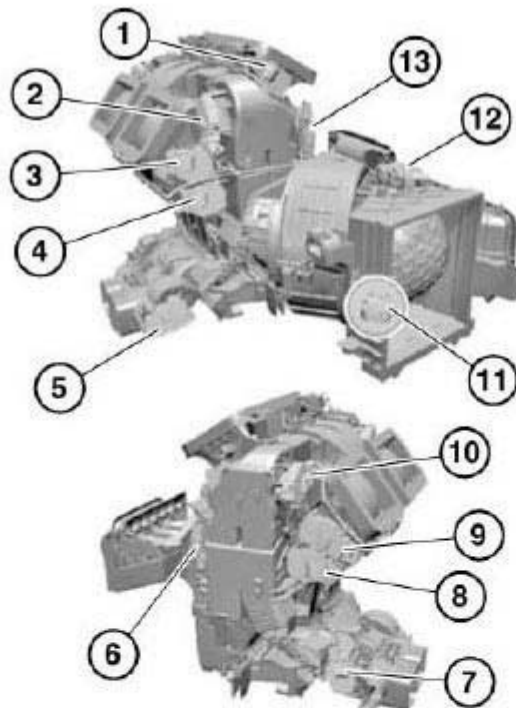


2007-08 HVAC

Heating And Air Conditioning - Repair Instructions - X5

11 HEATER WITH OPERATION

64 11 ... OVERVIEW OF HEATER/AIR CONDITIONER SERVOMOTORS



R64 1441

1	Servomotor, <u>defrosting</u>	8	Servomotor, <u>stratification, front left/right</u>
2	Servomotor, <u>footwell, rear cabin, right</u>	9	Servomotor, <u>ventilation, front left/right</u>
3	Servomotor, <u>ventilation, front right</u>	10	Servomotor, footwell, rear cabin, left
4	Servomotor, <u>stratification, front right</u>	11	Servomotor, <u>dynamic pressure compensation</u>
5	Servomotor, stratification/shut-off, rear cabin, right	12	Servomotor, <u>fresh air/recirculated air</u>
6	Servomotor, footwell, front left	13	Servomotor, footwell, front left/right
7	Servomotor, stratification, rear cabin, left/right		

Fig. 1: Identifying Heater/Air Conditioner Servomotors Components Location
 Courtesy of BMW OF NORTH AMERICA, INC.

64 11 ... INSTALLING SERVODRIVE

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Installation:

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

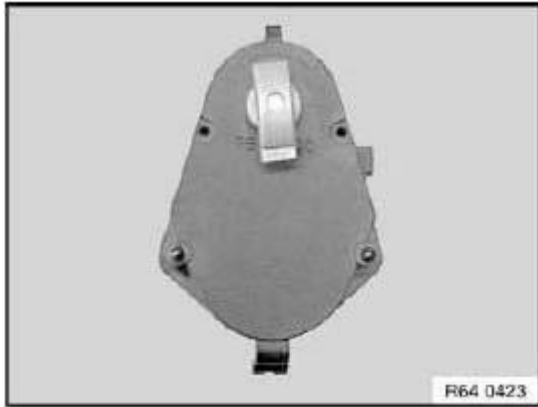


Fig. 2: Identifying Servodrive Installation Position
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 206 REMOVING AND INSTALLING/REPLACING HEATER

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage

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

If A/C system is opened for more than 24 hours: Replacing drier insert for A/C system

Necessary preliminary tasks:

- Drain off air conditioner . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).
- Remove carrier for instrument panel . See 51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL .
- Unclip wiring harness holders from heater

Recycling

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

Catch and dispose of escaping coolant.

Observe country-specific waste-disposal regulations.

Release screw (1) and remove refrigerant lines with cover (1) and associated seal.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES**.

Replace sealing rings and moisten with refrigerant oil.

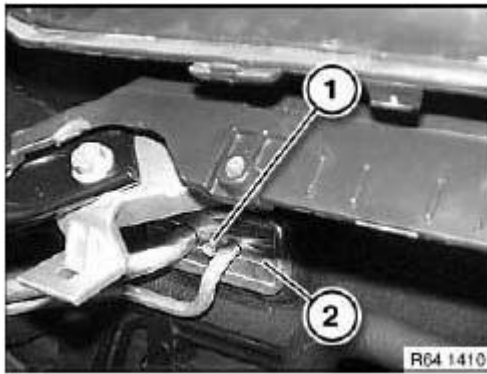


Fig. 3: Identifying Refrigerant Lines With Screw
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Connections must not be mixed up!
Mark connection sequence of water hoses prior to removal.

Release hose clamps (1) and detach water hoses.

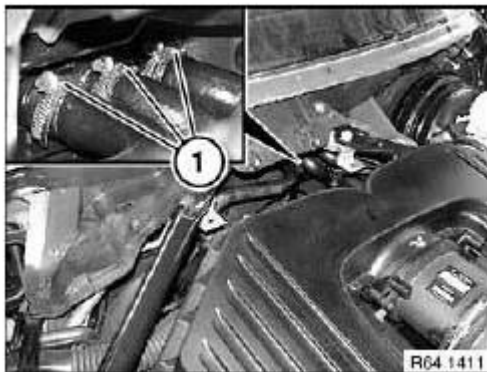
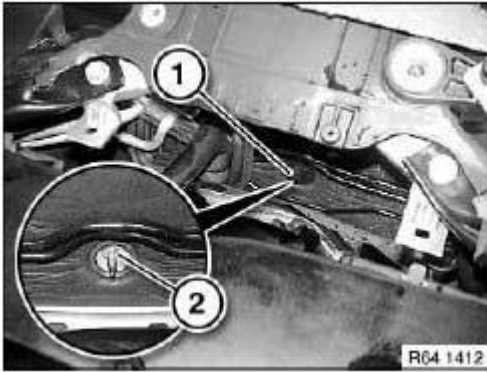


Fig. 4: Identifying Hose Clamps
Courtesy of BMW OF NORTH AMERICA, INC.

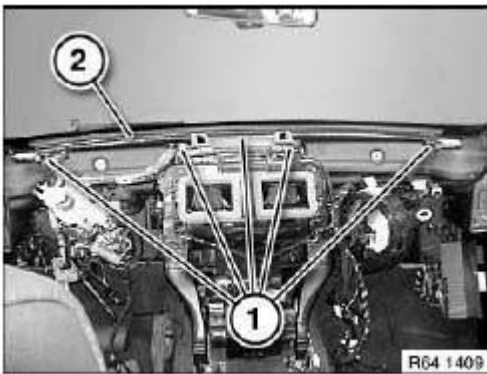
Release nut (1) and nut (2) underneath.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES**.

**Fig. 5: Identifying Nut**

Courtesy of BMW OF NORTH AMERICA, INC.

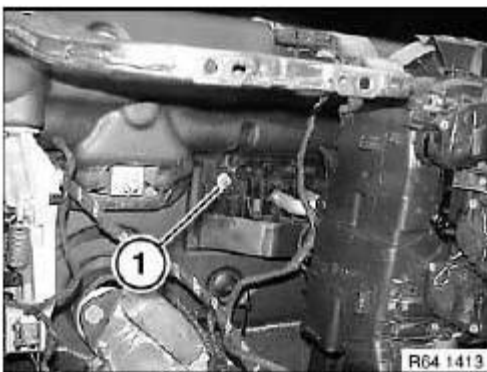
Release screws (1) and remove windscreen air guide (2).

**Fig. 6: Identifying Windscreen Air Guide With Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

**Fig. 7: Identifying Heater Screw**

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

IMPORTANT: Cover vehicle interior with protective cover to prevent interior being fouled by escaping coolant.

Feed out heater (2).

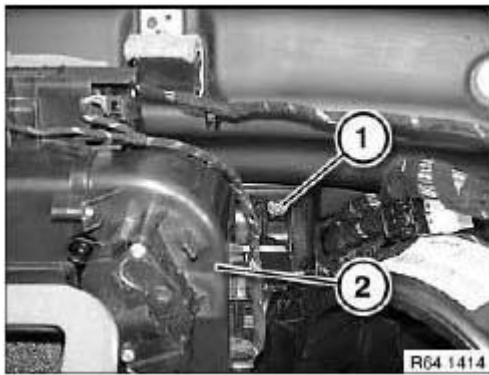


Fig. 8: Identifying Heater Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Modify evaporator . See 64 51 002 REPLACING EVAPORATOR.
- Modify heater core
- Modify expansion valve . See 64 51 525 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE.
- Modify all servodrives

Installation:

Water drain (1) must be inserted on both sides into outlet channel (2).

IMPORTANT: In the event of incorrect fitting, there is a risk of leakage in the passenger compartment!

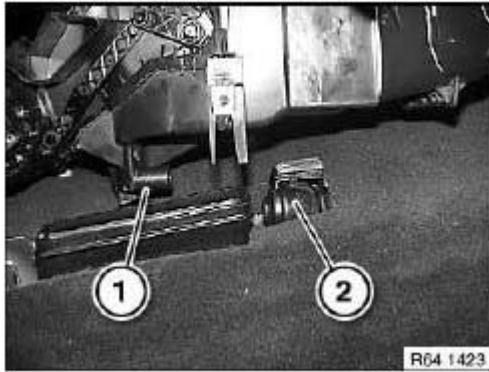


Fig. 9: Identifying Water Drain With Outlet Channel
 Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Fill and vent cooling system

64 11 212 REMOVING AND INSTALLING/REPLACING HEATER/AIR CONDITIONER FAN

Necessary preliminary tasks:

- Disconnect battery negative lead . See **12 00... INSTRUCTIONS FOR DISCONNECTING AND CONNECTING BATTERY** .
- Remove lower trim from instrument panel . See **51 45 181 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT TRIM FOR INSTRUMENT PANEL** .

Release screws (1).

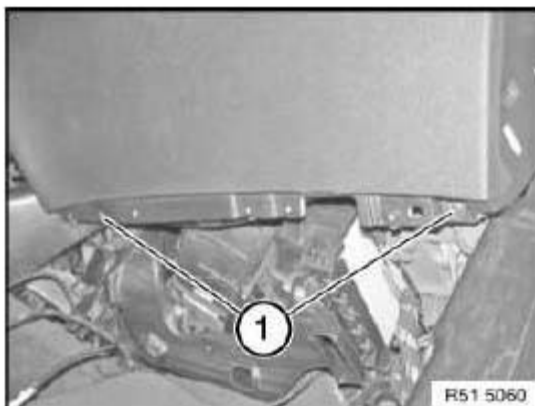


Fig. 10: Identifying Heater/Air Conditioner Fan Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove air duct (2).

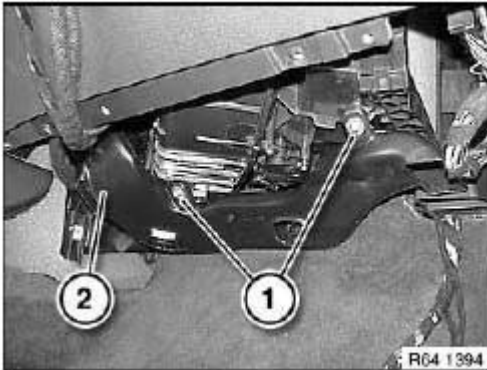


Fig. 11: Identifying Air Duct With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).



Fig. 12: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage to instrument panel trim (2) if it is pulled away too forcefully.

Release screw (1).

Carefully pull instrument panel trim (2) away in direction of arrow and feed out fan (3).

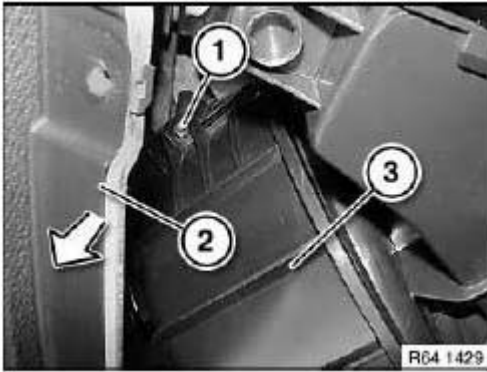


Fig. 13: Pulling Instrument Panel Trim

Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Installation:

Make sure cover (2) is securely seated.

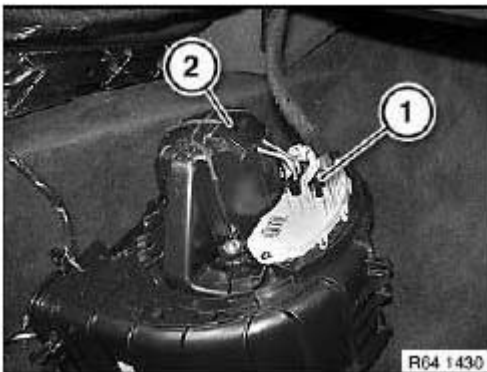


Fig. 14: Identifying Plug Connection With Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Disconnect plug connection (1) and release screws (2).

Remove controller for fan (3).

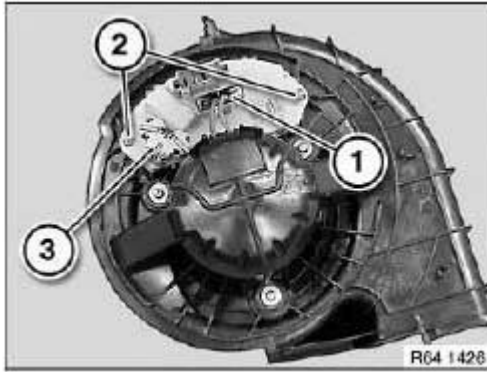


Fig. 15: Identifying Plug Connection And Controller Fan With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 224 REPLACING CONTROLLER FOR HEATER/AIR CONDITIONER FAN

Necessary preliminary tasks:

- Remove insert for right glovebox . See **51 16 ... REMOVING AND INSTALLING INSERT FOR RIGHT GLOVEBOX** .

Disconnect plug connection (1).

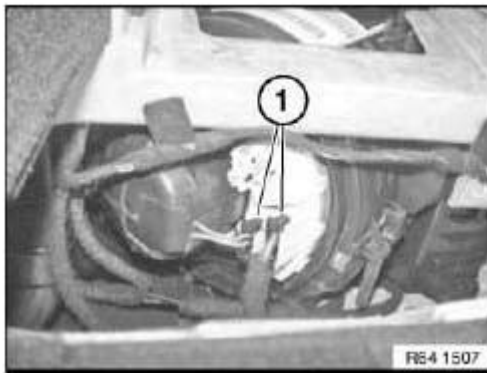


Fig. 16: Identifying Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove controller (2).

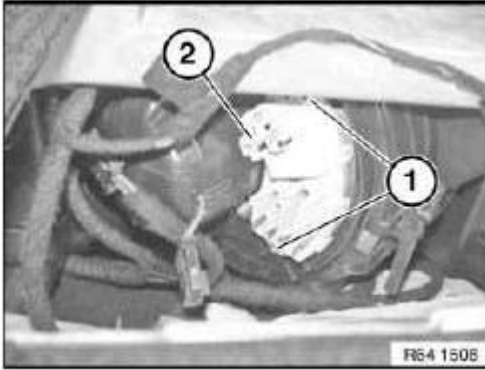


Fig. 17: Identifying Controller And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 224 REPLACING CONTROLLER FOR HEATER/AIR CONDITIONER FAN (US VERSION)

Necessary preliminary tasks:

- Remove heater/air conditioner fan . See **64 11 212 REMOVING AND INSTALLING/REPLACING HEATER/AIR CONDITIONER FAN.**

Disconnect plug connection (1) and release screws (2).

Remove controller (3).

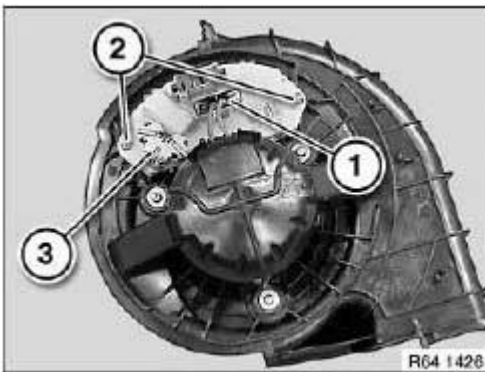


Fig. 18: Identifying Plug Connection And Controller Fan With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 263 REMOVING AND INSTALLING COMPLETE REAR CABIN FAN

Necessary preliminary tasks:

- Remove complete center console . See **51 16 165 REMOVING AND INSTALLING COMPLETE CENTER CONSOLE .**

If necessary, release screw (1) on both sides and disconnect plug connection on rear cabin fan controller.

