2003-2008 ENGINE

Cooling

19 01 01 CHECKING COOLING SYSTEM - AS OF MY 2003 (ALL MODELS)

TOOLS

Designation	Type	Number	Explanation	
Filling device	special tool	P 9696		

TOOLS AND MATERIALS

Tools and materials

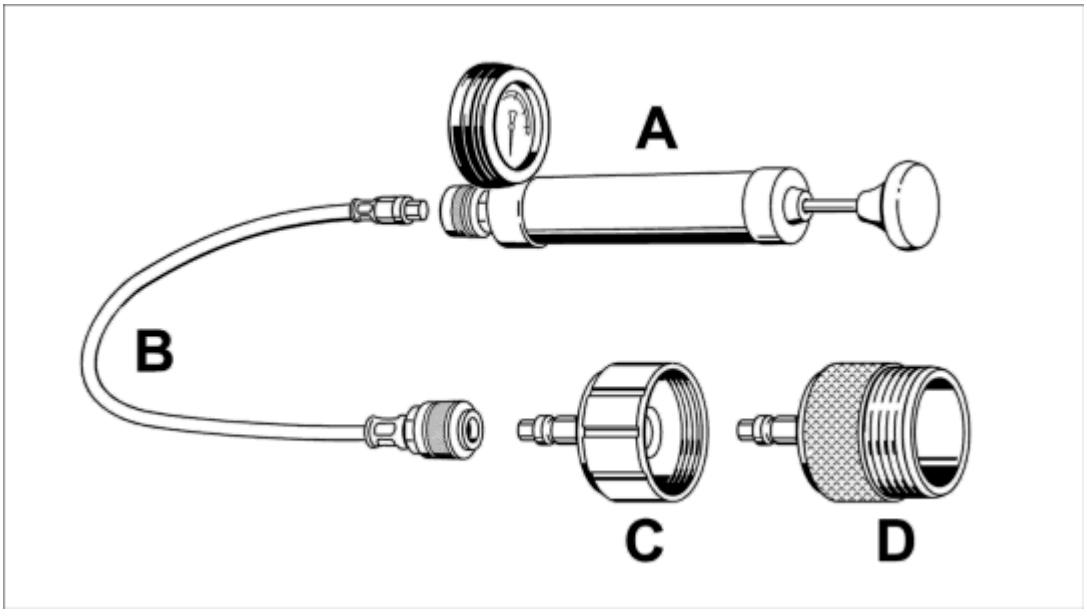


Fig. 1: Tools
Courtesy of PORSCHE OF NORTH AMERICA, INC.

A - Cooling system leak tester (pump), see Workshop Equipment Manual, Chapter 3 "WE1069"

B - Hose extension FZ 100

C - K22 cap adapter (for sports cars)

D - K60 cap adapter included (in scope of delivery **Filling device P 9696**)

CHECKING COOLING SYSTEM

Coolant: Checking the level and antifreeze content

CAUTION: Danger of poisoning!

- **Coolant additives and cleaning liquids are toxic.**

--> Swallowing coolant additives and cleaning liquids must be urgently avoided.

--> Do not consume any food or drink while working (danger of accidental mixing).

--> If swallowed, observe the warning information on the containers and contact a doctor. If necessary, show the doctor the warning information on the packaging.

WARNING: The vehicle fans can continue running or start up automatically.

- **Injuries which can lead to the loss of body parts.**

--> The power supply to the fans must be disconnected before starting work on the radiator, radiator fans, or the belt drive. Refer to **97 84 IN Fuse carrier - as of MY 2003 (All Models)** or battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

CAUTION: Risk of damaging the cooling system!

--> Do not relieve the system pressure of the cooling system and then run the engine.

--> Relieving the system pressure and subsequently starting the engine can cause severe damage to components in the cooling system. If the cooling system must be opened when it is hot, allow the cooling system to cool down before starting the engine again.

NOTE:

- ***The coolant filled in at the factory is intended to suffice for the entire service life. As long as the coolant is not contaminated by foreign bodies or other fluids it need not be changed.***
- ***Different coolant additives must not be mixed and doing so may damage the cooling system. Only use original Porsche coolant additives.***
- ***The coolant must be set to antifreeze protection of -37 °C. This corresponds to a mixing ratio of 50 : 50 (coolant additive : water). This mixing ratio provides optimum corrosion and antifreeze protection.***
- ***Coolant additives, coolants and cleaning agents must be disposed of according to the respective, applicable national laws.***
- ***Seals in the cooling system must be replaced by new ones following disassembly.***

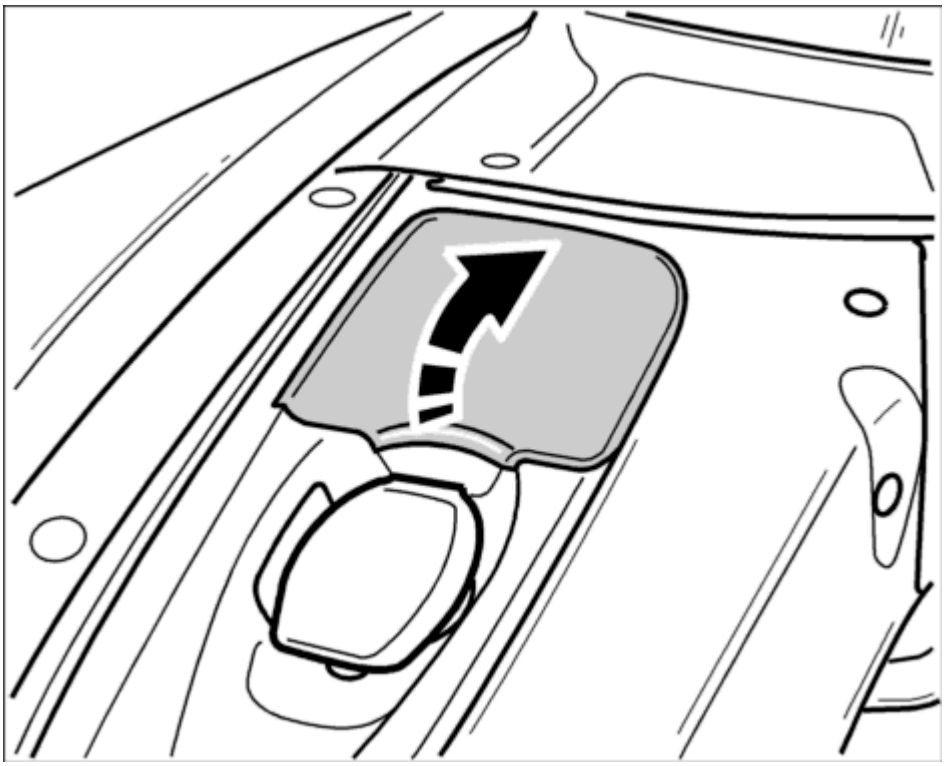


Fig. 2: Maintenance cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Open maintenance cover.

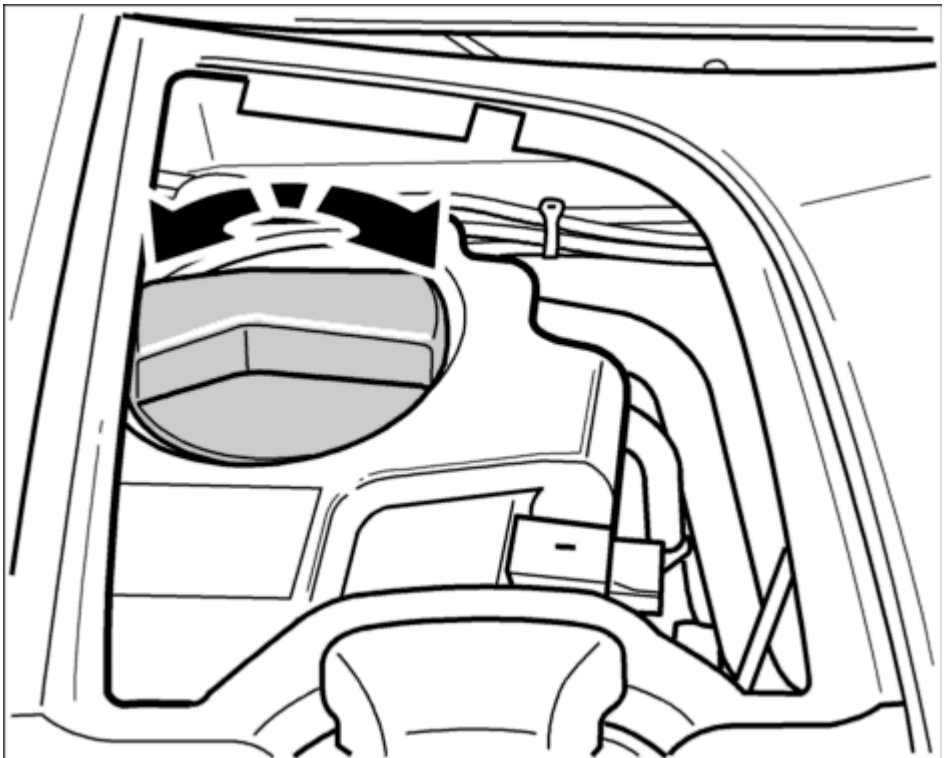


Fig. 3: Cap on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

CAUTION: Danger of scalding with hot coolant!

--> Never open the cooling system when it is hot. Emerging coolant may be very hot and can cause scalding.

--> The cooling system must be depressurized before being opened.

--> Allow engine to cool down.

2. Carefully open the cap on the coolant reservoir. Unscrew the cap in an anti-clockwise direction.

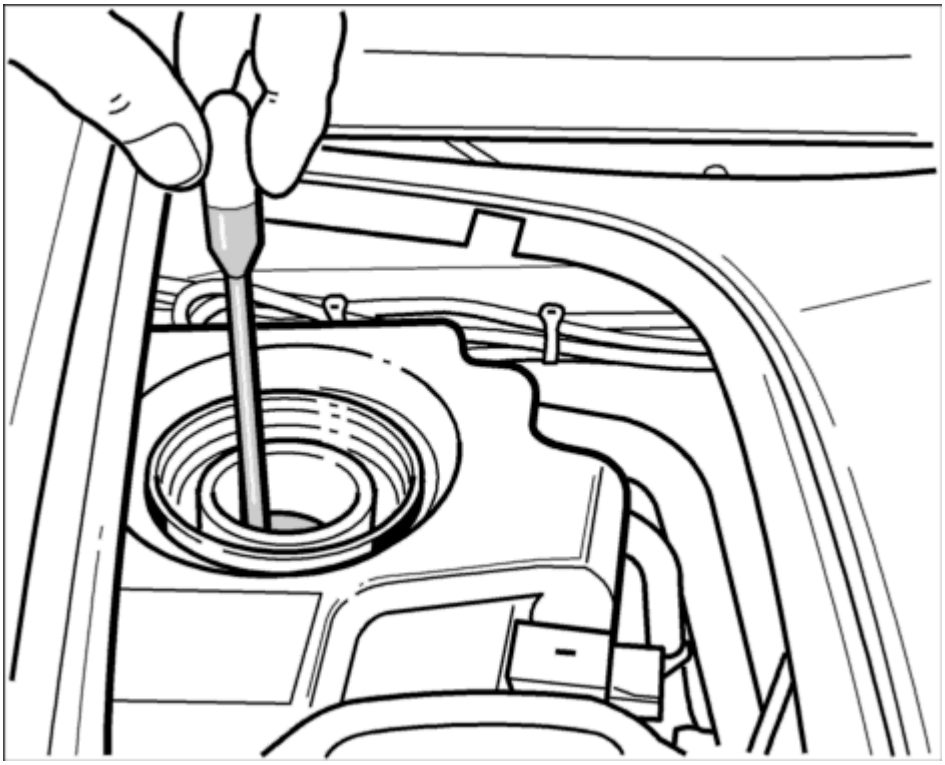


Fig. 4: Checking the antifreeze content
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Check antifreeze content with a commercially available antifreeze tester. If it is lower than -37 °C, it must be adjusted accordingly. The coolant level must not drop below the minimum mark.

NOTE:

- ***The following table specifies how much coolant must be replaced by pure antifreeze in order to adjust the freezing point to -37 °C.***

Measured antifreeze protection in °C	Antifreeze quantity to be added (in liters)

- 5	9
- 10	8.5
- 15	7.5
- 20	7
- 25	5
- 30	3.5
- 35	1.5

Checking the antifreeze content of the coolant using a refractometer

NOTE:

- ***The following diagram shows the scale used by Leitenberger.***
- ***The scale can vary slightly, depending on the manufacturer.***
- ***The ETHYLENE scale must be used for Porsche antifreeze.***

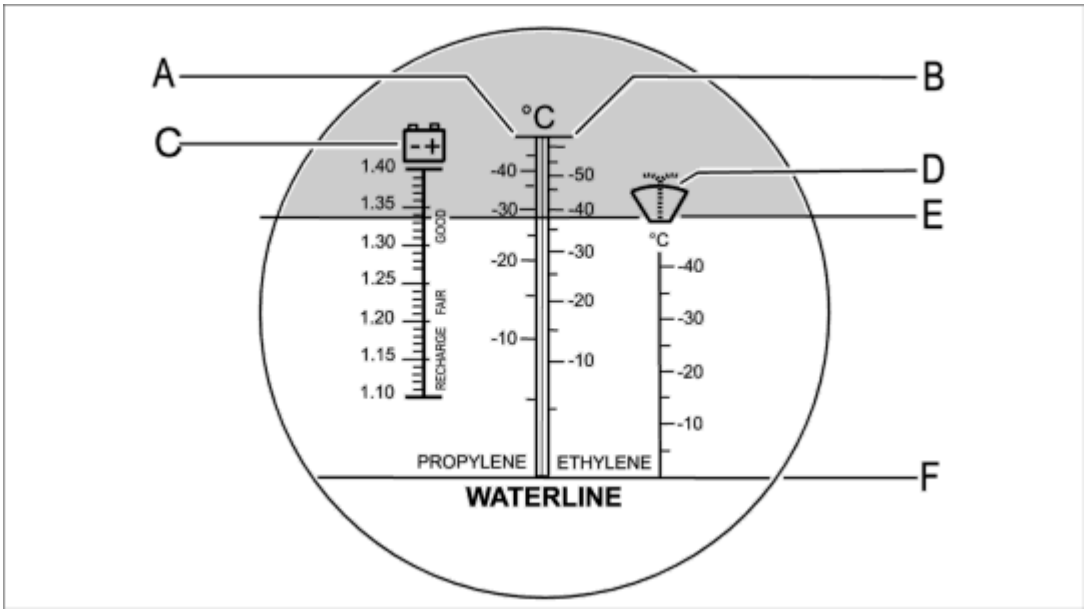


Fig. 5: Refractometer
Courtesy of PORSCHE OF NORTH AMERICA, INC.

Item	Designation of the display	Explanation
-A- See **Fig. 5**.	Scale for propylene-based coolant	Do not use for engine type M48.
-B- See **Fig. 5**.	Scale for ethylene-based coolant	Coolant such as elf GLACELF SUPRA. Use for engine type M48.
-C- See **Fig. 5**.	Scale for battery acid	The charge state of a battery can be checked here. The values on the left side indicate the specific gravity of the electrolyte. The battery must be recharged once the charge drops below 1.20.

-D- See **Fig. 5**.	Scale for alcohol-based windscreen cleaner	The freezing point of the windscreen cleaner can be read off here.
-E- See **Fig. 5**.	Light/dark limit	In conjunction with the points of intersection of the relevant scales, it specifies the value to be established.
-F- See **Fig. 5**.	Waterline	The light/dark limit must be located here when sprinkled with distilled water.

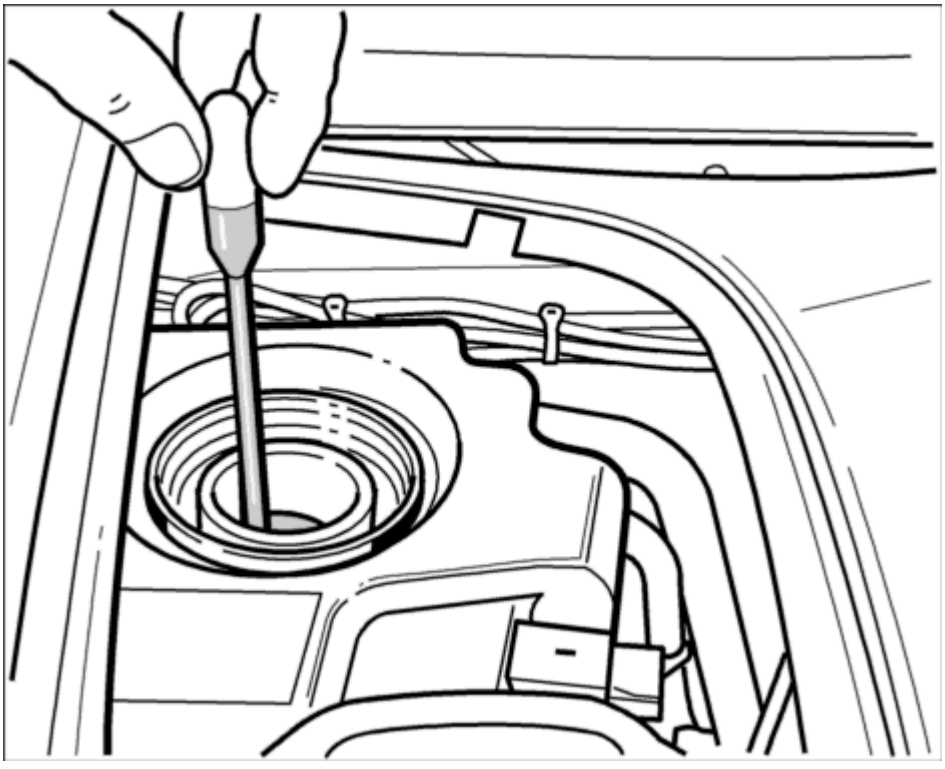


Fig. 6: Pipette
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Using a pipette, take a sample from the coolant reservoir.

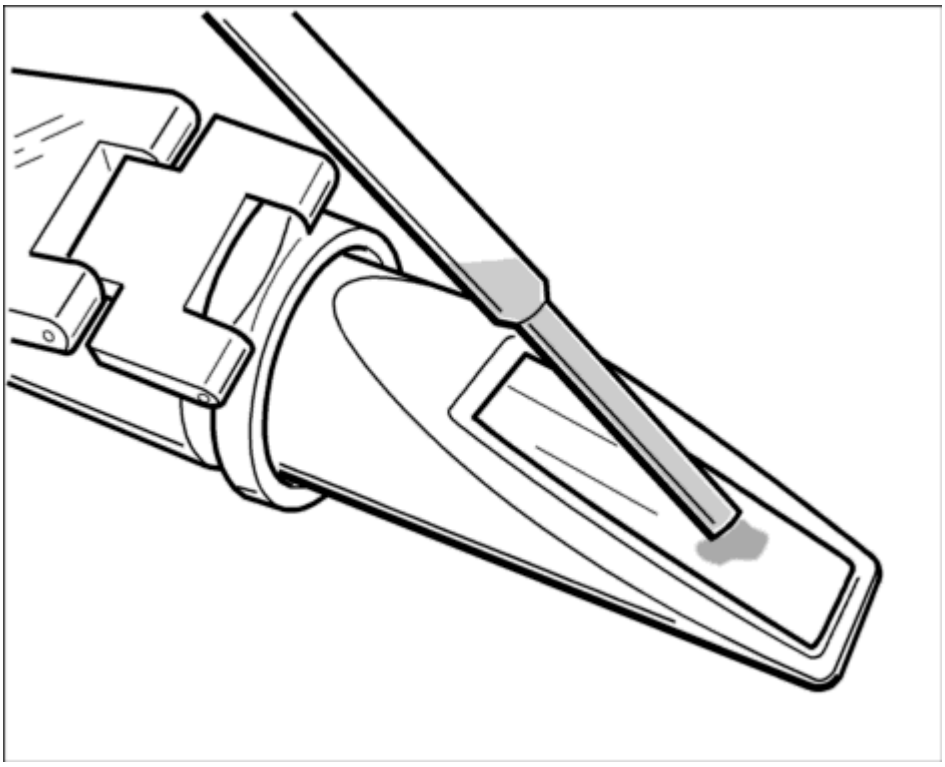


Fig. 7: Depositing drops on the test surface
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Deposit a few drops on the test surface.

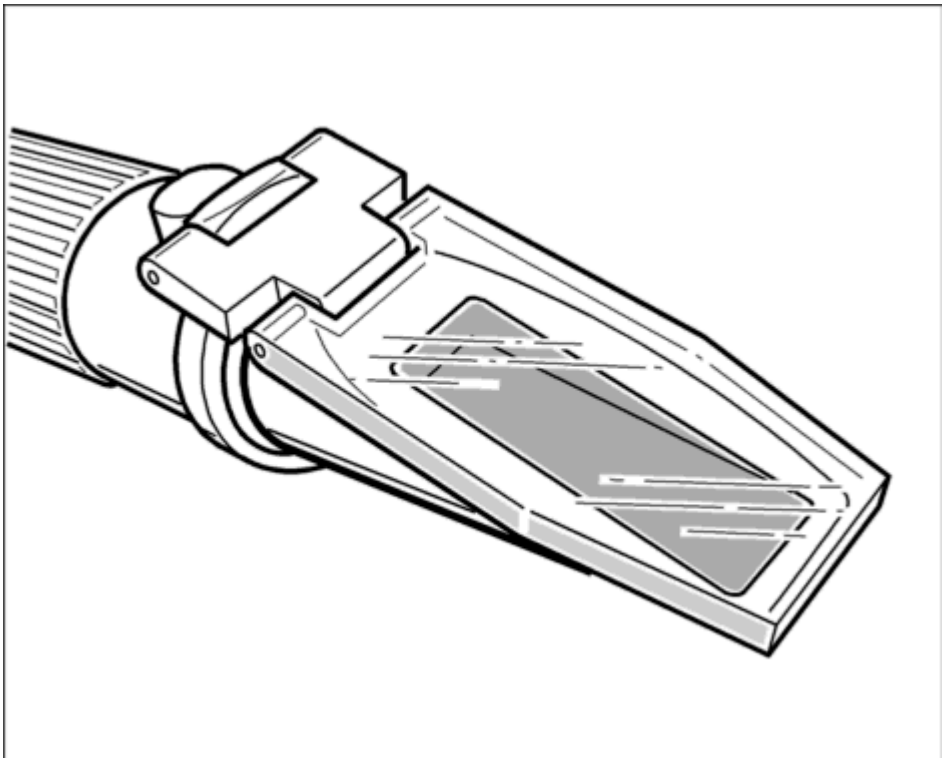


Fig. 8: Closing the light-diffusing lens
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Close the light-diffusing lens. A closed film must form.

4. Using the refractometer, view against a very bright light source. A very clear light/dark limit emerges. The point of intersection between this line and the display scale marks the freezing point of the coolant.

5. A freezing point that is too low must be adjusted accordingly.

NOTE:

- ***The following table specifies how much coolant must be replaced by pure antifreeze in order to adjust the freezing point to -37°C.***

Measured antifreeze protection in °C	Antifreeze quantity to be added (in liters)
- 5	9
- 10	8.5
- 15	7.5
- 20	7
- 25	5
- 30	3.5
- 35	1.5

Checking the cooling system for leaks

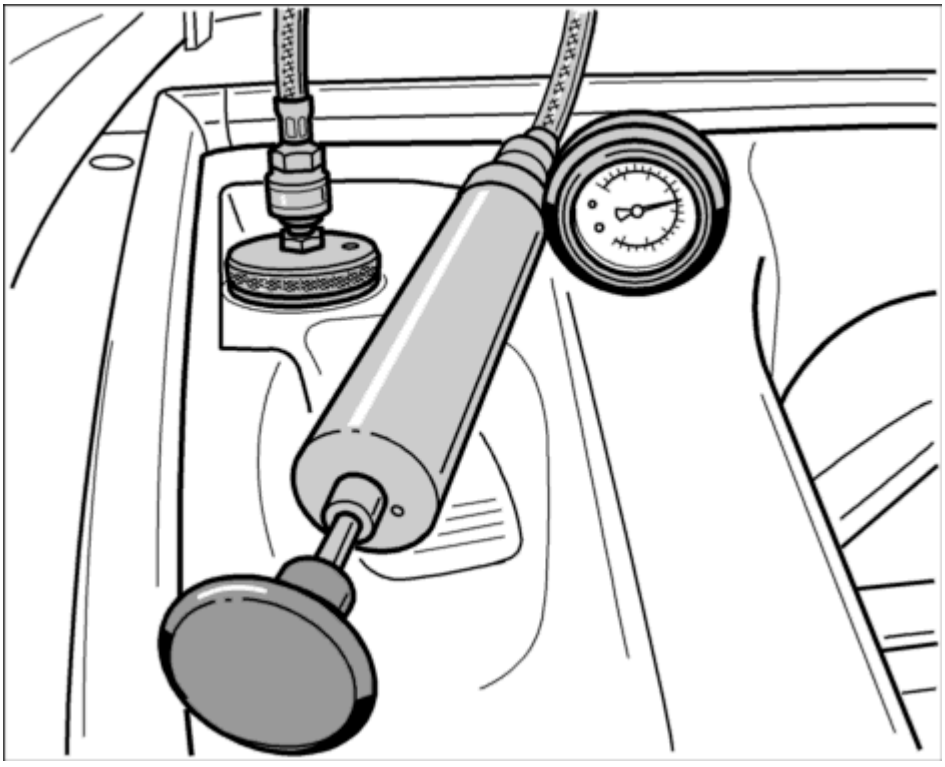


Fig. 9: Cooling system test device
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Check the cooling system for leaks. To do this, apply a test pressure of approx. 1.5 bar using the cooling system test device and check hose connections for leakage. The pressure must not drop.

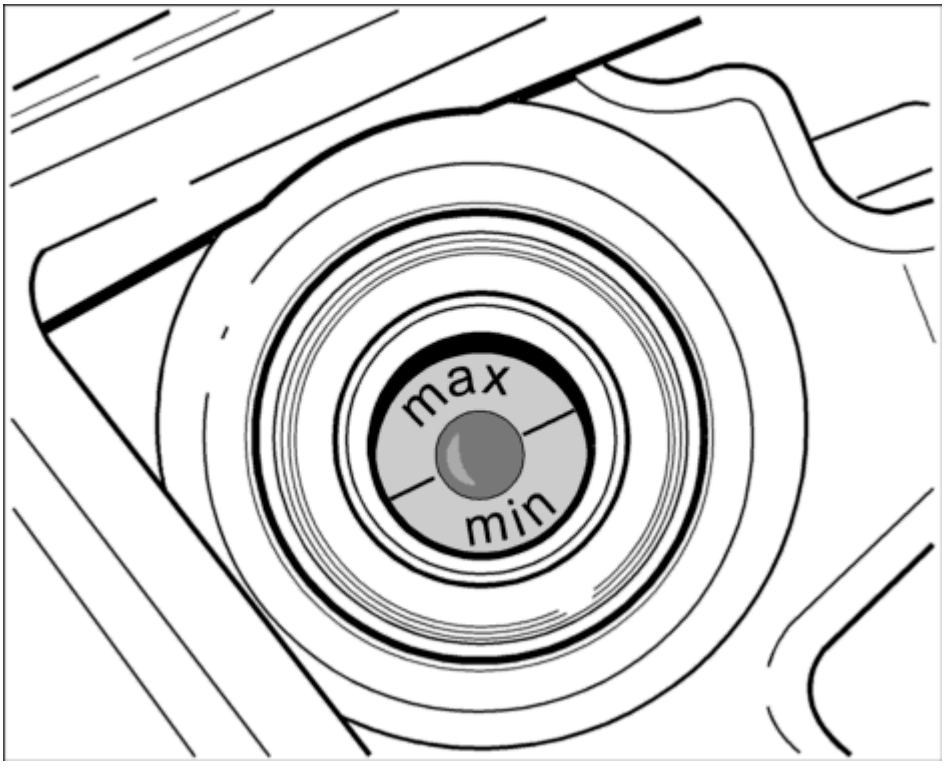


Fig. 10: Graduated disc in the opening of the reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Check the coolant level. A graduated disc with a "min" and "max" marking is located in the opening of the reservoir. The "min" level must be covered with coolant.

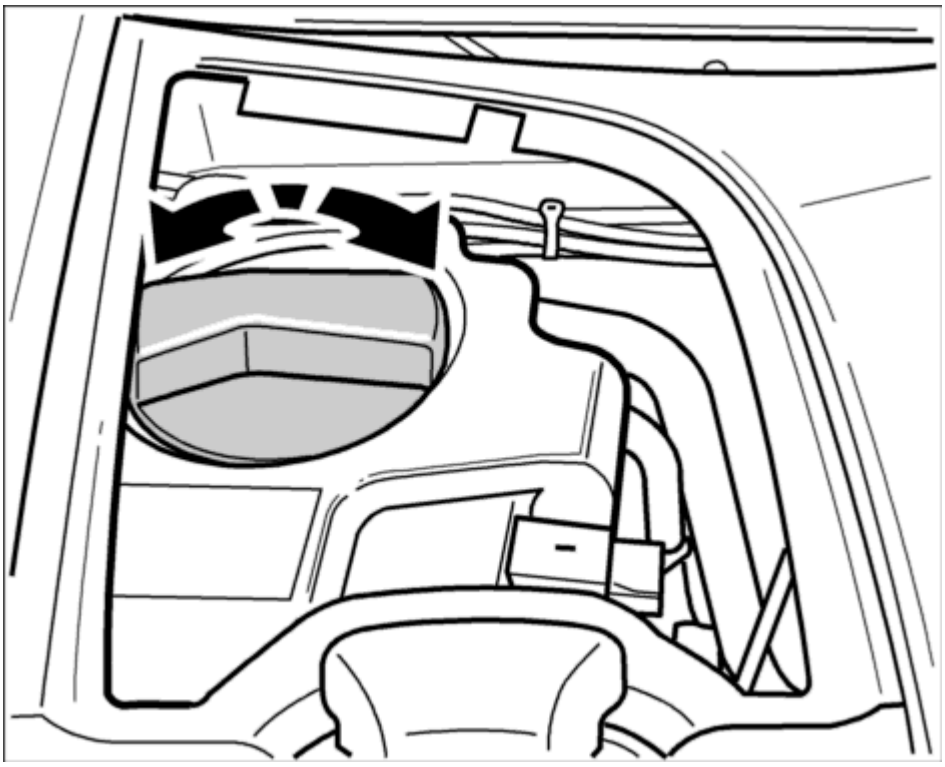


Fig. 11: Cap on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Screw on the cap of the coolant reservoir again until it locks with an audible click.

4. Close the maintenance flap.

5. Check radiator for external dirt. The radiators should not be excessively dirty. If necessary, they can be cleaned using a vacuum cleaner with a brush attachment.

19 01 29 COOLING SYSTEM CLEANED (AFTER OIL/COOLANT MIXING) - AS OF MY 2003 (ALL MODELS)

TOOLS

Designation	Type	Number	Explanation	
filling device	special tool	P 9696		

CLEANING THE COOLING SYSTEM

Cleaning the cooling system

CAUTION: Danger of poisoning!

- **Coolant additives and cleaning liquids are toxic.**

--> Swallowing coolant additives and cleaning liquids must be urgently avoided.

--> Do not consume any food or drink while working (danger of accidental mixing).

--> If swallowed, observe the warning information on the containers and contact a doctor. If necessary, show the doctor the warning information on the packaging.

WARNING: The vehicle fans can continue running or start up automatically.

- **Injuries which can lead to the loss of body parts.**

--> The power supply to the fans must be disconnected before starting work on the radiator, radiator fans, or the belt drive. Refer to **97 84 IN Fuse carrier - as of MY 2003 (All Models)** or battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

CAUTION: Risk of damaging the cooling system!

--> Do not relieve the system pressure of the cooling system and then run the engine.

--> Relieving the system pressure and subsequently starting the engine can cause severe damage to components in the cooling system. If the cooling system must be opened when it is hot, allow the cooling system to cool down before starting the engine again.

NOTE:

- ***The coolant filled in at the factory is intended to suffice for the entire service life. As long as the coolant is not contaminated by foreign bodies or other fluids it need not be changed.***
- ***Different coolant additives must not be mixed and doing so may damage the cooling system. Only use original Porsche coolant additives.***
- ***The coolant must be set to antifreeze protection of -37 °C. This corresponds to a mixing ratio of 50 : 50 (coolant additive : water). This mixing ratio provides optimum corrosion and antifreeze protection.***
- ***Coolant additives, coolants and cleaning agents must be disposed of according to the respective, applicable national laws.***
- ***Seals in the cooling system must be replaced by new ones following disassembly.***

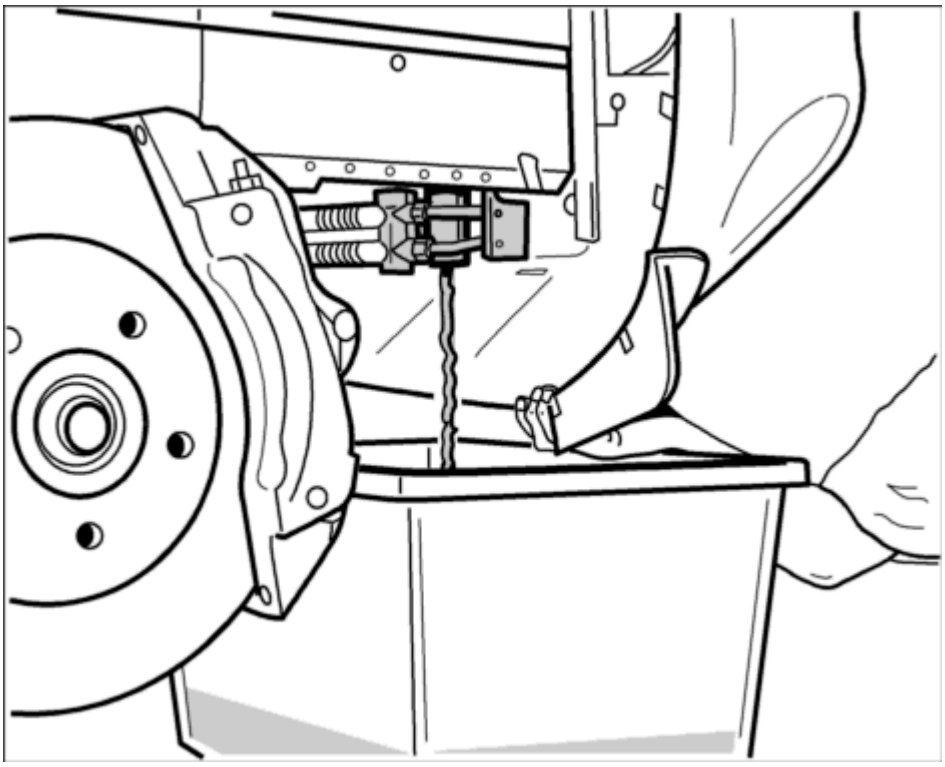


Fig. 12: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

NOTE:

- ***The cleaning work steps must be repeated until no more oil rises to the surface in the coolant reservoir.***
- ***The radiator cleaning agent mixture must be approx. 23 liters in the filling canister of the filling device filling device P 9696.***
- ***The cleaning agent is mixed with water at a ratio of 50:50 (Frostox R Spezial).***

2. Fill the cooling circuit with the cleaning agent mixture. To do this, proceed with the cooling system analogously to filling the coolant. **--> 193817 Draining and filling in coolant (includes bleeding) - chapter on "Filling in"**

3. Start the vehicle.

4. After the vehicle has been bled and the coolant temperature is > 80 °C, let the stationary vehicle run at medium engine speed for at least 15 minutes.

5. Switch off engine.

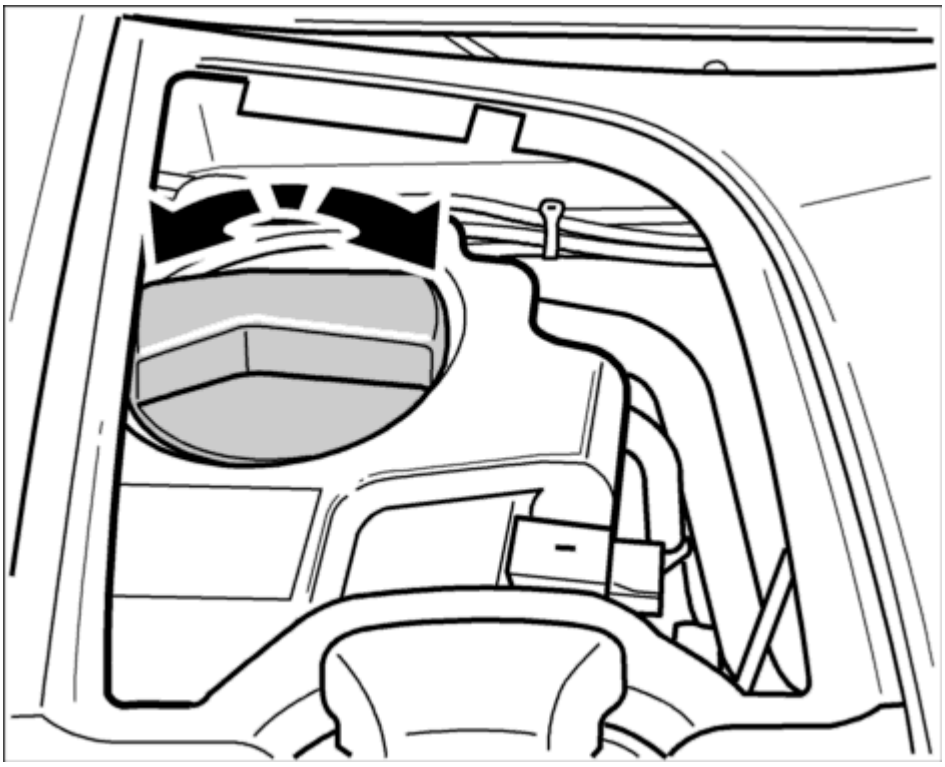


Fig. 13: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

CAUTION: Danger of scalding with hot coolant!

