

CABIN AIR FILTER

BMW - X3

CABIN AIR FILTER

NOTE: Manufacturer's terminology for this filter is Microfilter.

REMOVAL & INSTALLATION

64 31 010 Replacing microfilter for interior ventilation

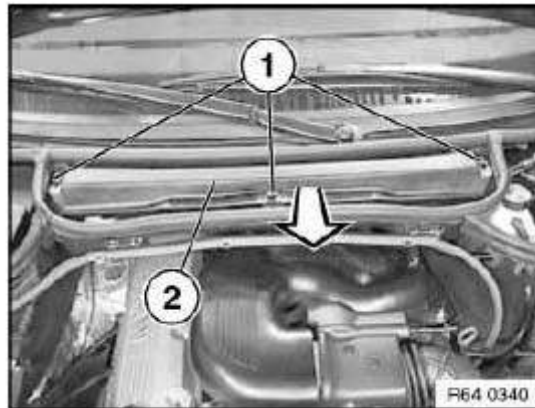


Fig. 1: Toggle And Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Turn toggle (1) through approx. 90° and remove cover (2) towards front.

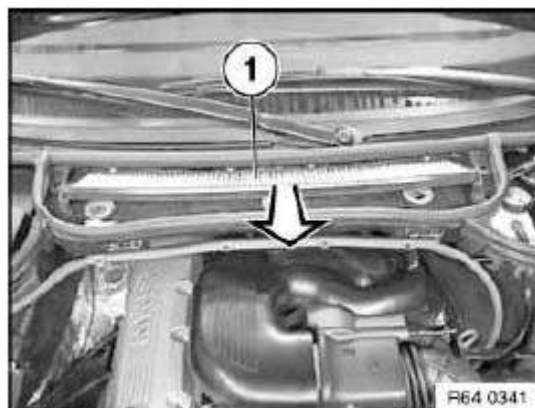


Fig. 2: Microfilter Element

Courtesy of BMW OF NORTH AMERICA, INC.

Remove microfilter element (1).

64 31 010 Replacing microfilter for interior ventilation

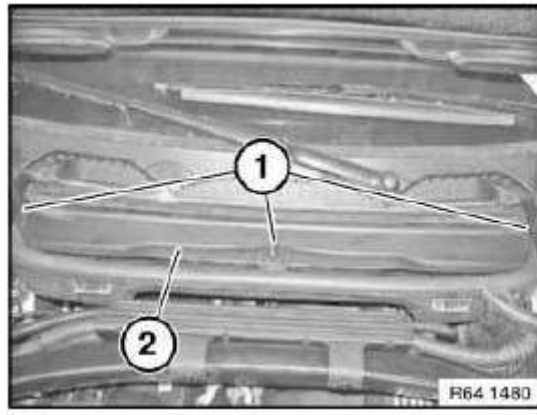


Fig. 3: Rotary Catches And Raise Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock rotary catches (1), raise cover (2) and remove microfilter.

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IMPORTANT: Risk of damage! A/C system must not be operated without the prescribed filter element.

Note on cleaning: Spray microfilter housing from inside with BMW pollen filter housing cleaner. Wipe away excess liquid. This kills off germs, bacteria and fungi that cause smells. The smell that results on the plastic parts of the microfilter housing is eliminated.

Remove sealing lips at marked points. Unclip line and water hose (1) from cover (3). Release retaining lug (2). Feed out cover (3).

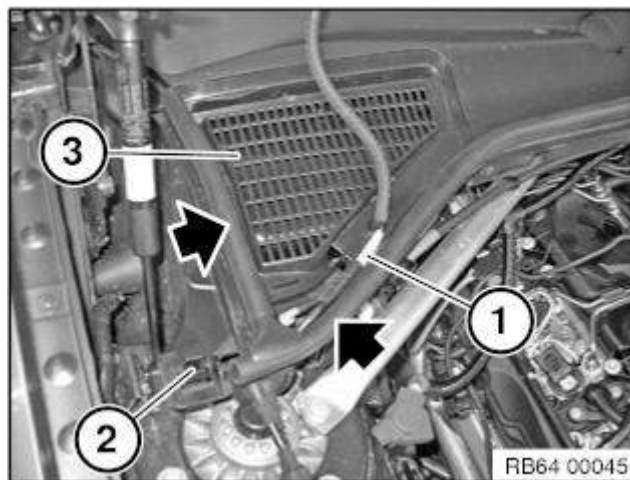


Fig. 4: Unclip Line And Water Hose (1) From Cover (3)

Courtesy of BMW OF NORTH AMERICA, INC.

Cover tabs (1) must snap in correctly under cowl panel.

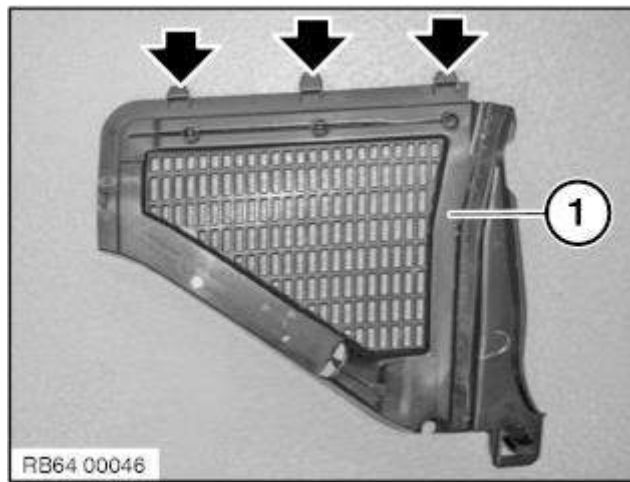


Fig. 5: Cover Tabs (1) Must Snap In Correctly Under Cowl Panel
Courtesy of BMW OF NORTH AMERICA, INC.

Remove filter cover (1) in direction of arrow.

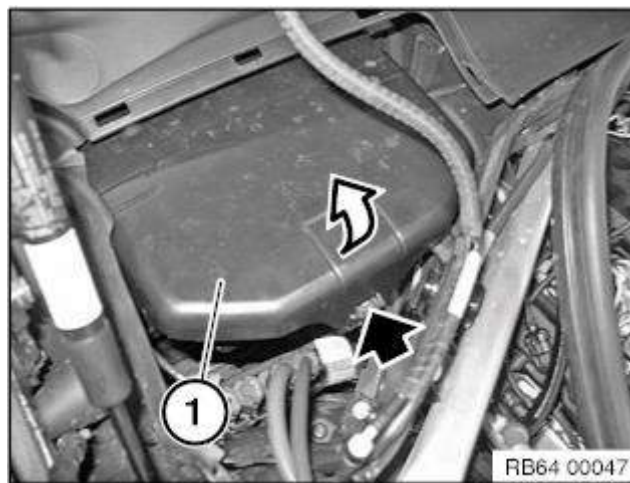


Fig. 6: Remove Filter Cover (1) In Direction Of Arrow
Courtesy of BMW OF NORTH AMERICA, INC.

Remove upper microfilter (1) in direction of arrow.

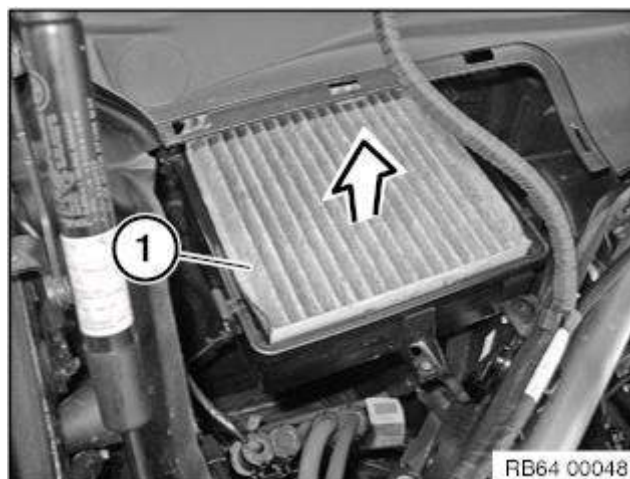


Fig. 7: Remove Upper Microfilter (1) In Direction Of Arrow
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip filter frame (1) at the marked points and detach. Remove lower microfilter (2) in direction of arrow.

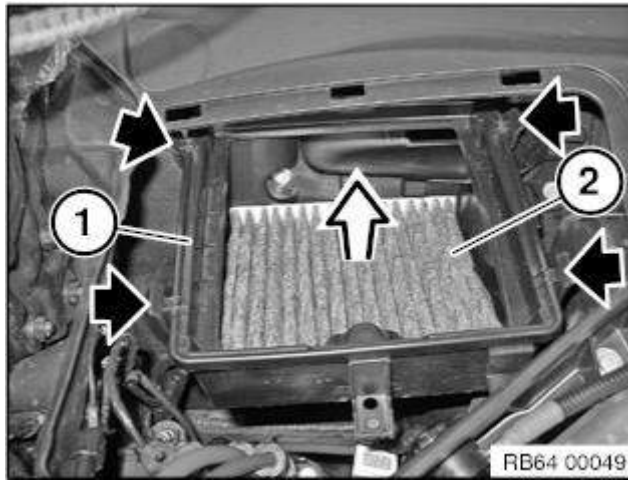


Fig. 8: Unclip Filter Frame (1) At The Marked Points And Detach
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note: Make sure upper microfilter (1) and lower microfilter (2) are installed in the correct position. The arrows mark the direction of the air intake.

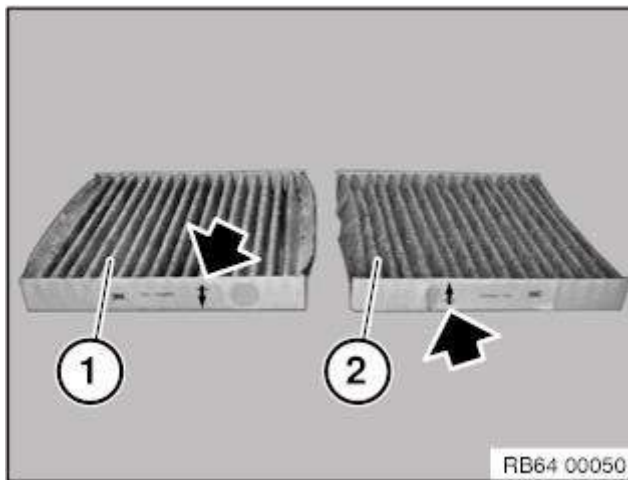


Fig. 9: Make Sure Upper Microfilter (1) And Lower Microfilter (2) Are Installed In The Correct Position
Courtesy of BMW OF NORTH AMERICA, INC.

64 31 080 Removing and installing/replacing microfilter housing

Necessary preliminary tasks:

- Remove microfilter.
- Remove cable duct cover .

Release screws (1). Remove lines from cable duct (2). Feed microfilter housing (3) upwards in direction of arrow.

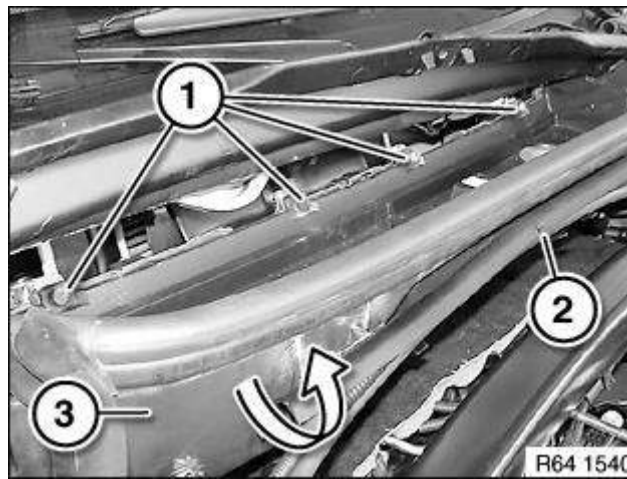


Fig. 10: Feed Microfilter Housing (3) Upwards In Direction Of Arrow
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation: Make sure water drain hoses (1) are correctly seated.

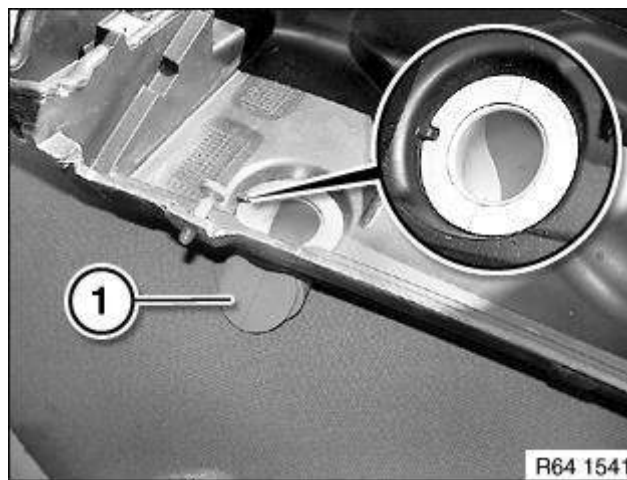


Fig. 11: Make Sure Water Drain Hoses (1) Are Correctly Seated
 Courtesy of BMW OF NORTH AMERICA, INC.

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Article GUID: A00600311

CABIN AIR FILTER

Cabin Air Filter (Special Applications) - General Information

CABIN AIR FILTER APPLICATIONS

NOTE: This article is generic in nature and applies to many different makes and models. We do our best to determine which vehicles do and do not have a cabin air filter.

The vehicle you have selected may not be equipped with a factory-installed cabin air filter or the manufacturer does not provide a removal & installation procedure.

Some vehicles may be equipped with dealer add-on or aftermarket versions. If the vehicle you are working on is equipped with such a filter, check the availability of the replacement filter which may help with the location and replacement information as some include this information in the packaging.

Vehicle manufacturers have many names for these filters including:

- A/C Air Filter
- A/C Filter
- Activated Charcoal Filter
- Air Conditioner Filter
- Air Refiner Filter
- Air Refresher Filter
- Cabin Air Filter
- Clean Air Filter
- Climate Control Air Filter
- Combination Filter
- Dust & Pollen Filter
- Dust Filter
- Evaporator Air Filter
- HVAC Air Filter
- HVAC Ventilation Filter
- In-Cabin Microfilter
- Microfilter
- Particle Filter
- Particle/Odor Filter
- Particulate Air Filter
- Passenger Compartment Air Cleaner
- Passenger Compartment Air Filter
- Pollen Filter
- Underhood Air Filter
- Ventilation Air Filter

ENGINE**Parts & Accessories (Engine + Chassis) - Tightening Torques - F25****AUXILIARY HEATING****64 12 AUXILIARY HEATING****TIGHTENING TORQUE SPECIFICATION - AUXILIARY HEATING**

Â	Type	Thread	Tightening specifications	Dimension
1AZ	Auxiliary heater to body	F25/F26	Â	8, 0 Nm
2AZ	Changeover valve holder to auxiliary heater	F25/F26	Â	8, 0 Nm
3AZ	Rubber mount to independent heater	F25/F26	Â	8, 0 Nm

TRAILER TOW HITCH**71 60 TRAILER TOW HITCH****TIGHTENING TORQUE SPECIFICATION - TRAILER TOW HITCH**

Â	Type	Thread	Tightening specifications	Dimension
1AZ Trailer tow hitch on body	F01/F02/F04/F07/F10/F11/F15/F16/F20/F21/F22./F23/F25/F26/F30/F31/F32/F33/F34/F35/F36/F45/F46/F85/F86	M12	Replace nuts	108 Nm
2AZ Charging socket on ball head	F01/F02/F04/F07/F10/F11/F20/F21/F22/F23/F25/F26	Â	Â	5 Nm
3AZ Power socket on trailer tow hitch	F45/F46	Â	Â	4 Nm

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Article GUID: A00702191

HVAC

Air Conditioning and Heating

OPERATING FLUIDS - AIR CONDITIONING AND HEATING

1.0 REFRIGERANT R134A

In order to fulfil the environmental compatibility requirements of BMW products and to reduce the ozone pollution of the earth's atmosphere caused by refrigerants needed for heating and air conditioning systems, from April 1991 on and starting with the model E32/M30 and the optional equipment IHKA, only the chlorine-free refrigerant R134a (tetrafluorethane) is used.

This product has been used since September 1992 in all models. The refrigerant used so far, called Frigen R12, is omitted.

The refrigerant used in the vehicle and the capacity are specified on the type plate in the engine compartment.

The boiling point of R134a is -26.2°C . The refrigerant R134a is non-combustible and does not form an explosive mixture in combination with air.

It is odourless and non-corrosive. However, it is very hygroscopic, i. e. it readily combines with water.

Safety regulations:

The safety regulations as specified for the refrigerant Frigen R12 in point 2.0 apply.

Observe notes on refrigerant and refrigerant oil from 09/2013!

OBSERVE NOTES ON DRAWING OFF, EVACUATING AND FILLING THE HEATING AND AIR CONDITIONING SYSTEM !

Trade name	BMW part number	Container size
Refrigerant R134a	83 19 9 408 386	12 kg steel cylinder

1.1 REFRIGERANT OIL FOR R134A

Especially for the refrigerant R134a (tetrafluorethane), a PAG refrigerant oil (polyalkylene glycol) had to be selected which ensures the lubrication of the compressor.

This oil may not be mixed with the refrigerant oil Sanden SP-A2!

This refrigerant oil is very hygroscopic and must only be exposed to air humidity for a very short period.

Observe notes on refrigerant and refrigerant oil from 09/2013!

READ AND COMPLY WITH NOTES ON COMPRESSOR REPLACEMENT .

Trade name	BMW part number	Container size
Refrigerant oil	81 22 9 407 724	250 ml tin can

2.0 REFRIGERANT R1234YF

2.1 REFRIGERANT OIL FOR R134A/R1234YF

3.0 COOLANT I3 FOR HEATER CIRCUIT (BMW I)

1.0 AIR CONDITIONER REFRIGERANT

FREON®

The refrigerant Freon® R12 is used in most BMW automobiles with an air conditioner up through the 1992 model year. It has a boiling point of -29.8°C (sea level), at which the refrigerant is transformed from a liquid into a gaseous state.

This boiling point, however, is not constant. It is displaced in the direction of higher temperatures as pressure increases.

Freon® R12 complies with the requirements expected of a safety refrigerant. Freon® is not combustible and does not turn into an explosive mixture with air. It is also odorless and non-toxic. Conformance with certain safety regulations is essential to the handling of refrigeration systems.

There are currently no BMW-approved alternative refrigerants to R12.

Safety Warning

Avoid any contact with liquid refrigerant, since this could cause frostbite. Protect eyes with safety goggles and hands with gloves. Contact a doctor without delay in case of an accident.

Freon® R12 is heavier than air, so this refrigerant must not be discharged in closed rooms. There is danger of asphyxiation in a sunken work area (pit). Do not store bottles of refrigerant at temperatures above 113°F/45°C or heat them.

Never weld on or near a system filled with refrigerant. Heat could cause excessive pressure and an explosion. In addition, Freon® R12 will decompose at high temperature or when subjected to an open flame. The resulting decomposition products would be hazardous to health.

Make sure you read the container label instructions completely prior to use.

Obtain and use the correct type of refrigerant recovery/recycling machine. Follow the directions included in the machine's instruction manual.

HFC-134A

The refrigerant HFC-134a (also known as R-134a) is used as of the following models with an air conditioner:

1992 E32/M30 from March 1992 production

1993 E34, E36, 325iC. E31, E32 from August 1992 production

This environmentally friendly refrigerant performs similar functions as Freon® R12, but the refrigerants Freon® R12 and R-134a must NEVER be mixed or combined in any way under any circumstances.

Safety Warning

Always wear eye protection and gloves while handling refrigerant or servicing air conditioning systems.

Avoid breathing R-134a and lubricant vapor or mist. Exposure may irritate eyes, nose, throat, and lungs. Use only approved service equipment to discharge A/C systems. If accidental system discharge occurs, ventilate work area before resuming service.

If refrigerant or compressor oil contacts the skin or eyes, large quantities of cool water should be used to flush the affected area.

Never heat a refrigerant container with an open flame. Keep all refrigerants away from open flames, since burning refrigerant can produce poisonous gas.

Under no circumstances should R-134a service equipment or vehicle A/C systems be pressure tested with air/R-134a mixtures. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures.

The use of compressed air (shop air) for leak detection in R-134a systems could result in fire or explosion causing injury or property damage. In addition, introducing compressed air into A/C systems or components contaminates the system and/or refrigerant with moisture.

Obtain and use the correct type of refrigerant recovery/recycling machine. Follow the directions included in the machine's instruction manual.

2.0 REFRIGERATION OIL

OIL USED IN FREON®-CHARGED SYSTEMS

A mineral-based oil is used. The oil level in the compressor must be checked before filling an air conditioner with refrigerant. It can be checked only if the system is without refrigerant.

Always check the oil level each time a new system is filled with Freon® R12 or after repairs. The oil level is very important for the entire air conditioning system. Part of the oil (approx. 25% depending on amount of refrigerant) is mixed with the refrigerant and is continuously circulated in the system. This oil lubricates the moving parts of the system, such as the expansion valve and compressor.

OIL USED IN R-134A-CHARGED SYSTEMS

A synthetic oil is used, which is totally different than the mineral-based oils used in Freon® R12 systems.

R-134a systems require Polyalkylene Glycol lubricants, often referred to as "PAG" oil. Use of R-12 compressor oil in R-134a systems will cause the compressor to seize and fail. The R-12 mineral oil does not stay in solution in R-134a. In addition, R-134a compressor should not be used in an R-12 system. Long term damage and corrosion will result.

The **GREEN** R-134a system labels, usually located near the top side of the fan shroud in the engine compartment, will display the refrigerant requirement for R-134a systems. An example is illustrated.

R-12 systems will have a **BLACK** label in a similar location.



Fig. 1: Identifying Oil Used In R-134A-Charged Systems Label

Courtesy of BMW OF NORTH AMERICA, INC.

PAG oil should only be stored in its original container, and sealed as tightly as possible. PAG oil is totally devoid of moisture when packaged, and will absorb moisture readily (hygroscopic) if exposed to the atmosphere, rendering it useless. Dispose of all extracted lubricants from A/C systems. Never reuse old compressor oil. Contaminated PAG oil should never be added to the air-conditioning system, and old PAG oil is typically contaminated with moisture. R-134a is even more sensitive to moisture contamination than R-12 systems, and because of the desiccant material change

PAG oil may be obtained from BMW of North America.

3.0 AIR CONDITIONING UNIT DISINFECTANTS

A musty odor may be detected in the vehicle, particularly when the air conditioner is first switched on.

This is caused by microorganisms growing on the evaporator from moisture condensation.

A disinfectant can be applied to the air conditioning system:

4.0 AIR CONDITIONER REFRIGERATION/OIL FILL CAPACITIES

Reference information for servicing BMW Air Conditioning systems is listed on the chart on page 6. Please refer to this chart when evacuating/recharging BMW A/C systems.

Note that some 1993 Model Year early production R-134a equipped vehicles have under-hood labels that specify higher charge values than those specified in the chart. Testing has confirmed that the values given are the optimum fill capacities. Consult the chart before refilling. Labels with the lower refrigerant charge amount specified on the chart have been phased into production as of 11/92.

When performing repairs to the A/C system that require recharging, only the specifications given in this chart should be used, as well as the label part numbers, as appropriate (see chart). However, inadvertent refrigerant charging up to the fill capacity given on an "original" ('93 MY production prior to 11/92) under-hood label will not cause any problems.

Refrigerant, Special Features, Production Range, Fill Capacity g (lbs), Fill Capacity ml (oz), BMW P/N

AIR CONDITIONER REFRIGERATION/OIL FILL CAPACITIES CHART

Series/Body, Refrigerant	Model or Type Special Features	Production Range	Fill Capacity g (lbs)	Refrigerant Oil Total Fill Capacity ml (oz)	A/C Label BMW P/N
1/E82, R-134a	N52K, N54	All	590 $\hat{A}\pm$ 10 (1.30 $\hat{A}\pm$ 0.02)	Refer to underhood label	64 50 6 985 512
1/E88, R-134a	N52K, N54	All	590 $\hat{A}\pm$ 10 (1.30 $\hat{A}\pm$ 0.02)	Refer to underhood label	64 50 6 985 512
3/E30, R-12	M3	All up to 9/92	875 $\hat{A}\pm$ 25 (1.93 $\hat{A}\pm$ 0.05)	200 $\hat{A}\pm$ 20 (6.8 $\hat{A}\pm$ 0.7)	64 50 1 381 958
3/E30, R-12	All Others	All up to 9/92	975 $\hat{A}\pm$ 25 (2.15 $\hat{A}\pm$ 0.05)	200 $\hat{A}\pm$ 20 (6.8 $\hat{A}\pm$ 0.7)	64 50 1 380 981
3/E30, R-134a	Convertible	All from 9/92	900 $\hat{A}\pm$ 25 (1.76 $\hat{A}\pm$ 0.05)	100 $\hat{A}\pm$ 20 (3.4 $\hat{A}\pm$ 0.7) (5)	64 50 8 391 026 (4)
3/E36, R-12	Modine Condenser (1)	9/91 - 3/92 (1)	1000 $\hat{A}\pm$ 25 (2.20 $\hat{A}\pm$ 0.05)	167 $\hat{A}\pm$ 20 (5.6 $\hat{A}\pm$ 0.7)	90 00 1 000 006
3/E36, R-12	Original Condenser	All up to 9/92	1200 $\hat{A}\pm$ 25 (2.65 $\hat{A}\pm$ 0.05)	200 $\hat{A}\pm$ 20 (6.8 $\hat{A}\pm$ 0.7)	71 21 2 122 023
3/E36, R-134a	All	9/92 - 11/92 (3)	1000 $\hat{A}\pm$ 25 (2.20 $\hat{A}\pm$ 0.05)	120 $\hat{A}\pm$ 20 (4.1 $\hat{A}\pm$ 0.7) (5)	64 50 8 391 524 (4)

3/E36, R-134a	Z3 except M coupe and M roadster	All	900 Å± 25 (1.98 Å± 0.05)	120 Å± 20 (4.1 Å± 0.7) (5)(6) 150 Å± 10 (5.1 Å± 0.3) (5)(7)	64 50 8 391 026
3/E36, R-134a	M coupe and M roadster	All	950 Å± 26 (2.09 Å± 0.05)	Refer to underhood label	64 50 8 391 525
3/E36, R-134a	All	All from 11/92	825 Å± 25 (1.82 Å± 0.05)	120 Å± 20 (4.1 Å± 0.7) (5)(6) 150 Å± 10 (5.1 Å± 0.3) (5)(7)	64 50 8 367 947
3/E46, R-134a	All	All	740 Å± 25 (1.63 Å± 0.05)	160 Å± 10 (5.4 Å± 0.3) (5)(6)	64 50 8 380 053
3/E90/E91, R-134a	N52	All	500 Å± 15 (1.10 Å± 0.03)	Refer to underhood label	64 50 6 952 937
3/E90/E91/E92/E93, R134a	N52KP, N54	All	590 Å± 10 (1.30 Å± 0.02)	Refer to underhood label	64 50 6 985 512
3/E90//E92/E93, R134a	S65	All	590 Å± 10 (1.30 Å± 0.02)	Refer to underhood label	64 50 6 985 512
5/E28, R-12	524, 535, M5	All	975 Å± 25 (2.15 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	64 50 1 380 981
5/E28, R-12	528e, 533	All	1275 Å± 25 (2.81 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	64 50 1 380 984
5/E34, R-12	525i, 535i, 525iT	All up to 9/92	1925 Å± 25 (4.24 Å± 0.05)	200 Å± 20 (6.8 Å± 0.7)	64 53 1 382 614
5/E34, R-12	M5	All up to 9/92	1500 Å± 25 (3.31 Å± 0.05)	200 Å± 20 (6.8 Å± 0.7)	64 53 1 378 247
5/E34, R-134a	M5	From 9/92(2)	1450 Å± 25 (3.19 Å± 0.05)	160 Å± 20 (5.4 Å± 0.7) (5)	64 50 8 391 751 (4)
5/E34, R-134a	All Others	All from 9/92	1550 Å± 25 3.42 Å± 0.05)	160 Å± 20 (5.4 Å± 0.7) (5)	64 50 8 391 523 (4)
5/E39, R-134a	All	Up to 9/98	1210 Å± 25 (2.67 Å± 0.05)	160 Å± 15 (5.4 Å± 0.5) (5)(6) 180 Å± 20 (6.1 Å± 0.7) (5)(7)	64 50 8 362 434
5/E39, R-134a	All	From 9/98	750 Å± 25 (1.65 Å± 0.05)	160 Å± 15 (5.4 Å± 0.5) (5)(6) 180 Å± 20 (6.1 Å± 0.7) (5)(7)	64 50 8 387 412
5/E60, R-134a	All (Includes M5)	From 8/03	810 Å± 10 (1.78 Å± 0.02)	Refer to underhood label	64 50 6 920 708
5/E61, R134a	All	All	810 Å± 10	Refer to	64 50 6 920

			(1.78 Å± 0.02)	underhood label	708
6/E24, R-12	Rear Air Conditioner	All	1800 Å± 25 (3.97 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	653 1 380 728
6/E24, R-12	All Others	All	1100 Å± 25 (2.43 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	64 50 1 380 982
6/E63/E64, R-134a	All	From 8/03	810 Å± 10 (1.78 Å± 0.02)	Refer to underhood label	64 50 6 920 708
7/E23, R-12	733, 735	All up to 9/85	1275 Å± 25 (2.81 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	64 50 1 380 984
7/E23, R-12	735	All from 9/85	1175 Å± 25 (2.59 Å± 0.05)	170 Å± 20 (5.7 Å± 0.7)	64 50 1 380 983
7/E32, R-12	750iL	All up to 11/92 (2)	1925 Å± 25 (4.24 Å± 0.05)	200 Å± 20 (6.8 Å± 0.7)	64 53 1 382 614
7/E32, R-12	735i, 735iL	All up to 3/92	1925 Å± 25 (4.24 Å± 0.05)	200 Å± 20 (6.8 Å± 0.7) (5)	64 53 1 382 614
7/E32, R-134a	735i, 735iL	From 3/92 (3)	1550 Å± 25 (3.42 Å± 0.05)	160 Å± 20 (5.4 Å± 0.7) (5)	64 50 8 391 523
7/E32, R-134a	740i, 740iL, 750iL	From 9/922	1550 Å± 25 (3.42 Å± 0.05)	160 Å± 20 (5.4 Å± 0.7) (5)	64 50 8 391 523 (4)
7/E38, R-134a	All All	All up to 11/97 All from 11/97	1210 Å± 25 (2.67 Å± 0.05) 680 Å± 25 (1.50 Å± 0.05)	180 Å± 30 (6.1 Å± 1.0) (5), (6) 180 Å± 20 (6.1 Å± 0.7) (5), (7)	64 50 8 362 434 64 50 8 381 241
7/E65, R-134a	745i, 750i	All	810 Å± 25 (1.78 Å± 0.05)	Refer to underhood label	64 50 6 920 708
7/E66, R-134a	745Li, 750Li	All	810 Å± 25 (1.78 Å± 0.05)	Refer to underhood label	64 50 6 920 708
7/E66, R-134a	760Li	All	1120 Å± 25 (2.46 Å± 0.05)	Refer to underhood label	64 50 6 924 568
8/E31, R-12	All	All up to 9/92	1925 Å± 25 (4.24 Å± 0.05)	200 Å± 20 (6.8 Å± 0.7)	64 53 1 382 614
8/E31, R-134a	All	All from 9/92	1550 Å± 25 (3.42 Å± 0.05)	Nippon Denso 160 Å± 30 (5.4 Å± 1.0) Seiko Seiki 180 Å± 20 (6.0 Å± 0.7)	64 50 8 391 523
Z4/E85, R-134a	M54, N52, N52KP, S54	All	740 Å± 10 (1.63 Å± 0.05)	Refer to underhood label	64 50 6 920 364

			0.05)		
Z8/E52, R-134a	All	All	710 $\hat{A}\pm 25$ (1.56 $\hat{A}\pm$ 0.05)	Refer to underhood label	64 50 8 384 651
X5/E53, R-134a	3.0, 4.4i, 4.6i, 4.8iS	All	440 $\hat{A}\pm 10$ (0.970 $\hat{A}\pm$ 0.02)	Refer to underhood label	64 50 8 385 985
X5/E70, R-134a	3.0i, 4.8i	All	700 $\hat{A}\pm 10$ (154.0 $\hat{A}\pm$ 0.02)	Refer to underhood label	64 50 6 917 364
X6/xDrive35i	All	All	700 $\hat{A}\pm 10$ (154.0 $\hat{A}\pm$ 0.02)	Refer to underhood label	64 50 6 917 364
X3/E83, R134a	2.5, 3.0	All	740 $\hat{A}\pm 25g$ (1.63 $\hat{A}\pm$ 0.05)	Refer to underhood label	64 50 8 385 985
X3/E83, R134a	3.0Si	All	740 $\hat{A}\pm 25g$ (1.63 $\hat{A}\pm$ 0.05)	Refer to underhood label	64 50 8 380 053

- (1) The Modine condenser was used in many E36 vehicles over the production range 9/91 - 3/92. This condenser has a smaller volume, and the A/C system must be charged accordingly.
- (2) Production start of 1993 MY E34/S38 (M5) 9/92; E32/M70 (750iL) 11/92.
- (3) R-134a, the environmentally friendly air conditioning refrigerant, was introduced to the U.S. market beginning with 3/92 production E32/M30 (735i/iL) vehicles.
- (4) Labels reflecting the proper charging volumes given on this chart are available from BMW Parts. These may be used in place of the original equipment labels on '93 model year vehicles produced before 11/92.
- (5) All vehicles equipped with R-134a refrigerant require special PAG lubricant..
- (6) Nippon Denso
- (7) Seiko Seiki

HVAC

Heating And Air Conditioning - Repair Instructions - F25

NOTE, OVERVIEW COMPONENTS CLIMATE CONTROL

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!

Observe following instructions:

IMPORTANT:

- 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).

Observe following instructions before use:

IMPORTANT:

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

Observe following instructions during use:

IMPORTANT:

- 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 vapors 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 0... DISCONNECTING A WATER HOSE

Special tools required:

- [13 3 010](#)

When removing water hoses which are located in the upper area of the cooling system, disconnecting them prevents a large-scale escape of coolant.

Place special tool 13 3 010 on the coolant hose (1) as depicted.

Disconnect water hose (1) by turning nut (2) in direction of arrow.

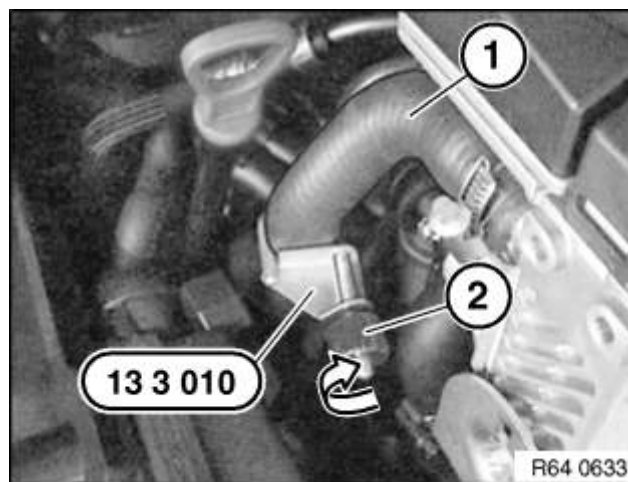


Fig. 1: Identifying Water Hose, Nut, Special Tool (13 3 010) And Removal Direction

Courtesy of BMW OF NORTH AMERICA, INC.

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

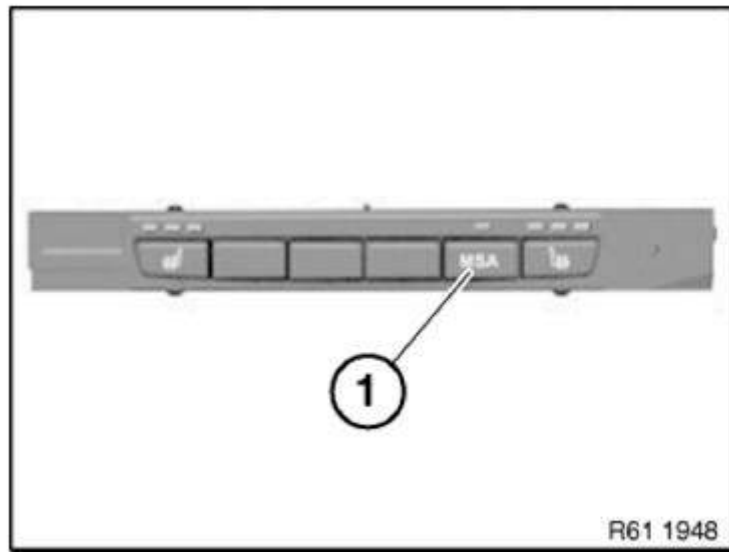


Fig. 2: Identifying MSA Button In Passenger Compartment

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

B = 7 mm

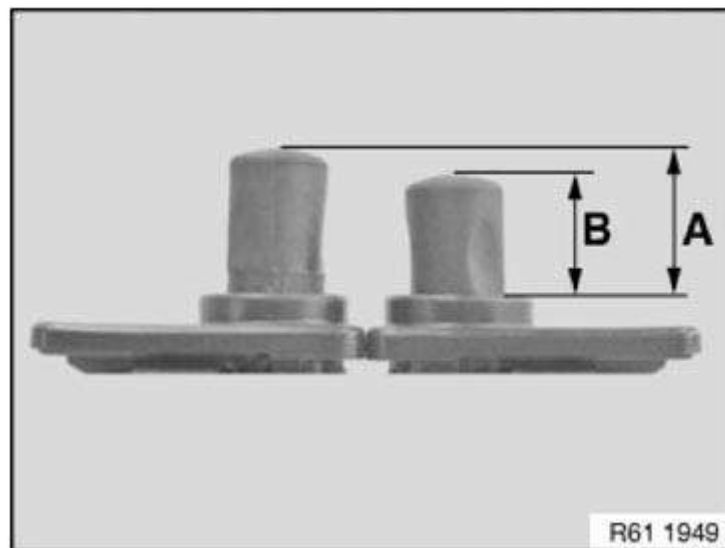


Fig. 3: Identifying Engine Hood/Bonnet Dimension

Courtesy of BMW OF NORTH AMERICA, INC.

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

HEATER WITH OPERATION

64 11... INSTALLING SERVODRIVE

Installation:

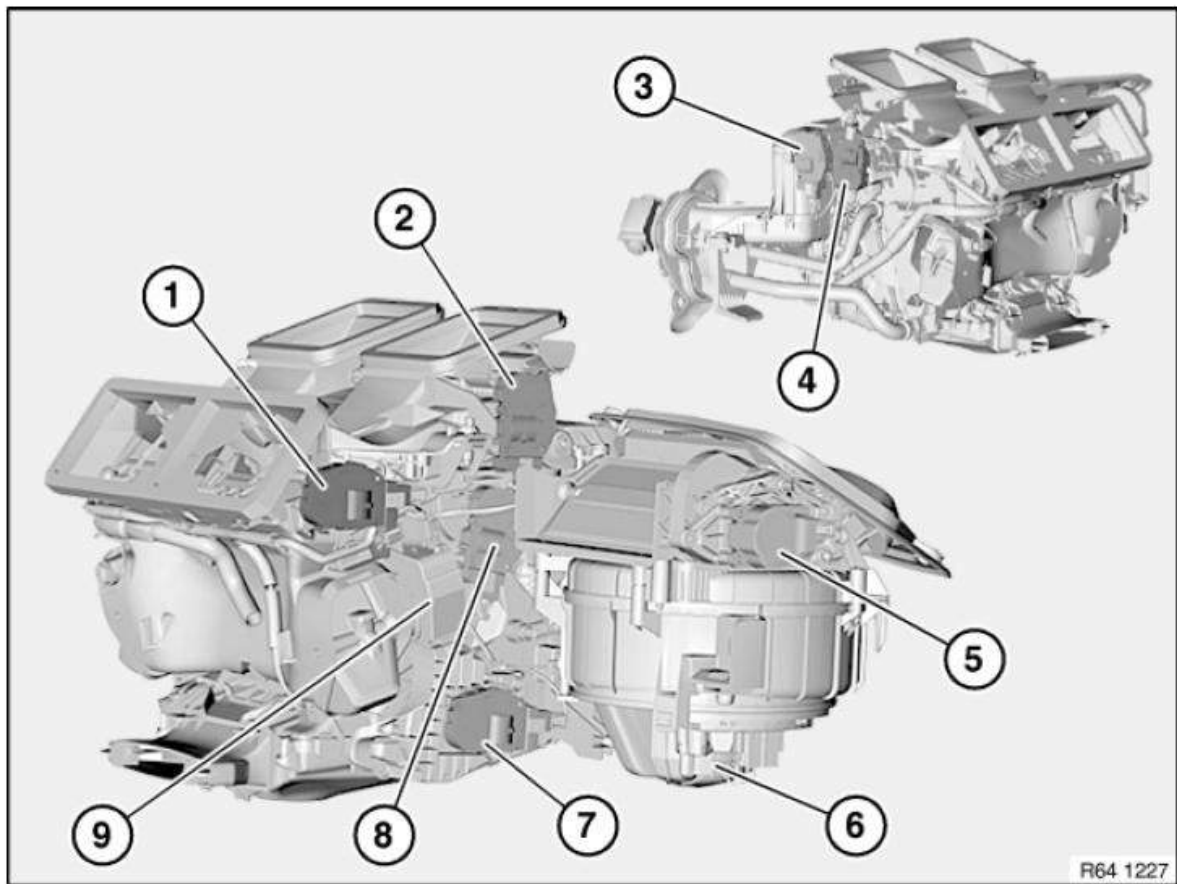
If necessary, align shaft of flap(s) to be actuated to position of servodrive to be installed.



Fig. 4: Identifying Servodrive

Courtesy of BMW OF NORTH AMERICA, INC.

64 11.. OVERVIEW OF ACTUATOR DRIVES ON HEATER/AIR CONDITIONER



- | | |
|---|---|
| 1 Stepper motor, ventilation flap | 6 Blower motor |
| 2 Stepper motor, defrosting flap | 7 Stepper motor, rear passenger compartment |
| 3 Stepper motor, stratification, front | 8 Stepper motor, air blending, right |
| 4 Stepper motor, air blending, left | 9 Stepper motor, footwell |
| 5 Stepper motor, fresh air/recirculated air | |

Fig. 5: Overview Of Actuator Drives On Heater/Air Conditioner

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 374 REMOVING AND INSTALLING (REPLACING) CONTROL PANEL FOR HEATING AND AIR CONDITIONING SYSTEM

Necessary preliminary tasks:

- Remove **RADIO AND A/C CONTROL PANEL**

The following operation describes the replacement.

Disconnect plug connection (1).

Release retainers (3) on air conditioning control panel (2) by pressing the retaining tabs (3) inward with a suitable tool.

At the same time press IHKA controls (2) forward out of retaining frame and remove.

Installation note:

The air conditioning control panel (2) must be felt and heard to engage in the retaining frame.

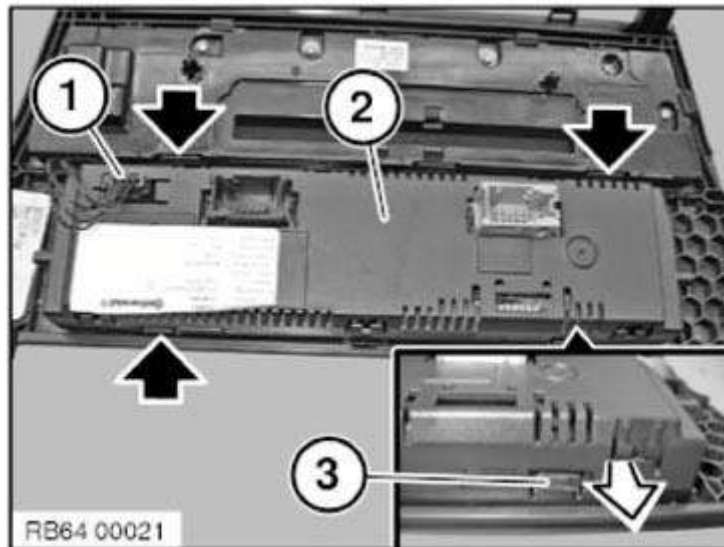


Fig. 6: Releasing Retainers On Air Conditioning Control Panel

Courtesy of BMW OF NORTH AMERICA, INC.

Retaining lugs on trim cover (1) must not be damaged.

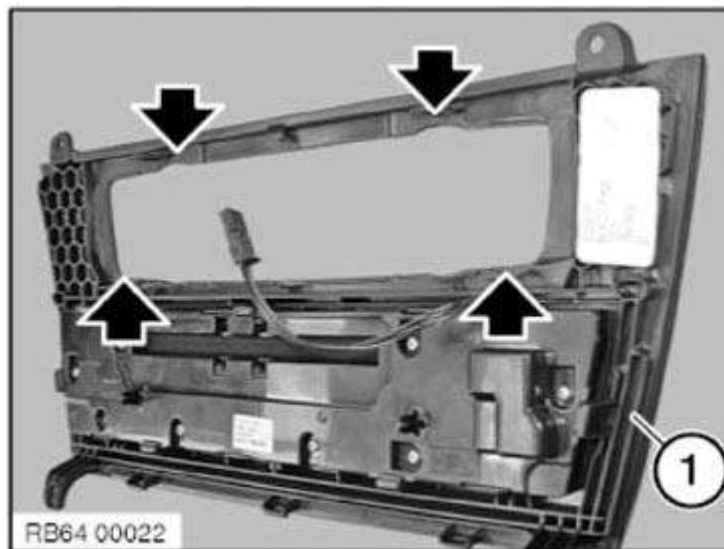


Fig. 7: Locating Retaining Lugs On Trim Cover

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 856 REMOVING AND INSTALLING/REPLACING ACTUATOR DRIVE FOR CENTRAL KINEMATICS (A/C CONTROL)

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

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

Necessary preliminary work:

- Remove **RIGHT GLOVE BOX WITH HOUSING**

Release screws (1).