Remove rear cabin fan housing (2) from air duct in center console (3).

Replacement:

Remove rear cabin fan controller . See **64 11 794 REMOVING AND INSTALLING/REPLACING CONTROLLER FOR REAR CABIN FAN**.

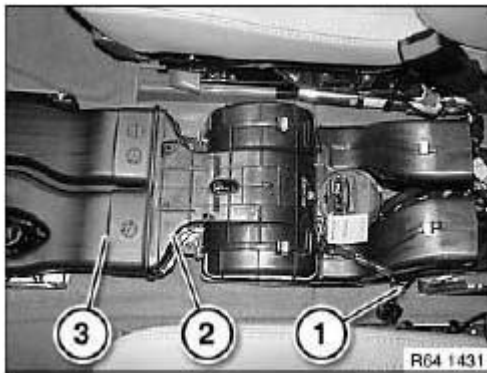


Fig. 19: Identifying Rear Cabin Fan Housing And Center Console
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 273 REPLACING WATER VALVE FOR HEATER

WARNING: Scalding hazard!

Work on the cooling system may only be carried out when it has cooled down.

Follow instructions for working on cooling system! See **17 00 ... INSTRUCTIONS FOR WORKING ON COOLING SYSTEM** .

NOTE: Disconnect coolant hoses on water valve.

Recycling

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

Catch and dispose of escaping coolant.

Observe country-specific waste-disposal regulations.

NOTE: Engine is shown removed for purposes of clarity.

Disconnect plug connection (1).

Release hose clamps (2, 3) and detach coolant hoses.

Installation:

Do **not** mix up connections of coolant hoses.

Replace damaged coolant hoses.

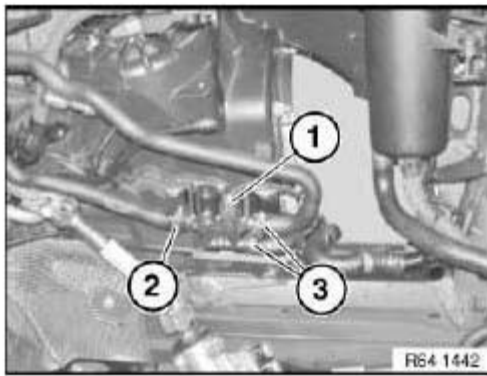


Fig. 20: Identifying Plug Connection And Hose Clamps
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

To avoid the buildup of noise, make sure that the rubber mounts (1) on the water valve are securely seated in the mounting on the frame side member (2).

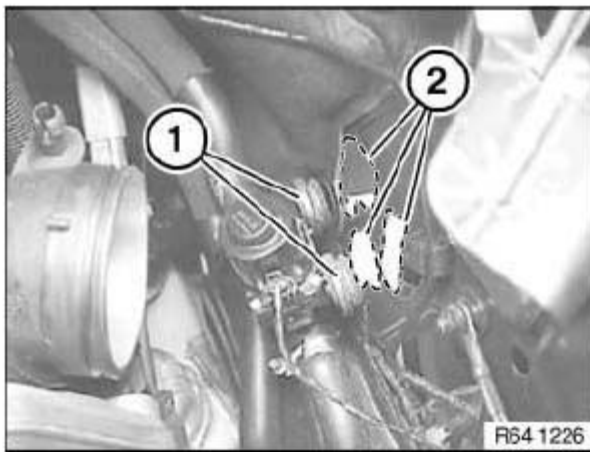


Fig. 21: Identifying Mounting On Frame Side Member
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

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- Fill and vent cooling system and check for leaks

64 11 376 REMOVING AND INSTALLING (REPLACING) CONTROL PANEL FOR HEATER - A/C SYSTEM

Necessary preliminary tasks:

- Remove middle trim for instrument panel . See **51 45 310 REMOVING AND INSTALLING (REPLACING) CENTER TRIM FOR INSTRUMENT PANEL** .

Disconnect plug connection (1).

Unclip control panel (2) along dashed line from trim (3) and remove.

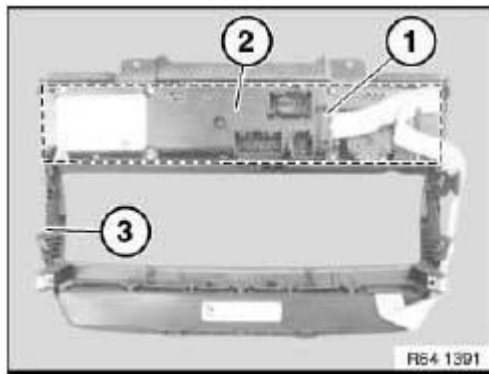


Fig. 22: Identifying Plug Connection And Control Panel

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The electrical steering column adjuster must be normalized when the control panel for the heater - A/C system is programmed or replaced.

64 11 395 REMOVING AND INSTALLING CONTROL PANEL FOR REAR CABIN A/C SYSTEM

Necessary preliminary tasks:

- Remove rear center console trim . See **51 16 160 REMOVING AND INSTALLING/REPLACING CENTER CONSOLE TRIM** .

Carefully unclip control panel (1) along dashed line from trim (2).

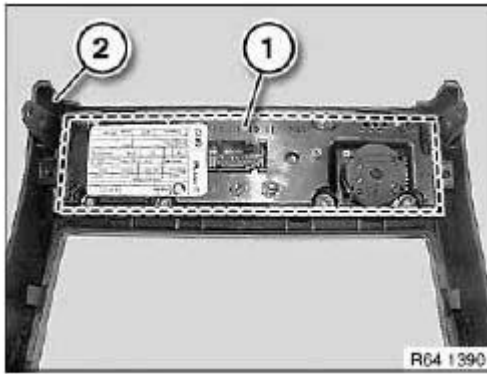


Fig. 23: Identifying Control Panel

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 794 REMOVING AND INSTALLING/REPLACING CONTROLLER FOR REAR CABIN FAN

Necessary preliminary tasks:

- Remove complete center console . See **51 16 165 REMOVING AND INSTALLING COMPLETE CENTER CONSOLE** .

Disconnect plug connection (1).

Unlock controller (2) in counterclockwise direction and remove.

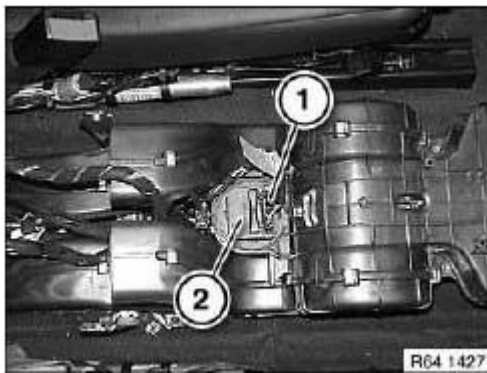


Fig. 24: Identifying Plug Connection And Controller

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 806 REMOVING AND INSTALLING/REPLACING SERVODRIVE FOR FRESH-/RECIRCULATED-AIR FLAP

Necessary preliminary tasks:

- Remove DVD changer . See **65 11 075 REMOVING AND INSTALLING/REPLACING DVD CHANGER** .

Release screws (1).

Remove servomotor (2) and disconnect plug connection (3).

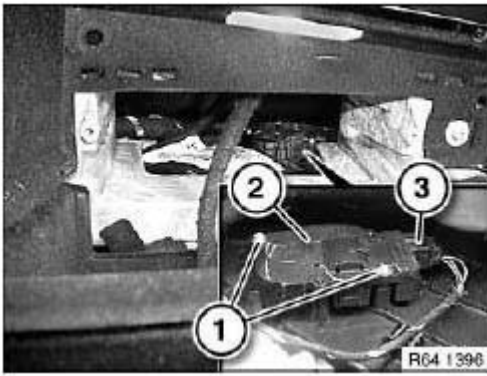


Fig. 25: Identifying Servomotor And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 822 REPLACING SERVODRIVE FOR LEFT REAR CABIN BLENDING FLAP

Necessary preliminary tasks:

- Remove carrier for instrument panel . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1) and feed out air duct (2).

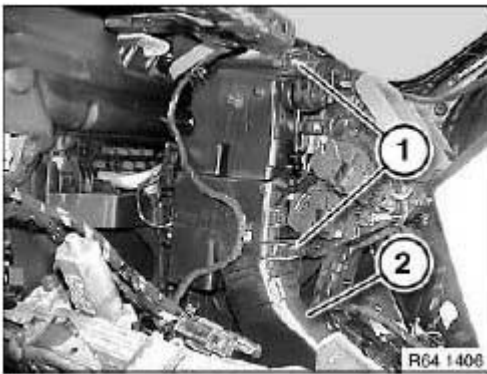


Fig. 26: Identifying Air Duct With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screws (2) and remove servodrive (3).

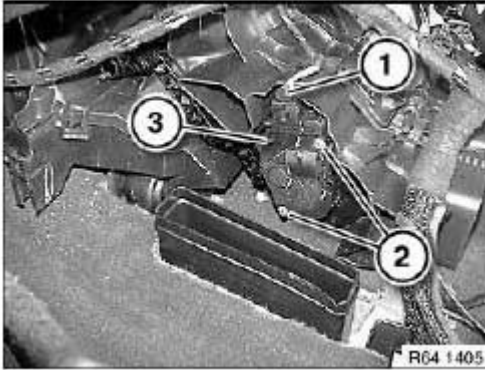


Fig. 27: Identifying Plug Connection And Servodrive With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 830 REPLACING SERVODRIVE FOR LEFT VENTILATION FLAP

Necessary preliminary tasks:

- Remove carrier for instrument panel . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servomotor (2) and disconnect plug connection (3).

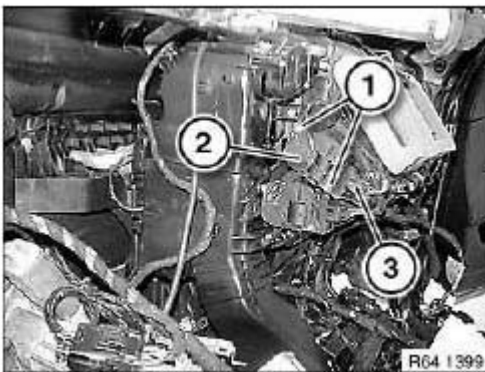


Fig. 28: Identifying Servomotor And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 832 REPLACING SERVODRIVE FOR RIGHT VENTILATION FLAP

Necessary preliminary tasks:

- Remove carrier for instrument panel . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servodrive (2) and disconnect plug connection (3).

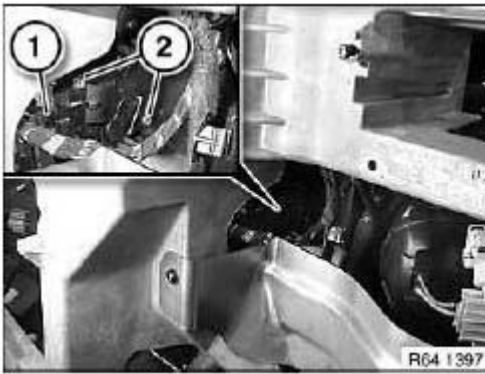


Fig. 29: Identifying Servodrive And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 835 REPLACING SERVODRIVE FOR LEFT BLENDING FLAP

Necessary preliminary tasks:

- Remove instrument panel carrier . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servodrive (2) and disconnect plug connection (3).

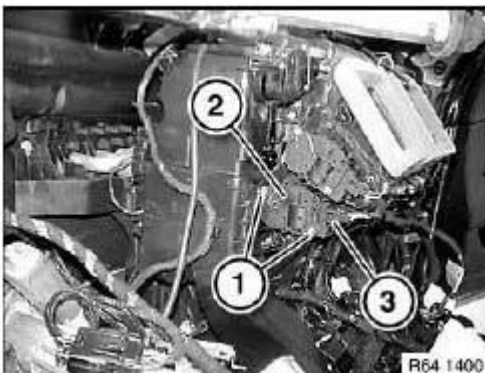


Fig. 30: Identifying Servodrive And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 835 REPLACING SERVODRIVE FOR RIGHT BLENDING FLAP

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Necessary preliminary tasks:

- Remove instrument panel carrier . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servodrive (2) and disconnect plug connection (3).

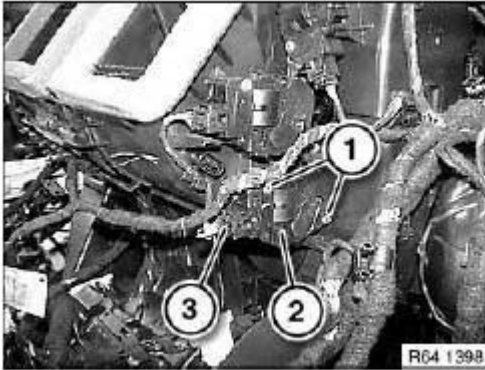


Fig. 31: Identifying Servodrive And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 837 REPLACING SERVODRIVE FOR RIGHT BLENDING FLAP

Necessary preliminary tasks:

- Remove instrument panel trim . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

NOTE: For purposes of clarity, following graphics show instrument panel carrier removed.

Release screws (1).

Remove servomotor (2) and disconnect plug connection (3).

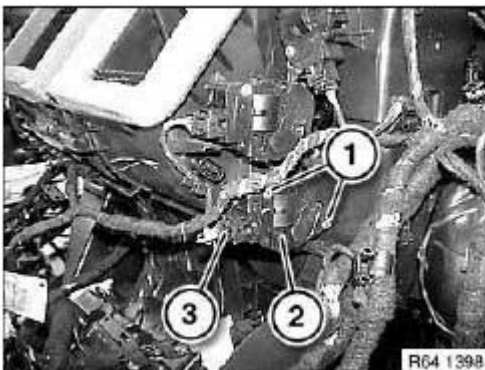


Fig. 32: Identifying Servodrive And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

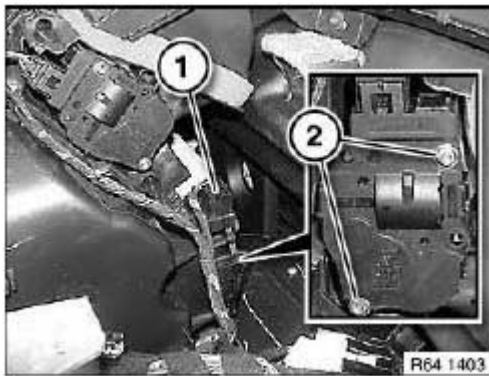
64 11 842 REPLACING SERVODRIVE FOR RIGHT FOOTWELL FLAP

Necessary preliminary tasks:

- Remove instrument panel trim . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Disconnect plug connection (1).

Release screws (2) and remove servodrive.

**Fig. 33: Identifying Plug Connection With Screws**

Courtesy of BMW OF NORTH AMERICA, INC.

64 11 846 REPLACING ACTUATOR DRIVE OF DEFROSTING FLAPS

Necessary preliminary tasks:

- Remove instrument panel trim . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servodrive (2) and disconnect plug connection (3).

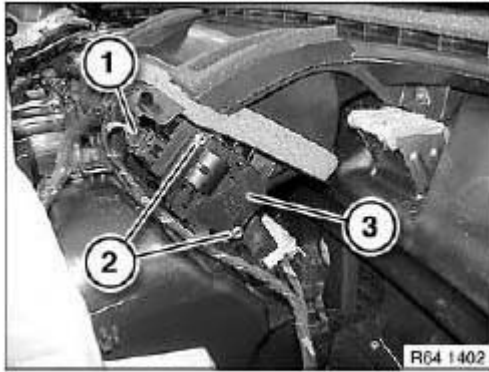


Fig. 34: Identifying Servodrive And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 849 REPLACING SERVODRIVE FOR DYNAMIC PRESSURE COMPENSATION

Necessary preliminary tasks:

- Remove trim for instrument panel, bottom left . See **51 45 181 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT TRIM FOR INSTRUMENT PANEL** .

