

2007-09 ENGINE**Cooling System - Repair Instructions - Cooper****00 COOLANT, CHECKING COOLING SYSTEM****00 SAFETY INFORMATION FOR WORKING ON VEHICLES WITH AUTOMATIC ENGINE START-STOP SYSTEM (MSA)**

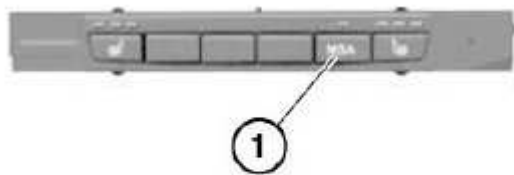
WARNING: If the engine hood/bonnet contact is pulled upwards (workshop mode), the information "switch closed" is output. The automatic engine start-stop function is active.
An automatic engine start may ensue.

Observe safety precautions when working on MSA vehicles.

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

MSA function is deactivated by:

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



R61 1948

Fig. 1: Passenger Compartment Button

Courtesy of BMW OF NORTH AMERICA, INC.

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

A = 10 mm

- Basic setting (engine hood/bonnet open)

B = 7 mm

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

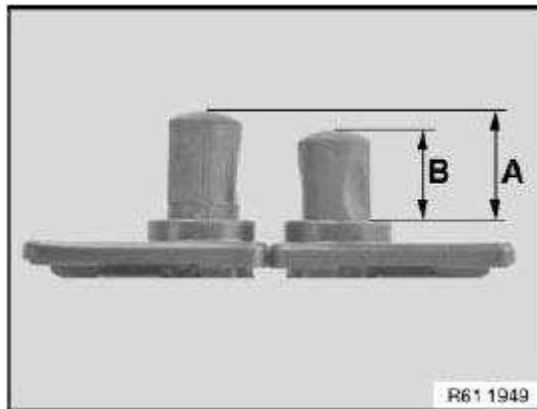


Fig. 2: Engine Hood/Bonnet Contact Setting
Courtesy of BMW OF NORTH AMERICA, INC.

When working with diagnosis tools:

- Observe instructions in diagnosis tool

17 00 ... INSTRUCTIONS FOR WORKING ON COOLING SYSTEM

WARNING: Scalding hazard!

Only carry out work on the cooling system after 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.

IMPORTANT: Make sure without fail that coolant hoses are correctly routed. Risk of damage due to sharp edges or chafing.

Recycling:

Catch and dispose of drained coolant.

Observe country-specific waste-disposal regulations.

Special tool kit 17 2 050 for removing and installing spring band clamps for coolant hoses.

- (1) Release tool
- (2) Pliers (bent version)
- (3) Pliers (straight version)

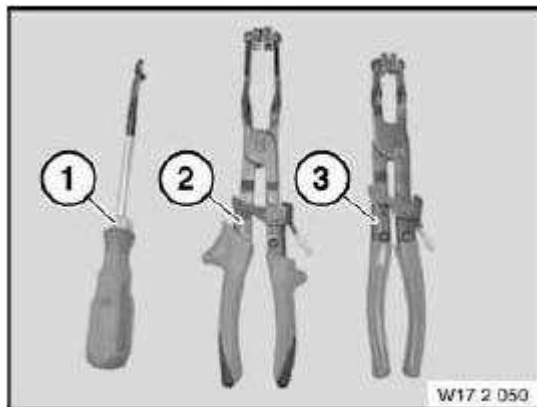


Fig. 3: Release Tool, Pliers (Bent Version) And Pliers (Straight Version)
Courtesy of BMW OF NORTH AMERICA, INC.

Release spring band clamp (1) with pliers (2).

