64 00 ... Information on using cleaning agent/paints (personal protection equipment)



Warning!

Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!

Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!



Important!

Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye douche on hand, change the water regularly (once a month).



Important!

Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations



Important!

Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.



Important!

Follow hazard warnings and wear personal protection equipment!

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First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.



Recycling:

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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64 00 ... Overview of A/C service stations

The following table shows an overview of the currently offered A/C service station depending on the refrigerant.

Note:

The different refrigerant connections for C2H2F4 and R1234yf play no role during flushing, as the A/C service station is connected with the refrigerant circuit of the vehicle via the refrigerant line from the air conditioning compressor.

Description	Order number	Refrigerant		Flushing of
		R134a	R1234yf	Refrigerant circuit*
BEISSBARTH BAC 4100a	81 34 2 286 739	x		81 34 2 286 908
BEISSBARTH BAC 5100yf	81 34 2 286 325		x	81 34 2 286 908
ROBINAIR RAC1x34-8i	81 34 5 A0E 610	x		81 34 5 A30 637
ROBINAIR RAC1234-8i	81 34 5 A0E 609		x	81 34 5 A30 637
760R	81 34 2 289 569	x		81 34 2 289 571
TEXA 770S	81 34 2 286 318		x	81 34 2 289 571
WAECO 2500 Low Emission	81 34 2 286 807	x		81 34 2 286 909
WAECO BMW 5500 G RPA Low Emission	81 34 2 456 364		x	81 34 2 286 909
* with optional accessories				

Also see the Specifications for A/C service station

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64 00 ... Overview of refrigerant oil to be filled

The following table shows an overview of which refrigerant oil may be added to which vehicle.*Note:*

The refrigerant oil to be filled can be found on the type plate on current vehicles.

Depending on the version and country, it may happen that the following table specifies a different refrigerant oil than the factory-filled refrigerant oil. This is permissible in certain cases. Observe notes on the refrigerant and refrigerant oil.

Model series		R134a	R1234yf	ND-8	Sanden SP-A2
E	All vehicles with combustion engines	x		x	
	E72 Hybrid	x		x	
F (BMW and MINI)	All vehicles with combustion engines	x		x	
	All vehicles with combustion engines		x		x
	Hybrid	x		x	
	Hybrid		x	x	
	PHEV	x			x
	PHEV		x		x
G	All vehicles with combustion engines	x			x
	All vehicles with combustion engines		x		x
	PHEV	x			x
	PHEV		x		x
I	All	x			x
	All		x		x
R (MINI)	All vehicles with combustion engines	x		x	
	All vehicles with combustion engines		x		x
RR	RR1, RR2, RR3 before model facelift	x		x	
	RR4 with optional rear air conditioning	x		x	
	All other vehicles	x			x
	All other vehicles		x		x

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

Warning!

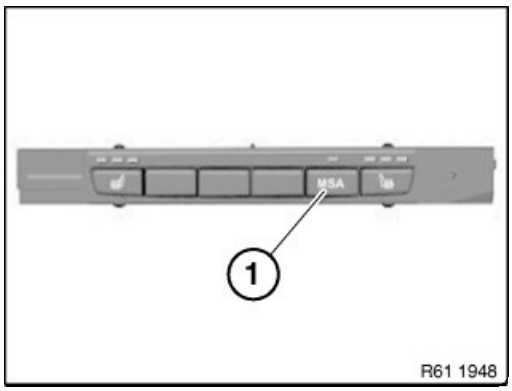
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

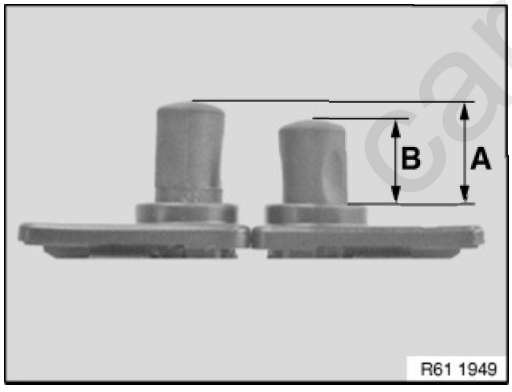
Observe safety precautions when working on MSA vehicles.

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

MSA function is deactivated by:



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



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

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

    B = 7 mm

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

When working with diagnosis tools:

- Observe instructions in diagnosis tool

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

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

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64 11 395 Removing and installing rear passenger compartment control panel

PRELIMINARY WORK

1 – Removing the rear centre console trim

RISK OF DAMAGE

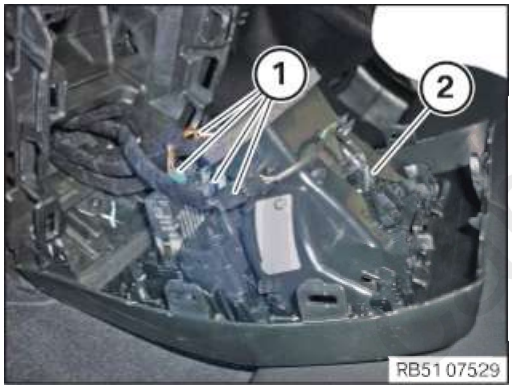
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.

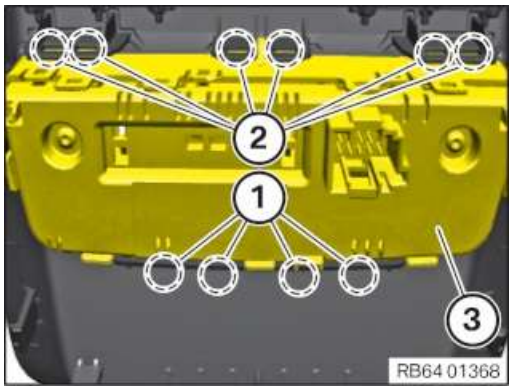


- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

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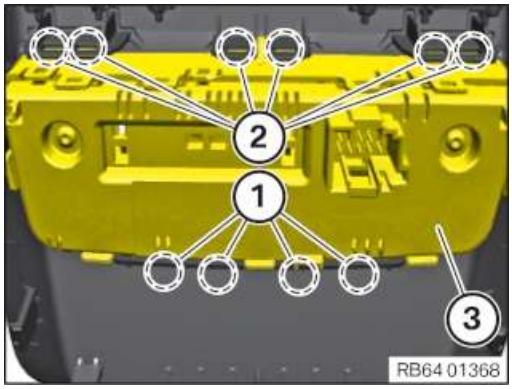
MAIN WORK

2 – Removing air conditioning control panel for the rear passenger compartment



- Detach air conditioning control panel first at the latch mechanisms (1) and then at the latch mechanisms (2).
- Remove air conditioning control panel (3) from the decorative strip.

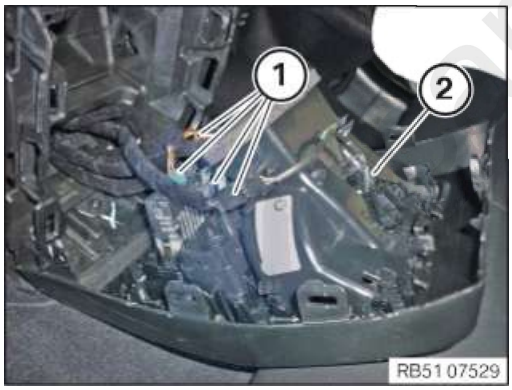
3 – Install air conditioning control panel for the rear side



- Fit the air conditioning control panel (3) on the decorative strip and position it correctly.
- Engage the latch mechanisms (1) and (2).

POSTPROCESSES

4 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.



- Position centre console trim (1) and engage at the latch mechanisms at the side.

avdiagn.com

64 11 377 Removing and installing the control panel of the heating and air conditioning system

RISK OF DAMAGE

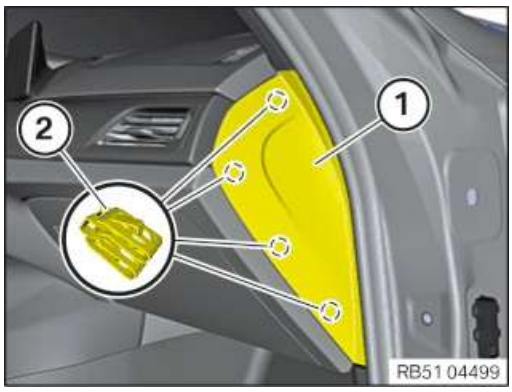
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

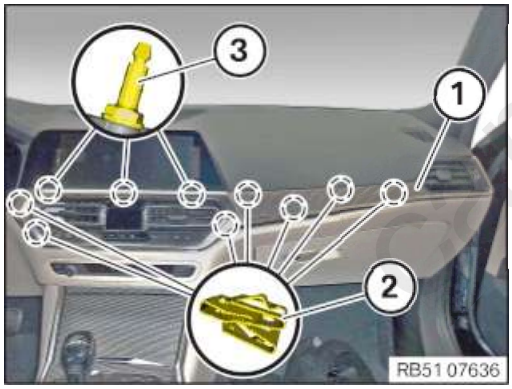
PRELIMINARY WORK

1 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

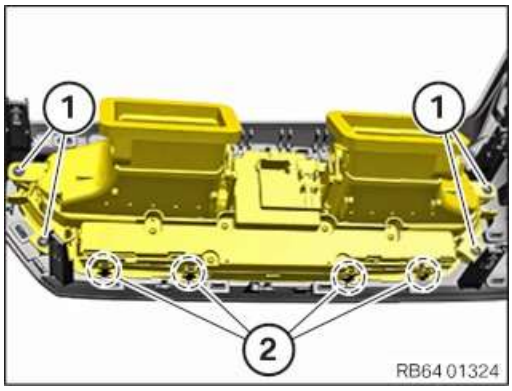
2 – Remove the finisher on the right instrument panel



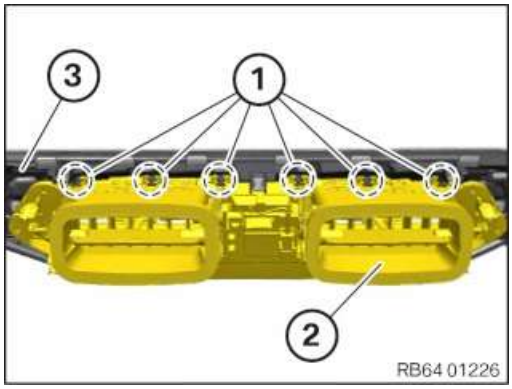
- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

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3 – Removing the centre ventilation grille with integrated air conditioning control panel

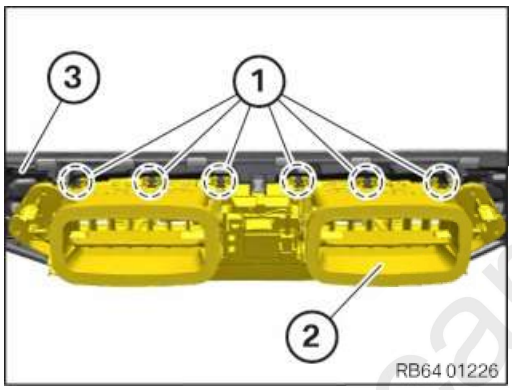


- Loosen screws (1).
- Disengage the latch mechanisms (2).

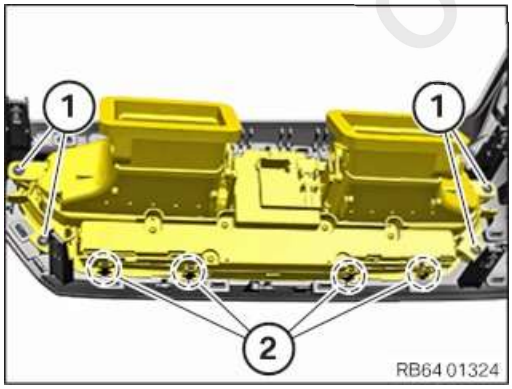


- Disengage the latch mechanism (1) from the ventilation grille (2).
- Remove the ventilation grille (2) with the integrated air conditioning control panel from the decorative strip (3).

4 – Installing the centre of the ventilation grille with the integrated air conditioning control panel



- Place ventilation grille (2) with the integrated air conditioning control panel on decorative strip (3) and position it correctly.
- Engage latch mechanisms (1) on ventilation grille (2).



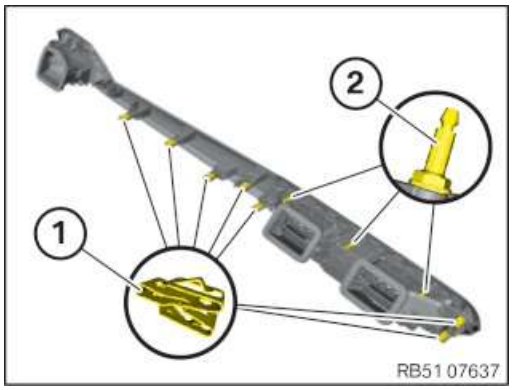
- Engage the latch mechanisms (2).
- Tighten the screws (1).

Ventilation grille to decorative strip/instrument panel

Screw		Tightening torque	1.8 Nm

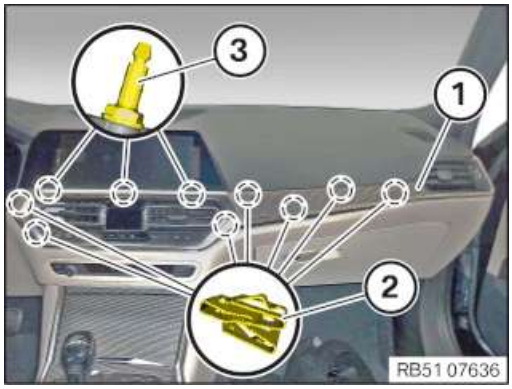
cardiag.com

5 – Install the finisher on the right instrument panel



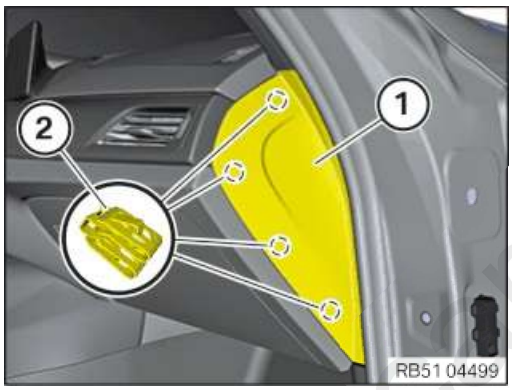
- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

6 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

carldiag.com

Additional Information

Overview of Tightening Torques

Ventilation grille to decorative strip/instrument panel — Used in step 4

Screw		Tightening torque	1.8 Nm

64 11 197 Removing and installing the heating and air-conditioning unit

CAUTION

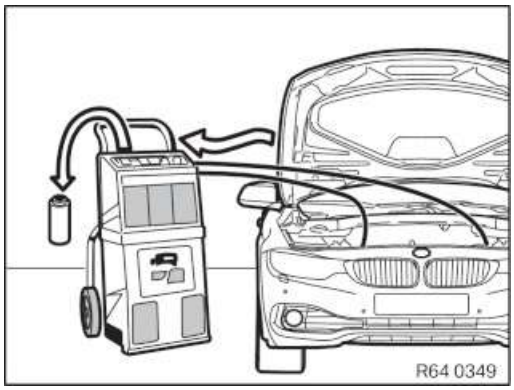
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

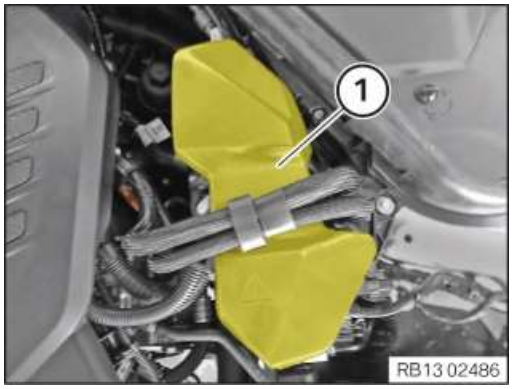
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



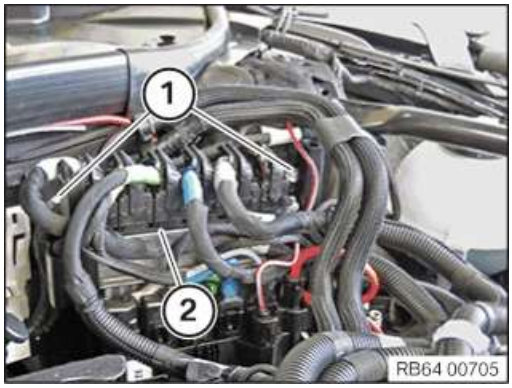
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

3 – Detach the control unit holder

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- Pull the cover (1) towards the top and feed out.



- Loosen screws (1).
- Remove control unit holder with the control units (2) and lay to one side.

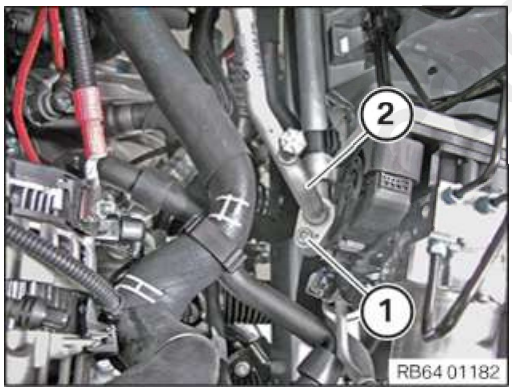
4 – Disconnect the refrigerant line on the connecting piece

CAUTION

Residual pressure in the air conditioning.

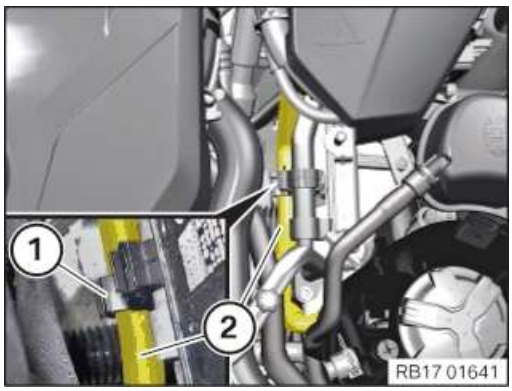
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

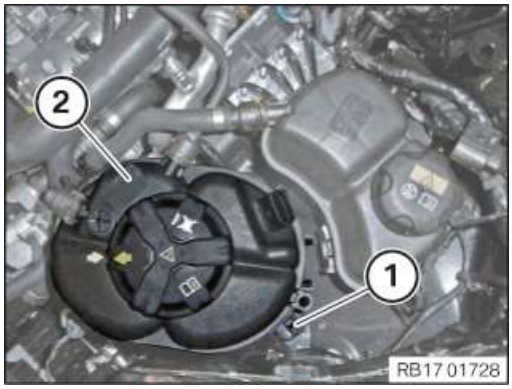


- Release the screw (1).
- Remove the refrigerant line (2).

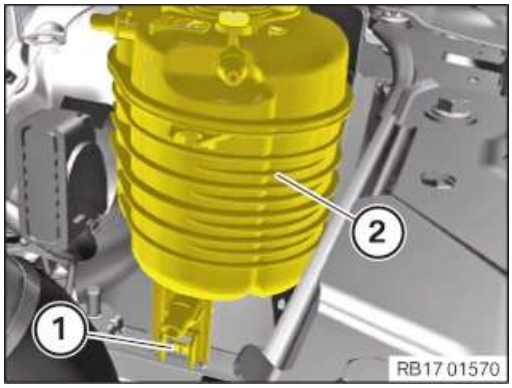
5 – Removing coolant expansion tank of high-temperature coolant circuit partially



- Unlock the holder (1).
- Feed out coolant line (2) and place to one side.



- Unlock the lock (1) at the coolant expansion tank (2).



NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Unlock the lock (1) below at the expansion tank (2).
- Set the coolant expansion tank (2) aside.

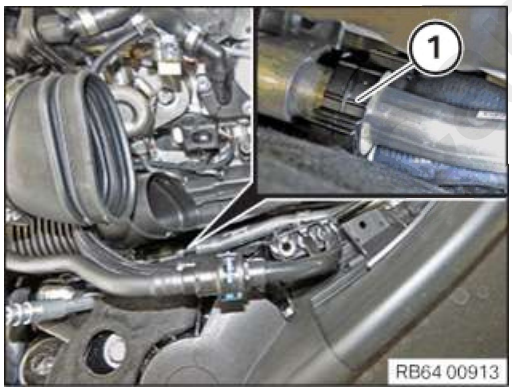
6 – Disconnect the refrigerant line from the expansion valve

CAUTION

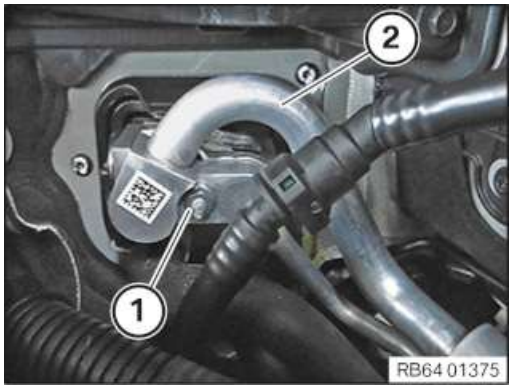
Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



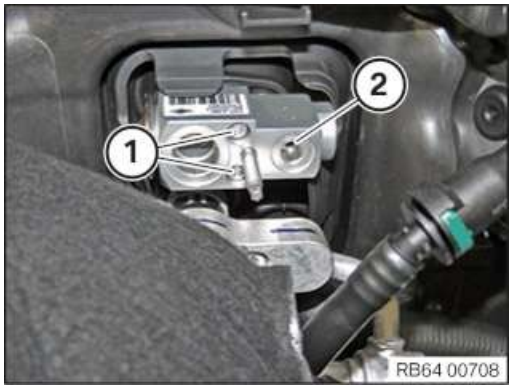
- Open the holder (1).



- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.

7 – Remove expansion valve

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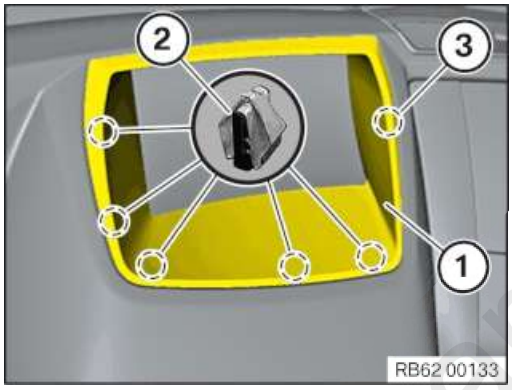
- Loosen screws (1).
- Remove the expansion valve (2).

8 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

9 – Removing trim for the Head-Up Display



- Unclip trim (1) for the Head-Up Display upwards from clamps (2) and latch mechanism (3).

10 – Remove cupholder



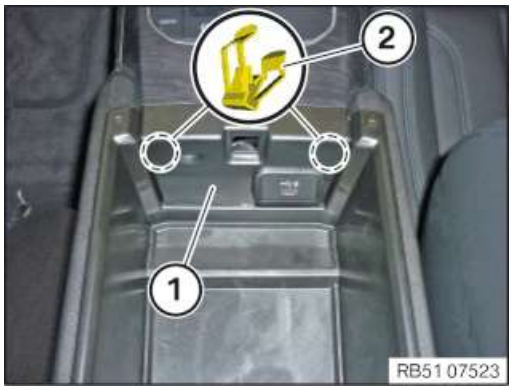
- Remove the insert (1).

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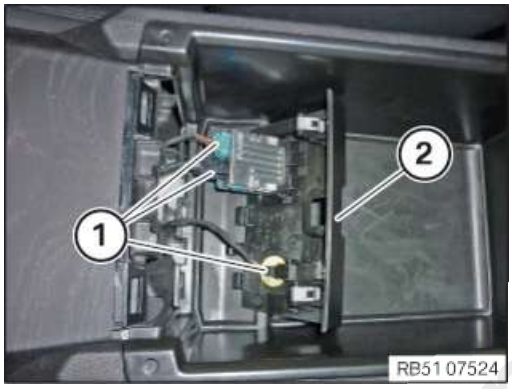


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

11 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

12 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

13 – Removing the decorative trim on the centre console on the left and right

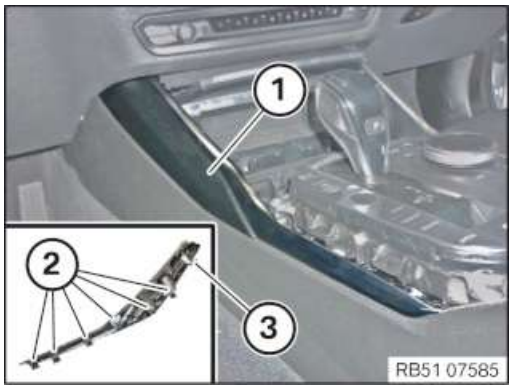
cardiagn.com

13 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

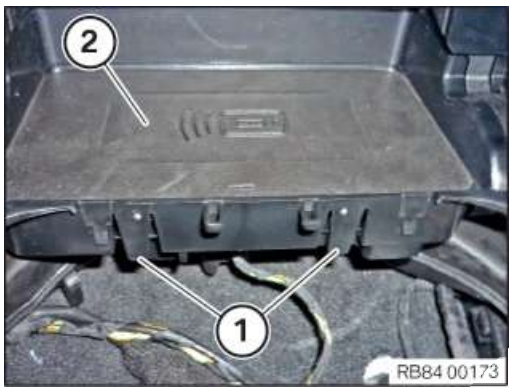
NOTICE

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

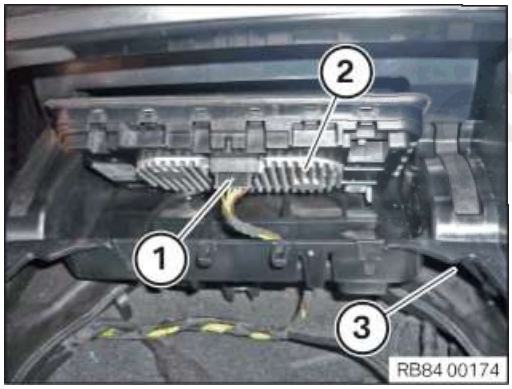


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

14 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

15 – Remove the operating facility in the centre console

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

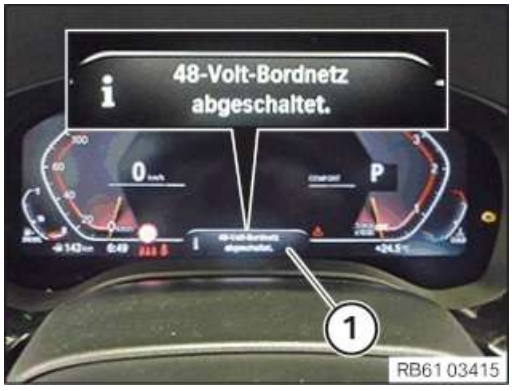
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

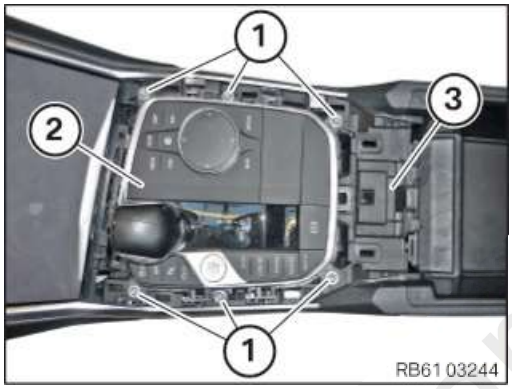
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

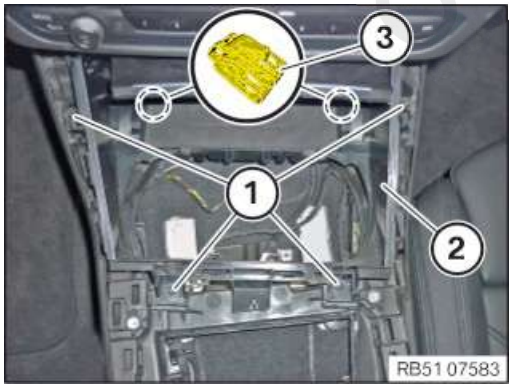


- See additional information.



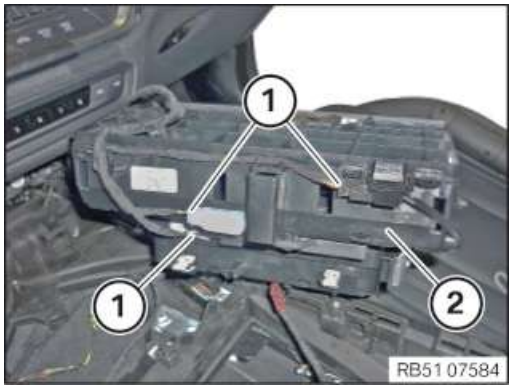
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

16 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

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- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

17 – Removing the rear centre console trim

RISK OF DAMAGE

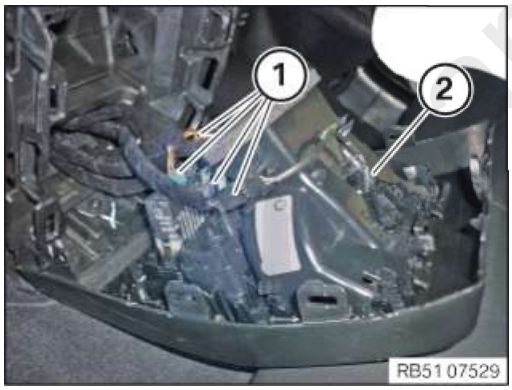
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.

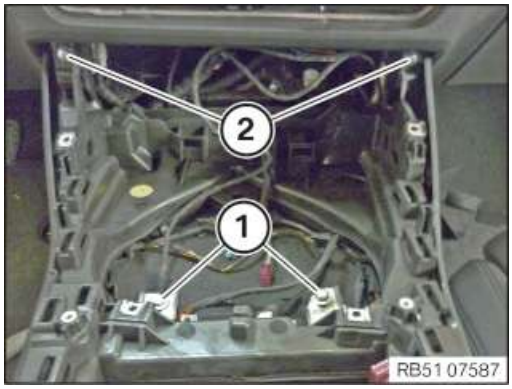


- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

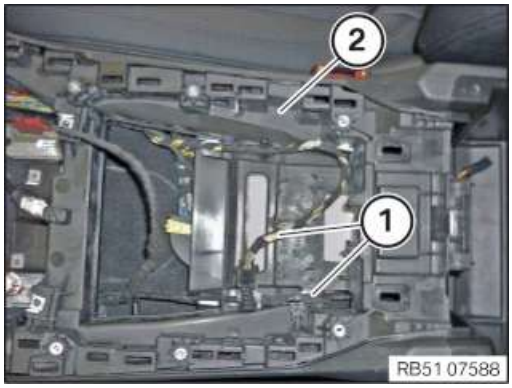
18 – Removing the centre console



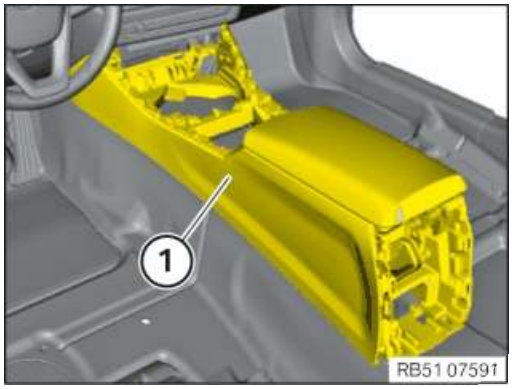
- Loosen screws (1).



- Loosen screws (1) and (2).



- Release the wiring harness (1) from the centre console (2).

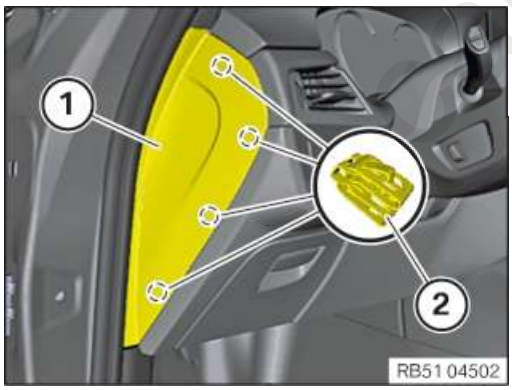


NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

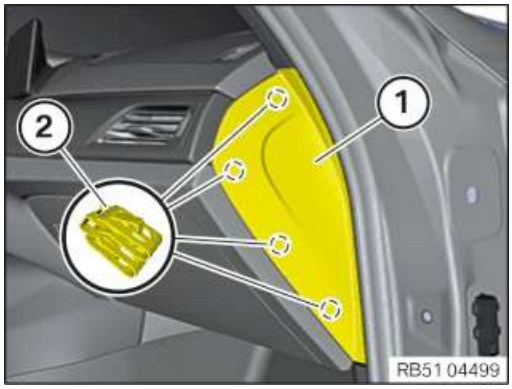
- Carefully raise rear centre console (1).
- Feed out wiring harness from the centre console (1) and unlock and disconnect existing plug connections, if required.
- Feed out and remove the centre console (1) on the instrument panel .

19 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

20 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

21 – Remove left and right A-pillar trim panel

NOTICE

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

▸ **Remove the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

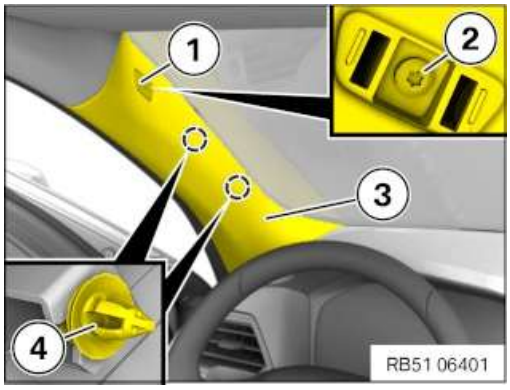
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

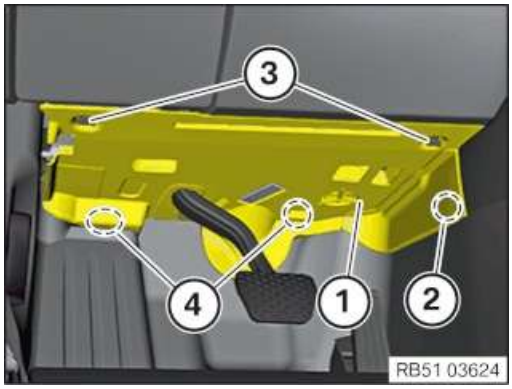
- Do not use sharp-edged tools when removing the trim panel.



- Unclip cover (1) with a suitable special tool from the special tool kit 0 493 752 (00 9 329).
- Loosen screw (2).
- Unclip A-pillar trim panel (3) with clips (4) and feed it out to the top.

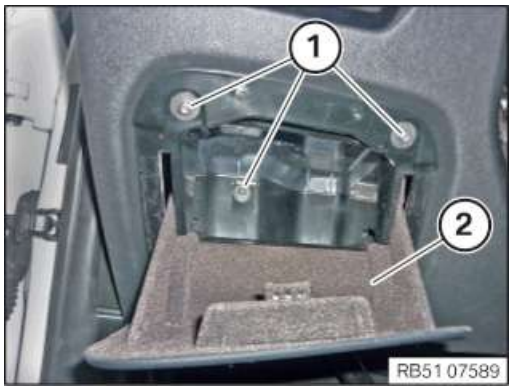
22 – Removing the trim panel for pedal mechanism

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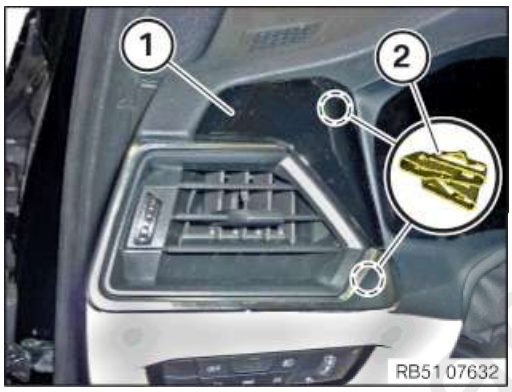
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

23 – Removing the left fold-down compartment



- Loosen screws (1).
- Remove the fold-down compartment (2) toward the bottom.

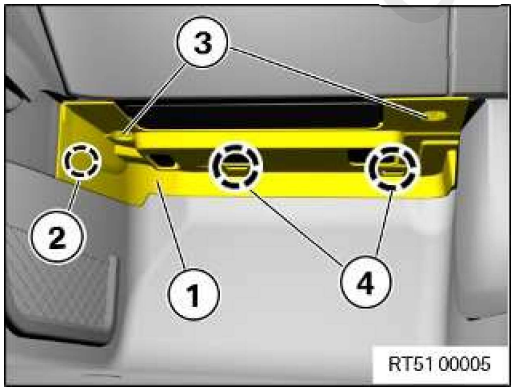
24 – Remove the finisher on the instrument panel on the left



- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

  Remove the decorative strip (1).

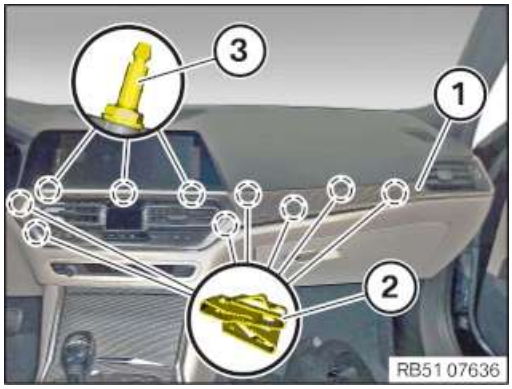
25 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

26 – Remove the finisher on the right instrument panel

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- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

27 – Remove Central Information Display (CID)

RISK OF DAMAGE

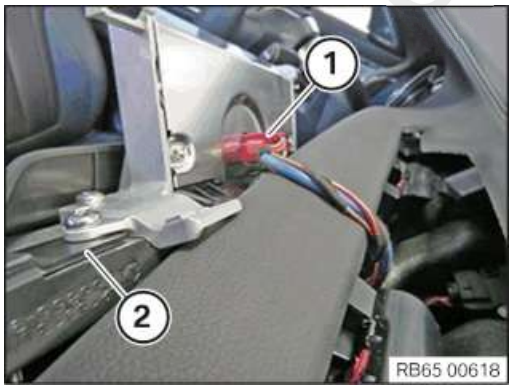
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Loosen screws (1).
- Pull out central information display (CID) (2) slightly off the instrument panel.



- Unlock plug connection (1) and disconnect.
- Remove the central information display (CID) (2).

28 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Removing the airbag unit for sports steering wheel**



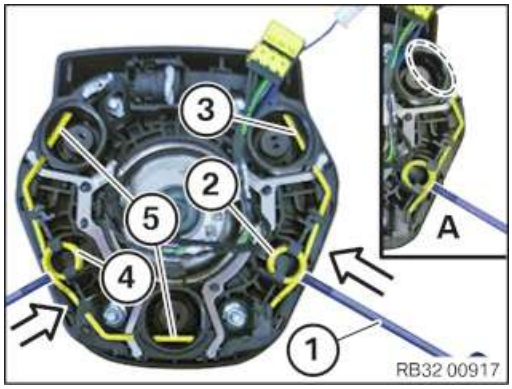
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

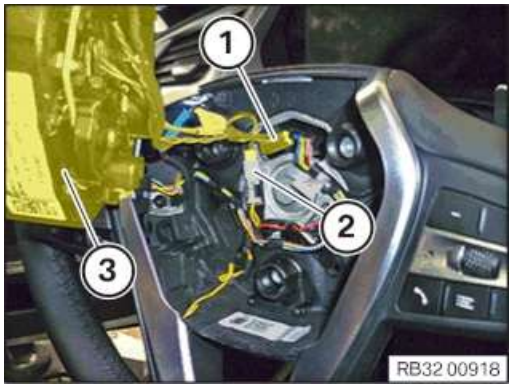
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Press wire spring clip (4) with Torx screwdriver T25 (1) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

▸ Removing the airbag unit for M Sport steering wheel



NOTICE

Perform the operations on the left and right side.

- Locate the mark (1) for unlocking the airbag unit on the steering wheel by touching it.



NOTICE

Perform the operations on the left and right side.

- Cut the mark (1) carefully with a knife (2) to an approx. length of 4 mm .

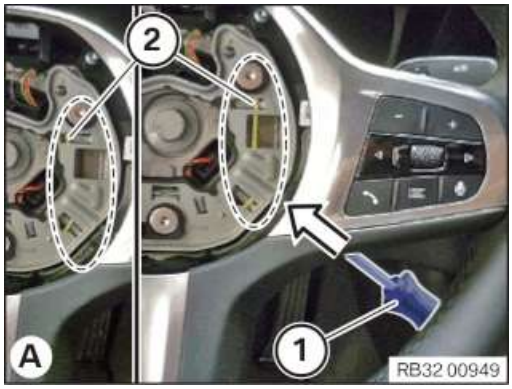


TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

- In case of vehicles with shift paddles (2) made of carbon-fibre-reinforced plastic, use a Torx socket T15 (1) for unlocking the airbag unit.

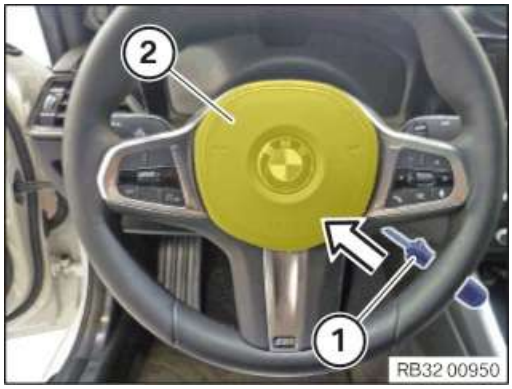
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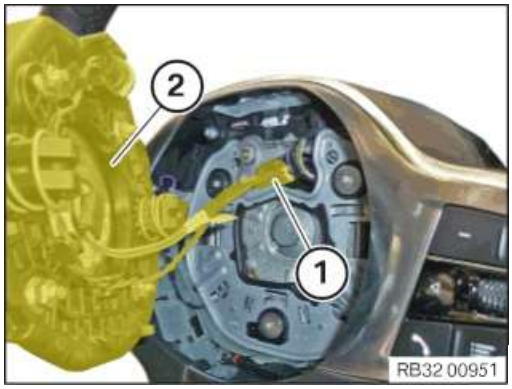
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Insert the Torx socket T15 (1) diagonally upwards until a resilient resistance is felt.
- Press in Torx socket T15(1) straight in the direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).

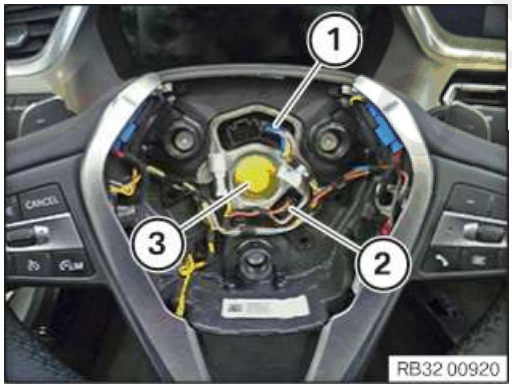


- Press in Torx screwdriver T15 (1) straight in direction of arrow towards the centre of the steering wheel and lift the airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



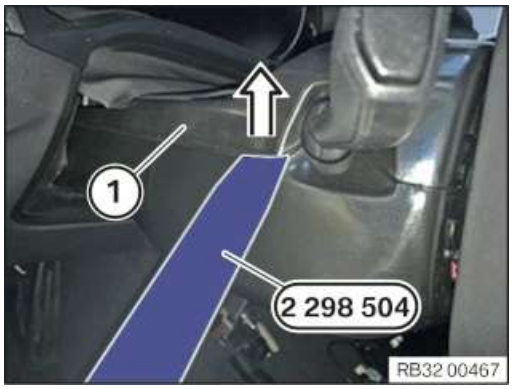
- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

29 – Remove sports steering wheel



- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

30 – Removing steering column shroud upper section

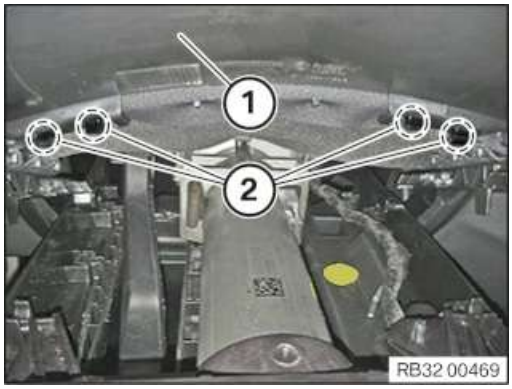


NOTICE

Perform the operations on the left and right side.

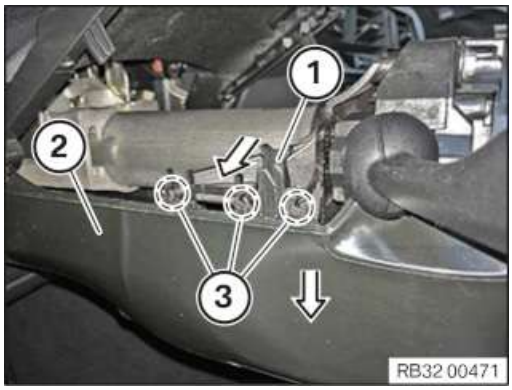
- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.

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- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

31 – Removing steering column shroud lower section



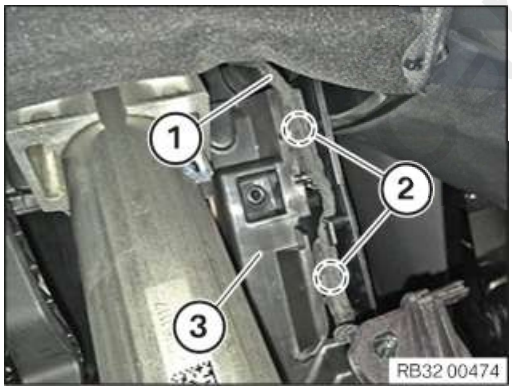
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

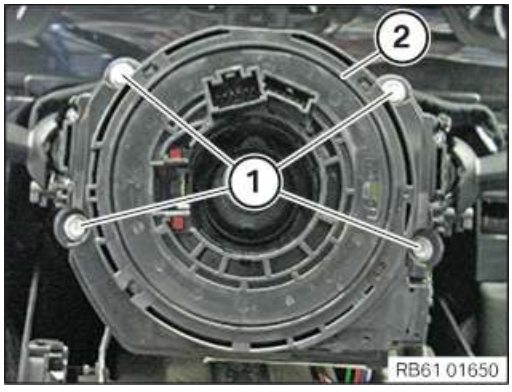


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).

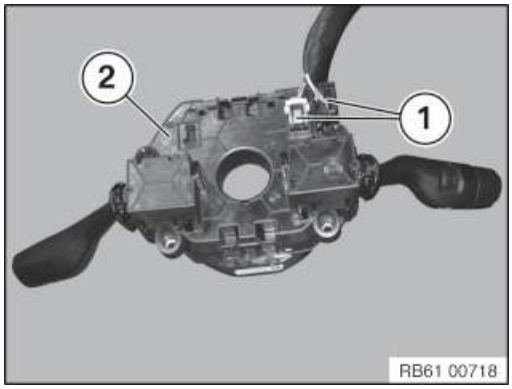


- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

32 – Removing the steering column switch cluster (SZL)



- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



- Unlock and disconnect plug connections (1) on the SZL (2).

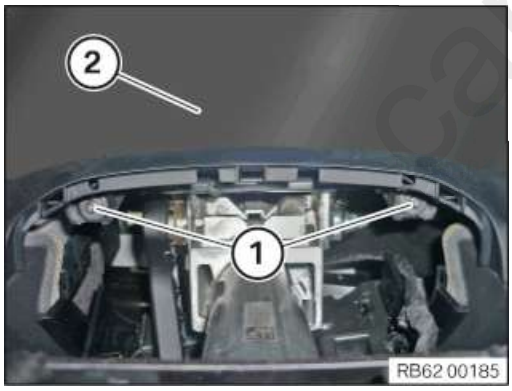
33 – Removing the instrument cluster (KOMBI)



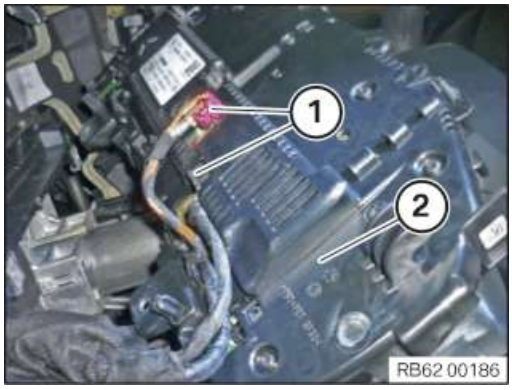
- Loosen screw (1).



- Loosen screw (1).



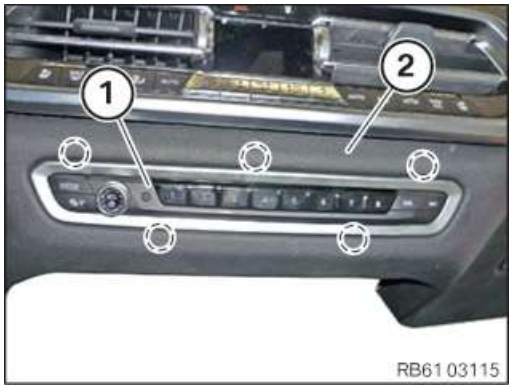
- Loosen screws (1).
- Feed out instrument cluster (KOMBI) (2).



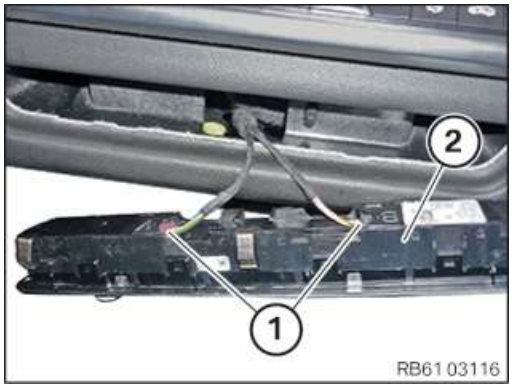
- Unlock and disconnect plug connections (1) from instrument cluster (KOMBI) (2).
- Remove the instrument cluster (KOMBI) (2).

34 – Remove the audio operating unit

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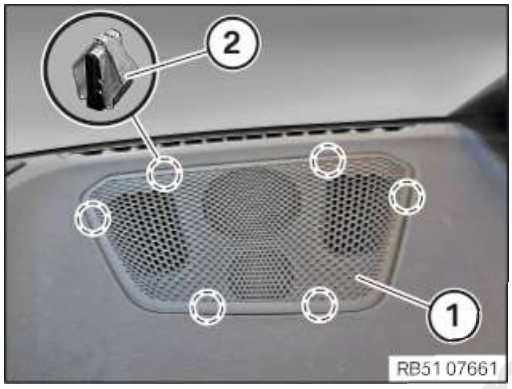


- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



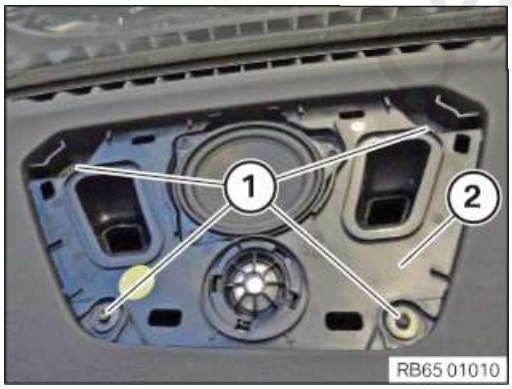
- Disconnect plug connections (1) and remove the audio operating unit (2).

35 – Remove the speaker trim at the instrument panel

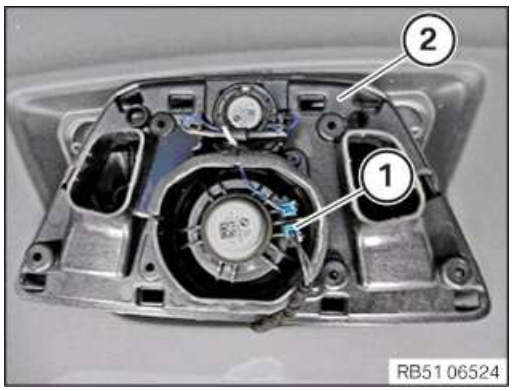


- Lever out the speaker trim (1) with the special tool 0 496 569 (00 9 325) from the clamps (2) toward the top and remove.

36 – Remove the speaker holder at the instrument panel



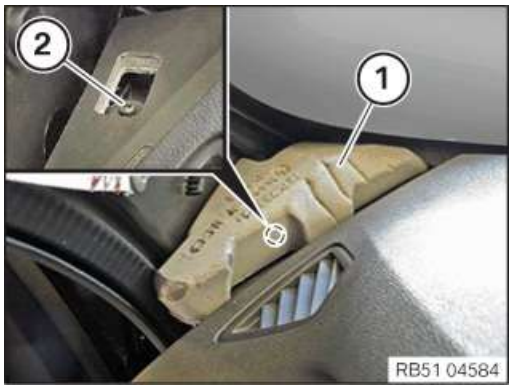
- Loosen screws (1).
- Pull out speaker holder (2) slightly with the loudspeakers and tilt it to the side.



- Unlock plug connection (1) and disconnect.
- Remove the speaker holder (2).

erdiagn.com

37 – Remove the instrument panel trim panel



NOTICE

Perform the operations on the left and right side.

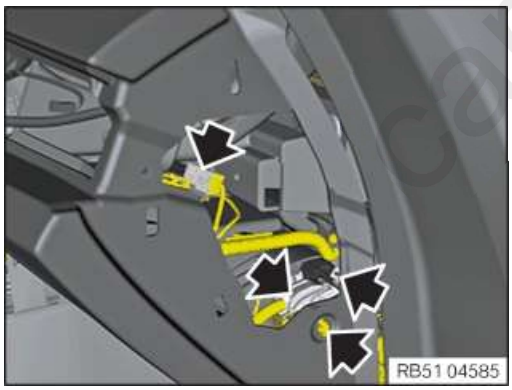
- Remove the sound insulation (1).
- Loosen screw (2).



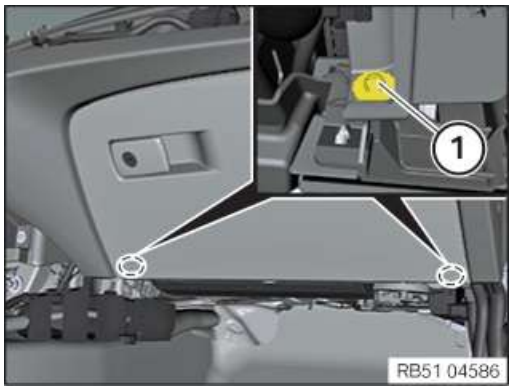
- Loosen screws (1).



- Loosen screws (1).

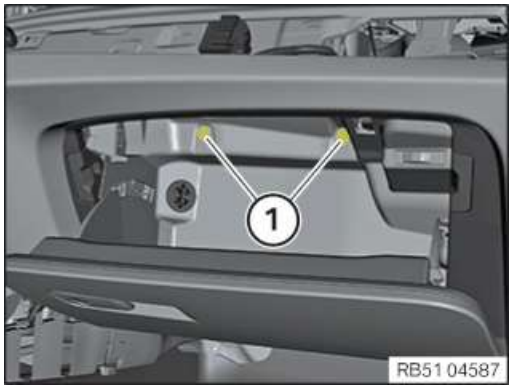


- Release all plug connections and cable clips (arrows) behind the glove box.

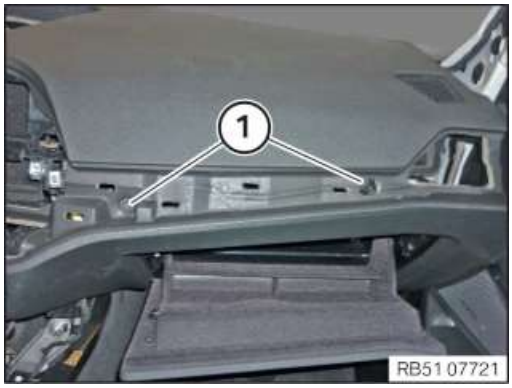


- Release the screws (1) on the lower side of the glove box.

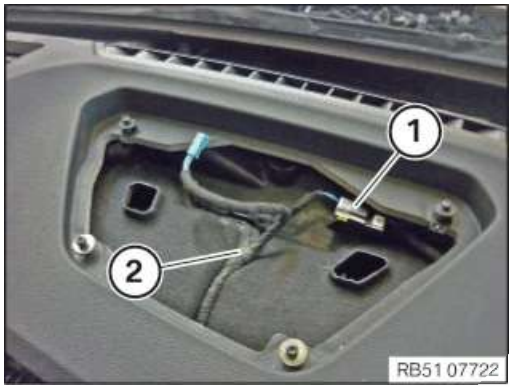
cardiagn.com



- Open glovebox.
- Loosen screws (1).



- Loosen screws (1).



- Unlock plug connection (1) and disconnect.
- Release the wiring harness (2) on the holders.



- Unlock the plug connection (1) on the light operating unit and disconnect it.



- Loosen screws (1).

TECHNICAL INFORMATION

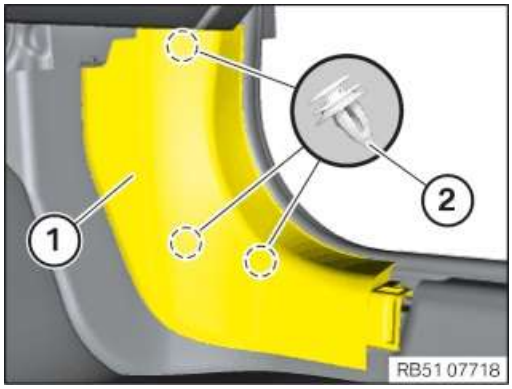
Conduct the following operation with the assistance of a second person.

- Pull the instrument panel trim back slightly.

  If necessary, unlock and disconnect additional plug connections.
- Remove the instrument panel trim from the vehicle.

38 – Removing the side trim panel in the footwell at the right-hand A-pillar

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- Loosen the side trim panel (1) at the clips (2) and remove it toward the inside.

39 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

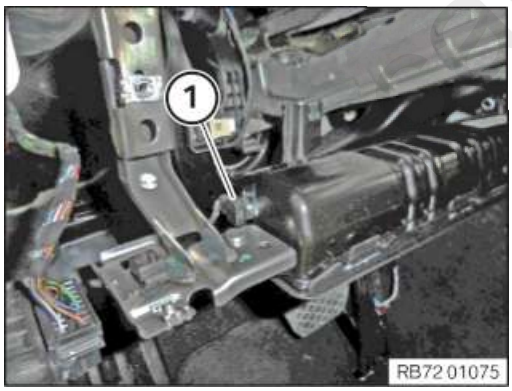
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

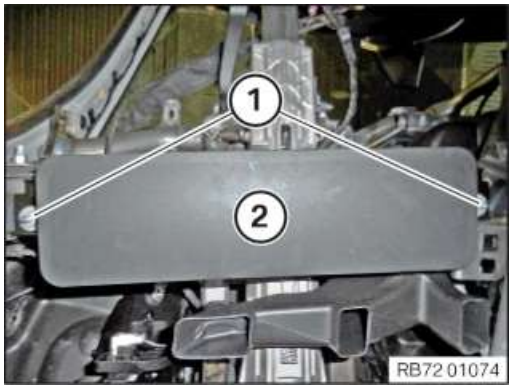
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



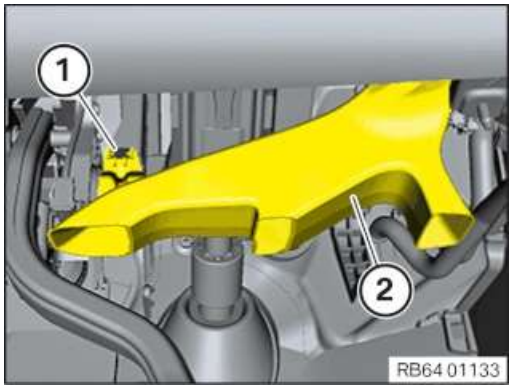
- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

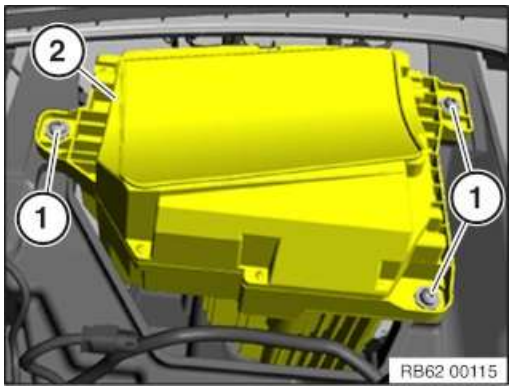
40 – Remove left air duct

40 – Remove left air duct



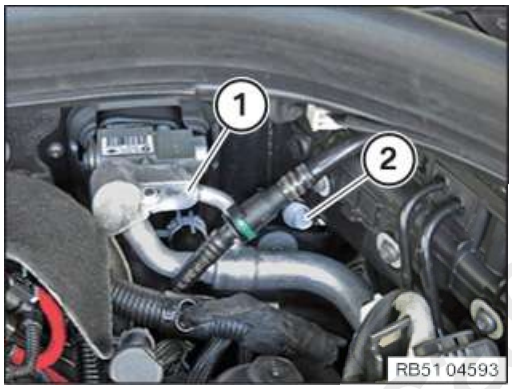
- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

41 – Removing the Head-Up Display



- Loosen screws (1).
- Remove head-up display (2) from support.
- Unlock associated cable and disconnect.

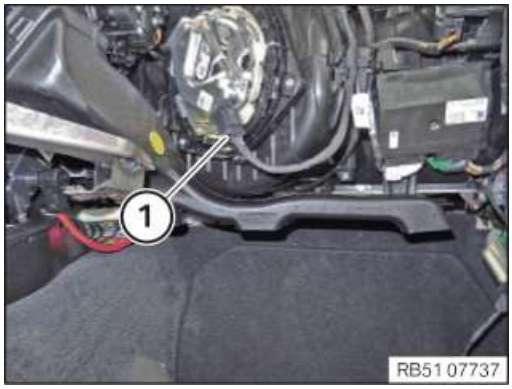
42 – Removing the support for the instrument panel



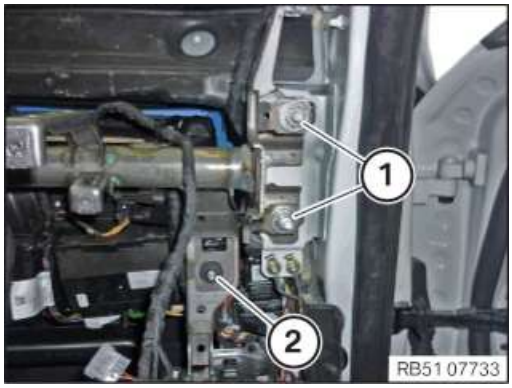
- Push the refrigerant line (1) slightly to one side and loosen the screw (2).



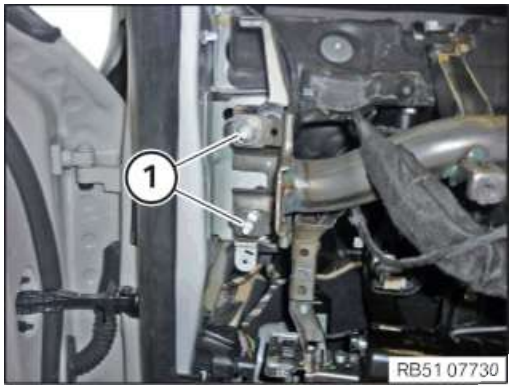
- Push the carpet in the area of the right B-pillar to the side.
- Unlock and disconnect plug connections (1).



- Unlock and disconnect the plug connection (1) on the blower motor.



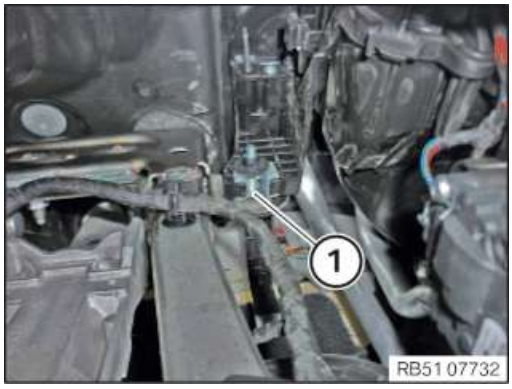
- Loosen nuts (1) and (2).



- Loosen nuts (1).

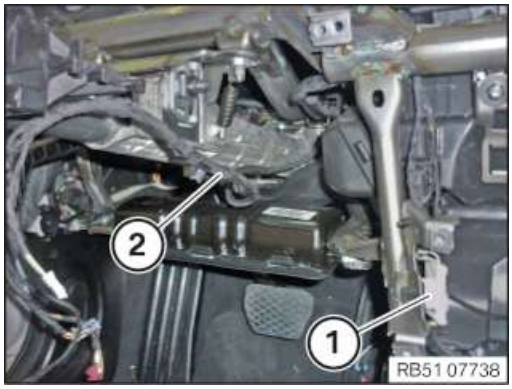


- Loosen screws (1).

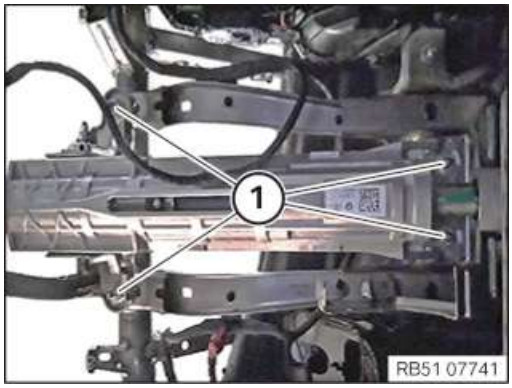


- Slacken the nut (1) in the left footwell on the heating and air-conditioning unit.

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- Release plug connection (1).
- Release the wiring harness (2) from the steering column.

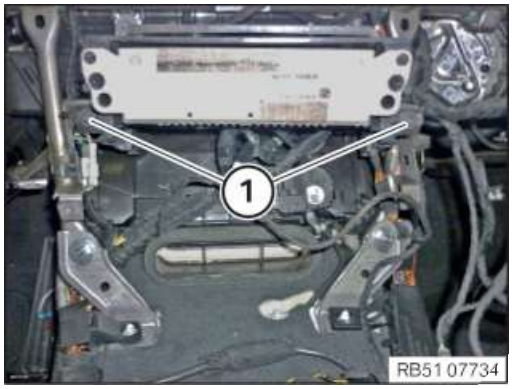


TECHNICAL INFORMATION

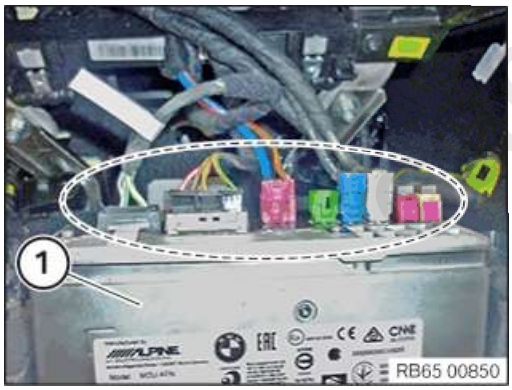
Secure component against falling.

- Release the nuts (1) at the steering column.
- Drop steering column (1) a little away and support it in the footwell.

  Drop steering column not too far away and support it absolutely.



- Loosen screws (1).
- Feed out Head Unit High.

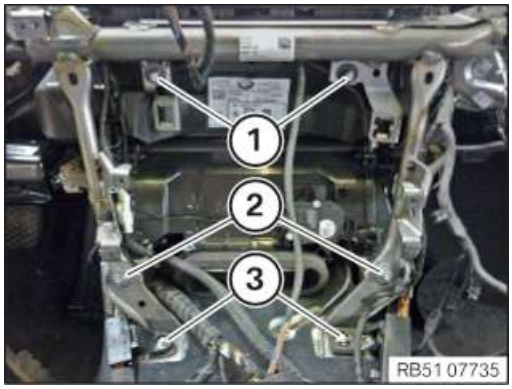


- Unlock and disconnect all connectors in the marked area.
- Remove headunit (1).



- Unlock and disconnect plug connection (1) from airbag control unit.
- Release the wiring harness (2) on the holders.

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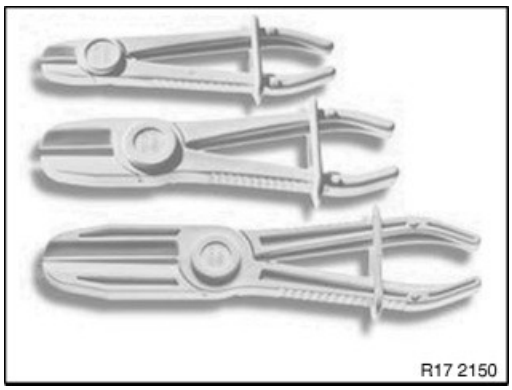
- Loosen nuts (1).
- Loosen nuts (2).
- Remove cable clip and release the nuts (3).

  Remove retaining bracket from left and right sides.
- Carefully feed out the support for the instrument panel to the rear.

  If necessary, unlock and disconnect additional plug connections.
- Carefully remove support for the instrument panel from the vehicle.

MAIN WORK

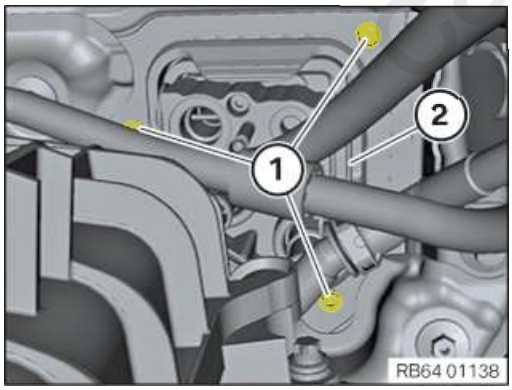
43 – Removing the heating and air-conditioning unit



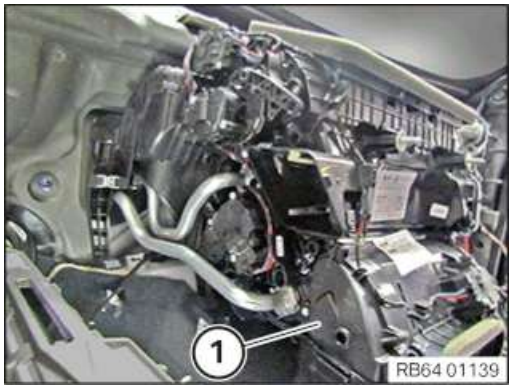
- Use commercially available disconnection tools to pinch off the coolant lines.



- Release the hose clamps (1) using special tool and pull off the coolant hoses.

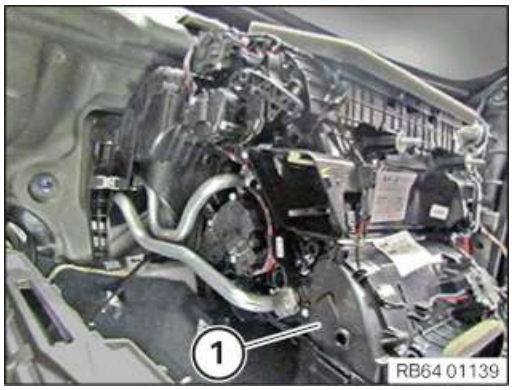


- Release screws (1) from flange (2).
- Protect the carpet in footwell against leaking coolant.

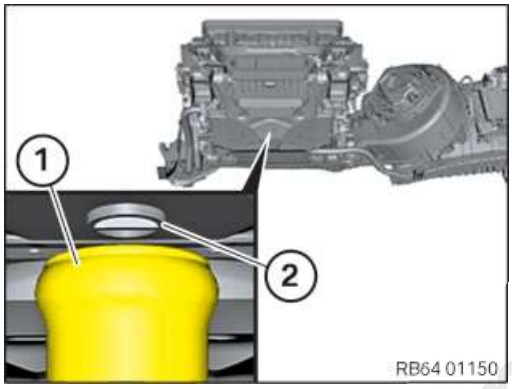


- Unfasten plug connection.
- Remove the heating and air-conditioning unit (1).

44 – Installing the heating and air-conditioning unit



- Position the heating and air-conditioning unit (1).
- Connect connectors and lock.



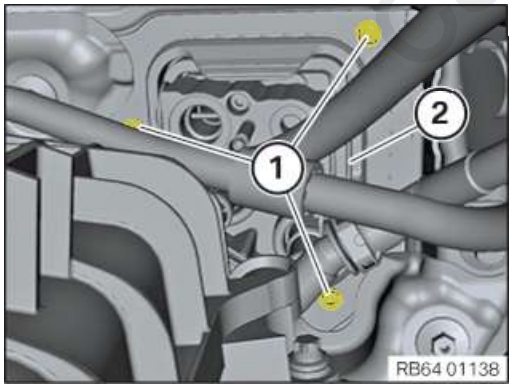
RISK OF DAMAGE

Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

- Ensure that the condensate drain (2) is correctly fitted onto the grommet (1).
- After installing the heating and air-conditioning unit, perform a visual inspection.



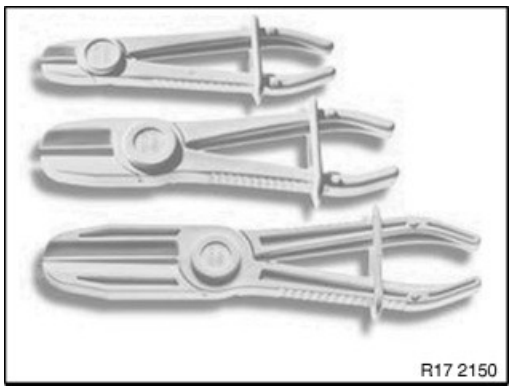
- Tighten the nuts (1) on the flange (2).

Heating and air-conditioning unit on the bulkhead

Oval-head screw		Tightening torque	2,8 Nm



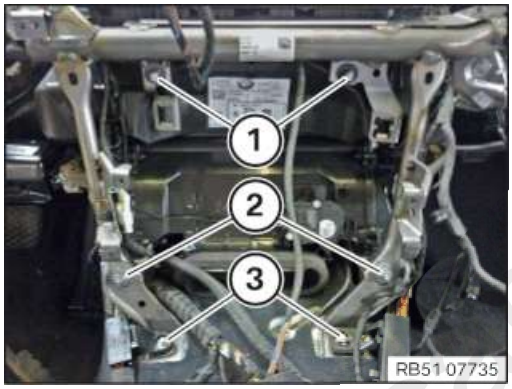
- Slide coolant hoses on correctly.
- Secure hose clamps (1) using the special tool .



- Remove disconnection tools.

POSTPROCESSES

45 – Installing the support for instrument panel



- Install the instrument panel support into the vehicle carefully.
- Insert the instrument panel support carefully.

  If necessary, connect and lock the additional connector.
- Tighten nuts (1).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

- Mount retaining bracket on left and right.

  Tighten nuts (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nuts (3) and fit cable clip .

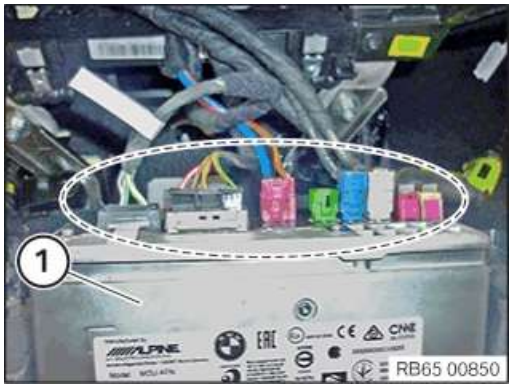
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

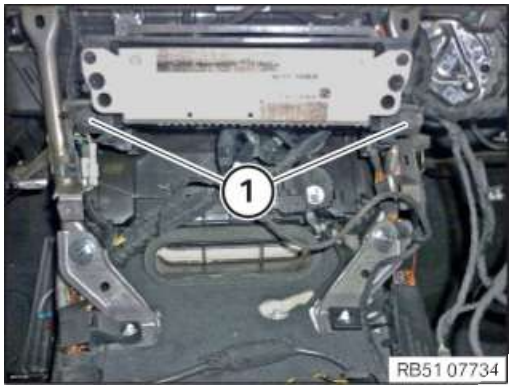
carfiagn.com



- Connect the connector (1) to the airbag control unit and lock it.
- Secure the wiring harness (2) on the holders.



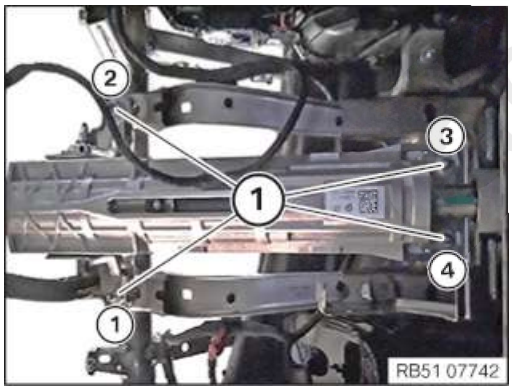
- Position head unit (1).
- Connect and lock all connectors in the marked area.



- Feed in the head unit.
- Tighten the screws (1).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm



- Correctly position the steering column (2) and tighten the nuts (1) in the sequence (1), (2), (3) and (4).

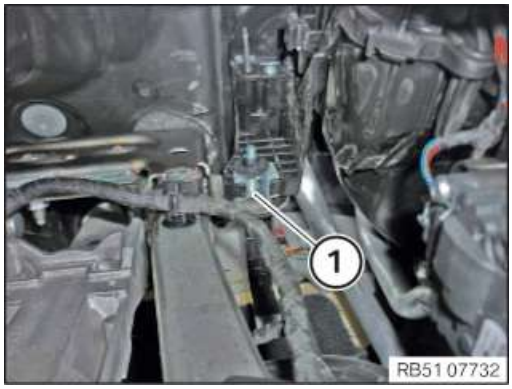
Steering column to dashboard support

M8	Observe tightening sequence.	Tightening torque	21,4 Nm



- Connect connectors (1) and lock.
- Secure the vehicle wiring harness (2) to the steering column.

.diagn.com



- Tighten nut (1) in the left foot well on the heating and air-conditioning unit.

Heating and air-conditioning unit on support

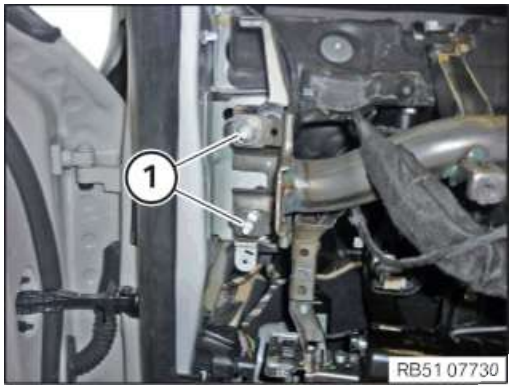
Nut M6		Tightening torque	4 Nm



- Tighten the screws (1).

Support for instrument panel

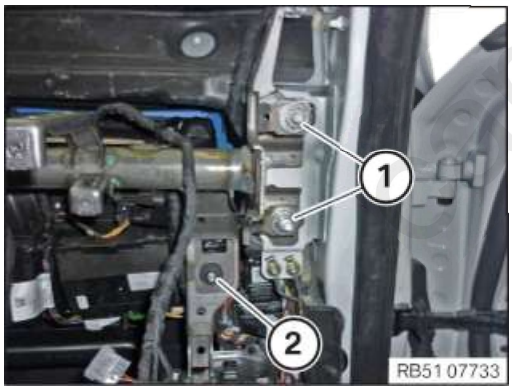
M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Tighten nuts (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Tighten nuts (1).

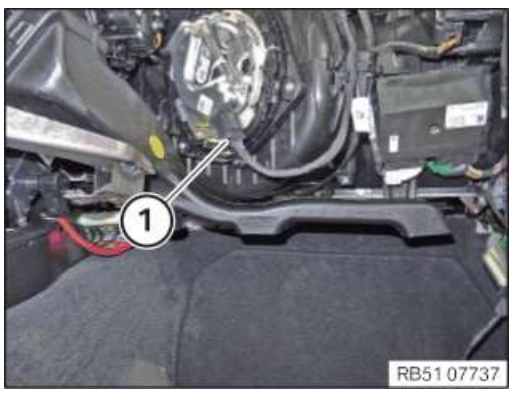
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nut (2).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

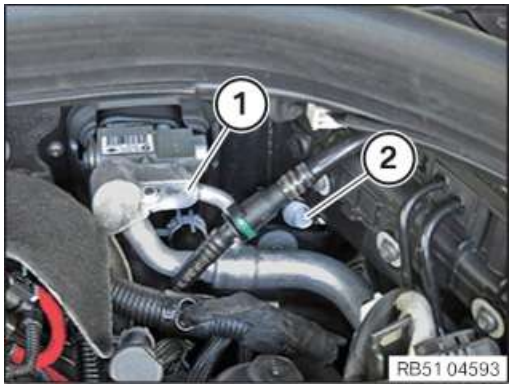


- Connect the connector (1) to the blower motor and lock.

.com



- Connect connectors (1) and lock.
- Correctly position the carpet in the area of B-pillar at the right.

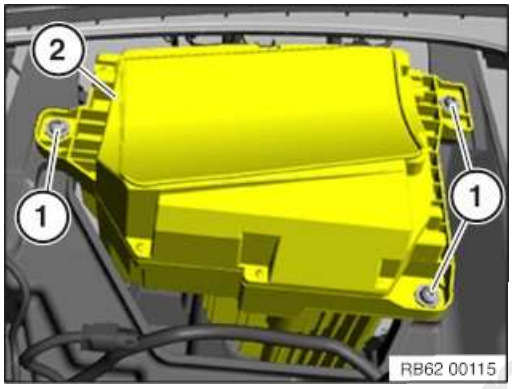


- Push the refrigerant line (1) slightly to one side and tighten the screw (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

46 – Installing the head-up display

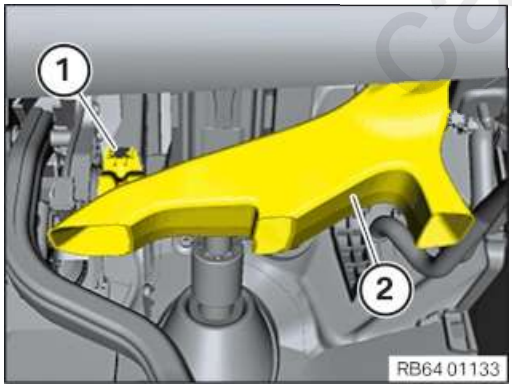


- Connect the associated connector to the Head-Up Display.
- Guide the Head-Up Display (2) into the support.
- Tighten the screws (1).

Head-Up Display to support

M6x25 screw		Tightening torque	13 Nm

47 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

48 – Installing knee airbag

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WARNING

Airbag unit.

Danger! Life-threatening injuries!

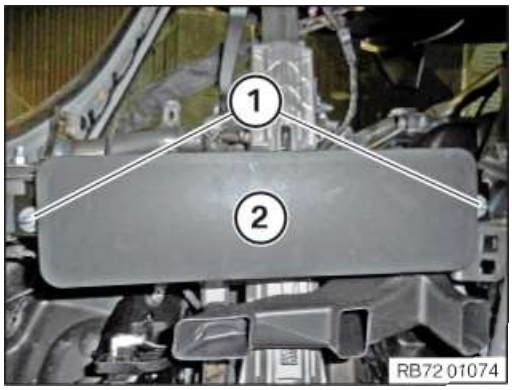
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

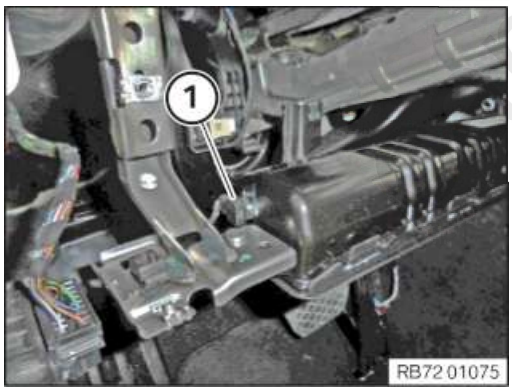
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

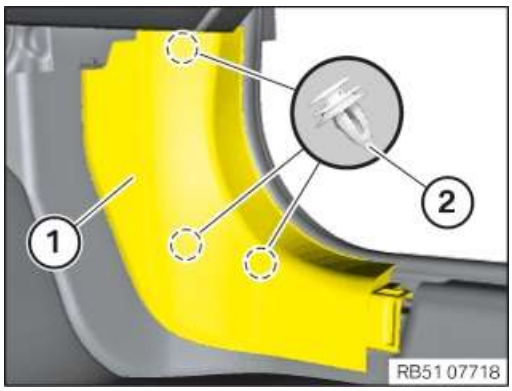
Knee airbag on support structure

Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

49 – Installing side trim panel in footwell on right A-pillar



- Check the clips (2) for damage.

  Renew damaged or missing clips (2).
- Correctly position the side trim panel (1) and clip in to the clips (2).
- Make sure that the side trim panel (1) is correctly fitted against edge protection.

50 – Install the trim panel for the instrument panel

50 – Install the trim panel for the instrument pane.



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

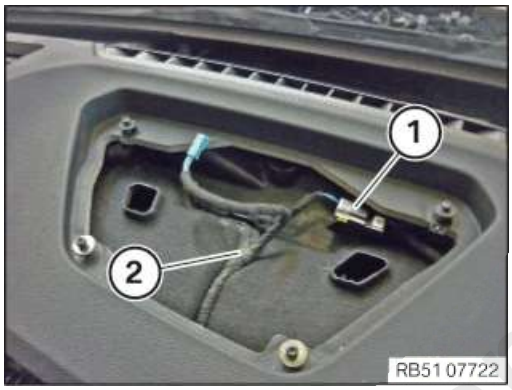
- Insert the instrument panel trim in the vehicle and position it at the support.
- Insert the associated wiring harnesses and connect the connectors.
- Tighten the screws (1).

Dashboard to support

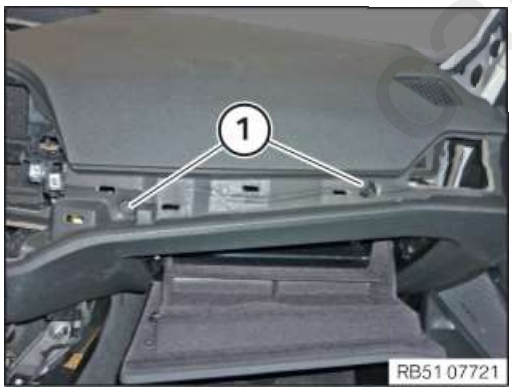
Screw		Tightening torque	2,4 Nm



- Connect connector (1) to the light operating unit and lock.



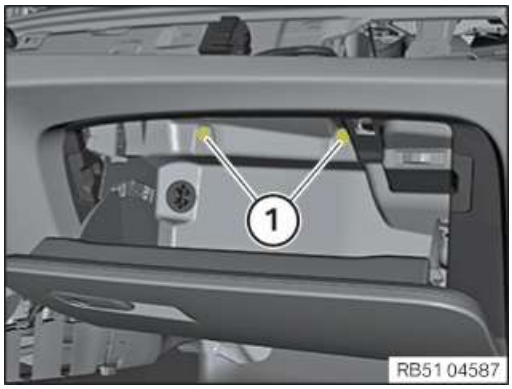
- Secure the wiring harness (2) on the holders.
- Connect connectors (1) and lock.



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

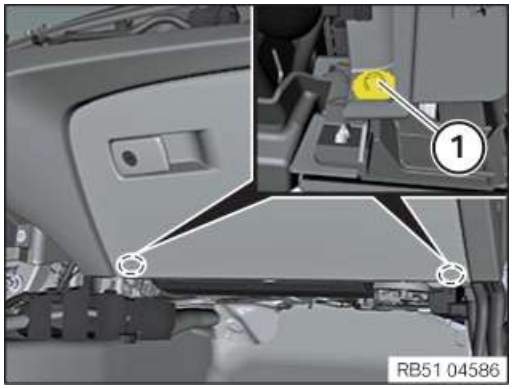


- Open glovebox.
- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

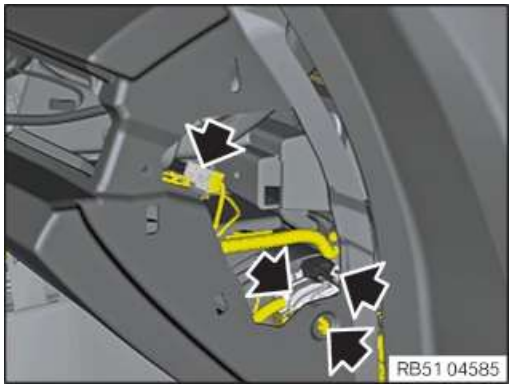
cardiagn.com



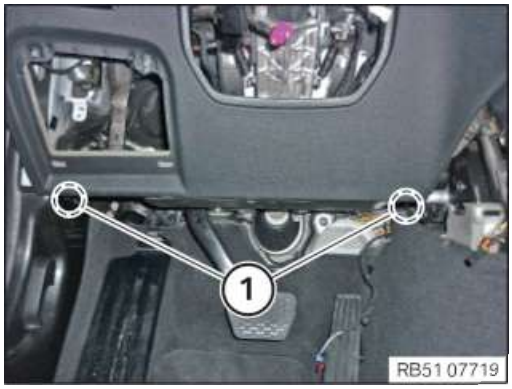
- Tighten the screws (1) on the lower side of the glove box button.

Dashboard to support

Screw		Tightening torque	2,4 Nm



- Connect all plug connections and cable clips (arrows) behind the glove box.



- Tighten the screws (1).

Dashboard to support

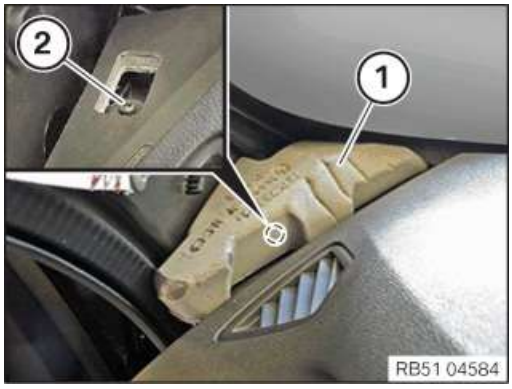
Screw		Tightening torque	2,4 Nm



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm



NOTICE

Perform the operations on the left and right side.

- Tighten down screw (2).

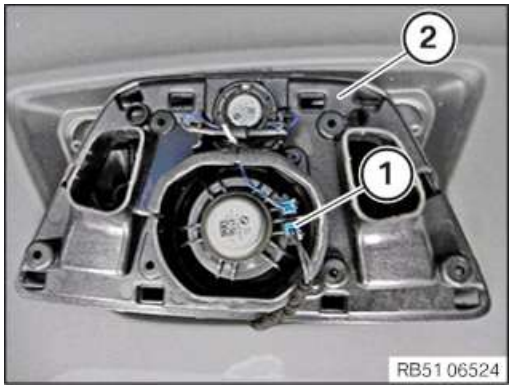
Dashboard to support

Screw		Tightening torque	2,4 Nm

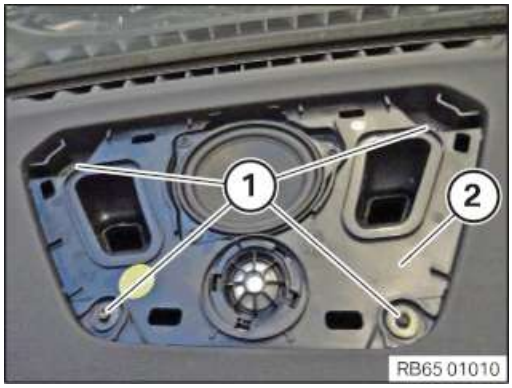
- Use sound insulation (1).

51 – Install the speaker holder at the instrument panel

rdiagn.com



- Position the speaker holder (2).
- Connect connector (1).

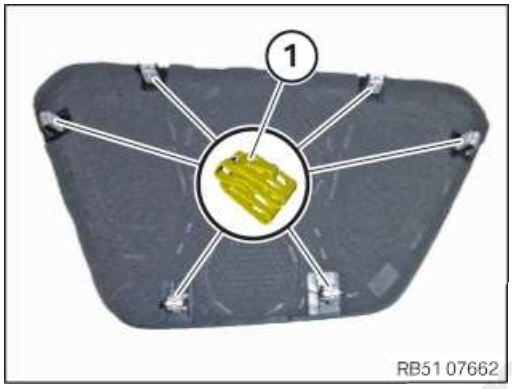


- Install the speaker holder (2).
- Tighten the screws (1).

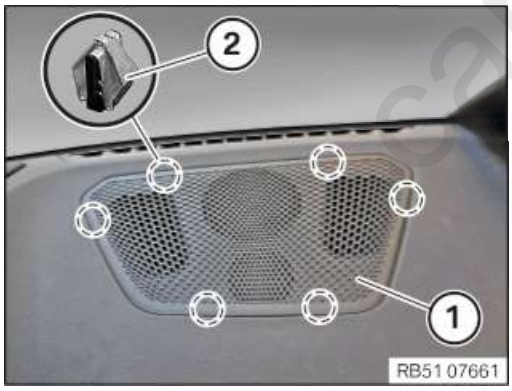
Speaker to support / support to instrument panel / support to body

Screw		Tightening torque	1,8 Nm

52 – Install the speaker trim at the instrument panel

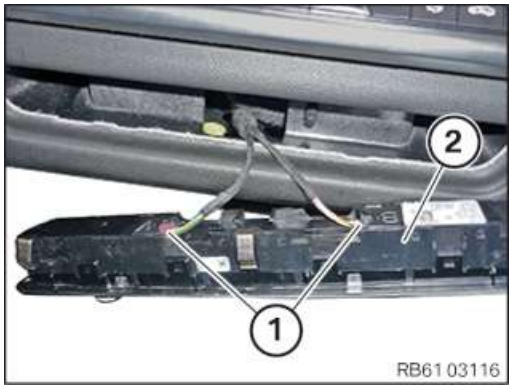


- Check clamps (1) for damage.
- Replace broken or missing clamps (1).



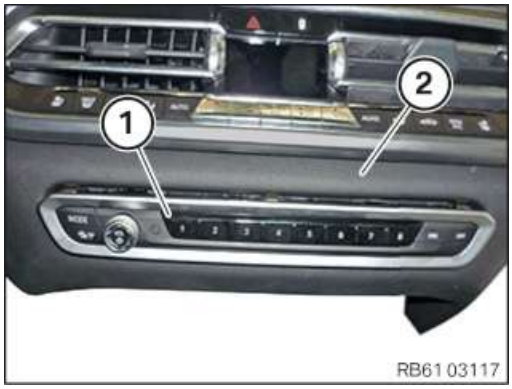
- Position the speaker trim (1) correctly and engage it at the clamps (2).

53 – Install the audio operating unit



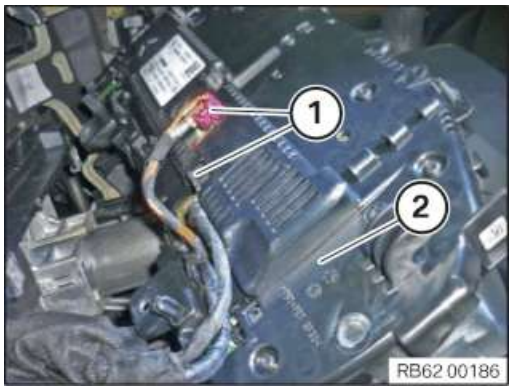
- Connect the connector (1) to the audio operating unit (2).

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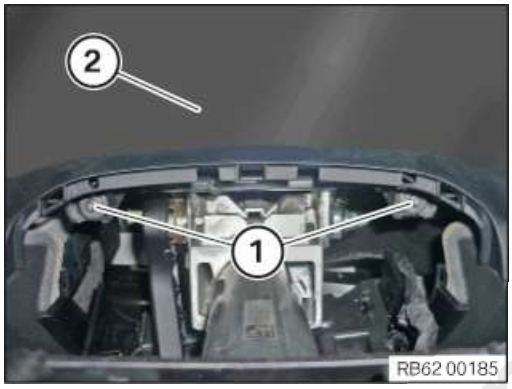


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

54 – Installing the instrument cluster (KOMBI)



- Connect and lock connector (1) to the instrument cluster (KOMBI) (2).



- Feed in and position the instrument cluster (KOMBI) (2).
- Tighten the screws (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm



- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

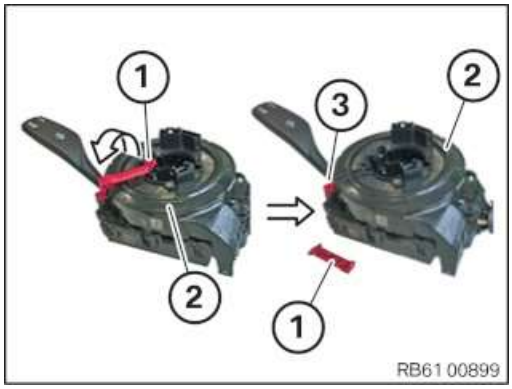


- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

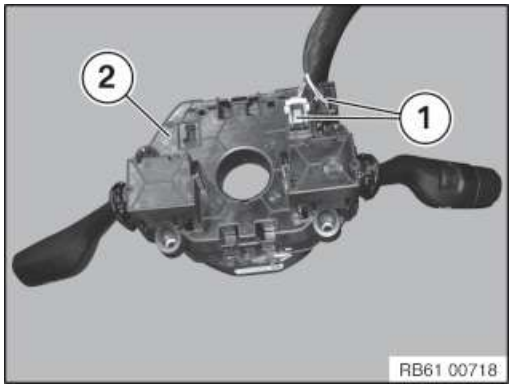
55 – Installing the steering column switch cluster (SZL)



- **Replacement:**

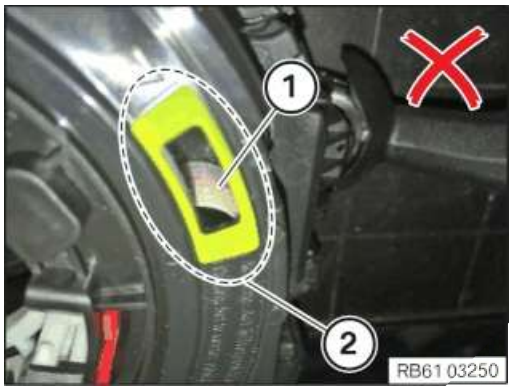
  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).



- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

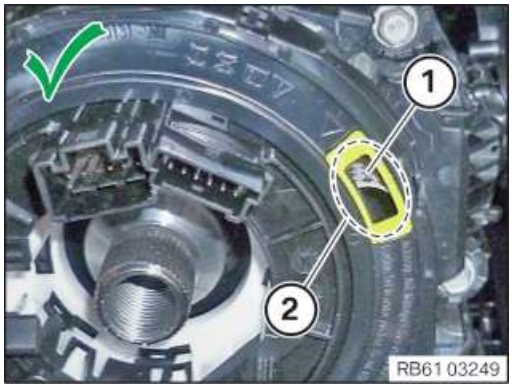
Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

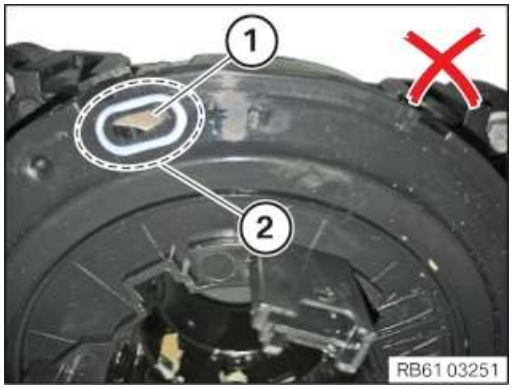
» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check

cardiagn.com



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version B:**

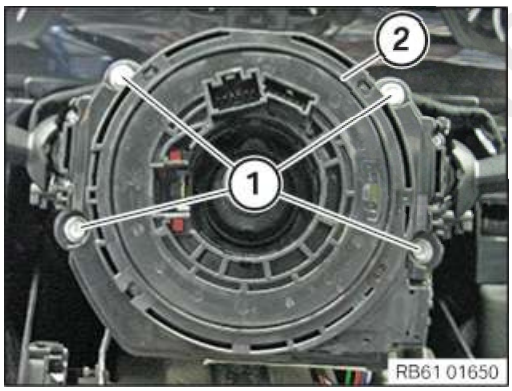
  Check if the correct mark (1) can be seen in the inspection glass (2).

Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next work step.

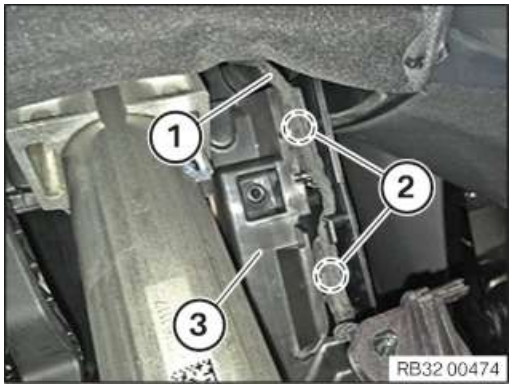


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm

56 – Install steering column shroud lower section

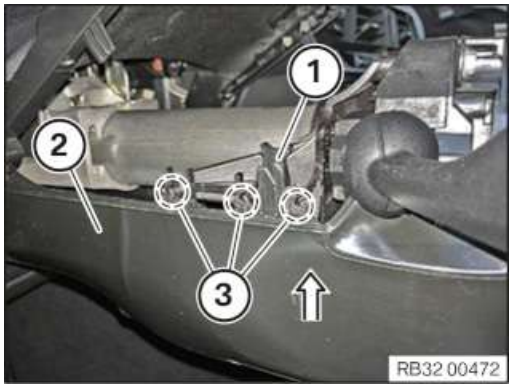


- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).

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- Connect the connector (1).

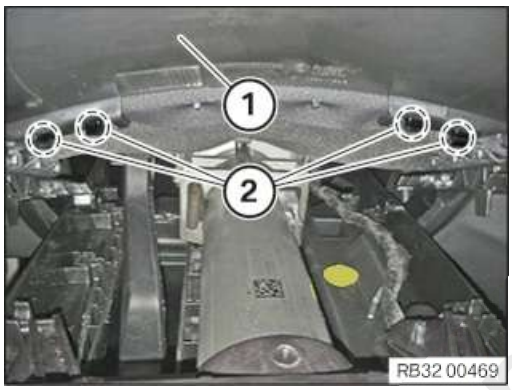


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

57 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

58 – Installing the sports steering wheel

diag.com

▶ **Check the neutral position of the clock spring**

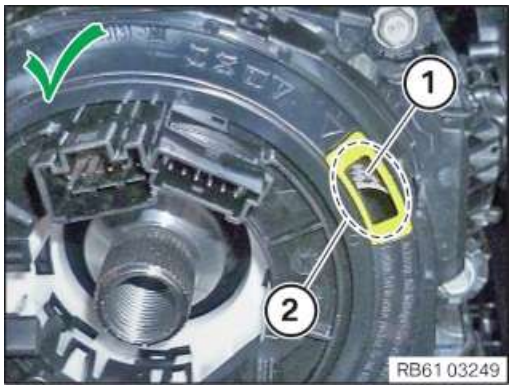
TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▷ **Version A: Checking the visibility of the marking on the coil spring**

Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .



Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

▷ **Version B: Checking the visibility of the marking on the coil spring**

Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .



Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

Check



- Check if a microencapsulated screw (3) is installed.

Result

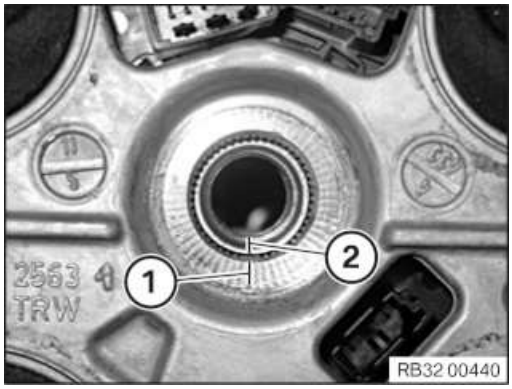
» Screw (3) is micro-encapsulated.

Measure

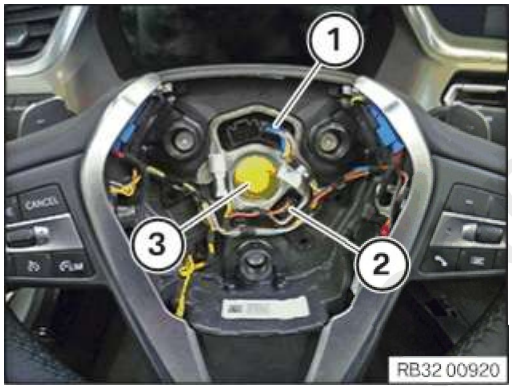
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

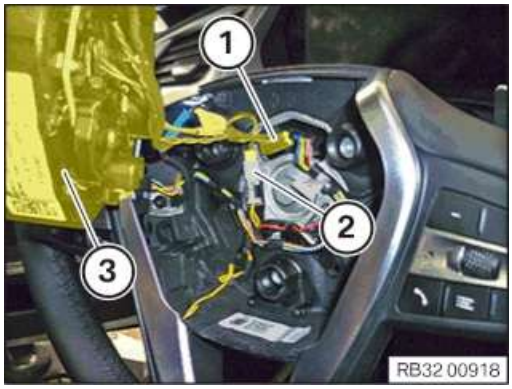
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

59 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Installing the airbag unit for the sports steering wheel**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



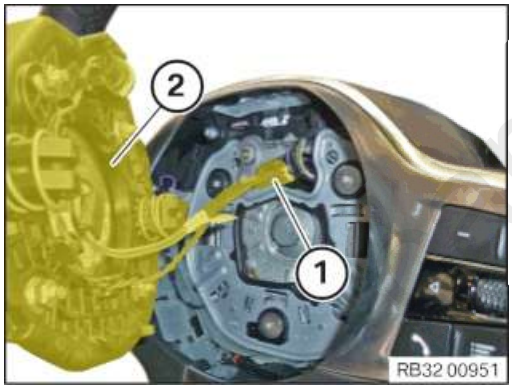
- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

▸ **Installing the airbag unit for M Sport steering wheel**

TECHNICAL INFORMATION

After replacing the airbag unit (M sport steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

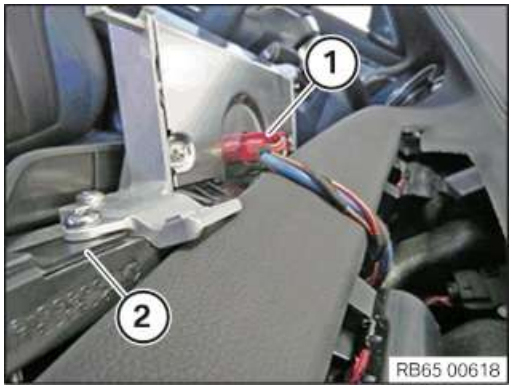
60 – Install the central information display (CID)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Position Central Information Display (CID) (2).
- Connect plug connection (1) and lock.

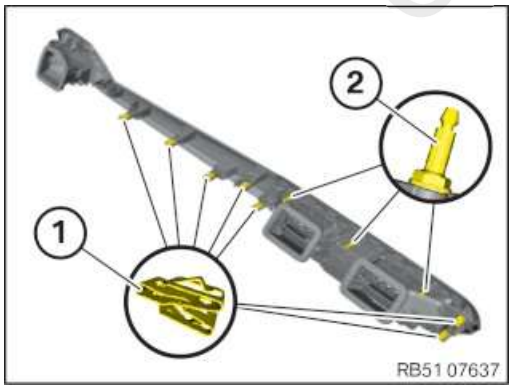


- Insert the central information display (CID) (2) in the instrument panel and position correctly.
- Tighten the screws (1).

Central information display to instrument panel

Screw		Tightening torque	2,4 Nm

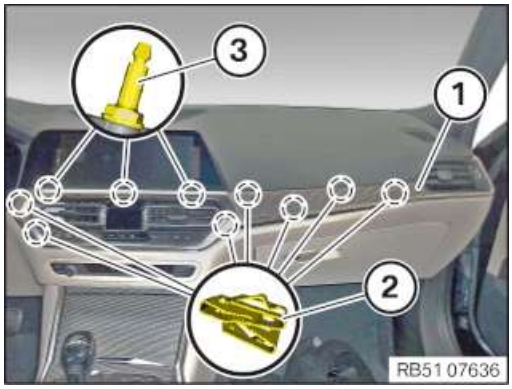
61 – Install the finisher on the right instrument panel



- Checks clamps (1) for damage.

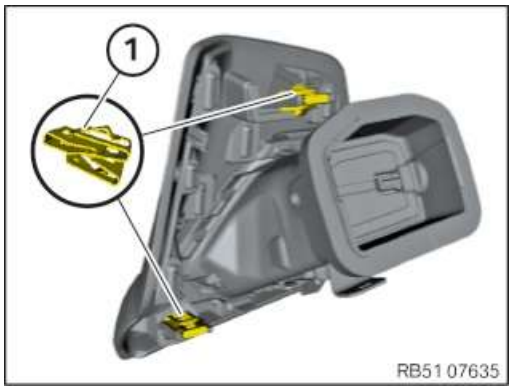
  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.

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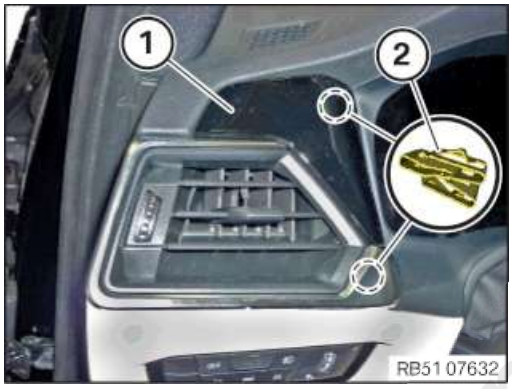
- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

62 – Install the finisher on the instrument panel on the left



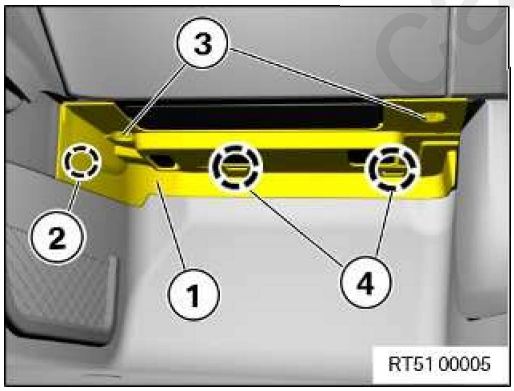
- Check the clamps (1) for damage and that they are present.

  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

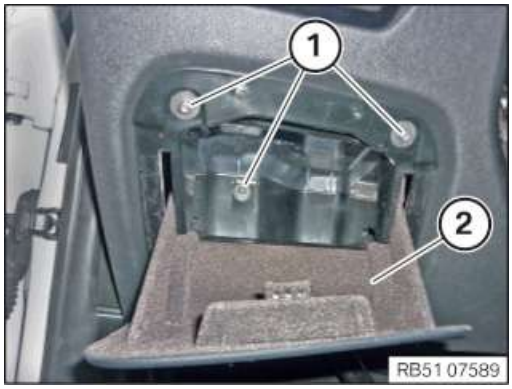
63 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

64 – Installing the left fold-down compartment

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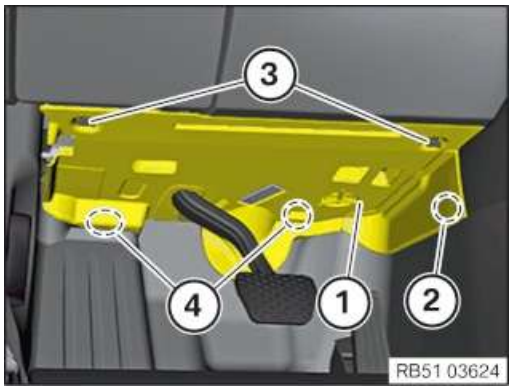


- Install the fold-down compartment (2).
- Tighten the screws (1).

Fold-down compartment to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

65 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

66 – Install the A-pillar trim panel on the left and right

NOTICE

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

▸ **Installing the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

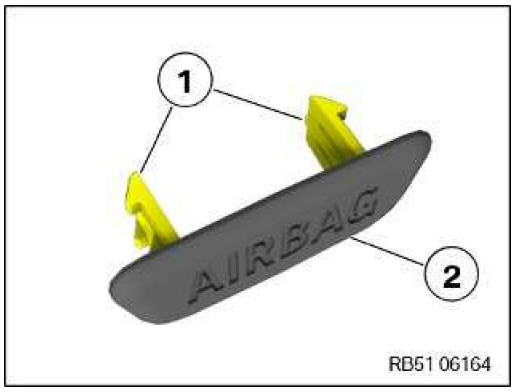
RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.

cardiagn.com



Check

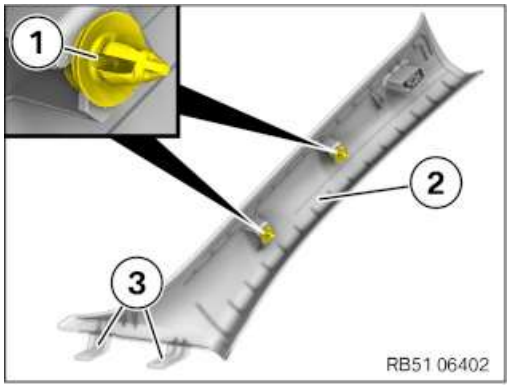
- Check retaining lugs (1) of cover (2) for damage.

Result

» Retaining lug is damaged.

Measure

- Renew the cover.



Check

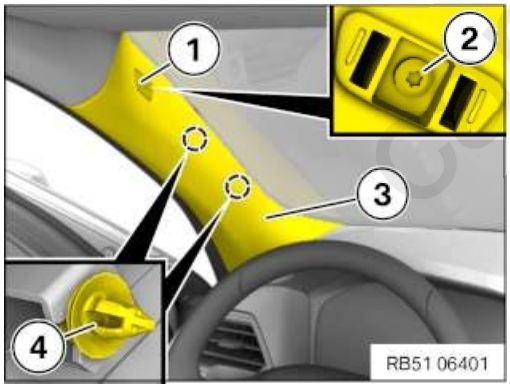
- Check the clips (1) for damage and renew if necessary.
- Check the guides (3) for damage.

Result

» Guide is damaged.

Measure

- Renew the A-pillar trim panel.



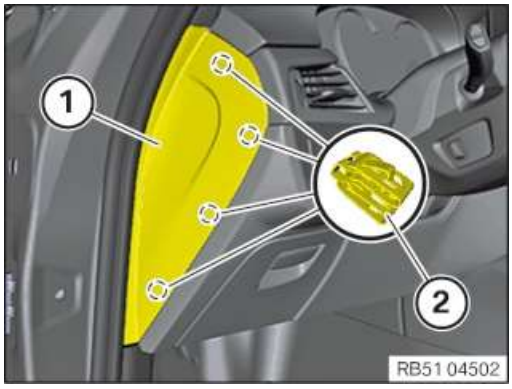
- Guide in A-pillar trim panel (3) downwards and clip it in with clips (4).
- Tighten down screw (2).

A-pillar trim panel to body

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

- Clip in the cover (1).

67 – Install the side panel on left instrument panel

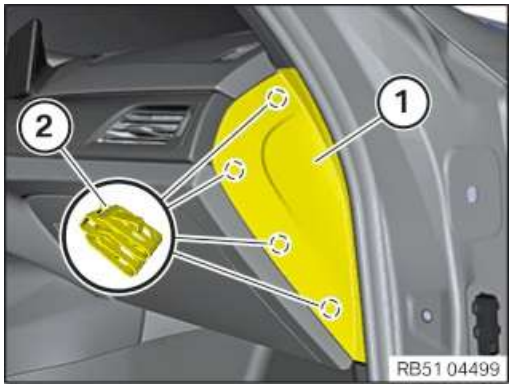


- Feed in the side panel (1) and clip it in at the clamps (2).

68 – Install the side panel on instrument panel on the right

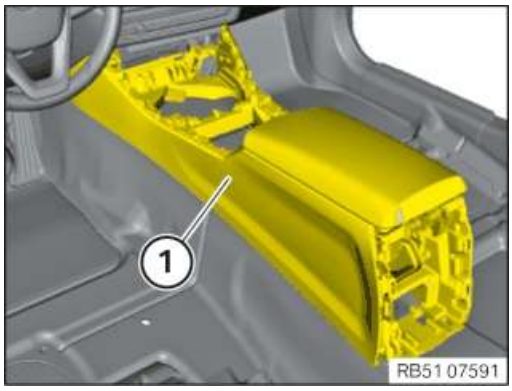
carmanualsdiagn.com

68 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

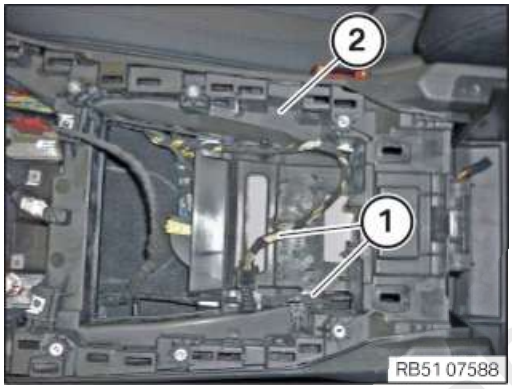
69 – Installing the centre console



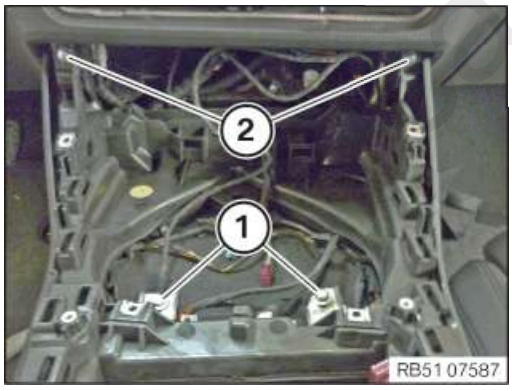
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Install centre console (1) and thereby feed in the wiring harness.
- Feed in the centre console (1) to the instrument panel and position correctly.



- Secure the wiring harness to the centre console (1) and connect and lock the existing plug connections.



- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

- Tighten the screws (2).

Centre console to instrument panel

Oval-head screw		Tightening torque	1,8 Nm



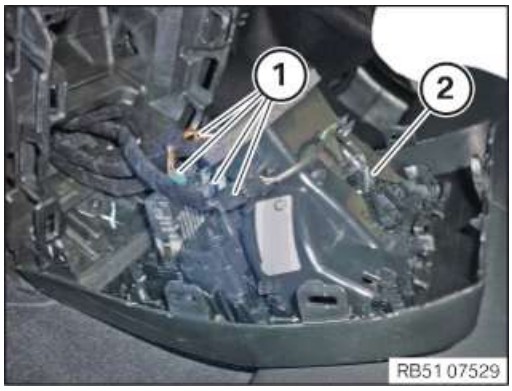
- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

rdiag.com

70 – Installing the rear centre console trim

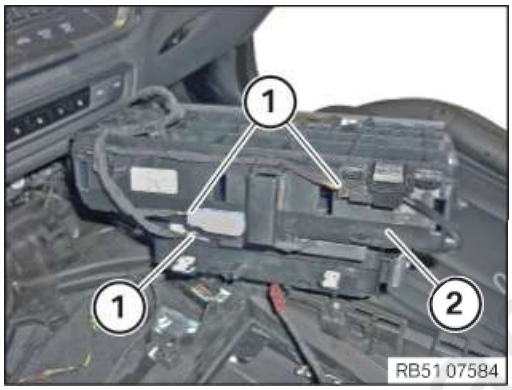


- Install the centre console trim (2).
- Connect connectors (1) and lock.

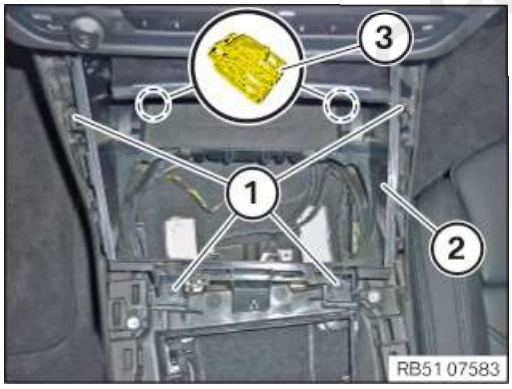


- Position centre console trim (1) and engage at the latch mechanisms at the side.

71 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

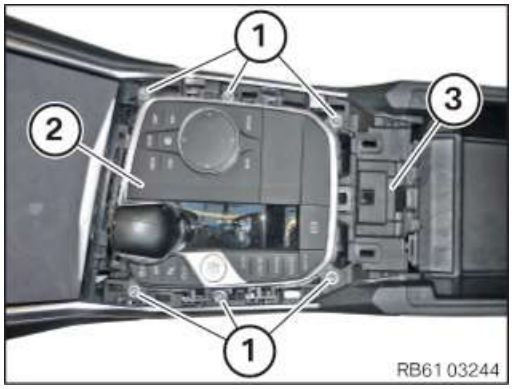


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

72 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



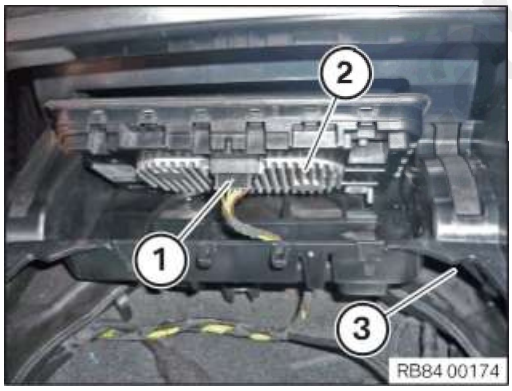
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



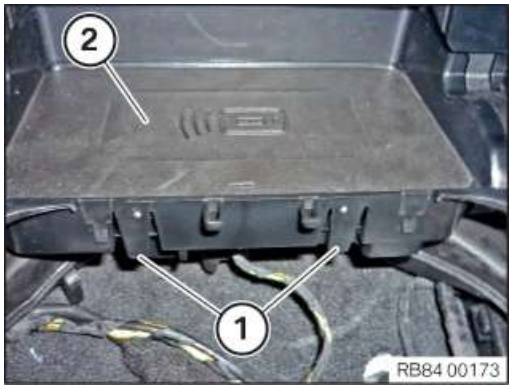
- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

73 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.

  The latch mechanisms (1) must engage correctly.

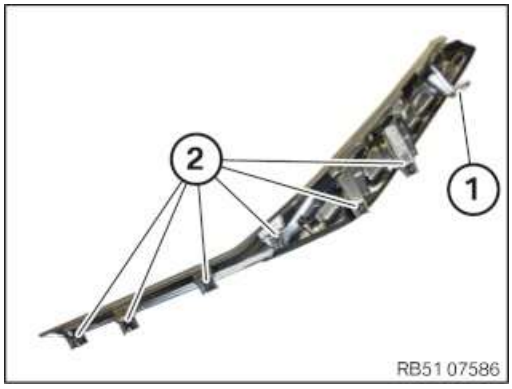
74 – Installing the decorative trim on the centre console on the left and right

rdiagn.com

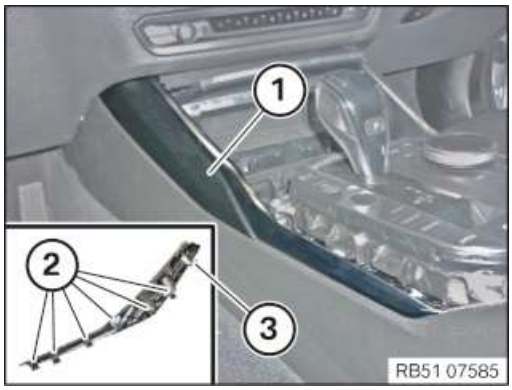
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

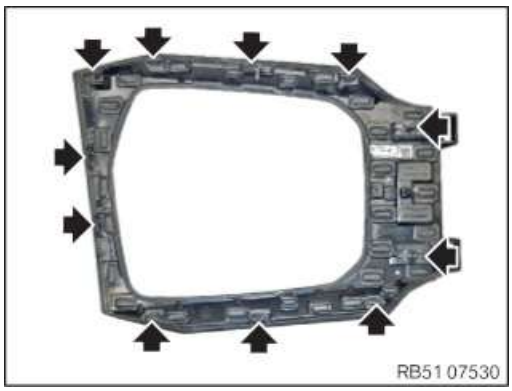
75 – Installing the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



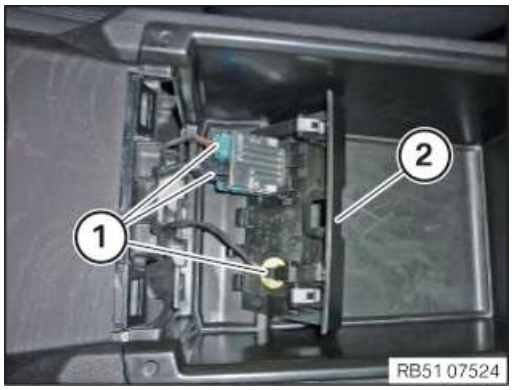
- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

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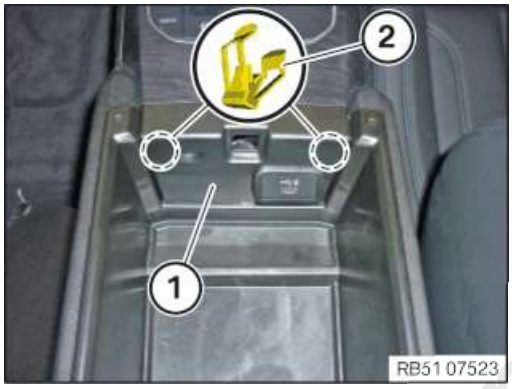


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

76 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

77 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

Cup holder to centre console

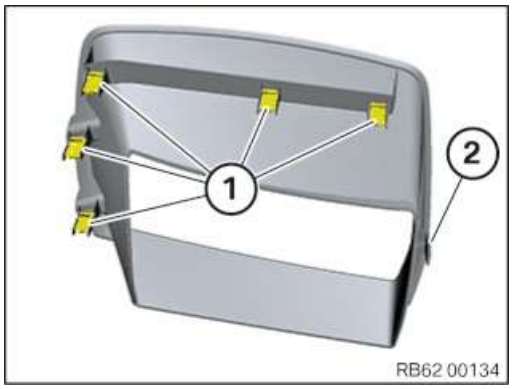
Oval-head screw		Tightening torque	1,8 Nm



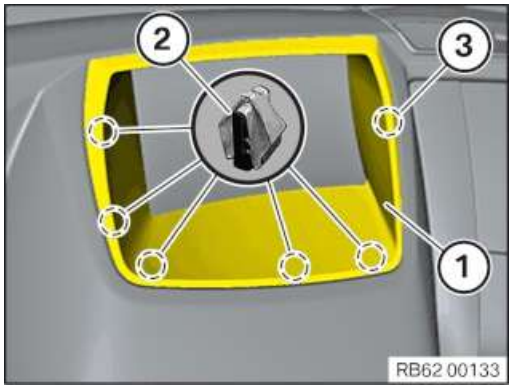
- Insert the insert (1).

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78 – Installing the trim for the Head-Up Display

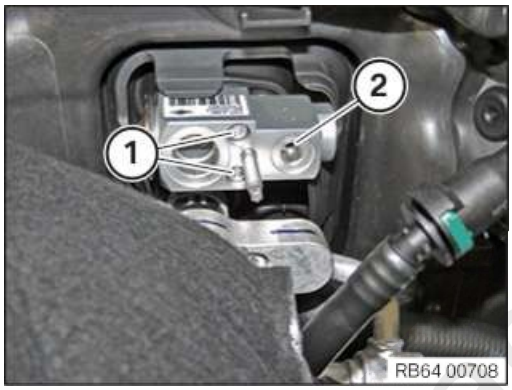


- Check clamps (1) and the latch mechanism (2) for damage, renew if necessary.



- Correctly position the trim (1) for the BMW Head-Up Display and engage it on the clamps (2) and the retaining lug (3).

79 – Install expansion valve



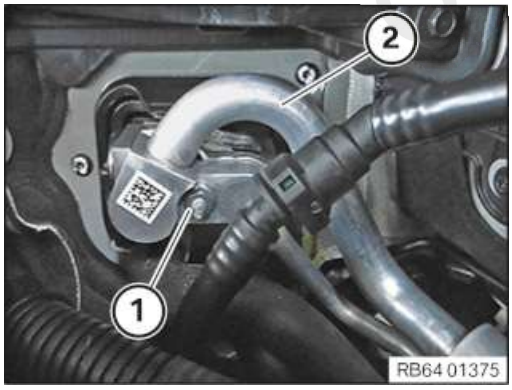
- Renew O-rings.

  Parts: O-rings
- Correctly position the expansion valves (2).
- Tighten the screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

80 – Connect the refrigerant line to the expansion valve



- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

Refrigerant line to expansion valve / connecting piece

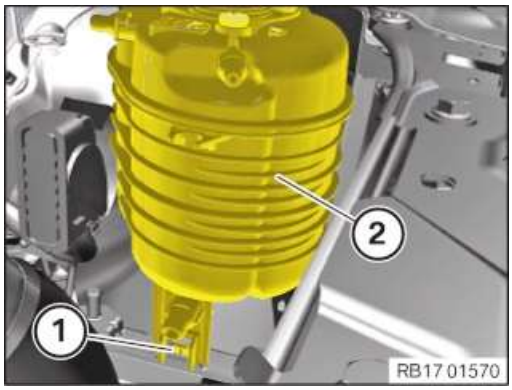
M6		Tightening torque	13 Nm

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- Close the holder (1).

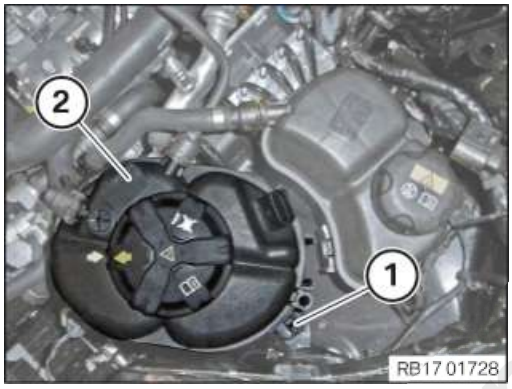
81 – Install coolant expansion tank of high-temperature coolant circuit, partially



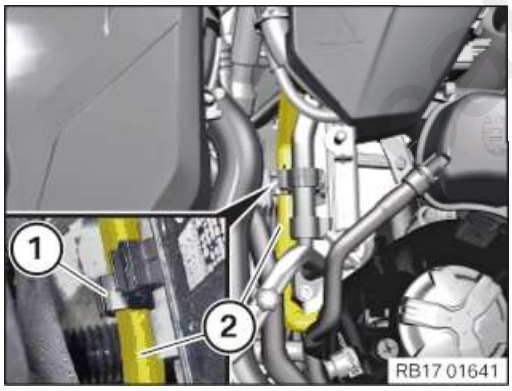
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Correctly feed coolant expansion tank (2) in.
- Lock the lock (1).



- Correctly position coolant expansion tank (2).
- Lock the lock (1).



- Feed in coolant line (2) and position.
- Lock holder (1).

82 – Fasten the refrigerant line on the connecting piece



- Renew the sealing ring.

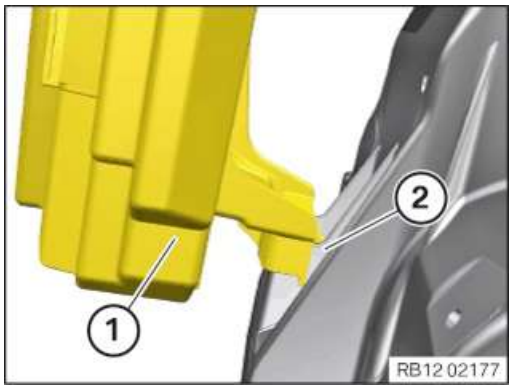
  Parts: Sealing ring
- Correctly position the refrigerant line (2).
- Tighten down screw (1).

Refrigerant line to connecting piece

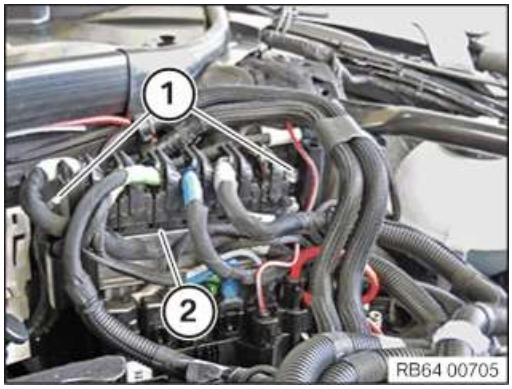
M8		Tightening torque	19 Nm

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83 – Fastening control unit holder



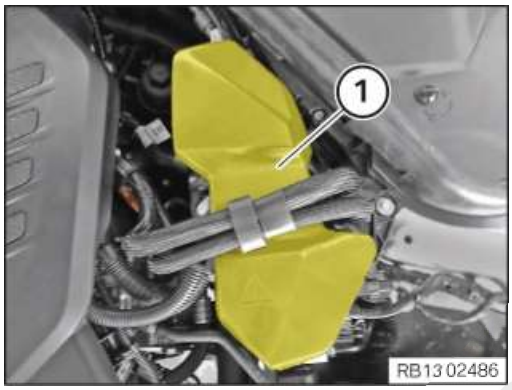
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Position the control unit holder together with the control units (2) and position correctly.
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



- Insert and install cover (1) into guides.

84 – Install acoustic cover

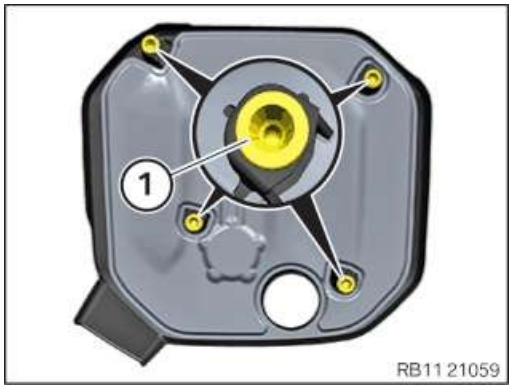
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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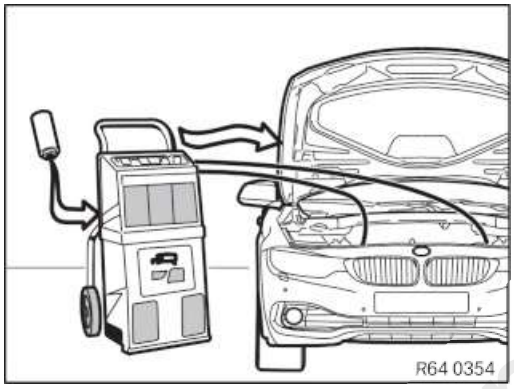


- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

85 – Evacuate and fill air conditioning



- See additional information.

86 – Fill and bleed the coolant circuit

▸ **Filling and bleed the high-temperature coolant circuit**



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Heating and air-conditioning unit on the bulkhead Used in step 44

Oval-head screw		Tightening torque	2,8 Nm

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Heating and air-conditioning unit on support — Used in step 45

Nut M6		Tightening torque	4 Nm

Support for instrument panel — Used in step 45

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

Head unit to holder / holder to support — Used in step 45

Screw		Tightening torque	1,8 Nm

Steering column to dashboard support — Used in step 45

M8	Observe tightening sequence.	Tightening torque	21,4 Nm

Head-Up Display to support — Used in step 46

M6x25 screw		Tightening torque	13 Nm

Knee airbag on support structure — Used in step 48

Nut		Tlghtening torque	8 Nm

Dashboard to support — Used in step 50

Screw		Tightening torque	2,4 Nm

Speaker to support / support to instrument panel / support to body — Used in step 51

Screw		Tightening torque	1,8 Nm

Instrument cluster (KOMBI) to support — Used in step 54

Screw		Tightening torque	1,8 Nm

Steering column switch cluster (SZL) on the steering column — Used in step 55

Screw TS5x20		Tightening torque	3 Nm

Steering wheel to steering column — Used in step 58

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Central information display to instrument panel — Used in step 60

Screw		Tightening torque	2,4 Nm

Fold-down compartment to instrument panel — Used in step 64

Oval-head screw		Tightening torque	1,8 Nm

A-pillar trim panel to body — Used in step 66

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

Centre console on tunnel — Used in step 69

M6x18 Hexagon screw		Tightening torque	4,6 Nm

Centre console to instrument panel — Used in step 69

Oval-head screw		Tightening torque	1,8 Nm

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Storage compartment in centre console			Used in step 71
Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim			Used in step 72
Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery			Used in step 72
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 77
Oval-head screw		Tightening torque	1,8 Nm

Expansion valve to heater - A/C			Used in step 79
M5		Tightening torque	5.5 Nm

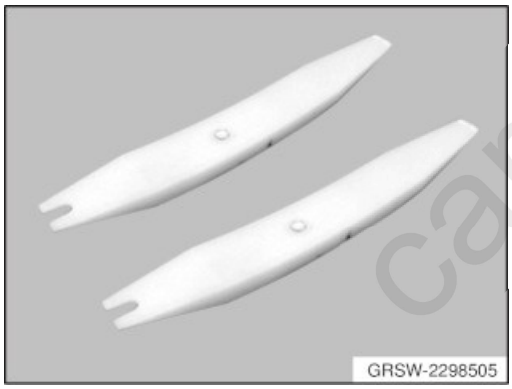
Refrigerant line to expansion valve / connecting piece			Used in step 80
M6		Tightening torque	13 Nm

Refrigerant line to connecting piece			Used in step 82
M8		Tightening torque	19 Nm

Control unit holder			Used in step 83
M6		Tightening torque	8 Nm

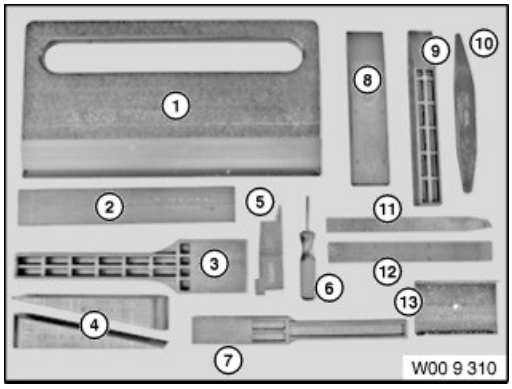
Overview of Special Tools

2 298 505 Wedge



Common	Used in step 1112
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

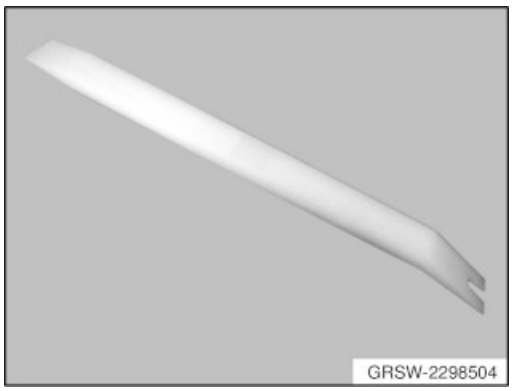
0 493 752 (00 9 329) Case



Common	Used in step 21
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

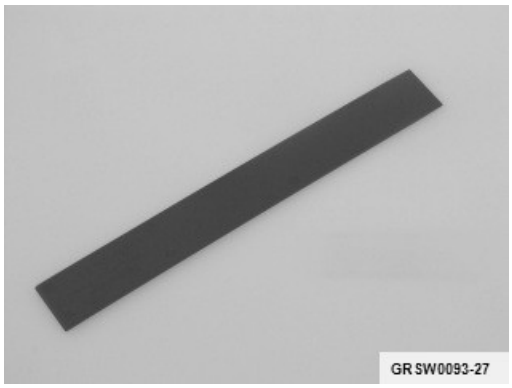
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2 298 504 Wedge



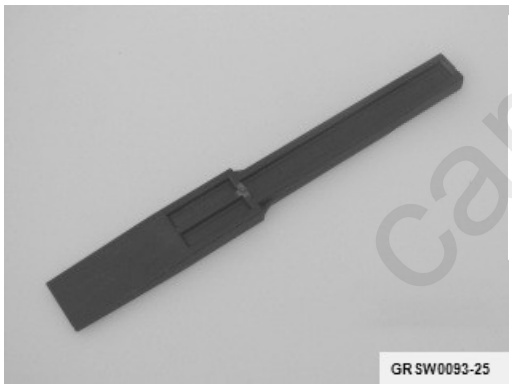
Common	Used in step 30
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 496 571 (00 9 327) Wedge



Common	Used in step 34
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

0 496 569 (00 9 325) Wedge



Common	Used in step 35
Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

Links

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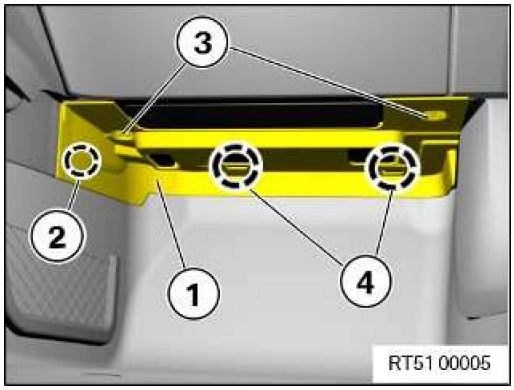
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64 11 213 Removing and installing/replacing heater/air conditioner fan

PRELIMINARY WORK

1 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

2 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

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▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

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Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

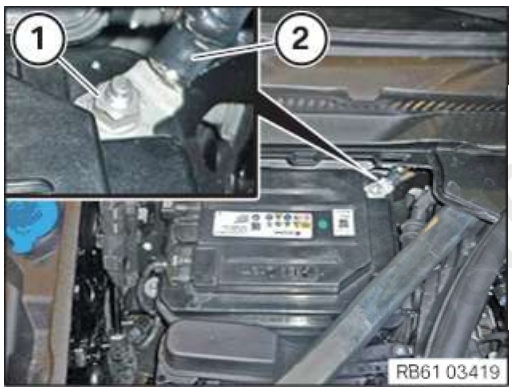
Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

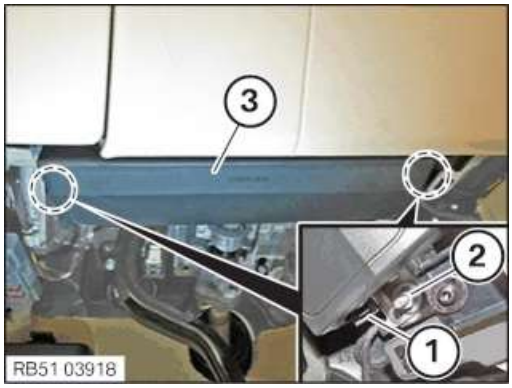
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ **Disconnecting all battery earth leads**

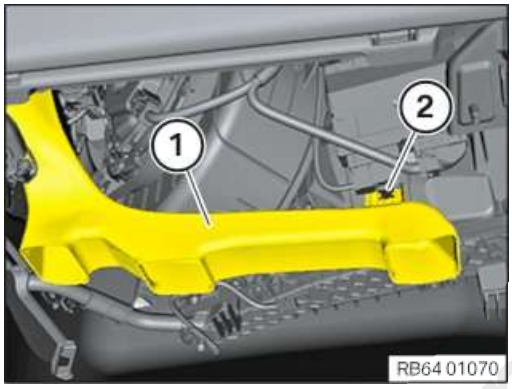


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

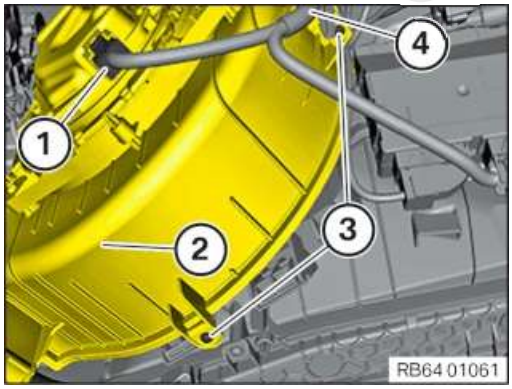
3 – Removing the right air duct



- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

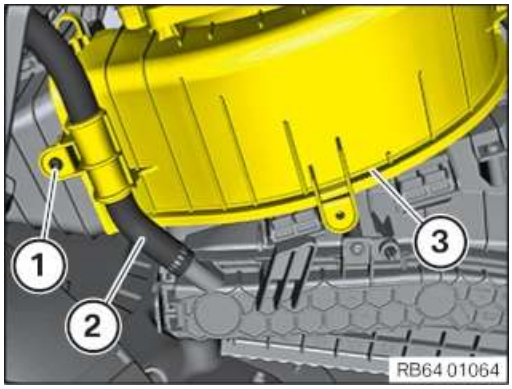
MAIN WORK

4 – Remove the blower for the heating and air-conditioning unit



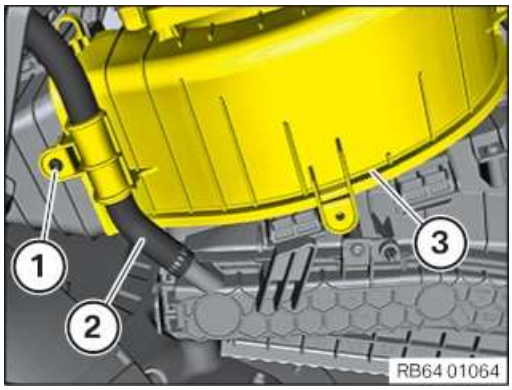
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).

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- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

5 – Install the blower for the heating and air-conditioning unit

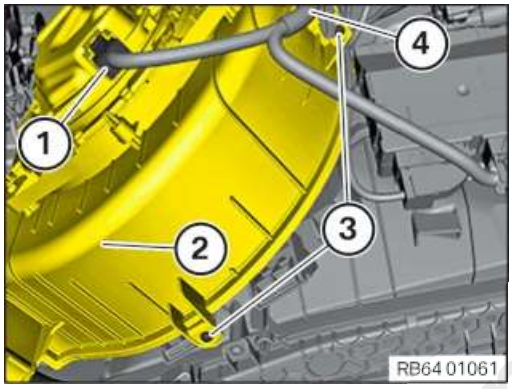


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

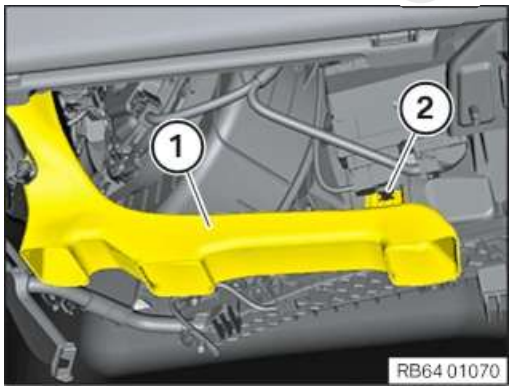
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

POSTPROCESSES

6 – Installing the air duct, right



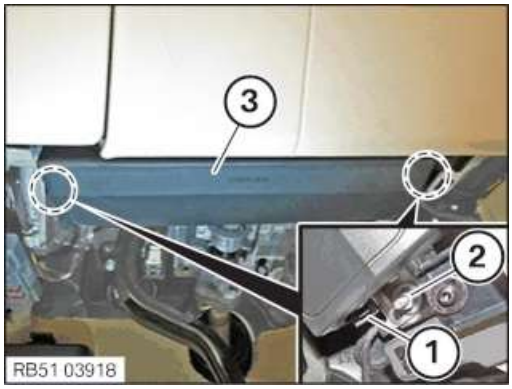
- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

7 – In vehicles with airbag module: Installing knee airbag

NOTICE

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

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- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



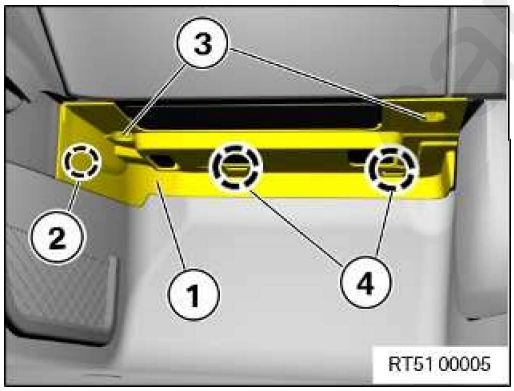
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

8 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 5

Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel Used in step 7

Hexagon nut		Tightening torque	8 Nm

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Negative battery cable to 48-V battery			Used in step 7
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

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Notes on 48-V battery	27

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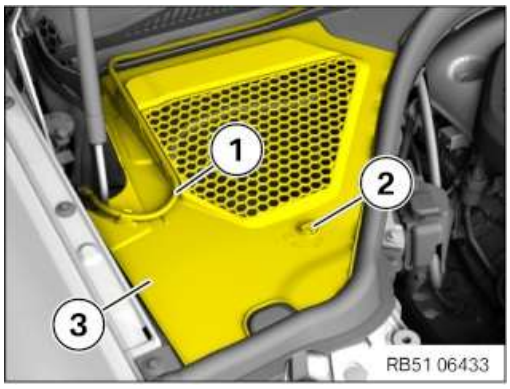
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64 11 991 Removing and installing/replacing sensor for automatic air recirculation control

PRELIMINARY WORK

1 – Removing rear right cover of engine compartment and, if necessary, covering any auxiliary battery



▸ **Remove the cover of the rear right engine compartment**

- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover (3) of the rear right engine compartment.

Check

- Check if an auxiliary battery is fitted in the engine compartment.

Result

» Auxiliary battery is fitted in the engine compartment.

Measure

- Cover the auxiliary battery.

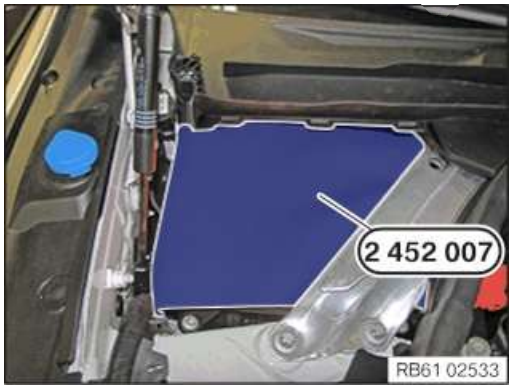
▸ **Covering the vehicle battery**

WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

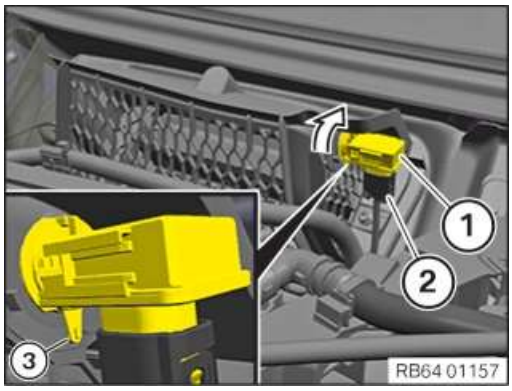
- Cover the vehicle battery.



- Cover the vehicle battery with the special tool as shown.

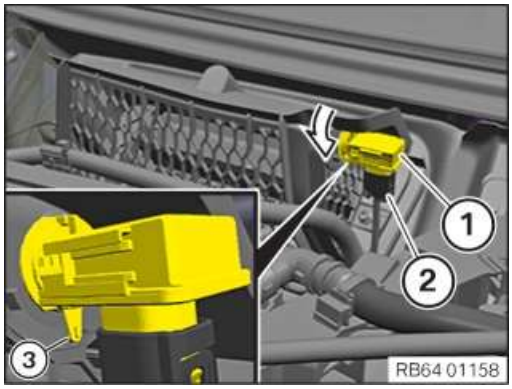
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2 – Removing the automatic air recirculation control sensor



- Unlock and disconnect connector (2).
- Raise guide pin (3) slightly and turn automatic air recirculation control sensor (1) in direction of arrow.
- Remove automatic air recirculation control sensor (1).

3 – Installing the automatic air recirculation control sensor



- Correctly position the automatic air recirculation control sensor (1) and turn it in the direction of arrow until the guide pin (3) engages.
- Connect connectors (2) and lock.

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4 – Install the cover of rear right engine compartment (if required, remove battery cover).

Check

- Check, whether an auxiliary battery is installed in the engine compartment.

Result

» Auxiliary battery is installed in the engine compartment

Measure

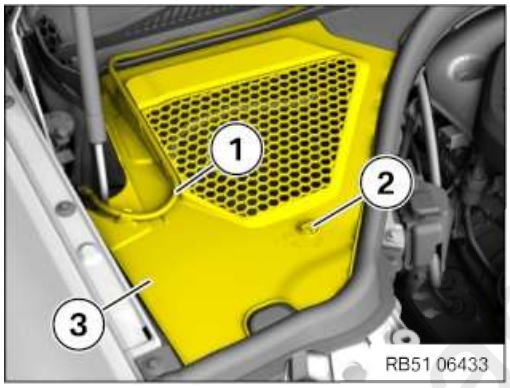
- Remove the battery cover

▸ **Remove the battery cover**



- Lift battery earth lead (1).
- Remove special tool .

▸ **Install the rear right engine compartment cover**



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

Additional Information

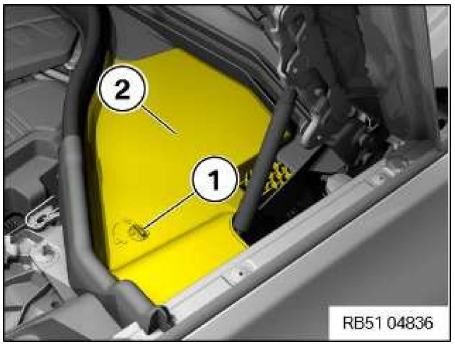
Overview of Special Tools

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64 11 991 Removing and installing/replacing sensor for automatic air recirculation control

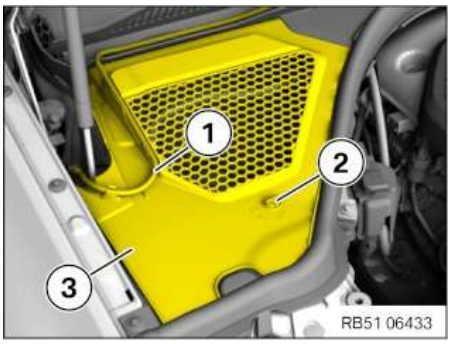
PRELIMINARY WORK

1 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove the cover (2) of the rear left engine compartment.

2 – Remove the cover of the rear right engine compartment



- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover (3) of the rear right engine compartment.

3 – Removing the wiper arm on the left and right

NOTICE

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

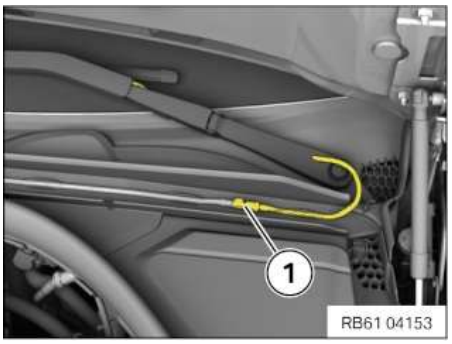
▸ **Remove the wiper arm**

RISK OF DAMAGE

Damage to wiper console.

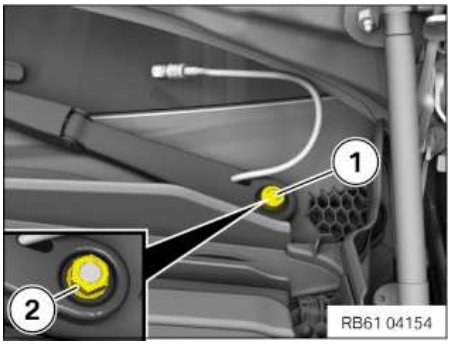
While removing the wiper arms without using special tool, the wiper console can break.

- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.

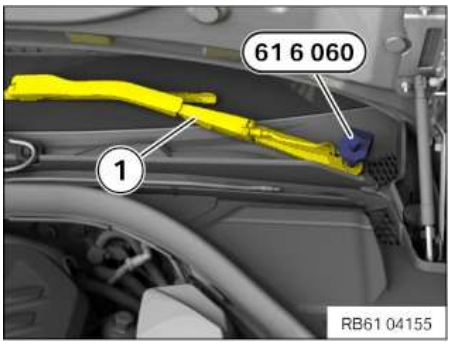


- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.

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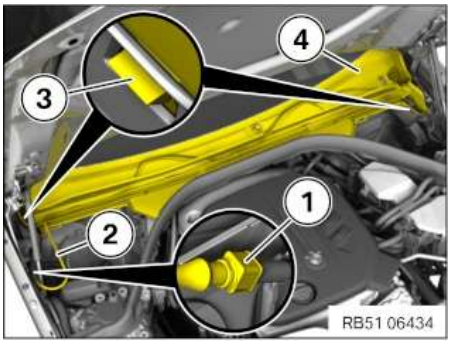


- Remove the protective cap (1).
- Loosen nut (2).

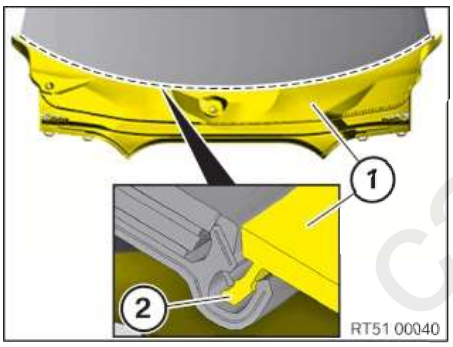


- Pull off the wiper arm (1) using special tool .

4 – Remove cowl panel cover



- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).

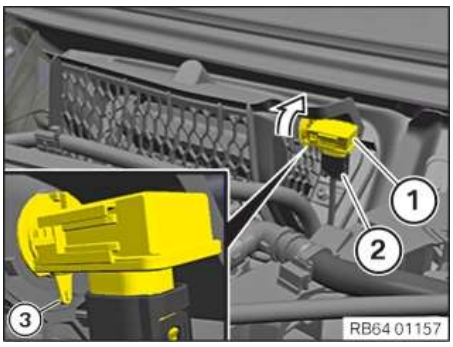


- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

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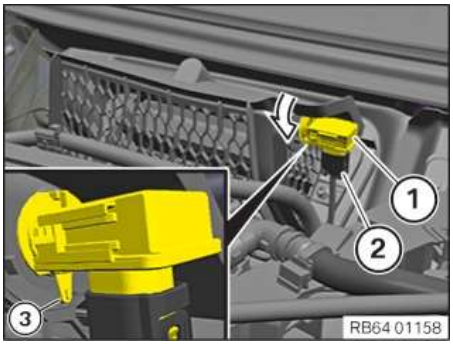
MAIN WORK

5 – Removing the automatic air recirculation control sensor



- Unlock and disconnect connector (2).
- Raise guide pin (3) slightly and turn automatic air recirculation control sensor (1) in direction of arrow.
- Remove automatic air recirculation control sensor (1).

6 – Installing the automatic air recirculation control sensor



- Correctly position the automatic air recirculation control sensor (1) and turn it in the direction of arrow until the guide pin (3) engages.
- Connect connectors (2) and lock.

POSTPROCESSES

7 – Installing cowl panel cover

RISK OF DAMAGE

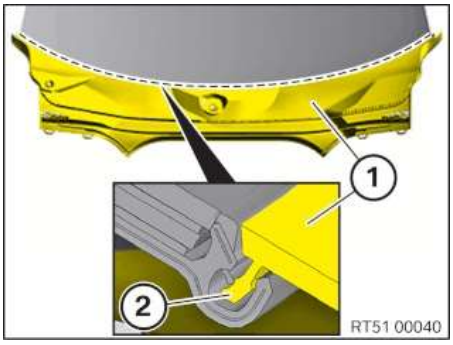
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

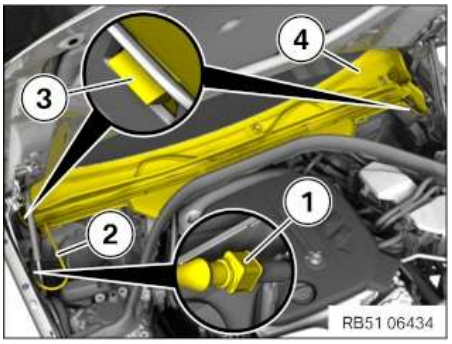
TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.

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- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

8 – Install left and right wiper arm

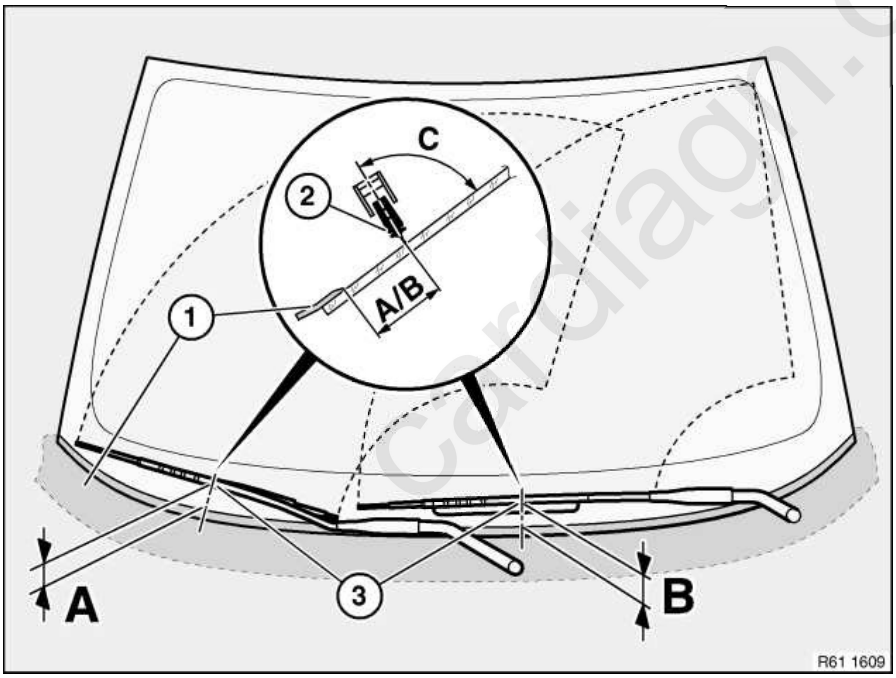
NOTICE

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

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

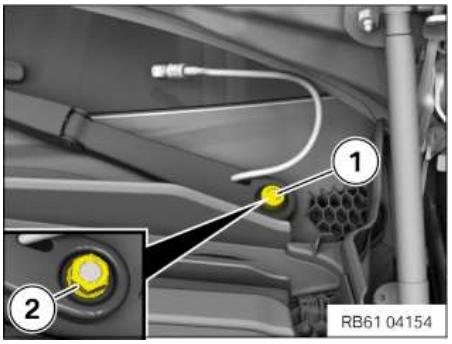
The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.



- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm



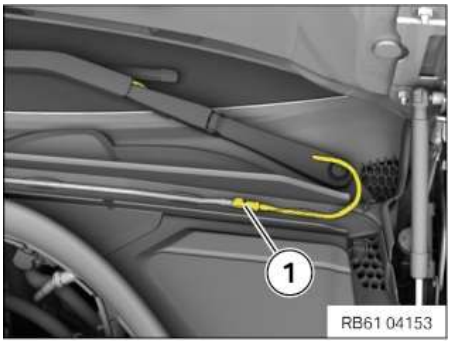
- Tighten nut (2).

Windscreen wiper arm

Combination hexagon nut		Tightening torque	35 Nm

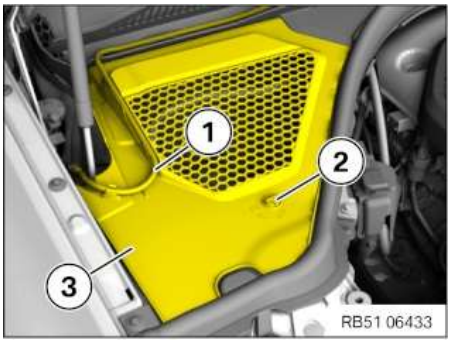
- Connect the protective cap (1).