Release screws (1) and remove air duct (2).

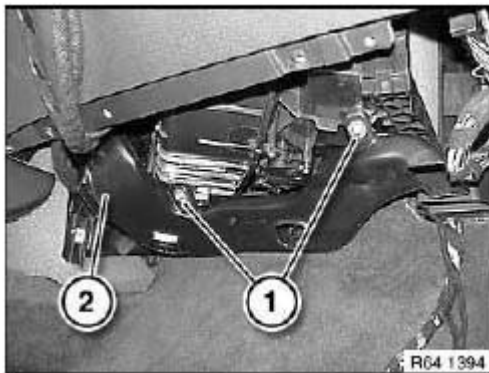


Fig. 35: Identifying Air Duct With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove servomotor (2) and disconnect associated plug connection.

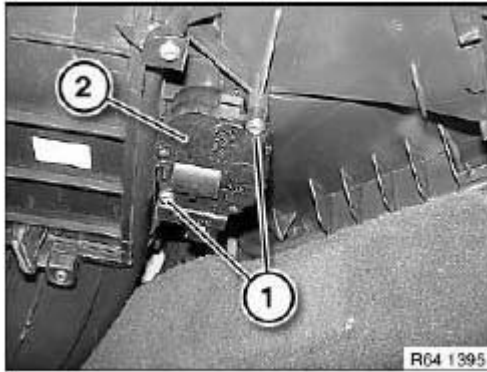


Fig. 36: Identifying Servomotor And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 858 REPLACING SERVODRIVE FOR RIGHT REAR CABIN FOOTWELL FLAP

Necessary preliminary tasks:

- Remove carrier for instrument panel . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

Release screws (1).

Remove servodrive (2) and disconnect plug connection (3).

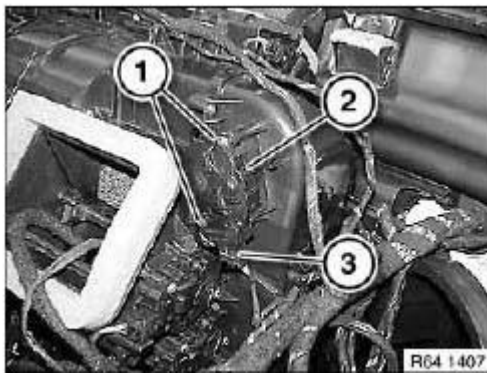


Fig. 37: Identifying Servodrive And Screws With Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 939 REPLACING (ONE) TEMPERATURE SENSOR FOR HEATER

Necessary preliminary tasks:

- Remove front speaker carrier . See **65 13 065 REMOVING AND INSTALLING/REPLACING FRONT SPEAKER CARRIER (INSTRUMENT PANEL)** .

Unlock temperature sensor (1) and feed out.

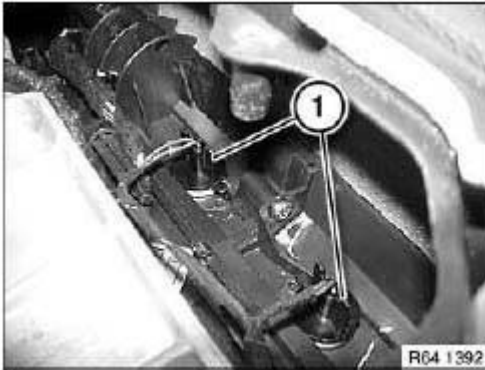


Fig. 38: Identifying Temperature Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect cables (1).

Connect cables to new temperature sensor with butt connectors and heat-shrink sleeves.

Insulate cables with insulating tape.

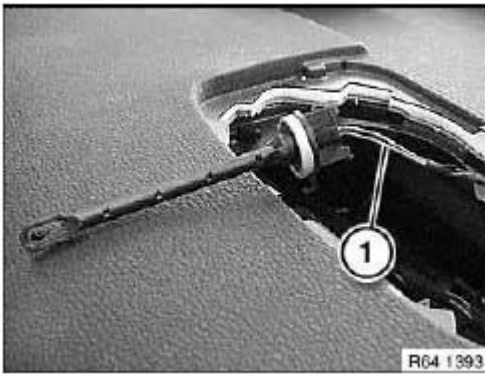


Fig. 39: Identifying Temperature Sensor Cables
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 942 REPLACING EVAPORATOR TEMPERATURE SENSOR

Necessary preliminary tasks:

- Remove panel for pedal assembly . See **51 45 185 REMOVING AND INSTALLING/REPLACING PANEL FOR PEDALS** .

Pull out temperature sensor (1) and disconnect associated plug connection.

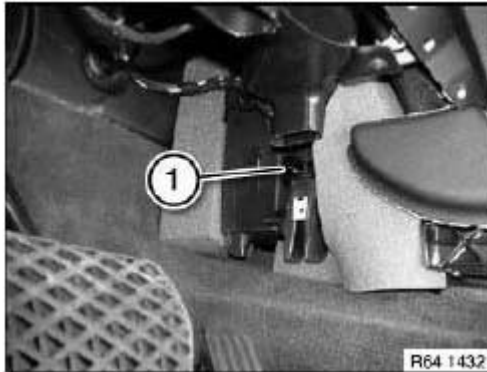


Fig. 40: Identifying Temperature Sensor
Courtesy of BMW OF NORTH AMERICA, INC.

64 11 970 REPLACING FOGGING SENSOR

Necessary preliminary tasks:

- Remove two-part mirror base cover . See **51 16 060 REMOVING AND INSTALLING/REPLACING INTERIOR REARVIEW MIRROR (WITH AUTOBEAM)** , **51 16 060 REMOVING AND INSTALLING/REPLACING INTERIOR REARVIEW MIRROR (WITH JAPANESE TOLL MIRROR)** or **51 16 060 REMOVING AND INSTALLING/REPLACING INTERIOR REARVIEW MIRROR (WITH RAIN SENSOR)** .

Unclip fogging sensor (1) from retaining tabs (2).

Disconnect plug connection (3).

Installation:

Make sure fogging sensor (1) is securely seated.

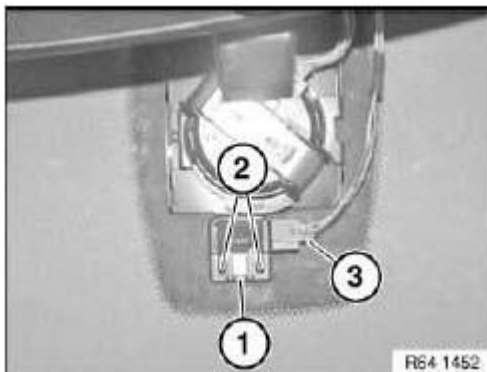


Fig. 41: Identifying Fogging Sensor And Retaining Tabs With Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Sensor surface (1) must be clean and free from grease.

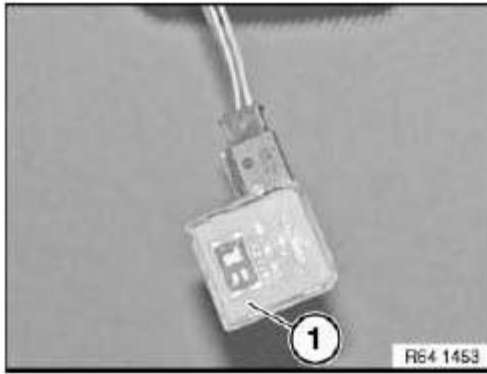


Fig. 42: Identifying Sensor

Courtesy of BMW OF NORTH AMERICA, INC.

**64 11 990 REMOVING AND INSTALLING/REPLACING SENSOR FOR AUTOMATIC
RECIRCULATED AIR CONTROL**

Necessary preliminary tasks:

- Remove right microfilter housing cover . See **64 31 106 REMOVING AND
INSTALLING/REPLACING RIGHT MICROFILTER HOUSING COVER.**

Disconnect plug connection (1).

Unlock solar sensor (2) and remove.

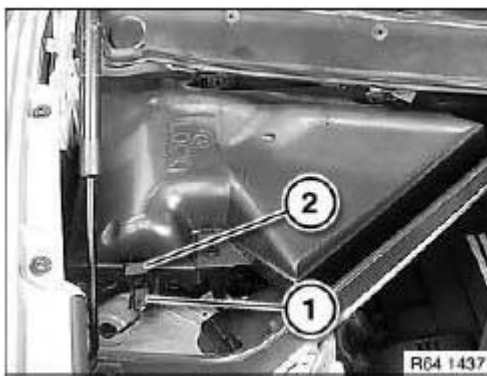


Fig. 43: Identifying Solar Sensor And Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

64 12 ... INITIALIZING TELESTART HAND TRANSMITTER

NOTE: The Telestart hand transmitter must be initialized when:

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

The independent heating is switched on under an outside temperature of approx. 15 °C with the hand transmitter and at a preselected switch-on time.

Direct activation is possible at any outside temperature via the "Climate" menu item in the i-Drive, but not in driving mode.

To initialize a new hand transmitter, perform the following operations from inside the vehicle:

- Close all vehicle doors
- Within 5 seconds: Switch ignition lock from terminal "0" to terminal "R" and then back to terminal "0"
- Within 5 seconds: Press OFF button (1) on hand transmitter and with OFF button (1) held down press ON button (2) three times quickly
- Release both buttons. LED (3) on hand transmitter flashes

NOTE: The vehicle's central locking closes and opens automatically on successful initialization.
The initialization process must be repeated if there is no check back signal from the central locking system.

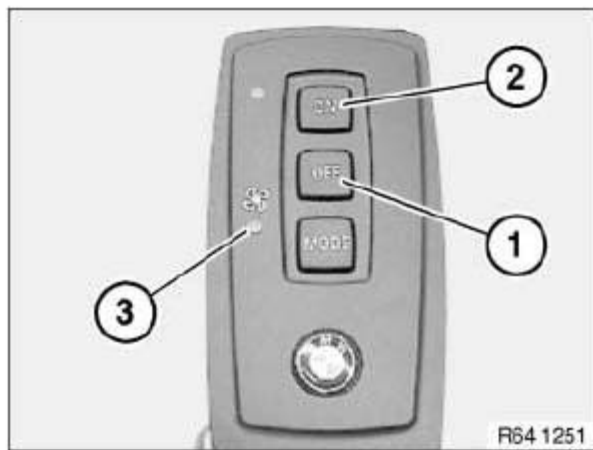


Fig. 44: Identifying Telestart Hand Transmitter
Courtesy of BMW OF NORTH AMERICA, INC.

WARNING: Scalding hazard!

Work on independent heating may only be carried out when it has cooled down.

Necessary preliminary tasks:

- Remove left underbody panelling . See 51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING .

Slacken clamp (1).

Release screws (2) and remove muffler (3).

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

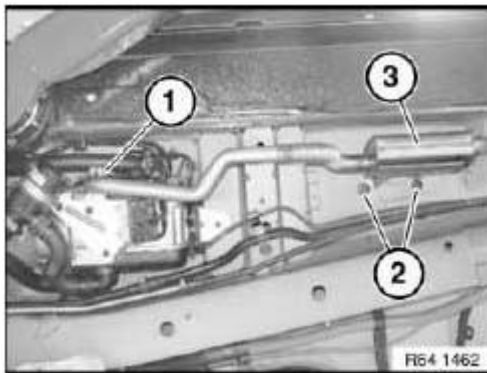


Fig. 45: Identifying Muffler/Silencer And Slacken Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

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

WARNING: Scalding hazard!

Work on independent heating may only be carried out when it has cooled down.

Necessary preliminary tasks:

- Remove front wheel arch cover . See 51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION) .
- Remove left underbody panelling . See 51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING .

Release screw (1) and unclip intake muffler (2).

Installation:

Retaining clip on intake muffler must not be damaged!

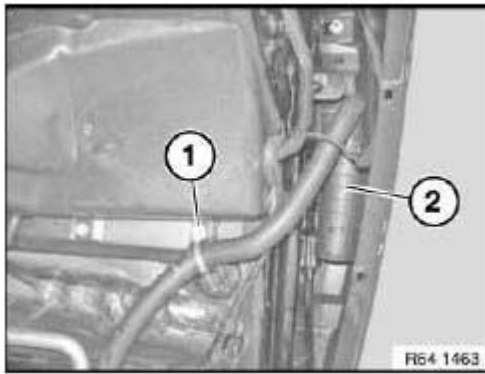


Fig. 46: Identifying Clip On Intake Muffler
Courtesy of BMW OF NORTH AMERICA, INC.

Release hose clamp (1), disconnect air intake hose (2) and feed out.

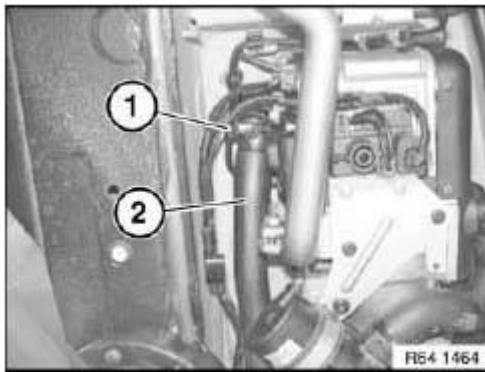


Fig. 47: Identifying Hose Clamp And Air Intake Hose
Courtesy of BMW OF NORTH AMERICA, INC.

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

Special tools required:

- 13 3 010

WARNING: Scalding hazard!

Work on independent heating may only be carried out when it has cooled down.

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

Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Remove left underbody panelling . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

Disconnect plug connection (1).

Release hose clamp (2) and detach fuel line.

Release screw (3).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

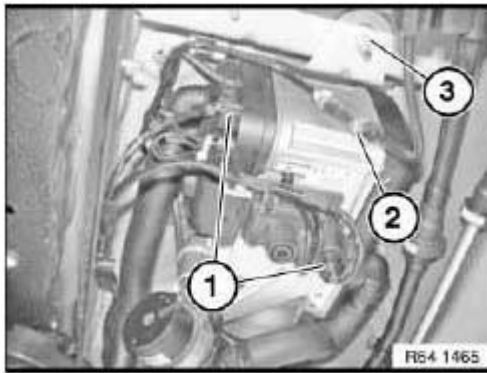


Fig. 48: Identifying Plug Connection And Hose Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Secure heater (3) against falling out.

Disconnect coolant hoses (1) with special tool 13 3 010 .

Release hose clamps (2) and detach coolant hoses (1).

Release nuts (4) and unclip associated hoses from holder (5).

Remove heater (3) and set down on a suitable surface.

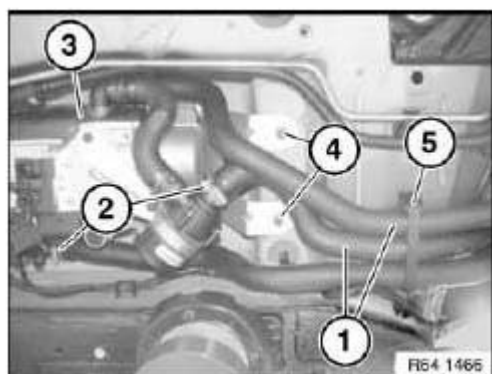


Fig. 49: Identifying Coolant Hoses, Hose Clamps And Heater
Courtesy of BMW OF NORTH AMERICA, INC.

Release hose clamp (1) and remove complete heater (2) with bracket.

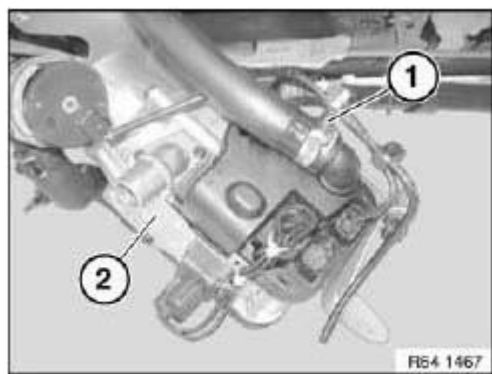


Fig. 50: Identifying Hose Clamp And Complete Heater
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Modify muffler . See **64 12 089 REMOVING AND INSTALLING OR REPLACING MUFFLER/SILENCER**.

