

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!

**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.

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

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 Refrigerant of circuit		Accessories for flushing
		R134a	R1234yf	Yes	No	Order number
Beissbarth 4100a	81 34 2 286 739	x		x		81 34 2 286 908
760R	81 34 2 289 569	x		x		81 34 2 289 571
WAECO AirCon Service Center	81 34 2 147 235	x		x		81 34 2 286 909
WAECO 2500 Low Emission	81 34 2 286 807	x		x		81 34 2 286 909
TEXA 770S	81 34 2 286 318		x		x	
BEISSBARTH 5100yf	81 34 2 286 325		x		x	
WAECO BMW 5000 Low Emission	81 34 2 286 324		x		x	

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

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



Warning!

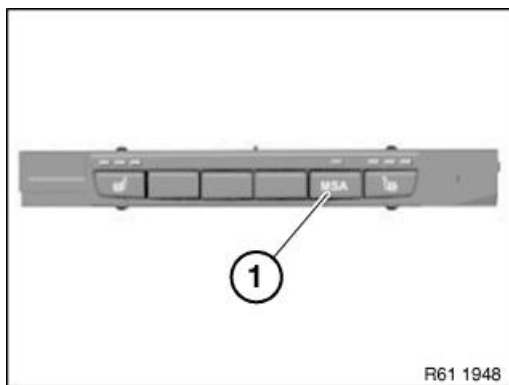
If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.

An automatic engine start is possible.

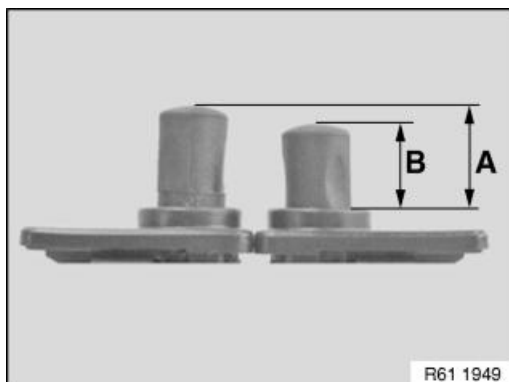
Observe safety precautions when working on MSA vehicles.

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
 $A = 10 \text{ mm}$
 - Basic setting (engine hood/bonnet open)
 $B = 7 \text{ mm}$

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



Note:

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

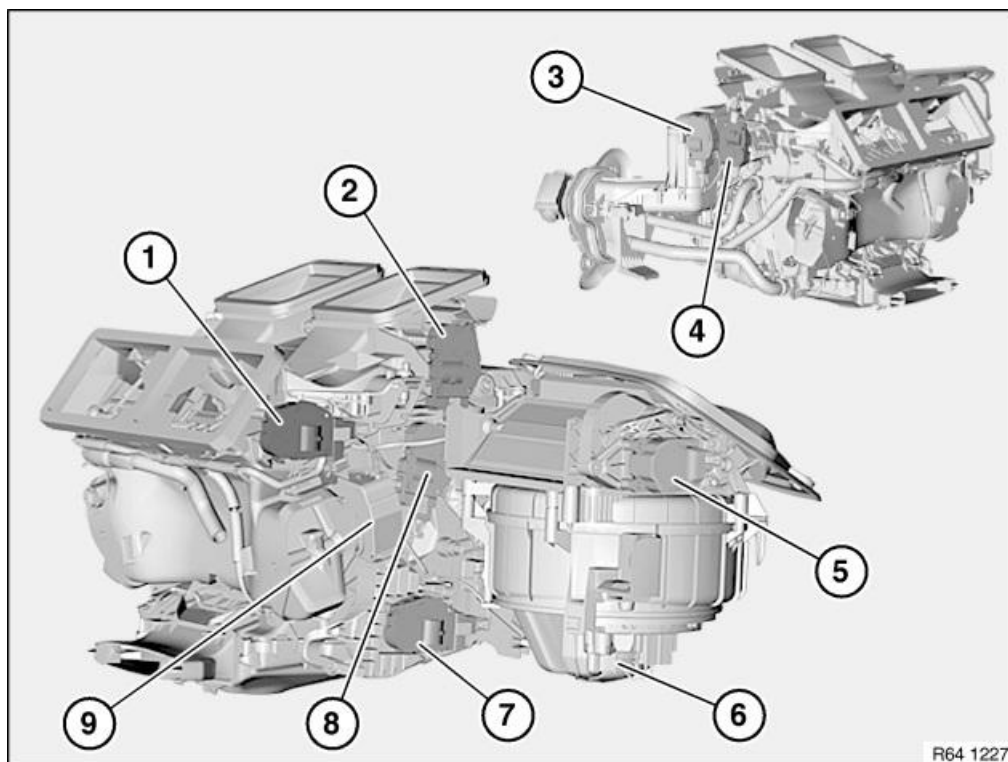
- Refer to the Service Information (bulletin) (for manual transmissions) [Service Information \(bulletin\) 61 01 07 335](#)
- Refer to the Service Information (bulletin) (for automatic transmissions or twin-clutch gearboxes) [Service Information \(bulletin\) 61 01 10 629](#)

64 11 ... Installing servodrive



Installation:

If necessary, align shaft of flap(s) to be actuated to position of servodrive to be installed.



- | | |
|--|--|
| 1 Stepping motor, ventilating flap | 6 Fan motor |
| 2 Stepping motor, defrosting flap | 7 E9x only: Stepping motor, rear compartment |
| 3 Stepping motor, stratification, front | 8 Stepping motor, air blending, right |
| 4 Stepping motor, air blending, left | 9 Stepping motor, footwell |
| 5 Stepping motor, fresh air/recirculated air | |

64 11 378 Removing and installing or replacing heating and air conditioning system control panel (version with CIC)



Special tools required:

- [00 9 340](#)
- [00 9 327](#)



Important!

Risk of damage!

A hard disk is installed in the Car Information Computer (CIC).

Carry out mechanical work on the CIC and adjacent components with care.

Avoid subjecting the CIC to vibration/shocks.



Important!

Read and comply with notes on protection against electrostatic damage ([ESD protection](#)).

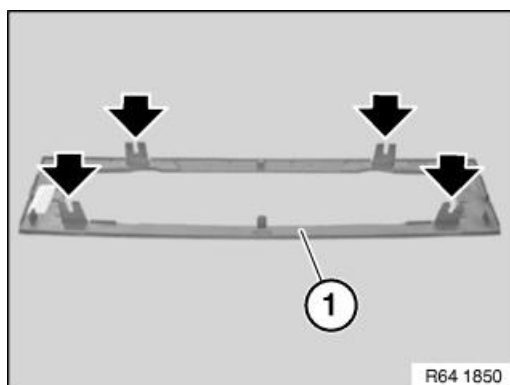


Car Infotainment Computer (CIC)



Fit special tool [00 9 340](#) on either side as illustrated.

Unclip and remove operator unit trim (1).



Installation note:

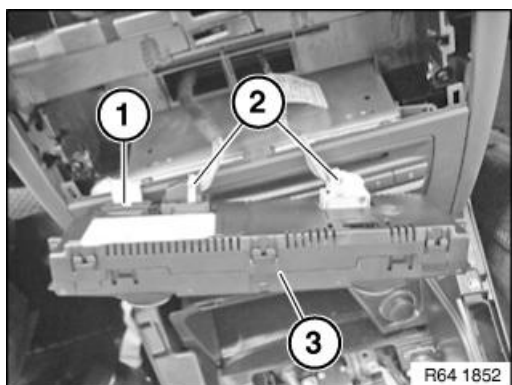
All marked retaining lugs on trim of A/C operator unit (1) must not be damaged.



Press IHKA controls (1) to the right.

Unlock latch mechanism with special tool [00 9 327](#).

Pull out A/C operator unit(1) toward to the front.



Unlock and detach plug connections (1 and 2).

Remove A/C operator unit (3).



Replacement:

Carry out [vehicle programming/coding](#).

64 11 377 Removing and installing or replacing heating and air conditioning system control panel (version without CIC)



Special tools required:

- [00 9 327](#)



Important!

Read and comply with [notes](#) on protection against electrostatic damage (ESD protection).



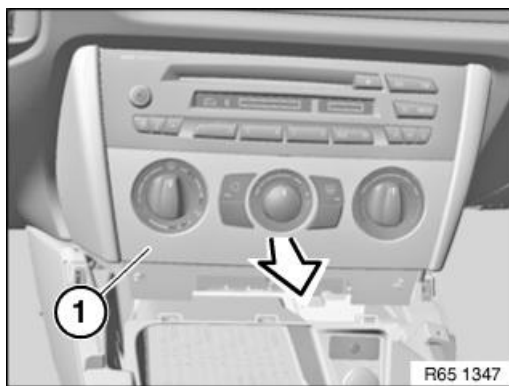
Note:

Car Infotainment Computer (CIC)



Necessary preliminary tasks:

- Remove [centre console cover](#)
- **Version from 07/2012:** Release [centre console](#)



First, unclip control panel cover (1) from the lower area, then unclip top part and remove unit.



Press IHKA controls (1) to the right.

Unlock latch mechanism with special tool [00 9 327](#) .

Pull out A/C operator unit(1) toward to the front.

Unlock associated plug connections and disconnect.

Remove IHKA controls (1).

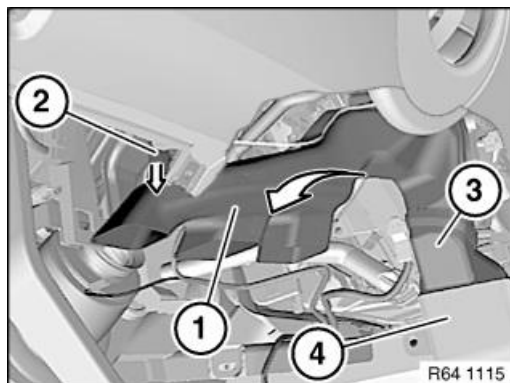


Carry out [vehicle programming and encoding](#).



Necessary preliminary tasks:

- [Remove instrument panel trim at bottom left](#)
- [E84/E90/E91/E92/E93:](#)
 - Remove [trim panel for pedal mechanism](#)

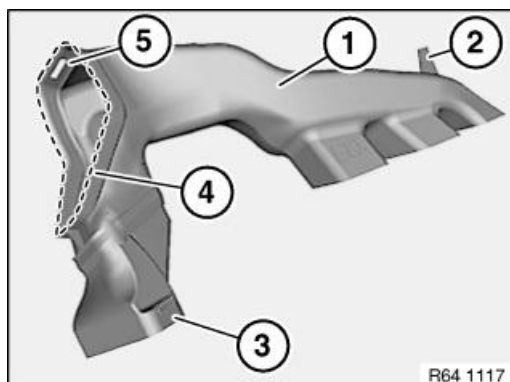


Note:

Lower instrument panel trim partially shown transparent.

Detach left footwell heating duct (1) in area (2) in direction of arrow.

Detach left footwell heating duct (1) with adapter (3) from heating and air conditioning and remove in direction of arrow from left rear compartment heating duct (4).

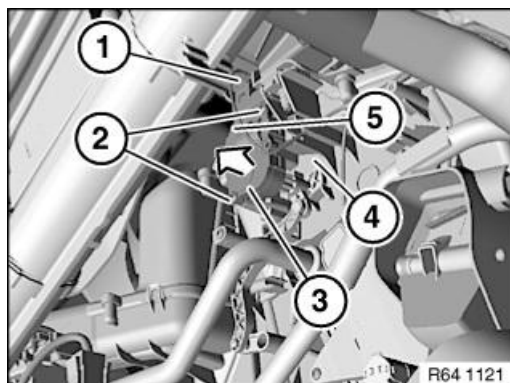


Installation note:

Make sure clamp (2) is correctly seated on left footwell heating duct (1).

Insert left footwell heating duct (1) with adapter (3) in left rear compartment heating duct (4).

Attach left footwell heating duct (1) in area (4) to heating and air conditioning. Make sure assembly is locked exactly at point (5).



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Detach actuator drive for stratification flap (3) in direction of arrow from heating and air conditioning system (4).

Installation note:

Place actuator drive for stratification flap (3) over guide pin (5).

**Important!**

Servomotors must be readdressed in the event of replacement!
Addressing can only be carried out with the BMW diagnosis system.

Service functions:

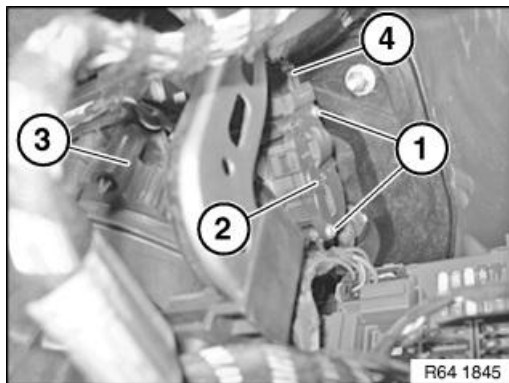
- Body
- Heating and air conditioning function
- Flap motors
- Readdress flap motors

64 11 806 Removing and installing/replacing actuator drive for fresh / recirculated air flap



Necessary preliminary tasks:

- Remove [right glove box with housing](#)



Release screws (1).

Pull off the controller drive of the fresh air/recirculated air flap (2) from the blower housing (3).

Unlock plug connection (4) and disconnect.

Installation note:

Accurately position the controller drive of the fresh air/recirculated air flap (2) on the associated gearing.



Replacement:

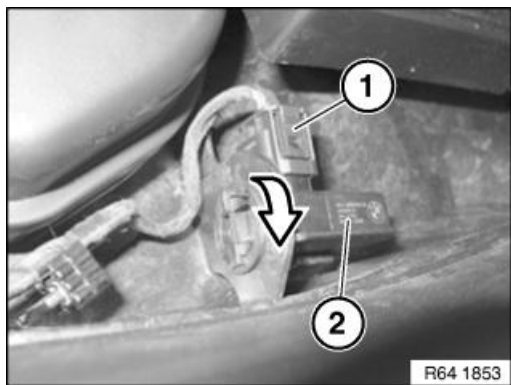
Servomotors must be readdressed in the event of replacement!

Addressing can only be carried out with the diagnosis system:

Service functions:

- Body
- Heating/air conditioning function
- Flap motors
- Readdress flap motors

64 11 991 Removing and installing/replacing automatic air recirculation control sensor (AUC sensor)



Unfasten plug connection (1) and disconnect.

Unlock AUC sensor (2) in direction of arrow and remove.

Installation:

Ensure that the AUC sensor (2) is correctly seated.

**Warning!**

Risk of scalding!

Only perform this work after engine has cooled down.

**Recycling**

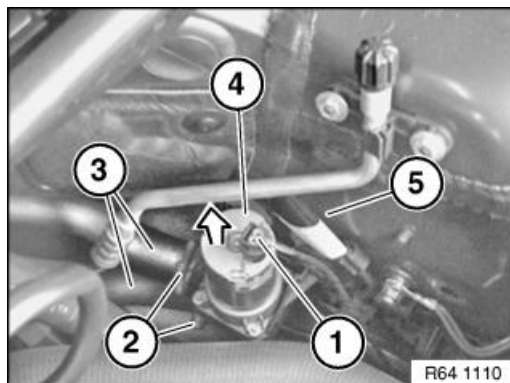
Coolant emerges when coolant lines are detached. Have a suitable collecting vessel ready.

Catch and dispose of emerging coolant.

Observe country-specific waste disposal regulations.

**Necessary preliminary tasks:**

- **N45/N46 only:**
Remove [intake silencer housing](#).
- Disconnect [coolant hoses from auxiliary water pump](#)

**Note:**

Illustrations show a vehicle with an M47T2 engine.

Unfasten plug connection (1) and disconnect.

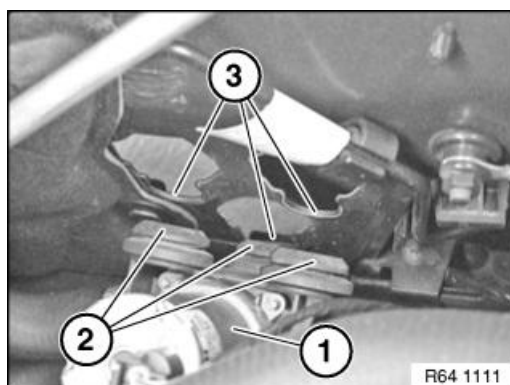
Release hose clamps (2) and detach coolant hoses (3) from auxiliary water pump (4).

Installation note:

Follow notes for [working on cooling system](#).

[Fill and vent](#) cooling system.

Pull auxiliary water pump (4) in direction of arrow out of front engine support (5).

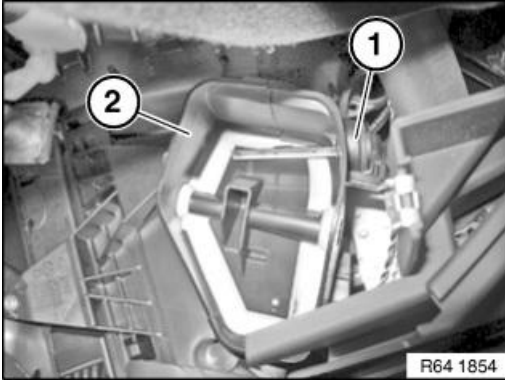
**Installation note:**

Install auxiliary water pump (1) in front engine support so that rubber mounts (2) slide exactly in associated locators (3).



Necessary preliminary tasks:

- Remove [trim panel for pedal assembly](#) .
- [Remove](#) left air duct

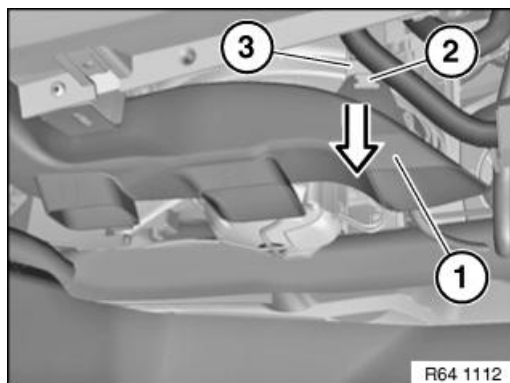


Remove temperature sensor (1) from air duct (2) .
Disconnect associated plug connection.

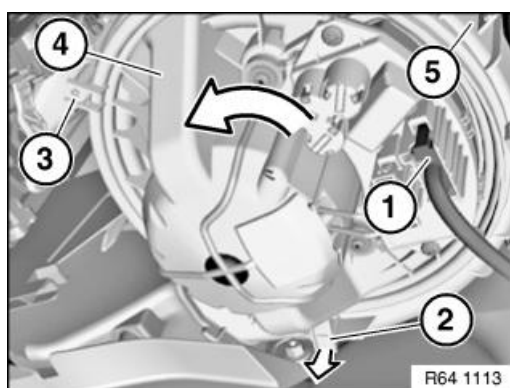


Necessary preliminary tasks:

- Remove [dashboard trim at bottom](#) right



Detach right footwell heating duct (1) in direction of arrow from retaining tab (3) and lay to one side slightly. *Installation note:* Make sure clamp (2) is correctly seated.



Unfasten plug connection (1) and disconnect.

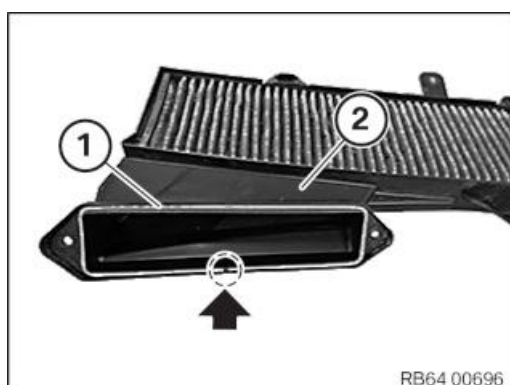
Raise plastic lug (2) slightly and turn blower (4) in direction of arrow. Remove fan (4) from blower shell (5).

Installation note:

If necessary, raise tab (3) slightly and screw in blower (4) anticlockwise.

Make sure blower (4) is correctly seated in blower shell (5).

Check exact position of tab (2).



Replacement:

Remove [upper section of microfilter housing](#).

Gasket (1) must be replaced on left and right of microfilter housing - upper section (2).

Gasket (1) must be installed in such a way that the sealing joint (1) is in the marked area.



Warning!

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant oil.

Read and comply with safety instructions:

- [Handling R 134a \(tetrafluorethane\) refrigerant](#)
- [Handling refrigerant oil](#)



Important!

Risk of damage!

Restart engine only when A/C system has been correctly filled.

Note:

If air conditioning system is opened for more than 24 hours:

Completely replace [desiccant insert or condenser](#)



Necessary preliminary tasks:

- N47 only: Remove [acoustic cover](#)
- N47 only: Remove [both trailing links from spring strut dome](#)
- Remove [expansion valve](#)
- Remove [instrument panel carrier](#)
- Unlock and disconnect all plug connections.

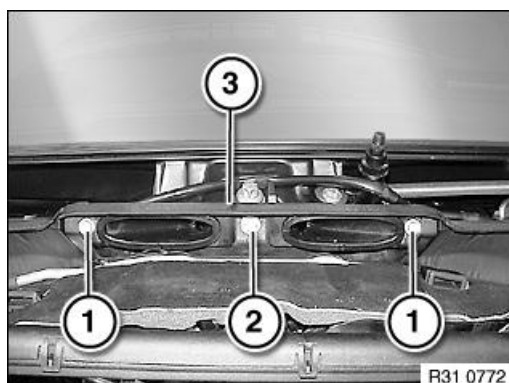


Recycling

Coolant emerges when coolant lines are detached. Have a suitable collecting vessel ready.

Catch and dispose of escaping coolant.

Observe country-specific waste disposal regulations.



N47 only:

Note:

Schematic diagram without cowl panel.