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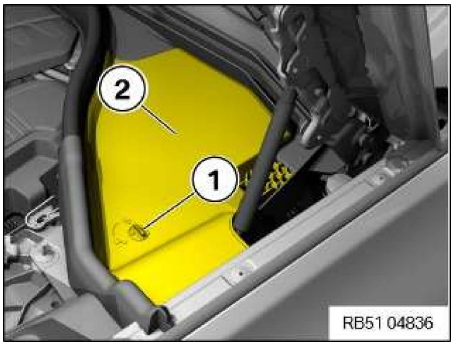
- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

9 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

10 – Install the cover of the engine compartment on the rear left



- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

Additional Information

Overview of Tightening Torques

Windscreen wiper arm			Used in step 8
Combination hexagon nut		Tightening torque	35 Nm

Overview of Special Tools

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 8
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

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64 11 879 Replace control panel for heating and air conditioning system

RISK OF DAMAGE

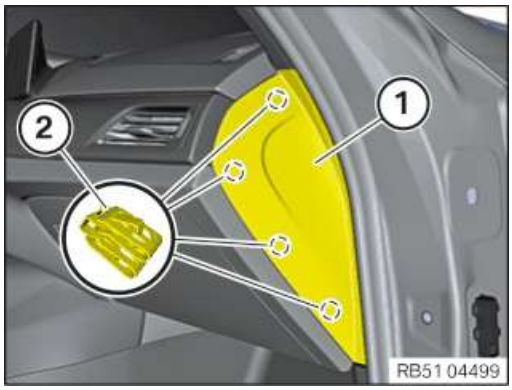
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

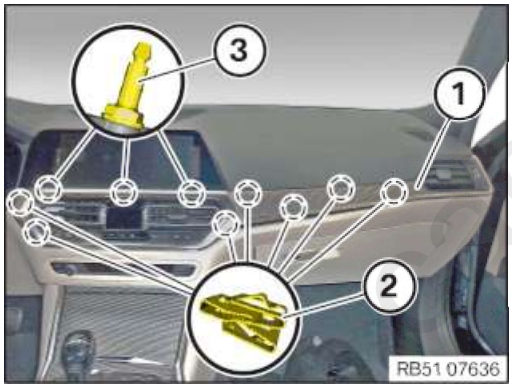
PRELIMINARY WORK

1 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

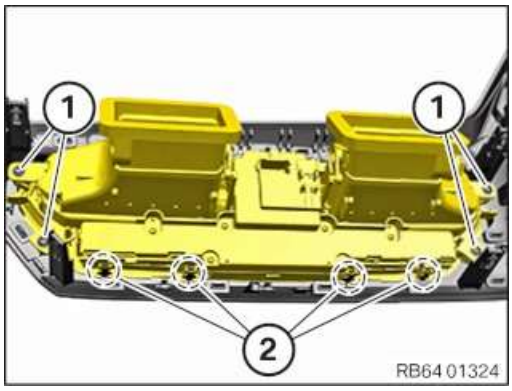
2 – Remove the finisher on the right instrument panel



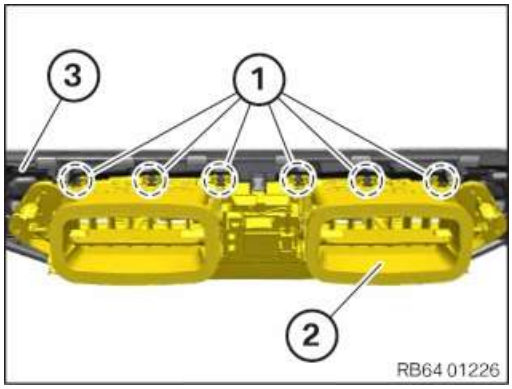
- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

MAIN WORK

3 – Removing the centre ventilation grille with integrated air conditioning control panel

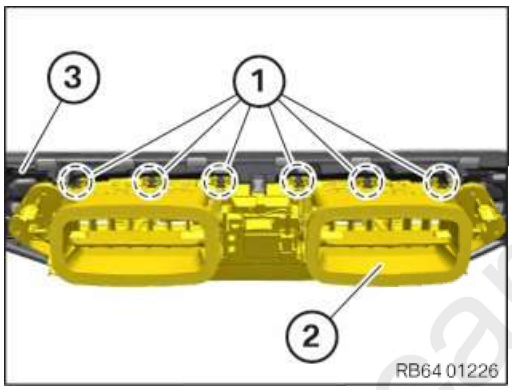


- Loosen screws (1).
- Disengage the latch mechanisms (2).

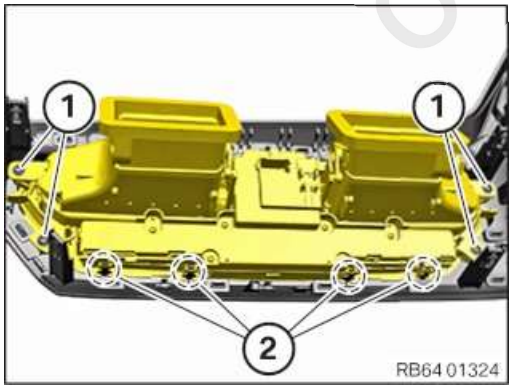


- Disengage the latch mechanism (1) from the ventilation grille (2).
- Remove the ventilation grille (2) with the integrated air conditioning control panel from the decorative strip (3).

4 – Installing the centre of the ventilation grille with the integrated air conditioning control panel



- Place ventilation grille (2) with the integrated air conditioning control panel on decorative strip (3) and position it correctly.
- Engage latch mechanisms (1) on ventilation grille (2).



- Engage the latch mechanisms (2).
- Tighten the screws (1).

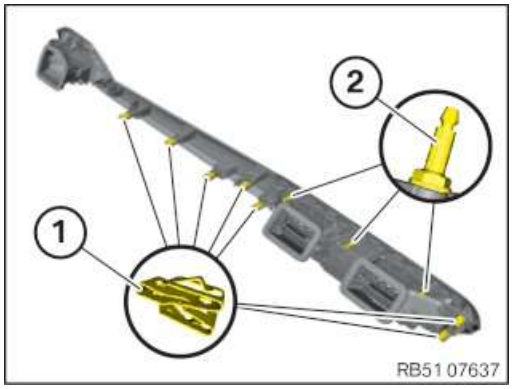
Ventilation grille to decorative strip/instrument panel

Screw		Tightening torque	1.8 Nm

POSTPROCESSES

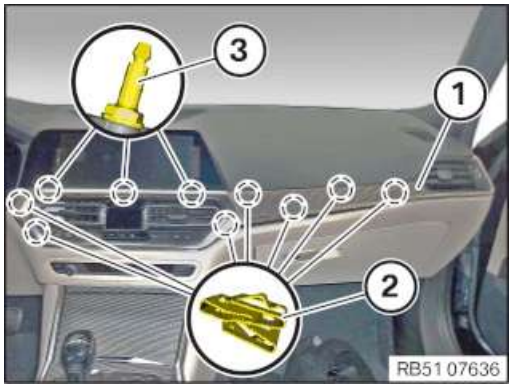
5 – Install the finisher on the right instrument panel

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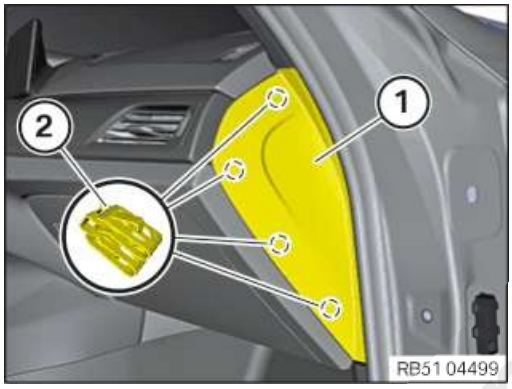
- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

6 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

7 – Encode/program control unit(s)

- **Replacement**.
- **This task is not included in this flat rate unit item.**

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

Additional Information

Overview of Tightening Torques

Ventilation grille to decorative strip/instrument panel Used in step 4

Screw		Tightening torque	1.8 Nm

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64 11 208 Replace heat exchanger

CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

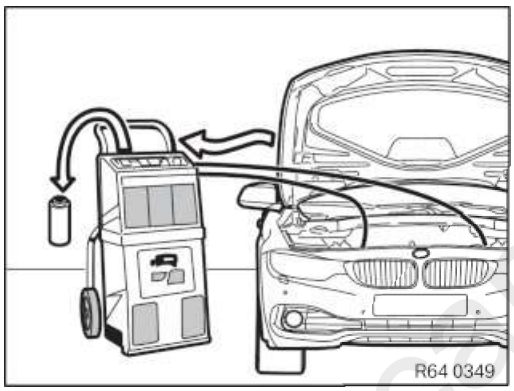
- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Drawing off the air conditioning



- See additional information.

3 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

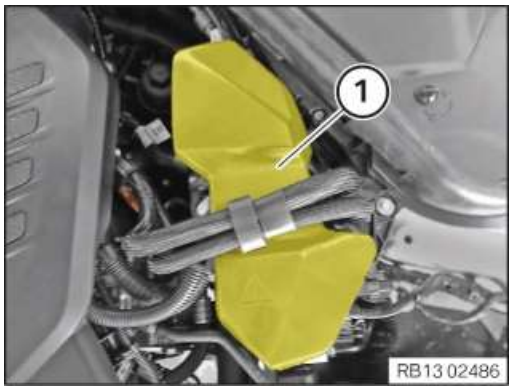
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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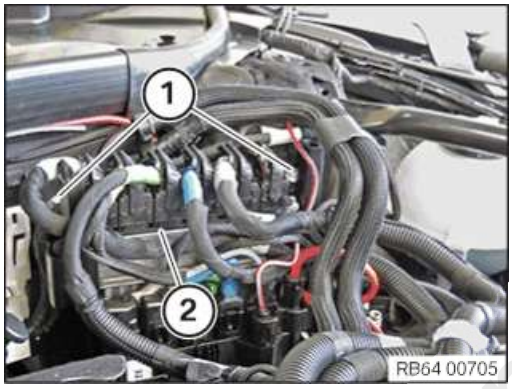


- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

4 – Detach the control unit holder



- Pull the cover (1) towards the top and feed out.



- Loosen screws (1).
- Remove control unit holder with the control units (2) and lay to one side.

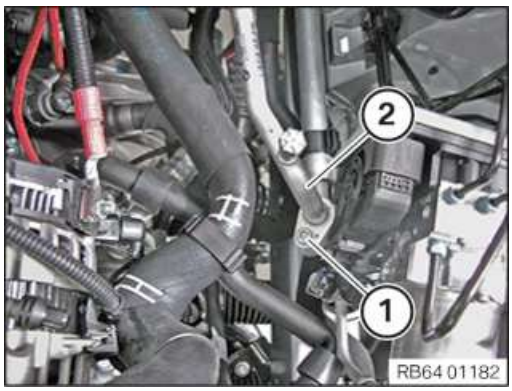
5 – Disconnect the refrigerant line on the connecting piece

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

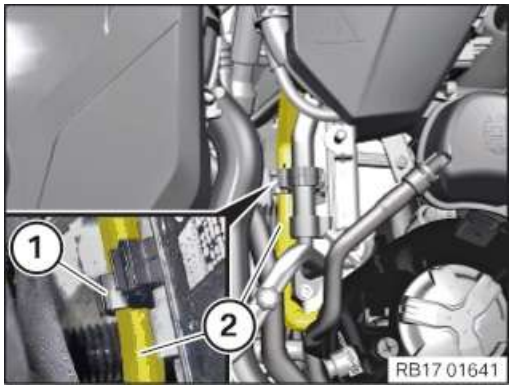
- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



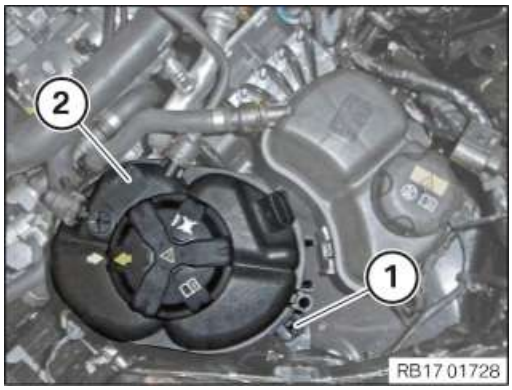
- Release the screw (1).
- Remove the refrigerant line (2).

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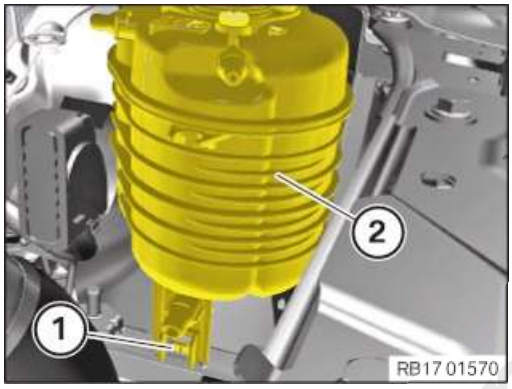
6 – Removing coolant expansion tank of high-temperature coolant circuit partially



- Unlock the holder (1).
- Feed out coolant line (2) and place to one side.



- Unlock the lock (1) at the coolant expansion tank (2).



NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Unlock the lock (1) below at the expansion tank (2).
- Set the coolant expansion tank (2) aside.

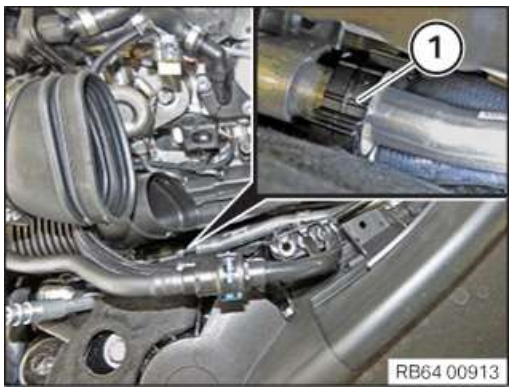
7 – Disconnect the refrigerant line from the expansion valve

CAUTION

Residual pressure in the air conditioning.

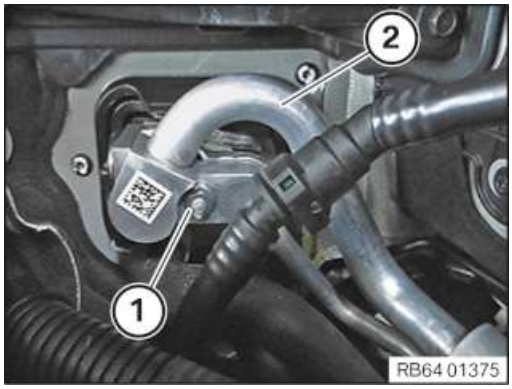
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



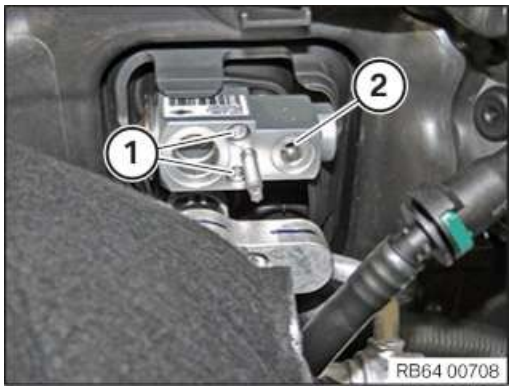
- Open the holder (1).

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- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.

8 – Remove expansion valve



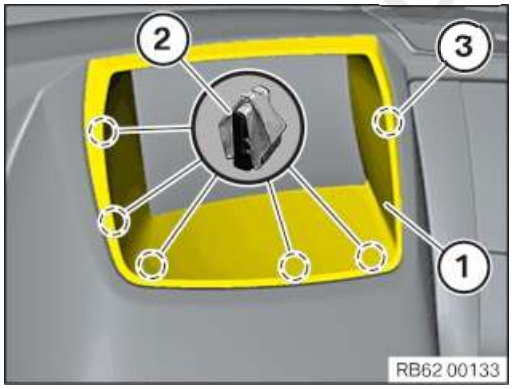
- Loosen screws (1).
- Remove the expansion valve (2).

9 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

10 – Removing trim for the Head-Up Display



- Unclip trim (1) for the Head-Up Display upwards from clamps (2) and latch mechanism (3).

11 – Remove cupholder

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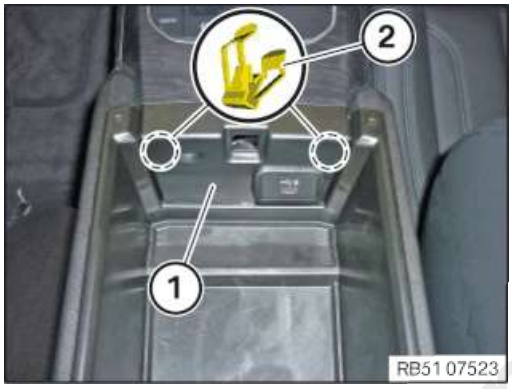


- Remove the insert (1).

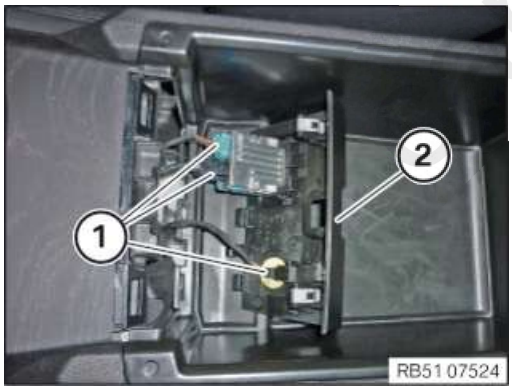


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

12 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

13 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



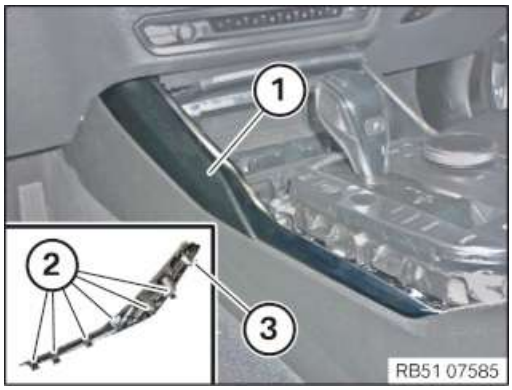
- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

14 – Removing the decorative trim on the centre console on the left and right

▸ Remove the decorative trim from the centre console

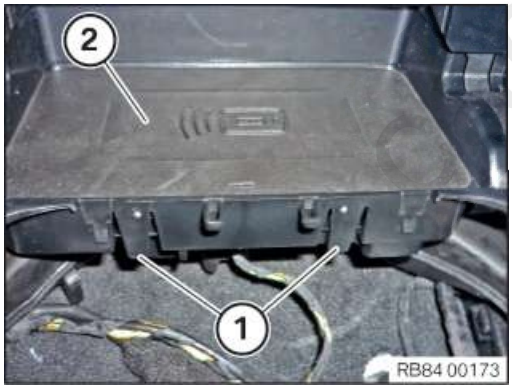
NOTICE

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

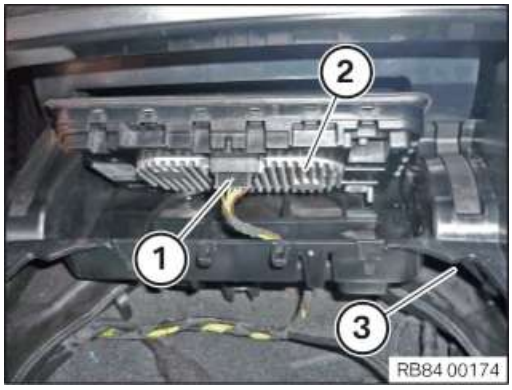


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

15 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

16 – Remove the operating facility in the centre console

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▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

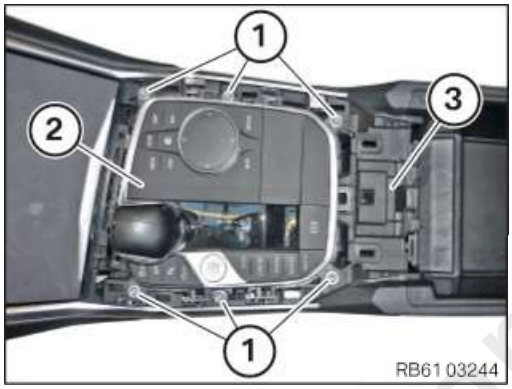
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

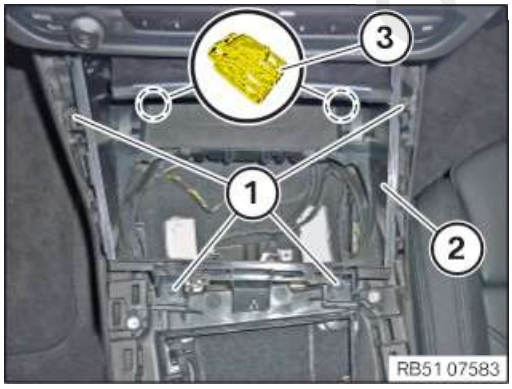


- See additional information.



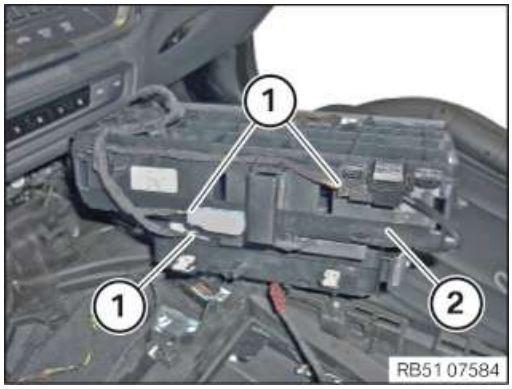
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

17 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

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- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

18 – Removing the rear centre console trim

RISK OF DAMAGE

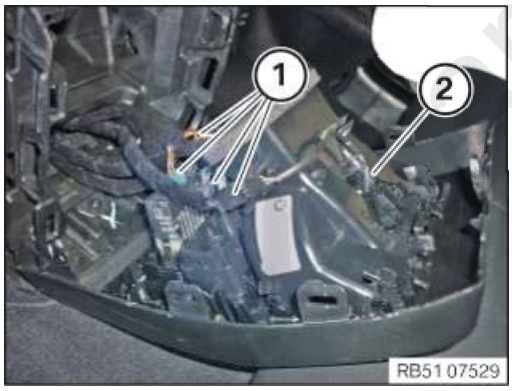
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.



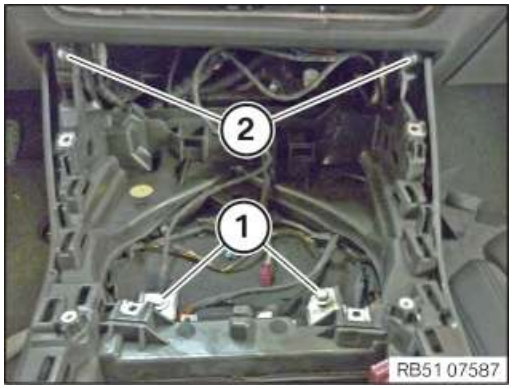
- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

19 – Removing the centre console

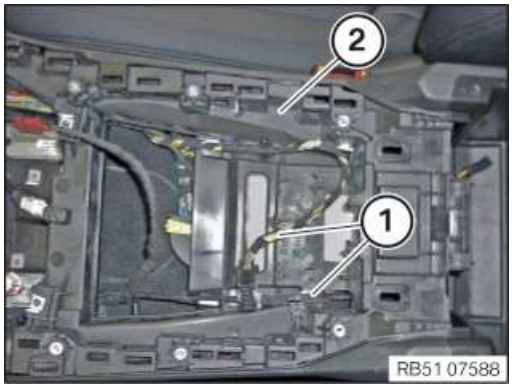


- Loosen screws (1).

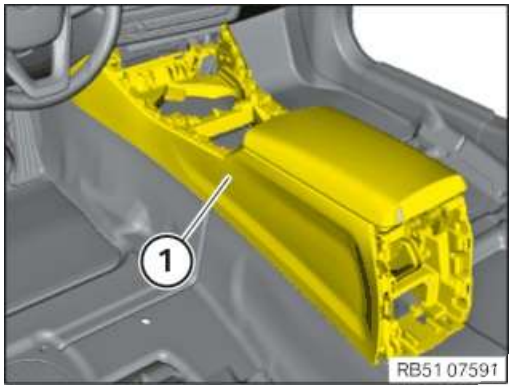
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- Loosen screws (1) and (2).



- Release the wiring harness (1) from the centre console (2).

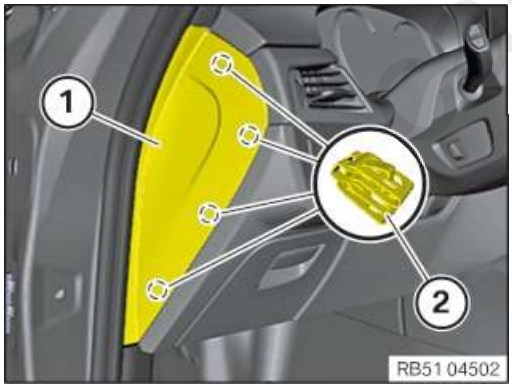


NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

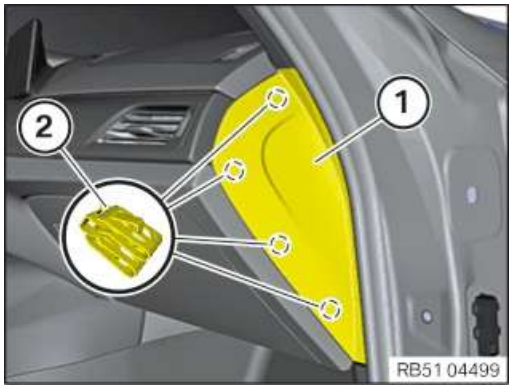
- Carefully raise rear centre console (1).
- Feed out wiring harness from the centre console (1) and unlock and disconnect existing plug connections, if required.
- Feed out and remove the centre console (1) on the instrument panel .

20 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

21 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

22 – Remove left and right A-pillar trim panel

NOTICE

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

▸ **Remove the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

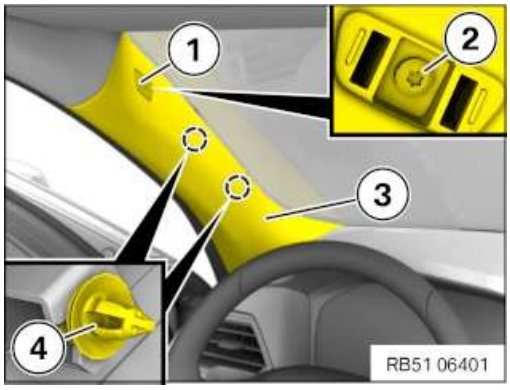
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

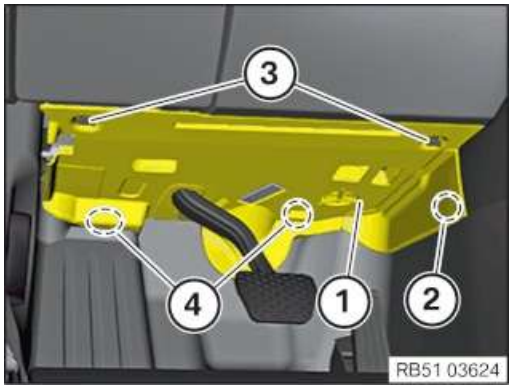
- Do not use sharp-edged tools when removing the trim panel.



- Unclip cover (1) with a suitable special tool from the special tool kit 0 493 752 (00 9 329).
- Loosen screw (2).
- Unclip A-pillar trim panel (3) with clips (4) and feed it out to the top.

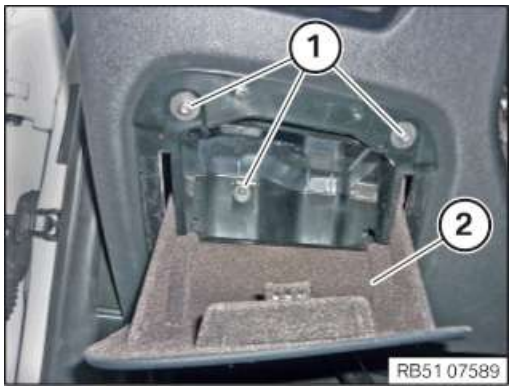
23 – Removing the trim panel for pedal mechanism

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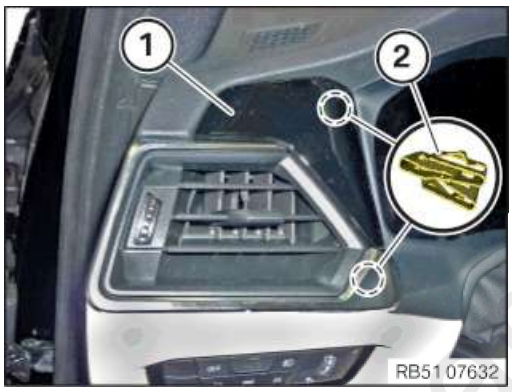
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

24 – Removing the left fold-down compartment



- Loosen screws (1).
- Remove the fold-down compartment (2) toward the bottom.

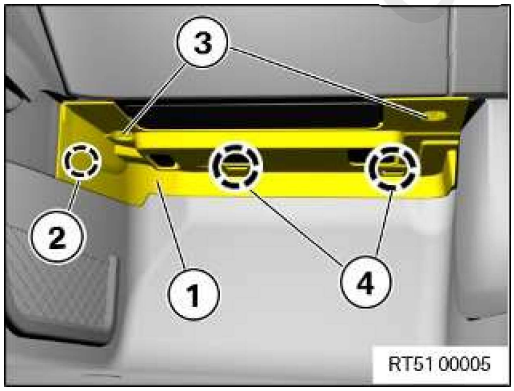
25 – Remove the finisher on the instrument panel on the left



- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

  Remove the decorative strip (1).

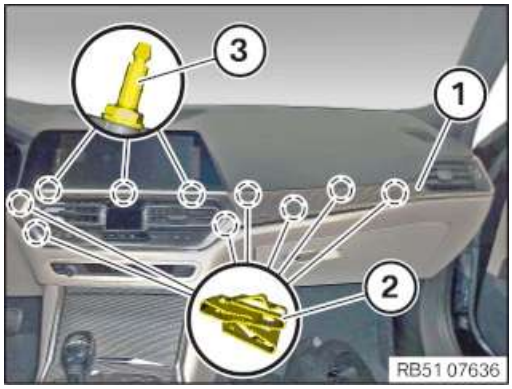
26 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

27 – Remove the finisher on the right instrument panel

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- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

28 – Remove Central Information Display (CID)

RISK OF DAMAGE

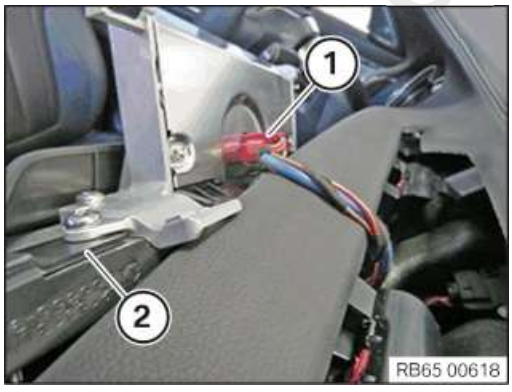
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Loosen screws (1).
- Pull out central information display (CID) (2) slightly off the instrument panel.



- Unlock plug connection (1) and disconnect.
- Remove the central information display (CID) (2).

29 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Removing the airbag unit for sports steering wheel**



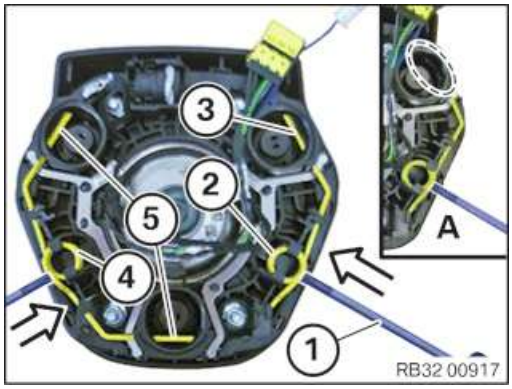
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

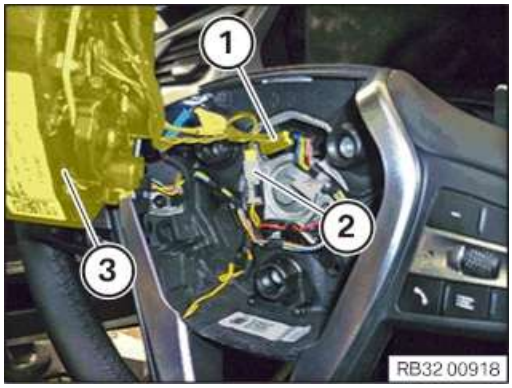
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Press wire spring clip (4) with Torx screwdriver T25 (1) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

▸ Removing the airbag unit for M Sport steering wheel



NOTICE

Perform the operations on the left and right side.

- Locate the mark (1) for unlocking the airbag unit on the steering wheel by touching it.



NOTICE

Perform the operations on the left and right side.

- Cut the mark (1) carefully with a knife (2) to an approx. length of 4 mm .

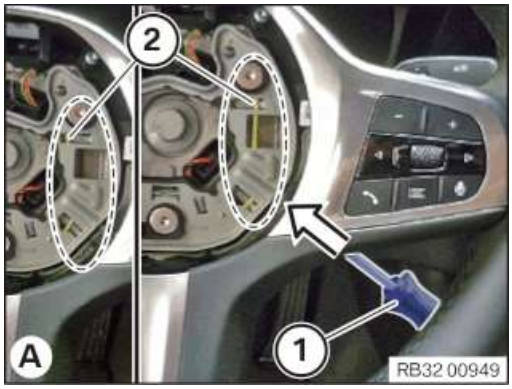


TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

- In case of vehicles with shift paddles (2) made of carbon-fibre-reinforced plastic, use a Torx socket T15 (1) for unlocking the airbag unit.

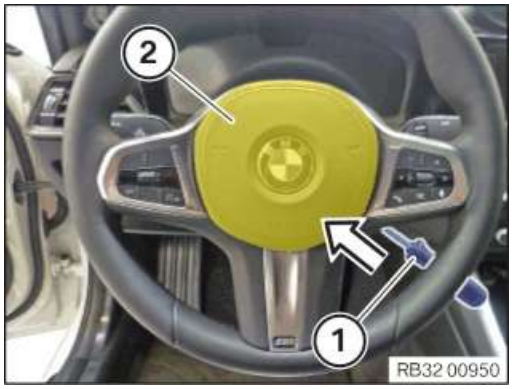
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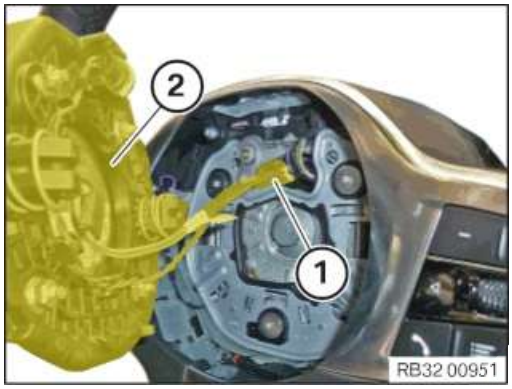
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Insert the Torx socket T15 (1) diagonally upwards until a resilient resistance is felt.
- Press in Torx socket T15(1) straight in the direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).

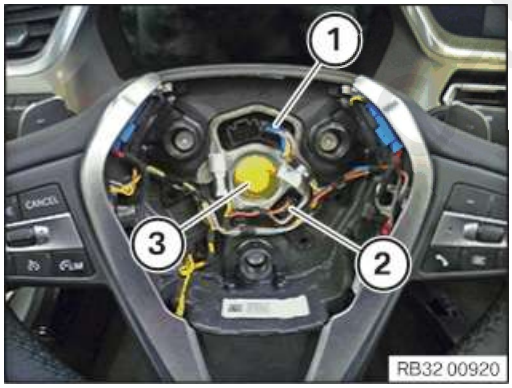


- Press in Torx screwdriver T15 (1) straight in direction of arrow towards the centre of the steering wheel and lift the airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



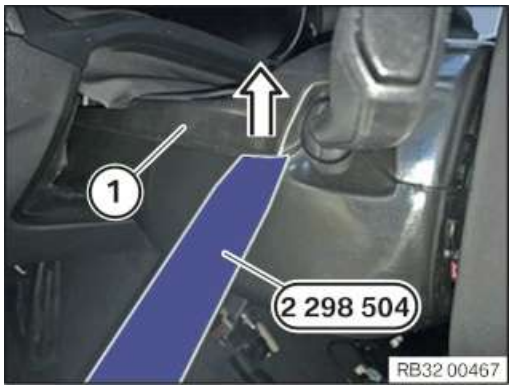
- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

30 – Remove sports steering wheel



- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

31 – Removing steering column shroud upper section

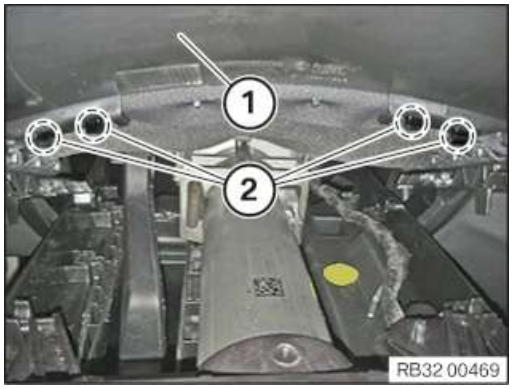


NOTICE

Perform the operations on the left and right side.

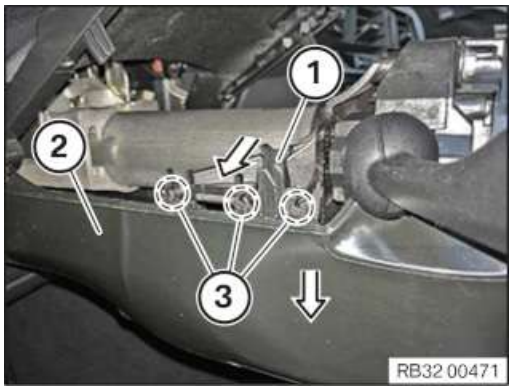
- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.

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- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

32 – Removing steering column shroud lower section



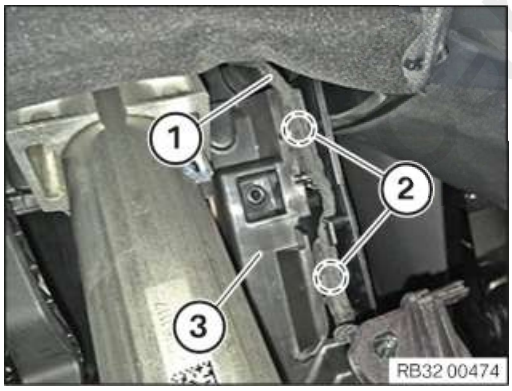
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

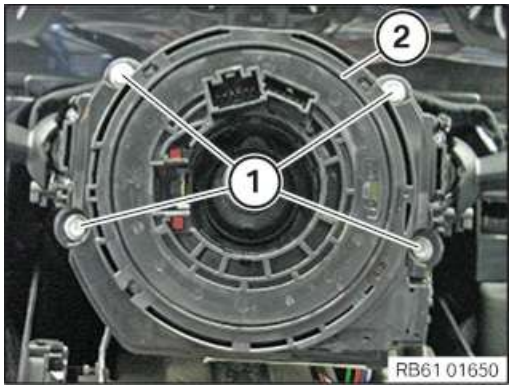


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).



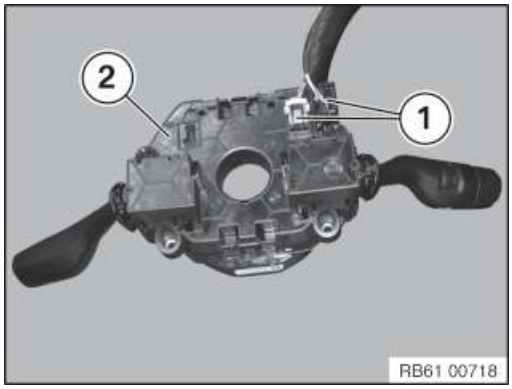
- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

33 – Removing the steering column switch cluster (SZL)



- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).

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- Unlock and disconnect plug connections (1) on the SZL (2).

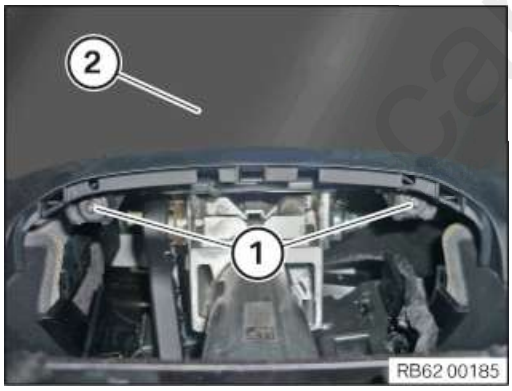
34 – Removing the instrument cluster (KOMBI)



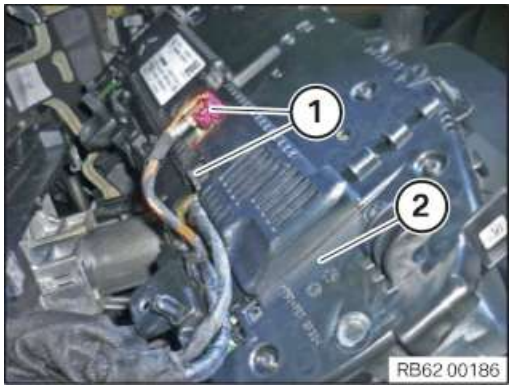
- Loosen screw (1).



- Loosen screw (1).



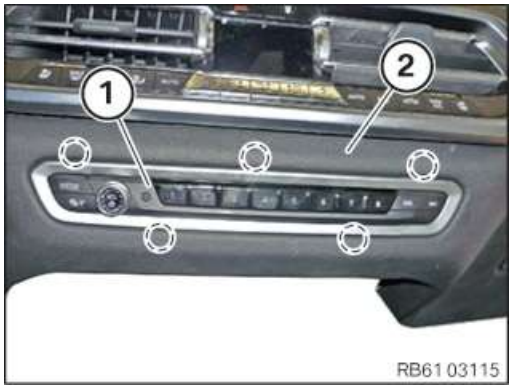
- Loosen screws (1).
- Feed out instrument cluster (KOMBI) (2).



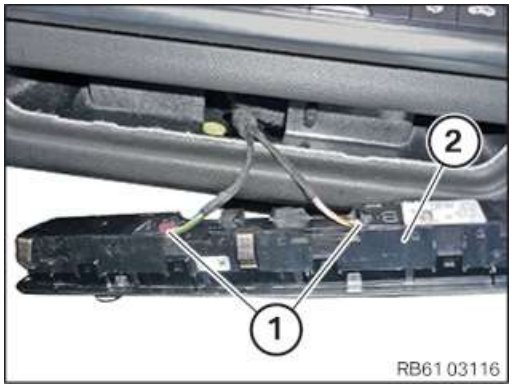
- Unlock and disconnect plug connections (1) from instrument cluster (KOMBI) (2).
- Remove the instrument cluster (KOMBI) (2).

35 – Remove the audio operating unit

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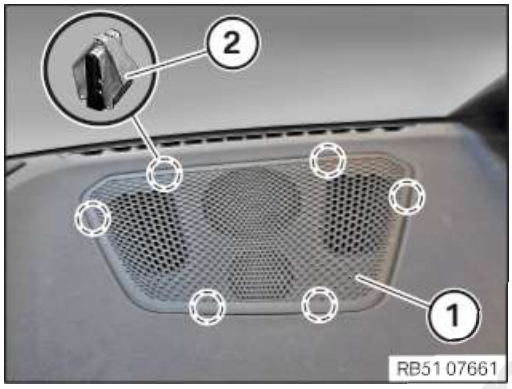


- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



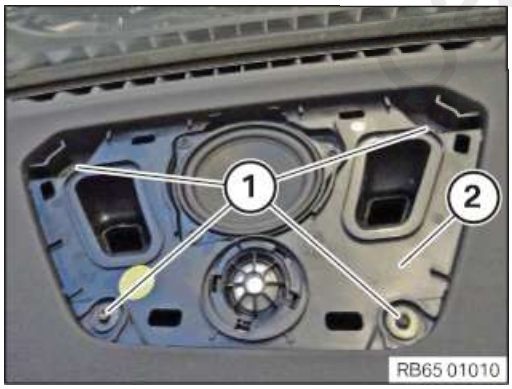
- Disconnect plug connections (1) and remove the audio operating unit (2).

36 – Remove the speaker trim at the instrument panel

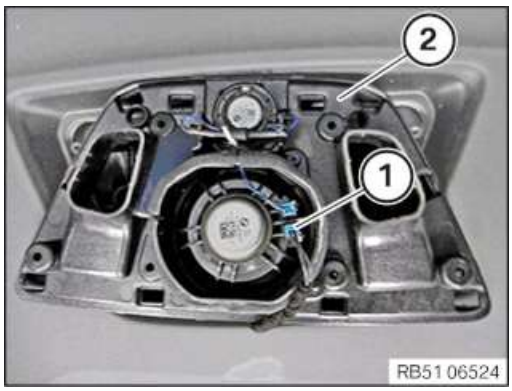


- Lever out the speaker trim (1) with the special tool 0 496 569 (00 9 325) from the clamps (2) toward the top and remove.

37 – Remove the speaker holder at the instrument panel



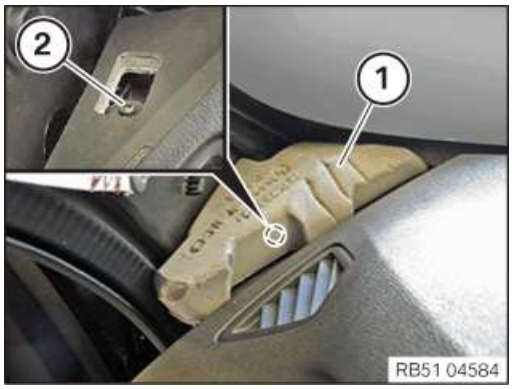
- Loosen screws (1).
- Pull out speaker holder (2) slightly with the loudspeakers and tilt it to the side.



- Unlock plug connection (1) and disconnect.
- Remove the speaker holder (2).

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38 – Remove the instrument panel trim panel



NOTICE

Perform the operations on the left and right side.

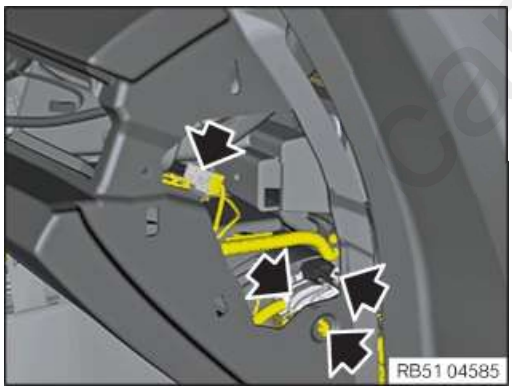
- Remove the sound insulation (1).
- Loosen screw (2).



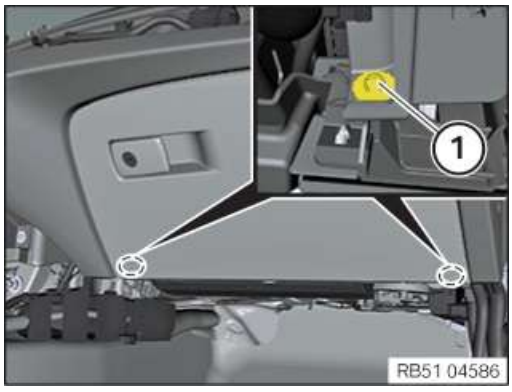
- Loosen screws (1).



- Loosen screws (1).

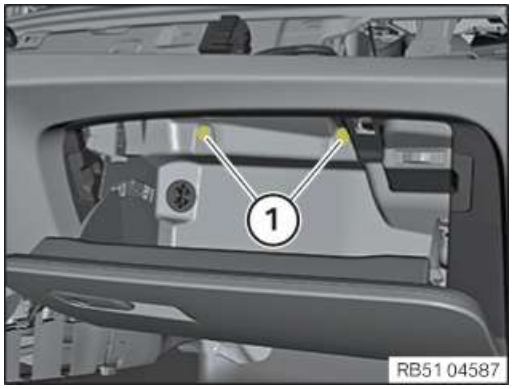


- Release all plug connections and cable clips (arrows) behind the glove box.

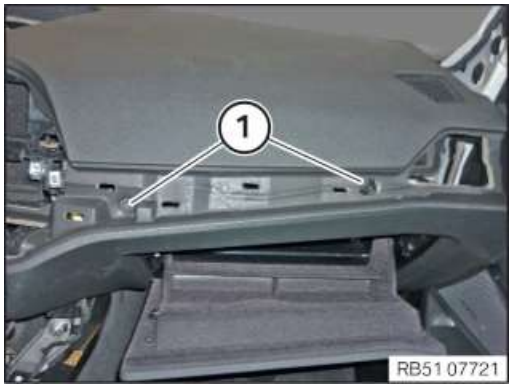


- Release the screws (1) on the lower side of the glove box.

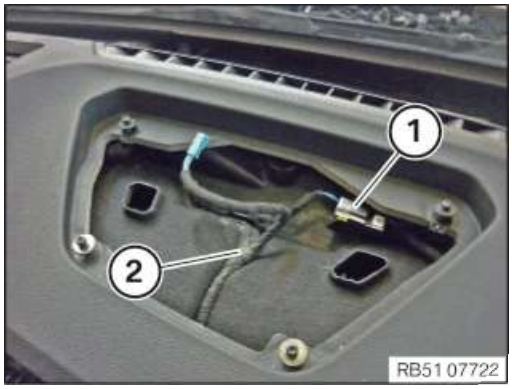
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- Open glovebox.
- Loosen screws (1).



- Loosen screws (1).



- Unlock plug connection (1) and disconnect.
- Release the wiring harness (2) on the holders.



- Unlock the plug connection (1) on the light operating unit and disconnect it.



- Loosen screws (1).

TECHNICAL INFORMATION

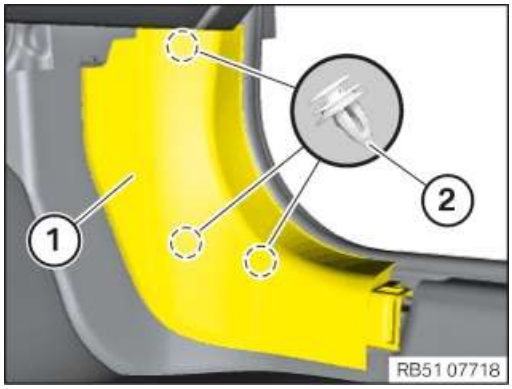
Conduct the following operation with the assistance of a second person.

- Pull the instrument panel trim back slightly.

  If necessary, unlock and disconnect additional plug connections.
- Remove the instrument panel trim from the vehicle.

39 – Removing the side trim panel in the footwell at the right-hand A-pillar

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- Loosen the side trim panel (1) at the clips (2) and remove it toward the inside.

40 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

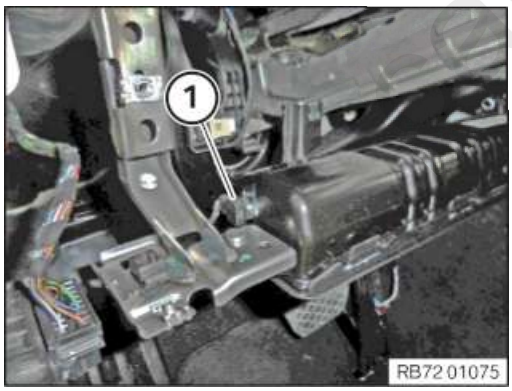
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

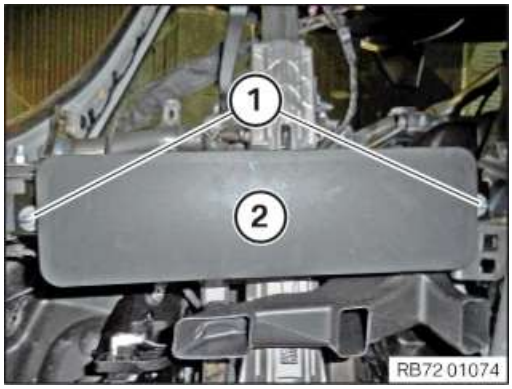
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



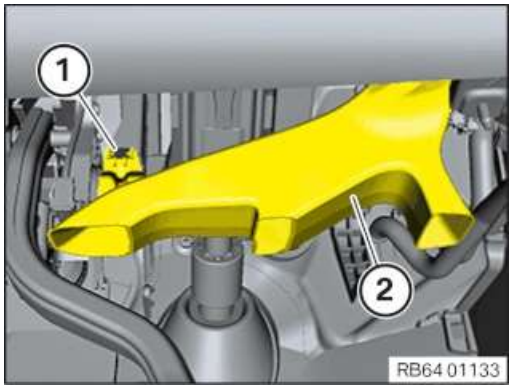
- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

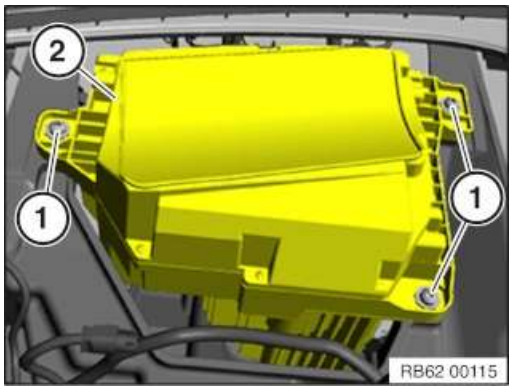
41 – Remove left air duct

41 – Remove left air duct



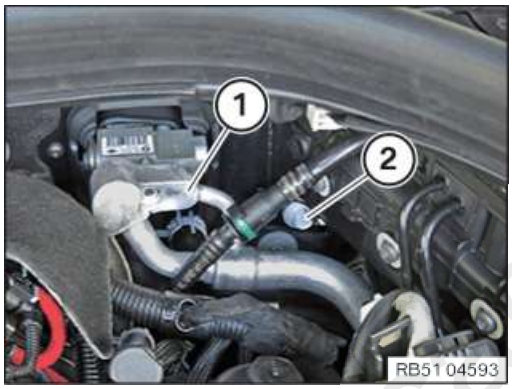
- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

42 – Removing the Head-Up Display



- Loosen screws (1).
- Remove head-up display (2) from support.
- Unlock associated cable and disconnect.

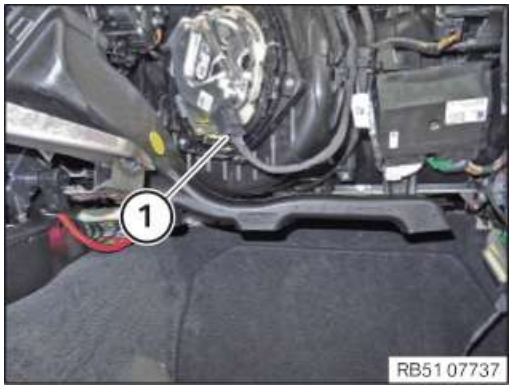
43 – Removing the support for the instrument panel



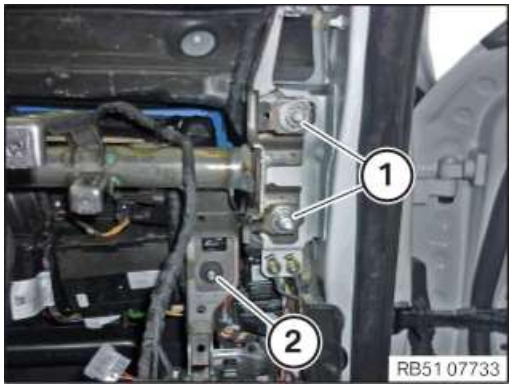
- Push the refrigerant line (1) slightly to one side and loosen the screw (2).



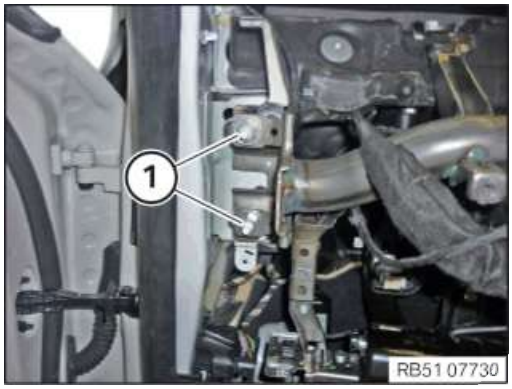
- Push the carpet in the area of the right B-pillar to the side.
- Unlock and disconnect plug connections (1).



- Unlock and disconnect the plug connection (1) on the blower motor.



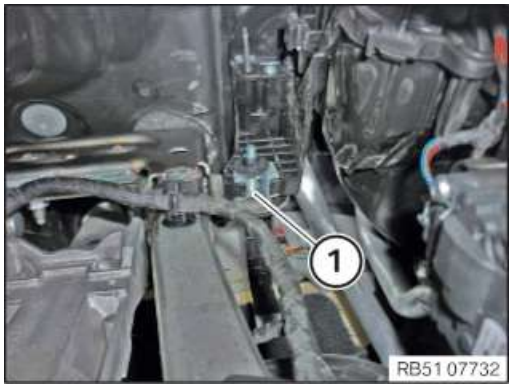
- Loosen nuts (1) and (2).



- Loosen nuts (1).

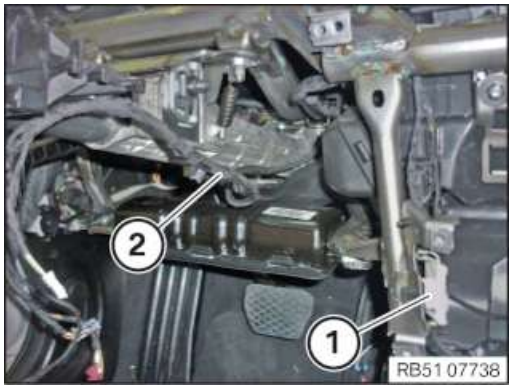


- Loosen screws (1).

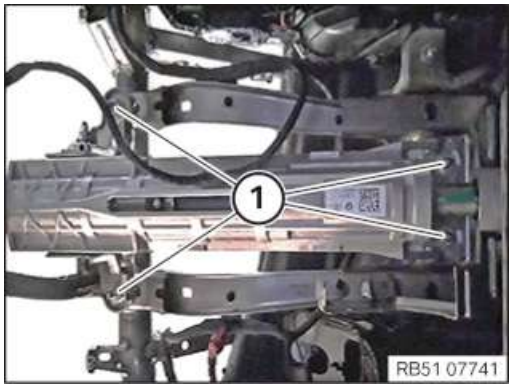


- Slacken the nut (1) in the left footwell on the heating and air-conditioning unit.

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- Release plug connection (1).
- Release the wiring harness (2) from the steering column.

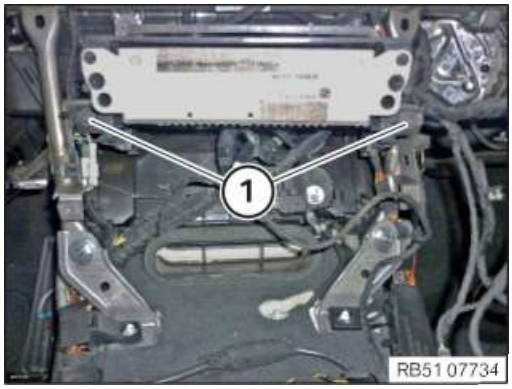


TECHNICAL INFORMATION

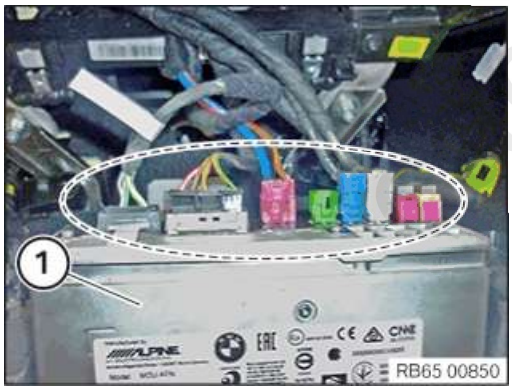
Secure component against falling.

- Release the nuts (1) at the steering column.
- Drop steering column (1) a little away and support it in the footwell.

  Drop steering column not too far away and support it absolutely.



- Loosen screws (1).
- Feed out Head Unit High.

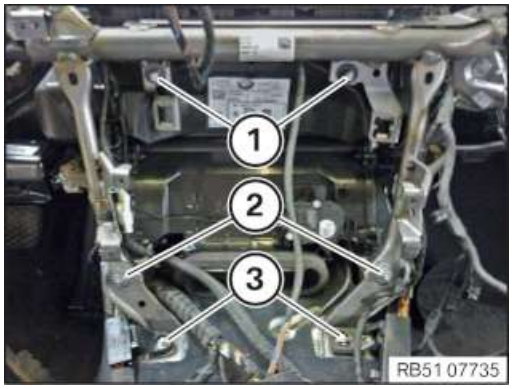


- Unlock and disconnect all connectors in the marked area.
- Remove headunit (1).



- Unlock and disconnect plug connection (1) from airbag control unit.
- Release the wiring harness (2) on the holders.

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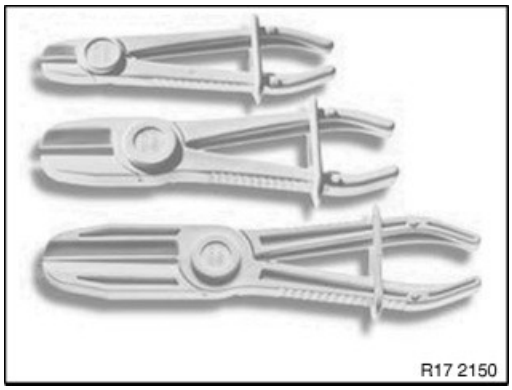


- Loosen nuts (1).
- Loosen nuts (2).
- Remove cable clip and release the nuts (3).

  Remove retaining bracket from left and right sides.
- Carefully feed out the support for the instrument panel to the rear.

  If necessary, unlock and disconnect additional plug connections.
- Carefully remove support for the instrument panel from the vehicle.

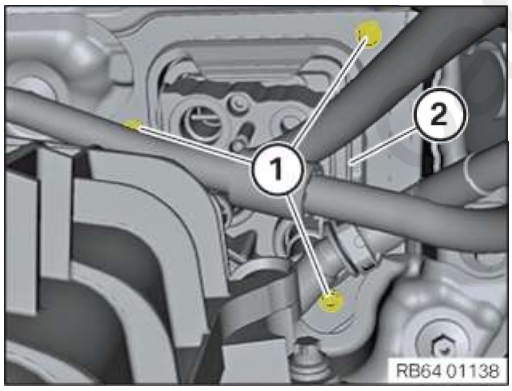
44 – Removing the heating and air-conditioning unit



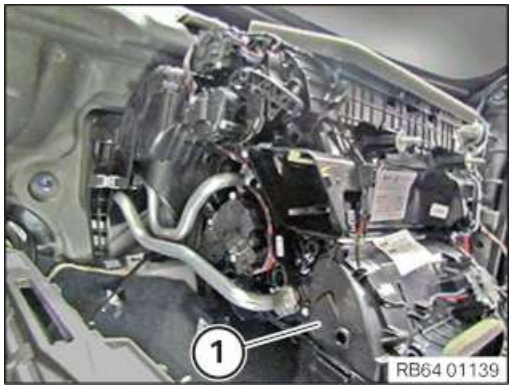
- Use commercially available disconnection tools to pinch off the coolant lines.



- Release the hose clamps (1) using special tool and pull off the coolant hoses.

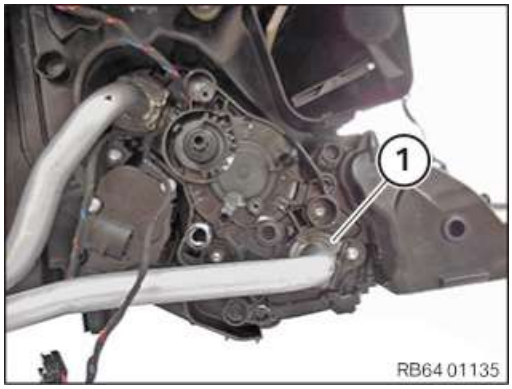


- Release screws (1) from flange (2).
- Protect the carpet in footwell against leaking coolant.

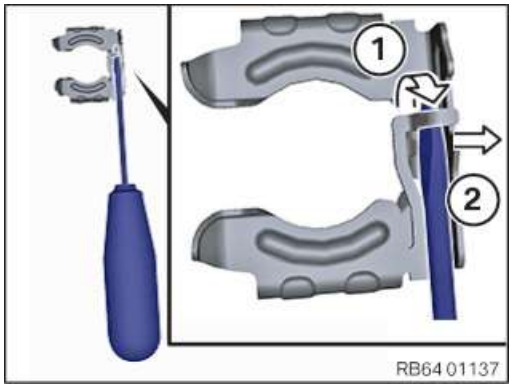


- Unfasten plug connection.
- Remove the heating and air-conditioning unit (1).

45 – Removing lower coolant pipe

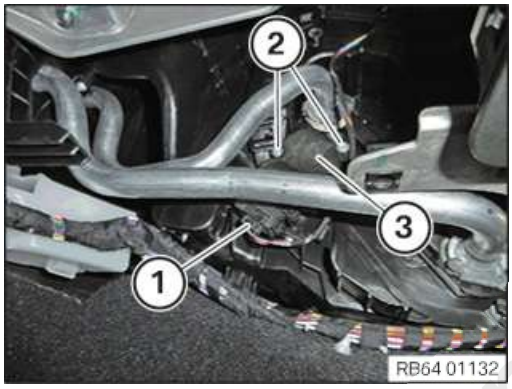


- Disassemble retaining clip (1) as shown in the next work step.



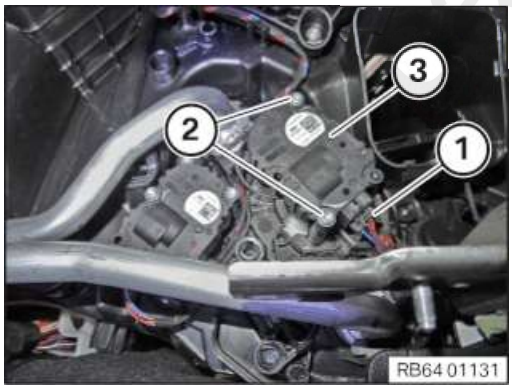
- Unlock the retaining clip in an upward direction (1), using a suitable slotted screwdriver.
- Push the retaining clip to the side (2) with a suitable screwdriver.
- Set the coolant pipe aside.

46 – Remove the mixed air flap motor at the front left (M23a)



- Disconnect plug connection (1).
- Loosen screws (2).
- Remove front left mixed air flap motor (3).

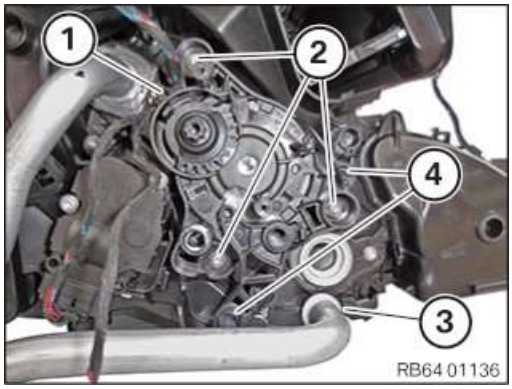
47 – Install the rear passenger compartment mixed air flap motor (M23b)



- Disconnect plug connection (1).
- Loosen screws (2).
- Remove mixed air flap motor rear (3).

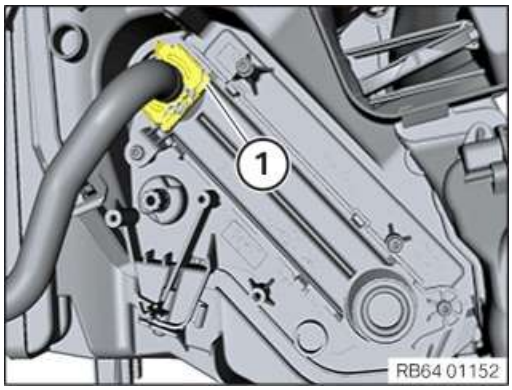
48 – Removing kinematics, bottom left

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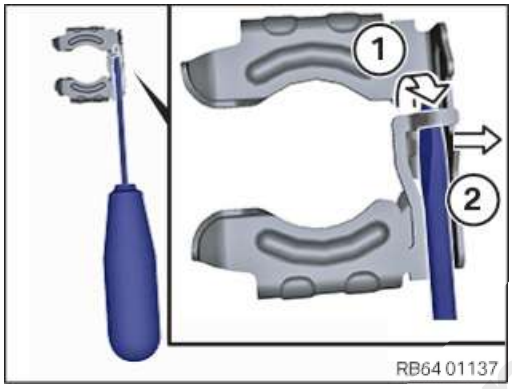


- Detach cable from the line routing (1).
- Slide coolant pipe (3) downwards.
- Disengage relay lever (4).
- Loosen screws (2).
- Remove kinematics.

49 – Removing coolant pipe, top



- Disassemble retaining clip (1) as described in the next step.

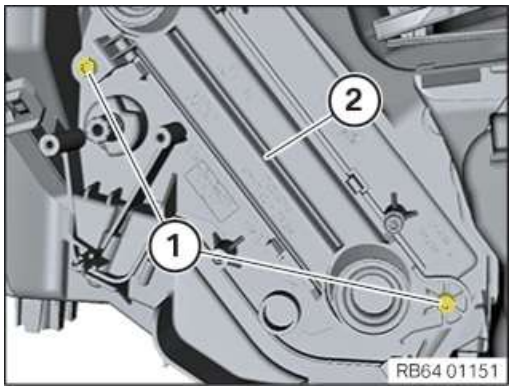


- Unlock the retaining clip in an upward direction, using a suitable screwdriver (1).
- Slide the retaining clip to the side with a suitable screwdriver (2).
- Set the coolant pipe aside.

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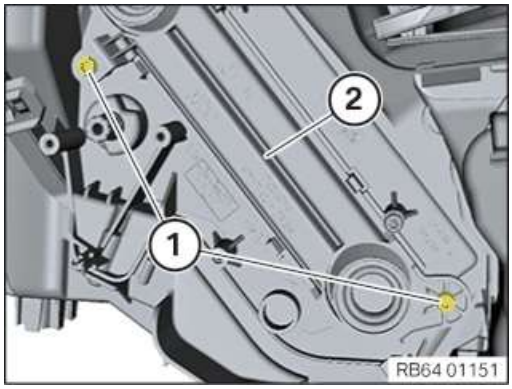
MAIN WORK

50 – Remove heat exchanger



- Loosen screws (1).
- Remove the heat exchanger (2).

51 – Installing heat exchanger



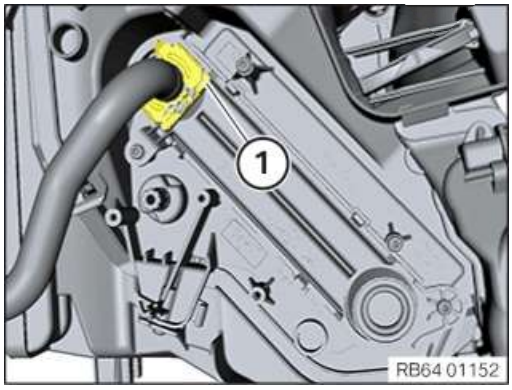
- Position heat exchanger (2).
- Tighten the screws (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

POSTPROCESSES

52 – Installing the top coolant pipe

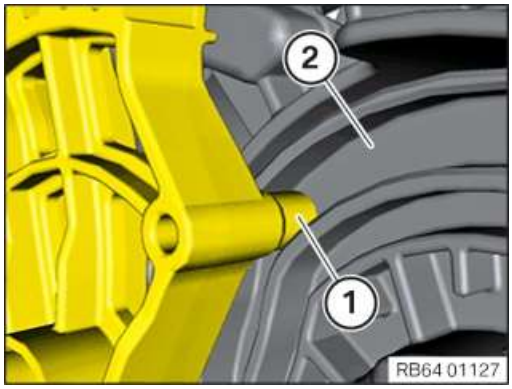


- Renew the sealing ring.

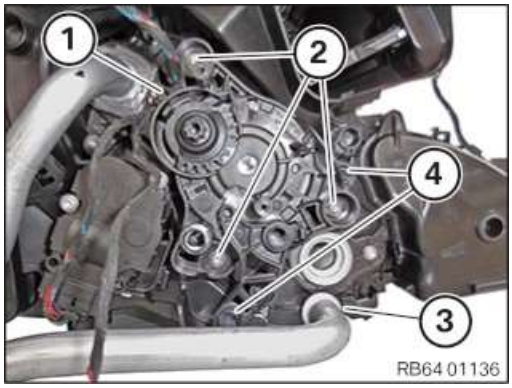
  Parts: Sealing ring
- Position the coolant pipe .
- Secure the coolant pipe with the retaining clip (1).
- Ensure that the coolant pipe is correctly positioned on the heat exchanger for heating system.

53 – Installing the lower left kinematics

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- Thread in and position kinematics (2).
- Make sure that the guide pin (1) is correctly positioned in the guide of the gate disc (2).



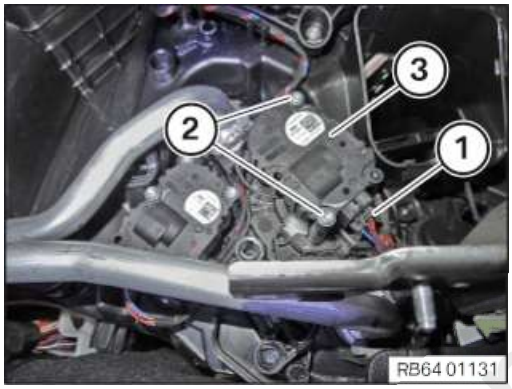
- Position kinematics.
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Engage the relay levers (4).
- Ensure that the relay levers (4) engage audibly.
- Position the coolant pipe (3).
- Attach the cable to the line routing (1).

54 – Install the rear passenger compartment mixed air flap motor (M23b)



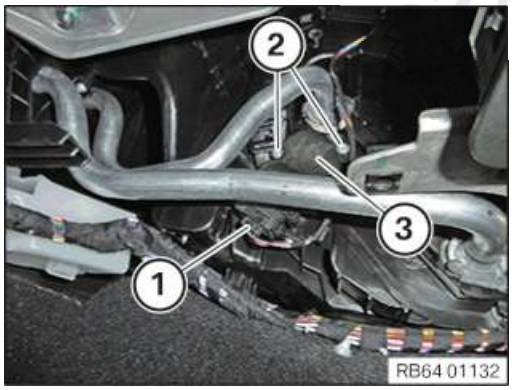
- Position the rear mixed air flap motor (3) .
- Tighten the screws (2).

Heater/air conditioner

Screw	Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

55 – Install the mixed air flap motor at the front left (M23a)



- Front left mixed air flap motor (3).
- Tighten down screws (2).

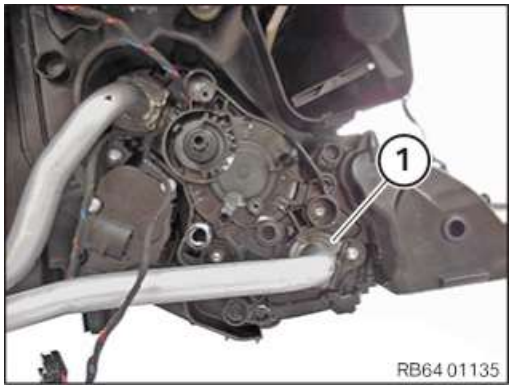
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

56 – Installing the lower coolant pipe

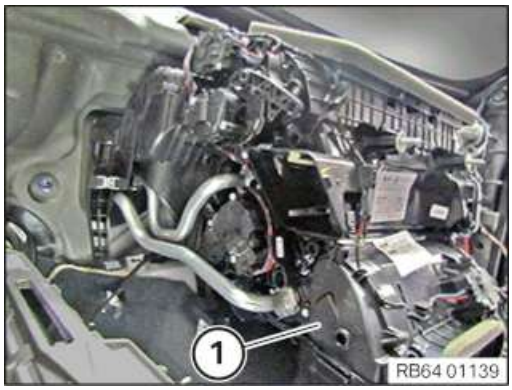
aidiagn.com



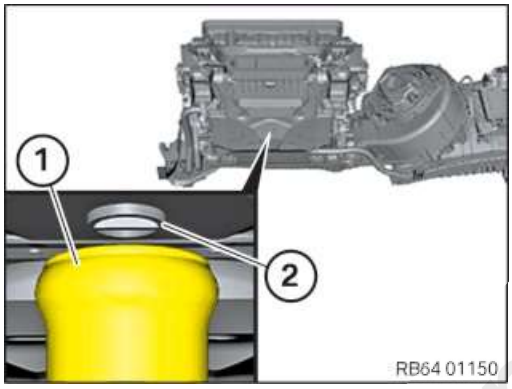
- Renew the sealing ring.

  Parts: Sealing ring
- Position the coolant pipe .
- Secure the coolant pipe with the retaining clip (1).
- Make sure that the coolant pipe is positioned correctly on heat exchanger for heating system.

57 – Installing the heating and air-conditioning unit



- Position the heating and air-conditioning unit (1).
- Connect connectors and lock.



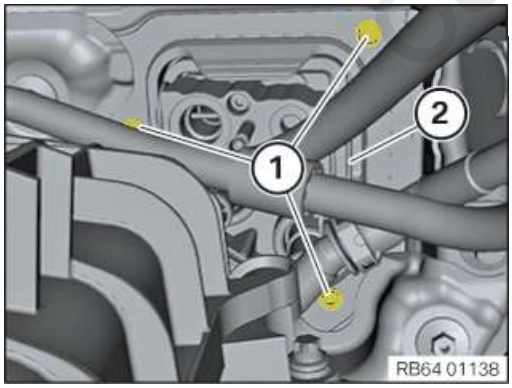
RISK OF DAMAGE

Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

- Ensure that the condensate drain (2) is correctly fitted onto the grommet (1).
- After installing the heating and air-conditioning unit, perform a visual inspection.



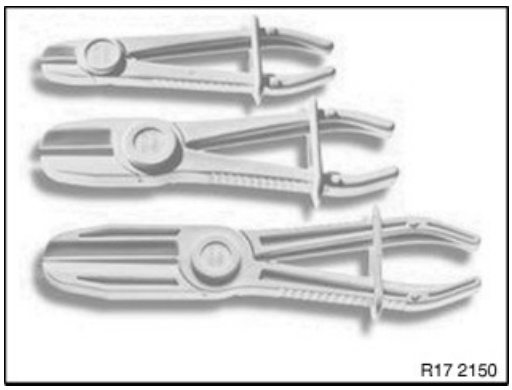
- Tighten the nuts (1) on the flange (2).

Heating and air-conditioning unit on the bulkhead

Oval-head screw		Tightening torque	2,8 Nm

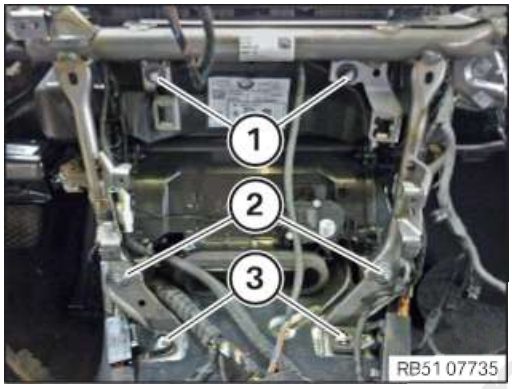


- Slide coolant hoses on correctly.
- Secure hose clamps (1) using the special tool .



- Remove disconnection tools.

58 – Installing the support for instrument panel



- Install the instrument panel support into the vehicle carefully.
- Insert the instrument panel support carefully.

  If necessary, connect and lock the additional connector.
- Tighten nuts (1).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

- Mount retaining bracket on left and right.

  Tighten nuts (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nuts (3) and fit cable clip .

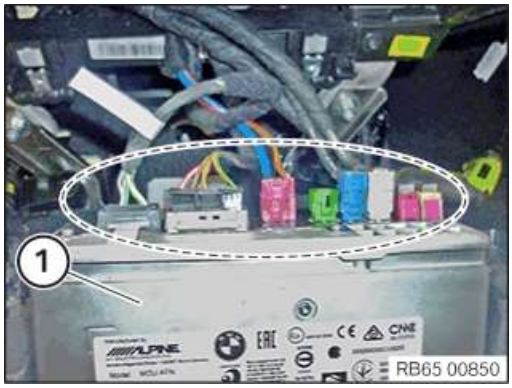
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

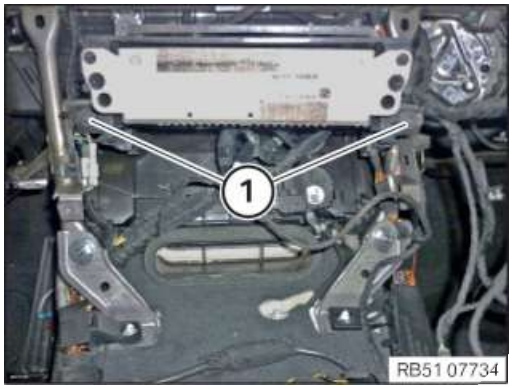
cardiagn.com



- Connect the connector (1) to the airbag control unit and lock it.
- Secure the wiring harness (2) on the holders.



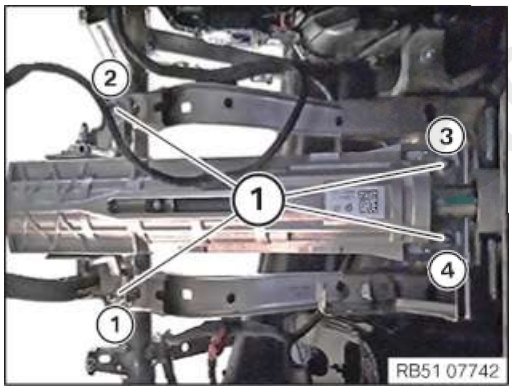
- Position head unit (1).
- Connect and lock all connectors in the marked area.



- Feed in the head unit.
- Tighten the screws (1).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm



- Correctly position the steering column (2) and tighten the nuts (1) in the sequence (1), (2), (3) and (4).

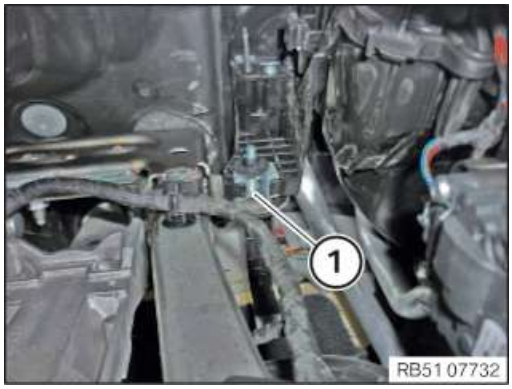
Steering column to dashboard support

M8	Observe tightening sequence.	Tightening torque	21,4 Nm



- Connect connectors (1) and lock.
- Secure the vehicle wiring harness (2) to the steering column.

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- Tighten nut (1) in the left foot well on the heating and air-conditioning unit.

Heating and air-conditioning unit on support

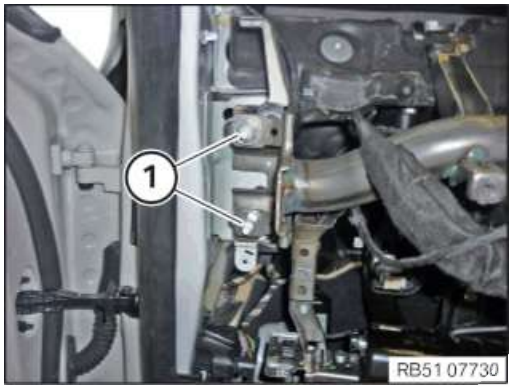
Nut M6		Tightening torque	4 Nm



- Tighten the screws (1).

Support for instrument panel

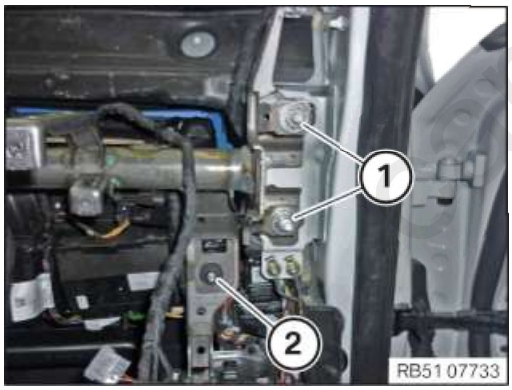
M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Tighten nuts (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Tighten nuts (1).

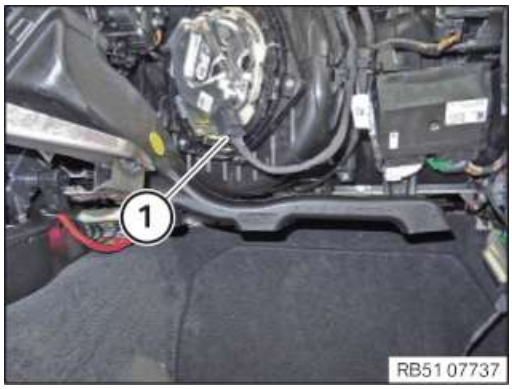
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nut (2).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

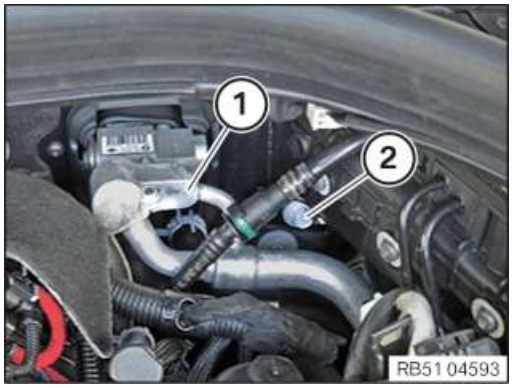


- Connect the connector (1) to the blower motor and lock.

.com



- Connect connectors (1) and lock.
- Correctly position the carpet in the area of B-pillar at the right.

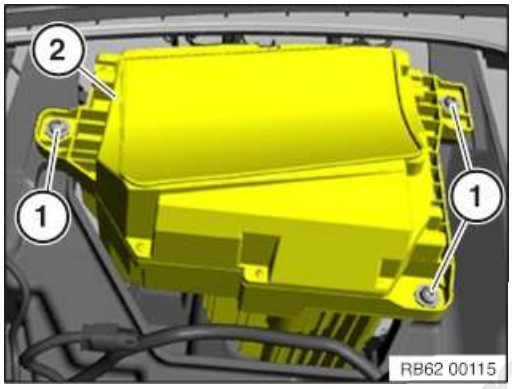


- Push the refrigerant line (1) slightly to one side and tighten the screw (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

59 – Installing the head-up display

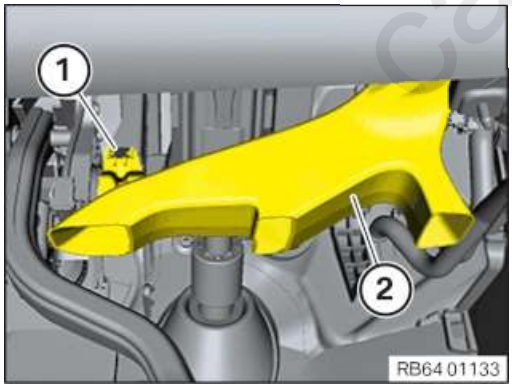


- Connect the associated connector to the Head-Up Display.
- Guide the Head-Up Display (2) into the support.
- Tighten the screws (1).

Head-Up Display to support

M6x25 screw		Tightening torque	13 Nm

60 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

61 – Installing knee airbag

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WARNING

Airbag unit.

Danger! Life-threatening injuries!

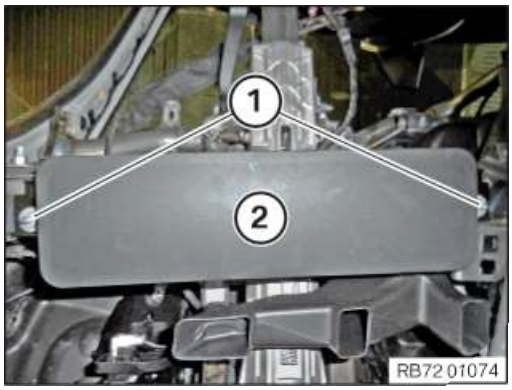
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

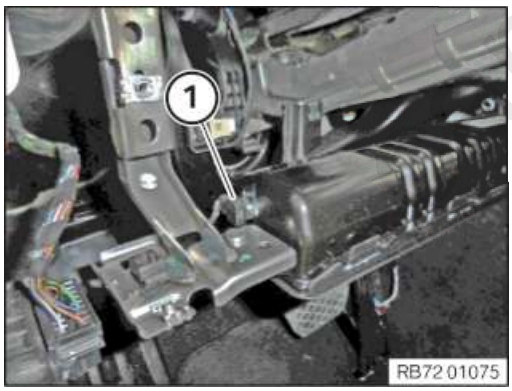
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

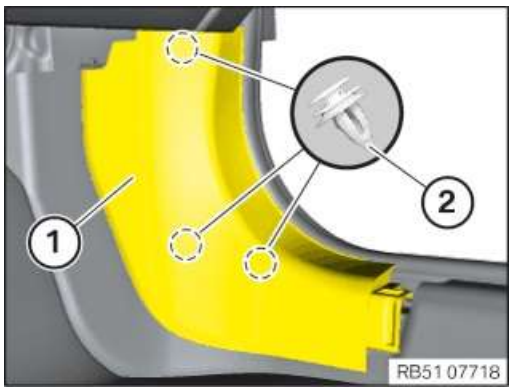
Knee airbag on support structure

Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

62 – Installing side trim panel in footwell on right A-pillar



- Check the clips (2) for damage.

  Renew damaged or missing clips (2).
- Correctly position the side trim panel (1) and clip in to the clips (2).
- Make sure that the side trim panel (1) is correctly fitted against edge protection.

63 – Install the trim panel for the instrument panel

63 – Install the trim panel for the instrument pane.



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

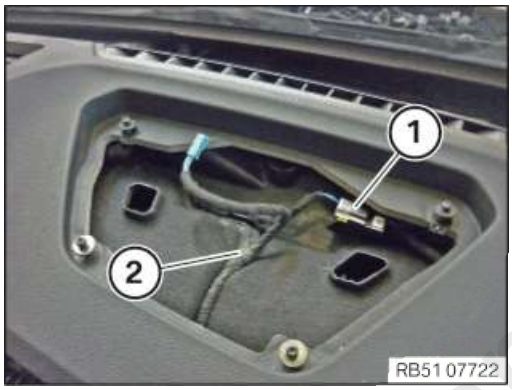
- Insert the instrument panel trim in the vehicle and position it at the support.
- Insert the associated wiring harnesses and connect the connectors.
- Tighten the screws (1).

Dashboard to support

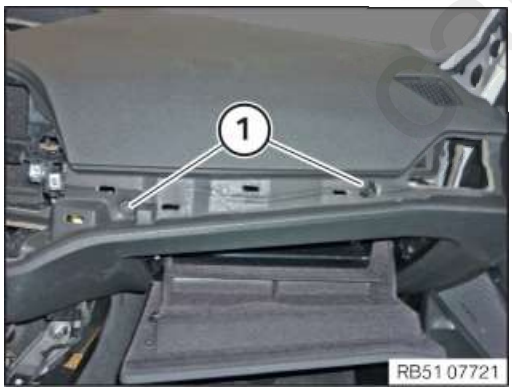
Screw		Tightening torque	2,4 Nm



- Connect connector (1) to the light operating unit and lock.



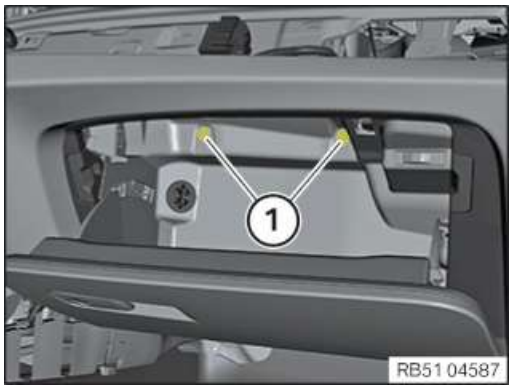
- Secure the wiring harness (2) on the holders.
- Connect connectors (1) and lock.



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

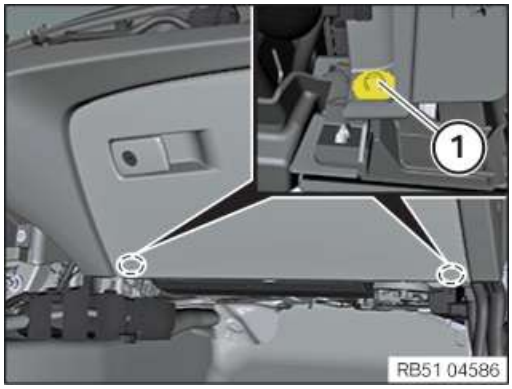


- Open glovebox.
- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

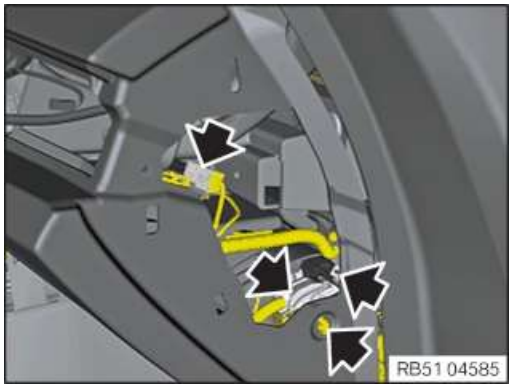
cardiagn.com



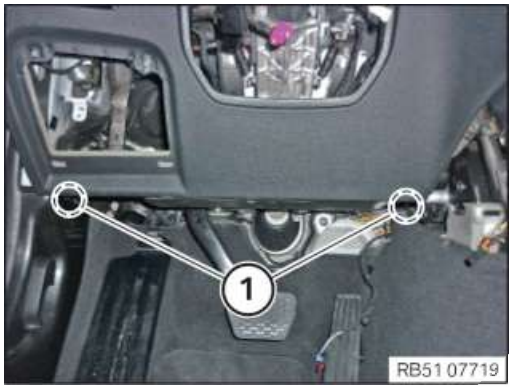
- Tighten the screws (1) on the lower side of the glove box button.

Dashboard to support

Screw		Tightening torque	2,4 Nm



- Connect all plug connections and cable clips (arrows) behind the glove box.



- Tighten the screws (1).

Dashboard to support

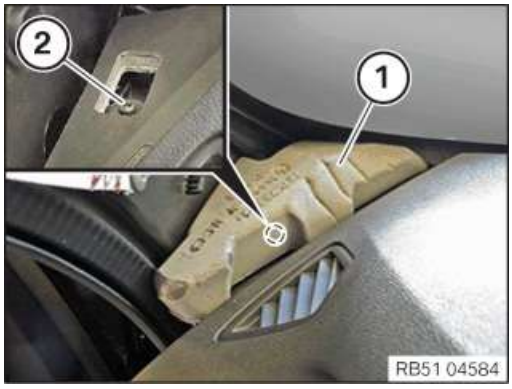
Screw		Tightening torque	2,4 Nm



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm



NOTICE

Perform the operations on the left and right side.

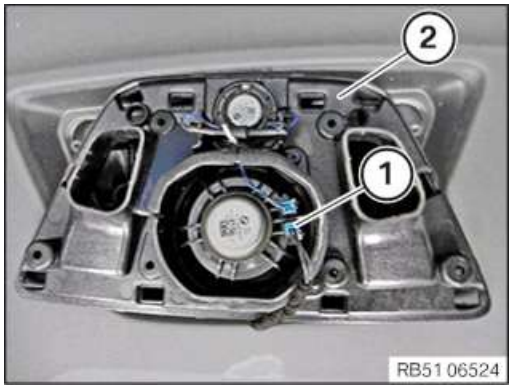
- Tighten down screw (2).

Dashboard to support

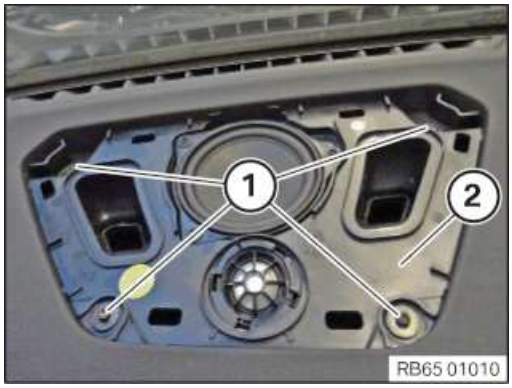
Screw		Tightening torque	2,4 Nm

- Use sound insulation (1).

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- Position the speaker holder (2).
- Connect connector (1).

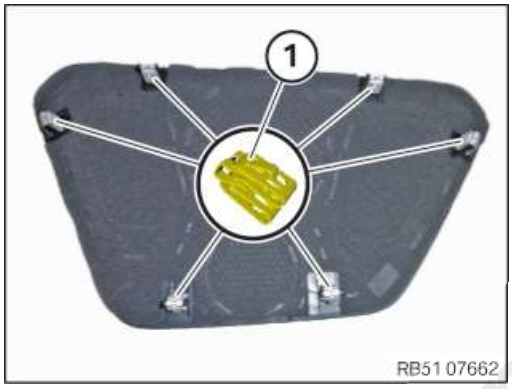


- Install the speaker holder (2).
- Tighten the screws (1).

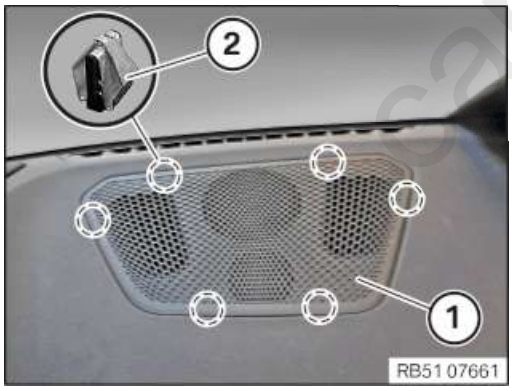
Speaker to support / support to instrument panel / support to body

Screw		Tightening torque	1,8 Nm

65 – Install the speaker trim at the instrument panel

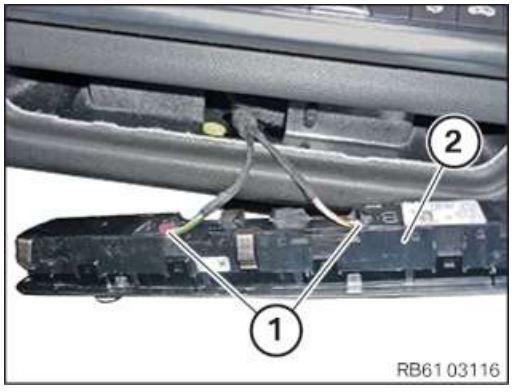


- Check clamps (1) for damage.
- Replace broken or missing clamps (1).



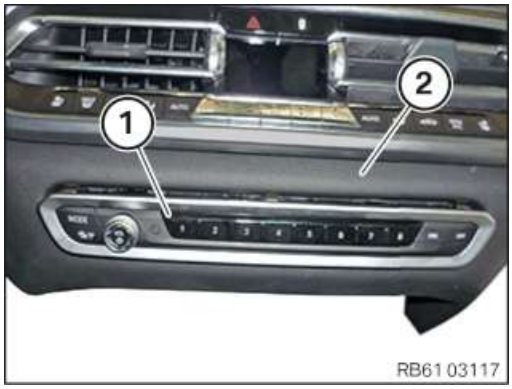
- Position the speaker trim (1) correctly and engage it at the clamps (2).

66 – Install the audio operating unit



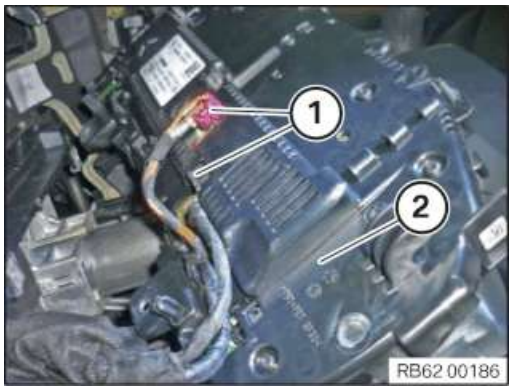
- Connect the connector (1) to the audio operating unit (2).

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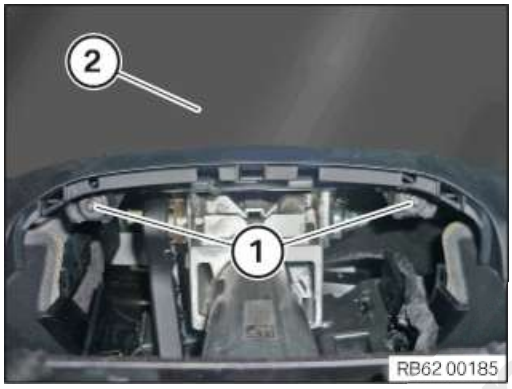


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

67 – Installing the instrument cluster (KOMBI)



- Connect and lock connector (1) to the instrument cluster (KOMBI) (2).



- Feed in and position the instrument cluster (KOMBI) (2).
- Tighten the screws (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm



- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

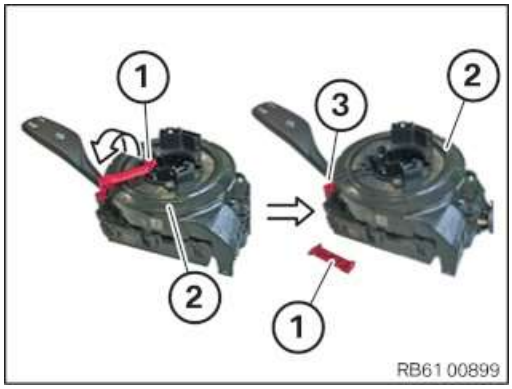


- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

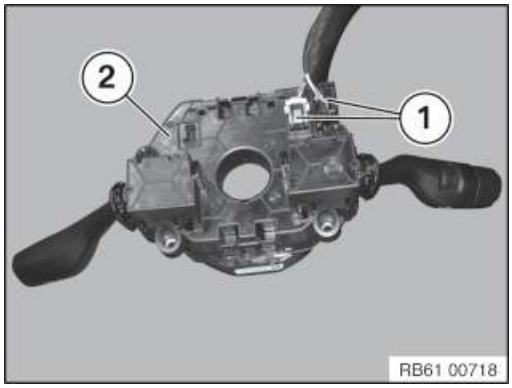
68 – Installing the steering column switch cluster (SZL)



- **Replacement:**

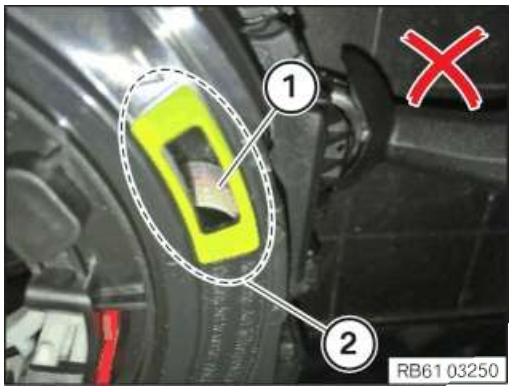
  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).



- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

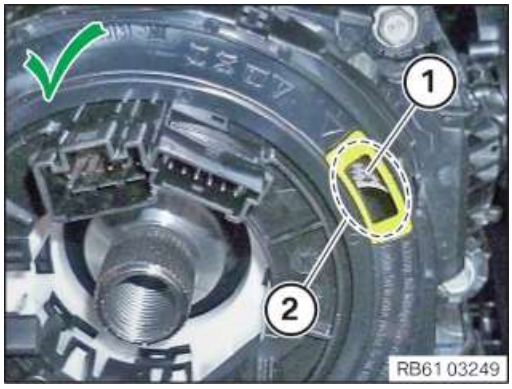
Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

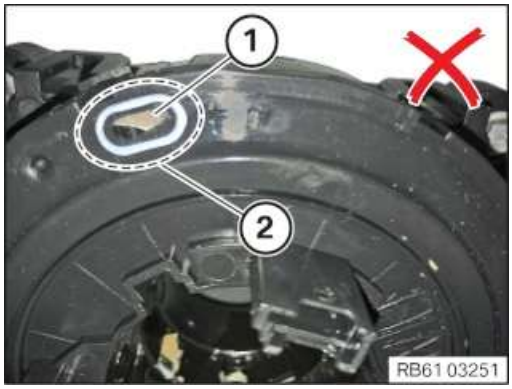
» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check

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- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version B:**

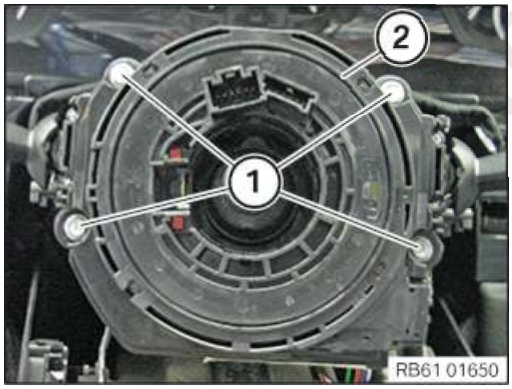
  Check if the correct mark (1) can be seen in the inspection glass (2).

Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next work step.

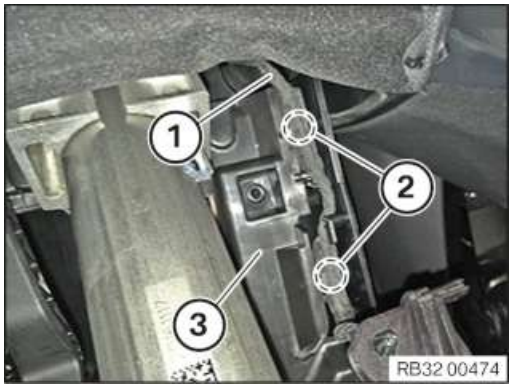


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm

69 – Install steering column shroud lower section

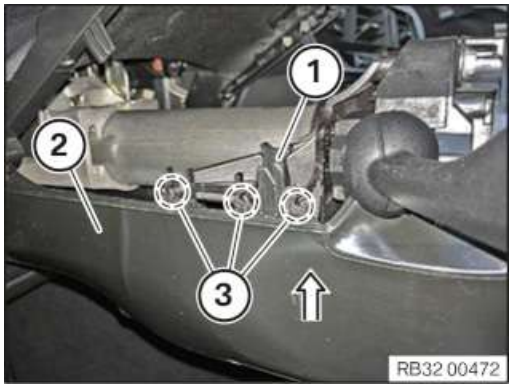


- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).

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- Connect the connector (1).

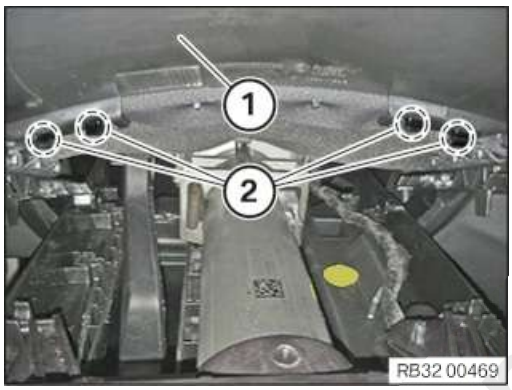


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

70 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

71 – Installing the sports steering wheel

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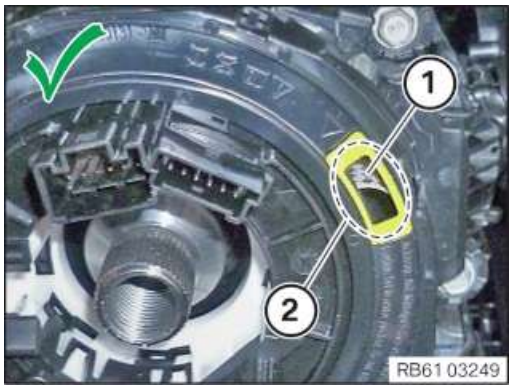
▶ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▷ **Version A: Checking the visibility of the marking on the coil spring**

Check



- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

▷ **Version B: Checking the visibility of the marking on the coil spring**

Check



- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

Check



- Check if a microencapsulated screw (3) is installed.

Result

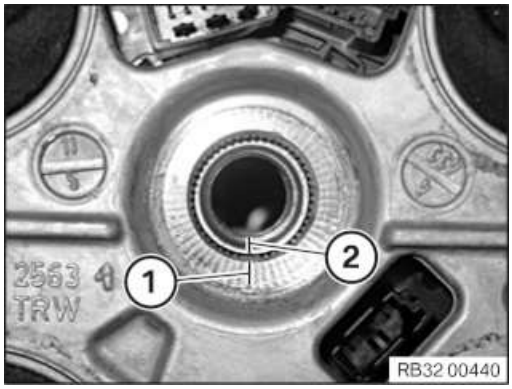
» Screw (3) is micro-encapsulated.

Measure

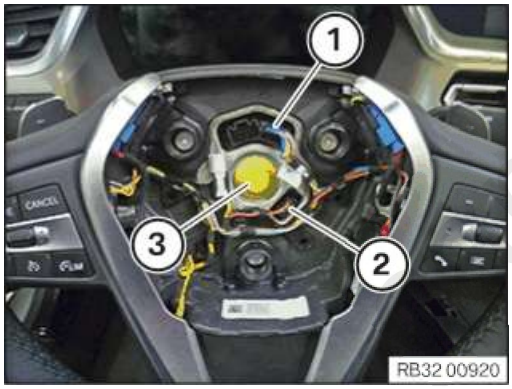
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

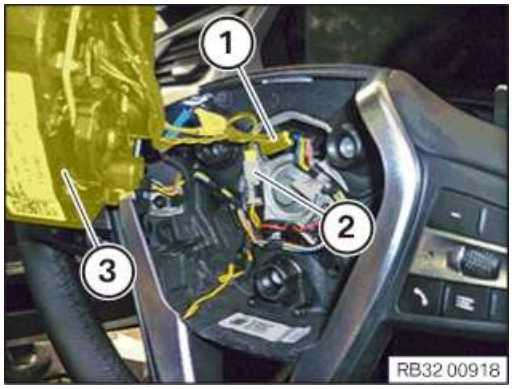
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

72 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Installing the airbag unit for the sports steering wheel**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



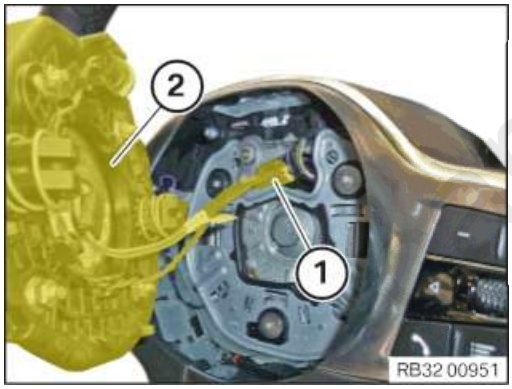
- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

▸ **Installing the airbag unit for M Sport steering wheel**

TECHNICAL INFORMATION

After replacing the airbag unit (M sport steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

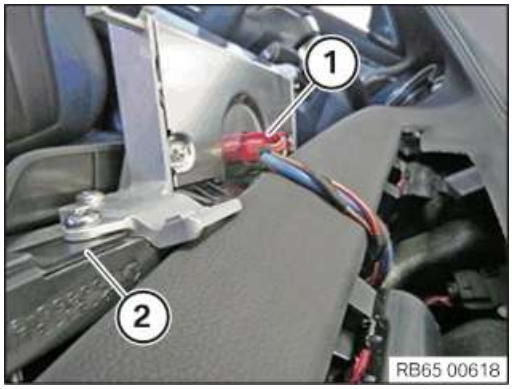
73 – Install the central information display (CID)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Position Central Information Display (CID) (2).
- Connect plug connection (1) and lock.

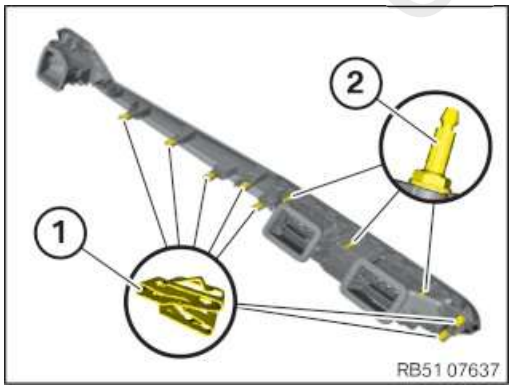


- Insert the central information display (CID) (2) in the instrument panel and position correctly.
- Tighten the screws (1).

Central information display to instrument panel

Screw		Tightening torque	2,4 Nm

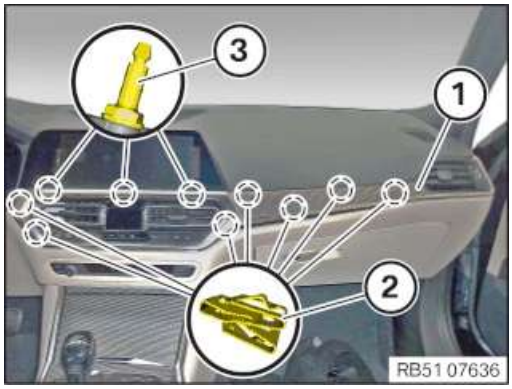
74 – Install the finisher on the right instrument panel



- Checks clamps (1) for damage.

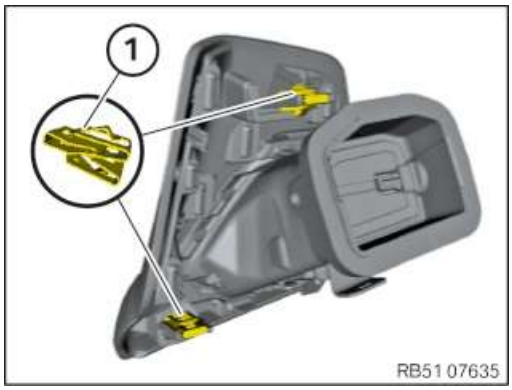
  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.

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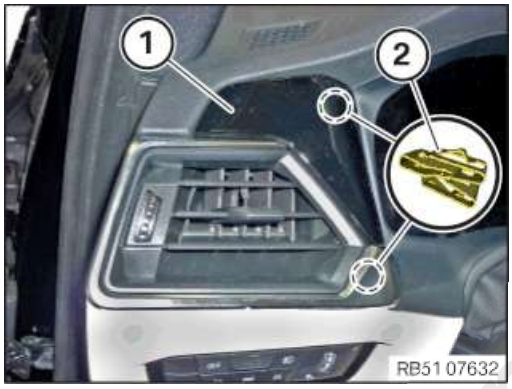
- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

75 – Install the finisher on the instrument panel on the left



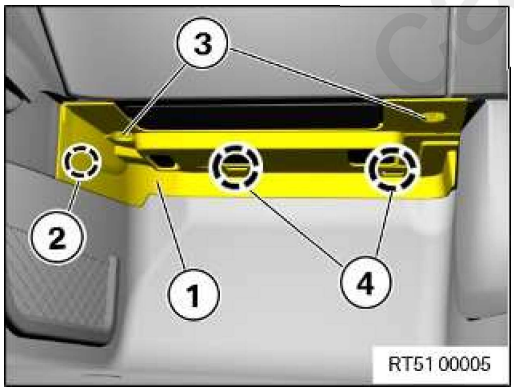
- Check the clamps (1) for damage and that they are present.

  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

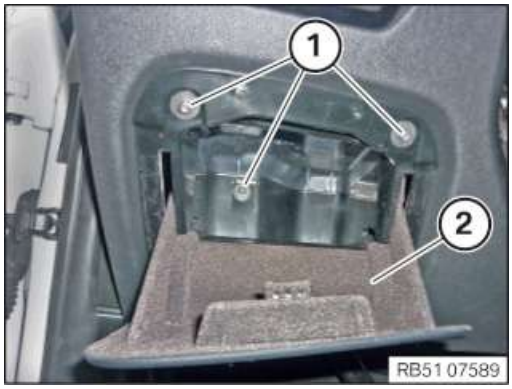
76 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

77 – Installing the left fold-down compartment

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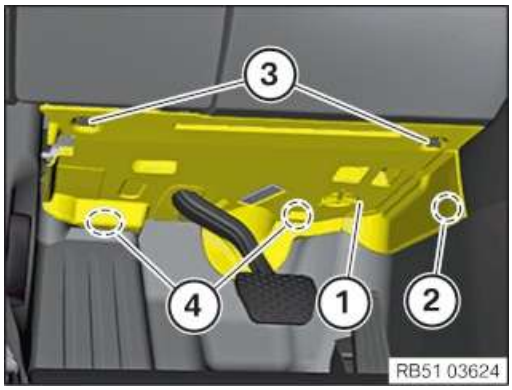


- Install the fold-down compartment (2).
- Tighten the screws (1).

Fold-down compartment to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

78 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

79 – Install the A-pillar trim panel on the left and right

NOTICE

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

▸ **Installing the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

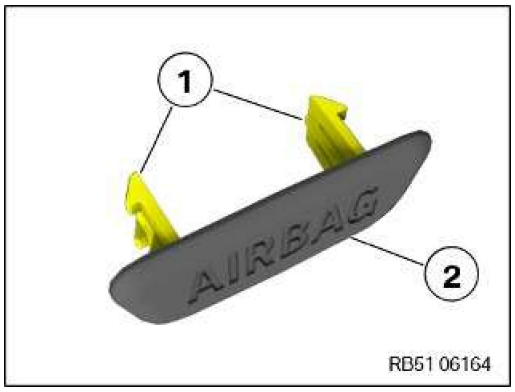
RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.

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Check

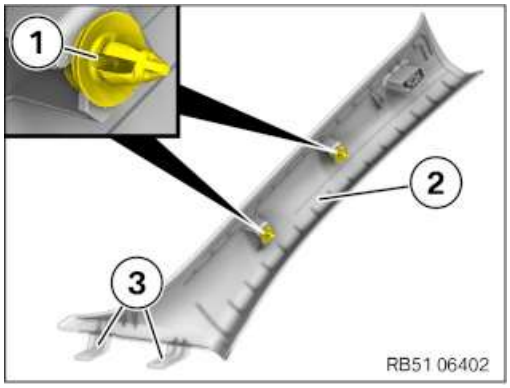
- Check retaining lugs (1) of cover (2) for damage.

Result

» Retaining lug is damaged.

Measure

- Renew the cover.



Check

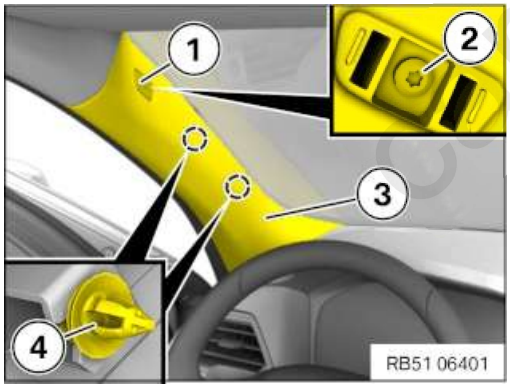
- Check the clips (1) for damage and renew if necessary.
- Check the guides (3) for damage.

Result

» Guide is damaged.

Measure

- Renew the A-pillar trim panel.
- Guide in A-pillar trim panel (3) downwards and clip it in with clips (4).
- Tighten down screw (2).

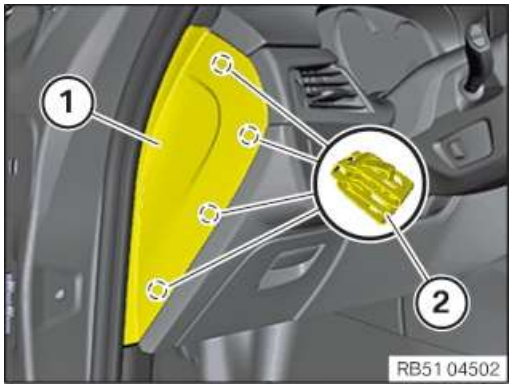


A-pillar trim panel to body

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

- Clip in the cover (1).

80 – Install the side panel on left instrument panel

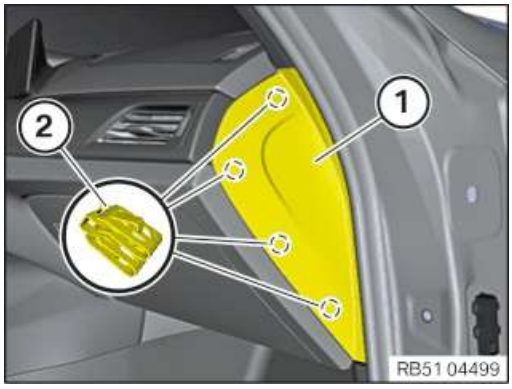


- Feed in the side panel (1) and clip it in at the clamps (2).

81 – Install the side panel on instrument panel on the right

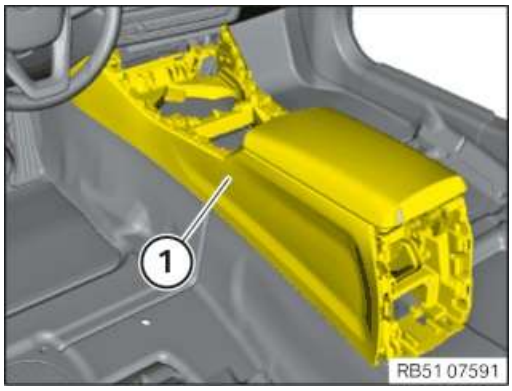
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81 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

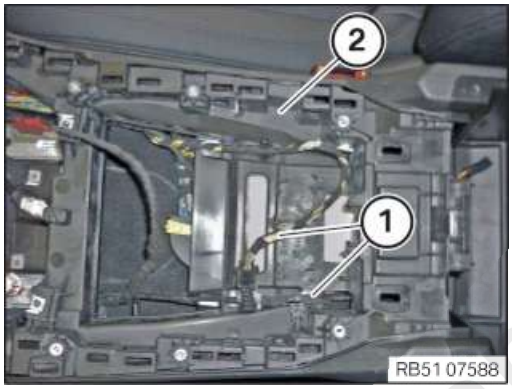
82 – Installing the centre console



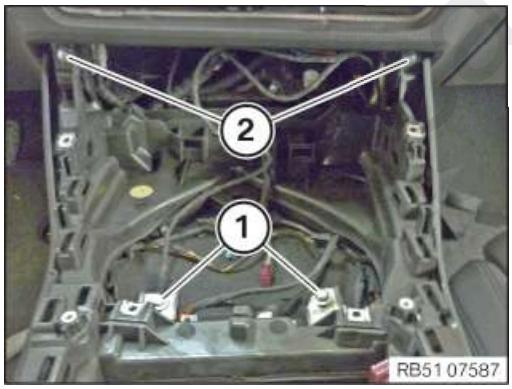
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Install centre console (1) and thereby feed in the wiring harness.
- Feed in the centre console (1) to the instrument panel and position correctly.



- Secure the wiring harness to the centre console (1) and connect and lock the existing plug connections.



- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

- Tighten the screws (2).

Centre console to instrument panel

Oval-head screw		Tightening torque	1,8 Nm



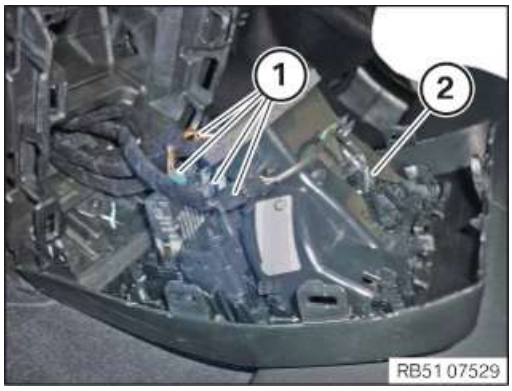
- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

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83 – Installing the rear centre console trim

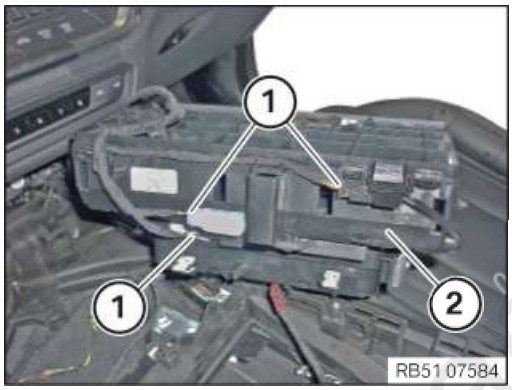


- Install the centre console trim (2).
- Connect connectors (1) and lock.

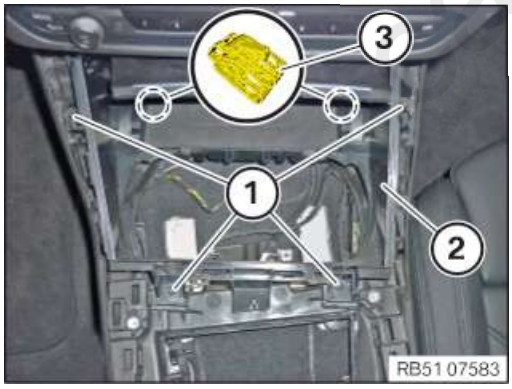


- Position centre console trim (1) and engage at the latch mechanisms at the side.

84 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

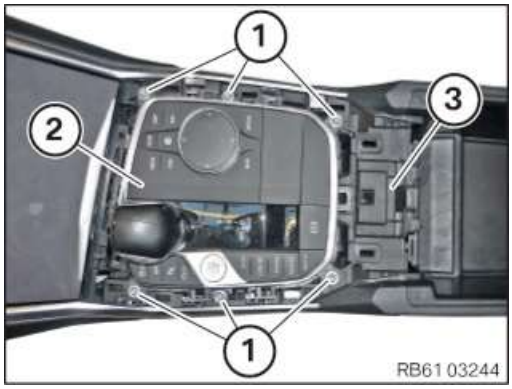


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

85 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



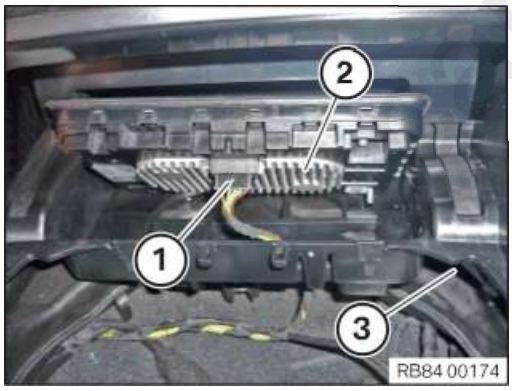
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



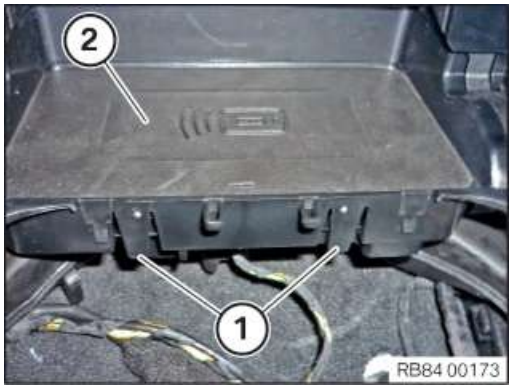
- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

86 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.

  The latch mechanisms (1) must engage correctly.

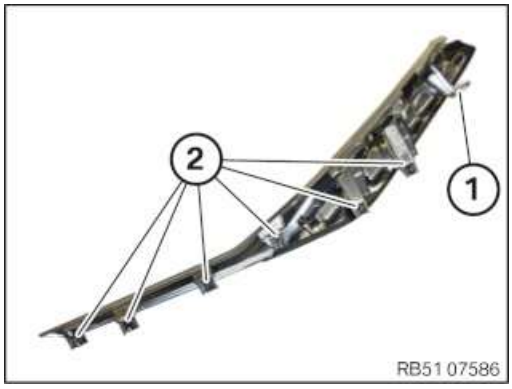
87 – Installing the decorative trim on the centre console on the left and right

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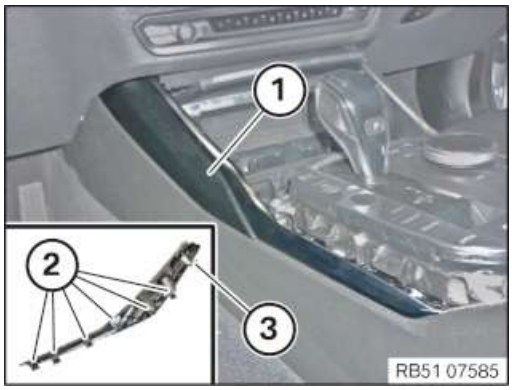
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

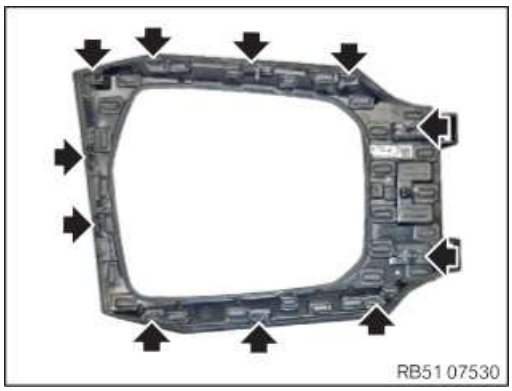
88 – Installing the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



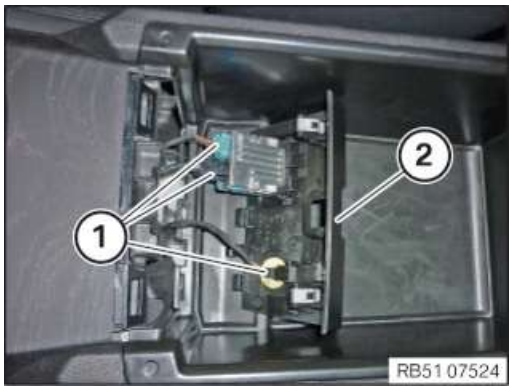
- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

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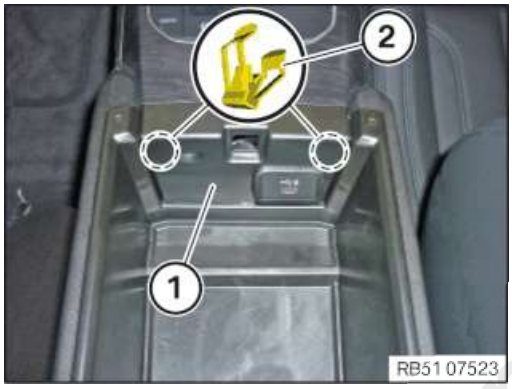


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

89 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

90 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

Cup holder to centre console

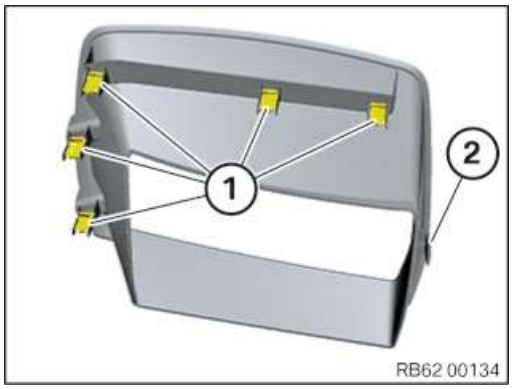
Oval-head screw		Tightening torque	1,8 Nm



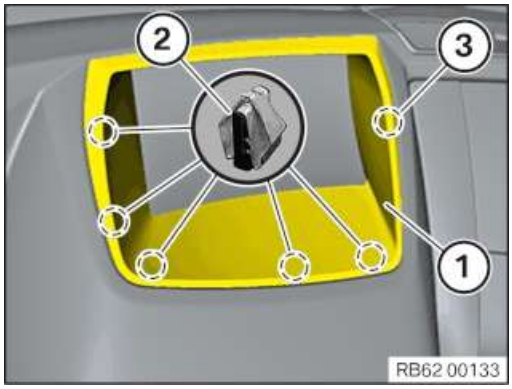
- Insert the insert (1).

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91 – Installing the trim for the Head-Up Display

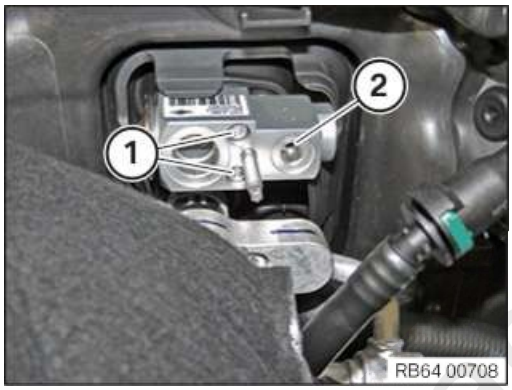


- Check clamps (1) and the latch mechanism (2) for damage, renew if necessary.



- Correctly position the trim (1) for the BMW Head-Up Display and engage it on the clamps (2) and the retaining lug (3).

92 – Install expansion valve



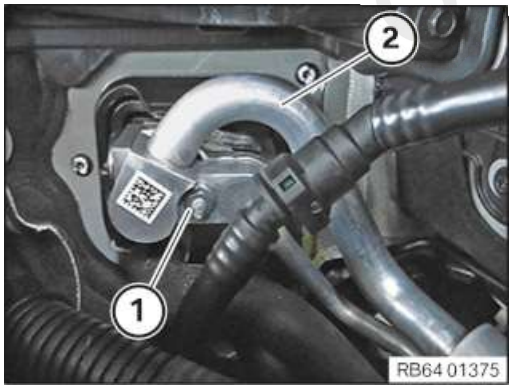
- Renew O-rings.

  Parts: O-rings
- Correctly position the expansion valves (2).
- Tighten the screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

93 – Connect the refrigerant line to the expansion valve



- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

Refrigerant line to expansion valve / connecting piece

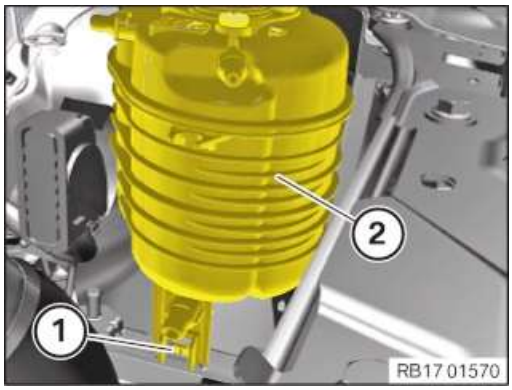
M6		Tightening torque	13 Nm

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- Close the holder (1).

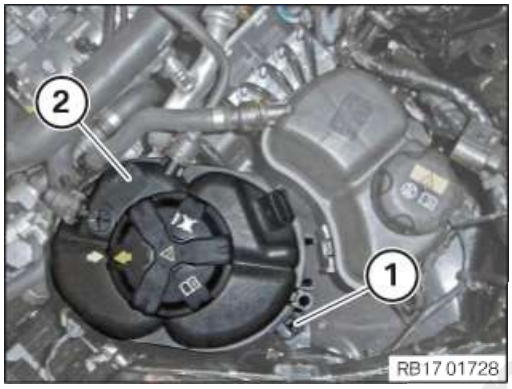
94 – Install coolant expansion tank of high-temperature coolant circuit, partially



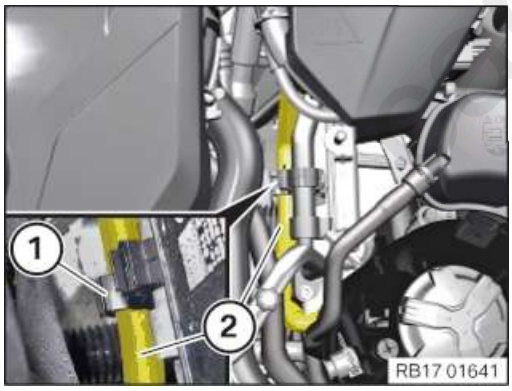
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Correctly feed coolant expansion tank (2) in.
- Lock the lock (1).



- Correctly position coolant expansion tank (2).
- Lock the lock (1).



- Feed in coolant line (2) and position.
- Lock holder (1).

95 – Fasten the refrigerant line on the connecting piece



- Renew the sealing ring.

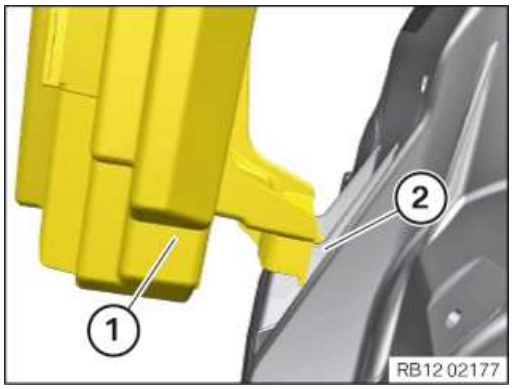
  Parts: Sealing ring
- Correctly position the refrigerant line (2).
- Tighten down screw (1).

Refrigerant line to connecting piece

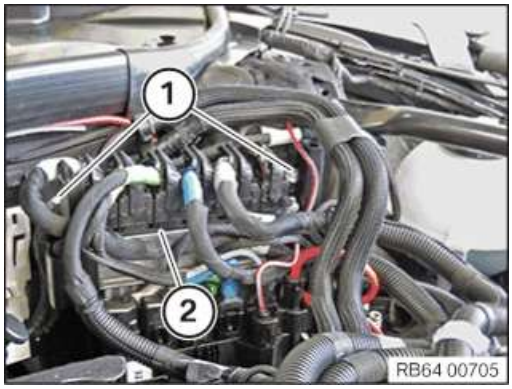
M8		Tightening torque	19 Nm

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96 – Fastening control unit holder



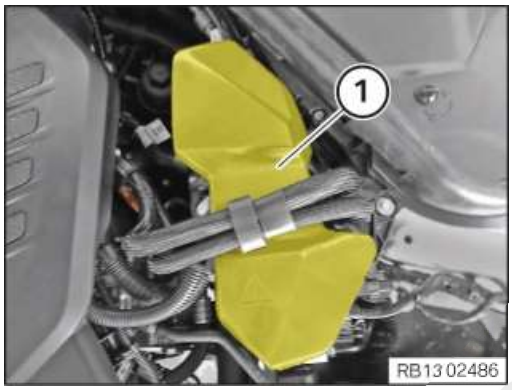
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Position the control unit holder together with the control units (2) and position correctly.
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



- Insert and install cover (1) into guides.

97 – Install acoustic cover

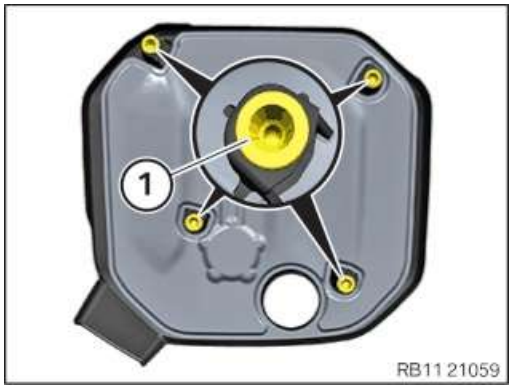
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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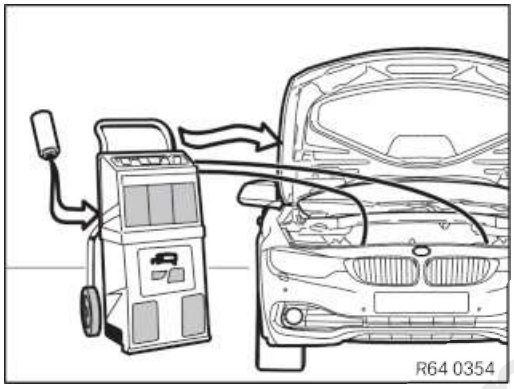


- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

98 – Evacuate and fill air conditioning



- See additional information.

99 – Fill and bleed the coolant circuit

▸ **Filling and bleed the high-temperature coolant circuit**



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 5153

Screw		Tightening torque	1,2 Nm

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Heater/air conditioner — Used in step 5455

Screw		Tightening torque	1,2 Nm

Heating and air-conditioning unit on the bulkhead — Used in step 57

Oval-head screw		Tightening torque	2,8 Nm

Heating and air-conditioning unit on support — Used in step 58

Nut M6		Tightening torque	4 Nm

Support for instrument panel — Used in step 58

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

Head unit to holder / holder to support — Used in step 58

Screw		Tightening torque	1,8 Nm

Steering column to dashboard support — Used in step 58

M8	Observe tightening sequence.	Tightening torque	21,4 Nm

Head-Up Display to support — Used in step 59

M6x25 screw		Tightening torque	13 Nm

Knee airbag on support structure — Used in step 61

Nut		Tlghtening torque	8 Nm

Dashboard to support — Used in step 63

Screw		Tightening torque	2,4 Nm

Speaker to support / support to instrument panel / support to body — Used in step 64

Screw		Tightening torque	1,8 Nm

Instrument cluster (KOMBI) to support — Used in step 67

Screw		Tightening torque	1,8 Nm

Steering column switch cluster (SZL) on the steering column — Used in step 68

Screw TS5x20		Tightening torque	3 Nm

Steering wheel to steering column — Used in step 71

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Central information display to instrument panel — Used in step 73

Screw		Tightening torque	2,4 Nm

Fold-down compartment to instrument panel — Used in step 77

Oval-head screw		Tightening torque	1,8 Nm

A-pillar trim panel to body — Used in step 79

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

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Centre console on tunnel			Used in step 82
M6x18 Hexagon screw		Tightening torque	4,6 Nm

Centre console to instrument panel			Used in step 82
Oval-head screw		Tightening torque	1,8 Nm

Storage compartment in centre console			Used in step 84
Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim			Used in step 85
Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery			Used in step 85
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 90
Oval-head screw		Tightening torque	1,8 Nm

Expansion valve to heater - A/C			Used in step 92
M5		Tightening torque	5.5 Nm

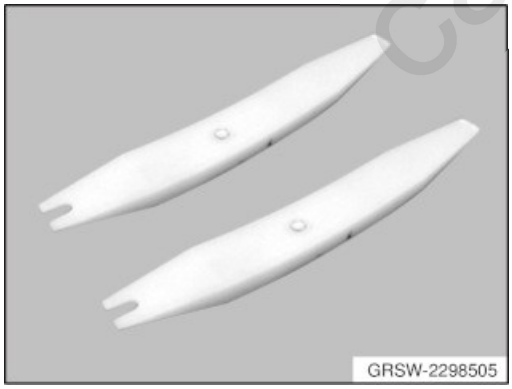
Refrigerant line to expansion valve / connecting piece			Used in step 93
M6		Tightening torque	13 Nm

Refrigerant line to connecting piece			Used in step 95
M8		Tightening torque	19 Nm

Control unit holder			Used in step 96
M6		Tightening torque	8 Nm

Overview of Special Tools

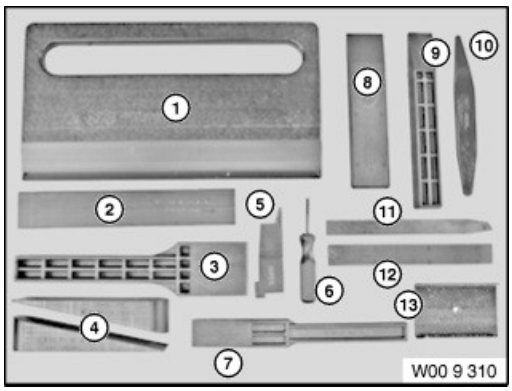
2 298 505 Wedge



Common		Used in step 1213
Usage	Set (delivery of 2 pieces)	
Included in the tool or work		
Storage location	C34	
Replaced by		
In connection with		
SI-Number	01 03 12 (792)	

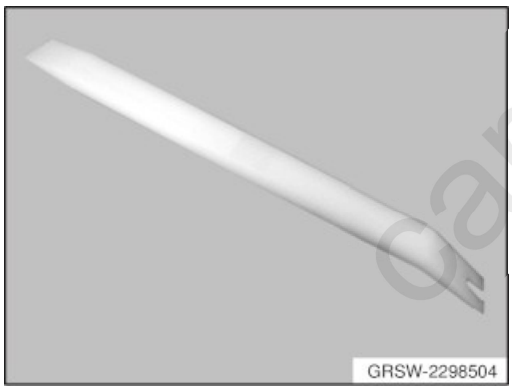
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0 493 752 (00 9 329) Case



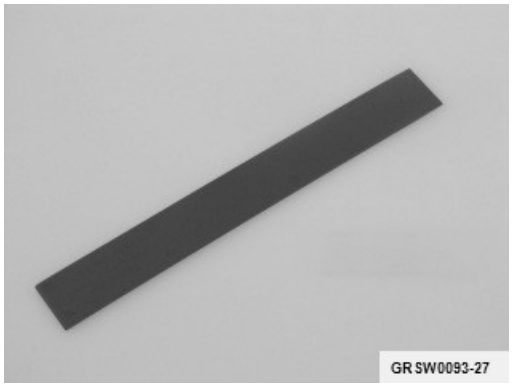
Common	Used in step 22
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

2 298 504 Wedge



Common	Used in step 31
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 496 571 (00 9 327) Wedge



Common	Used in step 35
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

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0 496 569 (00 9 325) Wedge



Common	Used in step 36
Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	1685

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	298
72 00 ... Safety regulations for handling components with gas generators	22294061
72 00 ... Safety regulations for handling components with gas generators	22

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	298
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	298
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	298
64 50 ... Notes on repairs to air conditioning	298
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	298
64 50 ... Safety information for handling refrigerant R1234yf	298
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	298
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1685
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1685
61 20 900 Disconnecting and connecting battery earth lead	1685
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61 20 900 Disconnecting and connecting battery earth lead	1685
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	1685
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17 00 008 Draining and topping up coolant for high-temperature circuit	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 008 Draining and topping up coolant for high-temperature circuit	99
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	99
17 00 039 Bleeding cooling system (B37, B47)	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	99
17 00 008 Draining and topping up the high-temperature coolant circuit	99
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17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	99
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	99
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99

17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 008 Draining and topping up coolant for high-temperature circuit	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 008 Draining and topping up coolant for high-temperature circuit	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	99

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64 11 511 Replace the controller drive for fresh/recirculated air flap

TECHNICAL INFORMATION

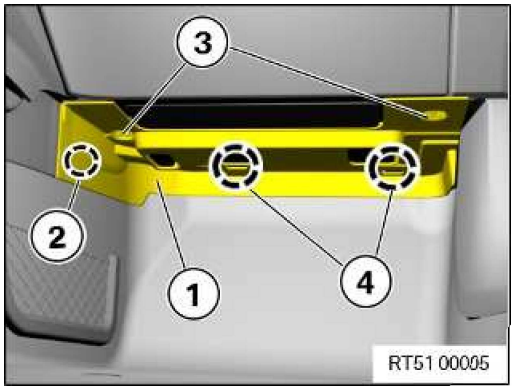
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite
Ignition is switched off.

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WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

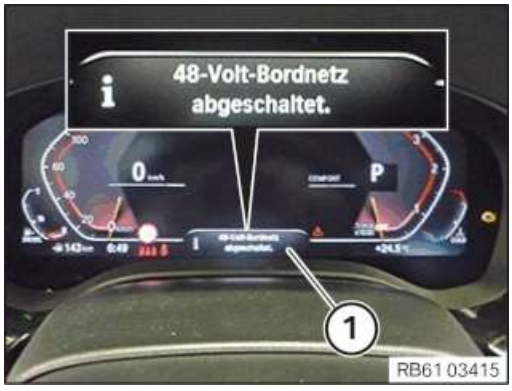
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.

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WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

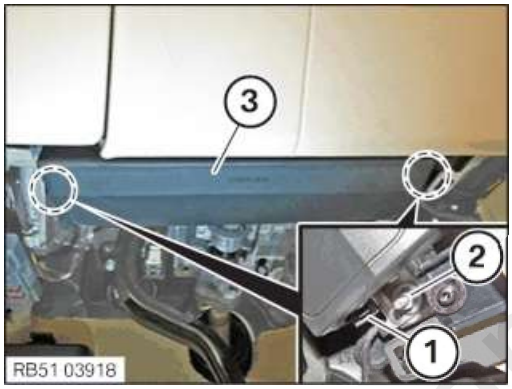
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

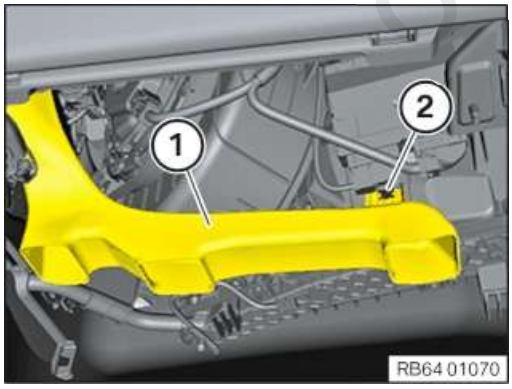


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

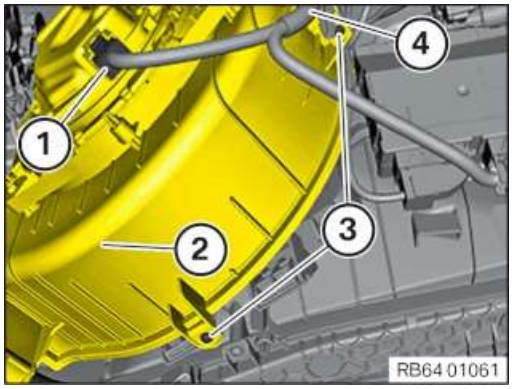
4 – Removing the right air duct



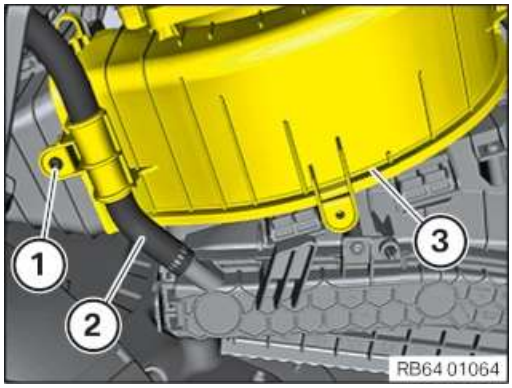
- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

5 – Remove the blower for the heating and air-conditioning unit

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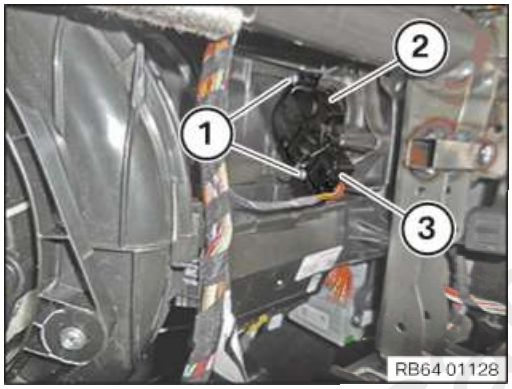
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

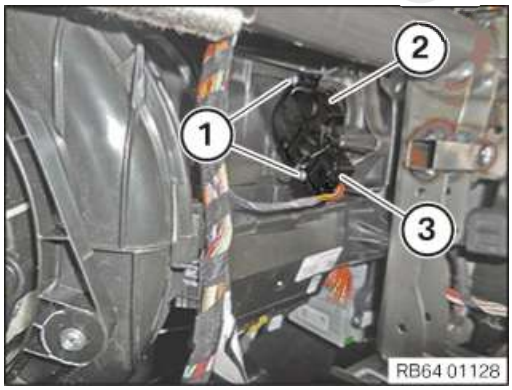
MAIN WORK

6 – Remove the fresh air / recirculated air flap motor (M16)



- Unlock plug connection (3) and disconnect.
- Loosen screws (1).
- Remove the fresh air/recirculated air flap motor (2).

7 – Install the fresh air / recirculated air flap motor (M16)



- Position the fresh air/recirculated air flap motor (2).
- Tighten the screws (1).

Heater/air conditioner

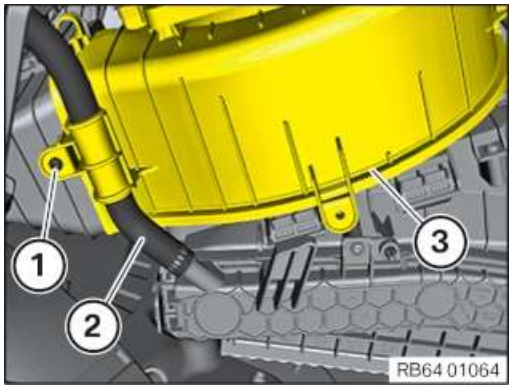
Screw		Tightening torque	1,2 Nm

- Connect connector (3).

POSTPROCESSES

8 – Install the blower for the heating and air-conditioning unit

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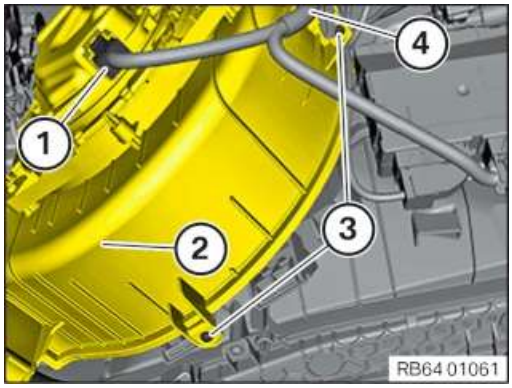


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



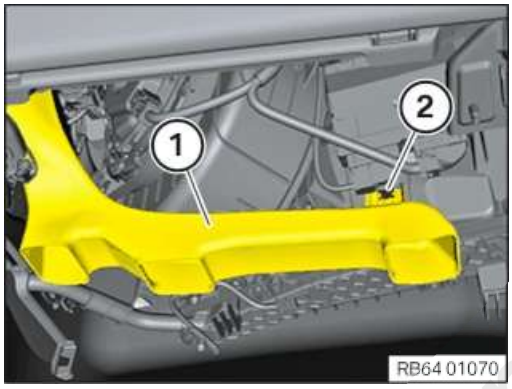
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

9 – Installing the air duct, right

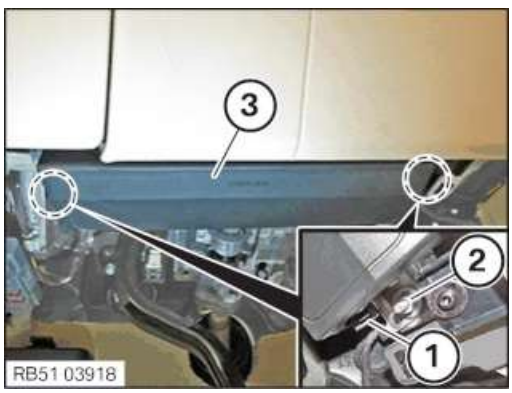


- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

10 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**

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- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

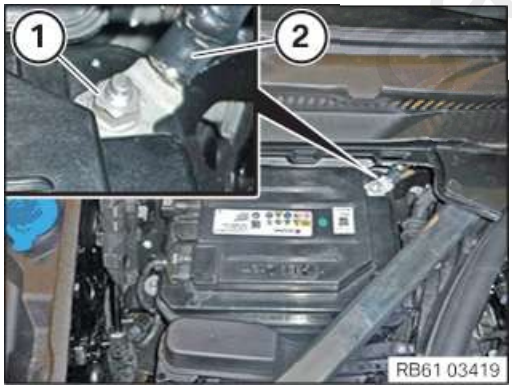
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

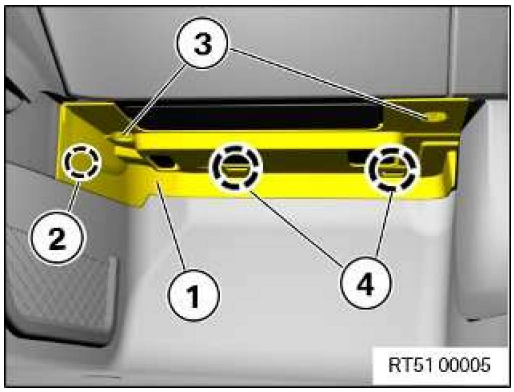


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

11 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

12 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 7
Screw		Tightening torque	1,2 Nm

Heater/air conditioner			Used in step 8
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 10
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 10
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**

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Notes on 48-V battery	310

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	310
61 20 900 Disconnecting and connecting battery earth lead	310
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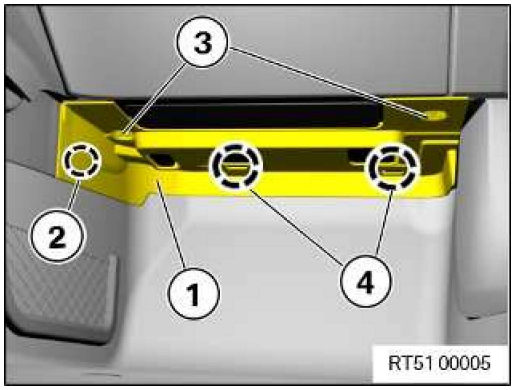
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310

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64 11 522 Replace the evaporator temperature sensor

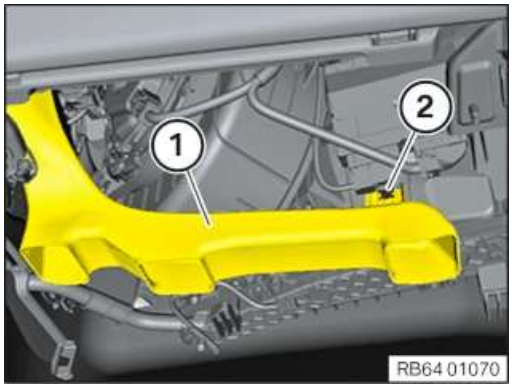
PRELIMINARY WORK

1 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

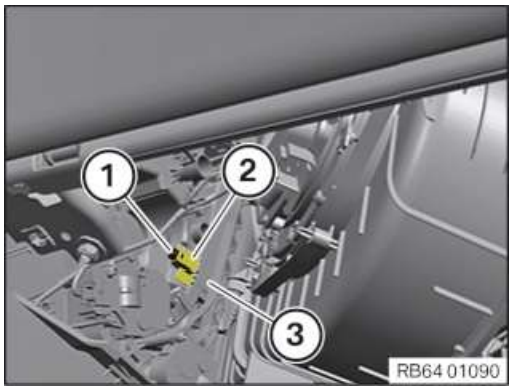
2 – Removing the right air duct



- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

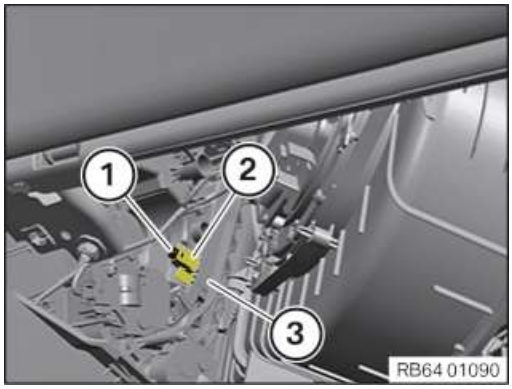
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3 – Remove evaporator temperature sensor



- Disconnect plug connection (1).
- Disengage the evaporator temperature sensor (2) and remove it from the heating and air-conditioning unit (3).

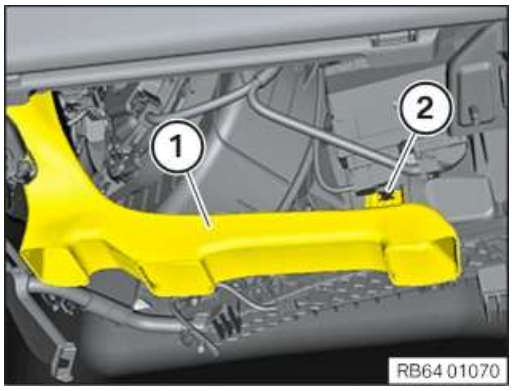
4 – Install evaporator temperature sensor



- Fit the evaporator temperature sensor (2) correctly in the heating and air-conditioning unit (3) and engage.
- Connect connector (1).

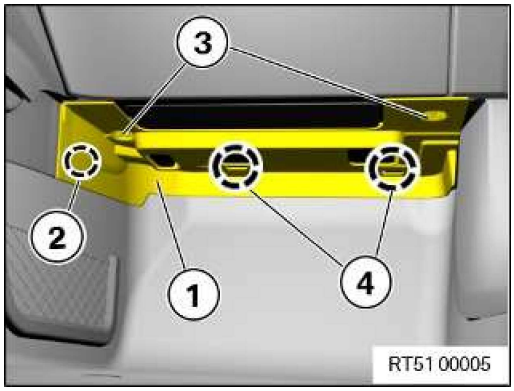
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5 – Installing the air duct, right



- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

6 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

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64 11 509 Replacing actuator drive for defroster flap

TECHNICAL INFORMATION

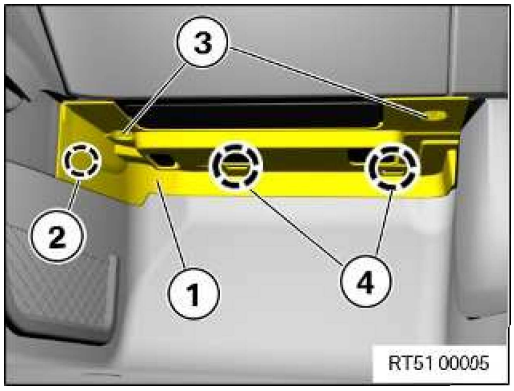
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite
Ignition is switched off.

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WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

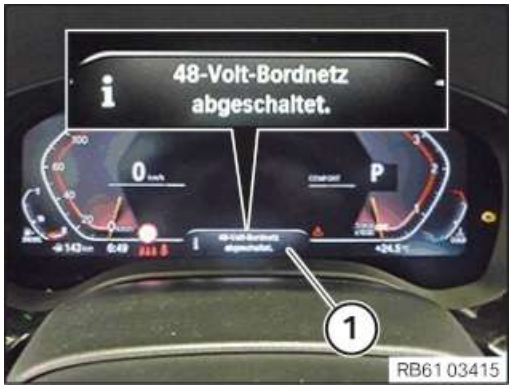
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.

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WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

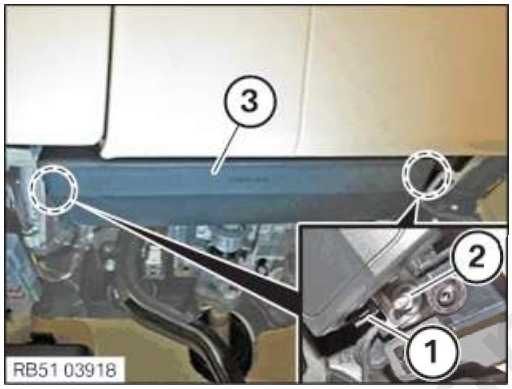
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

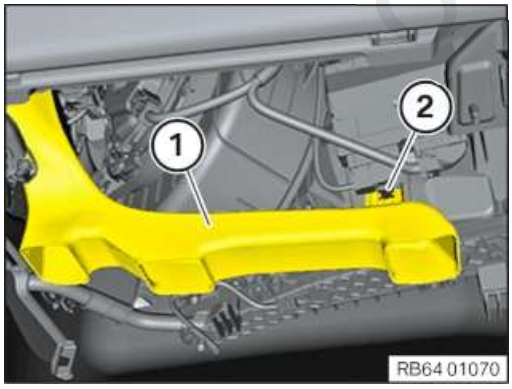


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

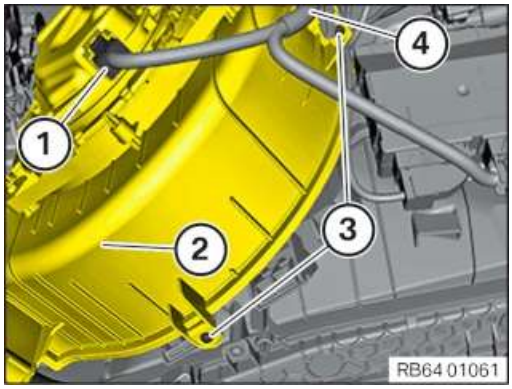
4 – Removing the right air duct



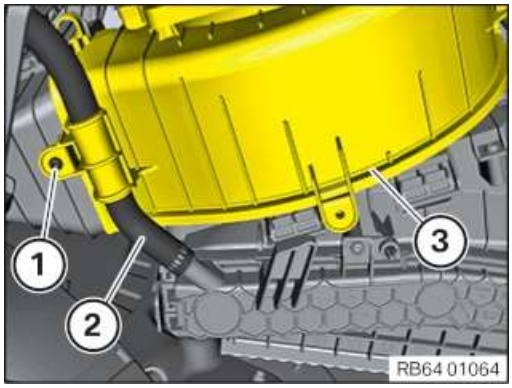
- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

5 – Remove the blower for the heating and air-conditioning unit

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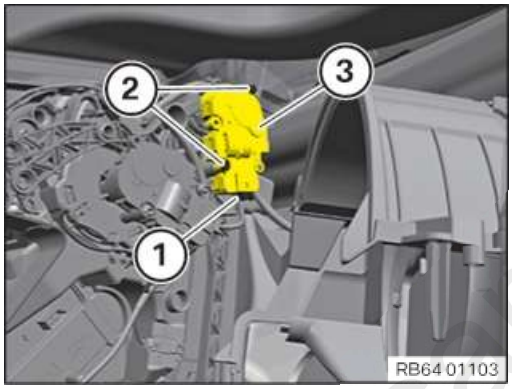
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

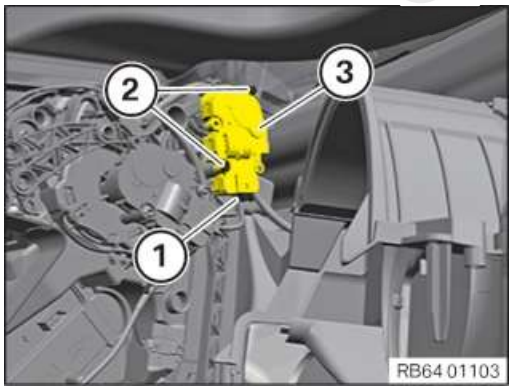
MAIN WORK

6 – Remove the defroster flap motor (M61)



- Unlock and disconnect connector (1).
- Unscrew the bolts (2) and remove the defroster flap motor (3).

7 – Install the defroster flap motor (M61)



- Install the defroster flap motor (3) and position it correctly.
- Tighten down screws (2).

