

ENGINE

Cooling System - Operating Fluids

1.0 GENERAL INFORMATION ON LONG-TERM ANTIFREEZE AND CORROSION INHIBITORS

The cooling system of BMW cars must only be filled with reputable brand name ethylene glycol long-term antifreeze having corrosion inhibitors that are compatible with aluminum radiators.

Coolants must fulfill four basic requirements.

- Guarantee sufficient cooling.
- Protect various metals (gray cast iron, steel, aluminum alloys, brass, copper and solder) against corrosion.
- Prevent excessive silicate gel precipitation, which may cause clogging of the cooling system.
- Guarantee operation of cooling system in winter (prevent freezing of coolant) and in summer by boosting the boiling point.

The quality or grade of a long-term antifreeze and corrosion inhibitor is very important to be able to protect metal (gray cast iron, steel, aluminum alloys, brass, copper and solder) in the cooling system against corrosion. It guarantees full operation of the cooling system in winter and also increases the boiling point at high outside temperatures and under heavy loads.

INITIAL FILLING IN FACTORY

The factory fills the cooling system for protection against freezing, for the U.S. and Canada, down to -34°F (-37°C). This means an antifreeze ratio of 50% antifreeze and 50% water. In severely cold areas, the antifreeze can be increased to 60% which provides freezing protection down to -62°F (-52°C). Do not exceed a 60% ratio of antifreeze. The specified antifreeze ratio is important, since an insufficient amount would impair antifreezing and corrosion inhibiting protection. An excessive amount would not improve freezing protection, but instead reduce freezing protection.

CHANGE INTERVALS

Regular checking of coolant concentration is part of Inspection I or II. for change intervals.

LIFETIME COOLANT

The BMW engine coolant has a lifetime rating, except when the cooling system requires repairs. Drained coolant is not to be re-used. Top up with new coolant.

REMARKS AND LIMITATIONS

Only tap water of drinking quality with the following properties may be used as coolant.

DRINKING QUALITY SPECIFICATION

Appearance	-	colorless, clear
Residue	-	without suspended matter
pH value	-	6.5 - 8.0
Total hardness	-	max. 357 PPM Calcium Carbonate
Chloride content	-	max. 100 mg/l
Sulfate content	-	max. 100 mg/l

The antifreeze concentration in a cooling system should be checked before the beginning of winter. When determining the mixture concentration it is important to make sure that there is sufficient protection against freezing.

A hydrometer (radiator antifreeze tester) is required for correct determination of antifreeze concentration. The composition of long-term antifreezes and corrosion inhibitors differs between manufacturers.

BMW Anti-Freeze/Coolant contains no nitrites or phosphates and has been formulated to prevent excessive silicate drop out. Order the 1gallon container under BMW Part No. 82 14 1 467 704.

NOTE: Do not mix BMW Anti-Freeze/Coolant with different antifreezes which contain nitrites and/or phosphates and a high silicate formulation.

2.0 COOLANT ADDITIVES

No aftermarket coolant additives, including but not limited to those which provide additional corrosion inhibition or seal off minor leaks are approved by BMW.

Use of non-approved coolant additives may cause reduced heat transfer from the cylinder head to the coolant and the formation of hot spots. This can cause the burning through of cylinder head gaskets and/or cracking of the cylinder head.

BMW NA cannot accept the liability for the resulting effects and consequential damage caused by the use of coolant additives.

ENGINE

Cooling System - Repair Instructions - X6

COOLANT, CHECKING COOLANT SYSTEM

17 00 ... INSTRUCTIONS FOR WORKING ON COOLING SYSTEM

WARNING: Danger of scalding! Work on the cooling system should only be carried out when the engine has cooled down.

IMPORTANT: Wear protective gloves and goggles.

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

IMPORTANT: Open cooling system only when it has cooled down.

Opening the cooling system while hot can result in air entering the system. This can cause overheating with permanent damage to the engine.

IMPORTANT: When working on the oil, coolant or fuel circuit, protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

IMPORTANT: Do not fill coolant expansion tank over MAX level as overfilling will cause the coolant to overflow. This may give rise to traces of residual coolant on the expansion tank or in the engine compartment and wrongly suggest possible leakages.

Recycling

Catch and dispose of drained coolant.

Observe country-specific waste-disposal regulations.

NOTE: Tightening torque, hose clamps 17 00 1AZ , see 17 00 COOLANT

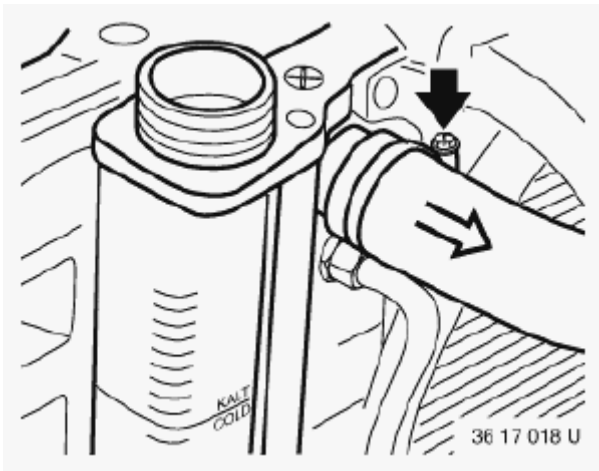


Fig. 1: Locating Hose Clamps
 Courtesy of BMW OF NORTH AMERICA, INC.

Instructions for disassembly/assembly of coolant hose fast-release couplings

Disassembly of fast-release coupling

Withdraw lock (1/2), disconnect hose.

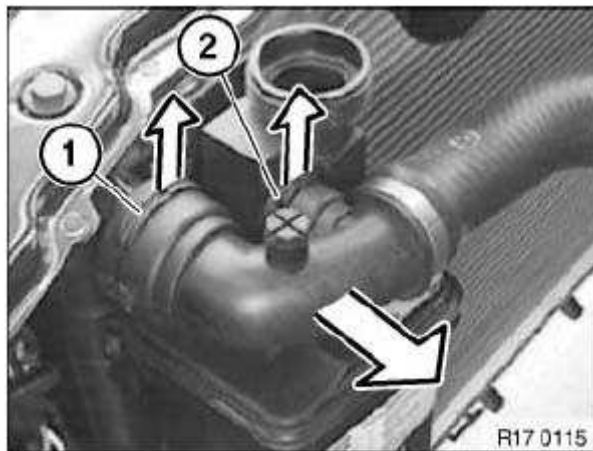


Fig. 2: Disconnecting Hose
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Check O-rings (1).

Do not coat O-rings (1) with antiseize agent.

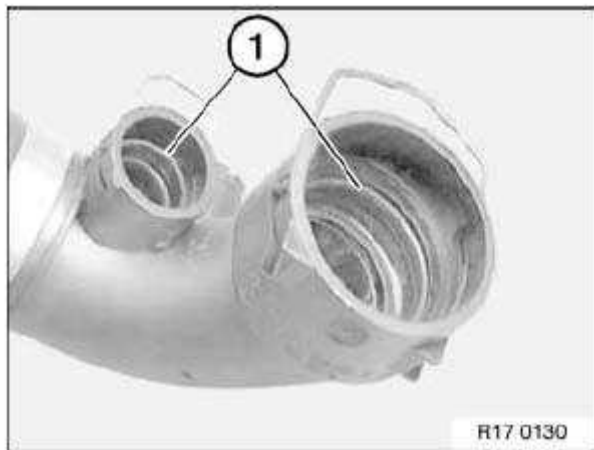


Fig. 3: Identifying O-Rings

Courtesy of BMW OF NORTH AMERICA, INC.

Assembly of fast-release coupling

Press in lock (1) before installing fast-release coupling.

Push on hose.

Fast-release coupling must clearly snap audibly into place.

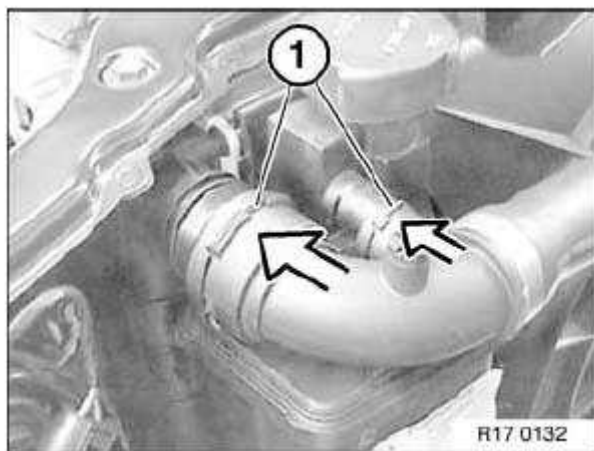


Fig. 4: Pressing Lock

Courtesy of BMW OF NORTH AMERICA, INC.

17 00 005 DRAINING AND ADDING COOLANT (N54)

Special tools required:

- 00 2 030

See **MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS** .

WARNING: Danger of scalding!

These tasks on the cooling system should only be carried out on an engine that has cooled down!

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant!

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

Installation:

Use **only recommended coolant** .

Observe **mixture ratio** .

Protective measures/rules of conduct:

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

**IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!**

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool **00 2 030** (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

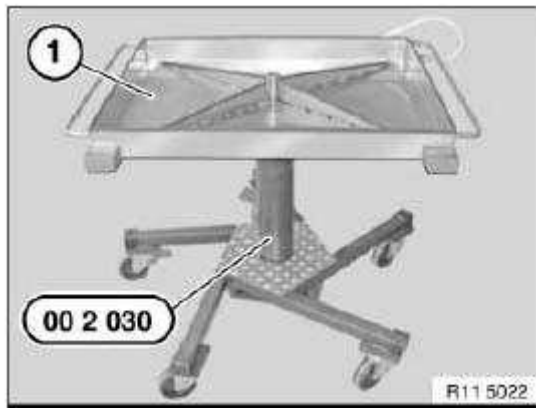


Fig. 5: Identifying Special Tool (00 2 030)
 Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Follow instructions for **working on cooling system**
- Remove **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove **reinforcement plate** . See **31 10 010 REMOVING AND INSTALLING/REPLACING REINFORCEMENT PLATE** .

Draining coolant:

Open cap (1) on coolant expansion tank (2).

Installation:

Close cap (1) until the arrow marks line up.

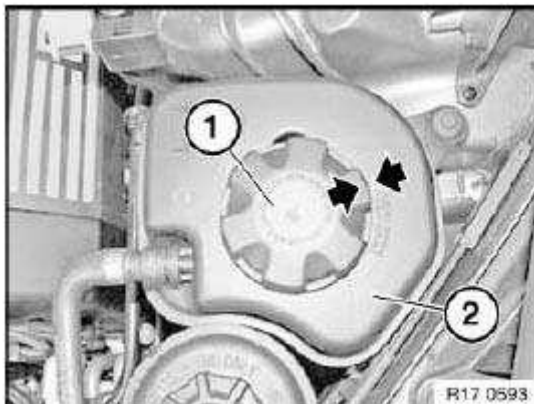


Fig. 6: Identifying Coolant Expansion Tank Cap
 Courtesy of BMW OF NORTH AMERICA, INC.

Without supplementary radiator:

Remove intercooler

Open coolant drain plug (1).

Drain, catch and dispose of coolant.

Installation:

- Replace sealing ring.

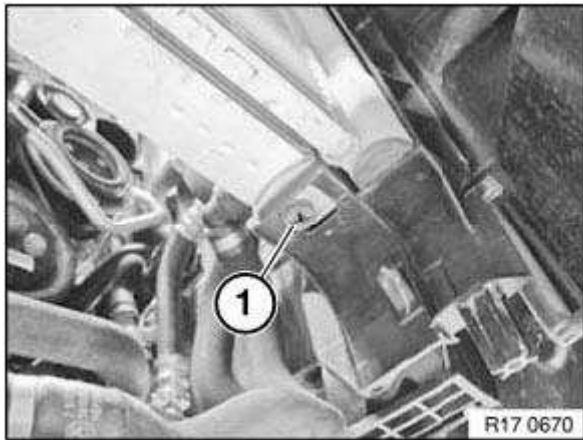


Fig. 7: Identifying Coolant Drain Plug
Courtesy of BMW OF NORTH AMERICA, INC.

With supplementary radiator:

Open coupling on coolant hose below intercooler.

Drain, catch and dispose of coolant.

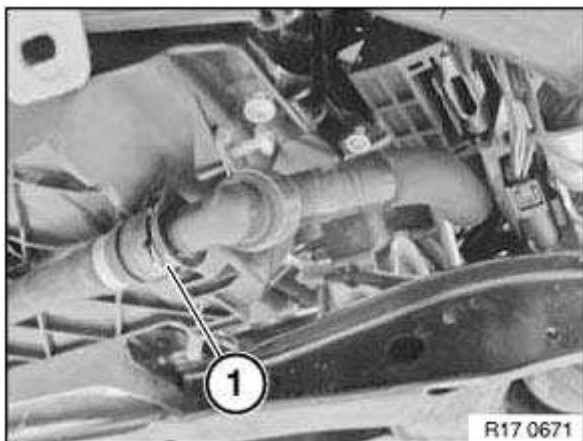


Fig. 8: Identifying Coolant Hose

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Adding coolant:**
 Use only recommended coolant .
 Observe mixture ratio .
 Observe filling capacities .
 Observe venting instructions without fail.

Fill and vent cooling system

17 00 009 CHECKING COOLING SYSTEM FOR WATER LEAKS

Special tools required:

- **00 2 030**
- **17 0 101**
- **17 0 113**
- **17 0 114**

See **MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS** .

See **COOLING SYSTEM - SPECIAL TOOLS (N54, N63)** .

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

Protective measures/rules of conduct:

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool **00 2 030** (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

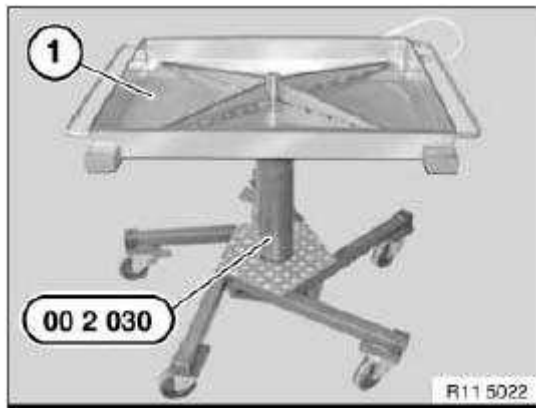


Fig. 9: Identifying Special Tool (00 2 030)
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure drop in cooling system:

Open cap on coolant expansion tank. Fit special tools **17 0 101 /17 0 113** .

Build up gauge pressure , wait approx. 2 minutes. See **17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63** .

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

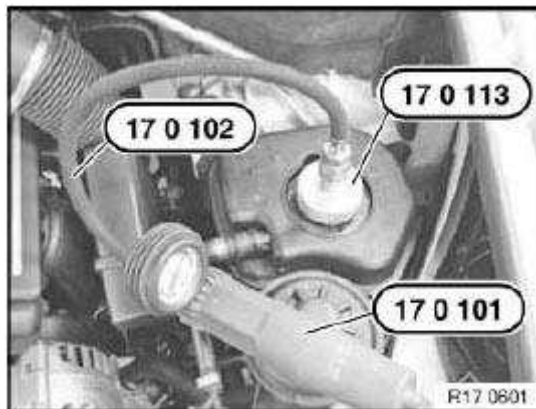


Fig. 10: Identifying Special Tool (17 0 102, 17 0 113 And 17 0 101)
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure relief valve in cap:

NOTE: While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with dissolved coolant to escape. This coolant vapour condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has

been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure.

Checking pressure relief valve in cap:

Screw cap (1) onto special tool 17 0 114 .

Build up pressure with special tool (hand pump) 17 0 101 ; observe pressure gauge to ascertain when opening pressure is achieved.

Compare **opening pressure of pressure relief valve** . See 17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63 .

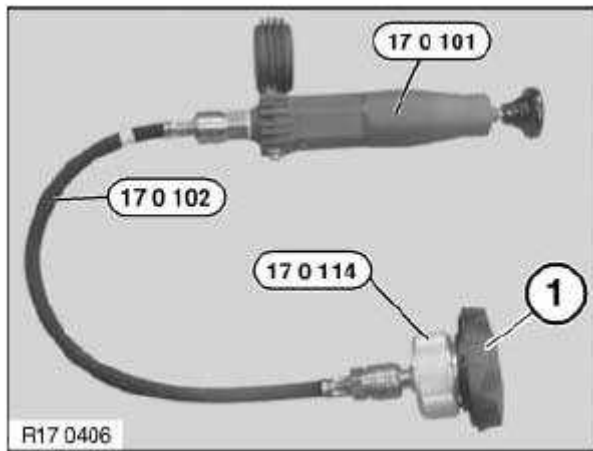


Fig. 11: Checking Pressure Relief Valve In Cap
Courtesy of BMW OF NORTH AMERICA, INC.

17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS (N52K)

WARNING: Danger of scalding!

Open sealing cap only after engine has cooled down.

IMPORTANT: Electric coolant pump!

Follow instructions for working on cooling system.

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant!

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

Only when refilling!

Use **only recommended coolant** .

Observe **mixture ratio** .

Perform filling operation slowly.

Adjust coolant level to MAX.

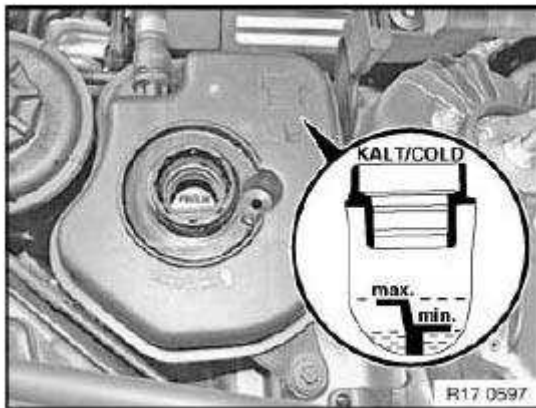


Fig. 12: Adjusting Coolant Level To MAX
Courtesy of BMW OF NORTH AMERICA, INC.

Close coolant expansion tank.

Installation:

Close cap (1) until the arrow marks line up.

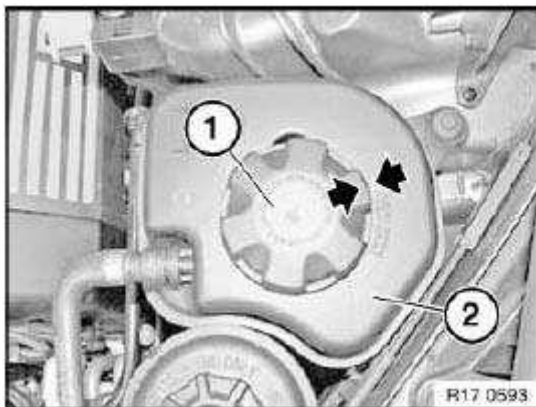


Fig. 13: Identifying Coolant Expansion Tank Cap
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The following venting procedure is necessary e.g. when a part is replaced in the cooling system or when the cooling system is refilled.

Adding coolant:

Fill expansion tank slowly with recommended **coolant** up to lower edge until fill level stops dropping.

Observe mixture ratio .

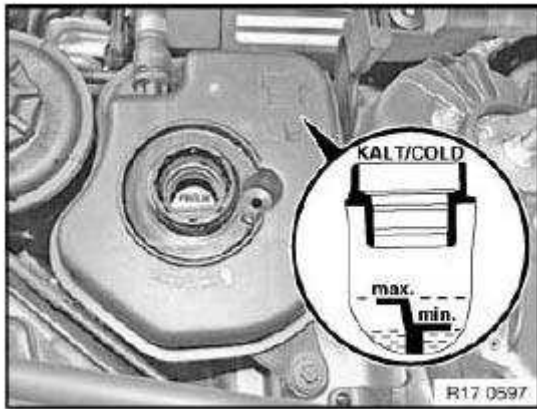


Fig. 14: Adjusting Coolant Level To MAX
Courtesy of BMW OF NORTH AMERICA, INC.

Venting cooling system:

NOTE: Do not leave the coolant expansion tank cap open during the venting procedure.

1. Connect battery charger.
2. Switch on ignition.
3. Set heater to maximum temperature and turn fan down to lowest speed.
4. Press accelerator pedal for 10 seconds to floor. **Engine must not** be started.
5. The venting procedure is started when the accelerator pedal is pressed and takes approx. 12 minutes. (Electric coolant pump was activated and shuts down automatically after approx. 12 minutes).
6. Then top up fill level in coolant expansion tank using measuring container with 300 ml above max.
7. Check **cooling system for leaks** .
8. If venting has to be carried out again (e.g. if cooling system is leaking), allow DME to fall completely (leave ignition key removed for approx. 3 minutes), then repeat from Point 2.

Close coolant expansion tank.

Installation:

Close cap (1) until the arrow marks line up.

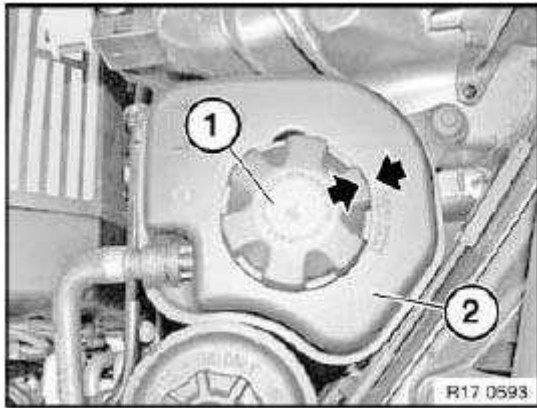


Fig. 15: Identifying Coolant Expansion Tank Cap
Courtesy of BMW OF NORTH AMERICA, INC.

17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS (N54)

WARNING: Danger of scalding!

Open sealing cap only after engine has cooled down.

IMPORTANT: Electric coolant pump!

Follow instructions for working on cooling system .

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant!

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

Only when refilling!

Use **only recommended coolant .**

Observe **mixture ratio .**

Perform filling operation slowly.

Adjust coolant level to MAX.

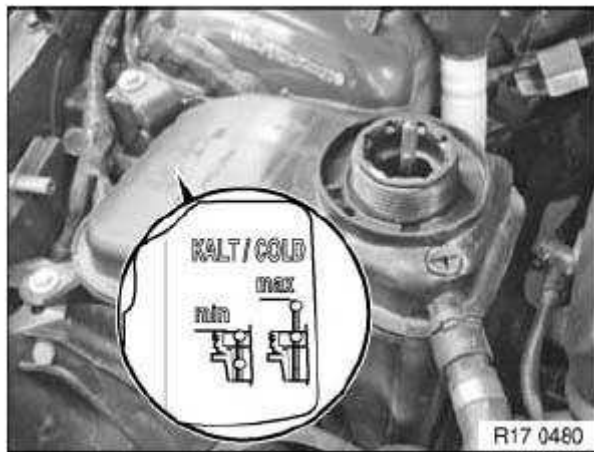


Fig. 16: Adjusting Coolant Level To MAX
 Courtesy of BMW OF NORTH AMERICA, INC.

Close coolant expansion tank.

Installation:

Close cap (1) until the arrow marks line up.

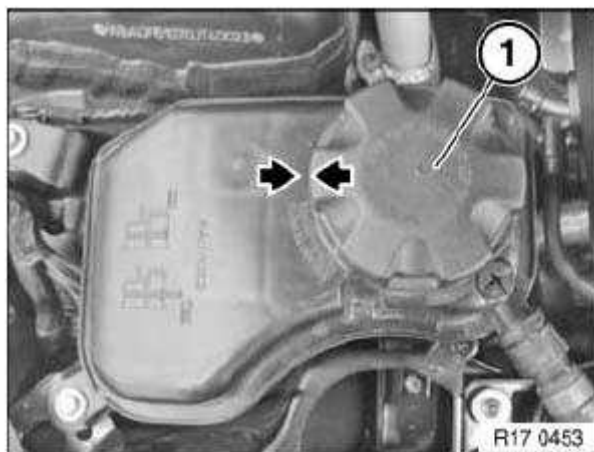


Fig. 17: Identifying Coolant Expansion Tank Cap
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The following venting procedure is necessary e.g. when a part is replaced in the cooling system or when the cooling system is refilled.

Vehicles with independent heating only:

Open vent screw (1).

Tightening torque **17 00 4AZ** , see **17 00 COOLANT**

Slowly fill coolant expansion tank with recommended **coolant** .

Close vent screw (1) after coolant emerges.

Installation:

Have a cleaning cloth ready and mop up emerging coolant.

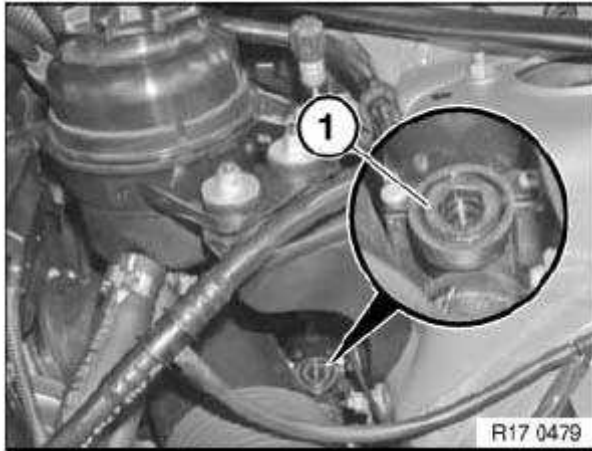


Fig. 18: Identifying Vent Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Adding coolant:

NOTE: **Open vent screw (1).**
 Fill coolant expansion tank up to lower edge of filler neck with recommended coolant .
 Observe mixture ratio .
 Close bleed screw (1).
 Close cap on expansion tank.

Installation:

Have a cleaning cloth ready and mop up emerging coolant.

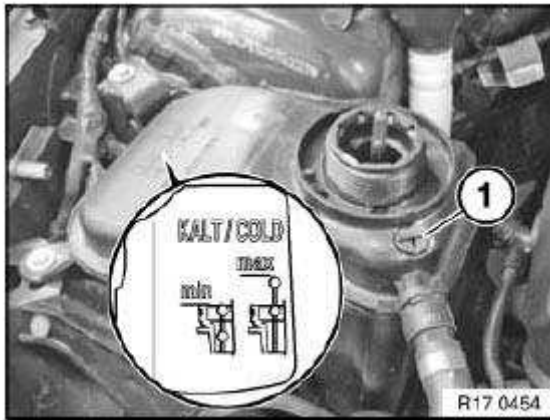


Fig. 19: Filling Coolant Expansion Tank Up To Lower Edge Of Filler Neck With Recommended
Courtesy of BMW OF NORTH AMERICA, INC.

