Before the fibre-optic cables with locks at the bottom are removed, the fibre-optic cable connector (4) must be removed from the holder (3).

Removing a fibre-optic cable:

Lift lock (1) carefully and feed fibre-optic cable (2) out of connector (4).

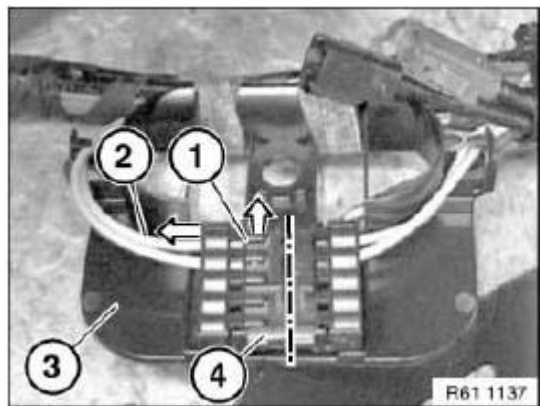


Fig. 26: Identifying Feed Fibre-Optic Cable And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure fibre-optic cable (2) is correctly engaged in fibre-optic cable connector (4).

Removing connector (2) from holder (3):

Release lock in bore (1) by pressing and remove fibre-optic cable connector (2) in direction of arrow from holder (3).

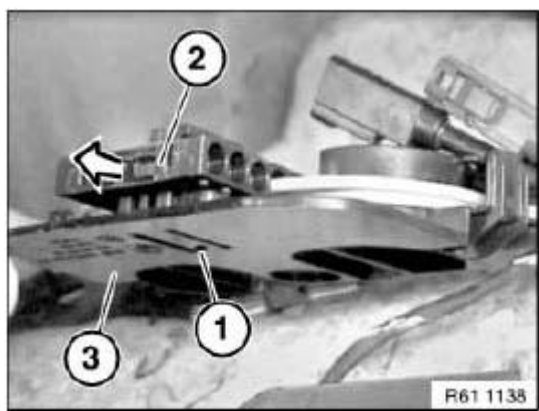


Fig. 27: Removing Fibre-Optic Cable Connector
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... SOCKET OF TAB CONNECTOR HOUSINGS

Unlock hook (1) with special tool **61 1 360** and slide plug housing downwards out of base.

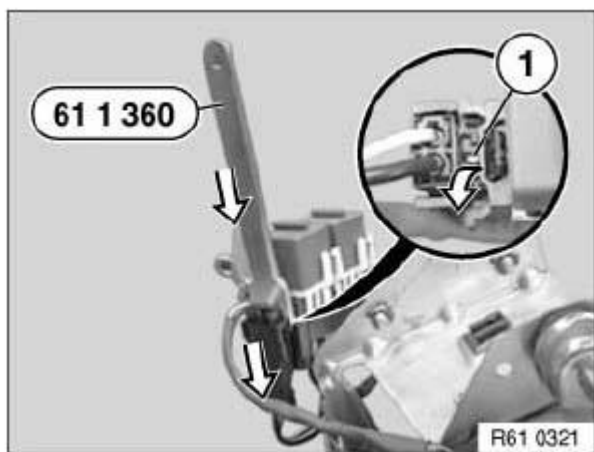


Fig. 28: Unlocking Hook Using Special Tool (61 1 360)
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... BUTT CONNECTOR FOR REPAIRING A PLUG CONNECTION

Special tools required:

- **61 0 300**
- **61 9 040**

IMPORTANT:

1. Identify cause of damage (e.g. sharp-edged body parts, 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 connection scheme (e.g. anti-lock braking system, active rear-axle kinematics, airbags, etc.) are influenced.

Otherwise replace faulty wiring harness or use repair cable (sourcing reference: BMW Parts Service)

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.

Special tools:

- special tool 61 9 040

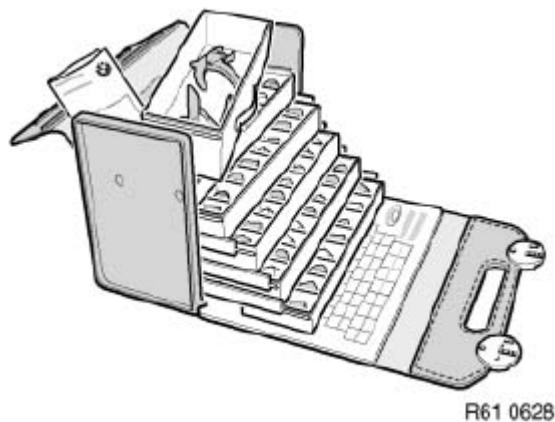
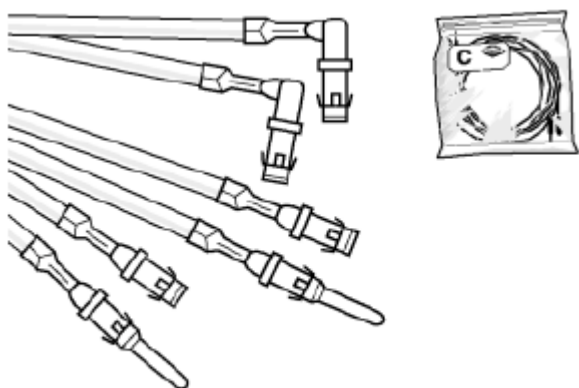


Fig. 29: Identifying Special Tool Kit (61 0 300)
Courtesy of BMW OF NORTH AMERICA, INC.

Choose repair kit.

Example: Repair kit, circular plug system D 2.5.

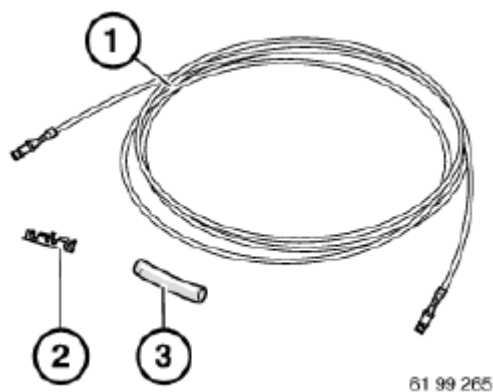


R61 99 257

Fig. 30: Identifying Special Tool (61 9 040)
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove following parts:

1. Prepackaged end of cable with requisite wire cross-section
2. Crimp connector for selected wire cross-section
3. Shrink-fit hose



61 99 265

Fig. 31: Identifying Shrink-Fit Hose, Crimp Connector And Prepackaged End Of Cable
 Courtesy of BMW OF NORTH AMERICA, INC.

Open secondary lock on housing.

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

Refer to repair instructions:

OPENING PLUG HOUSINGS AND REMOVING CONTACTS OF DIFFERENT PLUG SYSTEMS

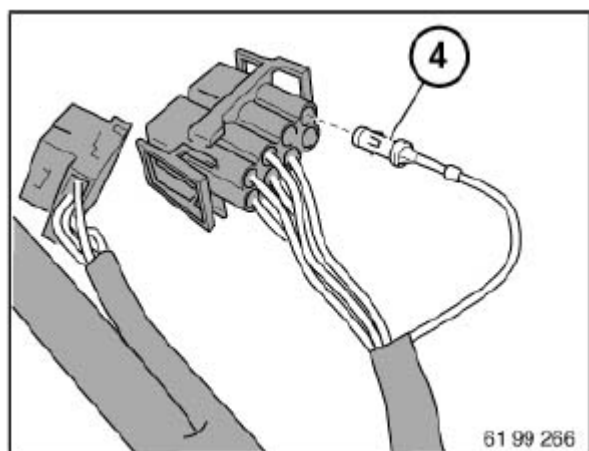


Fig. 32: Identifying Damaged Contact

Courtesy of BMW OF NORTH AMERICA, INC.

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.

Observe 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

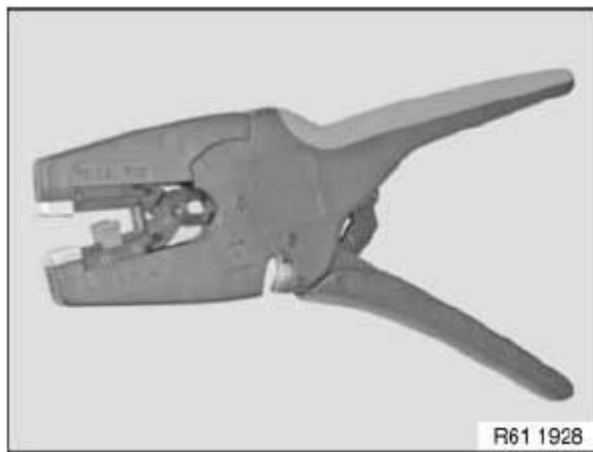


Fig. 33: Identifying Pliers

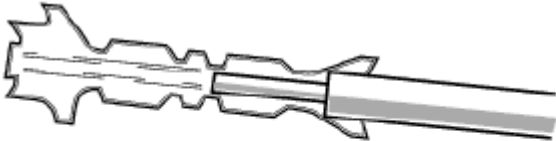
Courtesy of BMW OF NORTH AMERICA, INC.

Refer also to repair instruction:

CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES

Crimp butt connector on preassembled wire end.

Refer to repair instructions:

CRIMPING ON STOP PARTS

61 99 270

Fig. 34: Identifying Crimp Butt Connector
Courtesy of BMW OF NORTH AMERICA, INC.

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

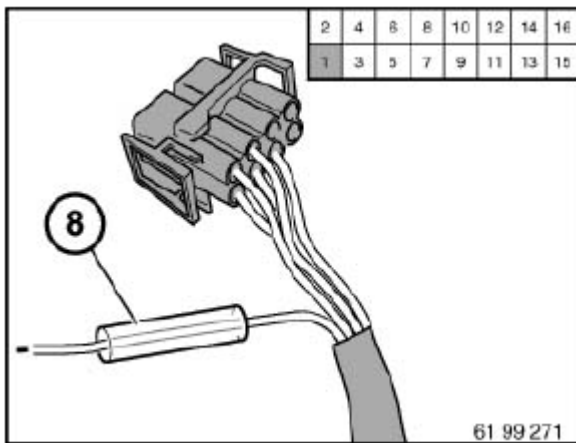


Fig. 35: Identifying Shrink-Fit Hose Onto Free Wire End
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp unused wire end to butt connector.

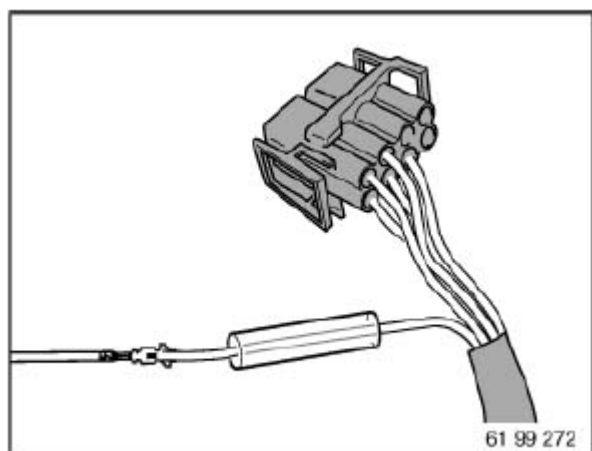


Fig. 36: Identifying Crimp Unused Wire End To Butt Connector
Courtesy of BMW OF NORTH AMERICA, INC.

Pull shrink-on sleeve over butt connector.

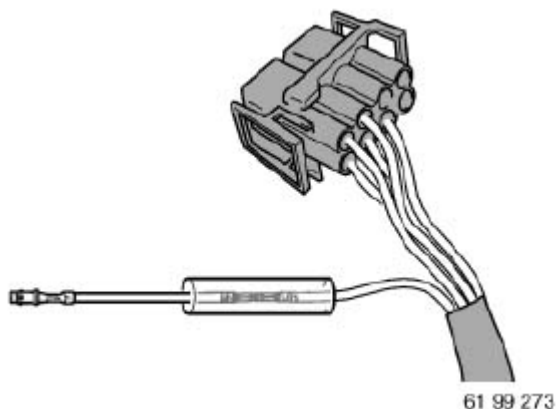


Fig. 37: Identifying Shrink-On Sleeve Over Butt Connector
Courtesy of BMW OF NORTH AMERICA, INC.

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.

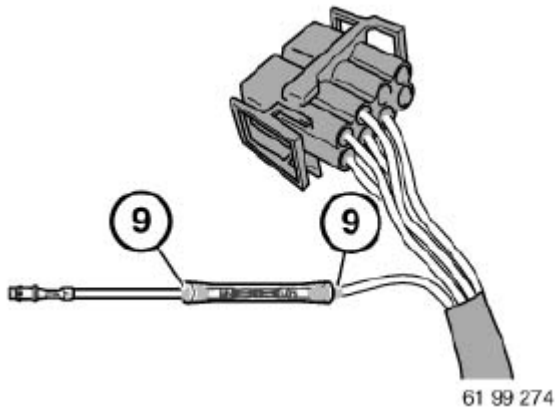


Fig. 38: Shrinking Sleeve On Both Sides With Hot Air Blower
 Courtesy of BMW OF NORTH AMERICA, INC.

61 13... CRIMPING MICRO POWER QUADLOCK CONTACTS (MPQ)

Special tools required:

- **61 4 320**

To crimp MPQ contacts, use pliers **61 4 321** (1) in conjunction with crimping head **61 4 325** (2) from crimping set **61 4 320**.

NOTE: Pliers (1) open automatically as far as they will go when handles are pressed together.

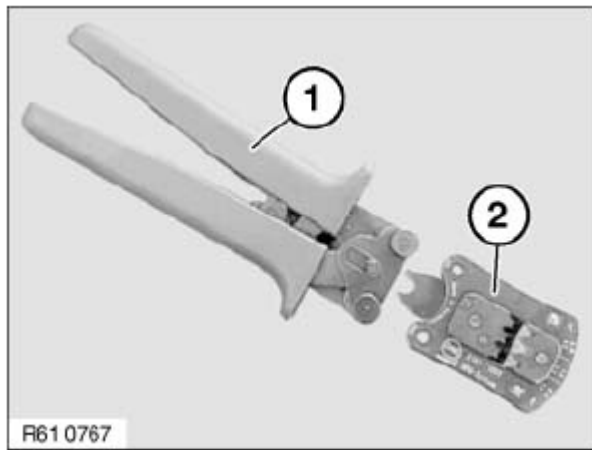


Fig. 39: Identifying Pliers (61 4 321) And Crimping Head (61 4 325)
 Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (1).

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

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

Close pliers (1) one notch.

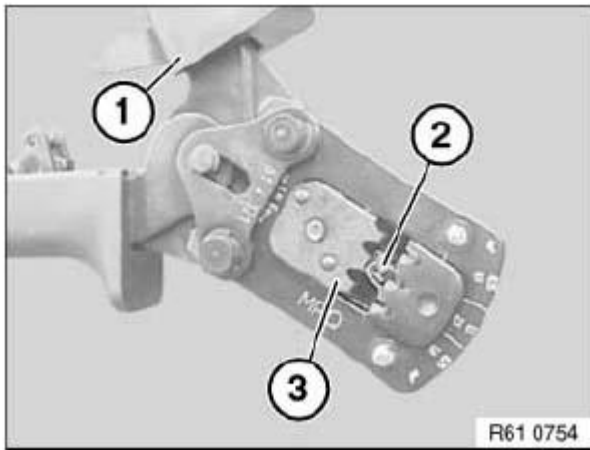


Fig. 40: Identifying Pliers, Crimping Head And MPQ Contact
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for CUTTING AND STRIPPING INSULATION from cables.

Insert stripped cable (2).

Close pliers (1) fully.

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

NOTE: CHECK CONTACT FOR CORRECT CRIMPING.

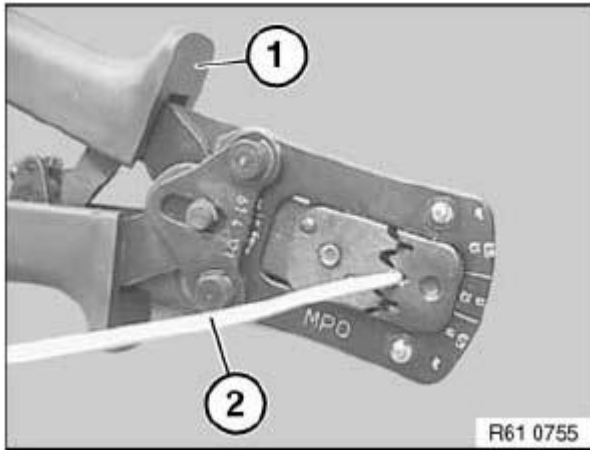


Fig. 41: Inserting Stripped Cable

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... CRIMPING MICRO QUADLOCK SYSTEM CONTACTS (MQS)

Special tools required:

- **61 4 320**

To crimp MQS contacts, use pliers **61 4 321** (1) in conjunction with crimping head **61 4 324** (2) from crimping set **61 4 320**.

NOTE: Pliers (1) open automatically as far as they will go when handles are pressed together.

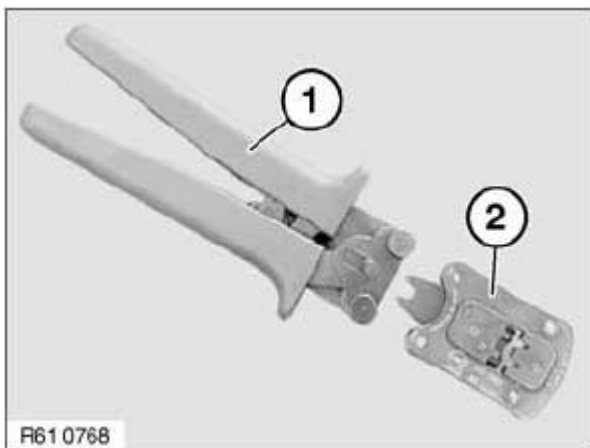


Fig. 42: Identifying Pliers (61 4 321) And Crimping Head (61 4 324)

Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (1).

Fold up contact carrier (2).

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

Fold back contact carrier (2).

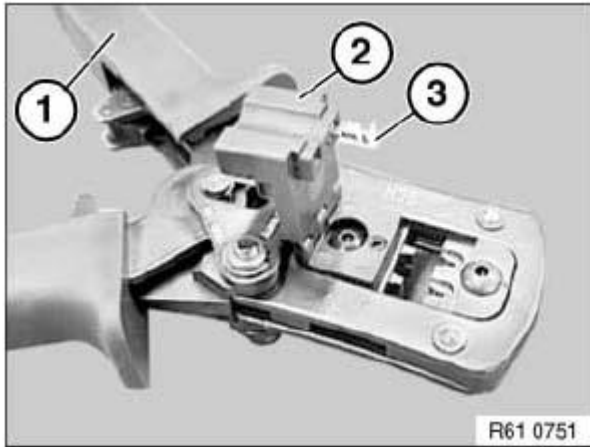


Fig. 43: Identifying Pliers, Contact Carrier And MQS Contact
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for CUTTING AND STRIPPING INSULATION from cables.

Close pliers (1) one notch.

Insert stripped cable (2).

Close pliers (1) fully.

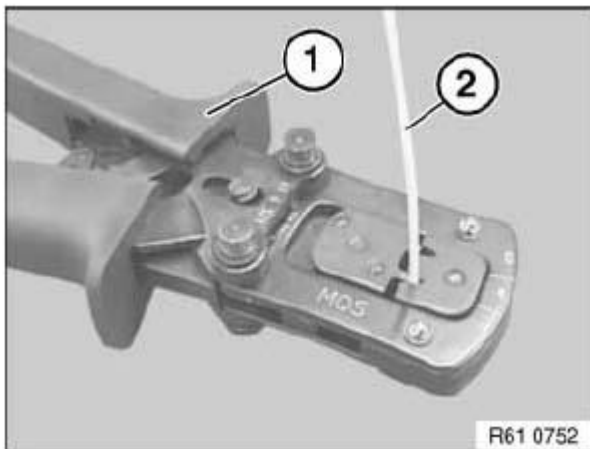


Fig. 44: Inserting Stripped Cable
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (1).

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

NOTE: **CHECK CONTACT FOR CORRECT CRIMPING.**

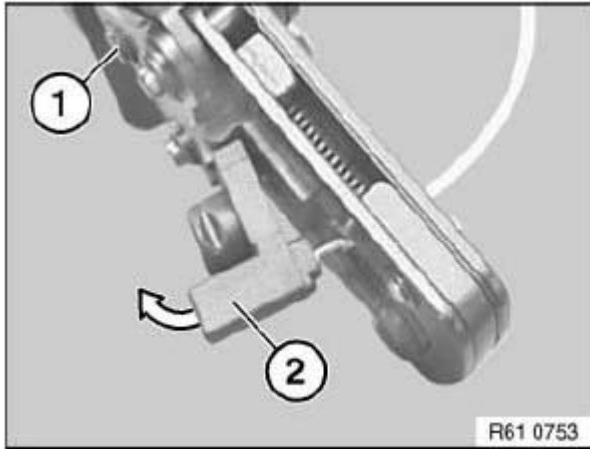


Fig. 45: Opening Contact Carrier

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... CRIMPING ANNULAR CONTACTS

Special tools required:

- **61 4 320**

Crimping annular contacts:

Special tool **61 4 320**

61 13... CRIMPING OPTICAL FIBRES

Special tools required:

- **61 4 320**

To crimp optical fibres, use pliers **61 4 321** (1) in conjunction with crimping head **61 4 323** (2) from crimping set **61 4 320**.

NOTE: **Pliers (1) open automatically as far as they will go when handles are pressed together.**

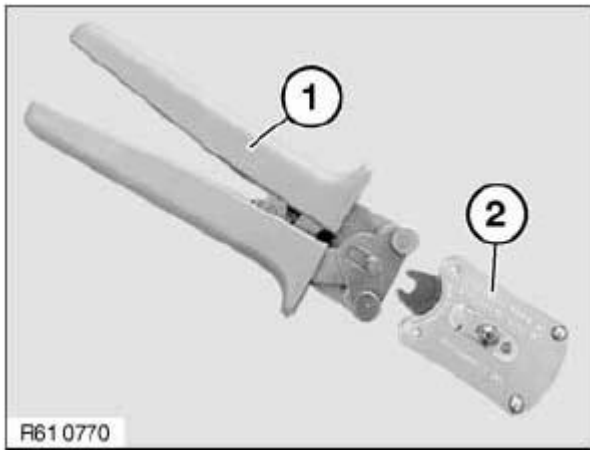


Fig. 46: Identifying Pliers (61 4 321) And Crimping Head (61 4 323)
Courtesy of BMW OF NORTH AMERICA, INC.

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

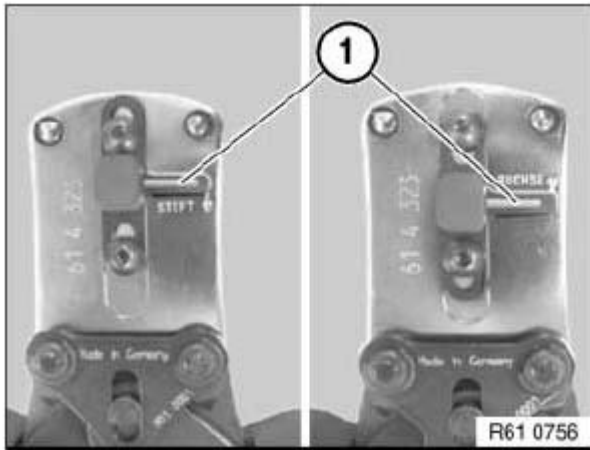


Fig. 47: Identifying Stop Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (2).

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

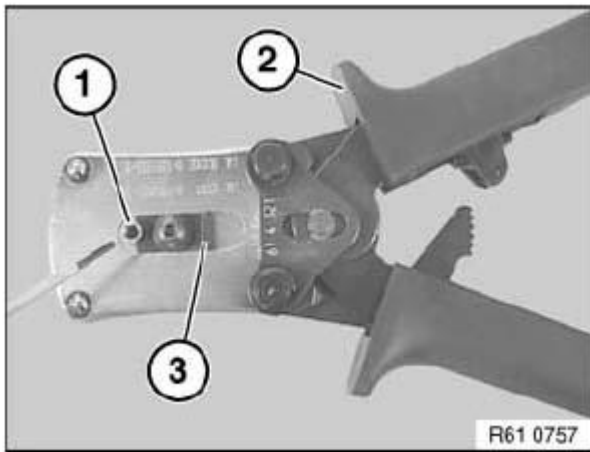


Fig. 48: Identifying Pliers And Locking Lever
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for CUTTING AND STRIPPING INSULATION FROM OPTICAL FIBRES.

Insert stripped optical fibre (1) as far as it will go into pin contact or jack (2).

Close pliers (3) fully.

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

Remove optical fibre (1).

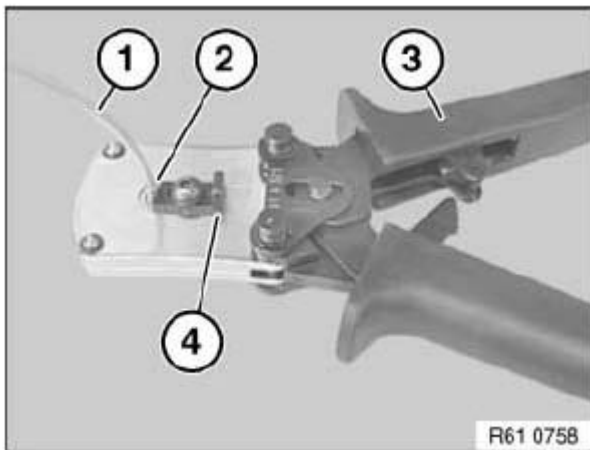


Fig. 49: Inserting Stripped Optical Fibre
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: 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).

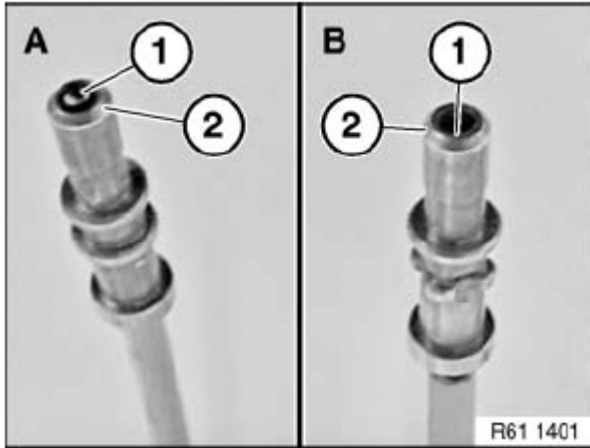


Fig. 50: Identifying Optical Fibre And Tip Of Pin Contact
Courtesy of BMW OF NORTH AMERICA, INC.

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 fan connectors up to 2.5 mm²

Refer to Service Information:

SI 2 04 06 293

2. Crimping butt connectors and contact sleeves for fan connectors from 2.5 mm²>

Refer to Service Information:

SI 2 02 05 194

SI 2 07 05 233

3. Crimping contact sleeves for fan connectors 4 mm² and ignition cable contacts

Special tool kit **12 1 080** is used to fit ignition cable contacts and to crimp 4 mm² contact sleeves for fan connectors.

- **12 1 081** (hand crimping tool)
- **12 1 083** (matrix)

Refer to repair instructions:

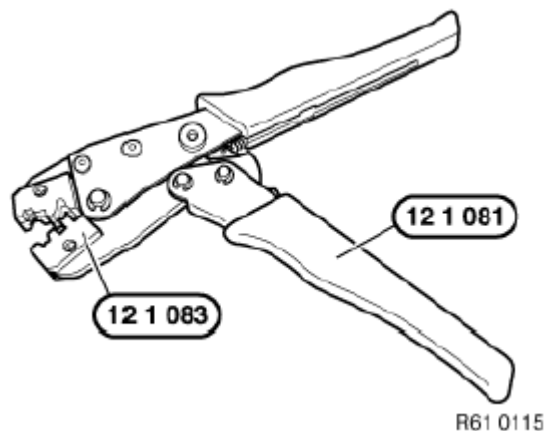
SPECIAL TOOLS FOR WIRING HARNESS REPAIRS

Fig. 51: Identifying Hand Crimping Tool (12 1 081)

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock special tool **12 1 081**:

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

Or:

Compress handles as far as they will go, tool unlocks automatically.

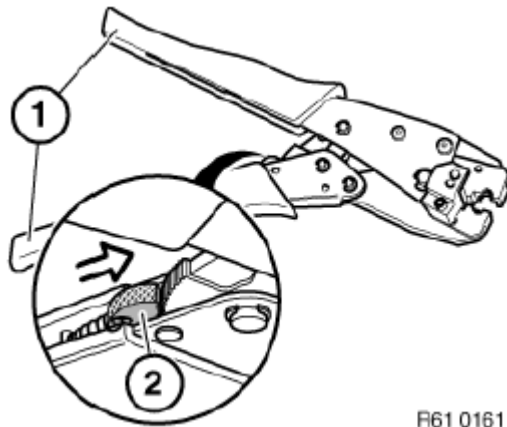


Fig. 52: Pushing Unlocking Lever

Courtesy of BMW OF NORTH AMERICA, INC.

Insert contact sleeve 4 mm² in nest with lock (1) as far as it will go.

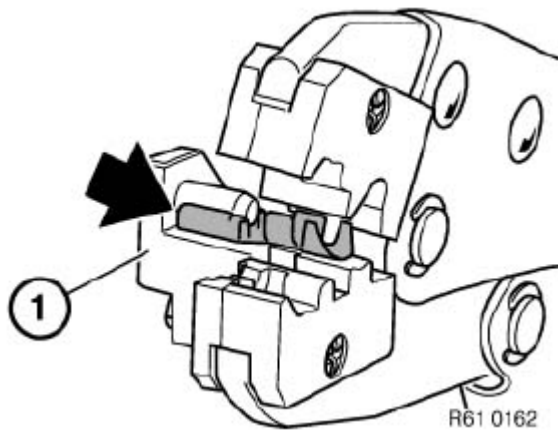


Fig. 53: Inserting Contact Sleeve

Courtesy of BMW OF NORTH AMERICA, INC.

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

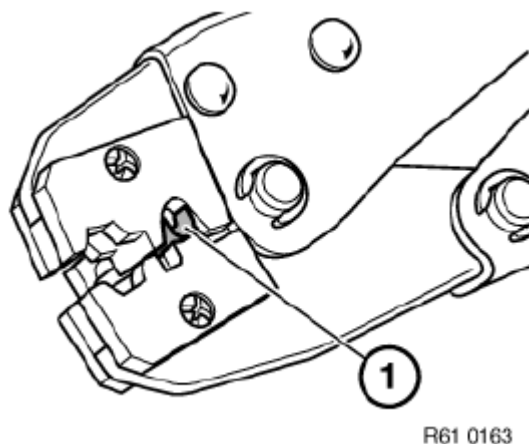


Fig. 54: Identifying Grip Contact

Courtesy of BMW OF NORTH AMERICA, INC.

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 as far as it will go.

Crimping tool unlocks automatically.

Take contact out of crimping tool.

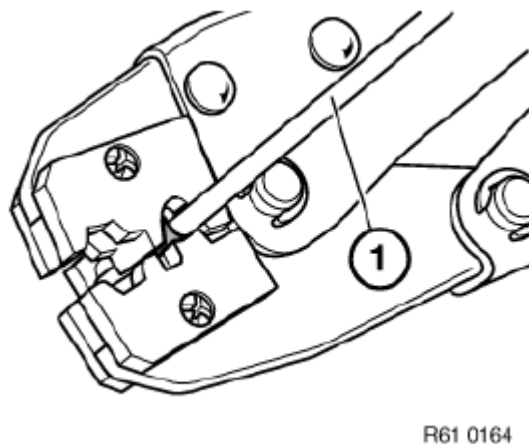


Fig. 55: Identifying Wire

Courtesy of BMW OF NORTH AMERICA, INC.

4. Checking crimping

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

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

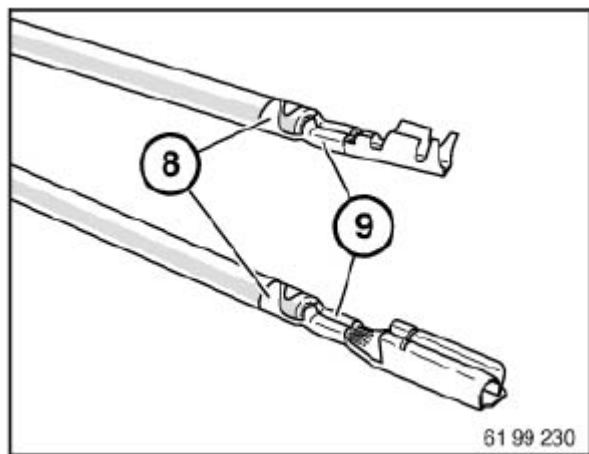
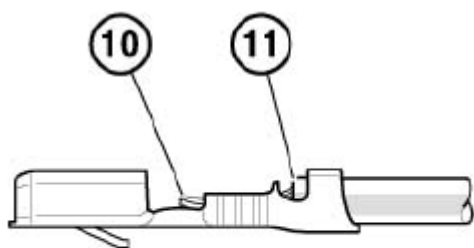


Fig. 56: Identifying Insulation Crimp And Wire Crimp
Courtesy of BMW OF NORTH AMERICA, INC.

Correct crimping:

Visible conductor end (10).

Visible insulation end (11).



61 99 231

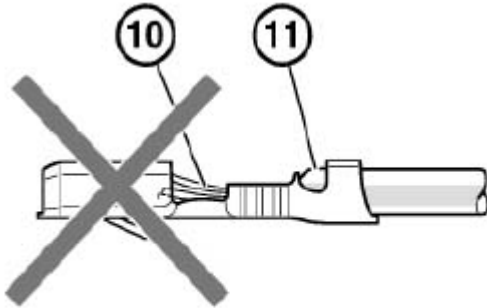
Fig. 57: Identifying Correct Crimping
Courtesy of BMW OF NORTH AMERICA, INC.

Incorrect crimping:

Conductor end (10) inserted too far.

Insulation end (11) in wire crimp.

If necessary, repeat crimping with a new contact.



61 99 232

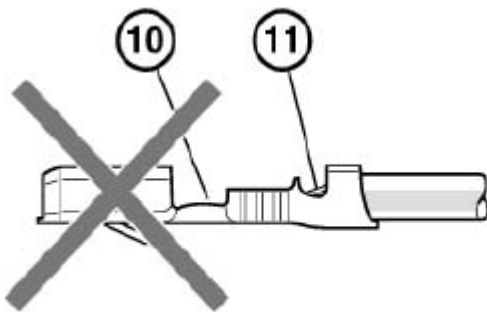
Fig. 58: Identifying Incorrect Crimping
Courtesy of BMW OF NORTH AMERICA, INC.

Incorrect crimping:

Conductor end (10) not visible.

Insulation end (11) not visible.

If necessary, repeat crimping with a new contact.



61 99 233

Fig. 59: Identifying Incorrect Crimping
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... CUTTING OFF, STRIPPING INSULATION AND CUTTING OPTICAL FIBRES TO LENGTH

Special tools required:

- **61 4 320**

To cut off, strip insulation and cut optical fibres to length, use pliers **61 4 321** (1) in conjunction with crimping head **61 4 322** (2) from crimping set **61 4 320**.

NOTE: Pliers (1) open automatically as far as they will go when handles are pressed together.

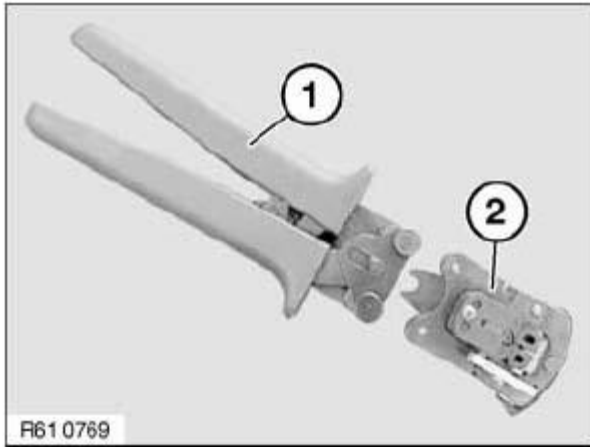


Fig. 60: Identifying Pliers (61 4 321) And Crimping Head (61 4 322)
Courtesy of BMW OF NORTH AMERICA, INC.

Cutting optical fibre

Open pliers (1).

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

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

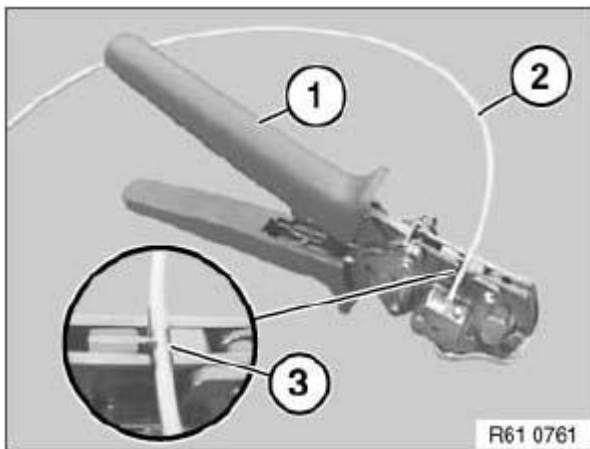


Fig. 61: Placing Optical Fibre In Cutting Device
Courtesy of BMW OF NORTH AMERICA, INC.

Stripping insulation from optical fibre

Open pliers (1).

Open lever (2) in direction of arrow.

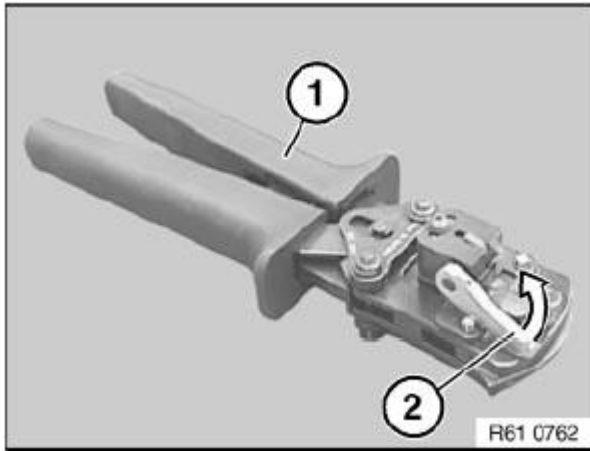


Fig. 62: Opening Lever

Courtesy of BMW OF NORTH AMERICA, INC.

Slide optical fibre (1) into stripping device (2) until flush at point (3).

Close pliers (4) fully.

Close clamping lever (5) in direction of arrow.

Open pliers (4) by one tooth notch.

Open clamping lever (5) against direction of arrow again and remove optical fibre (1).

NOTE: A stripping replacement blade set is available under number 61 4 327 .

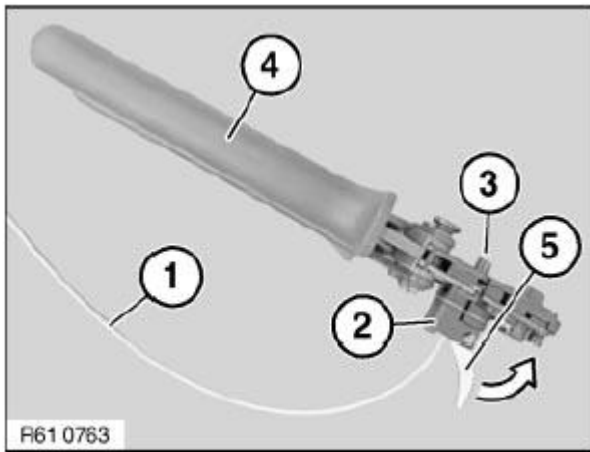


Fig. 63: Opening Clamping Lever

Courtesy of BMW OF NORTH AMERICA, INC.

Cutting optical fibre to length

IMPORTANT: The cutting blade must be replaced prior to each cutting of the optical fibre.

Pull pin (1) in direction of arrow.

Fold up blade retaining link (2) in direction of arrow.

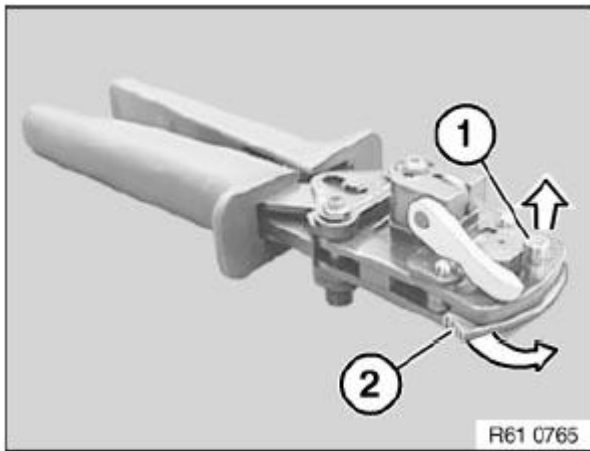


Fig. 64: Identifying Pin And Blade Retaining Link

Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Risk of injury when changing the blade.

Remove blade (1) and replace.

Installation:

Make sure blade (1) is correctly seated on locating points (2).

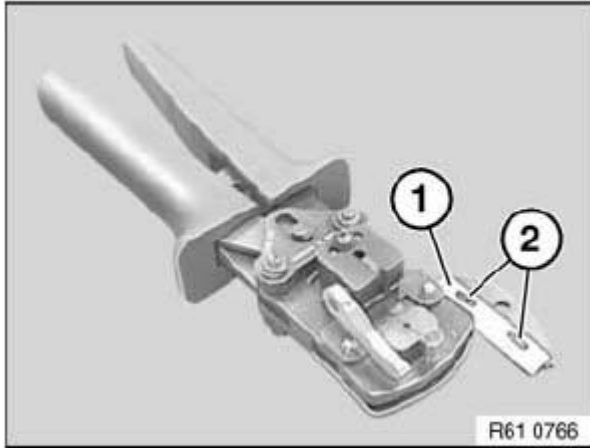


Fig. 65: Identifying Blade Is Correctly Seated On Locating Points
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (3).

Slide optical fibre (1) into cutting device (2) until insulation of optical fibre (1) butts against clamping device.

Close pliers (3) fully and keep closed.

Remove optical fibre (1).

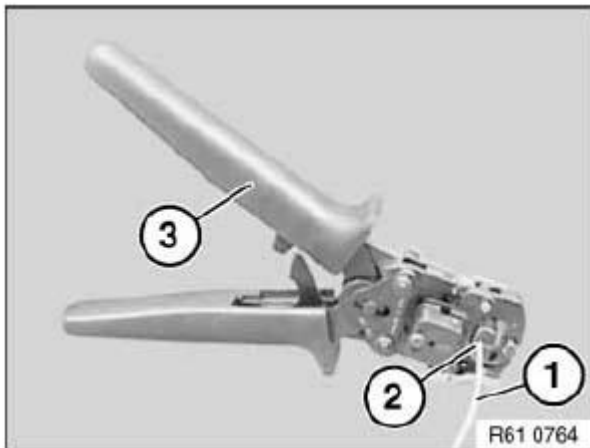


Fig. 66: Identifying Optical Fibre, Cutting Device And Pliers
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES

For cutting cables to length and stripping insulation: refer to **CUTTING OFF, STRIPPING INSULATION AND CUTTING OPTICAL FIBRES TO LENGTH.**

Stripped length:

STRIPPED LENGTH REFERENCE

Wire cross-section (mm ²)	Stripped length (mm)
0.35... 0.50	4.0
0.75... 1.00	4.5
1.00... 2.50	5.0

61 13... IN-LINE PLUGS, 2-PIN, SYSTEM JPT ELA

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

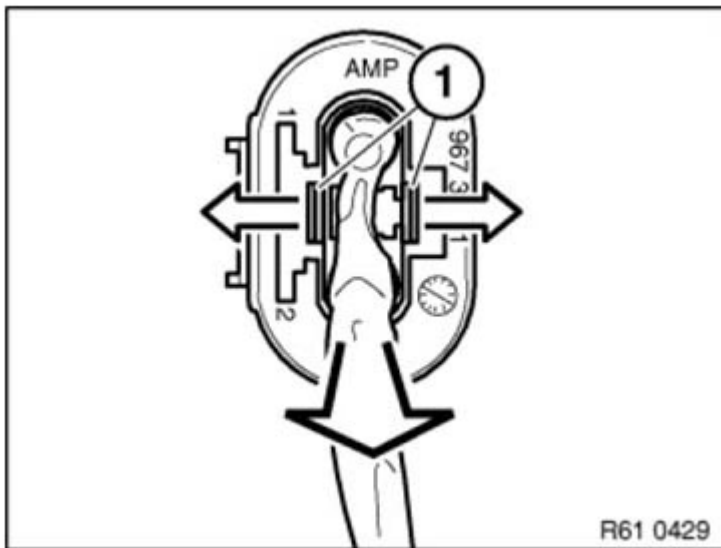
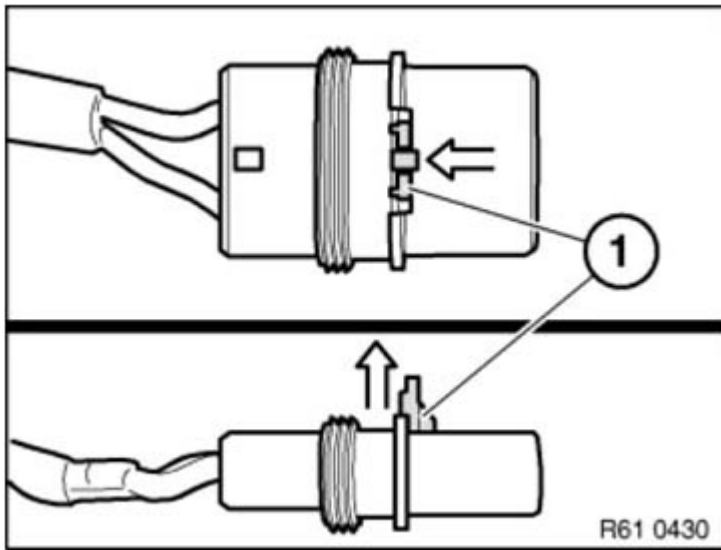


Fig. 67: Sliding Connector

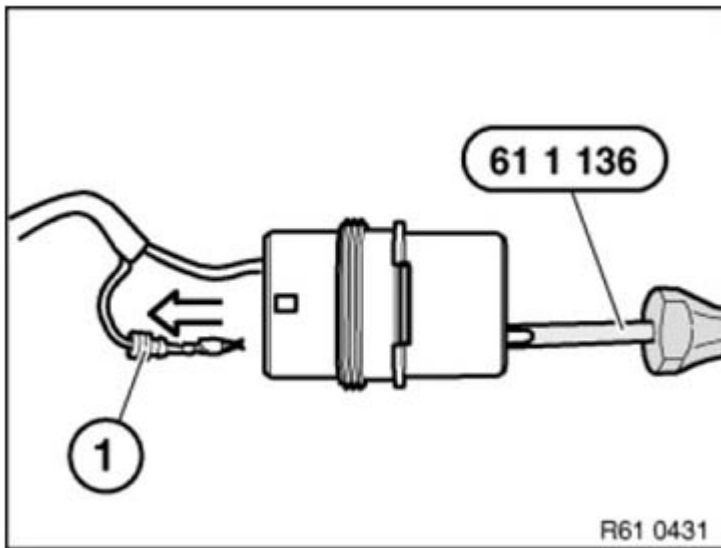
Courtesy of BMW OF NORTH AMERICA, INC.

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

**Fig. 68: Sliding Lock**

Courtesy of BMW OF NORTH AMERICA, INC.

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

**Fig. 69: Pulling Out Cable With Contact Using Special Tool (61 1 136)**

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... IN-LINE PLUGS, 24-PIN, HYBRID SYSTEM MQS/MPQ

Manufactured by AMP: The following contact types without strand sealing can be fitted in the plug 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 cap (2) upwards on both sides.

Detach cap from contact carrier (3).

NOTE: Detaching the cap releases the secondary locks of the socket contacts.

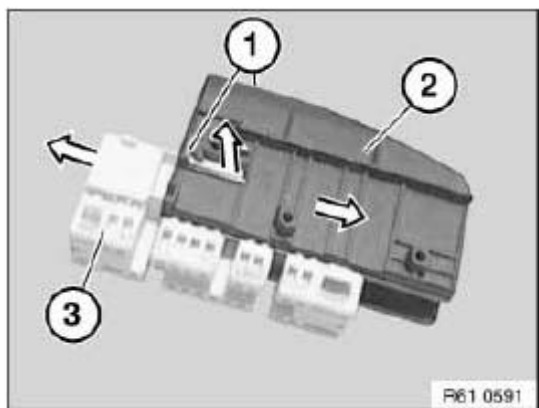


Fig. 70: Pressing Locks On Cap

Courtesy of BMW OF NORTH AMERICA, INC.

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).

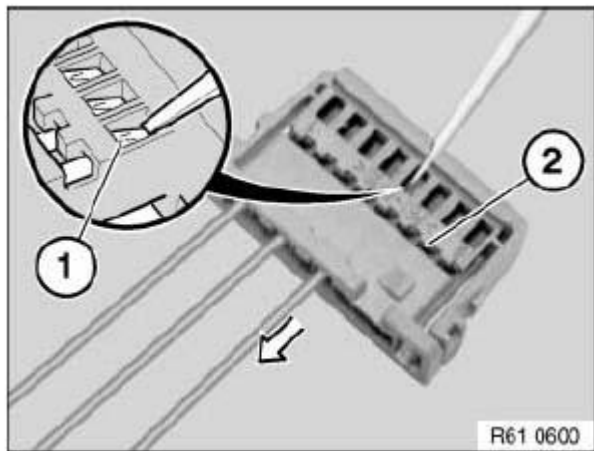


Fig. 71: Identifying Retaining Hook And Secondary Lock

Courtesy of BMW OF NORTH AMERICA, INC.

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

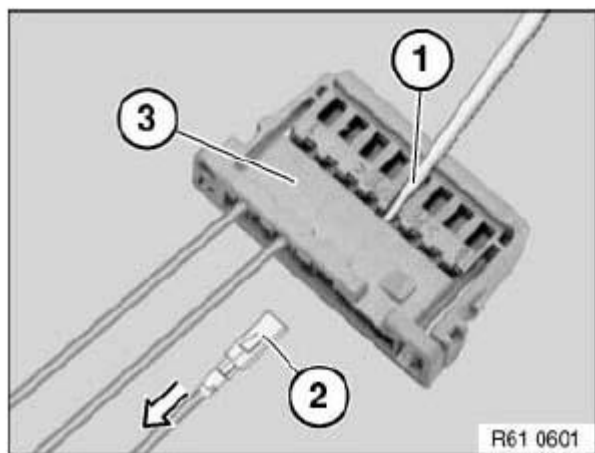


Fig. 72: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

Pin housing:

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

Detach cap from housing carrier (3).

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

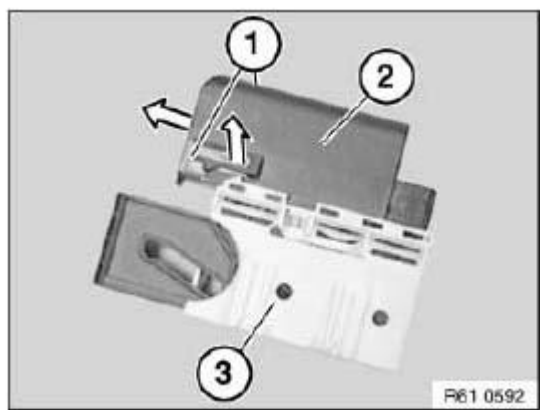


Fig. 73: Pressing Locks On Cap
Courtesy of BMW OF NORTH AMERICA, INC.