Detach actuator drive for central kinematics (2).

Unlock associated plug connection and disconnect.

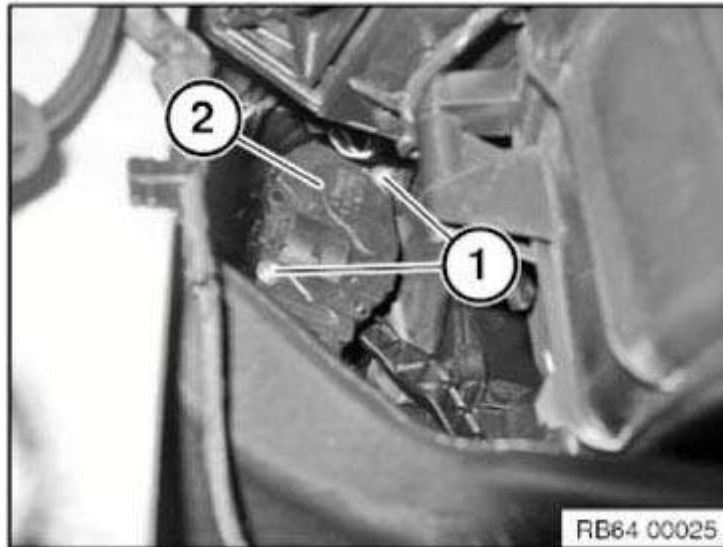


Fig. 8: Identifying Actuator Drive For Air Mix Flap, Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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

61 31 321 REMOVING AND INSTALLING RADIO AND A/C CONTROL PANEL

Special tools required:

- **00 9 340**

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**)

IMPORTANT: Carry out installation in a dust-free workshop area only.
To avoid damage, do not touch or dirty the display field.

Necessary preliminary work:

- Remove **DECORATIVE STRIP ON DASHBOARD IN MIDDLE**

Insert special tool **00 9 340** (00 9 341) as illustrated.

Lever trim cover (1) slightly forward and unclip.



Fig. 9: Removing Trim Cover Using Special Tool 00 9 340

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip LED (1).

Remove cover (2).

Installation note:

Retaining lugs and clips must not be damaged.

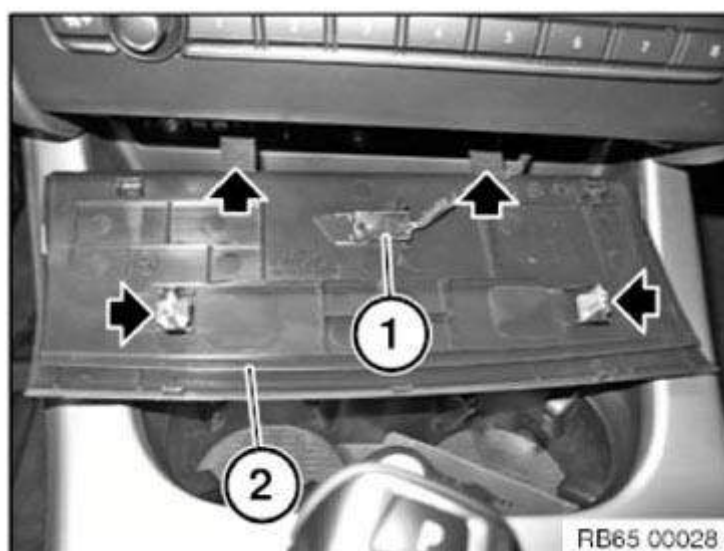


Fig. 10: Identifying LED And Cover Retaining Lugs

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws.

Remove control panel (1) towards front.

Unlock associated plug connections and disconnect.

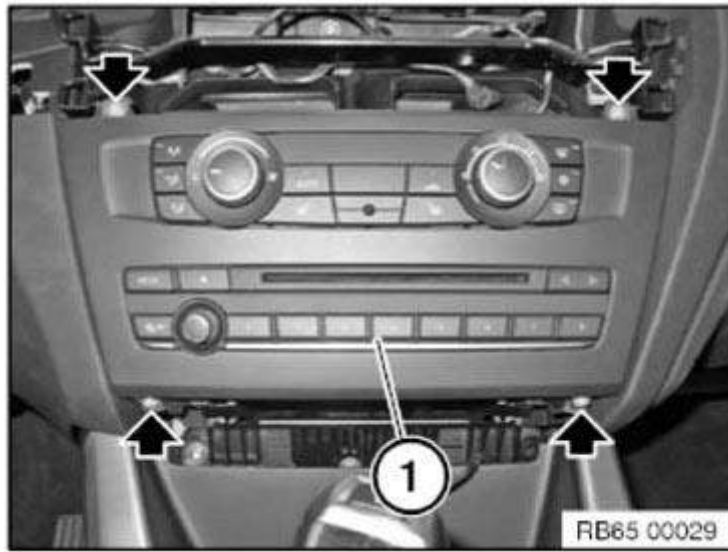


Fig. 11: Locating Control Panel Plug Connections

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out VEHICLE PROGRAMMING/ENCODING .

64 11 206 REMOVING AND INSTALLING/RENEWING HEATING UNIT

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant fluid.

Read and comply with safety instructions:

- Handling R 134a (tetrafluoroethane) refrigerant . See 64 50... NOTE FOR HANDLING R134A REFRIGERANT or 64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A
- HANDLING REFRIGERANT OIL

IMPORTANT: Risk of damage!
Restart engine only when the air conditioning system has been correctly filled.

NOTE:

If the air conditioning system is open for longer than 24 hours: replace DESICCANT INSERT FOR AIR CONDITIONING

Necessary preliminary tasks:

- Draw off AIR CONDITIONING SYSTEM
- Remove SUPPORT FOR DASHBOARD
- Remove **expansion valve** . See 64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N55, N47) or 64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N20, N57)

NOTE: Diesel vehicles only:

Disconnect positive line (1) and plug connection (2) at electric auxiliary heater (3)

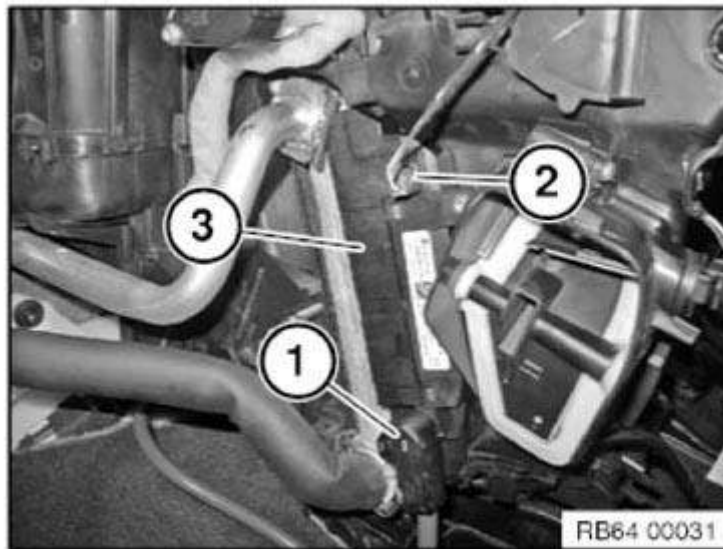


Fig. 12: Identifying Electric Auxiliary Heater Plug Connection And Positive Line
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Diesel vehicles only:

Fold back carpet in area (2).

Slacken nut (1).

Take off grounding cable (3).

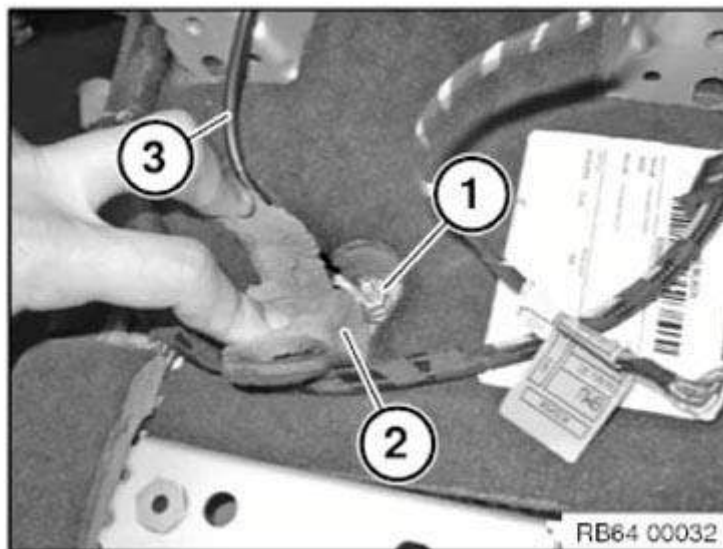


Fig. 13: Folding Back Carpet
Courtesy of BMW OF NORTH AMERICA, INC.

Release plug connection (1) at blower motor (2) and disconnect.

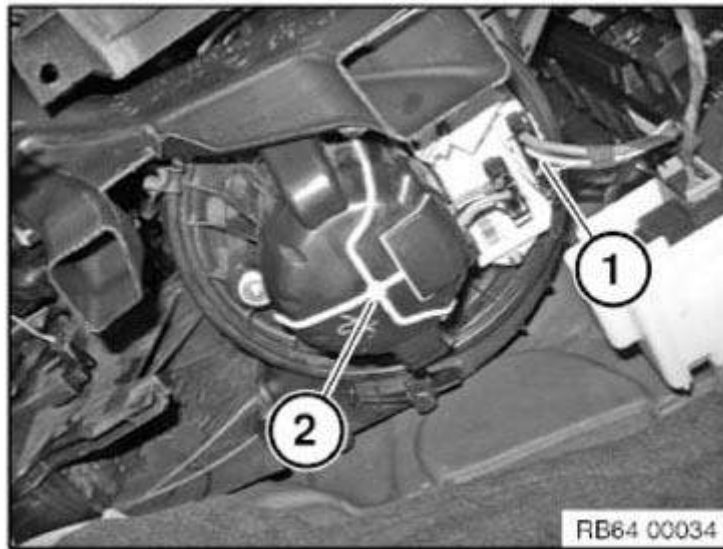


Fig. 14: Identifying Blower Motor Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Make sure remaining coolant is removed completely.

Carefully blow through aluminum double pipe to remove remaining coolant from heat exchanger for heating system.

Installation note:

Vent cooling system and check on watertightness. See [17 00 039 VENTING AND FILLING COOLING SYSTEM WITH VACUUM FILLING UNIT](#) , [17 00 009 CHECKING COOLING SYSTEM FOR WATERTIGHTNESS](#) , [17 00 039 BLEED COOLING SYSTEM AND CHECK FOR WATERTIGHTNESS \(N52T, N55\)](#) or [17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATERTIGHTNESS \(N20\)](#) .

IMPORTANT: Risk of soiling by leaking coolant!

Remove heating and air-conditioning unit (1) from vehicle.

Installation note:

Make sure that blower housing (2) and sealing plates for media openings (4) in bulkhead (5) are fitted correctly.

Footwell ventilation ducts (3) must be fitted correctly in the corresponding connection piece (3).

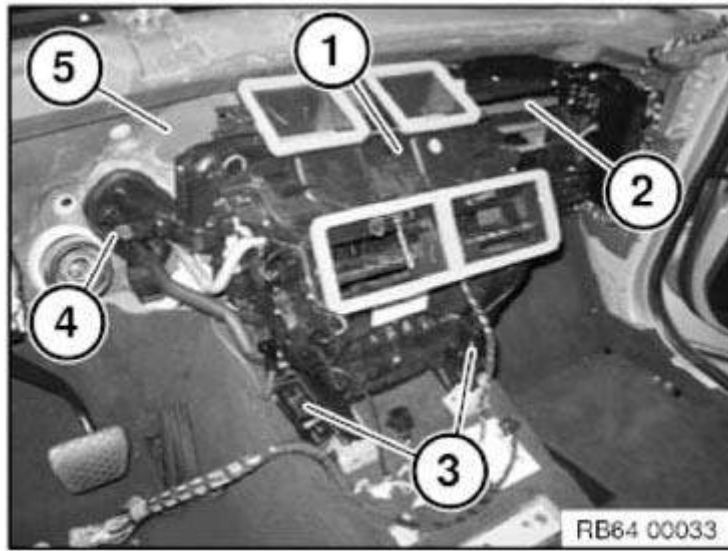


Fig. 15: Identifying Heating And Air-Conditioning Unit, Blower Housing, Ventilation Ducts
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Mat (3) under the heating and air-conditioning unit must be correctly positioned and bonded onto the carpet.

Make sure condensate drain (1) is correctly seated on grommet (2) (see next operation).

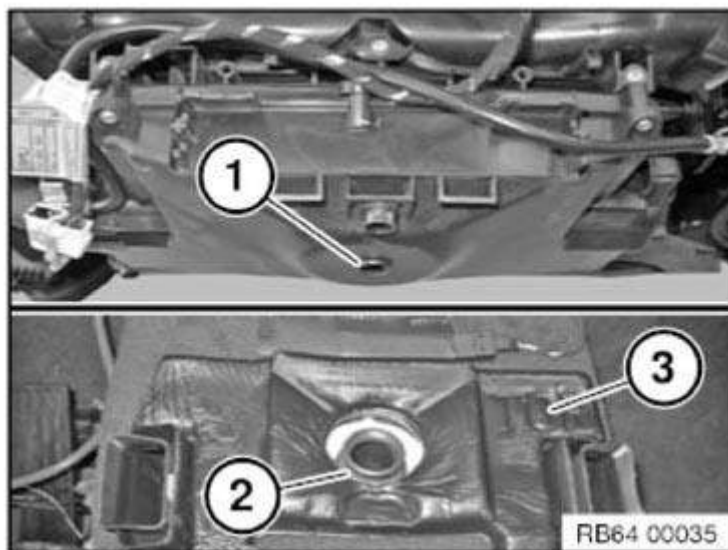


Fig. 16: Identifying Condensate Drain Seated On Grommet
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of water damage in the passenger compartment!

Installation note:

Before mounting the heater (2), spray grommet (1) with lubricant G13 (sourcing reference from BMW Parts Department).

Make sure condensate drain (2) is correctly seated on grommet (1).

Perform a visual inspection after installing the heater (2).

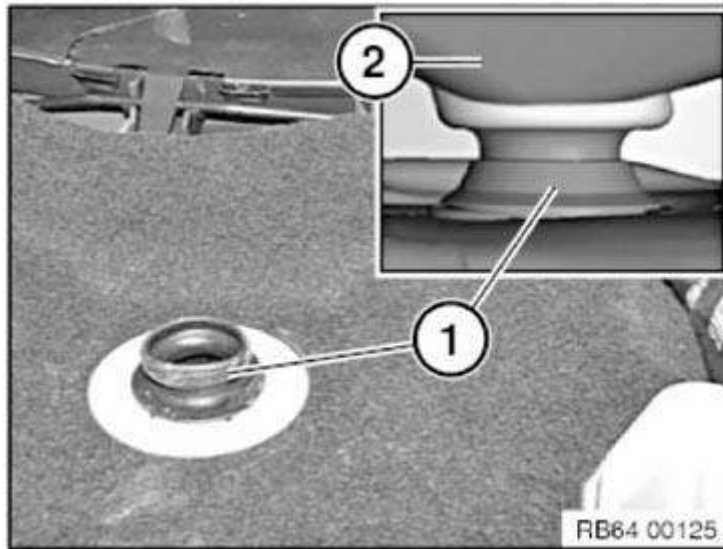


Fig. 17: Identifying Heater And Spray Grommet
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 806 REMOVING AND INSTALLING/REPLACING ACTUATOR DRIVE FOR FRESH/RECIRCULATED AIR FLAP

Necessary preliminary work:

- Remove **RIGHT GLOVE COMPARTMENT WITH HOUSING**

Release screws (1).

Detach actuator drive for fresh air/recirculating air flap (2) from heating/air conditioning unit.

Unlock plug connection (3) and disconnect.

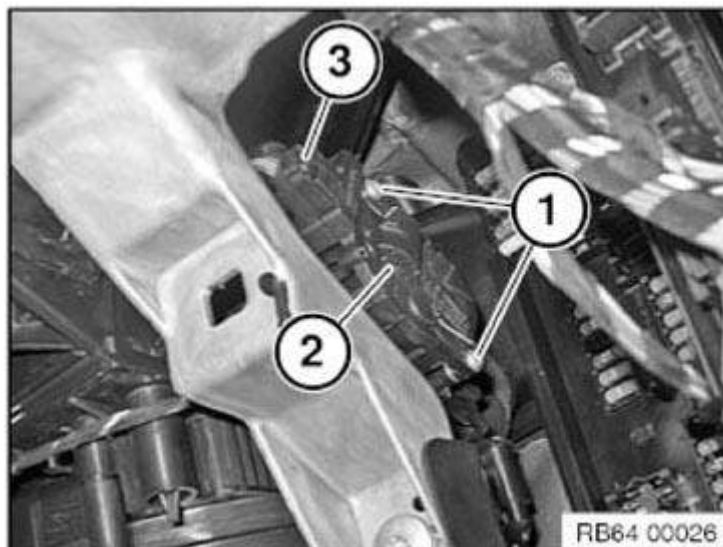


Fig. 18: Identifying Actuator Drive For Fresh Air/Recirculating Air Flap And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

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 11 908 REMOVING AND INSTALLING/REPLACING FOOTWELL TEMPERATURE SENSOR

Necessary preliminary work:

- Remove **SUPPORT FOR DASHBOARD**

NOTE: For purposes of clarity, the following graphic shows the heater/air conditioner removed.

Remove temperature sensor (2) from air duct (1).

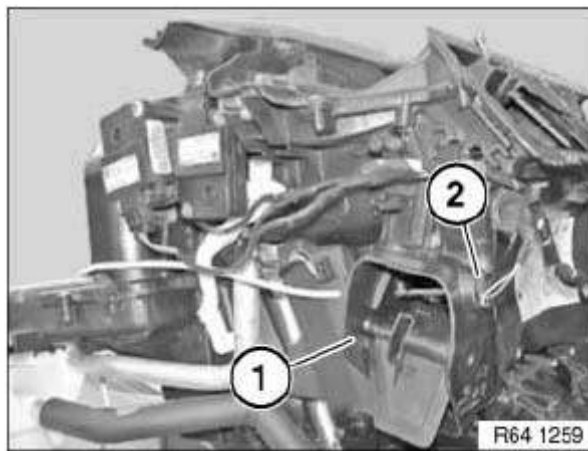


Fig. 19: Identifying Temperature Sensor From Air Duct

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 213 REMOVING AND INSTALLING/REPLACING HEATER/AIR CONDITIONER BLOWER

Necessary preliminary work:

- Remove **TRIM FOR INSTRUMENT PANEL AT BOTTOM RIGHT**

Detach right footwell heating duct (1) in direction of arrow from retaining lug (3) and lay to one side slightly.

Installation note:

Make sure clip (2) is correctly seated.

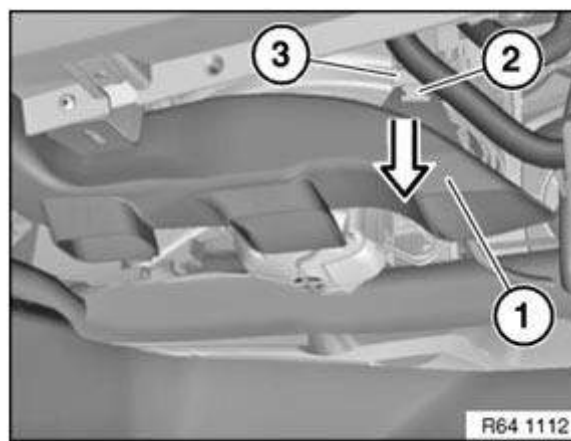


Fig. 20: Detaching Right Footwell Heating Duct From Retaining Lug
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Raise plastic lug (2) slightly and turn fan (4) in direction of arrow.

Remove fan (4) from fan shell (5).

Installation note:

If necessary, raise lug (3) slightly and screw in fan (4) anticlockwise.

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

Check exact position of lug (2).

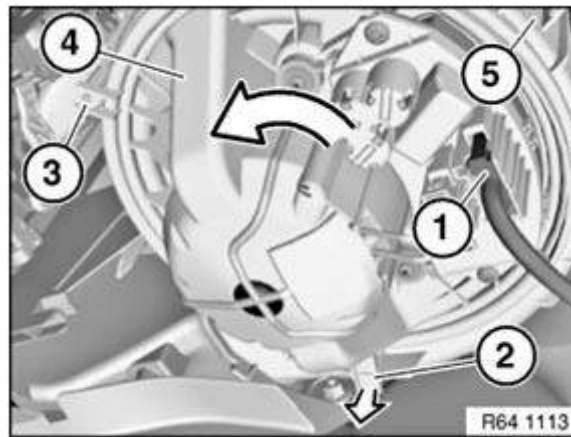


Fig. 21: Removing Fan From Shell
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 991 REMOVING AND INSTALLING/REPLACING SENSOR FOR AUTOMATIC RECIRCULATED AIR CONTROL (AUC)

Necessary preliminary work:

- **REMOVING** and installing/replacing right microfilter housing cover

Remove filter cover (1) in direction of arrow.

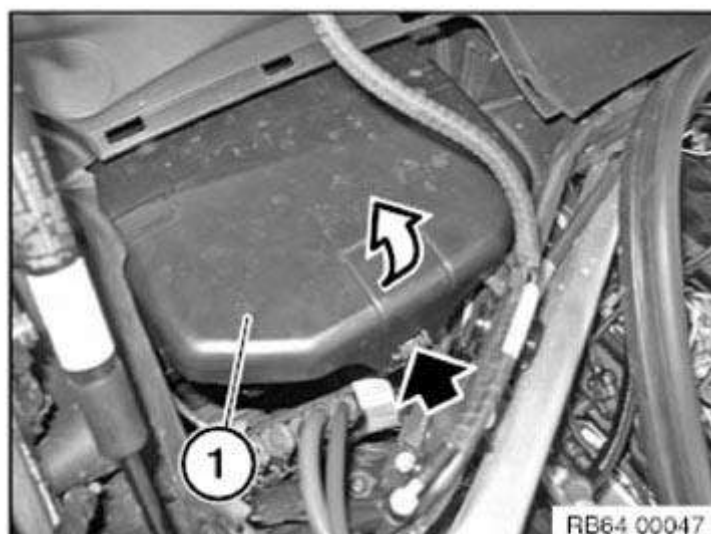


Fig. 22: Removing Filter Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (2) and disconnect.

Unlock retaining tab (1) and remove AUC sensor.

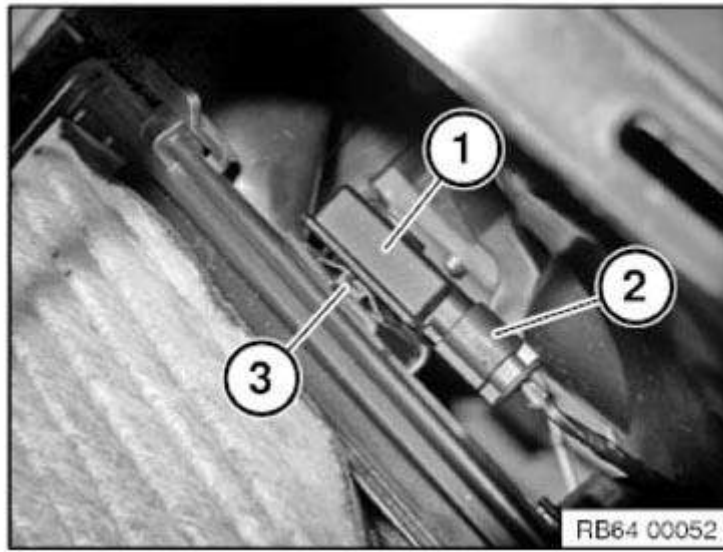


Fig. 23: Identifying AUC Sensor Plug Connection, Retaining Tab

Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Retaining tab (1) on AUC sensor (2) must not be damaged.

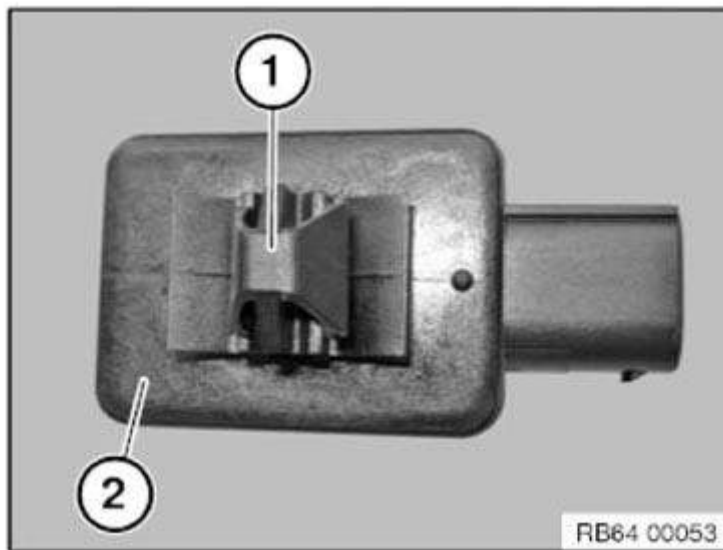


Fig. 24: Identifying Retaining Tab On AUC Sensor

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 866 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR BLENDING FLAP (LEFT)

Necessary preliminary work:

- Remove **SUPPORT FOR DASHBOARD**

Release screws (1).

Remove actuator drive (2).

Unlock plug connection (3) and disconnect.

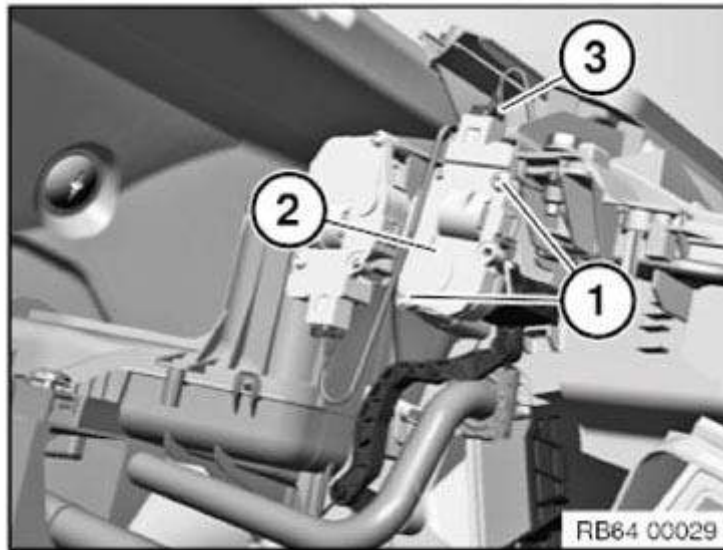


Fig. 25: Identifying Actuator Drive Plug Connection, Screws

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

64 11 872 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR BLENDING FLAP (RIGHT)

Necessary preliminary work:

- Remove **RIGHT GLOVE BOX WITH HOUSING**

Release screws (1).

Detach actuator drive for air mix flap (2).

Unlock associated plug connection and disconnect.

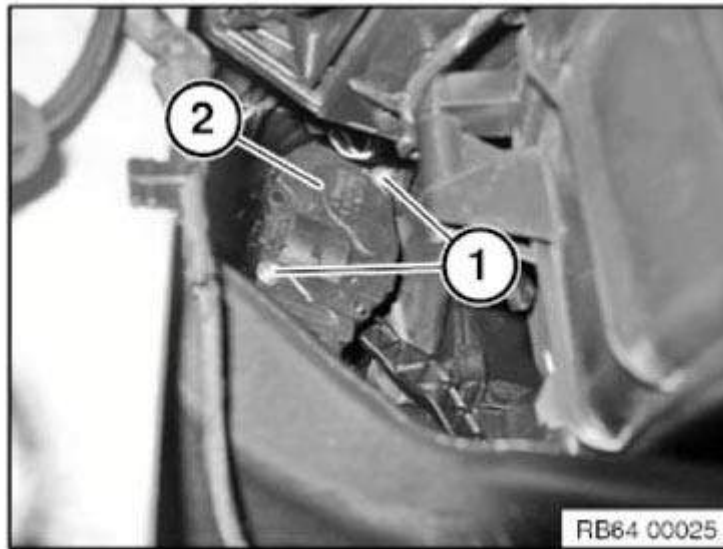


Fig. 26: Identifying Actuator Drive For Air Mix Flap, Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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 11 868 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR DEFROSTING FLAP (RIGHT)

Necessary preliminary work:

- Remove **SUPPORT FOR DASHBOARD**

Release screws (1).

Remove actuator drive (2).

Release plug connection (3) and disconnect.

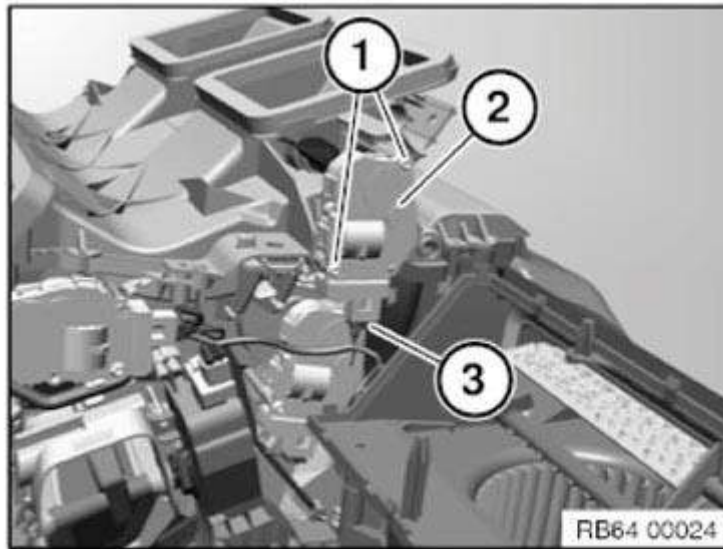


Fig. 27: Identifying Actuator Drive, Plug Connection And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

64 11 905 REMOVING AND INSTALLING/REPLACING VENTILATION TEMPERATURE SENSOR

Necessary preliminary work:

- Remove **DECORATIVE STRIP ON DASHBOARD IN MIDDLE**

Pull temperature sensor (1) out of retaining lug (2).

Installation note:

Make sure rubber ring is correctly seated.

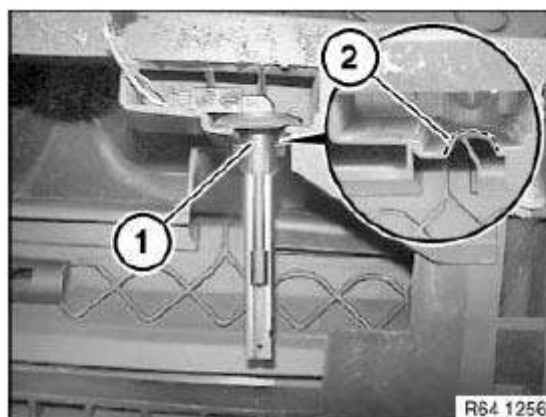


Fig. 28: Identifying Temperature Sensor Out Of Retaining Lug

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1) and remove temperature sensor (2).

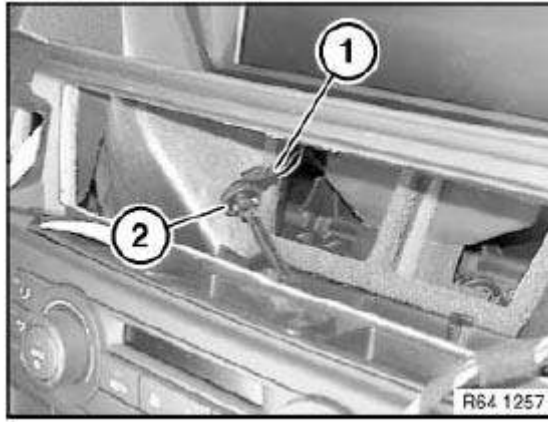


Fig. 29: Identifying Temperature Sensor And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 850 REPLACING ACTUATOR DRIVE FOR REAR COMPARTMENT FLAP

Necessary preliminary tasks:

- Remove **RIGHT GLOVE BOX WITH HOUSING**

Release screws (1).

Detach actuator drive for rear compartment flap (2) from heating/air conditioning unit.

Unlock associated plug connection and disconnect.

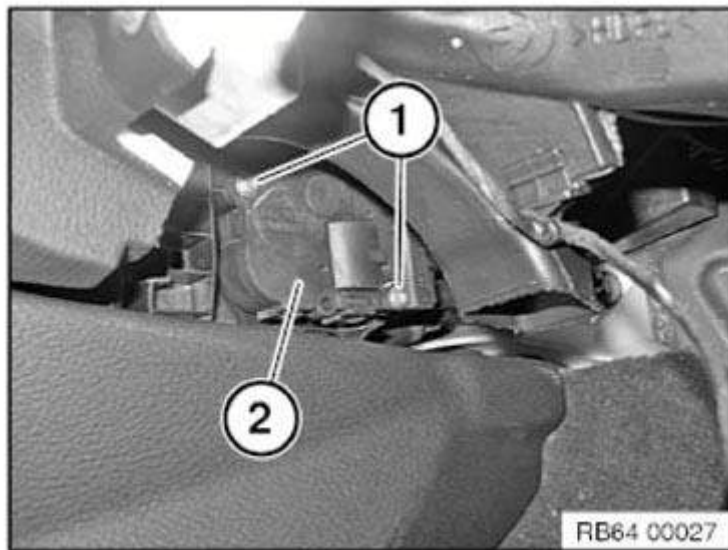


Fig. 30: Identifying Actuator Drive For Rear Compartment Flap And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

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

- IMPORTANT:
- Body
 - Heating and air conditioning function
 - Flap motors

- Readdress flap motors

64 11 829 REPLACING ACTUATOR DRIVE OF VENTILATION FLAPS

Necessary preliminary work:

- Remove SUPPORT FOR DASHBOARD

Release screws (1).

Release plug connection (3) and disconnect.

Detach servodrive for ventilation flaps (2) in direction of arrow from heater/air conditioner.

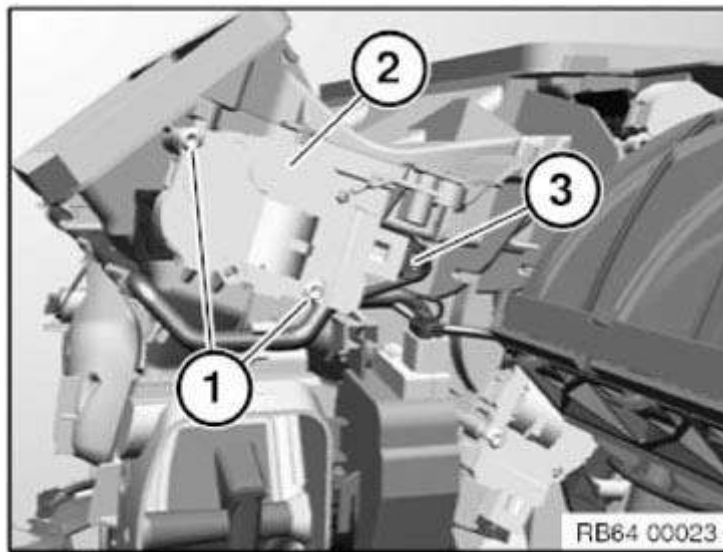


Fig. 31: Identifying Servodrive For Ventilation Flaps Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

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 11 225 REPLACING CONTROLLER FOR HEATING AND AIR CONDITIONING SYSTEM BLOWER

Necessary preliminary work:

- Remove TRIM FOR INSTRUMENT PANEL, BOTTOM LEFT

Removal:

Release screws (1).

Unlock and disconnect connector (2).

Remove controller (3) downwards.

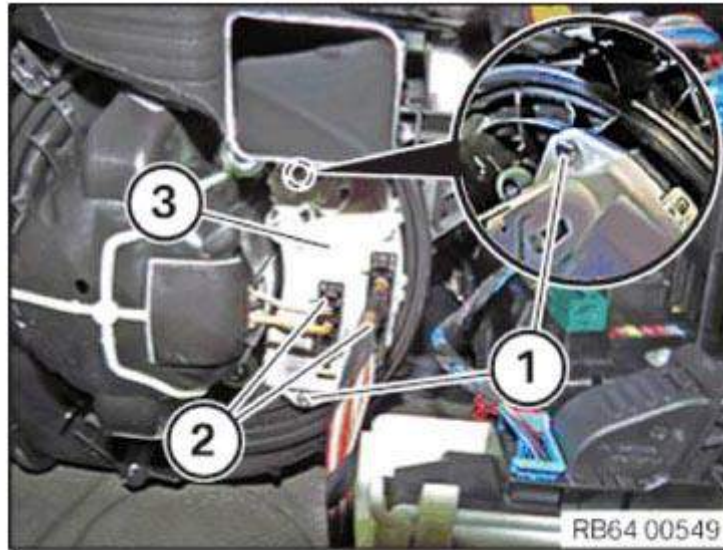


Fig. 32: Identifying Controller, Connector And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Position controller (3) correctly.

Tighten down the screws (1).

Connect connector (2).

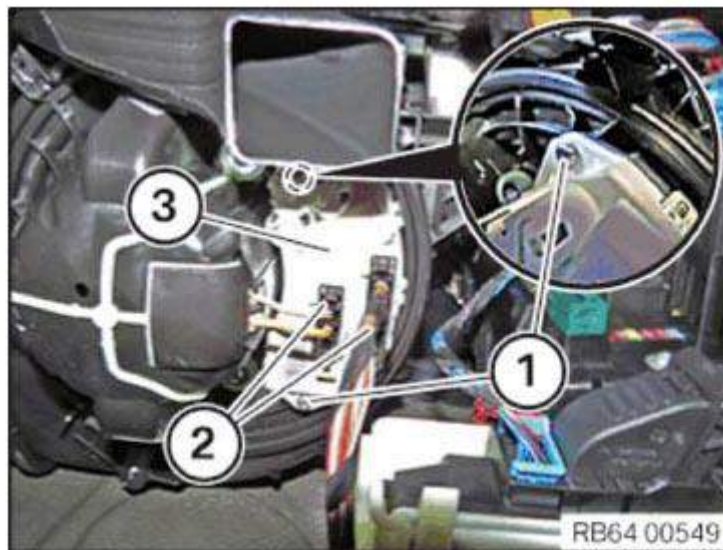


Fig. 33: Identifying Controller, Connector And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Install **BOTTOM RIGHT INSTRUMENT PANEL TRIM**

64 11 943 REPLACING EVAPORATOR TEMPERATURE SENSOR

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 heater/air conditioner (3) and remove.

Installation note:

Ensure evaporator temperature sensor (2) is correctly seated.

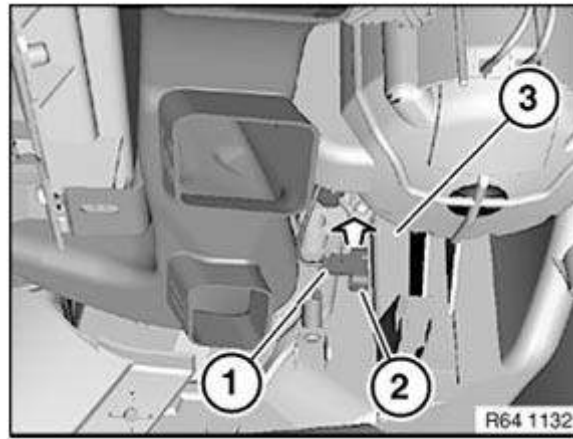


Fig. 34: Pulling Evaporator Temperature Sensor Out Of Heater/Air Conditioner

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 208 REPLACING HEAT EXCHANGER

Necessary preliminary work:

- Remove **HEATER**

IMPORTANT: Before ordering spare parts, determine manufacturer of the installed heater!

Installation note:

Pipes are included in the repair kit!

Release screws (1).

Slide rubber grommet (2) with foam seal forward slightly.

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

Installation note:

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

Make sure rubber grommet (2) is fitted correctly on pipe holder (3).

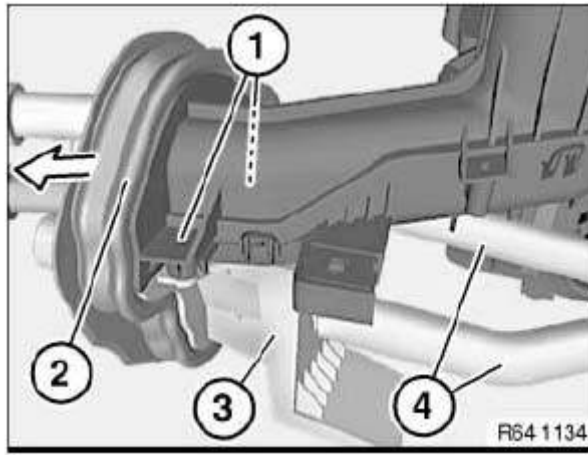


Fig. 35: Sliding Rubber Grommet With Foam Seal Forward
Courtesy of BMW OF NORTH AMERICA, INC.

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 heater (4) in direction of arrow.

Remove heat exchanger (5) from heater/air conditioner (6).

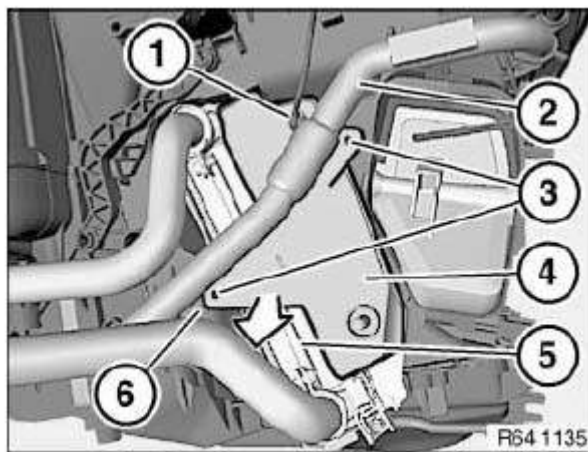


Fig. 36: Removing Heat Exchanger From Heater/Air Conditioner
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 869 REPLACING SERVODRIVE FOR BLENDING FLAP

Necessary preliminary work:

- Remove **SUPPORT FOR DASHBOARD**

Release screws (1).

Detach actuator drive for stratification flap (2) from heating/air conditioning unit (4).

Unlock plug connection (3) and disconnect.

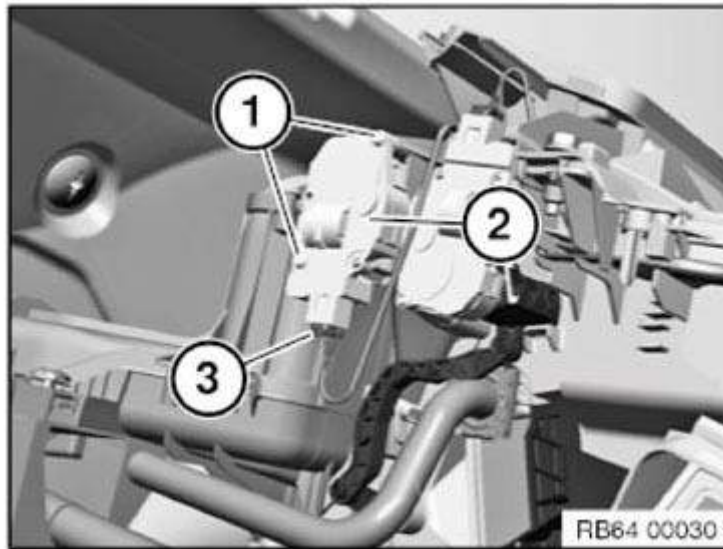


Fig. 37: Identifying Actuator Drive For Stratification Flap From Heating/Air Conditioning Unit
Courtesy of BMW OF NORTH AMERICA, INC.

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 11 839 REPLACING SERVODRIVE FOR FOOTWELL FLAP (AUTOMATIC A/C)

Necessary preliminary work:

- Remove **RIGHT GLOVE BOX WITH HOUSING**

Release screws (1).

Detach actuator drive for footwell flap (2).

Release plug connection (3) and disconnect.

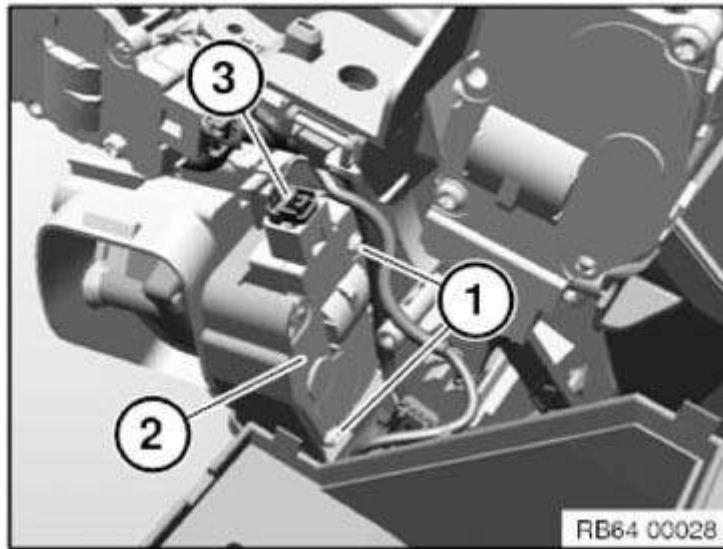


Fig. 38: Identifying Actuator Drive For Footwell Flap And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

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

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

64 11 326 REPLACING THE BUTTON CAPS OF THE HEATING AND AIR CONDITIONING SYSTEM CONTROL PANEL

Special tools required:

- [00 9 340](#)

Tape area (1) around the button caps with adhesive tape.



Fig. 39: Identifying Adhesive Tape Applying Area

Courtesy of BMW OF NORTH AMERICA, INC.

Press blower rocker switch (1) on one side and pry it off on the other side with special tool [00 9 340](#) .