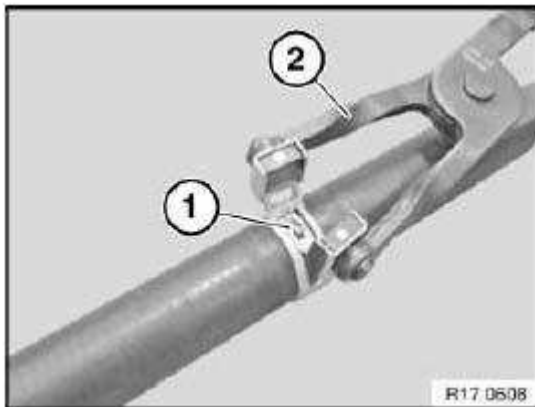


Fig. 4: Spring Band Clamp And Pliers
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock spring band clamp (1) with release tool (2).

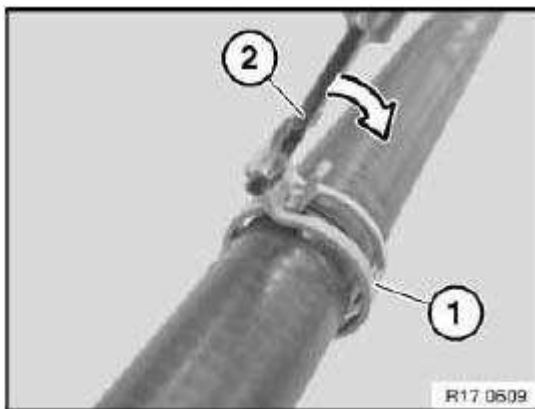


Fig. 5: Unlocking Spring Band Clamp With Release Tool
Courtesy of BMW OF NORTH AMERICA, INC.

17 00 005 DRAINING AND ADDING COOLANT (N12)

Special tools required:

- 17 2 051 **17 2 050 PLIERS SET**

WARNING: Danger of scalding!

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

IMPORTANT: Wear protective gloves and goggles.

Necessary preliminary tasks:

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Follow instructions for working on cooling system, see **17 00 ... Instructions for working on cooling system.**

After adding coolant, check cooling system for water leaks.

Draining coolant:

Unscrew cap (1) on coolant expansion tank.

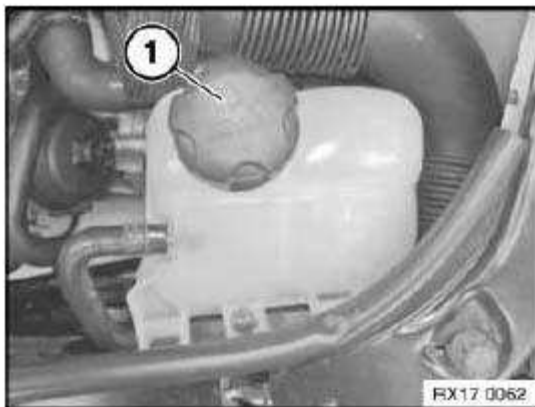


Fig. 6: Coolant Expansion Tank Cap
Courtesy of BMW OF NORTH AMERICA, INC.

Release spring strap on lower coolant hose (1) with special tool 17 2 051 .

Detach coolant hose (1). Drain, catch and dispose of coolant.

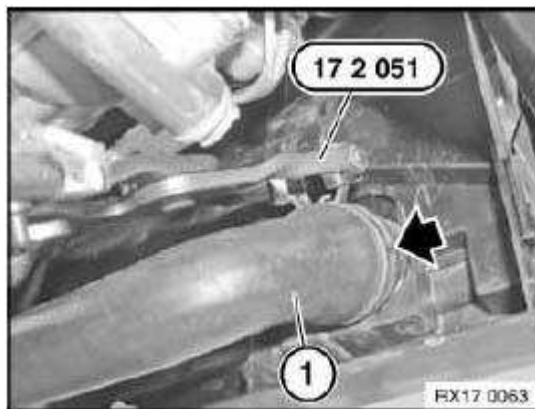


Fig. 7: Locating Coolant Hose
Courtesy of BMW OF NORTH AMERICA, INC.