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

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

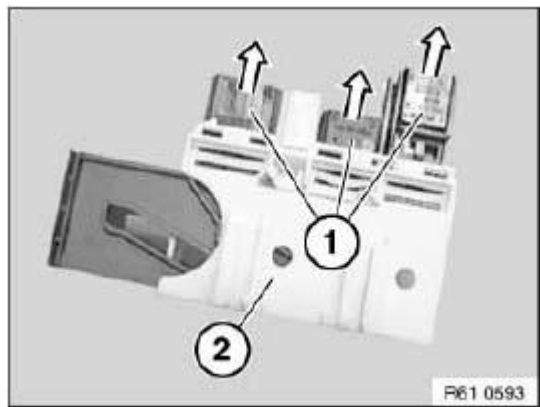


Fig. 74: Pulling Contact Carrier Out Of Housing Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... IN-LINE PLUGS, 30-PIN, HYBRID SYSTEM MQS/MPQ

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

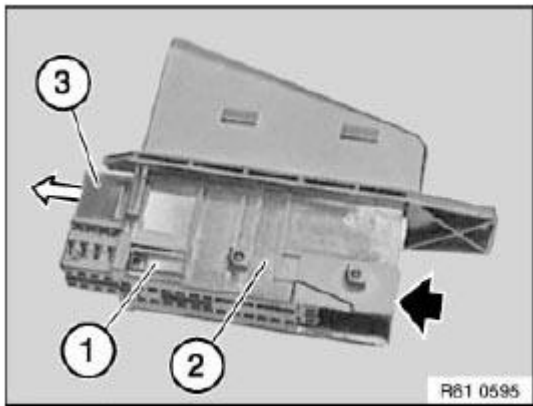
- MQS (Micro Quadlock System)
- MPQ, width 2.8 mm (Micro Power Quadlock)
- MPQ, width 5.2 mm (Micro Power Quadlock)

Socket housing:

Raise lock (1) on housing (2).

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

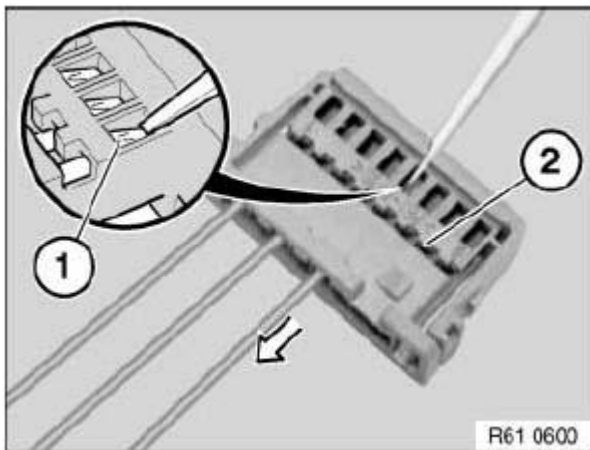
NOTE: Pushing out the contact carrier releases the secondary locks of the socket contacts.

**Fig. 75: Pushing Contact Carrier**

Courtesy of BMW OF NORTH AMERICA, INC.

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).

**Fig. 76: Identifying Retaining Hook And Secondary Lock**

Courtesy of BMW OF NORTH AMERICA, INC.

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

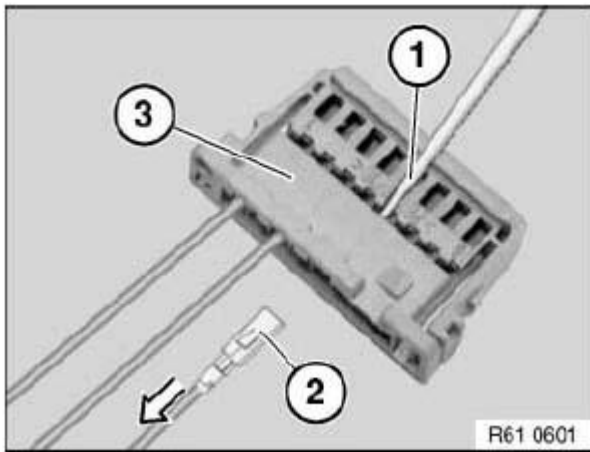


Fig. 77: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

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.

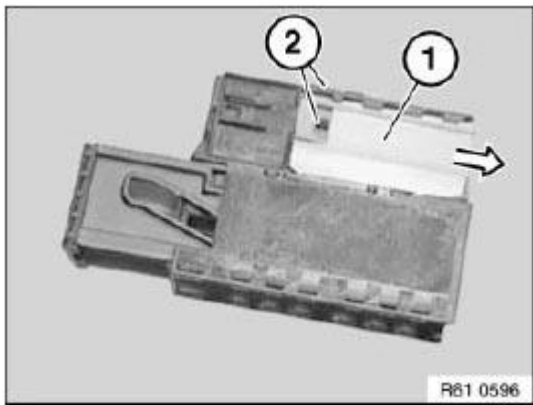


Fig. 78: Raising Locking Slide On Both Sides Of Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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.

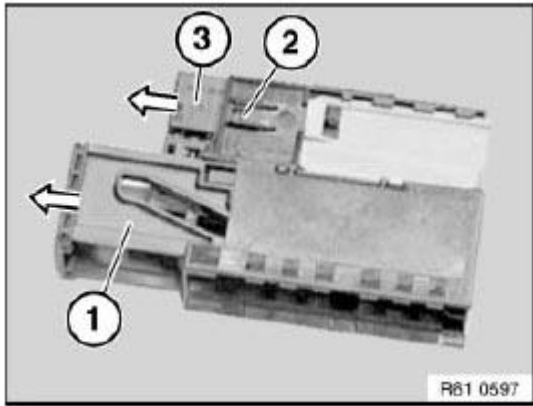


Fig. 79: Pulling Contact Carrier Out Of Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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

61 13... IN-LINE PLUGS, 6- TO 50-PIN, SYSTEM ELO

Unlock lock.

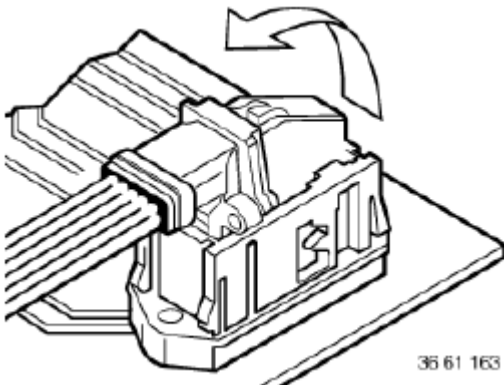
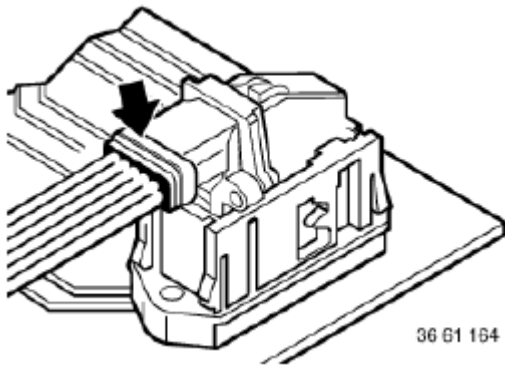


Fig. 80: Unlocking Lock
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten cable clip.

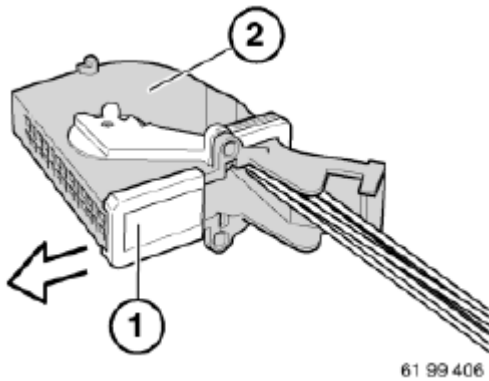
Installation:

Cable clip must be reinstalled.

**Fig. 81: Locating Cable Clip**

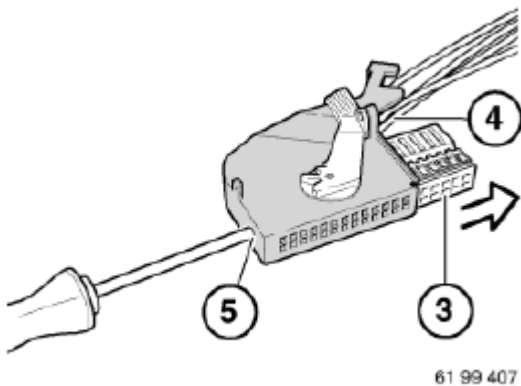
Courtesy of BMW OF NORTH AMERICA, INC.

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

**Fig. 82: Detaching Catch From Plug Housing**

Courtesy of BMW OF NORTH AMERICA, INC.

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

**Fig. 83: Pressing Out Contact Carrier With Wiring Harness**

Courtesy of BMW OF NORTH AMERICA, INC.

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

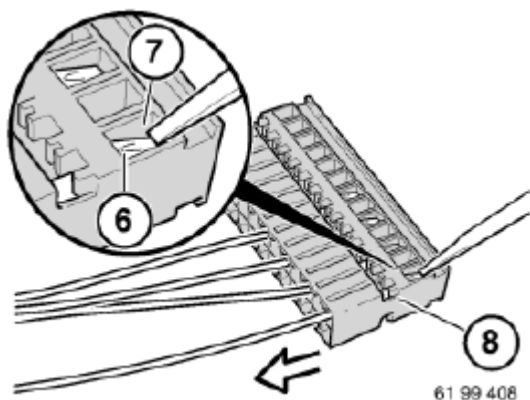


Fig. 84: Identifying Arrester Hook And Secondary Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

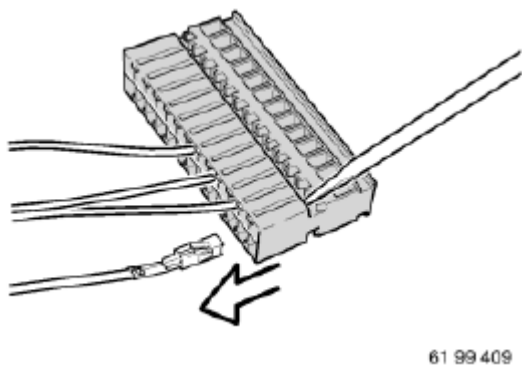
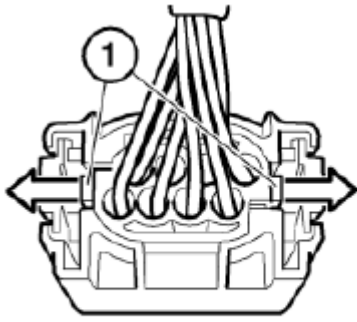


Fig. 85: Removing Secondary Lock
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... IN-LINE PLUGS, 6-, 8-PIN, SYSTEM MQS

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

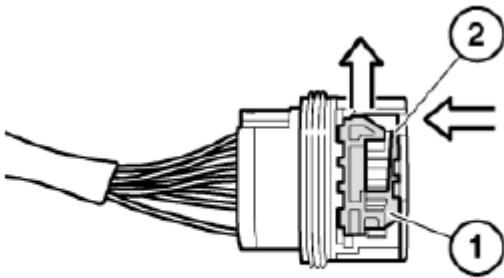


F61 0415

Fig. 86: Pressing Lock

Courtesy of BMW OF NORTH AMERICA, INC.

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

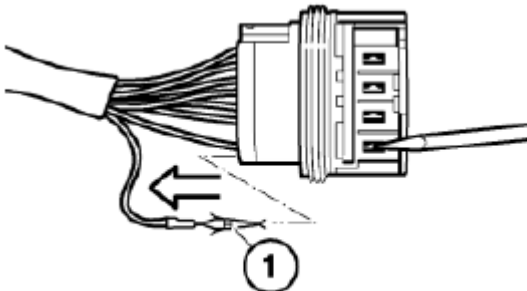


F61 0416

Fig. 87: Pressing Locking Hook

Courtesy of BMW OF NORTH AMERICA, INC.

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



F61 0417

Fig. 88: Pressing Down Arrester Hook

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... INLINE PLUGS, 8-, 12-PIN, SYSTEM D2.5

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

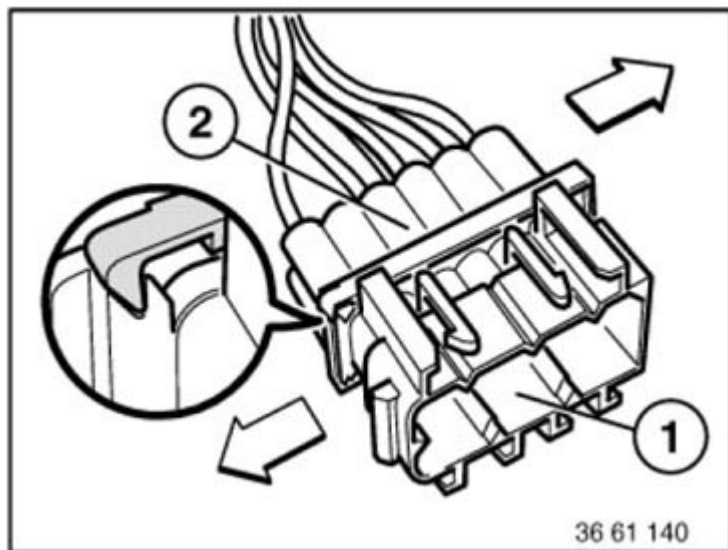


Fig. 89: Moving Upper And Lower Section Of Connector In Opposite Direction
Courtesy of BMW OF NORTH AMERICA, INC.

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

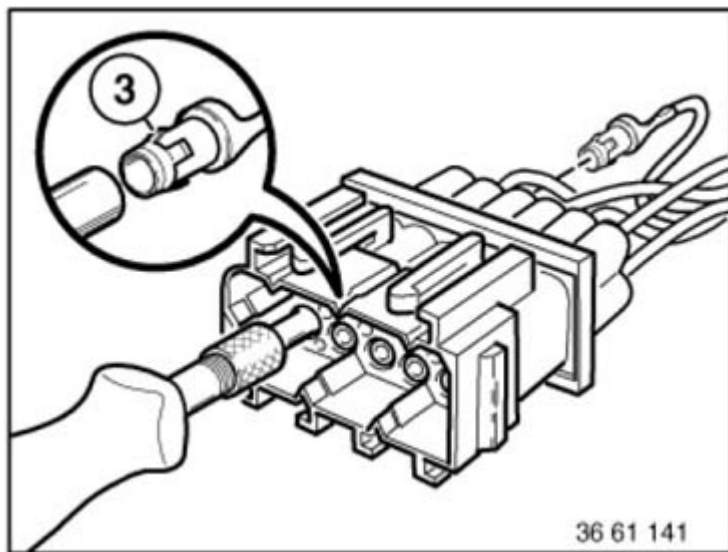


Fig. 90: Pressing Retaining Hook Of Corresponding Contact Using Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... INSTALLING FAN CONNECTOR FOR RETROFITTING/REPAIRS

Special tools required:

CARMANUALSUSA

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- 61 9 040
- 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.

Special tools:

- special tool **61 9 040**

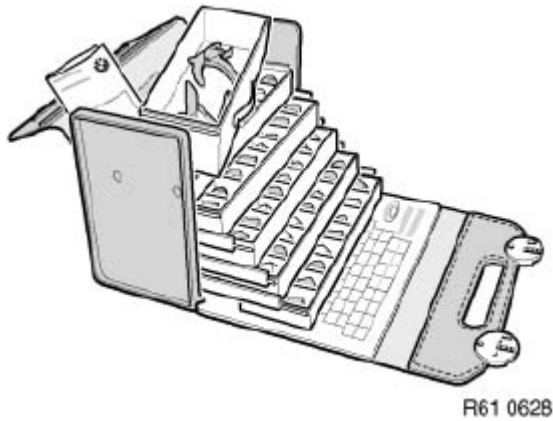


Fig. 91: Identifying Special Tool Kit (61 0 300)
Courtesy of BMW OF NORTH AMERICA, INC.

Choose contact sleeve (up to 4 mm²) in accordance with wire cross-section.

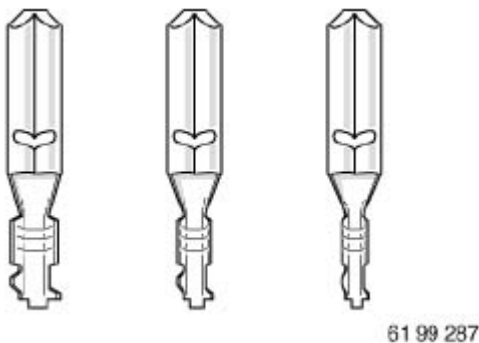


Fig. 92: Identifying Contact Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

Alternatively:

Choose contact sleeves (up to 2.5 mm²) for fan connectors.

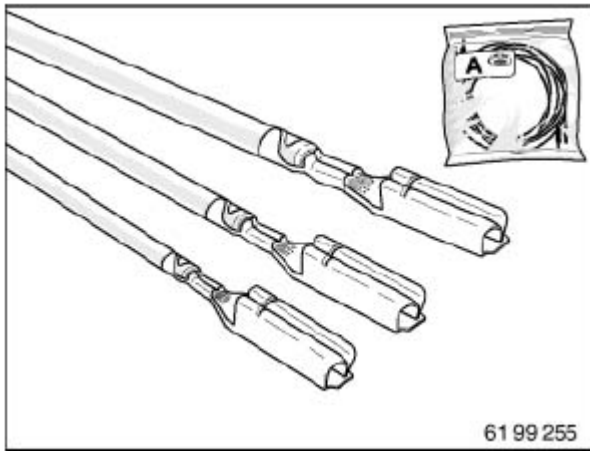


Fig. 93: Identifying Contact Sleeves For Fan Connectors
Courtesy of BMW OF NORTH AMERICA, INC.

Cut through wire loop in wiring harness at established point.

Strip insulation from both wire ends.

Refer to repair instructions:

CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES

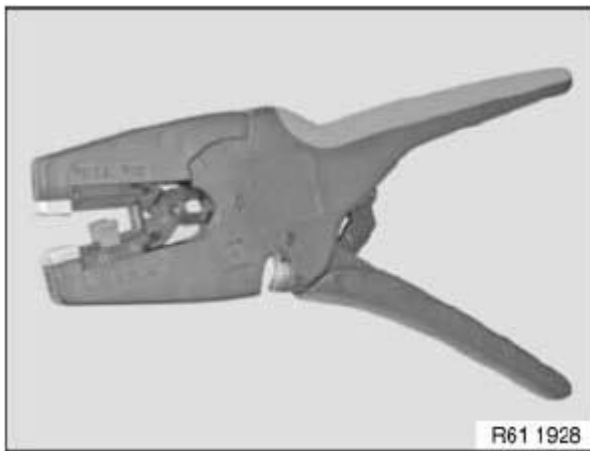


Fig. 94: Identifying Pliers
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp contact sleeves on both wire ends.

Refer to repair instructions:

CRIMPING ON STOP PARTS

NOTE: If using repair kit for contact sleeves, refer to repair instruction:
BUTT CONNECTOR FOR REPAIRING A PLUG CONNECTION.

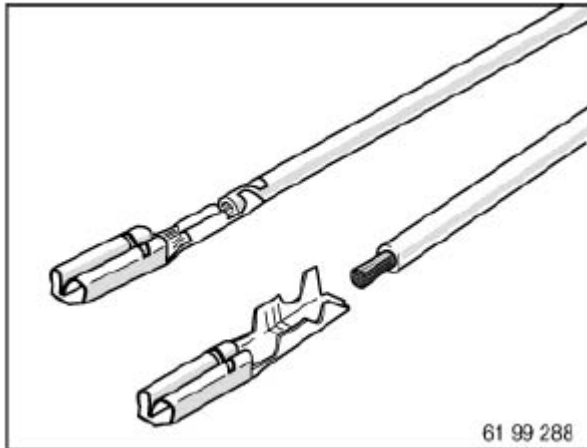


Fig. 95: Identifying Crimp Contact Sleeves On Both Wire Ends
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp connecting cable for retrofitting likewise with contact sleeve.

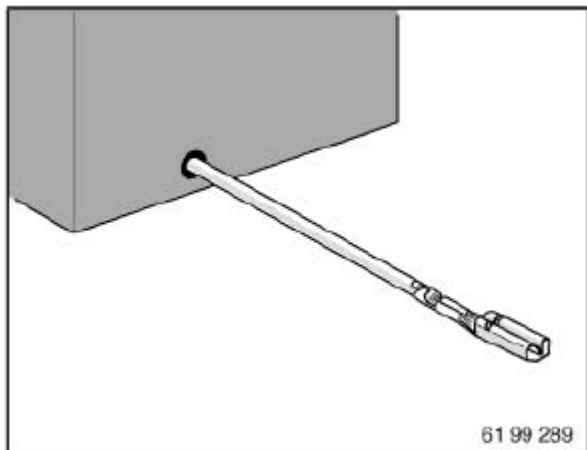
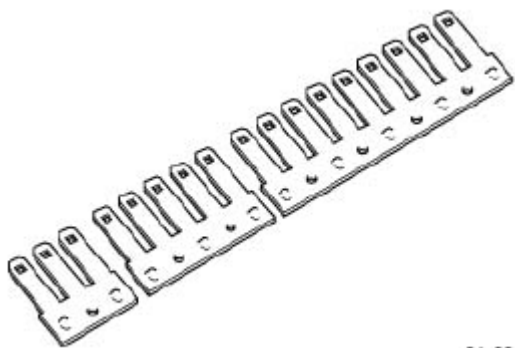


Fig. 96: Crimping Connecting Cable
Courtesy of BMW OF NORTH AMERICA, INC.

Cut required number of poles to length for fan connectors.



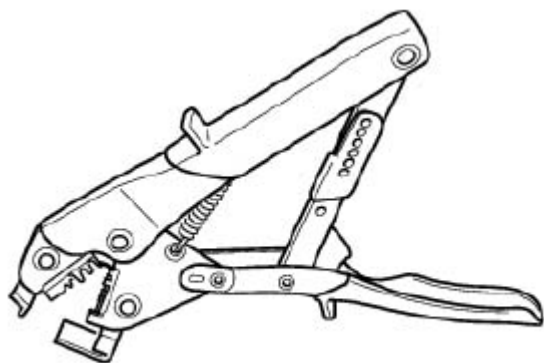
61 99 291

Fig. 97: Identifying Fan Connectors Poles
Courtesy of BMW OF NORTH AMERICA, INC.

Special tool **61 9 041** (hand crimping tool) in conjunction with **61 9 042** (matrix) are used for pushing contact sleeves onto fan connectors.

Refer to repair instructions:

SPECIAL TOOLS FOR WIRING HARNESS REPAIRS.



61 99 217

Fig. 98: Identifying Hand Crimping Tool (61 9 041)
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock special tool **61 9 041**:

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

Or:

Compress handles as far as they will go, tool unlocks automatically.

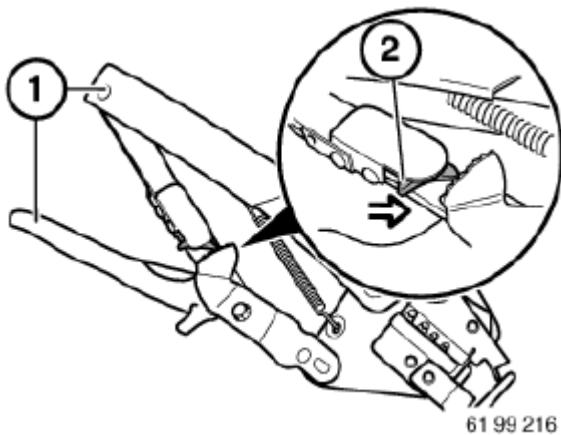


Fig. 99: Pushing Unlocking Lever

Courtesy of BMW OF NORTH AMERICA, INC.

Insert prepared fan connector (3) in special tool 61 9 041 / 61 9 042 .

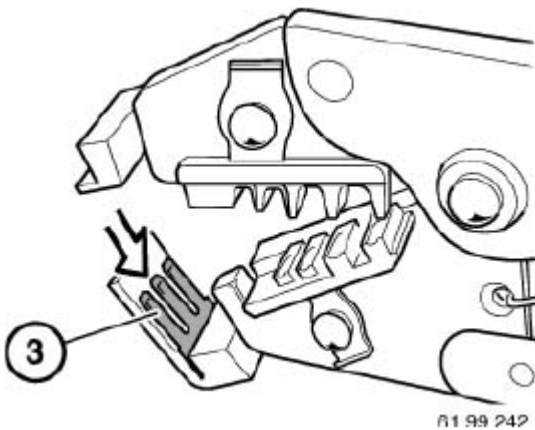


Fig. 100: Inserting Prepared Fan Connector In Special Tool

Courtesy of BMW OF NORTH AMERICA, INC.

Attach wire with contact sleeve to fan connector.

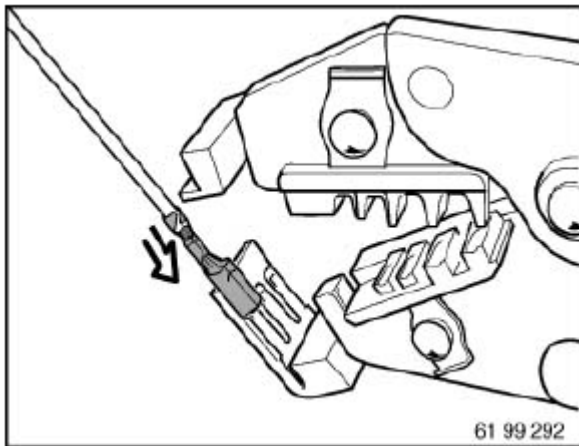


Fig. 101: Attaching Wire With Contact Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

Press crimping tool together and slide contact sleeve firmly home.

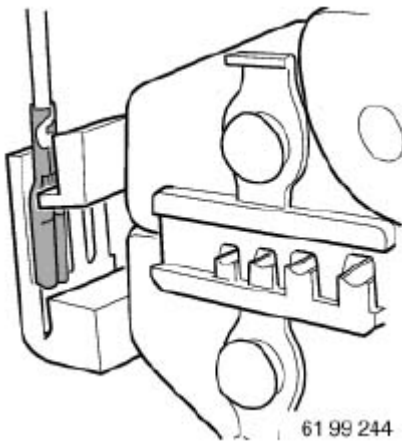


Fig. 102: Pressing Crimping Tool
Courtesy of BMW OF NORTH AMERICA, INC.

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

Push on further contact sleeves for potential branching.

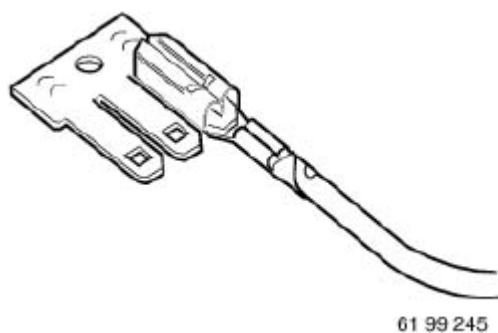


Fig. 103: Identifying Contact Sleeves

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

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

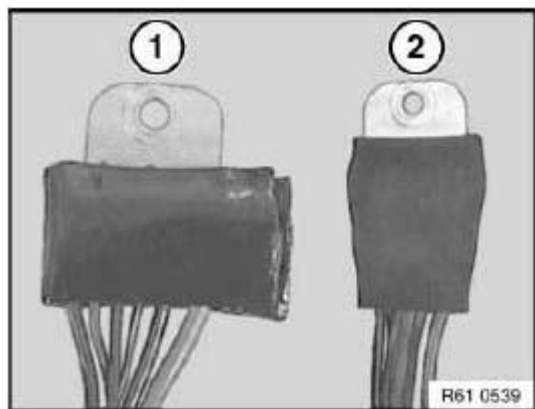


Fig. 104: Identifying Sealing Compound

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Ensure that fan connector has sufficient contact surface on mounting point. Do not heat shrink-fit hose on edges of fan connector too strongly, risk of cracking.

Allow shrink-fit hose to cool down until hand-warm. Then press sealing material again into contacts and onto edges of fan connector.

If necessary, carefully heat shrink-fit hose again.

Installation in dry area (interior, luggage compartment):

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

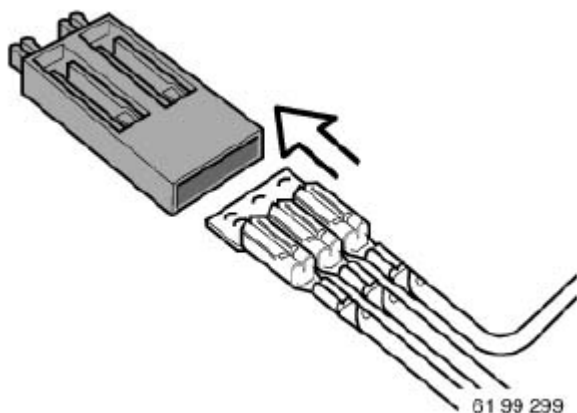


Fig. 105: Sliding Assembled Fan Connector Into Insulation Housing

Courtesy of BMW OF NORTH AMERICA, INC.

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 REFERENCE CHART

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

Ultrasonic-welded connectors:

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

The contacts of these connectors cannot be replaced. The plug must be replaced completely.

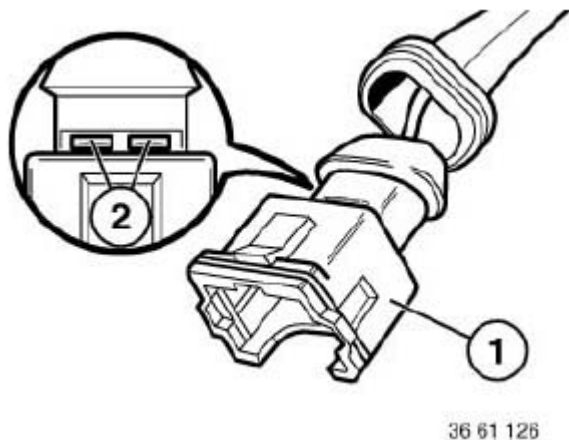


Fig. 106: Identifying Ultrasonic-Welded Connectors

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Special tools used for connector repair procedures in this service information are contained in the following special tool kits:

- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- **61 1 100 RELEASING KIT (engine)**

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).

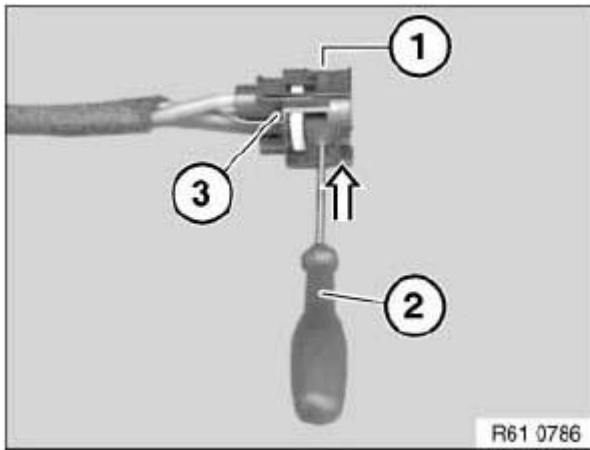


Fig. 107: Pressing Lock With Suitable Tool
Courtesy of BMW OF NORTH AMERICA, INC.

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

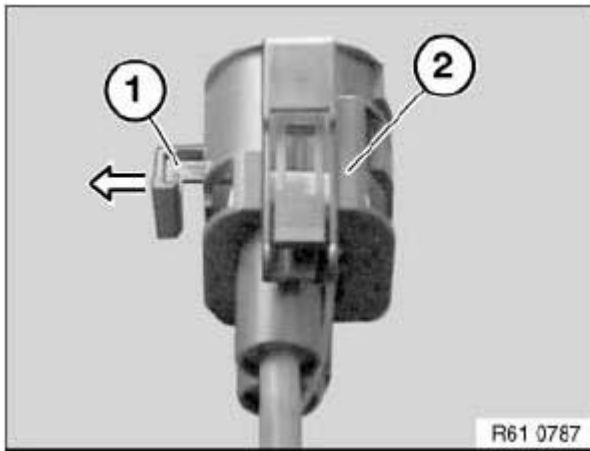


Fig. 108: Pulling Lock Out Of Socket Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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

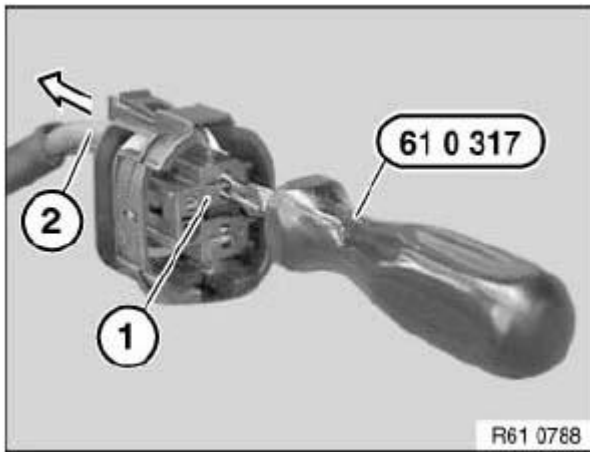


Fig. 109: Pulling Out Lead With LCC Contact
Courtesy of BMW OF NORTH AMERICA, INC.

Pin housing:

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

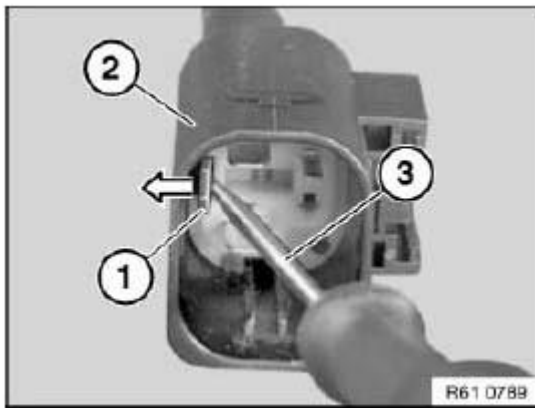


Fig. 110: Unlocking Locking Slide Of Pin Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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

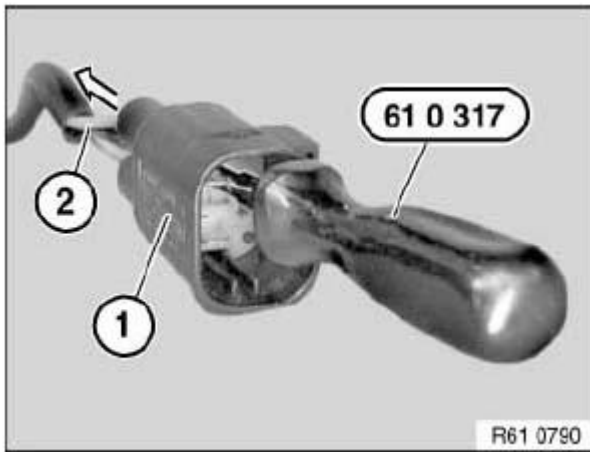


Fig. 111: Inserting Special Tool (61 0 317) Into Pin Housing
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... RELAY CARRIER

Place special tool **61 1 153** on relay carrier (1) and carefully pull in direction of arrow until retaining lugs (2) on relay carrier are raised.

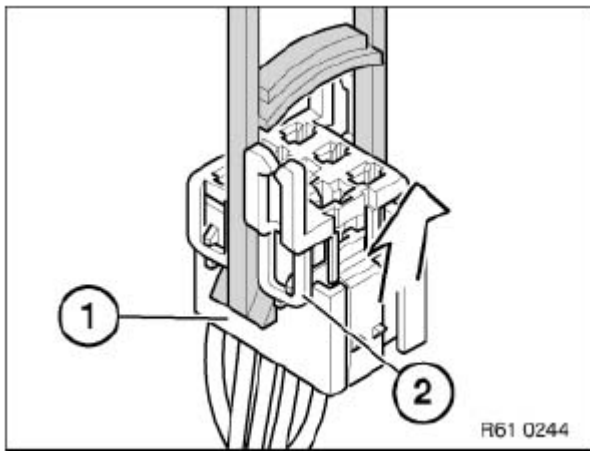
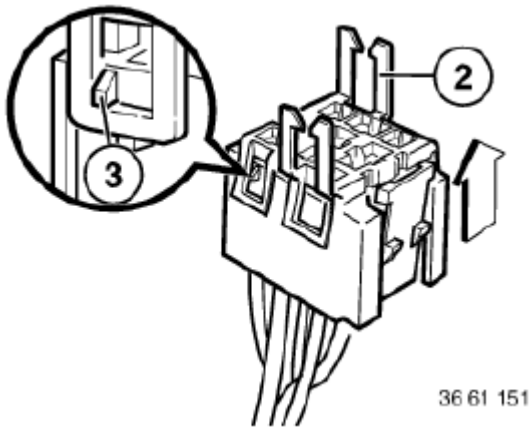


Fig. 112: Placing Special Tool (61 1 153) On Relay Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

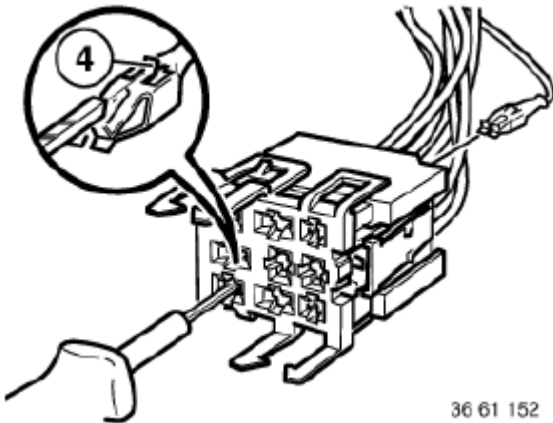
Pull relay carrier (2) in direction of arrow into first catch (3).

**Fig. 113: Pulling Relay Carrier**

Courtesy of BMW OF NORTH AMERICA, INC.

Press down arrester hook (4) of appropriate contact and pull out cable with contact.

Press out double flat spring contact with special tool **61 1 136** or **61 1 137** (ejector).

**Fig. 114: Pressing Down Arrester Hook**

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... REMOVING AND INSTALLING/REPLACING OBD-II SOCKET

Special tools required:

- **61 0 315**

Necessary preliminary tasks:

- Remove **FOOTWELL SIDE TRIM PANEL ON A-PILLAR, LEFT**

Release screws (1).

Remove OBD-II socket (2) from holder (3).

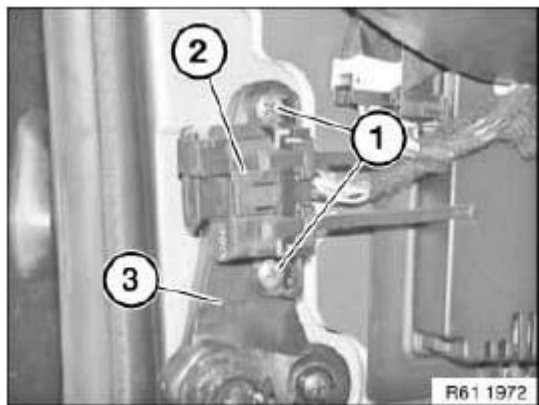


Fig. 115: Identifying OBD-II Socket, Holder And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Remove OBD-II socket cover (2) from OBD-II socket (1).

Unlock slide plate (3) with a suitable tool in direction of arrow.

Insert special tool **61 0 315** in OBD-II socket (1) in direction of arrow and press out associated flat spring contact (4). Press remaining flat spring contacts with special tool **61 0 315** out of OBD-II socket (1).

Installation:

Pay attention to pin assignment of OBD-II socket (1).

Make sure flat spring contacts and slide plate (3) are correctly engaged and seated in OBD-II socket (1).

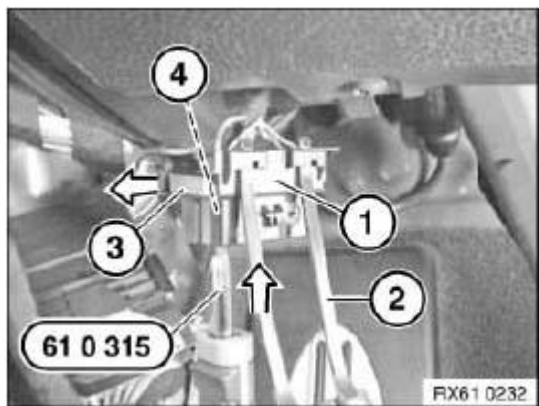


Fig. 116: Unlocking Slide Plate
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... REPAIRING RIBBON CABLES

Special tools required:

- **61 1 190**

Place ribbon cables (1) in connector housing (2) and close cover (3).

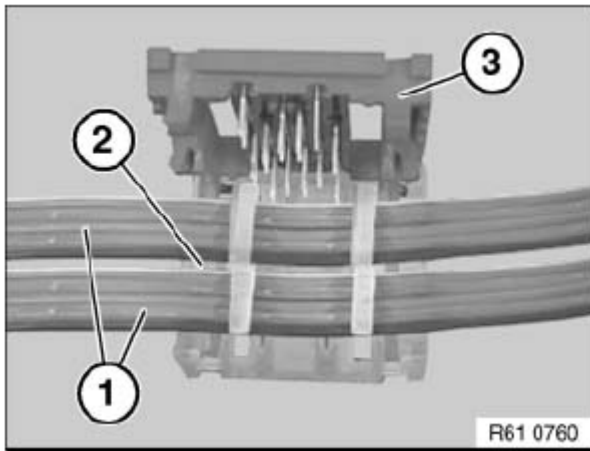


Fig. 117: Identifying Ribbon Cables And Connector Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Place connector housing (1) in tool (2) **61 1 190**.

Close tool (2).

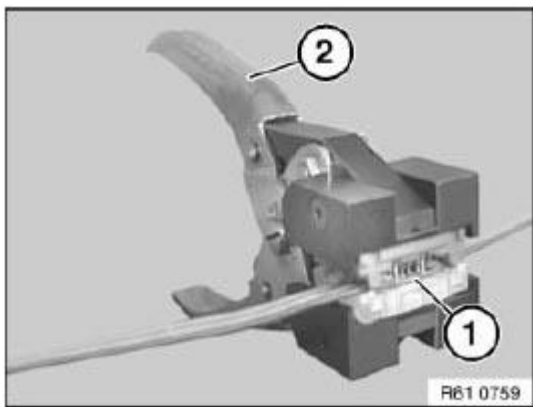


Fig. 118: Placing Connector Housing In Tool
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... FUSE HOLDER

Remove appropriate fuse from fuse holder (1).

NOTE: Identify the position when removing fuses.

Pull sliding lock (2) out of fuse holder (1) completely.

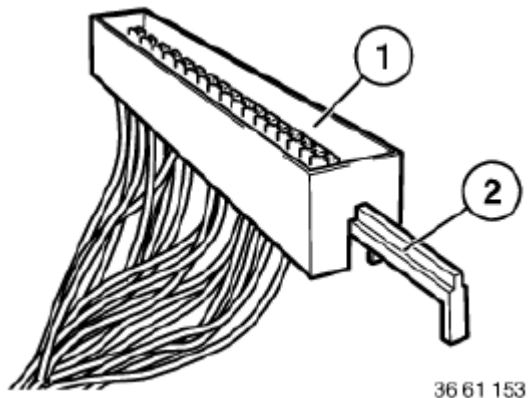


Fig. 119: Identifying Fuse Block
Courtesy of BMW OF NORTH AMERICA, INC.

With special tool 61 1 136 or 61 1 137 (pressing-off tool), press back retaining hooks (3) of appropriate contact and pull out cable.

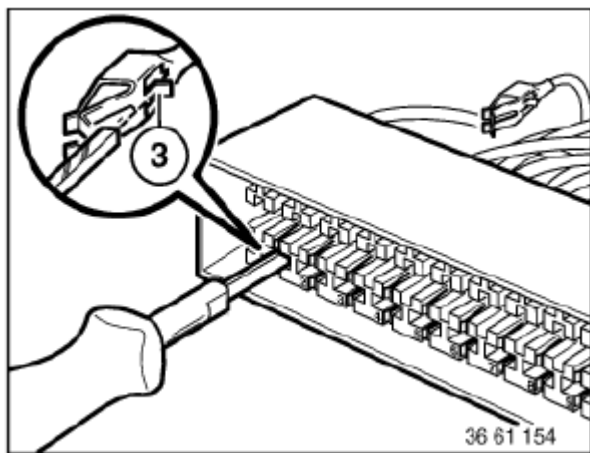


Fig. 120: Pressing Back Arrester Hook
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... SOCKET HOUSING (RADIO PLUG), HYBRID SYSTEM MQS/MPQ

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

Press lock (1) in direction of arrow.

Detach secondary lock (2) from radio plug.

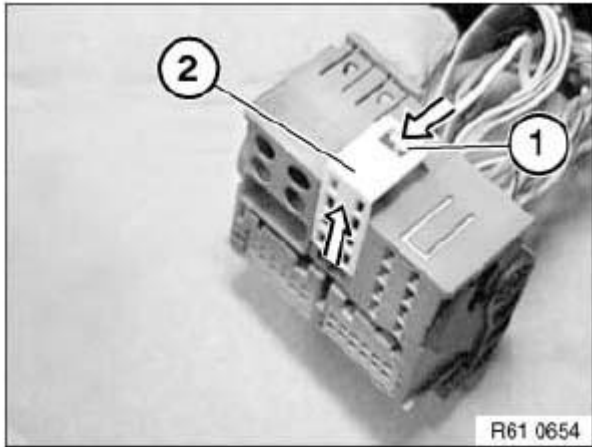


Fig. 121: Detaching Secondary Lock From Radio Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Feed special tool 61 1 135 past side of contact.

Press special tool 61 1 135 in direction of arrow.

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

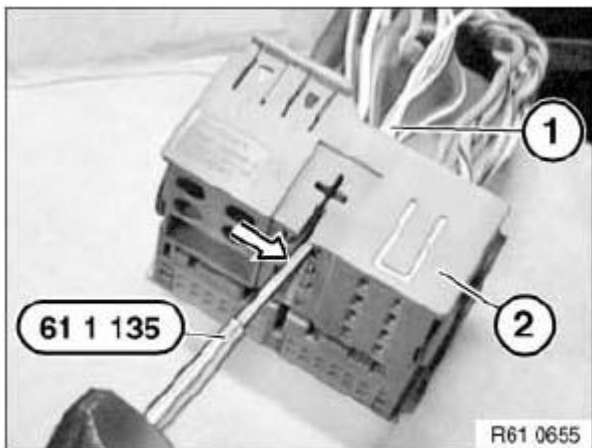


Fig. 122: Pressing Special Tool (61 1 135)
Courtesy of BMW OF NORTH AMERICA, INC.

Removing MQS contacts from contact carrier:

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

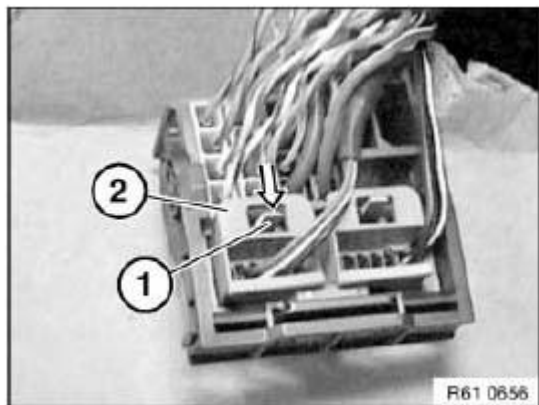


Fig. 123: Pulling Housing Out Of Radio Plug
Courtesy of BMW OF NORTH AMERICA, INC.

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.

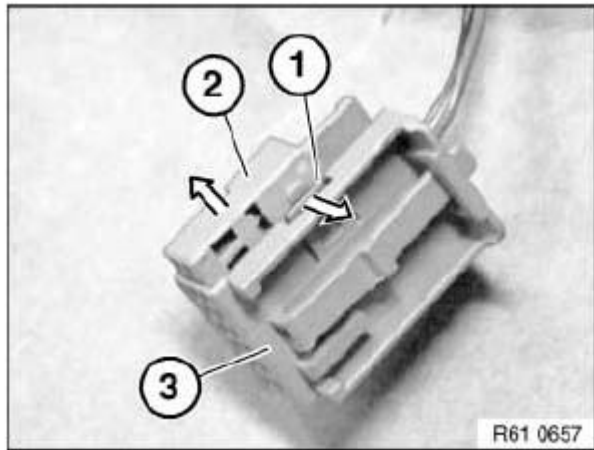


Fig. 124: Pulling Contact Carrier Out Of Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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).

NOTE: The illustration shows an 8-pin socket housing where removal of the contacts is identical.

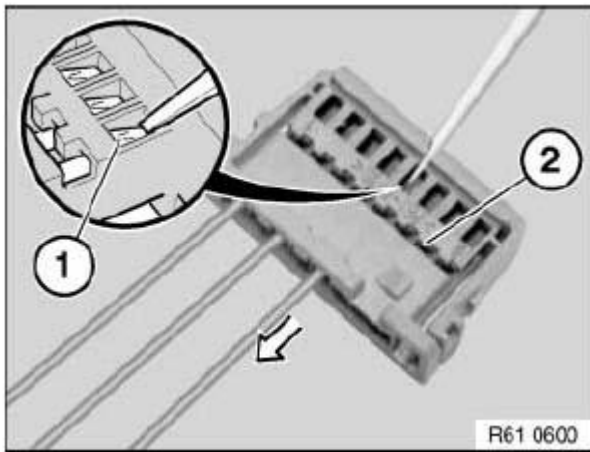


Fig. 125: Identifying Retaining Hook And Secondary Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

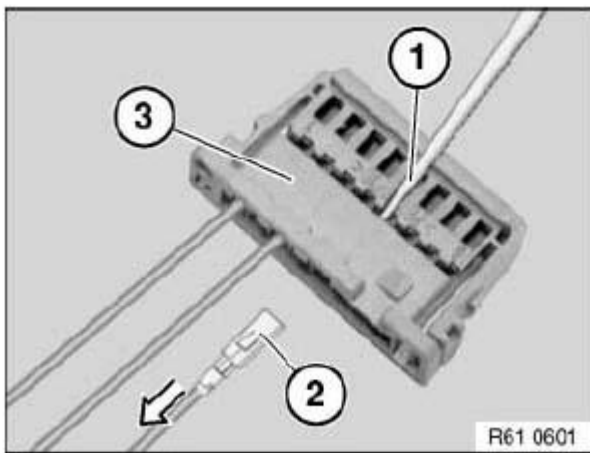


Fig. 126: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

Removing MPQ contacts from contact carrier:

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

Raise lock (2) on radio plug.

Pull contact carrier (3) out of radio plug.

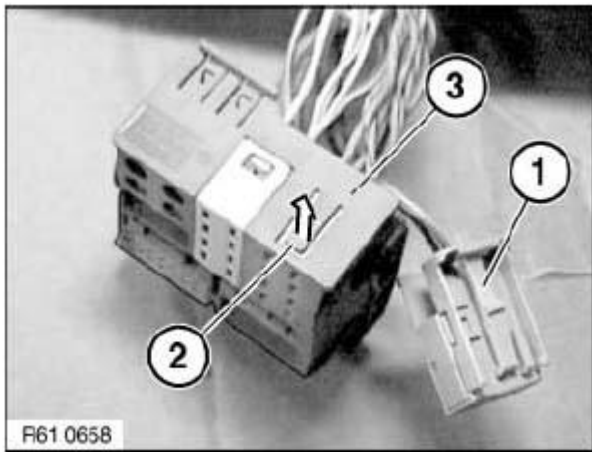


Fig. 127: Raising Lock On Radio Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock (1) in direction of arrow.