Release hose clamp (1) and detach coolant hose.

Release bolt (2).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

Disconnect plug connection (3) and remove auxiliary water pump (4).

Installation:

Check coolant hoses for damage and replace if necessary.

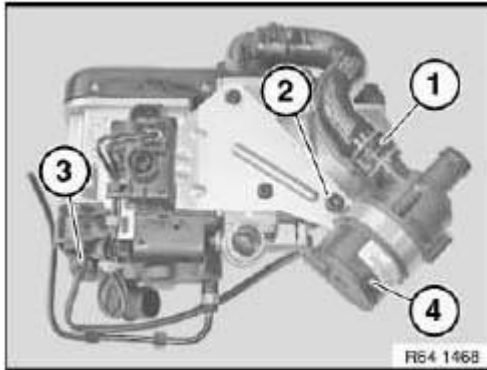


Fig. 51: Identifying Plug Connection And Auxiliary Water Pump With Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove heater from bracket (2).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES**.

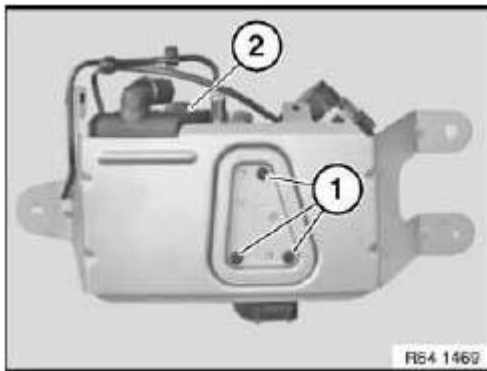


Fig. 52: Identifying Heater Bracket With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Vent cooling system . See **17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS (N52K)**.

64 12 570 REPLACING AUXILIARY WATER PUMP FOR INDEPENDENT/AUXILIARY HEATER

WARNING: Scalding hazard!

Work on the cooling system may only be carried out when it has cooled down.

Catch and dispose of emerging coolant.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Remove left floor assembly cover . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

NOTE: **Disconnect coolant hoses.**

Disconnect coolant hoses (1) with special tool 13 3 010 and release associated hose clamps.

Release bolt (2).

Detach auxiliary water pump (3) and disconnect associated plug connection.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

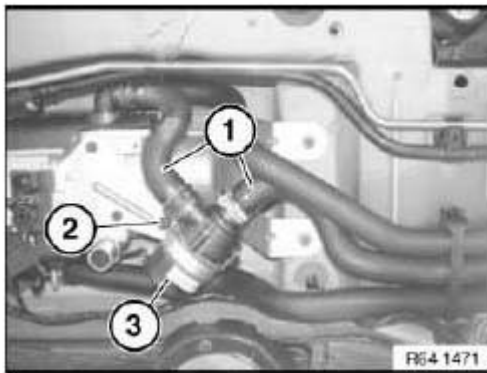


Fig. 53: Detaching Auxiliary Water Pump
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Fill and vent cooling system and check for leaks . See **17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS (N52K)** .

64 12 600 REMOVING AND INSTALLING OR REPLACING FUEL PUMP

Special tools required:

- 13 3 010

Necessary preliminary tasks:

- Remove left underbody panelling . See **51 47 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT UNDERBODY PANELLING** .

Seal off water hoses at fuel pump with special tool 13 3 010

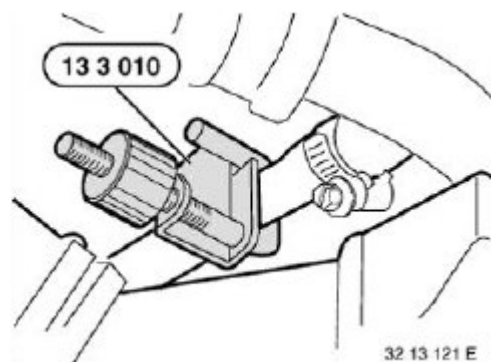


Fig. 54: Identifying Special Tool (13 3 010) On Water Hoses
Courtesy of BMW OF NORTH AMERICA, INC.

Recycling

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

Catch and dispose of escaping fuel.

Observe country-specific waste-disposal regulations.

Disconnect plug connection (1).

Release hose clamps (2) and detach fuel hoses.

NOTE: **Secure fuel pump (4) against falling out.**

Disengage rubber retainers (3).

Installation:

Observe direction of flow of fuel pump (4).

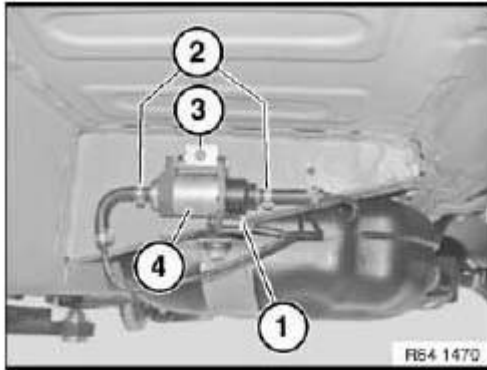


Fig. 55: Identifying Plug Connection And Hose Clamps With Rubber Retainers
Courtesy of BMW OF NORTH AMERICA, INC.

64 12 670 REPLACING FRONT ELECTRIC AUXILIARY HEATER

Necessary preliminary tasks:

- Remove carrier for instrument panel . See **51 45 075 REMOVING AND INSTALLING CARRIER FOR INSTRUMENT PANEL** .

NOTE: For purposes of clarity, the following graphics show the heater/air conditioner removed.

Disconnect plug connection (1).



Fig. 56: Identifying Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Lay servomotor (2) to one side.



Fig. 57: Identifying Servomotor With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

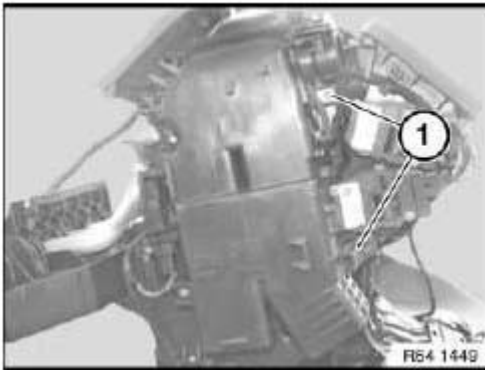


Fig. 58: Identifying Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (2) and remove housing side section (2).

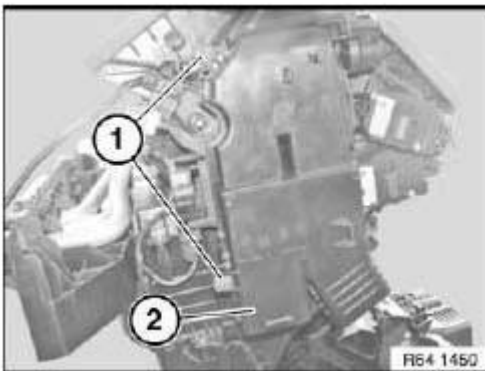


Fig. 59: Identifying Auxiliary Heater Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screw (2).

Pull out electric auxiliary heater (3) and detach associated ground cable (4).

Installation:

Make sure ground cable (4) is securely seated.

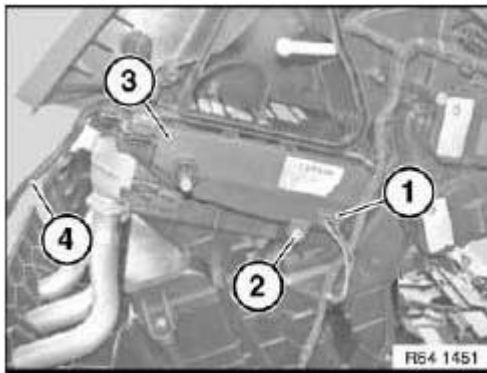


Fig. 60: Identifying Plug Connection And Electric Auxiliary Heater
Courtesy of BMW OF NORTH AMERICA, INC.

22 NOZZLES AND OUTLETS

64 22 ... REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT B-PILLAR AIR VENT

Necessary preliminary tasks:

- Remove B-pillar trim . See **51 43 150 REMOVING AND INSTALLING OR REPLACING TRIM FOR LEFT OR RIGHT DOOR PILLAR (BOTTOM)** .

Unclip retaining clip (1) and feed out air vent (2) in upward direction.

Installation:

Replace damaged retaining clips (1).

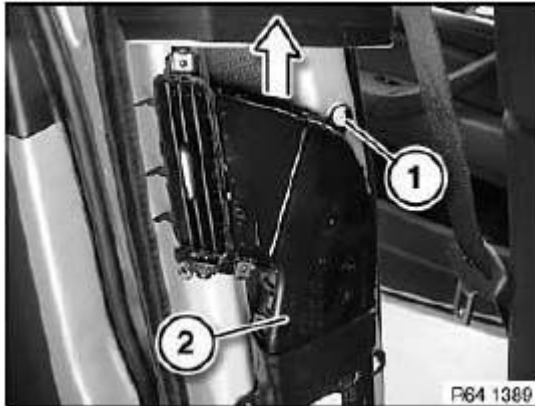


Fig. 61: Identifying Air Vent Upward Positions
 Courtesy of BMW OF NORTH AMERICA, INC.

64 22 135 REMOVING AND INSTALLING/REPLACING LEFT/RIGHT FRESH-AIR GRILLE

Special tools required:

- 64 1 030

Necessary preliminary tasks:

- Remove decorative strip from fresh-air grille . See **51 45 376 REMOVING AND INSTALLING/REPLACING DECORATIVE STRIP ON LEFT FRESH-AIR GRILLE** and **51 45 378 REMOVING AND INSTALLING/REPLACING DECORATIVE STRIP ON RIGHT FRESH-AIR GRILLE** .

Release screw (1).



Fig. 62: Identifying Air Grille Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

Pull out fresh-air grille (2) with special tool 64 1 030.

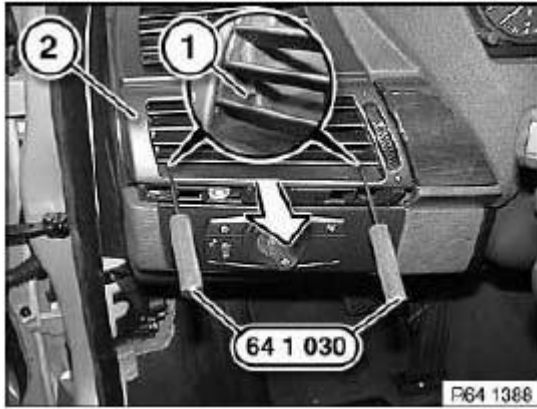


Fig. 63: Pulling Out Fresh-Air Grille With Special Tool (64 1 030)
Courtesy of BMW OF NORTH AMERICA, INC.

64 22 164 REMOVING AND INSTALLING/REPLACING MIDDLE FRESH-AIR GRILLE

Special tools required:

- 64 1 030

Lever out fresh-air grille (1) with special tool 64 1 030 towards top and feed out.

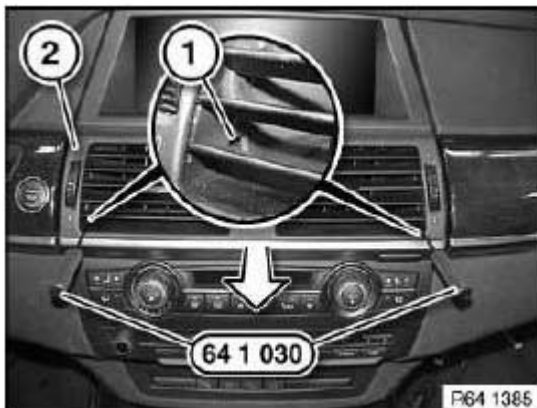


Fig. 64: Pulling Out Fresh-Air Grille With Special Tool (64 1 030)
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connections (1) and remove fresh-air grille (2).

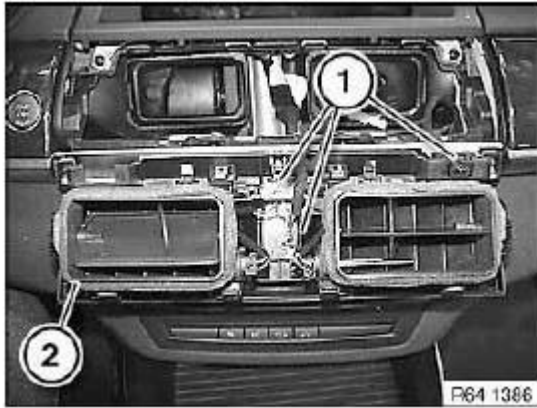


Fig. 65: Identifying Plug Connections And Fresh-Air Grille
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Modify decorative trim on middle fresh-air grille . See **51 45 377 REMOVING AND INSTALLING/REPLACING DECORATIVE STRIP ON MIDDLE FRESH-AIR GRILLE** .

64 22 191 REMOVING AND INSTALLING/REPLACING REAR CABIN FRESH-AIR GRILLE

Necessary preliminary tasks:

- Remove rear center console trim . See **51 16 163 REMOVING AND INSTALLING/REPLACING REAR CENTER CONSOLE TRIM** .
- If necessary, remove trim for rear cabin monitor at rear . See **65 50 150 REMOVING AND INSTALLING/REPLACING TRIM FOR REAR CABIN MONITOR BASE AT FRONT** .

Unclip catches (1) on both sides.

Carefully lift out fresh-air grille (2).

NOTE: Trim grille must not be detached from air duct!

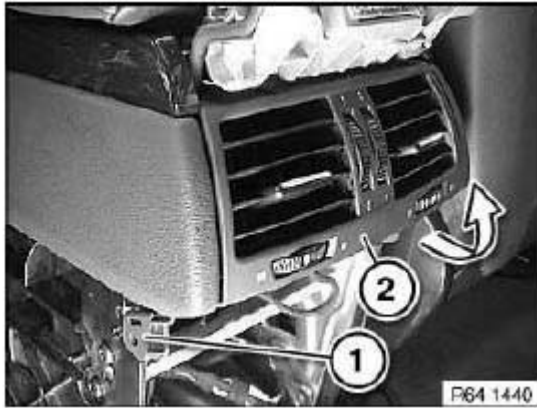


Fig. 66: Lifting Out Fresh-Air Grille

Courtesy of BMW OF NORTH AMERICA, INC.

64 52 521 REMOVING AND INSTALLING/REPLACING A/C SYSTEM COMPRESSOR (N62TU)

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage

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

Read and comply with notes on replacing compressor . See 64 52 ... INSTRUCTIONS FOR COMPRESSOR REPLACEMENT.

Follow instructions for opening and replacing parts in refrigerant circuit! See 64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT.

If A/C system is opened for more than 24 hours:

Replacing drier insert for A/C system . See 64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM.

Necessary preliminary tasks:

- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).
- Remove A/C compressor drive belt
- Remove front underbody protection . See 51 47 490 REMOVING AND INSTALLING / REPLACING FRONT ASSEMBLY UNDERSIDE PROTECTION .
- Remove steering gear cover at top right . See 51 71 ... REMOVING AND INSTALLING/REPLACING TOP RIGHT STEERING GEAR COVER .

Release screws (1) and remove both refrigerant lines.

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

Replace sealing rings and moisten with refrigerant oil.

Disconnect plug connection (2).

Release screws (3).

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

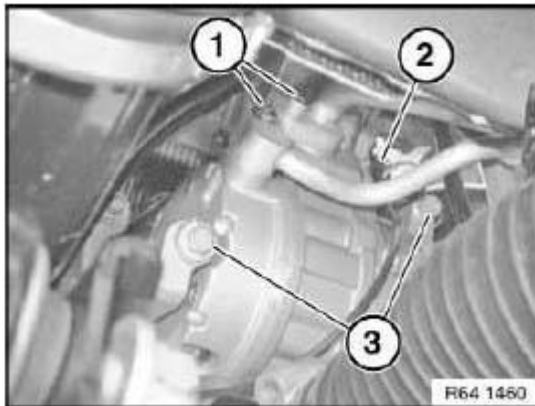


Fig. 67: Identifying Plug Connection With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

Lower vehicle.

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

Release screw (1) from above and feed out compressor (2) in upward direction.