Only when venting!

NOTE: **Do not open the coolant expansion tank cap during the venting procedure.**

1. Connect battery charger.
2. Switch on ignition.
3. Set heater to maximum temperature and turn fan down to lowest speed.
4. Press accelerator pedal for 10 seconds to floor. **Engine** must **not** be started.
5. The venting procedure is started when the accelerator pedal is pressed and takes approx. 12 minutes. (Electric coolant pump was activated and shuts down automatically after approx. 12 minutes).
6. Then top up fill level in coolant expansion tank with 100 ml above max.
7. Check **cooling system for leaks** .
8. If venting has to be carried out again (e.g. if cooling system is leaking), allow DME to fall completely (leave ignition key removed for approx. 3 minutes), then repeat from Point 3.

Only when venting!

Perform filling operation slowly.

Fill coolant expansion tank with 100 ml above max.

100 ml corresponds to A=6 mm.

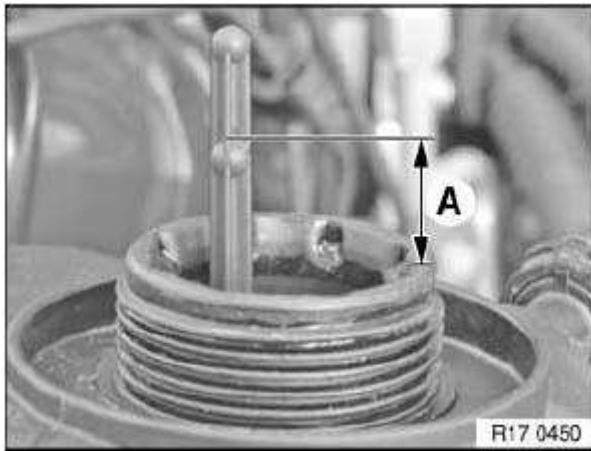


Fig. 20: Identifying Coolant Filling Level On Expansion Tank
 Courtesy of BMW OF NORTH AMERICA, INC.

Close coolant expansion tank.

Installation:

Close cap (1) until the arrow marks line up.

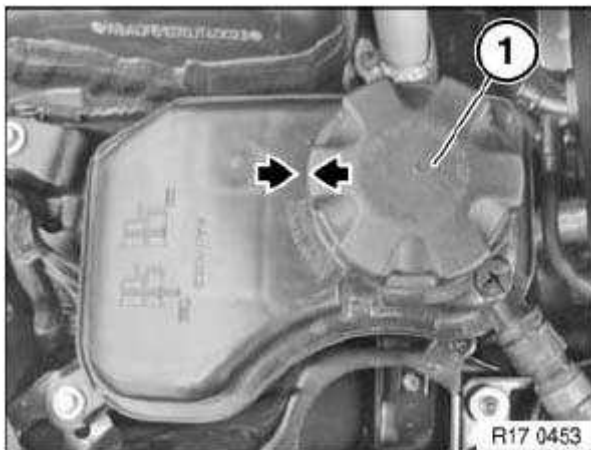


Fig. 21: Identifying Coolant Expansion Tank Cap
 Courtesy of BMW OF NORTH AMERICA, INC.

17 00 515 CHECKING FUNCTION OF RADIATOR AND HEATING SYSTEM

Special tools required:

- 13 3 010

See **FUEL SYSTEM - SPECIAL TOOLS** .

WARNING: Danger of scalding!

Only carry out work on cooling system after engine has cooled down.

Necessary preliminary tasks:

- Switch off ignition.
- Remove air duct.
- Remove **fan cowl** with electronic fan.

Check production date.

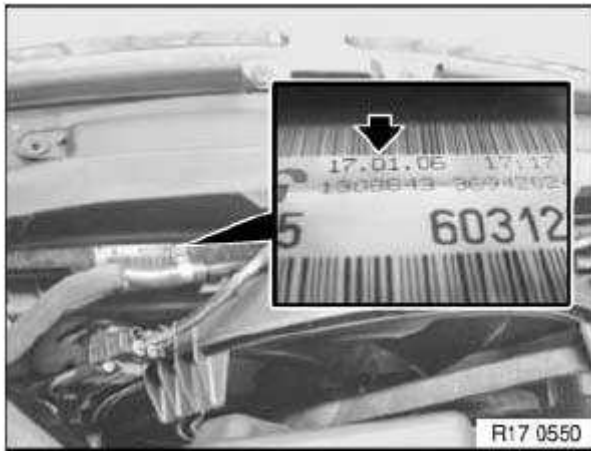


Fig. 22: Identifying Production Date

Courtesy of BMW OF NORTH AMERICA, INC.

Clamp off low-temperature feed lines with special tool **13 3 010** .

Function test:

Observe diagnosis instructions.

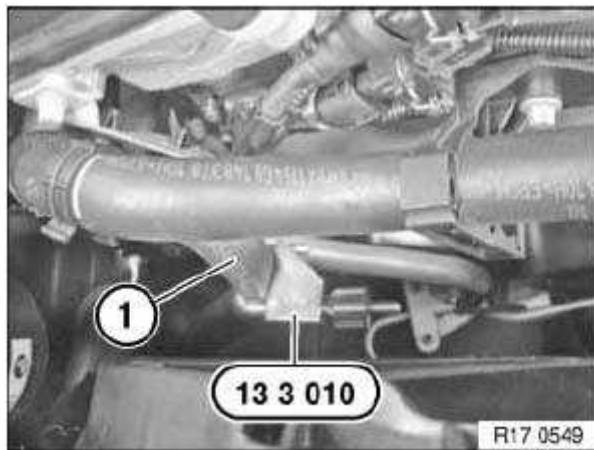


Fig. 23: Clamping Low-Temperature Feed Lines With Special Tool (13 3 010)
 Courtesy of BMW OF NORTH AMERICA, INC.

Check function of radiator.

Clamp off low-temperature feed line (1) at coolant pump outlet **or** radiator inlet with special tool **13 3 010** (see arrows).

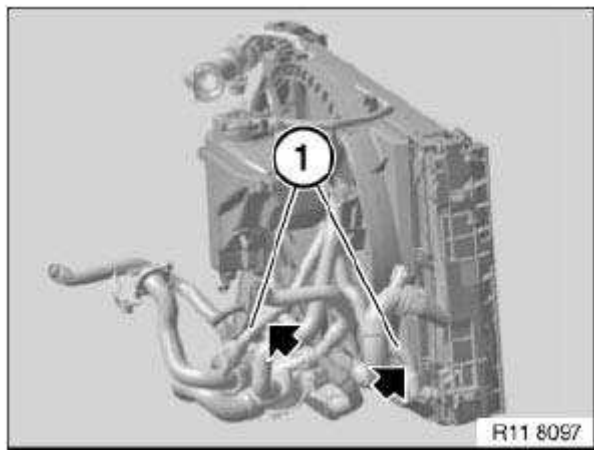


Fig. 24: Identifying Low-Temperature Feed Line
 Courtesy of BMW OF NORTH AMERICA, INC.

Automatic transmission only

Check function of heat exchanger.

Clamp off low-temperature feed line (1) at coolant pump outlet with special tool **13 3 010** (see arrow).

Clamp off low-temperature feed line (2) at oil-coolant heat exchanger with special tool **13 3 010** (see arrow).

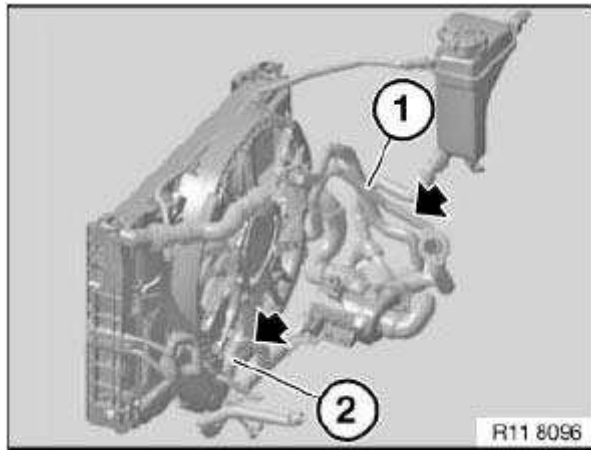


Fig. 25: Identifying Low-Temperature Feed Line
Courtesy of BMW OF NORTH AMERICA, INC.

Check heating and cooling circuits in accordance with diagnosis instruction.

RADIATOR, EXPANSION TANK, PIPES

17 00 009 CHECKING COOLING SYSTEM FOR WATER LEAKS

Special tools required:

- 00 2 030
- 17 0 101
- 17 0 113
- 17 0 114

See **MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS** .

See **COOLING SYSTEM - SPECIAL TOOLS (N54, N63)** .

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

Protective measures/rules of conduct:

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool **00 2 030** (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

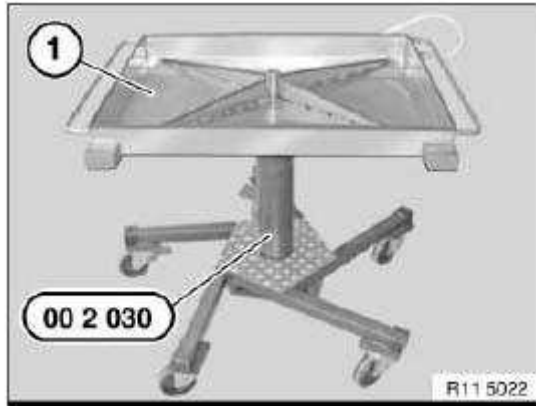


Fig. 26: Identifying Special Tool (00 2 030)
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure drop in cooling system:

Open cap on coolant expansion tank. Fit special tools **17 0 101** / **17 0 113** .

Build up gauge pressure , wait approx. 2 minutes. See **17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63** .

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

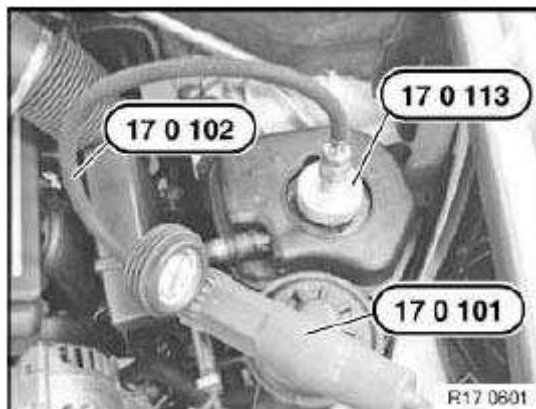


Fig. 27: Identifying Special Tool (17 0 102, 17 0 113 And 17 0 101)
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure relief valve in cap:

NOTE: While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with dissolved coolant to escape. This coolant vapour condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure.

Checking pressure relief valve in cap:

Screw cap (1) onto special tool 17 0 114 .

Build up pressure with special tool (hand pump) 17 0 101 ; observe pressure gauge to ascertain when opening pressure is achieved.

Compare **opening pressure of pressure relief valve** . See 17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63 .

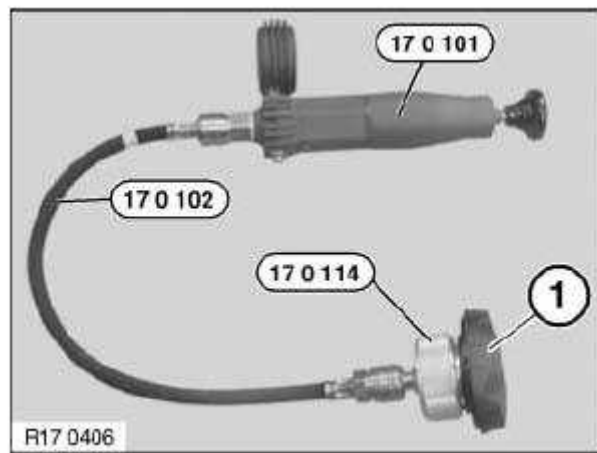


Fig. 28: Checking Pressure Relief Valve In Cap
Courtesy of BMW OF NORTH AMERICA, INC.

ENGINE RADIATOR WITH ATTACHMENT

17 11 000 REMOVING AND INSTALLING RADIATOR (N52K, N54)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

Necessary preliminary tasks:

- Follow instructions for working on cooling system.
- Remove fan cowl .
- Drain **coolant** .
- Unlock coolant hoses and detach.

Release screws.

Remove cover (1).

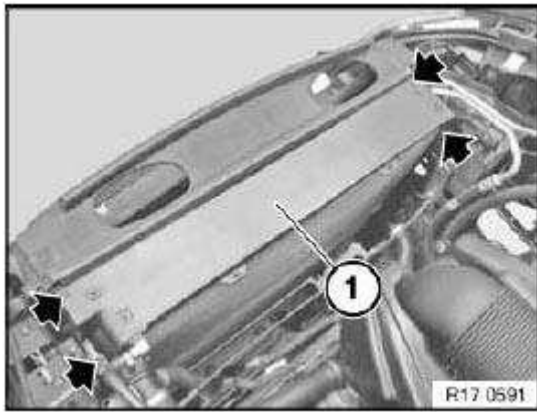


Fig. 29: Identifying Cover Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Remove radiator (1) towards top.

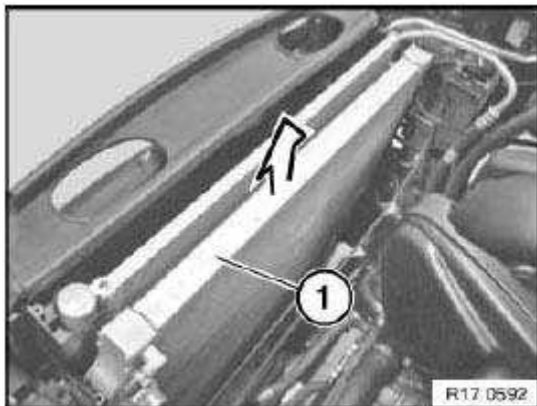


Fig. 30: Removing Radiator Towards Top

Courtesy of BMW OF NORTH AMERICA, INC.

17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N54)

Necessary preliminary tasks:

- Read out fault memory of DME control unit
- Switch off ignition
- Remove **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .

Lever expander rivets (1) out of transverse reinforcement.

Press lock and raise intake duct (2).

Detach intake duct (2) from air filter housing and remove.

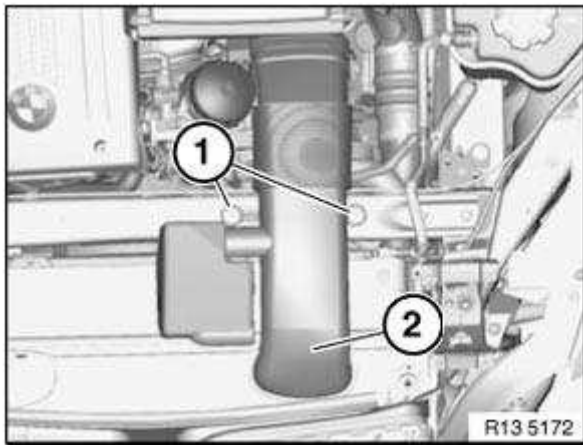


Fig. 31: Identifying Intake Duct

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip Bowden cable for engine bonnet/hood actuator from transverse reinforcement (1).

Detach A/C line from holder.

Release screws on left and right sides. Tightening torque **51 71 4AZ** , see **51 71 SEALS AND LOOSE BODY PARTS**

Remove cross-brace (1).

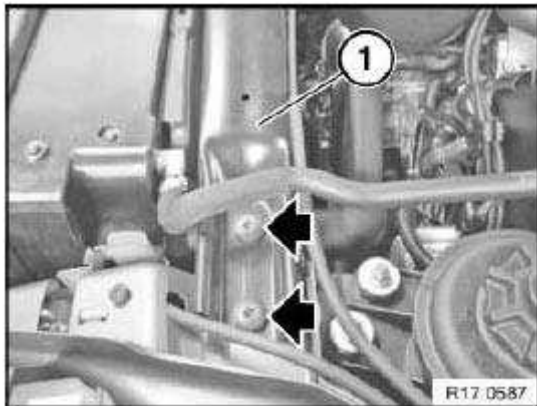


Fig. 32: Identifying Transverse Reinforcement
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

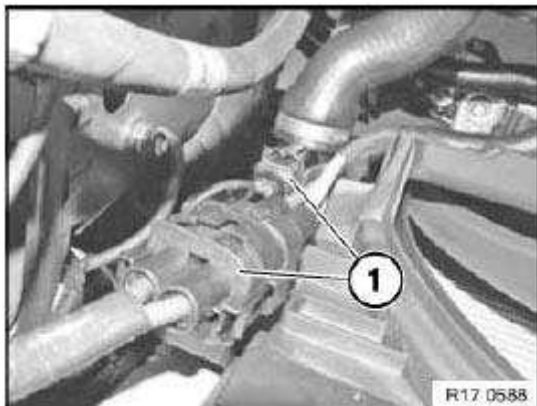


Fig. 33: Identifying Plug
 Courtesy of BMW OF NORTH AMERICA, INC.

Press hose (1) out of holder (2).

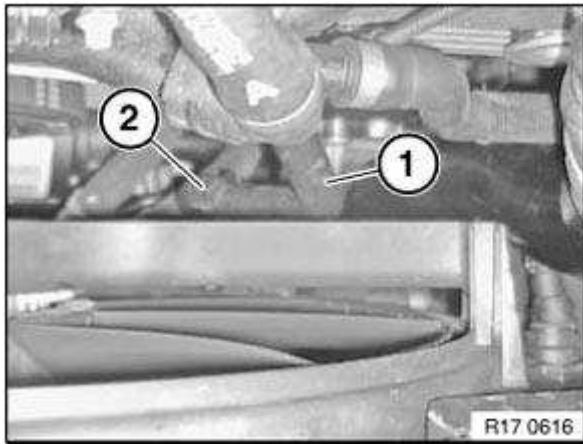


Fig. 34: Pressing Hose Out Of Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Pull pressure pipe (1) out of holder (2).

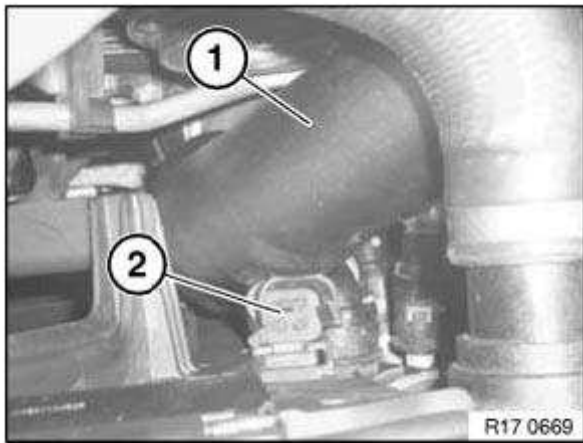


Fig. 35: Pulling Pressure Pipe Out Of Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock (1).

Raise fan cowl (2) until holder (3) can be brought into assembly position.

NOTE: For reasons of clarity, illustration and text show coolant hose removed.
Do not raise fan cowl by fan impeller.

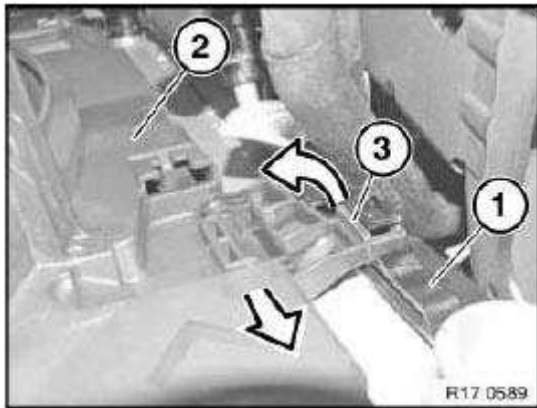


Fig. 36: Raising Fan Cowl Until Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

Press lock (1).

Feed out fan cowl (2) towards top and remove.

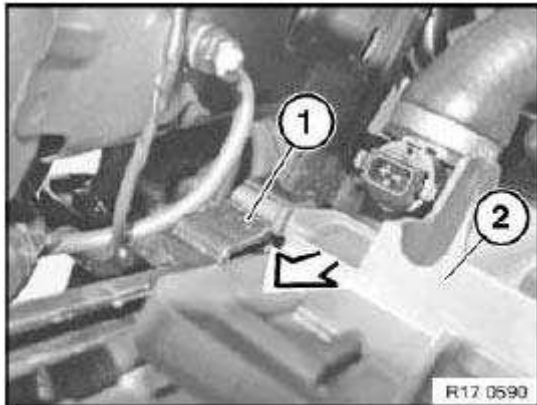


Fig. 37: Removing Fan Cowl
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert retaining tab (1) at bottom on module carrier.

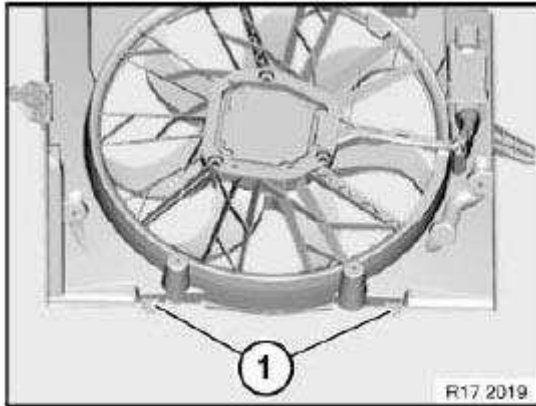


Fig. 38: Identifying Retaining Tab

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Check stored fault messages.
 Add final details to vehicle.
 Now clear the fault memory.

17 11 040 REMOVING AND INSTALLING/REPLACING THERMOSTAT CARTRIDGE (N62TU/N52K/N54/M57T2)

IMPORTANT: Danger of scalding!
Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow instructions for **working on cooling system**
- Draining **coolant**
- Remove **fan cowl**

Unlock and detach coolant hose (1).

Release nuts and remove thermostat cartridge (2).

Installation:

- Clean contact faces.
- Check seals and replace if necessary.

Add final details to vehicle.

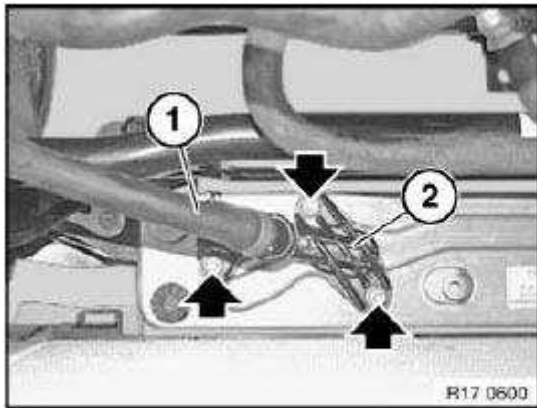


Fig. 39: Identifying Coolant Hose And Thermostat Cartridge
Courtesy of BMW OF NORTH AMERICA, INC.

17 11 056 REMOVING AND INSTALLING BOTH MODULE CARRIERS (N54)

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Remove fan cowl .
- Remove intercooler
- Remove steering cooling coil

Unclip module carrier holders (1) on left and right.

(Picture shows right module carrier holder)

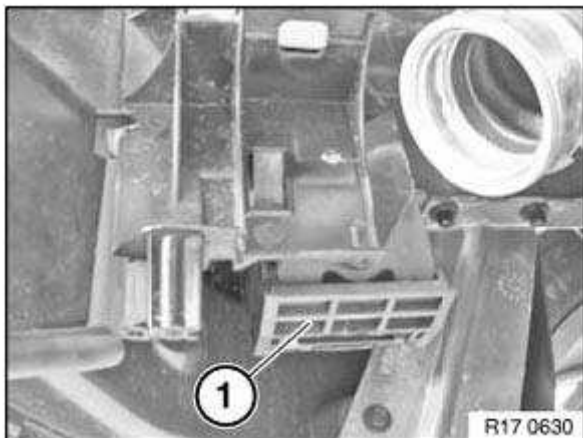


Fig. 40: Identifying Module Carrier Holders
Courtesy of BMW OF NORTH AMERICA, INC.

Remove left and right module carriers (1).

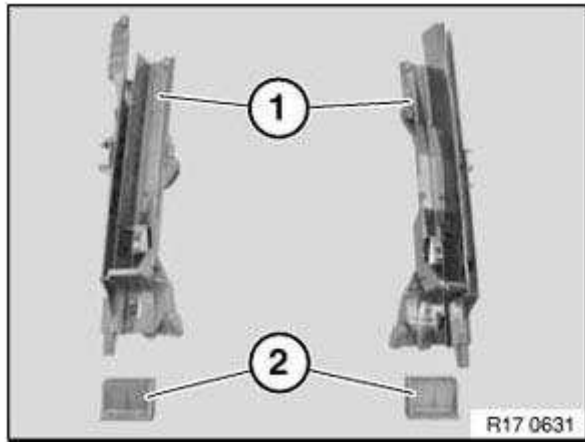


Fig. 41: Identifying Left And Right Module Carriers
Courtesy of BMW OF NORTH AMERICA, INC.

17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N62TU/N52K/N54)

IMPORTANT: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working** on cooling system.
- Drain **coolant** from radiator down to lower edge on expansion tank.

Unlock and detach coolant hose (1).

Release screws.

Raise coolant expansion tank (2) until plug for coolant level switch and lower coolant hose are accessible.

Installation:

- Make sure expansion tank is in correct installation position.
- Tightening torque **17 10 2AZ** , see **17 10 RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)** . Applies to N54 engine.

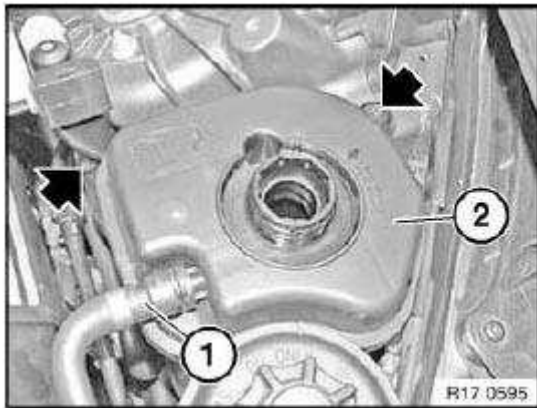


Fig. 42: Identifying Coolant Hose And Coolant Expansion Tank
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Unlock and detach lower coolant hose (2).

Remove expansion tank (3).