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

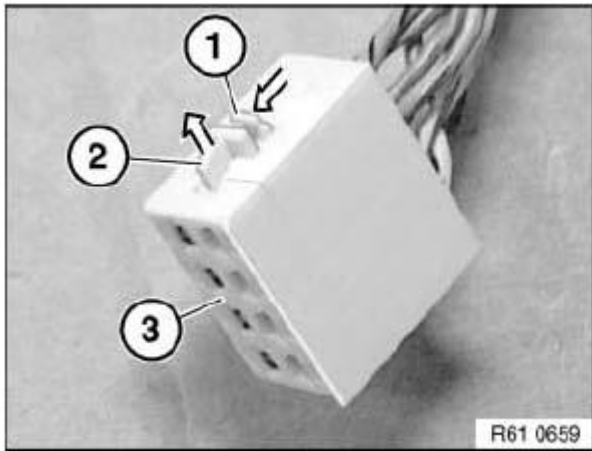


Fig. 128: Pulling Secondary Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

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

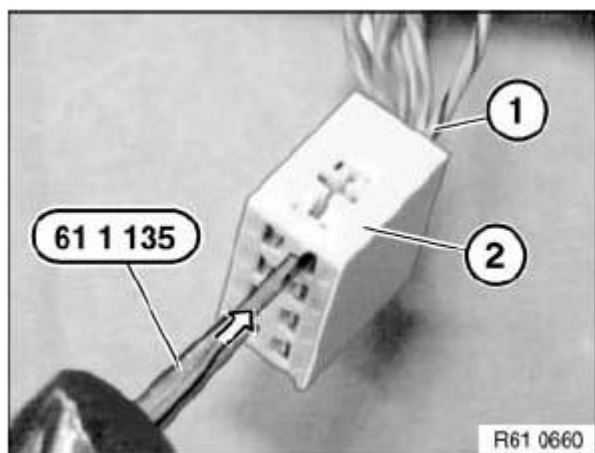


Fig. 129: Pressing Special Tool (61 1 135) Into Contact Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... SOCKET HOUSING 42-, 43-PIN, HYBRID SYSTEM MQS / MPQ

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 1 134 and pull out cable with contact.

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

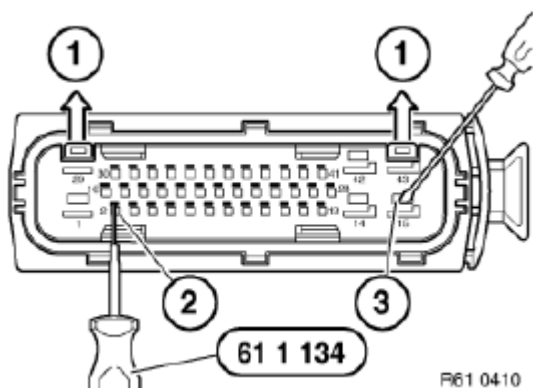
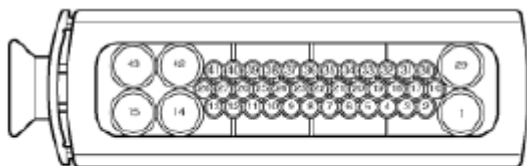


Fig. 130: Pressing Back Retaining Hook Of MQS Contacts Using Special Tool (61 1 134)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Bend open retaining hook of contacts gently before inserting into plug housing.

To install contacts, observe cavity numbers on reverse side of socket housing.



P61 0411

Fig. 131: Identifying Socket Housing

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... SOCKET HOUSINGS, 2 X 21-, 2 X 27-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)

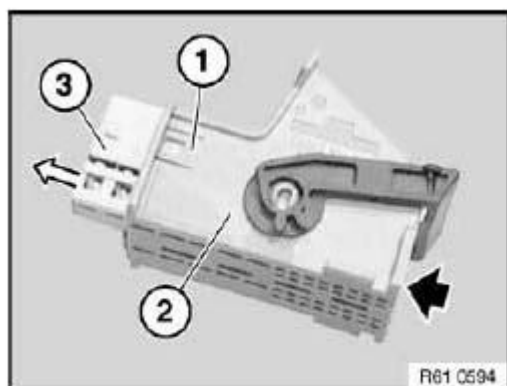
Manufactured by Siemens: The following contact types without strand sealing can be fitted in the socket housings:

- Elo (electronic contact)
- Elo-Power 2.8 mm wide (electronic contact for heavy loads)
- Elo-Power 5.2 mm wide (electronic contact for heavy loads)

Raise lock (1) on housing (2).

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

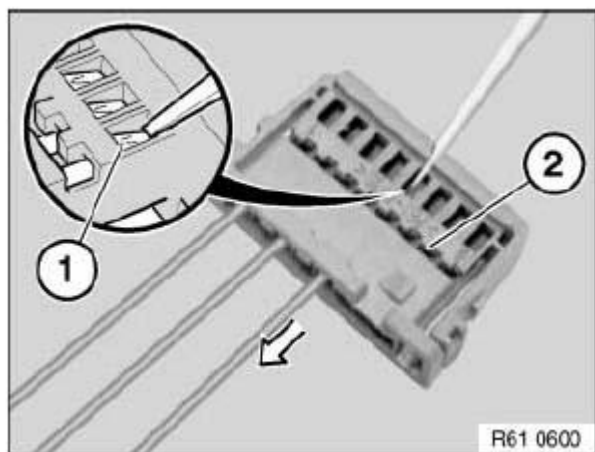
NOTE: The second contact carrier is pushed out in the same way.
Pushing out the contact carrier releases the secondary locks of the socket contacts.

**Fig. 132: Pushing Contact Carrier**

Courtesy of BMW OF NORTH AMERICA, INC.

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).

**Fig. 133: Identifying Retaining Hook And Secondary Lock**

Courtesy of BMW OF NORTH AMERICA, INC.

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

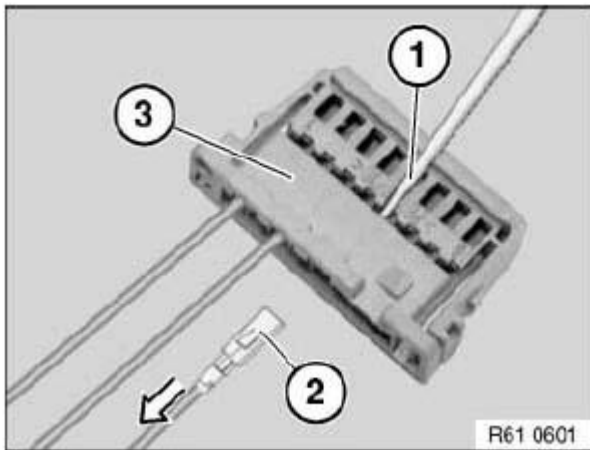


Fig. 134: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

61 13... SPECIAL TOOLS FOR WIRING HARNESS REPAIRS

Special tools required:

- 12 1 080
- 61 1 200
- 61 0 210
- 61 0 220
- 61 0 230
- 61 0 300
- 61 0 400
- 61 1 190
- 61 4 320
- 61 9 041
- 61 9 044

Repair range, vehicle electrical system:

- Refer to Service Information:

SI 2 04 07 341

Release and press-out tool:

- Special tool **61 0 300**
- Special tool **61 0 400** (MINI N12/N14)

Handling:

- **OPENING PLUG HOUSINGS AND REMOVING CONTACTS** of different plug systems

Refer to Service Information:

- SI 2 05 05 217
- SI 2 05 06 294
- SI 2 08 06 312



Fig. 135: Identifying Press-Out Tool
Courtesy of BMW OF NORTH AMERICA, INC.

Cutting to length and stripping insulation from cables:

Handling:

- **CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES**

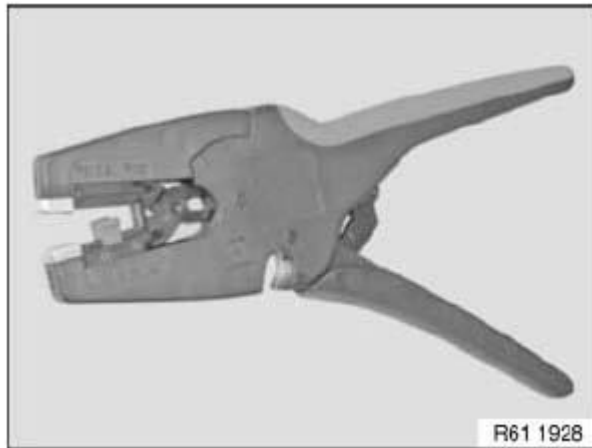
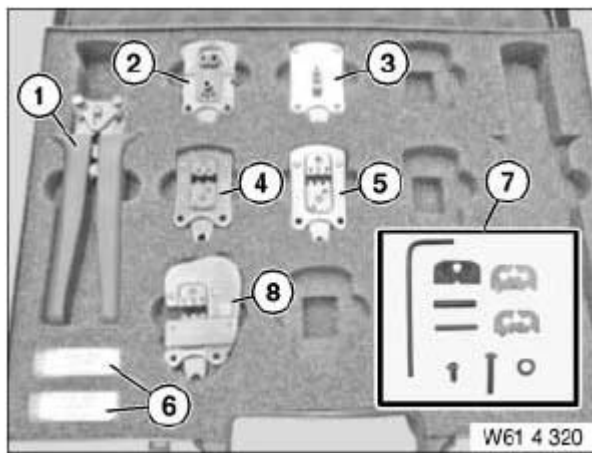


Fig. 136: Identifying Pliers

Courtesy of BMW OF NORTH AMERICA, INC.

Crimping stop parts (small contacts):

- special tool **61 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

**Fig. 137: Identifying Crimping Stop Parts (Small Contacts)**

Courtesy of BMW OF NORTH AMERICA, INC.

Crimping stop parts (large contacts):

- Special tool **61 0 200** (crimping set)
- Special tool **61 0 210** (matrix set LSK 8)
- Special tool **61 0 220** (matrix set SLK 2.8)
- Special tool **61 0 230** (matrix set MAK 8 / DFK4)

Handling:

- Refer to Service Information:

SI 2 02 05 194

SI 2 07 05 233

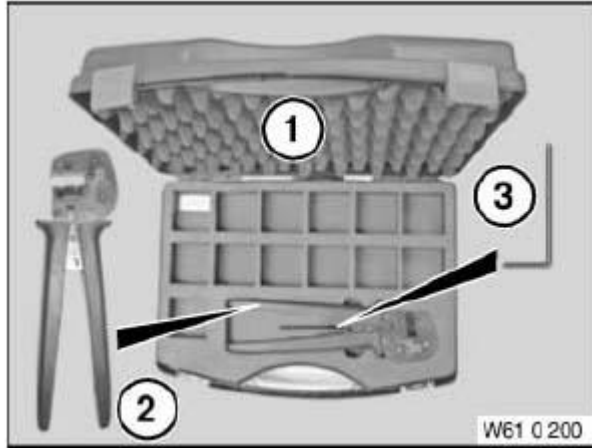


Fig. 138: Identifying Crimping Stop Parts (Large Contacts)
Courtesy of BMW OF NORTH AMERICA, INC.

Crimping antenna elbow plugs:

- Special tool **61 9 041** (hand crimping tool)
- Special tool **61 9 044** (matrix)

Handling:

- Antenna elbow plug on radio receiver

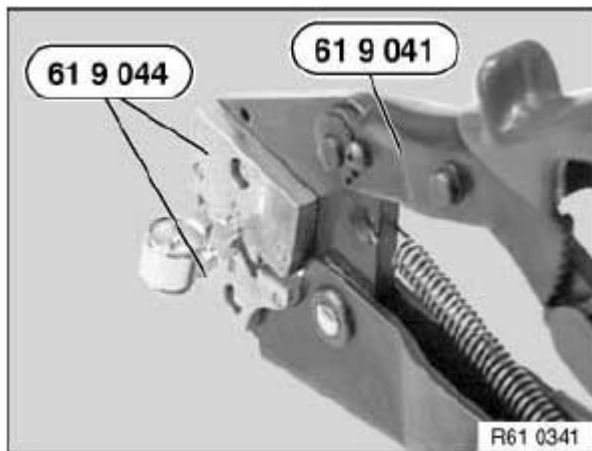


Fig. 139: Identifying Hand Crimping Tool (61 9 041) And Matrix (61 9 044)
Courtesy of BMW OF NORTH AMERICA, INC.

Repair kit for ignition cables and for crimping fan connector receptacles **4 mm²** :

- special tool **12 1 080**

Handling:

- **CRIMPING STOP PARTS (CONTACTS)**



W12 1 080

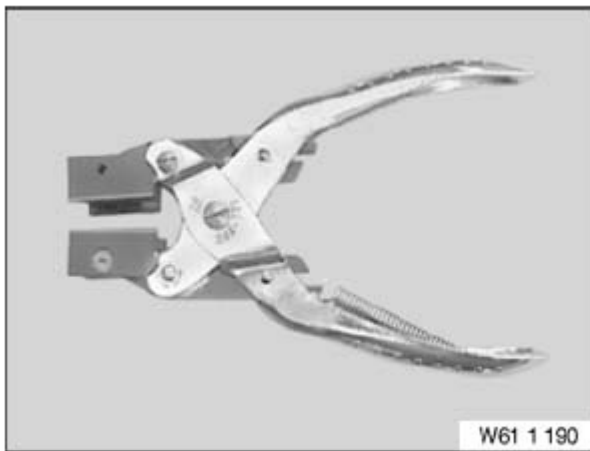
Fig. 140: Identifying Special Tool (12 1 080)
Courtesy of BMW OF NORTH AMERICA, INC.

Repairing ribbon cables:

- special tool **61 1 190**

Handling:

- **REPAIRING RIBBON CABLES**



W61 1 190

Fig. 141: Identifying Special Tool (61 1 190)

Courtesy of BMW OF NORTH AMERICA, INC.

61 13... TREATING CABLES AND FIBRE-OPTIC CABLES

Special tools required:

- **61 1 190**
- **61 4 320**

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

SPECIAL TOOLS REFERENCE

Repair range for vehicle electrical system	
Crimping set with tool for fibre-optic cables, Micro Power Quadlock (MPQ), Micro Quadlock System (MQS) contacts and universal crimping head	61 4 320
Insulation displacement tool for ribbon cable	61 1 190

Subject of repair instructions

- **SPECIAL TOOLS FOR WIRING HARNESS REPAIRS**
- **CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES**
- **CRIMPING STOP PARTS (CONTACTS)**
- **BUTT CONNECTOR FOR REPAIRING A PLUG CONNECTION**
- **FAN CONNECTOR FOR RETROFITTING/REPAIRS**
- Aerial elbow plug on radio receiver
- **CUTTING TO LENGTH AND STRIPPING INSULATION FROM OPTICAL FIBERS**
- **CRIMPING OPTICAL FIBRES**
- Insulation displacement connector for **REPAIRING RIBBON CABLES**

61 13... UNLOCKING AND DISCONNECTING DIFFERENT PLUG CONNECTIONS

NOTE: Examples of unlocking and disconnecting different plug connections.

Press lock and open clip in direction of arrow.

Disconnect plug connection.

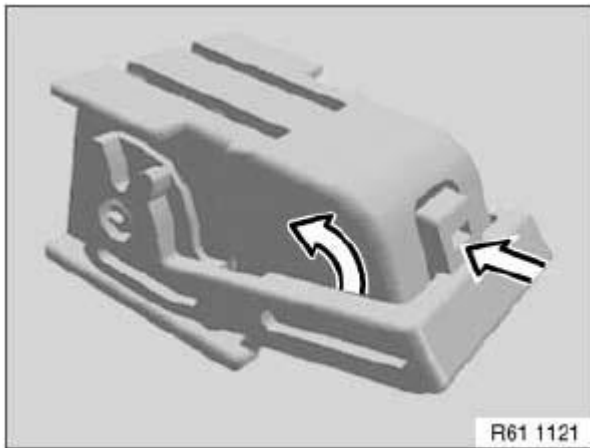


Fig. 142: Pressing Lock And Open Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and open clip in direction of arrow.

Disconnect plug connection.

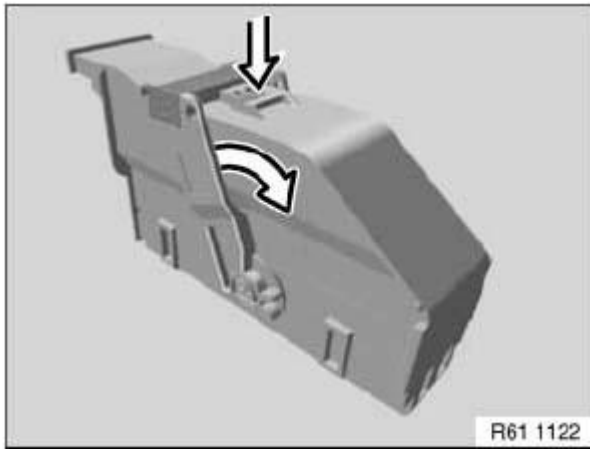


Fig. 143: Pressing Lock And Open Clip
Courtesy of BMW OF NORTH AMERICA, INC.

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

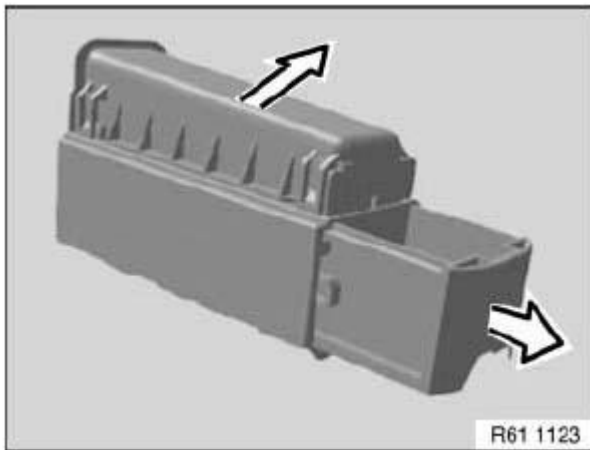


Fig. 144: Disconnecting Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

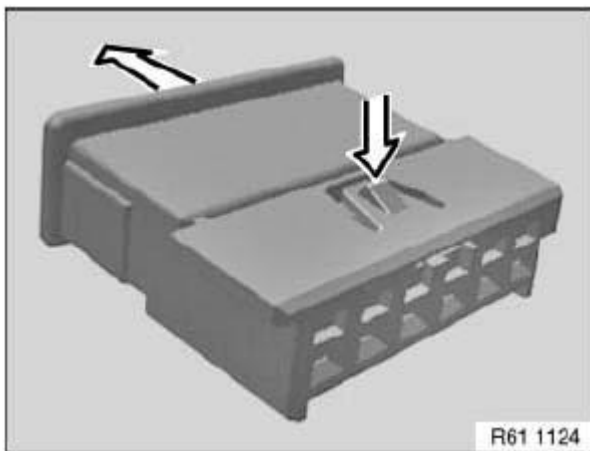
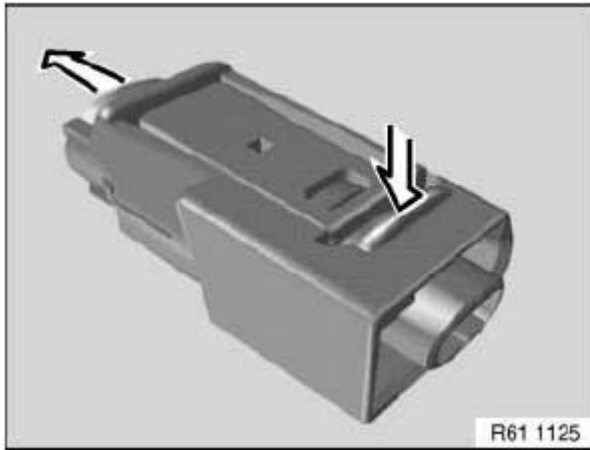


Fig. 145: Pressing Lock

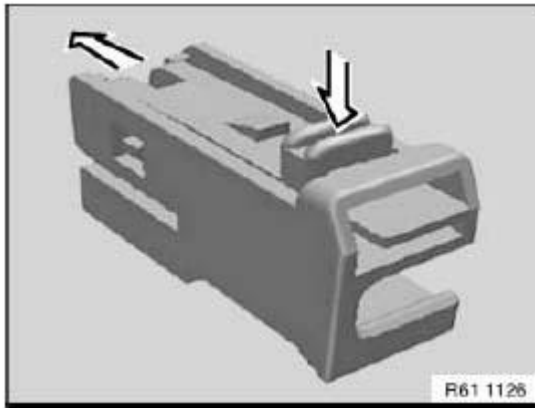
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 146: Pressing Lock**

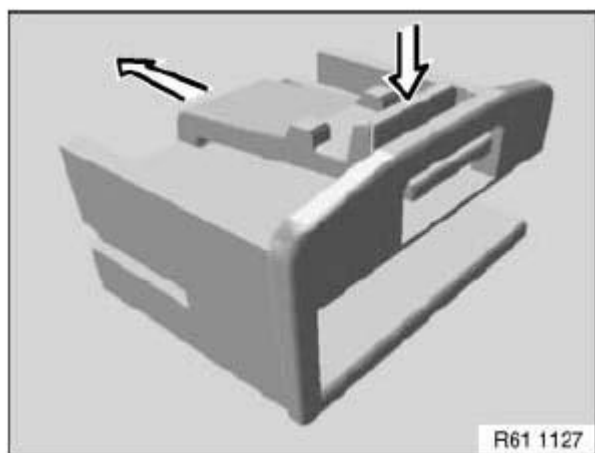
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 147: Pressing Lock**

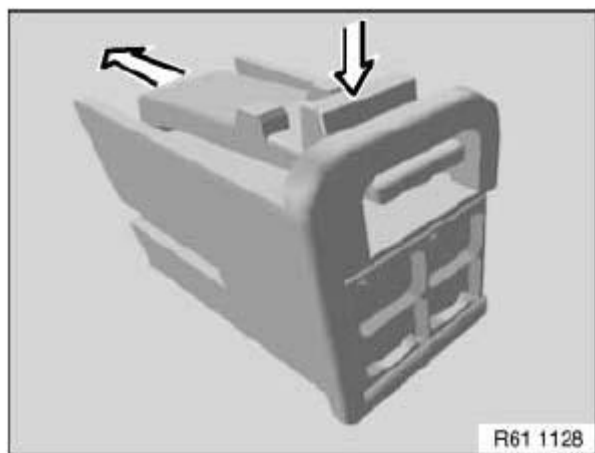
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 148: Pressing Lock**

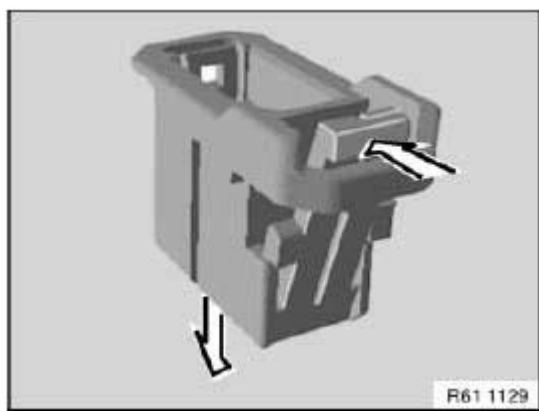
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 149: Pressing Lock**

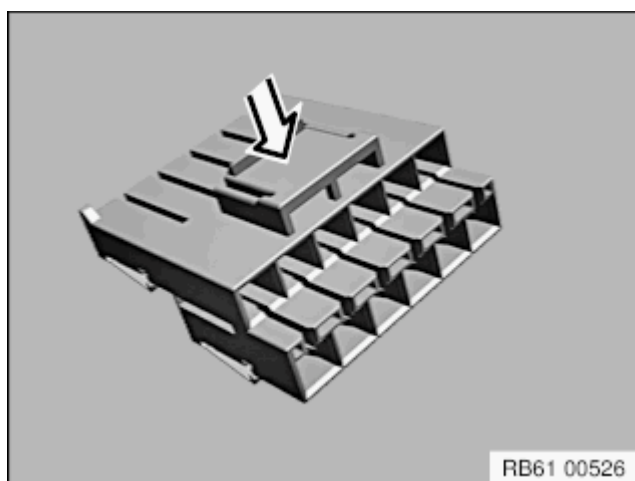
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 150: Pressing Lock**

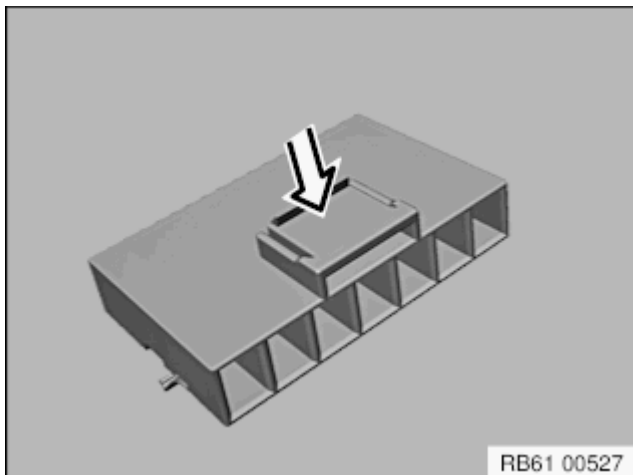
Courtesy of BMW OF NORTH AMERICA, INC.

Press the lock and detach plug connection.

**Fig. 151: Pressing Lock**

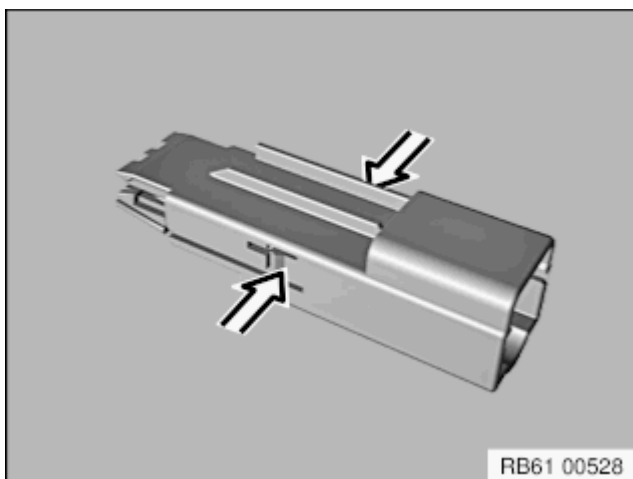
Courtesy of BMW OF NORTH AMERICA, INC.

Press the lock and detach plug connection.

**Fig. 152: Pressing Lock**

Courtesy of BMW OF NORTH AMERICA, INC.

Press the lock on both sides and detach plug connection.

**Fig. 153: Pressing Lock**

Courtesy of BMW OF NORTH AMERICA, INC.

Press the lock and detach plug connection.

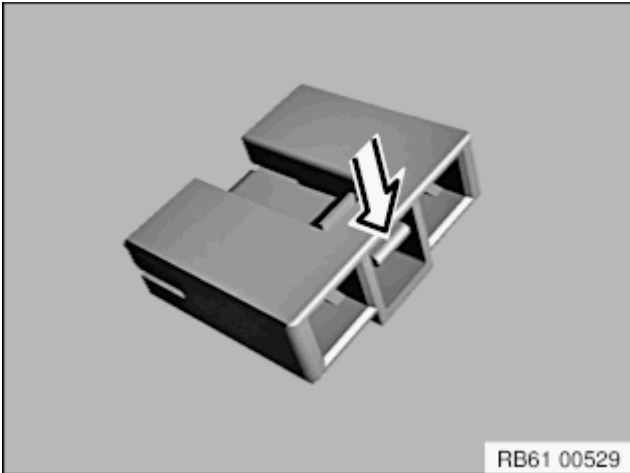


Fig. 154: Pressing Lock

Courtesy of BMW OF NORTH AMERICA, INC.

61 13 040 REPLACING DISTRIBUTION BOX (PASSENGER COMPARTMENT)

WARNING: Observe SAFETY INSTRUCTIONS for handling vehicle battery.

Necessary preliminary tasks:

- Remove LUGGAGE COMPARTMENT TRIM ON SIDE PANEL ON RIGHT
- Disconnect negative battery cable
- Remove TRIM FOR INSTRUMENT PANEL, BOTTOM LEFT
- Remove RIGHT GLOVEBOX WITH HOUSING

Release screws (1) and remove distribution box (2).

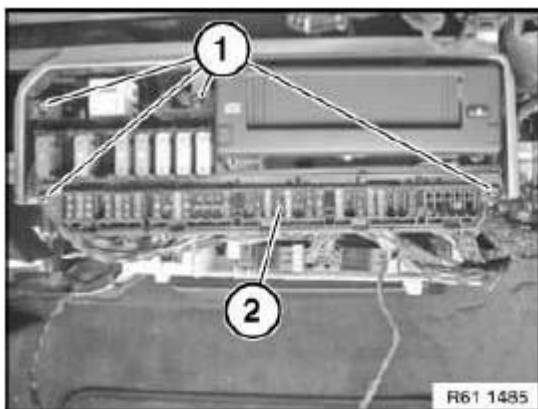


Fig. 155: Identifying Distribution Box And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect all plug connections (1).

Unlock relay base (3) and disconnect.

Open cover (2) on positive battery cable and release nut underneath.

Tightening torque **61 21 2AZ** .

Disconnect positive battery cable from distribution box.

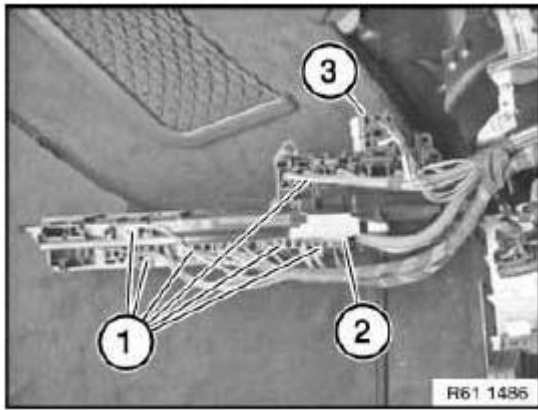


Fig. 156: Identifying Relay Base And Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure positive battery cable is correctly seated on fuse box.

Replacement:

Remove fuses.

61 13 042 REPLACING DISTRIBUTION BOX (LUGGAGE COMPARTMENT)

WARNING: Observe **SAFETY INSTRUCTIONS** for handling vehicle battery.

Necessary preliminary tasks:

- Remove **LUGGAGE COMPARTMENT TRIM ON SIDE PANEL ON RIGHT**
- Disconnect negative battery cable

Security version:

- Remove protective cover from distribution box/battery positive terminal (luggage compartment)

Open cover (1) and release nut underneath.

Tightening torque **61 21 2AZ** .

Disconnect plug connection (2) in direction of arrow.

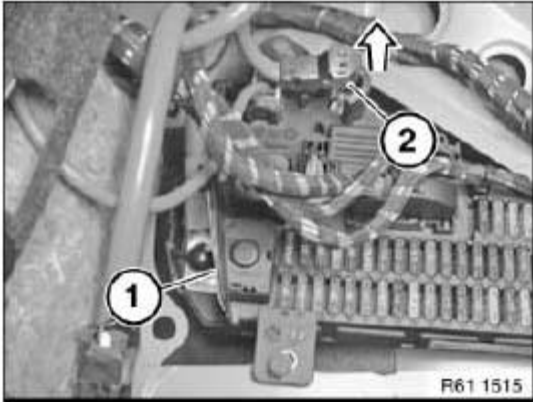


Fig. 157: Identifying Cover And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screws (2) and remove distribution box.

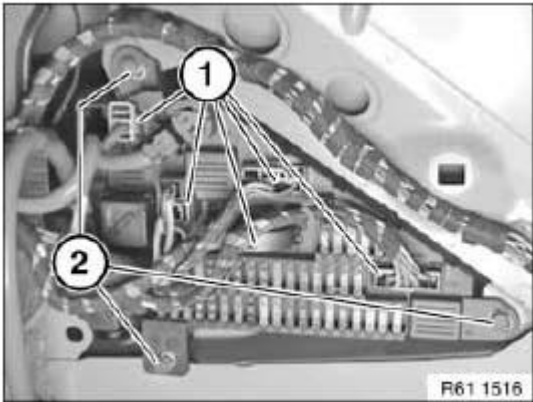


Fig. 158: Identifying Distribution Box Screws And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Security replacement only:

Remove rib (1).

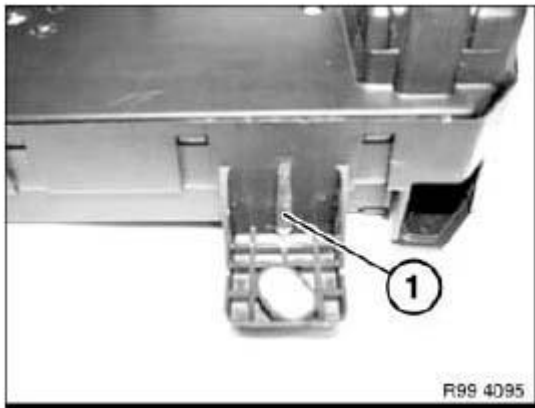


Fig. 159: Identifying Rib

Courtesy of BMW OF NORTH AMERICA, INC.

Remove rib (1).

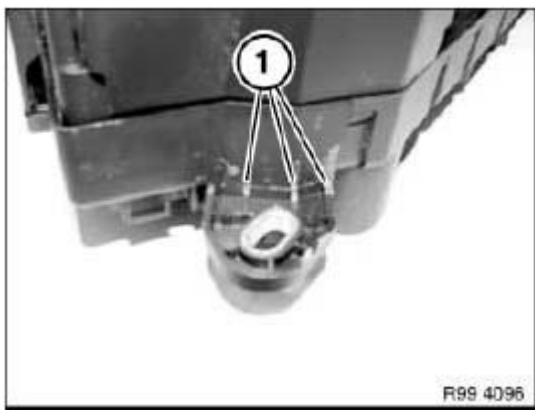


Fig. 160: Identifying Rib

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Remove fuses and relays.

BATTERY

12 00... INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY

Observe **SAFETY INSTRUCTIONS FOR HANDLING VEHICLE BATTERY.**

Before disconnecting battery:

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

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

- IMPORTANT:**
- There is a danger of mixing up battery leads: If the battery positive and negative leads are the same color and you are in doubt, follow the polarity to the battery, then mark and cover the leads.
 - On vehicles with radio code: After disconnecting the battery, the radio code must be re-entered. Therefore obtain the radio code card from the customer beforehand. Note stored stations and restore them after connecting the battery.
 - Stored settings of the on-board computer and clock will also be lost.
 - All available central keys must be recoded for cars with first generation infrared transmitter locking systems.

General notes on disconnecting battery:

- Do not disconnect battery leads and leads from alternator and starter motor while engine is running.
- Cars with IBS on battery negative terminal:

Do not under any circumstances pull/lever off pole shoes by force.

Do not under any circumstances release socket-head cap screw of IBS.

- Detach **TERMINAL OF BATTERY NEGATIVE** lead from car battery and second battery if fitted. 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 battery is connected.
- When installing battery terminal: Tightening torque **61 21 1AZ** .

After connecting battery:

IMPORTANT: The scope of application of some systems may be restricted after a power supply interruption.

Likewise, individual settings may be lost.

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

Example:

- Vehicles with automatic engine start-stop system (MSA):

MSA function is active only after learning period (vehicle must not be woken for a period of approx. 6 hours) > if necessary, notify customer of the situation

- E46 (AWD)/ E53/ E83: Carry out STEERING ANGLE SENSOR ADJUSTMENT
- If necessary, carry out ADJUSTMENT OF ACTIVE FRONT STEERING
- If necessary, activate SLIDING SUNROOF
- If necessary, activate POWER WINDOWS
- If necessary, activate mirror with compass

Please refer to the Progan user documentation for further information on vehicle-specific activation.

Vehicles with a two-battery system

Starter and equipment batteries

A two-battery system has a starter battery circuit and an equipment battery circuit. A supplementary control unit monitors both battery circuits. Depending on the situation, the battery circuits are connected to or isolated from the supplementary control unit via an isolating relay.

Two AGM batteries, whose design and properties are described in AGM BATTERIES, are used as a storage battery.

IMPORTANT: These batteries must not under any circumstances be charged with a voltage in excess of 14.8 V. Rapid programs must not be used either.

Receiving/giving starting assistance via jump start terminal

The engine can be jump-started with an external voltage supply via the jump start terminal on the right side of the engine compartment.

NOTE: The starter battery is isolated from the alternators when the engine hood/bonnet is open.

Giving starting assistance via the jump start terminal is thus limited by the capacity of the starter battery when the engine hood/bonnet is open.

Charging starter and equipment batteries via jump start terminal

The starter battery is charged as a matter of priority with a charger connected to the jump start terminal. The voltage at the starter battery is the decisive factor in determining whether the equipment battery is also included in the charging operation. The supplementary control unit automatically detects a charging operation at a charging voltage at the starter battery of $>$ or $=$ 13.5 V. The isolating relay is closed and thus the equipment battery is connected in parallel. Both batteries are now charged.

Prerequisite:

- Terminal 61 inactive
- Terminal 15 inactive

If terminal 15 becomes "active" during the charging operation, the isolating relay is opened immediately and again only the starter battery is charged.

NOTE: When the engine hood is open, the isolating relay is also opened in normal operation when the engine is running.
A special mode can be set by means of diagnosis for workshop/garage operation. The isolating relay is closed from terminal R in this operating mode. This mode is automatically reset once a distance of 5 km has been driven.

Trickle charging

The increased closed-circuit current consumption can be compensated for via the jump-start connection point with the aid of the "Acctiva easy" battery trickle charger .

IMPORTANT: The cigarette lighter is isolated from the electrical system after terminal R "OFF" on a timed basis (60 mins.), thereby interrupting charging of the equipment battery via the cigarette lighter. This is prevented if the battery master switch (on the right side of the luggage compartment behind the panel) is turned on and off again twice within 2 seconds. (Cigarette light battery charging function).

61 20... THRESHOLD VALUES FOR BATTERY INSPECTION OF ALL BATTERY (TELEPHONE EXCEPT FOR TELEPHONE BATTERY)

IMPORTANT: Read and comply with SAFETY INSTRUCTIONS FOR HANDLING VEHICLE BATTERY.

Test step 1 - before battery charge:

Charge state ⁽¹⁾	Starting capability ⁽²⁾	Test result
Not testable		Charge
less than 50 % ⁽²⁾		Charge
greater than 50 %	less than 75 %	Charge
greater than 50 %	greater than 75 % ⁽³⁾	Charge
greater than 80 %	greater than 75 %	O.K.
(1) State of charge and start output must always be evaluated in combination		
(2) Test charging for more than 5 hours with Gossen CG 32 or Siemens / Gossen VB 801 charger		

(3) Fully charge until the state of charge is greater than 80%.

Test step 2 - after battery charge:

Charge condition (1)	Starting capability (2)	Test result
Not testable		Faulty
less than 50 %	less than 75 %	Charge
greater than 50 %	greater than 75 %	Charge
(1) State of charge and start output must always be evaluated in combination		
(2) Test charging for more than 5 hours with Gossen CG 32 or Siemens / Gossen VB 801 charger		

NOTE: If the battery has been tested from the positive terminal in the engine compartment, repeat the test for safety directly on the battery.

61 20... (SAFETY) INFORMATION ON AGM BATTERY



T6-1040/16

Fig. 161: Identifying AGM Battery
Courtesy of BMW OF NORTH AMERICA, INC.

Introduction

In September 2002 so-called VRLA batteries, better known as **AGM batteries**, were introduced.

(VRLA stands for Valve Regulated Lead Acid, i.e. lead acid battery with pressure relief valve; **AGM** stands for **A**bsorbent **G**lass **M**at, i.e. absorbent glass fibre fleece)

AGM batteries are fitted in models with electrical loads/consumers which have a high energy demand.

With the option SA 146 (2nd battery), the AGM battery (70 Ah) is fitted as the 2nd battery.

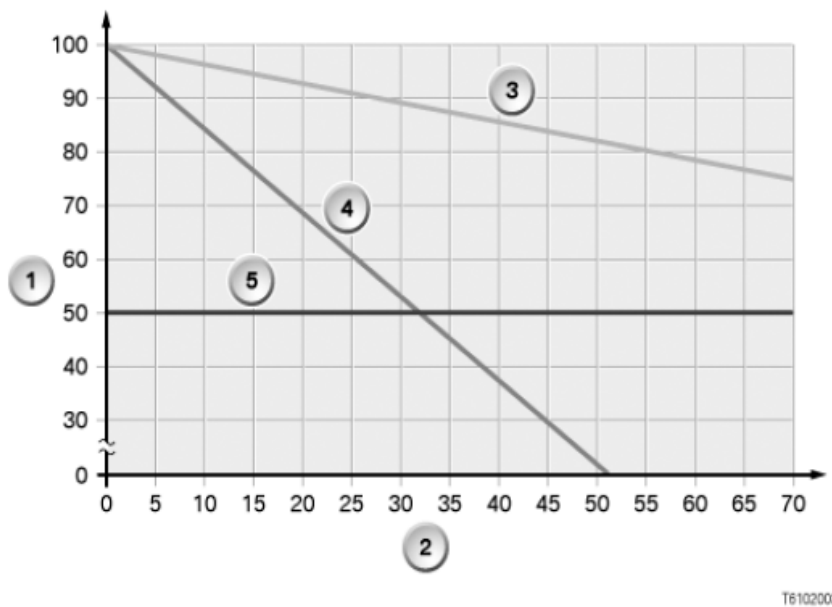
The constantly increasing energy demand of modern vehicle electrical systems calls for ever more powerful battery solutions.

Today, up to 100 servomotors, which have to be electrically powered, operate in a modern luxury-class motor vehicle. Added to these are safety, environmental and comfort and convenience elements which are increasingly becoming standard features, such as e.g. Anti-lock Brake System (ABS), Dynamic Stability Control (DSC), electric steering effort assistance (EPS), heated catalytic converter, electronic chassis and suspension control, air conditioning and navigation system. The power consumption is considerable even when the vehicle is parked.

The somewhat higher price compared with a battery of similar size is fully balanced by the following benefits:

- Significantly longer service life
- Increased starting reliability at low temperatures
- Safe starting of engines with high starting current demands, e.g. high-performance diesel engines
- 100 % freedom from maintenance
- Low risk in event of an accident (reduced risk to the environment)

Service life of AGM battery



T6102003

Key	Explanation	Key	Explanation
1	Available capacity [%]	2	Kilometres covered [1000 km]
3	AGM battery	4	Lead calcium battery
5	50 % capacity limit		

Fig. 162: AGM Battery Service Life Graph

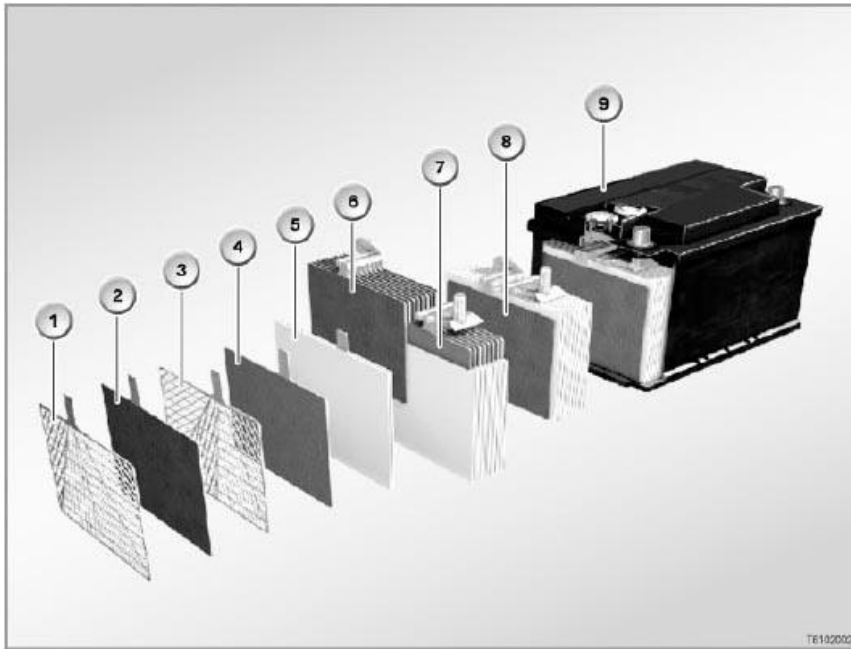
Courtesy of BMW OF NORTH AMERICA, INC.

Unlike the previously used lead calcium batteries, the sulfuric acid contained in batteries with fleece technology is not self-contained in the battery housing.

Instead, the sulfuric acid is 100 % bound up in glass fibre fleece mats (separators). Thus, no acid can escape if the battery housing is damaged. In addition, the AGM battery is sealed gas-tight. This is possible because the gases are converted back into water as a result of the separator permeability.

Brief description of components

An AGM battery can be recognized by its black housing and the lack of a so-called "Magic Eye".



Key	Explanation	Key	Explanation
1	Positive grid with silver alloy	2	Positive plate
3	Negative grid	4	Negative plate
5	Separator made of glass fibre fleece	6	Positive plate pack
7	Negative plate pack	8	Plate block
9	Block holder with bottom rails		

Fig. 163: Identifying AGM Battery Components
 Courtesy of BMW OF NORTH AMERICA, INC.

Design

The AGM battery differs from the conventional lead calcium battery as follows:

- Larger plates:

Larger plates provide for a 25 % higher power density.

- Separators made of glass fibre fleece:

These provide for up to 3 times higher cycle reliability.

This in turn improves cold starting performance, current consumption and service life.

- Gas-tight housing with pressure relief valve (see also mode of operation):

The cell plugs are welded and cannot be opened.

- Acid bound up in the glass fibre fleece:

The acid is not as previously self-contained in the housing, but 100 % bound up in the glass fibre fleece. This provides increased protection against acid leakage and thus represents a reduced risk to the environment.

Mode of operation

The AGM battery differs from conventional batteries in its non-polluting and substance-retaining behavior during charging.

When vehicle batteries are charged, the two gases oxygen and hydrogen are released by electrolysis.

- 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 way, the gas and thus also the electrolyte are not lost.

Only in the event of an excessively heavy buildup of gas, i.e. excessively high pressure buildup (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 a valve regulates the pressure in the battery, the AGM battery is also known as a VRLA battery (Valve Regulated Lead Acid).

Notes and instructions for service personnel

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 $> \text{ or } = 15.2 \text{ V}$. No quick-charging routines!

When charging removed batteries (so-called stand-alone batteries), do not exceed the maximum charging voltage of 15.2 V at room temperature. Also when charging via the jump start terminal, do not exceed the maximum charging voltage of 15.2 V at room temperature.

The AGM battery will be damaged even when it is only briefly charged with a charging voltage of more than 15.2 V. A charging voltage of more than 15.2 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 the AGM battery.*

The AGM battery must not be opened under any circumstances as the introduction of oxygen from the air will cause the battery to lose its chemical equilibrium and be rendered non-operational.

Battery changing

Any conventional lead calcium battery can always be replaced by an AGM battery.

Using an AGM battery does not require any alterations to be made to the vehicle electrical system.

NOTE: *The AGM battery is recommended for "problem customers".*

"Problem customers" encounter a high energy throughput through their batteries. This high energy throughput is caused by stationary loads/consumers (TV, independent heating, etc.) and a bad use profile for the battery ("chauffeur operation", short-distance driving, "stop-and-go"). The use of an AGM battery is recommended for these problem customers.

61 20... BATTERY CHARGING

If a normal or quick charger is used to charge the battery, the battery must be disconnected from the vehicle electrical system and removed. This prevents damage to paintwork and upholstery.

Ideally, battery charging is performed with BMW-approved charging computers, refer to

SI 2 03 98 350 and

SI 2 06 02 854.

IMPORTANT: In order to prevent malfunctions on the intelligent battery sensor (IBS), the charging terminals in the engine compartment must be used without fail on vehicles with IBS (from E60). On other vehicles, it is recommended that the charging terminals in the engine compartment are used.

IMPORTANT: Before charging the battery while it is installed, first carry out a **CLOSED-CIRCUIT CURRENT TEST**. If here the voltage is 10 V or less, one or more of the cells may be faulty or the entire battery may already be damaged. In this case, always remove the battery as escaping gases during charging could damage the interior equipment and trim. Attempt to regenerate faulty cells with low charging current.

If necessary, open existing plugs on the individual cells.

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 motorization 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.

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).

NOTE: **Vehicles with energy management systems (IBS, power module): Register battery replacement**

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 replacement

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

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

61 20... BATTERY OPEN-CIRCUIT CURRENT TEST

NOTE: Observe SAFETY INSTRUCTIONS FOR HANDLING VEHICLE BATTERY.
Observe Service Information Adapter for open-circuit current measurement.



W05 95 001

Fig. 164: Identifying Battery Open-Circuit Current Test
Courtesy of BMW OF NORTH AMERICA, INC.

The open-circuit current test is performed using the Diagnosis and Information System (DIS).

61 20 005 TESTING BATTERY WITH BATTERY TESTER

See **TESTING BATTERY WITH BATTERY TESTER**.

61 20 503 VEHICLE BATTERY - CLOSED-CIRCUIT CURRENT MONITORING

Necessary preliminary tasks:

To access negative lead of battery, perform the necessary preliminary work described in **DISCONNECTING NEGATIVE BATTERY CABLE**.

IMPORTANT: Do not disconnect negative lead of battery.

Connect BMW diagnosis system

Connect clip-on probe to negative lead of battery. The arrow on the current clamp must point towards the

battery.

Measure closed-circuit current.

61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD

WARNING: Observe **SAFETY INSTRUCTIONS** for handling vehicle battery.
Follow instructions **FOR DISCONNECTING AND CONNECTING BATTERY!**

Observe notes on power supply / on intelligent battery sensor (IBS).

Necessary preliminary tasks:

- **REMOVE BATTERY COVER OR OPEN RIGHT LUGGAGE COMPARTMENT TRIM PANEL**

Security version:

- Remove luggage compartment equipment carrier

Loosen nut (1).

Tightening torque **61 21 1AZ** .

IMPORTANT: Do not under any circumstances use force to pull off pole shoe.
Do not under any circumstances release socket-head cap screw of IBS.

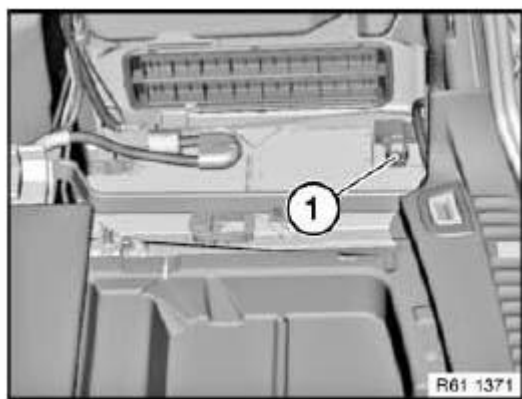


Fig. 165: Identifying Nut

Courtesy of BMW OF NORTH AMERICA, INC.

Detach battery negative lead with IBS towards top, lay to one side and secure.