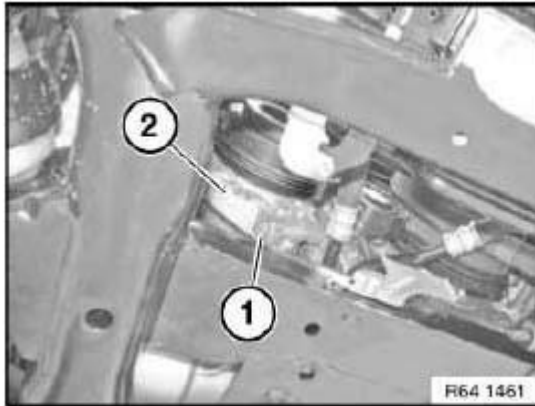


Fig. 68: Identifying Compressor

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

31 MICROFILTER

64 31 011 REPLACING MICROFILTER FOR INTERIOR VENTILATION

Necessary preliminary tasks:

- Remove microfilter housing . See **64 31 081 REMOVING AND INSTALLING/REPLACING MICROFILTER HOUSING.**

Unclip catches (1) and remove microfilter (2).

Installation:

Reset Condition Based Service display according to factory specification.

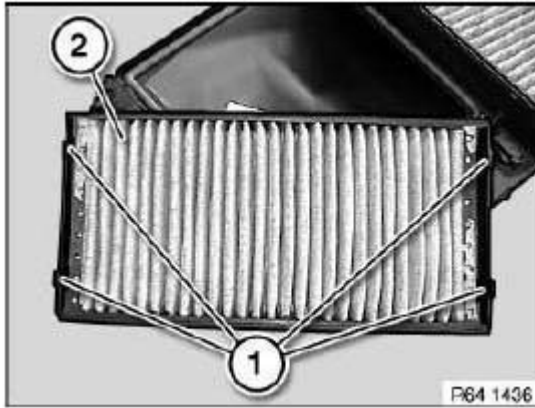


Fig. 69: Identifying Catches And Microfilter
 Courtesy of BMW OF NORTH AMERICA, INC.

64 31 017 REPLACING RECIRCULATED AIR MICROFILTER

Necessary preliminary tasks:

- Remove lower instrument panel trim . See **51 45 181 REMOVING AND INSTALLING/REPLACING BOTTOM RIGHT TRIM FOR INSTRUMENT PANEL** .

Release screws (1) and remove air duct (2).

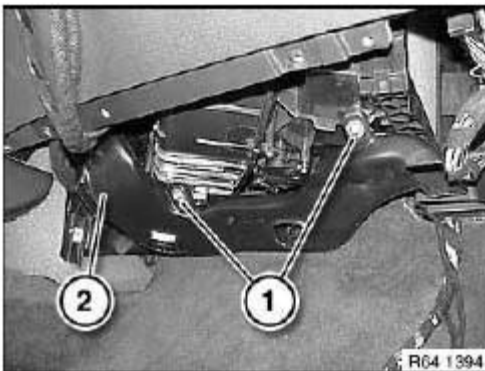


Fig. 70: Identifying Air Duct With Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Unclip air vent (1).

Slide lock (2) in direction of arrow and remove.

Feed out filter (3) towards bottom.

Installation:

Replacement filter consists of two halves.

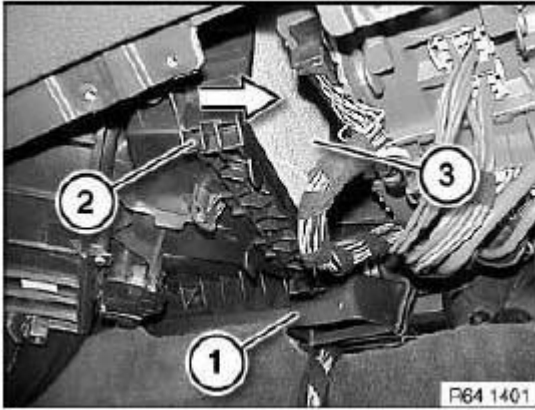


Fig. 71: Removing Filter

Courtesy of BMW OF NORTH AMERICA, INC.

64 31 053 REMOVING AND INSTALLING OR REPLACING FRESH AIR DUCT

Necessary preliminary tasks:

- Remove microfilter housing . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

Release retaining clips (1) and feed out fresh-air duct (2).

Installation:

Make sure fresh-air duct is securely seated.

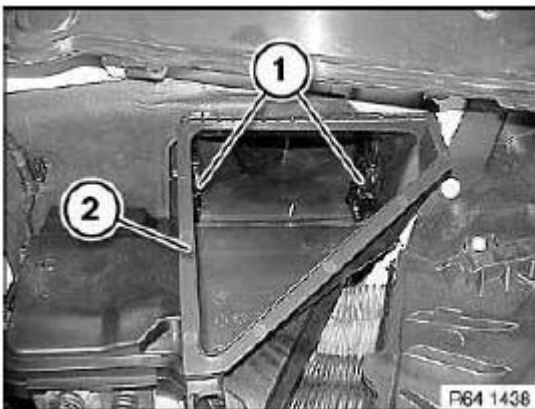


Fig. 72: Identifying Retaining Clips And Fresh-Air Duct

Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Remove right microfilter housing cover . See **64 31 106 REMOVING AND INSTALLING/REPLACING RIGHT MICROFILTER HOUSING COVER**.

Disconnect plug connection (1).

Unlock rotary catches (2) and remove microfilter housing.

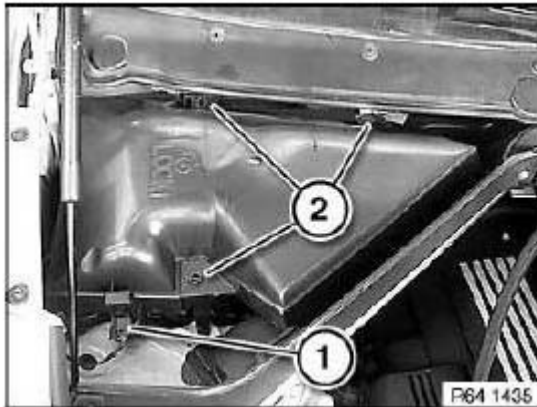


Fig. 73: Identifying Plug Connection

Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

- Remove sensor for automatic recirculated air control . See **64 11 990 REMOVING AND INSTALLING/REPLACING SENSOR FOR AUTOMATIC RECIRCULATED AIR CONTROL**.
- Replace microfilter
- Reset Condition Based Service display according to factory specification.

64 31 101 REMOVING AND INSTALLING/REPLACING LEFT MICROFILTER HOUSING COVER

Detach mocket (1) in working area.

Unlock rotary catches (2) and remove microfilter housing cover.

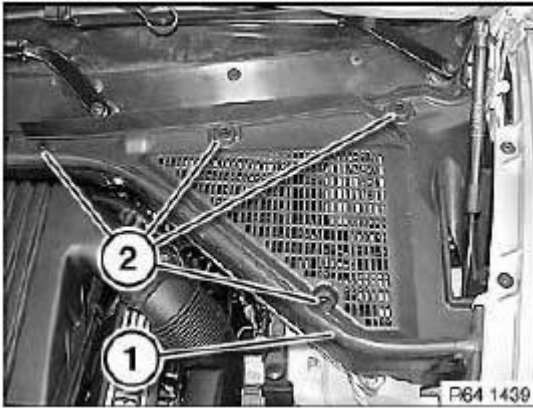


Fig. 74: Identifying Rotary Catches

Courtesy of BMW OF NORTH AMERICA, INC.

64 31 106 REMOVING AND INSTALLING/REPLACING RIGHT MICROFILTER HOUSING COVER

Detach mocket (1) in working area.

Unlock rotary catches (2) and remove microfilter housing cover (3).

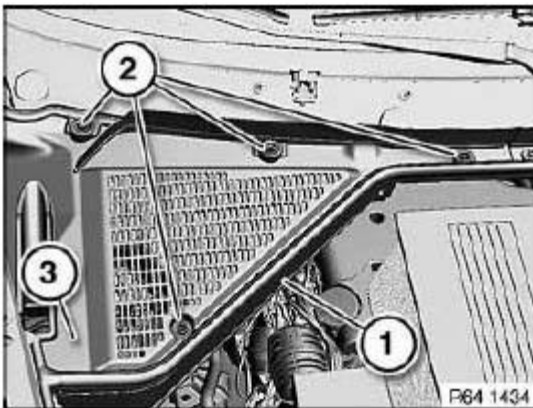


Fig. 75: Identifying Microfilter Housing Cover And Rotary Catches

Courtesy of BMW OF NORTH AMERICA, INC.

50 AIR CONDITIONING SYSTEMS

64 50 ... AIR CONDITIONER TEST (R 134A)

Before A/C efficiency test, satisfy following conditions:

1. Provide a MoDiC or DIS. Safeguard electrical system integrity by checking the fault memory (no faults in the fault memory).

2. Provide a thermometer with separate gauge.
3. Perform the test in a suitable work bay with an ambient temperature between 20 °C and 30 °C.

Re 1:

Connect MoDiC or DIS to car and display evaporator temperature.

Re 2:

Position a thermometer with a separate gauge approx. 5 cm below the roof liner at the height of the B-pillar. Lay gauge outwards out of vehicle interior.

Re 3:

Heating up vehicle interior:

- A/C button is not activated during heating up.
- Close all windows and doors.
- Set recirculated air mode.
- Select air distribution mode for footwell and defrosting.
- Maximum temperature setting.
- Maximum fan stage.
- Run engine at approx. 2000 RPM until operating temperature is reached, then idle speed.

A/C efficiency test:

Turn on A/C compressor at a vehicle interior temperature of 50 °C.

After 3-4 minutes, the evaporator sensor temperature must be > or = 15 °C.

Draw off A/C system if this temperature is not reached. Measure amount of refrigerant drawn off. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

If drawn-off quantity does not correspond to specified fill quantity : supplement refrigerant and repeat test. See **HEATING AND AIR CONDITIONING - TECHNICAL DATA** .

If fill quantity is correct, continue troubleshooting by pressure measurement.

64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A

WARNING: Although R 134a at normal temperature is non-toxic, non-flammable and not explosive in air in any mixture ratio, it is still essential to follow various safety precautions.

The filled refrigerant circuit of the A/C system is subject to gauge pressure. When carrying out repairs on the A/C system, it is absolutely essential to draw off the refrigerant.

Do not weld or solder on filled A/C systems or in rooms into which R 134a may have leaked. Exposure to flames or high temperatures ($< \text{or} = 50\text{ }^{\circ}\text{C}$) may give rise to toxic decomposition products (fluorine gas). For this reason, do not smoke either.

R 134a must be drawn off, cleaned and returned to the A/C system with a service station following the relevant operating instructions.

Avoid all contact with liquid or gaseous R 134a. Wear protective goggles and gloves when working on the refrigerant circuit. R 134a acting on the skin can cause frostbite. Rinse affected body parts thoroughly with cold water. If R 134a gets into your eyes, likewise rinse with plenty of water and, if necessary, remove contact lenses if worn. Then seek immediate medical attention. Likewise seek immediate medical attention if you experience problems after inhaling R 134a fumes.

As a gas, R 134a is colorless, odorless and heavier than air. If it gets into the atmosphere, this may result especially in workshop pits in an imperceptible danger of asphyxiation or in cardiac palpitations. Ventilate rooms adequately; if necessary, turn on installed extractor systems.

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 best possible evacuation (at least 30 minutes dehumidification from refrigerant circuit) before each filling of the A/C system.

R 134a absorbs moisture very easily. Therefore seal off opened pipes, condenser, evaporator, compressor and drier bottle immediately with plugs.

With replacement parts, the plugs may only be removed immediately before the lines are connected.

In the event of warranty claims, the old parts must be provided with plugs to be able to determine the cause of the damage.

If an A/C system has been completely drained by leakage, accident or repair, the drier element must be replaced as excessive moisture may have entered the system. See .

Store filled pressurized refrigerant bottles in such a way that they are not exposed to direct sunlight or other heat sources (max. $45\text{ }^{\circ}\text{C}$). Also avoid exposing them to mechanical stress (e.g. by dropping).

In the event of fire, carbon dioxide (CO_2), extinguishant powder and a sprayed water jet are deemed to be suitable extinguishants. Cool reservoirs at risk with a sprayed water jet (risk of bursting!).

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

WARNING: Observe the following points when handling refrigerant oil:

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

Action to be taken after contact with refrigerant oil:

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

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

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

IMPORTANT: Refrigerant oil is hygroscopic and must therefore be stored in suitable containers that are sealed airtight

Recycling:

Dispose of drawn-off refrigerant oil as hazardous waste.

Observe country-specific waste-disposal regulations.

Absorb escaping refrigerant oil with fluid-binding material.

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

64 50 ... LEAK TESTING WITH ULTRAVIOLET ADDITIVES (UV ADDITIVES) (BMW LEAK-TESTING CASE)

IMPORTANT: It is absolutely essential to read and comply with the equipment manufacturer's instructions for use provided in the equipment case!

Read and comply with the instructions for use 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!

WARNING: Avoid contact with refrigerant.

Follow safety precautions when handling refrigerant .

IMPORTANT: UV lamp gets very hot in the radiation area!

Do not use the UV lamp without the filter glass.

Eyes and skin will suffer damage if the UV lamp is used without the filter glass.

When using the UV lamp, wear the protective goggles provided in the case.

NOTE:

- **Fill the hose system of the hand pump completely with UV additive PRIOR to use**
- **Use the UV additive exclusively for BMW-approved refrigerant oils**
- **Do not operate the A/C system while the hand pump is connected or in use**
- **The A/C 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-detecting lamp to ensure that no AV additive is already in the area of the refrigerant circuit.

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

On initial use :

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

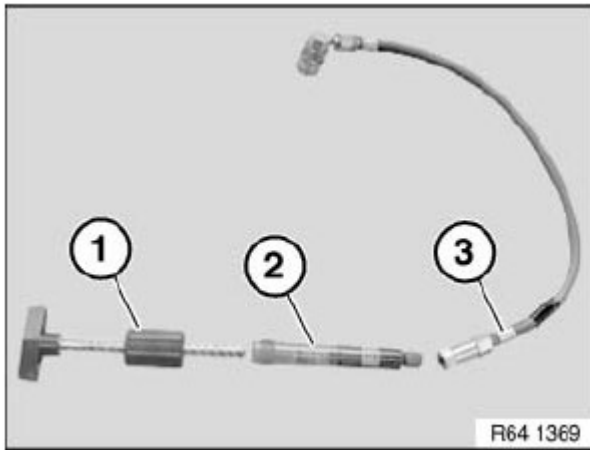


Fig. 76: Identifying Hand Pump And Additive Cartridge With Hose Piece
 Courtesy of BMW OF NORTH AMERICA, INC.

On initial use :

Attach vent valve (1) to quick-connect coupling (2).

Turn handle (3) on hand pump to advance the plunger 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.

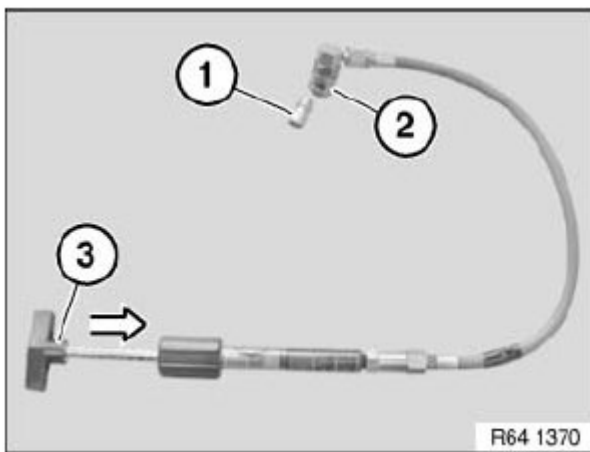


Fig. 77: Attaching Vent Valve To Quick-Connect Coupling
 Courtesy of BMW OF NORTH AMERICA, INC.