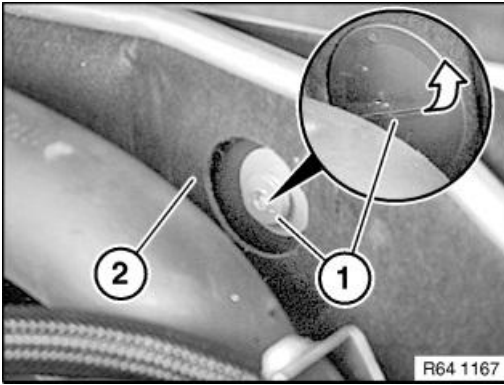
Release screws (1,2).

Remove heater end panel (3).

Installation note:

Make sure heater end panel is correctly seated.

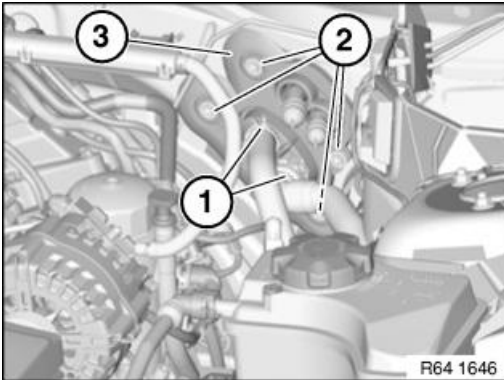
M6x20 bolt must be fitted in middle.



Release protective cap (1) from bulkhead (2).

Release screw (1).

Tightening torque [64 11 1AZ](#).



Release clamps (1) on coolant hoses.

Pull off the coolant hoses from the heating and air-conditioning unit.

Unscrew nuts (2).

Feed out media passage sealing plate (3) and associated rubber grommet.

Installation note:

Makes sure media passage sealing plate and associated rubber grommet are correctly seated.

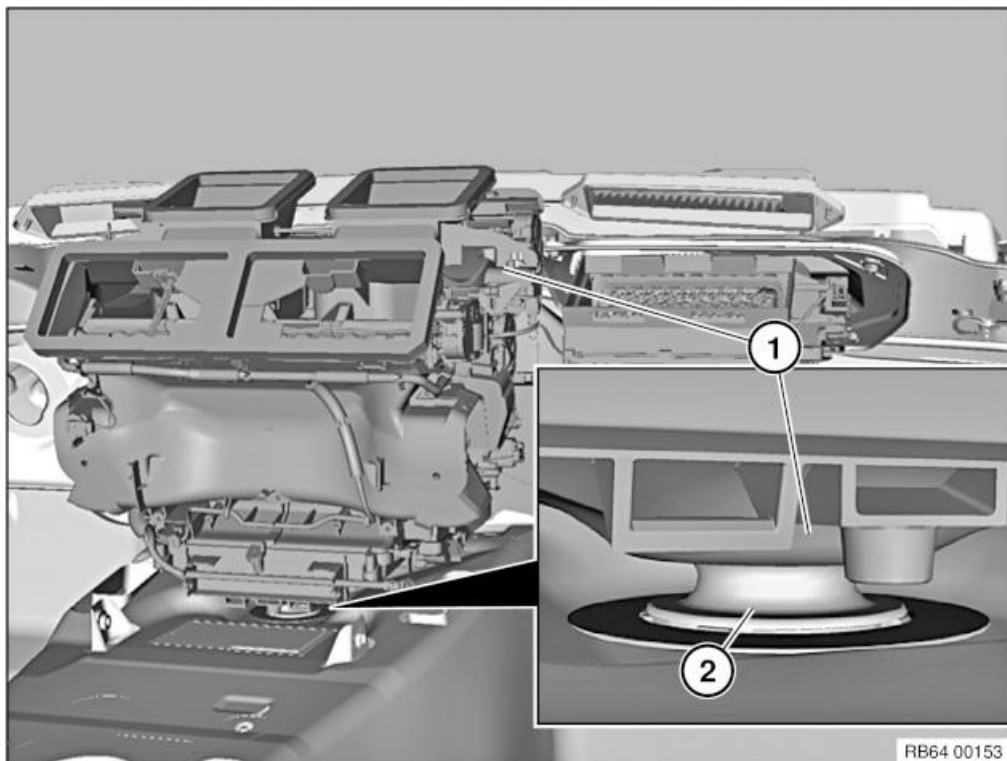


Important!

Make sure remaining coolant is removed completely.

Carefully blow through aluminium double pipe to remove remaining coolant from heat exchanger for heating system. *Installation note:*

- [Add coolant](#)
- [Vent cooling system and check for water leaks](#)



Warning!

Protect passenger compartment against emerging coolant.

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

Attention!

In the event of incorrect installation, there is a risk of water damage in the passenger compartment!

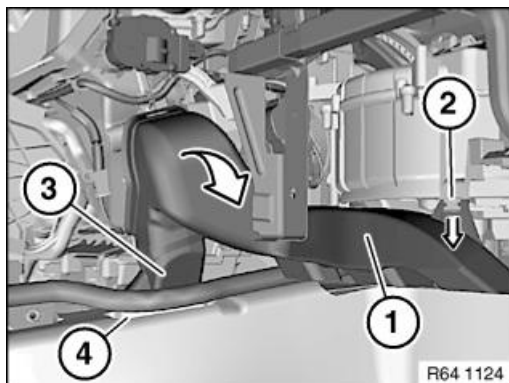
Installation note:

Make sure the heating and air-conditioning unit (1) is correctly fitted in the condensation water drain hose (2).

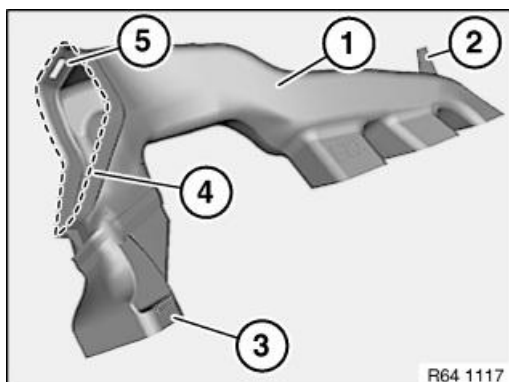


Necessary preliminary tasks:

- Remove [right glovebox with housing](#)
- E87 only:
 - Remove [centre console](#)



Detach right footwell heating duct (1) in area (2) in direction of arrow.
Detach right footwell heating duct (1) with adapter (3) from heater/air conditioner and remove in direction of arrow from right rear compartment heating duct (4).

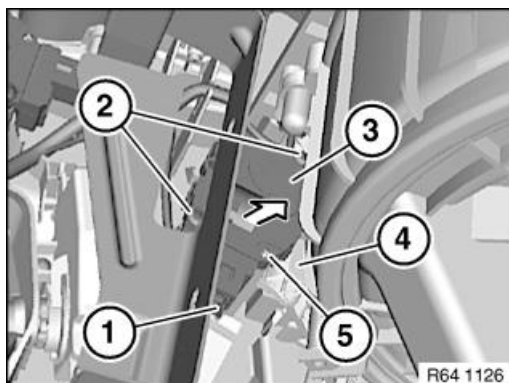


Installation:

Make sure retainer (2) is correctly seated on right footwell heating duct (1).

Insert right footwell heating duct (1) with adapter (3) in right rear compartment heating duct (4).

Attach right footwell heating duct (1) in area (4) to heater/air conditioner. Make sure assembly is locked exactly at point (5).



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Detach servodrive for blending flap (3) in direction of arrow from heater/air conditioner (4).

Installation:

Place servodrive for blending flap (3) over guide pin (5).

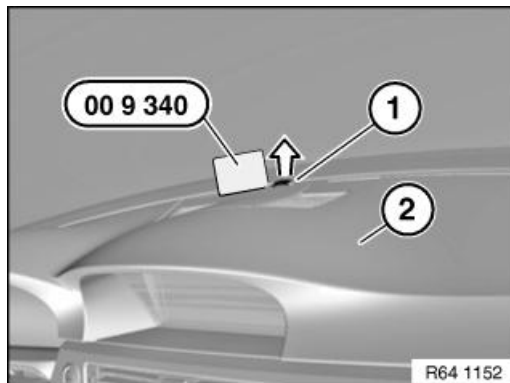


Servomotors must be re-addressed in the event of replacement!
Addressing can only be carried out with the BMW diagnosis system.
Service functions:

- Body
- Heating and A/C function
- Flap motors
- Re-address flap motors

**Special tools required:**

- [00 9 340](#)



Lever out solar sensor (1) with special tool [00 9 340](#) in direction of arrow.

Note:

Secure disconnected wiring harness of solar sensor (1) against falling out below instrument panel trim (2).

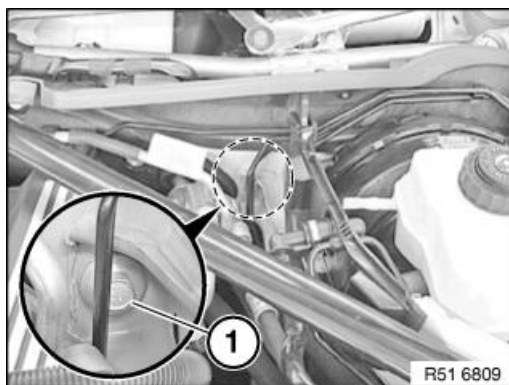
Disconnect associated plug connection and remove solar sensor (1) from instrument panel trim (2).

*Necessary preliminary tasks:*

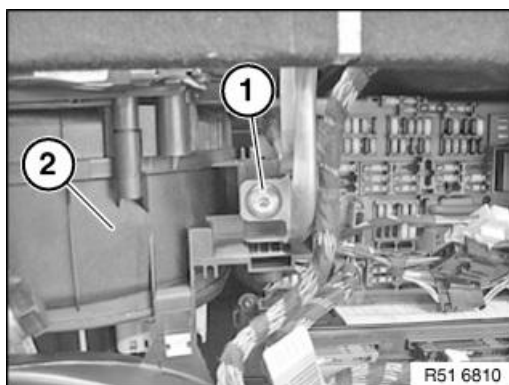
- Remove [instrument panel trim](#)
- Remove [cowl panel cover](#)

*Installation:*

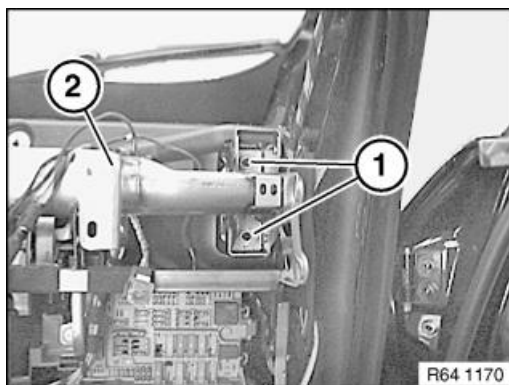
Make sure wiring harnesses/cable ducts are correctly routed and secured.



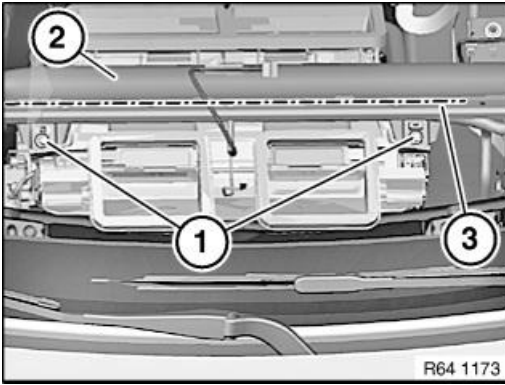
Release screw (1) on bulkhead in engine compartment.
Tightening torque [51 71 5AZ](#).



Release right screw (1) on heating and air-conditioning unit (2).
Tightening torque [51 71 6AZ](#).



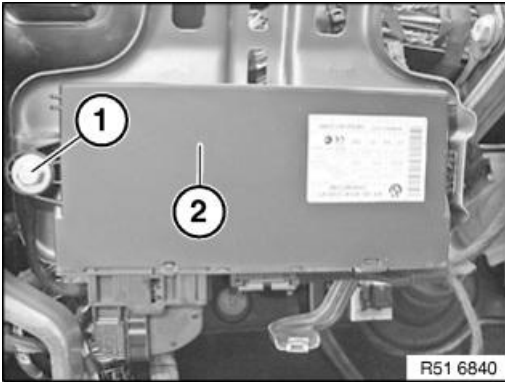
Release nuts (1) on right on support (2).
Tightening torque [51 71 5AZ](#).



Detach wiring harness (3) from support (2).

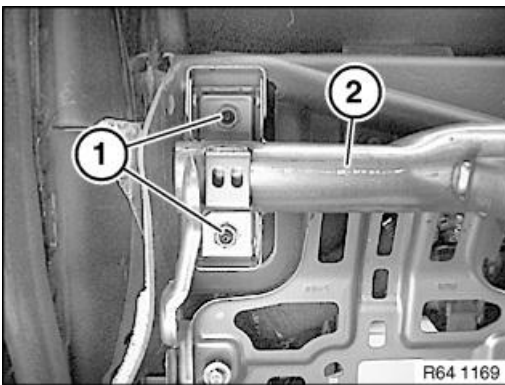
Remove upper screw (1) from support (2) on heating and air-conditioning unit

Tightening torque [64 11 6AZ](#) .



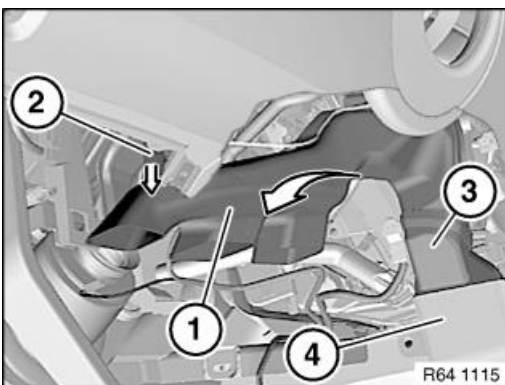
Release screw (1) from CAS control unit(2).

Remove CAS control unit (2).



Remove left nut (1) from support (2).

Tightening torque [51 71 5AZ](#) .

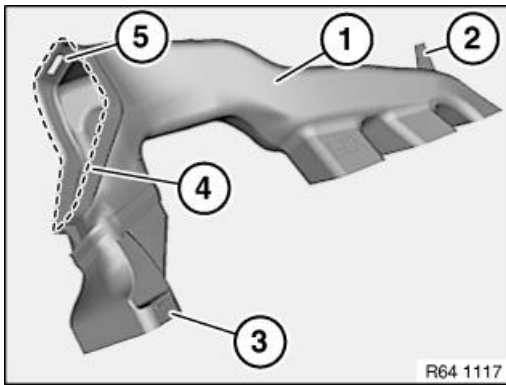


Note:

Lower instrument panel trim partially shown.

Detach left footwell heating duct (1) in area (2) in direction of arrow.

Detach left footwell heating duct (1) with adapter (3) from heater/air conditioner and remove in direction of arrow from left rear compartment heating duct (4).



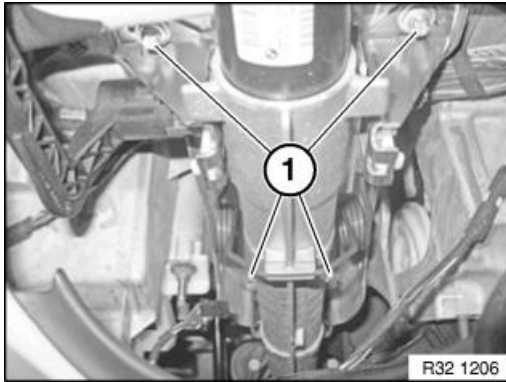
R64 1117

Installation:

Make sure retainer (2) is correctly seated on left footwell heating duct (1).

Insert footwell heating duct (1) with adapter (3) in rear compartment heating duct (4).

Attach footwell heating duct (1) in area (4) to heater/air conditioner. Make sure assembly is locked exactly at point (5).



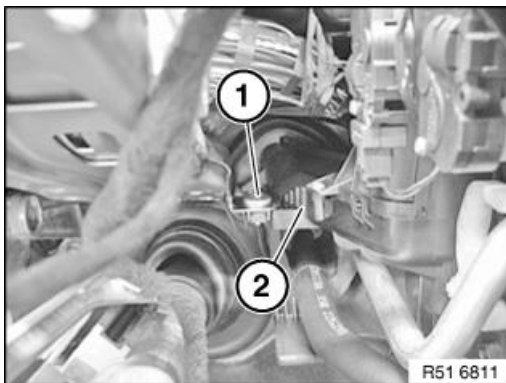
R32 1206

Secure steering column against falling out.

Release screw (1) on steering column.

Tightening torque [32 31 2AZ](#).

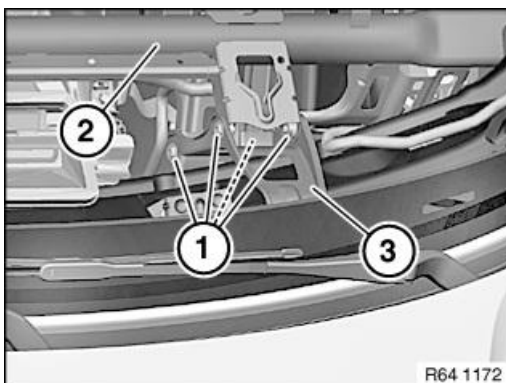
Carefully place steering column onto seat and secure from twisting.



R51 6811

Release left screw (1) on heating and air-conditioning unit (2).

Tightening torque [51 71 6AZ](#).



R64 1172

Note:

For better clarity view is shown from above and through front window (area of steering column).

Release screws (1) on support (2) from bracket (3).

Tightening torque [51 71 4AZ](#).

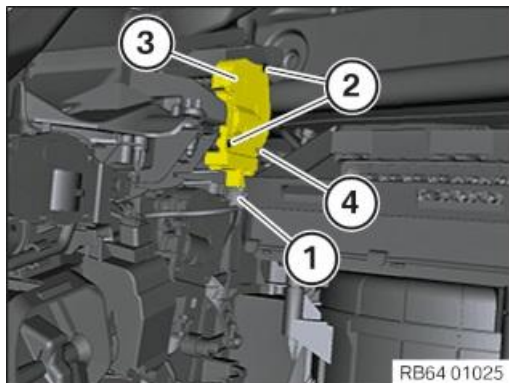
Detach support (2) and remove from vehicle with assistance of a second person.

64 11 868 Removing and installing/replacing the controller drive of the defroster flap



Necessary preliminary tasks:

- Remove [right glove box with housing](#)



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Pull off the controller drive of the defroster flap (3) from the heating and air-conditioning unit.

Installation note:

Position the controller drive of the defroster flap (3) using the guide pin (4).



Replacement:

Servomotors must be readdressed in the event of replacement!

Addressing can only be carried out with the diagnosis system:

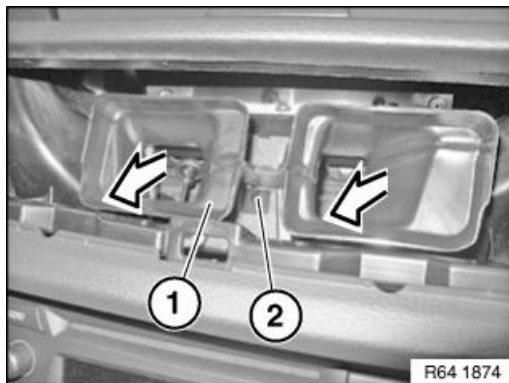
Service functions:

- Body
- Heating/air conditioning function
- Flap motors
- Readdress flap motors

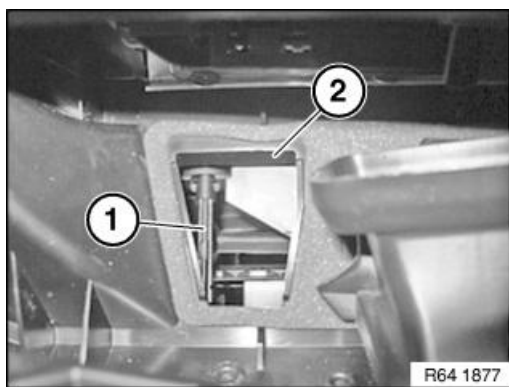


Necessary preliminary tasks:

- Remove [right instrument panel trim](#)



Unclip air duct (1) from catch (2) and remove in direction of arrow.



Release temperature sensor (1) and feed out of holder on air duct (2).
Unlock associated plug connection and disconnect.

Installation:

Make sure rubber ring is correctly seated on temperature sensor (1).



Special tools required:

- [00 9 030](#)



Attention!

Determine the manufacturer of the installed heat exchanger for heating system (Denso or Valeo) prior to placing the replacement part order!

Remove [trim panel for pedal mechanism](#).

Installation note:

Also replace the pipes!

Denso: the pipes automatically form part of the repair kit.

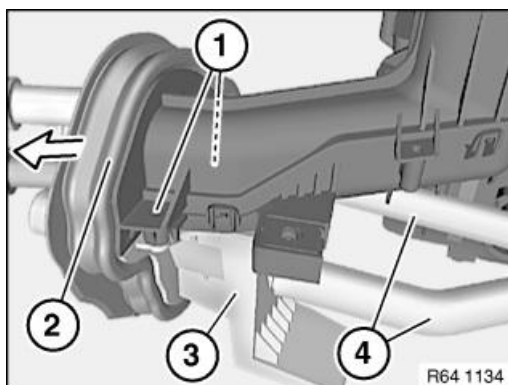
Valeo: the pipes must be ordered additionally.

Observe Electronic Parts Catalogue!



Necessary preliminary work:

- Remove [heater/air conditioner](#)



Release screws (1).