--> Never open the cooling system when it is hot. Emerging coolant may be very hot and can cause scalding.

--> The cooling system must be depressurized before being opened.

--> Allow engine to cool down.

6. Open coolant reservoir carefully and slowly in an anti-clockwise direction with gloves and a cloth.

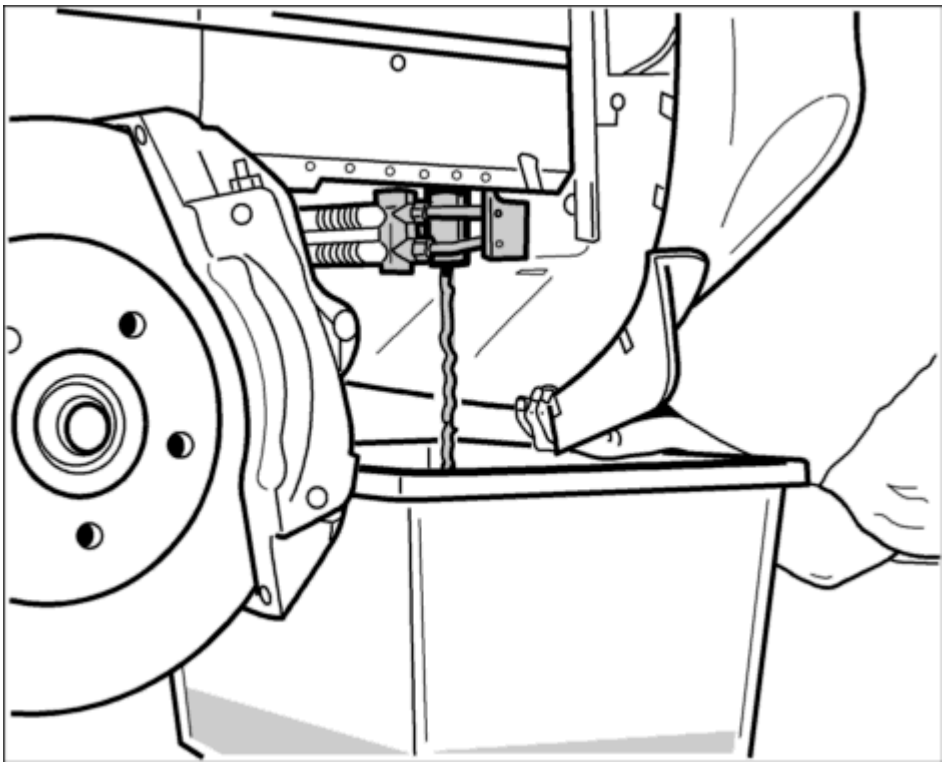


Fig. 14: Coolant drain plug
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

8. Use hot water to rinse out any oil which has adhered inside the coolant reservoir.

9. Close the cooling system and fill the coolant circuit with water only and then bleed the cooling system according to regulations. **--> 193817 Draining and filling coolant (includes bleeding)**

10. Start engine.

11. After the vehicle has been bled and the coolant temperature is > 80 °C, let the stationary vehicle run at medium engine speed for at least 15 minutes.

12. Switch off engine.

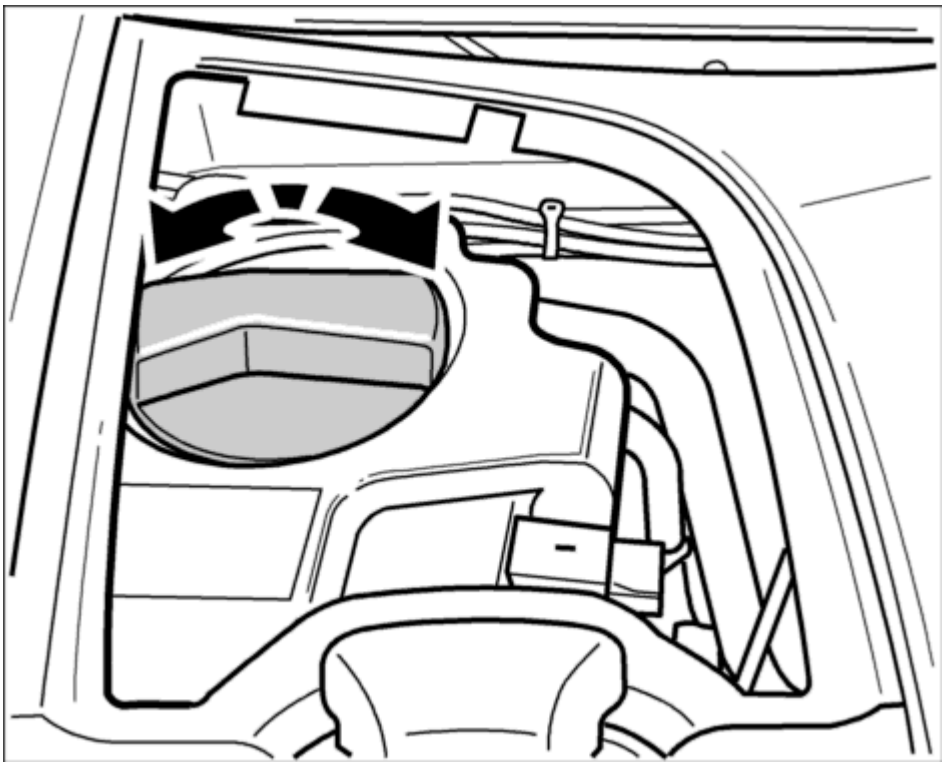


Fig. 15: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

CAUTION: Danger of scalding with hot coolant!

--> Never open the cooling system when it is hot. Emerging coolant may be very hot and can cause scalding.

--> The cooling system must be depressurized before being opened.

--> Allow engine to cool down.

13. Open coolant reservoir carefully in an anti-clockwise direction with gloves and a cloth and relieve any residual pressure.

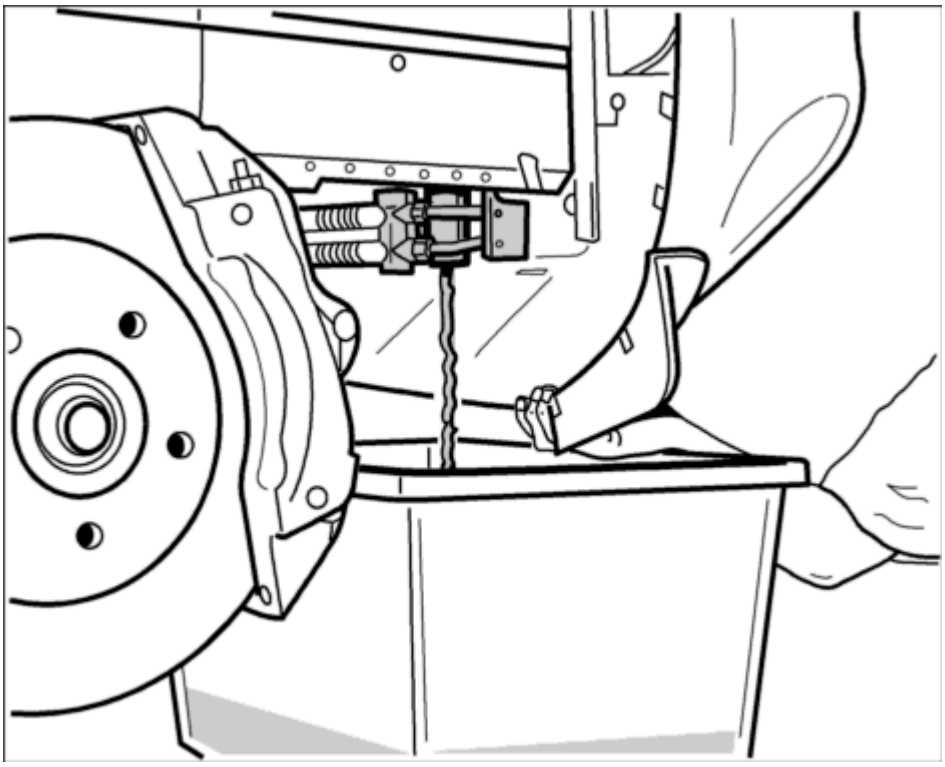


Fig. 16: Coolant drain plug
Courtesy of PORSCHE OF NORTH AMERICA, INC.

14. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

15. Close the cooling system and bleed with the approved antifreeze mixture according to regulations. --> **193817 Draining and filling coolant (includes bleeding)**

19 08 19 REMOVING AND INSTALLING ELECTRIC FAN - AS OF MY 2003 (ALL MODELS)

REMOVING ELECTRIC FAN

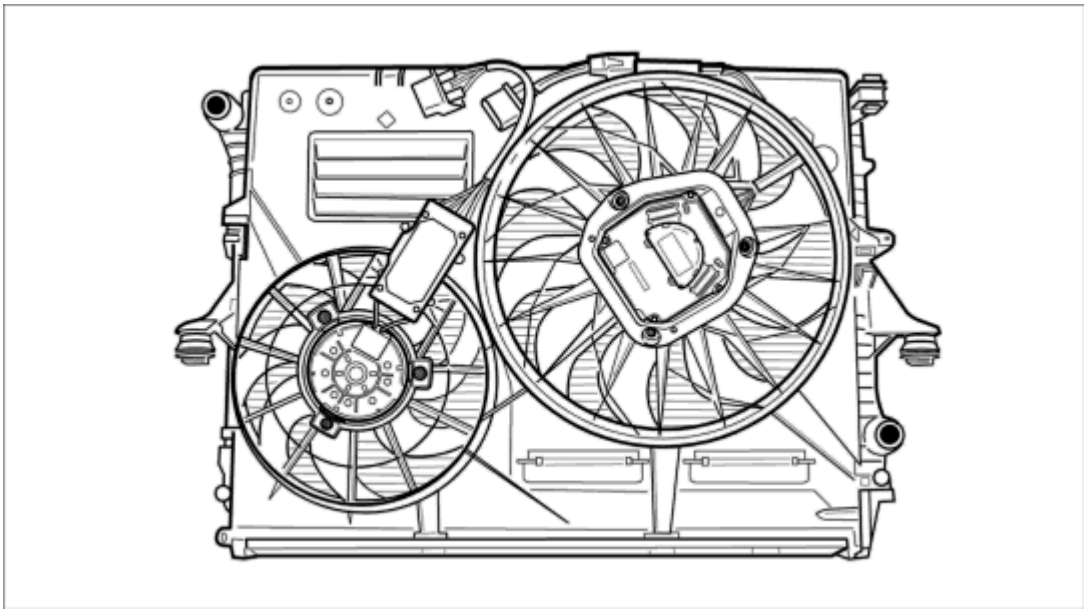


Fig. 17: The small fan on the left is for the air conditioning - the big fan on the right is for engine cooling
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***The big fan is for the engine cooling, the small fan is for the air conditioning***
- ***The sheetmetal clips on the fans are for balancing the fans and must not be pulled off.***

1. Remove the radiator frame. **--> 192019 Removing and installing cooling fan housing (radiator frame) - chapter on "Removing"**

Removing motor fan

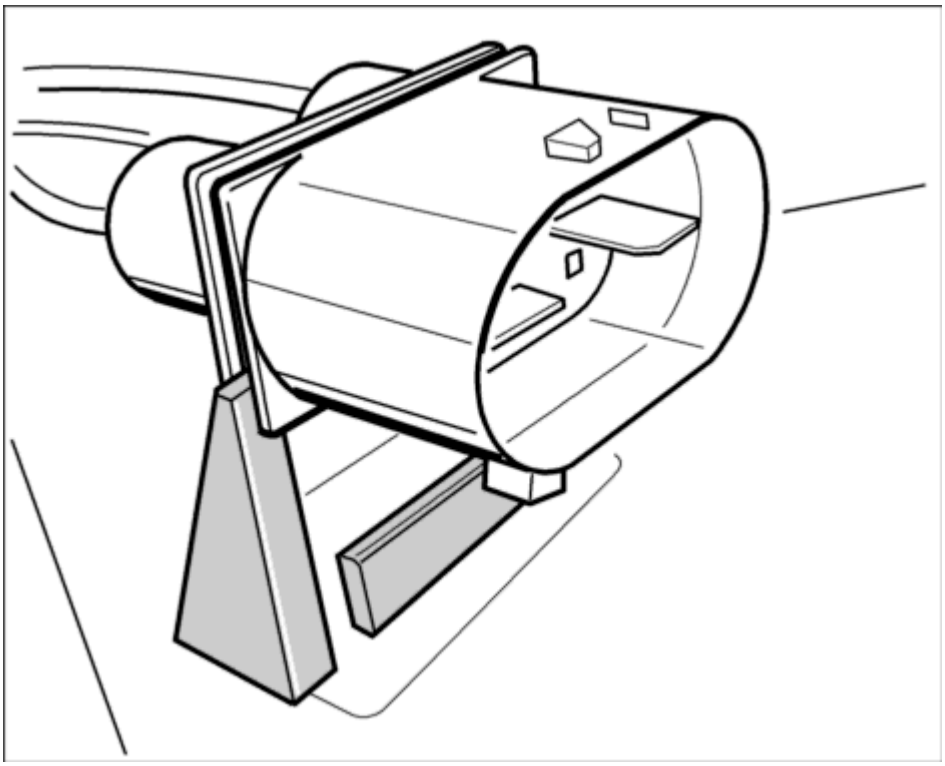


Fig. 18: Electric connector on radiator frame
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Unclip the electric plug on the radiator frame.

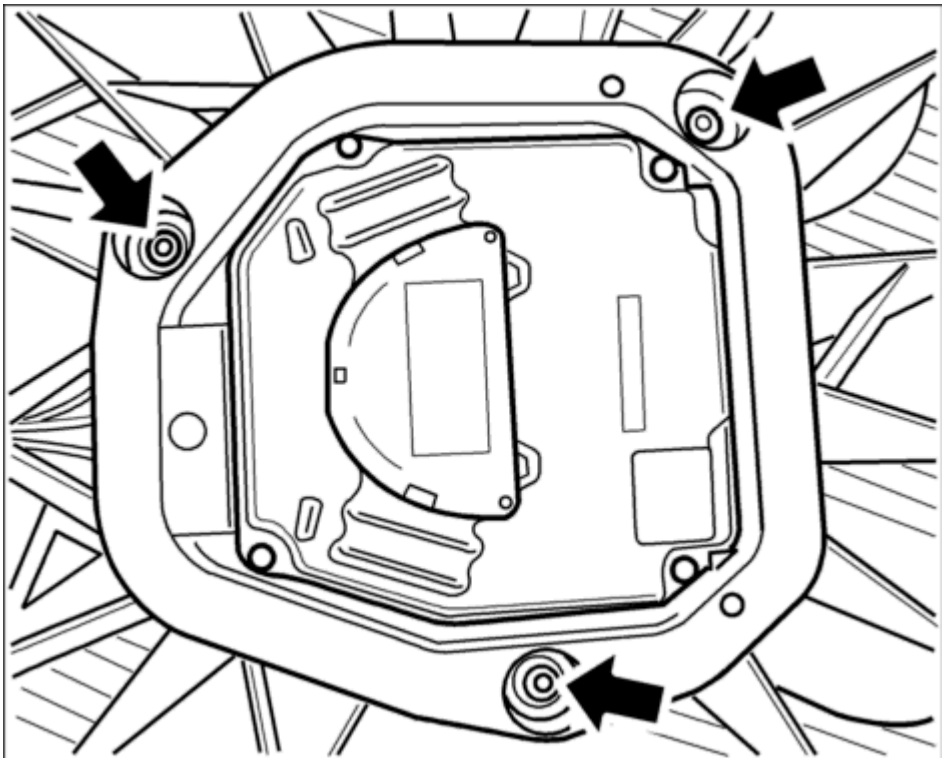


Fig. 19: Fastening screws for securing fan to engine
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Undo the 3 fastening screws on fan and pull fan down and out.

Removing fan for air conditioning

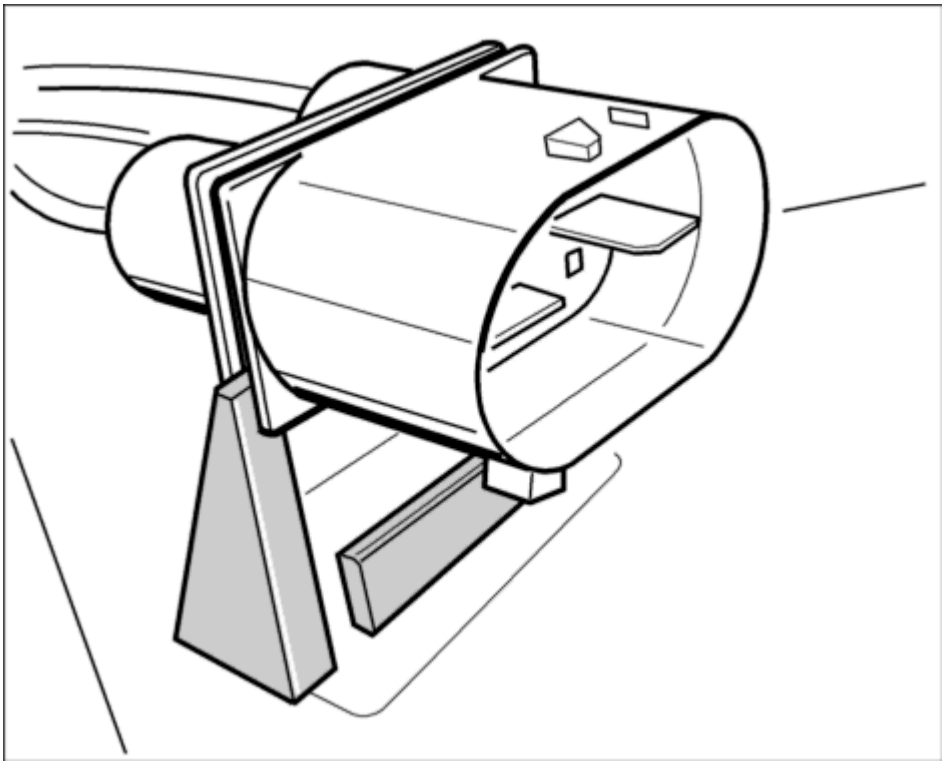


Fig. 20: Electric connector on radiator frame
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Unclip the electric plug on the radiator frame.

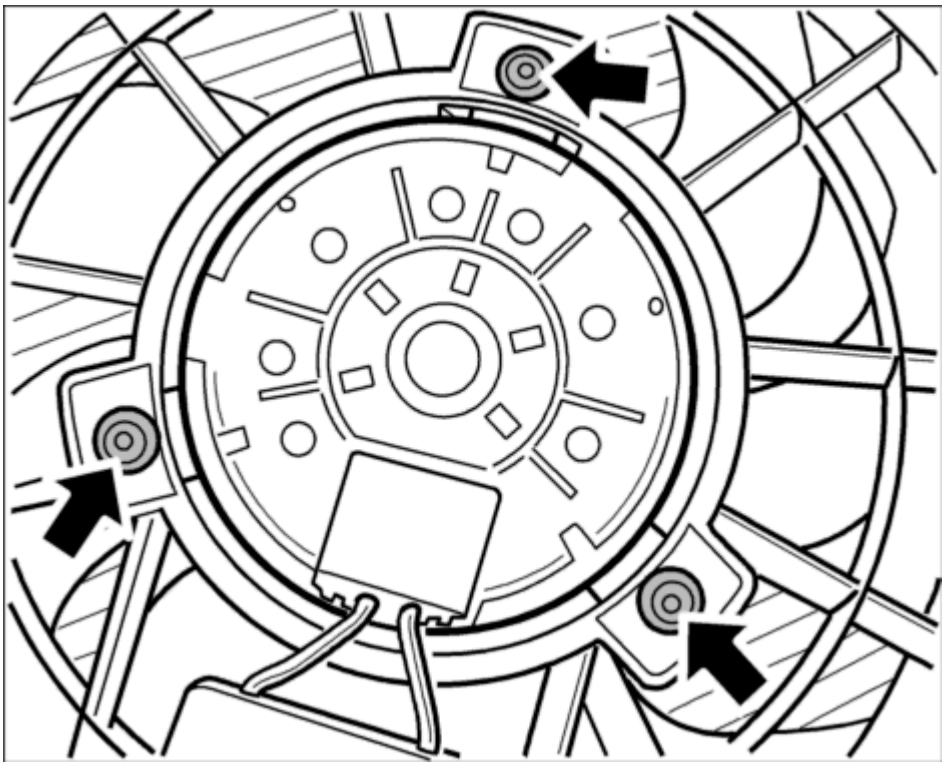


Fig. 21: Fastening screws for securing fan to air conditioner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Undo the 3 fastening screws on fan and pull fan down and out. When doing so, guide the cables and control unit.

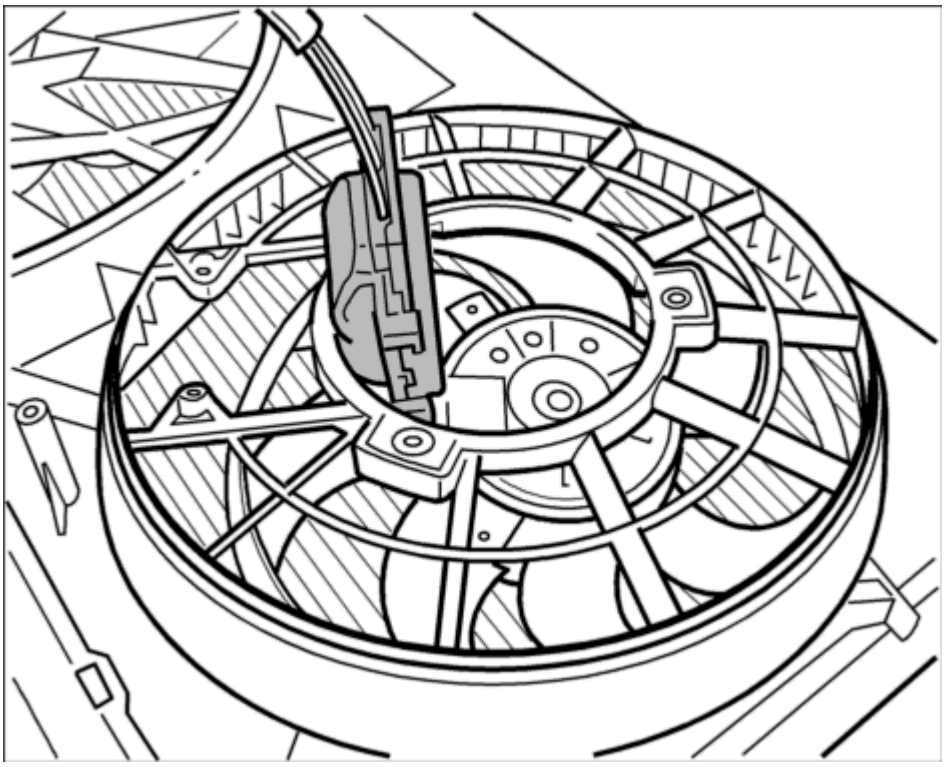


Fig. 22: View shows the removal process
Courtesy of PORSCHE OF NORTH AMERICA, INC.

INSTALLING ELECTRIC FAN

Installing fan for air conditioning

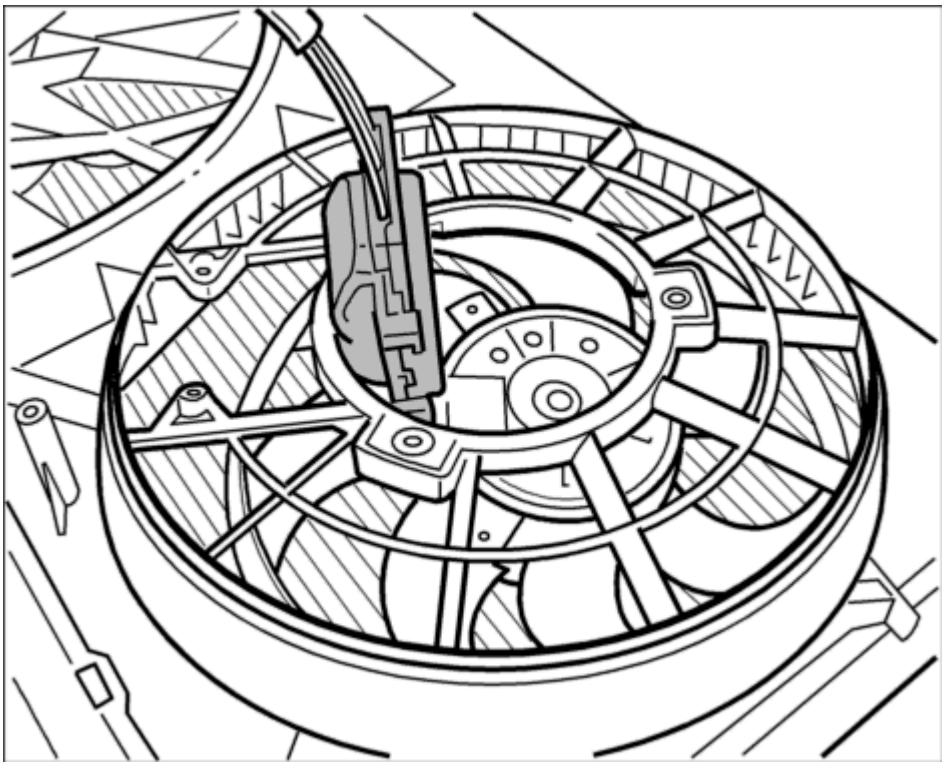


Fig. 23: View shows the installation
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Push fan cable with control module from underneath through the radiator frame.

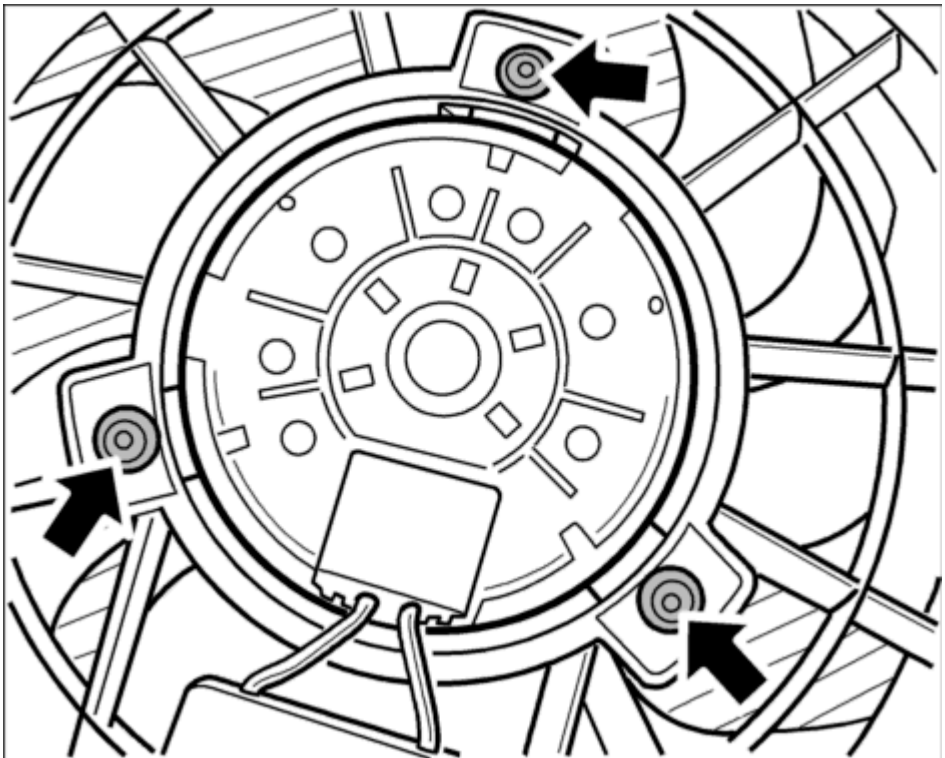


Fig. 24: Fastening screws for securing fan to air conditioner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Tighten the three fastening screws. --> **Tightening torque: 3 ftlb.**

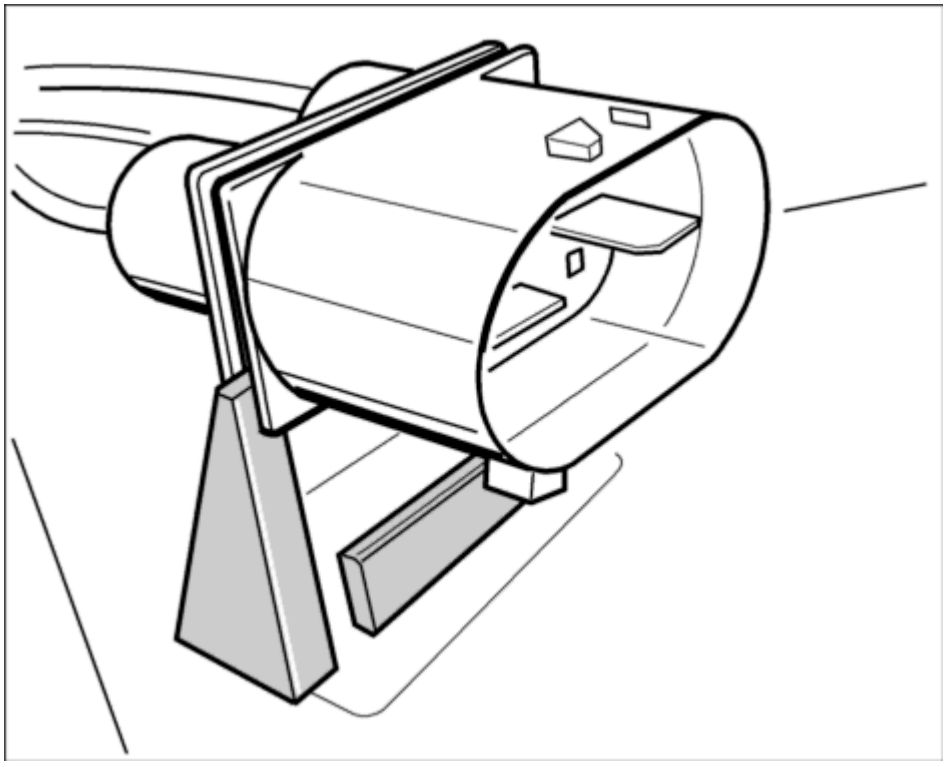


Fig. 25: Electric connector on radiator frame
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Route cables correctly and clip electric plug into the frame at the top.

Installing engine fan

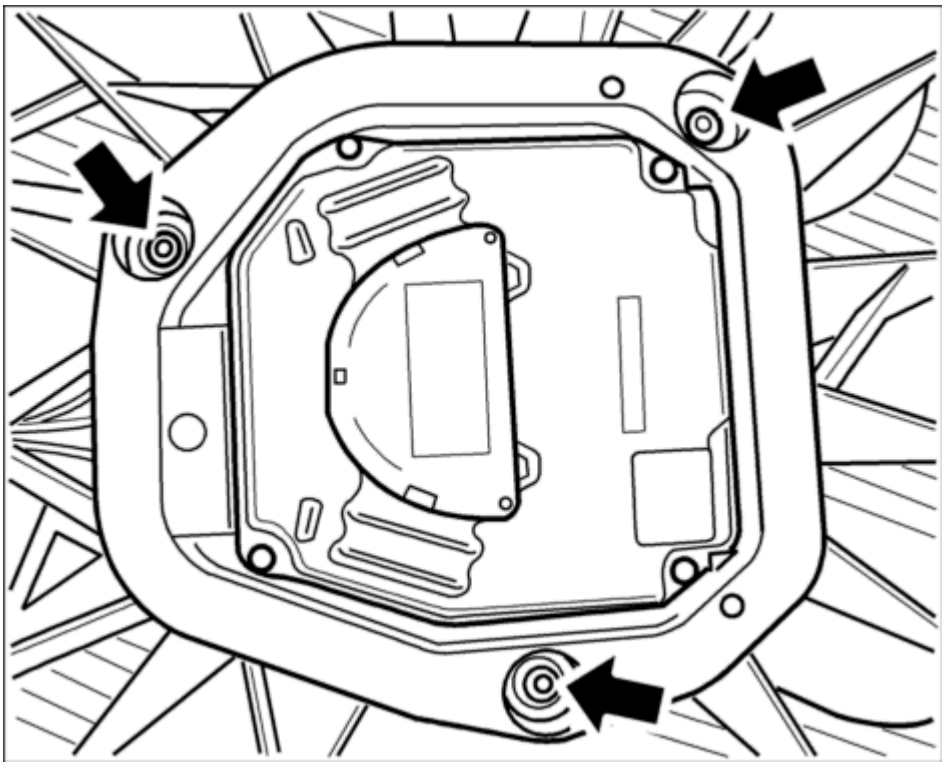


Fig. 26: Fastening screws for securing fan to engine
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Push fan from the bottom into the frame and tighten the 3 fastening screws to 4 Nm (3 ftlb.).

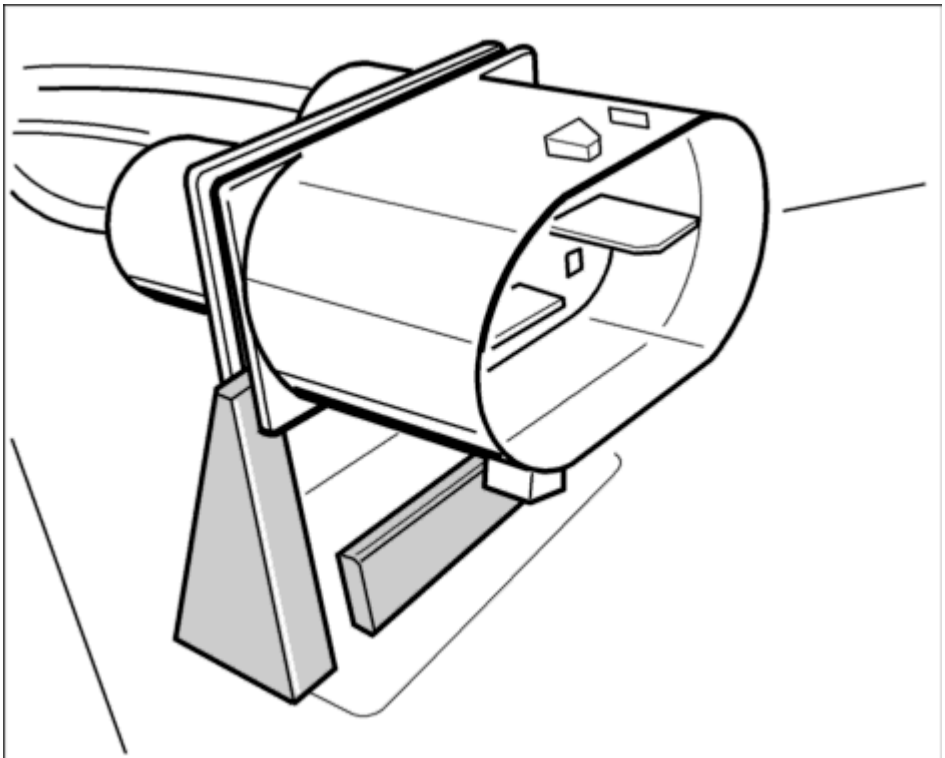


Fig. 27: Electric connector on radiator frame
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Route connecting cables correctly and clip electric connector into the radiator frame at the top.