Attach quick-connect coupling (1) to low-pressure connection (2) of A/C 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 :

- A/C systems with refrigerant filling up to 900 g: one graduation mark (4) on additive cartridge
- A/C systems with refrigerant filling in excess of 900 g: two graduation marks (4) on additive cartridge

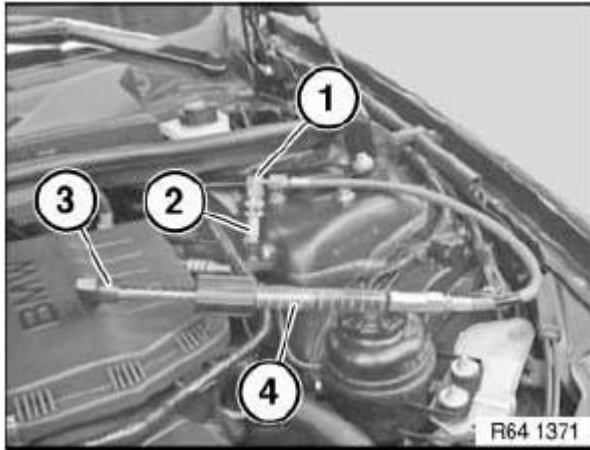


Fig. 78: Identifying Handle On Hand Pump
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After filling, remove quick-connect 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 A/C system at highest setting for 5-10 minutes in order to ensure adequate distribution of dye in the system
- Switch off engine
- Check all A/C system components for possible leaks
- Possible leaks show up in luminous green

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

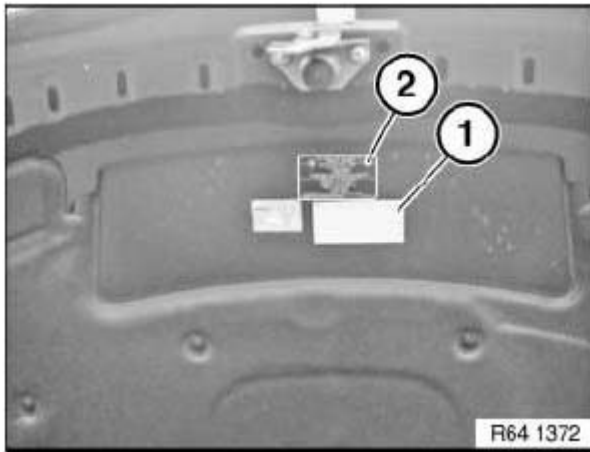


Fig. 79: Identifying Information Label
Courtesy of BMW OF NORTH AMERICA, INC.

64 50 ... SAFETY INSTRUCTIONS FOR HANDLING REFRIGERANT R134A

WARNING: Risk of injury!

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

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

The refrigerant circuit is depressurized AFTER drawing off!

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

Protective measures/rules of conduct:

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

First aid measures:

- Eye contact: In the event of contact with the eyes, rinse immediately with plenty of running water and consult an ophthalmologist.
- Skin contact: In the event of contact with skin, remove affected clothing immediately and rinse with plenty of water.
- After inhalation: If refrigerant vapors are inhaled in greater concentrations, remove the person affected to an area of fresh air and keep them under supervision. Consult a doctor. If breathing problems are experienced, breathe additional oxygen. If the person affected is breathing with difficulty or has stopped breathing, incline the person's head at the neck and administer the kiss of life.

64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)

WARNING: Refrigerant circuit is under high pressure!

Repair work may only be carried out on a DEPRESSURIZED refrigerant circuit!

Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See 64 50 ...

INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ...

INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage!

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

NOTE: Draw off, evacuate and fill the A/C system in accordance with the operating instructions of the relevant service station.

E60 only:

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

Instructions for drawing off A/C system:

To help separation of refrigerant and refrigerant oil, run engine at low speed (800-1200 RPM) and with A/C system turned on for a few minutes.

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

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

If at the end of the drawing-off procedure the service station moisture indicator shows that the drawn-off refrigerant is excessively moist, clean the refrigerant in accordance with the service station operating instructions.

Recycling:

Dispose of drawn-off refrigerant oil as hazardous waste.

Observe country-specific waste-disposal regulations.

Instructions for evacuating off A/C system:

The evacuation procedure removes all traces of ambient air, water vapor and any other gases present from the A/C system. This enables subsequent system filling with refrigerant.

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A decrease in the vacuum level indicates a leak in the refrigerant circuit.

Instructions for filling A/C system:

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

Follow instructions for opening and replacing parts in refrigerant circuit!

Depending on the type of component replaced on the A/C system, it may be necessary to top up the refrigerant oil, even if no measurable losses have occurred during drawing off. Read and comply with the A/C system manufacturer's notes in this regard and the operating instructions of the relevant service station.

Information on the required refrigerant fill quantity for the entire A/C system is contained on the rating plate (1) in the engine compartment.

Installation:

Reseal refrigerant filler necks on vehicle with sealing caps.



Fig. 80: Identifying A/C System Is Contained On Rating Plate
Courtesy of BMW OF NORTH AMERICA, INC.

64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT**WARNING:**

- Avoid contact with refrigerant and refrigerant oil
- Follow safety instructions for handling R 134a refrigerant . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.
- Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

CAUTION:

- Always use new O-rings each time A/C connections are opened.
- Moisten O-rings with refrigerant oil prior to fitting.

- **Seal all parts to be returned at openings to prevent ingress of moisture or foreign bodies.**

I. Opening refrigerant circuit without part replacement, as preliminary work to further work

(e.g. engine removal):

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out main work
- Replace removed refrigerant oil with new refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

II. Part replacement and part replacement on account of insidious leak

(minor leak, e.g. hairline crack)

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

III. Part replacement on account of sudden leak

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

Work sequence:

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- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009**

DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish 25 ml new refrigerant oil and new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

51 AC HOUSING-EVAPORATOR**64 51 001 CLEANING EVAPORATOR****Special tools required:**

- 64 1 300

WARNING: When handling cleaning agent, observe following protection measures:
Wear protective rubber gloves and protective goggles.
If cleaning agent comes into contact with eyes or skin, wash immediately with lots of water.

IMPORTANT: To avoid dirtying vehicle interior:

- Close all air vents
- Heater - A/C system must be switched to recirculated-air mode
- Cover carpet in work area

Recycling:

Carry out the cleaning operation in a suitable washing bay as the emerging cleaning agent escapes through the drain openings in the transmission tunnel.

After completing cleaning, allow car to drip-dry for approx. 5 minutes.

Necessary preliminary tasks:

- Remove rear underbody protection . See **51 47 491 REMOVING AND INSTALLING/REPLACING REAR UNDERBODY PROTECTION** .
- Move steering column in "top" and "extended" position.
- Remove evaporator temperature sensor . See **64 11 942 REPLACING EVAPORATOR TEMPERATURE SENSOR**.

NOTE: Direction arrows on special tool 64 1 300 must point in direction of travel.

Insert guide lug (1) of special tool 64 1 300 into opening of evaporator temperature sensor.

Guide lug (1) must be firmly seated in opening of evaporator temperature sensor.

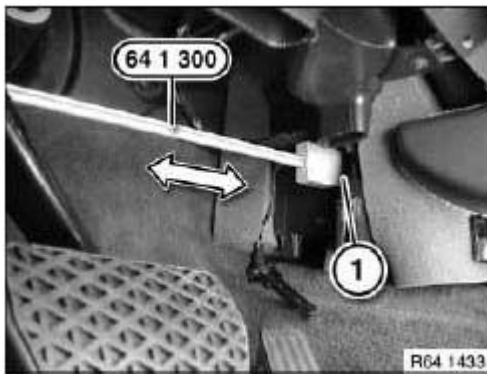


Fig. 81: Inserting Guide Lug
Courtesy of BMW OF NORTH AMERICA, INC.

Connect special tool 64 1 300 to spray apparatus.

Move special tool 64 1 300 inwards.

Release clamping screw (2) and pull out guide wire (1) in order to position the folding spray element vertically.

Apply cleaning agent uniformly to evaporator by carefully moving special tool 64 1 300 back and forth.

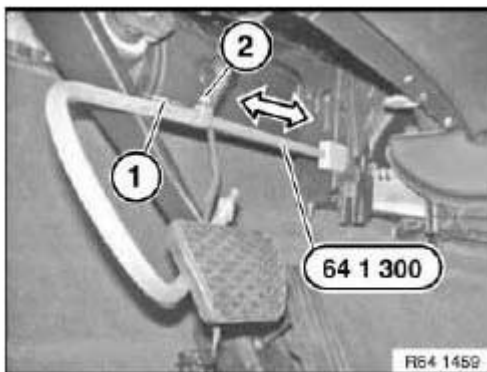
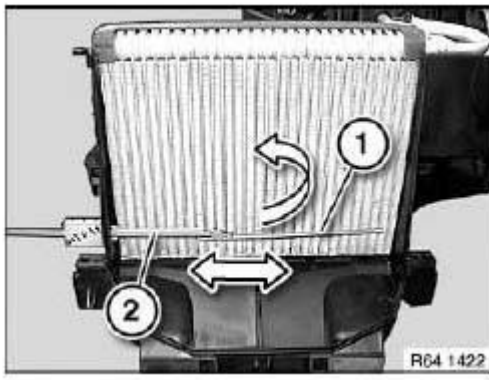


Fig. 82: Connecting Special Tool (64 1 300)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For purposes of clarity, the cleaning procedure is shown on the removed heater/air conditioner.

Set up spray element (1) by pulling out guide wire and carefully move lance (2) back and forth.

**Fig. 83: Pulling Out Guide Wire**

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Set heating - A/C system to footwell ventilation and fresh-air mode. Open windows/doors.
Start car and run heating - A/C system at max. fan power for approx. 5 minutes in order to dry evaporator.
In order to eliminate the last remnants of cleaning agent, repeat this procedure shortly before handing over to the customer.

64 51 002 REPLACING EVAPORATOR

Necessary preliminary tasks:

- Remove heater

Release screws (1).

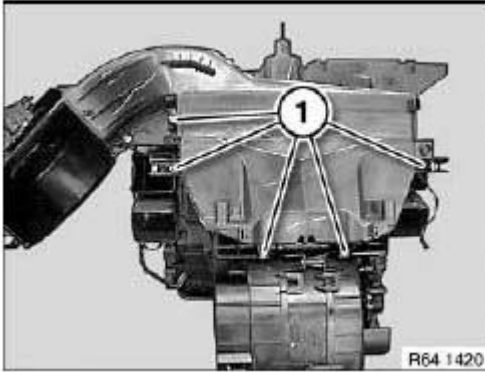


Fig. 84: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove expansion valve (2).

Installation:

Ensure that seals are correctly seated.

Replace sealing rings and moisten with refrigerant oil.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

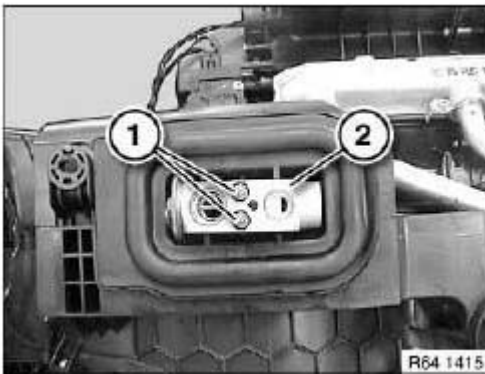


Fig. 85: Identifying Expansion Valve With Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and carefully remove upper housing section (2).

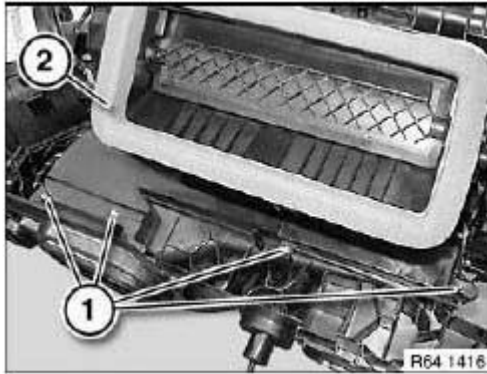


Fig. 86: Identifying Upper Housing Section
Courtesy of BMW OF NORTH AMERICA, INC.

Remove evaporator (1).

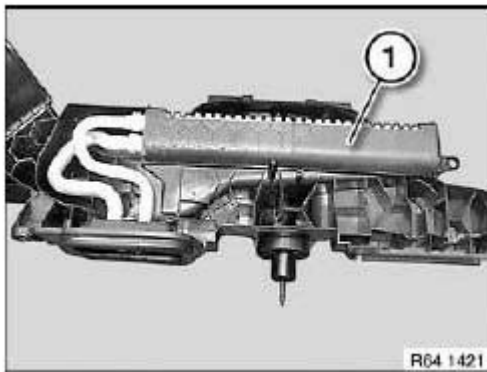


Fig. 87: Identifying Evaporator
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**
- Fill and vent cooling system

64 51 525 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE

WARNING: Avoid contact with refrigerant and refrigerant oil.
Follow safety instructions for handling refrigerant R 134a . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.**
Follow safety instructions for handling refrigerant oil . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).**

IMPORTANT: Risk of damage!

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

Follow instructions for opening and replacing parts in refrigerant circuit!

If A/C system is opened for more than 24 hours: Replacing drier insert for A/C system

Necessary preliminary tasks:

- Remove double pipe . See **64 53 733 REPLACING DOUBLE PIPE**.
- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

Remove gasket (1).

Installation:

Observe direction arrows (2) without fail.

If necessary, replace damaged seal (1).

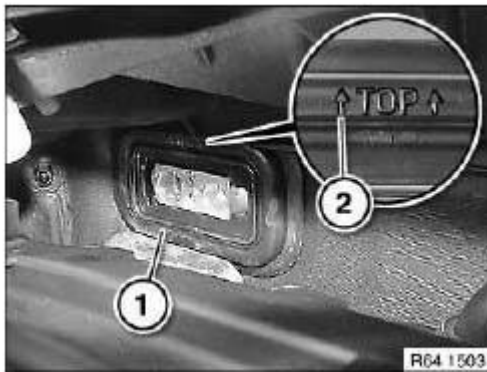


Fig. 88: Identifying Gasket Positions

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and carefully remove expansion valve (2).

Replace sealing rings and moisten with refrigerant oil.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

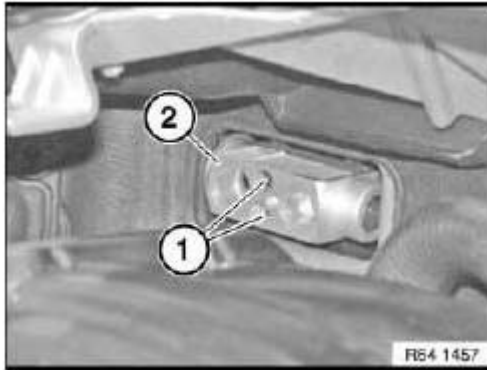


Fig. 89: Identifying Expansion Valve Screws
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

64 51 580 LEAK-TESTING EVAPORATOR

Special tools required:

- 64 5 104
- 64 5 108

Necessary preliminary tasks:

- Remove expansion valve . See **64 51 525 REMOVING AND INSTALLING OR REPLACING EXPANSION VALVE.**

Replace sealing rings (1) and coat with refrigerant oil.

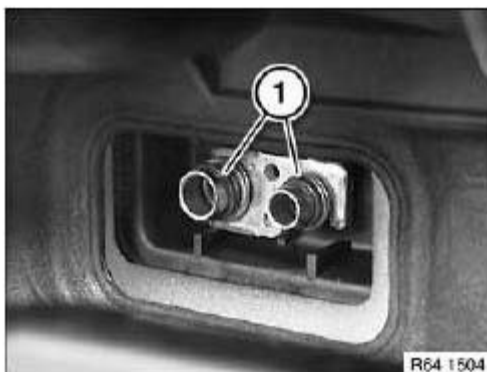


Fig. 90: Identifying Sealing Rings
Courtesy of BMW OF NORTH AMERICA, INC.

Mount special tool 64 5 108 and retainer (1) with screws of expansion valve.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

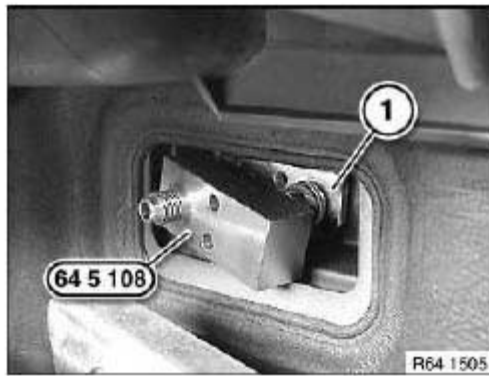


Fig. 91: Identifying Special Tool (64 5 108)
Courtesy of BMW OF NORTH AMERICA, INC.