Heater/air conditioner

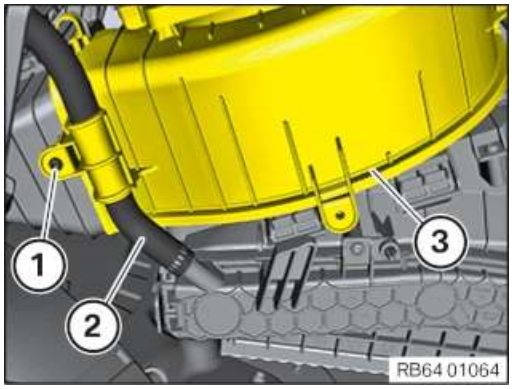
Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

POSTPROCESSES

8 – Install the blower for the heating and air-conditioning unit

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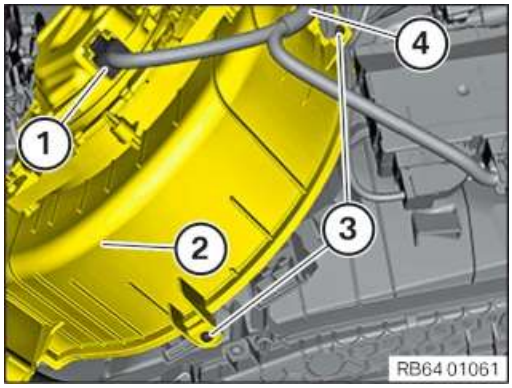


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



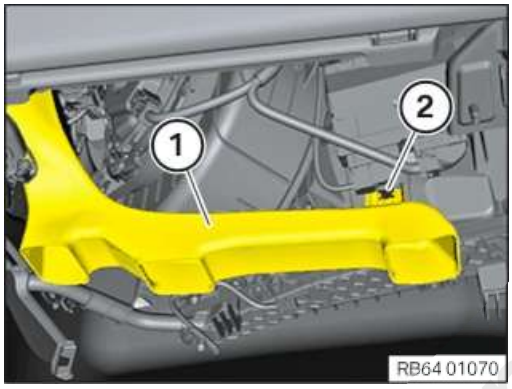
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

9 – Installing the air duct, right

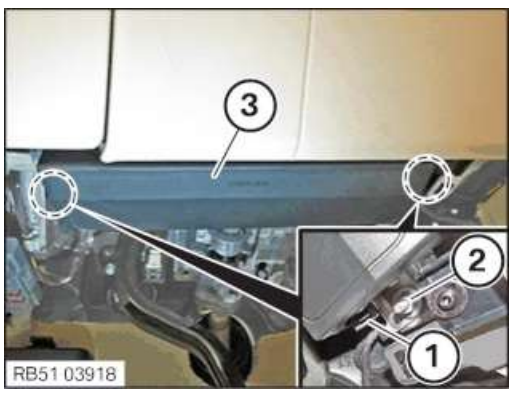


- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

10 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**

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- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

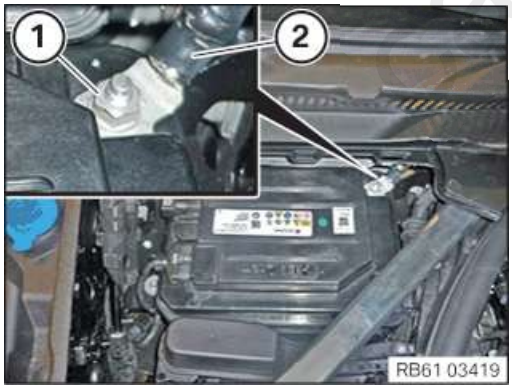
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

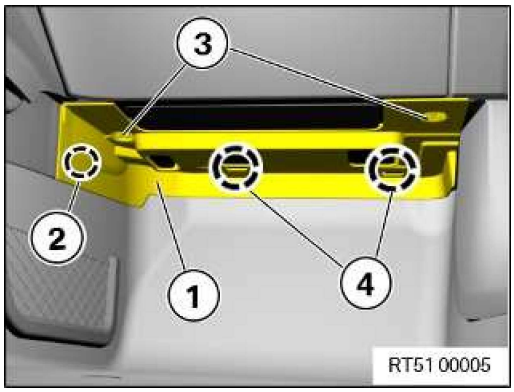


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

11 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

12 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 7
Screw		Tightening torque	1,2 Nm

Heater/air conditioner			Used in step 8
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 10
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 10
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**

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Notes on 48-V battery	310

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
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61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	310
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61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting battery earth lead	310

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64 11 501 Replacing actuator drive for front left blend air door

TECHNICAL INFORMATION

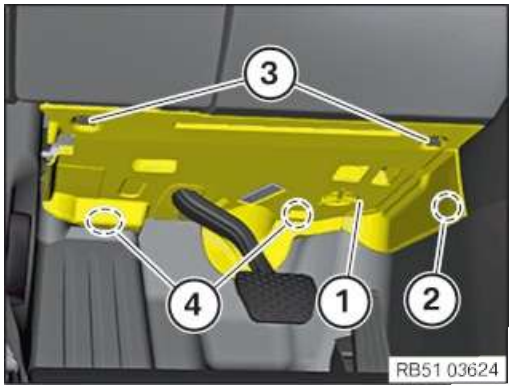
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

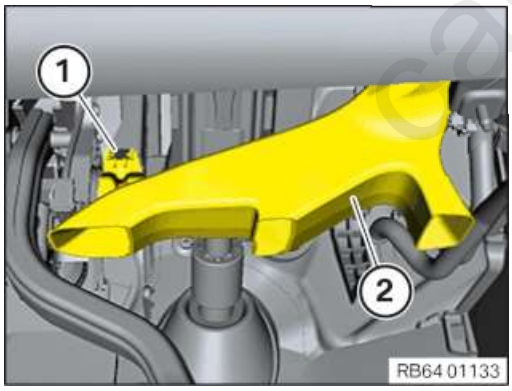
- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Removing the trim panel for pedal mechanism



- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – Remove left air duct



- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

4 – In vehicles with airbag module: Removing knee airbag

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WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

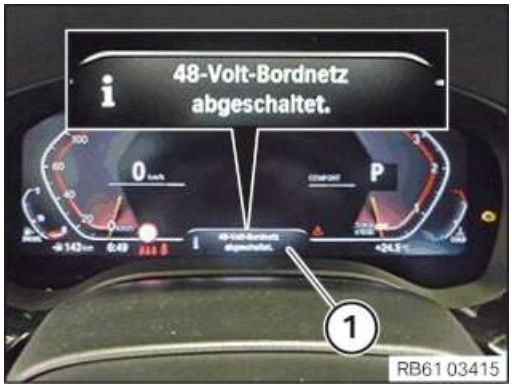
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.

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- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

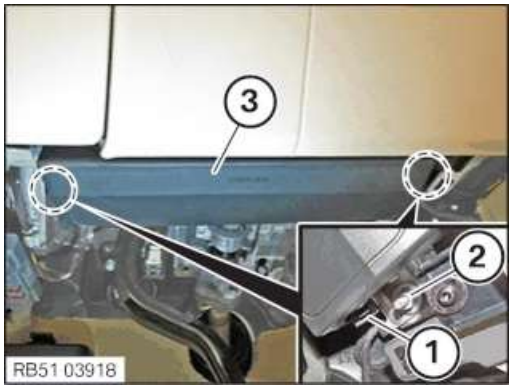
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ **Disconnecting all battery earth leads**



- See additional information.

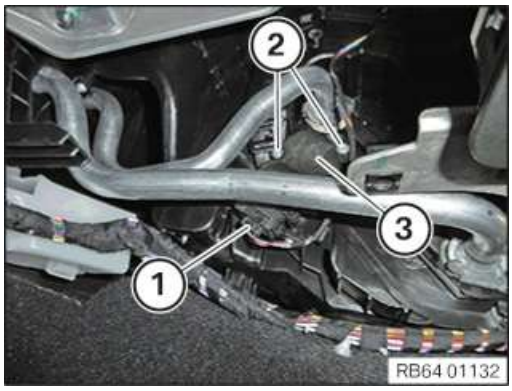


- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

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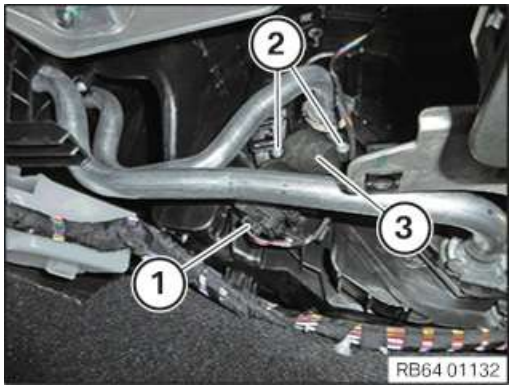
MAIN WORK

5 – Remove the mixed air flap motor at the front left (M23a)



- Disconnect plug connection (1).
- Loosen screws (2).
- Remove front left mixed air flap motor (3).

6 – Install the mixed air flap motor at the front left (M23a)



- Front left mixed air flap motor (3).
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

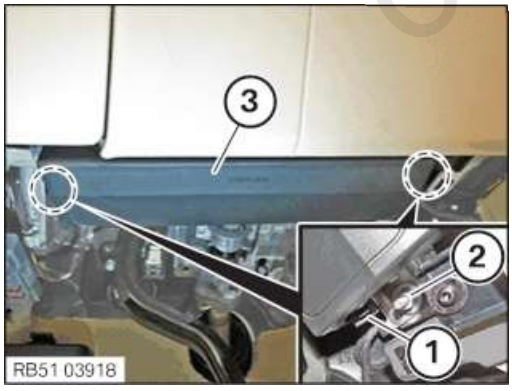
- Connect connectors (1) and lock.

POSTPROCESSES

7 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**

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- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

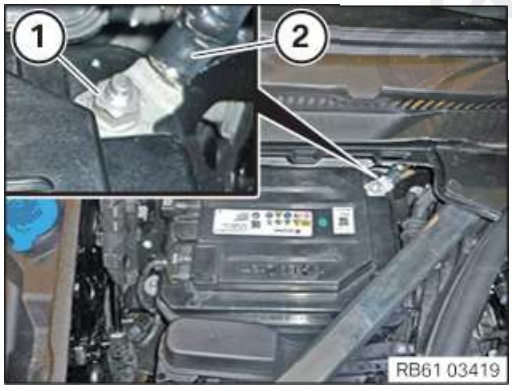
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



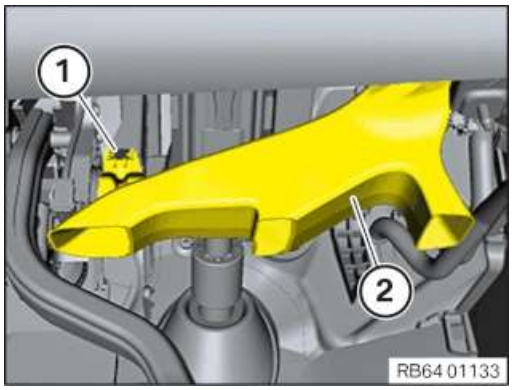
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

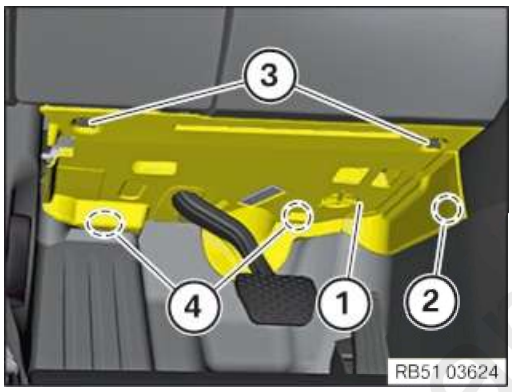
  The activation takes place automatically.

8 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

9 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

10 – Connecting all battery earth leads



- See additional information.

11 – Address the controller drive

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- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 6
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 7
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 7
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**
Notes on 48-V battery	47

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

Repair instructions	**Used in step**
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	4710
61 20 900 Disconnecting and connecting battery earth lead	4710
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61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	4710
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64 11 504 Replacing actuator drive for front left stratification flap

TECHNICAL INFORMATION

After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Deactivating the 48 V electrical system

Prerequisite
Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

4 – Adjust the steering column position

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- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

5 – Remove cupholder

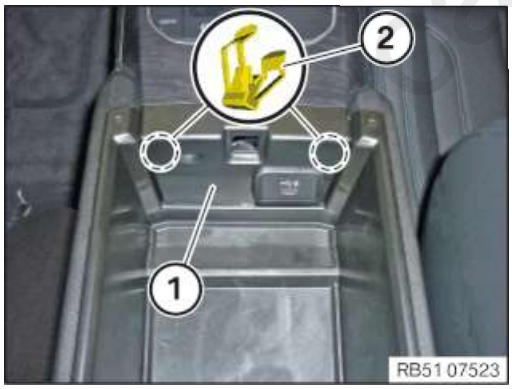


- Remove the insert (1).

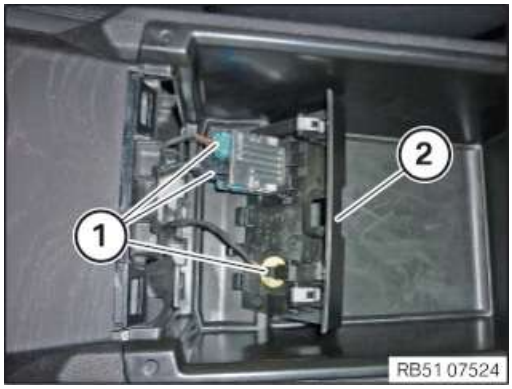


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

6 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

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7 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



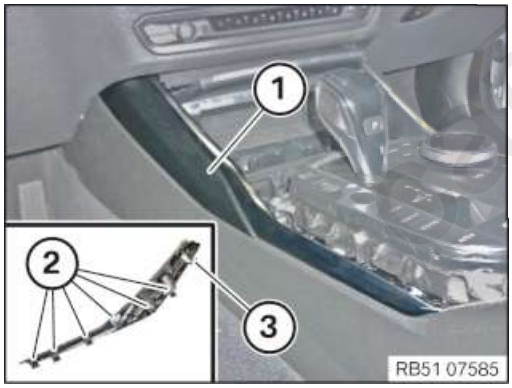
- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

8 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

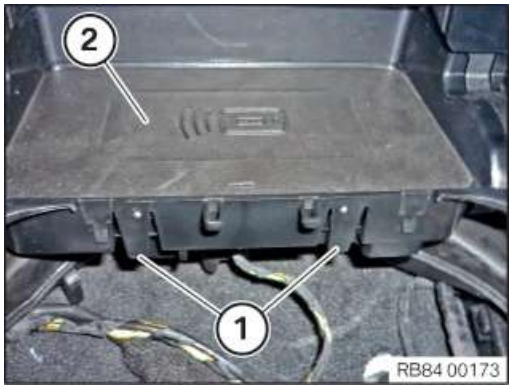
NOTICE

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

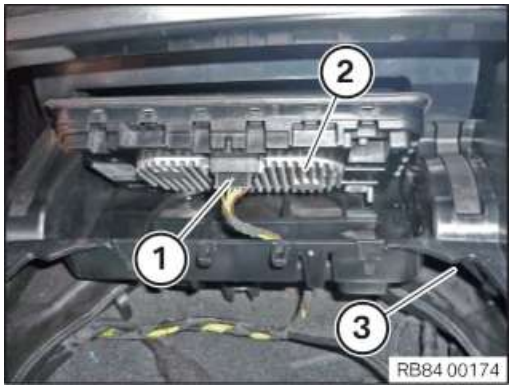


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

9 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

10 – Remove the operating facility in the centre console

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

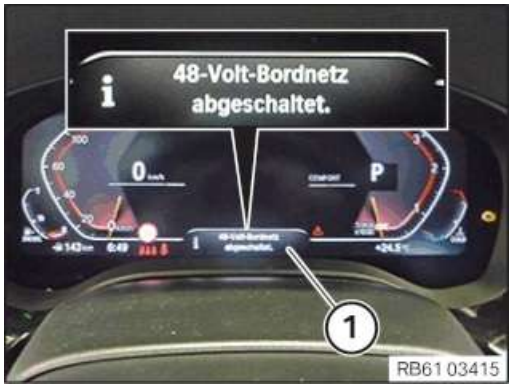
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.

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- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

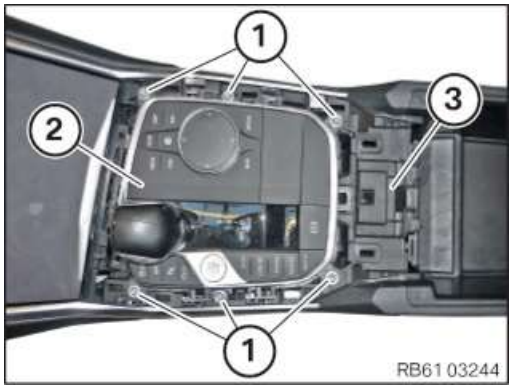
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ Disconnecting all battery earth leads



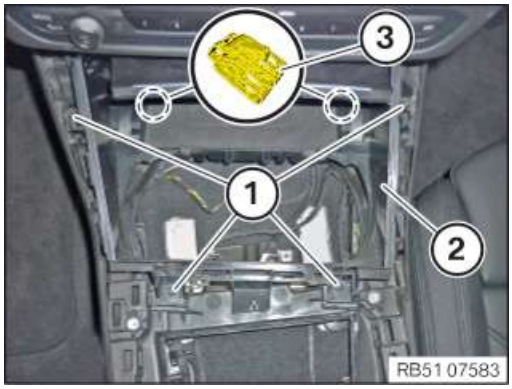
- See additional information.



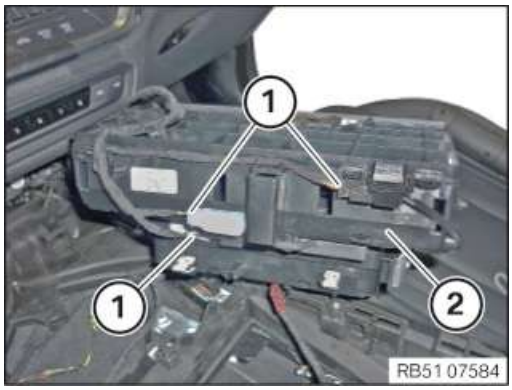
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

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11 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).



- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

12 – Removing the rear centre console trim

RISK OF DAMAGE

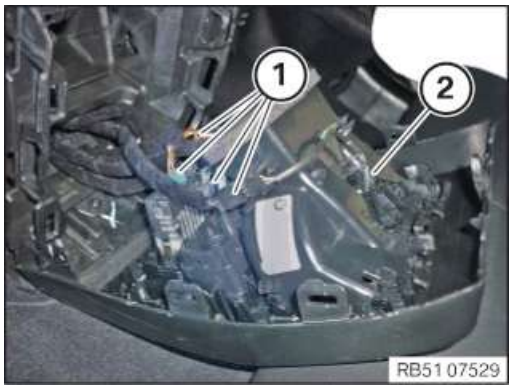
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.



- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

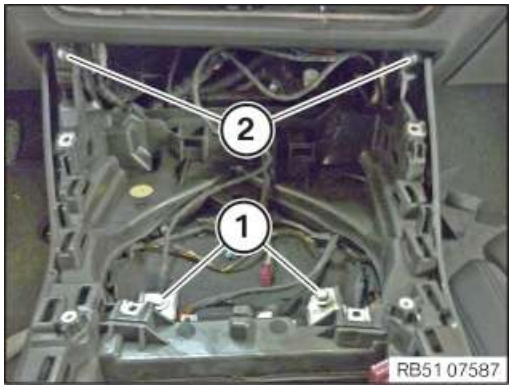
13 – Removing the centre console

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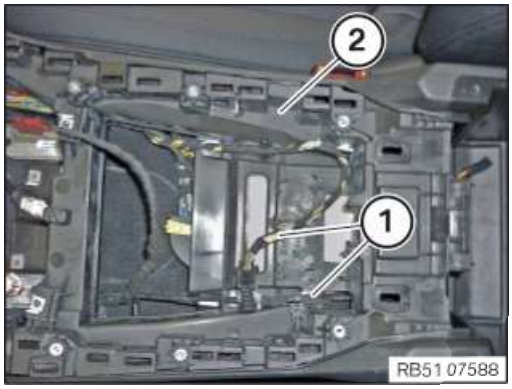
13 – Removing the centre console



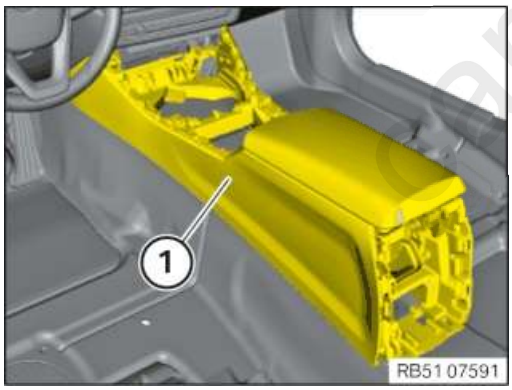
- Loosen screws (1).



- Loosen screws (1) and (2).



- Release the wiring harness (1) from the centre console (2).

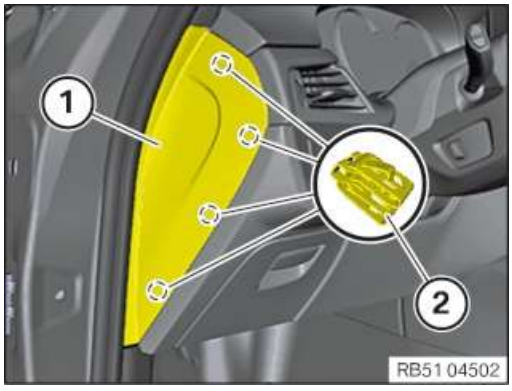


NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Carefully raise rear centre console (1).
- Feed out wiring harness from the centre console (1) and unlock and disconnect existing plug connections, if required.
- Feed out and remove the centre console (1) on the instrument panel .

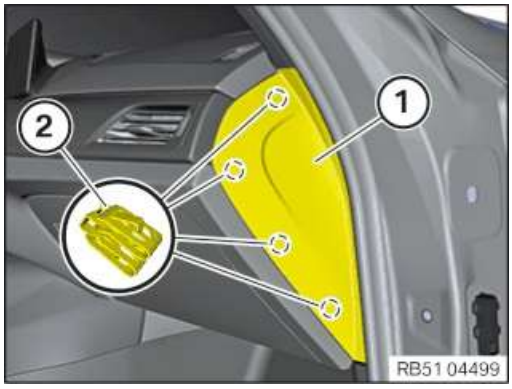
14 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

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15 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

16 – Remove left and right A-pillar trim panel

NOTICE

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

▸ **Remove the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

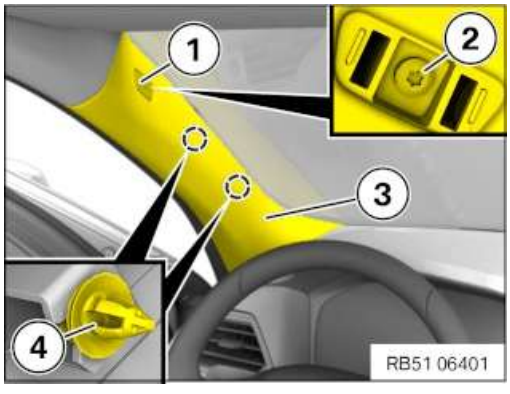
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

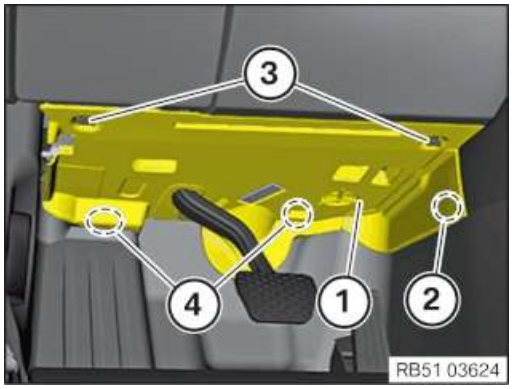
- Do not use sharp-edged tools when removing the trim panel.



- Unclip cover (1) with a suitable special tool from the special tool kit 0 493 752 (00 9 329).
- Loosen screw (2).
- Unclip A-pillar trim panel (3) with clips (4) and feed it out to the top.

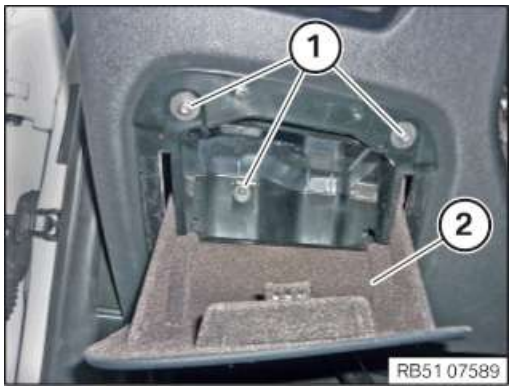
17 – Removing the trim panel for pedal mechanism

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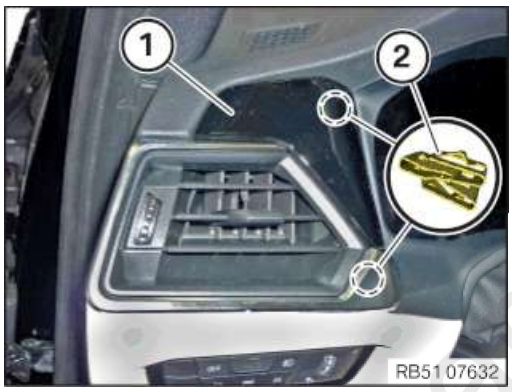
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

18 – Removing the left fold-down compartment



- Loosen screws (1).
- Remove the fold-down compartment (2) toward the bottom.

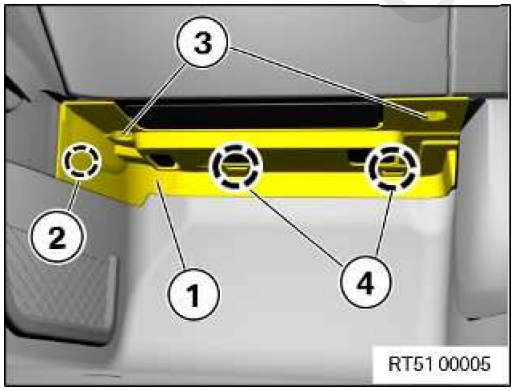
19 – Remove the finisher on the instrument panel on the left



- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

  Remove the decorative strip (1).

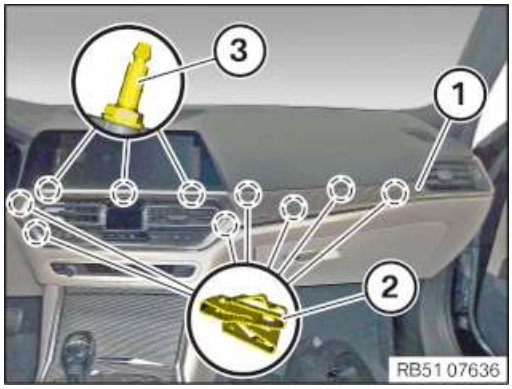
20 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

21 – Remove the finisher on the right instrument panel

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- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

22 – Remove Central Information Display (CID)

RISK OF DAMAGE

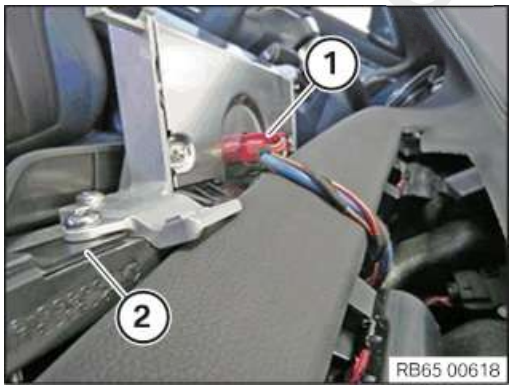
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Loosen screws (1).
- Pull out central information display (CID) (2) slightly off the instrument panel.



- Unlock plug connection (1) and disconnect.
- Remove the central information display (CID) (2).

23 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Removing the airbag unit for sports steering wheel**



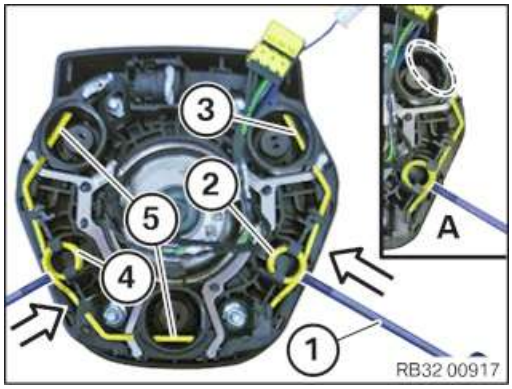
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

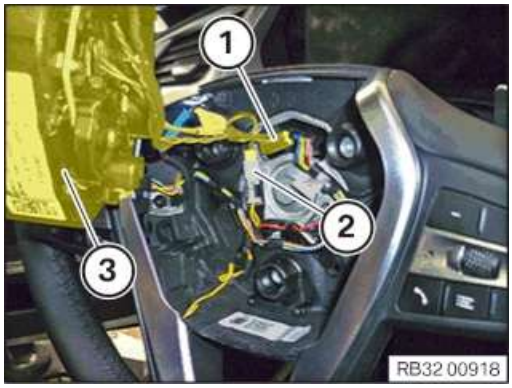
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Press wire spring clip (4) with Torx screwdriver T25 (1) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

▸ Removing the airbag unit for M Sport steering wheel



NOTICE

Perform the operations on the left and right side.

- Locate the mark (1) for unlocking the airbag unit on the steering wheel by touching it.



NOTICE

Perform the operations on the left and right side.

- Cut the mark (1) carefully with a knife (2) to an approx. length of 4 mm .

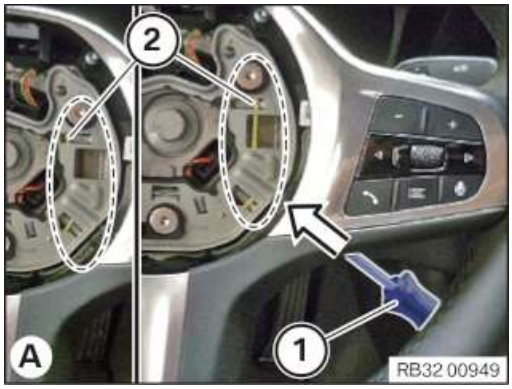


TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

- In case of vehicles with shift paddles (2) made of carbon-fibre-reinforced plastic, use a Torx socket T15 (1) for unlocking the airbag unit.

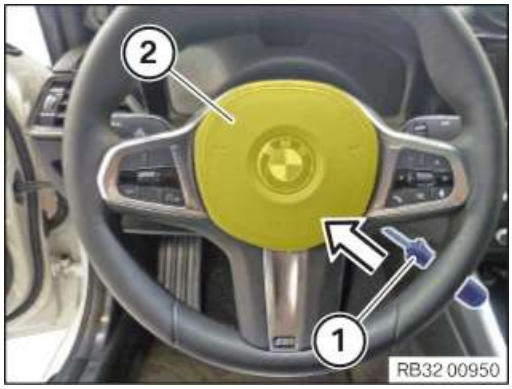
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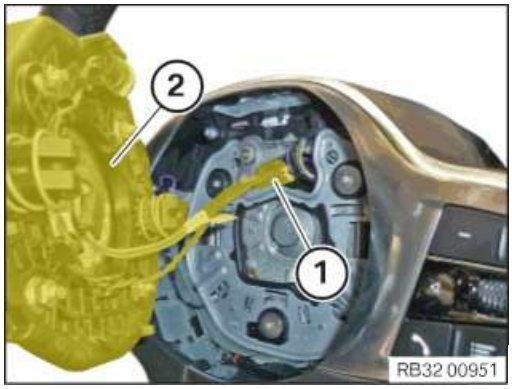
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Insert the Torx socket T15 (1) diagonally upwards until a resilient resistance is felt.
- Press in Torx socket T15(1) straight in the direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).

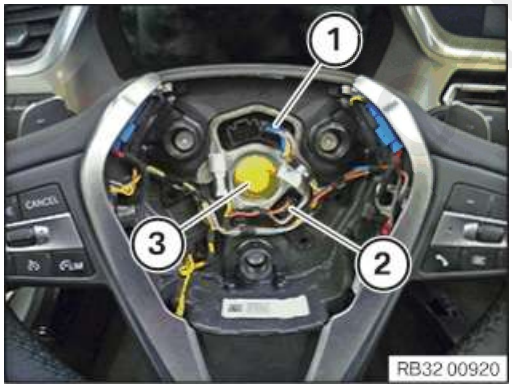


- Press in Torx screwdriver T15 (1) straight in direction of arrow towards the centre of the steering wheel and lift the airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



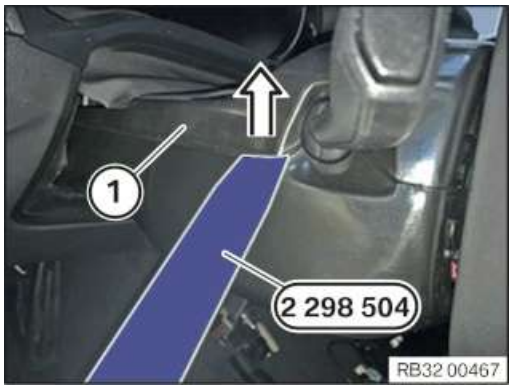
- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

24 – Remove sports steering wheel



- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

25 – Removing steering column shroud upper section

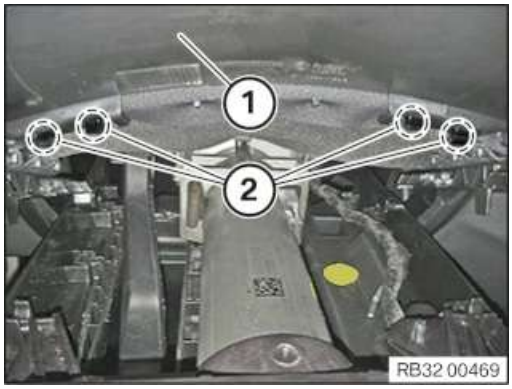


NOTICE

Perform the operations on the left and right side.

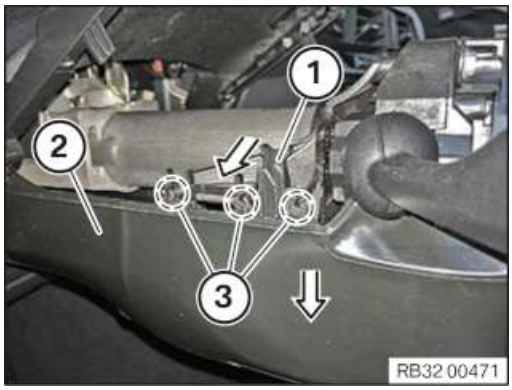
- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.

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- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

26 – Removing steering column shroud lower section



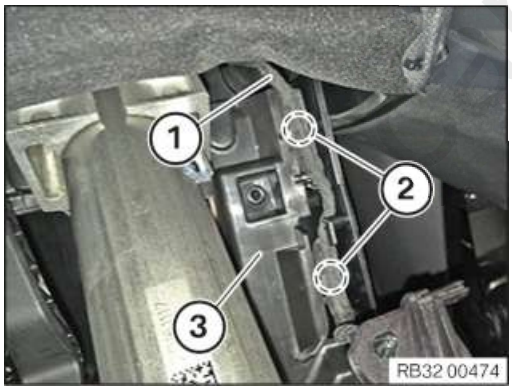
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

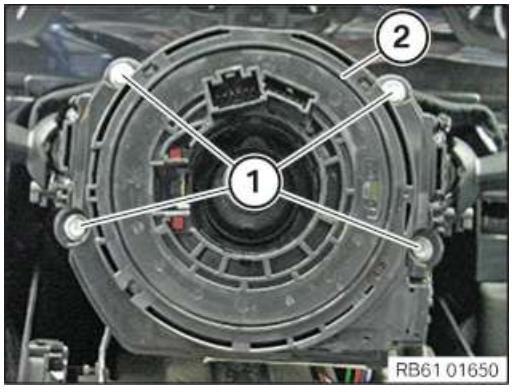


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).

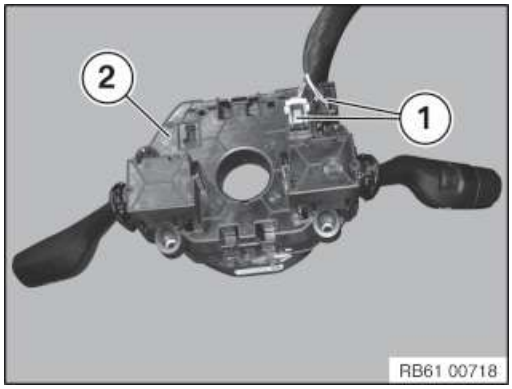


- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

27 – Removing the steering column switch cluster (SZL)



- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



- Unlock and disconnect plug connections (1) on the SZL (2).

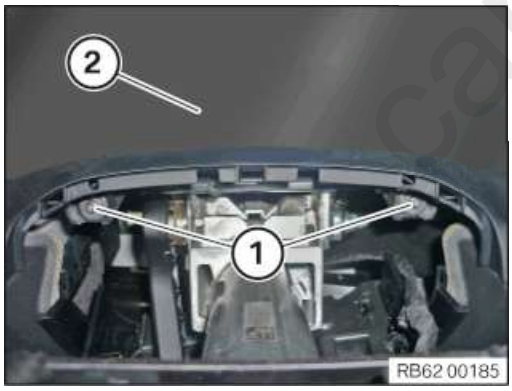
28 – Removing the instrument cluster (KOMBI)



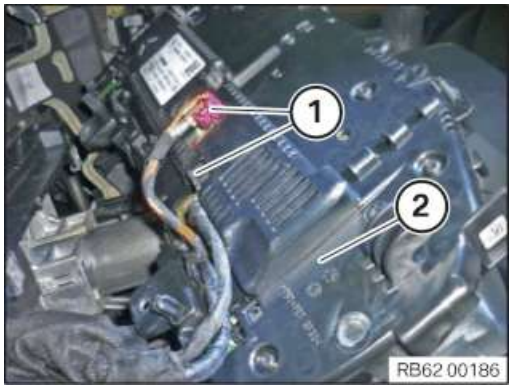
- Loosen screw (1).



- Loosen screw (1).



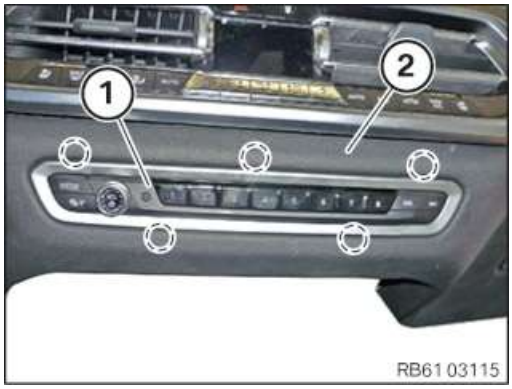
- Loosen screws (1).
- Feed out instrument cluster (KOMBI) (2).



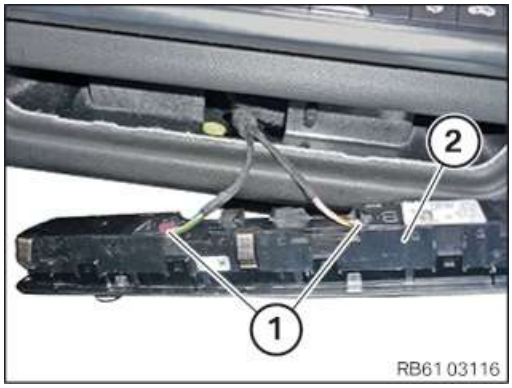
- Unlock and disconnect plug connections (1) from instrument cluster (KOMBI) (2).
- Remove the instrument cluster (KOMBI) (2).

29 – Remove the audio operating unit

cardiagn.com

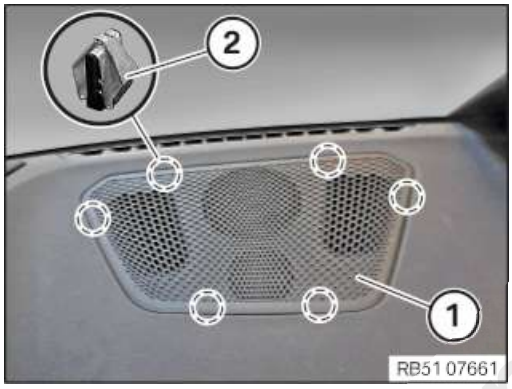


- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



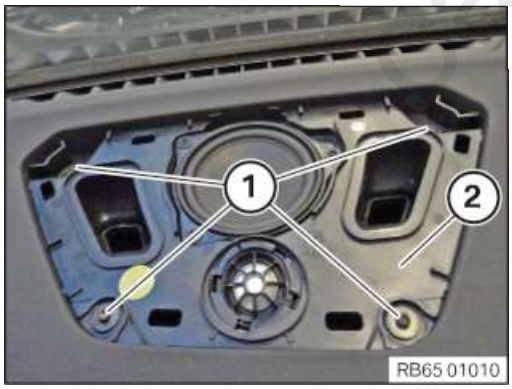
- Disconnect plug connections (1) and remove the audio operating unit (2).

30 – Remove the speaker trim at the instrument panel

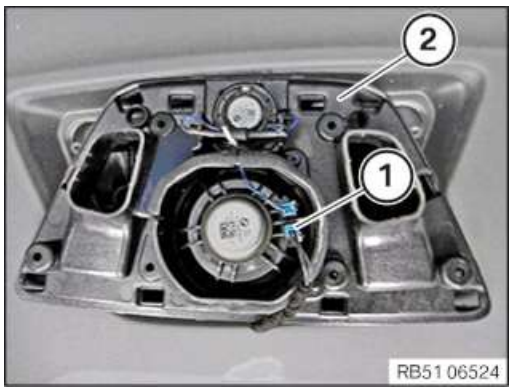


- Lever out the speaker trim (1) with the special tool 0 496 569 (00 9 325) from the clamps (2) toward the top and remove.

31 – Remove the speaker holder at the instrument panel



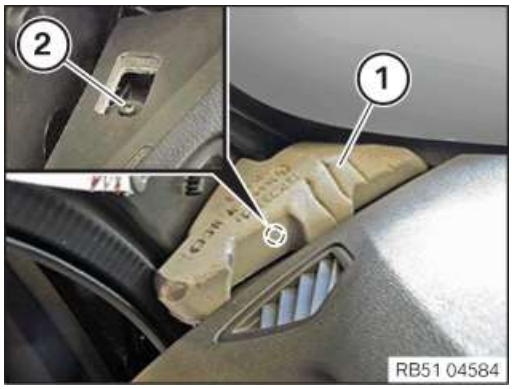
- Loosen screws (1).
- Pull out speaker holder (2) slightly with the loudspeakers and tilt it to the side.



- Unlock plug connection (1) and disconnect.
- Remove the speaker holder (2).

erdiagn.com

32 – Remove the instrument panel trim panel



NOTICE

Perform the operations on the left and right side.

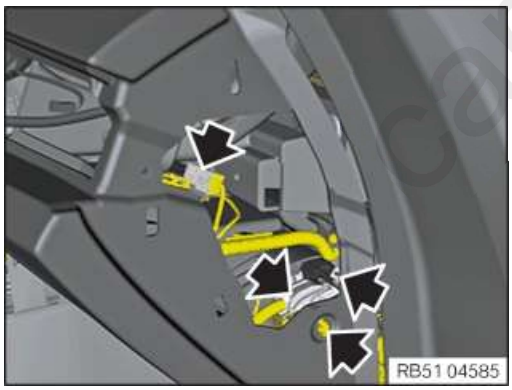
- Remove the sound insulation (1).
- Loosen screw (2).



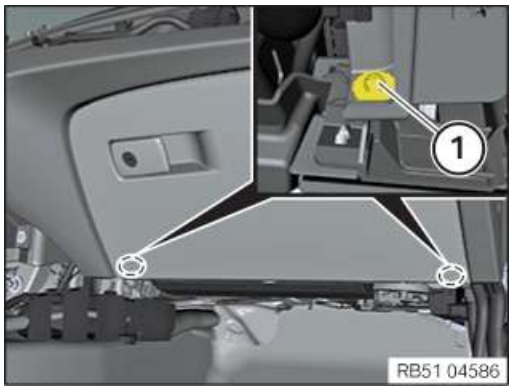
- Loosen screws (1).



- Loosen screws (1).

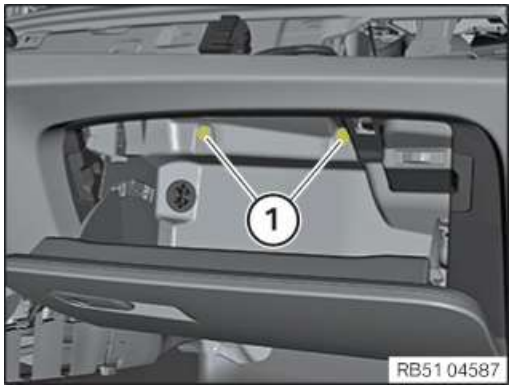


- Release all plug connections and cable clips (arrows) behind the glove box.

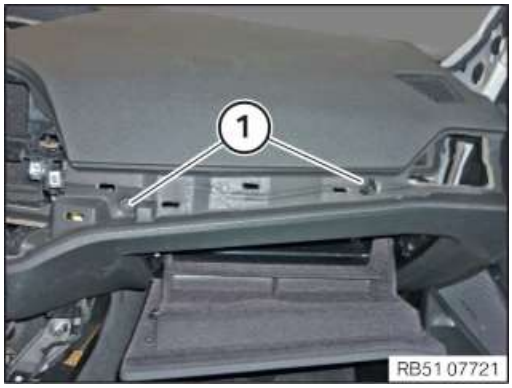


- Release the screws (1) on the lower side of the glove box.

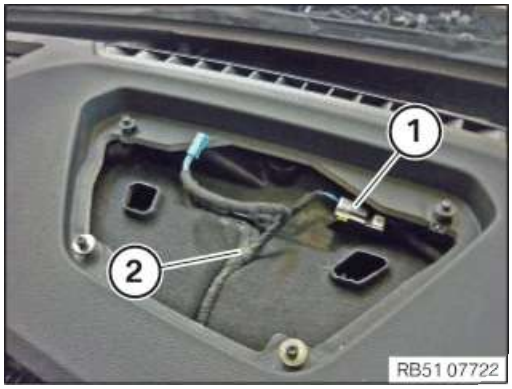
cardiagn.com



- Open glovebox.
- Loosen screws (1).



- Loosen screws (1).



- Unlock plug connection (1) and disconnect.
- Release the wiring harness (2) on the holders.



- Unlock the plug connection (1) on the light operating unit and disconnect it.



- Loosen screws (1).

TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Pull the instrument panel trim back slightly.

  If necessary, unlock and disconnect additional plug connections.
- Remove the instrument panel trim from the vehicle.

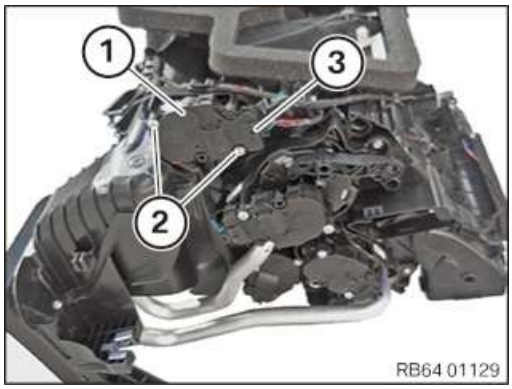
rdiagn.com

MAIN WORK

33 – Remove the front left stratification flap motor (M9)

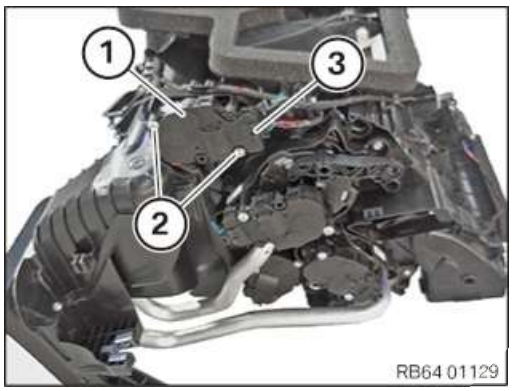
NOTICE

For a better overview the removed condition is shown here.



- Disconnect plug connection (3).
- Loosen screws (2).
- Remove the front left stratification flap motor (1).

34 – Install the front left stratification flap motor (M9)



- Position the front left stratification flap motor (1).
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Connect connectors (3) and lock.

POSTPROCESSES

35 – Install the trim panel for the instrument panel



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Insert the instrument panel trim in the vehicle and position it at the support.
- Insert the associated wiring harnesses and connect the connectors.
- Tighten the screws (1).

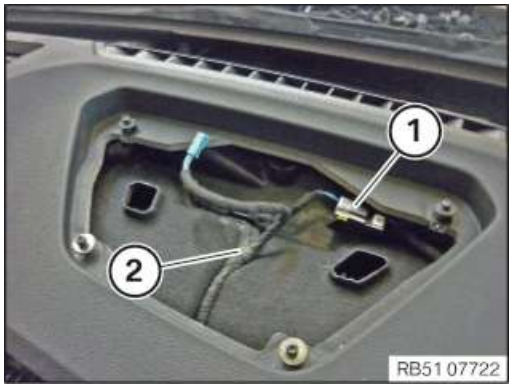
Dashboard to support

Screw		Tightening torque	2,4 Nm

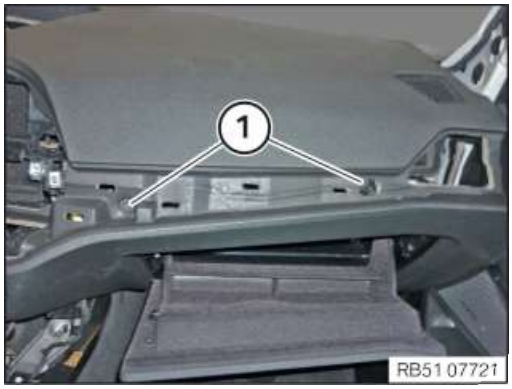
cardiagn.com



- Connect connector (1) to the light operating unit and lock.



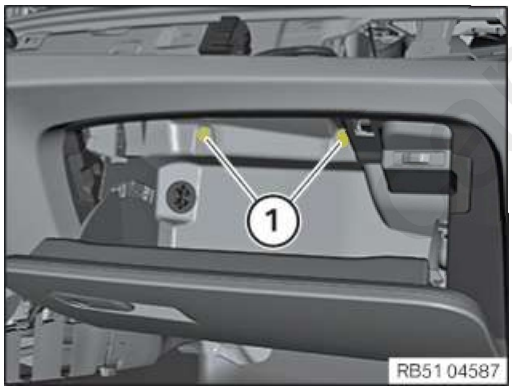
- Secure the wiring harness (2) on the holders.
- Connect connectors (1) and lock.



- Tighten the screws (1).

Dashboard to support

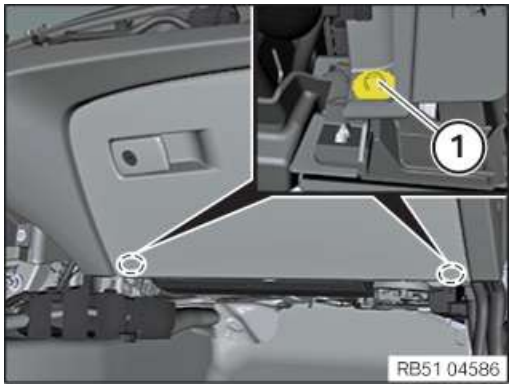
Screw		Tightening torque	2,4 Nm



- Open glovebox.
- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

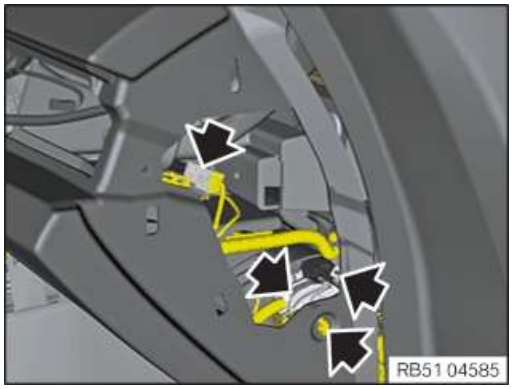


- Tighten the screws (1) on the lower side of the glove box button.

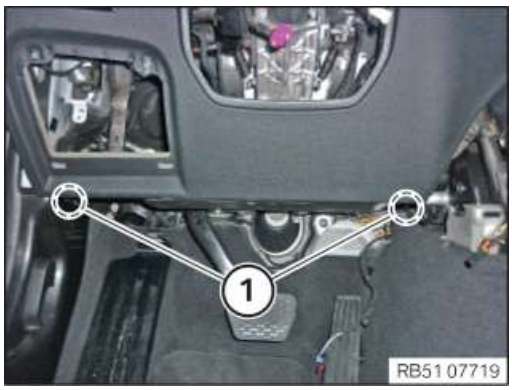
Dashboard to support

Screw		Tightening torque	2,4 Nm

mdiagn.com



- Connect all plug connections and cable clips (arrows) behind the glove box.



- Tighten the screws (1).

Dashboard to support

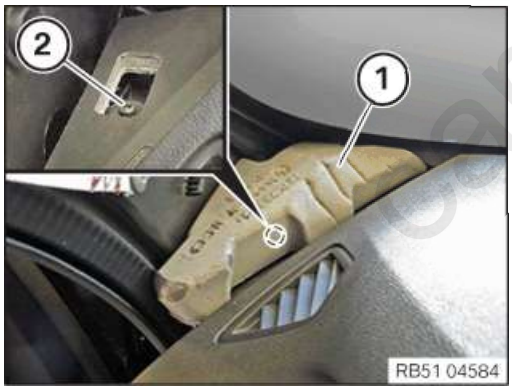
Screw		Tightening torque	2,4 Nm



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm



NOTICE

Perform the operations on the left and right side.

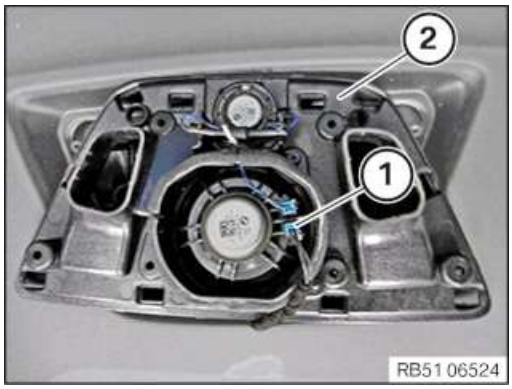
- Tighten down screw (2).

Dashboard to support

Screw		Tightening torque	2,4 Nm

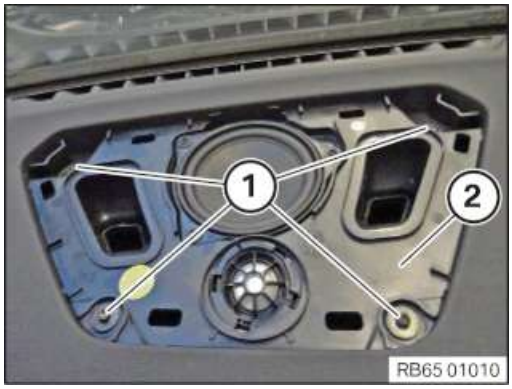
- Use sound insulation (1).

36 – Install the speaker holder at the instrument panel



- Position the speaker holder (2).
- Connect connector (1).

carmanualsdiagn.com

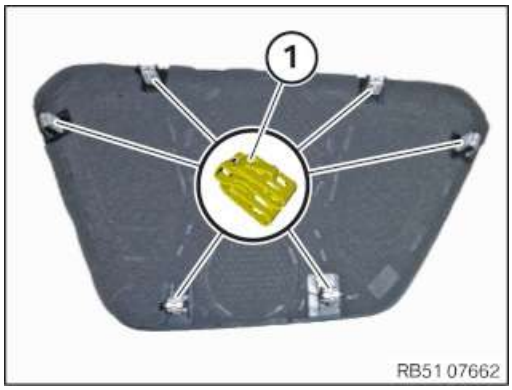


- Install the speaker holder (2).
- Tighten the screws (1).

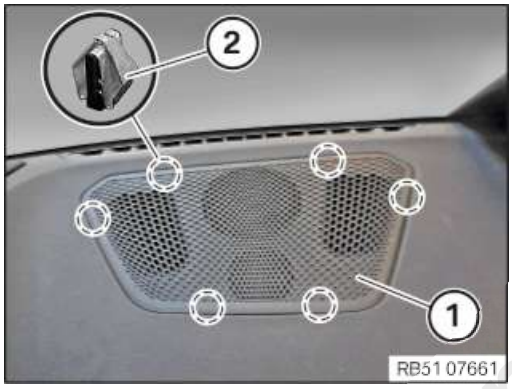
Speaker to support / support to instrument panel / support to body

Screw		Tightening torque	1,8 Nm

37 – Install the speaker trim at the instrument panel

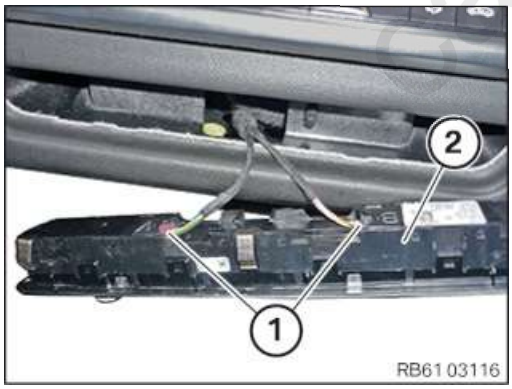


- Check clamps (1) for damage.
- Replace broken or missing clamps (1).

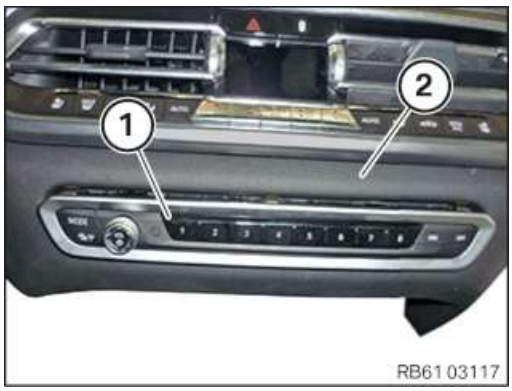


- Position the speaker trim (1) correctly and engage it at the clamps (2).

38 – Install the audio operating unit



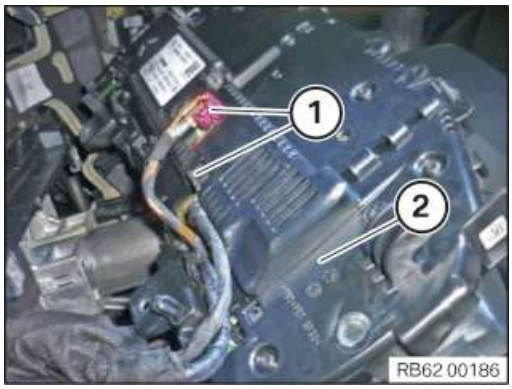
- Connect the connector (1) to the audio operating unit (2).



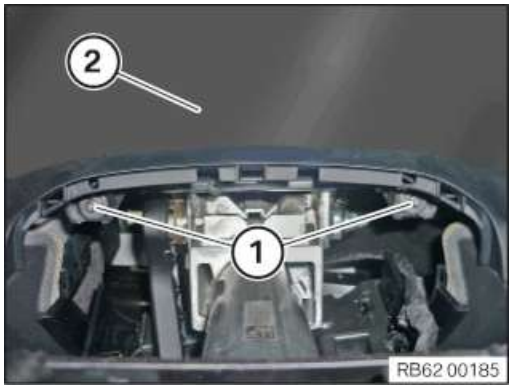
- Correctly position the audio operating unit (1) and install in the instrument panel(2).

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39 – Installing the instrument cluster (KOMBI)



- Connect and lock connector (1) to the instrument cluster (KOMBI) (2).



- Feed in and position the instrument cluster (KOMBI) (2).
- Tighten the screws (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm



- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

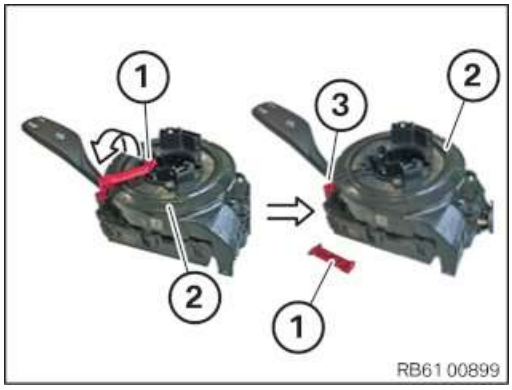


- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

40 – Installing the steering column switch cluster (SZL)

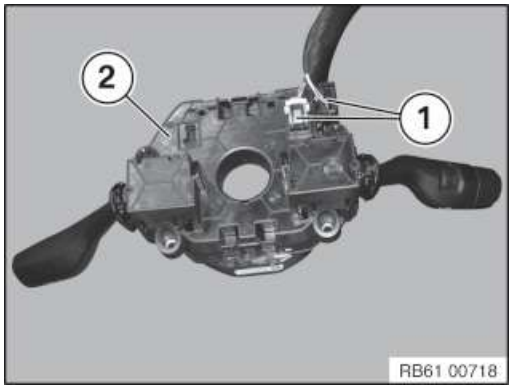


- **Replacement:**

  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

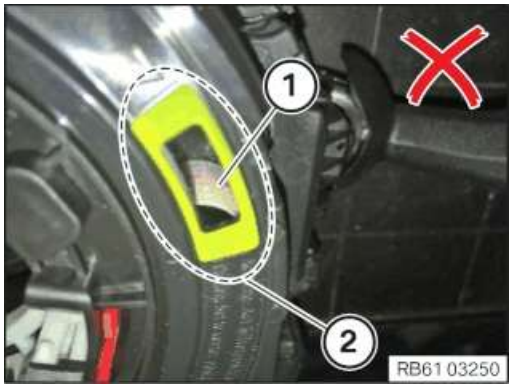
  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).

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- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

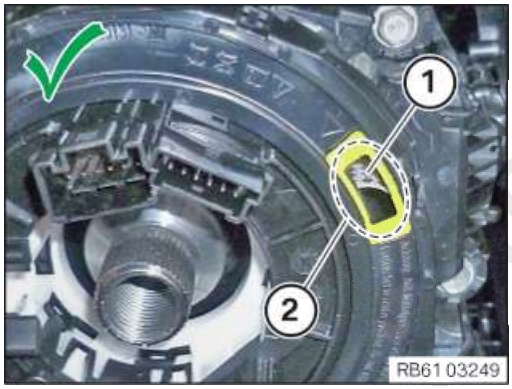
Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

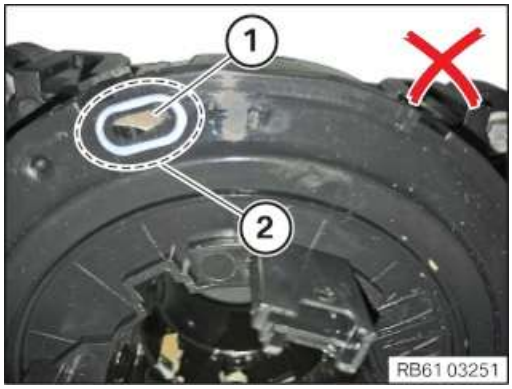
Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version B:**

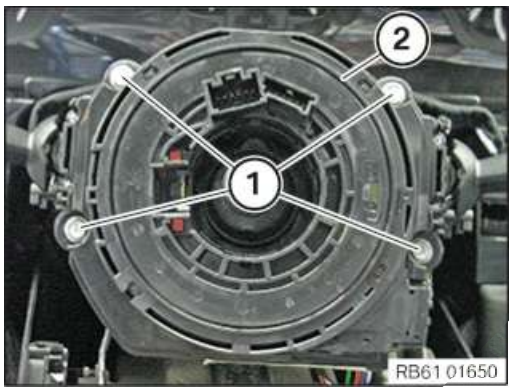
  Check if the correct mark (1) can be seen in the inspection glass (2).

Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next work step.

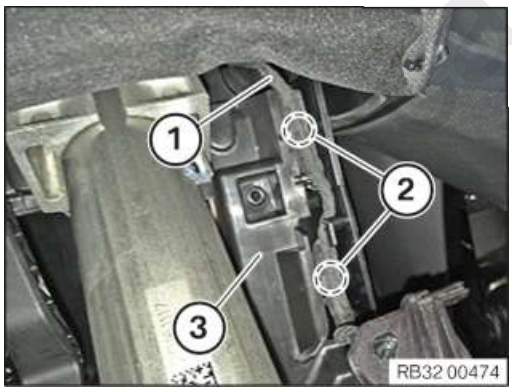


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm

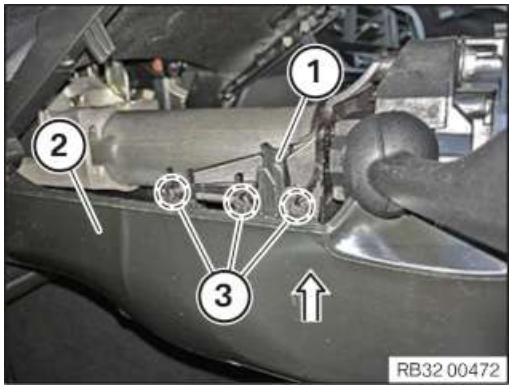
41 – Install steering column shroud lower section



- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).



- Connect the connector (1).

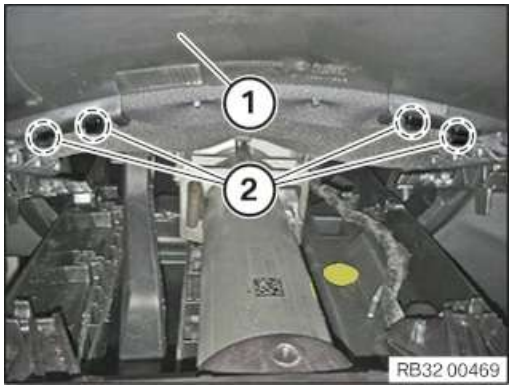


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

42 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

43 – Installing the sports steering wheel

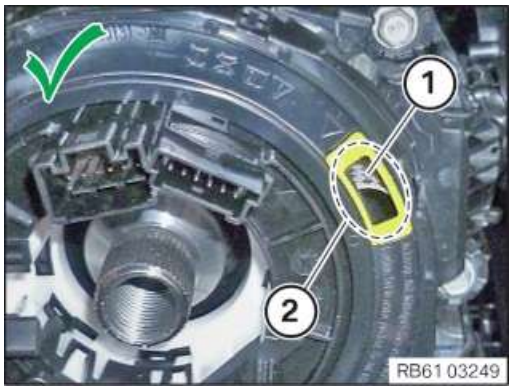
▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▹ **Version A: Checking the visibility of the marking on the coil spring**

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Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

▷ **Version B: Checking the visibility of the marking on the coil spring**



Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁



Check

- Check if a microencapsulated screw (3) is installed.

Result

» Screw (3) is micro-encapsulated.

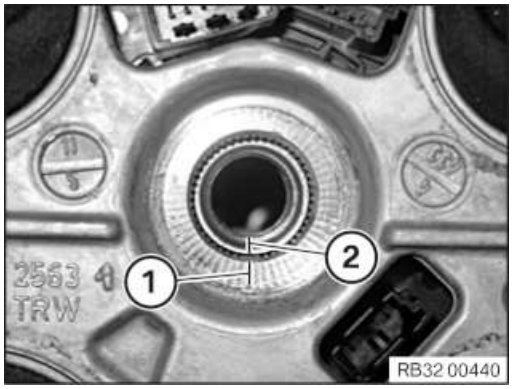
cardiagn.com

Measure

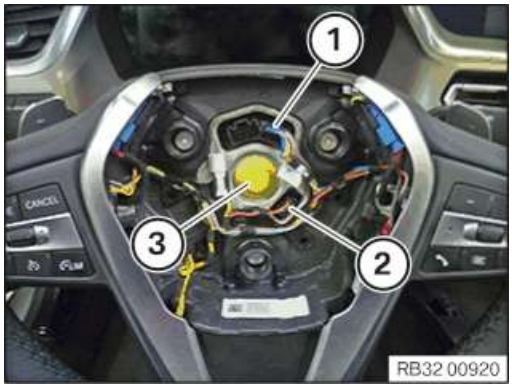
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

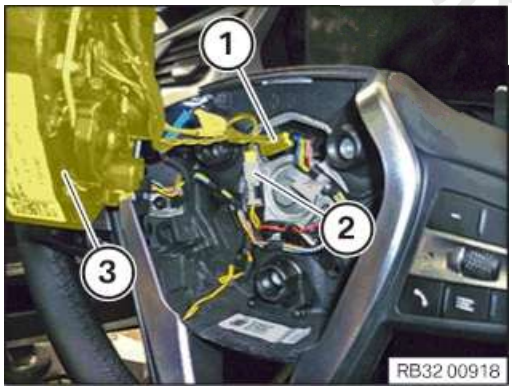
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

44 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Installing the airbag unit for the sports steering wheel**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

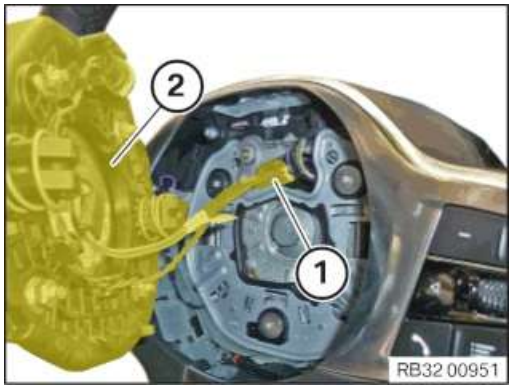
  The airbag unit (1) must engage audibly and perceptibly.

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▸ **Installing the airbag unit for M Sport steering wheel**

TECHNICAL INFORMATION

After replacing the airbag unit (M sport steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

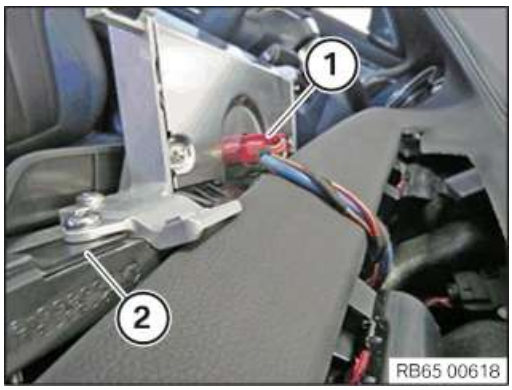
45 – Install the central information display (CID)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Position Central Information Display (CID) (2).
- Connect plug connection (1) and lock.

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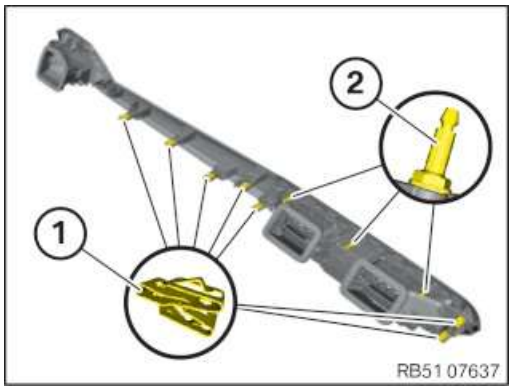


- Insert the central information display (CID) (2) in the instrument panel and position correctly.
- Tighten the screws (1).

Central information display to instrument panel

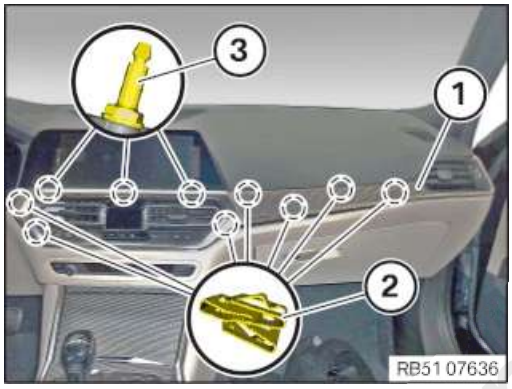
Screw		Tightening torque	2,4 Nm

46 – Install the finisher on the right instrument panel



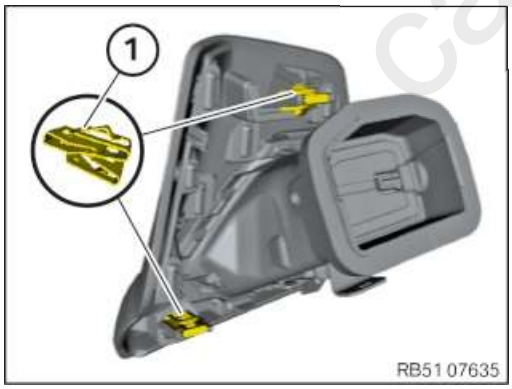
- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



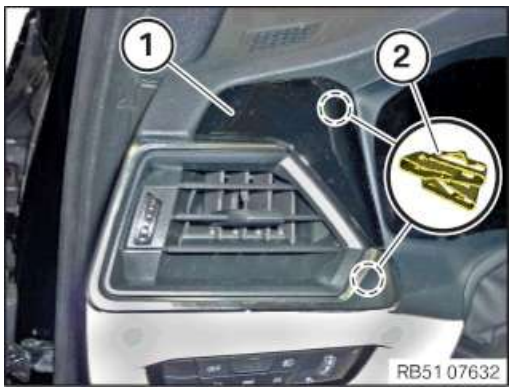
- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

47 – Install the finisher on the instrument panel on the left



- Check the clamps (1) for damage and that they are present.

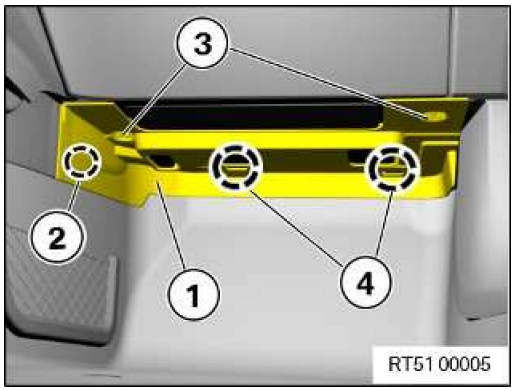
  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

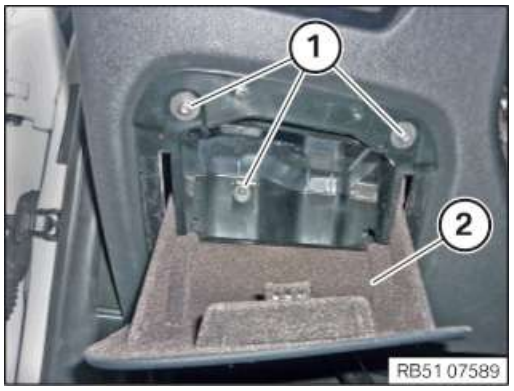
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48 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

49 – Installing the left fold-down compartment

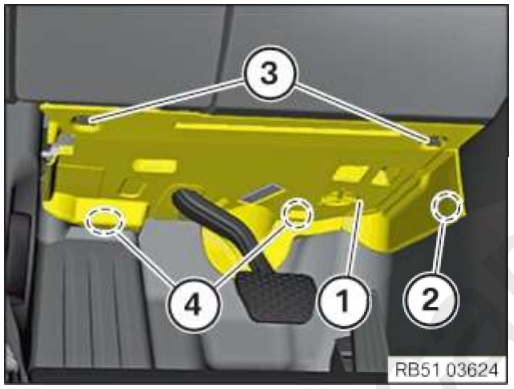


- Install the fold-down compartment (2).
- Tighten the screws (1).

Fold-down compartment to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

50 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

51 – Install the A-pillar trim panel on the left and right

NOTICE

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

▸ **Installing the A-pillar trim panel**

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WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

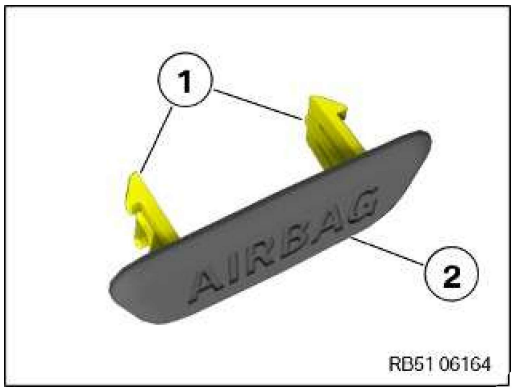
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.



Check

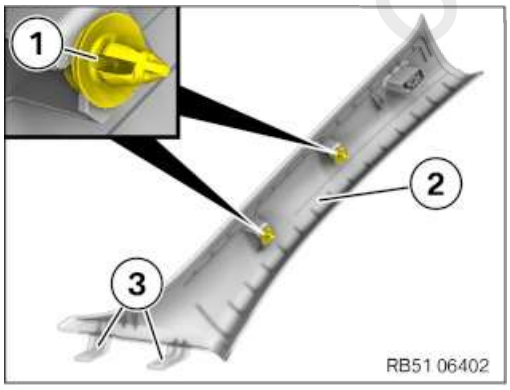
- Check retaining lugs (1) of cover (2) for damage.

Result

» Retaining lug is damaged.

Measure

- Renew the cover.



Check

- Check the clips (1) for damage and renew if necessary.
- Check the guides (3) for damage.

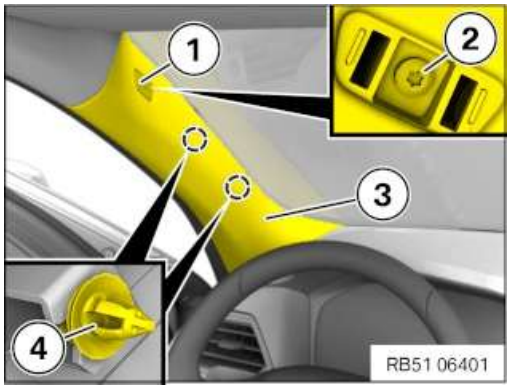
Result

» Guide is damaged.

Measure

- Renew the A-pillar trim panel.

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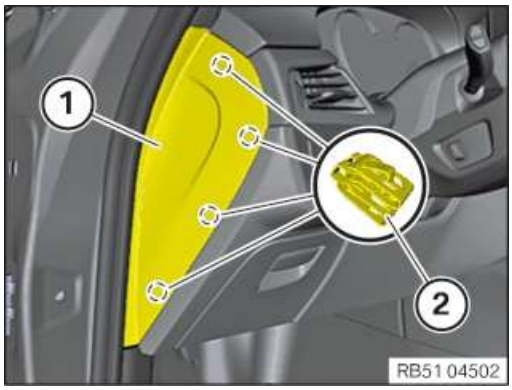
- Guide in A-pillar trim panel (3) downwards and clip it in with clips (4).
- Tighten down screw (2).

A-pillar trim panel to body

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

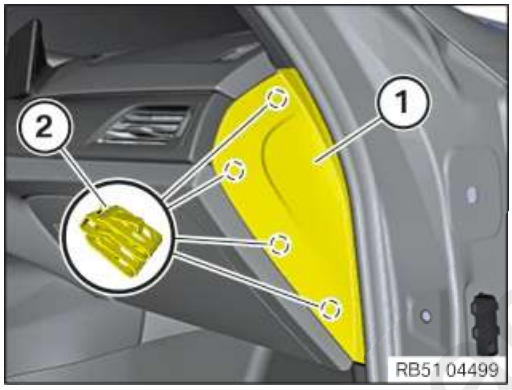
- Clip in the cover (1).

52 – Install the side panel on left instrument panel



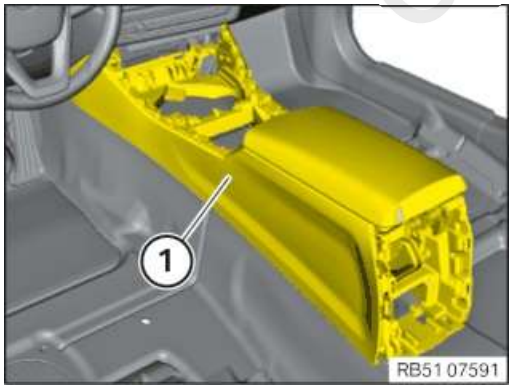
- Feed in the side panel (1) and clip it in at the clamps (2).

53 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

54 – Installing the centre console

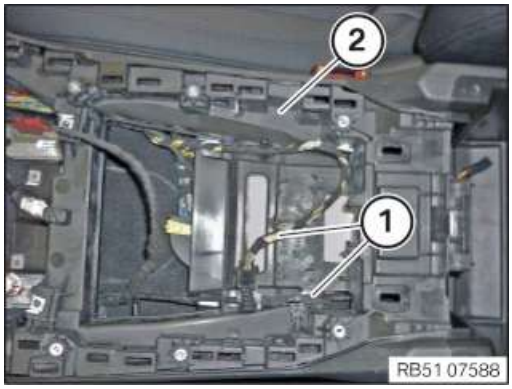


NOTICE

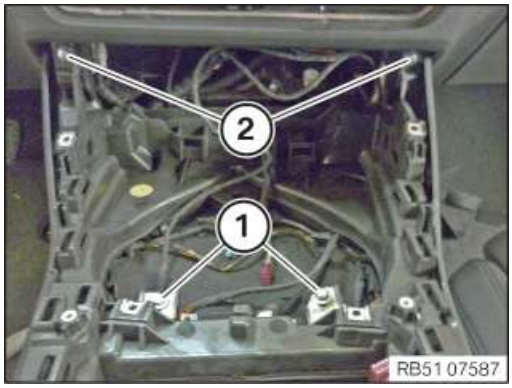
To provide a better overview: Schematic diagram with partially hidden components.

- Install centre console (1) and thereby feed in the wiring harness.
- Feed in the centre console (1) to the instrument panel and position correctly.

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- Secure the wiring harness to the centre console (1) and connect and lock the existing plug connections.



- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

- Tighten the screws (2).

Centre console to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

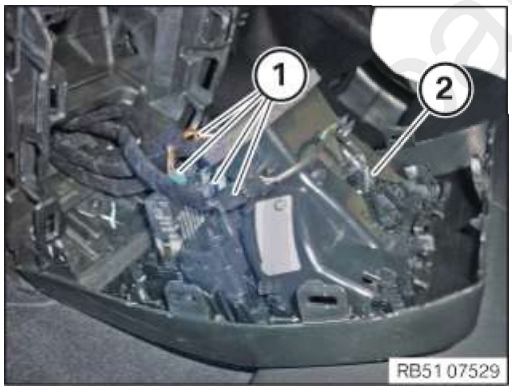


- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

55 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.

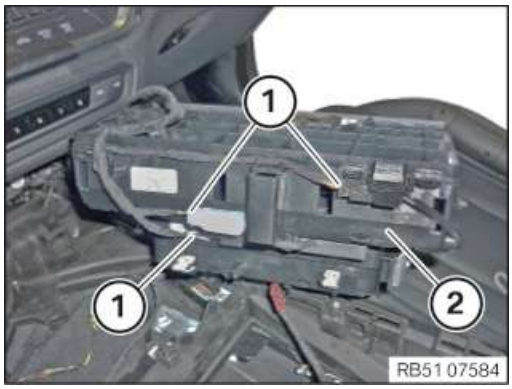


- Position centre console trim (1) and engage at the latch mechanisms at the side.

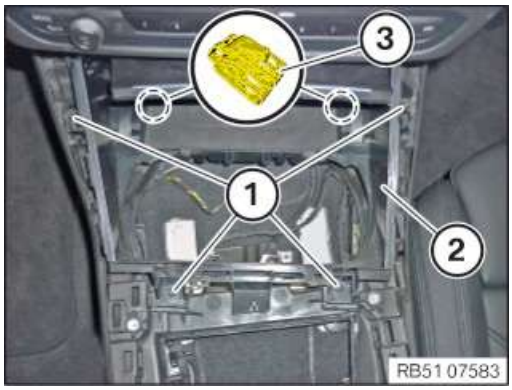
56 – Installing the storage compartment in the centre console in the front

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56 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

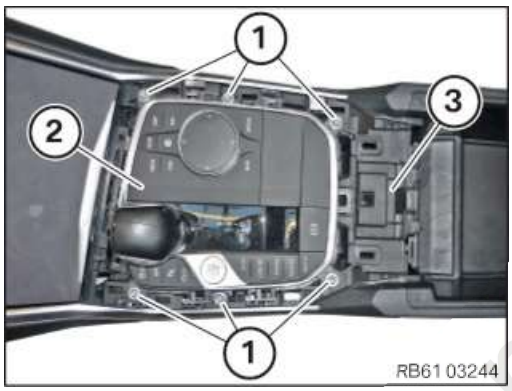


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

57 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw	Tightening torque	1,8 Nm

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

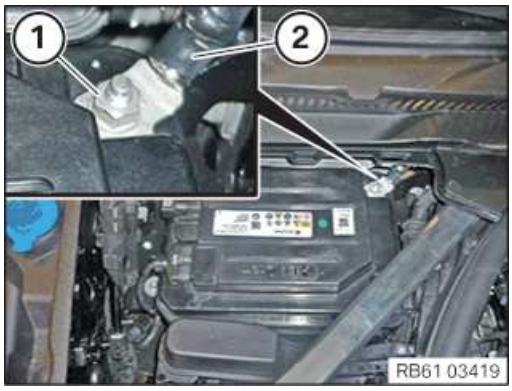
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

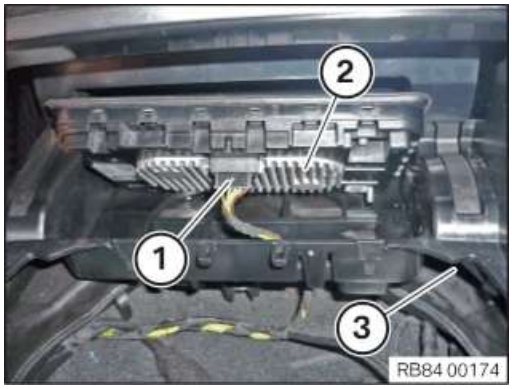


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).

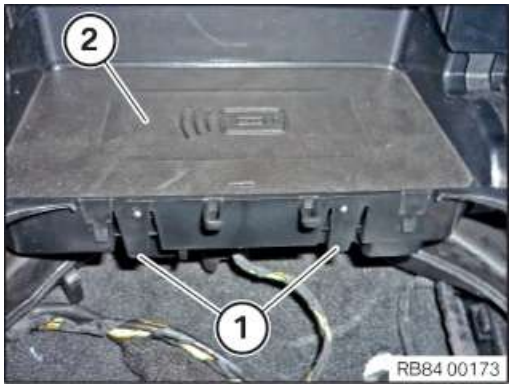


- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.

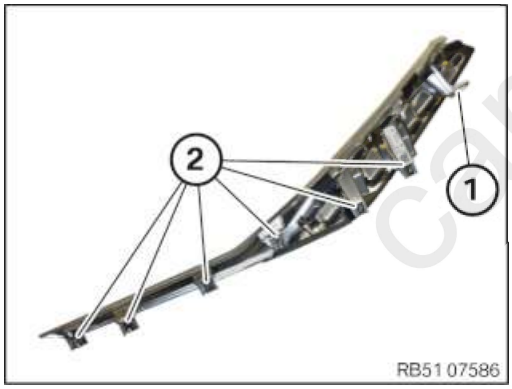
  The latch mechanisms (1) must engage correctly.

59 – Installing the decorative trim on the centre console on the left and right

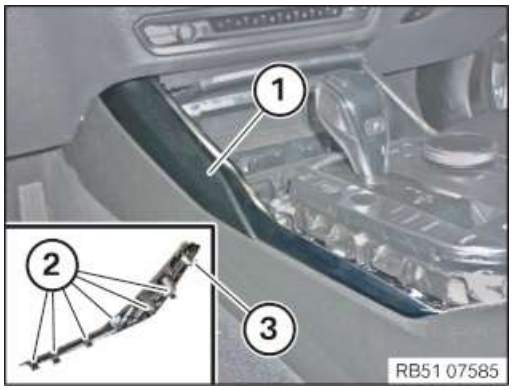
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

60 – Installing the centre console trim

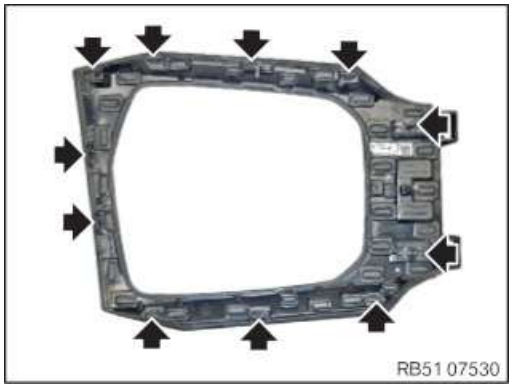
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RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

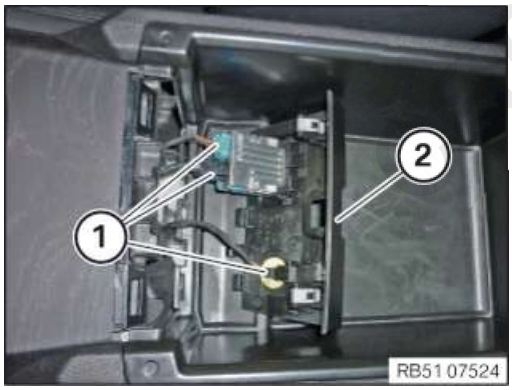


- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

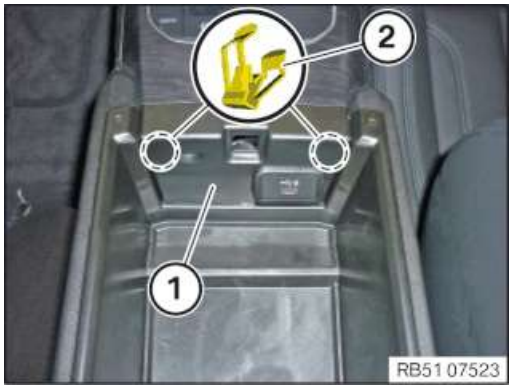


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

61 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

62 – Install the cup holder

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- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

Cup holder to centre console

Oval-head screw		Tightening torque	1,8 Nm



- Insert the insert (1).

63 – Connecting all battery earth leads



- See additional information.

64 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

65 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

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Heater/air conditioner			Used in step 34
Screw		Tightening torque	1,2 Nm

Dashboard to support			Used in step 35
Screw		Tightening torque	2,4 Nm

Speaker to support / support to instrument panel / support to body			Used in step 36
Screw		Tightening torque	1,8 Nm

Instrument cluster (KOMBI) to support			Used in step 39
Screw		Tightening torque	1,8 Nm

Steering column switch cluster (SZL) on the steering column			Used in step 40
Screw TS5x20		Tightening torque	3 Nm

Steering wheel to steering column			Used in step 43
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Central information display to instrument panel			Used in step 45
Screw		Tightening torque	2,4 Nm

Fold-down compartment to instrument panel			Used in step 49
Oval-head screw		Tightening torque	1,8 Nm

A-pillar trim panel to body			Used in step 51
Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

Centre console on tunnel			Used in step 54
M6x18 Hexagon screw		Tightening torque	4,6 Nm

Centre console to instrument panel			Used in step 54
Oval-head screw		Tightening torque	1,8 Nm

Storage compartment in centre console			Used in step 56
Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim			Used in step 57
Screw		Tightening torque	1,8 Nm

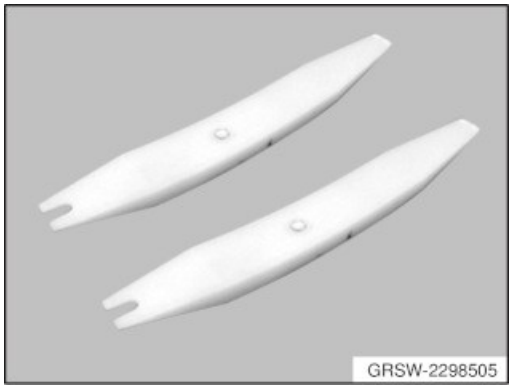
Negative battery cable to 48-V battery			Used in step 5764
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 62
Oval-head screw		Tightening torque	1,8 Nm

Overview of Special Tools

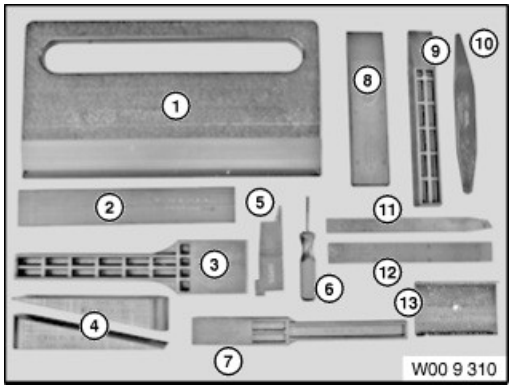
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2 298 505 Wedge



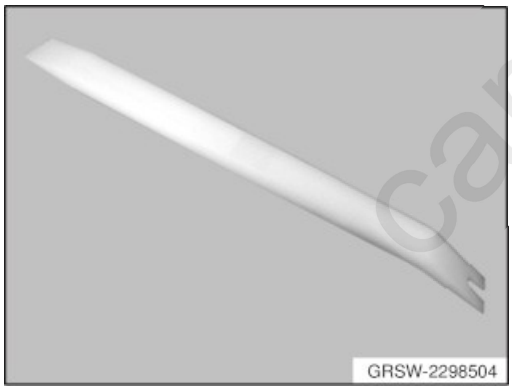
Common	Used in step 67
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 493 752 (00 9 329) Case



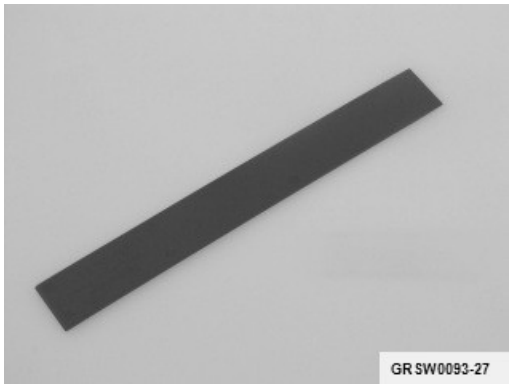
Common	Used in step 16
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

2 298 504 Wedge



Common	Used in step 25
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 496 571 (00 9 327) Wedge



Common	Used in step 29
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

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0 496 569 (00 9 325) Wedge



Common	Used in step 30
Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	2105764

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	1623
72 00 ... Safety regulations for handling components with gas generators	16

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
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61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763

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61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
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61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 20 900 Disconnecting and connecting battery earth lead	3105763
61 35 ... Notes on ESD protection (Electro Static Discharge)	2245
61 35 ... Notes on ESD protection (Electro Static Discharge)	2245

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64 11 507 Replacing actuator drive for front right blend air door

TECHNICAL INFORMATION

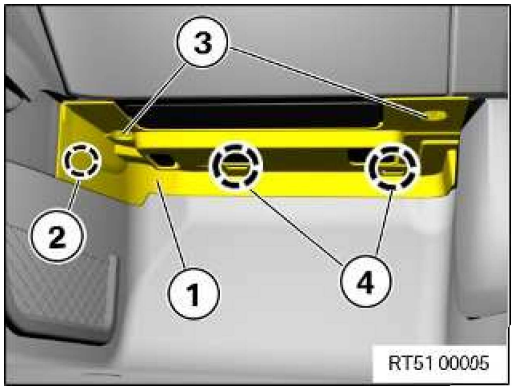
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

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WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

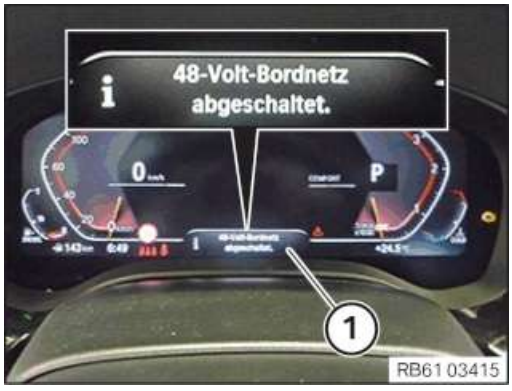
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.

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WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

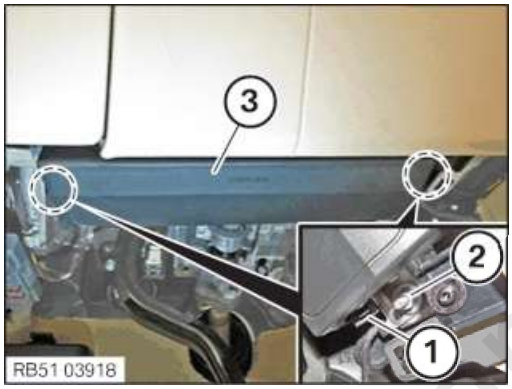
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

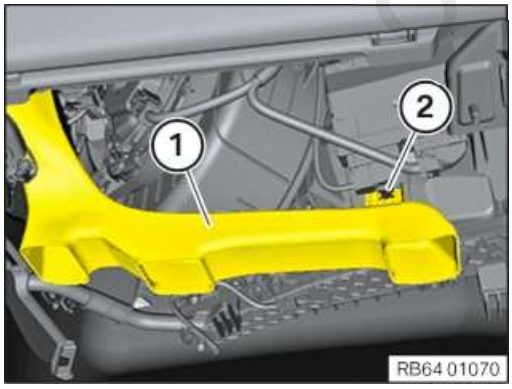


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

4 – Removing the right air duct

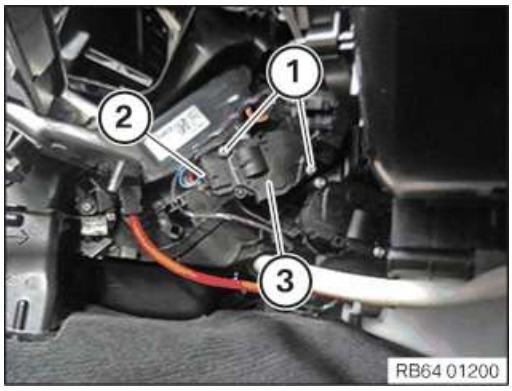


- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

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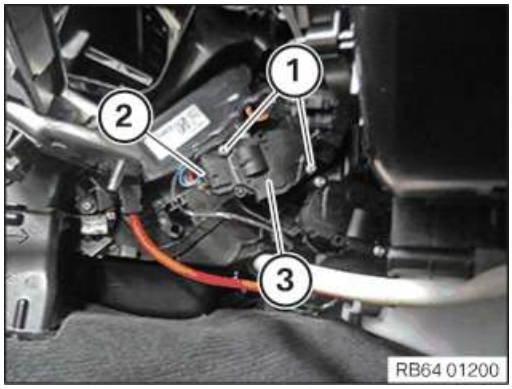
MAIN WORK

5 – Removing the front right mixed air flap motor (M83a)



- Loosen screws (1).
- Disconnect plug connection (2).
- Remove mixed air flap motor, front right:(3).

6 – Installing front right mixed air flap motor (M83a)



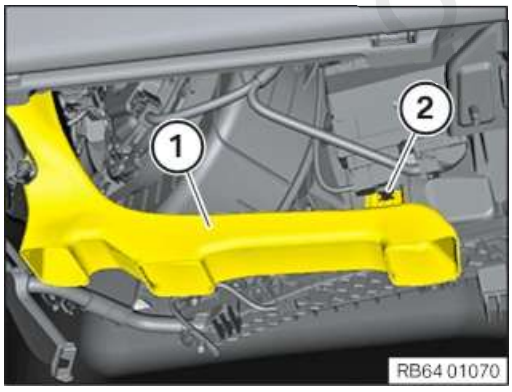
- Install and correctly position mixed air flap motor front right (3).
- Connect connector (2).
- Tighten the screws (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

POSTPROCESSES

7 – Installing the air duct, right



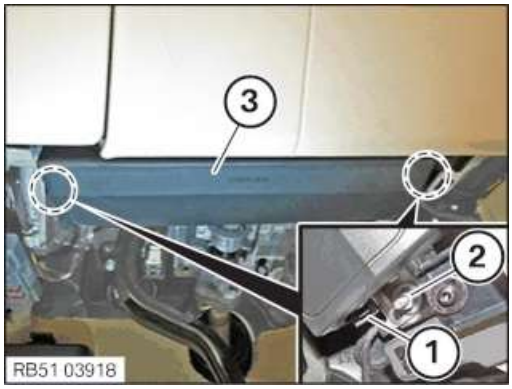
- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

8 – In vehicles with airbag module: Installing knee airbag

NOTICE

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

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- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



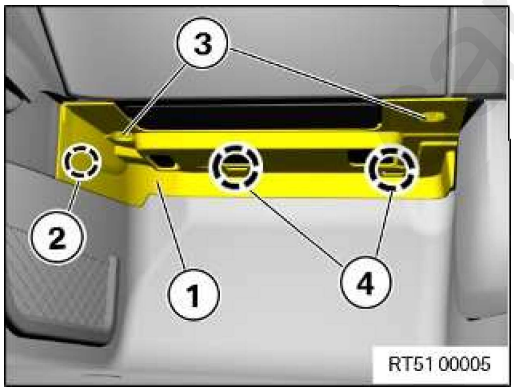
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

9 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

10 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

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Overview of Tightening Torques

Heater/air conditioner			Used in step 6
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 8
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 8
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	38

Repair instructions	Used in step
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64 11 506 Replacing actuator drive for front right stratification flap

TECHNICAL INFORMATION

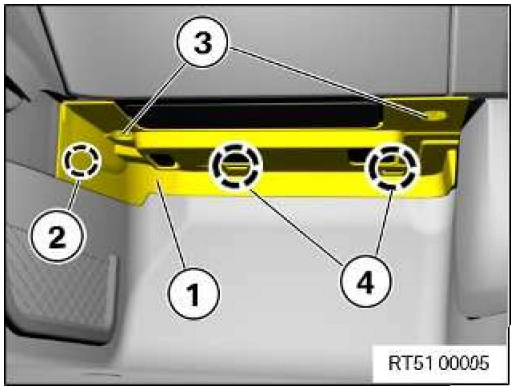
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite
Ignition is switched off.

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WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

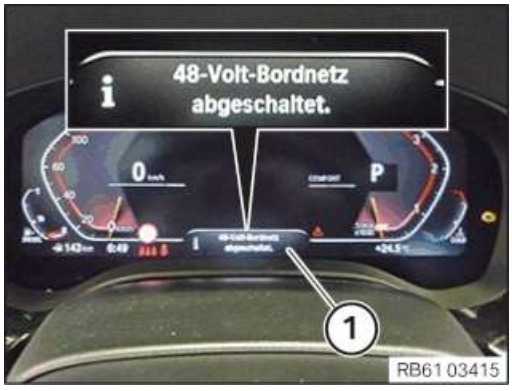
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.

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WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

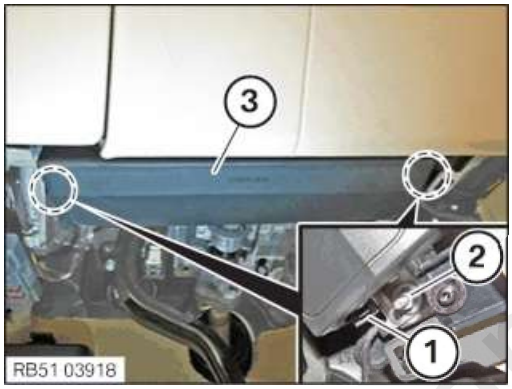
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

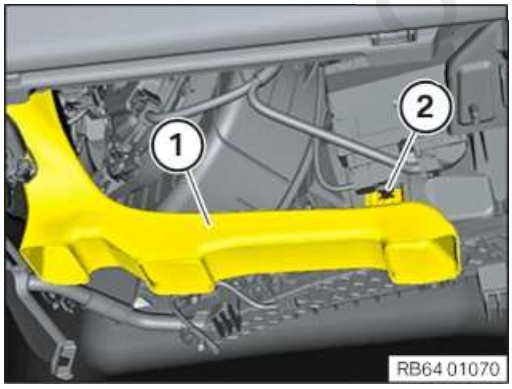


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

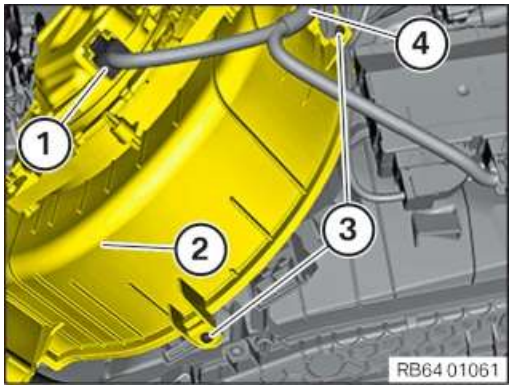
4 – Removing the right air duct



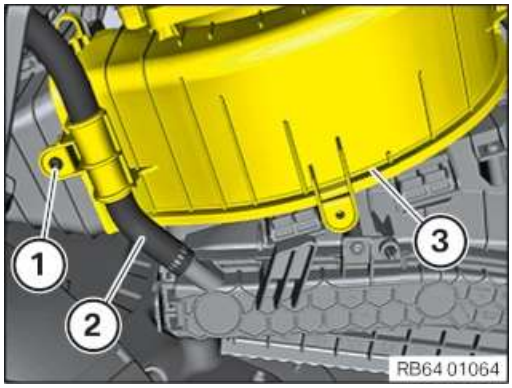
- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

5 – Remove the blower for the heating and air-conditioning unit

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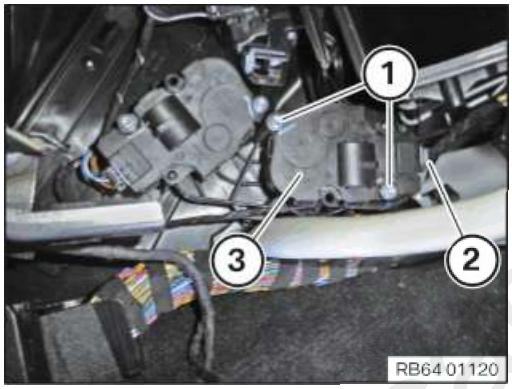
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

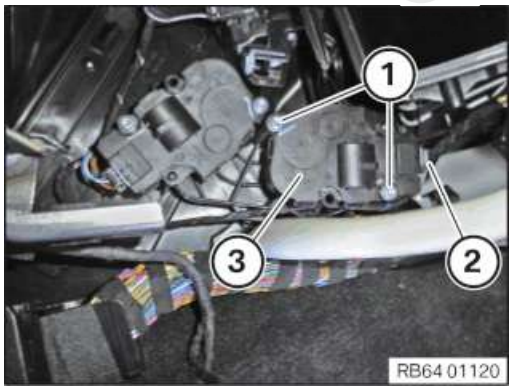
MAIN WORK

6 – Remove the stratification flap motor (M69)



- Disconnect plug connection (2).
- Release the screws (1) and remove the stratification flap motor (3).

7 – Install the stratification flap motor (M69)



- Install the stratification flap motor (3) and correctly position.
- Tighten the screws (1).

Heater/air conditioner

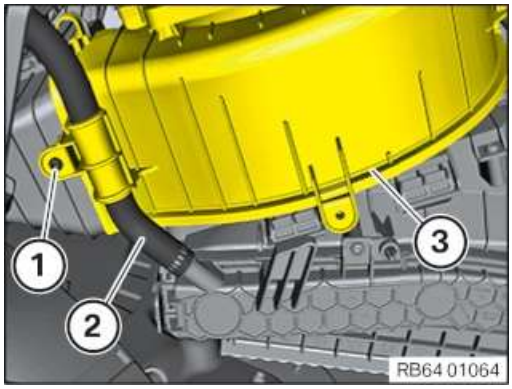
Screw		Tightening torque	1,2 Nm

- Connect connectors (2) and lock.

POSTPROCESSES

8 – Install the blower for the heating and air-conditioning unit

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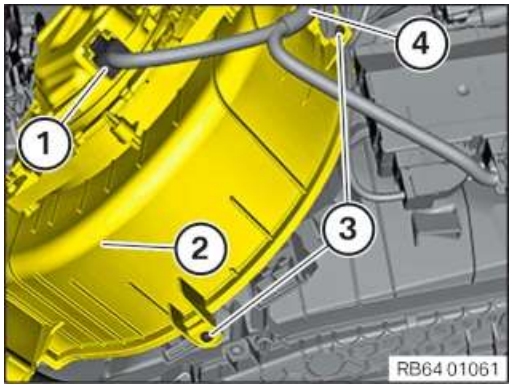


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



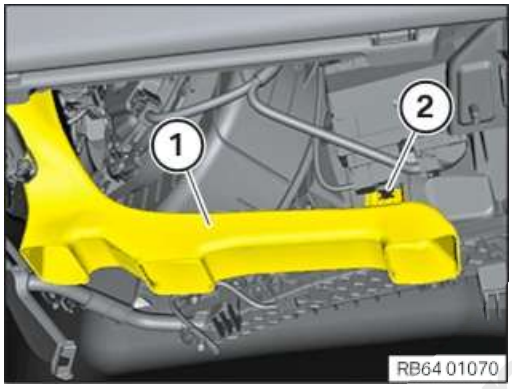
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

9 – Installing the air duct, right

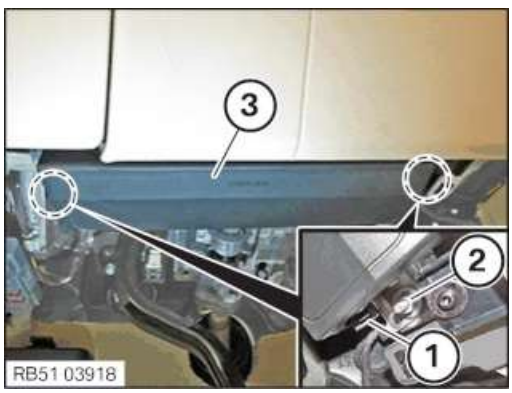


- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

10 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**

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- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

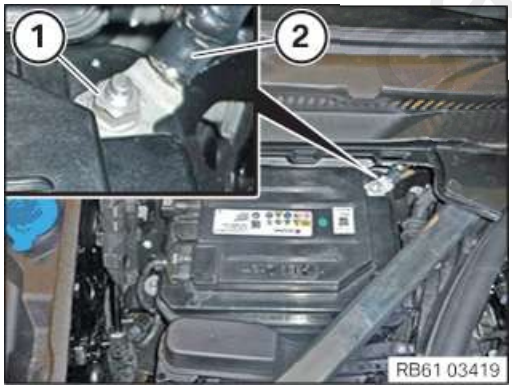
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

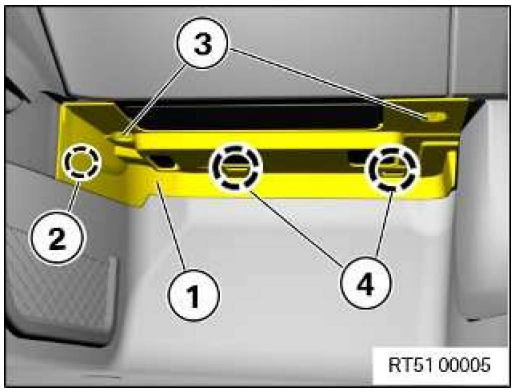


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

11 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

12 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 7
Screw		Tightening torque	1,2 Nm

Heater/air conditioner			Used in step 8
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 10
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 10
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**

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Notes on 48-V battery	310

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting battery earth lead	310

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64 11 503 Replacing actuator drive for left air distribution flap

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

TECHNICAL INFORMATION

After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

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WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

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Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

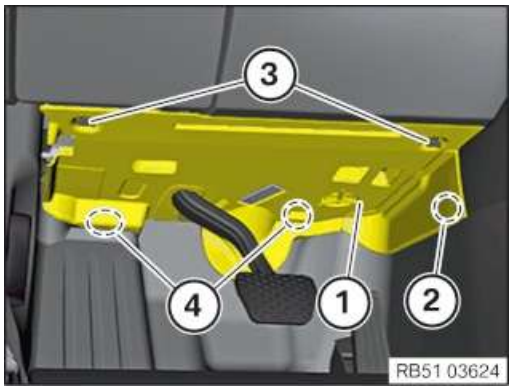
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



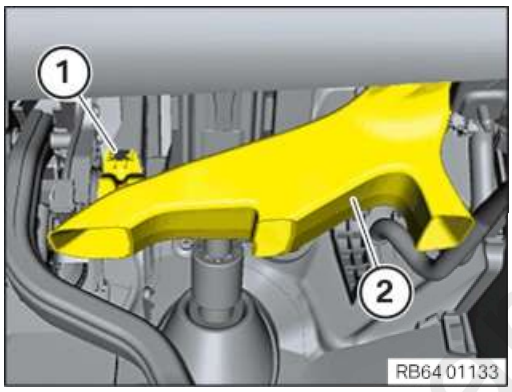
- See additional information.

4 – Removing the trim panel for pedal mechanism



- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

5 – Remove left air duct



- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

6 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

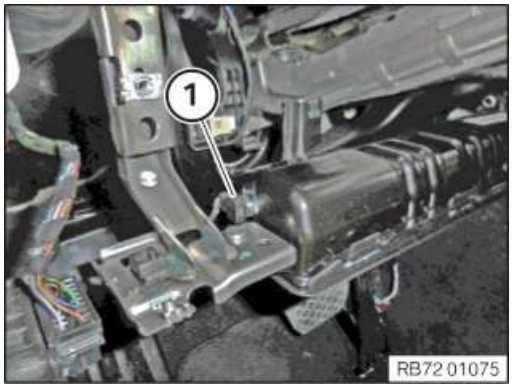
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WARNING

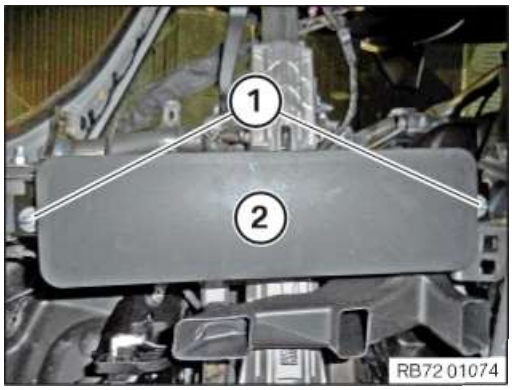
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

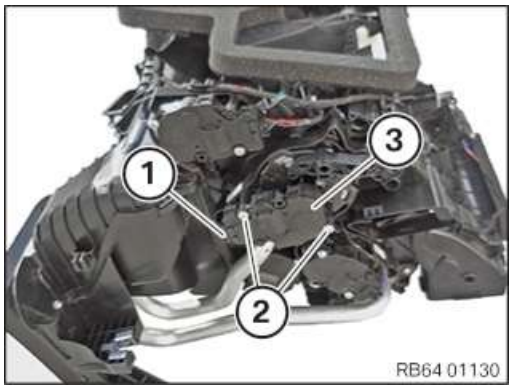
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MAIN WORK

7 – Remove the left air distribution flap motor (M21b)

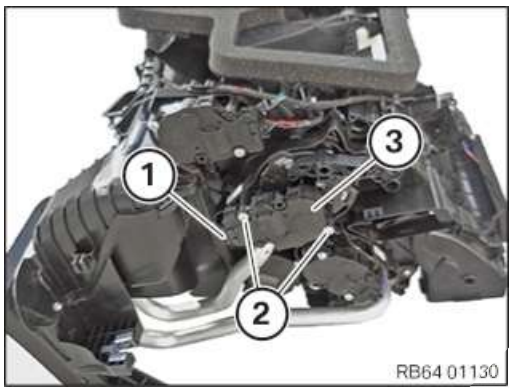
NOTICE

For a better overview the removed condition is shown here.



- Disconnect plug connection (1).
- Loosen screws (2).
- Remove the left-hand air distribution flap motor (3).

8 – Install the left air distribution flap motor (M21b)



- Position the air distribution flap motor on the left (3).
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

POSTPROCESSES

9 – Installing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

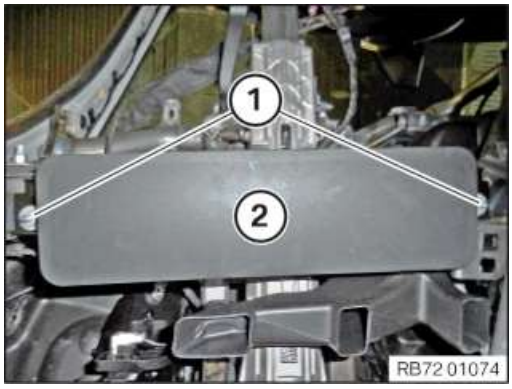
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WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

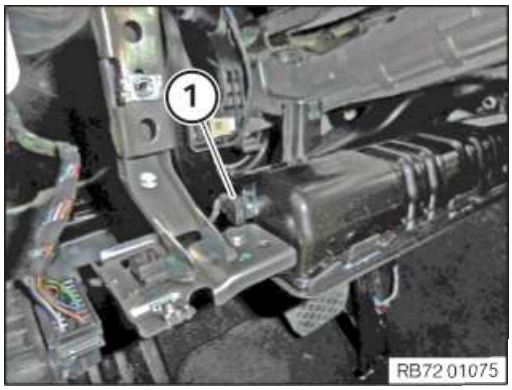
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

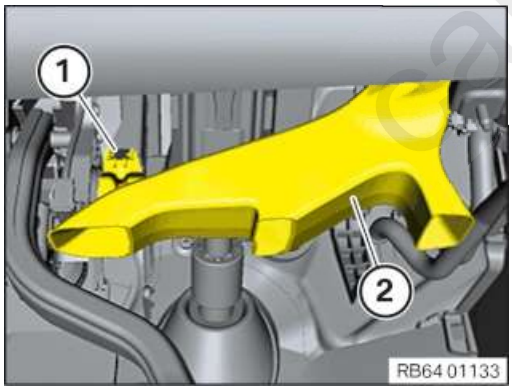
Knee airbag on support structure

Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

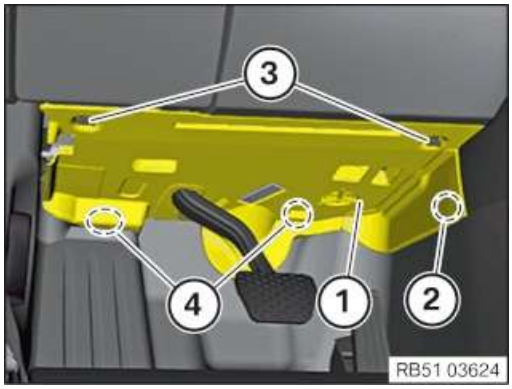
10 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

11 – Installing the trim panel for the pedal mechanism

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- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

12 – Connecting all battery earth leads



- See additional information.

13 – Activating the 48 V electrical system

Prerequisite

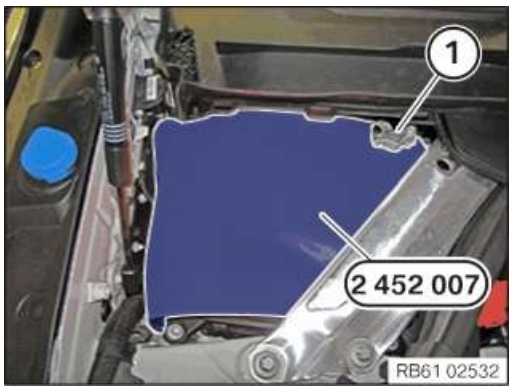
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

14 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 8

Screw		Tightening torque	1,2 Nm

Knee airbag on support structure Used in step 9

Nut		Tlghtening torque	8 Nm

Negative battery cable to 48-V battery Used in step 13

Nut M8		Tightening torque	19 Nm

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Overview of Special Tools

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	213

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	69

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	312
61 20 900 Disconnecting and connecting battery earth lead	312
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64 11 505 Replacing actuator drive for rear passenger compartment flap

TECHNICAL INFORMATION

After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Deactivating the 48 V electrical system

Prerequisite
Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

4 – Remove cupholder

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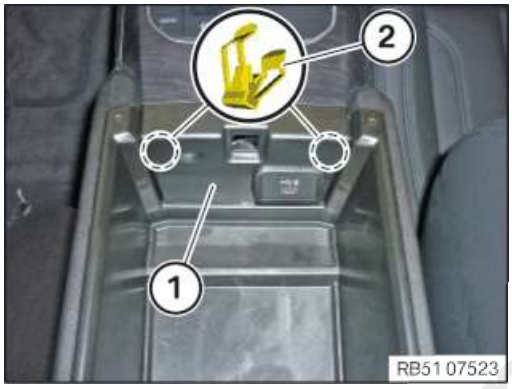


- Remove the insert (1).

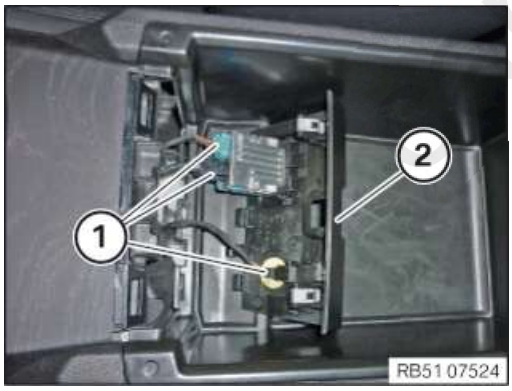


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

5 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

6 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



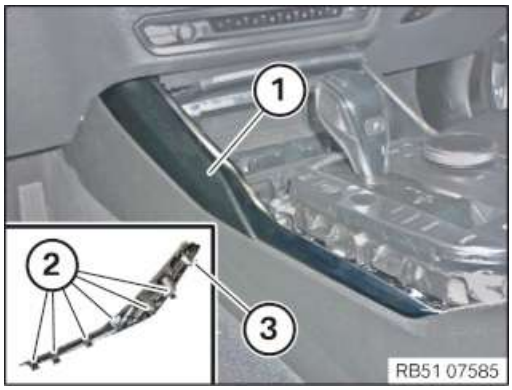
- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

7 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

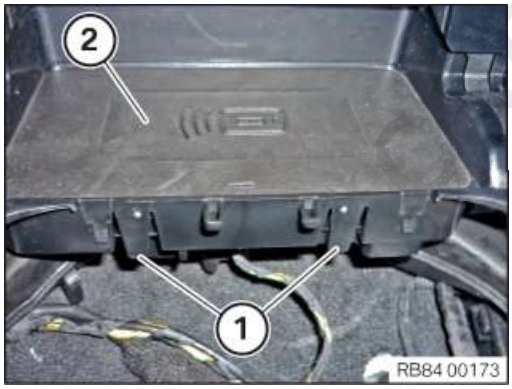
NOTICE

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

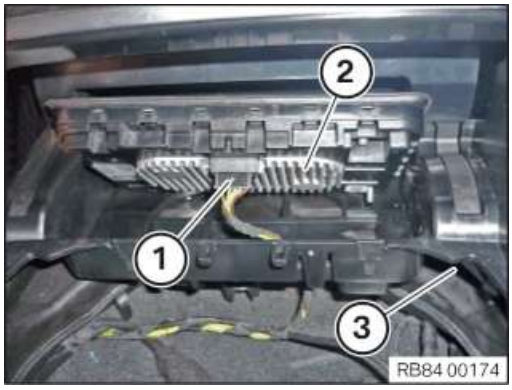


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

8 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

9 – Remove the operating facility in the centre console

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▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

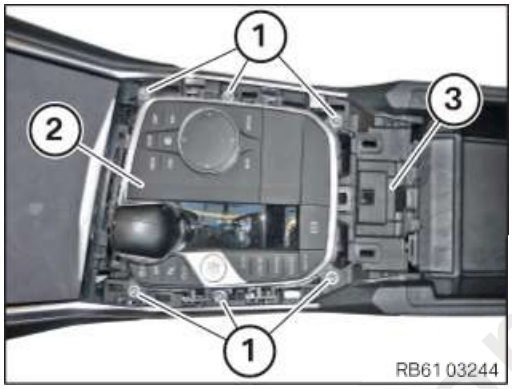
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

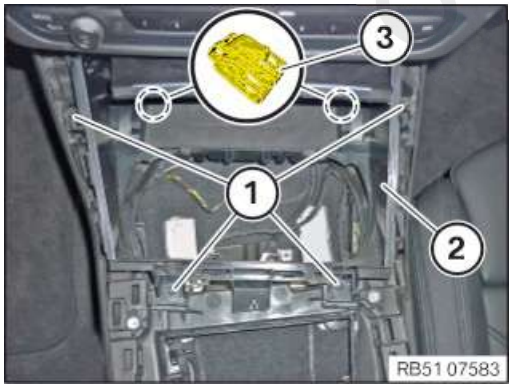


- See additional information.



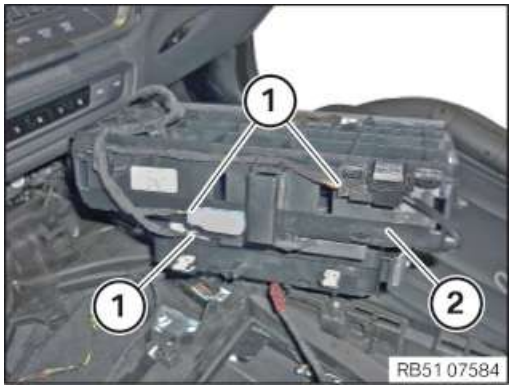
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

10 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

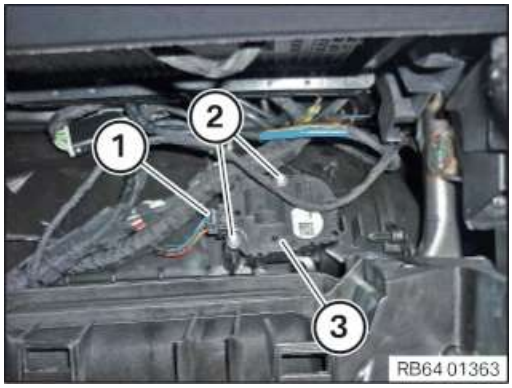
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- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

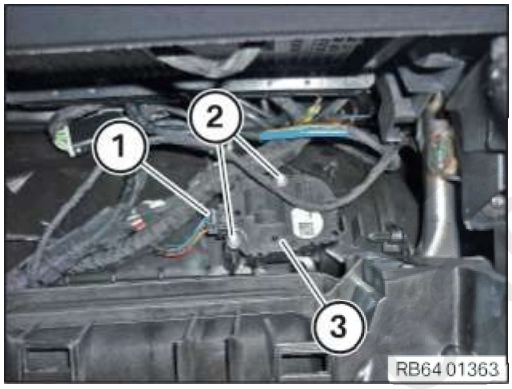
MAIN WORK

11 – Remove the rear compartment flap motor (M8)



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) and remove rear compartment flap motor(3).

12 – Install the rear compartment flap motor (M8)



- Install and correctly position rear compartment flap motor (3) .
- Tighten the screws (2).

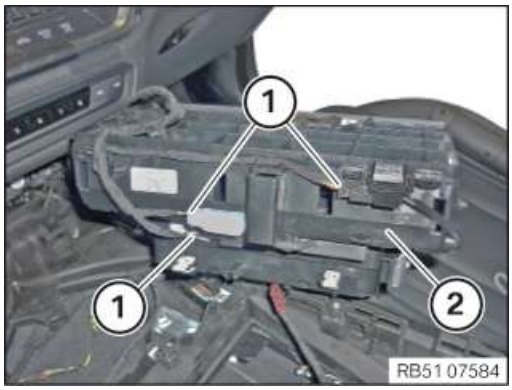
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

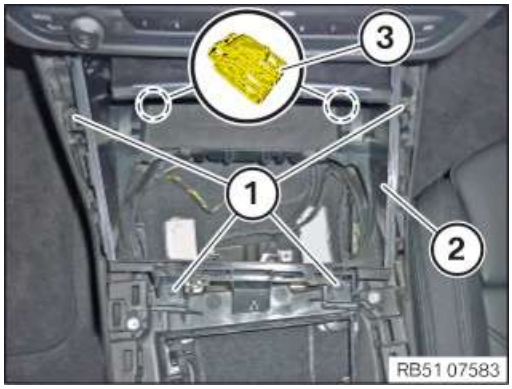
- Connect connectors (1) and lock.

POSTPROCESSES

13 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

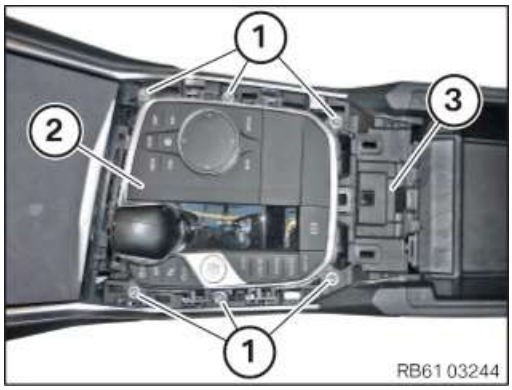


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

14 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



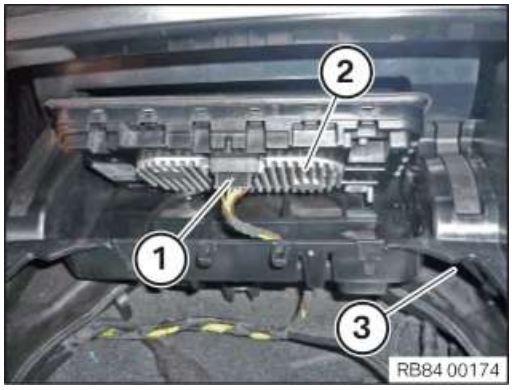
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

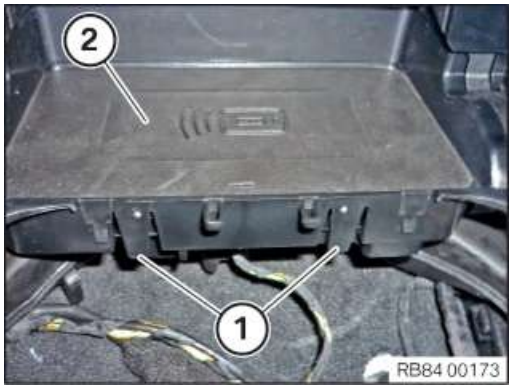
  The activation takes place automatically.

15 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).

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- Push the wireless charging tray (2) down.

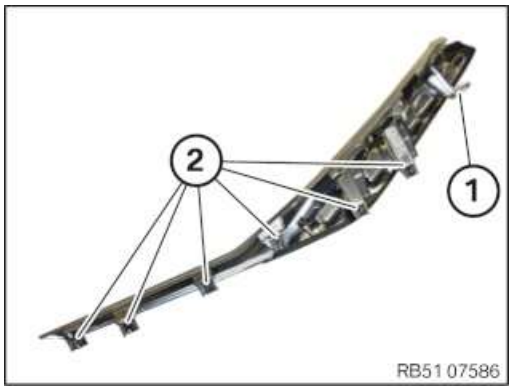
  The latch mechanisms (1) must engage correctly.

16 – Installing the decorative trim on the centre console on the left and right

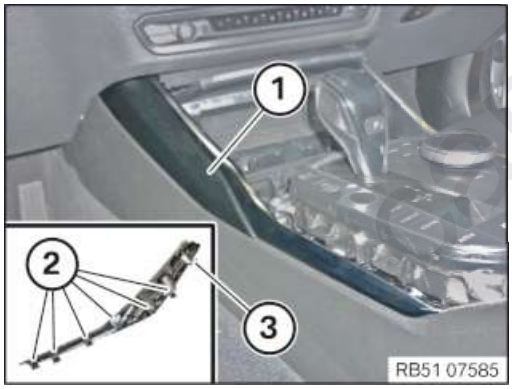
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

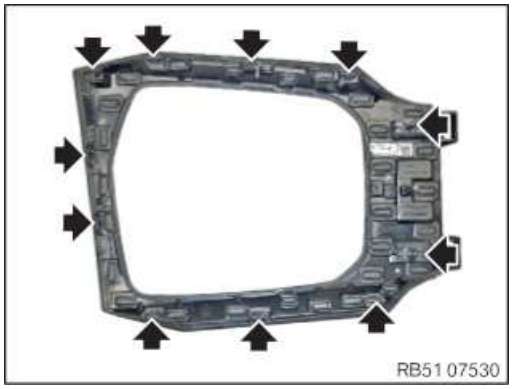
17 – Installing the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

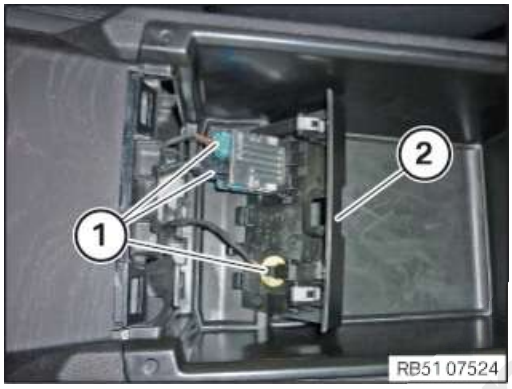


- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

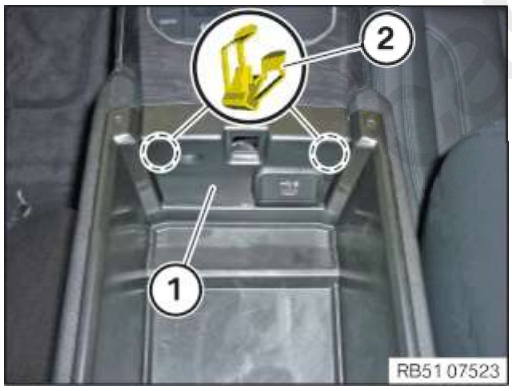


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

18 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

19 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

Cup holder to centre console

Oval-head screw		Tightening torque	1,8 Nm

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- Insert the insert (1).

20 – Connecting all battery earth leads



- See additional information.

21 – Activating the 48 V electrical system

Prerequisite

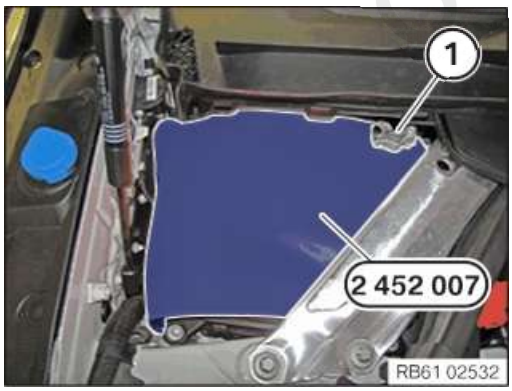
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

22 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 12

Screw		Tightening torque	1,2 Nm

Storage compartment in centre console Used in step 13

Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim Used in step 14

Screw		Tightening torque	1,8 Nm

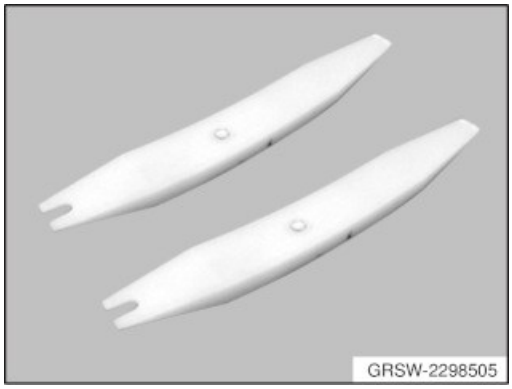
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Negative battery cable to 48-V battery			Used in step 1421
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 19
Oval-head screw		Tightening torque	1,8 Nm

Overview of Special Tools

2 298 505 Wedge



Common	Used in step 56
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	291421

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420

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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	391420
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
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61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 20 900 Disconnecting and connecting battery earth lead	391420
61 35 ... Notes on ESD protection (Electro Static Discharge)	

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64 11 508 Replacing actuator drive for right air distribution flap

TECHNICAL INFORMATION

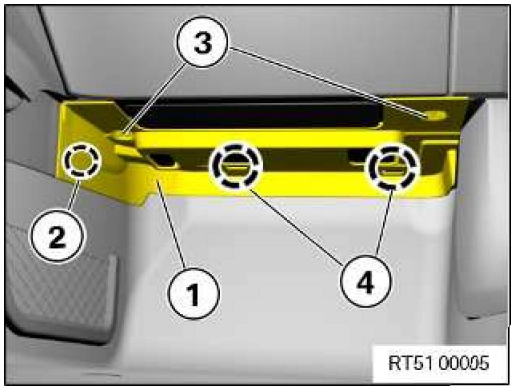
After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

3 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite
Ignition is switched off.

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WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

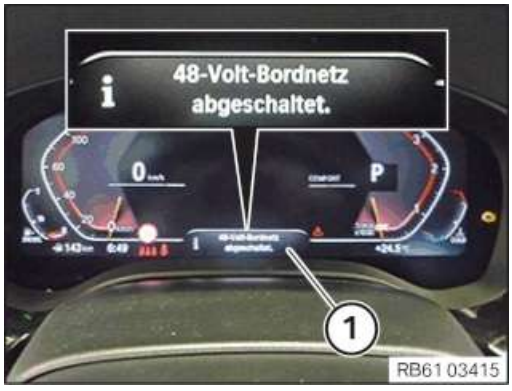
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.

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WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

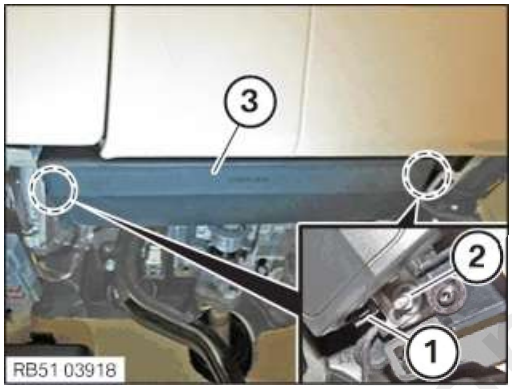
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

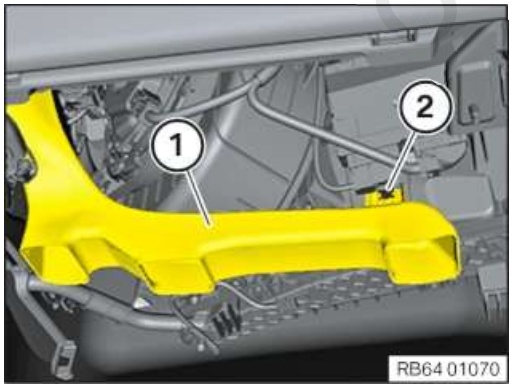


- See additional information.



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

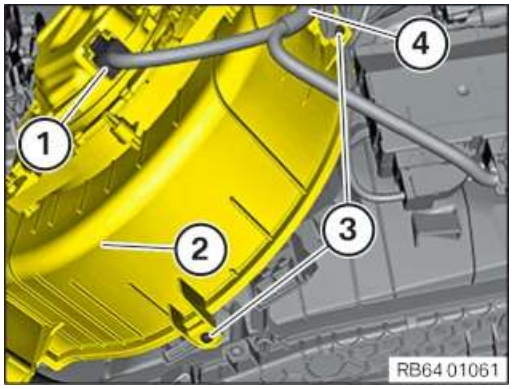
4 – Removing the right air duct



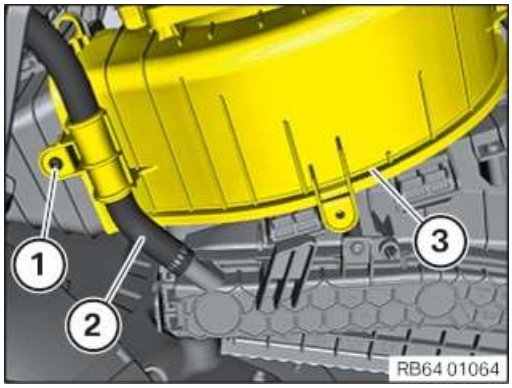
- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

5 – Remove the blower for the heating and air-conditioning unit

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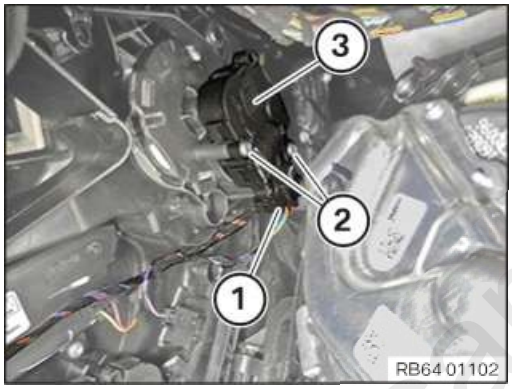
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

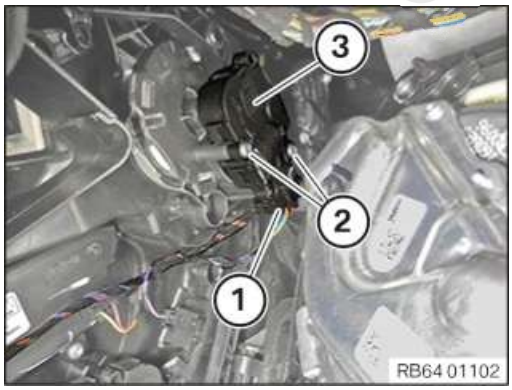
MAIN WORK

6 – Remove the air distribution flap motor on the right (M7a)



- Unlock plug connection (1) and disconnect.
- Loosen screws (2) and remove the air distribution flap motor (3) on the right.

7 – Install the air distribution flap motor on the right (M7a)



- Position the right-hand air distribution flap motor (3) correctly and tighten the screws (2).

Heater/air conditioner

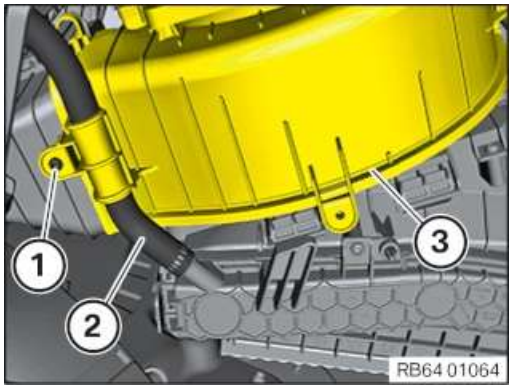
Screw		Tightening torque	1,2 Nm

- Connect and engage the connectors (1).

POSTPROCESSES

8 – Install the blower for the heating and air-conditioning unit

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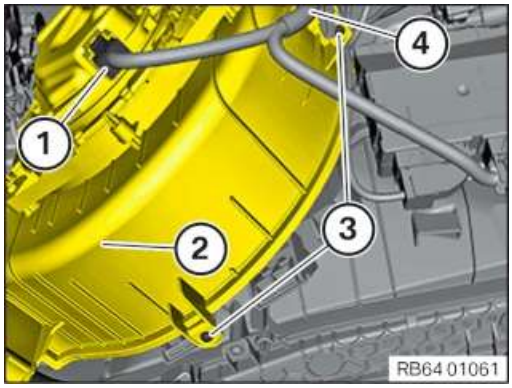


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



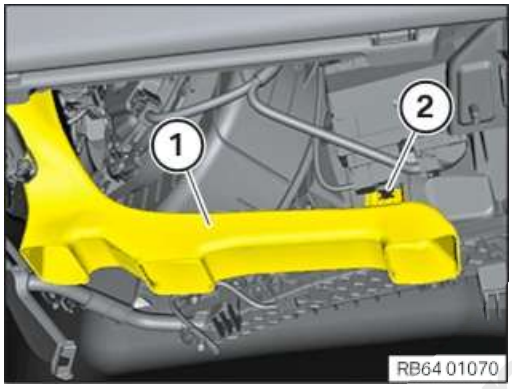
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

9 – Installing the air duct, right

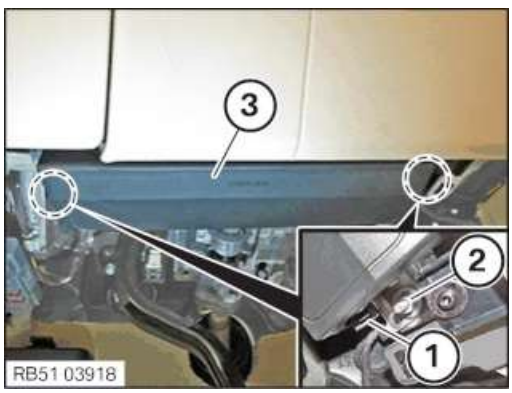


- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

10 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**

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- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

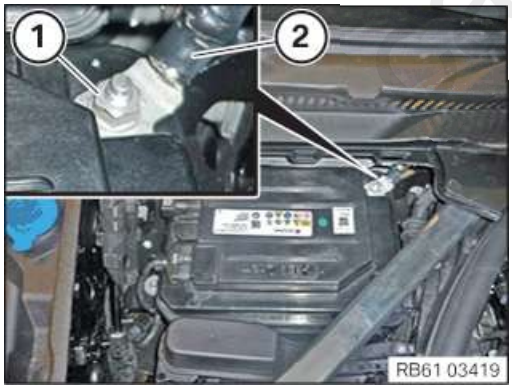
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

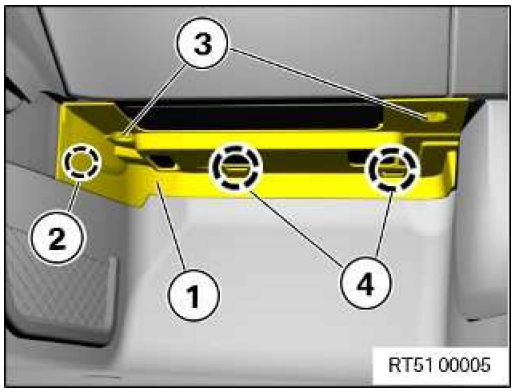


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

11 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

12 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 7
Screw		Tightening torque	1,2 Nm

Heater/air conditioner			Used in step 8
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 10
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 10
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**

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Notes on 48-V battery	310

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
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61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	310
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310
61 20 900 Disconnecting and connecting battery earth lead	310

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64 11 502 Replacing controller drive for rear blend air door

TECHNICAL INFORMATION

After the replacement, the controller drive must be reconfigured.
The address can only be configured with the diagnosis system.

PRELIMINARY WORK

1 – Moving to installation position of flap motors

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Installation position of flap motors

2 – Deactivating the 48 V electrical system

Prerequisite
Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

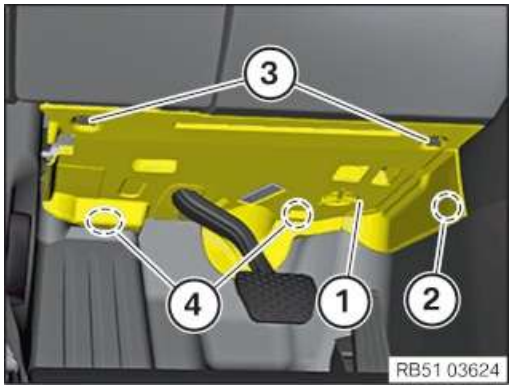
3 – Disconnecting all battery earth leads



- See additional information.

4 – Removing the trim panel for pedal mechanism

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- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

5 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

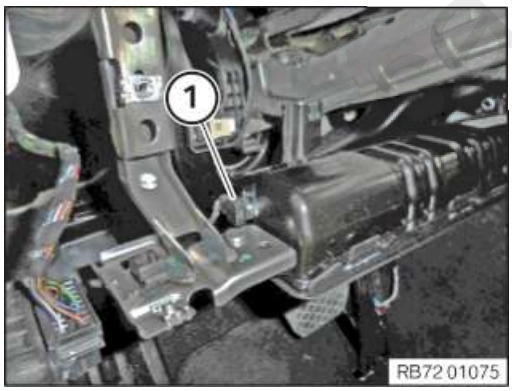
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

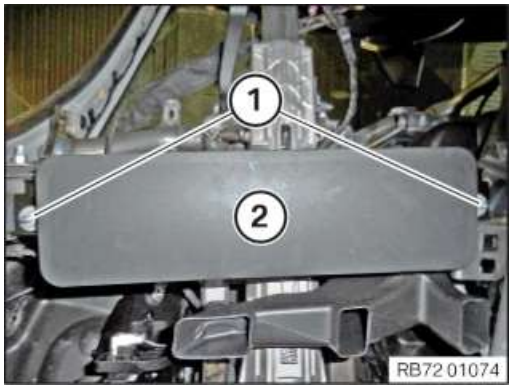
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



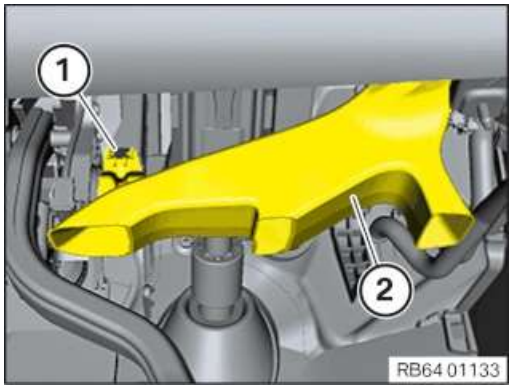
- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

6 – Remove left air duct

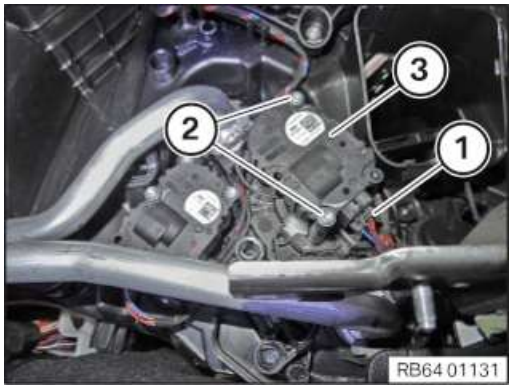
6 – Remove left air duct



- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

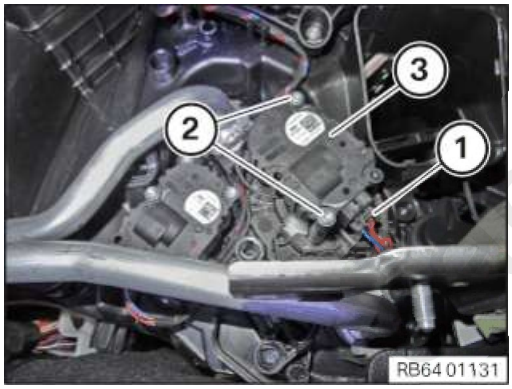
MAIN WORK

7 – Install the rear passenger compartment mixed air flap motor (M23b)



- Disconnect plug connection (1).
- Loosen screws (2).
- Remove mixed air flap motor rear (3).

8 – Install the rear passenger compartment mixed air flap motor (M23b)



- Position the rear mixed air flap motor (3) .
- Tighten the screws (2).

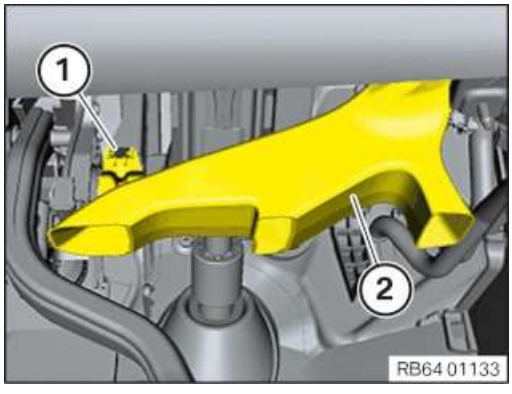
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

POSTPROCESSES

9 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

10 – Installing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

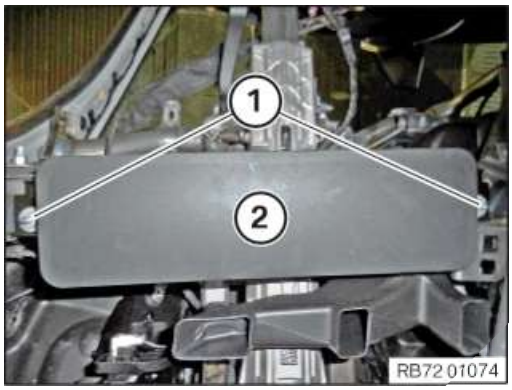
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

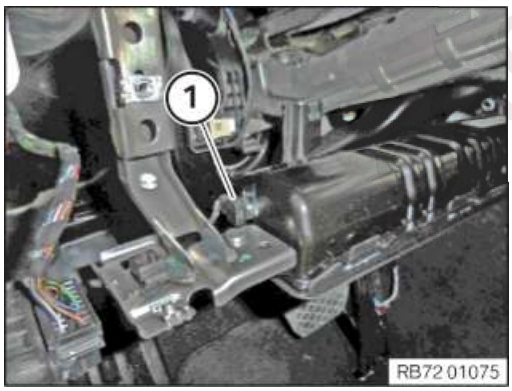
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

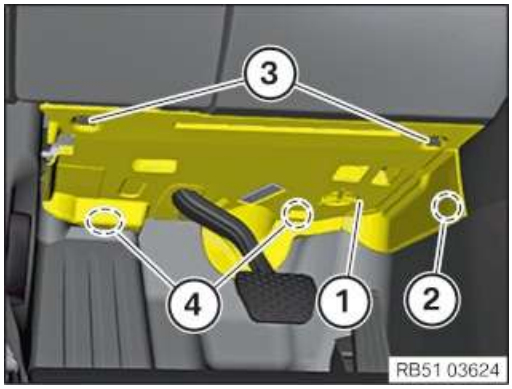
Knee airbag on support structure

Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

11 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

12 – Connecting all battery earth leads



- See additional information.

13 – Activating the 48 V electrical system

Prerequisite

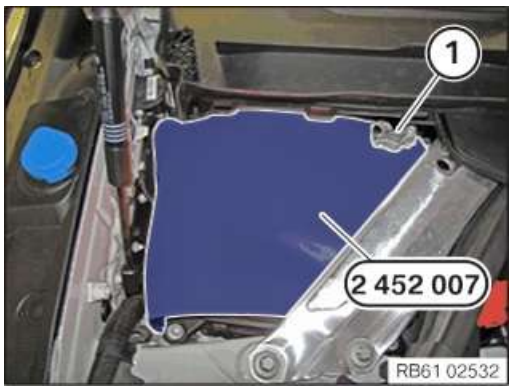
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

14 – Address the controller drive

- Carry out the service function as follows:
  - Body
  - Heating and air conditioning function
  - Flap motors
  - Address flap motors

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 8

Screw		Tightening torque	1,2 Nm

Knee airbag on support structure Used in step 10

Nut		Tlghtening torque	8 Nm

Negative battery cable to 48-V battery Used in step 13

Nut M8		Tightening torque	19 Nm

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Overview of Special Tools

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	213

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	510

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	312
61 20 900 Disconnecting and connecting battery earth lead	312
61 20 900 Disconnecting and connecting battery earth lead	312
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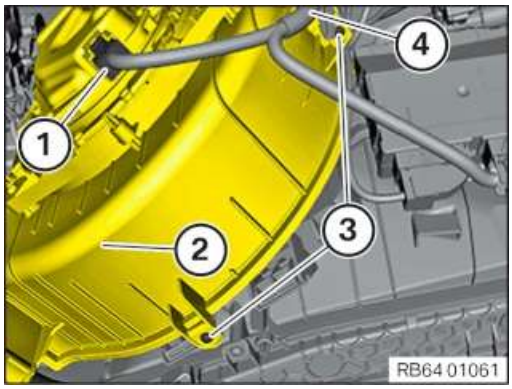
64 11 575 Replacing housing for heating and air-conditioning unit

Prerequisite

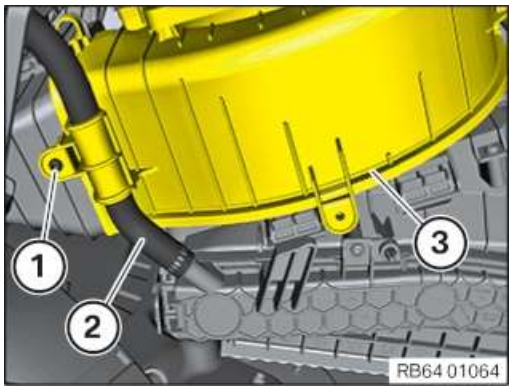
- Heating and air-conditioning unit removed.

1 – Remounting the electric auxiliary heater (heating and air-conditioning unit is removed)

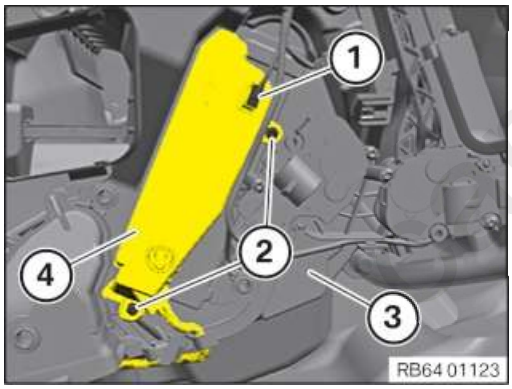
▸ **Remove the blower for the heating and air-conditioning unit**



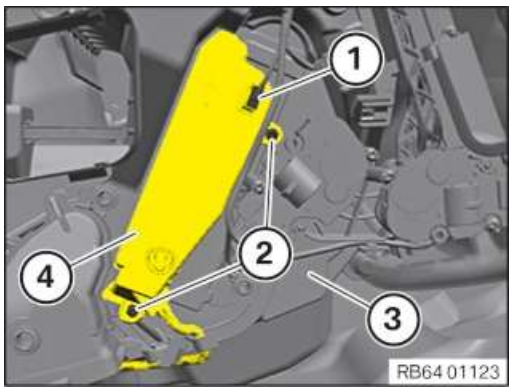
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).



- Unlock plug connection (1) and disconnect.
- Loosen screws (2).
- Remove the electric auxiliary heater (4) from the heating and air-conditioning unit (3).



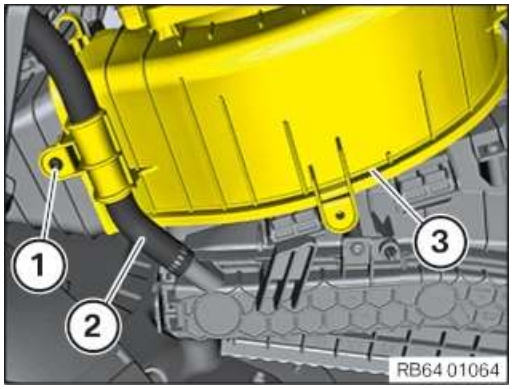
- Position electric auxiliary heater (4) correctly and insert in the heating and air-conditioning unit (3).
- Connect connectors (1) and lock.
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

▸ **Install the blower for the heating and air-conditioning unit**

mdiagn.com

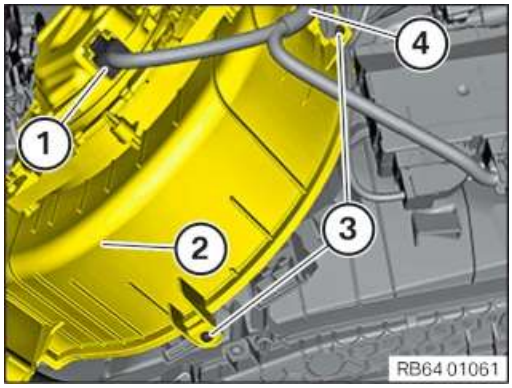


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

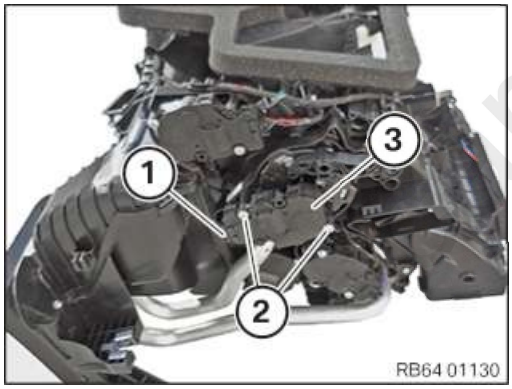
- Secure the cable clip (4) on the housing of the blower motor (2).

2 – Replacing the heat exchanger for heating system (heating and air-conditioning unit removed)

▸ **Remove the left air distribution flap motor (M21b)**

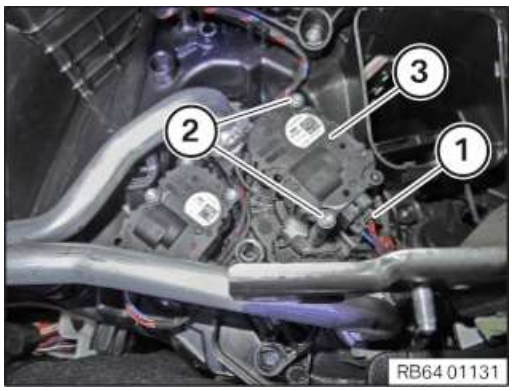
NOTICE

For a better overview the removed condition is shown here.



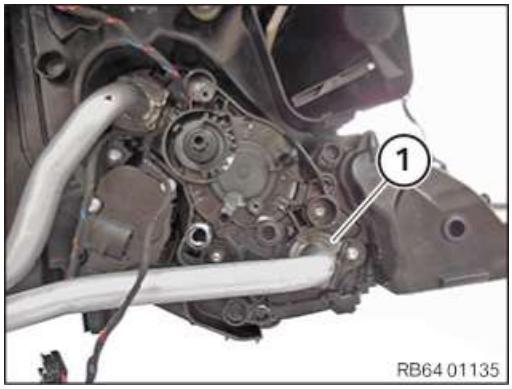
- Disconnect plug connection (1).
- Loosen screws (2).
- Remove the left-hand air distribution flap motor (3).

▸ **Install the rear passenger compartment mixed air flap motor (M23b)**

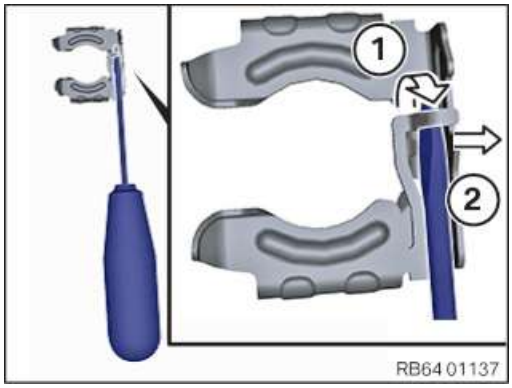


- Disconnect plug connection (1).
- Loosen screws (2).
- Remove mixed air flap motor rear (3).

▸ **Removing lower coolant pipe**

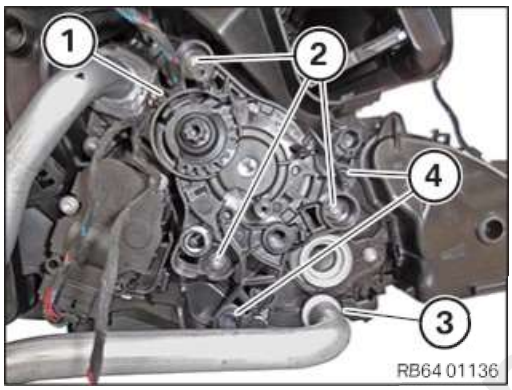


- Disassemble retaining clip (1) as shown in the next work step.



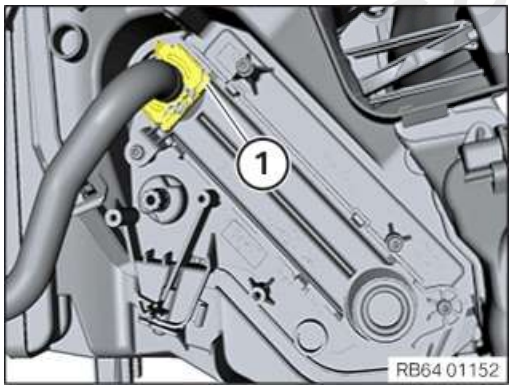
- Unlock the retaining clip in an upward direction (1), using a suitable slotted screwdriver.
- Push the retaining clip to the side (2) with a suitable screwdriver.
- Set the coolant pipe aside.

▸ **Removing kinematics, bottom left**

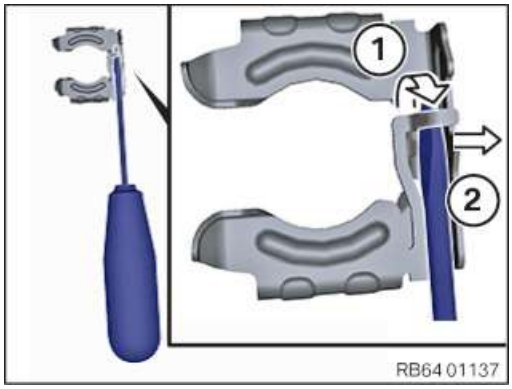


- Detach cable from the line routing (1).
- Slide coolant pipe (3) downwards.
- Disengage relay lever (4).
- Loosen screws (2).
- Remove kinematics.

▸ **Removing coolant pipe, top**

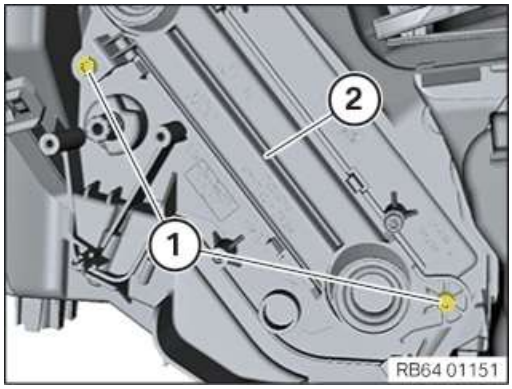


- Disassemble retaining clip (1) as described in the next step.



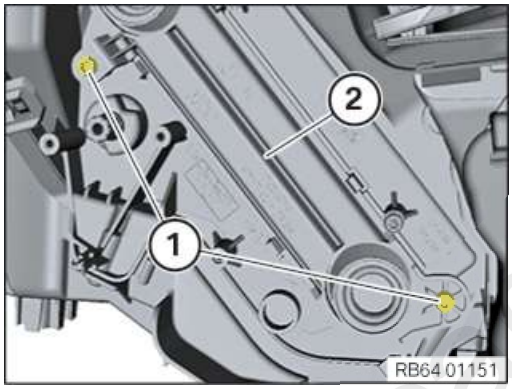
- Unlock the retaining clip in an upward direction, using a suitable screwdriver (1).
- Slide the retaining clip to the side with a suitable screwdriver (2).
- Set the coolant pipe aside.

▸ Remove heat exchanger



- Loosen screws (1).
- Remove the heat exchanger (2).

▸ Installing heat exchanger

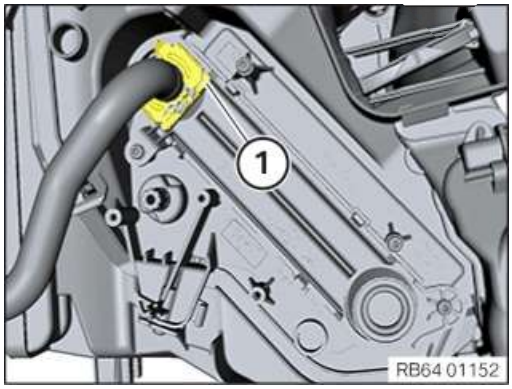


- Position heat exchanger (2).
- Tighten the screws (1).