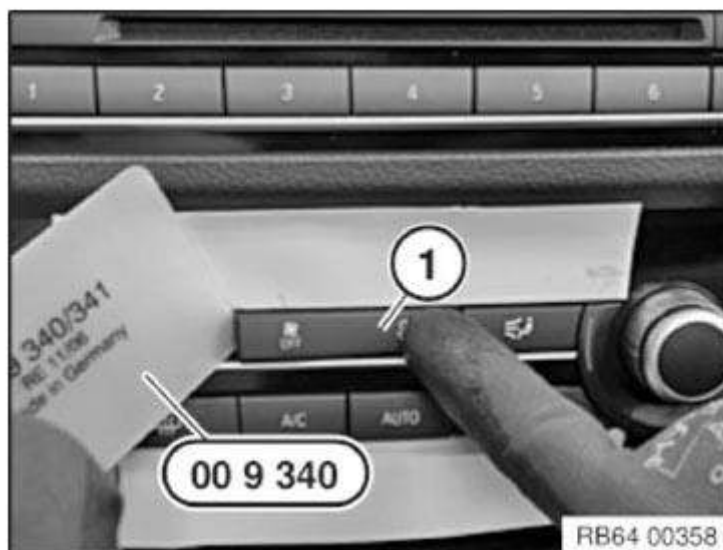


Fig. 40: Pressing Blower Rocker Switch

Courtesy of BMW OF NORTH AMERICA, INC.

Pry off remaining button caps (1) with special tool [00 9 340](#) .



Fig. 41: Prying Off Remaining Button Caps

Courtesy of BMW OF NORTH AMERICA, INC.

Clip in button caps (1) into operating unit.

Remove adhesive tape.

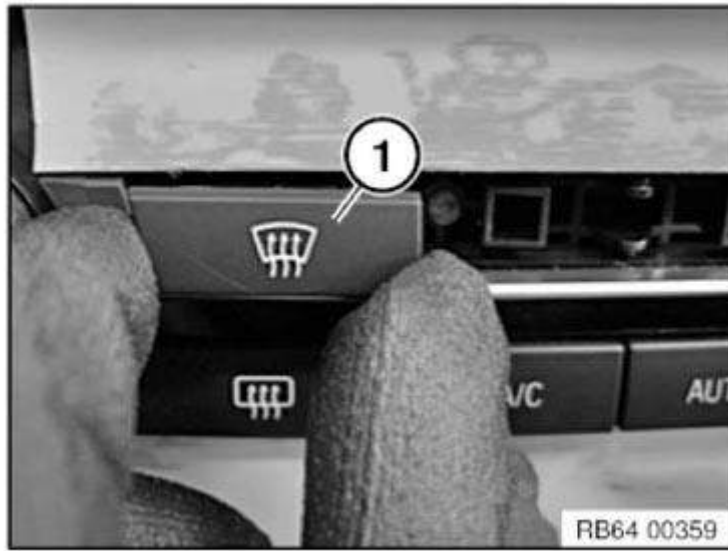


Fig. 42: Installing Button Caps Into Operating Unit
Courtesy of BMW OF NORTH AMERICA, INC.

Check function of the air conditioning.

AUXILIARY. HEATER WITH CONTROL ELEMENTS

64 12... INITIALIZING TELESTART HAND-HELD TRANSMITTER

NOTE: The Telestart hand-held transmitter must be initialized when:

- Hand-held transmitter is replaced
- Car Access System control unit is replaced

The auxiliary heater is switched on with the hand-held transmitter and at a preselected switch-on time under an ambient temperature of approx. 15 °C.

Heating can be activated directly in the Central Information Display at any ambient temperature. To do so, go to the parking function menu under direct operation and mark the auxiliary heating box.

NOTE: Initialization can only be carried out with the BMW diagnosis system.

Follow instructions and specifications in procedure.

Service functions:

- Complete vehicle
- Body
- Air conditioning function
- Telestart transmitter
- Initialization

64 12 160 REMOVING AND INSTALLING OR REPLACING COMPLETE INDEPENDENT HEATER WITH BRACKET

WARNING: Risk of burning!
Work on auxiliary heater may only be carried out when it has cooled down.

NOTE: **CLAMP OFF** coolant hoses on independent heater.

Recycling

Fuel escapes when fuel lines are detached. Have a suitable collecting vessel ready.

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

Necessary preliminary tasks:

- Remove **LEFT WHEEL ARCH COVER**

Removal:

Unclip intake silencer in marked area (2).

Release screws (2).

Disconnect fuel line (3).

Unlock connector (4) and disconnect.

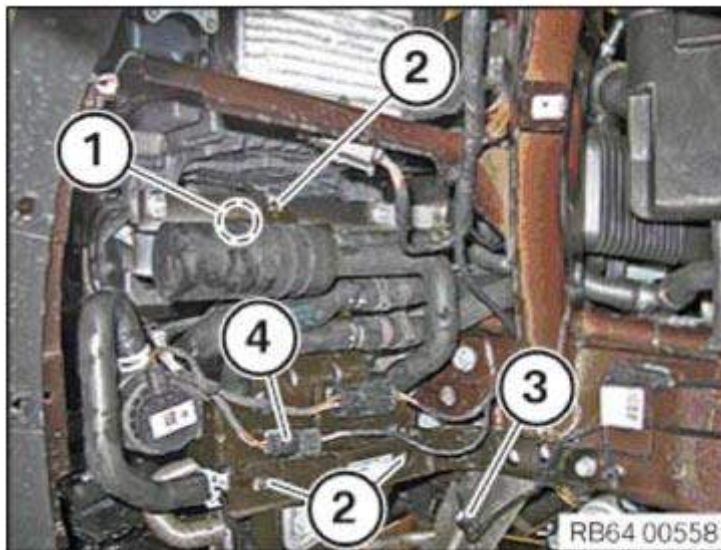


Fig. 43: Identifying Intake Silencer, Fuel Line, Screws And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Unclip the fuel line (2).

Detach the holder (3).

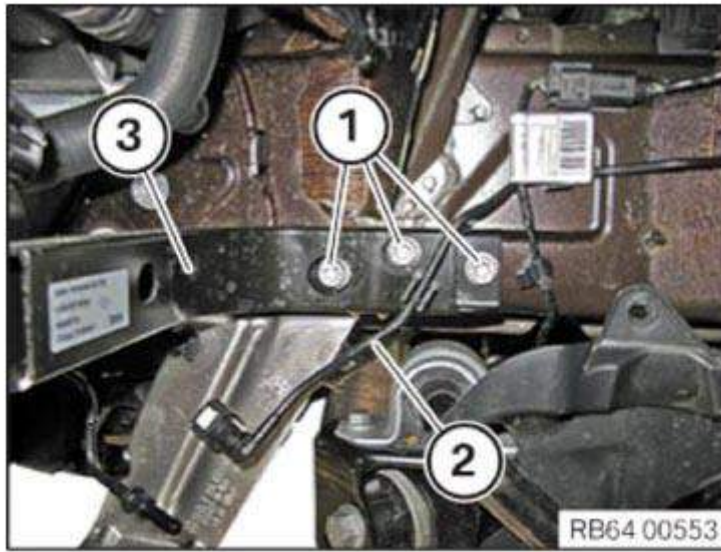


Fig. 44: Identifying Holder, Fuel Line And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Cut open cable straps (1).

Unlock and disconnect connector (2).

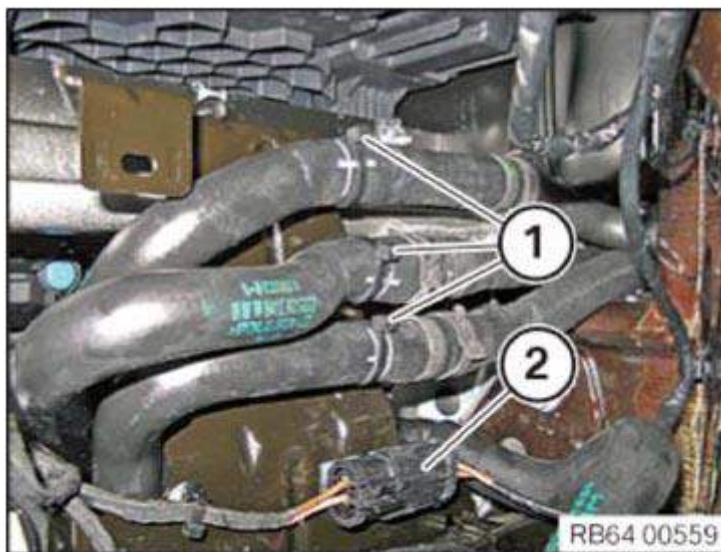


Fig. 45: Identifying Cable Straps And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Secure auxiliary heater (2) against falling off/down!

Release spring band clamps (1) and detach coolant hoses.

Remove auxiliary heater (2).

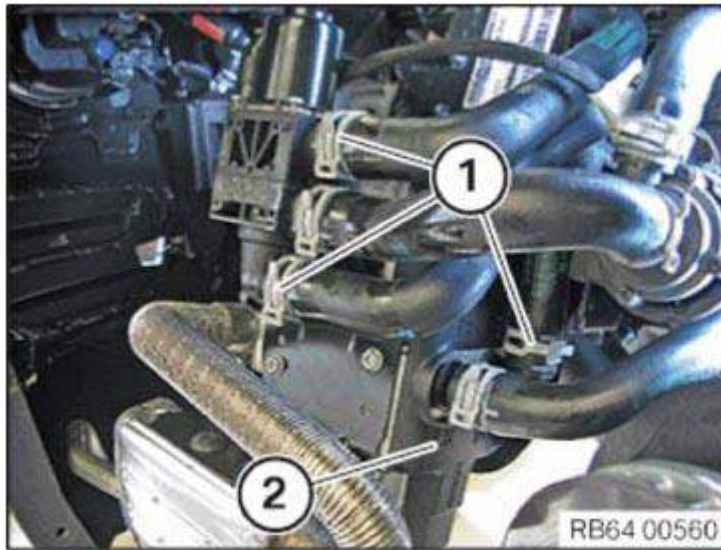


Fig. 46: Identifying Auxiliary Heater And Spring Band Clamps

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release spring band clamp (1).

Release screws (2).

Tightening torque [64 12 2AZ](#) .

Slacken clamp (3) and pull off exhaust hose.

Take off holder (4).

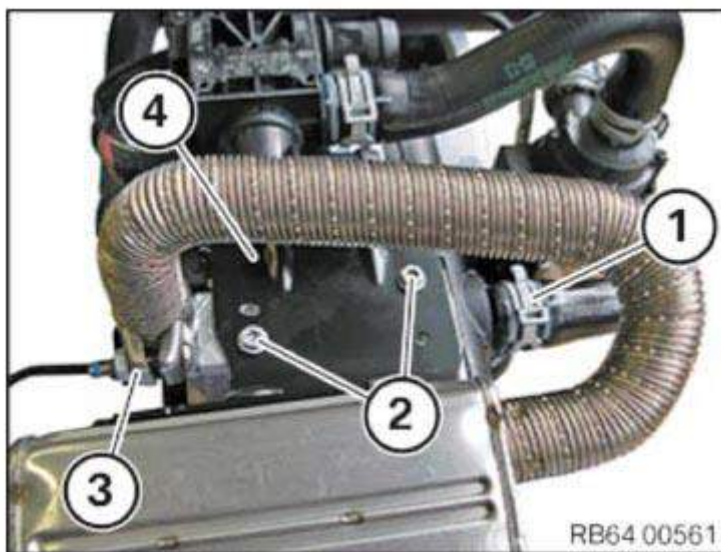


Fig. 47: Identifying Spring Band Clamp, Holder And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock and disconnect connector (1).

Pull off air intake hose (2).

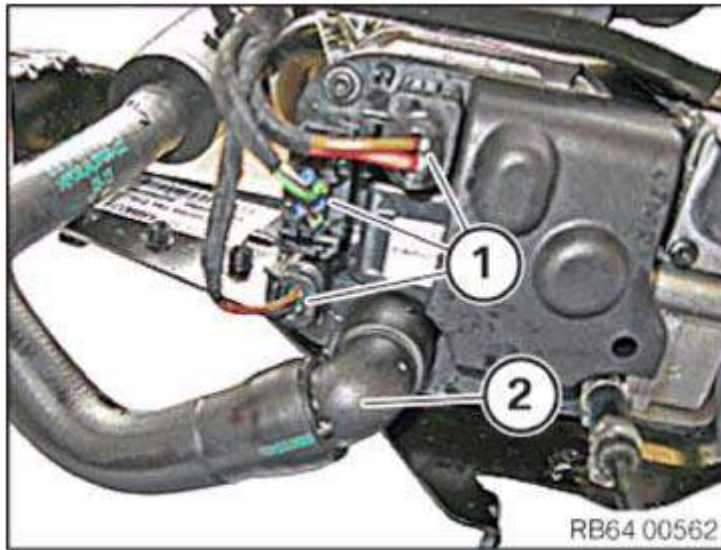


Fig. 48: Identifying Air Intake Hose And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque [64 12 3AZ](#) .

Remove holder (2) from auxiliary heater (3).

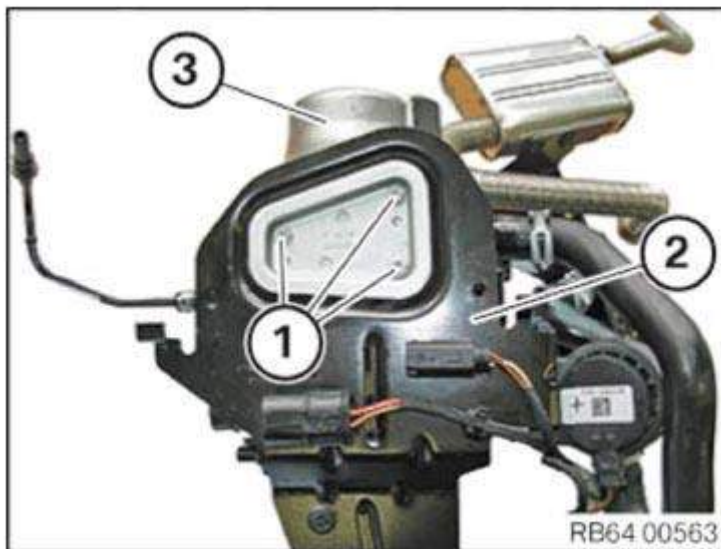


Fig. 49: Identifying Holder From Auxiliary Heater And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Position auxiliary heater (2) correctly.

Attach coolant hoses and secure by spring band clamps (1).

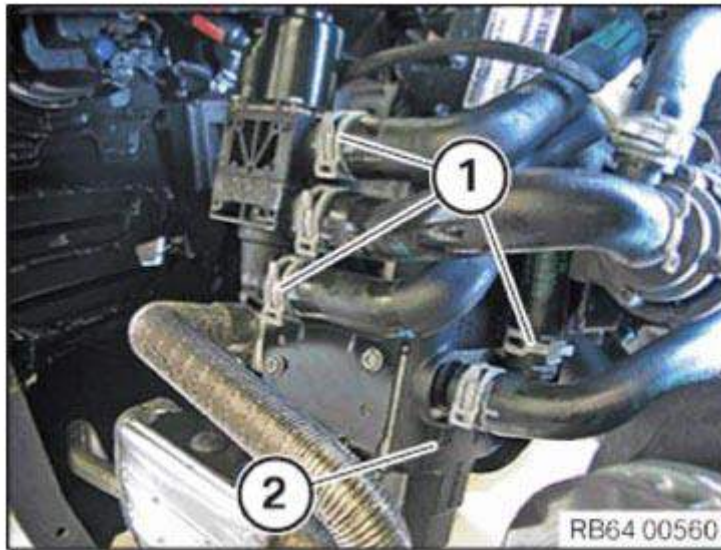


Fig. 50: Identifying Auxiliary Heater And Spring Band Clamps

Courtesy of BMW OF NORTH AMERICA, INC.

Connect connector (2).

Replace and secure cable straps (1).

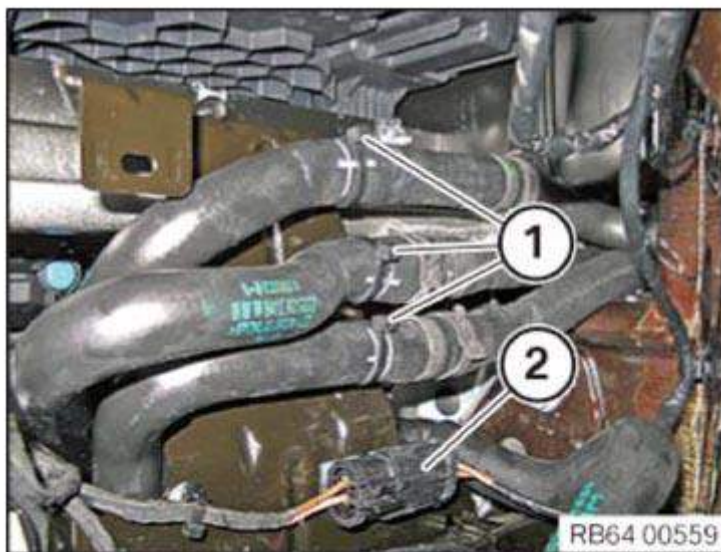


Fig. 51: Identifying Cable Straps And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Position the holder (3) correctly.

Tighten down the screws (1).

Clip in the fuel line (2).

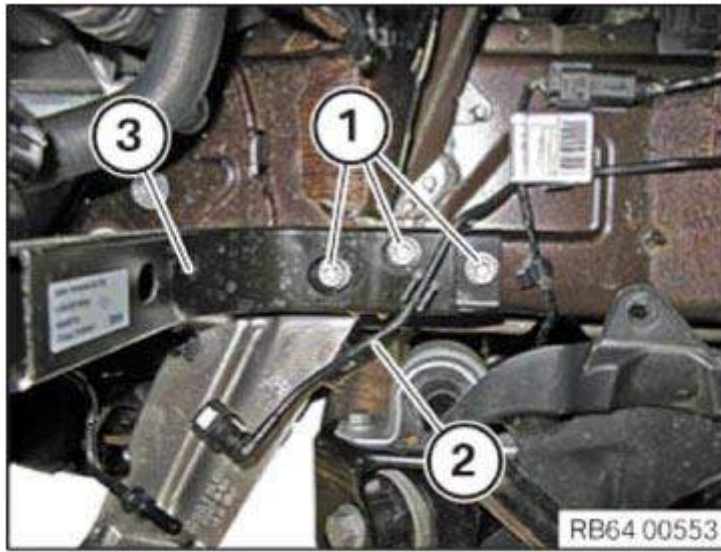


Fig. 52: Identifying Holder, Fuel Line And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Tighten screws (2).

Tightening torque [64 12 1AZ](#).

Connect fuel line (3).

Connect the connector (4).

Clip in intake silencer in marked area (2).

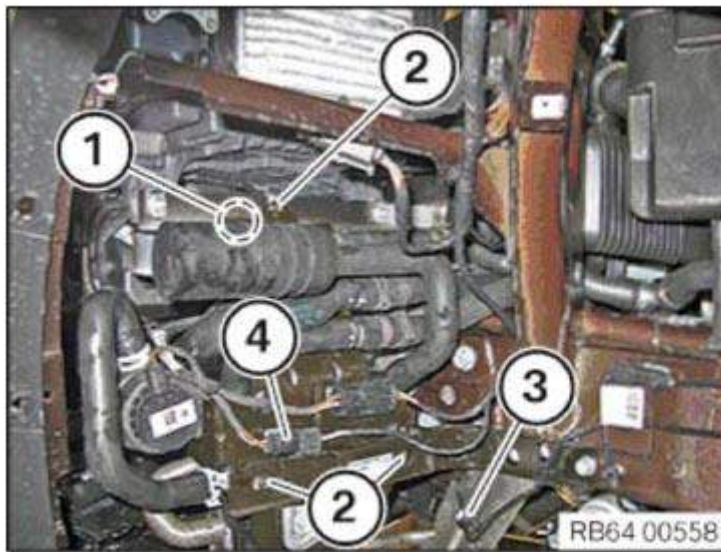


Fig. 53: Identifying Intake Silencer, Fuel Line, Screws And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Install [LEFT WHEEL ARCH COVER](#)
- Fill and vent cooling system and check for leaks. See [17 00 039 VENTING AND FILLING COOLING SYSTEM WITH VACUUM FILLING UNIT](#), [17 00 009 CHECKING COOLING SYSTEM FOR WATERTIGHTNESS](#), [17 00 039 BLEED COOLING SYSTEM AND CHECK FOR WATERTIGHTNESS \(N52T, N55\)](#) or [17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATERTIGHTNESS \(N20\)](#)

64 12 600 REMOVING AND INSTALLING OR REPLACING FUEL PUMP (AUXILIARY HEATER)

Special tools required:

- [13 3 010](#)

Recycling

Fuel escapes when fuel lines are detached. Have a suitable collecting vessel ready.

Catch and dispose of escaping fuel.

Observe country-specific waste disposal regulations.

Seal off fuel hoses at fuel pump with special tool [13 3 010](#) .

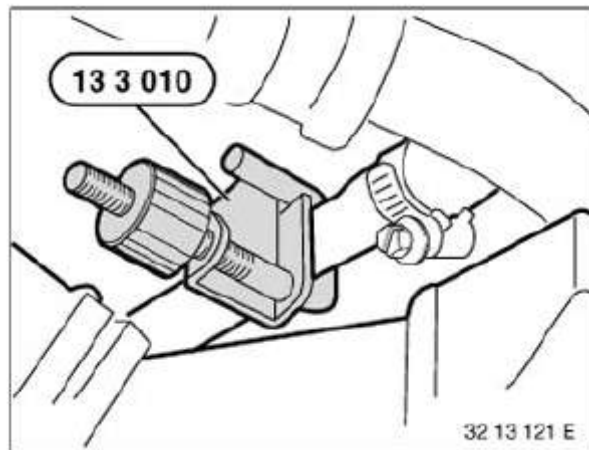


Fig. 54: Identifying Special Tool (13 3 010)

Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary work:

- Remove [LEFT UNDERBODY PANELLING](#)

Removal:

Release hose clamps (1) and pull fuel lines off.

Unlock and disconnect connector (2).

Release screw (3).

Remove electric fuel pump (4).

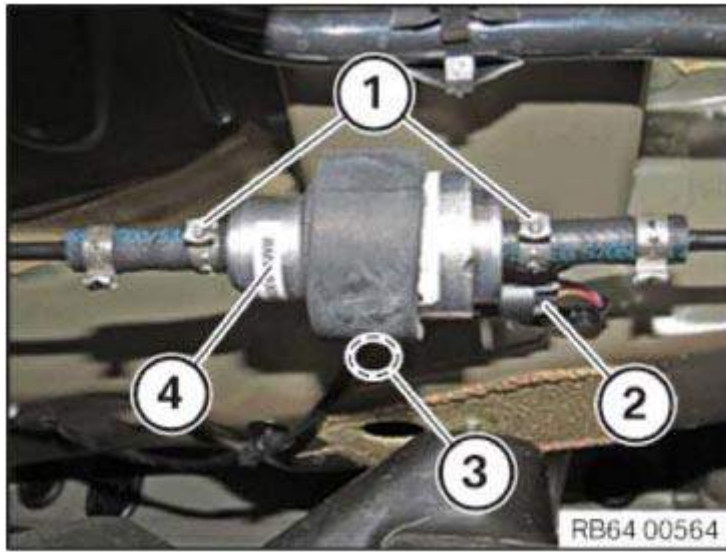


Fig. 55: Identifying Electric Fuel Pump, Hose Clamps And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Mount electric fuel pump (4) and tighten screw (3).

Insert fuel lines and fasten with new hose clamps (1).

Connect connector (2).

NOTE: Observe direction of flow of fuel pump (4).

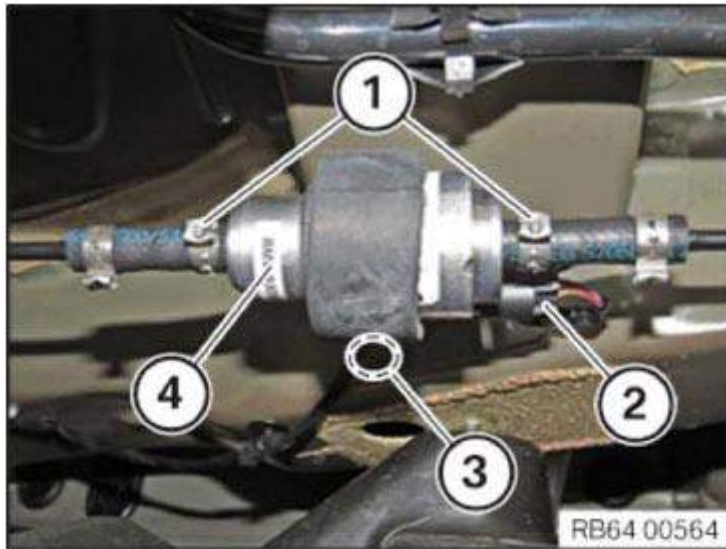


Fig. 56: Identifying Electric Fuel Pump, Hose Clamps And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Mount **LEFT UNDERBODY PANELLING**

64 12 060 REMOVING AND INSTALLING/REPLACING COMPLETE ELECTRIC AUXILIARY HEATING

Risk of burning!

Carry out repair work only after engine has cooled down.

Necessary preliminary work:

- Remove **SUPPORT FOR DASHBOARD**

Fold up the carpet (2) as shown.

Slacken nut (1).

Take off earth cable (3).

Installation note:

Ensure correct line routing.

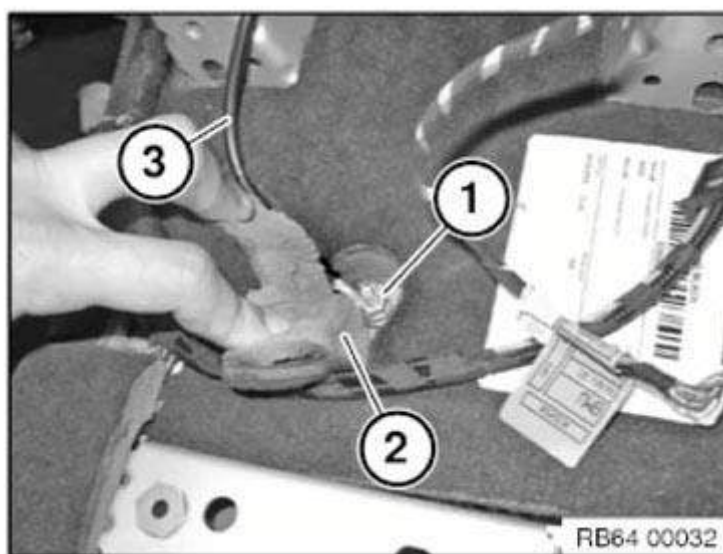


Fig. 57: Folding Back Carpet

Courtesy of BMW OF NORTH AMERICA, INC.

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

Release screws (3).

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

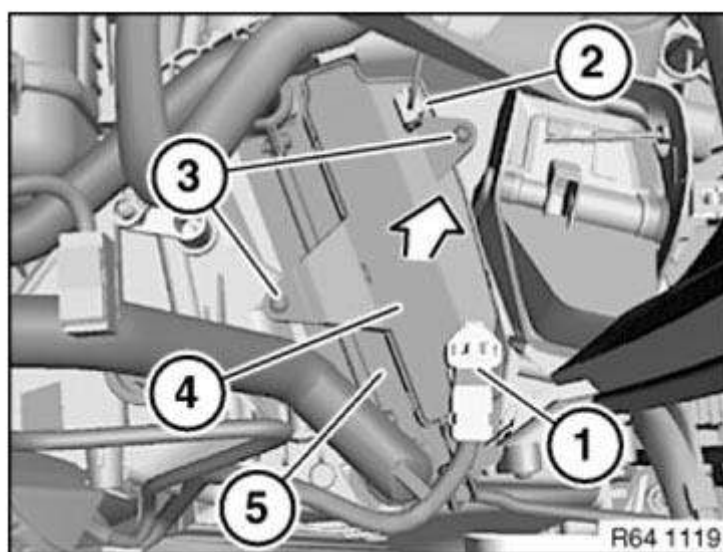


Fig. 58: Removing Electric Auxiliary Heater From Heating And Air Conditioning Unit
Courtesy of BMW OF NORTH AMERICA, INC.

64 12 120 REMOVING AND INSTALLING/REPLACING INTAKE SILENCER FOR INDEPENDENT/AUXILIARY HEATER

WARNING: Risk of burning!
Work on auxiliary heater may only be carried out when it has cooled down.

Necessary preliminary work:

- Remove **FRONT LEFT WHEEL ARCH COVER**

Removal:

Pull air intake hose (1) off stationary/auxiliary heater.

Unclip intake silencer (2) in marked area.

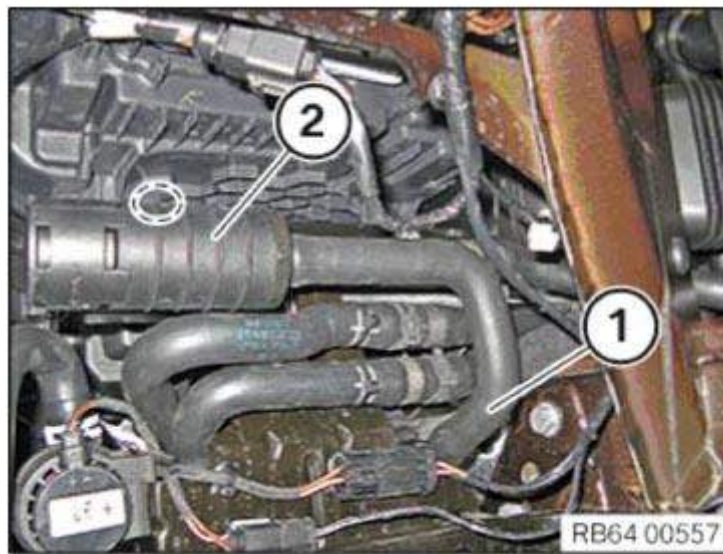


Fig. 59: Identifying Air Intake Hose And Intake Silencer
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

NOTE: The mounting clip on the intake silencer must not be damaged!

Clip in intake silencer (2) in marked area.

Connect air intake hose (1) to stationary/auxiliary heater.

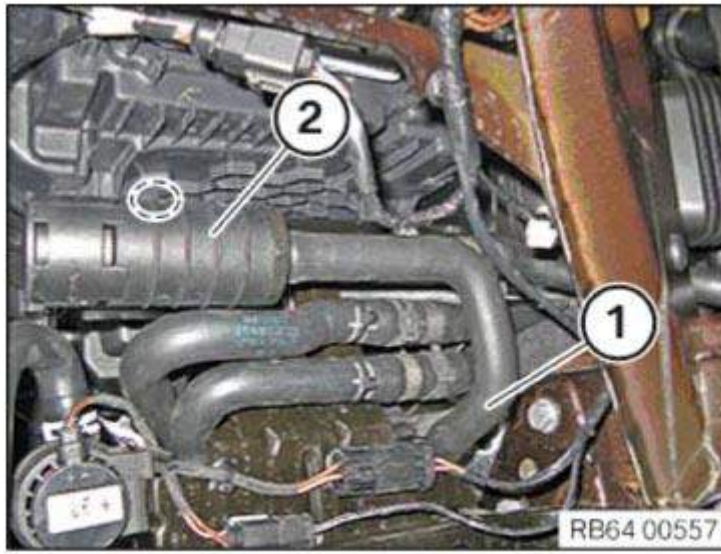


Fig. 60: Identifying Air Intake Hose And Intake Silencer

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Mount **FRONT LEFT WHEEL ARCH COVER**

64 12 089 REMOVING AND INSTALLING/REPLACING SILENCER (AUXILIARY HEATER)

WARNING:

Risk of burning!

Work on auxiliary heater may only be carried out when it has cooled down.

Necessary preliminary work:

- **REMOVE FRONT LEFT WHEEL ARCH TRIM**

Removal:

Slacken clamp (1).

Release screw (2) and remove silencer (3).

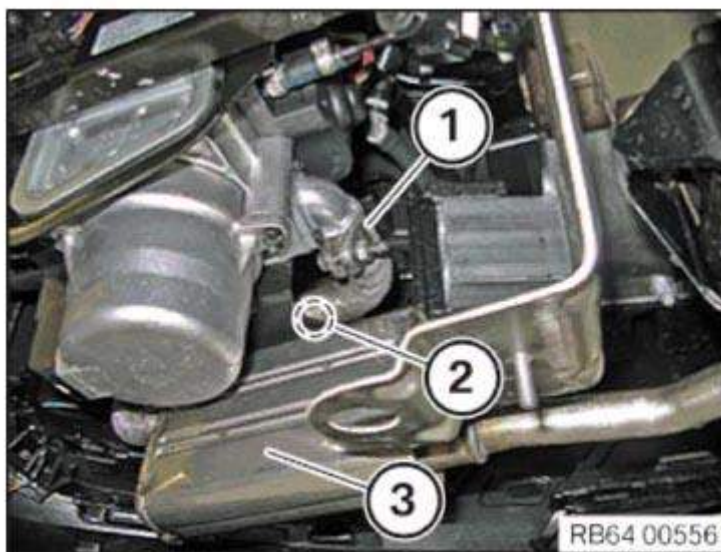


Fig. 61: Identifying Silencer, Clamp And Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Position silencer (3) correctly.

Tighten down screw (2).

Tighten clamp (1).

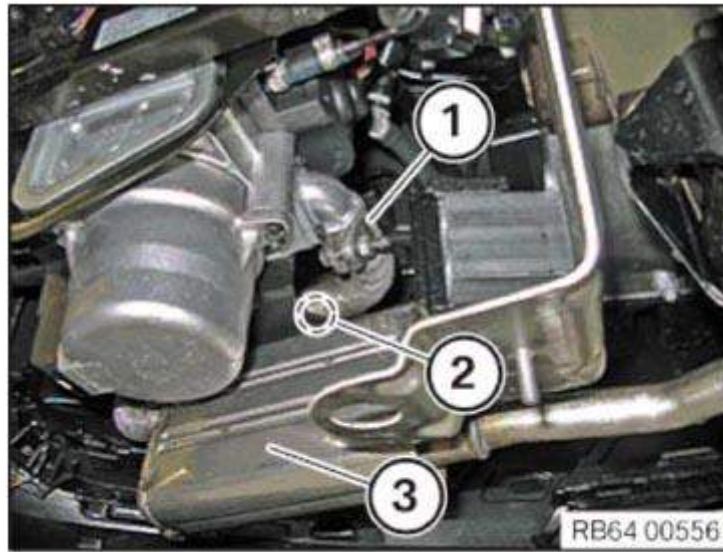


Fig. 62: Identifying Silencer, Clamp And Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Install **FRONT LEFT WHEEL ARCH COVER**

64 12 577 REPLACING CHANGEOVER VALVE FOR INDEPENDENT/AUXILIARY HEATING

WARNING:

Risk of scalding!

Only perform the following repair work on an engine that has cooled down.
FOLLOW NOTES FOR REPAIR WORK ON COOLING SYSTEM .

NOTE:

DISCONNECT coolant hoses from changeover valve for independent/auxiliary heater.

Necessary preliminary tasks:

- **REMOVE FRONT LEFT WHEEL ARCH COVER**

Removal:

Release screws (1).

Disconnect fuel line (2).

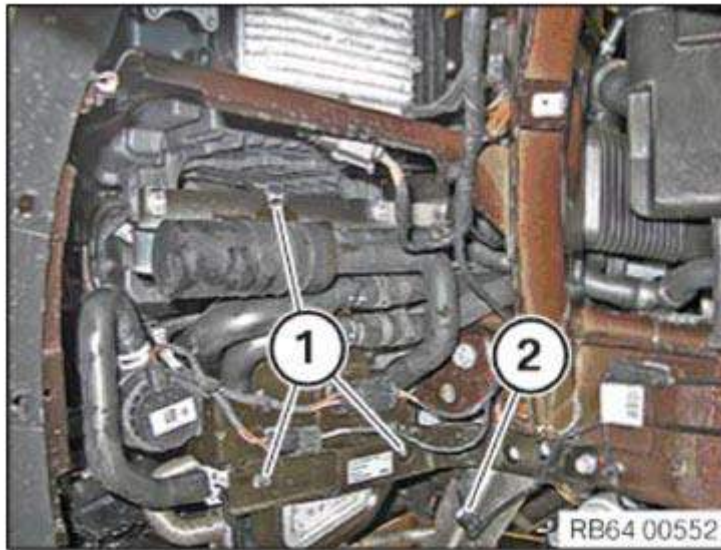


Fig. 63: Identifying Fuel Line And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Unclip the fuel line (2).

Detach the holder (3).

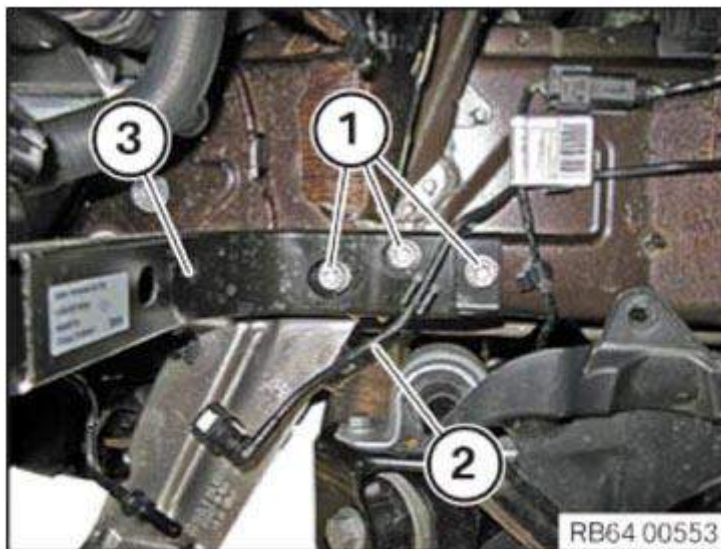


Fig. 64: Identifying Holder, Fuel Line And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Observe coolant through flow direction, mark coolant hoses before removing.

NOTE: If necessary, catch escaping coolant.

Unlock and disconnect the connector (1).

Release hose clips (2) and detach coolant hoses (3).

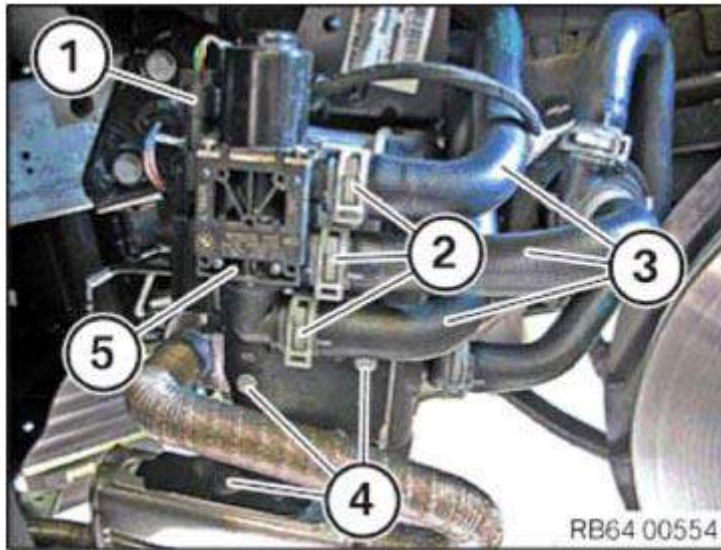


Fig. 65: Identifying Hose Clips, Connector And Coolant Hoses

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (4).

Remove changeover valve for independent/auxiliary heating (5).

Installation:

Replacement:

Release screws (1).

Remove holder (2) from changeover valve for independent/auxiliary heating (3).

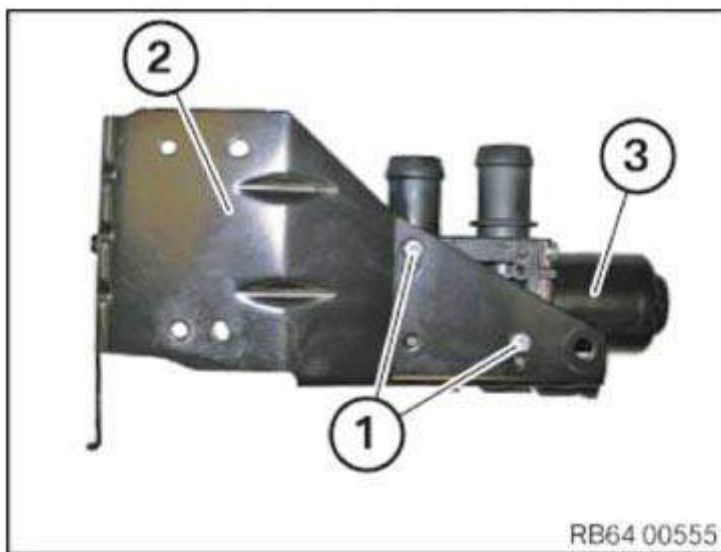


Fig. 66: Identifying Holder From Changeover Valve And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Position changeover valve for independent/auxiliary heating (5) correctly.

Tighten screws (4).

Attach coolant hoses (3) correctly and secure with spring band clamps (2).

Connect the connector (1).

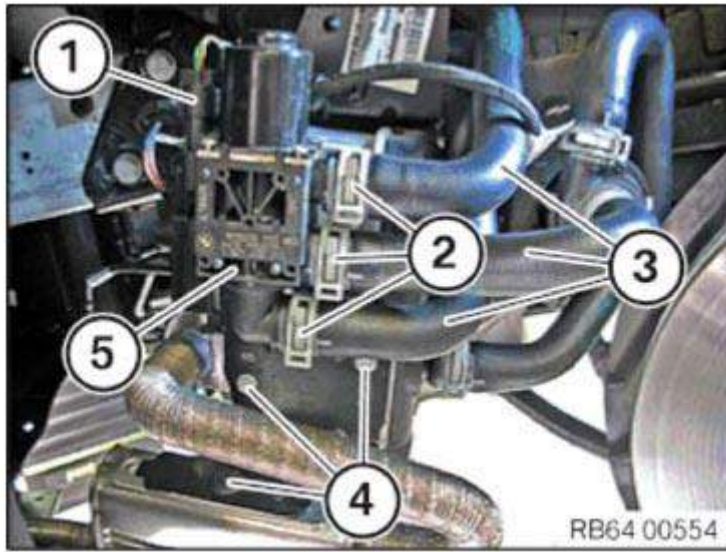


Fig. 67: Identifying Hose Clips, Connector And Coolant Hoses
 Courtesy of BMW OF NORTH AMERICA, INC.

Position the holder (3) correctly.

Tighten down the screws (1).

Clip in the fuel line (2).

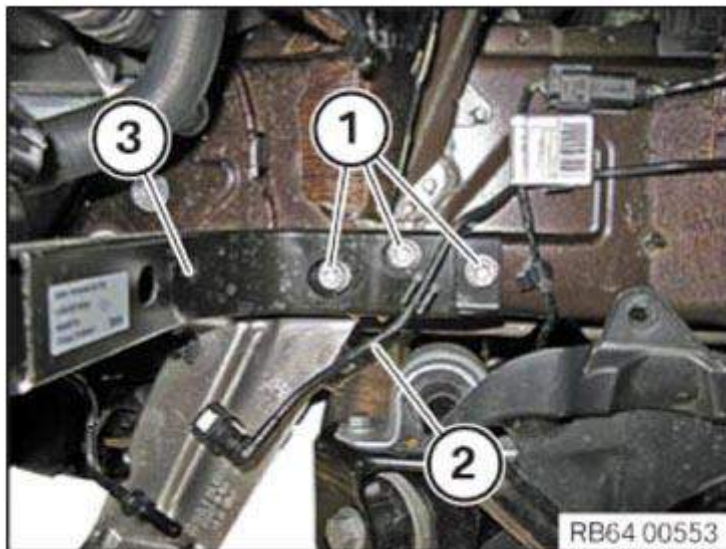


Fig. 68: Identifying Holder, Fuel Line And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Tighten down the screws (1).

Connect fuel line (2).

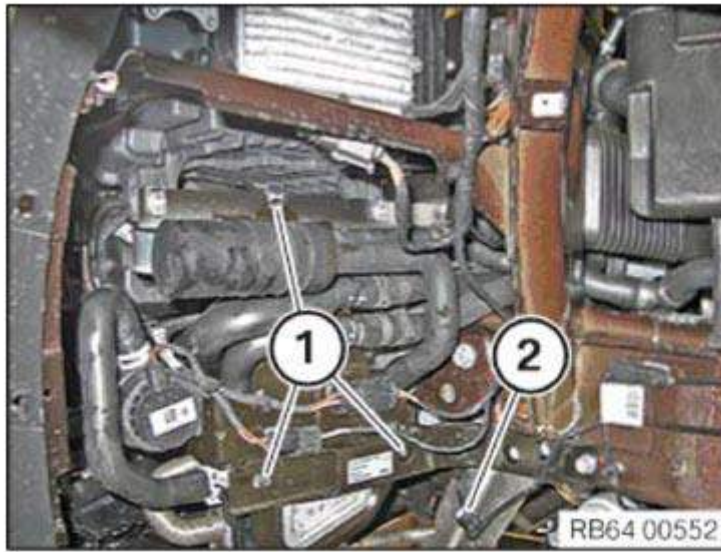


Fig. 69: Identifying Fuel Line And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- **INSTALL FRONT LEFT WHEEL ARCH COVER**
- Vent cooling system and check on watertightness. See **17 00 039 VENTING AND FILLING COOLING SYSTEM WITH VACUUM FILLING UNIT**, **17 00 009 CHECKING COOLING SYSTEM FOR WATERTIGHTNESS**, **17 00 039 BLEED COOLING SYSTEM AND CHECK FOR WATERTIGHTNESS (N52T, N55)** or **17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATERTIGHTNESS (N20)**

64 12 570 REPLACING TURBOCHARGER COOLANT PUMP FOR AUXILIARY HEATING

Special tools required:

- **13 3 010**

WARNING:

Risk of burning!

Repair work on the cooling system may only be carried out when it 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.

NOTE:

CLAMP OFF coolant hoses

Necessary preliminary tasks:

- Remove **WHEEL ARCH COVER, LEFT**

Removal:

Unlock and disconnect the connector (1).