61 20 908 PERFORMING BATTERY "POWER RESET" (FOR PROGRAMMING/CODING CONTROL UNIT(S))

IMPORTANT: Observe SAFETY INSTRUCTIONS FOR HANDLING VEHICLE BATTERY.

The following steps must be carried out for a "power reset":

- Switch off and disconnect battery charger
- Switch off ignition

Cars with ignition key: Turn ignition key to 0 position

Cars with identification sensor: Remove identification sensor from slot

Cars with comfort access system: Make sure terminal is in 0 position

- Disconnect battery negative terminal
- Reconnect battery negative terminal (to ensure bus activity)
- Waiting time (5-10 seconds)
- Disconnect battery negative terminal
- Waiting time (1 minute)
- Connect battery negative terminal and tighten, tightening torque **61 21 1AZ**
- Connect and switch on battery charger
- Switch ignition on

BATTERY / VAPOR SEPARATOR**61 21... REMOVING AND INSTALLING BATTERY COVER**

Necessary preliminary tasks:

- Remove flap in luggage compartment panel on right. See **REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL (WITH STOWAGE PACK)** and **REMOVING AND INSTALLING / REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT**
- Remove rear trim for luggage compartment floor. See **REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL (WITH STOWAGE PACK)** and **51 47 101 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**

Unscrew nuts (1).

Release screw (4).

Fold back battery cover (2) in direction of arrow.

If necessary, lift luggage compartment floor storage tub (3) in area of battery cover (2).

Remove battery cover (2) towards top.

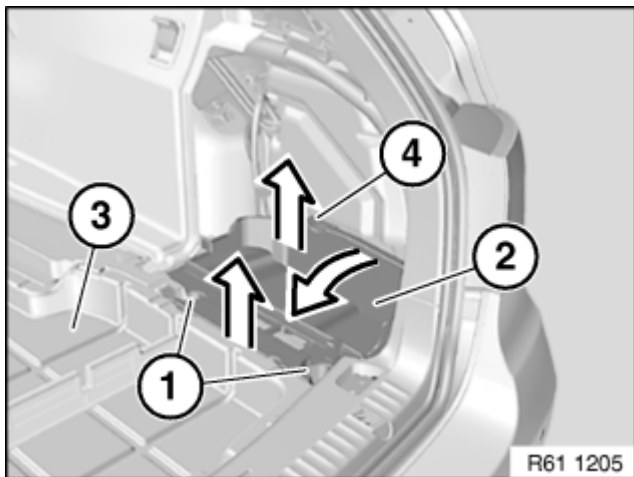


Fig. 166: Identifying Battery Cover, Nuts, And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 21 010 REMOVING AND INSTALLING OR REPLACING BATTERY

WARNING: Observe SAFETY INSTRUCTIONS for handling vehicle battery.
Observe notes on power supply / on intelligent battery sensor (IBS).

Necessary preliminary tasks:

- Disconnect battery negative lead

Security version:

- Remove protective cover from distribution box/battery positive terminal (luggage compartment)

Disconnect plug connection (1) of IBS cable.

Unscrew nut (3). Tightening torque **61 21 1AZ** .

IMPORTANT: Do not under any circumstances pull/lever safety battery terminal (2) off by force.

Detach safety battery terminal (2) towards top, lay to one side and secure.

Release nuts (4) and remove rollover protection (5).

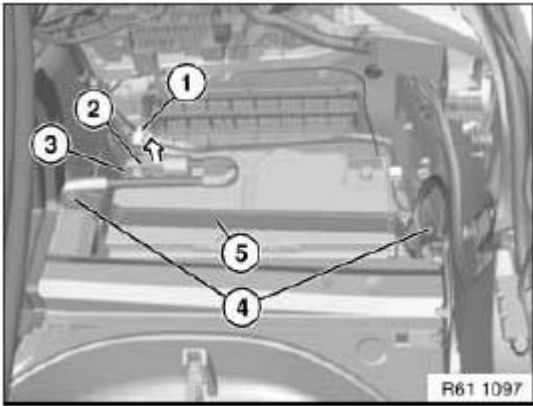


Fig. 167: Identifying IBS Cable Plug Connection, Battery Terminal And Rollover Protection
Courtesy of BMW OF NORTH AMERICA, INC.

Release threaded pin (1) and remove holder (2).

Detach vent (4) in direction of arrow.

Fold both clips (3) open.

Pull battery (5) back from front fixture and remove towards top.

Installation:

Make sure battery (5) is correctly seated in front fixture.

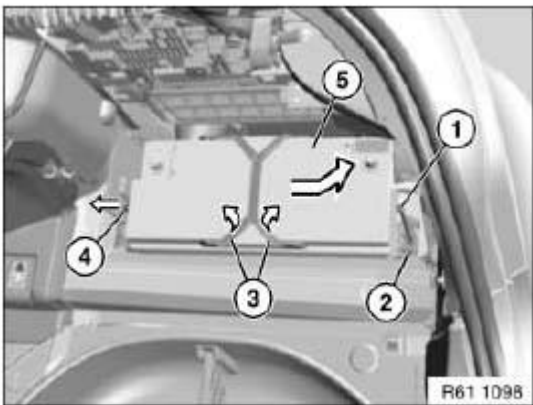


Fig. 168: Identifying Threaded Pin, Holder And Battery
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Read out fault memory, clear if necessary
- Register battery replacement

61 21 028 TESTING BATTERY WITH BATTERY TESTER

IMPORTANT: Check is not permissible for AGM batteries!

WARNING: Read and comply with SAFETY INFORMATION pertaining to vehicle battery.

Necessary preliminary tasks:

Remove LUGGAGE COMPARTMENT FLOOR TRIM PANEL .

NOTE: Use BMW-recommended battery tester to test the battery.

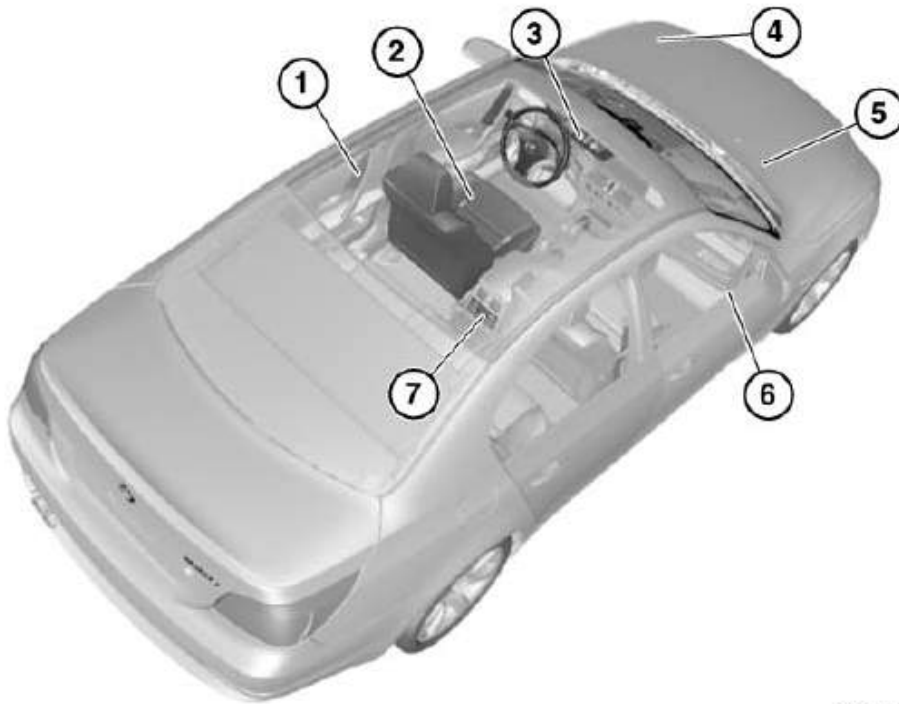
Procedure:

- Turn off ignition and close doors
- Connect battery tester directly to battery terminals
- Select Battery test and confirm
- Enter vehicle identification number
- Enter battery data
- Carry out battery test



Fig. 169: Identifying BMW-Recommended Battery Tester
Courtesy of BMW OF NORTH AMERICA, INC.

SWITCH

61 31. OVERVIEW OF SWITCHES

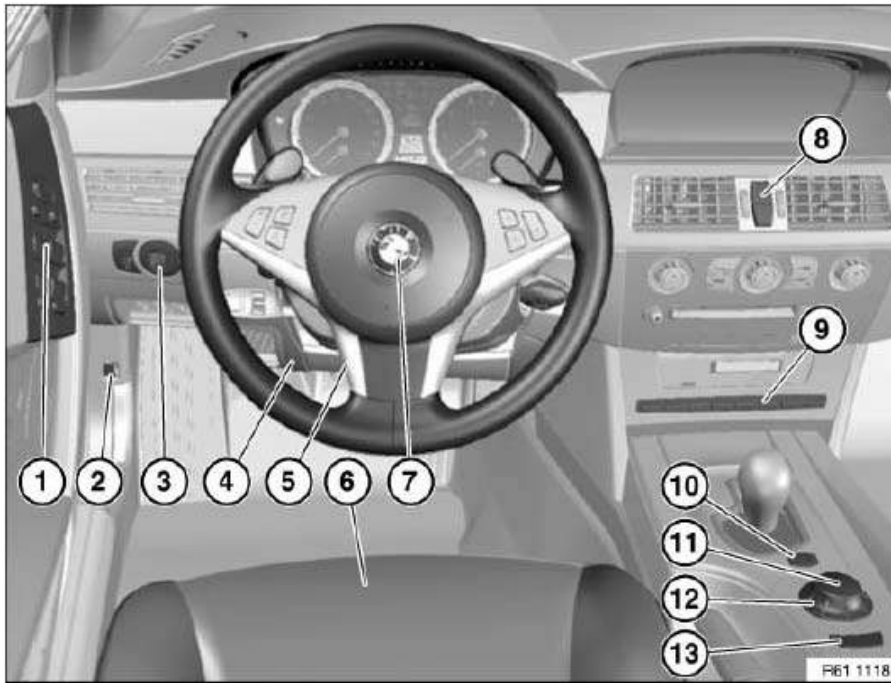
R61 1117

- | | |
|--|---|
| 1 Rocker switch for side window operation (rear) | 5 Engine hood contact switch |
| 2 Overview of switches in driver's area | 6 Switch for glovebox light |
| 3 Switch in front headliner trim | 7 Switch in rear insert (storage compartment) |
| 4 Level switch for windscreen washer system | |

Fig. 170: Overview Of Switches

Courtesy of BMW OF NORTH AMERICA, INC.

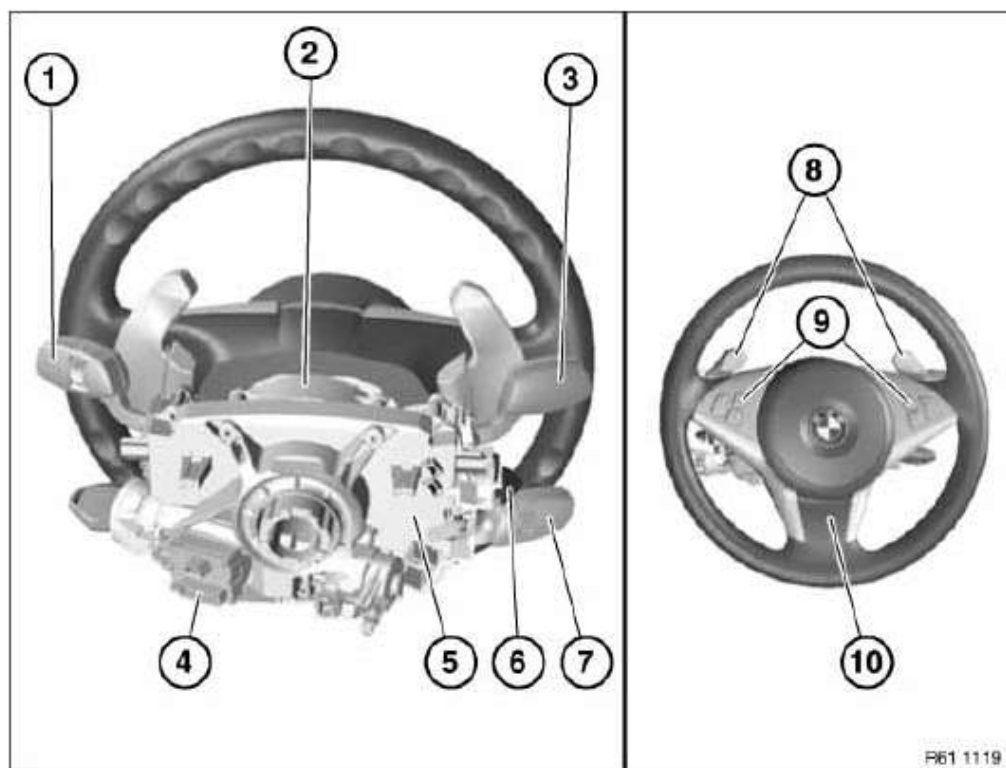
61 31.. OVERVIEW OF SWITCHES IN DRIVER'S AREA



- | | |
|---|--|
| 1 Rocker switch for side window operation (front) | 8 Switch for hazard warning system/central locking |
| 2 Rear lid unlocking switch | 9 Center console switch cluster |
| 3 Light operating unit | 10 Driving dynamics switch |
| 4 Clutch switch module | 11 Knob for controller |
| 5 Brake-light switch | 12 Controller |
| 6 Seat functions switch | 13 Button unit (for on-board monitor) |
| 7 Overview of switches in steering wheel area | |

Fig. 171: Overview Of Switches In Driver Area
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31... OVERVIEW OF SWITCHES IN STEERING WHEEL AREA



- | | |
|---|--|
| 1 Windshield wiper switch | 6 Steering column adjustment switch /
Heated steering wheel button |
| 2 Coil spring casing | 7 Cruise control switch |
| 3 Turn signal/headlight dipping stalk | 8 Shifters for SMG transmission |
| 4 Ignition starter switch | 9 Multifunction steering wheel switch |
| 5 Fixture for steering column stalk | 10 Steering wheel module control unit |

Fig. 172: Overview Of Switches In Steering Wheel Area

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 006 REMOVING AND INSTALLING/REPLACING FIXTURE FOR STEERING COLUMN STALK (FROM 09/2005)

WARNING: Move wheels into straight-ahead position and do not alter this position during the repair work.
Read and comply with notes on protection against electrostatic damage (ESD PROTECTION).
Comply with notes and instructions on HANDLING OPTICAL WAVEGUIDES.

Necessary preliminary tasks:

- Remove STEERING WHEEL .
- Remove FRONT SECTION OF STEERING COLUMN TRIM

- Remove **LOWER SECTION OF STEERING COLUMN TRIM**
- Remove **TOP SECTION OF STEERING COLUMN CASING.**
- If necessary, remove deformation element for steering column trim.

Disconnect plug connections from rear on fixture for steering column stalk (2).

Release screws (1).

Remove fixture for steering column switch (2) in direction of arrow.

Installation:

Carry out **STEERING ANGLE SENSOR ADJUSTMENT.**

On vehicles with active front steering, steering angle sensor adjustment is performed by means of **INITIAL OPERATION** / adjustment of active front steering.

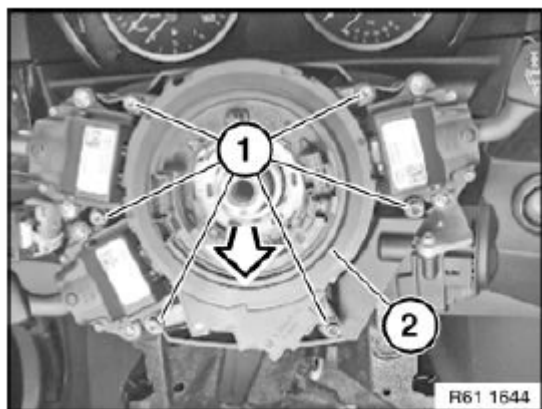


Fig. 173: Identifying Steering Column Stalk And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Remove **TURN INDICATOR/HEADLIGHT DIPPING SWITCH**
- Remove **WINDSHIELD WIPER SWITCH**
- If necessary, remove **CRUISE CONTROL SWITCH**
- Remove **VOLUTE SPRING CASSETTE**
- Carry out **VEHICLE PROGRAMMING/CODING**
- Carry out **STEERING ANGLE SENSOR ADJUSTMENT**

On vehicles with active front steering, steering angle sensor adjustment is performed by means of **INITIAL OPERATION** / adjustment of active front steering

61 31 011 REMOVING AND INSTALLING/REPLACING VOLUTE SPRING CASSETTE (FROM 09/2005)

WARNING: Move wheels into straight-ahead position and do not alter this position during the repair work.

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove AIRBAG UNIT
- Remove STEERING WHEEL
- Remove FRONT SECTION OF STEERING COLUMN TRIM
- Remove LOWER SECTION OF STEERING COLUMN TRIM
- Remove CRUISE CONTROL SWITCH
- Remove WINDSHIELD WIPER SWITCH

Release screws (1).

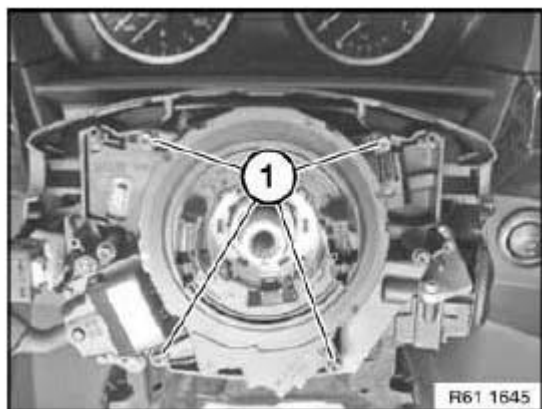


Fig. 174: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock catches (1) and remove volute spring cassette (2) in direction of arrow from fixture for steering column switch (3).

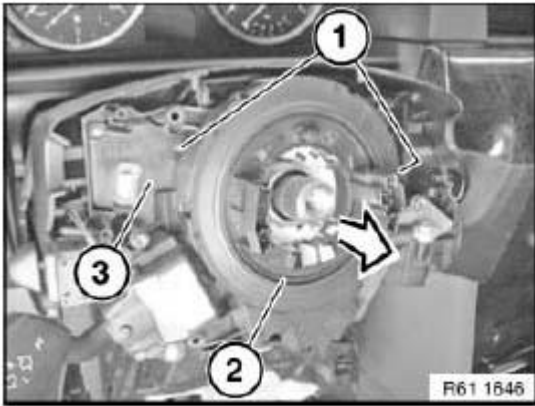


Fig. 175: Removing Volute Spring Cassette

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT:

- Do not turn ring (1).
- Also turning ring (1) through 360° is not permitted!
- Secure ring (1) against unauthorized turning.

Installation:

For purposes of clarity, fixture for steering column stalk (2) is shown removed.

Marking (3) must line up with marking (4).

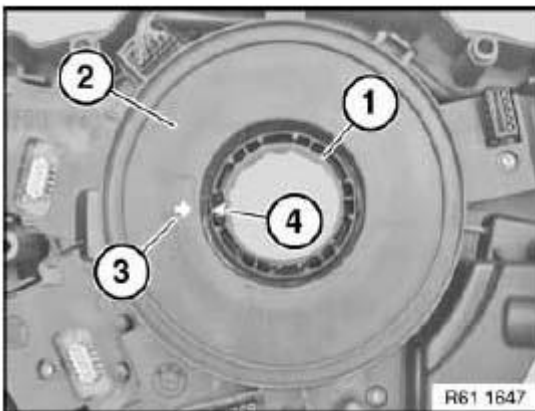


Fig. 176: Identifying Ring

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Drive pin (1) of volute spring (2) must line up correctly with opening (3) in inner ring of stalk.

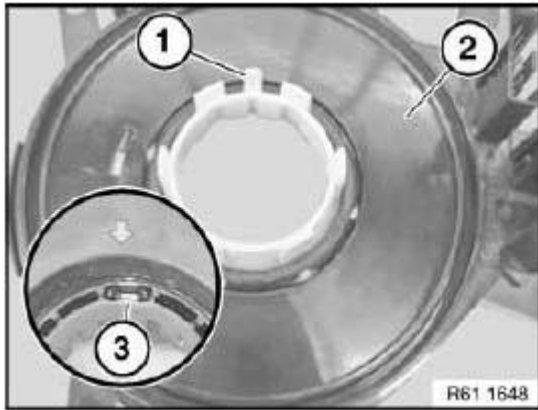


Fig. 177: Identifying Pin Of Volute Spring

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 016 REMOVING AND INSTALLING/REPLACING TURN INDICATOR/HEADLIGHT DIPPING SWITCH

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **AIRBAG UNIT**
- Remove **STEERING WHEEL**
- Remove **FRONT SECTION OF STEERING COLUMN TRIM**

Release screws (1) and remove turn indicator/headlight dipping switch (2) towards rear.

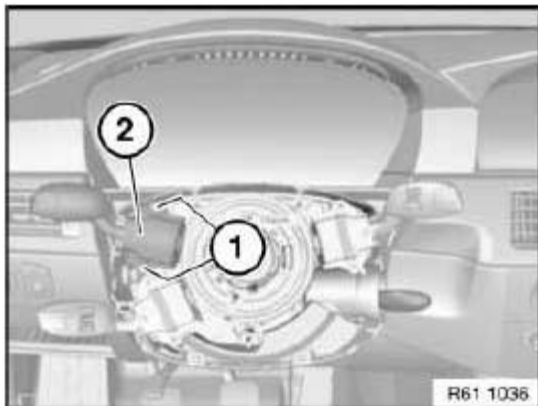


Fig. 178: Identifying Turn Indicator/Headlight Dipping Switch And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 018 REMOVING AND INSTALLING/REPLACING CRUISE CONTROL SWITCH

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **AIRBAG UNIT**
- Remove **STEERING WHEEL**
- Remove **FRONT SECTION OF STEERING COLUMN TRIM**

Release screws (1) and remove cruise control switch (2) towards rear.

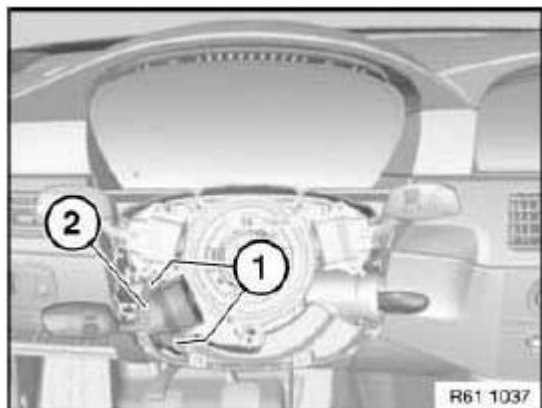


Fig. 179: Identifying Cruise Control Switch And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 020 REMOVING AND INSTALLING/REPLACING IGNITION STARTER SWITCH

Necessary preliminary tasks:

- Move ignition lock to key position 0 (stop)
- Remove **LOWER SECTION OF STEERING COLUMN TRIM**

IMPORTANT: Before removing ignition starter switch (1), secure inner shaft against turning:
Insert a M2.5*8 screw in bore (2).

Installation:

Remove screw in bore (2).

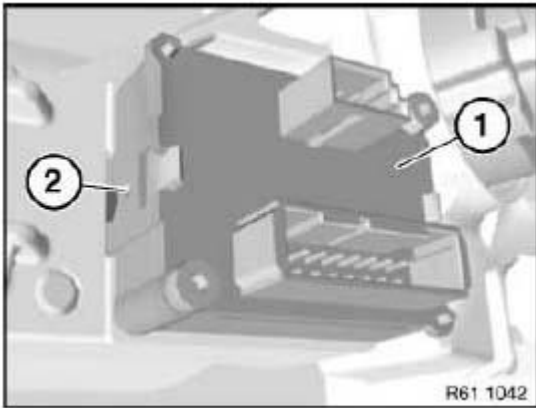


Fig. 180: Identifying Ignition Starter Switch
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1), tightening torque **61 31 1AZ** .

Installation:

Secure screws (1) with sealing paint.

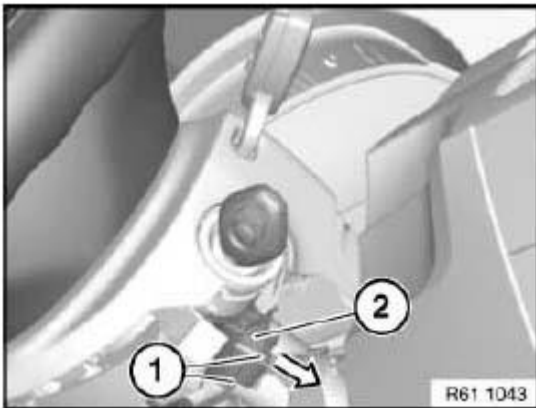


Fig. 181: Removing Ignition Starter Switch
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Carefully unlock and disconnect associated plug connection for ribbon cable.
Replace the ribbon cable if damaged.
The ribbon cable leads to the CONTROL UNIT FOR THE CAR ACCESS SYSTEM.

Remove ignition starter switch (2).

61 31 023 REMOVING AND INSTALLING/REPLACING START/STOP SWITCH

Special tools required:

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- **00 9 341**

Attach special tool **00 9 341** as illustrated.

Unclip Start/Stop switch with associated ribbon cable in direction of arrow.

IMPORTANT: Carefully unlock and disconnect associated plug connection for ribbon cable.

Replace the ribbon cable if damaged.

Remove Start/Stop switch.

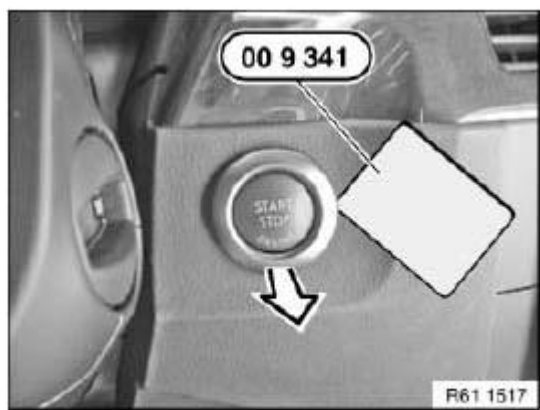


Fig. 182: Identifying Special Tool (00 9 341)

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 035 REMOVING AND INSTALLING/REPLACING SWITCH FOR STEERING COLUMN ADJUSTMENT

Necessary preliminary tasks:

- Remove **TOP SECTION OF STEERING COLUMN CASING** .

Disconnect associated plug connections of steering column adjustment switch (1).

Unclip steering column adjustment switch (1) in direction of arrow.

Remove steering column adjustment switch (1) towards front from fixture for steering column stalk (2).

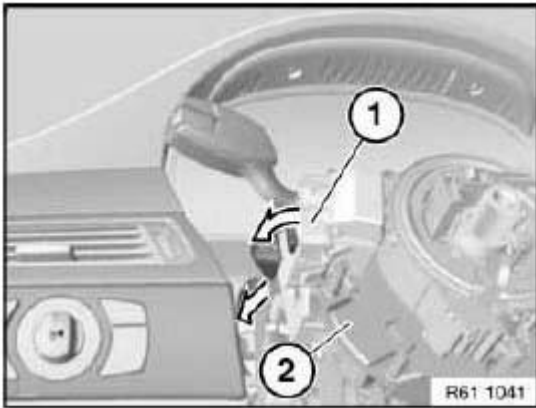


Fig. 183: Unclipping Steering Column Adjustment Switch
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 037 REMOVING AND INSTALLING/REPLACING LIGHTING CONTROL UNIT

Special tools required:

- **64 1 020**

Attach special tool **64 1 020** at openings (1) and lever out catches (2).

Pull back lighting control unit (3).

Unlock and disconnect associated plug connection, remove lighting control unit (3).

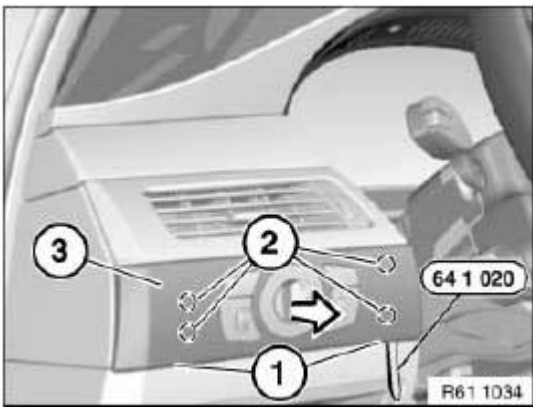


Fig. 184: Identifying Lighting Control Unit And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure clips (1) are correctly seated on trim of lighting control unit (2).

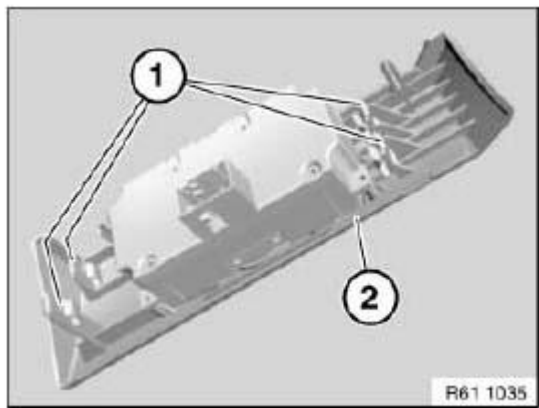


Fig. 185: Identifying Lighting Control Unit And Clips

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 038 REMOVING AND INSTALLING (REPLACING) SWITCH FOR PASSENGER AIRBAG DEACTIVATION

WARNING: Read and comply with SAFETY REGULATIONS for handling airbag modules and pyrotechnical belt pretensioners.
Incorrect handling can activate airbag and cause injury.

Necessary preliminary tasks:

- Disconnect battery negative lead
- Open glovebox lid

Unclip switch receptacle for passenger airbag deactivation (1) in rear area by pressing in direction of arrow out of glovebox housing (2).

Feed switch receptacle for passenger airbag deactivation (1) in front area in direction of arrow out of glovebox housing (2).

Installation:

Make sure switch receptacle for passenger airbag deactivation (1) is correctly engaged on glovebox housing (2).

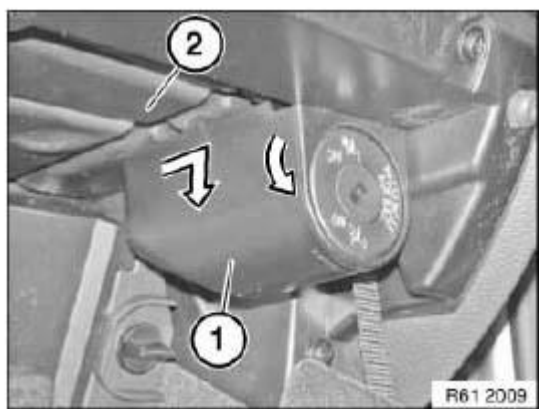


Fig. 186: Identifying Passenger Airbag Deactivation
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock catches (2) and feed switch for passenger airbag deactivation (4) in direction of arrow out of switch receptacle for passenger airbag deactivation (5).

Installation:

Guides (3) and retaining lugs (6) must not be damaged or missing.

Make sure switch for passenger airbag deactivation (4) is correctly seated in switch receptacle for passenger airbag deactivation (5).

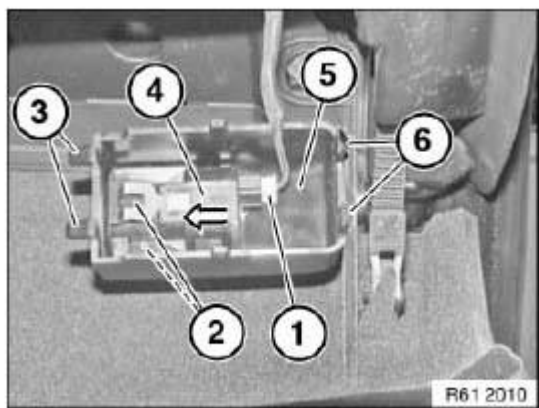


Fig. 187: Unlocking Catches And Feed Switch For Passenger Airbag Deactivation
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Remove **LOCK CYLINDER FOR PASSENGER AIRBAG DEACTIVATION** .

61 31 040 REMOVING AND INSTALLING/REPLACING SWITCH FOR WINDSCREEN WIPERS

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove AIRBAG UNIT
- Remove STEERING WHEEL
- Remove FRONT SECTION OF STEERING COLUMN TRIM

Release screws (1) and remove windshield wiper switch (2) towards rear.

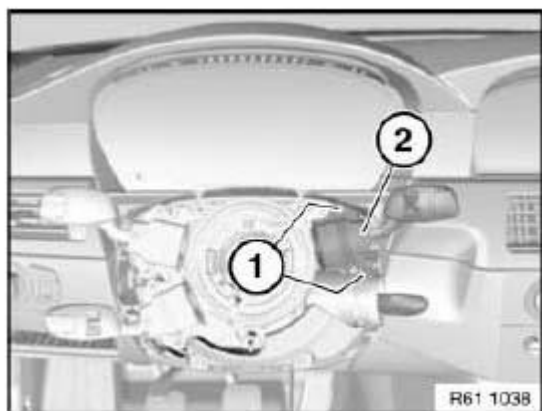


Fig. 188: Identifying Windshield Wiper Switch And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 044 REMOVING AND INSTALLING/REPLACING CENTER CONSOLE SWITCH CLUSTER ON LEFT (FROM 03/2007)

Operation is described in:

Removing and installing/replacing CENTRE CONSOLE SWITCH CLUSTER ON LEFT AND RIGHT

61 31 046 REMOVING AND INSTALLING/REPLACING CENTER CONSOLE SWITCH CLUSTER ON RIGHT (FROM 03/2007)

Operation is described in:

Removing and installing/replacing CENTRE CONSOLE SWITCH CLUSTER ON LEFT AND RIGHT

61 31 052 REMOVING AND INSTALLING (REPLACING) CENTER CONSOLE SWITCH CLUSTER (UP TO 03/2007)

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION).

Necessary preliminary tasks:

- Remove **MIDDLE TRIM FOR INSTRUMENT PANEL**

Unclip switch cluster in center console (1) all round and remove from middle trim for instrument panel (2).

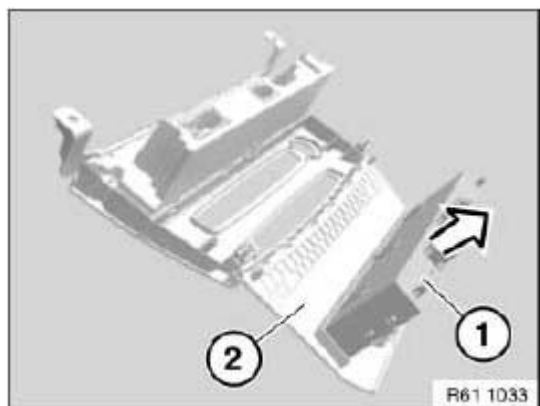


Fig. 189: Unclipping Switch Cluster In Centre Console
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 31 052 REMOVING AND INSTALLING/REPLACING CENTER CONSOLE SWITCH CLUSTER ON LEFT AND RIGHT (FROM 03/2007)

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION).

Necessary preliminary tasks:

- Remove **MIDDLE TRIM FOR INSTRUMENT PANEL**

Unclip center console switch cluster on left and right (1) all round and remove from middle trim for instrument panel (2).

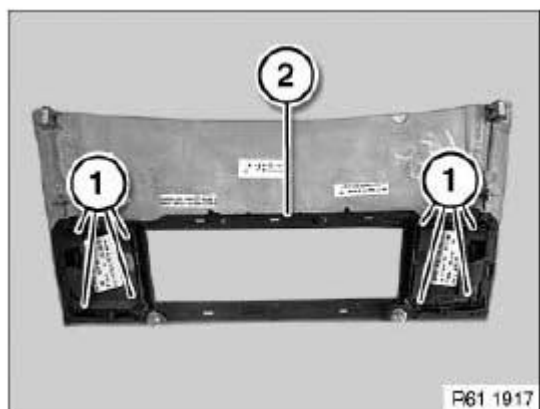


Fig. 190: Identifying Instrument Panel And Centre Console Switch Cluster
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 31 062 REMOVING AND INSTALLING/REPLACING BUTTON FOR STEERING WHEEL HEATING

This operation is described in:

"Removing and installing/replacing **SWITCH FOR STEERING COLUMN ADJUSTMENT**".

61 31 069 REMOVING AND INSTALLING/REPLACING INDICATOR FOR FRONT PASSENGER AIRBAG DEACTIVATION

Necessary preliminary tasks:

- **E60, E63:** Remove **FRONT ROOFLINER TRIM**
- **E64:** Remove front roofliner trim insert

Press locks (1) and unclip indicator for front passenger airbag deactivation (2) in direction of arrow from front roofliner trim (3).

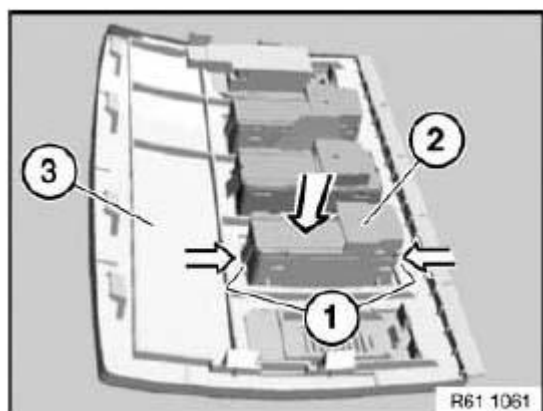


Fig. 191: Pressing Locks And Unclip Indicator For Front Passenger Airbag Deactivation
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 079 REMOVING AND INSTALLING/REPLACING SWITCH FOR HAZARD WARNING FLASHERS/CENTRAL LOCKING

Special tools required:

- **64 1 020**

IMPORTANT: Risk of damage!

Protect middle fresh-air grille decorative trim in working area against damage, tape off if necessary.

Lever out switch for hazard warning system/central locking (1) with special tool **64 1 020** and pull back.

Disconnect associated plug connection and remove switch for hazard warning flashers/central locking (1).

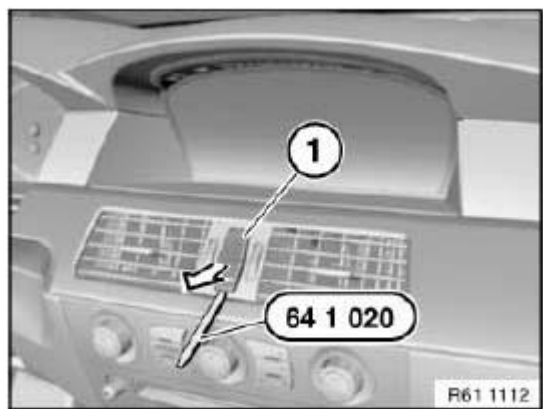


Fig. 192: Identifying Hazard Warning Flashers/Central Locking
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 083 REMOVING AND INSTALLING/REPLACING SWITCH FOR UNLOCKING REAR LID

NOTE: To unclip switch for unlocking rear lid (4), partially detach mocket (1).
Grip from outside behind footwell side trim panel on A-pillar on left (2).

Press retaining lugs (3) together and feed switch for unlocking rear lid (4) out of footwell side trim panel on A-pillar on left (2). Disconnect associated plug connection and remove switch for unlocking rear lid (4).

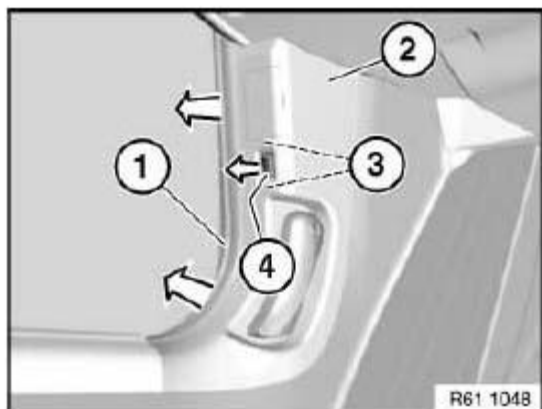


Fig. 193: Detaching Mocket And Retaining Lugs
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 091 REMOVING AND INSTALLING/REPLACING SWITCH FOR LEFT OR RIGHT SEAT HEATING (REAR)

Necessary preliminary tasks:

- Remove **REAR INSERT (IN STORAGE COMPARTMENT)**

NOTE: Removal of switch for left seat heating (2) is depicted.
Switch for right seat heating (4) is removed in the same way as switch for left seating (2).

Press locks (1) together, feed switch for seat heating (2) out of rear insert (3) and remove.

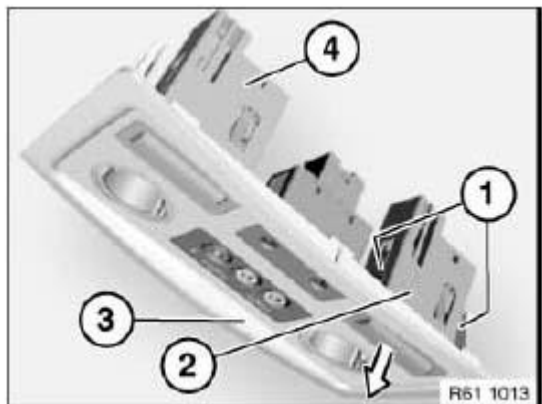


Fig. 194: Identifying Seat Heating

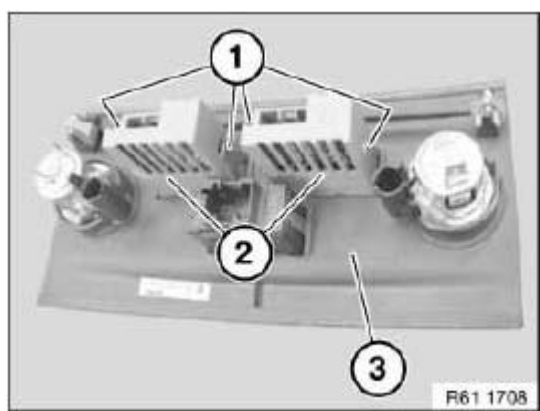
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 091 REMOVING AND INSTALLING/REPLACING SWITCH FOR LEFT OR RIGHT SEAT HEATING (REAR, LONG VERSION)

Necessary preliminary tasks:

- Remove **REAR INSERT (IN STORAGE COMPARTMENT)**

Press locks (1) together and press switches for seat heating (2) out of trim (3).

**Fig. 195: Pressing Switches For Seat Heating**

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 103 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SHIFT PADDLE FOR SMG TRANSMISSION

Necessary preliminary tasks:

- Remove **DECORATIVE TRIM FOR MULTIFUNCTION STEERING WHEEL SWITCH**

Disconnect plug connection (1).

Release screws (2).

Remove shift paddle for SMG transmission (3) from steering wheel (4).

Installation:

- Make sure wiring harness is routed exactly
- Make sure shift paddle for SMG transmission (3) is correctly seated on steering wheel (4)

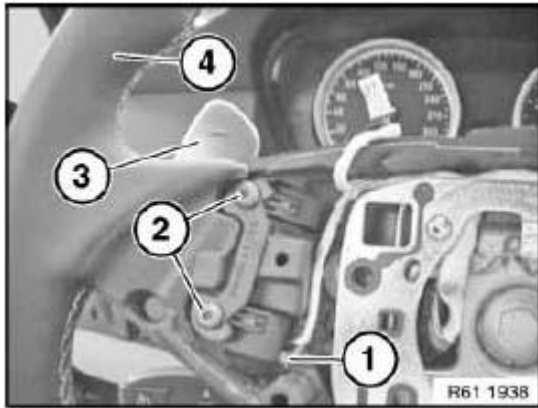


Fig. 196: Identifying Shift Paddle For SMG Transmission And Plug Connection
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 112 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SHIFT PADDLE FOR AUTOMATIC TRANSMISSION

Operation is described in:

Removing and installing/replacing left or right **SHIFT PADDLE FOR SMG TRANSMISSION**

61 31 115 REPLACING ROCKER SWITCH FOR SIDE WINDOW OPERATION (FRONT) (UP TO 03/2007)

Necessary preliminary tasks:

- Remove **FRONT DOOR TRIM PANEL** .

Unscrew nut (1).

Unlock catches (2). Remove rocker switch for side window operation (3) downwards out of front door trim panel (4).

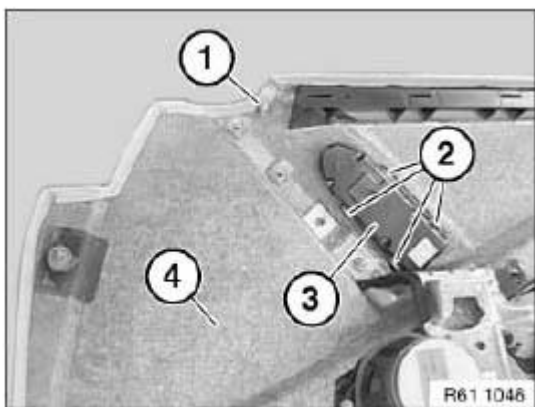


Fig. 197: Identifying Front Door Trim Panel, Catches And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hook (1) and plastic pin (2) must not be damaged.

Make sure rocker switch for side window operation (3) is installed in correct position.

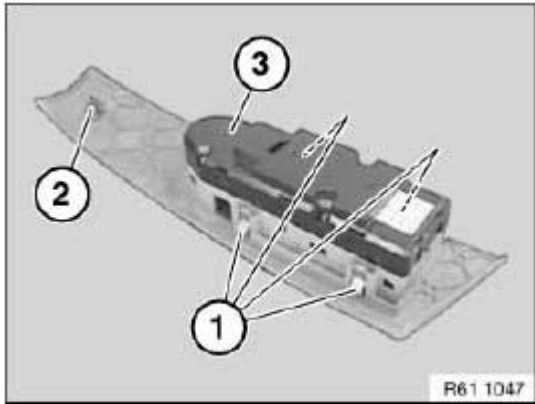


Fig. 198: Identifying Hook And Plastic Pin
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 116 REPLACING ROCKER SWITCH FOR SIDE WINDOW OPERATION (REAR) (UP TO 03/2007)

Necessary preliminary tasks:

- Remove **REAR DOOR TRIM PANEL** .

Unscrew nut (1).

Unlock catches (2). Remove rocker switch for side window operation (3) downwards out of rear door trim panel (4).

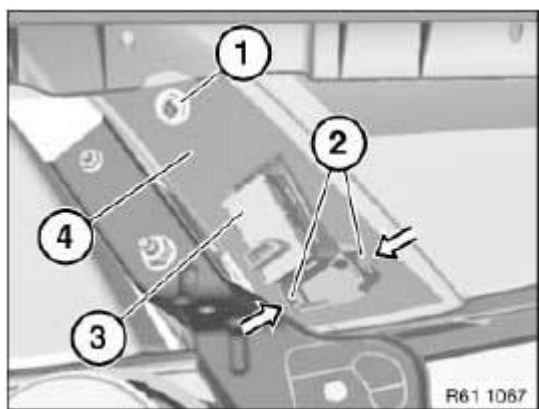


Fig. 199: Identifying Rear Door Trim Panel, Catches And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hook (1) and plastic pins (2) must not be damaged.

Make sure rocker switch for side window operation (3) is installed in correct position.

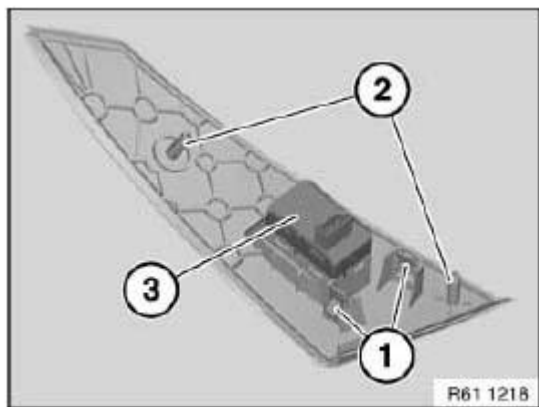


Fig. 200: Identifying Hook And Plastic Pins
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 116 REPLACING ROCKER SWITCH FOR SIDE WINDOW OPERATION (REAR, LONG VERSION OR FROM 03/2007)

Special tools required:

- **00 9 317**

Lever rocker switch (1) with special tool **00 9 317** upwards out of armrest.

Disconnect plug connection.



Fig. 201: Identifying Rocker Switch And Special Tool (00 9 317)

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hooks (1) of rocker switch (2) must not be damaged.

Make sure rocker switch (2) is correctly seated.

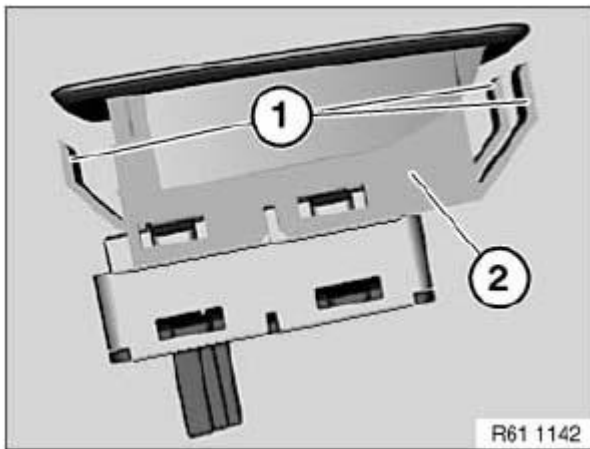


Fig. 202: Identifying Hooks Of Rocker Switch

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 117 REMOVING AND INSTALLING/REPLACING POWER WINDOW SWITCH (DRIVER SIDE) (LONG VERSION OR FROM 03/2007)

Necessary preliminary tasks:

- Remove **FRONT DOOR TRIM PANEL**
- Remove **HANDLE RECESS IN FRONT DOOR**

Unlock catches (1) and remove switch for side window operation (2) downwards out of handle recess (3).

Installation:

Catch (1) must not be damaged.

Make sure rocker switch for side window operation (2) is installed in correct position.

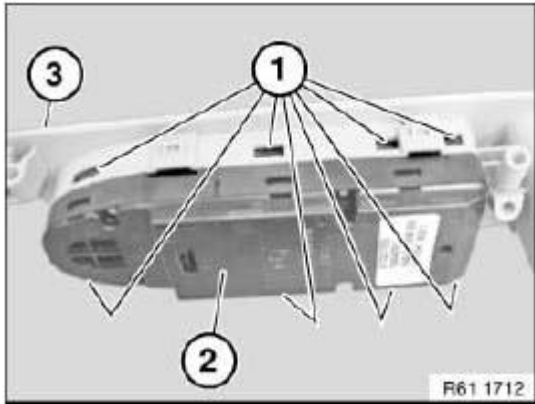


Fig. 203: Identifying Side Window And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

**61 31 118 REMOVING AND INSTALLING/REPLACING POWER WINDOW SWITCH
(PASSENGER SIDE) (LONG VERSION OR FROM 03/2007)**

Special tools required:

- **00 9 317**

Lever rocker switch (1) with special tool **00 9 317** upwards out of armrest.

Disconnect plug connection.

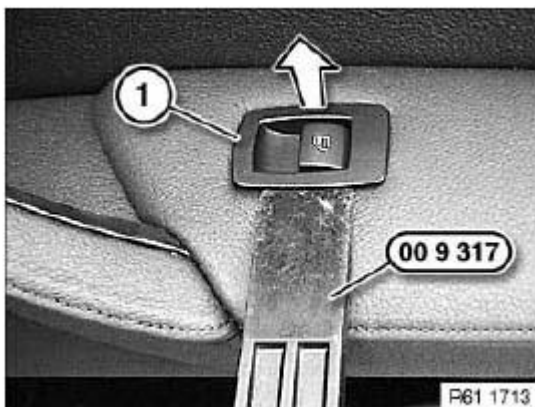


Fig. 204: Identifying Rocker Switch
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hooks (1) of rocker switch (2) must not be damaged.