Adding coolant:

NOTE: Before filling, turn on ignition and set heating control to maximum temperature.
Set fan to sow setting.

Pour in coolant slowly.

Observe mixture ratio.

The cooling system is vented during filling.

NOTE:

- **Installation location of vent screw: thermostat housing.**
- **For purposes of clarity, illustration shows and text refers to released cable duct (1).**

Release vent screw.

Pour in special coolant through expansion tank filler neck until bubble-free coolant emerges at vent screw.

Close vent screw.

Tightening torque 17 00 1AZ . See **COOLING SYSTEM - TIGHTENING TORQUES -- COOPER (N12 ENGINE)** .

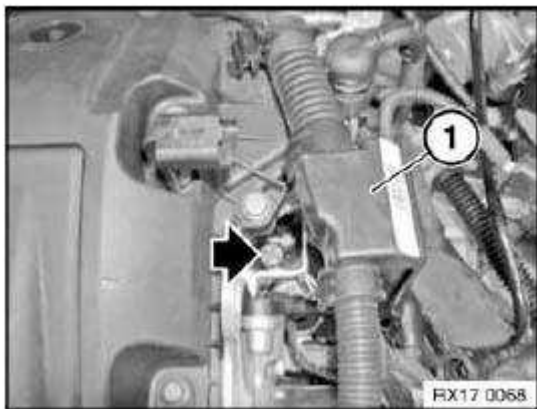


Fig. 8: Locating Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Continue topping up coolant in expansion tank to max. level (1).

Start engine and run at idle speed.

If the level drops, top up coolant until the level no longer drops.

Switch off engine and if necessary top up coolant to max. level.

Close expansion tank.

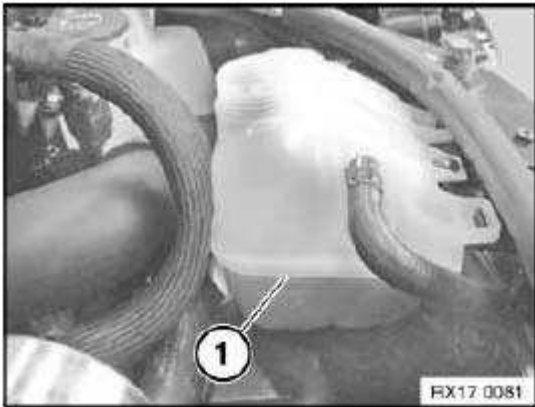


Fig. 9: Coolant Max. Level In Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Check cooling system for leaks, see 17 00 009 Checking cooling system for leaks (N12, N14)

17 00 009 CHECKING COOLING SYSTEM FOR LEAKS (N12, N14)

Special tools required:

- 17 0 101 17 0 100 TESTER
- 17 0 102 17 0 100 TESTER
- 17 0 109 17 0 100 TESTER
- 17 0 115 17 0 100 TESTER

WARNING: Risk of burning and scalding!
Only perform this work after engine has cooled down.

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!

Necessary preliminary tasks:

Follow instructions for working on cooling system, see 17 00 ... Instructions for working on cooling system.

Checking pressure drop in cooling system:

Unscrew cap from filler neck.

Connect special tool 17 0 109 to filler neck.

Connect special tools 17 0 102 and 17 0 101 .

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Build up gauge pressure and wait approx. 2 minutes, see **17 11 RADIATOR AND MOUNTING PARTS R56 / R55 / N12 / N14 / W16**

Cooling system is tight if pressure drop does not exceed 0.1 bar.