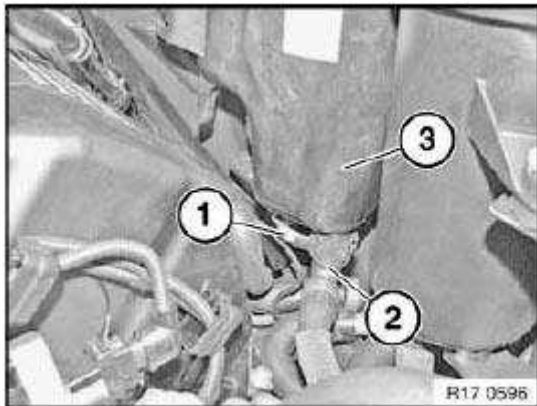


Fig. 43: Identifying Lower Coolant Hose And Expansion Tank With Plug
 Courtesy of BMW OF NORTH AMERICA, INC.

17 11 150 REMOVING AND INSTALLING/REPLACING BRACKET FOR ENGINE OIL COOLER

Necessary preliminary tasks:

- Remove supplementary oil cooler

Release screws.

Remove cooler bracket.

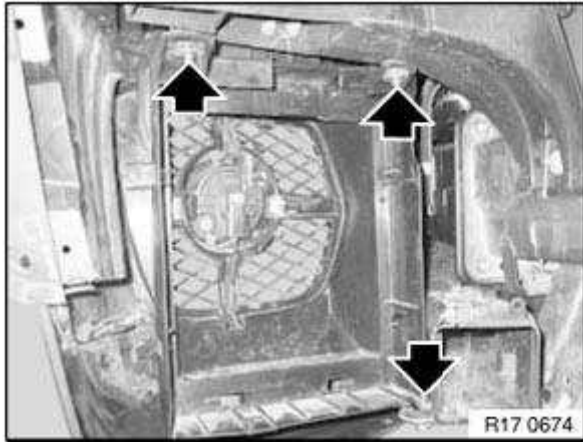


Fig. 44: Identifying Cooler Bracket With Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Add final details to vehicle.

17 11 150 REMOVING AND INSTALLING/REPLACING BRACKET FOR SUPPLEMENTARY RADIATOR

Necessary preliminary tasks:

- Remove supplementary radiator .

Release screws.

Bracket remove.

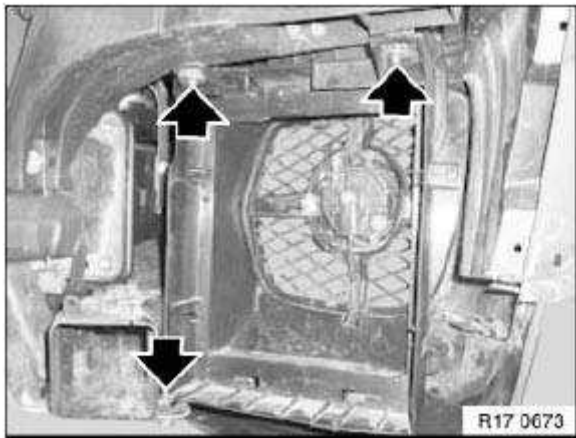


Fig. 45: Identifying Bracket Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Add final details to vehicle.

17 11 150 REMOVING AND INSTALLING/REPLACING ENGINE OIL COOLER (N62TU, N54)

Necessary preliminary tasks:

- Remove **left wheel arch cover front section** . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

Recycling:

Engine oil escapes when oil lines are released. Catch and dispose of emerging engine oil.

Observe country-specific waste-disposal regulations.

Release screw.

Installation:

- Replace sealing rings.
- N54 tightening torque **17 21 4AZ** , see **17 21 ENGINE OIL COOLER**

Detach oil line (1) from engine oil cooler flange.

Catch and dispose of emerging fluid.

Unlock and disconnect holder (2).

Remove engine oil cooler (3).

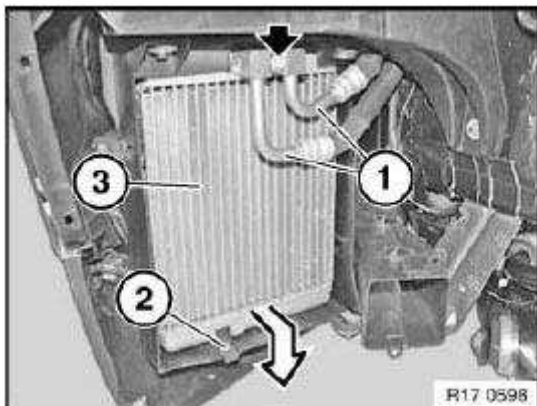


Fig. 46: Removing Engine Oil Cooler
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check engine oil level and top up if necessary.

17 11 150 REMOVING AND INSTALLING/REPLACING SUPPLEMENTARY COOLANT COOLER (N54)

Necessary preliminary tasks:

- Remove **right wheel arch cover front section** . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

Recycling:

Coolant emerges when coolant lines are detached. Catch and dispose of escaping coolant in a suitable container.

Observe country-specific waste-disposal regulations.

Detach coolant lines (1).

Catch and dispose of escaping coolant.

Unlock and disconnect holder (2).

Remove radiator (3).

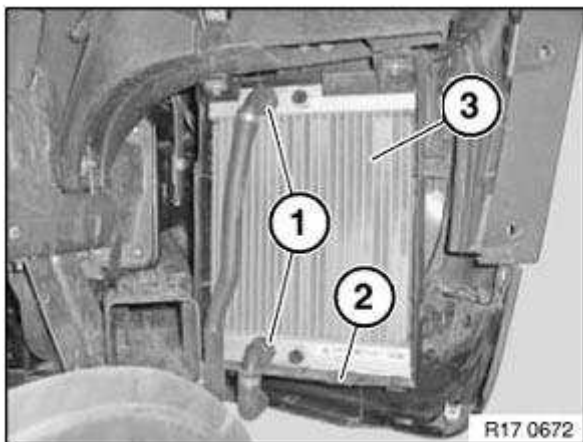


Fig. 47: Identifying Coolant Lines And Radiator
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completion of work, check coolant level.
If necessary, add coolant .
Add final details to vehicle.

17 11 150 REMOVING AND INSTALLING/REPLACING SUPPLEMENTARY OIL COOLER

Necessary preliminary tasks:

- Remove **left wheel arch cover front section** . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

Recycling:

Engine oil escapes when oil lines are released. Catch and dispose of escaping engine oil in a suitable container.

Observe country-specific waste-disposal regulations.

Release screw.

Installation:

Tightening torque 17 21 2AZ , see **17 21 ENGINE OIL COOLER**

Detach oil line (1) from engine oil cooler flange.

Catch and dispose of emerging fluid.

Unlock and disconnect holder (2).

Remove engine oil cooler (3).

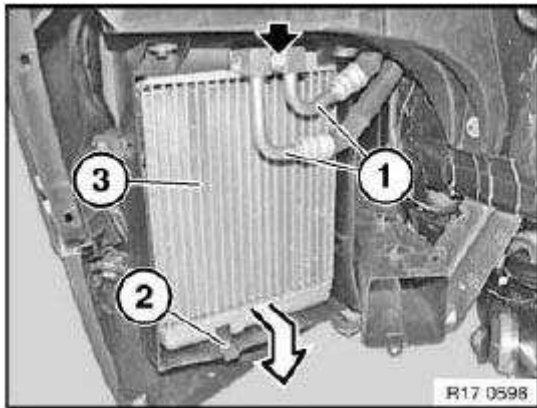


Fig. 48: Removing Engine Oil Cooler
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check engine oil level and top up if necessary.

17 11 370 REMOVING AND INSTALLING/REPLACING POWER STEERING COOLING COIL (N62TU/N52K/N54/M57T2)

Special tools required:

- 17 0 030

See COOLING SYSTEM - SPECIAL TOOLS (N54, N63) .

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

Necessary preliminary tasks:

- Remove **radiator air duct** . See 51 71 099 REMOVING AND INSTALLING/REPLACING RADIATOR AIR GUIDE .
- Remove **fan cowl**
- After completing this operation, check **fluid level in tank of power steering system** . See 32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE) .

Press lines (1) in direction of cooling coil (2). Pull locking ring towards rear and keep pressed.

Detach lines (1) from cooling coil (2).

If necessary, use special tool **17 0 030** .

IMPORTANT: Catch and dispose of emerging fluid.

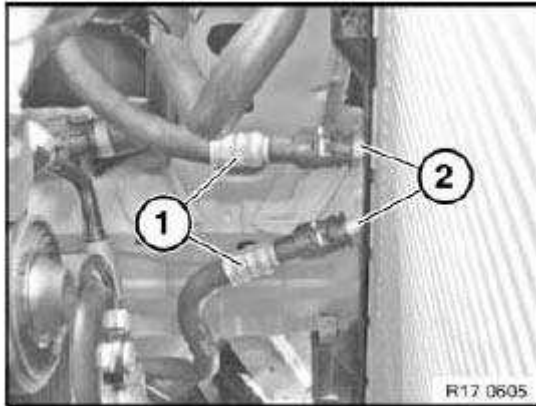


Fig. 49: Detaching Lines From Cooling Coil
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws and detach side holder (1).

Tightening torque **17 10 1AZ** , see **17 10 RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)** . Applies to N54 engine.

Feed out cooling coil (2) towards front and remove.

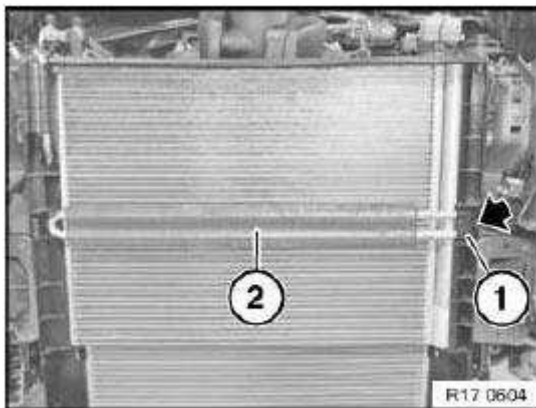


Fig. 50: Identifying Cooling Coil And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

OIL COOLER

17 11 150 REMOVING AND INSTALLING/REPLACING BRACKET FOR ENGINE OIL COOLER

See 17 11 150 Removing and installing/replacing bracket for engine oil cooler.

17 21 500 FLUSHING TRANSMISSION OIL COOLER WITH LINES (AUTOMATIC TRANSMISSION)

Special tools required:

- 17 2 018
- 17 2 019

See COOLING SYSTEM - SPECIAL TOOLS (N54, N63) .

NOTE: Carry out the work steps listed when:
Installing a new or replacement transmission.
Flushing can only be carried out with the automatic transmission removed.

Procedure:

Automatic transmission removed.

Connect appropriate adapters to oil lines exiting from automatic transmission.

Connect connecting line **17 2 019** from the oil collection unit with the quick-release coupling.

Connect drain line **17 2 018** using quick-release coupling.

Hold and direct open end of drain line into a suitable drip tray.

Using oil collection unit, flush approx. 1 litre of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

Flush oil lines/transmission oil cooler in opposite direction with approx. 1 litre of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**).

Disconnect quick-release couplings.

Remove adapter.

NOTE: Dispose of flushing oil correctly.
Do not reuse under any circumstances.

Arrangement, flushing apparatus for transmissions A5S 310Z, A5S 560Z, A5S 360R/390R, A4S 200R, A5S 325Z

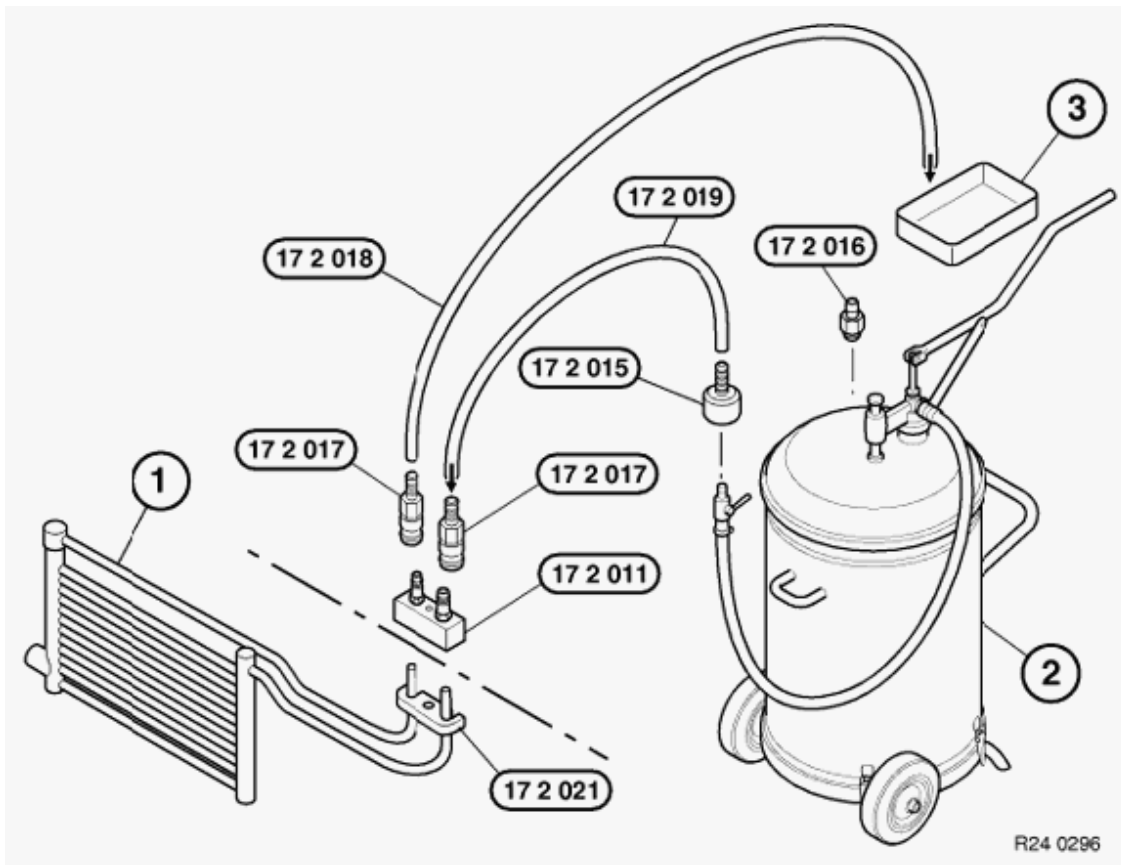


Fig. 51: Arrangement, Flushing Apparatus For Transmissions A5S 310Z, A5S 560Z, A5S 360R/390R, A4S 200R, A5S 325Z

Courtesy of BMW OF NORTH AMERICA, INC.

1. Transmission oil cooler with lines
2. Oil collection unit
3. Oil drip tray

17 2 011 Adapter for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 2 017 Quick-release coupling (2 pieces)

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

17 2 021 Mounting plate for adapter 17 2 011 for transmissions A5S 325Z, GA6HP26Z

Arrangement of flushing apparatus for transmission A4S 310R

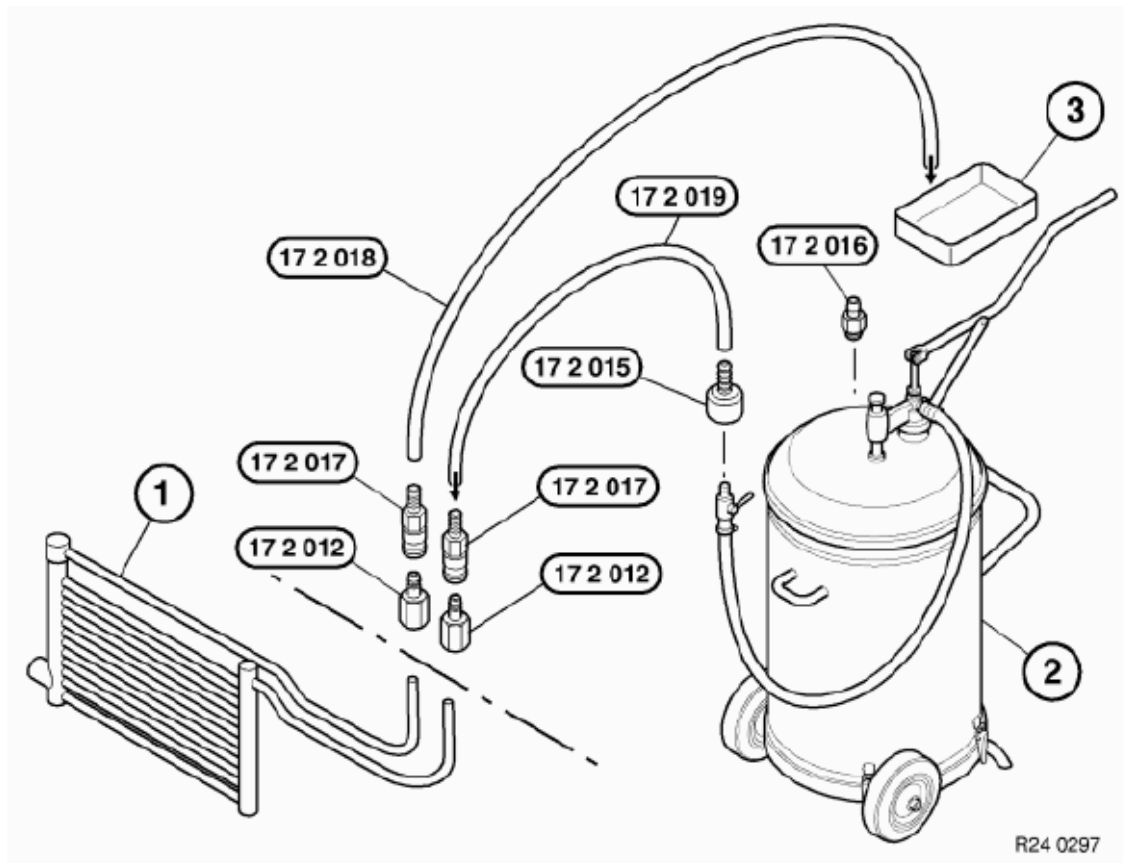


Fig. 52: Arrangement Of Flushing Apparatus For Transmission A4S 310R
Courtesy of BMW OF NORTH AMERICA, INC.

1. Transmission oil cooler with lines
2. Oil collection unit
3. Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 2 017 Quick-release coupling (2 pieces)

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

Arrangement of flushing apparatus for transmission A4S 300J

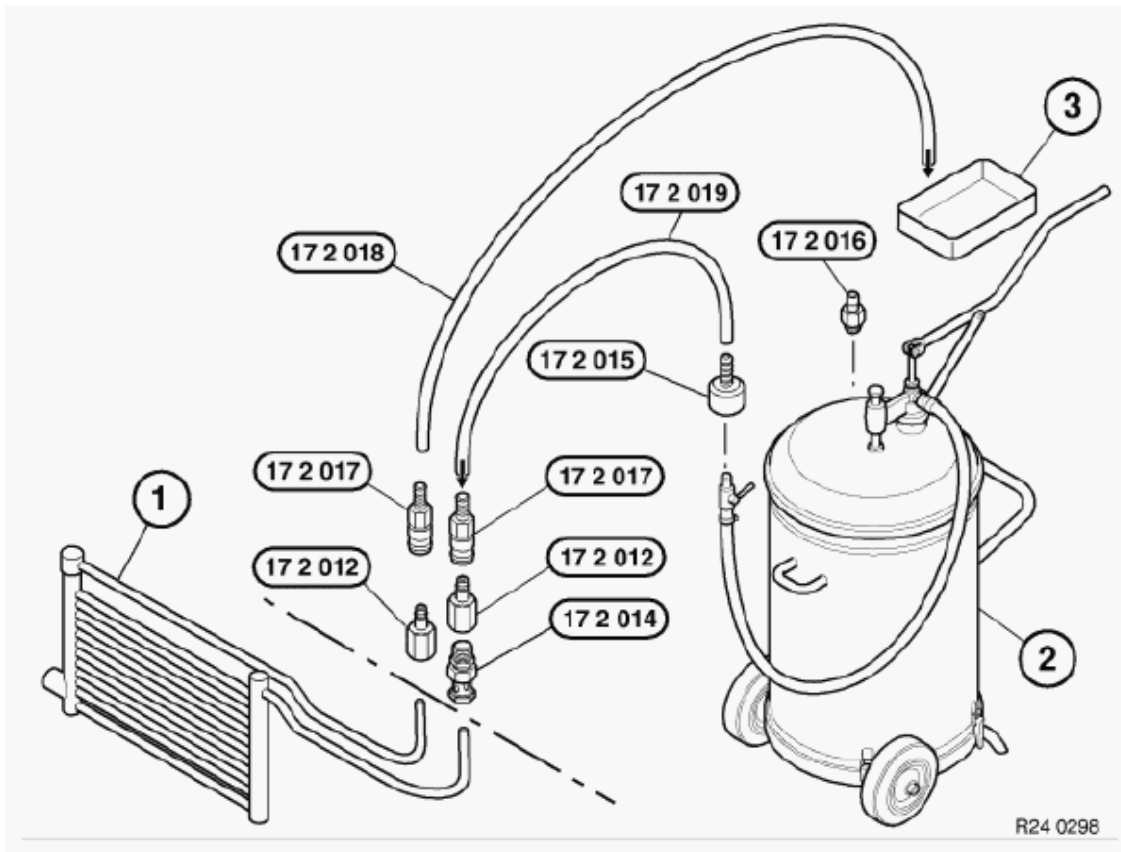


Fig. 53: Arrangement Of Flushing Apparatus For Transmission A4S 300J
Courtesy of BMW OF NORTH AMERICA, INC.

1. Transmission oil cooler with lines
2. Oil collection unit
3. Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 014 Banjo bolt for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 2 017 Quick-release coupling (2 pieces)

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

Arrangement of flushing apparatus for transmission A5S 440Z

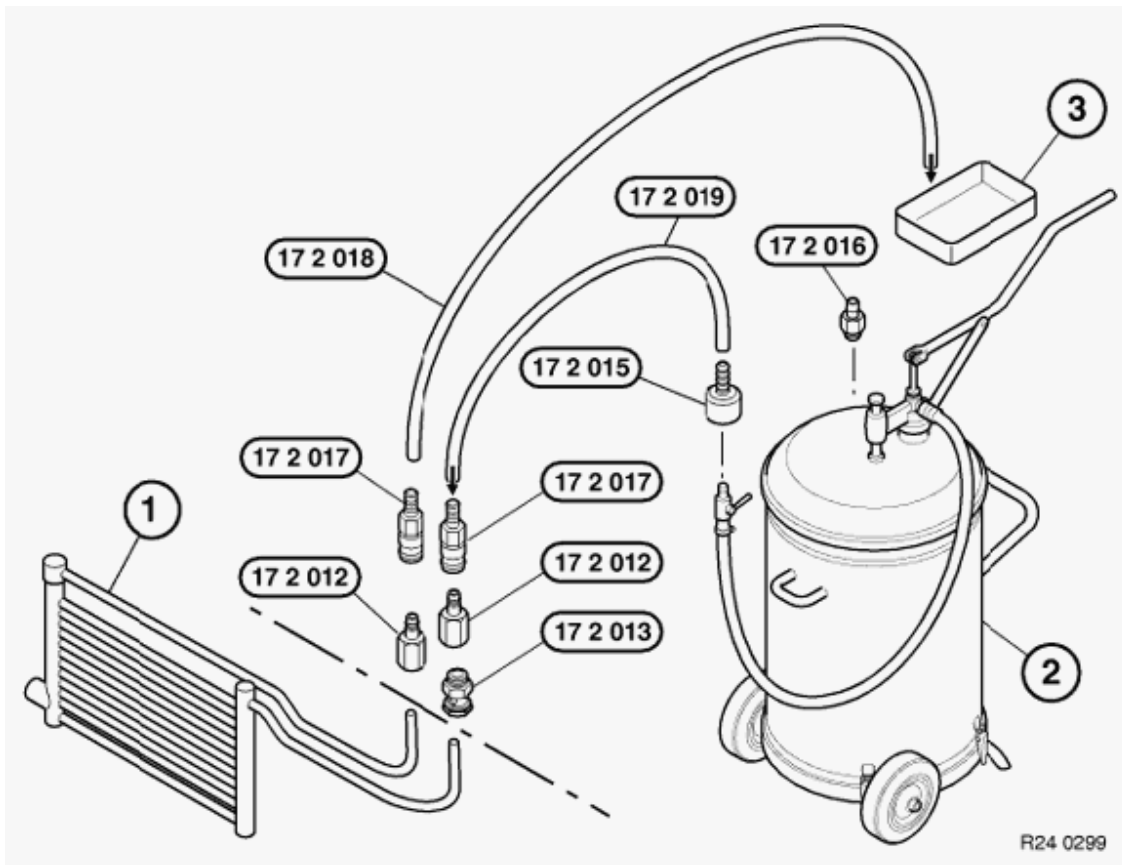


Fig. 54: Arrangement Of Flushing Apparatus For Transmission A5S 440Z
Courtesy of BMW OF NORTH AMERICA, INC.

1. Transmission oil cooler with lines
2. Oil collection unit
3. Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 013 Banjo bolt for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecalemit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 2 017 Quick-release coupling (2 pieces)

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

17 21 500 FLUSHING TRANSMISSION OIL COOLER WITH LINES (AUTOMATIC TRANSMISSION) (GA6HP19Z, GA6HP26Z, GA6HP32Z)

Special tools required:

- 17 2 018
- 17 2 019

See COOLING SYSTEM - SPECIAL TOOLS (N54, N63) .

NOTE: **Carry out the work steps listed when:
Installing a new or replacement transmission.**

Procedure:

Automatic transmission removed.

Connect appropriate adapters to oil lines exiting from automatic transmission.

Connect connecting line 17 2 019 from the oil collection unit with the quick-release coupling.

Connect drain line 17 2 018 using quick-release coupling.

Hold and direct open end of drain line into a suitable drip tray.

Using oil collection unit, flush approx. 1 litre of transmission fluid (refer to AUTOMATIC TRANSMISSION - OPERATING FLUIDS) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

Flush oil lines/transmission oil cooler in opposite direction with approx. 1 litre of transmission fluid (refer to AUTOMATIC TRANSMISSION - OPERATING FLUIDS).

Disconnect quick-release couplings.

Remove adapter.

NOTE: **Dispose of flushing oil correctly.
Do not reuse under any circumstances.**

Press hydraulic lines (1) into adapters (2).

