

ACCESSORIES AND EQUIPMENT**Accessories Control System - Repair Instructions - X3****00 TROUBLESHOOTING****12 00 ... INSTRUCTIONS ON STARTING AID**

Do not start the engine with help of starting sprays.

Preparation:

Conform with the following when starting engine with starting cable.

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

CAUTION: Never touch ignition system components and current - dangerous high tension!

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

Carrying out:

Always conform with the procedures to avoid injury to persons or damage to parts.

- On automatic transmission, select "P" setting, apply handbrake.
- Move the shift lever of vehicles with manual transmission into neutral and apply the parking brake.
- Ensure that the jump leads cannot get caught in rotating parts, e.g. fan.
- First connect positive terminals of both batteries with one jump lead (red).
- Use positive connection point in engine compartment for vehicles with one battery in trunk.
- Then attach second jump lead (black) to negative terminal of donor battery and to engine ground or body ground on vehicle to be started.

CAUTION: Never connect second jump lead (black) to negative terminal of battery in vehicle to be started. This would produce explosive gas which could be ignited by sparks.

Danger of explosion!

After engine of vehicle to be started has started up, first disconnect the jump lead on the negative terminal/ground connection. Then remove jump lead from positive terminals.

61 00 ... BATTERY

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

- Battery master document
- Disconnecting battery, see 12 00 ... Instructions for disconnecting and connecting battery
- Battery charging, see 61 20 ... Battery charging
- Welding work
- External jump-starting aid, see 12 00 ... Instructions on 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 sulphated and/or heavily contaminated plates will also lead to incorrect acid density test results.

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, see 72 00 ... SAFETY REGULATIONS FOR

HANDLING COMPONENTS WITH GAS GENERATORS .

Instructions for disconnecting and connecting battery, see **12 00 ... 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, see **61 13 Cutting to length and stripping insulation from cables**

Repairing a plug connection using connectors, see **61 13 Butt connector for repairing a plug connection**

Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

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 unpin 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:

Cutting off and insulating cables, see **61 13 Cutting to length and stripping insulation from cables**

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Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

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!).

61 13 OPENING PLUG HOUSINGS AND REMOVING CONTACTS OF DIFFERENT PLUG SYSTEMS

Special tools required:

- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- 61 0 400
- **61 1 150 RELEASING TOOL KIT**

Abbreviations and what they mean:

ABBREVIATIONS REFERENCE CHART

D 1.5 / 2.5	Round contacts of 1.5 mm or 2.5 mm diameter
MDK 3plus	Miniature double flat spring contact
JPT ELA	Junior Power Timer flat spring contacts with strand sealing
DFK ELA	Double flat spring contacts with strand sealing
Elo	Electronic contacts with and without strand sealing Manufacturer: Siemens
Elo Power	Electronic contacts for heavy loads with and without strand sealing Manufacturer: Siemens
MQS	Micro Quadlock System electronic contacts with and without strand sealing Manufacturer: AMP
MPQ	Micro Power Quadlock electronic contacts for heavy loads with and without strand sealing Manufacturer: AMP

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. Replace plug completely.

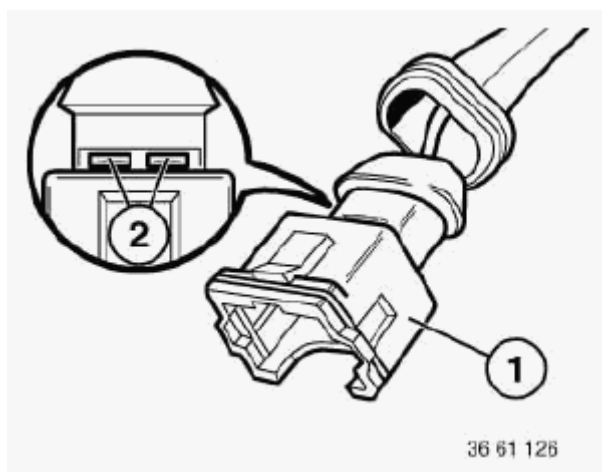


Fig. 1: Identifying Ultrasonic-Welded Connectors
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release and press-out tool 61 1 150

Replaced as from 09/2005 by: 61 0 300

61 0 400

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.

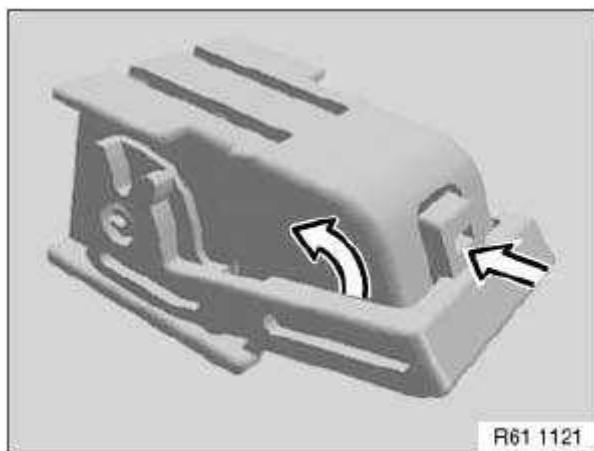


Fig. 2: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and open clip in direction of arrow.

Disconnect plug connection.

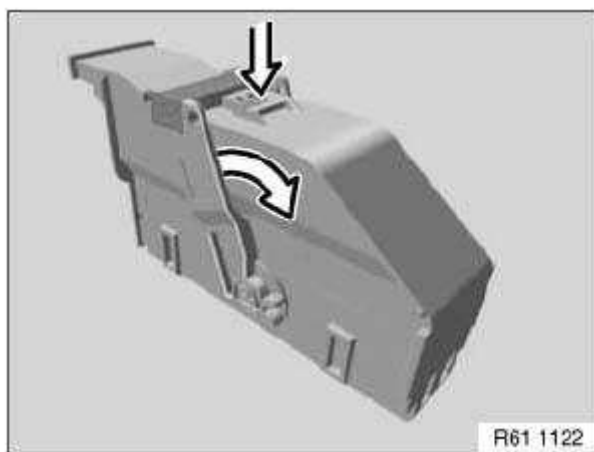


Fig. 3: Pressing Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

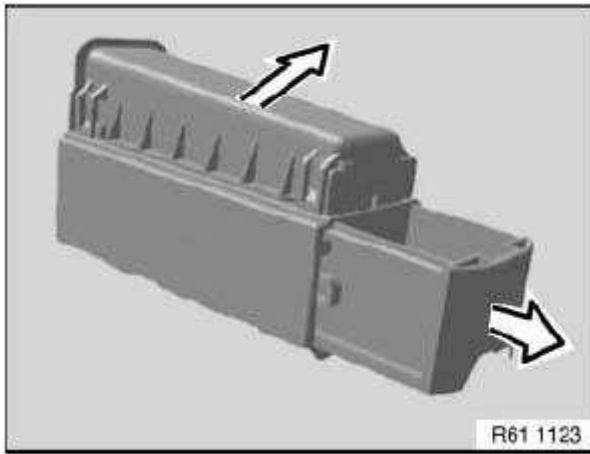


Fig. 4: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

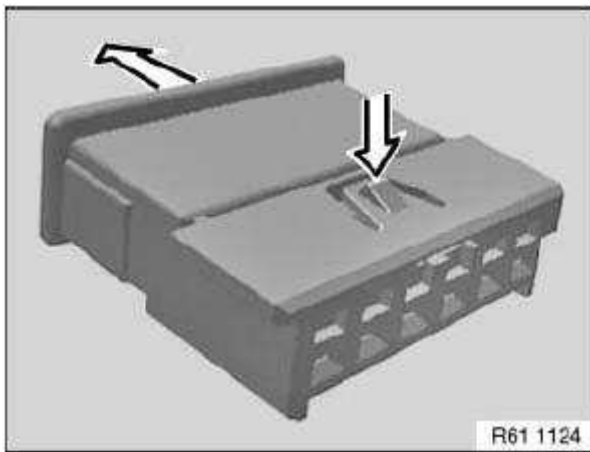


Fig. 5: Pressing Lock (1 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

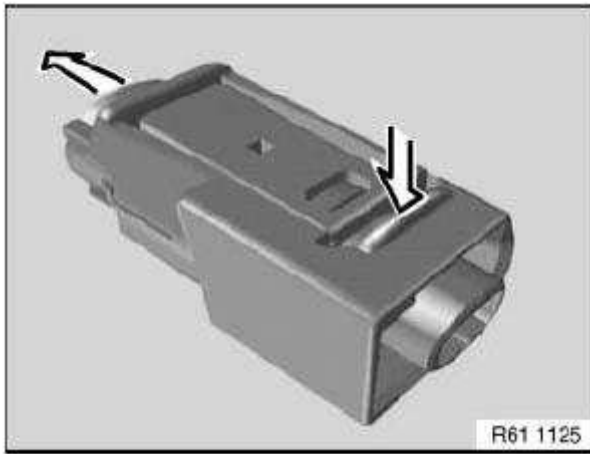


Fig. 6: Pressing Lock (2 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

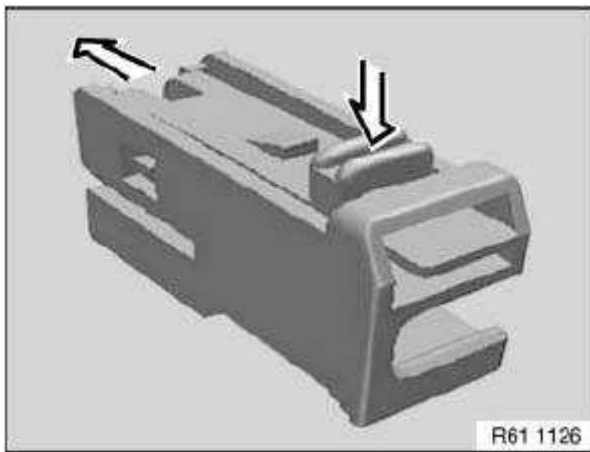


Fig. 7: Pressing Lock (3 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

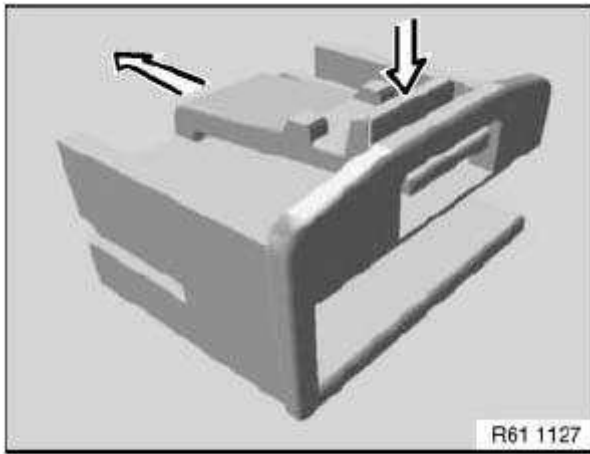


Fig. 8: Pressing Lock (4 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

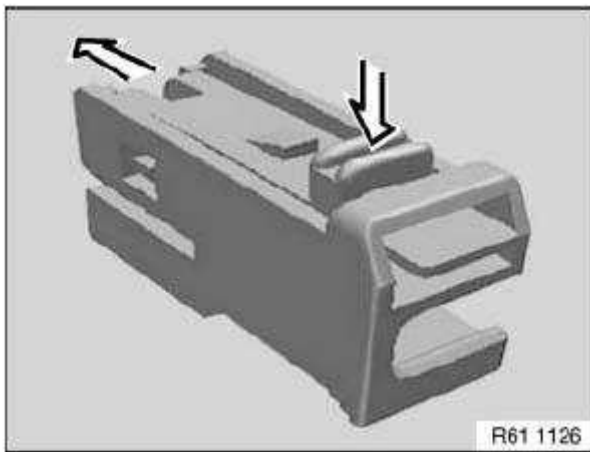
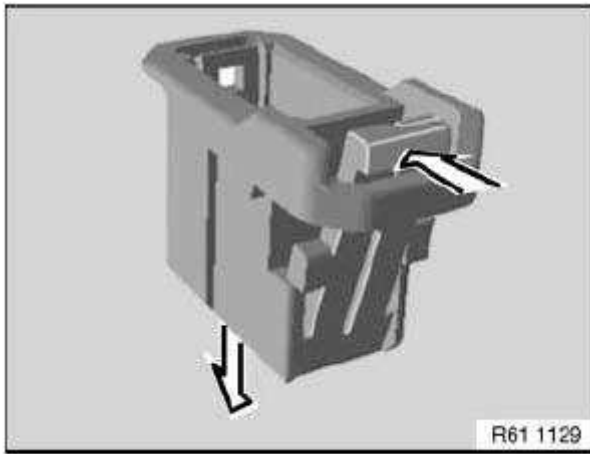


Fig. 9: Pressing Lock (5 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

**Fig. 10: Pressing Lock (6 Of 6)**

Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **61 1 190 PLIERS**
- **61 4 320 CRIMPING SET WITH PLIERS**

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

REPAIR INSTRUCTIONS CHART

Repair range for vehicle electrical system	SI 2 04 07 341
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, see **61 13 Special tools for wiring harness repairs**
- Cutting to length and stripping insulation from cables, see **61 13 Cutting to length and stripping insulation from cables**
- Crimping stop parts (contacts), see **61 13 Crimping stop parts**
- Butt connector for repairing a plug connection, see **61 13 Butt connector for repairing a plug connection**
- Fan connector for retrofitting/repairs, see **61 13 Installing fan connector for retrofitting/repairs**
- Aerial elbow plug on radio receiver
- Cutting to length and stripping insulation from optical fibers, see **61 13 ... Cutting off, stripping**

insulation and cutting optical fibres to length

- Crimping optical fibres, see **61 13 ... Crimping optical fibres**
- Insulation displacement connector for repairing ribbon cables, see **61 13 ... Repairing ribbon cables**

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

IMPORTANT: Observe safety instructions for handling vehicle battery, see 61 00 ... 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, see **61 21 BATTERY WITH TERMINAL** .
- Connect and switch on battery charger
- Switch ignition on

12 AUXILIARY CABLES**61 12 004 REPLACING BATTERY POSITIVE LEAD (FROM BATTERY TO ENGINE COMPARTMENT PARTITION CONNECTOR)**

WARNING: Observe safety instructions for handling vehicle battery, see 61 00 ... Safety instructions for handling vehicle battery

Necessary preliminary tasks:

- Remove right luggage compartment wheel arch trim, see **51 47 161 REMOVING AND INSTALLING/REPLACING RIGHT LUGGAGE COMPARTMENT WHEEL ARCH TRIM**

- Remove instrument panel trim, see **51 45 030 REMOVING AND INSTALLING INSTRUMENT PANEL TRIM**
- Remove right front seat, see **52 13 015 REMOVING AND INSTALLING / REPLACING CONTROLS ON LEFT / RIGHT FRONT SEAT (NORMAL / MANUAL)**
- Remove central bass cover, see **65 12 050 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT CENTRAL BASS SPEAKER (UNDER FRONT SEAT)**
- Remove panel for door pillar on right, see **51 43 150 REMOVING AND INSTALLING OR REPLACING TRIM FOR LEFT OR RIGHT DOOR PILLAR (BOTTOM)**

Unfasten plug connection (2) and disconnect.

Disconnect battery negative lead (1), see **61 20 900 Disconnecting and connecting battery negative lead.**

Open positive terminal cover (3).

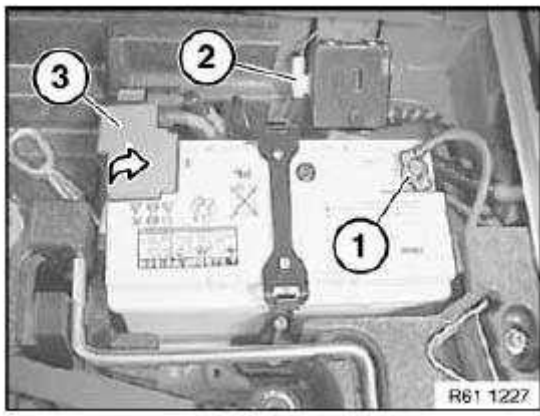


Fig. 11: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (3), tightening torque: 61 12 1AZ, see **61 12 AUXILIARY CABLES/LEADS** .

Disconnect lead (4).

Release nut (1) of safety battery terminal (2), tightening torque: 61 21 1AZ, see **61 12 AUXILIARY CABLES/LEADS** .

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.

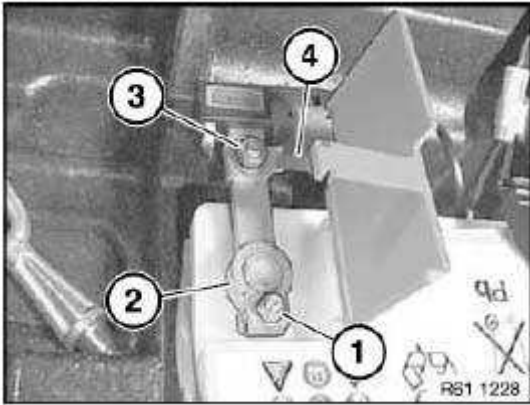


Fig. 12: Identifying Battery Terminal And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Lever out covers (1) and remove.

Unfasten screws (2).

Lift out rail (3).

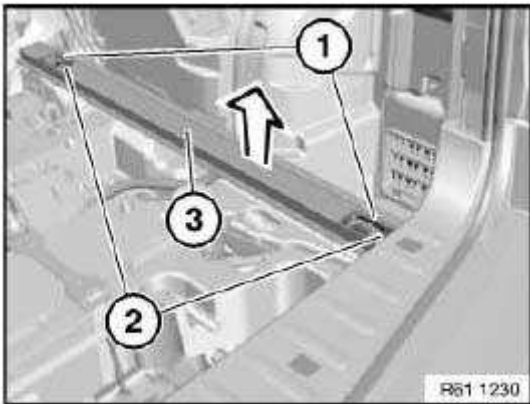


Fig. 13: Lifting Out Rail
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not kink floor panelling under any circumstances!

Cut and fold back floor panelling (1) in area (2).

Installation:

Cut into floor panelling (2) at marked points. Join cutting lines with cable straps (short).

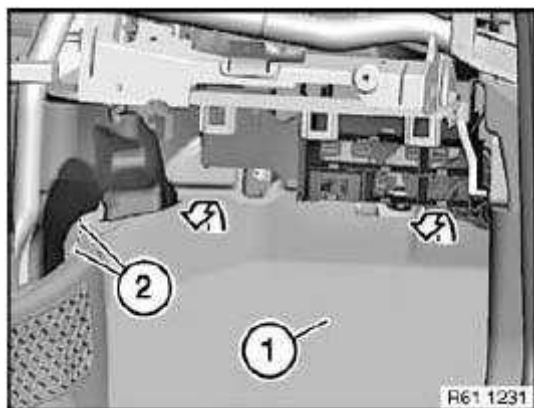


Fig. 14: Folding Back Floor Panelling

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock cable lug mounting (1) and fold back.

Release screw (2), tightening torque: 61 12 2AZ, see **61 12 AUXILIARY CABLES/LEADS** .

Unclip cable lug mounting (1) from positive battery cable (3) and remove.

WARNING: Risk of short circuits!
When installing, ensure:

- Correct seating of cable lug mounting (1) on positive battery cable (3)
- Correct screw connection

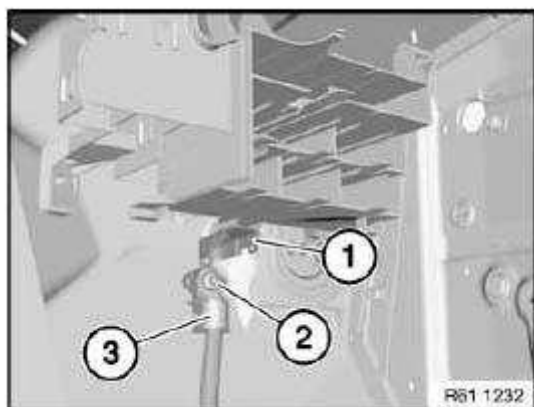


Fig. 15: Identifying Cable Lug Mounting And Screw

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For purposes of clarity, the following illustrations show the front/rear floor panelling removed.

Raise front/rear floor panelling in area of battery positive lead.

Remove front insert (1).

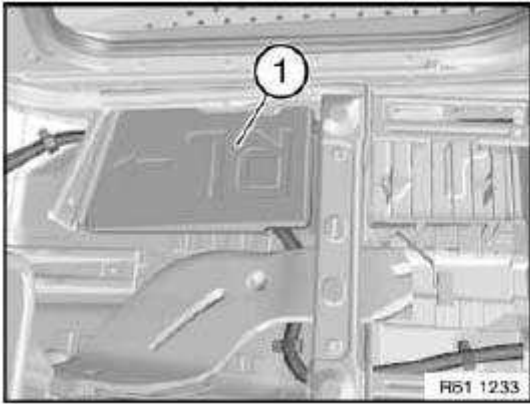


Fig. 16: Identifying Front Insert

Courtesy of BMW OF NORTH AMERICA, INC.

Remove battery positive lead (1) from cable guides (2).

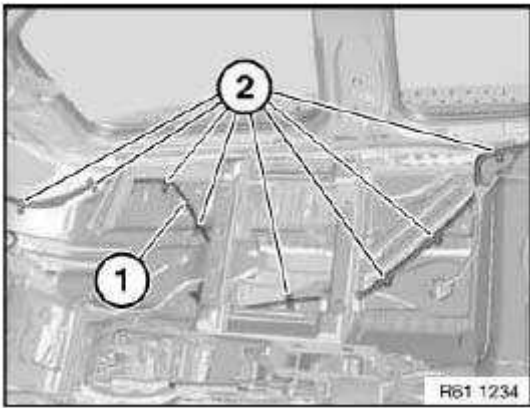


Fig. 17: Identifying Battery Lead And Cable Guides

Courtesy of BMW OF NORTH AMERICA, INC.

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

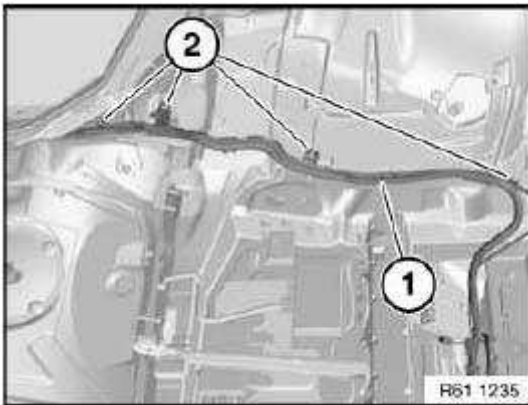


Fig. 18: Identifying Battery Lead And Cable Guides
 Courtesy of BMW OF NORTH AMERICA, INC.

61 12 013 REPLACING NEGATIVE BATTERY CABLE

WARNING: Observe safety instructions for handling vehicle battery, see 61 00 ...
Safety instructions for handling vehicle battery

Necessary preliminary tasks:

- Remove roller cover from luggage compartment.
- Release cover on seat belt at top rear, see 72 11 100 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SEAT BELTS
- Remove both rest side sections on rear seat backrest, see 52 26 008 REMOVING AND INSTALLING/REPLACING LEFT/RIGHT SIDES OF BACKREST ON REAR SEAT BACKREST (THROUGH-LOADING)
- Remove backrest for rear seat, see 52 26 015 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT REAR SEAT BACKREST (THROUGH-LOADING SYSTEM)
- Remove rear luggage compartment floor trim, see 51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL
- Remove front trim for luggage compartment floor, see 51 47 131 REPLACING FRONT TRIM FOR LUGGAGE COMPARTMENT FLOOR
- Remove trim for rear right roof pillar (C-pillar), see 51 43 251 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR REAR LEFT OR RIGHT ROOF PILLAR (C - PILLAR)
- Remove flap in luggage compartment panel, see 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT
- Remove both trims for rear roof pillar (D-pillar), see 51 43 252 REPLACING TRIM PANEL FOR REAR LEFT OR RIGHT ROOF PILLAR (D-PILLAR)
- Remove trim on tail panel at top, see 51 46 050 REMOVING AND INSTALLING/REPLACING TOP TRIM ON REAR APRON
- Remove inner window cavity cover strip on right, see 51 37 261 REMOVING AND

INSTALLING/REPLACING WINDOW CAVITY COVER STRIP FOR DOOR WINDOW, REAR LEFT OR RIGHT

- Remove storage compartment in luggage compartment on right, see **51 47 ... REMOVING AND INSTALLING/REPLACING STORAGE COMPARTMENT IN LUGGAGE COMPARTMENT ON RIGHT**
- Remove right luggage compartment wheel arch trim, see **51 47 161 REMOVING AND INSTALLING/REPLACING RIGHT LUGGAGE COMPARTMENT WHEEL ARCH TRIM .**
- Remove lashing rail in luggage compartment floor on right, see **51 47 135 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT LASHING RAIL IN LUGGAGE COMPARTMENT FLOOR**
- Remove right luggage compartment recess panel

Release nut (1) on battery negative terminal.

Tightening torque: 61 21 1AZ, see **61 21 BATTERY WITH TERMINAL .**

Detach battery negative cable (2) upwards.

Release nut (3) and battery negative cable (2).

Tightening torque: 61 21 2AZ, see **61 21 BATTERY WITH TERMINAL .**

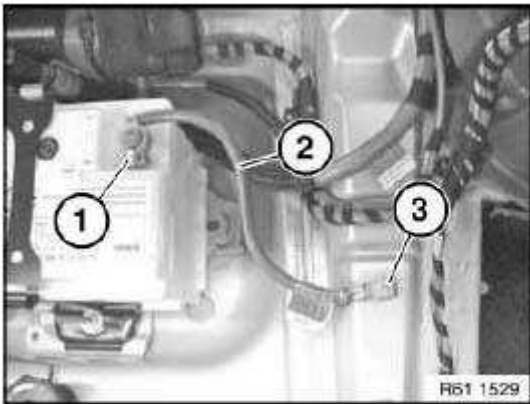


Fig. 19: Identifying Battery Cable Nut
Courtesy of BMW OF NORTH AMERICA, INC.

61 12 137 REPLACING WIRING HARNESS FOR REAR LID ON RIGHT

Necessary preliminary tasks:

- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove trim for rear lid, see **51 49 008 REMOVING AND INSTALLING/REPLACING PANEL FOR REAR LID**
- Remove roofliner, see **51 44 002 REMOVING AND INSTALLING ROOFLINER (ON VERSION WITHOUT PANORAMA SUNROOF)**

Disconnect plug connection (1).

Feed wiring harness (2) out of rear lid.

Installation:

Correctly lay wiring harness (2).

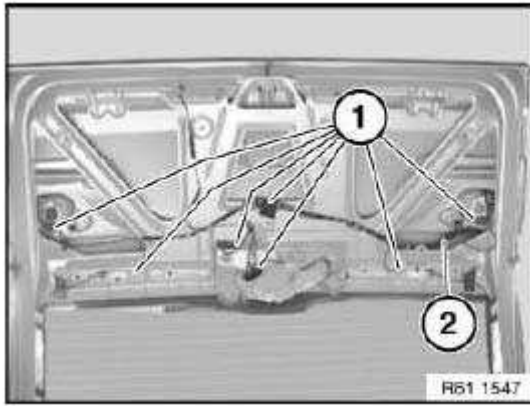


Fig. 20: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure rubber seal (1) is correctly installed in groove on frame.

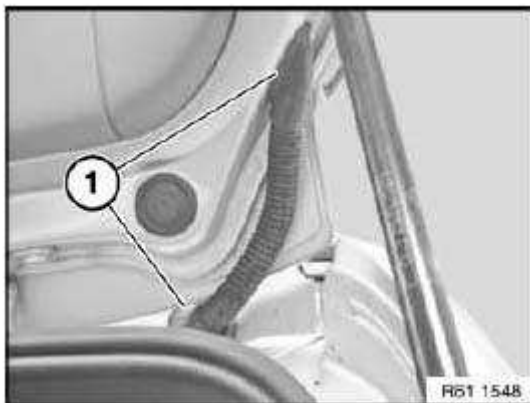


Fig. 21: Identifying Rubber Seal

Courtesy of BMW OF NORTH AMERICA, INC.

Remove wiring harness sheathing in area (A).

Cut one cable after another at the appropriate point.

Connect cables of new wiring harness with butt connectors and heat-shrink sleeves.

Insulate wiring harness with insulating tape and secure in place.

Installation:

Correctly lay wiring harness (2).

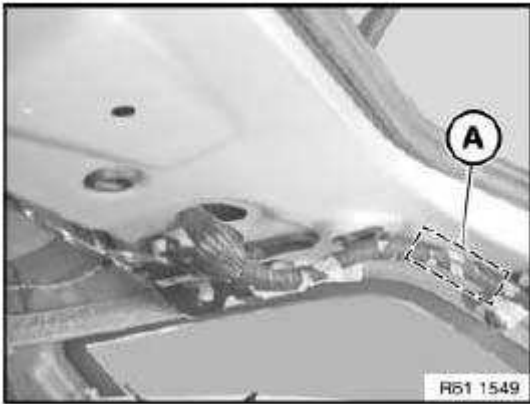


Fig. 22: Identifying Wiring Harness Sheathing Area
Courtesy of BMW OF NORTH AMERICA, INC.

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, see **51 41 000 REMOVING AND INSTALLING LEFT OR RIGHT FRONT DOOR TRIM PANEL**
- Remove front acoustic insulation, see **51 48 060 REMOVING AND INSTALLING/REPLACING SOUND INSULATION IN LEFT OR RIGHT FRONT DOOR**

Disconnect plug connection (1).

Unclip door wiring harness at points (2).

Installation:

Make sure door wiring harness is correctly laid.

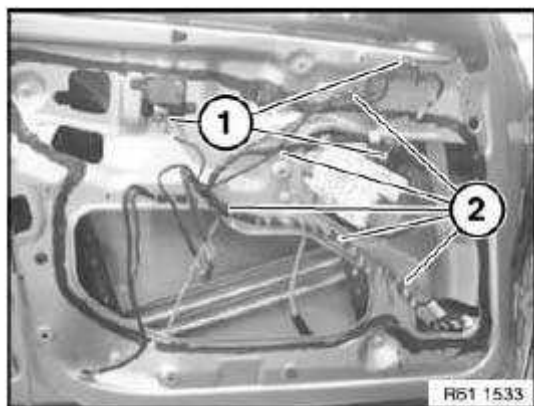


Fig. 23: Identifying Plug Connection And Door Wiring Harness Points
 Courtesy of BMW OF NORTH AMERICA, INC.

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) out of front door.

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

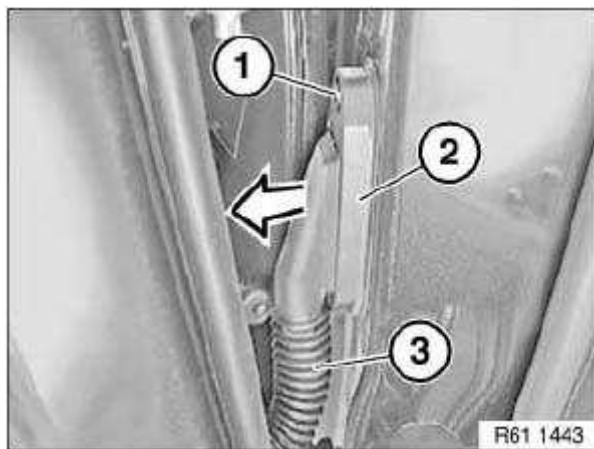


Fig. 24: Pulling Rubber Grommet
 Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Close rear side window completely
- Remove cover on door handle, see **51 41 017 REMOVING AND INSTALLING/REPLACING COVER ON DOOR HANDLE, FRONT LEFT OR RIGHT**

- Remove rear door trim panel, see **51 42 000 REMOVING AND INSTALLING LEFT OR RIGHT REAR DOOR TRIM PANEL**
- Remove rear acoustic insulation, see **51 48 070 REMOVING AND INSTALLING/REPLACING SOUND INSULATION ON LEFT OR RIGHT REAR DOOR**

Disconnect plug connection (1) on power window unit.

Unclip door wiring harness at points (2).

Installation:

Make sure door wiring harness is correctly laid.

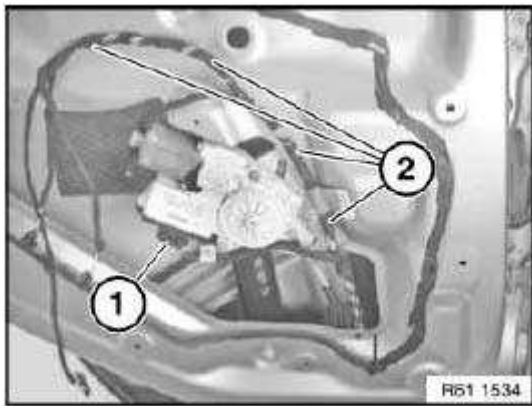


Fig. 25: Identifying Plug Connection And Door Wiring Harness Points
Courtesy of BMW OF NORTH AMERICA, INC.

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) out of rear door.

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

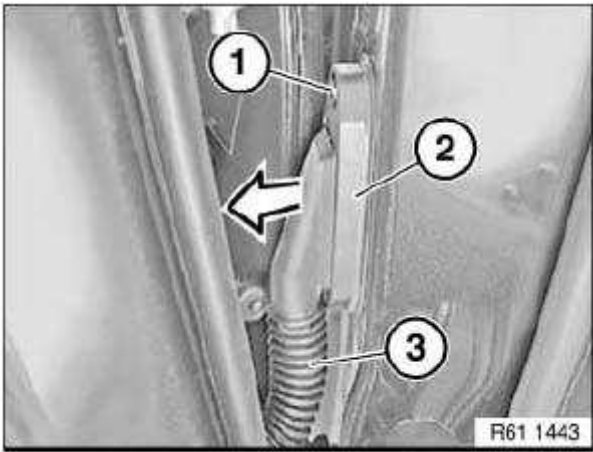


Fig. 26: Pulling Rubber Grommet
Courtesy of BMW OF NORTH AMERICA, INC.

61 13 OPENING PLUG HOUSINGS AND REMOVING CONTACTS OF DIFFERENT PLUG SYSTEMS

Special tools required:

- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- 61 0 400
- **61 1 150 RELEASING TOOL KIT**

Abbreviations and what they mean:

ABBREVIATIONS REFERENCE CHART

D 1.5 / 2.5	Round contacts of 1.5 mm or 2.5 mm diameter
MDK 3plus	Miniature double flat spring contact
JPT ELA	Junior Power Timer flat spring contacts with strand sealing
DFK ELA	Double flat spring contacts with strand sealing
Elo	Electronic contacts with and without strand sealing Manufacturer: Siemens
Elo	Power Electronic contacts for heavy loads with and without strand sealing Manufacturer: Siemens
MQS	Micro Quadlock System electronic contacts with and without strand sealing Manufacturer: AMP
MPQ	Micro Power Quadlock electronic contacts for heavy loads with and without strand sealing Manufacturer: AMP

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. Replace plug completely.

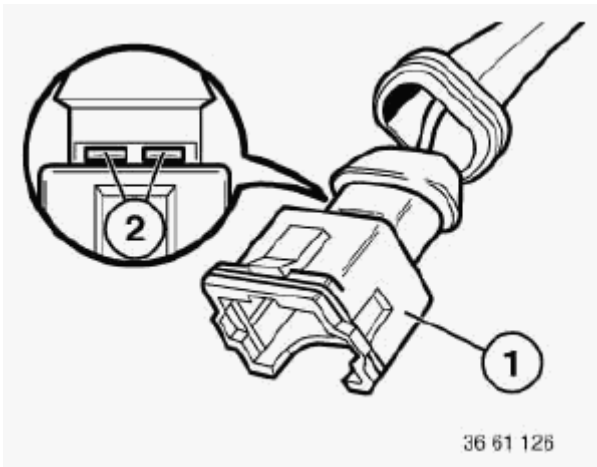


Fig. 27: Identifying Ultrasonic-Welded Connectors
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release and press-out tool 61 1 150

Replaced as from 09/2005 by: 61 0 300

61 0 400

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.

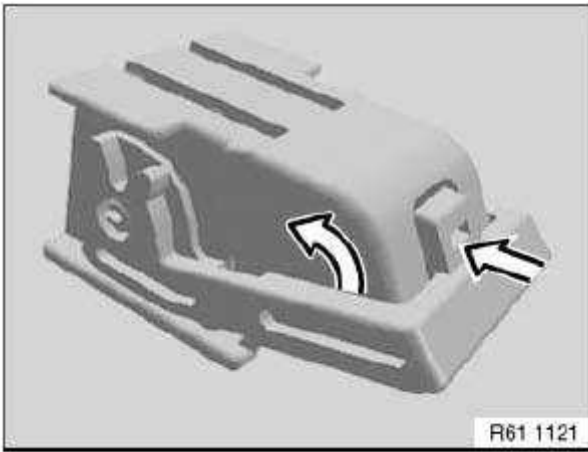


Fig. 28: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and open clip in direction of arrow.

Disconnect plug connection.

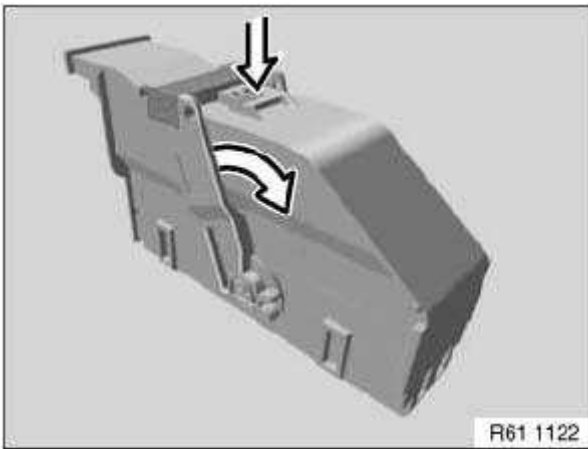


Fig. 29: Pressing Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

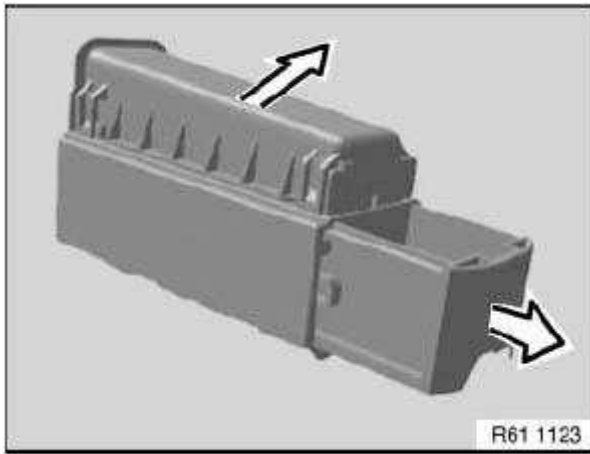


Fig. 30: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

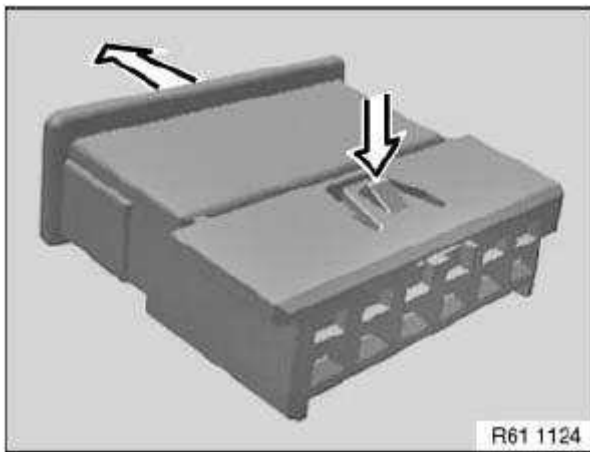


Fig. 31: Pressing Lock (1 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

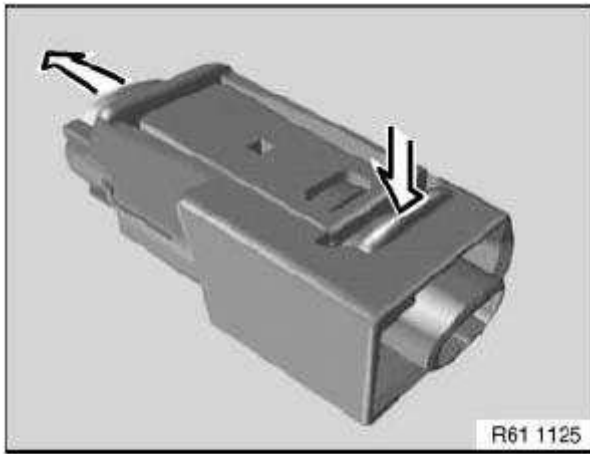


Fig. 32: Pressing Lock (2 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

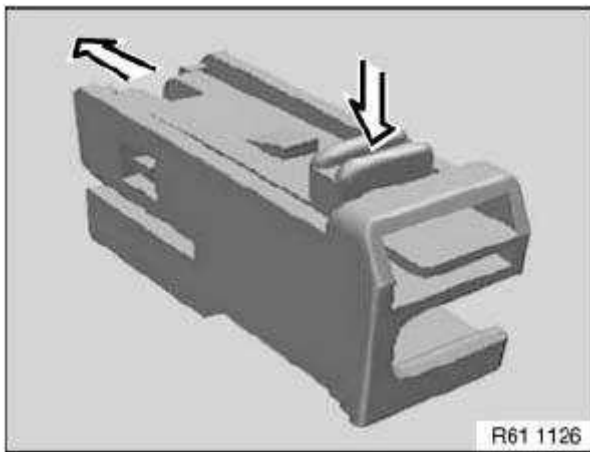


Fig. 33: Pressing Lock (3 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

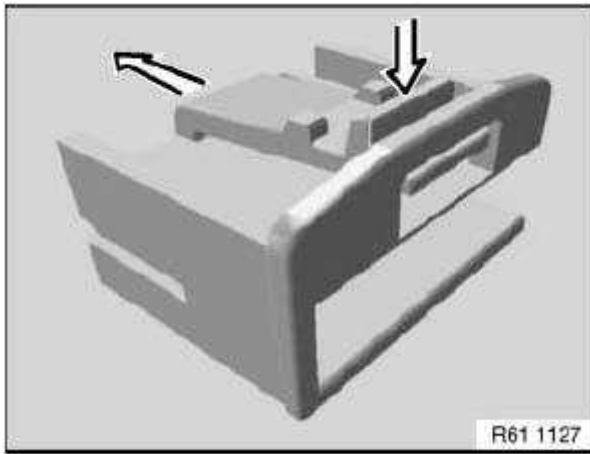


Fig. 34: Pressing Lock (4 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

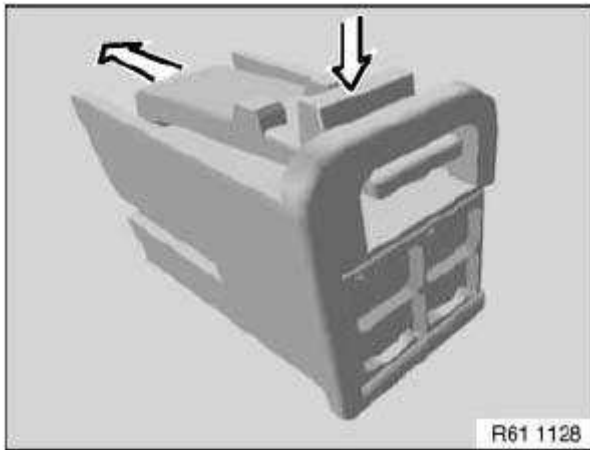


Fig. 35: Pressing Lock (5 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

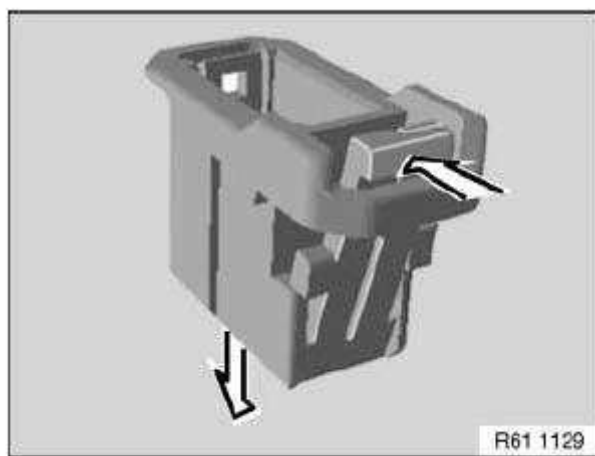


Fig. 36: Pressing Lock (6 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

13 CONNECTORS, TERMINALS, FUSE BOX

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, see 72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS .

Instructions for disconnecting and connecting battery, see 12 00 ... 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, see **61 13 Cutting to length and stripping insulation from cables**

Repairing a plug connection using connectors, see **61 13 Butt connector for repairing a plug connection**

Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

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:

Cutting off and insulating cables, see **61 13 Cutting to length and stripping insulation from cables**

Repairing a plug connection using connectors, see **61 13 Butt connector for repairing a plug connection**

Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

61 13 BUTT CONNECTOR FOR REPAIRING A PLUG CONNECTION

Special tools required:

- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**

- 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.

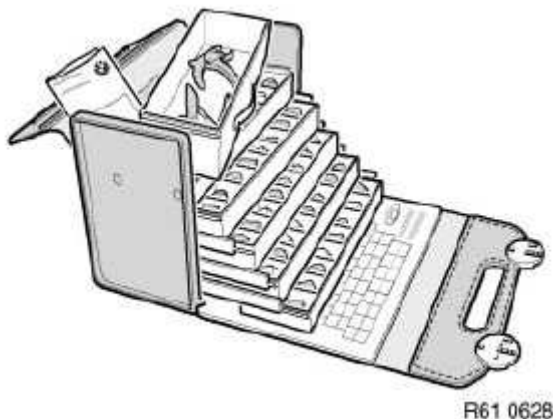
The case can no longer be ordered. Order individual parts for wiring harness repair through BMW Parts Service.

Special tools:

- Special tool 61 9 040

Choose repair kit.

Example: Repair kit, circular plug system D 2.5.



R61 0628

Fig. 37: Identifying Special Tool Kit
Courtesy of BMW OF NORTH AMERICA, INC.

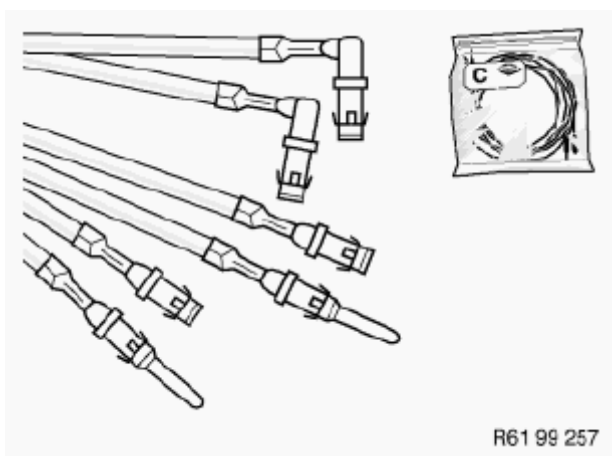


Fig. 38: Identifying Circular Plug System D 2.5
 Courtesy of BMW OF NORTH AMERICA, INC.

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

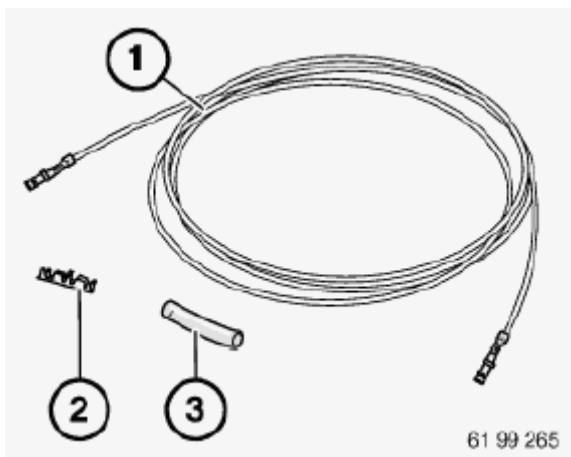


Fig. 39: Identifying Crimp Connector And Shrink-Fit Hose
 Courtesy of BMW OF NORTH AMERICA, INC.

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, see **61 13 Opening plug housings and removing contacts of different plug systems**

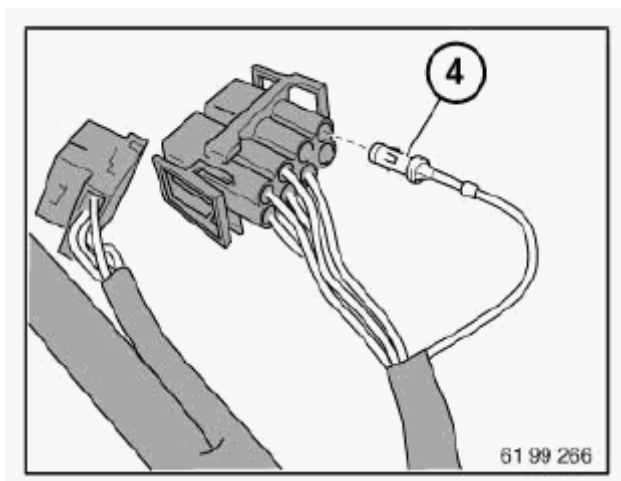


Fig. 40: Identifying Damaged Contact Mark With Socket Number
Courtesy of BMW OF NORTH AMERICA, INC.

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 wiring-harness wire end (6).
- Cut preassembled wire end (7) to length and strip insulation.

Refer also to repair instruction:

Cutting to length and stripping insulation from cables, see **61 13 Cutting to length and stripping insulation from cables**

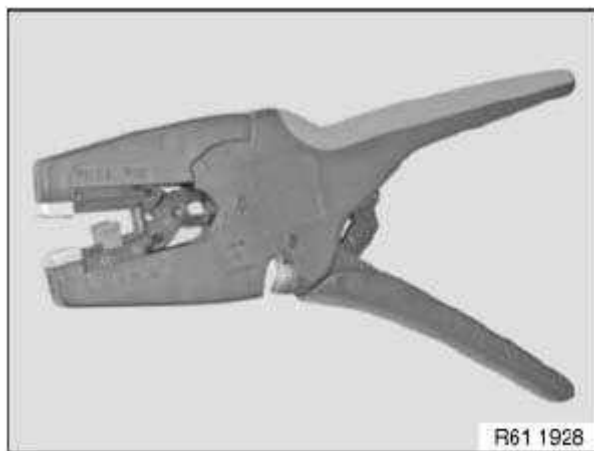


Fig. 41: Identifying Cutting Plier

Courtesy of BMW OF NORTH AMERICA, INC.

Crimp butt connector on preassembled wire end.

Refer to repair instructions:

Crimping on stop parts, see **61 13 Crimping stop parts**

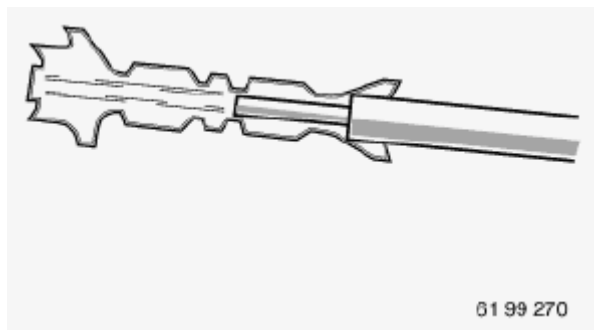


Fig. 42: Identifying Crimp Butt Connector On Preassembled Wire End
Courtesy of BMW OF NORTH AMERICA, INC.

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

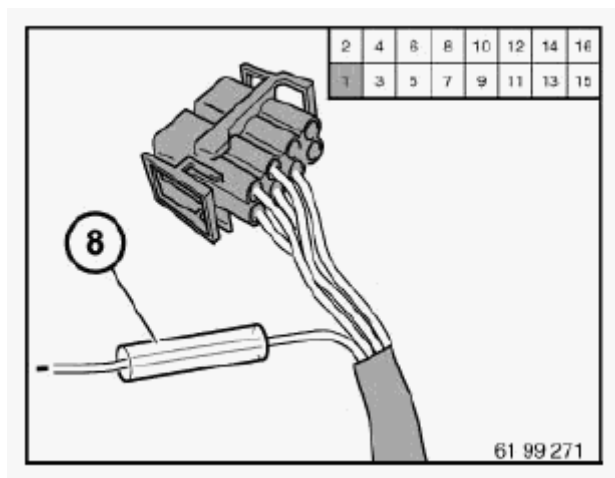


Fig. 43: Identifying Shrink-Fit Hose
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp unused wire end to butt connector.

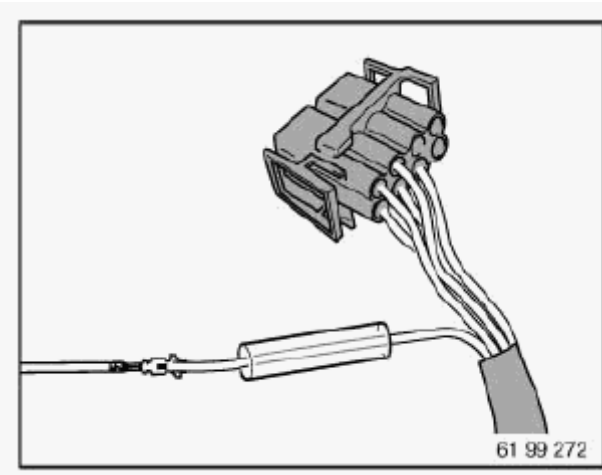


Fig. 44: Crimping Unused Wire End To Butt Connector
Courtesy of BMW OF NORTH AMERICA, INC.

Pull shrink-on sleeve over butt connector.

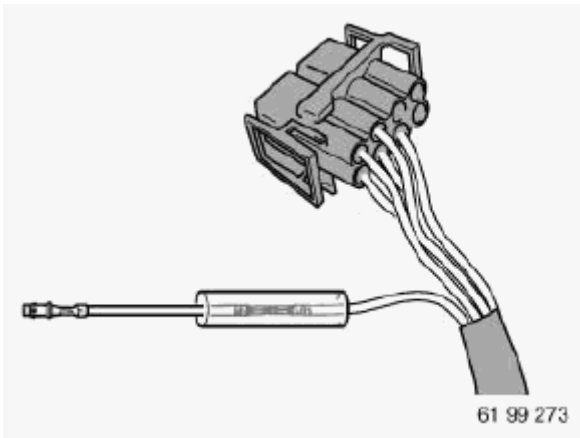


Fig. 45: Identifying Shrink-On Sleeve Over Butt Connector
Courtesy of BMW OF NORTH AMERICA, INC.

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.

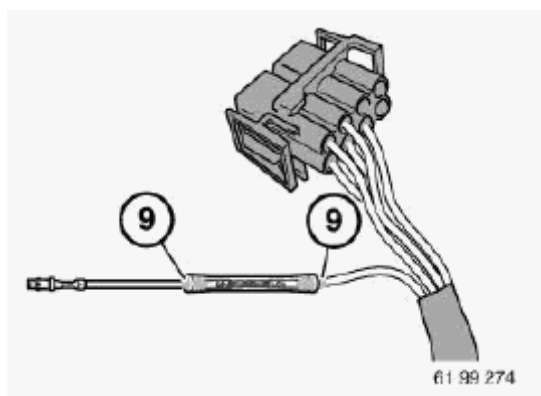


Fig. 46: Identifying Shrink-On Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

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):

1. Crimping butt connectors and contact sleeves for fan connectors up to 2.5 mm²
2. Crimping butt connectors and contact sleeves for fan connectors from 2.5 mm²
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 to crimp 4 mm² contact sleeves for fan connectors.

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

Special tools for wiring harness repairs, see **61 13 Special tools for wiring harness repairs**

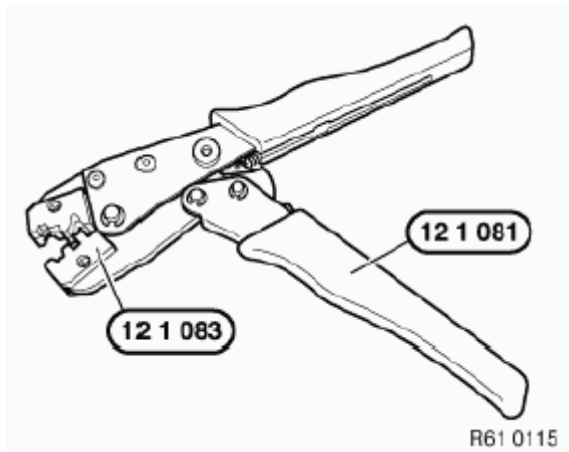


Fig. 47: Identifying Special Tool (12 1 083) And (12 1 081)
Courtesy of BMW OF NORTH AMERICA, INC.

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.