SUBSEQUENT WORK

Subsequent work

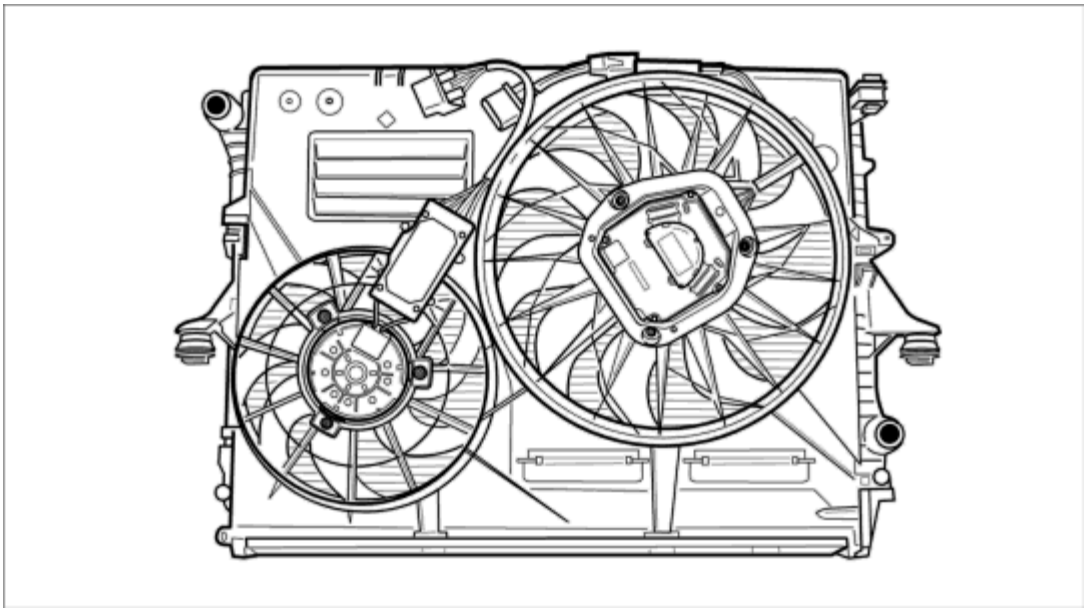


Fig. 28: The small fan on the left is for the air conditioning - the big fan on the right is for engine cooling
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***The big fan is for the engine cooling, the small fan is for the air conditioning***
- ***The sheetmetal clips on the fans are for balancing the fans and must not be pulled off.***

1. Install the radiator frame. **--> 192019 Removing and installing cooling fan housing (radiator frame) - chapter on "Installing"**

19 20 19 REMOVING AND INSTALLING RADIATOR FAN HOUSING (RADIATOR FRAME) - AS OF MY 2003 (ALL MODELS)

PRELIMINARY WORK

Preliminary work

1. Removing the front engine compartment cover. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

2. Remove Y-shaped pipes. Refer to **24 35 19 Removing and installing cowl for throttle housing (Y-shaped pipe) - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne S TIO Titan)** . Refer to **24 35 19 Removing and installing cowl for throttle housing (intake manifold) - as of MY 2004 (Cayenne TIP, Cayenne MAN)** . Refer to **24 35 19 Removing and installing cowl for throttle housing (Y-shaped pipe) - as of MY 2003 (Cayenne Turbo, Cayenne Turbo S)** .

REMOVING RADIATOR FAN HOUSING (RADIATOR FRAME)

Removing radiator fan housing (radiator frame)

WARNING: The vehicle fans can continue running or start up automatically.

- **Injuries which can lead to the loss of body parts.**

--> The power supply to the fans must be disconnected before starting work on the radiator, radiator fans, or the belt drive. Refer to **97 84 IN Fuse carrier - as of MY 2003 (All Models)** or battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

NOTE: The repair instructions differ slightly in the illustrations for the V6. The work steps are essentially identical.

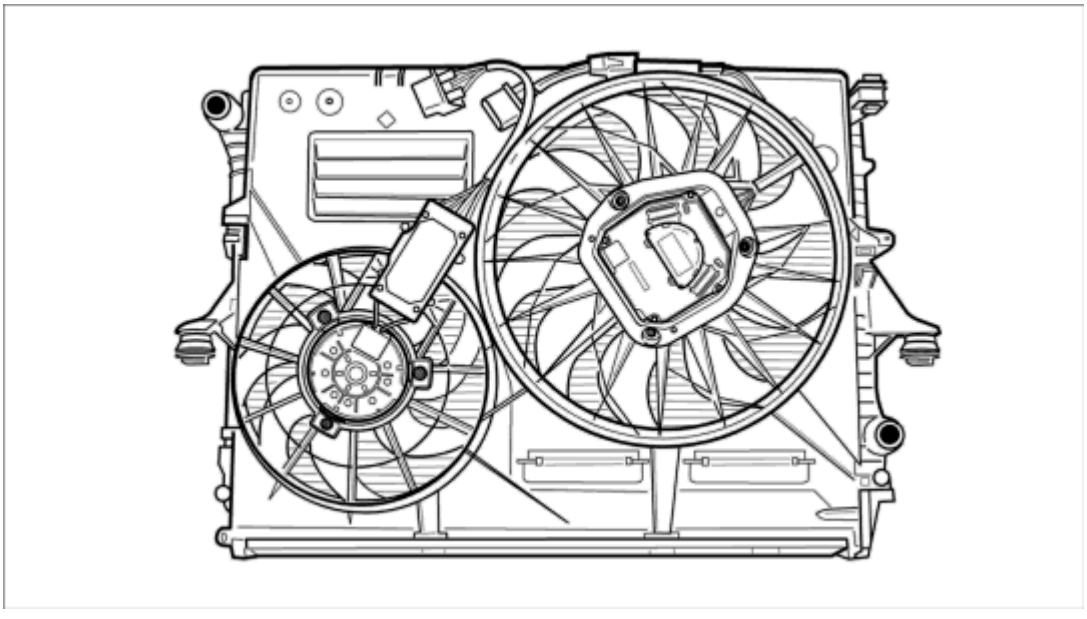


Fig. 29: Cooling fan housing (radiator frame)
Courtesy of PORSCHE OF NORTH AMERICA, INC.

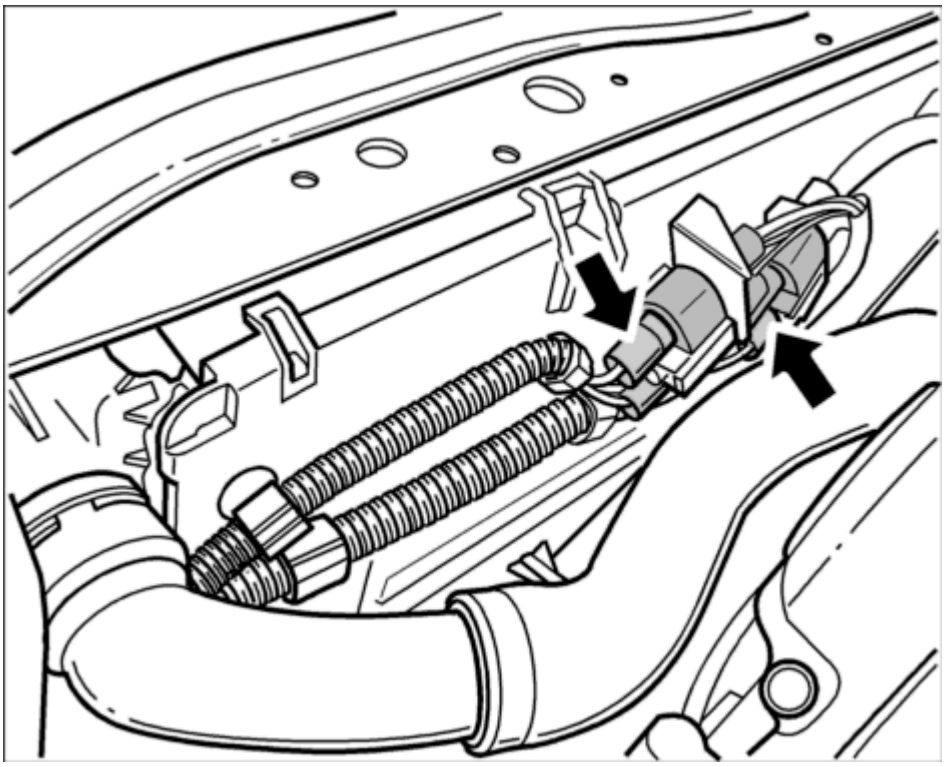


Fig. 30: Electric connector for the fan
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Disconnect the electric plugs on the fans.

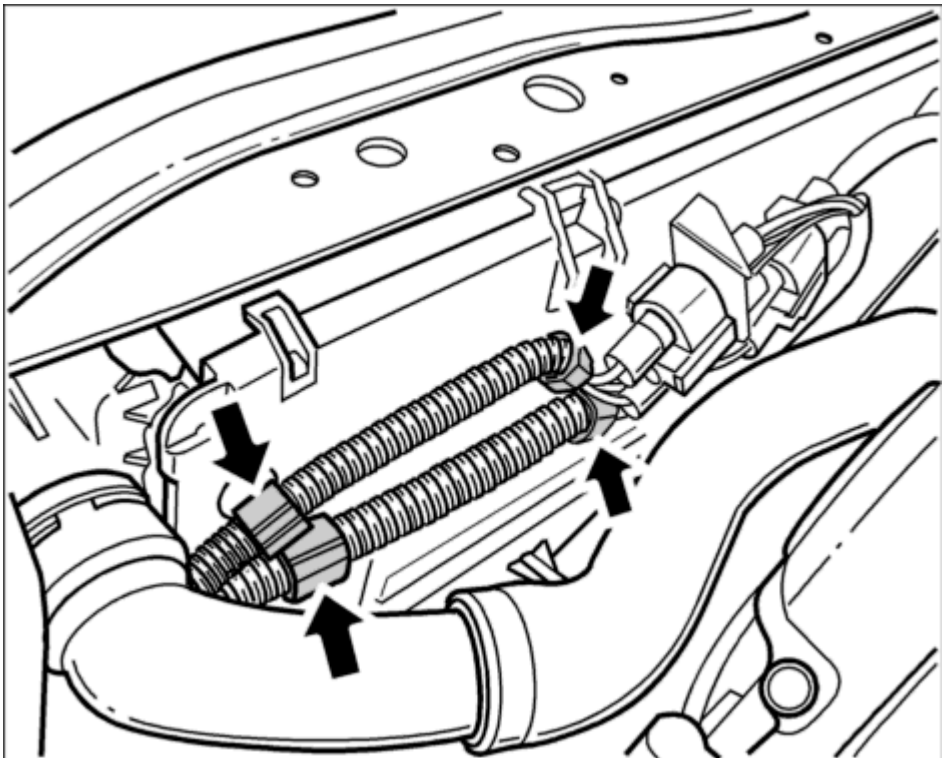


Fig. 31: Wiring harness fixed to the vehicle
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Unclip the cable harness fixed to the vehicle from the clips on the radiator frame.

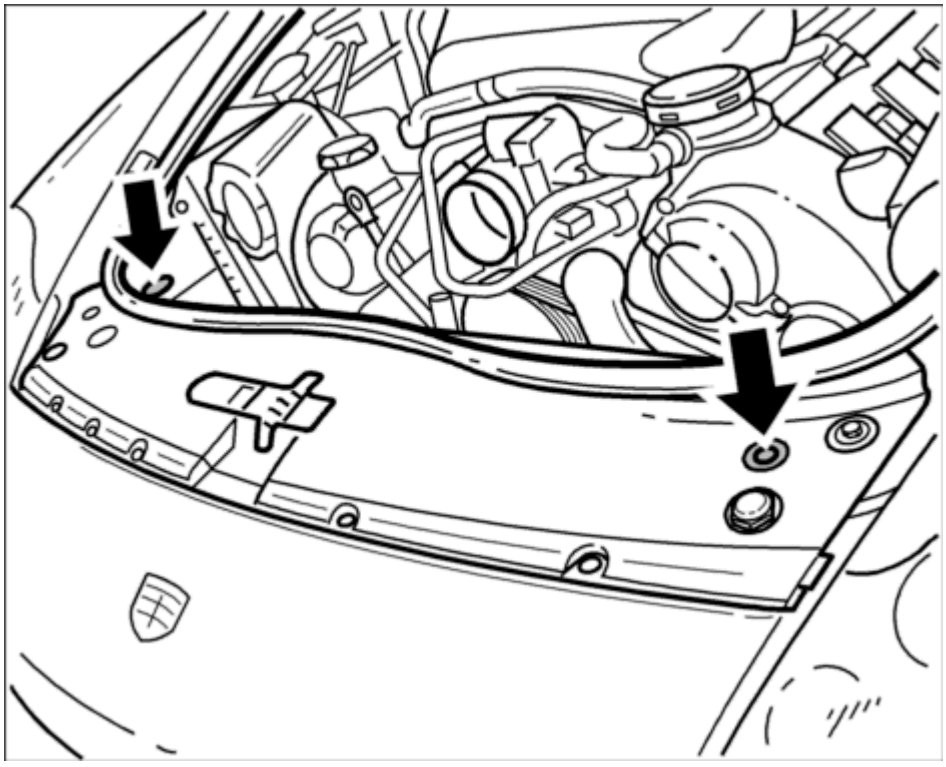


Fig. 32: Upper fastening screws for radiator motor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Loosen the two upper fastening screws of the radiator module on the lock carrier.

4. Press the radiator module towards the engine until the frame can be pulled up and out.

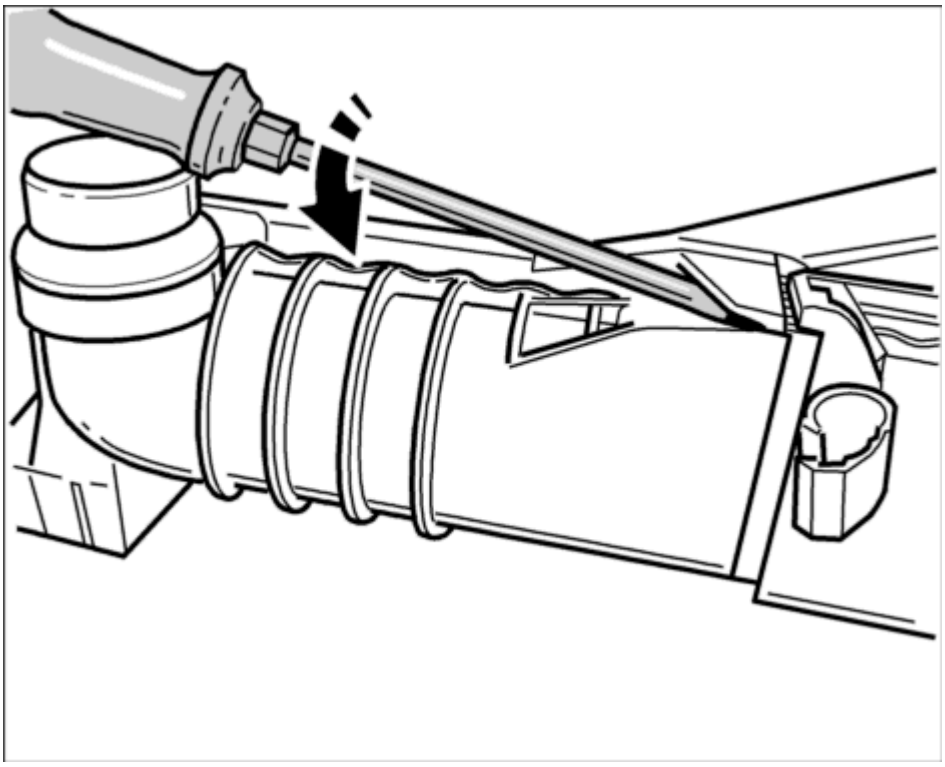


Fig. 33: View of the catch springs when the radiator has been removed
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Release the catch springs to the left and right on the radiator module and pull the frame up and out.

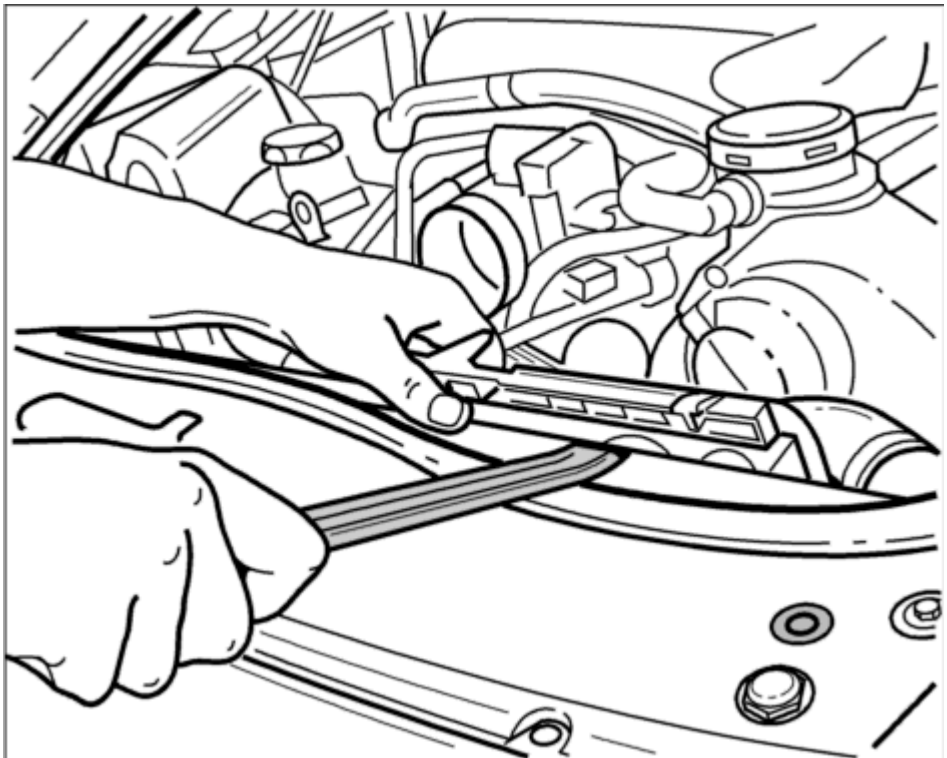


Fig. 34: Loosen stuck radiator frame with mounting lever
Courtesy of PORSCHE OF NORTH AMERICA, INC.

If the radiator frame is stuck, it can be released carefully by means of a crowbar.

INSTALLING RADIATOR FAN HOUSING (RADIATOR FRAME)

Installing radiator fan housing (radiator frame)

1. Slide the radiator frame from the top to the bottom along the radiator into the engine compartment.

2. Check whether the installation is correct. To do this, check whether the catch springs on the left and right have engaged properly and that the four fastening projections on the underside have engaged in the plastic clamps.

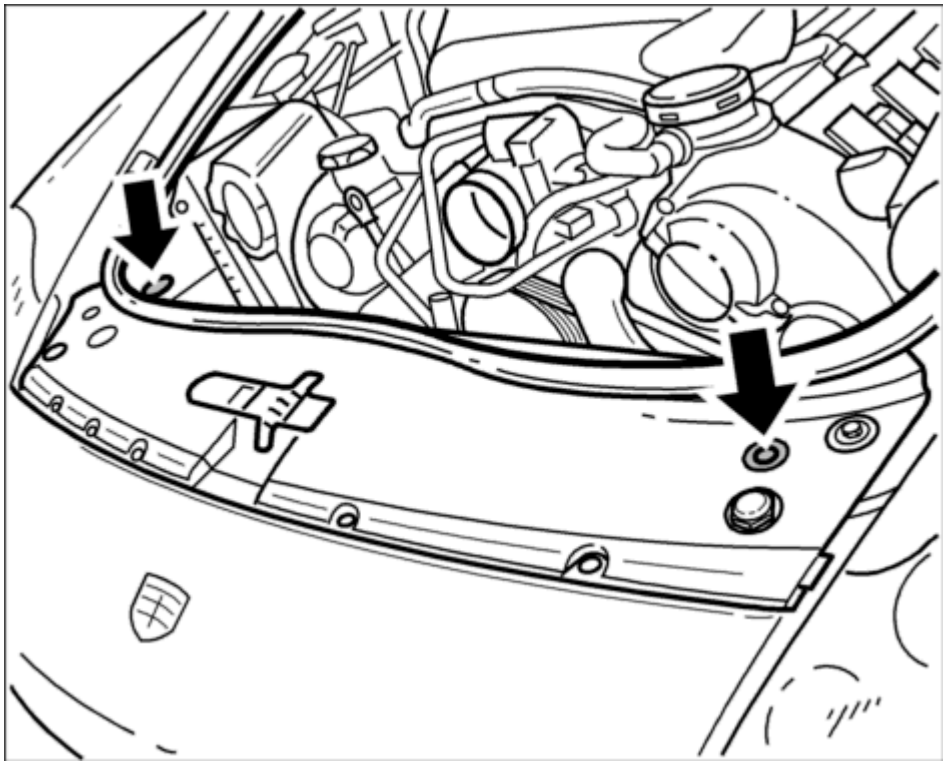


Fig. 35: Upper fastening screws for radiator motor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Tighten the two upper fastening screws of the radiator module on the lock carrier.

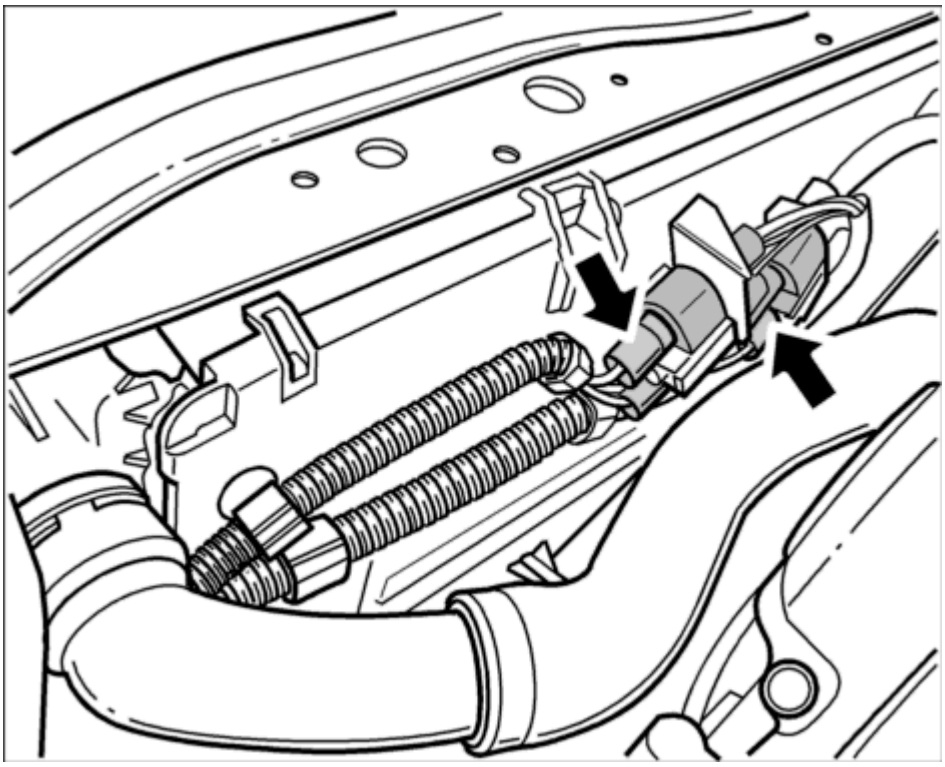


Fig. 36: Electric connector for the fan
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Join the two electric connectors on the top side.

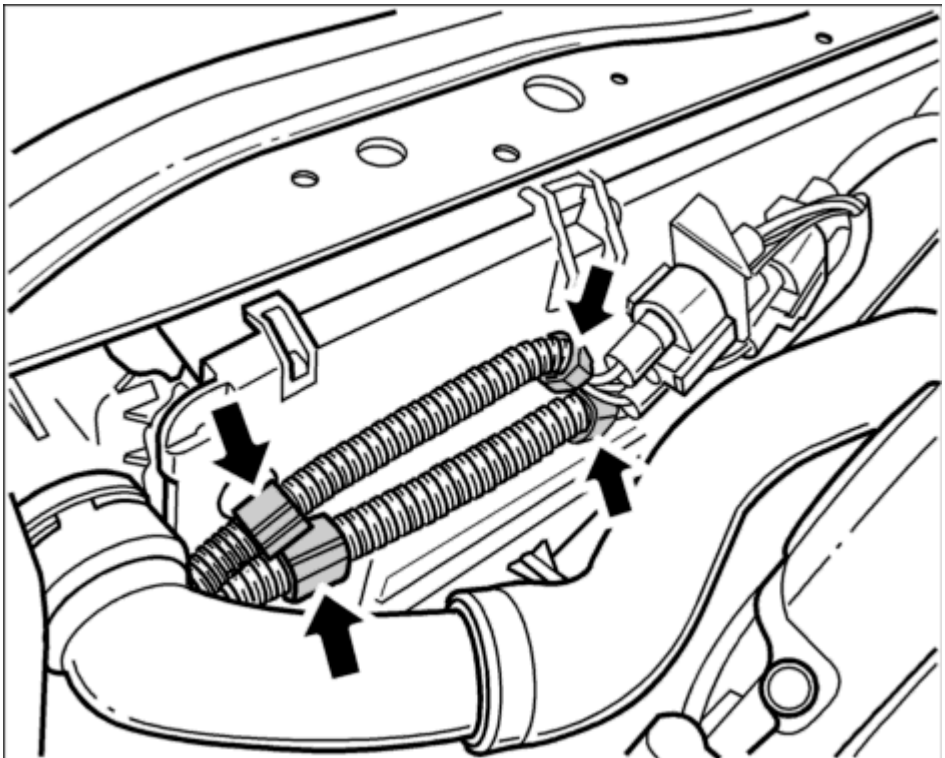


Fig. 37: Pressing the wiring harness into fastening clips
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Press the wiring harness into the 4 fastening clips.

SUBSEQUENT WORK

Subsequent work

1. Install Y-shaped pipes. Refer to **24 35 19 Removing and installing cowl for throttle housing (Y-shaped pipe) - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne S TIO Titan)** . Refer to **24 35 19 Removing and installing cowl for throttle housing (intake manifold) - as of MY 2004 (Cayenne TIP, Cayenne MAN)** . Refer to **24 35 19 Removing and installing cowl for throttle housing (Y-shaped pipe) - as of MY 2003 (Cayenne Turbo, Cayenne Turbo S)** .

2. Install front engine cover. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

19 38 17 DRAINING AND FILLING IN COOLANT (INCLUDES BLEEDING) - AS OF MY 2003 (ALL MODELS)

TOOLS

Designation	Type	Number	Explanation	
Assembly tools for spring band clamps	commercially available tool	NR.72		
Flexible screwdriver a/f 7	commercially available tool	NR.73-1		
Filling device	special tool	P 9696		

TOOLS AND MATERIALS

Special tools

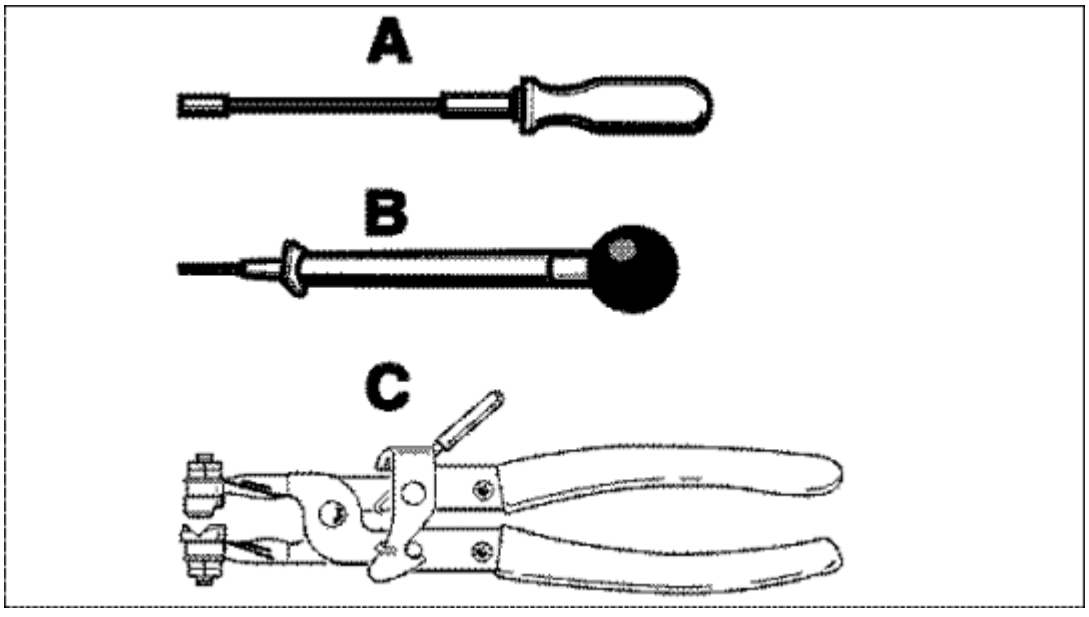


Fig. 38: Special tools 1
Courtesy of PORSCHE OF NORTH AMERICA, INC.

-A- - Flexible screwdriver a/f 7 (for loosening or tightening screw hose clamps) **Flexible screwdriver a/f 7 NR.73-1**

-B- - Antifreeze protection testing device (for checking the antifreeze content in the cooling system. The design can deviate from that shown in the picture.)

-C- - Spring band clamp pliers (for opening and closing spring band clamps) **Assembly tools for spring band clamps NR.72**

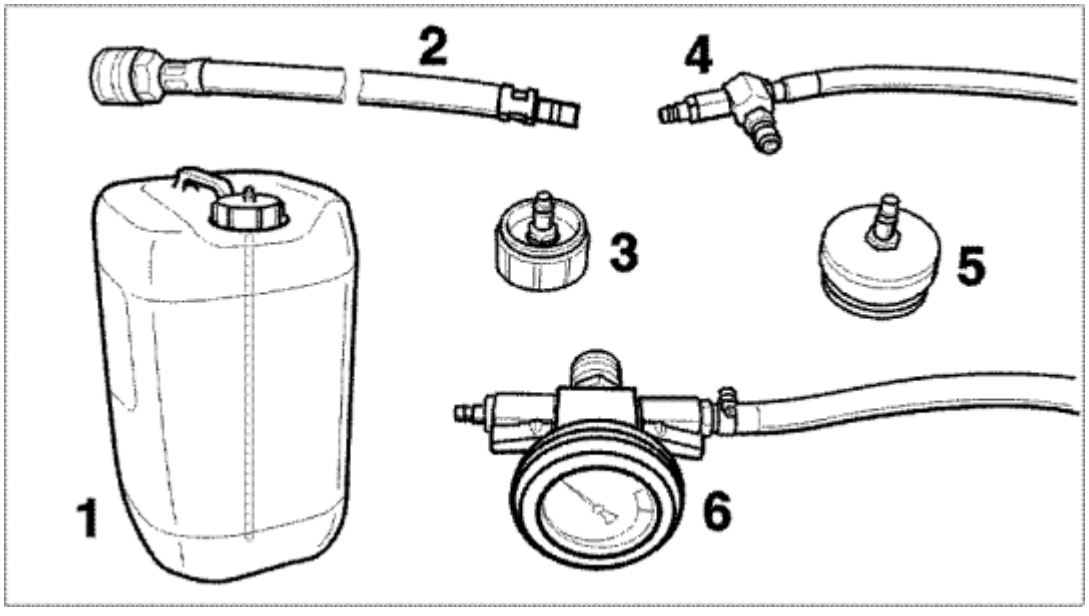


Fig. 39: Special tools 2

Courtesy of PORSCHE OF NORTH AMERICA, INC.

Filling device P 9696

-1- - Canister (canister with lifting tube, capacity approx. 30 l, with volume scale)

-2- - Hose extension

-3- - Adapter K 22 (included in the scope of delivery of radiator vacuum filling device)

-4- - Venturi nozzle (included in the scope of delivery of radiator vacuum filling device)

-5- - Adapter K 60 (included in the scope of delivery of radiator vacuum filling device)

-6- - Pressure gauge (included in the scope of delivery of radiator vacuum filling device)

INFORMATION

Components of the radiator vacuum filling device

NOTE:

- ***Pay attention to the special features in the corresponding chapter for vehicles with auxiliary heater. --> 193817 Draining and filling coolant (includes bleeding) - chapter on "Bleeding"***

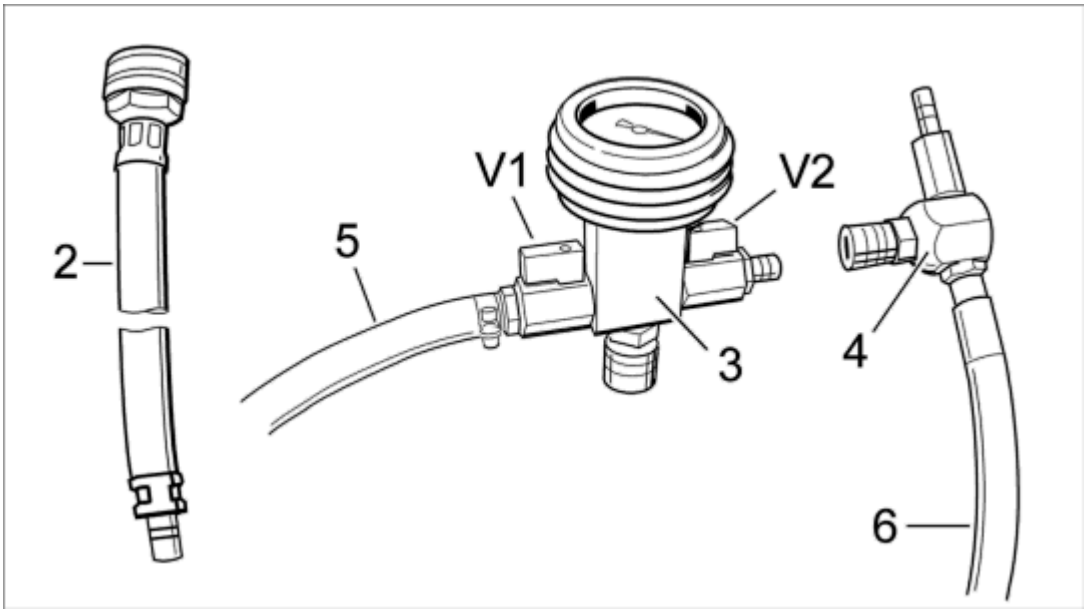


Fig. 40: Vacuum filling device components
Courtesy of PORSCHE OF NORTH AMERICA, INC.

Filling device P 9696

-1- - Adapter K 22 (installed in place of the cap on the coolant reservoir.)

-2- - Hose extension FZ 100 (installed between K22 and KVB 01.)

-3- - KVB 01 (vacuum pressure gauge with two shut-off valves)

-V1- - Shut-off valve V1 (shutoff valve for the filler hose.)

-V2- - Shut-off valve V2 (shutoff valve for the filler hose.)

-4- - Venturi nozzle (a vacuum is produced in this component by means of compressed air. A pressure between 6 and 10 bar must be present.)

-5- - Filler hose (the cooling system is refilled via this hose.)

-6- - Return lines (the compressed air and the extracted coolant are drawn off via this hose.)

DRAINING COOLANT

Draining coolant

CAUTION: Danger of poisoning!

- **Coolant additives and cleaning liquids are toxic.**

--> Swallowing coolant additives and cleaning liquids must be urgently avoided.

--> Do not consume any food or drink while working (danger of accidental mixing).

--> If swallowed, observe the warning information on the containers and contact a doctor. If necessary, show the doctor the warning information on the packaging.

CAUTION: Danger of scalding with hot coolant!

--> Never open the cooling system when it is hot. Emerging coolant may be very hot and can cause scalding.

--> The cooling system must be depressurized before being opened.

--> Allow engine to cool down.

WARNING: The vehicle fans can continue running or start up automatically.

- **Injuries which can lead to the loss of body parts.**

--> The power supply to the fans must be disconnected before starting work on the radiator, radiator fans, or the belt drive. Refer to **97 84 IN Fuse carrier - as of MY 2003 (All Models)** or battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

CAUTION: Risk of damaging the cooling system!

--> Do not relieve the system pressure of the cooling system and then run the engine.

--> Relieving the system pressure and subsequently starting the engine can cause severe damage to components in the cooling system. If the cooling system must be opened when it is hot, allow the cooling system to cool down before starting the engine again.