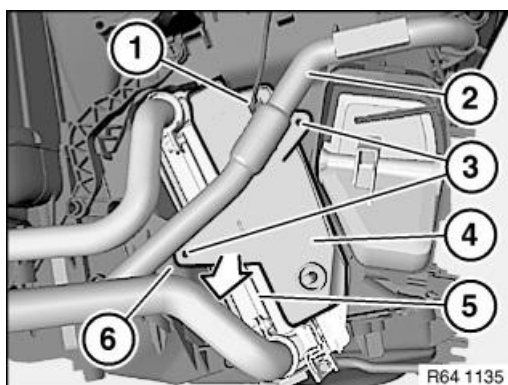
Slide rubber grommet (1) with foam seal forward slightly.

Carefully feed pipe clip (3) with pipes (4) past rubber grommet (2).

Installation note:

If necessary, replace rubber grommet (1) and/or foam seal.

Make sure rubber grommet (1) is correctly seated on line clip (3).



If necessary, remove coolant hose (2).

Release screws (3) and remove cover.

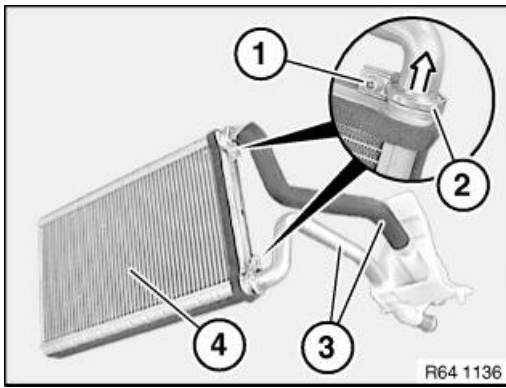
Note:

Diesel version only:

Unfasten plug connection (1) and disconnect.

Withdraw electric auxiliary heating (4) in direction of arrow.

Remove the heat exchanger for heating system (5) from the heating and air-conditioning unit (6).



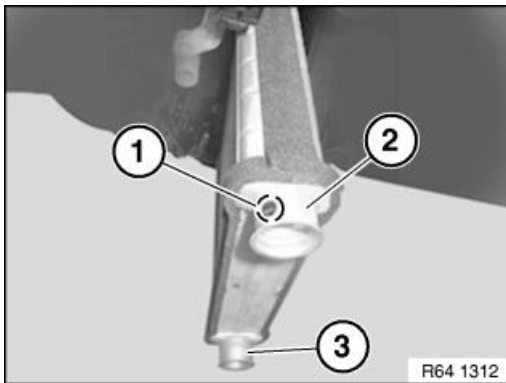
Release screws (1) and slide screw clamps (2) upward slightly.

Remove the pipes (3) from the heat exchanger for heating system (4).

Installation note:

Renew sealing rings.

Use special tool [00 9 030](#) to install sealing rings without damaging them.



Attention!

During installation make sure that the larger opening (2) has been aligned towards the top. If applicable the larger opening (2) may have been highlighted by a black dot (1).

The fuel feed line (3) must be positioned at the bottom only.



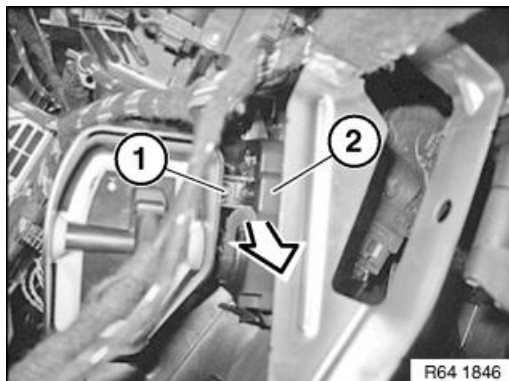
Necessary preliminary tasks:

- Remove [right glovebox with housing](#)



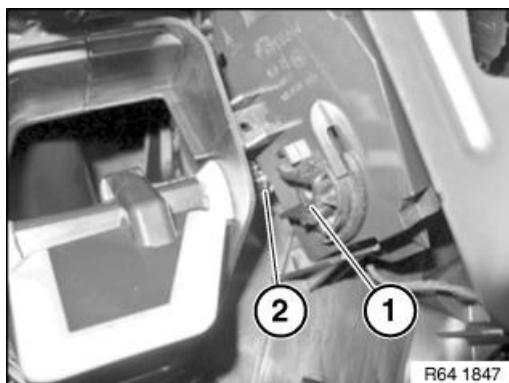
Detach right footwell heating duct (1) in area (2) in direction of arrow.

Detach right footwell heating duct (1) with adapter (3) from heater/air conditioner and remove in direction of arrow from right rear compartment heating duct (4).



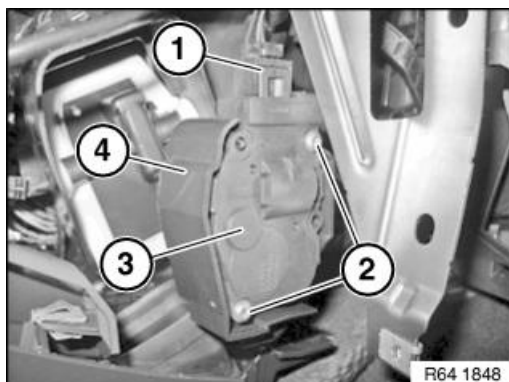
Release screw (1).

Remove adjusting drive with holder (2) towards front.



Installation:

Adjuster unit (1) must be correctly seated on pivot (2) of footwell flap (3).



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Remove adjusting drive (3) from holder (4).

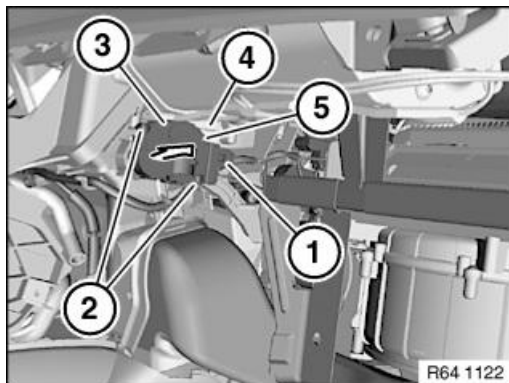


Servomotors must be re-addressed in the event of replacement!
Addressing can only be carried out with the BMW diagnosis system.
Service functions:

- Body
- Heating and A/C function
- Flap motors
- Re-address flap motors

*Necessary preliminary tasks:*

- Remove [right glovebox with housing](#)



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Detach servodrive for ventilation flaps (3) in direction of arrow from heater/air conditioner (4).

Installation:

Place servodrive for ventilation flaps (3) over guide pin (5).

Replacement:

Servomotors must be re-addressed in the event of replacement!

Addressing can only be carried out with the BMW diagnosis system.

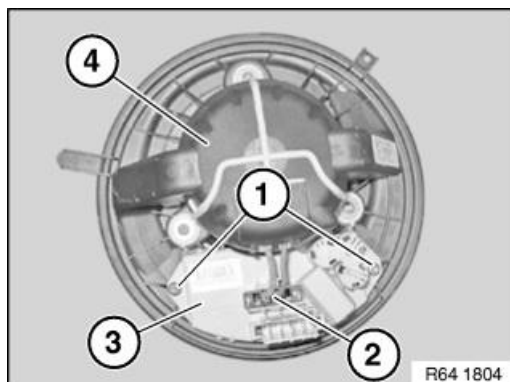
Service functions:

- Body
- Heating and A/C function
- Flap motors
- Re-address flap motors



Necessary preliminary work:

- Remove [instrument panel trim, bottom right](#)



Note:

For purposes of clarity, graphic shows component removed.

Release screws (1).

Tightening torque [64 11 3AZ](#).

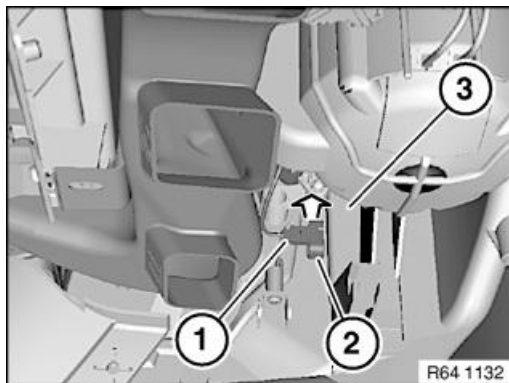
Unfasten plug connection (2) and disconnect.

Remove controller (3) from blower motor housing (4).



Necessary preliminary tasks:

- Remove [trim for instrument panel, bottom left](#)



Disconnect plug connection (1).

Pull evaporator temperature sensor (2) in direction of arrow out of heating and air conditioning system (3) and remove.

Installation note:

Ensure evaporator temperature sensor (2) is correctly seated.

**Special tools required:**

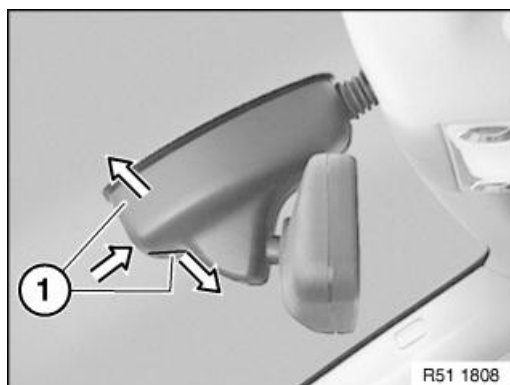
- [00 9 317](#)

**Warning!**

Make sure rooms are well ventilated when working with adhesive remover indoors.

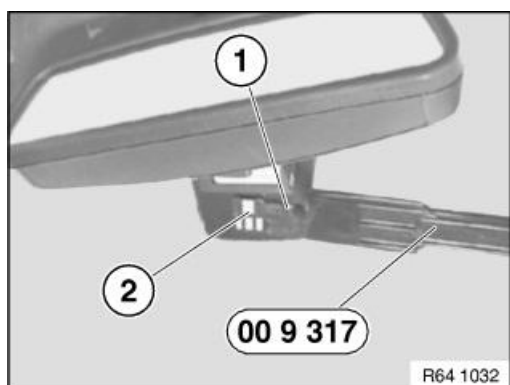
**Important!**

Do not under any circumstances use paint thinner to clean the bonding surface.



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

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



Disconnect plug connection (1).

Note:

If necessary, carefully heat fogging sensor (2) with a hot air blower to approx. 40-60 °C.

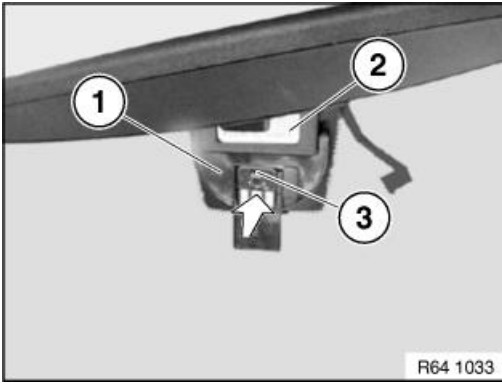
Lift off fogging sensor (2) with special tool [00 9 317](#) and slowly pull off from windshield.

Installation:

Bonding surface must be dry and free of dust and grease.

Clean bonding surface with adhesive remover (sourcing reference: BMW Parts Service).

After cleaning, do not touch bonding surface with bare hands.



Pull off protective film completely from fogging sensor (3).

Place mounting template (1) as pictured on rain sensor (2).

Press fogging sensor (3) in direction of arrow with a contact pressure of $\geq 15 \text{ N/cm}^2$ onto inside of windshield.

Note:

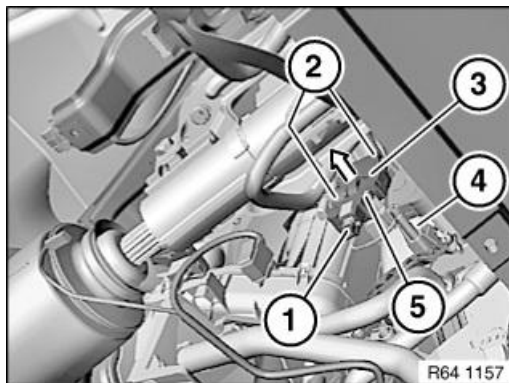
Firm thumb pressure attains approx. 30 N/cm^2 .

Remove mounting template (1) carefully from fogging sensor (3).



Necessary preliminary tasks:

- Remove [trim panel for pedal assembly](#) .



Unfasten plug connection (1) and disconnect.

Unfasten screws (2).

Detach servodrive for blending flap (3) in direction of arrow from heater/air conditioner (4).

Installation:

Place servodrive for blending flap (3) over guide pin (5).



Servomotors must be re-addressed in the event of replacement!

Addressing can only be carried out with the BMW diagnosis system.

Service functions:

- Body
- Heating and A/C function
- Flap motors
- Re-address flap motors



Risk of burning!

Carry out repair work only after engine has cooled down.

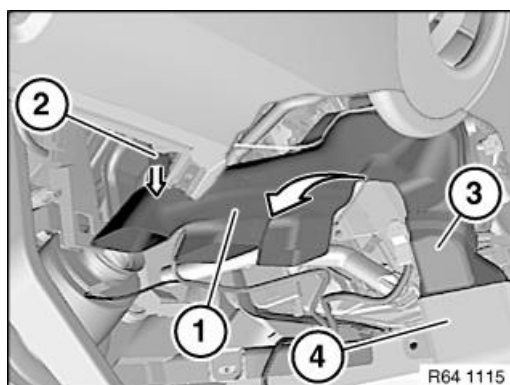


Necessary preliminary work:

- Remove [steering column](#)
- Remove [complete centre console](#)
- Clamp off [negative battery cable](#)

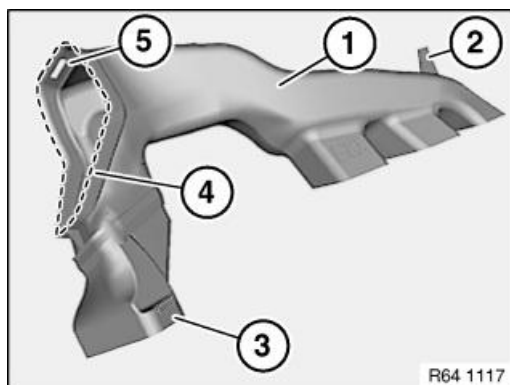
Note:

Lower instrument panel trim partially shown transparent.



Detach left footwell heating duct (1) in area (2) in direction of arrow.

Detach left footwell heating duct (1) with adapter (3) from heating and air-conditioning unit and remove in direction of arrow from left rear compartment heating duct (4).

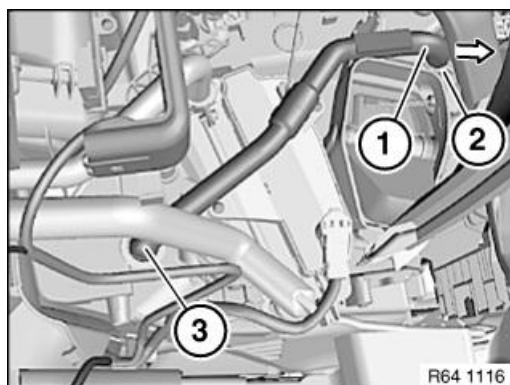


Installation note:

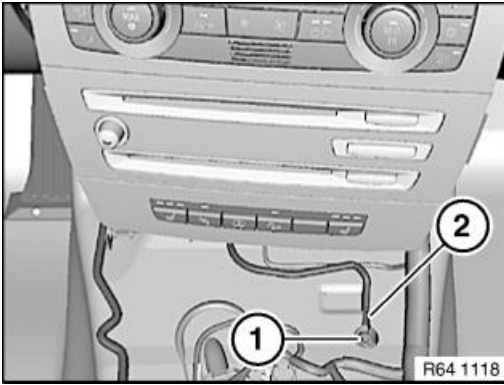
Make sure clamp (2) is correctly seated on left footwell heating duct (1).

Insert left footwell heating duct (1) with adapter (3) in left rear compartment heating duct (4).

Attach left footwell heating duct (1) in area (4) to heating and air-conditioning unit. Make sure assembly is locked exactly at point (5).



If necessary, disengage the bleeder tube (1) from the clamp (2) and detach at point (3) from heating and air-conditioning unit.

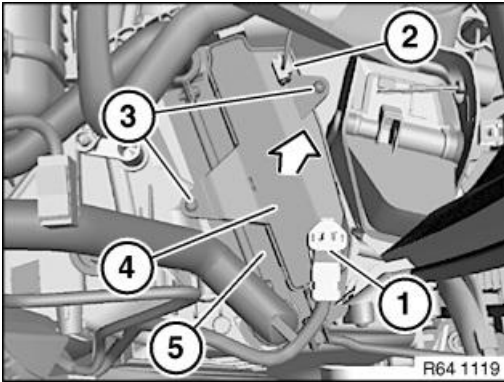


Slacken nut (1).

Disconnect negative lead (2) from the stud bolt and expose to electric auxiliary heating unit.

Installation note:

Ensure correct line routing.



Unlock plug connections (1) and (2) and disconnect.

Release screws (3).

Remove electric auxiliary heating unit (4) in direction of arrow from heating and air-conditioning unit (5).



Important!

With vehicles that have a production date until 03/2010 the part number of the auxiliary heating unit and works I phase status must be adhered to!

In the case of the following part numbers no additional work is necessary:

- 9 153 884
- 9 175 923

These part numbers may no longer be installed in vehicles with production date from 03/2010!

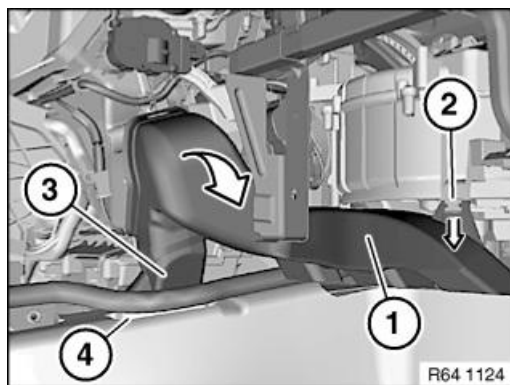
Works I phase status:

- I-09-09-XXX and older: Only the above-mentioned part numbers may be installed.
- From I-09-12-XXX: Only part numbers other than the those mentioned above may be installed.

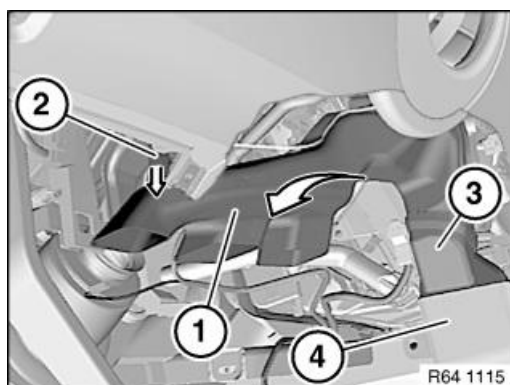
Carry out [vehicle programming and encoding](#).

- From I-10-03-XXX: Only part numbers other than the those mentioned above may be installed. No additional work necessary.

64 22 ... Removing air ducts

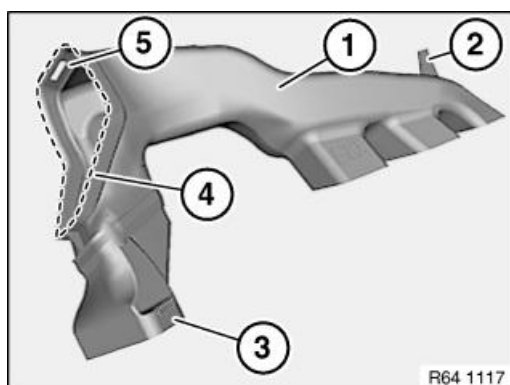


Detach right footwell heating duct (1) in area (2) in direction of arrow.
Detach right footwell heating duct (1) with adapter (3) from heater/air conditioner and remove in direction of arrow from right rear compartment heating duct (4).



Note:
Lower instrument panel trim partially shown.

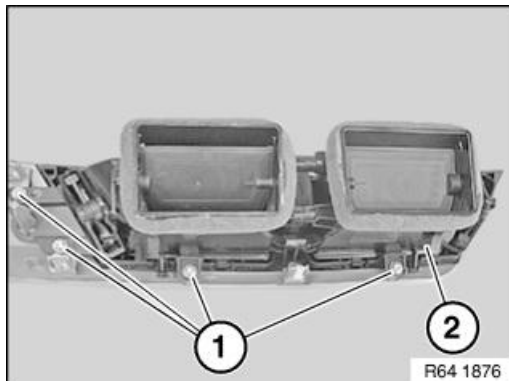
Detach left footwell heating duct (1) in area (2) in direction of arrow.
Detach left footwell heating duct (1) with adapter (3) from heater/air conditioner and remove in direction of arrow from left rear compartment heating duct (4).



Installation:
Make sure retainer (2) is correctly seated on left/right footwell heating duct (1).
Insert footwell heating duct (1) with adapter (3) in rear compartment heating duct (4).
Attach footwell heating duct (1) in area (4) to heater/air conditioner. Make sure assembly is locked exactly at point (5).

Necessary preliminary tasks:

- Remove [right instrument panel trim](#)



Release screws (1).

Remove centre fresh-air grille (2).

Installation:

Make sure centre fresh-air grille (2) is correctly seated.

Replacement:

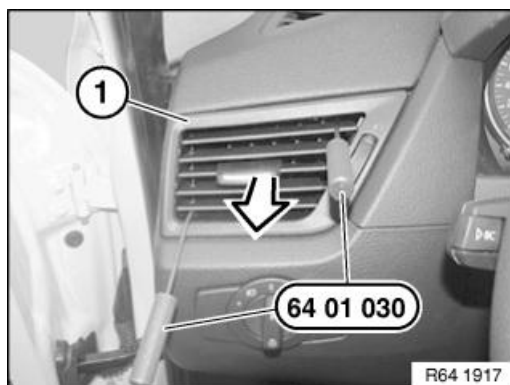
- Remove [switch for hazard warning flashers/central locking system](#)

**Special tools required:**

- [64 1 030](#)



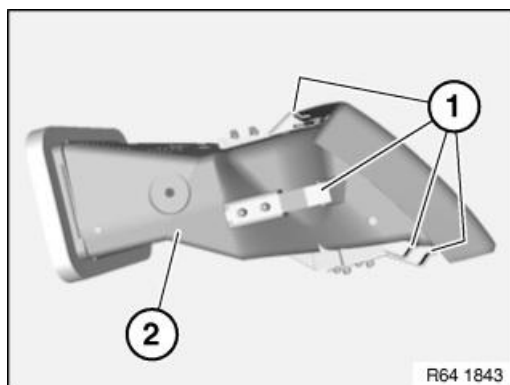
Proceed with care so as to avoid damaging the fresh air grille.