Slide clamping bar (3) into guides and secure with screw (4).

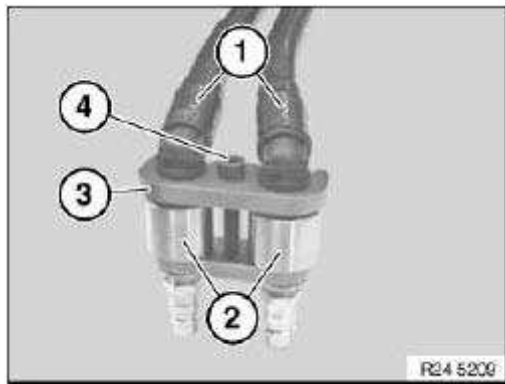


Fig. 55: Pressing Hydraulic Lines Into Adapters
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of flushing apparatus for transmissions GA6HP19Z, GA6HP26Z, GA6HP32Z

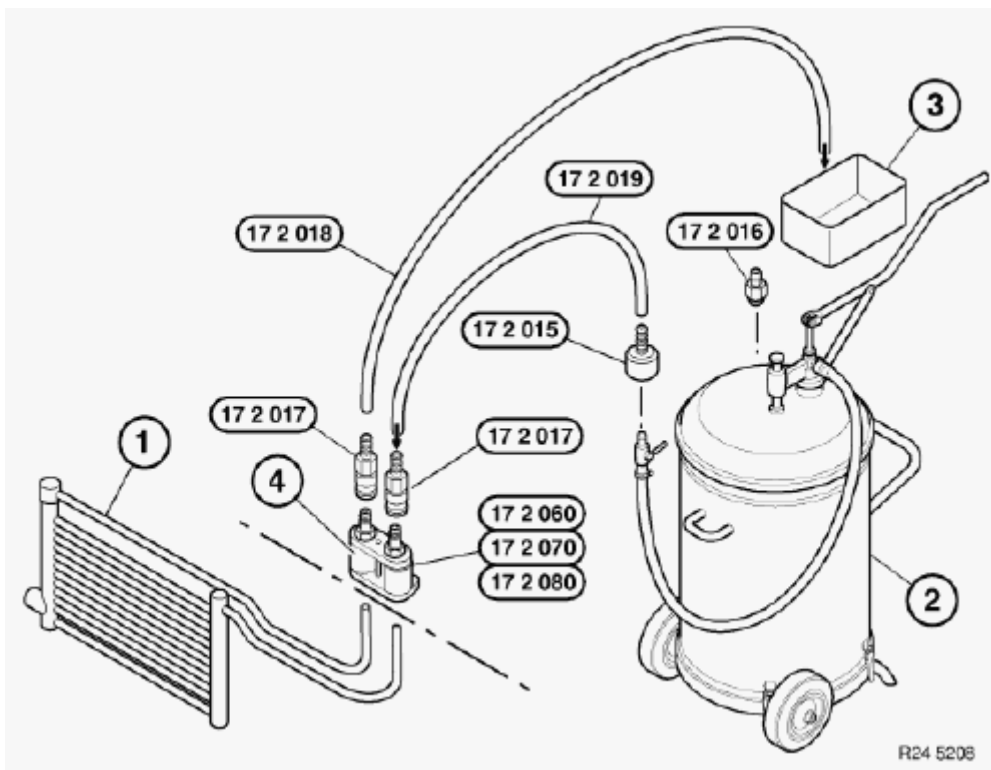


Fig. 56: Arrangement Of Flushing Apparatus For Transmissions GA6HP19Z, GA6HP26Z, GA6HP32Z
Courtesy of BMW OF NORTH AMERICA, INC.

1. Transmission-oil cooler with lines
2. Oil collection unit

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecalemit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 2 017 Quick-release coupling (2 pieces)

17 2 019 Hose to oil collection unit (2)

3. Oil drip tray

17 2 018 Hose to oil drip tray (3)

4. Adapter with clamping bar

17 2 060 Adapter with clamping bar for aluminium lines and steel lines with aluminium connection (line diameter 12 mm) GA6HP19Z

17 2 070 Adapter with clamping bar (line diameter 15 mm) GA6HP26Z, GA6HP32Z, TCT for N54 engine

17 2 080 Adapter with clamping bar for fuel lines GA6HP26Z

OIL COOLER LINES

17 22 010 REMOVING AND INSTALLING/REPLACING HEAT EXCHANGER FOR AUTOMATIC TRANSMISSION (M57T2, N54)

IMPORTANT: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working** on cooling system.
- **Drain coolant**
- **Remove fan cowl**

Recycling

Catch and dispose of drained coolant in a suitable container.

Transmission fluid emerges when oil lines are detached from heat exchanger.

Catch and dispose of escaping transmission fluid in a suitable container.

Observe country-specific waste-disposal regulations.

Picture shows M57T2:

Release and disconnect coolant hoses (1).

Release screw and remove lines (2).

Installation:

- Replace sealing rings.
- Tightening torque **17 22 1AZ** , see **17 22 TRANSMISSION OIL COOLER LINES**

Unclip hose (3).

Release screws (4) and remove heat exchanger (5).

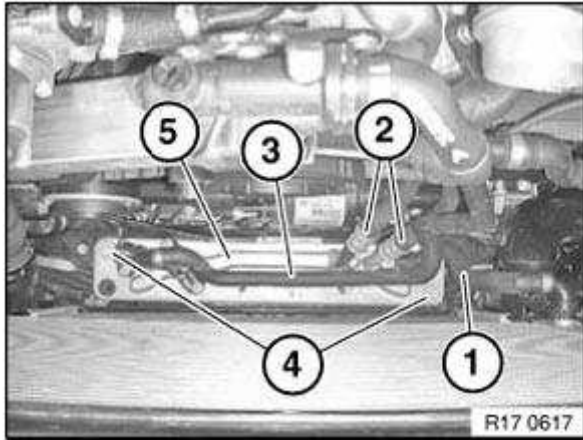


Fig. 57: Identifying Coolant Hoses And Heat Exchanger With Hose
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

- Tightening torque **17 22 2AZ** , see **17 22 TRANSMISSION OIL COOLER LINES**

IMPORTANT: Distance between oil cooler line and ribbed V-belt must be at least 25 mm.
Check fluid level in automatic transmission .
Refer to **MAINTENANCE AND GENERAL INFORMATION - REPAIR INSTRUCTIONS** .

CHARGE AIR COOLER WITH MOUNT

17 51 000 REMOVING AND INSTALLING/REPLACING INTERCOOLER (N54)

Remove underbody protection . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .

If active front steering is fitted: Remove **fan cowl**

IMPORTANT: Coat sealing rings of quick-connect couplings with antiseize agent.
Pressure pipes cannot be fitted without antiseize agent.

Unclip coolant line (1) from holders.

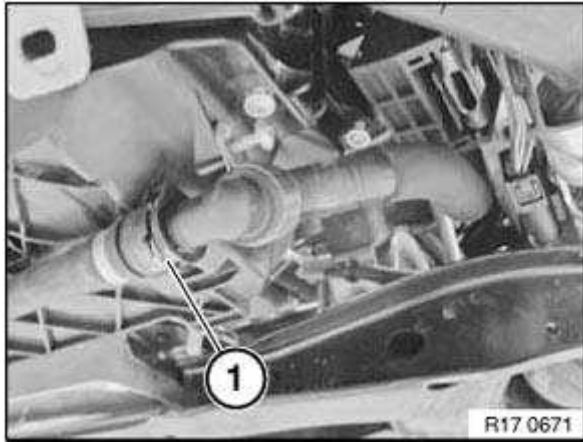


Fig. 58: Identifying Coolant Hose

Courtesy of BMW OF NORTH AMERICA, INC.

Remove intercooler cover.

(Picture shows right bolts)

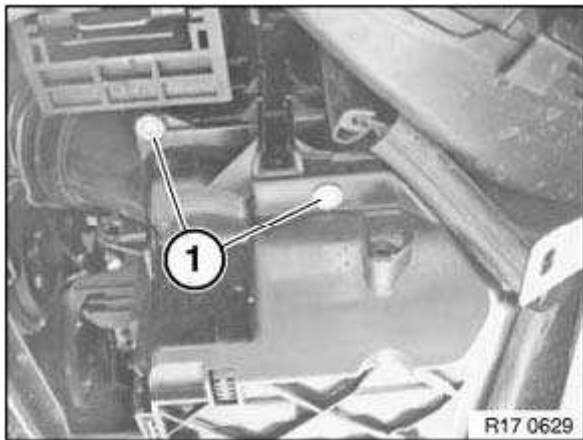


Fig. 59: Identifying Intercooler Cover Bolts

Courtesy of BMW OF NORTH AMERICA, INC.

Unlock quick-connect couplings (1) and detach charge-air hoses.

Remove intercooler.

Installation:

Charge-air hoses must audibly snap into place.

Coat sealing rings of charge-air hoses with antiseize agent.

Pressure pipes cannot be fitted without antiseize agent.

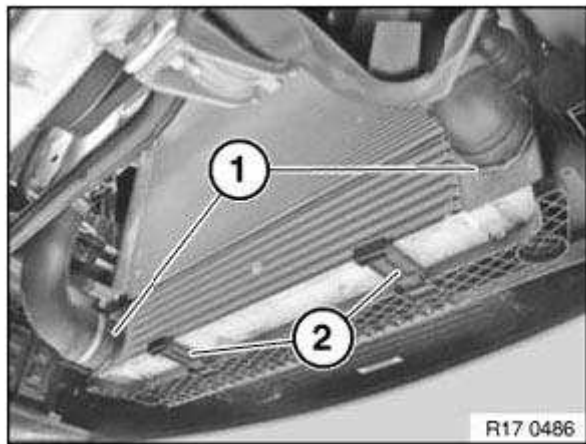


Fig. 60: Unlocking Quick-Connect Couplings
Courtesy of BMW OF NORTH AMERICA, INC.

ENGINE

Cooling System - Repair Instructions - X6

COOLANT CHECKING

17 ... VENTING COOLING SYSTEM FOR INTERCOOLER (N63)

Special tools required:

- 00 2 030

See MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS .

WARNING: Danger of scalding!

Open sealing cap only after engine has cooled down.

IMPORTANT: Cooling system for intercooler has a separate cooling circuit.

Coolant is added at intercooler expansion tank.

Electric coolant pump!

Follow instructions for working on cooling system .

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant!

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

IMPORTANT: Risk of slipping due to coolant on the floor.

Danger of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool 00 2 030 (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

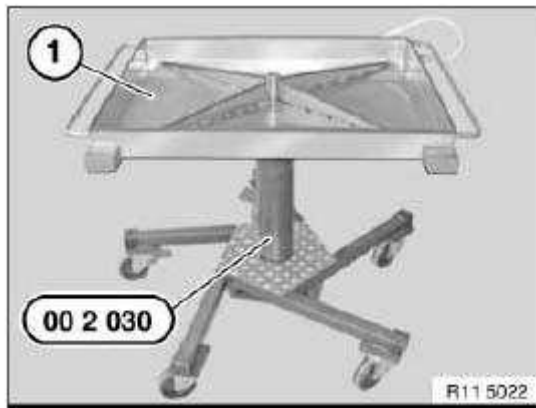


Fig. 1: Identifying Drip Tray
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The following venting procedure is necessary when a part is replaced in the cooling system or when the cooling system is refilled.

Add coolant

Coolant is added at intercooler expansion tank.

Use only approved **coolant** .

Observe **mixture ratio** .

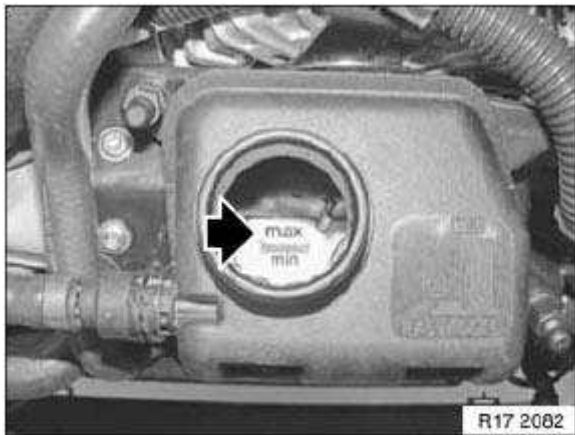


Fig. 2: Identifying Intercooler Expansion Tank
 Courtesy of BMW OF NORTH AMERICA, INC.

Venting cooling system

NOTE: Do not leave the coolant expansion tank cap open during the venting procedure.

1. Add coolant up to top edge of expansion tank. Coolant must not drop any further! No drop in coolant for approx. 1 minute.
2. Connect battery charger.
3. Switch on ignition.
4. Set heater to maximum temperature. Press "Automatic" button. Then reduce fan to lowest setting.
5. Press accelerator pedal for 15 seconds to floor. **Engine** must **not** be started.
6. The venting procedure is started when the accelerator pedal is pressed and takes approx. 12 minutes.
7. Refill expansion tank up to top edge immediately after drawing off until empty.
8. Adjust expansion tank to maximum level at end of venting process.
9. Check cooling system for leaks.
10. Close expansion tank.
11. If the venting procedure has to be carried out again, allow DME to drop completely (ignition key removed for approx. 3 minutes), then repeat from Point 5.

17 00 ... INSTRUCTIONS FOR WORKING ON COOLING SYSTEM

WARNING: Danger of scalding! Work on the cooling system should only be carried out when the engine has cooled down.

IMPORTANT: Wear protective gloves and goggles.

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

IMPORTANT: Open cooling system only when it has cooled down.

Opening the cooling system while hot can result in air entering the system. This can cause overheating with permanent damage to the engine.

IMPORTANT: When working on the oil, coolant or fuel circuit, protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

IMPORTANT: Do not fill coolant expansion tank over MAX level as overfilling will cause the coolant to overflow. This may give rise to traces of residual coolant on the

expansion tank or in the engine compartment and wrongly suggest possible leakages.

Recycling

Catch and dispose of drained coolant.

Observe country-specific waste-disposal regulations.

NOTE: Tightening torque, hose clamps 17 00 1AZ, see 17 00 COOLANT

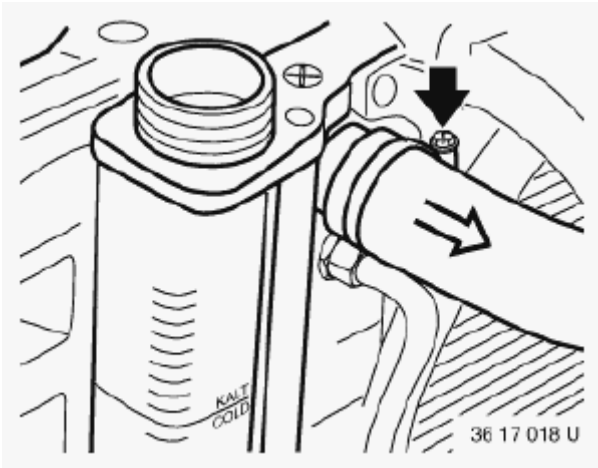


Fig. 3: Tightening Hose Clamps

Courtesy of BMW OF NORTH AMERICA, INC.

Instructions for disassembly/assembly of coolant hose fast-release couplings

Disassembly of fast-release coupling

Withdraw lock (1/2), disconnect hose.

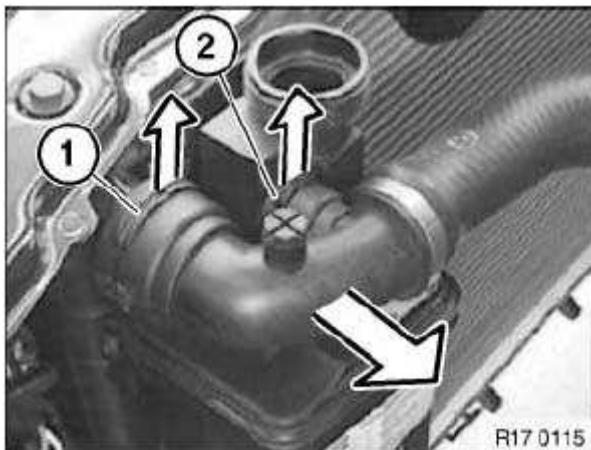


Fig. 4: Disconnecting Hose

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Check O-rings (1).

Do not coat O-rings (1) with antiseize agent.

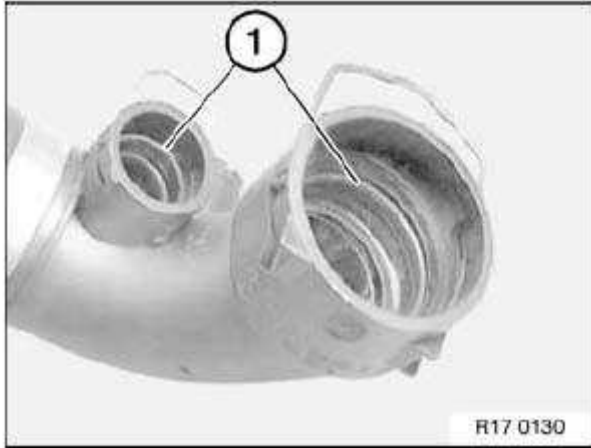


Fig. 5: Identifying O-rings Location

Courtesy of BMW OF NORTH AMERICA, INC.

Assembly of fast-release coupling

Press in lock (1) before installing fast-release coupling.

Push on hose.

Fast-release coupling must clearly snap audibly into place.

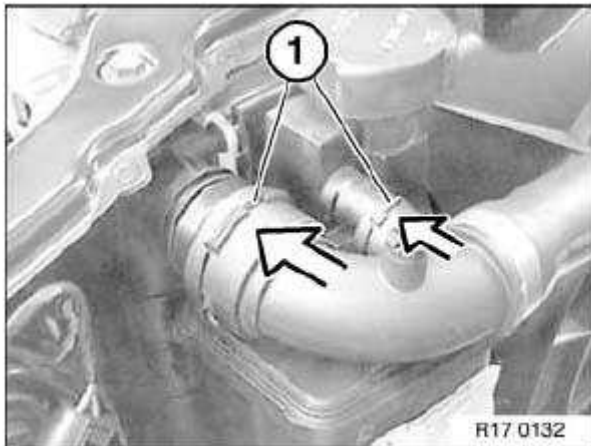


Fig. 6: Installing Fast-Release Coupling
Courtesy of BMW OF NORTH AMERICA, INC.

17 00 008 DRAINING AND ADDING COOLANT IN RADIATOR (N62TU, N63)

Special tools required:

- **00 2 030**

See **MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS** .

WARNING: Danger of scalding!

These tasks on the cooling system should only be carried out on an engine that has cooled down!

IMPORTANT: Lifetime coolant filling:

Never reuse used coolant!

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

Installation:

Use **only recommended coolant** .

Observe **mixture ratio** .

Protective measures/rules of conduct

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

**IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!**

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool 00 2 030 (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

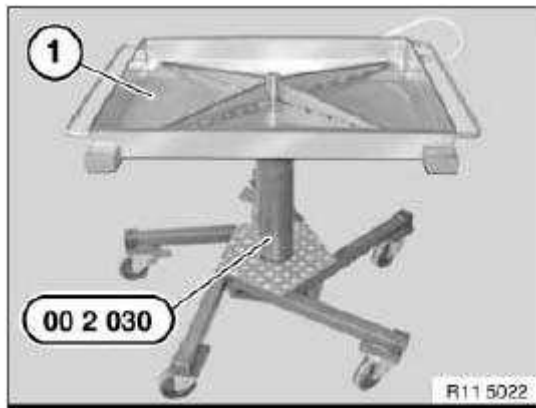


Fig. 7: Identifying Drip Tray
 Courtesy of BMW OF NORTH AMERICA, INC.

Necessary preliminary tasks:

- Follow instructions for **working on cooling system**
- Remove **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .

Draining coolant

Open cap (1) on coolant expansion tank (2).

Installation:

Close cap (1) until the arrow marks line up.

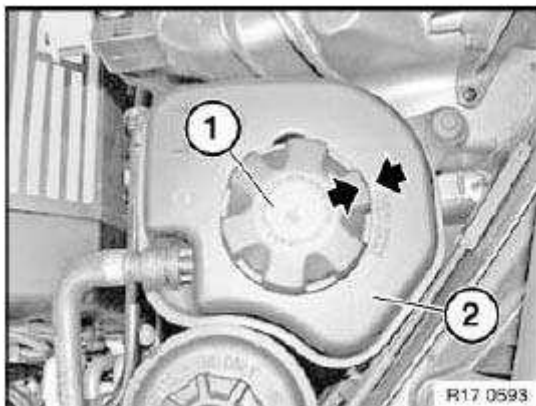


Fig. 8: Identifying Coolant Expansion Tank
 Courtesy of BMW OF NORTH AMERICA, INC.

If fitted, release drain plug (1) on coolant radiator. On coolant radiators which do not have a drain plug, remove coolant hose.

Drain, catch and dispose of coolant.

Installation:

- Replace sealing ring.
- Tightening torque 17 11 2AZ, see **17 11 RADIATOR AND MOUNTING PARTS**

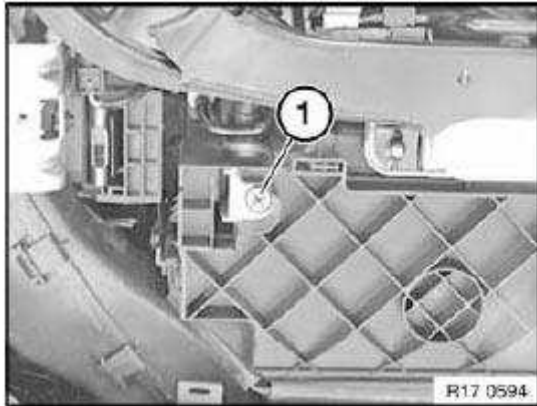


Fig. 9: Identifying Drain Plug

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Adding coolant:**

Use **only recommended coolant** .

Observe **mixture ratio** .

Observe **venting instructions without fail** .

Fill and vent cooling system

17 00 009 CHECKING COOLING SYSTEM FOR WATER LEAKS

Special tools required:

- **00 2 030**
- **17 0 101**
- **17 0 113**
- **17 0 114**

See **MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS** .

See **COOLING SYSTEM - SPECIAL TOOLS (N54, N63)** .

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

Protective measures/rules of conduct

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

**IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!**

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool 00 2 030 (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

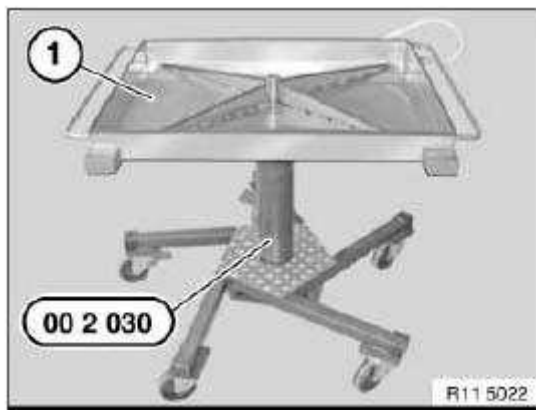


Fig. 10: Identifying Drip Tray
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure drop in cooling system

Open cap on coolant expansion tank. Fit special tools 17 0 101 / 17 0 113.

Build up gauge pressure , wait approx. 2 minutes.

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

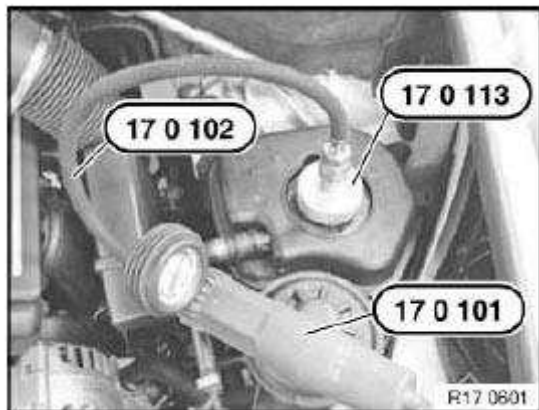


Fig. 11: Identifying Cooling System With Special Tools
 Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure relief valve in cap

NOTE: While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with dissolved coolant to escape. This coolant vapor condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure .

Checking pressure relief valve in cap

Screw cap (1) onto special tool 17 0 114.

Build up pressure with special tool (hand pump) 17 0 101; observe pressure gauge to ascertain when opening pressure is achieved.

Compare **opening pressure of pressure relief valve** . See **17 00 COOLANT, COOLING SYSTEM TEST E71 / N63**

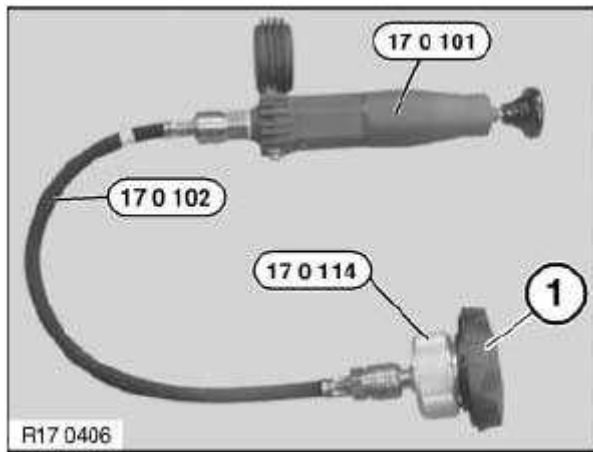


Fig. 12: Identifying Pressure Relief Valve
 Courtesy of BMW OF NORTH AMERICA, INC.

17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS (N63)

WARNING: Danger of scalding!
 Open sealing cap only after engine has cooled down.

IMPORTANT: You must protect the alternator against contamination before carrying out any work on the coolant circuit.
 Cover alternator with suitable materials.
 Failure to comply with this procedure may result in an alternator malfunction.

IMPORTANT: Electric coolant pump!
 Follow instructions for working on cooling system .

IMPORTANT: Lifetime coolant filling:
 Never reuse used coolant!
 When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.
 In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

Only when refilling!

Use **only recommended coolant** .

Observe **mixture ratio** .

Observe filling capacities.

Perform filling operation slowly.

Adjust coolant level to max.