NOTE:

- ***The coolant filled in at the factory is intended to suffice for the entire service life. As long as the coolant is not contaminated by foreign bodies or other fluids it need not be changed.***
- ***Different coolant additives must not be mixed and doing so may damage the cooling system. Only use original Porsche coolant additives.***
- ***The coolant must be set to antifreeze protection of -37 °C. This corresponds to a mixing ratio of 50 : 50 (coolant additive : water). This mixing ratio provides optimum corrosion and antifreeze protection.***
- ***Coolant additives, coolants and cleaning agents must be disposed of according to the respective, applicable national laws.***
- ***Seals in the cooling system must be replaced by new ones following disassembly.***

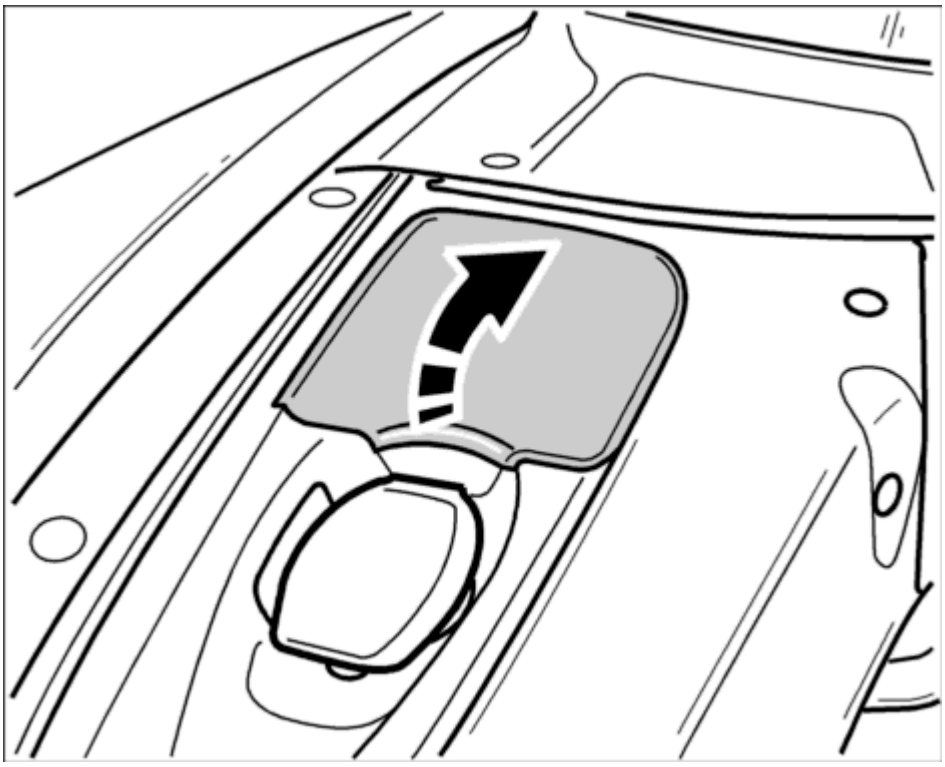


Fig. 41: Maintenance cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Open maintenance cover.

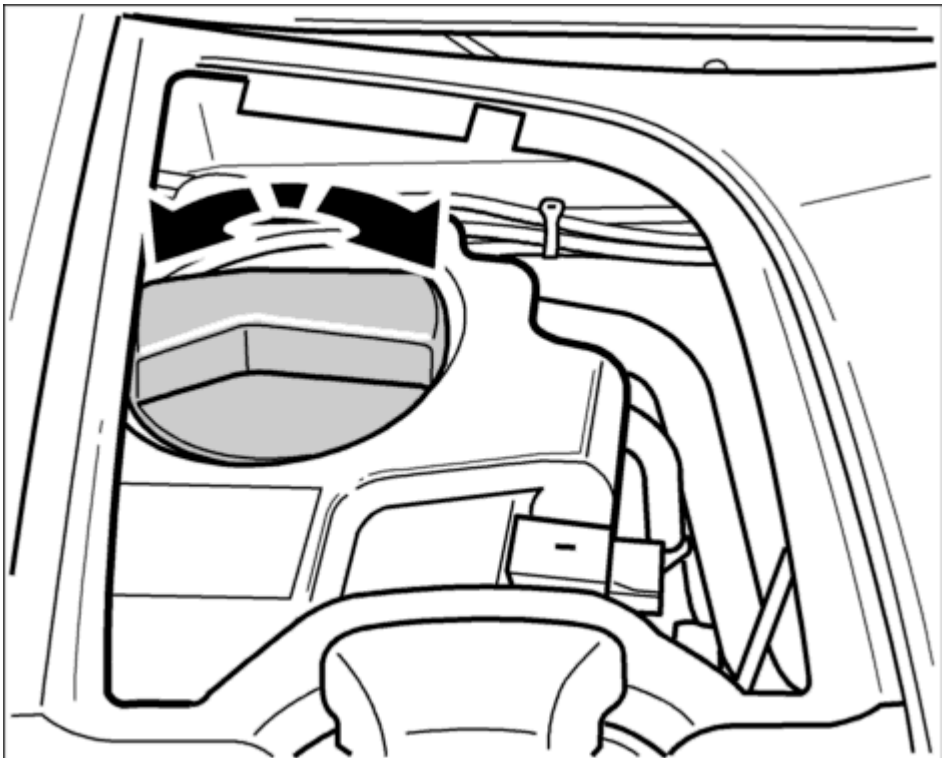


Fig. 42: Cap on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Carefully open the cap on the coolant reservoir. Unscrew the cap in an anti-clockwise direction.

3. Open cap on the reservoir and remove.

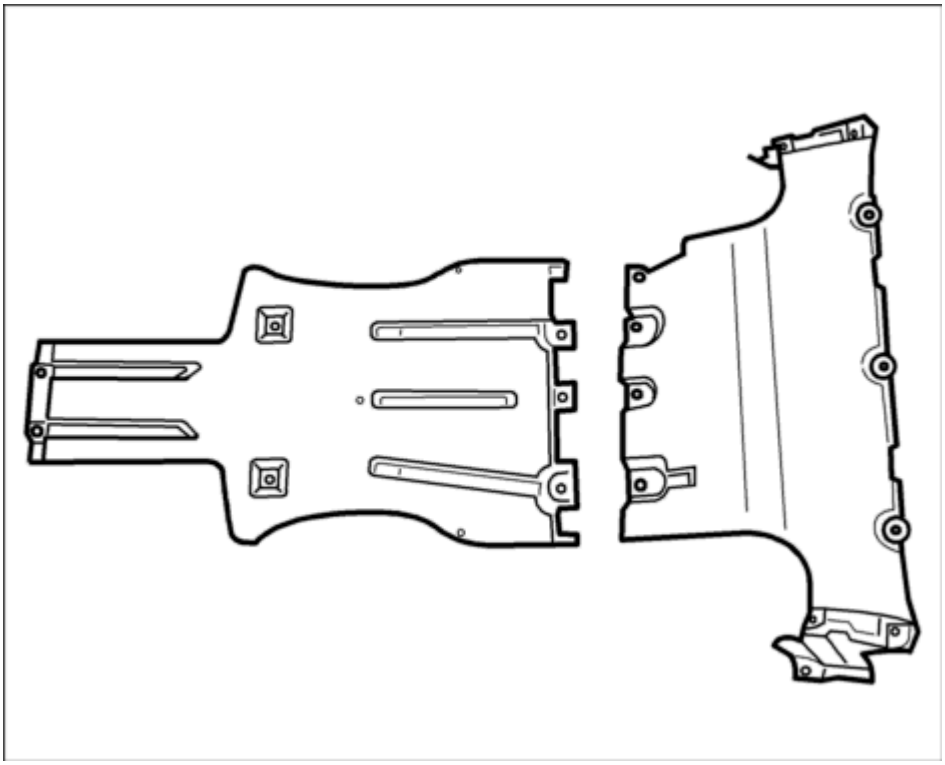


Fig. 43: Engine guard
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Remove engine guard. Refer to **10 80 19 Removing and installing engine guard - as of MY 2003 (All Models)** .

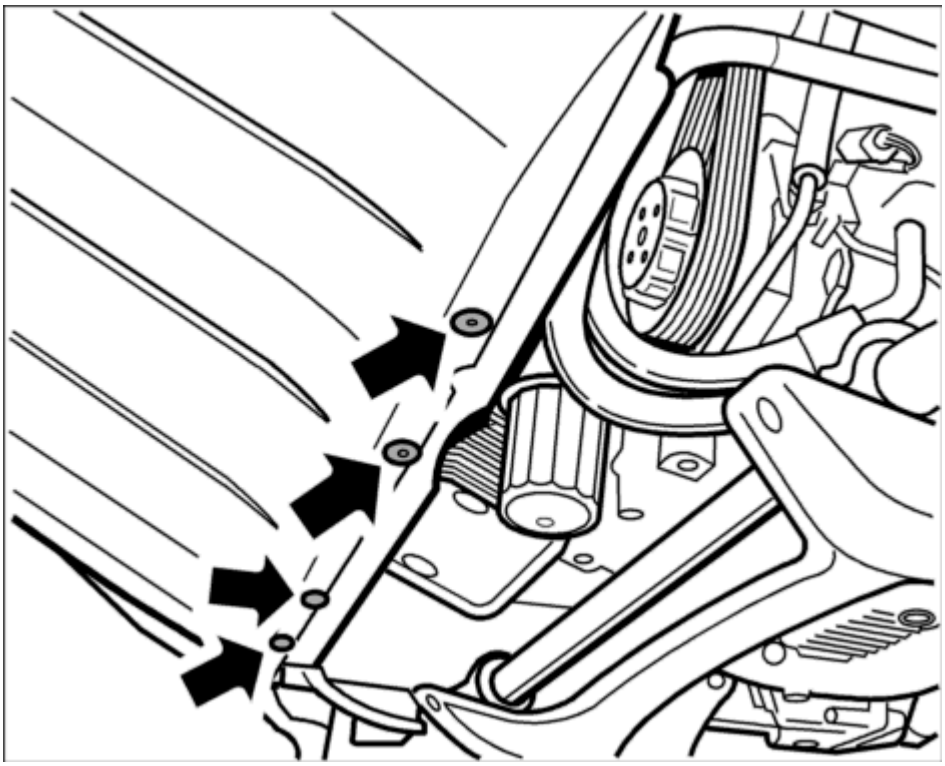


Fig. 44: Front apron fastening screws
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Release the front apron on the underside.

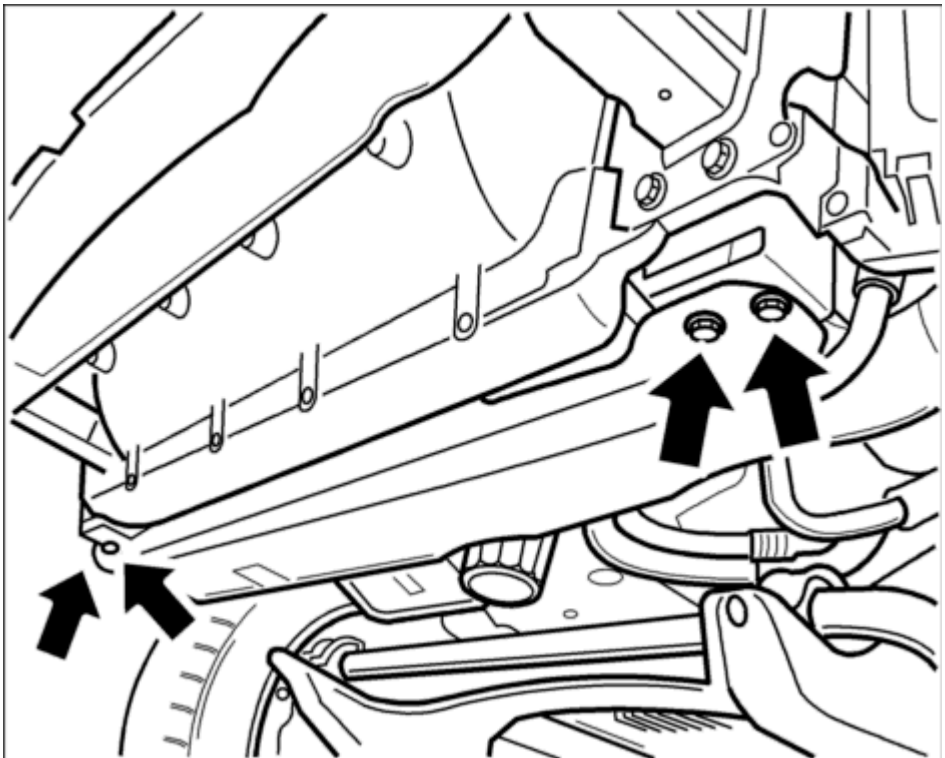


Fig. 45: Support plate fastening screws
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Remove the support plate under the radiator. To do this, loosen the 4 fastening screws.

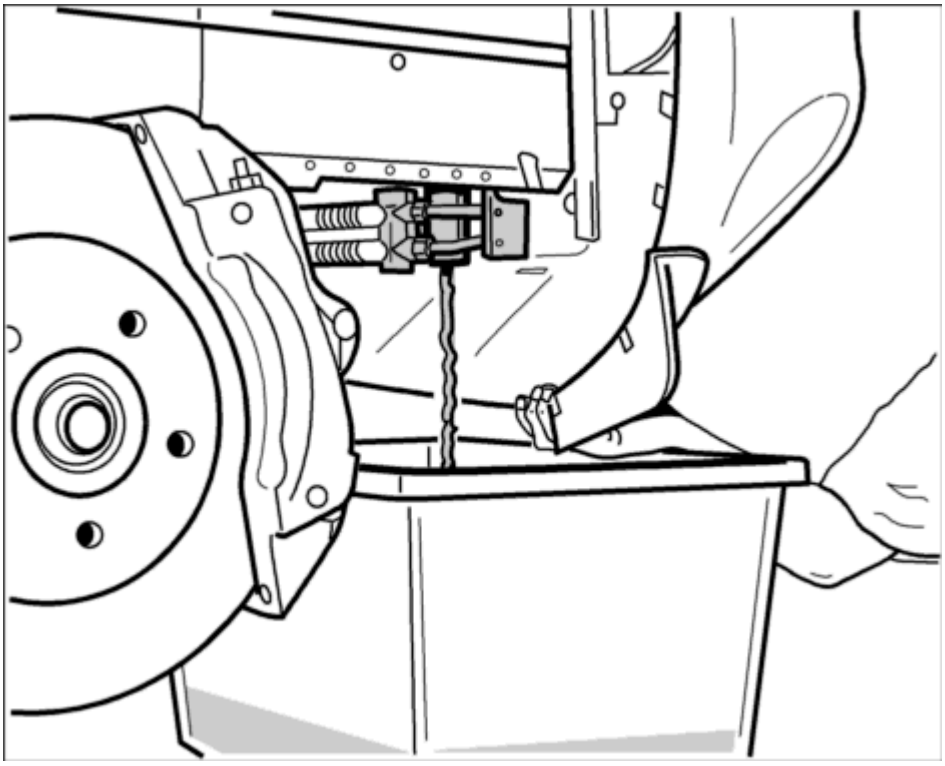


Fig. 46: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Drain cooling system. If present, remove the drain plug from the radiator, otherwise open the lowest coolant hose on the radiator, and drain the coolant into a container and dispose of it according to the applicable national laws if no longer required.

8. Fit a new drain plug on the radiator and tighten it. If removed, fasten coolant hose.

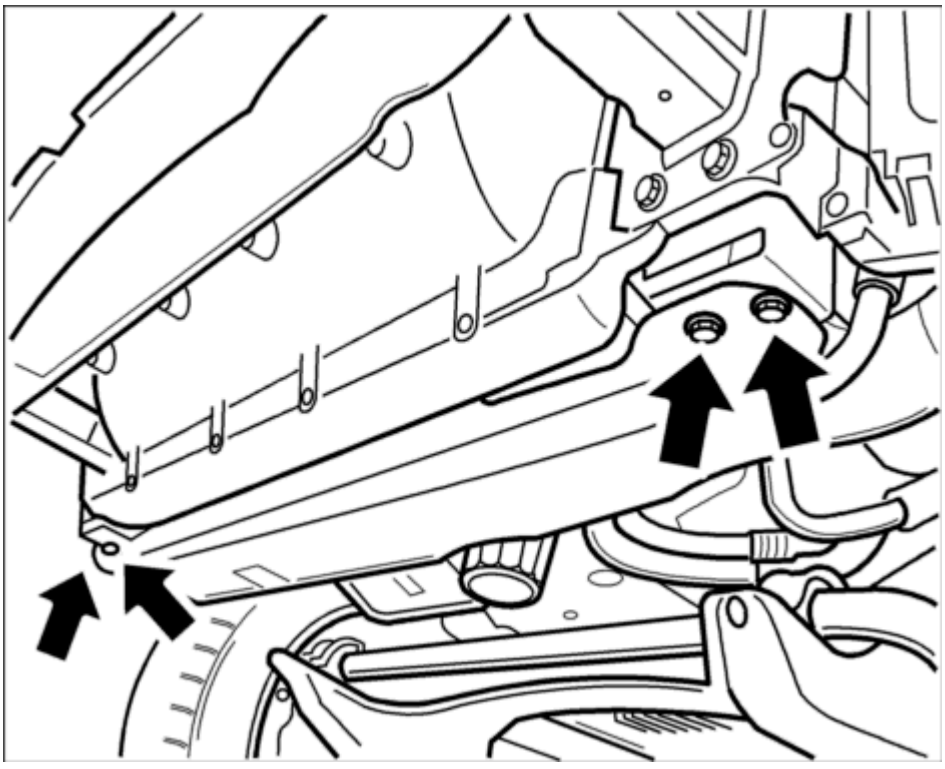


Fig. 47: Support plate fastening screws
Courtesy of PORSCHE OF NORTH AMERICA, INC.

9. Install the support plate under the radiator. Tighten the four fastening screws. --> **Tightening torque: 17 ftlb.**

FILLING THE COOLING SYSTEM (INCLUDES BLEEDING)

Filling cooling system (includes bleeding)

1. Screw the cap adapter for the coolant reservoir (K 60) onto the reservoir.

2. Connect the flexible extension (Fz 100) to the cap.

3. Connect the vacuum pressure gauge of the bleeder tool to the flexible extension. When doing so, ensure that both shut-off valves are closed (positioned at 90° to flow direction).

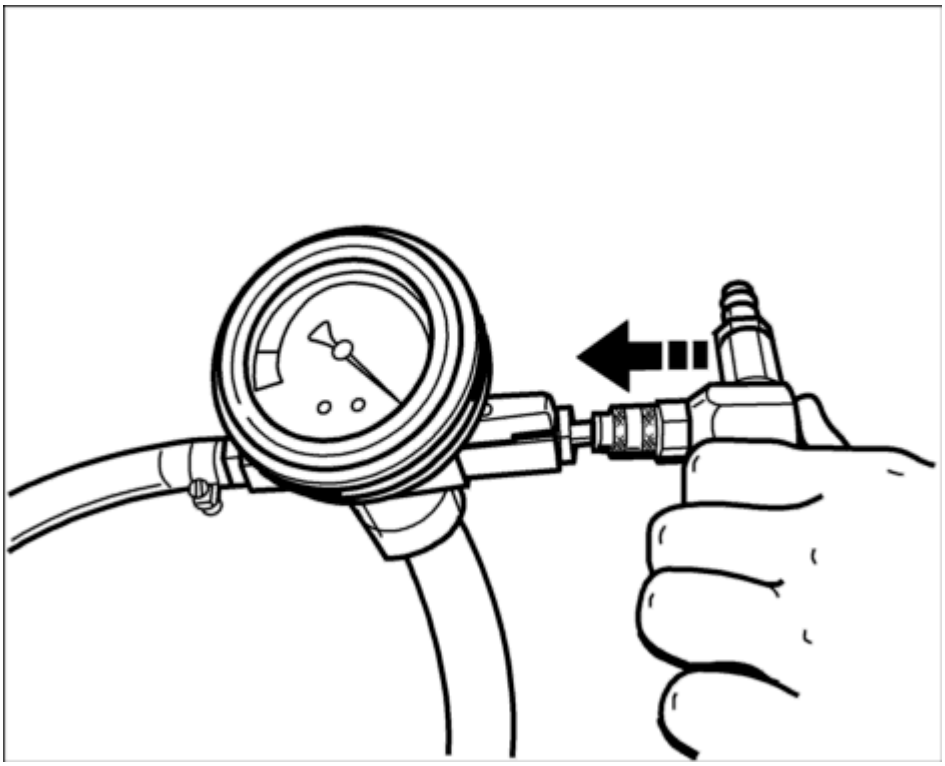


Fig. 48: Connecting the Venturi nozzle to the vacuum pressure gauge
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Connect the Venturi nozzle to the vacuum pressure gauge.

NOTE:

- **The coolant amount provided must be approx. 2 liters more than the amount which has to be filled. Refer to 10 01 IN Tightening torques for Cayenne S (M48/00) and Cayenne Turbo (M48/50) - as of MY 2003 (Cayenne S TIP, Cayenne S MAN) . Refer to 10 01 IN Tightening torques for Cayenne S (M48/00) and Cayenne Turbo (M48/50) - as of MY 2003 (Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan) . Refer to 10 01 IN Technical data for BFD engine (Cayenne) - as of MY 2004 (Cayenne TIP, Cayenne MAN) .**
- ***Because differing quantities of coolant can drain away for different types of repairs, the filling capacities can vary greatly. Recommendation: To be on the safe side, fill the canister to 30 l, then bleed the cooling system. The difference after bleeding is the suctioned-in coolant quantity. Observe volume scale on the canister.***
- ***An antifreeze content of -35°C corresponds to a mixture of 50:50 (antifreeze: water).***

5. Place a canister with a sufficient amount of coolant and with an antifreeze content of -35°C beside the vehicle near the reservoir.

NOTE:

- ***The bleeding process is completed more quickly if the canister is***

positioned at roughly the same height as the coolant expansion tank.

6. Push the filler hose **-5-** of the vacuum pressure gauge onto the canister connection. Lay the return line **-6-** from the Venturi nozzle to a second container (bucket). See **Fig. 49**.

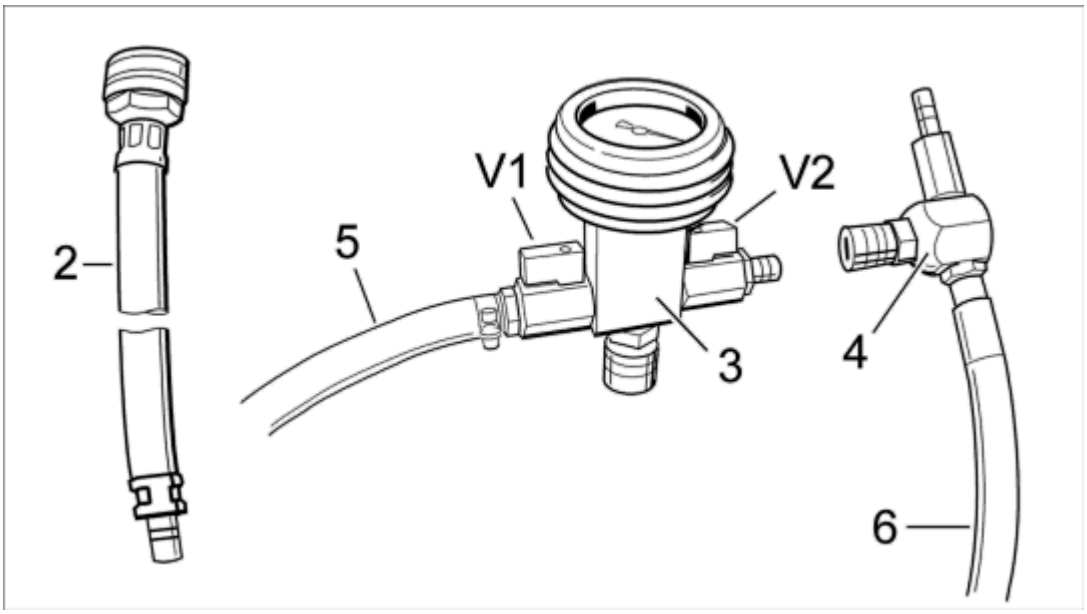


Fig. 49: Vacuum filling device components
Courtesy of PORSCHE OF NORTH AMERICA, INC.

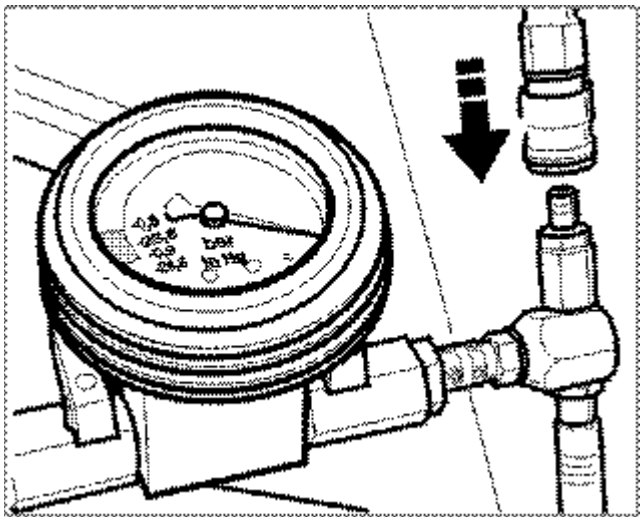


Fig. 50: Connecting the compressed air supply
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***A hissing sound after connecting the compressed air supply is usual.***

7. Connect the compressed air supply.

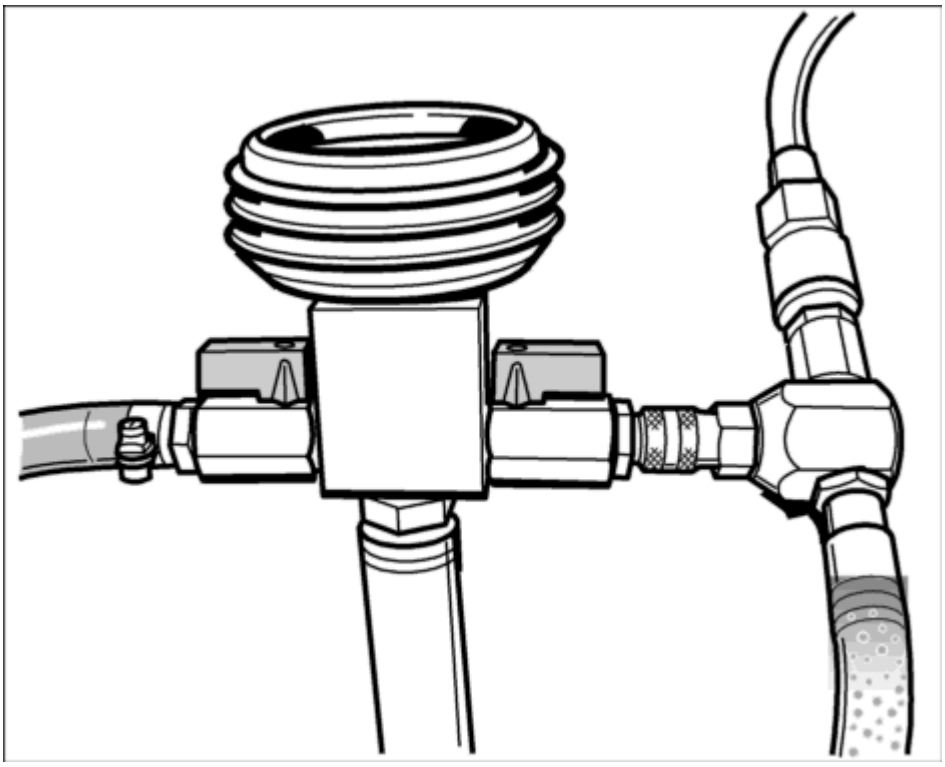


Fig. 51: Shut-off valves on the vacuum pressure gauge
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Open both shut-off valves on the vacuum pressure gauge until the transparent filler hose **-5-** has completely filled with coolant. See **Fig. 49**.

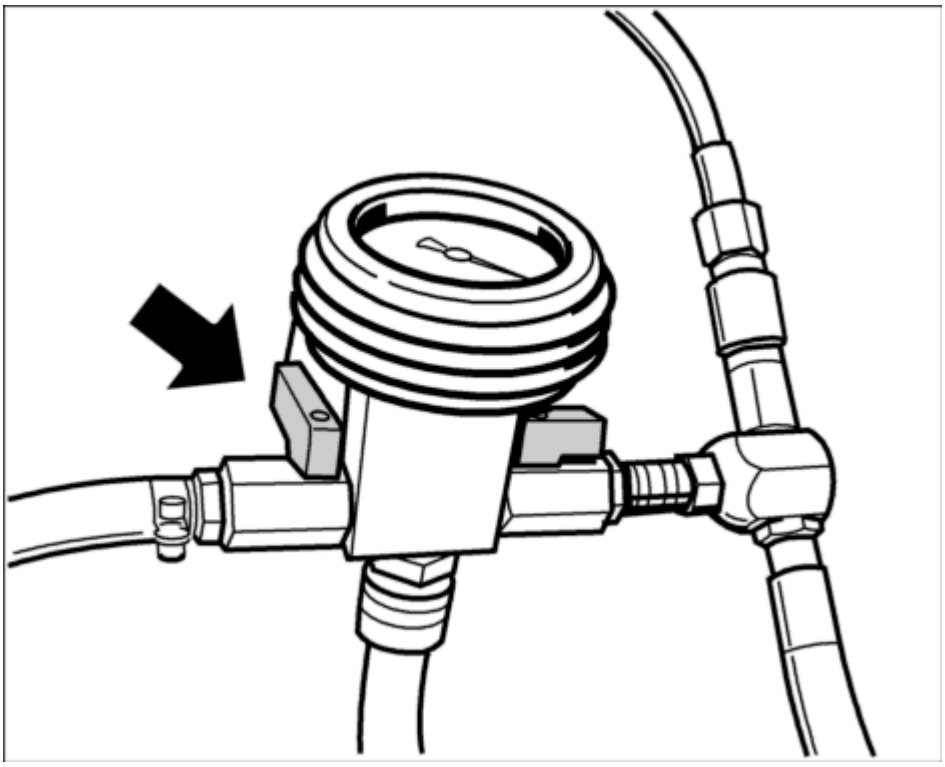


Fig. 52: Closing the left shut-off valve (V1)
Courtesy of PORSCHE OF NORTH AMERICA, INC.

9. Close the left shut-off valve (V1) on the vacuum pressure gauge and allow a vacuum to build up in the cooling system.

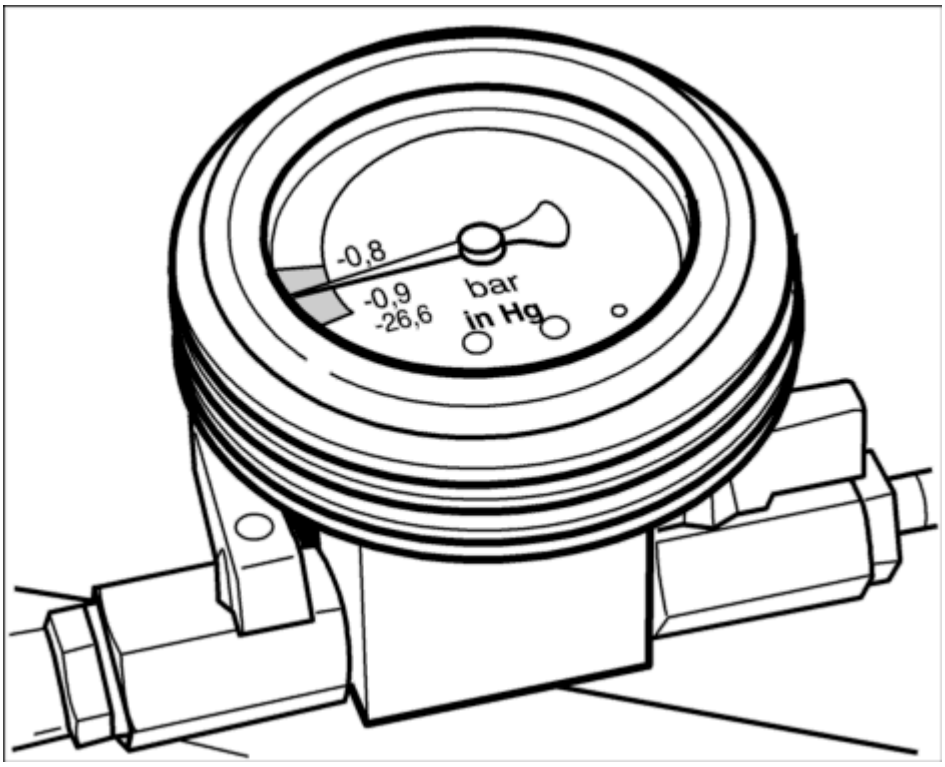


Fig. 53: When there is sufficient vacuum, close the right shut-off valve (V2)
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***If no vacuum is generated (the pointer does not move to the green area), there is a leak in the cooling system.***
- ***Deformation of the rubber hoses of the cooling system is normal.***
- ***When the pressure gauge pointer is in the green area of the display scale, a sufficient vacuum has been built up.***
- ***After both shutoff valves on the vacuum pressure gauge have been closed and the compressed air supply has been disconnected, the vacuum must not drop. If the vacuum drops within approx. 30 seconds, there is a leak in the coolant circuit.***

10. When there is a sufficient vacuum in the cooling system (indicator is in the green area), close the right shut-off valve (V2) and then disconnect the compressed air supply.

11. Re-open the left shut-off valve (V1) on the vacuum pressure gauge. The cooling system is then filled.

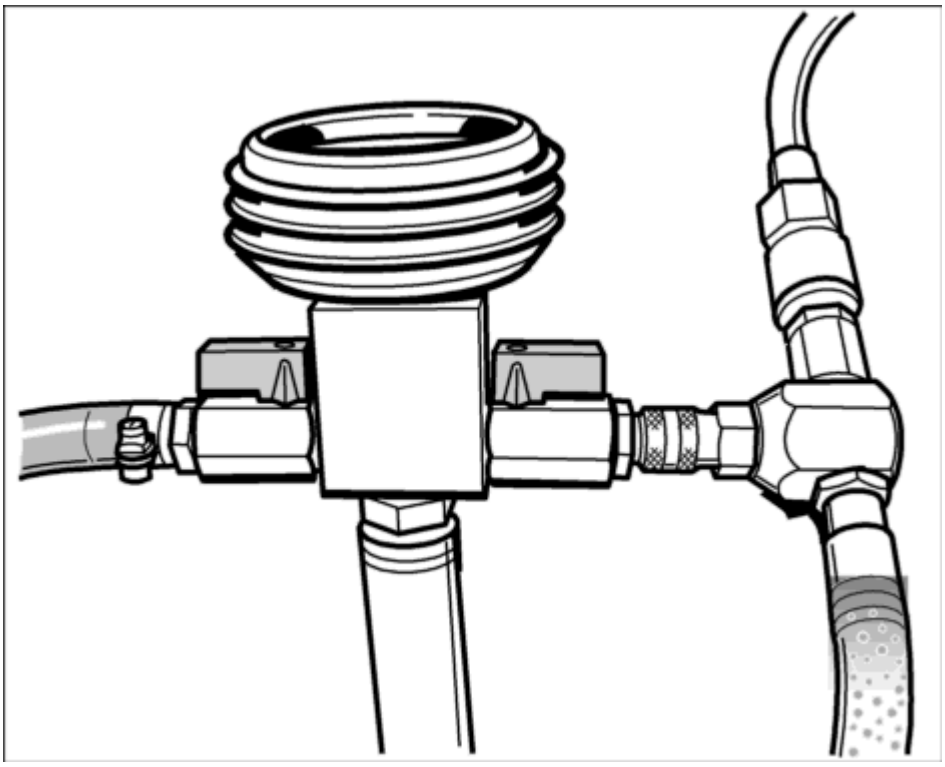


Fig. 54: Opening right shut-off valve
Courtesy of PORSCHE OF NORTH AMERICA, INC.

12. When there is no trace of vacuum present or the coolant is no longer drawn from the canister, open the right shut-off valve (V2).