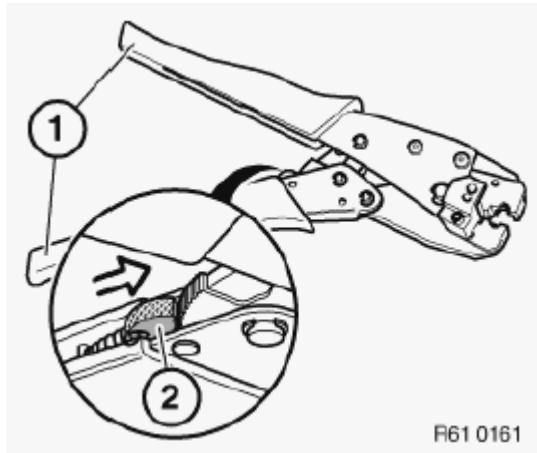


Fig. 48: Identifying Grips And Lever
Courtesy of BMW OF NORTH AMERICA, INC.

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

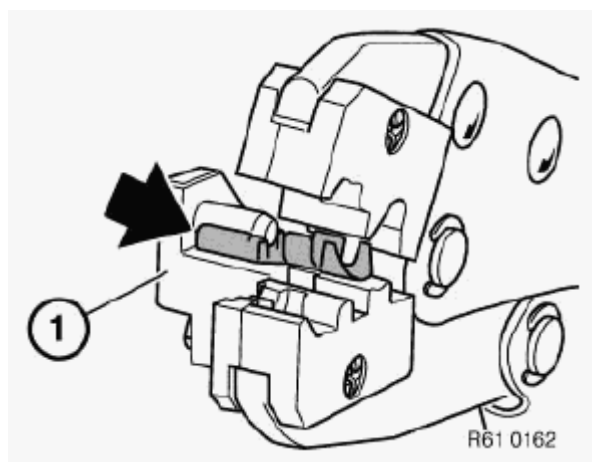


Fig. 49: Locating Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

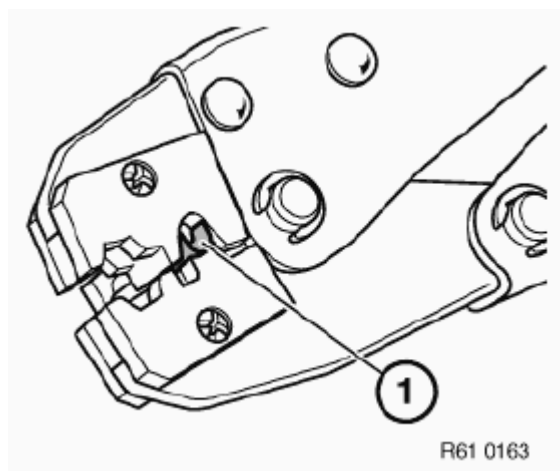


Fig. 50: Locating Grip Contact
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for cutting and stripping insulation from cables, see **61 13 Cutting to length 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.

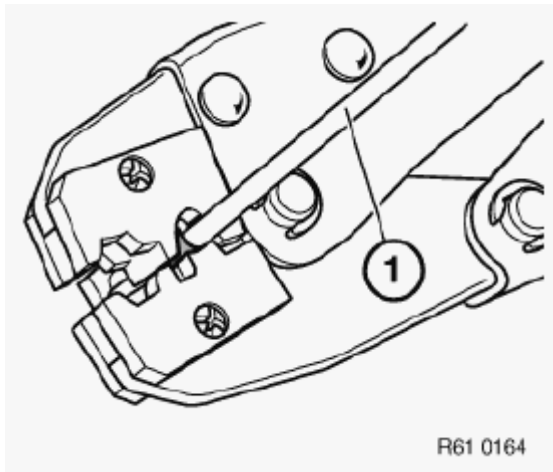


Fig. 51: Identifying Wire And Crimping Tool
Courtesy of BMW OF NORTH AMERICA, INC.

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.

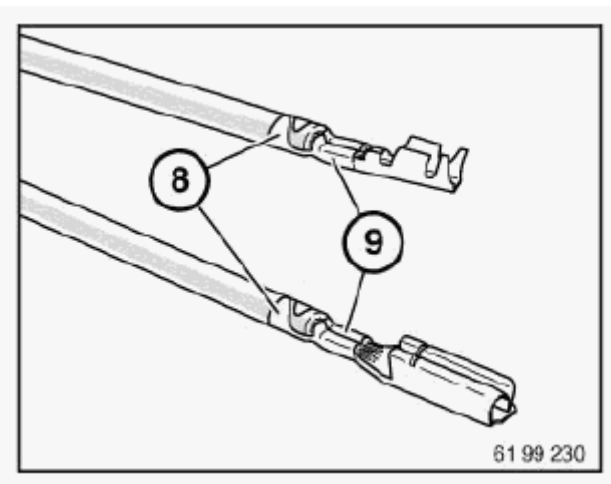


Fig. 52: Identifying Insulation Crimp And Wire Crimp
Courtesy of BMW OF NORTH AMERICA, INC.

Correct crimping:

Visible conductor end (10).

Visible insulation end (11).

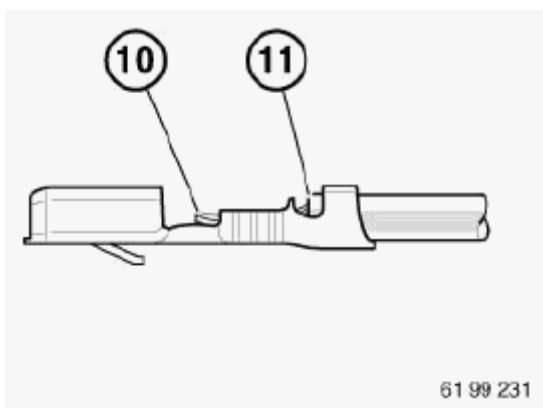


Fig. 53: Identifying Conductor End And Insulation End (Correct Crimping)
Courtesy of BMW OF NORTH AMERICA, INC.

Incorrect crimping:

Conductor end (10) inserted too far.

Insulation end (11) in wire crimp.

If necessary, repeat crimping with a new contact.

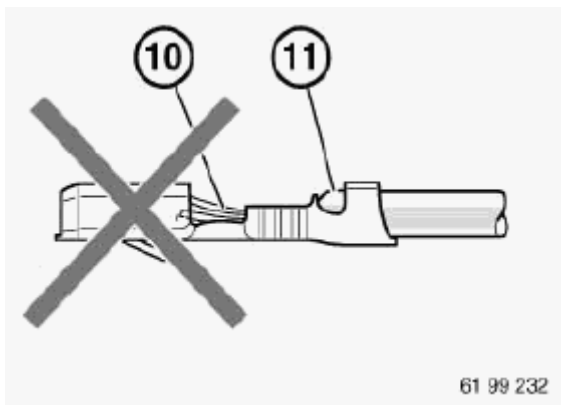


Fig. 54: Identifying Conductor End And Insulation End (Incorrect Crimping) (1 Of 2)
Courtesy of BMW OF NORTH AMERICA, INC.

Incorrect crimping:

Conductor end (10) not visible.

Insulation end (11) not visible.

If necessary, repeat crimping with a new contact.

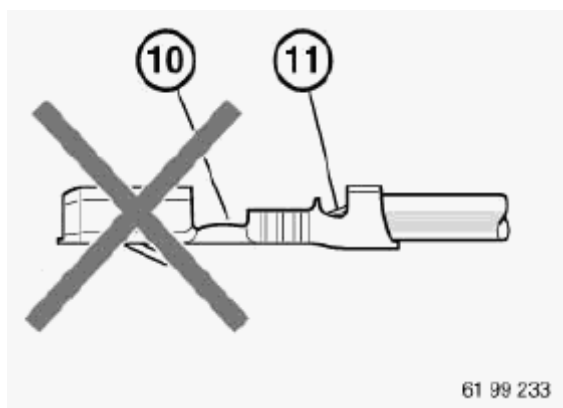


Fig. 55: Identifying Conductor End And Insulation End (Incorrect Crimping) (2 Of 2)
 Courtesy of BMW OF NORTH AMERICA, INC.

61 13 CUTTING TO LENGTH AND STRIPPING INSULATION FROM CABLES

Stripped length:

STRIPPED LENGTH SPECIFICATION

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 ... DME MASTER RELAY CONNECTOR

Unlock locking flap (1) of corresponding cable.

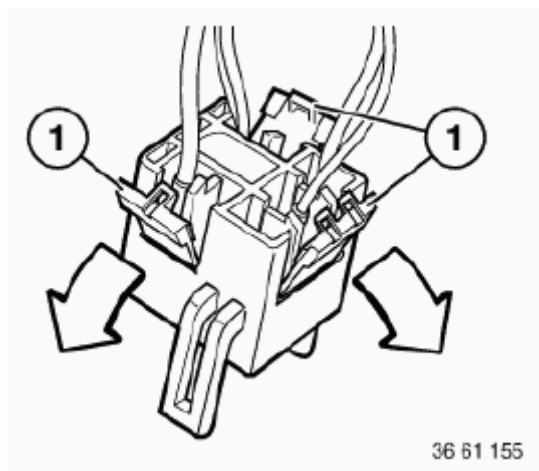


Fig. 56: Unlocking Locking Flap
 Courtesy of BMW OF NORTH AMERICA, INC.

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

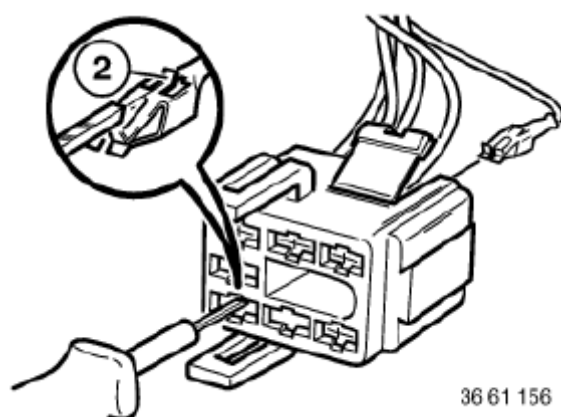


Fig. 57: Identifying Arrester Hook

Courtesy of BMW OF NORTH AMERICA, INC.

61 13 INSTALLING FAN CONNECTOR FOR RETROFITTING/REPAIRS

Special tools required:

- **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**
- 61 9 041 **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**
- 61 9 042 **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**

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

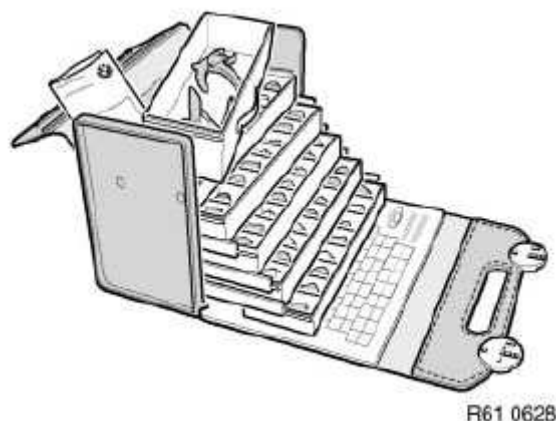


Fig. 58: Identifying Special Tool Kit

Courtesy of BMW OF NORTH AMERICA, INC.

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

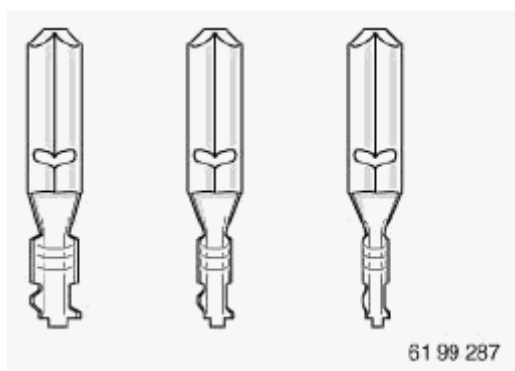


Fig. 59: Identifying Contact Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

Alternatively:

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

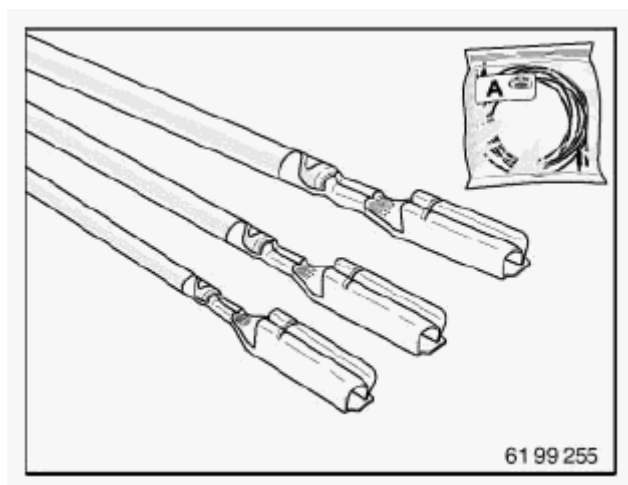


Fig. 60: Identifying Contact Sleeves
Courtesy of BMW OF NORTH AMERICA, INC.

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, see **61 13 Cutting to length and stripping insulation from cables**

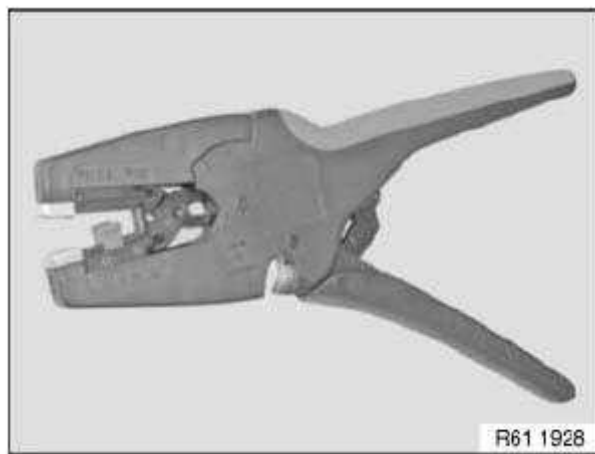


Fig. 61: Identifying Cutting Plier
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp contact sleeves on both wire ends.

Refer to repair instructions:

Crimping on stop parts, see **61 13 Crimping stop parts**

NOTE: If using repair kit for contact sleeves, refer to repair instruction Butt connector for repairing a plug connection, see **61 13 Butt connector for repairing a plug connection**

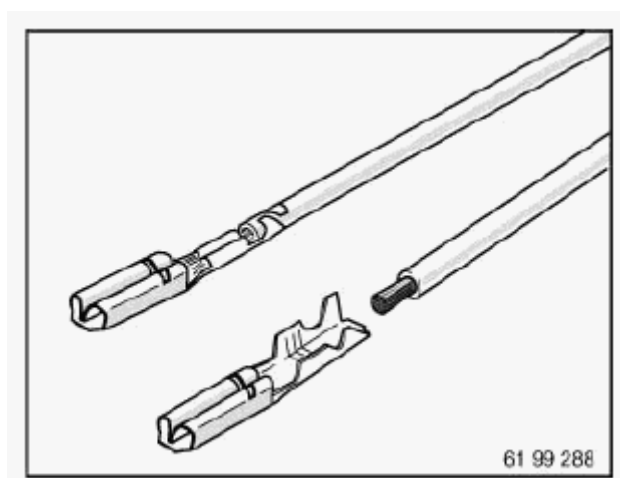


Fig. 62: Identifying Crimp Contact Sleeves On Wire Ends
Courtesy of BMW OF NORTH AMERICA, INC.

Crimp connecting cable for retrofitting likewise with contact sleeve.

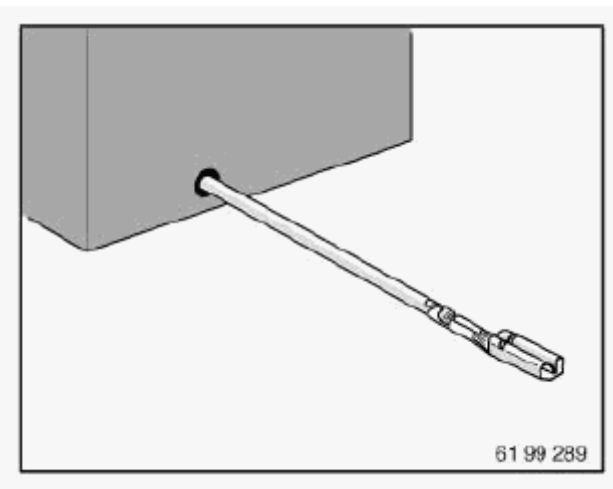


Fig. 63: Crimping Connecting Cable
Courtesy of BMW OF NORTH AMERICA, INC.

Cut required number of poles to length for fan connectors.

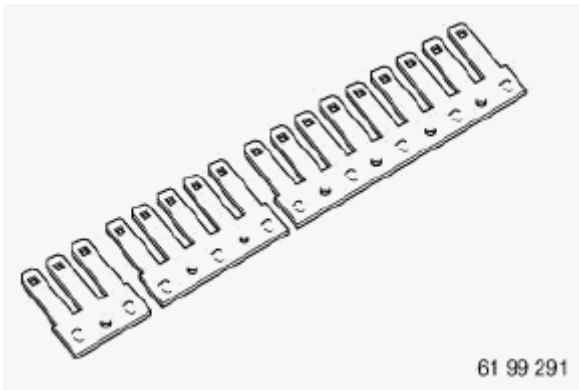


Fig. 64: Identifying Fan Connectors Poles
Courtesy of BMW OF NORTH AMERICA, INC.

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, see **61 13 Special tools for wiring harness repairs**

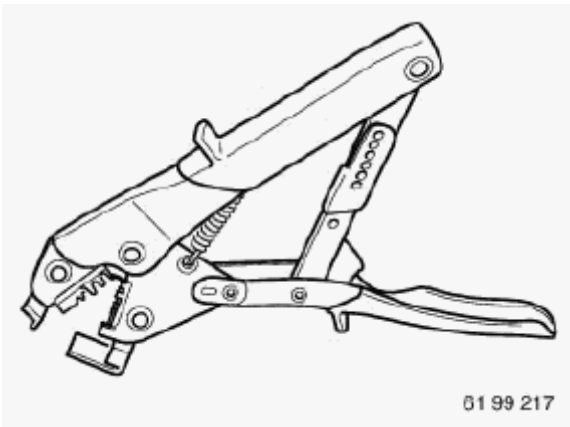


Fig. 65: Identifying Special Tools

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.

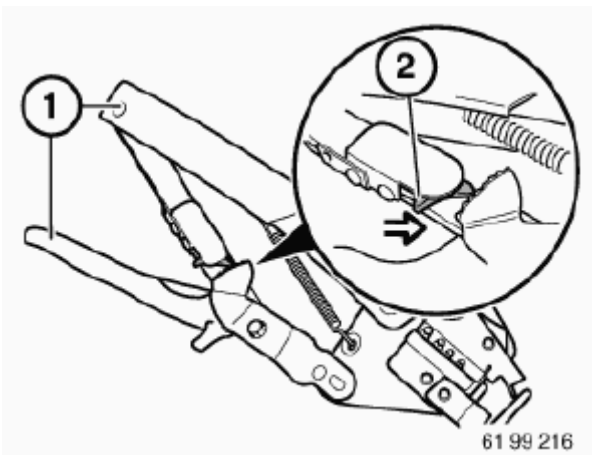


Fig. 66: Identifying Grips And Unlocking Lever

Courtesy of BMW OF NORTH AMERICA, INC.

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

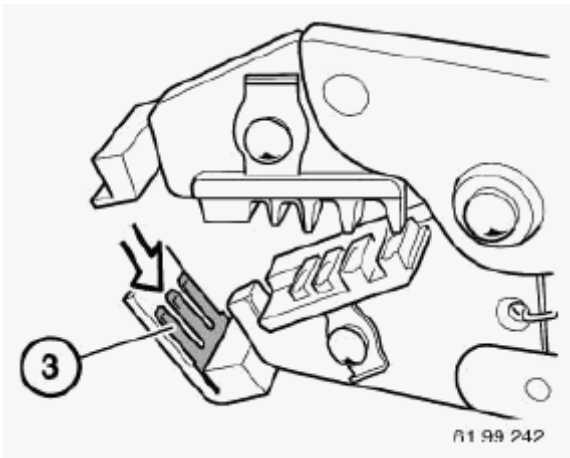


Fig. 67: Inserting Fan Connector
Courtesy of BMW OF NORTH AMERICA, INC.

Attach wire with contact sleeve to fan connector.

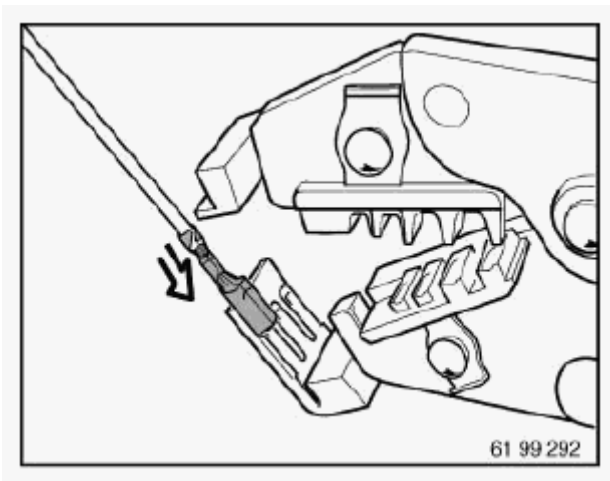


Fig. 68: Attaching Wire With Contact Sleeve To Fan Connector
Courtesy of BMW OF NORTH AMERICA, INC.

Press crimping tool together and slide contact sleeve firmly home.

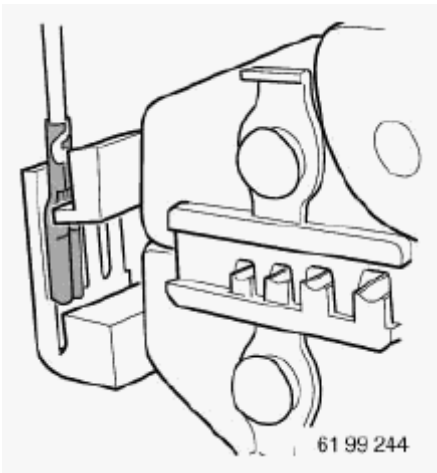


Fig. 69: Identifying Slide Contact Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

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.

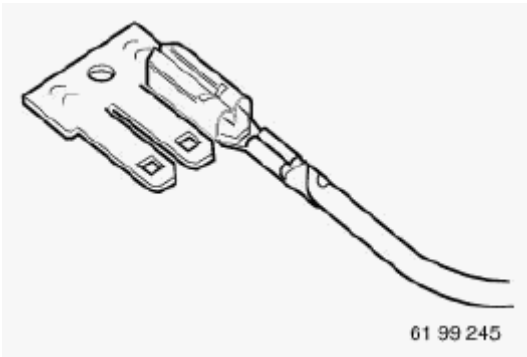


Fig. 70: Identifying Contact Sleeves
Courtesy of BMW OF NORTH AMERICA, INC.

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).

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.

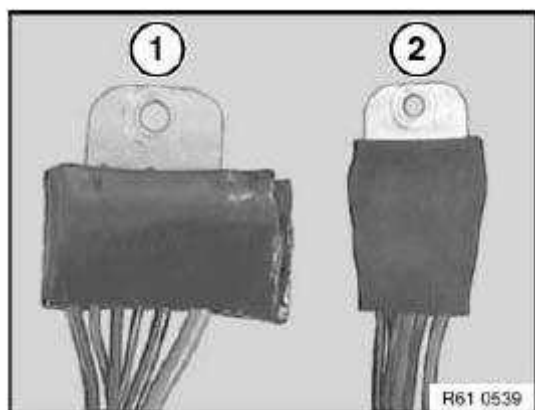


Fig. 71: Identifying Sealing Compound
Courtesy of BMW OF NORTH AMERICA, INC.

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.

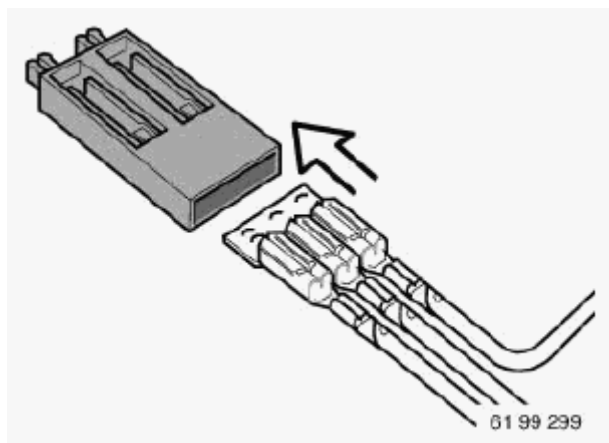


Fig. 72: Sliding Fan Connector Into Insulation Housing
Courtesy of BMW OF NORTH AMERICA, INC.

61 13 OPENING PLUG HOUSINGS AND REMOVING CONTACTS OF DIFFERENT PLUG SYSTEMS

Special tools required:

- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- 61 0 400

- **61 1 150 RELEASING TOOL KIT**

Abbreviations and what they mean:

ABBREVIATIONS REFERENCE CHART

D 1.5 / 2.5	Round contacts of 1.5 mm or 2.5 mm diameter
MDK 3plus	Miniature double flat spring contact
JPT ELA	Junior Power Timer flat spring contacts with strand sealing
DFK ELA	Double flat spring contacts with strand sealing
Elo	Electronic contacts with and without strand sealing Manufacturer: Siemens
Elo Power	Electronic contacts for heavy loads with and without strand sealing Manufacturer: Siemens
MQS	Micro Quadlock System electronic contacts with and without strand sealing Manufacturer: AMP
MPQ	Micro Power Quadlock electronic contacts for heavy loads with and without strand sealing Manufacturer: AMP

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. Replace plug completely.

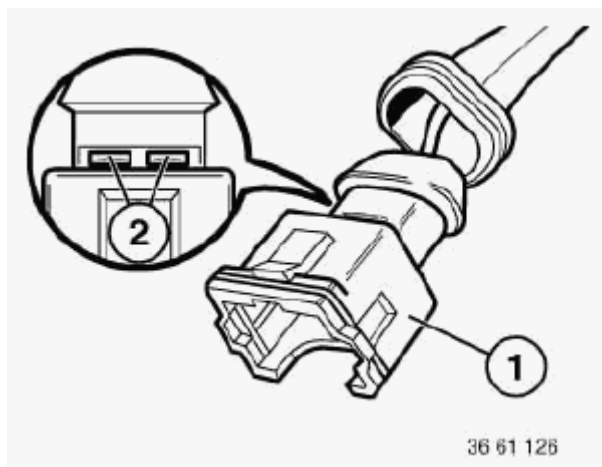


Fig. 73: Identifying Ultrasonic-Welded Connectors

Courtesy of BMW OF NORTH AMERICA, INC.

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

Release and press-out tool 61 1 150

Replaced as from 09/2005 by: 61 0 300

61 0 400

61 13 SPECIAL TOOLS FOR WIRING HARNESS REPAIRS

Special tools required:

- 12 1 080
- **61 0 200 CRIMPING SET (BASIC TOOL)**
- **61 0 210 MATRIX LSK 8**
- **61 0 220 MATRIX FOR SLK 2.8**
- **61 0 230 STENCIL FOR CONTACTS "DFK 40" AND "MAK 8"**
- **61 0 300 RELEASING TOOL (COMPLETE KIT)**
- 61 0 400
- **61 1 190 PLIERS**
- **61 4 320 CRIMPING SET WITH PLIERS**
- 61 9 041 **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**
- 61 9 044 **61 9 040 SET OF TOOLS FOR REPAIR KIT IV**

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, see **61 13 Opening plug housings and removing contacts of different plug systems**



Fig. 74: Identifying Special 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, see **61 13 Cutting to length and stripping insulation from cables**

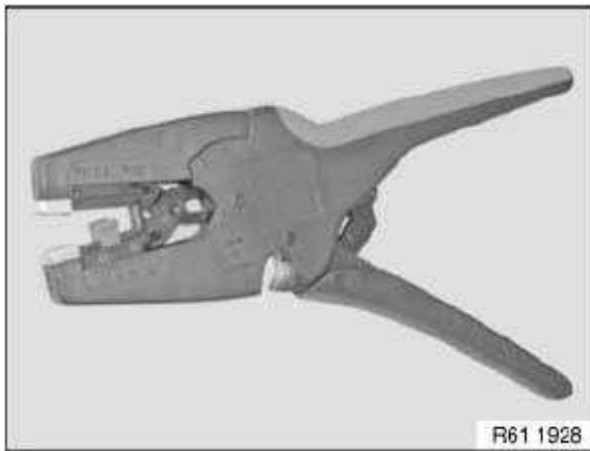


Fig. 75: Identifying Cutting Plier

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, see **61 13 ... Cutting off, stripping insulation and cutting optical fibres to length**
 3. Crimping head, see **61 13 ... Crimping optical fibres**

4. Crimping head **61 13 ... Crimping Micro Quadlock System contacts (MQS)**
5. Crimping head, see **61 13 ... Crimping Micro Power Quadlock contacts (MPQ)**
6. Replacement blade (face-cutting fibre-optic cables)
7. Replacement blade with tool (insulation stripping unit)
8. Universal crimping head

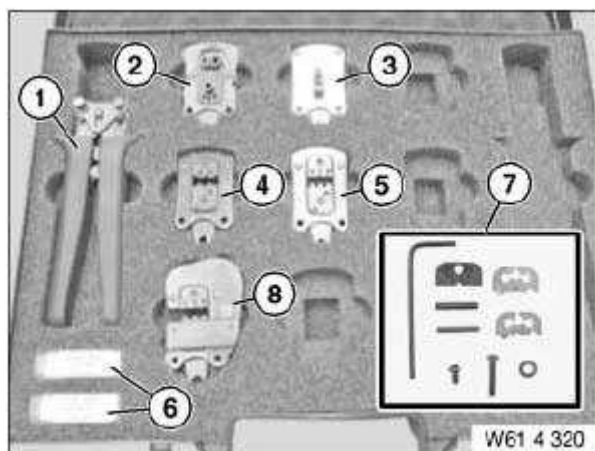


Fig. 76: Identifying Crimping Stop Parts (Small Contacts)
 Courtesy of BMW OF NORTH AMERICA, INC.

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)

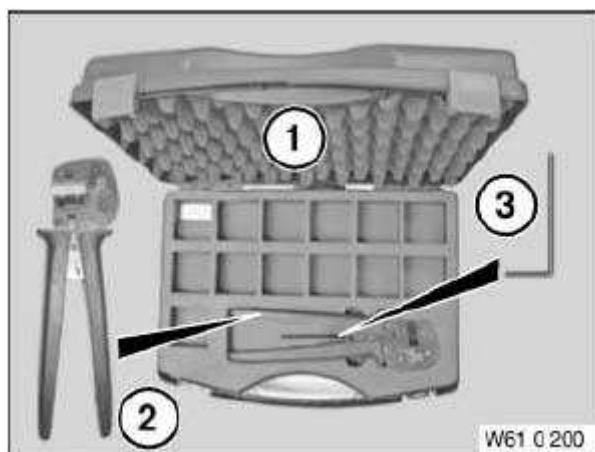


Fig. 77: Identifying Crimping Stop Parts (Large Contacts)
 Courtesy of BMW OF NORTH AMERICA, INC.

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

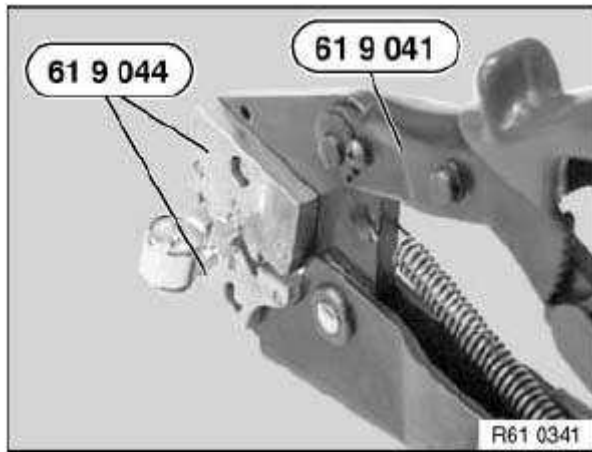


Fig. 78: Identifying Special Tool (61 9 044) And (61 9 041)
Courtesy of BMW OF NORTH AMERICA, INC.

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

- Special tool 12 1 080

Handling:

- Crimping stop parts (contacts), see **61 13 Crimping stop parts**



Fig. 79: Identifying Special Tool Kit

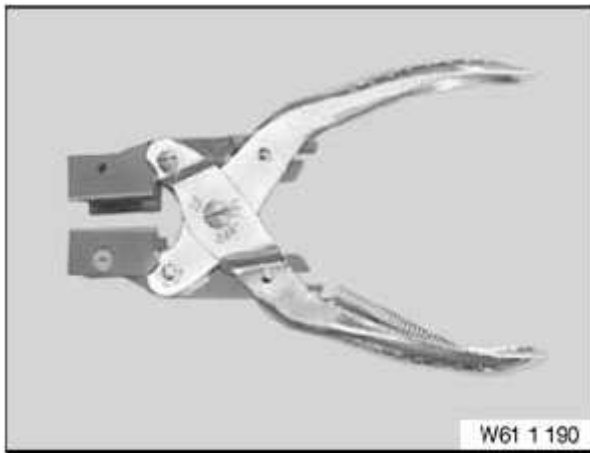
Courtesy of BMW OF NORTH AMERICA, INC.

Repairing ribbon cables:

- Special tool 61 1 190

Handling:

- Repairing ribbon cables, see **61 13 ... Repairing ribbon cables**

**Fig. 80: Identifying Special Tool**

Courtesy of BMW OF NORTH AMERICA, INC.

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.

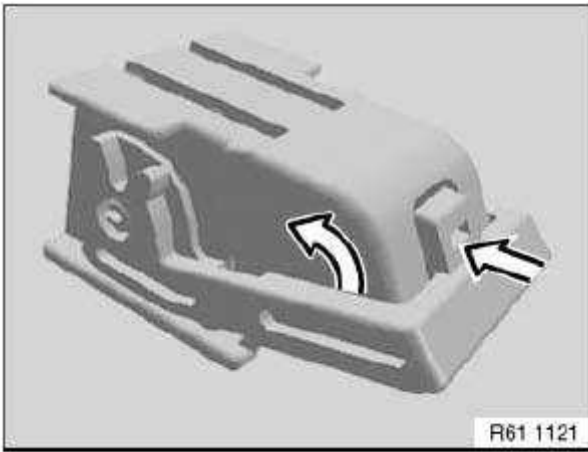


Fig. 81: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and open clip in direction of arrow.

Disconnect plug connection.

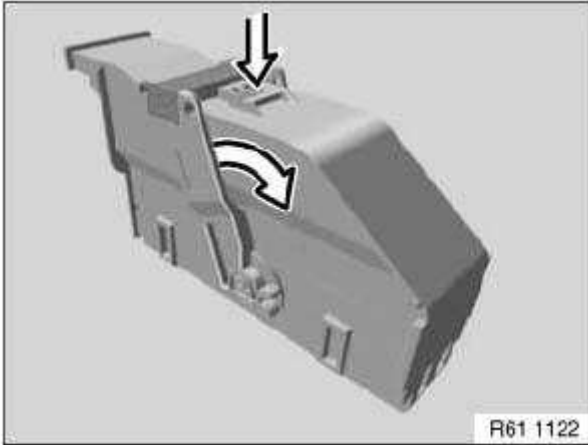


Fig. 82: Pressing Lock
Courtesy of BMW OF NORTH AMERICA, INC.

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

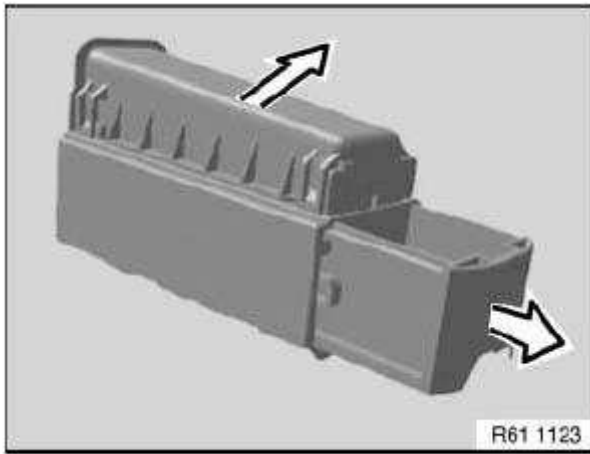


Fig. 83: Disconnecting Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

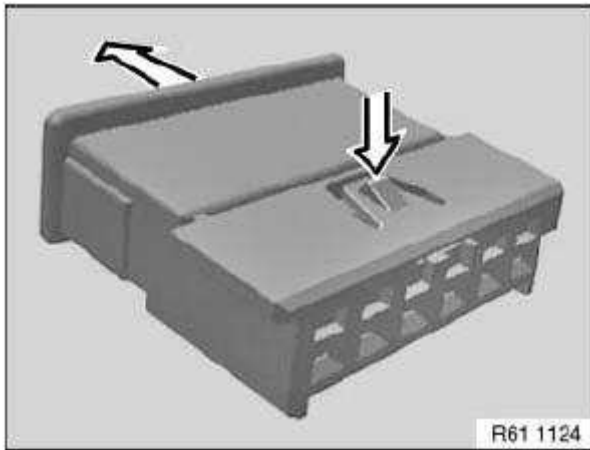


Fig. 84: Pressing Lock (1 Of 6)
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

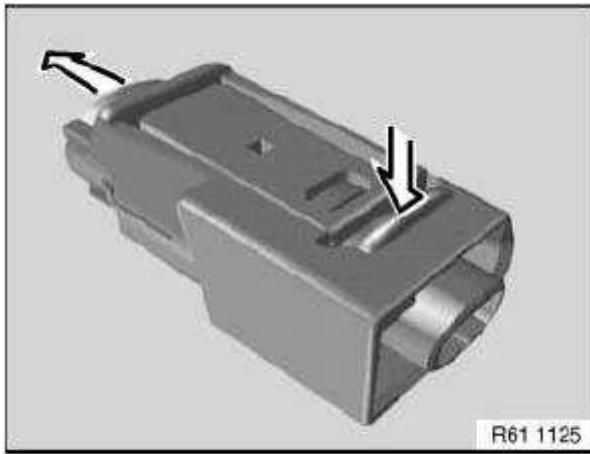


Fig. 85: Pressing Lock (2 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

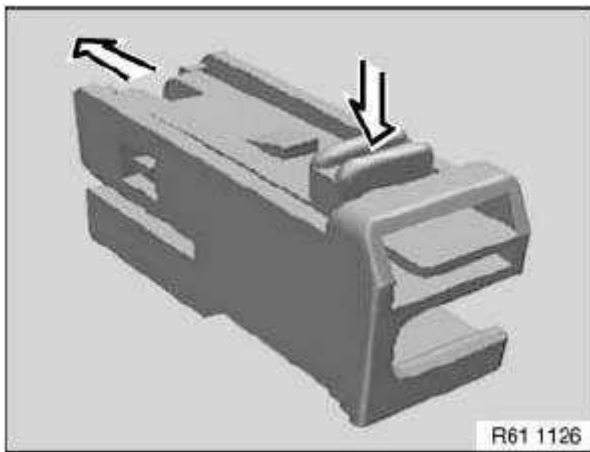


Fig. 86: Pressing Lock (3 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

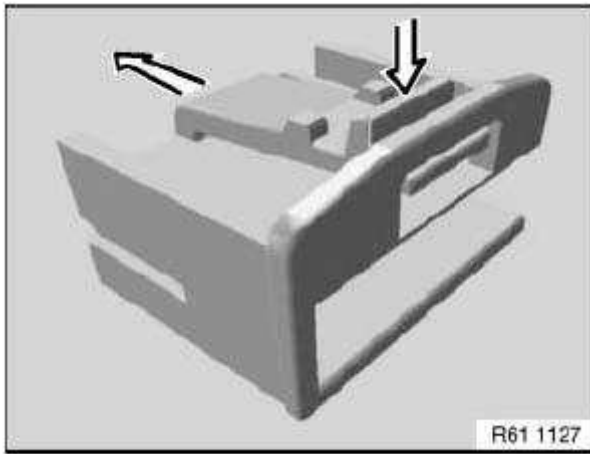


Fig. 87: Pressing Lock (4 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

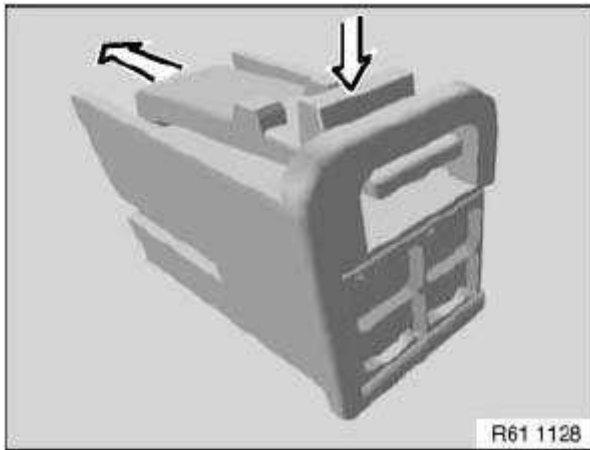


Fig. 88: Pressing Lock (5 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

Press lock and disconnect plug connection in direction of arrow.

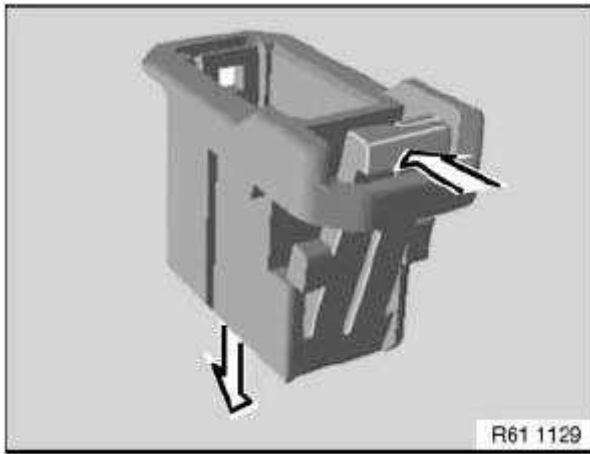


Fig. 89: Pressing Lock (6 Of 6)

Courtesy of BMW OF NORTH AMERICA, INC.

61 13 ... BASE OF TAB CONNECTOR HOUSINGS

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

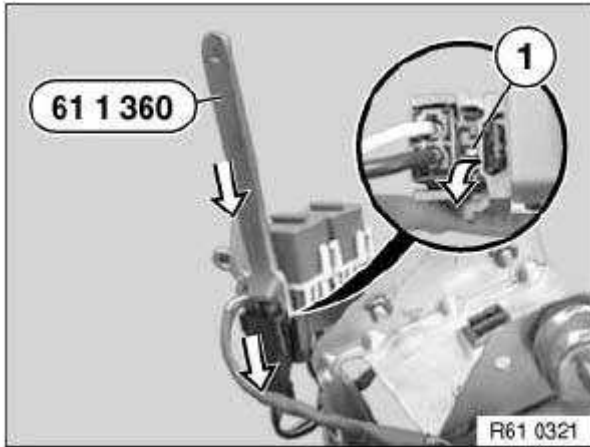


Fig. 90: Identifying Special Tool (61 1 360)

Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **61 4 320 CRIMPING SET WITH PLIERS**

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.

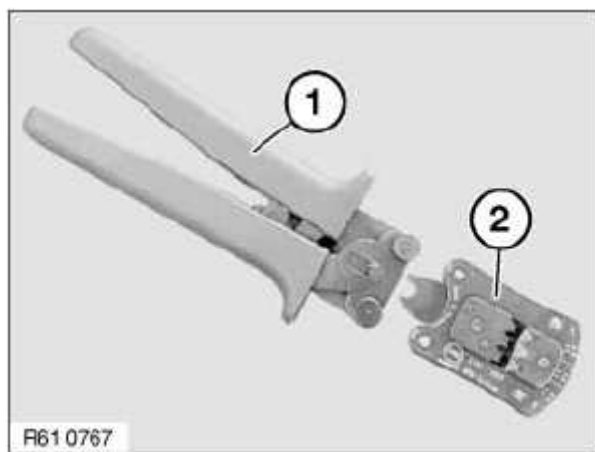


Fig. 91: Identifying Crimping Head And Crimping Set Plier
Courtesy of BMW OF NORTH AMERICA, INC.

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.

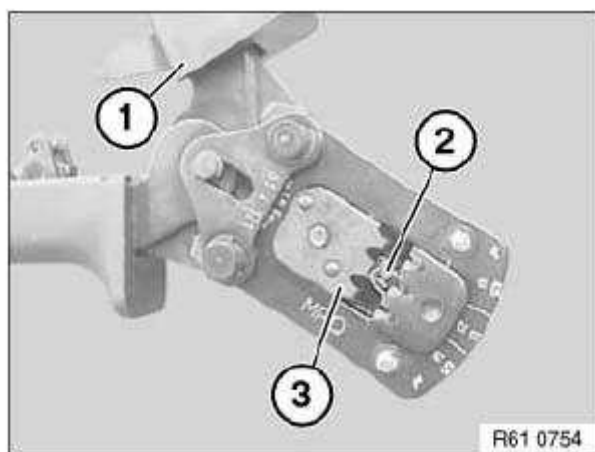


Fig. 92: Identifying MPQ Contact In Crimping Head
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for cutting and stripping insulation from cables, see 61 13 Cutting to length 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.

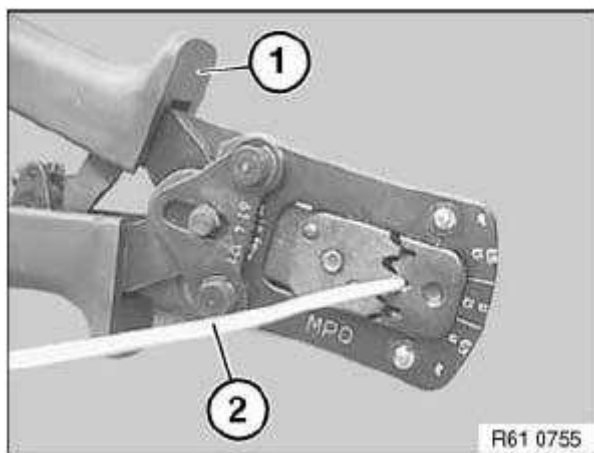


Fig. 93: Identifying Pliers And Stripped Cable
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **61 4 320 CRIMPING SET WITH PLIERS**

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.

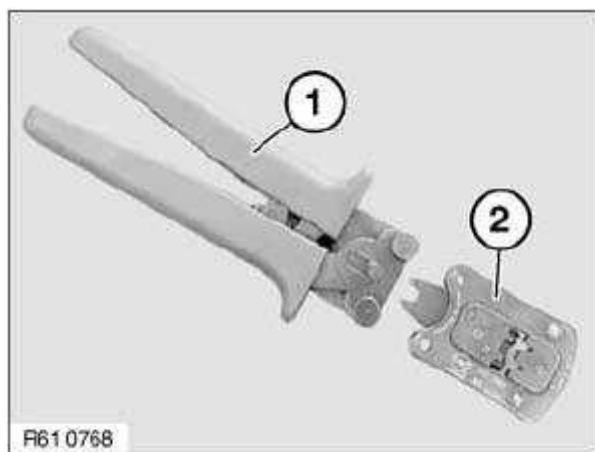


Fig. 94: Identifying Crimping Head And Crimping Set Plier
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (1).

Fold up contact carrier (2).

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

Fold back contact carrier (2).

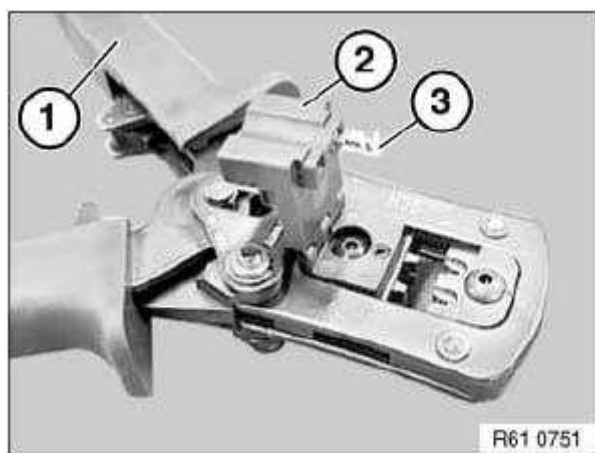


Fig. 95: Identifying MQS Contact
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for cutting and stripping insulation from cables, see 61 13 Cutting to length and stripping insulation from cables

Close pliers (1) one notch.

Insert stripped cable (2).

Close pliers (1) fully.

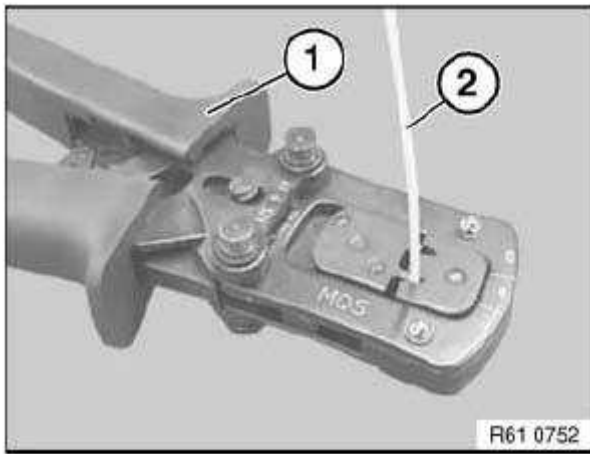


Fig. 96: Identifying Pliers And Cable
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (1).

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

NOTE: Check contact for correct crimping.

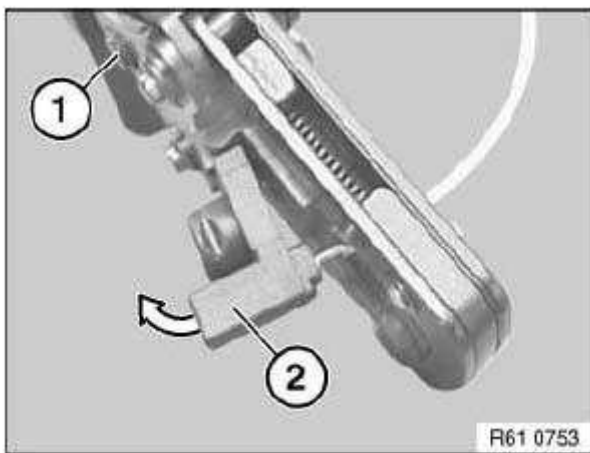


Fig. 97: Opening Contact Carrier
Courtesy of BMW OF NORTH AMERICA, INC.

61 13 ... CRIMPING ANNULAR CONTACTS

Special tools required:

- **61 4 320 CRIMPING SET WITH PLIERS**

Crimping annular contacts:

Special tool 61 4 320

61 13 ... CRIMPING OPTICAL FIBRES**Special tools required:**

- **61 4 320 CRIMPING SET WITH PLIERS**

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.**

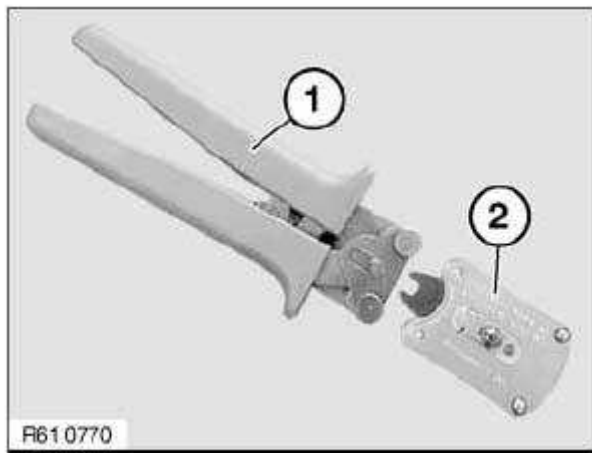


Fig. 98: Identifying Crimping Head Plier
Courtesy of BMW OF NORTH AMERICA, INC.

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

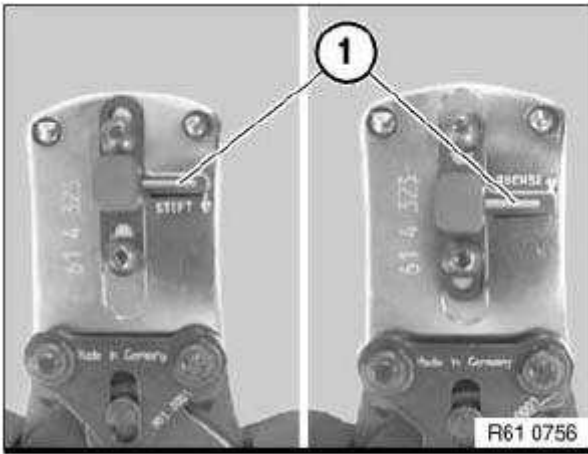


Fig. 99: Identifying Stop Lever
Courtesy of BMW OF NORTH AMERICA, INC.

Open pliers (2).

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

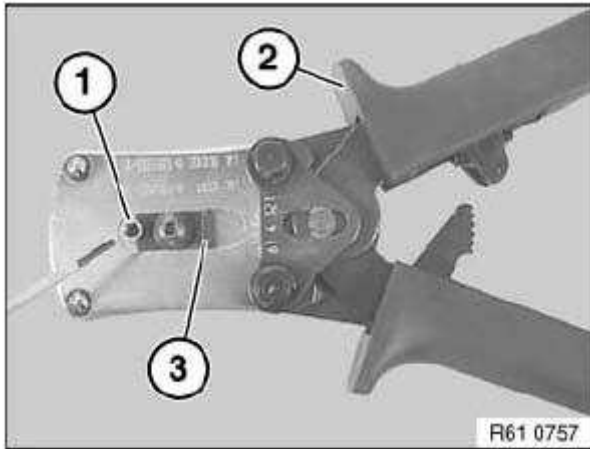


Fig. 100: Identifying Pin Contact Or Jack
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Follow procedure for cutting and stripping insulation from cables, see 61 13 Cutting to length and stripping insulation from cables

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).

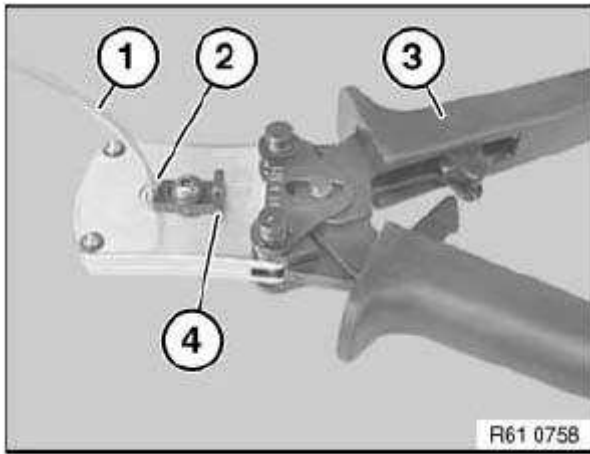


Fig. 101: Identifying Optical Fibre Plier
Courtesy of BMW OF NORTH AMERICA, INC.

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).

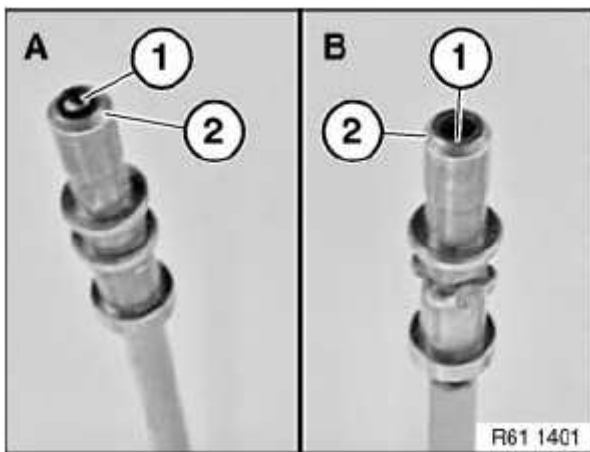


Fig. 102: Identifying End Of Optical Fibre
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **61 4 320 CRIMPING SET WITH PLIERS**

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.**

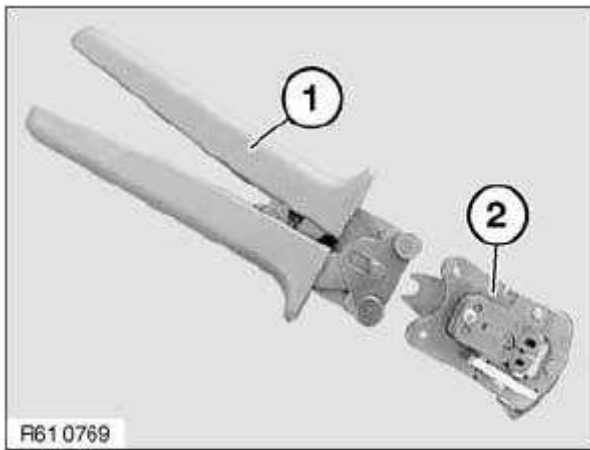


Fig. 103: Identifying Crimping Head And Crimping Set
Courtesy of BMW OF NORTH AMERICA, INC.

Cutting optical fibre

Open pliers (1).