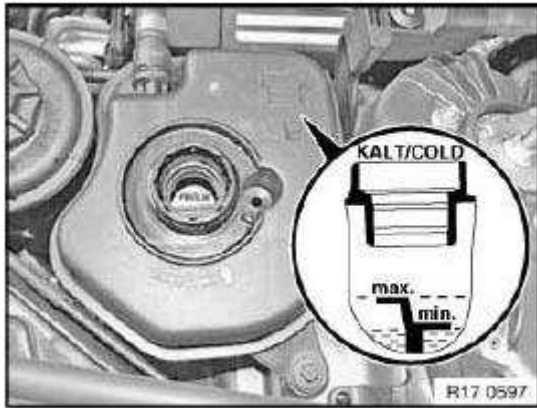


Fig. 13: Identifying Coolant Level To Max
Courtesy of BMW OF NORTH AMERICA, INC.

Close coolant expansion tank.

Installation:

Close cap (1) until the arrow marks line up.

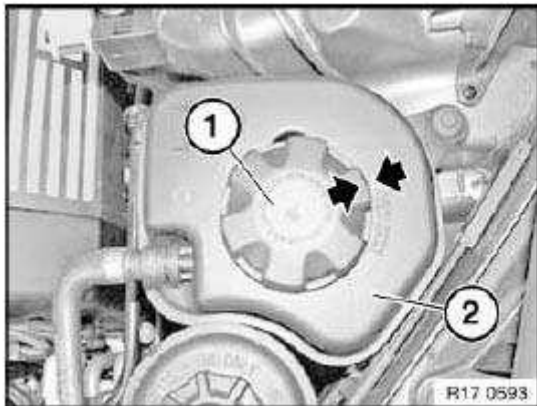


Fig. 14: Locating Coolant Expansion Tank Cap
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: The following venting procedure is necessary when a part is replaced in the cooling system or when the cooling system is refilled.

Adding coolant

Fill expansion tank slowly with recommended **coolant** up to lower edge until fill level stops dropping.

Observe mixture ratio .

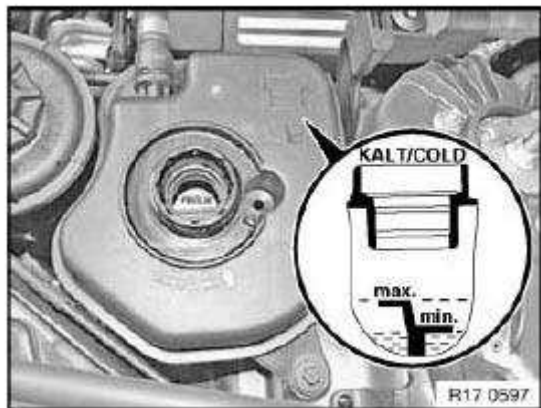


Fig. 15: Identifying Coolant Level To Max
Courtesy of BMW OF NORTH AMERICA, INC.

Venting cooling system

NOTE: **Do not leave the coolant expansion tank cap open during the venting procedure.**

1. Open vent plugs on coolant feed lines to turbocharger.
2. Add coolant up to top edge of expansion tank. Coolant level must not drop further! No drop in coolant for approx. 1 minute. Close vent plugs on turbocharger when coolant emerges.
3. Set heater to maximum temperature. Press Automatic button. Then turn blower down to lowest stage for a minimum period of 5 minutes.
4. After switching off heater pump, add further coolant up to top edge of expansion tank.
5. Check cooling system for leaks.
6. Close expansion tank.
7. Start engine. Allow engine to idle for approx. 1 minute. During this period, press accelerator pedal 3 times (each time lasting 5 secs.) to approx. 3000 RPM.
8. Warm up engine and activate map thermostat via BMW diagnosis system.
9. When engine has cooled down, check coolant level and adjust to max.

Close coolant expansion tank.

Installation:

Close cap (1) on expansion tank (2) until arrow markings are flush.

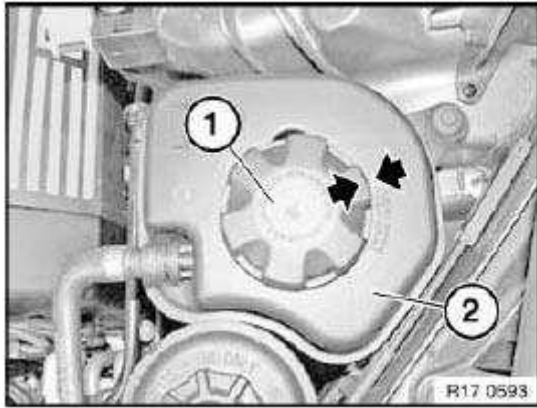


Fig. 16: Locating Expansion Tank Cap
Courtesy of BMW OF NORTH AMERICA, INC.

RADIATOR EXPANSION TANK

17 00 009 CHECKING COOLING SYSTEM FOR WATER LEAKS

Special tools required:

- 00 2 003
- 17 0 101
- 17 0 113
- 17 0 114

See MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS .

See COOLING SYSTEM - SPECIAL TOOLS (N54, N63) .

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

Protective measures/rules of conduct

- Wear protective goggles
- Wear protective gloves
- Observe national/country-specific regulations

IMPORTANT: Risk of slipping due to coolant on the floor.
Danger of injury!

Catch and dispose of drained coolant in drip tray (1) and if necessary special tool 00 2 030 (universal hydraulic lifter).

Recycling:

Observe country-specific waste-disposal regulations.

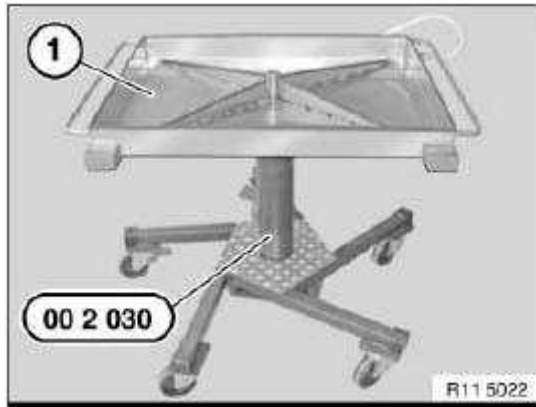


Fig. 17: Identifying Drip Tray

Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure drop in cooling system

Open cap on coolant expansion tank. Fit special tools 17 0 101/17 0 113.

Build up gauge pressure , wait approx. 2 minutes.

Cooling system is impervious to leaks if pressure drop is max. 0.1 bar.

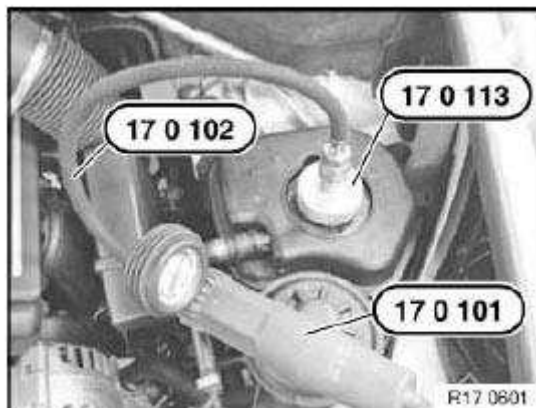


Fig. 18: Identifying Cooling System With Special Tools

Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure relief valve in cap

NOTE: While the vehicle is driven at high outside temperatures, the design may cause the pressure relief valve in the cap to open slightly and air together with

dissolved coolant to escape. This coolant vapor condenses on the surface of the expansion tank and leaves traces when the vehicle has cooled down. These traces do not indicate whether the cap is defective or not. When the vehicle has been parked up for an extended period of time, the residual escaping coolant can cause the pressure relief valve in the cap to stick; therefore check the cap again 2 to 3 times.

Replace the cap only after you have checked three times and there is an incorrect opening pressure .

Checking pressure relief valve in cap

Screw cap (1) onto special tool 17 0 114.

Build up pressure with special tool (hand pump) 17 0 101; observe pressure gauge to ascertain when opening pressure is achieved.

Compare **opening pressure of pressure relief valve** .

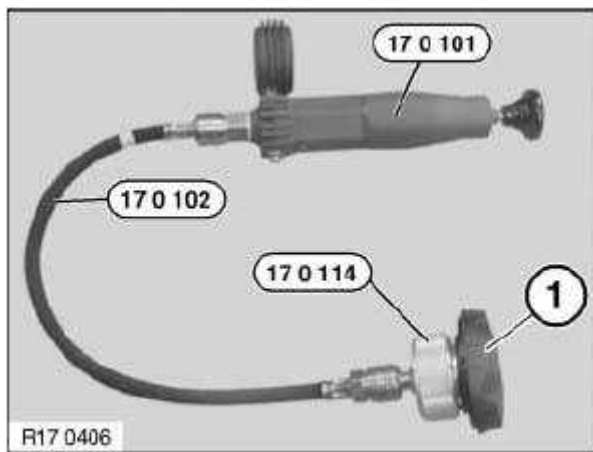


Fig. 19: Identifying Pressure Relief Valve And Screw Cap
Courtesy of BMW OF NORTH AMERICA, INC.

ENGINE RADIATOR

17 11 000 REMOVING AND INSTALLING RADIATOR (N63)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

Necessary preliminary tasks:

- Remove **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Follow **instructions for working** on cooling system.
- Remove **fan cowl** .
- Drain **coolant** .
- Unlock coolant hoses and detach.
- Release radiator **air duct** . Do not remove air duct. See **51 71 099 REMOVING AND INSTALLING/REPLACING RADIATOR AIR GUIDE** .

Release screws.

Remove cover (1).

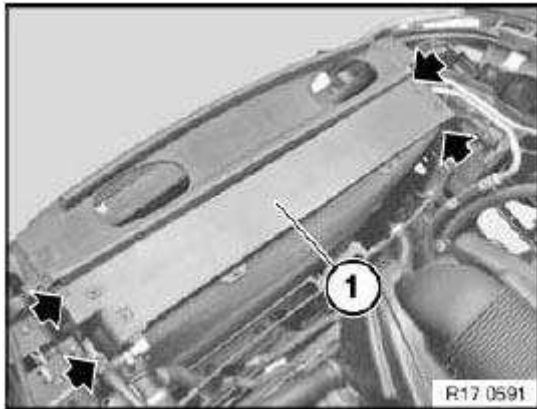


Fig. 20: Identifying Radiator Cover And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Remove radiator (1) towards top.

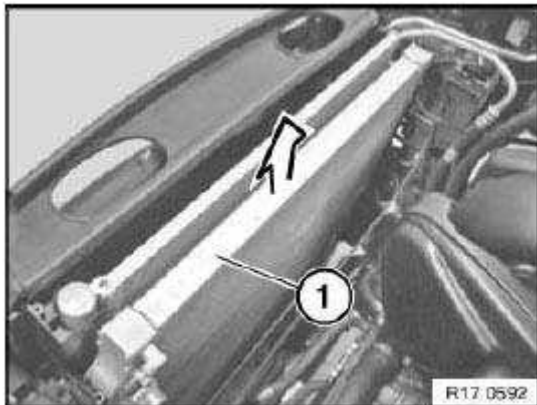


Fig. 21: Removing Radiator Top
Courtesy of BMW OF NORTH AMERICA, INC.

17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N63)

Necessary preliminary tasks:

- Read out fault memory of DME control unit.
- Switch off ignition.
- Remove **intake manifold** . See **13 REMOVING INTAKE DUCT (N63)** .

Unclip Bowden cable for engine bonnet/hood actuator from transverse reinforcement (1).

Detach A/C line from holder.

Release screws on left and right sides. Tightening torque 51 71 4AZ, see **51 71 SEALS AND LOOSE BODY PARTS**

Remove cross-brace (1).

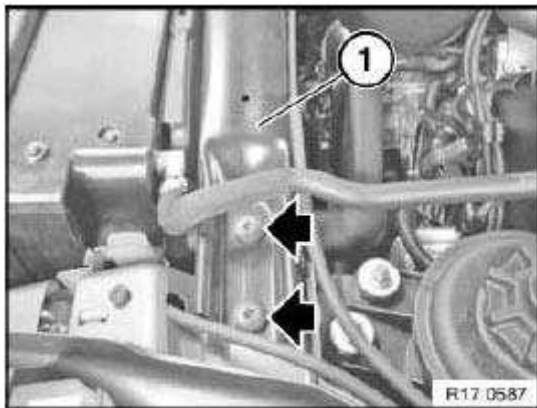


Fig. 22: Identifying Transverse Reinforcement And Cross-Brace
Courtesy of BMW OF NORTH AMERICA, INC.

Release coolant hose (1) from fan cowl.

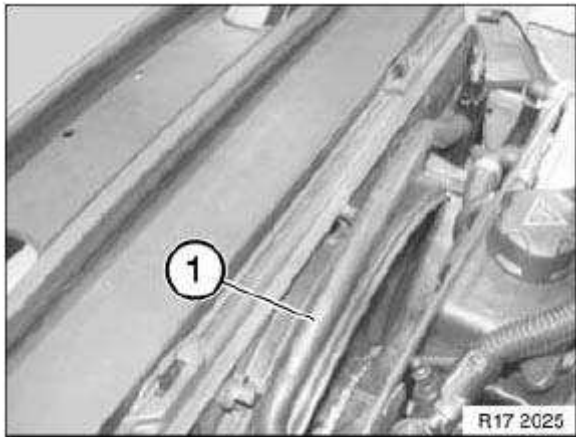


Fig. 23: Identifying Coolant Hose And Fan Cowl
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

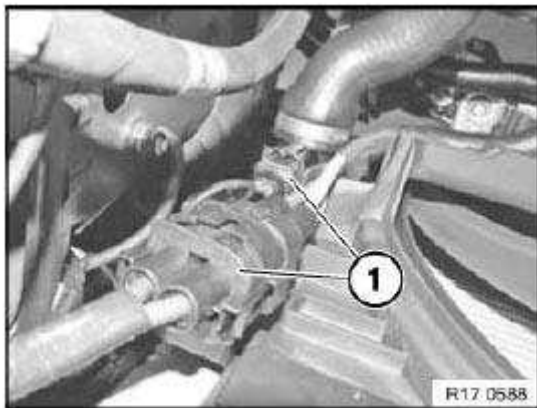


Fig. 24: Identifying Plug Location
Courtesy of BMW OF NORTH AMERICA, INC.

Press lock (1).

Raise fan cowl (2) until holder (3) can be brought into assembly position.

NOTE: For reasons of clarity, illustration and text show coolant hose removed.
Do not raise fan cowl by fan impeller.

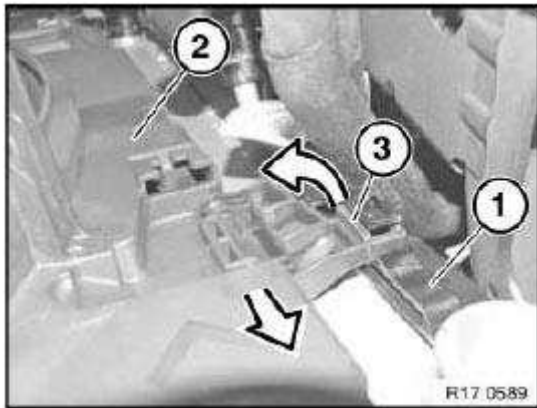


Fig. 25: Identifying Fan Cowl, Holder And Lock
 Courtesy of BMW OF NORTH AMERICA, INC.

Press lock (1).

Feed out fan cowl (2) towards top and remove.

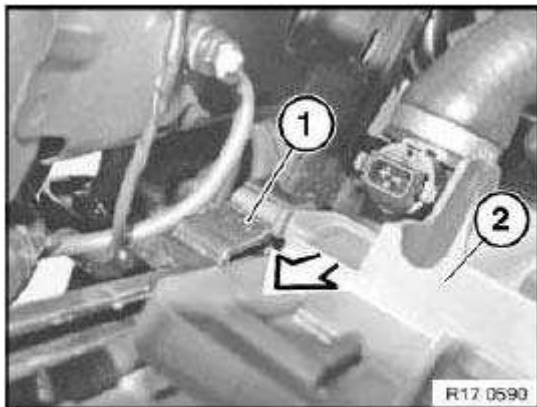


Fig. 26: Identifying Fan Cowl And Lock
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Insert retaining tab (1) at bottom on module carrier.

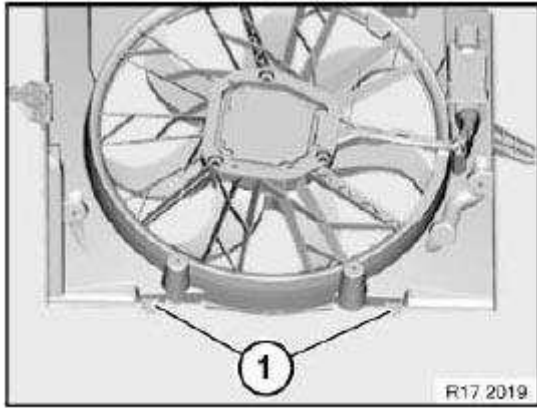


Fig. 27: Identifying Retaining Tab

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Check stored fault message.
Add final details to vehicle.
Now clear the fault memory.

17 11 040 REMOVING AND INSTALLING/REPLACING THERMOSTAT CARTRIDGE (N63)

IMPORTANT: Danger of scalding!
Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working** on cooling system
- Draining **coolant**
- Remove **fan cowl**

Unlock and detach coolant hose (1).

Unscrew nuts.

Tightening torque 17 22 8AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Remove thermostat cartridge (2).

Installation:

- Clean contact faces.

Add final details to vehicle.

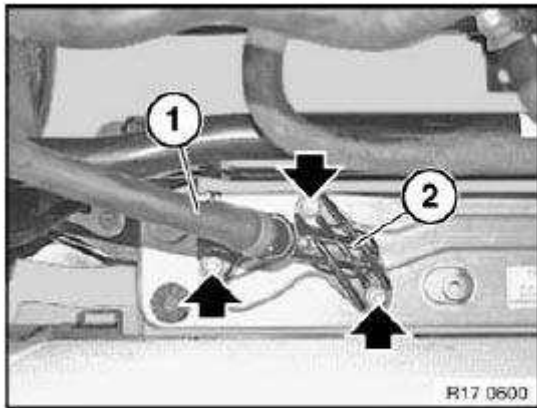


Fig. 28: Identifying Thermostat Cartridge And Coolant Hose
 Courtesy of BMW OF NORTH AMERICA, INC.

17 11 046 REMOVING AND INSTALLING/REPLACING MODULE CARRIER (N63)

Necessary preliminary tasks:

- Remove **fan cowl**
- Remove **radiator**
- Remove **A/C condenser** . See **64 53 551 REMOVING AND INSTALLING OR REPLACING CONDENSER FOR A/C SYSTEM** .
- Remove **coolant cooler** for intercooler
- Remove **cooling loop** for power steering
- Remove **auxiliary coolant pump** for intercooler

Release coolant hoses (1) from module carrier (2).

Unlock rubber mount (3).

Lift out module carrier (2).

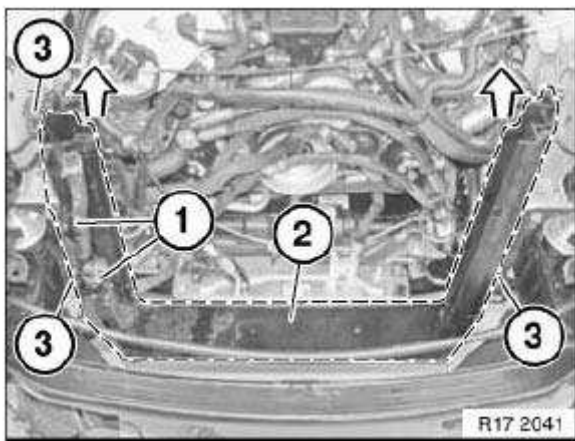


Fig. 29: Identifying Module Carrier, Rubber Mount And Coolant Hoses
Courtesy of BMW OF NORTH AMERICA, INC.

Add final details to vehicle.

Check system for leaks.

17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N63)

IMPORTANT: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working** on cooling system.
- Drain **coolant** from radiator down to lower edge on expansion tank.

Unlock and detach coolant hose (1).

Release screws.

Raise coolant expansion tank (2) slightly until plug for coolant level switch and lower coolant hose are accessible. Unclip line on side of expansion tank.

Installation:

- Make sure expansion tank is in correct installation position.

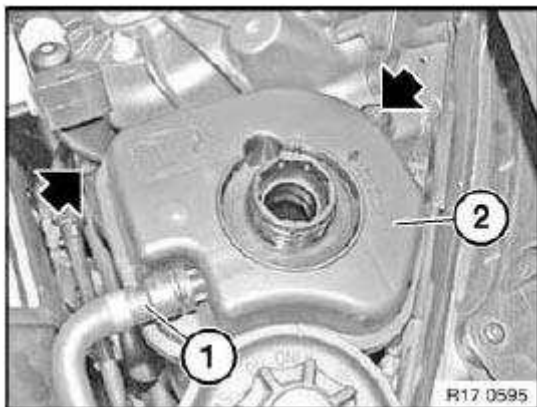


Fig. 30: Identifying Coolant Expansion Tank And Coolant Hose
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Unlock and detach lower coolant hose (2).

Remove expansion tank (3).

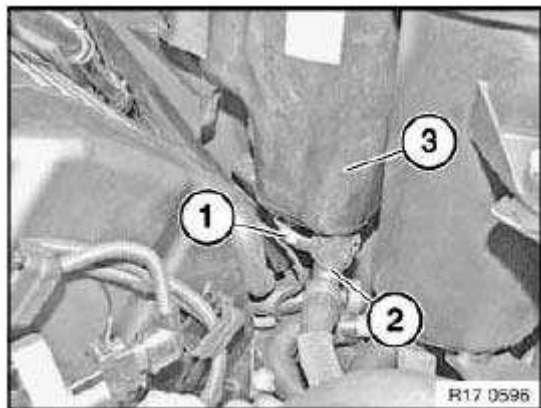


Fig. 31: Identifying Expansion Tank, Lower Coolant Hose And Plug
Courtesy of BMW OF NORTH AMERICA, INC.

17 11 120 REMOVING AND INSTALLING/REPLACING COOLING RADIATOR FOR INTERCOOLER (N63)

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

IMPORTANT: When working on the cooling circuit, protect the alternator against fouling.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

Necessary preliminary tasks:

- Remove front **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove **fan cowl**
- Release radiator **air duct** . Do not remove air duct. Pull air duct forwards only. See **51 71 099 REMOVING AND INSTALLING/REPLACING RADIATOR AIR GUIDE** .
- Drain coolant for intercooler.

Release screws.

Remove cover (1)

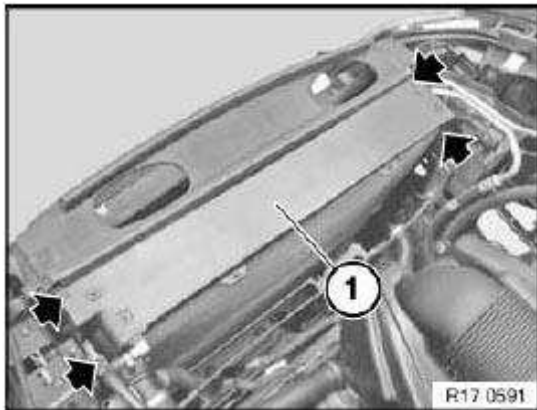


Fig. 32: Identifying Radiator Cover
 Courtesy of BMW OF NORTH AMERICA, INC.

Release and disconnect coolant hoses (1).

Lift out cooling radiator for intercooler (2).

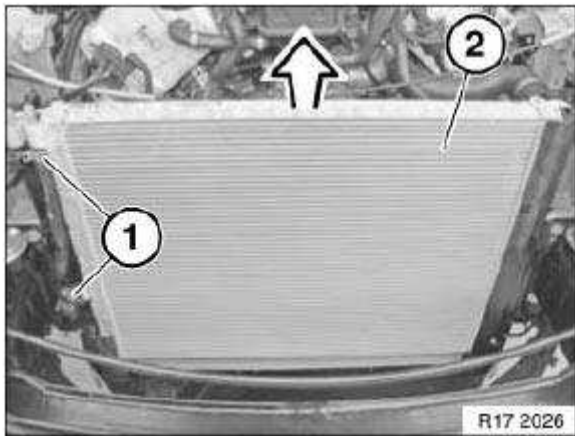


Fig. 33: Lifting Cooling Radiator For Intercooler
 Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

After completing work, fill intercooler with coolant.

Vent **cooling system for intercooler** .

Check cooling system for leaks.

Assemble engine.

Necessary preliminary tasks:

- Remove front right **wheel arch trim** . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .

WARNING: Danger of scalding!
Only perform this work after engine has cooled down.

IMPORTANT: Wear protective goggles and gloves.

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the engine oil circuit.
When removing engine oil lines and engine oil cooler, seal off all openings with suitable plugs.
To avoid engine damage, do not allow any dirt particles to get into the engine oil circuit.

Recycling:

Engine oil escapes when oil lines are released. Catch and dispose of emerging engine oil.

Observe country-specific waste-disposal regulations.

Release screw (1).

Tightening torque 17 22 11AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Detach oil lines (2) from engine oil cooler flange.

Installation:

Replace sealing rings.

Catch and dispose of emerging oil.

Unlock and detach retainer (3).

Remove engine oil cooler (4).

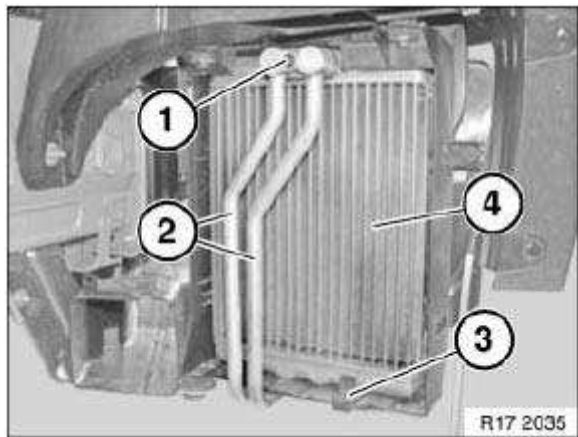


Fig. 34: Identifying Engine Oil Cooler And Retainer
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check engine oil level and top up engine oil if necessary.

17 11 150 REMOVING AND INSTALLING/REPLACING HOLDER FOR ENGINE OIL COOLER (N63)

Necessary preliminary tasks:

- Remove **engine oil cooler** .

Release screws.

Bracket remove.