Lift auxiliary coolant pump (2) off of holder (3).

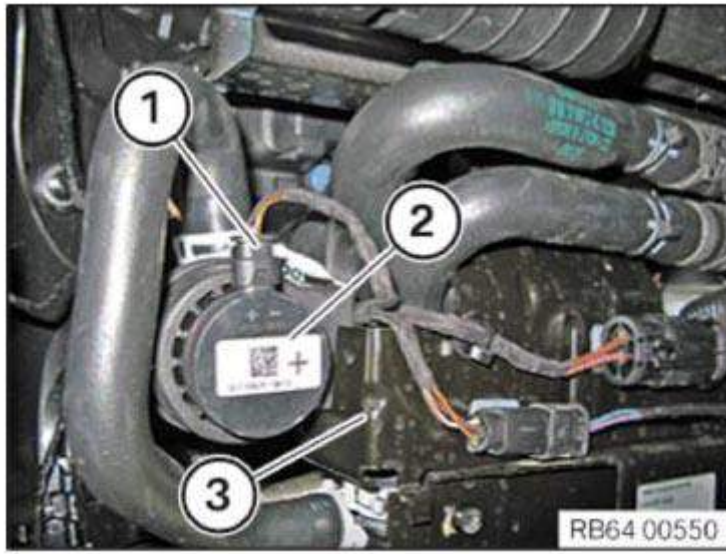


Fig. 70: Identifying Auxiliary Coolant Pump Into Holder And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect coolant hoses (2) with special tool [13 3 010](#)

Release spring band clamps (1) and pull off coolant hoses (2) from auxiliary coolant pump (3).

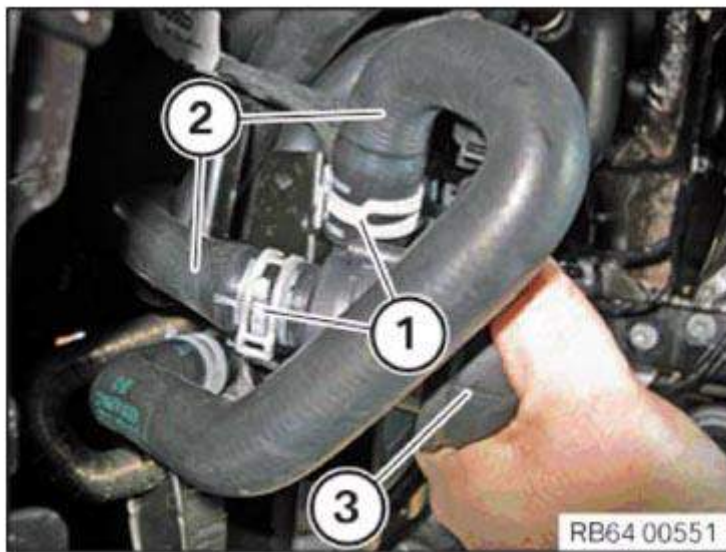


Fig. 71: Identifying Coolant Hoses From Auxiliary Coolant Pump

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Attach coolant hoses (2) on auxiliary coolant pump (3) correctly and secure with spring band clamps (1).

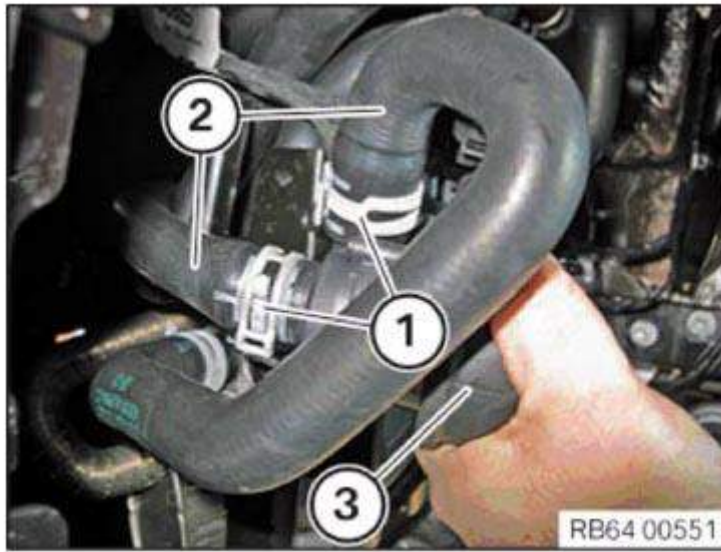


Fig. 72: Identifying Coolant Hoses From Auxiliary Coolant Pump

Courtesy of BMW OF NORTH AMERICA, INC.

Push auxiliary coolant pump (2) down into holder (3).

Connect the connector (1).

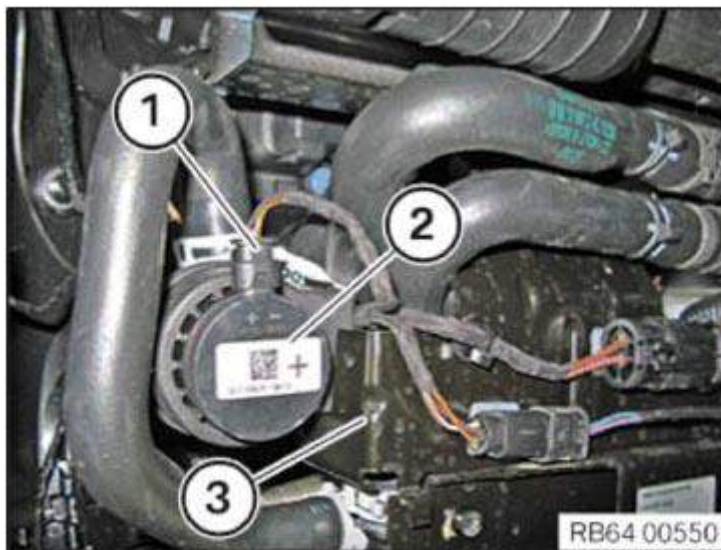


Fig. 73: Identifying Auxiliary Coolant Pump Into Holder And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Install **WHEEL ARCH COVER, LEFT**
- Fill and vent cooling system and check for leaks. See **17 00 039 VENTING AND FILLING COOLING SYSTEM WITH VACUUM FILLING UNIT** , **17 00 009 CHECKING COOLING SYSTEM FOR WATERTIGHTNESS** , **17 00 039 BLEED COOLING SYSTEM AND CHECK FOR WATERTIGHTNESS (N52T, N55)** or **17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATERTIGHTNESS (N20)**

NOZZLES AND OUTLETS

64 22 137 REMOVING AND INSTALLING OR REPLACING LEFT FRESH AIR GRILLE

Necessary preliminary work:

- Remove **DECORATIVE STRIP ON INSTRUMENT PANEL ON LEFT**

Release screws (1).

Pull out left fresh air vent (2) towards front.

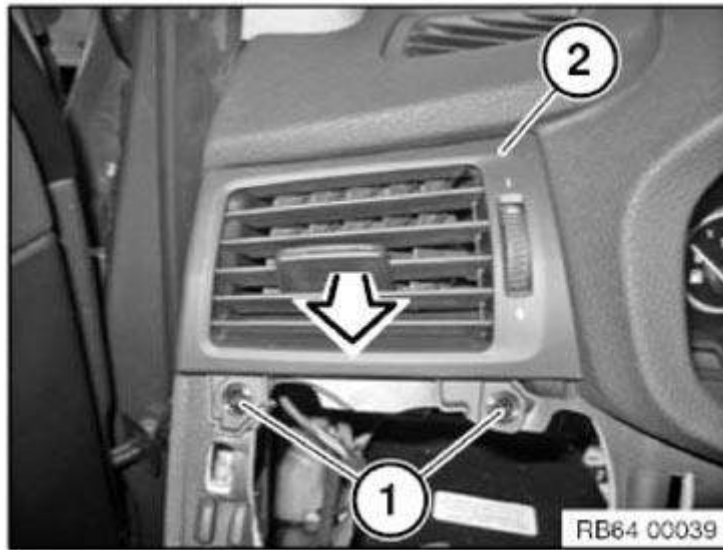


Fig. 74: Pulling Out Left Fresh Air Vent Towards Front
Courtesy of BMW OF NORTH AMERICA, INC.

Version with automatic climate control:

Unfasten plug connection (1) and disconnect.

Remove left fresh-air grille (2).

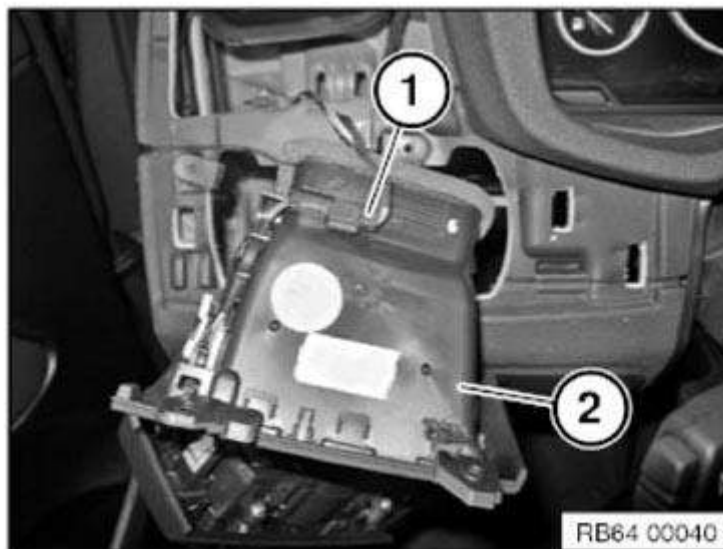


Fig. 75: Identifying Left Fresh-Air Grille And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 22 165 REMOVING AND INSTALLING/REPLACING CENTER FRESH AIR GRILLE

Necessary preliminary work:

- Remove **DECORATIVE STRIP ON DASHBOARD IN MIDDLE**

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

Replacement:

Unclip fresh air vent (1) from trim strip (2) in direction of arrow.

Remove center fresh-air grille (1).

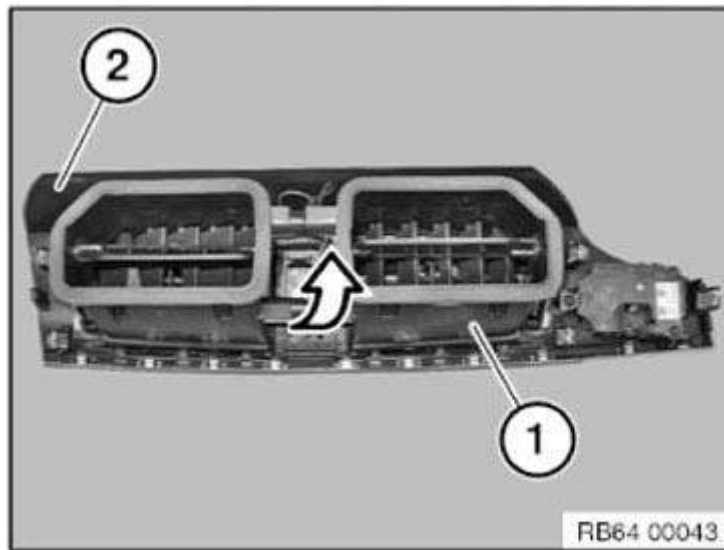


Fig. 76: Removing Fresh Air Vent From Trim Strip

Courtesy of BMW OF NORTH AMERICA, INC.

64 22 191 REMOVING AND INSTALLING/REPLACING REAR PASSENGER COMPARTMENT FRESH AIR GRILLE

Necessary preliminary work:

- Remove **CENTER ARMREST STORAGE COMPARTMENT**

Pull storage compartment (1) in the upper area out and fold down as shown.



Fig. 77: Identifying Storage Compartment In Upper Area

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (2) on fresh air grille (1).

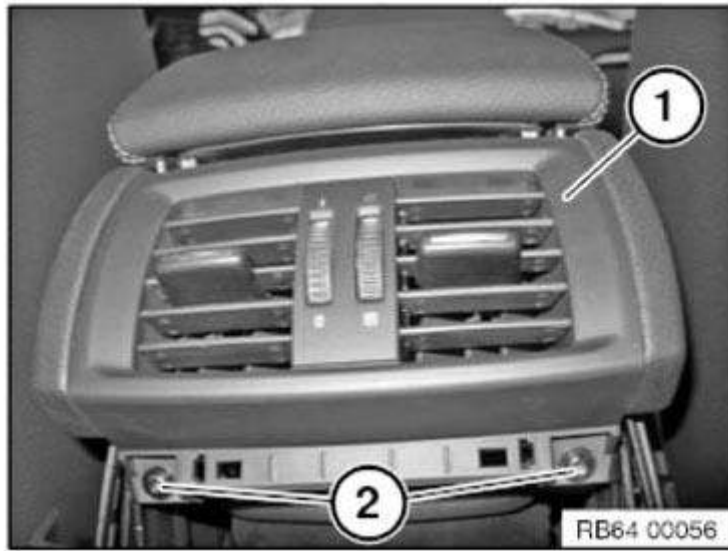


Fig. 78: Identifying Screws On Fresh Air Grille
 Courtesy of BMW OF NORTH AMERICA, INC.

Lift the fresh air grille (2) upper over the locking tabs (1) and remove toward the front.

Disconnect associated plug connection (3).

Remove fresh air grille (2).

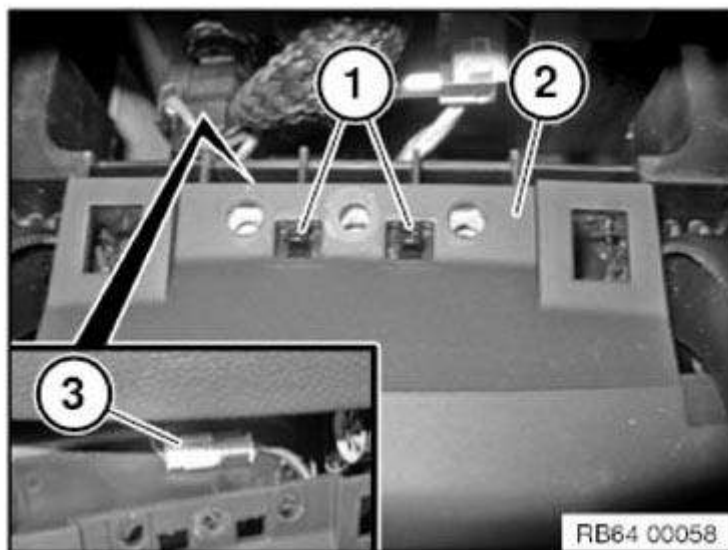


Fig. 79: Identifying Fresh Air Grille, Locking Tabs And Plug Connection
 Courtesy of BMW OF NORTH AMERICA, INC.

64 22 138 REMOVING AND INSTALLING/REPLACING RIGHT FRESH AIR GRILLE

Necessary preliminary work:

- Remove **DECORATIVE STRIP ON DASHBOARD ON RIGHT**

Release screws (1).

Remove fresh air grille (2).

Disconnect associated plug connection.

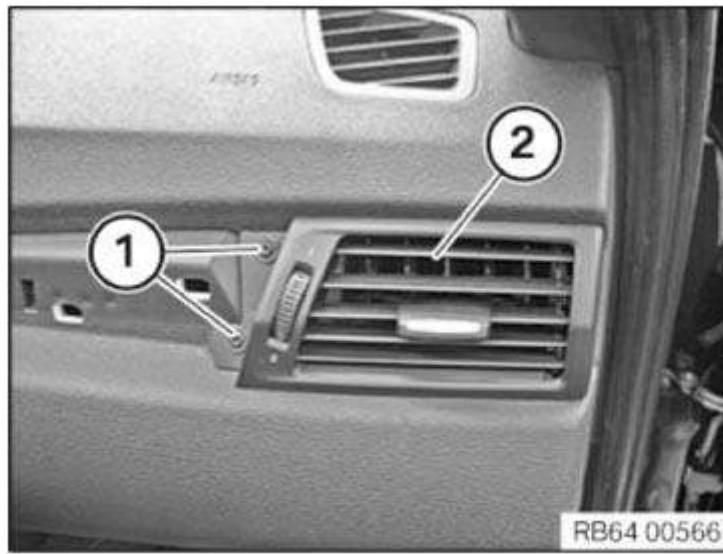


Fig. 80: Identifying Fresh Air Grille Screws

Courtesy of BMW OF NORTH AMERICA, INC.

MICROFILTER

64 31 105 REMOVING AND INSTALLING/REPLACING RIGHT MICROFILTER HOUSING COVER

Remove sealing lips at marked points.

Unclip line and water hose (1) from cover (3).

Unlock retaining lug (2).

Feed out cover (3).

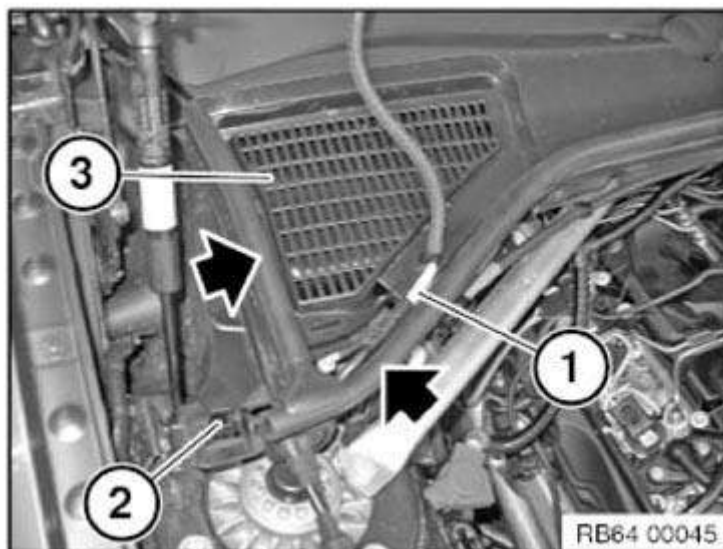


Fig. 81: Identifying Water Hose From Cover And Retaining Lug

Courtesy of BMW OF NORTH AMERICA, INC.

Cover tabs (1) must snap in correctly under cowl panel.

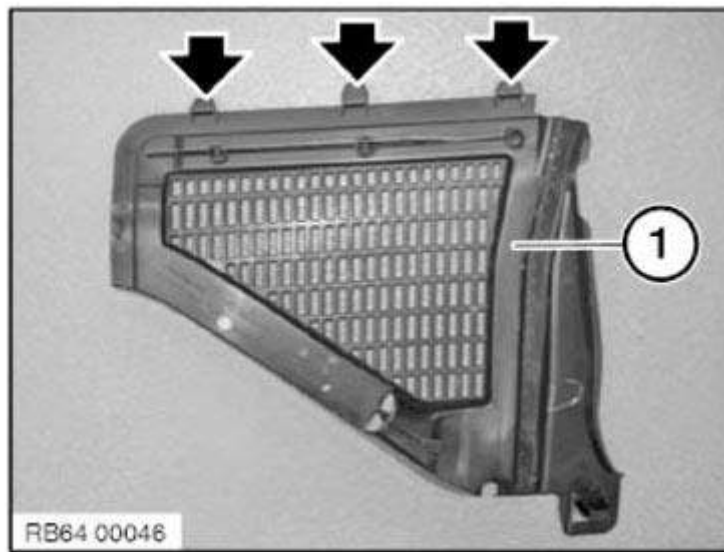


Fig. 82: Locating Cover Tabs

Courtesy of BMW OF NORTH AMERICA, INC.

64 31 010 REPLACING MICROFILTER FOR INTERIOR VENTILATION

IMPORTANT: Risk of damage!
A/C system must not be operated without the prescribed filter element.

Note on cleaning:

Spray microfilter housing from inside with BMW pollen filter housing cleaner* (observe instructions for use).

Comply **WITH NOTES AND INSTRUCTIONS ON HANDLING CLEANING AGENTS !**

Wipe away excess fluid.

This kills off germs, bacteria and fungi that cause smells.

The smell that results on the plastic parts of the microfilter housing is eliminated.

* Sourcing reference: BMW Parts Department

Remove sealing lips at marked points.

Unclip line and water hose (1) from cover (3).

Unlock retaining lug (2).

Feed out cover (3).

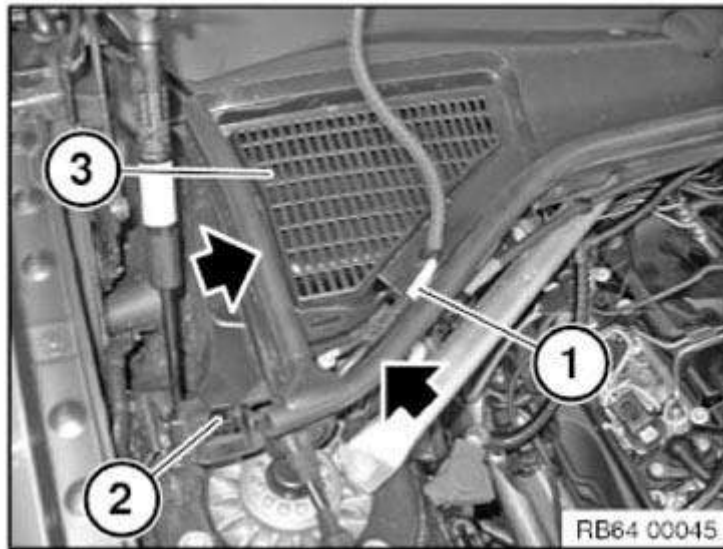


Fig. 83: Identifying Water Hose From Cover And Retaining Lug
 Courtesy of BMW OF NORTH AMERICA, INC.

Cover tabs (1) must snap in correctly under cowl panel.

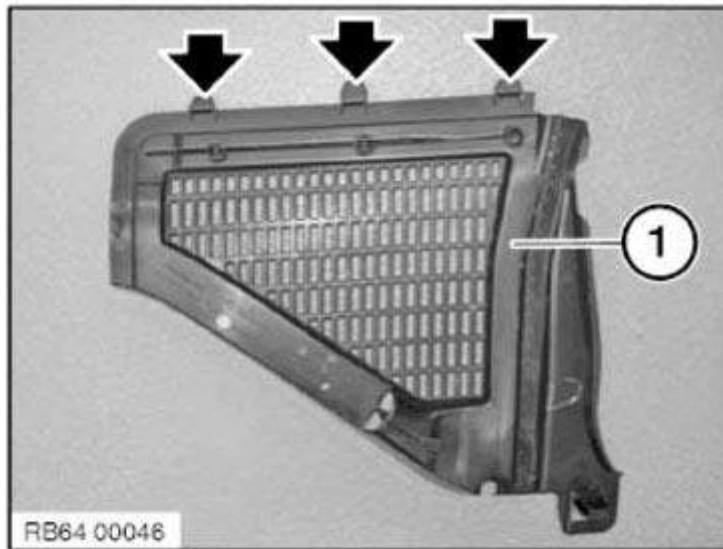


Fig. 84: Locating Cover Tabs
 Courtesy of BMW OF NORTH AMERICA, INC.

Remove filter cover (1) in direction of arrow.



Fig. 85: Removing Filter Cover

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

NOTE: For purposes of clarity, illustration shows removed cowl panel.

Ensure that the latch mechanisms on the microfilter housing cover (1) are correctly seated under retaining lugs on the microfilter housing (2).

Retaining lugs on microfilter housing (2) must be neither bent nor damaged.

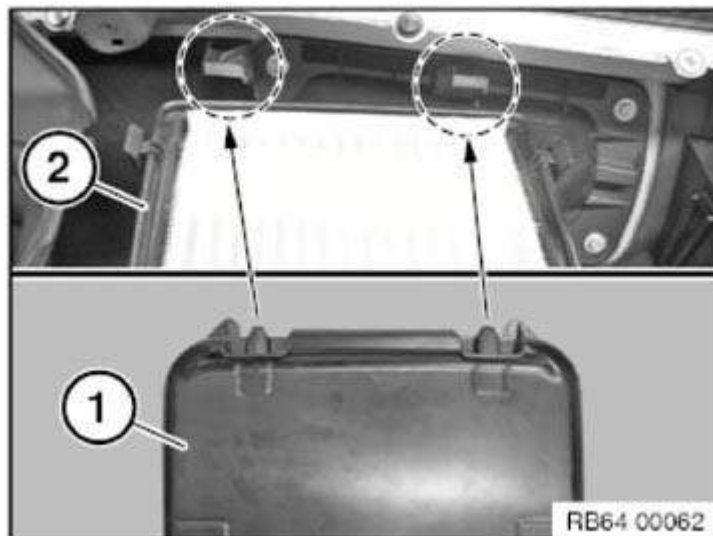


Fig. 86: Locating Retaining Lugs On Microfilter Housing

Courtesy of BMW OF NORTH AMERICA, INC.

Remove upper microfilter (1) in direction of arrow.

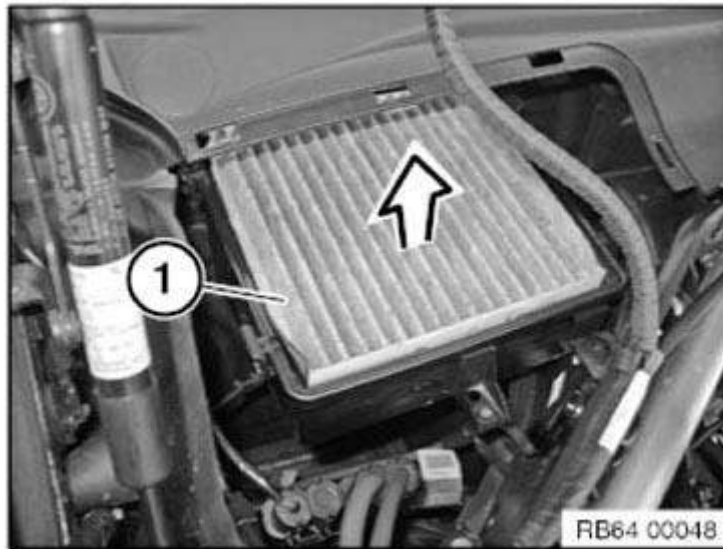


Fig. 87: Removing Upper Microfilter

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip filter frame (1) at the marked points and detach.

Remove lower microfilter (2) in direction of arrow.

Installation note:

Two micro filters are installed in the vehicle. These are connected by a hinge.

Make sure upper microfilter and lower microfilter are installed in the correct position.

The arrows on the micro filters mark the direction of the air intake.

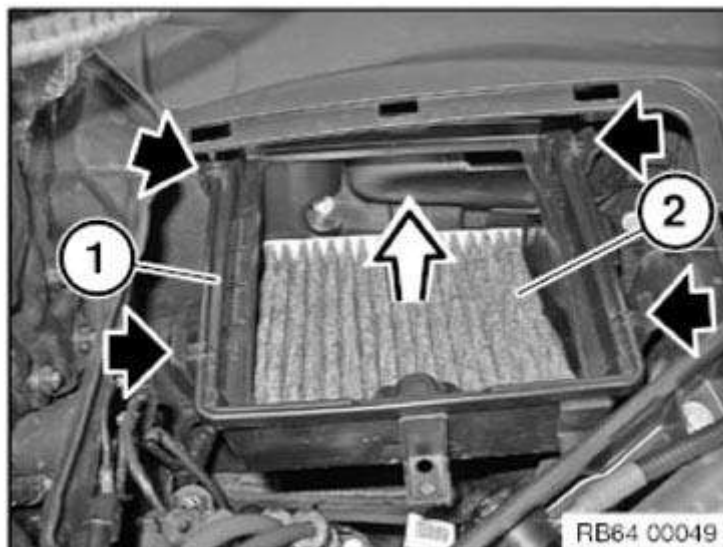


Fig. 88: Removing Lower Microfilter

Courtesy of BMW OF NORTH AMERICA, INC.

64 31 016 REPLACING RECIRCULATED AIR MICROFILTER

Special tools required:

- **00 9 322**

Open glove compartment (2).

Unclip service bracket (1) at marked location and remove in direction of arrow.

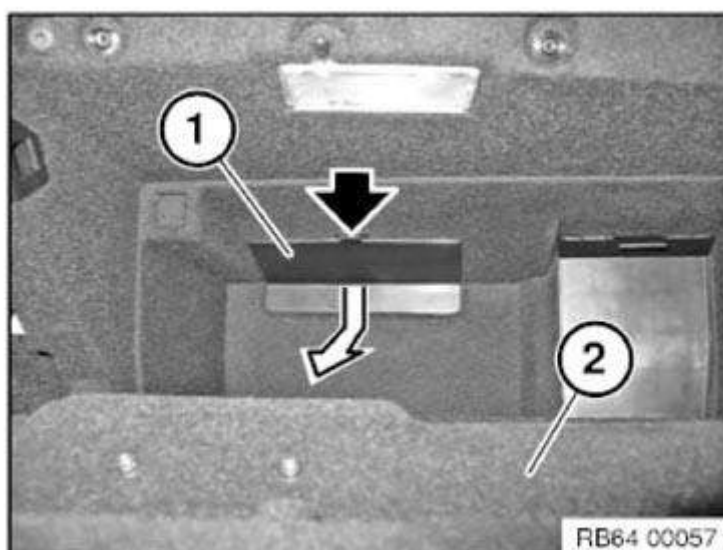


Fig. 89: Removing Service Bracket

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip flap (1) at the marked tabs and remove in direction of arrow.

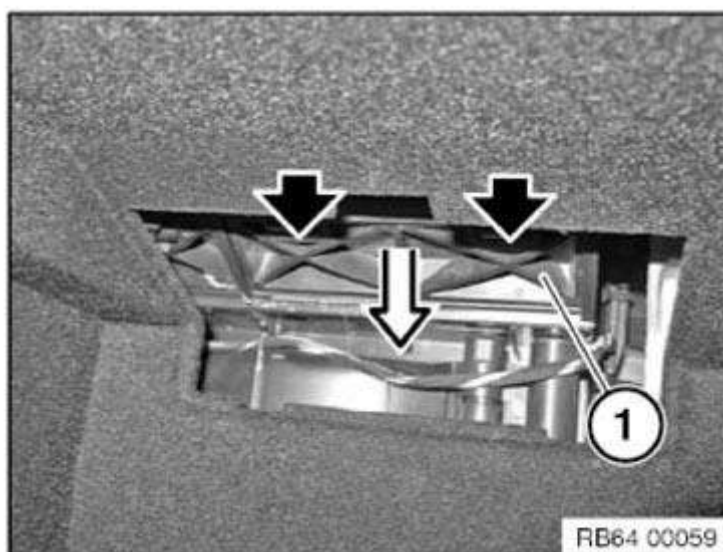


Fig. 90: Removing Flap

Courtesy of BMW OF NORTH AMERICA, INC.

Remove right microfilter (1) in direction of arrow.

If necessary, use special tool [00 9 322](#) as an aid.

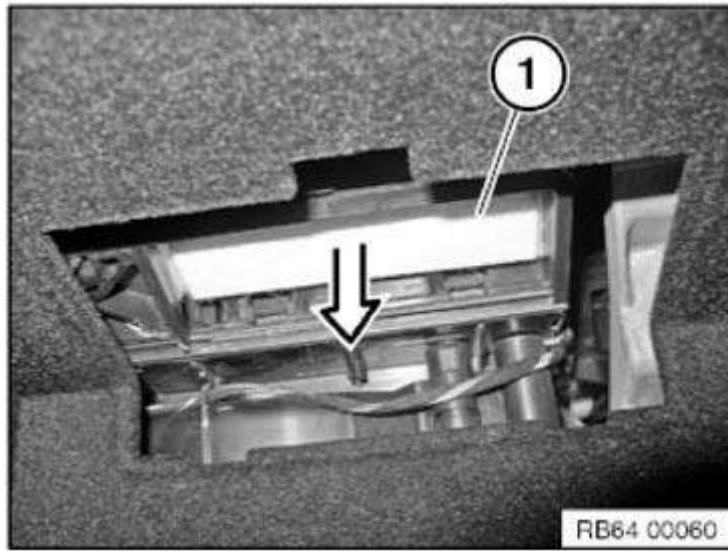


Fig. 91: Removing Right Microfilter

Courtesy of BMW OF NORTH AMERICA, INC.

First, pull the left microfilter (1) to the right and then remove toward the bottom.

If necessary, use special tool [00 9 322](#) as an aid.

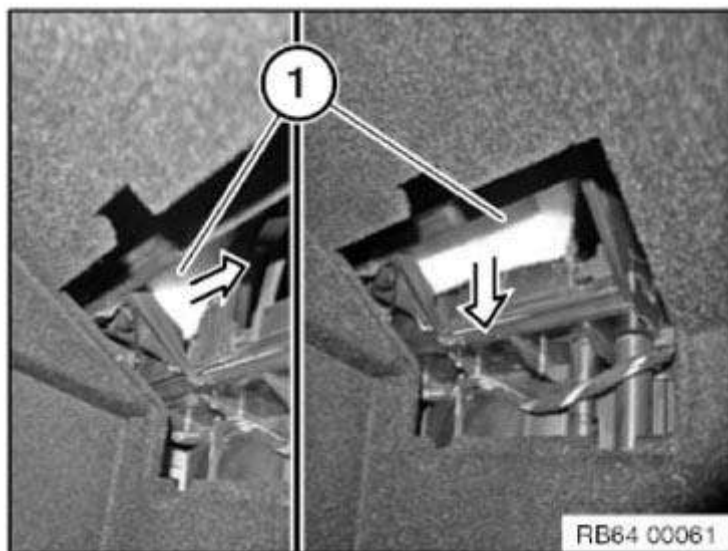


Fig. 92: Pulling Left Microfilter To Right

Courtesy of BMW OF NORTH AMERICA, INC.

AIR CONDITIONING, LEAK DETECTION

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 18Â° 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).

Heat passenger compartment:

- "A/C button" is **not** activated during the heating process
- Close all 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 Â°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 center fresh air grille, left and right)

After 5 minutes measure both ventilation temperatures with a thermometer at the same time (fresh air grille center, left and right). The measured temperature must be ≤ 16 Â°C and the difference between right and left may not be greater than 2 Â°C.

If one or both temperature specifications is not reached **DRAIN OFF HEATING AND AIR CONDITIONING SYSTEM**. Measure amount of refrigerant drawn off.

If drawn-off quantity does not correspond to **SPECIFIED FILL QUANTITY** : supplement refrigerant and repeat test.

If capacity is correct, continue troubleshooting by pressure measurement.

64 50 010 DRAWING OFF, EVACUATING AND FILLING HEATING AND AIR CONDITIONING SYSTEM (R134A)

WARNING: Only persons in possession of a professional certificate of competence for the maintenance and repair of heating and air conditioning systems are authorized 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 **depressurized** 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 instructions for **handling R134a refrigerant** . See [64 50... NOTE FOR HANDLING R134A REFRIGERANT](#) or [64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#) .
- Follow safety information for [HANDLING REFRIGERANT OIL](#) .

Risk of damage!

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

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

Vehicle-specific notes:

E60/E61 M5only:

To access refrigerant line connections, the right intake silencer housing must be removed.

Only F01/F02/F03/F04/F06/F12/F13 (N63) from 07/2012:

To access refrigerant line connections, the right intake port must be removed.

F02/F03/F04 only:

To guarantee a virtually complete draining of refrigerant from the automatic rear air-conditioning system or the hybrid battery cooling system:

In the diagnosis system test module, carry out "draining/filling refrigerant circuit".

F23/F33 only:

To access refrigerant line connections, the left front end strut must be removed.

Only M3 F8x:

In order to access the connections of the refrigerant lines, undo charge air cooler and place to one side.

NOTE: On the F01, F02, F10, F11, an additional refrigerant low pressure connection (2) may be installed specific to the engine and model year.

This refrigerant low pressure connection (2) is not to be used in the inspection!

Use exclusively refrigerant connections (1) for drawing off, evacuating and filling!



Fig. 93: Identifying Refrigerant Low Pressure Connection

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: 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.

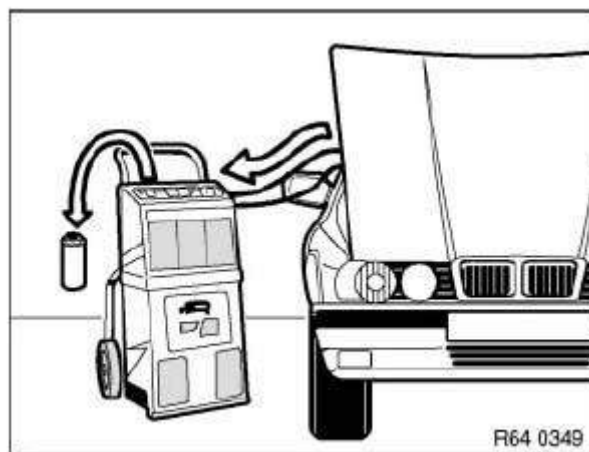


Fig. 94: Testing Air Conditioning System

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: 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 the event of complaints, perform A/C 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.

Instructions for drawing off air conditioning:

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

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

Drawn-off refrigerant oil must be changed and reintroduced via the A/C service station.

During drawing off, set blower of heating and air-conditioning unit to 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.

Instructions for evacuating off air conditioning:

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 vapor 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 blower of heating and air-conditioning unit to middle blower speed. This ensures that evacuation is more effective since the pressure on the low pressure side increases.

Notes for filling heating and air conditioning system:

Before filling with refrigerant, replace the refrigerant oil entrained 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 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 R134a refrigerant
 - It is **not permitted** to top up the refrigerant oil
- b. Loss of refrigerant per **Table 1** is exceeded
- c. Top up lost R134a refrigerant
- d. 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 **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 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 capacity of the air conditioning is found on the type plate (1).

If necessary, refer to the Technical Data for **CAPACITY**.



Fig. 95: Identifying Air Conditioning Refrigerant Capacity Label Plate
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

Reseal refrigerant filler necks on vehicle with sealing caps.

64 52... INSTRUCTIONS FOR OPENING AND PART REPLACEMENT IN REFRIGERANT CIRCUIT

Refer to **64 52... INSTRUCTIONS FOR OPENING AND PART REPLACEMENT IN REFRIGERANT CIRCUIT**.

64 53... INSTRUCTIONS FOR REPLACEMENT OF AIR CONDITIONING CAPACITORS AND RADIATOR/COOLERS

64 50... LEAK DETECTION WITH FORMING GAS

NOTE: Leak detection with forming gas replaces the leak detection that is restricted in EU countries using UV.

Observe national regulations in all other countries!

Compliance with the manufacturers operating instructions provided in the equipment case is absolutely mandatory!

IMPORTANT: Read and comply with the manufacturers operating instructions provided with the special tool particularly with regard to accident prevention, health protection and environmental protection. **Only the basic procedure is described in the following!**

IMPORTANT: Wear personal protective clothing/equipment!

NOTE: Determine the customer's use behavior prior to leak detection!

Certain user behaviors 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 heating and air conditioning system 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 system 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
- Center fresh air grille
- Covers
- Trim panels
- Air duct
- Intake silencer
- Bulkheads
- Parts of the interior equipment (automatic rear air-conditioning system)

With some vehicles, the air flaps of the automatic air flap control (LKS) must be opened.

F01 h, F02 h, F02, F03, F04:

Before filling the refrigerant circuit with forming gas, perform **test module** "Draining/Filling of refrigerant circuit".

Vehicle-specific notes I01:

Equipment specification **with and without** heat pump:

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

Equipment specification with heat pump:



Fig. 96: Identifying Heat Pump Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Carry out the following steps before filling the refrigerant circuit with forming gas:

1. **Switch on terminal 15:** To do so, press the Start/Stop button **without operating the brake pedal** .
2. **Switch off blower at IHKA controls** (so that air conditioning compressor cannot start up).
3. **Switch on low-beam headlight** (so that terminal 15 can switch off automatically after a certain period).

If nec., charge the high-voltage battery (12 V battery is charged via the high-voltage battery).

4. **Pull off connector (1).**

This state must last for the duration of the entire leak detection process!

Equipment specification **with and without** heat pump:

After filling the refrigerant circuit with refrigerant, delete fault memory!

IMPORTANT: Always perform the leak detection with a pressure of **5 bar at first!**

This is absolutely necessary to find certain leaks, such as in the area of the O-rings.

If no leak is detected, repeat the leak detection with **10 bar** .

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

Forming gas consists of 95% nitrogen and 5% hydrogen. The leak detector will detect hydrogen. If this is leaking from the refrigerant circuit even though the pressure remains, the leak detection bears no results.

Risk of damage!

IMPORTANT: Maximum approved pressure: **10 bar**

Do not start the engine during the entire procedure!

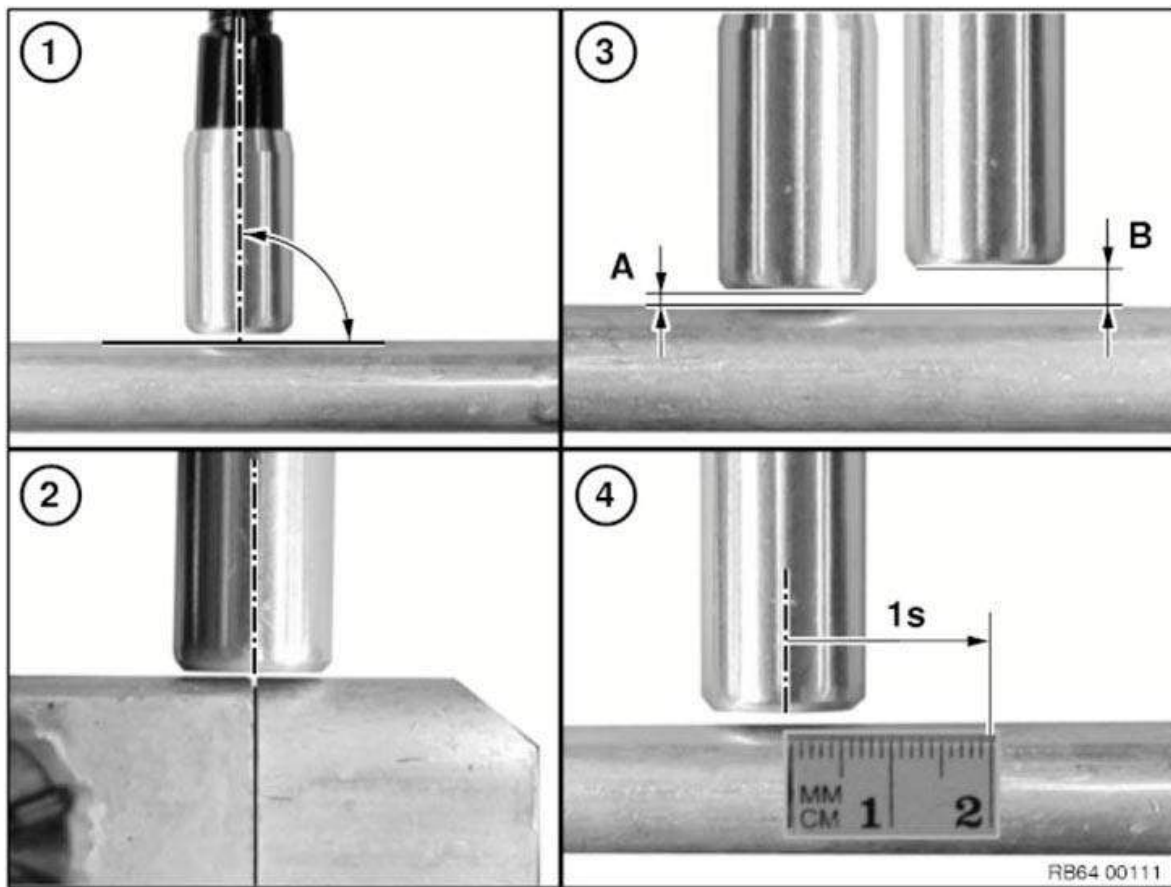


Fig. 97: Identifying Distance Between Sensor Head And Surface

Courtesy of BMW OF NORTH AMERICA, INC.

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 center of the point to be checked. Slowly guide the sensor head around the point (e.g. connection point, sealing surface, etc.).
3. The optimal distance (A) between sensor head and surface to be checked should permanently be approximately 1 mm.

Maximum distance (B) at points that are difficult to access approximately 5 mm.

4. Checking speed may not be more than maximum 2 cm per s.

NOTE: If the leak detector displays a leak, remove the sensor head from the leak for approximately 10 s.

Then check if the leak is still displayed at the same point. Repeat the process up to three times, to ensure that a leak is actually present at this point.

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

IMPORTANT: Compliance with the instructions above is absolutely mandatory!
Non-compliance will significantly reduce the efficiency of leak detection!