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

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

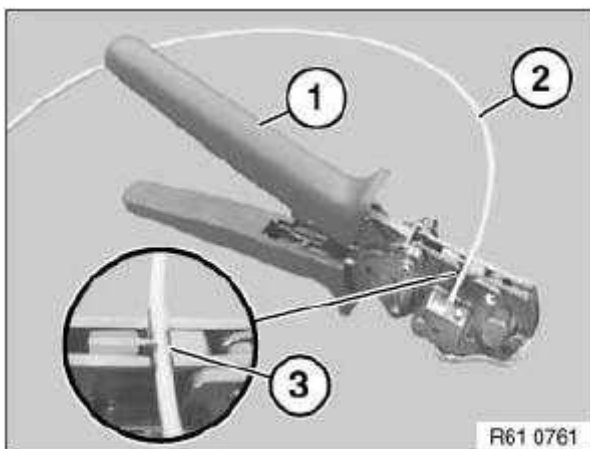


Fig. 104: Identifying Optical Fibre Plier

Courtesy of BMW OF NORTH AMERICA, INC.

Stripping insulation from optical fibre

Open pliers (1).

Open lever (2) in direction of arrow.

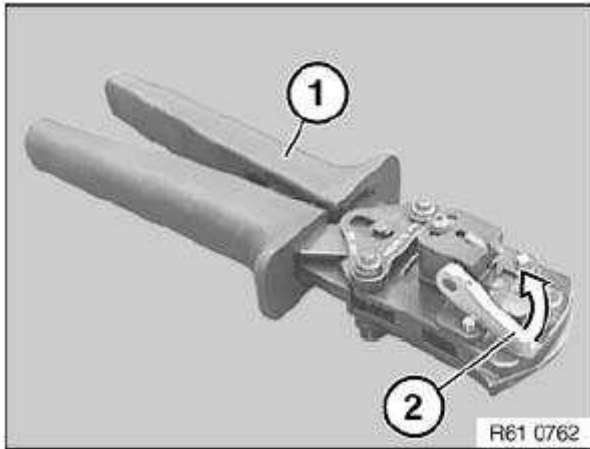


Fig. 105: Opening Lever

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.

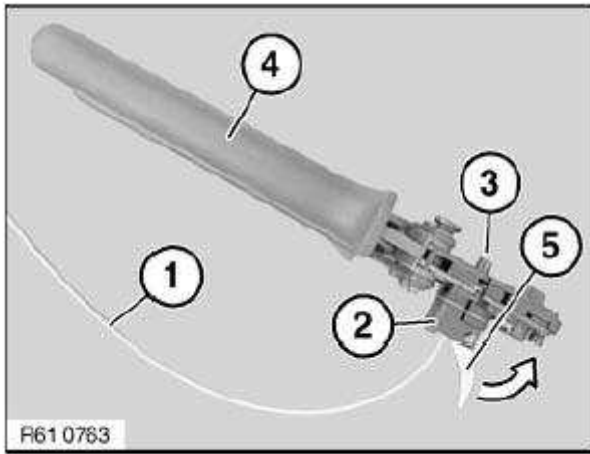


Fig. 106: Identifying Pliers Clamping Lever
Courtesy of BMW OF NORTH AMERICA, INC.

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.

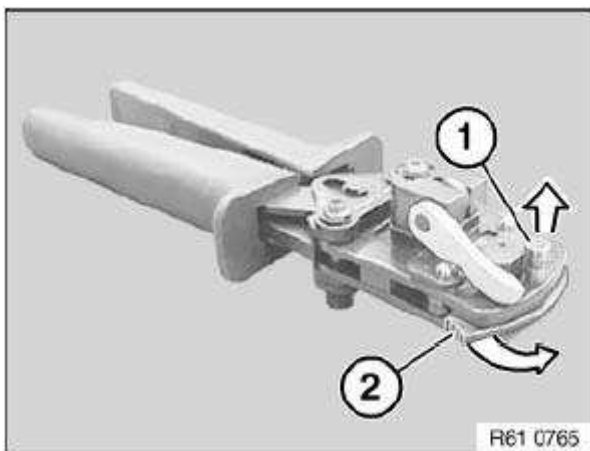


Fig. 107: Pulling Pin
Courtesy of BMW OF NORTH AMERICA, INC.

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).

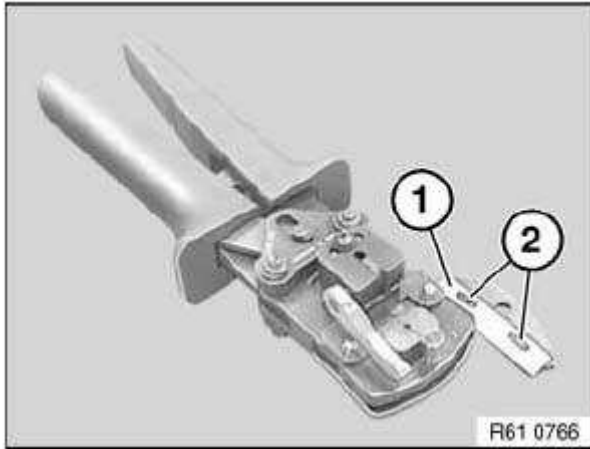


Fig. 108: Identifying Blade

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).

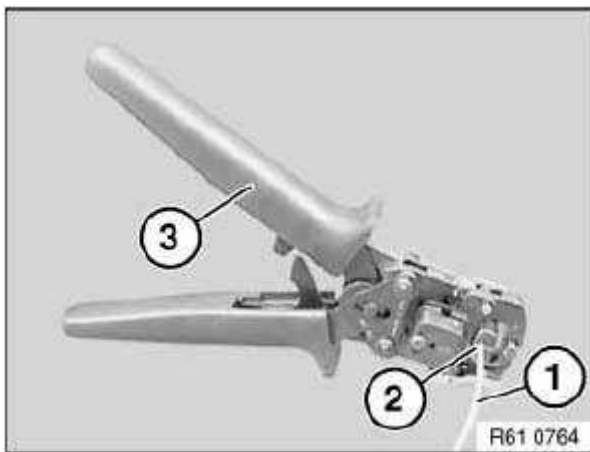


Fig. 109: Identifying Optical Fibre Plier

Courtesy of BMW OF NORTH AMERICA, INC.

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.

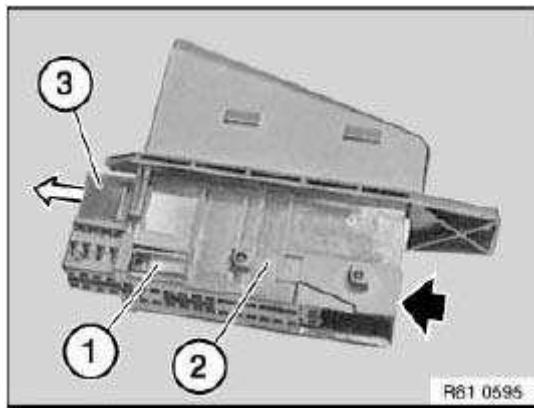


Fig. 110: Pushing Contact Carrier From Rear Out Of Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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).

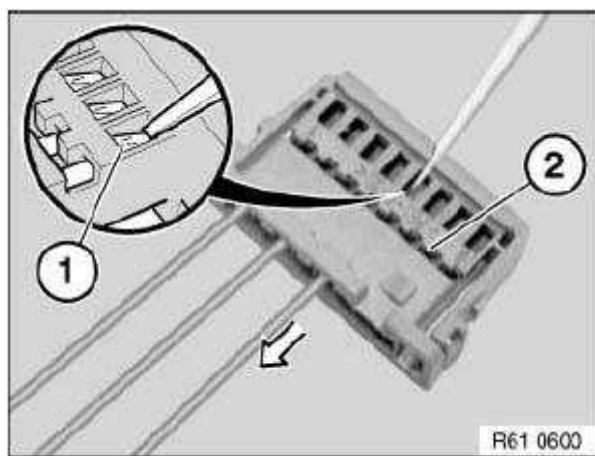


Fig. 111: Identifying Retaining Hook Of Socket
Courtesy of BMW OF NORTH AMERICA, INC.

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

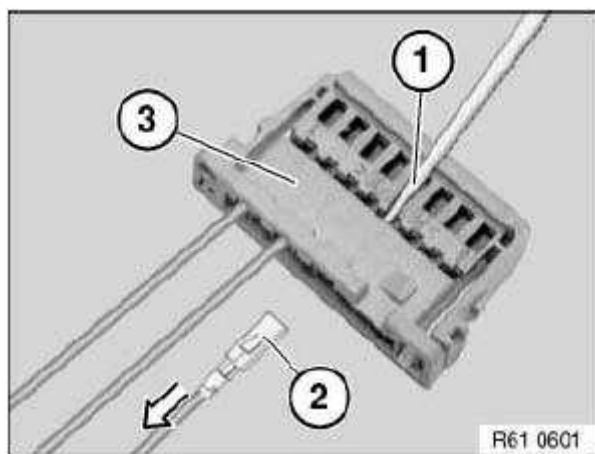


Fig. 112: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

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.

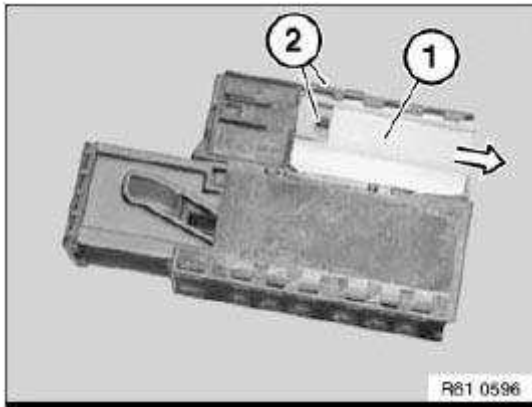


Fig. 113: Raising Locking Slide

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.

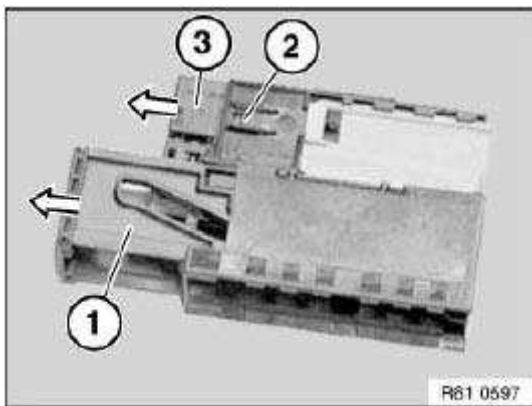


Fig. 114: Pulling Slide And Contact Carrier

Courtesy of BMW OF NORTH AMERICA, INC.

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

61 13 ... PLUG HOUSING, LCC CONTACT (LOAD CURRENT CONTACT)

Special tools required:

- 61 0 317 **61 0 300 RELEASING TOOL (COMPLETE KIT)**

Socket housing:

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

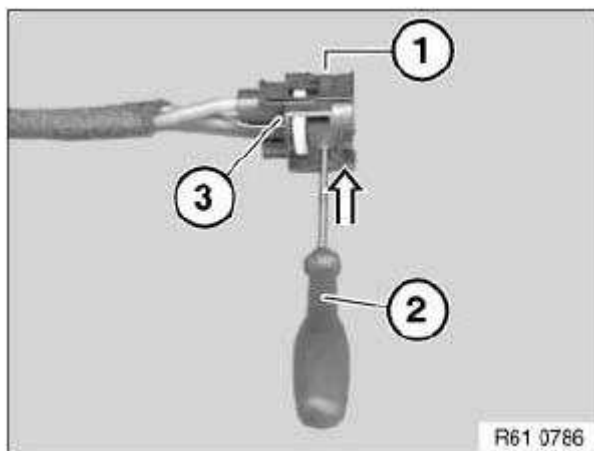


Fig. 115: Pressing Lock

Courtesy of BMW OF NORTH AMERICA, INC.

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

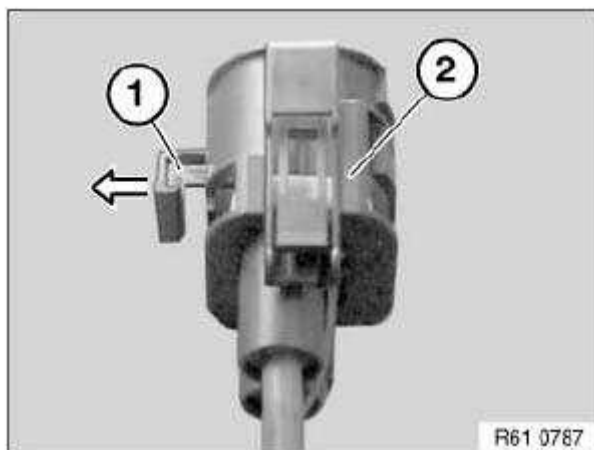


Fig. 116: Pulling Lock Out Of Socket Housing

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.

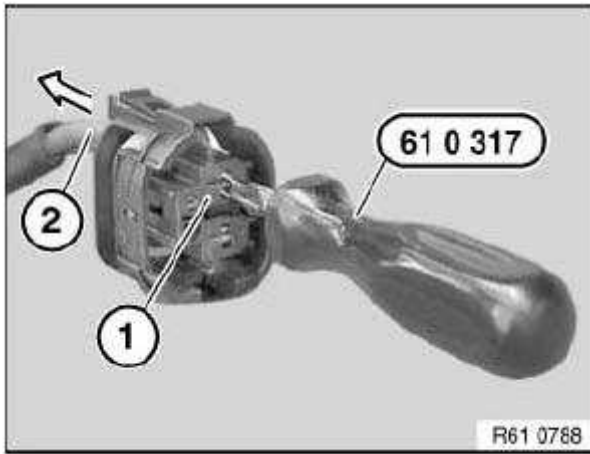


Fig. 117: Identifying Special Tool (61 0 317)
Courtesy of BMW OF NORTH AMERICA, INC.

Pin housing:

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

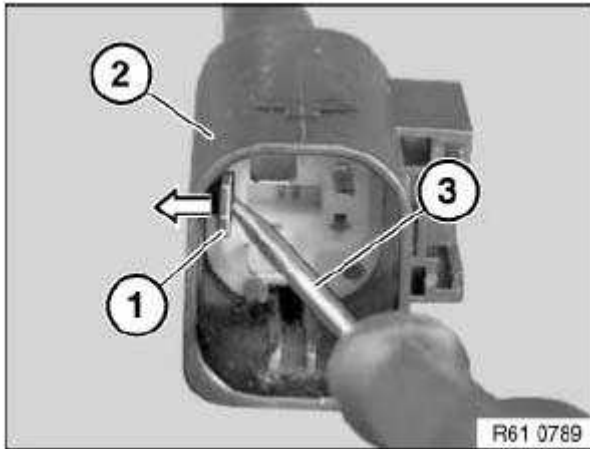


Fig. 118: Unlocking Locking Slide Of Pin Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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

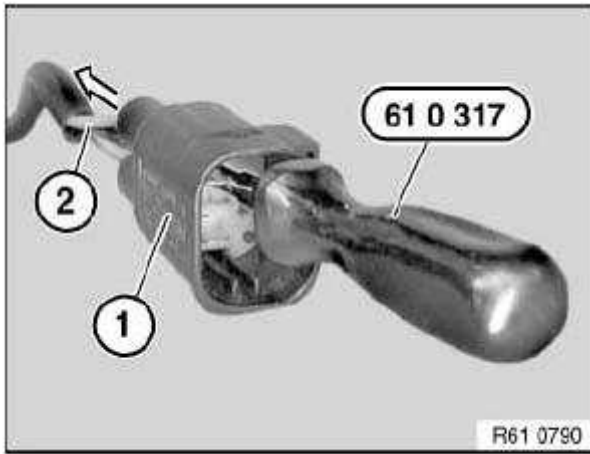


Fig. 119: Identifying Special Tool (61 0 317)
Courtesy of BMW OF NORTH AMERICA, INC.

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.

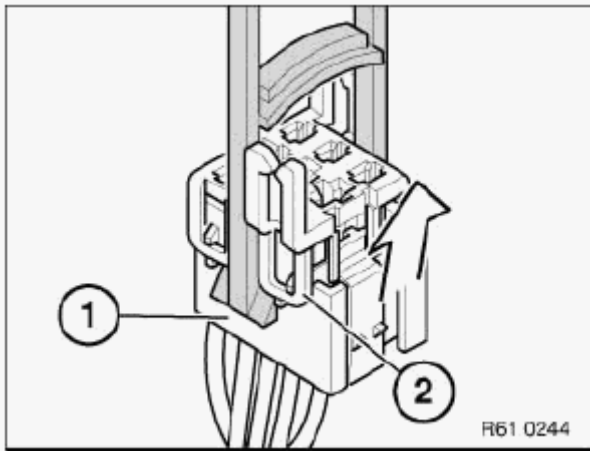
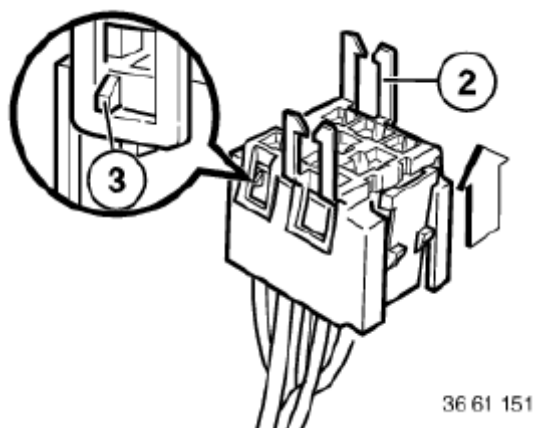


Fig. 120: Identifying Relay Carrier And Retaining Lugs
Courtesy of BMW OF NORTH AMERICA, INC.

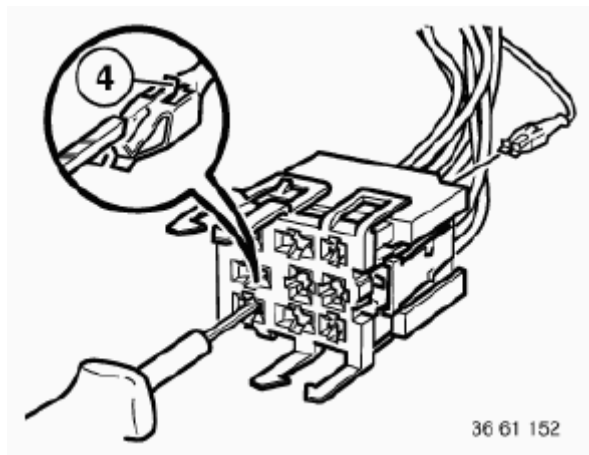
Pull relay carrier (2) in direction of arrow into first catch (3).

**Fig. 121: 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. 122: Identifying Arrester Hook**

Courtesy of BMW OF NORTH AMERICA, INC.

61 13 ... REPAIRING RIBBON CABLES

Special tools required:

- **61 1 190 PLIERS**

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

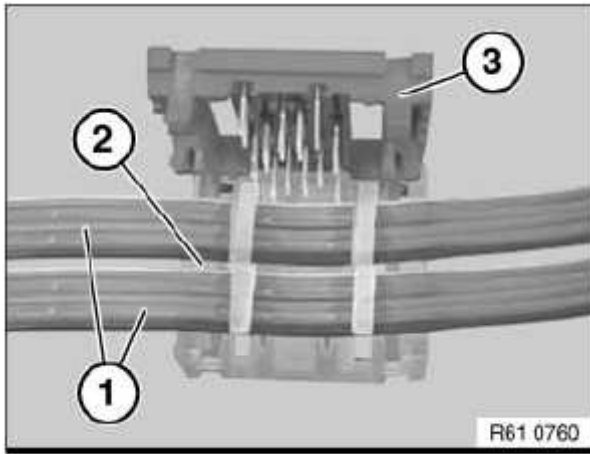


Fig. 123: Identifying Ribbon Cables And Connector Housing
Courtesy of BMW OF NORTH AMERICA, INC.

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

Close tool (2).

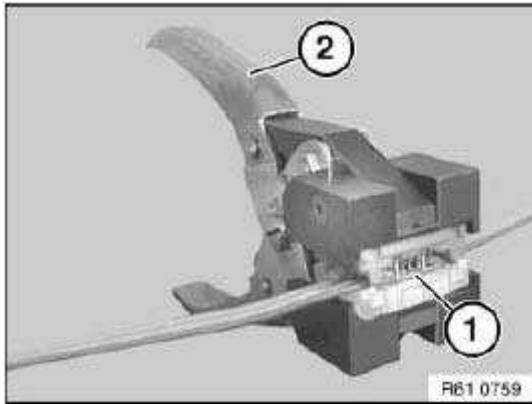


Fig. 124: Identifying Connector Housing
Courtesy of BMW OF NORTH AMERICA, INC.

61 13 ... Retaining bracket

Pull relevant fuse out of fuse block (1).

NOTE: Mark positions when removing fuses.

Pull locking slide (2) out of fuse block (1) as far as it will go.

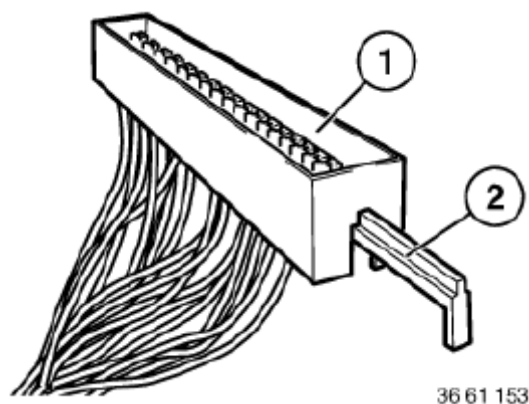


Fig. 125: Identifying Fuse Block

Courtesy of BMW OF NORTH AMERICA, INC.

With special tool 61 1 136 or 61 1 137 (ejector), press back arrester hook (3) of appropriate contact and pull out cable.

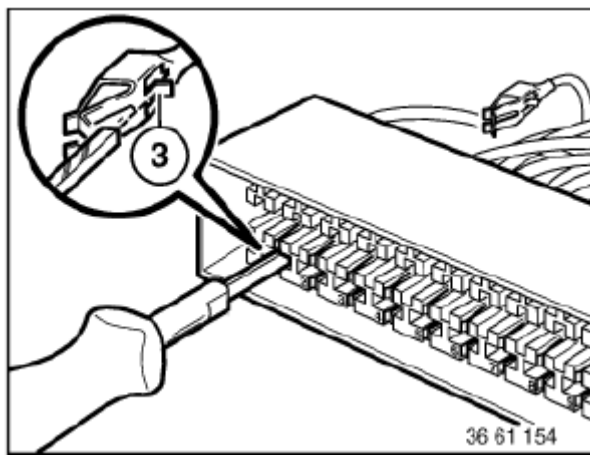


Fig. 126: Identifying Locking Slide And Fuse Block

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.

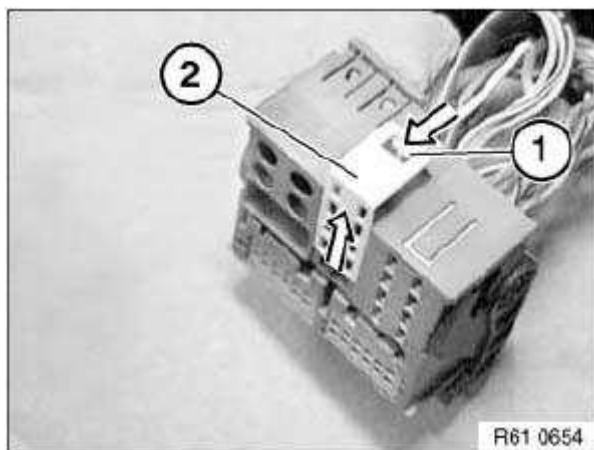


Fig. 127: Pressing Lock

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).

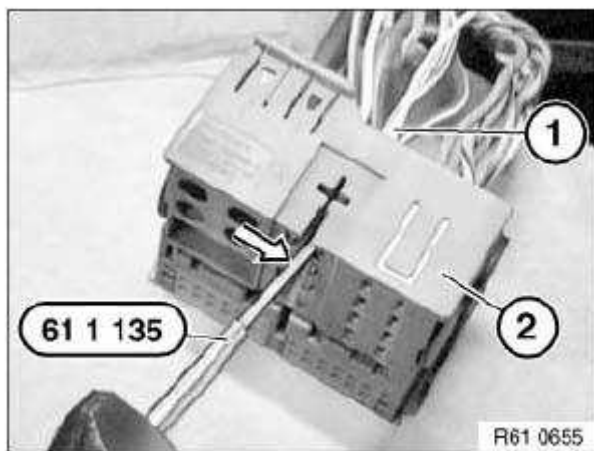


Fig. 128: Pulling Wire With Socket Contact Out Of Radio Plug

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.

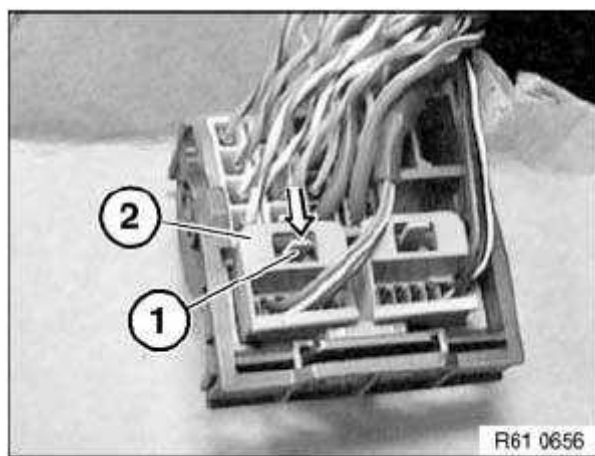


Fig. 129: Pressing Lock

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.

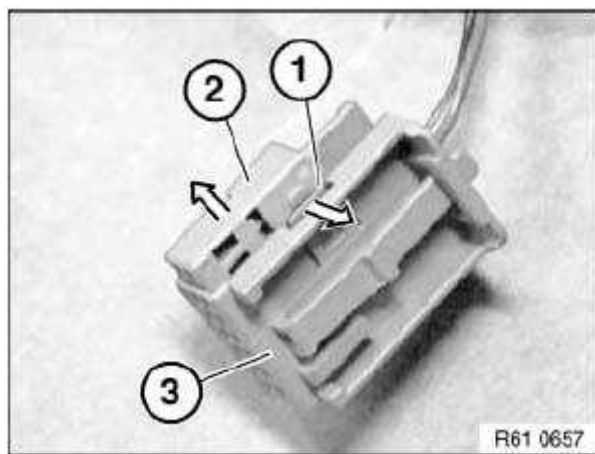


Fig. 130: Pressing Lock

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.

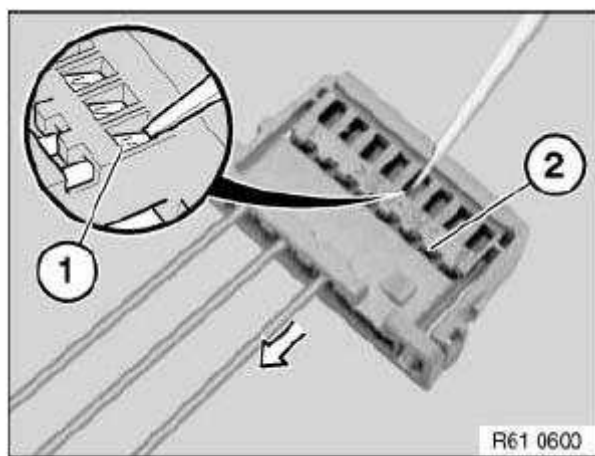


Fig. 131: Identifying Retaining Hook Of Socket
Courtesy of BMW OF NORTH AMERICA, INC.

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

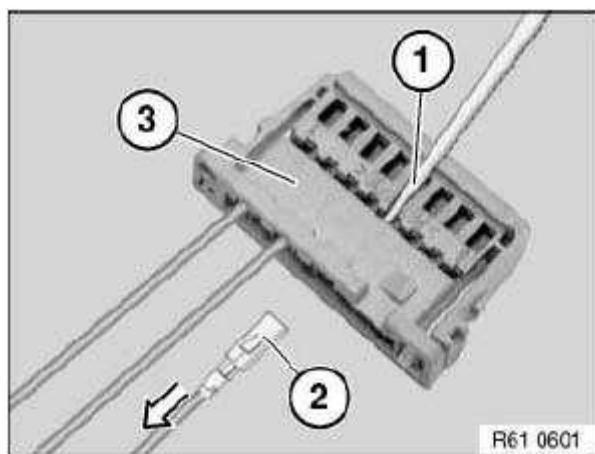


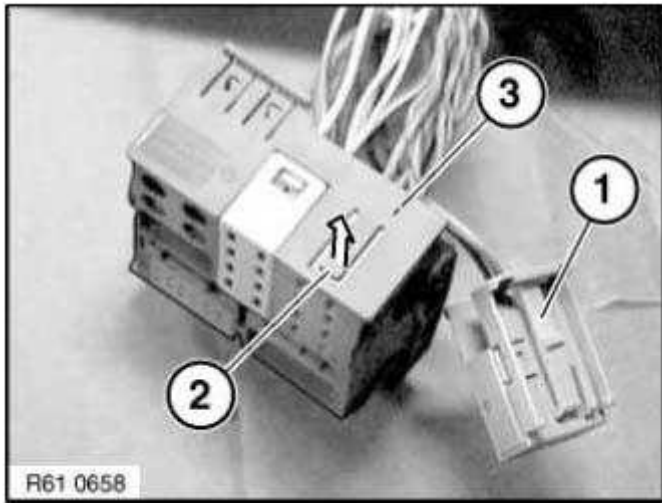
Fig. 132: Pulling Cable With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

Removing MPQ contacts from contact carrier:

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

Raise lock (2) on radio plug.

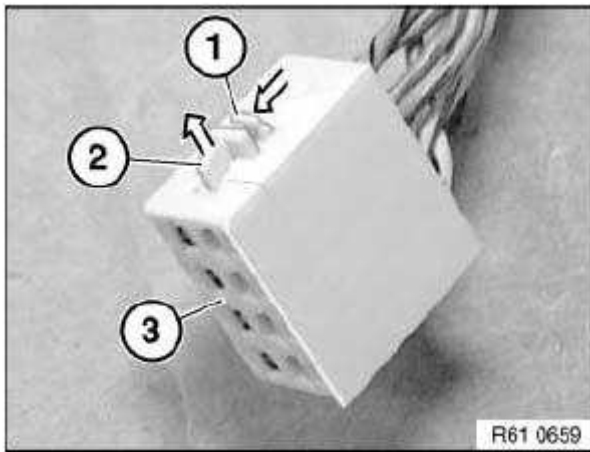
Pull contact carrier (3) out of radio plug.

**Fig. 133: Pressing Lock**

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. 134: 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).

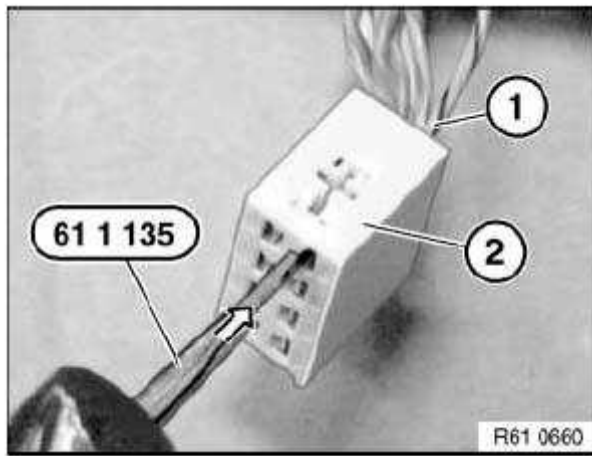


Fig. 135: Pulling Wire With Socket Contact
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **61 1 190 PLIERS**
- **61 4 320 CRIMPING SET WITH PLIERS**

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

REPAIR INSTRUCTIONS CHART

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, see **61 13 Special tools for wiring harness repairs**
- Cutting to length and stripping insulation from cables, see **61 13 Cutting to length and stripping insulation from cables**
- Crimping stop parts (contacts), see **61 13 Crimping stop parts**
- Butt connector for repairing a plug connection, see **61 13 Butt connector for repairing a plug connection**
- Fan connector for retrofitting/repairs, see **61 13 Installing fan connector for retrofitting/repairs**
- Aerial elbow plug on radio receiver
- Cutting to length and stripping insulation from optical fibers, see **61 13 ... Cutting off, stripping**

insulation and cutting optical fibres to length

- Crimping optical fibres, see **61 13 ... Crimping optical fibres**
- Insulation displacement connector for repairing ribbon cables, see **61 13 ... Repairing ribbon cables**

20 BATTERY**12 00 ... INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY**

Observe safety instructions for handling vehicle battery, see **61 00 ... 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, see **61 21 BATTERY WITH TERMINAL**.

After connecting battery:

IMPORTANT: After a power supply interruption some equipment is disabled and must be reactivated.

Likewise, individual settings are lost and must be activated.

Example:

- Vehicles with build date from 03/2007:

Teach-in mid-position for power steering, see 61 31 996 Carry out steering angle sensor adjustment

- If necessary, activate sliding sunroof
- If necessary, carry out adjustment of active front steering
- If necessary, activate power windows
- If necessary, activate mirror with compass, see 51 16 ... CALIBRATING COMPASS IN INTERIOR REARVIEW MIRROR

Please refer to the Progman 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 secondary control unit monitors both battery circuits. Depending on the situation, the battery circuits are connected to or isolated from the secondary control unit via an isolating relay.

Two AGM batteries, whose design and properties are described in 61 20 ... AGM battery, 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 secondary control unit automatically detects a charging operation at a charging voltage at the starter battery of greater than 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).

12 00 ... INSTRUCTIONS ON STARTING AID

Do not start the engine with help of starting sprays.

Preparation:

Conform with the following when starting engine with starting cable.

- Ensure that jump lead wires are to appropriate cross-section size.

- Only use fuse-protected jump leads.
- Check whether the current supplying battery has 12 V voltage.
- If engine is started from battery of another vehicle, ensure that there is no contact between the bodies of both vehicles.

CAUTION: Never touch ignition system components and current - dangerous high tension!

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

Carrying out:

Always conform with the procedures to avoid injury to persons or damage to parts.

- On automatic transmission, select "P" setting, apply handbrake.
- Move the shift lever of vehicles with manual transmission into neutral and apply the parking brake.
- Ensure that the jump leads cannot get caught in rotating parts, e.g. fan.
- First connect positive terminals of both batteries with one jump lead (red).
- Use positive connection point in engine compartment for vehicles with one battery in trunk.
- Then attach second jump lead (black) to negative terminal of donor battery and to engine ground or body ground on vehicle to be started.

CAUTION: Never connect second jump lead (black) to negative terminal of battery in vehicle to be started. This would produce explosive gas which could be ignited by sparks.

Danger of explosion!

After engine of vehicle to be started has started up, first disconnect the jump lead on the negative terminal/ground connection. Then remove jump lead from positive terminals.

61 00 ... BATTERY

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

- Battery master document
- Disconnecting battery, see 12 00 ... Instructions for disconnecting and connecting battery
- Battery charging, see 61 20 ... Battery charging
- Welding work
- External jump-starting aid, see 12 00 ... Instructions on 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 sulphated and/or heavily contaminated plates will also lead to incorrect acid density test results.

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, see **72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS** .

Instructions for disconnecting and connecting battery, see **12 00 ... 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, see **61 13 Cutting to length and stripping insulation from cables**

Repairing a plug connection using connectors, see **61 13 Butt connector for repairing a plug connection**

Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

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:

Cutting off and insulating cables, see **61 13 Cutting to length and stripping insulation from cables**

Repairing a plug connection using connectors, see **61 13 Butt connector for repairing a plug connection**

Installing and removing contacts, see **61 13 Opening plug housings and removing contacts of different plug systems**

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!).

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

Observe safety instructions for handling vehicle battery, see **61 00 ... Safety instructions for handling vehicle battery**

Test step 1 - before charging the battery

BATTERY CHARGING REFERENCE CHART

Charge state ⁰	Starting capability ⁰	Test result
Not testable		Charge
less than 50 % ⁰		Charge
more than 50 %	less than 75 %	Charge
more than 50 %	more than 75 % ⁰	Charge
more than 80 %	more than 75 %	O.K.

Test step 2 - after charging the battery

BATTERY CHARGING REFERENCE CHART

Charge condition ⁽¹⁾	Starting capability ⁽²⁾	Test result
Not testable		Defective
less than 50 %	less than 75 %	Charge
more than 50 %	more than 75 %	Charge

- (1) Charge condition and starting power must always be evaluated together
- (2) When test charging for more than 5 hours, use charger Gossen CG 32 or Siemens / Gossen VB 801
- (3) Fully charge until charge state is more than 80 %.

NOTE: If battery was checked on the positive terminal in the engine compartment, repeat check directly on battery for sake of safety.

61 20 ... AGM BATTERY



T610891E

Fig. 136: 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 **V**alve **R**egulated **L**ead **A**cid, i.e. lead acid battery with pressure relief valve; **AGM** stands for **A**bsorbent **G**lass Mat, 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

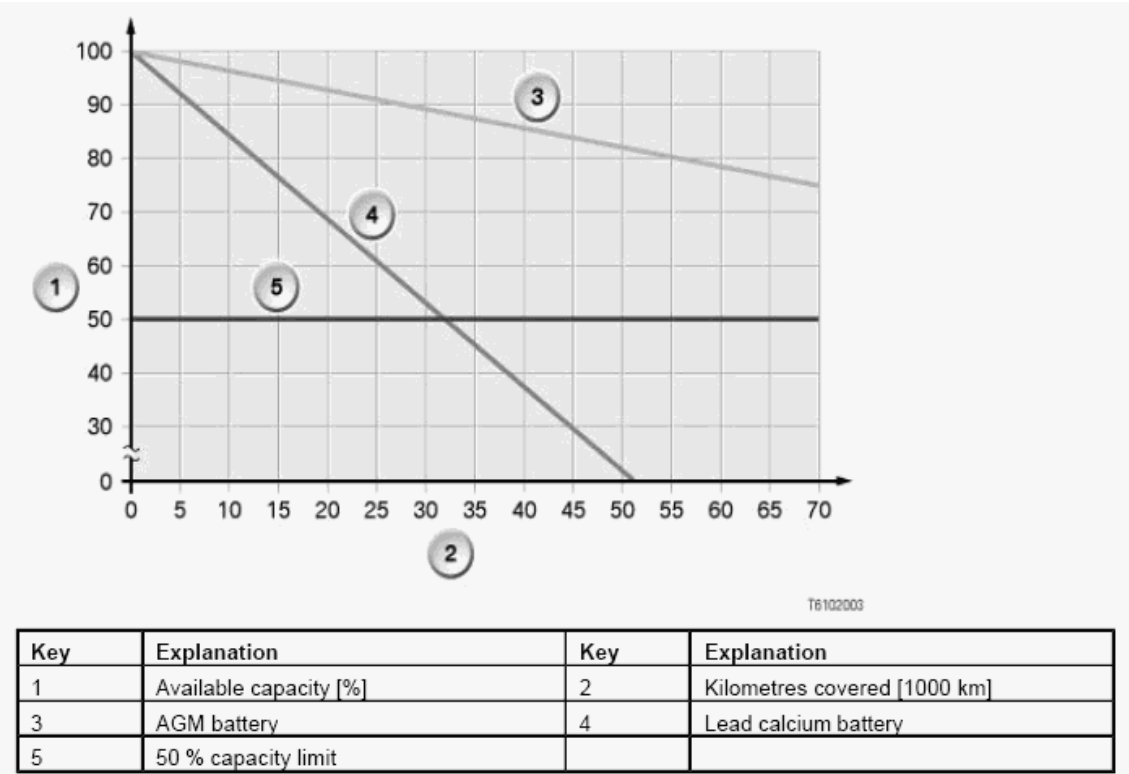


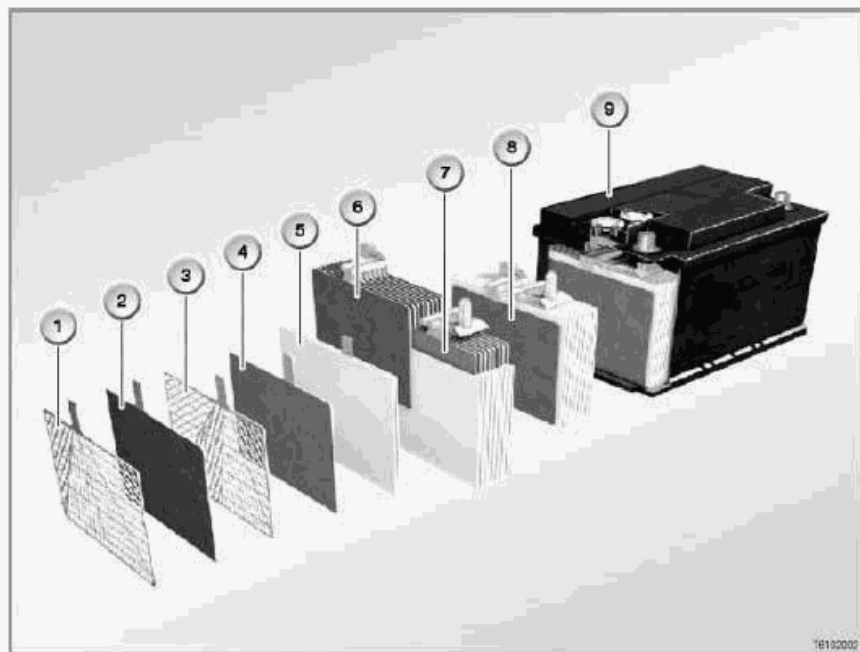
Fig. 137: AGM Battery Service Life Graph
Courtesy of BMW OF NORTH AMERICA, INC.

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

Instead, the sulphuric 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. 138: 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:

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 greater than 15.2 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.

IMPORTANT: In order to prevent the intelligent battery sensor from malfunctioning, the charging terminals in the engine compartment must be used without fail in vehicles from E60 and should be used if possible in other vehicles.

IMPORTANT: Before charging the battery while it is installed, first carry out a closed-circuit current test, see 61 20 ... Battery open-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 OPEN-CIRCUIT CURRENT TEST

NOTE: Observe safety instructions for handling vehicle battery, see 61 00 ... Safety instructions for handling vehicle battery
Observe Service Information Adapter for open-circuit current measurement.



W05 95 001

Fig. 139: Identifying Battery Open-Circuit Current Testing Machine
Courtesy of BMW OF NORTH AMERICA, INC.

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

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 luggage compartment floor trim panel with fitted mat, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**

Version with intelligent battery sensor (IBS):

Loosen nut (1).

Tightening torque: 61 21 1AZ, see **61 21 BATTERY WITH TERMINAL** .

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 (2).

Detach battery negative lead (3) with IBS (2) in upward direction, lay to one side and secure.

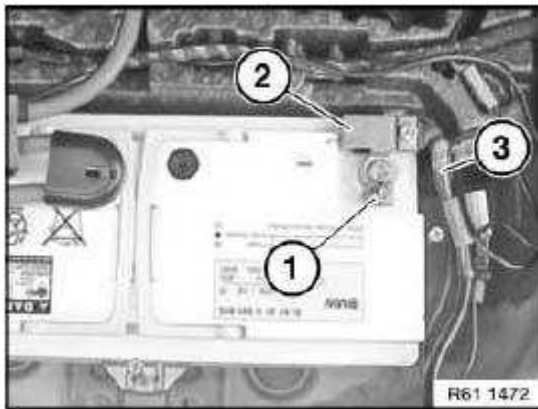


Fig. 140: Identifying Head Cap Screw Of IBS
Courtesy of BMW OF NORTH AMERICA, INC.

Version without intelligent battery sensor (IBS):

Disconnect battery negative lead (1).

IMPORTANT: Cover battery negative terminal post and secure negative lead (1) at side.

Tightening torque: 61 21 1AZ, see **61 21 BATTERY WITH TERMINAL** .

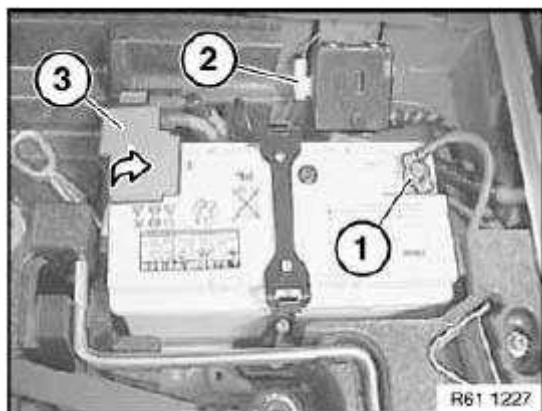


Fig. 141: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

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

IMPORTANT: Observe safety instructions for handling vehicle battery, see 61 00 ... 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, see 61 21 BATTERY WITH TERMINAL .
- Connect and switch on battery charger
- Switch ignition on

21 BATTERY REMOVAL

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 luggage compartment floor trim panel with fitted mat, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**

Version with intelligent battery sensor (IBS):

Loosen nut (1).

Tightening torque: 61 21 1AZ, see **61 21 BATTERY WITH TERMINAL** .

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 (2).

Detach battery negative lead (3) with IBS (2) in upward direction, lay to one side and secure.

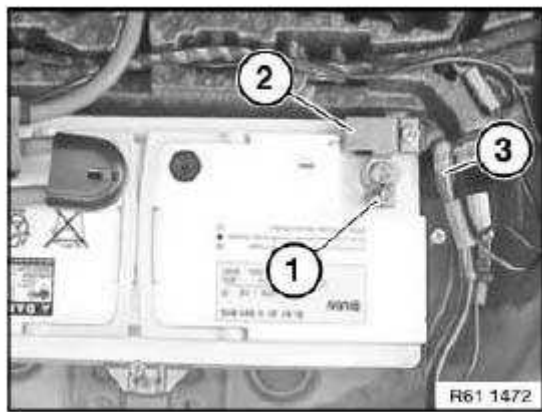


Fig. 142: Identifying Head Cap Screw Of IBS
Courtesy of BMW OF NORTH AMERICA, INC.

Version without intelligent battery sensor (IBS):

Disconnect battery negative lead (1).

IMPORTANT: Cover battery negative terminal post and secure negative lead (1) at side.

Tightening torque: 61 21 1AZ, see **61 21 BATTERY WITH TERMINAL** .

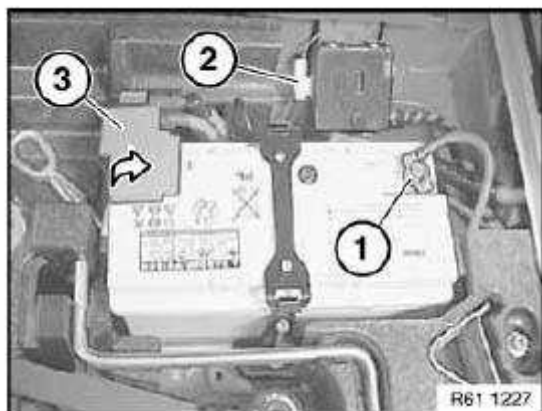


Fig. 143: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

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

IMPORTANT: Observe safety instructions for handling vehicle battery, see 61 00 ... 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, see 61 21 BATTERY WITH TERMINAL .
- Connect and switch on battery charger
- Switch ignition on

61 21 010 REMOVING AND INSTALLING BATTERY

WARNING: Observe safety instructions for handling vehicle battery, see 61 00 ... Safety instructions for handling vehicle battery

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see 51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL

Unfasten plug connection (2) and disconnect.

Disconnect battery negative lead, see 61 20 900 Disconnecting and connecting battery negative lead

Open positive terminal cover (3).

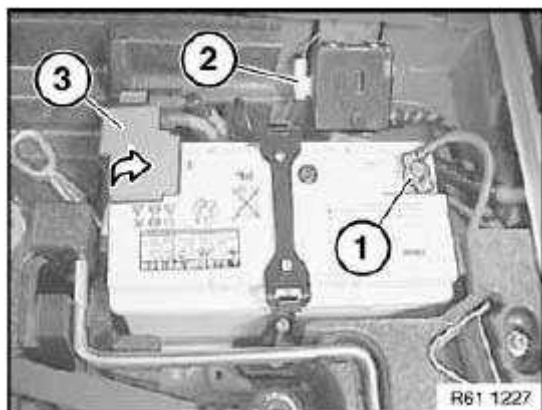


Fig. 144: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Release nut (1) of safety battery terminal (2), tightening torque: 61 21 1AZ, see 61 21 BATTERY WITH TERMINAL .

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.

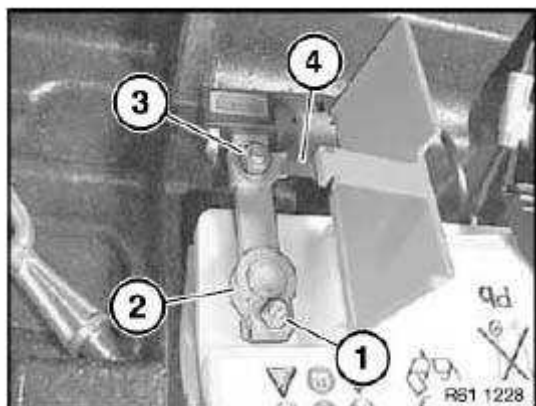


Fig. 145: Identifying Battery Terminal And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Release threaded pin (1).

Fold upper holder (3) up.

Take off holder (2).

Detach vent (6) in direction of arrow.

Fold both clips (4) open.

Lift out battery (5).

Installation:

Make sure battery (5) is correctly seated in associated mounts.

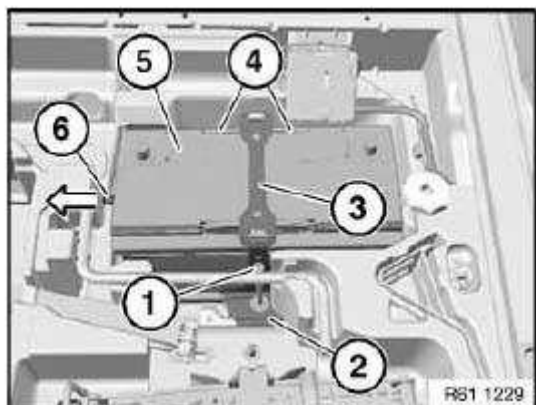
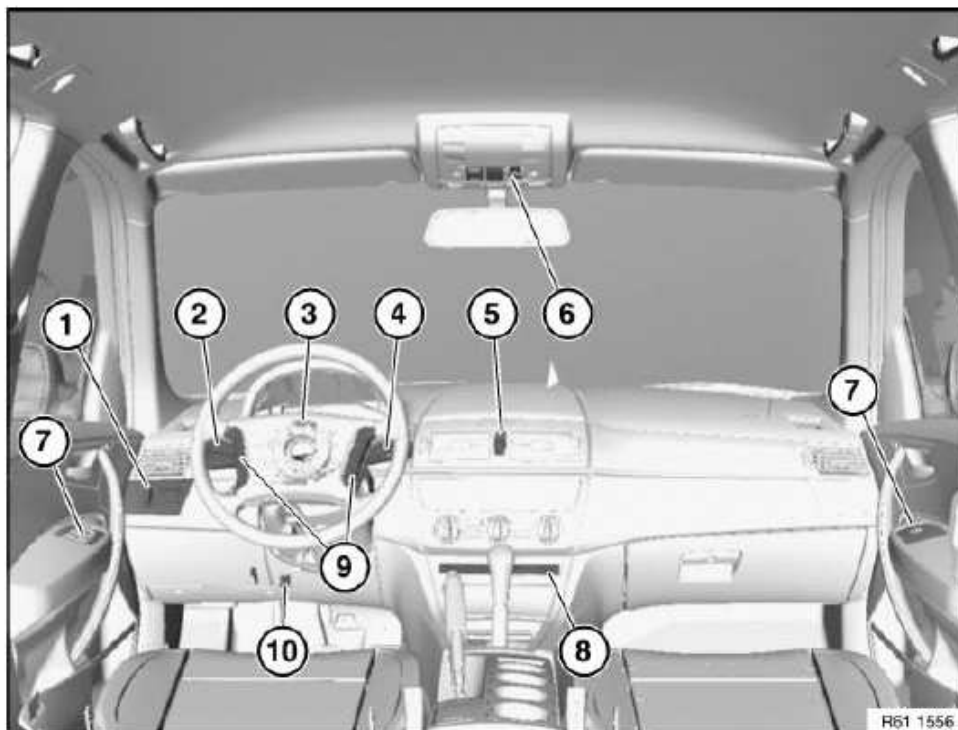


Fig. 146: Detaching Vent
Courtesy of BMW OF NORTH AMERICA, INC.

31 SWITCH

61 31 .. OVERVIEW OF SWITCHES



- | | |
|--|--|
| 1 Light operating unit | 6 Switch for slide/tilt sunroof |
| 2 Turn signal/headlight dipping stalk | 7 Toggle switch for power window control |
| 3 Fixture for steering column stalk | 8 Switch unit on center console |
| 4 Windscreen wiper switch | 9 Switch for sport steering wheel |
| 5 Switch for hazard warning system/central locking | 10 Brake light switch / clutch switch module |

Fig. 147: Identifying Switches Components

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 005 REMOVING AND INSTALLING/REPLACING FIXTURE FOR STEERING COLUMN STALK

WARNING: Move wheels into straight-ahead position and do not alter this position during the repair work.
With steering wheel removed, do not under any circumstances turn/twist fixture for steering column stalk!

Necessary preliminary tasks:

- Remove steering wheel, see [32 33 000 REMOVING AND INSTALLING/REPLACING STEERING WHEEL \(FROM 09/2006\)](#)

- Remove lower section of steering column trim, see **32 31 020 REMOVING AND INSTALLING / REPLACING LOWER SECTION OF STEERING COLUMN TRIM**
- Remove top section of steering column casing, see **32 31 003 REPLACING UPPER SECTION OF STEERING COLUMN TRIM** .

Unlock and disconnect plug connections (1) on turn indicator/headlight dipping stalk and on windscreen wiper stalk.

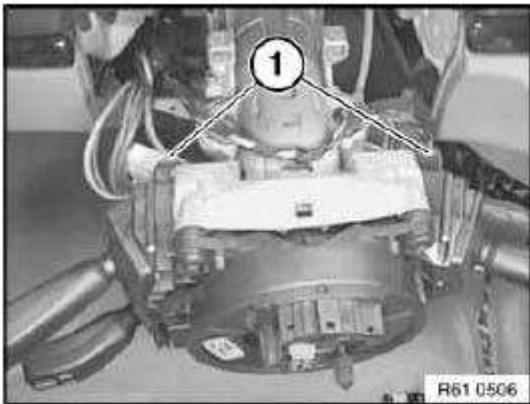


Fig. 148: Identifying Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock and disconnect plug connections (1) on fixture for steering column stalk.

If necessary, unlock and disconnect plug connection (2) on steering column adjustment stalk.

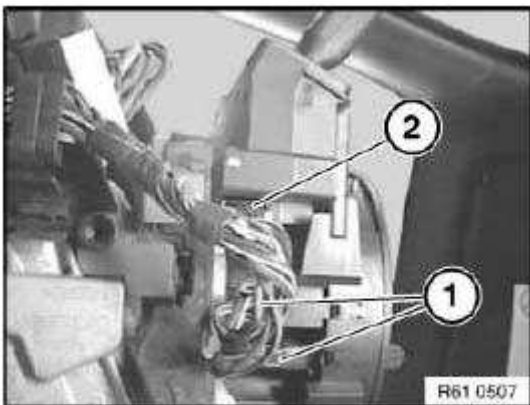


Fig. 149: Identifying Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove fixture for steering column stalk (2).

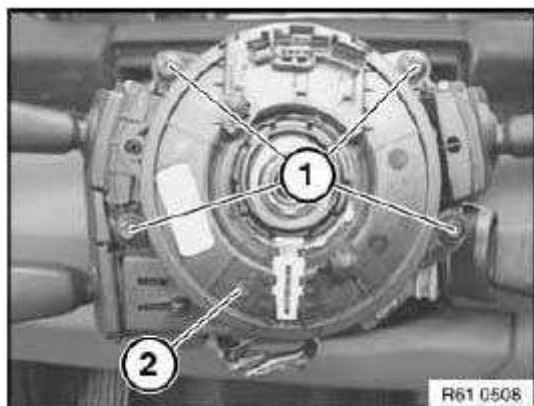


Fig. 150: Identifying Fixture And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: When removed, the cover (1) of the fixture for the steering column stalk (2) is secured against turning/twisting by the lock (3). Do not under any circumstances twist the cover (1) out of its centered position against the fixture for the steering column stalk (2).

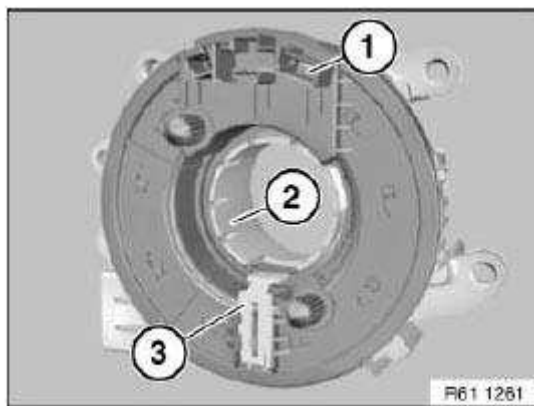


Fig. 151: Identifying Cover Of Fixture For Steering Column Stalk
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock clips and pull out stalk for windscreen wipers (1).