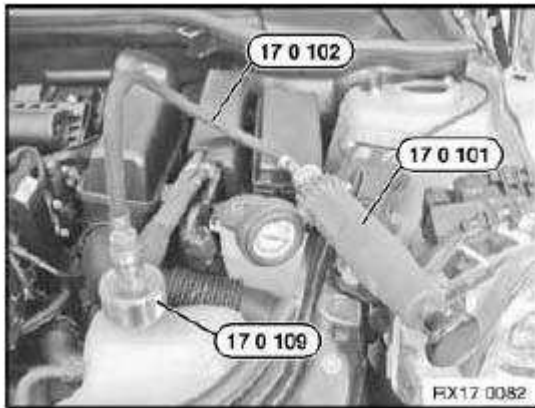


Fig. 10: Special Tools (17 0 109), (17 0 101) And (17 0 102)
Courtesy of BMW OF NORTH AMERICA, INC.

Checking pressure relief valve in cap:

Connect special tool 17 0 115 to cap (1).

Connect special tools 17 0 101 and 17 0 102 .

Pressurize cap.

Compare opening pressure of pressure relief valve, see **17 11 RADIATOR AND MOUNTING PARTS R56 / R55 / N12 / N14 / W16**

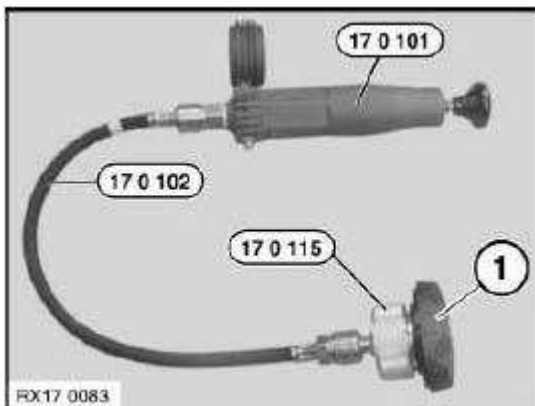


Fig. 11: Cap And Special Tools
Courtesy of BMW OF NORTH AMERICA, INC.

17 00 039 VENTING COOLING SYSTEM AND CHECKING FOR WATER LEAKS

WARNING: Danger of scalding! Only remove cap when engine has cooled down.

The cooling system is vented during filling.

This operation is described in **DRAINING AND ADDING COOLANT**.

Check cooling system for leaks, see **17 00 009 Checking cooling system for leaks (N12, N14)**

Checking coolant level:

Allow engine to cool down before checking coolant level.

Coolant temperature must not be more than 30°C.

If ambient temperature exceeds 30°C, wait until engine has cooled down to ambient temperature.

Top up coolant, see **17 00 005 Draining and adding coolant (N12)**

11 ENGINE RADIATOR WITH ATTACHMENT

17 11 000 REMOVING AND INSTALLING RADIATOR (N12)

Special tools required:

- 17 2 052 **17 2 050 PLIERS SET**

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

Necessary preliminary tasks:

- Switch off ignition
- Remove carrier for bumper trim at front, see **51 11 050 REMOVING AND INSTALLING/REPLACING CARRIER FOR FRONT BUMPER TRIM**
- Drain coolant, see **17 00 005 Draining and adding coolant (N12)**

IMPORTANT: Make sure without fail that coolant hoses are correctly routed, risk of damage by sharp edges or abrasion.

Release retaining screws for refrigerant lines (1) on front panel.

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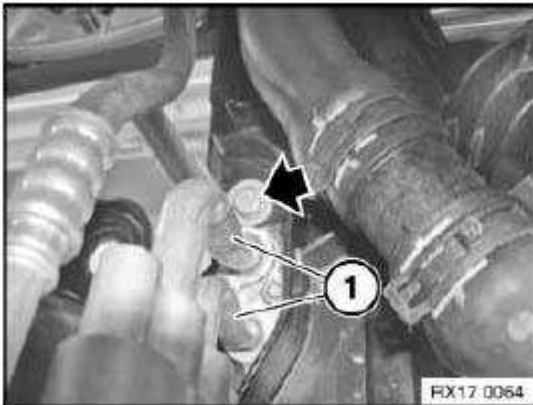


Fig. 12: Locating Refrigerant Lines Screws

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws and carefully tilt condenser (1) towards front.