Heater/air conditioner

Screw	Tightening torque	1,2 Nm

▸ Installing the top coolant pipe

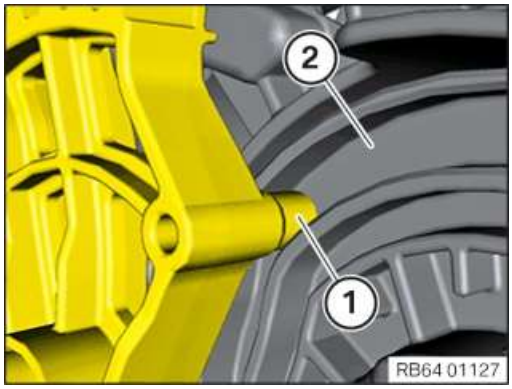


- Renew the sealing ring.

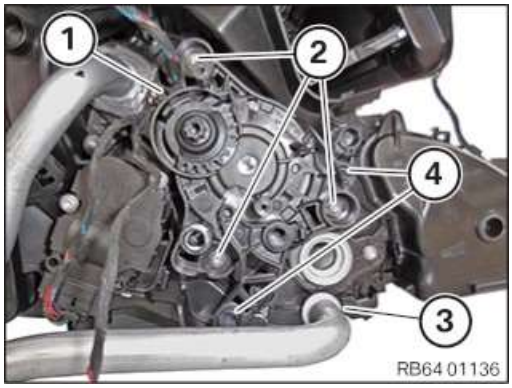
  Parts: Sealing ring
- Position the coolant pipe .
- Secure the coolant pipe with the retaining clip (1).
- Ensure that the coolant pipe is correctly positioned on the heat exchanger for heating system.

▸ Installing the lower left kinematics

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- Thread in and position kinematics (2).
- Make sure that the guide pin (1) is correctly positioned in the guide of the gate disc (2).



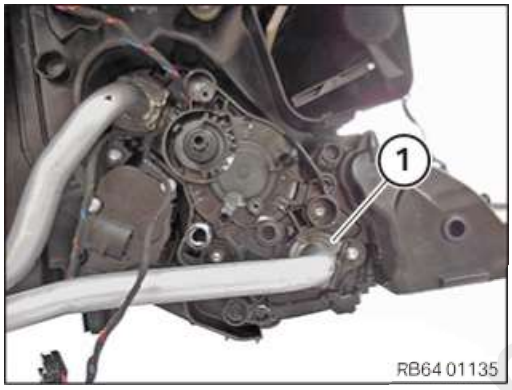
- Position kinematics.
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Engage the relay levers (4).
- Ensure that the relay levers (4) engage audibly.
- Position the coolant pipe (3).
- Attach the cable to the line routing (1).

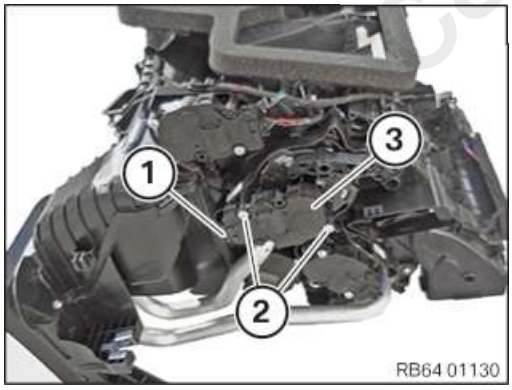
▸ **Installing the lower coolant pipe**



- Renew the sealing ring.

  Parts: Sealing ring
- Position the coolant pipe .
- Secure the coolant pipe with the retaining clip (1).
- Make sure that the coolant pipe is positioned correctly on heat exchanger for heating system.

▸ **Install the left air distribution flap motor (M21b)**



- Position the air distribution flap motor on the left (3).
- Tighten down screws (2).

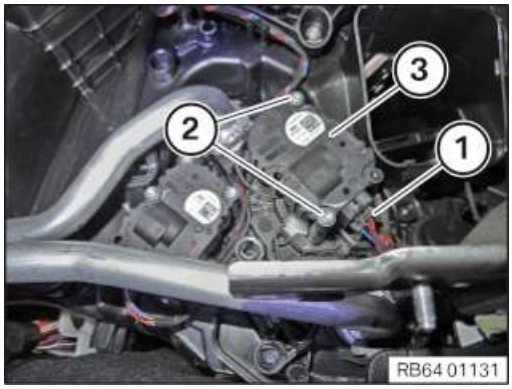
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

▸ **Install the rear passenger compartment mixed air flap motor (M23b)**

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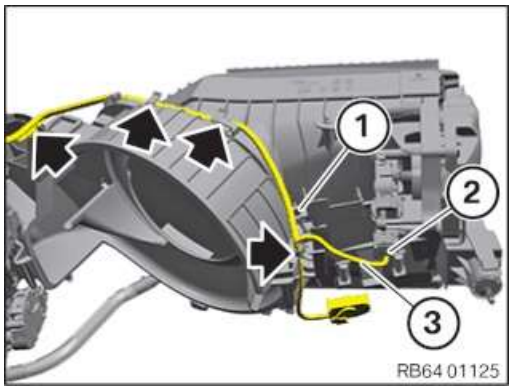
- Position the rear mixed air flap motor (3) .
- Tighten the screws (2).

Heater/air conditioner

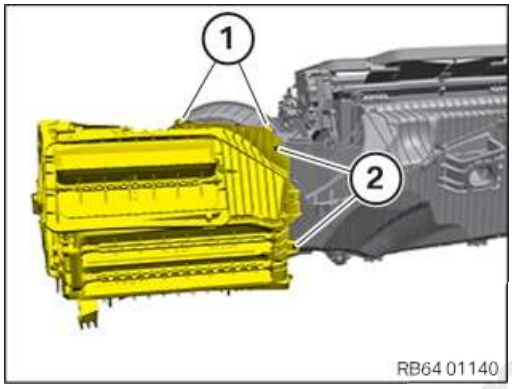
Screw		Tightening torque	1,2 Nm

- Connect connectors (1) and lock.

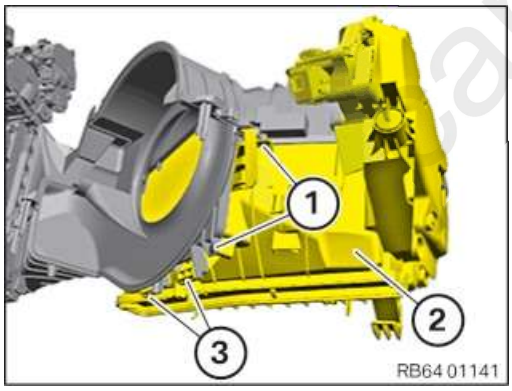
3 – Remounting the evaporator



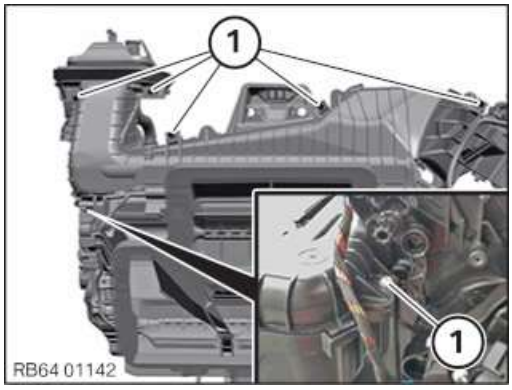
- Loosen screw (1).
- Unlock plug connection (2) and disconnect.
- Remove the cable (3) from the brackets (arrows) and place to one side.



- Disengage the latch mechanisms (1).
- Loosen screws (2).

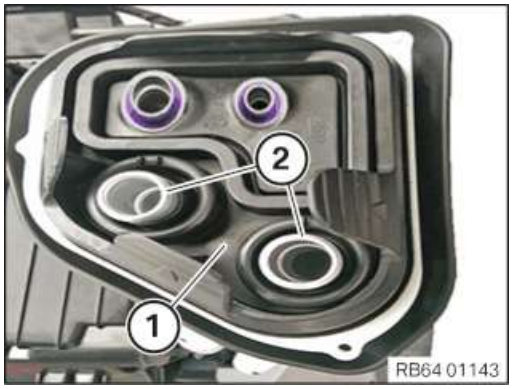


- Loosen screws (1).
- Slightly tilt the housing (2) and detach it from the hook (3).

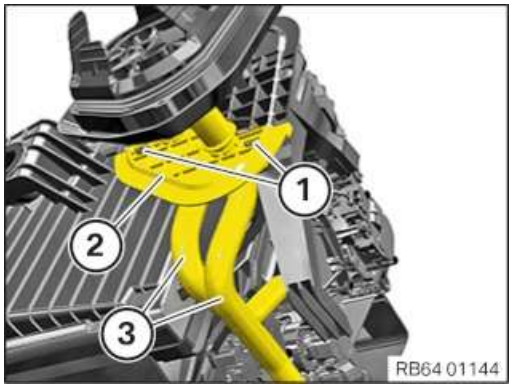


- Loosen screws (1).

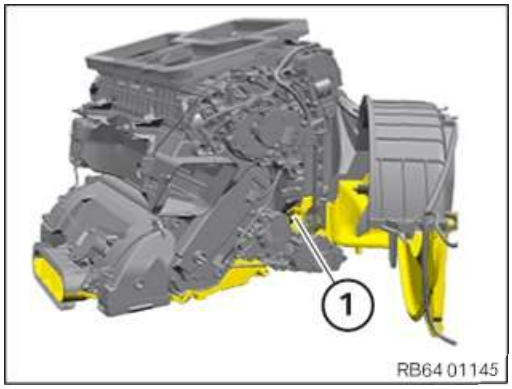
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- Guide out the seal (1) via the lines (2) and remove completely.



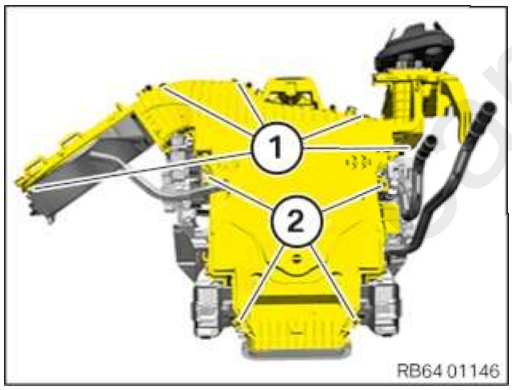
- Disengage the latch mechanisms (1) and remove the cover (2).
- Turn the coolant pipe (3) downwards.



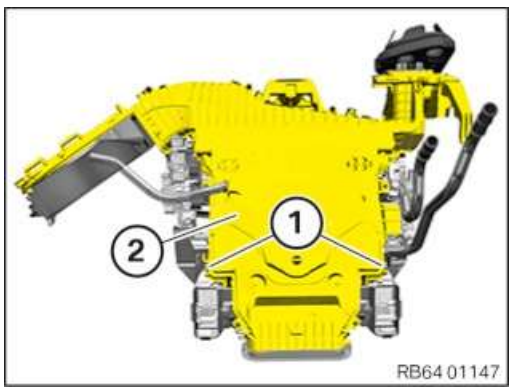
NOTICE

The operations shown only for one side must be carried out on both sides.

- Release latch mechanism (1).

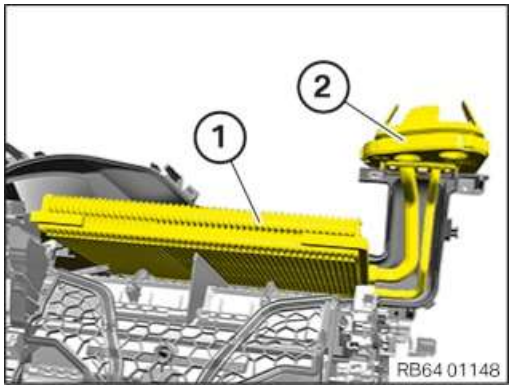


- Turn the heating and air-conditioning unit around.
- Loosen the latch mechanisms (1).
- Loosen screws (2).

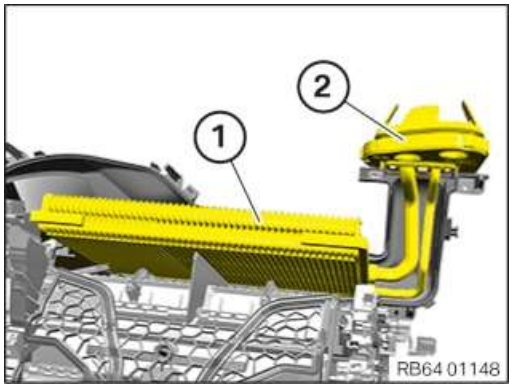


- Unlock the latch mechanisms (1) and feed out the housing (2) and remove it.

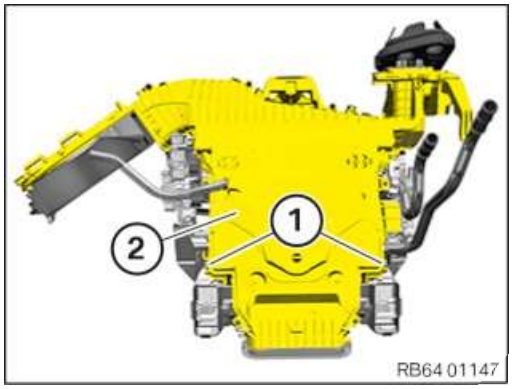
erdiagn.com



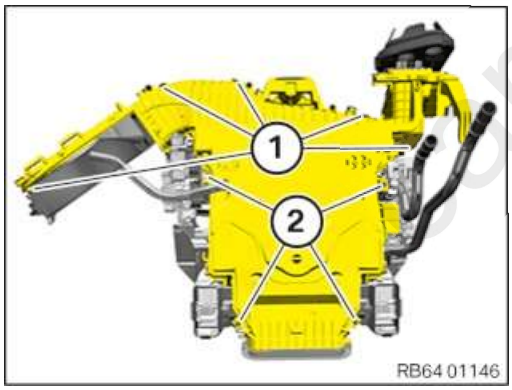
- Remove the evaporator (1) with the seal (2) from the distributor housing (3).



- Insert the evaporator (1) in the distributor housing (3) correctly.
- Make sure that the seal (2) is positioned correctly.



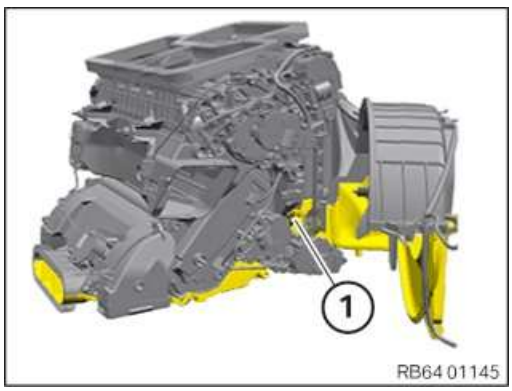
- Guide in housing (2) and engage it in latch mechanisms (1).



- Engage the latch mechanisms (1).
- Tighten the screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm



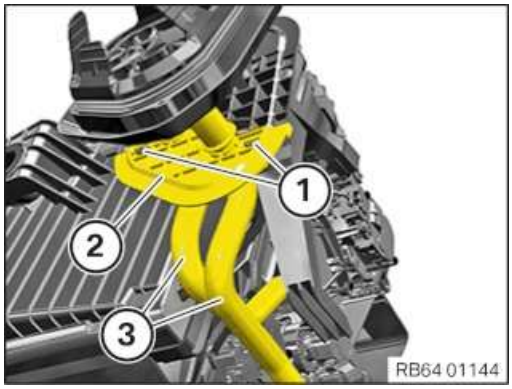
- Turn the heating and air-conditioning unit around.

NOTICE

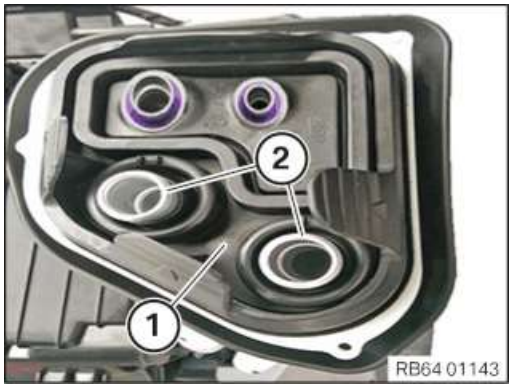
The operations shown only for one side must be carried out on both sides.

- Engage latch mechanism (1).

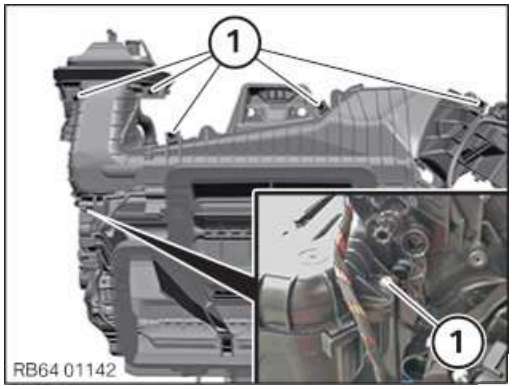
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- Turn coolant pipes (3) to the front and position them correctly.
- Engage the cover (2) at the latch mechanisms (1).



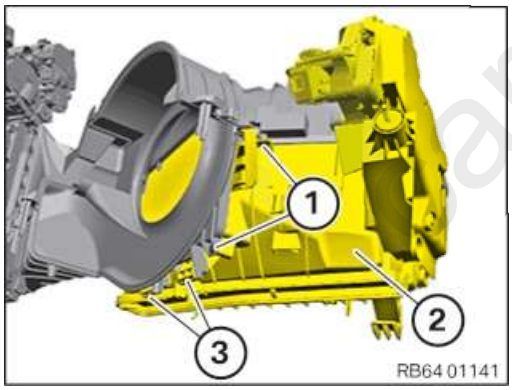
- Guide in seals (1) completely over the lines (2) and position them correctly.



- Tighten the screws (1).

Heater/air conditioner

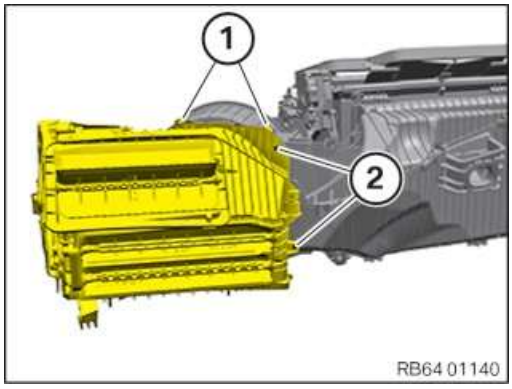
Screw		Tightening torque	1,2 Nm



- Hook housing (2) onto the hook (3) and position correctly.
- Tighten the screws (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

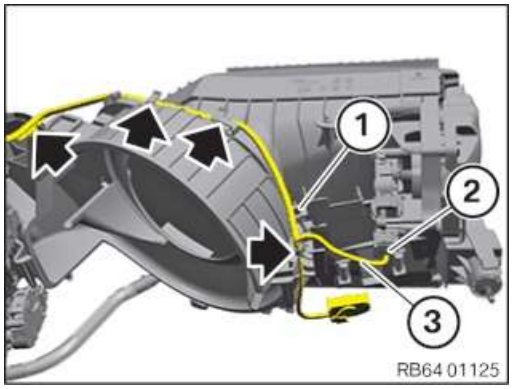


- Engage the latch mechanisms (1).
- Tighten the screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

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- Engage cable (3) at the latch mechanisms (arrows).
- Connect connectors (2) and lock.
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 123

Screw		Tightening torque	1,2 Nm

Heater/air conditioner Used in step 2

Screw		Tightening torque	1,2 Nm

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64 11 520 Replacing left footwell temperature sensor

PRELIMINARY WORK

1 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

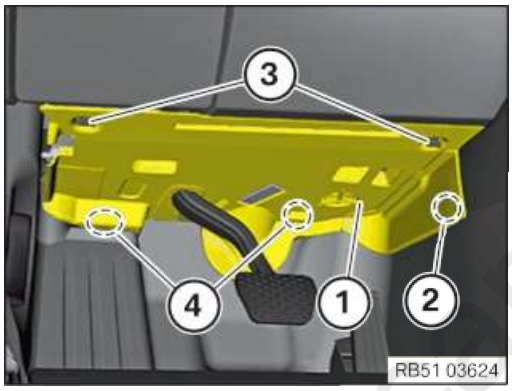
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



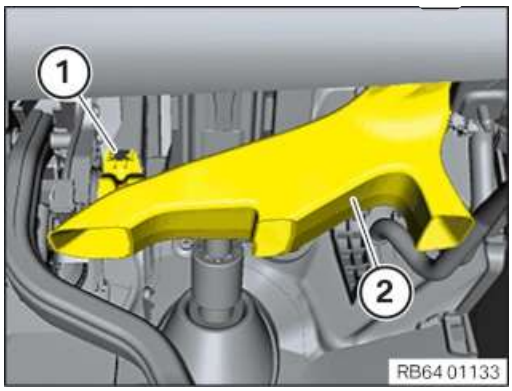
- See additional information.

3 – Removing the trim panel for pedal mechanism



- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

4 – Remove left air duct



- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

5 – Remove cupholder

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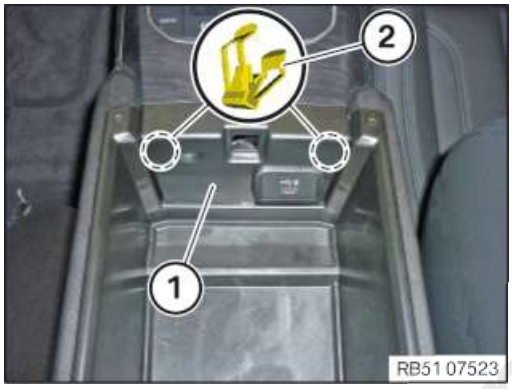


- Remove the insert (1).

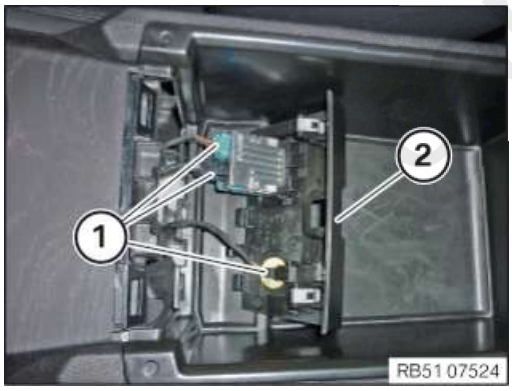


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

6 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

7 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



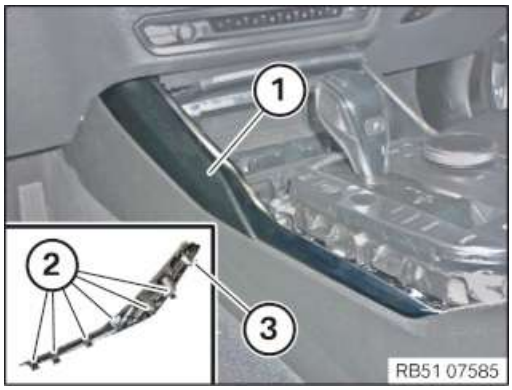
- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

8 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

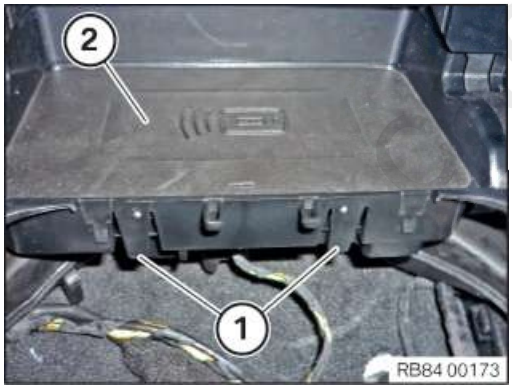
NOTICE

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

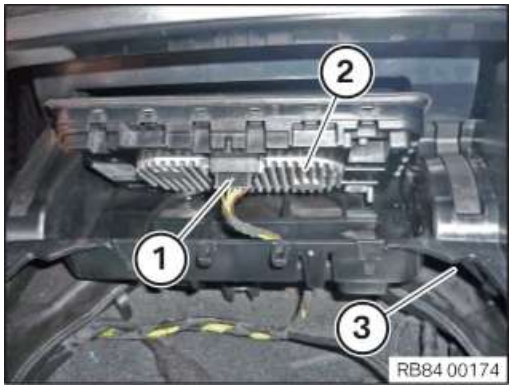


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

9 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

10 – Remove the operating facility in the centre console

.com

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

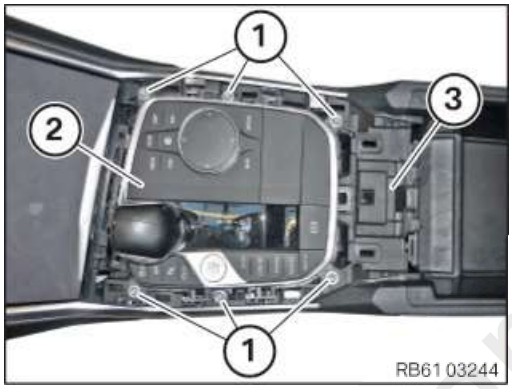
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

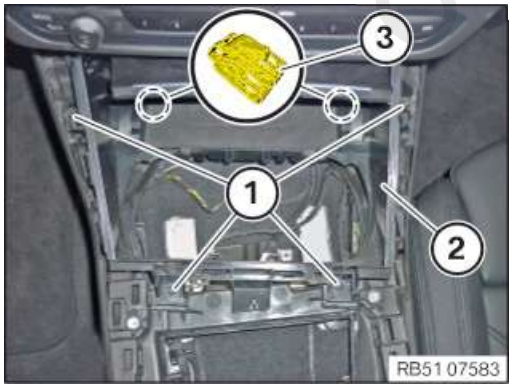


- See additional information.



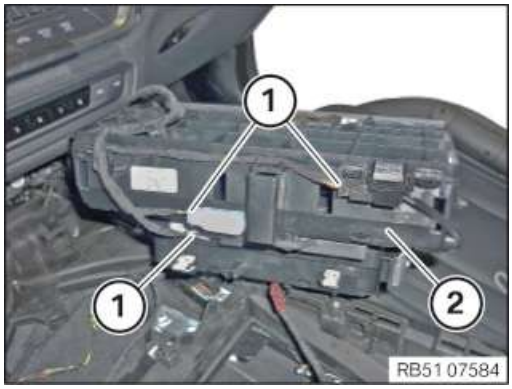
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

11 – Removing the storage compartment in the front centre console



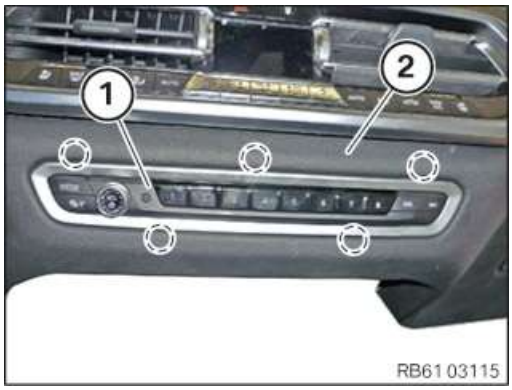
- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

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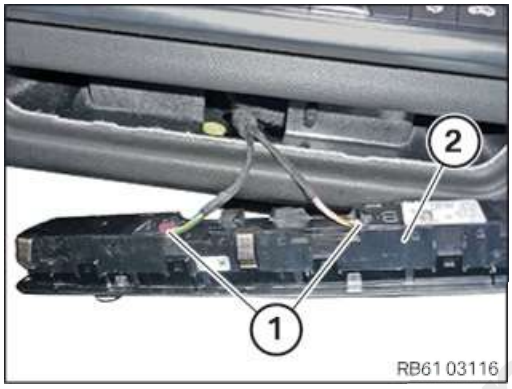


- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

12 – Remove the audio operating unit



- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



- Disconnect plug connections (1) and remove the audio operating unit (2).

13 – Remove Head Unit High (HU-H)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

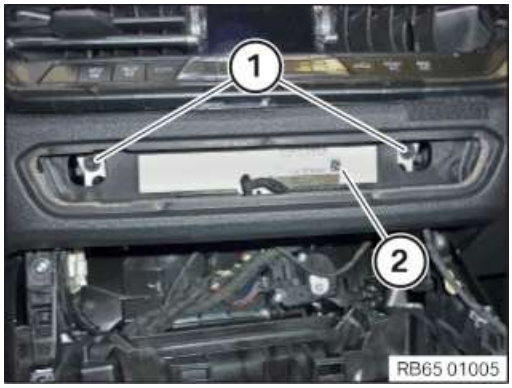
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RISK OF DAMAGE

Damage to the head unit.

The hard disk of the head unit can be damaged by vibration.

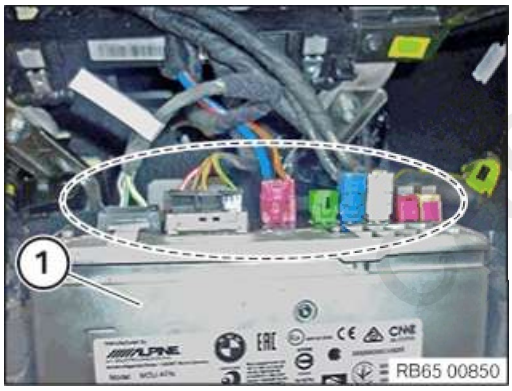
- Carry out mechanical work on the head unit and adjacent components with care.



- Release screws (1) on the head unit (2).
- Slightly pull head unit (2) to the rear and tilt downwards.

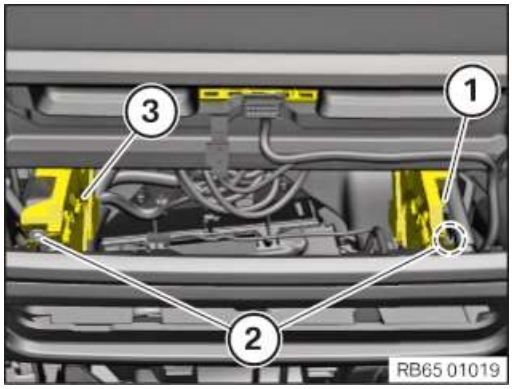


- Feed out the head unit (1) through the marks as illustrated, until the connectors behind are accessible.



- Unlock and disconnect all the plug connections in the marked area in the correct order.
- Remove headunit (1).

14 – Remove holder for the head unit

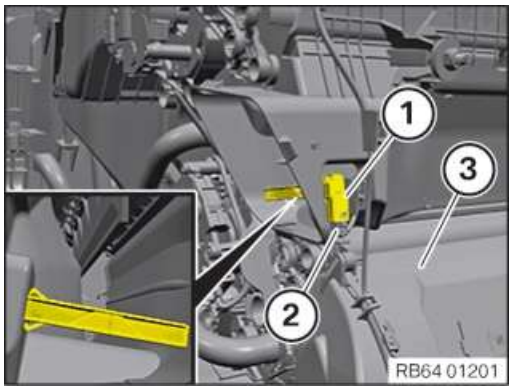


- Release cable clip (1) and set aside.
- Loosen screws (2).
- Screw together the holder (3) for the head unit and feed out towards the bottom.

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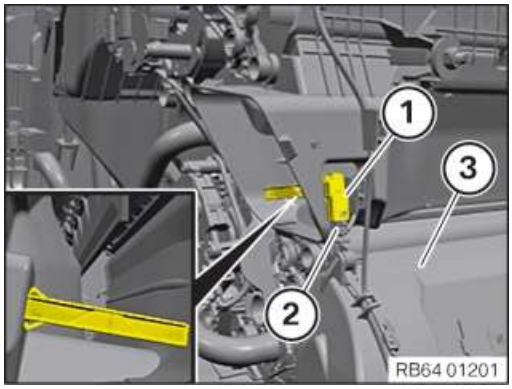
MAIN WORK

15 – Removing the left footwell temperature sensor (B184a)



- Disconnect plug connection (2).
- Disengage and remove the left footwell temperature sensor (1) from the heating and air-conditioning unit (3).

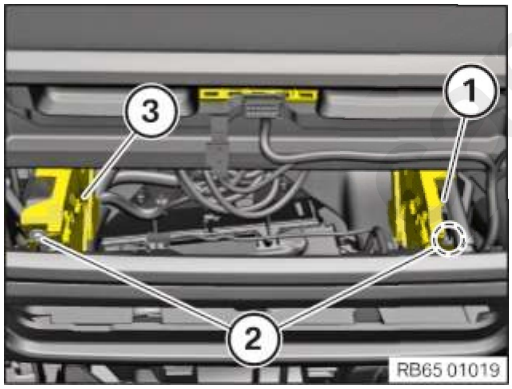
16 – Installing left footwell temperature sensor (B184a)



- Insert and lock the footwell temperature sensor (1) in the heating and air-conditioning unit (3).
- Connect connector (2).

POSTPROCESSES

17 – Install holder for the head unit



- Slightly slide in the holder (3) for the head unit together, feed in from the bottom and position correctly.
- Tighten the screws (2).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

- Secure the cable clips (1).

18 – Install the Head Unit High (HU-H)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

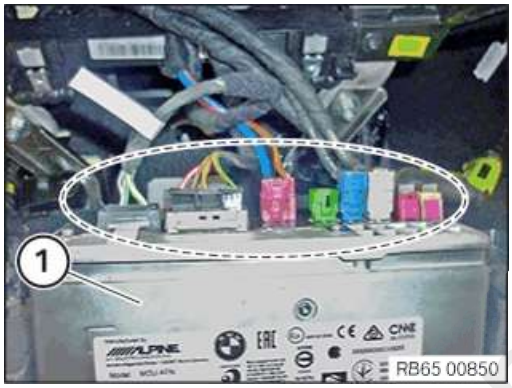
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Damage to the head unit.

The hard disk of the head unit can be damaged by vibration.

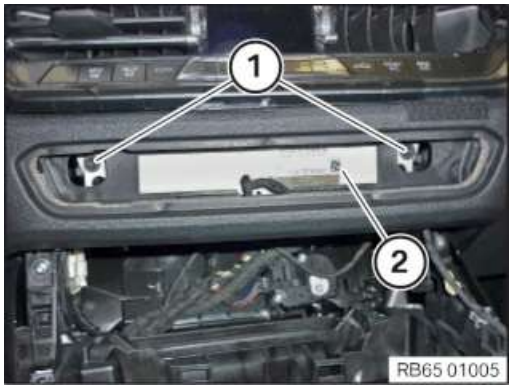
- Carry out mechanical work on the head unit and adjacent components with care.



- Position head unit (1).
- Connect and lock all connectors in the marked area in a correct assembly sequence.



- Feed in the head unit (1) through the marked areas upwards.

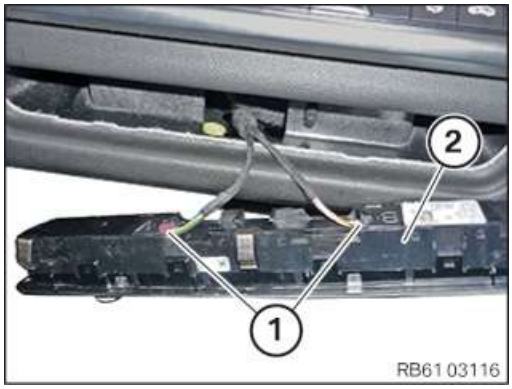


- Slide head unit (2) slightly forward and position it correctly.
- Tighten screws (1) on the head unit (2).

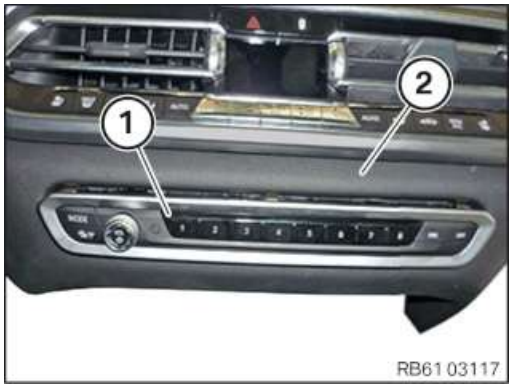
Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

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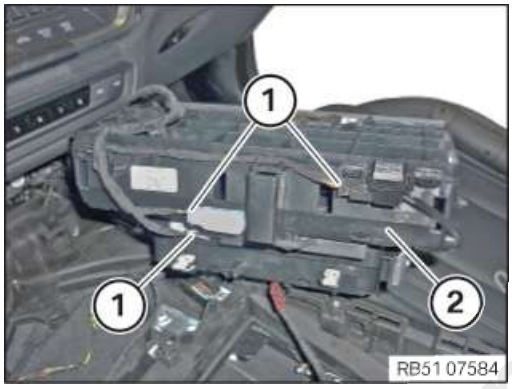


- Connect the connector (1) to the audio operating unit (2).

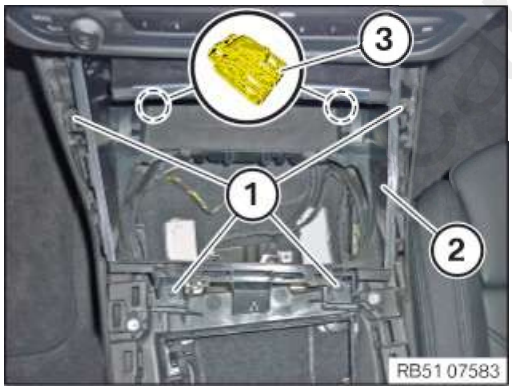


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

20 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

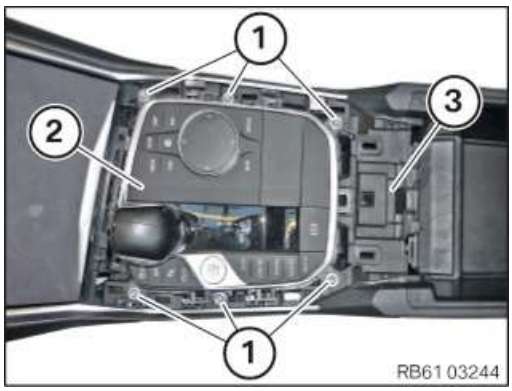


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

21 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

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▶ **Connecting all battery earth leads**



- See additional information.

▶ **Activating the 48 V electrical system**

Prerequisite

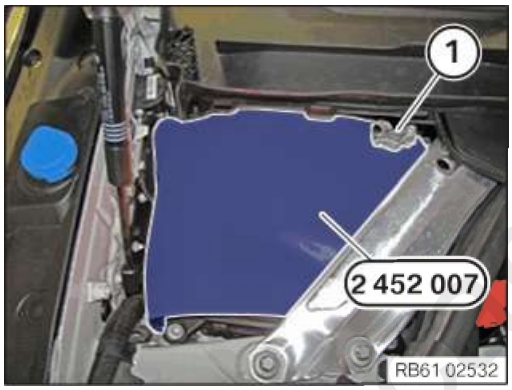
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

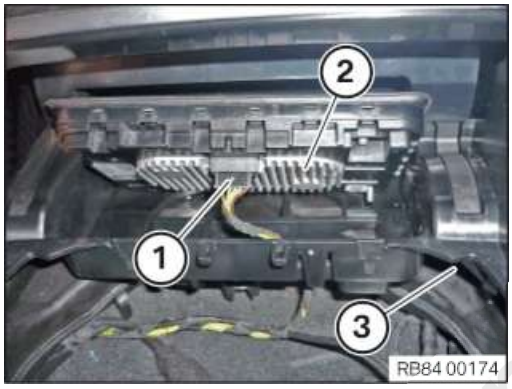


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).

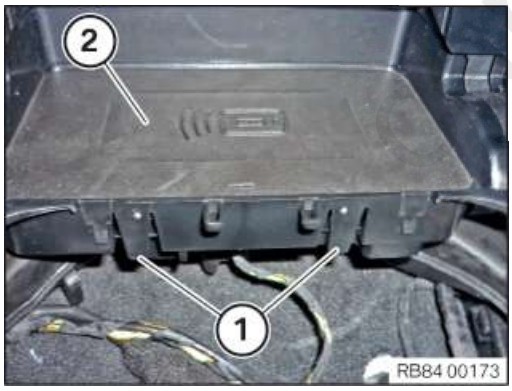


- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

22 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.
  The latch mechanisms (1) must engage correctly.

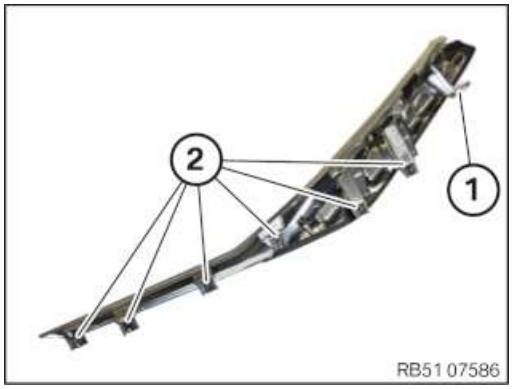
23 – Installing the decorative trim on the centre console on the left and right

▸ **Installing the decorative trim on the centre console**

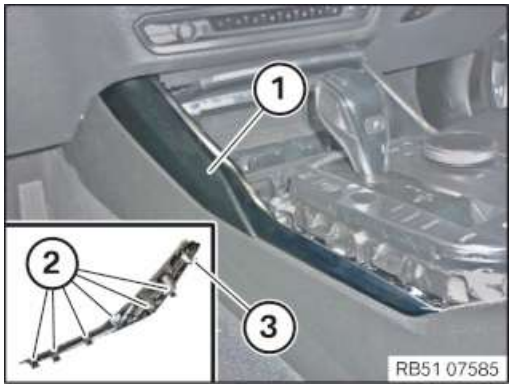
NOTICE

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

.com



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

24 – Installing the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



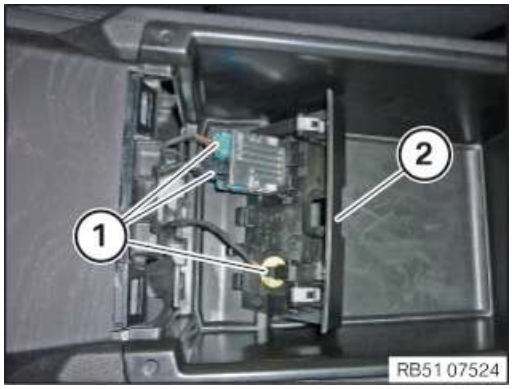
- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .



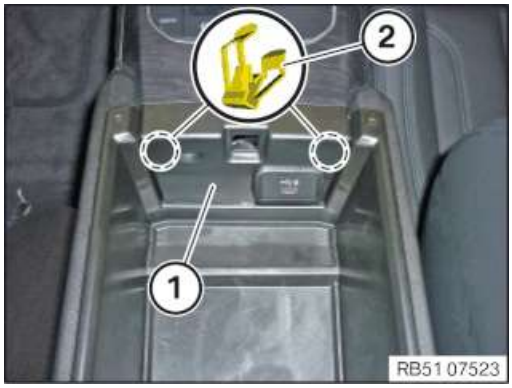
- Correctly position the centre console trim (1) and engage at the latch mechanisms.

25 – Installing the trim in the storage compartment of the centre armrest

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- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

26 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

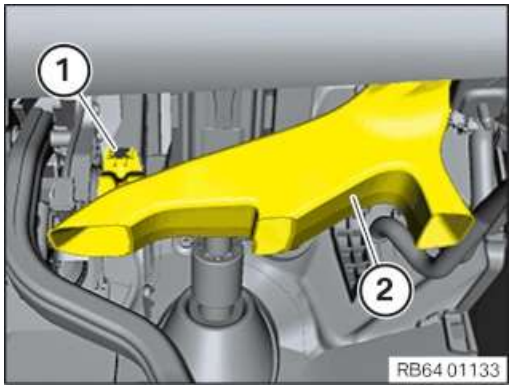
Cup holder to centre console

Oval-head screw	Tightening torque	1,8 Nm



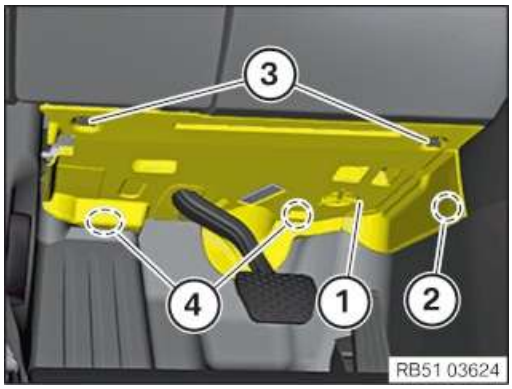
- Insert the insert (1).

27 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

28 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

29 – Connecting all battery earth leads



- See additional information.

30 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

31 – Initialising component protection

TECHNICAL INFORMATION

After renewal of the BDC or the head unit **or** after installation of a **used** head unit, the component protection must be reinitialised.

- During **renewal** of BDC or the head unit , reinitialize the component protection with the diagnosis system as follows:
  - The BDC or the head unit under: Mark "Vehicle management / control unit replacement / after the exchange" as exchanged.
  - Determine the measures plan and execute.
  - Observe instructions without fail!
- When installing a **used head unit** , reinitialize as follows:
  - contact Technical Support
  - Then, reinitialize the component protection in **workshop system** via **immediate measure** "Initialisation of component protection of head unit (HU)" in the "Additional software" tab.
  - Observe instructions without fail!

Additional Information

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Overview of Tightening Torques

Head unit to holder / holder to support			Used in step 1718
Screw		Tightening torque	1,8 Nm

Storage compartment in centre console			Used in step 20
Oval-head screw		Tightening torque	1,8 Nm

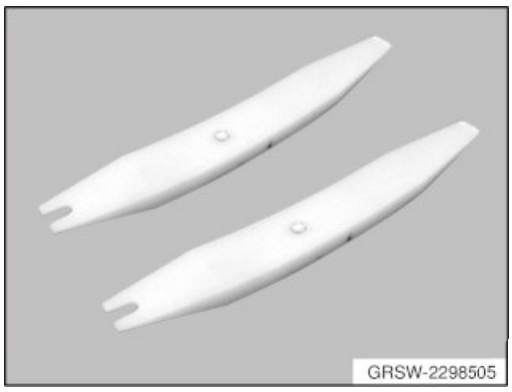
Gear selector switch to centre console trim			Used in step 21
Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery			Used in step 2130
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 26
Oval-head screw		Tightening torque	1,8 Nm

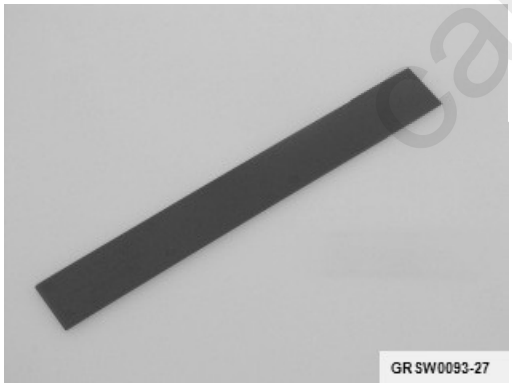
Overview of Special Tools

2 298 505 Wedge



Common	Used in step 67
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 496 571 (00 9 327) Wedge



Common	Used in step 12
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	1102130

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129

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61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129

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61 35 ... Notes on ESD protection (Electro Static Discharge) 1318
61 35 ... Notes on ESD protection (Electro Static Discharge) 1318

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64 11 896 Replacing rear passenger compartment control panel

PRELIMINARY WORK

1 – Removing the rear centre console trim

RISK OF DAMAGE

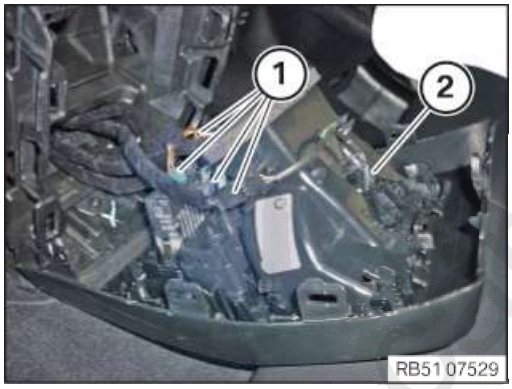
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.

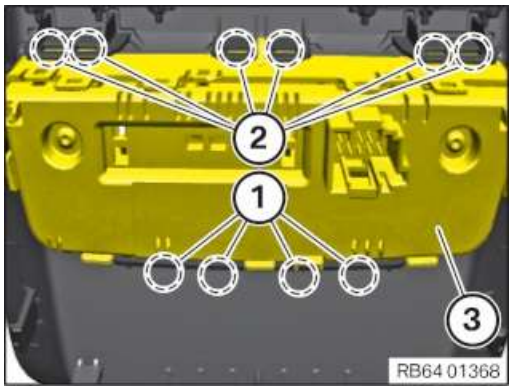


- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

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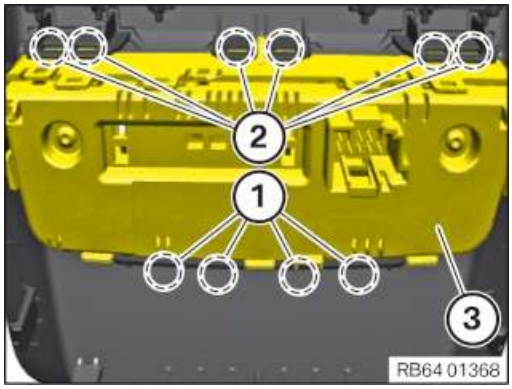
MAIN WORK

2 – Removing air conditioning control panel for the rear passenger compartment



- Detach air conditioning control panel first at the latch mechanisms (1) and then at the latch mechanisms (2).
- Remove air conditioning control panel (3) from the decorative strip.

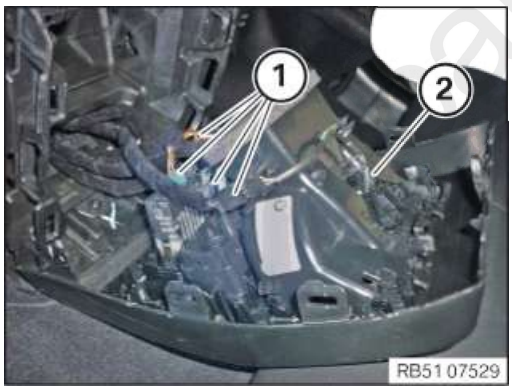
3 – Install air conditioning control panel for the rear side



- Fit the air conditioning control panel (3) on the decorative strip and position it correctly.
- Engage the latch mechanisms (1) and (2).

POSTPROCESSES

4 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.



- Position centre console trim (1) and engage at the latch mechanisms at the side.

5 – Encode/program control unit(s)

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- **Replacement**.
- **This task is not included in this flat rate unit item.**

▶ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

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64 11 521 Replacing right footwell temperature sensor

PRELIMINARY WORK

1 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

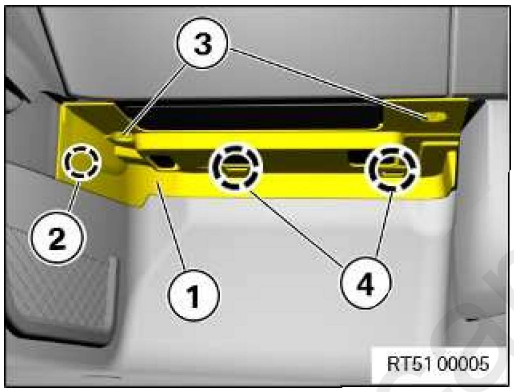
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

2 – Disconnecting all battery earth leads



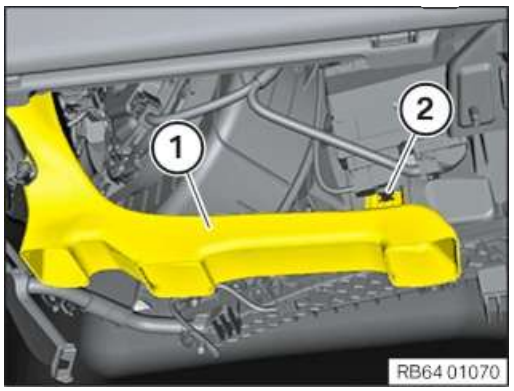
- See additional information.

3 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

4 – Removing the right air duct



- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

5 – Remove cupholder

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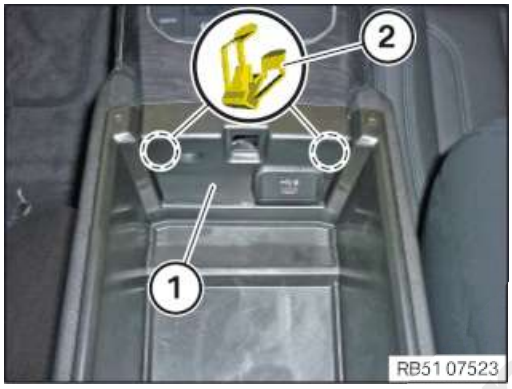


- Remove the insert (1).

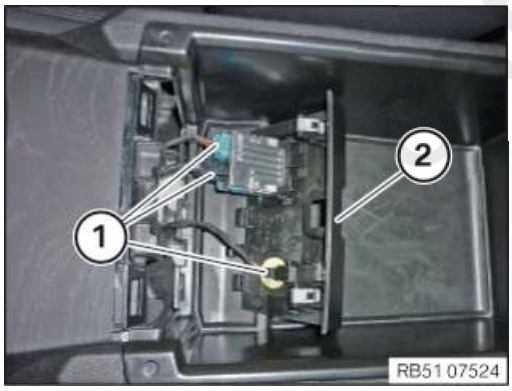


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

6 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

7 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



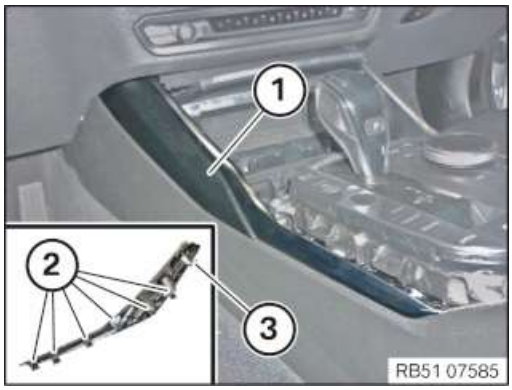
- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

8 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

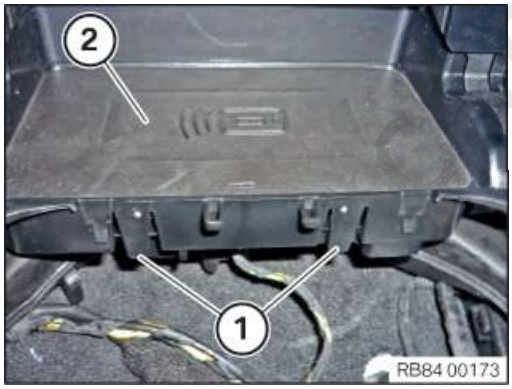
NOTICE

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

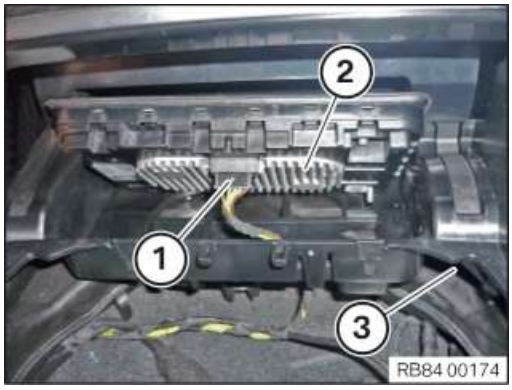


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

9 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

10 – Remove the operating facility in the centre console

.com

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check

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TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

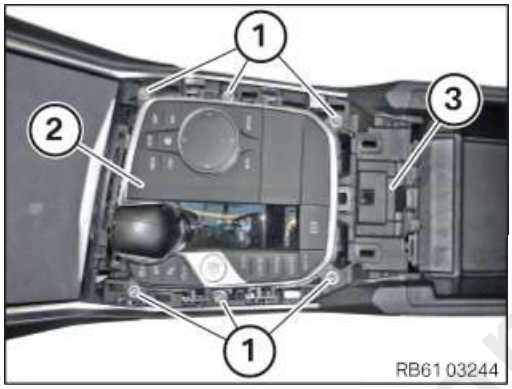
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

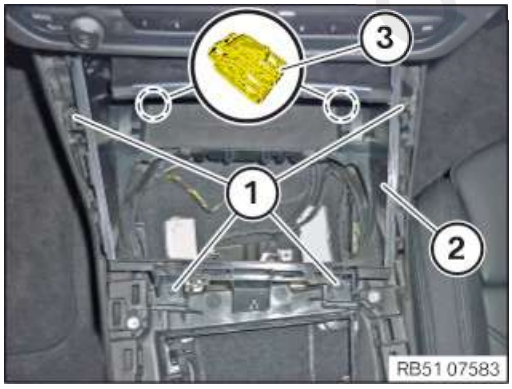


- See additional information.



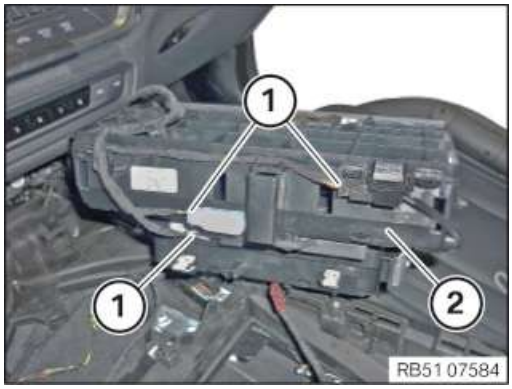
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

11 – Removing the storage compartment in the front centre console



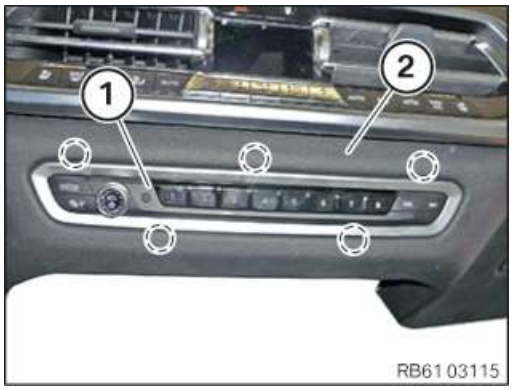
- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

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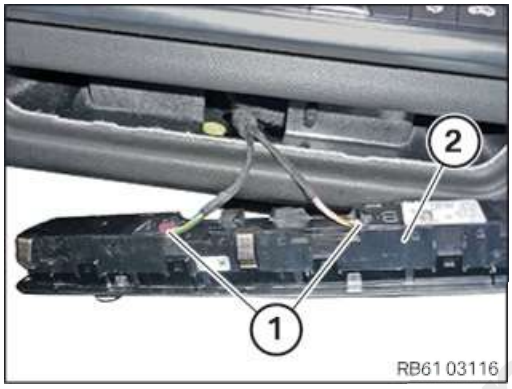


- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

12 – Remove the audio operating unit



- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



- Disconnect plug connections (1) and remove the audio operating unit (2).

13 – Remove Head Unit High (HU-H)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

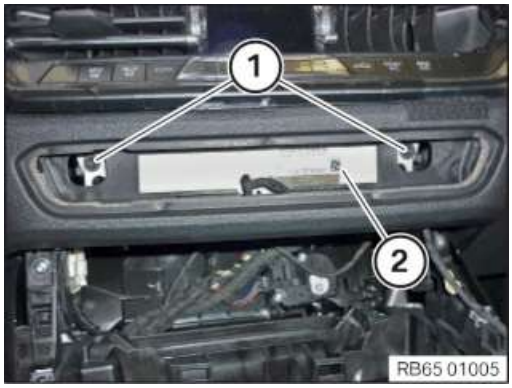
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RISK OF DAMAGE

Damage to the head unit.

The hard disk of the head unit can be damaged by vibration.

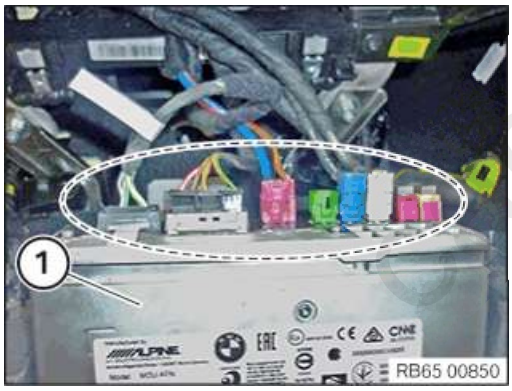
- Carry out mechanical work on the head unit and adjacent components with care.



- Release screws (1) on the head unit (2).
- Slightly pull head unit (2) to the rear and tilt downwards.

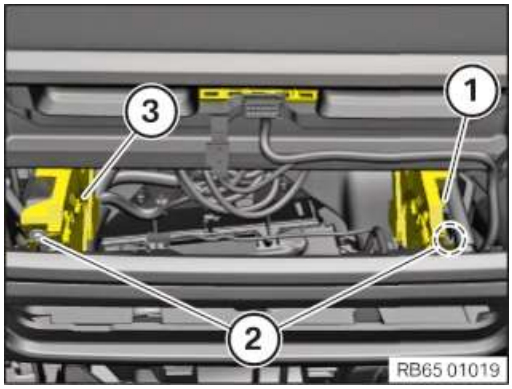


- Feed out the head unit (1) through the marks as illustrated, until the connectors behind are accessible.



- Unlock and disconnect all the plug connections in the marked area in the correct order.
- Remove headunit (1).

14 – Remove holder for the head unit

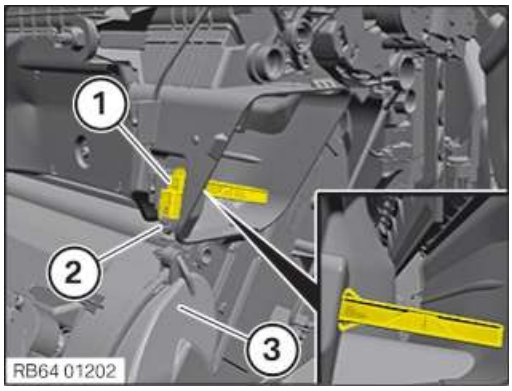


- Release cable clip (1) and set aside.
- Loosen screws (2).
- Screw together the holder (3) for the head unit and feed out towards the bottom.

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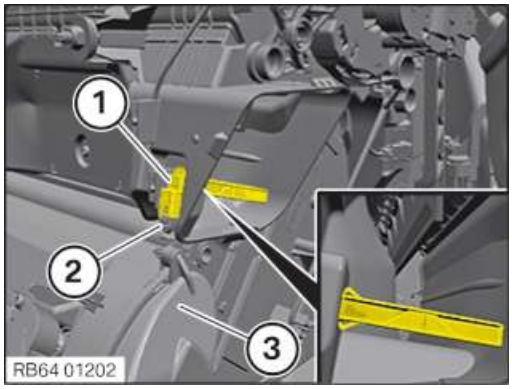
MAIN WORK

15 – Removing the right footwell temperature sensor (B183)



- Disconnect plug connection (2).
- Disengage and remove the footwell temperature sensor (1) from the heating and air-conditioning unit (3).

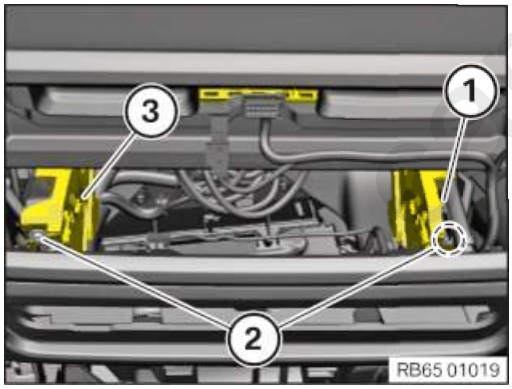
16 – Installing right footwell temperature sensor (B183)



- Insert and lock the footwell temperature sensor (1) in the heating and air-conditioning unit (3).
- Connect connector (2).

POSTPROCESSES

17 – Install holder for the head unit



- Slightly slide in the holder (3) for the head unit together, feed in from the bottom and position correctly.
- Tighten the screws (2).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

- Secure the cable clips (1).

18 – Install the Head Unit High (HU-H)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

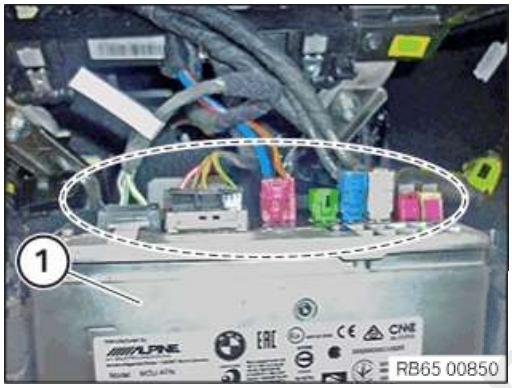
- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

RISK OF DAMAGE

Damage to the head unit.

The hard disk of the head unit can be damaged by vibration.

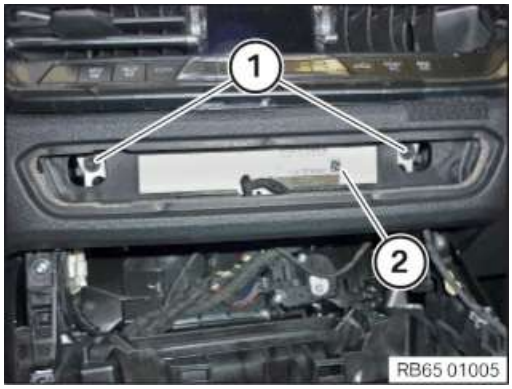
- Carry out mechanical work on the head unit and adjacent components with care.



- Position head unit (1).
- Connect and lock all connectors in the marked area in a correct assembly sequence.



- Feed in the head unit (1) through the marked areas upwards.

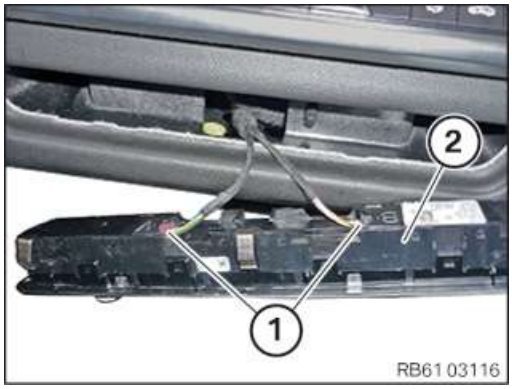


- Slide head unit (2) slightly forward and position it correctly.
- Tighten screws (1) on the head unit (2).

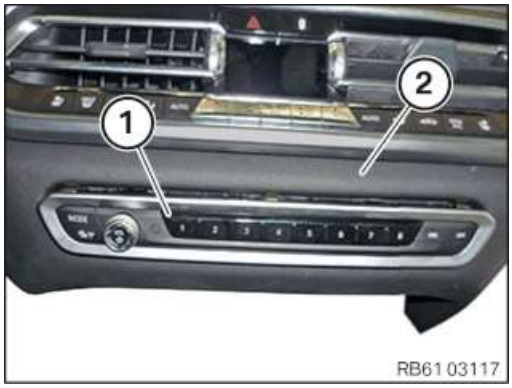
Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

diagn.com

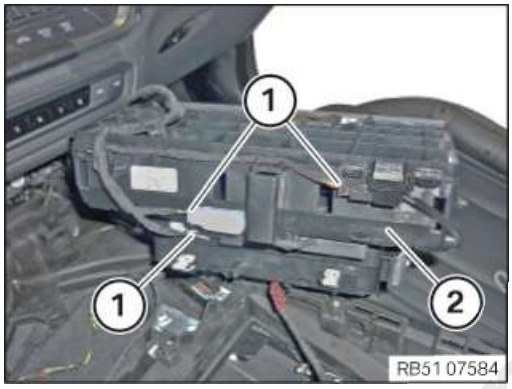


- Connect the connector (1) to the audio operating unit (2).

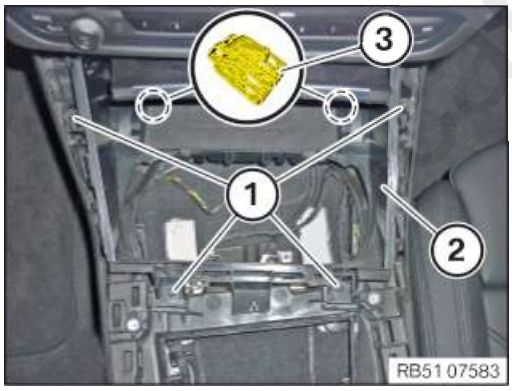


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

20 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

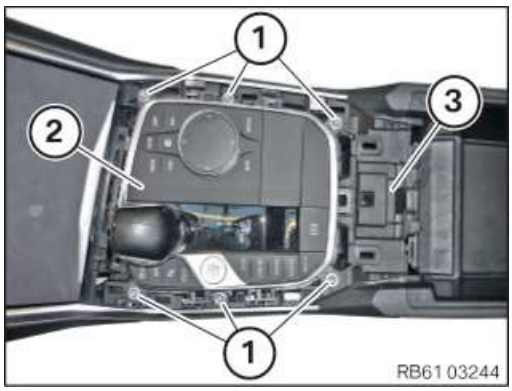


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

21 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

rdiagn.com

▶ **Connecting all battery earth leads**



- See additional information.

▶ **Activating the 48 V electrical system**

Prerequisite

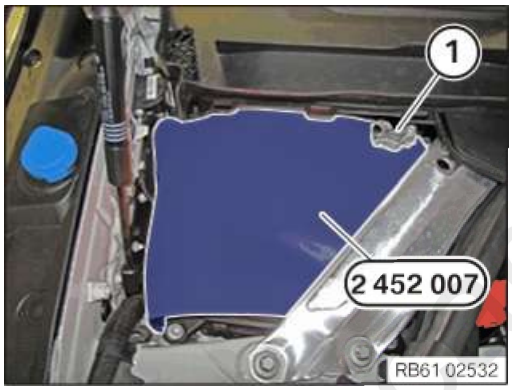
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

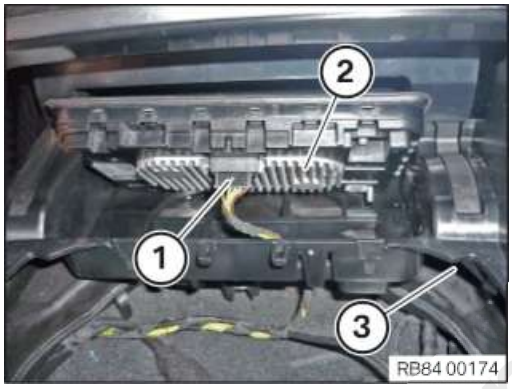


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).

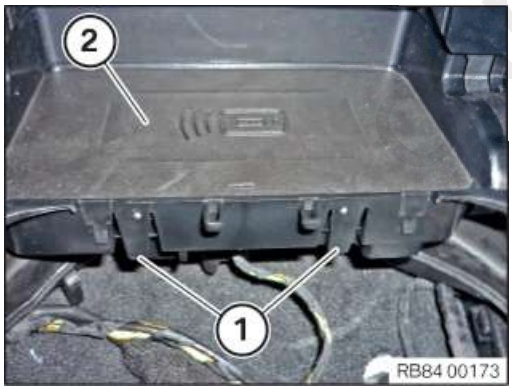


- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

22 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.
  The latch mechanisms (1) must engage correctly.

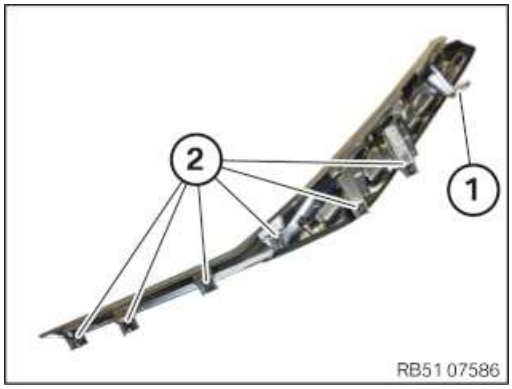
23 – Installing the decorative trim on the centre console on the left and right

▸ **Installing the decorative trim on the centre console**

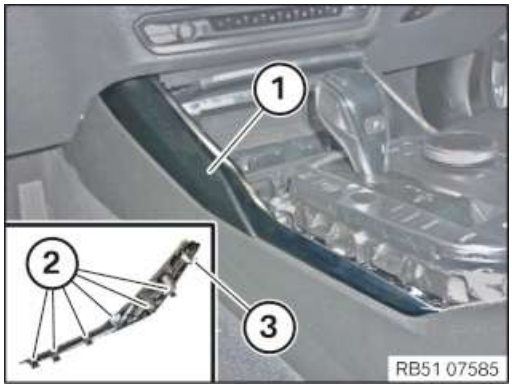
NOTICE

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

.com



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

24 – Installing the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



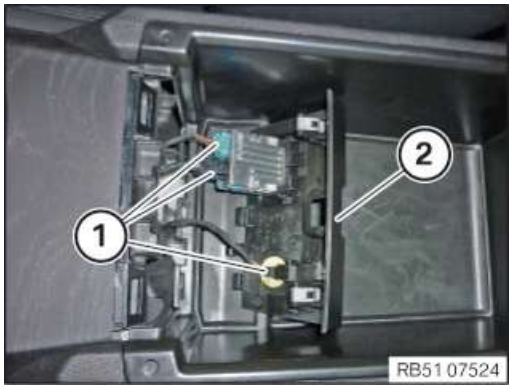
- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .



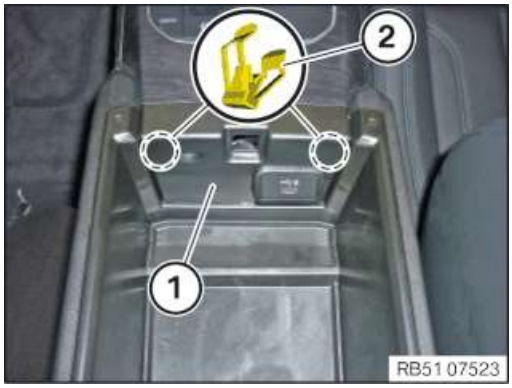
- Correctly position the centre console trim (1) and engage at the latch mechanisms.

25 – Installing the trim in the storage compartment of the centre armrest

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- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

26 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

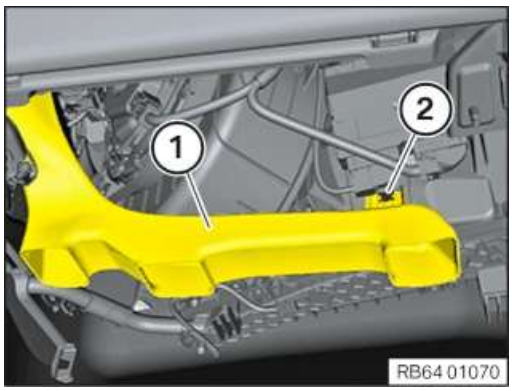
Cup holder to centre console

Oval-head screw	Tightening torque	1,8 Nm



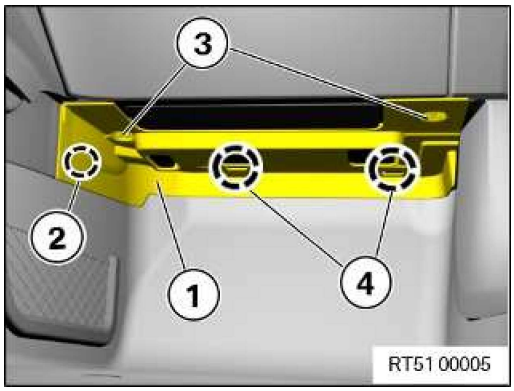
- Insert the insert (1).

27 – Installing the air duct, right



- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

28 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

29 – Connecting all battery earth leads



- See additional information.

30 – Activating the 48 V electrical system

Prerequisite

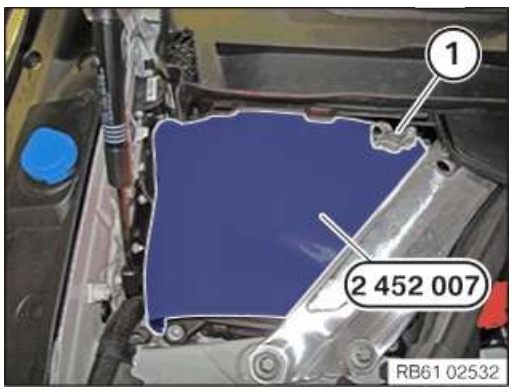
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .

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- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

31 – Initialising component protection

TECHNICAL INFORMATION

After renewal of the BDC or the head unit **or** after installation of a **used** head unit, the component protection must be reinitialised.

- During **renewal** of BDC or the head unit , reinitialize the component protection with the diagnosis system as follows:
  - The BDC or the head unit under: Mark "Vehicle management / control unit replacement / after the exchange" as exchanged.
  - Determine the measures plan and execute.
  - Observe instructions without fail!
- When installing a **used head unit** , reinitialize as follows:
  - contact Technical Support
  - Then, reinitialize the component protection in **workshop system** via **immediate measure** "Initialisation of component protection of head unit (HU)" in the "Additional software" tab.
  - Observe instructions without fail!

Additional Information

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Overview of Tightening Torques

Head unit to holder / holder to support			Used in step 1718
Screw		Tightening torque	1,8 Nm

Storage compartment in centre console			Used in step 20
Oval-head screw		Tightening torque	1,8 Nm

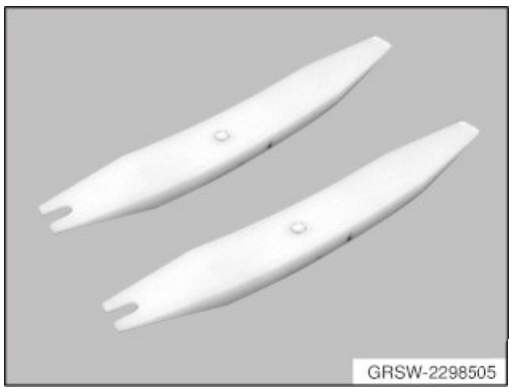
Gear selector switch to centre console trim			Used in step 21
Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery			Used in step 2130
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 26
Oval-head screw		Tightening torque	1,8 Nm

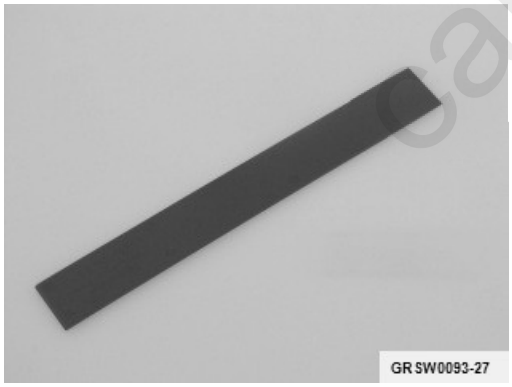
Overview of Special Tools

2 298 505 Wedge



Common	Used in step 67
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 496 571 (00 9 327) Wedge



Common	Used in step 12
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	1102130

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129

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61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	2102129
61 20 900 Disconnecting and connecting battery earth lead	2102129
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61 20 900 Disconnecting and connecting battery earth lead	2102129

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61 35 ... Notes on ESD protection (Electro Static Discharge) 1318
61 35 ... Notes on ESD protection (Electro Static Discharge) 1318

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64 11 653 Replacing right rear-cabin footwell-temperature sensor

NOTICE

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

PRELIMINARY WORK

1 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

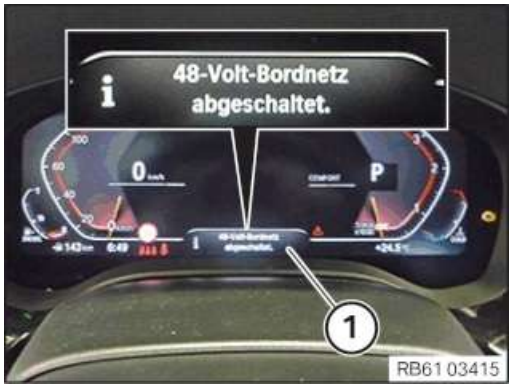
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.

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- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

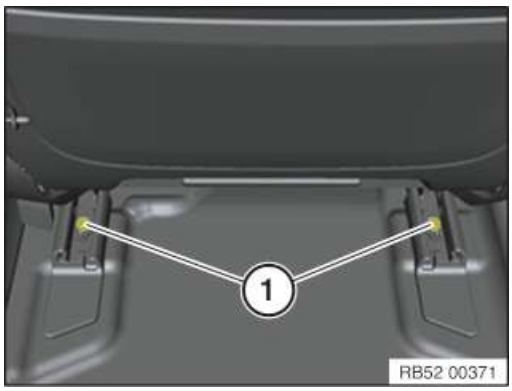
2 – Remove front seat

WARNING

Pyrotechnic components.

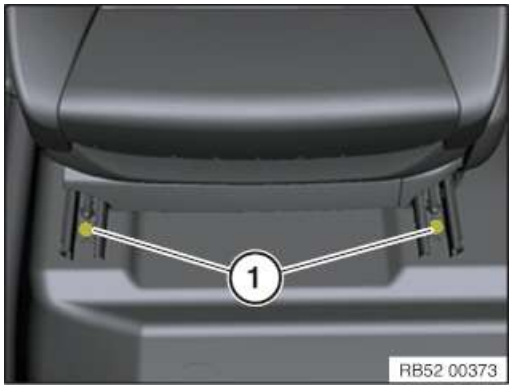
Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Loosen screws (1).

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- Loosen screws (1).
- Adjust the front seat to the centre position.
- **When removing the driver's seat:**

  Completely retract the steering column

  Adjust the steering column completely upwards.

▸ Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

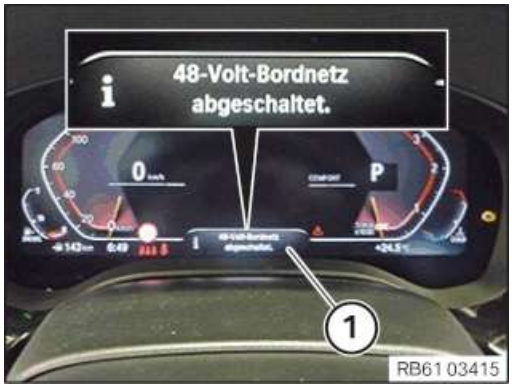
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.

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- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.

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- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

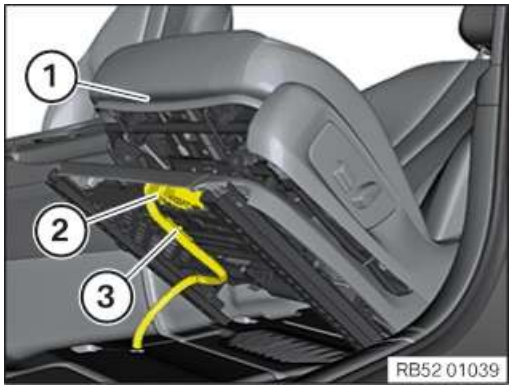
- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ **Disconnecting all battery earth leads**

- See additional information.



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RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

- Cover the door sill using protective covers.
- Place front seat (1) to the rear.
- Unlock plug connection (2) and disconnect.
- Loosen the cable clip (3).

RISK OF DAMAGE

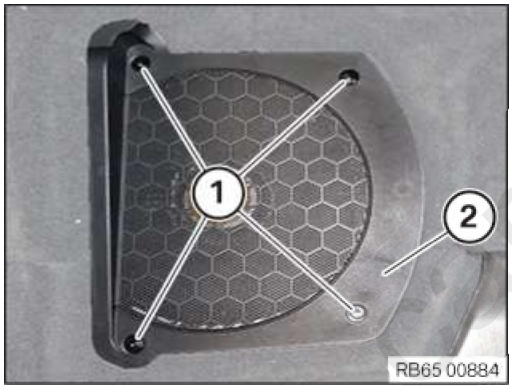
Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.

- Lift out front seat (1) with the assistance of a second person.

3 – Remove the speaker trim for the central bass



- Loosen screws (1).
- Remove the speaker trim for the central bass (2).

4 – Removing inner right door sill cover strip

NOTICE

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

▸ **Removing the inner door sill cover strip**

RISK OF DAMAGE

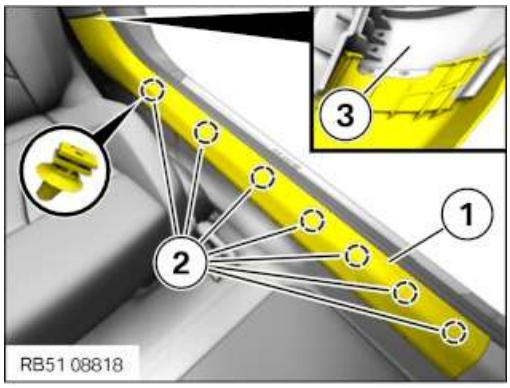
Bending of plastic parts.

Application of too much force can lead to bending of plastic parts.

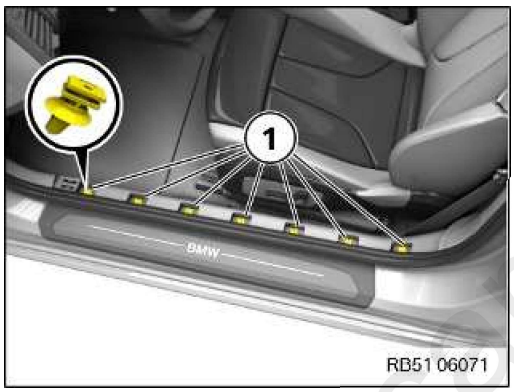
- Place special tool directly beside the mounting clip.
- Continue unclipping the part without using the tool if possible.

NOTICE

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



- Release door sill cover strip (1) with clips (2) starting from the front using a suitable special tool from the set of special tools 0 493 752 (00 9 329).
- Guide out and remove door sill cover strip (1) under the rear side trim panel (3) .

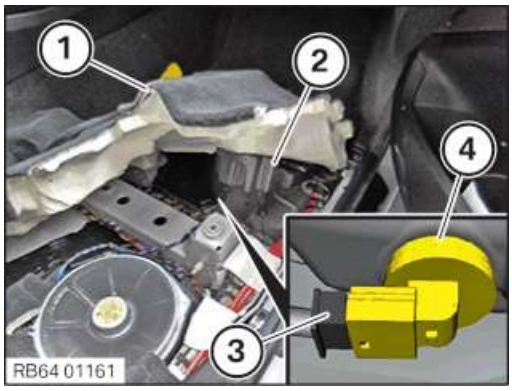


- If necessary, remove clips (1) and connect them to the door sill cover strip.

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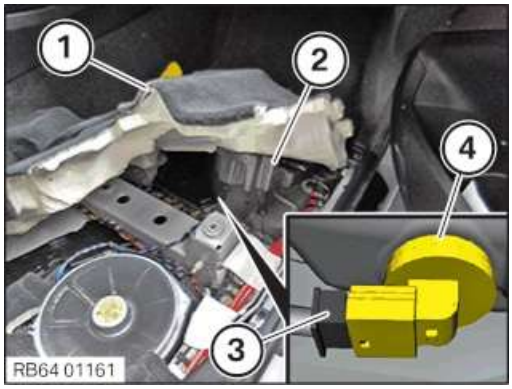
MAIN WORK

5 – Removing rear-cabin footwell-temperature sensor (B512)



- Lift up carpet (1).
- Lift up insert in the front footwell (2).
- Disconnect plug connection (3).
- Turn rear-cabin footwell-temperature sensor (4) in clockwise direction upwards and then remove it.

6 – Install the rear-cabin footwell-temperature sensor (B512)



- Position the rear-cabin footwell-temperature sensor (4) and lock it downwards and anticlockwise.
- Connect connector (3).
- Position the inserts in the front footwell (2).
- Fold back the carpet (1).

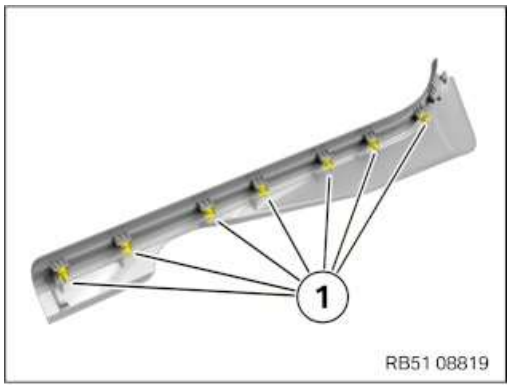
POSTPROCESSES

7 – Installing inner right door sill cover strip

NOTICE

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

▸ **Installing the inner door sill cover strip**

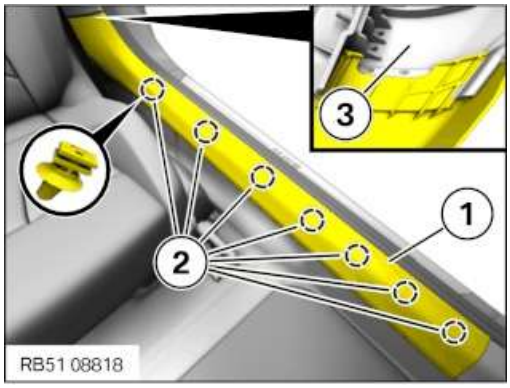


NOTICE

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

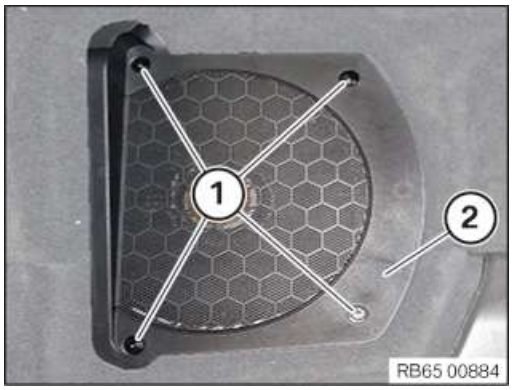
- Check the clips (1) for damage and renew if necessary.

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- Insert the door sill cover strip (1) below the rear side trim panel (3).
- Clip the door sill cover strip (1) in with the clips (2).

8 – Install the speaker trim for the central bass



- Position the speaker trim for the central bass (2).
- Tighten the screws (1).

Central bass speaker trim

Screw		Tightening torque	2 Nm

9 – Install front seat

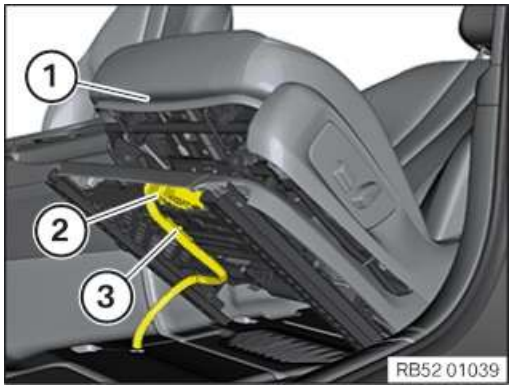
WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

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RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

- Cover the door sill using protective covers.

RISK OF DAMAGE

Heavy component.

Heavy components can lead to injury or damage.

- Remove and install heavy components with the aid of another person/other persons.

- Lift front seat (1) into the vehicle with the assistance of a second person.
- Place front seat (1) to the rear.
- Connect connectors (2) and lock.
- Attach the cable clip (3).

▸ **Connecting all battery earth leads**

- See additional information.



▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

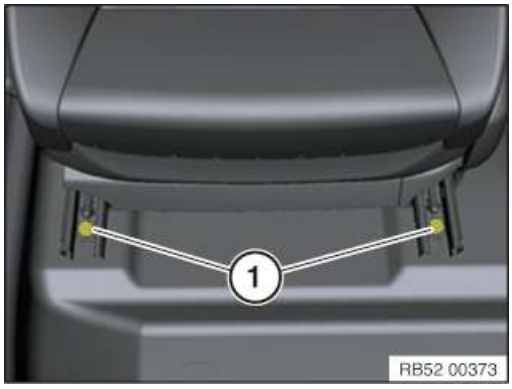


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.



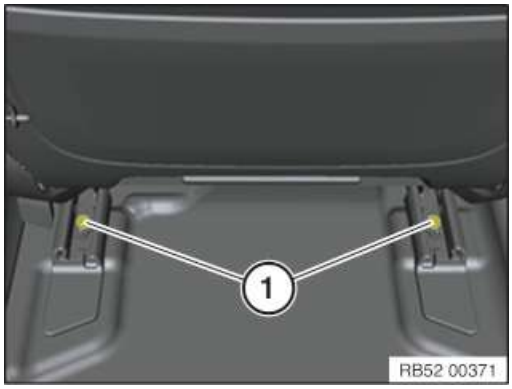
- Move front seat rearwards.
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Seat to body

Cheese head screw with collar	Renew screw.	Tightening torque	42 Nm

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- Move front seat forwards.
- Renew screws (1).

  Parts: Screws
- Tighten the screws (1).

Seat to body

Cheese head screw with collar	Renew screw.	Tightening torque	42 Nm

10 – Activating the 48 V electrical system

Prerequisite

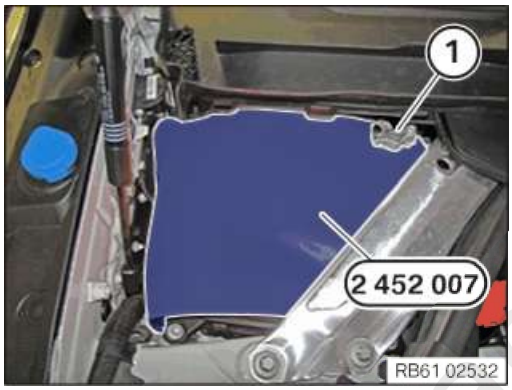
Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.
  The activation takes place automatically.

Additional Information

Overview of Tightening Torques

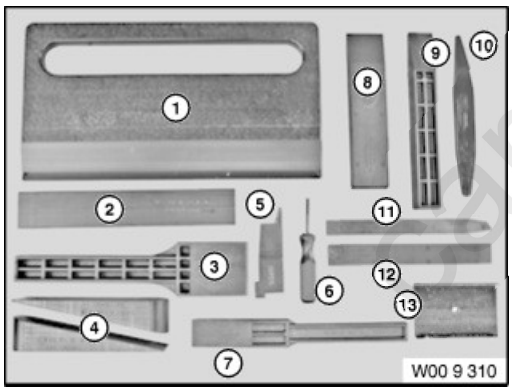
Central bass speaker trim			Used in step 8
Screw		Tightening torque	2 Nm

Negative battery cable to 48-V battery			Used in step 910
Nut M8		Tightening torque	19 Nm

Seat to body			Used in step 9
Cheese head screw with collar	Renew screw.	Tightening torque	42 Nm

Overview of Special Tools

0 493 752 (00 9 329) Case



Common	Used in step 4
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	12910

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	29

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	29
61 20 900 Disconnecting and connecting battery earth lead	29
61 20 900 Disconnecting and connecting battery earth lead	29

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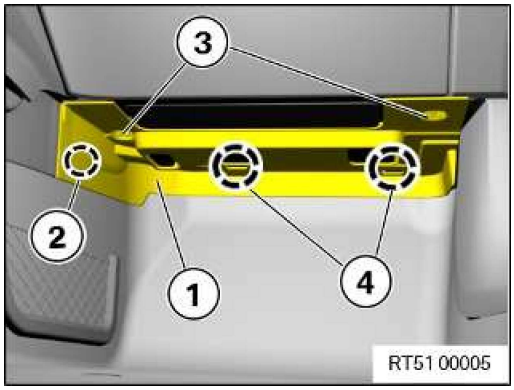
61 20 900 Disconnecting and connecting battery earth lead	29
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61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	29
61 20 900 Disconnecting and connecting battery earth lead	29
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64 11 692 Replacing the control unit for the air conditioning

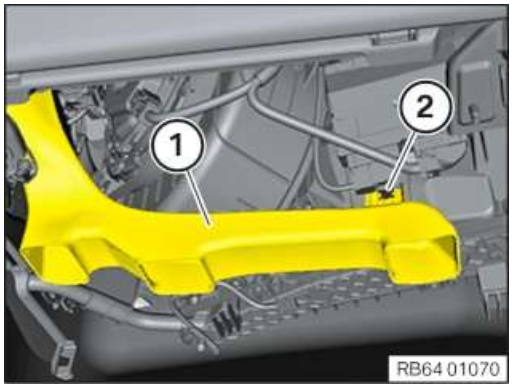
PRELIMINARY WORK

1 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

2 – Removing the right air duct

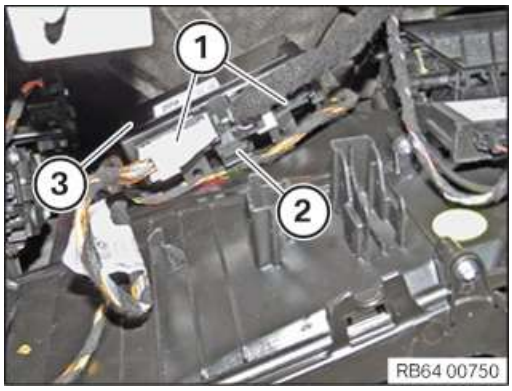


- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

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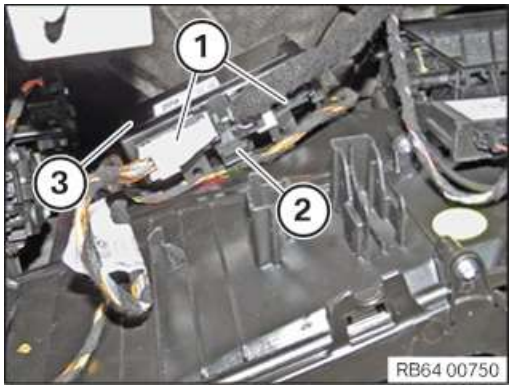
MAIN WORK

3 – Removing the air conditioning control unit



- Unlock plug connections (1) and disconnect.
- Release the lock (2) and remove the control unit (3) towards the bottom.

4 – Installing air conditioning control unit

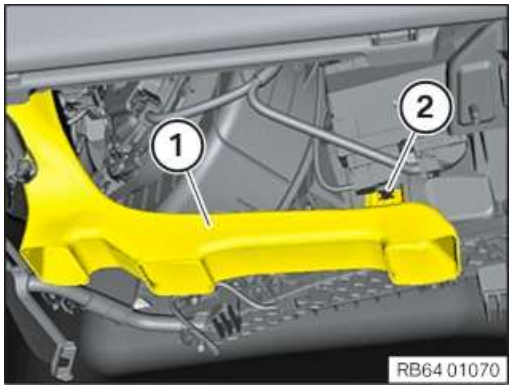


- Position the control unit (3) correctly and push in upward direction until the latch mechanism (2) locks.
- Connect connectors (1) and lock.

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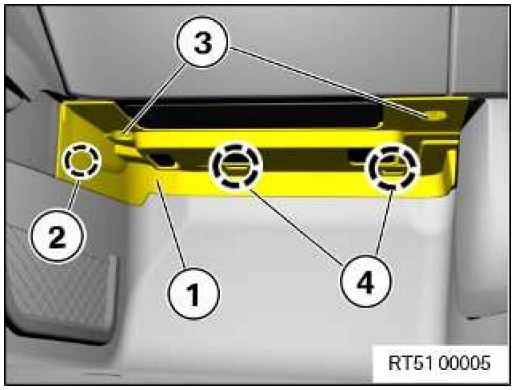
POSTPROCESSES

5 – Installing the air duct, right



- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

6 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

7 – Encode/program control unit(s)

- **Replacement**.
- **This task is not included in this flat rate unit item.**

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

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64 12 526 Completely replace stationary heating

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

PRELIMINARY WORK

1 – Removing the front left wheel

▶ **Removing the wheel**

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TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

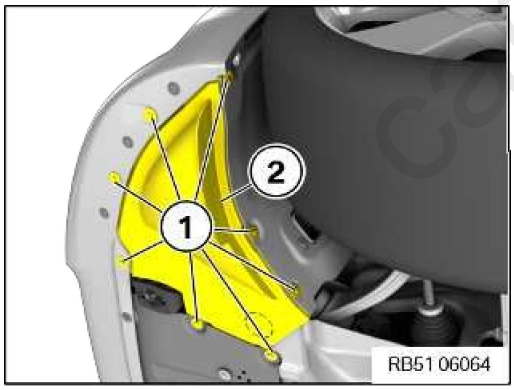
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the lower front cover at the side



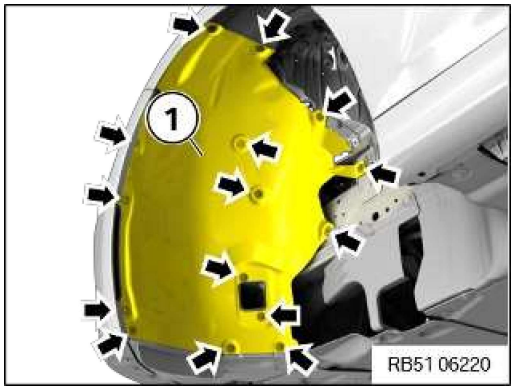
- Loosen screws (1).
- Removing the lower front cover at the side (2).

3 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

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- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

MAIN WORK

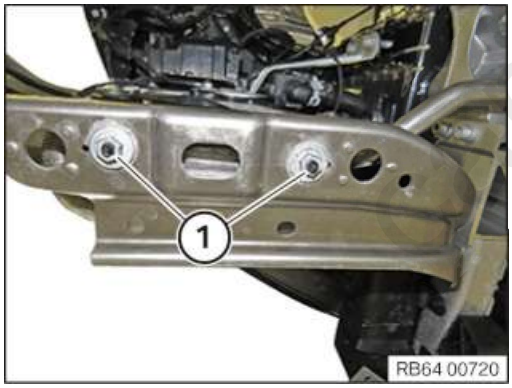
4 – Extend auxiliary heater with holder

TECHNICAL INFORMATION

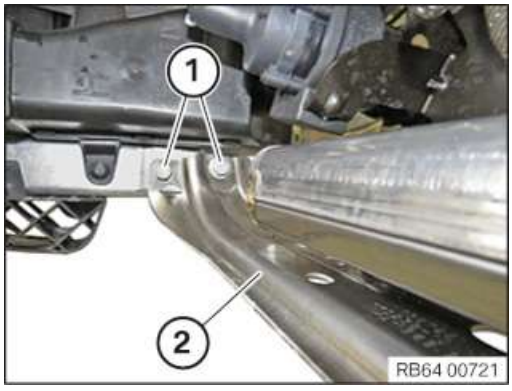
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Loosen screws (1).
- Loosen nuts (2).
- Unclip the fuel line from the latch mechanisms (arrows).
- Remove upper holder (3) from independent heater.

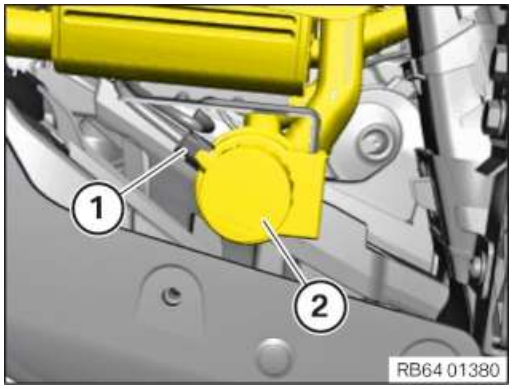


- Release all nuts (1) on lower holder of independent heater.

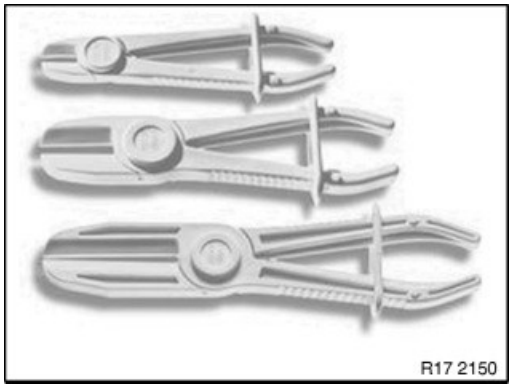


- Loosen screws (1) and remove holder (2).

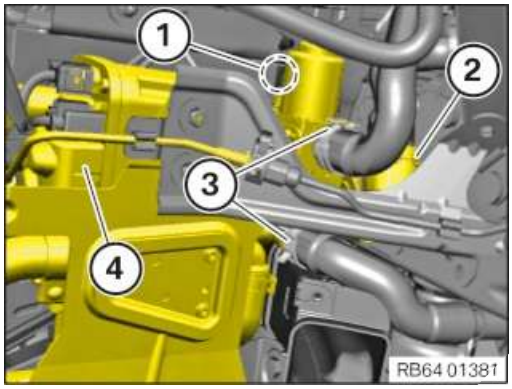
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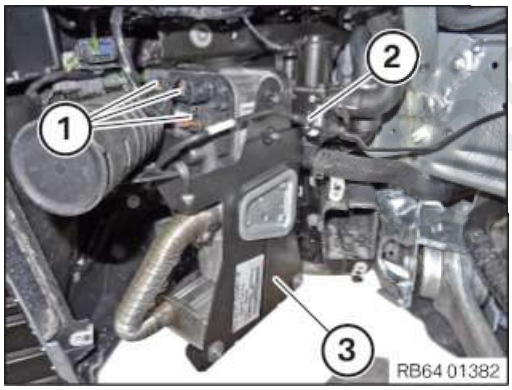
- Unlock and disconnect connector (1) on the auxiliary coolant pump (2) of the stationary heating function.



- Use commercially available disconnection tools to pinch off the coolant lines.



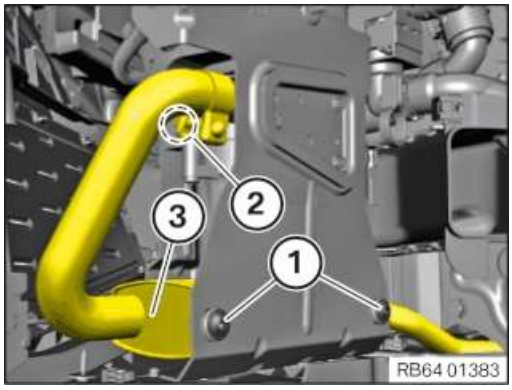
- Unlock and disconnect connector (1).
- Unlock coolant hose (2) and pull off.
- Detach the hose clamps (3) and remove the coolant hoses from the changeover valve.



- Unlock and disconnect connector (1).
- Unlock and pull off fuel line (2).
- Guide out the independent heater (3) with the holder and remove it.

5 – Replace auxiliary heater

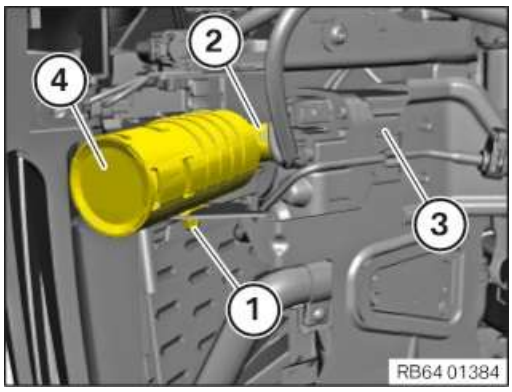
▸ **Remove the silencer**



- Loosen screws (1).
- Loosen nut (2).
- Remove silencer (3) upwards from the parking heater.
- Slide silencer (3) out and remove.

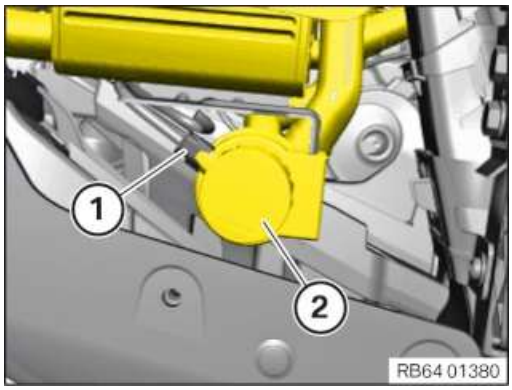
rdiagn.com

▸ **Remove the intake silencer**

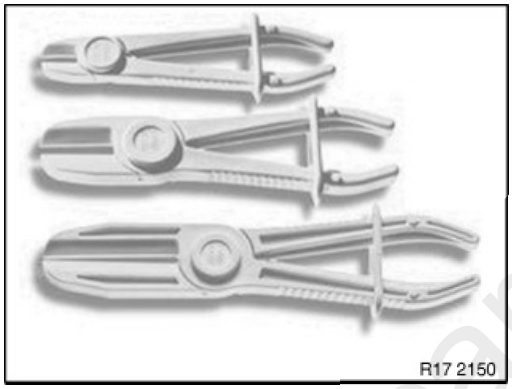


- Unclip latch mechanism (1).
- Remove hose connector (2) from the parking heater (3).
- Feed intake silencer (4) out and remove.

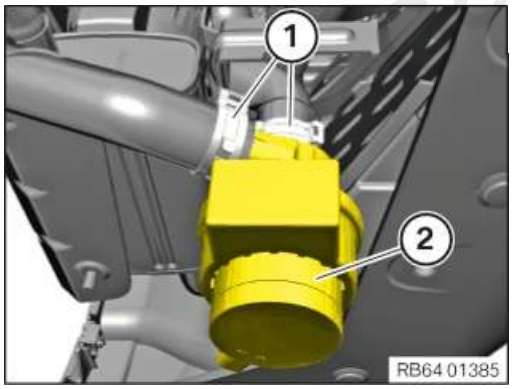
▸ **Removing auxiliary coolant pump for auxiliary heater**



- Unlock and disconnect connector (1) on the auxiliary coolant pump (2) of the stationary heating.
- Pull off the auxiliary coolant pump (2) from the holder to the front and set it aside.



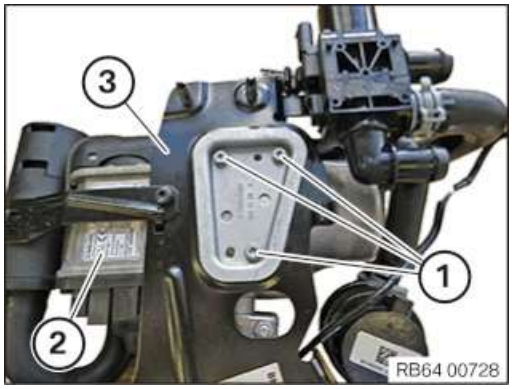
- Use commercially available disconnection tools to pinch off the coolant lines.



- Loosen hose clamps (1) and pull off coolant hoses.
- Remove auxiliary coolant pump (2).

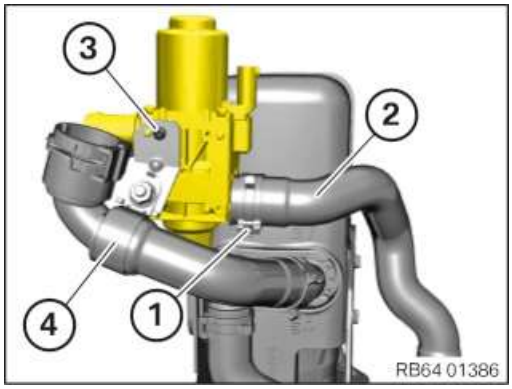
▸ **Remove parking heater from holder**

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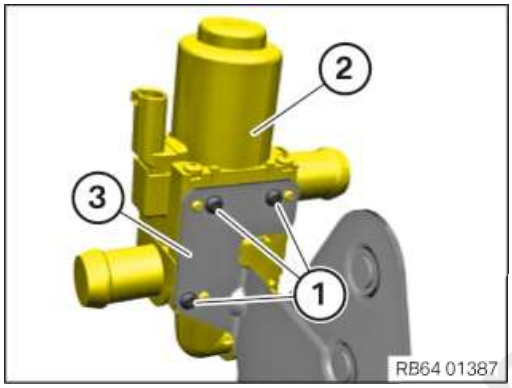


- Loosen screws (1).
- Remove auxiliary heater (2) from holder (3).

▸ Removing changeover valve

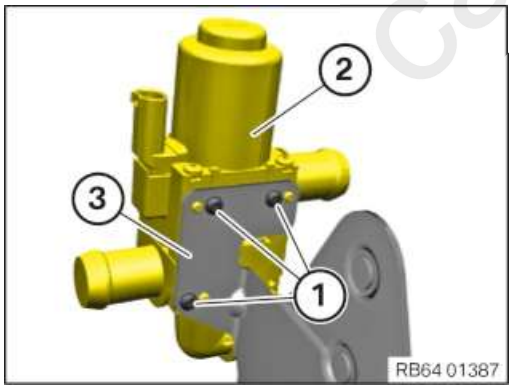


- Loosen hose clamp (1).
- Pull off the coolant hose (2).
- Loosen screw (3).
- Remove coolant hose (4) with the holder.



- Loosen screws (1).
- Remove the changeover valve (2) from the holder (3).

▸ Installing the changeover valve

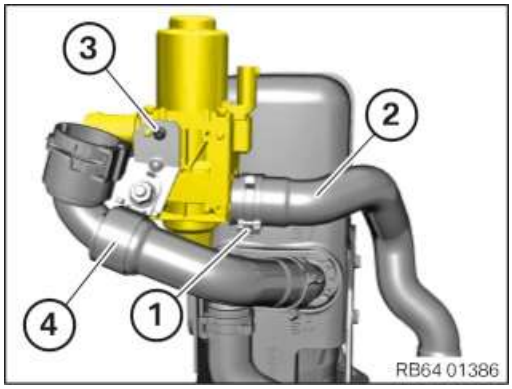


- Position switching valve (2) on bracket (3).
- Tighten the screws (1).

Changeover valve to holder

Screw		Tightening torque	1,8 Nm

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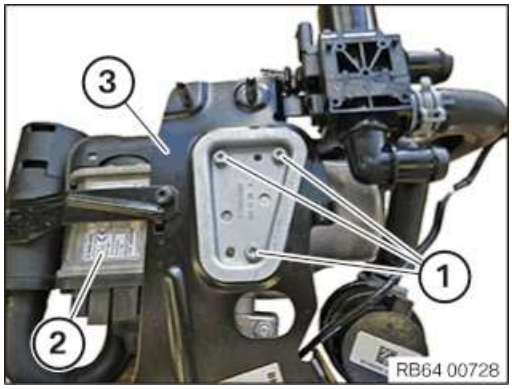
- Position coolant hose (4) with the bracket.
- Tighten down screw (3).

Changeover valve to holder

Screw		Tightening torque	1,8 Nm

- Slide coolant hose (2) on.
- Secure hose clamp (1).

▸ **Removing stationary heating on the holder**

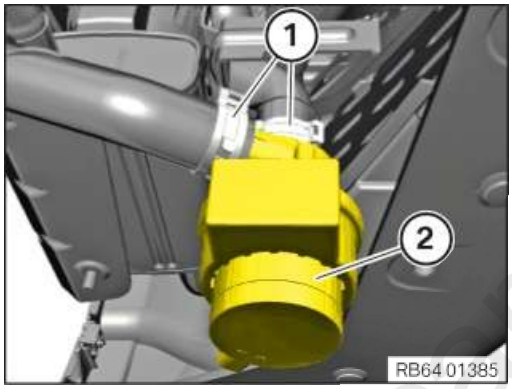


- Position stationary heating (2) on the holder (3).
- Tighten the screws (1).

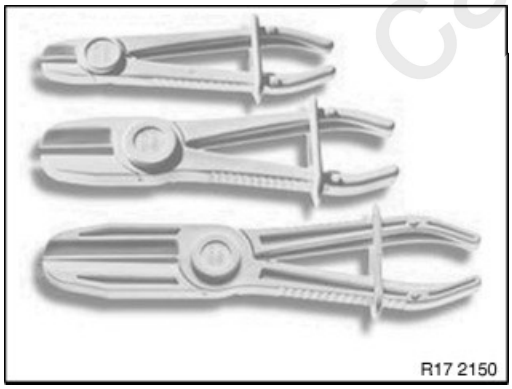
Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

▸ **Install auxiliary coolant pump for the auxiliary heater**

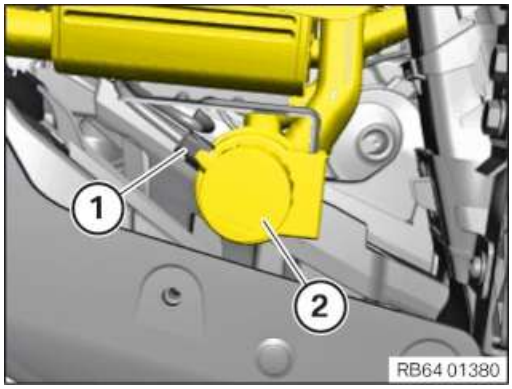


- Position the auxiliary coolant pump (2).
- Slide coolant hoses onto the auxiliary coolant pump (2) and secure the hose clamps (1).



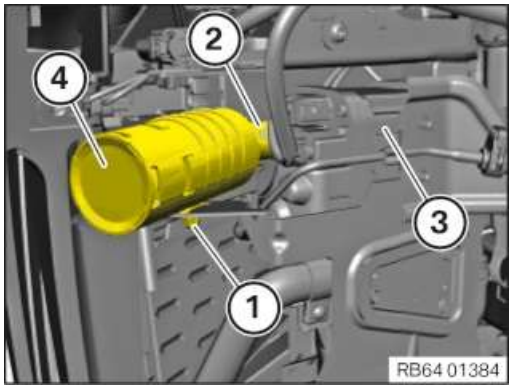
- Remove disconnection tools.

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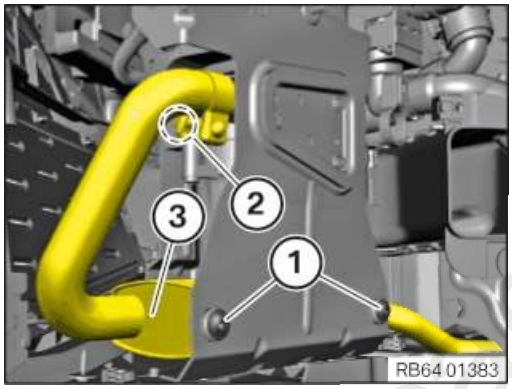
- Slide auxiliary coolant pump (2) to the rear on the holder.
- Connect and lock connector (1) to the auxiliary coolant pump (2) .

▸ **Install intake silencer**



- Feed intake silencer (4) in and install.
- Slide connecting hose (2) onto the parking heater (3).
- Clip in latch mechanism (1).

▸ **Installing the silencer**



- Feed in silencer (3) and install.
- Slide silencer (3) up onto the stationary heating.
- Tighten nut (2).

Silencer to stationary heating

Nut		Tightening torque	6 Nm

- Tighten the screws (1).

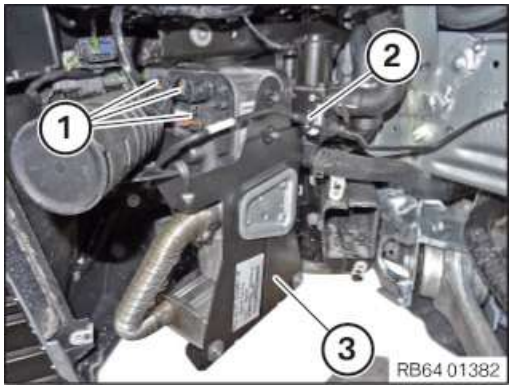
Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

6 – Install auxiliary heater with holder

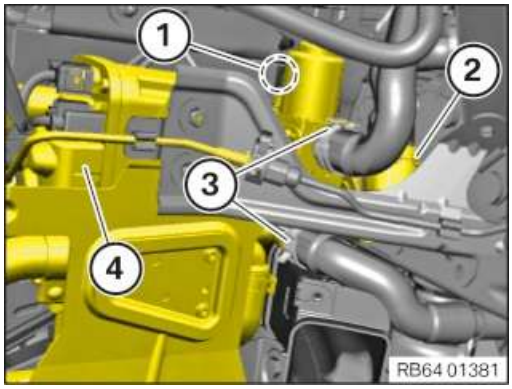
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

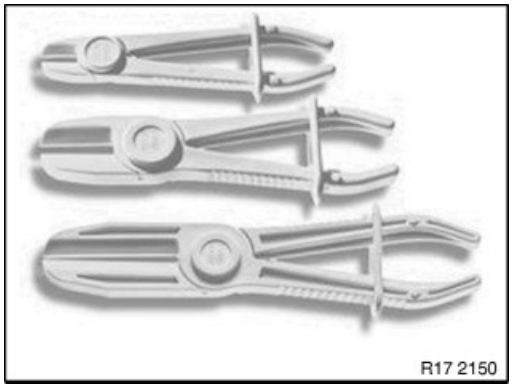


- Guide the stationary heating in (3) with the holder and install it.
- Connect and secure the fuel line (2).
- Connect connectors (1) and lock.

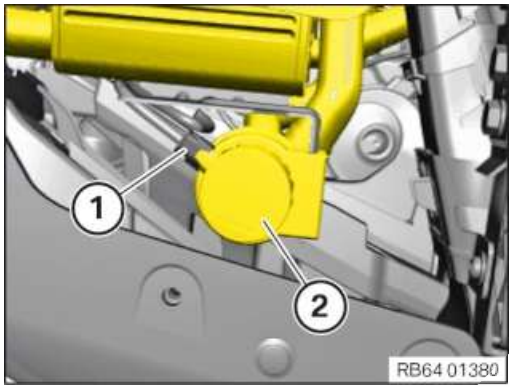
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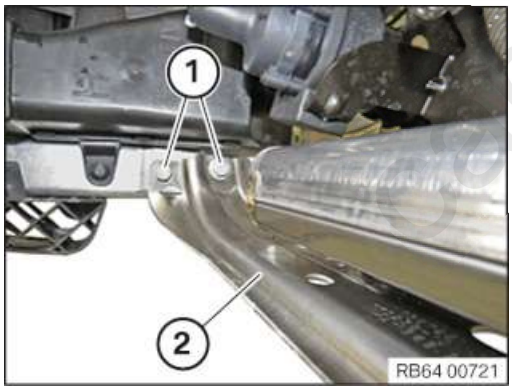
- Mount the coolant hoses on the changeover valve and secure the hose clamps (3).
- Slide on and lock the coolant hose (2).
- Connect connectors (1) and lock.



- Remove disconnection tools.



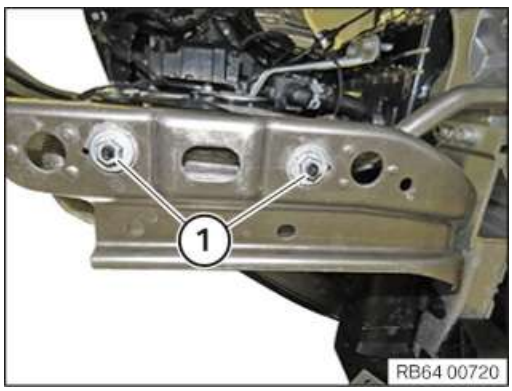
- Connect and lock connector (1) to the auxiliary coolant pump (2) of the stationary heating.



- Position the lower holder (2) of the stationary heating.
- Tighten the screws (1).

Stationary heating to holder/body

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm



- Tighten all the nuts (1) on the lower holder of the stationary heating.

Stationary heating to holder/body

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

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- Guide the upper holder (3) of the stationary heating in and install.
- Tighten nuts (2).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

- Tighten the screws (1).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

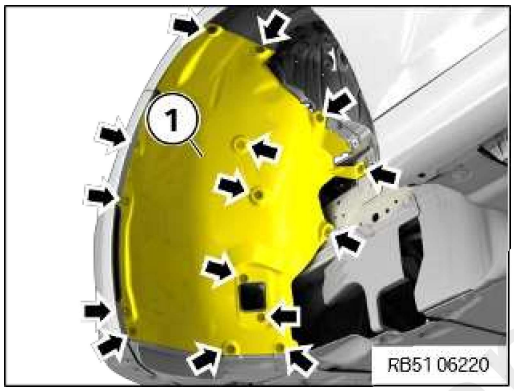
- Clip in the fuel line to the locking units (arrow).

POSTPROCESSES

7 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

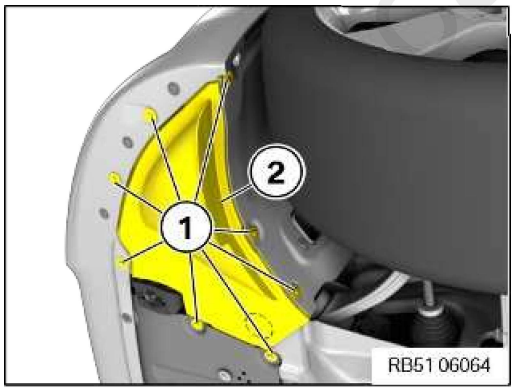


- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

8 – Install the lower front cover at the side



- Install front bottom side cover(2).
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

9 – Attaching the front left wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

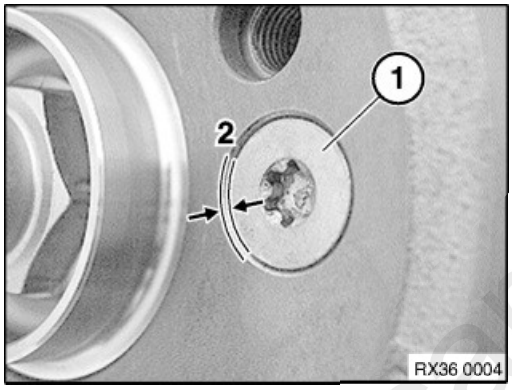
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

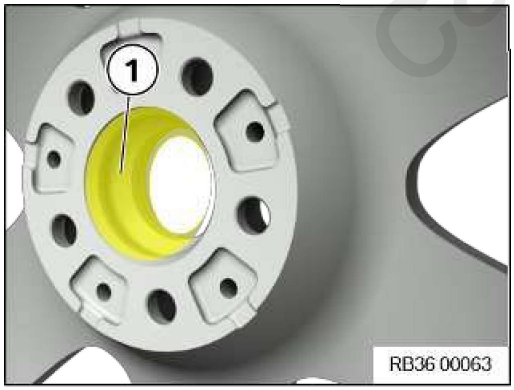
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

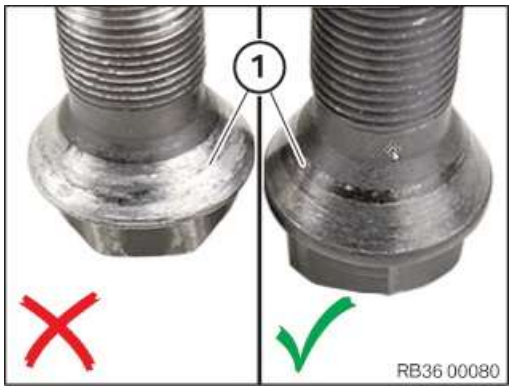
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.		
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Check	140 Nm

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10 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.

Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

11 – Filling and bleed the low-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Changeover valve to holder — Used in step 5

Screw		Tightening torque	1,8 Nm

Silencer to holder / holder to body — Used in step 56

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

Silencer to stationary heating — Used in step 5

Nut		Tightening torque	6 Nm

Stationary heating to holder/body — Used in step 6

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

Wheel arch trim panel, front — Used in step 7

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 8

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 9

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 9

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

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Overview of Special Tools

2 344 011 Tool



Common	Used in step 9
Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



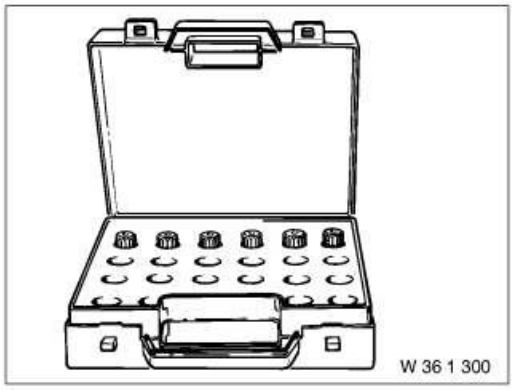
Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

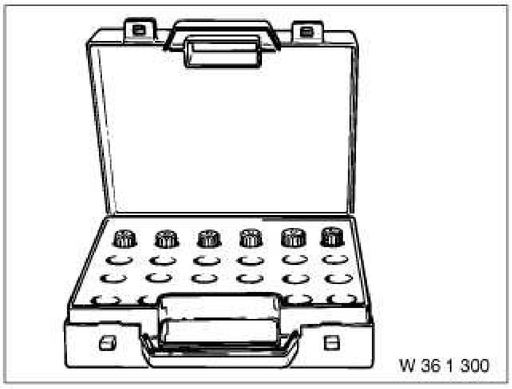
0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	19
17 00 008 Draining and topping up coolant for high-temperature circuit	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 008 Draining and topping up coolant for high-temperature circuit	10
17 00 008 Draining and topping up coolant for high-temperature circuit	10
17 00 008 Draining and topping up coolant for high-temperature circuit	10
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	10
17 00 039 Bleeding cooling system (B37, B47)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	10
17 00 008 Draining and topping up the high-temperature coolant circuit	10
17 00 008 Draining and topping up the high-temperature coolant circuit	10
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	10
17 00 008 Draining and topping up the high-temperature coolant circuit	10
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	10
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	10
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	1011
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	10
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 008 Draining and topping up coolant for high-temperature circuit	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 008 Draining and topping up coolant for high-temperature circuit	10

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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	10
17 00 011 Draining and topping up the coolant for the low-temperature circuit	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	11
17 11 103 Removing and installing/replacing coolant expansion tank for the low-temperature coolant circuit	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Venting cooling system and checking on watertightness	11
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	11
17 00 040 Venting high temperature - cooling system and checking for water leaks (N20 hybrid drive)	11
17 00 040 Bleeding lower-temperature cooling system (B48)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 011 Draining and topping up coolant circuit for low temperature	11
17 00 040 Bleed the low-temperature cooling system and check for watertightness (coolant circuit for low temperature)	11
17 00 040 Bleeding and filling low temperature cooling system using vacuum filler device (B48)	11
17 00 011 Draining and topping up low-temperature coolant circuit	11
17 00 011 Draining and topping up low-temperature coolant circuit	11
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	11
17 00 040 Bleeding the low-temperature coolant circuit and checking it for watertightness	11
17 00 015 Draining and topping up the coolant circuit for the drive \PREMIUM	11
17 00 011 Draining and topping up low-temperature coolant circuit	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (low-temperature coolant circuit)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11

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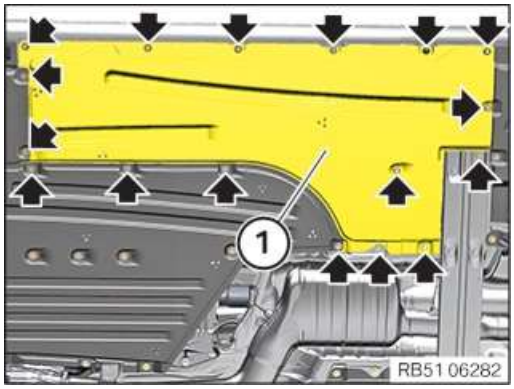
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11
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17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	11

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64 12 600 Removing and installing or replacing fuel pump

PRELIMINARY WORK

1 – Remove side underbody panelling



- Unscrew all bolts and nuts (arrows).
- Remove the underbody panelling (1).

MAIN WORK

2 – Removing the electric fuel pump for the auxiliary heater

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

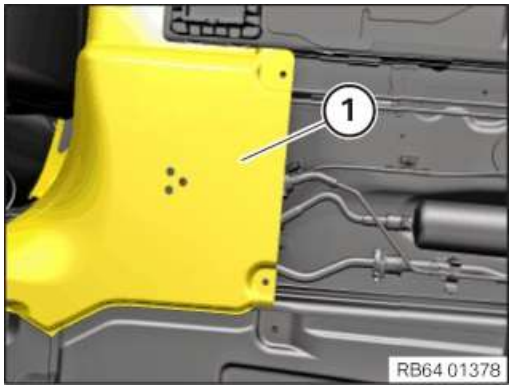
Hazardous to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

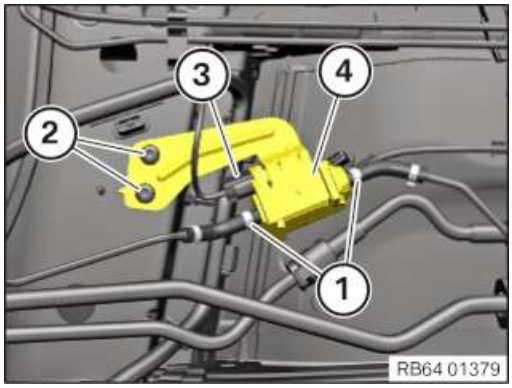
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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- (1)



- Unfasten hose clamps (1).
- Loosen screws (2).
- Unlock and disconnect connector (3).
- Guide out and remove the electric fuel pump (4).

3 – Installing the electric fuel pump for the auxiliary heater

WARNING

Working on fuel system.

Risk of fire! Danger of explosion!

- When working on the fuel system, make sure that the workbay is sufficiently ventilated, e.g. using extraction unit.
- Tightly seal off open lines and connections; collect any escaping fuel directly at the point of exit.
- No fire, sparks, open flames or smoking.

WARNING

Contact with hazardous fluids.

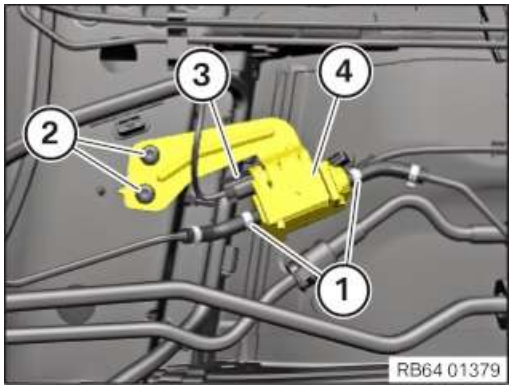
Hazardous to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

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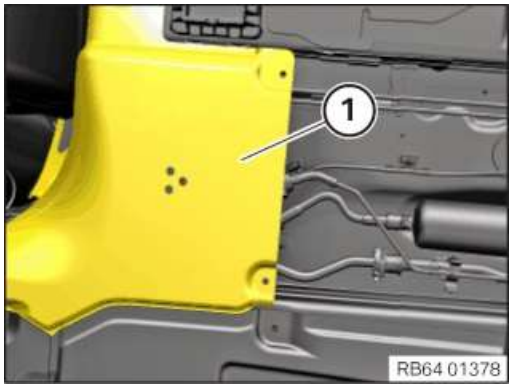
- Guide in and install electric fuel pump (4).
- Connect connectors (3) and lock.
- Tighten the screws (2).

Electric fuel pump to body

Screw		Tightening torque	6 Nm

- Renew and secure hose clamps (1).

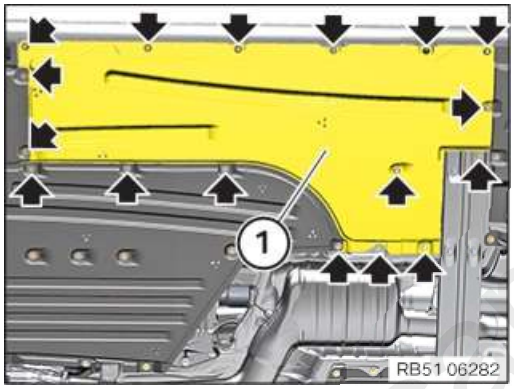
  Parts: Hose clamps



- Position the wheel arch cover (1) correctly.

POSTPROCESSES

4 – Installing the underbody panelling on the sides



- Insert the underbody panelling (1).
- Tighten all bolts and nuts (arrows).

Underbody panelling, side

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

Additional Information

Overview of Tightening Torques

Electric fuel pump to body — Used in step 3

Screw		Tightening torque	6 Nm

Underbody panelling, side — Used in step 4

Hexagon screw		Tightening torque	2.6 Nm
Plastic nut		Tightening torque	2.6 Nm

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64 12 089 Removing and installing or replacing muffler/silencer

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.

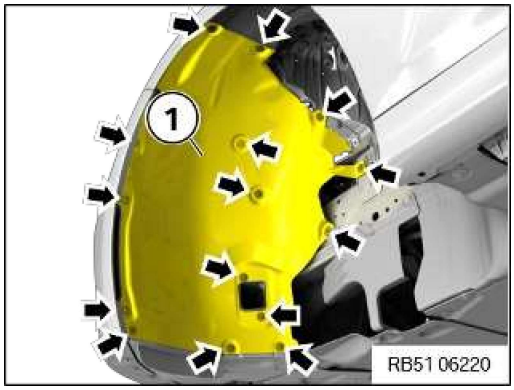


- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the front section of the front wheel arch cover

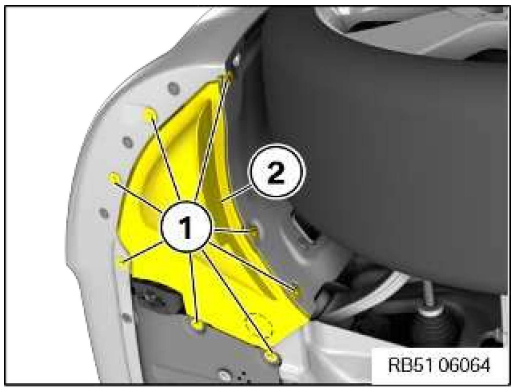
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



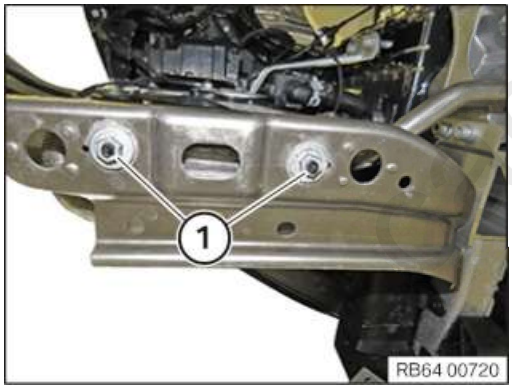
- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

3 – Removing the lower front cover at the side



- Loosen screws (1).
- Removing the lower front cover at the side (2).

4 – Release stationary heating system



- Release nuts (1) on the lower holder of the stationary heating.

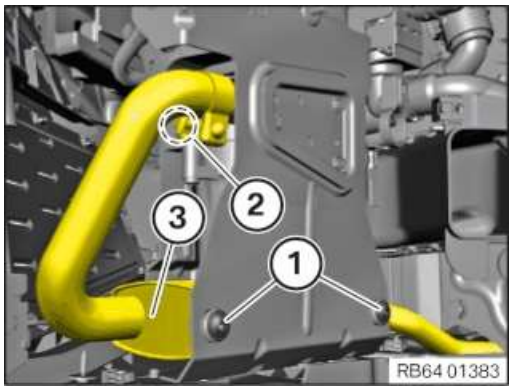


- Loosen screws (1).
- Loosen nuts (2).
- Unclip the fuel line from the latch mechanism (arrow).
- Remove the upper holder (3) of the stationary heating.
- Tilt the stationary heating slightly on the side.

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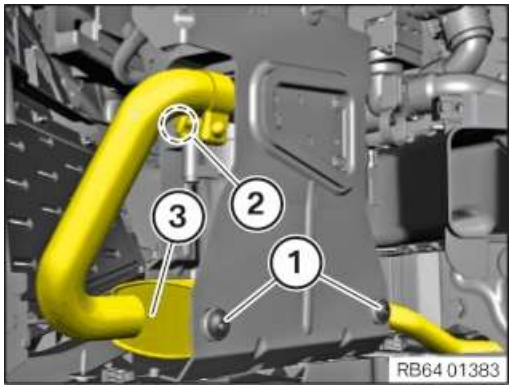
MAIN WORK

5 – Remove the silencer



- Loosen screws (1).
- Loosen nut (2).
- Remove silencer (3) upwards from the parking heater.
- Slide silencer (3) out and remove.

6 – Installing the silencer



- Feed in silencer (3) and install.
- Slide silencer (3) up onto the stationary heating.
- Tighten nut (2).

Silencer to stationary heating

Nut		Tightening torque	6 Nm

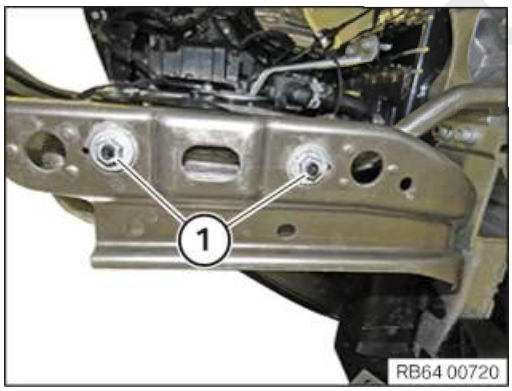
- Tighten the screws (1).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

POSTPROCESSES

7 – Securing the stationary heating



- Tighten all nuts (1) on the bottom holder of the stationary heating.

Stationary heating to holder/body

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

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- Position the stationary heating system.
- Feed in and install the top holder (3) of the stationary heating.
- Tighten nuts (2).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

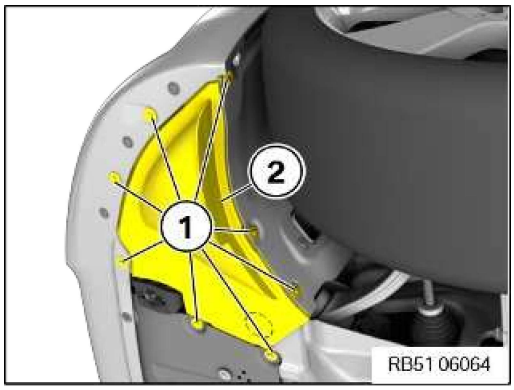
- Tighten the screws (1).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

- Clip in the fuel line at the latch mechanisms (arrows).

8 – Install the lower front cover at the side



- Install front bottom side cover(2).
- Tighten the screws (1).

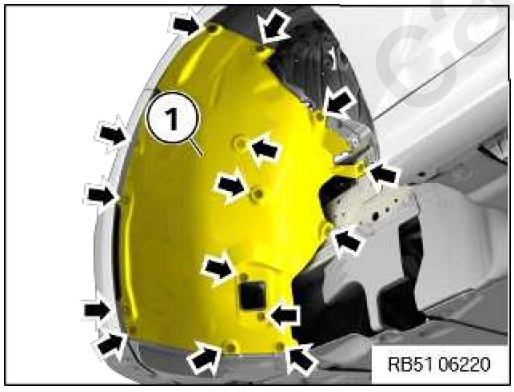
Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

9 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

10 – Attaching the front left wheel

▸ **Mounting the wheel**

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TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

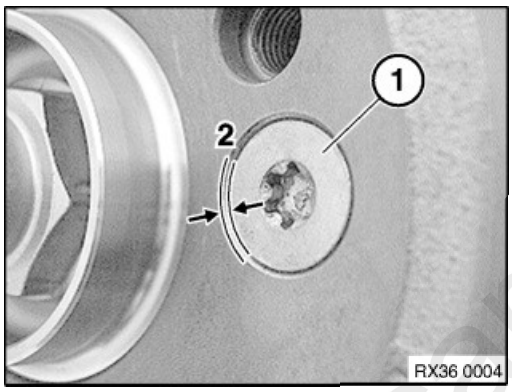
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

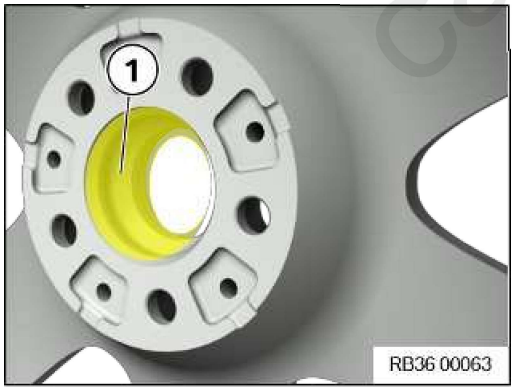
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

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TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

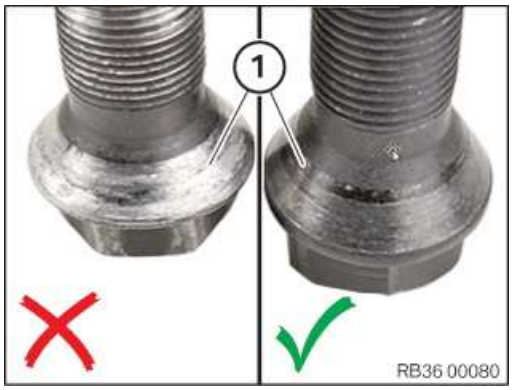
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.		
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Check	140 Nm

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Additional Information

Overview of Tightening Torques

Silencer to stationary heating — Used in step 6

Nut		Tightening torque	6 Nm

Silencer to holder / holder to body — Used in step 67

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

Stationary heating to holder/body — Used in step 7

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

Cover, front bottom on side — Used in step 8

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Wheel arch trim panel, front — Used in step 9

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 10

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 10

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 344 011 Tool



Common — Used in step 10

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common — Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	110

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64 12 120 Removing and installing/replacing intake silencer for independent/auxiliary heater

WARNING

Vehicle may slip off the vehicle hoist if the vehicle hoist is handled incorrectly.

Danger! Life-threatening injuries!

- Observe safety information on raising the vehicle using a vehicle hoist.
- For additional information see: 00 ... Raise the vehicle using a vehicle lift.

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**



TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



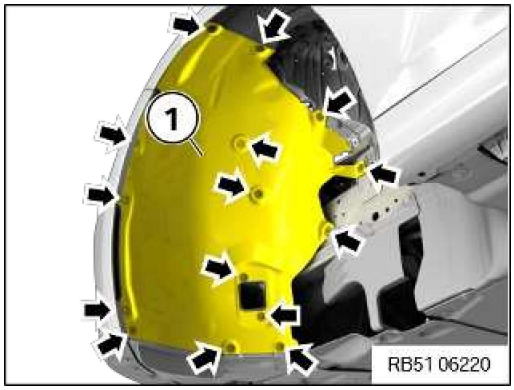
- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the front section of the front wheel arch cover

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NOTICE

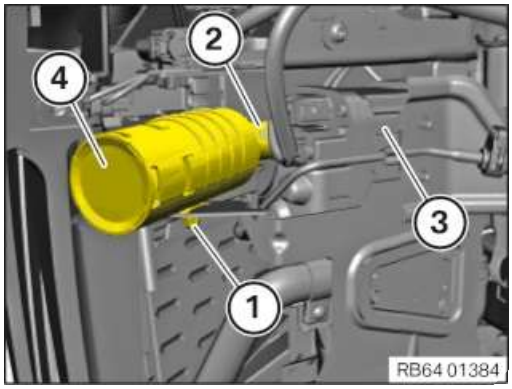
To provide a better overview: Schematic diagram with partially hidden components.



- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

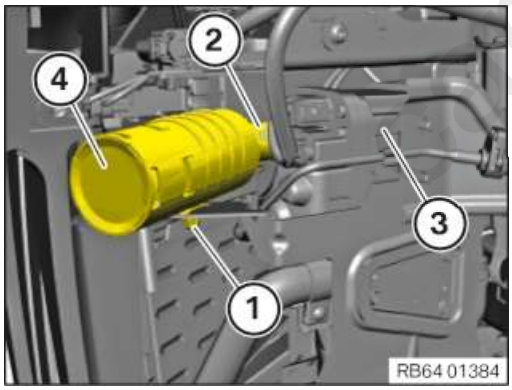
MAIN WORK

3 – Remove the intake silencer



- Unclip latch mechanism (1).
- Remove hose connector (2) from the parking heater (3).
- Feed intake silencer (4) out and remove.

4 – Install intake silencer



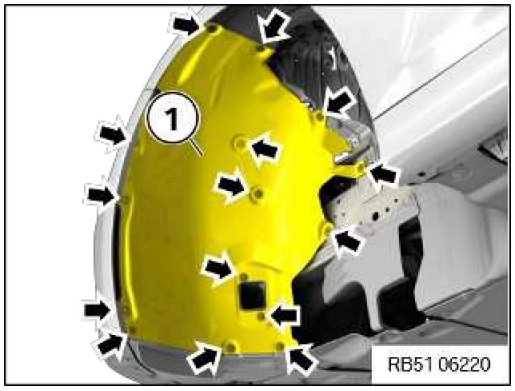
- Feed intake silencer (4) in and install.
- Slide connecting hose (2) onto the parking heater (3).
- Clip in latch mechanism (1).

POSTPROCESSES

5 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

6 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

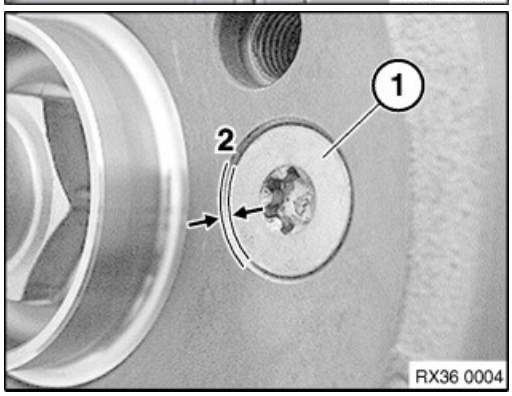
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

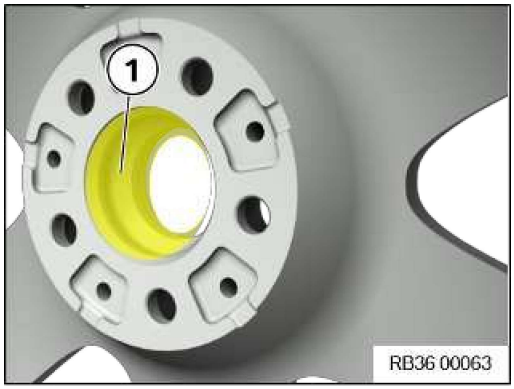
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

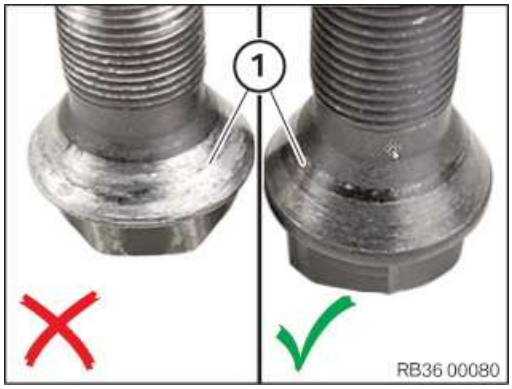
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts

- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

Additional Information

Overview of Tightening Torques

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Wheel arch trim panel, front — Used in step 5

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Brake disc to front wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 6

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 6

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 344 011 Tool



Common — Used in step 6

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common — Used in step 1

Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	16

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64 12 577 Replacing changeover valve for independent/auxiliary heating

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

PRELIMINARY WORK

1 – Removing the front left wheel

▶ **Removing the wheel**

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TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

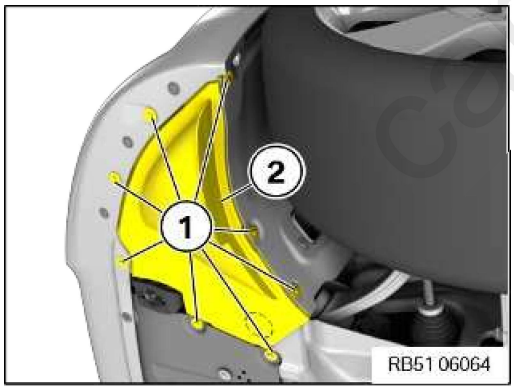
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the lower front cover at the side



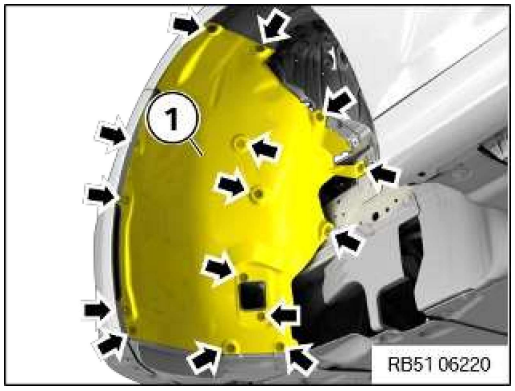
- Loosen screws (1).
- Removing the lower front cover at the side (2).

3 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

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- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

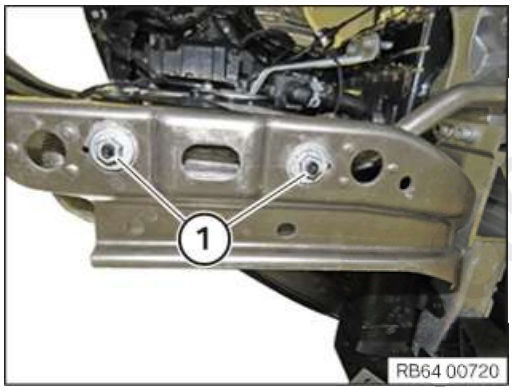
4 – Extend auxiliary heater with holder

TECHNICAL INFORMATION

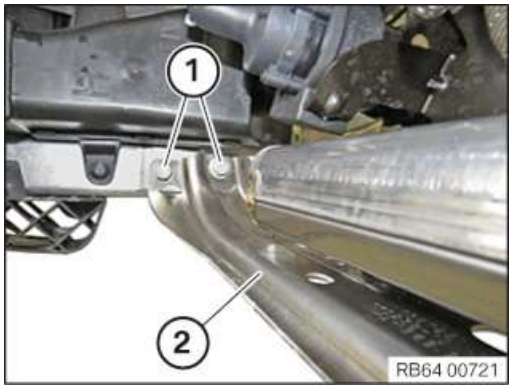
Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Loosen screws (1).
- Loosen nuts (2).
- Unclip the fuel line from the latch mechanisms (arrows).
- Remove upper holder (3) from independent heater.

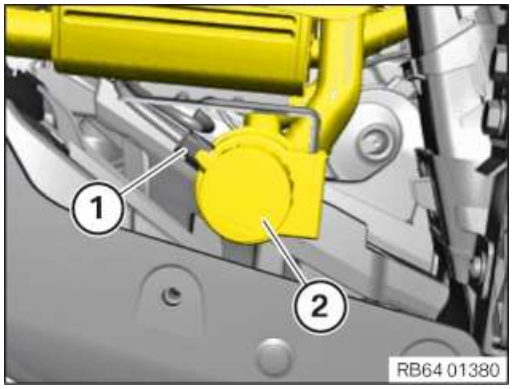


- Release all nuts (1) on lower holder of independent heater.

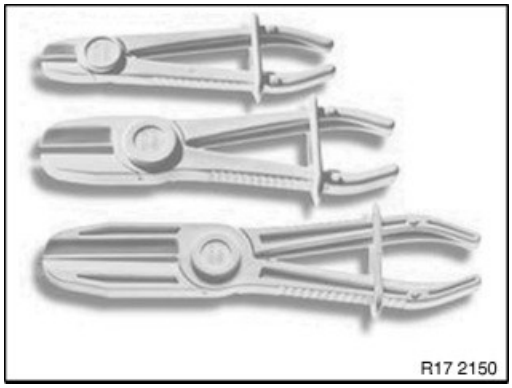


- Loosen screws (1) and remove holder (2).

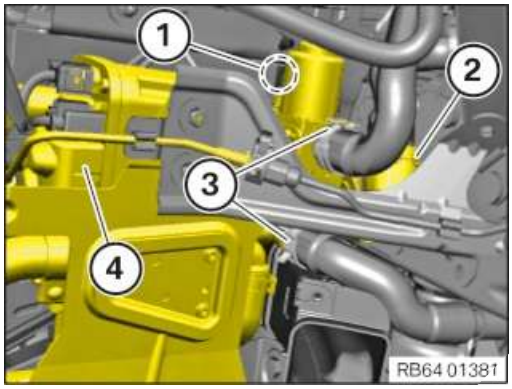
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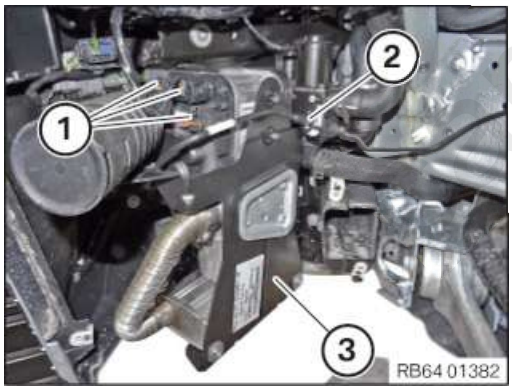
- Unlock and disconnect connector (1) on the auxiliary coolant pump (2) of the stationary heating function.



- Use commercially available disconnection tools to pinch off the coolant lines.

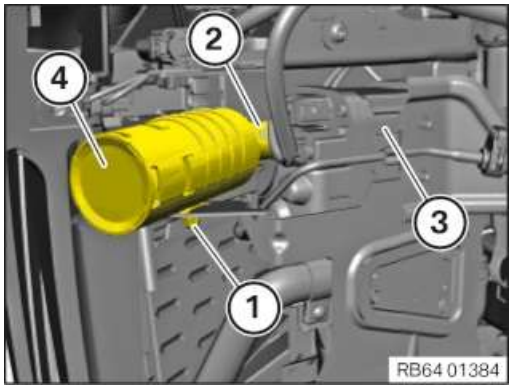


- Unlock and disconnect connector (1).
- Unlock coolant hose (2) and pull off.
- Detach the hose clamps (3) and remove the coolant hoses from the changeover valve.



- Unlock and disconnect connector (1).
- Unlock and pull off fuel line (2).
- Guide out the independent heater (3) with the holder and remove it.

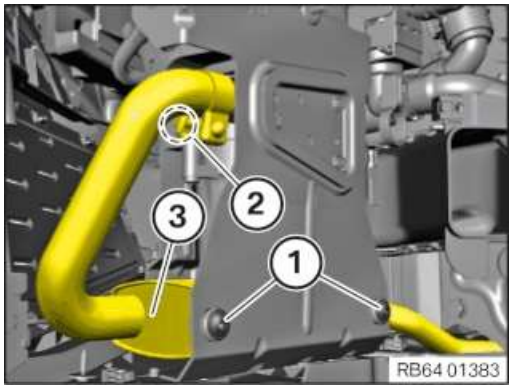
5 – Remove the intake silencer



- Unclip latch mechanism (1).
- Remove hose connector (2) from the parking heater (3).
- Feed intake silencer (4) out and remove.

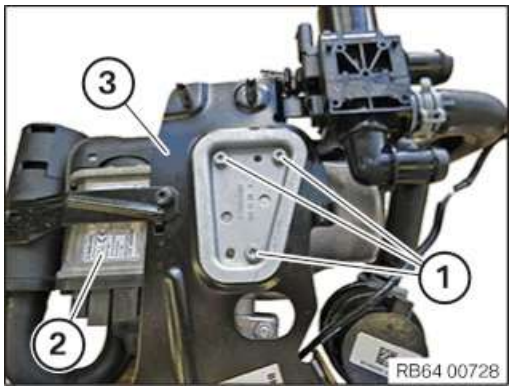
6 – Remove the silencer

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- Loosen screws (1).
- Loosen nut (2).
- Remove silencer (3) upwards from the parking heater.
- Slide silencer (3) out and remove.

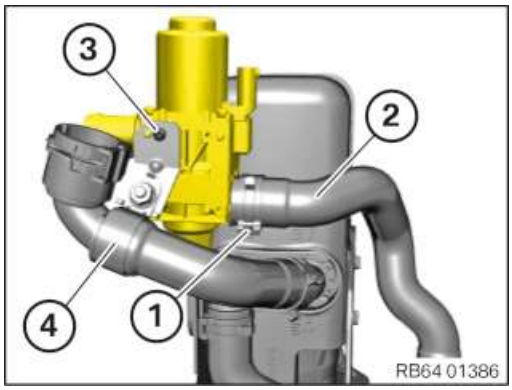
7 – Remove parking heater from holder



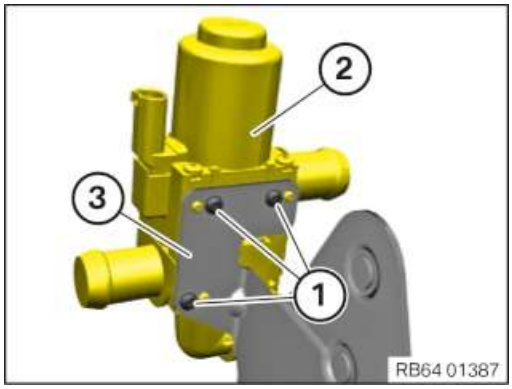
- Loosen screws (1).
- Remove auxiliary heater (2) from holder (3).

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8 – Removing changeover valve

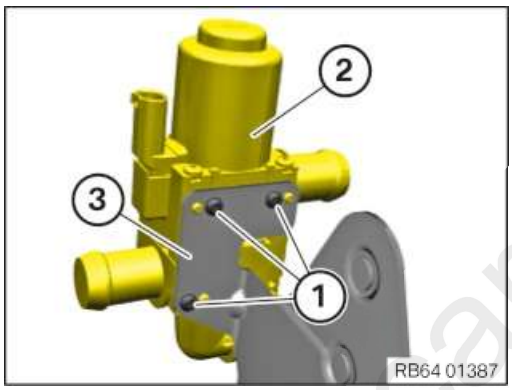


- Loosen hose clamp (1).
- Pull off the coolant hose (2).
- Loosen screw (3).
- Remove coolant hose (4) with the holder.



- Loosen screws (1).
- Remove the changeover valve (2) from the holder (3).

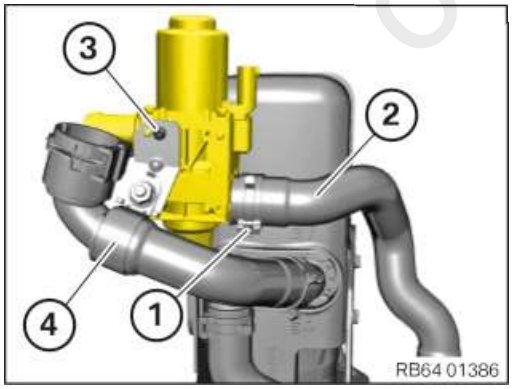
9 – Installing the changeover valve



- Position switching valve (2) on bracket (3).
- Tighten the screws (1).

Changeover valve to holder

Screw		Tightening torque	1,8 Nm



- Position coolant hose (4) with the bracket.
- Tighten down screw (3).

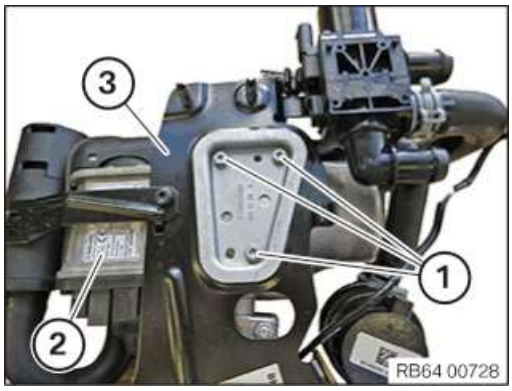
Changeover valve to holder

Screw		Tightening torque	1,8 Nm

- Slide coolant hose (2) on.
- Secure hose clamp (1).

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10 – Removing stationary heating on the holder

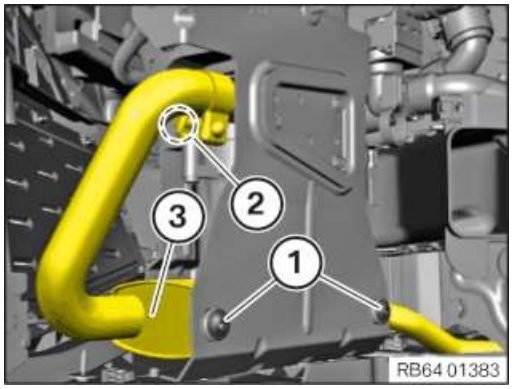


- Position stationary heating (2) on the holder (3).
- Tighten the screws (1).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

11 – Installing the silencer



- Feed in silencer (3) and install.
- Slide silencer (3) up onto the stationary heating.
- Tighten nut (2).

Silencer to stationary heating

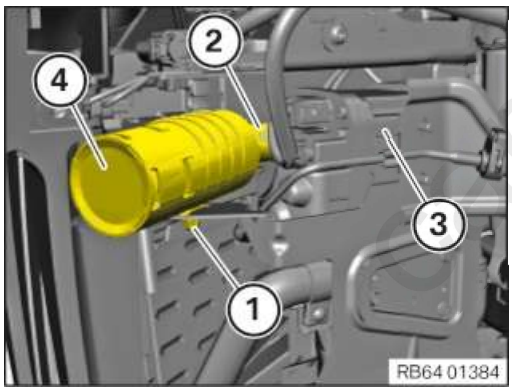
Nut		Tightening torque	6 Nm

- Tighten the screws (1).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

12 – Install intake silencer



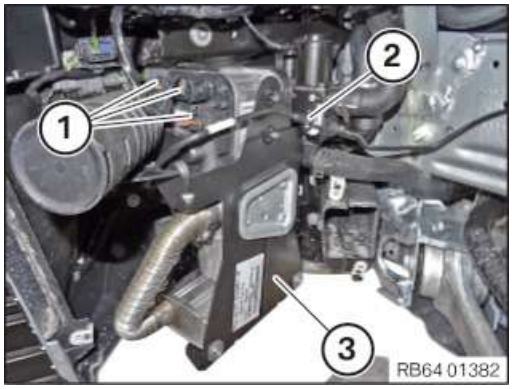
- Feed intake silencer (4) in and install.
- Slide connecting hose (2) onto the parking heater (3).
- Clip in latch mechanism (1).

13 – Install auxiliary heater with holder

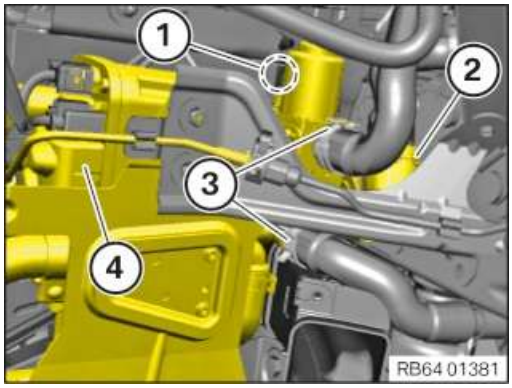
TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.