NOTE: If necessary, remove steering column adjustment stalk (2).
Raise lock in direction of arrow and pull out stalk for steering column adjustment (2) in direction of arrow.

Unlock clips and pull out turn indicator/dimmer stalk (3) towards top.

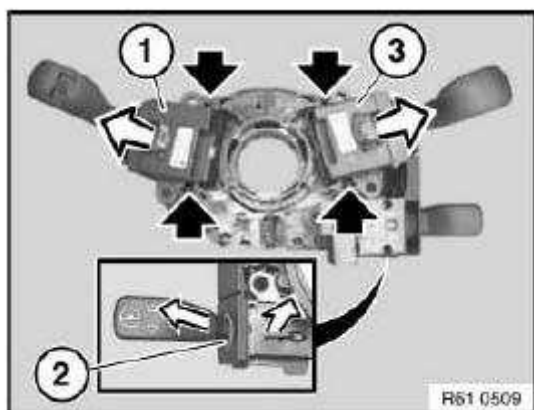


Fig. 152: Pulling Out Stalk For Steering Column Adjustment
 Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove fixture for steering column stalks, see **61 31 005 Removing and installing/replacing fixture for steering column stalk**
- **E85, E86 only:** Remove cruise control switch

Press locks (1) and feed direction indicator/dipping stalk (2) in direction of arrow out of fixture for steering column stalk (3).

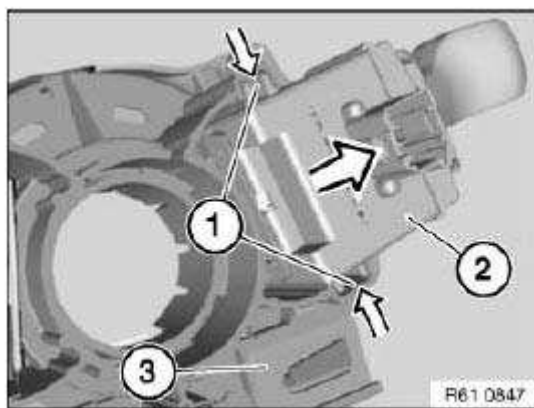


Fig. 153: Pressing Locks And Feed Direction Indicator/Dipping Stalk
 Courtesy of BMW OF NORTH AMERICA, INC.

61 31 020 REMOVING AND INSTALLING/REPLACING IGNITION STARTER SWITCH

Necessary preliminary tasks:

- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove lower section of steering column trim, see **32 31 020 REMOVING AND INSTALLING / REPLACING LOWER SECTION OF STEERING COLUMN TRIM**

Remove sealing varnish and release headless setscrews (1).

Detach ignition starter switch (2) in direction of arrow.

Installation:

Secure headless setscrews (1) with sealing varnish.

Open lock (3) in direction of arrow and disconnect plug (4) from ignition starter switch (2).

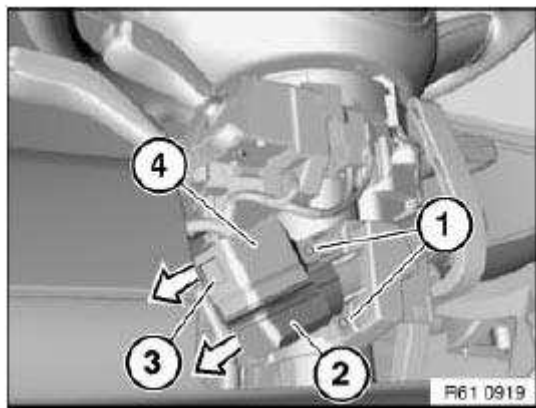


Fig. 154: Opening Lock

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 037 REMOVING AND INSTALLING/REPLACING LIGHT CONTROL UNIT

Special tools required:

- 00 9 341

Necessary preliminary tasks:

- Remove left fresh-air grill, see **64 22 135 REMOVING AND INSTALLING/REPLACING LEFT FRESH-AIR GRILL**

Fit special tool 00 9 341 at side as illustrated.

Lever out lighting control unit (1) all round.

Unlock and disconnect associated plug connection, remove lighting control unit (1) in direction of arrow.

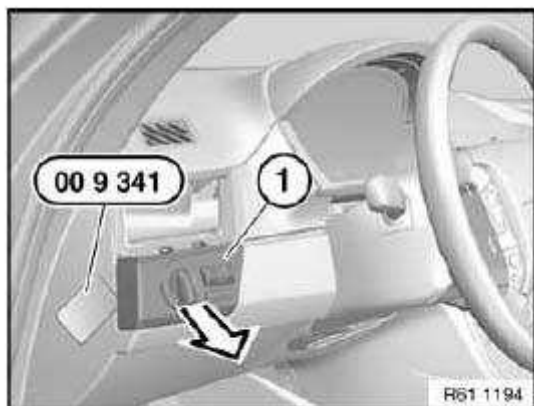


Fig. 155: Identifying Special Tool (00 9 341)
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

If necessary, remove felt strip (1) from instrument panel (2).

Installation:

Make sure lighting control unit is correctly seated in instrument panel (2).

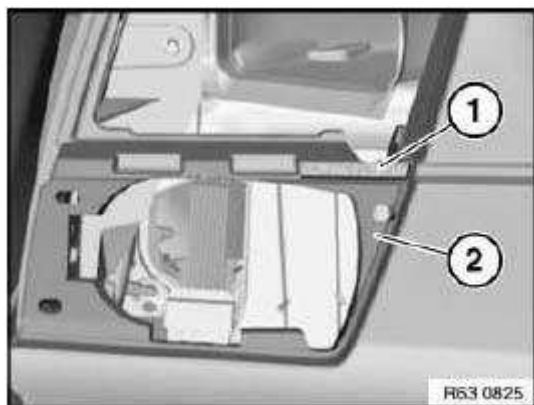


Fig. 156: Identifying Felt Strip From Instrument Panel
Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove fixture for steering column stalks, see **61 31 005 Removing and installing/replacing fixture for steering column stalk**

Press locks (1) and windshield wiper stalk (2) in direction of arrow out of fixture for steering column stalk (3).

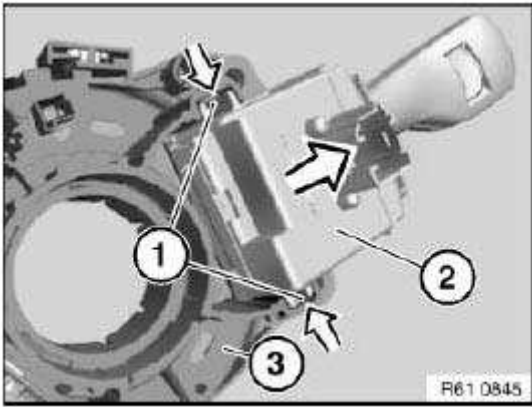


Fig. 157: Pressing Locks And Windshield Wiper Stalk
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 057 REMOVING AND INSTALLING/REPLACING SWITCH UNIT IN CENTER CONSOLE

Necessary preliminary tasks:

- Remove operator unit for heater/air conditioner, see **64 11 377 REMOVING AND INSTALLING CONTROL PANEL FOR HEATER - A/C SYSTEM (REPLACING, AUTOMATIC AIR CONDITIONING)**

Press out switch unit in storage tray (1) in direction of arrow.

Unlock and disconnect associated plug connection (2), remove switch unit in storage tray (1).

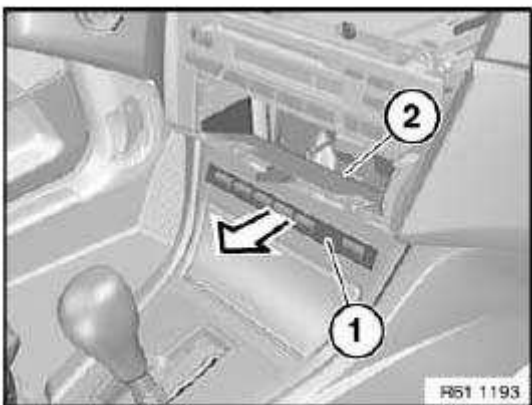


Fig. 158: Pressing Out Switch Unit In Storage Tray
Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Remove front roofliner trim, see **51 44 ... REMOVING AND INSTALLING FRONT ROOFLINER TRIM**

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

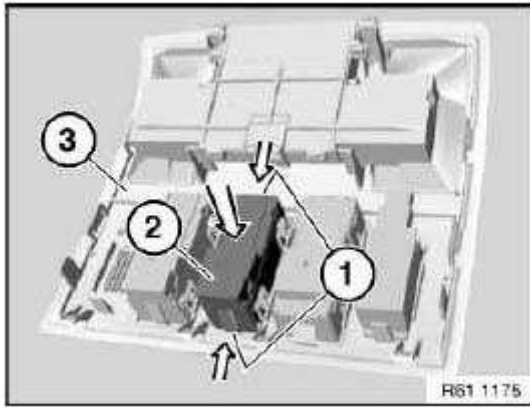


Fig. 159: Pressing Locks And Unclip Indicator
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- **64 1 020 RELEASE HOOK**

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 system/central locking (1).

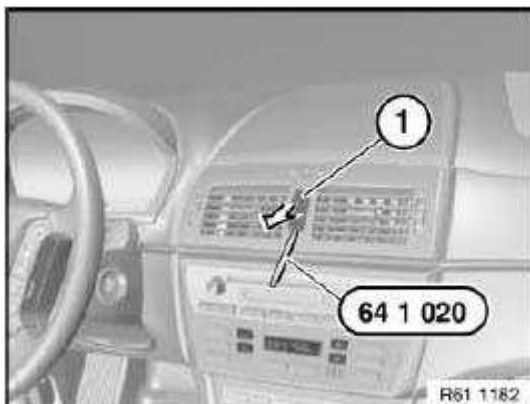


Fig. 160: Identifying Special Tool (64 1 020)

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 115 REPLACING ROCKER SWITCH FOR SIDE WINDOW OPERATION (FRONT)

Special tools required:

- 00 9 341

Carefully lever out rocker switch for side window operation (1) with special tool 00 9 341 at specified points.

Feed rocker switch for side window operation (1) out of front door trim panel (2).

Disconnect associated plug connection and remove rocker switch for side window operation (1).

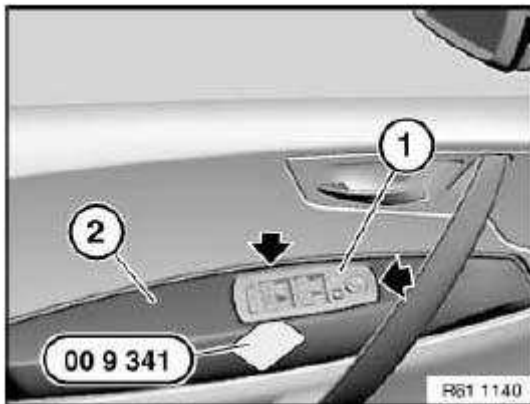


Fig. 161: Identifying Special Tool (00 9 341)

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hooks (1) of rocker switch for side window operation (2) must not be damaged.

Make sure rocker switch for side window operation (2) is correctly seated.

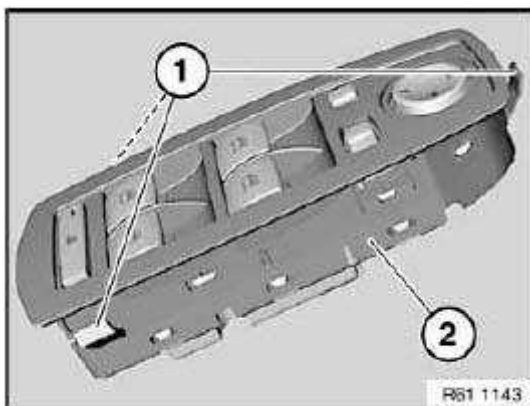


Fig. 162: Identifying Retaining Hooks Of Rocker Switch
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 116 REPLACING ROCKER SWITCH FOR SIDE WINDOW OPERATION (REAR)

Special tools required:

- 00 9 317 **00 9 310 ASSEMBLY WEDGES (SET IN PLASTIC CASE)**

IMPORTANT: Comply with the following work steps in order to avoid damaging the door trim panel and rocker switch.
To avoid damaging leather armrests, wrap front end of special tool 00 9 317 in fabric adhesive tape.

Procedure:

- Slide special tool 00 9 317 under rocker switch for side window operation (1) (do not lift the switch in the process).
- Slide rocker switch (1) with special tool 00 9 317 towards rear and lever out.

Feed rocker switch (1) out of rear door trim panel (2) and disconnect plug connection.

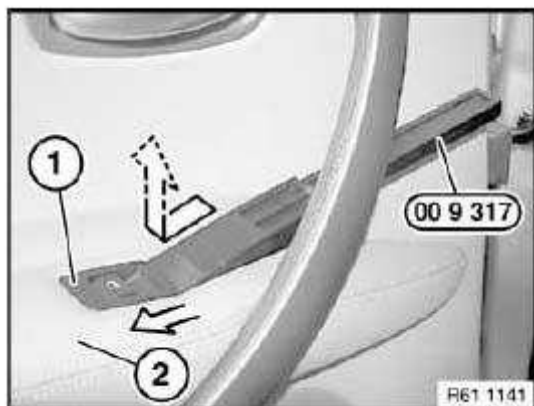


Fig. 163: Identifying Special Tool (00 9 317)
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining hooks (1) of rocker switch for side window operation (2) must not be damaged.

Make sure rocker switch for side window operation (2) is correctly seated.

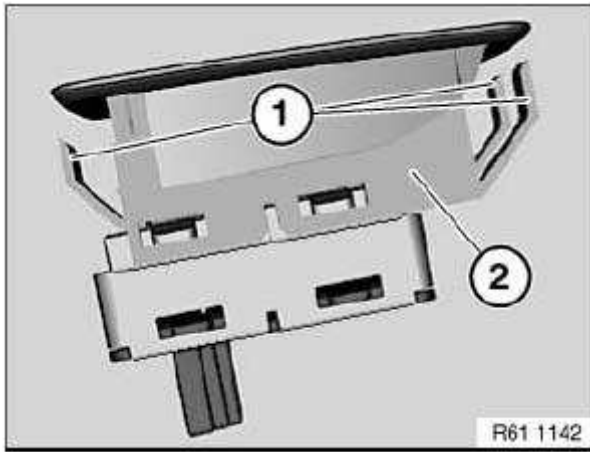


Fig. 164: Identifying Retaining Hooks Of Rocker Switch
 Courtesy of BMW OF NORTH AMERICA, INC.

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

Necessary preliminary tasks:

- Remove front roofliner trim, see **51 44 ... REMOVING AND INSTALLING FRONT ROOFLINER TRIM**

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

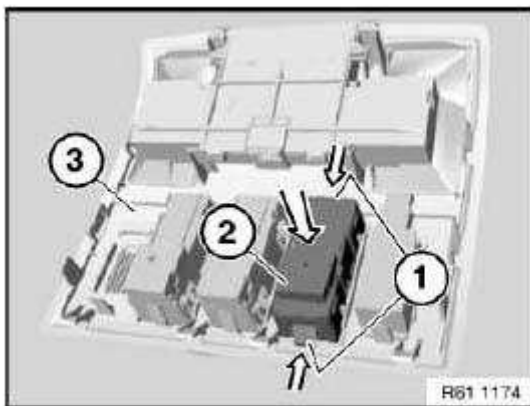


Fig. 165: Pressing Catches And Unclip Switch
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialise slide/tilt sunroof.

61 31 176 REMOVING AND INSTALLING/REPLACING EMERGENCY CALL BUTTON

Necessary preliminary tasks:

- Remove front roofliner trim, see **51 44 ... REMOVING AND INSTALLING FRONT ROOFLINER TRIM**

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

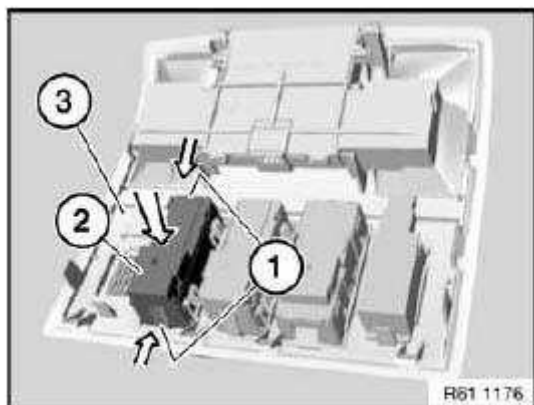


Fig. 166: Pressing Catches And Unclip Emergency Call Button
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 204 REPLACING SWITCH COMBINATION FOR SEAT ADJUSTMENT

This operation is described in:

"Removing outer cover on front seat", see **52 14 040 REMOVING AND INSTALLING/REPLACING OUTER COVER ON FRONT LEFT OR RIGHT SEAT (NORMAL/ELECTRIC)** .

All models except Convertible:

Carry out programming/coding, see **Vehicle programming and coding**.

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

This operation is described in:

"Removing outer cover on front seat" see **52 13 040 REMOVING AND INSTALLING / REPLACING OUTER COVER ON LEFT OR RIGHT FRONT SEAT BACK-REST (NORMAL / MANUAL)** .

61 31 225 REPLACING SWITCH ON IMPACT CUSHION FOR LEFT AND RIGHT AIRBAGS

Necessary preliminary tasks:

- Remove airbag unit, see **32 34 020 REMOVING AND INSTALLING/REPLACING AIRBAG UNIT (FROM 09/2006)**

Disconnect plug connections (1).

Loosen screws (2).

Feed out switch on impact cushion for airbag (3) in each case in direction of arrow from airbag unit (4) and remove.

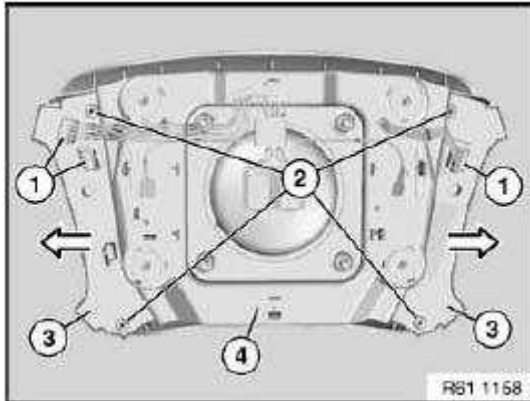


Fig. 167: Disconnecting Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 228 REPLACING SWITCH ON SPORTS STEERING WHEEL

Necessary preliminary tasks:

- Remove steering wheel, see **32 33 000 REMOVING AND INSTALLING/REPLACING STEERING WHEEL (FROM 09/2006)**

Release screws (1) on sports steering wheel (2).

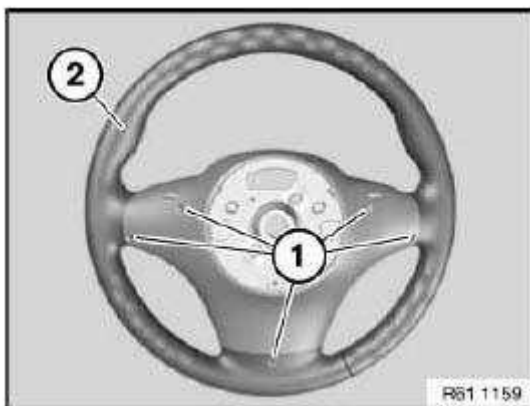
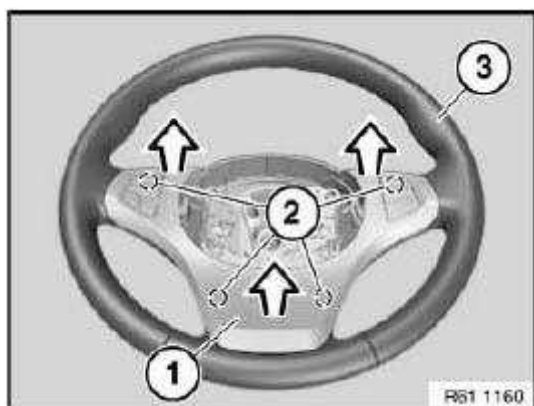


Fig. 168: Identifying Sports Steering Wheel Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip complete trim (1) in direction of arrow from mountings (2) and remove from sports steering wheel (3).

**Fig. 169: Unclipping Trim**

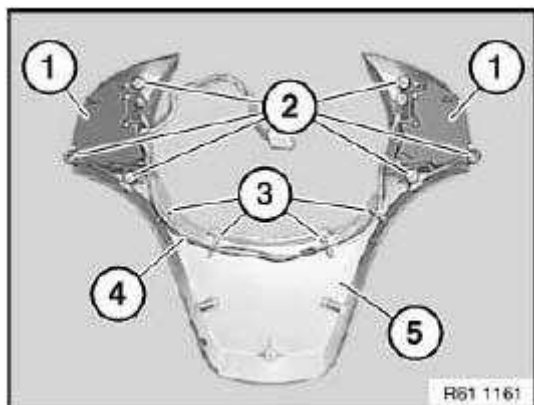
Courtesy of BMW OF NORTH AMERICA, INC.

Loosen screws (2).

Remove both switches on sports steering wheel (1) together from trim (5).

Installation:

Make sure wiring harness (4) is correctly laid in associated mountings (3).

**Fig. 170: Identifying Sports Steering Wheel Switches**

Courtesy of BMW OF NORTH AMERICA, INC.

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

Unfasten plug connection (1) and disconnect.

Press catches (2) together and feed hood contact switch (4) in direction of arrow out of fixture (3).

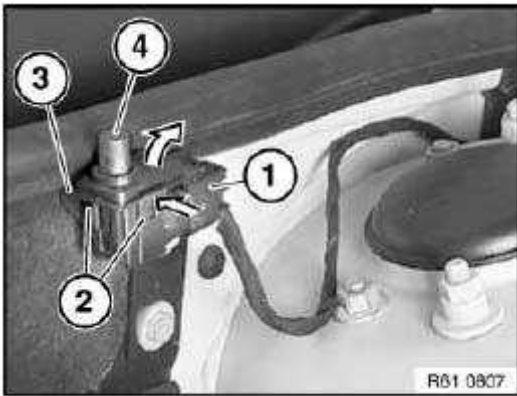


Fig. 171: Unfastening Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 255 REPLACING SWITCH FOR OUTSIDE MIRROR

This operation is described in:

Replacing rocker switch for side window operation, see **61 31 115 Replacing rocker switch for side window operation (front)**.

61 31 270 REMOVING AND INSTALLING/REPLACING SWITCH FOR REVERSING LIGHT

Unfasten plug connection (1) and disconnect.

Unfasten switch for reversing light (2), tightening torque: 23 41 5AZ, see **23 41 EXTERNAL GEARSHIFT COMPONENTS** .

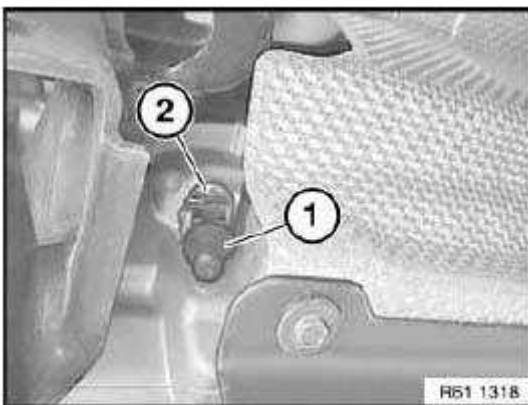


Fig. 172: Identifying Plug Connection And Reversing Light

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, see **51 45 185 REMOVING AND INSTALLING/REPLACING TRIM 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).

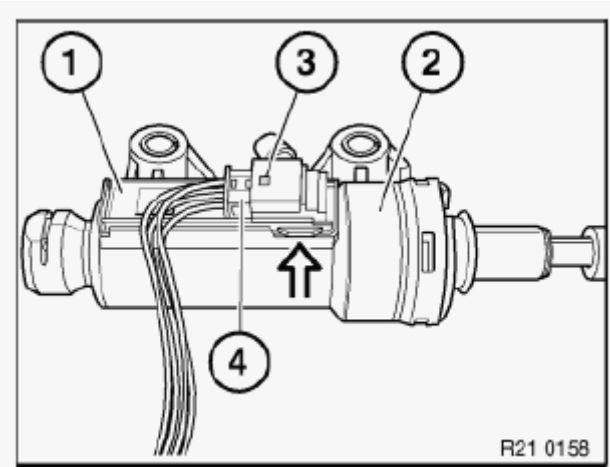


Fig. 173: Identifying Clutch Master Cylinder And Clutch Switch Module
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Clutch switch module is secured against incorrect installation.

Clutch switch module must snap audibly into place.

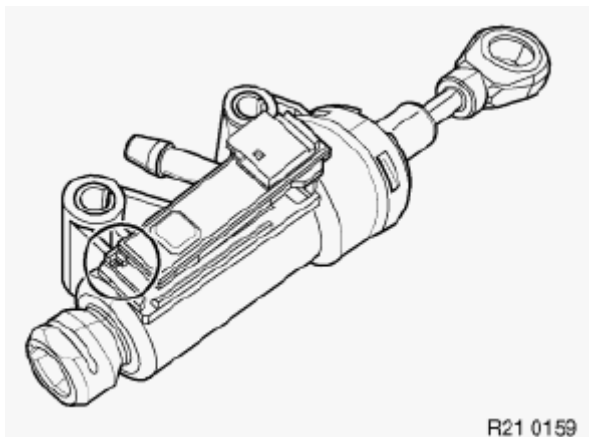


Fig. 174: Identifying Clutch Switch Module
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 310 REPLACING BRAKE-LIGHT SWITCH

Necessary preliminary tasks:

- Remove trim panel for pedal assembly, see **51 45 185 REMOVING AND INSTALLING/REPLACING TRIM FOR PEDAL ASSEMBLY**.

NOTE: Brake light switch (2) is situated above the brake pedal.

Disconnect plug connection (1).

Pull brake light switch (2) in direction of arrow out of brake light switch holder (3).

Press catches (4) together and unclip brake light switch holder (3) from brake pedal.

Installation:

Depress brake pedal.

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 to starting position and pull back to stop.

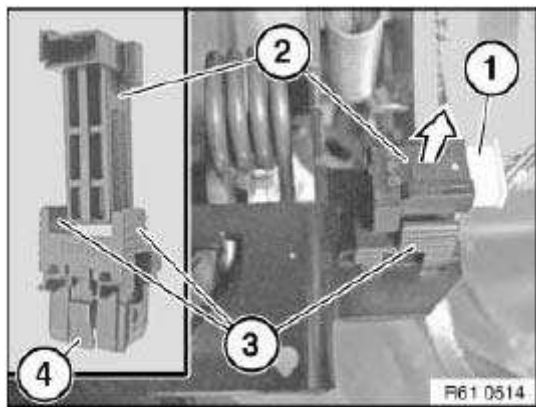


Fig. 175: Identifying Brake Light Switch
Courtesy of BMW OF NORTH AMERICA, INC.

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).

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.

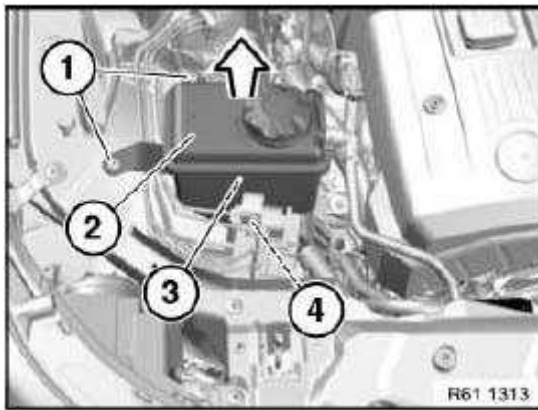


Fig. 176: Pulling Coolant Expansion Tank

Courtesy of BMW OF NORTH AMERICA, INC.

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.

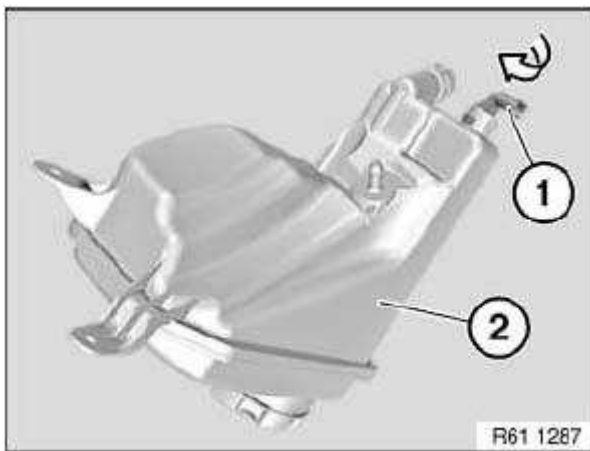


Fig. 177: Turning Coolant Level Switch

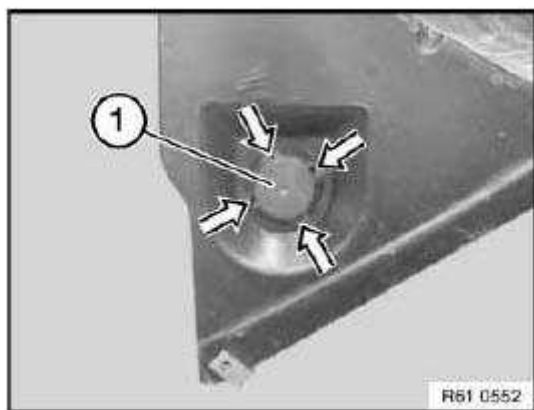
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 440 REMOVING AND INSTALLING/REPLACING TEMPERATURE SWITCH FOR HEATED WINDSHIELD SPRAY JETS*Necessary preliminary tasks:*

- **E52:** Detach front right wheel arch cover (front section)
- **E83:** Remove front underbody protection, see **51 47 490 REMOVING AND INSTALLING / REPLACING FRONT UNDERBODY PROTECTION**

If necessary, unlock associated plug connection and disconnect.

Unclip temperature switch for heated windshield spray jets (1) in direction of arrow and remove.

**Fig. 178: Identifying Heated Windshield Spray Jets**

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 465 REMOVING AND INSTALLING/REPLACING RELAY/MODULE (IN DEVICE HOLDER ON LEFT)*Necessary preliminary tasks:*

- Remove luggage compartment floor trim panel, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**

Release screws (1).

Remove electronics box cover (2).

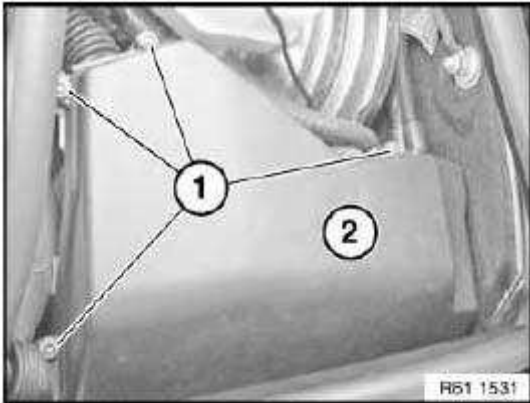


Fig. 179: Identifying Electronics Box Cover Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Detach relay.



Fig. 180: Identifying Relay
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 470 REMOVING AND INSTALLING/REPLACING RELAY/MODULE (IN INSTRUMENT PANEL AT BOTTOM RIGHT)

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove right glovebox with housing, see **51 16 366 REMOVING AND INSTALLING RIGHT GLOVEBOX WITH HOUSING**

Detach relay.

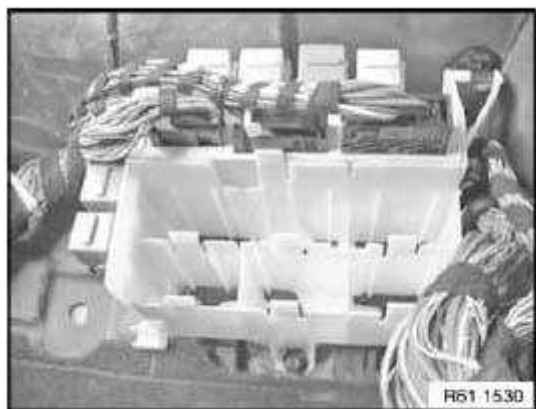


Fig. 181: Identifying Relay

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 492 REPLACING LEVEL SWITCH FOR WINDSCREEN WASHER SYSTEM

This operation is described in:

"Replacing fluid reservoir for windscreen washer system", see **61 71 061 Replacing fluid reservoir for windshield washer system**

61 31 996 CARRY 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
- 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.

33 HORN

61 33 040 REMOVING AND INSTALLING/REPLACING A FANFARE HORN (LEFT OR RIGHT)

Necessary preliminary tasks:

- Remove front underbody protection, see **51 47 490 REMOVING AND INSTALLING / REPLACING FRONT UNDERBODY PROTECTION**

Unfasten plug connection (1) and disconnect.

Release nut (2) and remove fanfare horn (3).

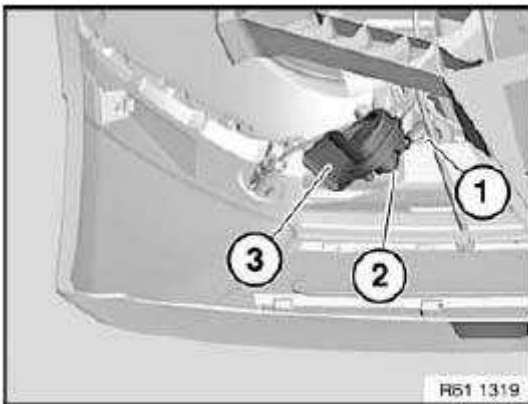
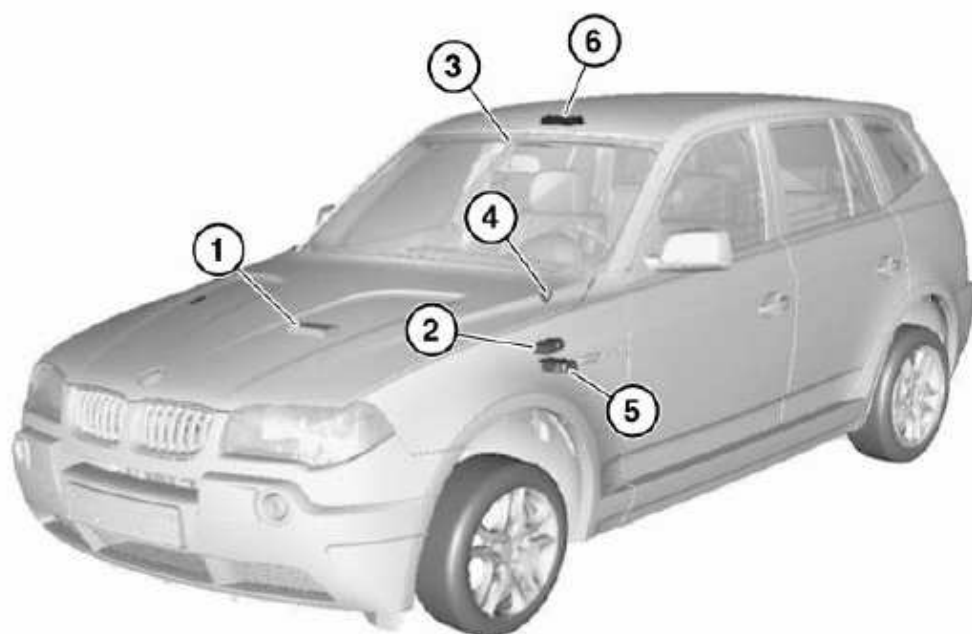


Fig. 182: Identifying Plug Connection And Fanfare Horn
Courtesy of BMW OF NORTH AMERICA, INC.

35 ECUS, MODULES

61 35 .. OVERVIEW OF CONTROL UNITS



R61 1555

- | | | | |
|---|--|---|--|
| 1 | General module | 4 | Ring antenna of electronic immobilizer |
| 2 | Control unit, electronic immobilizer | 5 | Control unit, light module |
| 3 | Rain/light sensor | 6 | Control unit, slide/tilt sunroof |

Fig. 183: Identifying Control Units Components
Courtesy of BMW OF NORTH AMERICA, INC.

61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)

Special tools required:

- 12 7 060 ANTISTATIC MAT (ESD)

NOTE: Electrical components which are particularly sensitive to electrostatic discharge (electronic control units, sensors, etc.) are marked with the ESD warning symbol.

E -Electro

S -Static

D -Discharge

IMPORTANT: Read and comply without fail with the notes on this subject from Service Information 2 06 04 128 .

Statically charged persons can discharge 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.

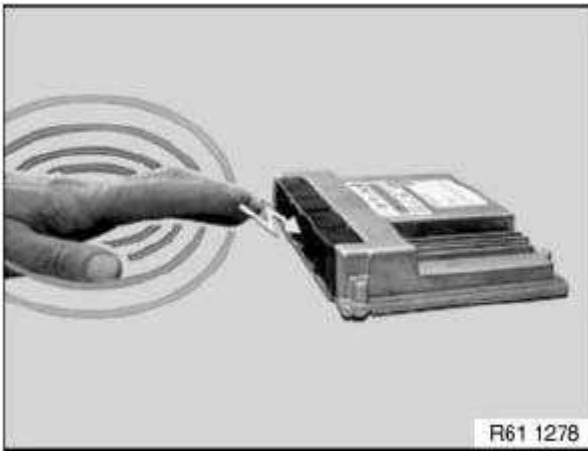


Fig. 184: Touching Electrical Components
Courtesy of BMW OF NORTH AMERICA, INC.

Example:

Mechatronic control unit.

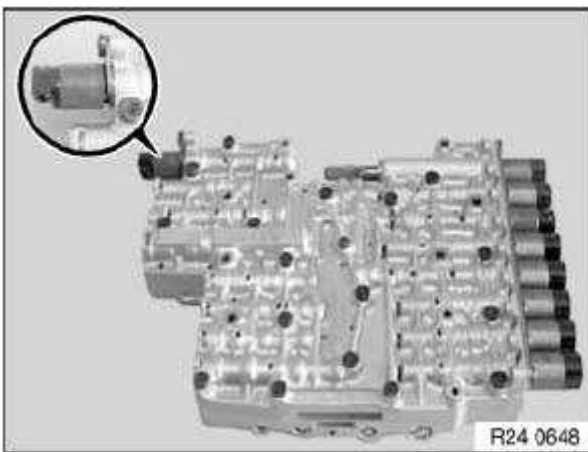


Fig. 185: Identifying Mechatronic Control Unit
Courtesy of BMW OF NORTH AMERICA, INC.



Fig. 186: 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

61 35 000 REMOVING AND INSTALLING/REPLACING MODULE (FOR TRAILER TWO HITCH)

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**

Remove clips (1) and fold up front luggage compartment floor trim panel (2) slightly.

Installation:

Make sure front luggage compartment floor trim panel (2) is correctly seated.

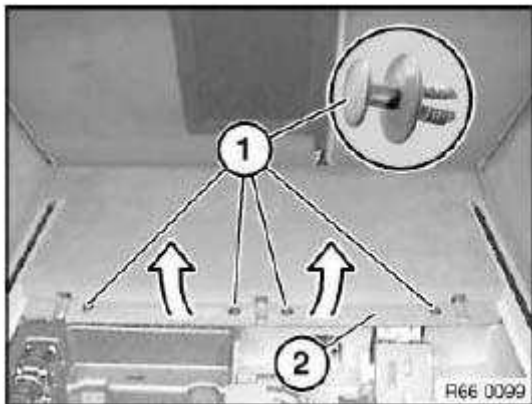


Fig. 187: Removing Clips

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Front luggage compartment floor trim panel shown removed for purposes of clarity.

Unfasten plug connection (1) and disconnect.

Unscrew nuts (2).

Remove module (3) in direction of arrow.

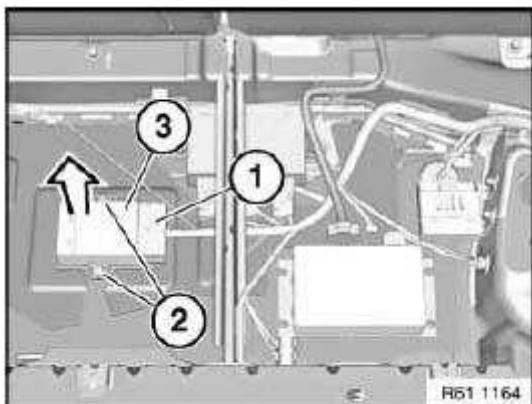


Fig. 188: Unfastening Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

61 35 122 REMOVING AND INSTALLING/REPLACING GENERAL MODULE

IMPORTANT: Read and comply with 61 35 ... Notes on ESD protection (Electro Static Discharge).

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see 51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL
- Disconnect negative battery cable
- Remove right glovebox with housing, see 51 16 366 REMOVING AND INSTALLING RIGHT GLOVEBOX WITH HOUSING

Release plastic nut (1).

Unclip device holder (2) from fixtures (3).

Unlock plug connections (4) and disconnect.

Press catch (6) and remove general module (5) towards rear.

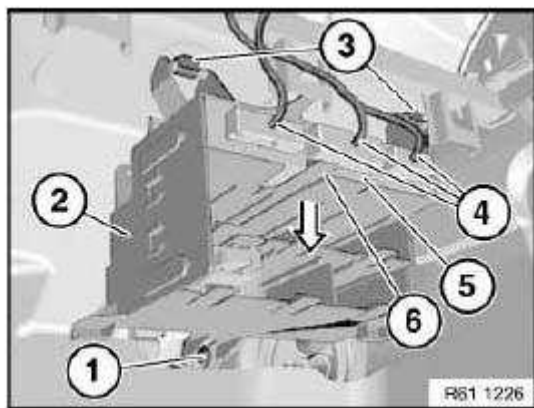


Fig. 189: Pressing Catch And Remove General Module
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out programming/coding, see Vehicle programming and coding.

61 35 177 REMOVING AND INSTALLING (REPLACING) RAIN/LIGHT SENSOR

Expand two-part mirror base cover (1) by pressing from below and detach.

Feed out two-part mirror base cover (1) and remove.

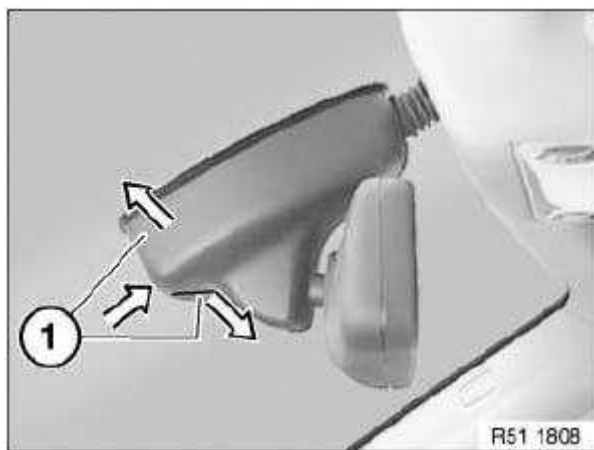


Fig. 190: Expanding Two-Part Mirror Base Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (3).

Press locks (1) in direction of arrow and remove rain/light sensor (2) towards bottom.

Installation:

Do not damage optical element covered by rain/light sensor (2).

If necessary, initialize rain/light sensor, see **61 35 679 Initializing rain/light sensor**.

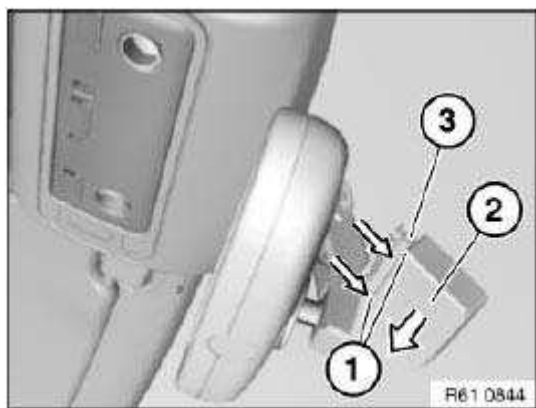


Fig. 191: Pressing Locks
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out programming/coding, see **Vehicle programming and coding**.

61 35 285 REMOVING AND INSTALLING (REPLACING) LIGHT MODULE

IMPORTANT: Read and comply with **61 35 ... Notes on ESD protection (Electro Static Discharge)**.

Necessary preliminary tasks:

- Remove trim panel for pedal assembly, see **51 45 185 REMOVING AND INSTALLING/REPLACING TRIM FOR PEDAL ASSEMBLY** .

Unlock plug connections (2) and (4) and disconnect.

Release screws (1), feed out light module (3) in direction of arrow and remove.

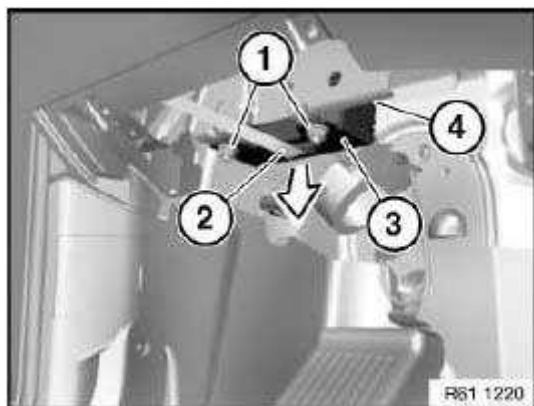


Fig. 192: Unlocking Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure guides (1) of light module (2) are correctly seated in associated mountings.

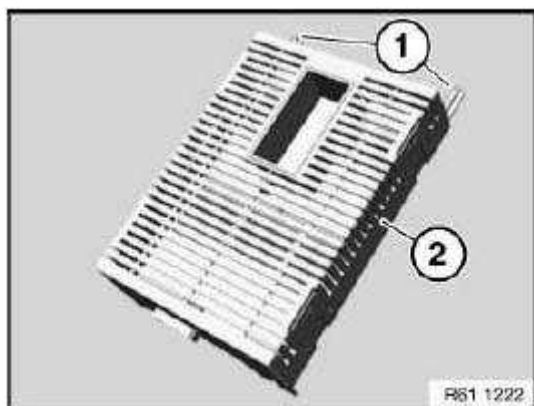


Fig. 193: Identifying Guides Of Light Module

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out programming/coding, see **Vehicle programming and coding**.

61 35 679 INITIALIZING RAIN/LIGHT SENSOR

NOTE: Initialization is necessary:

- After replacing windshield
- When installing a used rain/light sensor

NOTE:

- Connect BMW diagnosis system
- Initialize rain/light sensor.

61 35 714 REMOVING AND INSTALLING/REPLACING CONTROL UNIT FOR SLIDE/TILT SUNROOF

IMPORTANT: Read and comply with **61 35 ... Notes on ESD protection (Electro Static Discharge)**.

Necessary preliminary tasks:

- Remove front roofliner trim, see **51 44 ... REMOVING AND INSTALLING FRONT ROOFLINER TRIM**
- Remove complete ceiling light (front)

NOTE: Secure drive for slide/tilt sunroof (3) against falling out.

Release screws (2).

Lower control unit for slide/tilt sunroof (3).

Unlock and disconnect plug connections (1) and remove control unit for slide/tilt sunroof (3).



Fig. 194: Identifying Lower Control Unit For Slide/Tilt Sunroof
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialise slide/tilt sunroof.

Replacement:

Carry out programming/coding, see **Vehicle programming and 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 **61 35 ... Notes on ESD protection (Electro Static Discharge)**.

Necessary preliminary tasks:

- Remove right glovebox with housing, see **51 16 366 REMOVING AND INSTALLING RIGHT GLOVEBOX WITH HOUSING**

Unlock catch (1) in direction of arrow.

Pull control unit for adaptive headlight (2) out of equipment carrier (3) slightly.

Unlock plug connection (4) and disconnect.

Remove control unit for adaptive headlight (2).

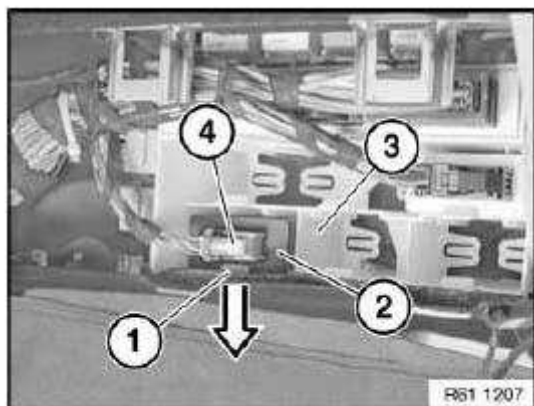


Fig. 195: Unlocking Catch

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out programming/coding, see **Vehicle programming and 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, see **32 31 003 REPLACING UPPER SECTION OF STEERING COLUMN TRIM**.

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.

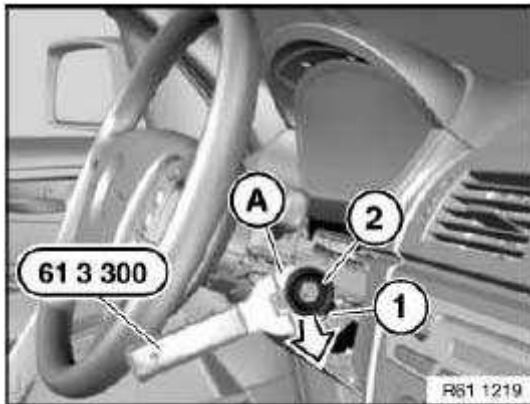


Fig. 196: Identifying Special Tool (61 3 300)

Courtesy of BMW OF NORTH AMERICA, INC.

61 35 910 REMOVING AND INSTALLING/REPLACING CONTROL UNIT OF ELECTRONIC IMMOBILIZER

IMPORTANT: Read and comply with 61 35 ... Notes on ESD protection (Electro Static Discharge).

Necessary preliminary tasks:

- Disconnect battery negative lead, see 61 20 900 Disconnecting and connecting battery negative lead
- Remove trim panel for pedal assembly, see 51 45 185 REMOVING AND INSTALLING/REPLACING TRIM FOR PEDAL ASSEMBLY.

Unfasten plug connection (1) and disconnect.

NOTE: Secure control unit of electronic immobilizer (3) against falling out.

Release screws (2) and remove control unit of electronic immobilizer (3).



Fig. 197: Unfastening Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

IMPORTANT: Check hardware version of old control unit.

Part numbers of control units with hardware version HW03:

- 61 35 8 374 957
- 61 35 6 905 666
- 61 35 6 905 667
- 61 35 6 905 670

If hardware version HW03 was fitted, observe the following.

Disconnect cable from pin 3 of plug.

Replace double flat spring contact with a larger one.

Connect cable to pin 2 of plug.

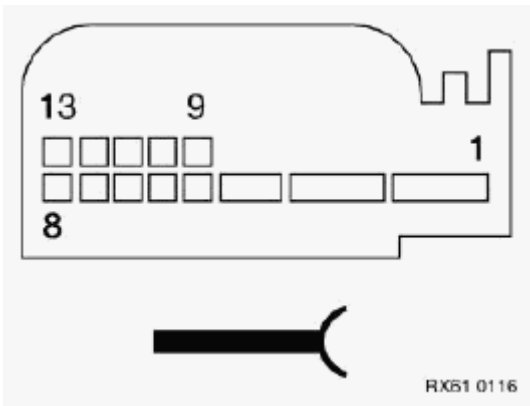
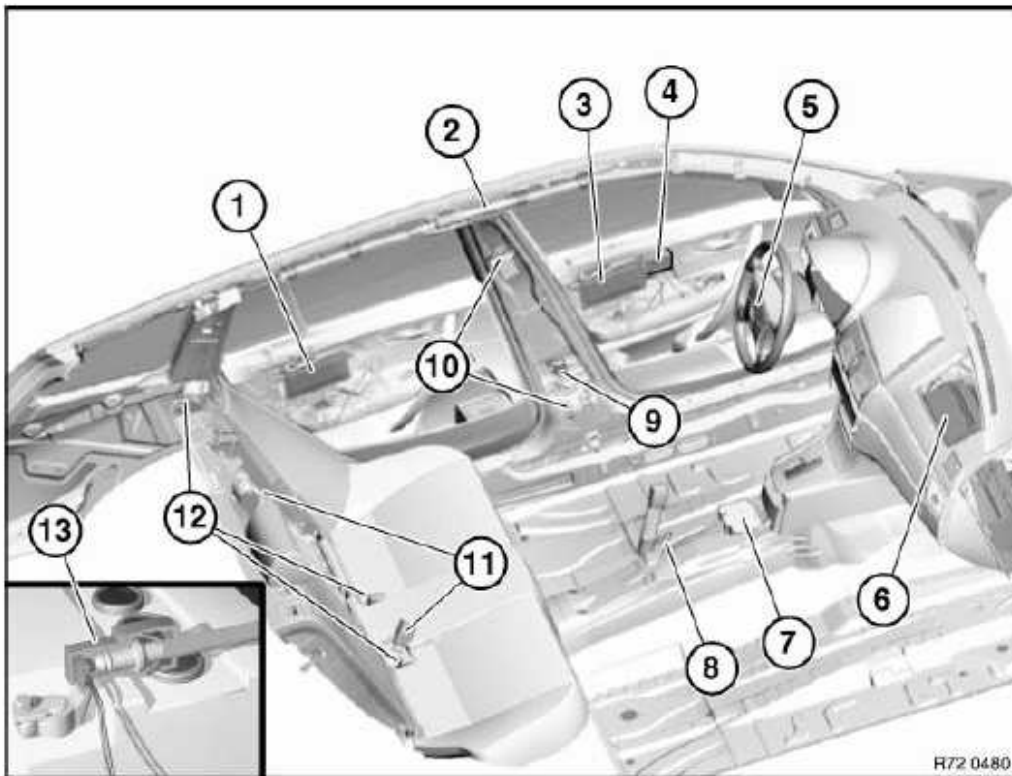


Fig. 198: Identifying Plug Connector Pin

Courtesy of BMW OF NORTH AMERICA, INC.

Carry out programming/coding, see [Vehicle programming and coding](#).

72 12 ... OVERVIEW OF AIRBAG MODULES, SEAT BELTS AND AIRBAG CONTROL UNITS



0 [Safety precautions and general information](#)

- | | | | |
|---|---|----|---|
| 1 | Airbag module, rear left/right | 8 | Lower strap (belt tensioner), front |
| 2 | AHPS head airbag, left/right | 9 | Sensor, B-pillar |
| 3 | Airbag module, front left/right | 10 | Seat belt, front left/right |
| 4 | Sensor, front door | 11 | Seat belts, rear middle |
| 5 | Airbag module, driver's side | 12 | Seat belt, rear left/right |
| 6 | Airbag module, front passenger side | 13 | Safety battery terminal |
| 7 | Airbag control unit | | |

Fig. 199: Identifying Airbag Modules, Seat Belts And Airbag Control Units Components
 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 initialization
- BMW/MINI service functions in Progman
- ...

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.

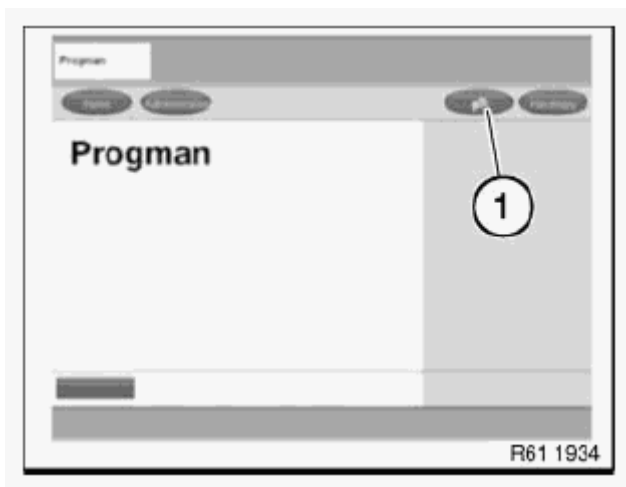


Fig. 200: Display Screen Of - Programming
Courtesy of BMW OF NORTH AMERICA, INC.

36 RELAYS

61 13 ... DME MASTER RELAY CONNECTOR

Unlock locking flap (1) of corresponding cable.

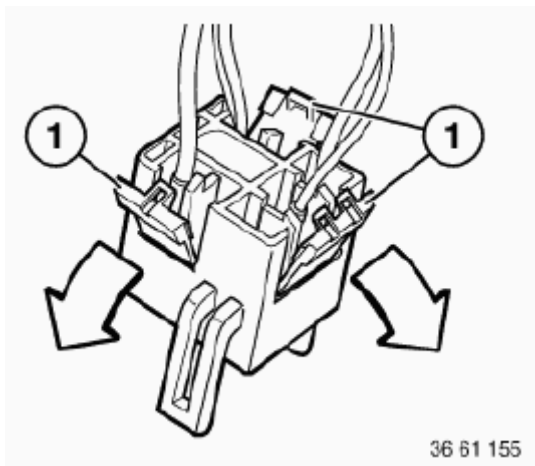


Fig. 201: Unlocking Locking Flap

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.