Make sure rocker switch (2) is correctly seated.

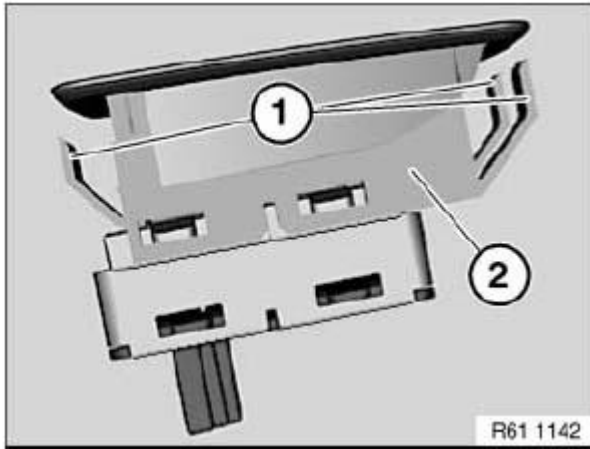


Fig. 205: Identifying Hooks Of Rocker Switch
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 133 REMOVING AND INSTALLING/REPLACING AV CONNECTION SOCKET

Necessary preliminary tasks:

- Remove **REAR INSERT (IN STORAGE COMPARTMENT)**

Press locks (1) together, feed AV connection socket (2) out of rear insert (3) and remove.

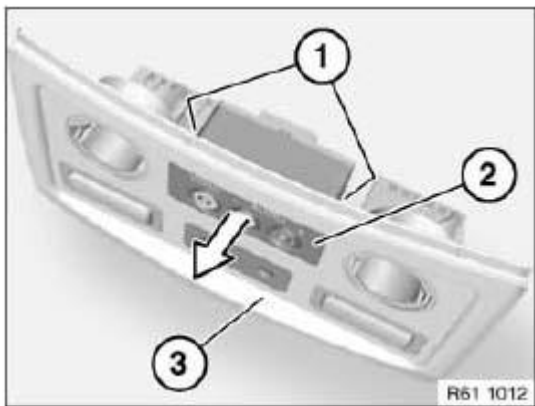


Fig. 206: Identifying AV Connection Socket And Locks
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 134 REMOVING AND INSTALLING/REPLACING USB/AUDIO INTERFACE CONNECTING

SOCKET

Necessary preliminary tasks:

- Remove **TRIM FOR STORAGE TRAY**

Insert suitable screwdriver (1) through opening (2) in direction of arrow.

NOTE: **Protect connecting socket wiring harness against being damaged by screwdriver (1).**

Press against connecting socket (3) in lower area.

Remove connecting socket (3) in direction of arrow.

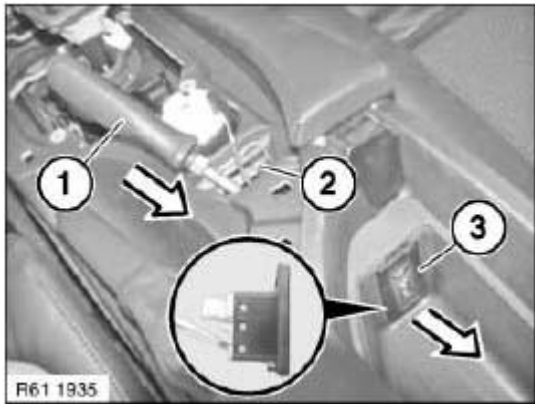


Fig. 207: Removing Connecting Socket
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Installation:

- Retaining lug (3) must not be damaged.
- Make sure connecting socket (2) is correctly seated in storage compartment (4).

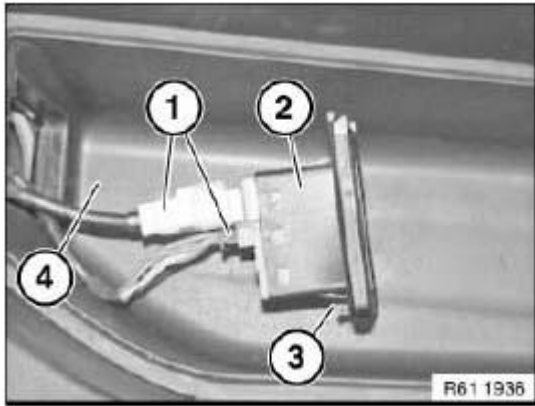


Fig. 208: Identifying Storage Compartment, Connecting Socket And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 135 REMOVING AND INSTALLING/REPLACING HEADPHONES CONNECTION SOCKET

Necessary preliminary tasks:

- Remove **REAR INSERT (IN STORAGE COMPARTMENT)**

Press locks (1) together, feed headphones connection socket (2) out of rear insert (3) and remove.

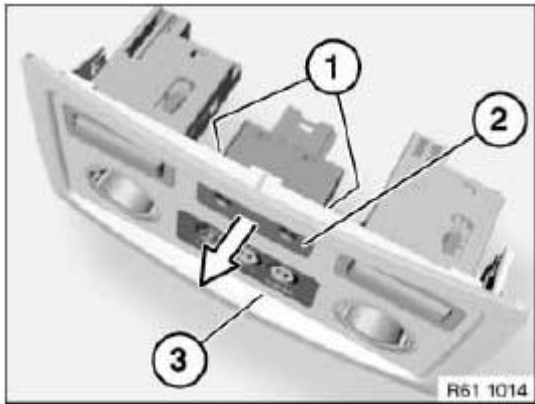


Fig. 209: Identifying Headphones Connection Socket And Locks
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 135 REMOVING AND INSTALLING/REPLACING HEADPHONES CONNECTION SOCKET (LONG VERSION)

Necessary preliminary tasks:

- Remove **REAR INSERT (IN STORAGE COMPARTMENT)**

Press locks (1) together and press headphones connection socket (2) out of trim (3).

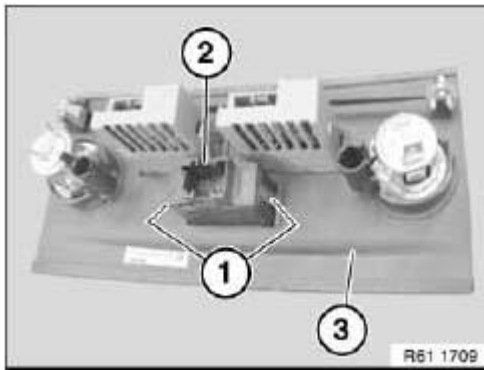


Fig. 210: Identifying Headphones Connection Socket And Locks
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 175 REMOVING AND INSTALLING/REPLACING SWITCH FOR SLIDE/TILT SUNROOF

Necessary preliminary tasks:

- Remove **FRONT ROOFLINER TRIM**

Press catches (1) and unclip switch for sunroof (2) in direction of arrow from front roofliner trim (3).

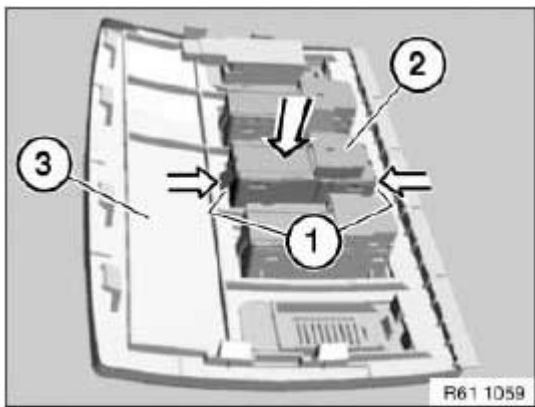


Fig. 211: Identifying Front Roofliner Trim And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialize **SLIDE/TILT SUNROOF**.

61 31 176 REMOVING AND INSTALLING/REPLACING EMERGENCY CALL BUTTON

Necessary preliminary tasks:

- Remove **FRONT ROOFLINER TRIM**

Press catches (1) and unclip emergency call button (2) in direction of arrow from front roofliner trim (3).

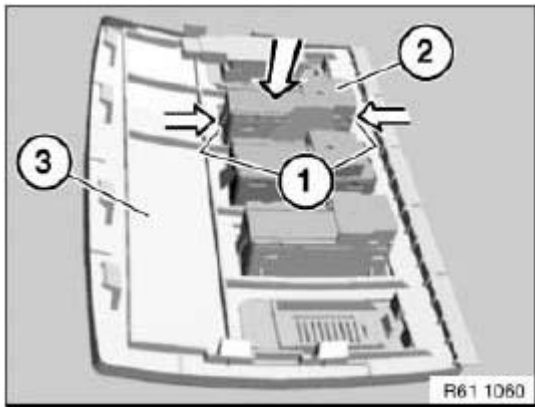


Fig. 212: Pressing Catches And Unclip Emergency Call Button
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 192 REPLACING BUTTON FOR CONTROLLER (UNTIL 09/2008)

IMPORTANT: Risk of damage!

Before dismantling the button it is imperative to note whether the controller is installed with a version before or after 09/2008 !

NOTE: The number of buttons and shape of controller can vary depending on vehicle type.

Before 09/2008: Controller (1) has buttons on bottom only .

After 09/2008: Controller (2) has buttons top and bottom .

Button may be removed from controller (1) only!

NOTE: These repair instructions describe the removal of the button from controller (1)!

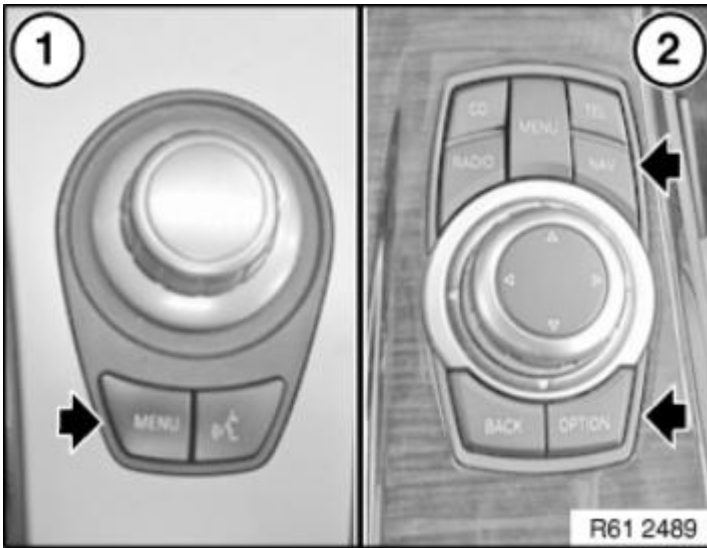


Fig. 213: Identifying Number Of Buttons And Shape Of Controller
Courtesy of BMW OF NORTH AMERICA, INC.

Pull off button for controller (1) in direction of arrow.

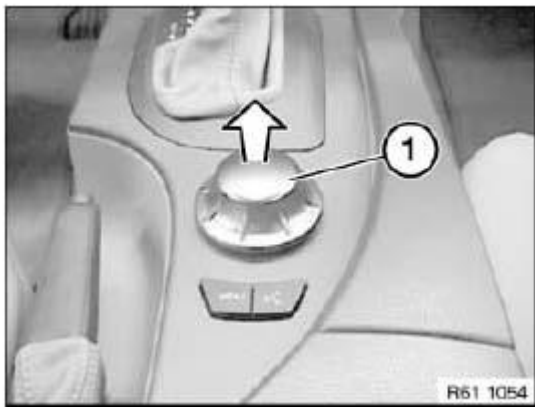


Fig. 214: Detaching Knob For Controller
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Fit button for controller (1) such that guides (2) are seated in mountings (3).

Press knob for controller (1) in middle until it engages.

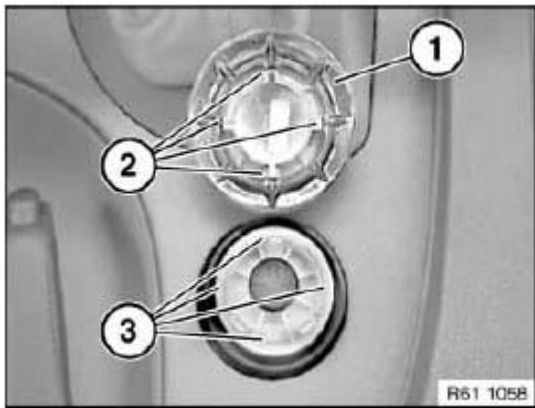


Fig. 215: Fitting Knob For Controller

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 193 REMOVING AND INSTALLING/REPLACING BUTTON UNIT (FOR ON-BOARD MONITOR)

Special tools required:

- **00 9 341**

Unclip button unit (1) with special tool **00 9 341** at retaining points (2) and lever out in direction of arrow.

Unlock and disconnect associated plug connection, remove button unit (1).

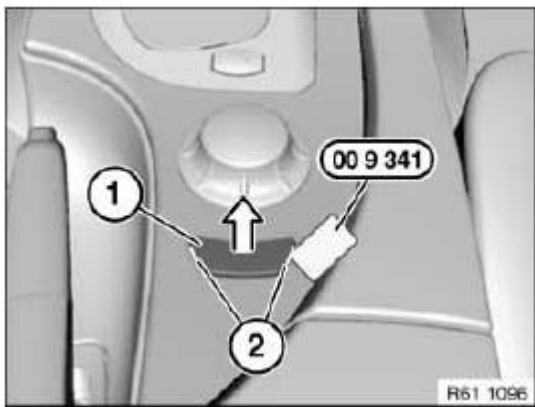


Fig. 216: Identifying Button Unit And Special Tool

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 195 REMOVING AND INSTALLING (REPLACING) FRONT CONTROLLER (UNTIL 09/2008)

IMPORTANT: Risk of damage!

Before dismantling it is imperative to note whether the controller is installed

with a version before or after 09/2008 !

NOTE: The number of buttons and shape of controller can vary depending on vehicle type.

Before 09/2008: Controller (1) has buttons on bottom only .

After 09/2008: Controller (2) has buttons top and bottom .

NOTE: These repair instructions describe the removal and installation (replacement) of controller (1) !

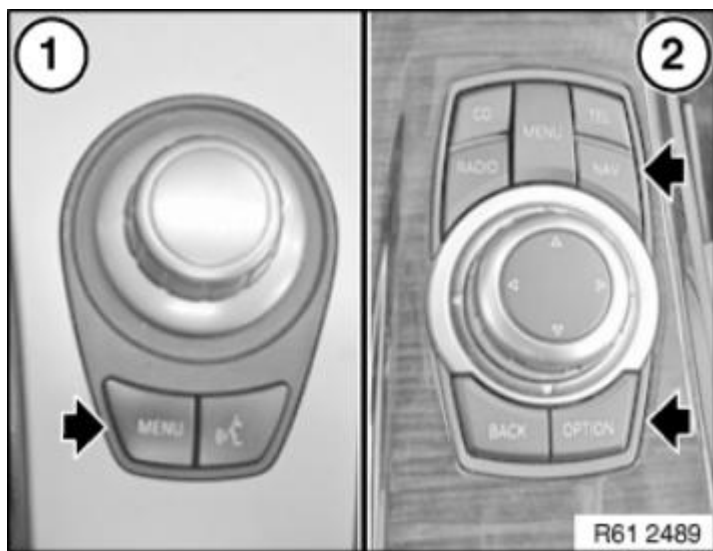


Fig. 217: Identifying Number Of Buttons And Shape Of Controller
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

The button for the controller must not be removed!

Necessary preliminary tasks:

- Remove **STORAGE COMPARTMENT** .

If necessary, disconnect plug connections.

Release screws (1).

Remove controller (2) in direction of arrow from storage compartment (3).

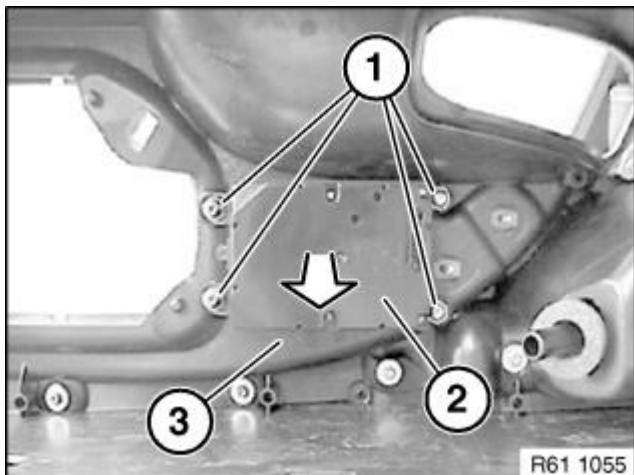


Fig. 218: Identifying Storage Compartment, Controller And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out VEHICLE PROGRAMMING/CODING.

61 31 195 REMOVING AND INSTALLING (REPLACING) FRONT CONTROLLER (FROM 09/2008)

IMPORTANT: Risk of damage!

Before dismantling it is imperative to note whether the controller is installed with a version before or after 09/2008 !

NOTE: The number of buttons and shape of controller can vary depending on vehicle type.

Before 09/2008: Controller (1) has buttons on bottom only .

After 09/2008: Controller (2) has buttons top and bottom .

NOTE: These repair instructions describe the removal and installation (replacement) of controller (2) !

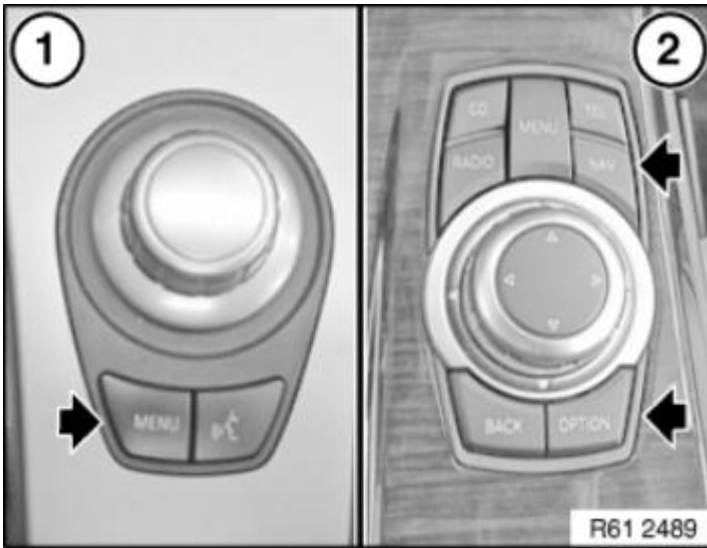


Fig. 219: Identifying Number Of Buttons And Shape Of Controller
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

The button for the controller must not be removed!

Necessary preliminary tasks:

- Remove **STORAGE COMPARTMENT** .

IMPORTANT: Risk of damage!

Carefully raise catches (1) on controller holder (3) and remove controller (2) towards top.

Installation note:

Make sure controller (2) is correctly engaged in controller holder (3).

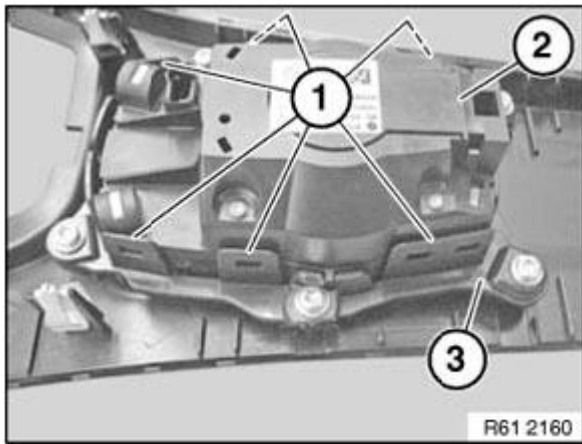


Fig. 220: Identifying Controller, Controller Holder And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **VEHICLE PROGRAMMING/CODING**.

61 31 199 REMOVING AND INSTALLING/REPLACING SWITCH COMBINATION FOR REAR CABIN SEAT ADJUSTMENT

Necessary preliminary tasks:

- Remove **LOWER REAR PANEL FROM FRONT SEAT BACKREST ON RIGHT**

Unlock retaining hooks (1) and press seat adjustment switch (2) out of rear panel (3).

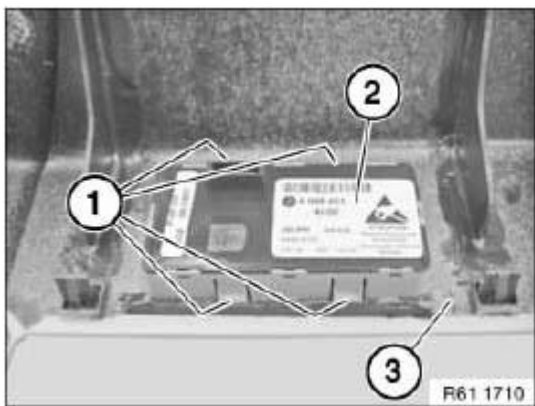


Fig. 221: Identifying Seat Adjustment Switch And Retaining Hooks
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 203 REPLACING SEAT ADJUSTMENT SWITCH COMBINATION (FULLY ELECTRIC FRONT SEAT)

Necessary preliminary tasks:

- Remove **OUTER COVER** on front seat.

Unfasten plug connection (1) and disconnect.

Loosen screws (2).

Unlock catch (3) in direction of arrow and remove seat adjustment switch combination (4) towards front.

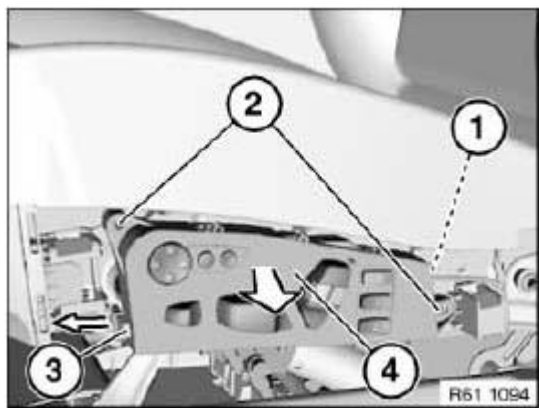


Fig. 222: Removing Seat Adjustment Switch Combination
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 204 REPLACING SEAT ADJUSTMENT SWITCH COMBINATION (SEMI-ELECTRIC FRONT SEAT)

Special tools required:

- **00 9 317**

Necessary preliminary tasks:

- Remove **OUTER COVER** on front seat.

Lever out seat adjustment control button (1) with special tool **00 9 317** in direction of arrow.

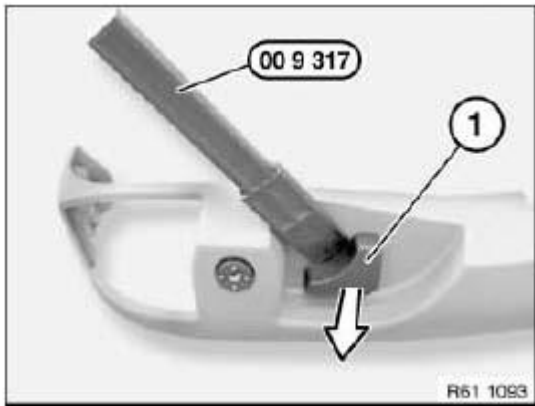


Fig. 223: Removing Seat Adjustment Control Button

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock catches (1) in direction of arrow and remove seat adjustment switch combination (2) from cover (3).

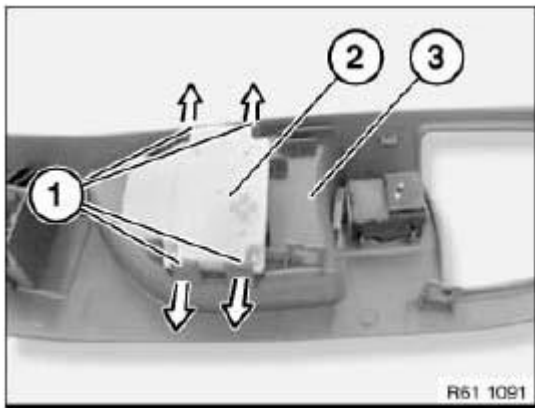


Fig. 224: Removing Catches And Seat Adjustment Switch Combination

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 208 REMOVING AND INSTALLING/REPLACING SWITCH FOR FRONT LUMBAR SUPPORT

Necessary preliminary tasks:

- Remove **OUTER COVER** on front seat.

Unlock catches (1) and remove switch for lumbar support (2) from cover (3).

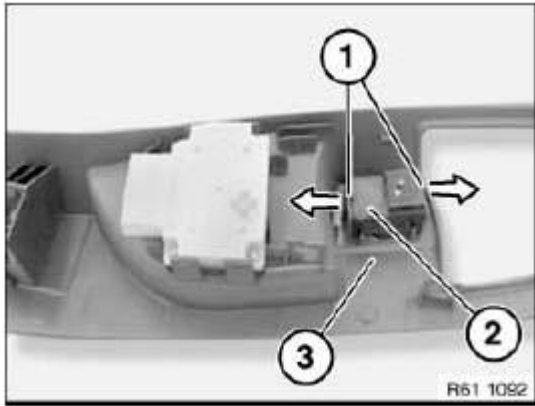


Fig. 225: Removing Catches And Switch For Lumbar Support
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 220 REMOVING AND INSTALLING/REPLACING MULTIFUNCTION STEERING WHEEL SWITCH

Special tools required:

- **61 3 120**

Necessary preliminary tasks:

- Remove **AIRBAG UNIT**

NOTE: Illustration shows steering wheel removed.

Release screws (1).

Remove retaining plate for steering wheel (2) from standard steering wheel (3).

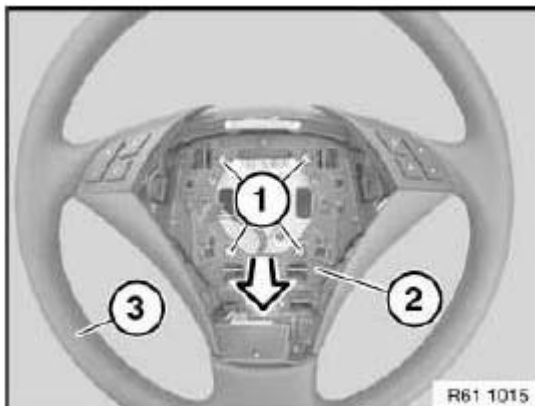


Fig. 226: Identifying Standard Steering Wheel, Retaining Plate And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Illustrations depict removal of the right multifunction steering wheel switch. The left multifunction steering wheel switch is removed in the same way.

Release screws (1).

Unclip right multifunction steering wheel switch (2) at point (3).

Disconnect associated plug connection and remove right multifunction steering wheel switch (2) with decorative strip.

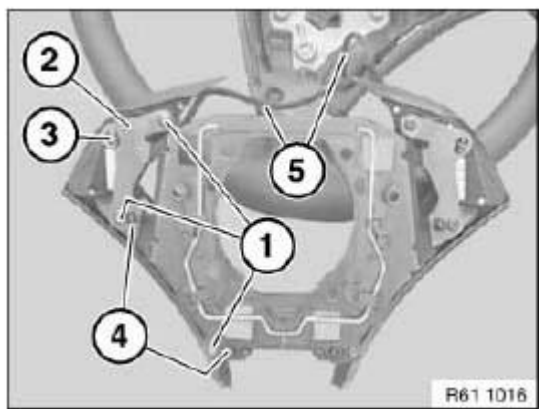


Fig. 227: Identifying Steering Wheel Switch, Guide Pins And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure guide pins (4) are correctly seated.

Make sure electrical leads (5) are correctly routed.

Installation:

Observe the following work steps to adjust the correct gap dimensions between decorative strips and airbag unit.

- Fit steering wheel retaining plate (1) with decorative strip (2) not yet screwed down on special tool **61 3 120**.
- Tighten screws (3).

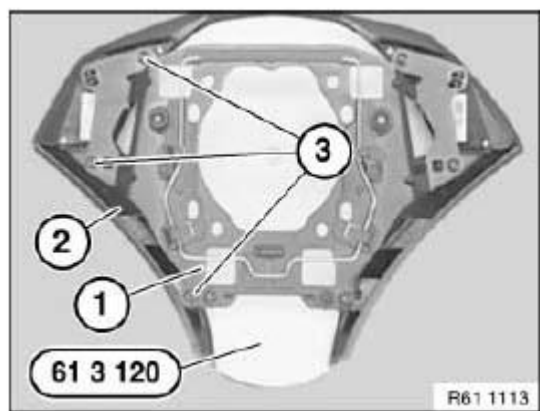


Fig. 228: Identifying Steering Wheel Retaining Plate With Decorative Strip
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock catch (1) and remove right multifunction steering wheel switch (2) in direction of arrow from decorative strip (3).

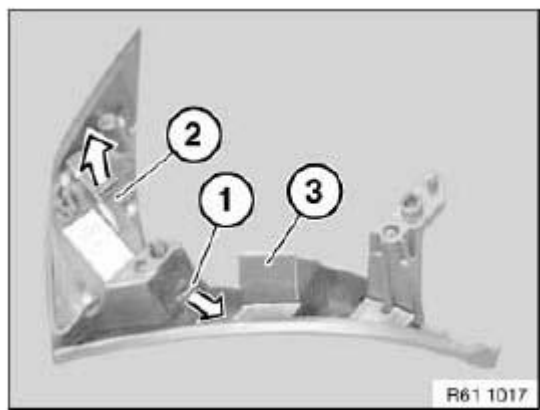


Fig. 229: Identifying Right Multifunction Steering Wheel Switch And Decorative Strip
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 220 REMOVING AND INSTALLING/REPLACING MULTIFUNCTION STEERING WHEEL SWITCH (FROM 03/2007)

Necessary preliminary tasks:

- Remove **AIRBAG UNIT**

Release screws (1).

Disconnect plug connection (2).

Remove retaining plate (3) from steering wheel.

Installation:

Make sure electrical leads are correctly routed.

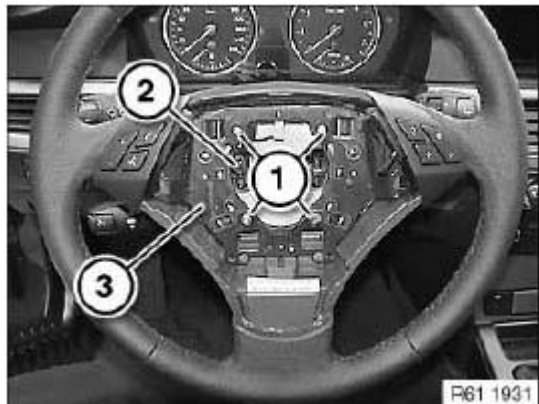


Fig. 230: Identifying Retaining Plate, Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Illustrations depict removal of the left multifunction steering wheel switch. The right multifunction steering wheel switch is removed in the same way.

Release screws (1).

Unclip multifunction steering wheel switch (2) at point (3).

Disconnect associated plug connections and remove multifunction steering wheel switch (2).

Installation:

Make sure guide pins (4) are correctly seated.

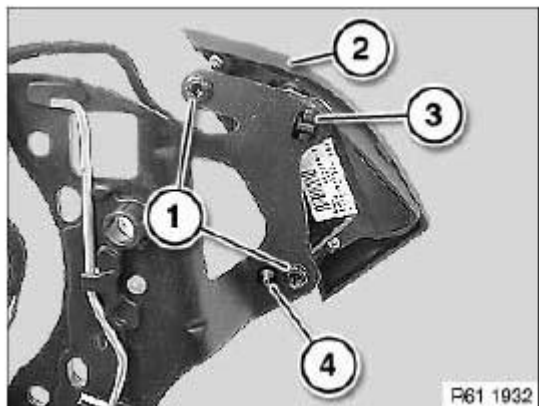


Fig. 231: Identifying Multifunction Steering Wheel Switch
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Observe the following work steps to adjust the correct gap dimensions between decorative strips and airbag unit.

- Fit airbag unit (1) on steering wheel retaining plate (2)
- Align switches (3)
- Tighten screws (4).

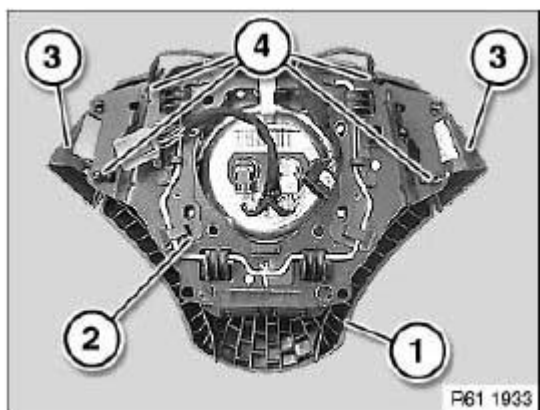


Fig. 232: Identifying Steering Wheel Retaining Plate, Switches And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 220 REMOVING AND INSTALLING/REPLACING MULTIFUNCTION STEERING WHEEL SWITCHES (SPORT STEERING WHEEL, FROM 09/2005)

Necessary preliminary tasks:

- Remove **AIRBAG UNIT**

Release screws (1).

IMPORTANT: Risk of breakage!

Lever out switches (2) complete with decorative strip (3) all round, do not tilt!

Disconnect associated plug connections and remove switches (2) complete with decorative strip (3).

Installation:

Make sure electrical leads are correctly routed.

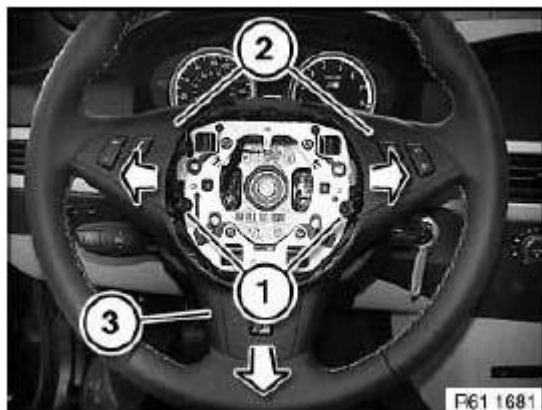


Fig. 233: Identifying Switches, Decorative Strip And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (2) and remove left multifunction steering wheel switches (3) from decorative strip (1).

Installation:

Guide pins (4) must not be damaged and must be correctly inserted.

Make sure there is a uniform gap between both multifunction steering wheel switches (3) and decorative strip (1).

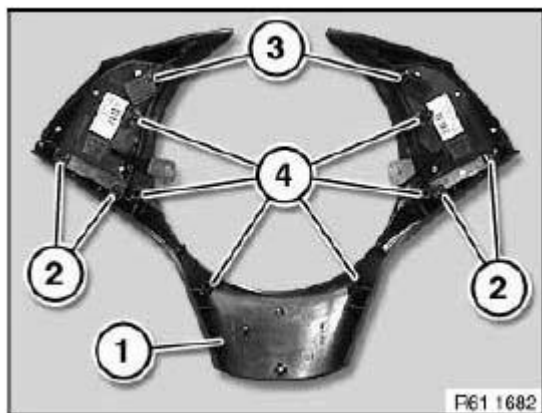


Fig. 234: Identifying Left Multifunction Steering Wheel Switches, Screws And Guide Pins
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 233 REMOVING AND INSTALLING/REPLACING LANE DEPARTURE WARNING MOTOR ELECTRICS (SPORT STEERING WHEEL)

Necessary preliminary tasks:

- Remove **DECORATIVE BAR FROM STEERING WHEEL**

Release screws (1) and remove retaining plate (2).

Tightening torque **32 33 2AZ** .

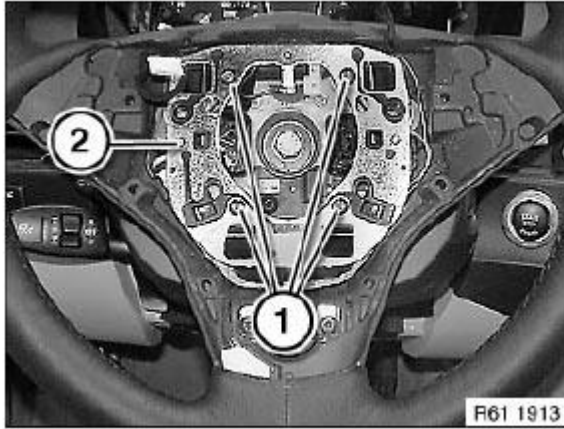


Fig. 235: Identifying Retaining Plate And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screw (2).

Release screws (3) and remove motor electrics (4) complete with electrical wires.

Installation:

Replace screws (2 and 3).

- Tightening torque **32 33 3AZ**
- Tightening torque **32 33 4AZ**

Ensure correct cable routing.

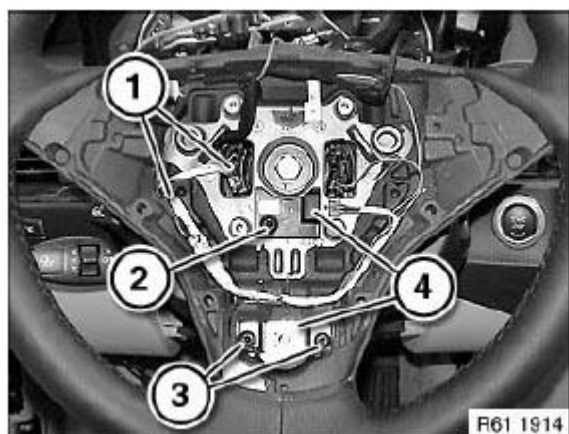


Fig. 236: Identifying Motor Electrics, Plug Connection And Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 238 REMOVING AND INSTALLING/REPLACING LANE DEPARTURE WARNING MOTOR ELECTRICS (STANDARD STEERING WHEEL)

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **AIRBAG UNIT**

Release screws (1) and remove retaining plate (2).

Tightening torque **32 33 2AZ** .

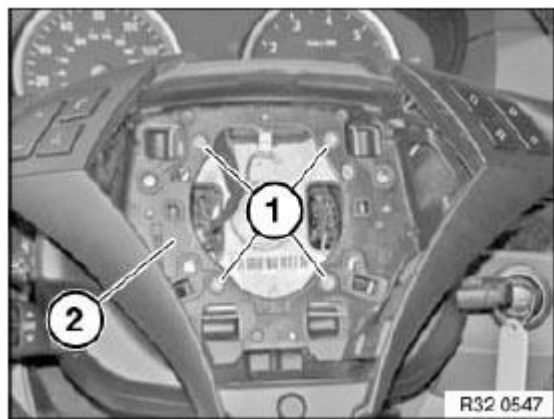


Fig. 237: Identifying Retaining Plate And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screw (2).

Release screws (3) and remove motor electrics (4) complete with electrical wires.

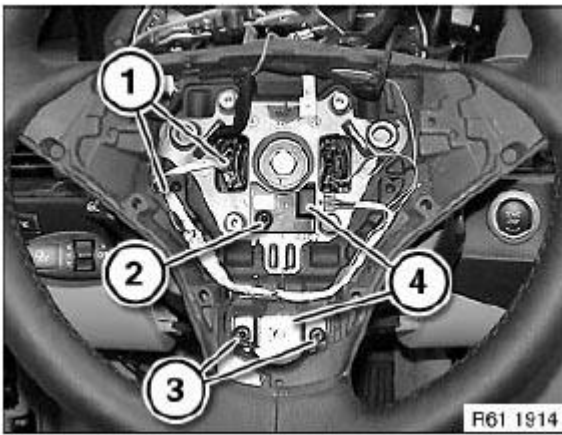


Fig. 238: Identifying Motor Electrics, Plug Connection And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace screws (2 and 3).

- Tightening torque **32 33 3AZ**
- Tightening torque **32 33 4AZ**

Ensure correct cable routing.

61 31 241 REMOVING AND INSTALLING/REPLACING ENGINE HOOD CONTACT SWITCH

Unfasten plug connection (1) and disconnect.

Pull engine hood contact switch (2) in direction of arrow and feed out of microfilter air duct (3).

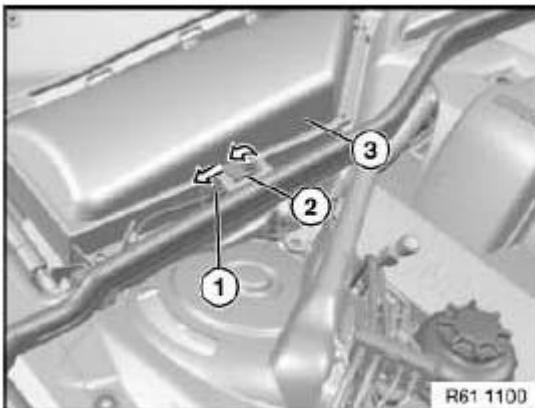


Fig. 239: Identifying Engine Hood Contact Switch, Microfilter Air Duct And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 245 REMOVING AND INSTALLING / REPLACING REAR WINDOW BUTTON

Necessary preliminary tasks:

- Remove **SHAFT BEARING FOR REAR WINDOW WIPER**

IMPORTANT: When disconnecting plug connection (2), make sure no tensile load is exerted on foil conductor (risk of damage).

If necessary, remove adhesive tape (1).

Disconnect plug connection (2).

Remove secured rear window button (3).

Installation:

If necessary, replace gasket.

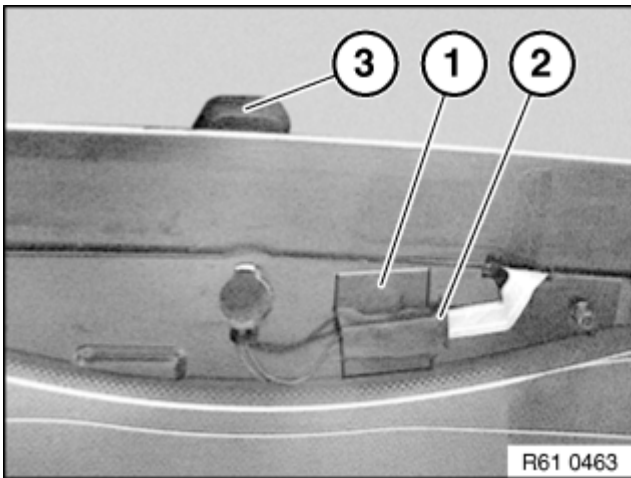


Fig. 240: Locating Plug Connection, Secured Rear Window Button, And Adhesive Tape
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Feed in cable (2) of rear window button (1) through bore hole (3).

Connect plug connection (4) and secure with adhesive tape if necessary.

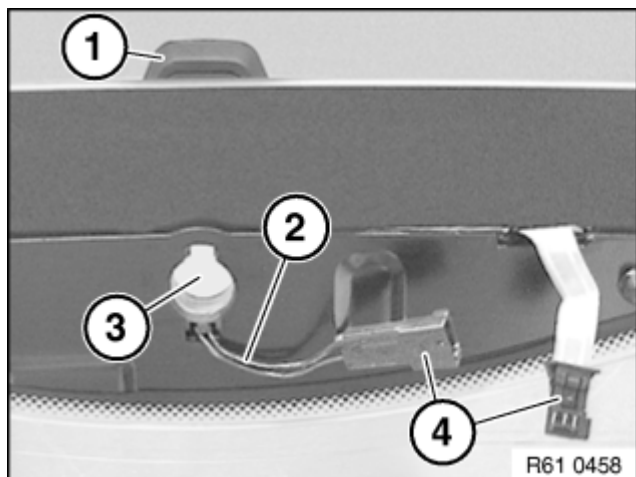


Fig. 241: Identifying Cable, Bore Hole, And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 255 REPLACING SWITCH FOR DOOR MIRROR

Operation is described in:

Replacing rocker switch for side window operation. See **SWITCH (UP TO 03/2007)** or **SWITCH (LONG VERSION OR FROM 03/2007)**

61 31 257 REMOVING AND INSTALLING/REPLACING SWITCH FOR LEFT OR RIGHT REAR CABIN MONITOR

Necessary preliminary tasks:

- Remove **UPPER REAR PANEL FROM FRONT SEAT BACKREST** on left or right

Press locks (1) together and press switches for seat heating (2) out of trim (3).

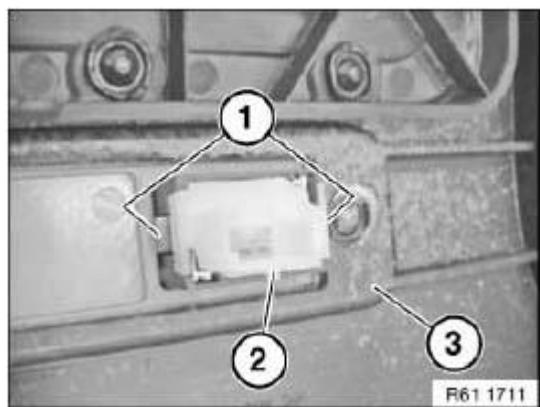


Fig. 242: Identifying Switches And Locks
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 270 REPLACING SWITCH FOR REVERSING LIGHT

NOTE: The installation location of the reversing light switch can vary, depending on the transmission model.

Necessary preliminary tasks:

- If necessary, remove **REAR UNDERBODY PROTECTION**

Version A:

Disconnect plug connection (1).

Release switch for reversing light (2).

Tightening torque: 16 Nm

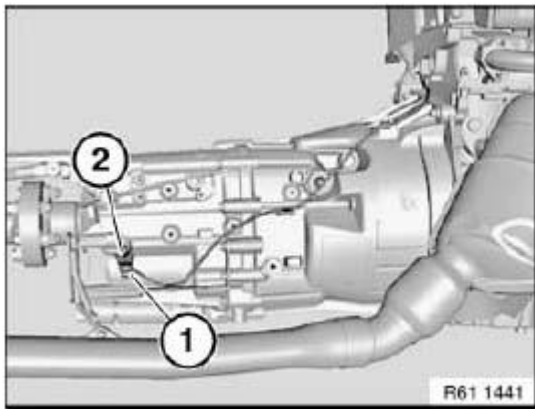


Fig. 243: Identifying Switch For Reversing Light And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Version B:

Disconnect plug connection (1).

Release switch for reversing light (2).

Tightening torque: 16 Nm

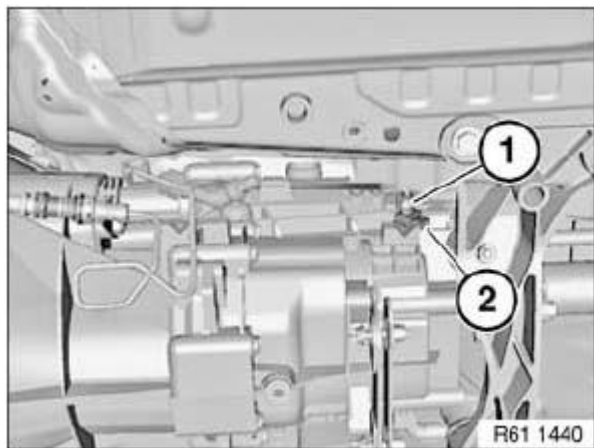


Fig. 244: Identifying Switch For Reversing Light And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 287 REMOVING AND INSTALLING/REPLACING DYNAMIC DRIVING SWITCH (SPORT BUTTON)

Special tools required:

- **64 1 020**

Necessary preliminary tasks:

- Remove trim for preselector lever. See **REMOVING AND INSTALLING/REPLACING TRIM FOR PRESELECTOR LEVER (FROM 03/2007)** or **REMOVING AND INSTALLING/REPLACING TRIM FOR PRESELECTOR LEVER (UP TO 03/2007)** .

Release screws (1).

If necessary, lever out actuation trim (4) with special tool **64 1 020** and remove.

Remove driving dynamics switch (2) in direction of arrow from finisher for preselector lever (3).

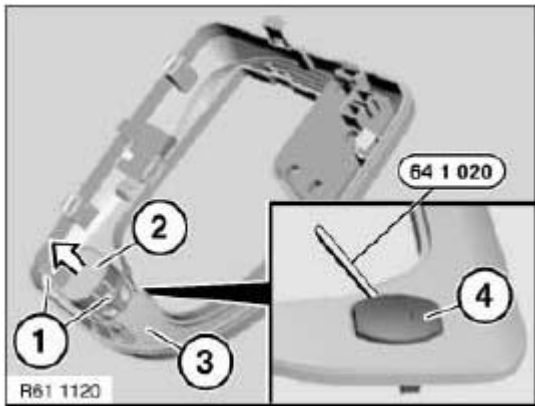


Fig. 245: Removing Driving Dynamics Switch
 Courtesy of BMW OF NORTH AMERICA, INC.

Version with automatic sport transmission:

Unlock catches (1).

Remove Sport button (2) in direction of arrow from trim for preselector lever (3).

Installation:

Make sure Sport button (2) is correctly seated on trim for preselector lever (3).

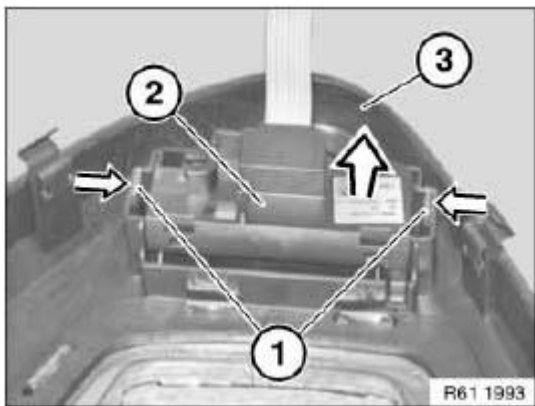


Fig. 246: Identifying Sport Button And Catches
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 299 REMOVING AND INSTALLING/REPLACING CLUTCH SWITCH MODULE

Necessary preliminary tasks:

- Remove **TRIM PANEL FOR PEDAL ASSEMBLY** .

NOTE: Clutch master cylinder (2) is removed for purposes of clarity.

Lever out clutch switch module (1) from clutch master cylinder (2) with screwdriver.

Unlock plug (4) and disconnect from housing (3).

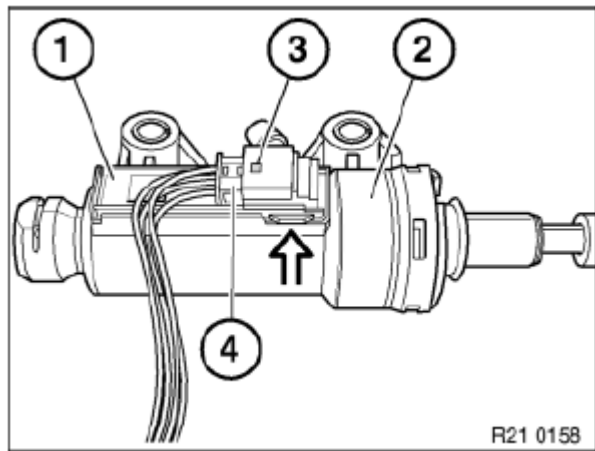


Fig. 247: Identifying Clutch Switch Module And Clutch Master Cylinder
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Clutch switch module is secured against incorrect installation.

Clutch switch module must snap audibly into place.

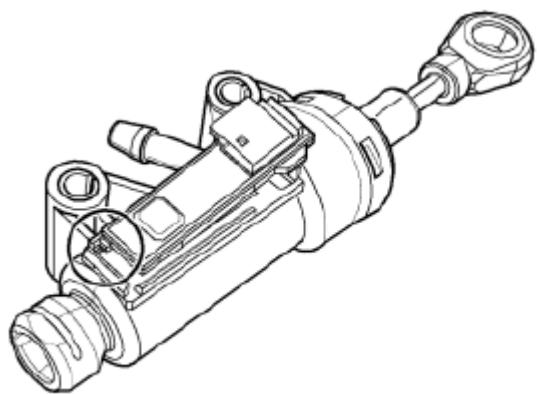


Fig. 248: Identifying Clutch Switch Module
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 310 REPLACING BRAKE LIGHT SWITCH

Necessary preliminary tasks:

- Remove **TRIM PANEL FOR PEDAL ASSEMBLY** .