Connect special tool 64 5 104 to special tool 64 5 108 .

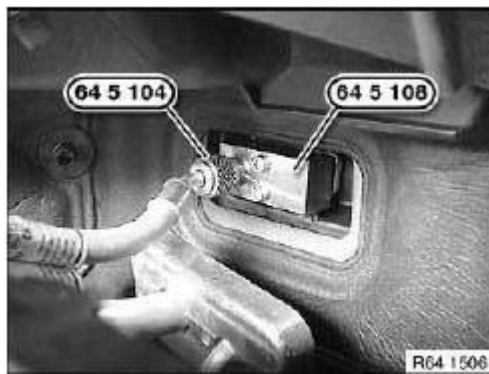


Fig. 92: Identifying Special Tool (64 5 104 And 64 5 108)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage: Use only nitrogen pressure bottles with pressure reducers for leak-testing.
Pressurize evaporator to 15 bar slowly only. Excessively fast pressurization and pressures in excess of 20 bar may cause damage to the evaporator.

Connect nitrogen pressure bottle with pressure reducer to pressure gauge and then connect to special tool 64 5 104 (connecting hose).

NOTE:

- **Testing apparatus must be leakproof.**
- **Ambient temperature and temperature of vehicle must not change during the test procedure.**

- **Do not move the vehicle during this period**

Apply test pressure of 15 bar **slowly** and close nitrogen pressure bottle.

Check leak-tightness of testing apparatus and of connection to refrigerant line.

Set test pressure of 15 bar is only permitted to drop by 2 bar to 13 bar over a test period of 2 hours.

If the pressure loss is greater than 2 bar, this indicates that there is a leak in the evaporator unit.

After installation:

- Replace all sealing rings and moisten with refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT

WARNING:

- **Avoid contact with refrigerant and refrigerant oil**
- **Follow safety instructions for handling R 134a refrigerant . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.**
- **Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).**

CAUTION:

- **Always use new O-rings each time A/C connections are opened.**
- **Moisten O-rings with refrigerant oil prior to fitting**
- **Seal all parts to be returned at openings to prevent ingress of moisture or foreign bodies**

I. Opening refrigerant circuit without part replacement, as preliminary work to further work

(e.g. engine removal):

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**
- Carry out main work
- Replace removed refrigerant oil with new refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

II Part replacement and part replacement on account of insidious leak

(minor leak, e.g. hairline crack)

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

III. Part replacement on account of sudden leak

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

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish 25 ml new refrigerant oil and new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

64 52 ... INSTRUCTIONS FOR COMPRESSOR REPLACEMENT

IMPORTANT: Compressors with plastic belt pulleys:

- Avoid impacts/knocks to plastic belt pulley (caused by tools, contact with base).
- Return faulty compressors in their original packaging only.

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

- Switch on A/C system
- Set all air vents in instrument cluster to "OPEN"
- Start engine and let it stabilize at idle speed
- Set blower output to min. 75 % of max. blower output
- Switch on A/C system and run for at least 2 minutes at idle speed (risk of damage at higher speed!)

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

After evacuation, the refrigerant must be filtered in the service station as the oil separator could still contain a liquid refrigerant/oil mixture. The filtering process gasifies the refrigerant completely and only the previously bound refrigerant oil remains in the oil separator. Measure and note down this quantity of refrigerant oil, refer to **EVACUATING A/C SYSTEM**.

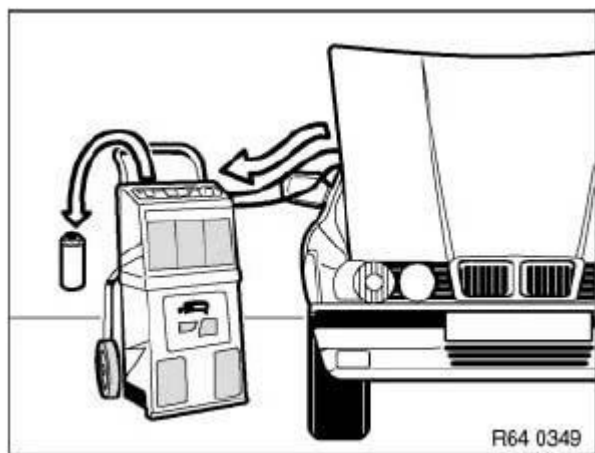


Fig. 93: Removing Liquid Refrigerant/Oil
 Courtesy of BMW OF NORTH AMERICA, INC.

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

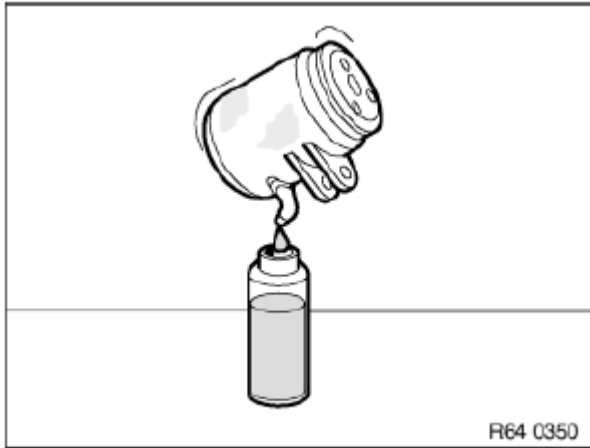


Fig. 94: Measuring Container
Courtesy of BMW OF NORTH AMERICA, INC.

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

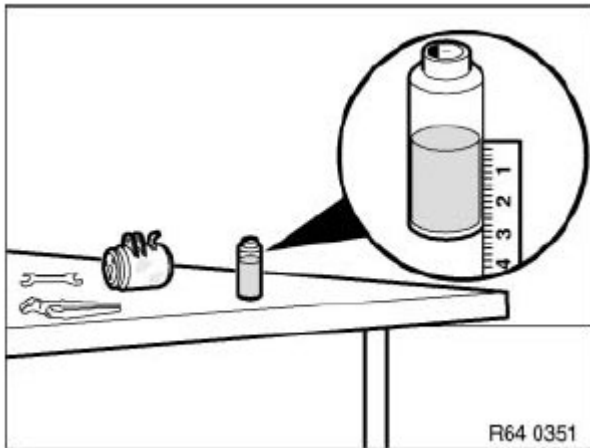


Fig. 95: Measuring Amount Of Refrigerant Oil
Courtesy of BMW OF NORTH AMERICA, INC.

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

Open filler plug and pour entire contents of compressor into a clean container.

Installation:

Replace sealing ring and moisten with refrigerant oil.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

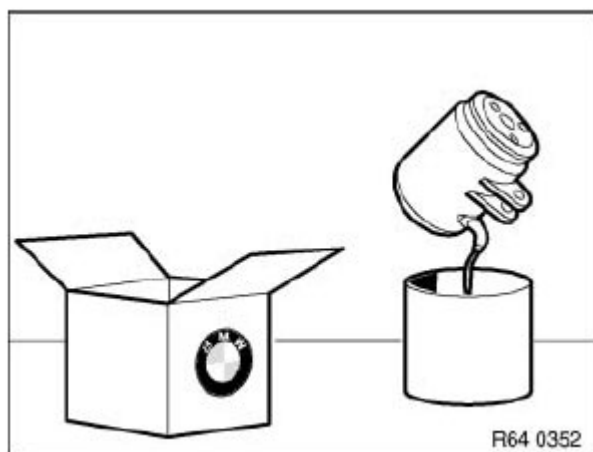


Fig. 96: Opening Filler Plug

Courtesy of BMW OF NORTH AMERICA, INC.

From the new compressor, pour the same amount of refrigerant oil (as drained from the previous compressor) + 10 g extra into a clean measuring container and pour again into the new compressor.

Remaining refrigerant oil can be poured into service station tank, refer to **EVACUATING A/C SYSTEM**.

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.

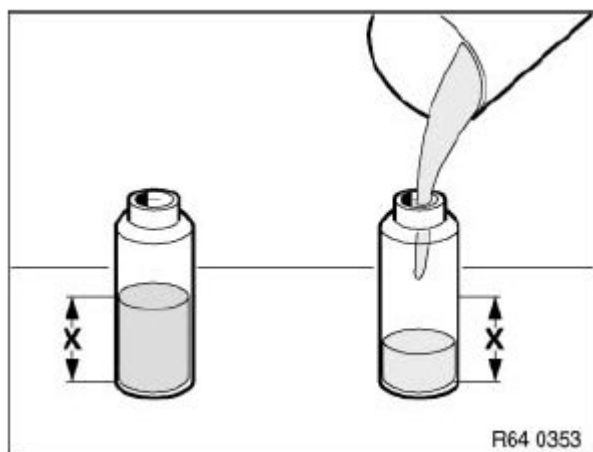


Fig. 97: Measuring Container Into Compressor

Courtesy of BMW OF NORTH AMERICA, INC.

The refrigerant oil drawn off from the oil separator of the service station and from the previous compressor must not be reused and must be correctly disposed of.

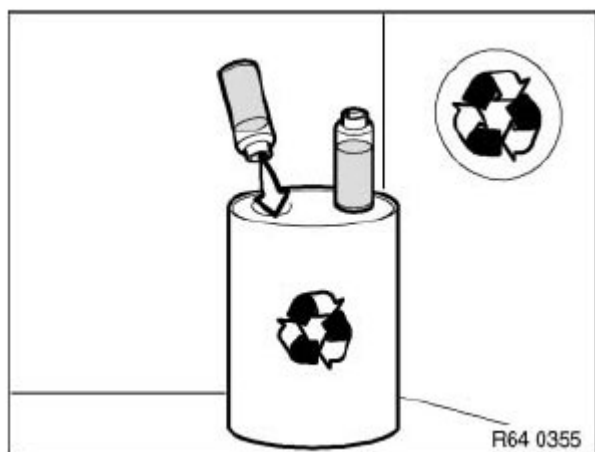


Fig. 98: Identifying Refrigerant Oil Drawn Off From Oil Separator
 Courtesy of BMW OF NORTH AMERICA, INC.

After installing the new compressor, it is essential before filling the A/C system to pour the same amount of the previously drawn off refrigerant oil into the system again, refer to **EVACUATING A/C SYSTEM**.

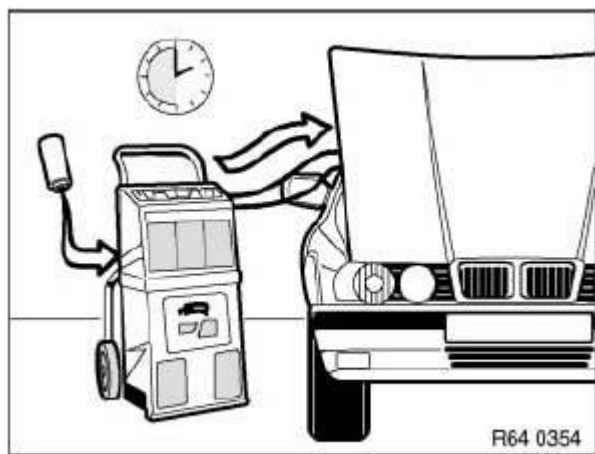


Fig. 99: Filling Liquid Refrigerant/Oil
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

If A/C system is opened for more than 24 hours: Replace drier bottle/drier insert . See **64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM**.

64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT

WARNING:

- Avoid contact with refrigerant and refrigerant oil
- Follow safety instructions for handling R 134a refrigerant . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A**.

- Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

CAUTION:

- Always use new O-rings each time A/C connections are opened.
- Moisten O-rings with refrigerant oil prior to fitting
- Seal all parts to be returned at openings to prevent ingress of moisture or foreign bodies

I. Opening refrigerant circuit without part replacement, as preliminary work to further work

(e.g. engine removal):

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).
- Carry out main work
- Replace removed refrigerant oil with new refrigerant oil
- Evacuate and fill A/C system . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

II. Part replacement and part replacement on account of insidious leak

(minor leak, e.g. hairline crack)

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to NOTES ON REPLACING COMPRESSOR
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

III. Part replacement on account of sudden leak

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

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish 25 ml new refrigerant oil and new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

64 52 521 REMOVING AND INSTALLING/REPLACING A/C SYSTEM COMPRESSOR (N62TU)

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A**.

Follow safety instructions for handling refrigerant oil . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A)**.

IMPORTANT: Risk of damage

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

Read and comply with notes on replacing compressor . See **64 52 ... INSTRUCTIONS FOR COMPRESSOR REPLACEMENT**.

Follow instructions for opening and replacing parts in refrigerant circuit! See **64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT**.

If A/C system is opened for more than 24 hours:

Replacing drier insert for A/C system . See **64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM**.

- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Remove A/C compressor drive belt
- Remove front underbody protection . See **51 47 490 REMOVING AND INSTALLING / REPLACING FRONT ASSEMBLY UNDERSIDE PROTECTION** .
- Remove steering gear cover at top right . See **51 71 ... REMOVING AND INSTALLING/REPLACING TOP RIGHT STEERING GEAR COVER** .

Release screws (1) and remove both refrigerant lines.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

Replace sealing rings and moisten with refrigerant oil.

Disconnect plug connection (2).

Release screws (3).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

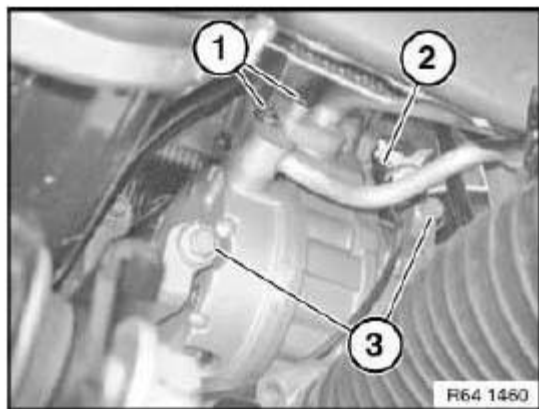


Fig. 100: Identifying Plug Connection With Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screw (1).

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

Lower vehicle.

NOTE: Secure compressor (2) against falling out.

Release screw (1) from above and feed out compressor (2) in upward direction.

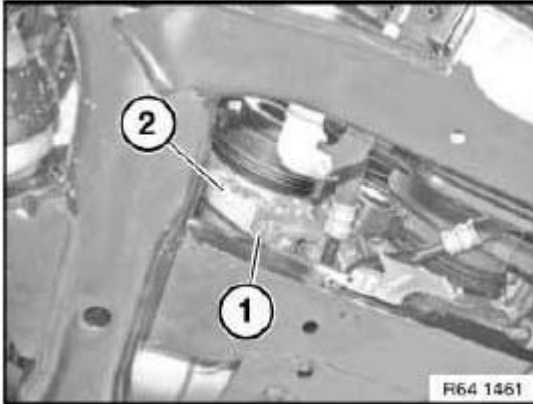


Fig. 101: Identifying Compressor

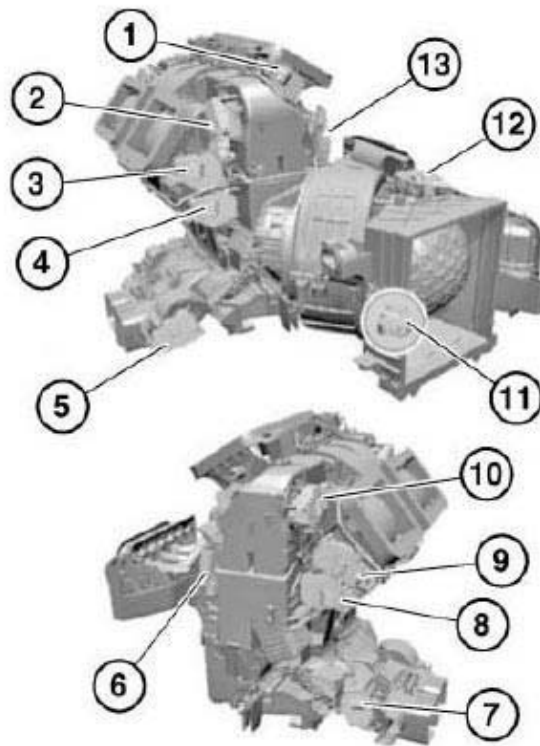
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).**

53 CONDENSER AND DRYER

64 11 ... OVERVIEW OF HEATER/AIR CONDITIONER SERVOMOTORS



R64 1441

1	Servomotor, <u>defrosting</u>	8	Servomotor, <u>stratification, front left/right</u>
2	Servomotor, <u>footwell, rear cabin, right</u>	9	Servomotor, <u>ventilation, front left/right</u>
3	Servomotor, <u>ventilation, front right</u>	10	Servomotor, <u>footwell, rear cabin, left</u>
4	Servomotor, <u>stratification, front right</u>	11	Servomotor, <u>dynamic pressure compensation</u>
5	Servomotor, <u>stratification/shut-off, rear cabin, right</u>	12	Servomotor, <u>fresh air/recirculated air</u>
6	Servomotor, <u>footwell, front left</u>	13	Servomotor, <u>footwell, front left/right</u>
7	Servomotor, <u>stratification, rear cabin, left/right</u>		

Fig. 102: Identifying Heater/Air Conditioner Servomotors Components Location
 Courtesy of BMW OF NORTH AMERICA, INC.