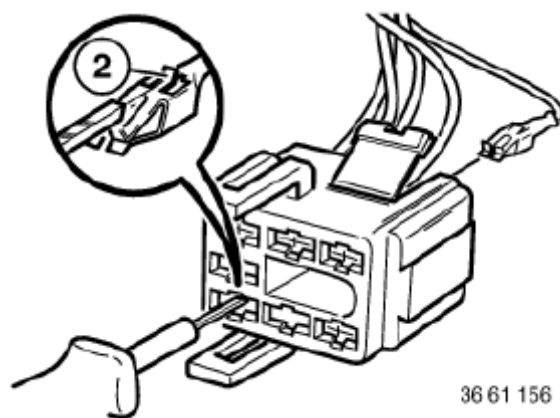


Fig. 202: Identifying Arrester Hook

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.

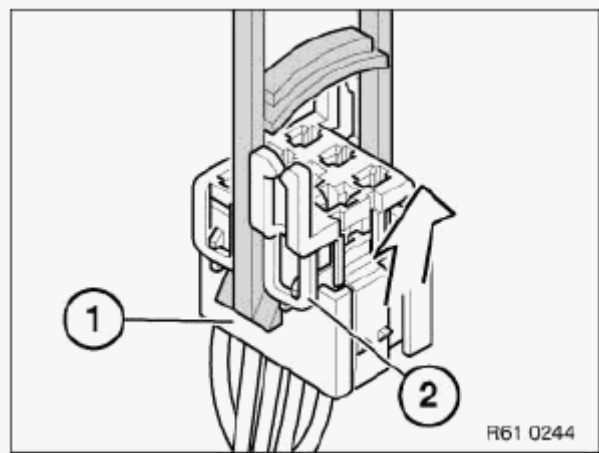
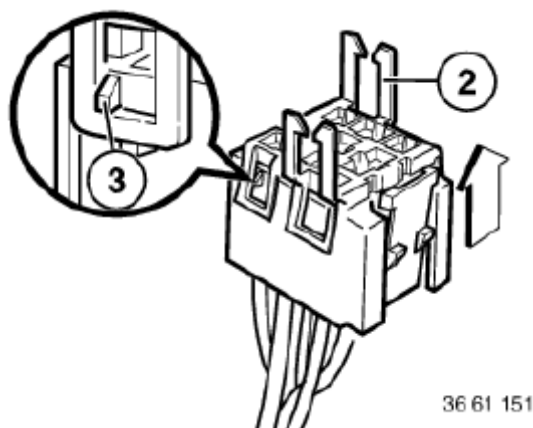


Fig. 203: Identifying Relay Carrier And Retaining Lugs

Courtesy of BMW OF NORTH AMERICA, INC.

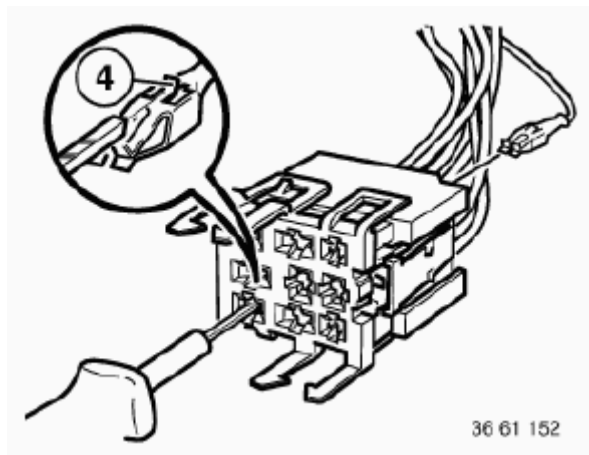
Pull relay carrier (2) in direction of arrow into first catch (3).

**Fig. 204: 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. 205: Identifying Arrester Hook**

Courtesy of BMW OF NORTH AMERICA, INC.

61 31 465 REMOVING AND INSTALLING/REPLACING RELAY/MODULE (IN DEVICE HOLDER ON LEFT)

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**

Release screws (1).

Remove electronics box cover (2).

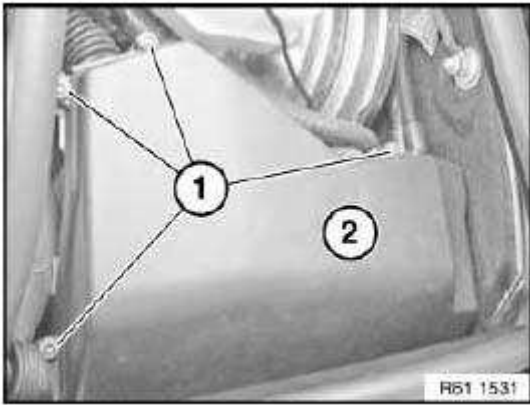


Fig. 206: Identifying Electronics Box Cover Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Detach relay.



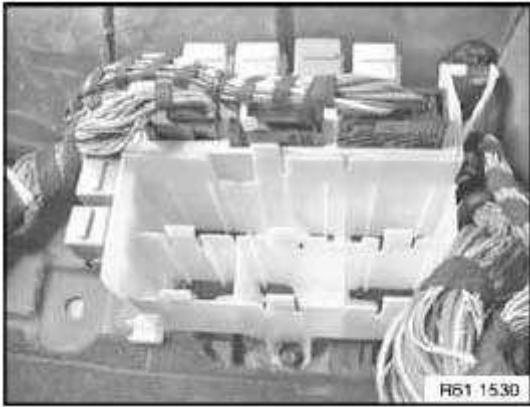
Fig. 207: Identifying Relay
Courtesy of BMW OF NORTH AMERICA, INC.

61 31 470 REMOVING AND INSTALLING/REPLACING RELAY/MODULE (IN INSTRUMENT PANEL AT BOTTOM RIGHT)

Necessary preliminary tasks:

- Remove luggage compartment floor trim panel, see **51 47 102 REMOVING AND INSTALLING/REPLACING LUGGAGE COMPARTMENT FLOOR TRIM PANEL**
- Disconnect battery negative lead, see **61 20 900 Disconnecting and connecting battery negative lead**
- Remove right glovebox with housing, see **51 16 366 REMOVING AND INSTALLING RIGHT GLOVEBOX WITH HOUSING**

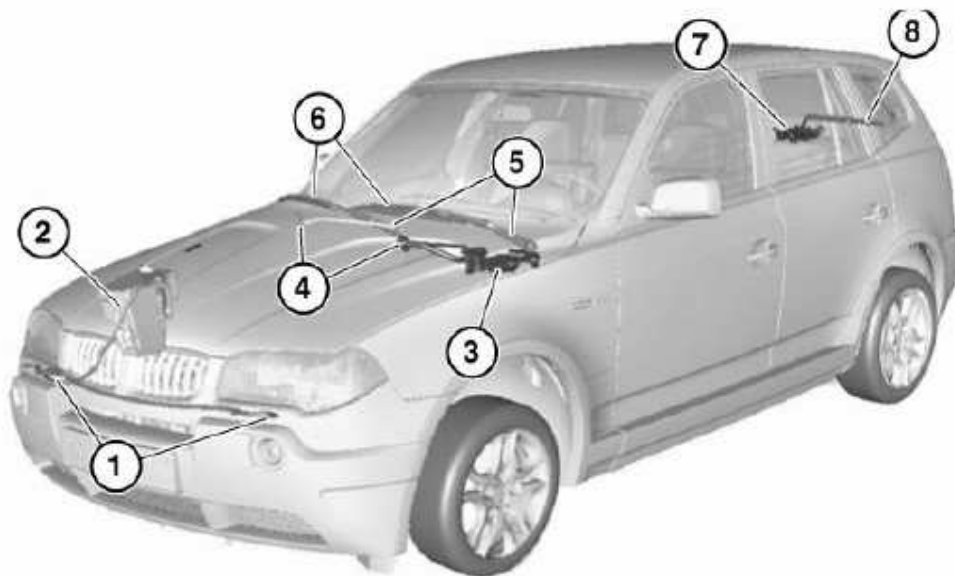
Detach relay.

**Fig. 208: Identifying Relay**

Courtesy of BMW OF NORTH AMERICA, INC.

61 WINDSCREEN WIPERS

61 61 .. OVERVIEW OF WINDSCREEN WIPER SYSTEM AND HEADLIGHT WASHER SYSTEM



R61 1554

- | | | | |
|---|---|---|--|
| 1 | Spray nozzles of headlight washer system | 5 | Windscreen wiper arms |
| 2 | Washer pumps, fluid reservoir for washer system | 6 | Wiper blades |
| 3 | Wiper bracket | 7 | Rear window wiper motor |
| 4 | Spray nozzles of windscreen washer system | 8 | Window wiper arm, window wiper blade |

Fig. 209: Identifying Windscreen Wiper System And Headlight Washer System Components

Courtesy of BMW OF NORTH AMERICA, INC.

61 61 01. ADJUSTING LEFT OR RIGHT WINDSCREEN WIPER

Special tools required:

- 61 6 100 ANGLE MEASURING INSTRUMENT

Correctly adjusting the contact angle of the wiper arms on the windscreen increases wiping quality. For adjustment, refer to the vehicle-specific repair instruction.

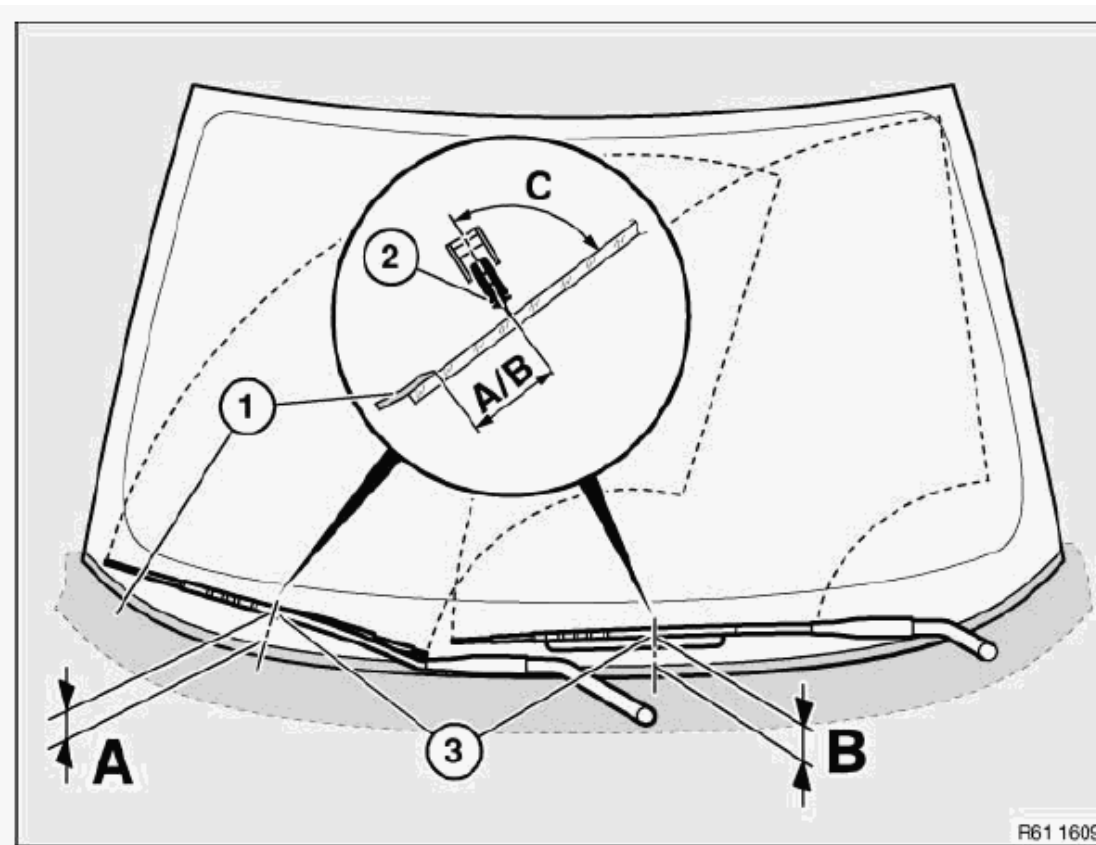


Fig. 210: Adjusting Contact Angle Of Wiper Arms On Windscreen

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.

2007 BMW X3

ACCESSORIES AND EQUIPMENT Accessories Control System - Repair Instructions - X3

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 ARM SPECIFICATIONS

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
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
3'	E46	85.7° ± 1°	85.3° ± 1°	-4	-5		
	E83	85.2° ± 1°	85.4° ± 1°	-5	-5	66 ± 3 mm	61 ± 3 mm
	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
	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
	E53	85.0° ± 1°	85.0° ± 1°	-5	-5	54 ± 3 mm	55 ± 3 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
	E70	85.6° ± 1°	85.0° ± 1°	-4	-5	103 ± 3 mm	90 ± 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
8'	E52	85.5° ± 1°	85.5° ± 1°	-4	-4	38 ± 2 mm	104 ± 2 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 9 220 BENDING LEVER (2 X)**
- **00 9 331 00 9 330 WINDSCREEN WIPER SETTING TOOL**
- **61 6 100 ANGLE MEASURING INSTRUMENT**

NOTE: Wipe quality is improved by precise adjustment of contact/approach angle of wiper arms, see **61 61 01. Adjusting left or right windscreen wiper**
Adjustment angle can be checked with special tool 00 9 331 or 61 6 100 .

Checking with setting gauge:

Before checking approach angle, briefly lift windscreen wiper arms off windscreen.

Place special tool 00 9 331 next to pivot point of wiper blade on windscreen.

Check light gap, adjust wiper arm if necessary.

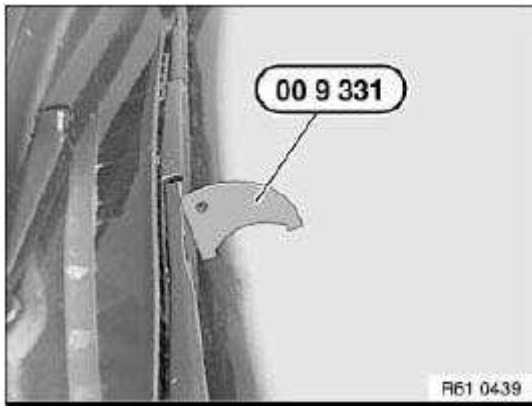


Fig. 211: Identifying Special Tool (00 9 331)
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Tape off wiper arm with fabric adhesive tape to avoid damage.

Press special tools 00 9 220 in appropriate direction until correct contact/approach angle is obtained.

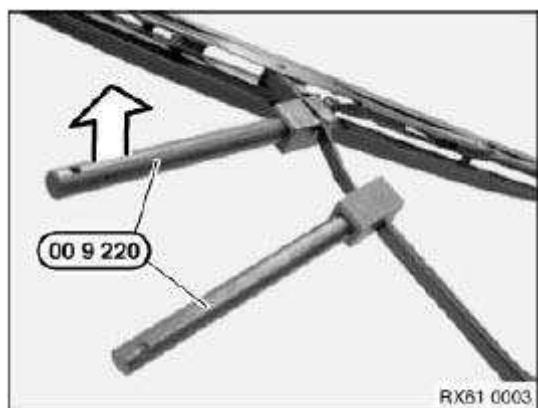


Fig. 212: Identifying Special Tool (00 9 220)
 Courtesy of BMW OF NORTH AMERICA, INC.

Checking with angulometer:

Remove wiper blades.

Insert windscreen wiper arm (1) in angulometer 61 6 100 .

Using screw (2) and pressure plate (3), locate windscreen wiper arm (1) and position on windscreen.

Read off value in degrees, adjust wiper arm if necessary.

NOTE: Windscreen wiper arm (1) must rest correctly on lower and side contact surfaces (4) of angulometer 61 6 100 .

On right-hand-drive cars, screw (2) must be located on left side of special tool 61 6 100.

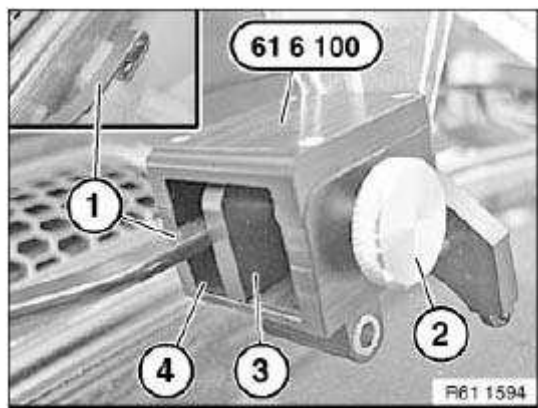


Fig. 213: Identifying Special Tool (61 6 100)
 Courtesy of BMW OF NORTH AMERICA, INC.

Press special tools 00 9 220 in appropriate direction until correct contact/approach angle is obtained.

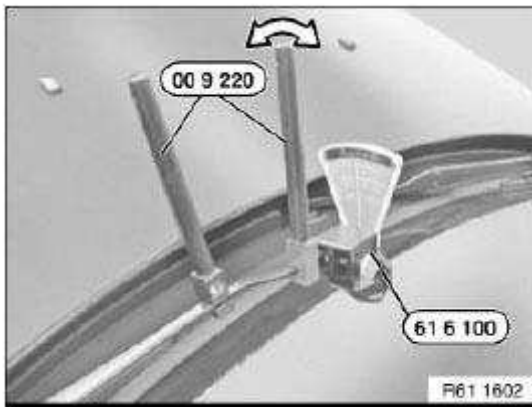


Fig. 214: Identifying Special Tool (00 9 220) And (61 6 100)
Courtesy of BMW OF NORTH AMERICA, INC.

61 61 041 REPLACING BOTH WINDSCREEN WIPER BLADES

Move wipers into fold-back position:

- Switch on terminal "R".
- Actuate wiper control lever and bring wiper arms to a stop in vertical position (fold-back position) by switching off terminal "R".
- Remove ignition key from ignition switch.

Fold back wiper arm (3).

Press locking spring (1) in direction of arrow. Pull wiper blade (2) to wiper arm (3) and feed out.

Installation:

Install new wiper blade and snap into place.

Fold wiper arms to windscreen.

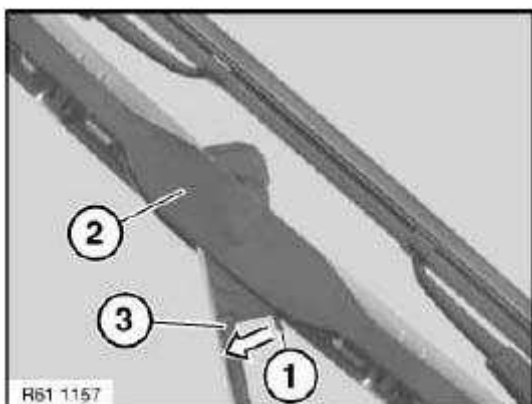


Fig. 215: Pressing Locking Spring

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Before switching on terminal "R" or the ignition or starting the engine, you must fold the wiper arms onto the windscreen otherwise damage will be caused.

Switch on terminal "R".

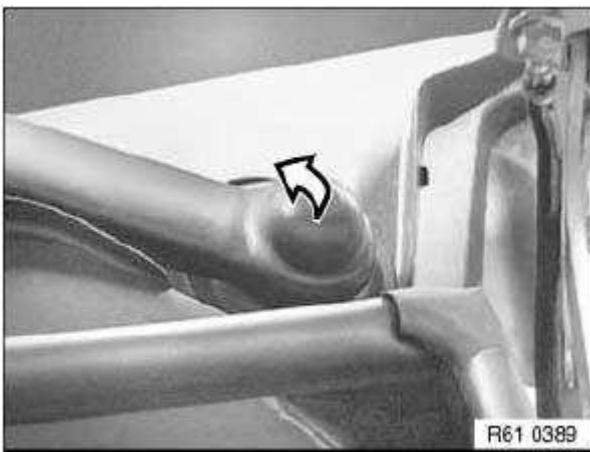
Set wiper system to rest position by flick-wiping.

61 61 100 REMOVING AND INSTALLING/REPLACING BOTH WINDSCREEN WIPER ARMS

Special tools required:

- **61 6 060 UNIVERSAL WIPER ARM PULLER**

Take off cap.

**Fig. 216: Taking Off Cap**

Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten nut.

Installation:

Observe tightening torque: 61 61 10AZ, see **61 61 WINDSHIELD WIPERS** .

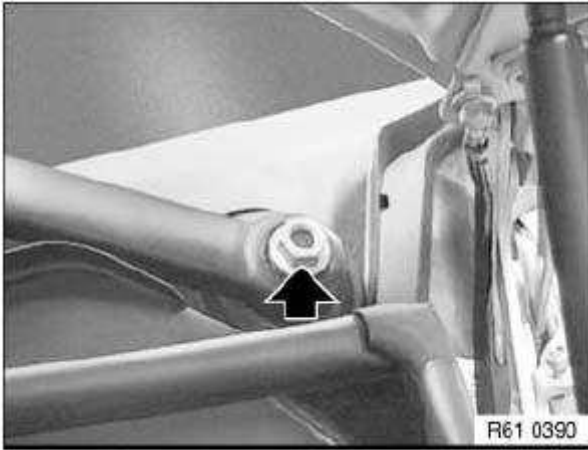


Fig. 217: Locating Nut

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not bend windscreen wiper arm during removal (risk of breakage).

Detach windscreen wiper arm with special tool 61 6 060 .



Fig. 218: Identifying Special Tool (61 6 060)

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check that sleeve (1) is firmly seated.

If sleeve (1) is loose, it must be replaced.

A sleeve (1) firmly seated in the windscreen wiper arm can be reused.

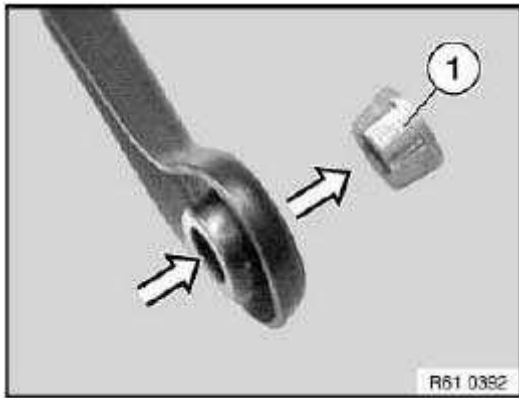


Fig. 219: Identifying Sleeve

Courtesy of BMW OF NORTH AMERICA, INC.

Windscreen wiper arm with firmly seated sleeve (1):

Return wiper system to rest position. Push wiper arm (2) with firmly seated sleeve (1) onto shaft and tighten down.

Observe tightening torque: 61 61 10AZ, see **61 61 WINDSHIELD WIPERS** .

Check setting of wiper arm (2).

To correct setting, replace sleeve (1).

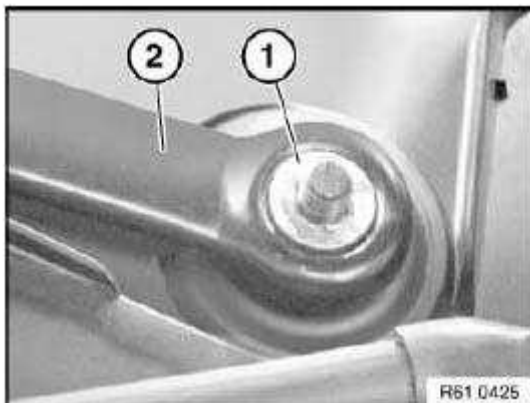


Fig. 220: Identifying Wiper Arm Sleeve

Courtesy of BMW OF NORTH AMERICA, INC.

Windscreen wiper arm with new sleeve (2):

Return wiper system to rest position.

Push wiper arm (1) with sleeve (2) onto shaft and tighten until hand-tight.

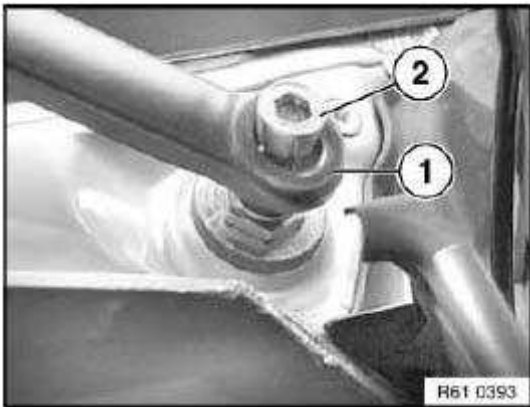


Fig. 221: Identifying Wiper Arm With Sleeve
Courtesy of BMW OF NORTH AMERICA, INC.

Adjust position of wiper arm in question in rest position (measured between wiper lip and top edge of cowl panel cover).

Then tighten down wiper arm and check position of relevant wiper arm again.

$66 \pm 1.5 \text{ mm}$

$61 \pm 1.5 \text{ mm}$

Observe tightening torque: 61 61 10AZ, see **61 61 WINDSHIELD WIPERS**.

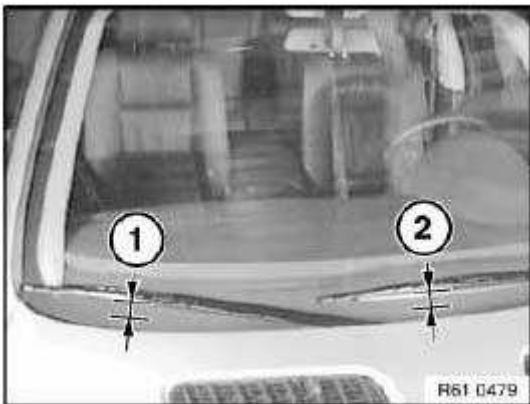


Fig. 222: Measuring Dimension Between Wiper Lip And Top Edge Of Cowl Panel Cover
Courtesy of BMW OF NORTH AMERICA, INC.

61 61 270 REMOVING AND INSTALLING COMPLETE WIPER CONSOLE

Necessary preliminary tasks:

- Remove cowl panel cover, see **51 13 115 REMOVING AND INSTALLING/REPLACING COWL PANEL COVER**

- Remove heater bulkhead, see **51 71 080 REMOVING AND INSTALLING/REPLACING HEATER BULKHEAD**

Unfasten plug connection (1) and disconnect.

Unscrew bolt (2).

Installation:

Observe tightening torque: 61 61 6AZ, see **61 61 WINDSHIELD WIPERS** .

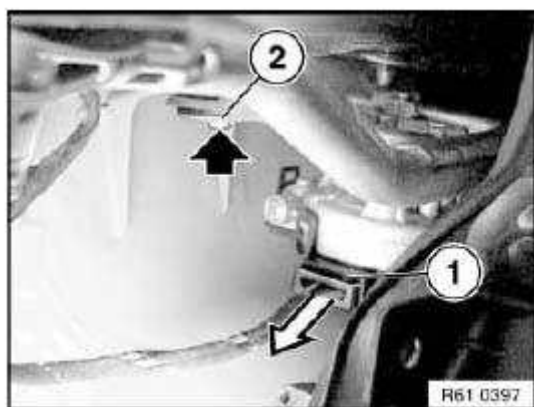


Fig. 223: Unfastening Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Fit rubber grommet (1) of wiper console on pin (2).

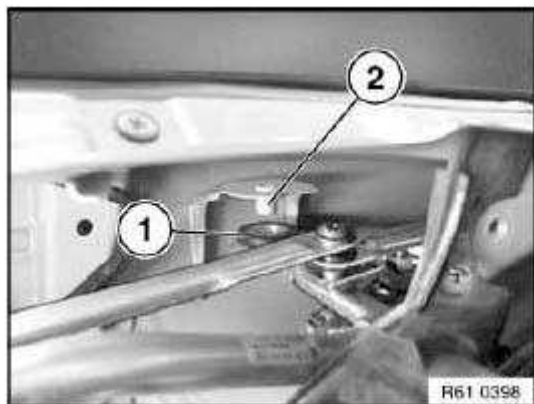


Fig. 224: Identifying Rubber Grommet Of Wiper Console On Pin
Courtesy of BMW OF NORTH AMERICA, INC.

Release nuts and feed out complete wiper console through opening in heater bulkhead.

Installation:

Observe tightening torque: 61 61 5AZ, see **61 61 WINDSHIELD WIPERS** .

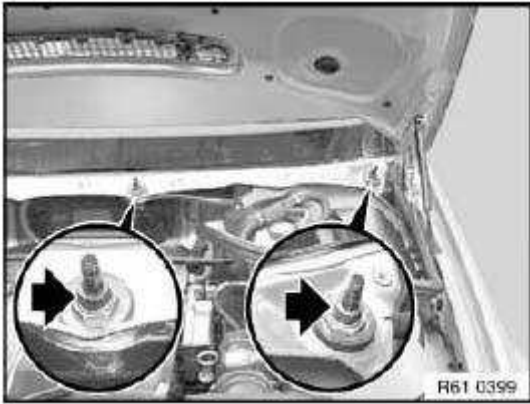
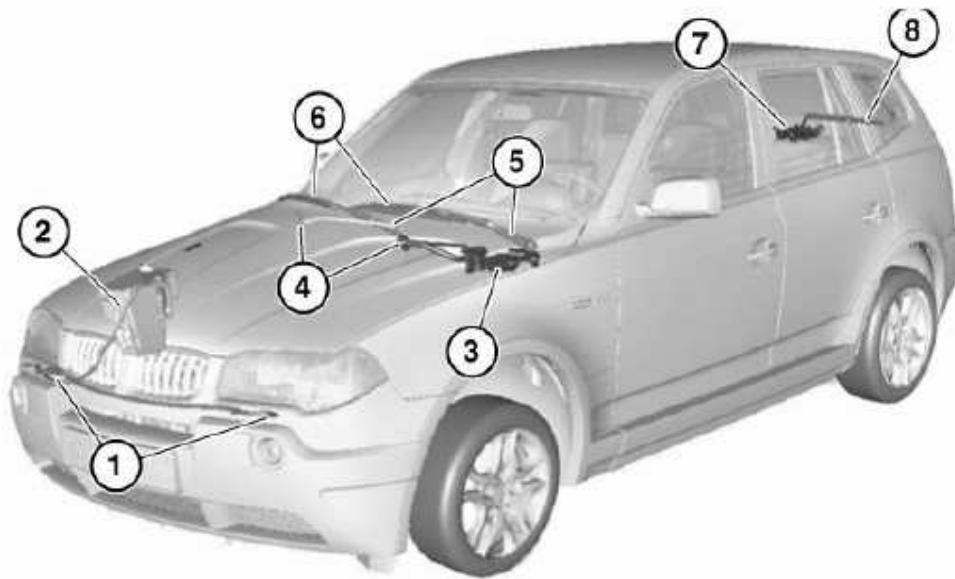


Fig. 225: Locating Wiper Console Nut
Courtesy of BMW OF NORTH AMERICA, INC.

62 REAR WINDOW WIPERS**61 61 .. OVERVIEW OF WINDSCREEN WIPER SYSTEM AND HEADLIGHT WASHER SYSTEM**



R51 1554

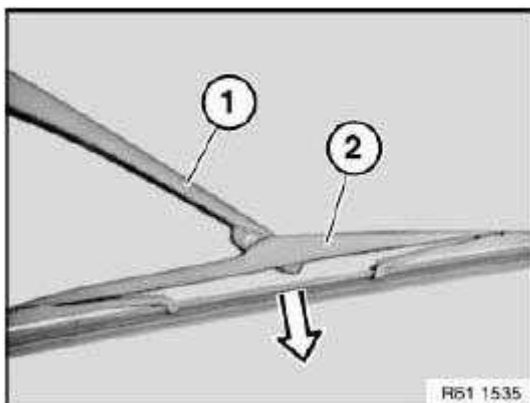
- | | | | |
|---|--|---|---|
| 1 | <u>Spray nozzles of headlight washer system</u> | 5 | <u>Windscreen wiper arms</u> |
| 2 | <u>Washer pumps, fluid reservoir for washer system</u> | 6 | <u>Wiper blades</u> |
| 3 | <u>Wiper bracket</u> | 7 | <u>Rear window wiper motor</u> |
| 4 | <u>Spray nozzles of windscreen washer system</u> | 8 | <u>Window wiper arm, window wiper blade</u> |

Fig. 226: Identifying Windscreen Wiper System And Headlight Washer System Components
 Courtesy of BMW OF NORTH AMERICA, INC.

61 62 020 REMOVING AND INSTALLING/REPLACING REAR WINDOW WIPER BLADE

Fold wiper arm (1) away from rear window.

Unclip wiper blade (2) in direction of arrow.



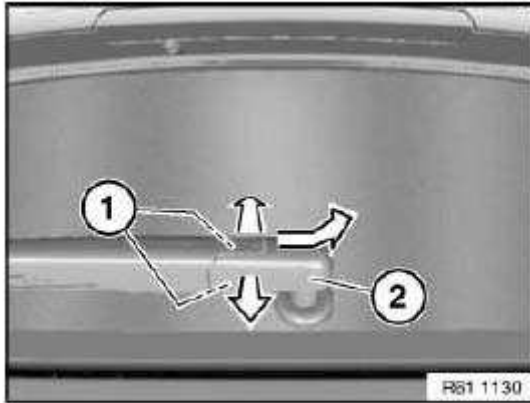
R51 1535

Fig. 227: Unclipping Wiper Blade

Courtesy of BMW OF NORTH AMERICA, INC.

61 62 030 REPLACING WIPER ARM FOR REAR WINDOW WIPER

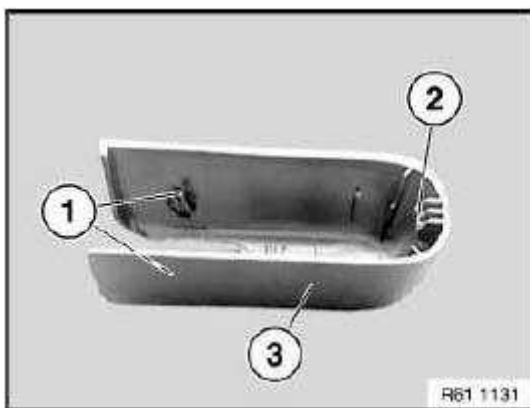
Pull internal locks (2) in direction of arrow and remove cover cap (1) as illustrated.

**Fig. 228: Pulling Internal Locks**

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Locks (1) and (2) of cover cap (3) must not be damaged.

**Fig. 229: Identifying Locks And Of Cover Cap**

Courtesy of BMW OF NORTH AMERICA, INC.

Set wiper arm (1) upwards.

Release nut (2) and remove wiper arm (1) in direction of arrow.

Installation:

Observe tightening torque: 61 61 5AZ, see **61 61 WINDSHIELD WIPERS** .

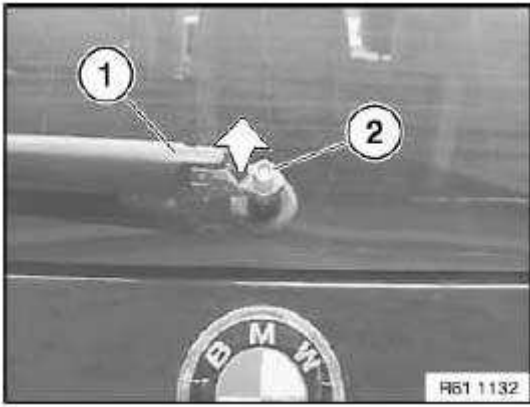


Fig. 230: Identifying Wiper Arm Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Rear window wiper motor must be in wiper rest position.

Adjust measurement (A) between wiper blade (1) and rear window edge (2).

Measurement (A): 29 mm.

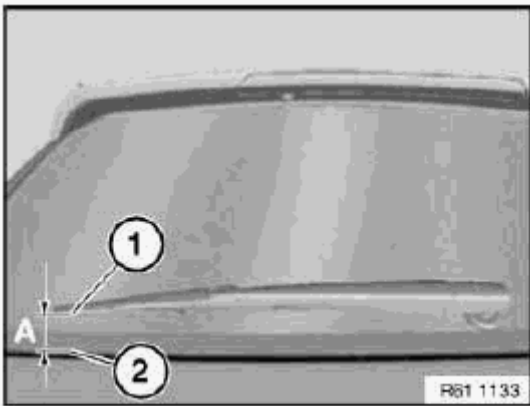


Fig. 231: Identifying Measurement Between Wiper Blade And Rear Window Edge
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 060 REMOVING AND INSTALLING/REPLACING REAR WINDOW WIPER MOTOR

Necessary preliminary tasks:

- Remove wiper arm for rear window, see **61 62 030 Replacing wiper arm for rear window wiper**
- Remove panel for rear lid, see **51 49 008 REMOVING AND INSTALLING/REPLACING PANEL**

FOR REAR LID .

Unfasten plug connections (1) and disconnect.

NOTE: **Secure rear window wiper motor (3) against falling out.**

Release screws (2).

Installation:

Tightening torque: 61 62 8AZ, see **61 62 TAILGATE WINDOW WIPER .**

Remove rear window wiper motor (3) in direction of arrow.

Installation:

Replace grommet (4) if necessary.

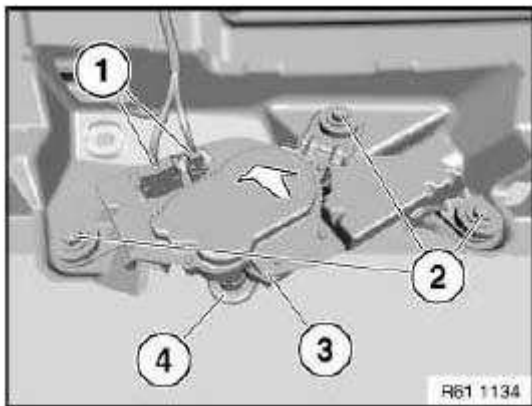


Fig. 232: Identifying Plug Connections And Rear Window Wiper Motor
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 100 ADJUSTING JET NOZZLE FOR REAR WINDOW WASHER UNIT

NOTE: **The spray must meet the contact point (1).**

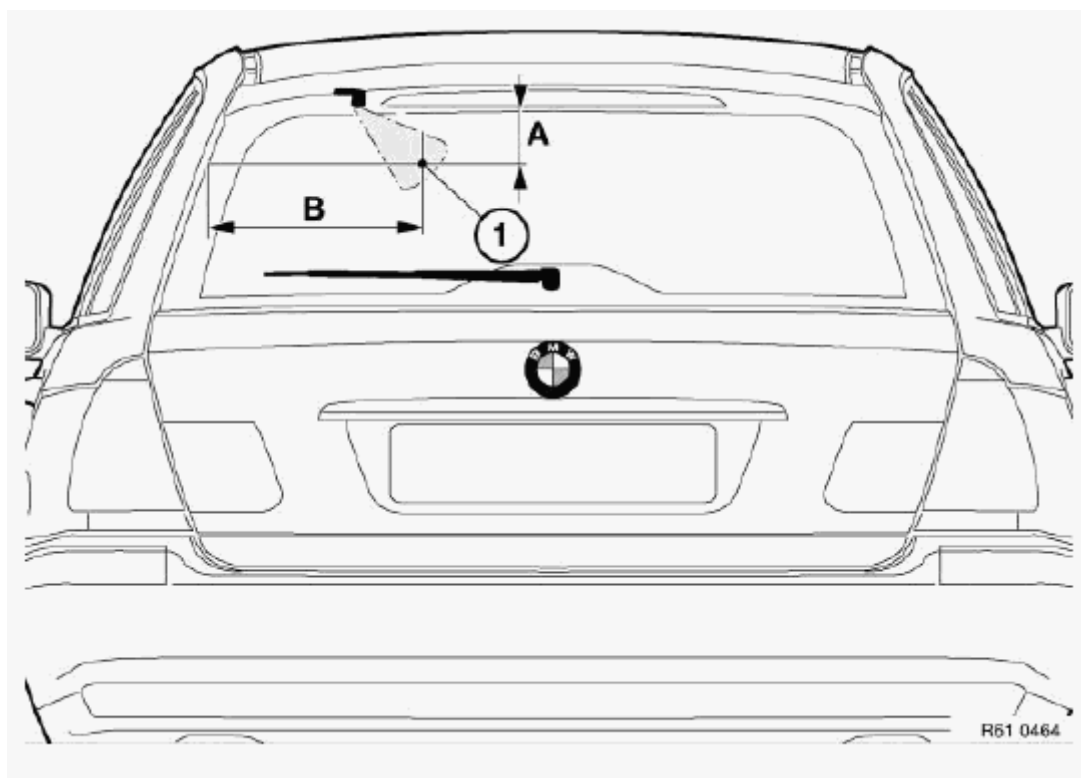


Fig. 233: Identifying Jet Nozzle For Rear Window Washer Unit Contact Point
 Courtesy of BMW OF NORTH AMERICA, INC.

Adjustment measurements:

MEASUREMENTS CHART

	Measurement A [mm]	Measurement B [mm]
E46 Touring	100	320
E53	100	450
E83	180	460

IMPORTANT: Do not insert any pointed objects in nozzle (risk of damage).

Mark contact point with crepe tape. Adjust jet nozzle with offset screwdriver (3.5 mm) in slot.

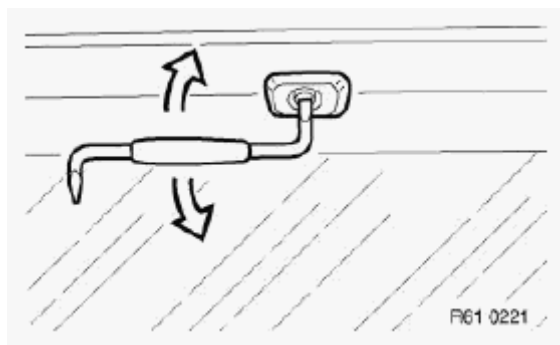


Fig. 234: Adjusting Jet Nozzle With Offset Screwdriver

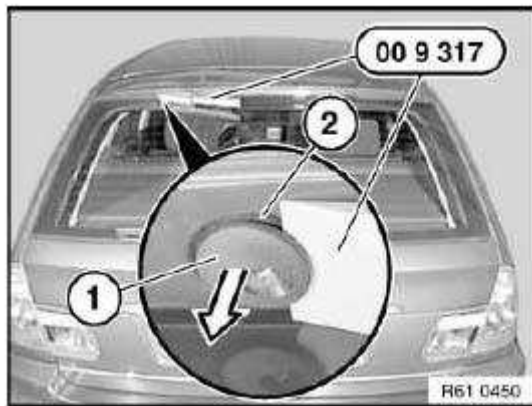
Courtesy of BMW OF NORTH AMERICA, INC.

61 62 110 REMOVING AND INSTALLING/REPLACING SPRAY NOZZLE FOR REAR WINDOW WIPER

Special tools required:

- 00 9 317 **00 9 310 ASSEMBLY WEDGES (SET IN PLASTIC CASE)**

Lever spray nozzle for rear window wiper (1) with special tool 00 9 317 out of spray nozzle holder (2).

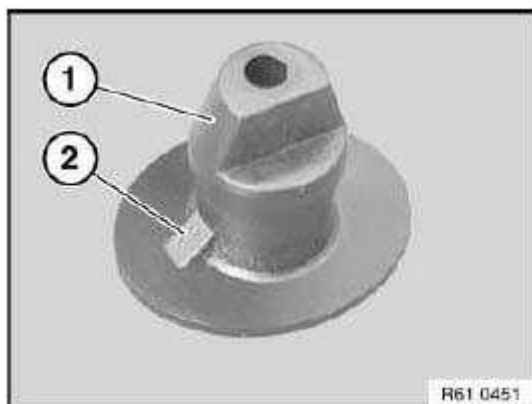
**Fig. 235: Identifying Special Tool (00 9 317)**

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure turning lock (2) of spray nozzle for rear window wiper (1) is correctly seated in spray nozzle holder.

Adjust spray nozzle, see **61 62 100 Adjusting jet nozzle for rear window washer unit**

**Fig. 236: Identifying Turning Lock Of Spray Nozzle**

Courtesy of BMW OF NORTH AMERICA, INC.

61 62 150 REMOVING AND INSTALLING/REPLACING WINDOW WASHER PUMP FOR REAR WINDOW WASHER SYSTEM

NOTE: Drain washer fluid reservoir.

Unfasten plug connection (1) and disconnect.

Detach hose (2) in direction of arrow from windshield washer pump (3).

If necessary, turn window washer pump (3) and pull in direction of arrow out of washer fluid reservoir (4).

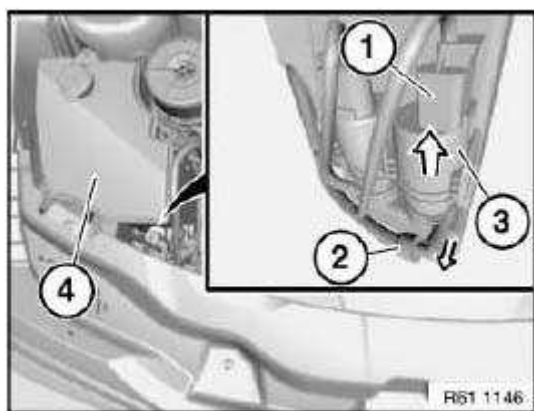


Fig. 237: Detaching Hose

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring of window washer pump.

Coat sealing ring of window washer pump with antiseize agent.

Ensure hose is laid without kinks.

Fill washer fluid reservoir.

61 62 170 REMOVING AND INSTALLING/REPLACING NONRETURN VALVE FOR REAR WINDOW WASHER SYSTEM

Necessary preliminary tasks:

- Remove rear spoiler, see **51 71 412 REMOVING AND INSTALLING REAR SPOILER** .

Detach hose (1) in direction of arrow from non-return valve (2).

Pull non-return valve (2) out of spray nozzle holder (3) and remove.

Installation:

Make sure hose (1) and non-return valve (2) are correctly seated.

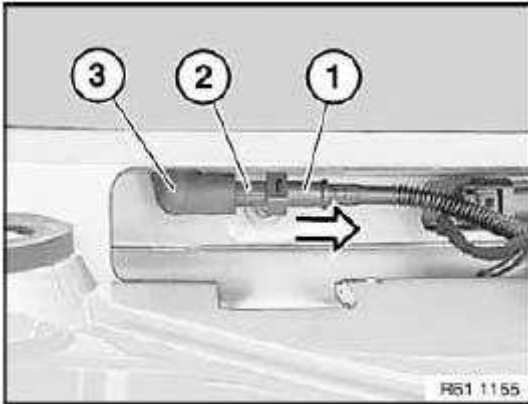
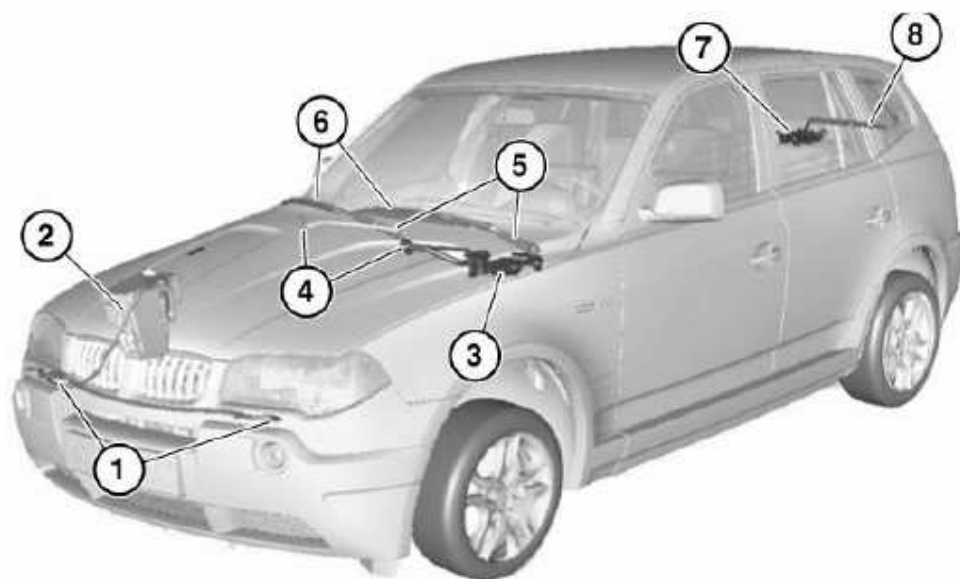


Fig. 238: Detaching Hose

Courtesy of BMW OF NORTH AMERICA, INC.

67 HEADLIGHT WASHER SYSTEM

61 61 .. OVERVIEW OF WINDSCREEN WIPER SYSTEM AND HEADLIGHT WASHER SYSTEM



R51 1554

- | | | | |
|---|---|---|--|
| 1 | Spray nozzles of headlight washer system | 5 | Windscreen wiper arms |
| 2 | Washer pumps, fluid reservoir for washer system | 6 | Wiper blades |
| 3 | Wiper bracket | 7 | Rear window wiper motor |
| 4 | Spray nozzles of windscreen washer system | 8 | Window wiper arm, window wiper blade |

Fig. 239: Identifying Windscreen Wiper System And Headlight Washer System Components
Courtesy of BMW OF NORTH AMERICA, INC.

61 67 010 REMOVING AND INSTALLING/REPLACING WASHER PUMP OF HEADLIGHT CLEANING SYSTEM

NOTE: Drain washer fluid tank.

Unfasten plug connection (1) and disconnect.

Press lock (2) and detach hose (3) from washer pump of headlight cleaning system (4).

Pull washer pump of headlight cleaning system (4) in direction of arrow out of washer fluid reservoir (5).

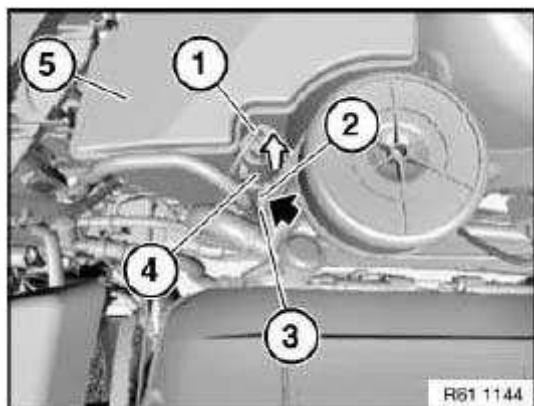


Fig. 240: Unfastening Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring/strainer of washer pump.

Coat sealing ring of washer pump with antiseize agent.

Ensure hose is laid without kinks.

Fill washer 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 67 045 REMOVING AND INSTALLING/REPLACING SPRAY NOZZLES FOR LEFT OR RIGHT HEADLIGHT CLEANING SYSTEM (UP TO 9/2006)

Necessary preliminary tasks:

- Remove front bumper trim, see **51 11 156 REMOVING AND INSTALLING/REPLACING FRONT BUMPER TRIM (M TECHNIC AERODYNAMIC KIT)**.

Press lock (1) and detach hose connection (2).

Pull out retainer (3) in direction of arrow.

Remove spray nozzle for headlight cleaning system (4) towards front.

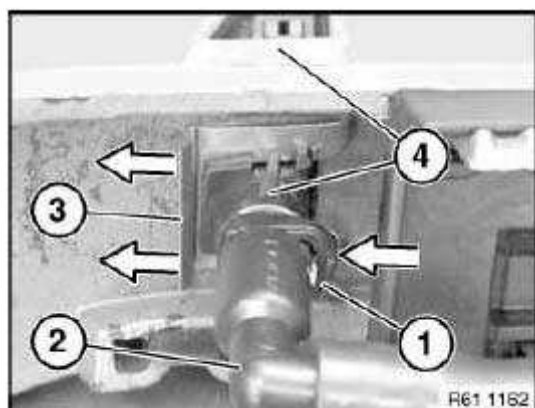


Fig. 241: Pulling Out Retainer

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Unclip spray nozzle (2) from trim (3).

Installation:

If necessary, replace backing (1).

Guides (5) of backing (1) must be located in openings of spray nozzle (2).

Catches (4) of trim (3) must not be damaged or missing.

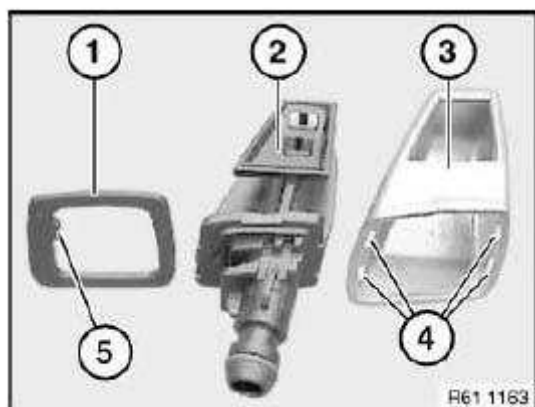


Fig. 242: Identifying Spray Nozzle From Trim

Courtesy of BMW OF NORTH AMERICA, INC.

61 67 045 REMOVING AND INSTALLING/REPLACING SPRAY NOZZLES OF HEADLIGHT WASHER SYSTEM ON LEFT OR RIGHT (FROM 09/2006)

- **13 3 010 HOSE CLIP**

Necessary preliminary tasks:

- Remove front bumper trim, see **51 11 156 REMOVING AND INSTALLING/REPLACING FRONT BUMPER TRIM (M TECHNIC AERODYNAMIC KIT)** .
- Remove cover for headlight washer system, see **1 11 ... REMOVING AND INSTALLING/REPLACING FRONT COVER FOR HEADLIGHT WASHER SYSTEM ON LEFT OR RIGHT (M TECHNIC AERODYNAMIC KIT)**

To prevent excess escape of washer fluid, seal off end of high - pressure line with special tool 13 3 010 .

Catch any escaping washer fluid if necessary.

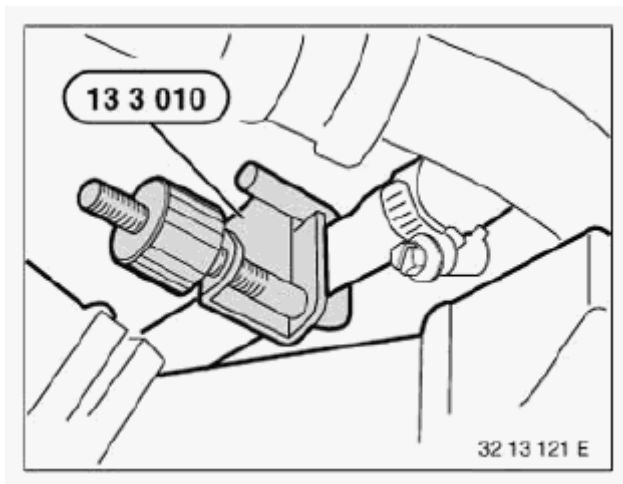


Fig. 243: Identifying Special Tool (13 3 010)
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug connection (1) and detach high-pressure line (2) from spray nozzle for headlight washer system (3). Release screws (5). Remove spray nozzle for headlight washer system (3) in direction of arrow from bumper trim (6).

Installation: Make sure guide (4) is correctly seated on bumper trim (6). Keep plug connection (1) of high-pressure line (2) and high-pressure nozzle (3) clean and free from grease.

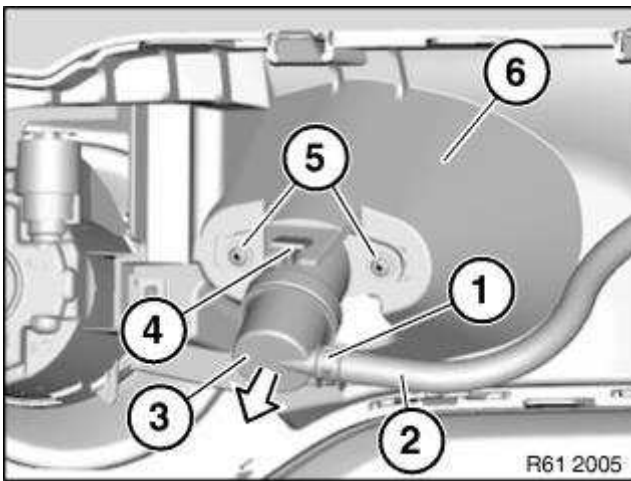


Fig. 244: Make Sure Guide (4) Is Correctly Seated On Bumper Trim (6)
Courtesy of BMW OF NORTH AMERICA, INC.

Make sure high-pressure line (2) is correctly engaged on spray nozzle (3). If necessary, top up washer fluid.

61 67 083 REMOVING AND INSTALLING/REPLACING HIGH - PRESSURE NOZZLE OF LEFT OR RIGHT HEADLIGHT WASHER SYSTEM (M AERODYNAMIC KIT)

Special tools required:

- **13 3 010 HOSE CLIP**

Necessary preliminary tasks:

- Remove cover for headlight washer system, see **1 11 ... REMOVING AND INSTALLING/REPLACING FRONT COVER FOR HEADLIGHT WASHER SYSTEM ON LEFT OR RIGHT (M TECHNIC AERODYNAMIC KIT)**
- Remove front bumper trim, see **51 11 156 REMOVING AND INSTALLING/REPLACING FRONT BUMPER TRIM (M TECHNIC AERODYNAMIC KIT)** .

To prevent excess escape of washer fluid, seal off end of high - pressure line with special tool 13 3 010 .