Open the fins of the fresh air grille (1).

Attach special tool [64 1 030](#) to the respective fixtures on both sides as shown.

Pull out fresh air grille (1) evenly in the direction of the arrow.

**Installation note:**

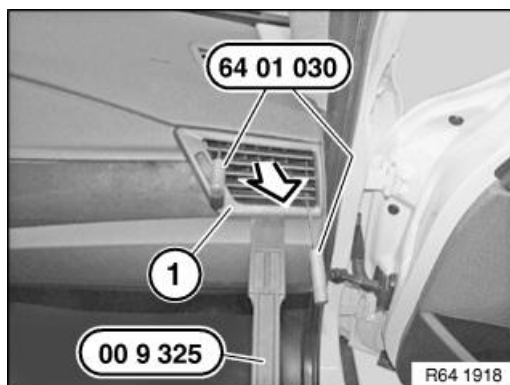
Retaining clip (1) on fresh air grille (2) must not be damaged.

**Special tools required:**

- [00 9 325](#)
- [64 1 030](#)



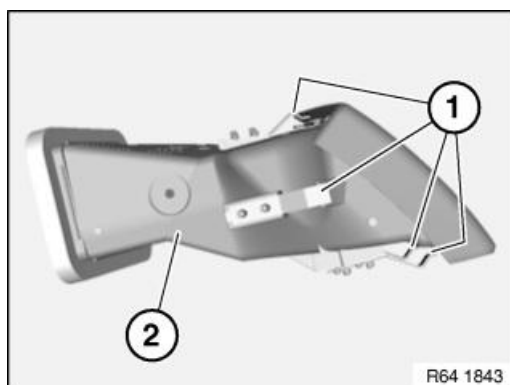
Proceed with care so as to avoid damaging the fresh air grille.



Open slats of fresh air grille (1).

Attach special tool [64 1 030](#) on both sides in the corresponding fixtures as shown.

Pull out fresh air grille (1) evenly in the direction of the arrow. (If necessary, use the aid of special tool [00 9 325](#).)

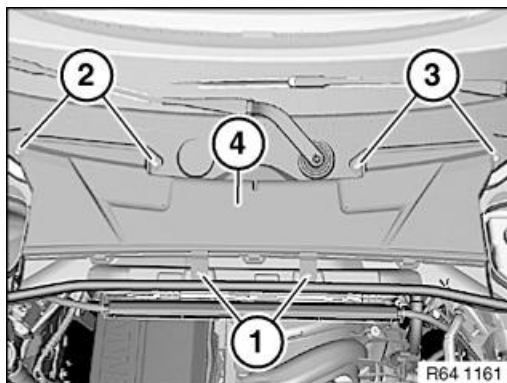
**Installation:**

Retaining clip (1) on fresh air grille (2) must not be damaged.

64 31 092 Removing and installing the microfilter housing (lower section) \PREMIUM

PRELIMINARY WORK

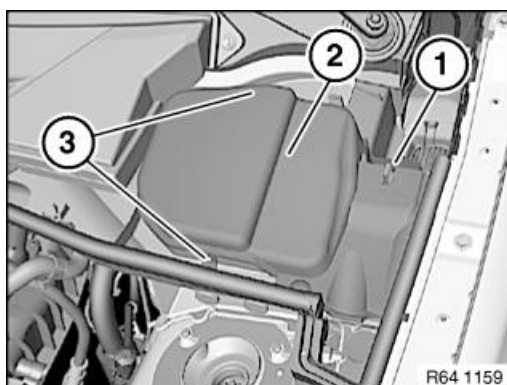
1 – Remove the top section of the microfilter housing



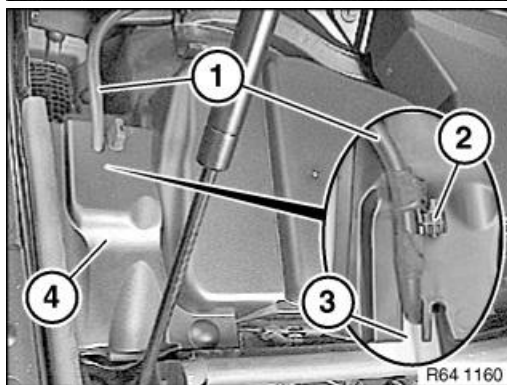
- Loosen screws (1), (2) and (3).
- Remove the upper section (4) of the microfilter housing.

MAIN WORK

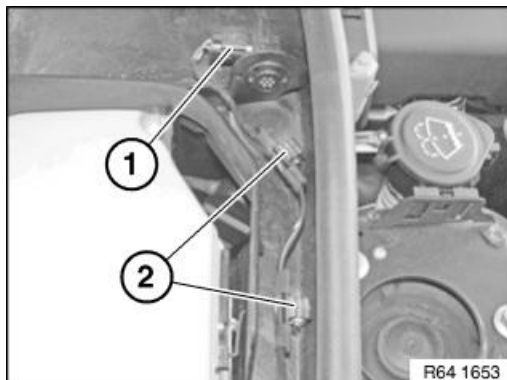
2 – Remove the lower section of the microfilter housing



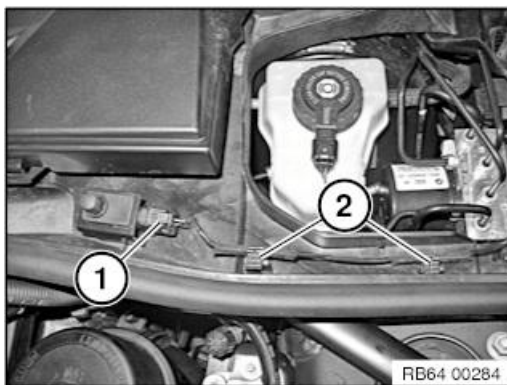
- Loosen the holder (1).
- Loosen the latch mechanisms (3).
- Remove the right-hand cover (2).



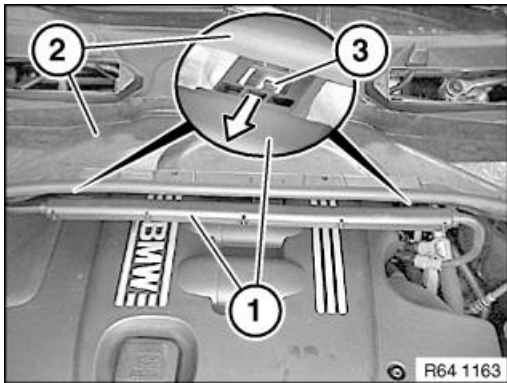
- Release the latch mechanisms of the left cover (4).
- Remove the left cover (4).
- Release the cable clip (2) and remove the hose (1) from the left cover (4).



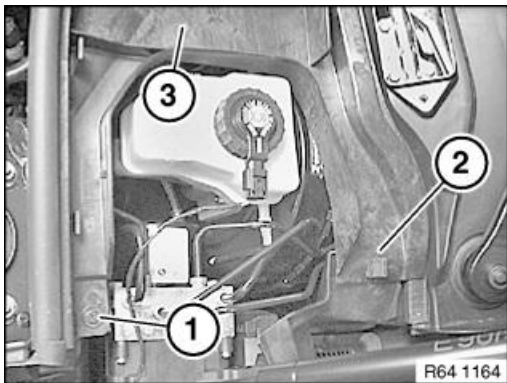
- Unlock plug connection (1) and disconnect.
- Unclip the cable from the guides (2).



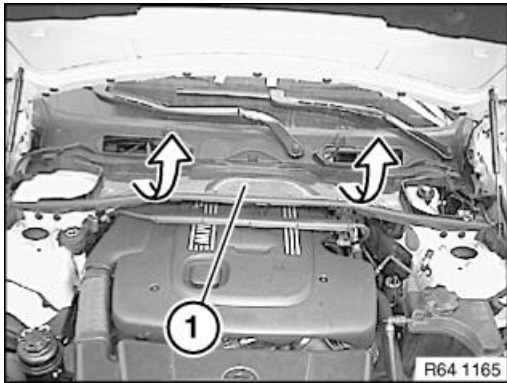
- Unlock plug connection (1) and disconnect.
- Unclip the cable from the guides (2).



- Press the retaining lugs (3).
- Detach the cable strip (1) in the direction of the arrow from the lower section (2) of the microfilter housing.



- Loosen the holder (2) on both sides.
- Unscrew the bolt (1) on both sides of the lower section (3) of the microfilter housing.

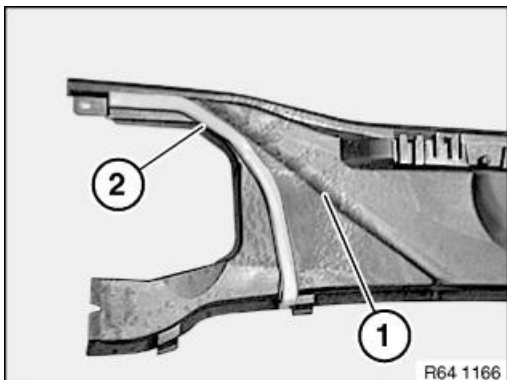


- Guide out the lower section (1) of the microfilter housing and remove it in the direction of the arrow.

3 – Install the lower section of the microfilter housing

Check

- Check the gasket (2) for damage.



desired state

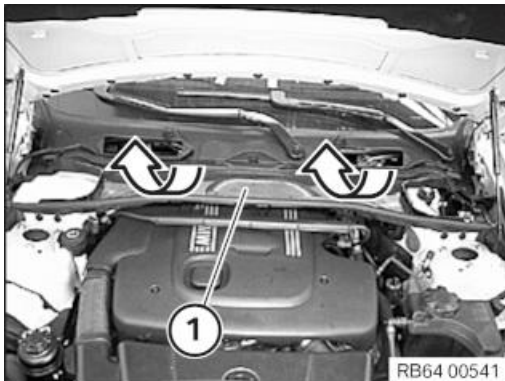
- The gasket is not porous and there are no cracks.

Result

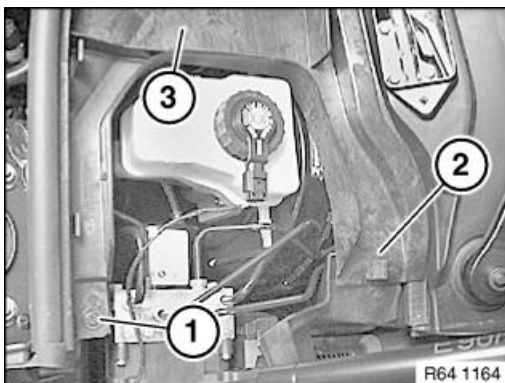
- » The gasket is porous, cracked or missing.

Measure

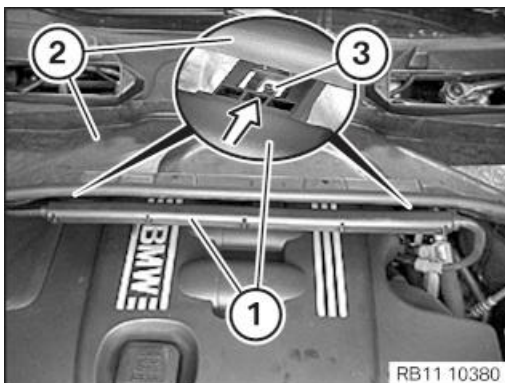
- Renew gasket.



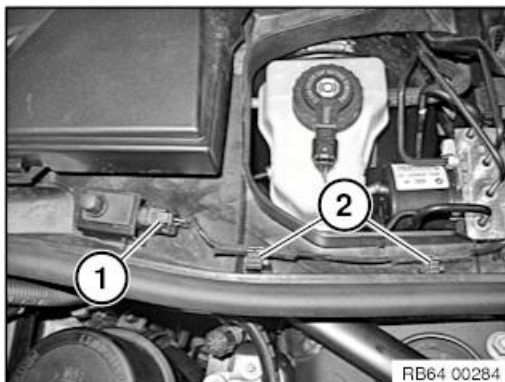
- Thread in the lower section (1) of the microfilter housing in the direction of the arrow.
- Make sure the lower section (1) of the microfilter housing is fitted correctly.



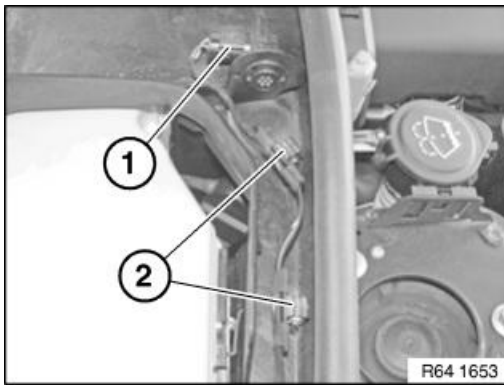
- Tighten the screw (1) on both sides of the lower section (3) of the microfilter housing.
- Secure the holder (2) on both sides.



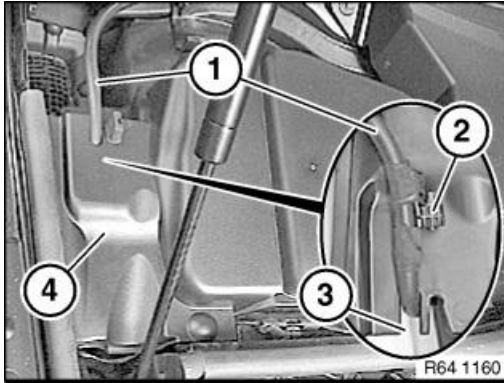
- Check the retaining lugs (3) for damage and renew if necessary.
The retaining lugs (3) must not be damaged or missing.
- Slide the cable strip (1) into the lower part (2) of the microfilter housing in the direction of the arrow until the retaining lugs (3) engage.
- Check that the cable strip (1) is correctly positioned.



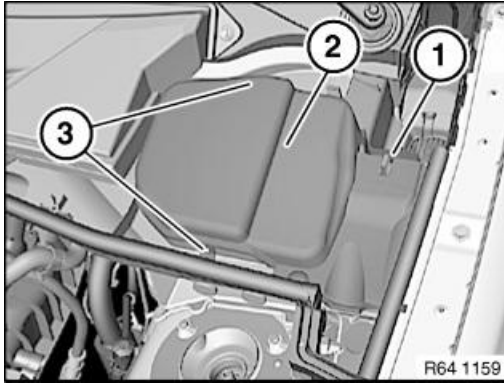
- Clip the cable into the guides (2).
- Plug in connector (1).
The connector must engage audibly.



- Clip the cable into the guides (2).
 - Plug in connector (1).
- The connector must engage audibly.



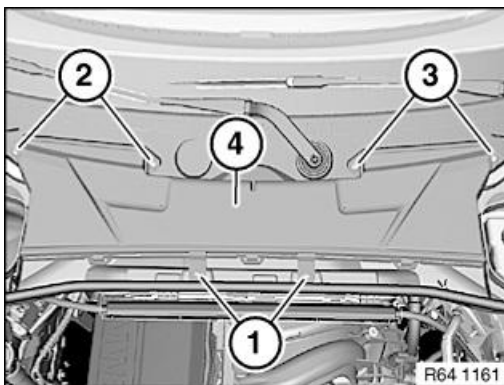
- Position the left cover (4). Ensure correct fit.
- Secure the cable clip (2) and the hose (1) on the left cover (4).
- Check that the cable clip (2) and the hose (1) fit correctly in the recess (3).
- Lock cover (4).



- Position the right cover (2). Ensure correct fit.
- Engage the latch mechanisms (3).
- Secure the holder (1).

POSTPROCESSES

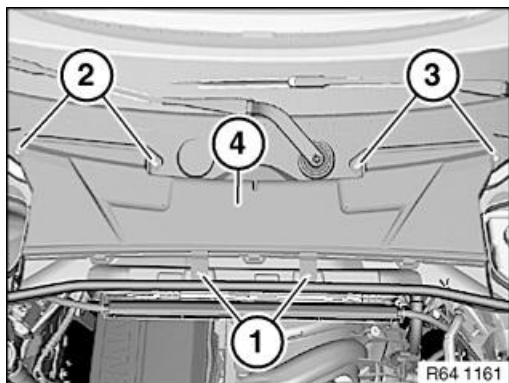
4 – Install the upper section of the microfilter housing



- Position the upper section (4) of the microfilter housing.
- Make sure the upper section (4) of the microfilter housing is correctly positioned.
- Tighten the screws (1), (2) and (3).

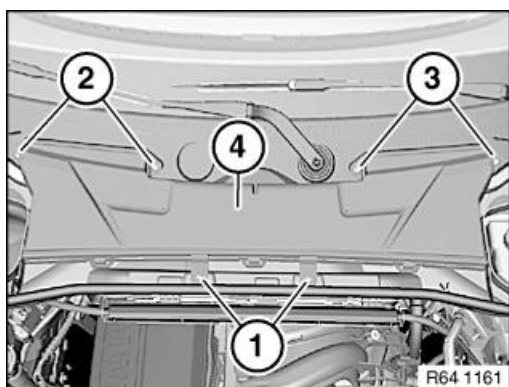
64 31 081 Removing and installing the microfilter housing (upper section) \PREMIUM

1 – Remove the top section of the microfilter housing



- Loosen screws (1), (2) and (3).
- Remove the upper section (4) of the microfilter housing.

2 – Install the upper section of the microfilter housing

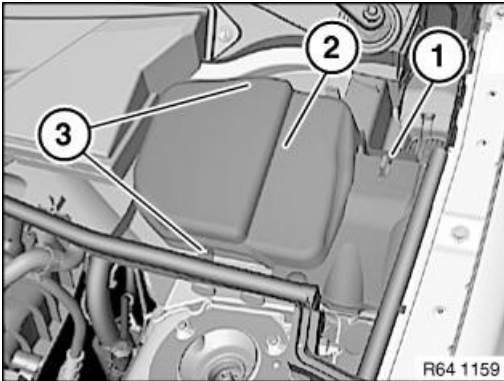


- Position the upper section (4) of the microfilter housing.
- Make sure the upper section (4) of the microfilter housing is correctly positioned.
- Tighten the screws (1), (2) and (3).



Necessary preliminary tasks:

- Remove [upper section of microfilter housing](#)



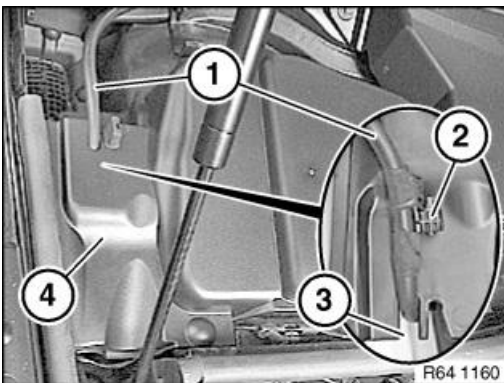
Release holder (1).

Release catches (3).

Remove right cover (2).

Installation note:

Make sure right cover (2) is correctly seated.



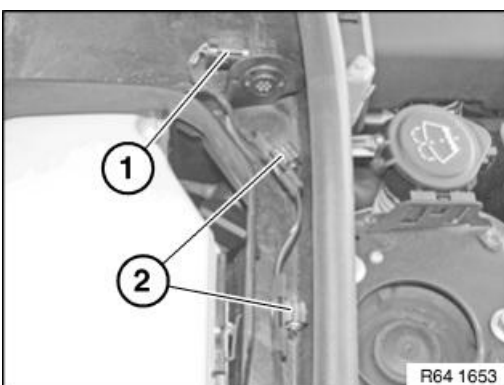
Left cover (4) is removed in same way as right cover.

Also for E90:

Release cable holder (2) and remove hose (1) from cover (4).

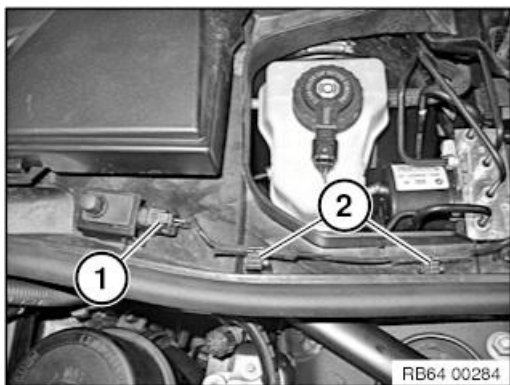
Installation note:

Make sure cable clip (2) and hose (1) are correctly seated in recess (3).

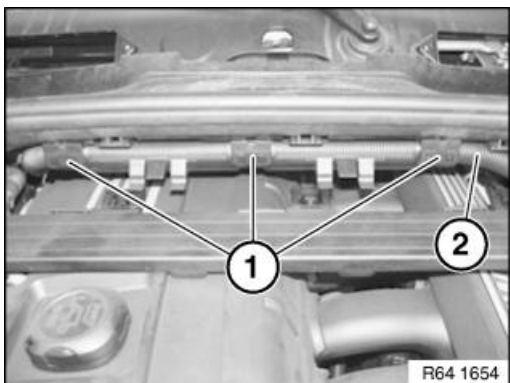


Unfasten plug connection (1) and disconnect.