Unfasten plug connection (1) and disconnect.

Pull brake light switch (2) in direction of arrow out of brake light switch holder (3).

Installation:

- Press brake pedal (4) to floor.
- Slide brake light switch (2) as far as it will go into brake light switch holder (3).
- Grip brake light switch holder (3), slowly return brake pedal (4) to starting position and pull back to stop .

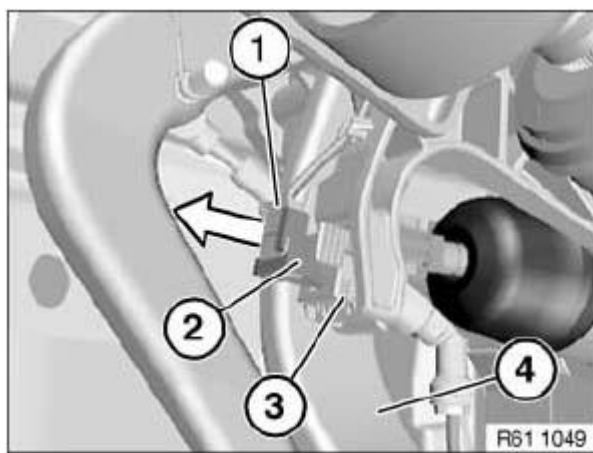


Fig. 249: Pulling Brake Light Switch

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Removing brake light switch holder (2):
Press brake pedal.
Press catches (1) together and unclip brake light switch holder (2) from bearing block (3).

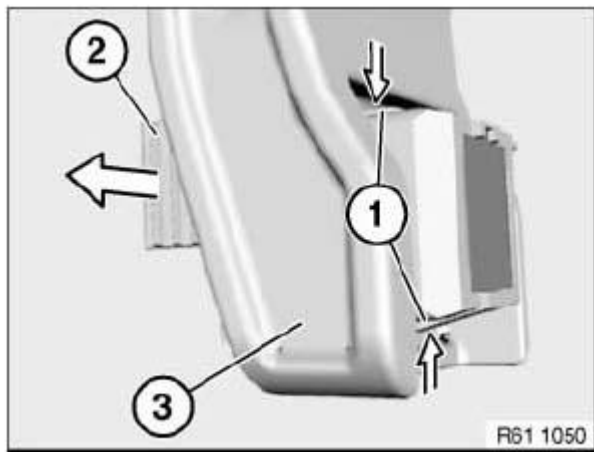


Fig. 250: Removing Brake Light Switch Holder
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 330 REMOVING SWITCH FOR GLOVEBOX LIGHT

Special tools required:

- **64 1 020**

Lever switch for glovebox light (1) with special tool **64 1 020** as pictured out of glovebox housing (2).

Unlock and disconnect associated plug connection, remove switch for glovebox light (1).

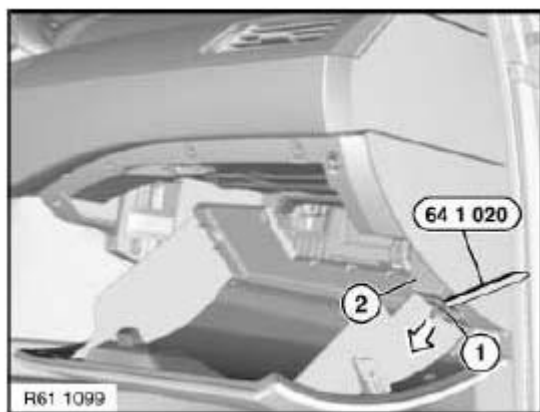


Fig. 251: Identifying Glovebox Light And Special Tool
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 334 REMOVING AND INSTALLING/REPLACING GRIP TRIM FOR GEAR SELECTOR SWITCH

Special tools required:

- **00 9 322**

Lever off side section (1) with special tool **00 9 322** from gear selector switch (2) and remove.

Installation:

Position side section (1) on metal pins of gear selector switch (2) and uniformly press down firmly and without leaving a gap.



Fig. 252: Identifying Special Tool (00 9 322)

Courtesy of BMW OF NORTH AMERICA, INC.

Lever off front shell (1) with special tool **00 9 322** from gear selector switch (2) and remove.

Press P button (3) and remove front shell (1) starting from top.

Installation:

Insert front shell (1) at bottom in retaining ring (4). Uniformly press front shell (1) upwards onto metal pins of gear selector switch (2) firmly and without leaving a gap.



Fig. 253: Identifying P Button, Front Shell And Gear Selector Switch

Courtesy of BMW OF NORTH AMERICA, INC.

Lever off P button (1) with special tool **00 9 322** from gear selector switch (2) and uniformly remove.

Installation:

After installing front shell, insert P button (1) into upper opening on gear selector switch (2) and uniformly press in until it engages.

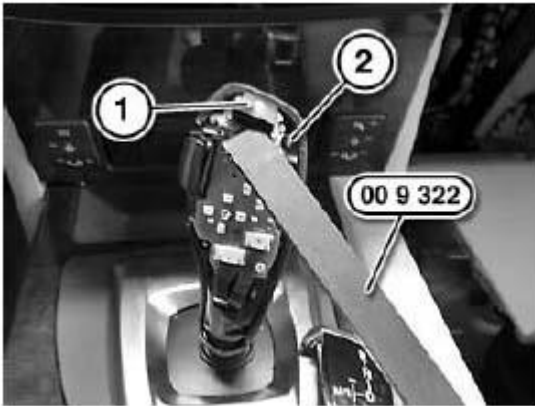


Fig. 254: Identifying P Button And Gear Selector Switch

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 342 REMOVING AND INSTALLING/REPLACING GEAR SELECTOR SWITCH

IMPORTANT: Read and comply with notes on protection against electrostatic damage (**ESD PROTECTION**).

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **TRIM FOR STORAGE COMPARTMENT**

Disconnect plug connection (1).

Release screws (3) and lay emergence release mechanism to one side. Tightening torque **61 31 7AZ** .

Release screws (2). Tightening torque **61 31 6AZ** .

Remove gear selector switch (4) from center console (5).

Installation:

Align gear selector switch (4) centrally.

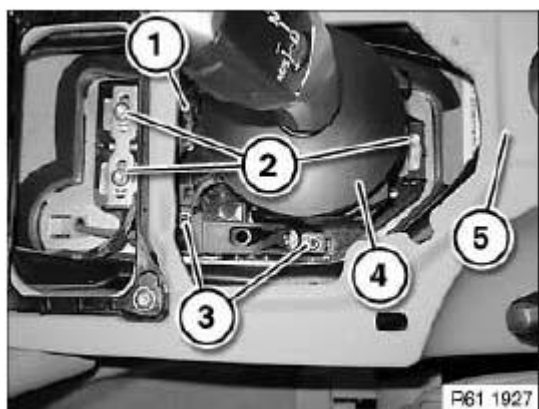


Fig. 255: Identifying Gear Selector Switch, Centre Console And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Modify spacer bolt.

Carry out **VEHICLE PROGRAMMING/CODING**.

61 31 382 REPLACING LEVEL SWITCH FOR COOLANT

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

Release screws (1).

Unlock plug connection for coolant level switch (4) and disconnect.

Pull coolant expansion tank (2) in direction of arrow out of grommet (3) underneath.

Installation:

Make sure coolant expansion tank (2) is correctly seated in grommet (3).

If necessary, replace grommet (3).

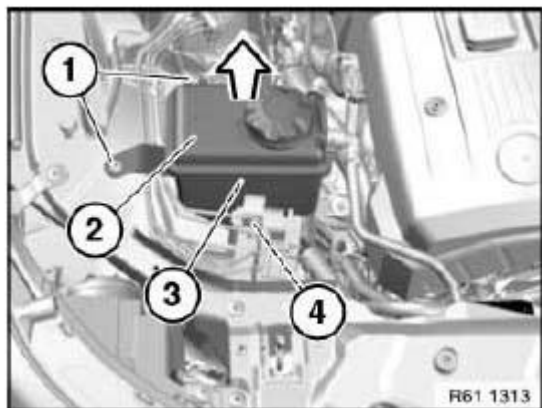


Fig. 256: Identifying Coolant Level Switch, Coolant Expansion Tank And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not damage connected water hoses.

Reposition coolant expansion tank (2) as far as possible until coolant level switch (4) forms the highest point. This will prevent coolant from escaping on opening.

If necessary, catch escaping coolant and feed back in later.

NOTE: For purposes of clarity, illustration shows coolant expansion tank (2) removed.

Turn coolant level switch (1) in direction of arrow, pull upwards out of coolant expansion tank (2) and remove.

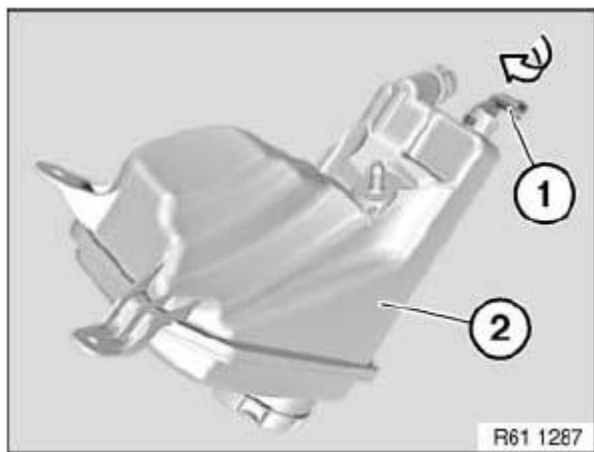


Fig. 257: Turning Coolant Level Switch

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 492 REPLACING (REMOVING AND INSTALLING) LEVEL SWITCH FOR WINDSCREEN WASHER UNIT

Necessary preliminary tasks:

- E60 M5:

Remove **FRONT UNDERBODY PROTECTION**

NOTE: For purposes of clarity, illustration shows front wheel removed.

Release screws.

Fold back wheel arch trim (1) in direction of arrow.

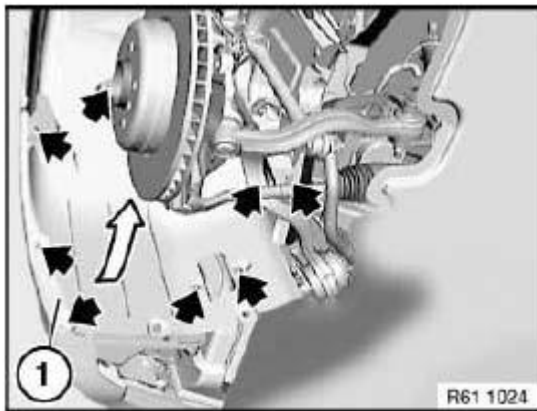


Fig. 258: Folding Back Wheel Arch Trim
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Turn level switch for windscreen washer unit (2) in direction of arrow and remove towards bottom from fluid reservoir for windscreen washer unit (3).

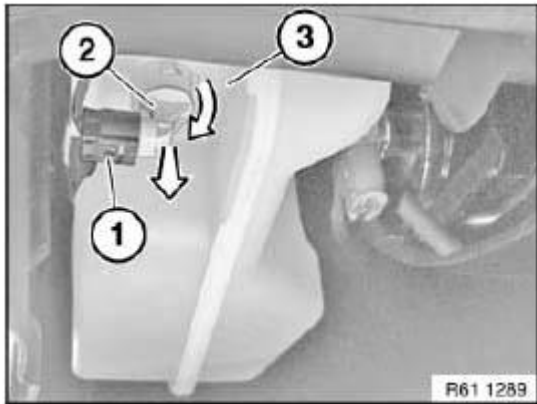


Fig. 259: Turning Level Switch For Windscreen Washer Unit
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 996 CARRYING OUT STEERING ANGLE SENSOR ADJUSTMENT

IMPORTANT: In vehicles with active front steering, steering angle sensor adjustment is integrated in the service function "INITIAL OPERATION/ADJUSTMENT FOR ACTIVE FRONT STEERING " and must not be carried out separately!

NOTE: Steering angle sensor adjustment must be carried out:

- after adjustment work on the front axle/steering
- after all mechanical work on the steering system
- E46 (AWD), E53, E83: after disconnection of battery
- after replacement / coding / programming of the following components:
 - Fixture for switches of steering column / switch cluster / steering angle sensor
 - Dynamic Stability Control (DSC) control unit
 - Control unit active anti-roll stabilization (ARS)

Connect vehicle to BMW diagnosis system or Software Service Station.

Select and carry out steering angle sensor adjustment under Service functions.

HORN**61 33 060 REMOVING AND INSTALLING/REPLACING BOTH FANFARE HORNS**

Release screws (1).

Detach cover (2) from front underride protection (3) and feed out in direction of arrow.

Remove cover (2).

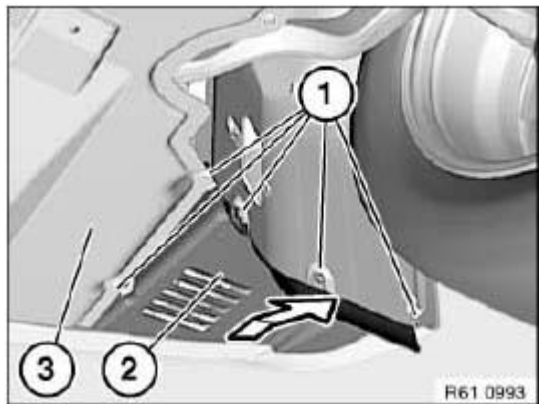


Fig. 260: Identifying Front Underride Protection And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug connections (1) and disconnect.

Release nuts (2) and remove fanfare horns (3).

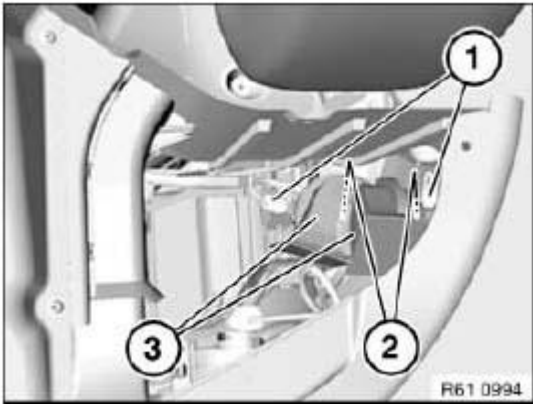


Fig. 261: Identifying Fanfare Horns And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

INSERT HOLDER FOR CIGARETTE LIGHTER

61 34... REMOVING AND INSTALLING/REPLACING POWER SOCKET IN REAR STORAGE COMPARTMENT

Necessary preliminary tasks:

- Remove rear insert (in storage compartment). See **REMOVING AND INSTALLING/REPLACING REAR INSERT (IN STORAGE COMPARTMENT)** or **REMOVING AND INSTALLING LOWER REAR CONSOLE TRIM (LONG VERSION)** .

Carefully lever bulb holder (1) in direction of arrow off power socket (2).

Press power socket (2) out of trim (3).

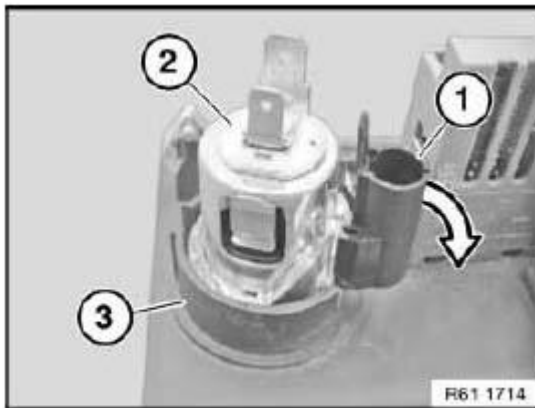
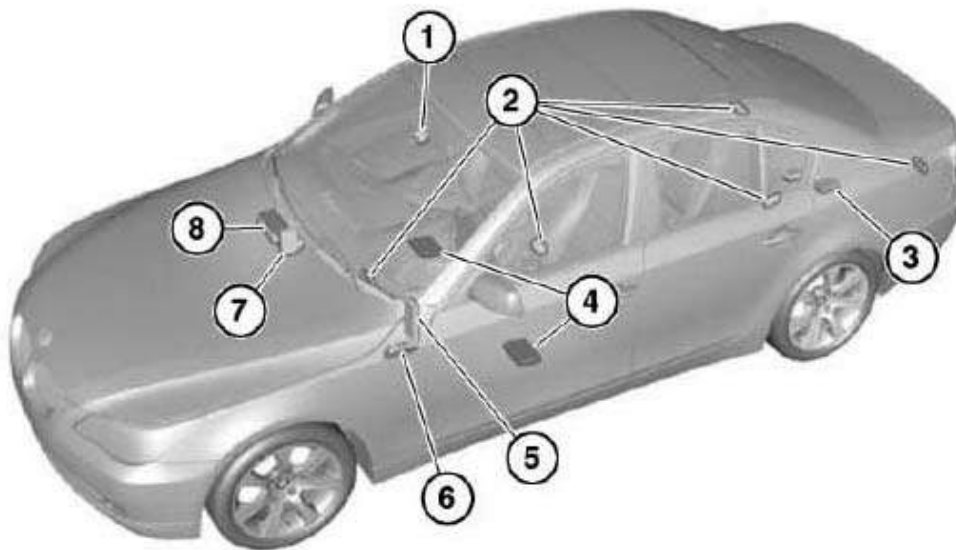


Fig. 262: Identifying Bulb Holder And Power Socket
Courtesy of BMW OF NORTH AMERICA, INC.

CONTROL UNITS, MODULES

61 35.. OVERVIEW OF CONTROL UNITS



R61 1522

- | | | | |
|---|--|---|---|
| 1 | <u>Rain/light sensor</u> | 5 | <u>Control unit, car access system</u> |
| 2 | <u>Antennas for comfort access system</u> | 6 | <u>Control unit, light module</u> |
| 3 | <u>Control unit, Park Distance Control</u> | 7 | <u>Control unit for comfort access system</u> |
| 4 | <u>Control unit for seat module</u> | 8 | <u>Control unit, body module</u> |

Fig. 263: Overview Of Control Units
Courtesy of BMW OF NORTH AMERICA, INC.

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

Statically charged persons can discharge by touching 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.

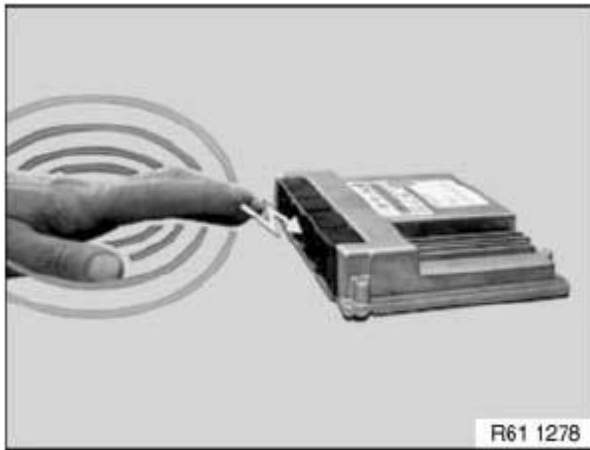


Fig. 264: Precaution For - Touching Electrical Components
Courtesy of BMW OF NORTH AMERICA, INC.

Example:

Mechatronic control unit.

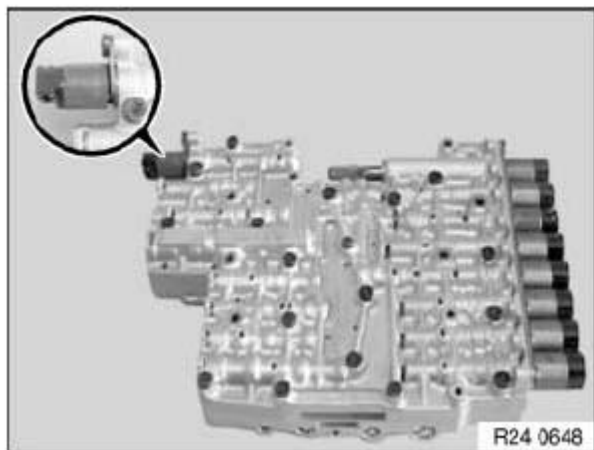


Fig. 265: Identifying Mechatronic Control Unit
Courtesy of BMW OF NORTH AMERICA, INC.



Fig. 266: Precaution For - Do Not Touch Pins Or Multi-Pin Connectors Directly
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not touch pins or multi-pin connectors directly!

Touch electrical components by their housings only.

IMPORTANT: To prevent electrical components from being damaged or destroyed by electrostatic discharge, it is absolutely essential to comply with 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).

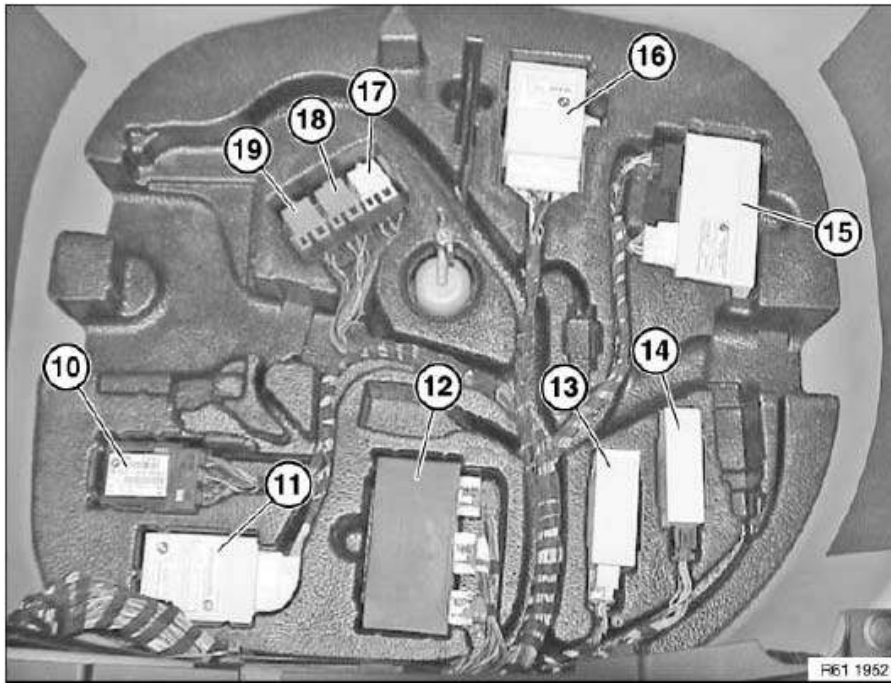
These can primarily be identified by the logo on the side.



Fig. 267: Identifying Antistatic Shoes

Courtesy of BMW OF NORTH AMERICA, INC.

61 35... OVERVIEW OF CONTROL UNITS, EQUIPMENT MOUNTING, LUGGAGE COMPARTMENT



- | | | | |
|----|--|----|--|
| 10 | Power amplifier (E61) | 15 | Control unit, slide/tilt sunroof, from 03/2007 (E61) |
| 11 | Control unit, electronic ride-height control (E61) | 16 | Control unit, automatic rear lid actuation (E61) |
| 12 | Control unit, Park Distance Control | 17 | Relay, Soft Close Automatic, rear lid (E61) |
| 13 | Control unit, trailer tow hitch | 18 | Relay, rear window wiper (E61) |
| 14 | Trailer module | 19 | Relay, electronic ride-height control (E61) |

Fig. 268: Overview Of Control Units, Equipment Mounting, Luggage Compartment
 Courtesy of BMW OF NORTH AMERICA, INC.

61 00... PROGRAM / ENCODE THE CONTROL UNIT(S)

See [PROGRAM / ENCODE THE CONTROL UNIT\(S\)](#).

61 35 001 REMOVING AND INSTALLING (REPLACING) TRAILER MODULE

IMPORTANT: Read and comply with notes on protection against electrostatic damage ([ESD PROTECTION](#)).

Necessary preliminary tasks:

- Remove [LUGGAGE COMPARTMENT FLOOR TRIM](#)
- If necessary, remove storage tray for car jack
- If necessary, remove spare wheel
- Remove control unit cover

M5 only:

- Remove battery

NOTE: Depending on the equipment specification, the position of the trailer module (2) can vary.

Lift trailer module (2) out of equipment mounting (3).

Disconnect plug connection (1).

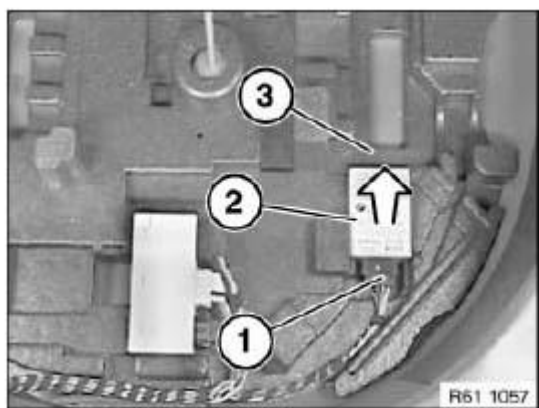


Fig. 269: Identifying Equipment Mounting And Trailer Module
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

61 35 015 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR CAR ACCESS SYSTEM

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION).

Necessary preliminary tasks:

- Remove TRIM PANEL FOR PEDAL ASSEMBLY .

Unfasten plug connection (2) and disconnect.

IMPORTANT: Carefully unlock and disconnect associated plug connection for ribbon cable (1).
Replace ribbon cable (1) if

- plug connection for ribbon cable (1) is damaged
- control unit for Car Access System (3) is replaced

The ribbon cable leads to the IGNITION STARTER SWITCH.

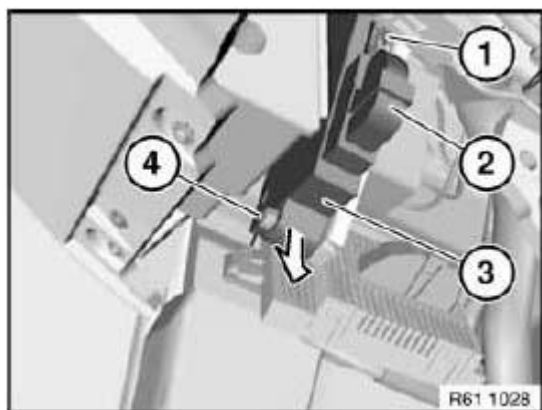


Fig. 270: Identifying Control Unit For Car Access System And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (4) and remove control unit for Car Access System (3) in direction of arrow.

Installation:

Feed guide (1) of control unit for Car Access System (2) correctly into associated mounting.

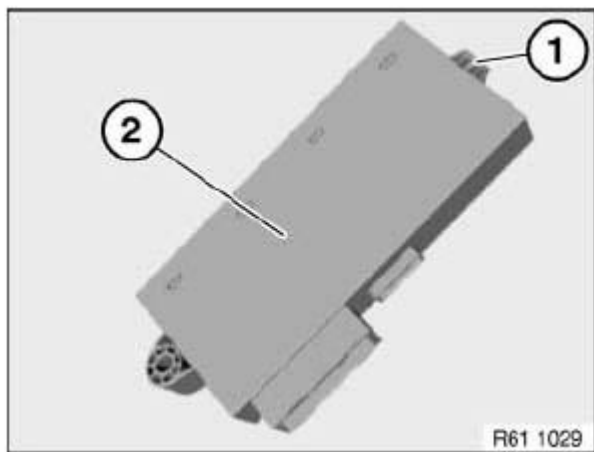


Fig. 271: Identifying Guide Of Control Unit For Car Access System
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

Version with independent heating:

Initialize all **INDEPENDENT HEATING REMOTE CONTROLS** .

61 35 030 REMOVING AND INSTALLING (REPLACING) POWER MODULE

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Necessary preliminary tasks:

- Remove **LUGGAGE COMPARTMENT FLOOR TRIM**
- Remove spare wheel

Take off cover for control units (1).

NOTE: Make sure cover for control units (1) is correctly seated on locating pins (2).

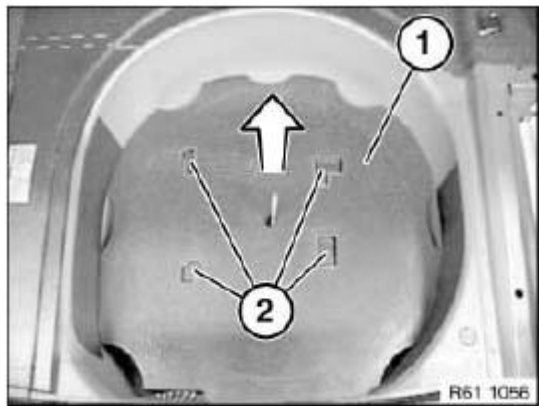


Fig. 272: Identifying Control Units And Locating Pins
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Remove power module (2) in direction of arrow from mounting for control units (3).

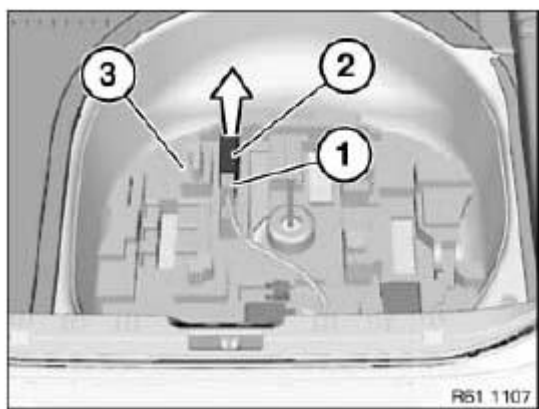


Fig. 273: Removing Power Module

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 35 076 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR BACKREST WIDTH ADJUSTMENT

Special tools required:

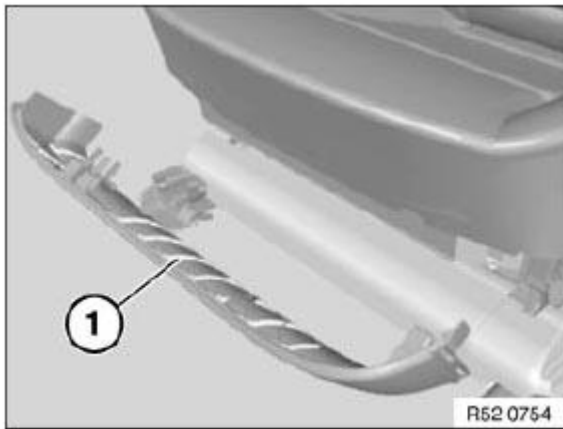
- **52 0 050**

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Necessary preliminary tasks:

- Remove switch combination for seat adjustment. See **REPLACING SEAT ADJUSTMENT SWITCH COMBINATION (FULLY ELECTRIC FRONT SEAT)** or **REPLACING SEAT ADJUSTMENT SWITCH COMBINATION (SEMI-ELECTRIC FRONT SEAT)**.

Unclip cover (1) on front seat.

**Fig. 274: Identifying Cover**

Courtesy of BMW OF NORTH AMERICA, INC.

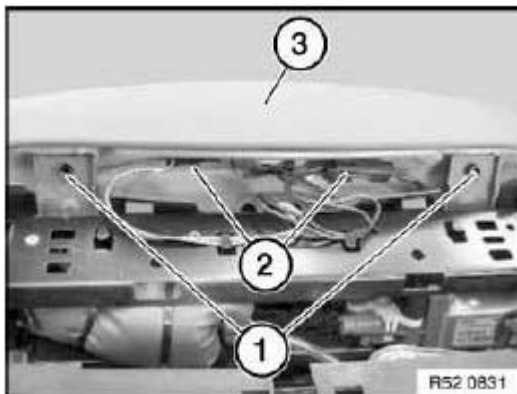
Release screws (1) on thigh support.

Disconnect plug connection (2).

Remove thigh support (3) towards top.

Installation:

Insert screws (1) with Loctite.

**Fig. 275: Identifying Thigh Support, Plug Connection And Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip trim (1) for thigh support carrier.

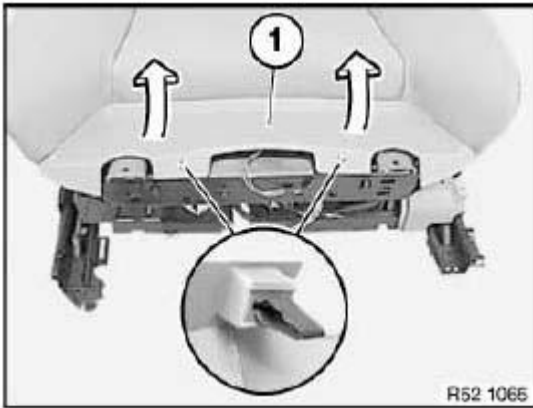


Fig. 276: Unclipping Trim For Thigh Support Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

Detach seat cover (1).

Tilt back seat cover (1) with padding towards middle of vehicle.

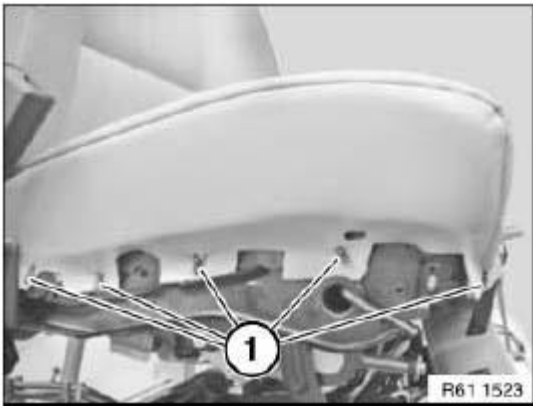


Fig. 277: Identifying Seat Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Loosen retainers (1).

Tilt back thigh support (2) towards rear.

Remove all remnants of clips from seat cover and seat mechanism.

Installation:

Bend new retainers closed with pliers 52 0 050 .

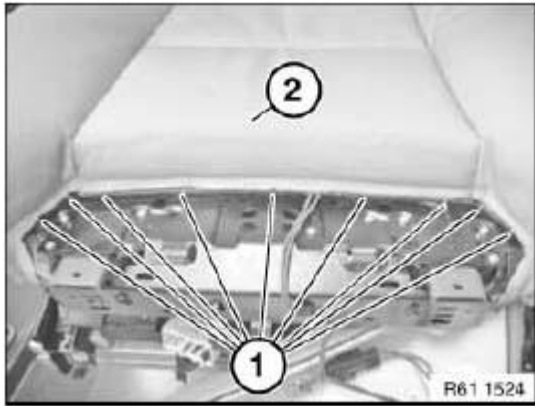


Fig. 278: Identifying Thigh Support And Retainers
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1) under tilted-up seat padding.

Unlock plug connections (2) and disconnect.

Remove control unit for backrest width adjustment (3) towards bottom.

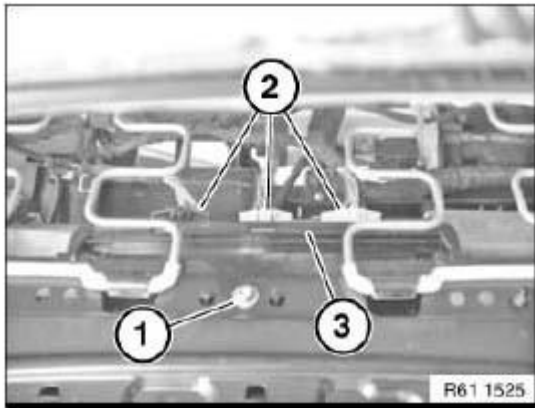


Fig. 279: Identifying Control Unit, Plug Connections And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 35 080 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR LEFT OR RIGHT SEAT ADJUSTMENT (FRONT SEAT)

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Illustration of problem: (replacement only)

In the event of a faulty seat module, new variants with a 30 mm wider housing will be used as replacements as of 03/2005.

- Seat module up to 03/2005 approx. 135 mm
- Seat module from 03/2005 approx. 165 mm

This results (on the right seat only) in a collision with the central seat connector.

In vehicles up to 03/2005 it is therefore necessary to fit the right seat with a new seat pan (applicable from 03/2005).

The following SM variants are affected:

- SM H
- SM BA/M
- SM BA/M-HK

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **TRIMS FOR TOP RAIL**

Removal and installation:

NOTE: To facilitate installation/removal of control unit, move seat upwards fully.

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

Unlock catches (2) towards rear, feed out control unit for seat adjustment (3) in direction of arrow and remove from seat rail (4).

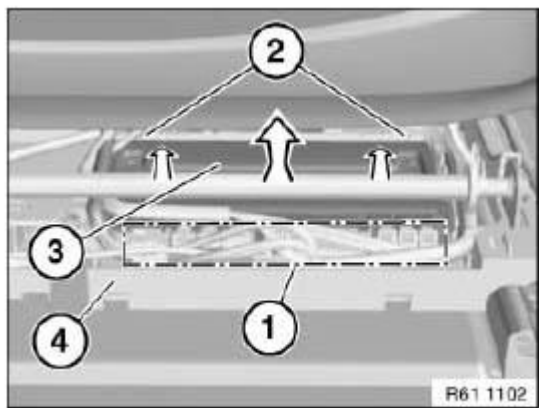


Fig. 280: Identifying Control Unit Of Seat Adjustment, Catches And Seat Rail
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure mounts (1) and retaining lugs (2) of control unit for seat adjustment (3) are correctly seated.

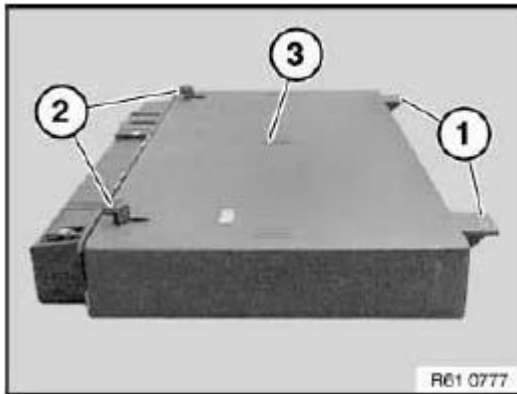


Fig. 281: Identifying Mounts And Retaining Lugs Of Control Unit
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

REMOVE trim for top rail on outside.

Unlock central seat connector (1) and disconnect.

Unlock and disconnect all plug connections from connector strips (2).

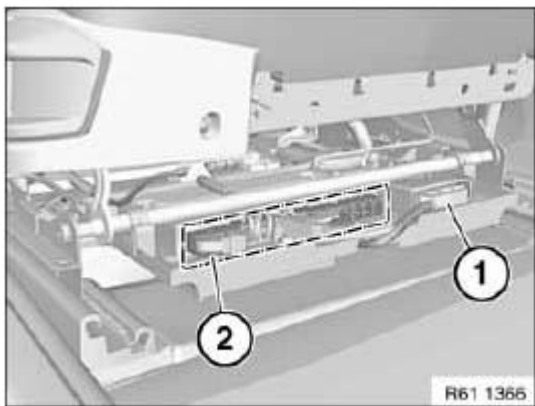


Fig. 282: Identifying Central Seat Connector And Connector Strips
Courtesy of BMW OF NORTH AMERICA, INC.

Pull seat pan (1) forwards slightly and unclip from seat linkage.

Lift seat pan at rear left and right out of seat rail.

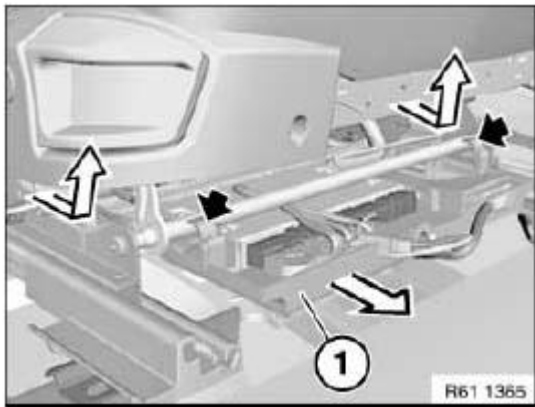


Fig. 283: Pulling Seat Pan

Courtesy of BMW OF NORTH AMERICA, INC.

Turn seat pan in seat mechanism and feed out towards front.

Unclip seat wiring harnesses from seat pan.

Remove seat pan.

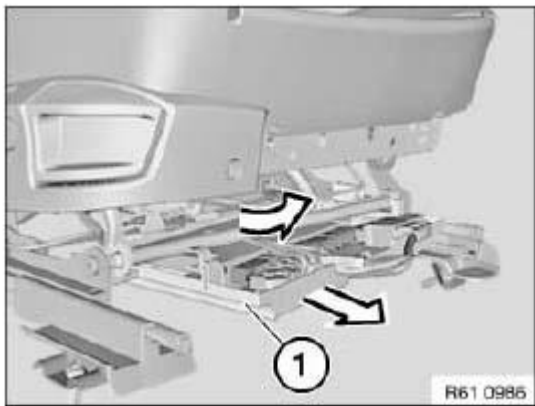


Fig. 284: Turning Seat Pan In Seat Mechanism

Courtesy of BMW OF NORTH AMERICA, INC.

The new seat module is secured to the new seat pan in the area marked "R".

Wiring harness (1) must be re-laid accordingly.

Pay attention to new clip positioning (2).

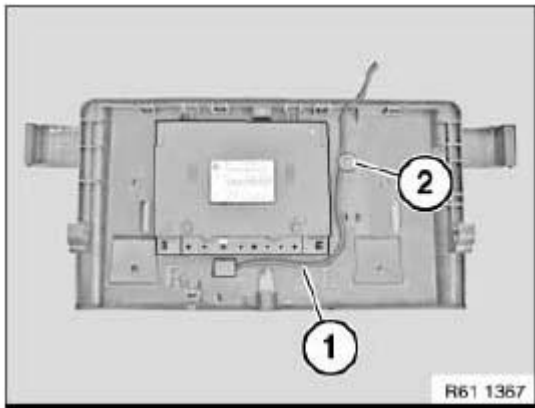


Fig. 285: Identifying Seat Module Wiring Harness

Courtesy of BMW OF NORTH AMERICA, INC.

Carry out **PROGRAMMING/CODING**.

61 35 125 REMOVING AND INSTALLING/REPLACING BODY MODULE

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Read out **PROGRAMMING/CODING**.

- Print out and make a note of settings for car and key memory in CKM menu

Necessary preliminary tasks:

- Disconnect battery negative lead
- Remove **TRIM FOR INSTRUMENT PANEL, BOTTOM LEFT**
- Detach **AIRBAG CONTROL UNIT WITH GATEWAY MODULE**

NOTE: Open glovebox.

Unclip pin (1) from retaining strap (2).

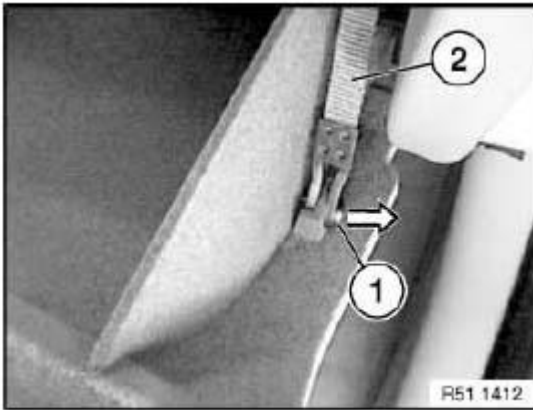


Fig. 286: Unclipping Pin From Retaining Strap
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip pin (1) from shock absorber (2).

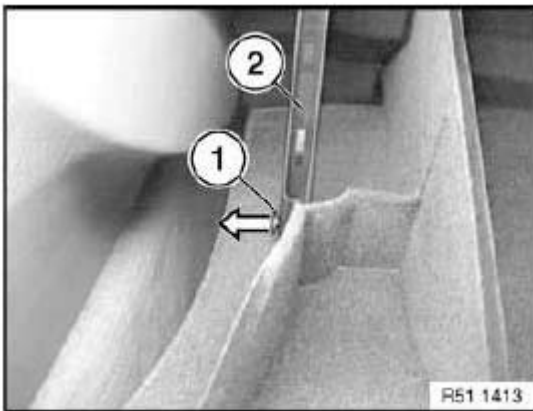
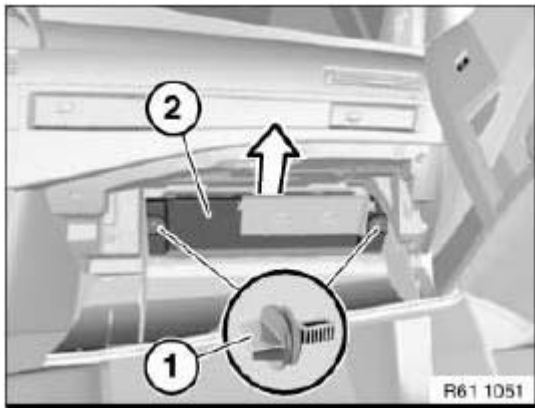


Fig. 287: Unclipping Pin From Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

Open rotary clips (1) and remove.

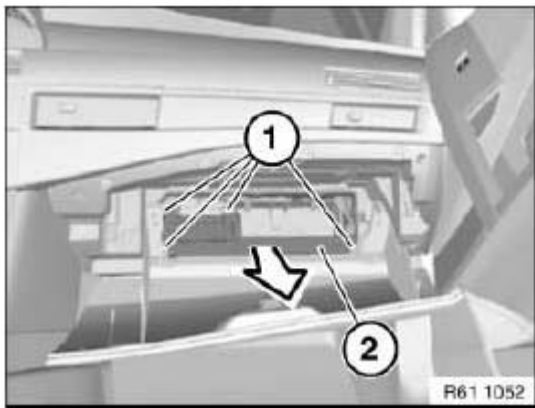
Remove cover (2) in direction of arrow.

**Fig. 288: Removing Cover**

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Pull fuse holder (2) back slightly.

**Fig. 289: Pulling Fuse Holder**

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug connections (1) and disconnect.

Unlock catches (3) in direction of arrow and remove body module (2) from equipment carrier (4).

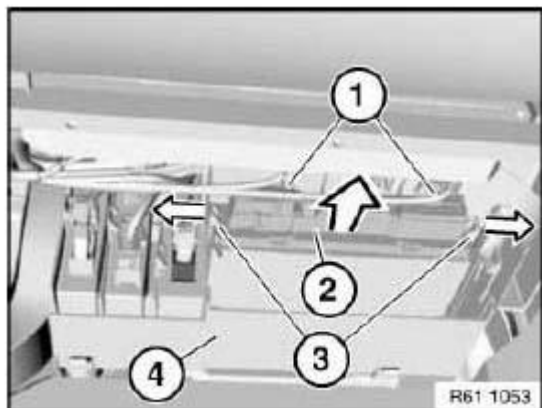


Fig. 290: Identifying Equipment Carrier, Plug Connections And Catches
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

- Check printed-out or noted-down settings for car and key memory in CKM menu and reset if necessary

61 35 127 REMOVING AND INSTALLING/REPLACING BODY GATEWAY MODULE

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Read out **PROGRAMMING/CODING**.

- Print out and make a note of settings for car and key memory in CKM menu

Necessary preliminary tasks:

- Disconnect negative battery cable
- Remove **TRIM FOR INSTRUMENT PANEL, BOTTOM LEFT**

NOTE: Open glovebox.

Unclip pin (1) from retaining strap (2).

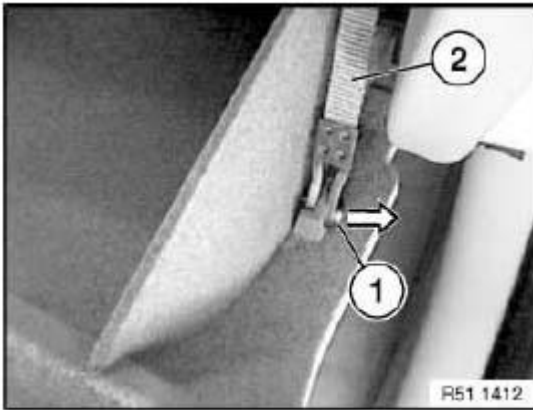


Fig. 291: Unclipping Pin From Retaining Strap
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip pin (1) from shock absorber (2).

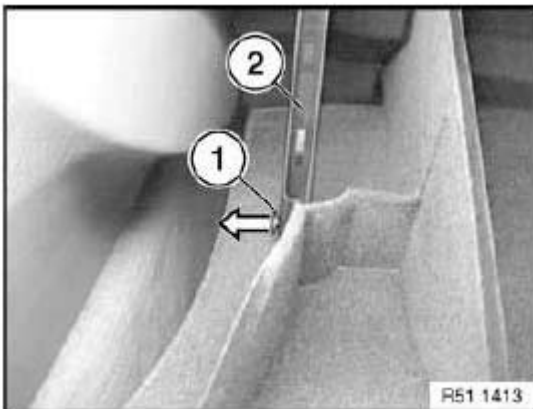


Fig. 292: Unclipping Pin From Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

Open rotary clips (1) and remove cover (2) in direction of arrow.

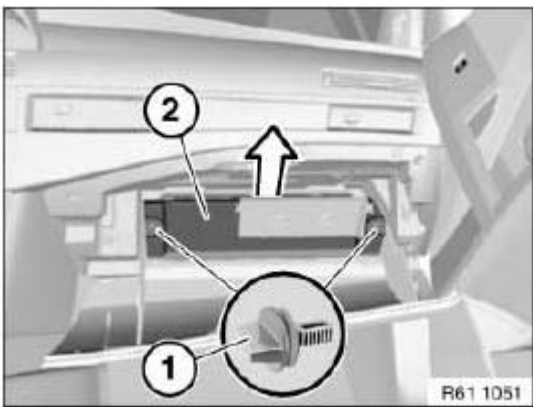
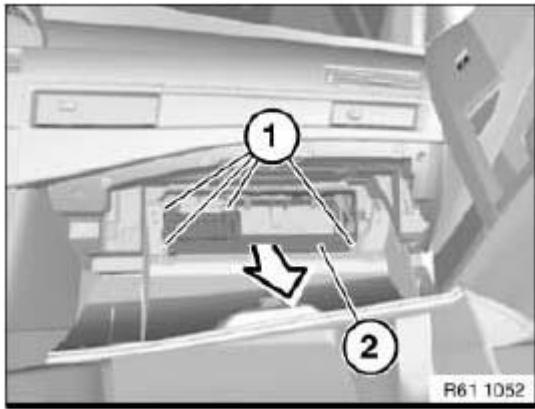


Fig. 293: Removing Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Pull fuse holder (2) back slightly.

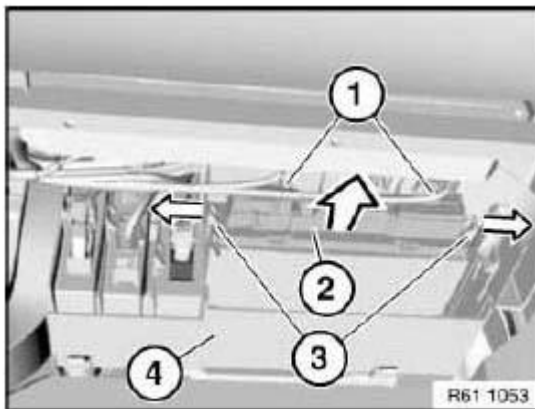
**Fig. 294: Pulling Fuse Holder**

Courtesy of BMW OF NORTH AMERICA, INC.

Detach **AIRBAG CONTROL UNIT WITH GATEWAY MODULE** .