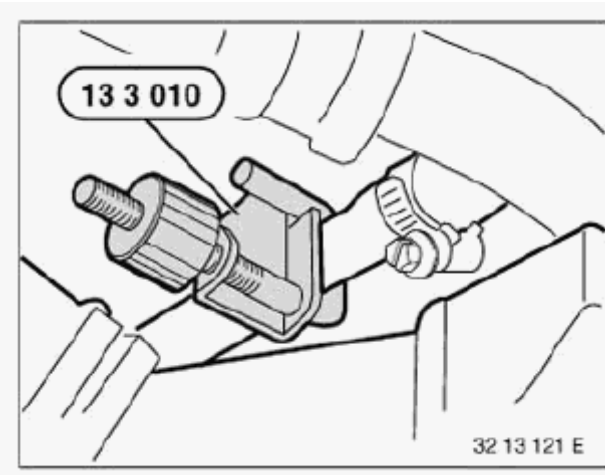


Fig. 245: Identifying Special Tool (13 3 010)
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock H.P. line (3) and detach from H.P. nozzle (1).

Release screws (2).

Remove H.P. nozzle (1).

Installation:

New spray nozzles are already preset.

Check function.

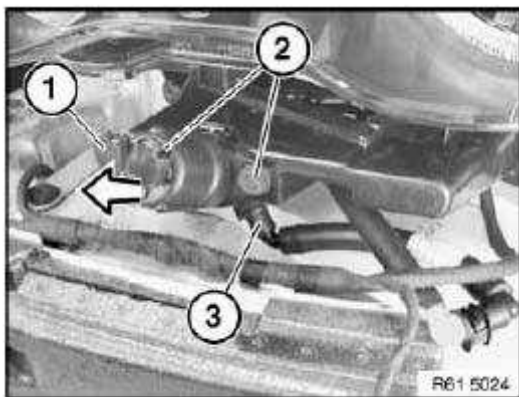
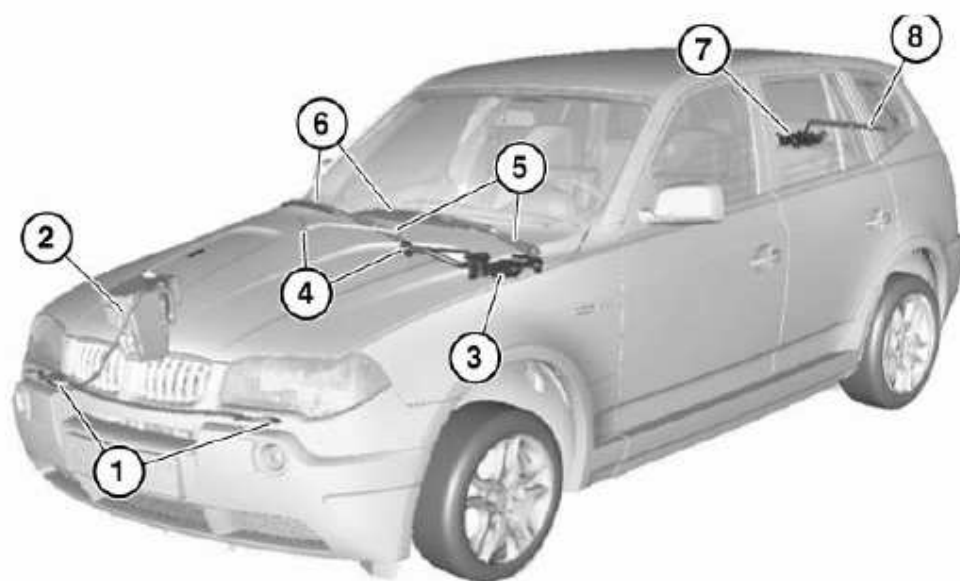


Fig. 246: Unlocking H.P. Line
 Courtesy of BMW OF NORTH AMERICA, INC.

71 WINDOW WASHER SYSTEM



R51 1554

- | | | | |
|---|---|---|--|
| 1 | Spray nozzles of headlight washer system | 5 | Windscreen wiper arms |
| 2 | Washer pumps, fluid reservoir for washer system | 6 | Wiper blades |
| 3 | Wiper bracket | 7 | Rear window wiper motor |
| 4 | Spray nozzles of windscreen washer system | 8 | Window wiper arm, window wiper blade |

Fig. 247: Identifying Windscreen Wiper System And Headlight Washer System Components
 Courtesy of BMW OF NORTH AMERICA, INC.

61 62 150 REMOVING AND INSTALLING/REPLACING WINDOW WASHER PUMP FOR REAR WINDOW WASHER SYSTEM

NOTE: Drain washer fluid reservoir.

Unfasten plug connection (1) and disconnect.

Detach hose (2) in direction of arrow from windshield washer pump (3).

If necessary, turn window washer pump (3) and pull in direction of arrow out of washer fluid reservoir (4).

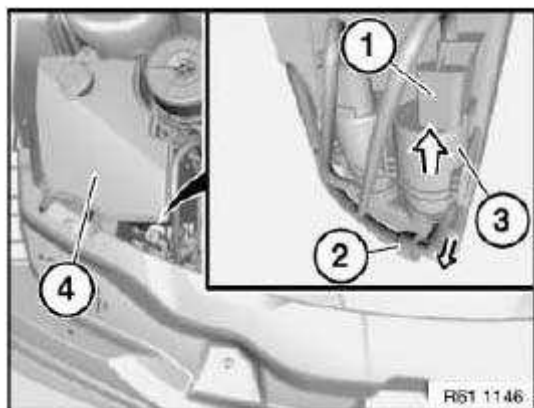


Fig. 248: Detaching Hose

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring of window washer pump.

Coat sealing ring of window washer pump with antiseize agent.

Ensure hose is laid without kinks.

Fill washer fluid reservoir.

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.

Lever out sealing plug (1) in direction of arrow.

Unclip, unlock and disconnect plug connection (2) behind.

Installation:

Make sure plug connection (2) is correctly seated in mounting (3).

Ensure correct installation position (mounting (3) at top) and correct seating of sealing plug (1).

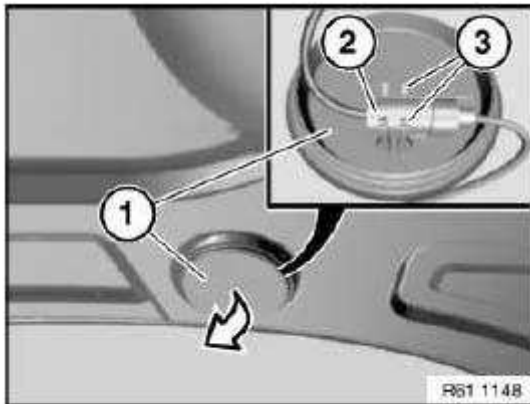


Fig. 249: Removing Sealing Plug

Courtesy of BMW OF NORTH AMERICA, INC.

Detach connector (1) in direction of arrow from nozzle of windshield washer system (2).

Unlock spray nozzle (2), press out through opening and remove.

Installation:

Make sure nozzle of windshield washer system (2) is correctly seated.

Ensure hose is laid without kinks.

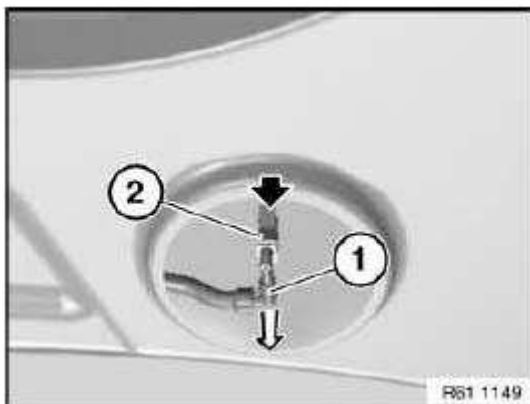


Fig. 250: Detaching Connector

Courtesy of BMW OF NORTH AMERICA, INC.

61 71 061 REPLACING FLUID RESERVOIR FOR WINDSHIELD WASHER SYSTEM

NOTE: Drain fluid tank for windshield washer system.

Necessary preliminary tasks:

- Pull out windshield washer pump (unlock and disconnect plug connection), see **61 71 100 Removing and installing/replacing windshield washer pump**
- Pull out window washer pump for rear window cleaning system (unlock and disconnect plug connection), see **61 62 150 Removing and installing/replacing window washer pump for rear window washer system**
- If necessary, pull out washer pump of headlight cleaning system (unlock and disconnect plug connection). See **61 67 010 Removing and installing/replacing washer pump of headlight cleaning system**

Unscrew bolt (1).

Unlock and disconnect level switch plug connection on windshield washer system (2).

If necessary, unclip hose (3).

Remove fluid reservoir for windshield washer system (4) in direction of arrow.

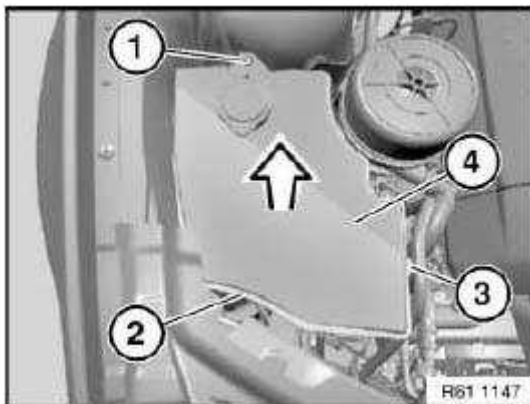


Fig. 251: Removing Fluid Reservoir For Windshield Washer System
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Feed guide (1) of fluid reservoir for windshield washer system (2) in direction of arrow into mountings (3).

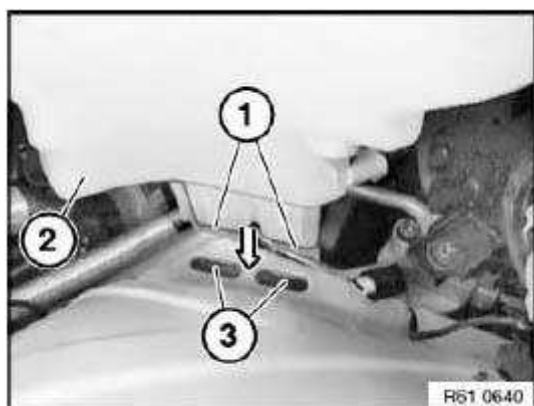


Fig. 252: Identifying Guide Of Fluid Reservoir
 Courtesy of BMW OF NORTH AMERICA, INC.

Turn level switch for windshield washer system (1) in direction of arrow, remove downwards from water reservoir for windshield washer system (2) and place to one side.

Remove cover and strainer from water reservoir for windshield washer system.

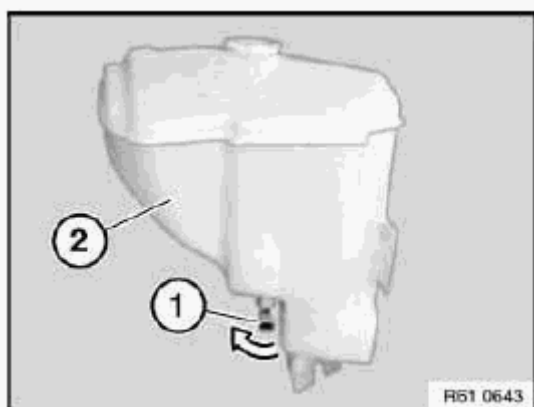


Fig. 253: Removing Cover And Strainer From Water Reservoir
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing rings/strainers on washer pumps.

Coat sealing rings of washer pump with anti-friction agent.

Make sure hoses are laid without kinks.

Fill fluid tank for windshield washer system.

NOTE: Drain washer fluid tank.

Unfasten plug connection (1) and disconnect.

Detach hose (2) in direction of arrow from windshield washer pump (3).

If necessary, turn window washer pump (3) and pull in direction of arrow out of washer fluid reservoir (4).

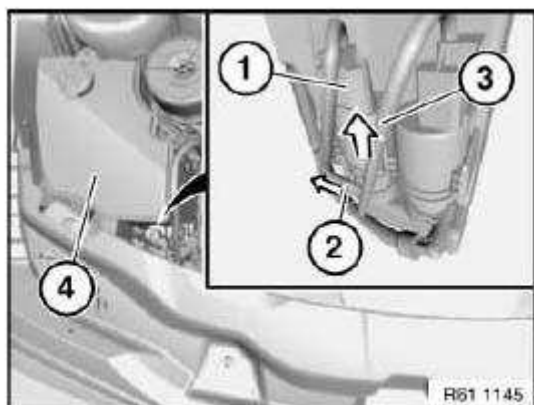


Fig. 254: Detaching Hose

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing ring of windshield washer pump.

Coat sealing ring of windshield washer pump with antiseize agent.

Ensure hose is laid without kinks.

Fill washer fluid reservoir.

ACCESSORIES AND EQUIPMENT**Electrical Drives - Repair Instructions - X3****11 CENTRAL LOCKING UNIT/UNLOCKING UNITS****67 11 510 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR FRONT LEFT OR RIGHT DOOR LOCKING MECHANISM**

NOTE: Servodrive for door locking mechanism is integrated in door lock in front door.

Procedure is described in the document **51 21 090 REMOVING AND INSTALLING/REPLACING DOOR LOCK IN LEFT OR RIGHT FRONT DOOR** .

67 11 530 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR REAR LEFT OR RIGHT DOOR LOCKING MECHANISM

This operation is described in:

51 22 090 REMOVING AND INSTALLING/REPLACING DOOR LOCK IN LEFT OR RIGHT REAR DOOR .

67 11 555 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR TANK FILLER FLAP

Necessary preliminary tasks:

- Remove Right Luggage Compartment Wheel Arch Trim, see **51 47 161 REMOVING AND INSTALLING/REPLACING RIGHT LUGGAGE COMPARTMENT WHEEL ARCH TRIM** .

Unclip emergency actuator (1) on emergency actuator pull strap (2).

Feed out emergency actuator pull strap (2) through opening (3).

Slacken screws (4) and feed servodrive for tank filler flap (5) towards rear out of retaining plate.

If necessary, carry out adjustment of servodrive for tank filler flap (5) via elongated holes of retaining plate. It must be possible to lock or unlock the fuel filler flap completely.

Disconnect associated plug connection and remove servodrive for tank filler flap (5).

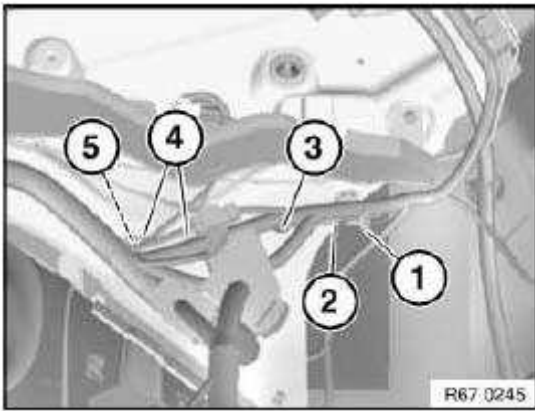


Fig. 1: Emergency Actuator And Strap
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert servodrive for tank filler flap (1) in direction of arrow into gaiter (2).

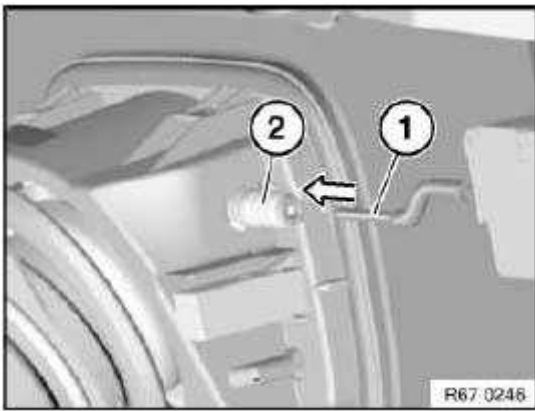


Fig. 2: Tank Filler Flap
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Unhook emergency actuator pull strap (1) from clip (2) and remove from locking pin (3) of servodrive for fuel filler flap (4).

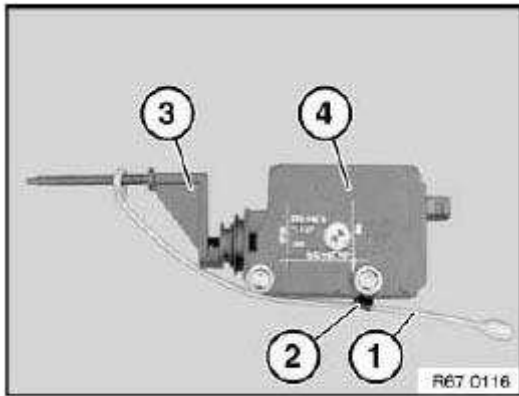


Fig. 3: Servodrive For Fuel Filler Flap

Courtesy of BMW OF NORTH AMERICA, INC.

67 11 560 REPLACING SERVODRIVE FOR REAR LID LOCK

This operation is described under:

51 24 105 REMOVING AND INSTALLING/REPLACING REAR LID LOCK (LOWER SECTION OF LOCK) .

13 MIRROR ADJUSTMENT

67 13 001 REPLACING DRIVE UNIT FOR ELECTRICALLY OPERATED LEFT OR RIGHT DOOR MIRROR

Necessary preliminary tasks:

- Remove Mirror Glass, see **51 16 026 REPLACING MIRROR GLASS .**

Release screws (1).

Fold out drive unit for electrically operated door mirror (2) in direction of arrow.

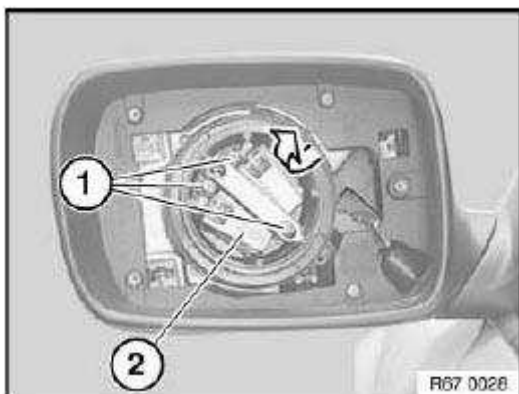


Fig. 4: Screws And Electrically Operated Door Mirror
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1) and remove drive unit for electrically operated door mirror (2).

IMPORTANT: In order to avoid ingress of water in non-sealed plug housing, coat plug housing (1) at cable and connection ends with battery terminal grease.

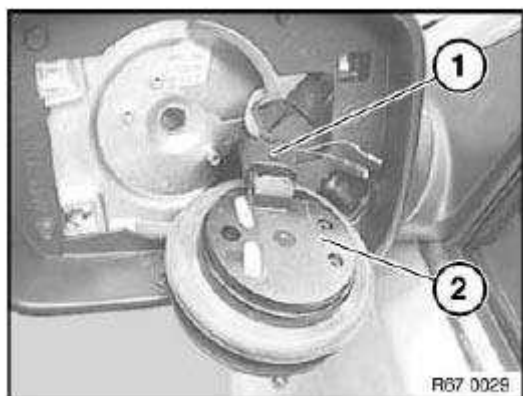


Fig. 5: Plug Connection And Electrically Operated Door Mirror
Courtesy of BMW OF NORTH AMERICA, INC.

67 13 005 REPLACING DRIVE UNIT FOR ELECTRICALLY ADJUSTABLE LEFT OR RIGHT DOOR MIRROR (WITH MEMORY)

Special tools required:

- **61 1 150 RELEASING TOOL KIT**

Necessary preliminary tasks:

- Remove Mirror Glass, see **51 16 026 REPLACING MIRROR GLASS** .
- Remove Mirror On Left Or Right Front Door, see **51 16 000 REMOVING AND INSTALLING/REPLACING MIRROR ON LEFT OR RIGHT FRONT DOOR** .

Release screws (1).

Remove drive unit for electrically adjustable door mirror (2) in direction of arrow.

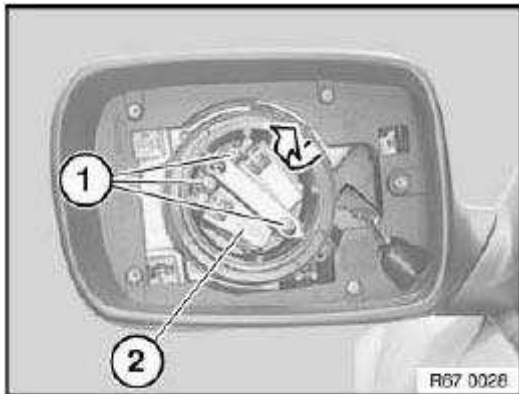


Fig. 6: Screws And Electrically Operated Door Mirror
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip cap (1) with a suitable tool.

Remove sound insulation (2) from mirror. Correctly disconnect cable plug (3) with special tool 61 1 150 .

Feed out cable (4).

Installation:

Make sure ribbon cable (4) is correctly routed. Cable must not be kinked!

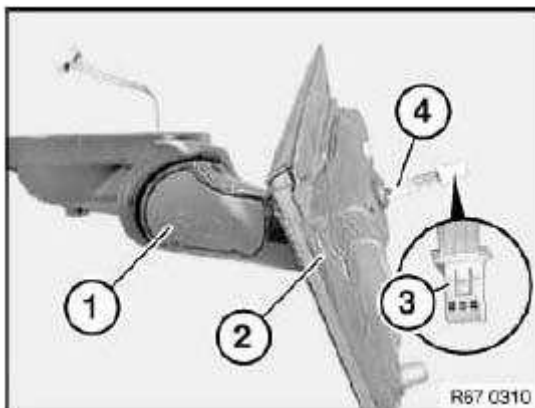


Fig. 7: Sound Insulation And Cable Plug
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Sound insulation (1) on mirror (2) must not be damaged.

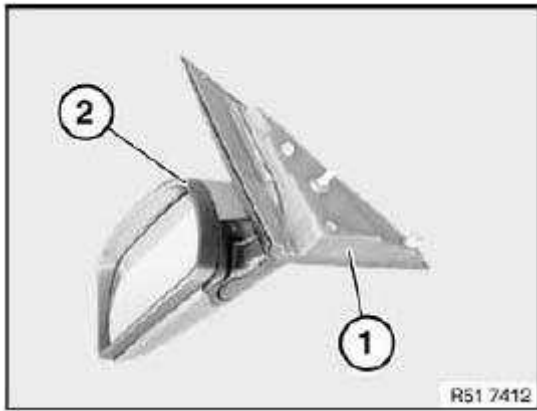


Fig. 8: Sound Insulation On Mirror

Courtesy of BMW OF NORTH AMERICA, INC.

31 DRIVE, SEAT ADJUSTMENT

67 31 501 REMOVING AND INSTALLING/REPLACING DRIVE FOR LONGITUDINAL SEAT ADJUSTMENT (FRONT SEAT REMOVED)

Disconnect plug connection (1).

Unclip plug housing (2) in direction of arrow from retaining fixture underneath.

NOTE: Secure drive for longitudinal seat adjustment (4) against falling out.

Release screws (3) and remove drive for longitudinal seat adjustment (4) in direction of arrow from flange (5).

If necessary, remove inner drive shaft from drive for longitudinal seat adjustment (4).

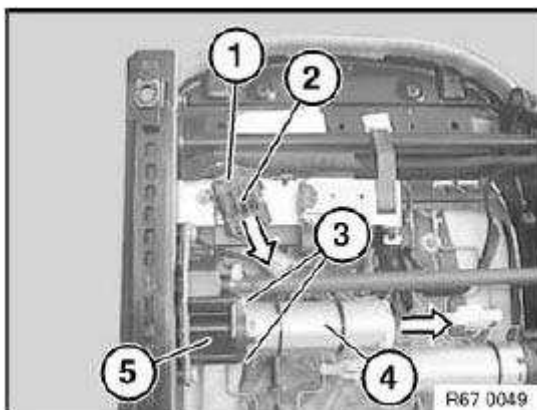


Fig. 9: Plug Housing

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure drive shaft (1) is correctly seated.

Make sure drive for longitudinal seat adjustment (2) is correctly seated on flange (3).

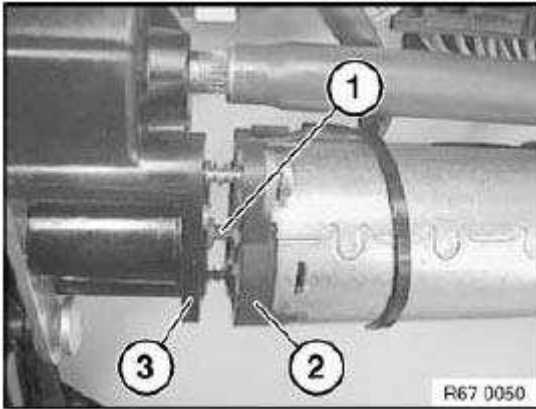


Fig. 10: Drive Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

67 31 511 REMOVING AND INSTALLING/REPLACING DRIVE FOR SEAT TILT ADJUSTMENT (FRONT SEAT REMOVED)

Disconnect plug connection (4).

NOTE: Secure drive for seat tilt adjustment (5) against falling out.

Loosen screws (1).

Remove drive for seat tilt adjustment (5) with fixture for plug connection (3) in direction of arrow from flange (2).

If necessary, remove inner drive shaft from drive for seat tilt adjustment (5).

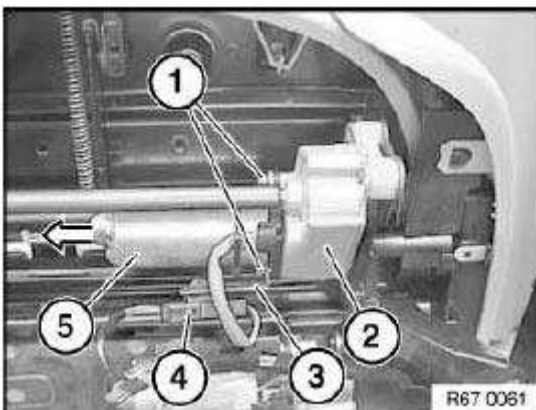


Fig. 11: Seat Tilt Adjustment

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure drive shaft (1) is correctly seated.

Ensure fixture for plug connection (3) and drive for seat tilt adjustment (4) on flange (2) are correctly seated.

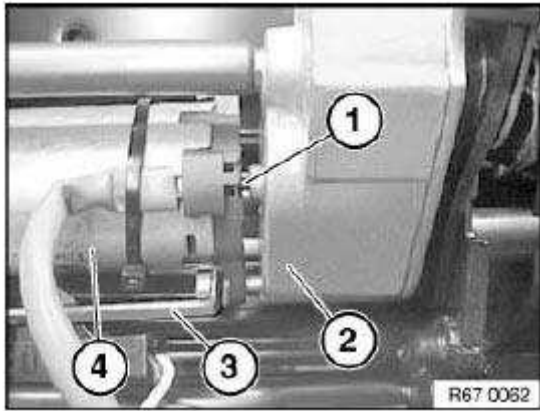


Fig. 12: Drive Shaft And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

67 31 521 REMOVING AND INSTALLING/REPLACING DRIVE FOR SEAT HEIGHT ADJUSTMENT (FRONT SEAT REMOVED)

Disconnect plug connection (2).

NOTE: **Secure drive for seat height adjustment (3) against falling out.**

Release screws (1).

Remove drive for seat height adjustment (3) with fixture for plug connection (4) in direction of arrow from flange (5).

If necessary, remove inner drive shaft from drive for seat height adjustment (3).

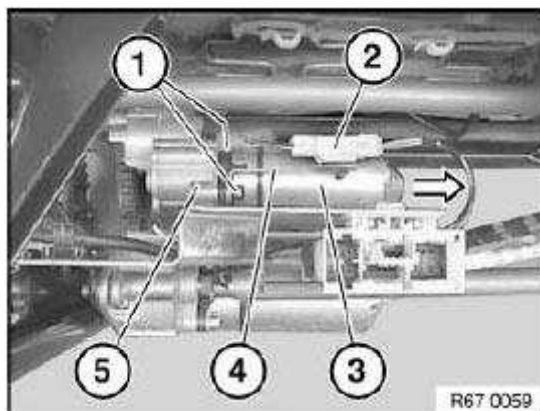


Fig. 13: Seat Height Adjustment And Inner Drive Shaft
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure drive shaft (1) is exactly seated.

Ensure fixture for plug connection (2) and drive for seat height adjustment (3) on flange (4) are correctly seated.

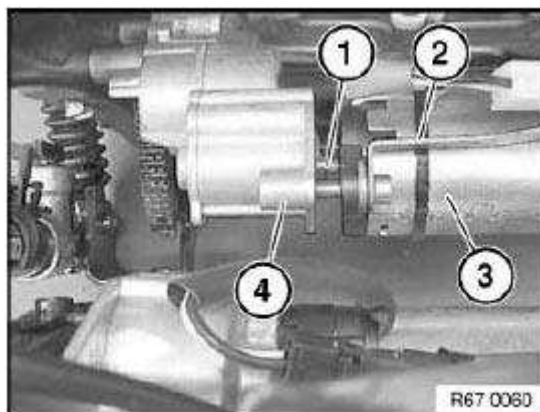


Fig. 14: Drive Shaft And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

67 31 531 REMOVING AND INSTALLING/REPLACING DRIVE FOR BACKREST ANGLE ADJUSTMENT (FRONT SEAT REMOVED)

Disconnect plug connection (1).

NOTE: **Secure drive for backrest angle adjustment (5) against falling out.**

Release screws (3).

Remove drive for backrest angle adjustment (5) with fixture for plug connection (2) in direction of arrow from

flange (4).

If necessary, remove inner drive shaft from drive for backrest angle adjustment (5).

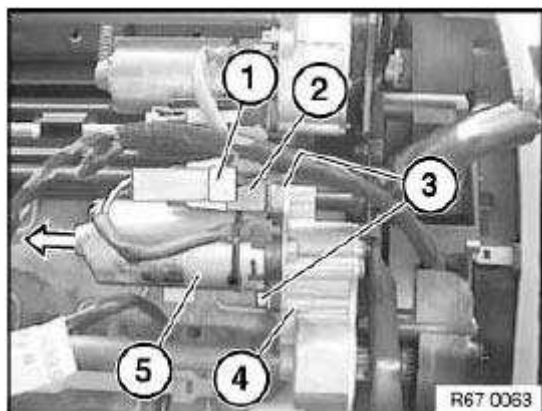


Fig. 15: Backrest Angle Adjustment

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Make sure drive shaft (1) is exactly seated.

Ensure fixture for plug connection (3) and drive for backrest angle adjustment (4) on flange (2) are correctly seated.

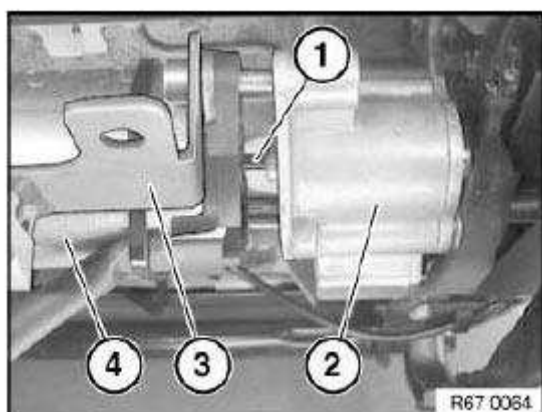


Fig. 16: Drive Shaft

Courtesy of BMW OF NORTH AMERICA, INC.

61 DRIVE, SLIDE-TILT SUNROOF/CONVERTIBLE TOP

67 61 515 REPLACING DRIVE WITH GEAR (FRONT) FOR ACTUATING SLIDE/TILT SUNROOF (PANORAMA GLASS SUNROOF)

Necessary preliminary tasks:

- **E53:** Remove mounting bracket from roofliner at front.
- **E83:** Remove Front Roofliner Trim, see 51 44 ... REMOVING AND INSTALLING FRONT ROOFLINER TRIM .

NOTE: **Secure drive with gear for actuating slide/tilt sunroof (2) against falling out.**

Release screws (1), tightening torque: 1AZ, see 54 13 ELECTRIC SUN ROOF COMPONENTS .

Lower drive with gear for actuating slide/tilt sunroof (2).

NOTE: **Screws (1) are microencapsulated.**

Unlock plug connection (3), disconnect and remove drive with gear for actuating slide/tilt sunroof (2).

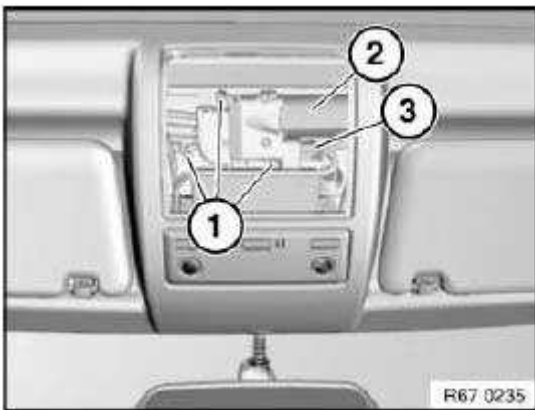


Fig. 17: Screws And Actuating Slide/Tilt Sunroof
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert gear wheel (1) of drive with gear for actuating slide/tilt sunroof (2) exactly in gear teeth (3).

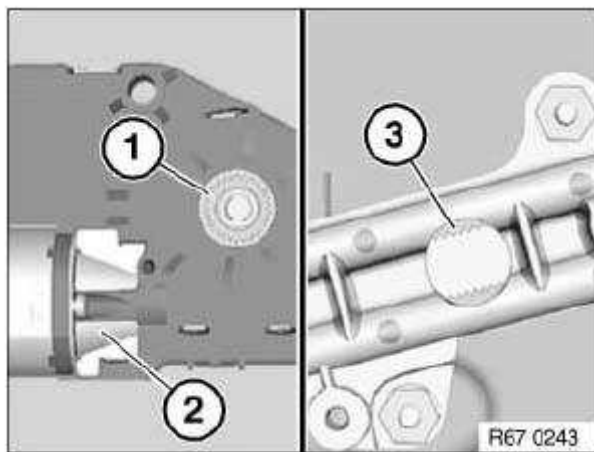


Fig. 18: Gear Wheel And Gear Teeth
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialize Panorama Glass Roof, see **54 0 ... NOTES ON PANORAMA GLASS ROOF (INITIALIZATION/NORMALIZATION/LEARNING OF CHARACTERISTIC CURVE)** .

67 61 517 REPLACING DRIVE WITH GEAR (REAR) FOR ACTUATING SLIDE/TILT SUNROOF

Necessary preliminary tasks:

- Remove rear grab handles, see **51 16 450 REMOVING AND INSTALLING/REPLACING REAR LEFT/RIGHT GRAB HANDLE** .
- Remove trim for rear left and right roof pillar (C-pillar), see **51 43 251 REMOVING AND INSTALLING/REPLACING TRIM PANEL FOR REAR LEFT OR RIGHT ROOF PILLAR (C - PILLAR)** .
- Remove trim for rear left and right roof pillar (D-pillar), see **51 43 252 REPLACING TRIM PANEL FOR REAR LEFT OR RIGHT ROOF PILLAR (D-PILLAR)** .
- Remove left and right interior lights, see **63 31 015 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT INTERIOR LIGHT (SIDE ROOFLINER)** .
- Detach mocket in area of roofliner

IMPORTANT: Do not under any circumstance kink roofliner (1).

Unclip roofliner (1) at retaining point (2) towards bottom and lower.

NOTE: Secure drive with gear for actuating slide/tilt sunroof (4) against falling out.

Release screws (3), tightening torque: 1AZ, see **54 13 ELECTRIC SUN ROOF COMPONENTS** .

Lower drive with gear for actuating slide/tilt sunroof (4).

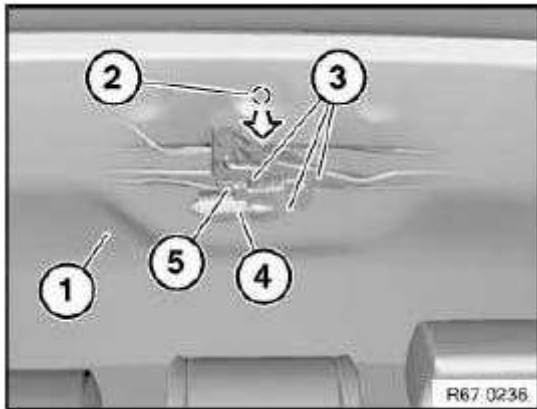


Fig. 19: Roofliner And Actuating Slide/Tilt Sunroof
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Screws (3) are microencapsulated.

Unlock plug connection (5), disconnect and remove drive with gear for actuating slide/tilt sunroof (4).

Installation:

Insert gear wheel (1) of drive with gear for actuating slide/tilt sunroof (2) exactly in gear teeth (3).

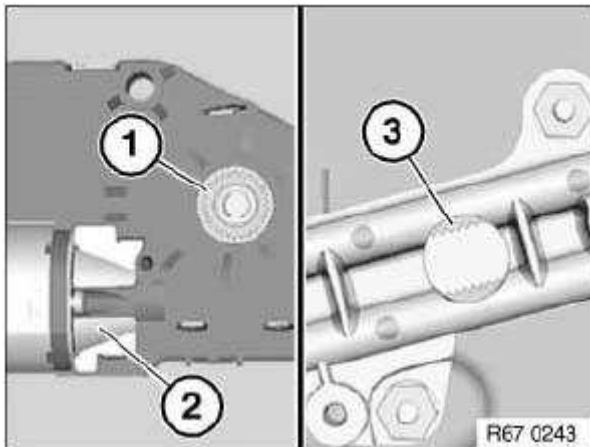


Fig. 20: Gear Wheel And Gear Teeth
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Initialize Panorama Glass Roof, see **54 0 ... NOTES ON PANORAMA GLASS ROOF (INITIALIZATION/NORMALIZATION/LEARNING OF CHARACTERISTIC CURVE)**.

62 DRIVE, WINDOW REGULATOR

67 62 000 REMOVING AND INSTALLING / REPLACING FLAT MOTOR FOR FRONT LEFT OR RIGHT POWER WINDOW UNIT**Special tools required:**

- **00 9 310 ASSEMBLY WEDGES (SET IN PLASTIC CASE)**

Necessary preliminary tasks:

- Detach sound insulation on front door in working area, see **51 48 060 REMOVING AND INSTALLING/REPLACING SOUND INSULATION IN LEFT OR RIGHT FRONT DOOR** .

NOTE: For clearer illustration, shown with sound insulation removed.

Disconnect plug connection (1).

Unfasten screws (2).

Detach flat motor (3) in direction of arrow from power window unit (4) and remove.

IMPORTANT: If necessary, use special tool 00 9 310 to release flat motor (3) from power window unit (4).

Guide wheel must not be pulled out of power window unit (4).

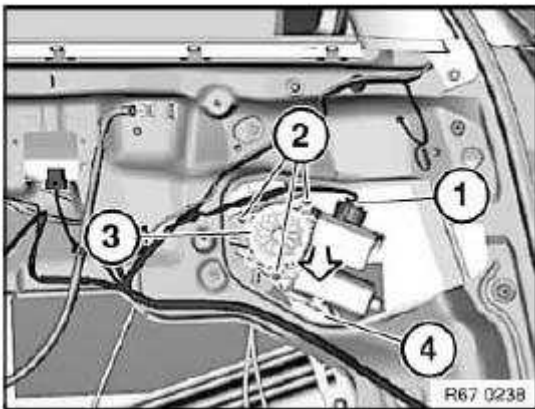


Fig. 21: Screws And Flat Motor

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Fit flat motor (3) exactly on teeth of power window unit.

Replacement:

A normalization must be carried out in order to activate anti - trapping protection.

Operating sequence for normalization:

- Open corresponding window completely.
- Operate corresponding power window switch in "Close" position (second switch stage).
- Once the upper end position has been reached, hold power window switch down for approx. 1 second more.

Normalization is thus completed.

NOTE: Carry out function check (one-touch function, anti-trapping protection and, if necessary, comfort function).

67 62 020 REMOVING AND INSTALLING/REPLACING FLAT MOTOR FOR REAR LEFT OR RIGHT POWER WINDOW UNIT

Necessary preliminary tasks:

- Detach sound insulation on rear door in working area, see **51 48 070 REMOVING AND INSTALLING/REPLACING SOUND INSULATION ON LEFT OR RIGHT REAR DOOR** .

NOTE: For clearer illustration, shown with sound insulation removed.

Unfasten plug connection (1) and disconnect.

Release screws (2).

Detach flat motor for power window unit (3) in direction of arrow from power window unit (4) and remove.

Installation:

Fit flat motor for power window unit (3) exactly on teeth of power window unit.

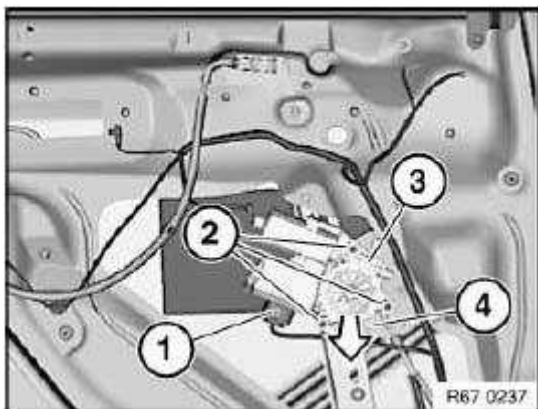


Fig. 22: Screws And Flat Motor

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

A normalization must be carried out in order to activate anti - trapping protection.

Operating sequence for normalization:

- Open corresponding window completely.
- Operate corresponding power window switch in "Close" position (second switch stage).
- Once the upper end position has been reached, hold power window switch down for approx. 1 second more.

Normalization is thus completed.

NOTE: Carry out function check (one-touch function, anti-trapping protection and, if necessary, comfort function).

66 DRIVE, SEAT ADJUSTMENT

67 66 010 REMOVING AND INSTALLING/REPLACING LUMBAR SUPPORT DRIVE MECHANISM ON FRONT SEAT, LEFT OR RIGHT

Necessary preliminary tasks:

- Remove rear panel on front seat backrest, see **52 13 198 REMOVING AND INSTALLING / REPLACING REAR PANEL ON LEFT OR RIGHT FRONT SEAT BACKREST (NORMAL/MANUAL)** .

E53 comfort seat:

- Remove rear panel at bottom.

Detach backrest cover (1) in direction of arrow from backrest frame (2).

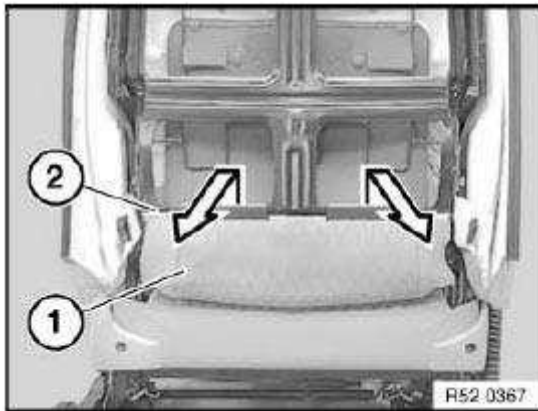


Fig. 23: Backrest Cover And Backrest Frame
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Detach transparent hose (2) from valve housing (3).

NOTE: If necessary, gently heat transparent hose (2) if firmly seated.

If necessary, detach fabric adhesive tape (4).

Detach drive unit for lumbar support (5) with jacket in direction of arrow.

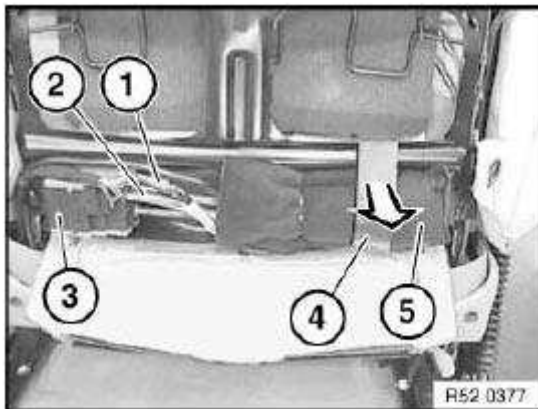


Fig. 24: Transparent Hose And Valve Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Clean adhesive area (1) on backrest frame (2).

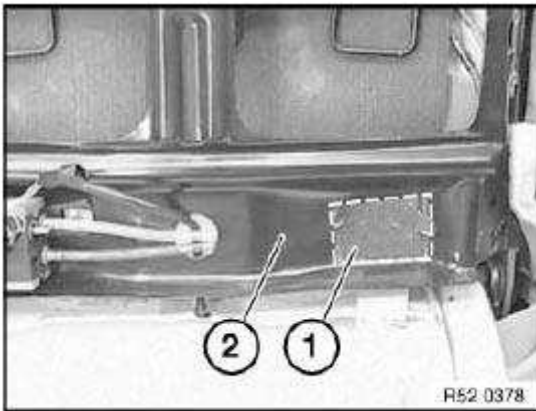


Fig. 25: Adhesive Area On Backrest Frame

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Transparent hose (1) of drive unit for lumbar support must not be kinked.

Pull off protective film (3) from jacket (2). Stick drive unit for lumbar support to backrest frame.

If necessary, secure jacket (2) with cable strap.

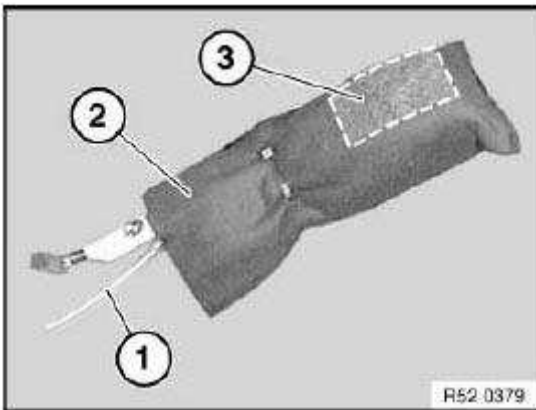


Fig. 26: Transparent Hose And Protective Film

Courtesy of BMW OF NORTH AMERICA, INC.

2007 BMW X3

ACCESSORIES AND EQUIPMENT Electrical Drives - Tightening Torques - X3

ACCESSORIES AND EQUIPMENT

Electrical Drives - Tightening Torques - X3

62 DRIVE, WINDOW REGULATOR

67 62 DRIVES, POWER WINDOWS

DRIVES, POWER WINDOWS TIGHTENING TORQUES

	Type	Thread	Tightening specification	Measure
1AZ Motor to window regulator	E46, E85, E86, E93			4.5 Nm
	E31, E36, E65, E66			5 Nm
	E81, E83			3 Nm
	E60, E61, E63, E64, E87, E90, E91, E92			6 Nm
	E70		Observe screwing sequence	6 Nm

ELECTRICAL**Electrical System - Operating Fluids****1.0 BATTERY**

Only distilled water (available locally) is to be used when topping up the electrolyte level.

If a new battery (delivered dry) is to be placed into service, use only battery electrolyte ("sulfuric acid"), available locally.

2.0 SEALANT/SUPER GLUE/CONTACT CLEANER**Sealant**

Aftermarket accessory installations which require routing electrical wires through metal body panels are to have the access holes sealed.

(former BMW Part No. 81 22 9 400 013)

BMW PART NUMBER SPECIFICATION

Würth	Part No. 893430
-------	-----------------

SUPER GLUE

The rubber seal around the trunk release button of E39 vehicles can be repositioned with Würth Rubberized Super Glue (Part No. 893 4103).

3.0 ELECTRICAL CONTACT ENHANCER AND CONTACT CLEANER**ELECTRICAL CONTACT/CONNECTOR GREASE**

NyoGel 760G is resistive to moisture and can be used for a lubrication of tin-lead type electrical connectors.

NyoGel 760G BMW Part No. 83 23 0 392 297

ELECTRICAL CONTACT ENHANCER

Stabilant 22A evaporates and leaves a thin polymer film which is conductive between the mating surfaces, while staying non-conductive between adjacent pins. At the same time it prevents the formation of any further harmful deposits.

BMW PART NUMBER SPECIFICATION

Würth	Part No. 893622 (Stabilant 22A)
-------	---------------------------------

2007 BMW X3

ELECTRICAL Electrical System - Operating Fluids

NOTE: **1 : Stabilant 22A must not be used on Oxygen Sensor connectors. To function, oxygen sensors require a flow of oxygen through the terminal connector to the sensor element. Stabilant 22A will affect this flow of oxygen, and will result in irreparable damage to the sensor.**

NOTE: **2 : Stabilant 22A must not be used on plug connectors which carry fiber optics. Stabilant 22A may migrate to the fiber optic and attenuate the optical signal.**

CONTACT CLEANER SPRAY

Use to clean electrical and electronic components of dirt, grease, etc. Will not harm components or epoxy coverings. Allow to air dry. **Do not** dry with shop air supply as this may contaminate the connector.

BMW PART NUMBER SPECIFICATION

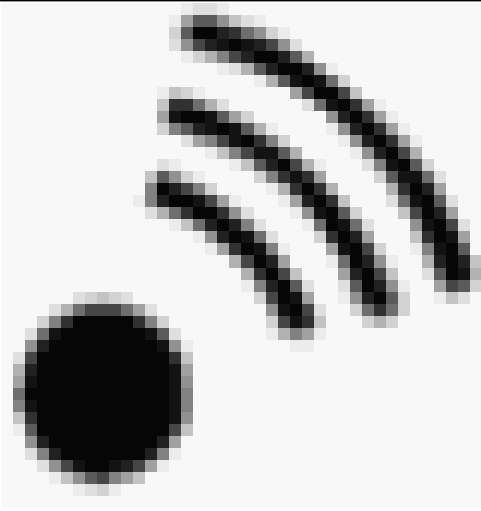
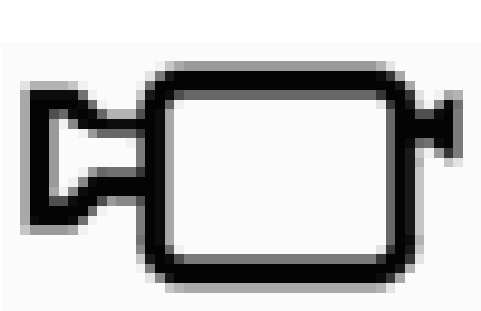
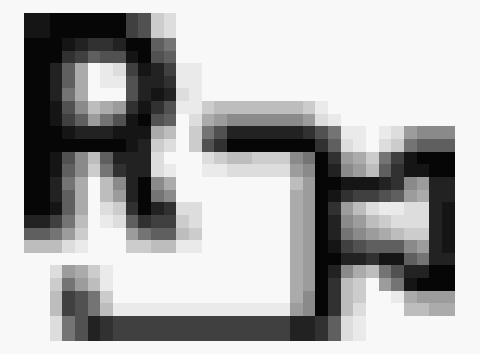
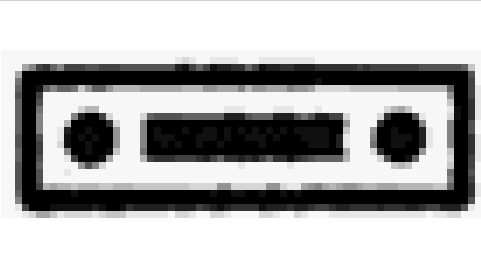
Wurth	Part No. 89365 (Zero Residue Electrical Contact Cleaner)
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ELECTRICAL

Fuse Assignment Symbol Definitions - BMW

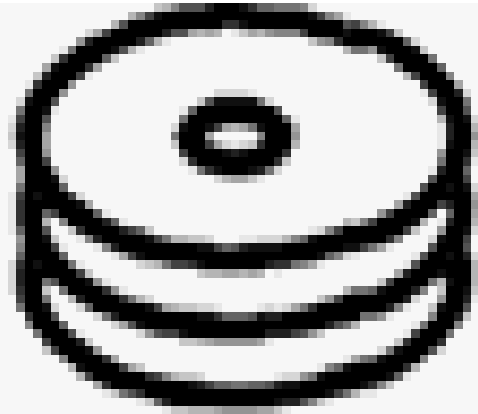
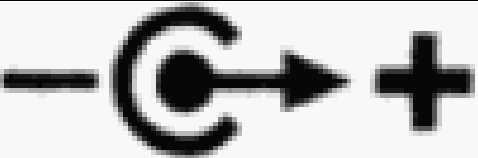
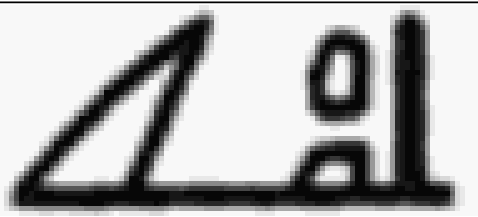
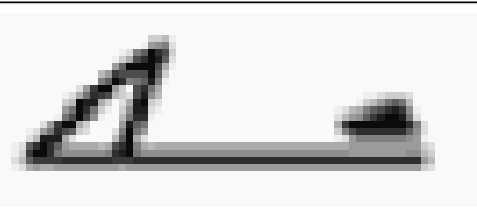
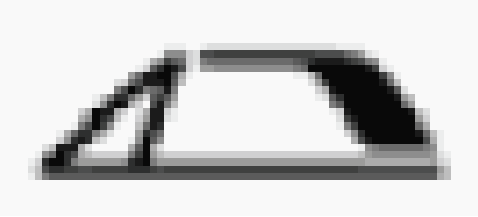
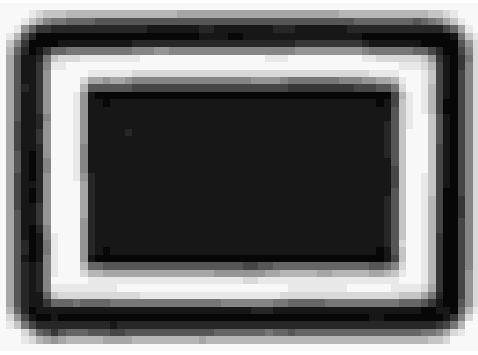
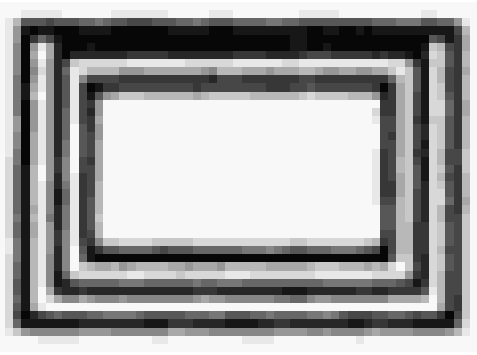
FUSE SYMBOLS

Fuse Assignment Symbol Definitions

System	Symbols (Including Variations)	
Accessories		
Alarm System		
Camera System/ (Rear View/Side View)		
CD/Radio		

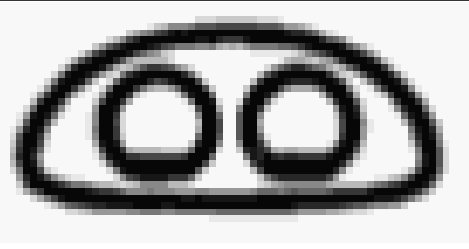
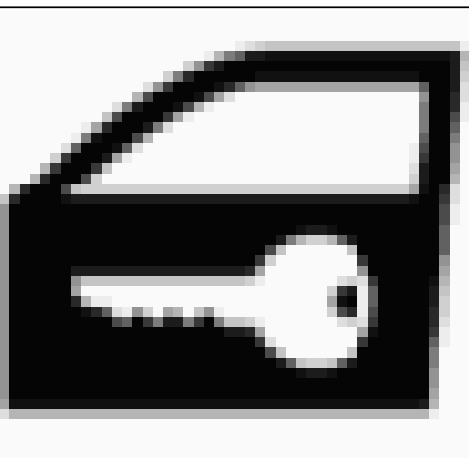
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

CD Changer		
Cigarette Lighter/ Accessory Socket		
Convertible Top (Down)		
Convertible Top (Up)		
Display (On-Board Monitor)		
Horn		

2007 BMW X3

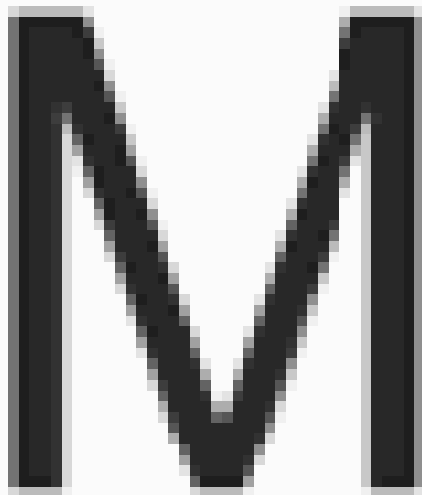
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

		
Instrument Cluster		
Door Module		
Locking System		

2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

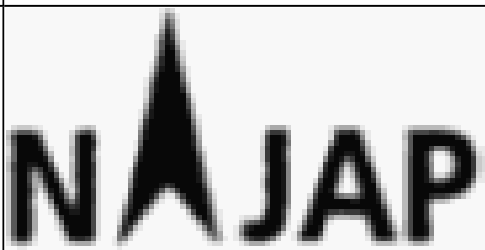
Memory
(Seat, Mirror, Steering
Wheel)



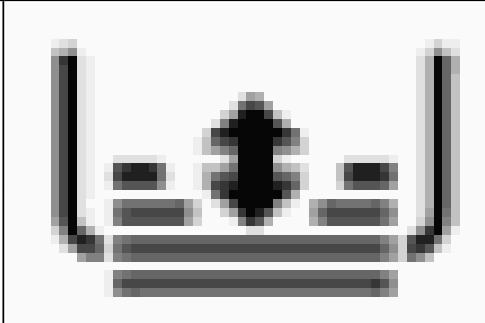
Mirror (Side)