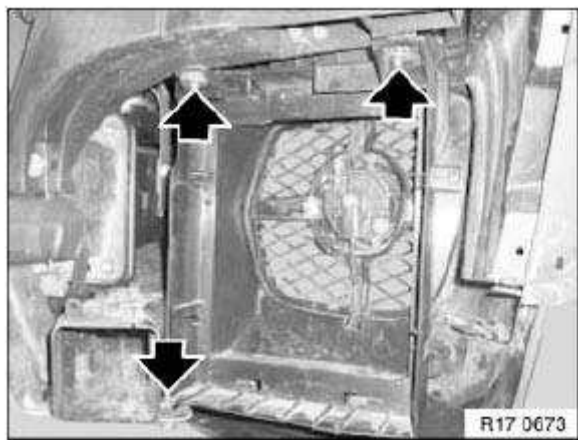


Fig. 35: Removing Bracket
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Add final details to vehicle.

17 11 370 REMOVING AND INSTALLING/REPLACING COOLING COIL FOR POWER STEERING (N63)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: When working on the oil, coolant or fuel circuit, you must protect the alternator against contamination.

Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.

Necessary preliminary tasks:

- Remove front **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove **fan cowl**
- Release radiator **air duct** . See **51 71 099 REMOVING AND INSTALLING/REPLACING RADIATOR AIR GUIDE** . Do not remove air duct. Pull air duct forwards only.
- After completing this operation, check **fluid level** in power steering fluid reservoir. See **32 13 006 BLEEDING POWER STEERING (VERSION WITH DYNAMIC DRIVE)** .

Release screws.

Remove cover (1)

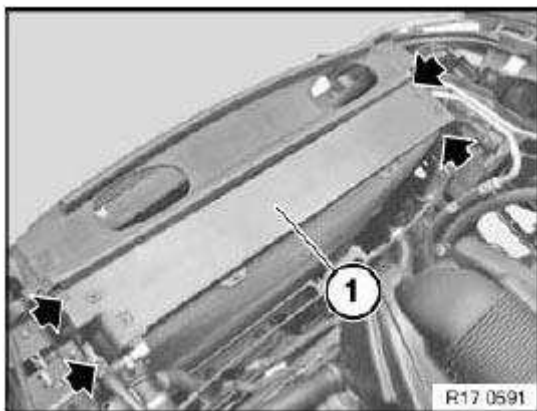


Fig. 36: Identifying Radiator Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Press lines (1) in direction of cooling coil (2). Pull locking ring towards rear and keep pressed.

Detach lines (1) from cooling coil (2).

IMPORTANT: Catch and dispose of emerging fluid.

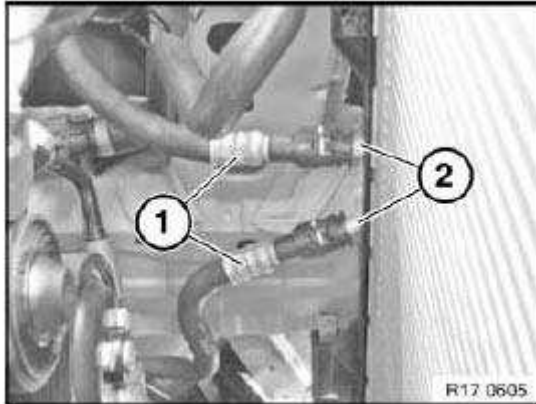


Fig. 37: Identifying Cooling Coil
Courtesy of BMW OF NORTH AMERICA, INC.

Lift out left stop buffer (1) at radiator core.

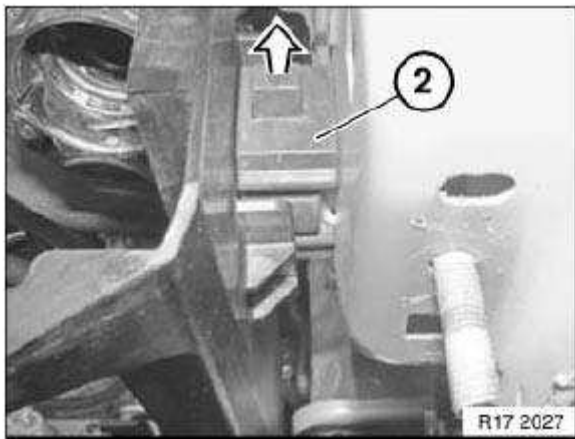


Fig. 38: Lifting Left Stop Buffer
Courtesy of BMW OF NORTH AMERICA, INC.

Pull out trim (1).

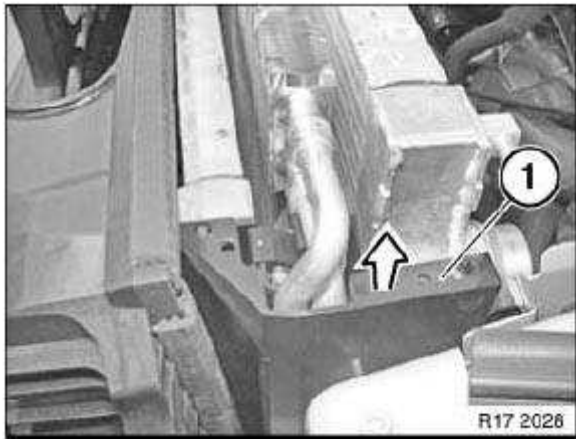


Fig. 39: Pulling Trim

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip cooling coil (1) from retainer (2).

Feed out cooling coil (1) towards top and remove.

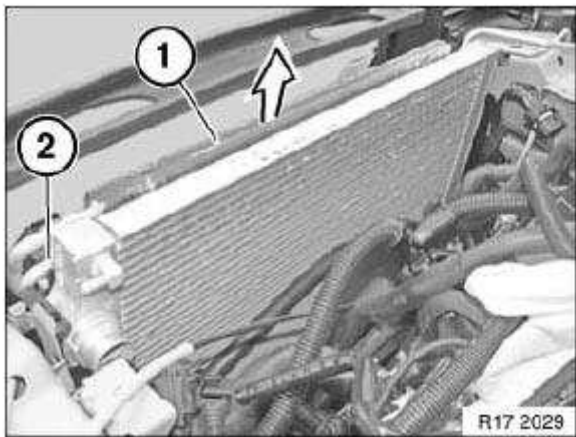


Fig. 40: Identifying Cooling Coil And Retainer

Courtesy of BMW OF NORTH AMERICA, INC.

17 13 020 REMOVING AND INSTALLING/REPLACING INTERCOOLER EXPANSION TANK (N63)

IMPORTANT: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working** on cooling system.
- Drain intercooler coolant from expansion tank.
- Remove **fan cowl** .

Release screws (1).

Release coolant hoses (2) from expansion tank (3) and detach.

Installation:

Replace faulty clamps.

Remove expansion tank (3).

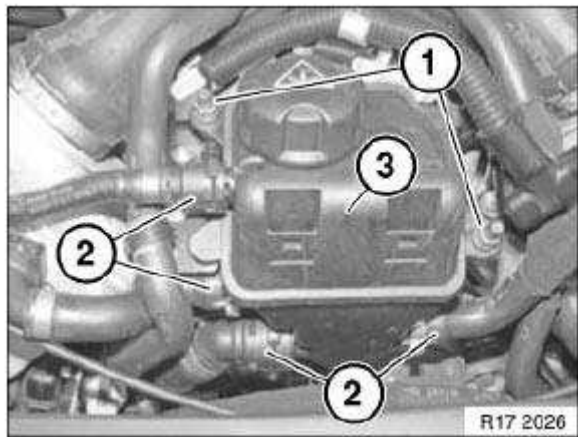


Fig. 41: Identifying Expansion Tank, Coolant Hose And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

After completing work, fill intercooler with coolant.

Vent cooling system for intercooler .

Check cooling system for leaks.

17 22 080 REMOVING AND INSTALLING/REPLACING FEED AND RETURN LINES FOR ENGINE OIL COOLER (N63)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

IMPORTANT: Wear protective gloves and goggles.

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the engine oil circuit.

When removing engine oil lines and engine oil cooler, seal off all openings with suitable plugs.

To avoid engine damage, do not allow any dirt particles to get into the engine oil circuit.

Recycling:

Engine oil escapes when oil line is released.

Catch and dispose of emerging engine oil.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Remove front right **wheel arch trim** . See **51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION)** .
- Lower **front axle support** . See **31 11 506 LOWERING/RAISING FRONT AXLE CARRIER (UNIVERSAL LIFTER)** .

Release screw.

Tightening torque 17 22 4AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Detach oil lines from oil filter control housing.

Catch and dispose of emerging oil.

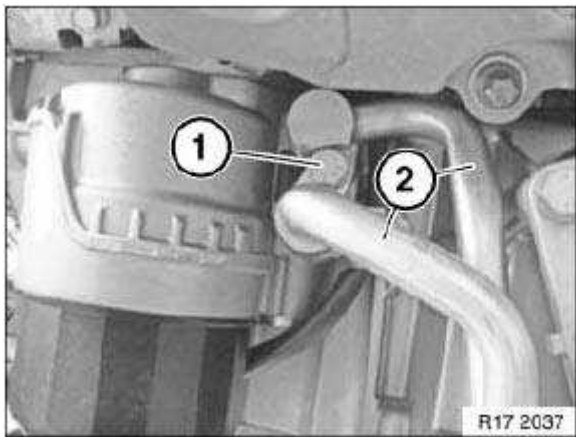


Fig. 42: Identifying Oil Filter Control Housing And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace all sealing rings on oil lines.

Release screw (1).

Tightening torque 17 22 5AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Remove oil lines (2) from holder.

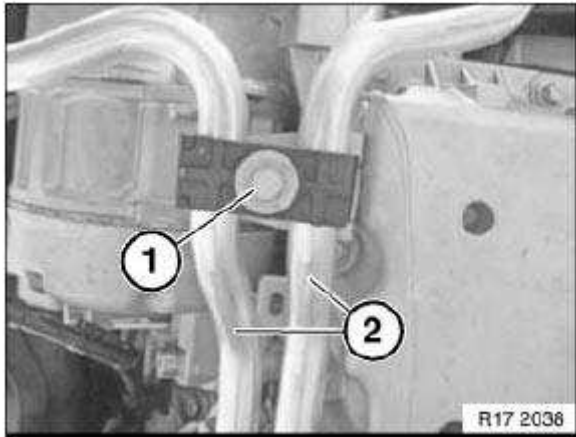


Fig. 43: Identifying Oil Lines And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque 17 22 12AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Remove oil lines with holder from strut.

Installation:

Modify holder when replacing oil lines.

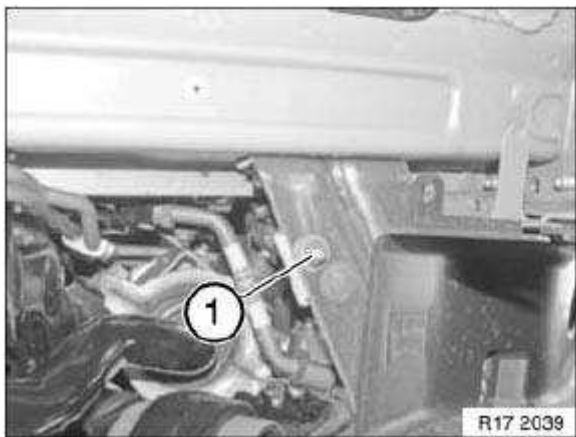


Fig. 44: Identifying Slacken Nut
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock oil line (1) and detach.

Feed out oil lines (1) and remove.

Catch and dispose of emerging oil.

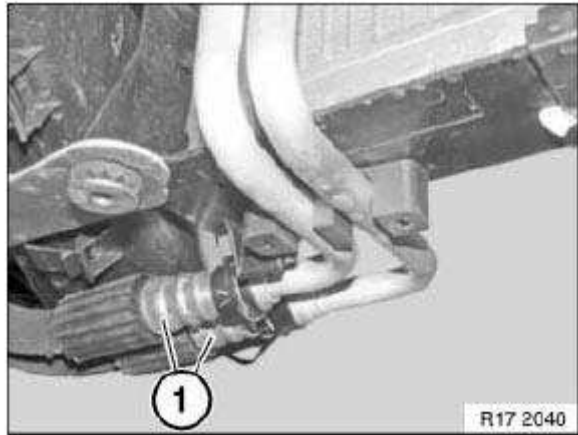


Fig. 45: Identifying Oil Lines Location
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check engine oil level and top up engine oil if necessary.
Check oil lines for leaks.

OIL COOLER

17 21 500 FLUSHING TRANSMISSION OIL COOLER WITH LINES (AUTOMATIC TRANSMISSION)

Special tools required:

- 17 2 018
- 17 2 019

See **COOLING SYSTEM - SPECIAL TOOLS (N54, N63)** .

NOTE: Carry out the work steps listed when:
Installing a new or replacement transmission.
Flushing can only be carried out with the automatic transmission removed.

Procedure

Automatic transmission removed.

Connect appropriate adapters (see description below) to oil lines exiting from automatic transmission.

Connect connecting line 17 2 019 from the oil collection unit with the quick-release coupling.

Connect drain line 17 2 018 using quick-release coupling.

Hold and direct open end of drain line into a suitable drip tray.

Using oil collection unit, flush approx. 1 liter of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

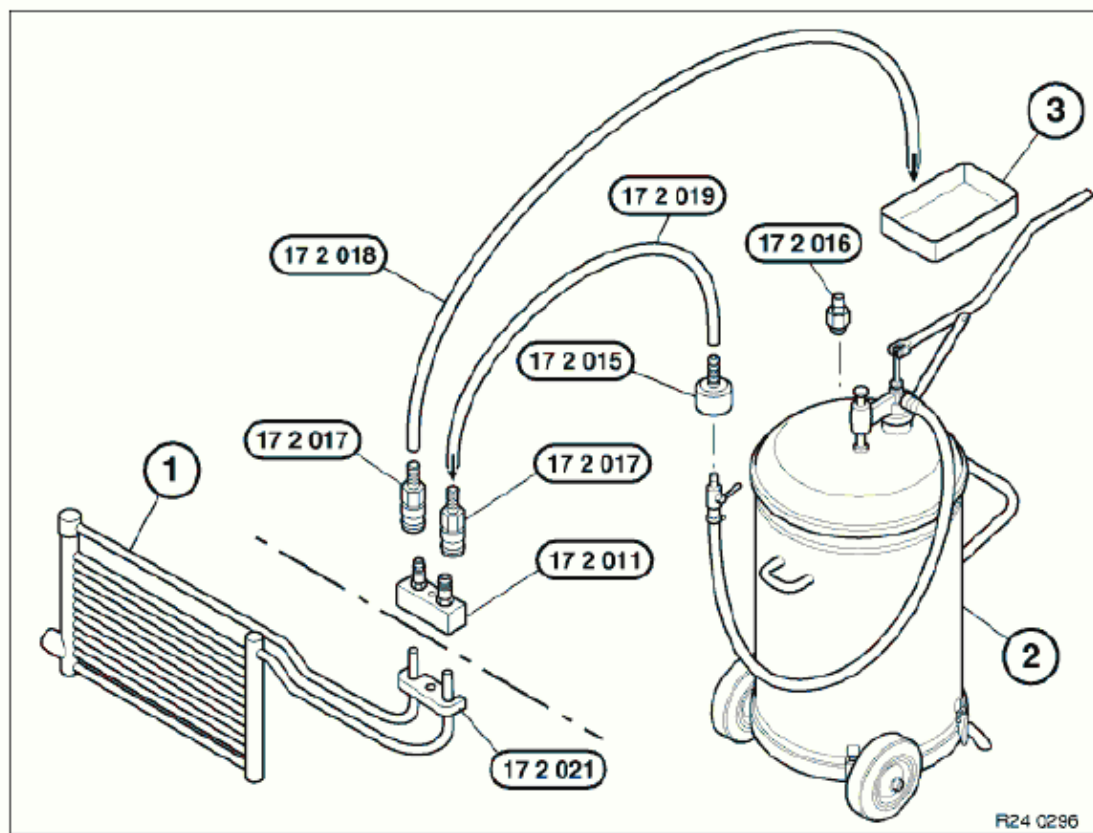
Flush oil lines/transmission oil cooler in opposite direction with approx. 1 liter of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**).

Disconnect quick-release couplings.

Remove adapter.

NOTE: **Dispose of flushing oil correctly.**
 Do not reuse under any circumstances.

Arrangement, flushing apparatus for transmissions A5S 310Z, A5S 560Z, A5S 360R/390R, A4S 200R, A5S 325Z



R24 0296

1) Transmission oil cooler with lines

2) Oil collection unit

3) Oil drip tray

17 2 011 Adapter for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 Quick-release coupling (2 pieces)

2

017

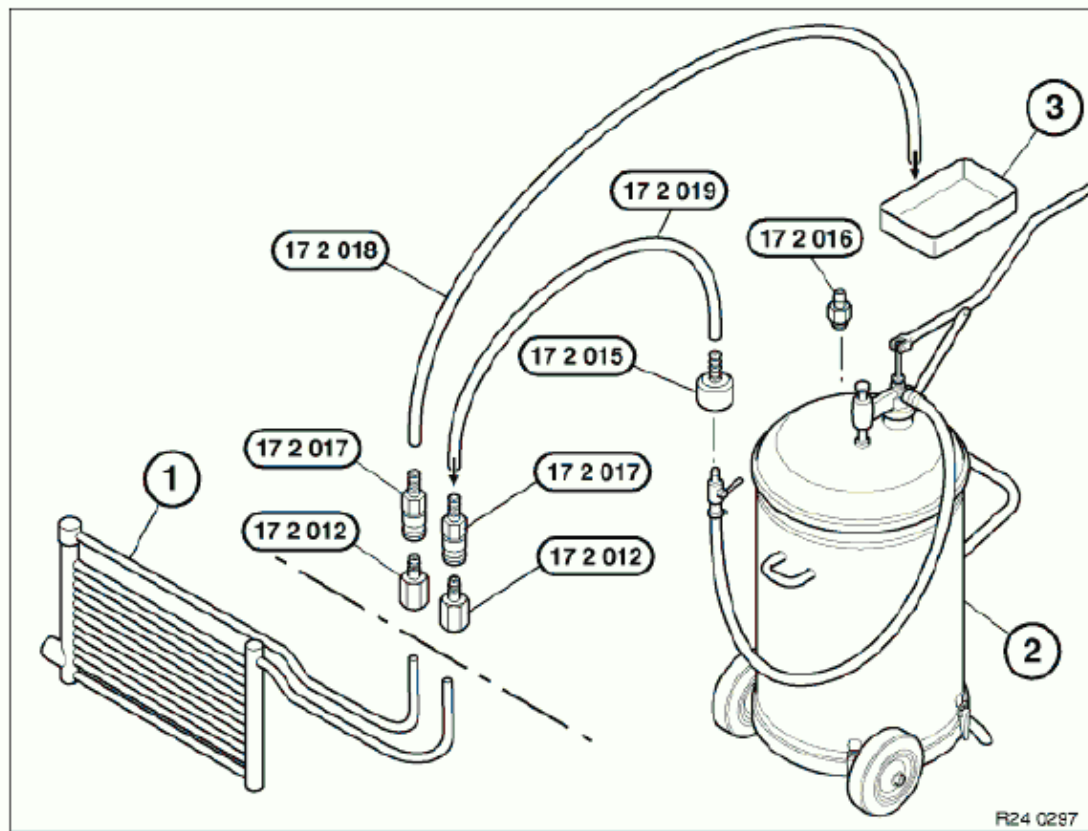
17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

17 2 021 Mounting plate for adapter 17 2 011 for transmissions A5S 325Z, GA6HP26Z

Fig. 46: Identifying Transmission Oil Cooler, Oil Collection Unit And Oil Drip Tray
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of flushing apparatus for transmission A4S 310R



1) Transmission oil cooler with lines

2) Oil collection unit

3) Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecalemit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 Quick-release coupling (2 pieces)

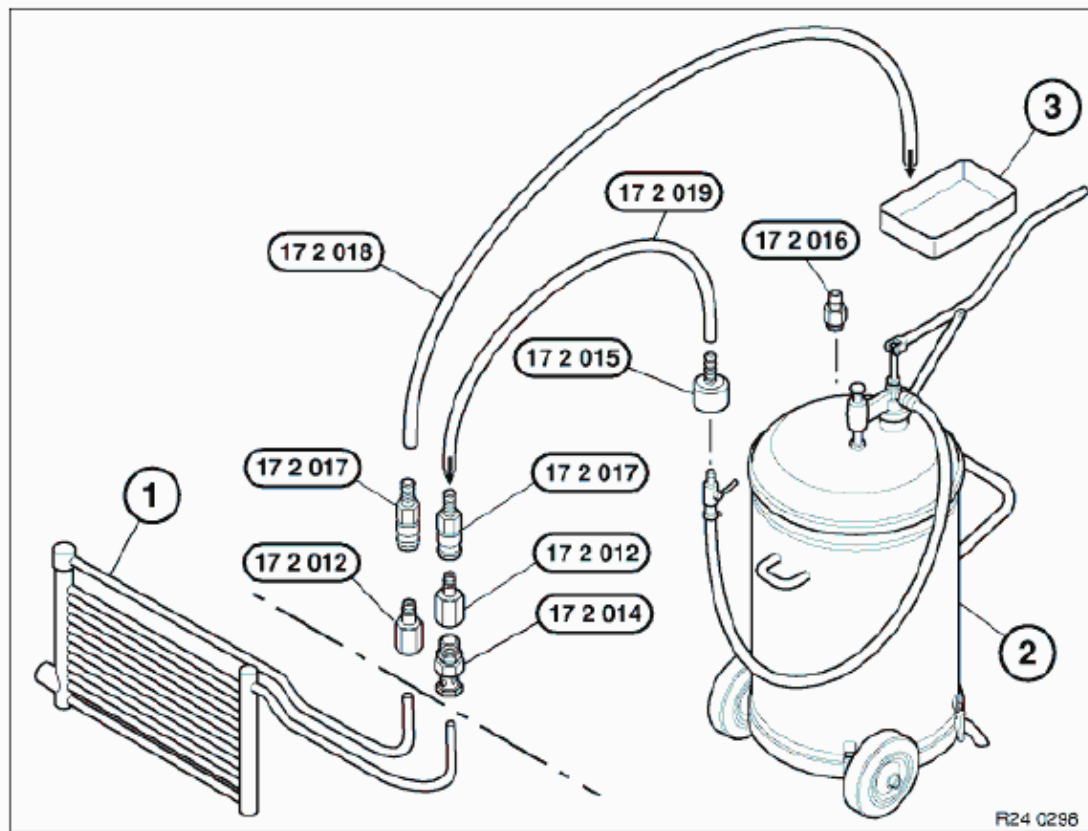
2
017

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

Fig. 47: Identifying Transmission Oil Cooler, Oil Collection Unit And Oil Drip Tray
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of flushing apparatus for transmission A4S 300J



1) Transmission oil cooler with lines

2) Oil collection unit

3) Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 014 Banjo bolt for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 Quick-release coupling (2 pieces)

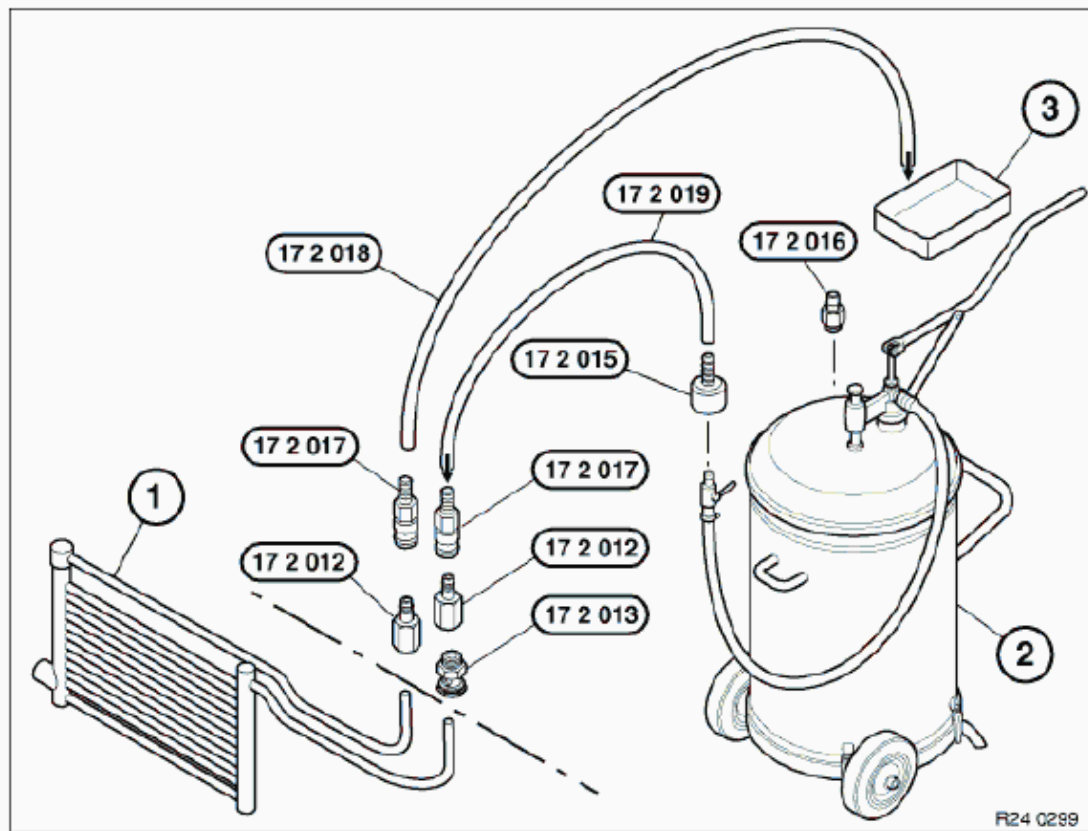
2
017

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

Fig. 48: Identifying Transmission Oil Cooler, Oil Collection Unit And Oil Drip Tray
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of flushing apparatus for transmission A5S 440Z



R24 0299

1) Transmission oil cooler with lines

2) Oil collection unit

3) Oil drip tray

17 2 012 Adapters (2 x) for connecting transmission-side oil cooler lines (1)

17 2 013 Banjo bolt for connecting transmission-side oil cooler lines (1)

17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or

17 2 016 Connection for oil collection unit (2), manufacturer: Horn

17 Quick-release coupling (2 pieces)

2
017

17 2 018 Hose to oil drip tray (3)

17 2 019 Hose to oil collection unit (2)

Fig. 49: Identifying Transmission Oil Cooler, Oil Collection Unit And Oil Drip Tray
Courtesy of BMW OF NORTH AMERICA, INC.