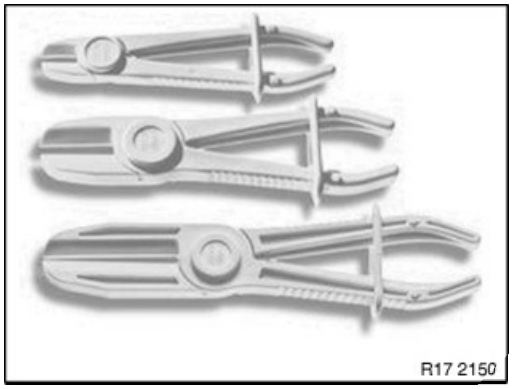
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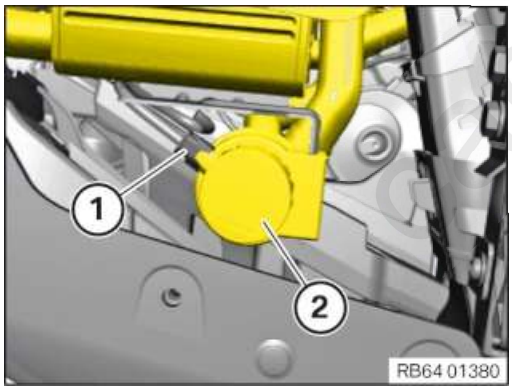
- Guide the stationary heating in (3) with the holder and install it.
- Connect and secure the fuel line (2).
- Connect connectors (1) and lock.



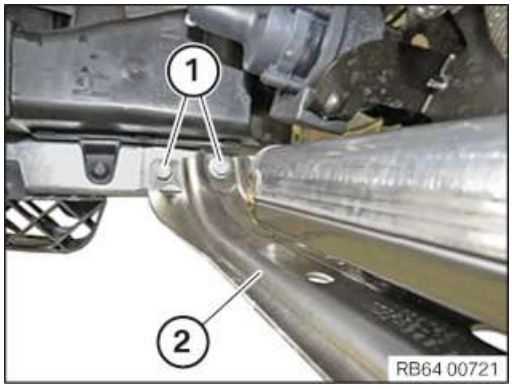
- Mount the coolant hoses on the changeover valve and secure the hose clamps (3).
- Slide on and lock the coolant hose (2).
- Connect connectors (1) and lock.



- Remove disconnection tools.



- Connect and lock connector (1) to the auxiliary coolant pump (2) of the stationary heating.

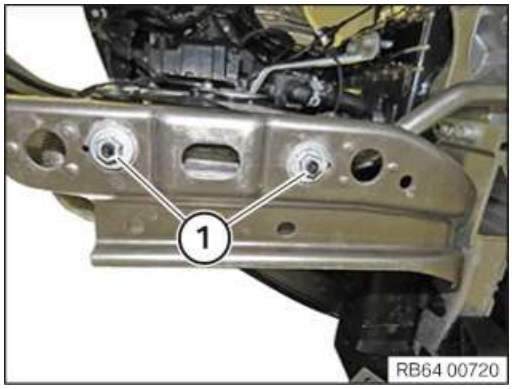


- Position the lower holder (2) of the stationary heating.
- Tighten the screws (1).

Stationary heating to holder/body

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

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- Tighten all the nuts (1) on the lower holder of the stationary heating.

Stationary heating to holder/body

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm



- Guide the upper holder (3) of the stationary heating in and install.
- Tighten nuts (2).

Silencer to holder / holder to body

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

- Tighten the screws (1).

Silencer to holder / holder to body

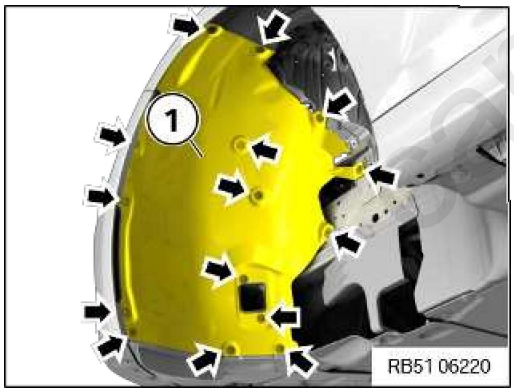
Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

- Clip in the fuel line to the locking units (arrow).

14 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

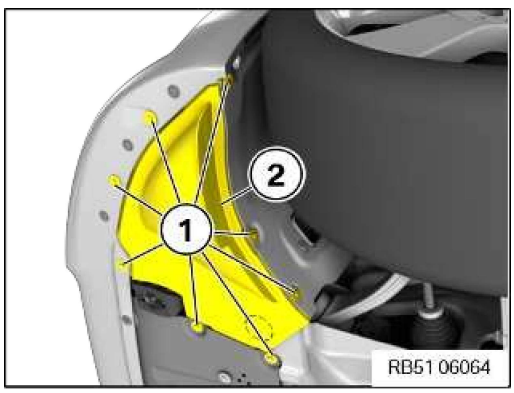


- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

15 – Install the lower front cover at the side



- Install front bottom side cover(2).
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

16 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

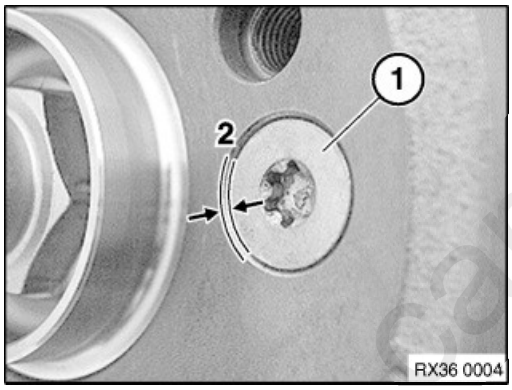
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

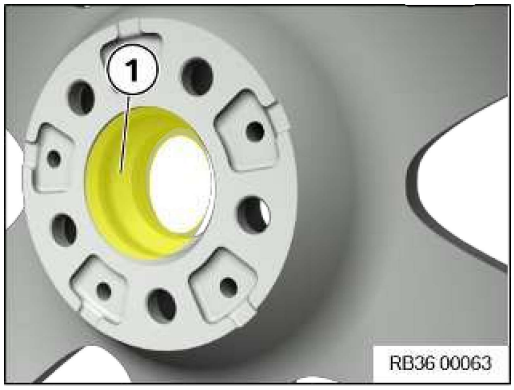
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233

carlion.com



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

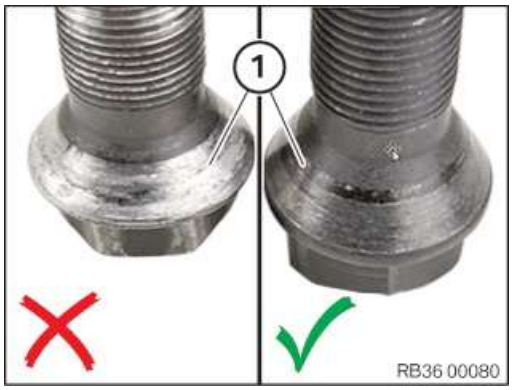
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

- **Check wheel bolts for wear.**



Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts
- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

17 – Filling and bleed the high-temperature coolant circuit



TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.

Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Changeover valve to holder Used in step 9

Screw		Tightening torque	1,8 Nm

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Silencer to holder / holder to body — Used in step 101113

Screw		Tightening torque	8 Nm
Nut		Tightening torque	8 Nm

Silencer to stationary heating — Used in step 11

Nut		Tightening torque	6 Nm

Stationary heating to holder/body — Used in step 13

Nut		Tightening torque	19 Nm
Screw		Tightening torque	19 Nm

Wheel arch trim panel, front — Used in step 14

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 15

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 16

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 16

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 16

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 344 011 Tool



Common — Used in step 16

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

Replacement tools:

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0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

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00 02 001 Raising the vehicle using a vehicle lift	116
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17 00 008 Draining and topping up the high-temperature coolant circuit	17
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17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	17
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	17

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64 12 670 Replacing electric auxiliary heater -front-

Prerequisite

- Air conditioning has been drawn off.

  Refrigerant line to the expansion valve is released.

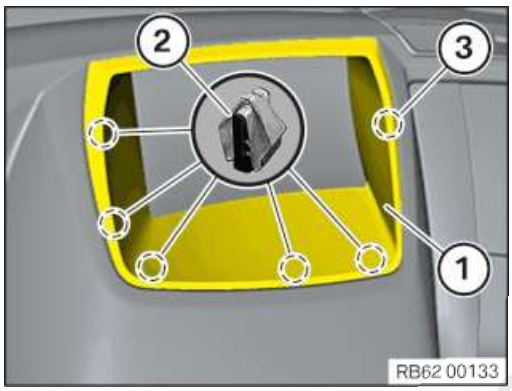
PRELIMINARY WORK

1 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

2 – Removing trim for the Head-Up Display

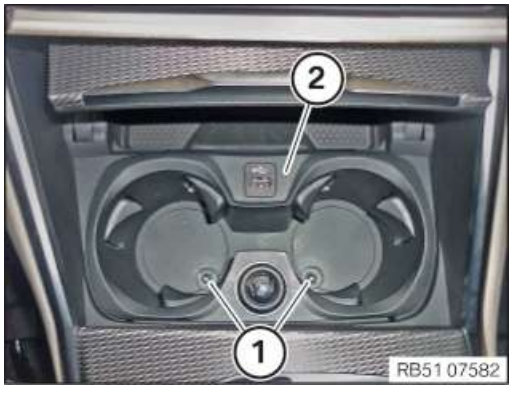


- Unclip trim (1) for the Head-Up Display upwards from clamps (2) and latch mechanism (3).

3 – Remove cupholder



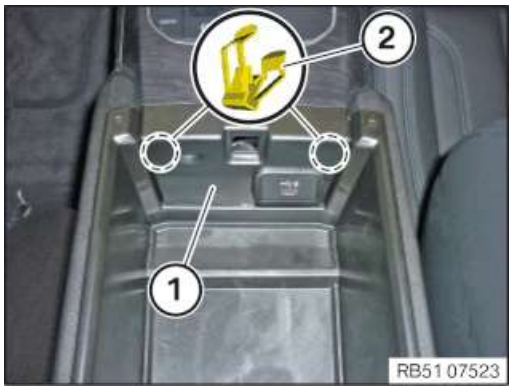
- Remove the insert (1).



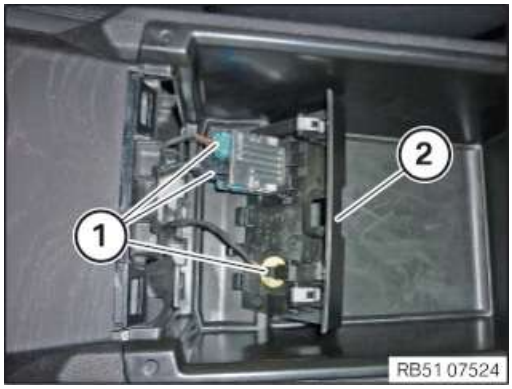
- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

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4 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

5 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

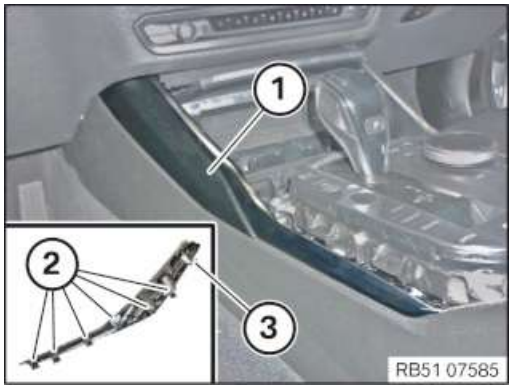
6 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

NOTICE

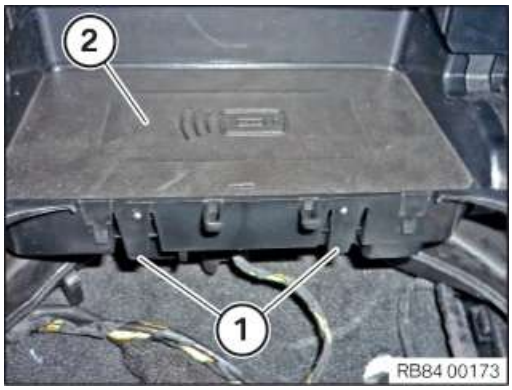
Description is for left component only. Procedure on the right side is identical.

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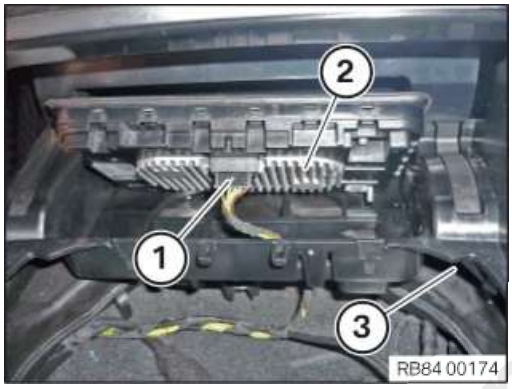


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

7 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

8 – Remove the operating facility in the centre console

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▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

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Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

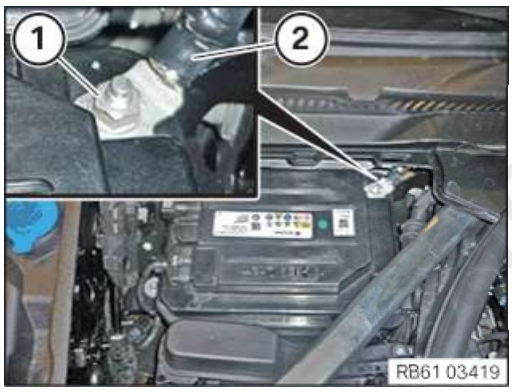
Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

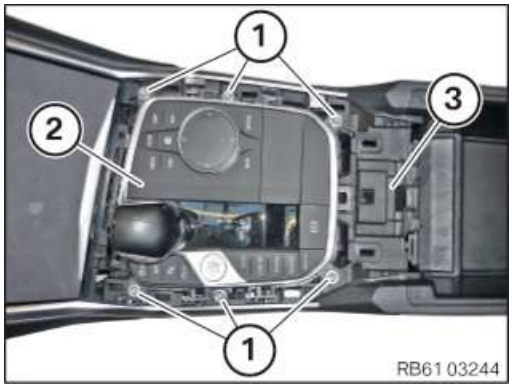
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ **Disconnecting all battery earth leads**

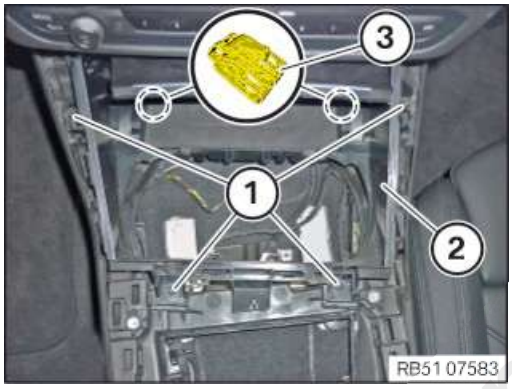


- See additional information.

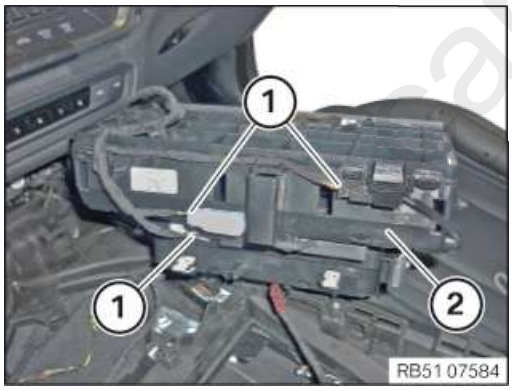


- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

9 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).



- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

10 – Removing the rear centre console trim

RISK OF DAMAGE

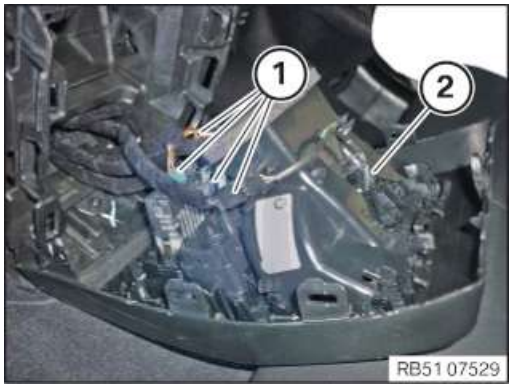
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.

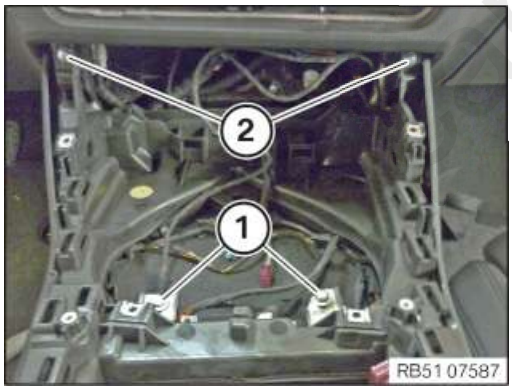


- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

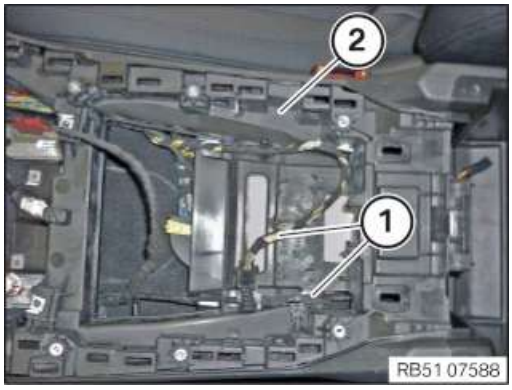
11 – Removing the centre console



- Loosen screws (1).

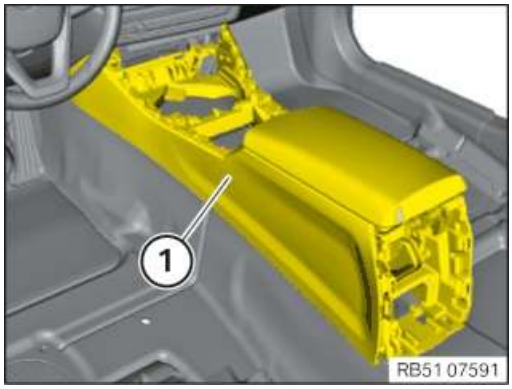


- Loosen screws (1) and (2).



- Release the wiring harness (1) from the centre console (2).

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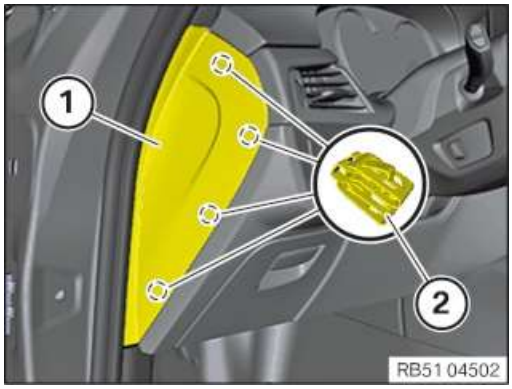


NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

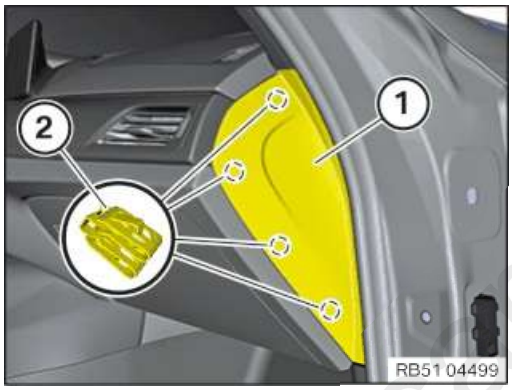
- Carefully raise rear centre console (1).
- Feed out wiring harness from the centre console (1) and unlock and disconnect existing plug connections, if required.
- Feed out and remove the centre console (1) on the instrument panel .

12 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

13 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

14 – Remove left and right A-pillar trim panel

NOTICE

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

▸ **Remove the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

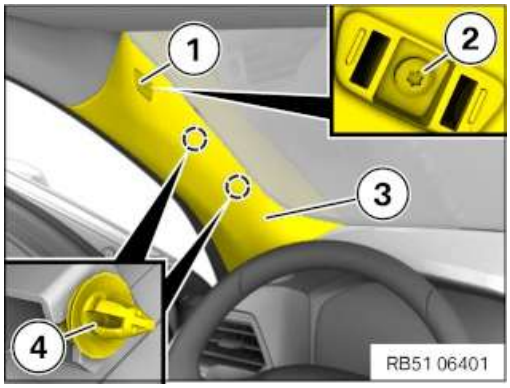
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RISK OF DAMAGE

Damage to the head airbag.

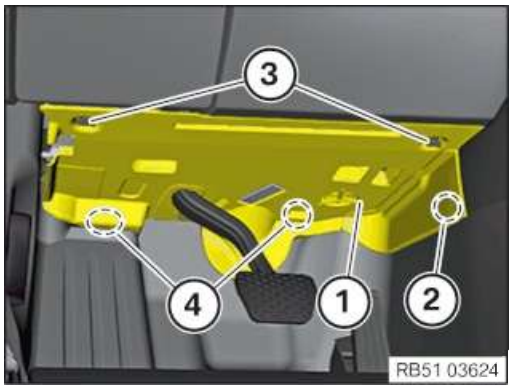
Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.



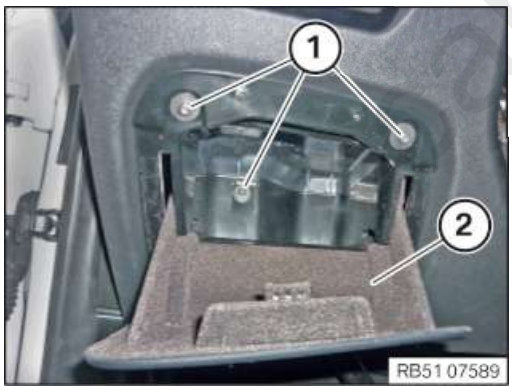
- Unclip cover (1) with a suitable special tool from the special tool kit 0 493 752 (00 9 329).
- Loosen screw (2).
- Unclip A-pillar trim panel (3) with clips (4) and feed it out to the top.

15 – Removing the trim panel for pedal mechanism



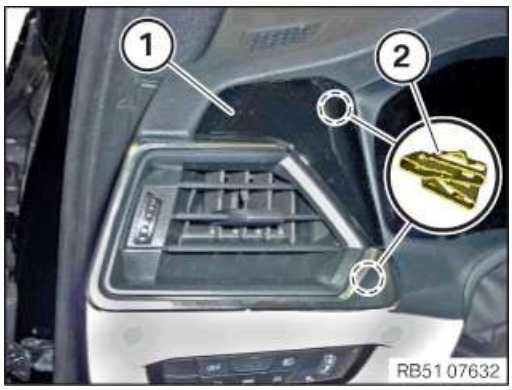
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

16 – Removing the left fold-down compartment



- Loosen screws (1).
- Remove the fold-down compartment (2) toward the bottom.

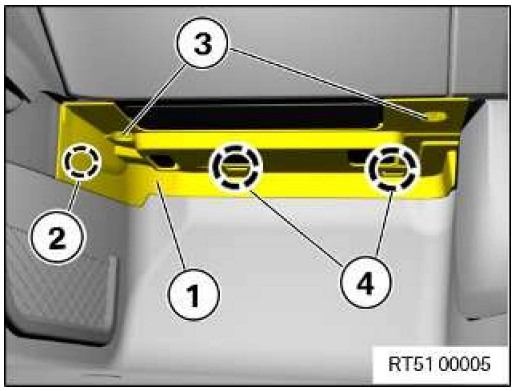
17 – Remove the finisher on the instrument panel on the left



- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

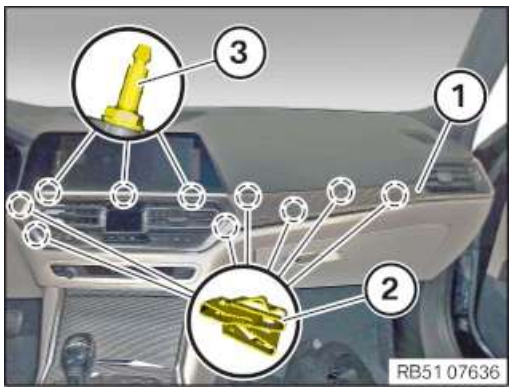
  Remove the decorative strip (1).

18 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

19 – Remove the finisher on the right instrument panel



- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

20 – Remove Central Information Display (CID)

RISK OF DAMAGE

Electrostatic discharge.

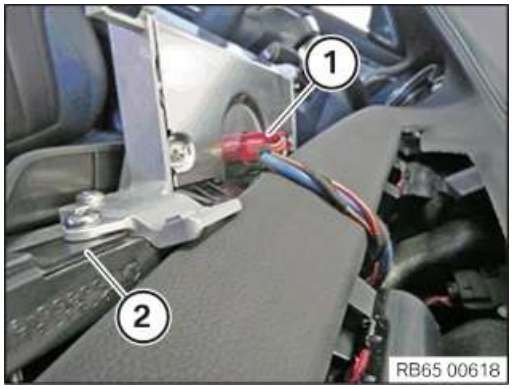
Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Loosen screws (1).
- Pull out central information display (CID) (2) slightly off the instrument panel.

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- Unlock plug connection (1) and disconnect.
- Remove the central information display (CID) (2).

21 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Removing the airbag unit for sports steering wheel**



- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.

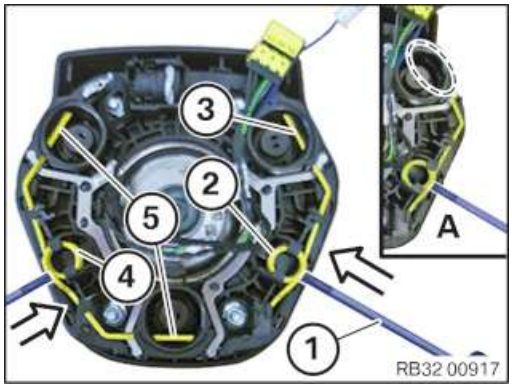
cardiagn.com



NOTICE

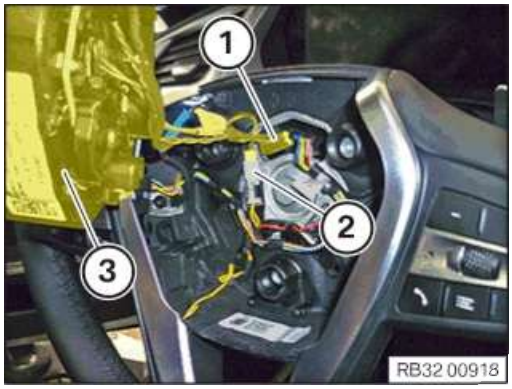
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Press wire spring clip (4) with Torx screwdriver T25 (1) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

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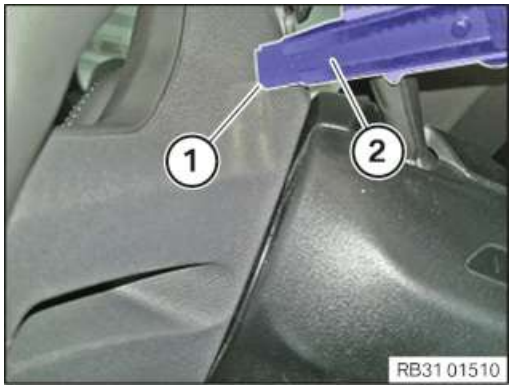
▸ Removing the airbag unit for M Sport steering wheel



NOTICE

Perform the operations on the left and right side.

- Locate the mark (1) for unlocking the airbag unit on the steering wheel by touching it.



NOTICE

Perform the operations on the left and right side.

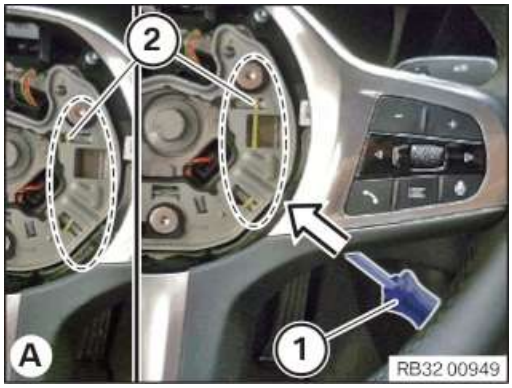
- Cut the mark (1) carefully with a knife (2) to an approx. length of 4 mm .



TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

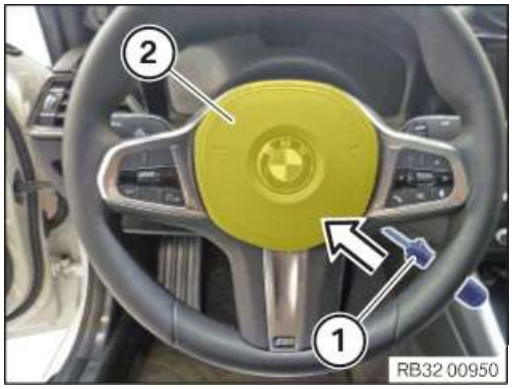
- In case of vehicles with shift paddles (2) made of carbon-fibre-reinforced plastic, use a Torx socket T15 (1) for unlocking the airbag unit.



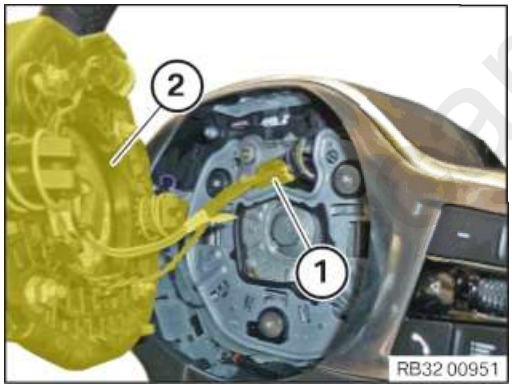
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Insert the Torx socket T15 (1) diagonally upwards until a resilient resistance is felt.
- Press in Torx socket T15(1) straight in the direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).



- Press in Torx screwdriver T15 (1) straight in direction of arrow towards the centre of the steering wheel and lift the airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

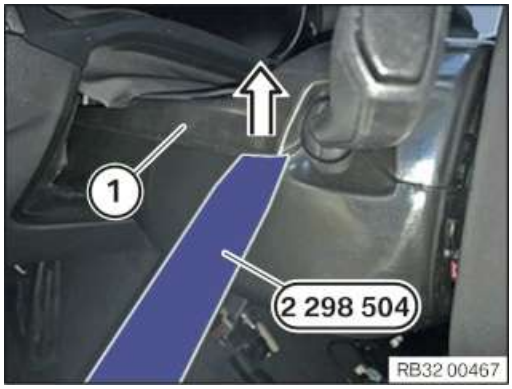
22 – Remove sports steering wheel



- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

23 – Removing steering column shroud upper section

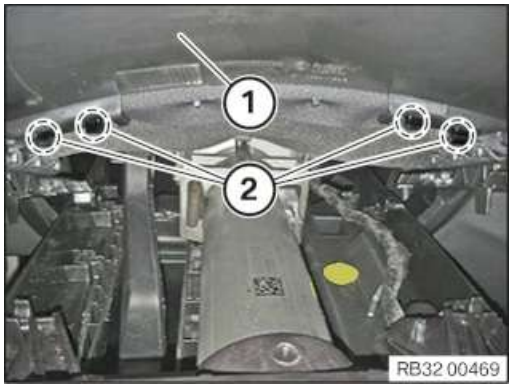
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NOTICE

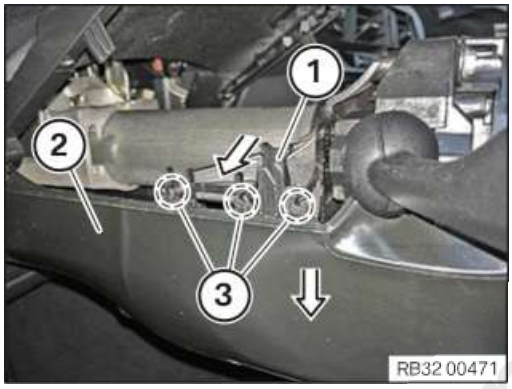
Perform the operations on the left and right side.

- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.



- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

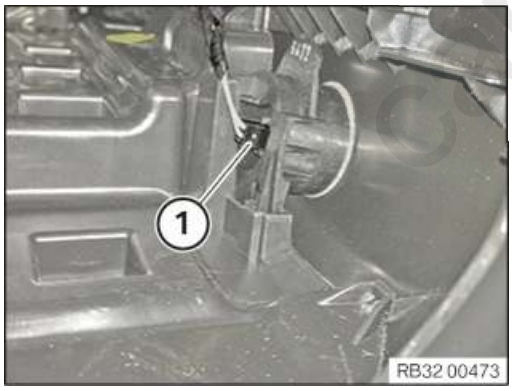
24 – Removing steering column shroud lower section



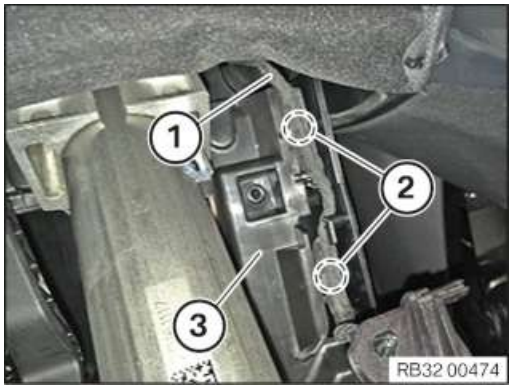
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

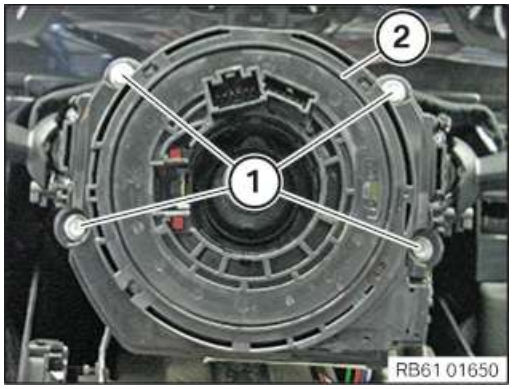


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).

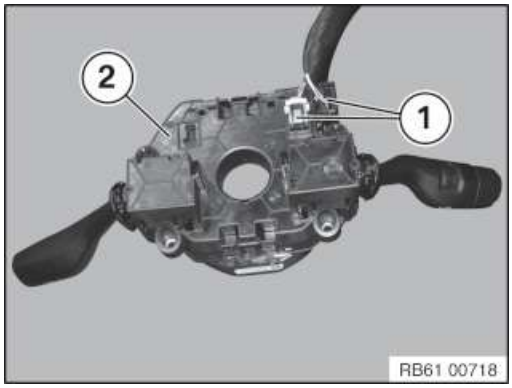


- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

25 – Removing the steering column switch cluster (SZL)

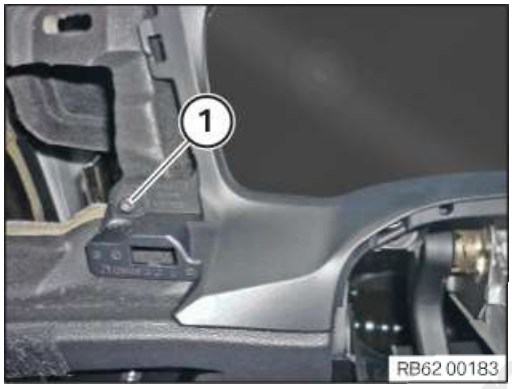


- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



- Unlock and disconnect plug connections (1) on the SZL (2).

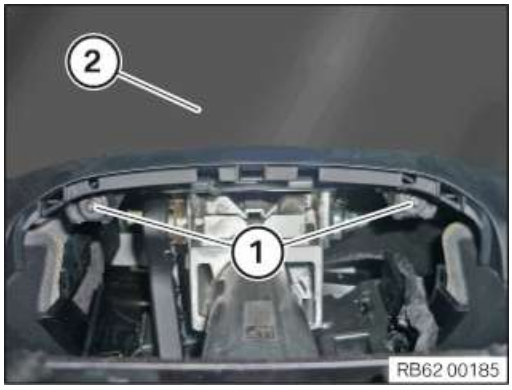
26 – Removing the instrument cluster (KOMBI)



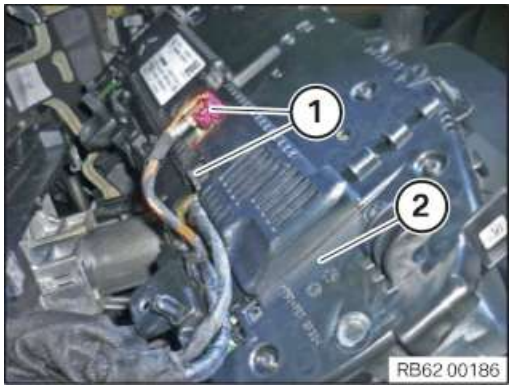
- Loosen screw (1).



- Loosen screw (1).

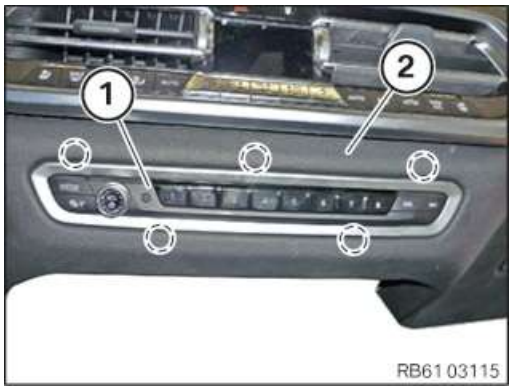


- Loosen screws (1).
- Feed out instrument cluster (KOMBI) (2).

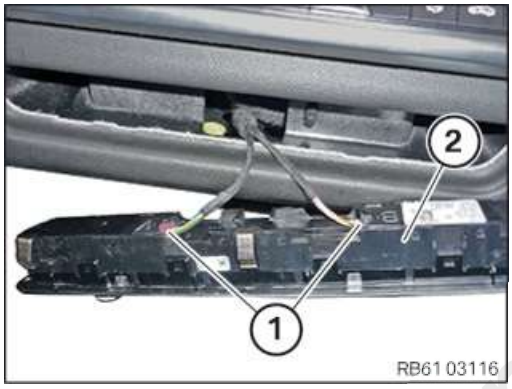


- Unlock and disconnect plug connections (1) from instrument cluster (KOMBI) (2).
- Remove the instrument cluster (KOMBI) (2).

27 – Remove the audio operating unit

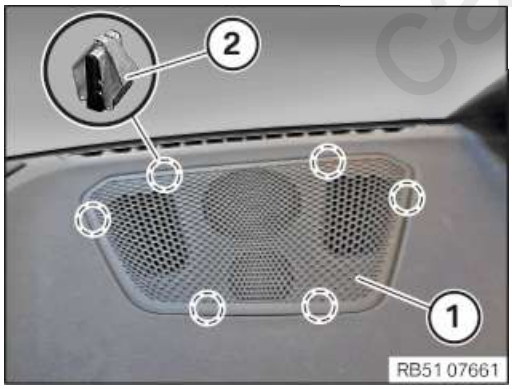


- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



- Disconnect plug connections (1) and remove the audio operating unit (2).

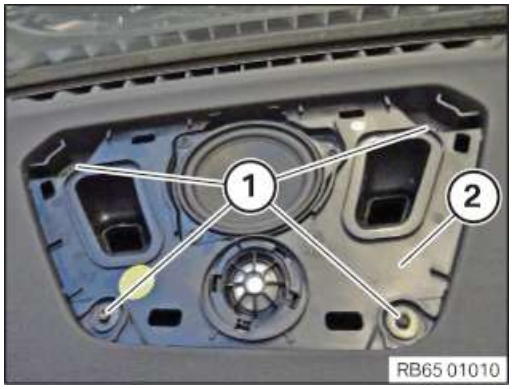
28 – Remove the speaker trim at the instrument panel



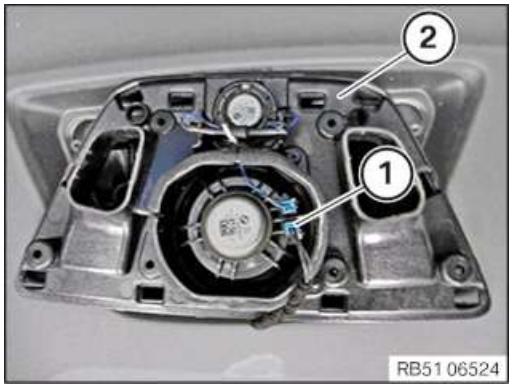
- Lever out the speaker trim (1) with the special tool 0 496 569 (00 9 325) from the clamps (2) toward the top and remove.

29 – Remove the speaker holder at the instrument panel

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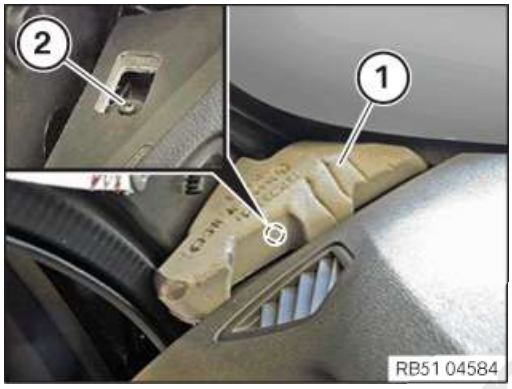


- Loosen screws (1).
- Pull out speaker holder (2) slightly with the loudspeakers and tilt it to the side.



- Unlock plug connection (1) and disconnect.
- Remove the speaker holder (2).

30 – Remove the instrument panel trim panel



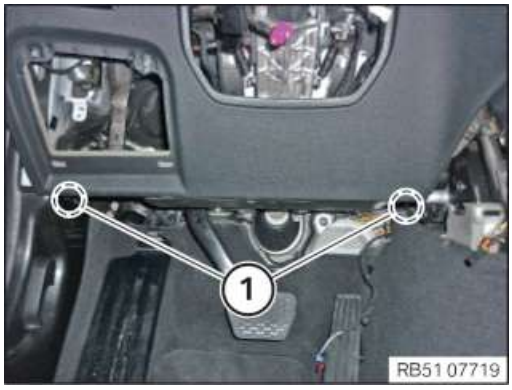
NOTICE

Perform the operations on the left and right side.

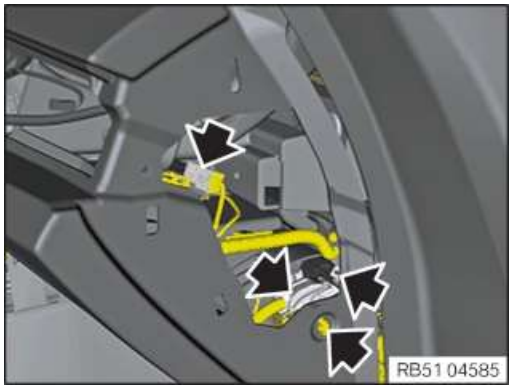
- Remove the sound insulation (1).
- Loosen screw (2).



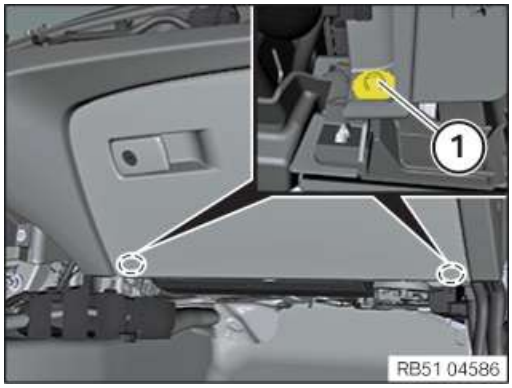
- Loosen screws (1).



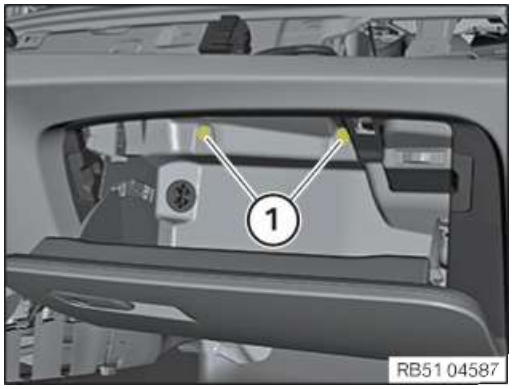
- Loosen screws (1).



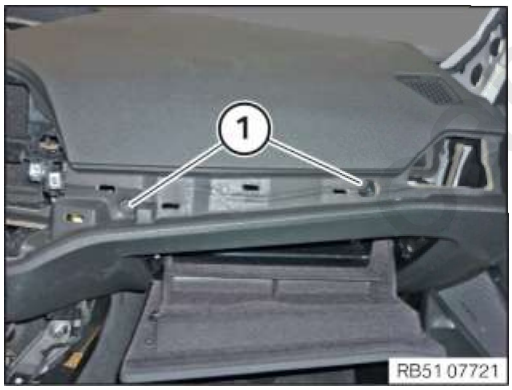
- Release all plug connections and cable clips (arrows) behind the glove box.



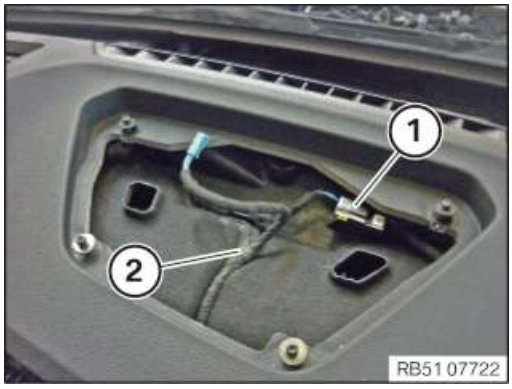
- Release the screws (1) on the lower side of the glove box.



- Open glovebox.
- Loosen screws (1).



- Loosen screws (1).



- Unlock plug connection (1) and disconnect.
- Release the wiring harness (2) on the holders.

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- Unlock the plug connection (1) on the light operating unit and disconnect it.



- Loosen screws (1).

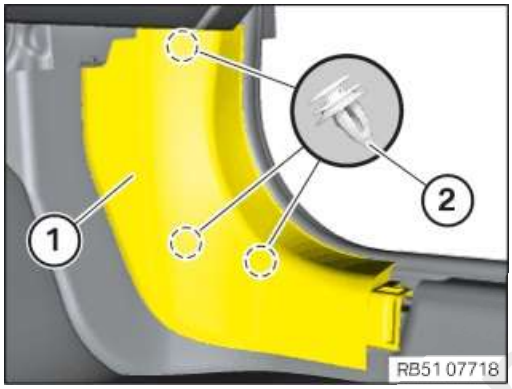
TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Pull the instrument panel trim back slightly.

  If necessary, unlock and disconnect additional plug connections.
- Remove the instrument panel trim from the vehicle.

31 – Removing the side trim panel in the footwell at the right-hand A-pillar



- Loosen the side trim panel (1) at the clips (2) and remove it toward the inside.

32 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

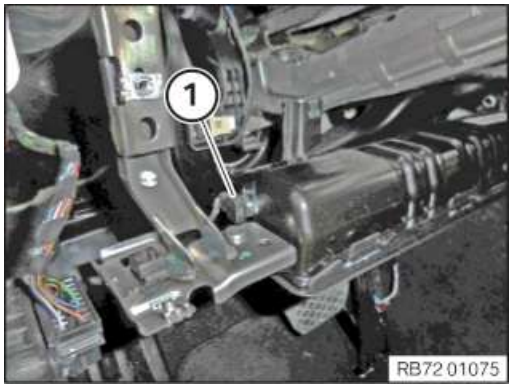
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WARNING

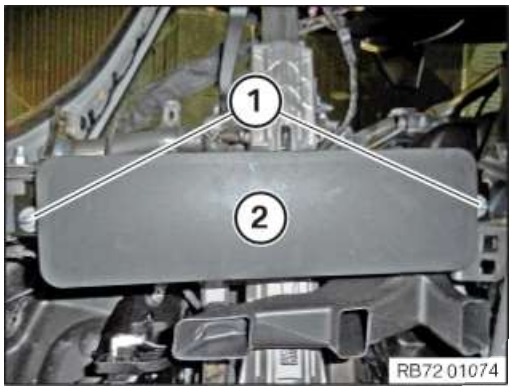
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

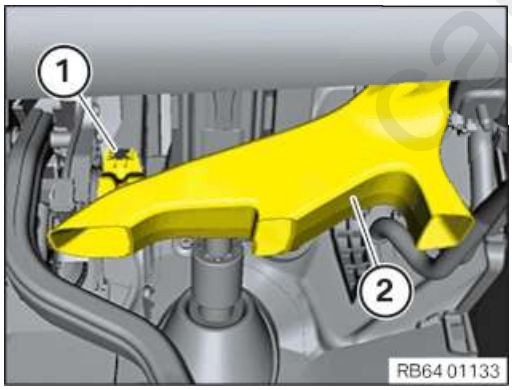


- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

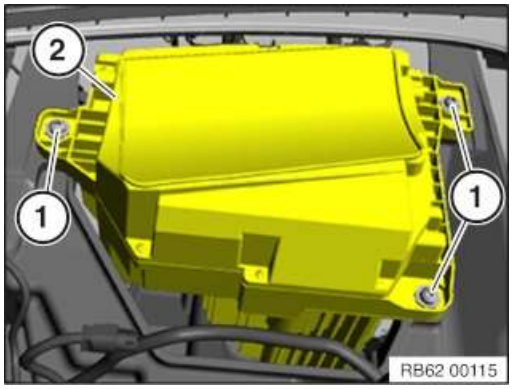
33 – Remove left air duct



- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

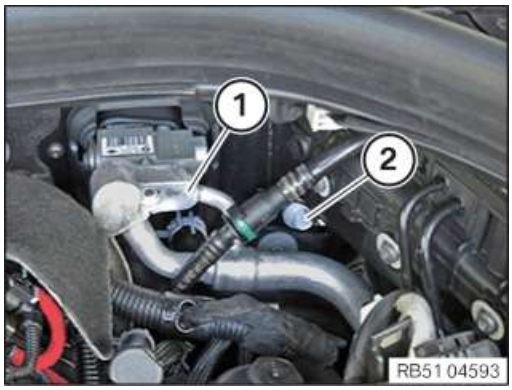
34 – Removing the Head-Up Display

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- Loosen screws (1).
- Remove head-up display (2) from support.
- Unlock associated cable and disconnect.

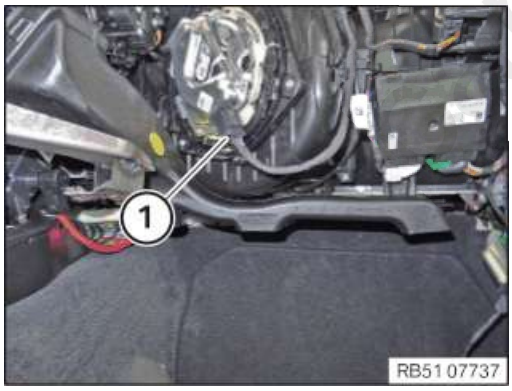
35 – Removing the support for the instrument panel



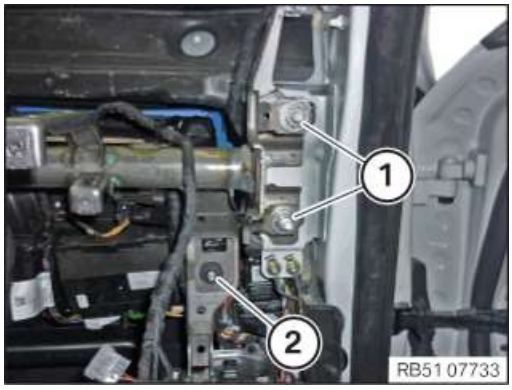
- Push the refrigerant line (1) slightly to one side and loosen the screw (2).



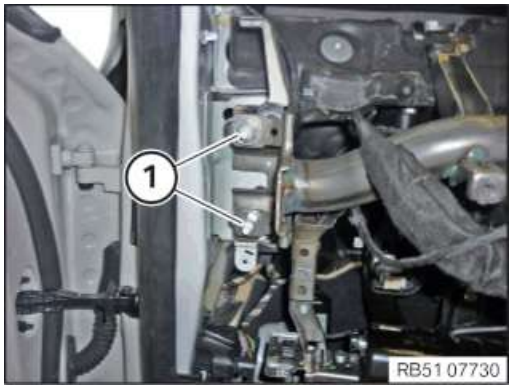
- Push the carpet in the area of the right B-pillar to the side.
- Unlock and disconnect plug connections (1).



- Unlock and disconnect the plug connection (1) on the blower motor.



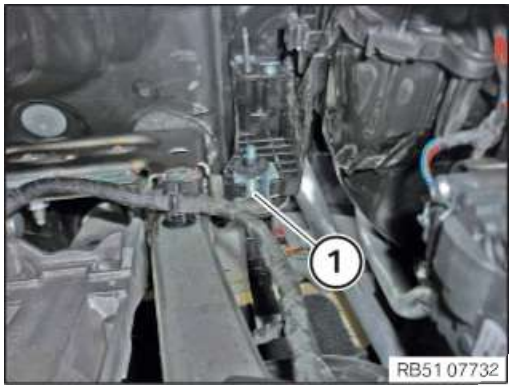
- Loosen nuts (1) and (2).



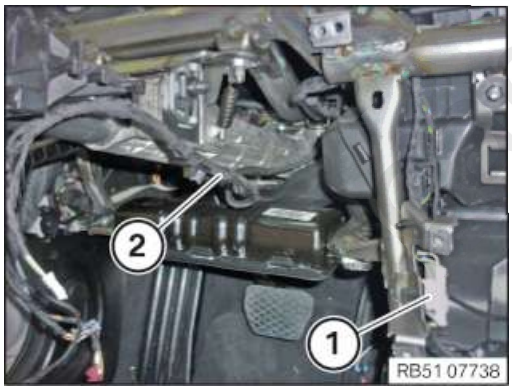
- Loosen nuts (1).



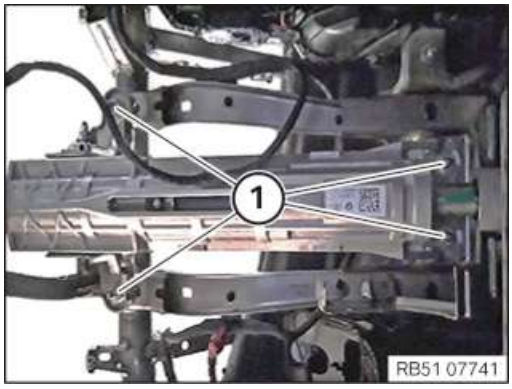
- Loosen screws (1).



- Slacken the nut (1) in the left footwell on the heating and air-conditioning unit.



- Release plug connection (1).
- Release the wiring harness (2) from the steering column.



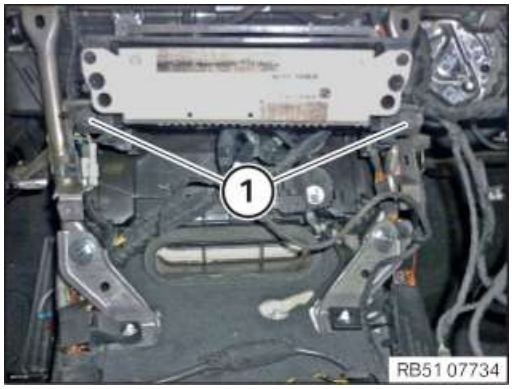
TECHNICAL INFORMATION

Secure component against falling.

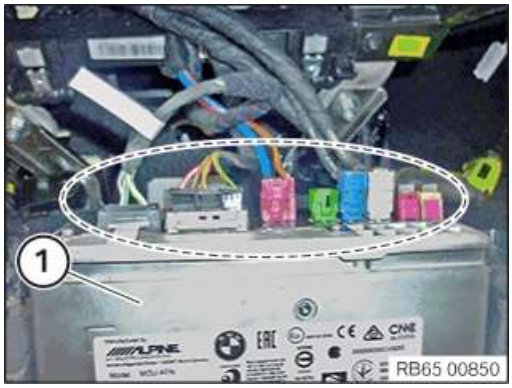
- Release the nuts (1) at the steering column.
- Drop steering column (1) a little away and support it in the footwell.

  Drop steering column not too far away and support it absolutely.

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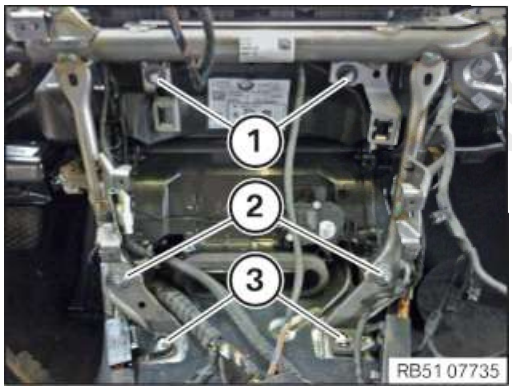
- Loosen screws (1).
- Feed out Head Unit High.



- Unlock and disconnect all connectors in the marked area.
- Remove headunit (1).

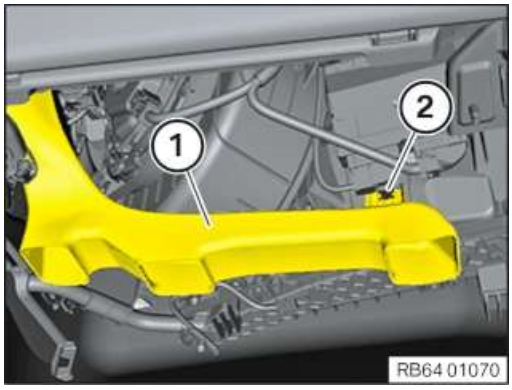


- Unlock and disconnect plug connection (1) from airbag control unit.
- Release the wiring harness (2) on the holders.



- Loosen nuts (1).
- Loosen nuts (2).
- Remove cable clip and release the nuts (3).
  Remove retaining bracket from left and right sides.
- Carefully feed out the support for the instrument panel to the rear.
  If necessary, unlock and disconnect additional plug connections.
- Carefully remove support for the instrument panel from the vehicle.

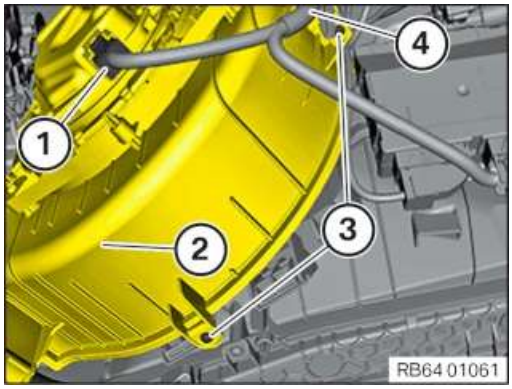
36 – Removing the right air duct



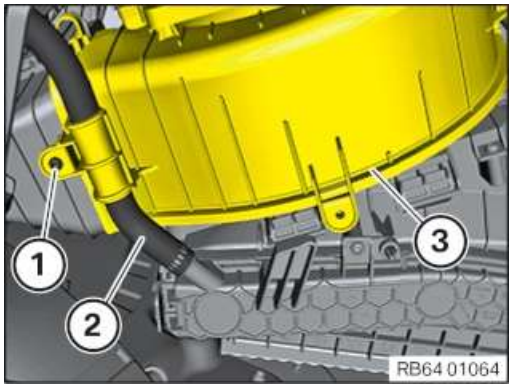
- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

37 – Remove the blower for the heating and air-conditioning unit

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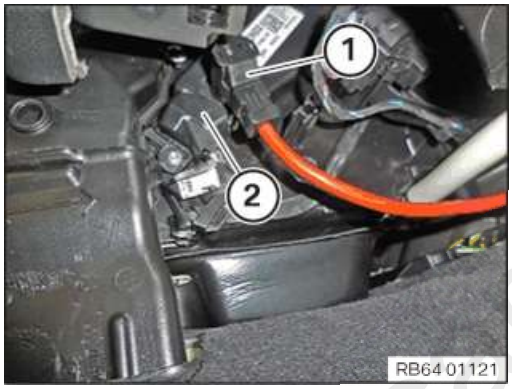
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



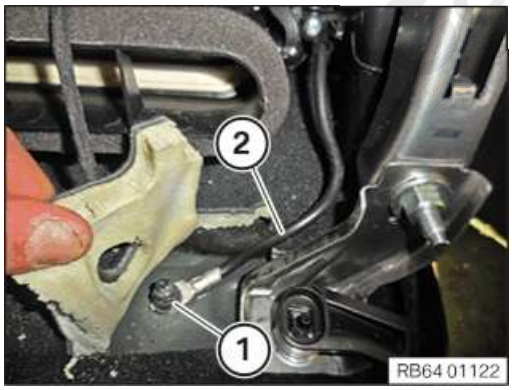
- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

MAIN WORK

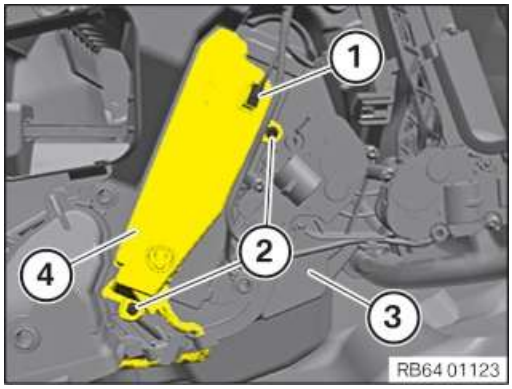
38 – Remove electric auxiliary heater



- Unlock and disconnect the plug connection (1) from the electric auxiliary heater (2).

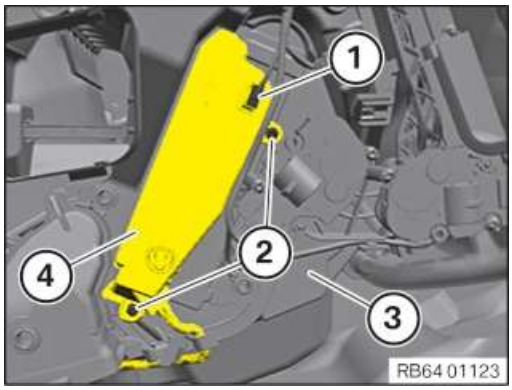


- Release the nut (1) and remove the ground cable (2).



- Unlock plug connection (1) and disconnect.
- Loosen screws (2).
- Remove the electric auxiliary heater (4) from the heating and air-conditioning unit (3).

39 – Installing the electric auxiliary heater



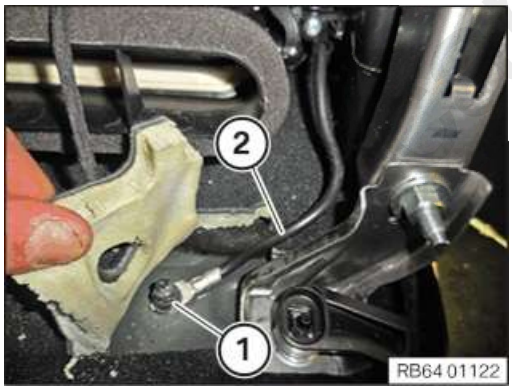
- Position electric auxiliary heater (4) correctly and insert in the heating and air-conditioning unit (3).
- Connect connectors (1) and lock.
- Tighten down screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm



- Connect and lock the connector (1) on the electric auxiliary heater (2).



- Correctly position the ground cable (2) and tighten the nut (1).

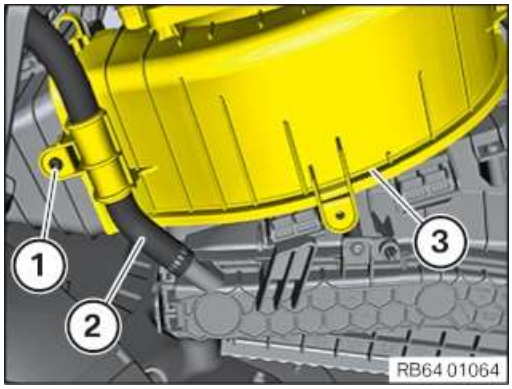
Ground cable to body

Hexagon nut		Tightening torque	8,0 Nm

POSTPROCESSES

40 – Install the blower for the heating and air-conditioning unit

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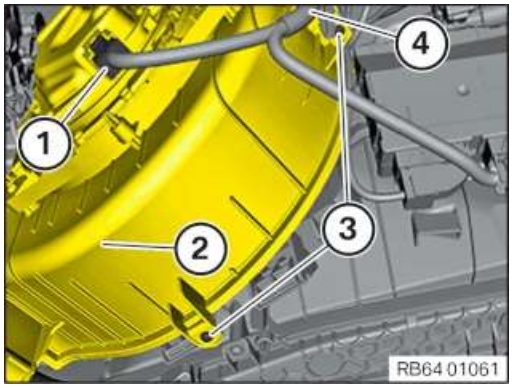


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



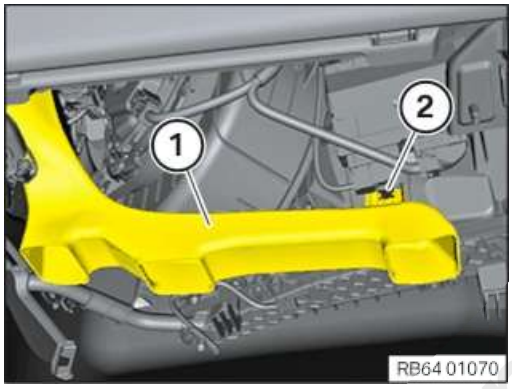
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

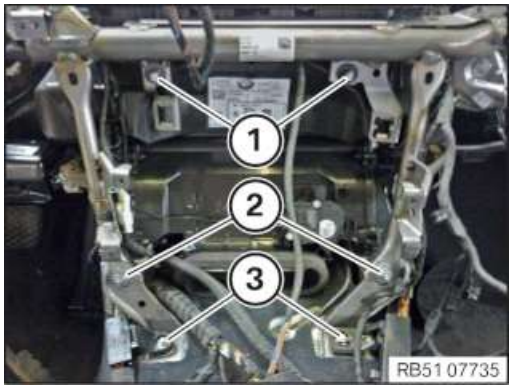
41 – Installing the air duct, right



- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

42 – Installing the support for instrument panel

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- Install the instrument panel support into the vehicle carefully.
- Insert the instrument panel support carefully.

  If necessary, connect and lock the additional connector.
- Tighten nuts (1).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

- Mount retaining bracket on left and right.

  Tighten nuts (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

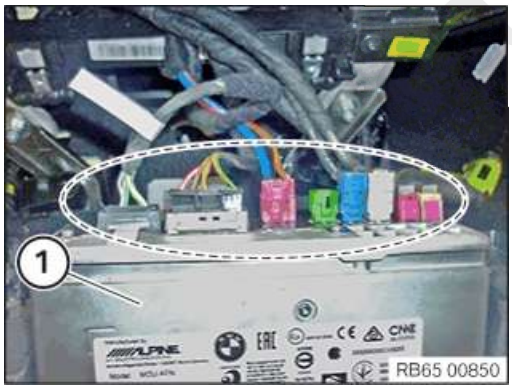
- Tighten nuts (3) and fit cable clip .

Support for instrument panel

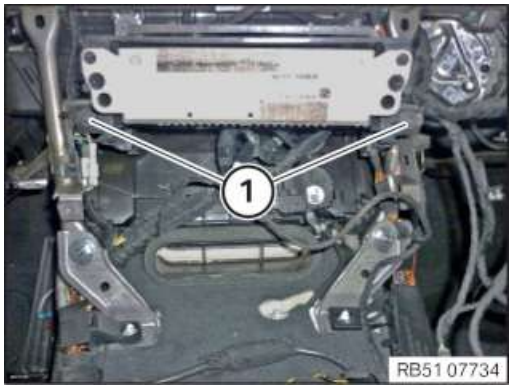
M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Connect the connector (1) to the airbag control unit and lock it.
- Secure the wiring harness (2) on the holders.



- Position head unit (1).
- Connect and lock all connectors in the marked area.

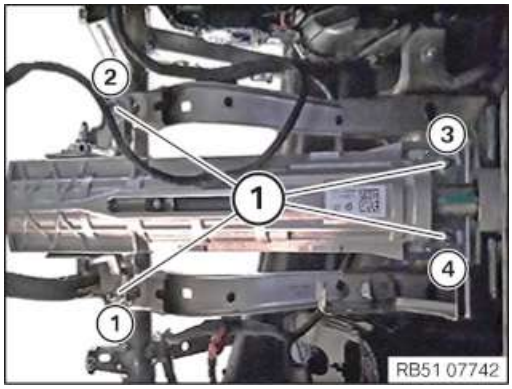


- Feed in the head unit.
- Tighten the screws (1).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

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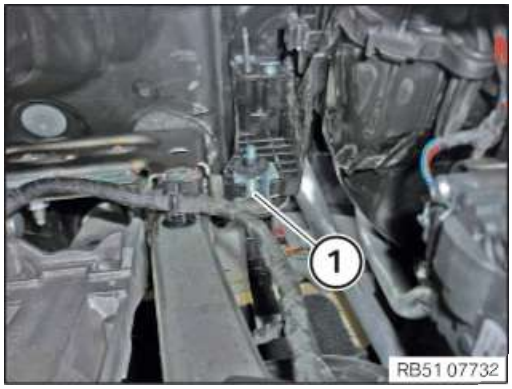
- Correctly position the steering column (2) and tighten the nuts (1) in the sequence (1), (2), (3) and (4).

Steering column to dashboard support

M8	Observe tightening sequence.	Tightening torque	21,4 Nm



- Connect connectors (1) and lock.
- Secure the vehicle wiring harness (2) to the steering column.



- Tighten nut (1) in the left foot well on the heating and air-conditioning unit.

Heating and air-conditioning unit on support

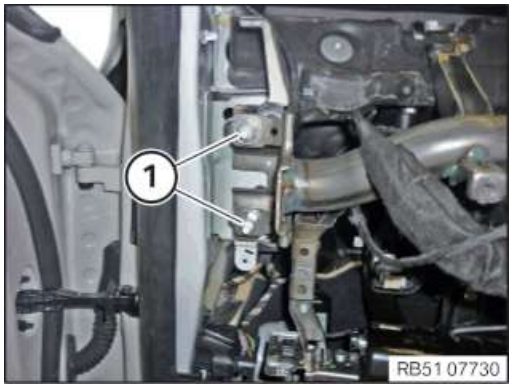
Nut M6		Tightening torque	4 Nm



- Tighten the screws (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

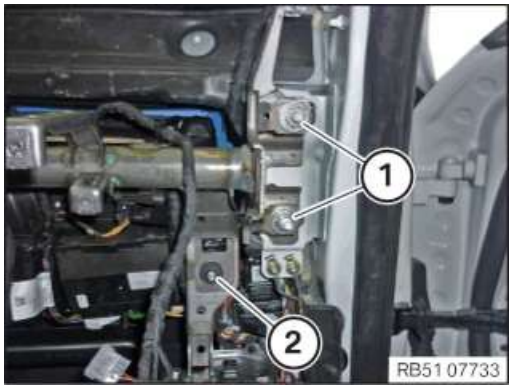


- Tighten nuts (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

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- Tighten nuts (1).

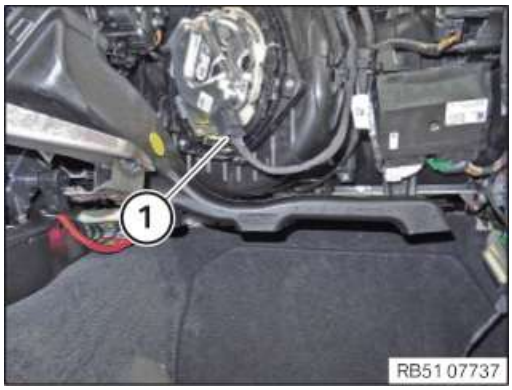
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nut (2).

Heating and air-conditioning unit on support

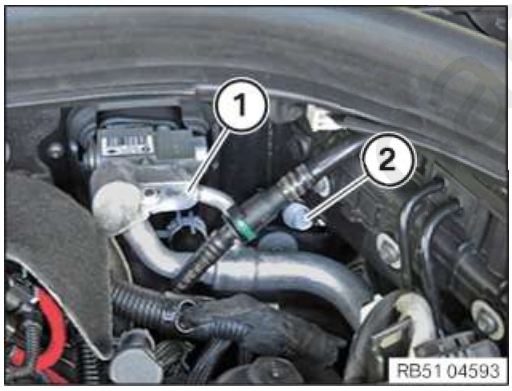
Nut M6		Tightening torque	4 Nm



- Connect the connector (1) to the blower motor and lock.



- Connect connectors (1) and lock.
- Correctly position the carpet in the area of B-pillar at the right.

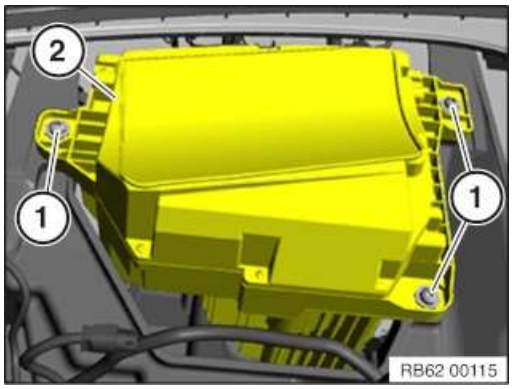


- Push the refrigerant line (1) slightly to one side and tighten the screw (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

43 – Installing the head-up display



- Connect the associated connector to the Head-Up Display.
- Guide the Head-Up Display (2) into the support.
- Tighten the screws (1).

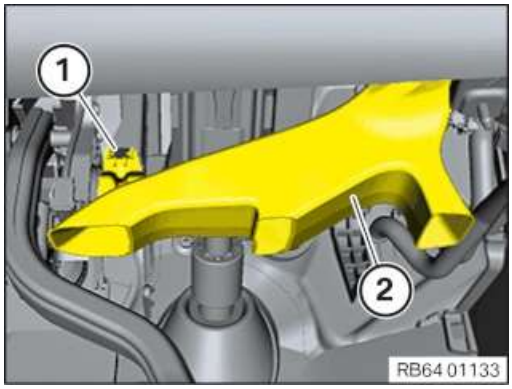
Head-Up Display to support

M6x25 screw		Tightening torque	13 Nm

44 – Installing the air duct, left

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44 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

45 – Installing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

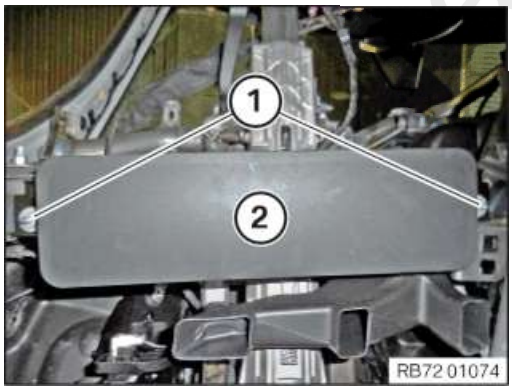
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

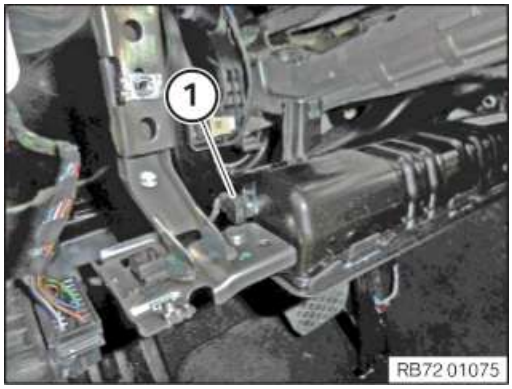
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

Knee airbag on support structure

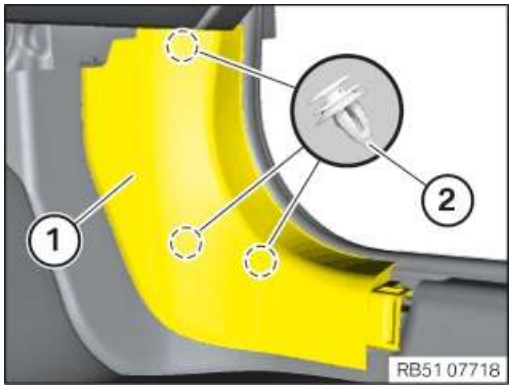
Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

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46 – Installing side trim panel in footwell on right A-pillar



- Check the clips (2) for damage.

  Renew damaged or missing clips (2).
- Correctly position the side trim panel (1) and clip in to the clips (2).
- Make sure that the side trim panel (1) is correctly fitted against edge protection.

47 – Install the trim panel for the instrument panel



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

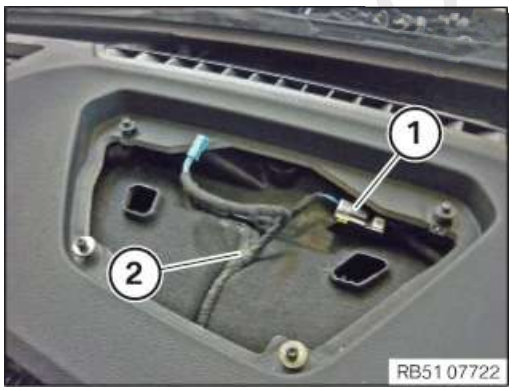
- Insert the instrument panel trim in the vehicle and position it at the support.
- Insert the associated wiring harnesses and connect the connectors.
- Tighten the screws (1).

Dashboard to support

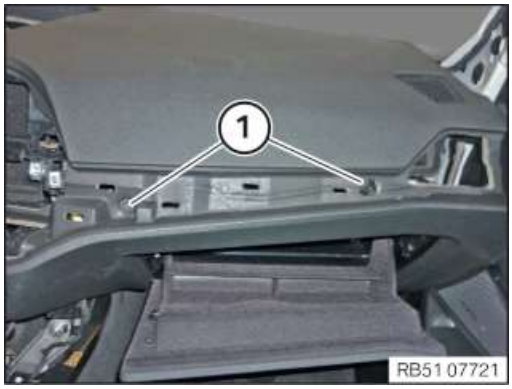
Screw		Tightening torque	2,4 Nm



- Connect connector (1) to the light operating unit and lock.



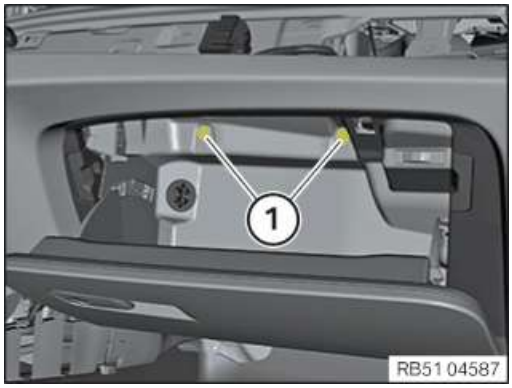
- Secure the wiring harness (2) on the holders.
- Connect connectors (1) and lock.



- Tighten the screws (1).

Dashboard to support

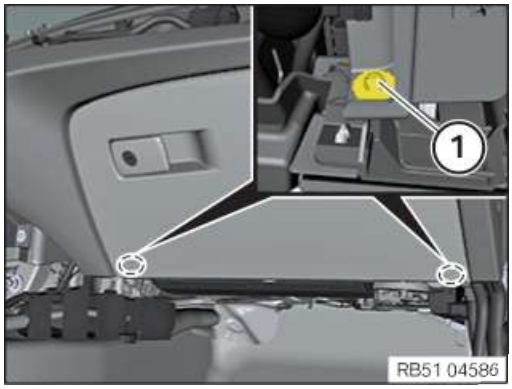
Screw		Tightening torque	2,4 Nm



- Open glovebox.
- Tighten the screws (1).

Dashboard to support

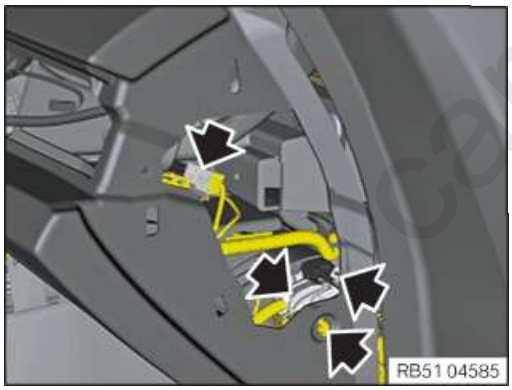
Screw		Tightening torque	2,4 Nm



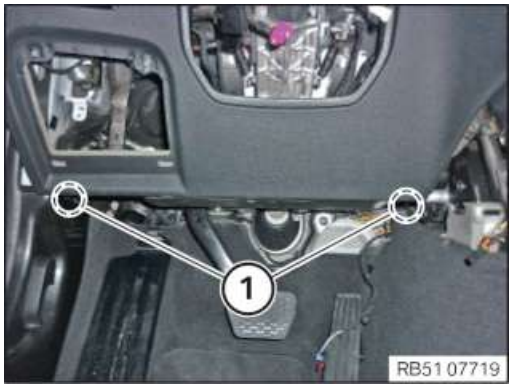
- Tighten the screws (1) on the lower side of the glove box button.

Dashboard to support

Screw		Tightening torque	2,4 Nm



- Connect all plug connections and cable clips (arrows) behind the glove box.



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

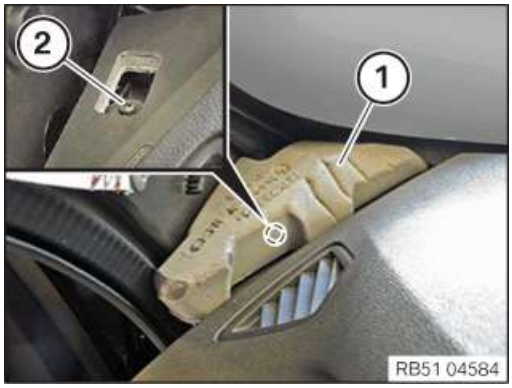
cardiagn.com



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm



NOTICE

Perform the operations on the left and right side.

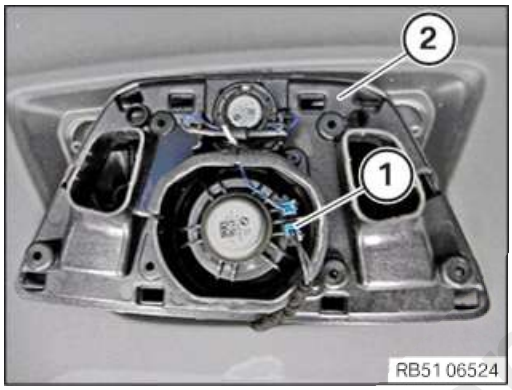
- Tighten down screw (2).

Dashboard to support

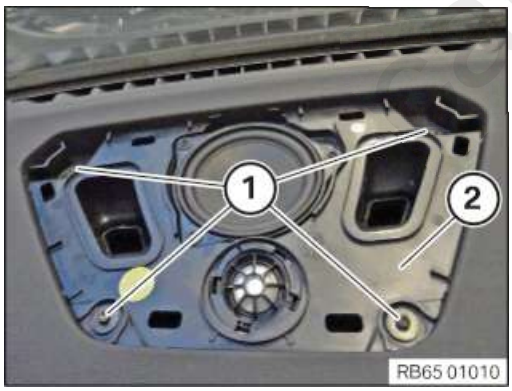
Screw		Tightening torque	2,4 Nm

- Use sound insulation (1).

48 – Install the speaker holder at the instrument panel



- Position the speaker holder (2).
- Connect connector (1).



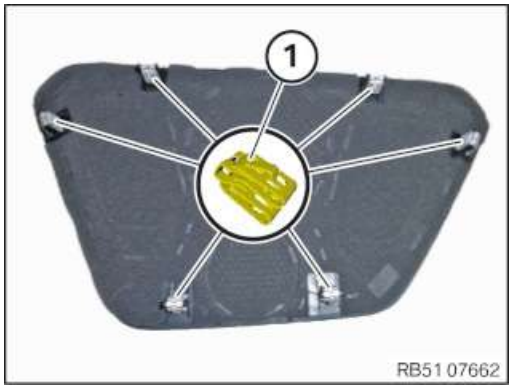
- Install the speaker holder (2).
- Tighten the screws (1).

Speaker to support / support to instrument panel / support to body

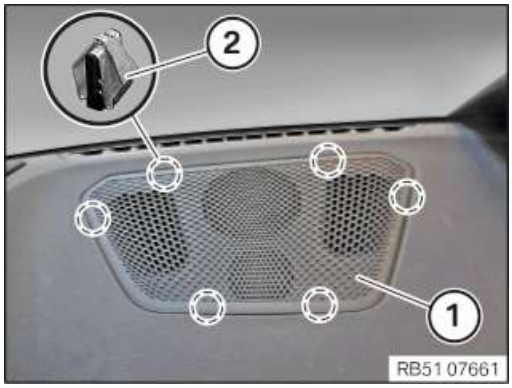
Screw		Tightening torque	1,8 Nm

49 – Install the speaker trim at the instrument panel

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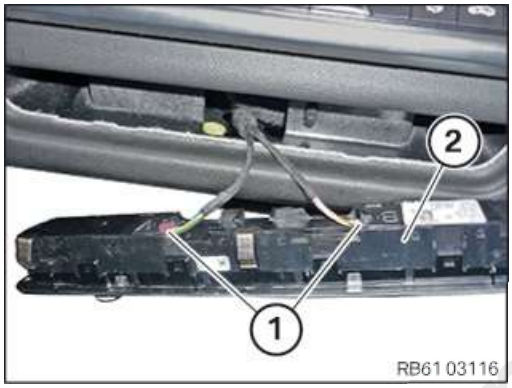


- Check clamps (1) for damage.
- Replace broken or missing clamps (1).

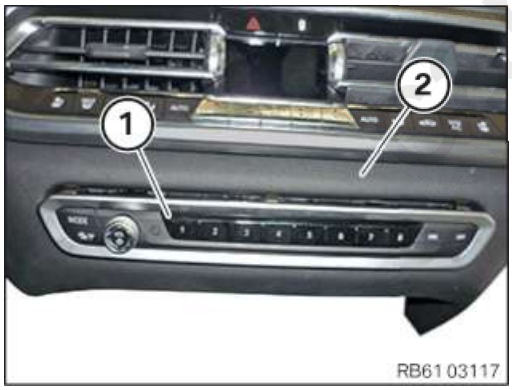


- Position the speaker trim (1) correctly and engage it at the clamps (2).

50 – Install the audio operating unit

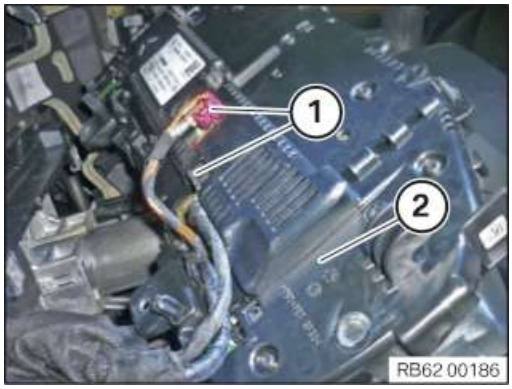


- Connect the connector (1) to the audio operating unit (2).

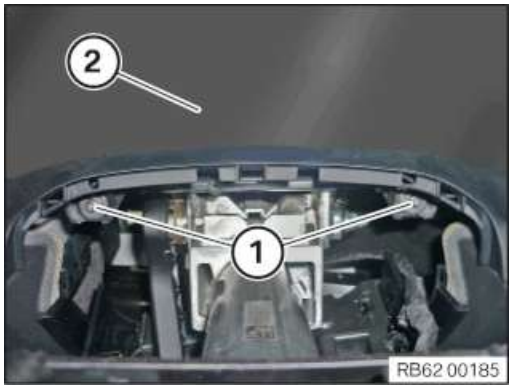


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

51 – Installing the instrument cluster (KOMBI)



- Connect and lock connector (1) to the instrument cluster (KOMBI) (2).



- Feed in and position the instrument cluster (KOMBI) (2).
- Tighten the screws (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm



- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

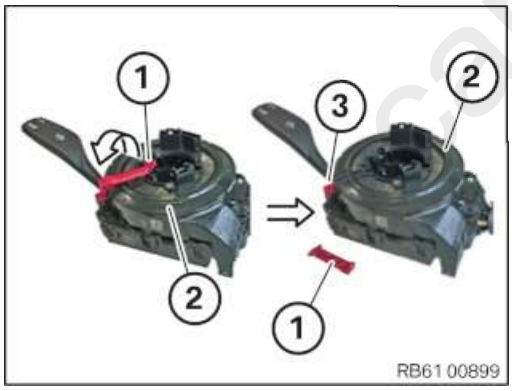


- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

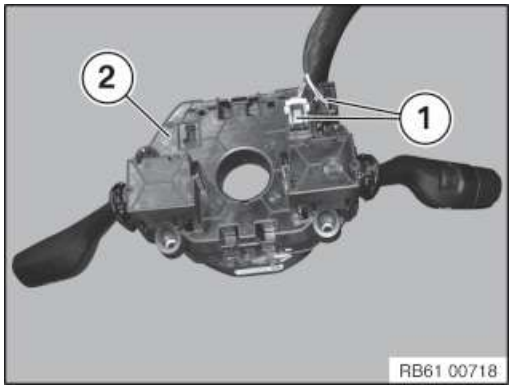
52 – Installing the steering column switch cluster (SZL)



- **Replacement:**

  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

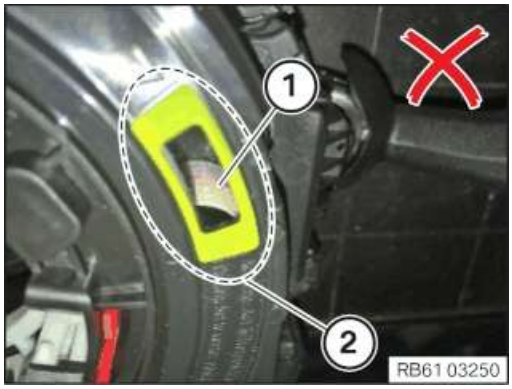
  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).



- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check

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- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

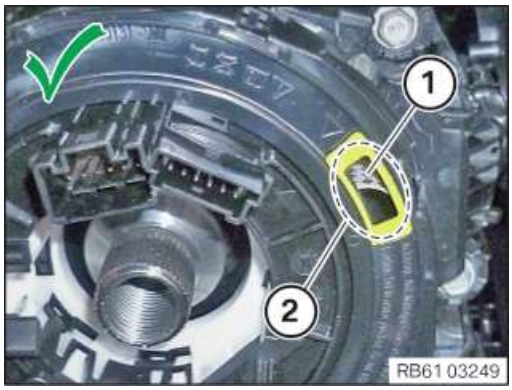
Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

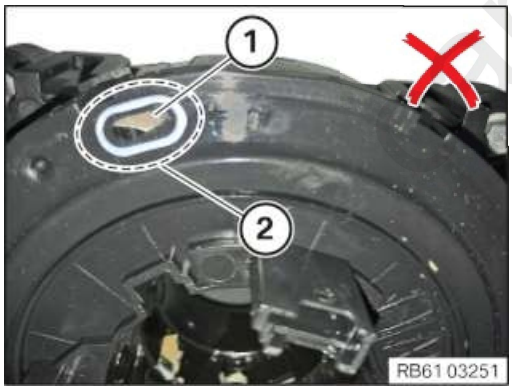
Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check

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- **Version B:**

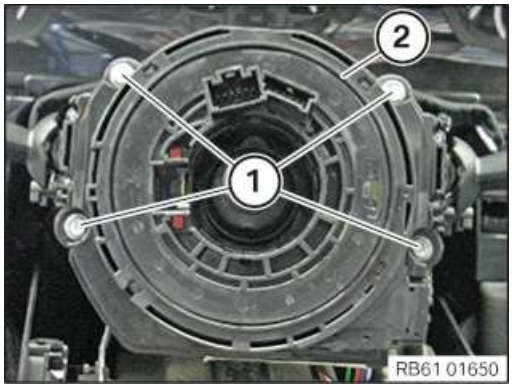
  Check if the correct mark (1) can be seen in the inspection glass (2).

Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next work step.

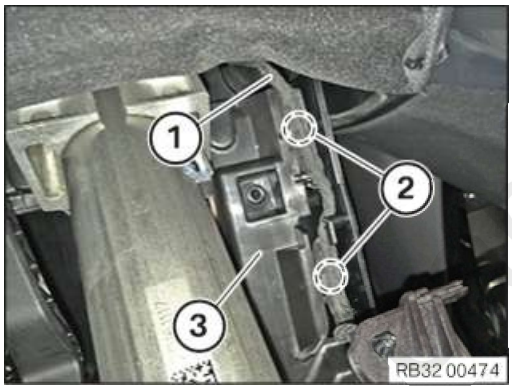


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm

53 – Install steering column shroud lower section

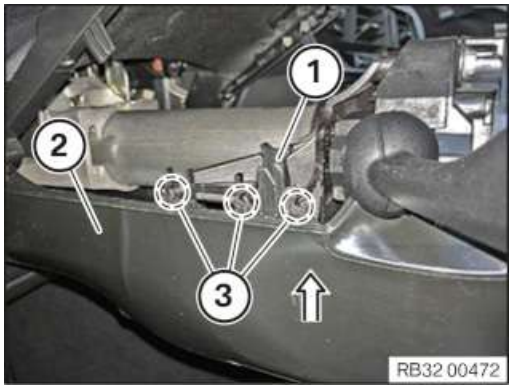


- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).



- Connect the connector (1).

mdiagn.com

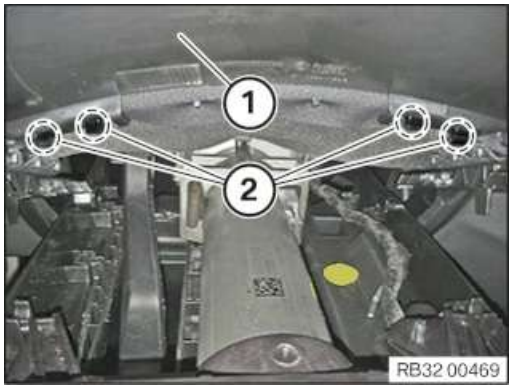


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

54 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

55 – Installing the sports steering wheel

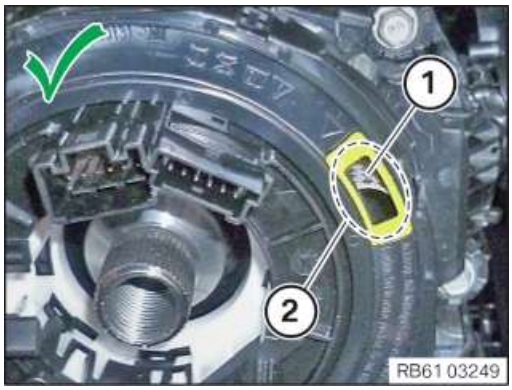
▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▹ **Version A: Checking the visibility of the marking on the coil spring**

vwdiagn.com



Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

▷ **Version B: Checking the visibility of the marking on the coil spring**



Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁



Check

- Check if a microencapsulated screw (3) is installed.

Result

» Screw (3) is micro-encapsulated.

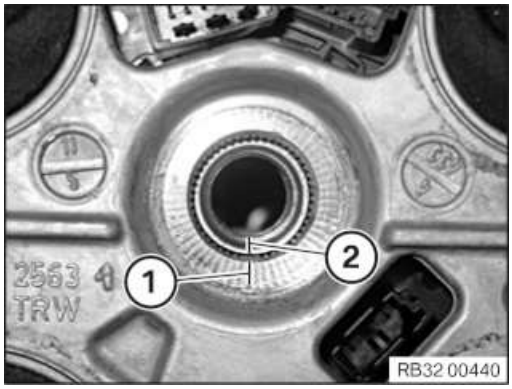
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Measure

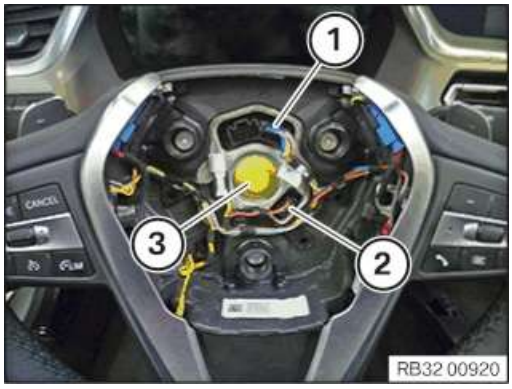
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

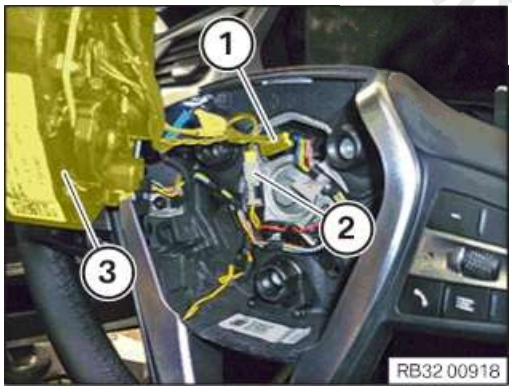
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

56 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Installing the airbag unit for the sports steering wheel**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

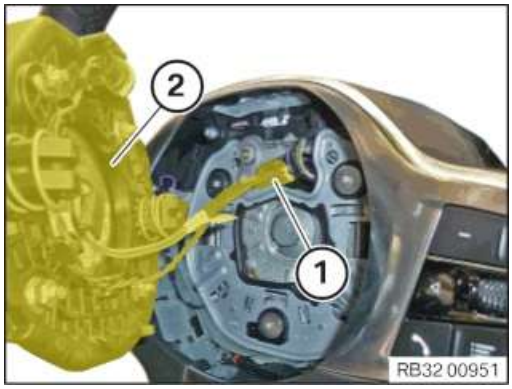
  The airbag unit (1) must engage audibly and perceptibly.

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▸ **Installing the airbag unit for M Sport steering wheel**

TECHNICAL INFORMATION

After replacing the airbag unit (M sport steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

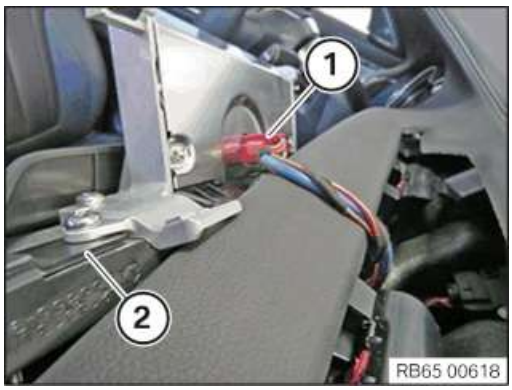
57 – Install the central information display (CID)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Position Central Information Display (CID) (2).
- Connect plug connection (1) and lock.

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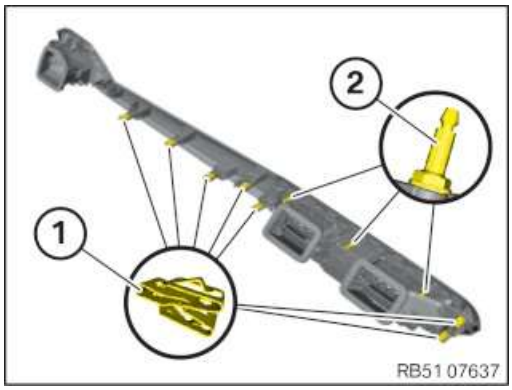


- Insert the central information display (CID) (2) in the instrument panel and position correctly.
- Tighten the screws (1).

Central information display to instrument panel

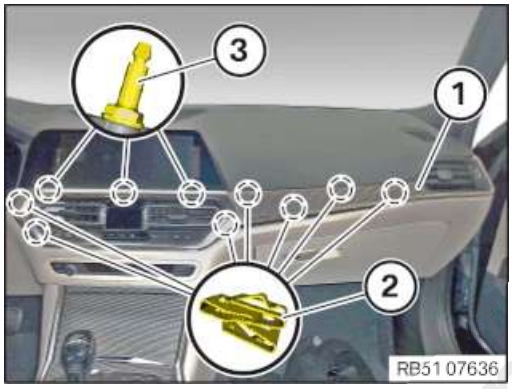
Screw		Tightening torque	2,4 Nm

58 – Install the finisher on the right instrument panel



- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



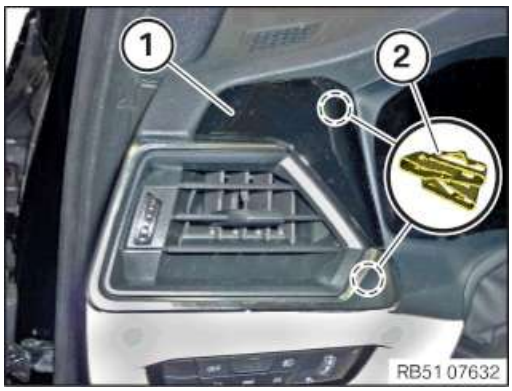
- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

59 – Install the finisher on the instrument panel on the left



- Check the clamps (1) for damage and that they are present.

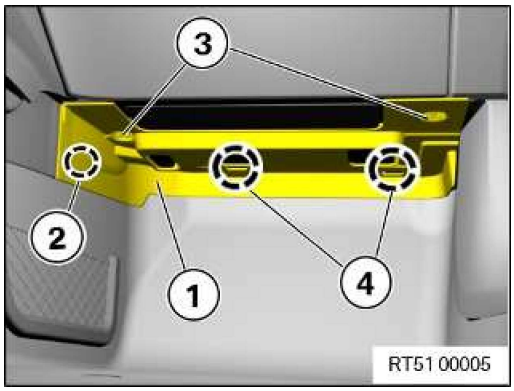
  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

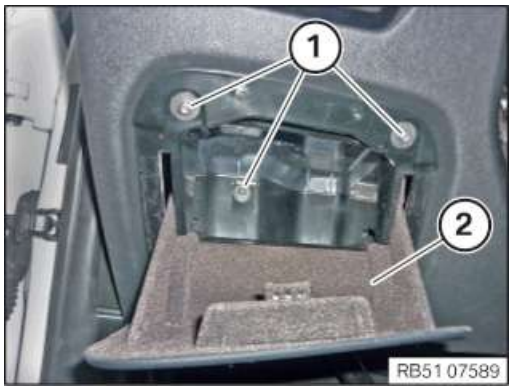
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60 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

61 – Installing the left fold-down compartment

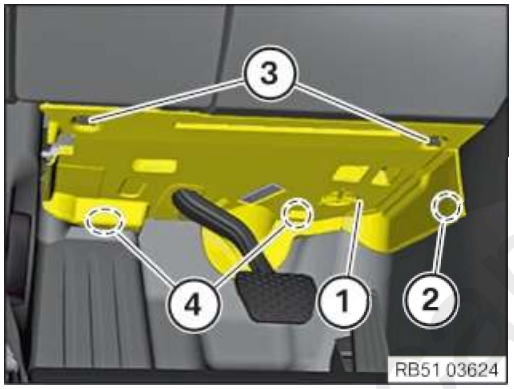


- Install the fold-down compartment (2).
- Tighten the screws (1).

Fold-down compartment to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

62 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

63 – Install the A-pillar trim panel on the left and right

NOTICE

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

▸ **Installing the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

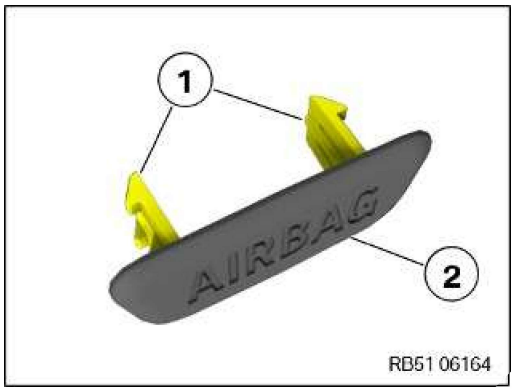
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.



Check

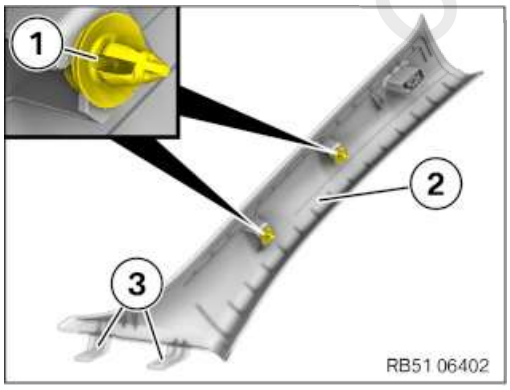
- Check retaining lugs (1) of cover (2) for damage.

Result

» Retaining lug is damaged.

Measure

- Renew the cover.



Check

- Check the clips (1) for damage and renew if necessary.
- Check the guides (3) for damage.

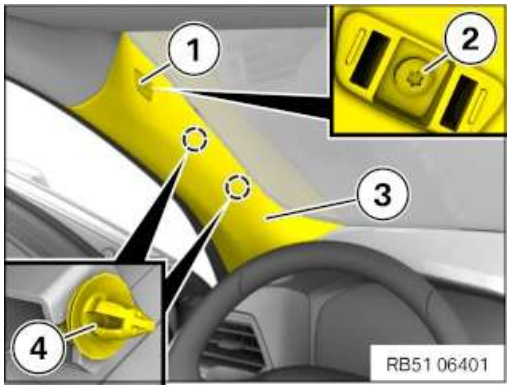
Result

» Guide is damaged.

Measure

- Renew the A-pillar trim panel.

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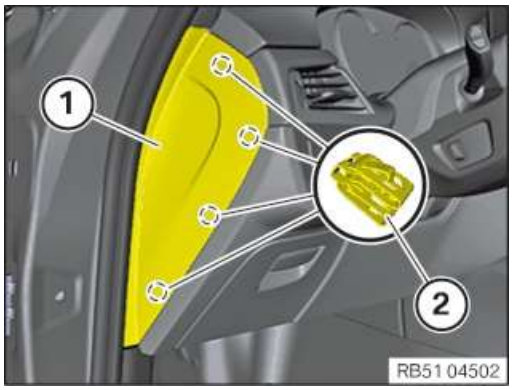
- Guide in A-pillar trim panel (3) downwards and clip it in with clips (4).
- Tighten down screw (2).

A-pillar trim panel to body

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

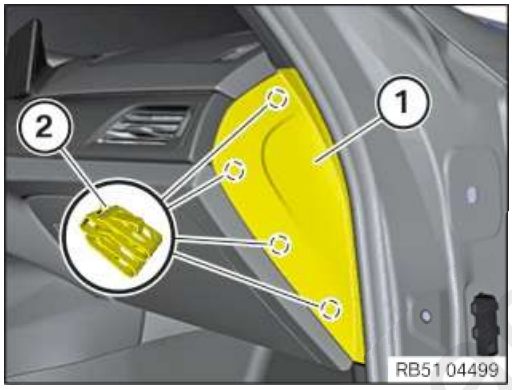
- Clip in the cover (1).

64 – Install the side panel on left instrument panel



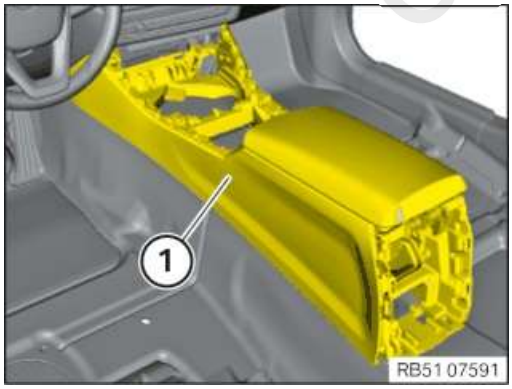
- Feed in the side panel (1) and clip it in at the clamps (2).

65 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

66 – Installing the centre console

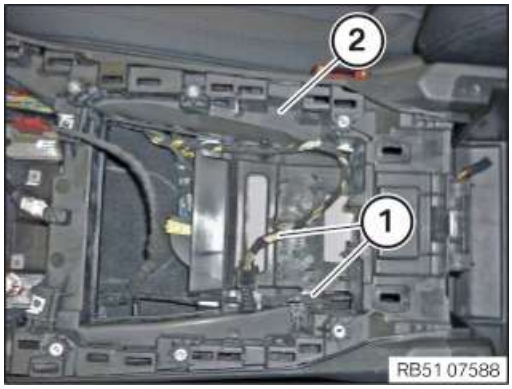


NOTICE

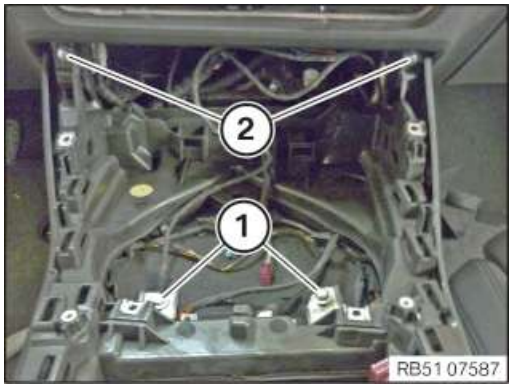
To provide a better overview: Schematic diagram with partially hidden components.

- Install centre console (1) and thereby feed in the wiring harness.
- Feed in the centre console (1) to the instrument panel and position correctly.

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- Secure the wiring harness to the centre console (1) and connect and lock the existing plug connections.



- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

- Tighten the screws (2).

Centre console to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

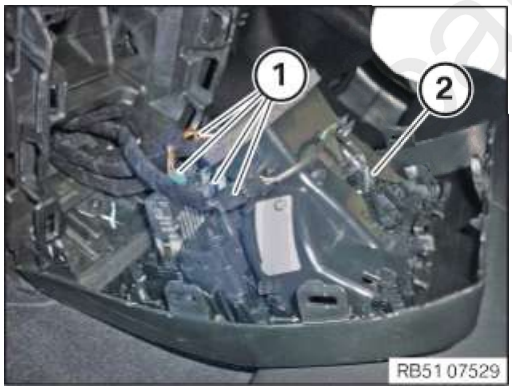


- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

67 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.

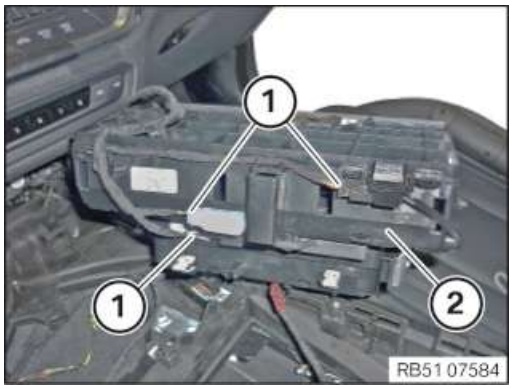


- Position centre console trim (1) and engage at the latch mechanisms at the side.

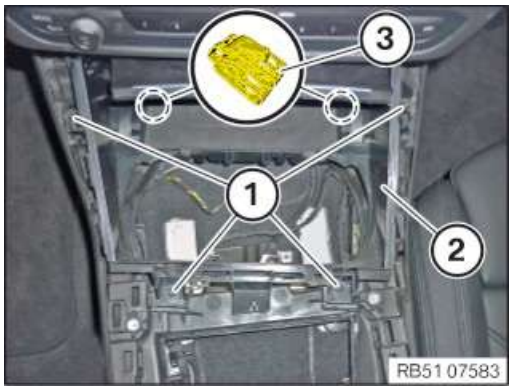
68 – Installing the storage compartment in the centre console in the front

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68 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

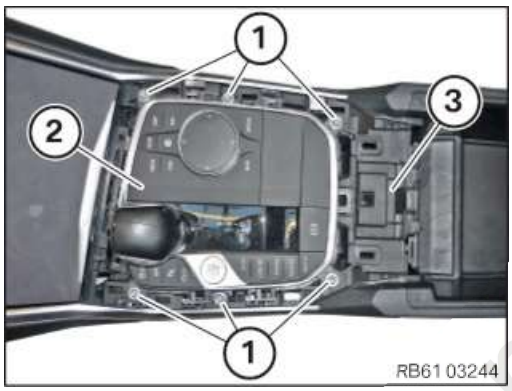


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

69 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw	Tightening torque	1,8 Nm

► **Connecting all battery earth leads**



- See additional information.

► **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

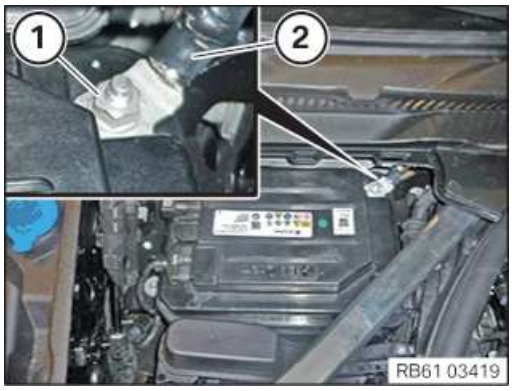
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm

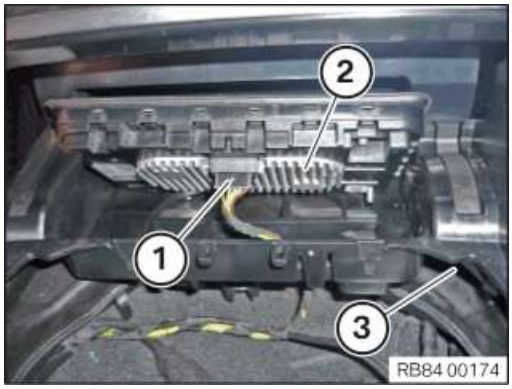


- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).

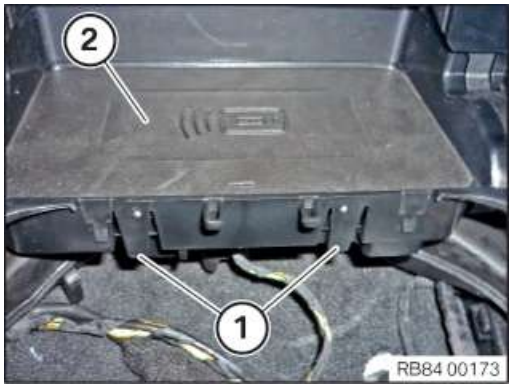


- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.

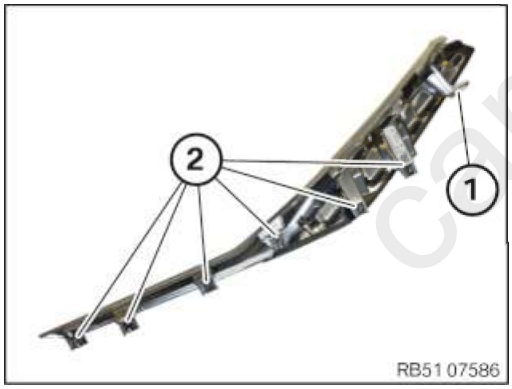
  The latch mechanisms (1) must engage correctly.

71 – Installing the decorative trim on the centre console on the left and right

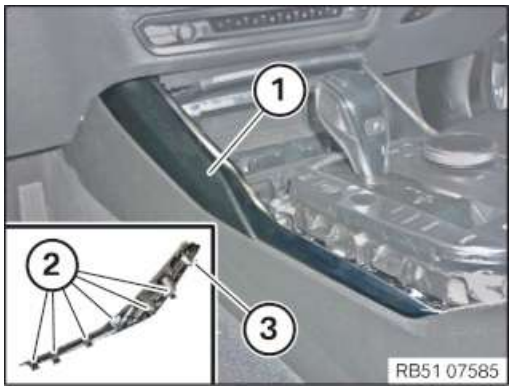
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

72 – Installing the centre console trim

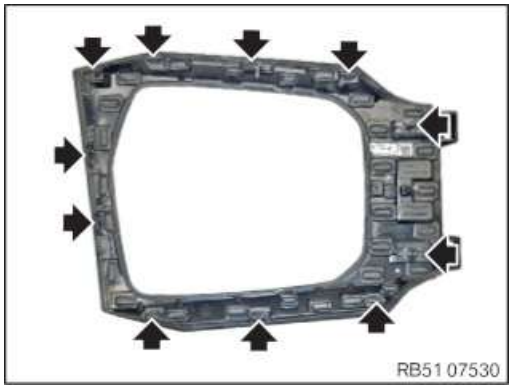
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RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

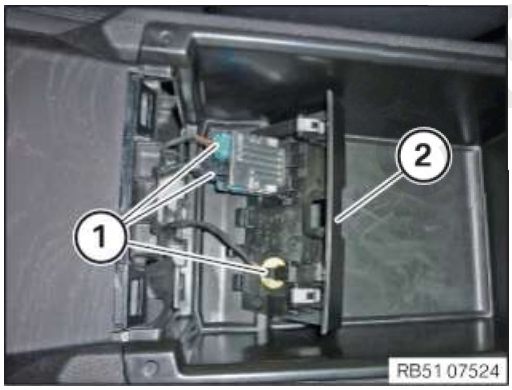


- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

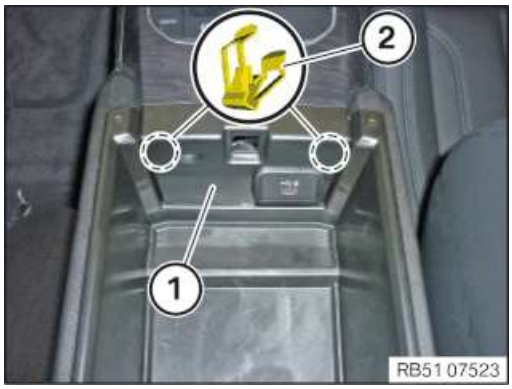


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

73 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

74 – Install the cup holder

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- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

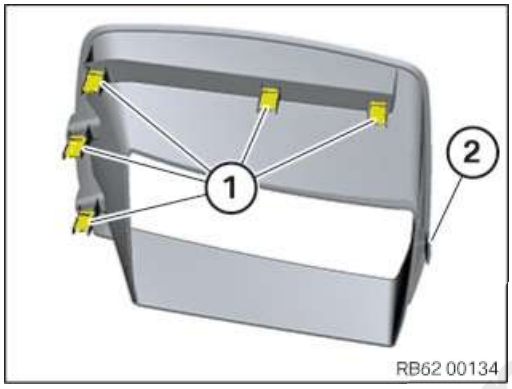
Cup holder to centre console

Oval-head screw		Tightening torque	1,8 Nm

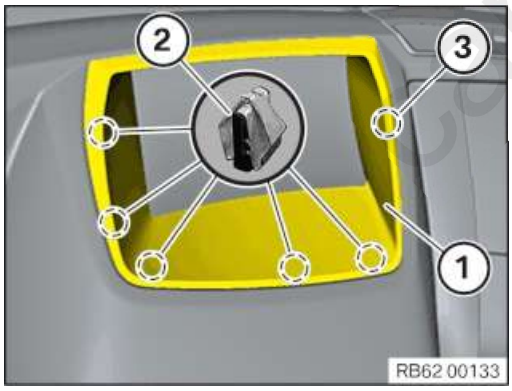


- Insert the insert (1).

75 – Installing the trim for the Head-Up Display



- Check clamps (1) and the latch mechanism (2) for damage, renew if necessary.



- Correctly position the trim (1) for the BMW Head-Up Display and engage it on the clamps (2) and the retaining lug (3).

Additional Information

Overview of Tightening Torques

Heater/air conditioner Used in step 3940

Screw		Tightening torque	1,2 Nm

Ground cable to body Used in step 39

Hexagon nut		Tightening torque	8,0 Nm

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Heating and air-conditioning unit on support — Used in step 42

Nut M6		Tightening torque	4 Nm

Support for instrument panel — Used in step 42

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

Head unit to holder / holder to support — Used in step 42

Screw		Tightening torque	1,8 Nm

Steering column to dashboard support — Used in step 42

M8	Observe tightening sequence.	Tightening torque	21,4 Nm

Head-Up Display to support — Used in step 43

M6x25 screw		Tightening torque	13 Nm

Knee airbag on support structure — Used in step 45

Nut		Tlghtening torque	8 Nm

Dashboard to support — Used in step 47

Screw		Tightening torque	2,4 Nm

Speaker to support / support to instrument panel / support to body — Used in step 48

Screw		Tightening torque	1,8 Nm

Instrument cluster (KOMBI) to support — Used in step 51

Screw		Tightening torque	1,8 Nm

Steering column switch cluster (SZL) on the steering column — Used in step 52

Screw TS5x20		Tightening torque	3 Nm

Steering wheel to steering column — Used in step 55

M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Central information display to instrument panel — Used in step 57

Screw		Tightening torque	2,4 Nm

Fold-down compartment to instrument panel — Used in step 61

Oval-head screw		Tightening torque	1,8 Nm

A-pillar trim panel to body — Used in step 63

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

Centre console on tunnel — Used in step 66

M6x18 Hexagon screw		Tightening torque	4,6 Nm

Centre console to instrument panel — Used in step 66

Oval-head screw		Tightening torque	1,8 Nm

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Storage compartment in centre console — Used in step 68

Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim — Used in step 69

Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery — Used in step 69

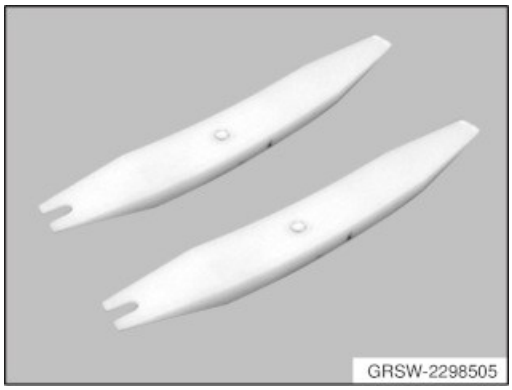
Nut M8		Tightening torque	19 Nm

Cup holder to centre console — Used in step 74

Oval-head screw		Tightening torque	1,8 Nm

Overview of Special Tools

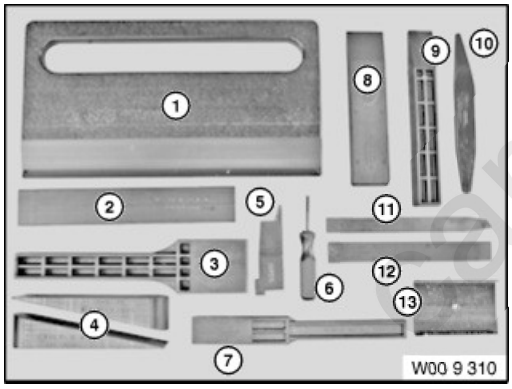
2 298 505 Wedge



Common — Used in step 45

Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

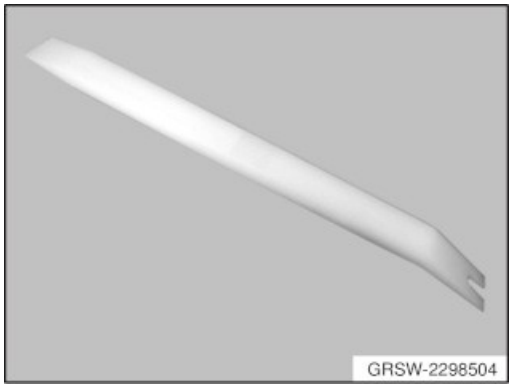
0 493 752 (00 9 329) Case



Common — Used in step 14

Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

2 298 504 Wedge

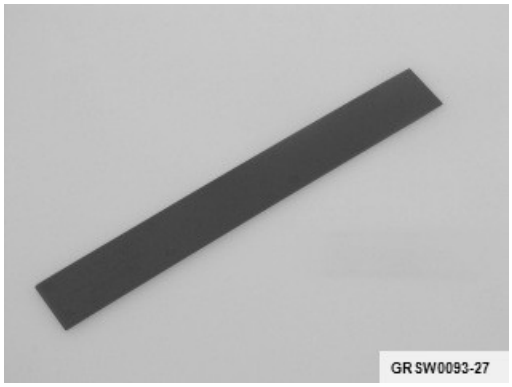


Common — Used in step 23

Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

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0 496 571 (00 9 327) Wedge



Common	Used in step 27
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

0 496 569 (00 9 325) Wedge



Common	Used in step 28
Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

Links

Repair instructions (PRE)	Used in step
Notes on 48-V battery	869

General repair instructions	Used in step
72 00 ... Safety regulations for handling components with gas generators	14213245
72 00 ... Safety regulations for handling components with gas generators	14

Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting battery earth lead	869

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61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
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61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 20 900 Disconnecting and connecting battery earth lead	869
61 35 ... Notes on ESD protection (Electro Static Discharge)	2057
61 35 ... Notes on ESD protection (Electro Static Discharge)	2057

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64 12 570 Replacing the auxiliary coolant pump for stationary/auxiliary heating

WARNING

Hot fluids.

Risk of scalding!

- Conduct all work in the vehicle wearing appropriate personal protective equipment only.

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

PRELIMINARY WORK

1 – Removing the front left wheel

▸ **Removing the wheel**

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TECHNICAL INFORMATION

A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

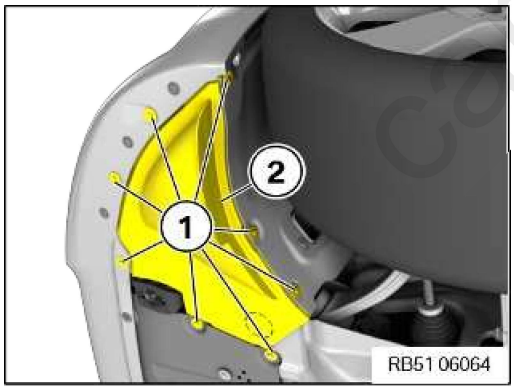
- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to remove the wheel.**

  This process is intended to prevent damage to the brake disc.



- If several wheels are removed at the same time: Use a piece of chalk to mark on each tyre the axle and side on which the corresponding wheel is fitted.
- Release the wheel bolts (arrows) crosswise and remove the wheel.
- To release and tighten wheel bolts with a security code: Use the correct adapter from the set of special tools .

2 – Removing the lower front cover at the side



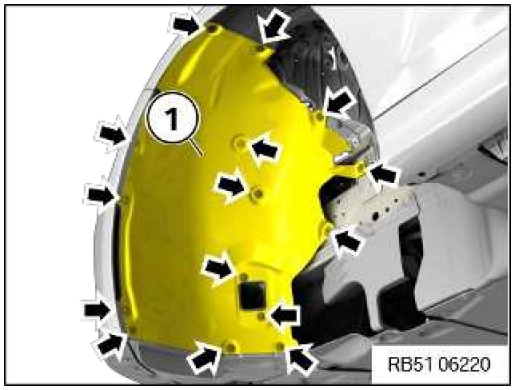
- Loosen screws (1).
- Removing the lower front cover at the side (2).

3 – Removing the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

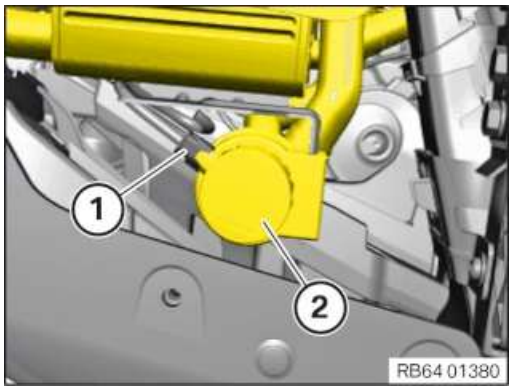
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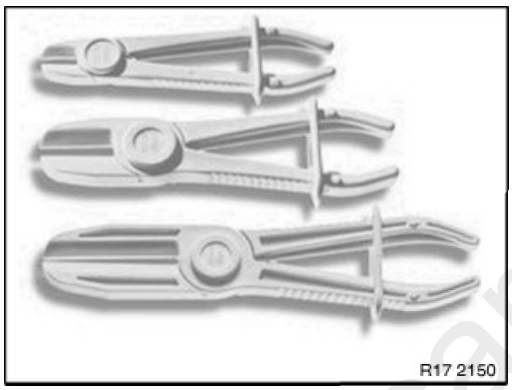
- Remove screws (arrows).
- Remove front section of the front wheel arch cover (1).

MAIN WORK

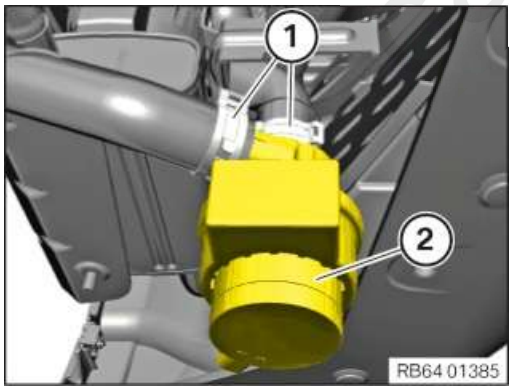
4 – Removing auxiliary coolant pump for auxiliary heater



- Unlock and disconnect connector (1) on the auxiliary coolant pump (2) of the stationary heating.
- Pull off the auxiliary coolant pump (2) from the holder to the front and set it aside.

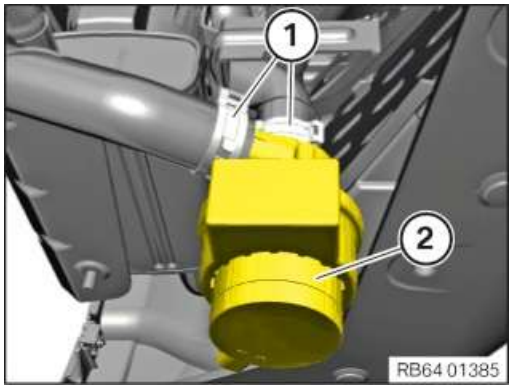


- Use commercially available disconnection tools to pinch off the coolant lines.

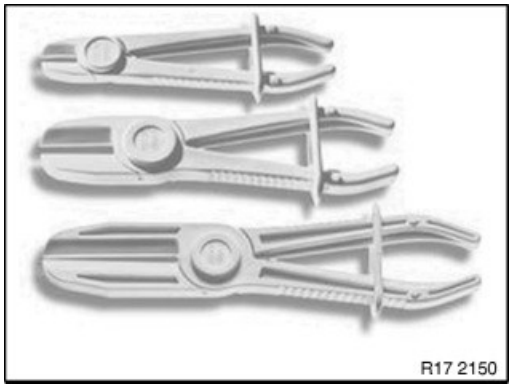


- Loosen hose clamps (1) and pull off coolant hoses.
- Remove auxiliary coolant pump (2).

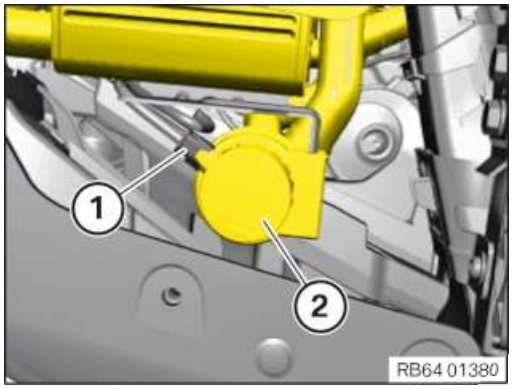
5 – Install auxiliary coolant pump for the auxiliary heater



- Position the auxiliary coolant pump (2).
- Slide coolant hoses onto the auxiliary coolant pump (2) and secure the hose clamps (1).



- Remove disconnection tools.



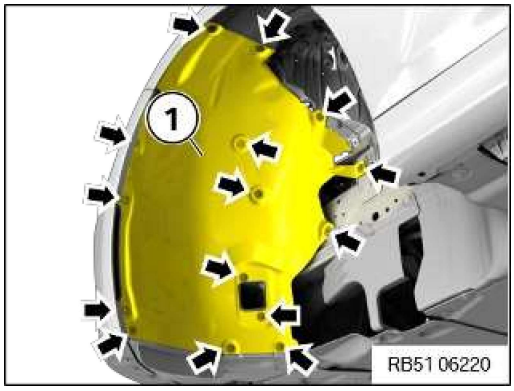
- Slide auxiliary coolant pump (2) to the rear on the holder.
- Connect and lock connector (1) to the auxiliary coolant pump (2) .

POSTPROCESSES

6 – Install the front section of the front wheel arch cover

NOTICE

To provide a better overview: Schematic diagram with partially hidden components.



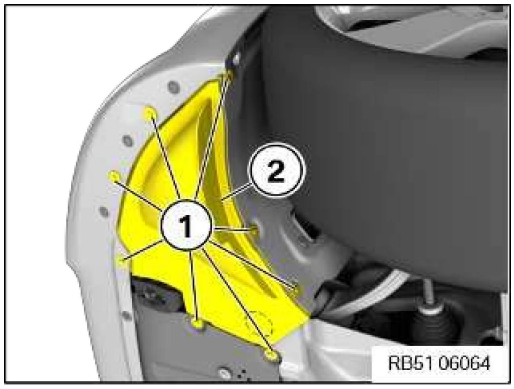
- Install the front section of the front wheel arch cover (1).
- Tighten screws (arrows).

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

7 – Install the lower front cover at the side

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- Install front bottom side cover(2).
- Tighten the screws (1).

Cover, front bottom on side

Hexagon screw for thermoplastic		Tightening torque	3 Nm

8 – Attaching the front left wheel

▸ **Mounting the wheel**



TECHNICAL INFORMATION

The contact surface between the brake disc and the wheel rim must be clean and free from oil and grease. There is otherwise a risk of the wheel becoming loose at a later time.

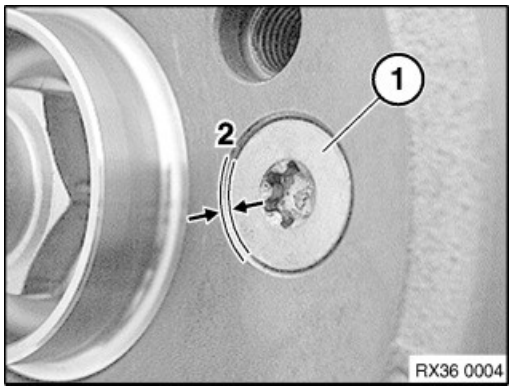
- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).
- In the event of grease residue in the area of the wheel bolt holes, remove and clean the brake disc.



- Remove dirt, grease residues and corrosion from the contact surface with a drill and the special tool 2 344 011.

  Do not operate special tool 2 344 011 with an impact screwdriver.
- Degrease the contact surfaces with the universal cleaner (see BMW Group Parts).



- Check that the mounting bolt (1) for the brake disc is securely seated.

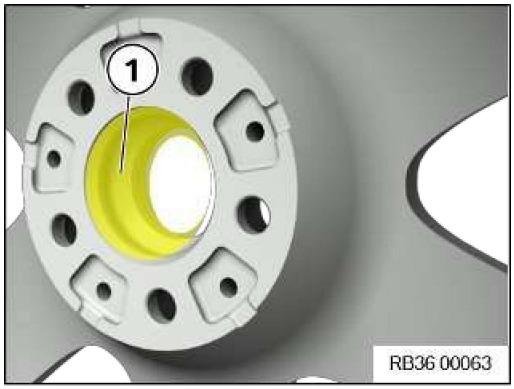
  The mounting bolt (1) for the brake disc **may not** protrude on the contact surface (2) between the brake disc and the wheel rim.

Brake disc to front wheel hub

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub

M8	Renew screw.	Tightening torque	16 Nm



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Thinly grease the wheel centring (1) in the wheel rim.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

Wheel hubs and wheel centering on the models G80, G82 and G83 **must not** be greased.

- Apply a thin layer of grease to the front and rear wheel hubs (1) to protect against corrosion.

Expendable materials

Brake block paste * TU = Trade Unit. TU numbers cannot be ordered! For invoicing purposes only.	3 g, Bag	83192158851
	100 g, Tube	83192158852
	5 g, TU*	83230140233



TECHNICAL INFORMATION

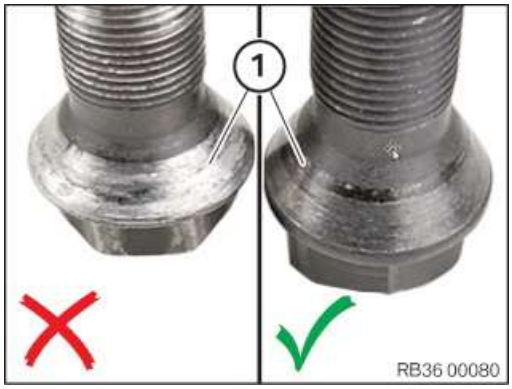
A wheel lift is recommended for easier wheel removal and installation without exertion (see Retailer Equipment Catalogue).

- **In vehicles with M Carbon ceramic brake: The wheel lift must be used to install the wheel.**

  This process is intended to prevent damage to the brake disc.

Check

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- **Check wheel bolts for wear.**

Result

» Places (> 30%) of the bearing surfaces (1) of the taper on the screw head show a silver wear.

Measure

- Replace wheel bolts.

  Parts: Wheel bolts



TECHNICAL INFORMATION

Never use impact screwdrivers or electric screwdrivers to screw in and tighten the wheel bolts.

The wheel rim must rest uniformly against the brake disc.

In the case of non-original BMW wheel bolts/wheel rims, it may be necessary to retighten the wheel bolts on account of setting properties (refer to the documentation from the manufacturer).

Do not apply oil to new wheel bolts.

- Renew the corroded wheel bolts (arrows).

  Parts: Wheel bolts

- Clean the wheel bolts (arrows).
- Check the wheel bolts (arrows) and threads for damage, renew the wheel bolts (arrows) if necessary.
- Join and tighten the wheel bolts (arrows).

Wheel bolts

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim.	Tightening torque	140 Nm
	Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence.	Check	140 Nm
	Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.		

9 – Fill and bleed the coolant circuit

▸ **Filling and bleed the high-temperature coolant circuit**

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TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Wheel arch trim panel, front — Used in step 6

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Cover, front bottom on side — Used in step 7

Hexagon screw for thermoplastic		Tightening torque	3 Nm

Brake disc to front wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Brake disc to rear wheel hub — Used in step 8

M8	Renew screw.	Tightening torque	16 Nm

Wheel bolts — Used in step 8

M14 / SW17	Screw in wheel bolts and evenly tighten crosswise by hand in order to centre the wheel rim. Tighten wheel bolts to the prescribed tightening torque with a calibrated torque wrench in a crosswise sequence. Check all the wheel bolts in the same order or retighten to the prescribed tightening torque again.	Tightening torque Check	140 Nm 140 Nm

Overview of Special Tools

2 344 011 Tool



Common — Used in step 8

Usage	Tool (wheel hub grinder) for cleaning the connection of the wheel rim (wheel contact face) to the wheel hub.
Included in the tool or work	
Storage location	
Replaced by	
In connection with	
SI-Number	08 08 12 (872)

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Replacement tools:

0 495 221 (36 1 323) Wheel stud



Common	Used in step 1
Usage	(Code 30) Code 39 available separately, (see EPC) under 36 13 1 181 259
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 224 (36 1 326) Wheel stud



Common	Used in step 1
Usage	(Code 33) With centring bore available separately, (see EPC) under 36 13 6 765 546
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 225 (36 1 327) Wheel stud



Common	Used in step 1
Usage	(Code 34) With centring bore available separately (see EPC) under 36 13 6 765 547
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 226 (36 1 328) Wheel stud



Common	Used in step 1
Usage	(Code 35) With centring bore available separately, (see EPC) under 36 13 6 762 340
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 227 (36 1 329) Wheel stud



Common	Used in step 1
Usage	(Code 36) With centring bore available separately (see EPC) under 36 13 6 762 341
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 228 (36 1 331) Wheel stud



Common	Used in step 1
Usage	(Code 37) With centring bore available separately (see EPC) under 36 13 6 762 342
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

0 495 229 (36 1 332) Wheel stud



Common	Used in step 1
Usage	(Code 38) With centring bore available separately (see EPC) under 36 13 6 762 343
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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0 495 230 (36 1 333) Wheel stud



Common	Used in step 1
Usage	(Code 40) With centring bore available separately (see EPC) under 36 13 6 762 344
Included in the tool or work	0 492 518
Storage location	
Replaced by	
In connection with	
SI-Number	

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Links

Repair instructions	Used in step
00 02 001 Raising the vehicle using a vehicle lift	18
17 00 008 Draining and topping up coolant for high-temperature circuit	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 008 Draining and topping up coolant for high-temperature circuit	9
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleeding the cooling system (B36, B38, B46, B48)	9
17 00 039 Bleeding cooling system (B37, B47)	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Filling and bleeding the high-temperature cooling system vacuum filler device (B48)	9
17 00 008 Draining and topping up the high-temperature coolant circuit	9
17 00 008 Draining and topping up the high-temperature coolant circuit	9
17 00 016 Draining and topping up coolant circuit for Range Extender \PREMIUM	9
17 00 008 Draining and topping up the high-temperature coolant circuit	9
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	9
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17 00 039 Bleeding the cooling system and checking watertightness using a special tool (coolant circuit for high temperatures)	9
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9

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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 040 Bleed the cooling system and check for watertightness with the special tool (coolant circuit for low temperature)	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	9
17 00 009 Check the cooling system for watertightness with a special tool (with a tester)	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 008 Draining and topping up coolant for high-temperature circuit	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9
17 00 008 Draining and topping up coolant for high-temperature circuit	9
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17 00 039 Bleed the cooling system and check it for watertightness with the special tool	9

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64 22 160 Removing and installing or replacing middle fresh-air grille

RISK OF DAMAGE

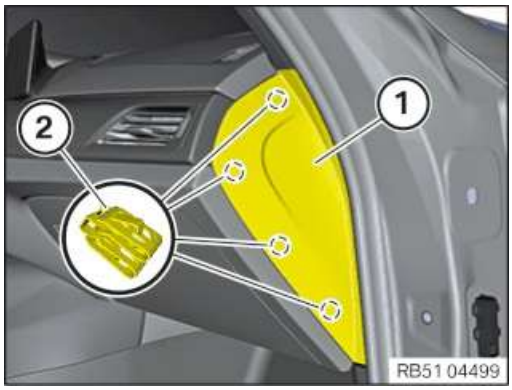
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

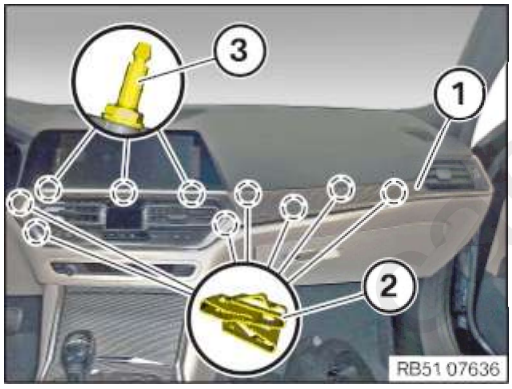
PRELIMINARY WORK

1 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

2 – Remove the finisher on the right instrument panel

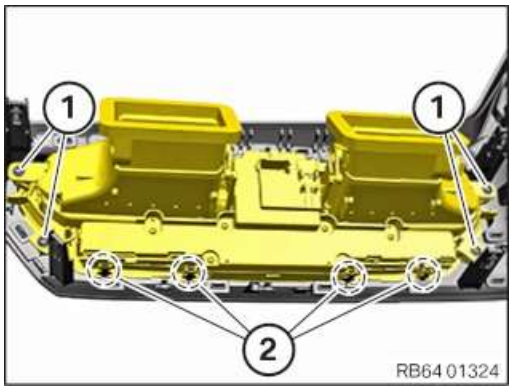


- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

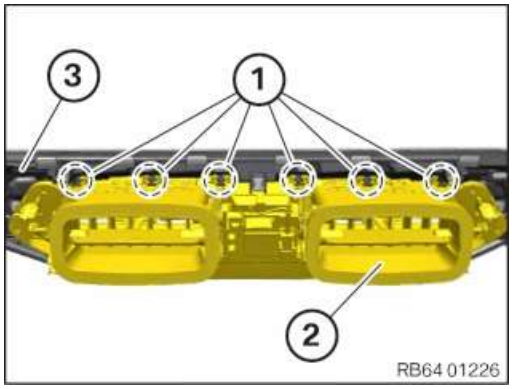
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MAIN WORK

3 – Removing the centre ventilation grille with integrated air conditioning control panel

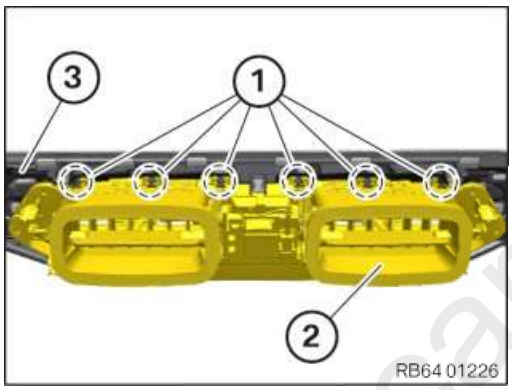


- Loosen screws (1).
- Disengage the latch mechanisms (2).

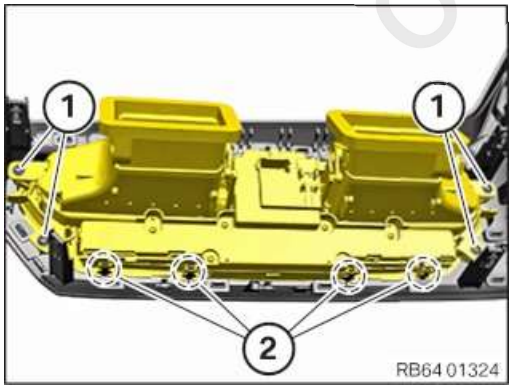


- Disengage the latch mechanism (1) from the ventilation grille (2).
- Remove the ventilation grille (2) with the integrated air conditioning control panel from the decorative strip (3).

4 – Installing the centre of the ventilation grille with the integrated air conditioning control panel



- Place ventilation grille (2) with the integrated air conditioning control panel on decorative strip (3) and position it correctly.
- Engage latch mechanisms (1) on ventilation grille (2).



- Engage the latch mechanisms (2).
- Tighten the screws (1).

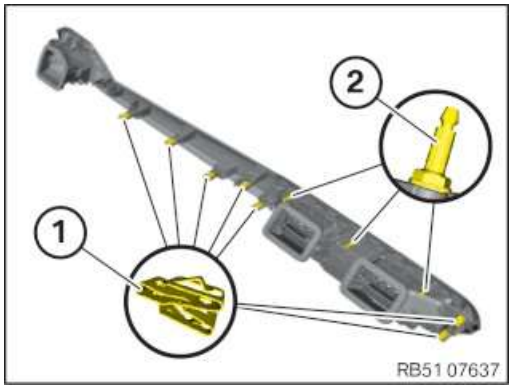
Ventilation grille to decorative strip/instrument panel

Screw		Tightening torque	1.8 Nm

POSTPROCESSES

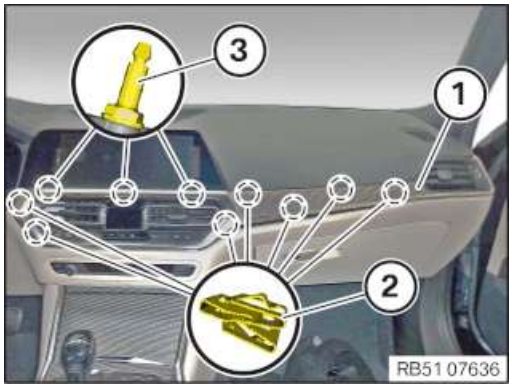
5 – Install the finisher on the right instrument panel

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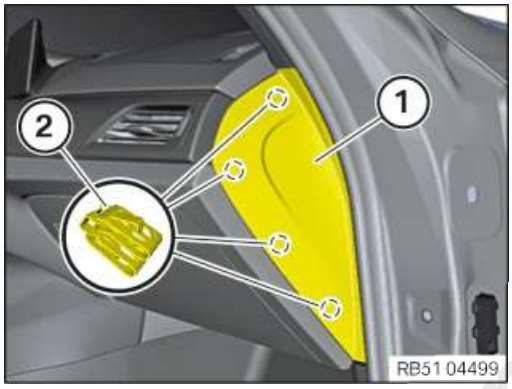
- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

6 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

7 – Encode/program control unit(s)

- **Replacement**.
- **This task is not included in this flat rate unit item.**

▸ **Encode/program control unit(s)**

Prerequisite

Component has been replaced.

TECHNICAL INFORMATION

Use the most recent software version to prevent faults during programming/encoding.
The battery voltage must not fall below 13.0 V during programming.
Use only chargers for a low volt-vehicle electrical system that are recommended by BMW.

TECHNICAL INFORMATION

No high-voltage switch off is required in electric vehicles or hybrid vehicles for programming/encoding.
The high-voltage system will be automatically switched off by the programming system.

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

Additional Information

Overview of Tightening Torques

Ventilation grille to decorative strip/instrument panel Used in step 4

Screw		Tightening torque	1.8 Nm

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64 22 137 Removing and installing/replacing left fresh-air grille

RISK OF DAMAGE

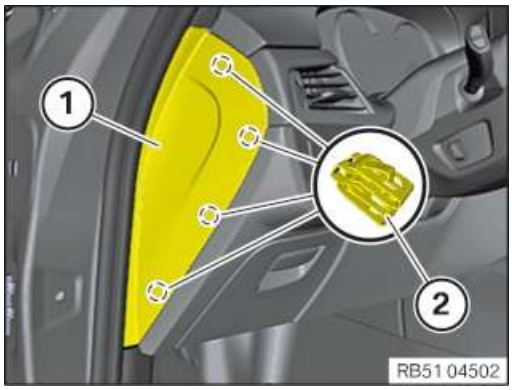
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

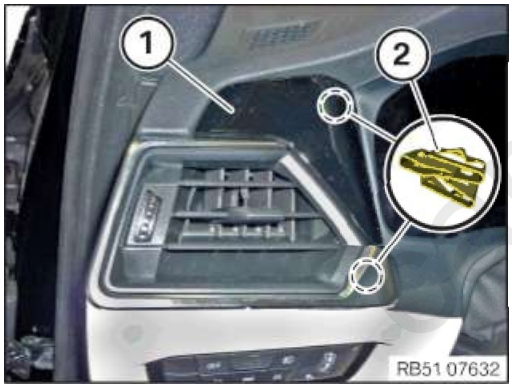
PRELIMINARY WORK

1 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

2 – Remove the finisher on the instrument panel on the left

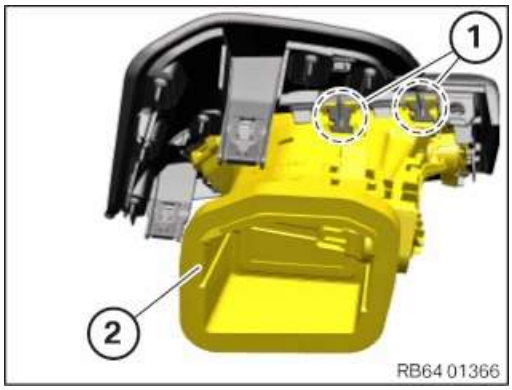


- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

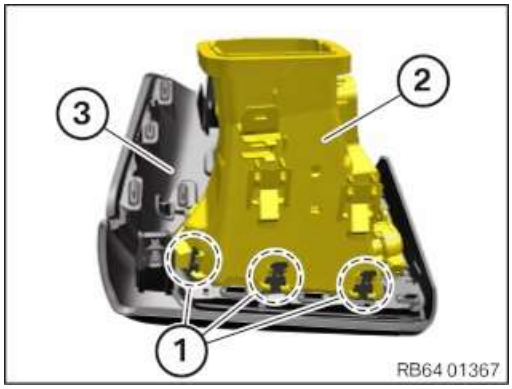
  Remove the decorative strip (1).

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3 – Removing the left ventilation grille

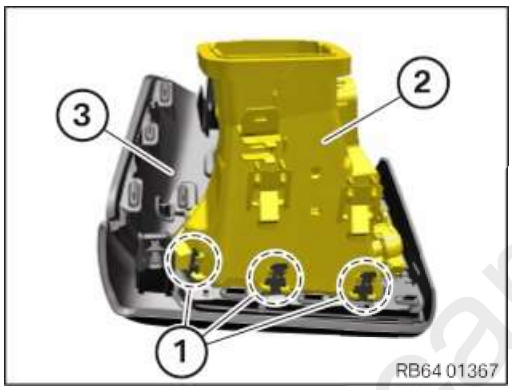


- Disengage the latch mechanisms (1) from the ventilation grille (2).

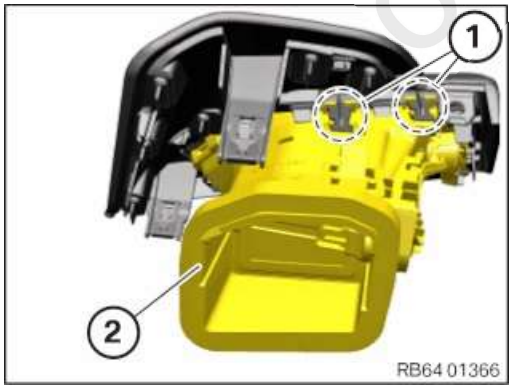


- Disengage the latch mechanisms (1) from the ventilation grille (2).
- Remove ventilation grille (2) from decorative strip (3).

4 – Installing the left ventilation grille



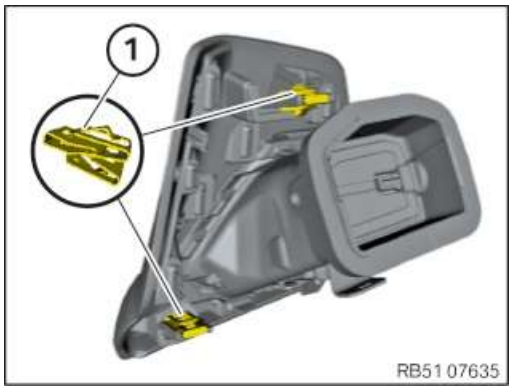
- Fit ventilation grille (2) on decorative strip (3) and position correctly.
- Engage the latch mechanisms (1) on the ventilation grille (2).



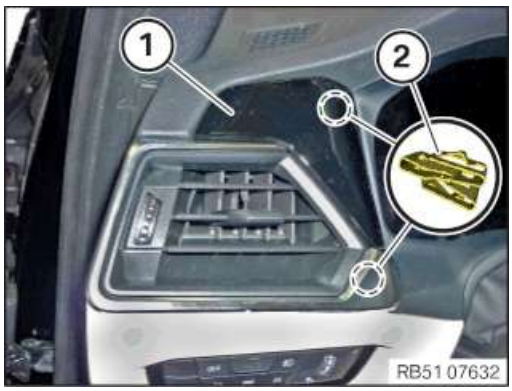
- Engage the latch mechanisms (1) on the ventilation grille (2).

cardiagn.com

5 – Install the finisher on the instrument panel on the left

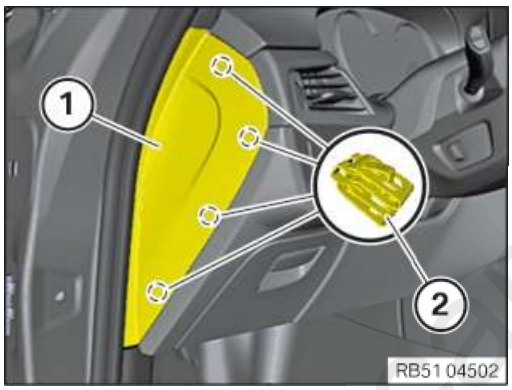


- Check the clamps (1) for damage and that they are present.
  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

6 – Install the side panel on left instrument panel



- Feed in the side panel (1) and clip it in at the clamps (2).

obdiagn.com

64 22 191 Removing and installing/replacing rear cabin fresh-air grille

PRELIMINARY WORK

1 – Removing the rear centre console trim

RISK OF DAMAGE

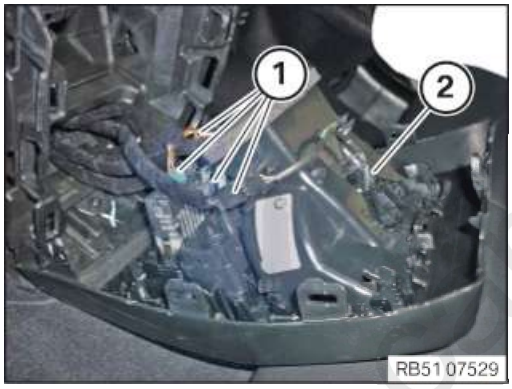
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



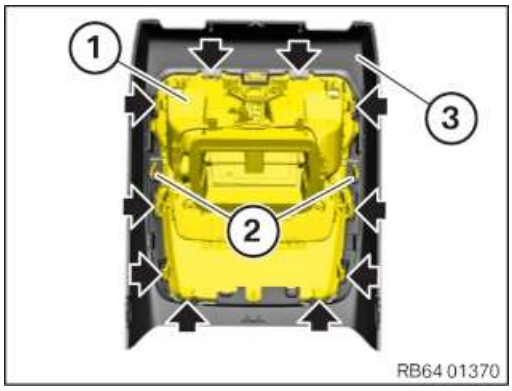
- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.



- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

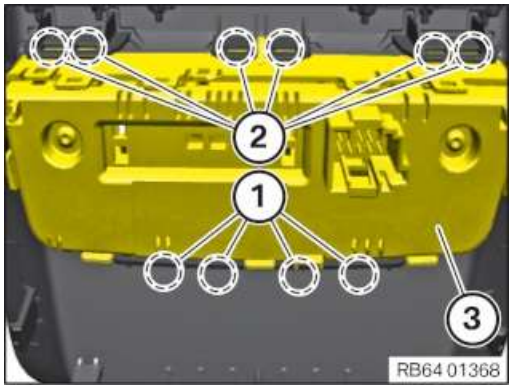
carldiagn.com

2 – Removing the rear ventilation grille



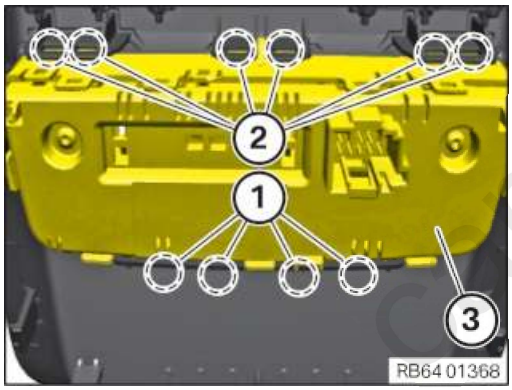
- Release the ventilation grille (1) at the latch mechanisms (arrows).
- Feed out the ventilation grille (1) at the guides (2) and remove it from the decorative strip (3).

3 – Removing air conditioning control panel for the rear passenger compartment



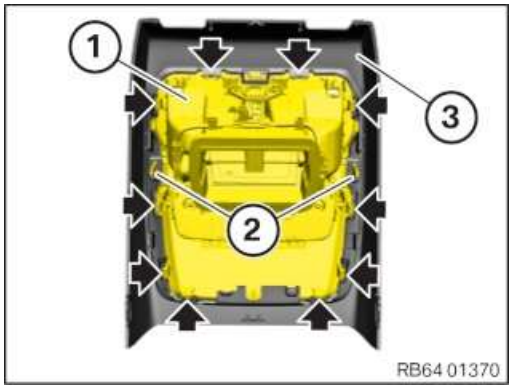
- Detach air conditioning control panel first at the latch mechanisms (1) and then at the latch mechanisms (2).
- Remove air conditioning control panel (3) from the decorative strip.

4 – Install air conditioning control panel for the rear side



- Fit the air conditioning control panel (3) on the decorative strip and position it correctly.
- Engage the latch mechanisms (1) and (2).

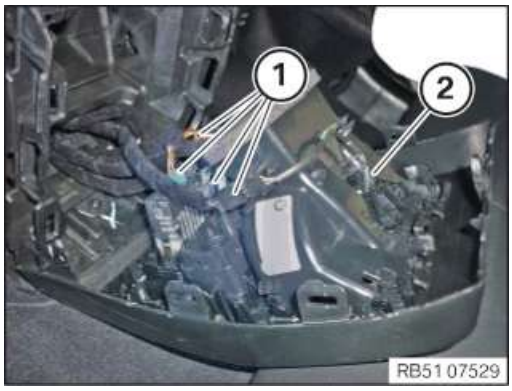
5 – Installing the rear ventilation grille



- Feed in the ventilation grille (1) with the guides (2) into the decorative strip (3).
- Engage latch mechanisms (arrows) at the decorative strip (3) .

carsdiagn.com

6 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.



- Position centre console trim (1) and engage at the latch mechanisms at the side.

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64 22 138 Removing and installing/replacing right fresh air grille

RISK OF DAMAGE

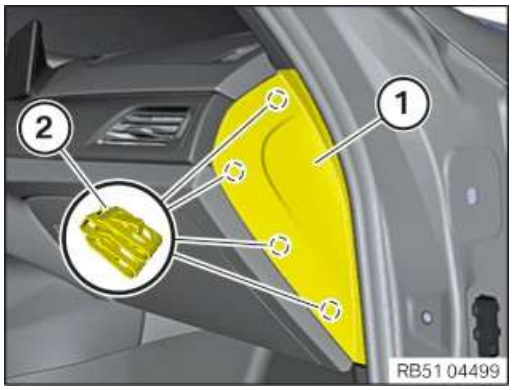
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

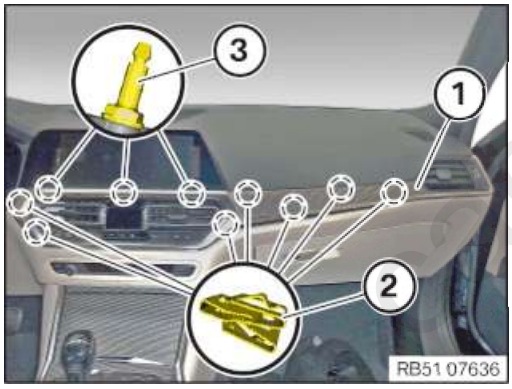
PRELIMINARY WORK

1 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

2 – Remove the finisher on the right instrument panel



- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

MAIN WORK

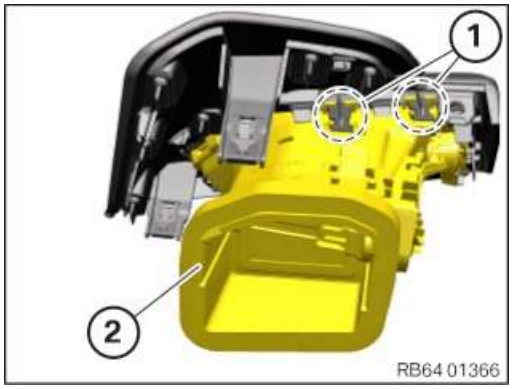
3 – Removing the right ventilation grille

NOTICE

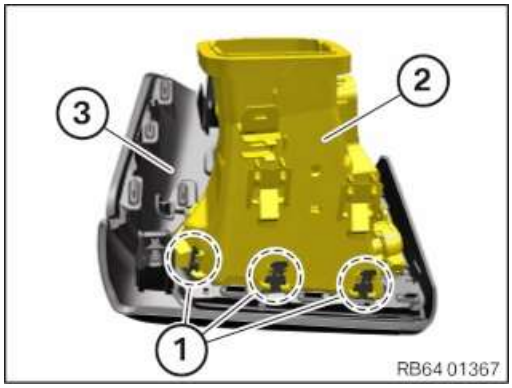
To provide a better overview: Schematic diagram with partially hidden components.

NOTICE

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



- Disengage the latch mechanisms (1) on the ventilation grille (2).



- Disengage the latch mechanisms (1) on the ventilation grille (2).
- Remove the ventilation grille (2) from the decorative strip (3) on the right side.

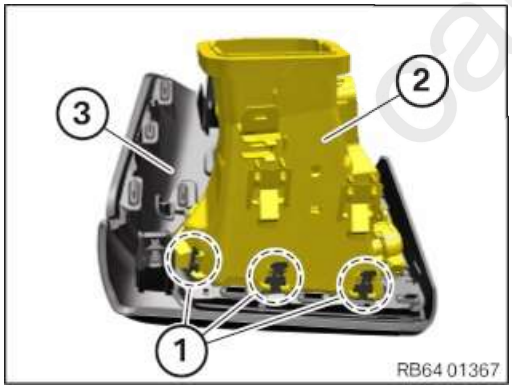
4 – Installing right ventilation grille

NOTICE

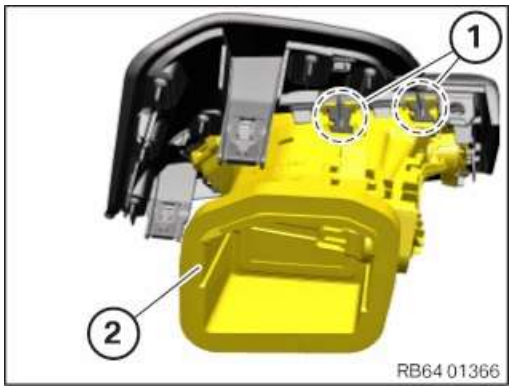
To provide a better overview: Schematic diagram with partially hidden components.

NOTICE

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



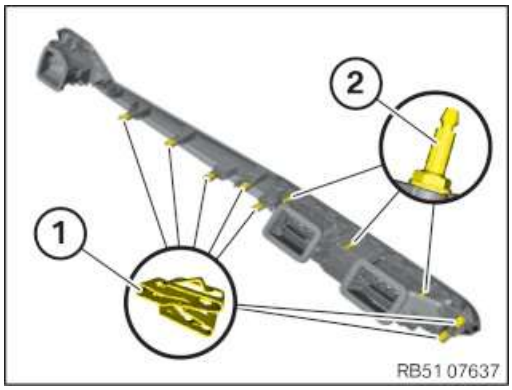
- Fit the ventilation grille (2) on the right side of the decorative strip (3) and position it correctly.
- Engage the latch mechanisms (1) on the ventilation grille (2).



- Engage the latch mechanisms (1) on the ventilation grille (2).