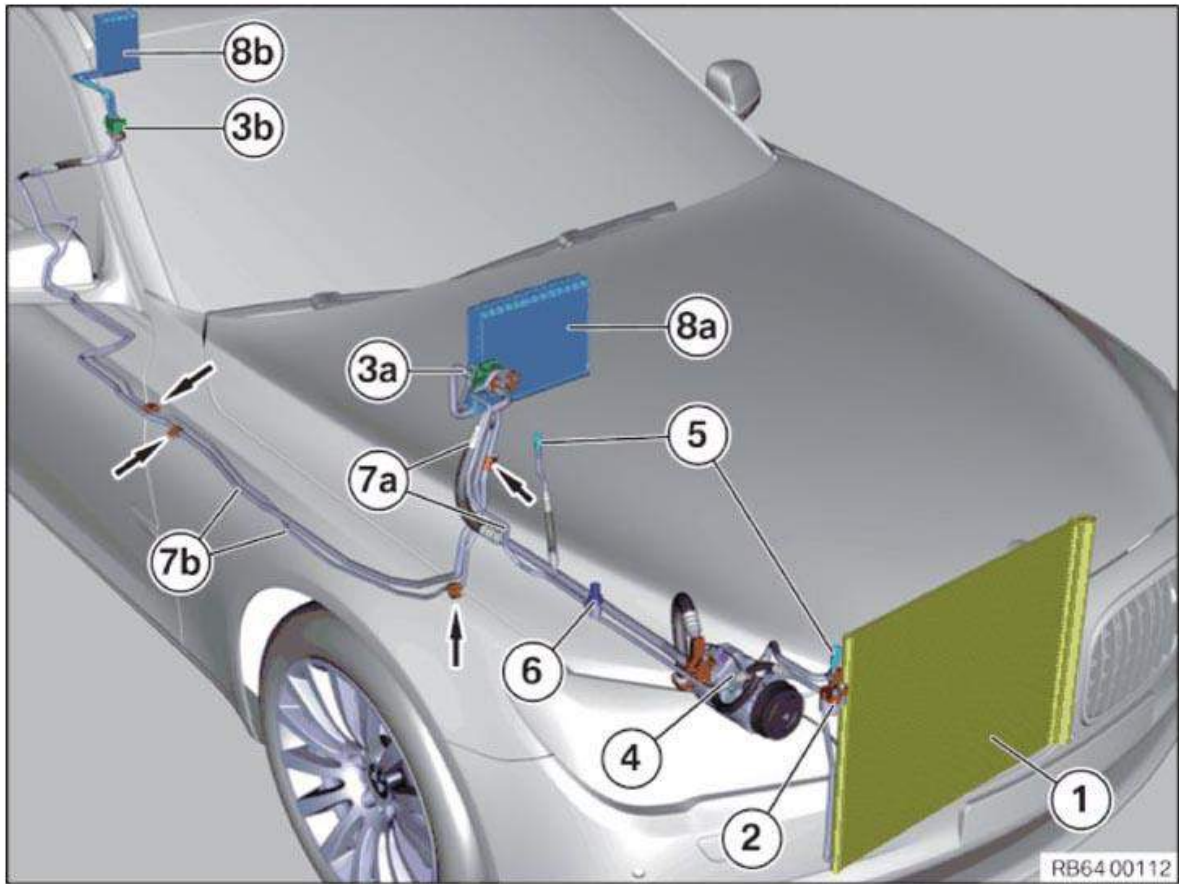


Fig. 98: Refrigerant Line Function Diagram

Courtesy of BMW OF NORTH AMERICA, INC.

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 circuit I01

Overview components refrigerant circuit I12

Pay attention to 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
 - 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
 - a. Refrigerant line, front (vehicles with and without automatic rear air-conditioning system)
 - b. Refrigerant line, rear (vehicles with automatic rear air-conditioning system)

- 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, center (3).
2. Check damaged points first.
3. Check the remainder of the air conditioning condenser.

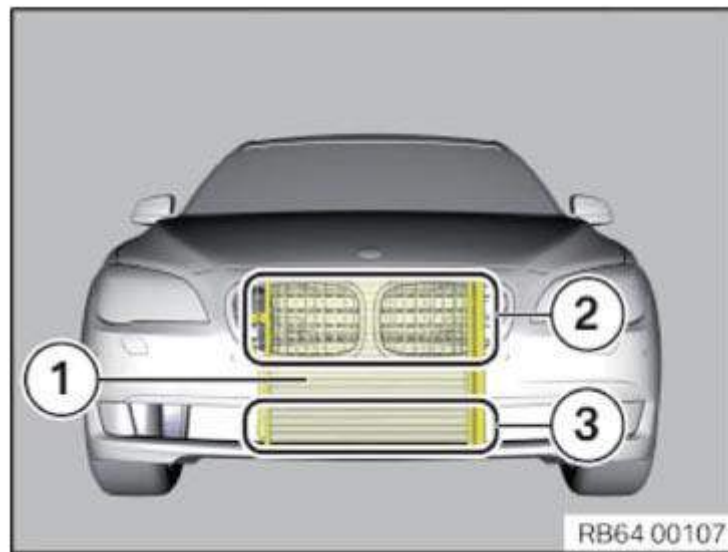


Fig. 99: Identifying Radiator Grille Area And Air Inlet Grille And Center
Courtesy of BMW OF NORTH AMERICA, INC.

2. Connection point capacitor - refrigerant line

Check the connection point between the connection at the air conditioning condenser (1) and refrigerant lines (2).

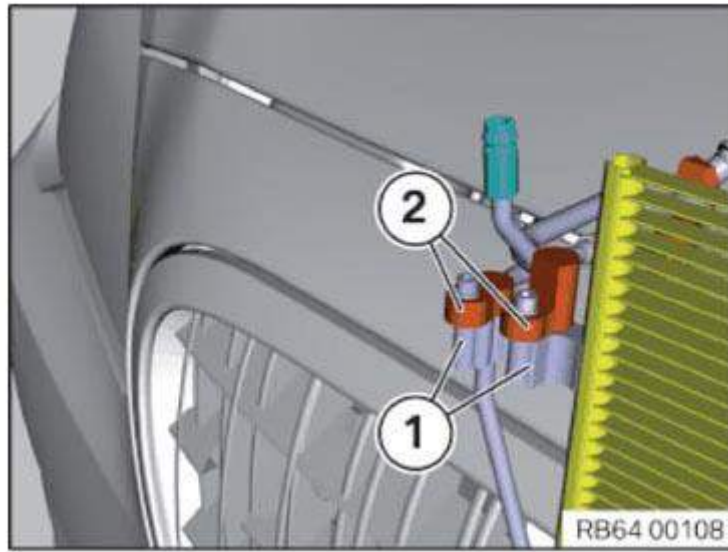


Fig. 100: Identifying Air Conditioning Condenser And Refrigerant Lines
Courtesy of BMW OF NORTH AMERICA, INC.

3. Expansion valve:

Check the connection point between the expansion valve (1) and refrigerant lines (2).

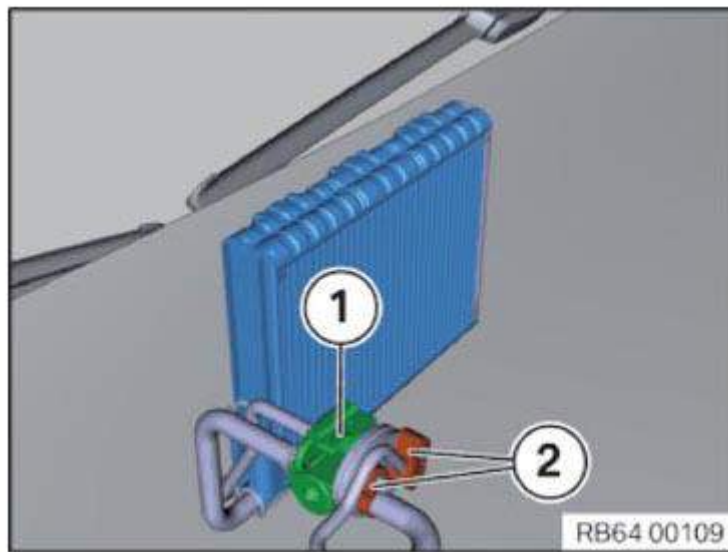


Fig. 101: Identifying Expansion Valve And Refrigerant Lines
Courtesy of BMW OF NORTH AMERICA, INC.

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.

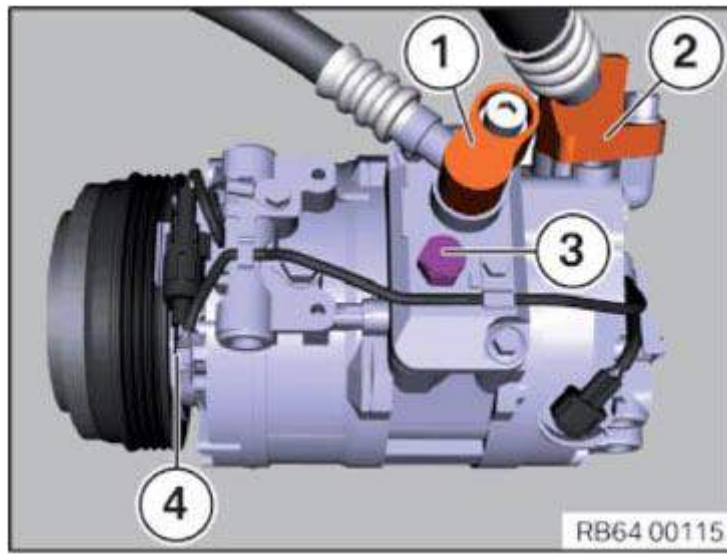


Fig. 102: Identifying Radial Shaft Seal, Pressure Connection And Relief Valve
 Courtesy of BMW OF NORTH AMERICA, INC.

5. Filler neck

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

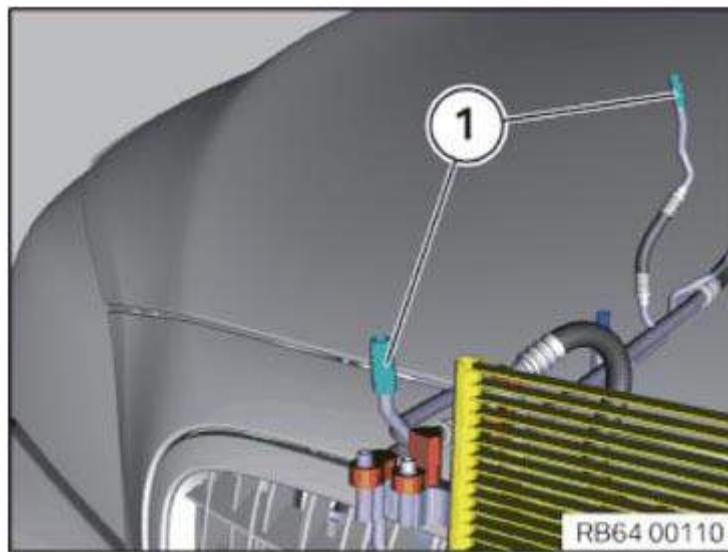


Fig. 103: Identifying Fuel Filler Neck
 Courtesy of BMW OF NORTH AMERICA, INC.

6. Refrigerant pressure sensor

Check the sealing surface between the refrigerant pressure sensor (1) and the refrigerant line (2).

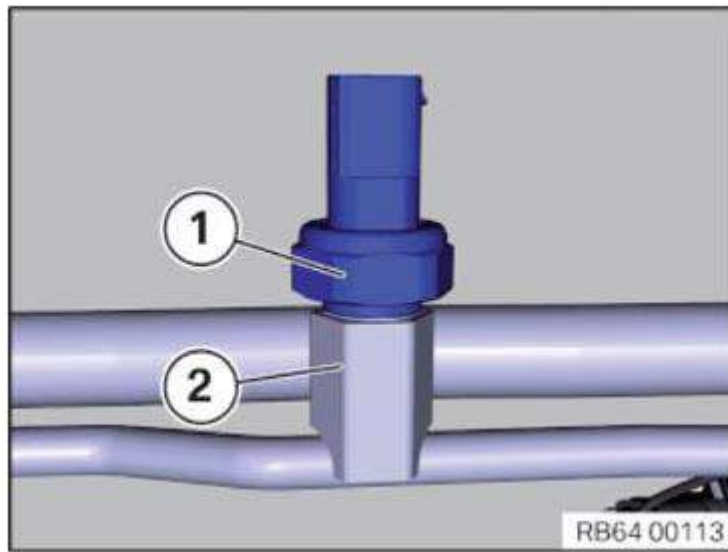


Fig. 104: Identifying Refrigerant Pressure Sensor And Refrigerant Line
Courtesy of BMW OF NORTH AMERICA, INC.

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.

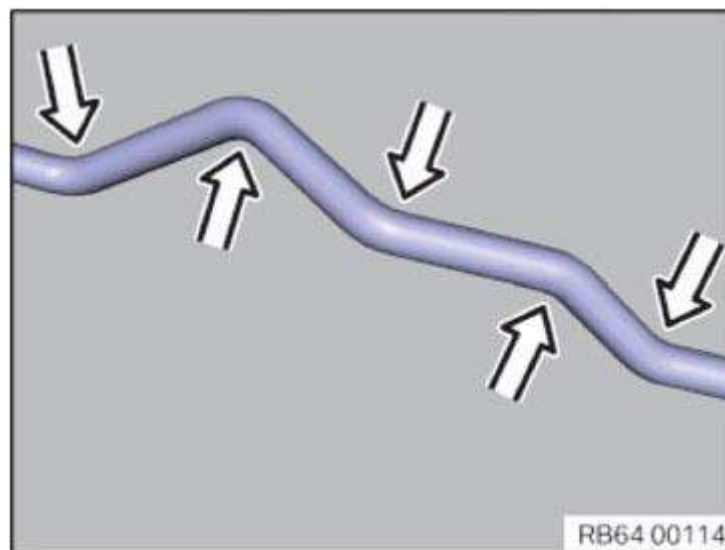


Fig. 105: Locating Refrigerant Line
Courtesy of BMW OF NORTH AMERICA, INC.

8. Evaporator:

Remove the center 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 center fresh air grille)

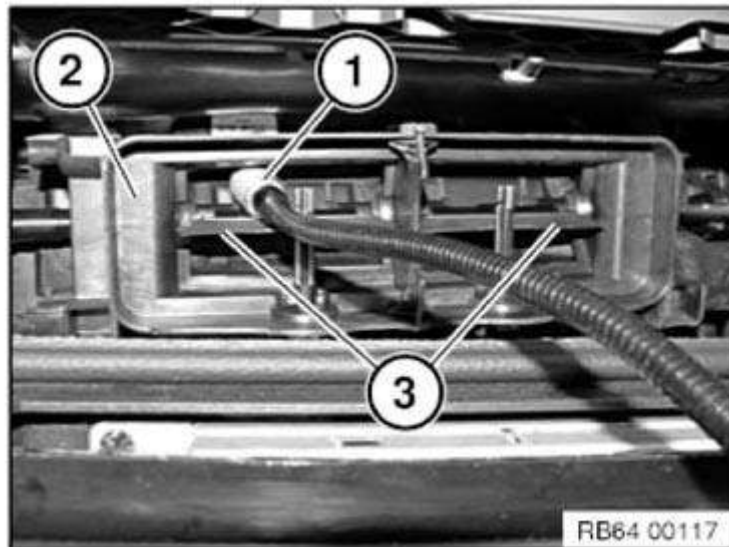


Fig. 106: Identifying Sensor Head, Fresh Air Grille And Air Flap

Courtesy of BMW OF NORTH AMERICA, INC.

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.

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)

IMPORTANT: In EU countries, only limited UV leak detection is permitted!
Observe national regulations in all other countries!

It is absolutely essential to read and comply with the equipment manufacturers operating instructions use provided in the equipment case!

IMPORTANT: Read and comply with the manufacturers operating instructions provided with the special tool particularly 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!

IMPORTANT: UV additives may not be used in vehicles with electric A/C compressors!

WARNING: Avoid contact with refrigerant.
Follow safety precautions when handling refrigerant . See **64 50... NOTE FOR HANDLING R134A REFRIGERANT** , **64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A** or **64 50... SAFETY INFORMATION FOR HANDLING REFRIGERANT OIL** .

Ultraviolet lamp gets very hot in the radiation area!

Do not use the ultraviolet lamp without the filter glass.
IMPORTANT: Eyes and skin will suffer damage if the ultraviolet lamp is used without the filter glass.

When using the ultraviolet lamp, wear the safety goggles provided in the case.

NOTE:

- **Fill the hose system of the hand pump completely with UV additive PRIOR to use**
- **The UV additive may be used exclusively for BMW-approved refrigerant oils**
- **Do not operate the air conditioning system while the hand pump is connected or in use**
- **The air conditioning system must always be filled with an adequate amount of refrigerant to enable the leak-detecting agent to be properly distributed**

Necessary preliminary tasks:

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

Leak areas which have already been detected by UV light must carefully cleaned with the cleaning agent provided in the case.

On initial use:

Connect hand pump (1) to additive cartridge (2) and hose piece (3).

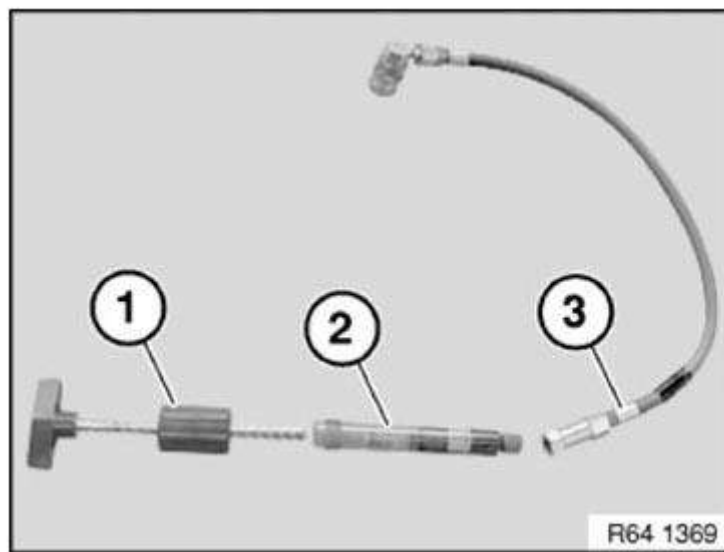


Fig. 107: Identifying Hand Pump, Additive Cartridge And Hose Piece
Courtesy of BMW OF NORTH AMERICA, INC.

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.

IMPORTANT: The entire hand pump with hose system must not be disassembled again once the filling work has been completed.

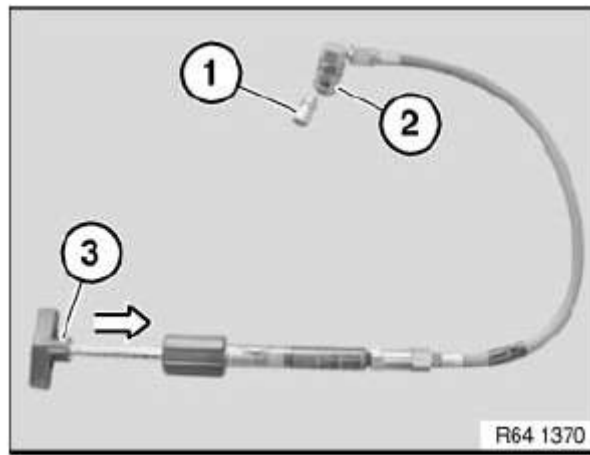


Fig. 108: Attaching Vent Valve To Quick-Release Coupling

Courtesy of BMW OF NORTH AMERICA, INC.

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** :

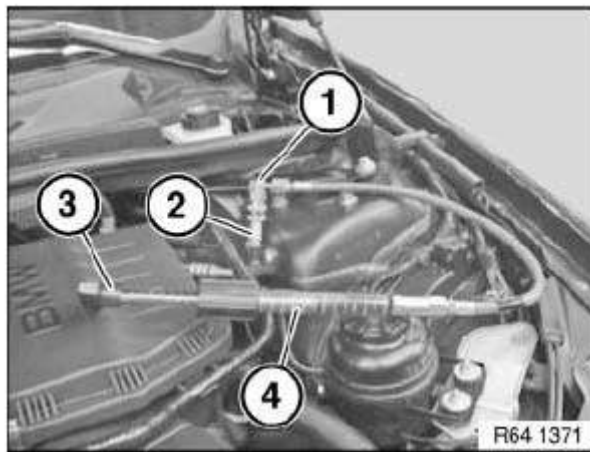


Fig. 109: Identifying Pressure Connection, Hand Pump And Quick-Release Coupling

Courtesy of BMW OF NORTH AMERICA, INC.

- 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 quick-release coupling (1) and if necessary use the cleaning agent contained in the special tool case to clean up the UV additive.

Further tasks:

- Start engine
- Run air conditioning system at highest stage for 5 - 10 minutes in order to ensure adequate distribution of dye in the system
- Turn off engine.
- Check all air conditioning system components for possible leaks

- Possible leakage is lit up green when the UV leak-detecting lamp and UV-absorbing safety goggles are used

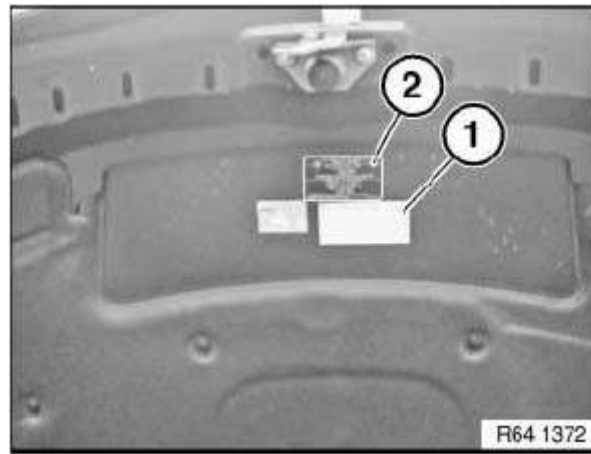


Fig. 110: Identifying Information Label Of Air Conditioning
Courtesy of BMW OF NORTH AMERICA, INC.

Complete accompanying information label (1) with the relevant data and attach in an easily visible position next to the filling capacity information label (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 safety goggles and gloves when working on the refrigerant circuit.

- **FOLLOW SAFETY INFORMATION 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 colorless, odorless 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 charged refrigerant pressure flasks in a place where they are not exposed to direct sunlight or any other heat source (max. 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 extinguishant. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

If the protective caps on the filling 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 heating and air conditioning 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.

R134a absorbs very small amounts of moisture. Therefore, seal off opened pipes, condenser, evaporator, compressor and dryer flask immediately with plugs.

- If an A/C system has been completely drained by leakage, accident or repair, the **DESICCANT INSERT** must be replaced as excessive moisture may have entered the system.

With exchange parts, the plugs may only be removed immediately before the lines are connected. In the event of warranty claims, the used parts must be provided with plugs to be able to determine the cause of the damage.

Installation note:

After each refill of an A/C system, check that the protective caps of the filler valves are hand-tight. They serve as additional seals.

64 50... SAFETY INFORMATION FOR HANDLING REFRIGERANT OIL

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 depressurized AFTER drawing off!

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

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

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:

IMPORTANT:

- Do not store in the vicinity of flames, heat sources or strongly oxidizing materials
- Suitable extinguishants are carbon dioxide (CO₂) dry 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 are discharged into aboveground water supplies, drainage systems or subsoil.

64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure! Work on the refrigerant circuit may only be carried out by experts!

Draw off refrigerant without fail BEFORE all repair work on the refrigerant circuit.

The refrigerant circuit is 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 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 vapors 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.

AC HOUSING/EVAPORATOR, SWITCHING ELEMENTS

64 52... INSTRUCTIONS FOR OPENING AND PART REPLACEMENT IN REFRIGERANT CIRCUIT

Refer to 64 52... INSTRUCTIONS FOR OPENING AND PART REPLACEMENT IN REFRIGERANT CIRCUIT.

64 51 520 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE

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 . See 64 50... NOTE FOR HANDLING R134A REFRIGERANT or 64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A**
- **HANDLING REFRIGERANT FLUID**

IMPORTANT: Risk of damage!
Restart engine only when A/C system has been correctly filled.

Follow NOTES for opening and replacing parts in refrigerant circuit.

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

- Replace DESICCANT INSERT FOR AIR CONDITIONING.

Necessary preliminary tasks:

- DRAIN OFF AIR CONDITIONING SYSTEM
- Remove TENSION STRUT FROM SPRING STRUT DOME ON LEFT

Release screws (1).

Tightening torque 64 53 11AZ .

Detach refrigerant lines (2) from expansion valve (3).

Installation note:

Replace sealing rings.

Use special tool 00 9 030 to install sealing rings without damaging them.

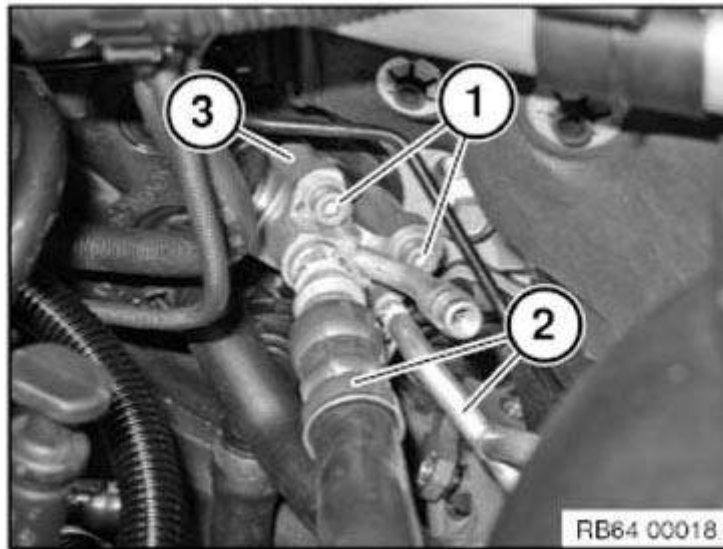


Fig. 111: Identifying Refrigerant Lines From Expansion Valve And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque **64 53 10AZ**.

Remove expansion valve (2) from retaining clip.

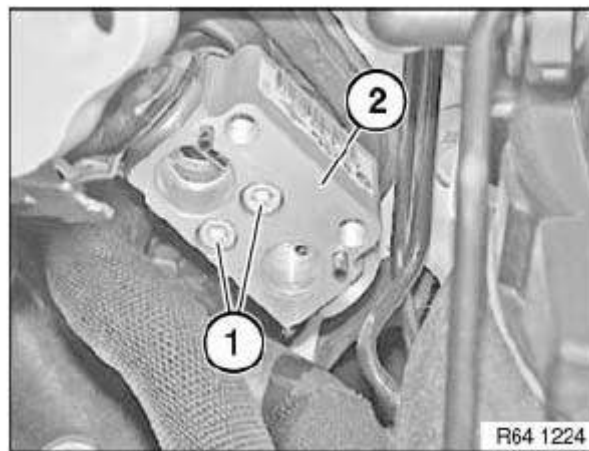


Fig. 112: Identifying Expansion Valve And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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.

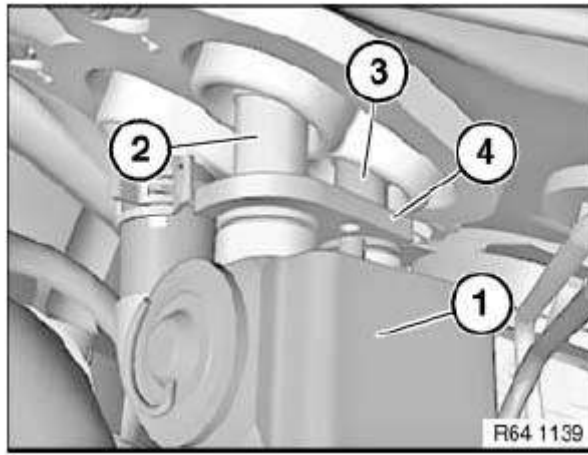


Fig. 113: Identifying Expansion Valve, Refrigerant Lines And Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **EVACUATE AND FILL AIR CONDITIONING SYSTEM**

64 51 591 REMOVING AND INSTALLING/RENEWING EVAPORATOR

Necessary preliminary work:

- 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).

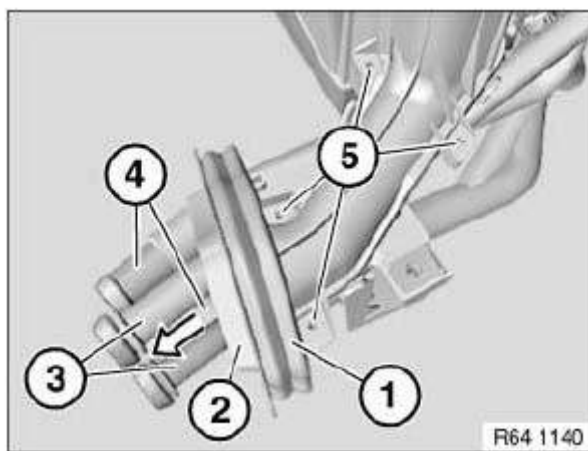


Fig. 114: Pulling Rubber Grommet And Foam Seal Over Pipes
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Carefully remove seal (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 cable (4) of temperature sensor for cold-air distributor (3) towards rear of heater/air conditioner (5).

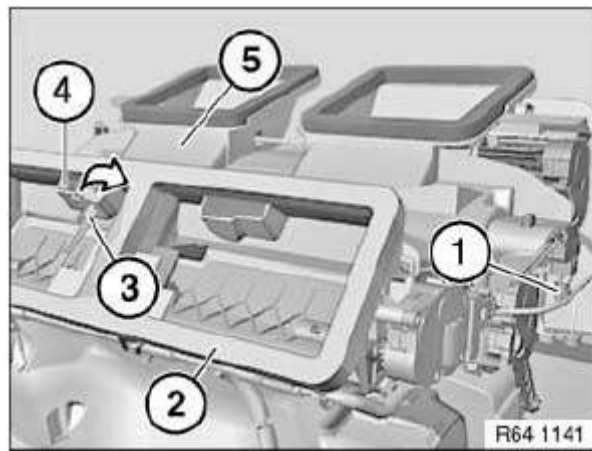


Fig. 115: Turning Temperature Sensor For Cold-Air Distributor
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

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

Installation note:

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

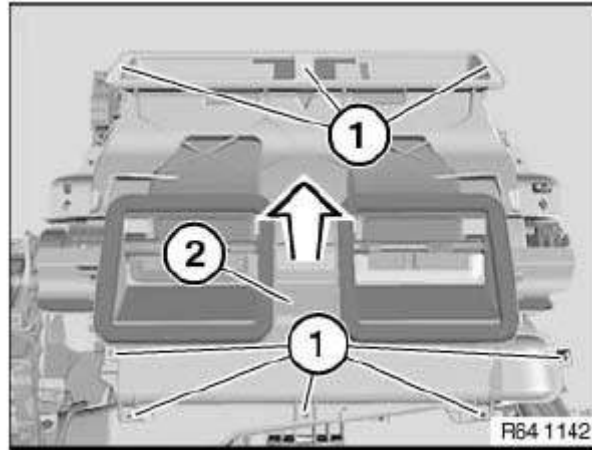


Fig. 116: Removing Upper Housing Of Heater/Air Conditioner
Courtesy of BMW OF NORTH AMERICA, INC.

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

Installation note:

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

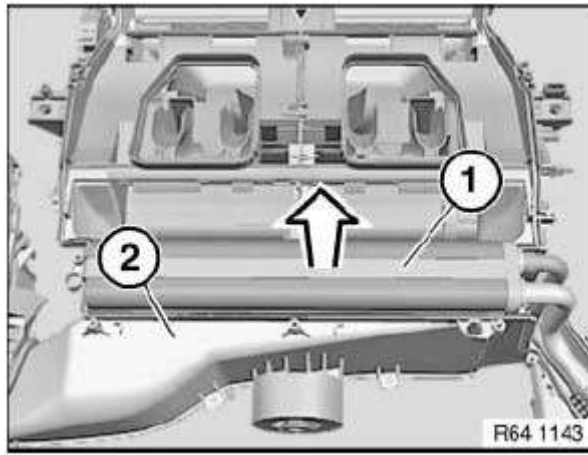


Fig. 117: Pulling Evaporator Out Of Lower Housing Of Heater/Air Conditioner
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Do not bend radiator fins.

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

64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N20, N57)

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 . See [64 50... NOTE FOR HANDLING R134A REFRIGERANT](#) or [64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#)
- [HANDLING REFRIGERANT FLUID](#)

IMPORTANT: Risk of damage!
Restart engine only when A/C system has been correctly filled.

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

NOTE:

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

- Replace [DESICCANT INSERT FOR AIR CONDITIONING](#).

Necessary preliminary work:

- [DRAIN OFF AIR CONDITIONING SYSTEM](#)
- Remove acoustic cover

Release screws (1).

Tightening torque [64 53 11AZ](#) .

Detach refrigerant lines (2) from expansion valve (3).

Installation note:

Replace sealing rings.

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

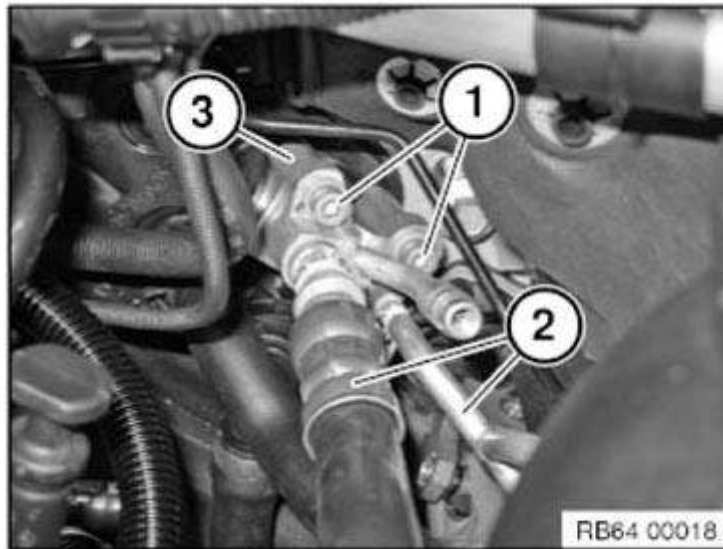


Fig. 118: Identifying Refrigerant Lines From Expansion Valve And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque [64 53 10AZ](#).

Remove expansion valve (2) from retaining clip.

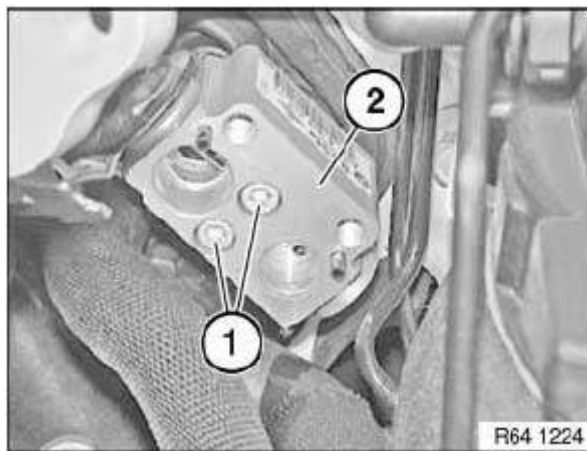


Fig. 119: Identifying Expansion Valve And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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.

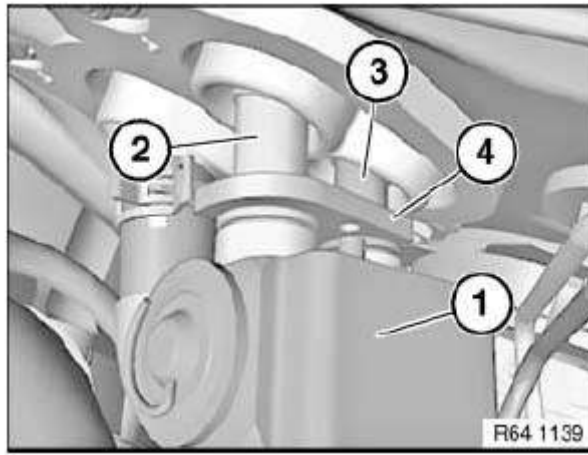


Fig. 120: Identifying Expansion Valve, Refrigerant Lines And Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **EVACUATE AND FILL AIR CONDITIONING SYSTEM**

64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N55, N47)

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 . See **64 50... NOTE FOR HANDLING R134A REFRIGERANT** or **64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A**
- **HANDLING REFRIGERANT FLUID**

IMPORTANT: Risk of damage!
Restart engine only when A/C system has been correctly filled.

Follow **NOTES** for opening and replacing parts in refrigerant circuit.

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

- Replace **DESICCANT INSERT FOR AIR CONDITIONING**.

Necessary preliminary tasks:

- **DRAIN OFF AIR CONDITIONING SYSTEM**
- Remove intake silencer housing . See **13 71 000 REMOVING/REPLACING INTAKE SILENCER HOUSING (N47 D20 O1)** or **13 71 000 REMOVING AND INSTALLING/REPLACING INTAKE SILENCER HOUSING (N55)**

Release screws (1).

Tightening torque **64 53 11AZ** .

Detach refrigerant lines (2) from expansion valve (3).

Installation note:

Replace sealing rings.

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

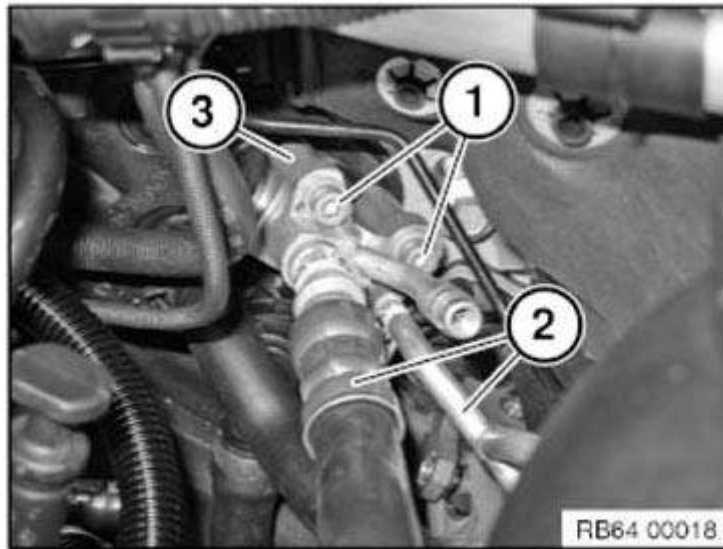


Fig. 121: Identifying Refrigerant Lines From Expansion Valve And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque [64 53 10AZ](#).

Remove expansion valve (2) from retaining clip.

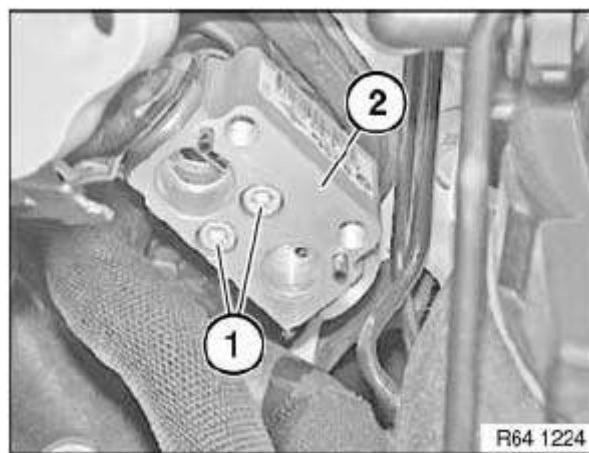


Fig. 122: Identifying Expansion Valve And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

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.

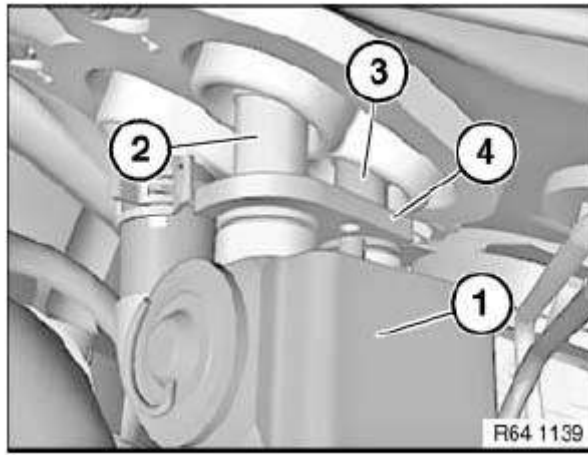


Fig. 123: Identifying Expansion Valve, Refrigerant Lines And Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **EVACUATE AND FILL AIR CONDITIONING SYSTEM**

COMPRESSOR

64 52 521 (REMOVING AND INSTALLING) REPLACING A/C SYSTEM COMPRESSOR (N47N)

Special tools required:

- **32 1 270**

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure!

Observe the safety information for handling the R 134a refrigerant . See **64 50...**

NOTE FOR HANDLING R134A REFRIGERANT or **64 50... SAFETY**
INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A
!

Avoid contact with refrigerant and refrigerant fluid.

FOLLOW SAFETY INSTRUCTIONS FOR HANDLING REFRIGERANT OIL !

Risk of damage!

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

Read and comply with notes on compressor replacement . See **64 52... NOTES FOR**
CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF
REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN)
or **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR**
(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR
KNOWN).

IMPORTANT:

FOLLOW INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN
REFRIGERANT CIRCUIT .

If Air conditioning is opened for more than 24 h:

REPLACE DESICCANT INSERT FOR HEATING AND AIR CONDITIONING
SYSTEM

Necessary preliminary tasks:

- **DRAIN OFF AIR CONDITIONING SYSTEM**
- **REMOVE COMPRESSOR DRIVE BELT**

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

Release screws (1) on refrigerant lines (3).

Tightening torque [64 53 4AZ](#).

Open brackets (4).

Disconnect refrigerant lines (3) and lay to one side.

Unfasten plug connection (2) and disconnect.

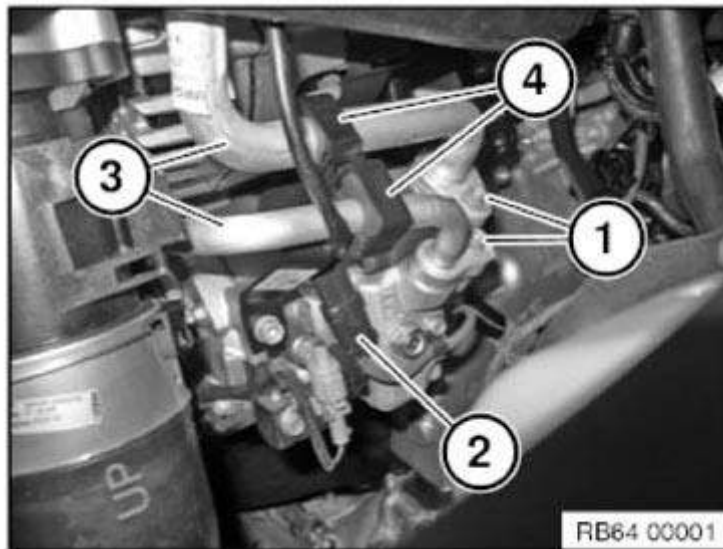


Fig. 124: Identifying Brackets, Plug Connection And Refrigerant Lines Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug connections (1) and disconnect.

Unclip cable clip (2).

Release screws (3) and place throttle valve (4) to one side.

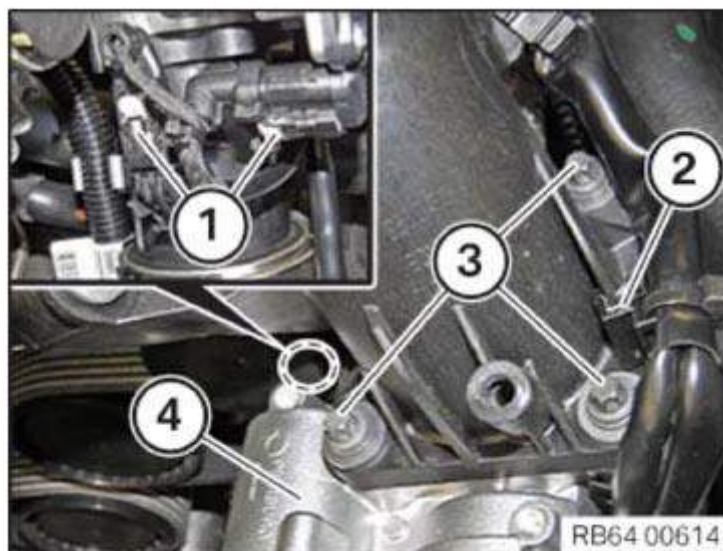


Fig. 125: Identifying Throttle Valve, Screws And Cable Clip
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (2) on compressor (1).

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

Feed out compressor (1) in direction of arrow.

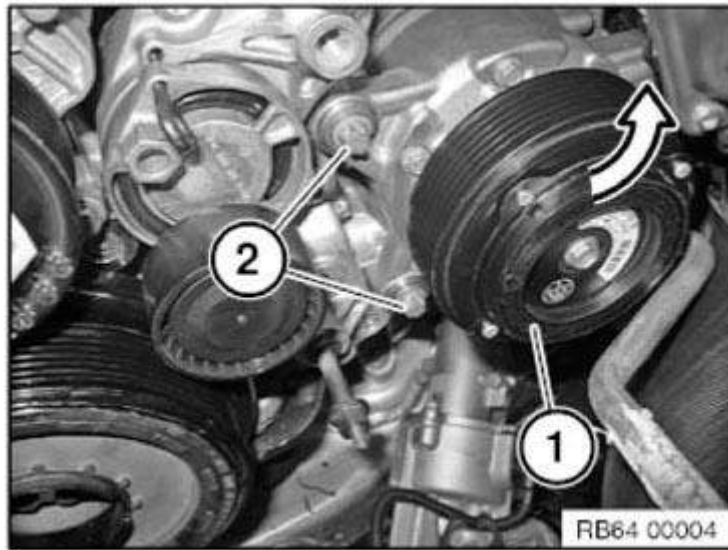


Fig. 126: Pulling Out Compressor

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Adjust the **amount of refrigerant oil in the new compressor** . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)

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!

IMPORTANT: **Compliance with safety information is mandatory** . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)!

After installation:

- [EVACUATE AND FILL A/C SYSTEM](#)

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 informations for handling refrigerant . See [64 50... NOTE FOR HANDLING R134A REFRIGERANT](#) or [64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#)**
- **Follow safety information for [HANDLING REFRIGERANT OIL](#)**

Attention!

- Always use new O-rings each time A/C connections are opened.

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 h, the dryer insert for the air conditioning must be replaced.

I. Part replacement as preliminary work fur further repair work and part replacement based on gradual leakage.

(minor leak, e.g. hairline crack)

Procedure:

- Draw off [HEATING AND AIR CONDITIONING SYSTEM](#), then determine drawn-off amount of refrigerant oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:
 - Compressor: refer to [NOTES ON COMPRESSOR REPLACEMENT](#)
 - Evaporator: 10 ml
 - Capacitor: 20 ml
 - Desiccant insert/dryer flask: 20 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer flask: 40 ml
 - Safety pressure switch and gasket: no additional refrigerant oil
 - Only I01: Radiator, high-voltage battery unit: 20 ml
- [EVACUATE AND FILL AIR CONDITIONING 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 oil
- Carry out part replacement
- Replace removed refrigerant oil and additionally top up with new refrigerant oil according to components replaced:

- Compressor: refer to [NOTES ON COMPRESSOR REPLACEMENT](#)
- Evaporator: 35 ml
- Capacitor: 35 ml
- Desiccant insert/dryer flask: 55 ml
- Each replaced refrigerant line: 35 ml
- Condenser with integrated dryer flask: 55 ml
- Safety pressure switch and gasket: no additional refrigerant oil
- Only I01: Radiator, high-voltage battery unit: 35 ml
- [EVACUATE AND FILL A/C SYSTEM](#)

64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN)

Special tools required:

- [00 9 030](#)

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** .