**IMPORTANT: Secure condenser without fail against falling out and against bending of lines.
Bent lines can cause leaks!**

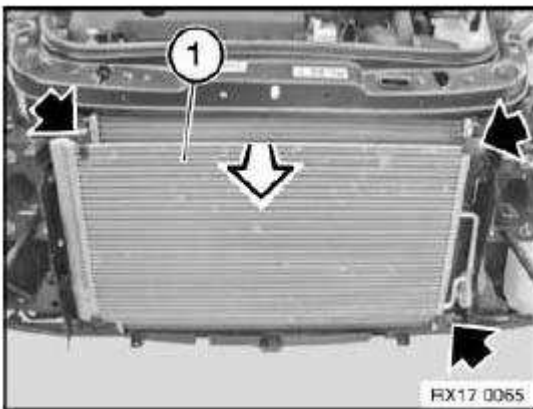


Fig. 13: Condenser

Courtesy of BMW OF NORTH AMERICA, INC.

Unclip radiator (1) at top left and right and tilt towards front.

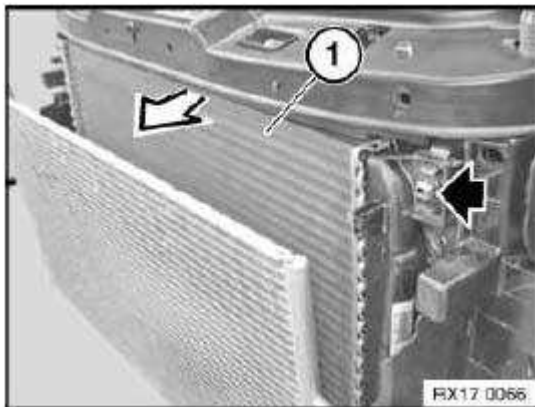


Fig. 14: Removing Radiator At Top Left And Right
Courtesy of BMW OF NORTH AMERICA, INC.

Release spring straps of both coolant hoses (1) with special tool 17 2 052 .

Detach coolant hoses (1), carefully feed out radiator (2) towards top and remove.

Do not damage the condenser in the process.

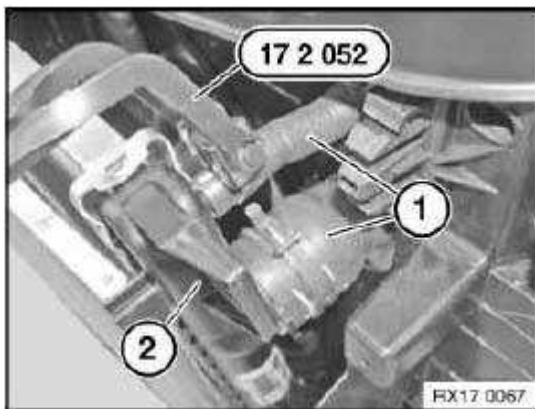


Fig. 15: Coolant Hoses, Radiator And Special Tools (17 2 052)
Courtesy of BMW OF NORTH AMERICA, INC.

17 11 001 REPLACING RADIATOR

Operation is identical to:

Removing and installing/replacing fan shroud with electric fan.

17 11 035 REMOVING AND INSTALLING/REPLACING FAN COWL WITH ELECTRIC FAN (N12)

WARNING: Scalding hazard!

Only perform this work after engine has cooled down.

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Unlock plug (1) and remove.

Release screw.

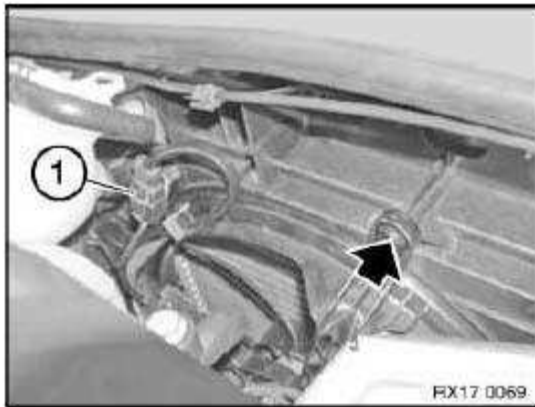


Fig. 16: Locating Screw

Courtesy of BMW OF NORTH AMERICA, INC.