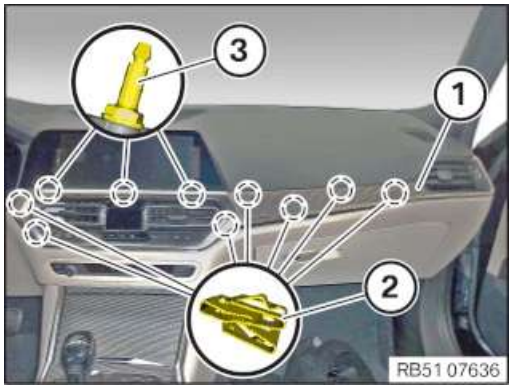
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5 – Install the finisher on the right instrument panel



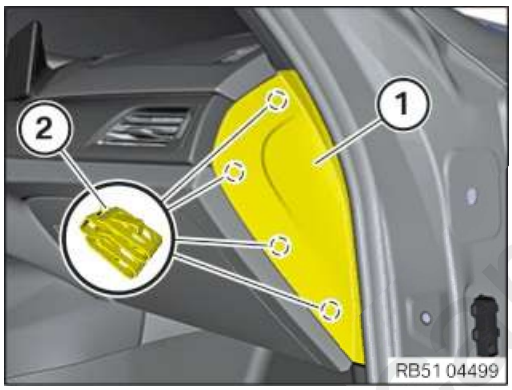
- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

6 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

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64 31 010 Replacing microfilter for interior ventilation

Prerequisite

- Ignition switched off.

RISK OF DAMAGE

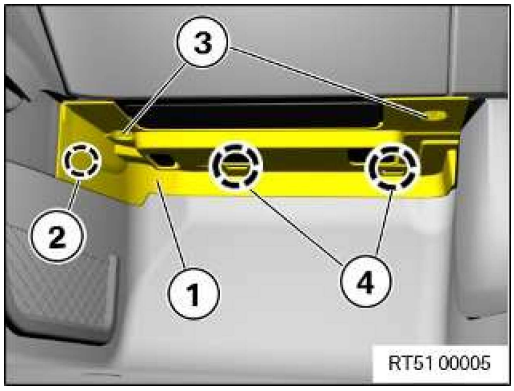
Damage to the heating and air conditioning system.

Use of unapproved microfilters may cause impairment of functions in the air conditioning.

- Only operate the heating and air conditioning system with the specified microfilter.

PRELIMINARY WORK

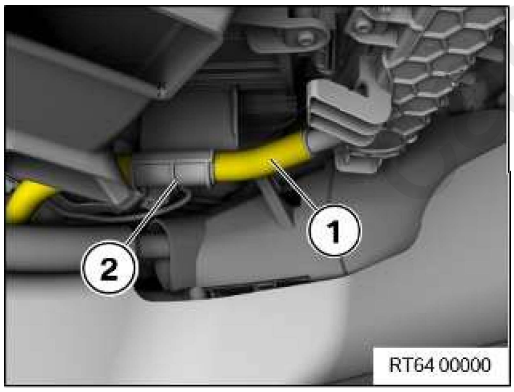
1 – Remove the right footwell trim



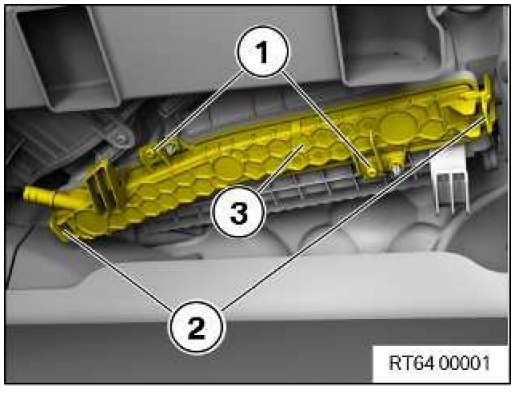
- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

MAIN WORK

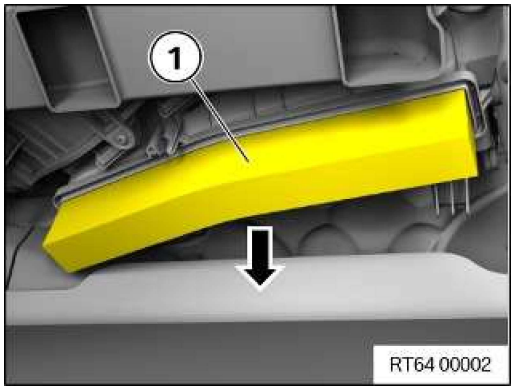
2 – Remove microfilter



- Pull off the water drain hose (1).
- Thread the water drain hose (1) out of the bracket (2).



- Loosen screws (1).
- Release latch mechanisms (2) and remove cover (3).



- Remove microfilter (1).

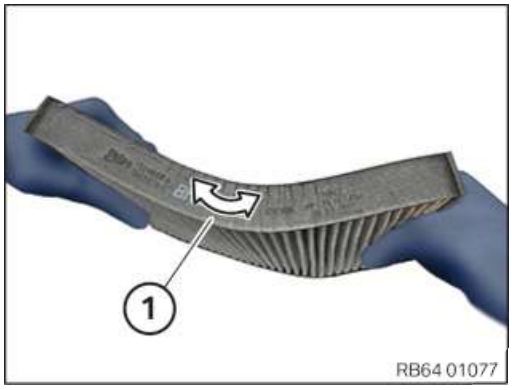
3 – Install microfilter

RISK OF DAMAGE

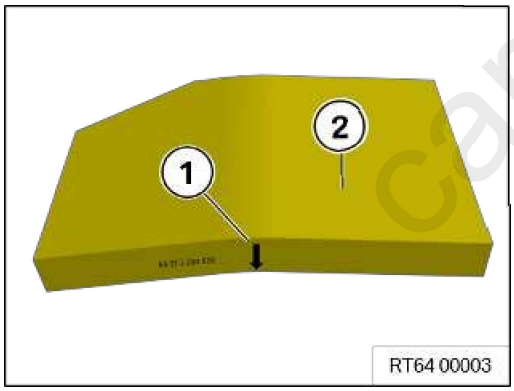
Damage to the heating and air conditioning system.

Use of unapproved microfilters may cause impairment of functions in the air conditioning.

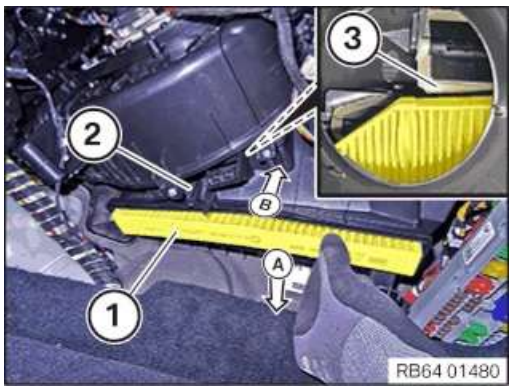
- Only operate the heating and air conditioning system with the specified microfilter.



- Pre-bend microfilter (1) slightly as shown in the graphic.



- Please note that the arrow (1) on the microfilter (2) must always point in the direction of travel during installation.

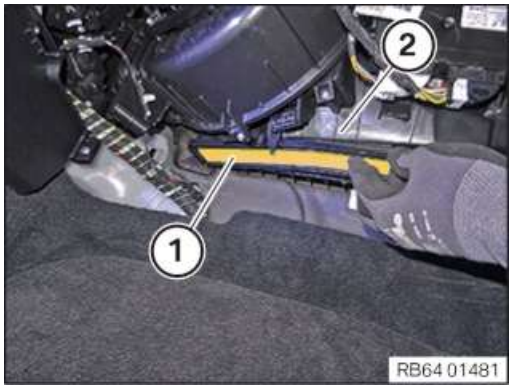


TECHNICAL INFORMATION

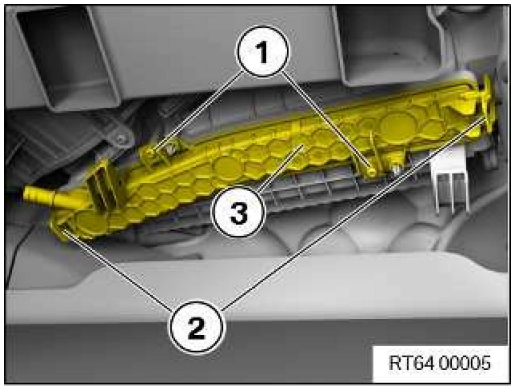
Mount the components correctly. Non-compliance with the instructions can lead to an impairment of function or component damage.

- Feed in the micro-filter (1) in the heating and air-conditioning unit (2) and press slightly forwards in the direction of arrow (A).
- Slide the micro-filter (1) upwards in the direction of arrow (B) in the heating and air-conditioning unit (2).
- It should be ensured that while sliding the micro-filter (1) into the heating and air-conditioning unit (2) does not lie up against the recirculated air flap (3).

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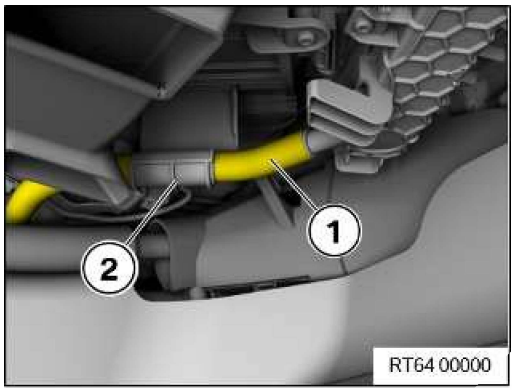
- Slide the micro-filter (1) without too much effort up to the limit position into the heating and air-conditioning unit (2) as shown.



- Make sure that the cover (3) is correctly inserted into the latch mechanisms (2) of the blower housing.
- Tighten the screws (1).

Microfilter lid on heating and air-conditioning unit

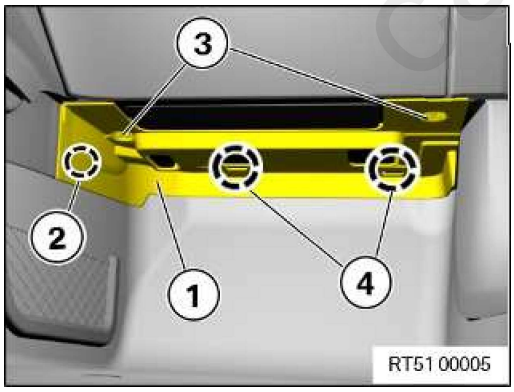
Screw		Tightening torque	2.8 Nm



- Connect water drain hose (1).
- Insert the water drain hose (1) into the holder (2).

POSTPROCESSES

4 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

Additional Information

Overview of Tightening Torques

Microfilter lid on heating and air-conditioning unit Used in step 3

Screw		Tightening torque	2.8 Nm

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64 50 ... A/C performance test

Observe the following conditions prior to the A/C performance test:

1. Connect diagnosis system. Check of the fault memory (no faults in the fault memory).
2. Attach a thermometer with separate display element to the head restraint. Lay display element outwards out of passenger compartment.
3. Perform the test in a suitable workshop area with an ambient temperature above 18° C.
4. Vehicle temperature should be approximately the same as the ambient temperature in the workshop.
5. Engine must be at operating temperature (does not apply for electric vehicles).
6. ECO PRO mode must not be switched on.

Heat passenger compartment:

- ”A/C button” is **not** activated during the heating process
- Close all side windows and doors
- Set air recirculation function.
- Select air distribution mode for footwell and defrosting.
- *On vehicles with CID*: In A/C menu (CID) in Air distribution index tab: select 100 % footwell for driver and front passenger and 100 % defrosting for driver (this applies here to driver and front passenger)
- Maximum temperature setting
- Maximum blower speed
- Start engine (does not apply for electric vehicles)

Cool down passenger compartment:

Switch on air conditioning compressor with "A/C button" at a vehicle interior temperature of 45 °C (measured at the head restraint).

On vehicles with MAX-AC button:

- Activation of MAX-AC (= maximum cooling power)

On vehicles without MAX-AC button:

- Set maximum cooling power by means of following steps:
  - Setting minimum temperature
  - Blower setting maximum
  - Stratification maximum cold (4 blue bars)
  - Only ventilation open
  - Close remaining flaps (air outlet **only** from centre fresh air grille, left and right)

After 5 min, measure both ventilation temperatures with a thermometer at the same time (centre, left and right fresh air grille). The measured temperature must be ≤ 16 °C and the difference between right and left may not be greater than 2 °C.

If one or both temperature specifications is not reached drain off heating and air conditioning system. Measure the amount of refrigerant drawn off and compare with the nominal fill amount.

Check whether refrigerant loss is present:

- If there is a permissible loss of refrigerant, fill the refrigerant circuit with the nominal fill amount.
- If there is an impermissible loss of refrigerant, check the refrigerant circuit for tightness. After rectifying the leak, fill the refrigerant circuit with the nominal fill amount.
- If there is no refrigerant loss, continue troubleshooting using the pressure measurement (only possible for vehicles with unregulated air conditioning compressor up to series E46/E53).

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64 50 010 Extract, evacuate and fill air conditioning system

1 – Drawing off the air conditioning

Prerequisite

The engine is switched off.

CAUTION

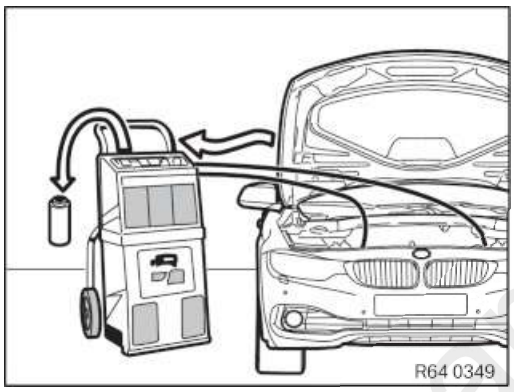
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

TECHNICAL INFORMATION

If the A/C service station for the R1234yf refrigerant identifies contaminated refrigerant in the refrigerant circuit of the vehicle before evacuation, then a special procedure to draw off and dispose of this refrigerant must be followed (see additional information).



- Let the engine run for a few minutes at a low engine speed (800-1200 rpm) and with the heating and air conditioning system switched on.
- Stop engine.
- Carry out the service function:
  - Body
  - Heating and air conditioning functions
  - Drain / fill up refrigerant circuit
- Remove the sealing caps from the refrigerant filler necks.
- Connect the high pressure line of the A/C service station with the vehicle's high-pressure connection (red).
- Connect the low-pressure line of the A/C service station with the vehicle's low-pressure connection (blue).
- Start the evacuation on the A/C service station.
- During evacuation, allow the blower of the heating and air-conditioning unit to run at middle blower speed.
- Record the amount of evacuated refrigerant and amount of refrigerant oil after having completed evacuation.
- Keep the sheet with the recorded quantities as the values are once again required when filling.
- Disconnect the high pressure line and low pressure line.
- Drain the high pressure line and low pressure line.
- Close the sealing cap of the coolant filler neck.
- Correctly dispose of the drained refrigerant oil.

2 – Drawing off the air conditioning

Prerequisite

The engine is switched off.

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CAUTION

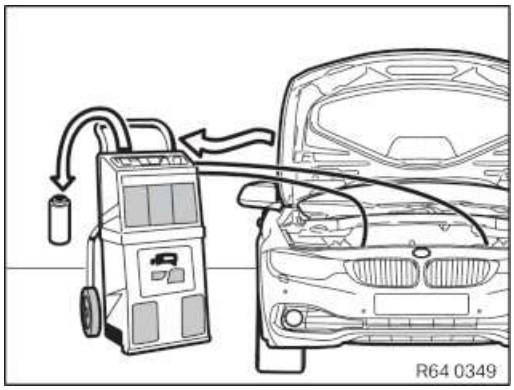
Refrigerant circuit under high pressure.

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TECHNICAL INFORMATION

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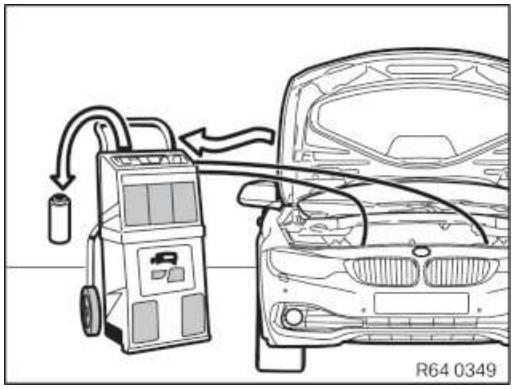
- Let the engine run for a few minutes at a low engine speed (800-1200 rpm) and with the heating and air conditioning system switched on.
- Stop engine.
- Remove the sealing caps from the refrigerant filler necks.
- Connect the high pressure line of the A/C service station with the vehicle's high-pressure connection (red).
- Connect the low-pressure line of the A/C service station with the vehicle's low-pressure connection (blue).
- Start the evacuation on the A/C service station.
- During evacuation, allow the blower of the heating and air-conditioning unit to run at middle blower speed.
- Record the amount of evacuated refrigerant and amount of refrigerant oil after having completed evacuation.
- Keep the sheet with the recorded quantities as the values are once again required when filling.
- Disconnect the high pressure line and low pressure line.
- Drain the high pressure line and low pressure line.
- Close the sealing cap of the coolant filler neck.
- Correctly dispose of the drained refrigerant oil.

3 – Evacuating the air conditioning

Prerequisite

The engine is switched off.

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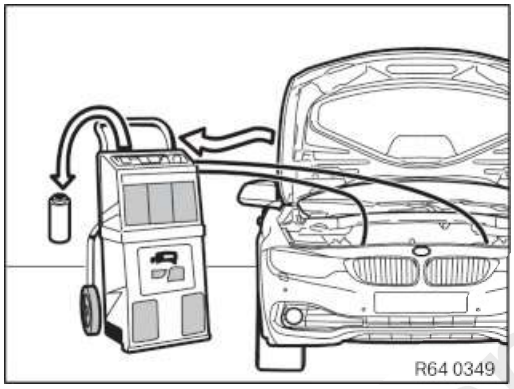


- Carry out the service function:
  - Body
  - Heating and air conditioning functions
  - Drain / fill up refrigerant circuit
- Remove the sealing caps from the refrigerant filler necks.
- Connect the high pressure line of the A/C service station with the vehicle's high-pressure connection (red).
- Connect the low-pressure line of the A/C service station with the vehicle's low-pressure connection (blue).
- Start the evacuation on the A/C service station.
- Adhere to an evacuation time of **at least** 30 min .
- During evacuation, allow the blower of the heating and air-conditioning unit to run at middle blower speed.
- If the vacuum does not remain stable during evacuation:
  - Run the ABL for leaks in the refrigerant circuit.
  - Rectify leaks in the refrigerant circuit.

4 – Evacuating the air conditioning

Prerequisite

The engine is switched off.



- Remove the sealing caps from the refrigerant filler necks.
- Connect the high pressure line of the A/C service station with the vehicle's high-pressure connection (red).
- Connect the low-pressure line of the A/C service station with the vehicle's low-pressure connection (blue).
- Start the evacuation on the A/C service station.
- Adhere to an evacuation time of **at least** 30 min .
- During evacuation, allow the blower of the heating and air-conditioning unit to run at middle blower speed.
- If the vacuum does not remain stable during evacuation:
  - Run the ABL for leaks in the refrigerant circuit.
  - Rectify leaks in the refrigerant circuit.

5 – Filling the air conditioning

Prerequisite

Service function must be active.

The engine is switched off.

Heating and air conditioning system is switched off.

The refrigerant circuit is evacuated and tight.

Vehicle must be positioned on the ground.

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CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

TECHNICAL INFORMATION

Filling a raised vehicle will result in insufficient filling levels.

TECHNICAL INFORMATION

In some cases, Sanden SP-A2 refrigerant oil must be injected into the refrigerant circuit. See further information.

Check

- Check whether the loss of refrigerant acc. to **Table 1** is exceeded.

  Table 1 indicates the permitted loss of refrigerant after a specific period of time.

  There is **no** leak.

Table 1					
Number of years since the last filling	0-1	1-2	2-3	3-4	4-5
Approved loss [g]	≤ 30	≤ 60	≤ 90	≤ 120	≤ 150

Result

» The loss of refrigerant is acc. to Table 1 **not exceeded.**

Measure

- Top up lost refrigerant.

  Do not top up **any** refrigerant oil.

Result

» The loss of refrigerant is acc. to Table 1 **exceeded.**

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Measure

- Top up lost refrigerant.

  Top up refrigerant oil acc. to **Table 2** .

  Table 2 indicates the amount of refrigerant oil which must be **topped up** after a specific period of time in the event of an **impermissible** loss of refrigerant due to a leak.

Number of years since last filling	Loss of refrigerant [g]	Top up quantity refrigerant oil
0-1	< 120	0
0-1	120-150	10
0-1	>150	20
1-2	< 180	0
1-2	180-210	10
1-2	> 210	20
2-3	< 240	0
2-3	240-270	10
2-3	> 270	20
3-4	< 300	0
3-4	300-330	10
3-4	> 330	20
4-5	< 360	10
4-5	> 360	20

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Check

- Check whether and why parts of the refrigerant circuit have been replaced.

Result

» **Version A:** Parts of the refrigerant circuit have been exchanged as the preliminary work to further work or due to a slow leak (minor leak, e.g. hairline crack).

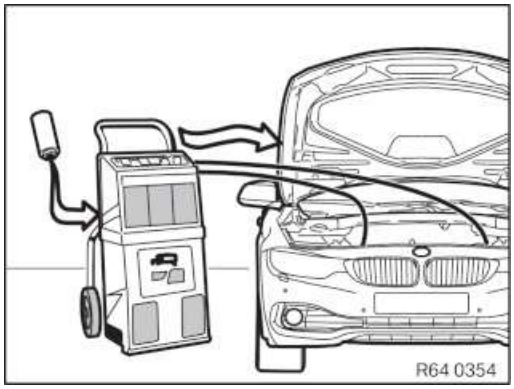
» **Version B:** Parts of the refrigerant circuit have been exchanged due to a sudden leak (major leak, e.g. pipe break caused by an accident).

Measure

- Top refrigerant oil acc. to table:

	Version A	Version B
Air conditioning compressor*	*	*
Evaporator	10 ml	35 ml
Air conditioning condenser without integrated desiccant insert	20 ml	35 ml
Air conditioning condenser with integrated desiccant insert	40 ml	55 ml
Desiccant insert/dryer flask	20 ml	55 ml
Per replaced refrigerant line	10 ml	35 ml
Safety pressure switch, gaskets	0 ml	0 ml

*Air conditioning compressor: see 6452, lubricating the air conditioning compressor



- Top up determined amount of refrigerant oil into the refrigerant circuit.
- Fill the amount of refrigerant as per the type plate into the refrigerant circuit.
- Disconnect the high pressure line and low pressure line on the vehicle.
- Drain the high pressure line and low pressure line.
- Once again close the refrigerant filler neck on the vehicle with the sealing caps.

6 – Filling the air conditioning

Prerequisite

The engine is switched off.

Heating and air conditioning system is switched off.

The refrigerant circuit is evacuated and tight.

Vehicle must be positioned on the ground.

CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

TECHNICAL INFORMATION

Filling a raised vehicle will result in insufficient filling levels.

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TECHNICAL INFORMATION

In some cases, Sanden SP-A2 refrigerant oil must be injected into the refrigerant circuit. See further information.

- Determine the quantities of **new** refrigerant oil to be refilled:

  In addition to the drawn off and recorded amount of refrigerant oil, add the following quantities (if applicable):

  - *Top up the refrigerant oil losses over time as per the table*:

  Table 1 indicates the permitted loss of refrigerant after a specific period of time. There is **no** leak. Refrigerant oil must **not** be topped up.

  Table 2 indicates the amount of refrigerant oil which must be **topped up** after a specific period of time with an **impermissible** loss of refrigerant due to a leak.

  Case 1: Refrigerant loss is **not exceeded** as per Table 1:

  - Top up missing refrigerant
  - It is **not permitted** to top up the refrigerant oil

  Case 2: Refrigerant loss is **exceeded** as per Table 1:

  - Top up missing refrigerant
  - Refrigerant oil must be **topped up additionally** as per Table 2

Table 1/case 1					
Number of years since last filling	0-1	1-2	2-3	3-4	4-5
Permissible loss [g] --> **Do not top up refrigerant oil**	≤ 30	≤ 60	≤ 90	≤ 120	≤ 150

Table 2/case 2		
Number of years since last filling	Loss of refrigerant [g]	Top up quantity refrigerant oil
0-1	< 120	0
0-1	120-150	10
0-1	> 150	20
1-2	< 180	0
1-2	180-210	10
1-2	> 210	20
2-3	< 240	0
2-3	240-270	10
2-3	> 270	20
3-4	< 300	0
3-4	300-330	10
3-4	> 330	20
4-5	< 360	10
4-5	> 360	20

  - *Add refrigerant oil as per the table if parts of the refrigerant circuit have been replaced:*

  Case 1: Part exchange as preliminary work for additional work and part exchange due to **slow leakage** (minor leak, e.g. hairline crack)

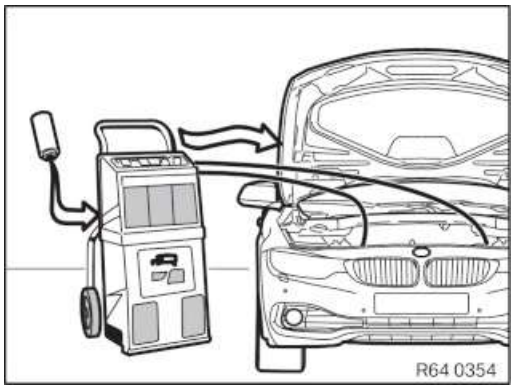
  Case 2: Part exchange due to **sudden leakage** (major leak, e.g. line

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disconnection caused by accident)

	Case 1	Case 2
Air conditioning compressor*	*	*
Evaporator	10 ml	35 ml
Air conditioning condenser without integrated desiccant insert	20 ml	35 ml
Air conditioning condenser with integrated desiccant insert	40 ml	55 ml
Desiccant insert/dryer flask	20 ml	55 ml
Per replaced refrigerant line	10 ml	35 ml
Safety pressure switch, gaskets	0 ml	0 ml

*Air conditioning compressor: see 6452 lubricating the air conditioning compressor



- Top up determined amount of refrigerant oil into the refrigerant circuit.
- Fill the amount of refrigerant as per the type plate into the refrigerant circuit.
- Disconnect the high pressure line and low pressure line on the vehicle.
- Drain the high pressure line and low pressure line.
- Once again close the refrigerant filler neck on the vehicle with the sealing caps.

Additional Information

Overview of Special Tools

Overview Technical Data

Links

Repair instructions (PRE)	Used in step
Draw off the contaminated R1234yf refrigerant and dispose of it	12

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	56

Repair instructions	Used in step
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	1234
64 50 ... Notice of repair work on air conditioning	123456
64 50 ... Notes regarding refrigerant (R134a, R1234yf) and refrigerant oil (Sanden SP-A2)	12
64 50 ... Filling refrigerant oil by means of injection	56
64 50 ... Safety information for handling refrigerant R1234yf	
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64 50 ... Instructions for handling R1234yf refrigerant

Work on the refrigerant circuit may only be carried out by experts!

Avoid all contact with liquid or gaseous R1234yf. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow safety information for handling refrigerant R1234yf!

Warning!

> Although R1234yf at normal temperature is non-toxic, non-flammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions. **At higher temperatures, R1234yf is inflammable.**

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

R1234yf must be drawn off, cleaned and returned to the A/C system using an A/C service station following the relevant operating instructions.

For a properly functioning A/C system, it is essential to have the greatest possible levels of cleanliness when working on the A/C system and the longest possible evacuation (at least 30 minutes dehumidification from refrigerant circuit) before each filling of the A/C system.

R1234yf easily absorbs moisture. Therefore, seal off opened pipes, air conditioning condenser, evaporator, air conditioning compressor and dryer flask immediately with seal plugs.

- If air conditioning has been completely drained by a leak, accident or repair, the desiccant insert must be replaced as excessive moisture may have entered the system.

With replacement parts, the plugs may only be removed immediately before the lines are connected. In the event of warranty claims, the old parts must be provided with plugs to be able to determine the cause of the damage.

Installation note:

After each refilling of an air conditioning, check that protective caps of filling valves are hand-tight. They serve as additional seals.

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 53 ... Instructions for replacement of air conditioning condensers and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

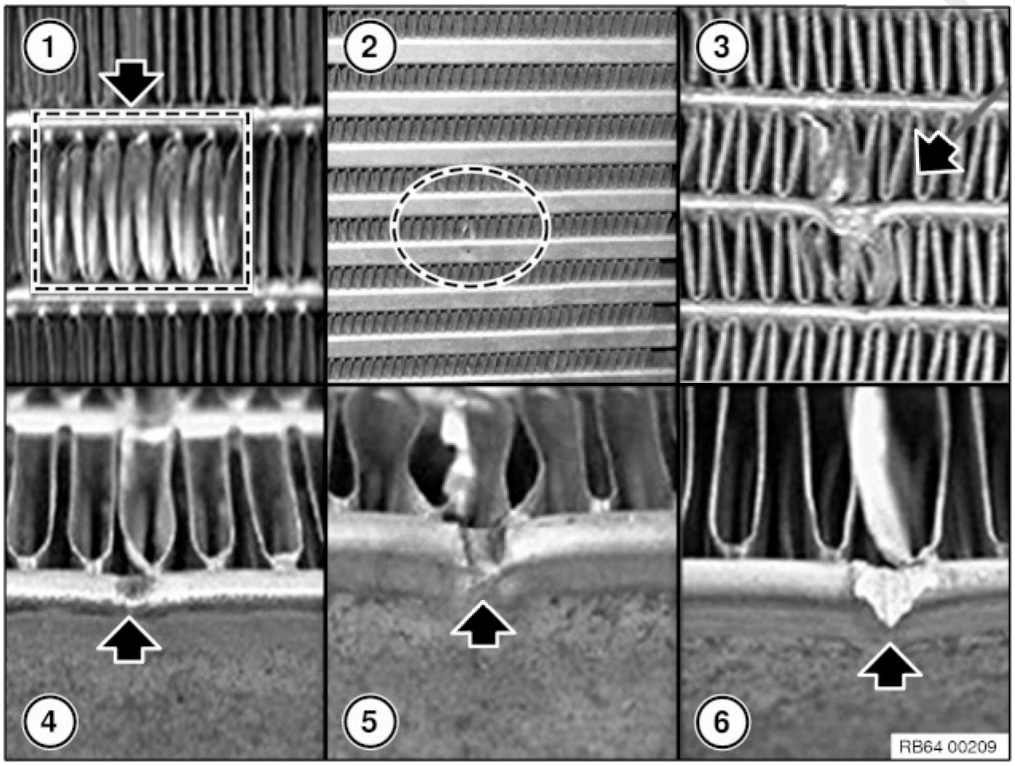
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 50 ... Leak detection with forming gas

Note:
Leak detection with forming gas replaces the leak detection that is restricted in EU countries using UV.

Observe national regulations in all other countries!

Observe the notes on repair work on the air conditioning!



Important!

Compliance with the manufacturer's operating instructions provided in the equipment case is absolutely mandatory!

Comply with SI 08 08 10 (670)!

Read and comply with the manufacturer's operating instructions provided with the special tool particularly with regard to accident prevention, health protection and environmental protection.

Only the basic procedure is described in the following!



Important!

Wear personal protective clothing/equipment!

Note:
Determine the customer's use behaviour prior to leak detection!

Certain user behaviours can lead to a loss of refrigerant from the refrigerant circuit even if there is no leak. This may occur if the customer has not used the air conditioning for a period of more than six months. This may cause O-rings to harden and refrigerant may escape. In this case, it will be sufficient to fill the refrigerant circuit again and switch on the air conditioning for approximately 10 minutes while the engine is running.

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Necessary preliminary work:

- **If components of the refrigerant circuit are contaminated, clean the engine compartment. Otherwise, the sensor head of the leak detector will become contaminated.**

  Comply with notes and instructions on handling high pressure cleaner.
- Drain off air conditioning system
- Fill the air conditioning with forming gas
- Set pressure to 5 bar

To reach the components of the refrigerant circuit with leak detector, specific parts must be removed depending on the vehicle.

Remove the following parts first immediately before the check of the respective components

- Drive belt from air conditioning compressor
- Centre fresh air grille
- Covers
- Trim panels
- Air duct
- Intake silencer
- Bulkheads
- Parts of the interior equipment (automatic rear air-conditioning system)

In some vehicles it is necessary to open the air flaps of the automatic air flap control.



G12, PHEV:

Before filling the refrigerant circuit with forming gas, perform **test module** "Draining/Filling of refrigerant circuit".



Important!

Always perform the leak detection with a pressure of **5 bar at first**!

This is absolutely necessary to find certain leaks, such as in the area of the O-rings.

If no leak is detected, repeat the leak detection with **10 bar**.

Important!

The leak detection may not be performed **more than 3 h** after filling the refrigerant circuit with forming gas!

Forming gas consists of 95% nitrogen and 5% hydrogen. The leak detector will detect hydrogen. If this is leaking from the refrigerant circuit even though the pressure remains, the leak detection bears no results.

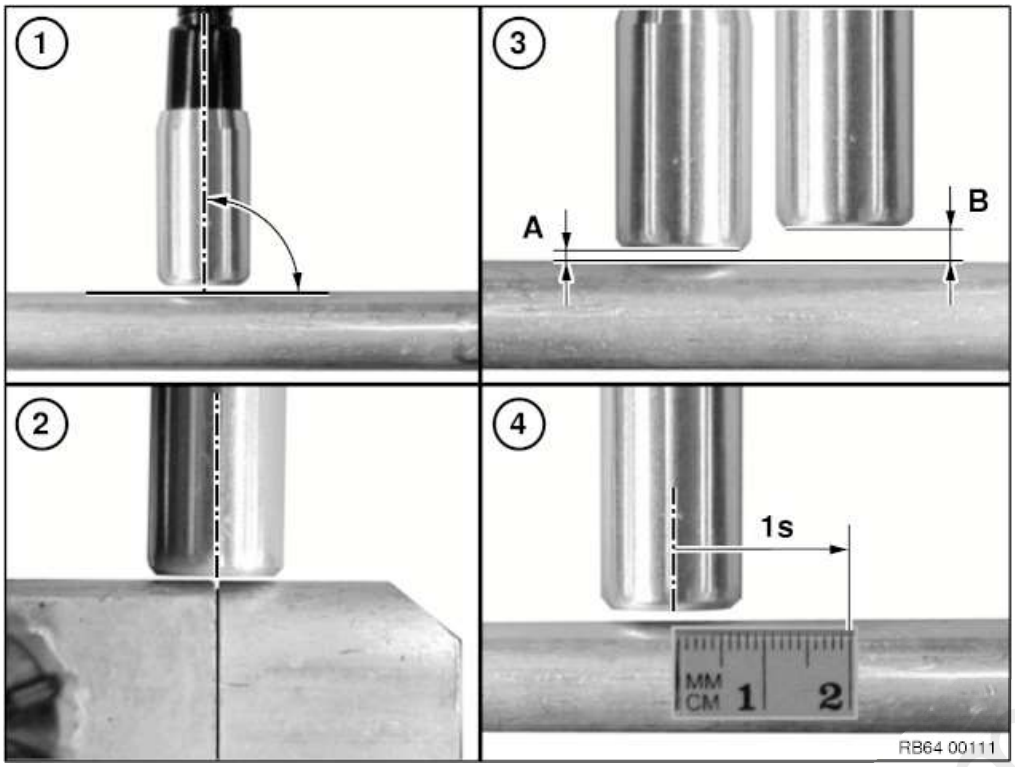
Important!

Risk of damage!

Maximum approved pressure: **10 bar**

Do not start the engine during the entire procedure!

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Notes for handling the leak detector:

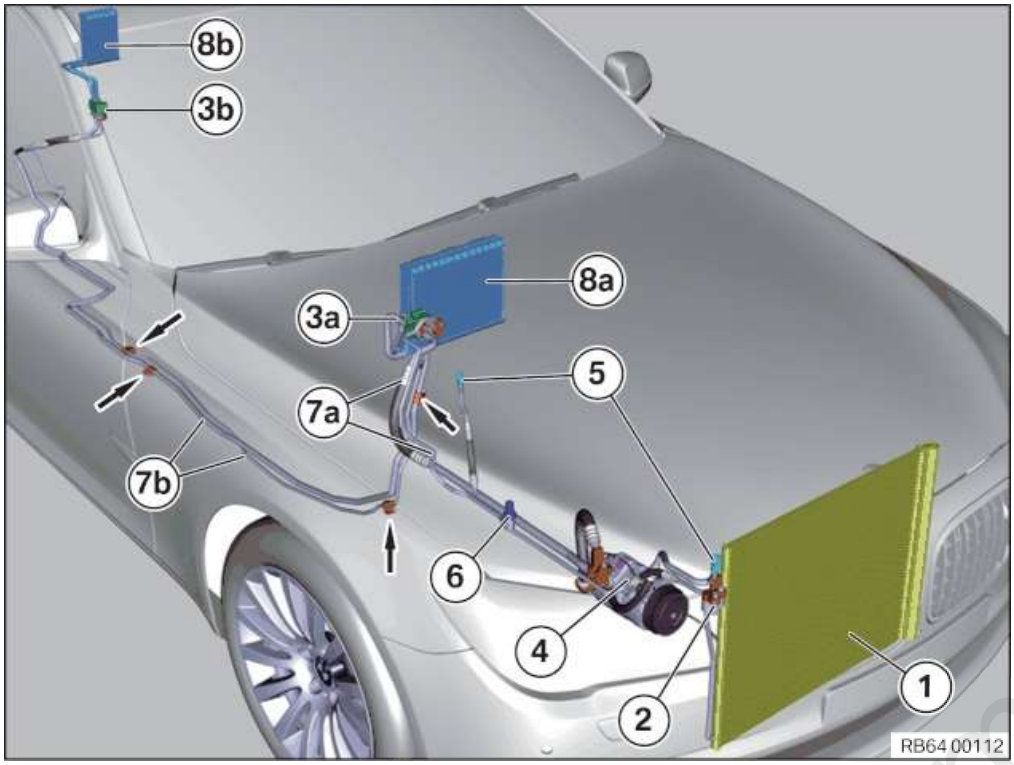
1. Sensor head should always stand vertical to the surface to be checked.
2. Sensor head must always be aligned to the centre of the point to be checked. Slowly guide the sensor head around the point (e.g. connection point, sealing surface, etc.).
3. The optimal distance (A) between sensor head and surface to be checked should permanently be approximately 1 mm.
   Maximum distance (B) at points that are difficult to access approximately 5 mm.
4. Checking speed may not be more than maximum 2 cm per s.

Note:
If the leak detector displays a leak, remove the sensor head from the leak for approximately 10 s.
Then check if the leak is still displayed at the same point. Repeat the process up to three times,
to ensure that a leak is actually present at this point.

Note:
Replace the leaking component. Relieve the pressure from the refrigerant circuit prior to replacement.

Important!
Compliance with the instructions above is absolutely mandatory!
Non-compliance will significantly reduce the efficiency of leak detection!

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Note:
The graphic shows the example of the refrigerant circuit on the F02 with the automatic rear air-conditioning system optional equipment .

Refrigerant circuits on other vehicles may differ from the graphic.

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Overview of positions to be checked:

1. Air conditioning condenser
2. Connection point between air conditioning condenser and refrigerant line
3. a) Expansion valve, front (vehicles with and without automatic rear air-conditioning system)

   b) Expansion valve, rear (vehicles with automatic rear air-conditioning system)
4. Air conditioning compressor
5. Filler neck high pressure and low pressure
6. Refrigerant pressure sensor
7. a) Refrigerant line, front (vehicles with and without automatic rear air-conditioning system)

   b) Refrigerant line, rear (vehicles with automatic rear air-conditioning system)
8. a) Evaporator, front (vehicles with and without automatic rear air-conditioning system)

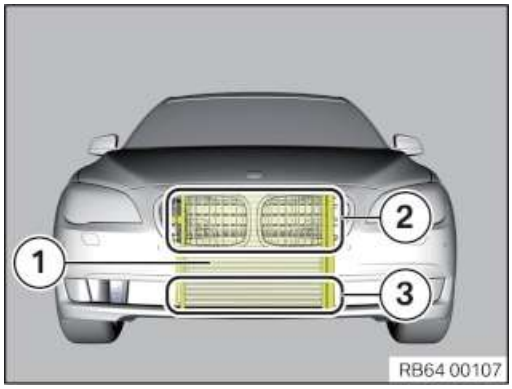
   b) Evaporator, rear (vehicles with automatic rear air-conditioning system)

Note:
Refrigerant line connection points are identified by arrows.

Checking sequence:

1. Check of components 1, 2, 3a, 4, 5, 6, 7a and 8a of the automatic front air-conditioning system.

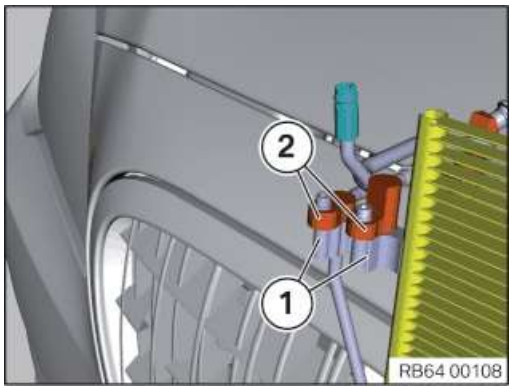
   If no fault found:
2. Check of components 3b, 7b, 8b and connection points of the automatic rear air-conditioning system.



1. Air conditioning condenser:

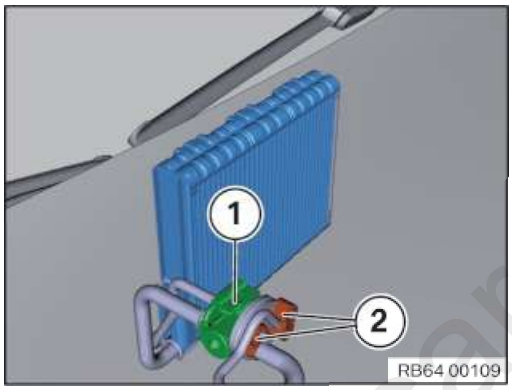
Damage caused by stone chipping, etc. is the most frequent cause of air conditioning condenser leaks (1):

1. Visual inspection in the area of the radiator grille (2) and air inlet grille, centre (3).
2. Check damaged points first.
3. Check the remainder of the air conditioning condenser.



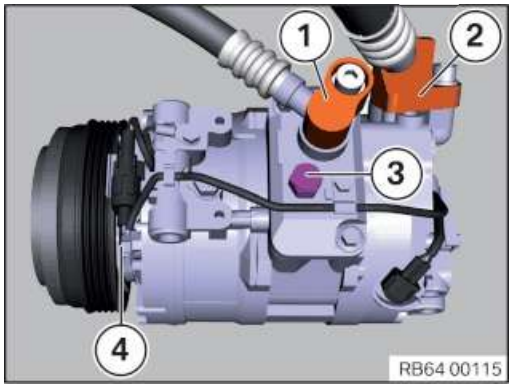
2. Connection point condenser - refrigerant line

Check the connection point between the connection at the air conditioning condenser (1) and refrigerant lines (2).



3. Expansion valve:

Check the connection point between the expansion valve (1) and refrigerant lines (2).



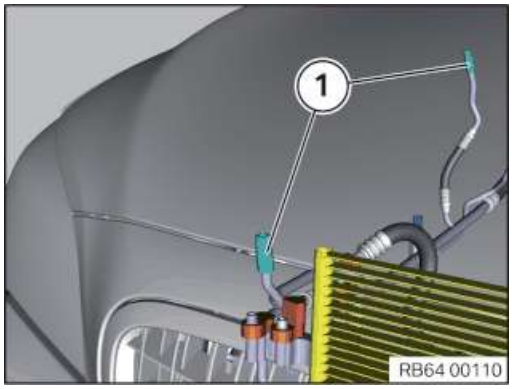
4. A/C compressor:

Remove drive belt from air conditioning compressor.

Check the following components on the air conditioning compressor:

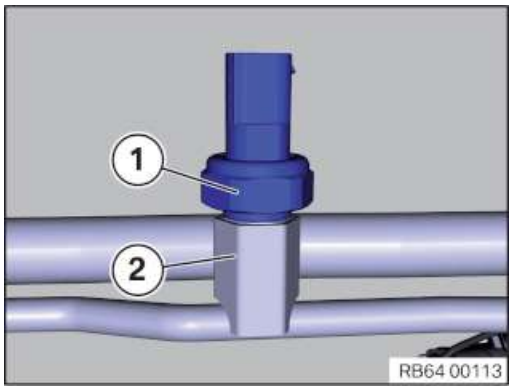
1. High-pressure connection
2. Low pressure connection
3. Pressure relief valve
4. Radial shaft seal of the magnetic coupling: Turn the magnetic coupling several times by hand during the leak detection.

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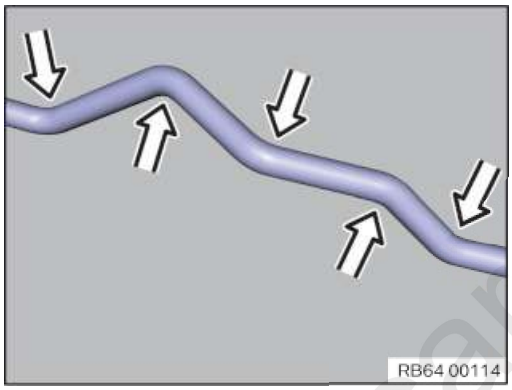
5. Filler neck

Blow out the fuel filler neck (1) prior to checking.



6. Refrigerant pressure sensor

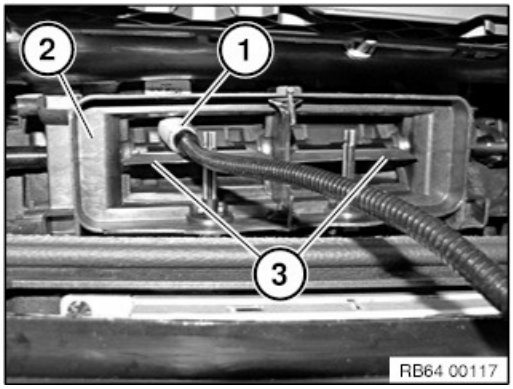
Check the sealing surface between the refrigerant pressure sensor (1) and the refrigerant line (2).



7. Refrigerant lines:

1. Perform visual inspection
2. Check damaged points first.
3. Check bending points at points marked with an arrow. Leaks occur especially frequently at these points.
4. Check the remainder of the refrigerant line.

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8. Evaporator:

Remove the centre fresh air grille.

Compliance with the following settings is **absolutely** required:

- Air recirculation function On
- Lowest blower speed
- Lowest temperature
- Set the air distribution to ventilation (air may only flow out of the centre fresh air grille)

Position sensor head (1) in air duct of middle fresh air grille (2) as illustrated and move slowly from inside to outside above and below air flap (3). Carry out this operation on the left and right fresh air grilles.

Important!

Some vehicles have an expansion valve directly next to the fresh air intake for the passenger compartment.

In this case the expansion valve must be covered!

Following the completed leak detection:

- Evacuate and fill heating and air conditioning system

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64 50 ... Leak detection with ultraviolet additives (UV additives) (BMW leak-testing case)



Leak detection using ultraviolet additives is generally not recommended as the UV additives lead to an uncontrolled over oiling of the refrigerant circuit. This results in a reduction of the cooling power. Leak detection with forming gas is preferable.

Leak detection using ultraviolet additives is permitted for refrigerants R134a and R1234yf.

Attention!

In EU countries it is prohibited by law to fill a knowingly leaking refrigerant circuit with the refrigerants (R134a and R1234yf):

- If a leak is suspected in the refrigerant circuit, refilling with refrigerant and UV additives for the purpose of a subsequent leak detection **is not permitted**

  In this case, carry out the leak detection with forming gas
- UV additives **must be filled only in a tight refrigerant circuit**

Observe national regulations in all other countries!



Attention!

It is absolutely essential to read and comply with the equipment manufacturer's operating instructions provided in the leak testing case!

Read and comply with the manufacturer's operating instructions provided with the leak testing case with regard to accident prevention, health protection and environmental protection.

Use only BMW-approved UV additives (e.g. TRACER).

Only the basic procedure is described in the following!

Attention!

UV additives may not be used in vehicles with electric A/C compressors!



Warning!

Avoid contact with refrigerant.

Follow safety precautions when handling refrigerant.

Attention!

Ultraviolet lamp gets very hot in the radiation area!

Do not use the ultraviolet lamp without the filter glass.

Eyes and skin will suffer damage if the ultraviolet lamp is used without the filter glass.

When using the ultraviolet lamp, wear the safety goggles provided in the leak testing case.

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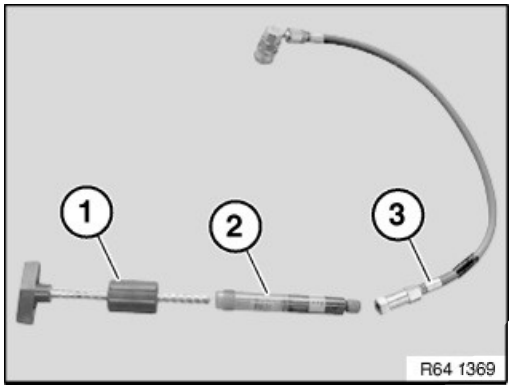
Note:

- Fill the hose system of the hand pump completely with UV additive PRIOR to use
- The UV additive may be used exclusively for BMW-approved refrigerant oils
- Do not operate the air conditioning while the hand pump is connected or in use
- The air conditioning must always be filled with an adequate amount of refrigerant to enable the UV additives to be properly distributed

Necessary preliminary work:

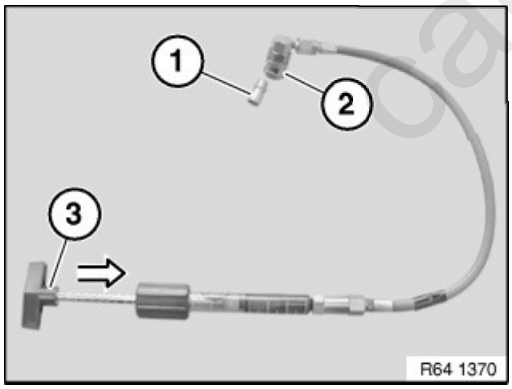
Before actually testing for leaks, check the entire refrigerant circuit using the UV leak detection lamp to ensure that no UV additive is already in the area of the refrigerant circuit.

Leak areas which have already been detected by UV light must carefully cleaned with the cleaning agent provided in the leak testing case.



<u>On initial use:</u>

Connect hand pump (1) to additive cartridge (2) and pipe section (3).



<u>On initial use:</u>

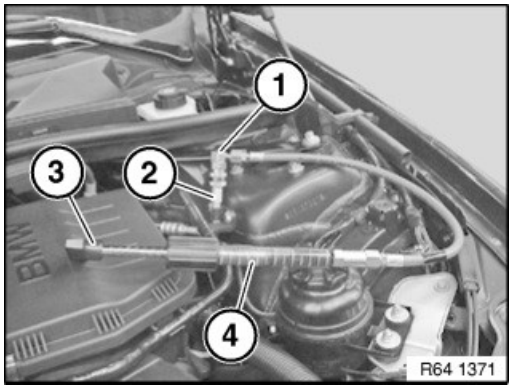
Attach vent valve (1) to quick-release coupling (2).

Turn handle (3) on hand pump to advance the piston until a small amount of UV additive emerges. This vents the hose system.

Attention!

The entire hand pump with hose system must not be disassembled again once filling has been completed.

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Attach quick-release coupling (1) to low-pressure connection (2) of air conditioning system.

Turn handle on hand pump (3) until the required amount of UV additive is added.

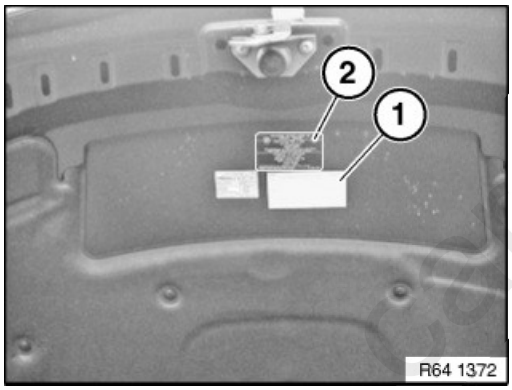
The quantity of UV additive to be added is dependent on the amount of refrigerant in the refrigerant circuit:

- Air conditioning systems with refrigerant filling up to 900 g: one graduation mark (4) on additive cartridge
- Air conditioning systems with refrigerant filling in excess of 900 g: two graduation marks (4) on additive cartridge

Note:
After filling remove the quick-release coupling (1). If necessary, clean the areas with contaminated with UV additive using the cleaning agent contained in the leak testing case.

<u>Further tasks:</u>

- Start engine
- Run air conditioning at highest level for 5 - 10 minutes in order to ensure adequate distribution of dye in the system
- Turn off engine.
- Check all the components of the refrigerant circuit for any leaks
- Possible leaks are displayed in green when using the UV leak detecting lamp and UV-absorbing safety goggles



Complete accompanying information label (1) with the relevant data and attach in an easily visible position next to the type plate (2).

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64 50 ... Notes on repairs to air conditioning



Special tools required:

- 00 9 030
- 32 1 270



Warning!

Only persons in possession of a professional certificate of competence for the maintenance and repair of heating and air conditioning systems are authorised to carry out repair work on the refrigerant circuit. It must be available no later than 04 July 2010 (applies only to EU countries; follow country-specific regulations in non-EU countries).

Refrigerant circuit is under high pressure!

- If the protective caps on the filling valves are difficult to open, there is a danger of injury from leaking valve inserts.

Repairs may only be carried out on a depressurised refrigerant circuit!

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service station

Avoid contact with refrigerant and refrigerant oil.

- Pay attention to the safety information for dealing with coolant
- Follow safety information for handling refrigerant oil

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Attention!

Risk of damage!

Only refrigerant and refrigerant oil country-specifically approved by BMW may be used.

Restart engine only when air conditioning has been correctly filled.

- Each time air connectors are opened continually **new O-Rings** are used (see electronic parts catalogue).

  They must **not** be coated.

  Use special tool 00 9 030 to mount sealing rings without damaging them.
- Open the refrigerant circuit for as short a period as possible.
- Close all components and lines in the refrigerant circuit and return parts immediately following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If refrigerant circuits are opened with special tool 32 1 270 but left open for more than 24 h, the **air conditioning condenser with desiccant insert** for air conditioning must be replaced.

In a functioning, sealed air conditioning, an **air conditioning condenser with desiccant insert** need **not** be changed at regular inspection intervals.

However, an air conditioning condenser with desiccant insert must be changed in case of:

- the refrigerant being dirty by swarf (e.g. when the air conditioning compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.



Vehicle-specific notes:

Only G12 and Plug-in Hybrid Electric Vehicle:

To ensure that refrigerant is fully drained from the rear passenger compartment air conditioning or the battery cooling system,

run the following test module:

- Car body service
- Heating and air conditioning functions
- Drain / fill up refrigerant circuit

Only G12, N74 US version:

An adapter is necessary to fill the air conditioning.

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In case of the handling the A/C service station observe the following without fail: Attention!

Risk of damage!

Comply with SI 08 07 10 (669)!

Carefully move the climate service station!

Comply with the operating instructions and service interval for the A/C service station!

Make sure that the hoses of the A/C service station are drained after the drawing off or filling procedure!

The climate service station contains highly sensitive components, such as scales. These components will be damaged due to improper handling, such as fast driving over a bump. This will result in a significant reduction of the measuring accuracy when drawing off and filling.

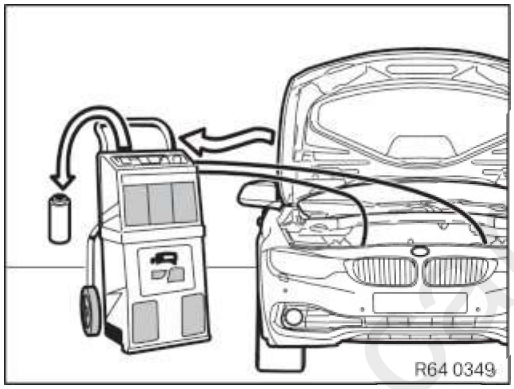
Attention!

During the entire filling procedure the vehicle must stand on the floor.

Filling a raised vehicle will result in insufficient filling levels.

Note:
In the event of complaints, perform A/C performance test!

If the system fails the test, draw off, evacuate and fill the air conditioning in accordance with the operating instructions of the relevant service station.



Instructions for drawing off air conditioning:

To help separation of refrigerant and refrigerant oil, run engine at low speed (800-1200 rpm) and with air conditioning switched on for a few minutes.

The limits the entrainment of refrigerant oil while it is drawn off.

Drawn-off refrigerant oil must be changed and reintroduced via the A/C service station.

During drawing off, set the blower of the heating and air-conditioning unit to the middle blower speed. This ensures that drawing off is more effective since the pressure on the low pressure side increases.

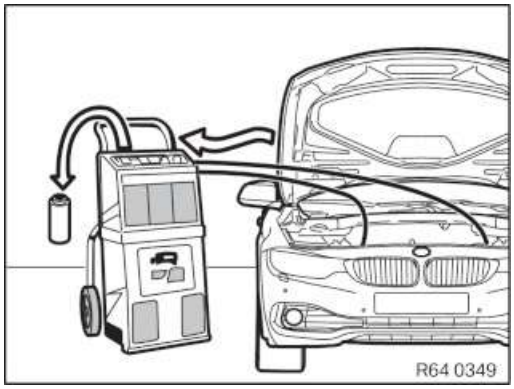
Recycling:

Dispose of drawn-off refrigerant oil as hazardous waste.

Observe country-specific waste disposal regulations.

Note in case of contaminated refrigerant R1234yf:
If the A/C service station for R1234yf refrigerant identifies contaminated refrigerant in the refrigerant circuit of the vehicle before evacuation, then a special procedure to draw off and dispose of this refrigerant must be followed.

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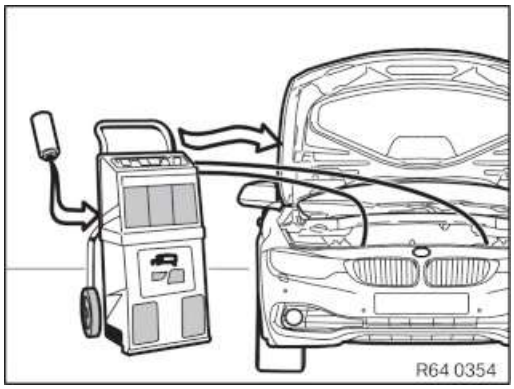
Instructions for evacuating off air conditioning:
Before each filling, evacuate the refrigerant circuit.

Observe an evacuation time of at least 30 minutes.

The evacuation procedure removes all traces of ambient air, water vapour and any other gases present from the heating and air conditioning system. This enables subsequent system filling with refrigerant.

If the vacuum does not remain stable when the system is off, run the procedure for leaks in the refrigerant circuit.

During evacuation, set the blower of the heating and air-conditioning unit to the middle blower speed. This ensures that evacuation is more effective since the pressure on the low pressure side increases.



Notes for filling heating and air conditioning system:
Before filling with refrigerant, replace the refrigerant oil entrained plus losses is to be filled up during drawing off.

Fill up the amount of refrigerant as per type plate.



Remove the capacity and type of the refrigerant from the type plate.

Refrigerant capacities

64 50 ... Notes on the refrigerant (R134a, R1234yf) and refrigerant oil



Attention!

Specific to the country , **2 different refrigerants** (R134a, R1234yf) are used.

Specific to the country, the vehicle and the year of manufacture **2 different refrigerant oils** (ND-8, Sanden SP-A2) are used.

Before carrying out repairs on the refrigerant circuit, always determine which refrigerant/refrigerant oil is used in the vehicle!

Refrigerant: This information can be found on the **type plate** on the bonnet.

Refrigerant oil: This information can be found on the **type plate** on the front flap in vehicles with a production date from 2013.

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R1234yf refrigerant is used **in the following countries**:

Observe notes on handling R1234yf refrigerant!

Europe				Asia	America
Belgium	Great Britain	Malta	Sweden	Israel	USA
Bosnia and Herzegovina	Ireland	Macedonia	Switzerland	Turkey	Canada
Bulgaria	Iceland	The Netherlands	Slovakia	India*	
Denmark	Italy	Norway	Slovenia	South Korea	
Germany	Croatia	Austria	Spain		
Estonia	Latvia	Poland	Czech Republic		
Finland	Liechtenstein	Portugal	Hungary		
France	Lithuania	Romania	Cyprus		
Greece	Luxembourg	Serbia			

*Only applies to vehicle models with Europe version. All other vehicle models have R134a.

Introduction of R1234yf refrigerant:

European countries listed in the table, Turkey and Israel:

- BMW i as of 09/2013
- from 07/2016, BMW, MINI, RR

USA and Canada:

- from 07/2016 BMW, BMW i, MINI

South Korea:

- from 11/2018 BMW, BMW i, MINI

The introduction date may vary slightly according to the specific country and model.

The refrigerant R134a will continue to be used **in all other countries**.

Observe notes on handling R134a refrigerant!

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Refrigerant oil Sanden SP-A2 is used for both, R1234yf and R134a.

Observe notes on handling refrigerant oil!

Attention!

I01, I12 with production date up to 08/2014:

In the national-market version with R134a a **wrong refrigerant oil** is present on the type plate

Always use Sanden SP-A2

(Part number of Sanden SP-A2: 2 339 920)

Attention!

Only vehicles with a production date from 09/2013 and **R1234yf** refrigerant/Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R1234yf**.

In addition to vehicles with a production date from 09/2013, also all previous vehicles **without the electric A/C compressor** with **R134a** refrigerant and both **ND-8** and Sanden **SP-A2** refrigerant oil can be filled using the A/C service station for **R134a**.

Exception:

BMW i and hybrid vehicles (with an electric A/C compressor) that are filled with **R134a** refrigerant/Sanden **SP-A2** refrigerant oil. These vehicles must be injected with Sanden **SP-A2** refrigerant oil.

When filling the refrigerant circuit with R134a, always ensure you use the correct, vehicle-specific refrigerant oil type!

The previous ND-8 refrigerant oil must not be mixed with Sanden SP-A2 refrigerant oil!

In other words, the refrigerant oil ND-8 must not be filled in refrigerant circuits which were filled with Sanden SP-A2 in the factory.

Sanden SP-A2 refrigerant oil may be mixed with ND-8 refrigerant oil in vehicles without an electric A/C compressor.

In other words, the refrigerant oil Sanden SP-A2 must be filled in refrigerant circuits which were filled with ND-8 in the factory.

However, this is permitted **only** in vehicles **starting from** F-series.

Note the overview of the refrigerant oil to be filled.

To prevent inadmissibly mixing the different refrigerant oil types, rinse the A/C service station hoses after each drawing off/filling procedure!

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64 50 ... Safety information for handling refrigerant R1234yf



R1234yf is non-toxic at normal temperature, non-flammable and not explosive in conjunction with air at any mixture ratio.

As a gas, R1234yf is colourless, odourless and heavier than air. If it enters the atmosphere, this may result in an imperceptible danger of asphyxiation or in cardiac palpitations, especially in workshop pits. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

Store filled refrigerant pressure flasks so that they are not subject to direct sunlight or other heat sources (at maximum 45 °C). Also avoid exposing them to mechanical stress (e.g. by dropping).

Do not weld or solder on to filled air conditioning systems or in rooms into which R1234yf may have leaked. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic products of decomposition (hydrofluoric acid). For this reason, do not smoke either.

In the event of fire, carbon dioxide (CO2), extinguishing powder and a sprayed water jet are deemed to be suitable extinguishing agents. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filler valves are difficult to open, there is a risk of injury from leaking valve inserts (high pressure).

The filled refrigerant circuit of the A/C system is subject to excess pressure. Before carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

After each refilling of an air conditioning, check that protective caps of the filling valves are hand-tight. They serve as additional seals.



Warning!

Work on the refrigerant circuit may only be carried out by experts!

Danger of injury!

Refrigerant circuit is under high pressure!

Draw off the refrigerant **before** any repairs on the refrigerant circuit!

The refrigerant circuit is only depressurised **after** drawing off.

- Check the pressure gauge on the A/C service station for actual pressure drops before repair.

The corresponding operating instructions of the A/C service station used must be observed!

Avoid all contact with liquid or gaseous R1234yf.

At high temperatures, R1234yf is inflammable!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.

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First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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64 50 ... Safety informations for handling tetrafluorethane refrigerant R134a



Warning!

Danger of injury!

Refrigerant circuit is under high pressure! Work on the refrigerant circuit may only be carried out by experts!

Draw off refrigerant without fail BEFORE all repair work on the refrigerant circuit.

The refrigerant circuit is depressurised AFTER drawing off.

- The pressure gauge on the A/C service unit must be checked for the actual pressure drop prior to repair work.

It is absolutely essential to read and observe the relevant operating instructions for the A/C service unit used!



Protective measures/rules of conduct:

- Wear safety goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.



First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapours are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Call for a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

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64 51 001 Cleaning evaporator

RISK OF DAMAGE

Damage to the heating and air conditioning system.

Use of unapproved microfilters may cause impairment of functions in the air conditioning.

- Only operate the heating and air conditioning system with the specified microfilter.

PRELIMINARY WORK

1 – In vehicles with airbag module: Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

NOTICE

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

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

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RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.



Check

TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

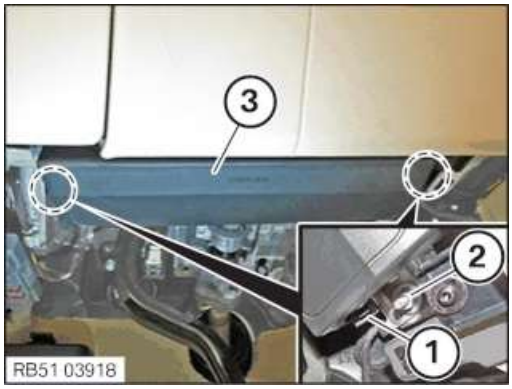
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▸ **Disconnecting all battery earth leads**

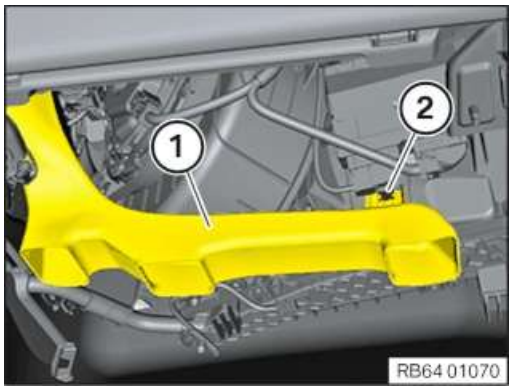


- See additional information.



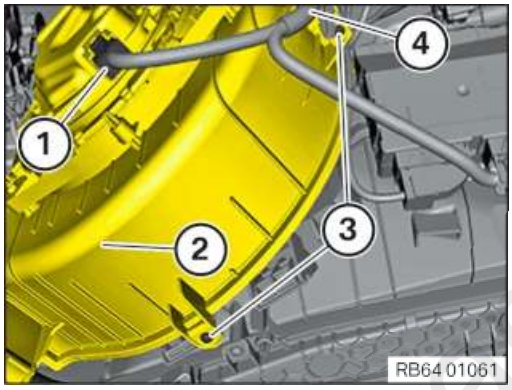
- Unlock plug connection (1) and disconnect.
- Loosen screws (2) on left and right.
- Remove knee airbag (3) towards the bottom.

2 – Removing the right air duct

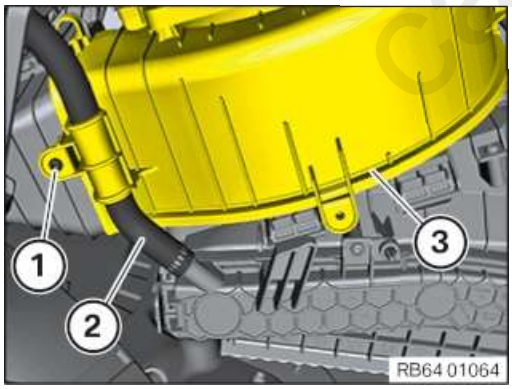


- Unclip the air duct (1) at an angle toward the bottom at the spring clip (2).

3 – Remove the blower for the heating and air-conditioning unit



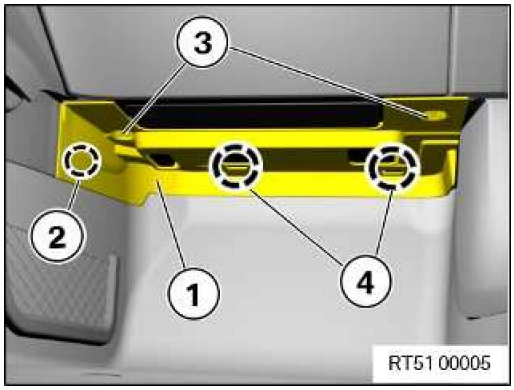
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

4 – Remove the right footwell trim

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- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

MAIN WORK

5 – Cleaning evaporator

Prerequisite

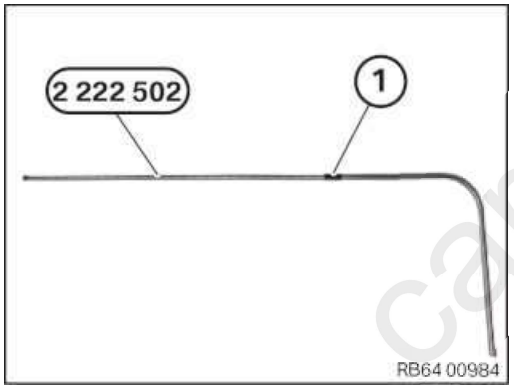
Vehicle is parked in a suitable washing bay, as the emerging cleaning agent escapes through the drain openings on the transmission tunnel.

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

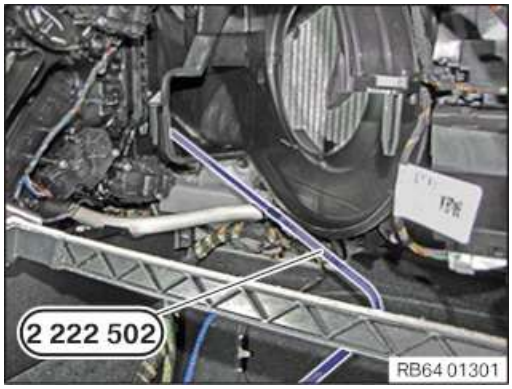


- At the special tool close the last 2 openings (1) with adhesive tape.
- Pour air conditioning system cleaning agent into the spray gun.

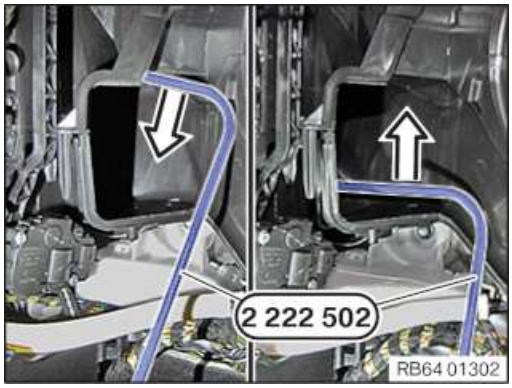
Description	Part number
Heating and air conditioning system cleaning agent	83 19 2 180 507
Spray gun	81 45 9 429 217

- Connect special tool to spray gun.
- Build pressure in spray gun.

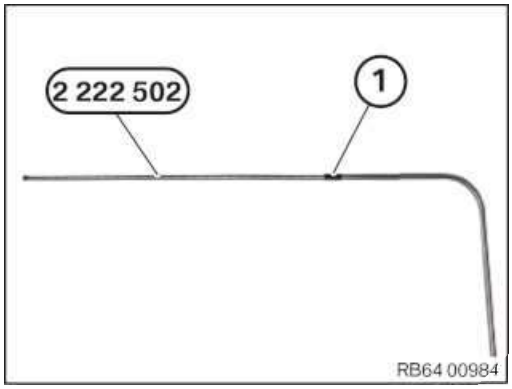
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- Close all the ventilation outlets.
- Set air conditioning to air recirculation function.
- Cover carpet in working area.
- Insert special tool into the heater/air conditioning unit as shown.



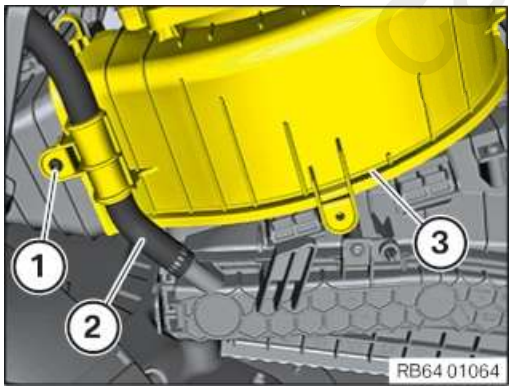
- Position special tool in lower limit position as shown.
- Move special tool back and forth from lower to upper limit position.
- Keep moving the special tool back and forth until the air conditioning system cleaning agent has been fully sprayed.
- After completing cleaning, allow the vehicle to drip-dry for approx. 5 minutes.



- Remove the adhesive tape (1) and the special tool.

POSTPROCESSES

6 – Install the blower for the heating and air-conditioning unit



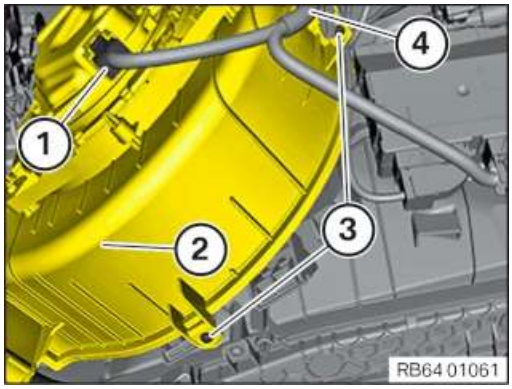
- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).

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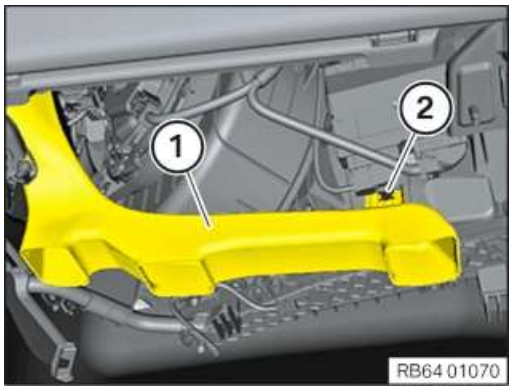
- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

7 – Installing the air duct, right

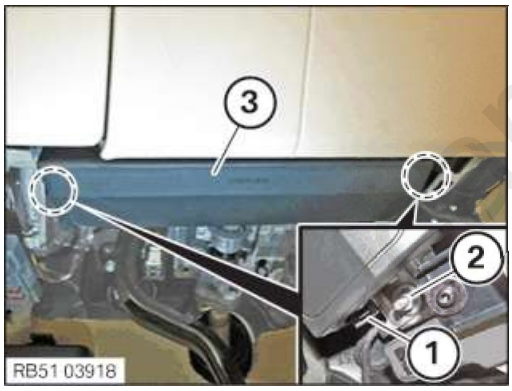


- Clip the air duct (1) in upward at an angle with the spring clip (2) on the heating and air-conditioning unit.

8 – In vehicles with airbag module: Installing knee airbag

NOTICE

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



- Install knee airbag (3).
- Tighten screws (2) on left and right.

Knee airbag on the instrument panel

Hexagon nut		Tightening torque	8 Nm

- Connect connectors (1) and lock.

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

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Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



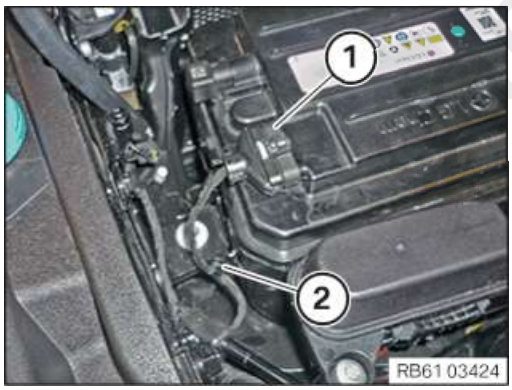
- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8	Tightening torque	19 Nm



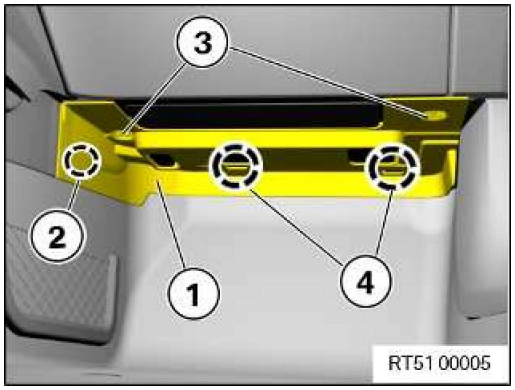
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

9 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 6
Screw		Tightening torque	1,2 Nm

Knee airbag on the instrument panel			Used in step 8
Hexagon nut		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 8
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

Links

Repair instructions (PRE)	**Used in step**
Notes on 48-V battery	18

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

Repair instructions	**Used in step**
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
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61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
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61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
61 20 900 Disconnecting and connecting battery earth lead	18
64 00 ... Information on using cleaning agent/paints (personal protection equipment)	5

Technical service information	**Used in step**
Musty odour from heating and air conditioning system, evaporator cleaning	5

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 51 580 Perform leakage test for evaporator

DANGER



High-voltage system.

The high-voltage system operates on the basis of hazardous, electrical voltage and high currents. Danger to life through electric shock!

- All work on the high-voltage system may only be carried out by specially trained and technically experienced personnel.
- For additional information see:
- For additional information see:

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

CAUTION

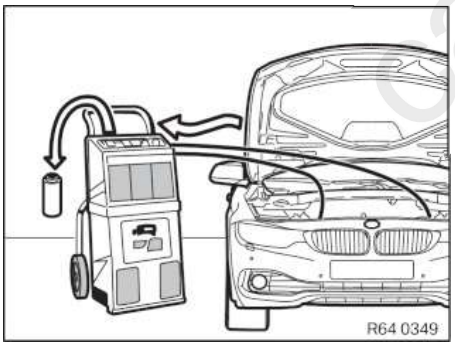
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

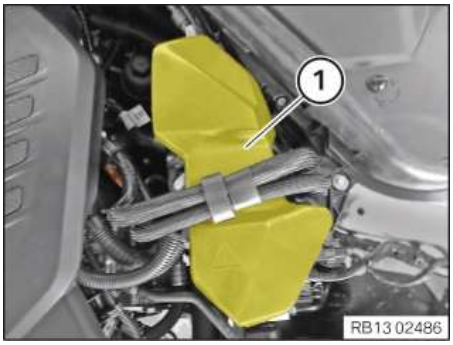
2 – Disconnecting all battery earth leads



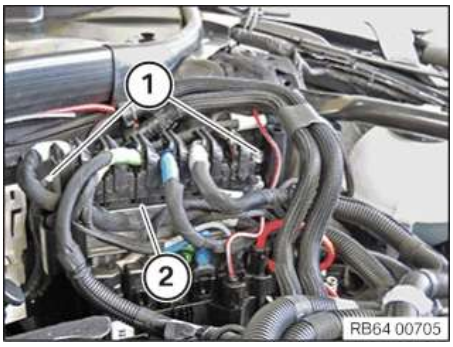
- See additional information.

3 – Detach the control unit holder

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- Pull the cover (1) towards the top and feed out.



- Loosen screws (1).
- Remove control unit holder with the control units (2) and lay to one side.

4 – Disconnect the refrigerant line on the connecting piece

CAUTION

Residual pressure in the air conditioning.

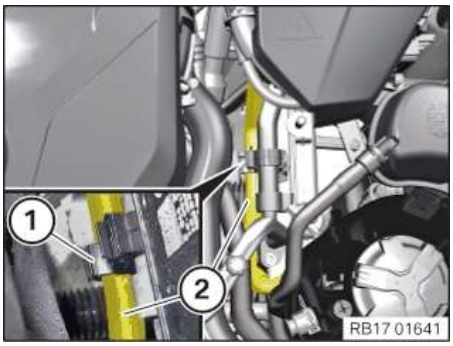
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



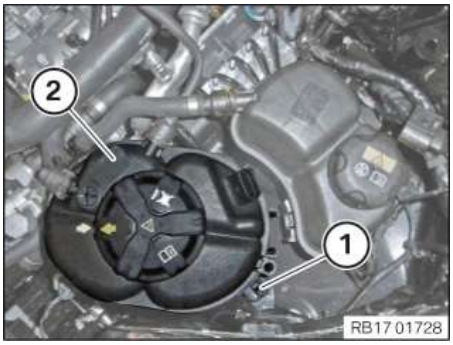
- Release the screw (1).
- Remove the refrigerant line (2).

5 – Removing coolant expansion tank of high-temperature coolant circuit partially

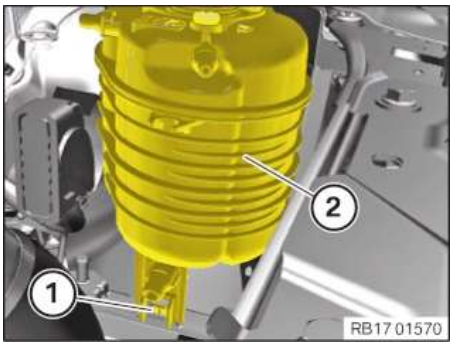


- Unlock the holder (1).
- Feed out coolant line (2) and place to one side.

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- Unlock the lock (1) at the coolant expansion tank (2).



NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Unlock the lock (1) below at the expansion tank (2).
- Set the coolant expansion tank (2) aside.

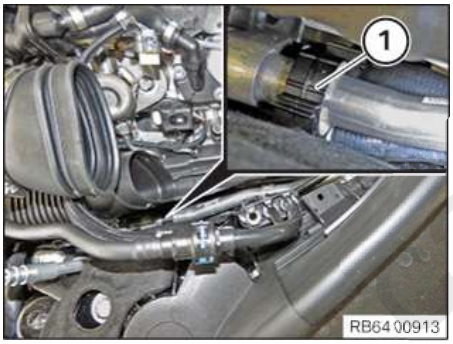
6 – Disconnect the refrigerant line from the expansion valve

CAUTION

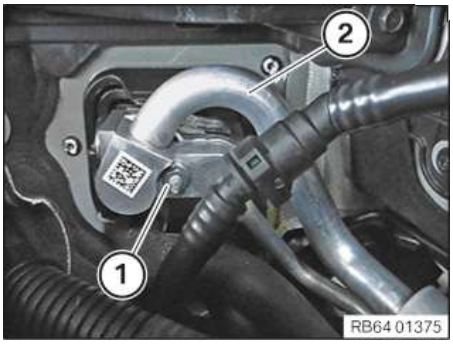
Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



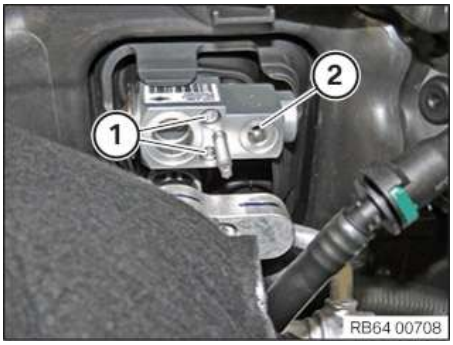
- Open the holder (1).



- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.

7 – Remove expansion valve

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- Loosen screws (1).
- Remove the expansion valve (2).

8 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



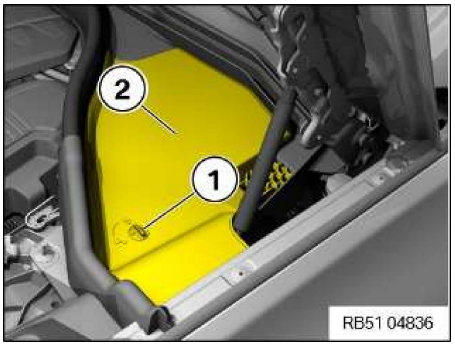
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

9 – Remove the seal for the rear bonnet



- Feed the cable (1) out of the brackets toward the front.
- Remove the rear bonnet seal (2) from the guide toward the inside.

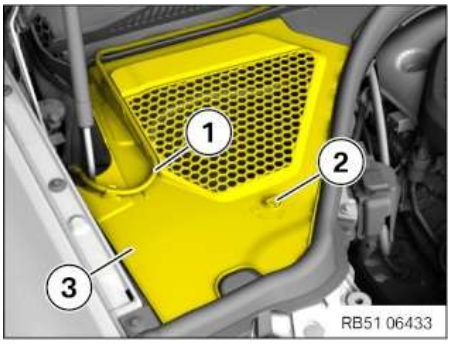
10 – Remove the cover of the engine compartment at the rear left



- Loosen the lock (1).
- Remove the cover (2) of the rear left engine compartment.

11 – Remove the cover of the rear right engine compartment

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- Release washer fluid hose (1) from the guides.
- Loosen the lock (2).
- Remove the cover (3) of the rear right engine compartment.

12 – Removing the wiper arm on the left and right

NOTICE

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

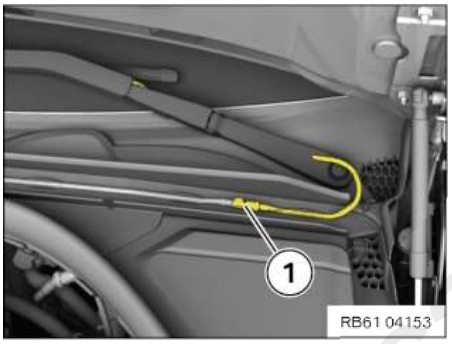
▶ **Remove the wiper arm**

RISK OF DAMAGE

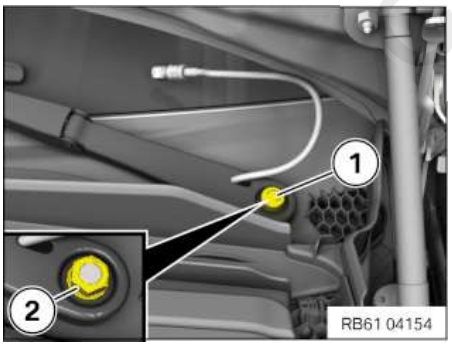
Damage to wiper console.

While removing the wiper arms without using special tool, the wiper console can break.

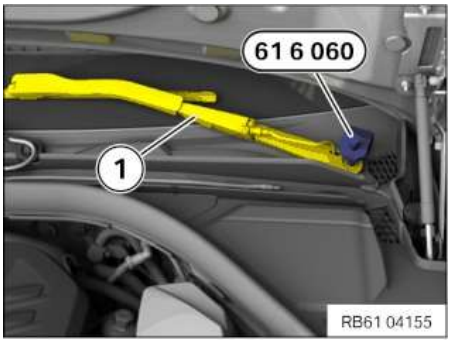
- Removing the wiper arms must be carried out only using the prescribed special tool.
- Do **not** lever off the wiper arm because otherwise the wiper console may break at the predetermined breaking point for active pedestrian protection.



- Disconnect the washer fluid hose (1) at the separation point and feed out from the cowl panel guide.



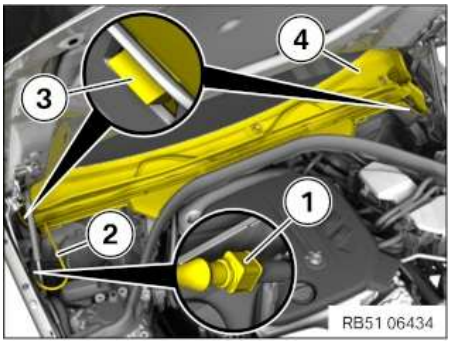
- Remove the protective cap (1).
- Loosen nut (2).



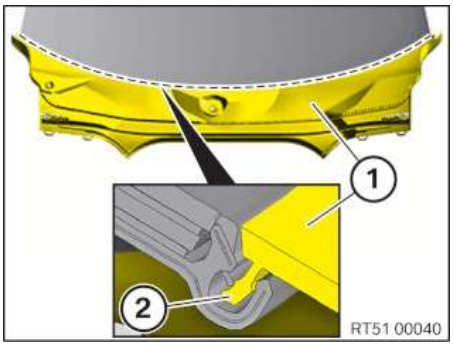
- Pull off the wiper arm (1) using special tool .

13 – Remove cowl panel cover

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- Release snap fastener (1) of the washer fluid hose (2) and put the washer fluid hose (2) to one side.
- Unclip clips (3) on the cowl panel cover (4).

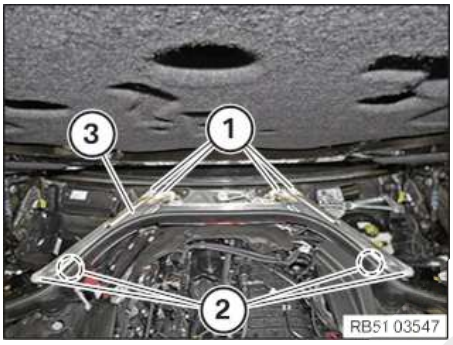


- Pull the cowl panel cover (1) upward out of the latch mechanism (2) beginning on the side.

14 – Removing the centre bulkhead upper part

TECHNICAL INFORMATION

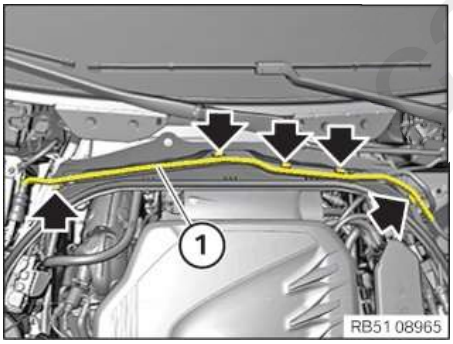
Driving without the strut brace/front-end strut or tension strut is not permitted.



NOTICE

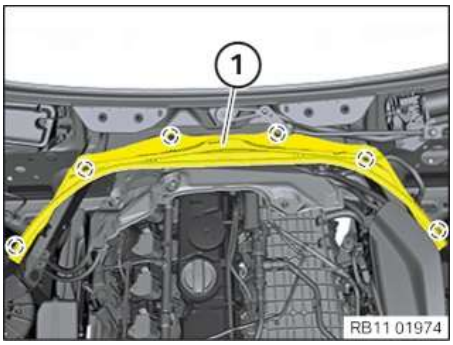
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Loosen screws (1) and (2).
- Remove tension strut (3) in the spring strut dome upwards.



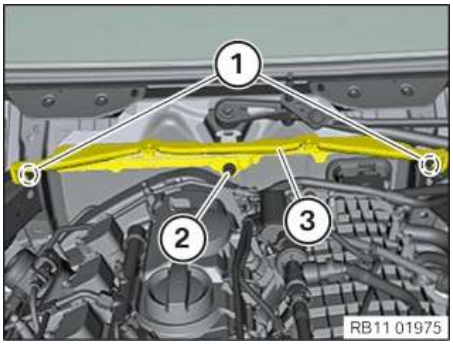
- **Version with mild hybrid technology:**

  Unclip the wire (1) at the holders (arrows).



- Unscrew the bolts in the marked areas.
- Remove the centre bulkhead upper part (1).

15 – Removing the centre bulkhead lower section



- Loosen screws (1).
- Loosen nut (2).
- Remove the centre bulkhead lower part (3).

MAIN WORK

16 – Perform leakage test for evaporator

Prerequisite

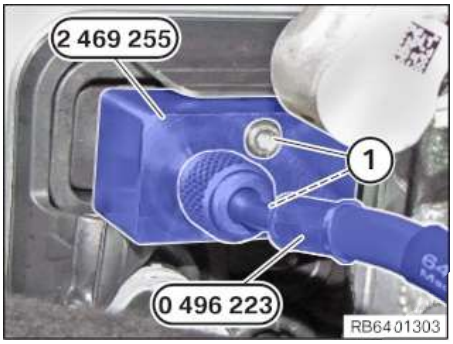
The vehicle must be cooled down. Ambient temperature and temperature of vehicle must not change during the test procedure. The vehicle must not be moved during the test procedure. Testing device must be tight.

WARNING

Pressure vessel with nitrogen.

Danger of injury! Risk of asphyxiation!

- Ensure there us sufficient ventilation in the surrounding area and protect the pressure vessel against overheating.
- Note information in safety data sheet for nitrogen.



- Install the new sealing rings with special tool 0 496 714 (00 9 030) without damaging them.
- Secure special tool with the expansion valve retaining clip with on-board screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

- Connect special tool 0 496 223 (64 5 121) to special tool .
- Connect nitrogen pressure cylinder with pressure reducer to pressure gauge.
- Connect special tool 0 496 223 (64 5 121) to pressure reducer.
- Slowly apply test pressure of **maximum 10 bar**.
- Close nitrogen pressure cylinder.

Check

- Check tightness of the testing device and of the connection to the refrigerant circuit by means of e.g. soapy water.

Result

» Leak was detected.

Measure

- Seal the connections prior to the leakage test of the evaporator.

Check

- Evaporator is tight if the adjusted test pressure of 10 bar **drops by 1.5 bar to 8.5 bar** over a test period of 2 h.

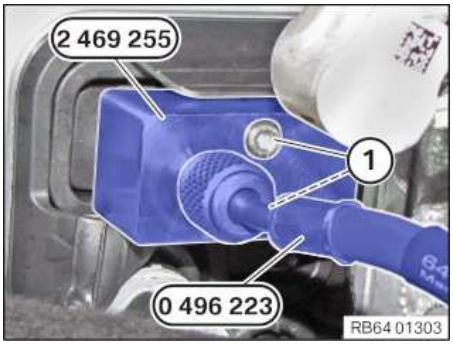
Result

» After a test period of 2 h, the pressure drop is more than 1.5 bar.

Measure

- Renew evaporator.

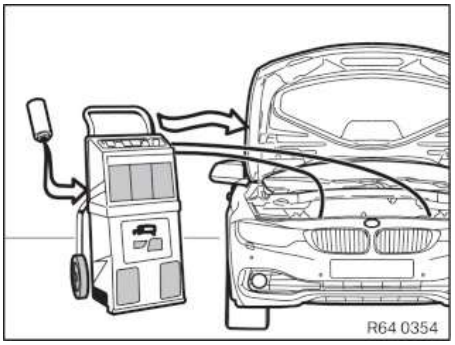
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- Slowly unscrew special tool 0 496 223 (64 5 121) **for the pressure drop** from special tool after the leakage test.
- Loosen screws (1).
- Remove special tool .

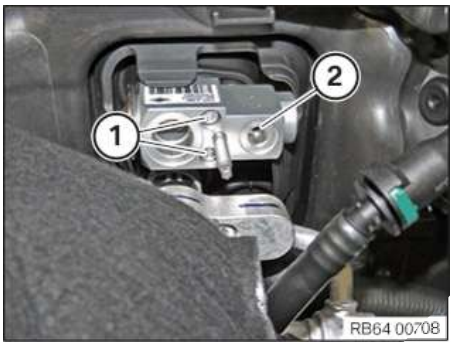
POSTPROCESSES

17 – Evacuate and fill air conditioning



- See additional information.

18 – Install expansion valve



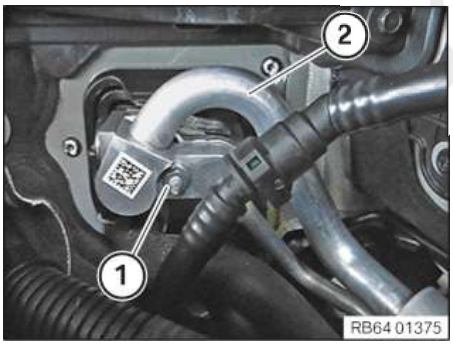
- Renew O-rings.

  Parts: O-rings
- Correctly position the expansion valves (2).
- Tighten the screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

19 – Connect the refrigerant line to the expansion valve

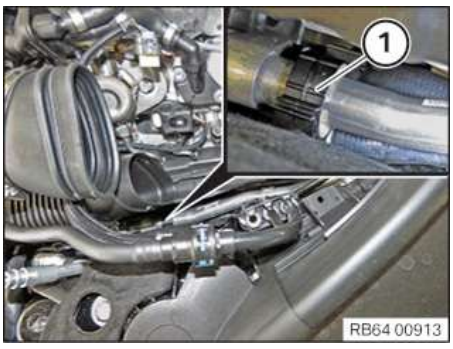


- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

Refrigerant line to expansion valve / connecting piece

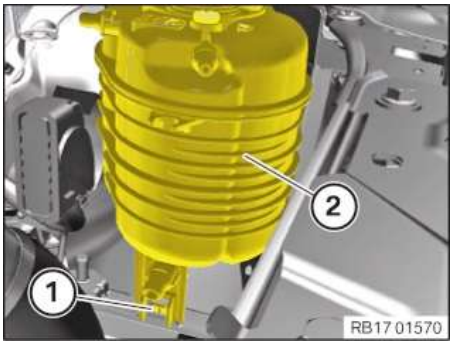
M6		Tightening torque	13 Nm



- Close the holder (1).

20 – Install coolant expansion tank of high-temperature coolant circuit, partially

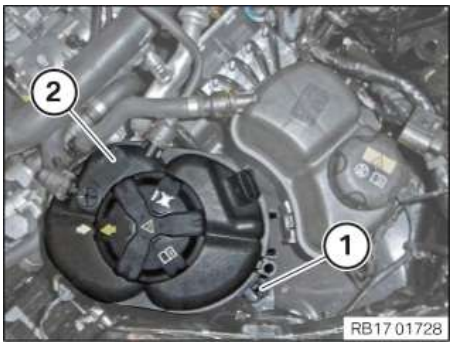
cardiagn.com



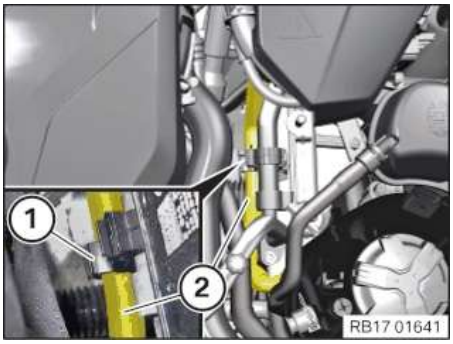
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Correctly feed coolant expansion tank (2) in.
- Lock the lock (1).

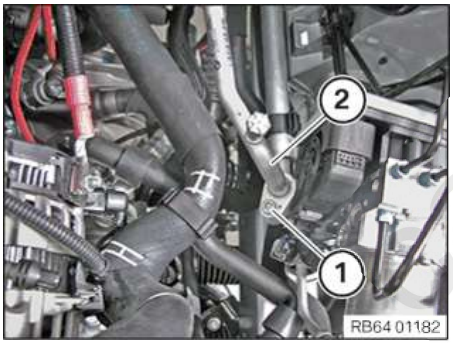


- Correctly position coolant expansion tank (2).
- Lock the lock (1).



- Feed in coolant line (2) and position.
- Lock holder (1).

21 – Fasten the refrigerant line on the connecting piece

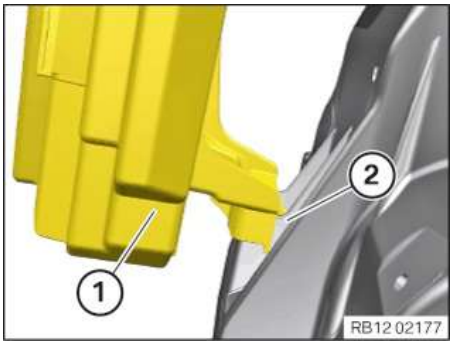


- Renew the sealing ring.
  Parts: Sealing ring
- Correctly position the refrigerant line (2).
- Tighten down screw (1).

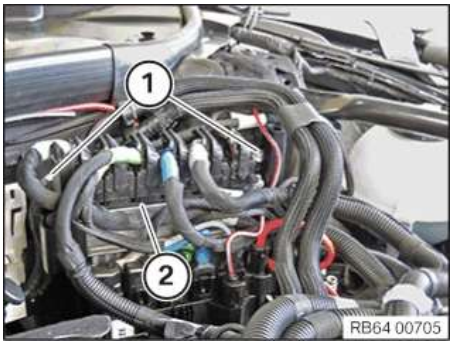
Refrigerant line to connecting piece

M8		Tightening torque	19 Nm

22 – Fastening control unit holder



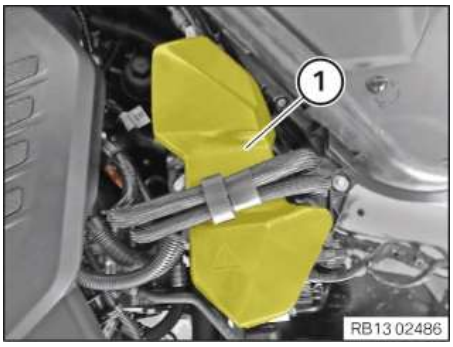
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Position the control unit holder together with the control units (2) and position correctly.
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



- Insert and install cover (1) into guides.

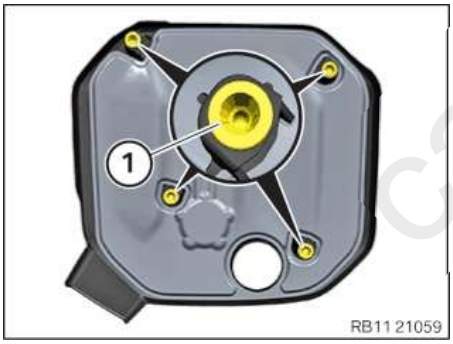
23 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



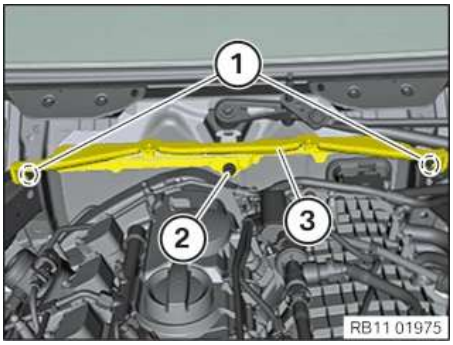
- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

24 – Installing centre bulkhead lower section

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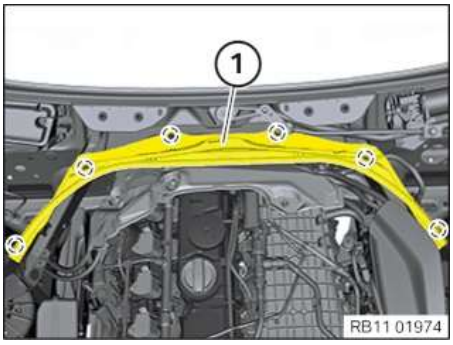


- Position the centre bulkhead lower part (3).
- Tighten nut (2) and screws (1).

Bulkhead lower part to body

Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

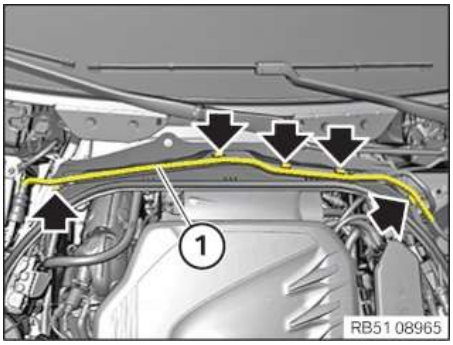
25 – Installing the centre bulkhead upper part



- Position the centre bulkhead upper part (1).
- Tighten the bolts in the marked areas.

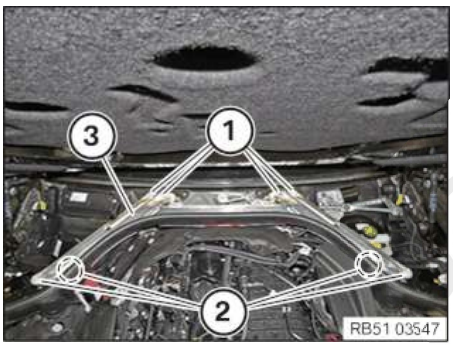
Bulkhead upper part to bottom bulkhead

		Tightening torque	3 Nm



- **Version with mild hybrid technology:**

  Clip in the wire (1) into the holders (arrows).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Install the tension strut (3) on the spring strut dome.
- Tighten the screws (1).

Tension strut on bulkhead

M10x25 screw		Tightening torque	56 Nm

- Renew screws (2).

  Parts: Screws
- Tighten the screws (2).

Tension strut to spring strut dome

Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

26 – Installing cowl panel cover

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RISK OF DAMAGE

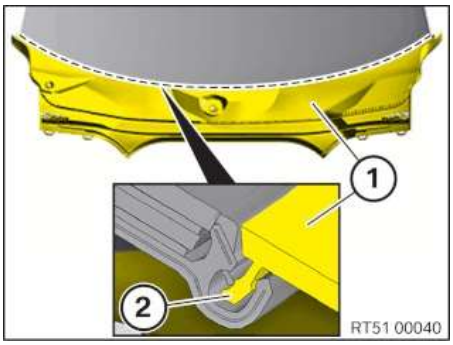
Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

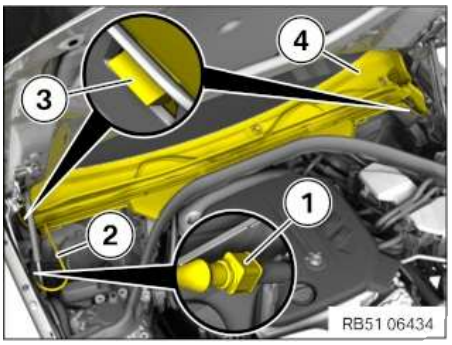
- Ensure correct installation of the components.
- Only use undamaged components.

TECHNICAL INFORMATION

Before installing the cowl panel cover it is **mandatory** to check that the 48 V line is routed correctly and fitted tightly.
An incorrectly laid or attached 48 V line can be damaged by the wiper kinematics.



- Push the cowl panel cover (1) into the latch mechanism (2) beginning on the side.



- Clip cowl panel cover (4)in by means of the latch mechanisms (3).
- Position windscreen wash hose (2) and connect windscreen wash hose (1)quick lock.

27 – Install left and right wiper arm

NOTICE

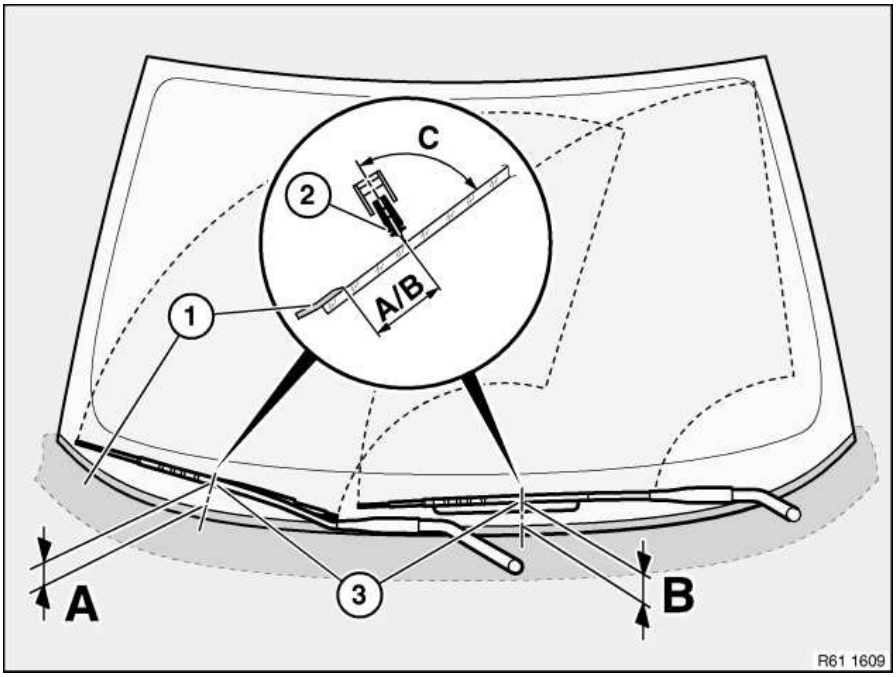
Description is for left component only. Procedure on the right side is identical.

▸ **Installing left and right wiper arm**

TECHNICAL INFORMATION

The wiper system must be in zero position.
After installing the cowl panel cover and before fitting the wiper arm:
Activate the wiper system once to ensure that it has the correct installation position.

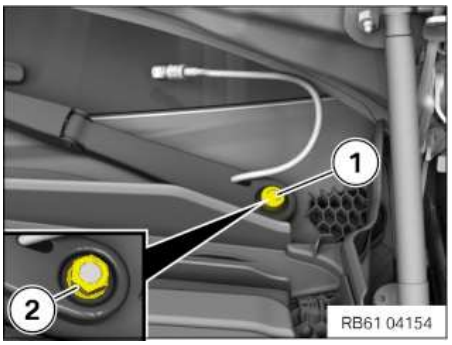
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- Connect the wiper arm (3).
- Correctly position the wiper arm (2) in relation to the window edge (1).

Distance from window pane edge to wiper blade

Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

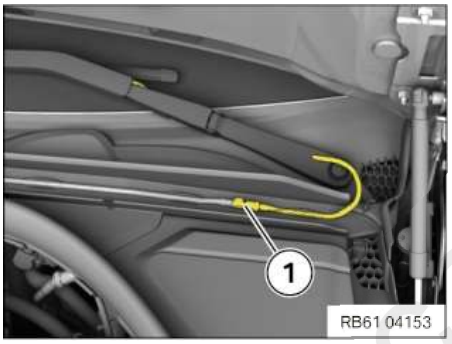


- Tighten nut (2).

Windscreen wiper arm

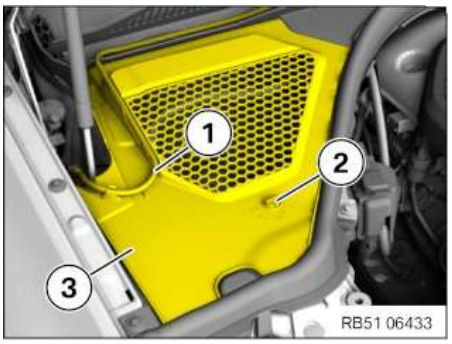
Combination hexagon nut		Tightening torque	35 Nm

- Connect the protective cap (1).



- Feed washer fluid hose (1) into the cowl panel guide and connect at the separation point.

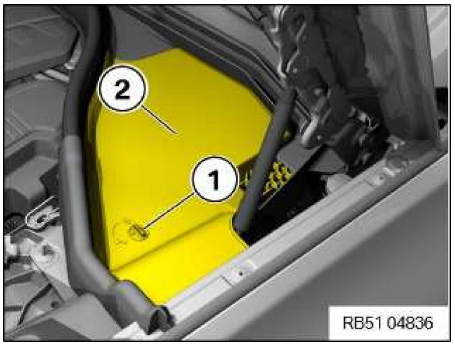
28 – Install the rear right engine compartment cover



- Position the cover of the engine compartment on the rear right (3).
- Close lock (2).
- Insert washer fluid hose (1) into the guides.

29 – Install the cover of the engine compartment on the rear left

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- Position the engine compartment cover at the rear left (2) .
- Close lock (1).

30 – Install the seal for the bonnet



- Press the rear bonnet seal (2) into the guide.
- Feed in cable (1) into the brackets.
- Check that the rear bonnet seal (2) and the cable (1) are seated correctly.

31 – Connecting all battery earth leads



- See additional information.

Additional Information

Overview of Tightening Torques

Expansion valve to heater - A/C			Used in step 1618
M5		Tightening torque	5.5 Nm

Refrigerant line to expansion valve / connecting piece			Used in step 19
M6		Tightening torque	13 Nm

Refrigerant line to connecting piece			Used in step 21
M8		Tightening torque	19 Nm

Control unit holder			Used in step 22
M6		Tightening torque	8 Nm

Bulkhead lower part to body			Used in step 24
Screw		Tightening torque	2,6 Nm
Plastic nut		Tightening torque	2,6 Nm

Bulkhead upper part to bottom bulkhead			Used in step 25
		Tightening torque	3 Nm

Tension strut on bulkhead			Used in step 25
M10x25 screw		Tightening torque	56 Nm

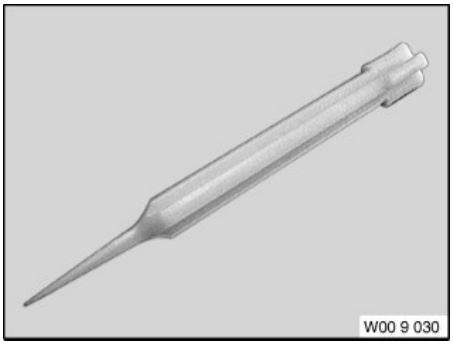
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Tension strut to spring strut dome			Used in step 25
Screw	Renew screws.	Jointing torque	56 Nm
		Angle of rotation	90 °

Windscreen wiper arm			Used in step 27
Combination hexagon nut		Tightening torque	35 Nm

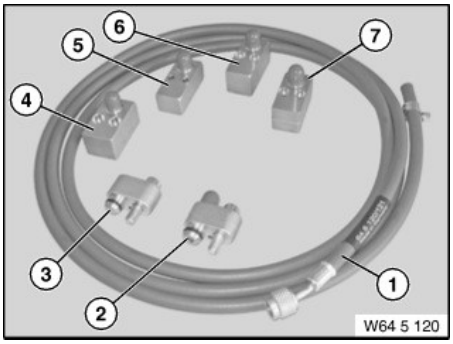
Overview of Special Tools

0 496 714 (00 9 030) Wedge



Common	Used in step 16
Usage	For dismantling O-rings, gaskets and trim panels. This special tool replaces special tool 00 9 316.
Included in the tool or work	
Storage location	A50
Replaced by	
In connection with	
SI-Number	01 20 09 (581)

0 496 223 (64 5 121) Hose



Common	Used in step 16
Usage	(Connection hose with clamp)
Included in the tool or work	0 496 222
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 04 08 (435)

Overview Technical Data

Distance from window pane edge to wiper blade	Used in step 27
Wiper arm right (A)	57,5 ± 5 mm
Wiper arm left (B)	63,3 ± 4 mm

Links

Repair instructions (PRE)	Used in step
Draw off the contaminated R1234yf refrigerant and dispose of it	

General repair instructions	Used in step
61 00 ... Safety information on handling hybrid cars	
61 25 ... Notes on repair of high-voltage battery unit	
64 52 ... Instructions for opening and part exchange in refrigerant circuit	117
12 00 ... Instructions for removal and replacement of control units	
64 52 ... Instructions for opening and part exchange in refrigerant circuit	

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	117
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	117
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	117
64 50 ... Notes on repairs to air conditioning	117
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	117

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64 50 ... Safety information for handling refrigerant R1234yf	117
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	117
64 50 ... Safety informations for handling refrigerant oil	117
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	231
61 20 900 Disconnecting and connecting battery earth lead	231
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231
61 20 900 Disconnecting and connecting battery earth lead	231

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64 50 ... Safety information for handling tetrafluorethane refrigerant R134a

64 50 ... Notes regarding refrigerant (R134a, R1234yf) and refrigerant oil (Sanden SP-A2)

61 35 ... Notes on ESD protection (Electro Static Discharge)

61 35 ... Notes on ESD protection (Electro Static Discharge)

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

64 50 ... Filling refrigerant oil by means of injection

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64 51 525 Removing and installing or replacing expansion valve

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

CAUTION

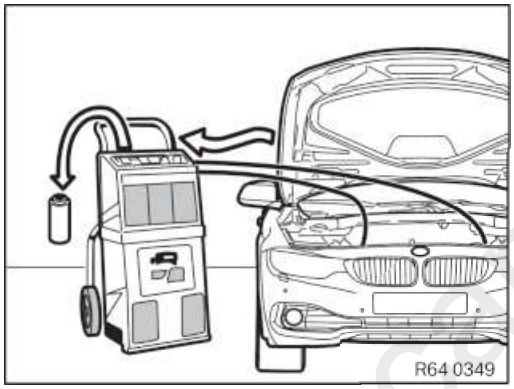
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

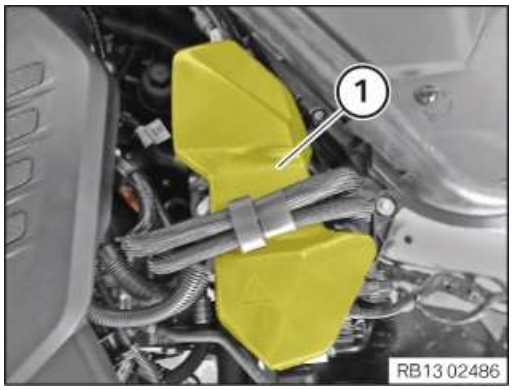
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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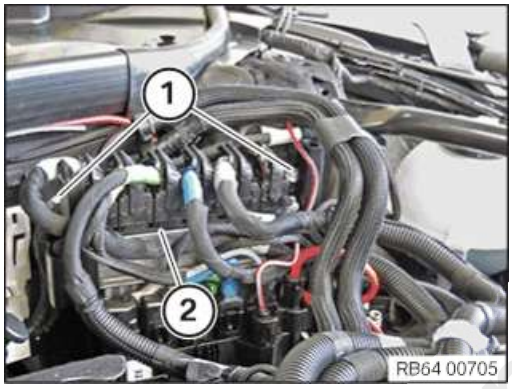


- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

3 – Detach the control unit holder



- Pull the cover (1) towards the top and feed out.



- Loosen screws (1).
- Remove control unit holder with the control units (2) and lay to one side.

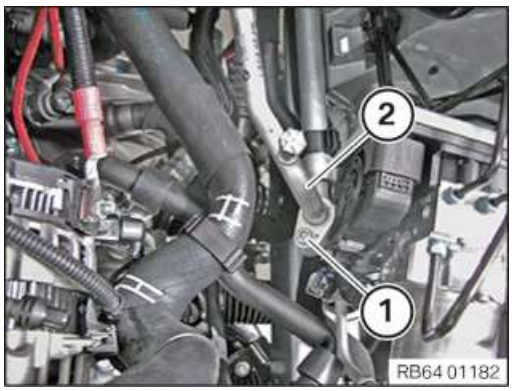
4 – Disconnect the refrigerant line on the connecting piece

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

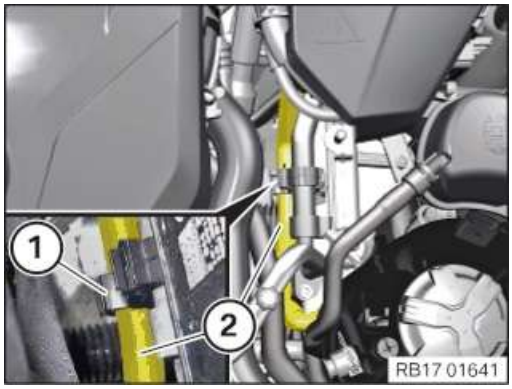
- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



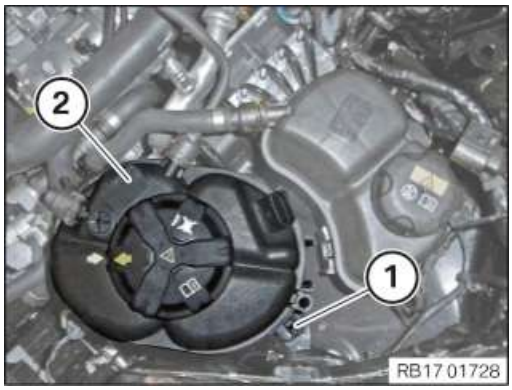
- Release the screw (1).
- Remove the refrigerant line (2).

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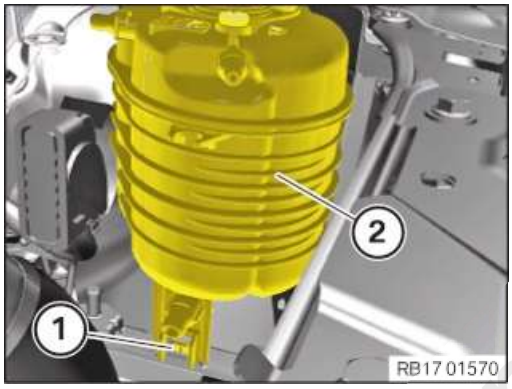
5 – Removing coolant expansion tank of high-temperature coolant circuit partially



- Unlock the holder (1).
- Feed out coolant line (2) and place to one side.



- Unlock the lock (1) at the coolant expansion tank (2).



NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Unlock the lock (1) below at the expansion tank (2).
- Set the coolant expansion tank (2) aside.

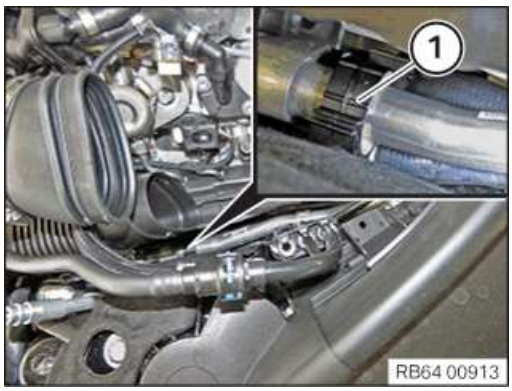
6 – Disconnect the refrigerant line from the expansion valve

CAUTION

Residual pressure in the air conditioning.

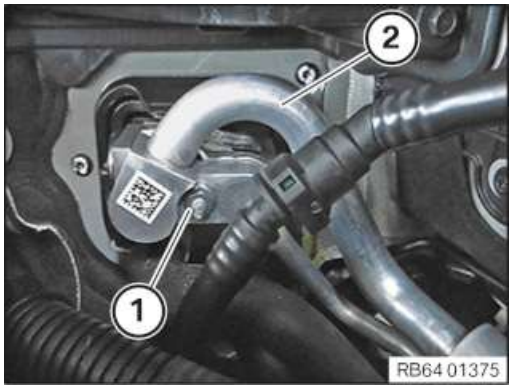
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Open the holder (1).

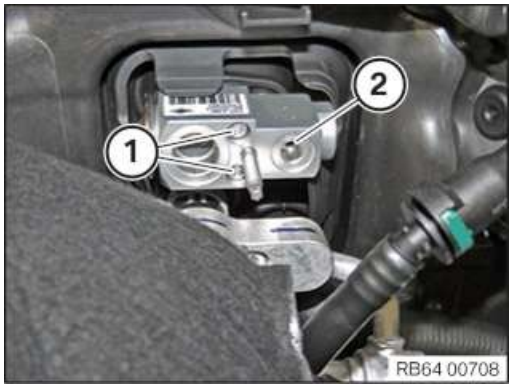
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- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.

MAIN WORK

7 – Remove expansion valve



- Loosen screws (1).
- Remove the expansion valve (2).

8 – Install expansion valve



- Renew O-rings.

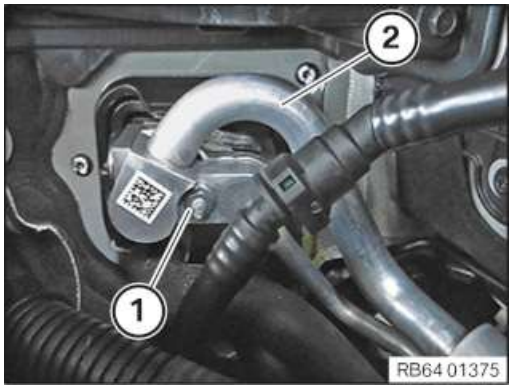
  Parts: O-rings
- Correctly position the expansion valves (2).
- Tighten the screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

POSTPROCESSES

9 – Connect the refrigerant line to the expansion valve



- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

Refrigerant line to expansion valve / connecting piece

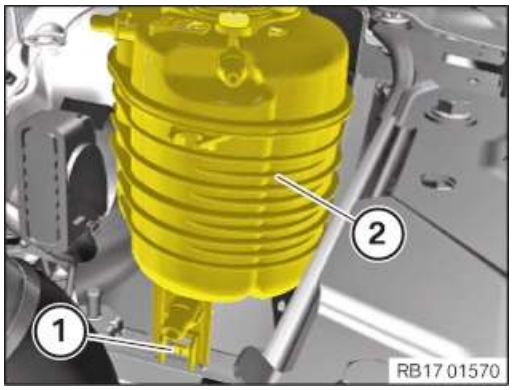
M6		Tightening torque	13 Nm

.com



- Close the holder (1).

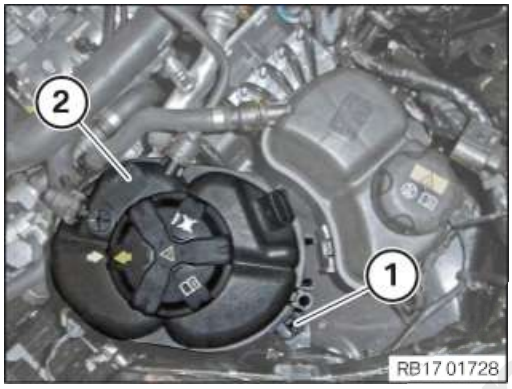
10 – Install coolant expansion tank of high-temperature coolant circuit, partially



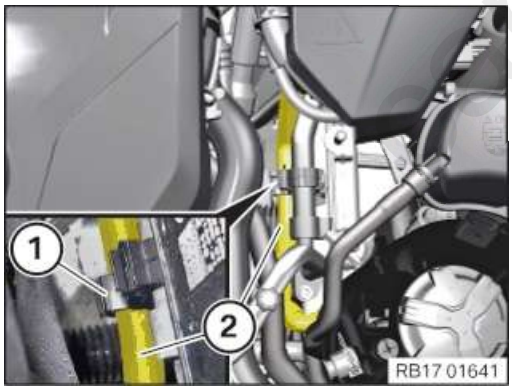
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Correctly feed coolant expansion tank (2) in.
- Lock the lock (1).

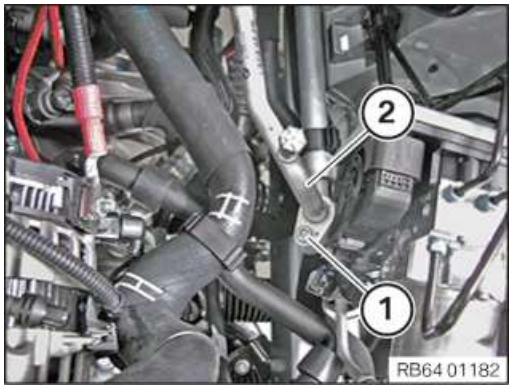


- Correctly position coolant expansion tank (2).
- Lock the lock (1).



- Feed in coolant line (2) and position.
- Lock holder (1).

11 – Fasten the refrigerant line on the connecting piece



- Renew the sealing ring.

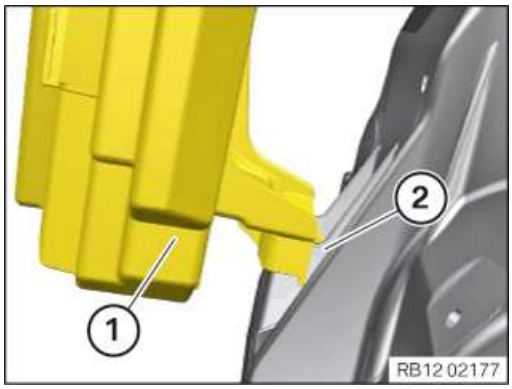
  Parts: Sealing ring
- Correctly position the refrigerant line (2).
- Tighten down screw (1).

Refrigerant line to connecting piece

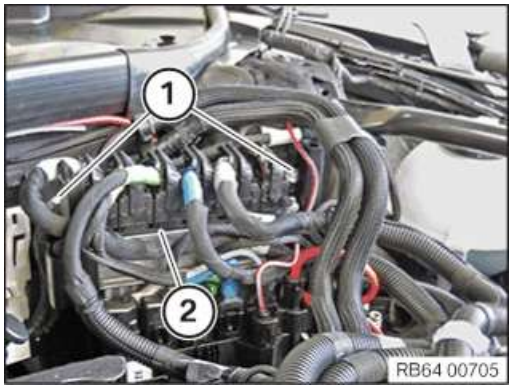
M8		Tightening torque	19 Nm

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12 – Fastening control unit holder



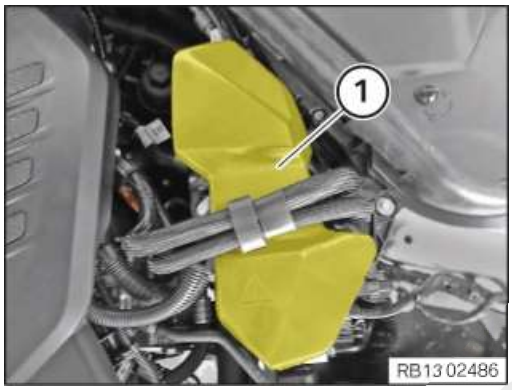
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Position the control unit holder together with the control units (2) and position correctly.
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



- Insert and install cover (1) into guides.

13 – Install acoustic cover

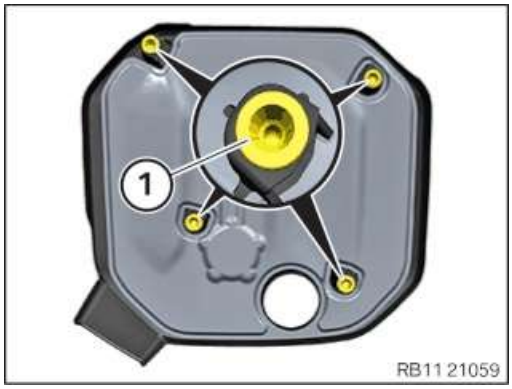
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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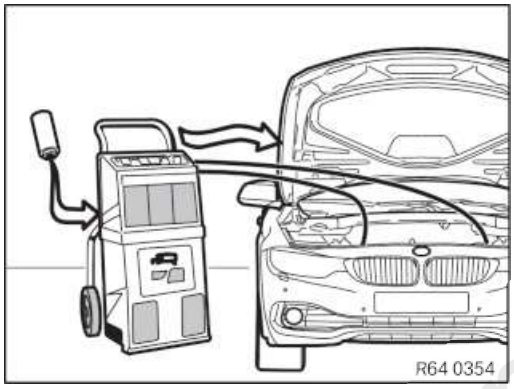


- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

14 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Expansion valve to heater - A/C			Used in step 8
M5		Tightening torque	5.5 Nm

Refrigerant line to expansion valve / connecting piece			Used in step 9
M6		Tightening torque	13 Nm

Refrigerant line to connecting piece			Used in step 11
M8		Tightening torque	19 Nm

Control unit holder			Used in step 12
M6		Tightening torque	8 Nm

Links

General repair instructions	**Used in step**

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64 52 ... Instructions for opening and part exchange in refrigerant circuit	114

Repair instructions	**Used in step**
64 50 010 Extract, evacuate and fill air conditioning system	114
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	114
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	114
64 50 ... Notes on repairs to air conditioning	114
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	114
64 50 ... Safety information for handling refrigerant R1234yf	114
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	114
64 50 ... Safety informations for handling refrigerant oil	114

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64 51 591 Removing and installing/renewing evaporator

CAUTION

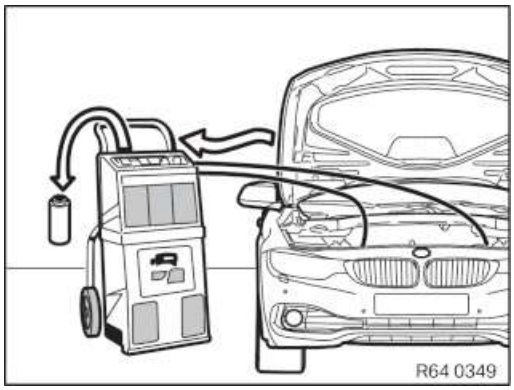
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

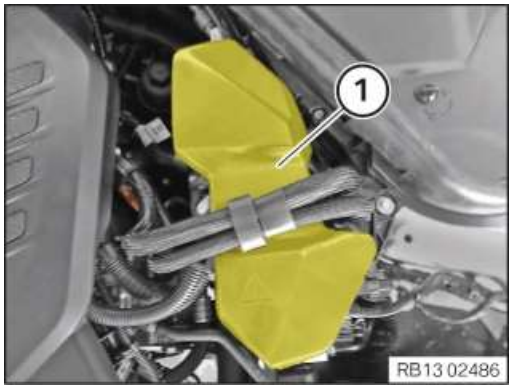
- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



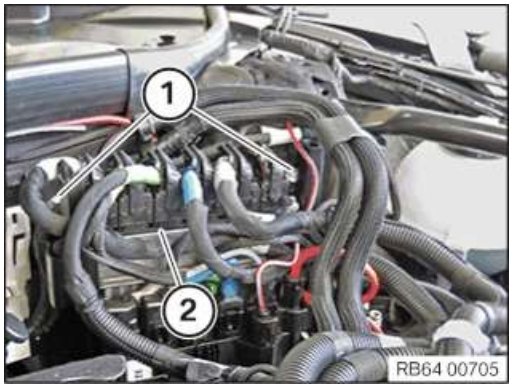
- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

3 – Detach the control unit holder

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- Pull the cover (1) towards the top and feed out.



- Loosen screws (1).
- Remove control unit holder with the control units (2) and lay to one side.

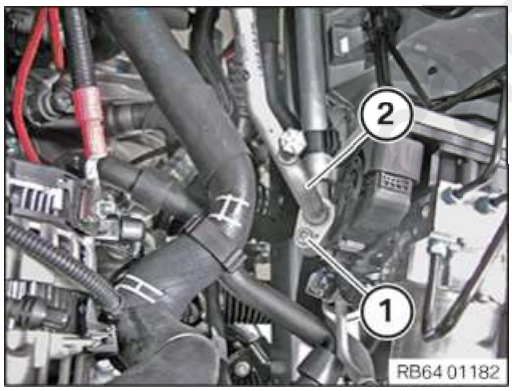
4 – Disconnect the refrigerant line on the connecting piece

CAUTION

Residual pressure in the air conditioning.

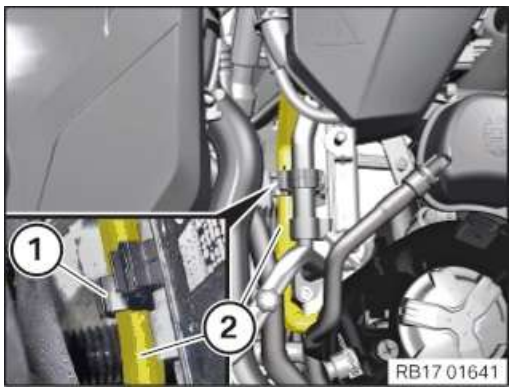
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

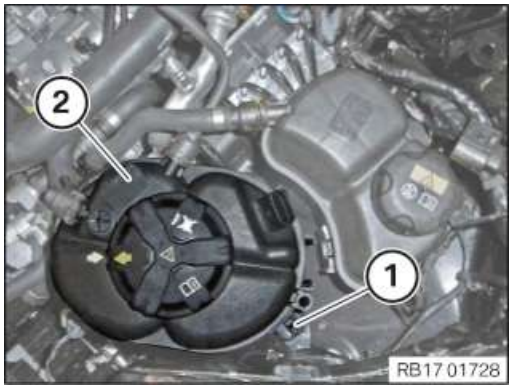


- Release the screw (1).
- Remove the refrigerant line (2).

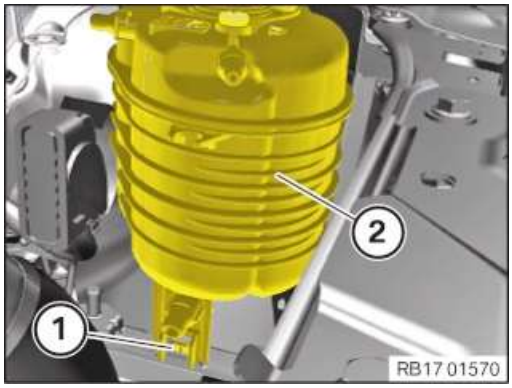
5 – Removing coolant expansion tank of high-temperature coolant circuit partially



- Unlock the holder (1).
- Feed out coolant line (2) and place to one side.



- Unlock the lock (1) at the coolant expansion tank (2).



NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Unlock the lock (1) below at the expansion tank (2).
- Set the coolant expansion tank (2) aside.

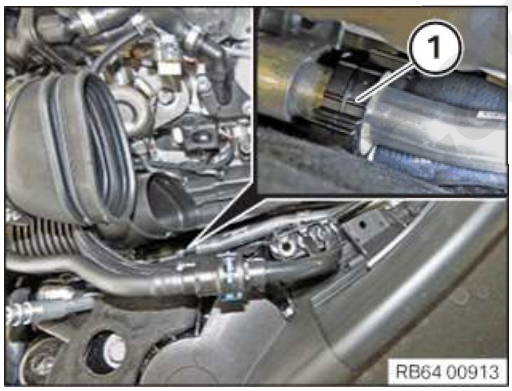
6 – Disconnect the refrigerant line from the expansion valve

CAUTION

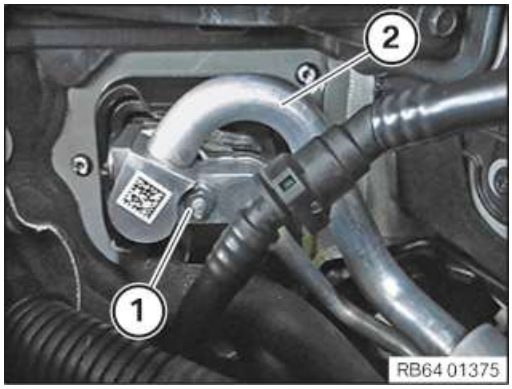
Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



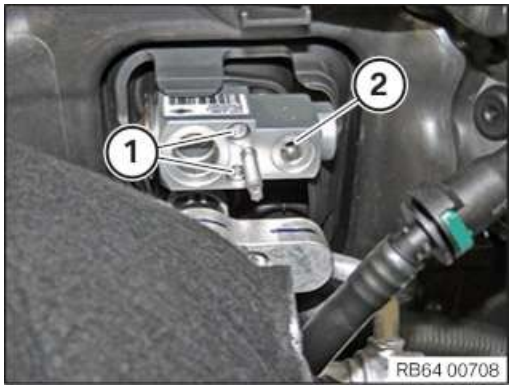
- Open the holder (1).



- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.

7 – Remove expansion valve

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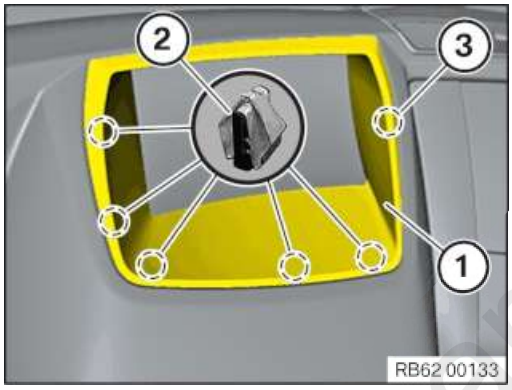
- Loosen screws (1).
- Remove the expansion valve (2).

8 – Adjust the steering column position



- Adjust the length of the steering column to the maximum length in the direction of arrow (1).
- Move the steering column to the lowest steering column position in the direction of arrow (2).

9 – Removing trim for the Head-Up Display



- Unclip trim (1) for the Head-Up Display upwards from clamps (2) and latch mechanism (3).

10 – Remove cupholder



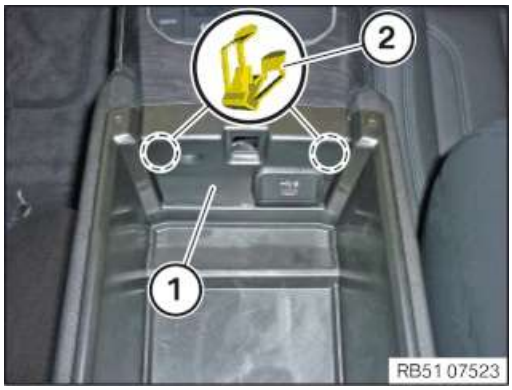
- Remove the insert (1).

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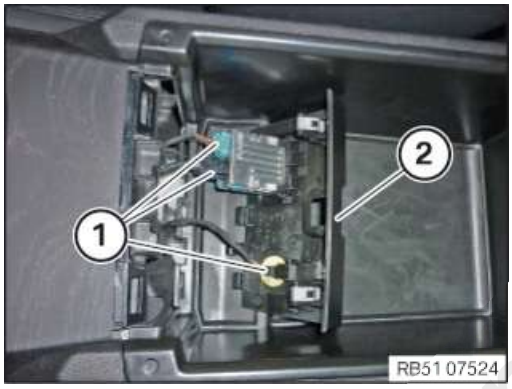


- Loosen screws (1).
- Feed the cup holder (2) out to the top.
- Unlock associated plug connections and disconnect.

11 – Removing the trim in the storage compartment on the centre armrest



- Lever out the trim (1) with the special tool (2) toward the rear from the clamps 2 298 505.



- Unlock and disconnect the plug connections (1) and remove the trim (2) .

12 – Remove the centre console trim

RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release and remove the centre console trim upwards (1) as shown using the special tool 2 298 505 from the latch mechanisms.

13 – Removing the decorative trim on the centre console on the left and right

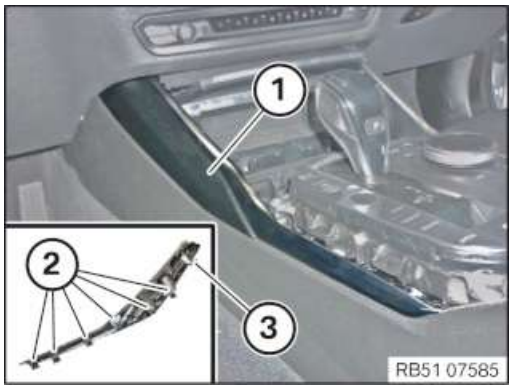
cardiagn.com

13 – Removing the decorative trim on the centre console on the left and right

▸ **Remove the decorative trim from the centre console**

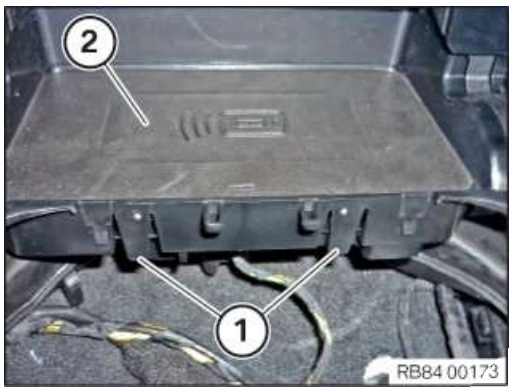
NOTICE

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

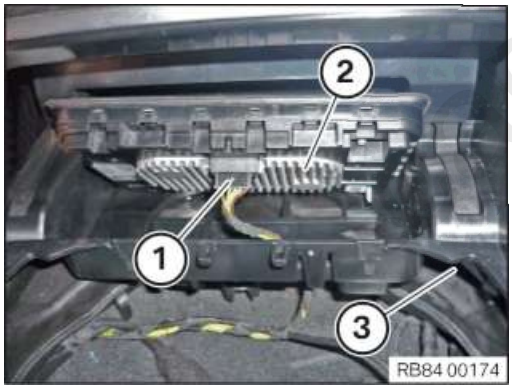


- Lever out the rear decorative trim (1) from the latch mechanisms (2) starting from the top.
- Feed out the decorative trim (1) backwards out of the guide (3) and remove.

14 – Removing the wireless charging station



- Loosen the latch mechanisms (1) and push out the wireless charging station (2) upwards.



- Unlock and disconnect the plug connection (1) and remove the wireless charging tray (2) from the centre console (3).

15 – Remove the operating facility in the centre console

▸ **Deactivating the 48 V electrical system**

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

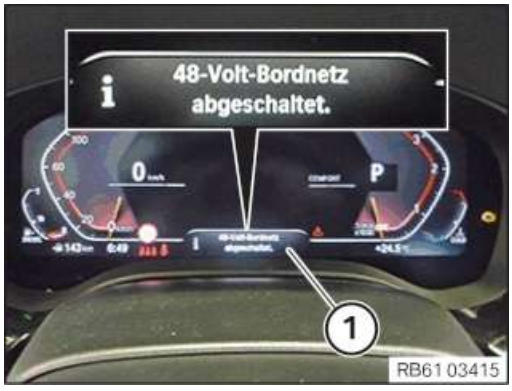
Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

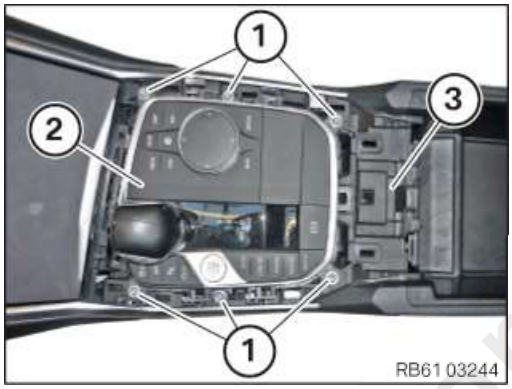
- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

▶ **Disconnecting all battery earth leads**

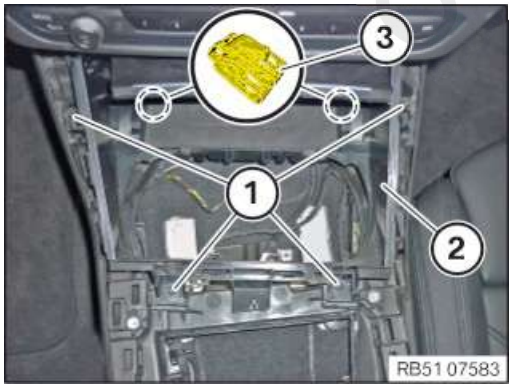


- See additional information.



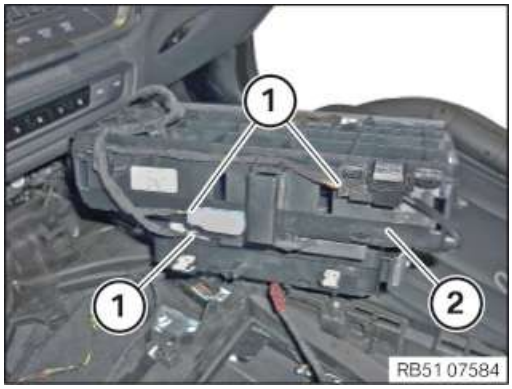
- Loosen screws (1).
- Remove the operating facility in the centre console (2) from the centre console (3).

16 – Removing the storage compartment in the front centre console



- Loosen screws (1).
- Pull the storage compartment in front centre console (2) backwards from the clamps (3).

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- Unlock and disconnect the plug connections (1) and remove the storage compartment in centre console (2).

17 – Removing the rear centre console trim

RISK OF DAMAGE

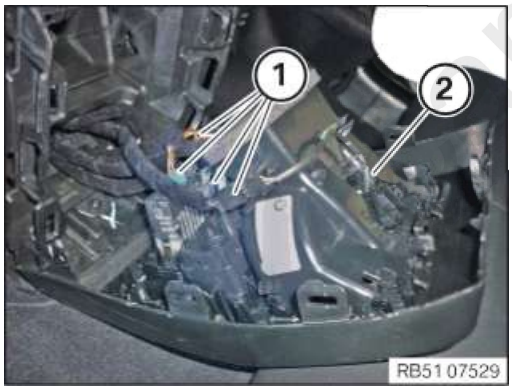
Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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



- Release centre console trim (1) backwards from the latch mechanisms at the side and remove it slightly at the back.

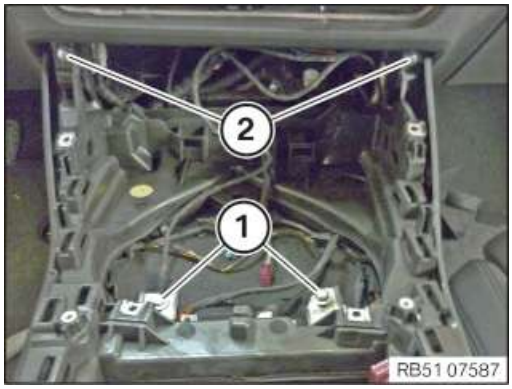


- Unlock and disconnect plug connections (1).
- Remove the centre console trim (2).

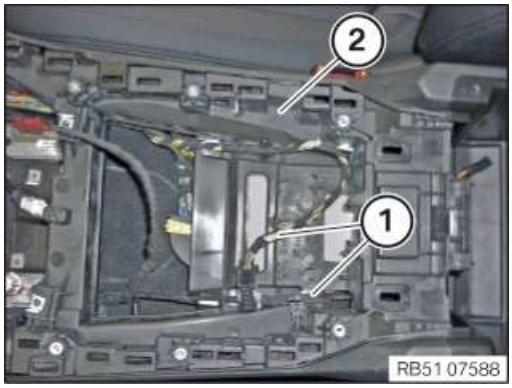
18 – Removing the centre console



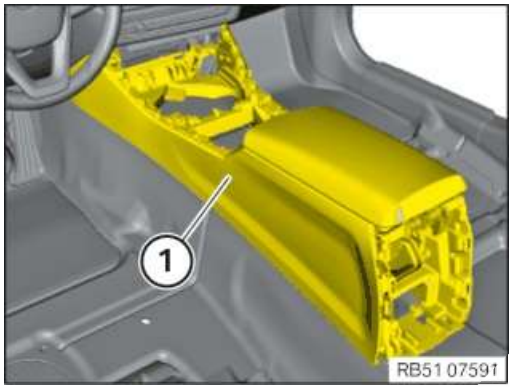
- Loosen screws (1).



- Loosen screws (1) and (2).



- Release the wiring harness (1) from the centre console (2).

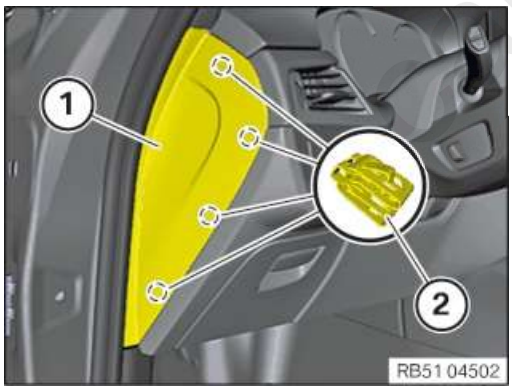


NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

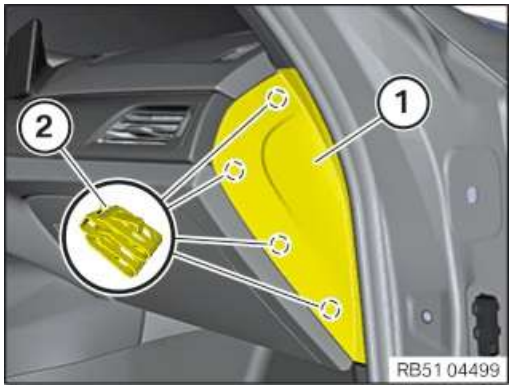
- Carefully raise rear centre console (1).
- Feed out wiring harness from the centre console (1) and unlock and disconnect existing plug connections, if required.
- Feed out and remove the centre console (1) on the instrument panel .

19 – Remove the side panel on the left instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).

20 – Remove the side panel on the right instrument panel



- Unclip and remove the side panel (1) towards the outside from the clamps (2).
- If necessary, unlock associated plug connection and disconnect.

21 – Remove left and right A-pillar trim panel

NOTICE

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

▸ **Remove the A-pillar trim panel**

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

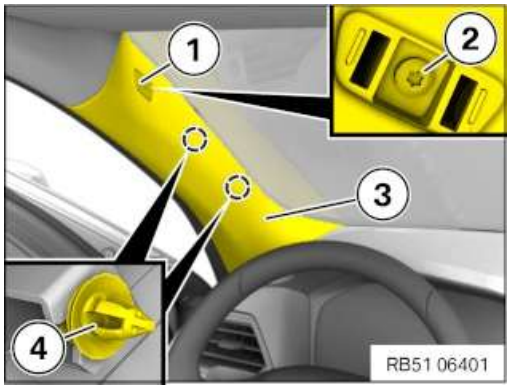
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

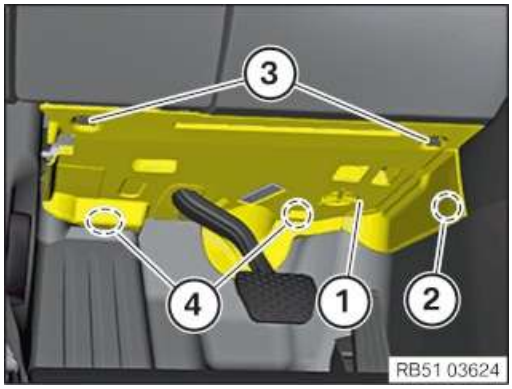
- Do not use sharp-edged tools when removing the trim panel.



- Unclip cover (1) with a suitable special tool from the special tool kit 0 493 752 (00 9 329).
- Loosen screw (2).
- Unclip A-pillar trim panel (3) with clips (4) and feed it out to the top.

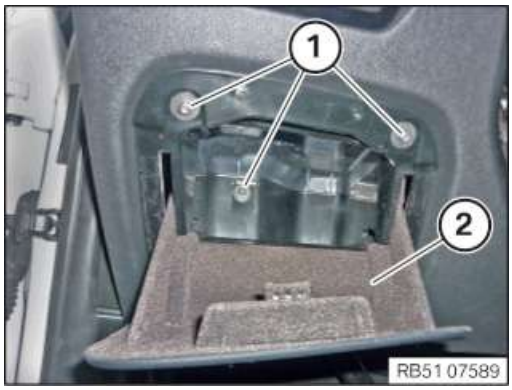
22 – Removing the trim panel for pedal mechanism

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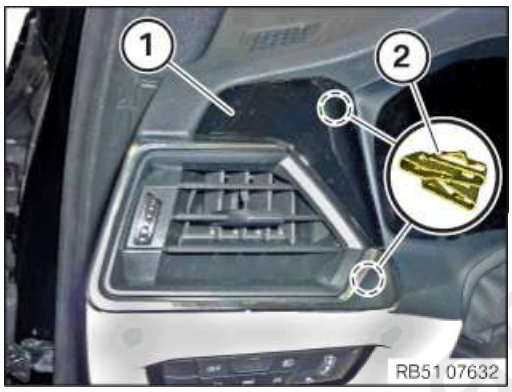
- Unclip the trim panel for the pedal mechanism (1) towards the inside in this area (2).
- Turn the locks (3) by 90°.
- Detach the trim panel for the pedal mechanism (1) inwards out of the guides (4).
- Unlock associated plug connection and disconnect.

23 – Removing the left fold-down compartment



- Loosen screws (1).
- Remove the fold-down compartment (2) toward the bottom.

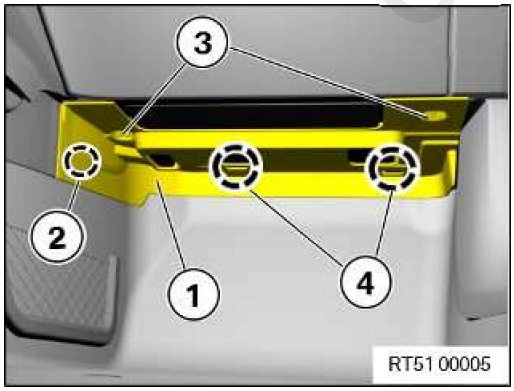
24 – Remove the finisher on the instrument panel on the left



- Unclip decorative strip (1) to the rear out of the clamps (2).
- Unlock associated plug connection and disconnect.

  Remove the decorative strip (1).

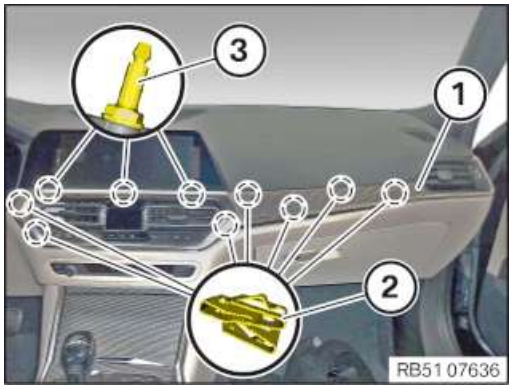
25 – Remove the right footwell trim



- Turn the locks (3) by 90°.
- Feed the footwell trim (1) out of the guide (2).
- Detach the footwell trim (1) inward out of the guides (4).
- Unlock associated plug connection and disconnect.

26 – Remove the finisher on the right instrument panel

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- Unclip the decorative strip (1) towards rear at the clamps (2) and the pins (3).
- Unlock associated plug connection and disconnect.
- Remove the decorative strip (1).

27 – Remove Central Information Display (CID)

RISK OF DAMAGE

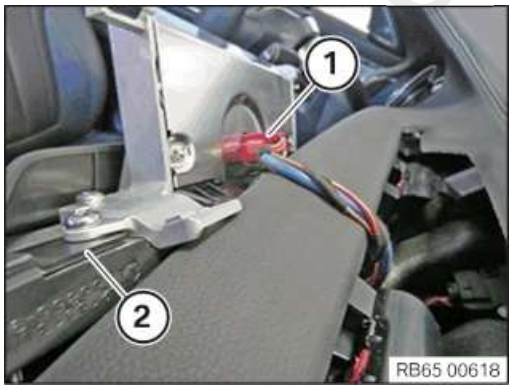
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Loosen screws (1).
- Pull out central information display (CID) (2) slightly off the instrument panel.



- Unlock plug connection (1) and disconnect.
- Remove the central information display (CID) (2).

28 – Removing the airbag unit

WARNING

Airbag unit.

Danger! Life-threatening injuries!

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

RISK OF DAMAGE

Damage to the steering wheel.

Incorrect handling of the tool may damage the steering wheel.

- Ensure the tool is positioned correctly (angle and inclination).
- When unlocking, do not use "levering" action. Instead, press in the Torx screwdriver toward the centre of steering wheel only.

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Removing the airbag unit for sports steering wheel**



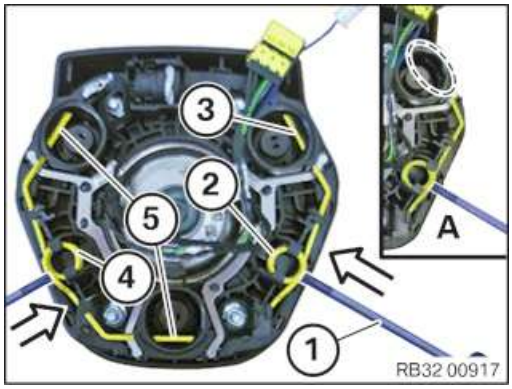
- Insert Torx screwdriver T25 (1) diagonally upwards in the hidden opening (2) on the rear side of the steering wheel until a spring resistance is felt.



NOTICE

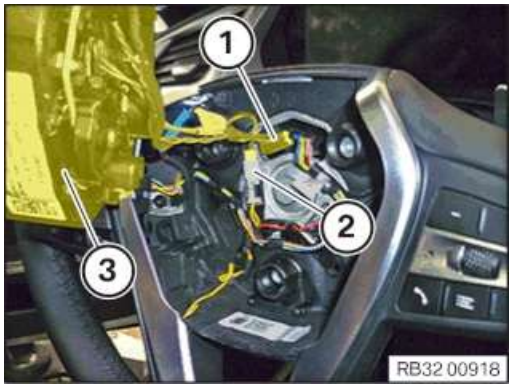
To provide a better overview: Diagram with airbag unit removed.

- To unlock the airbag unit, press Torx screwdriver T25 (1) diagonally upwards in the direction of the arrow to the centre of the steering wheel.



- Press the airbag unit over a large area of the steering wheel.
- Use Torx screwdriver T25 (1) to press wire spring clip (2) in the direction of the arrow towards the centre of the steering wheel and release lock (3).

  (A): Wire spring clip (2) is unlocked.
- Press wire spring clip (4) with Torx screwdriver T25 (1) in the direction of the arrow towards the centre of the steering wheel and release locks (5).
- Carefully raise the airbag unit.



- Unlock and disconnect the plug connections (1) and (2).
- Remove airbag unit (3).

▸ Removing the airbag unit for M Sport steering wheel



NOTICE

Perform the operations on the left and right side.

- Locate the mark (1) for unlocking the airbag unit on the steering wheel by touching it.



NOTICE

Perform the operations on the left and right side.

- Cut the mark (1) carefully with a knife (2) to an approx. length of 4 mm .

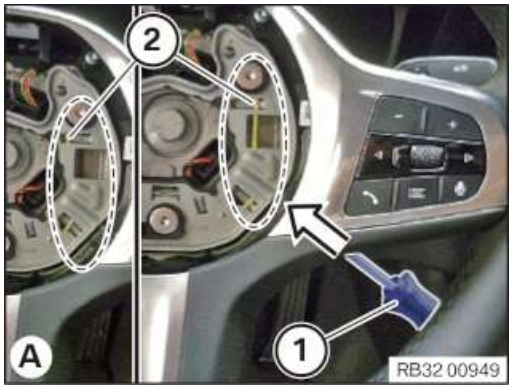


TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

- In case of vehicles with shift paddles (2) made of carbon-fibre-reinforced plastic, use a Torx socket T15 (1) for unlocking the airbag unit.

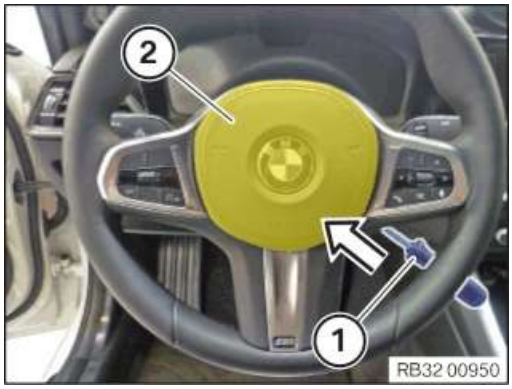
.com



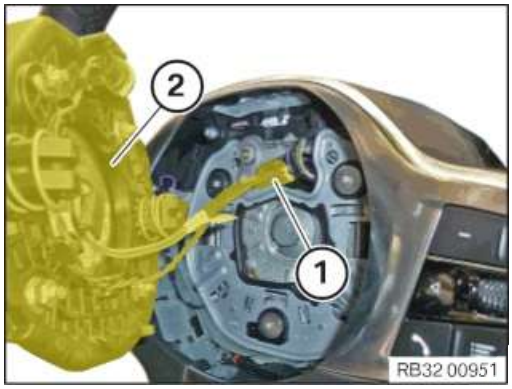
NOTICE

To provide a better overview: Diagram with airbag unit removed.

- Insert the Torx socket T15 (1) diagonally upwards until a resilient resistance is felt.
- Press in Torx socket T15(1) straight in the direction of arrow towards the centre of the steering wheel in order to unlock the wire spring clip (2) or to unlock the airbag unit (A).

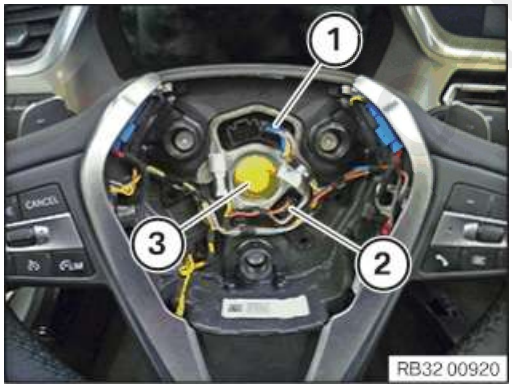


- Press in Torx screwdriver T15 (1) straight in direction of arrow towards the centre of the steering wheel and lift the airbag unit (2) on the unlocked side.
- Repeat procedure on left side and carefully release airbag unit (2) from the steering wheel.



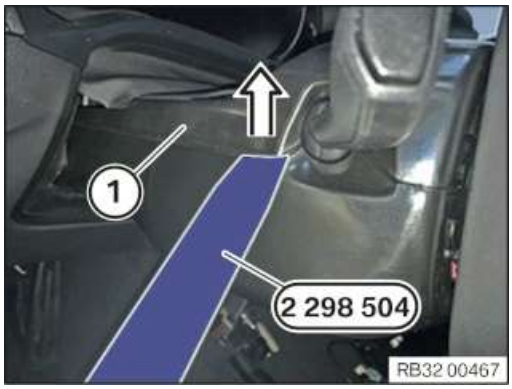
- Unlock and disconnect the plug connection (1) and remove the airbag unit (2).

29 – Remove sports steering wheel



- Move the steering wheel and wheels to the straight-ahead position.
- Unlock plug connection (1) and disconnect.
- If installed: Unlock plug connection (2) and disconnect.
- Release the screw (3) and pull off and remove the steering wheel.

30 – Removing steering column shroud upper section

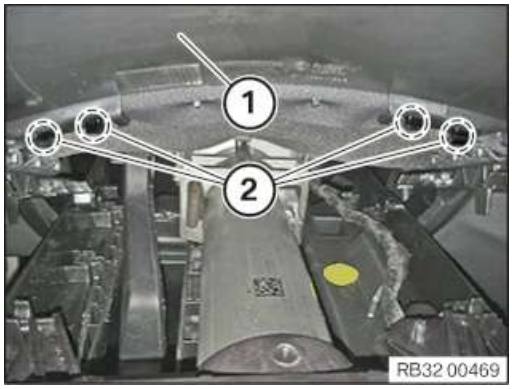


NOTICE

Perform the operations on the left and right side.

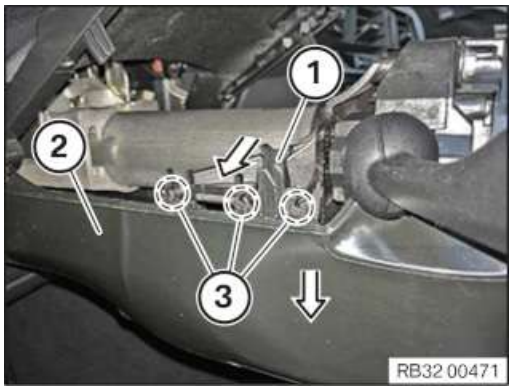
- Unlock the steering column shroud upper section (1) with the special tool 2 298 504 and fold up.

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- Unclip the steering column shroud upper section (1) from the brackets (2).
- Remove the steering column shroud upper section (1).

31 – Removing steering column shroud lower section



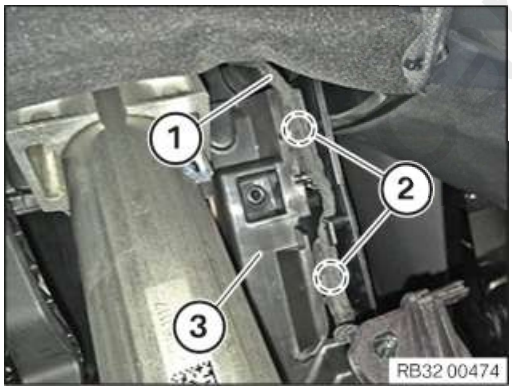
NOTICE

Perform the operations on the left and right side.