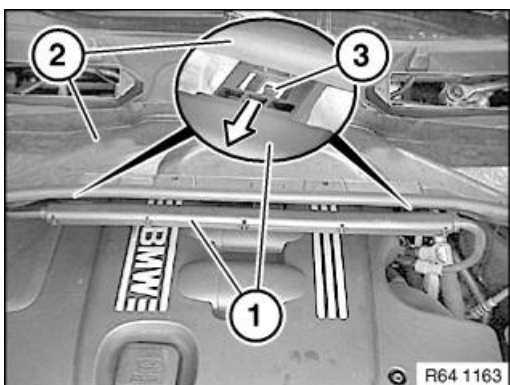
Unclamp cable from guides (2).



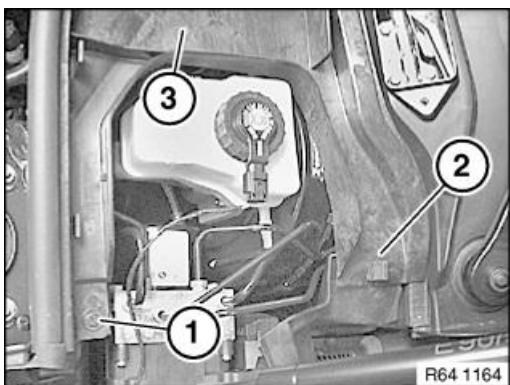
Unfasten plug connection (1) and disconnect.
Unclamp cable from guides (2).



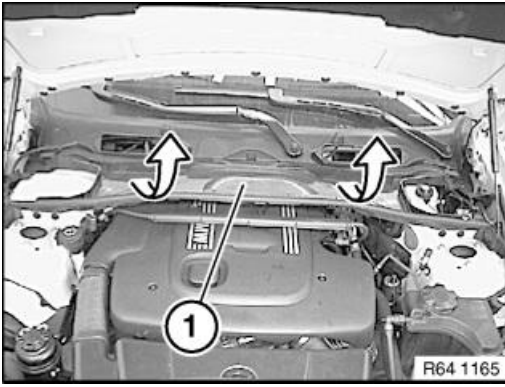
Applies to: E81, E82, E87, E88
Open hose clamps (2) on hose (1).



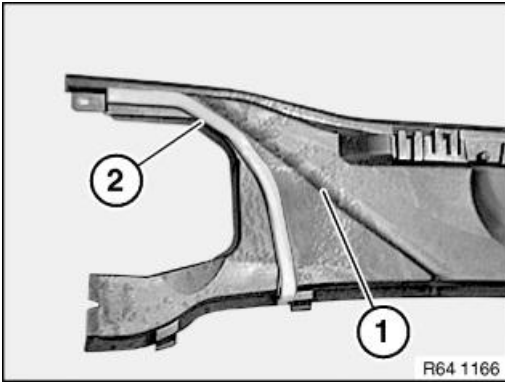
Except for: E84 / N20
Press retaining lugs (3).
Release cable strip (1) in direction of arrow from lower section of microfilter housing (2).
Installation note:
Retaining lugs (3) must not be damaged or missing.
Make sure cable strip is correctly seated.



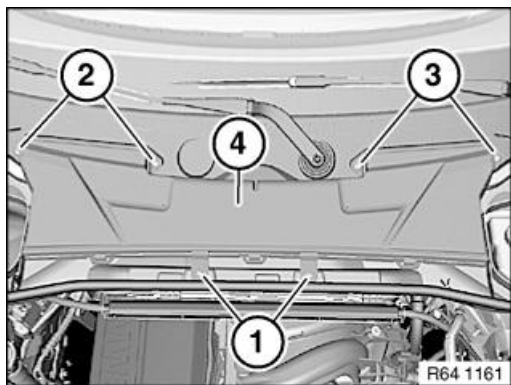
Release holder (2) on both sides.
Release screw (1) on both sides on lower section of microfilter housing (3).



Feed out microfilter housing lower section (1) in direction of arrow and remove. *Installation note:*
Make sure microfilter housing lower section (1) is correctly seated.



Installation note:
Seal (2) of microfilter housing lower section (1) must not be damaged or missing.



Note:

Example shown on E87:

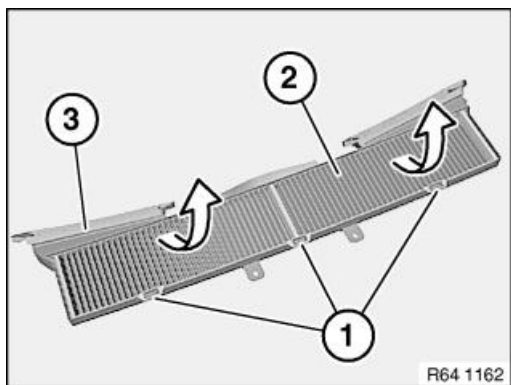
Release screws (1).

Unfasten screws (2 and 3).

Remove upper section of microfilter housing (4).

Installation note:

Make sure upper section of microfilter housing (4) is correctly seated.



Replacement:

Release catches (1).

Release microfilter (2) in direction of arrow from upper section of microfilter housing (3).

Installation note:

Make sure microfilter (2) is correctly fitted.

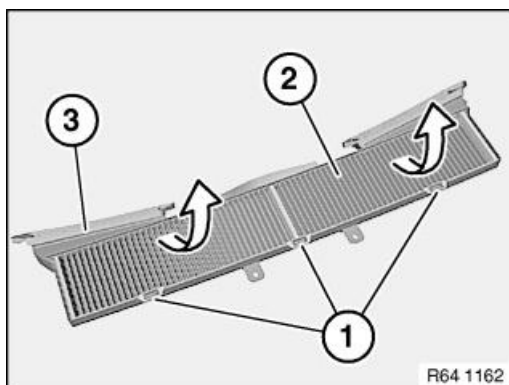
**Important!**

Risk of damage!

Air conditioning must not be operated without the prescribed filter element.

**Necessary preliminary work:**

- [Remove](#) microfilter housing (upper part)



Release catches (1).

Release microfilter (2) in direction of arrow from upper part of microfilter housing (3).

Installation note:

Make sure microfilter (2) is correctly fitted.

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).

**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.

Repair work 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.

- Follow safety information for [handling R 134a refrigerant](#).
- Follow safety information for [handling refrigerant oil](#).

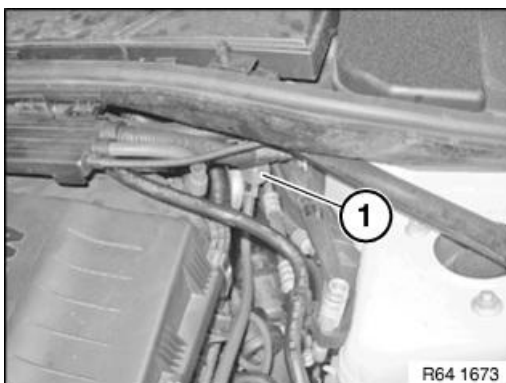
**Attention!**

The suction-side filling line of the refrigerant circuit is omitted from the engine versions of model series E9X and E8X.

This is replaced by a direction connection on the expansion valve.

Changeover time frame:

- From 07/09 - N54
- From 08/09 - N43
- Until end of 2009 - all other engine versions except N45/N46 and S65

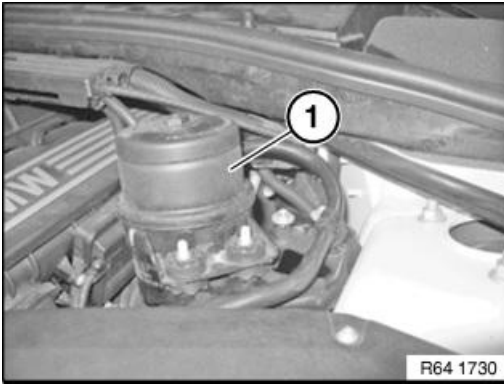


Shown on N54 engine by way of example.

Direct connection of filling adapter (1) on the expansion valve is shown.

Note:

Make sure filling hose (1) is laid without kinks.



Note:

N52 engine only:

On vehicles with hydraulic steering (e.g. AFS) oil reservoir (1) must be detached.

Refer to: [Remove oil reservoir for hydraulic steering](#)

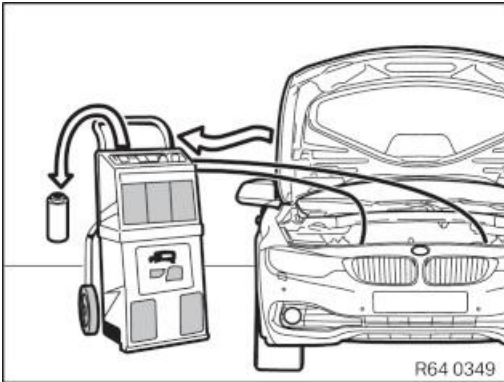


Attention!

Risk of damage!

Only BMW-approved R134a refrigerant may be used. ([refer to sourcing reference: Operating Fluids](#))

Restart engine only when the air conditioning system has been correctly filled.



Attention!

Risk of damage!

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!

The vehicle must be parked on the floor during all drawing off, evacuation and filling procedures!

Filling a raised vehicle will result in insufficient filling levels.



Note:

In case of complaints, carry out a heating and air conditioning performance test!

If the system fails the test, draw off, evacuate and fill the heating and air conditioning system in accordance with the operating instructions of the relevant service station.

Service interval of service station must be adhered to.

E60 only:

If necessary, to connect service station, use manufacturer's adapter for high-pressure connection (red).



Instructions for drawing off heating and air conditioning system:

To help separation of refrigerant and refrigerant oil, run engine at low speed (800-1200 rpm) and with heating and air conditioning system turned on for a few minutes.

This limits the entrainment of refrigerant oil while it is drawn off.

Drawn-off refrigerant oil must be changed and reintroduced via the 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.



Attention!

E72 only:

Vehicle must be evacuated from both sides!



Instructions for evacuating heating and air conditioning system:

Before each filling, evacuate the refrigerant system.

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.

Instructions for filling heating and air conditioning system:

Before filling with refrigerant, replace the refrigerant oil entrained during drawing off.

Also top up any lost fluid as indicated in the table:

Loss of R134a refrigerant

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 must be topped up with an unapproved loss of refrigerant due to a leak after a specific period of time.

Different cases:

- a. Loss of refrigerant per **Table 1** is not exceeded
 - Top up lost R134a refrigerant
 - It is not permitted to top up the refrigerant oil

b. Loss of refrigerant per **Table 1** is exceeded

- Top up lost R134a refrigerant
- refrigerant oil must be topped up **additionally** per Table 2

Table 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: Number of years since last filling	R134a loss of coolant [g]	Top up quantity refrigerant oil
0 - 1	- <120	0
	120 - 150	10
	> 150	20
1 - 2	- <180	0
	180 - 210	10
	> 210	20
2 - 3	- <240	0
	240 - 270	10
	> 270	20
3 - 4	- <300	0
	300 - 330	10
	> 330	20
4 - 5	- <360	10
	> 360	20



Follow [instructions for opening and part replacement](#) in refrigerant circuit.

Depending on the type of component replaced on the heating and air conditioning system, it may be necessary to top up the refrigerant oil, even if no measurable losses have occurred during drawing off. Follow the notes provided by the heating and air conditioning system manufacturer, taking account of the tolerances (and inaccuracies) indicated in the operating instructions of the relevant service station.

Information on the required refrigerant fill quantity for the entire heating and air conditioning system is contained on the type plate (1) in the engine compartment.

If necessary, refer to the Technical Data for [capacity](#).

Installation note:

Reseal refrigerant filler necks on vehicle with sealing caps.

64 50 010 Drawing off, evacuating and filling heating and air conditioning system (R1234yf)



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.

- Observe safety information for [handling refrigerant R1234yf](#)
- Follow safety information for [handling refrigerant oil](#).



Attention!

Risk of damage!

Only BMW-approved R1234yf refrigerant may be used ([refer to sourcing reference: Operating Fluids](#)).

Restart engine only when air conditioning has been correctly filled.



Vehicle-specific notes:

Only I01:



To access the connections for the refrigerant lines, [remove front luggage compartment well](#).

Only I12:



Attention!

Risk of damage!

Risk of paint damage and scratches!

[Open engine compartment lid](#) to access the connections of the refrigerant lines.

Open and close the engine compartment lid as specified in the instructions without exception!

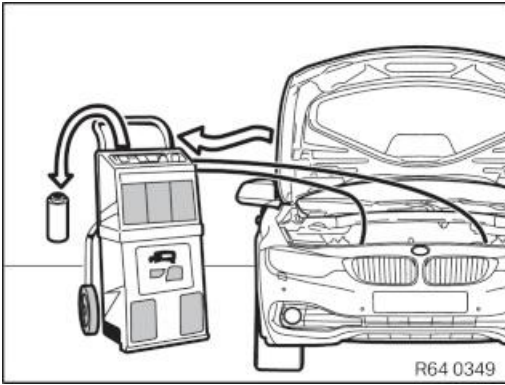
BMW i, Plug-in Hybrid Electric Vehicle and vehicles with rear passenger compartment air conditioning:



To ensure almost full draining of the refrigerant circuit or the hybrid battery cooling system, run the following test module:

- Body
- Air conditioning function
- Drain / fill the refrigerant circuit
- Drain/fill the refrigerant circuit (without I01 with heat pump)
- Drain/fill the refrigerant circuit of the heat pump (I01 with heat pump)

After filling the refrigerant circuit, delete the fault memory.



Attention!

For R1234yf, an A/C service station especially suited for this refrigerant must be used!

A/C service station for R134a must not be used!

[Comply with the notes on refrigerant \(R134a, R1234yf\) and refrigerant oil \(Sanden SP-A2\).](#)

Risk of damage!

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!

The vehicle must be parked on the floor during all drawing off, evacuation and filling procedures!

Filling a raised vehicle will result in insufficient filling levels.



Note:

Perform A/C performance test in event of customer complaint!

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:

Before evacuation, the A/C service station will investigate the refrigerant.

If the refrigerant is consistent with the requirements, evacuation is continued.

If the refrigerant fails to meet the requirements, then a [special procedure](#) must be complied with when drawing off and disposing of this refrigerant.

In order to enhance the separation of refrigerant and refrigerant oil, allow the Air conditioning to run for a few minutes before drawing off.

This 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.



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:

[In certain cases, Sanden SP-A2 refrigerant oil must be injected into the refrigerant circuit.](#)

Before filling with refrigerant, replace the refrigerant oil entrained during drawing off.

Also top up any lost fluid as indicated in the table:

Loss of R1234yf refrigerant

Table 1 indicates the permitted loss of refrigerant after a specific period of time. There is no leak. refrigerant oil may not be topped up.

Table 2 indicates the amount of refrigerant oil must be topped up with an unapproved loss of refrigerant due to a leak after a specific period of time.

Different cases:

- a. Loss of refrigerant per **Table 1** is not exceeded
 - Top up lost R1234yf refrigerant
 - It is not permitted to top up the refrigerant oil
- b. Loss of refrigerant per **Table 1** is exceeded
 - Top up lost R1234yf refrigerant
 - refrigerant oil must be topped up **additionally** per Table 2

Table 1:	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5
Number of years since last filling					
Permissible loss [g] → Do not top up refrigerant oil	≤ 30	≤ 60	≤ 90	≤ 120	≤ 150

Table 2: Number of years since last filling	Loss of R1234yf refrigerant [g]	Top up quantity refrigerant oil
0 - 1	< 120	0
	120 - 150	10
	> 150	20
1 - 2	< 180	0
	180 - 210	10
	> 210	20
2 - 3	< 240	0
	240 - 270	10
	> 270	20
3 - 4	< 300	0
	300 - 330	10
	> 330	20
4 - 5	< 360	10
	> 360	20



Follow [notes for opening and replacing parts](#) in refrigerant circuit.

Depending on the type of component replaced on the heating and air conditioning system, it may be necessary to top up the refrigerant oil, even if no measurable losses have occurred during drawing off. Follow the notes provided by the air conditioning manufacturer, taking account of the tolerances (and inaccuracies) indicated in the operating instructions of the relevant service station.

Information on the required refrigerant capacity for the entire air conditioning is contained on the type plate (1) in the engine compartment.

If necessary, refer to the Technical Data for [capacities](#).

Installation note:

Reseal refrigerant filler necks on vehicle with sealing caps.



The retrofit kit may be used for vehicles with a production date from 09/2008.



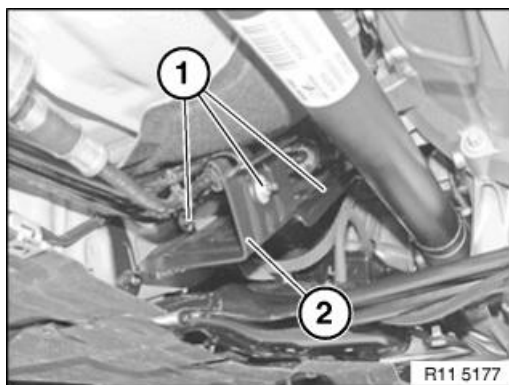
Important!

The retrofit kit with part number 6 987 991 may no longer be used!



Necessary preliminary tasks:

Remove [rear underbody protection](#)

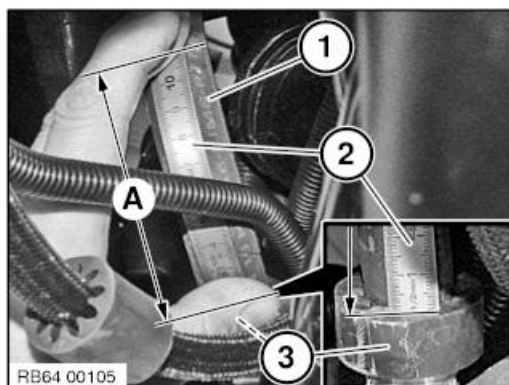


Unscrew nuts (1).

Remove the protective plate (2).

Note:

Figure All-wheel drive vehicle

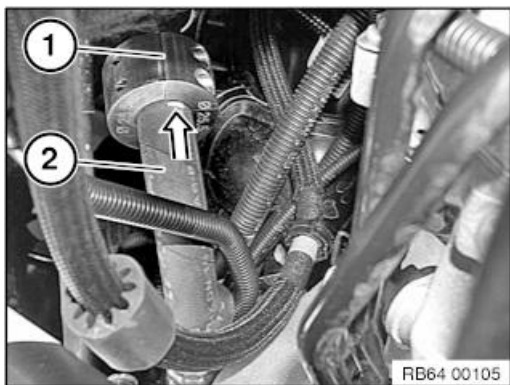


Lay the steel measuring tape (2) onto the intake pipe (1).

Important!

The steel measuring tape (2) must be flush with the bottom of the rubber ring (3)!

Mark distance A = 11 cm.



Attach the lower edge of the vibration absorber (1) at the marked position and screw it to the intake pipe (2).

Tightening torque: 8 Nm

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.

**Warning!**

Observe the following points when handling refrigerant oil:

- Wear protective goggles.
- Wear protective gloves made from impermeable plastic.
- Do not swallow.
- Do not inhale.

Action to be taken after contact with refrigerant oil:

- After contact with eyes, rinse thoroughly with plenty of water and take out contact lenses (if worn). Then seek immediate medical attention.
- After contact with the skin, wash body parts affected with plenty of soap and water.
- Do not induce vomiting if oil is swallowed, seek immediate medical attention.
- If inhaled, introduce the person affected to fresh air. Seek medical attention if problems persist.

**Warning!**

refrigerant oil is non-combustible and non-explosive at normal temperatures. In spite of this, the following precautions must be observed:

- Do not store in the vicinity of flames, heat sources or strongly oxidising materials.
- Suitable extinguishants: Carbon dioxide (CO₂), dry extinguishant, foam.

**Important!**

refrigerant oil is hygroscopic and must therefore be stored in suitable containers that are sealed airtight!

**Recycling:**

Dispose of drawn-off refrigerant oil as hazardous waste.

Observe country-specific waste disposal regulations.

Absorb escaping refrigerant oil with fluid-binding material.

Notify the relevant authorities if larger amounts of refrigerant fluid are discharged into aboveground water supplies, drainage systems or subsoil.

64 52 ... Instructions for opening and part replacement in refrigerant circuit



Special tools required:

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. Part replacement as preliminary work for 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. Part replacement due to sudden leakage

(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- 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
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil

- Evacuate and fill [A/C system](#)

**Special tools required:**

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work for further repair work and 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- Carry out part replacement
- Replace removed refrigerant oil and additionally replace with new refrigerant oil according to parts replaced:
 - Compressor: refer to [Notes on compressor replacement](#)
 - Evaporator: 35 ml
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- Evacuate and fill [A/C system](#)

64 53 ... Instructions for replacement of air conditioning capacitors 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.

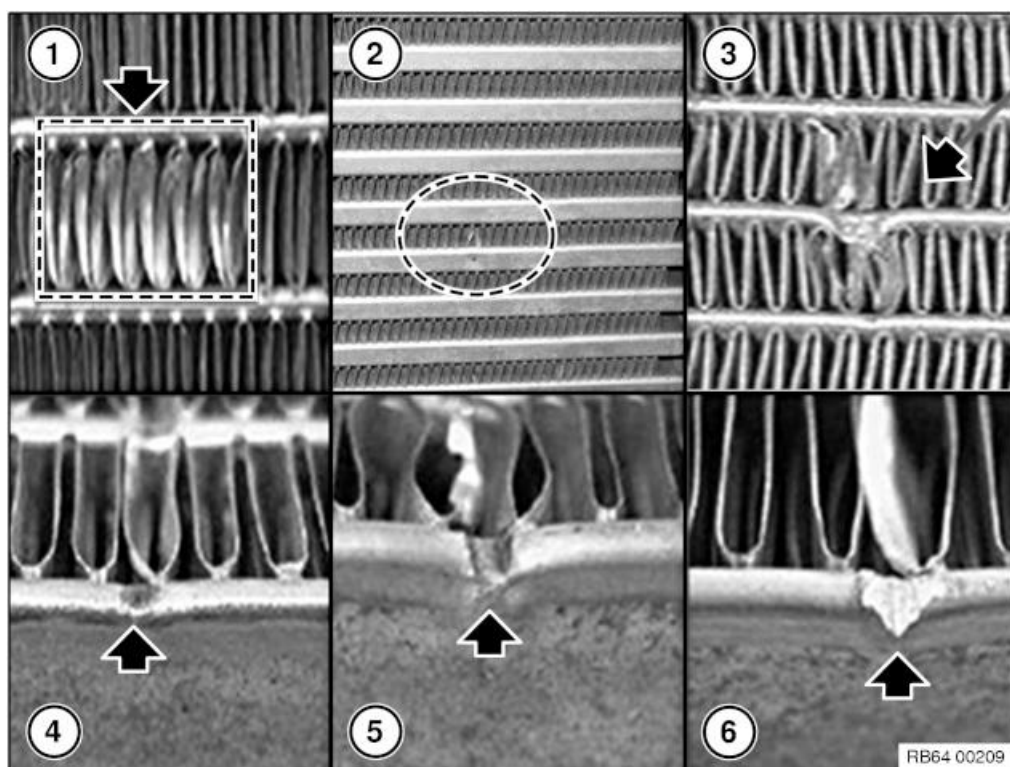
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig.Â (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.