17 21 500 FLUSHING TRANSMISSION OIL COOLER WITH LINES (AUTOMATIC TRANSMISSION) (GA6HP19Z, GA6HP26Z, GA6HP32Z)

Special tools required:

- 17 2 018
- 17 2 019

See **COOLING SYSTEM - SPECIAL TOOLS (N54, N63)** .

NOTE: **Carry out the work steps listed when:
Installing a new or replacement transmission.**

Procedure

Automatic transmission removed.

Connect appropriate adapters (see description below) to oil lines exiting from automatic transmission.

Connect connecting line 17 2 019 from the oil collection unit with the quick-release coupling.

Connect drain line 17 2 018 using quick-release coupling.

Hold and direct open end of drain line into a suitable drip tray.

Using oil collection unit, flush approx. 1 liter of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**) through oil lines and transmission oil cooler.

Reposition quick-release couplings.

Flush oil lines/transmission oil cooler in opposite direction with approx. 1 liter of transmission fluid (refer to **AUTOMATIC TRANSMISSION - OPERATING FLUIDS**).

Disconnect quick-release couplings.

Remove adapter.

NOTE: **Dispose of flushing oil correctly.
Do not reuse under any circumstances.**

Press hydraulic lines (1) into adapters (2).

Slide clamping bar (3) into guides and secure with screw (4).

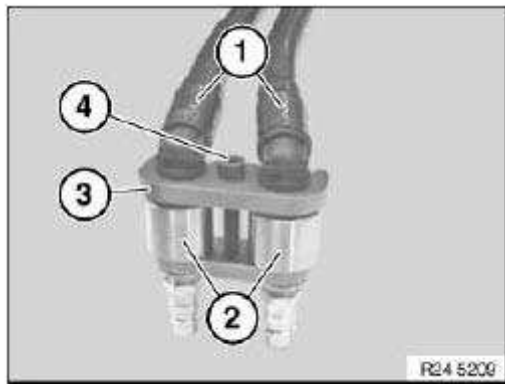
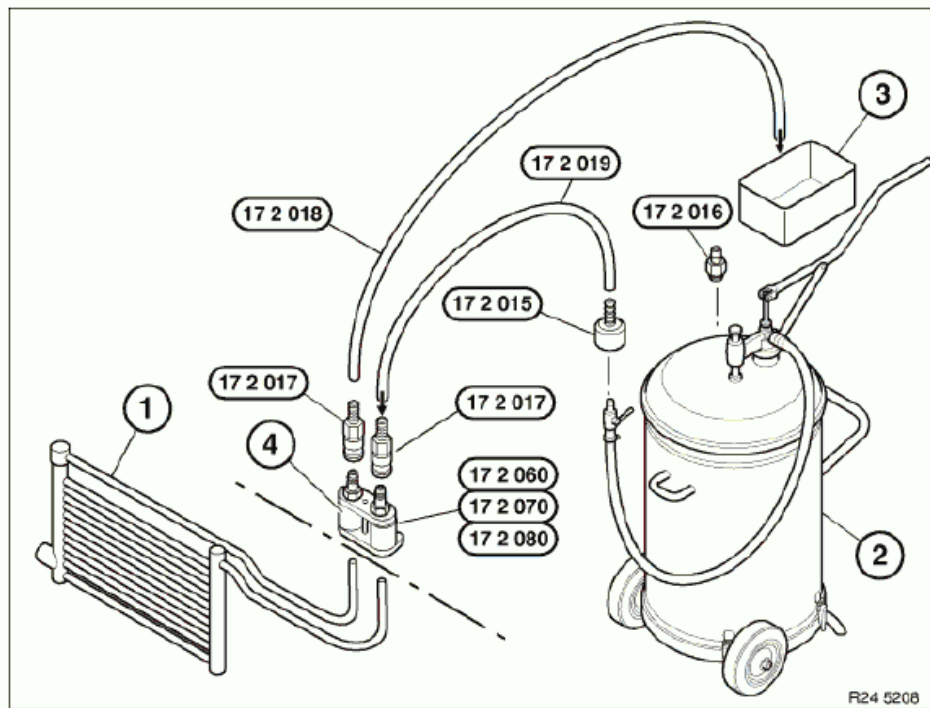


Fig. 50: Identifying Hydraulic Lines, Adapters And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Arrangement of flushing apparatus for transmissions GA6HP19Z, GA6HP26Z, GA6HP32Z



- 1) Transmission-oil cooler with lines
- 2) Oil collection unit
 - 17 2 015 Connection for oil collection unit (2), manufacturer: Deutsche Tecaletit or
 - 17 2 016 Connection for oil collection unit (2), manufacturer: Horn
 - 17 2 017 Quick-release coupling (2 pieces)
 - 17 2 019 Hose to oil collection unit (2)
- 3) Oil drip tray
 - 17 2 018 Hose to oil drip tray (3)
- 4) Adapter with clamping bar
 - 17 2 060 Adapter with clamping bar for aluminium lines and steel lines with aluminium connection (line diameter 12 mm) GA6HP19Z
 - 17 2 070 Adapter with clamping bar (line diameter 15 mm) GA6HP26Z, GA6HP32Z, TCT for N54 engine
 - 17 2 080 Adapter with clamping bar for fuel lines GA6HP26Z

Fig. 51: Identifying Transmission-Oil Cooler, Oil Collection Unit And Adapter
 Courtesy of BMW OF NORTH AMERICA, INC.

OIL COOLER LINES

17 22 010 REMOVING AND INSTALLING/REPLACING TRANSMISSION FLUID COOLER FOR AUTOMATIC TRANSMISSION (N63)

IMPORTANT: Danger of scalding!
 Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Follow **instructions for working on cooling system** on cooling system.
- Drain **coolant** .
- Remove **fan cowl** .

Recycling

Catch and dispose of drained coolant in a suitable container.

Transmission fluid emerges when fluid lines are detached from transmission fluid cooler.

Catch and dispose of escaping transmission fluid in a suitable container.

Observe country-specific waste-disposal regulations.

Unlock and disconnect coolant hoses (1) and (2).

Release screw (3) and remove lines (4).

Installation:

- Replace sealing rings.
- Tightening torque 17 22 9AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Release screws (5).

Tightening torque 17 22 10AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Remove transmission fluid cooler (6).

Installation:

Only when replacing transmission fluid cooler, modify **thermostat cartridge** .

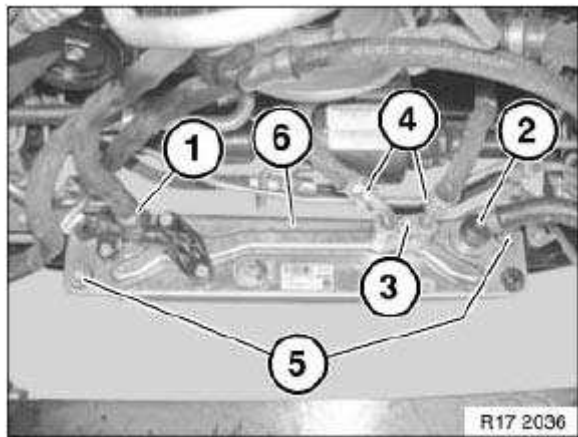


Fig. 52: Identifying Transmission Fluid Cooler And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check fluid level in automatic transmission, topping up transmission fluid if necessary. See 00 11 237 CHECKING/TOPPING UP FLUID LEVEL IN AUTOMATIC TRANSMISSION (GA6HP26Z) .

17 22 080 REMOVING AND INSTALLING/REPLACING FEED AND RETURN LINES FOR ENGINE OIL COOLER (N63)

WARNING: Danger of scalding!
 Only perform this work after engine has cooled down.

IMPORTANT: Wear protective gloves and goggles.

IMPORTANT: Adhere to conditions of absolute cleanliness when working on the engine oil circuit.
 When removing engine oil lines and engine oil cooler, seal off all openings with suitable plugs.
 To avoid engine damage, do not allow any dirt particles to get into the engine oil circuit.

Recycling:

Engine oil escapes when oil line is released.

Catch and dispose of emerging engine oil.

Observe country-specific waste-disposal regulations.

Necessary preliminary tasks:

- Remove front right wheel arch trim . See 51 71 038 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (FRONT SECTION) .
- Lower front axle support . See 31 11 506 LOWERING/RAISING FRONT AXLE CARRIER (UNIVERSAL LIFTER) .

Release screw.

Tightening torque 17 22 4AZ, see 17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES

Detach oil lines from oil filter control housing.

Catch and dispose of emerging oil.

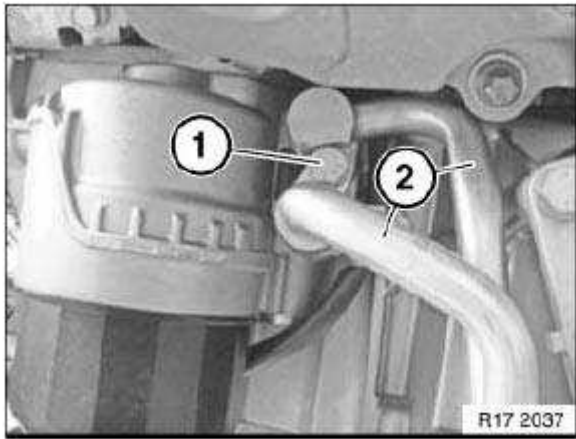


Fig. 53: Identifying Oil Filter Control Housing
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Replace all sealing rings on oil lines.

Release screw (1).

Tightening torque 17 22 5AZ, see 17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES

Remove oil lines (2) from holder.

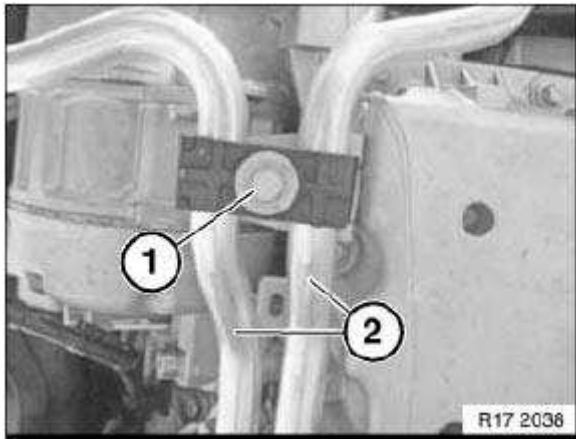


Fig. 54: Identifying Oil Lines And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Slacken nut (1).

Tightening torque 17 22 12AZ, see **17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES**

Remove oil lines with holder from strut.

Installation:

Modify holder when replacing oil lines.

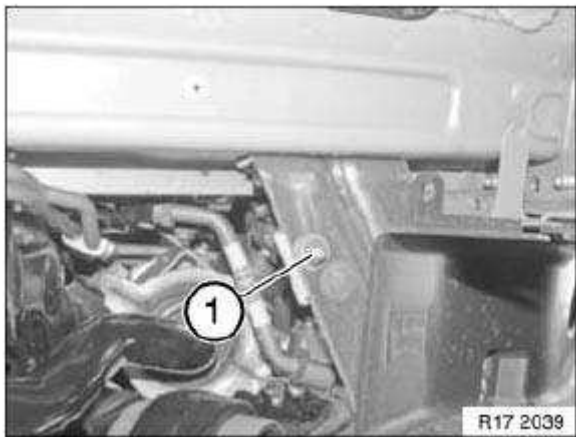


Fig. 55: Identifying Slacken Nut
 Courtesy of BMW OF NORTH AMERICA, INC.

Unlock oil line (1) and detach.

Feed out oil lines (1) and remove.

Catch and dispose of emerging oil.

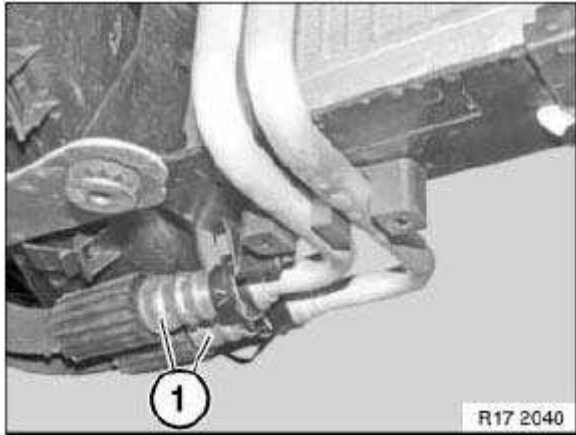


Fig. 56: Identifying Oil Line

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: After completing work, check engine oil level and top up engine oil if necessary.
Check oil lines for leaks.

CHARGE AIR COOLER

17 51 001 REMOVING AND INSTALLING/REPLACING LEFT INTERCOOLER (N63)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Remove **acoustic cover** from engine.
- Remove front **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove **fan cowl**
- Drain coolant for intercooler.

Release clamp (1).

Tightening torque 13 71 8AZ, see **13 71 AIR INTAKE DUCT**

Release clamp (2).

Replace clamp (2).

Remove left charge-air duct (3).

Installation:

Check gasket on turbocharger, replacing if necessary.

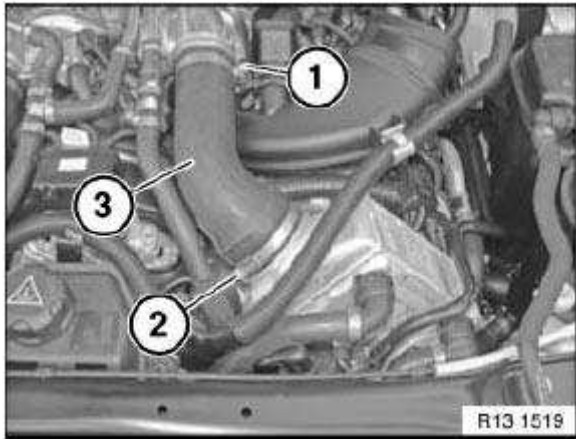


Fig. 57: Identifying Left Charge-Air Duct And Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: When detaching the coolant hoses from the intercooler, make sure that the connector remains connected to the throttle valve assembly. Do not allow any coolant to get into the plug connection on the throttle valve assembly.

Release and disconnect coolant hoses (1).

Remove tank venting valve (2) from intercooler (3).

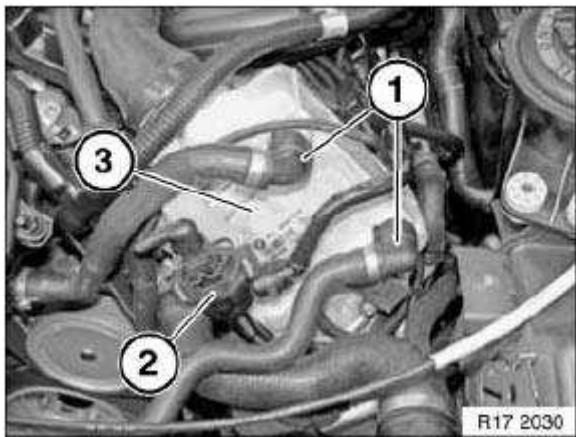


Fig. 58: Identifying Coolant Hoses, Tank Venting Valve And Intercooler
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Release screw (2).

Tightening torque 13 71 6AZ, see **13 71 AIR INTAKE DUCT**

Installation:

Screw (2) is longer than screws (3)

Unscrew screws (3).

Tightening torque 13 71 6AZ, see **13 71 AIR INTAKE DUCT**

Release clamp (4) on throttle valve unit.

Tightening torque 13 71 7AZ, see **13 71 AIR INTAKE DUCT**

Lift out intercooler.

Installation:

Only when replacing intercooler .

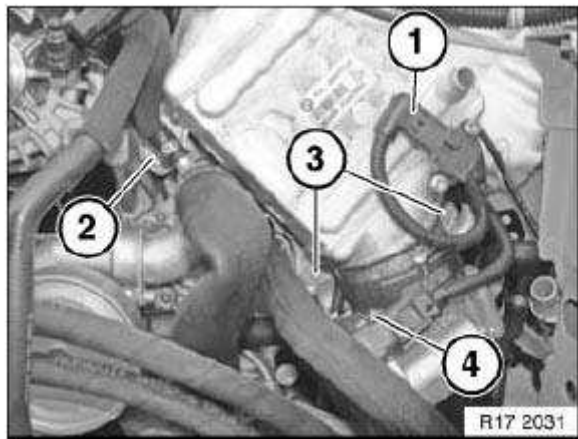


Fig. 59: Identifying Throttle Valve Unit, Clamp And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Modify holder of tank venting valve.

Modify **pressure sensor** on intercooler. See **13 62 591 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON LEFT INTERCOOLER (N63) .**

Modify charge-air hose.

Replace faulty hose clamps.

After completing work, fill intercooler with coolant.

Vent **cooling system for intercooler** .

Check cooling system for leaks.

Assemble engine.

17 51 001 REMOVING AND INSTALLING/REPLACING RIGHT INTERCOOLER (N63)

WARNING: Danger of scalding!

Only perform this work after engine has cooled down.

Necessary preliminary tasks:

- Remove **acoustic cover** from top of engine.
- Remove front **underbody protection** . See **51 47 490 REMOVING AND INSTALLING/REPLACING FRONT UNDERBODY PROTECTION** .
- Remove **fan cowl**
- Drain coolant for intercooler.

Release clamp (1).

Tightening torque 13 71 8AZ, see **13 71 AIR INTAKE DUCT**

Release clamp (2).

Replace clamp (2).

Remove right charge-air duct (3).

Check gasket on turbocharger, replacing if necessary.

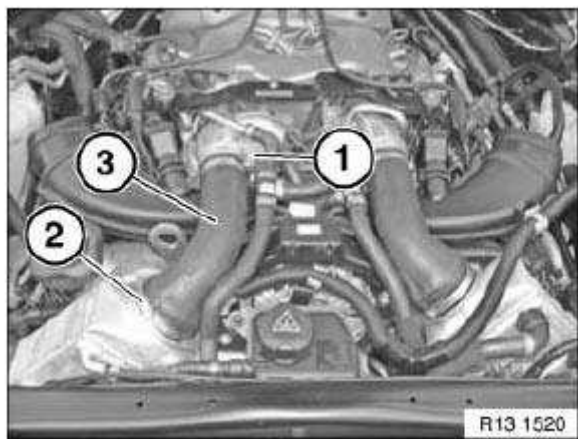


Fig. 60: Identifying Right Charge-Air Duct And Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: When detaching the coolant hoses from the intercooler, make sure that the connector remains connected to the throttle valve assembly. Do not allow any coolant to get into the plug connection on the throttle valve assembly.

Release and disconnect coolant hoses (1).

Detach coolant hose (2) from intercooler.

Replace faulty clamps.

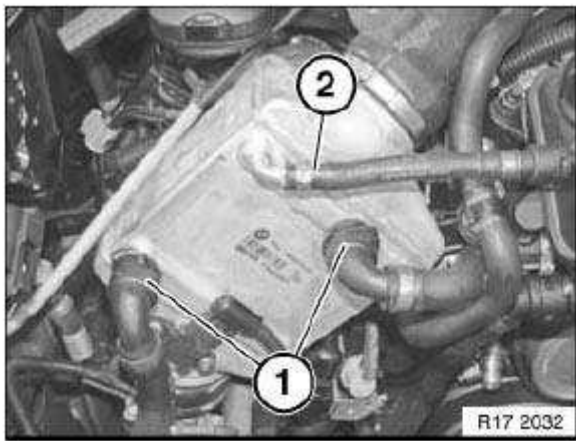


Fig. 61: Identifying Coolant Hoses And Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock plug (1) and remove.

Release screw (2).

Tightening torque 13 71 6AZ, see **13 71 AIR INTAKE DUCT**

Installation:

Screw (2) is longer than screws (3)

Unscrew screws (3).

Tightening torque 13 71 6AZ, see **13 71 AIR INTAKE DUCT**

Release clamp (4) on throttle valve unit.

Tightening torque 13 71 7AZ, see **13 71 AIR INTAKE DUCT**

Lift out intercooler.

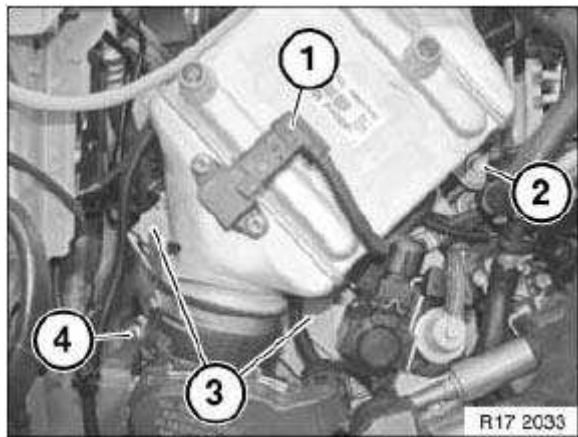


Fig. 62: Identifying Plug, Clamp And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Only when replacing intercooler .

Modify **pressure sensor** on intercooler. See **13 62 591 REMOVING AND INSTALLING/REPLACING PRESSURE SENSOR ON LEFT INTERCOOLER (N63) .**

Modify charge-air hose.

Replace faulty hose clamps.

After completing work, fill intercooler with coolant.

Vent **cooling system for intercooler** .

Check cooling system for leaks.

Assemble engine.

17 51 020 REMOVING AND INSTALLING OR REPLACING SUPPLEMENTARY COOLANT PUMP FOR INTERCOOLER (N63)

Necessary preliminary tasks:

- Check stored fault message.
- Switch off ignition.
- Remove **fan cowl** .
- Drain coolant for intercooler

Release clamp (1) and detach coolant hose.

Unlock and detach coolant hose (2).

Unlock plug (3) and remove.

Release screw (4).

Remove supplementary coolant pump (5).

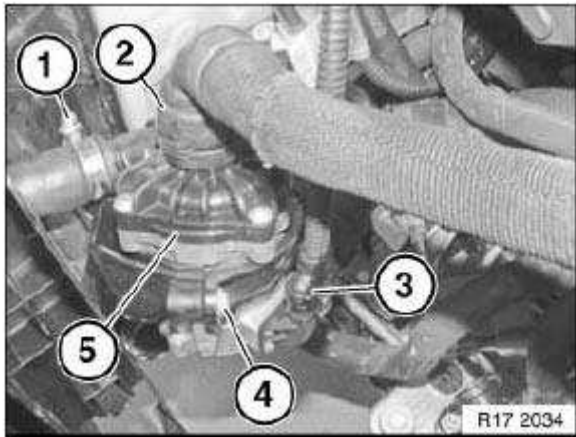


Fig. 63: Identifying Supplementary Coolant Pump, Plug And Clamp
Courtesy of BMW OF NORTH AMERICA, INC.

After completing work, fill intercooler with coolant.

Vent **cooling system for intercooler** .

Check cooling system for leaks.

Assemble engine.

Read out fault memory of DME control unit.

Now clear the fault memory.

ENGINE

Cooling System - Special Tools - X6

17 0 000 TESTER

NOTE: For checking cooling system for leaks and function of pressure relief valve in radiator cap. Replaced by 17 0 100

Storage location: A43, C17

Order number: 17 0 000

Tester

Consisting of:

1 = 17 0 001 Adapter

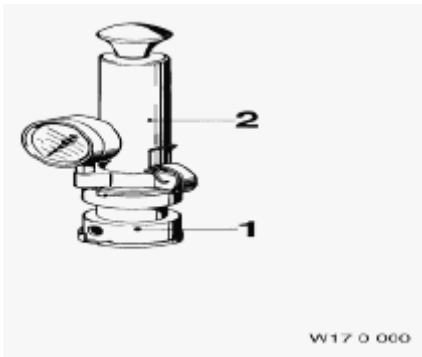


Fig. 1: Identifying Special Tool (17 0 000)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For checking pressure relief valve in radiator cap / model series: all, except E28

2 = 17 0 002 Tester without adapter

NOTE: Pressure range 0...2.5 bar / model series: all, except E28

3 = 17 0 003 Screw neck

NOTE: For screw-on radiator caps (normal thread)/ model series: E28, E30, E31, E32
Engine: all, except M51

4 = 17 0 004 Adapter

NOTE: For screw-on radiator caps (normal thread) / model series: E28, E30, E32 / Engine: M51

5 = 17 0 005 Screw neck

NOTE: For screw-on radiator caps (buttress thread) / model series: E31, E32, E34, E36, E38, E39

7 = 17 0 007 Adapter

NOTE: For checking expansion tank cap / model series: E31, E32, E34, E36, E38, E39

8 = 17 0 008 Pressure hose

9 = 17 0 009 Adapter for radiator expansion tank

NOTE: Model series: E36 / Model: M3 US Engine W10

17 0 030 PLIERS

Minimum set: Mechanical tools

NOTE: For releasing fasteners on transmission oil cooler

Series: E46, E53, E60, E61, E63, E64, E65, E66, E70, E71, E81, E83, E85, E86, E87, E90, E91, E92, E93, R50, R52, R53, RR1

Storage location: B46

SI number: 1 14 01 (766)

Order number: 17 0 030

Pliers

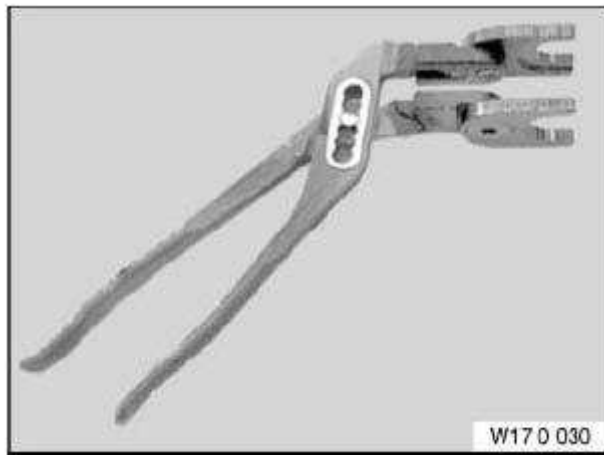


Fig. 2: Identifying Special Tool (17 0 030)
 Courtesy of BMW OF NORTH AMERICA, INC.

17 0 100 TESTER

Minimum set: Mechanical tools

NOTE: For checking engine cooling system for water leaks. For checking radiator cap.