13. Then remove the complete filling tool (including the cap K 60).

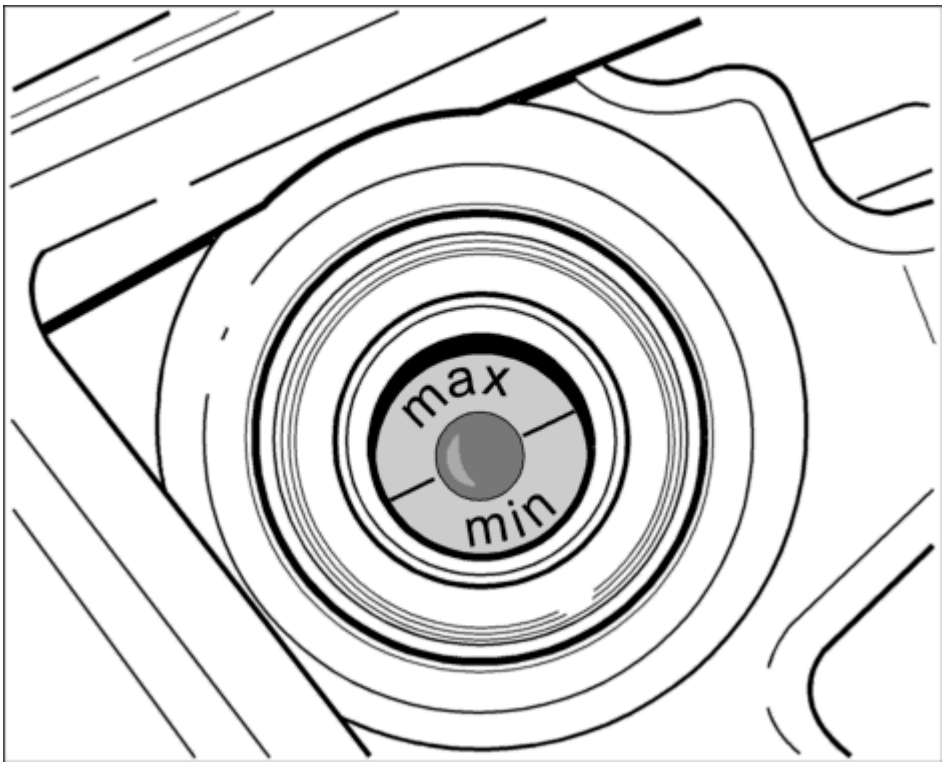


Fig. 55: Maximum marking for coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

14. If necessary, fill the coolant reservoir with coolant to the maximum marking.

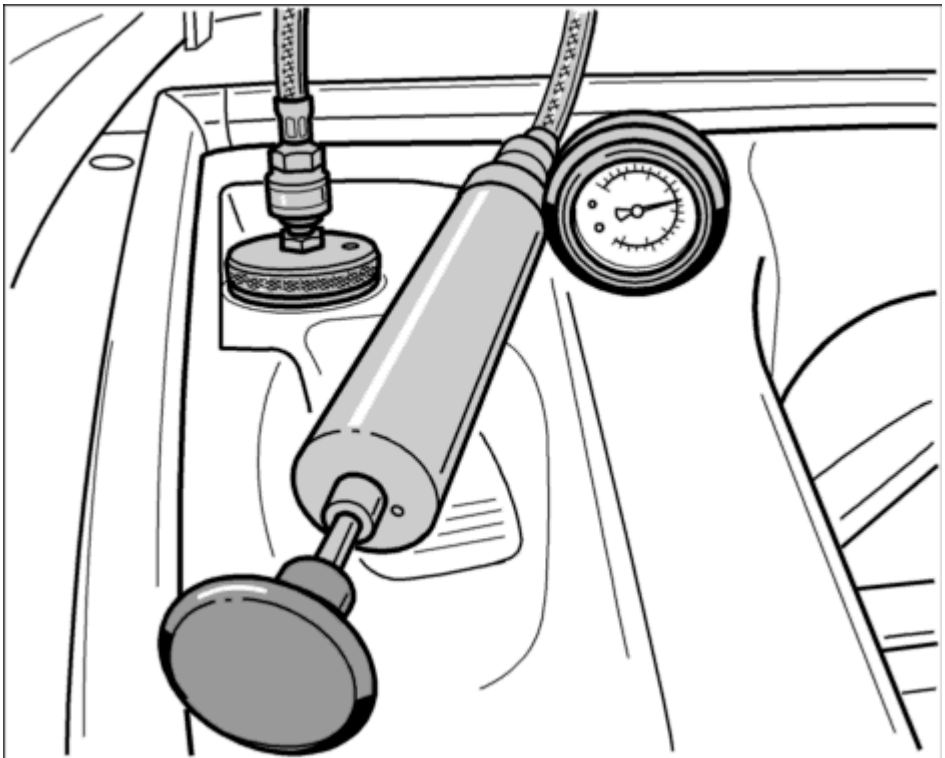


Fig. 56: Cooling system test device
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***If necessary, the system can be checked for leaks. --> 190101 Checking cooling system - chapter on "Checking"***



Fig. 57: Reservoir cap
Courtesy of PORSCHE OF NORTH AMERICA, INC.

15. Screw on the cover of the reservoir in a clockwise direction.

16. Close the maintenance cover.

17. Re-install the complete engine guard. Refer to **10 80 19 Removing and installing engine guard - as of MY 2003 (All Models)** .

18. Conduct a test drive with the vehicle, check the fluid level in the reservoir after the cooling system has cooled again and, if necessary, fill up to the max marking with coolant.

BLEEDING VEHICLES WITH AUXILIARY HEATER

Bleeding vehicles with auxiliary heater

1. Fill and bleed the vehicle as described in the previous chapter using the vacuum filling device. **--> 193817 Draining and filling coolant (includes bleeding)**

2. Warm engine to operating temperature ([>=] 90 °C).

NOTE:

- ***Do not activate the 2/3 directional-control valve with the Porsche System Tester above 1500 rpm.***
- ***Activate the 2/3 directional-control valve with the Porsche System Tester below 1500 rpm.***

3. Operate engine for 5 minutes with changing engine speeds. When doing this, run the engine for 10 seconds in idle and then for 10 seconds at 4,000 rpm. In the speed transition from higher engine speeds (1500 to 4000 rpm) to idle (approx. 600), the directional-control valve should be activated with the Porsche System Tester below 1500 rpm. Note that the 2/3 directional-control valve is not activated with the Porsche System Tester above 1500 rpm.

4. Let the vehicle cool down.

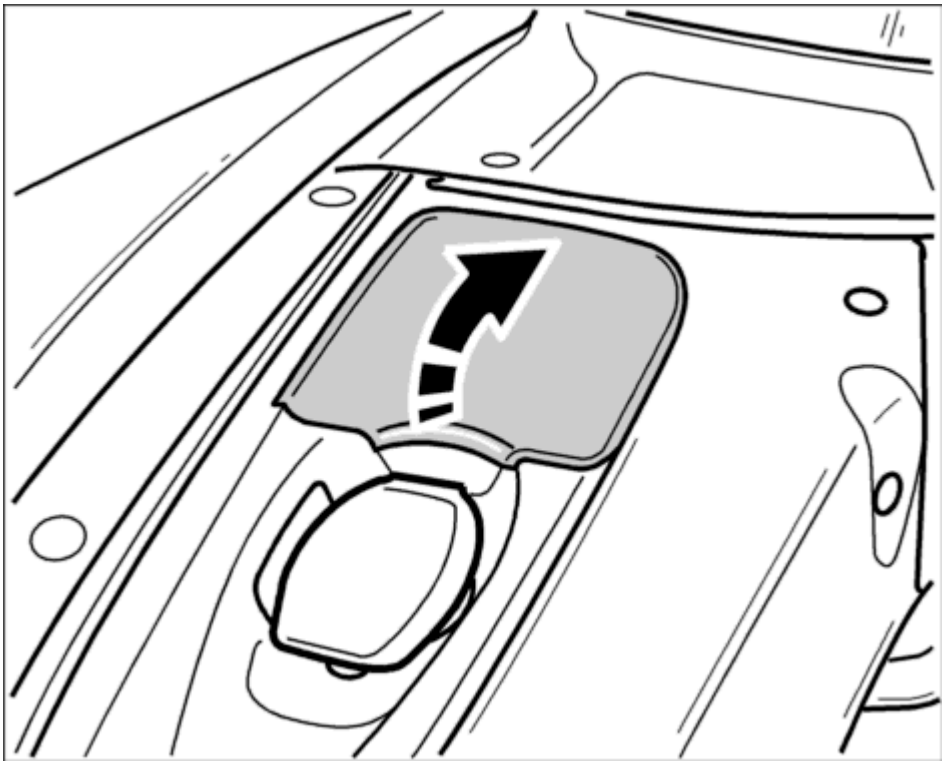


Fig. 58: Maintenance cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Open maintenance cover.

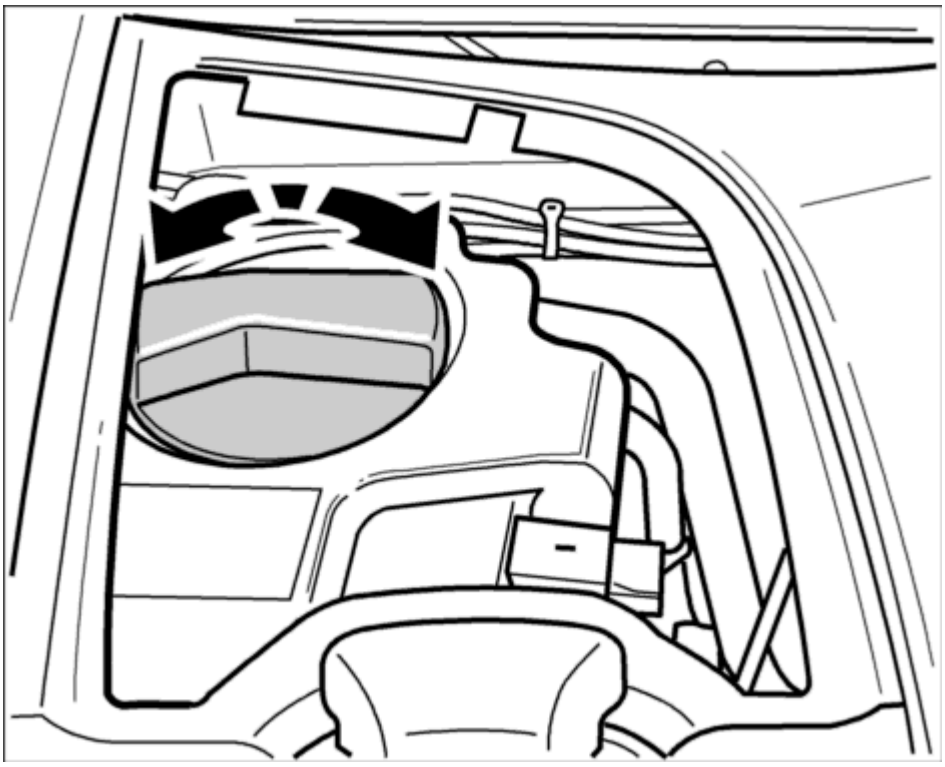


Fig. 59: Cap on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Carefully open the cap on the coolant reservoir. Unscrew the cap in an anti-clockwise direction.

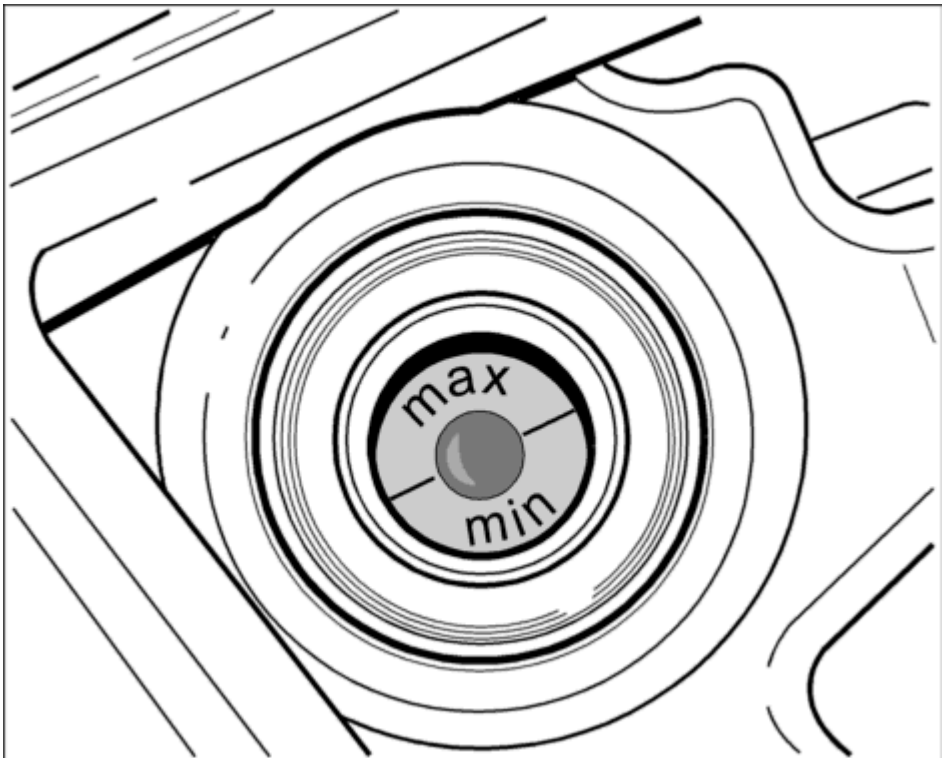


Fig. 60: Maximum marking for coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Check coolant level and, if necessary, fill the coolant reservoir with coolant to the maximum marking.



Fig. 61: Reservoir cap
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Screw on the cover of the reservoir.

9. Close the maintenance cover.

19 40 19 REMOVING AND INSTALLING COOLANT EXPANSION TANK - AS OF MY 2003 (CAYENNE TIP, CAYENNE MAN)

PRELIMINARY WORK

Preliminary work

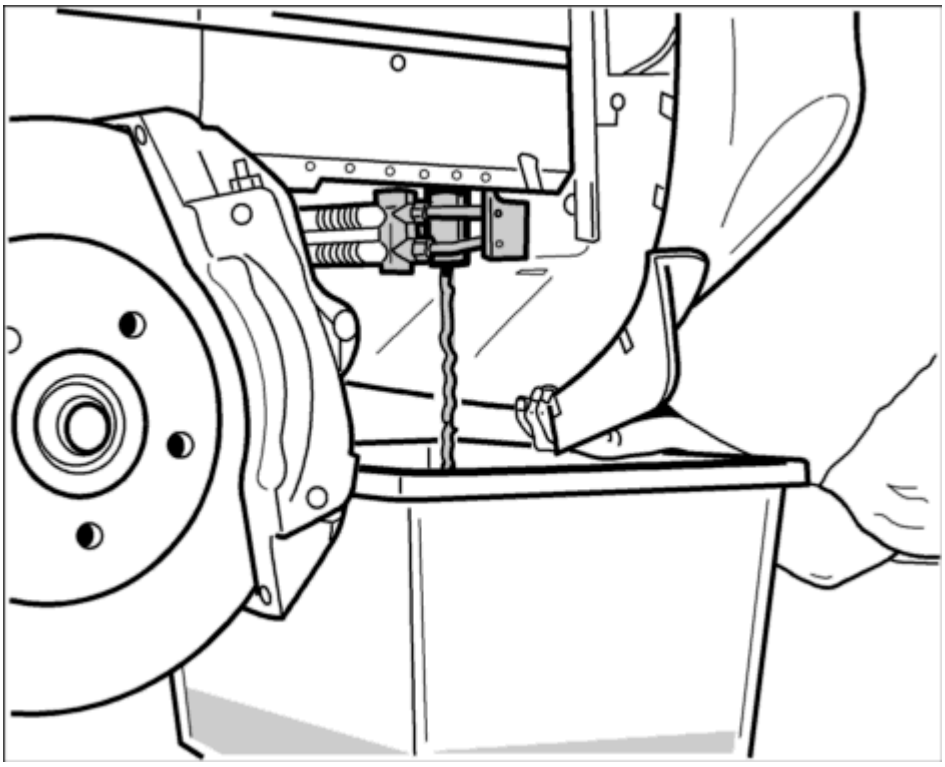


Fig. 62: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Draining"**

2. Remove the right-hand headlight. Refer to **94 15 19 Removing and installing main headlight - as of MY 2003 (All Models)** .

3. Remove engine compartment cover on the right and rear. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

REMOVING COOLANT EXPANSION TANK

Removing coolant reservoir

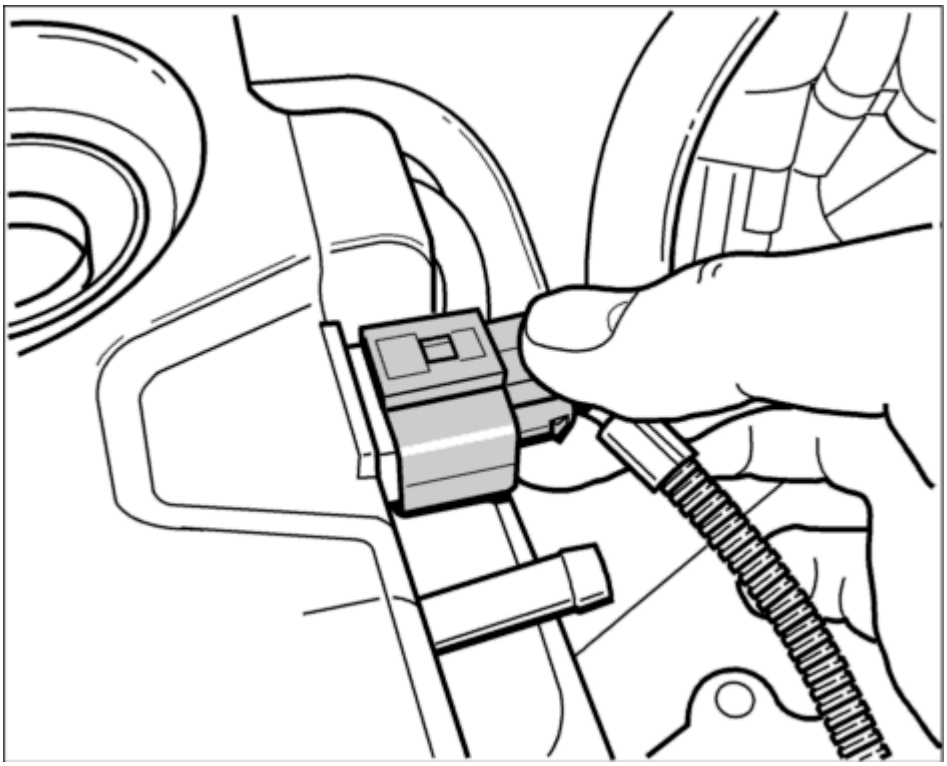


Fig. 63: Electric connector on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Remove electric connector from coolant reservoir.

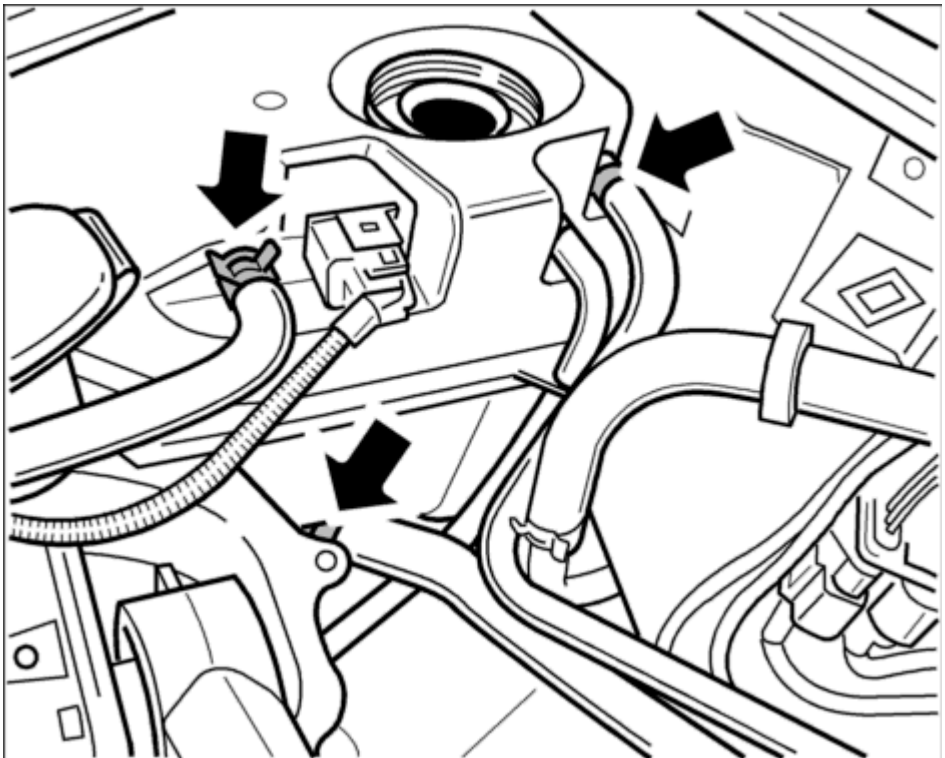


Fig. 64: Coolant hoses
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Pull off the 3 coolant hoses shown.

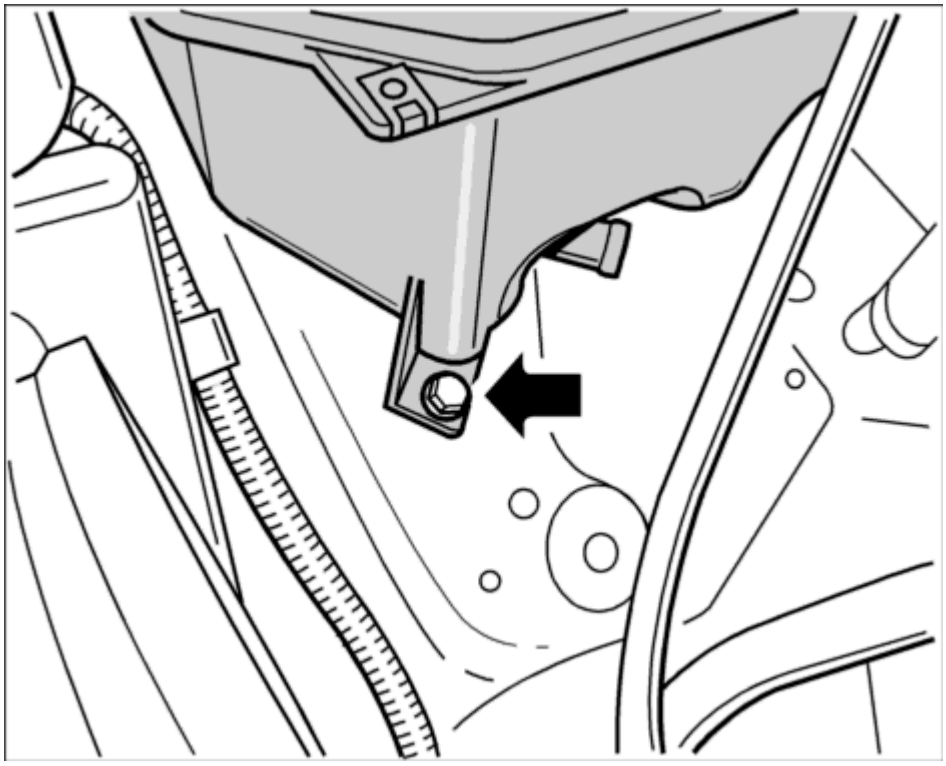


Fig. 65: Fastening screw
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Loosen the coolant reservoir fastening screw.

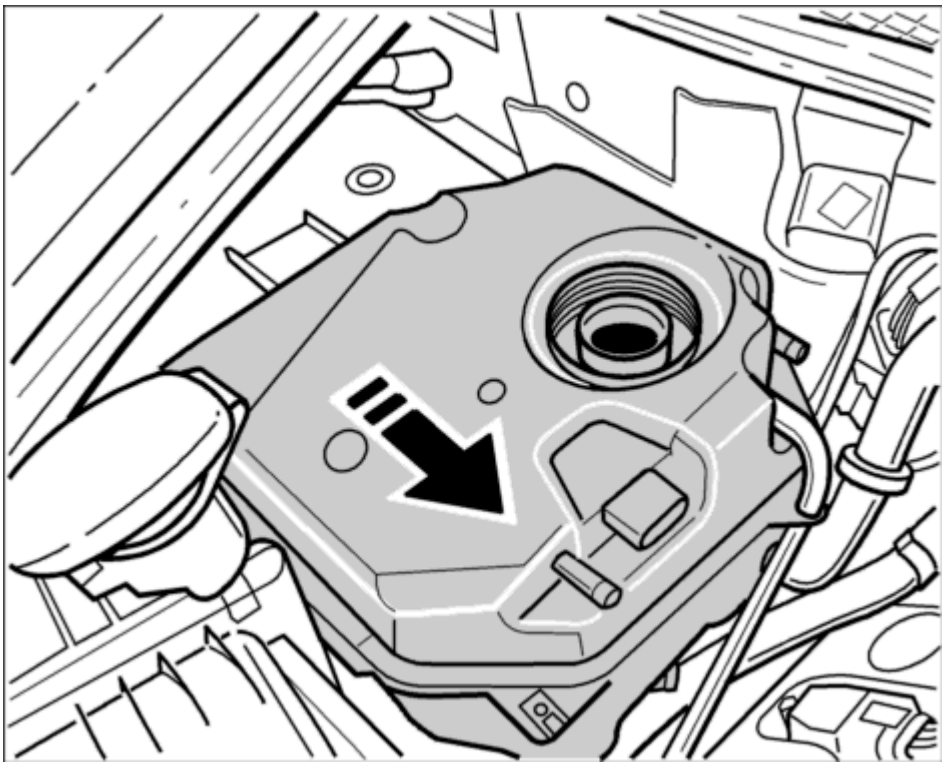


Fig. 66: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Pull coolant reservoir towards engine and take out of the bracket.

INSTALLING COOLANT EXPANSION TANK

Installing coolant reservoir

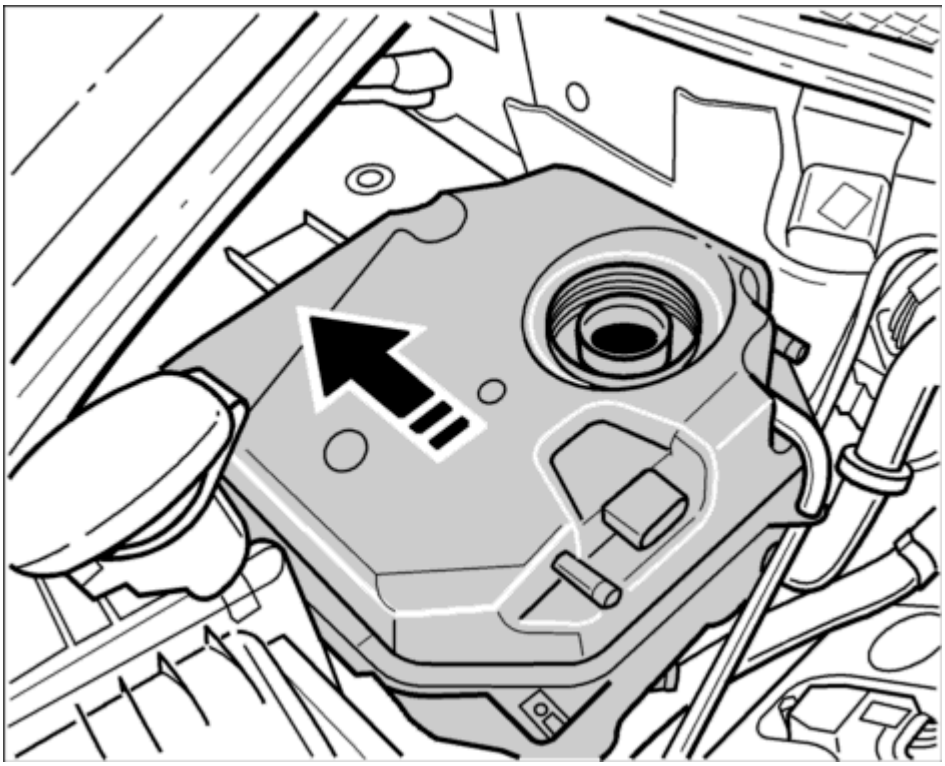


Fig. 67: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert coolant reservoir into the bracket and push in the direction of the wing.

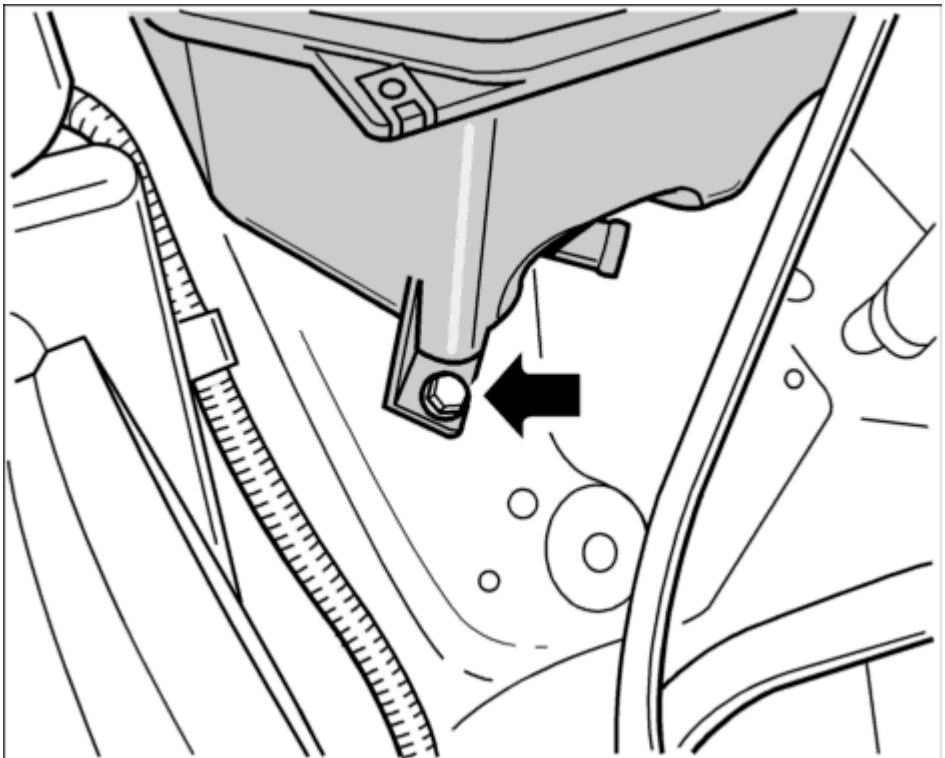


Fig. 68: Fastening screw
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Tighten fastening screw. **--> Tightening torque: 7.5 ftlb.**

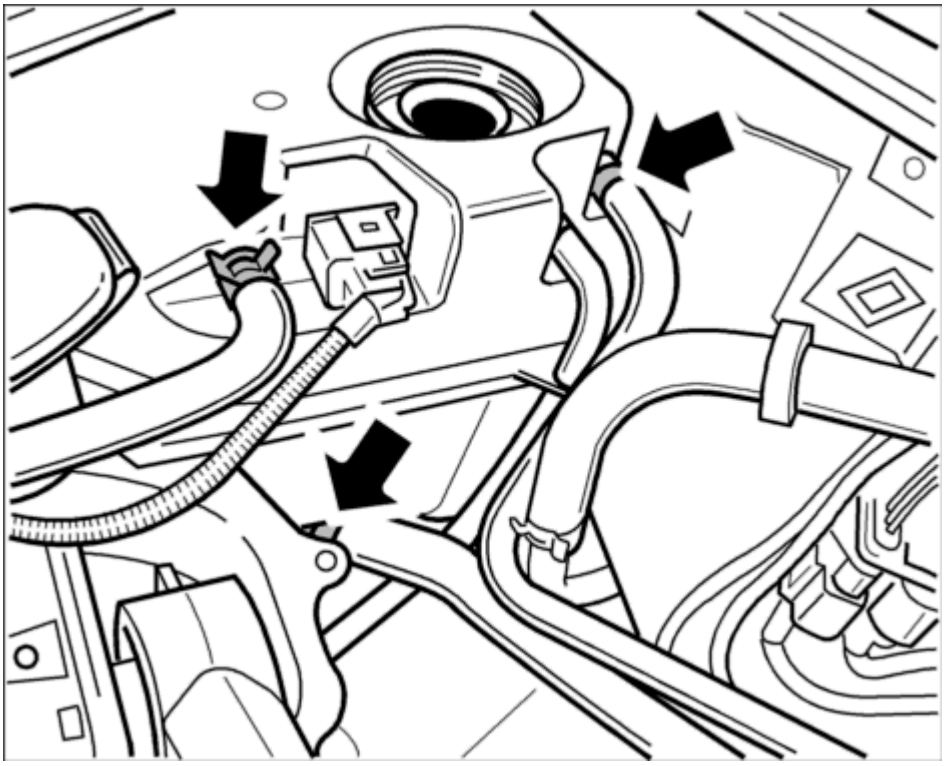


Fig. 69: Coolant hoses
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Mount and tighten the three coolant hoses.

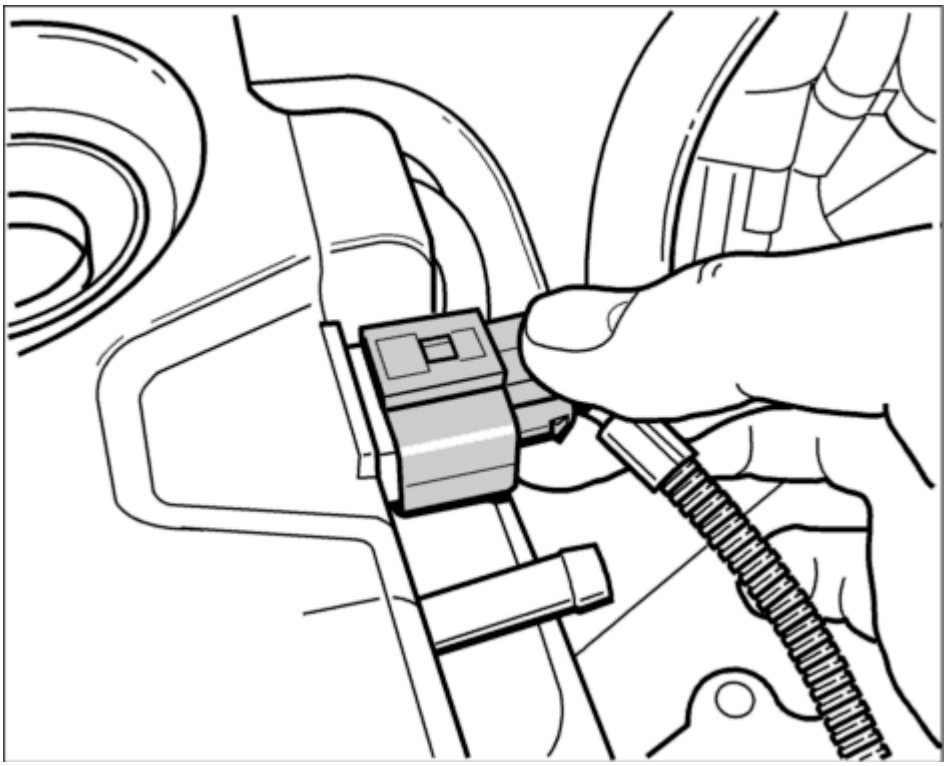


Fig. 70: Electric plug at reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Connect electric plug to reservoir.

SUBSEQUENT WORK

Subsequent work

1. Install the engine compartment cover at the right and rear. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

2. Install right headlight. Refer to **94 15 19 Removing and installing main headlight - as of MY 2003 (All Models)** .

3. Fill and bleed the cooling system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

19 40 19 REMOVING AND INSTALLING COOLANT EXPANSION TANK - AS OF MY 2003 (CAYENNE S TIP, CAYENNE S MAN, CAYENNE TURBO, CAYENNE TURBO S, CAYENNE S TIO TITAN)

PRELIMINARY WORK

Preliminary work

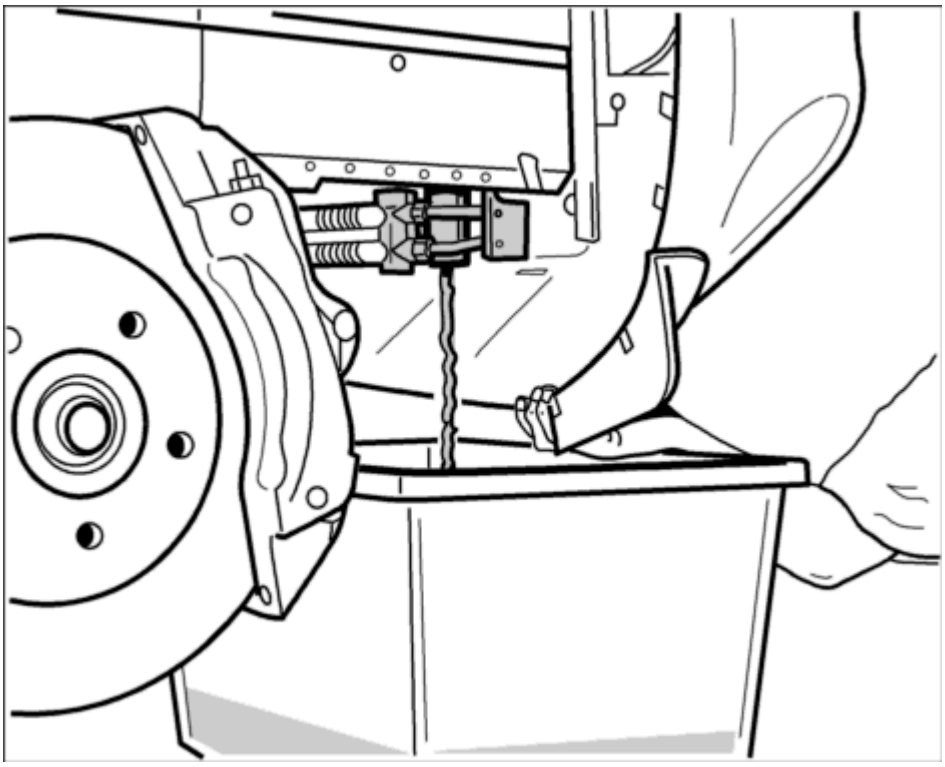


Fig. 71: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Draining"**

2. Remove the right-hand headlight. Refer to **94 15 19 Removing and installing main headlight - as of MY 2003 (All Models)** .