*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!

**Attention!**

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!

**Attention!**

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.



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.



Vehicle-specific notes:

Only I01:



To access the connections for the refrigerant lines, remove front luggage compartment well.

Only I12:



Attention!

Risk of damage!

Risk of paint damage and scratches!

[Open engine compartment lid](#) to access the connections of the refrigerant lines.

Open and close the engine compartment lid as specified in the instructions without exception!

Only BMW i and hybrid vehicles:



To ensure almost full draining of the refrigerant circuit or the hybrid battery cooling system, run the following test module:

- Body
- Air conditioning function
- Drain / fill the refrigerant circuit
- Drain / fill the refrigerant circuit
- Drain/fill refrigerant circuit of heat pump (only I01 with heat pump)

Delete fault memory after filling refrigerant circuit.

**Attention!**

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**.

Attention!

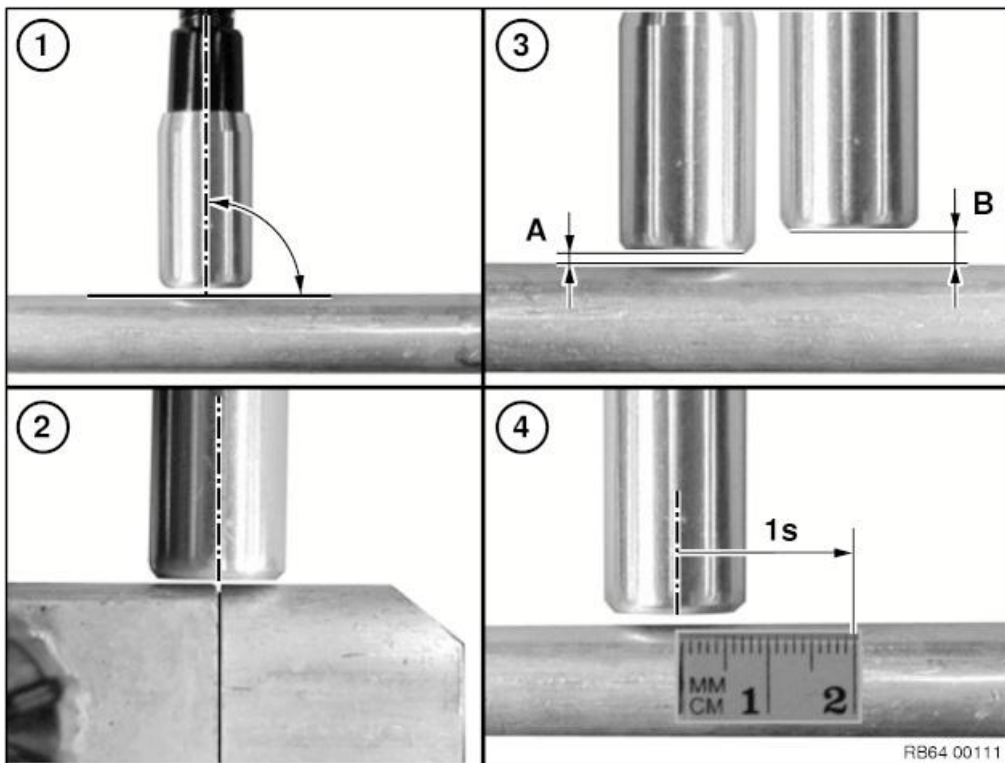
The leak detection may not be performed **more than 3 h** after filling the refrigerant circuit with forming gas!

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.

Attention!**Risk of damage!**

Maximum approved pressure: **10 bar**

Do not start the engine during the entire procedure!

**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:

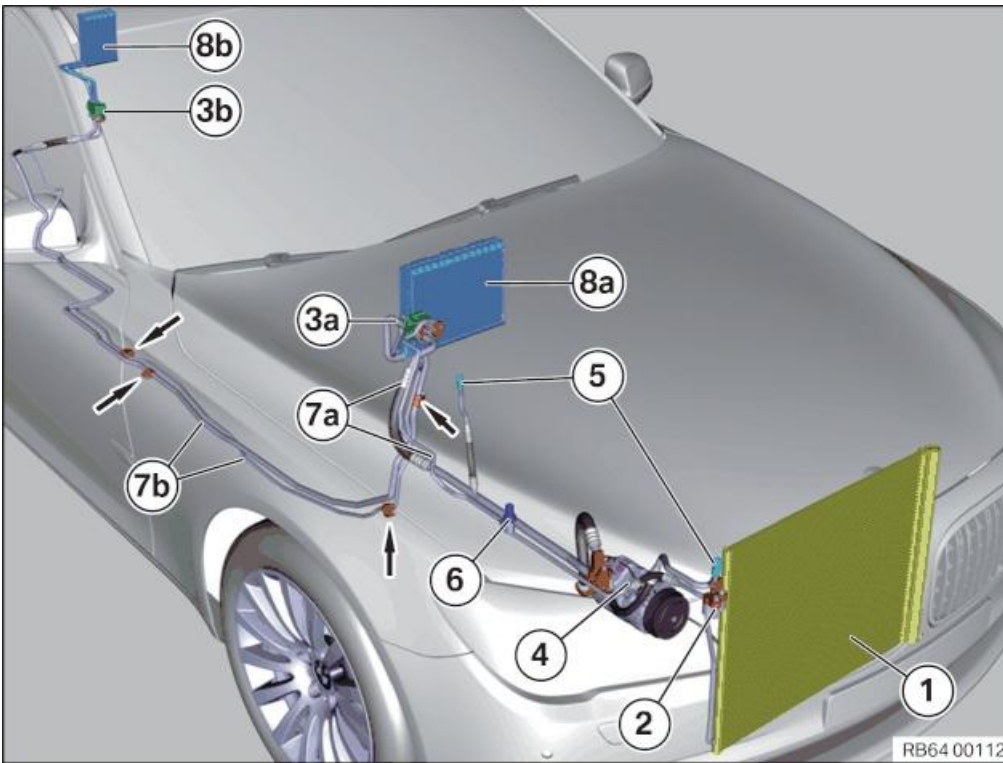
Replace the leaking component. Relieve the pressure from the refrigerant circuit prior to replacement.



Attention!

Compliance with the instructions above is absolutely mandatory!

Non-compliance will significantly reduce the efficiency of leak detection!



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.

Refrigerant circuits of BMW i vehicles differ a lot from the figure:

[Overview components refrigerant circuitI01](#)

[Overview components refrigerant circuitI12](#)

Note additional components during leak detection in these vehicles!

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.

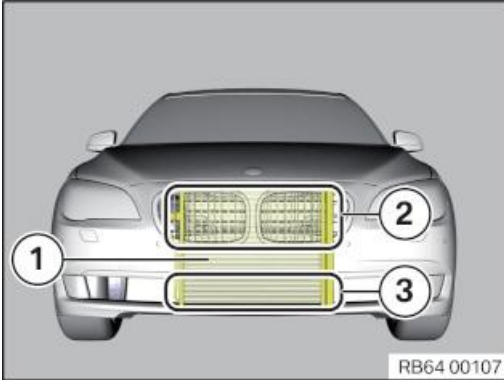


Checking sequence:

1. Check of components 1, 2, 3a, 4, 5, 6, 7a and 8a of the automatic front air-conditioning system.

If no fault found:

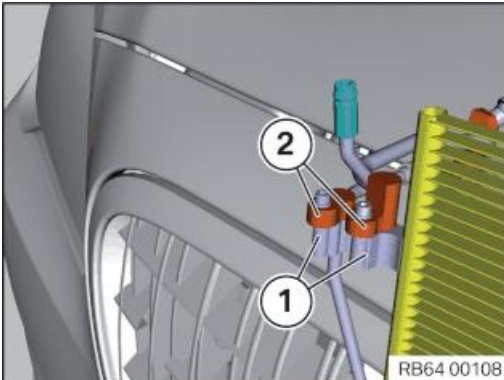
2. Check of components 3b, 7b, 8b and connection points of the automatic rear air-conditioning system.



1. Air conditioning condenser:

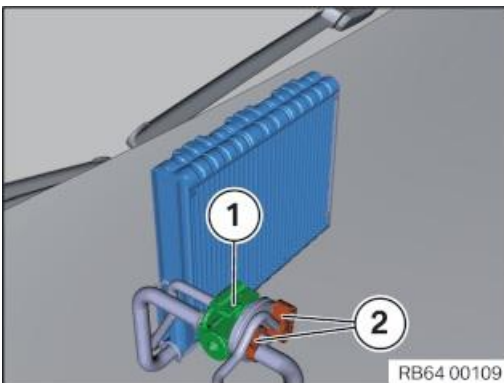
Damage caused by stone chipping, etc. is the most frequent cause of air conditioning condenser leaks (1):

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.



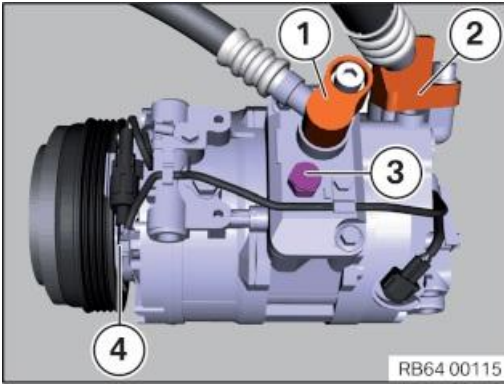
2. Connection point capacitor - refrigerant line

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).

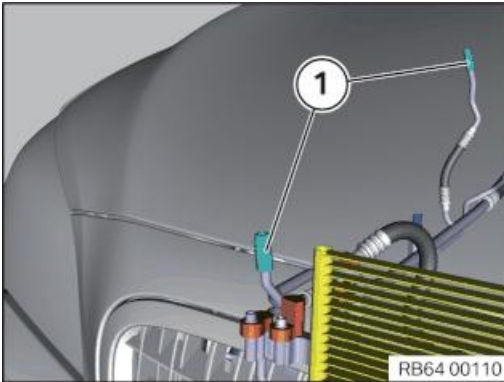


4. A/C compressor:

Remove drive belt from air conditioning compressor.

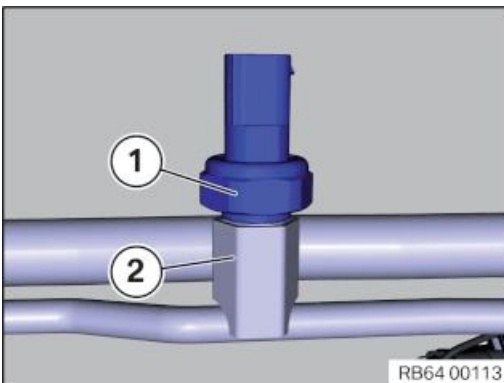
Check the following components on the air conditioning compressor:

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.



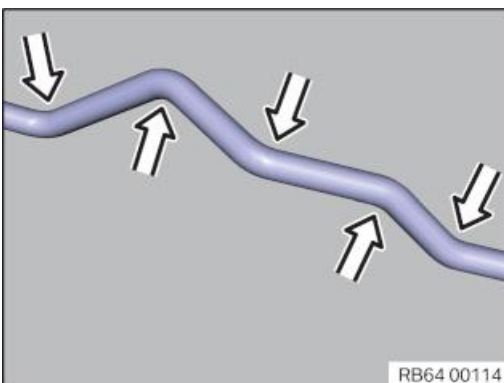
5. Filler neck

Blow out the fuel filler neck (1) prior to checking.



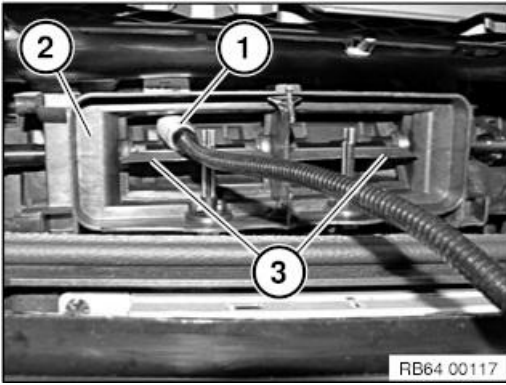
6. Refrigerant pressure sensor

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.



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.



Attention!

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](#)

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 [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 UV lamp, wear the safety goggles provided in the case.



Note:

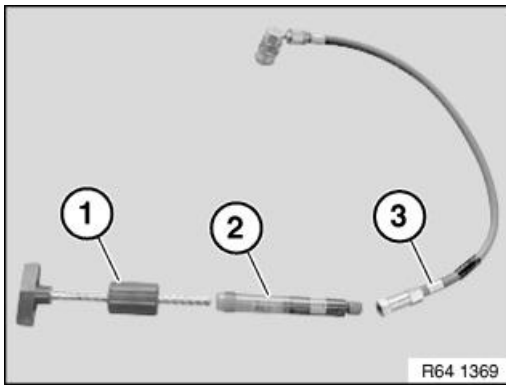
- Fill the hose system of the hand pump completely with UV additive PRIOR to use
- Use the UV additive exclusively for refrigerant oil approved by BMW
- Do not operate the air conditioning while the hand pump is connected or in use
- The air conditioning must always be filled with an adequate amount of refrigerant to enable the UV additives to be properly distributed



Necessary preliminary work:

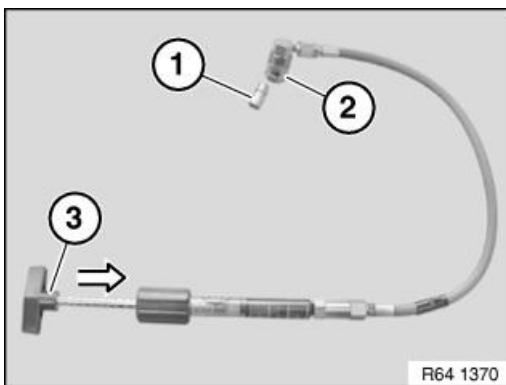
Before actually testing for leaks, check the entire refrigerant circuit using the UV leak detection lamp to ensure that no UV additive is already in the area of the refrigerant circuit.

If already illuminated areas are found, carefully clean the area in question with the cleaning agent contained in the leak testing case.



On initial use:

Connect hand pump (1) to additive cartridge (2) and pipe section (3).



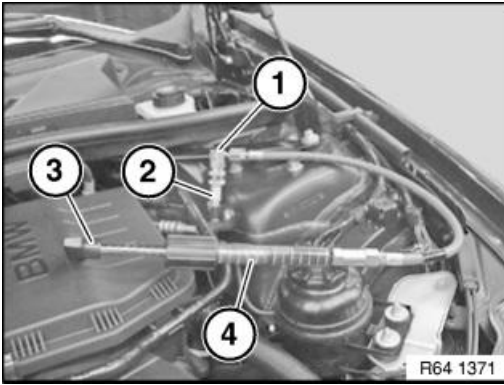
On initial use:

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.



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

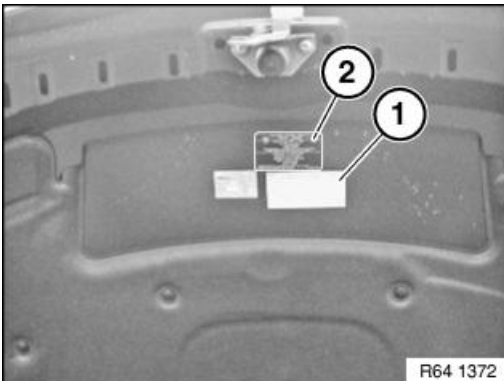
Note:

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.



Further tasks:

- 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 components of the refrigerant circuit for possible leaks
- Possible leaks are displayed in luminous green



Complete accompanying information label (1) with the relevant data and attach in an easily visible position next to the type plate (2).

64 50 ... Note for handling R134a refrigerant

Work on the refrigerant circuit may only be carried out by experts!

Avoid all contact with liquid or gaseous R134a. Wear protective goggles and gloves when working on the refrigerant circuit.

- Follow [safety instructions](#) for handling R134a refrigerant.

Warning!

Although R134a at normal temperature is non-toxic, not inflammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions.

As a gas, R134a 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 heating and air conditioning systems or in rooms into which R134a may have escaped. Exposure to flames or high temperatures (≥ 50 °C) may give rise to toxic decomposition products (fluorine gas). 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

R134a must be drawn off, cleaned and returned to the air conditioning 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.

R134a absorbs very small amounts of moisture. Therefore, seal off opened pipes, condenser, evaporator, compressor or drier bottle immediately with plugs.

- If an air conditioning has been emptied completely because of a leak, accident or in the course of a repair, the desiccant insert and complete condenser must be replaced, since too much moisture may penetrate the inside

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.

**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.



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!](#)



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!

**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!

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.

**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.

**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!

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:**

- If swallowed: Do NOT induce vomiting, unless expressly instructed to do so by medical personnel. Do not administer anything to an unconscious person through their mouth. Consult a doctor immediately if larger quantities of this substance are swallowed. Loosen tight-fitting items of clothing (e.g. collar, tie, belt or similar).
- Eye contact: Remove contact lenses if worn. In the event of eye contact, rinse eyes for at least 15 minutes with plenty of water. It is essential to use WARM WATER. Consult a doctor.
- Skin contact: In the event of skin contact, rinse immediately with plenty of water. Remove contaminated clothes and shoes. Wash affected clothes before wearing again. Clean shoes thoroughly before reusing. **Call for a doctor.**
- After inhalation: If inhaled, take the person affected outside into fresh air immediately and keep them under supervision. **Call for a doctor.** If breathing difficulties are experienced, administer additional oxygen. If the person affected stops breathing, administer the kiss of life.

**Recycling**

Catch and dispose of emerging refrigerant oil.

Observe country-specific waste disposal regulations.

**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!

It is absolutely essential to read and observe the relevant operating instructions for the A/C service unit used!

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- 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.

**Warning!**

Risk 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 depressurized AFTER drawing off!

- Before conducting repairs, check the actual pressure drop on the pressure gauge of the A/C service unit.

Read and comply with the relevant operating instructions for the A/C service unit used.

**Protective measures/rules of conduct:**

- Wear protective goggles
- Wear oil-resistant protective gloves
- Do not smoke!
- Observe country-specific safety regulations.

**First aid measures:**

- If swallowed: Do NOT induce vomiting, unless expressly instructed to do so by medical personnel. Do not administer anything to an unconscious person through their mouth. Consult a doctor immediately if larger quantities of this substance are swallowed. Loosen tight-fitting items of clothing (e.g. collar, tie, belt or similar).
- Eye contact: Remove contact lenses if worn. In the event of eye contact, rinse eyes for at least 15 minutes with plenty of water. It is essential to use WARM WATER. Consult a doctor.
- Skin contact: In the event of skin contact, rinse immediately with plenty of water. Remove contaminated clothes and shoes. Wash affected clothes before wearing again. Clean shoes thoroughly before reusing. **Call for a doctor.**
- After inhalation: If inhaled, take the person affected outside into fresh air immediately and keep them under supervision. **Call for a doctor.** If breathing difficulties are experienced, administer additional oxygen. If the person affected stops breathing, administer the kiss of life.

**Important!**

Refrigerant is hygroscopic and must therefore be stored in suitable containers that are sealed airtight!

Refrigerant oil is non-combustible and non-explosive at normal temperatures. Nevertheless, the following points must be observed:

- Do not store in the vicinity of flames, heat sources or strongly oxidizing materials
- Suitable extinguishants are carbon dioxide (CO₂) extinguishant and foam

**Recycling**

Catch and dispose of emerging refrigerant oil.

Observe country-specific waste-disposal regulations.

Absorb escaping refrigerant oil with fluid-binding material.

Notify the relevant authorities if larger amounts of refrigerant oil are discharged into above-ground water supplies, drainage systems or subsoil.

**Warning!**

Risk 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 depressurized 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 protective 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.

64 52 ... Instructions for opening and part replacement in refrigerant circuit



Special tools required:

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. Part replacement as preliminary work for 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. Part replacement due to sudden leakage

(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- 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
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil

- Evacuate and fill [A/C system](#)

**Special tools required:**

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work for further repair work and 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- Carry out part replacement
- Replace removed refrigerant oil and additionally replace with new refrigerant oil according to parts replaced:
 - Compressor: refer to [Notes on compressor replacement](#)
 - Evaporator: 35 ml
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- Evacuate and fill [A/C system](#)

This documentation refers to special tools that were not yet available when going to press.

64 51 580 Perform leakage test for evaporator



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 more information see: 64 50 Handling refrigerant and 6450 Notes on repair work on air conditioning

PRELIMINARY WORK

1 – Drawing off the air conditioning

- See additional information.

MAIN WORK

2 – 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.