IMPORTANT: 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.

When starting up a new air conditioning compressor for the first time, it is absolutely essential to carry out the following breaking-in procedure:

- IMPORTANT:**
- Switch on Air conditioning system
 - Set all air vents in the dashboard to "OPEN"
 - Start engine and let it stabilize at idle speed
 - Set blower output to min. 75% of max. blower output
 - Switch on heating and air conditioning system and run for at least 2 minutes at **idle speed**

Risk of damage at increased engine speed!

In the event of a mechanical air conditioning compressor failure and the resulting ingress of chips into the refrigerant circuit, replace the following parts:
All vehicles except I01:

- Air conditioning compressor. See [64 52 521 \(REMOVING AND INSTALLING\) REPLACING A/C SYSTEM COMPRESSOR \(N47N\)](#), [64 52 523 REPLACING A/C SYSTEM COMPRESSOR \(N52\)](#), [64 52 523 REPLACING AIR CONDITIONING COMPRESSOR \(N20\)](#) or [64 52 523 REPLACING AIR CONDITIONING SYSTEM COMPRESSOR \(N55\)](#).

IMPORTANT:

- Replace **DESICCANT INSERT**
- Line to the capacitor
- Refrigerant oil

I01 only:

- air conditioning compressor
- Capacitor with desiccant insert/dryer flask
- all expansion valves

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!

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 I01**) .

When **EVACUATING THE HEATING AND 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 HEATING AND AIR CONDITIONING SYSTEM** on the display of the A/C service station.

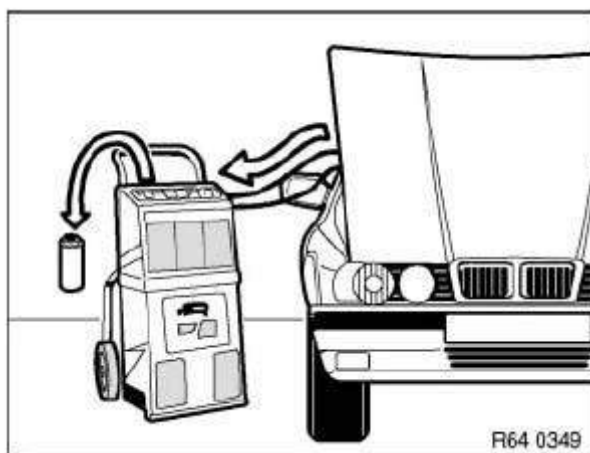


Fig. 127: Testing Air Conditioning System

Courtesy of BMW OF NORTH AMERICA, INC.

Take a note of the amount of refrigerant oil displayed on the display of the A/C service station (= **amount of refrigerant oil 1**) .

Example:

30 nm read on the display of the A/C service station.

Amount of refrigerant oil 1 = 30 ml

Transfer the refrigerant oil remaining in the **previous air conditioning compressor** via the oil filler plug completely into a measuring cup.

Read the amount of refrigerant oil at the measuring cup. Add **at least 10 ml extra to the amount of refrigerant oil read, but note an overall total of 50 ml** (= amount of refrigerant oil 2) .

Example:

20 ml read at measuring cup:

20 ml + 10 ml extra = 30 ml < 50 ml

Amount of refrigerant oil 2 = **50 ml**

Turn the belt pulley during the filling process.

This allows more refrigerant oil to flow out of the previous air conditioning compressor.

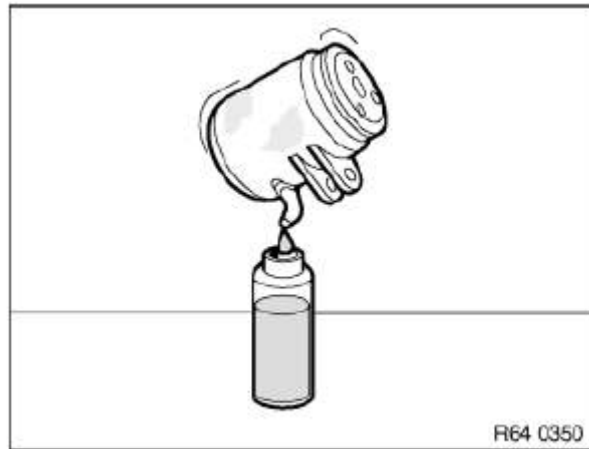


Fig. 128: Filling Refrigerant Oil

Courtesy of BMW OF NORTH AMERICA, INC.

Determination of the amount of refrigerant oil to be filled in the refrigerant circuit:

Amount of refrigerant oil to be filled = amount of refrigerant oil 1 + amount of refrigerant oil 2

Example:

Amount of refrigerant oil to be filled = 30 ml + 50 ml = 80 ml

Open oil filler plug. 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 = amount of refrigerant oil of new air conditioning compressor - amount

of refrigerant oil to be filled

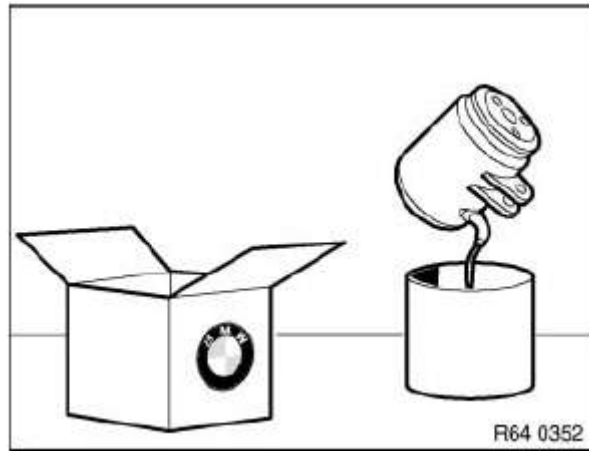


Fig. 129: Draining Refrigerant Oil

Courtesy of BMW OF NORTH AMERICA, INC.

Example:

Amount of refrigerant oil of new air conditioning compressor: 150 ml

Amount of refrigerant oil to be drained = 150 ml - 80 ml = **70 ml**

70 ml must be drained from the **new air conditioning compressor** .

Installation note:

Replace sealing rings.

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

Tightening torque [64 52 2AZ](#) .

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

On account of its hygroscopic properties, refrigerant oil must not be stored in open containers.

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.

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.

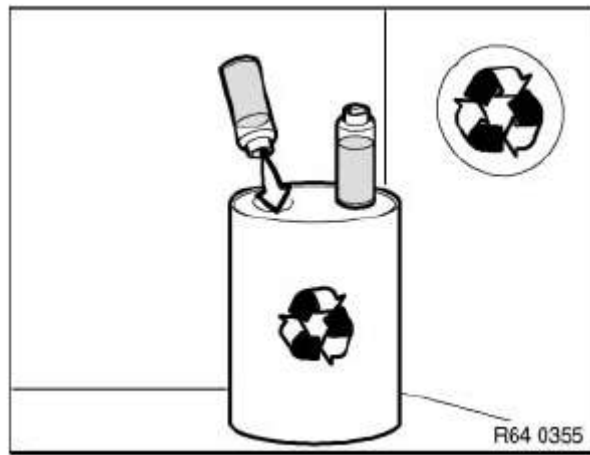


Fig. 130: Draining Refrigerant Oil From Air Conditioning Compressor

Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

If the refrigerant circuit is open for longer than 24 hours:

- Replace desiccant insert

64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN)

Special tools required:

- **00 9 030**

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.

IMPORTANT: 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.

When starting up a new air conditioning compressor for the first time, it is absolutely essential to carry out the following breaking-in procedure:

IMPORTANT:

- Switch on Air conditioning system
- Set all air vents in the dashboard to "OPEN"
- Start engine and let it stabilize at idle speed
- Set blower output to min. 75% of max. blower output
- Switch on heating and air conditioning system and run for at least 2 minutes at **idle speed**

Risk of damage at increased engine speed!

In the event of a mechanical air conditioning compressor failure and the resulting ingress of chips into the refrigerant circuit, replace the following parts:
All vehicles except I01:

- Air conditioning compressor. See [64 52 521 \(REMOVING AND INSTALLING\) REPLACING A/C SYSTEM COMPRESSOR \(N47N\)](#), [64 52 523 REPLACING A/C SYSTEM COMPRESSOR \(N52\)](#), [64 52 523 REPLACING AIR CONDITIONING COMPRESSOR \(N20\)](#) or [64 52 523 REPLACING AIR CONDITIONING SYSTEM COMPRESSOR \(N55\)](#).
 - Replace [DESICCANT INSERT](#)
- IMPORTANT:
- Line to the capacitor
 - Refrigerant oil

I01 only:

- air conditioning compressor
- Capacitor with desiccant insert/dryer flask
- all expansion valves

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!

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 I01**).

When evacuating the air conditioning system, refrigerant oil is also extracted and collected in the oil separator of the A/C service station.

After evacuation, the refrigerant must be filtered in the A/C service station as the oil separator could still contain a liquid refrigerant/oil mixture. The refrigerant completely gasifies through the cleaning operation. Only the prior bound refrigerant oil remains in the oil separator. Measure and note down this quantity of refrigerant oil.

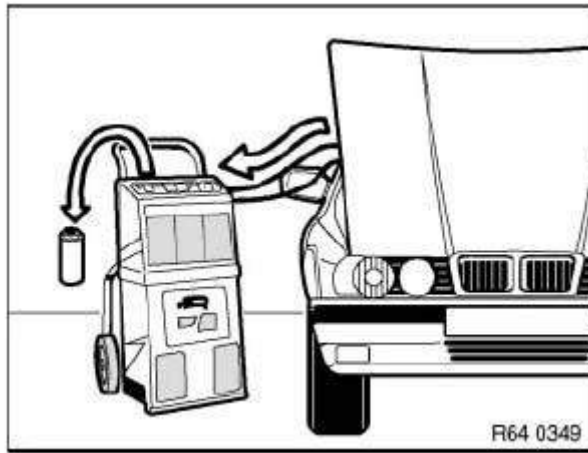


Fig. 131: Testing Air Conditioning System
Courtesy of BMW OF NORTH AMERICA, INC.

- **REFER TO "DRAWING OFF AIR CONDITIONING SYSTEM"**

Transfer the refrigerant oil remaining in the previous air conditioning compressor via the oil filler plug completely into a measuring cup.

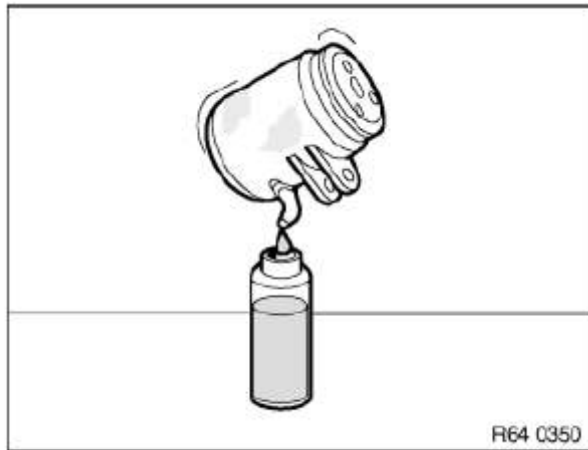


Fig. 132: Filling Refrigerant Oil
Courtesy of BMW OF NORTH AMERICA, INC.

Measure the amount of refrigerant oil collected from the previous air conditioning compressor.

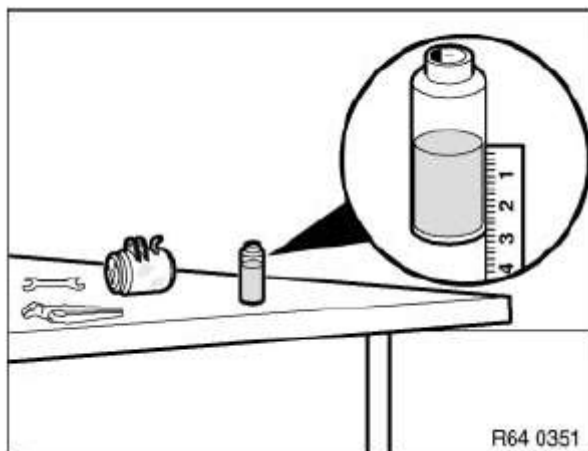


Fig. 133: Measuring Amount Of Refrigerant Oil From Air Conditioning Compressor
Courtesy of BMW OF NORTH AMERICA, INC.

Open oil filler plug and pour entire contents of air conditioning compressor into a clean collecting vessel.

Installation note:

Replace sealing rings.

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

Tightening torque [64 52 2AZ](#) .

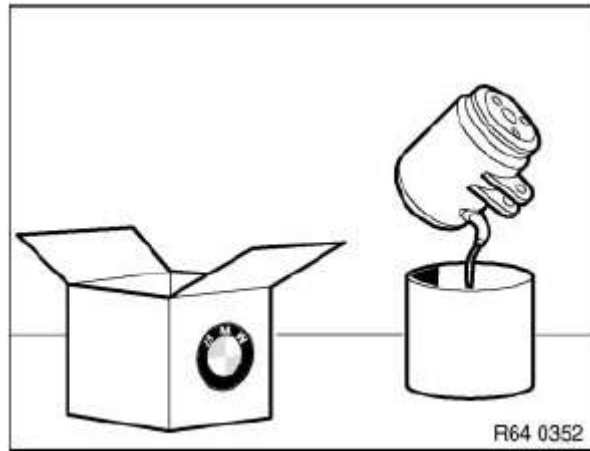


Fig. 134: Draining Refrigerant Oil

Courtesy of BMW OF NORTH AMERICA, INC.

From the new air conditioning compressor, pour the same amount of refrigerant oil (as drained from the previous air conditioning compressor) + **10 ml extra** into a clean measuring cup and pour again into the new air conditioning compressor. **At least but a total of 50 g** .

Remaining refrigerant oil can be poured into A/C service station tank.

- Refer to "[EVACUATING AIR CONDITIONING SYSTEM](#)".

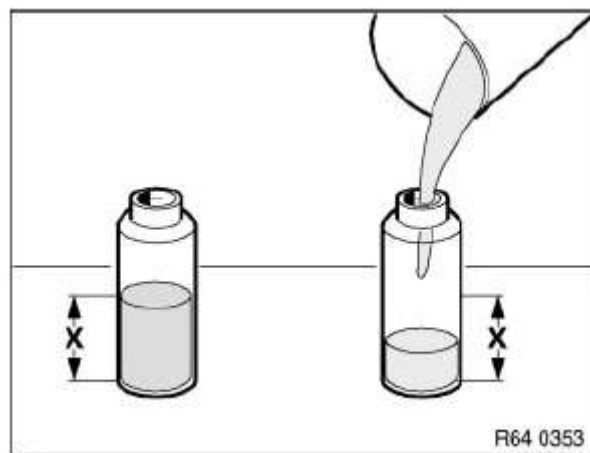


Fig. 135: Measuring Refrigerant Oil

Courtesy of BMW OF NORTH AMERICA, INC.

Otherwise the excess refrigerant oil must be disposed of correctly.

On account of its hygroscopic properties, refrigerant oil must not be stored in open containers.

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.

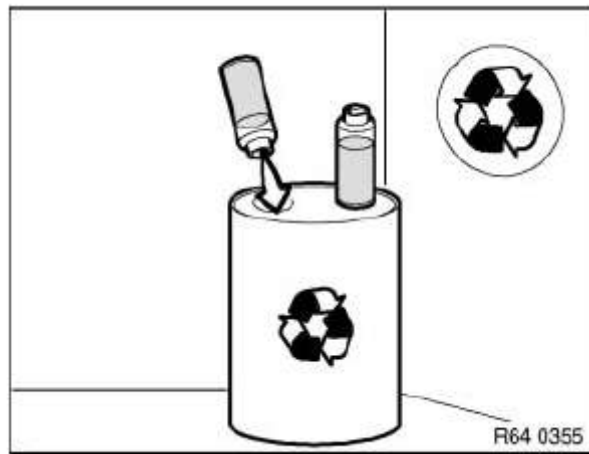


Fig. 136: Draining Refrigerant Oil From Air Conditioning Compressor
Courtesy of BMW OF NORTH AMERICA, INC.

After installing the new air conditioning compressor, it is essential before filling the heating and air conditioning system to pour the same amount of the previously drawn off refrigerant oil into the system again.

- **REFER TO "FILLING AIR CONDITIONING SYSTEM"**

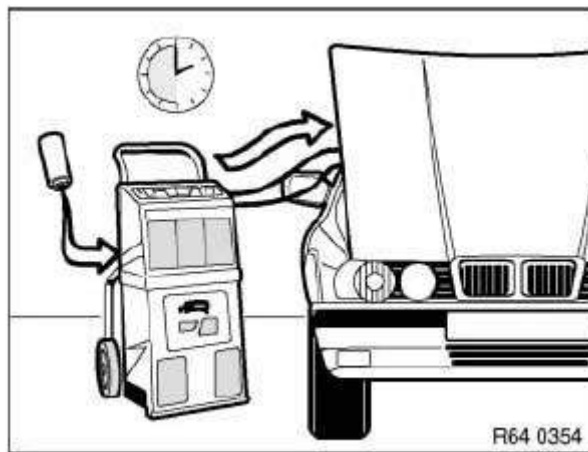


Fig. 137: Testing Air Conditioning System
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note:

If the refrigerant circuit is open for longer than 24 hours:

- **REPLACE DESICCANT INSERT**

64 51 520 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE

Refer to **64 51 520 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE**.

64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N20, N57)

Refer to **64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N20, N57)**.

64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N55, N47)

Refer to **64 51 520 REMOVING AND INSTALLING/REPLACING EXPANSION VALVE (N55, N47)**.

64 52 523 REPLACING A/C SYSTEM COMPRESSOR (N52)

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 the R 134a refrigerant . See [64 50...](#)

NOTE FOR HANDLING R134A REFRIGERANT or [64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#) !

Avoid contact with refrigerant and refrigerant oil.

FOLLOW SAFETY INSTRUCTIONS FOR HANDLING REFRIGERANT OIL !

Risk of damage!

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

IMPORTANT: **Read and comply with notes on compressor replacement . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#).**

FOLLOW NOTES FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT .

If Air conditioning is opened for more than 24 h:

Replace desiccant insert for heating and air conditioning system

Aluminium-magnesium materials.

No steel screws/bolts may be used due to the threat of electrochemical corrosion!

A magnesium crankcase requires aluminum screws/bolts exclusively!

IMPORTANT: Aluminium screws/bolts must be replaced each time they are **released!**

The end faces of aluminum screws/bolts are painted blue for the purposes of reliable identification.

Jointing torque and angle of rotation must be observed without fail (**risk of damage**)!

Necessary preliminary work:

- **DRAIN OFF AIR CONDITIONING SYSTEM** Remove alternator **DRIVE BELT**
- Remove coolant thermostat

Release and disconnect plug connection (1) at A/C compressor.

Release screws (4).

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

Remove intake pipe (2) and pressure line (3).

Installation note:

Replace sealing rings.

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

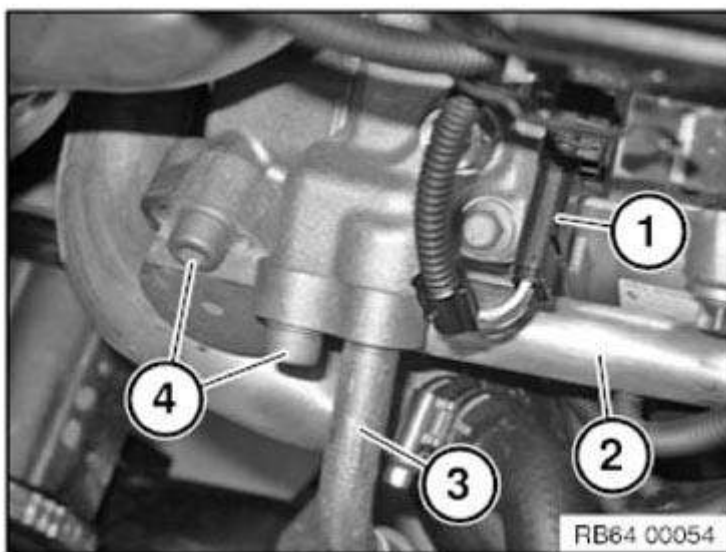


Fig. 138: Identifying Intake Pipe And Pressure Line Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

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

NOTE: Secure compressor (3) against falling out.

Release bolt (2) and if necessary remove with bush behind.

Release screw (1).

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

Remove compressor (3) towards front.

Installation note:

Make sure bushes are installed correctly.

If necessary, replace faulty bushes.

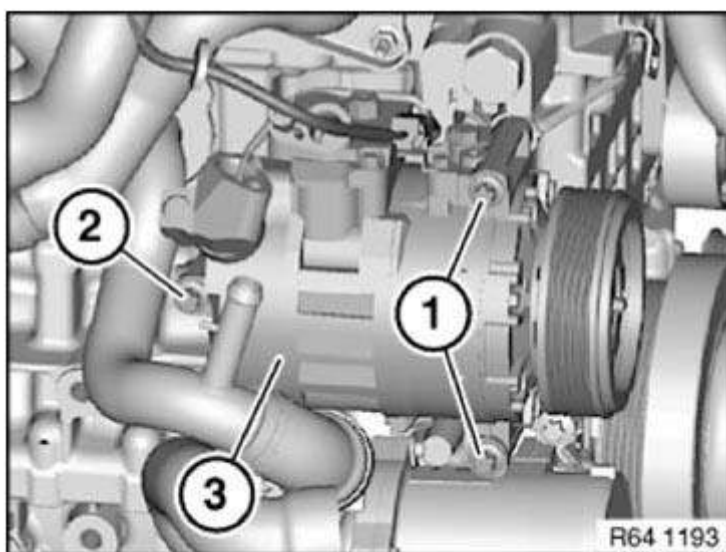


Fig. 139: Identifying Compressor And Bolt

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Adjust the amount of refrigerant oil in the new compressor. See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#).

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!

IMPORTANT: The safety information must be observed . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)!

After installation:

- [EVACUATE AND FILL HEATING AND AIR CONDITIONING SYSTEM](#)

64 52 523 REPLACING AIR CONDITIONING COMPRESSOR (N20)

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 the R 134a refrigerant . See [64 50... NOTE FOR HANDLING R134A REFRIGERANT](#) or [64 50... SAFETY](#)

[INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#)

!

Avoid contact with refrigerant and refrigerant fluid.

[FOLLOW SAFETY INSTRUCTIONS FOR HANDLING REFRIGERANT OIL !](#)

Risk of damage!

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

IMPORTANT: **Read and comply with notes on compressor replacement . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#).**

[FOLLOW NOTES FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT .](#)

If Air conditioning is opened for more than 24 h:

[REPLACE DESICCANT INSERT FOR HEATING AND AIR CONDITIONING SYSTEM](#)

Aluminium-magnesium materials.

No steel screws/bolts may be used due to the threat of electrochemical corrosion!

A magnesium crankcase requires aluminum screws/bolts exclusively!

IMPORTANT: Aluminium screws/bolts must be replaced each time they are **released!**

The end faces of aluminum screws/bolts are painted blue for the purposes of reliable

identification.

Joining torque and angle of rotation must be observed without fail (**risk of damage**) !

Necessary preliminary tasks:

- **DRAIN OFF AIR CONDITIONING SYSTEM**
- Remove alternator **DRIVE BELT**
- Remove left **CHARGE AIR DUCT**

Release and disconnect plug connection (2) at A/C compressor.

Release screws (1).

Tightening torque **64 52 1AZ** .

Remove refrigerant lines (3).

Installation note:

Replace sealing rings.

Use special tool **00 9 030** to mount sealing rings without damaging them.

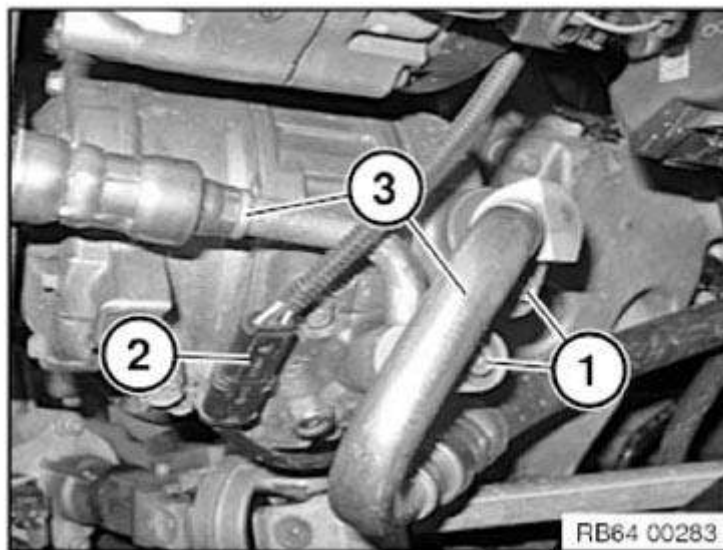


Fig. 140: Identifying A/C Compressor Plug Connection, Refrigerant Lines And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Seal openings or lines on compressor with special tool **32 1 270** to prevent escape of media and dirt contamination.

NOTE: **Secure compressor (2) against falling out.**

Release screw (1).

Tightening torque **64 52 3AZ** .

Feed out compressor (2) upwards to the front.

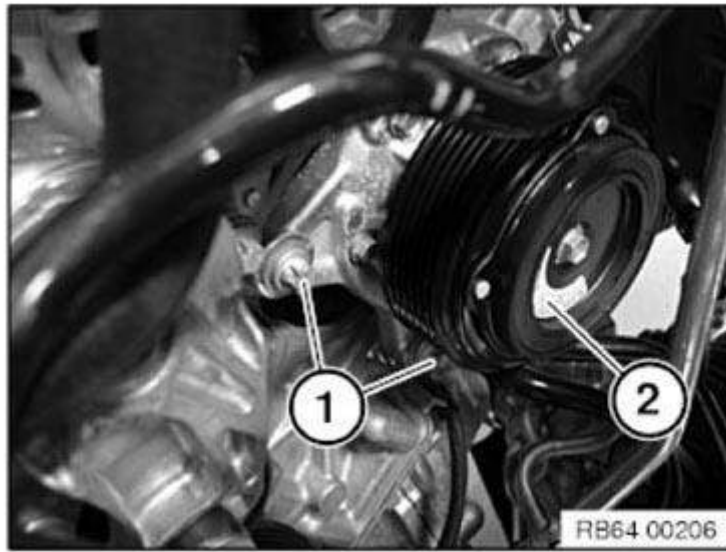


Fig. 141: Identifying Compressor And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Adjust the **amount of refrigerant oil in the new compressor** . See **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN)** or **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN)**

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!

IMPORTANT: The safety information must be observed . See **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN)** or **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN)**!

After installation:

- **EVACUATE AND FILL HEATING AND AIR-CONDITIONING SYSTEM**

64 52 523 REPLACING AIR CONDITIONING SYSTEM COMPRESSOR (N55) (VERSION 1)

Special tools required:

- **00 9 030**
- **32 1 270**

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 refrigerant** . See **64 50... NOTE FOR HANDLING R134A REFRIGERANT** or **64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A**
- **HANDLING REFRIGERANT FLUID**

Risk of damage!

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

Read and comply with notes on compressor replacement. See **64 52... NOTES FOR**

IMPORTANT:

CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN) or **64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN)**.

FOLLOW NOTES FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT .

If Air conditioning is opened for more than 24 h:

Replace desiccant insert for air conditioning system. See **64 53 517 REPLACING DESICCANT INSERT FOR AIR CONDITIONING SYSTEM**.

Necessary preliminary work:

- **DRAWING OFF, EVACUATING AND FILLING THE AIR CONDITIONING** are not included in the time value given for this job item
- **REMOVE COMPRESSOR DRIVE BELT**
- Remove left **CHARGE AIR DUCT**

IMPORTANT: Seal openings or lines on compressor with special tool **32 1 270** to prevent escape of media and dirt contamination.

Unfasten plug connection (1) and disconnect.

Release screws (2) and remove refrigerant lines (3).

Tightening torque **64 52 1AZ** .

Installation note:

Replace sealing rings.

Use special tool **00 9 030** to mount sealing rings without damaging them.

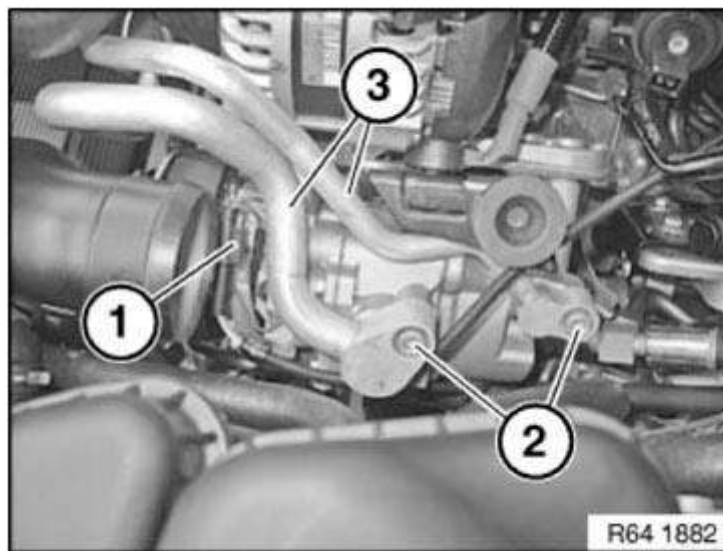


Fig. 142: Identifying Plug Connection, Screws And Refrigerant Lines

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1) at holder for refrigerant lines (2) and pull out, including spacer sleeve.

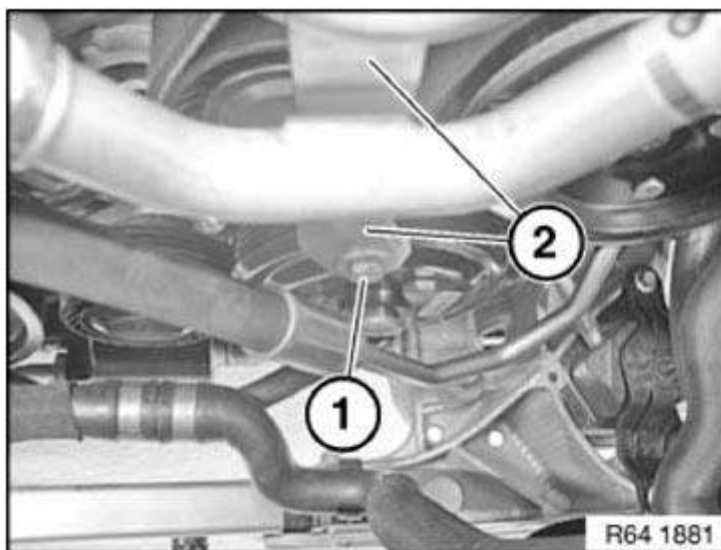


Fig. 143: Identifying Refrigerant Lines And Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

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

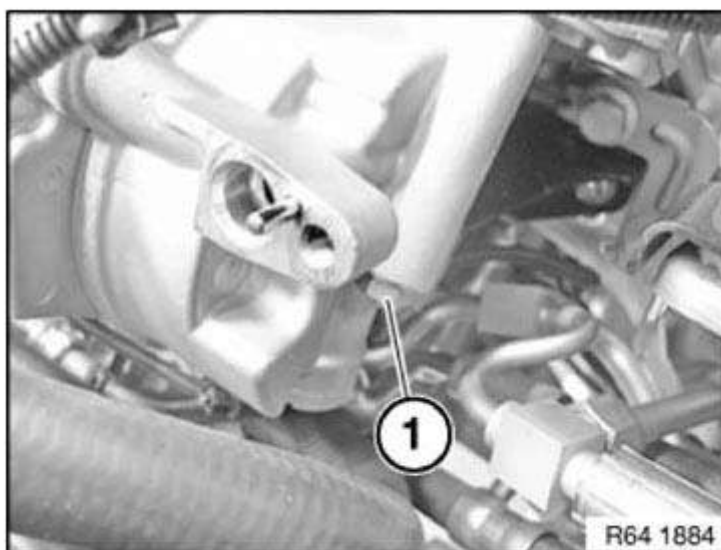


Fig. 144: Identifying Screw

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Shown with clearance for better clarity.

Release screw (1).

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

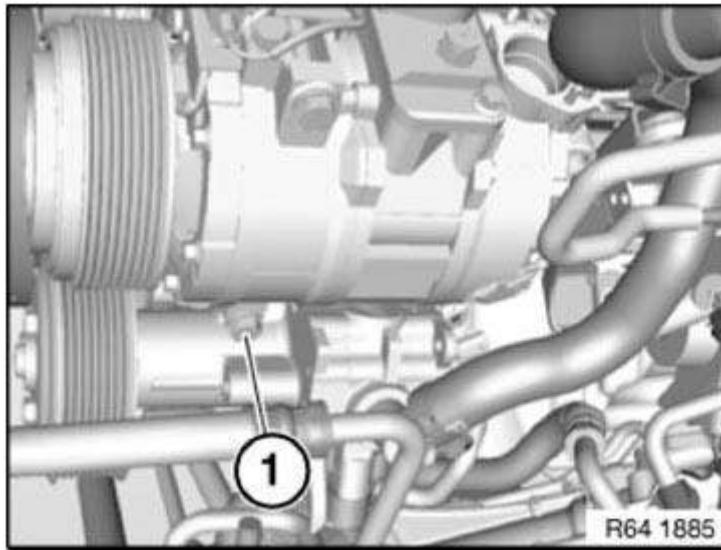


Fig. 145: Identifying Air Conditioning System Compressor Screw (N55)

Courtesy of BMW OF NORTH AMERICA, INC.

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

NOTE: Secure compressor (2) against falling off/down.

Release screw (1).

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

Lift out compressor (2).

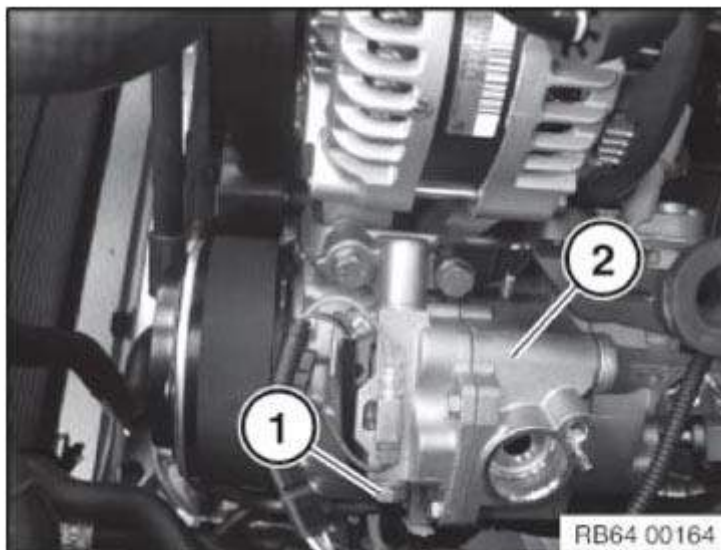


Fig. 146: Identifying Compressor And Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Adjust the amount of refrigerant oil in the new compressor . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)

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!

IMPORTANT: The safety information must be observed . See 64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN) or 64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN)!

After installation:

- EVACUATE AND FILL AIR CONDITIONING SYSTEM

64 52 523 REPLACING AIR CONDITIONING SYSTEM COMPRESSOR (N55) (VERSION 2)

Special tools required:

- 00 9 030
- 32 1 270

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure!

Avoid contact with refrigerant and refrigerant fluid.

Read and comply with safety instructions:

- Handling R 134a refrigerant . See 64 50... NOTE FOR HANDLING R134A REFRIGERANT or 64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A
- HANDLING REFRIGERANT FLUID

Risk of damage!

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

IMPORTANT: Read and comply with notes on compressor replacement. . See 64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN) or 64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR (AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN)

FOLLOW NOTES FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT .

If Air conditioning is opened for more than 24 h:

REPLACE desiccant insert for heating and air conditioning system.

Necessary preliminary tasks:

- DRAWING OFF, EVACUATING AND FILLING THE AIR CONDITIONING are not included in the time value given for this job item
- REMOVE COMPRESSOR DRIVE BELT

Removal:

Release screw (1).

Undo latch mechanisms (2) on intake silencer housing.

Feed out intake port (3).

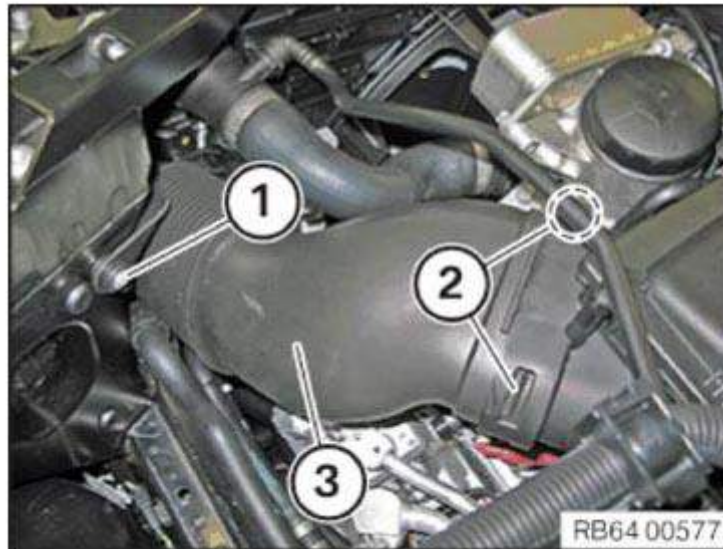


Fig. 147: Identifying Intake Port, Latch Mechanisms On Intake Silencer Housing And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

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

Release screws (1) and remove refrigerant lines (2).

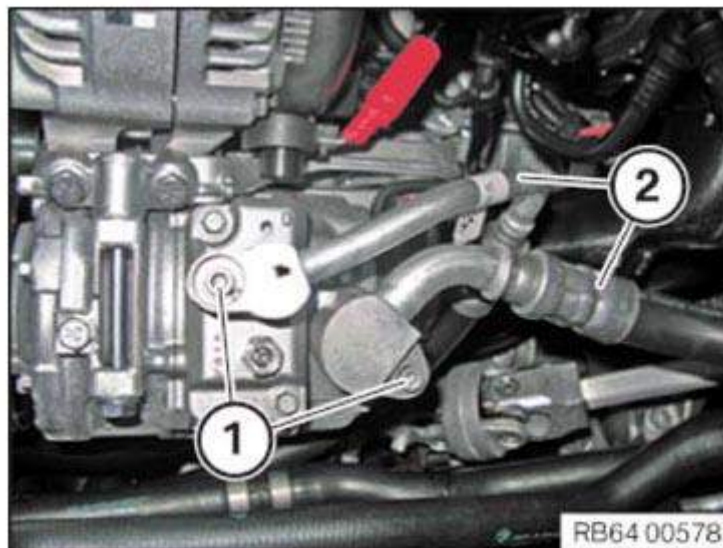


Fig. 148: Identifying Refrigerant Lines With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

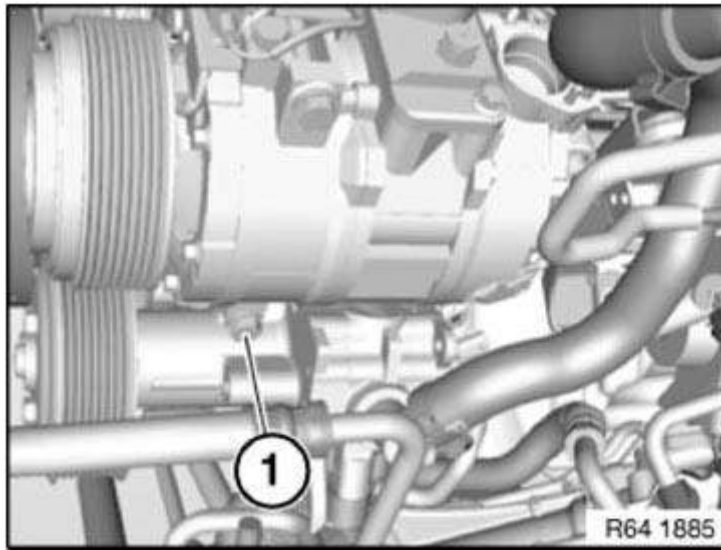


Fig. 149: Identifying Air Conditioning System Compressor Screw (N55)

Courtesy of BMW OF NORTH AMERICA, INC.

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

NOTE: Secure compressor (3) against falling off/down!

Disconnect the connector (1).

Release screw (2).

Lift out compressor (3).

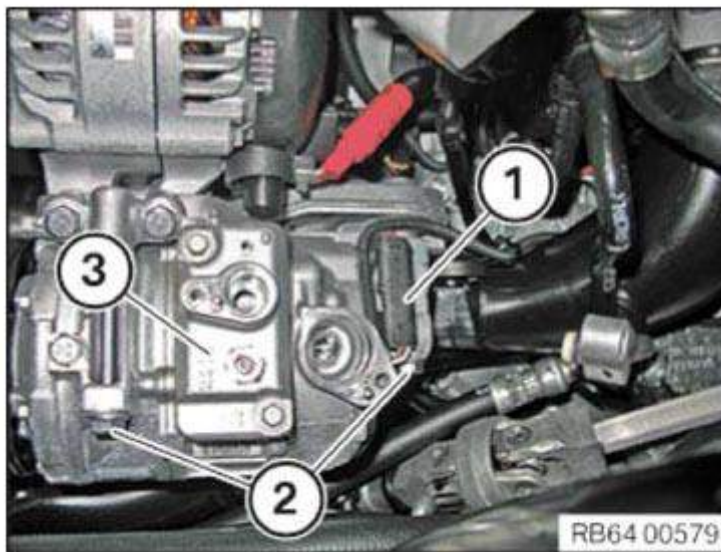


Fig. 150: Identifying Compressor, Screw And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Adjust the **amount of refrigerant oil in the new compressor** . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)

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!

IMPORTANT: **The safety information must be observed . See [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR NOT KNOWN\)](#) or [64 52... NOTES FOR CHANGING THE AIR CONDITIONING COMPRESSOR \(AMOUNT OF REFRIGERANT OIL OF NEW AIR CONDITIONING COMPRESSOR KNOWN\)](#)!**

Installation:

Position compressor (3) correctly.

Tighten down screw (2).

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

Connect the connector (1).

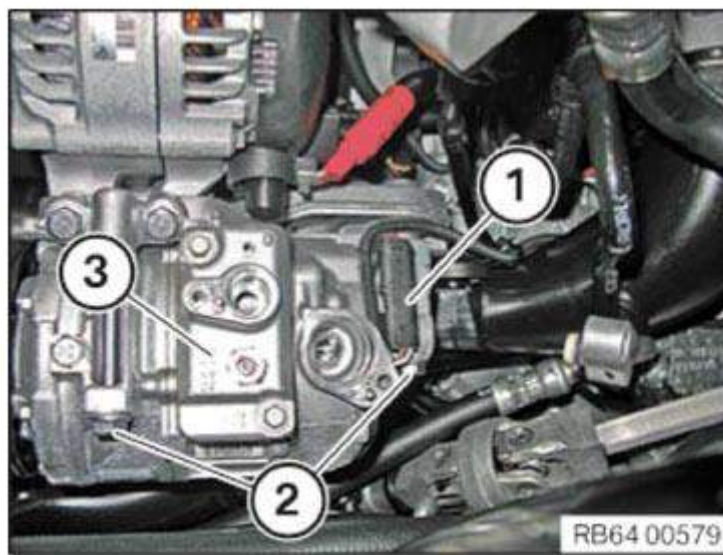


Fig. 151: Identifying Compressor, Screw And Connector

Courtesy of BMW OF NORTH AMERICA, INC.

Tighten down screw (1).

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

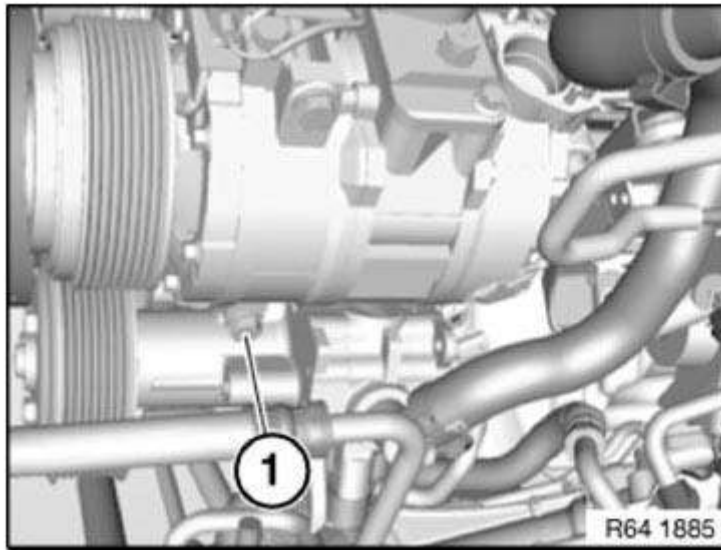


Fig. 152: Identifying Air Conditioning System Compressor Screw (N55)

Courtesy of BMW OF NORTH AMERICA, INC.

Position refrigerant lines (2) correctly.

Tighten down the screws (1).

Tightening torque **64 52 1AZ**.

NOTE: Renew sealing rings.

Use special tool **00 9 030** to mount sealing rings without damaging them.