- Push the retaining lug (1) to the outside in the direction of the arrow and unclip the steering column shroud lower section (2) from the holders (3) in the direction of the arrow to the bottom at the same time.

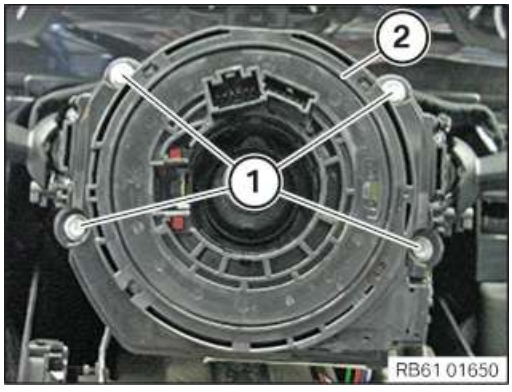


- Fold the steering column shroud lower section down.
- Unlock and disconnect connector (1).

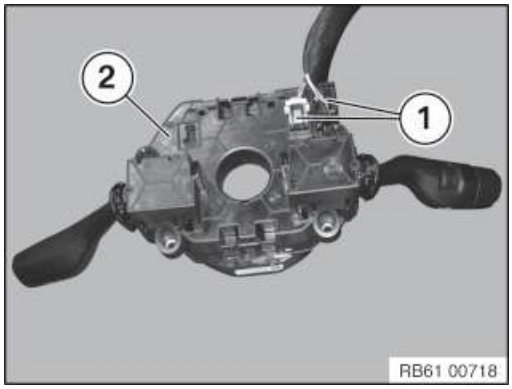


- Detach the cable (1) from the brackets (2).
- Remove the steering column shroud lower section (3).

32 – Removing the steering column switch cluster (SZL)



- Loosen screws (1).
- Remove the steering column switch cluster (SZL) (2).



- Unlock and disconnect plug connections (1) on the SZL (2).

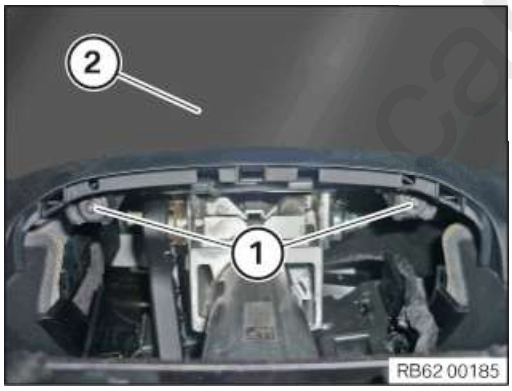
33 – Removing the instrument cluster (KOMBI)



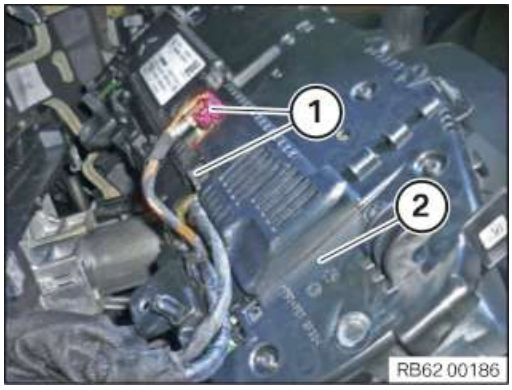
- Loosen screw (1).



- Loosen screw (1).



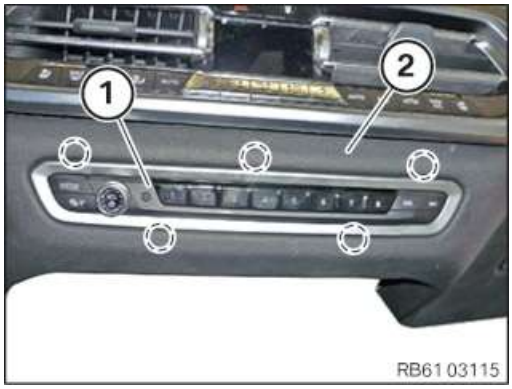
- Loosen screws (1).
- Feed out instrument cluster (KOMBI) (2).



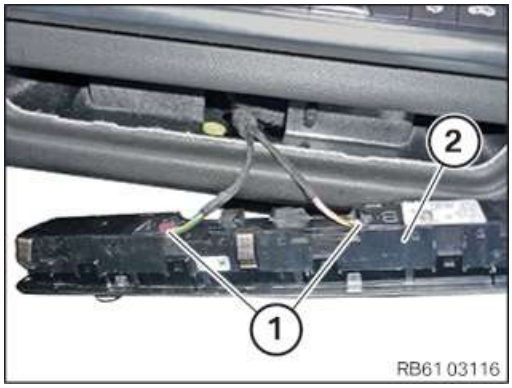
- Unlock and disconnect plug connections (1) from instrument cluster (KOMBI) (2).
- Remove the instrument cluster (KOMBI) (2).

34 – Remove the audio operating unit

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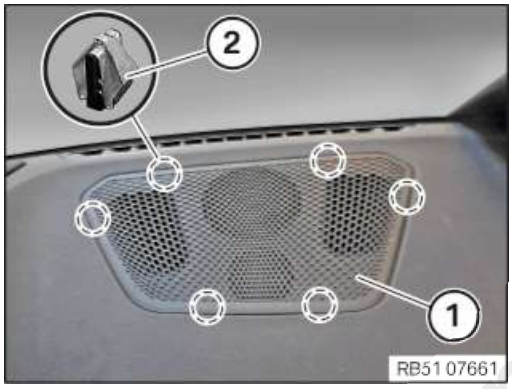


- Unclip the audio operating unit (1) from the instrument panel (2) at the points marked using special tool 0 496 571 (00 9 327).



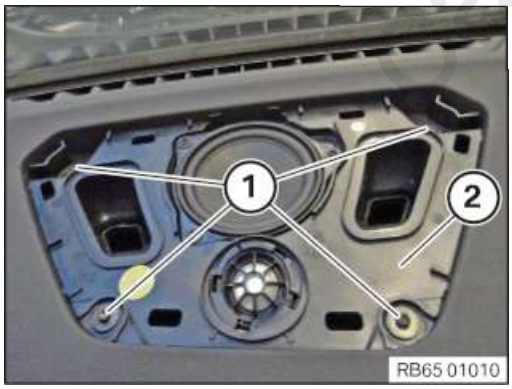
- Disconnect plug connections (1) and remove the audio operating unit (2).

35 – Remove the speaker trim at the instrument panel

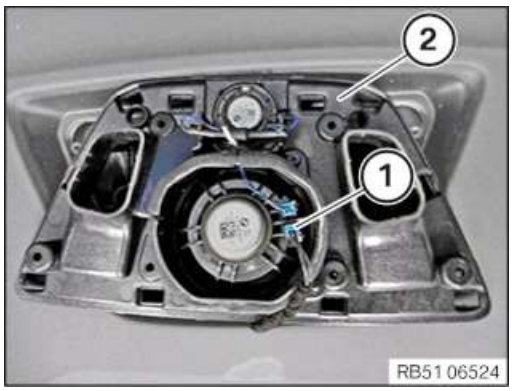


- Lever out the speaker trim (1) with the special tool 0 496 569 (00 9 325) from the clamps (2) toward the top and remove.

36 – Remove the speaker holder at the instrument panel



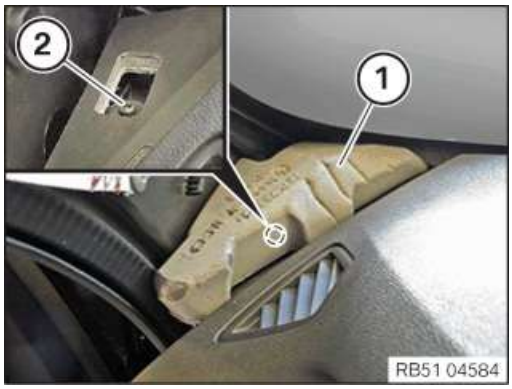
- Loosen screws (1).
- Pull out speaker holder (2) slightly with the loudspeakers and tilt it to the side.



- Unlock plug connection (1) and disconnect.
- Remove the speaker holder (2).

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37 – Remove the instrument panel trim panel



NOTICE

Perform the operations on the left and right side.

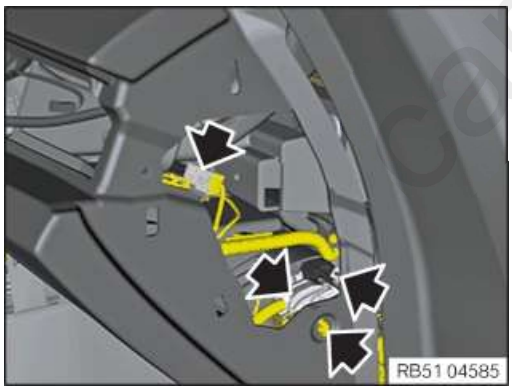
- Remove the sound insulation (1).
- Loosen screw (2).



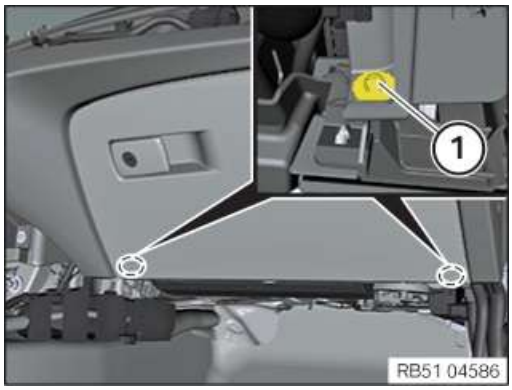
- Loosen screws (1).



- Loosen screws (1).

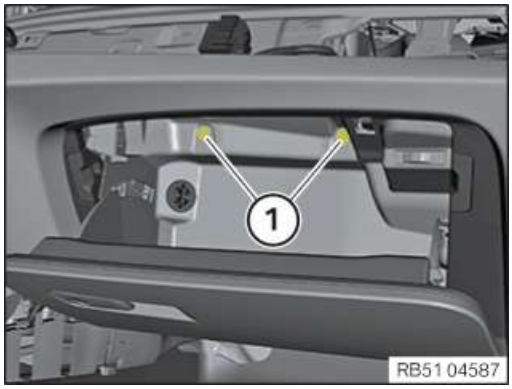


- Release all plug connections and cable clips (arrows) behind the glove box.

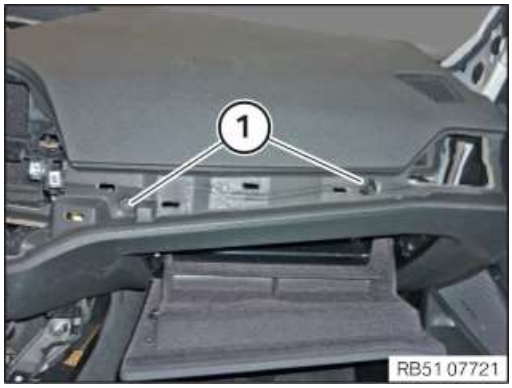


- Release the screws (1) on the lower side of the glove box.

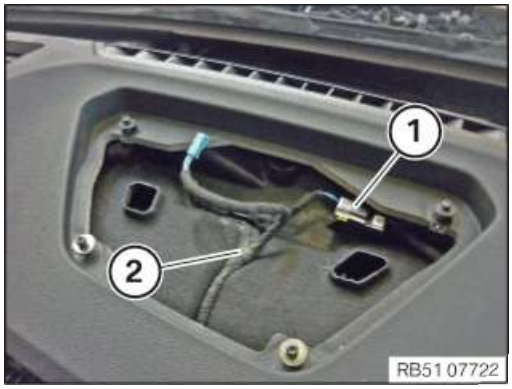
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- Open glovebox.
- Loosen screws (1).



- Loosen screws (1).



- Unlock plug connection (1) and disconnect.
- Release the wiring harness (2) on the holders.



- Unlock the plug connection (1) on the light operating unit and disconnect it.



- Loosen screws (1).

TECHNICAL INFORMATION

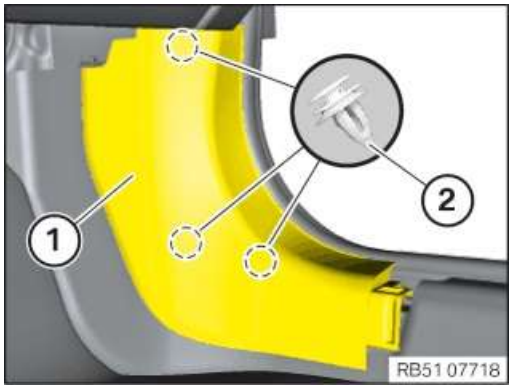
Conduct the following operation with the assistance of a second person.

- Pull the instrument panel trim back slightly.

  If necessary, unlock and disconnect additional plug connections.
- Remove the instrument panel trim from the vehicle.

38 – Removing the side trim panel in the footwell at the right-hand A-pillar

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- Loosen the side trim panel (1) at the clips (2) and remove it toward the inside.

39 – Removing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

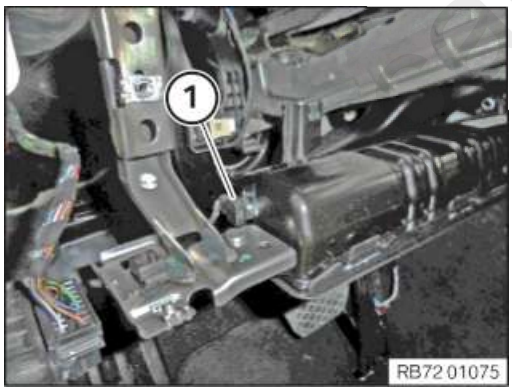
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

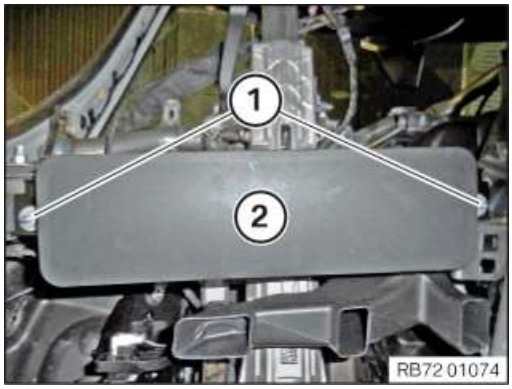
Pyrotechnic components.

Danger! Life-threatening injuries!

- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



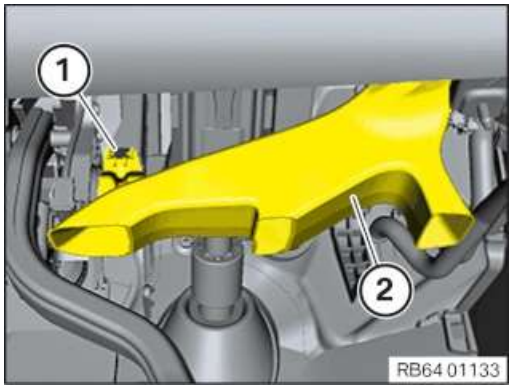
- Unlock plug connection (1) and disconnect.



- Loosen nuts (1).
- Remove knee airbag (2).

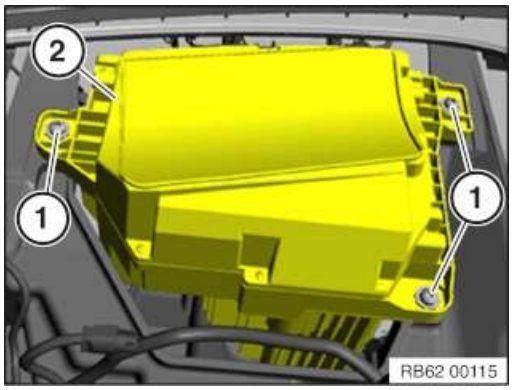
40 – Remove left air duct

40 – Remove left air duct



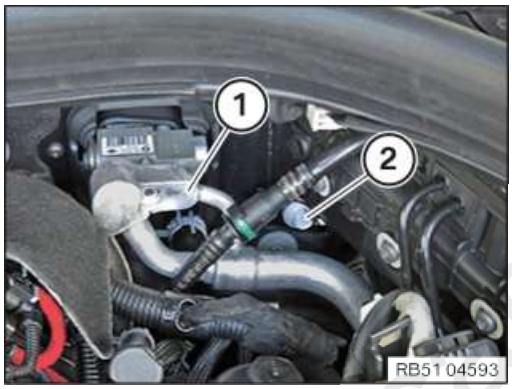
- Unclip the air duct (2) from the air conditioning housing at an angle towards the bottom at the clamp (1).

41 – Removing the Head-Up Display



- Loosen screws (1).
- Remove head-up display (2) from support.
- Unlock associated cable and disconnect.

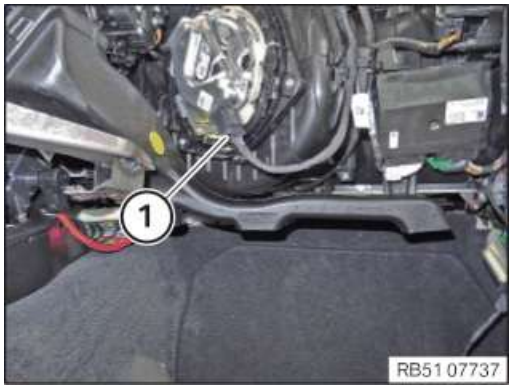
42 – Removing the support for the instrument panel



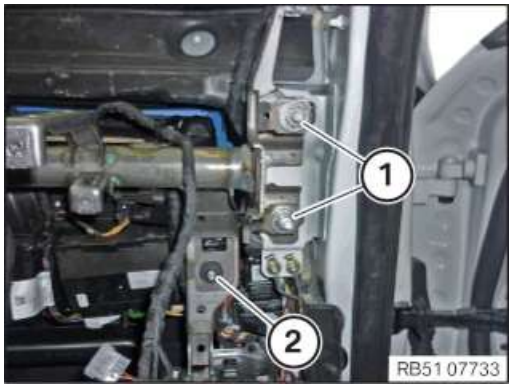
- Push the refrigerant line (1) slightly to one side and loosen the screw (2).



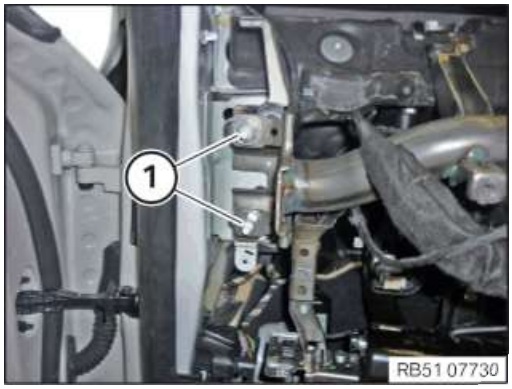
- Push the carpet in the area of the right B-pillar to the side.
- Unlock and disconnect plug connections (1).



- Unlock and disconnect the plug connection (1) on the blower motor.



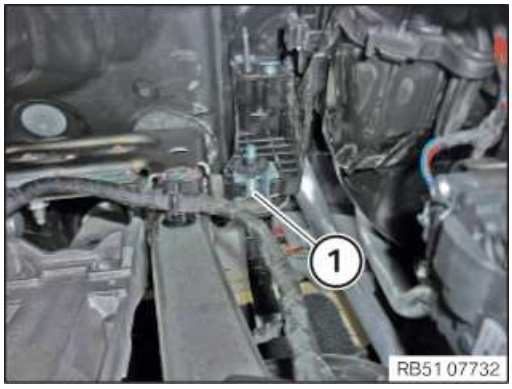
- Loosen nuts (1) and (2).



- Loosen nuts (1).

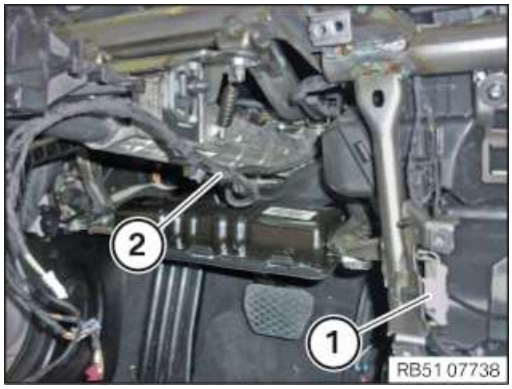


- Loosen screws (1).

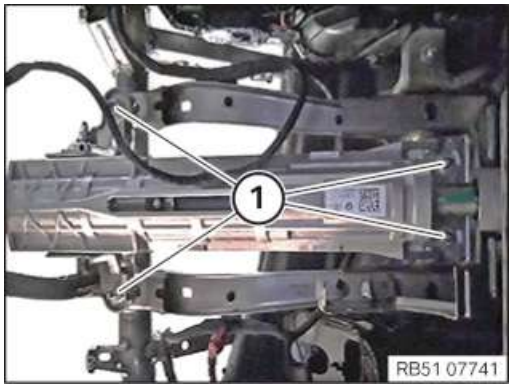


- Slacken the nut (1) in the left footwell on the heating and air-conditioning unit.

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- Release plug connection (1).
- Release the wiring harness (2) from the steering column.

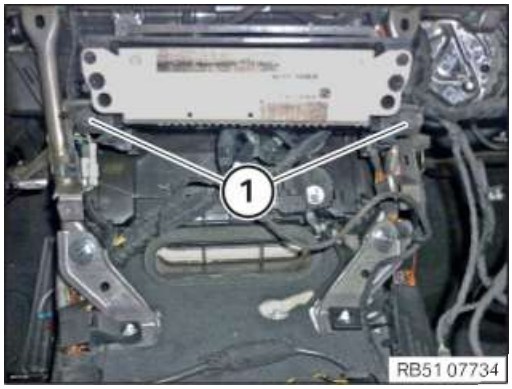


TECHNICAL INFORMATION

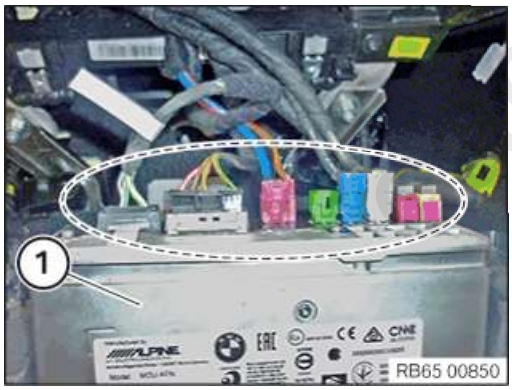
Secure component against falling.

- Release the nuts (1) at the steering column.
- Drop steering column (1) a little away and support it in the footwell.

  Drop steering column not too far away and support it absolutely.



- Loosen screws (1).
- Feed out Head Unit High.

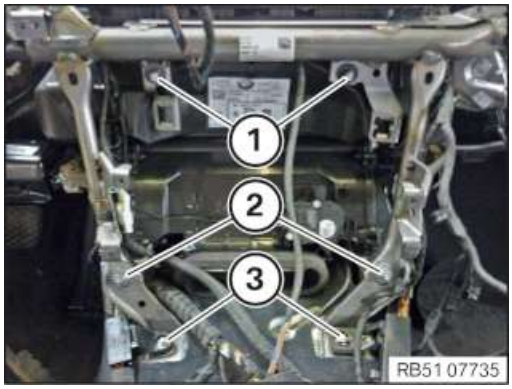


- Unlock and disconnect all connectors in the marked area.
- Remove headunit (1).



- Unlock and disconnect plug connection (1) from airbag control unit.
- Release the wiring harness (2) on the holders.

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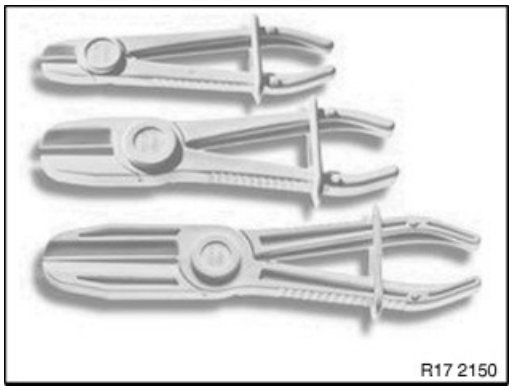


- Loosen nuts (1).
- Loosen nuts (2).
- Remove cable clip and release the nuts (3).

  Remove retaining bracket from left and right sides.
- Carefully feed out the support for the instrument panel to the rear.

  If necessary, unlock and disconnect additional plug connections.
- Carefully remove support for the instrument panel from the vehicle.

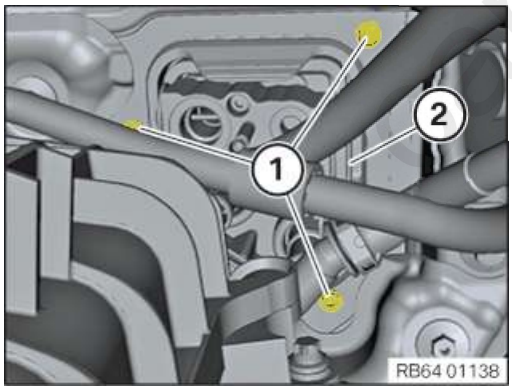
43 – Removing the heating and air-conditioning unit



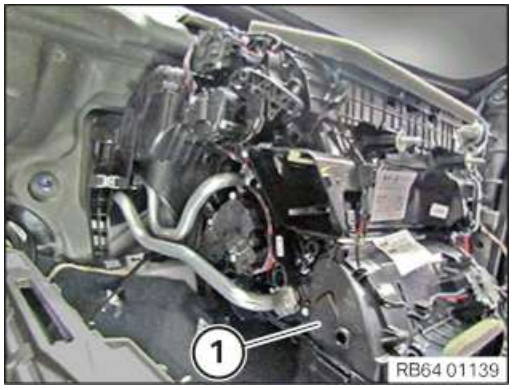
- Use commercially available disconnection tools to pinch off the coolant lines.



- Release the hose clamps (1) using special tool and pull off the coolant hoses.



- Release screws (1) from flange (2).
- Protect the carpet in footwell against leaking coolant.

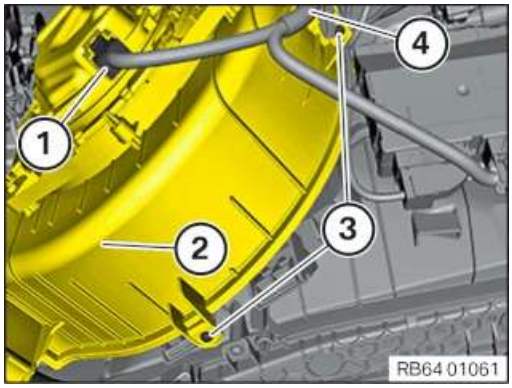


- Unfasten plug connection.
- Remove the heating and air-conditioning unit (1).

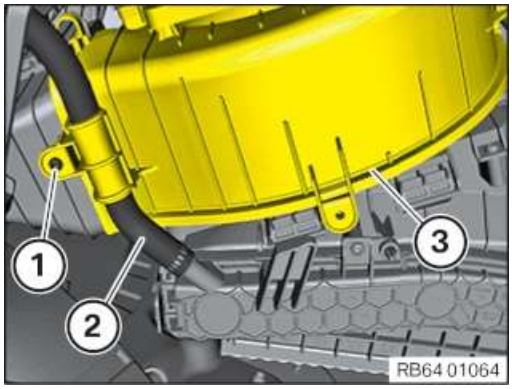
mdiagn.com

44 – Removing the evaporator

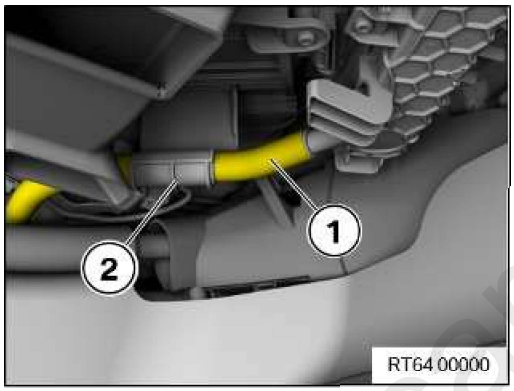
▶ **Remove the blower for the heating and air-conditioning unit**



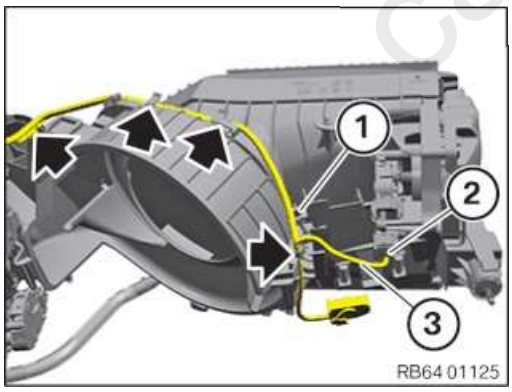
- Unlock and disconnect the plug connection (1) from the blower motor (2).
- Loosen screws (3).
- Pull of the cable clip (4) from the housing of the blower motor (2).



- Loosen screw (1).
- Guide out the hose (2) from the housing of the blower motor (3).
- Remove the housing of the blower motor (3).

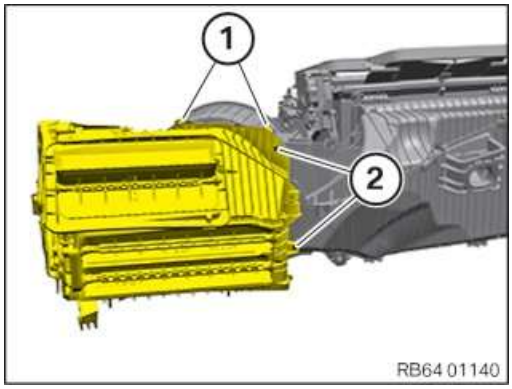


- Pull off the water drain hose (1).

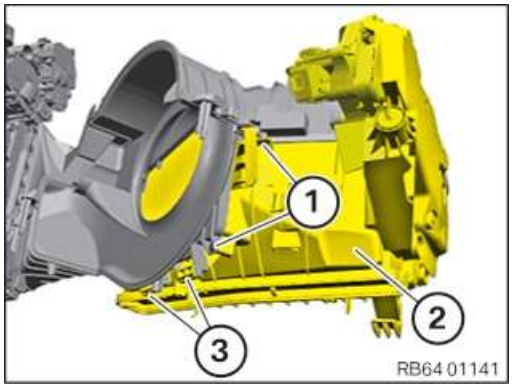


- Loosen screw (1).
- Unlock plug connection (2) and disconnect.
- Remove the cable (3) from the brackets (arrows) and place to one side.

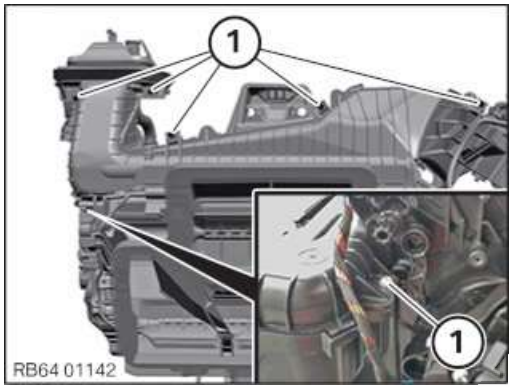
cardiagn.com



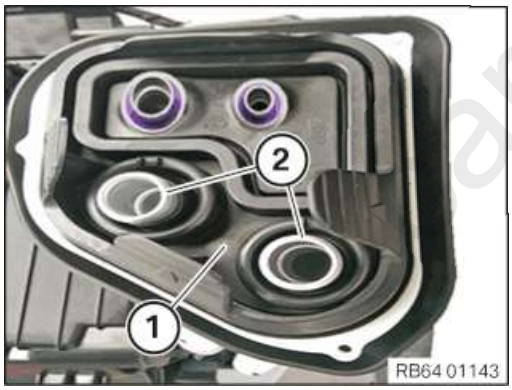
- Disengage the latch mechanisms (1).
- Loosen screws (2).



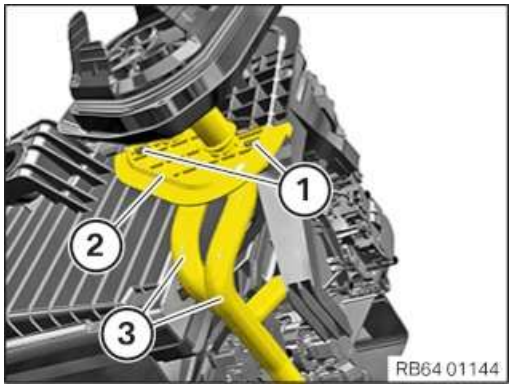
- Loosen screws (1).
- Tilt the housing (2) slightly and detach from the hook (3).



- Loosen screws (1).

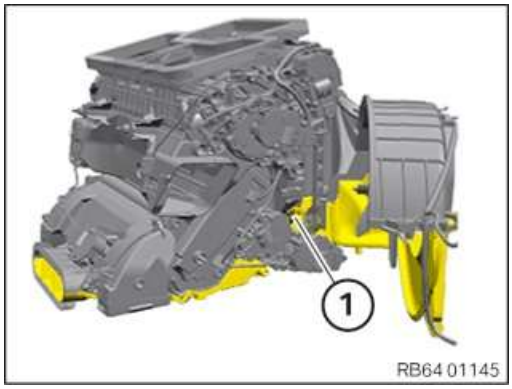


- Feed out the seal (1) via the coolant pipes (2) and fold it back slightly.



- Disengage the latch mechanisms (1) and remove the cover (2).
- Twist the coolant pipe (3) towards the bottom.

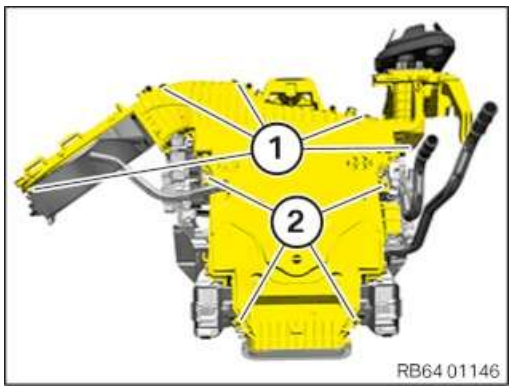
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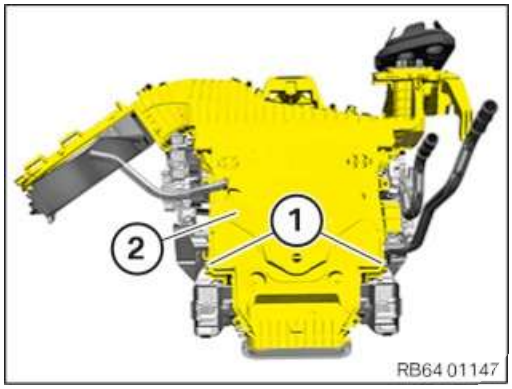
NOTICE

The operations shown only for one side must be carried out on both sides.

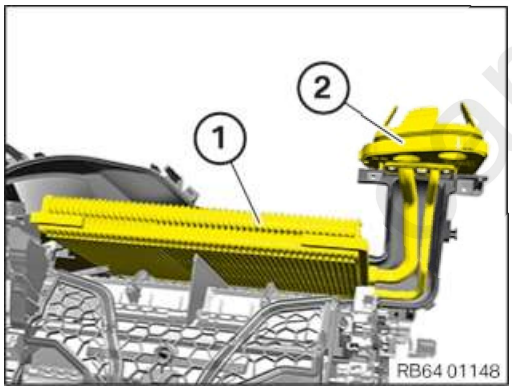
- Release latch mechanism (1).



- Turn the heating and air-conditioning unit around.
- Loosen the latch mechanisms (1).
- Loosen screws (2).



- Unlock the latch mechanisms (1) and feed out the housing (2) and remove it.



RISK OF DAMAGE

Damage to the component.

Excessive force may damage the component.

- Handle component carefully.

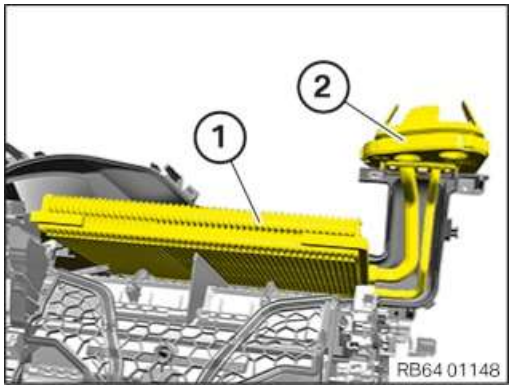
- Remove the evaporator (1) with seal (2) out of the distributor housing (3).

45 – Installing the evaporator

TECHNICAL INFORMATION

Mount the components correctly. Non-compliance with the instructions can lead to an impairment of function or component damage.

.com



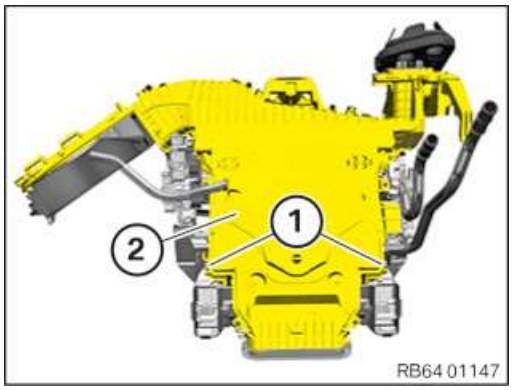
RISK OF DAMAGE

Damage to the component.

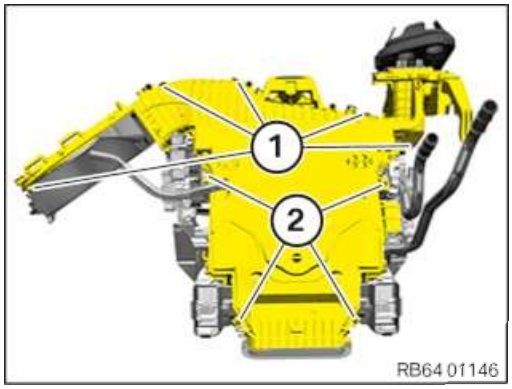
Excessive force may damage the component.

- Handle component carefully.

- Insert the evaporator (1) in the distributor housing (3) correctly.
- Make sure that the seal (2) is positioned correctly.



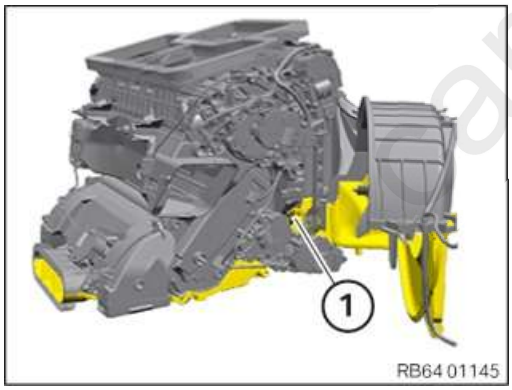
- Guide in housing (2) and engage it in latch mechanisms (1).



- Engage the latch mechanisms (1).
- Tighten the screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

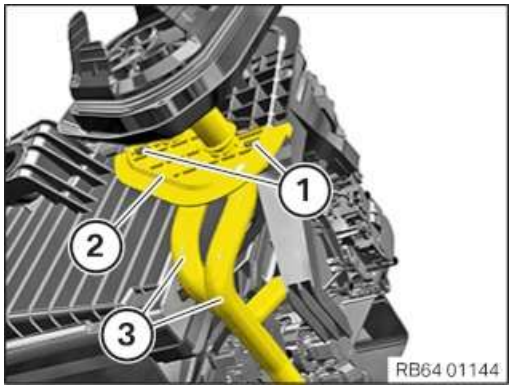


- Turn the heating and air-conditioning unit around.

NOTICE

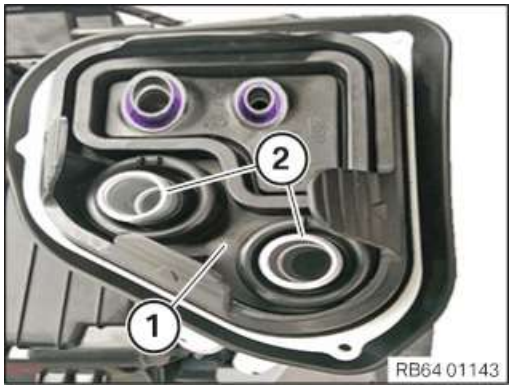
The operations shown only for one side must be carried out on both sides.

- Engage latch mechanism (1).

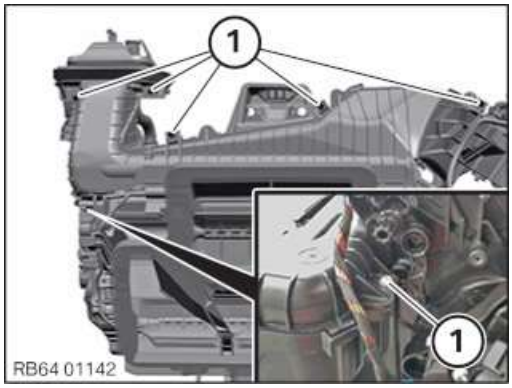


- Turn coolant pipes (3) to the front and position them correctly.
- Engage the cover (2) at the latch mechanisms (1).

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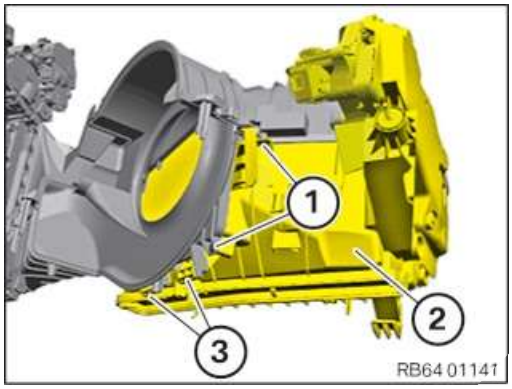
- Feed the seals (1) in via the coolant pipes (2) and position it correctly.



- Tighten the screws (1).

Heater/air conditioner

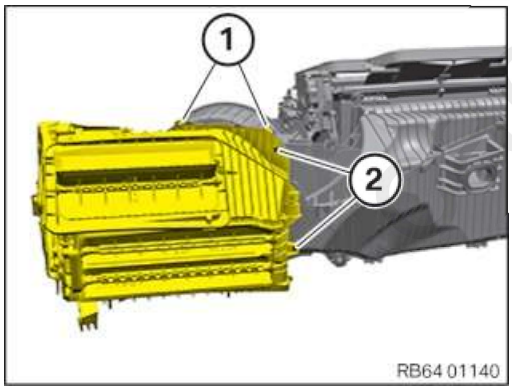
Screw		Tightening torque	1,2 Nm



- Hook housing (2) onto the hook (3) and position correctly.
- Tighten the screws (1).

Heater/air conditioner

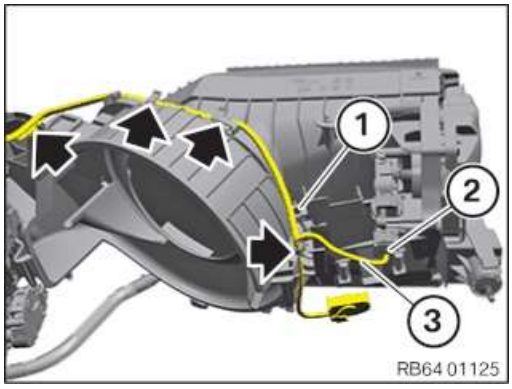
Screw		Tightening torque	1,2 Nm



- Engage the latch mechanisms (1).
- Tighten the screws (2).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

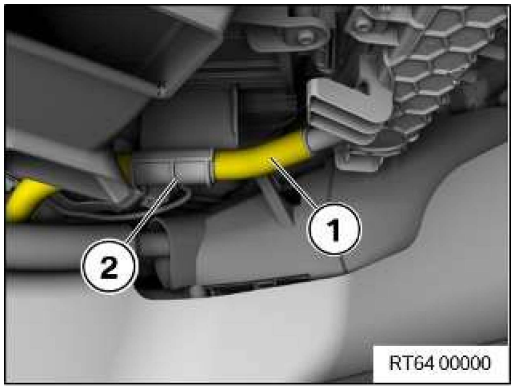


- Engage cable (3) at the latch mechanisms (arrows).
- Connect connectors (2) and lock.
- Tighten down screw (1).

Heater/air conditioner

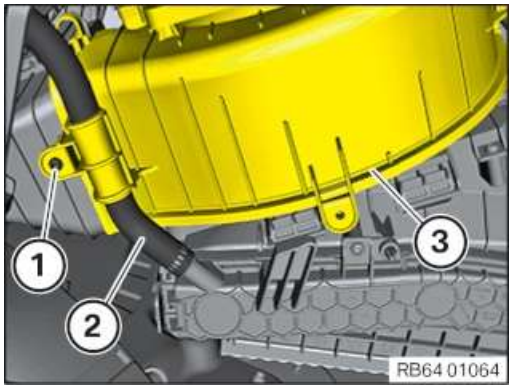
Screw		Tightening torque	1,2 Nm

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- Connect water drain hose (1).

▸ **Install the blower for the heating and air-conditioning unit**

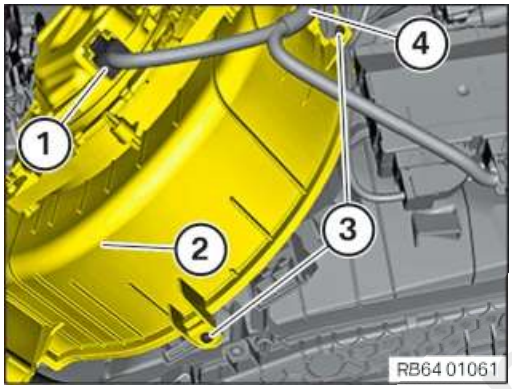


- Position the housing of the blower motor (3).
- Tighten down screw (1).

Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Feed in the hose (2) at the housing of the blower motor (3).



- Connect and lock plug connection (1) of blower motor (2).
- Tighten down screws (3).

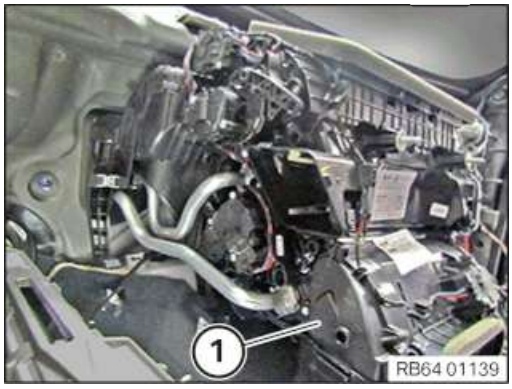
Heater/air conditioner

Screw		Tightening torque	1,2 Nm

- Secure the cable clip (4) on the housing of the blower motor (2).

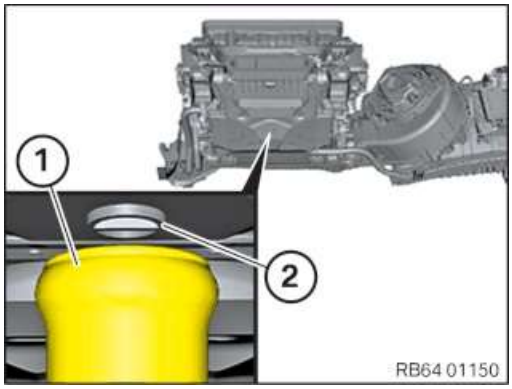
POSTPROCESSES

46 – Installing the heating and air-conditioning unit



- Position the heating and air-conditioning unit (1).
- Connect connectors and lock.

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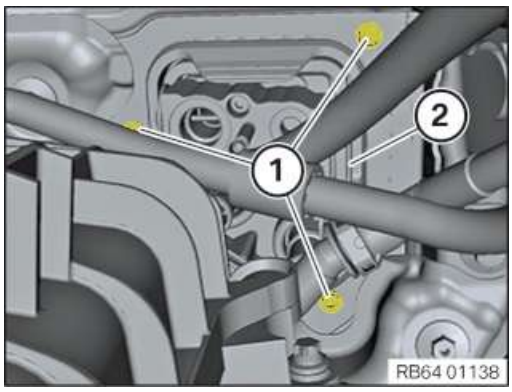
RISK OF DAMAGE

Damage caused by water ingress into the vehicle.

Water ingress into the vehicle may result in damage to components, malfunctions and corrosion.

- Ensure correct installation of the components.
- Only use undamaged components.

- Ensure that the condensate drain (2) is correctly fitted onto the grommet (1).
- After installing the heating and air-conditioning unit, perform a visual inspection.



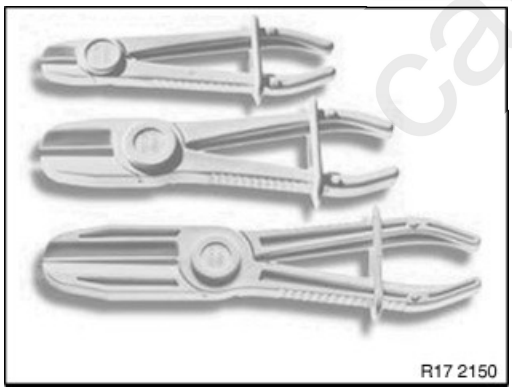
- Tighten the nuts (1) on the flange (2).

Heating and air-conditioning unit on the bulkhead

Oval-head screw		Tightening torque	2,8 Nm



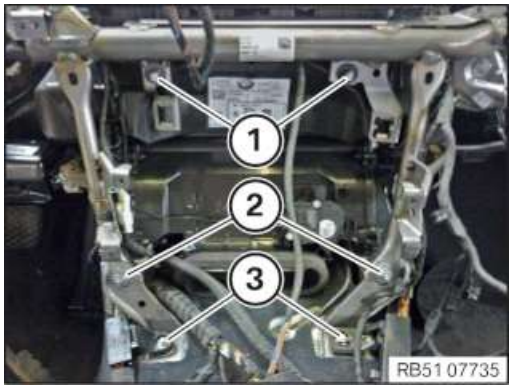
- Slide coolant hoses on correctly.
- Secure hose clamps (1) using the special tool .



- Remove disconnection tools.

47 – Installing the support for instrument panel

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- Install the instrument panel support into the vehicle carefully.
- Insert the instrument panel support carefully.

  If necessary, connect and lock the additional connector.
- Tighten nuts (1).

Heating and air-conditioning unit on support

Nut M6		Tightening torque	4 Nm

- Mount retaining bracket on left and right.

  Tighten nuts (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

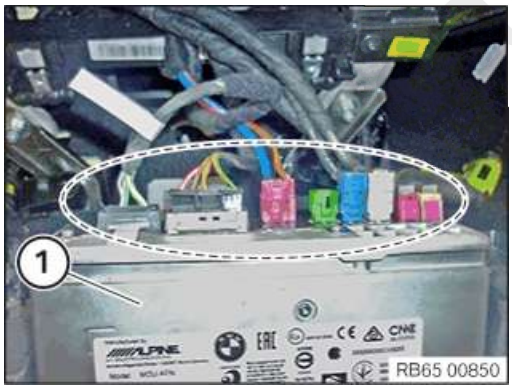
- Tighten nuts (3) and fit cable clip .

Support for instrument panel

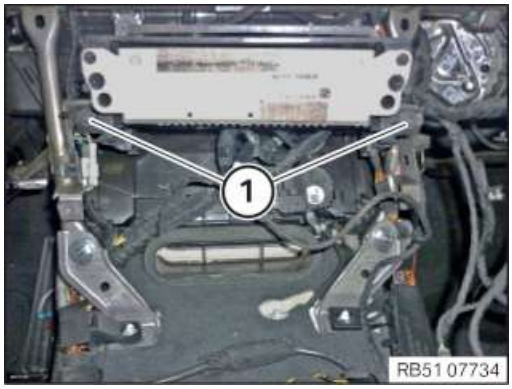
M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm



- Connect the connector (1) to the airbag control unit and lock it.
- Secure the wiring harness (2) on the holders.



- Position head unit (1).
- Connect and lock all connectors in the marked area.

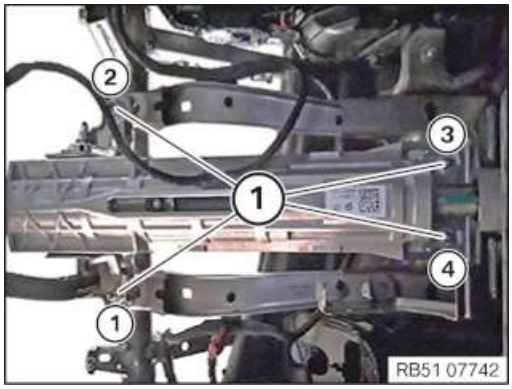


- Feed in the head unit.
- Tighten the screws (1).

Head unit to holder / holder to support

Screw		Tightening torque	1,8 Nm

rdiagn.com



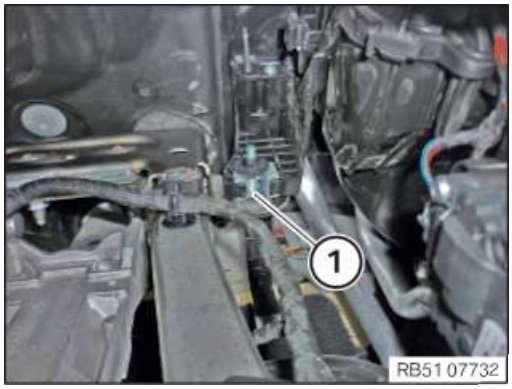
- Correctly position the steering column (2) and tighten the nuts (1) in the sequence (1), (2), (3) and (4).

Steering column to dashboard support

M8	Observe tightening sequence.	Tightening torque	21,4 Nm



- Connect connectors (1) and lock.
- Secure the vehicle wiring harness (2) to the steering column.



- Tighten nut (1) in the left foot well on the heating and air-conditioning unit.

Heating and air-conditioning unit on support

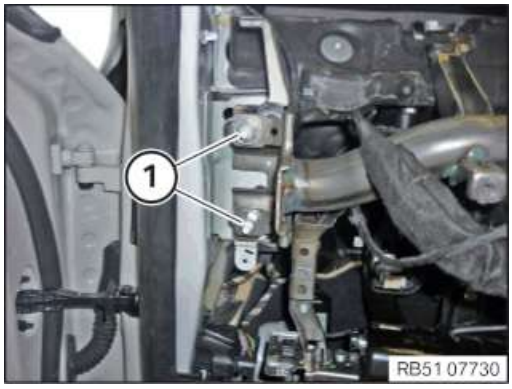
Nut M6		Tightening torque	4 Nm



- Tighten the screws (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

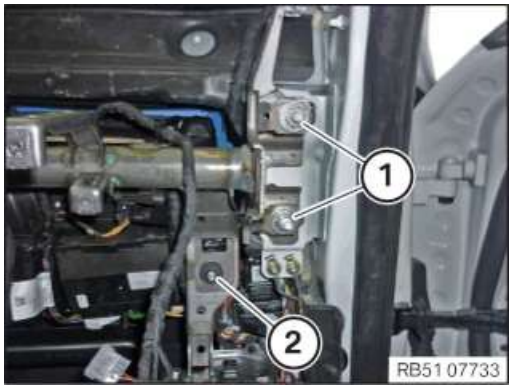


- Tighten nuts (1).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

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- Tighten nuts (1).

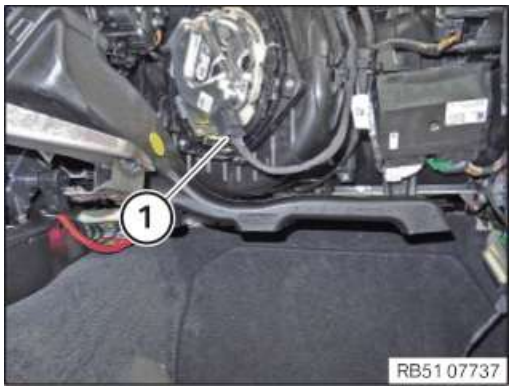
Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

- Tighten nut (2).

Heating and air-conditioning unit on support

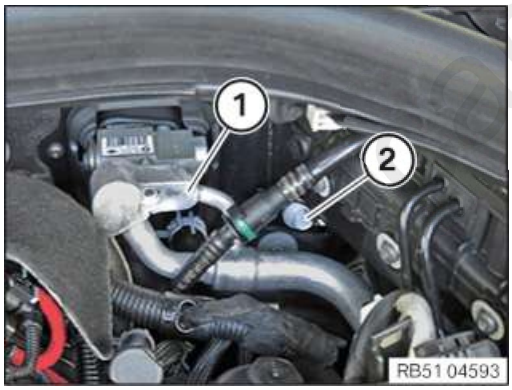
Nut M6		Tightening torque	4 Nm



- Connect the connector (1) to the blower motor and lock.



- Connect connectors (1) and lock.
- Correctly position the carpet in the area of B-pillar at the right.

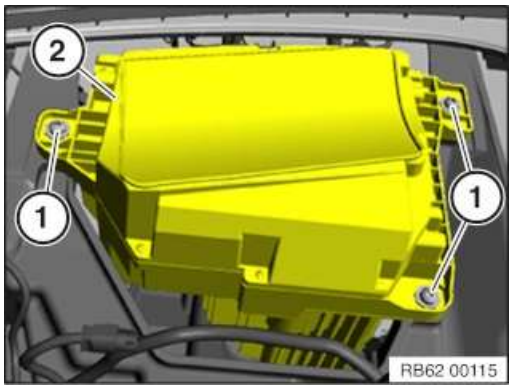


- Push the refrigerant line (1) slightly to one side and tighten the screw (2).

Support for instrument panel

M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

48 – Installing the head-up display



- Connect the associated connector to the Head-Up Display.
- Guide the Head-Up Display (2) into the support.
- Tighten the screws (1).

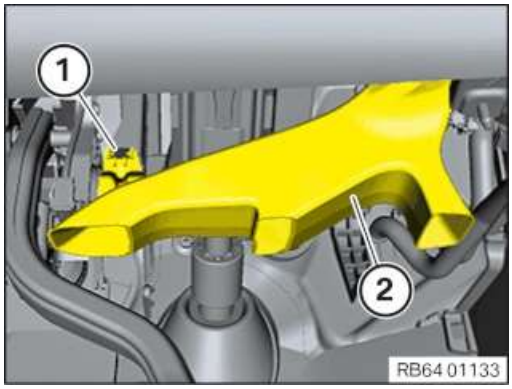
Head-Up Display to support

M6x25 screw		Tightening torque	13 Nm

49 – Installing the air duct, left

mdiagn.com

49 – Installing the air duct, left



- Clip in the air duct (2) at the clamp (1) in the air conditioning housing at an angle towards the top.

50 – Installing knee airbag

WARNING

Airbag unit.

Danger! Life-threatening injuries!

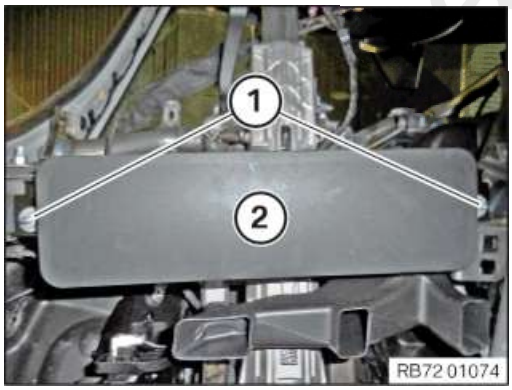
- Before performing any work on the airbag, always disconnect the battery earth lead from the battery.
- Airbag unit may only be set down with the cushion (airbag itself) facing upwards.
- For additional information see: 72 00 ... Safety regulations on handling airbag system components/gas generators

WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

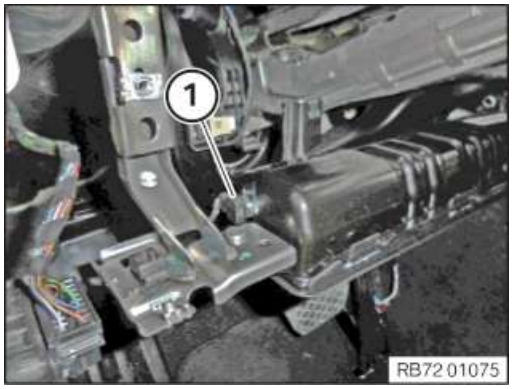
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.



- Position knee airbag (2) correctly.
- Tighten nuts (1).

Knee airbag on support structure

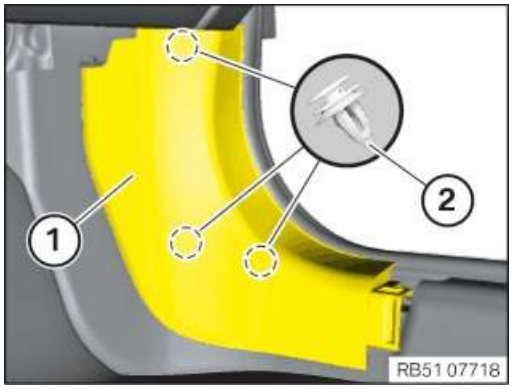
Nut		Tlghtening torque	8 Nm



- Connect connectors (1) and lock.

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51 – Installing side trim panel in footwell on right A-pillar



- Check the clips (2) for damage.

  Renew damaged or missing clips (2).
- Correctly position the side trim panel (1) and clip in to the clips (2).
- Make sure that the side trim panel (1) is correctly fitted against edge protection.

52 – Install the trim panel for the instrument panel



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

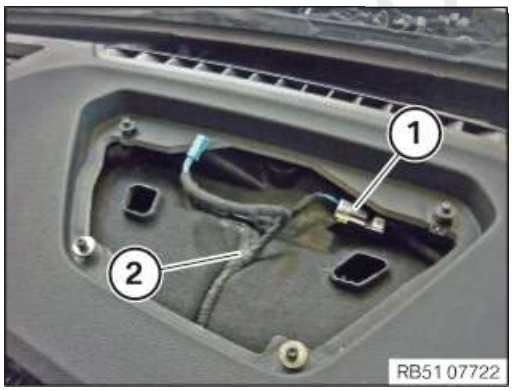
- Insert the instrument panel trim in the vehicle and position it at the support.
- Insert the associated wiring harnesses and connect the connectors.
- Tighten the screws (1).

Dashboard to support

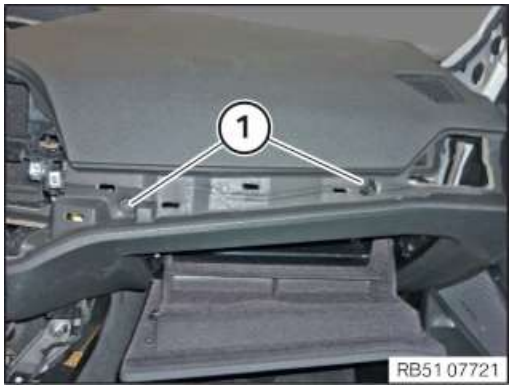
Screw		Tightening torque	2,4 Nm



- Connect connector (1) to the light operating unit and lock.



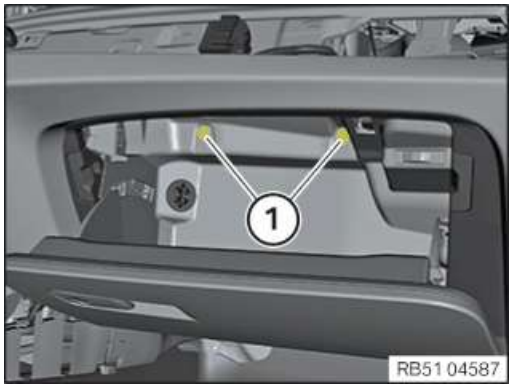
- Secure the wiring harness (2) on the holders.
- Connect connectors (1) and lock.



- Tighten the screws (1).

Dashboard to support

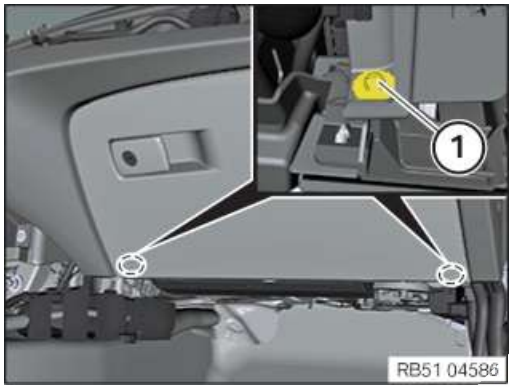
Screw		Tightening torque	2,4 Nm



- Open glovebox.
- Tighten the screws (1).

Dashboard to support

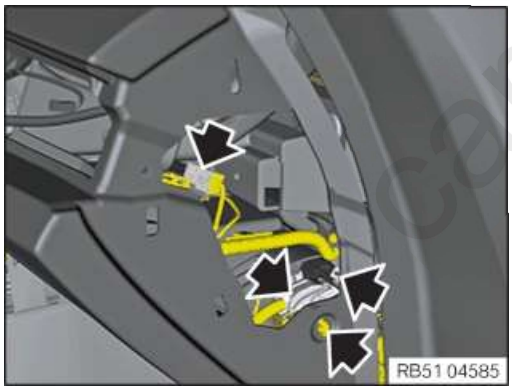
Screw		Tightening torque	2,4 Nm



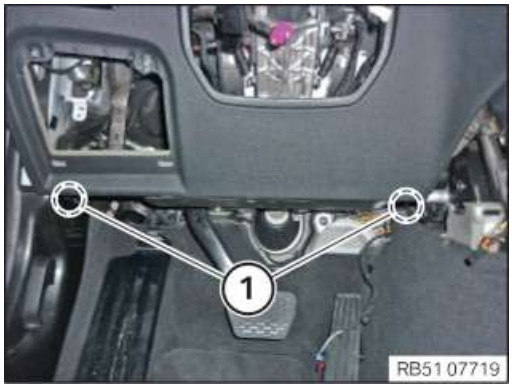
- Tighten the screws (1) on the lower side of the glove box button.

Dashboard to support

Screw		Tightening torque	2,4 Nm



- Connect all plug connections and cable clips (arrows) behind the glove box.



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm

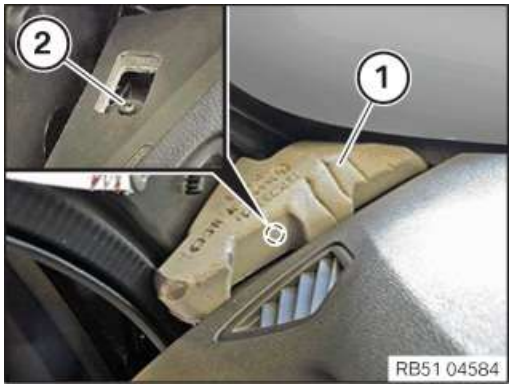
carldiagn.com



- Tighten the screws (1).

Dashboard to support

Screw		Tightening torque	2,4 Nm



NOTICE

Perform the operations on the left and right side.

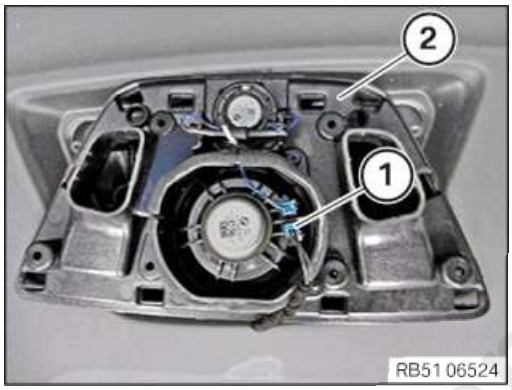
- Tighten down screw (2).

Dashboard to support

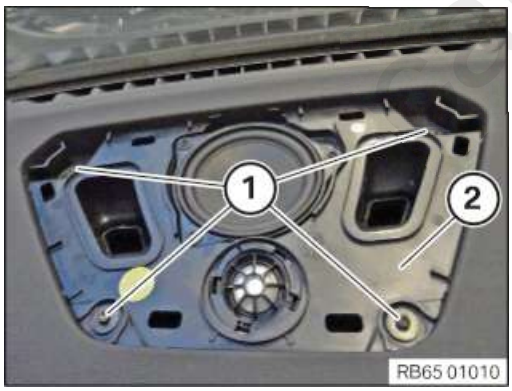
Screw		Tightening torque	2,4 Nm

- Use sound insulation (1).

53 – Install the speaker holder at the instrument panel



- Position the speaker holder (2).
- Connect connector (1).



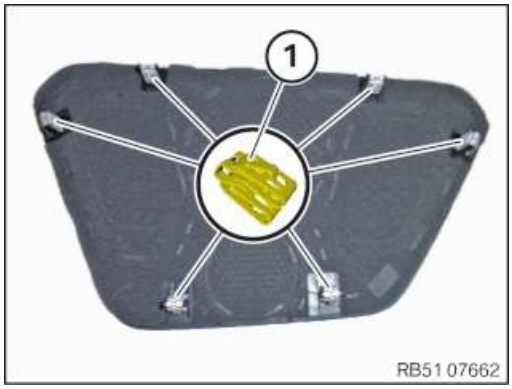
- Install the speaker holder (2).
- Tighten the screws (1).

Speaker to support / support to instrument panel / support to body

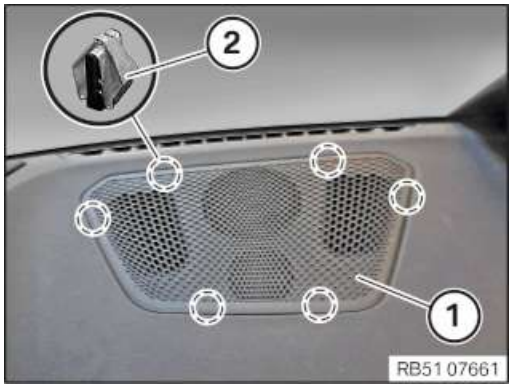
Screw		Tightening torque	1,8 Nm

54 – Install the speaker trim at the instrument panel

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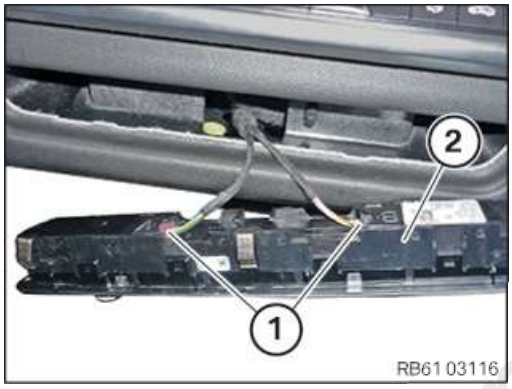


- Check clamps (1) for damage.
- Replace broken or missing clamps (1).

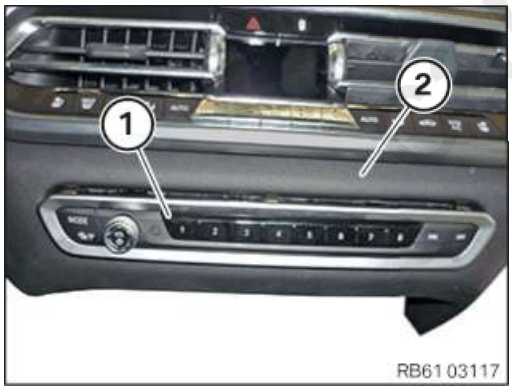


- Position the speaker trim (1) correctly and engage it at the clamps (2).

55 – Install the audio operating unit

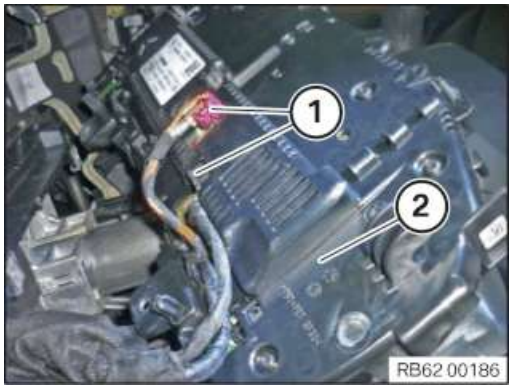


- Connect the connector (1) to the audio operating unit (2).

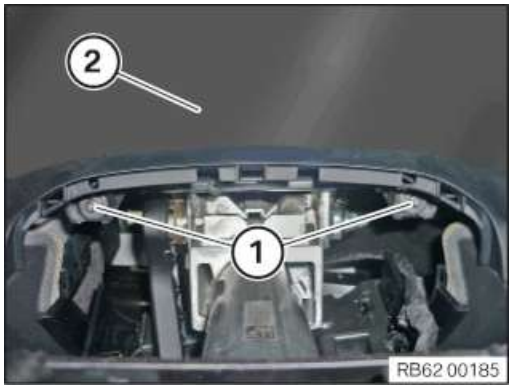


- Correctly position the audio operating unit (1) and install in the instrument panel(2).

56 – Installing the instrument cluster (KOMBI)



- Connect and lock connector (1) to the instrument cluster (KOMBI) (2).



- Feed in and position the instrument cluster (KOMBI) (2).
- Tighten the screws (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm



- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

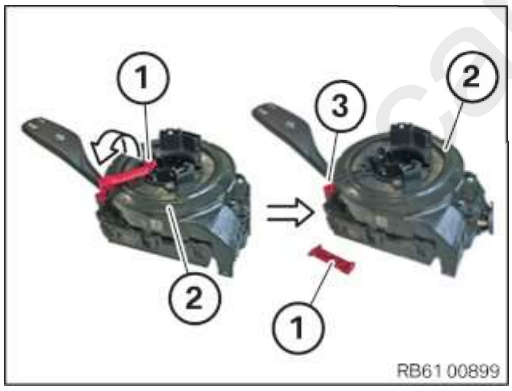


- Tighten down screw (1).

Instrument cluster (KOMBI) to support

Screw		Tightening torque	1,8 Nm

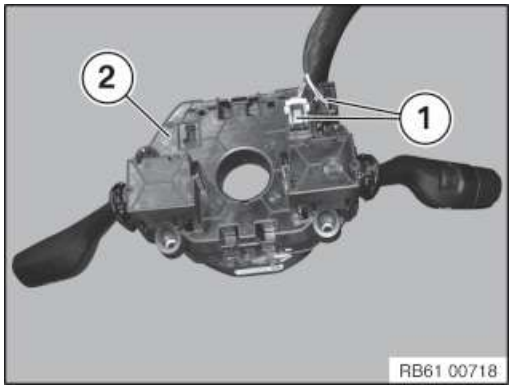
57 – Installing the steering column switch cluster (SZL)



- **Replacement:**

  Break off the transportation retainer (1) on the steering column switch cluster (SZL) (2) in direction of arrow.

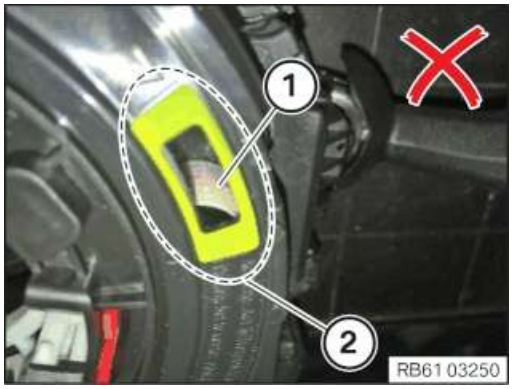
  The broken off piece (3) of the transportation retainer (1) remains in the steering column switch cluster (SZL) (2).



- Connect the connector (1) with the steering column switch cluster (SZL) (2).

Check

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- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

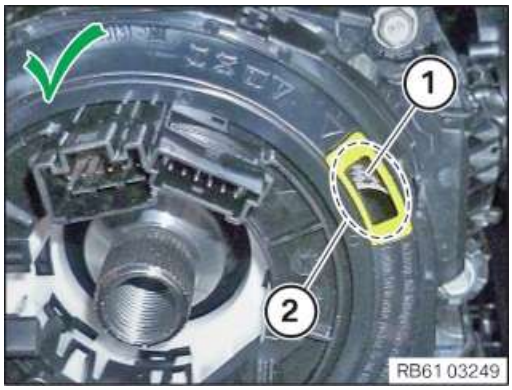
Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check



- **Version A:**

  Check whether the correct marking (1) is seen in inspection glass (2).

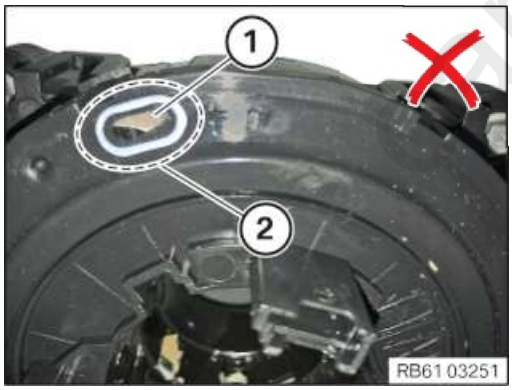
Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next step.

Check



- **Version B:**

  Check whether the correct marking (1) is seen in inspection glass (2).

Result

» Ensure that no incorrect marking (1) is seen in inspection glass (2).

Measure

- Turn the coil spring cassette until the right mark (1) becomes visible in the inspection glass (2).

Check

ardiagn.com



- **Version B:**

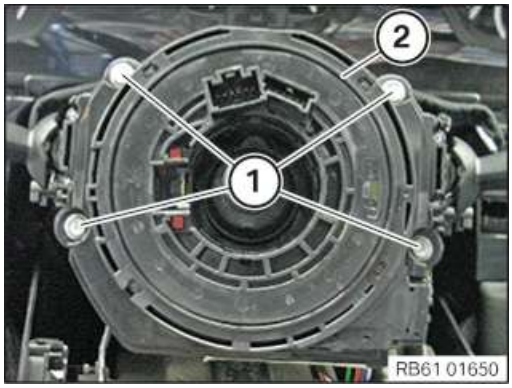
  Check if the correct mark (1) can be seen in the inspection glass (2).

Result

» Correct marking (1) is seen in inspection glass (2).

Measure

- Continue with the next work step.

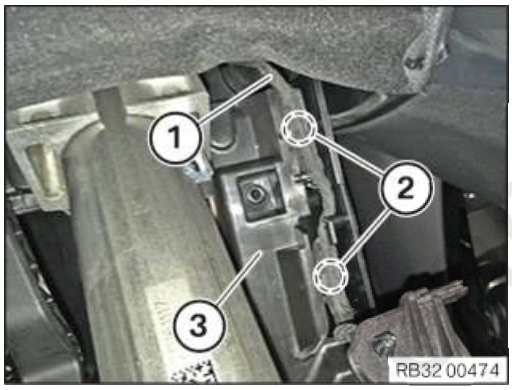


- Position the steering column switch cluster (SZL) (2).
- Tighten the screws (1).

Steering column switch cluster (SZL) on the steering column

Screw TS5x20		Tightening torque	3 Nm

58 – Install steering column shroud lower section

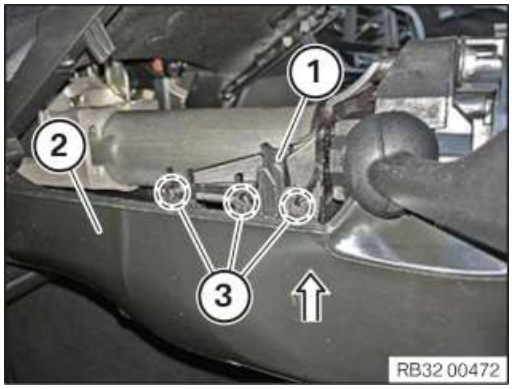


- Position the steering column shroud lower section (3).
- Secure the line (1) on the brackets (2).



- Connect the connector (1).

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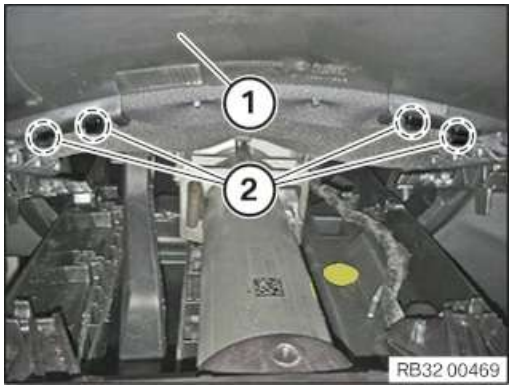


NOTICE

Perform the operations on the left and right side.

- Align the steering column shroud lower section (2) to the steering column using the retaining lug (1).
- Push the steering column shroud lower section (2) up in the direction of the arrow until the brackets (3) engage.

59 – Fit steering column shroud upper section



- Clip in the steering column shroud upper section (1) at the brackets (2).



NOTICE

Perform the operations on the left and right side.

- Clip in the steering column shroud upper section (1)into the guide (2).



NOTICE

Perform the operations on the left and right side.

- Press the upper section of the steering column shroud (1) downwards in direction of arrow.

  The upper section of the steering column shroud must engage audibly and perceptibly.

60 – Installing the sports steering wheel

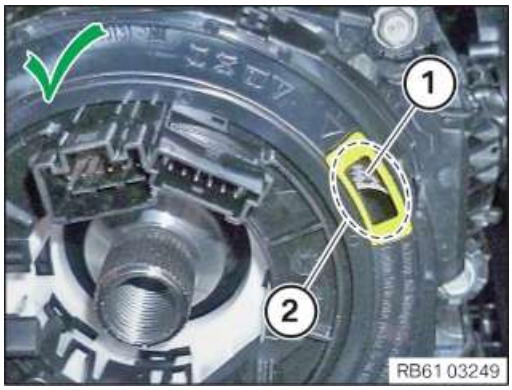
▸ **Check the neutral position of the clock spring**

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▹ **Version A: Checking the visibility of the marking on the coil spring**

.com



Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁

▷ **Version B: Checking the visibility of the marking on the coil spring**



Check

- Check the visibility of the marking (1) on the coil spring in the inspection glass (2) .

Result

» The mark (1) on the coil spring is not visible.

Measure

- Turn the coil spring cassette until the mark (1) on the coil spring becomes visible in the inspection glass (2).

◁



Check

- Check if a microencapsulated screw (3) is installed.

Result

» Screw (3) is micro-encapsulated.

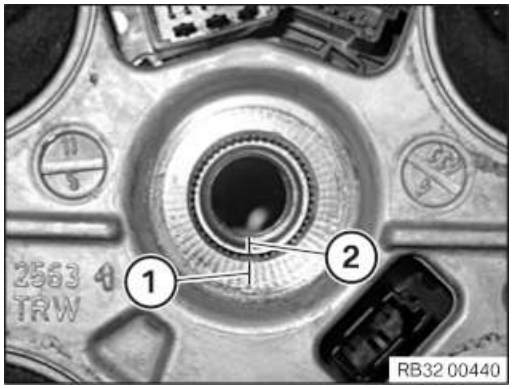
cardiagn.com

Measure

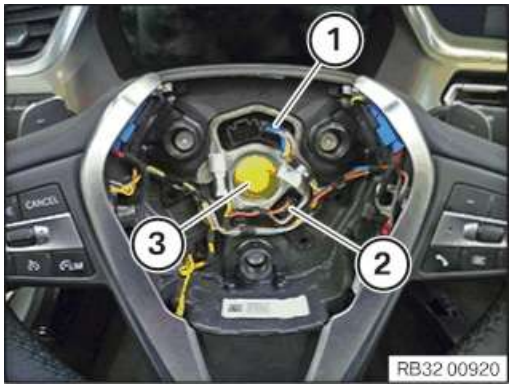
- Clean thread in the steering column.

  Renew the screw (3).

  Parts: Screw



- Align mark (1) on steering wheel to mark (2) on steering column.
- Connect steering wheel.



- Connect connectors (1) and lock.
- If installed: Connect connectors (2) and lock.
- Tighten screw (3) .

Steering wheel to steering column

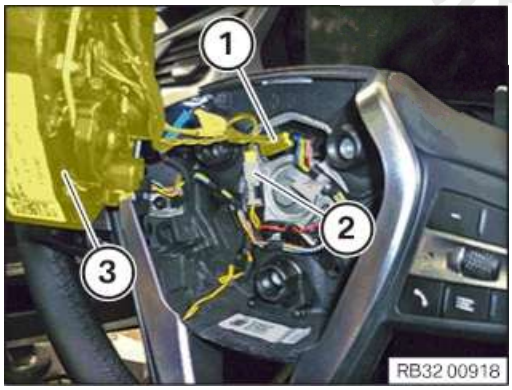
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

61 – Installing the airbag unit

TECHNICAL INFORMATION

Different variants may be installed depending on the vehicle equipment.

▸ **Installing the airbag unit for the sports steering wheel**



- Position airbag unit (3).
- Connect connectors (1) and (2) lock.



- Press the airbag unit (1) with even pressure in the direction of the arrow into the steering wheel.

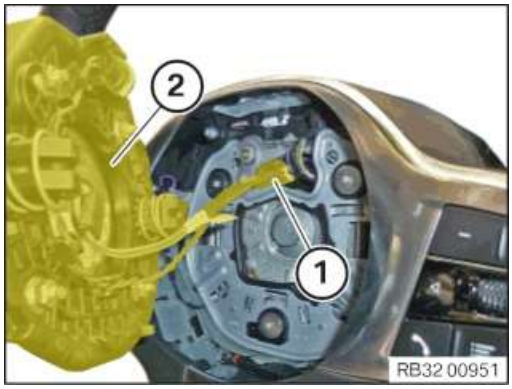
  The airbag unit (1) must engage audibly and perceptibly.

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▸ **Installing the airbag unit for M Sport steering wheel**

TECHNICAL INFORMATION

After replacing the airbag unit (M sport steering wheel) or after a possible conversion of standard steering wheel and airbag unit to M-sports steering wheel, a software update or a programming/encoding via ISTA must be performed!



- Connect and lock the connector (1) of the airbag unit (2).



- Press the airbag unit further (1) with even pressure in the direction of the arrow into the steering wheel.

  The airbag unit (1) must engage audibly and perceptibly.

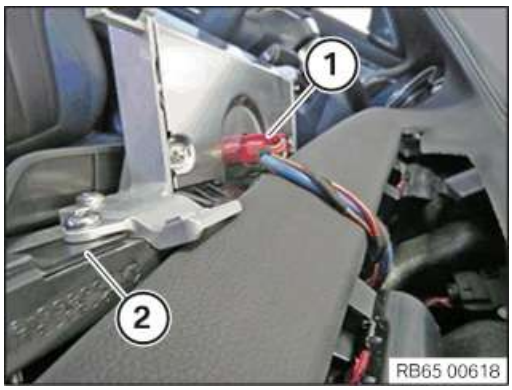
62 – Install the central information display (CID)

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)



- Position Central Information Display (CID) (2).
- Connect plug connection (1) and lock.

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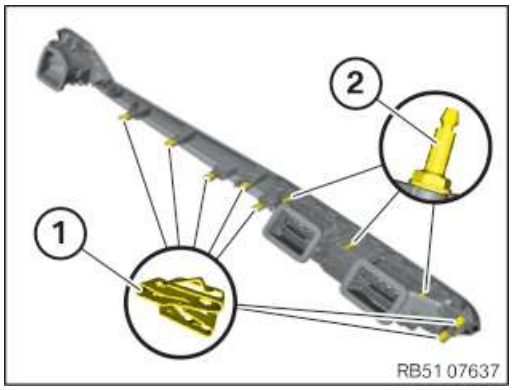


- Insert the central information display (CID) (2) in the instrument panel and position correctly.
- Tighten the screws (1).

Central information display to instrument panel

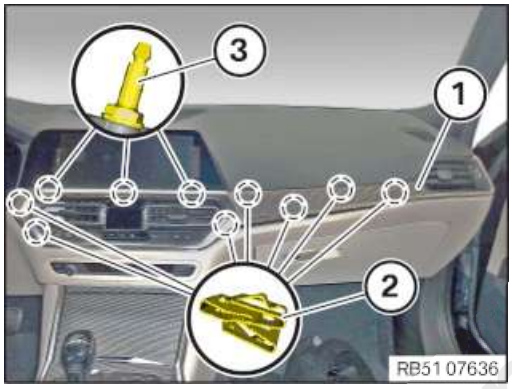
Screw		Tightening torque	2,4 Nm

63 – Install the finisher on the right instrument panel



- Checks clamps (1) for damage.

  Defective or missing clamps (1) need to be renewed.
- Check the pins (2) and the accompanying clamps at the instrument panel trim for damage, renew if necessary.



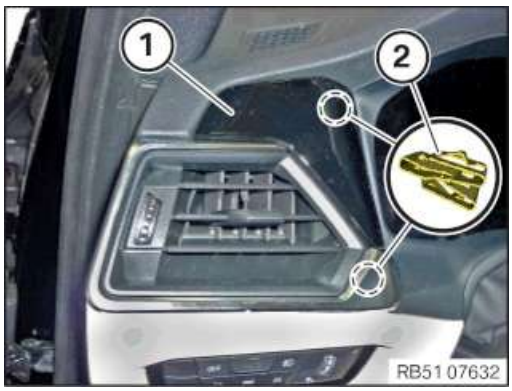
- Install the decorative strip (1).
- Connect and lock corresponding connectors.
- Correctly position the decorative strip (1) and at the clamps (2) and clip in the pins (3).

64 – Install the finisher on the instrument panel on the left



- Check the clamps (1) for damage and that they are present.

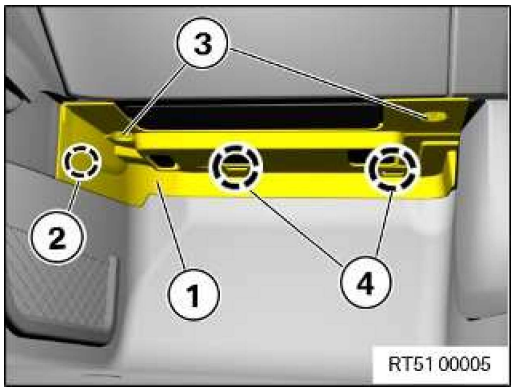
  Damaged or missing clamps (1) must be renewed.



- Install the decorative strip (1).
- Connect and lock the associated connectors.
- Clip decorative strip (1) into clamps (2).

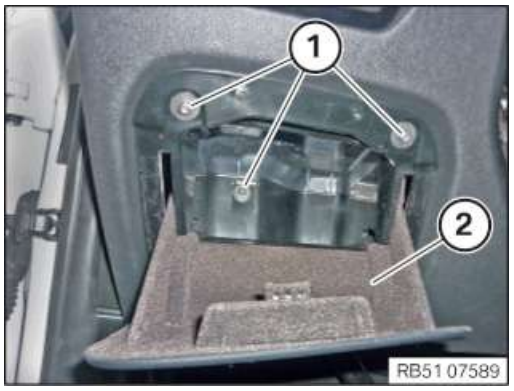
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65 – Install the right footwell trim panel



- Connect associated connector.
- Attach the footwell trim (1) to the guides (4) and fold up.
- Guide the footwell trim (1) into the guide (2) of the centre console.
- Position the locks (3) correctly and turn by 90°.

66 – Installing the left fold-down compartment

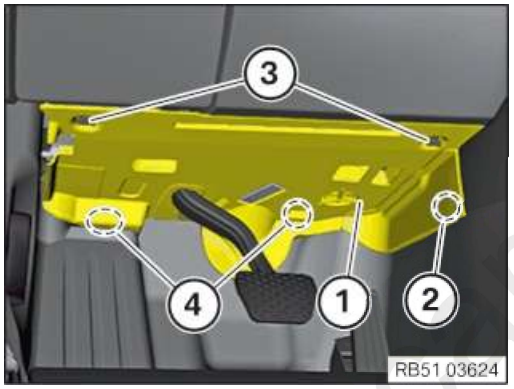


- Install the fold-down compartment (2).
- Tighten the screws (1).

Fold-down compartment to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

67 – Installing the trim panel for the pedal mechanism



- Connect associated connector.
- Attach the trim panel for the pedal mechanism (1) in the guides (4) and fold it up.
- Clip the trim panel for the pedal mechanism (1) into the centre console in this area (2).

TECHNICAL INFORMATION

It is **imperative** that the screws caps of the trim panel be correctly locked. This is the only way to ensure that the trim panel does not come loose and potentially tilt into the pedal area.

- Insert screw caps (3) correctly and turn by 90° to lock.

68 – Install the A-pillar trim panel on the left and right

NOTICE

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

▸ **Installing the A-pillar trim panel**

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WARNING

Pyrotechnic components.

Danger! Life-threatening injuries!

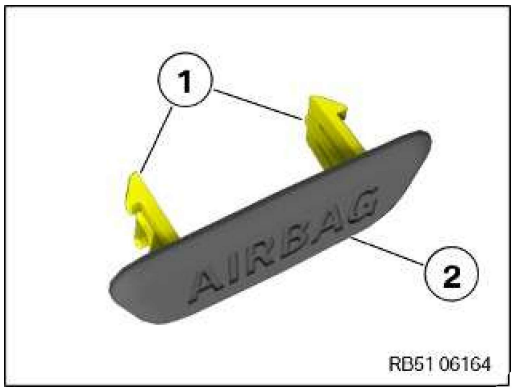
- All work on pyrotechnic parts may be carried out by technically experienced and appropriately trained personnel only.
- Replace any damaged part or ones that have been dropped.
- For additional information see: 72 00 Safety regulations on handling components with gas generators.

RISK OF DAMAGE

Damage to the head airbag.

Improper use of a tool when removing the trim panel may damage the head airbag.

- Do not use sharp-edged tools when removing the trim panel.



Check

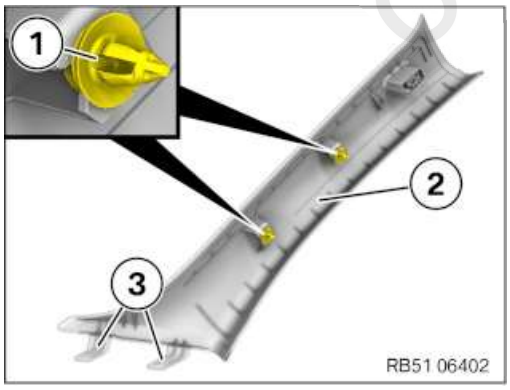
- Check retaining lugs (1) of cover (2) for damage.

Result

» Retaining lug is damaged.

Measure

- Renew the cover.



Check

- Check the clips (1) for damage and renew if necessary.
- Check the guides (3) for damage.

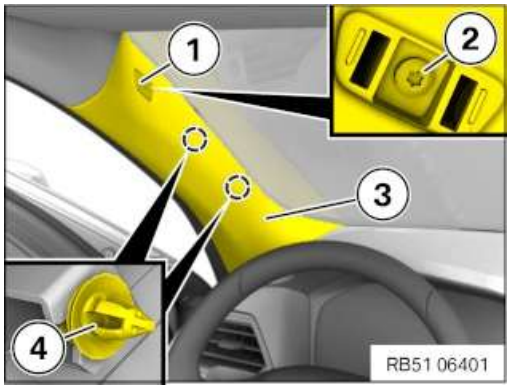
Result

» Guide is damaged.

Measure

- Renew the A-pillar trim panel.

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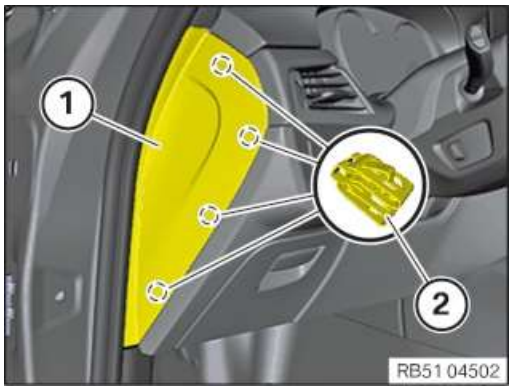
- Guide in A-pillar trim panel (3) downwards and clip it in with clips (4).
- Tighten down screw (2).

A-pillar trim panel to body

Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

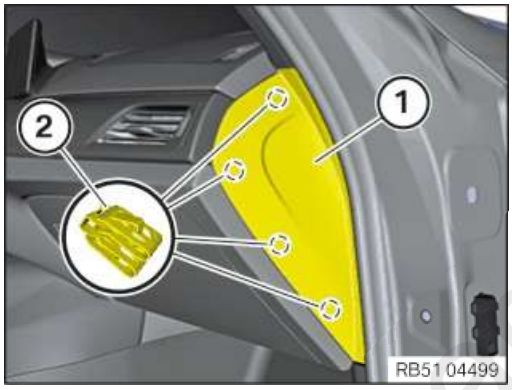
- Clip in the cover (1).

69 – Install the side panel on left instrument panel



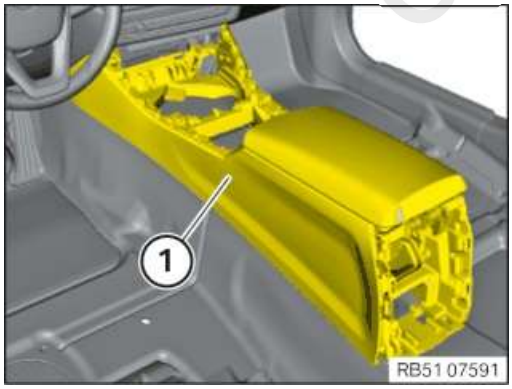
- Feed in the side panel (1) and clip it in at the clamps (2).

70 – Install the side panel on instrument panel on the right



- If required, connect the associated connector.
- Feed in the side panel (1) and clip it in at the clamps (2).

71 – Installing the centre console

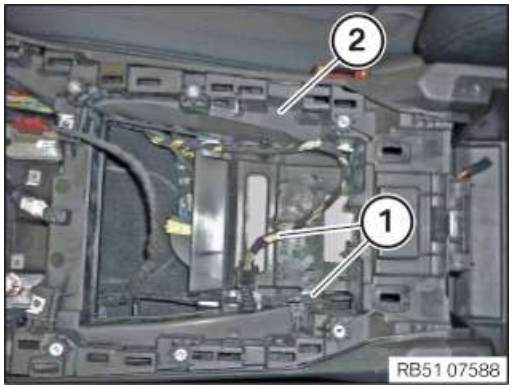


NOTICE

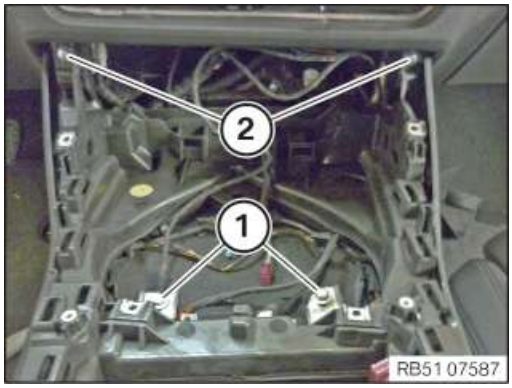
To provide a better overview: Schematic diagram with partially hidden components.

- Install centre console (1) and thereby feed in the wiring harness.
- Feed in the centre console (1) to the instrument panel and position correctly.

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- Secure the wiring harness to the centre console (1) and connect and lock the existing plug connections.



- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

- Tighten the screws (2).

Centre console to instrument panel

Oval-head screw		Tightening torque	1,8 Nm

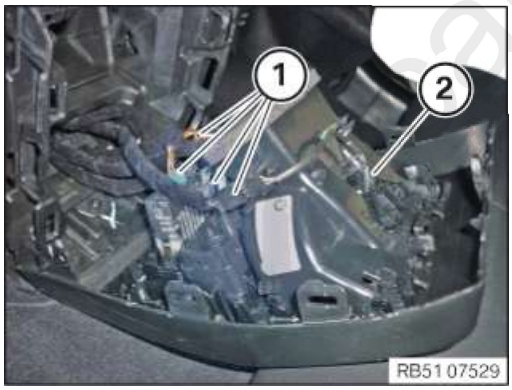


- Tighten the screws (1).

Centre console on tunnel

M6x18 Hexagon screw		Tightening torque	4,6 Nm

72 – Installing the rear centre console trim



- Install the centre console trim (2).
- Connect connectors (1) and lock.

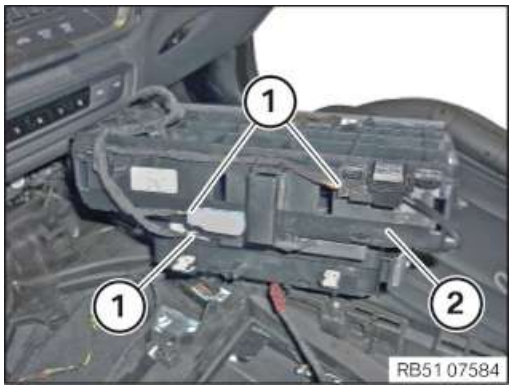


- Position centre console trim (1) and engage at the latch mechanisms at the side.

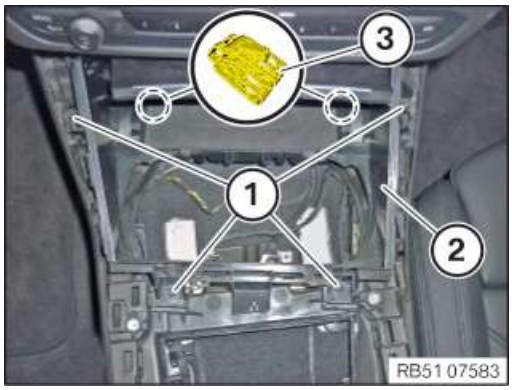
73 – Installing the storage compartment in the centre console in the front

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73 – Installing the storage compartment in the centre console in the front



- Mount the storage compartment in the centre console in the front (2) and connect and lock connectors (1).

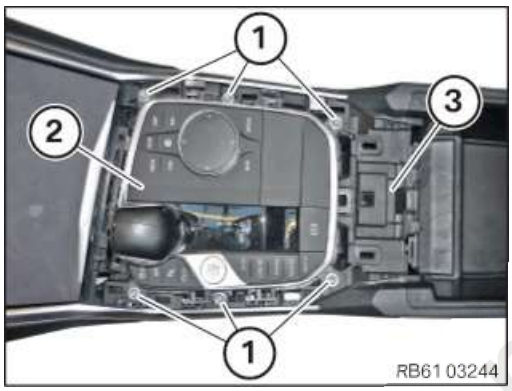


- Engage the storage compartment in the centre console in the front (2) into clamps (3) in the rear.
- Tighten the screws (1).

Storage compartment in centre console

Oval-head screw		Tightening torque	1,8 Nm

74 – Install the operating facility in the centre console



- Position the operating facility (2) in the centre console (3).
- Tighten the screws (1).

Gear selector switch to centre console trim

Screw		Tightening torque	1,8 Nm

▸ **Connecting all battery earth leads**



- See additional information.

▸ **Activating the 48 V electrical system**

Prerequisite

Ignition is switched off.

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RISK OF DAMAGE

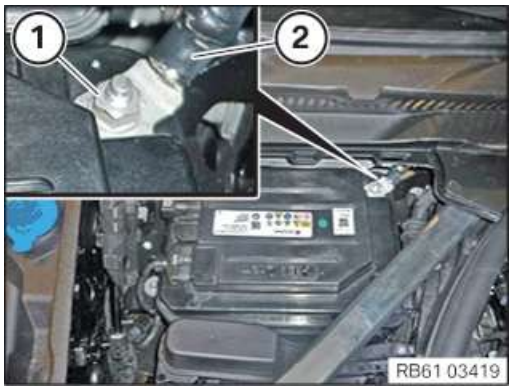
Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.



- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



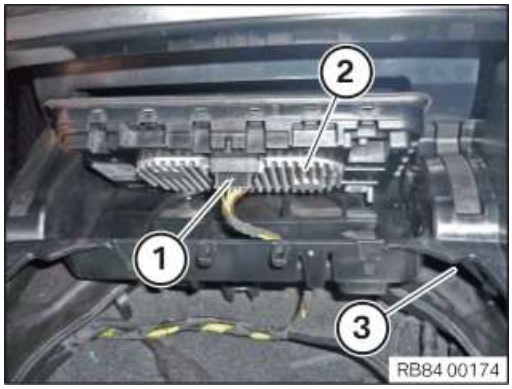
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



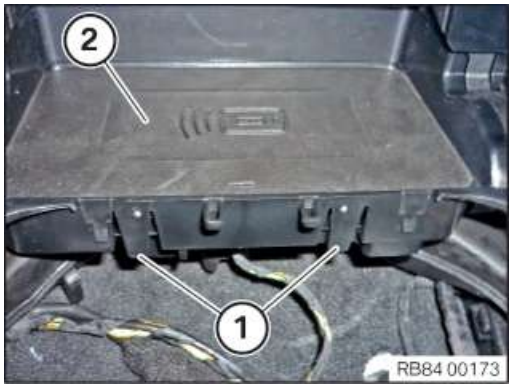
- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

75 – Installing the wireless charging station



- Connect connectors (1) and lock.
- Position the wireless charging station (2) in the centre console (3).



- Push the wireless charging tray (2) down.

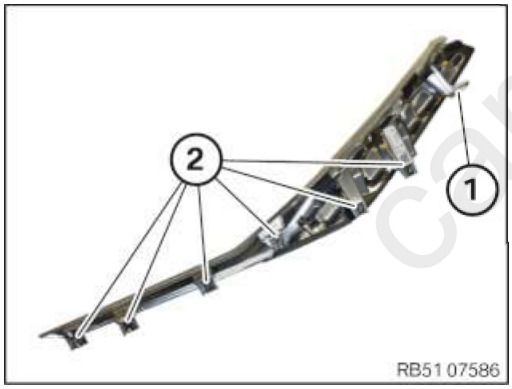
  The latch mechanisms (1) must engage correctly.

76 – Installing the decorative trim on the centre console on the left and right

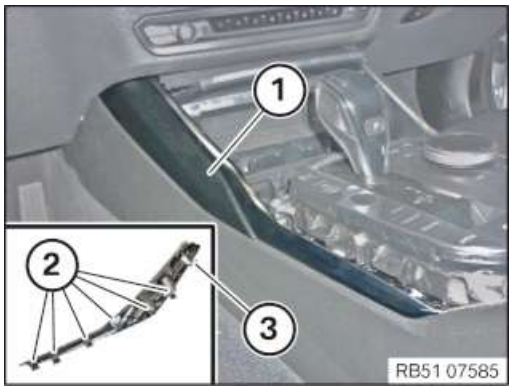
▸ **Installing the decorative trim on the centre console**

NOTICE

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



- Check the guide (1) and the latch mechanisms (2) for damage, renew the decorative trim if necessary.



- Feed in the decorative trim (1) forward in the guide (3).
- Engage decorative trim (1) in latch mechanisms (2).

77 – Installing the centre console trim

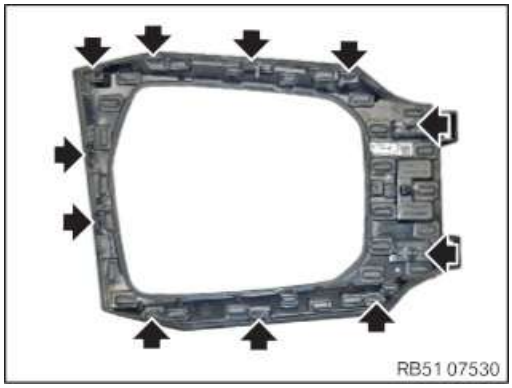
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RISK OF DAMAGE

Careless handling of tools and sharp-edged components.

Scratch, surface damage.

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

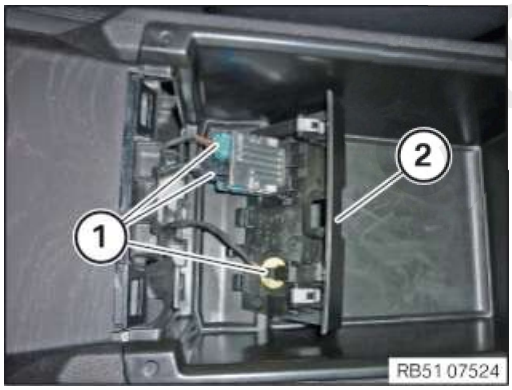


- Check all the latch mechanisms or clamps (arrows).
- In case the latch mechanisms or the clamps (arrows) are faulty, renew the centre console trim .

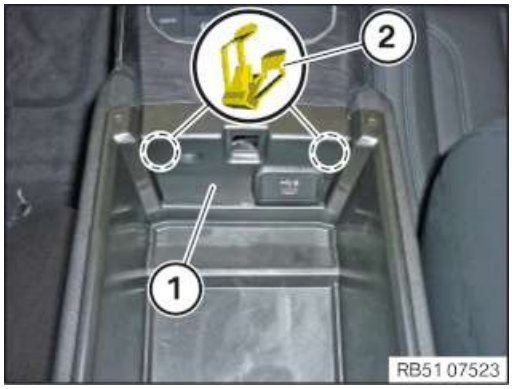


- Correctly position the centre console trim (1) and engage at the latch mechanisms.

78 – Installing the trim in the storage compartment of the centre armrest



- Mount the trim (2) and connect connector (1) and lock.



- Correctly position trim (1) and snap into the clamps (2).

79 – Install the cup holder



- Fix the cup holder (2) and the belonging connectors.
- Correctly position the cup holder (2).
- Tighten the screws (1).

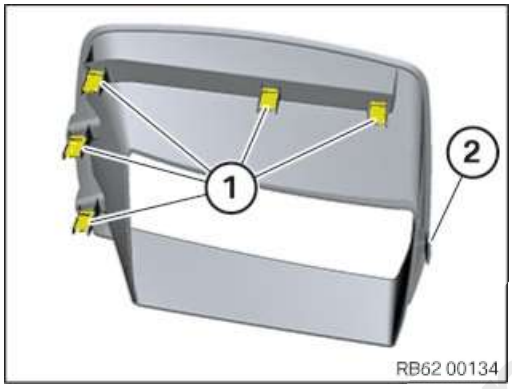
Cup holder to centre console

Oval-head screw		Tightening torque	1,8 Nm

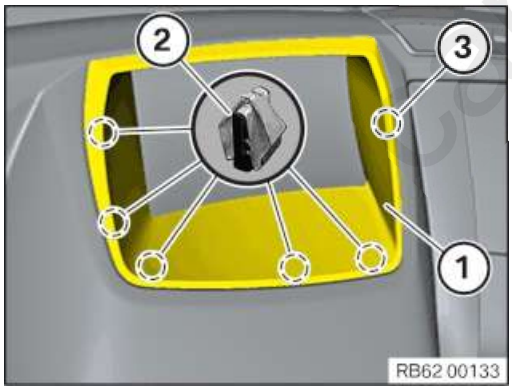


- Insert the insert (1).

80 – Installing the trim for the Head-Up Display

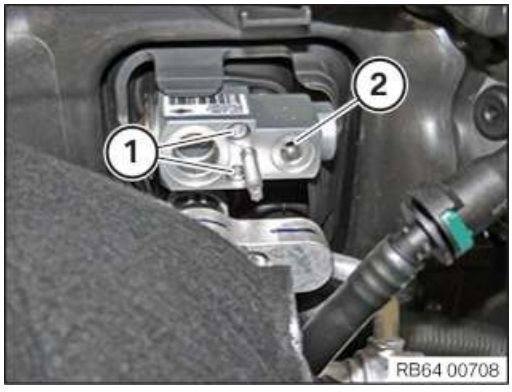


- Check clamps (1) and the latch mechanism (2) for damage, renew if necessary.



- Correctly position the trim (1) for the BMW Head-Up Display and engage it on the clamps (2) and the retaining lug (3).

81 – Install expansion valve



- Renew O-rings.

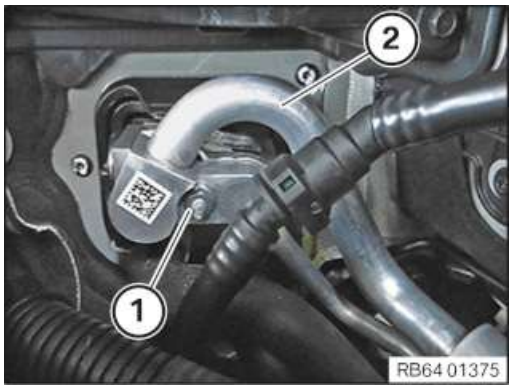
  Parts: O-rings
- Correctly position the expansion valves (2).
- Tighten the screws (1).

Expansion valve to heater - A/C

M5		Tightening torque	5.5 Nm

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82 – Connect the refrigerant line to the expansion valve



- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

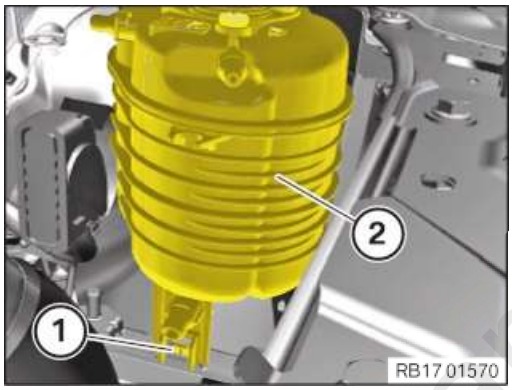
Refrigerant line to expansion valve / connecting piece

M6		Tightening torque	13 Nm



- Close the holder (1).

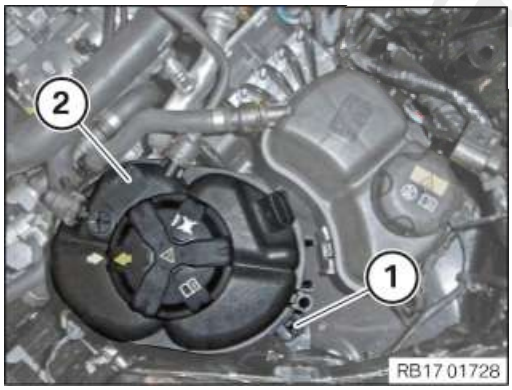
83 – Install coolant expansion tank of high-temperature coolant circuit, partially



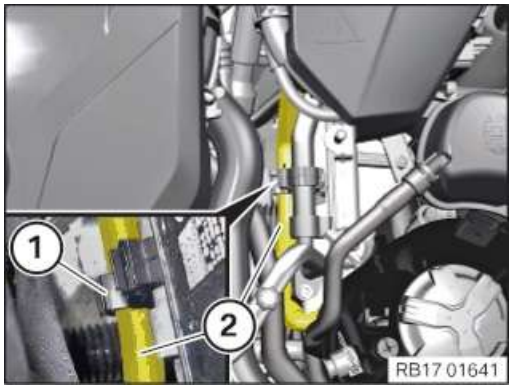
NOTICE

To provide a better overview: Schematic diagram with partially hidden components.

- Correctly feed coolant expansion tank (2) in.
- Lock the lock (1).



- Correctly position coolant expansion tank (2).
- Lock the lock (1).



- Feed in coolant line (2) and position.
- Lock holder (1).

84 – Fasten the refrigerant line on the connecting piece



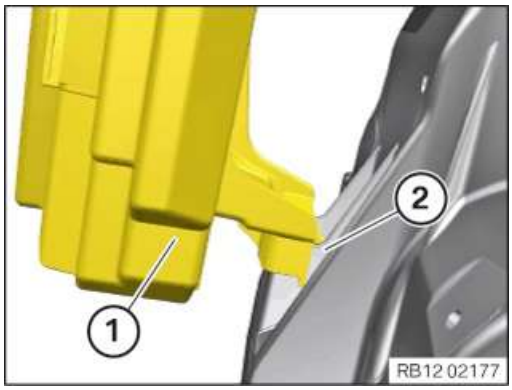
- Renew the sealing ring.

  Parts: Sealing ring
- Correctly position the refrigerant line (2).
- Tighten down screw (1).

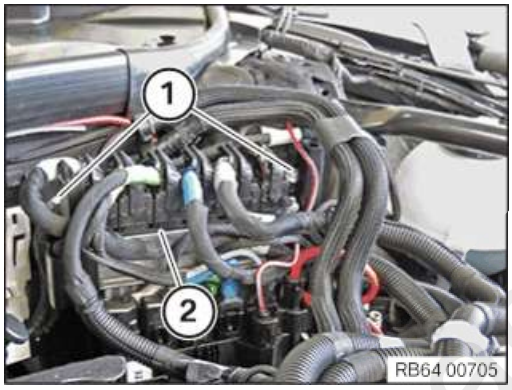
Refrigerant line to connecting piece

M8		Tightening torque	19 Nm

85 – Fastening control unit holder



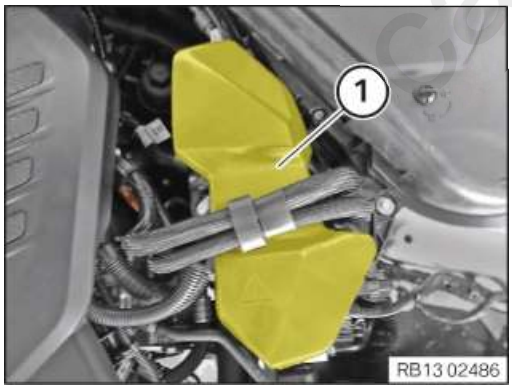
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Position the control unit holder together with the control units (2) and position correctly.
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



- Insert and install cover (1) into guides.

86 – Install acoustic cover

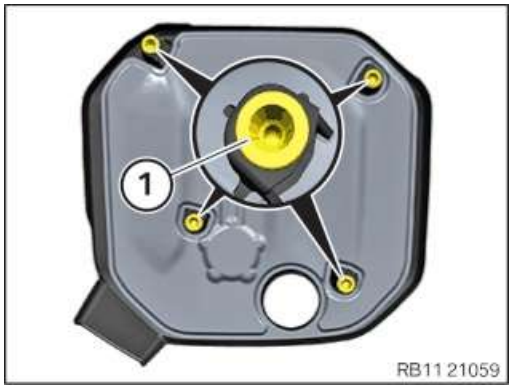
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RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

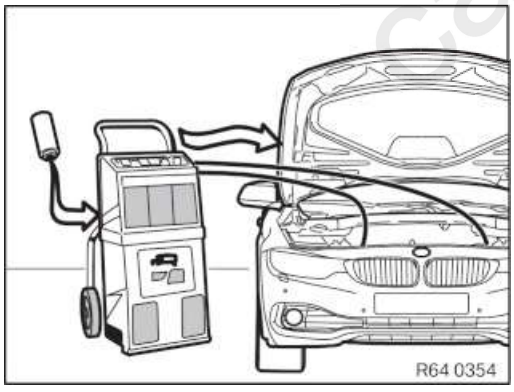


- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

87 – Evacuate and fill air conditioning



- See additional information.

88 – Fill and bleed the coolant circuit

▸ **Filling and bleed the high-temperature coolant circuit**

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TECHNICAL INFORMATION

It is **mandatory** to fill the cooling system before bleeding.
Fill **both** the circuits for high and low-temperature coolant circuits.

- See additional information.

Additional Information

Overview of Tightening Torques

Heater/air conditioner			Used in step 45
Screw		Tightening torque	1,2 Nm

Heating and air-conditioning unit on the bulkhead			Used in step 46
Oval-head screw		Tightening torque	2,8 Nm

Heating and air-conditioning unit on support			Used in step 47
Nut M6		Tightening torque	4 Nm

Support for instrument panel			Used in step 47
M8 hexagon nut		Tightening torque	21 Nm
Hexagon screw		Tightening torque	21 Nm

Head unit to holder / holder to support			Used in step 47
Screw		Tightening torque	1,8 Nm

Steering column to dashboard support			Used in step 47
M8	Observe tightening sequence.	Tightening torque	21,4 Nm

Head-Up Display to support			Used in step 48
M6x25 screw		Tightening torque	13 Nm

Knee airbag on support structure			Used in step 50
Nut		Tlghtening torque	8 Nm

Dashboard to support			Used in step 52
Screw		Tightening torque	2,4 Nm

Speaker to support / support to instrument panel / support to body			Used in step 53
Screw		Tightening torque	1,8 Nm

Instrument cluster (KOMBI) to support			Used in step 56
Screw		Tightening torque	1,8 Nm

Steering column switch cluster (SZL) on the steering column			Used in step 57
Screw TS5x20		Tightening torque	3 Nm

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Steering wheel to steering column			Used in step 60
M14	Only for a micro-encapsulated screw: Renew screw.	Tightening torque	62,5 Nm

Central information display to instrument panel			Used in step 62
Screw		Tightening torque	2,4 Nm

Fold-down compartment to instrument panel			Used in step 66
Oval-head screw		Tightening torque	1,8 Nm

A-pillar trim panel to body			Used in step 68
Sheet metal screw 4,8x38		Tightening torque	2,6 Nm

Centre console on tunnel			Used in step 71
M6x18 Hexagon screw		Tightening torque	4,6 Nm

Centre console to instrument panel			Used in step 71
Oval-head screw		Tightening torque	1,8 Nm

Storage compartment in centre console			Used in step 73
Oval-head screw		Tightening torque	1,8 Nm

Gear selector switch to centre console trim			Used in step 74
Screw		Tightening torque	1,8 Nm

Negative battery cable to 48-V battery			Used in step 74
Nut M8		Tightening torque	19 Nm

Cup holder to centre console			Used in step 79
Oval-head screw		Tightening torque	1,8 Nm

Expansion valve to heater - A/C			Used in step 81
M5		Tightening torque	5.5 Nm

Refrigerant line to expansion valve / connecting piece			Used in step 82
M6		Tightening torque	13 Nm

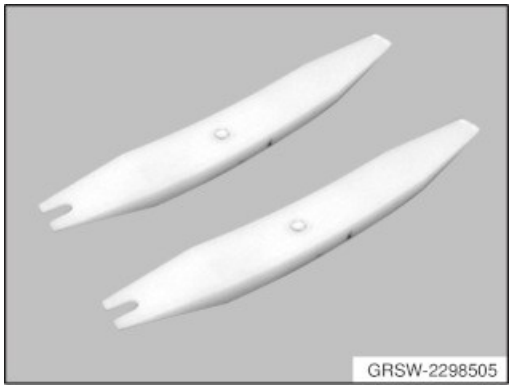
Refrigerant line to connecting piece			Used in step 84
M8		Tightening torque	19 Nm

Control unit holder			Used in step 85
M6		Tightening torque	8 Nm

Overview of Special Tools

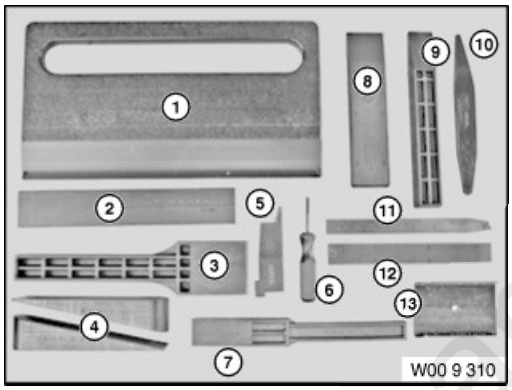
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2 298 505 Wedge



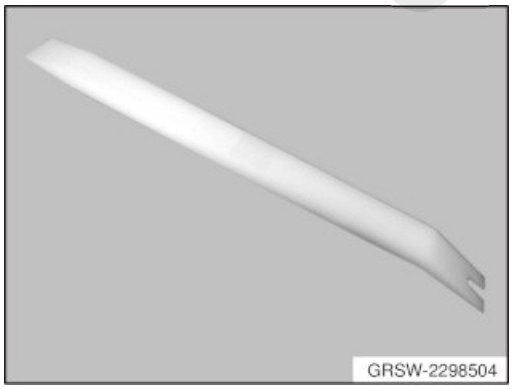
Common	Used in step 1112
Usage	Set (delivery of 2 pieces)
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

0 493 752 (00 9 329) Case



Common	Used in step 21
Usage	(Case) with insert without mounting wedges, delivery while stocks last - as of 02/2019.
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

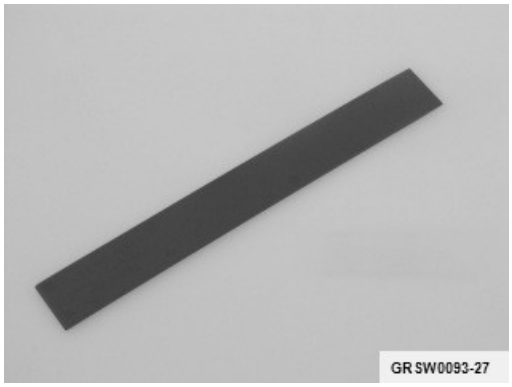
2 298 504 Wedge



Common	Used in step 30
Usage	Wedge with angled lug
Included in the tool or work	
Storage location	C34
Replaced by	
In connection with	
SI-Number	01 03 12 (792)

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0 496 571 (00 9 327) Wedge



Common	Used in step 34
Usage	(Cleaning wedge) From 11/2008 this special tool replaces panel wedge 00 9 323 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	01 07 09 (530)

0 496 569 (00 9 325) Wedge



Common	Used in step 35
Usage	(Panel wedge) From 11/2008 this special tool replaces panel wedge 00 9 317 (different material)
Included in the tool or work	0 490 527
Storage location	Individual
Replaced by	
In connection with	
SI-Number	41 01 09 (507)

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 52 ... Notes for changing the air conditioning compressor, determining the amount of refrigerant oil (amount of refrigerant oil of new air conditioning compressor known)

Note:
This procedure only applies if the **new air conditioning compressor has a label with the amount of refrigerant oil**.

A different procedure applies for air conditioning compressors **without a label indicating the amount of refrigerant oil**.

Caution!
Risk of damage!

Remove the air conditioning compressor without damaging and without the use of force!

Air conditioning compressors with plastic belt pulleys:

- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty air conditioning compressors in their original packaging only and with sealed connected branches.

Caution!
In the event of a mechanical air conditioning compressor failure and the resulting ingress of chips into the refrigerant circuit, replace the following parts:

- Air conditioning compressor
- Air conditioning condenser
- Replace desiccant insert
- Line to the air conditioning condenser
- Refrigerant oil
- all expansion valves

BEV, PHEV:

- Additionally rinse the refrigerant circuit

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All vehicles without I01 with heat pump:

The new air conditioning compressor is filled at the factory with refrigerant oil.

The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

Only I01 with heat pump:

The new air conditioning compressor and new dryer flask are filled at the factory with refrigerant oil.

The amount of refrigerant oil in the new air conditioning compressor and in the new dryer flask corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

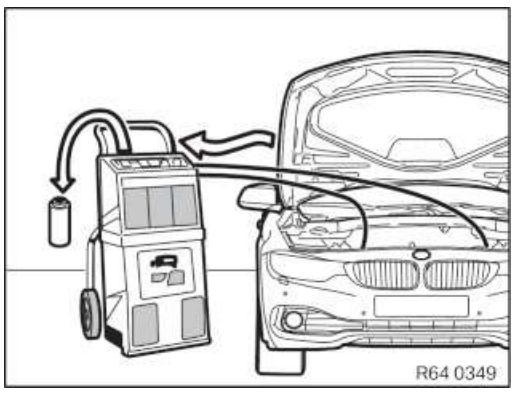
When replacing the air conditioning compressor it is absolutely essential to adapt the amount of refrigerant oil in accordance with the instructions below!

BMW I01with heat pump: An adaptation is also required for the replacement of the dryer flask.

An adaptation of the amount of refrigerant oil is not required in the following cases:

- Replacement of the complete refrigerant circuit
- If the refrigerant circuit was rinsed (only BMW i, PHEV)

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Step 1:

Determination of the amount of refrigerant oil drawn off from the refrigerant circuit:

- Draw off A/C system.
- Note down the amount of refrigerant oil shown on the A/C service station display.

When evacuating the air conditioning refrigerant oil is also extracted and collected in the oil separator of the A/C service station. This amount of refrigerant oil is displayed after the extraction of the air conditioning on the display of the A/C service station.

The refrigerant oil amount specification is located on the label on the air conditioning compressor.

The position of the label can vary depending on the air conditioning compressor.

Information about the amount of refrigerant oil is provided on the label in g, ml or cc.

Ml are specified throughout these repair instructions for adjusting the amount of refrigerant oil, as g or cc closely correspond to ml.

Step 2:

Compare information of amount of refrigerant oil of the present and new air conditioning compressor:

- Read and record amount of refrigerant oil specified on the previous air conditioning compressor.

  (If there is no label, continue with **Step 3, Case 1** .)
- Read and record amount of refrigerant oil specified on the new air conditioning compressor.
- Compare both amounts of refrigerant oil with each other.

Different cases:

1. Amount of refrigerant oil specified on the previous and new air conditioning compressor **is same**. In this case continue with **Step 3, Case 1**.
2. Amount of refrigerant oil specified on the previous and new air conditioning compressor **is not the same**:

   Different cases:

   1. Information of the amount of refrigerant oil on the present air conditioning compressor **is higher** than the information of the amount of refrigerant oil on the new air conditioning compressor:

      Difference is not taken into account. In this case continue with **Step 3, Case 1**.
   2. Information of the amount of refrigerant oil on the present air conditioning compressor **is lower** than the information of the amount of refrigerant oil on the new air conditioning compressor:

      Generate and record the difference between both amounts of refrigerant oil. After that continue with **Step 3, Case 2**.

Example:

Information of the amount of refrigerant oil of present air conditioning compressor 110 g

Information of the amount of refrigerant oil of new air conditioning compressor 150 g

150 g - 110 g = 40 g correspond to almost 40 ml

Note the difference of 40 ml.

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Step 3:

Examine drained refrigerant oil from the removed air conditioning compressor in the measuring cup:

If no refrigerant oil escapes from the removed air conditioning compressor, examine the extracted refrigerant oil in the collecting vessel of the A/C service station.

- There are no shavings in the drained refrigerant oil.

  No additional work required.

- There are shavings in the drained refrigerant oil.

  In addition to the air conditioning compressor, replace the following parts:

- Air conditioning condenser
- Desiccant insert (if individually replaceable, if not air conditioning condenser)
- Line to air conditioning condenser
- Refrigerant oil
- All expansion valves
- BEV, PHEV: Additionally rinse the refrigerant circuit.

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Step 4:

Determination of the amount of refrigerant oil in the new air conditioning compressor:

- Transfer all of the refrigerant oil remaining in the previous air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during the filling process. This allows more refrigerant oil to flow out of the previous air conditioning compressor.
- Read the amount of refrigerant oil at the measuring cup.

Different cases:

Case 1:

- **Add 10 ml precautionary allowance** to the read amount of refrigerant oil**.**
- Note **at least but a total of 50 ml**.

Example:

20 ml read at measuring cup:

20 ml + 10 ml precautionary allowance = 30 ml < 50 ml

determined amount of refrigerant oil for new air conditioning compressor = 50 ml

Case 2:

- Add the **10 ml precautionary allowance** to the read amount of refrigerant oil.
- Add **the difference to that**.
- Note **at least but a total of 50 ml**.

Example:

Difference = 40 ml

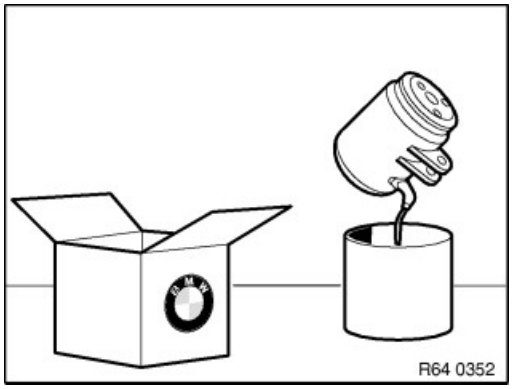
20 ml read at measuring cup:

20 ml + 10 ml precautionary allowance = 30 ml

30 ml + 40 ml difference = 70 ml > 50 ml

determined amount of refrigerant oil for new air conditioning compressor = 70 ml

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Step 5:

Determination of the amount of refrigerant oil to be drained from the new air conditioning compressor:

- Open oil filler plug. Tightening torque 64 52 2AZ.
- Drain the following amount of refrigerant oil from the new air conditioning compressor into a clean measuring cup:

Amount of refrigerant oil to be drained from the new air conditioning compressor = amount of refrigerant oil on the label of the new air conditioning compressor - determined amount of refrigerant oil in the new air conditioning compressor

Example:

Amount of refrigerant oil stated on the label of the new air conditioning compressor: 150 ml

Determined amount of refrigerant oil for new air conditioning compressor: 50 ml

Amount of refrigerant oil to be drained = 150 ml - 50 ml = 100 ml

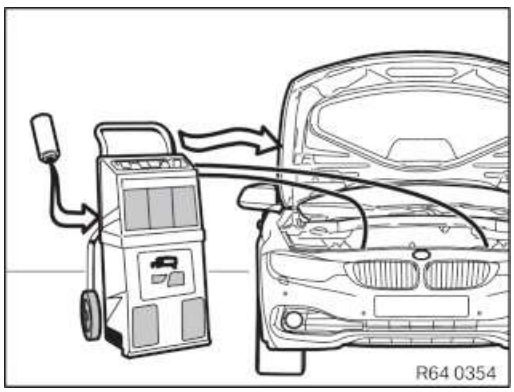
100 ml must be drained from the new air conditioning compressor.

The drained new refrigerant oil can be filled into the expansion tank of the A/C service station after draining.

If the new, drained refrigerant oil is not filled straight away into the expansion tank of the A/C service station, it must be disposed of properly.

On account of its hygroscopic properties, refrigerant oil must not be stored in open collecting vessels.

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Step 6

Fill the refrigerant circuit with the correct amount of refrigerant and refrigerant oil:

- Reassemble the vehicle.
- Evacuate Air conditioning.
- Before filling the air conditioning with refrigerant, again fill in the quantity of refrigerant oil noted in Step 1 as previously drawn off into the system.
- Fill A/C system.

Step 7

Caution!

Risk of damage!

During initial operation of a new air conditioning compressor, it is absolutely essential to carry out the following breaking-in procedure.

Do not exceed idle speed.

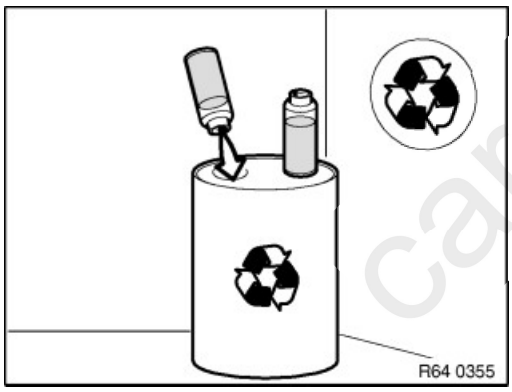
Note:
The running-in procedure for the new air conditioning compressor can either be performed manually or using the diagnosis system.

Manual:

- Switch off the air conditioning.
- Set all ventilation outlets in the instrument panel to "OPEN".
- Start engine and let it stabilise at idle speed.
- Set the blower output to a minimum of 75 % of the maximum blower output.
- Switch on the air conditioning and allow the engine to run at idle speed for a minimum of 2 minutes.

Carry out the following service function with the diagnosis system:

- Body
- Heating and air conditioning functions
- Run-in protection for A/C compressor



Step 8

Dispose off the drawn off refrigerant oil:

- The refrigerant oil drawn off from the oil separator of the A/C service station and from the previous air conditioning compressor **must not be reused and must be correctly disposed of.**

Observe country-specific waste disposal regulations.

Installation note:
If the refrigerant circuit is open for longer than 24 hours:

- Replace desiccant insert

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64 52 523 Replace the air conditioning compressor

CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

RISK OF DAMAGE

External damage to air conditioning compressor.

Excessive force applied during removal will result in damage to the air conditioning compressor.

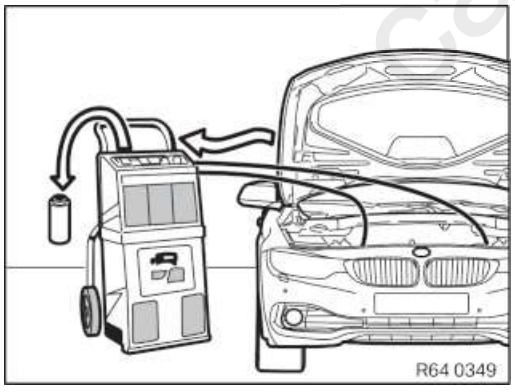
- Remove the air conditioning compressor without damaging it and without applying external force.
- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty air conditioning compressors in their original packaging only.

TECHNICAL INFORMATION

If mechanical failure of the air conditioning compressor occurs resulting in chips entering the refrigerant circuit, replace the following parts: air conditioning compressor, air conditioning condenser with desiccant insert, line to air conditioning condenser and refrigerant oil.

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Removing the acoustic cover

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RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

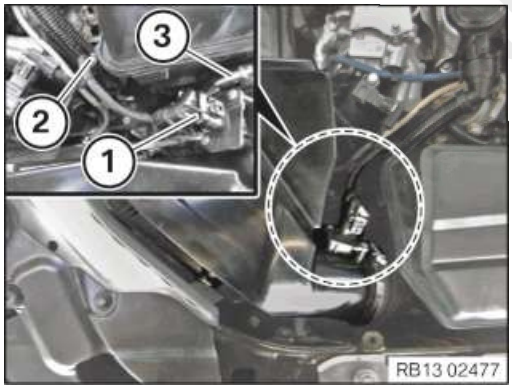
3 – Removing the clean air pipe with the resonator

WARNING

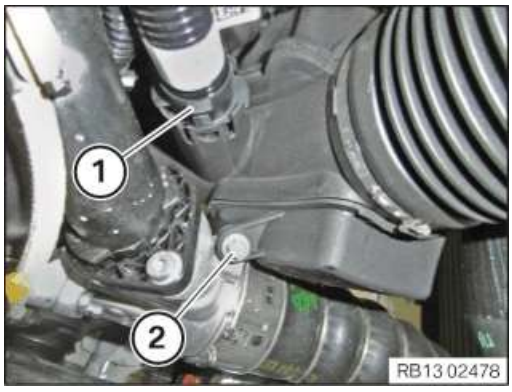
Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.

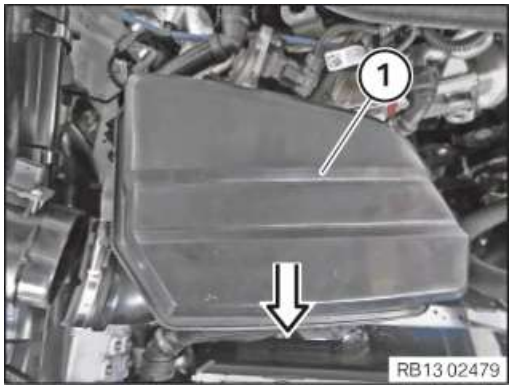


- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).

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- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

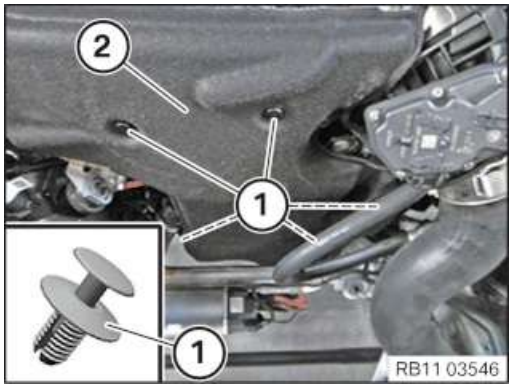
4 – Remove acoustic cover of the front engine

WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

5 – Removing the drive belt for the starter motor generator

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CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

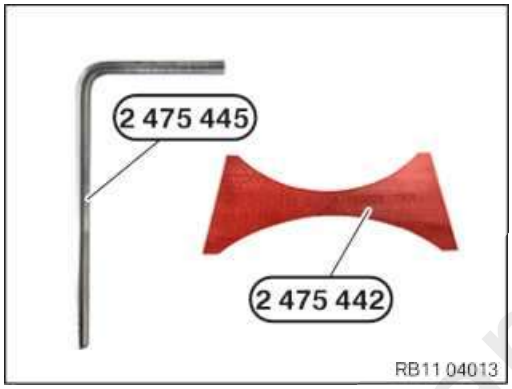
Component with preload.

Danger of injury!

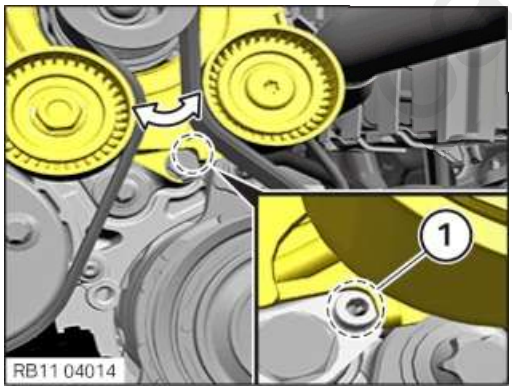
- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

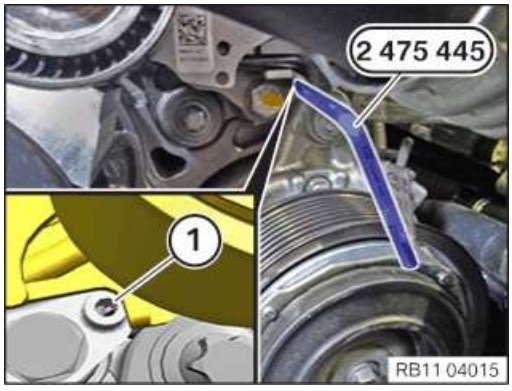
The drive belt must be replaced if contaminated with coolant- and oil residues.



- Prepare the special tool 2 475 442 and the special tool 2 475 445.

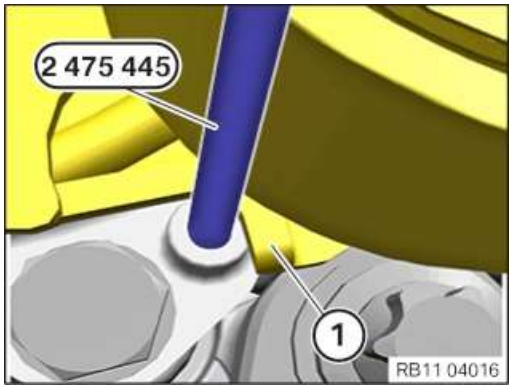


- Position the belt tensioner in the direction of the arrow so that the bore hole is visible in the area (1).

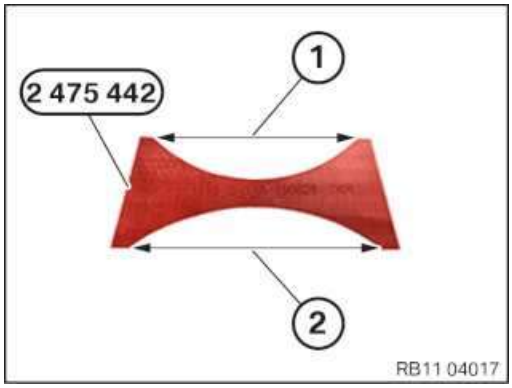


- Guide in the special tool 2 475 445 and install it in the bore hole (1).

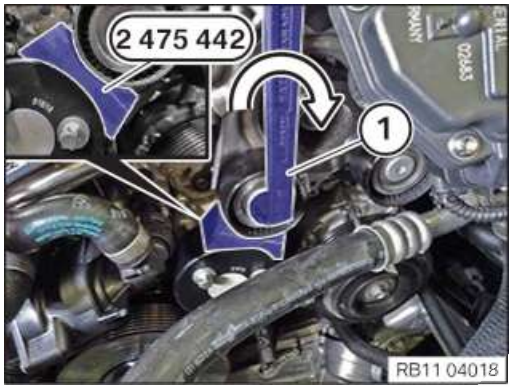
  The special tool 2 475 445 must rest against the starter motor generator.



- Ensure that the belt tensioner (1) is supported on the special tool 2 475 445.



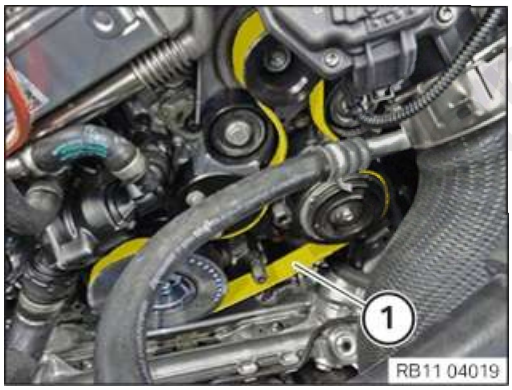
- Ensure that the radius (1) of the special tool 2 475 442 supports the tensioning pulley of the belt tensioner.
- Ensure that the radius (2) of the special tool 2 475 442 is supported on the belt pulley of the coolant pump.



TECHNICAL INFORMATION

Conduct the following operation with the assistance of a second person.

- Twist the tensioning pulley (1) in the direction of the arrow.
- Guide in and install the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

- Guide out and remove the drive belt (1) for the starter motor generator.

MAIN WORK

6 – Removing the air conditioning compressor

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

RISK OF DAMAGE

External damage to air conditioning compressor.

Excessive force applied during removal will result in damage to the air conditioning compressor.

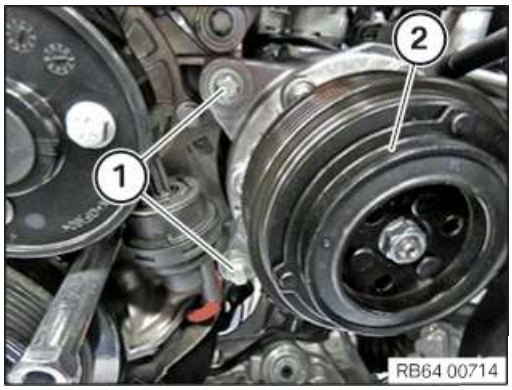
- Remove the air conditioning compressor without damaging it and without applying external force.
- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty air conditioning compressors in their original packaging only.

RISK OF DAMAGE

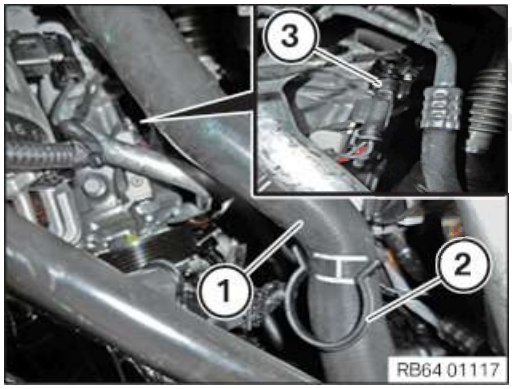
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



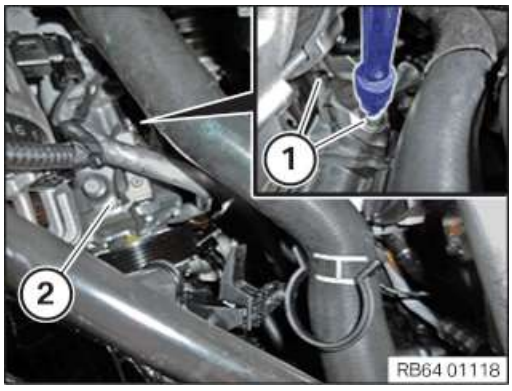
- Release screws (1) on the air conditioning compressor (2).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Take the coolant hose (1) out of the holder (2) and slide it slightly to the side.
- Unlock plug connection (3) and disconnect.



TECHNICAL INFORMATION

Secure component against falling.

- Release the screws (1) and remove the refrigerant lines.
- Feed out and remove air conditioning compressor (2) upfront

7 – Lubricating the air conditioning compressor (amount of refrigerant oil in new air conditioning compressor known)

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TECHNICAL INFORMATION

The new air conditioning compressor is filled with refrigerant oil at the factory. The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

When the air conditioning compressor is replaced, it is essential to adapt the amount of refrigerant oil.

TECHNICAL INFORMATION

The following procedure only applies when the new air conditioning compressor has **a label** with the amount of refrigerant oil.

The refrigerant oil amount specification is located on the label on the air conditioning compressor.

The position of the label can vary depending on the air conditioning compressor.

The refrigerant oil specification on the label is in g, ml or cc.

ml are specified throughout these repair instructions for adjusting the amount of refrigerant oil, as g and cc closely correspond to ml.

- **Step 1**
- Read and note the amount of refrigerant oil on the removed air conditioning compressor.

  (If no label is present, continue with **step 3, case 1**.)
- Read and record amount of refrigerant oil specified on the new air conditioning compressor.
- Compare both amounts of refrigerant oil with each other:

  Different cases:

  - Amount of refrigerant oil on the removed and new air conditioning compressor **is same**. In this case, continue with **step 3, case 1**.
  - Amount of refrigerant oil on the removed and new air conditioning compressor **is not the same**:

  Different cases:

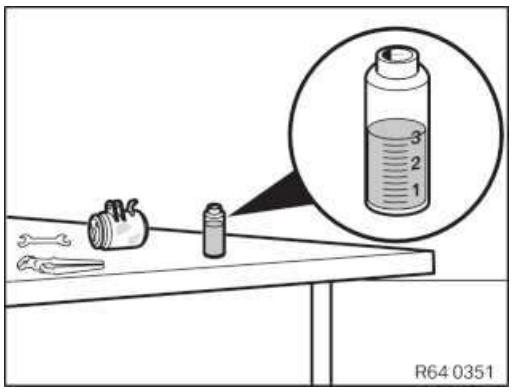
  - Amount of refrigerant oil on the removed air conditioning compressor **is higher** than on the new air conditioning compressor. Difference is not taken into account. In this case, continue with **step 3, case 1**.
  - Amount of refrigerant oil on the removed air conditioning compressor **is lower** than on the new air conditioning compressor: Generate and record the difference between both amounts of refrigerant oil. Then, continue with **step 3, case 2** .

Example:
Amount of refrigerant oil *on removed* air conditioning compressor 110 g
Amount of refrigerant oil specified on the *new* air conditioning compressor 150 g
150 g - 110 g = 40 g approximately 40 ml
Record the difference 40 ml.

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- **Step 2**
- **Mechanical air conditioning compressor (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Completely drain the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the **high-pressure connection and low pressure connection**.



- **Step 3**
- *Inspect the refrigerant oil drained from the removed air conditioning compressor in the measuring cup.*

  If no refrigerant oil escapes from the removed air conditioning compressor, inspect the extracted refrigerant oil in the collecting vessel of the A/C service station.
- No swarf is present in the drained refrigerant oil.

  Additional work is not necessary.
- Swarf is present in the drained refrigerant oil.

  In addition to the air conditioning compressor, replace the following parts:

  - Air conditioning condenser

  - Desiccant insert (if it can be replaced individually, if not air conditioning condenser)

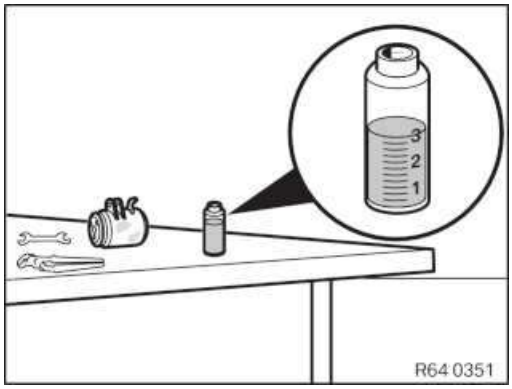
  - Line to the air conditioning condenser

  - Refrigerant oil

  - all expansion valves

  - BEV, PHEV: In addition, flush the refrigerant circuit.

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- **Step 4**
- Read the drained amount of refrigerant oil from the removed air conditioning compressor on the measuring cup.

Case 1:

- Add **10 ml extra to the amount of refrigerant oil read as a precautionary allowance.**
- Record **at least but a total of 50 ml**.

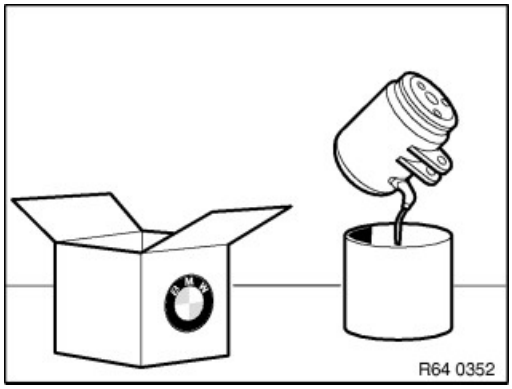
Example:
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml < 50 ml
determined amount of refrigerant oil for new air conditioning compressor = 50 ml

Case 2:

- Add **10 ml extra to the amount of refrigerant oil read as a precautionary allowance.**
- To this **add the difference**.
- Record **at least but a total of 50 ml**.

Example:
Difference = 40 ml
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml
30 ml + 40 ml difference = 70 ml > 50 ml
Amount of refrigerant oil determined for the new air conditioning compressor = 70 ml

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- **Step 5**
- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Open the oil filler plug.
- Drain the amount of refrigerant oil specified in the table from the **new** air conditioning compressor into a clean measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (new):**
- Remove the dummy plugs from the high-pressure connection.
- Drain the amount of refrigerant oil specified in the table from the **new** air conditioning compressor into a clean measuring cup via **high-pressure connection**.

Amount of refrigerant oil to be drained from the new air conditioning compressor = amount of refrigerant oil on the label for the new air conditioning compressor - amount of refrigerant oil determined for the new air conditioning compressor

Example:
Amount on the new air conditioning compressor refrigerant oil label: 150 ml
Amount of refrigerant oil determined for new air conditioning compressor: 50 ml
Amount of refrigerant oil to be drained = 150 ml - 50 ml = 100 ml
100 ml must be drained from the **new** air conditioning compressor

- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Renew the sealing ring.
- Tighten oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Seal the high-pressure connection with dummy plug.



- The drained, new refrigerant oil must be filled into the A/C service station expansion tank **immediately** after draining.
- Drained, new refrigerant oil must be disposed of correctly if it is not immediately refilled into the A/C service station expansion tank.
- Refrigerant oil drained from the previous air conditioning compressor **must not be reused and must be disposed of correctly**.

8 – Lubricating the air conditioning compressor (amount of refrigerant oil in new air conditioning compressor not known)

TECHNICAL INFORMATION

The new air conditioning compressor is filled with refrigerant oil at the factory. The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

When the air conditioning compressor is replaced, it is essential to adapt the amount of refrigerant oil.

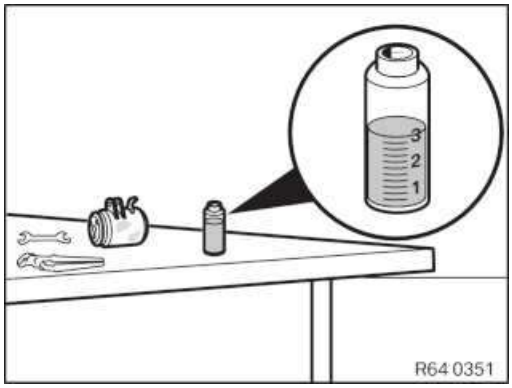
TECHNICAL INFORMATION

The following procedure only applies if the new air conditioning compressor **has** a label indicating the amount of refrigerant oil.

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- **Mechanical air conditioning compressor (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Completely drain the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the **high-pressure connection and low pressure connection**.



- *Inspect the refrigerant oil drained from the removed air conditioning compressor in the measuring cup.*

  If no refrigerant oil escapes from the removed air conditioning compressor, inspect the extracted refrigerant oil in the collecting vessel of the A/C service station.
- No swarf is present in the drained refrigerant oil.

  Additional work is not necessary.
- Swarf is present in the drained refrigerant oil.

  In addition to the air conditioning compressor, replace the following parts:

  - Air conditioning condenser

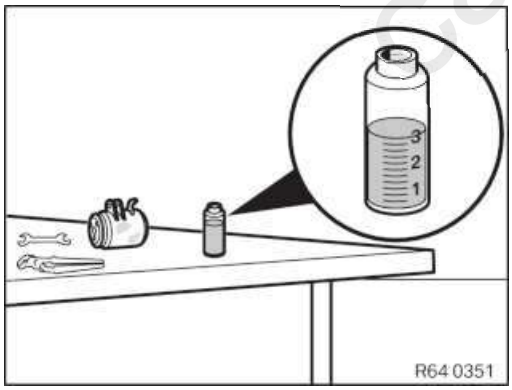
  - Desiccant insert (if it can be replaced individually, if not air conditioning condenser)

  - Line to the air conditioning condenser

  - Refrigerant oil

  - all expansion valves

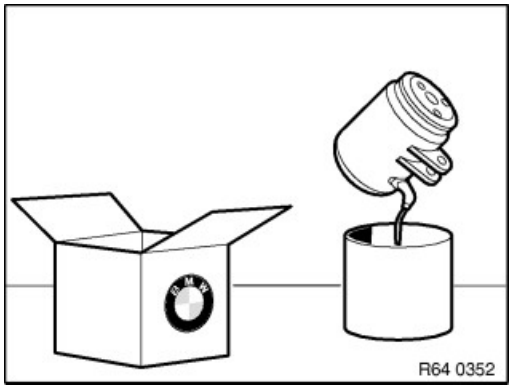
  - BEV, PHEV: In addition, flush the refrigerant circuit.



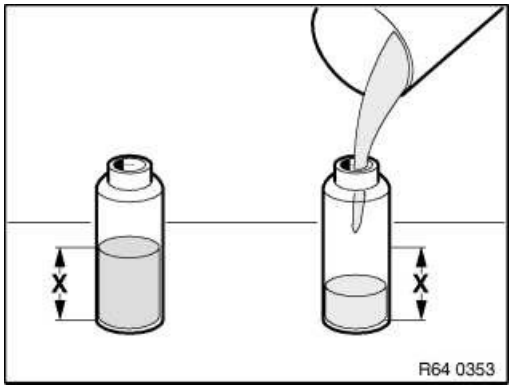
- Read the drained amount of refrigerant oil from the **removed** air conditioning compressor on the measuring cup.
- Add **10 ml extra to the recorded amount of refrigerant oil as a precautionary allowance, but record at least a total of 50 ml.**

Example:
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml < 50 ml
Amount of refrigerant oil to be filled in the new air conditioning compressor = 50 ml

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- **Mechanical air conditioning compressor (new):**
- Open the oil filler plug.
- Drain the full amount of refrigerant oil from the **new** air conditioning compressor into a **clean** collecting vessel.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (new):**
- Open the oil filler plug.
- Drain the full amount of refrigerant oil from the **new** air conditioning compressor into a **clean** collecting vessel.
- **Electric A/C compressor without oil filler plug (new):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Drain the full amount of refrigerant oil from **new** air conditioning compressor into a **clean** collecting vessel via the **high-pressure connection and low pressure connection**.



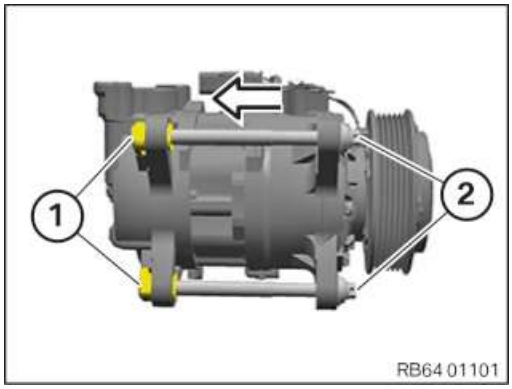
- **Immediately after draining,** fill the amount of refrigerant oil to be filled from the collecting vessel into a **clean** measuring cup.
- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Fill the amount of refrigerant oil to be filled from the measuring cup into the **new** air conditioning compressor via oil filler plug.
- Renew the sealing ring.
- Tighten oil filler plug.
- **Electric A/C compressor without oil filler plug (new):**
- Fill the amount of refrigerant oil to be filled from the measuring cup into the **new** air conditioning compressor via the **low pressure connection**.
- Seal the high-pressure connection and low pressure connection with a dummy plug.



- **Immediately** after draining, the remaining, new refrigerant oil must be filled into the A/C service station expansion tank.
- The remaining, new refrigerant oil must be disposed of correctly if it is not immediately filled into the expansion tank of the A/C service station.
- Refrigerant oil drained from the removed air conditioning compressor **must not be reused and must be disposed of correctly**.

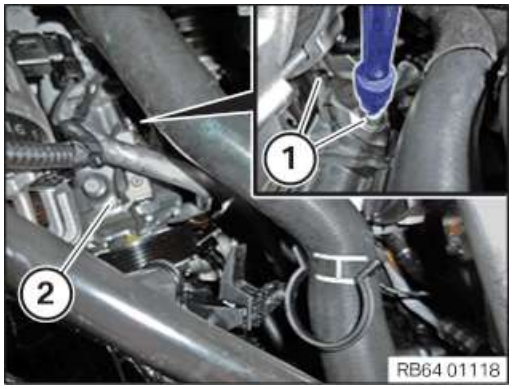
9 – Installing air conditioning compressor

▸ **Prepare for the installation of the air conditioning compressor**



- Screw the screws (2) in the threaded support sleeves (1).
- Slightly press back the threaded support sleeves (1) with the help of screws (2) in the direction of arrow.
- Screw the screws (2) out of the threaded support sleeves (1) once again.

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TECHNICAL INFORMATION

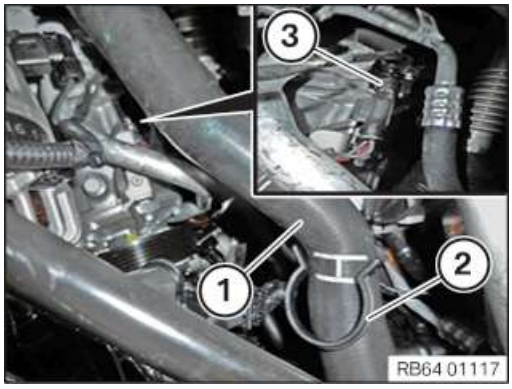
Secure component against falling.

- Renew O-rings.

  Parts: O-rings
- Install in and position the air conditioning compressor (2) from front above.
- Correctly position the refrigerant lines on the air conditioning compressor (2).
- Tighten the screws (1).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm

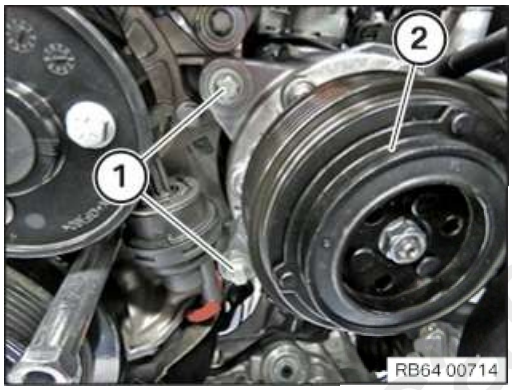


- Slide the coolant hose (1) slightly to the side.
- Connect connectors (3) and lock.

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Position coolant hose (1) correctly and hook it into holder (2).



- Correctly position the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm

POSTPROCESSES

10 – Installing the drive belt for the starter motor generator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

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CAUTION

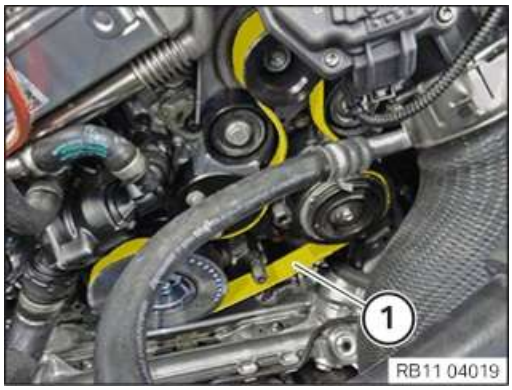
Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

TECHNICAL INFORMATION

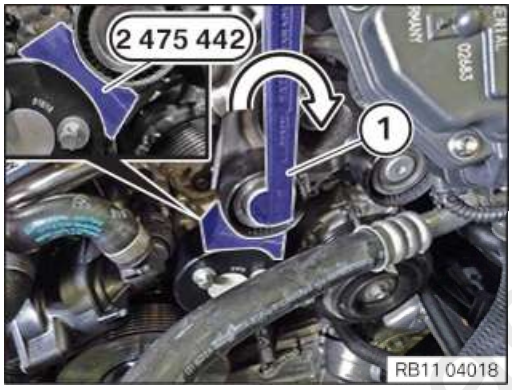
The drive belt must be replaced if contaminated with coolant- and oil residues.



TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

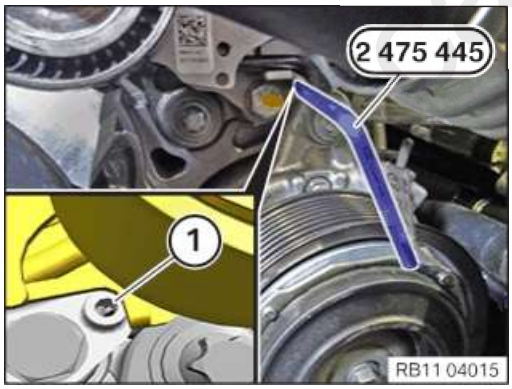
- Feed in and install the drive belt (1) for the starter motor generator.



TECHNICAL INFORMATION

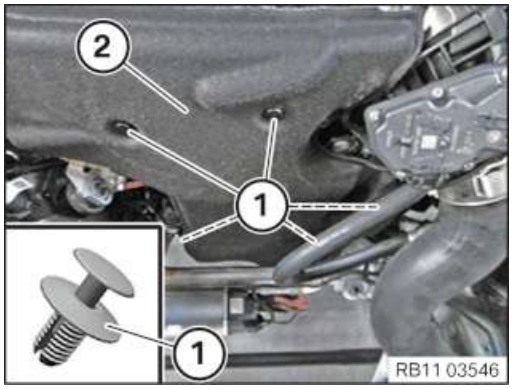
Conduct the following operation with the assistance of a second person.

- Turn the tensioning pulley in (1) in the direction of arrow.
- Feed out the special tool 2 475 442 between the belt pulley of the coolant pump and the tensioning pulley and remove it.



- Feed out the special tool 2 475 445 from the bore hole (1) and remove it.

11 – Install acoustic cover for the engine, front

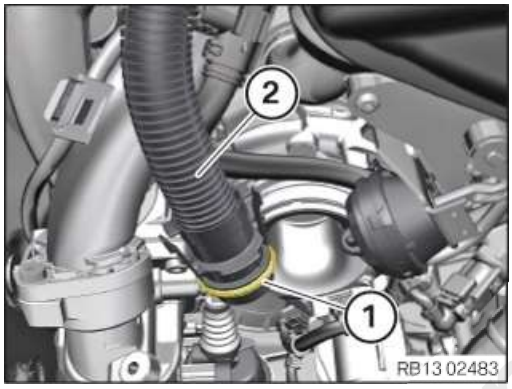


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

12 – Installing the clean air pipe with resonator



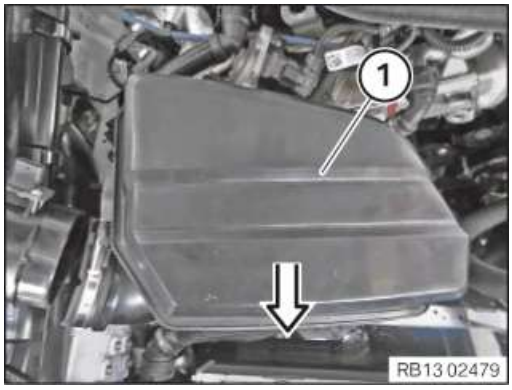
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



- Feed in and install clean air pipe with resonator (1) in the direction of the arrow.