Navigation System



Roller Sun Blind



2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Seat (Adjust)



Seat (Passenger Adjust)/
Gentleman Function



Seat (Heated)



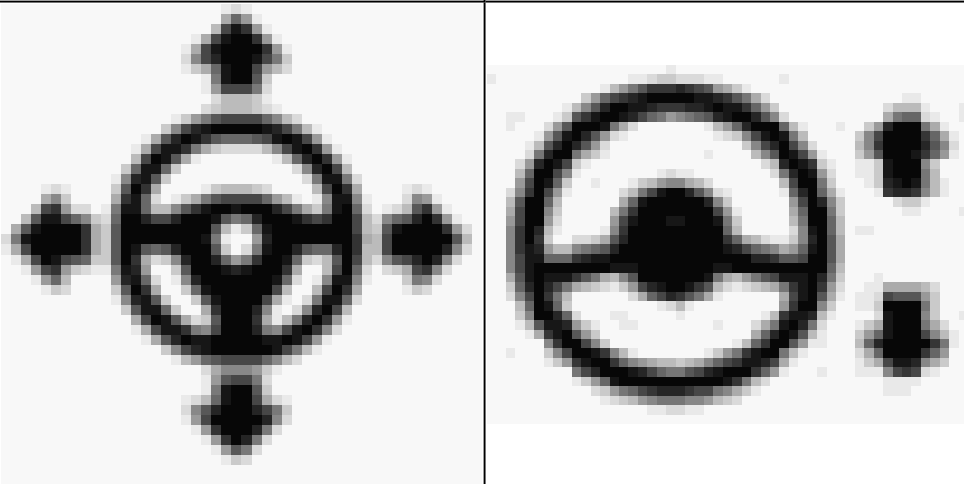
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

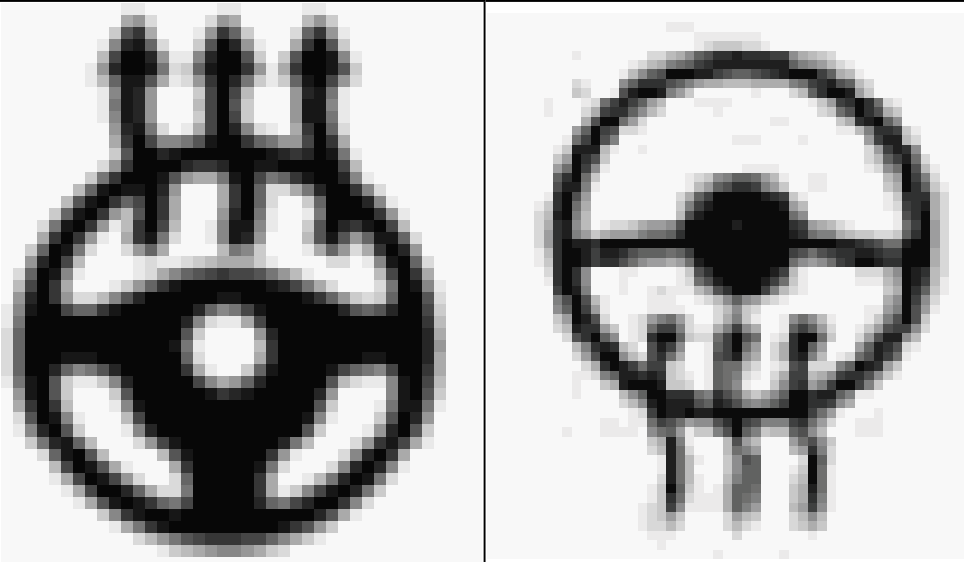
Seat (Active)



Steering Wheel (Adjust)



Steering Wheel (Heated)



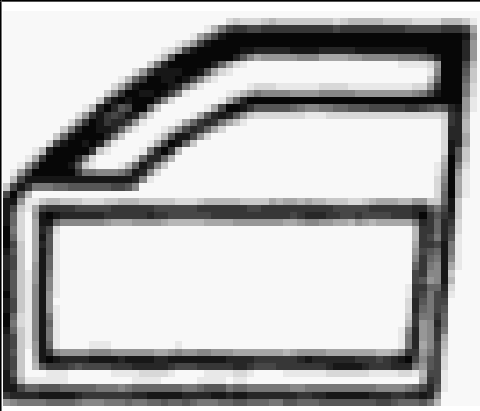
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

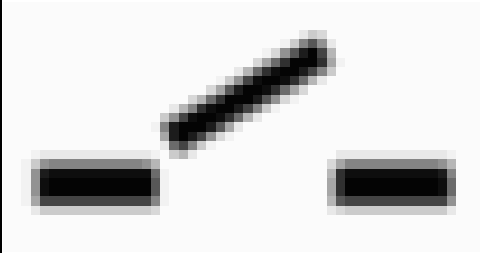
Telephone



Window (Up/Down)

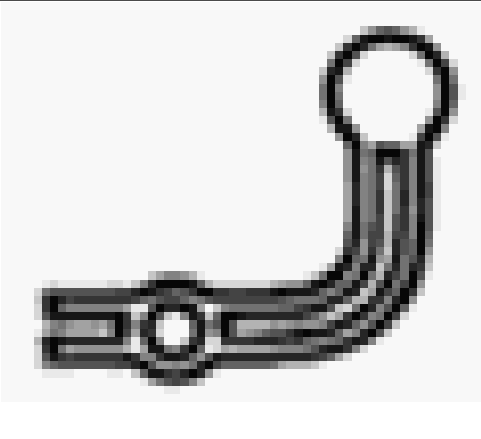


Sunroof (Powered)



2007 BMW X3

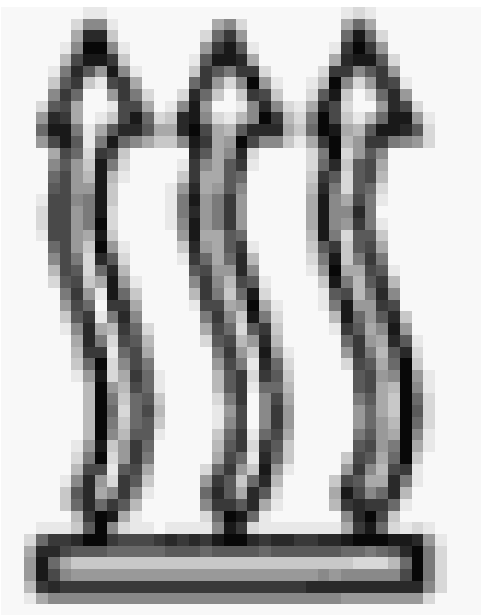
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

		
Rear Hatch/Trunk		
Trailer/Tow		
A/C & Heating		

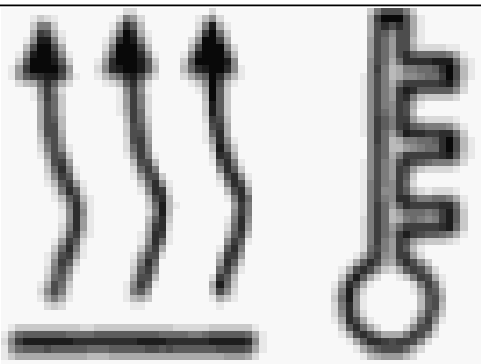
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Heater
(Heated seats on older
models)



Heater
(Auxillary/Independent)



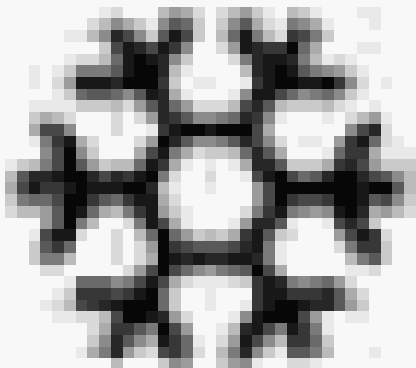
Heater (Fuel Burning)



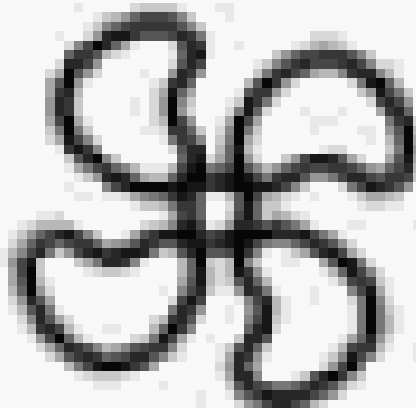
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

A/C Cooling



A/C-Heater Blower



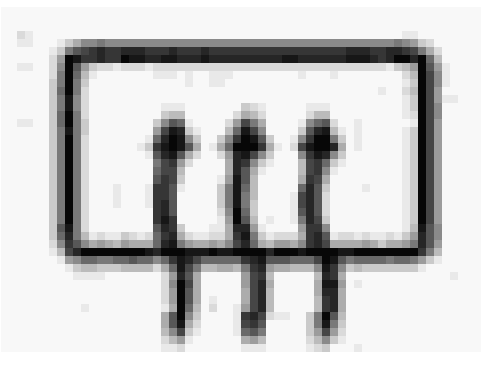
Window Defroster



Window Defroster (Rear)/
Heated Rear Window

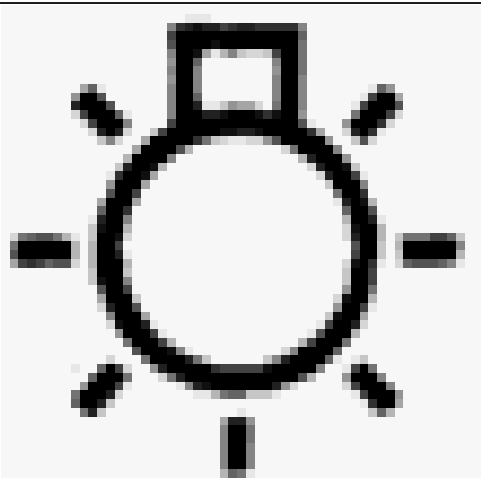
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

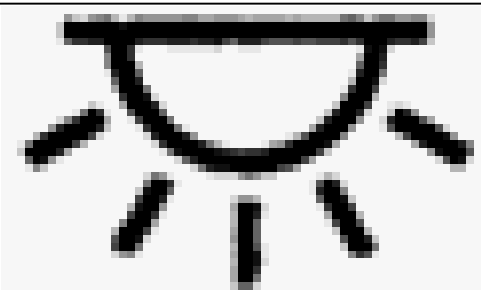


Lighting (Interior/Exterior)

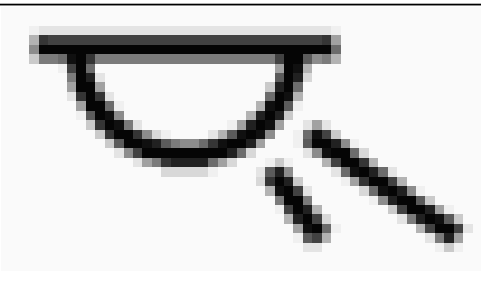
Lighting System



Lighting (Interior)

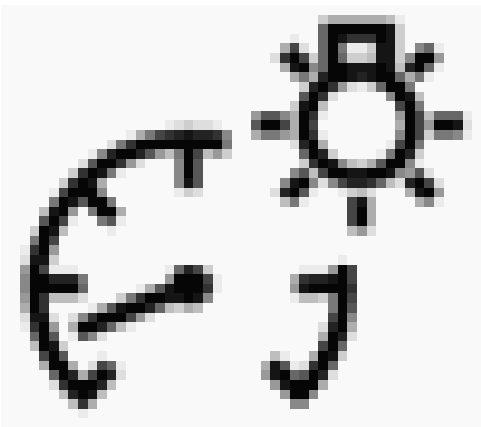
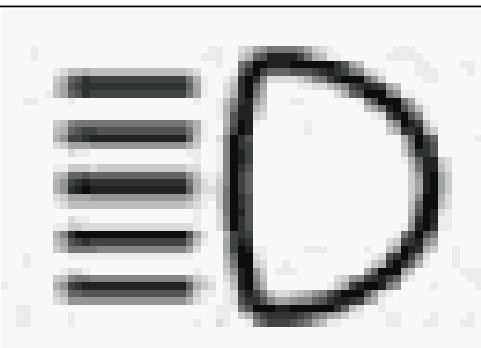
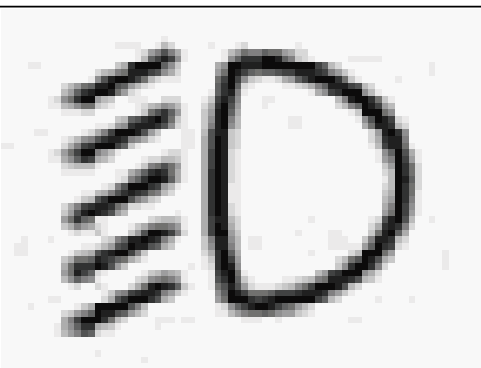


Lighting (Reading)



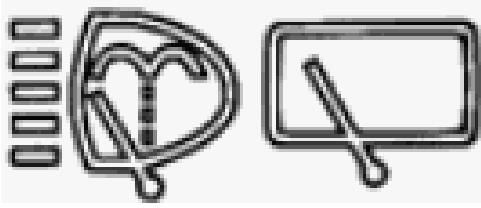
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Lighting (Instrument)		
Exterior Lights (Adaptive Headlight on Some Models)		
Headlight (High Beam)		
Headlight (Low Beam)		
Headlight (Automatic Control)		

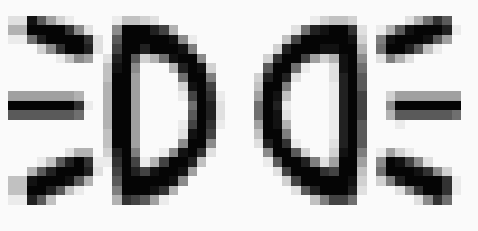
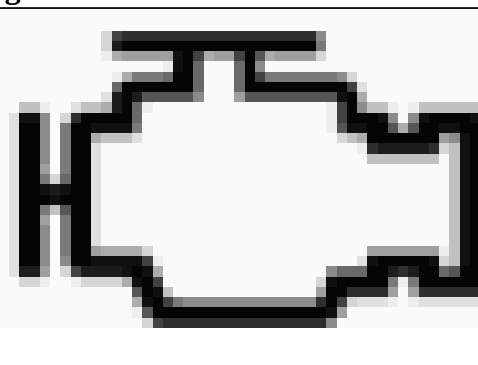
2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

		
Headlight (Cleaning System)		
Headlight (Cleaning System)/ Wiper (Rear) ⁽²⁾		
Fog Light		

2007 BMW X3

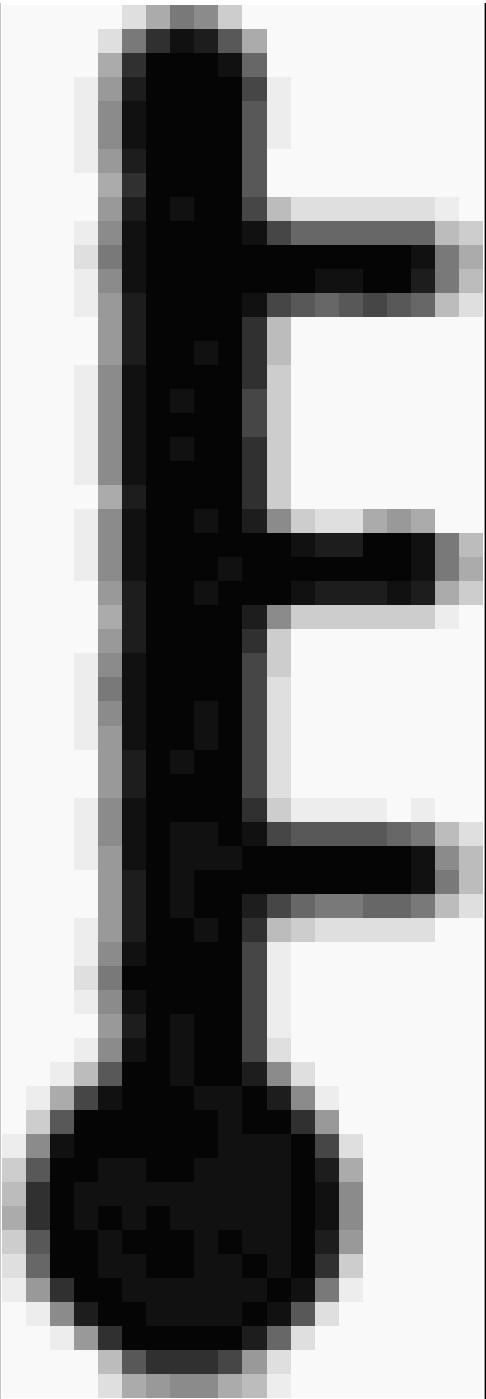
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Parking Lights or Daytime Running Lights		
Parking Lights (Roadside)		
Engine, Transmission, & Diagnostic		
Engine Management		

2007 BMW X3

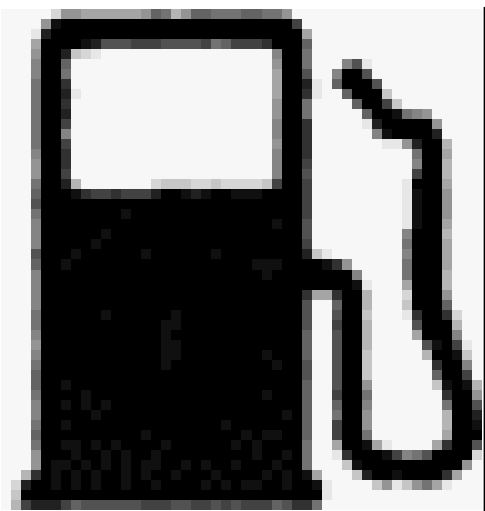
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Engine Fan



2007 BMW X3

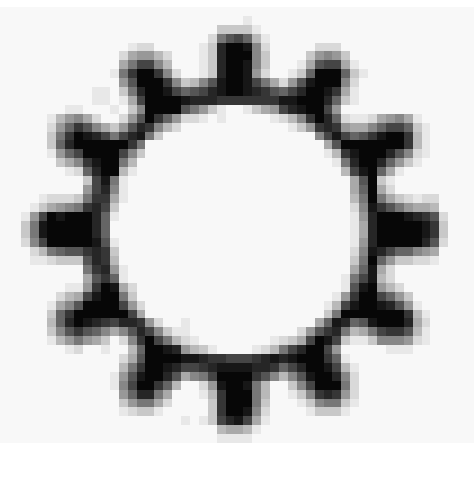
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Fuel Pump		
Hybrid Interface Module	HIM (Hybrid Interface Modul)	
Ignition System (Electronic)	START STOP	
Data Link Connector (DLC)/ Diagnostic Socket	OBD	

2007 BMW X3

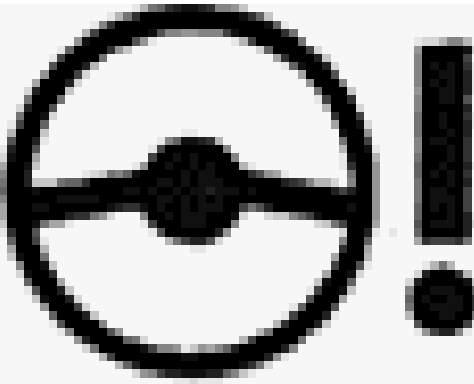
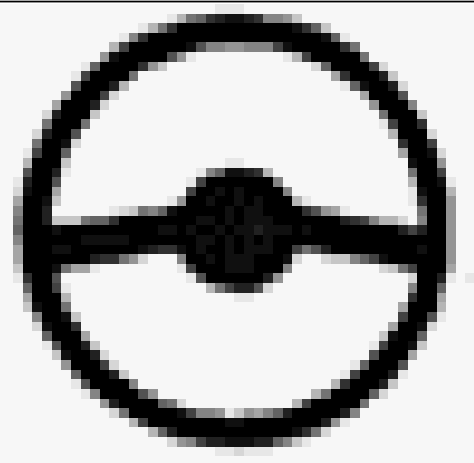
ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Transmission



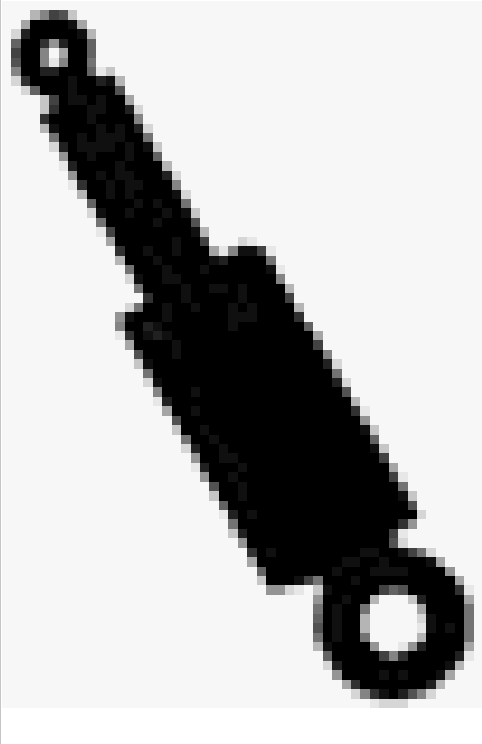
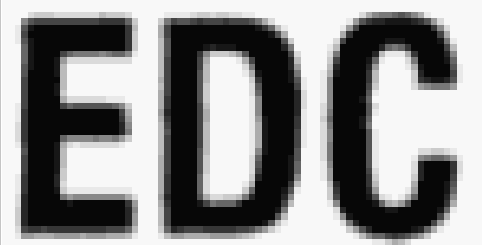
Steering & Suspension

Steering System/
Active Steering



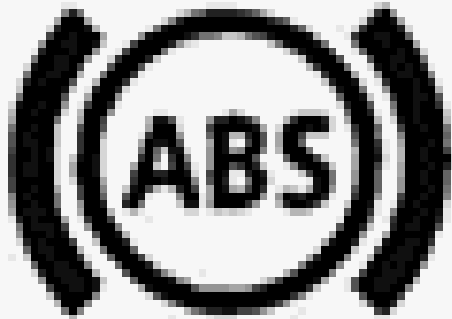
Suspension System
(Electronic)



		
Electronic Damper Control		
Suspension System (Self-Leveling)		
Safety & Vehicle Control		
ABS		

2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW



DSC



Active Roll Stabilization



2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Cruise Control/
Active Cruise Control



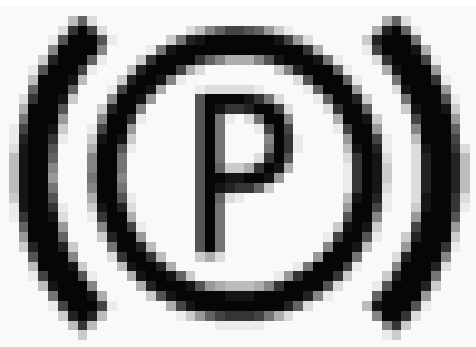
Park Distance Control (PDC)



Park Distance Control
(PDC)/
Remote Garage Door Opener
(2)

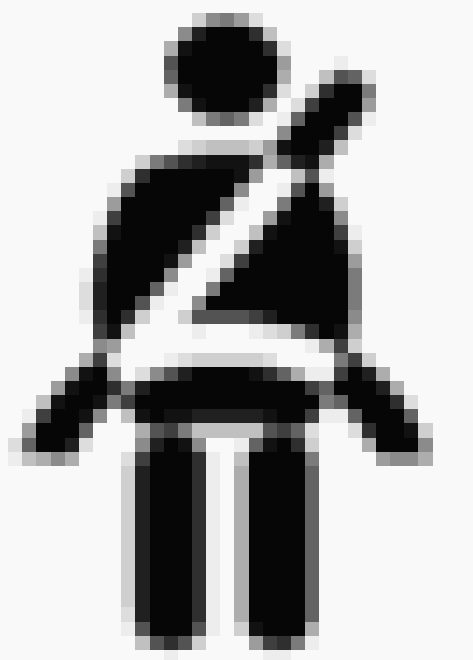


Parking Brake



2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Restraint System (Belts/Air Bag)		
Tire Pressure Monitor (TPMS)		
Wiper/Washer		
Wiper System		
Wiper (Front)		

2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

		
Wiper (Rear)		
Wiper (Rain Sensor)		
Washer System		

2007 BMW X3

ELECTRICAL Fuse Assignment Symbol Definitions - BMW

Washer (Rear Window)		
Washer (Heated Jets)		
Misc.		
(1)		
(1) Definition has not been determined.		
(2) While the definition of the individual symbols in this combined set is known, the meaning behind the combination has not been determined.		

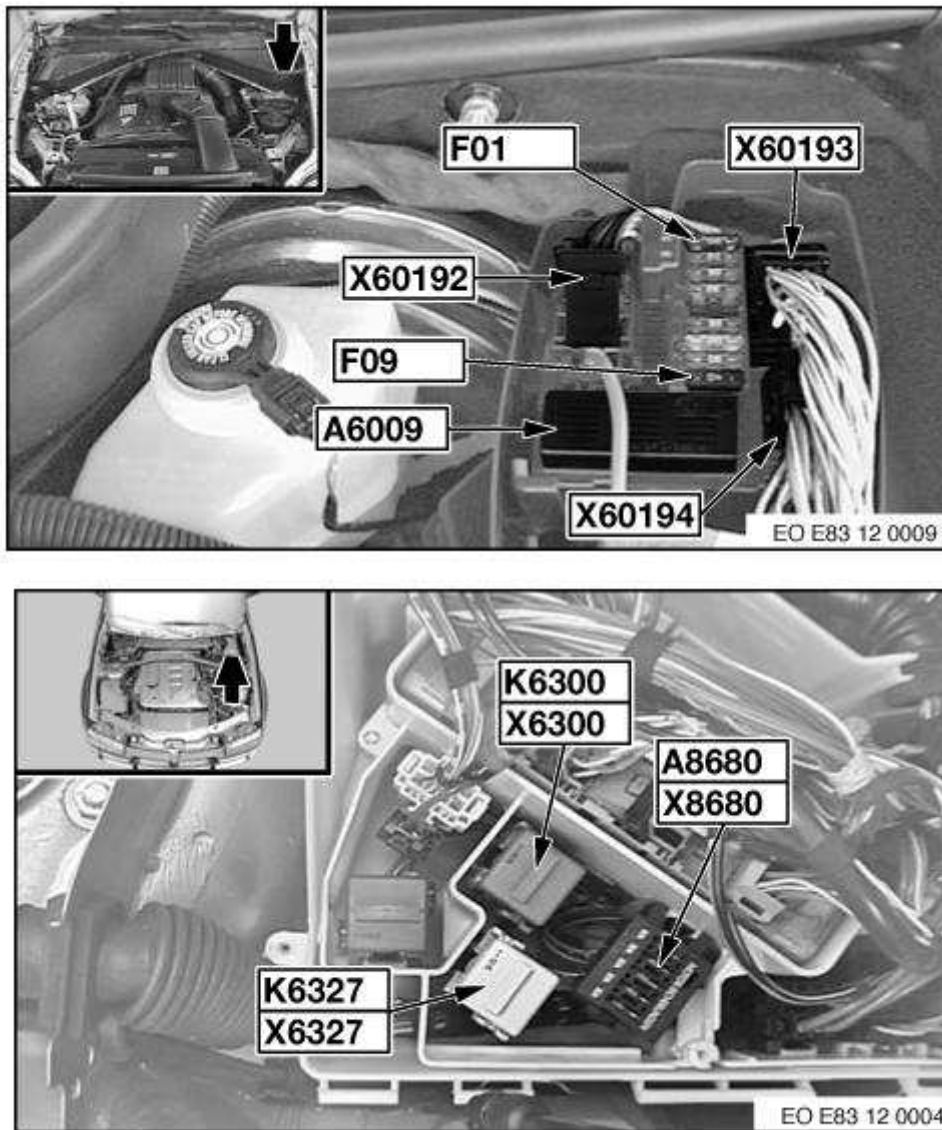
ELECTRICAL**BMW - X3 (E83) - 2004-10****IDENTIFICATION**

WARNING: Vehicles are equipped with air bag supplemental restraint system. Before attempting any repairs involving steering column, instrument panel or related components, see appropriate **AIR BAG SAFETY PRECAUTIONS** and **ACTIVATING AIR BAG SYSTEM** in **AIR BAG RESTRAINT SYSTEMS** article.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See appropriate **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

COMPONENT IDENTIFICATION**ENGINE ELECTRONICS FUSE CARRIER**

Engine electronics fuse carrier (A8680 or A6009) is located in left rear of engine compartment. See **Fig. 1**.



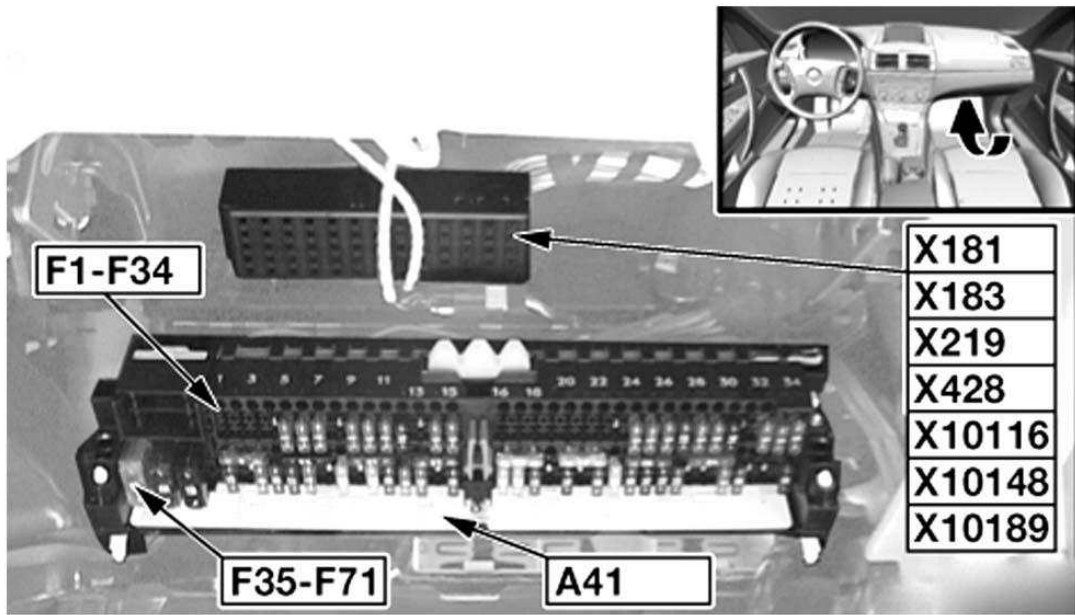
G00315123

Fig. 1: Locating Engine Electronics Fuse Carrier
 Courtesy of BMW OF NORTH AMERICA, INC.

FRONT FUSE HOLDER

For location of front fuse holder and power distribution (A41), see **Fig. 2**.

For amperage and components covered, see **Fig. 3** or **Fig. 4**.



G00315119

Fig. 2: Locating Fuses & Power Distribution
Courtesy of BMW OF NORTH AMERICA, INC.

2007 BMW X3

ELECTRICAL BMW - X3 (E83) - 2004-10

Equipment	Fuse No.	Equipment	Fuse No.
A/C auxiliary water pump	62	Interior light	49,52
Adaptive light control	23,58	Light module	9,32
Adjustment driver seat	65	Make-up mirror light	6
Adjustment passenger seat	70	Navigation	7,42
Airbag	11	On-board computer	9
Air conditioner	28,62,63	On-board Diagnose II	30,43
Automatic gearbox diesel	56	On-board monitor	42
Blower	50	Outside mirror	31,57
Brake light	9	Panoramic sunroof	46
Central locking system	49,52,60	Parking aid	24
Central locking system		Passenger comp./trunk lighting	52
Japan/Korea	52,60,67	Radio	7,41
CD changer	42	Rain sensor	15
Cigarette lighter	47	Rear wiper	15,45
Cigarette lighter (Australia)	26,47	Reversing light	27
Clutch switch	9	Secondary air pump	36
Diesel fuel heater	36	Servotronic	69
DSC 4-wheel drive	12,33,35,40,53	Shifting gate illumination	40
Electric fan	37	Side airbag	11
Electric seat heating	12,61	Socket	47
Engine control	27,29,30	Speed control	9
Folding outside mirror	57	Starter interlock	14
Front fog light	38	Telephone	7,39
Fuel pump	34,54	Theftproofing system	49,67
Garage door opener	24	Trailer coupling	44
Glove box light	52	Transfer gear	26
Hand lamp	52	TV	42
Headlight cleaning	51	Voice input system	7
Heated outside mirror, passenger	25	Water valve, A/C	62
Heated rear window	28,68	Window lift front	48,49,57
Heated spray nozzles	52	Window lift rear	57,71
Heated steering wheel	66	Windscreen washer system	49,52,59
Horn	5,55		
Immobilizer	14,67		
Instrument cluster	10,34,43		
Inside mirror electrochromic	24,67		

Fuse No.	Replacement f.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Amperes	Fuse	-	-	-	-	5	5	5	-	5	5	5	7,5	-	5	5

Fuse No.	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Amperes	40	50	60	15	5	5	30	10	5	20	20	20	20	30	5	40	30	30

Fuse No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Amperes	-	-	-	-	-	-	-	5	5	5	5	10	5	5	7,5	5	5	5	5

Fuse No.	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
Amperes	25	20	15	5	7,5	7,5	30	25	30	7,5	7,5	-	30	10	5	30	5	30	30

G00492810

Fig. 3: Identifying Fuses (2004 to Sept 2005)
Courtesy of BMW OF NORTH AMERICA, INC.

2007 BMW X3

ELECTRICAL BMW - X3 (E83) - 2004-10

Fuse No.	Replacement f.			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Amperes	Fuse			-	-	-	-	5	5	5	-	5	5	5	7,5	-	5	5

Fuse No.	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Amperes	40	50	60	15	5	5	30	10	5	20	20	20	20	30	5	40	30	30

Equipment	Fuse No.	Equipment	Fuse No.
A/C auxiliary water pump	62	Electric fan	37
Adaptive light control	23,58	Electric seat heating	12,61
Adjustment driver seat	65	Engine control	27,29,30,22
Adjustment passenger seat	70	Folding outside mirror	57
Airbag	11	Front fog light	38
Air conditioner	28,62,63	Fuel pump	34,54
Automatic gearbox diesel	56	Garage door opener	24
Blower	50	Glove box light	52
Brake light	9	Hand lamp	52
Central locking system	49,52,60	Headlight cleaning	51
Central locking system		Heated outside mirror, passenger	25
Japan/Korea	52,60,67	Heated rear window	28,68
CD changer	42	Heated spray nozzles	52
Cigarette lighter	47	Heated steering wheel	66
Cigarette lighter (Australia)	26,47	Horn	5,55
Clutch switch	9	Immobilizer	14,67
Diesel fuel heater	36	Instrument cluster	10,34,43
DSC 4-wheel drive	12,33,35,40,53	Inside mirror electrochromic	24,67

Fuse No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Amperes	-	-	-	-	-	-	5	5	5	5	5	10	5	5	7,5	5	5	5	5

Fuse No.	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
Amperes	25	20	15	5	7,5	7,5	30	25	30	7,5	7,5	-	30	10	5	30	5	30	30

Equipment	Fuse No.	Equipment	Fuse No.
Interior light	49,52	Side airbag	11
Light module	9,32	Socket	47
Make-up mirror light	6	Speed control	9
Navigation	7,42	Starter interlock	14
On-board computer	9	Telephone	7,39
On-board Diagnose II	30,43	Thiefproofing system	49,67
On-board monitor	42	Trailer coupling	44
Outside mirror	31,57	Transfer gear	26
Panoramic sunroof	46	TV	42
Parking aid	24	Tyre pressure	69
Passenger comp./trunk lighting	52	Voice input system	7
Radio	7,41	Water valve, A/C	62
Rain sensor	15	Window lift front	48,49,57
Rear wiper	15,45	Window lift rear	51,71
Reversing light	27	Windscreen washer system	49,52,59
Secondary air pump	36		
Servotronic	69		
Shifting gate illumination	40		

G00492797

Fig. 4: Identifying Fuses (Oct 2005 to 2010)

Courtesy of BMW OF NORTH AMERICA, INC.

POWER DISTRIBUTION

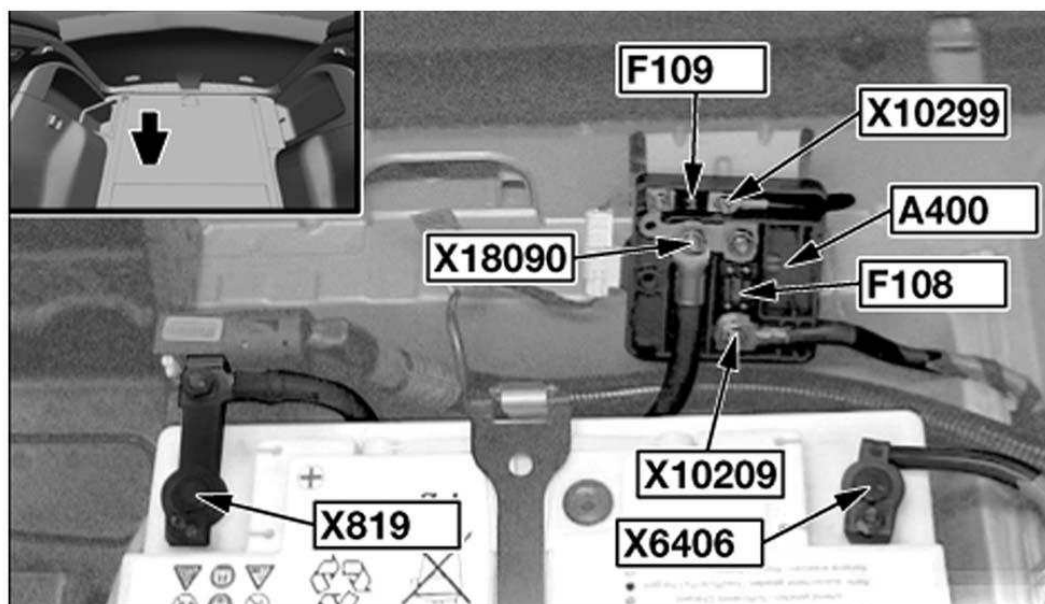
For location of power distribution (A41), see **Fig. 2**. Power distribution contains the following fuses:

- F102 - 80 Amp - B+ Potential Distributor
- F104 - 100 Amp - Preheating Control Module
- F105 - 50 Amp - Ignition Switch
- F106 - 50 Amp - Light Switch Cluster, Ignition Switch
- F107 - 50 Amp - Light Switch Cluster, Trailer Module

REAR FUSE BOX (A400)

For location, see **Fig. 5**. Rear fuse box (A400) contains the following fuses:

- F108 - 250 Amp - Power Distribution
- F109 - 60 Amp - Rear Fuse Holder



G00315122

Fig. 5: Locating Rear Fuse Box

Courtesy of BMW OF NORTH AMERICA, INC.

REAR FUSE HOLDER (A49)

For location, see **Fig. 6**. Rear fuse holder (A49) contains the following fuses:

- F80 - 30 Amp - Transfer Box Control Module

- F81 - 30 Amp - Amplifier

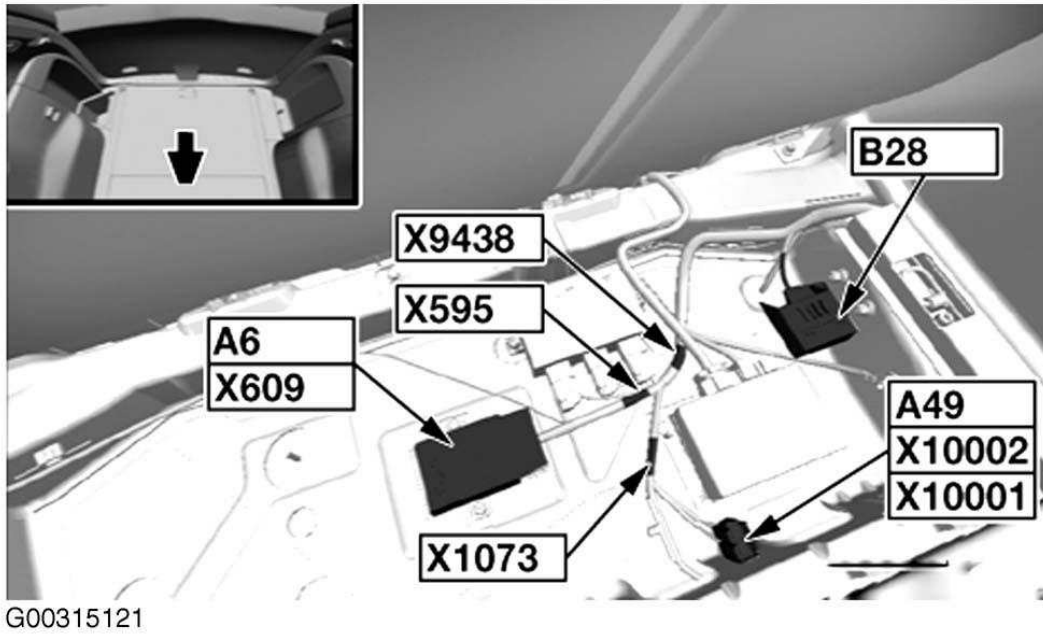


Fig. 6: Locating Rear Fuse Holder
Courtesy of BMW OF NORTH AMERICA, INC.

ACCESSORIES AND EQUIPMENT

General Electrical System - SI Techniques - X3

INTERIOR MIRROR WITH DIGITAL COMPASS

E70, E83, E90, E91, E92, E93



Fig. 1: Interior Mirror With Digital Compass
Courtesy of BMW OF NORTH AMERICA, INC.

INTRODUCTION

A digital compass in the interior mirror is offered as an optional extra (option 4NA) for the following BMW vehicles: 3 Series and X3 and X5.

- **> Up to 09/2006**

A small LC display at top right in the interior mirror indicates the point of the compass in which the direction of travel is pointing: e.g. **SW** for South West.

- **> From 09/2006**

The display is effected with transmitted light technology. An LC display (window) is no longer needed. The display can be deactivated.

The compass offers an additional benefit especially in the USA. In large cities the streets are frequently arranged according to the points of the compass. The points of the compass are also marked on signposts.

The compass also makes orientation in European cities easier.

NOTE: Option 4NA only in conjunction with option 430 or 431.

Option 4NA "Interior mirror with digital compass" is offered only in conjunction with the following option:

- Option 430 "Interior mirror and exterior mirrors with automatic antiglare control"
- Option 431 "Interior mirror with automatic antiglare control"

Option 4NA **cannot** be combined with option 449 "Interior mirror with toll function for Japan".

Option 4NA **cannot** be combined with option 802 "Korea version".

Option 4NA **cannot** be combined with option 5AC "Main-beam assistant".

BRIEF DESCRIPTION OF COMPONENTS

The following components deliver signals for the digital compass:

- **Magnetic field sensor**
 - **> up to 09/2006**

The magnetic field sensor is installed in the mirror base. The magnetic field sensor measures the current alignment of the magnetic field. The signal is sent to the control electronics for the compass in the interior mirror.

- **> from 09/2006**

The magnetic field sensor is on the PCB in the interior mirror.

- **Control electronics for the compass**

The interior mirror is electrically connected to the roof control panel (FZD).

The control electronics for the compass are integrated into the board for the interior mirror. The signals from the magnetic field sensor are received by the control electronics. The LCD display is activated directly by the control electronics.

The following components are controlled:

- **Display in interior mirror**

- **> up to 09/2006**

The LC display (window) is situated at top right in the interior mirror.

The points of the compass are presented digitally on the LCD display (LCD: Liquid Crystal Display). The display is divided into eight compass points.

- **> from 09/2006**

The point of the compass is displayed in transparent light technology in the interior mirror as well. The display is likewise situated at top right in the interior mirror. The display is divided into 8 points of the compass.

SYSTEM FUNCTIONS

The following system functions for the digital compass are described:

- Display
- Brightness control of display
- Adjustment of magnetic field zones and calibration
- from 09/2006: Further adjustments
- up to 09/2006: Fault display

Display

The 8 points of the compass are digitally displayed by abbreviations.

- **> From 09/2006**

The display is available in English and German (delivery status: English LHD)

N: North

NE: North East

E: East

SE: South East

S: South

SW: South West

W: West

NW: North West

The changeover between displays is carried out as follows:

- The current vehicle position is the center of a 360° circle.
- The eight points of the compass divide these 360° into sixteen 22.5° segments.
- The display changes over if the direction of travel changes by more than 22.5°.

Brightness control of display

2 photocells in the electrochromic interior mirror record the surrounding brightness (1 photocell for the surrounding brightness coming from the front, 1 photocell for the surrounding brightness coming from the rear).

The photocells deliver the signals for the display brightness control.

The brightness of the display is adjusted by the interior mirror control electronics to suit the surrounding brightness.

Adjustment of magnetic field zones and calibration

The worldwide magnetic field zones are permanently stored in the interior mirror. The magnetic field zones represent the deviations in relation to an ideal magnetic field for earth. The orientation "North" is precisely determined by the magnetic field zones.

The current magnetic field zone may be adjusted according to the geographic location. For example, Germany is located in magnetic field zone "8".

A vehicle has its own magnetic field. This makes it possible for the magnetic field sensor to measure an overlapping of the magnetic field with the earth's magnetic field. This overlapping is "worked out" by calibrating the compass.

A changed magnetic field is normally calibrated "automatically".

The vehicle's magnetic field may change under the following special circumstances:

- Powerful vibration during an accident
- Very large external magnetic field - e.g. if a vehicle passes under a train when travelling through an underpass

However, a manual calibration may speed up the automatic calibration.

For procedure to be followed when setting the magnet field zones as well as manual calibration: see notes for service staff.

from 09/2006: Further adjustments

Different time-based adjustment menus can be obtained by means of the adjustment button:

- 0 to 3 seconds: Display ON/OFF
- 3 to 6 seconds: Adjustment of magnetic field zones (0 - 15)
- 6 to 9 seconds: Calibration (C)
- 9 to 12 seconds: Left-hand drive or right-hand drive (L or R)
- 12 to 15 seconds: English or German (E or O)

Release the adjustment button when the correct menu is obtained. Select values in the menu by pressing briefly.

After approx. 5 seconds the value is stored and the menu is automatically exited.

up to 09/2006: Fault display

The LC matrix for the LCD display lights up completely if a system fault develops. A fault is displayed under the following conditions:

- If the vehicle is highly magnetised (2,200-2,500 milligauss), the measuring range of the magnetic field sensor will be exceeded.
- If a fault develops in the circuitry of the magnetic field sensor.

NOTE: **regarding the physical unit "gauss".**

Gauss is the unit of measurement for magnetic flux density.

Preconditions for activation

At terminal 15 ON, the display is activated with a test run.

- **> Up to 09/2006**

During this process, the LC matrix lights up completely (approx. 3 seconds). The digital compass is then switched on. There is no switch for turning off the LCD display at terminal 15 ON.

BUS STRUCTURES

All models from E38 and MINI

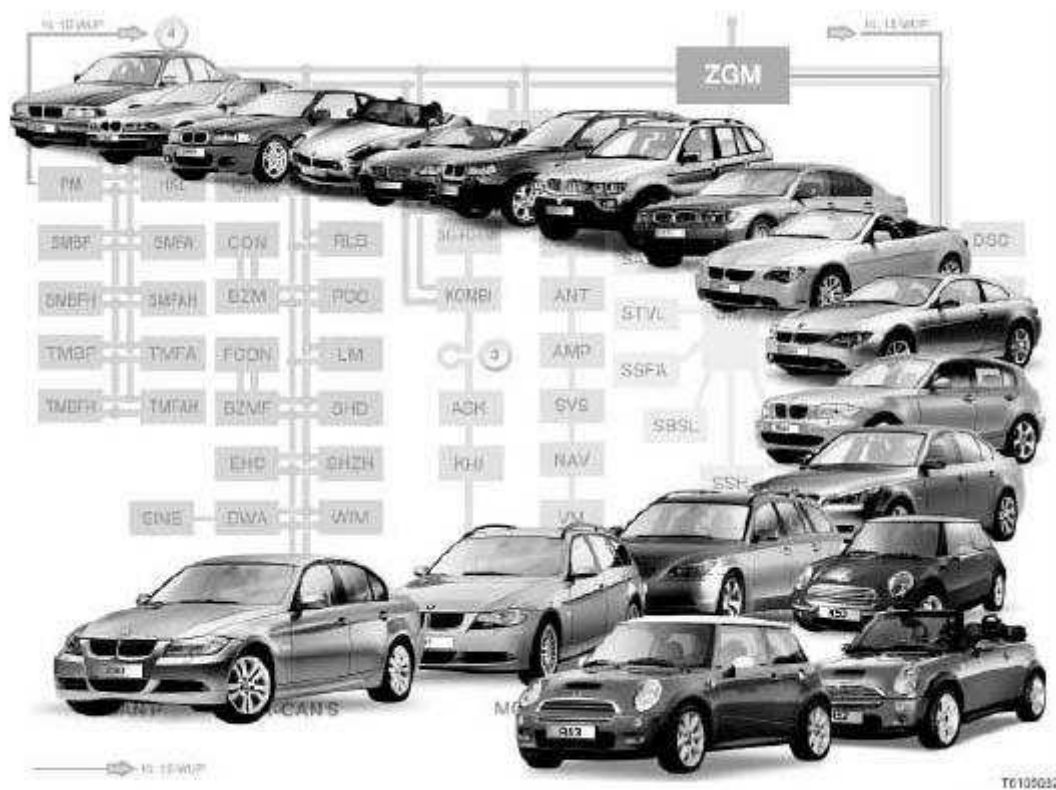


Fig. 2: Bus Structures

Courtesy of BMW OF NORTH AMERICA, INC.

INTRODUCTION

In the vehicles of today, components and control units are networked by means of data buses. Data buses are capable of transmitting messages and signals.

The connected control units only read off those messages and signals that are of relevance to their operation.

Most buses are CAN buses (CAN: Controller Area Network).

A fibre-optic cable is used for navigation and entertainment: The MOST bus (MOST = "Media Oriented System Transport").

It has its own data wire for diagnosis: the diagnostics cable, also known as the "K-line"

This SI Technology bulletin (SBT) contains system overviews of bus structures for the following model series:

- E38 (7-Series, manufacturing period from 1994 to 2001)
- E39 (5-Series, manufacturing period from 1995 to 2003)
- E46 (3-Series, manufacturing period from 1997 to 2005)
- E52 (Z8, manufacturing period from 1999 to 2003)
- E53 (X5, start of series production 2001)

- E60, E61, E63, E64
 - > E60, E61, E63, E64 from 09/2005:
 - > E60, E61, E63, E64 from 03/2005 until 09/2005:
 - > E60, E61, E63, E64 until 03/2005:
- E65, E66
 - > E65 and E66 from 03/2005:
 - > E65 and E66 from 03/2004 until 03/2005:
 - > E65 and E66 until 03/2004:
- E70 (X5, start of series production 2006)
- E83 (X3, start of series production 2004)
- E85, E86
 - > E85 (Z4), start of series production 2002 until 01/2006:
 - > E85, E86 from 01/2006:
- E87 (1-Series, start of series production 2004)
- E90, E91, E92, E93 (3-Series, start of series production 2005)
- R50, R52, R53 (MINI and MINI Convertible, start of series production 2001)
- R56 (start of series production 2006)

This SI Technology bulletin (SBT) also contains a section with frequently asked questions.

NOTE: Abbreviations for control unit names

In the overviews of bus structures, all diagnosis and programming control units are indicated by abbreviations.

The abbreviated names of the control units are listed in alphabetical order and explained in a separate section "Abbreviations" in the SI Technology bulletin (SBT).

The following control units are numbered:

- Control units that **cannot** be programmed and **cannot** be encoded and which **do not** appear in the quick test.

These control units do not have an abbreviation, just a number.

- Control units with control unit designation from the time before electrical system 2000:

Besides the abbreviation, these control units have a number for entering in the table.

On the history of control unit designations:

Since the start of series production of the E65 (electrical system 2000), the control unit designations have been harmonised. Earlier model series have varying control unit designations.

For technical reasons associated with the system, these control units have not been renamed.

This is because: These control unit designations appear in the quick test on the BMW diagnosis system.

BUSES AND CONTROL UNITS IN THE E60, E61, E63, E64

In the E60, the K-CAN S and K-CAN P from the E65, E66 have been combined to form the K-CAN.

This means the E60 has the following buses: **byteflight** , K-CAN, MOST, F-CAN, PT-CAN plus a local CAN (for the engine control system).

The central interface for exchanging data between buses is the safety and gateway module (SGM).

NOTE: Modifications to the bus structures for the E60 as from 09/2005

From September 2005, the bus structures of the E60 are modified as follows:

- No **byteflight** data bus

The SZL control unit is connected to the PT-CAN and no longer to the **byteflight** .

As before, the SZL control unit is connected to the F-CAN.

Following control units are dropped together with the **byteflight** :

- SBSL: B-pillar satellite, left
- SBSR: B-pillar satellite, right
- TMBF: Door module, front-passenger
- TMFA: Door module, driver

- ACSM is added.

The crash safety system is controlled by a new control unit:

ACSM: crash safety module

The ACSM control unit is on the K-CAN.

("ACSM" = Advanced Crash Safety Module or Management)

- ALBBF and ALBFA are added.

2 new control units for the active backrest width adjustment are added on the PT-CAN.

ALBBF: Active seat back width, front passenger seat

ALBFA: Active seat back width, driver's seat

- CA is added.

A control unit for comfort access is added on the K-CAN.

CA: Comfort Access

- KGM is added.

As of September 2005, the data interface for the buses is the body-gateway module (KGM). The previous data interface for the buses, the safety and gateway module (SGM) has been dropped.

The following functions are integrated in the KGM control unit:

- Data interface for buses
- Outside door handle electronics
- Vehicle center satellite
- micro-power module
- IBS: Intelligent battery sensor

The IBS is connected via the bit-serial data interface (BSD) to the engine control unit. The IBS has been part of the power supply on the BMW 5-Series since start of series production.

- FLA is added.

A new control unit for the main-beam assistant is added on the K-CAN:

FLA: Main-beam assistant

- For US vehicles: IBOC is added.

For US vehicles, a control unit is added to the MOST for analogue and digital radio reception.

IBOC: Digital tuner US

- For Korea vehicles: KNAV is added.

A control unit for the navigation system is added for vehicle in Korea.

KNAV: Korea navigation system

The KNAV control unit is connected to the MOST.

- A new control unit for the night vision assistant is added on the K-CAN:

NVE: night vision electronics

- MPM dropped.

No micro-power module (MPM) on the K-CAN. The KGM control unit performs the functions of the MPM.

- For US vehicles: RDC is added.

For US vehicles, a new control unit added on the K-CAN for monitoring tire pressure has been.

RDC: tire pressure control

- > E60, E61, E63, E64 from 09/2005: Buses and control units:

NOTE: Modifications to the bus structures for the E60 as from 03/2005

From March 2005, the bus structures of the E60 are modified as follows:

- AHL discontinued:

From March 2005, the AHL control unit (adaptive headlights) is integrated into the light module. The light module is connected to the K-CAN and the PT-CAN.

- The VTG is now also integrated: For the E60 and E61, an all-wheel drive vehicle is available. The control unit for the xDrive on the E60 and E61 is known as the VTG: Transfer case.

- > E60, E61, E63, E64 from 03/2005 until 09/2005: Buses and control units:

NOTE: Original version: Buses and control units on E60, E61 E63, E64 up to 03/2005

To support the workshops, a description of the previous version of the bus structures on the E60 is also provided:

- > E60, E61, E63, E64 up to 03/2005: Buses and control units:

BUSES AND CONTROL UNITS IN THE E65 AND E66

The main buses in the E65 and E66 are called: K-CAN P, K-CAN S, MOST, **byteflight** , Local CAN, PT-CAN.

NOTE: Modifications to the bus structures for the E65 and E66 from 03/2005

From March 2005, the AHL control unit (adaptive headlights) is integrated into the light module. The light module is connected to the K-CAN S and the PT-CAN.

- > E65 and E66 from 03/2005: Buses and control units:

NOTE: Predecessor version: Buses and control units on E65, E66 from 03/2004

To support the workshops, a description of the predecessor version of the bus structures on the E65 and E66 is also provided:

The key modification compared to the original version of the bus structures on the E65 and E66 is:

SIM and ZGM have been combined to create the SGM. The SGM is the central data interface for all buses and control units.

(SIM: safety and information module)

(ZGM: central gateway module)

(SGM: safety and gateway module)

- > E65 and E66 from 03/2004 to 03/2005: Buses and control units:

NOTE: Original version: Buses and control units on E65, E66 up to 03/2004

To support the workshops, the original version of the bus structures on the E65 and E66 is also available:

In the original version, the E65, E66 had the two control units SIM and ZGM.

- SIM: safety and information module

The SIM was the data interface for the control units on the **byteflight** data bus.