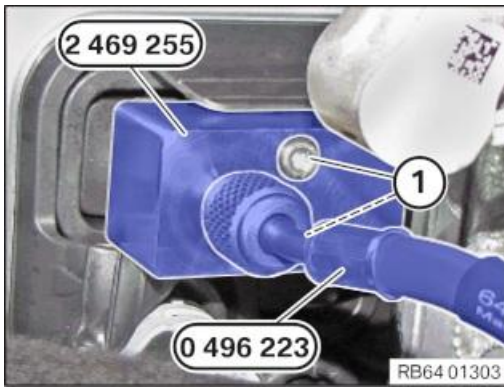


WARNING

Pressure vessel with nitrogen.

Danger of injury! Risk of asphyxiation!

- Ensure there is 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).
- 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

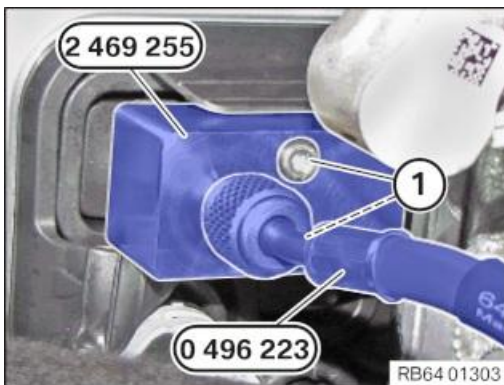
- Evaporator is tight if the adjusted test pressure of 10 bar **drops by 1.5 bar to 8.5 bar** over a test period of 2 h.

Result

» After a test period of 2 h, the pressure drop is more than 1.5 bar.

Measure

- Renew evaporator.



- 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

3 – Evacuate and fill air conditioning

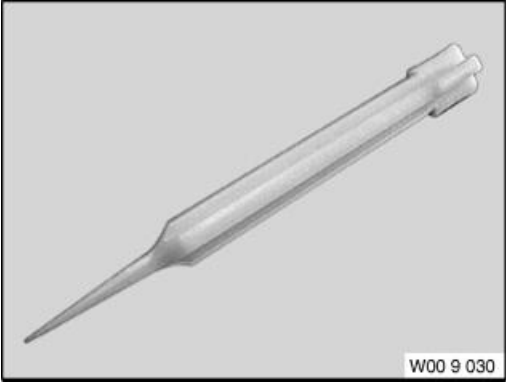
- See additional information.

Additional Information

Overview of Tightening Torques

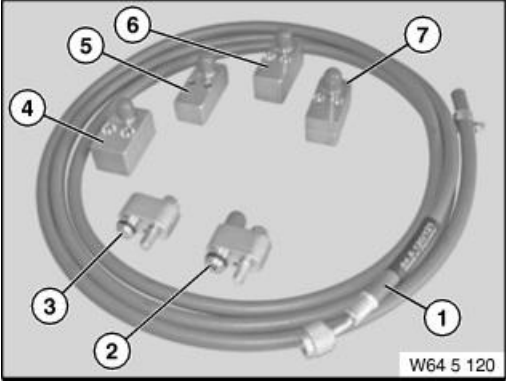
Overview of Special Tools

0 496 714 (00 9 030) Wedge



Common		Used in step	2
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	2
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

Links

Repair instructions	Used in step
64 50 010 Extract, evacuate and fill air conditioning system	1 3
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	1 3
64 50 010 Drawing off, evacuating and filling air conditioning (R134a)	1 3
64 50 ... Notes on repairs to air conditioning	1 3
64 50 010 Drawing off, evacuating and filling air conditioning (R1234yf)	1 3
64 50 ... Safety information for handling refrigerant R1234yf	1 3
64 50 ... Safety information for handling tetrafluorethane refrigerant R134a	1 3
64 50 ... Safety informations for handling refrigerant oil	1 3

**Special tools required:**

- [00 9 030](#)

**Warning!**

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant oil.

Read and comply with safety information:

- [Handling refrigerant R134a \(tetrafluorethane\)](#)
- [Handling refrigerant fluid](#)

**Attention!**

Risk of damage!

Restart engine only when air conditioning has been correctly filled.

Follow [notes](#) for opening and replacing parts in refrigerant circuit.

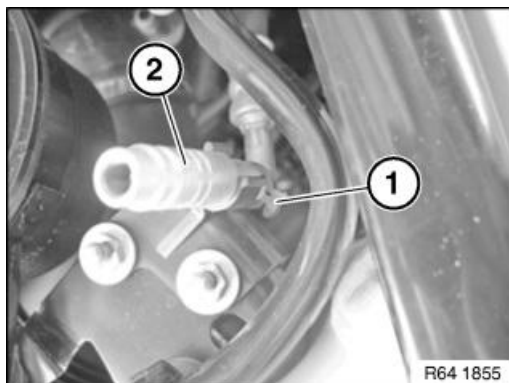
Note:

If Air conditioning is opened for more than 24 h:

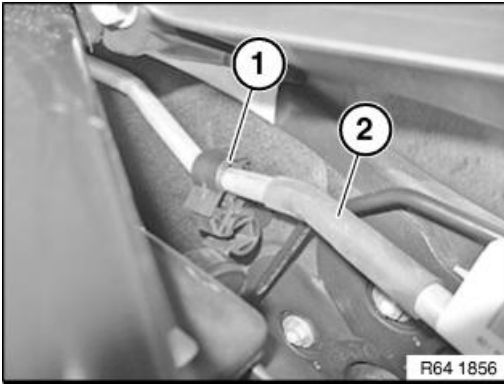
- Replace [desiccant insert](#) (N46 and N52 engine only). (Otherwise, renew [air conditioning condenser assembly](#).)

**Necessary preliminary work:**

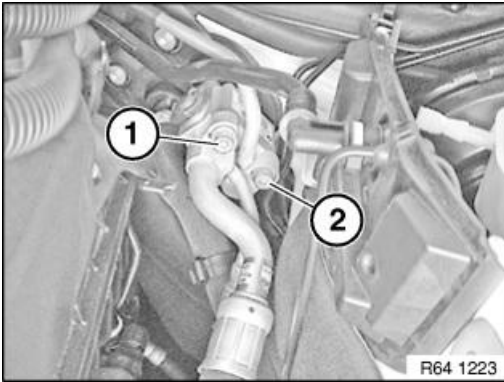
- [Drain off air conditioning system](#)
- Remove [lower section of microfilter housing](#)



Unlock plastic clamp (1) on intake pipe (2) and open.



Unlock plastic clamp (1) on pressure line (2) and open.



Release screws (1) and (2).

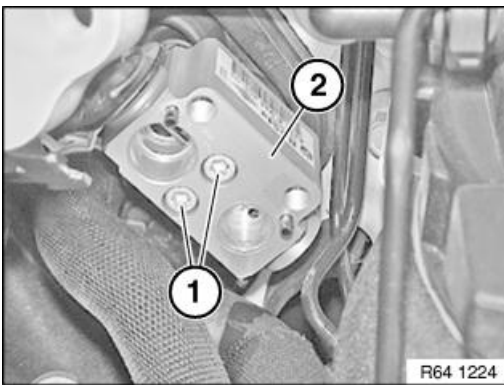
Tightening torque [64 53 2AZ](#).

Remove refrigerant lines and set aside.

Installation note:

Renew sealing rings.

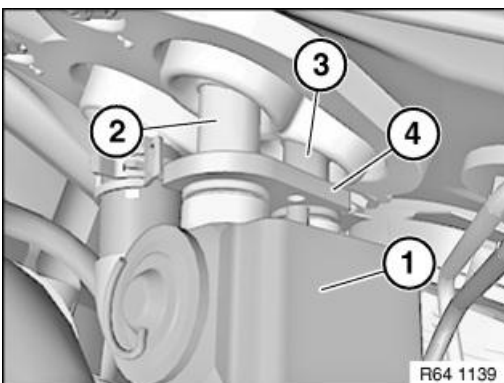
Use special tool [00 9 030](#) to install sealing rings without damaging them.



Release screws (1).

Tightening torque [64 53 13AZ](#).

Remove expansion valve (2).



Installation note:

Renew sealing rings.

Use special tool [00 9 030](#) to mount sealing rings without damaging them.

Place expansion valve (1) exactly on refrigerant lines (2) and (3).

Fit screws of expansion valve (1) and make sure retaining clip (4) is correctly positioned.

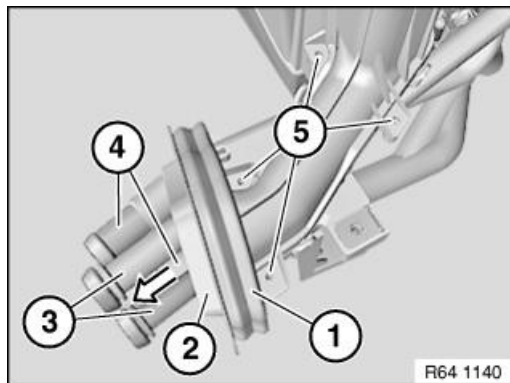


After installation:

- [Evacuate and fill air conditioning system](#)

**Necessary preliminary tasks:**

- Remove [heater/air conditioner](#)

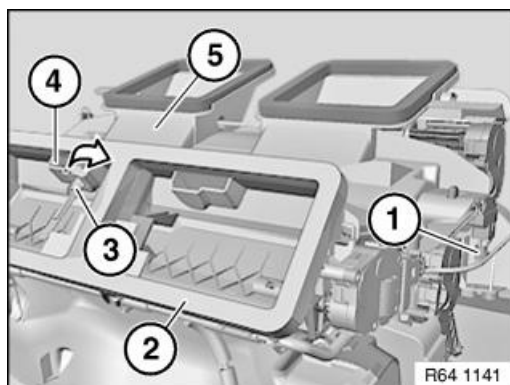


Carefully pull rubber grommet (1) and foam seal (2) over pipes (3) and (4).

Note:

If necessary, replace rubber grommet (1) and/or foam seal (2).

Release screws (5).



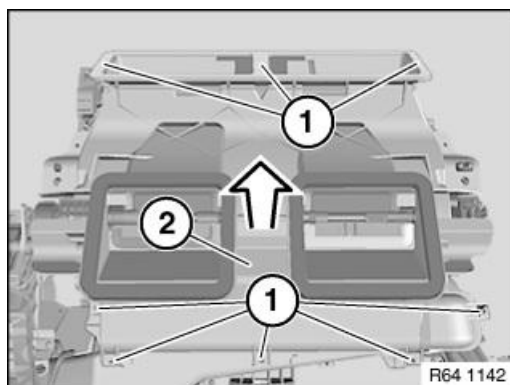
Unfasten plug connection (1) and disconnect.

Carefully remove gasket (2) and all remnants.

Installation note:

Replace gasket (2).

Turn temperature sensor for cold-air distributor (3) in direction of arrow and detach in upwards direction. Expose connecting line (4) of temperature sensor for cold-air distributor (3) towards rear of heater/air conditioner (5).

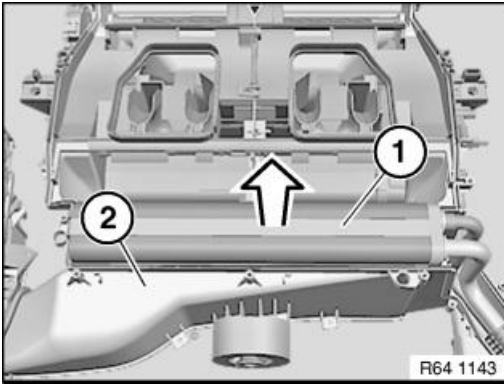


Release screws (1).

Remove upper housing section (2) of heater/air conditioner in direction of arrow.

Installation note:

Make sure upper housing section (2) is correctly seated on heater/air conditioner.



Pull evaporator (1) in direction of arrow out of lower housing section (2) of heater/air conditioner.

Clean housing components with suitable cleaning agent.

Installation note:

Make sure evaporator (1) is correctly seated in lower housing section (2) of heater/air conditioner.



Important!

Do not bend radiator fins.

If necessary, clean or straighten cooler fins with slat comb.

64 52 ... Instructions for opening and part replacement in refrigerant circuit



Special tools required:

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. Part replacement as preliminary work for 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. Part replacement due to sudden leakage

(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- 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
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil

- Evacuate and fill [A/C system](#)

**Special tools required:**

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work for further repair work and 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
- 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
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 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- Carry out part replacement
- Replace removed refrigerant oil and additionally replace with new refrigerant oil according to parts replaced:
 - Compressor: refer to [Notes on compressor replacement](#)
 - Evaporator: 35 ml
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- Evacuate and fill [A/C system](#)

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.**



Attention!

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.



Attention!

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
- Desiccant insert
- Line to the air conditioning condenser
- Refrigerant oil
- BMW i, PHEV: all expansion valves

BMW i, PHEV:

- Rinse the refrigerant circuit

**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.

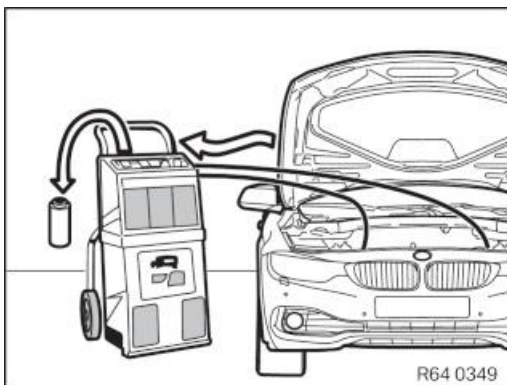


When replacing the air conditioning compressor it is absolutely essential to adapt the amount of refrigerant oil in accordance with the instructions below!

BMW I01 with 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).

**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 system, 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. The information of the amount of refrigerant oil on the present and new air conditioning compressor **is the same**. In this case continue with **Step 3, Case 1**.
2. The information of the amount of refrigerant oil on the present 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**.

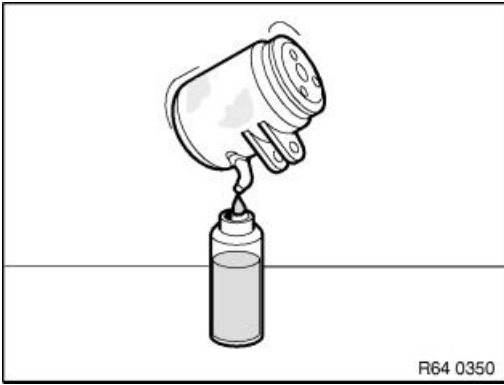
Example:

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

$150\text{ g} - 110\text{ g} = 40\text{ g}$ correspond to almost 40 ml

Note the difference of 40 ml.



Step 3:

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:

$20 \text{ ml} + 10 \text{ ml precautionary allowance} = 30 \text{ ml} < 50 \text{ ml}$

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:

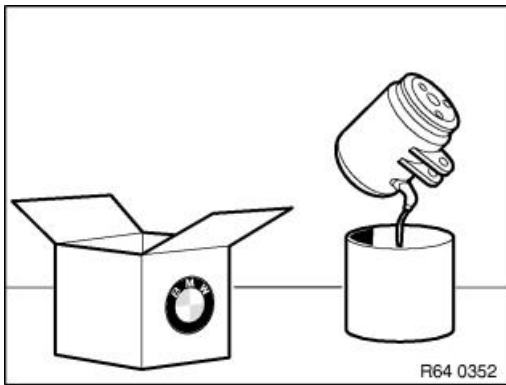
Difference = 40 ml

20 ml read at measuring cup:

$20 \text{ ml} + 10 \text{ ml precautionary allowance} = 30 \text{ ml}$

$30 \text{ ml} + 40 \text{ ml difference} = 70 \text{ ml} > 50 \text{ ml}$

determined amount of refrigerant oil for new air conditioning compressor = 70 ml



Step 4:

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 of the 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.



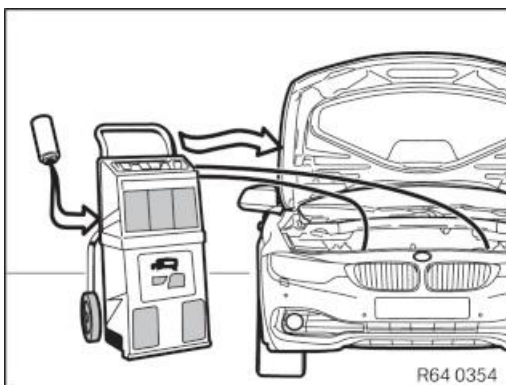
The drained new refrigerant oil can be filled into the expansion tank of the A/C service station after draining.



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.



Step 5

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 6



Attention!

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:

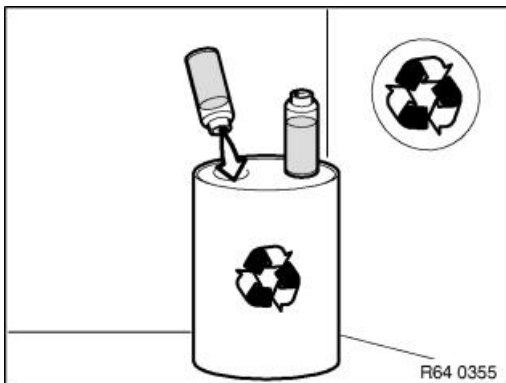
The breaking-in procedure for the new air conditioning compressor can be carried either manually or with the diagnosis system.

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 7

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](#)

64 52 ... Notes on changing the air conditioning compressor, determining the amount of refrigerant oil (amount of refrigerant oil of new air conditioning compressor not known)



Note:

This procedure only applies if the **new air conditioning compressor does not have a label with the amount of refrigerant oil**.

A [different procedure](#) applies for air conditioning compressors with a label indicating the amount of refrigerant oil.



Attention!

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.



Attention!

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
- Desiccant insert
- Line to the air conditioning condenser
- Refrigerant oil



The new air conditioning compressor is filled at the factory with refrigerant oil.

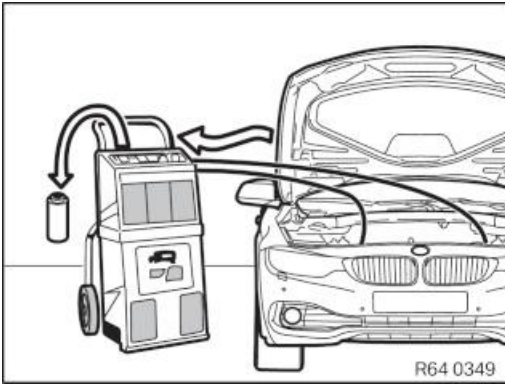
The amount of refrigerant oil in the new air conditioning compressor corresponds to the amount of refrigerant oil for the entire new and unfilled refrigerant circuit.



When replacing the air conditioning compressor it is absolutely essential to adapt the amount of refrigerant oil in accordance with the instructions below!

An adjustment of the amount of refrigerant oil is not required in the following case:

- Replacement of the complete refrigerant circuit.

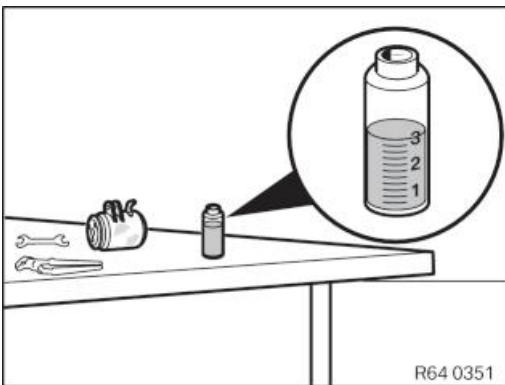


- [Draw off A/C system.](#)
- Note down the amount of refrigerant oil shown on the A/C service station display.

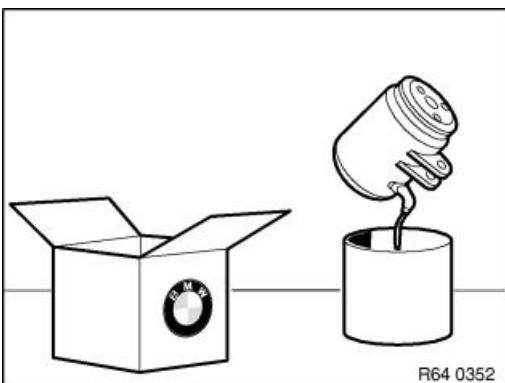
i When evacuating the air conditioning system, refrigerant oil is also extracted and collected in the oil separator of the A/C service station. This amount of refrigerant oil is displayed after the extraction of the air conditioning on the display of the A/C service station.



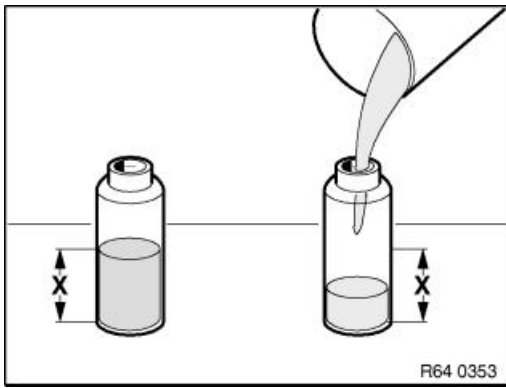
- Transfer all of the refrigerant oil remaining in the previous air conditioning compressor into a measuring cup via the oil filler plug.
- Turn the belt pulley during the filling process. This allows more refrigerant oil to flow out of the previous air conditioning compressor.



- Read the amount of refrigerant oil at the measuring cup.



- Open oil filler plug. Tightening torque [64 52 2AZ](#).
- Fill the entire contents of the new air conditioning compressor in a clean collecting vessel.