Unlock plug connections (1) and disconnect.

Unlock catches (3) in direction of arrow and remove body module (2) from equipment carrier (4).

**Fig. 295: Identifying Body Module, Equipment Carrier And Plug Connections**

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

- Check printed-out or noted-down settings for car and key memory in CKM menu and reset if necessary

61 35 177 REMOVING AND INSTALLING (REPLACING) RAIN/LIGHT SENSOR

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD PROTECTION)).

Necessary preliminary tasks:

Version with Autobeam:

- Remove INTERIOR REAR-VIEW MIRROR

Detach two-part mirror base cover (1) by pressing from below.

Feed out two-part mirror base cover (1) and remove.

NOTE: Catches of two-part mirror base cover (1) must not be damaged or missing.

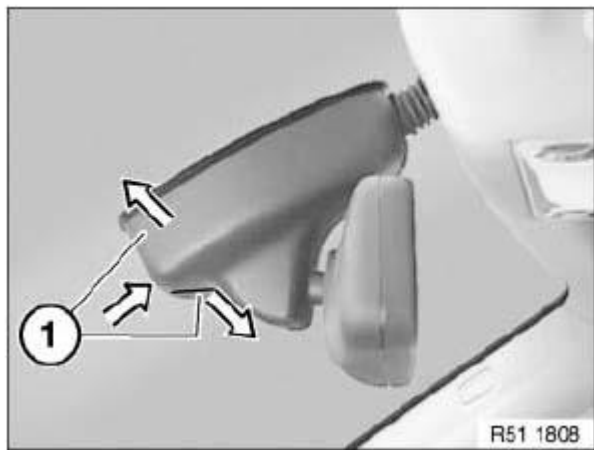


Fig. 296: Pressing Two-Part Mirror Base Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (3).

Release locks (1) in direction of arrow and remove rain/light sensor (2) from optical element.

Installation:

Do not damage optical element covered by rain/light sensor (2).

Initialize RAIN/LIGHT SENSOR.

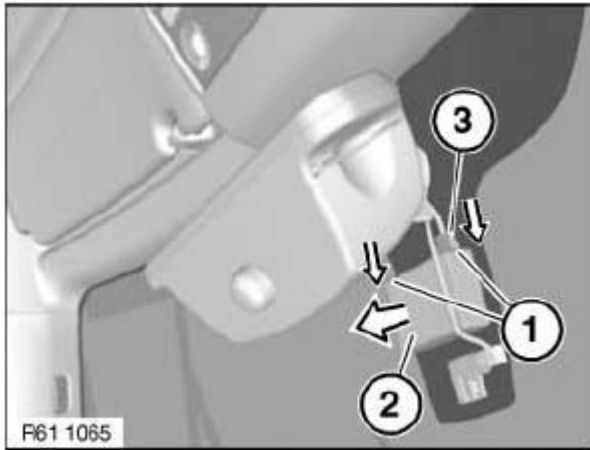


Fig. 297: Removing Rain/Light Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **VEHICLE PROGRAMMING/CODING**.

61 35 220 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR LEFT OR RIGHT FRONT DOOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Read out **PROGRAMMING/CODING**.

- Print out and make a note of settings for car and key memory in CKM menu

Necessary preliminary tasks:

- Remove **FRONT DOOR TRIM**

Unlock plug connections (1) and disconnect.

If necessary, unclip electrical leads at points (2).

Release screws (3).

Remove control unit in front door (4).

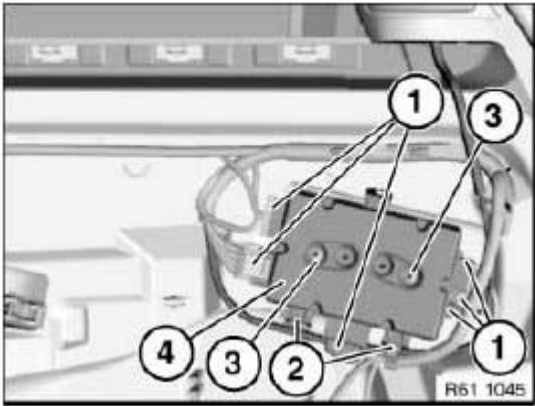


Fig. 298: Identifying Front Door Control Unit, Plug Connections And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

- Check printed-out or noted-down settings for car and key memory in CKM menu and reset if necessary

61 35 285 REMOVING AND INSTALLING (REPLACING) LIGHT MODULE

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Necessary preliminary tasks:

- Remove **TRIM PANEL FOR PEDAL ASSEMBLY** .

Unlock catch (1) and feed out/remove light module (2) in direction of arrow.

Installation:

Make sure light module (2) is correctly seated in mounting (3) and catch (1).

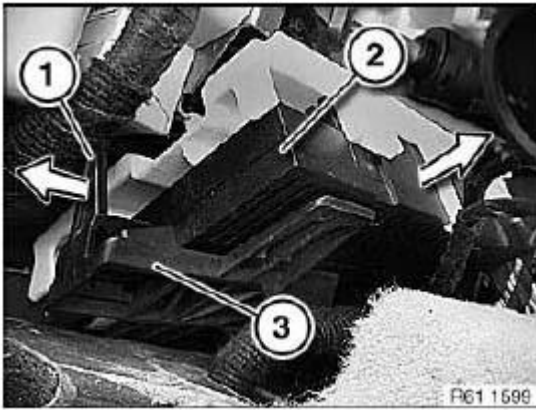


Fig. 299: Removing Light Module

Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, unlock catch (1) and remove cover (2) from light module (3).

Installation:

Make sure cover (2) is correctly seated on light module (3).

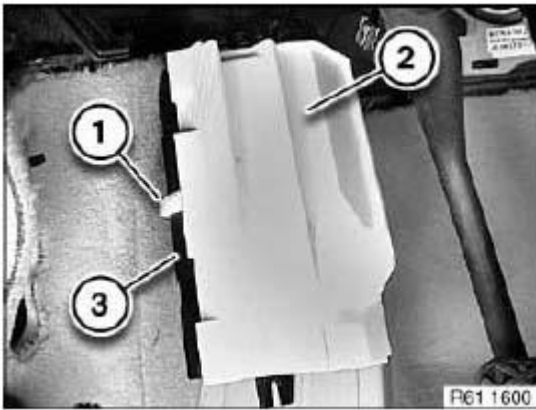


Fig. 300: Identifying Light Module, Cover And Catch

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).



Fig. 301: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 35 502 REPLACING TRAILER MODULE (09/2006-03/2009)

NOTE: From 03/2009 trailer module AHM3+ will be replaced by trailer module AHM4R.

Plug connectors and associated pin assignments must be adapted if the old plug connector AHM3(+) is fitted.

- A. Plug connector, new AHM4
- B. Plug connector, old AHM3(+)

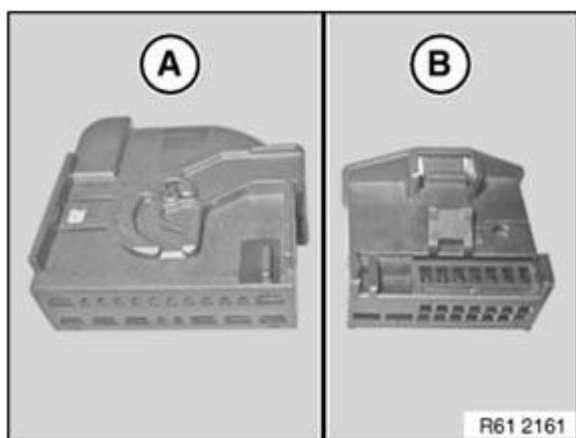


Fig. 302: Identifying Plug Connector Models

Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove **TRAILER MODULE**

From build date/version 03/2007 Series E60/61:

Installation:

Cut out device holder up to marking (1).

Cut out indentation in area (2).

Make sure AHM module is exactly seated and wiring harness is correctly routed.

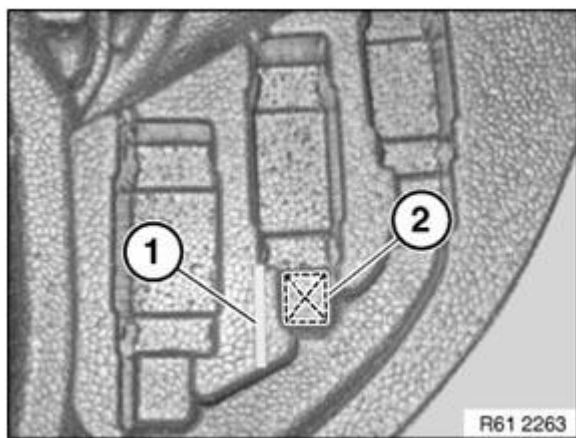


Fig. 303: Identifying Marking On Device Holder
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Positions of plugs and associated pin assignments are set out in the diagnosis system.

The repair instruction represents the highest vehicle configuration. Pin assignments of plug connections may be absent if optional equipments are not fitted.

Special tools for disconnecting:

Secondary lock:

Special tool **61 0 324**

Primary lock:

Special tool **61 0 316**

Special tool for crimping:

Double flat spring contact:

Crimping tool special tool **61 0 202** (crimping tool) with special tool **61 0 230** (matrix)

For information about special tools used in this procedure, see **GENERAL ELECTRICAL SYSTEM - SPECIAL TOOLS**.

SPECIAL TOOL FOR CRIMPING REFERENCE CHART

(09/2006 - 03/2009)			
Previously AHM3(+)		New AHM4R	
Pin no.	Contact (mm ²)	Pin no.	Contact (mm ²)
1	2.8	13	2.8
2	2.8	20	2.8
3	0.63	-	-
4	0.63	17	0.63
5	0.63	2	0.63
6	0.63	3	0.63
7	0.63	11	0.63
8	0.63	9	0.63
9	0.63	10	0.63
10	0.63	18	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
11	0.63	14	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
12	0.63	15	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
13	0.63	19	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
14	0.63	12	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
15	0.63	16	0.63
16	0.63	1	2.8
Recrimp contact from 0.63 mm ² to 2.8 mm ²			
-	-	4-8	0.63

Carry out **VEHICLE PROGRAMMING/CODING**.

61 35 679 INITIALIZING RAIN/LIGHT (SOLAR) SENSOR

NOTE: Initialization is necessary:

- after replacing windscreen
- after replacing rain/light (solar) sensor
- after replacing optical element on rain/light (solar) sensor
- after installing a used rain/light (solar) sensor

NOTE:

- Connect BMW diagnosis system
- Initializing rain/light (solar) sensor

61 35 683 REPLACING OPTICAL ELEMENT FOR SOLAR RAIN/LIGHT SENSOR

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION).

Necessary preliminary tasks:

Remove SOLAR RAIN/LIGHT SENSOR

Optical element can only be replaced in the following equipment specifications:

- E60/E61 without head-up display
- E60/E61 without lane departure warning

Carefully expand catches (1) of solar rain/light sensor (2).

Remove optical element (3).

Installation:

Remove protective cover from replacement optical element.

Catches (1) of solar sensor (2) must not be damaged.

Observe laser markings (4) of fitting aid.

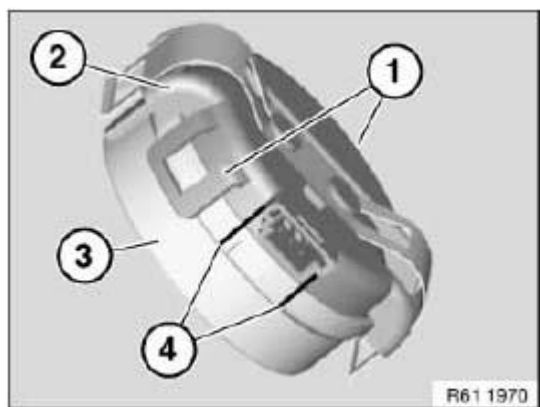


Fig. 304: Identifying Solar Rain/Light Sensor, Optical Element And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

Carry out **INITIALIZATION**.

Carry out **PROGRAMMING/CODING** if installing a different windscreen type.

61 35 685 REPLACING RAIN/LIGHT SOLAR SENSOR

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Expand two-part mirror base cover (1) by pressing from below and detach.

Feed out two-part mirror base cover (1) and remove.

If necessary, remove **INTERIOR REARVIEW MIRROR**.

NOTE: Catches of two-part mirror base cover (1) must not be damaged.

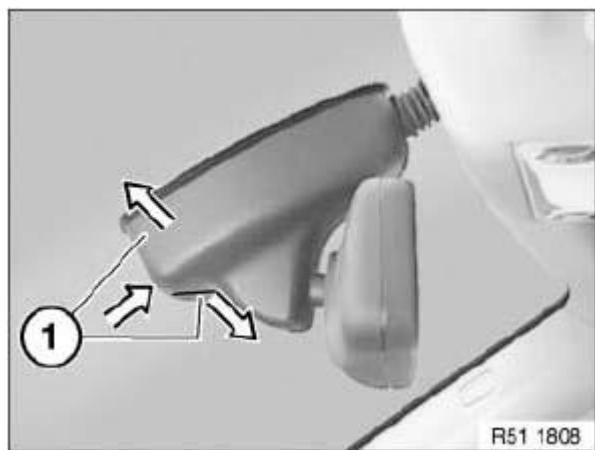


Fig. 305: Pressing Two-Part Mirror Base Cover
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock metal spring (3) in direction of arrow.

Pull off solar rain/light sensor (2) from windscreen.

Installation:

Close plug connection (1) only after fitting solar rain/light sensor on windscreen!

Carefully clean the windscreen where it comes in contact with the solar rain/light sensor! Remove all silicone residues!

Pull off protective cover from new solar rain/light sensor. Do not touch the silicon-coated surface underneath!

Align solar rain/light sensor (2) and press firmly on windscreen. Pay attention to mechanical coding (5).

Press metal spring (3) centrally to ensure that retaining element (4) engages correctly in both hooks (6).

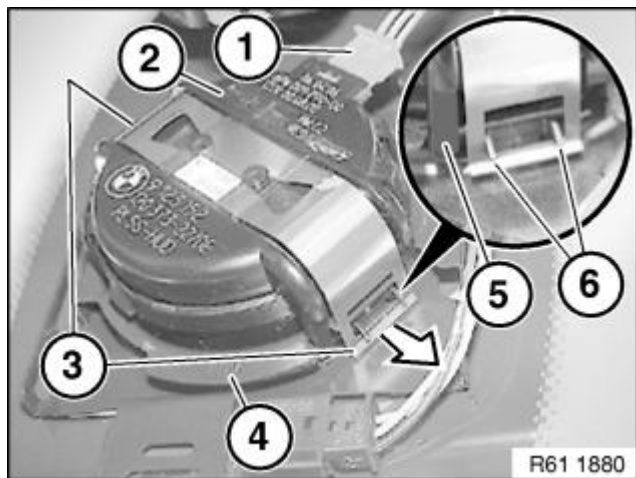


Fig. 306: Unlocking Metal Spring
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Carry out **CODING** to determine the windscreen type for the light sensor.
- Carry out **INITIALIZATION** to calibrate the rain sensor to the windscreen.

**61 35 714 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR
 SLIDING/TILTING SUNROOF (UP TO 03/2007) (SPORTS WAGON)**

IMPORTANT: Read and comply with notes on protection against electrostatic damage (**ESD PROTECTION**).

Necessary preliminary tasks:

- Remove **TRIM FOR INSTRUMENT PANEL AT BOTTOM RIGHT**

Open lock (1) and pull back control unit for slide/tilt sunroof (2).

Disconnect associated plug connections (3).

Remove control unit for slide/tilt sunroof (2).

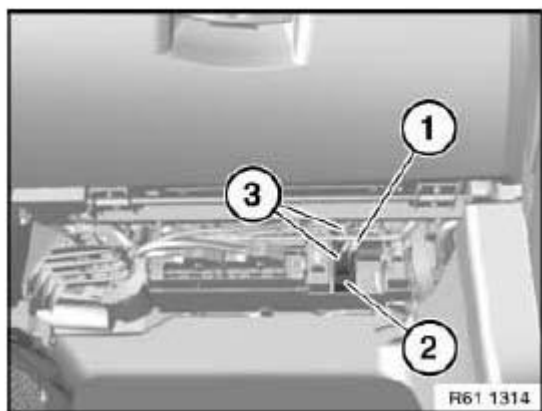


Fig. 307: Identifying Lock, Slide/Tilt Sunroof & Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialize **SLIDE/TILT SUNROOF**

Replacement:

- Carry out **VEHICLE PROGRAMMING/CODING**.

IMPORTANT: There is a risk of permanent battery discharge if programming/coding is not carried out!

61 35 795 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR ADAPTIVE HEADLIGHT

IMPORTANT: Read and comply with notes on **PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION)**.

Necessary preliminary tasks:

- Remove **TRIM FOR INSTRUMENT PANEL** , bottom left

Unlock catch (1) in direction of arrow.

Pull control unit for adaptive headlight (2) out of equipment carrier (3) slightly.

Unfasten plug connection (4) and disconnect.

Remove control unit for adaptive headlight (2).

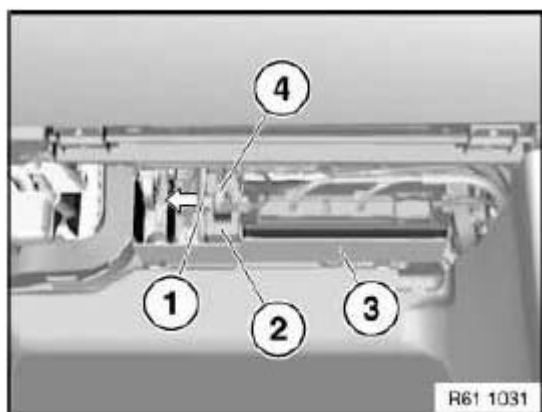


Fig. 308: Identifying Control Unit For Adaptive Headlight And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 35 900 REMOVING AND INSTALLING/REPLACING RING ANTENNA OF ELECTRONIC IMMOBILIZER

Special tools required:

- **61 3 300**

Necessary preliminary tasks:

- Remove **TOP SECTION OF STEERING COLUMN CASING** .

Disconnect plug connection (1).

Position special tool **61 3 300** as illustrated with flattened side (A) to ring antenna of electronic immobilizer (2).

Lever out ring antenna of electronic immobilizer (2) in direction of arrow and remove.

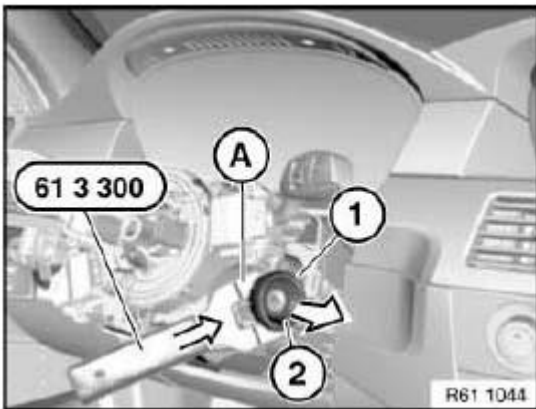


Fig. 309: Positioning Special Tool (61 3 300)

Courtesy of BMW OF NORTH AMERICA, INC.

61 35 950 REMOVING AND INSTALLING (REPLACING) CONTROL UNIT FOR COMFORT ACCESS SYSTEM

IMPORTANT: Read and comply with notes on PROTECTION AGAINST ELECTROSTATIC DAMAGE (ESD PROTECTION).

NOTE: The comfort access system is a radio-based system and can be interfered with by radio waves from other systems (e.g. mobile phone).

Necessary preliminary tasks:

- Remove LUGGAGE COMPARTMENT FLOOR TRIM PANEL
- Remove LUGGAGE COMPARTMENT TRIM ON SIDE PANEL ON RIGHT
- Disconnect battery negative lead
- Remove TRIM FOR INSTRUMENT PANEL, BOTTOM LEFT

Unclip pin (1) from shock absorber (2).

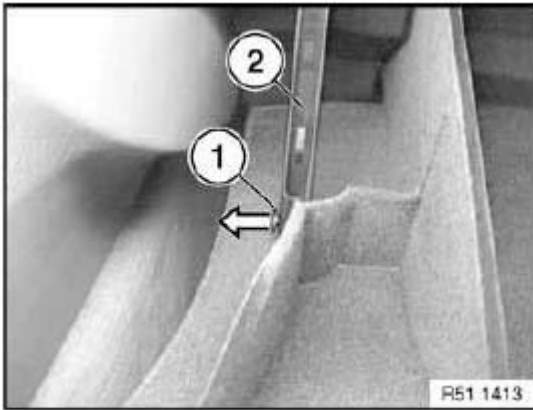


Fig. 310: Unclipping Pin From Shock Absorber
Courtesy of BMW OF NORTH AMERICA, INC.

Open rotary clips (1) and remove.

Remove cover (2) in direction of arrow.

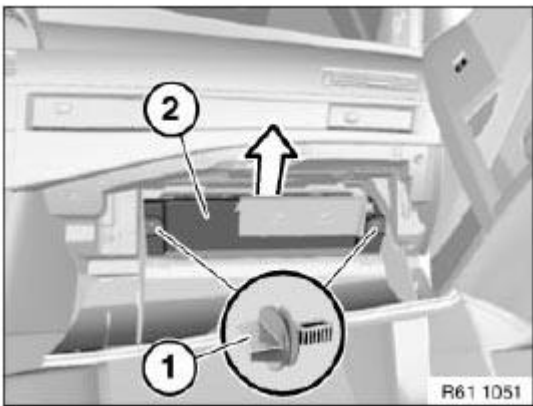


Fig. 311: Removing Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Pull fuse holder (2) back slightly.

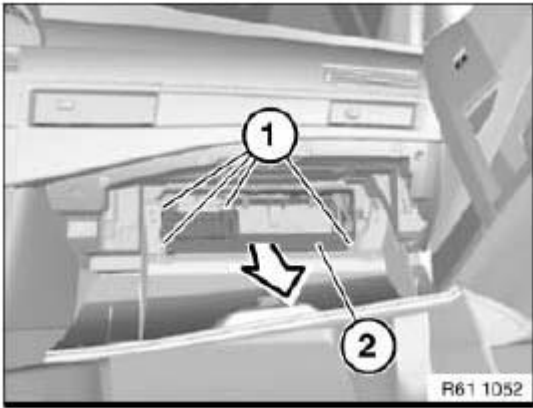


Fig. 312: Pulling Fuse Holder

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unlock catch (2) in direction of arrow and remove control unit for comfort access system (3) from device carrier (4).

Installation:

Make sure control unit (3) is correctly seated in device carrier (4).

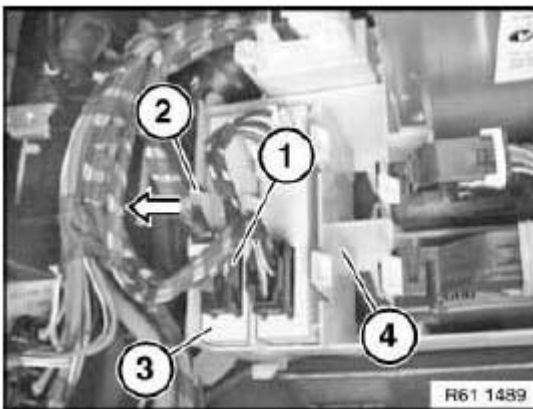


Fig. 313: Identifying Device Carrier, Control Unit And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **PROGRAMMING/CODING**.

61 35 953 REMOVING AND INSTALLING/REPLACING INTERIOR ANTENNA FOR COMFORT ACCESS SYSTEM (FRONT)

Necessary preliminary tasks:

- Remove **AUDIO SYSTEM CONTROLLER**
- Remove **STORAGE COMPARTMENT**

Release screws (2).

Remove middle function carrier (1) in direction of arrow.

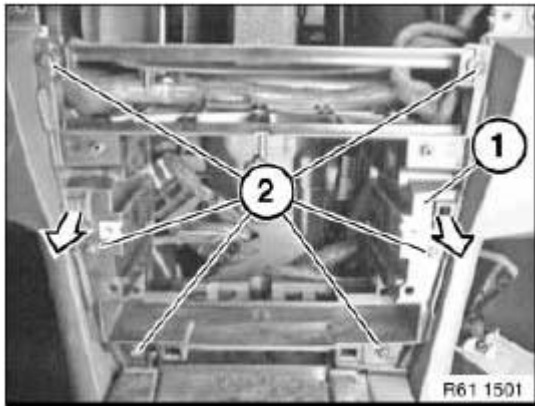


Fig. 314: Identifying Middle Function Carrier And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Remove middle air duct in direction of arrow.

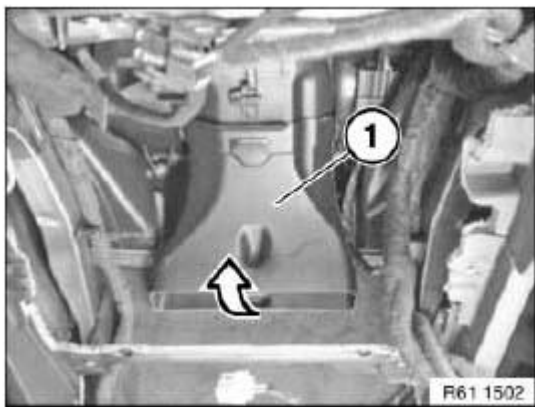


Fig. 315: Removing Middle Air Duct
Courtesy of BMW OF NORTH AMERICA, INC.

Detach felt (1) from interior antenna for comfort access system (2).

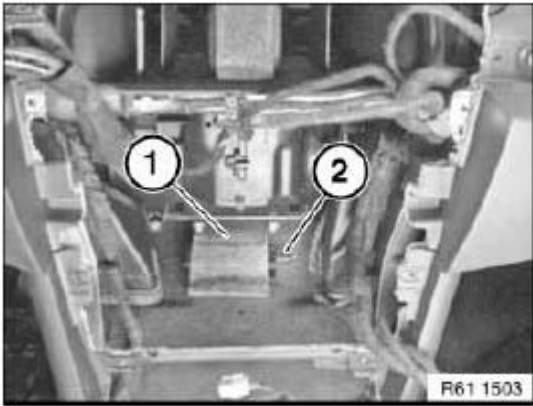


Fig. 316: Identifying Interior Antenna
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Unclip interior antenna for comfort access system (2) from clip (3).

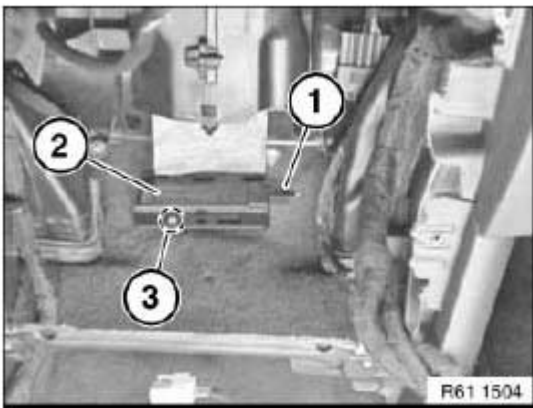


Fig. 317: Identifying Comfort Access System And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

61 35 954 REMOVING AND INSTALLING/REPLACING INTERIOR ANTENNA FOR COMFORT ACCESS SYSTEM (REAR)

Necessary preliminary tasks:

- Remove **STORAGE COMPARTMENT**

Disconnect plug connection (1).

Disconnect plug connection (2).

Remove rear compartment air duct (3).

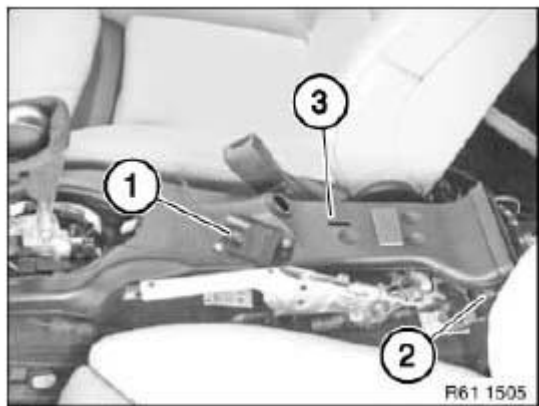


Fig. 318: Identifying Rear Compartment Air Duct And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove interior antenna for comfort access system (2).

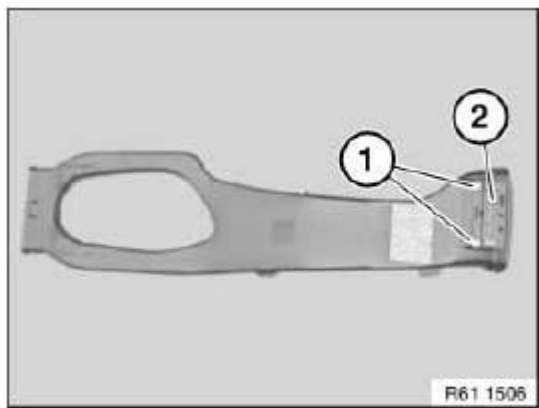


Fig. 319: Identifying Interior Antenna For Comfort Access System And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 35 965 REMOVING AND INSTALLING/REPLACING REAR PARCEL ANTENNA FOR COMFORT ACCESS SYSTEM

Necessary preliminary tasks:

- Remove both **TRIMS FOR ROOF PILLAR AT REAR (REAR)**
- Remove both **TRIMS FOR ROOF PILLAR AT REAR (FRONT)**
- Remove **BACKREST FOR REAR SEAT**
- Remove panel for parcel shelf. See **REMOVING AND INSTALLING TRIM FOR ODDMENTS TRAY (BACK SHELF WITH REAR WINDOW ROLLER BLIND)** and **REMOVING AND INSTALLING/REPLACING TRIM FOR REAR PARCEL SHELF** .

Disconnect plug connection (1).

Unfasten screws (2).

Remove interior antenna for comfort access system (3).

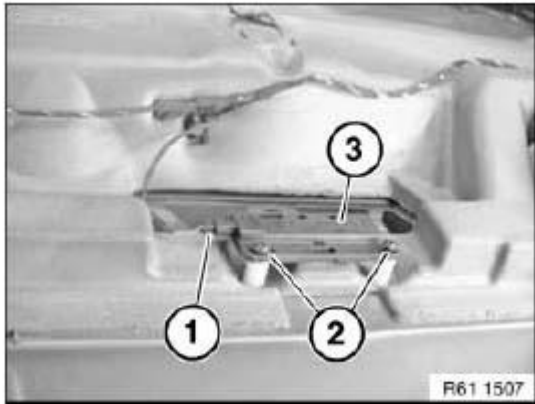


Fig. 320: Identifying Comfort Access System And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 35 970 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT ANTENNA FOR COMFORT ACCESS SYSTEM

Necessary preliminary tasks:

- Remove **LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Remove storage tray for car jack
- Remove spare wheel
- Remove control unit cover

Disconnect plug connection (1).

Pull luggage compartment antenna (2) for comfort access system from control unit receptacle (3).

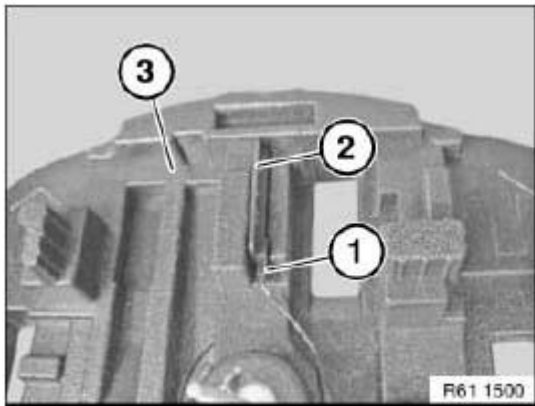


Fig. 321: Identifying Luggage Compartment Antenna And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 35 975 REMOVING AND INSTALLING/REPLACING BUMPER ANTENNA FOR COMFORT ACCESS SYSTEM

Necessary preliminary tasks:

- Remove **REAR BUMPER TRIM**

Disconnect plug connection (2).

Press catches (1), feed out bumper antenna for comfort access system (3) in direction of arrow and remove.

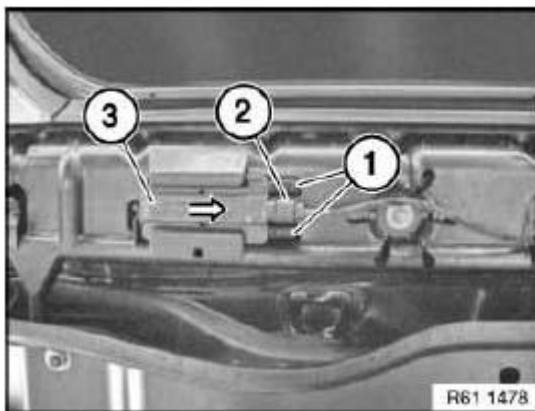


Fig. 322: Pressing Catches

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 970 REPLACING FOGGING SENSOR

Special tools required:

- **00 9 317**

WARNING: Make sure rooms are well ventilated when working with adhesive remover indoors.

IMPORTANT: Do not under any circumstances use paint thinner to clean the bonding surface.

Expand two-part mirror base cover (1) by pressing from below and detach.

Feed out two-part mirror base cover (1) and remove.

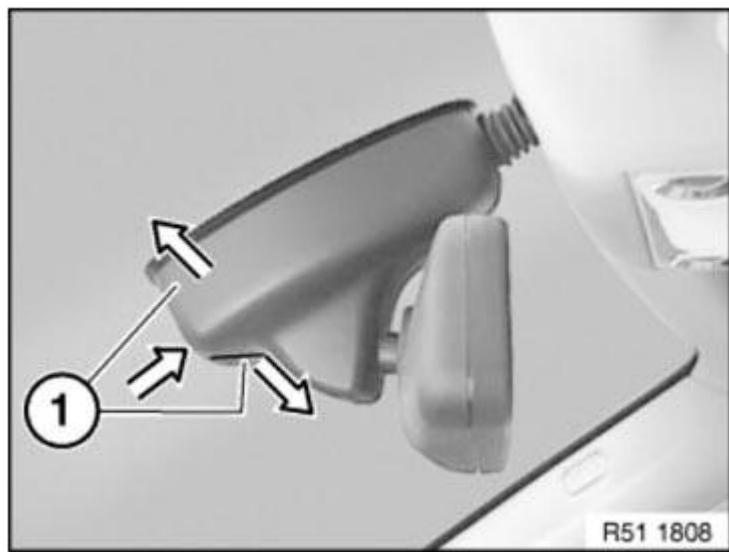


Fig. 323: Expanding Two-Part Mirror Base Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

NOTE: If necessary, carefully heat fogging sensor (2) with a hot air blower to approx. 40-60 °C.

Lift off fogging sensor (2) with special tool **00 9 317** and slowly pull off from windshield.

Installation:

Bonding surface must be dry and free of dust and grease.

Clean bonding surface with adhesive remover.

After cleaning, do not touch bonding surface with bare hands.

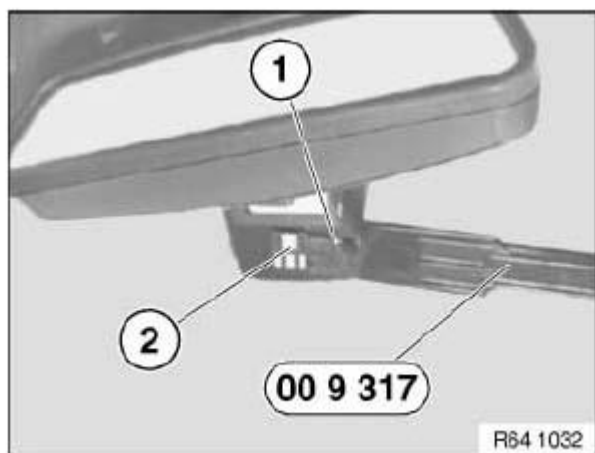


Fig. 324: Identifying Fogging Sensor With Special Tool

Courtesy of BMW OF NORTH AMERICA, INC.

Pull off protective film completely from fogging sensor (3).

Place mounting template (1) as pictured on rain sensor (2).

Press fogging sensor (3) in direction of arrow with a contact pressure of $> \text{ or } = 15 \text{ N/cm}^2$ onto inside of windshield.

NOTE: Firm thumb pressure attains approx. 30 N/cm^2 .

Remove mounting template (1) carefully from fogging sensor (3).

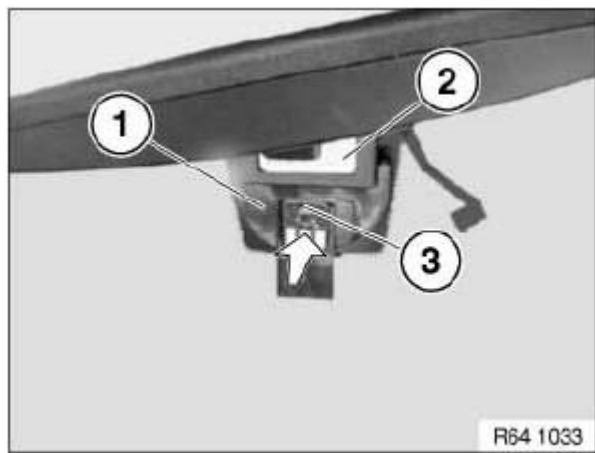


Fig. 325: Identifying Rain Sensor, Fogging Sensor And Mounting Template

Courtesy of BMW OF NORTH AMERICA, INC.

VEHICLE PROGRAMMING AND CODING

Select menu item (1).

Select corresponding procedure from selection list.

Example:

- Preparation and subsequent evaluation of vehicle programming
- Start a Progman session
- Sequence of BMW/MINI vehicle programming and coding
- BMW/MINI Car & Key Memory
- BMW/MINI initializations
- BMW/MINI service functions in Progman
- ...

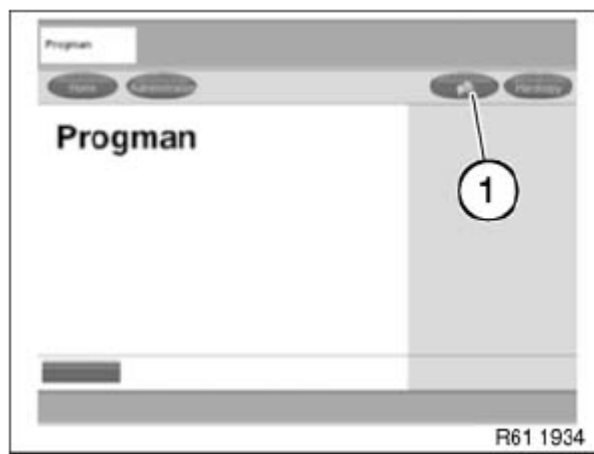


Fig. 326: Vehicle Programming And Coding Display - Menu Item
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: In order to avoid incorrect programming procedures and error messages, it is essential when working with the Progman programming system always to use the latest Progman version.

RELAYS

61 36 520 REMOVING AND INSTALLING / REPLACING RELIEF RELAY (EDC)

Necessary preliminary tasks:

- Remove **LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Remove storage tray for car jack
- Remove spare wheel

- Remove control unit cover

Detach relay (1).

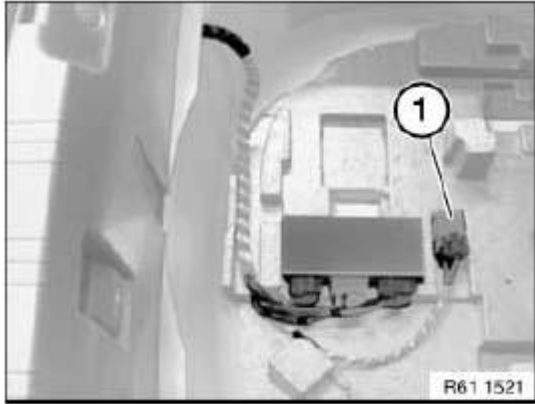


Fig. 327: Identifying Relay

Courtesy of BMW OF NORTH AMERICA, INC.

61 36 560 REMOVING AND INSTALLING/REPLACING HEADLIGHT WASHER RELAY

Necessary preliminary tasks:

- Open glovebox.

Unclip pin (1) from shock absorber (2).

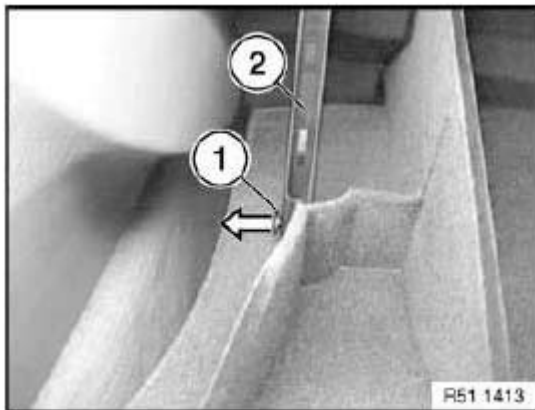


Fig. 328: Unclipping Pin From Shock Absorber

Courtesy of BMW OF NORTH AMERICA, INC.

Open rotary clips (1) and remove cover (2) in direction of arrow.

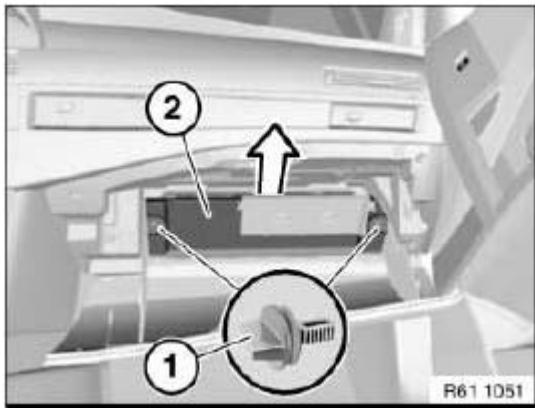


Fig. 329: Removing Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Detach relay (1).

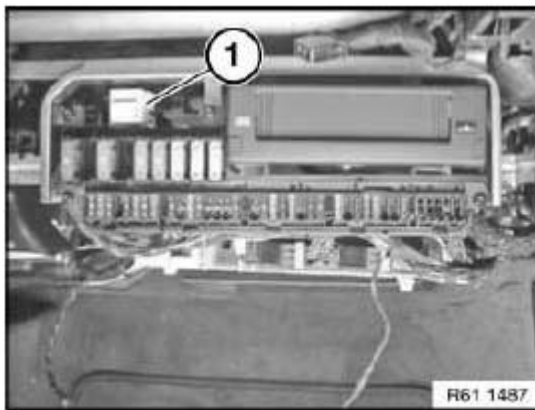


Fig. 330: Identifying Relay

Courtesy of BMW OF NORTH AMERICA, INC.

61 36 570 REMOVING AND INSTALLING/REPLACING WINDSCREEN WIPER SYSTEM RELAY

Necessary preliminary tasks:

- Remove **LOWER SECTION OF MICROFILTER HOUSING ON RIGHT** .

Release screws (1).

Remove electronics box cover (2).

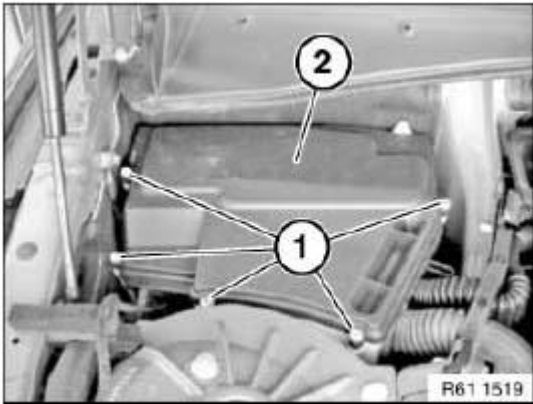


Fig. 331: Identifying Electronics Box Cover And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Detach relay (1).

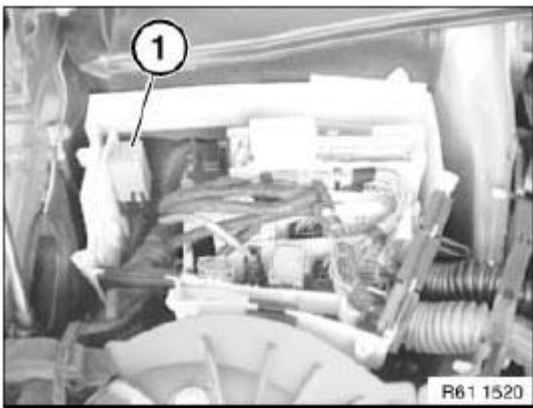
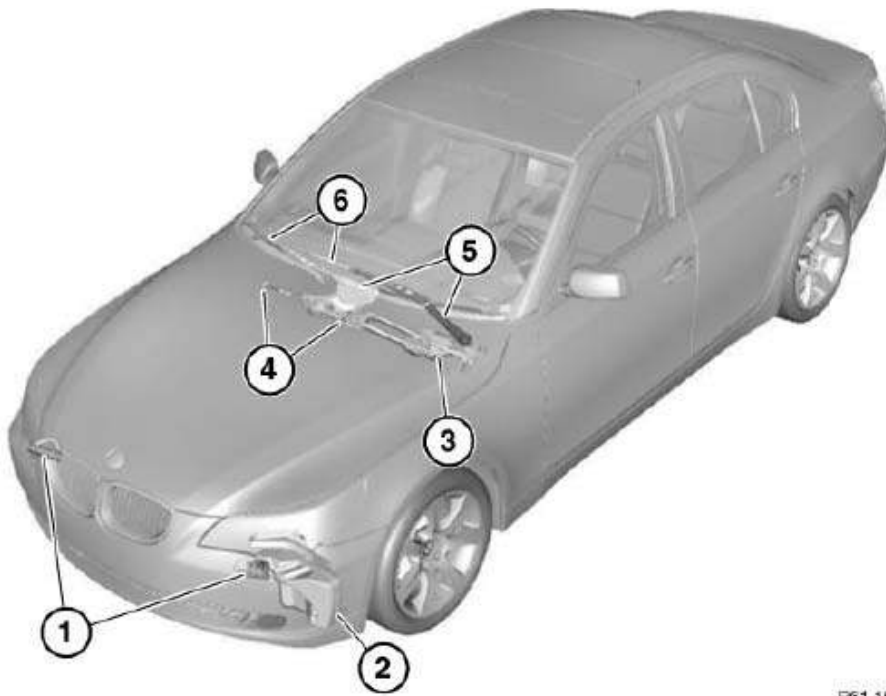


Fig. 332: Identifying Relay
Courtesy of BMW OF NORTH AMERICA, INC.

WINDSCREEN WIPERS

61 61.. OVERVIEW OF WINDOW WIPER SYSTEMS



F61 1518

- | | | | |
|---|--|---|--|
| 1 | <u>Spray nozzles of headlight washer system</u> | 4 | <u>Spray nozzles of windscreen washer system</u> |
| 2 | <u>Washer pumps, fluid reservoir for washer system</u> | 5 | <u>Windscreen wiper arms</u> |
| 3 | <u>Wiper bracket</u> | 6 | <u>Wiper blades</u> |

Fig. 333: Overview Of Window Wiper Systems

Courtesy of BMW OF NORTH AMERICA, INC.

61 61... ADJUSTING LEFT OR RIGHT WINDSCREEN WIPER**Special tools required:**

- **61 6 100**

Correctly adjusting the contact angle of the wiper arms on the windscreen increases wiping quality. For adjustment, refer to the vehicle-specific repair instruction.

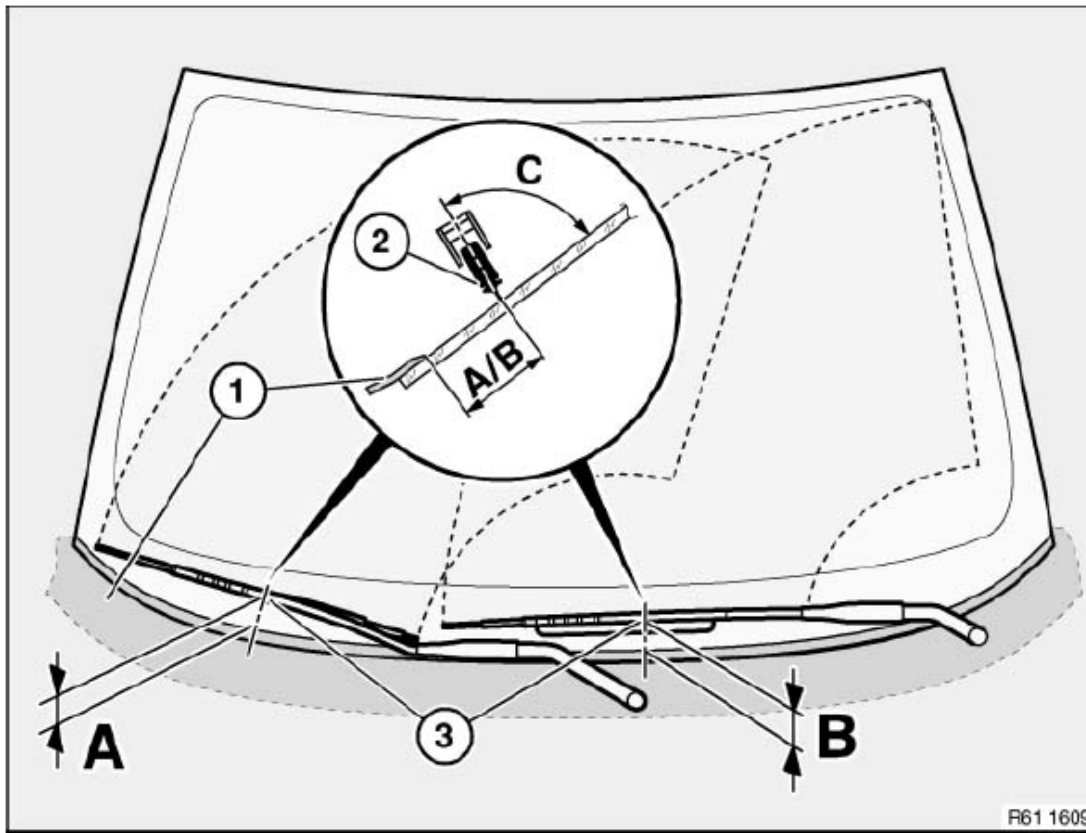


Fig. 334: Identifying Distance Between Windscreen Wiper Blade And Trim Panel
 Courtesy of BMW OF NORTH AMERICA, INC.

A/B = Distance between windscreen wiper blade (2) and trim panel on cowl panel (1)

NOTE: Measurement is taken at the height of the locators (3) for the windscreen wiper arms

C= Contact angle between wiper blade center plane and windscreen

When adjusting with special tool 61 6 100, set the scale value in accordance with the following table.

For RHD cars, change the preceding sign of the scale values.