- ZGM: Central gateway module

The ZGM is the central data interface for all buses and control units.

- > E65 and E66 up to 03/2004: Buses and control units:

BUSES AND CONTROL UNITS IN THE E70

The important buses in the E70 are called: K-CAN, MOST, PT-CAN, F-CAN, FlexRay.

FlexRay is a new communication system that offers extremely efficient, real time data transfer between the electrical and mechatronic components in the vehicle. FlexRay has a data transfer rate of 10 MBit/s.

FlexRay is used for data exchange between the VDM control unit and the shock absorber satellites.

CHAMP: On the US national version, instead of the multi-audio system controller (M-ASK), the Central Headset And Multimedia Platform (CHAMP) operates as the BMW "Professional" radio. In contrast to M-ASK, CHAMP **does not** have a navigation system.

- > E70: Buses and control units

BUSES AND CONTROL UNITS IN THE E87

The important buses in the E87 are called: K-CAN, MOST, PT-CAN and F-CAN.

The MOST, the innovation in the bus structure on the E65 and E66, is now also used in the E87.

The central interface for data transmission is the junction box electronics (JBE) in the junction box.

- > E87: Buses and control units

BUSES AND CONTROL UNITS ON THE E90, E91, E92, E93

The most important buses on the E90 are: K-CAN, MOST, PT-CAN, F-CAN.

The new feature is that the footwell module (FRM) is connected to the PT-CAN. This is because:

- The adaptive headlights are integrated into the footwell module. The adaptive headlights need the high-speed PT-CAN.
- The longitudinal dynamics management sends the signal for the brake light on the PT-CAN.

Compared with the E87, some new control units are connected to the F-CAN, e.g. LDM and ACC (LDM: longitudinal dynamic management; ACC: active cruise control).

- > E90, E91, E92, E93: Buses and control units:

PANORAMA GLASS SUNROOF

E53, E61, E83, E91



TE103054

Fig. 3: Panorama Glass Sunroof

Courtesy of BMW OF NORTH AMERICA, INC.

INTRODUCTION

The fully automatic Panorama glass sunroof consists of 2 glass sunroofs and a 2-piece sliding visor. The front glass sunroof works like a sliding/tilting sunroof, the rear glass sunroof is a tilting glass sunroof. The Panorama glass sunroof is actuated in the usual way by its own control unit.

- > E53, E83
- > E61
- > E91

The Panorama glass sunroof is available as special equipment (option 402).

BRIEF DESCRIPTION OF COMPONENTS

The following components supply the input signals for the Panorama glass sunroof:

- **Panorama glass sunroof switch**

The switch is located in the control unit in the roof console.

The switch can be moved in 3 directions (pushed forwards, pushed backwards, pushed upwards).

- **Hall sensors in Panorama glass sunroof drive**

There are 2 Hall sensors integrated in each of the two electric motors for the Panorama glass sunroof. The Hall sensors detect the motor speed. The signals are forwarded to the SHD control unit. These signals enable the control unit to recognize the position of the two glass sunroofs and of the 2-piece sliding visor. Moreover, the closing speed of each electric motor is used to calculate the closing force for the two glass sunroofs and for the sliding visor.

The control units involved in the functions of the Panorama glass sunroof are as follows:

- **SHD control unit (control unit for Panorama glass sunroof)**

The SHD control unit controls all the electrical functions of the Panorama glass sunroof.

- **GM: General module 3 (E53) or general module 5 (E83)**

The general module controls the convenience opening or closing function of the Panorama glass sunroof. The general module forwards the request (from the remote control, for example) to the SHD control unit via the body bus.

- **CAS: Car Access System (E61, E91)**

The CAS controls the convenience opening or closing function of the Panorama glass sunroof. The CAS forwards the request (from the remote control, for example) to the SHD control unit via the Body CAN.

- **CA: Comfort Access**

Option 322 "Comfort Access" allows convenience closing of the Panorama glass sunroof without actively using the ID transmitter.

- **LSZ: Light switch cluster (E53, E83)**

The light switch cluster sends the SHD control unit the request to switch on the locating light via the body bus (terminal 58g).

- **LM: Light module (E61)**

The light module sends the SHD control unit the request to switch on the locating light via the Body CAN (terminal 58g).

- **FRM: Footwell module (E91)**

The footwell module sends the SHD control unit the request to switch on the locating light via the Body CAN (terminal 58g).

- **FZD: Roof control panel (E91)**

The roof control panel picks up the signals from the switch for the Panorama glass sunroof. In addition, the FZD control unit also converts the signal into a CAN message. The CAN message is forwarded to the

SHD control unit via the K-CAN.

○ **KOMBI: Instrument cluster**

The instrument cluster sends the road speed signal to the SHD control unit.

- > via the K-bus (body bus) on the **E53, E83**
- > via the K-CAN (Body CAN) on the **E61, E91**

The signal is needed to extend and retract the wind deflector and to adjust the closing force limitation.

The following components are actuated for the purposes of the functions of the Panorama glass sunroof:

○ **Panorama glass sunroof drive**

The drive consists of 2 DC motors with reduction gearing. One motor operates the two glass sunroofs, the other motor the sliding visor and the wind deflector.

○ **Wind deflector**

The wind deflector is extended to reduce noises inside the vehicle when the sliding/tilting glass sunroof is open. The wind deflector automatically extends depending on the road speed.

○ **2-piece sliding visor**

When driving with the Panorama glass sunroof tilted ("vent" position), a suction effect develops on the 2-piece sliding visor. This suction effect can lead to noise disturbance.

- > E53, E61, E83:

To minimize the suction effect, the rear piece of the 2-piece sliding visor is opened approximately 3 cm.

- > E91 :

The 2-piece sliding visor moves back approx. 5 cm and forms an opening at the front.

SYSTEM FUNCTIONS

The Panorama glass sunroof comprises the following functions:

- Opening and closing
- Convenience opening and closing
- Emergency closing
- Anti-trap function (limits closing force)
- Safety functions

Opening and closing

The functions for opening and closing are as follows:

- Manual opening or closing

Push the switch for the Panorama glass sunroof backwards to the first resistance point to open it, or forwards to close it.

The glass sliding/tilting sunroof (front glass sunroof) keeps moving as long as the switch remains pushed.

- Automatic opening or closing
 - Automatic opening:

Press the switch for the Panorama glass sunroof beyond the pressure point. The Panorama glass sunroof is partially opened automatically. That means: Depending on the initial position of the Panorama glass sunroof, the sliding visor is first opened fully. Then, if the switch is again pressed beyond the pressure point, the glass sliding/tilting sunroof is opened. When it is opened, the sliding/tilting glass sunroof automatically moves to the comfort position (sliding/tilting glass sunroof approx. 3/4 open). The switch must be pushed again to completely open the glass sliding/tilting sunroof.

- Automatic closing:

The closing procedure is a reverse of the above. When the comfort position is reached during closing, the closing operation is interrupted and must be restarted.

- Automatic opening or closing with a double click

Press the button for the Panorama glass sunroof beyond the pressure point to "Open" or "Close" twice within the space of 2 seconds. The Panorama glass sunroof completely opens or closes automatically. When this happens, the sliding visor and the sliding/tilting glass sunroof open or close together. However, the sliding visor always moves out-of-line with the sliding/tilting glass sunroof. This ensures that the sliding visor is always slightly more open than the sliding/tilting glass sunroof as the sliding/tilting glass sunroof is opened or closed.

- Tilt
 - Push the switch for the Panorama glass sunroof upwards until it reaches its mechanical stop. The front glass sliding/tilting sunroof and the rear tilting glass sunroof are automatically lifted from every other position as long as the switch remains pushed.
 - Press the switch for the Panorama glass sunroof up twice within the space of 2 seconds. The Panorama glass sunroof moves to the "Vent" position, regardless of the starting position. ("Vent" position means: both glass sunroofs are fully tilted, the rear section of the 2-piece sliding visor is opened approx. 3 cm.)

NOTE: Automatic closing is not possible if the anti-trap function fails.

Automatic closing is not possible if the anti-trap function fails (on account of defective Hall sensor, for example). Closing is then only possible with the mechanical emergency mode.

Any fault data is then stored in the SHD control unit.

Convenience opening and closing

The controls that can be used for this purpose are as follows:

- Button on remote control (radio-control key)

Press the button on the remote control to "unlock" or "lock" and hold it in this position until the Panorama glass sunroof reaches the desired position.

- Door lock on driver's door

Use the mechanical key to turn the lock in the driver's door to the position for unlocking or locking, and hold it in this position until the Panorama glass sunroof reaches the desired position.

- Driver-side outside door handle and passenger-side outside door handle

If the vehicle is equipped with Comfort Access (CA), **convenience closing** can be started using the outside door handle electronics in the bow handle.

The convenience opening/convenience closing function is stopped if the command is cancelled.

Emergency closing

Emergency closing is a function for deliberate closure of the Panorama glass sunroof without anti-trap function (closing-force limitation). Emergency closing may be necessary if someone attempts to reach into the interior of the car or if mechanical difficulty is experienced in closing the Panorama glass sunroof.

Emergency closing can be activated when the car is stopped or travelling at a speed up to 16 km/h.

To activate emergency closing:

Push the switch for the Panorama glass sunroof in the "close" direction until it reaches its mechanical stop and hold it there. The Panorama glass sunroof is closed with maximum force and maximum speed without anti-trap function.

If the Panorama glass sunroof is blocked, the electric motor continues to run until the overheating protection is activated.

Anti-trap function (closing-force limitation)

WARNING: Note initialization

The Panorama glass sunroof has to be initialized in order for the anti-trap function to work correctly. The Panorama glass sunroof has to be initialized by service staff.

The anti-trap function is active over the entire range of movement in the closing direction.

The anti-trap function works as follows:

- The sliding/tilting glass sunroof and/or the sliding visor is opened approx. 20 cm.
- When closing from the "tilt" position, the sunroof will return to the "tilt" position.

Anti-trap function does not in principle prevent trapping; instead, it limits the maximum permissible force applied to the trapped object (by limiting the closing force).

To prevent impermissibly high closing forces, there are 2 Hall sensors integrated in each of the electric motors. The speed of closure can be measured on the basis of the signals from these two Hall sensors.

The closing force is calculated from the speed of closure.

The mechanical forces involved change with ambient temperature and as a result of ageing. For this reason, the closing forces required are adapted during the closing process.

Automatic closing is not possible if the anti-trap function fails (on account of defective Hall sensor, for example). Closing is then only possible with the mechanical emergency mode.

SAFETY FUNCTIONS

- **Maximum motor ON time**

If a motor runs in a single direction for longer than 15 seconds, the SHD control unit will deactivate the drive.

- **Overheating protection**

The heating up of the electric motors is computed in the SHD control unit. The outside temperature is available as a temperature signal (via the body bus or CAN). Moreover, there is a temperature sensor on the board of the SHD control unit. After a certain temperature threshold is reached the overheating protection is activated. The drive is switched off.

- **Emergency operation**

In emergency mode, the Panorama glass sunroof can only be moved in small steps.

Emergency mode is possible in the following conditions:

- Encoding of the SHD control unit incorrect

- Implausible signal from a Hall sensor
- Initialization incomplete

NOTE: **Mechanical emergency mode is possible**

In case of an electrical defect, emergency mode of the Panorama glass sunroof is available.

There is no emergency mode for the sliding visor.

ELECTRICAL**General Electrical System - Special Tools - X3****61 GENERAL ELECTRICAL SYSTEM****61 0 021 FUSE LINK FF 3.15 A / 500 V**

Note: For analog/digital multimeter M 2005, M 2007, M2008

Storage location: H 107

Order number: 61 0 021

Fuse link FF 3.15 A / 500 V

61 0 200 CRIMPING SET (BASIC TOOL)**Minimum set: Measuring and testing equipment**

Note: Consisting of case + basic crimping tool

Series: E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 02 02 05 (194)

Order number: 61 0 200

Crimping set (basic tool)

Consisting of:

1 = 61 0 201 Plastic case

Note: As storage system for complete set.

2 = 61 0 202 Crimping tool

Note: Basic tool for assorted matrices (crimping insert set)

3 = 61 0 203 Allen key

Note: For securing individual matrices in crimping tool

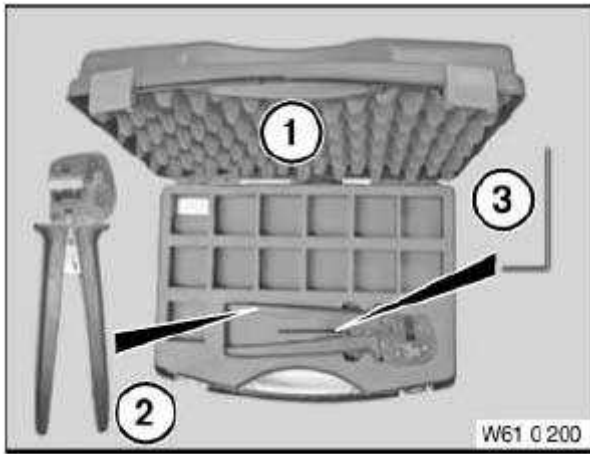


Fig. 1: Crimping Set (61 0 200)

Courtesy of BMW OF NORTH AMERICA, INC.

61 0 210 MATRIX LSK 8

In conjunction with: 61 0 202 (crimping tool)

Note: (crimping insert set for load current contact 8)

SI number: 02 02 05 (194)

Order number: 61 0 210

Matrix LSK 8

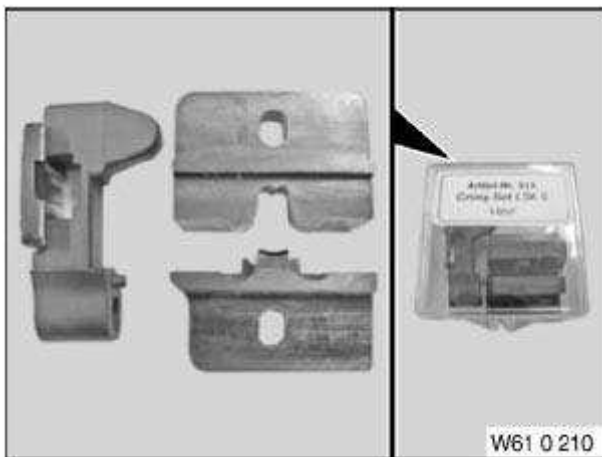


Fig. 2: Matrix LSK 8 (61 0 210)

Courtesy of BMW OF NORTH AMERICA, INC.

61 0 220 MATRIX FOR SLK 2.8

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In conjunction with: 61 0 202 (crimping tool)

Note: (crimping insert set for load contact tube 2.8)

SI number: 02 02 05 (194)

Order number: 61 0 220

Matrix for SLK 2.8

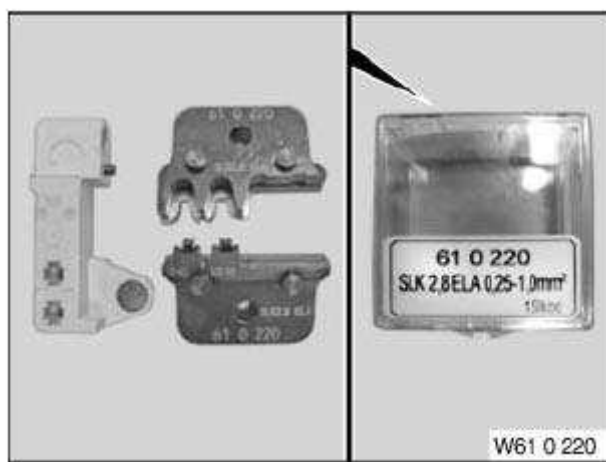


Fig. 3: Matrix For SLK 2 (61 0 220)

Courtesy of BMW OF NORTH AMERICA, INC.

61 0 230 STENCIL FOR CONTACTS "DFK 40" AND "MAK 8"

In conjunction with: 61 0 202 (crimping tool)

Note: For crimping contacts when replacing passenger compartment fuse box (up to model year 09/2005)

Series: E46, E65, E66, E67, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 02 07 05 233

Order number: 61 0 230

Stencil for contacts "DFK 40" and "MAK 8"

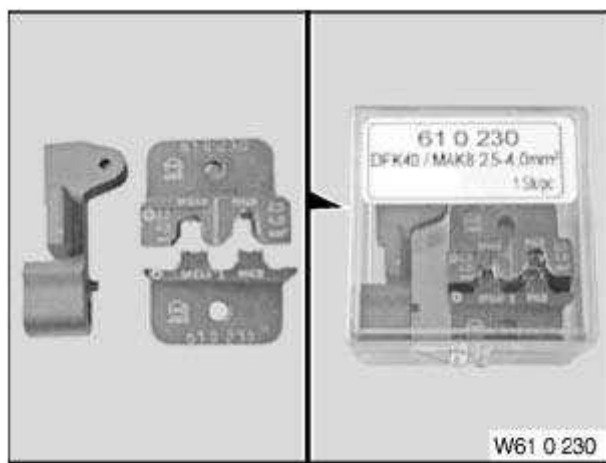


Fig. 4: Stencil For Contacts DFK 40 And MAK 8 (61 0 230)
 Courtesy of BMW OF NORTH AMERICA, INC.

61 0 300 RELEASING TOOL (COMPLETE KIT)

Minimum set: Measuring and testing equipment

Note: Replaces from 09/2005 special tool 61 1 150. From 06/2006 extended by tools 61 0 325 - 61 0 331.

Series: E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 2 05 05 (217)

Order number: 61 0 300

Releasing tool (complete kit)

Consisting of:

1 = 61 0 301 Release tool for round contacts (diameter 1.5)

Note: Replaces from 09/2005 special tool 61 1 131

2 = 61 0 302 Replacement sleeve D=1.5

Note: Replaces from 09/2005 special tool 61 1 157

In conjunction with: 61 3 301

3 = 61 0 303 Release tool for round systems with D=2.5

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Note: Replaces from 09/2005 special tool 61 1 132

4 = 61 0 304 Replacement sleeve (D=2.5)

Note: Replaces from 09/2005 special tool 61 1 156

5 = 61 0 305 Release tool for round contacts (D=3.5)

Note: Replaces from 09/2005 special tool 61 1 133

6 = 61 0 306 Replacement sleeve (D=3.5) for 61 0 305

Note: Replaces from 09/2005 special tool 61 1 155

7 = 61 0 307 Release tool for socket-side round contacts (D=2.5)

8 = 61 0 308 Replacement sleeve for special tool 61 0 307 (D=2.5)

9 = 61 0 309 Release tool for pin-side round contact (D=1.5) manufacturer: Kostal

Note: Replaces from 09/2005 special tool 61 1 139

10= 61 0 311 Replacement sleeve for special tool 61 0 309

Note: Replaces from 09/2005 special tool 61 1 154

11= 61 0 312 Release tool for flat spring contact with a detent lug (1.6 mm)

Note: Replaces from 09/2005 special tool 61 1 134

12= 61 0 313 Release tool for flat spring contacts with a snap-in pin (1.9 mm)

Note: Replaces from 09/2005 special tool 61 1 137

13= 61 0 314 Release tool for flat spring contact with a snap-in pin (2.7 mm)

Note: Replaces from 09/2005 special tool 61 1 135

14= 61 0 315 Release tool for flat spring contacts with double snap-in pin "Micro-Timer 2"

Note: Replaces from 09/2005 special tool 61 1 151

15= 61 0 316 Release tool for flat spring contacts with double snap-in pin "SPT 4.8" "JPT 2.8"

Note: Replaces from 09/2005 special tool 61 1 136

16= 61 0 317 Release tool for LSK 8

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Note: Replaces from 09/2005 special tool 61 1 200

17= 61 0 318 Release tool for "Maxi Power Timer 9.5"

Note: Replaces from 09/2005 special tool 61 1 180

18= 61 0 319 Release tool for sensor laminated contacts ("SLK2.8")

Note: Replaces from 09/2005 special tool 61 1 148

19= 61 0 321 Release tool for sensor laminated contacts with unlocking element ("SLK 2.8")

20 = 61 0 322 Release tool for mini laminated contact ("MLK 1.2 mm")

21 = 61 0 323 Release tool for flat spring contacts with a detent lug (MQS)

Note: Replaces from 09/2005 special tool 61 1 152

22 = 61 0 324 Release tool for secondary locking

Note: Universal tool for damage-free opening/removal of secondary locks

23 = 61 0 329 Case with foam inlay without tools

Note: Storage system for release tools from set 61 0 300

24 = 61 0 325 Release tool "JPT"

25 = 61 0 326 Release tool "MQS"

Note: For releasing all micro contacts

26 = 61 0 327 Plug-in aid

Note: For inserting contacts (0.64 - 1.2 mm) in housing

27 = 61 0 328 Plug-in aid

Note: For inserting contacts (2.8 - 4.8 mm) in housing

28 = 61 0 331 Release tool "SLK 5.8"

Note: For releasing "SLK 5.8 mm" contacts



Fig. 5: Releasing Tool (61 0 300)

Courtesy of BMW OF NORTH AMERICA, INC.

61 1 150 RELEASING TOOL KIT

Note: For circular connector / press-out tool - Contains kits 61 1 130, 61 1 140 and 61 1 180 Replaced by special tool 61 0 300 from 09/2005.

Series: E12, E21, E23, E24, E28, E30, E31, E32, E34, E36, E38, E39, E46, E52, E53, E65, E66, E83, E85, R50, R53, RR1

Storage location: K 106

Order number: 61 1 150

Releasing tool kit

Consisting of:

61 1 151 Press-out tool

Note: For Power timer contacts / AMP and Bosch Replaced by special tool 61 0 315 from 09/2005.

61 1 152 Press-out tool

Note: For Micro timer contacts Replaced by special tool 61 0 323 from 09/2005.

61 1 153 Releasing tool

Note: For retaining tab of relay holder

61 1 154 Replacement sleeve dia. 1.5 mm for 61 1 139

Note: Order number was temporarily assigned for case inlay in 8/95 on delivery of case Replaced by special

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tool 61 0 311 from 09/2005.

61 1 155 Replacement sleeve dia. 3.5 mm for 61 1 133

Note: Replaced by special tool 61 0 306 from 09/2005.

61 1 156 Replacement sleeve dia. 2.5 mm for 61 1 132

Note: Replaced by special tool 61 0 304 from 09/2005.

61 1 157 Replacement sleeve dia. 1.5 mm for 61 1 131

Note: Replaced by special tool 61 0 302 from 09/2005.

61 1 158 Case with inlay

Note: Replaced by special tool 61 0 329 from 09/2005.

61 1 159 Operating instructions

61 1 131 Press-out tool

Note: Replaced by special tool 61 0 301 from 09/2005

61 1 132 Press-out tool

Note: For 2.5 mm round contacts Replaced by special tool 61 0 303 from 09/2005.

61 1 133 Press-out tool

Note: For 3.5 mm round contacts Replaced by special tool 61 0 305 from 09/2005.

61 1 134 Press-out tool

Note: For Mini flat spring contacts Replaced by special tool 61 0 312 from 09/2005.

61 1 135 Press-out tool

Note: For standard flat spring contacts Replaced by special tool 61 0 314 from 09/2005.

61 1 136 Press-out tool

Note: For Power timer contacts (G & H) Replaced by special tool 61 0 316 from 09/2005.

61 1 137 Press-out tool

Note: For timer contacts Replaced by special tool 61 0 313 from 09/2005.

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61 1 138 Socket wrench

Note: For telltale lamps (instrument cluster)

61 1 139 Press-out tool

Note: Slotted sleeve for Kostal round contacts with dia. 1.5 mm Replaced by special tool 61 0 311 from 09/2005.

61 1 141 Releasing tool

Note: For D 2.5 / ELA, 4-pin, round

61 1 142 Releasing tool

Note: For D 2.5 / ELA, 7-pin, round

61 1 143 Releasing tool

Note: For D 2.5 / ELA, 12 -pin, round

61 1 144 Releasing tool

Note: For D 2.5 / ELA, 25 -pin, round

61 1 145 Releasing tool

Note: For D 1.5 / ELA, 10 -pin, round

61 1 149 Replacement blades

Note: For press-out tool 61 1 148

61 1 148 Press-out tool for SLK

Note: SLK = sensor laminated contacts Replaced by special tool 61 0 319 from 09/2005.

61 1 180 Press-out tool

Note: For load current contacts Replaced by special tool 61 0 318 from 09/2005.

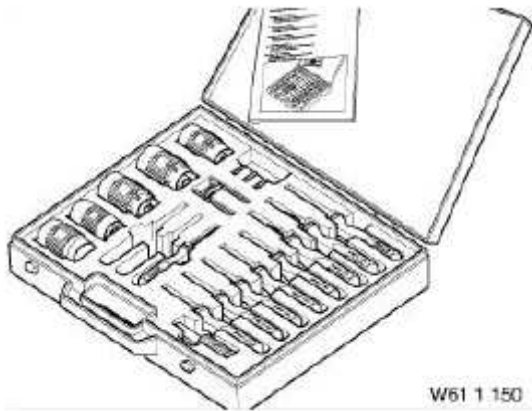


Fig. 6: Releasing Tool Kit (61 1 150)

Courtesy of BMW OF NORTH AMERICA, INC.

61 1 180 REMOVAL TOOL

Minimum set: Mechanical tools

Note: For load current contacts

Series: All models

SI number: 20600(636)

Order number: 61 1 180

Removal tool

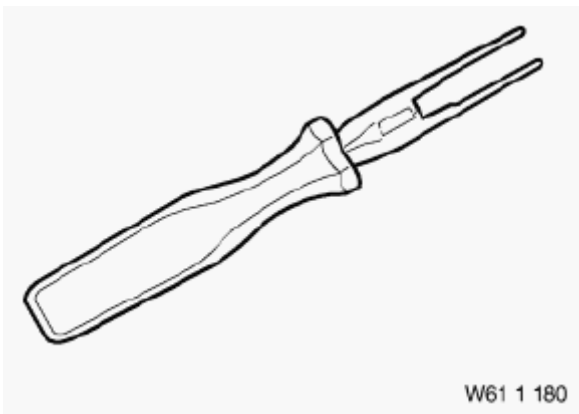


Fig. 7: Removal Tool (61 1 180)

Courtesy of BMW OF NORTH AMERICA, INC.

61 1 190 PLIERS

Note: For insulation displacement connectors for repairing ribbon cables

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Series: E60, E61, E63, E64, E65, E66, E67, E81, E82, E83, E86, E87, E90, E91, E92, R50, R52, R55, R56, RR1, RR2

SI number: 1 14 01 (766)

Order number: 61 1 190

Pliers

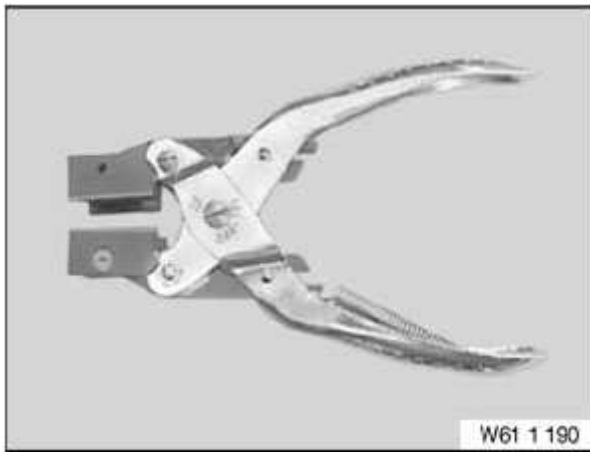


Fig. 8: Pliers (61 1 190)

Courtesy of BMW OF NORTH AMERICA, INC.

61 1 350 SET OF ASSEMBLY TOOLS

Note: For removing and installing socket in transmission connector on automatic transmission

Transmission: 4 HP 22, 4 HP 24

Storage location: I 103

Order number: 61 1 350

Set of assembly tools

Consisting of:

1 = 61 1 351 Removal tool

2 = 61 1 352 Fitting drift

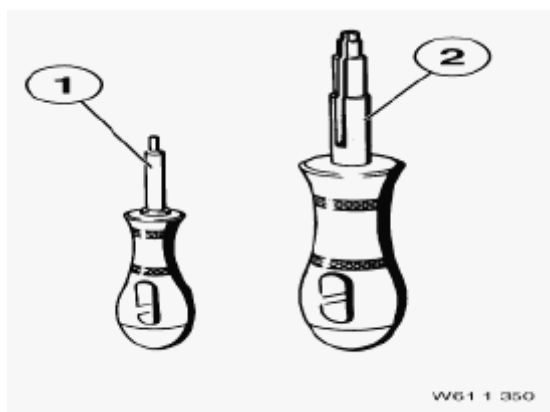


Fig. 9: Set Of Assembly Tools (61 1 350)

Courtesy of BMW OF NORTH AMERICA, INC.

61 1 410 SET OF DIS TEST PRODS

Series: E12, E21, E23, E24, E28, E30, E31, E32, E34, E36, E38, E39, E39tou, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E70, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, RR1

Storage location: H 107

Order number: 61 1 410

Set of DIS test prods

Consisting of:

1 = 61 1 411 Clip SAGK4-K, red

1 = 61 1 421 Clamping test probe XB/100, black

2 = 61 1 412 Clip SAGK4-K, black

3 = 61 1 413 Clip SAGK4, red

4 = 61 1 414 Clip SAGK4, black

5 = 61 1 415 Clip XDK-1033, red

6 = 61 1 416 Clip XDK-1033, black

7 = 61 1 417 Test probe SPP4-S, red

8 = 61 1 418 Test probe SPP4-S, black

9 = 61 1 419 Clamping test probe XB/100, red

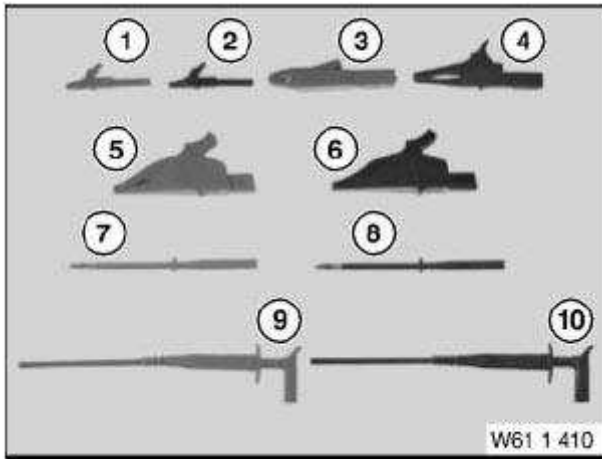


Fig. 10: Set Of DIS Test Prods (61 1 410)

Courtesy of BMW OF NORTH AMERICA, INC.

61 2 250 V-ADAPTER LEAD (RAIL PRESSURE SENSOR)

Minimum set: Measuring and testing equipment

Note: For system check of rail pressure control for common-rail diesel engines. Also suitable for connection to: Crank-/camshaft sensor, boost pressure sensor, particulate filter pressure sensor, swirl flap actuator, oil level sensor etc.

Series: E39, E46, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E70, E83, E85, E86, E87, E90, E91, E92, E93

SI number: 02 01 06 283

Order number: 61 2 250

V-adapter lead (rail pressure sensor)

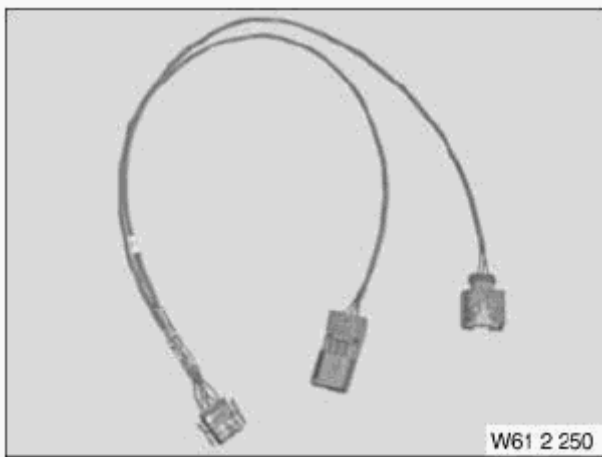


Fig. 11: V-Adapter Lead (61 2 250)**Courtesy of BMW OF NORTH AMERICA, INC.****61 2 410 BATTERY TRICKLE CHARGER**

Note: Will in future be replaced by the battery trickle charger "Acctiva easy". Order number 81 39 0 409 468 (Europe version) and 81 39 0 409 471 (USA version)

Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E87, R50, R52, R53, RR1

Storage location: Single

SI number: 2 02 00 (545)

Order number: 61 2 410

Battery trickle charger

Consisting of:

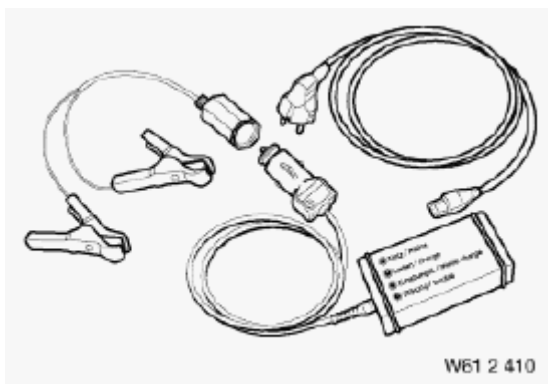
1 = 61 2 411 Trickle charger

Note: Including connection cable (ribbon cable) for cigarette lighter socket

3 = 61 2 413 Adapter cable

Note: for direct connection to battery or terminal point

9 = 61 2 419 Operating instructions

**Fig. 12: Battery Trickle Charger (61 2 410)****Courtesy of BMW OF NORTH AMERICA, INC.****61 2 440 SYSTEM CONNECTING CABLE (COUNTRY-SPECIFIC)**

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Note: System connecting cable for battery trickle charger 61 2 410

Order number: 61 2 440

System connecting cable (country specific)

Consisting of:

1 = 61 2 441 System connecting cable (country specific)

Note: Algeria / Armenia / Belarus / Belgium / Brazil / Denmark / Dubai / Egypt / Finland / France / Germany / Greece / Korea / Luxembourg / Martinique / Morocco / Norway / Saudi Arabia / Sweden / Spain and others

2 = 61 2 442 System connecting cable (country specific)

Note: Australia / New Zealand

3 = 61 2 443 System connecting cable (country specific)

Note: Italy

4 = 61 2 444 System connecting cable (country specific)

Note: Bahrain / Brunei Dar es Salaam / England / Hong Kong / India / Kuwait / Nigeria / Northern Ireland / Oman / Qatar / Singapore / Sri Lanka (Ceylon)

5 = 61 2 445 System connecting cable (country specific)

Note: Switzerland

6 = 61 2 446 System connecting cable (country specific)

Note: Argentina / Barbados / Canada / China / Guam / Honduras / Jamaica / Mexico / Panama / Philippines / Tahiti / Taiwan / USA

7 = 61 2 447 System connecting cable (country specific)

Note: Japan

61 3 080 V-ADAPTER LEAD FOR TRANSFER CASE - ECU E83 (8-PIN)

Minimum set: Measuring and testing equipment

Note: For checking function of engine at transfer box (X3)

Series: E83

SI number: 02 08 03 (045)

Order number: 61 3 080

V-adapter lead for transfer case - ECU E83 (8-pin)

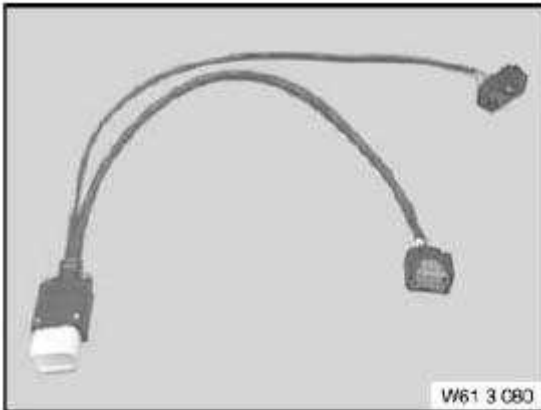


Fig. 13: V-Adapter Lead For Transfer Case - ECU E83 (61 3 080)

Courtesy of BMW OF NORTH AMERICA, INC.

61 3 090 V-ADAPTER LEAD DXC CONTROL UNIT E83 (6 -PIN)

Minimum set: Measuring and testing equipment

Note: For checking function of DXC control unit in X3

Series: E83

SI number: 02 08 03 (045)

Order number: 61 3 090

V-adapter lead DXC control unit E83 (6 - pin)

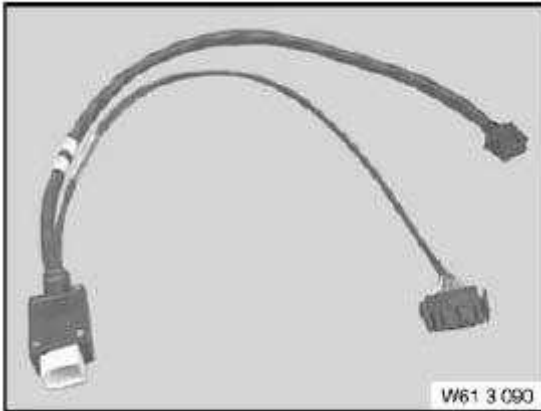


Fig. 14: V-Adapter Lead DXC Control Unit E83 (61 3 090)
Courtesy of BMW OF NORTH AMERICA, INC.

61 3 130 I-ADAPTER LEAD AIRBAG CONTROL UNIT E83 (75-PIN)

Minimum set: Measuring and testing equipment

In conjunction with: Test box 61 4 380

Note: For checking function of airbag control unit in X3

Series: E83

SI number: 02 08 03 (045)

Order number: 61 3 130

I-adapter lead airbag control unit E83 (75-pin)

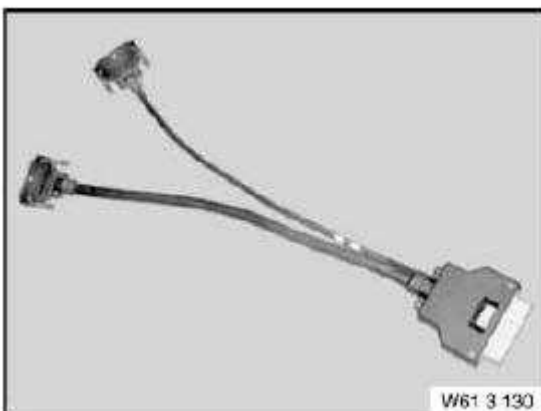


Fig. 15: I-Adapter Lead Airbag Control Unit E83 (61 3 130)
Courtesy of BMW OF NORTH AMERICA, INC.

61 3 300 REMOVAL TOOL**Minimum set: Mechanical tools**

Note: For removing ring antenna at ignition lock

Series: E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/C, E38, E38/3, E39, E39tou, E46, E52, E53, E60, E61, E63, E64, E83, E85, E86, R50, R52, R53

SI number: 1 17 97 (228)

Order number: 61 3 300

Removal tool

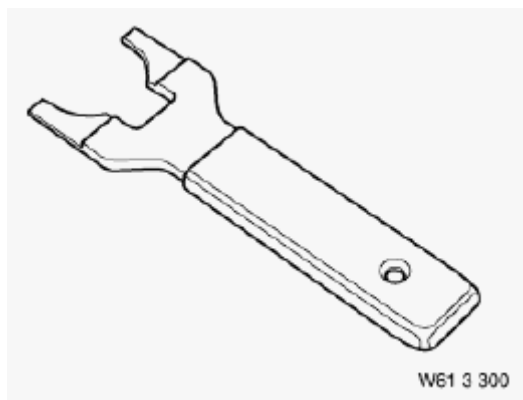


Fig. 16: Removal Tool (61 3 300)

Courtesy of BMW OF NORTH AMERICA, INC.

61 4 300 ADAPTER LEAD FOR OBD SOCKET

Note: For connecting diagnosis system to OBD socket from 06/2000.

Storage location: Single

SI number: 2 04 00 (561)

Order number: 61 4 300

Adapter lead for OBD socket



Fig. 17: Adapter Lead For OBD Socket (61 4 300)
Courtesy of BMW OF NORTH AMERICA, INC.

61 4 320 CRIMPING SET WITH PLIERS

Minimum set: Measuring and testing equipment

Note: For repairing fibre optics conductors and cables. Universal crimp head 61 4 328 added as from 06/2006.

Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 1 14 01 (766)

Order number: 61 4 320

Crimping set with pliers

Consisting of:

1 = 61 4 321 Pliers without crimping head

2 = 61 4 322 Crimping head

Note: For stripping insulation and cutting fibre optic cable to length

3 = 61 4 323 Crimping head

Note: For crimping fibre optic cable contacts

4 = 61 4 324 Crimping head

Note: For crimping MQS contacts

5 = 61 4 325 Crimping head

Note: For crimping MPQ contacts

6 = 61 4 326 Substitute blade

Note: For face-cutting fibre optic cables

7 = 61 4 327 Substitute blade

Note: With tool for replacing blade in cable stripping unit. Must be ordered separately, not included in 61 4 320 delivery specification!

8 = 61 4 328 Universal crimping head

Note: For crimping contacts (without seal) and cable cross-sections of 0.35 - 2.5 mm.

In conjunction with: in conjunction with 61 4 321

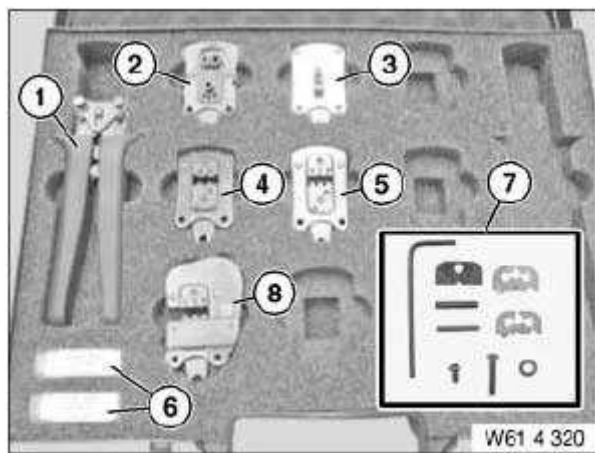


Fig. 18: Crimping Set With Pliers (61 4 320)
Courtesy of BMW OF NORTH AMERICA, INC.

61 4 370 V-ADAPTER LEAD (2-PIN), ZERO-CODED

Minimum set: Measuring and testing equipment

Note: Can be used on different plug housings in engine wiring harness (e.g. from Kostal - "SLK 2.8", Tyco" Junior-Power-Timer" or Bosch) with different codings.

Series: E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E83, E85, E87, E90, E91, R50, R52, R53, RR1

SI number: 02 01 05 186

Order number: 61 4 370

V-adapter lead (2-pin), zero-coded



Fig. 19: V-Adapter Lead (2-Pin), Zero-Coded (61 4 370)
Courtesy of BMW OF NORTH AMERICA, INC.

61 4 380 MEASURING BOX, 105-PIN, COMPLETE

Minimum set: Measuring and testing equipment

Note: For connecting all adapter cables with 61- to 105-pin plug connections

Series: E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E70, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R56, RR1

Storage location: G 110, S 205, U 202, U 205

SI number: 2 04 01(710)

Order number: 61 4 380

Measuring box, 105-pin, complete

Consisting of:

1 = 61 4 381 Measuring box, 105-pin

Note: Without accessories

2 = 61 4 382 Test lead, black

Note: 2 mm system, lead length: 750 mm

3 = 61 4 383 Test lead, red

Note: 2 mm system, lead length: 750 mm

4 = 61 4 384 Test lead set

Note: 2/4 mm system, lead length: 200 mm

5 = 61 4 385 Earth/ground cable

Note: For shield pick-off, lead length: 1.5 m

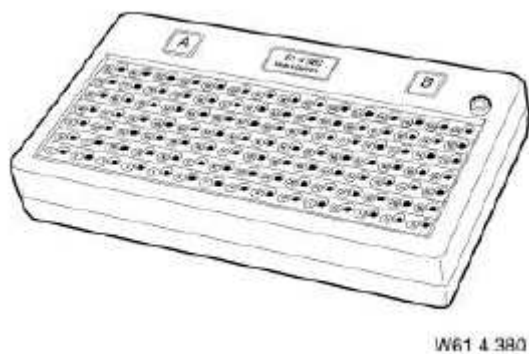


Fig. 20: Measuring Box, 105-Pin, Complete (61 4 380)

Courtesy of BMW OF NORTH AMERICA, INC.

61 4 390 MEASURING BOX, 60-PIN

Minimum set: Measuring and testing equipment

Note: For connecting all adapter cables with 27 - to 60-pin plug connections

Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E70, E83, E85, E87, E90, E91, E92, E93, R50, R52, R53, R56, RR1

Storage location: T 210

SI number: 2 02 98(308)

Order number: 61 4 390

Measuring box, 60-pin



Fig. 21: Measuring Box, 60-Pin (61 4 390)
 Courtesy of BMW OF NORTH AMERICA, INC.

61 6 060 UNIVERSAL WIPER ARM PULLER

Minimum set: Mechanical tools

Note: For removing windscreen wiper arm from drive shaft

Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E81, E82, E83, E85, E86, E87, E90, E91, RR1, RR2

Storage location: B40

SI number: 1 10 99 (433)

Order number: 61 6 060

Universal wiper arm puller

Consisting of:

1 = 61 6 061 Basic body

2 = 61 6 062 Claw, left/right

3 = 61 6 063 Spindle

4 = 61 6 064 Thrust piece

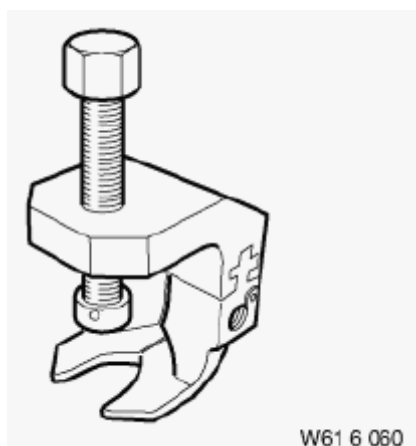


Fig. 22: Universal Wiper Arm Puller (61 6 060)
Courtesy of BMW OF NORTH AMERICA, INC.

61 6 100 ANGLE MEASURING INSTRUMENT

Minimum set: Mechanical tools

Note: For measuring contact/approach angle of wiper blades to window (angle when setting wiper arms)

Series: E36, E39, E46, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E81, E82, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

SI number: 1 21 05 220

Order number: 61 6 100

Angle measuring instrument



Fig. 23: Angle Measuring Instrument (61 6 100)
Courtesy of BMW OF NORTH AMERICA, INC.

61 6 210 WIPER ARM PULLER**Minimum set: Mechanical tools**

Series: E52, E53, E60, E61, E63, E64, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53

SI number: 1 01 05 (172)

Order number: 61 6 210

Wiper arm puller



Fig. 24: Wiper Arm Puller (61 6 210)

Courtesy of BMW OF NORTH AMERICA, INC.

61 8 081 ADDITIONS TO REPAIR KIT I

Note: Order through BMW EPC (Electronic Parts Catalogue), (order numbers: 12 52 1 706 059" 12 52 1 706 068" 12 52 1 706 069" 61 13 1 352 607" 61 31 1 378 942)

Storage location: K 108

Order number: 61 8 081

Additions to repair kit I

61 8 082 ADDITIONS TO REPAIR KIT II

Note: Order through BMW EPC (Electronic Parts Catalogue), (order numbers: 61 13 1 368 534" 61 13 1 369 747" 61 13 1 374 225" 61 13 1 378 722)

Storage location: K 108

2007 BMW X3

ELECTRICAL General Electrical System - Special Tools - X3

Order number: 61 8 082

Additions to repair kit II

61 8 083 ADDITIONS TO REPAIR KIT III

Note: Order through BMW EPC (Electronic Parts Catalogue), (order numbers: 61 13 1 378 110" 61 13 1 378 130" 61 13 1 378 136" 61 13 1 378 137" 61 13 1 378 138" 61 13 1 378 139" 61 13 1 378 908" 61 13 1 378 944" 61 13 1 378 987)

Storage location: K 108

Order number: 61 8 083

Additions to repair kit III

61 9 040 SET OF TOOLS FOR REPAIR KIT IV

Series: E12, E21, E23, E24, E28, E30, E31, E32, E34, E36, E38, E39, E46, E52, E53, E60, E61, E63, E64, E65, E83, E85, E87, E90, E91, E92, R50, R52, R53

Storage location: K 108

SI number: 2 02 92(505)

Order number: 61 9 040

Set of tools for repair kit IV

Consisting of:

1 = 61 9 041 Hand pliers without crimper

2 = 61 9 042 Crimper

Note: For crimping butt connectors and contact sleeves for strip connectors

3 = 61 9 043 Cable stripper with wire cutter

4 = 61 9 044 Crimper

Note: For crimping antenna connector (antenna cable/radio plug connection)

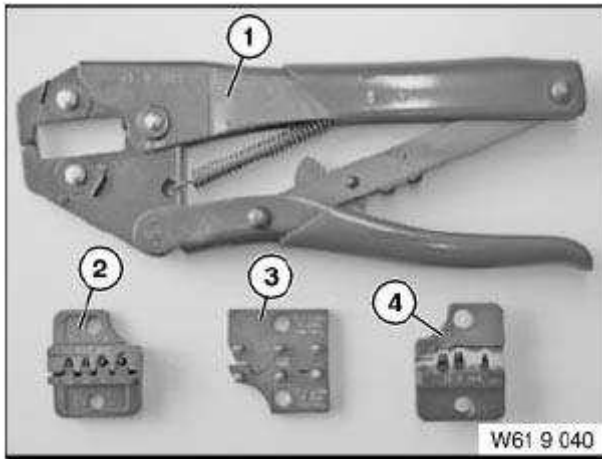


Fig. 25: Set Of Tools For Repair Kit IV (61 9 040)
Courtesy of BMW OF NORTH AMERICA, INC.

61 9 045 FEMALE DIE

In conjunction with: 61 9 041 Crimping tool

Note: For crimping 2.5 mm (dia.) sleeves

Order number: 61 9 045

Female die

ACCESSORIES AND EQUIPMENT**General Electrical System - Technical Data - X3****11 WIRING HARNESS****61 11 WIRING HARNESS SECTIONS (REPAIR CONNECTOR IN DIS) E83****TECHNICAL DATA - WIRING HARNESS SECTIONS (REPAIR CONNECTOR DIS) E83**

Front left	X18985, X18986 (connect unpinned lines to light switch centre A3a)
Front right	X18987, X18988, X18993
Rear right	X11590, X11591
Rear Lid	X19030

61 WINDSCREEN WIPERS**61 61 WINDSCREEN WIPERS E83 /****TECHNICAL DATA - WINDSCREEN WIPERS E83**

Adjustment dimension - right windscreen wiper arm	Millimetres	66.0 ±3 mm
Adjustment dimension - left windscreen wiper arm	Millimetres	61.0 ±3 mm
Contact angle - right windscreen wiper blade	Degrees	85.2° ± 1
Contact angle - left windscreen wiper blade	Degrees	85.4° ±1
Adjustment dimension - rear window wiper arm	Millimetres	29.0 ± 3 mm

ACCESSORIES AND EQUIPMENT**General Electrical System - Tightening Torques - X3****12 AUXILIARY CABLE****61 12 AUXILIARY CABLES/LEADS****AUXILIARY CABLES/LEADS - TIGHTENING TORQUES**

	Type	Thread	Tightening specification	Measure
1AZ Battery positive lead to distributor, luggage compartment	E60 / E61 / E63 / E64 / E65 / E66 / E70 / E83 / E90 / E91 / E92 / E93	M8		15 Nm
2AZ Battery positive lead to connector, engine compartment partition wall	E83	M8		19 Nm
3AZ Battery positive lead to connection support point, luggage compartment floor	E60 / E61 / E63 / E64 / E65 / E66 / E70 / E85 / E86 / E90 / E91 / E92 / E93	M8		15 Nm
4AZ Battery positive lead to engine compartment B+ terminal	E70 / E81 / E82 / E85 / E86 / E87 / E90 / E91 / E92 / E93	M8		15 Nm
	E70 / E81 / E82 / E85 / E86 / E87 / E90 / E91 / E92 / E93	M6		8 Nm
5AZ Battery negative lead to body	E70 / E85 / E86 / E93	M8		15 Nm

21 BATTERY WITH TERMINAL**61 21 BATTERY WITH TERMINAL****BATTERY WITH TERMINAL - TIGHTENING TORQUES**

	Type	Thread	Tightening specification	Measure
1AZ Positive battery lead, negative battery lead, safety battery terminal, IBS (screw connection from above)	E38 / E39 / E46 / E53/E60/E61/ E63 / E64 / E65 / E66 / E67 / E70 / E81 / E82 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93	M6		5 Nm
	E38 / E39	M8		15 Nm
2AZ Distribution box	E60 / E61 / E63 / E64/E70/E81/ E82 / E87 / E90 / E91 / E92 / E93	M8		15 Nm
	E60 / E61 / E63 / E64	M6		5 Nm
3AZ Fuse box	E85 / E86	M8		15 Nm
	E85 / E86	M6		8 Nm
	E85 / E86	M5		5 Nm

2007 BMW X3**ACCESSORIES AND EQUIPMENT General Electrical System - Tightening Torques - X3**

4AZ Positive cable to distributor, safety battery terminal	E46 / E53 / E60 / E61 / E63 / E64 / E65 / E66 / E67 / E70 / E81 / E82 / E83 / E85 / E86 / E87/ E90/ E91/ E92 / E93	M8		15 Nm
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31 SWITCH**61 31 SWITCH****SWITCH - TIGHTENING TORQUES**

	Type	Thread	Tightening specification	Measure
1AZ Ignition starter switch	E60 / E61 / E63 / E64			0.4 Nm
2AZ Reversing light switch	E36 / E38 / E39 / E46 / E53 / E60 / E61 / E63 / E64 / E81 / E82 / E83 / E85 / E86 / E87 / E90 / E91 / E92 / E93	M12		16 Nm
3AZ Trim, gear selector switch	E70	M4		2 Nm
4AZ Gear selector switch	E70	M5		5 Nm
5AZ Controller	E70	M4		1.5 Nm
6AZ Gear selector switch	E60 / E61	M6 x 12		7.5 Nm
7AZ Emergency release to gear selector switch	E60 / E61	4 x 12		1.6 Nm

61 WINDSCREEN WIPERS**61 61 WINDSHIELD WIPERS****WINDSHIELD WIPERS - TIGHTENING TORQUES**

	Type	Thread	Tightening specification	Measure
1AZ Wiper motor mounting to wiper console	E31 LHD / E38	M6		7.5 Nm
	E31 RL / E36			10 Nm
	E39			12 Nm
2AZ Stop for park position to wiper console	E31			15 Nm
3AZ Wiper contact pressure motor to wiper console	E31 / E32 / E34 / E38 to 04/98			6.5 Nm
4AZ Motor crank to wiper motor	E38	M8		21 Nm
	E36 / E39	M8		27 Nm

2007 BMW X3**ACCESSORIES AND EQUIPMENT General Electrical System - Tightening Torques - X3**

5AZ Wiper shaft nut to body	E31 / E36 / E32 / E34			12 Nm
	E46 / E83			10 Nm
6AZ Holder to firewall	E31 / E46 / E83	M6		10 Nm
Wiper bracket to firewall	E36 Coup / E38 / E39			10 Nm
7AZ Upper cowl panel support	E31	M4		5 Nm
8AZ Wiper support bracket to firewall	E36			10 Nm
9AZ Wiper support bracket to wiper console	E36			10 Nm
10AZ Wiper arms				
Driver's side	E31/E39			40 Nm
	E38 from 04/98			25 Nm
	E46 / E83			30 Nm
Driver's side without ADV (contact pressure adjustment)	E32 / E34 E36 / E38 to 04/98			25 Nm
Driver's side with ADV (contact pressure adjustment)	E32 / E34			21 Nm
	E38 to 04/98			40 Nm
Passenger's side	E31 / E32 / E34 / E36 / E38 / E39			25 Nm
	E46 / E83			30 Nm

62 REAR WINDOW WIPER**61 62 TAILGATE WINDOW WIPER****TAILGATE WINDOW WIPER - TIGHTENING TORQUES**

	Type	Thread	Tightening specification	Measure
1AZ Wiper pivot bearing to rear window	E34 / Touring			5 Nm
	E39/Touring, E46 / Touring, E61			10 Nm
	E91	M6		7.5 Nm
2AZ Wiper bracket to rear lid (rubber mount)	E34 / Touring			5 Nm
	E36 / Compact / Touring			10 Nm
3AZ Wiper motor to console	E34 / Touring			13 Nm
4AZ Motor crank to wiper motor	E34 / Touring			13 Nm
5AZ Wiper arm to wiper pivot bearing	E34, E36 / Compact / Touring, E39 / Touring, E61			13 Nm
	E46 / Touring			9.5 Nm
	E46 / Compact			11 Nm

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	E83			12 Nm
	E81 / E87, E91	M8		9.5 Nm
6AZ Washer jet to rear lid	E34 / Touring			10 Nm
7AZ Rear window button to rear window	E39 / Touring			7 Nm
	E46 / Touring, E61, E91			9.5 Nm
8AZ Wiper motor to rear lid	E46 / Compact / Touring, E39 / Touring, E61, E83, E87 / E81, E91			10 Nm