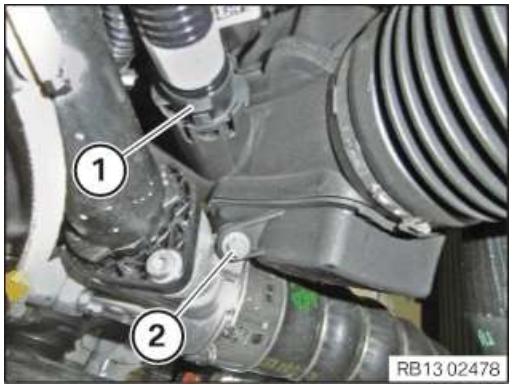
- Press and hold clean air pipe with resonator (1) in the direction of the arrow.

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- Attach and lock the clamp (1).

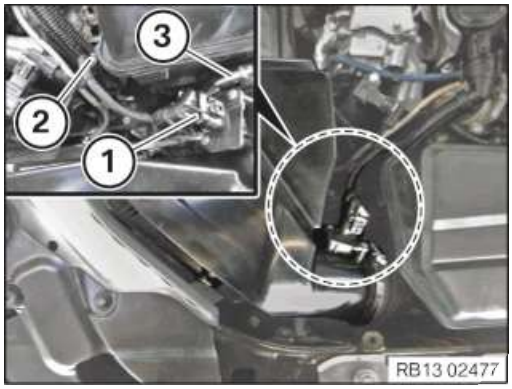
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

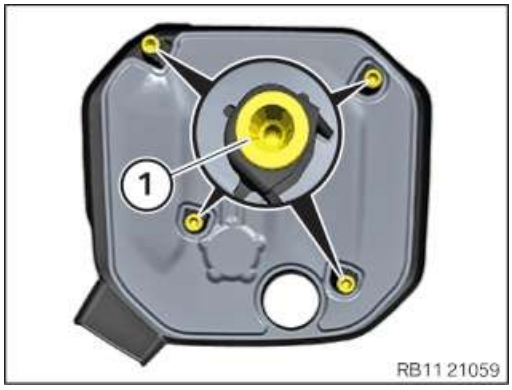
13 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



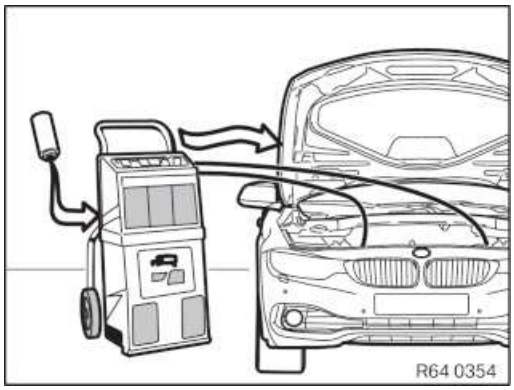
- Check the acoustic cover for correct fit of the rubber mounts (1).

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- Clip in the acoustic cover (1) into the holders in the indicated areas.

14 – Evacuate and fill air conditioning



- See additional information.

15 – Running in the new air conditioning compressor

RISK OF DAMAGE

Mechanical damage to the new air conditioning compressor.

An increased quantity of refrigerant oil in the new air conditioning compressor can cause mechanical damage.

- Perform the running-in procedure.
- Do not exceed the idle speed during running in.

TECHNICAL INFORMATION

The running-in procedure for the new air conditioning compressor can either be performed manually or using the diagnosis system.

- **Manual:**
- Switch off the air conditioning.
- Set all ventilation outlets in the instrument panel to "OPEN".
- Start the engine and allow the idle speed to stabilise.
- Set the blower output to a minimum of 75% of the maximum blower output.
- Switch on the air conditioning and allow the engine to run at **idle speed** for a **minimum of 2 minutes**.
- Switch off the air conditioning and blower.
- Stop engine.

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- **Carry out the following service function with the diagnosis system:**
  - Body
  - Heating and air conditioning functions
  - Run-in protection for A/C compressor

Additional Information

Overview of Tightening Torques

Refrigerant line on air conditioning compressor			Used in step 9
M8		Tightening torque	19 Nm

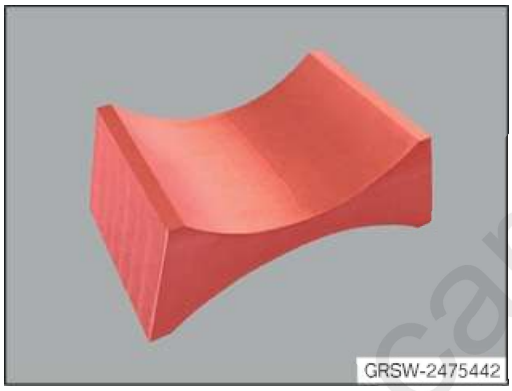
Air conditioning compressor in component carrier			Used in step 9
M10		Tightening torque	38 Nm

Clean air pipe to exhaust turbocharger			Used in step 12
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 12
Clamp		Tightening torque	3 Nm

Overview of Special Tools

2 475 442 Removal and installation tool



Common	Used in step 510
Usage	For removing and installing the drive belt of the ancillary components.
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475445
SI-Number	01 19 19 (668)

2 475 445 Pin



Common	Used in step 510
Usage	Tool for drive belt of 48 V ancillary components
Included in the tool or work	
Storage location	A8
Replaced by	
In connection with	83302475442 83302475444
SI-Number	01 19 19 (668)

Links

General repair instructions	**Used in step**
64 52 ... Instructions for opening and part exchange in refrigerant circuit	114

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Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	114
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	114
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	114
64 50 ... Notes on repairs to air conditioning	114
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	114
64 50 ... Safety information for handling refrigerant R1234yf	114
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	114
64 50 ... Safety informations for handling refrigerant oil	114

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64 52 523 Replace the air conditioning compressor

CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

RISK OF DAMAGE

External damage to air conditioning compressor.

Excessive force applied during removal will result in damage to the air conditioning compressor.

- Remove the air conditioning compressor without damaging it and without applying external force.
- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty air conditioning compressors in their original packaging only.

TECHNICAL INFORMATION

If mechanical failure of the air conditioning compressor occurs resulting in chips entering the refrigerant circuit, replace the following parts: air conditioning compressor, air conditioning condenser with desiccant insert, line to air conditioning condenser and refrigerant oil.

PRELIMINARY WORK

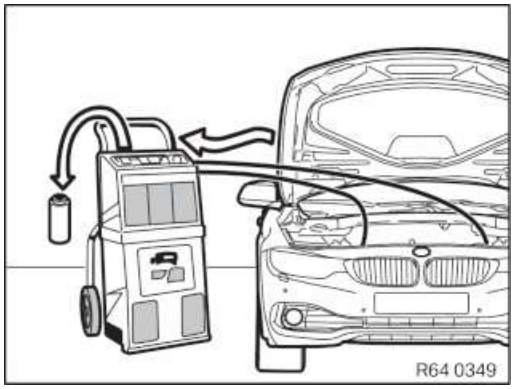
1 – Disconnecting all battery earth leads



- See additional information.

2 – Drawing off the air conditioning

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- See additional information.

3 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

4 – Removing the clean air pipe with the resonator

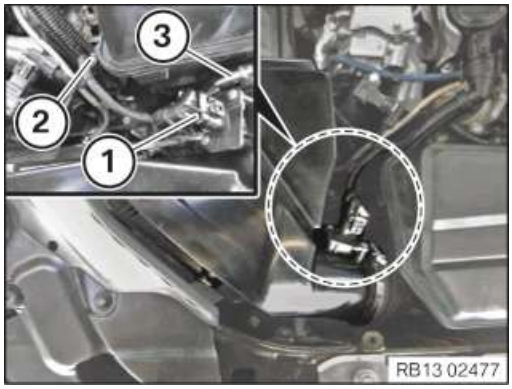
WARNING

Hot surfaces.

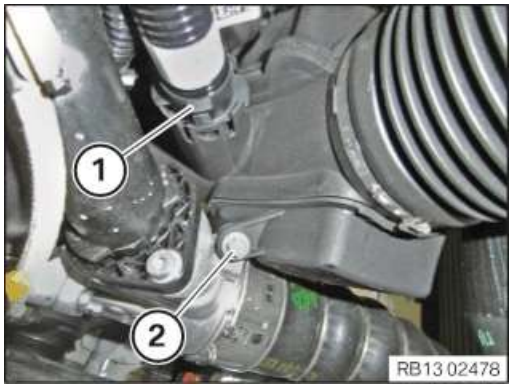
Risk of burning!

- Perform all work only on components that have cooled down.

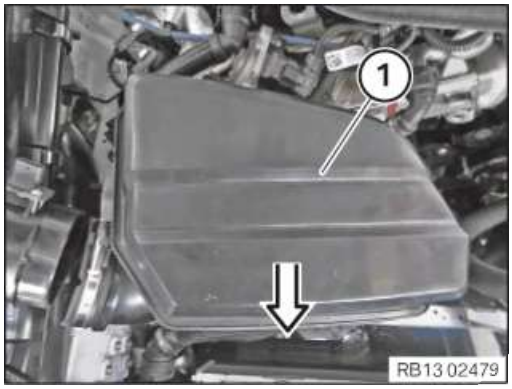
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- Unlock plug connection (1) and disconnect.
- Loosen clamp (2).
- Unfasten clamp (3).
- Separate the clean air pipe with resonator from the intake filter housing.



- Unlock engine ventilation line (1), disconnect it and place it aside.
- Loosen screw (2).



- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Unlock and loosen clamp (1).



- Feed out and remove clean air pipe with resonator (1) in the direction of the arrow.

5 – Remove acoustic cover of the front engine

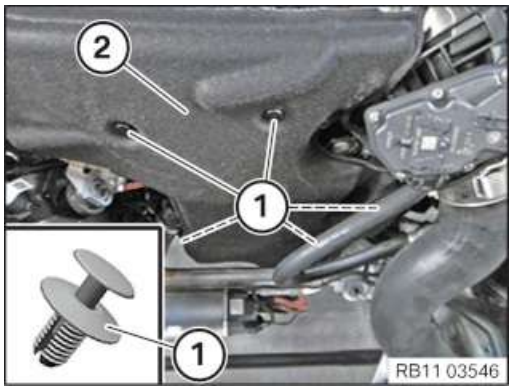
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WARNING

Hot surfaces.

Risk of burning!

- Perform all work only on components that have cooled down.



- Release and remove expanding rivet (1).
- Guide the acoustic cover (2) out and remove.

6 – Removing the drive belt for alternator

CAUTION

Spring preload.

Danger of injury!

- The use of the specified special tool (tool) is mandatory.
- The described operation must be carried out properly.

CAUTION

Component with preload.

Danger of injury!

- Reduce preload as far as possible before disassembly. Relieve component.

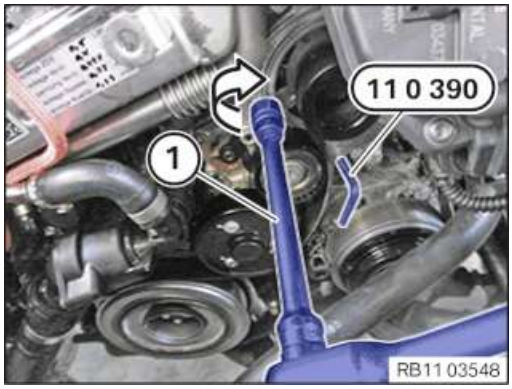
TECHNICAL INFORMATION

If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

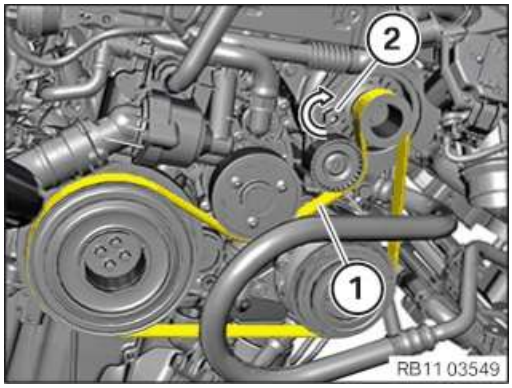
TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

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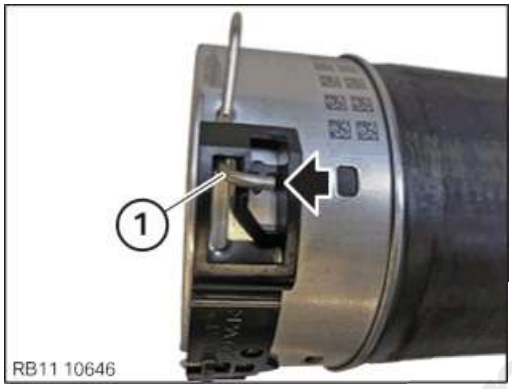


- If reusing the drive belt for alternator: Mark the direction of rotation.
- Relax the belt tensioner in the direction of the arrow using a standard tool (1).
- Fix the belt tensioner with the special tool 0 496 268 (11 0 390).



- Relieve belt tensioner at hexagon head (2) in direction of arrow up to limit position.
- Guide out and remove drive belt for alternator (1).

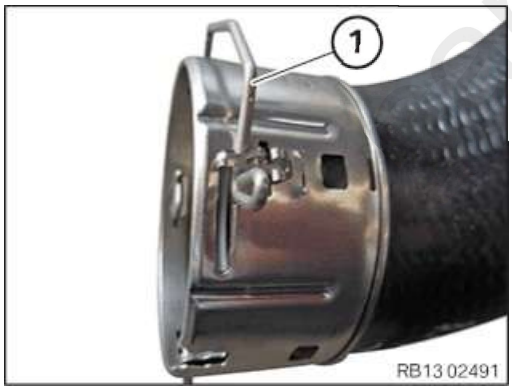
7 – Loosening the pressure pipe from the throttle body



- **Version A:**

  Unlock the lock (1) (arrow).

  You must be able to hear the lock (1) engage when unlocking.



- **Version B:**

  Unlock clamp (1) and engage in this position.



- Unlock the lock (1) and engage.
- Disconnect pressure pipe from throttle valve.

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8 – Removing the air conditioning compressor

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

RISK OF DAMAGE

External damage to air conditioning compressor.

Excessive force applied during removal will result in damage to the air conditioning compressor.

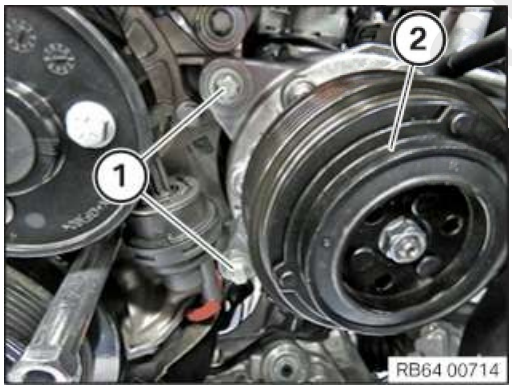
- Remove the air conditioning compressor without damaging it and without applying external force.
- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty air conditioning compressors in their original packaging only.

RISK OF DAMAGE

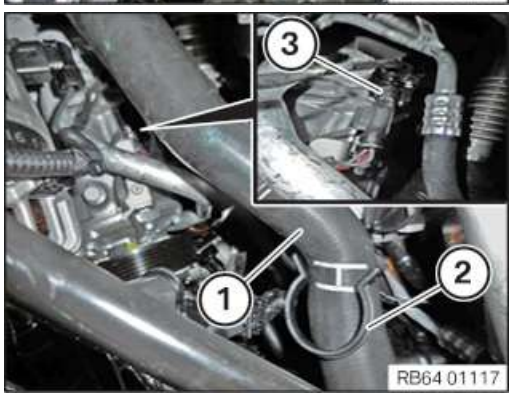
Contaminant or foreign body.

Contamination can result in malfunctions, operating failure or leaks.

- Adhere to the utmost cleanliness.
- Protect components from contamination e.g. by covering.
- Close off line connections with seal plugs.



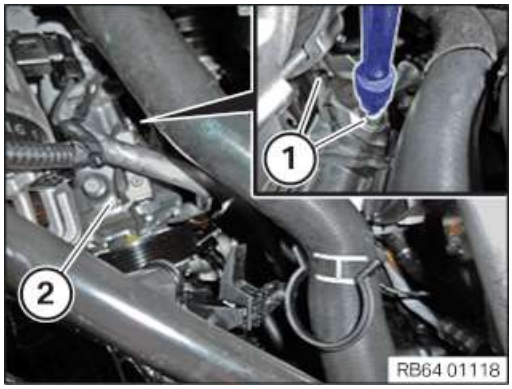
- Release screws (1) on the air conditioning compressor (2).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Take the coolant hose (1) out of the holder (2) and slide it slightly to the side.
- Unlock plug connection (3) and disconnect.



TECHNICAL INFORMATION

Secure component against falling.

- Release the screws (1) and remove the refrigerant lines.
- Feed out and remove air conditioning compressor (2) upfront

9 – Lubricating the air conditioning compressor (amount of refrigerant oil in new air conditioning compressor known)

TECHNICAL INFORMATION

The new air conditioning compressor is filled with refrigerant oil at the factory. The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

When the air conditioning compressor is replaced, it is essential to adapt the amount of refrigerant oil.

TECHNICAL INFORMATION

The following procedure only applies when the new air conditioning compressor has **a label** with the amount of refrigerant oil.

The refrigerant oil amount specification is located on the label on the air conditioning compressor.

The position of the label can vary depending on the air conditioning compressor.

The refrigerant oil specification on the label is in g, ml or cc.

ml are specified throughout these repair instructions for adjusting the amount of refrigerant oil, as g and cc closely correspond to ml.

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- **Step 1**
- Read and note the amount of refrigerant oil on the removed air conditioning compressor.

  (If no label is present, continue with **step 3, case 1**.)
- Read and record amount of refrigerant oil specified on the new air conditioning compressor.
- Compare both amounts of refrigerant oil with each other:

  Different cases:

  - Amount of refrigerant oil on the removed and new air conditioning compressor **is same**. In this case, continue with **step 3, case 1**.
  - Amount of refrigerant oil on the removed and new air conditioning compressor **is not the same**:

  Different cases:

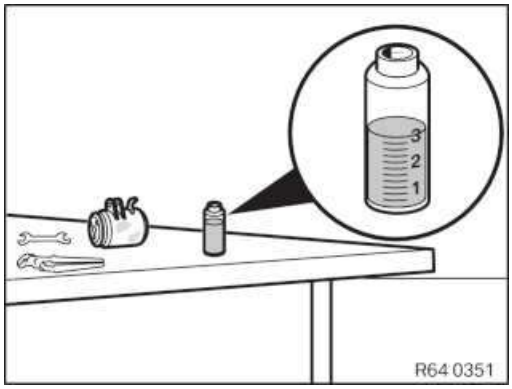
  - Amount of refrigerant oil on the removed air conditioning compressor **is higher** than on the new air conditioning compressor. Difference is not taken into account. In this case, continue with **step 3, case 1**.
  - Amount of refrigerant oil on the removed air conditioning compressor **is lower** than on the new air conditioning compressor: Generate and record the difference between both amounts of refrigerant oil. Then, continue with **step 3, case 2** .

Example:
Amount of refrigerant oil *on removed* air conditioning compressor 110 g
Amount of refrigerant oil specified on the *new*air conditioning compressor 150 g
150 g - 110 g = 40 g approximately 40 ml
Record the difference 40 ml.



- **Step 2**
- **Mechanical air conditioning compressor (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Completely drain the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the **high-pressure connection and low pressure connection**.

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- **Step 3**
- *Inspect the refrigerant oil drained from the removed air conditioning compressor in the measuring cup.*

  If no refrigerant oil escapes from the removed air conditioning compressor, inspect the extracted refrigerant oil in the collecting vessel of the A/C service station.
- No swarf is present in the drained refrigerant oil.

  Additional work is not necessary.
- Swarf is present in the drained refrigerant oil.

  In addition to the air conditioning compressor, replace the following parts:

  - Air conditioning condenser

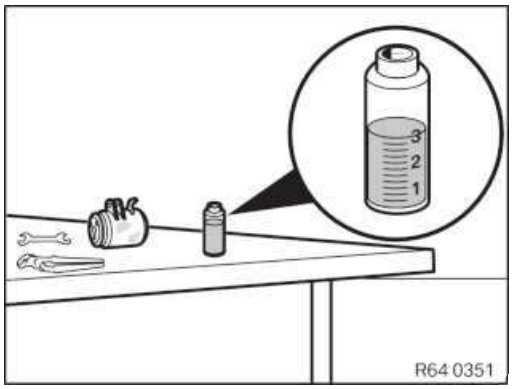
  - Desiccant insert (if it can be replaced individually, if not air conditioning condenser)

  - Line to the air conditioning condenser

  - Refrigerant oil

  - all expansion valves

  - BEV, PHEV: In addition, flush the refrigerant circuit.



- **Step 4**
- Read the drained amount of refrigerant oil from the removed air conditioning compressor on the measuring cup.

  Case 1:
- Add **10 ml extra to the amount of refrigerant oil read as a precautionary allowance.**
- Record **at least but a total of 50 ml**.

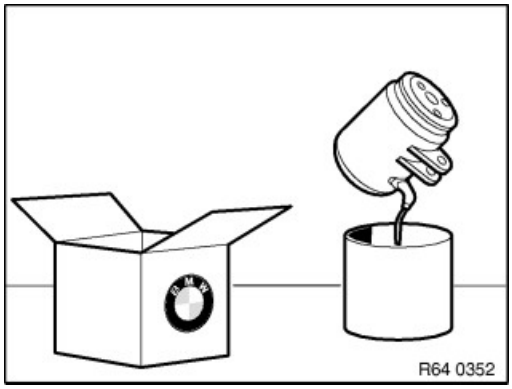
Example:
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml < 50 ml
determined amount of refrigerant oil for new air conditioning compressor = 50 ml

Case 2:

- Add **10 ml extra to the amount of refrigerant oil read as a precautionary allowance.**
- To this **add the difference**.
- Record **at least but a total of 50 ml**.

Example:
Difference = 40 ml
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml
30 ml + 40 ml difference = 70 ml > 50 ml
Amount of refrigerant oil determined for the new air conditioning compressor = 70 ml

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- **Step 5**
- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Open the oil filler plug.
- Drain the amount of refrigerant oil specified in the table from the **new** air conditioning compressor into a clean measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (new):**
- Remove the dummy plugs from the high-pressure connection.
- Drain the amount of refrigerant oil specified in the table from the **new** air conditioning compressor into a clean measuring cup via **high-pressure connection**.

Amount of refrigerant oil to be drained from the new air conditioning compressor = amount of refrigerant oil on the label for the new air conditioning compressor - amount of refrigerant oil determined for the new air conditioning compressor

Example:
Amount on the new air conditioning compressor refrigerant oil label: 150 ml
Amount of refrigerant oil determined for new air conditioning compressor: 50 ml
Amount of refrigerant oil to be drained = 150 ml - 50 ml = 100 ml
100 ml must be drained from the **new** air conditioning compressor

- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Renew the sealing ring.
- Tighten oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Seal the high-pressure connection with dummy plug.



- The drained, new refrigerant oil must be filled into the A/C service station expansion tank **immediately** after draining.
- Drained, new refrigerant oil must be disposed of correctly if it is not immediately refilled into the A/C service station expansion tank.
- Refrigerant oil drained from the previous air conditioning compressor **must not be reused and must be disposed of correctly**.

10 – Lubricating the air conditioning compressor (amount of refrigerant oil in new air conditioning compressor not known)

TECHNICAL INFORMATION

The new air conditioning compressor is filled with refrigerant oil at the factory. The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.

When the air conditioning compressor is replaced, it is essential to adapt the amount of refrigerant oil.

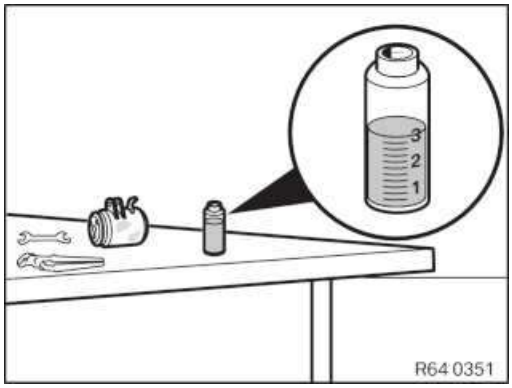
TECHNICAL INFORMATION

The following procedure only applies if the new air conditioning compressor **has** a label indicating the amount of refrigerant oil.

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- **Mechanical air conditioning compressor (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (removed):**
- Open the oil filler plug.
- Drain all of the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the oil filler plug.
- **Electric A/C compressor without oil filler plug (removed):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Completely drain the refrigerant oil remaining in the **removed** air conditioning compressor into a measuring cup via the **high-pressure connection and low pressure connection**.



- *Inspect the refrigerant oil drained from the removed air conditioning compressor in the measuring cup.*

  If no refrigerant oil escapes from the removed air conditioning compressor, inspect the extracted refrigerant oil in the collecting vessel of the A/C service station.
- No swarf is present in the drained refrigerant oil.

  Additional work is not necessary.
- Swarf is present in the drained refrigerant oil.

  In addition to the air conditioning compressor, replace the following parts:

  - Air conditioning condenser

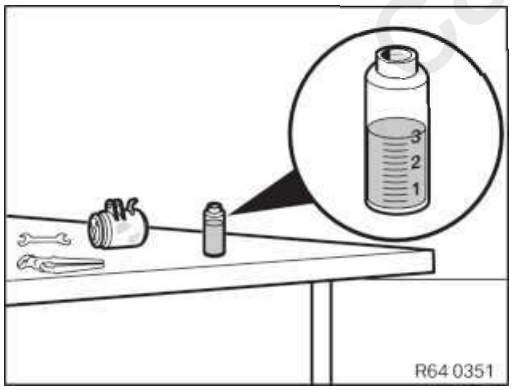
  - Desiccant insert (if it can be replaced individually, if not air conditioning condenser)

  - Line to the air conditioning condenser

  - Refrigerant oil

  - all expansion valves

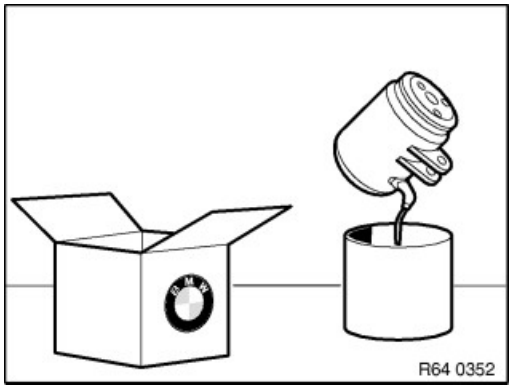
  - BEV, PHEV: In addition, flush the refrigerant circuit.



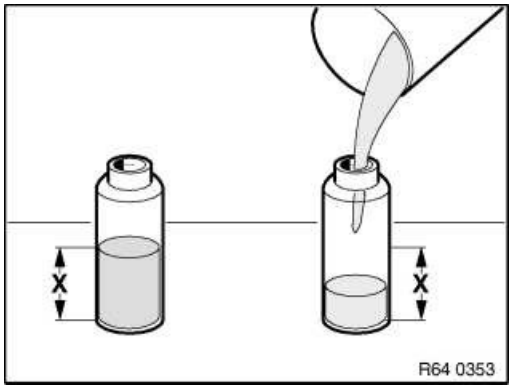
- Read the drained amount of refrigerant oil from the **removed** air conditioning compressor on the measuring cup.
- Add **10 ml extra to the recorded amount of refrigerant oil as a precautionary allowance, but record at least a total of 50 ml.**

Example:
20 ml read at measuring cup:
20 ml + 10 ml precautionary allowance = 30 ml < 50 ml
Amount of refrigerant oil to be filled in the new air conditioning compressor = 50 ml

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- **Mechanical air conditioning compressor (new):**
- Open the oil filler plug.
- Drain the full amount of refrigerant oil from the **new** air conditioning compressor into a **clean** collecting vessel.
- Turn the belt pulley during draining.
- **Electric A/C compressor with oil filler plug (new):**
- Open the oil filler plug.
- Drain the full amount of refrigerant oil from the **new** air conditioning compressor into a **clean** collecting vessel.
- **Electric A/C compressor without oil filler plug (new):**
- Remove the dummy plugs from the high-pressure connection and the low pressure connection.
- Drain the full amount of refrigerant oil from **new** air conditioning compressor into a **clean** collecting vessel via the **high-pressure connection and low pressure connection**.



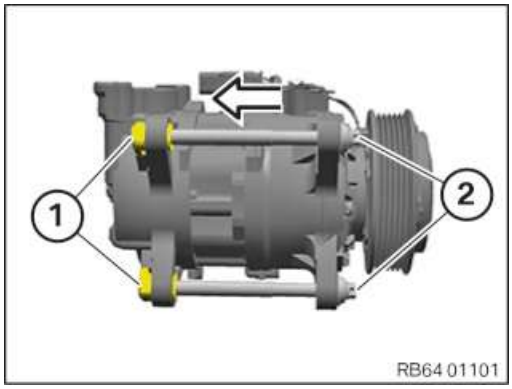
- **Immediately after draining,** fill the amount of refrigerant oil to be filled from the collecting vessel into a **clean** measuring cup.
- **Mechanical air conditioning compressor and electric A/C compressor with oil filler plug (new):**
- Fill the amount of refrigerant oil to be filled from the measuring cup into the **new** air conditioning compressor via oil filler plug.
- Renew the sealing ring.
- Tighten oil filler plug.
- **Electric A/C compressor without oil filler plug (new):**
- Fill the amount of refrigerant oil to be filled from the measuring cup into the **new** air conditioning compressor via the **low pressure connection**.
- Seal the high-pressure connection and low pressure connection with a dummy plug.



- **Immediately** after draining, the remaining, new refrigerant oil must be filled into the A/C service station expansion tank.
- The remaining, new refrigerant oil must be disposed of correctly if it is not immediately filled into the expansion tank of the A/C service station.
- Refrigerant oil drained from the removed air conditioning compressor **must not be reused and must be disposed of correctly**.

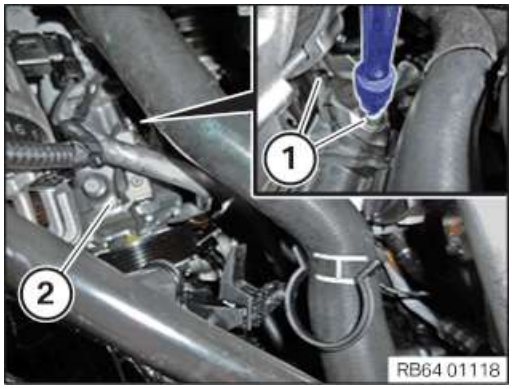
11 – Installing air conditioning compressor

▸ **Prepare for the installation of the air conditioning compressor**



- Screw the screws (2) in the threaded support sleeves (1).
- Slightly press back the threaded support sleeves (1) with the help of screws (2) in the direction of arrow.
- Screw the screws (2) out of the threaded support sleeves (1) once again.

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TECHNICAL INFORMATION

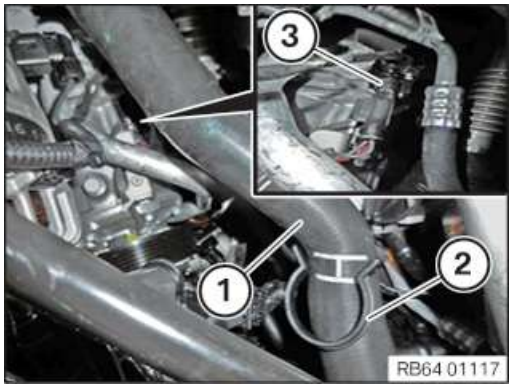
Secure component against falling.

- Renew O-rings.

  Parts: O-rings
- Install in and position the air conditioning compressor (2) from front above.
- Correctly position the refrigerant lines on the air conditioning compressor (2).
- Tighten the screws (1).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm

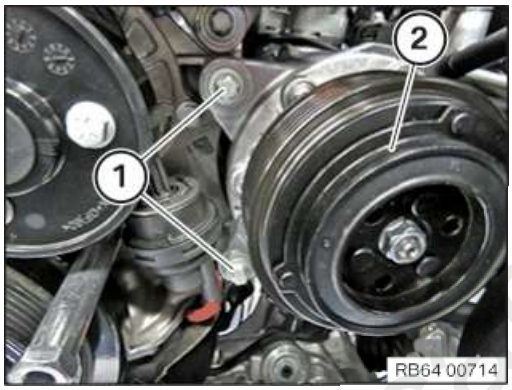


- Slide the coolant hose (1) slightly to the side.
- Connect connectors (3) and lock.

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Position coolant hose (1) correctly and hook it into holder (2).



- Correctly position the air conditioning compressor (2).
- Tighten the screws (1).

Air conditioning compressor in component carrier

M10		Tightening torque	38 Nm

POSTPROCESSES

12 – Fasten the pressure pipe on the throttle body

RISK OF DAMAGE

Damage to the exhaust turbocharger.

A leak at the pressure pipe can damage the exhaust turbocharger.

- Replace the gaskets and pressure pipe if necessary.

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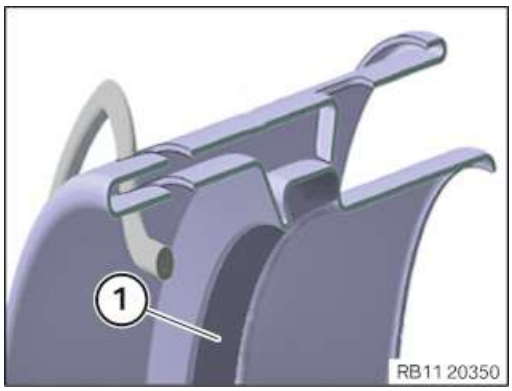


- Check the seal (1) for damage, and renew if necessary.

▸ **Replacing damaged seal**

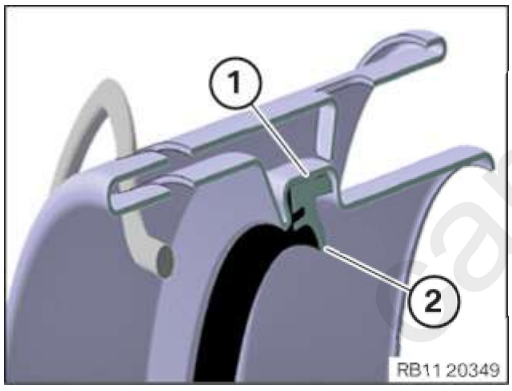
TECHNICAL INFORMATION

Do not use pointed or sharp-edged tools for the installation and/or removal.



- Remove damaged seal.
- Clean gasket groove (1) with a dry towel.

  The gasket groove (1) must be clean.



- Renew gasket.

  Parts: Gasket
- Install seal dry without lubricant or mounting agent.

TECHNICAL INFORMATION

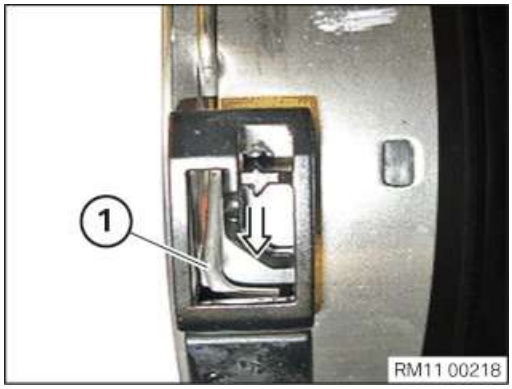
Incorrect assembly is possible. Ensure correct installation position.

- Feed in and install the seal.
- Make sure the seal is correctly installed in the gasket groove (1).
- Make sure that the sealing lip (2) is directed inwards as shown.



- Insert the pressure pipe in the throttle body until lock (1) engages on both sides.

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- **Version A:**

  Lock the lock (1) in direction of arrow.

  The lock (1) on the pressure pipe must engage audibly.



- **Version B:**

  Lock the lock (1).

  The lock (1) on the pressure pipe must engage audibly.

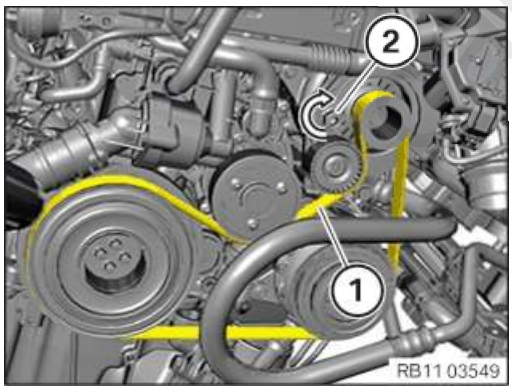
13 – Installing the drive belt for alternator

TECHNICAL INFORMATION

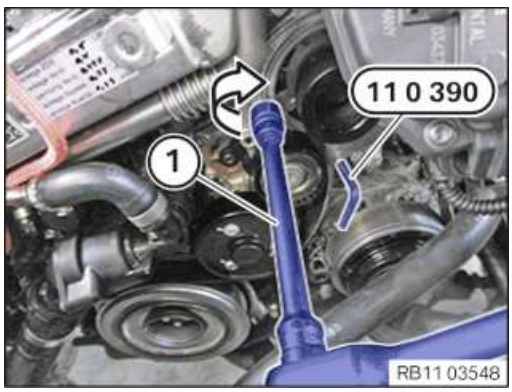
If the drive belt is reused: Mark direction of travel and reinstall drive belt in same direction of travel.

TECHNICAL INFORMATION

The drive belt must be replaced if contaminated with coolant- and oil residues.

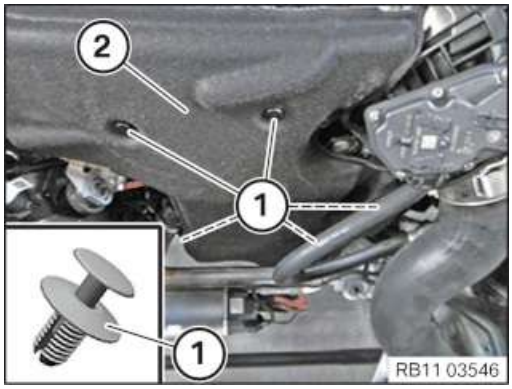


- Check drive belt for alternator (1) for coolant and oil residues and, if necessary, renew it.
- Relieve belt tensioner at hexagon head (2) up to limit position in direction of arrow.
- Install drive belt for alternator (1).



- Increase the preload of the belt tensioner using conventional tool (1) in the direction of arrow until the special tool 0 496 268 (11 0 390) can be removed.
- Remove special tool 0 496 268 (11 0 390).
- Stretch the drive belt for the alternator.

14 – Install acoustic cover for the engine, front

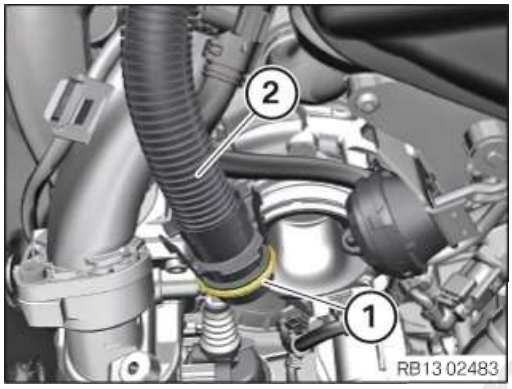


- Feed the acoustic cover (2) in and install.
- Secure the acoustic cover (2) with the expanding rivets (1).

15 – Installing the clean air pipe with resonator



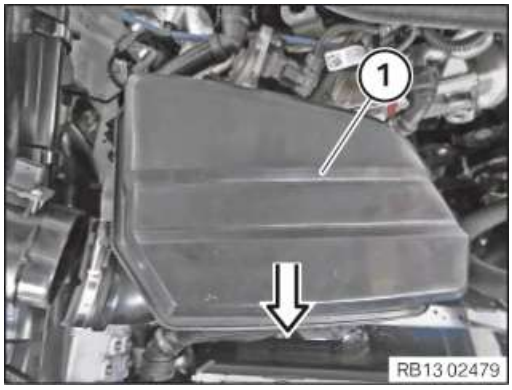
- Check the sealing ring (1) on the exhaust turbocharger for damage and renew if necessary.



- Check the sealing ring (1) for the engine ventilation line (2) for damage and renew where required.



- Feed in and install clean air pipe with resonator (1) in the direction of the arrow.

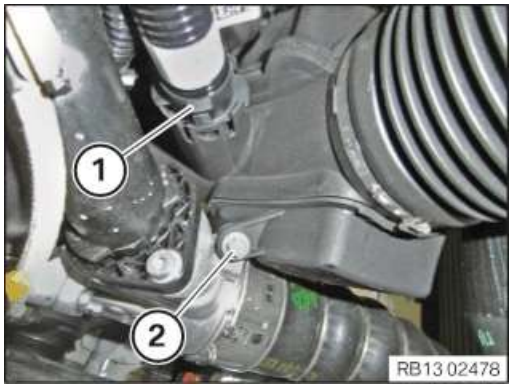


- Press and hold clean air pipe with resonator (1) in the direction of the arrow.



- Attach and lock the clamp (1).

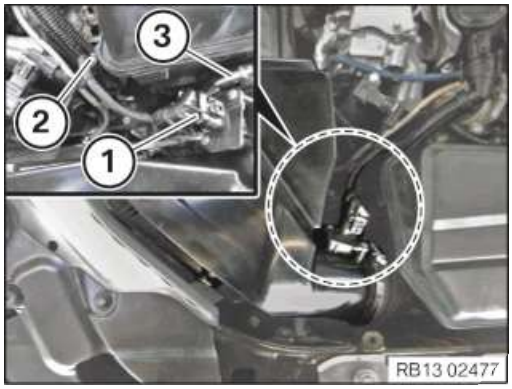
  The clamp (1) must engage audibly.



- Tighten down screw (2).

Clean air pipe to exhaust turbocharger

M6X20		Tightening torque	8 Nm



- Connect the clean air pipe with resonator to the intake filter housing.
- Tighten clamp (3).

Clean air pipe to upper section of intake filter housing

Clamp		Tightening torque	3 Nm

- Secure clamps (2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

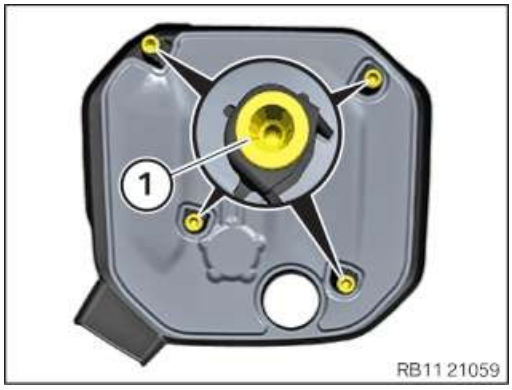
16 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



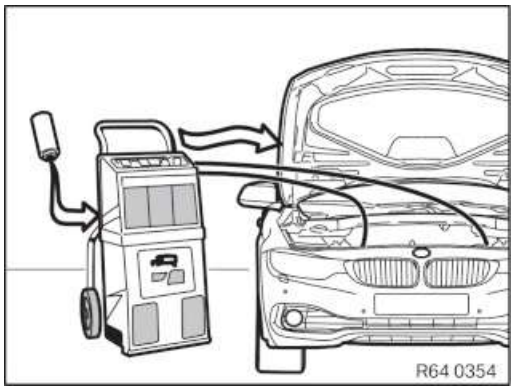
- Check the acoustic cover for correct fit of the rubber mounts (1).

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- Clip in the acoustic cover (1) into the holders in the indicated areas.

17 – Evacuate and fill air conditioning



- See additional information.

18 – Connecting all battery earth leads



- See additional information.

19 – Running in the new air conditioning compressor

RISK OF DAMAGE

Mechanical damage to the new air conditioning compressor.

An increased quantity of refrigerant oil in the new air conditioning compressor can cause mechanical damage.

- Perform the running-in procedure.
- Do not exceed the idle speed during running in.

TECHNICAL INFORMATION

The running-in procedure for the new air conditioning compressor can either be performed manually or using the diagnosis system.

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- **Manual:**
- Switch off the air conditioning.
- Set all ventilation outlets in the instrument panel to "OPEN".
- Start the engine and allow the idle speed to stabilise.
- Set the blower output to a minimum of 75% of the maximum blower output.
- Switch on the air conditioning and allow the engine to run at **idle speed** for a **minimum of 2 minutes**.
- Switch off the air conditioning and blower.
- Stop engine.



- **Carry out the following service function with the diagnosis system:**
  - Body
  - Heating and air conditioning functions
  - Run-in protection for A/C compressor

Additional Information

Overview of Tightening Torques

Refrigerant line on air conditioning compressor			Used in step 11
M8		Tightening torque	19 Nm

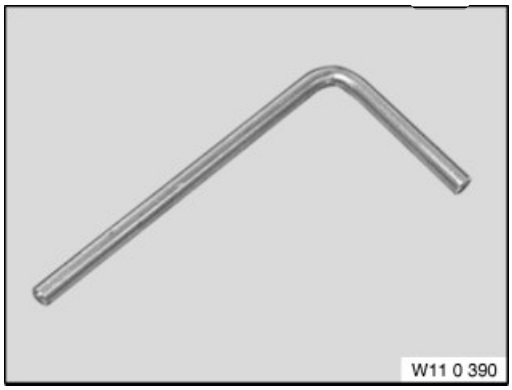
Air conditioning compressor in component carrier			Used in step 11
M10		Tightening torque	38 Nm

Clean air pipe to exhaust turbocharger			Used in step 15
M6X20		Tightening torque	8 Nm

Clean air pipe to upper section of intake filter housing			Used in step 15
Clamp		Tightening torque	3 Nm

Overview of Special Tools

0 496 268 (11 0 390) Pin



Common	Used in step 613
Usage	(roll pin) For securing new tensioning pulley (poly-V belt)
Included in the tool or work	
Storage location	B24
Replaced by	
In connection with	
SI-Number	01 15 07 (390)

Links

General repair instructions	**Used in step**
64 52 ... Instructions for opening and part exchange in refrigerant circuit	217

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Repair instructions	Used in step
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	118
61 20 900 Disconnecting and connecting battery earth lead	118
61 20 900 Disconnecting and connecting battery earth lead	118
61 20 900 Disconnecting and connecting battery earth lead	118
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	118
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64 50 010 Extract, evacuate and fill air conditioning system	217
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64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	217
64 50 ... Notes on repairs to air conditioning	217
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	217
64 50 ... Safety information for handling refrigerant R1234yf	217
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	217
64 50 ... Safety informations for handling refrigerant oil	217

Parts

Parts required

Designation	Used in step
Seal, pressure pipe on throttle body	12

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61 00 ... Safety information on handling hybrid cars

Please observe the current version. Safety information for handling electric and hybrid vehicles

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

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

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

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=> In this case, Technical Support must be contacted!

- Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging cable from the vehicle.
  Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

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

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64 53 ... Instructions for desiccant insert replacement



Special tools required:

- 32 1 270

A desiccant insert need **not** be changed at regular inspection intervals in a well functioning, sealed air conditioning system.

However, the dryer flask or desiccant insert must absolutely be replaced in the event of:

- the refrigerant being dirty by swarfs (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- In case of a refrigerant circuit which was closed using special tool 32 1 270 but remains open for more than 24 hours.

The desiccant insert cannot be replaced in the following vehicles:

- *1-Series E8x, 3-Series E9x* from 12/2008
- *E84, E89*
- *F-series*
- *G model series*
- *BMW i without heat pump*

In these vehicles, the condenser for the heating and air conditioning system must be replaced.

- *BMW i 01 with heat pump*

On this vehicle the low pressure battery must be replaced.

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64 52 ... Instructions for opening and part exchange in refrigerant circuit



Special tools required:

- 00 9 030
- 32 1 270

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety informations for handling refrigerant
- Follow safety information for handling refrigerant oil

Attention!

- Always use new O-rings each time A/C connections are opened (refer to Electronic Parts Catalogue)
  They must **not** be coated.
  Use special tool 00 9 030 to install sealing rings without damaging them.
- Open the referigerant circuit for as short of a period as possible.
- Close all components and lines in the refrigerant circuit and return parts **immediately** following the removals at openings with special tool 32 1 270 to prevent penetration of moisture or foreign objects.
- If the refrigerant circuit was closed at the openings with special tool 32 1 270 but it remains open for more than 24 h, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.**
(minor leak, e.g. hairline crack)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 10 ml
  - Condenser: 20 ml
  - Desiccant insert / dryer flask: 20 ml
  - Each replaced refrigerant line: 10 ml
  - Condenser with integrated dryer flask: 40 ml
  - Safety pressure switch and gasket: no additional refrigerant oil
  - Only l01: Radiator, high-voltage battery unit: 20 ml
- Evacuate and fill air conditioning system

II. **Part replacement due to sudden leakage**
(major leak, e.g. line disconnection due to accident)

Procedure:

- Draw off heating and air conditioning system, then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
  - Compressor: refer to Notes on compressor replacement
  - Evaporator: 35 ml
  - Condenser: 35 ml
  - Desiccant insert / dryer flask: 55 ml
  - Each replaced refrigerant line: 35 ml

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    - Condenser with integrated dryer flask: 55 ml
    - Safety pressure switch and gasket: no additional refrigerant oil
    - Only I01: Radiator, high-voltage battery unit: 35 ml
- Evacuate and fill A/C system

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64 53 ... Instructions for replacement of air conditioning condensers and radiator/coolers

Attention!

Even when they are correctly installed or due to normal driving, radiators (oil cooler, radiator, charge air cooler) or air conditioning condensers may show slight impressions or deformations on their discs (1).

A slight sag with a large radius for the air conditioning condenser is also permissible.

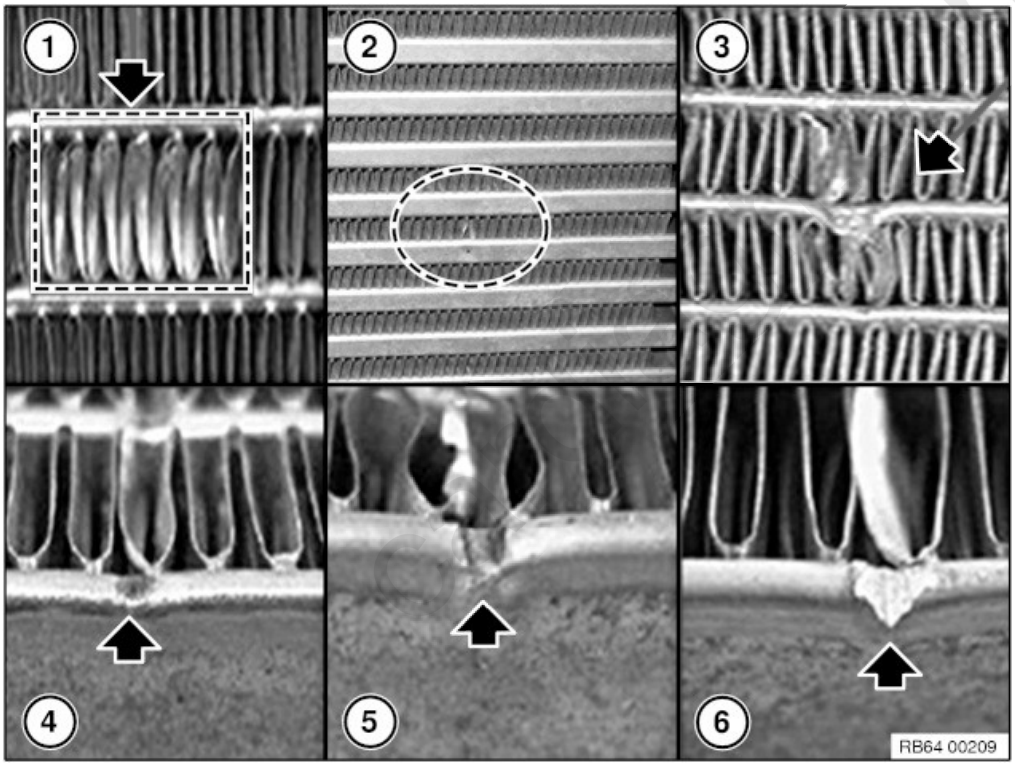
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig. (1) can be bent back with a standard fin comb..

Damage to lines carrying media or on the flat pipe require exchange of the radiator or air conditioning condenser (2-6).



Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 53 551 Removing and installing/replacing air conditioning condenser

CAUTION

Refrigerant circuit under high pressure.

Danger of injury!

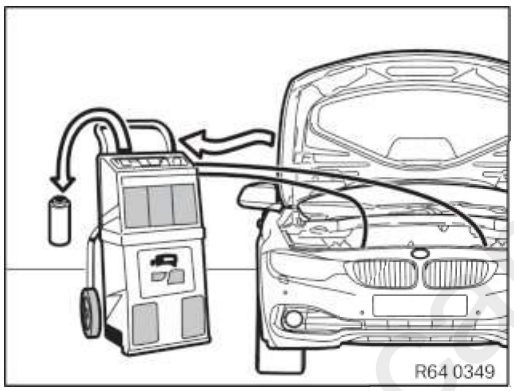
- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

TECHNICAL INFORMATION

- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!

PRELIMINARY WORK

1 – Drawing off the air conditioning

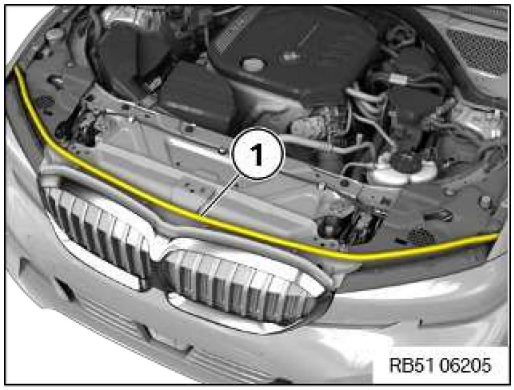


- See additional information.

2 – Remove the seal for the bonnet in front

NOTICE

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

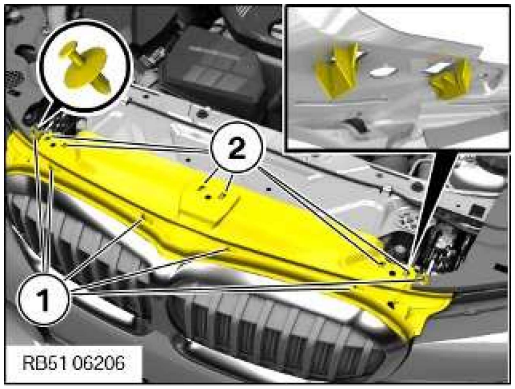


- Pull offfront bonnet seal (1) upwards.

3 – Removing the centre engine compartment cover

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3 – Removing the centre engine compartment cover



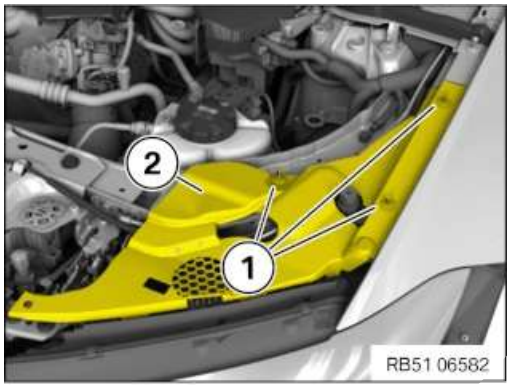
- Detach all expanding rivets (1).
- Release the cover at the latch mechanisms (2) and feed it out to the rear.

4 – If installed: Partially remove the top left and right cover in the engine compartment

NOTICE

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

▸ **Removing the cover in the engine compartment on top partially**

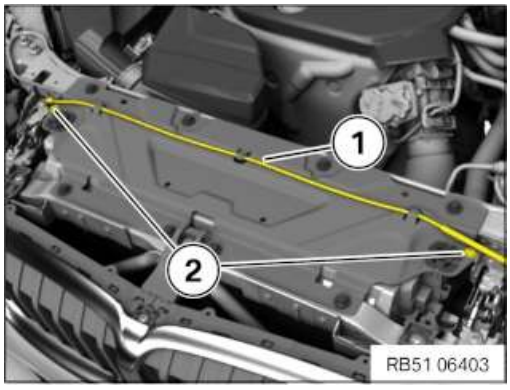


- Loosen the expanding rivet (1).
- Remove cover (2) at the top of the engine compartment.

5 – Removing the top cross connection

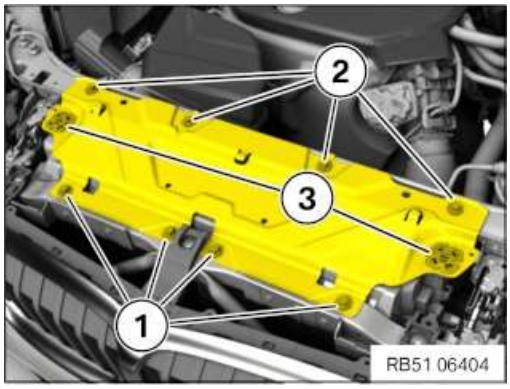


- Release housing (1) for the coupling of the Bowden cables from the body.



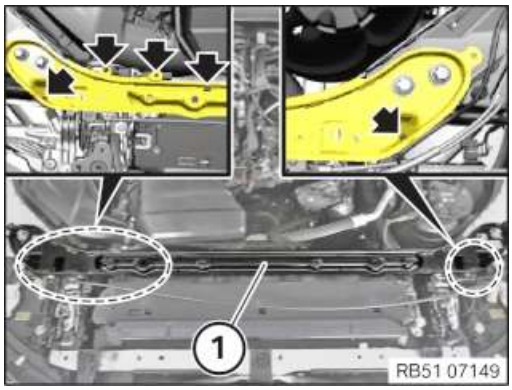
- Detach Bowden cable (1) at the top cross connection.
- Loosen screws (2).

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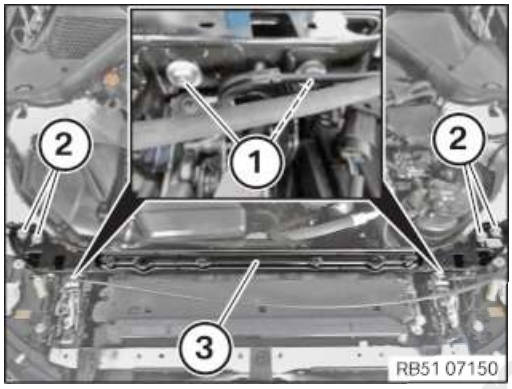


- Loosen screws (1) and (2).
- Remove the top cross connection with holders (3) to the top.

6 – Remove the rear top cross connection



- Release the clips (arrows) in the marked areas from the cross connection (1) at the rear top.

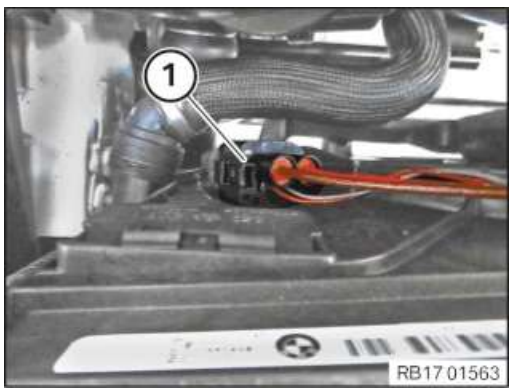


- Loosen screws (1).
- Loosen screws (2).
- Guide out and remove top rear cross connection (3).

7 – Removing the fan cowl

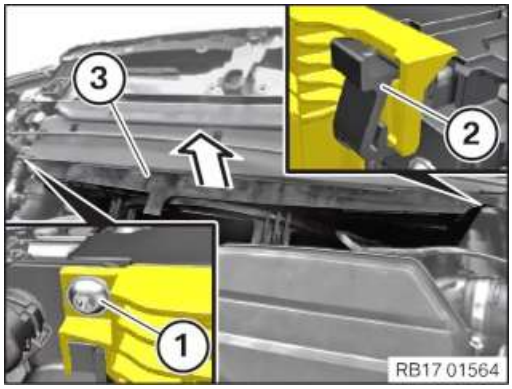
TECHNICAL INFORMATION

- When the engine is stopped after the end of the journey, it may be necessary to run the electric fan. In rare cases, operation of the electric fan can last up to 11 min. This protects the components. In this case, replacing the electric fan will not remedy the problem!



- Unlock plug connection (1) and disconnect.

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- Loosen screw (1).
- Unlock lock (2).
- **Carefully** guide out the fan cowl (3) in direction of arrow and remove.

MAIN WORK

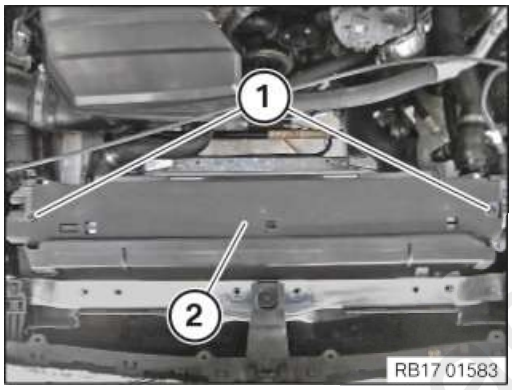
8 – Remove A/C condenser

CAUTION

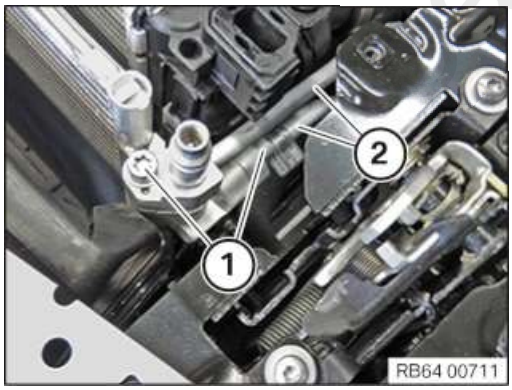
Residual pressure in the air conditioning.

Danger of injury!

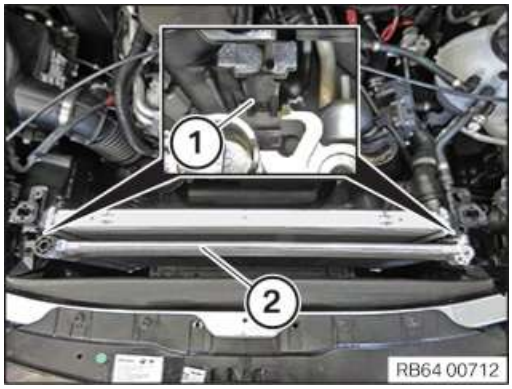
- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Loosen screws (1).
- Feed the cover (2) out towards the top and remove.



- Loosen screws (1).
- Take off refrigerant line (2).



- Guide out the air conditioning condenser (2) on the guides (1).
- Guide out the air conditioning condenser (2) toward the top and remove it.

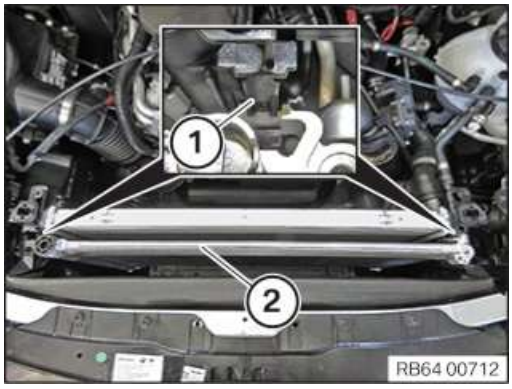
9 – Installing air conditioning condenser

CAUTION

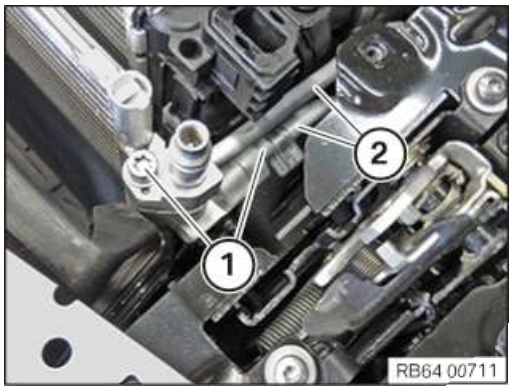
Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Insert and install the air conditioning condenser (2) from the top.
- Insert air conditioning condenser (2) on the guides (1).

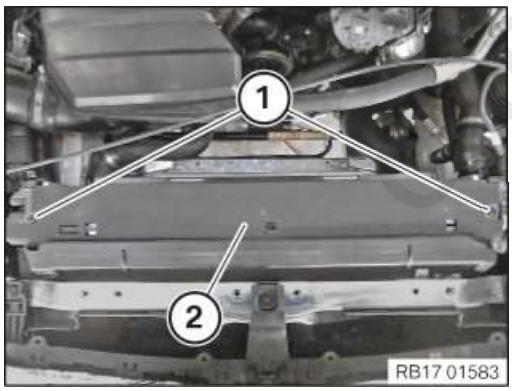


- Renew O-rings.

  Parts: O-rings
- Position the refrigerant lines (2).
- Tighten the screws (1).

Refrigerant lines to air conditioning condenser/connecting piece

M6	Tightening torque	13 Nm



- Guide in and install cover (2) towards the top.
- Tighten the screws (1).

Cooling module cover on holder

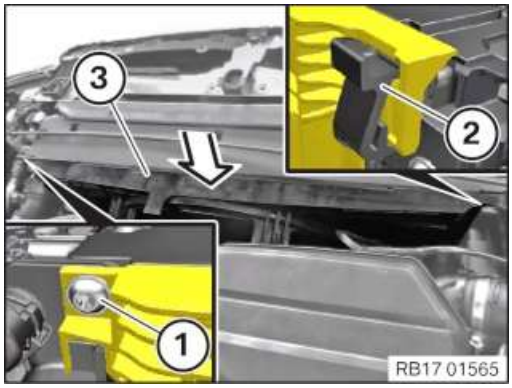
D6X20		Tightening torque	7 Nm

POSTPROCESSES

10 – Install fan cowl



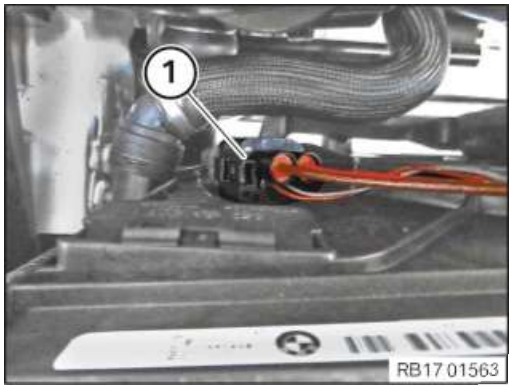
- Feed guides (1) into the radiator.
- Feed guides (2) into the charge air cooler.



- Guide the fan cowl (3) in **carefully** in the direction of the arrow and install.
- Make sure that the lock (2) engages audibly.
- Tighten down screw (1).

Fan cowl with electric fan on radiator

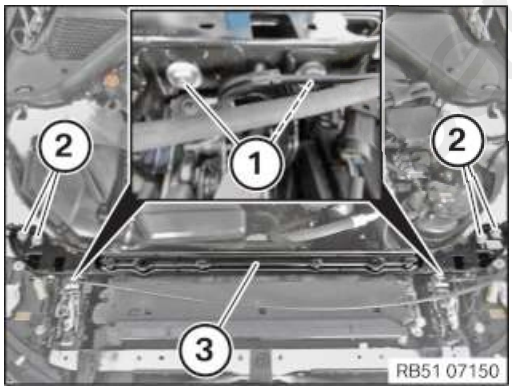
TS6x20		Tightening torque	6,5 Nm



- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

11 – Install the rear top cross connection



- Guide in and position the top rear cross connection (3).
- Tighten the screws (1).

Top rear cross connection to bonnet catch support

Flat-head screw M6x20		Tightening torque	11,8 Nm

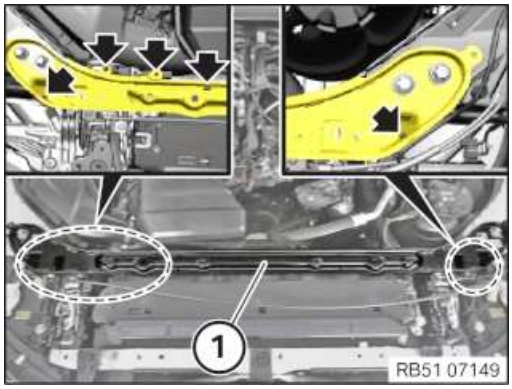
- Renew screws (2).

  Parts: Bolts
- Tighten the screws (2).

Rear top cross connection to wheel arch carrier support

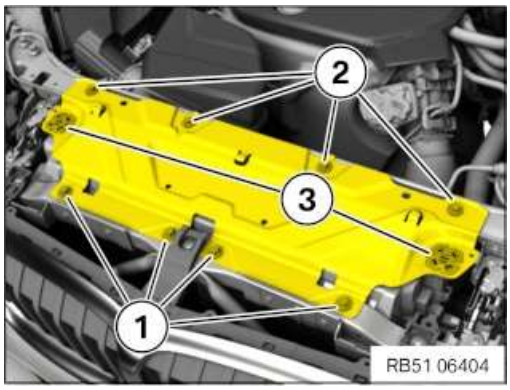
M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

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- Secure the clips (arrows) in the marked areas to the top rear cross connection (1).

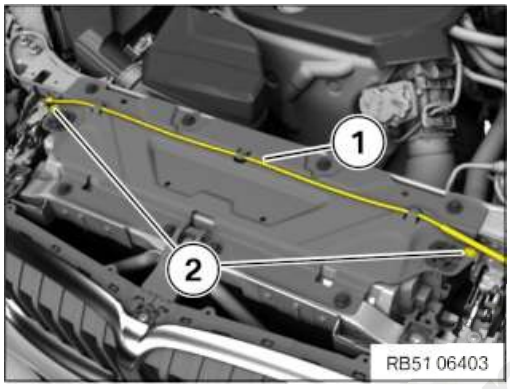
12 – Installing the top cross connection



- Set and position the upper cross connection with holders (3) from above.
- Tighten screws (1) and (2).

Cross connection, top

M8x20		Tightening torque	28 Nm



- Tighten the screws (2).

Cross connection, top

M6x20		Tightening torque	11,8 Nm

- Attach Bowden cable (1) on the upper cross connection.



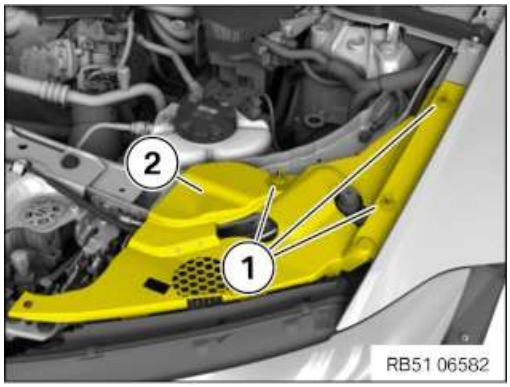
- Clip in the housing (1) for the coupling of the Bowden cables.

13 – If installed: Install the cover in the engine compartment at top left and right (partially removed)

NOTICE

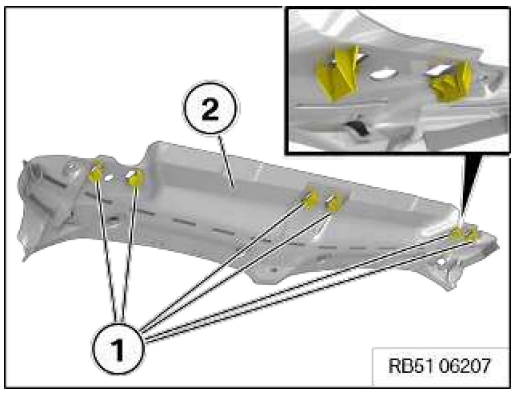
Description is for left component only. Procedure on the right side is identical.

▸ Installing the cover in the top engine compartment (partially removed)



- Install the cover (2) in the engine compartment on top.
- Secure expanding rivet (1).

14 – Installing the cover for the centre engine compartment



Check

- Check the latch mechanisms (1) of the cover (2) for damage.

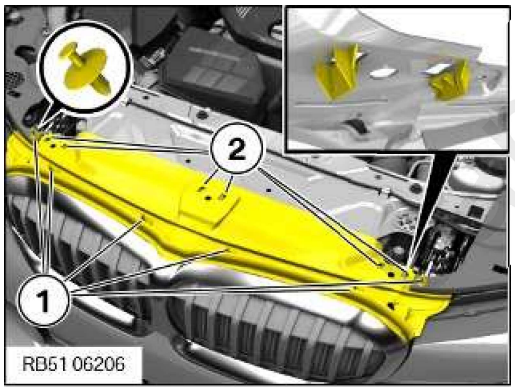
Result

» Latch mechanisms (1) are damaged.

Measure

- Replace the cover (2).

  Parts: Cover

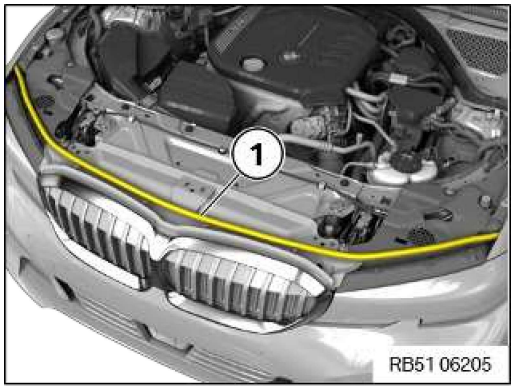


- Insert the cover from the rear and position it.
- Clip in the latch mechanisms (2).
- Mount all expanding rivets (1).

15 – Install the seal for the front bonnet

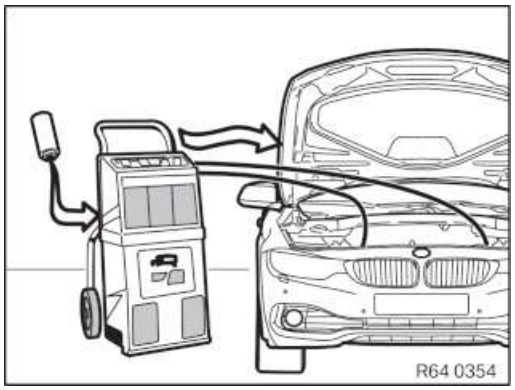
NOTICE

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



- Position the bonnet seal(1) and connect it on the mounting on the bumper and on the headlights.

16 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Refrigerant lines to air conditioning condenser/connecting piece			Used in step 9
M6		Tightening torque	13 Nm

Cooling module cover on holder			Used in step 9
D6X20		Tightening torque	7 Nm

Fan cowl with electric fan on radiator			Used in step 10
TS6x20		Tightening torque	6,5 Nm

Top rear cross connection to bonnet catch support			Used in step 11
Flat-head screw M6x20		Tightening torque	11,8 Nm

Rear top cross connection to wheel arch carrier support			Used in step 11
M10x20 screw	Renew screw.	Jointing torque	56 Nm
		Angle of rotation	90 °

Cross connection, top			Used in step 12
M8x20		Tightening torque	28 Nm

Cross connection, top			Used in step 12
M6x20		Tightening torque	11,8 Nm

Links

General repair instructions	**Used in step**

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64 52 ... Instructions for opening and part exchange in refrigerant circuit	116

Repair instructions	**Used in step**
64 50 010 Extract, evacuate and fill air conditioning system	116
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	116
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	116
64 50 ... Notes on repairs to air conditioning	116
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	116
64 50 ... Safety information for handling refrigerant R1234yf	116
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	116
64 50 ... Safety informations for handling refrigerant oil	116

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64 53 800 Replacing pressure line for air conditioning compressor, air conditioning condenser

CAUTION

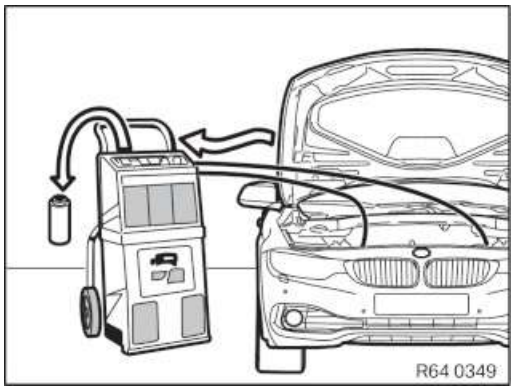
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

MAIN WORK

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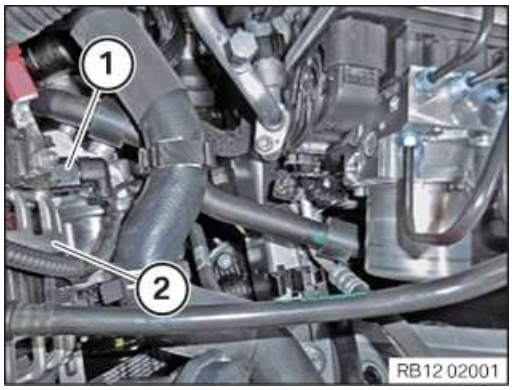
3 – Removing the pressure line between the air conditioning condenser and the condenser

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

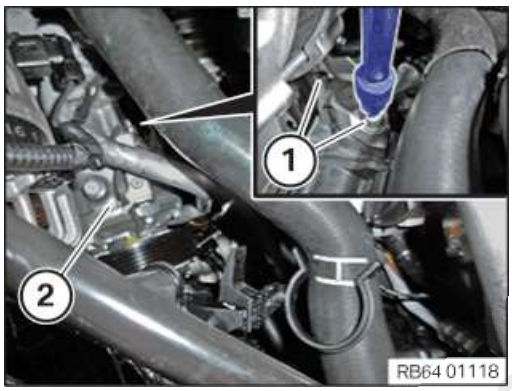
- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



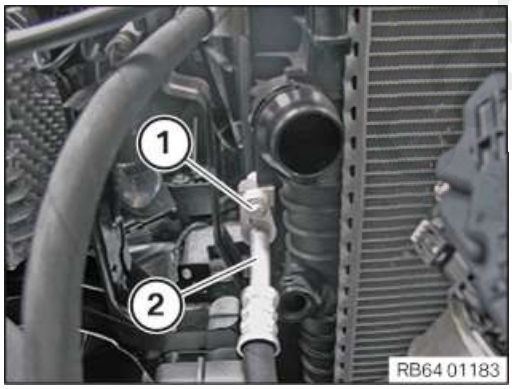
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock and disconnect the plug connection (1) on the alternator (2).

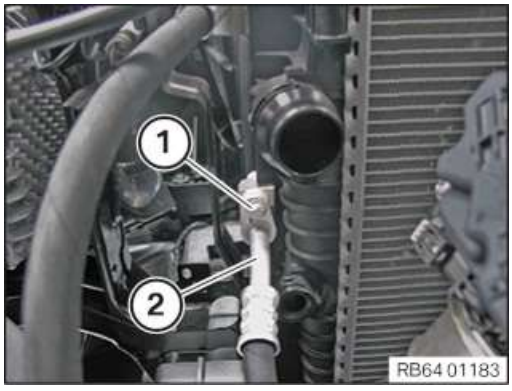


- Loosen screws (1).
- Remove the refrigerant line from air conditioning compressor (2).



- Loosen screw (1).
- Feed out and remove pressure line (2) between the air conditioning condenser and the condenser

4 – Install the pressure line between the air conditioning compressor and the condenser



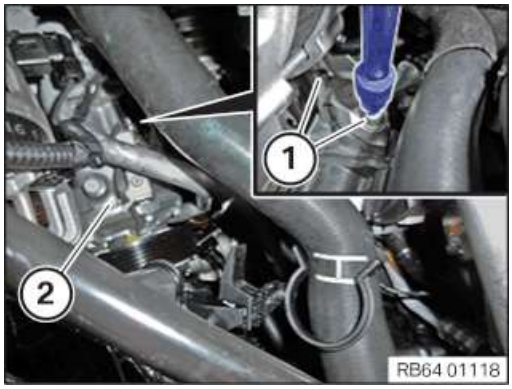
- Renew O-rings.

  Parts: O-rings
- Feed in and correctly position the pressure line (2) between the air conditioning compressor and the condenser.
- Tighten down screw (1).

Refrigerant lines to air conditioning condenser/connecting piece

M6		Tightening torque	13 Nm

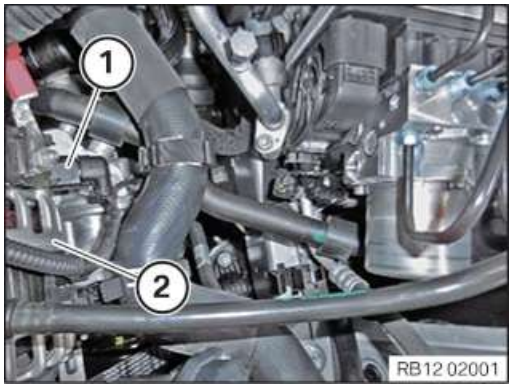
mdiagn.com



- Position the refrigerant lines on the air conditioning compressor (2).
- Tighten the screws (1).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Connect plug connector (1) to the generator (2) and lock.

POSTPROCESSES

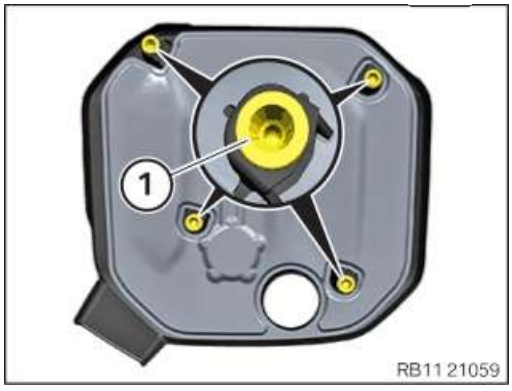
5 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



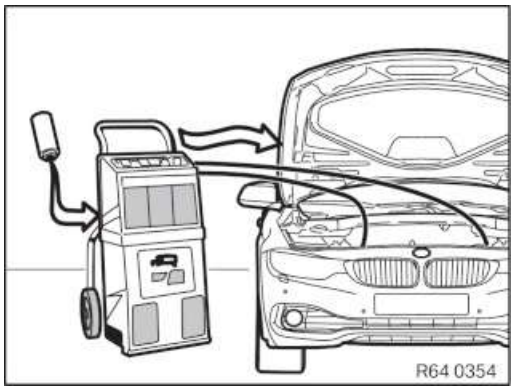
- Check the acoustic cover for correct fit of the rubber mounts (1).

carmanuals.com



- Clip in the acoustic cover (1) into the holders in the indicated areas.

6 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Refrigerant lines to air conditioning condenser/connecting piece			Used in step 4
M6		Tightening torque	13 Nm

Refrigerant line on air conditioning compressor			Used in step 4
M8		Tightening torque	19 Nm

Links

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	16

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	16
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	16
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	16
64 50 ... Notes on repairs to air conditioning	16
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	16
64 50 ... Safety information for handling refrigerant R1234yf	16
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	16
64 50 ... Safety informations for handling refrigerant oil	16

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64 53 800 Replacing pressure line for air conditioning compressor, air conditioning condenser

CAUTION

Refrigerant circuit under high pressure.

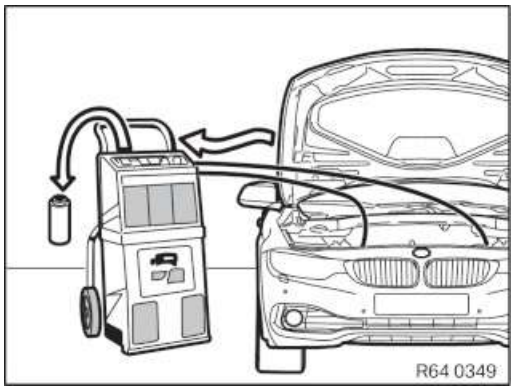
Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

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PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Disconnecting all battery earth leads



- See additional information.

3 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

MAIN WORK

4 – Removing the pressure line between the air conditioning condenser and the condenser

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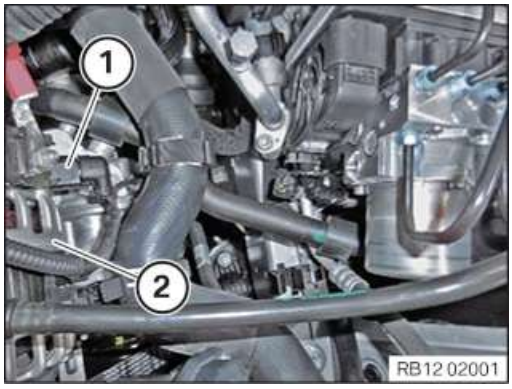
4 – Removing the pressure line between the air conditioning condenser and the condenser

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

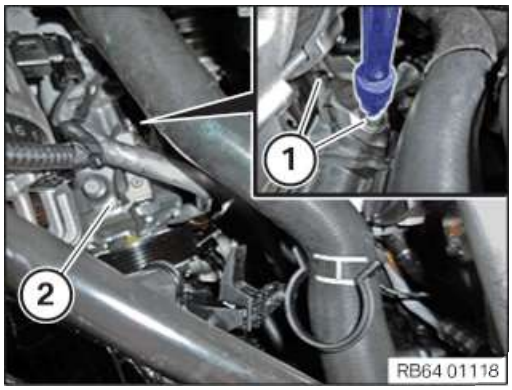
- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



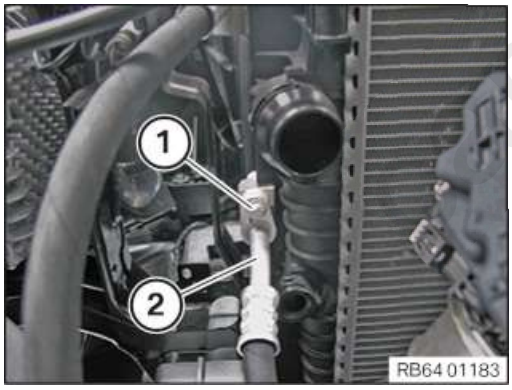
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock and disconnect the plug connection (1) on the alternator (2).

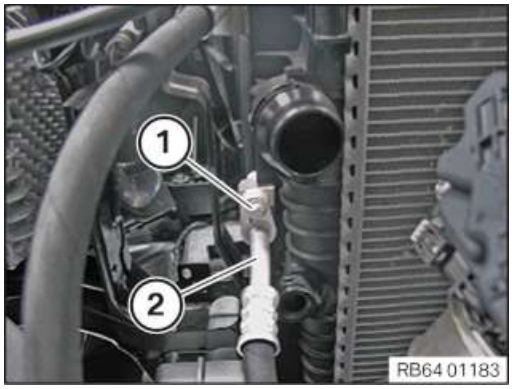


- Loosen screws (1).
- Remove the refrigerant line from air conditioning compressor (2).



- Loosen screw (1).
- Feed out and remove pressure line (2) between the air conditioning condenser and the condenser

5 – Install the pressure line between the air conditioning compressor and the condenser



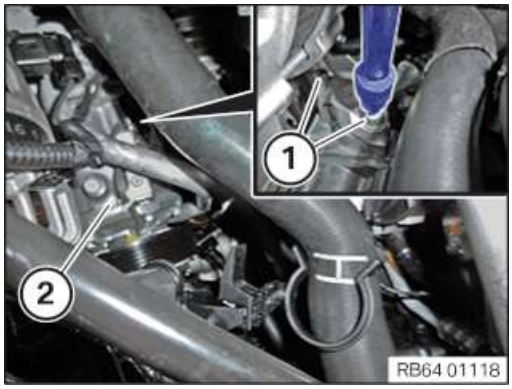
- Renew O-rings.

  Parts: O-rings
- Feed in and correctly position the pressure line (2) between the air conditioning compressor and the condenser.
- Tighten down screw (1).

Refrigerant lines to air conditioning condenser/connecting piece

M6		Tightening torque	13 Nm

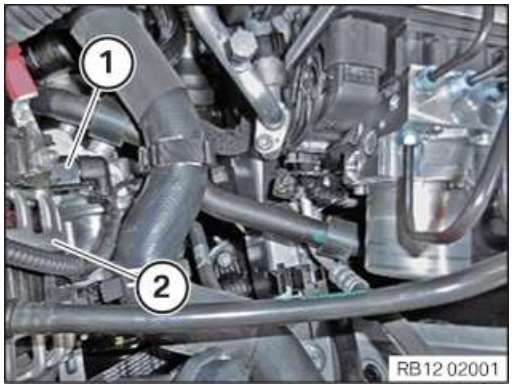
mdiagn.com



- Position the refrigerant lines on the air conditioning compressor (2).
- Tighten the screws (1).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Connect plug connector (1) to the generator (2) and lock.

POSTPROCESSES

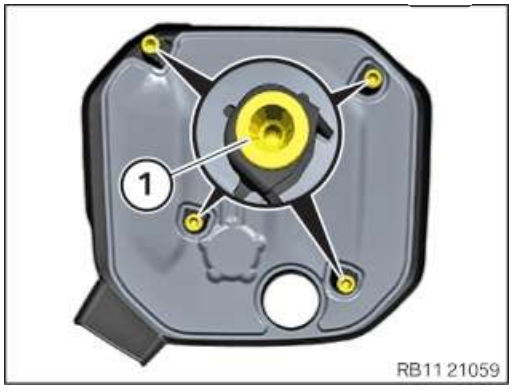
6 – Install acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Check the acoustic cover for correct fit of the rubber mounts (1).

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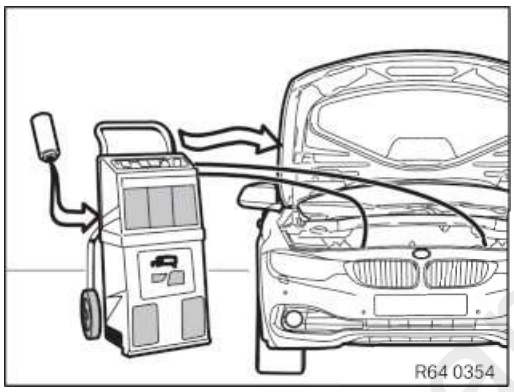
- Clip in the acoustic cover (1) into the holders in the indicated areas.

7 – Connecting all battery earth leads



- See additional information.

8 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Refrigerant lines to air conditioning condenser/connecting piece			Used in step 5
M6		Tightening torque	13 Nm

Refrigerant line on air conditioning compressor			Used in step 5
M8		Tightening torque	19 Nm

Links

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	18

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	18

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64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	18
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	18
64 50 ... Notes on repairs to air conditioning	18
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	18
64 50 ... Safety information for handling refrigerant R1234yf	18
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	18
64 50 ... Safety informations for handling refrigerant oil	18
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
61 20 900 Disconnecting and connecting battery earth lead	27
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	27
61 20 900 Disconnecting and connecting battery earth lead	27
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61 20 900 Disconnecting and connecting battery earth lead	27

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64 53 521 Replacing safety pressure switch

CAUTION

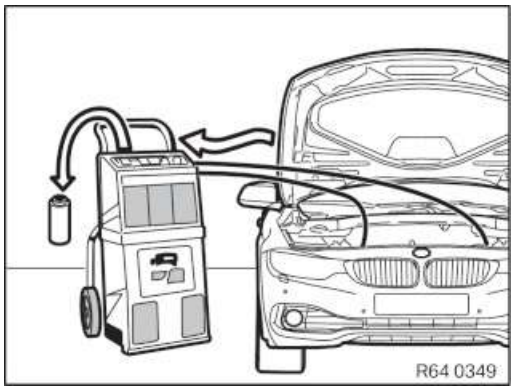
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

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MAIN WORK

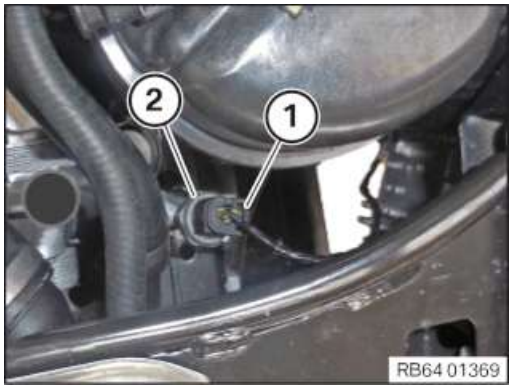
2 – Remove safety pressure switch

CAUTION

Residual pressure in the air conditioning.

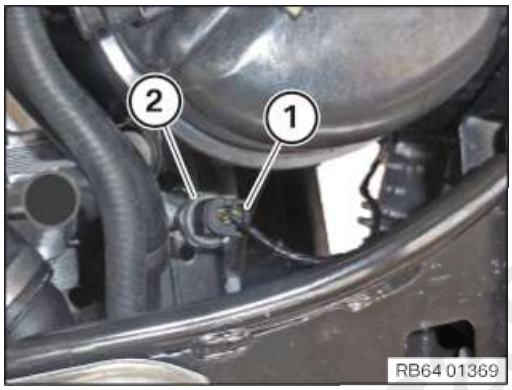
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Unlock and disconnect connector (1).
- Loosen the safety pressure switch (2).

3 – Installing the safety pressure switch



- Correctly position and tighten the safety pressure switch (2).

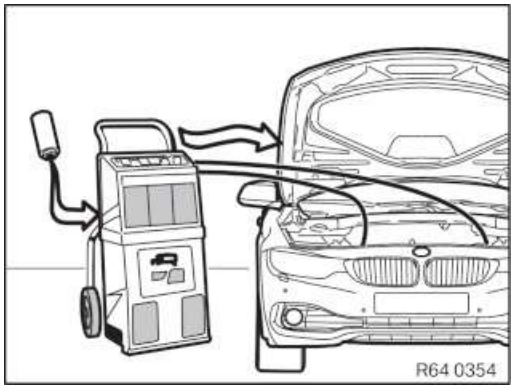
Safety pressure switch

	Tightening torque	10 Nm

- Insert and connect the connector (1).

POSTPROCESSES

4 – Evacuate and fill air conditioning



- See additional information.

Additional Information

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Overview of Tightening Torques

Safety pressure switch		Used in step 3
	Tightening torque	10 Nm

Links

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	14

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	14
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	14
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	14
64 50 ... Notes on repairs to air conditioning	14
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	14
64 50 ... Safety information for handling refrigerant R1234yf	14
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	14
64 50 ... Safety informations for handling refrigerant oil	14

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64 53 822 Replacing the front intake pipe

CAUTION

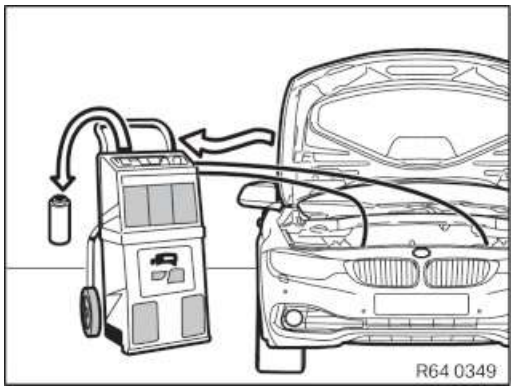
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

MAIN WORK

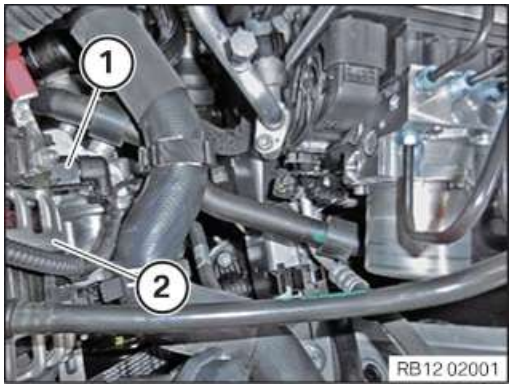
2 – Remove the front intake pipe

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

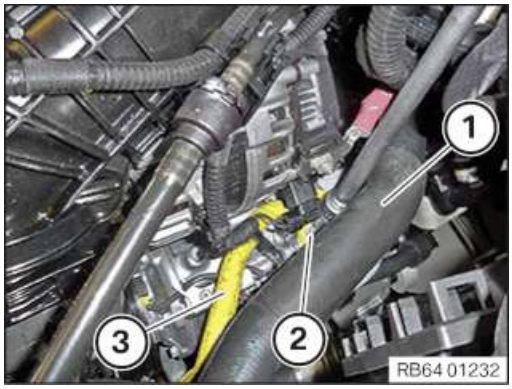


NOTICE

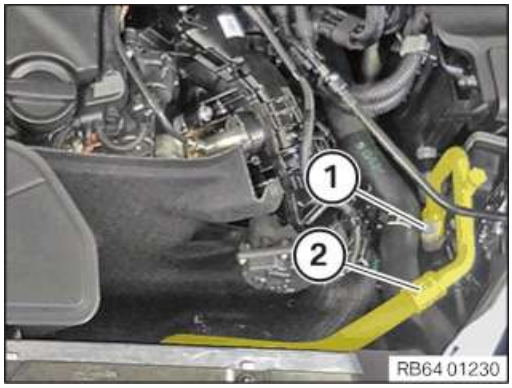
The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock and disconnect plug connection (1) to alternator (2).

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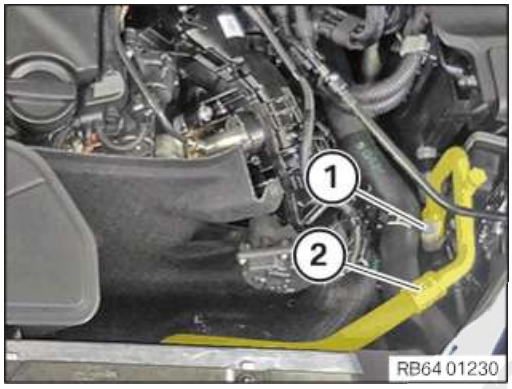


- Slide the coolant hose (1) slightly to the side.
- Loosen screw (2).
- Place intake pipe (3) aside.



- Loosen screw (1).
- Feed out intake pipe (2) completely and remove.

3 – Install the front intake pipe

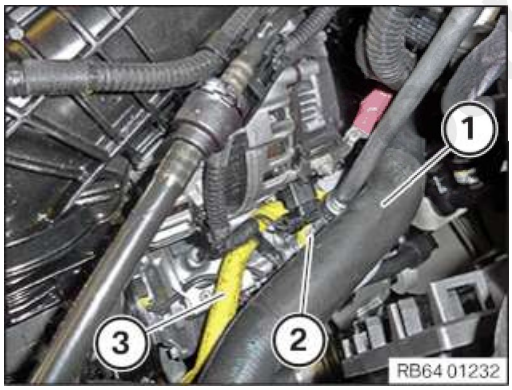


- Renew O-rings.

  Parts: O-rings.
- Completely feed in the intake pipe (2) and position correctly.
- Tighten down screw (1).

Refrigerant line to connecting piece

M8		Tightening torque	19 Nm

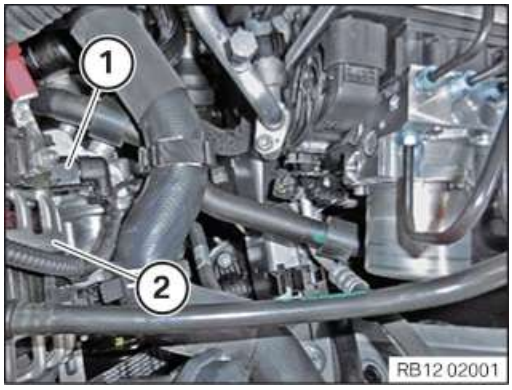


- Attach intake pipe (3) and position it correctly.
- Tighten down screw (2).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm

- Correctly position the coolant hose (1).

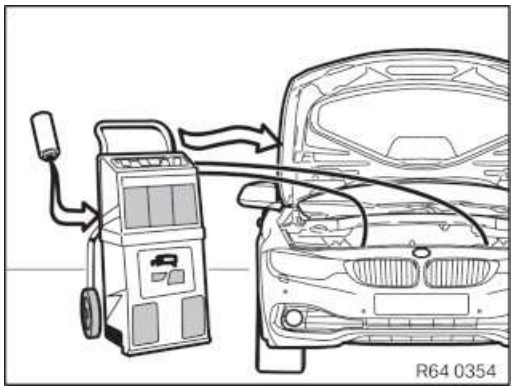


NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Connect the connector (1) to the alternator (2) and lock.

4 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Refrigerant line to connecting piece			Used in step 3
M8		Tightening torque	19 Nm

Refrigerant line on air conditioning compressor			Used in step 3
M8		Tightening torque	19 Nm

Links

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	14

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	14
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	14
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	14
64 50 ... Notes on repairs to air conditioning	14
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	14
64 50 ... Safety information for handling refrigerant R1234yf	14
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	14
64 50 ... Safety informations for handling refrigerant oil	14

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64 53 822 Replacing the front intake pipe

CAUTION

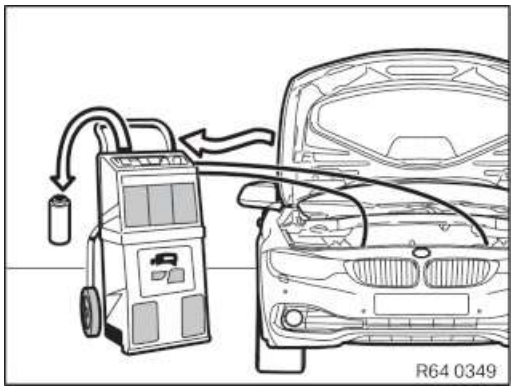
Refrigerant circuit under high pressure.

Danger of injury!

- Note and follow safety information on containers.
- Avoid contact with refrigerant; wear safety goggles and protective gloves.
- For additional information see: 64 50 Handling refrigerant and 6450 Notes on air conditioning repair work

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Disconnecting all battery earth leads



- See additional information.

MAIN WORK

3 – Remove the front intake pipe

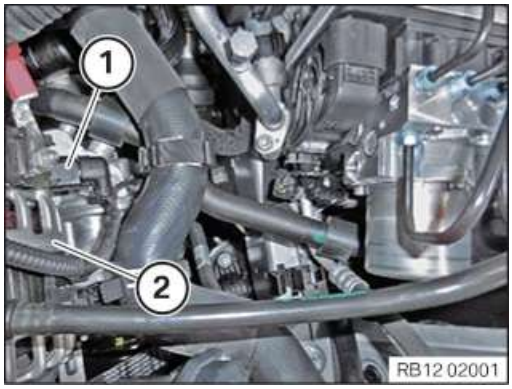
CAUTION

Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.

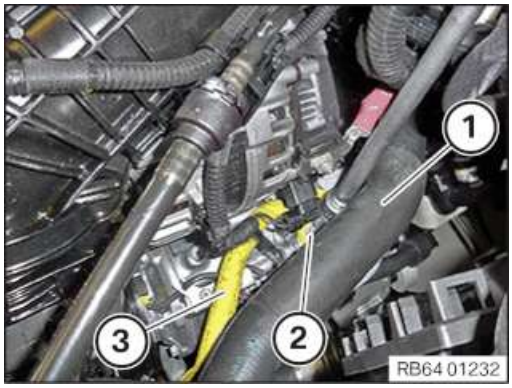
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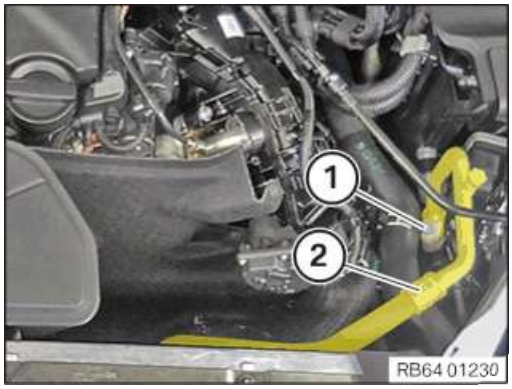
NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Unlock and disconnect plug connection (1) to alternator (2).

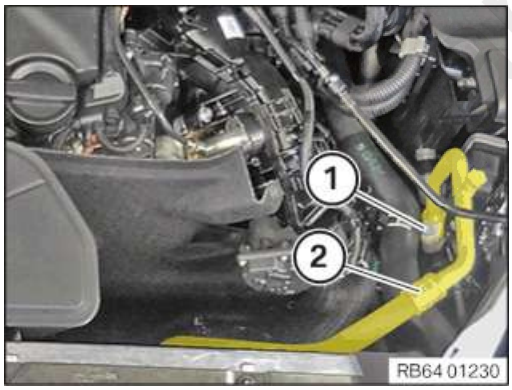


- Slide the coolant hose (1) slightly to the side.
- Loosen screw (2).
- Place intake pipe (3) aside.



- Loosen screw (1).
- Feed out intake pipe (2) completely and remove.

4 – Install the front intake pipe

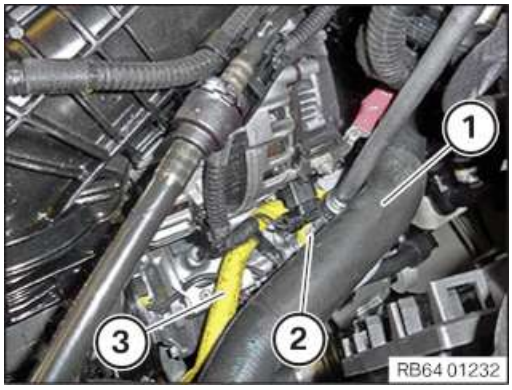


- Renew O-rings.

  Parts: O-rings.
- Completely feed in the intake pipe (2) and position correctly.
- Tighten down screw (1).

Refrigerant line to connecting piece

M8		Tightening torque	19 Nm



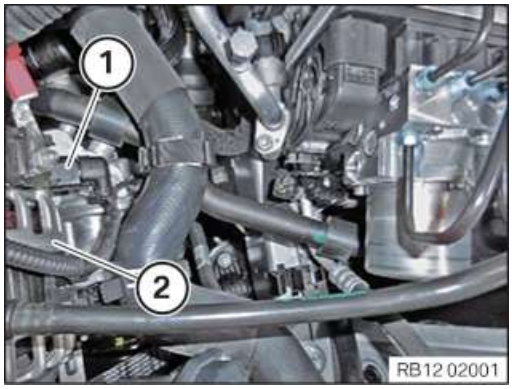
- Attach intake pipe (3) and position it correctly.
- Tighten down screw (2).

Refrigerant line on air conditioning compressor

M8		Tightening torque	19 Nm

- Correctly position the coolant hose (1).

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NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

- Connect the connector (1) to the alternator (2) and lock.

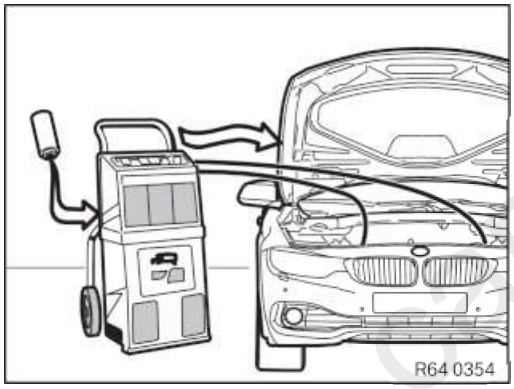
POSTPROCESSES

5 – Connecting all battery earth leads



- See additional information.

6 – Evacuate and fill air conditioning



- See additional information.

Additional Information

Overview of Tightening Torques

Refrigerant line to connecting piece			Used in step 4
M8		Tightening torque	19 Nm

Refrigerant line on air conditioning compressor			Used in step 4
M8		Tightening torque	19 Nm

Links

General repair instructions	Used in step
64 52 ... Instructions for opening and part exchange in refrigerant circuit	16

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Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	16
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	16
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	16
64 50 ... Notes on repairs to air conditioning	16
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	16
64 50 ... Safety information for handling refrigerant R1234yf	16
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	16
64 50 ... Safety informations for handling refrigerant oil	16
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25
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61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	25
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	25
61 20 900 Disconnecting and connecting battery earth lead (Plug-in Hybrid Electric Vehicle)	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25
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61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting the battery earth lead (all battery earth leads)	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25
61 20 900 Disconnecting and connecting battery earth lead	25

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64 53 810 Replacing the pressure line between air conditioning condenser and evaporator

WARNING

Working on 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.
- Detach battery earth lead from battery.
- With auxiliary batteries: Detach all battery earth leads from additional batteries.

RISK OF DAMAGE

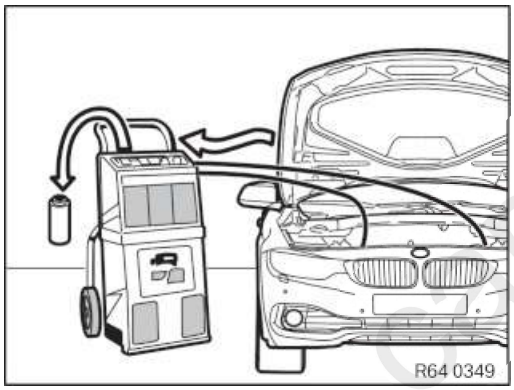
Damage to battery terminal, the safety battery terminal or the intelligent battery sensor (IBS).

Damaged battery terminals can lead to malfunctions or vehicle electrical system faults.

- Pull off battery terminal from battery pole by carefully moving to and fro. Do not pry off using a tool.

PRELIMINARY WORK

1 – Drawing off the air conditioning



- See additional information.

2 – Deactivating the 48 V electrical system

Prerequisite

Ignition is switched off.

WARNING

Deactivation of the 12 V vehicle electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no battery charger** is connected to the jump start terminal point in the engine compartment.
- For vehicles with additional electrical systems (48 V electrical system, high-voltage vehicle electrical system), it is mandatory to deactivate them **before** disconnecting the vehicle battery.

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WARNING

Deactivation of the 48 V electrical system.

Risk of short circuits! Risk of fire!

- Make sure that **no charger** is connected to the jump start support point in the engine compartment.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

TECHNICAL INFORMATION

Follow notes for 48-V battery. See further information 6120 ... Notes on 48-V battery.



- Deactivate the 48V electrical system by opening the bonnet.

  The deactivation takes place automatically.

Check



TECHNICAL INFORMATION

Zero voltage (48V electrical system is switched off) is displayed only in PAD mode.

- Press the START-STOP button quickly 3 times without stepping on the brake pedal to establish the PAD mode.
- Check isolation from the supply in the instrument cluster in PAD mode.

desired state

- The Check Control message "48V electrical system switched off." (1) is displayed.

Result

» **The absence of voltage** cannot be determined by means of the Check Control message "48V electrical system switched off:" (1). Work is not permitted to be started.

ardiagn.com

Measure

- Carry out the service function "48 V electrical system deactivation".
  - Vehicle management > Service functions > Voltage supply > Deactivate 48 V electrical system

  Only when the Check Control message “48 V electrical system switched off.” (1) is displayed in the instrument cluster is it permitted to disconnect the 12 V battery.

  If the absence of voltage is not indicated clearly, contact Technical Support.

Result

» The Check Control message signals that the 48V electrical system has been switched off.

Measure

- Exit PAD mode by pressing the START-STOP button once without depressing the brake pedal.

  The work “Disconnecting the negative battery cable of the 48-V battery” can be started.



- Unlock and disconnect plug connection (1) of the CAN bus.
- Release the clip (2).



- Loosen nut (1).
- Pull off negative battery cable (2) of the 48-V battery from the negative battery terminal, set it aside and secure it.



WARNING

Unprotected battery terminals.

Risk of short circuits! Risk of fire!

- Cover the vehicle battery.

- Cover the vehicle battery with the special tool as shown.
- Position the battery earth lead (1) as shown.

3 – Disconnecting all battery earth leads



- See additional information.

4 – Removing the acoustic cover

RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.



- Unclip the acoustic cover (1) from the holders in the indicated area towards the top.

5 – Remove DDE control unit

RISK OF DAMAGE

Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

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TECHNICAL INFORMATION

In a warranty case, you must always provide a fault memory printout with the defective part, even if the fault memory does not contain an entry.

TECHNICAL INFORMATION

Follow instructions for removing and installing control units.

For additional information see: 12 00 ... Notes on removal and installation of control units

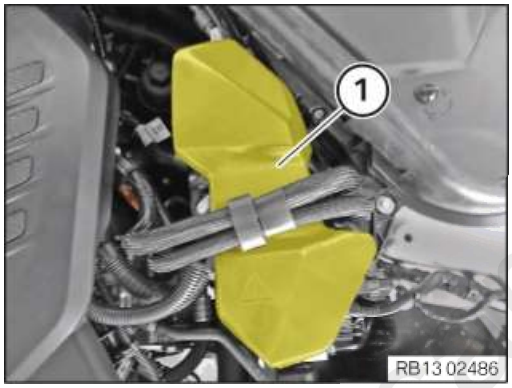
TECHNICAL INFORMATION

Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

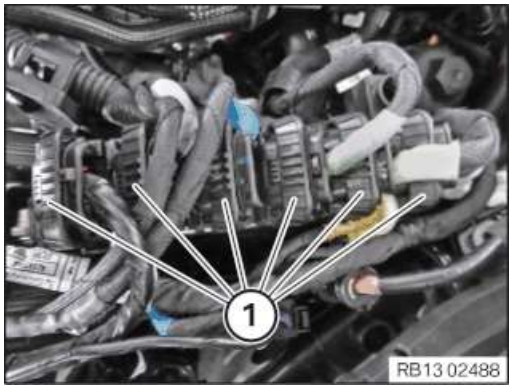
For additional information see: 61 00 ... Programming/encoding control unit(s)



- Pull off cover (1) upwards, feed out and remove.



- Unlock plug connection (1) and disconnect.



- Unlock and disconnect plug connections (1).



- Release the latch mechanisms (arrows).
- Thread out and remove DDE control unit (1).

6 – Removing integrated supply module (PDM)

RISK OF DAMAGE

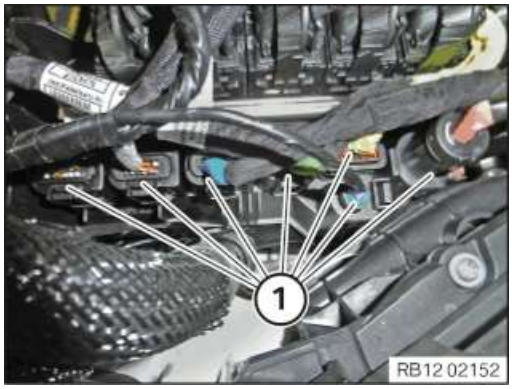
Electrostatic discharge.

Damage to or destruction of electrical components.

- Leave electrical components in original packaging until just before they are installed. Use the original packaging only for any return shipments. Always package removed components straight away.
- Read and comply with user information on using the associated special tool 12 7 060.
- Only touch the housings of electrical components. Do not touch pins or multi-pin connectors directly.
- Wear electrically conductive clothing and antistatic shoes (with ESD symbol).
- For additional information see: 61 35 ... Notes for ESD protection (electrostatic discharge)

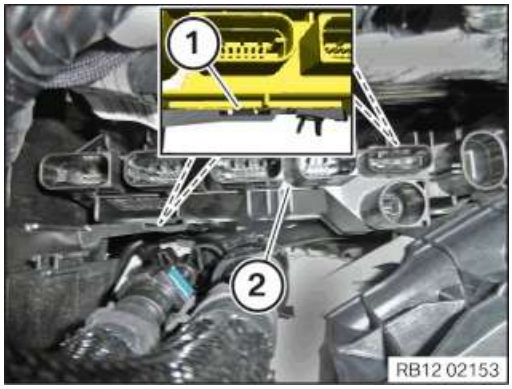
TECHNICAL INFORMATION

The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.



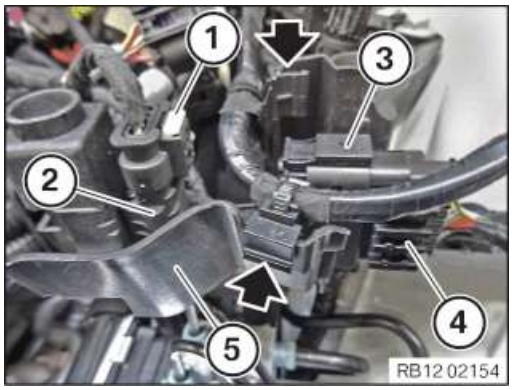
- Unlock and disconnect plug connections (1).

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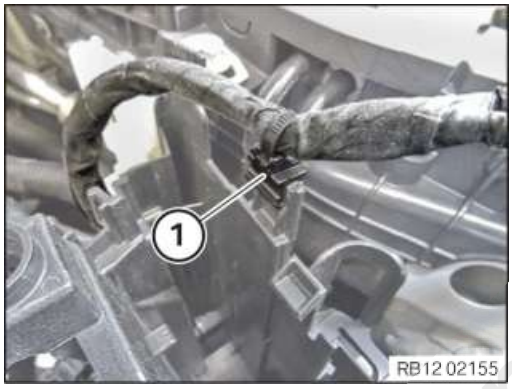


- Loosen the latch mechanisms (1).
- Feed out and remove the integrated supply module (PDM) (2) upwards.

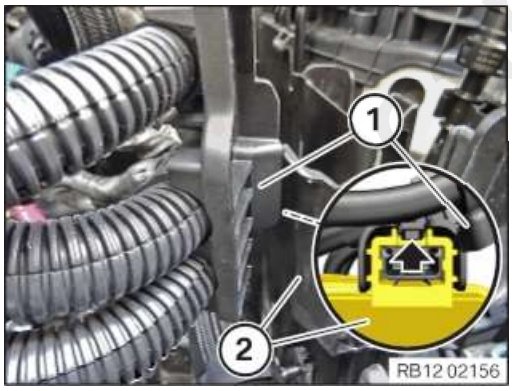
7 – Removing the control unit holder



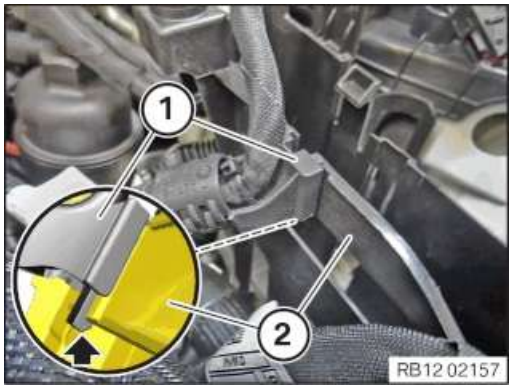
- Unlock plug connection (1) and disconnect.
- Unlock connector (2) and disconnect from the control unit holder (5).
- Unlock plug connection (3) and disconnect.
- Unlock connector (4) and disconnect from the control unit holder (5).
- Release the clamps (arrows).



- Loosen clamp (1).

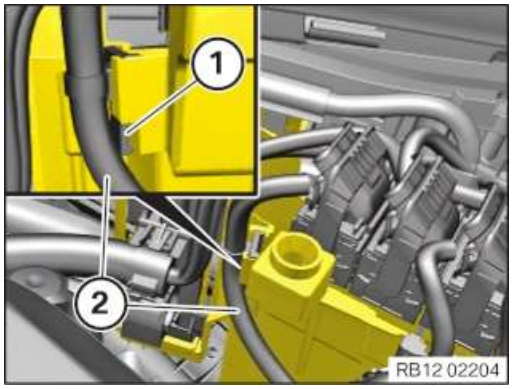


- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.



- Unlock the lock (arrow).
- Disconnect cable clip (1) from the control unit holder (2) to the top.

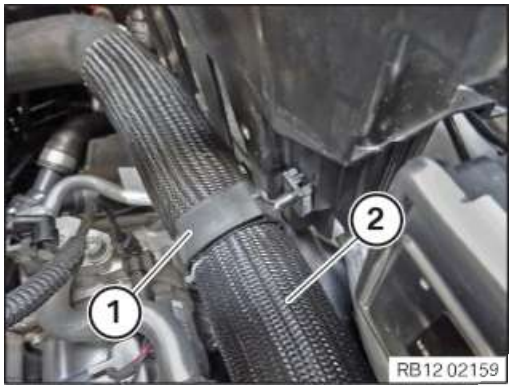
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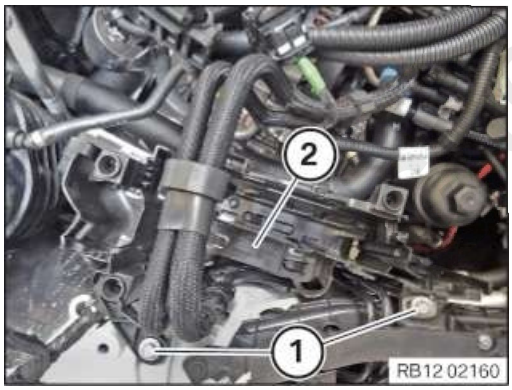
- Unlock and loosen the cable clip (1).
- Remove the wiring harness section (2) and put to one side.



- Unlock the lock (arrow).
- Feed out the cable clip (1) to the top and set it aside.

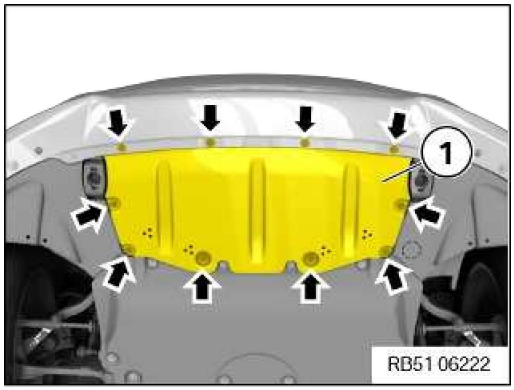


- Unlock holder (1), feed out coolant line (2) and place to one side.



- Loosen screws (1).
- Guide out and remove the control unit holder (2).

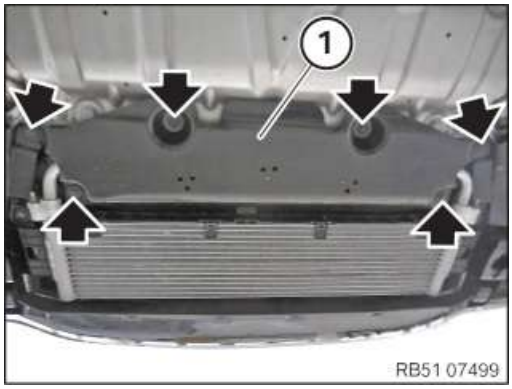
8 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

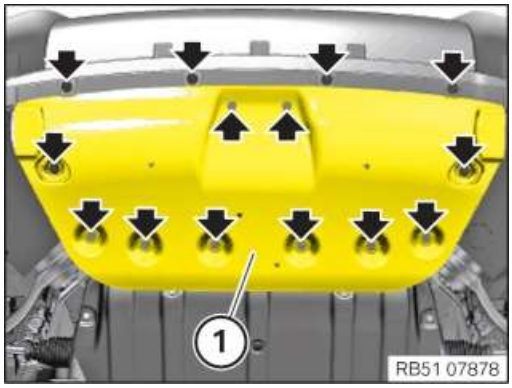
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

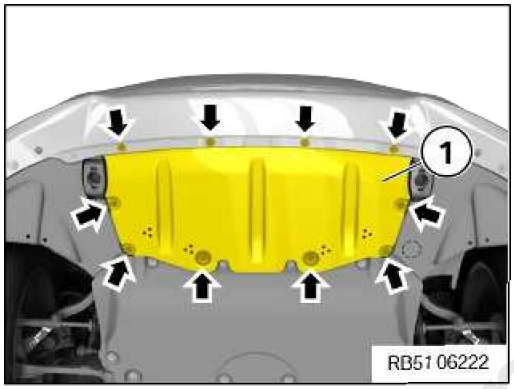


- **Version C:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

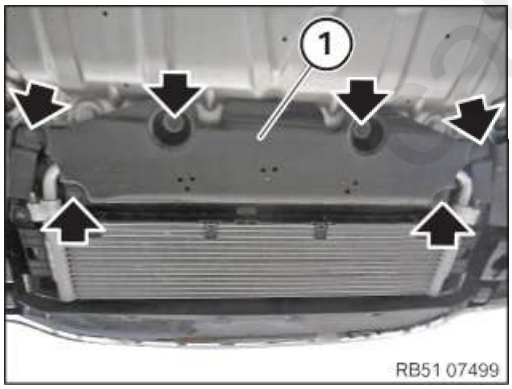
9 – Removing the front underbody protection



- **Version A:**

  Remove screws (arrows).

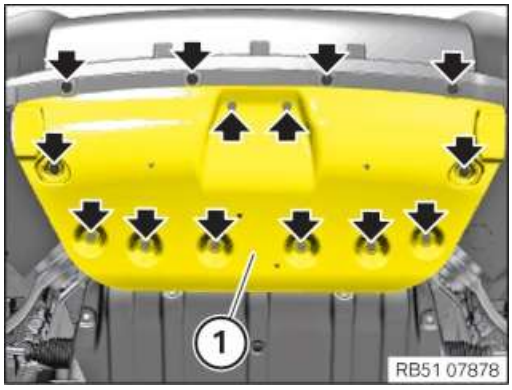
  Feed front underbody protection (1) backwards out of the bumper panel.



- **Version B:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.



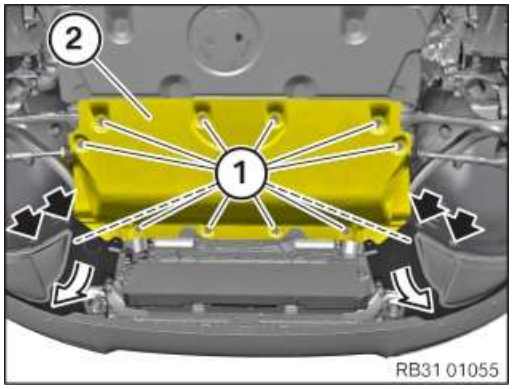
- **Version C:**

  Remove screws (arrows).

  Guide out front underbody protection (1) and remove it.

10 – Remove the underbody protection of the steering gear

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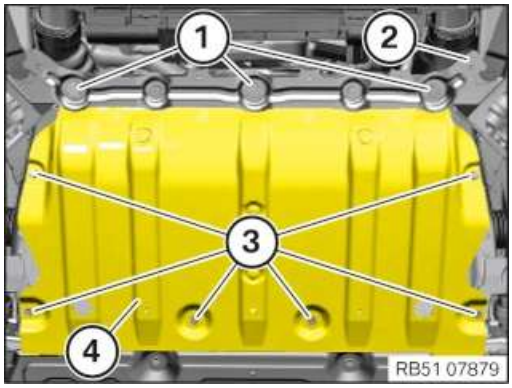
- **Version A:**

  Unscrew the screws (arrows) of the wheel arch cover on the wheel arch cover.

  Fold the bottom wheel arch cover to the side.

  Loosen screws (1).

  Remove the underbody protection (2) of the steering gear.



- **Version B:**

  Loosen screws (1).

  Remove the holder (2) for the underride protection.

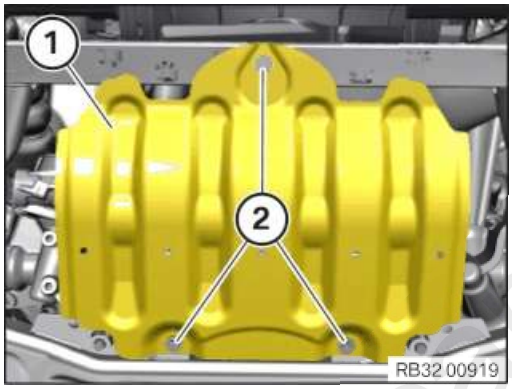
  Loosen screws (3).

  Feed out and remove the underbody protection (4) of the steering gear.

11 – If installed: Removing the steering underbody protection

Prerequisite

Front underbody protection has been removed.



- Loosen screws (2).
- Remove underbody protection (1).

12 – Remove coolant expansion tank

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

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TECHNICAL INFORMATION

Life-long fill of coolant!

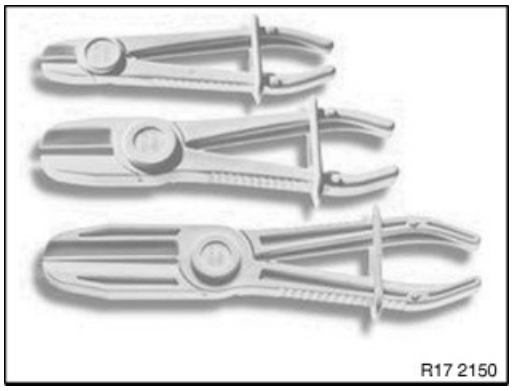
Do not reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

TECHNICAL INFORMATION

Collect and dispose of emerging fluids. Observe country-specific waste disposal regulations.



- Use commercially available disconnection tools to pinch off the coolant lines.

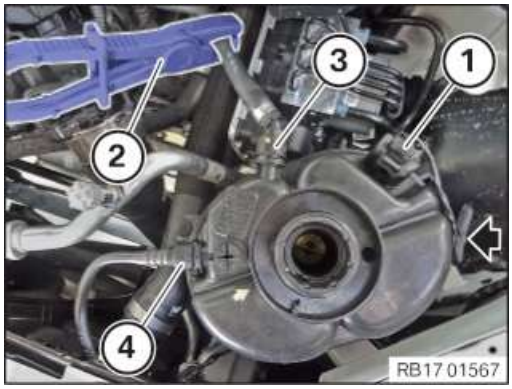


- Use commercially available syringe (1) or suitable tool to draw off coolant expansion tank.



- Open the lid (1) on the coolant expansion tank.
- Draw off coolant using **standard pump** from the coolant expansion tank and dispose of it.

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- Unlock plug connection (1) and disconnect.

TECHNICAL INFORMATION

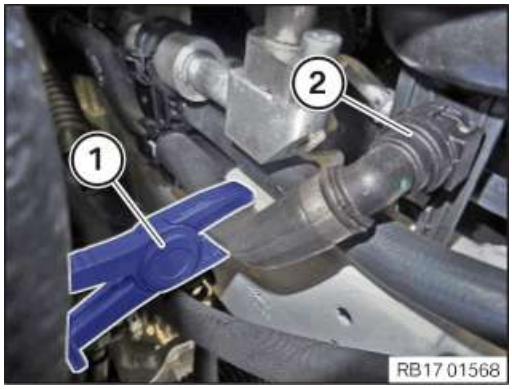
Only flexible hose pipes may be disconnected.

- Disconnect the coolant line (3) using standard disconnection tool (2).
- Unlock and disconnect the coolant line (3).

NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

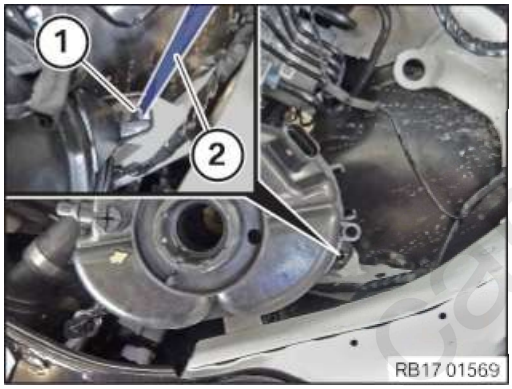
- Unlock and disconnect the coolant line (4).



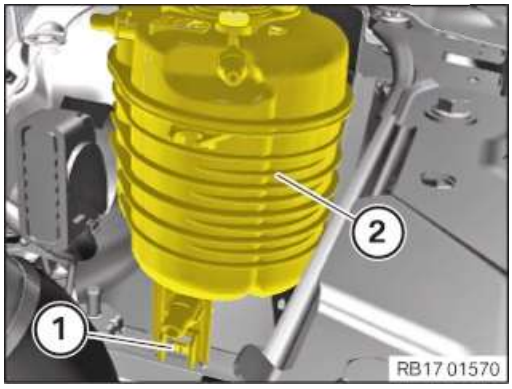
TECHNICAL INFORMATION

Only flexible hose pipes may be disconnected.

- Disconnect the coolant line (2) using standard disconnection tool (1).
- Unlock and disconnect the coolant line (2).



- Unlock the lock (1) with a suitable screwdriver (2).



- Unlock lock (1).
- Thread out coolant expansion tank (2) and remove.

13 – Remove safety pressure switch

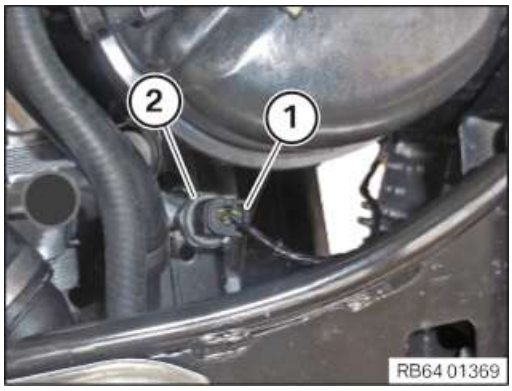
cardiagn.com

CAUTION

Residual pressure in the air conditioning.

Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Unlock and disconnect connector (1).
- Loosen the safety pressure switch (2).

MAIN WORK

14 – Removing the pressure line between the evaporator and the air conditioning condenser

▸ **Disconnect the refrigerant line from the expansion valve**

CAUTION

Residual pressure in the air conditioning.

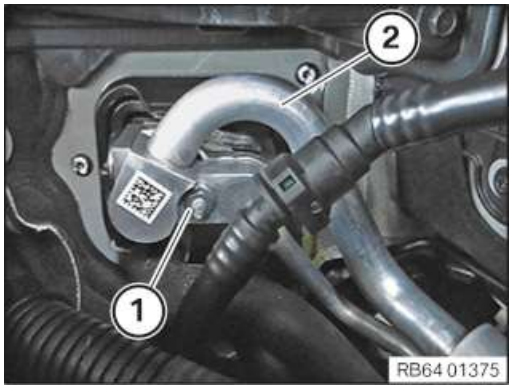
Danger of injury!

- Wear safety goggles and protective gloves when disconnecting the refrigerant line.
- Seal refrigerant lines with seal plugs.



- Open the holder (1).

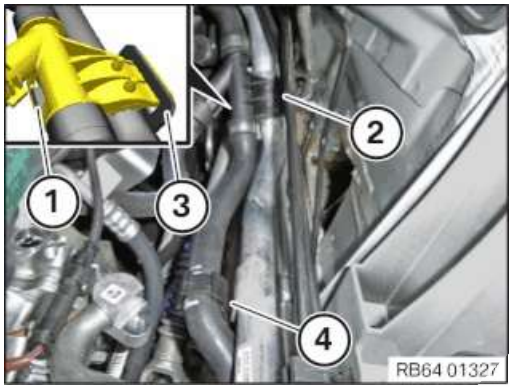
cardiagn.com



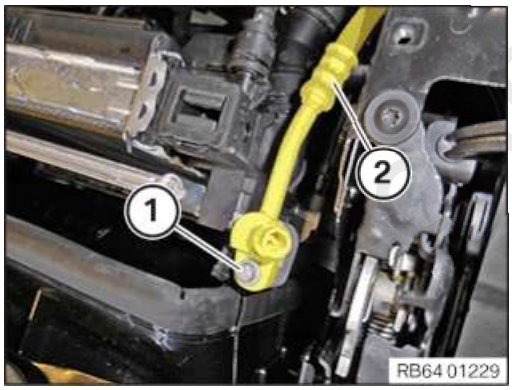
- Loosen nut (1).
- Remove the refrigerant line (2) and set it aside.



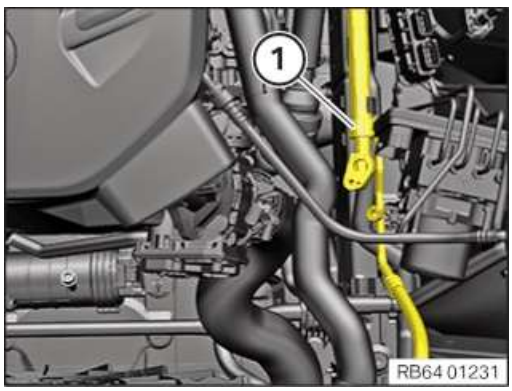
- Unlock and disconnect the vacuum line (1).



- Unlock the lock (1) below on the pipe neck (2).
- Feed out pipe neck (2) upward out of the guide (3).
- Place pipe neck (2) to one side.
- Disengage the hose support (1).
- Disengage the hose support (4).

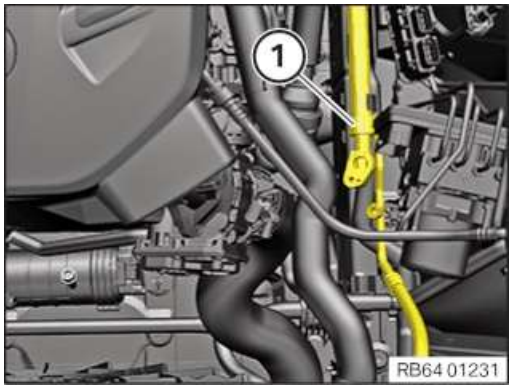


- Loosen screw (1).
- Partially feed out the front section of the pressure line (2).



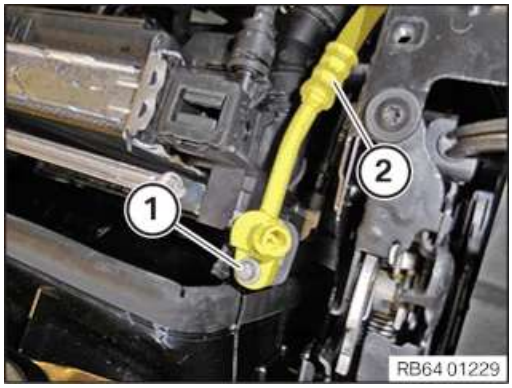
- Feed out and remove pressure line (1) between the evaporator and the air conditioning condenser.

15 – Installing the pressure line between the evaporator and the air conditioning condenser



- Renew O-rings.

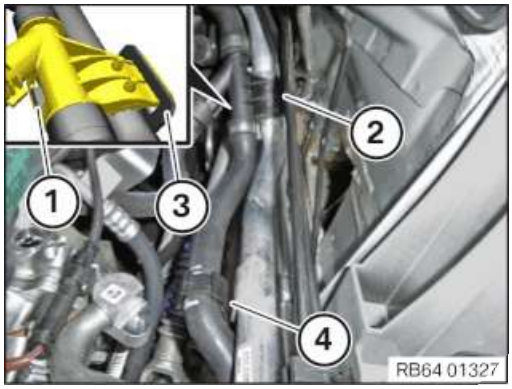
  Parts: O-rings
- Guide in pressure line (1) between the evaporator and the air conditioning condenser fully and position it correctly.



- Position the front section of pressure line (2) on the air conditioning condenser.
- Tighten down screw (1).

Refrigerant lines to air conditioning condenser/connecting piece

M6		Tightening torque	13 Nm

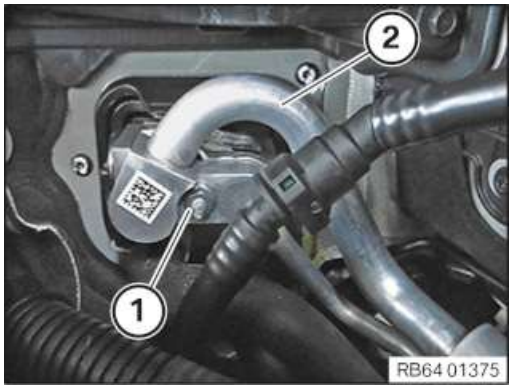


- Engage the hose support (1).
- Feed in pipe neck (2) upward into the guide (3).
- Secure the lock (1) below on the pipe neck (2).



- Connect and lock the vacuum line (1).

▸ **Connect the refrigerant line to the expansion valve**



- Renew O-rings.

  Parts: O-rings
- Correctly position the refrigerant line (2).
- Tighten nut (1).

Refrigerant line to expansion valve / connecting piece

M6		Tightening torque	13 Nm

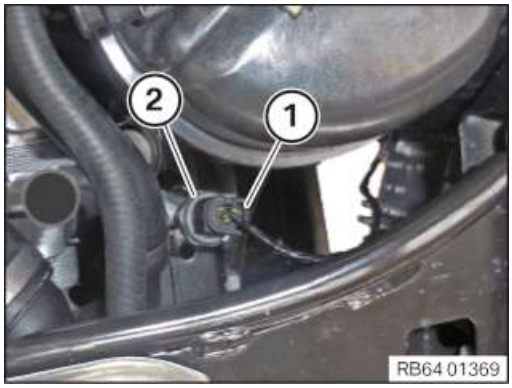
rdiagn.com



- Close the holder (1).

POSTPROCESSES

16 – Installing the safety pressure switch



- Correctly position and tighten the safety pressure switch (2).

Safety pressure switch

	Tightening torque	10 Nm

- Insert and connect the connector (1).

17 – Installing coolant expansion tank

CAUTION

Materials harmful to health.

Contact with fluids harmful to health!

- Note and follow safety information on containers.
- Conduct all work in appropriate personal protective equipment only.

TECHNICAL INFORMATION

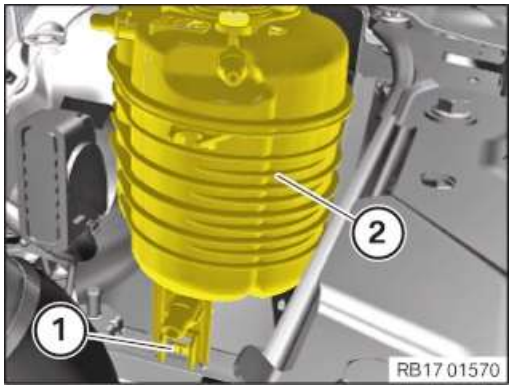
Life-long fill of coolant!

Do not reuse used coolant.

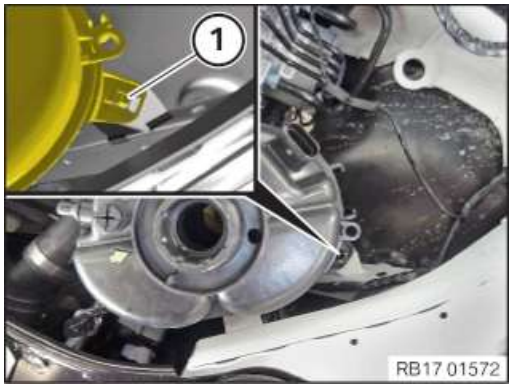
When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be emptied and refilled.

In the case of other removal work involving the draining of part quantities of coolant, the coolant level must be topped up with new coolant.

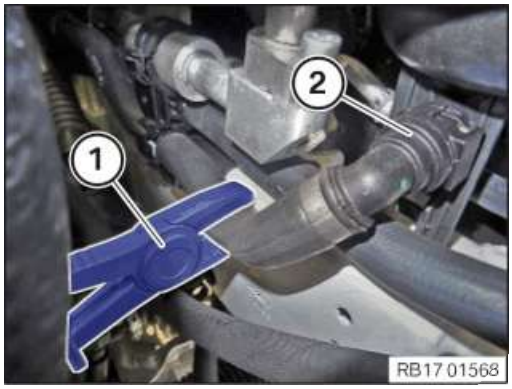
cardiagn.com



- Feed in and install coolant expansion tank (2).
- Ensure that the lock (1)engages audibly.

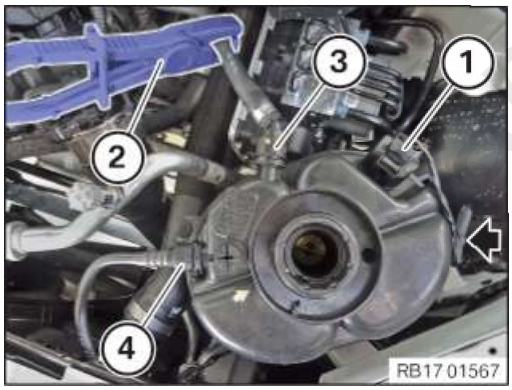


- Ensure that the lock (1)engages audibly.



- Connect and lock the coolant line (2).

  The coolant line (2) must audibly engage.
- Remove conventional disconnection tool(1).



NOTICE

The following work step(s) is / are to be carried out if the specified component(s) is/are fitted.

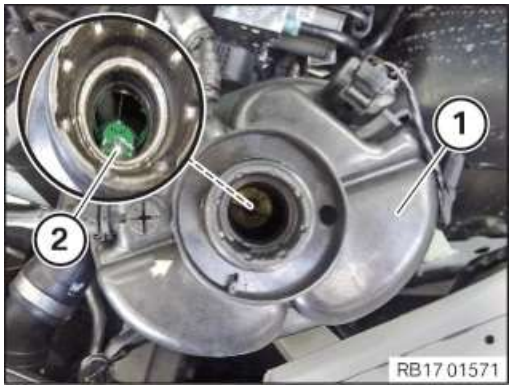
- Connect and lock the coolant line (4).

  The coolant line (4) must audibly engage.
- Connect and lock the coolant line (3).

  The coolant line (3) must audibly engage.
- Remove conventional disconnection tool(2).
- Connect connectors (1) and lock.

  The connector (1) must engage audibly.

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TECHNICAL INFORMATION

Follow notes for repair work on the cooling system.
For additional information see:
Main group 17
17 00 ... Notes for working on the cooling system

- Fill up coolant expansion tank (1) with coolant upto **max. mark** (2).

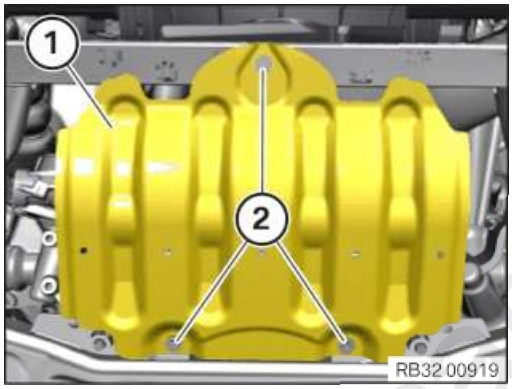


- Close the sealing cap (1) until the **arrows** are flush.

18 – If installed: Install underbody protection of the steering

Prerequisite

Front underbody protection has been removed.



- Position underbody protection (1).
- Tighten the screws (2).

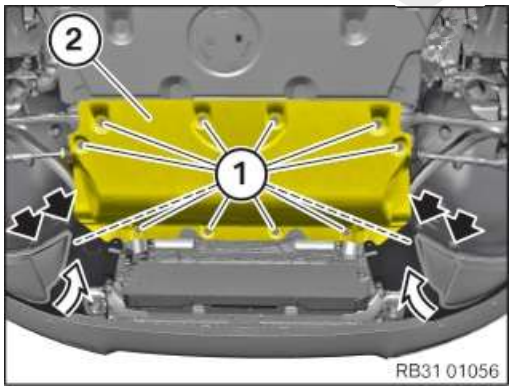
Underbody protection, steering, to front axle support

Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support

Hexagon bolt M6		Tightening torque	8 Nm

19 – Install the underbody protection of the steering gear



- **Version A:**

  Position the underbody protection (2) of the steering gear.

  Tighten the screws (1).

Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

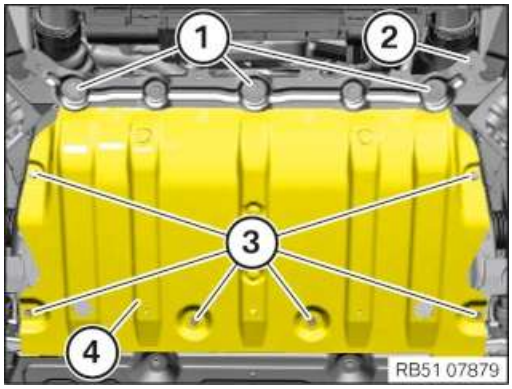
- Position the bottom wheel arch cover.

  Tighten the screws (arrows) of the lower wheel arch cover on the wheel arch cover.

Wheel arch trim panel, front

Thermoplastic hexagon screw		Tightening torque	2,6 Nm

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- **Version B:**

  Feed in the underbody protection (4) of steering gear and install it.

  Tighten the screws (3).

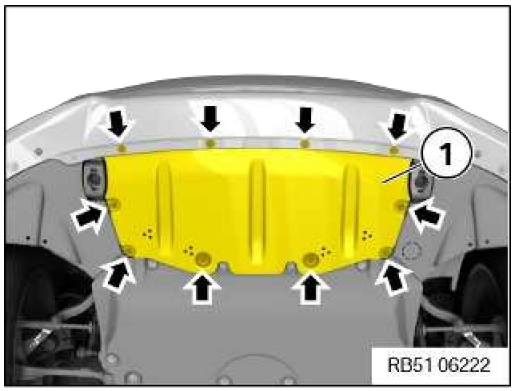
Underbody protection of the steering gear

Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

- Position the holder (2) for the underride protection.

  Tighten the screws (1).

20 – Installing the front underbody protection



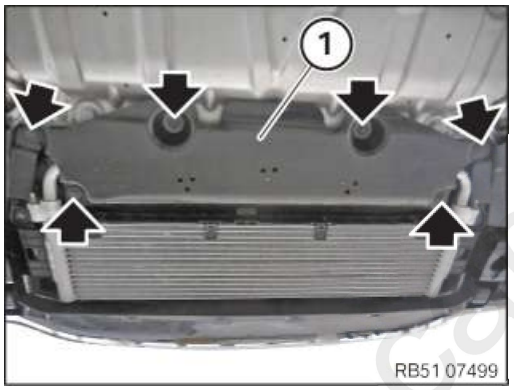
- **Version A:**

  Feed in the front underbody protection (1) towards the front under the bumper panel and position.

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



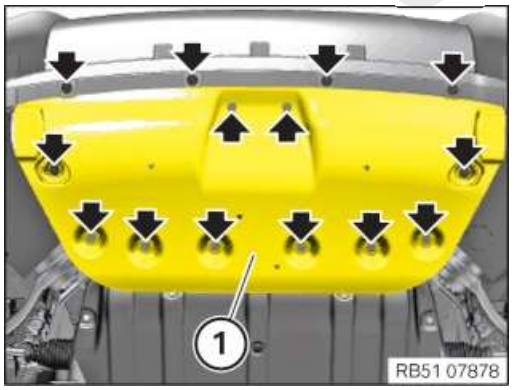
- **Version B:**

  Feed in and position the front underbody protection (1).

  Tighten screws (arrows).

Underbody protection front

Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm



- **Version C:**

  Feed in and install front underbody protection (1).

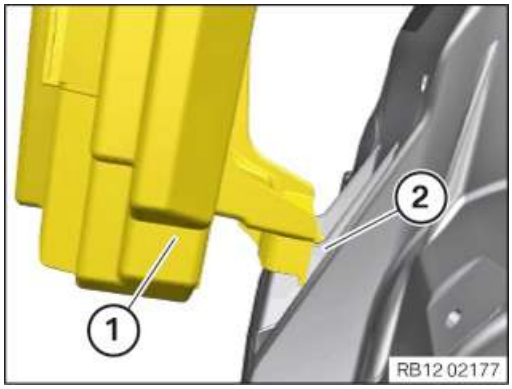
  Tighten screws (arrows).

Underbody protection front

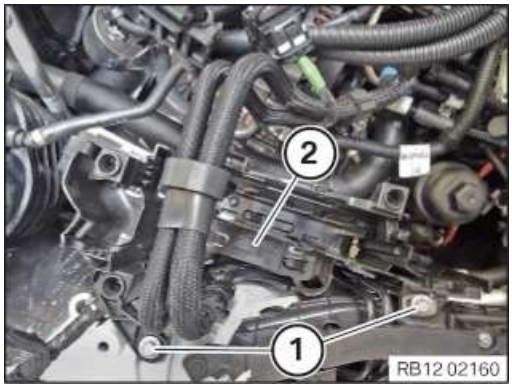
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

21 – Installing the control unit holder

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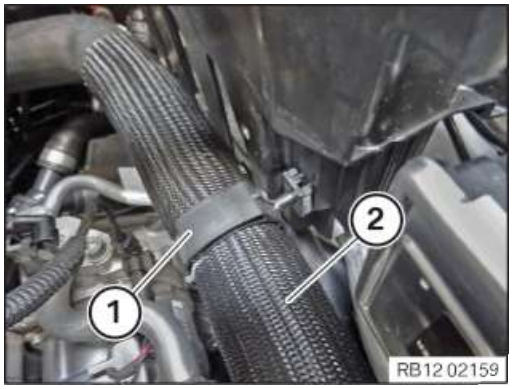
- Make sure the bottom control unit holder (1) is inserted correctly into the fixture (2).



- Guide in and install control unit holder (2).
- Tighten the screws (1).

Control unit holder

M6		Tightening torque	8 Nm



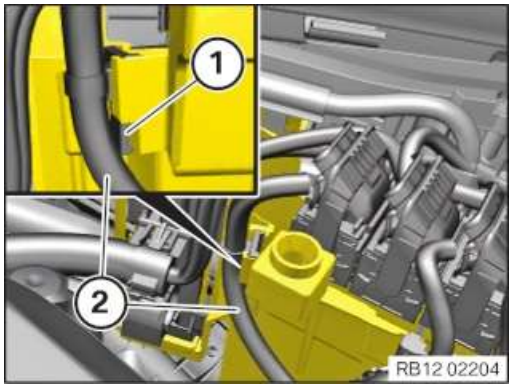
- Feed in and install coolant line (2).
- Lock holder (1).

  The holder (1) must engage audibly.



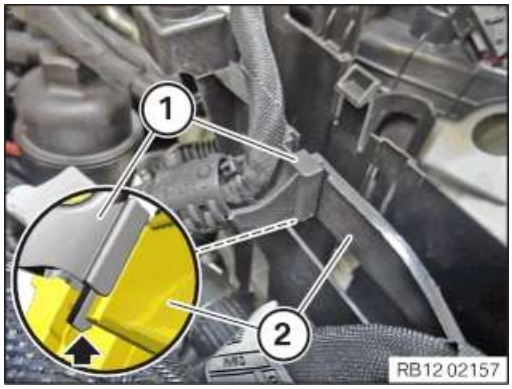
- Feed in and install the cable clip (1).

  Lock (arrow) must audibly engage.

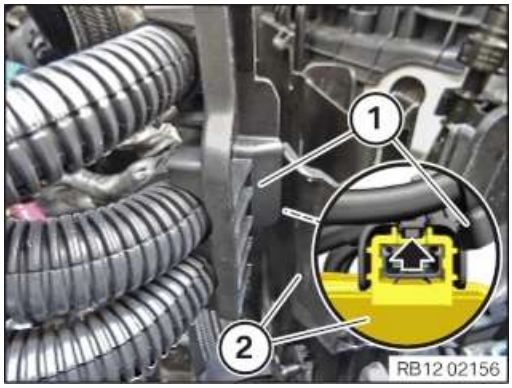


- Guide in the wiring harness section (2) and install.
- Connect and lock the cable clip (1).

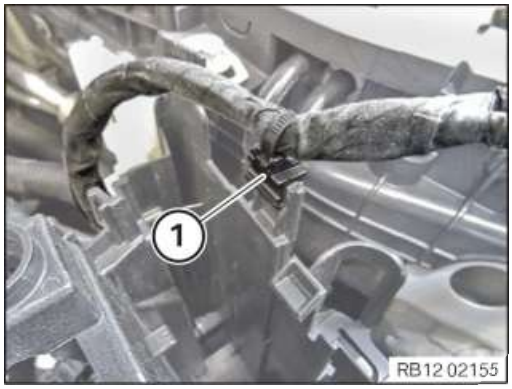
rdiagn.com



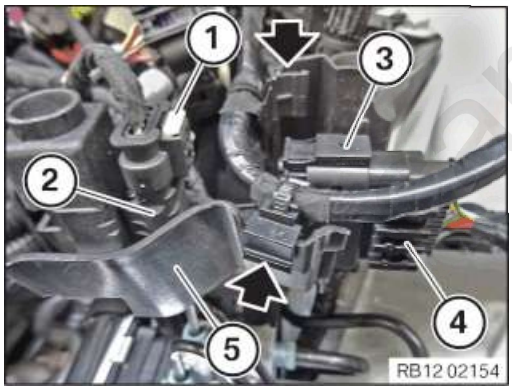
- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Connect the cable clip (1) with the control unit holder (2) and lock.
  Lock (arrow) must audibly engage.



- Secure clamps (1).



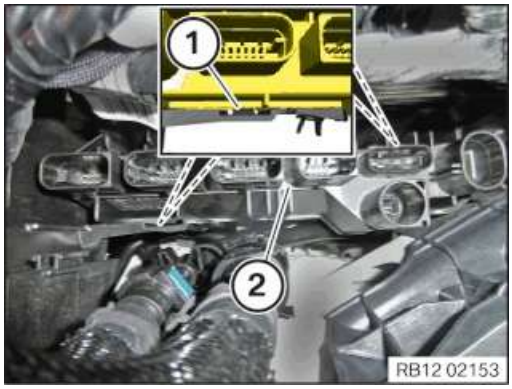
- Connect and lock the connector (4) with the control unit holder (5).
  The connector (4) must engage audibly.
- Connect connectors (3) and lock.
  The connector (3) must engage audibly.
- Connect and lock the connector (2) with the control unit holder (5).
  The connector (2) must engage audibly.
- Connect connectors (1) and lock.
  The connector (1) must engage audibly.
- Secure the clamps (arrows).

22 – Installing the integrated supply module (PDM)

TECHNICAL INFORMATION

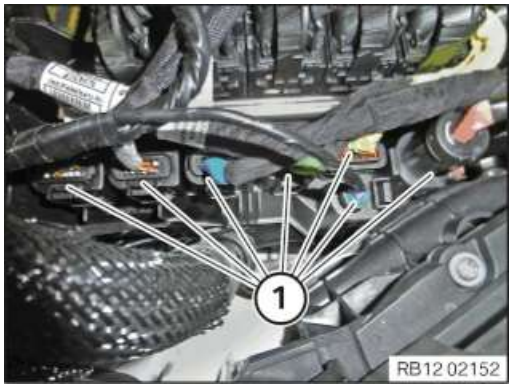
The number of connectors on the described component may vary depending on the equipment specification.
If necessary, unlock all other connectors and disconnect or connect and lock respectively.

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- Insert and install the integrated supply module (PDM) (2).

  The latch mechanisms (1) must engage audibly.



- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.

23 – Install DDE control unit

TECHNICAL INFORMATION

If the DDE control unit or an injector has been replaced, it will also be necessary to carry out injection quantity compensation. The adjustment value (7-position letter/number code) is engraved on each injector.

TECHNICAL INFORMATION

Follow instructions for removing and installing control units.

For additional information see: 12 00 ... Notes on removal and installation of control units

TECHNICAL INFORMATION

Control unit must be programmed after it is replaced.

For additional information see: 61 00 ... Programming/encoding control unit(s)

TECHNICAL INFORMATION

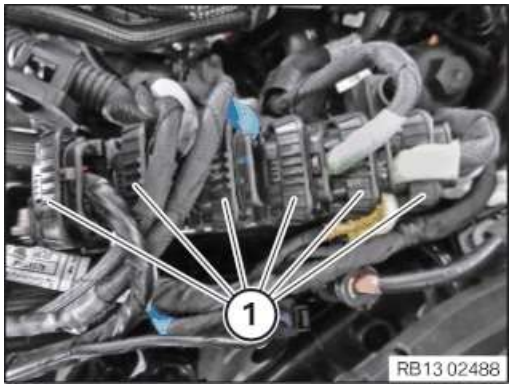
Disconnecting control units may cause fault code entries and functional limitations. Fault code entries must be read out and deleted if necessary.

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- Install DDE control unit(1).

  The latch mechanisms (arrows) must engage audibly.



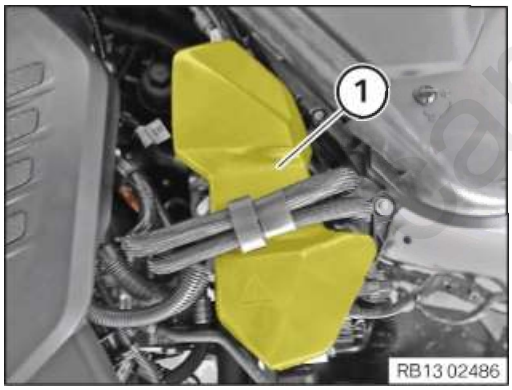
- Connect connectors (1) and lock.

  The connectors (1) must engage audibly.



- Connect connectors (1) and lock.

  The connector (1) must engage audibly.



- Insert and install cover (1) into guides.

24 – Install acoustic cover

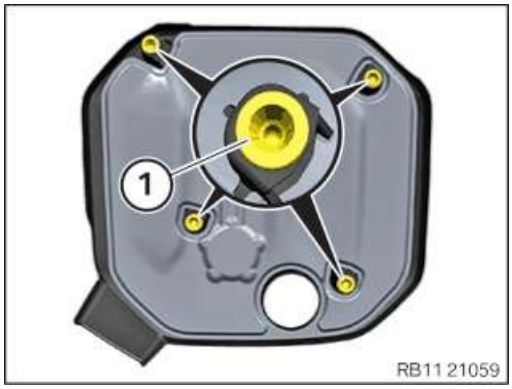
RISK OF DAMAGE

Damage to the acoustic cover/design cover.

Jerky movements during disassembly and excessive application of force during installation may result in breakage of the acoustic cover/design cover.

- Disassemble or mount the acoustic cover/design cover carefully.
- Disassemble or mount snap-lock couplings of the ball pivots one after the other.
- Disassemble or mount acoustic cover/design cover only at temperatures >20 °C.
- Use only distilled water as an auxiliary material during installation, no lubricants.

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- Check the acoustic cover for correct fit of the rubber mounts (1).



- Clip in the acoustic cover (1) into the holders in the indicated areas.

25 – Connecting all battery earth leads



- See additional information.

26 – Activating the 48 V electrical system

Prerequisite

Ignition is switched off.

RISK OF DAMAGE

Damage to 48-V battery

If a 48-V battery that is disconnected from the electrical system is activated, the battery electronics will be damaged.

- Only carry out activation of the 48V electrical system with a completely connected 48-V battery.

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- Lift battery earth lead (1).
- Remove special tool .



- Release the negative battery cable (2) of the 48-V battery from the mounting.
- Position the negative battery cable (2) of the 48-V battery on the negative battery terminal.
- Tighten nut (1).

Negative battery cable to 48-V battery

Nut M8		Tightening torque	19 Nm



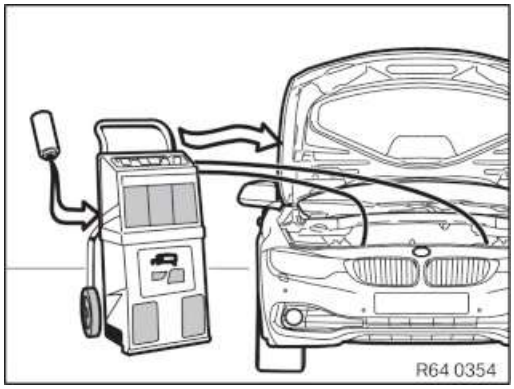
- Connect the connector (1) of the CAN bus and lock it.
- Clip in clip (2).



- Activate the 48V electrical system by closing the bonnet.

  The activation takes place automatically.

27 – Evacuate and fill air conditioning



- See additional information.

Additional Information

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Overview of Tightening Torques

Refrigerant lines to air conditioning condenser/connecting piece			Used in step 15
M6		Tightening torque	13 Nm

Refrigerant line to expansion valve / connecting piece			Used in step 15
M6		Tightening torque	13 Nm

Safety pressure switch			Used in step 16
		Tightening torque	10 Nm

Underbody protection, steering, to front axle support			Used in step 18
Multi-purpose boltM10		Tightening torque	56 Nm

Underbody protection, steering, to front axle support			Used in step 18
Hexagon bolt M6		Tightening torque	8 Nm

Underbody protection of the steering gear			Used in step 19
Hexagon screw for thermoplastic		Tightening torque	2.6 Nm
Hexagon bolt M6x20		Tightening torque	8 Nm

Wheel arch trim panel, front			Used in step 19
Thermoplastic hexagon screw		Tightening torque	2,6 Nm

Underbody protection front			Used in step 20
Hexagon screw for thermoplastic		Tightening torque	2,6 Nm
Hexagon screw M6x20		Tightening torque	8 Nm

Control unit holder			Used in step 21
M6		Tightening torque	8 Nm

Negative battery cable to 48-V battery			Used in step 26
Nut M8		Tightening torque	19 Nm

Overview of Special Tools

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64 00 ... Information on using cleaning agent/paints (personal protection equipment)



Warning!

Use of cleaning agents/paints not compliant with instructions can cause serious injuries or burns!

Handling cleaning agents/paints can trigger allergic skin and respiratory reactions!



Important!

Observe following instructions:

- Store cleaning agents/paints only in a secure cabinet.
- Keep cleaning agents/paints away from naked flames and other sources of ignition.
- Protect cleaning agents/paints from high temperatures and direct sunlight.
- Always keep an eye douche on hand, change the water regularly (once a month).



Important!

Observe following instructions before use:

- Manufacturer's instructions (on container/packaging)
- Hazard warnings (on container/packaging)
- Manufacturer's instructions on package insert
- Material safety data sheet of manufacturer
- Product information in EPC
- National market regulations



Important!

Observe following instructions during use:

- Do not eat, drink or smoke while working with these products.
- Avoid direct contact with skin and eyes.
- Wear personal protective clothing/equipment.
- Ensure that all enclosed areas are well ventilated or extract fumes directly.
- Immediately change working clothes soiled with cleaning agent/paint.
- After finishing work, wash your hands and apply protective skin cream.



Important!

Follow hazard warnings and wear personal protection equipment!

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First Aid:

- If product comes in contact with eyes, immediately flush with running water for about 10 - 15 minutes. Seek the advice of eye specialist.
- In the event of skin contact and where applicable an allergic skin reaction, clean the affected areas immediately with soap and water and then apply silicone-free skin cream. Seek advice of physician.
- If an adhesive product is swallowed, rinse mouth/parts of mouth thoroughly with running water. Drink 1-2 glasses of water. Do not induce vomiting. Consult a doctor.
- After inhaling vapours ensure ample supply of fresh air. Keep calm, keep respiratory tracks clear and call doctor.



Recycling:

Dispose of cleaning agents/paints in a professional manner!

Observe national/country-specific disposal regulations.

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61 00 ... Parking-residing-driving

Vehicles of the G series feature a new type of terminal control:

Functional description of the parking-residing-driving terminal control

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