3. Remove engine compartment cover on the right and rear. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

REMOVING COOLANT EXPANSION TANK

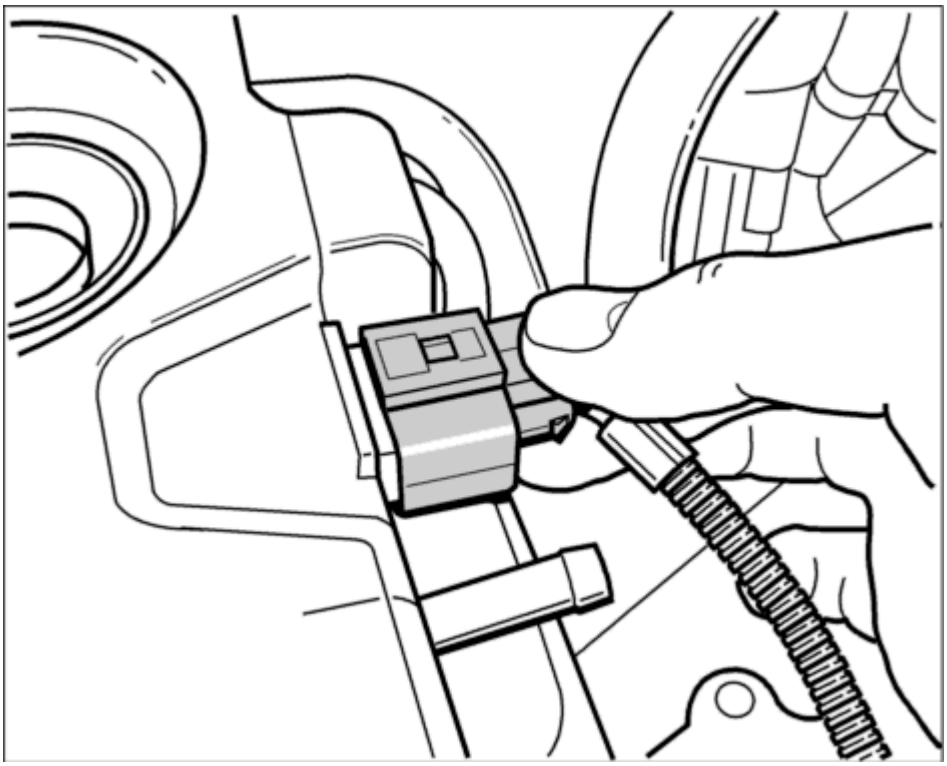


Fig. 72: Electric connector on coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Remove electric connector from coolant reservoir.

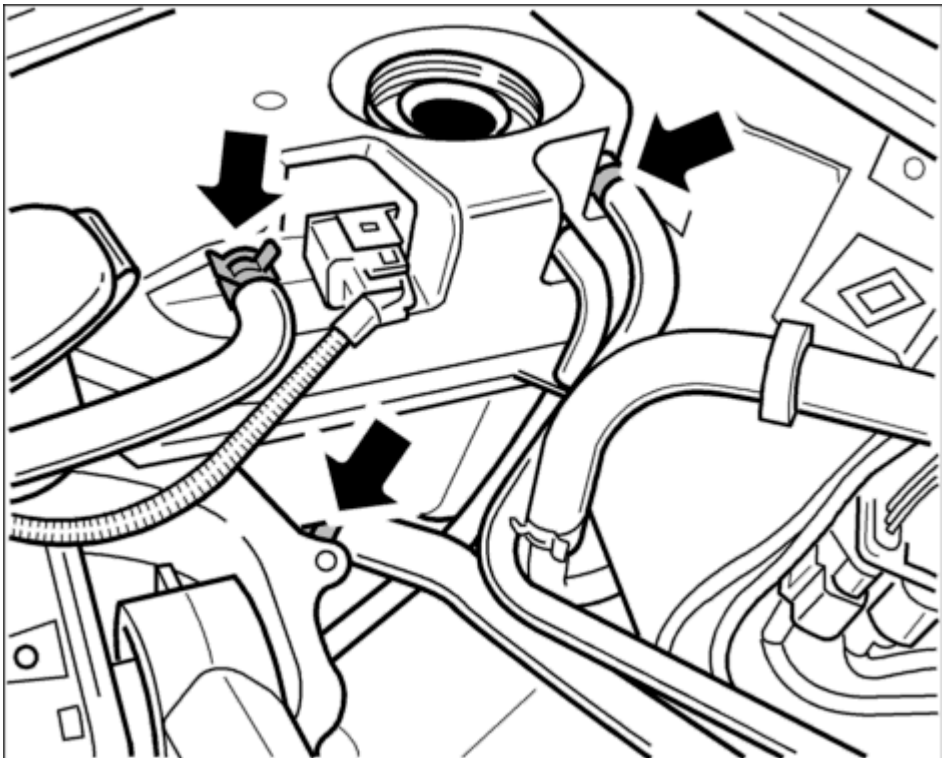


Fig. 73: Coolant hoses
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Pull off the three coolant hoses shown.

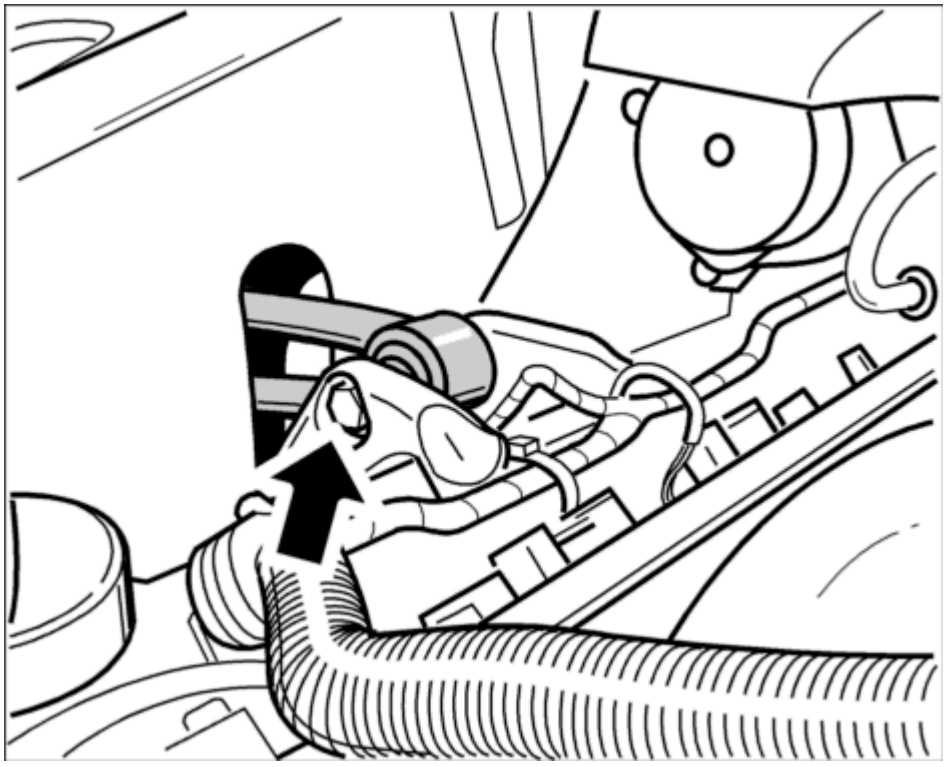


Fig. 74: Fastening screw for torque support bracket
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Detach the torque support. To do this, unscrew the fastening screw on the torque support bracket and pull it out.

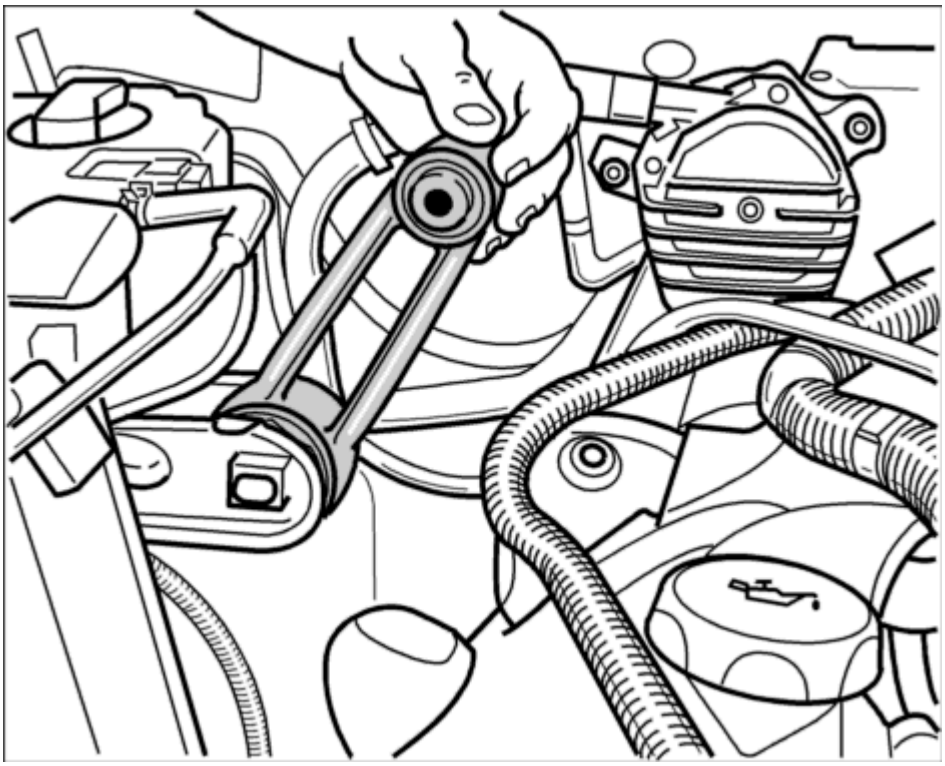


Fig. 75: Torque support on body
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Detach the torque support from the body and swivel upwards.

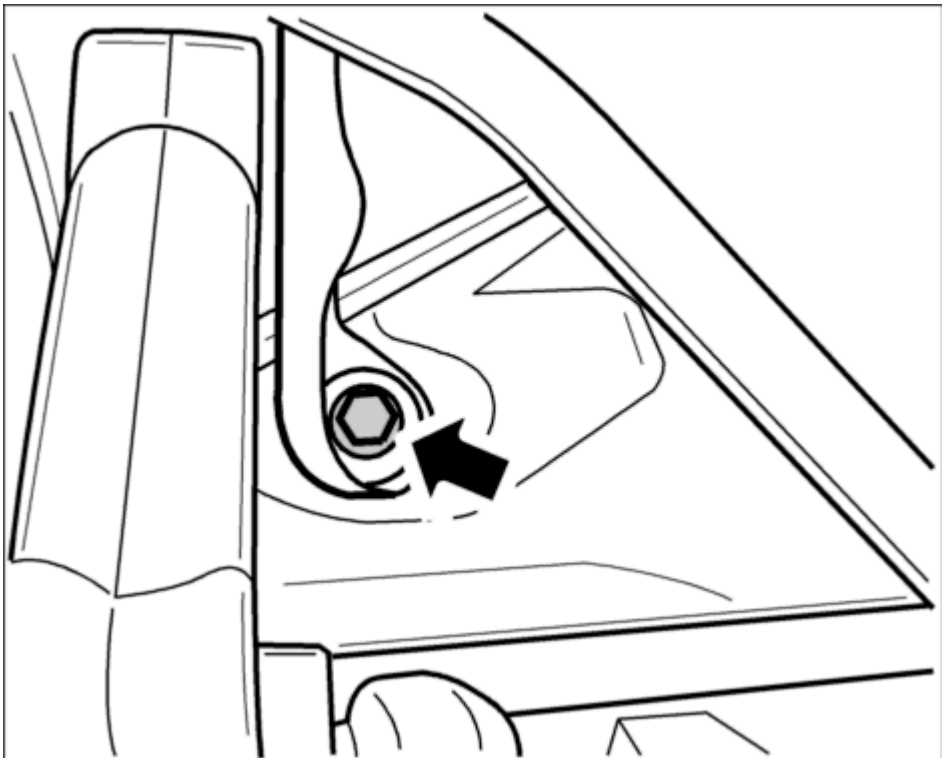


Fig. 76: View shows screw on spring dome
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Undo torque support bracket fastening screw from the body. One fastening screw is loosened through the headlight opening. The second screw is accessible from the top.

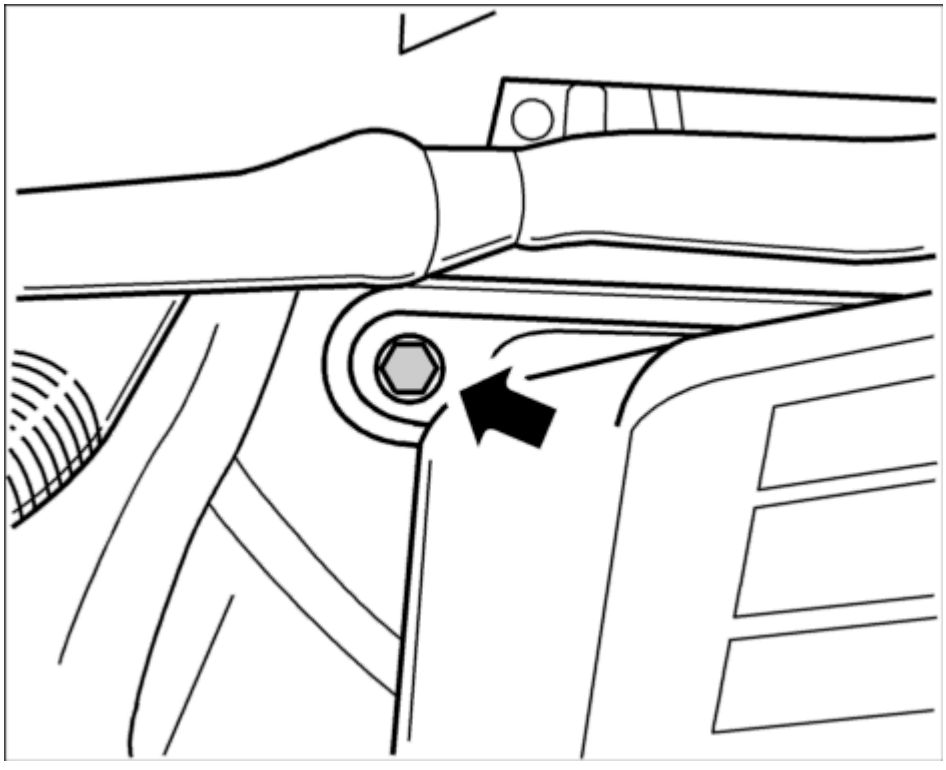


Fig. 77: View shows how screw is connected through headlight opening
Courtesy of PORSCHE OF NORTH AMERICA, INC.

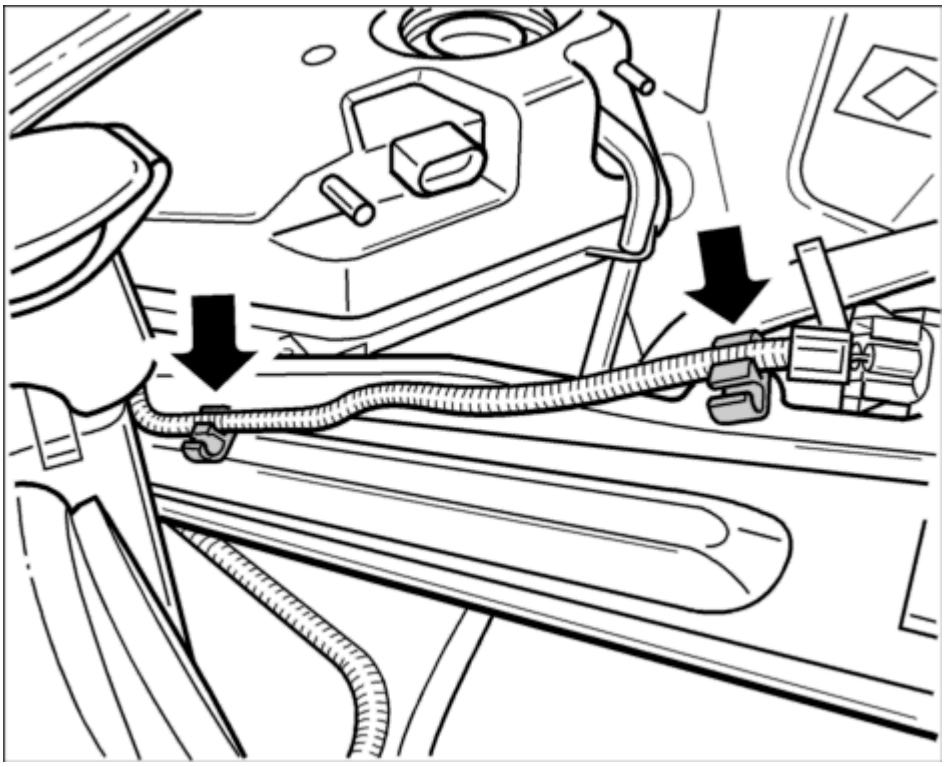


Fig. 78: Taking out electric cable
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Remove body bracket. When doing this, unclip the electric cable (2 x).

7. Loosen the secondary air pump from cylinder row 1-4. Refer to **26 65 19 Removing and installing secondary air pump - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

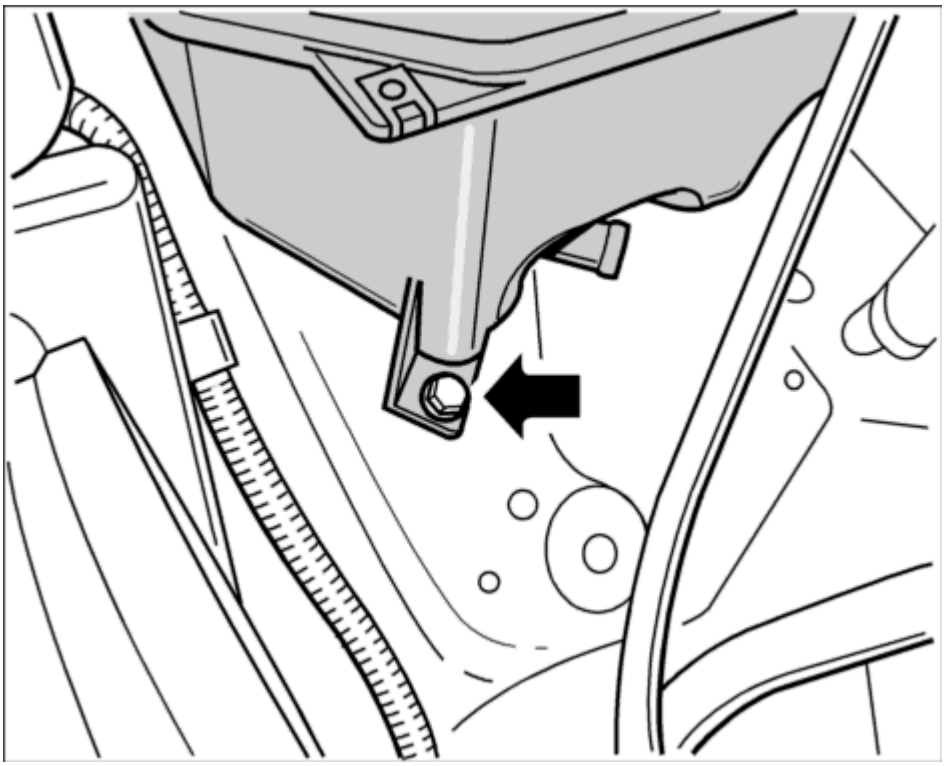


Fig. 79: Fastening screw
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Undo the coolant reservoir fastening screw.

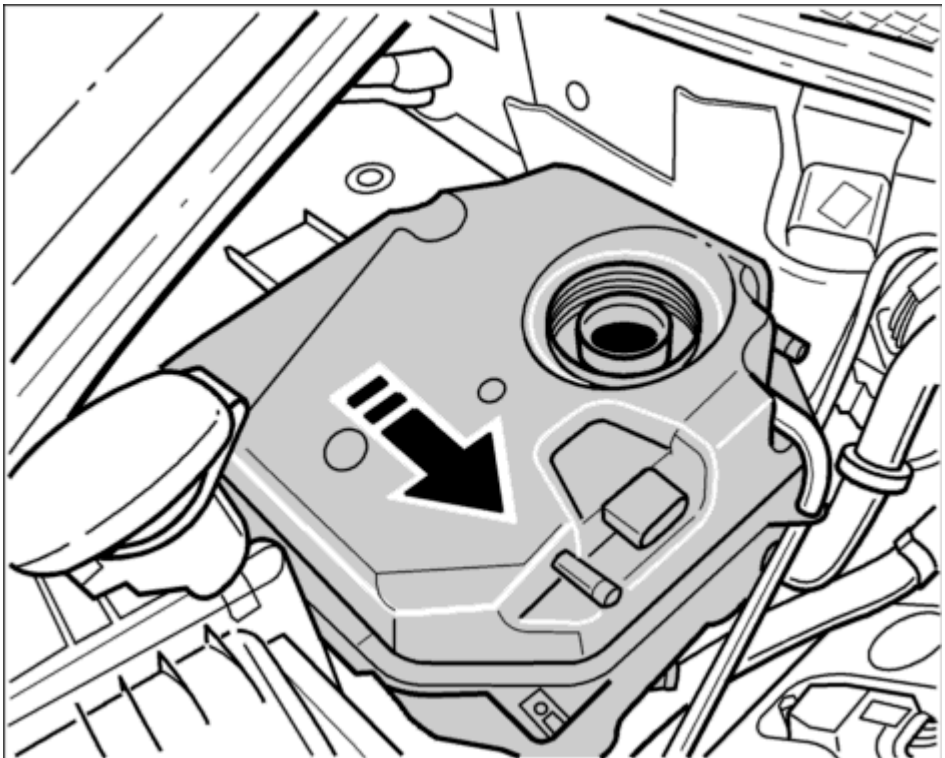


Fig. 80: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

9. Pull coolant reservoir towards engine and take out of the holder.

INSTALLING COOLANT EXPANSION TANK

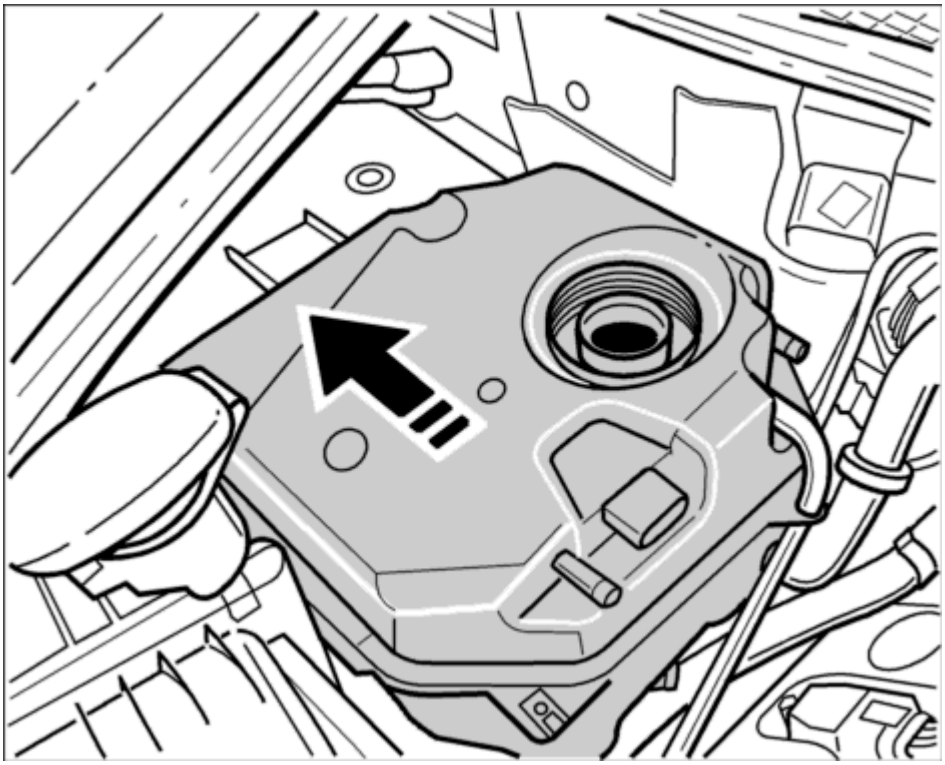


Fig. 81: Coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert coolant reservoir into the holder and push in the direction of the wing.

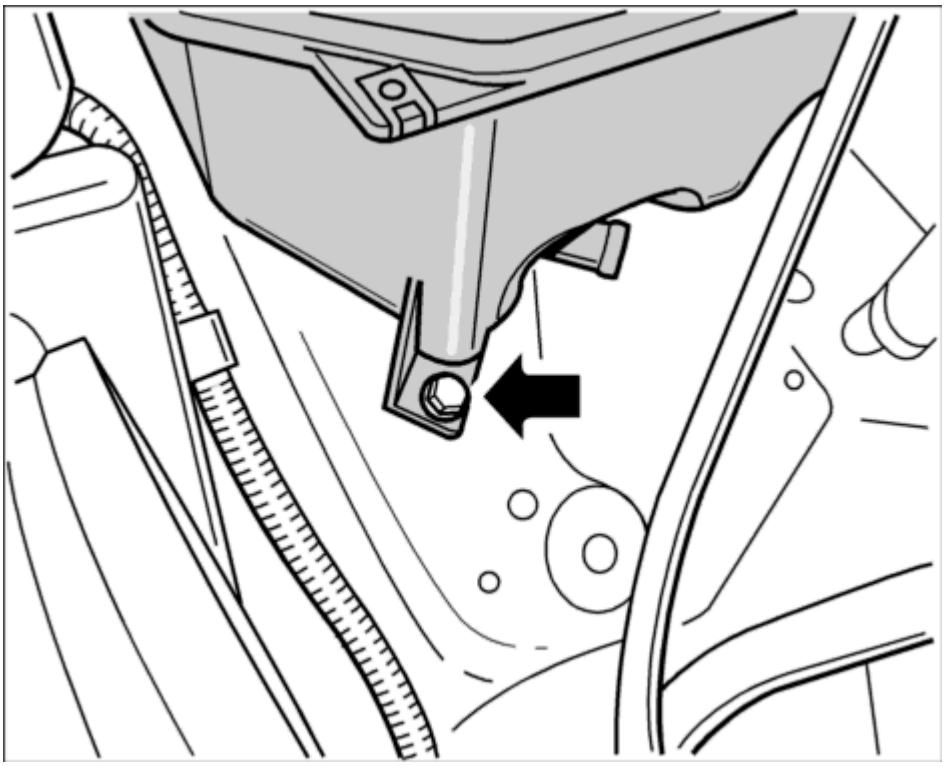


Fig. 82: Fastening screw, coolant reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Tighten fastening screw. --> **Tightening torque: 7.5 ftlb.**

3. Tighten the secondary air pump from cylinder row 1-4. Refer to **26 65 19 Removing and installing secondary air pump - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

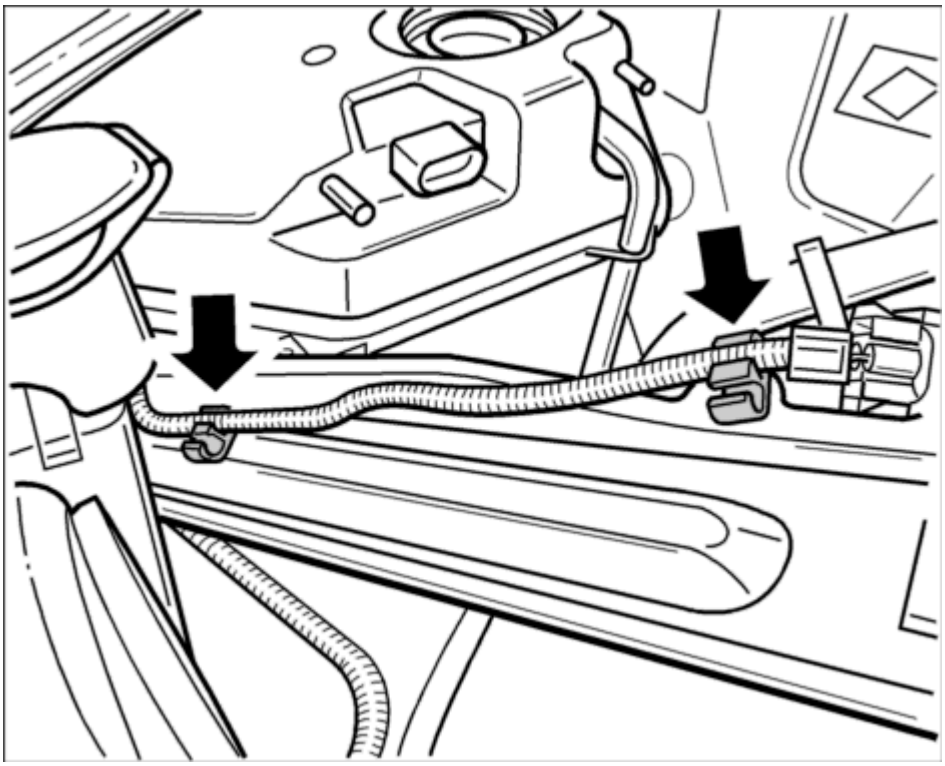


Fig. 83: Clipping in electric cable
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Reinstall body bracket for the torque support. Clip on electric cable for coolant reservoir (2 x).

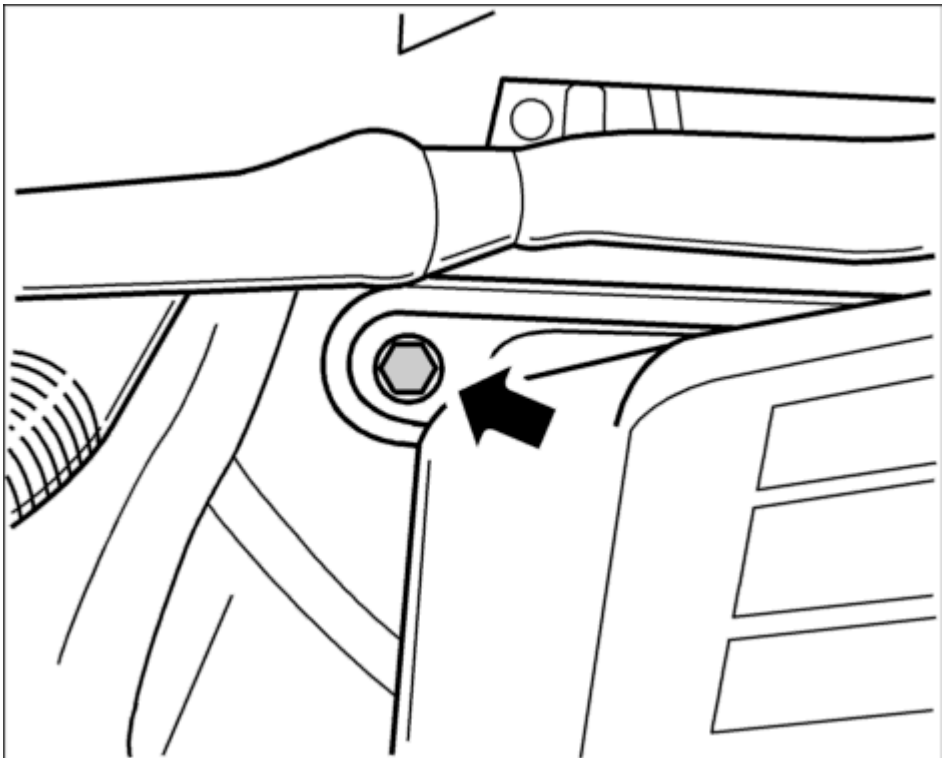


Fig. 84: Tightening fastening screw through the headlight opening
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Tighten fastening screw (M10 x 20) through the headlight opening. **--> Tightening torque: 44 ftlb.**

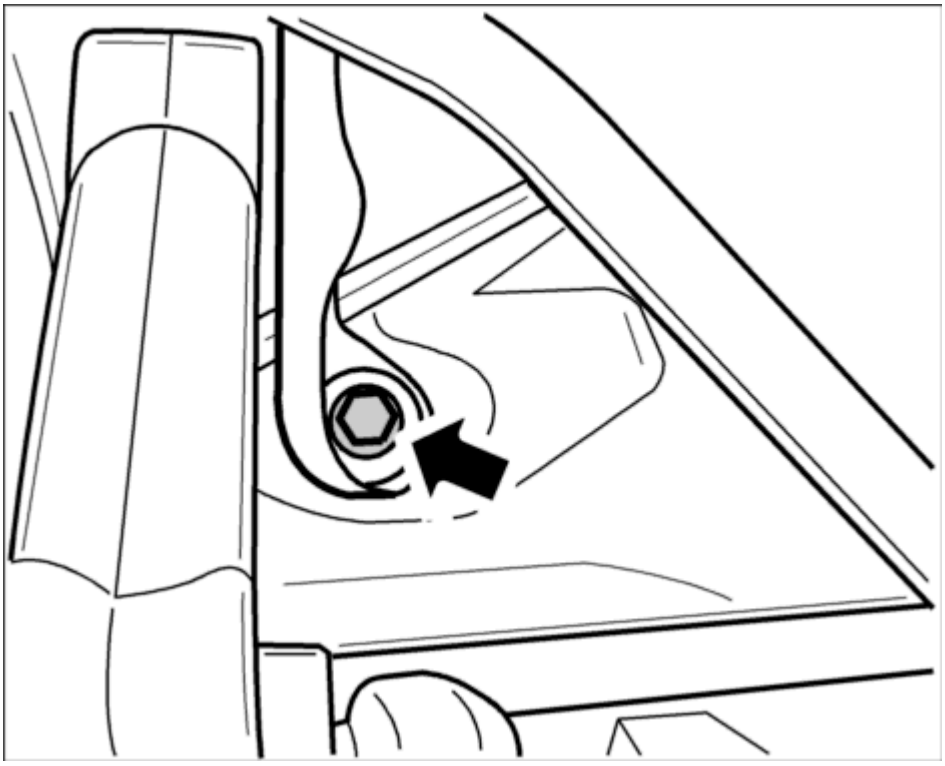


Fig. 85: Tightening fastening screw from the engine compartment
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Tighten fastening screw (M10 x 37) from the engine compartment. **--> Initial tightening: 37 ftlb. --> Final tightening: 90°**

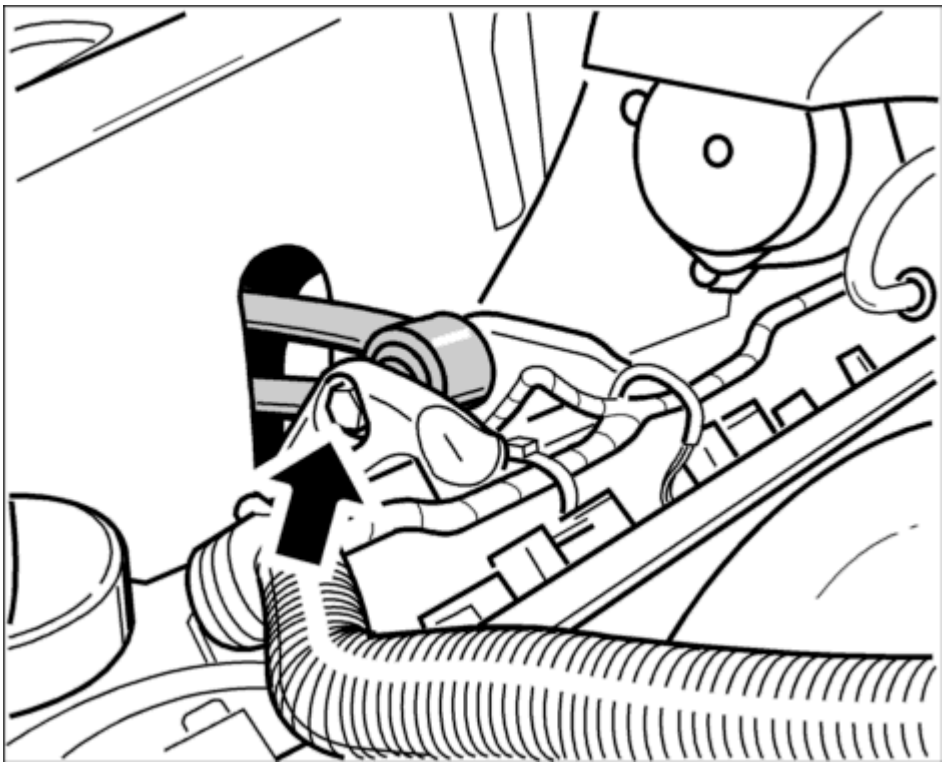


Fig. 86: Torque converter support
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Reinstall torque support. Install the fastening screw (M10 x 85) with a new fastening nut on the bracket. --> **Tightening torque: 44 ftlb.**

8. Tighten the fastening screw of the torque support onto the body (M10 x 70). --> **Tightening torque: 44 ftlb.**

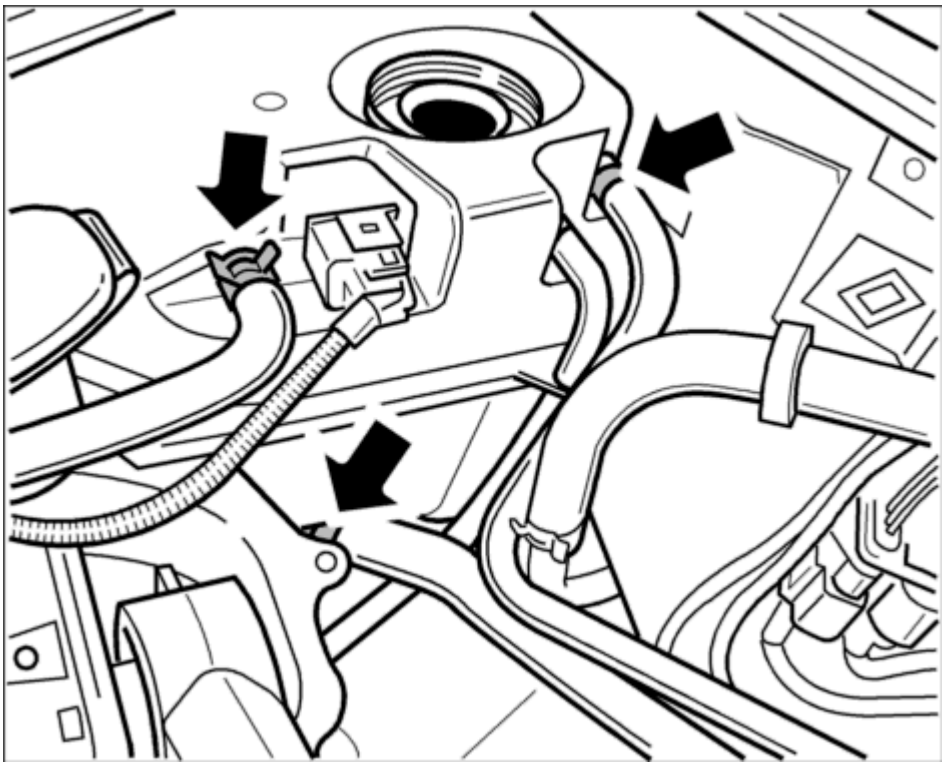


Fig. 87: Coolant hoses
Courtesy of PORSCHE OF NORTH AMERICA, INC.