- Fill the same quantity of refrigerant oil (from the new air conditioning compressor), as was drained from the present air conditioning compressor, **+ 10 ml precautionary allowance** in a clean measuring cup and again fill it in the new air conditioning compressor . **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



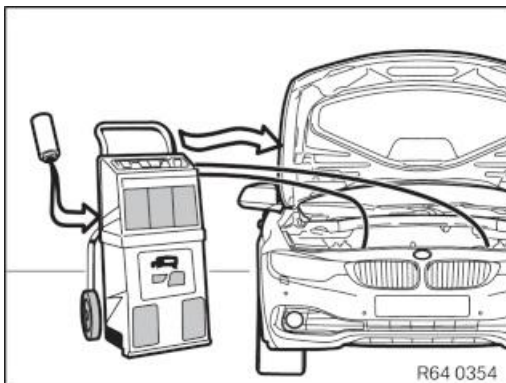
The drained new refrigerant oil can be filled into the expansion tank of the A/C service station after draining.



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.



- Reassemble the vehicle.
- [Evacuate Air conditioning.](#)
- Before filling the air conditioning with refrigerant, fill in the noted quantity of refrigerant oil previously drawn off, into the system.
- [Fill A/C system.](#)



Attention!

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:

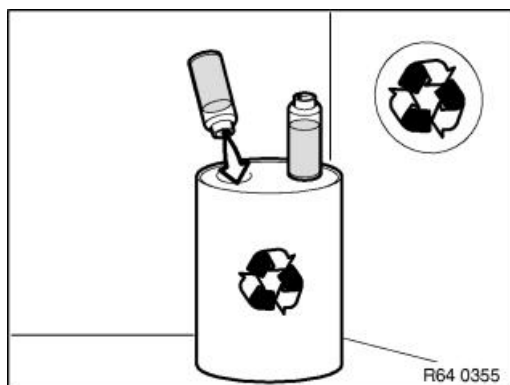
The breaking-in procedure for the new air conditioning compressor can be carried either manually or with the diagnosis system.

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



- 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](#)

**Special tools required:**

- [00 9 030](#)
- [32 1 270](#)

**Warning!**

Danger of injury!

Refrigerant circuit is under high pressure!

Observe the [safety information for handling R134a refrigerant](#).

Avoid contact with refrigerant and refrigerant oil.

Observe the [safety instructions for handling refrigerant oil](#).

**Attention!**

Risk of damage!

Restart engine only when air conditioning has been correctly filled.

[Read and comply with notes on compressor replacement!](#)

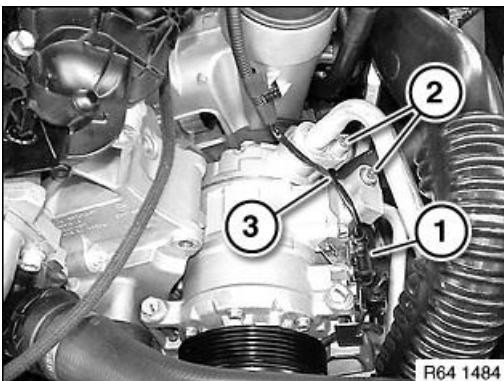
Follow instructions for [opening and replacing parts in refrigerant circuit](#).

If Air conditioning is opened for more than 24 h:

Replace the [desiccant insert](#) for the Air conditioning or [capacitor](#).

**Necessary preliminary work:**

- [Drawing off, evacuating and filling the air conditioning](#) are not included in the time value given for this job item.
- [Remove drive belt](#).
- [Removing air duct for intake air](#).



Disconnect plug connection (1).

Release screws (2) and remove refrigerant lines.

Tightening torque [64 52 1AZ](#).

Installation note:

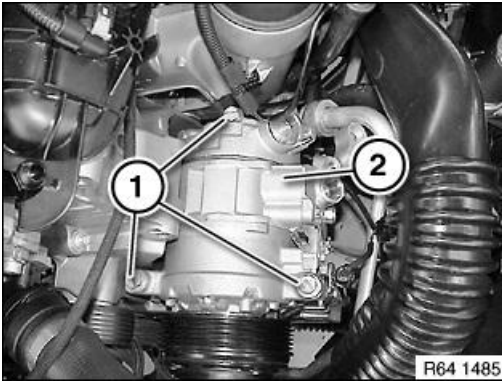
Renew sealing rings.

Use special tool [00 9 030](#) to mount sealing rings without damaging them.

Ensure correct cable routing (3)!

**Attention!**

Seal openings or lines on compressor with special tool [32 1 270](#) to prevent escape of media and fouling.



Release screws (1) and feed out compressor (2) to the front.

Tightening torque [64 52 3AZ](#).

Installation note:

Replace damaged fitting sleeves.

Insert screws (1) prior to installation in the air conditioning compressor.



Replacement:

- Adjust the [amount of refrigerant oil in the new compressor](#)



Attention!

Danger of compressor damage!

Danger of customer complaints due to reduced cooling power of the Air conditioning!

Before the installation of the new compressor, it is absolutely necessary to adjust the amount of refrigerant oil in the new compressor !

[The safety information must be observed!](#)



After installation:

- [Evacuate and fill A/C system](#)

61 00 ... Safety information on handling hybrid cars

1. Qualification:

All repair work on high-voltage components may **only be performed by specially trained personnel** (qualification: Work on high-voltage inherently safe vehicles) must be performed by qualified technicians. Each hybrid car requires additional vehicle specific training with training achievement controls.

Required training is offered by the BMW Training Academy.

2. Identification:

Observe **warning notices** on high-voltage components. When replacing individual high-voltage components, check if warning stickers are present. Independently attaching warnings is only allowed on the locations provided for them. Use only approved and appropriately identified original new parts.

3. Rules of conduct/protective measures:

- Note operating instructions for handling high-voltage battery units.
- Do not under any circumstances touch open high-voltage cables and high-voltage components on damaged vehicle before shutting down the high-voltage electrical system.
- In the event of damage (mechanical, thermal) transition metal oxides, carbon, electrolyte solvents and their products of decomposition may be released.
Suitable acid-resistant protective clothing/equipment must therefore be used when handling the vehicle!

- Hand protection: Gloves
- Eye protection: Safety goggles

Damaged high-voltage battery units must be stored in an acid-resistant pan in a location in the open that is protected against the weather (sun, rain) and secured against unauthorised access. Do not inhale escaping gasses.

- Prevent escaping substances from entering drains, pits and the sewer system.
- Collect any material that is discharged and have it disposed of according to the work instruction, wear acid-resistant protective clothing when doing so.
- Notify the fire brigade if fire breaks out, clear the area immediately and make accident scene safe. Attempt to extinguish the fire without putting persons in danger (suitable extinguishant: water and water foam).
- A cut 2nd emergency separation point must be repaired with a butt connector.

4. Measures before starting work:

- Each job on the vehicle must be assigned by appropriately trained personnel. Before work is started, this electrician must place the vehicle in the operating condition required to perform the relevant activity. The qualified personnel's instructions and directions absolutely must be followed. **No work may be carried out without this qualified personnel being consulted first.**
- It is **not** permitted to work on the high voltage system or on high voltage components while the engine is running.
- The readiness to drive must be ended before shutting off the voltage of the high-voltage system. The readiness to drive is ended when the driver is absent only under the following conditions:
 1. seat belt buckle unlocked **and**
 2. the driver's door is open **and**
 3. no brake activated **and**
 4. the accelerator pedal is not activated **and**
 5. speed < 3 km/h (2 mph)
- Work on live high-voltage components is expressly prohibited. Before each operation on the high-voltage system, the system must be isolated from the power supply by qualified personnel (high-voltage safety connector Off) and secured against unauthorised recommissioning (padlock).
- After each deactivation of the high-voltage system, it is essential to observe a **waiting period** of at least **10 seconds** prior to further work.
- Before beginning work, it is mandatory to check that the equipment is de-energised and is protected against being energised again.
Work is only permitted to begin if:
 1. Corresponding display in the KOMBI **High-voltage system deactivated** orWhen a high-voltage warning is active (indicator light, Check Control, etc.), it is essential to determine and eliminate the cause of this warning via the diagnosis system before continuing with any other work.
If it cannot be definitively established that the equipment is de-energised, work is not permitted to begin. **Danger to life!** Before work begins, a qualified electrician (1000 V AC) must verify that the

system is de-energised using appropriate measuring devices and procedures.

=> In this case, Technical Support must be contacted!

- Do not perform any work on the vehicle while it is charging. Before starting work, disconnect the charging cable from the vehicle.
Battery charging may result in heating of the high-voltage battery unit. This heating may lead to sporadic launches of the electric fan (switch-on request from the electric fan). Therefore, work in the vicinity of the electric fan during the charging procedure is prohibited. Ensure freedom of movement of the battery charge lines in the vicinity of the electric fan.

5. *Measures during/after activities:*

- Identifiable mechanical damage to or tampering with high-voltage components must be reported immediately to the qualified personnel in charge.
- When carrying out any work on the high-voltage system, it is prohibited to drive externally all the drivetrain components (wheels, gearbox, drive shafts, etc.).
- *E72 only:* When the "Power Electronic Box Cover" is removed, the high-voltage system is not permitted to be activated. The high-voltage service disconnect must only be used when the "Power Electronics Box Cover" is completely installed.
- High-voltage cables (orange coating) and their connectors and stop parts **may not** be repaired. If damaged, a cable must always be replaced completely.
- When working in the vicinity of high-voltage components (identified accordingly with warning stickers and orange-coloured coating), protect these components against damage.
- The specified work steps in the repair instructions must be adhered to exactly.
- High-voltage components and their holders must be screwed/bolted to the defined tightening torque. Tightening torques and tightening specifications must be observed.
- Connecting high-voltage components to body ground is crucial to safety for reasons of equipotential bonding. For this reason, it is prohibited to operate any high-voltage components without them being correctly connected to body ground. The measurements (insulation/potential equalisation measurement) are performed automatically by the vehicle. Manual measurement is not therefore necessary.
For a correct earthing connection, the retaining elements of high-voltage components must not be painted. Follow further [painting notes](#).
- Removed high-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. *Potential compensation:*

Equipotential bonding lines, high-voltage cables and the battery negative lead to the EME are fitted with safety screws.

- Clean contact faces and have then checked by a second person.
- Tighten down screws/bolts to specified torque.
- Have tightening torque checked by a second person.
- Both persons must document that the work has been carried out correctly in the vehicle records.

64 53 ... Instructions for desiccant insert replacement



Special tools required:

- [32 1 270](#)

A desiccant insert that is in a correctly functioning, sealed heating and air conditioning system does **not** have to be changed at regular service-inspection intervals.

However, the dryer flask or desiccant insert must absolutely be replaced in the event of:

- contamination of the refrigerant with swarf (e.g. when the compressor is clamped).
- With depressurised and/or completely drained refrigerant circuit.
- With 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
- 1-Series F2x, 3-Series F3x
- BMW i 01 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.

64 52 ... Instructions for opening and part replacement in refrigerant circuit



Special tools required:

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. Part replacement as preliminary work for 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. Part replacement due to sudden leakage

(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- 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
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil

- Evacuate and fill [A/C system](#)

**Special tools required:**

- [00 9 030](#)
- [32 1 270](#)

Warning!

- Avoid contact with refrigerant and refrigerant oil
- Follow safety information for [handling R134a 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 refrigerant 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 hours, the dryer insert for the air conditioning must be replaced.

I. **Part replacement as preliminary work for further repair work and 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
- 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
 - Capacitor: 20 ml
 - Desiccant insert / dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Capacitor with integrated dryer: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- [Evacuate and fill](#) A/C system

II. **Part replacement due to sudden leakage**
(major leak, e.g. pipe break due to accident)

Procedure:

- [Draw off](#) heating and air conditioning system, then determine drawn-off amount of refrigerant
- Carry out part replacement
- Replace removed refrigerant oil and additionally replace with new refrigerant oil according to parts replaced:
 - Compressor: refer to [Notes on compressor replacement](#)
 - Evaporator: 35 ml
 - Capacitor: 35 ml
 - Desiccant insert / dryer flask: 55 ml
 - Each replaced refrigerant line: 35 ml
 - Capacitor with integrated dryer: 55 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
- Evacuate and fill [A/C system](#)

64 53 ... Instructions for replacement of air conditioning capacitors 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.

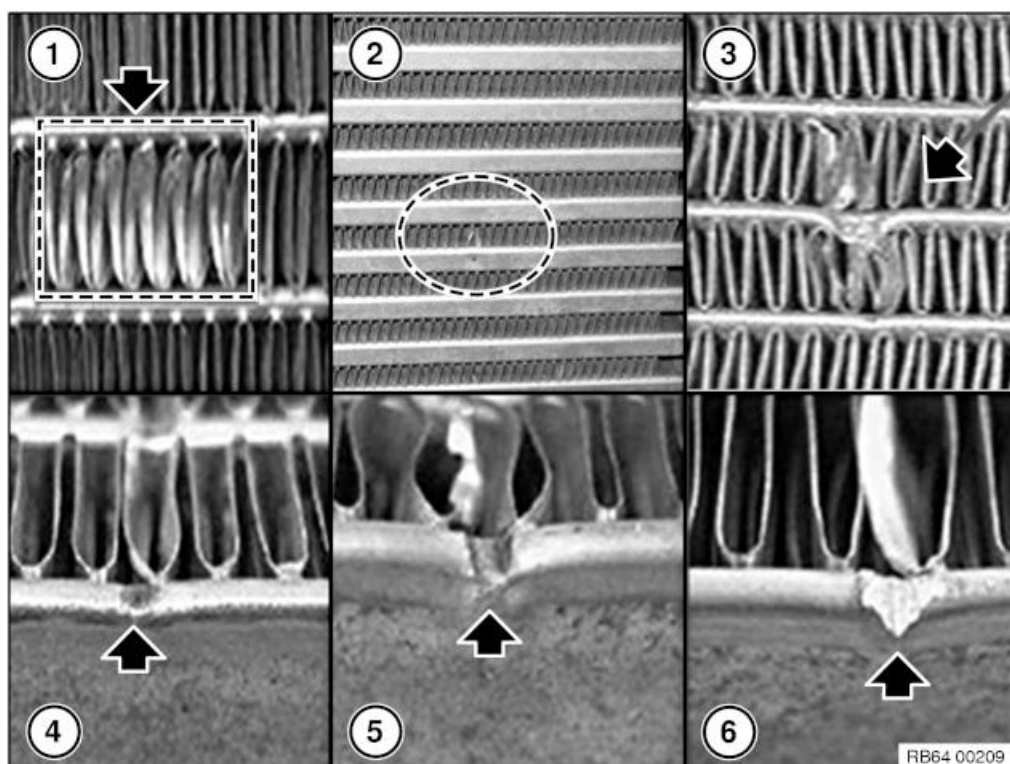
As long as tightness/function are not degraded and an adequate distance of a few mm between the radiator and air conditioning condenser remains in place, **this is not damage in either case.**

Radiators or air conditioning condensers are not to be replaced in these cases!

Note:

The deformations shown in Fig.Â (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 53 550 Removing and installing/replacing capacitor (with desiccant insert) for heating and air conditioning system



Special tools required:

- [00 9 030](#)



Warning!

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant oil.

Read and comply with safety instructions:

- [Handling R 134a tetrafluorethane refrigerant](#)
- [Handling refrigerant fluid](#)



Important!

Risk of damage!

Restart engine only when A/C system has been correctly filled.



Note:

[Follow instructions for opening and replacing parts in refrigerant circuit.](#)

If air conditioning system is opened for more than 24 hours:

[Replace desiccant insert for A/C system](#)

Important!

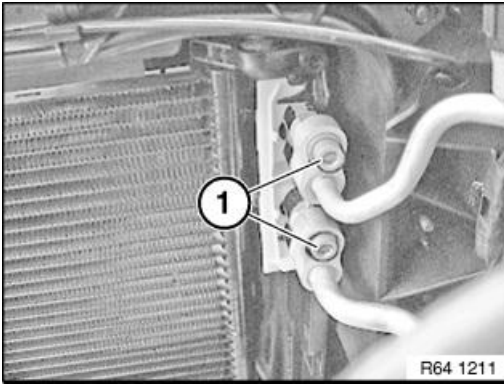
The desiccant insert can only be replaced in vehicles with production dates up to 12/08!

In vehicles after 12/08, the heating and air conditioning system capacitor must be replaced!



Necessary preliminary tasks:

- [Drawing off, evacuating and filling the heating and air conditioning system](#) are not included in the time value given for this job item
- Remove [radiator](#)



Release screws (1).

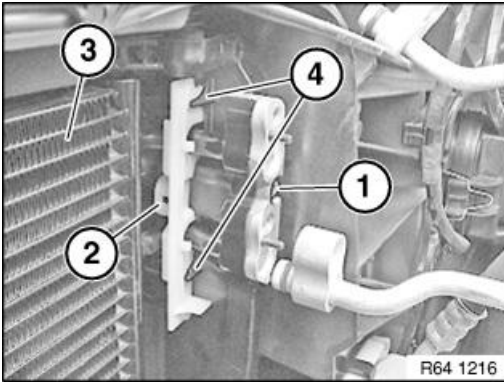
Tightening torque [64 53 1AZ](#).

Disconnect suction and pressure lines and lay to one side.

Installation note:

Replace sealing rings.

Use special tool [00 9 030](#) to install sealing rings without damaging them.



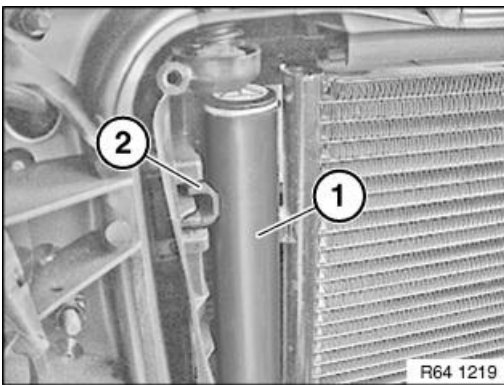
Release screw (1).

Lever out clamp (2).

Remove capacitor (3) rearwards.

Installation note:

Make sure retaining clips are correctly seated in area (4).



Installation note:

Make sure capacitor (1) is securely seated in area (2).



After installation:

- [Evacuate and fill heating and air conditioning system](#)
- [Fill cooling system](#)

**Special tools required:**

- [00 9 030](#)

**Warning!**

Danger of injury!

Refrigerant circuit is under high pressure!

Follow safety informations for [handling R 134a refrigerant](#).

Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for [handling refrigerant oil](#).

**Important!**

Risk of damage!

Restart engine only when A/C system has been correctly filled.

**Note:**

[Follow instructions for opening and replacing parts in refrigerant circuit.](#)

If air conditioning system is opened for more than 24 hours:

Replace desiccant insert for heating and air conditioning system.

Follow [instructions on replacing desiccant insert](#).

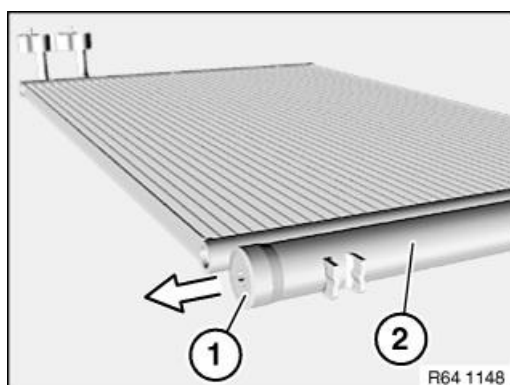
Important!

The desiccant insert can only be replaced in vehicles with production dates up to 12/08!

In vehicles after 12/08, the heating and air conditioning system capacitor must be replaced!

**Necessary preliminary tasks:**

- [Drawing off, evacuating and filling the air conditioning system](#) are not included in the time value given for this job item
- Remove [capacitor](#)



If necessary, pierce label over screw plug (1).

Open screw plug (1) and remove desiccant insert from heating and air conditioning system capacitor (3).

Installation note:

Tightening torque [64 53 12AZ](#).

Replace sealing rings.

Use special tool [00 9 030](#) to mount sealing rings without damaging them.



After installation:

- [Evacuate and fill A/C system](#)

**Warning!**

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant oil.

Read and comply with safety instructions:

- [Handling R 134a \(tetrafluorethane\) refrigerant](#)
- [Handling refrigerant oil](#)

**Important!**

Risk of damage!

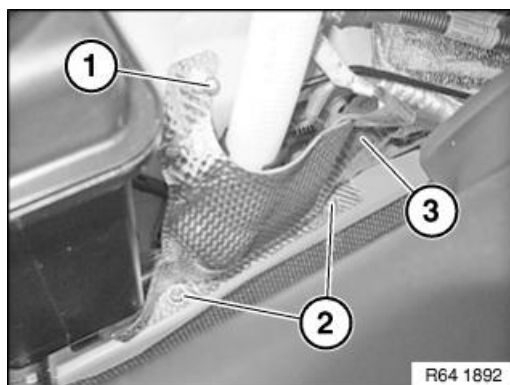
Restart engine only when A/C system has been correctly filled.

Follow [instructions](#) for opening and replacing parts in refrigerant circuit.

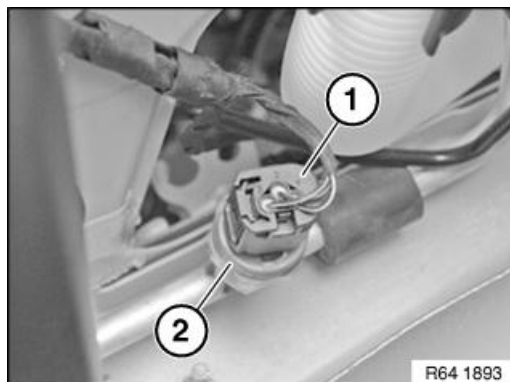
If air conditioning system is opened for more than 24 hours: [Replace entire capacitor](#)

**Necessary preliminary tasks:**

- [Drawing off, evacuating and filling the heating and air conditioning system](#) are not included in the time value given for this job item



If necessary, release screws (1, 2) and remove heat insulation (3).



Unfasten plug connection (1) and disconnect.

Release safety pressure switch (2).

Tightening torque [64 53 14AZ](#).



After installation:

- [Evacuate and fill A/C system](#)

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!

**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.