Release screw.

Unlock fan cowl duct (1) in direction of arrow and remove.

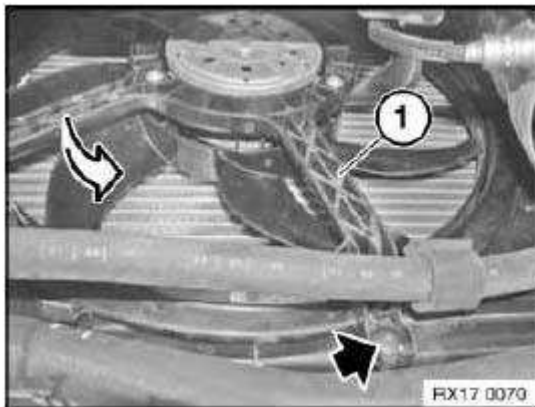


Fig. 17: Unlocking Fan Cowl Duct

Courtesy of BMW OF NORTH AMERICA, INC.

17 11 100 REMOVING AND INSTALLING/REPLACING COOLANT EXPANSION TANK (N12, N14)

Special tools required:

- 17 2 052 17 2 050 PLIERS SET

NOTE: Follow instructions for working on cooling system, see 17 00 ... Instructions for working on cooling system

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IMPORTANT: Make sure without fail that coolant hoses are correctly routed. Risk of damage due to sharp edges or chafing.

Release spring strap for hose (1) with special tool 17 2 052 and detach hose (1).

Release screw (2).

Release expansion tank (3) from rubber mount and raise slightly until lower coolant hose is accessible.

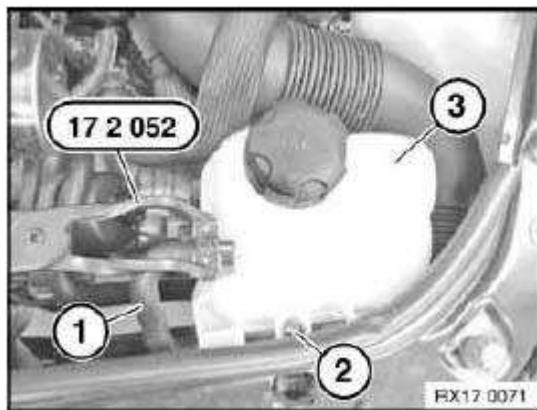


Fig. 18: Hose, Screw And Expansion Tank
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock and detach lower coolant hose (1). Catch and dispose of escaping coolant.

Remove expansion tank.

Installation:

Make sure bearing pin (2) is installed in correct position in rubber mount.

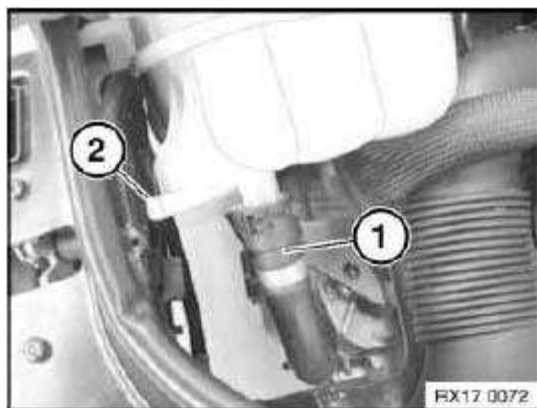


Fig. 19: Lower Coolant Hose And Bearing Pin
Courtesy of BMW OF NORTH AMERICA, INC.

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NOTE: Check coolant level, see 17 00 005 Draining and adding coolant (N12)