9. Mount and tighten the three coolant hoses.

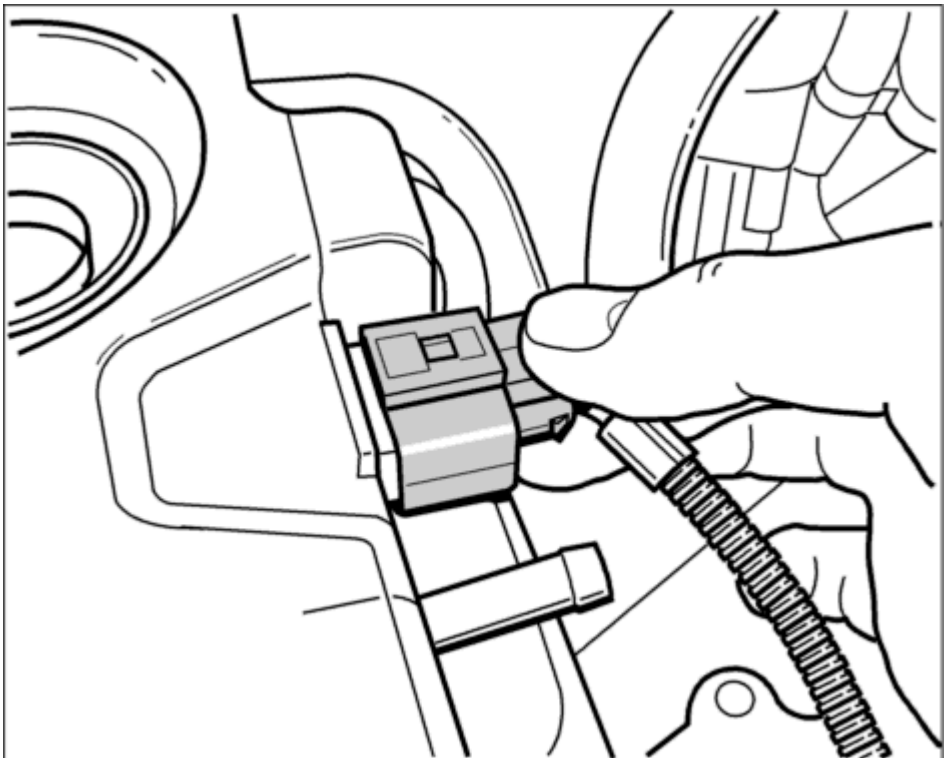


Fig. 88: Electric connector to reservoir
Courtesy of PORSCHE OF NORTH AMERICA, INC.

10. Connect electric plug to reservoir.

SUBSEQUENT WORK

Subsequent work

1. Install the engine compartment cover at the right and rear. Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

2. Install right headlight. Refer to **94 15 19 Removing and installing main headlight - as of MY 2003 (All Models)** .

3. Fill and bleed the cooling system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

19 45 19 REMOVING AND INSTALLING ADDITIONAL COOLANT PUMP - AS OF MY 2003 (CAYENNE S TIP, CAYENNE S MAN, CAYENNE TURBO, CAYENNE TURBO S, CAYENNE S TIO TITAN)

PRELIMINARY WORK

Preliminary work

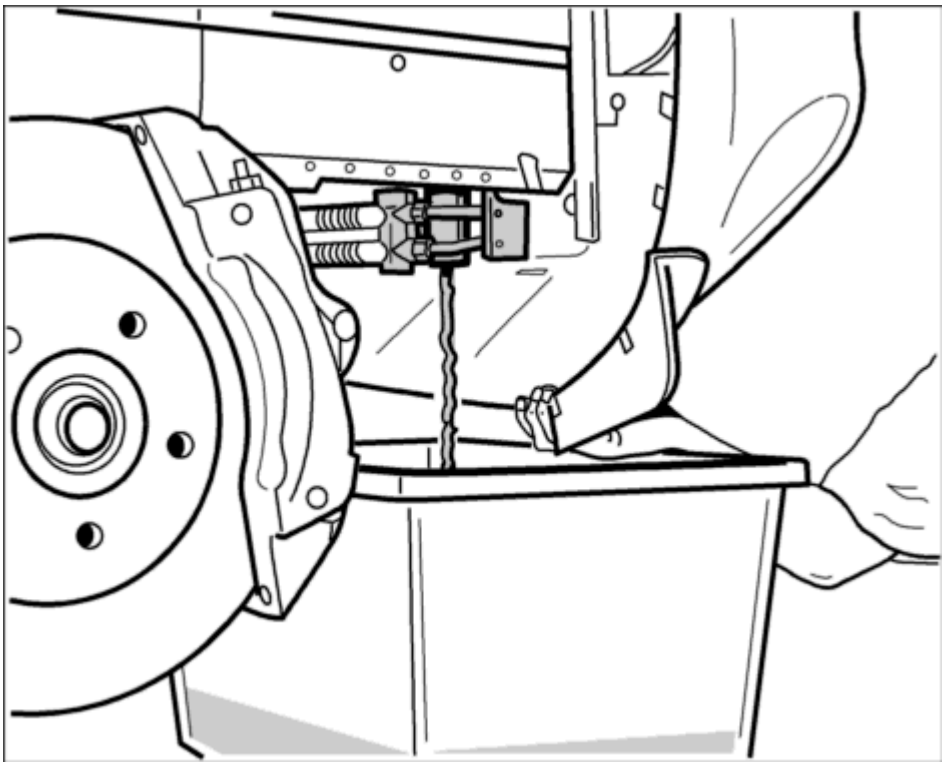


Fig. 89: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

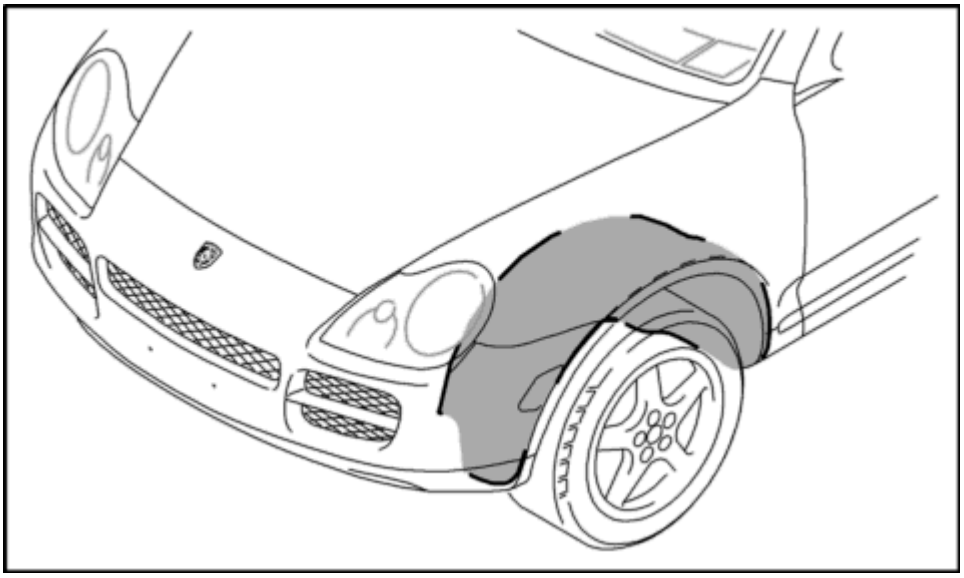


Fig. 90: Front left wheel housing liner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Remove front left wheel housing liner. Refer to **50 56 19 Removing and installing front wheel housing liner - as of MY 2003 (All Models)** .

REMOVING ADDITIONAL COOLANT PUMP

Removing the additional coolant pump

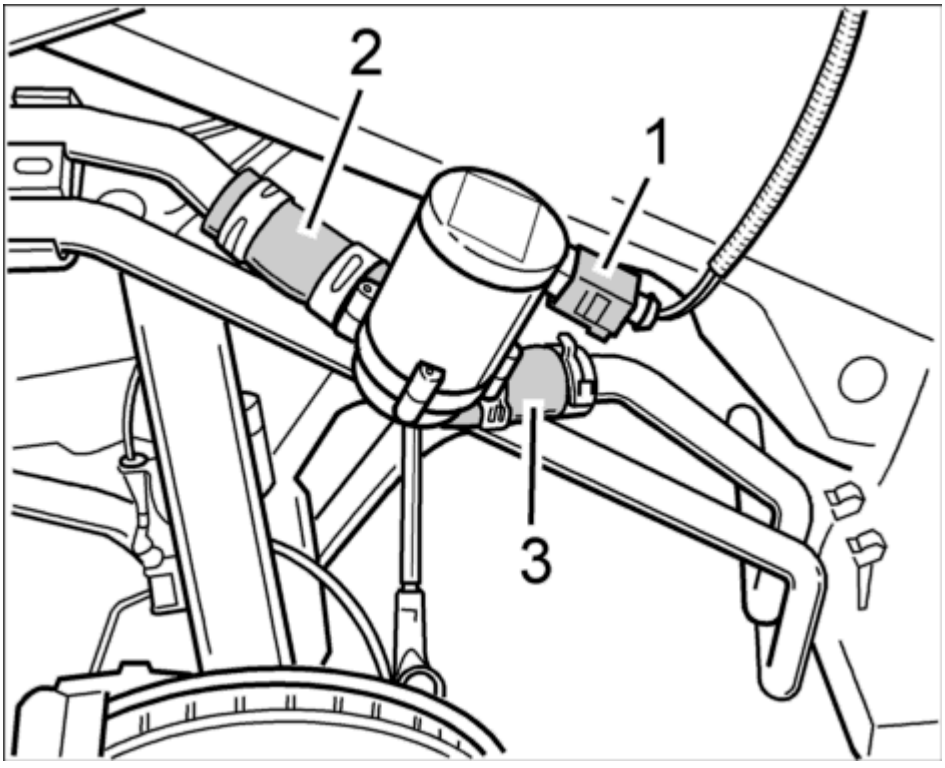


Fig. 91: Additional coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Undo sheetmetal holder of coolant line by removing fastening screw (M6 x 16) on the body. Unclip the coolant line from the holder. Carefully pull the additional coolant pump forward under the wing. Pull off electric connector **-1-** on the pump. Then open the coolant hoses **-2 and 3-** and remove the pump by loosening the screw-type hose clamp. See **Fig. 91**.

INSTALLING ADDITIONAL COOLANT PUMP

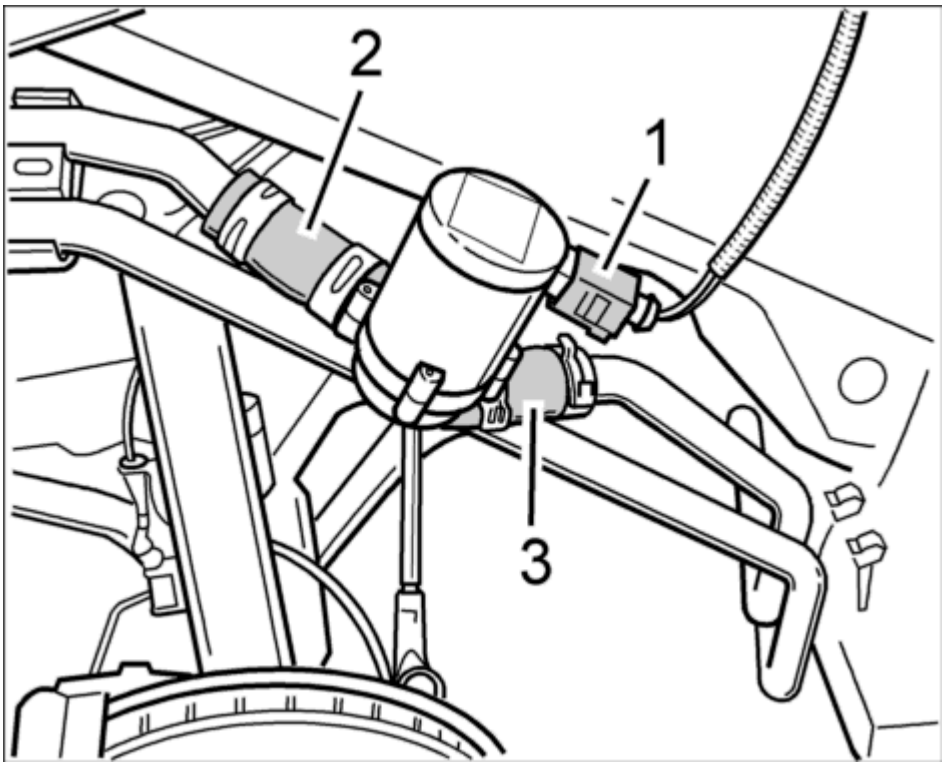


Fig. 92: Additional coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert the additional coolant pump in the screw-type hose clamp and screw in the fastening screw hand-tight. Install the coolant hoses **-2 and 3-** , position the spring-band clamps and then connect the electric connector **-1-** . Clip coolant lines into holder and fasten sheetmetal holder of coolant line by mounting the fastening screw on the body. **--> Tightening torque: 7.5 ftlb.** See **Fig. 92**.

SUBSEQUENT WORK

Subsequent work

NOTE:

- ***If necessary, the system can be checked for leaks. --> 190101 Checking cooling system***

1. Fill and bleed the cooling system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

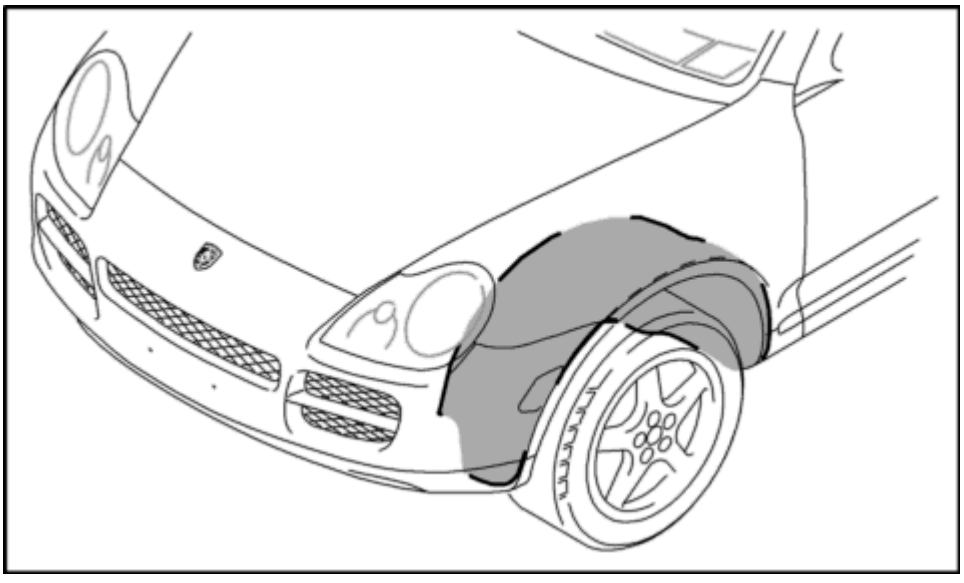


Fig. 93: Front left wheel housing liner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Install front left wheel housing liner. Refer to **50 56 19 Removing and installing front wheel housing liner - as of MY 2003 (All Models)** .

19 45 19 REMOVING AND INSTALLING ADDITIONAL COOLANT PUMP - AS OF MY 2004 (CAYENNE TIP, CAYENNE MAN)

PRELIMINARY WORK

Preliminary work

1. Drain coolant **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Draining"**

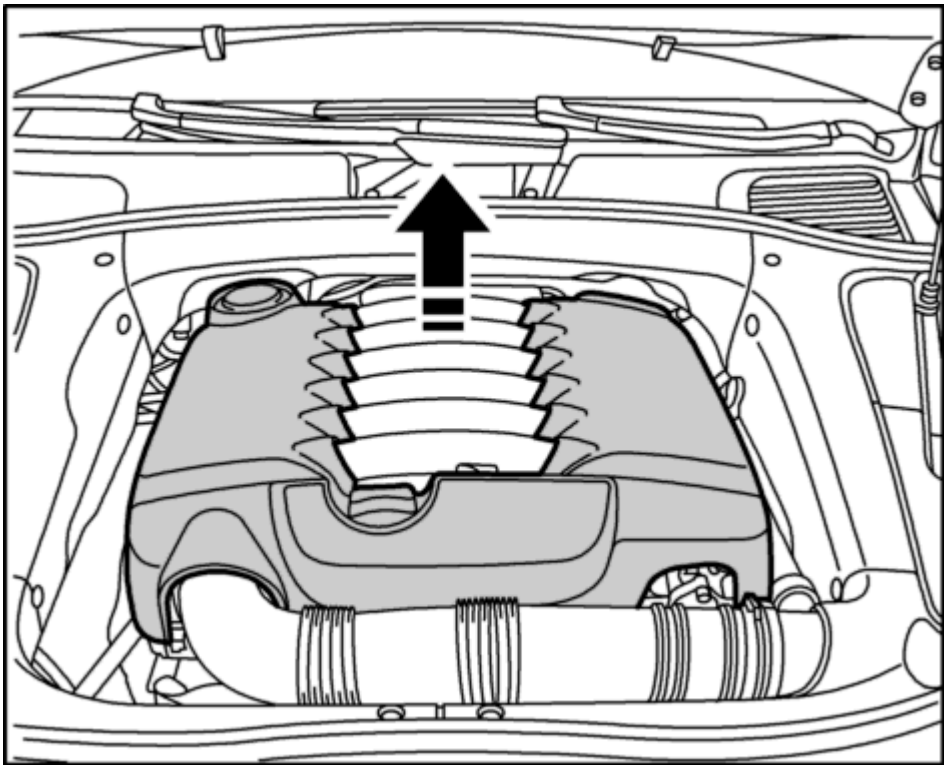


Fig. 94: Design cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Pull the design cover vertically upwards and off.

3. Remove right engine compartment covers and center plenum panel Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

REMOVING THE ADDITIONAL COOLANT PUMP

Removing the additional coolant pump

NOTE:

- ***Cover the engine.***
- ***For this work, the worker must lie on the engine.***
- ***The additional coolant pump is difficult to reach.***

1. Cover the intake-air distributor with covers.

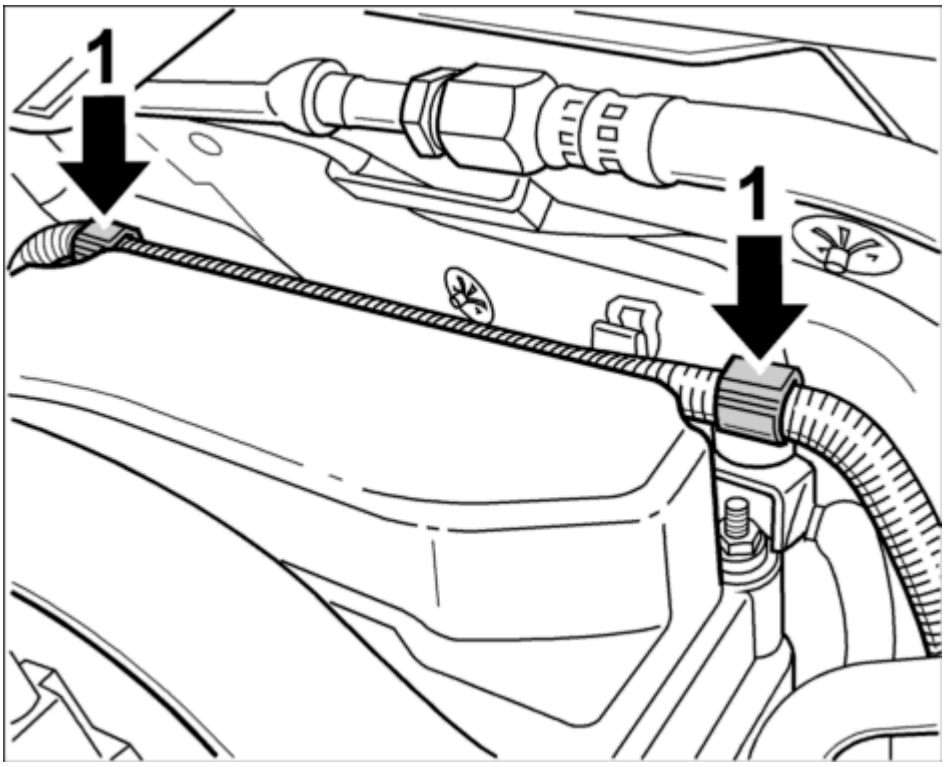


Fig. 95: Wiring harness
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Open both plastic clips of the rear valve cover wiring harness and lay the wiring harness aside **-1-** . See **Fig. 95**.

3. Loosen both fastening nuts of the engine wire harness on the top chain case lid and push the engine wire harness to the side.

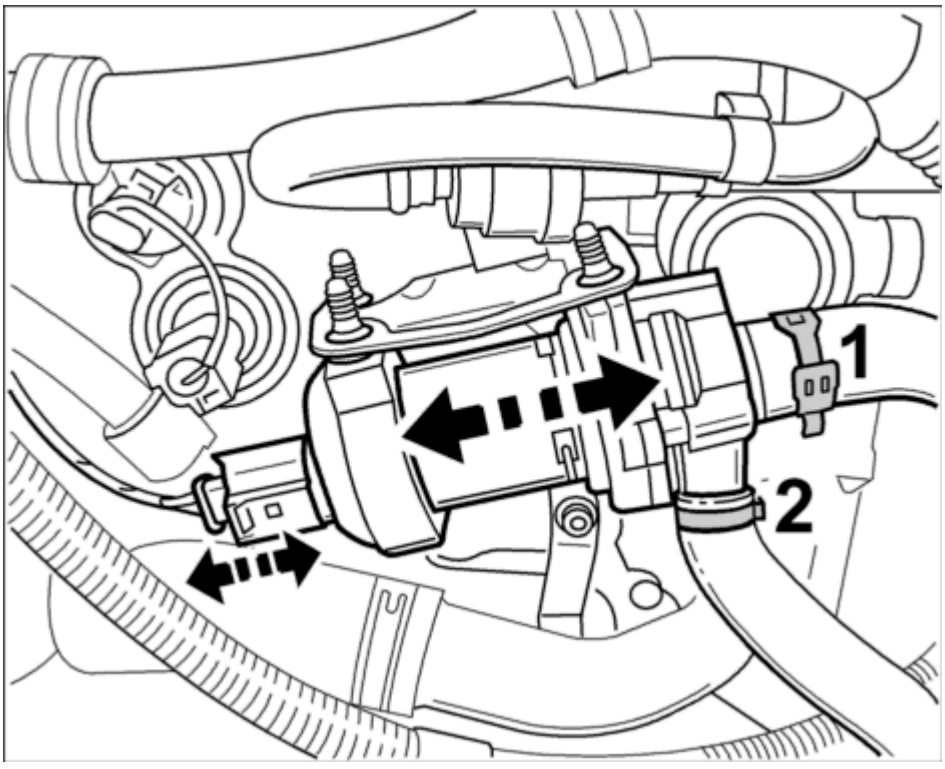


Fig. 96: Additional coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Disconnect cable plug of the additional coolant pump. Pull out additional coolant pump laterally from the rubber mountings. Pull off spring band clamps **-1 and 2-** of the coolant hoses. See **Fig. 96**.

INSTALLING ADDITIONAL COOLANT PUMP

Installing additional coolant pump

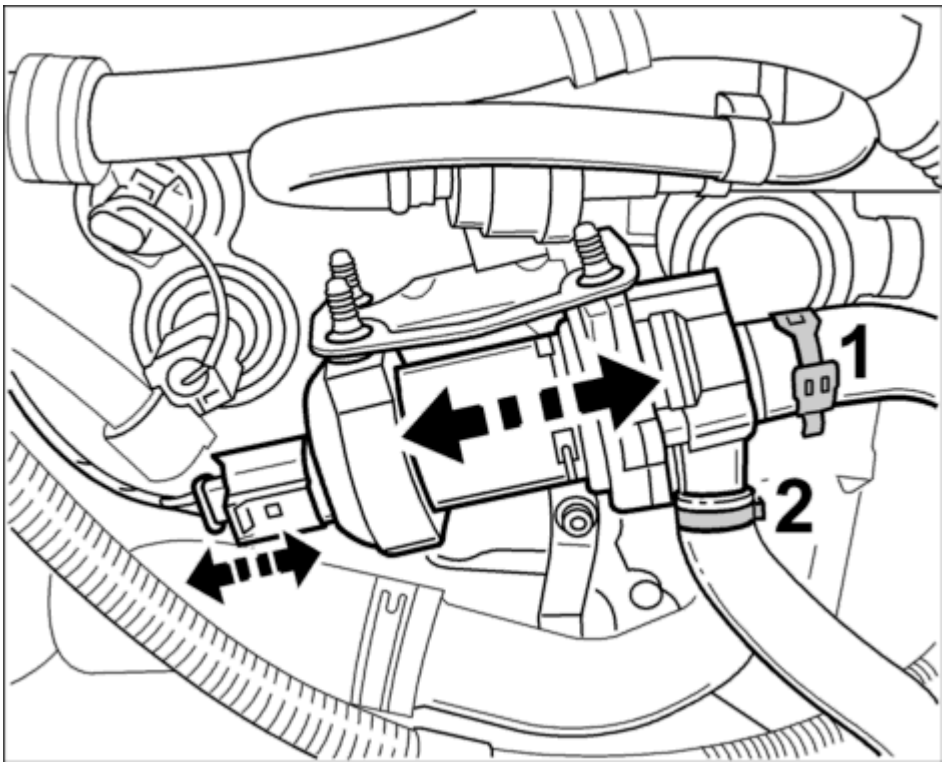


Fig. 97: Additional coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

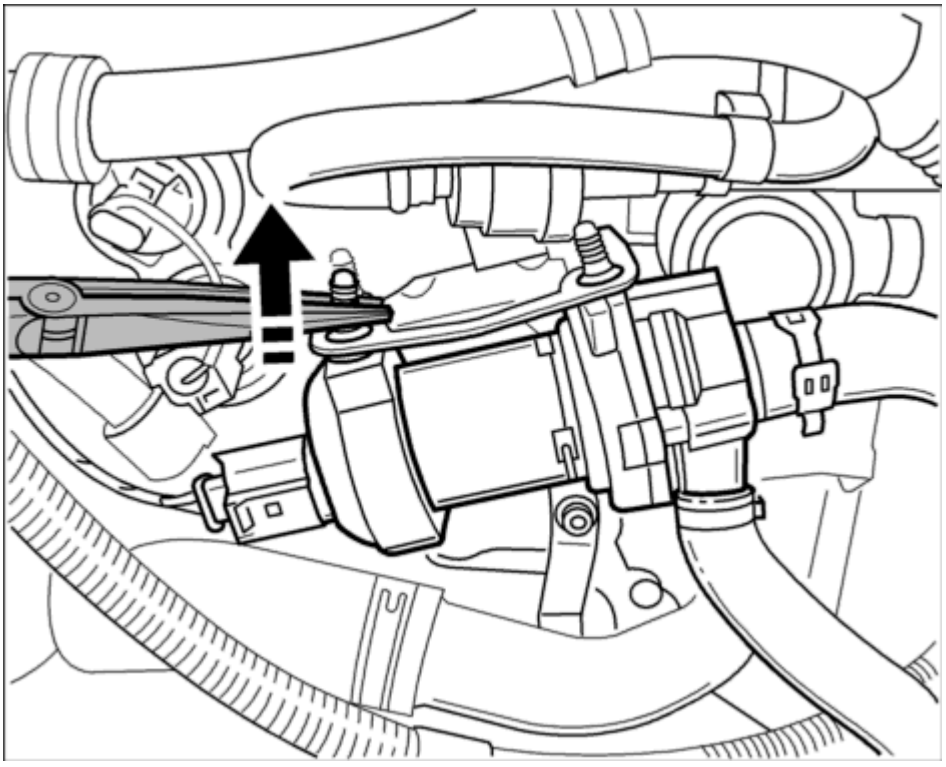


Fig. 98: Pointed-nose pliers
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***If one or more rubber sleeves slide out of the sheetmetal holder when inserting the additional coolant pump, grab the rubber sleeves with a pointed-nose pliers and pull them up through the holes in the sheetmetal holder.***

1. Mount the coolant hoses and spring band clamps on the additional coolant pump **-1 and 2-** . Connect the additional coolant pump laterally into the rubber mounting. Push on cable plug. See **Fig. 97**.

2. Mount wiring harnesses. Tighten fastening nuts **--> Tightening torque: 6 ftlb.** . Clip in the component.

SUBSEQUENT WORK

Subsequent work

1. Fill coolant and bleed system **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

2. Mount right engine compartment covers and center plenum panel Refer to **70 02 19 Removing and installing front cover (engine compartment) - as of MY 2003 (All Models)** .

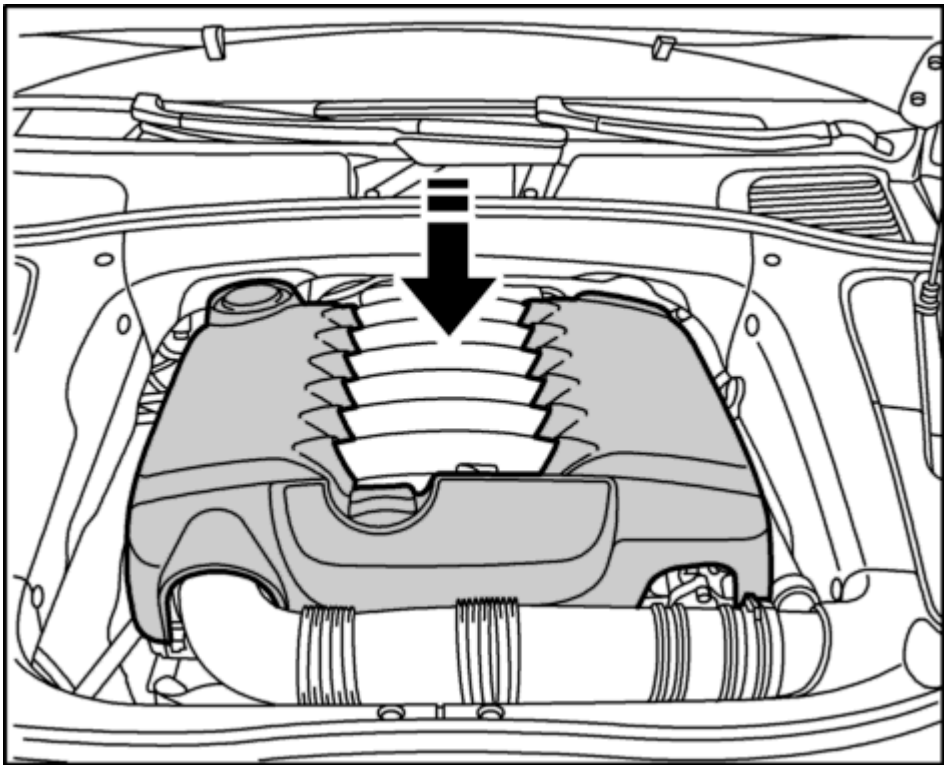


Fig. 99: Design cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Mount design cover.

19 50 19 REMOVING AND INSTALLING COOLANT PUMP - AS OF MY 2003 (CAYENNE S TIP, CAYENNE S MAN, CAYENNE TURBO, CAYENNE TURBO S)

PRELIMINARY WORK

Preliminary work

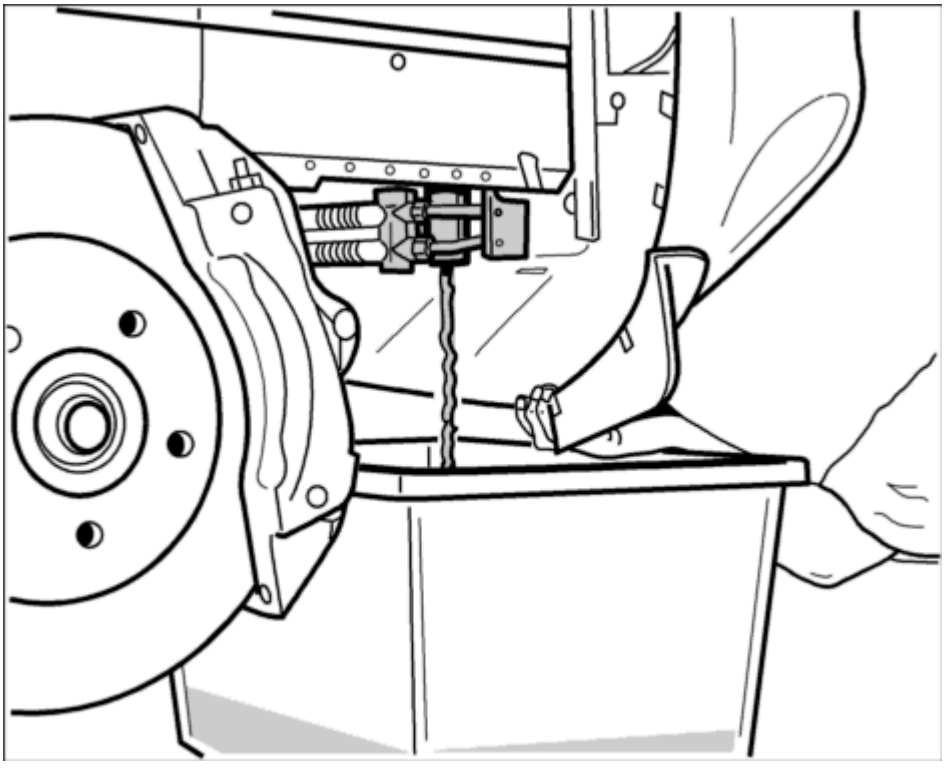


Fig. 100: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

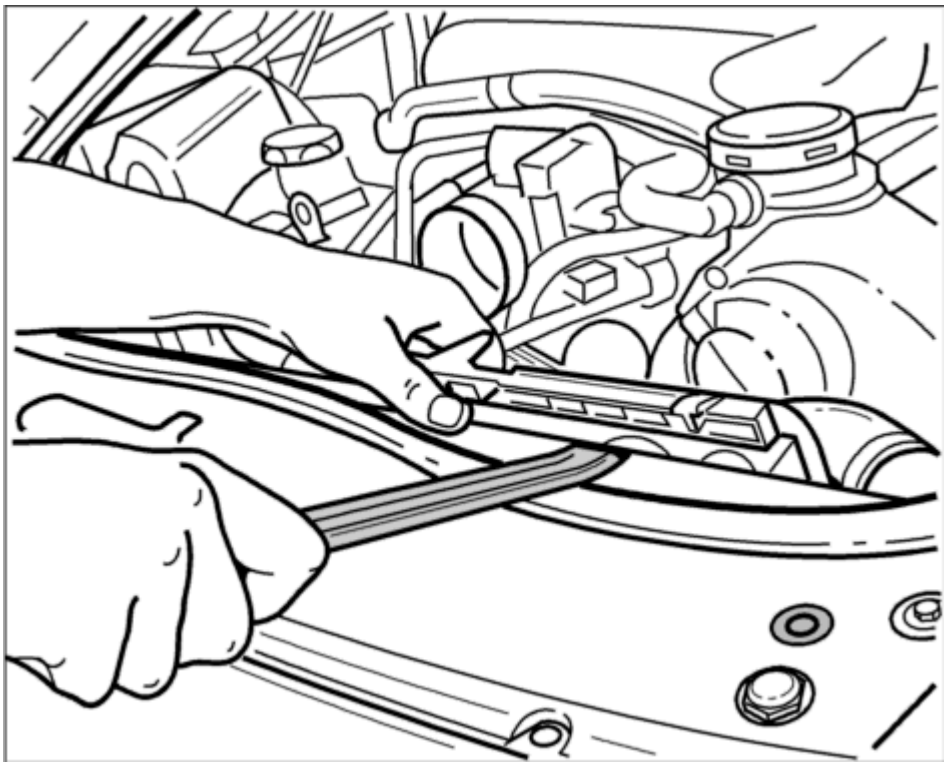


Fig. 101: Radiator frame
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Remove the radiator frame. **--> 193817 Draining and filling coolant (includes bleeding)**

INFORMATION

Component overview for coolant pump

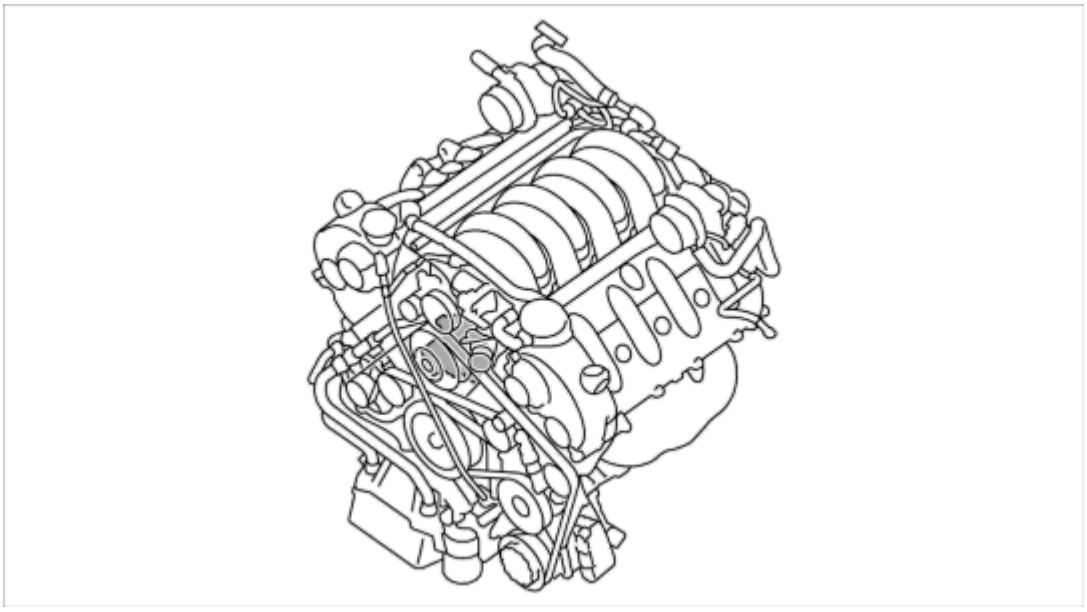


Fig. 102: Overview of coolant pump in engine
Courtesy of PORSCHE OF NORTH AMERICA, INC.