Series: E12, E21, E23, E24, E28, E30, E30/C, E30tou, E31, E32, E32/3, E34, E34tou, E36, E36/2, E36/3, E36/5, E36/7, E36/C, E36tou, E38, E38/3, E39, E39PL, E39tou, E46, E46/16, E46/2, E46/3, E46/5, E46/C, E52, E53, E60, E61, E63, E64, E65, E66, E67, E68, E70, E71, E81, E82, E83, E85, E86, E87, E88, E90, E91, E92, E93, R50, R52, R53, R55, R56, RR1, RR2

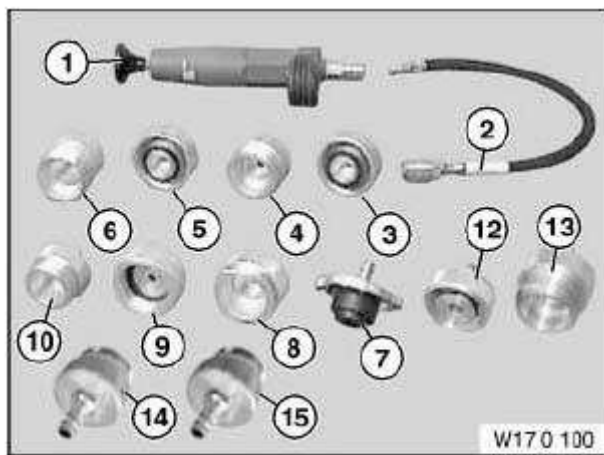


Fig. 3: Identifying Special Tool (17 0 100)
 Courtesy of BMW OF NORTH AMERICA, INC.

SI number: 01 07 02 (884)

Order number: 17 0 100

Tester

Consisting of:

1 = 17 0 101 Pump

2 = 17 0 102 Hose with quick-connect coupling

3 = 17 0 103 Adapter

NOTE: For radiator cap (normal thread)

4 = 17 0 104 Adapter

NOTE: For radiator cap (normal thread)

5 = 17 0 105 Adapter

NOTE: For radiator cap (sawtooth thread)

6 = 17 0 106 Adapter

NOTE: For radiator cap (sawtooth thread)

7 = 17 0 107 Adapter

NOTE: For radiator cap R50 / W10

8 = 17 0 108 Adapter

NOTE: For radiator cap R50 / W10

9 = 17 0 109 Adapter

NOTE: For radiator connection R53/W11, R50/W17 Adapter corresponds to 17 0 051

10= 17 0 111 Adapter

NOTE: For radiator cap R53/W11, R50/W17 Adapter corresponds to 17 0 052

11= 17 0 112 Case

2= 17 0 113 Adapter

NOTE: For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)

13= 17 0 114 Adapter

NOTE: For radiator cap Model series: E60, E61, E63, E64 SI no.: 1 08 03 (988)

14= 17 0 115 Adapter

NOTE: For radiator cap Model series: N12, N14

17 0 130 SET OF ADAPTERS

In conjunction with: 17 0 101, 17 0 102

NOTE: For connecting adapters from 17 0 000 to pump 17 0 101 and hose 17 0 102.

SI number: 01 07 02 (884)

Order number: 17 0 130

Set of adapters

Consisting of:

1 = 17 0 131 Adapter

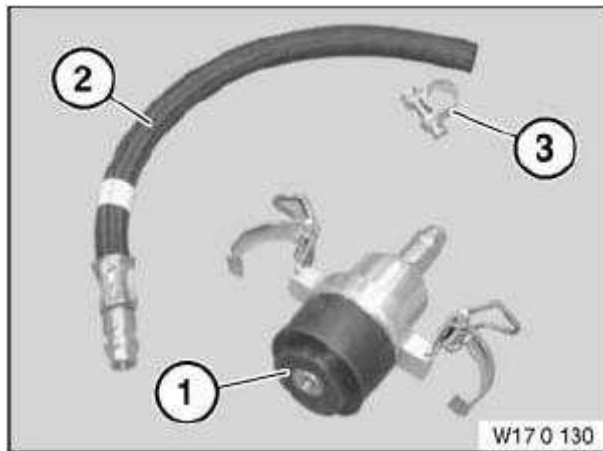


Fig. 4: Identifying Special Tool (17 0 130)

Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: For connecting pump 17 0 101 and hose 17 0 102 to adapter from 17 0 000

2 = 17 0 132 Hose with coupling connection

NOTE: For connecting pump 17 0 101 to adapter 17 0 007

3 = 17 0 133 Hose clamp

NOTE: For hose 17 0 132

17 2 010 SET OF ADAPTERS

Minimum set: Mechanical tools

In conjunction with: Oil collection units

NOTE: For flushing fluid cooler of automatic transmissions.

Transmission: A4S 310R, A5S 300J, A5S 310Z, A5S 325Z, A5S 360R, A5S 390G, A5S 440Z, A5S 560Z, GA6 HP19Z, GA6 HP26Z, GA6 HP32Z

SI number: 01 12 96 (103)

Order number: 17 2 010

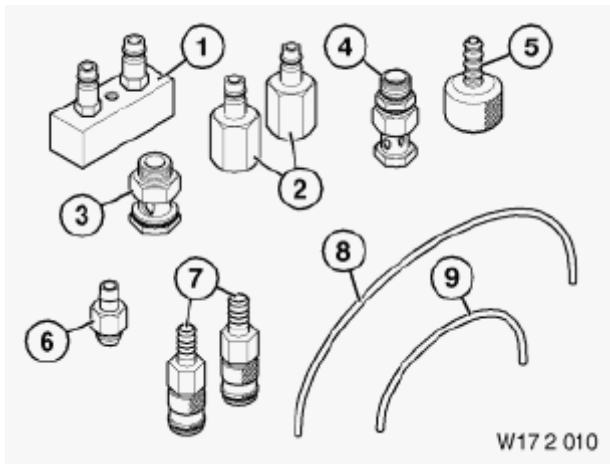


Fig. 5: Identifying Special Tool (17 2 010)
Courtesy of BMW OF NORTH AMERICA, INC.

Set of adapters

Consisting of:

1 = 17 2 011 Adapter

NOTE: For connecting oil cooler lines to oil dispensing unit - transmission: A5S 310Z,

A5S 560Z, A5S 325Z

In conjunction with: 17 2 015, 17 2 016, 17 2 017, 17 2 018, 17 2 019

1 = 17 2 021 Retaining plate

NOTE: For Adapter 17 2 011 - transmission: A5S 325Z

2 = 17 2 012 Adapter (2 x)

NOTE: For connecting oil cooler lines to oil dispensing unit - transmission: A4S 310R

In conjunction with: 17 2 015, 17 2 016, 17 2 017, 17 2 01, 17 2 018, 17 2 019

3 = 17 2 013 Banjo bolt (2 x)

NOTE: M18x1.5 thread with nut and seal for connecting oil cooler lines to oil dispensing unit - transmission: A5S 440Z

In conjunction with: 17 2 012, 17 2 015, 17 2 016, 17 2 017, 17 2 018, 17 2 019

4 = 17 2 014 Banjo bolt (2 x)

NOTE: M16x1.5 thread with nut, seal and threaded piece for connecting oil cooler lines to oil dispensing unit - transmission: A5S 300J

In conjunction with: 17 2 012, 17 2 015, 17 2 016, 17 2 017, 17 2 018, 17 2 019

5 = 17 2 015 Connecting piece

NOTE: For Tecalemit oil dispensing unit

6 = 17 2 016 Connecting piece

NOTE: For Horn oil dispensing unit

7 = 17 2 017 Coupling (2 x)

8 = 17 2 018 Hose, long

9 = 17 2 019 Hose, short

17 2 050 PLIERS SET

NOTE: For removing and installing spring band clamps (coolant hoses)

Engine: N12, N14, N54, N57, N63, W10, W11, W16, W17

SI number: 01 26 06 321

Order number: 17 2 050

Pliers set

Consisting of:

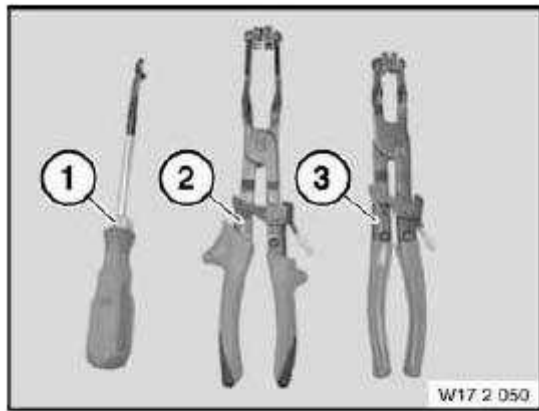


Fig. 6: Identifying Special Tool (17 2 050)
Courtesy of BMW OF NORTH AMERICA, INC.

1 = 17 2 051 Release tool

2 = 17 2 052 Pliers (bent version)

3 = 17 2 053 Pliers (straight version)

17 2 060 ADAPTER

Minimum set: Mechanical tools

In conjunction with: 17 2 017 / 018 / 019

NOTE: For flushing fluid cooler and lines of automatic transmission. Lines: Diameter 12 mm

Transmission: GA6 HP19Z

SI number: 01 14 08 (464)

Order number: 17 2 060

Adapter

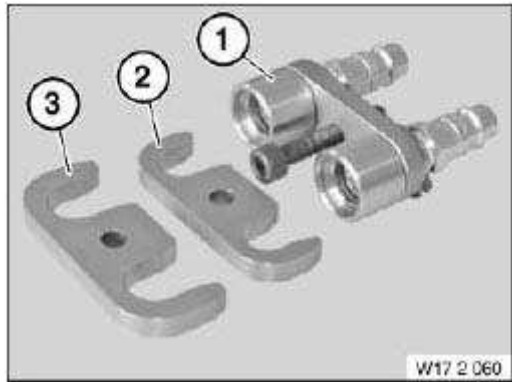


Fig. 7: Identifying Special Tool (17 2 060)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1 = 17 2 061 Adapter

2 = 17 2 062 Clamp

NOTE: Clamp for aluminium line.

3 = 17 2 063 Clamp

NOTE: Clamp for steel line with pressed-on aluminium bushing (connection).

17 2 070 ADAPTER

Minimum set: Mechanical tools

In conjunction with: 17 2 017 / 018 / 019

NOTE: For flushing fluid cooler and lines of automatic transmission. Lines: Diameter 15 mm

Transmission: GA6 HP26Z, GA6 HP32Z

SI number: 01 14 08 (464)

Order number: 17 2 070

Adapter

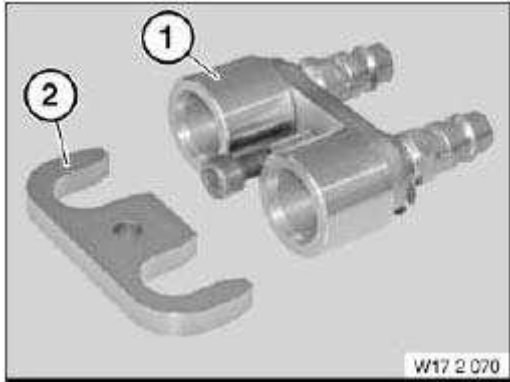


Fig. 8: Identifying Special Tool (17 2 070)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1 = 17 2 071 Adapter

2 = 17 2 072 Clamp

17 2 080 ADAPTER

Minimum set: Mechanical tools

In conjunction with: 17 2 017 / 018 / 019

NOTE: **For flushing fluid cooler and lines of automatic transmission. Lines: Plastic lines**

Transmission: GA6 HP26Z

SI number: 01 14 08 (464)

Order number: 17 2 080

Adapter

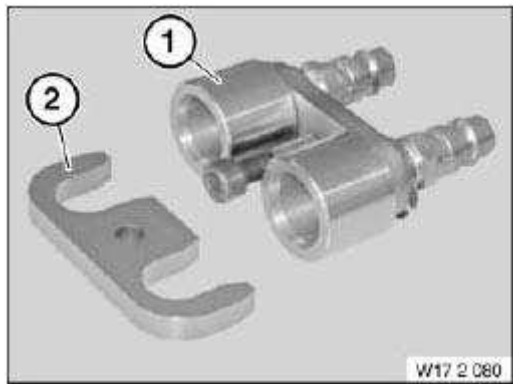


Fig. 9: Identifying Special Tool (17 2 080)
Courtesy of BMW OF NORTH AMERICA, INC.

Consisting of:

1 = 17 2 081 Adapter

2 = 17 2 082 Clamp

ENGINE

Cooling System - Technical Data

COOLANT, CHECKING COOLANT

17 00 COOLANT, COOLING SYSTEM TEST E71/N54

COOLANT, COOLING SYSTEM TEST E71/N54-SPECIFICATION

Coolant volume (incl. heater) MT	Litres	
Coolant volume (incl. heater) AT	Litres	
with integrated air conditioner MT	Litres	
with integrated air conditioner AT	Litres	10.9
Test pressure for cooling system (gauge pressure)	bar	1.5

17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63

RADIATOR AND MOUNTING PARTS E71/N54/N63-SPECIFICATION

Cap for cooling system		
Pressure relief valve opens at overpressure to ambient pressure	bar	2 ^{+0.1} -0.2
Vacuum valve must open at latest at partial vacuum to ambient pressure	bar	0.1
Test pressure, coolant radiator (gauge pressure)	bar	2.0

ENGINE RADIATOR

17 11 RADIATOR AND MOUNTING PARTS E71/N54/N63

RADIATOR AND MOUNTING PARTS E71/N54/N63-SPECIFICATION

Cap for cooling system		
Pressure relief valve opens at overpressure to ambient pressure	bar	2 ^{+0.1} -0.2
Vacuum valve must open at latest at partial vacuum to ambient pressure	bar	0.1
Test pressure, coolant radiator (gauge pressure)	bar	2.0

ENGINE

Cooling System - Technical Data - X6

COOLANT CHECKING COOLANT

17 00 COOLANT, COOLING SYSTEM TEST E71 / N63

COOLANT - TECHNICAL DATA

Coolant volume (incl. heater) MT	Litres	
Coolant volume (incl. heater) AT	Litres	
with integrated air conditioner MT	Litres	
with integrated air conditioner AT	Litres	17.2
Test pressure for cooling system (gauge pressure)	bar	1.5

17 11 RADIATOR AND MOUNTING PARTS E71 / N54 / N63

RADIATOR AND MOUNTING PARTS - TECHNICAL DATA

Cap for cooling system		
Pressure relief valve opens at overpressure to ambient pressure	bar	2 ^{+0.1} -0.2
Vacuum valve must open at latest at partial vacuum to ambient pressure	bar	0.1
Test pressure, coolant radiator (gauge pressure)	bar	2.0

ENGINE RADIATOR

17 11 RADIATOR AND MOUNTING PARTS E71 / N54 / N63

RADIATOR AND MOUNTING PARTS - TECHNICAL DATA

Cap for cooling system		
Pressure relief valve opens at overpressure to ambient pressure	bar	2 ^{+0.1} -0.2
Vacuum valve must open at latest at partial vacuum to ambient pressure	bar	0.1
Test pressure, coolant radiator (gauge pressure)	bar	2.0

ENGINE

Cooling System - Tightening Torques

COOLANT, CHECKING COOLANT

17 00 COOLANT

COOLANT-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Hose clamps to coolant hoses 32 ... 48 mm dia.	All			2.5 Nm
2AZ Bleed screw (WAF 8) to thermostat housing	All, without E46			8 Nm
Plastic bleed screws to coolant lines	E46			2 -0.5/+1 Nm
3AZ Level switch (WAF 30) to coolant expansion tank	All			3 Nm
4AZ Bleed screw to water valve or auxiliary water pump	E90/E91			3.5 Nm

RADIATOR, EXPANSION TANK

17 10 RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)

RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Assembly, cooling module: module carrier cover, oil-coolant heat exchanger, thermostat with housing, power steering cooler	N62TU/N52K/ M57T2	K60 x 20		5 Nm
2AZ Expansion tank to spring strut dome	N62TU/N52K/M57T2	M6		8 Nm

ENGINE RADIATOR

17 10 RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)

RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Assembly, cooling module:				

module carrier cover, oil-coolant heat exchanger, thermostat with housing, power steering cooler	N62TU/N52K/M57T2	K60 x 20		5 Nm
2AZ Expansion tank to spring strut dome	N62TU/N52K/M57T2	M6		8 Nm

17 12 COOLANT LINES

COOLANT LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Hose to connection, feed line/crankcase	N54	L16-29	Clamp	3 Nm
2AZ Assembly: coolant pipe to front axle carrier	N54	M6x34		7.5 Nm

17 11 RADIATOR AND MOUNTING PARTS

RADIATOR AND MOUNTING PARTS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Radiator to body				
self-tapping screw	All	B6.3		9 Nm
	All	M6		10 Nm
2AZ Drain plug to radiator	All			2.5 Nm
3AZ Temperature switch to radiator (91 °C/99 °C) max.	All			15 Nm
4AZ Expansion tank to body	All			9 Nm
	M57TU/E65			4 Nm
5AZ Radiator on module carrier	E46			4 + 1 Nm
6AZ Retaining plate, expansion tank, to radiator	E46			4 + 1 Nm
7AZ Fan cowl on radiator	E46			4 + 1 Nm
8AZ Plug in radiator (temperature switch omitted)	E36/7/M54	M14 x 1.5		15 Nm
9AZ Mounting plate to radiator	M57TU/E65			4.5 Nm
10AZ Radiator bracket	All			2.5 Nm

OIL COOLER

17 10 RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)

RADIATOR, EXPANSION TANK, LINES (N62TU, N52K, M57T2)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
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1AZ Assembly, cooling module: module carrier cover, oil-coolant heat exchanger, thermostat with housing, power steering cooler	N62TU/N52K/M57T2	K60 x 20		5 Nm
2AZ Expansion tank to spring strut dome	N62TU/N52K/M57T2	M6		8 Nm

17 12 COOLANT LINES

COOLANT LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Hose to connection, feed line/crankcase	N54	L16-29	Clamp	3 Nm
2AZ Assembly: coolant pipe to front axle carrier	N54	M6x34		7.5 Nm

17 21 ENGINE OIL COOLER

ENGINE OIL COOLER-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Engine oil cooler to body	All			14 Nm
Oil cooler vapor extraction guide to trim panel	E36/M3	B4.8		4 Nm

17 21 ENGINE OIL COOLER AND LINES

ENGINE OIL COOLER AND LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Engine oil cooler line to oil filter control housing	N54	M8 x 25		19 Nm
2AZ Engine oil cooler line to engine oil cooler flange	N54	M8 x 25		19 Nm
3AZ Engine oil cooler to cooler locating plate	N54	BM8		20 Nm
4AZ Engine oil cooler to bracket, engine carrier	N54	M6 x 20		8 Nm

17 22 TRANSMISSION OIL COOLER LINES

TRANSMISSION OIL COOLER LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Assembly, transmission oil cooler line to oil sump	N54	M6		10 Nm
Transmission oil line to transmission oil cooler	N54	M6x35		8 Nm
2AZ Assembly, transmission oil cooler line to transmission	N54	M6x30		8 Nm
Transmission oil cooler to front axle	N54	M6x35		8 Nm
3AZ Assembly, transmission oil cooler line to transmission	N54	M8x28		20 Nm
4AZ Assembly, transmission oil cooler line to transmission oil-water heat exchanger, Minimodule	N54	M6x30		8 Nm

OIL COOLER LINES

17 22 TRANSMISSION OIL COOLER LINES

TRANSMISSION OIL COOLER LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Assembly, transmission oil cooler line to oil sump	N54	M6		10 Nm
Transmission oil line to transmission oil cooler	N54	M6x35		8 Nm
2AZ Assembly, transmission oil cooler line to transmission	N54	M6x30		8 Nm
Transmission oil cooler to front axle	N54	M6x35		8 Nm
3AZ Assembly, transmission oil cooler line to transmission	N54	M8x28		20 Nm
4AZ Assembly, transmission oil cooler line to transmission oil-water heat exchanger, Minimodule	N54	M6x30		8 Nm

17 40 ADDITIONAL FAN (ELECTRIC)

ADDITIONAL FAN (ELECTRIC)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Electric auxiliary fan on fan cowl	E46			6 Nm
2AZ Electronics for auxiliary fan on fan cowl	E46			6 Nm

17 22 OIL COOLER PIPES

OIL COOLER PIPES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
5AZ Cap nut on transmission oil cooler (on radiator) and on transmission	All	M18 x 1.5		20 Nm
	5HP30	M22 x 1.5		28 Nm
6AZ Oil lines on transmission				
Hollow bolt	All	M16 x 1.5		37 Nm
7AZ Oil lines on transmission oil cooler	A 5 S 300 J			28 Nm
Hollow bolt	All	M14 x 1.5		27 Nm
8AZ Screw-in fitting on transmission	All	M14x1.5 und M16x1.5		37 Nm
9AZ Oil hose on oil pipe	E23			28 Nm
10AZ Oil pipe bracket on radiator	E23			2 Nm
11AZ Oil pipe bracket on body	E23			6.5 Nm
12AZ Oil cooler on transmission	5HP30			10 Nm
13AZ Transmission oil cooler line to transmission	N42	M8		21 Nm

AUXILIARY ELECTRICAL

17 40 ADDITIONAL FAN (ELECTRIC)

ADDITIONAL FAN (ELECTRIC)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Electric auxiliary fan on fan cowl	E46			6 Nm
2AZ Electronics for auxiliary fan on fan cowl	E46			6 Nm

ENGINE

Cooling System - Tightening Torques - X6

COOLANT CHECKING

17 00 COOLANT

COOLANT-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Hose clamps to coolant hoses 32 ... 48 mm dia.	All			2.5 Nm
2AZ Bleed screw (WAF 8) to thermostat housing	All, without E46			8 Nm
Plastic bleed screws to coolant lines	E46			2 -0.5/+1 Nm
3AZ Level switch (WAF 30) to coolant expansion tank	All			3 Nm
4AZ Bleed screw to water valve or auxiliary water pump	E90/E91			3.5 Nm

17 10 COOLANT

COOLANT-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Expansion tank to body	N63	M6		10 Nm
2AZ Expansion tank for intercooler to holder	N63	M6		8 Nm
3AZ Coolant pipe to cylinder head cover	N63	M6		10 Nm

ENGINE RADIATOR

17 11 RADIATOR AND MOUNTING PARTS

RADIATOR AND MOUNTING PARTS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Radiator to body				
self-tapping screw	All	B6.3		9 Nm
	All	M6		10 Nm
2AZ Drain plug to radiator	All			2.5 Nm
3AZ Temperature switch to radiator (91°C/99°C) max.	All			15 Nm
4AZ Expansion tank to body	All			9 Nm

	M57TU/E65			4 Nm
5AZ Radiator on module carrier	E46			4 + 1 Nm
6AZ Retaining plate, expansion tank, to radiator	E46			4 + 1 Nm
7AZ Fan cowl on radiator	E46			4 + 1 Nm
8AZ Plug in radiator (temperature switch omitted)	E36/7/M54	M14 x 1.5		15 Nm
9AZ Mounting plate to radiator	M57TU/E65			4.5 Nm
10AZ Radiator bracket	All			2.5 Nm

OIL COOLER

17 21 ENGINE OIL COOLER

ENGINE OIL COOLER-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Engine oil cooler to body	All			14 Nm
Oil cooler vapor extraction guide to trim panel	E36/M3	B4.8		4 Nm

17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES

ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Transmission oil cooler line to transmission	N63	M8		21 Nm
2AZ Holder, transmission oil cooler line, to front axle carrier	N63	M6		8 Nm
3AZ Transmission oil cooler line to holder	N63	M6		10 Nm
4AZ Engine oil cooler line to oil sump thermostat	N63	M8		21 Nm
5AZ Engine cooler line to holder, front axle carrier and oil sump	N63	M6		10 Nm
6AZ Holder, engine oil cooler line, to front axle carrier	N63	M6		8 Nm
7AZ Holder, engine oil cooler line, to oil sump	N63	M6		10 Nm
8AZ Thermostat cartridge to transmission oil cooler	N63	M6		nut 6 Nm
9AZ Transmission oil line to transmission oil cooler	N63	M6		10 Nm
10AZ Transmission oil cooler to front axle carrier	N63	M6		10 Nm
11AZ Engine oil line to engine oil cooler	N63	M6		10 Nm
12AZ Engine oil line, holder, to strut	N63	M6 nut		10 Nm

OIL COOLER LINES

17 22 ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES

ENGINE OIL COOLER LINES AND TRANSMISSION OIL COOLER LINES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Transmission oil cooler line to transmission	N63	M8		21 Nm
2AZ Holder, transmission oil cooler line, to front axle carrier	N63	M6		8 Nm
3AZ Transmission oil cooler line to holder	N63	M6		10 Nm
4AZ Engine oil cooler line to oil sump thermostat	N63	M8		21 Nm
5AZ Engine cooler line to holder, front axle carrier and oil sump	N63	M6		10 Nm
6AZ Holder, engine oil cooler line, to front axle carrier	N63	M6		8 Nm
7AZ Holder, engine oil cooler line, to oil sump	N63	M6		10 Nm
8AZ Thermostat cartridge to transmission oil cooler	N63	M6 nut		6 Nm
9AZ Transmission oil line to transmission oil cooler	N63	M6		10 Nm
10AZ Transmission oil cooler to front axle carrier	N63	M6		10 Nm
11AZ Engine oil line to engine oil cooler	N63	M6		10 Nm
12AZ Engine oil line, holder, to strut	N63	M6 nut		10 Nm

17 40 ADDITIONAL FAN (ELECTRIC)

ADDITIONAL FAN (ELECTRIC) - TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Electric auxiliary fan on fan cowl	E46			6 Nm
2AZ Electronics for auxiliary fan on fan cowl	E46			6 Nm

17 22 OIL COOLER PIPES

OIL COOLER PIPES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
5AZ Cap nut on transmission oil cooler (on radiator) and on transmission	All	M18 x 1.5		20 Nm
	5HP30	M22 x 1.5		28 Nm
6AZ Oil lines on transmission				
Hollow bolt	All	M16 x 1.5		37 Nm
7AZ Oil lines on transmission oil cooler	A 5 S 300 J			28 Nm
Hollow bolt	All	M14 x 1.5		27 Nm

8AZ Screw-in fitting on transmission	All	M14x1.5 und M16x1.5		37 Nm
9AZ Oil hose on oil pipe	E23			28 Nm
10AZ Oil pipe bracket on radiator	E23			2 Nm
11AZ Oil pipe bracket on body	E23			6.5 Nm
12AZ Oil cooler on transmission	5HP30			10 Nm
13AZ Transmission oil cooler line to transmission	N42	M8		21 Nm

AUXILIARY ELECTRICAL

17 40 ADDITIONAL FAN (ELECTRIC)

ADDITIONAL FAN (ELECTRIC) - TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Electric auxiliary fan on fan cowl	E46			6 Nm
2AZ Electronics for auxiliary fan on fan cowl	E46			6 Nm