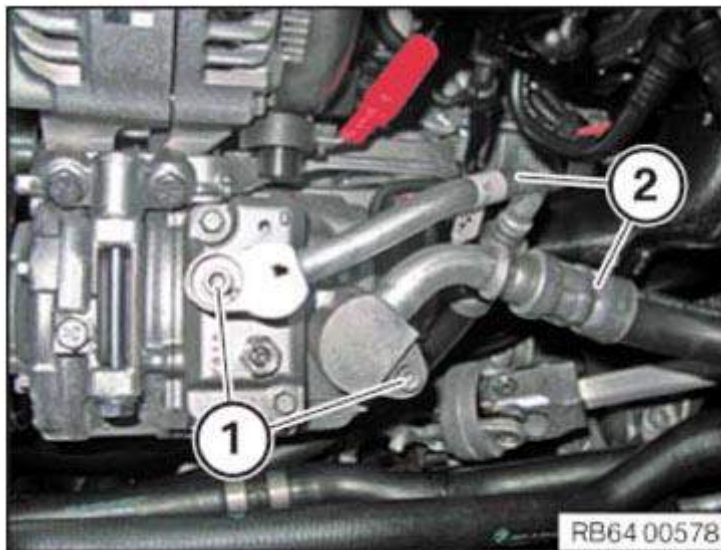


Fig. 153: Identifying Refrigerant Lines With Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Feed in intake port (3) correctly.

Engage latch mechanisms (2) on intake silencer housing.

Tighten down screw (1).

NOTE: Make sure intake port (3) is fitted correctly!

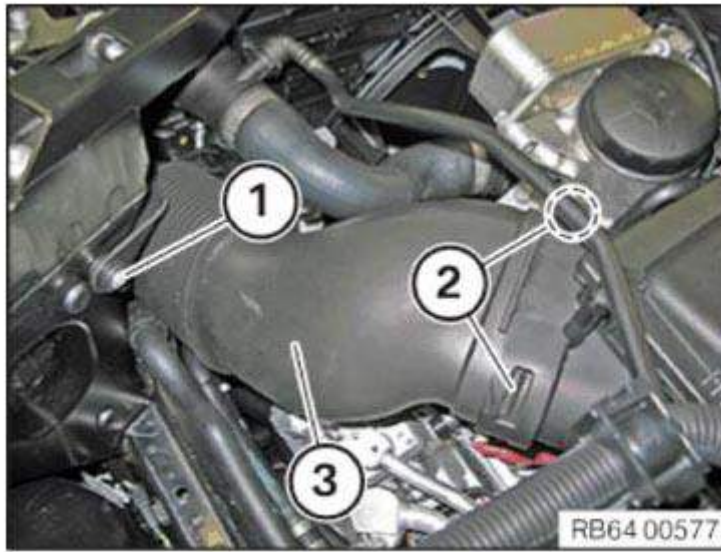


Fig. 154: Identifying Intake Port, Latch Mechanisms On Intake Silencer Housing And Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

Required reworking:

- Install **DRIVE BELT FOR COMPRESSOR**
- **EVACUATE AND FILL AIR CONDITIONING SYSTEM**

CONDENSER AND DRYER WITH LINES

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 depressurized 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

Refer to **64 52... INSTRUCTIONS FOR OPENING AND PART REPLACEMENT IN REFRIGERANT CIRCUIT.**

64 53... INSTRUCTIONS FOR REPLACEMENT OF AIR CONDITIONING CAPACITORS AND RADIATOR/COOLERS

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).

IMPORTANT: 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. 155](#) 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).

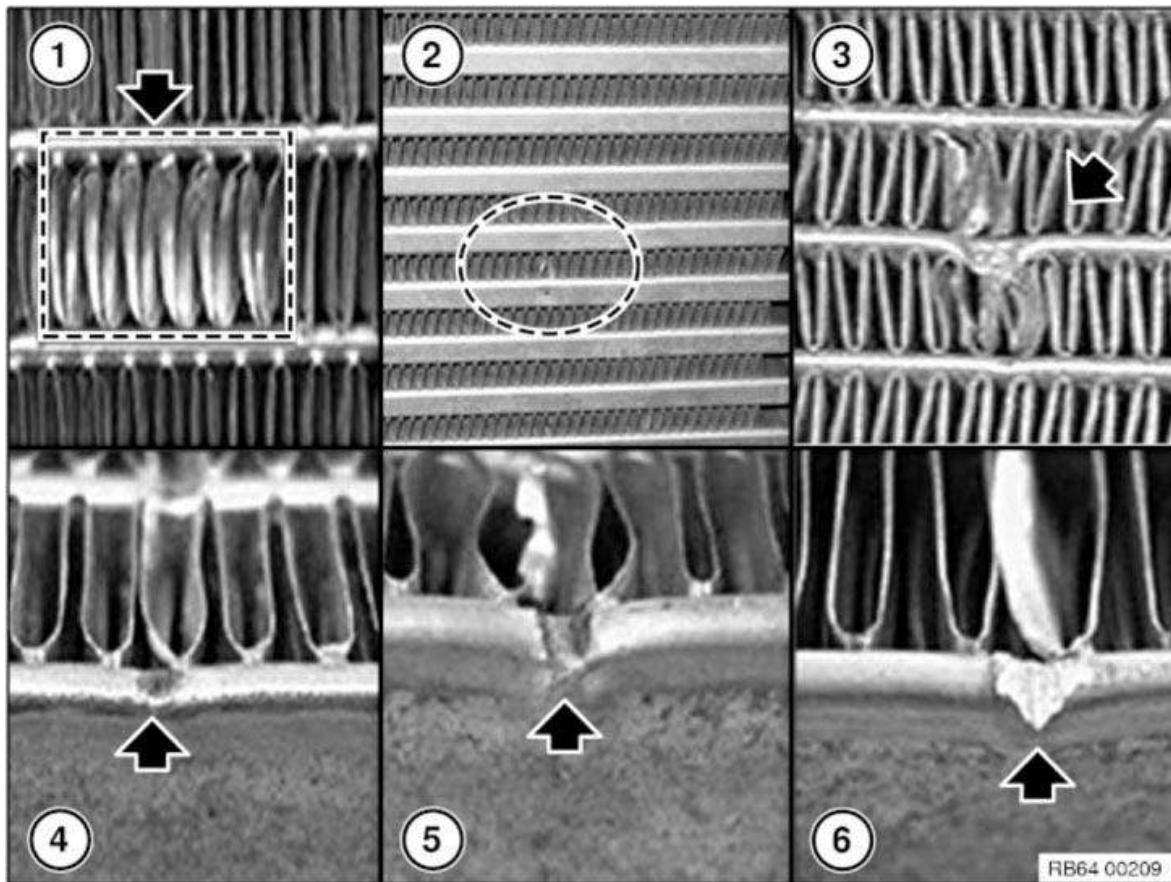


Fig. 155: Locating Air Conditioning Capacitors And Radiator/Coolers

Courtesy of BMW OF NORTH AMERICA, INC.

Dryer flask (integrated in the air conditioning condenser):

Round dents/depressions are permitted.

The air conditioning condenser is not to be replaced in this case.

64 53 551 REMOVING AND INSTALLING OR REPLACING CAPACITOR 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 fluid.

Read and comply with safety instructions:

- Handling R 134a tetrafluorethane refrigerant . See [64 50... NOTE FOR HANDLING R134A REFRIGERANT](#) or [64 50... SAFETY INFORMATION FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A](#)
- [HANDLING REFRIGERANT FLUID](#)

IMPORTANT: Risk of damage!
Restart engine only when A/C system has been correctly filled.

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

If air conditioning is open for longer than 24 hours: replace [DESICCANT INSERT FOR AIR CONDITIONING](#)

Necessary preliminary tasks:

- [DRAIN OFF AIR CONDITIONING SYSTEM](#)
- Remove fan cowl with electric fan . See [17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN \(N47 D20 O1, B47\)](#) or [17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN \(N20, N55, N52T\)](#)

Release screw (1).

Release screws (2) on refrigerant lines (3).

Tightening torque [64 53 3AZ](#) .

Remove refrigerant lines (3) from condenser.

Installation note:

Replace sealing rings.

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

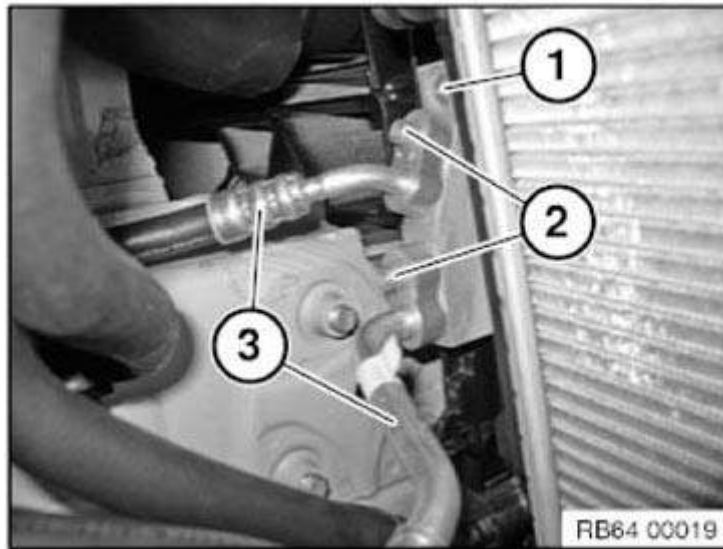


Fig. 156: Identifying Refrigerant Lines Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove radiator (2) from guides.

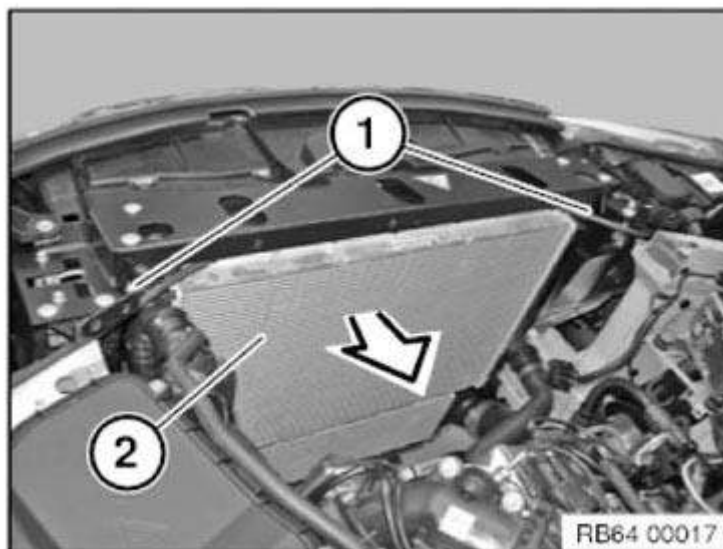


Fig. 157: Removing Radiator From Guides
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
 The fins on the radiator and condenser should not be damaged.

Position radiator (1) as illustrated.

Carefully feed out condenser (2) upwards.

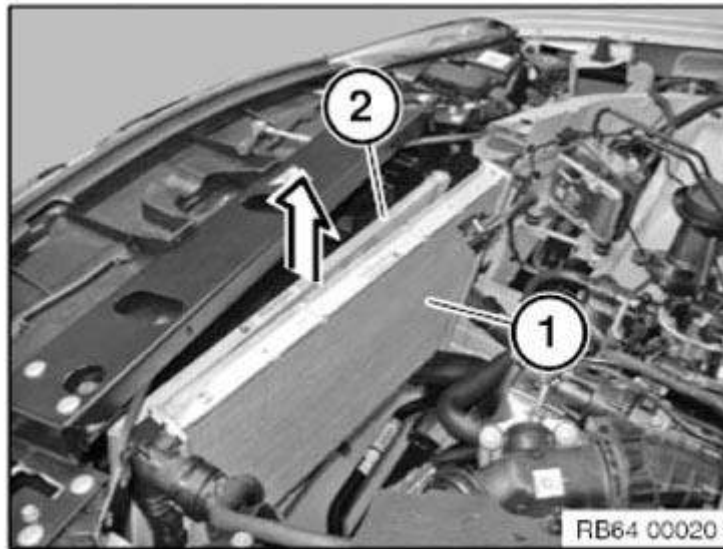


Fig. 158: Pulling Out Condenser

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **EVACUATE AND FILL AIR CONDITIONING**

64 53 517 REPLACING DESICCANT INSERT FOR AIR CONDITIONING SYSTEM

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure!

Follow safety instructions for handling R 134a refrigerant . See 64 50... NOTE FOR HANDLING R134A REFRIGERANT or 64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A .

Follow safety information for HANDLING REFRIGERANT FLUID .

Avoid contact with refrigerant and refrigerant fluid.

Risk of damage!

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

IMPORTANT: 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 air conditioning system

Follow **INSTRUCTIONS ON REPLACING DESICCANT INSERT** .

Necessary preliminary tasks:

- Remove **CONDENSER**

Undo the plastic screw connection (1).

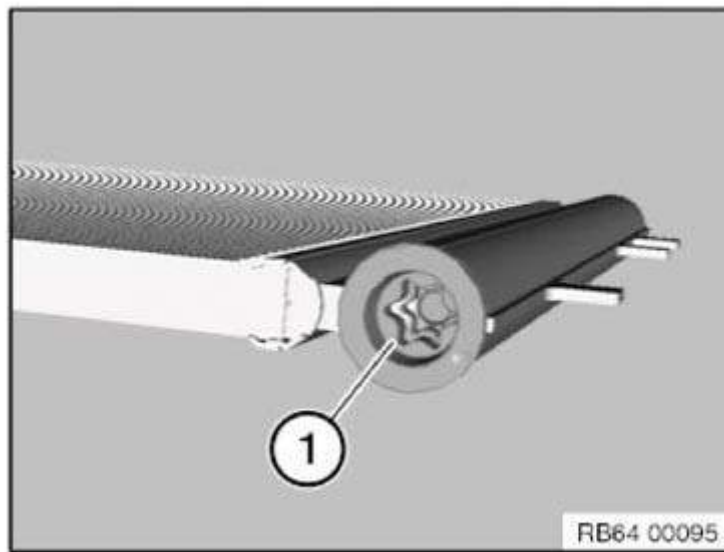


Fig. 159: Identifying Plastic Screw Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Remove the desiccant insert (1).

Installation note:

Replace the sealing ring (3) on the plastic screw connection (2).

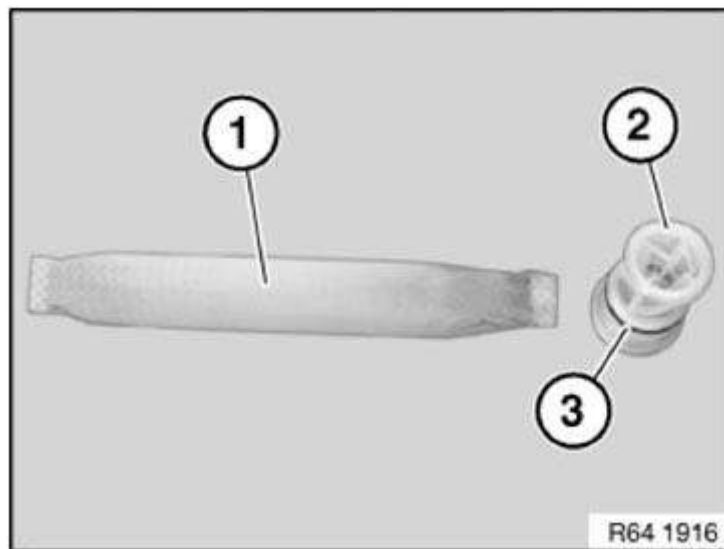


Fig. 160: Identifying Sealing Ring On Plastic Screw Connection

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

EVACUATE AND FILL A/C SYSTEM

64 53 520 REPLACING SAFETY PRESSURE SWITCH

WARNING:

Danger of injury!

Refrigerant circuit is under high pressure!

Follow safety informations for handling R 134a refrigerant . See **64 50... NOTE FOR HANDLING R134A REFRIGERANT** or **64 50... SAFETY INFORMATIONS FOR HANDLING TETRAFLUORETHANE REFRIGERANT R134A** .

Avoid contact with refrigerant and refrigerant fluid.

Follow safety instructions for HANDLING REFRIGERANT OIL .

Risk of damage!

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

IMPORTANT: Follow INSTRUCTIONS for opening and replacing parts in refrigerant circuit.

If air conditioning system is open for longer than 24 hours: replace DESICCANT INSERT FOR AIR CONDITIONING

Necessary preliminary tasks:

- **DRAIN OFF AIR CONDITIONING SYSTEM**

Unclip wiring harness (1).

Pull expansion tank (2) upward out of retaining bracket.

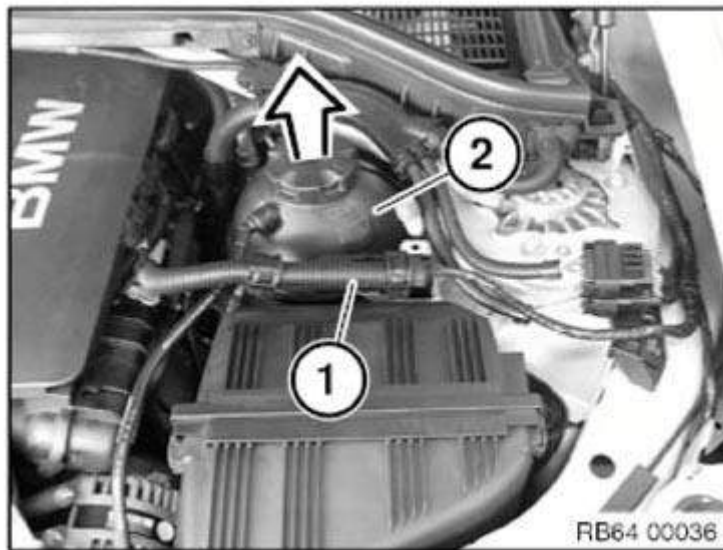


Fig. 161: Pulling Expansion Tank Out Of Retaining Bracket
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Installation note:

Guide pin (2) must be fit correctly in rubber guide (3).

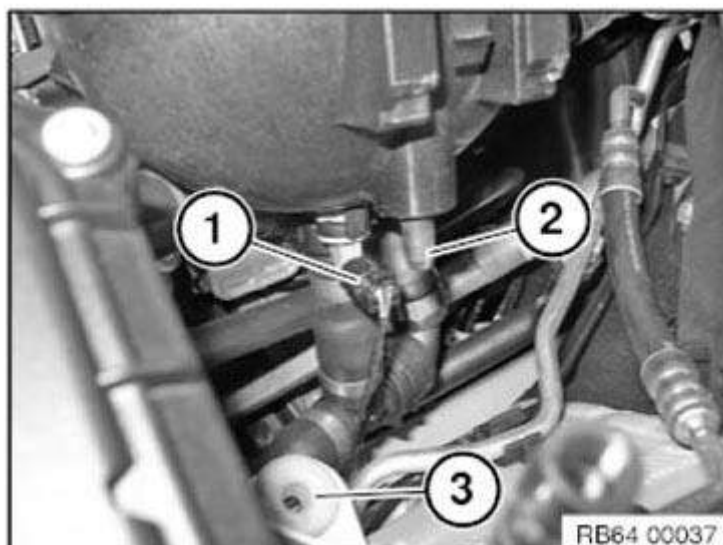


Fig. 162: Identifying Guide Pin And Rubber Guide Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Unfasten plug connection (1) and disconnect.

Release safety pressure switch (2) and remove.

Tightening torque **64 53 8AZ**.

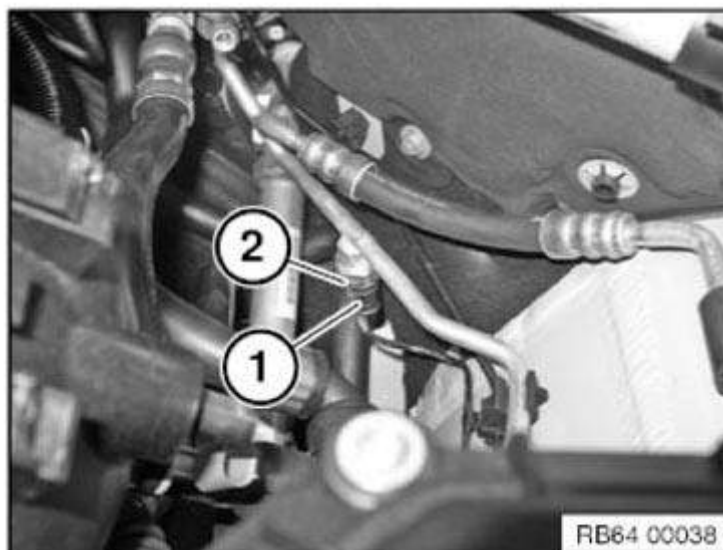


Fig. 163: Identifying Pressure Switch Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **EVACUATE AND FILL A/C SYSTEM**

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Article GUID: A00702197

HVAC

Heating And Air Conditioning - Special Tools - X3 Utility

HEATING AND AIR CONDITIONING

0301361 ACCESSORIES

0301361 Accessories Mechanical tool

NOTE: For detecting leaks in the refrigerant circuit



Fig. 1: Identifying Accessories (0301361)

Courtesy of BMW OF NORTH AMERICA, INC.

0496087 ADAPTER

0496087 645107 Adapter AM

NOTE: (Sealing adapter) For closing off the line for the leakage test for E81, E87, E90, E91, E92, E93 (included in delivery from 02/2007)

SI number

01 09 07 (360)

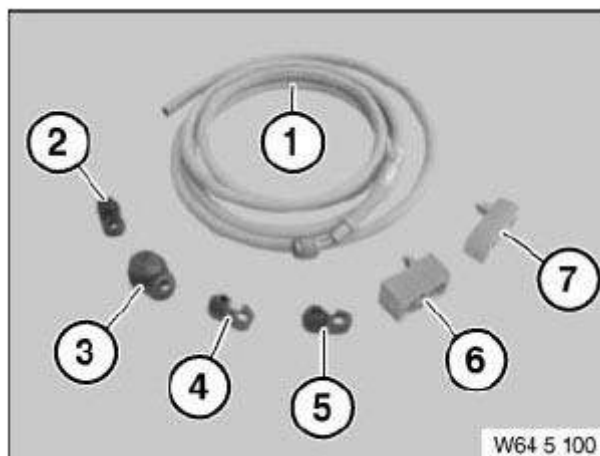


Fig. 2: Identifying Adapter (0496087)

Courtesy of BMW OF NORTH AMERICA, INC.

0496300 ADAPTER

0496300 645127 Adapter AM

NOTE: (Evaporator test adapter) E85, E86

SI number

01 04 08 (435)

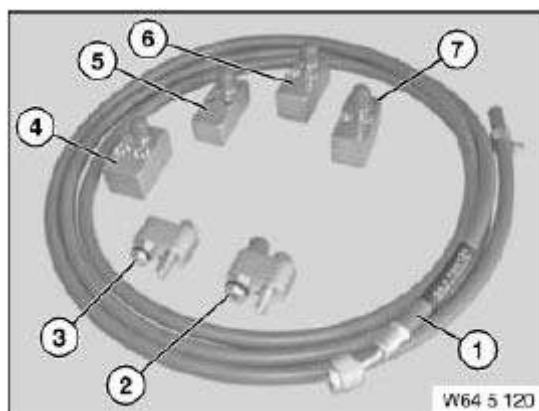


Fig. 3: Identifying Adapter (0496300)

Courtesy of BMW OF NORTH AMERICA, INC.

0496259 ADAPTER

0496259 645124 Adapter AM

NOTE: (Evaporator test adapter) PL2, formerly 64 5 107

SI number

01 04 08 (435)

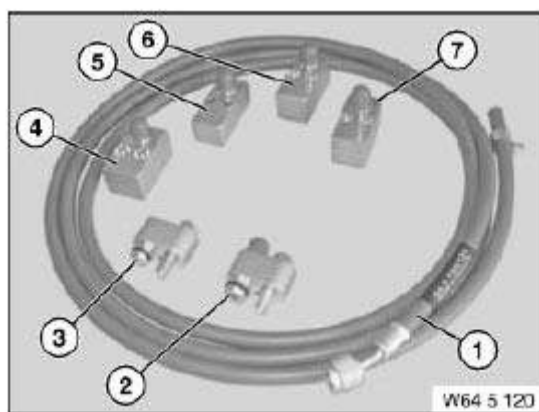


Fig. 4: Identifying Adapter (0496259)

Courtesy of BMW OF NORTH AMERICA, INC.

0495257 ADAPTER

0495257 645105 Adapter AM

NOTE: (Filler adapter) For sealing pressure line and connection to connecting hose

(replaces special tool 64 5 101 from 01/2005)

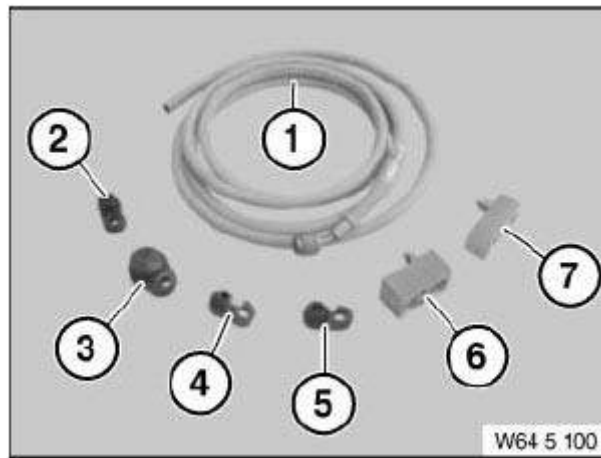


Fig. 5: Identifying Adapter (0495257)

Courtesy of BMW OF NORTH AMERICA, INC.

0495258 ADAPTER

0495258 645106 Adapter AM

NOTE: (Sealing adapter) Sealing adapter for closing off the line for the leakage test (included in delivery from 01/2005)

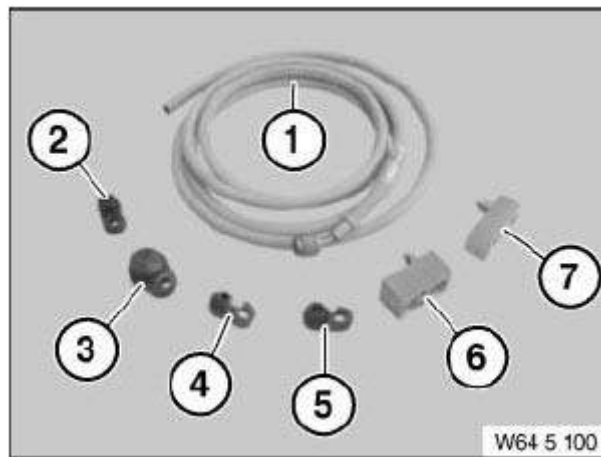


Fig. 6: Identifying Adapter (0495258)

Courtesy of BMW OF NORTH AMERICA, INC.

0493087 ADAPTER

0493087 645080 Adapter Mechanical tool

NOTE: For adjusting the expansion valve

Storage Location

X1

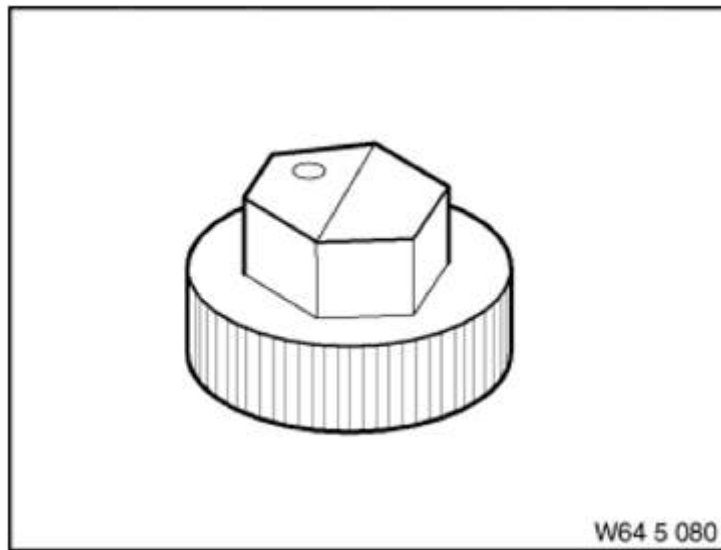


Fig. 7: Identifying Adapter (0493087)

Courtesy of BMW OF NORTH AMERICA, INC.

0496299 ADAPTER

0496299 645126 Adapter AM

NOTE: (Evaporator test adapter) E60, E61, E63, E64

SI number

01 04 08 (435)

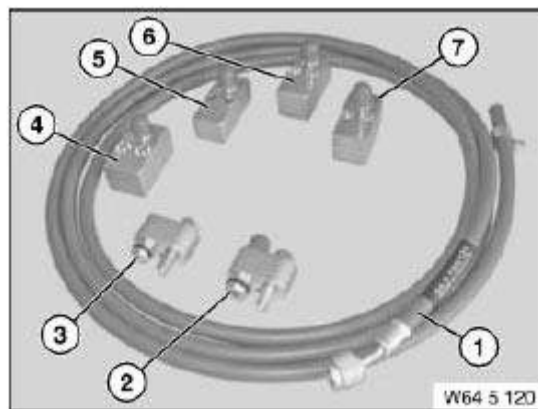


Fig. 8: Identifying Adapter (0496299)

Courtesy of BMW OF NORTH AMERICA, INC.

0493317 ADAPTER

0493317 645101 Adapter AM

Replaced by: 83300495257

NOTE: (Filling adapter) is replaced by 64 5 105 (from 01/2005) Replaced by 64 5 105 (0495 257)

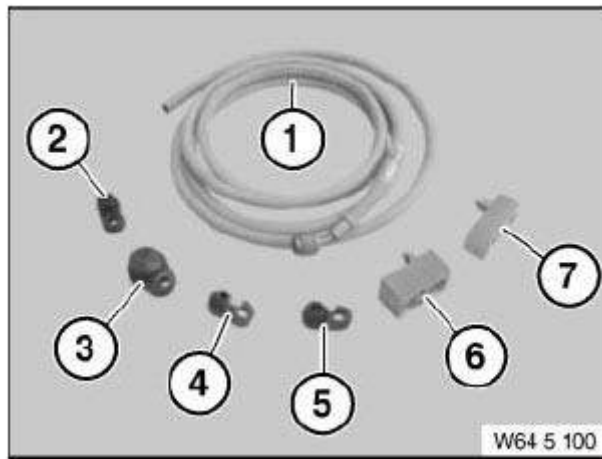


Fig. 9: Identifying Adapter (0493317)

Courtesy of BMW OF NORTH AMERICA, INC.

2286737 ADAPTER

2286737 Adapter Minimum set: Mechanical tools AM

NOTE: For pressure test (via pressure drop test) on the evaporator of the air conditioning on all F2x and F3x vehicles.

SI number

08 06 14 (081)



Fig. 10: Identifying Adapter (2286737)

Courtesy of BMW OF NORTH AMERICA, INC.

0496182 ADAPTER

0496182 645108 Adapter AM

NOTE: Leak-tight adapter) For sealing the line during the evaporator leakage test in the E70 (included in the delivery specification from 02/2007)

SI number

01 09 07 (360)

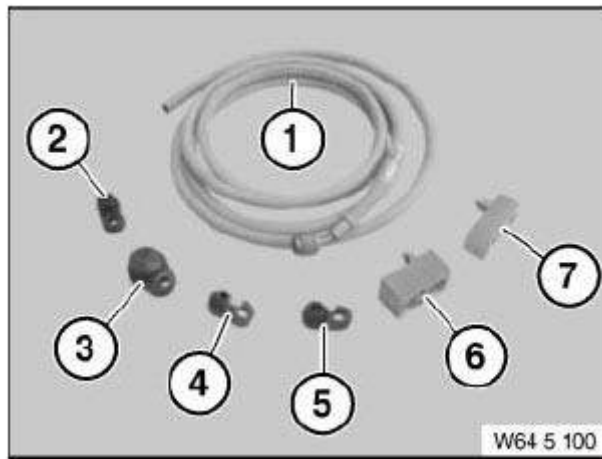


Fig. 11: Identifying Adapter (0496182)

Courtesy of BMW OF NORTH AMERICA, INC.

0493319 ADAPTER

0493319 645103 Adapter AM

NOTE: (Sealing adapter) For sealing suction connection on compressor

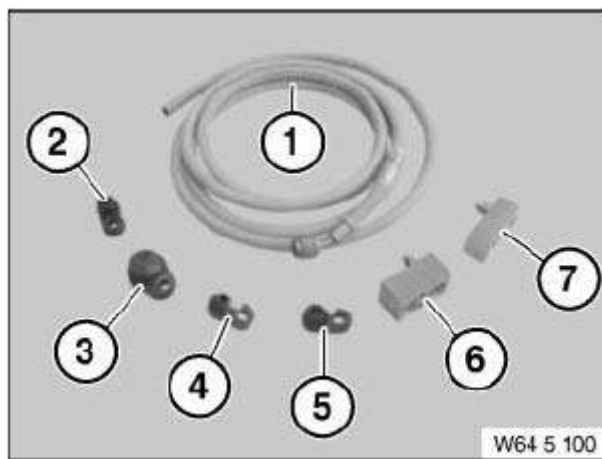


Fig. 12: Identifying Adapter (0493319)

Courtesy of BMW OF NORTH AMERICA, INC.

0496260 ADAPTER

0496260 645125 Adapter AM

NOTE: (Evaporator test adapter) E46, E83, E70, R55, R56 (formerly 64 5 108)

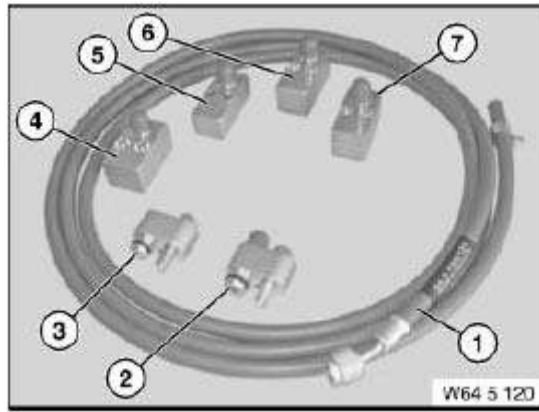


Fig. 13: Identifying Adapter (0496260)

Courtesy of BMW OF NORTH AMERICA, INC.

0493318 ADAPTER

0493318 645102 Adapter AM

NOTE: (Seal adapter) For closing off the intake pipe

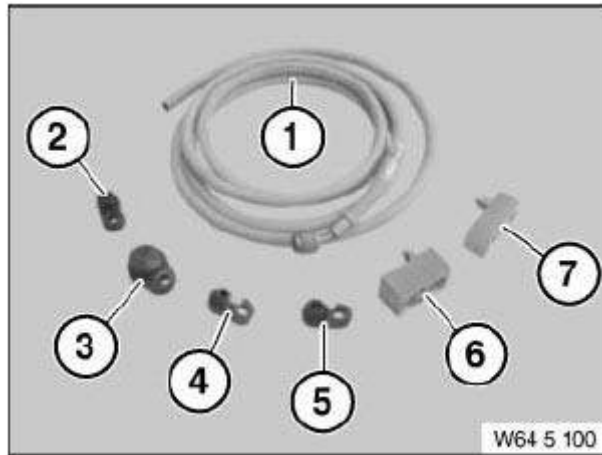


Fig. 14: Identifying Adapter (0493318)

Courtesy of BMW OF NORTH AMERICA, INC.

0496224 ADAPTER

0496224 645122 Adapter AM

NOTE: (Climate condenser test adapter)

SI number

01 04 08 (435)

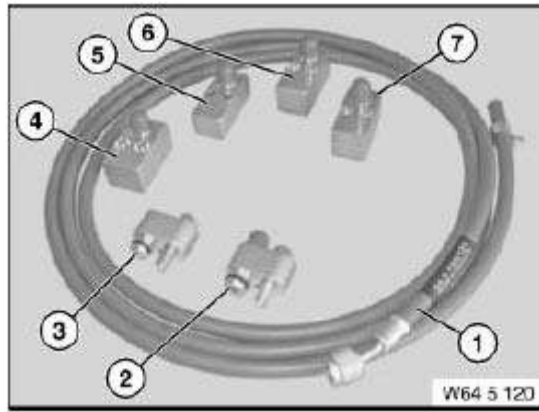


Fig. 15: Identifying Adapter (0496224)

Courtesy of BMW OF NORTH AMERICA, INC.

0493078 ADAPTER CABLE

0493078 641230 Adapter cable MP

NOTE: For fault finding in auxiliary heater and its periphery - model year: from 9/95

Storage Location

B117

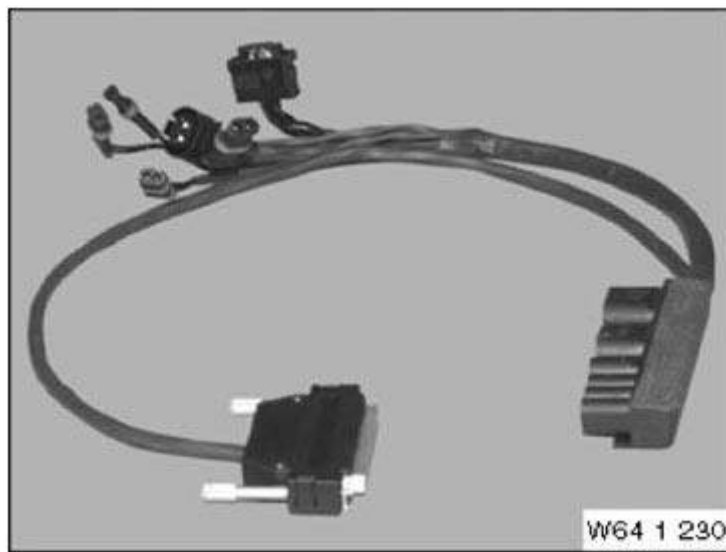


Fig. 16: Identifying Adapter Cable (0493078)

Courtesy of BMW OF NORTH AMERICA, INC.

0493077 CAP

0493077 641223 Cap AM

NOTE: (Sealing cap) For resistance opening on the rear side

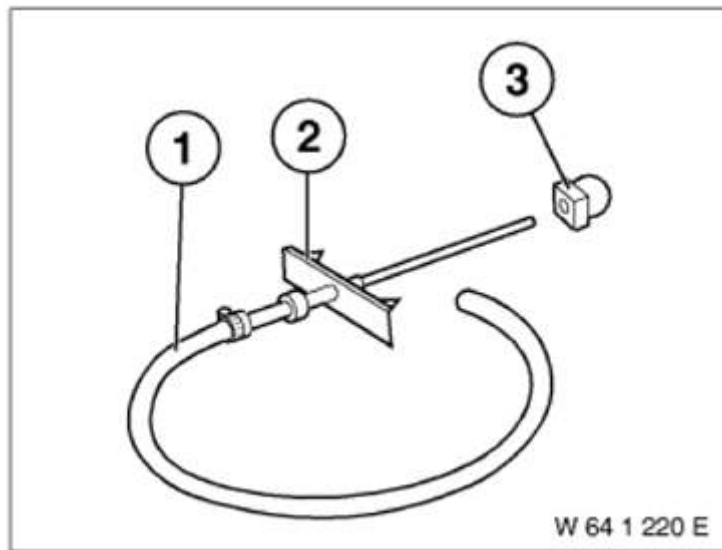


Fig. 17: Identifying Cap (0493077)

Courtesy of BMW OF NORTH AMERICA, INC.

0493073 CAP

0493073 641213 Cap AM

NOTE: (Sealing cap) For resistance opening on the rear side

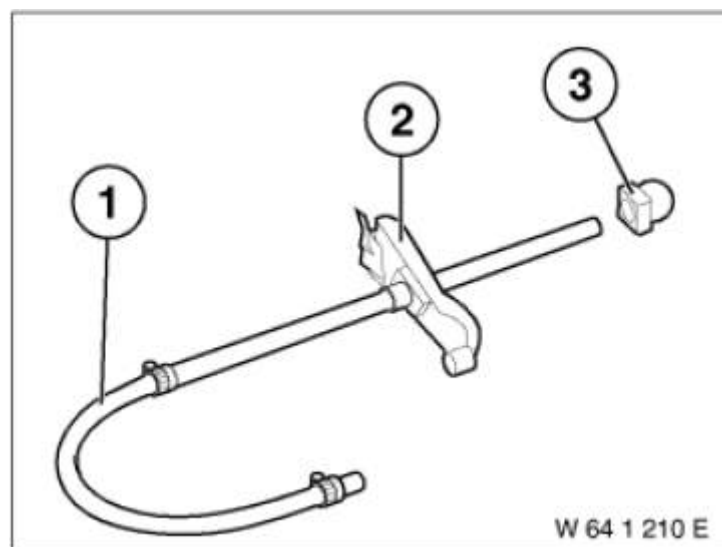


Fig. 18: Identifying Cap (0493073)

Courtesy of BMW OF NORTH AMERICA, INC.

2362832 CLEANING AGENT

2362832 Cleaning agent AM

NOTE: For cleaning the evaporator and blower shafts in the vehicle ventilation system



Fig. 19: Identifying Cleaning Agent (2362832)

Courtesy of BMW OF NORTH AMERICA, INC.

0493065 DEVICE

0493065 641150 Device Mechanical tool

NOTE: For drill out of heating discs. Other: Canada, Japan and USA only

0493314 DIAGONAL CUTTING PLIERS

0493314 649011 Diagonal cutting pliers AM

0493083 EXTRACTOR

0493083 645030 Extractor Mechanical tool

NOTE: For the thrust washer in the front housing cover of the swash plate compressor

Storage Location

B12

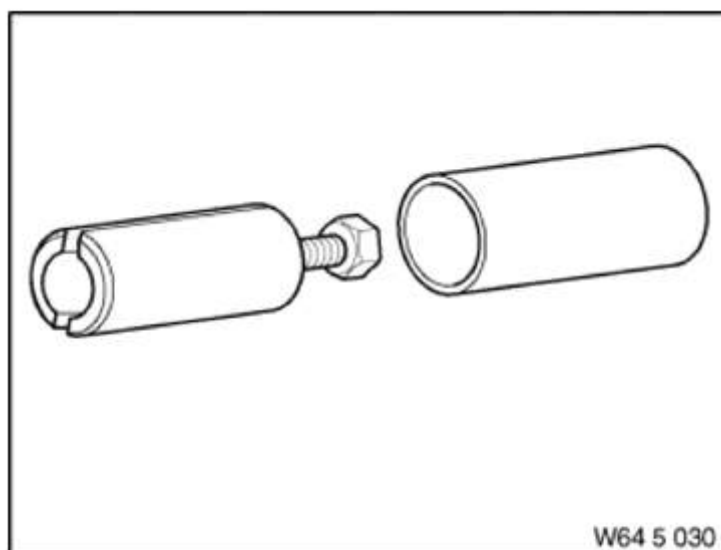


Fig. 20: Identifying Extractor (0493083)

Courtesy of BMW OF NORTH AMERICA, INC.

0493081 EXTRACTOR

0493081 645010 Extractor Mechanical tool

NOTE: For belt pulley on the blade cell compressor - air conditioning

Storage Location

B11

SI number

01 05 86 (604)

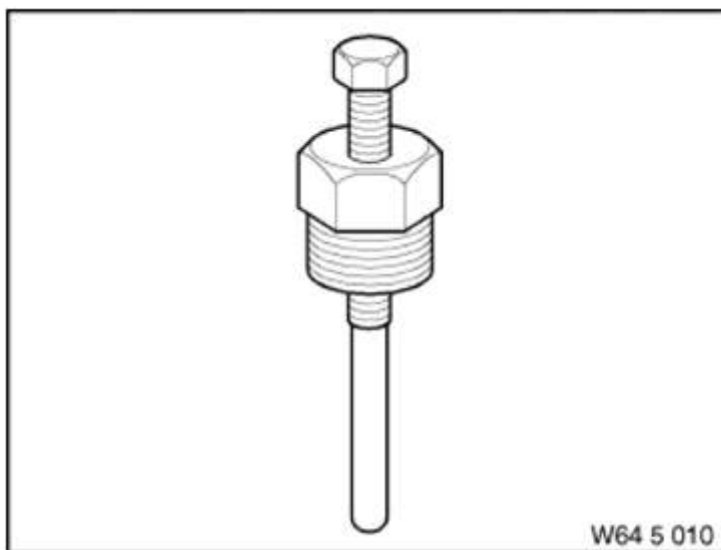


Fig. 21: Identifying Extractor (0493081)

Courtesy of BMW OF NORTH AMERICA, INC.

0493080 EXTRACTOR

0493080 645000 Extractor Mechanical tool

NOTE: For the belt pulley on the swash plate compressor - air conditioning

Storage Location

B11

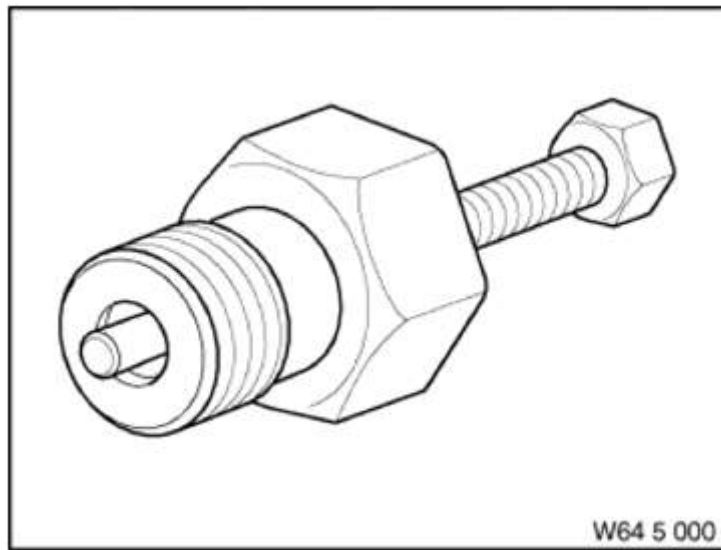


Fig. 22: Identifying Extractor (0493080)

Courtesy of BMW OF NORTH AMERICA, INC.