- LHD cars, scale range 0 to -10
- RHD cars, scale range 0 to +10

WINDSCREEN WIPER ADJUSTING SPECIFICATION

Model	Contact angle (C) on windscreen wiper arm		Scale value (LHD) on special tool		Adjustment dimension (A, B) on windscreen wiper arm		
	Passenger side	Driver side	Passenger side	Driver side	Passenger side	Driver side	Rear end

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1'	E81	85.5° +1.5 to 1.0°	85.5° +1.5 to 1.0°	-5	-5	47 ± 3 mm	54 ± 3 mm	
	E82	85.5° +1.5 to 1.0°	85.5° +1.5 to 1.0°	-5	-5	47 ± 3 mm	54 ± 3 mm	
	E87	85.5° +1.5 to 1.0°	85.5° +1.5 to 1.0°	-5	-5	47 ± 3 mm	54 ± 3 mm	
	E88	85.5° +1.5 to 1.0°	85.5° +1.5 to 1.0°	-5	-5	47 ± 3 mm	54 ± 3 mm	
3'	E46	85.7° ±1°	85.3° ±1°	-4	-5			
	E90	86.7° ±1°	86.0° ±1°	-3	-4	88 ± 3 mm	95 ± 3 mm	
	E91	86.7° ±1°	86.0° ±1°	-3	-4	88 ± 3 mm	95 ± 3 mm	35 ± 3 mm
	E92	86.7° ±1°	86.0° ±1°	-3	-4	75 ± 3 mm	84 ± 3 mm	
	E93	86.7° ±1°	86.0° ±1°	-3	-4	75 ± 3 mm	84 ± 3 mm	
5'	E39	86.5° ±1°	86.5° ±1°	-4	-4			60.1 ±1 mm
	E60	86.0° ±1°	86.0° ±1°	-4	-4	69 ± 3 mm	87 ± 3 mm	
	E61	86.0° ±1°	86.0° ±1°	-4	-4	69 ± 3 mm	87 ± 3 mm	30 ± 3 mm
6'	E63	86.0° ±1°	86.0° ±1°	-4	-4	69 ± 3 mm	87 ± 3 mm	
	E64	86.0° ±1°	86.0° ±1°	-4	-4	69 ± 3 mm	87 ± 3 mm	
7'	E38	87.0° ±1°	87.0° ±1°	-3	-3	65 ± 3 mm	58 ± 3 mm	
	E65	85.5° ±1°	87.0° ±1°	-	-	20 ± 3 mm	48 ± 3 mm	
	E66	85.5° ±1°	87.0° ±1°	-	-	20 ± 3 mm	48 ± 3 mm	
	E67	85.5° ±1°	87.0° ±1°	-	-	20 ± 3 mm	48 ± 3 mm	
8'	E52	85.5° ±1°	85.5° ±1°	-4	-4	38 ± 2 mm	104 ± 2 mm	
X	E53	85.0° ±1°	85.0° ±1°	-5	-5	54 ± 3 mm	55 ± 3 mm	32.5 ± 3 mm
	E70	85.6° ±1°	85.0° ±1°	-4	-5	103 ±3 mm	90 ±3 mm	39 ±2 mm
	E71	85.6° ±1°	85.0° ±1°	-4	-5	103 ±3 mm	90 ±3 mm	
	E83	85.2° ±1°	85.4° ±1°	-5	-5	66 ± 3 mm	61 ± 3 mm	29 ± 1 mm
Z	E85	85.5° ±1°	85.5° ±1°	-4	-4	57 ± 2 mm	52 ± 2 mm	
	E86	85.5° ±1°	85.5° ±1°	-4	-4	57 ± 2 mm	52 ± 2 mm	

61 61 010 CHECKING/ADJUSTING CONTACT ANGLE OF WINDSCREEN WIPER ARMS ON WINDSCREEN

Special tools required:

- **00 9 331**
- **61 6 100**

NOTE: Wipe quality is improved by precise adjustment of CONTACT/APPROACH ANGLE of wiper arms.
Adjustment angle can be checked with special tool 00 9 331 or 61 6 100.

Checking with setting gauge:

Remove load from windscreen wiper blades (1) before checking contact angle. To do so, lift wiper blades (1) briefly off windscreen before placing them back on windscreen.

Fit special tool **00 9 331** as illustrated on wiper arm and windscreen.

When the contact angle is correctly adjusted, no light gap is visible between special tool **00 9 331** and the wiper arm.

If necessary, adjust wiper arm.

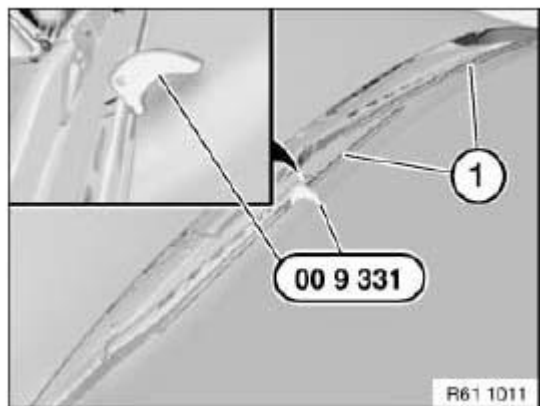


Fig. 335: Identifying Windscreen Wiper Blades
Courtesy of BMW OF NORTH AMERICA, INC.

Checking with angulometer:

Remove wiper blades.

Insert windscreen wiper arm (1) in special tool **61 6 100**.

Using screw (2) and pressure plate (3), locate windscreen wiper arm (1) and position on windscreen.

Read off scale value, adjust wiper arm if necessary.



Fig. 336: Inserting Windscreen Wiper Arm In Special Tool (61 6 100)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Windscreen wiper arm (1) must rest correctly on lower and side contact surfaces (4) of special tool 61 6 100.
On right-hand-drive cars, screw (2) must be located on left side of special tool 61 6 100.

Adjusting left wiper arm:

Unclip wiper arm cap (1) and remove in direction of arrow.

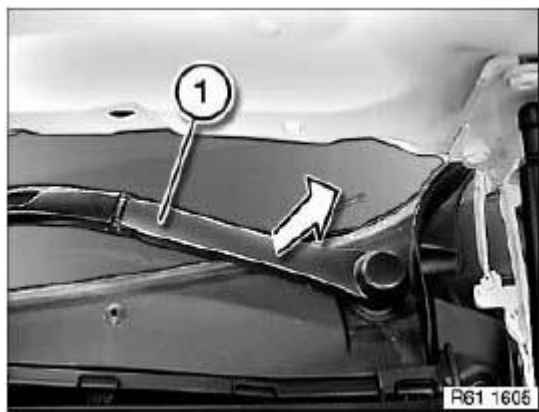


Fig. 337: Unclipping Wiper Arm Cap

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Catches (1) of wiper arm cap (2) must not be damaged.

Make sure wiper arm cap (2) is correctly seated.

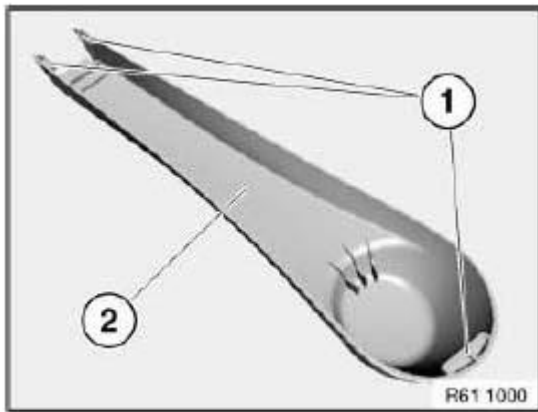


Fig. 338: Identifying Catches Of Wiper Arm Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) slightly.

Position windscreen wiper arm (2) with special tool **00 9 331** or **61 6 100** on windscreen.

Turn windscreen wiper arm (2) in direction of arrow until contact angle is correct.

Hold wiper arm (2) in this position and tighten down nut (1).

Installation:

Tightening torque **61 61 12AZ** .

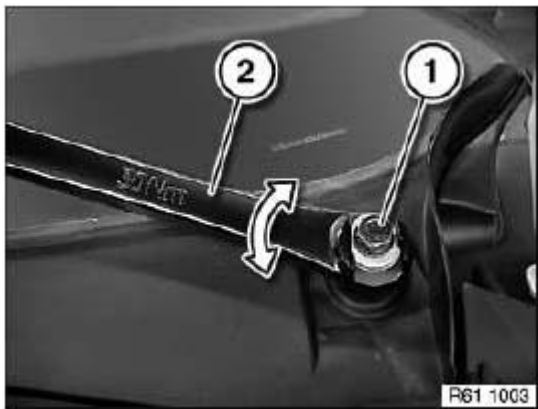


Fig. 339: Turning Windscreen Wiper Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Adjusting right wiper arm:

Unclip four-way linkage protective cap (1) and remove in direction of arrow.

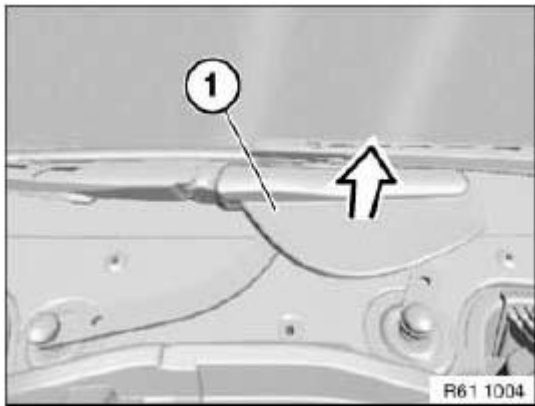


Fig. 340: Unclipping Four-Way Linkage Protective Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Catches (1) of four-way linkage protective cap (2) must not be damaged.

Make sure four-way linkage protective cap (2) is correctly seated.

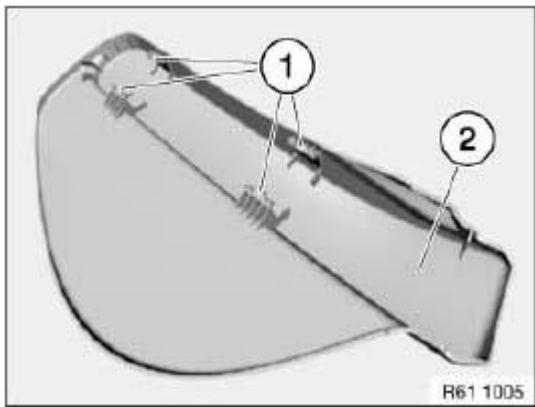


Fig. 341: Identifying Catches Of Four-Way Linkage Protective Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) slightly.

Position windscreen wiper arm (2) with special tool **00 9 331** or **61 6 100** on windscreen.

Turn windscreen wiper arm (2) in direction of arrow until contact angle is correct.

Hold wiper arm (2) in this position and tighten down nut (1).

Installation:

Tightening torque **61 61 14AZ** .

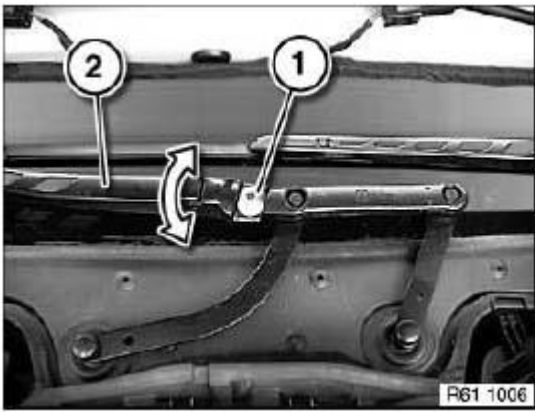


Fig. 342: Turning Windscreen Wiper Arm
Courtesy of BMW OF NORTH AMERICA, INC.

61 61 041 REPLACING BOTH WINDSHIELD WIPER BLADES

IMPORTANT: The windshield wiper arms can only be folded away approx. 45° from the windshield.

Make sure the wiper arm does not contact the windshield without its wiper blade.

Fold wiper arm (1) away from windshield.

Press lock (2) and remove wiper blade (3) in direction of arrow.

Installation:

Make sure wiper blade (3) is correctly seated.

Fold wiper arm back onto windshield.

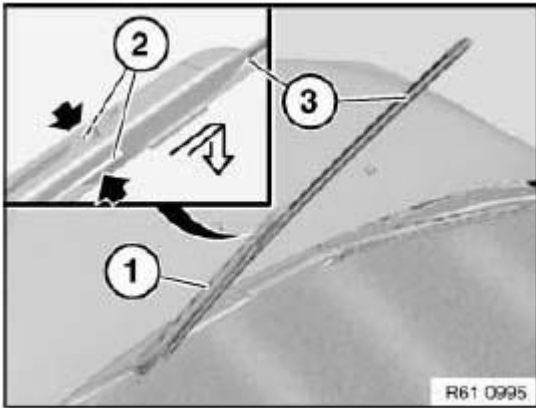


Fig. 343: Removing Wiper Blade

Courtesy of BMW OF NORTH AMERICA, INC.

61 61 101 REMOVING AND INSTALLING BOTH WINDSHIELD WIPER ARMS

Special tools required:

- **61 6 060**

IMPORTANT: Do not damage wiper arms when removing (risk of breakage).

Installation:

Adjust the position of the relevant wiper arm in the wiper rest position.

Measure distance between wiper lip (1) and top edge of cowl panel cover (3) at mounting point (2) of wiper blade.

Adjustment measurements:

- A: 87 ± 3 mm
- B: 69 ± 3 mm

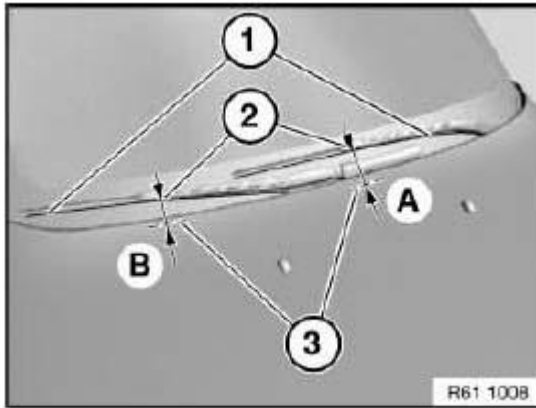


Fig. 344: Measuring Distance Between Wiper Lip And Top Edge Of Cowl Panel Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Removing left wiper arm:

Unclip wiper arm cap (1) and remove in direction of arrow.

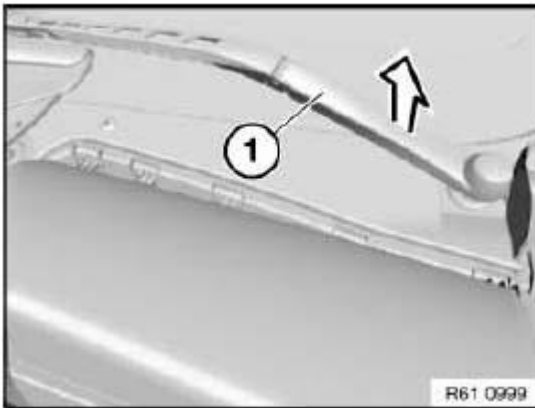


Fig. 345: Removing Left Wiper Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Catches (1) of wiper arm cap (2) must not be damaged.

Make sure wiper arm cap (2) is correctly seated.

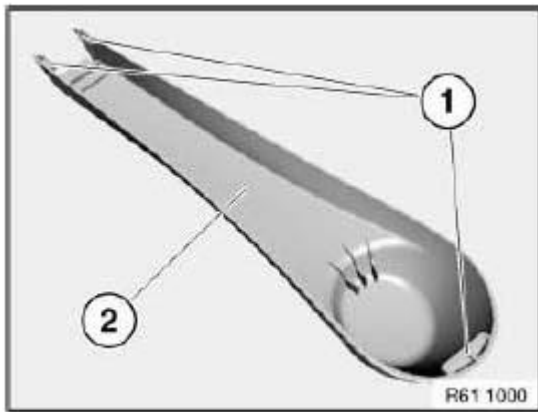


Fig. 346: Identifying Wiper Arm Cap And Catches
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nut (1).

Installation:

Tightening torque **61 61 12AZ** .

IMPORTANT: Observe tightening specification (settling time) without fail (risk of detaching).

Remove wiper arm (2) in direction of arrow.

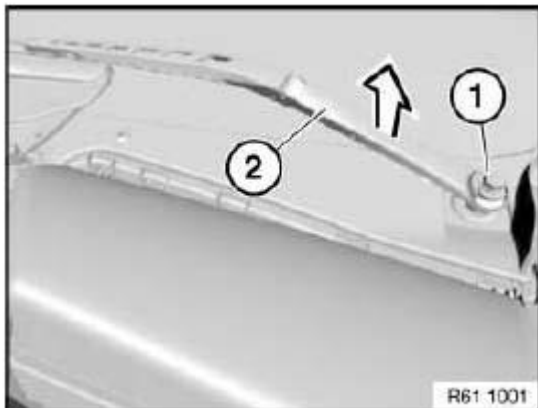


Fig. 347: Removing Wiper Arm
Courtesy of BMW OF NORTH AMERICA, INC.

Pull off adjusting disk (1) with special tool **61 6 060** .

Installation:

Replace adjusting disk (1).

Mount adjusting disk (1) together with wiper arm on shaft.

CHECK/ADJUST contact angle of wiper arms to windshield.

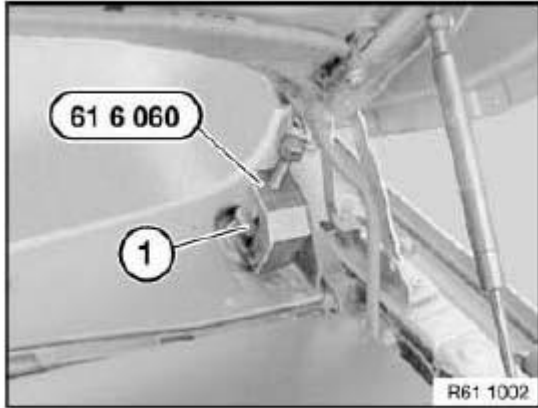


Fig. 348: Identifying Special Tool (61 6 060) On Adjusting Disk
Courtesy of BMW OF NORTH AMERICA, INC.

Removing right wiper arm:

Remove caps (1).

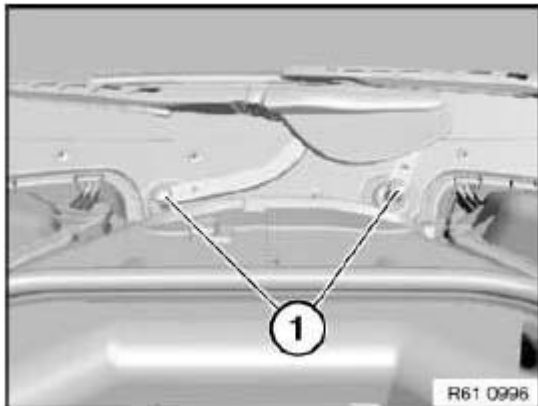


Fig. 349: Identifying Right Wiper Arm Caps
Courtesy of BMW OF NORTH AMERICA, INC.

Unscrew nuts (1).

Installation:

Tightening torque **61 61 13AZ** .

IMPORTANT: Observe tightening specification (settling time) without fail (risk of detaching).

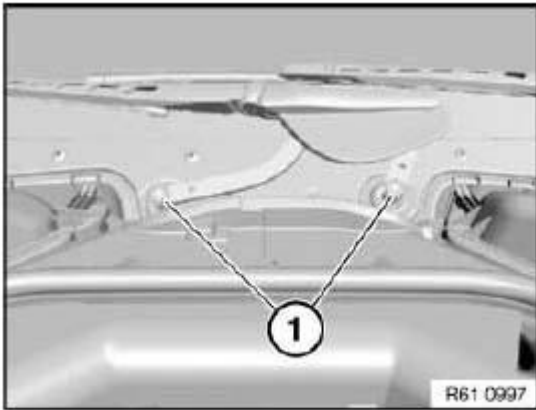


Fig. 350: Identifying Nuts

Courtesy of BMW OF NORTH AMERICA, INC.

Detach wiper arm (1) as illustrated with special tool **61 6 060**.

Installation:

CHECK/ADJUST contact angle of wiper arms to windshield.

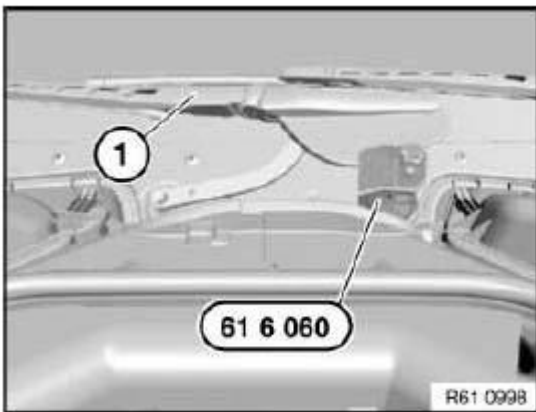


Fig. 351: Identifying Special Tool (61 6 060) On Wiper Arm

Courtesy of BMW OF NORTH AMERICA, INC.

61 61 102 REPLACING BOTH WINDSHIELD WIPER ARMS

Necessary preliminary tasks:

REMOVE BOTH WINDSHIELD WIPER ARMS.

NOTE: If necessary, FIT wiper blades on new wiper arms.

61 61 270 REMOVING AND INSTALLING CONSOLE FOR WINDSHIELD WIPER SYSTEM

COMPLETELY WITH MOTOR

Necessary preliminary tasks:

- **REMOVE COWL PANEL COVER** .
- **REMOVE TENSION STRUT ON SPRING STRUT DOME** .
- **REMOVE FRESH AIR DUCT** .

IMPORTANT: Before fitting windshield wiper arms, allow wiper motor to run into rest position.

Release screws (1).

Installation:

Tightening torque **61 61 15AZ** .

Remove cross-strut bearing block (2) in direction of arrow.

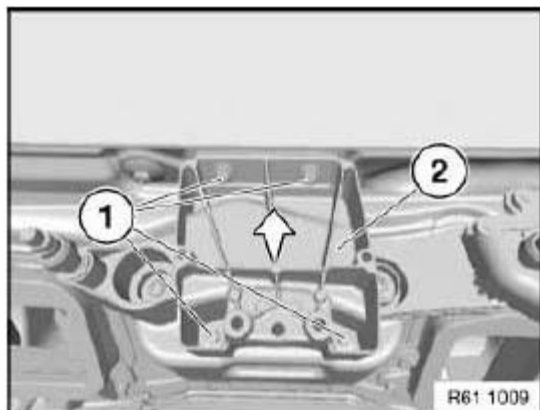


Fig. 352: Identifying Cross-Strut Bearing Block And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Release screws (A5...A1).

Installation:

Insert screws (A1...A5) in specified sequence until hand-tight.

To tighten down screw (A2), if necessary move complete wiper console linkage (2) into reversal position.

Tighten down screws (A1...A5) in specified sequence to tightening torque **61 61 6AZ** .

Lever out complete wiper console (2) in direction of arrow.

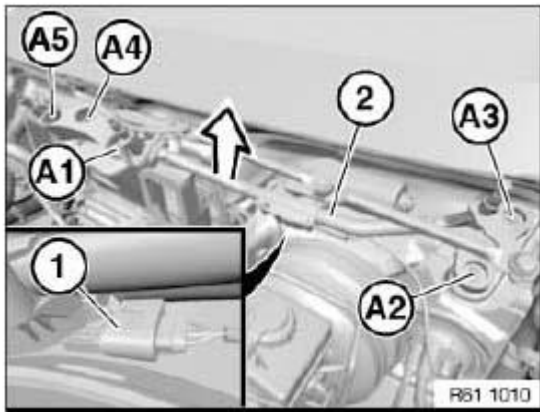


Fig. 353: Identifying Complete Wiper Console
Courtesy of BMW OF NORTH AMERICA, INC.

REAR SCREEN WIPER

61 62 030 REMOVING AND INSTALLING/REPLACING WIPER ARM ON REAR WINDOW

Fold up cover cap (1) in direction of arrow.

If necessary, spread internal mounts (2) as illustrated and remove cover cap (1).

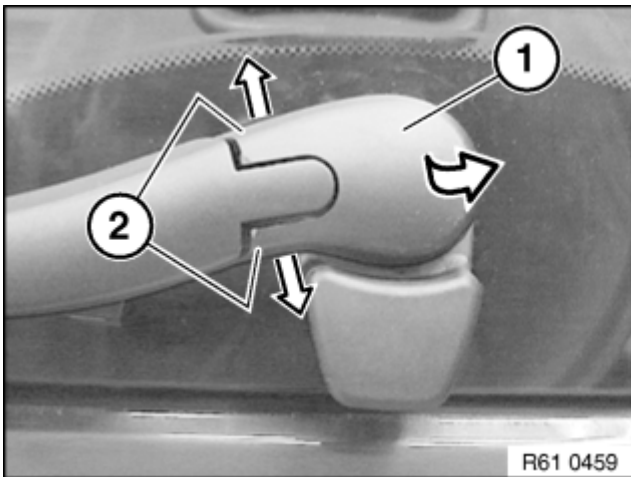


Fig. 354: Identifying Cover Cap And Internal Mounts
Courtesy of BMW OF NORTH AMERICA, INC.

Mounts (1) and catches (2) of cover cap (3) must not be damaged.

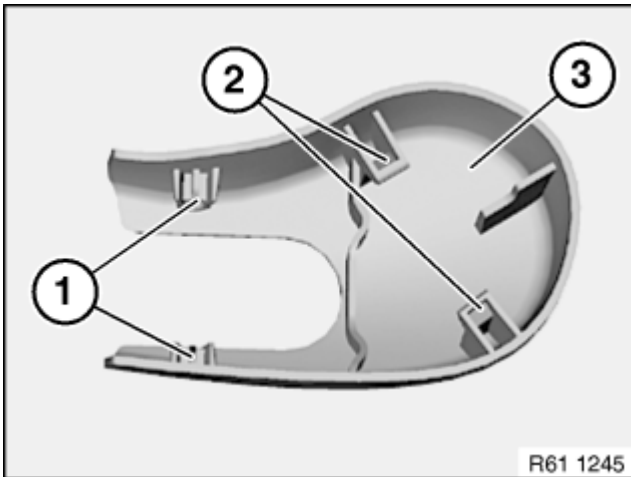


Fig. 355: Locating Mounts And Catches On Cover Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Raise rear window wiper arm (1).

Release nut (2) and remove rear window wiper arm (1).

If necessary, replace wiper blade.

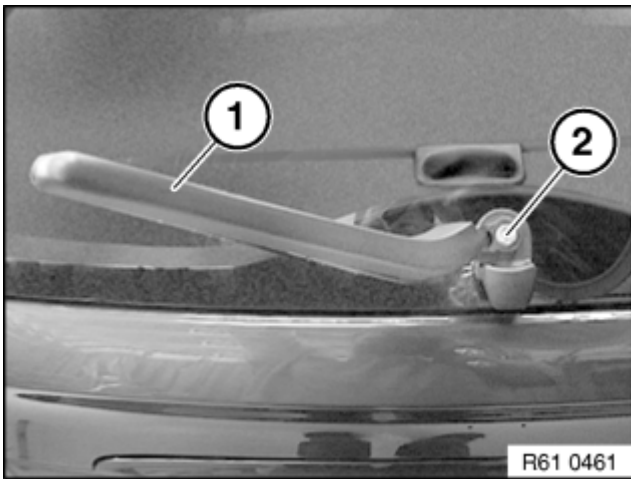


Fig. 356: Identifying Rear Window Wiper Arm And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Wiper motor must be in end position.

Adjust dimension (A) between middle of rear window wiper arm and rear window edge.

Measurement (A): 30 mm.

Tighten nut to specified torque, tightening torque **61 62 5AZ** .

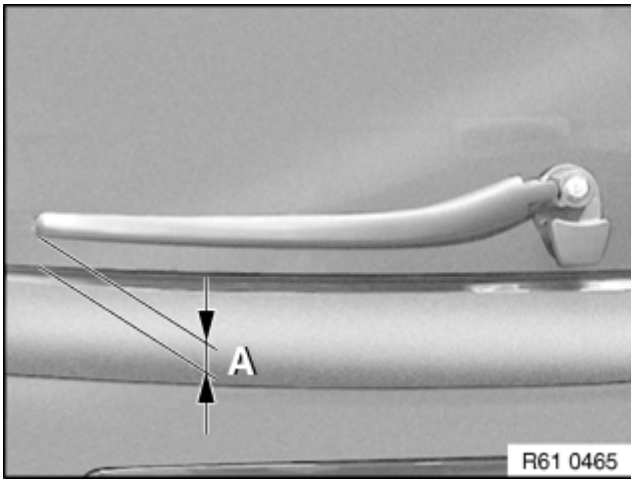


Fig. 357: Identifying Dimension (A) Measurement
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 060 REMOVING AND INSTALLING/REPLACING REAR WINDOW WIPER MOTOR (TOURING)

Special tools required:

- **61 1 330**

Necessary preliminary tasks:

- Remove **TRIM FOR REAR LID**

Disconnect plug connections (1).

Release screws (2).

Remove rear window wiper motor (3).

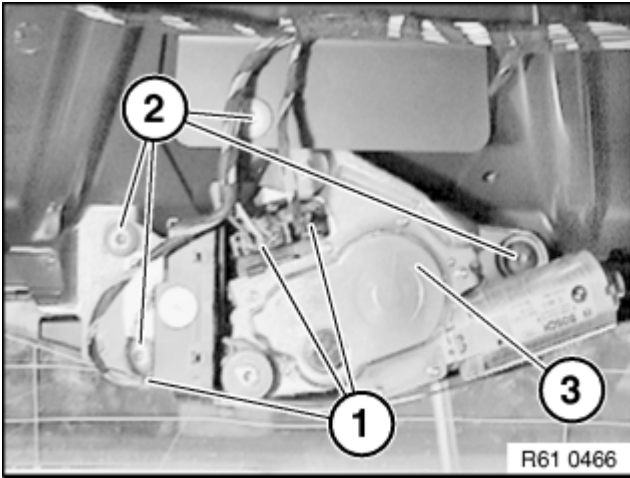


Fig. 358: Identifying Rear Window Wiper Motor, Plug Connections, And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release screws (1) and remove rear window lock (2).

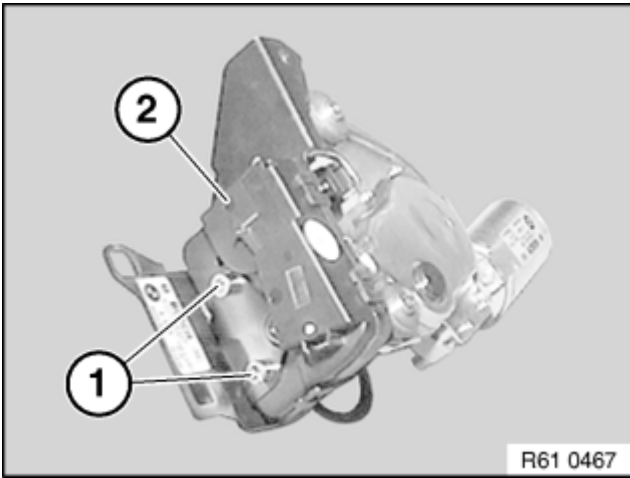


Fig. 359: Identifying Rear Window Lock And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Place special tool **61 1 330** on drive of rear window wiper and close rear window.

Allow journal of wiper shaft bearing to snap into bore (1) with rear window wiper standing vertical.

Tighten rear window wiper motor to specified torque, tightening torque **61 62 8AZ** .

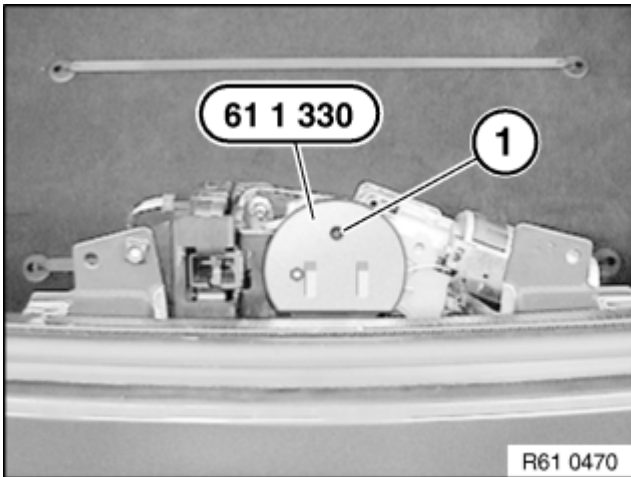


Fig. 360: Identifying Special Tool (61 1 330)
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 090 REMOVING AND INSTALLING/REPLACING SHAFT BEARING FOR REAR WINDOW WIPER (TOURING)

Necessary preliminary tasks:

- Remove **REAR WINDOW WIPER ARM**
- Remove **TRIM ON SHAFT BEARING**

Secure rear window button (2) against falling down.

Release nut (1) and remove sealing ring underneath.

IMPORTANT: Risk of water ingress. Always replaced micro-coated nut (1) and associated sealing ring. New sealing ring must not show any signs of damage.

Tightening torque **61 62 7AZ** .

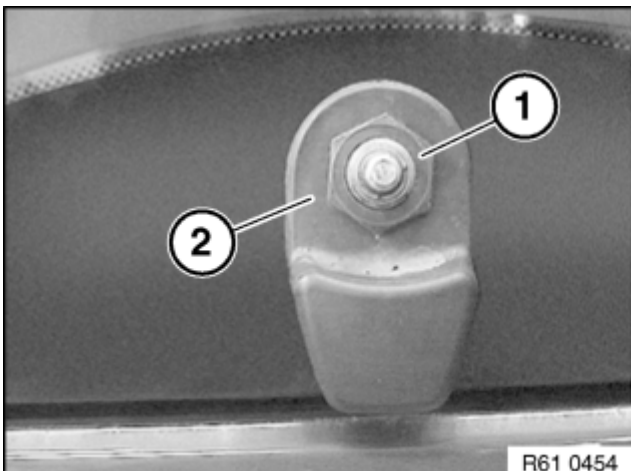


Fig. 361: Identifying Window Button And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) and withdraw shaft bearing (2).

Installation:

Tighten nut (1) to specified torque, tightening torque **61 62 1AZ** .

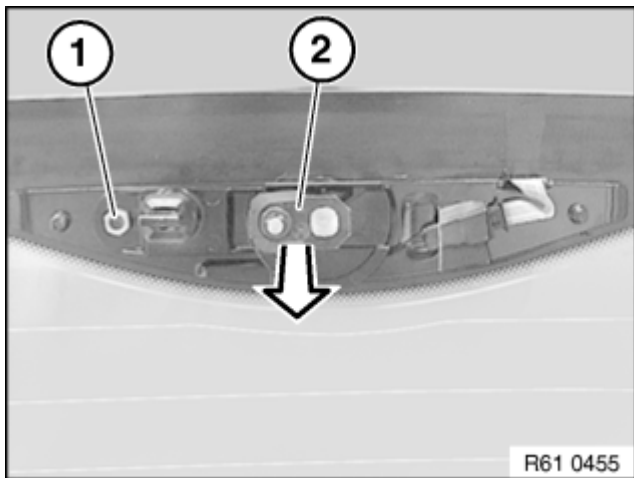


Fig. 362: Identifying Shaft Bearing And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 110 REMOVING AND INSTALLING/REPLACING SPRAY NOZZLE FOR REAR WINDOW WASHER UNIT

Necessary preliminary tasks:

- Remove **REAR SPOILER**

Release screws (1).

Open hose holder (2).

Installation:

Make sure hose holder (2) is correctly engaged.

Feed additional stop light (3) in direction of arrow out of rear spoiler (4) and remove.

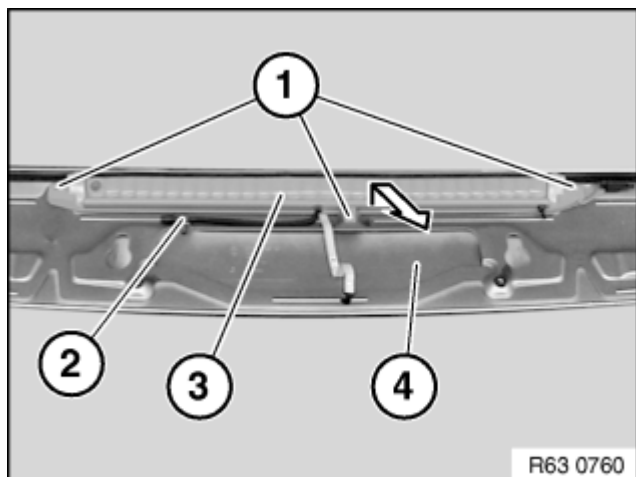


Fig. 363: Identifying Hose Holder, Stop Light, Rear Spoiler, And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock catch (1) and pull spray nozzle (2) in direction of arrow out of additional stop light (3).

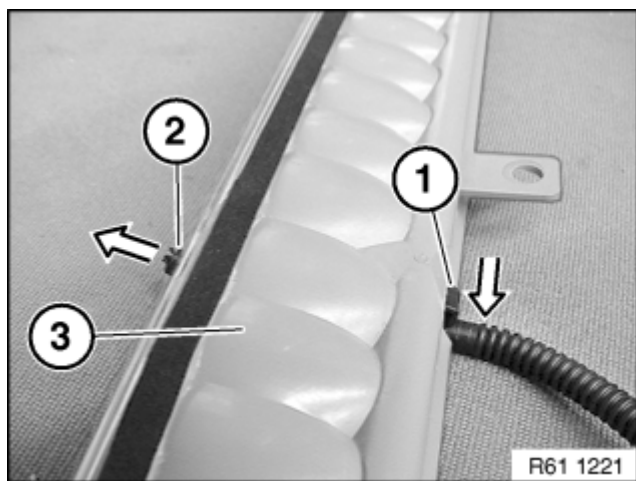


Fig. 364: Locating Catch And Spray Nozzle
Courtesy of BMW OF NORTH AMERICA, INC.

HEADLIGHT WASHER SYSTEM

61 67 010 REMOVING AND INSTALLING/REPLACING WASHER PUMP OF HEADLIGHT WASHER SYSTEM

Necessary preliminary tasks:

- If necessary, remove left front wheel
- Remove **FRONT UNDERBODY PROTECTION**

NOTE: For purposes of clarity, illustration shows front wheel removed.

Release screws.

Fold back wheel arch trim (1) in direction of arrow.

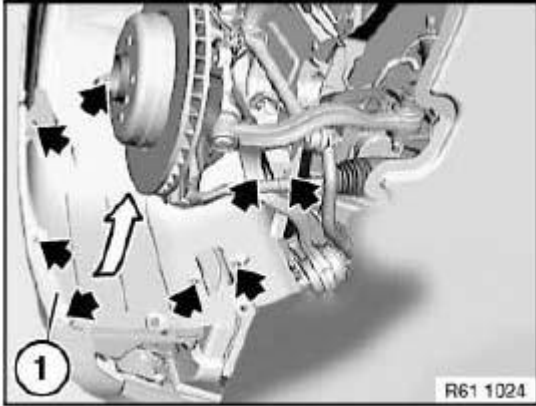


Fig. 365: Folding Back Wheel Arch Trim
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Catch any escaping washer fluid if necessary.

Disconnect plug connection (1).

Unlock hose (2) and detach from washer pump of headlight washer system (3).

Turn washer pump of headlight washer system (3) and pull in direction of arrow out of fluid reservoir for windscreen washer unit (4).

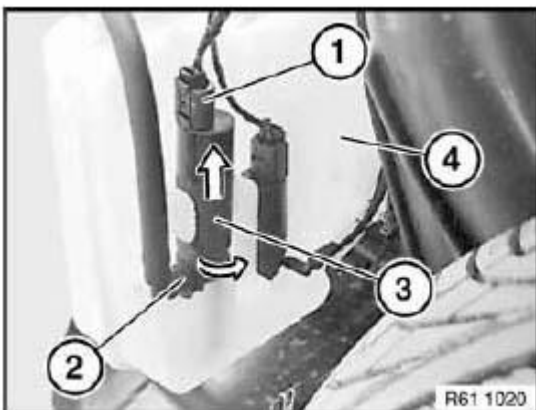


Fig. 366: Turning Washer Pump Of Headlight Washer System
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Replace strainer for washer pump
- If necessary, coat sealing ring of washer pump with antiseize agent
- Ensure hose is laid without kinks.
- Fill fluid reservoir

61 67 040 ADJUSTING SPRAY NOZZLES FOR HEADLIGHT CLEANING SYSTEM

NOTE: The spray nozzles of the headlight cleaning system have been adjusted at the factory and normally this setting is not altered (except by an accident). The nozzles therefore do not have to be adjusted.

The spray nozzles do not have to be adjusted even in the event of replacement as the nozzles themselves and the telescopic nozzle form a single unit (high-pressure nozzle) and are already preset.

61 67 083 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT HIGH-PRESSURE NOZZLE OF HEADLIGHT CLEANING SYSTEM

Special tools required:

- **13 3 010**

Necessary preliminary tasks:

- Remove **FRONT BUMPER TRIM**

To prevent excessive escape of washer fluid, seal off end of high-pressure line with special tool **13 3 010**.

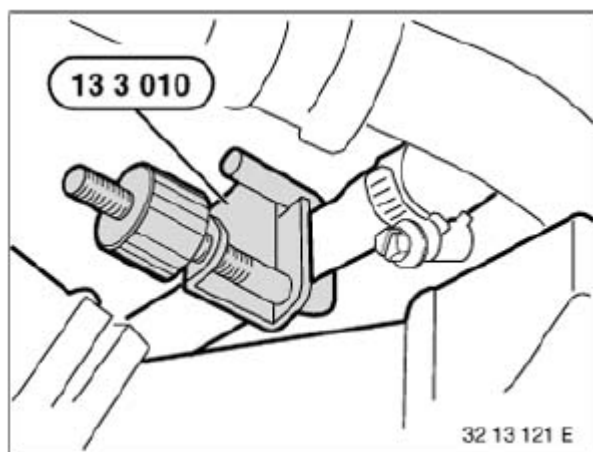


Fig. 367: Identifying Special Tool (13 3 010)
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock high-pressure line (1) and detach from high-pressure nozzle (2).

Release screws (3).

Remove high-pressure nozzle (2).

Installation:

New spray nozzles are already preset.

Carry out a function test before fitting bumper trim.

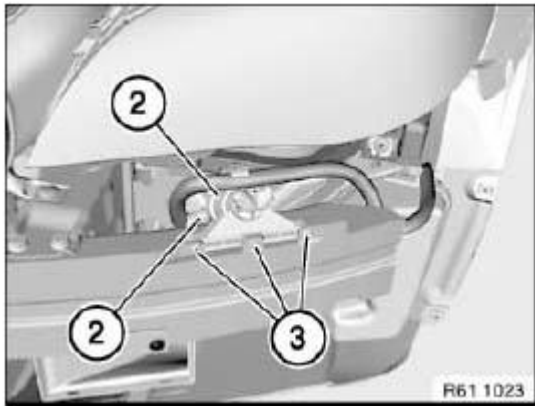


Fig. 368: Identifying High-Pressure Nozzle And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

61 67 200 REMOVING AND INSTALLING/REPLACING SPRAY NOZZLE FOR NIGHT VISION CAMERA

Special tools required:

- **13 3 010**

Necessary preliminary tasks:

- Remove **FRONT BUMPER TRIM**

To prevent excess escape of washer fluid, seal off end of high-pressure line with special tool **13 3 010** .

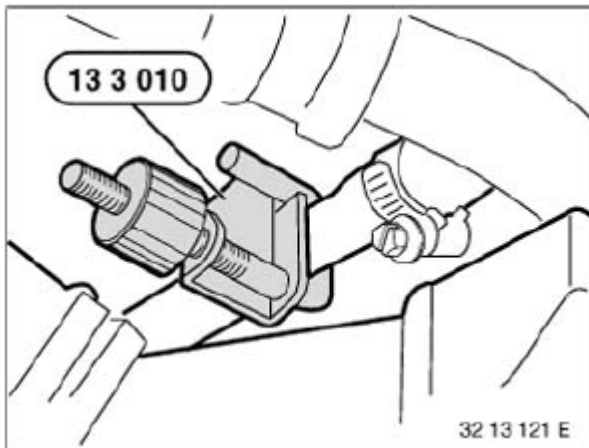


Fig. 369: Identifying Special Tool (13 3 010)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Night vision camera removed for purposes of clarity.

Press retainer (1) and detach high-pressure line (2) from high-pressure nozzle.

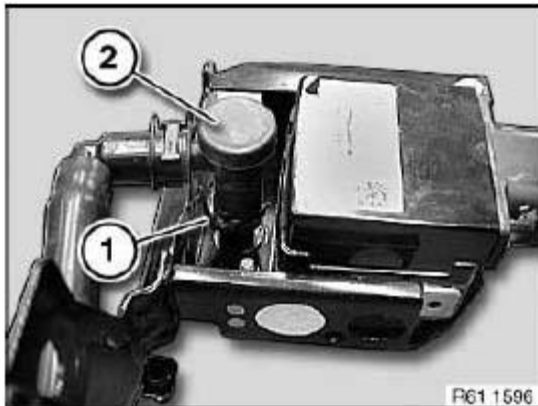


Fig. 370: Identifying Retainer And High-Pressure Line

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove high-pressure nozzle (2).

Installation:

New spray nozzles are already preset.

Check function.

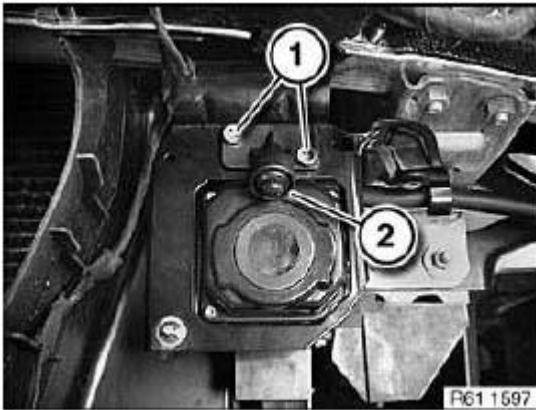


Fig. 371: Identifying High-Pressure Nozzle And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

WINDOW WASHER SYSTEM

61 71 015 REMOVING AND INSTALLING/REPLACING A JET NOZZLE IN WINDSHIELD WASHER SYSTEM

NOTE: The jet nozzles of the windshield washer system are preset at the factory and cannot be readjusted.

Unfasten plug connection (1) and disconnect.

Unlock plug housing (2) and disconnect.

Detach connector (3) in direction of arrow from nozzle of windshield washer system (4).

Unlock nozzle of windshield washer system (4), press out through opening and remove.

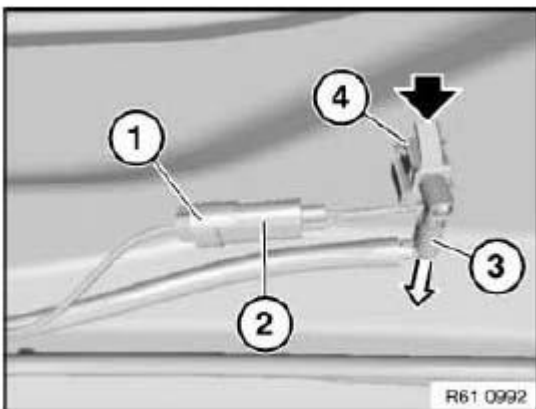


Fig. 372: Identifying Nozzle Of Windshield Washer System And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure nozzle of windshield washer system (4) is correctly seated.

Ensure hose is laid without kinks.

61 71 061 REPLACING (REMOVING AND INSTALLING) FLUID RESERVOIR FOR WINDSCREEN WASHER UNIT*Necessary preliminary tasks:*

- Remove **LEVEL SWITCH**
- Remove **WINDSCREEN WASHER PUMP**
- If necessary, remove **WASHER PUMP** for headlight washer system

Release screws (1) on fluid reservoir for windscreen washer unit.

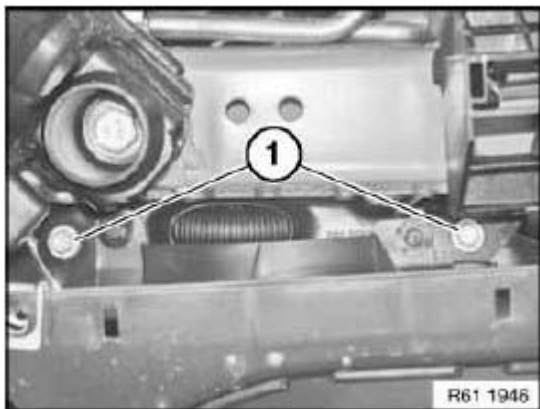


Fig. 373: Identifying Fluid Reservoir For Windscreen Washer Unit Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1) and pull fluid reservoir for windscreen washer unit (3) forward in direction of arrow slightly.

Disconnect filler hose (2).

If necessary, detach hose for headlight washer system from fluid reservoir for windscreen washer unit (3).

Remove fluid reservoir for windscreen washer unit (3).

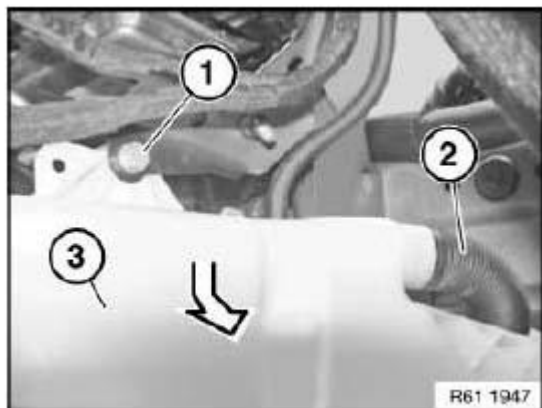


Fig. 374: Pulling Fluid Reservoir For Windscreen Washer Unit
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Replace strainers on washer pumps
- Coat sealing rings of washer pumps with antiseize agent
- Lay lines of washer pumps without kinks and clip into holders on fluid reservoir
- Fill fluid reservoir

61 71 100 REMOVING AND INSTALLING/REPLACING WINDSCREEN WASHER PUMP

Necessary preliminary tasks:

- If necessary, remove left front wheel
- Remove **FRONT UNDERBODY PROTECTION**

NOTE: For purposes of clarity, illustration shows front wheel removed.

Release screws.

Fold back wheel arch trim (1) in direction of arrow.

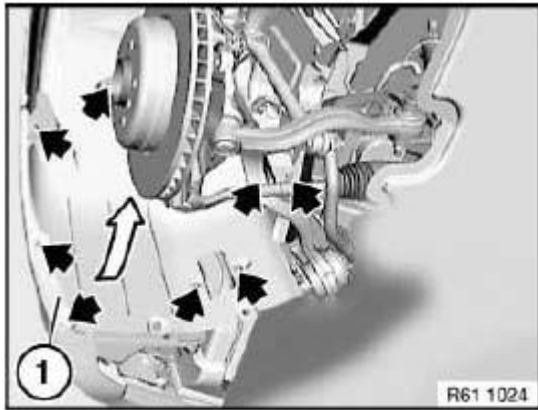


Fig. 375: Folding Back Wheel Arch Trim

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Catch any escaping washer fluid if necessary.

Disconnect plug connection (1).

Detach hose (2) from windscreen washer pump (3).

Pull windscreen washer pump (3) in direction of arrow out of fluid reservoir for windscreen washer unit (4).

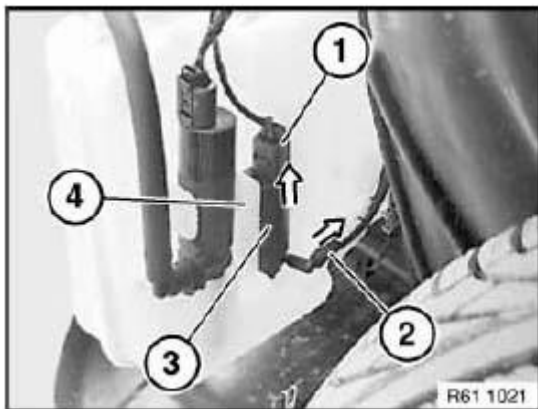


Fig. 376: Detaching Hose From Windscreen Washer Pump

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Replace strainer for windscreen washer pump.
- If necessary, coat sealing ring of windscreen washer pump with antiseize agent.
- Ensure hose is laid without kinks.
- Fill fluid reservoir