64 52 ... INSTRUCTIONS FOR OPENING AND REPLACING PARTS IN REFRIGERANT CIRCUIT

WARNING:

- Avoid contact with refrigerant and refrigerant oil
- Follow safety instructions for handling R 134a refrigerant . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.
- Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

- CAUTION:**
- Always use new O-rings each time A/C connections are opened.
 - Moisten O-rings with refrigerant oil prior to fitting
 - Seal all parts to be returned at openings to prevent ingress of moisture or foreign bodies

I. Opening refrigerant circuit without part replacement, as preliminary work to further work

(e.g. engine removal):

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out main work
- Replace removed refrigerant oil with new refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

II. Part replacement and part replacement on account of insidious leak

(minor leak, e.g. hairline crack)

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

III. Part replacement on account of sudden leak

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

Work sequence:

- Draw off A/C system, then determine drawn-off refrigerant oil quantity. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Carry out part replacement
- Replace removed refrigerant oil with new refrigerant oil
- Additionally replenish 25 ml new refrigerant oil and new refrigerant oil in accordance with replaced parts:
 - Compressor: refer to **NOTES ON REPLACING COMPRESSOR**
 - Evaporator: 10 ml
 - Condenser: 10 ml
 - Desiccant insert / desiccant bottle: 30 ml
 - Each replaced refrigerant line: 10 ml
 - Condenser with integrated dryer: 30 ml
 - Safety pressure switch and seals: no additional refrigerant oil
- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

64 53 ... NOTES ON REPLACING DRIER BOTTLE OR DRIER INSERT

The drier bottle or drier insert does not have to be replaced at regular service intervals in a functioning, leakproof A/C system.

However, the drier bottle or drier insert must be replaced without fail in the event of:

- fouling of the refrigerant by filings/shavings (e.g. when the compressor is clamped)
- a leaking A/C system or loss of refrigerant
- the refrigerant circuit being opened for a period exceeding 24 hours, e.g. during repair work.

64 53 ... REPLACING VALVE INSERT FOR REFRIGERANT LINE

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A**.

Follow safety instructions for handling refrigerant oil . See **64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A)**.

IMPORTANT: Risk of damage

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

If A/C system is opened for more than 24 hours: Replacing drier insert for A/C system . See **64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM**.

NOTE: The special tool is available under BMW order number: 81 34 0 427 679 from the

BMW workshop equipment catalogue.

Necessary preliminary tasks:

- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

Twist valve insert out of filler neck (2) with remover (1).

Installation:

Screw in valve insert hand-tight only.

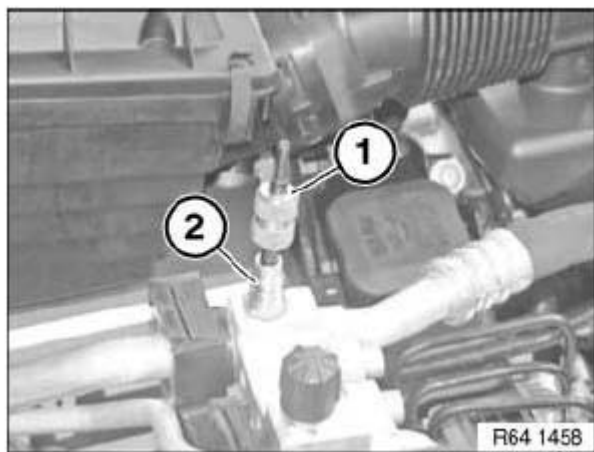


Fig. 103: Identifying Filler Neck With Remover
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Check leak-tightness of valve insert with soapy solution

In event of leakage:

- Evacuate A/C system. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.
- Check sealing faces on line and valve insert for damage, replace line or valve insert if necessary

64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM

WARNING: Avoid contact with refrigerant and refrigerant oil.
Follow safety instructions for handling refrigerant R 134a . See **64 50 ...**

INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ...

INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).**IMPORTANT: Risk of damage!**

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

Follow instructions for opening and replacing parts in refrigerant circuit!

If A/C system is opened for more than 24 hours:

Replacing drier insert for A/C system

Necessary preliminary tasks:

- Remove condenser . See **64 53 551 REMOVING AND INSTALLING OR REPLACING CONDENSER FOR A/C SYSTEM.**

Remove cover cap (1) from condenser (2).

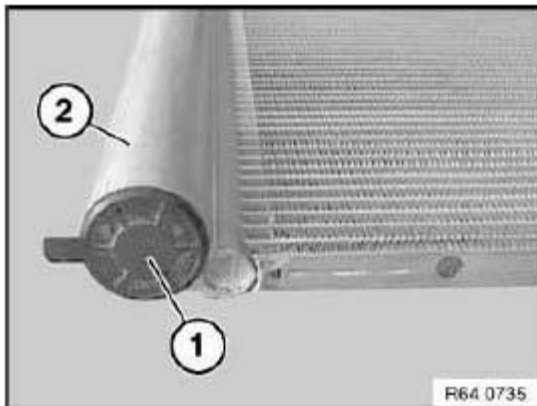


Fig. 104: Identifying Cover Cap And Condenser
Courtesy of BMW OF NORTH AMERICA, INC.

Press sealing cap (1) inwards and remove circlip (2).

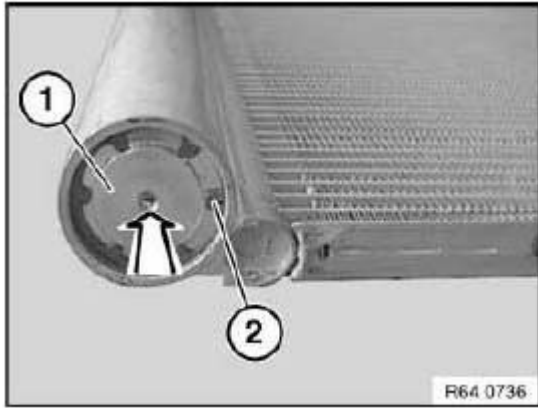


Fig. 105: Pressing Sealing Cap

Courtesy of BMW OF NORTH AMERICA, INC.

With assistance of a screwed-in screw (1), remove sealing cap from condenser (3).

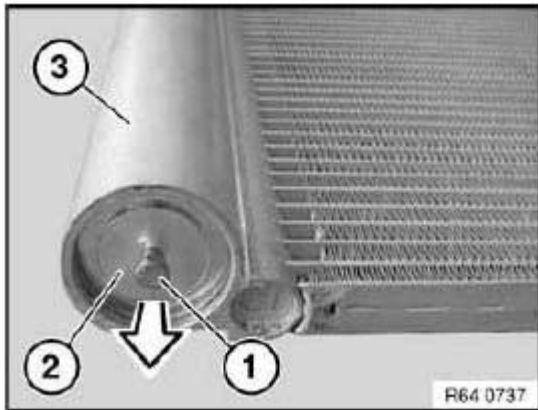


Fig. 106: Removing Sealing Cap From Condenser

Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace sealing rings (1) of sealing cap (2) and coat with refrigerant oil.

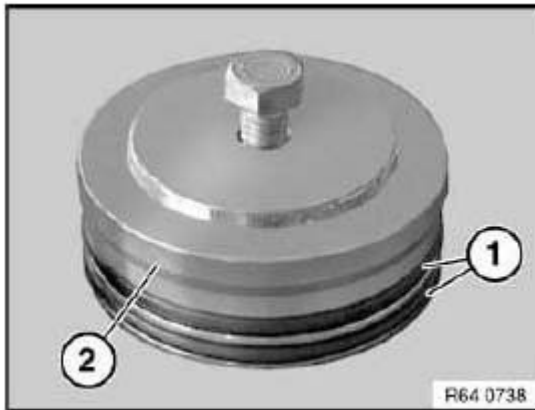


Fig. 107: Identifying Sealing Rings And Sealing Cap
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!
Removal is made more difficult if rib (2) is damaged!

Carefully pull out desiccant insert (1) with a pair of wide pliers on rib (2).

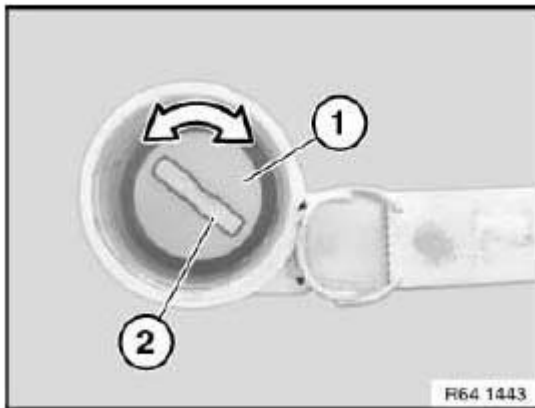


Fig. 108: Turning Rib
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

64 53 520 REPLACING SAFETY PRESSURE SWITCH

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See 64 50 ...
INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage!

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

If A/C system is opened for more than 24 hours: Replacing drier insert for A/C system . See 64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM.

Necessary preliminary tasks:

- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

Disconnect plug connection (1) and release safety pressure switch (2).

Installation:

Moisten sealing ring with refrigerant oil.

Tightening torque. See HEATING AND AIR CONDITIONING - TIGHTENING TORQUES .

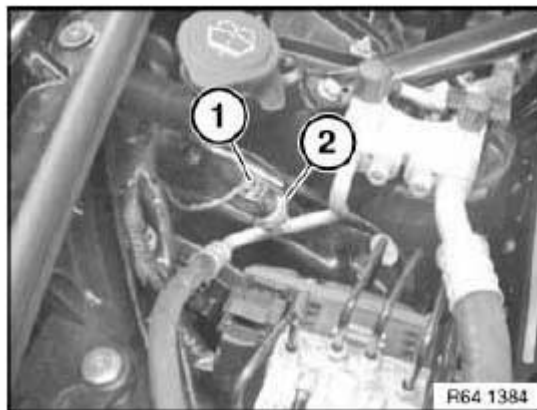


Fig. 109: Identifying Plug Connection And Pressure Switch
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

64 53 551 REMOVING AND INSTALLING OR REPLACING CONDENSER FOR A/C SYSTEM

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage!

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

Follow instructions for opening and replacing parts in refrigerant circuit!

If A/C system is opened for more than 24 hours: Replace desiccant insert for A/C system

Necessary preliminary tasks:

- Remove intake duct
- Remove radiator cover
- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.

Slacken screws (1) on both sides and pull fan cowl upwards.

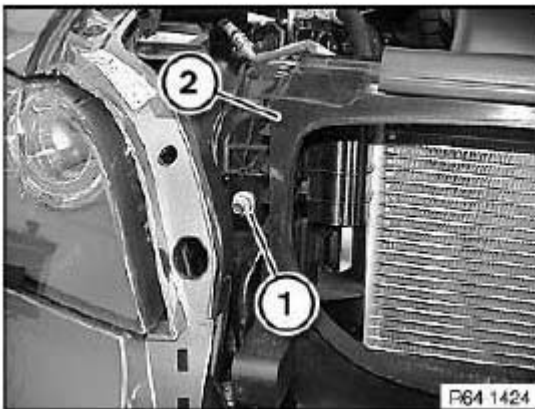


Fig. 110: Identifying Radiator Cover

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and pull condenser (2) up and out.

Installation:

Replace sealing rings and moisten with refrigerant oil.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

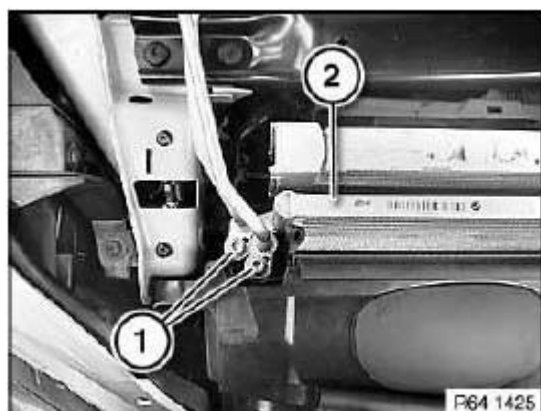


Fig. 111: Identifying Condenser And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

64 53 733 REPLACING DOUBLE PIPE

WARNING: Avoid contact with refrigerant and refrigerant oil.

Follow safety instructions for handling refrigerant R 134a . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT R 134A.

Follow safety instructions for handling refrigerant oil . See 64 50 ... INSTRUCTIONS FOR HANDLING REFRIGERANT OIL (FOR REFRIGERANT R 134A).

IMPORTANT: Risk of damage!

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

If A/C system is opened for more than 24 hours: Replacing drier insert for A/C system . See 64 53 517 REPLACING DESICCANT INSERT FOR A/C SYSTEM.

Necessary preliminary tasks:

- Drawing off, evacuating and filling the A/C system are not included in the time value given for this work operation. See 64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A).

Release screw (1).

Installation:

Check that rubber seal is correctly seated.

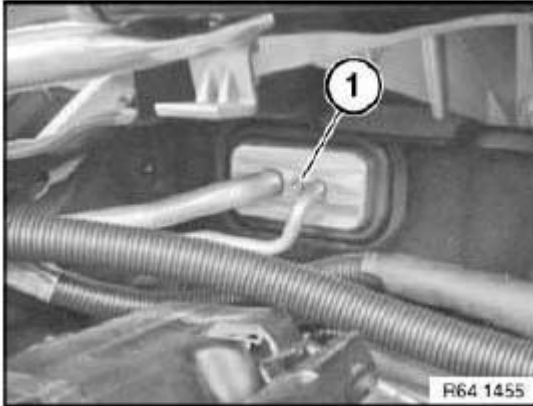


Fig. 112: Identifying Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove refrigerant lines.

Remove refrigerant line from double pipe holder (2).

Installation:

Replace all sealing rings and moisten with refrigerant oil.

Tightening torque. See **HEATING AND AIR CONDITIONING - TIGHTENING TORQUES** .

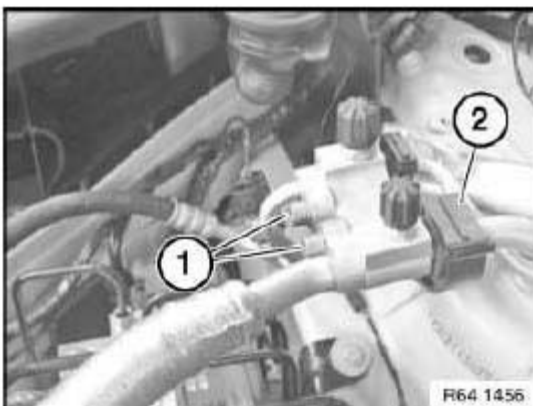


Fig. 113: Identifying Double Pipe Holder And Screws

Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Evacuate and fill A/C system . See **64 50 009 DRAWING OFF, EVACUATING AND FILLING A/C SYSTEM (R 134A)**.