0493086 EXTRACTOR

0493086 645070 Extractor Mechanical tool

NOTE: For the fitting sleeve in the Seiko compressor

Storage Location

X1

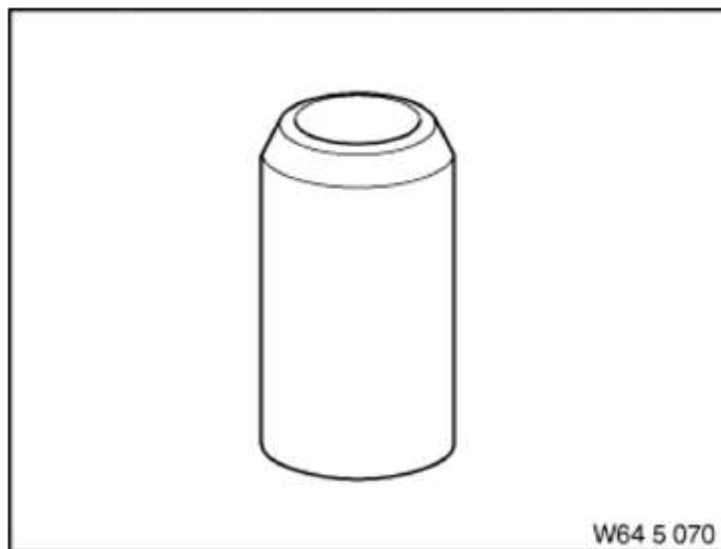


Fig. 23: Identifying Extractor (0493086)

Courtesy of BMW OF NORTH AMERICA, INC.

0493315 FOIL

0493315 649012 Foil AM

NOTE: (Covering foil, black (3 pieces))

0494845 GUIDE

0494845 641252 Guide AM

NOTE: Now only available in set 64 1 250.

SI number

01 26 03 (044)

0493082 HOLDER

0493082 645020 Holder Mechanical tool

NOTE: (Counter support) For belt pulley on the blade cell and Seiko compressor

Storage Location

B8

C8

SI number

01 05 86 (604)

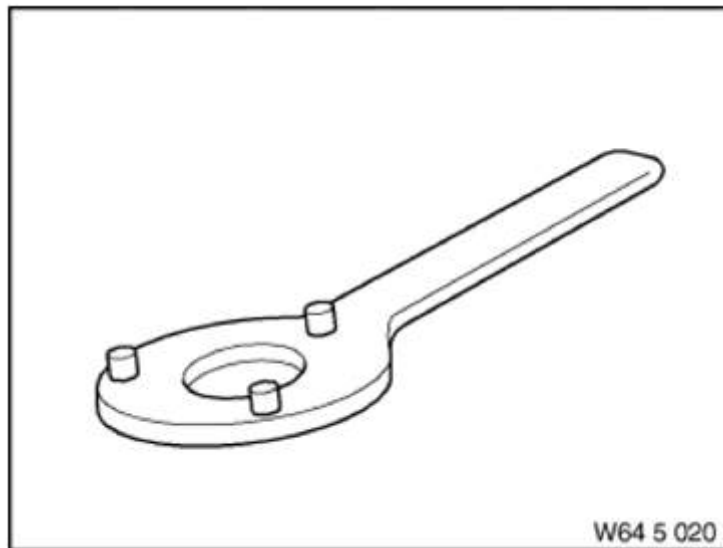


Fig. 24: Identifying Holder (0493082)

Courtesy of BMW OF NORTH AMERICA, INC.

0493084 HOLDING SLEEVE

0493084 645040 Holding sleeve Mechanical tool

NOTE: (Assembly sleeve) For the sliding ring gasket in the housing cover of the swash plate compressor

Storage Location

A6

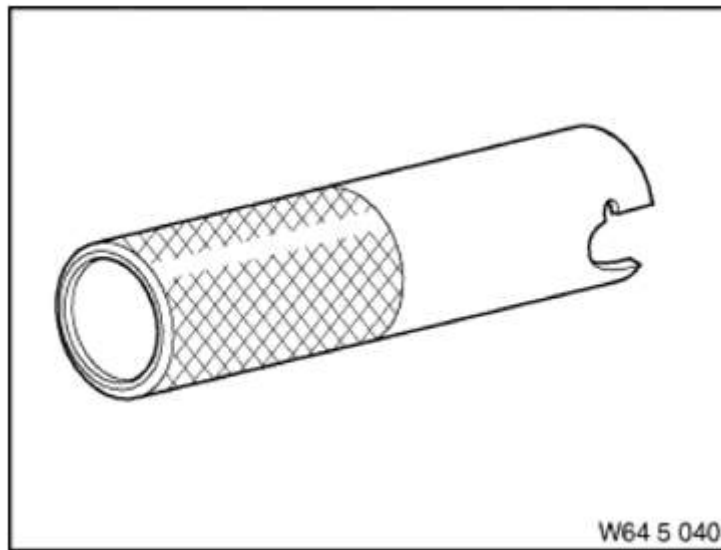


Fig. 25: Identifying Holding Sleeve (0493084)

Courtesy of BMW OF NORTH AMERICA, INC.

0493681 HOOK

0493681 641020 Hook Minimum set: Mechanical tools AM

NOTE: (release hook) For releasing and removing fresh air grille. For removing various covers.

Storage Location

A3

B3

SI number

01 15 99 (483)

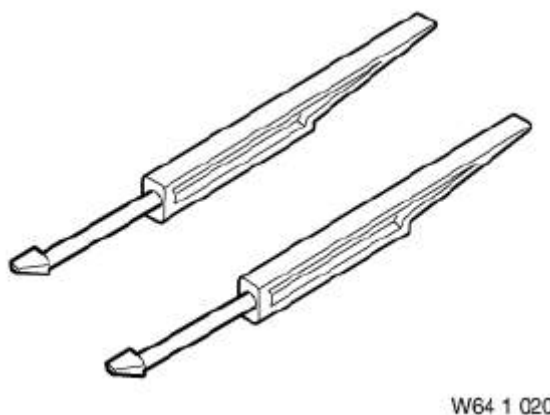


Fig. 26: Identifying Hook (0493681)

Courtesy of BMW OF NORTH AMERICA, INC.

0493320 HOSE

0493320 645104 Hose AM

NOTE: (connecting hose) For connecting the pressure cylinder to the filler adapter

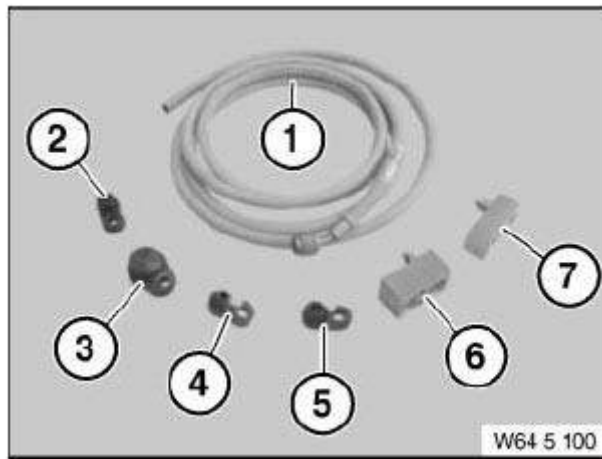


Fig. 27: Identifying Hose (0493320)

Courtesy of BMW OF NORTH AMERICA, INC.

0493072 HOSE

0493072 641212 Hose AM

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

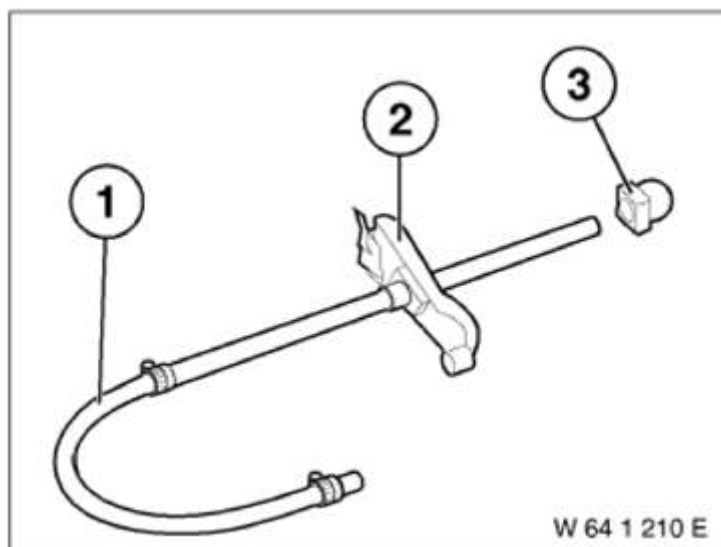


Fig. 28: Identifying Hose (0493072)

Courtesy of BMW OF NORTH AMERICA, INC.

0493069 HOSE

0493069 641202 Hose AM

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

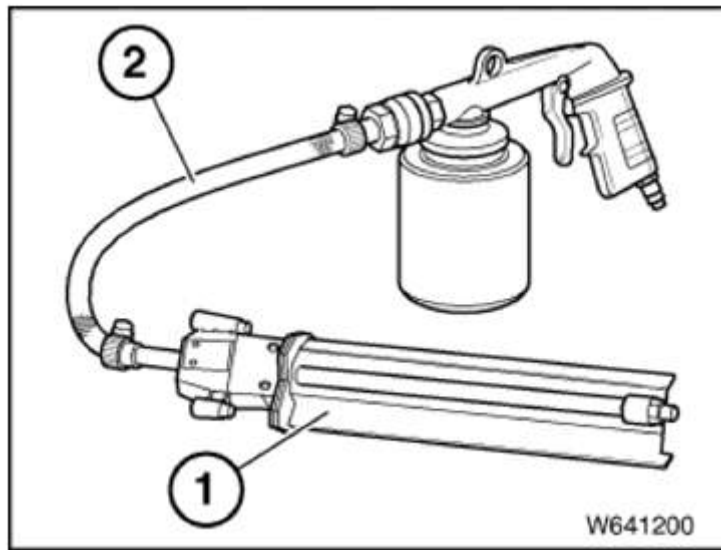


Fig. 29: Identifying Hose (0493069)

Courtesy of BMW OF NORTH AMERICA, INC.

0496223 HOSE

0496223 645121 Hose AM

NOTE: (Connection hose with clamp)

SI number

01 04 08 (435)

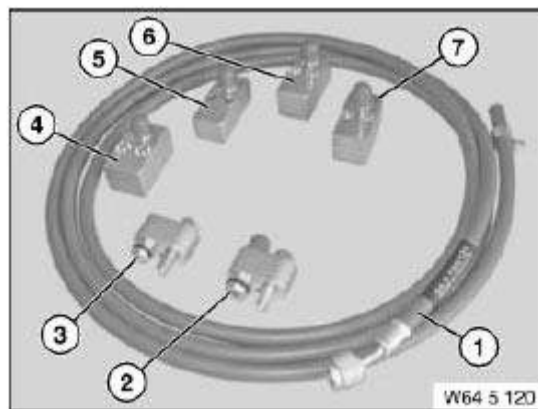


Fig. 30: Identifying Hose (0496223)

Courtesy of BMW OF NORTH AMERICA, INC.

0493076 HOSE

0493076 641222 Hose AM

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

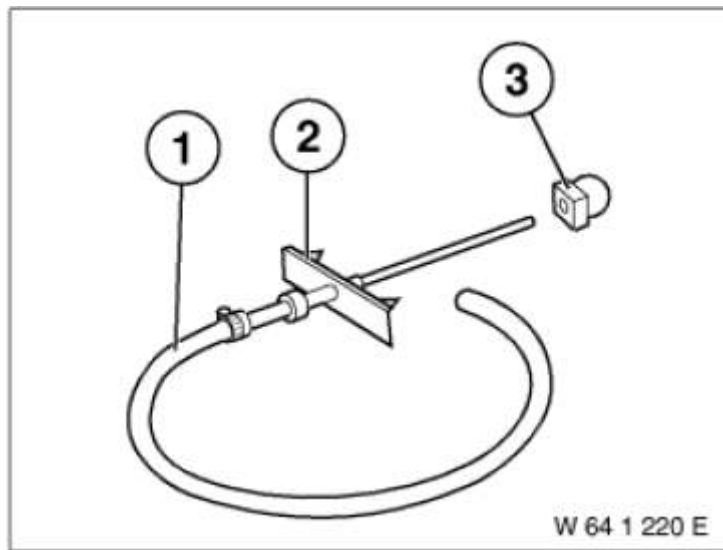


Fig. 31: Identifying Hose (0493076)

Courtesy of BMW OF NORTH AMERICA, INC.

0493316 LABELS

0493316 649013 Labels AM

NOTE: (Official mark, grey (5 pieces))

0493085 MANDREL

0493085 645060 Mandrel Mechanical tool

NOTE: (fitting mandrel) For the fitting keys in the drive shaft of the swash plate compressor

Storage Location

A6

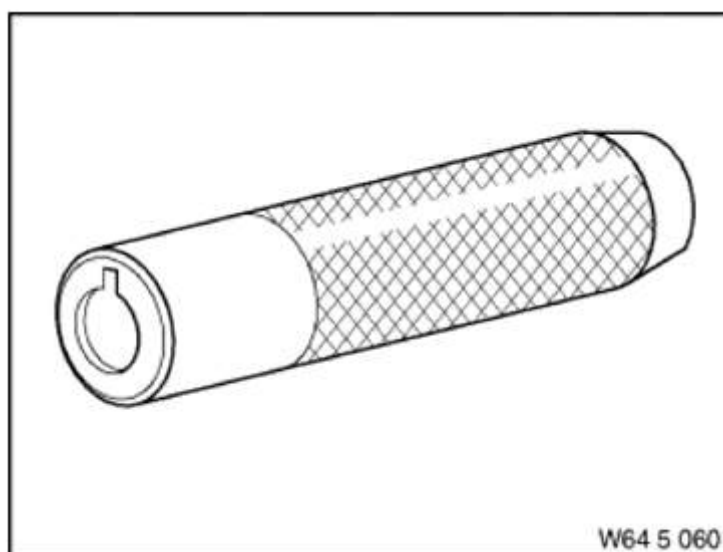


Fig. 32: Identifying Mandrel (0493085)

Courtesy of BMW OF NORTH AMERICA, INC.

0493062 MEASURING DEVICE

0493062 641100 Measuring device Mechanical tool

NOTE: (Precision spring balance) For preloading the temperature blending flap for heating and air conditioning

Storage Location

C1



Fig. 33: Identifying Measuring Device (0493062)
Courtesy of BMW OF NORTH AMERICA, INC.

0493063 PIN WRENCH

0493063 641110 Pin wrench Mechanical tool

NOTE: For releasing the belt pulley on the vane-type compressor (slotted nut)

Storage Location

X4

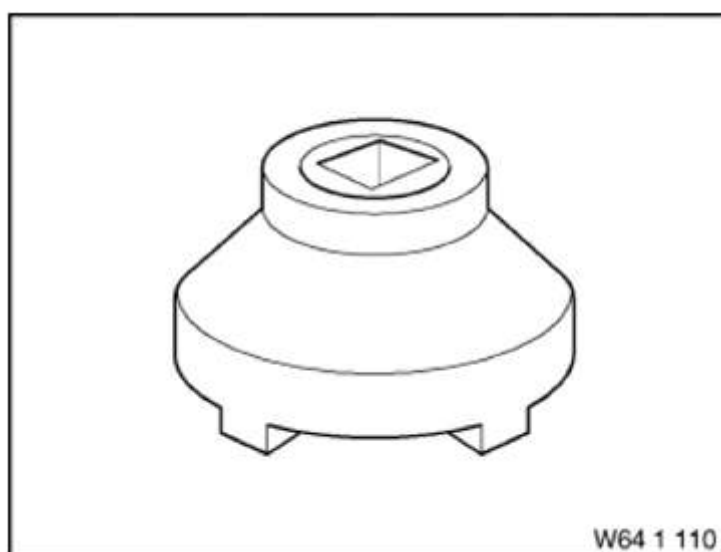


Fig. 34: Identifying Pin Wrench (0493063)
Courtesy of BMW OF NORTH AMERICA, INC.

0493088 PLIERS

0493088 645090 Pliers Mechanical tool

NOTE: (clamping pliers) For removing and fitting the clutch disc of the air conditioning compressor

Storage Location

Z10

SI number

01 10 91 (443)

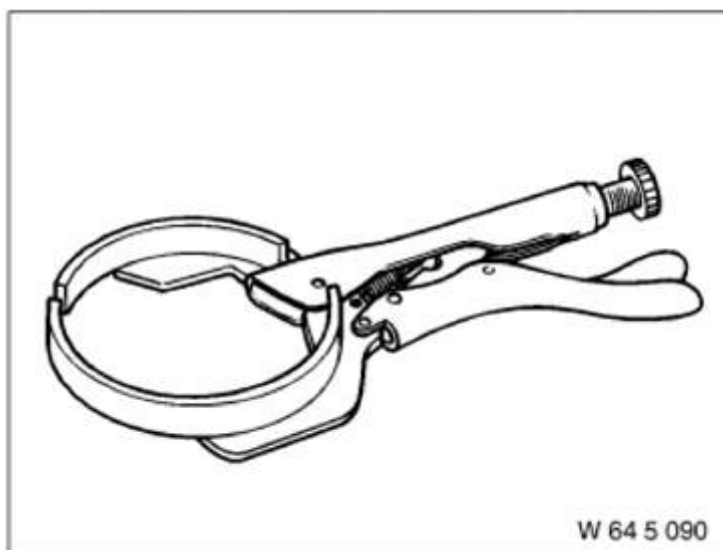


Fig. 35: Identifying Pliers (0493088)

Courtesy of BMW OF NORTH AMERICA, INC.

0493061 PLIERS

0493061 641000 Pliers Mechanical tool

NOTE: (Special pliers) For pressing through the retaining spring when removing the two heating control shafts for operation of the water valve and air distribution flaps on the heater

Storage Location

Z10

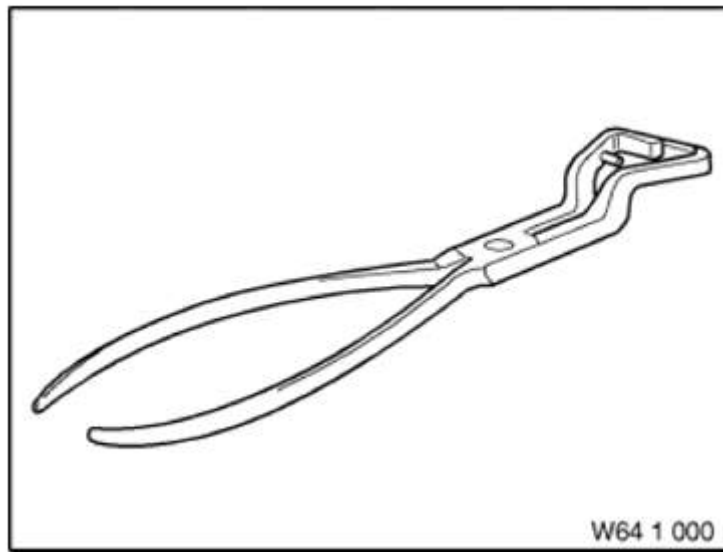


Fig. 36: Identifying Pliers (0493061)

Courtesy of BMW OF NORTH AMERICA, INC.

0496258 PLUG

0496258 645123 Plug AM

NOTE: (Climate condenser seal plug)

SI number

01 04 08 (435)

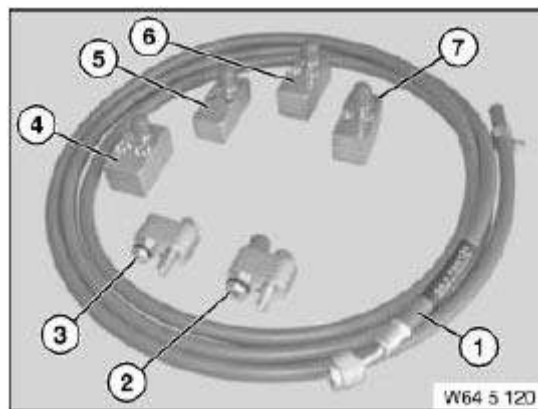


Fig. 37: Identifying Plug (0496258)

Courtesy of BMW OF NORTH AMERICA, INC.

0493064 RELEASE TOOL

0493064 641120 Release tool Mechanical tool

NOTE: For releasing Bowden cables (also E36/5)

Storage Location

B2

SI number

01 04 94 (788)

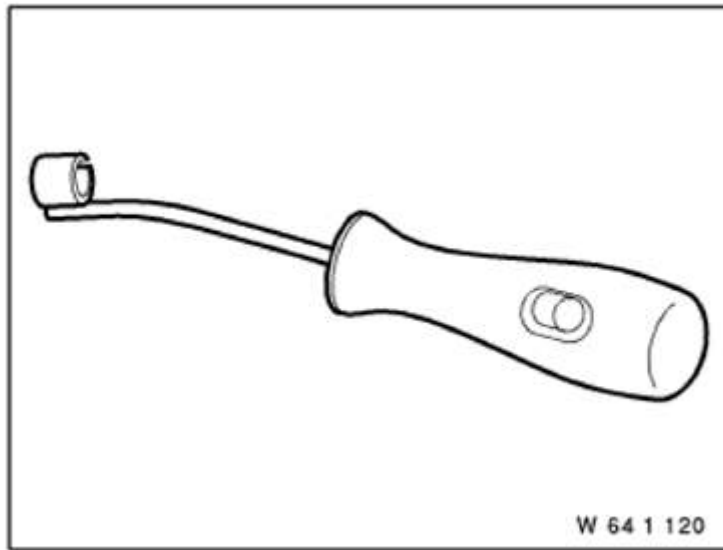


Fig. 38: Identifying Release Tool (0493064)
Courtesy of BMW OF NORTH AMERICA, INC.

0493176 RELEASE TOOL

0493176 641010 Release tool Mechanical tool

NOTE: (Releasing and attachment aid) For heater controls

Storage Location

A3

SI number

01 02 98 (302)

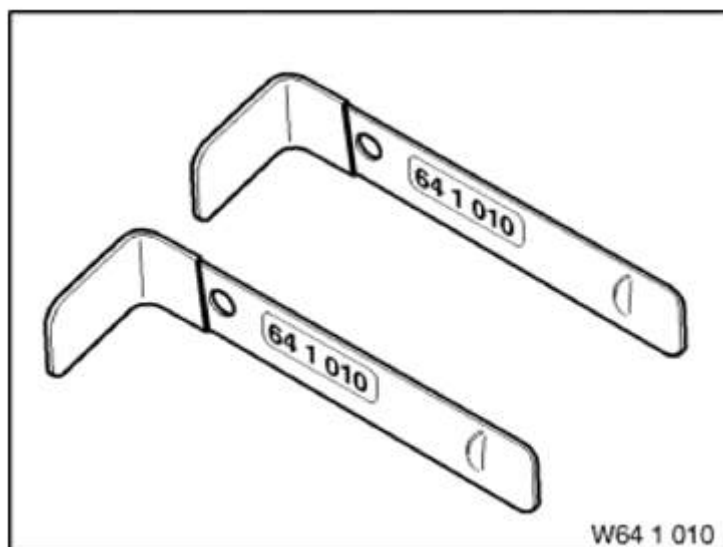


Fig. 39: Identifying Release Tool (0493176)
Courtesy of BMW OF NORTH AMERICA, INC.

0493075 SPRAY LANCE

0493075 641221 Spray lance AM

NOTE: (Lance with lid)

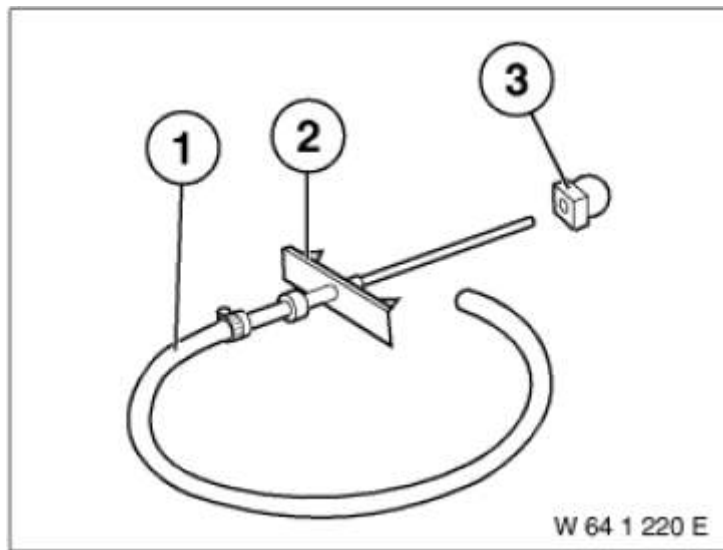


Fig. 40: Identifying Spray Lance (0493075)

Courtesy of BMW OF NORTH AMERICA, INC.

0494841 SPRAY LANCE

0494841 641491 Spray lance AM

NOTE: (Spray lance (left-hand drive vehicle)) Deletion, only available via tool set

0494840 SPRAY LANCE

0494840 641490 Spray lance AM

NOTE: (sprayer for evaporator cleaning (left hand drive)) sprayer for cleaning the evaporator

SI number

01 26 03 (044)

Consisting of:

1. [0494841](#) Spray lance

NOTE: (Spray lance (left-hand drive vehicle)) Deletion, only available via tool set

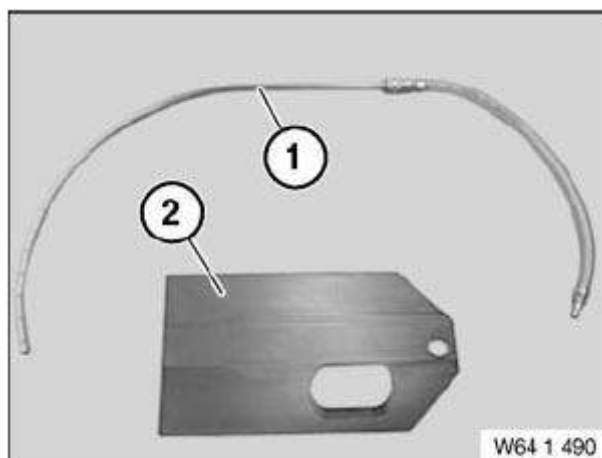


Fig. 41: Identifying Spray Lance (0494840)

Courtesy of BMW OF NORTH AMERICA, INC.

2. **0494842** Spray lance

NOTE: (Guide for spray lance (left-hand drive vehicle)) Deletion, only available via tool set

0494844 SPRAY LANCE

0494844 641251 Spray lance AM

NOTE: Now only available in set 64 1 250.

SI number

01 26 03 (044)

0494842 SPRAY LANCE

0494842 641492 Spray lance AM

NOTE: (Guide for spray lance (left-hand drive vehicle)) Deletion, only available via tool set

0493068 SPRAY LANCE

0493068 641201 Spray lance AM

NOTE: (Guide) discontinued, available as part of set of special tools only

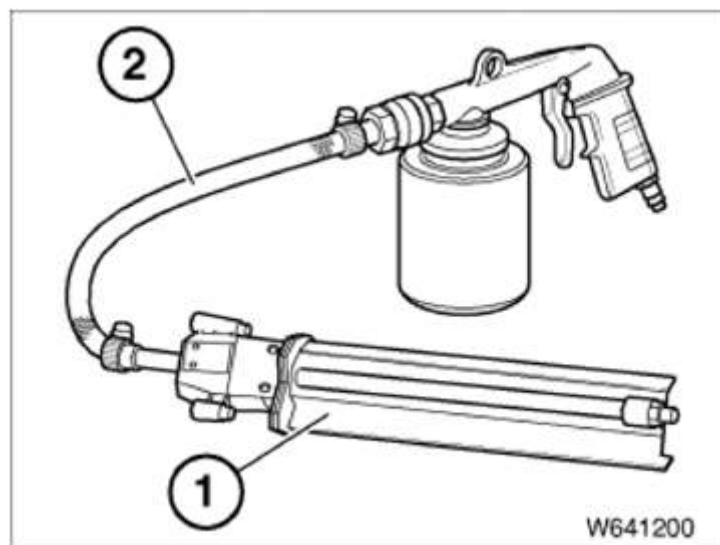


Fig. 42: Identifying Spray Lance (0493068)

Courtesy of BMW OF NORTH AMERICA, INC.

2289613 SPRAY LANCE

2289613 Spray lance Mechanical tool

NOTE: For cleaning evaporators for right-hand drive vehicles.

SI number

01 19 12 (889)

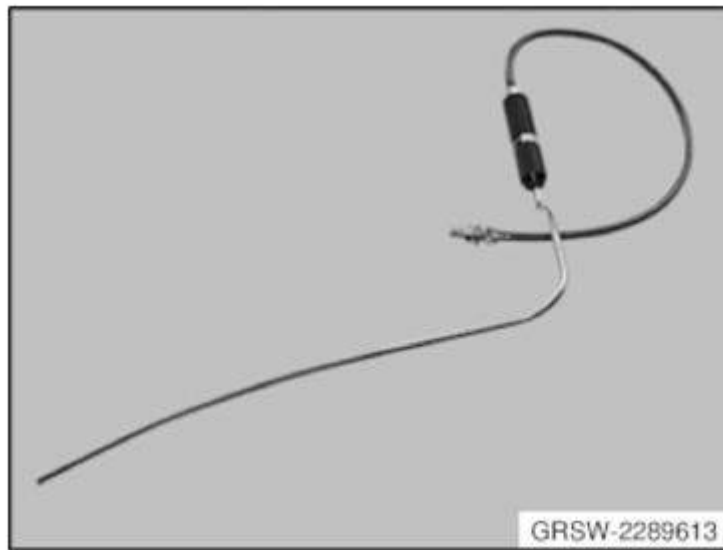


Fig. 43: Identifying Spray Lance (2289613)

Courtesy of BMW OF NORTH AMERICA, INC.

0493071 SPRAY LANCE

0493071 641211 Spray lance AM

NOTE: (Lance with lid)

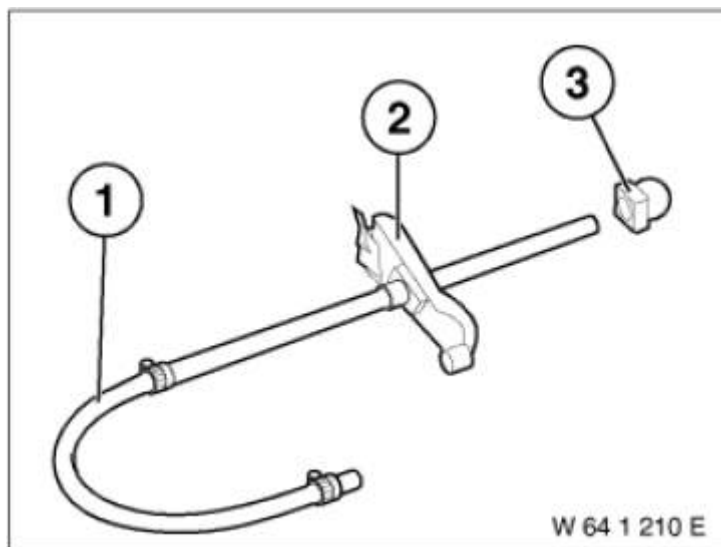


Fig. 44: Identifying Spray Lance (0493071)

Courtesy of BMW OF NORTH AMERICA, INC.

0493067 SPRAYER

0493067 641200 Sprayer AM

NOTE: For cleaning the IHKA and IHKR1 A/C system evaporator

SI number

01 06 91 (398)

Consisting of:

1. 0493068 Spray lance

NOTE: (Guide) discontinued, available as part of set of special tools only

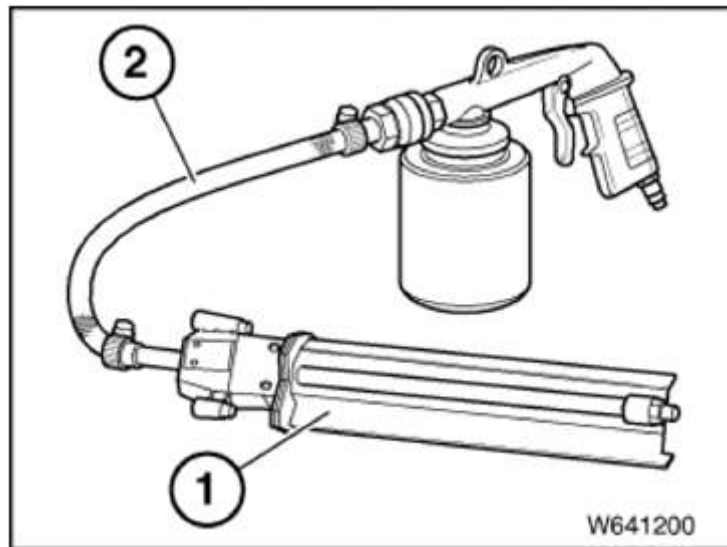


Fig. 45: Identifying Sprayer (0493067)

Courtesy of BMW OF NORTH AMERICA, INC.

2. **0493069** Hose

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

0494843 SPRAYER

0494843 641250 Sprayer AM

NOTE: (sprayer for cleaning evaporator (RHD models)) for cleaning air conditioning evaporator

SI number

01 26 03 (044)

Consisting of:

1. **0494844** Spray lance

NOTE: Now only available in set 64 1 250.

2. **0494845** Guide

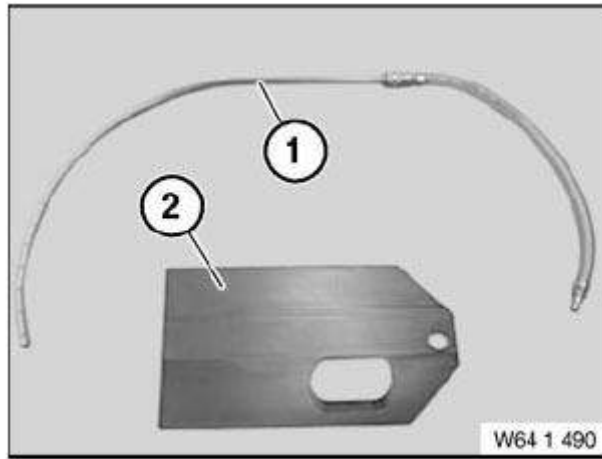


Fig. 46: Identifying Sprayer (0494843)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Now only available in set 64 1 250.

0493074 SPRAYER

0493074 641220 Sprayer AM

NOTE: For cleaning and disinfecting the IHKR A/C system evaporator

SI number

01 07 92 (516)

Consisting of:

2 = 0493075 Spray lance

NOTE: (Lance with lid)

1 = 0493076 Hose

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

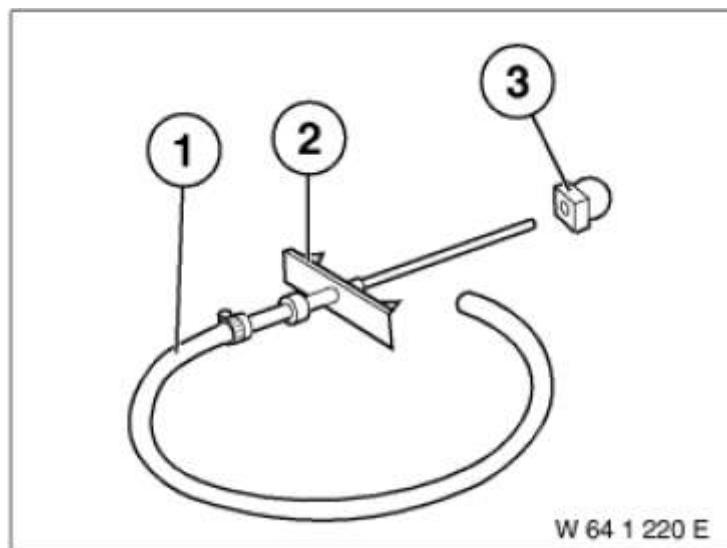


Fig. 47: Identifying Sprayer (0493074)

Courtesy of BMW OF NORTH AMERICA, INC.

3 = [0493077](#) Cap

NOTE: (Sealing cap) For resistance opening on the rear side

0493070 SPRAYER

0493070 641210 Sprayer AM

NOTE: For cleaning and disinfecting the IHKR3 A/C system evaporator

SI number

01 07 92 (516)

Consisting of:

2 = [0493071](#) Spray lance

NOTE: (Lance with lid)

1 = [0493072](#) Hose

NOTE: (Connecting hose) discontinued, available as part of set of special tools only

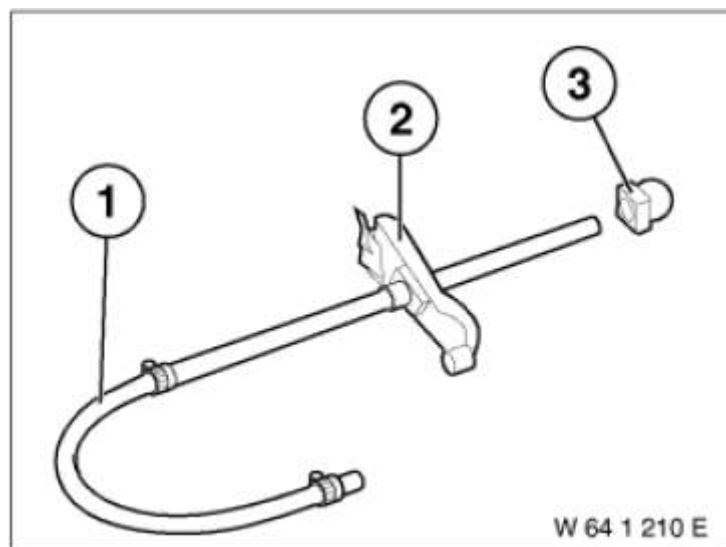


Fig. 48: Identifying Sprayer (0493070)

Courtesy of BMW OF NORTH AMERICA, INC.

3 = [0493073](#) Cap

NOTE: (Sealing cap) For resistance opening on the rear side

9429217 SPRAYER

9429217 Sprayer AM

NOTE: For cleaning the air conditioning condensers in conjunction with spray lances.

SI number



Fig. 49: Identifying Sprayer (9429217)

Courtesy of BMW OF NORTH AMERICA, INC.

0493066 TEST CABLE

0493066 641160 Test cable Mechanical tool

NOTE: For activation of water valves

Storage Location

B116

SI number

02 04 93 (652)

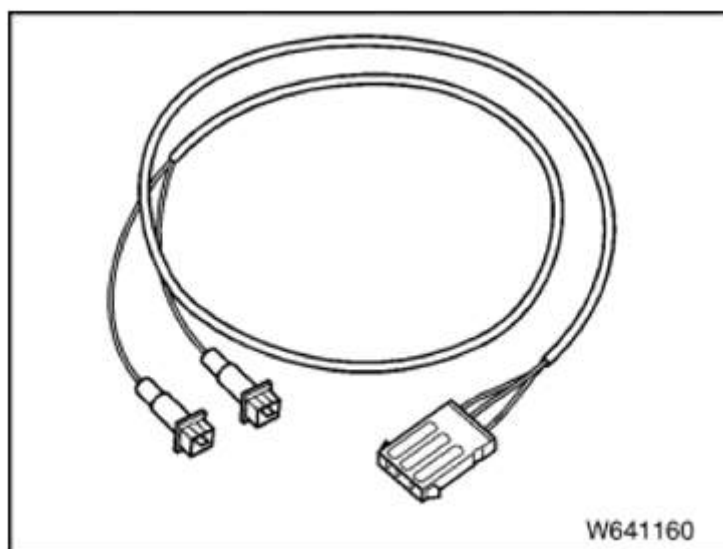


Fig. 50: Identifying Test Cable (0493066)

Courtesy of BMW OF NORTH AMERICA, INC.

0493079 TESTER

0493079 641400 Tester Mechanical tool

NOTE: (Testing set) For checking the salt content in coolant. Only applies to vehicles with latent-heat storage system. Testing set was supplied as a one-off campaign!

0493313 TOOL

0493313 649010 Tool AM

NOTE: (Tool set) for removal of resistor R58 from the printed circuit board of the Automatic air conditioning IHKA, one-off campaign for VK-23

Consisting of:

1. [0493314](#) Diagonal cutting pliers
2. [0493315](#) Foil

NOTE: (Covering foil, black (3 pieces))

3. [0493316](#) Labels

NOTE: (Official mark, grey (5 pieces))

0427679 WRENCH

0427679 Wrench Mechanical tool

NOTE: For opening the service coupling valves for R134a air conditioning lines



Fig. 51: Identifying Wrench (0427679)

Courtesy of BMW OF NORTH AMERICA, INC.

HVAC

Heating And Air Conditioning - Technical Data - F25

HEATING AND AIR-CONDITIONING UNIT (EVAPORATOR), SWITCHING ELEMENTS

64 51 HEATING AND AIR-CONDITIONING UNIT (EVAPORATOR), SWITCHING ELEMENTS

HEATING AND AIR-CONDITIONING UNIT (EVAPORATOR), SWITCHING ELEMENTS SPECIFICATION

Resistance as a function of temperature	$\hat{A}^{\circ}$	-5/11.4... 11.9 0/8.8... 9.2 5/6.8... 7.2 10/5.3... 5.6 15/4.2... 4.5 20/3.3...
	C/k Ω	3.6 25/2.6... 2.9 30/2.1... 2.3 35/1.7... 1.9

HEATING AND AIR-CONDITIONING UNIT (EXPANSION VALVE), SWITCHING ELEMENTS

64 51 HEATING AND AIR-CONDITIONING UNIT (EXPANSION VALVE), SWITCHING ELEMENTS

HEATING AND AIR-CONDITIONING UNIT (EXPANSION VALVE), SWITCHING ELEMENTS SPECIFICATION

Inlet pressure (excess pressure)	bar	14
Outlet pressure (excess pressure)	bar	1.8
Leak test with detector at excess pressure	bar	1... 2

AIR CONDITIONING, REFRIGERANT AMOUNTS

64 50 AIR CONDITIONING, REFRIGERANT AMOUNTS

AIR CONDITIONING, REFRIGERANT AMOUNTS SPECIFICATION

Refrigerant capacity R 134a	g	480 $\hat{A}\pm 10$
(The data on the nameplate in the engine compartment are definitive)	g	520 $\hat{A}\pm 10$ (N52 engine only)

AIR CONDITIONING COMPRESSOR

64 52 AIR CONDITIONING COMPRESSOR

TIGHTENING TORQUE SPECIFICATION - AIR CONDITIONING COMPRESSOR

Â	Type	Thread
1AZ lines to compressor	F01/F02/F03/F06/F07/F10/F10h/F11/F18/F12/F13/F15/F25	M8
	F10/F11/F15/F16/F20/F21/F22/F25/F26/F30/F31/F32/F33/F34/F35/F36/F80/F82/F83	M6
2AZ oil filler plug	F01/F02/F03/F06/F07/F10/F11/F18/F12/F13/F15/F16/F25/F26/F20/F21/F22/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56/F80/F82/F83	Â
3AZ to crankcase	N47T, F10/F11/F20/F15/F21/F22/F25/F26/F30/F31/F32/F33/F34/F36	M10
	N13, F20/F21/F22/F30/F31	M8
	N20, F10/F11/F20/F21/F22/F25/F26/F30/F31/F33/F34/F32/F35/F36	M10
	N54, F01/F02	M8
	N55, F06/F07/F10/F10h/F11/F15/F16/F18/F12/F13/F20/F21/F22/F26/F25/F30/F31/F32/F33/F34/F35/F36	M8
	N57, F01/F02/F07/F10/F11	M8
	N57, F06/F07/F10/F11/F12/F13/F15/F16/F26/F25/F30/F32/F31/F33/F34/F36	M10
	N63, F01/F02/F03/F04/F06/F07/F10/F11/F12/F13	M8
	N63T, F15/F16	M8
	N74, F01/F02/F03	M8
	F45/F46/F55/F56 All	M10
	B47, F25/F26	M10
	B37, F20/F21	M10
	S55, F80/F82/F83	M8
	N52, F01/F02/F10/F11/F18/F25	M8
4AZ lines to compressor	F04	M6
5AZ lower crankcase section	N55, F20/F21/F22/F30/F32/F31/F33/F35/F36	Â
6AZ lines to component carrier	F10h	M6
7AZ Holder for refrigerant lines to compressor	N57X, F10/F11	M6

AUXILIARY HEATING

64 12 AUXILIARY HEATING

TIGHTENING TORQUE SPECIFICATION - AUXILIARY HEATING

Â	Type	Thread	Tightening specifications	Di
1AZ	Auxiliary heater to body	F25/F26	Â	8.
2AZ	Changeover valve holder to auxiliary heater	F25/F26	Â	8.
3AZ	Rubber mount to independent heater	F25/F26	Â	8.

REFRIGERANT LINES AND EXPANSION VALVE

64 53 REFRIGERANT LINES AND EXPANSION VALVE

TIGHTENING TORQUE SPECIFICATION - REFRIGERANT LINES AND EXPANSION VALVE

Â	Type	Threa
1AZ Refrigerant lines to flange (expansion valve)	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13/F20/F21/F22/F23/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56/F80/F82/F83	M6
2AZ Expansion valve to heater - A/C	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13/F20/F21/F22/F23/F25/F26/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56/F80/F82/F83	M6
3AZ Refrigerant lines to capacitor	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13/F20/F21/F22/F23/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56/F80/F82/F83	M6
	F25/F26	M6

4AZ	Refrigerant lines to air-conditioning compressor	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13/F20/F21/F22/F23/F25/F26/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56	M8
5AZ	Rear air conditioner expansion valve coolant lines	F01/F02/F03	M6
6AZ	Rear air conditioner expansion valve	F02/F03	Â
7AZ	Intake pipe 1 to intake pipe 2	F01/F02/F03/F04/F10	M6
8AZ	Pressure sensor	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13/F20/F21/F22/F23/F25/F26/F30/F31/F32/F33/F34/F35/F36/F45/F46/F55/F56/F80/F82/F83	Â
9AZ	Sealing plate for refrigerant lines on bulkhead	F01/F02/F03/F04/F06/F07/F10/F11/F18/F12/F13	Â
10AZ	Expansion valve to retaining clip	F25/F26	M10
11AZ	Refrigerant lines to expansion valve	F25/F26	Â
12AZ	Refrigerant lines with retaining clip to expansion valve	F10h/F01h/F02h	Â
13AZ	Refrigerant line to high-voltage battery unit	F01h/F02h/F10h/F30h	M6
14AZ	Nuts for expansion valve	F10h/F01h/F02h	M5
15AZ	Expansion valve to high-voltage battery unit	F30h	M6

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Article GUID: A00702188