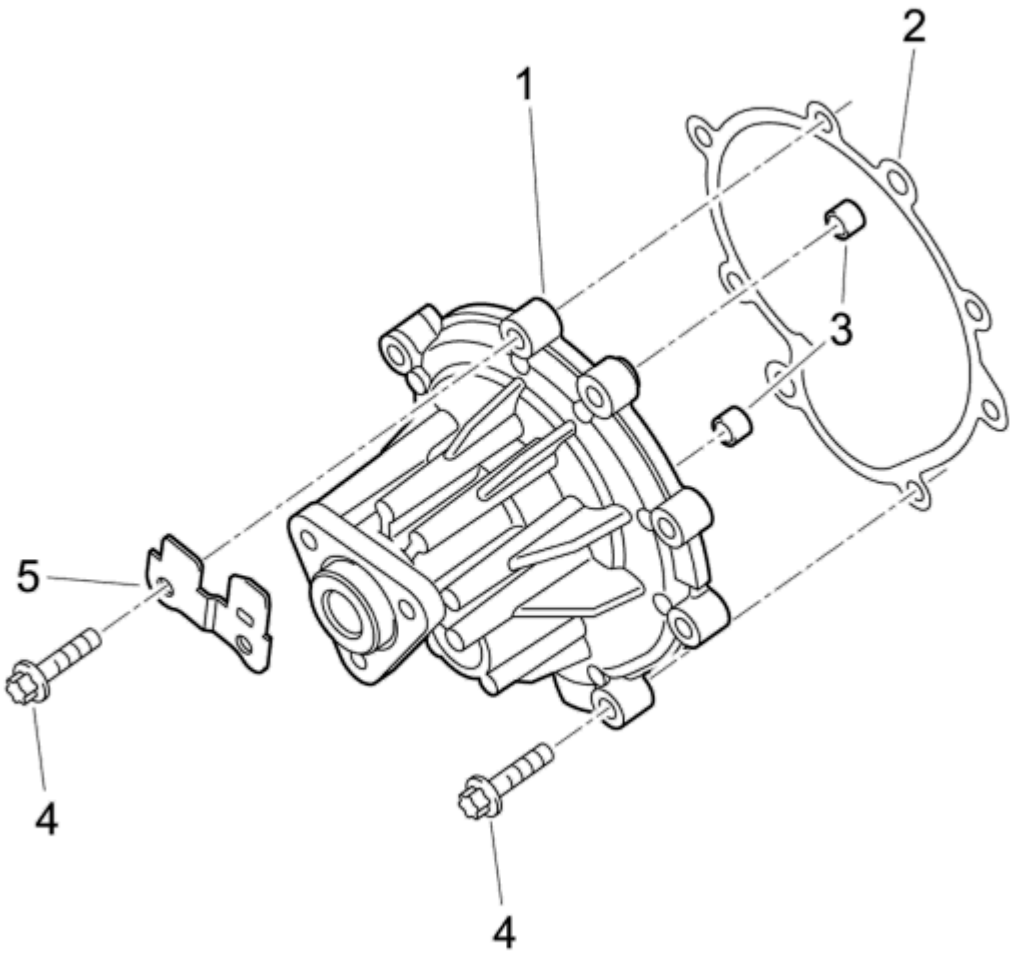


Fig. 103: Component overview for coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1 - Coolant pump

2 - Seal for coolant pump (replace seal)

3 - 2 dowel sleeves (do not remove)

4 - 8 M6 x 25 fastening screws (tightening torque 10 Nm (7.5 ftlb.))

5 - Support for cable duct (fit with the two upper fastening screws)

REMOVING COOLANT PUMP

Removing coolant pump

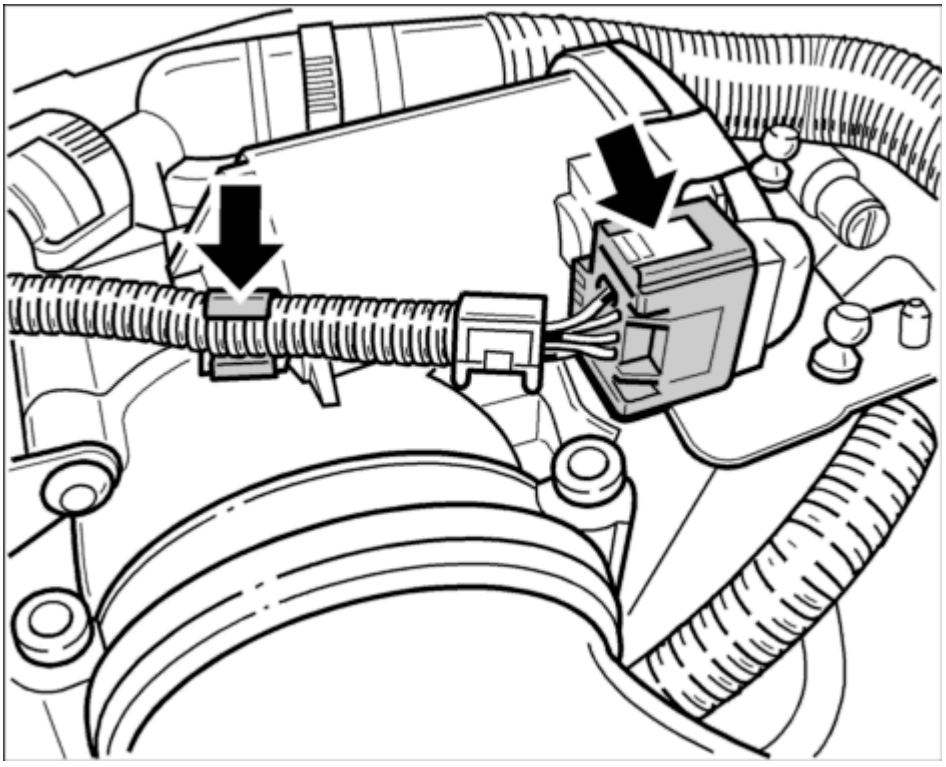


Fig. 104: Electric connection on throttle adjuster
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Separate the electric connection from the throttle adjuster. To do this, press on the plug at the top and bottom and, at the same time, pull it off. Unclip the cable from the sheetmetal holder.

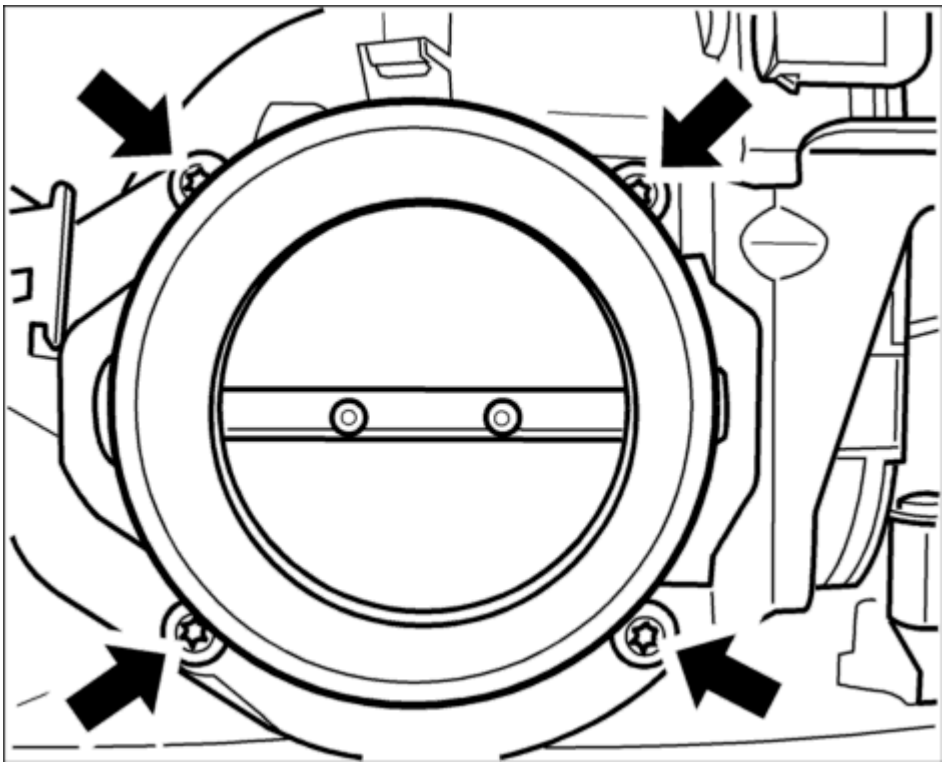


Fig. 105: Fastening screws on throttle adjuster
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Remove the throttle adjuster.

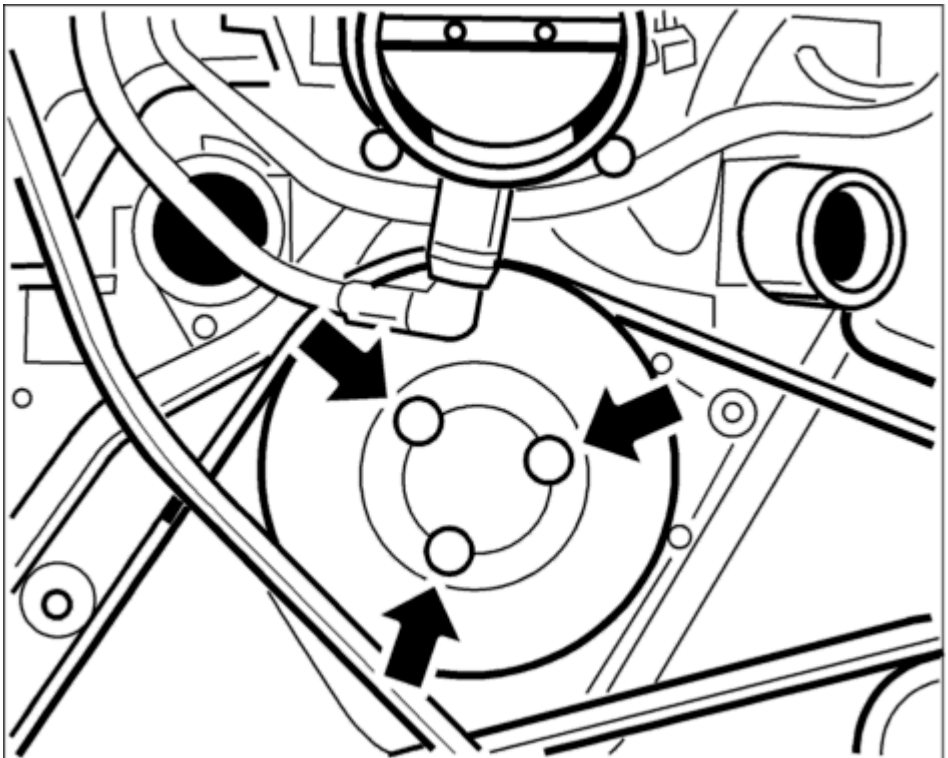


Fig. 106: Fastening screws for coolant pump pulley
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***To ease removal, spray the pulley from the rear side with an anti-corrosion agent.***

3. Unscrew the three fastening screws on the coolant pump pulley. Wrench size is T 40.

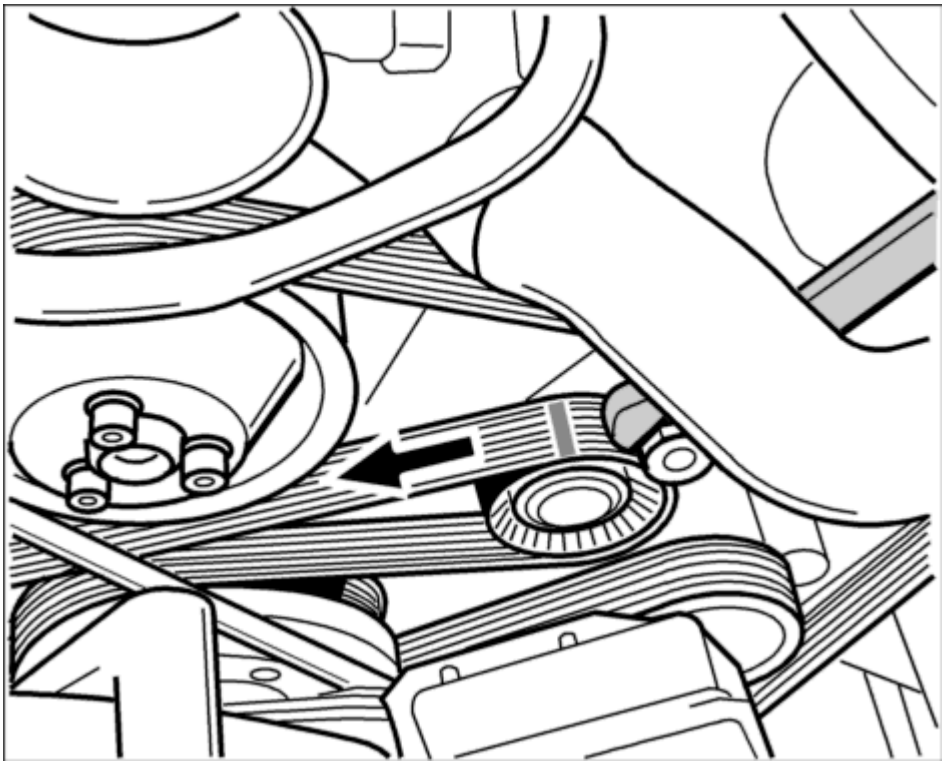


Fig. 107: Drive belt on coolant pump pulley
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Remove the drive belt from the coolant pump pulley. Mark the direction of running of the drive belt with chalk.

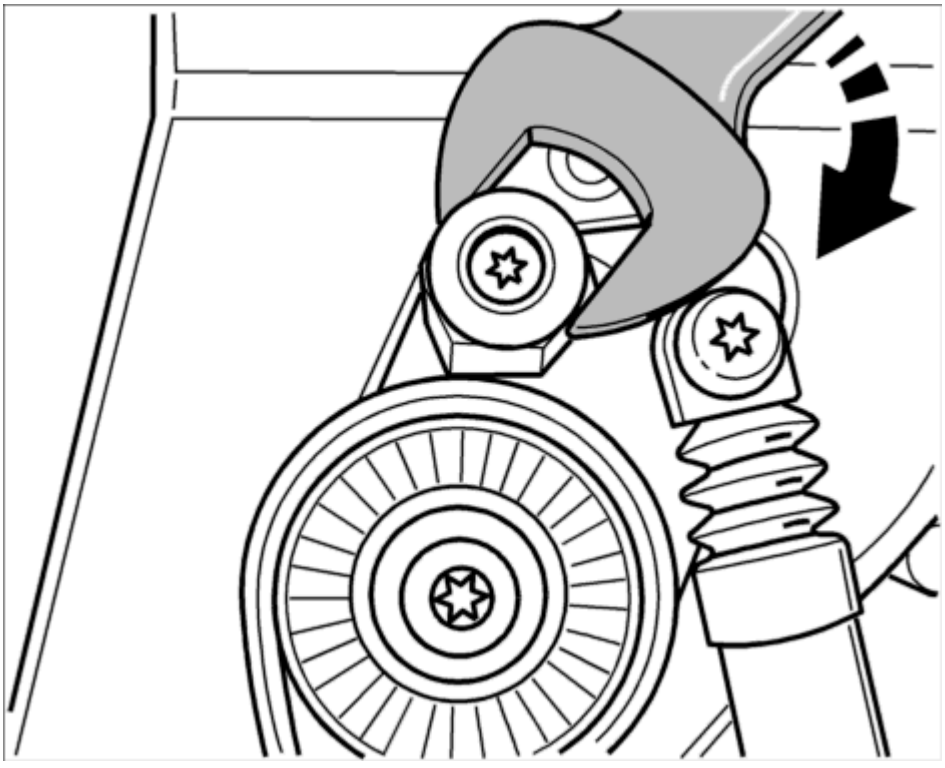


Fig. 108: Belt tensioner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Use an open-ended wrench (a/f 30) to turn the belt tensioner clockwise and, at the same time, remove the drive belt from the tensioning roller. Relieve the belt tensioner carefully. Remove the drive belt from the coolant pump.

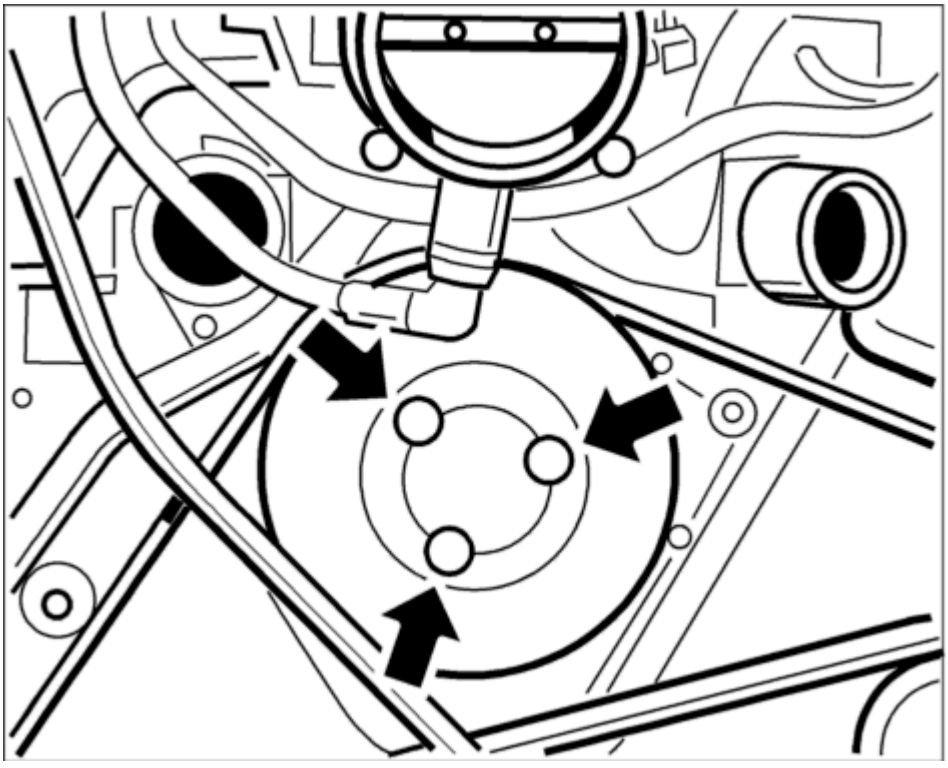


Fig. 109: Fastening screws for pulley
Courtesy of PORSCHE OF NORTH AMERICA, INC.

CAUTION: Risk of damaging pulley!

--> The pulleys of the engine accessories are made of plastic. Do not use damaged pulleys.

--> The pulley is sensitive to impacts.

--> Do not pry off the pulley with a screwdriver.

6. Remove the 3 loosened fastening screws on the pulley and remove the pulley.

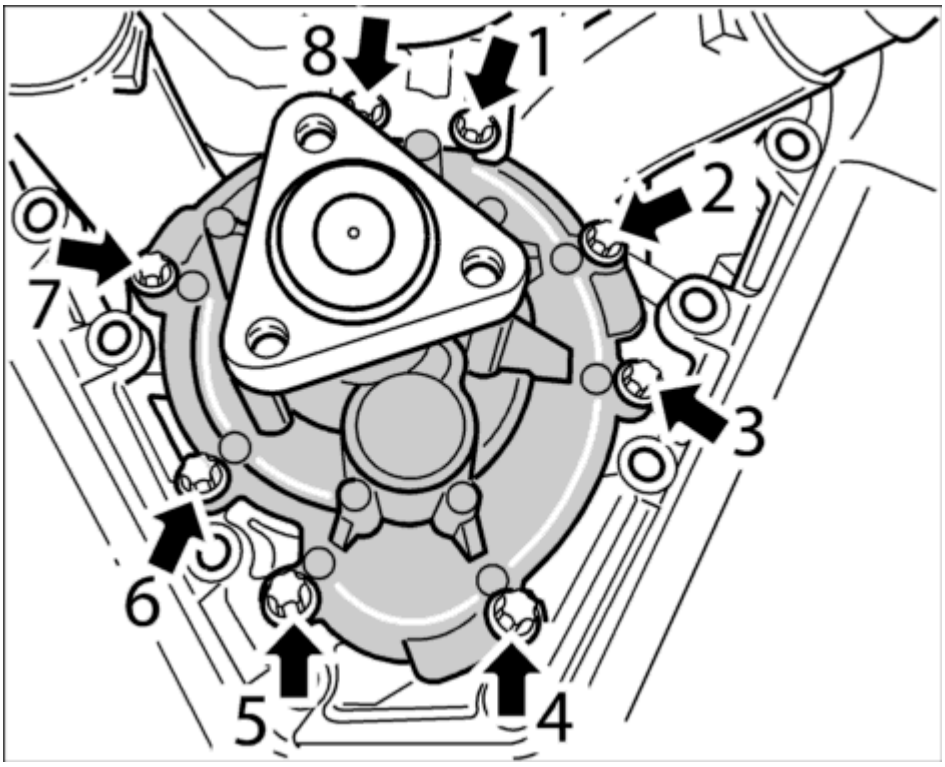


Fig. 110: Fastening screws for coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Remove the eight fastening screws on the coolant pump and remove the pump. If the pump is stuck, loosen it by gently tapping with a plastic hammer.

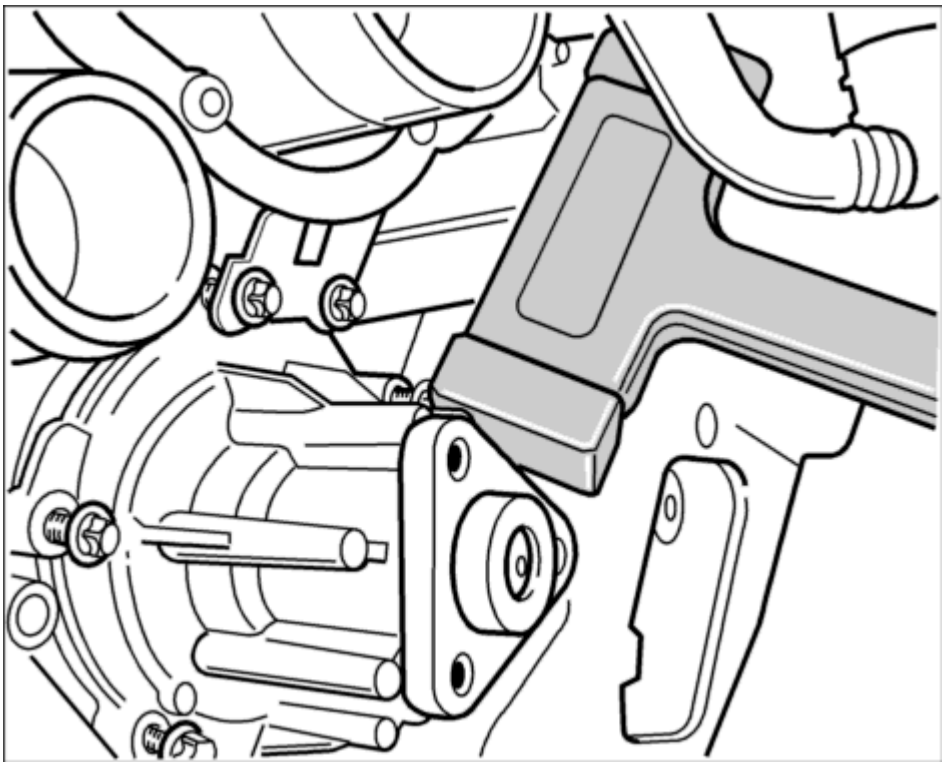


Fig. 111: Loosening the coolant pump with a plastic hammer
Courtesy of PORSCHE OF NORTH AMERICA, INC.

INSTALLING COOLANT PUMP

Installing coolant pump

CAUTION: Risk of damaging pulley!

--> The pulleys of the engine accessories are made of plastic. Do not use damaged pulleys.

--> The pulley is sensitive to impacts.

--> Do not pryoff the pulley with a screwdriver.

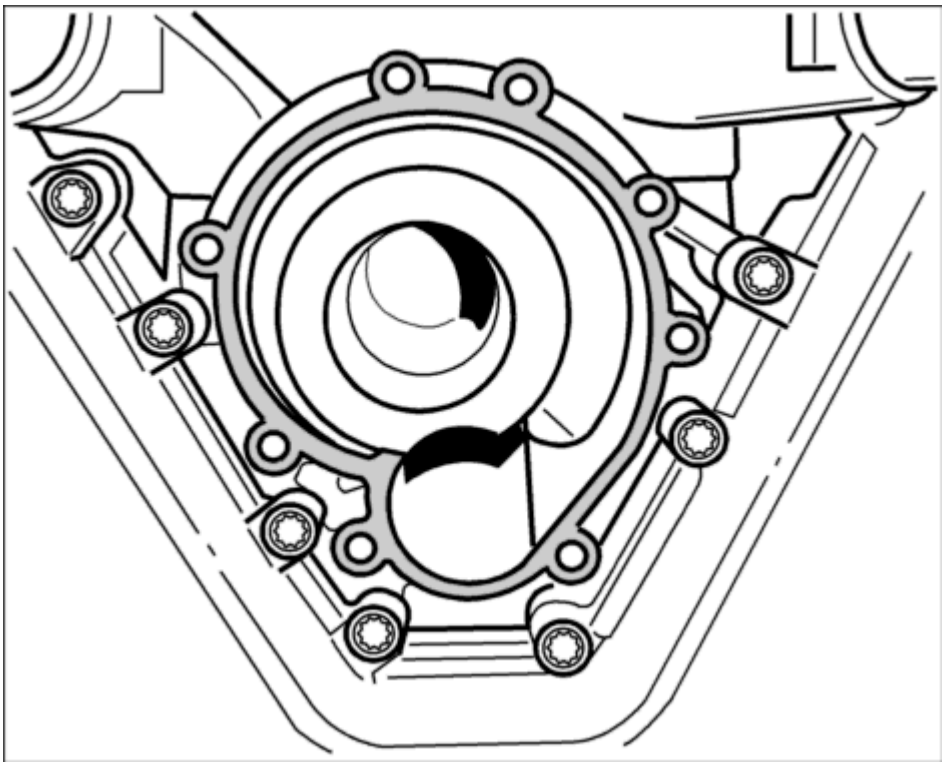


Fig. 112: New sheetmetal seal on the coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Clean sealing surfaces. Mount new sheetmetal seal on the coolant pump. Slide the new sheetmetal seal over the dowel pins.

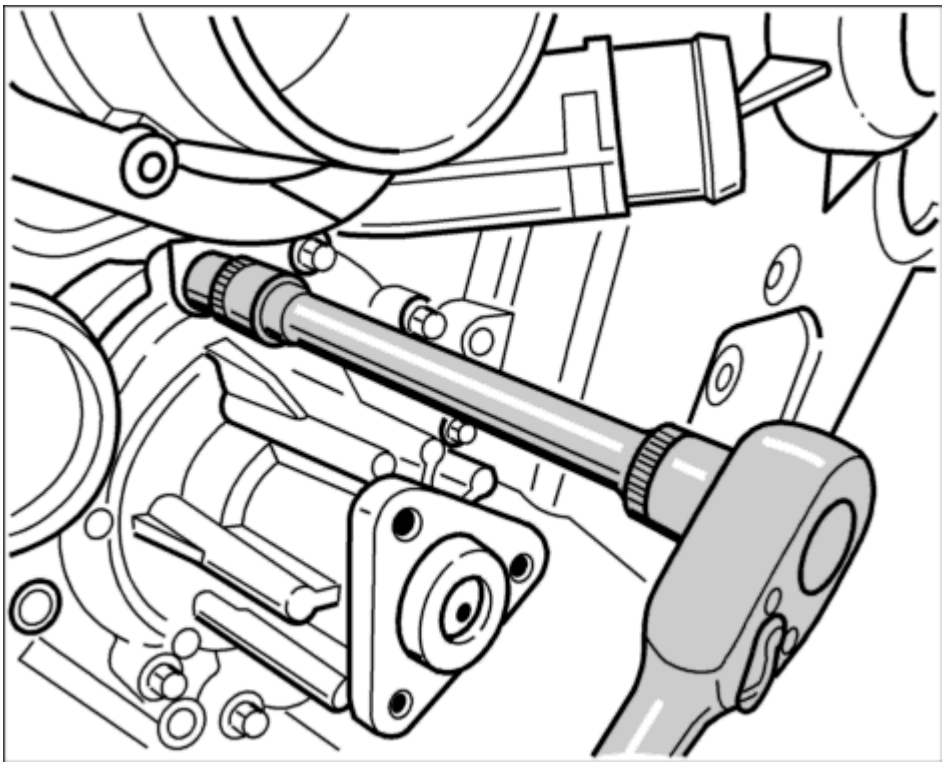


Fig. 113: Mount the fastening screws for the coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Tighten the 8 fastening screws. --> **Tightening torque: 7.5 ftlb.** Mount the sheetmetal holder for the cable duct using the two upper fastening screws.

3. Fit the pulley on the coolant pump. Screw in the three fastening screws by hand.

4. Mount drive belt **-as shown in the following-** . To do this, turn the belt tensioner clockwise and thread the drive belt around all the pulleys. Then carefully relieve the tensioning roller. Refer to **13 78 19 Removing and installing drive belt - as of MY 2003 (Cayenne S TIP, Cayenne S MAN)** . Refer to **13 78 19 Removing and installing drive belt - as of MY 2003 (Cayenne Turbo, Cayenne Turbo S)** . See **Fig. 114**.

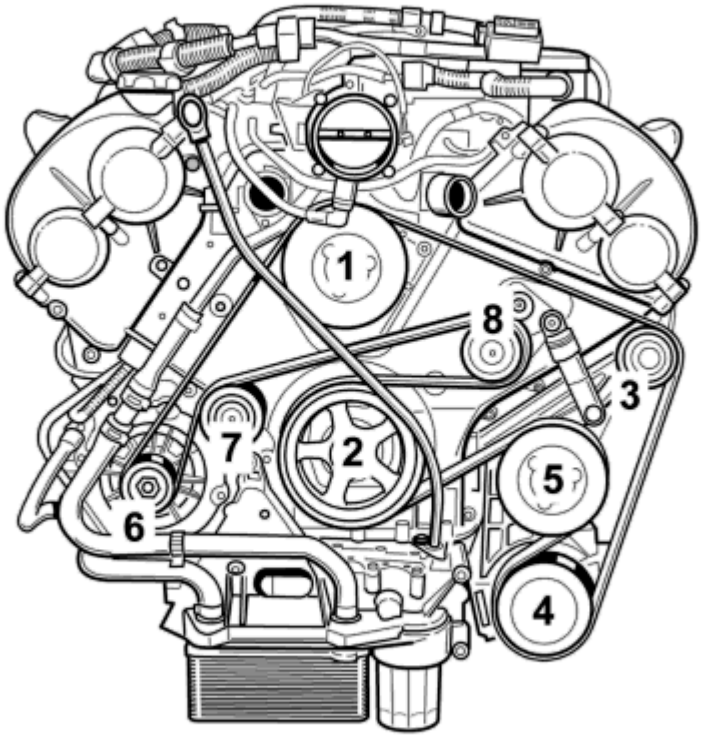


Fig. 114: Installation sequence for drive belt
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Check whether the drive belt is correctly installed.

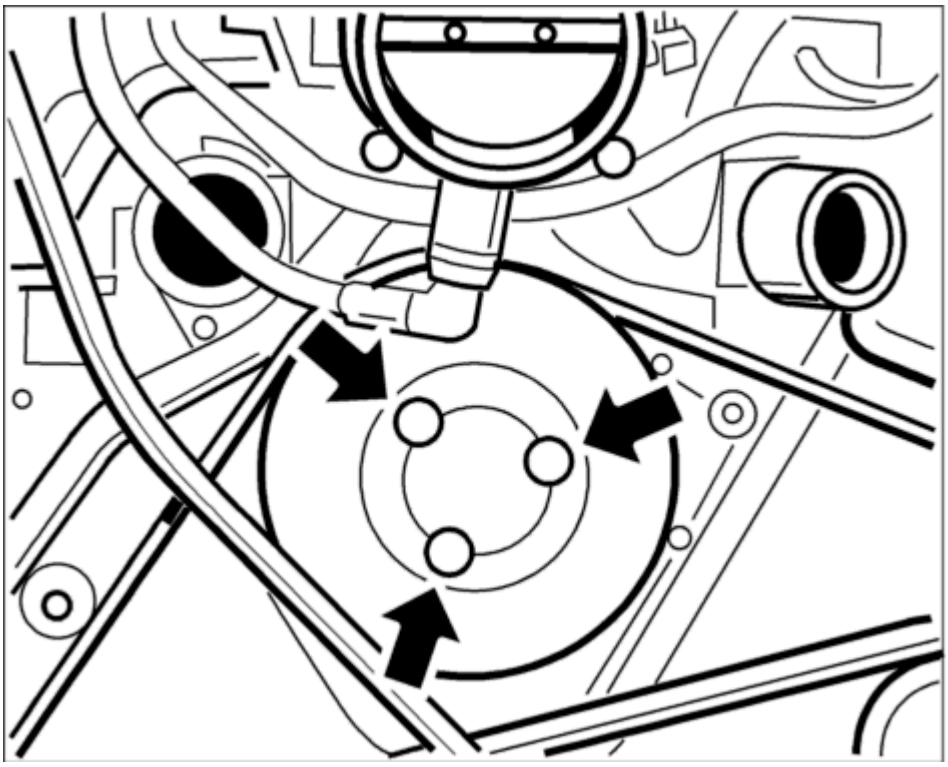


Fig. 115: Fastening screws for coolant pump pulley
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Tighten the three fastening screws of the coolant pump pulley. --> **Tightening torque: 17 ftlb.**

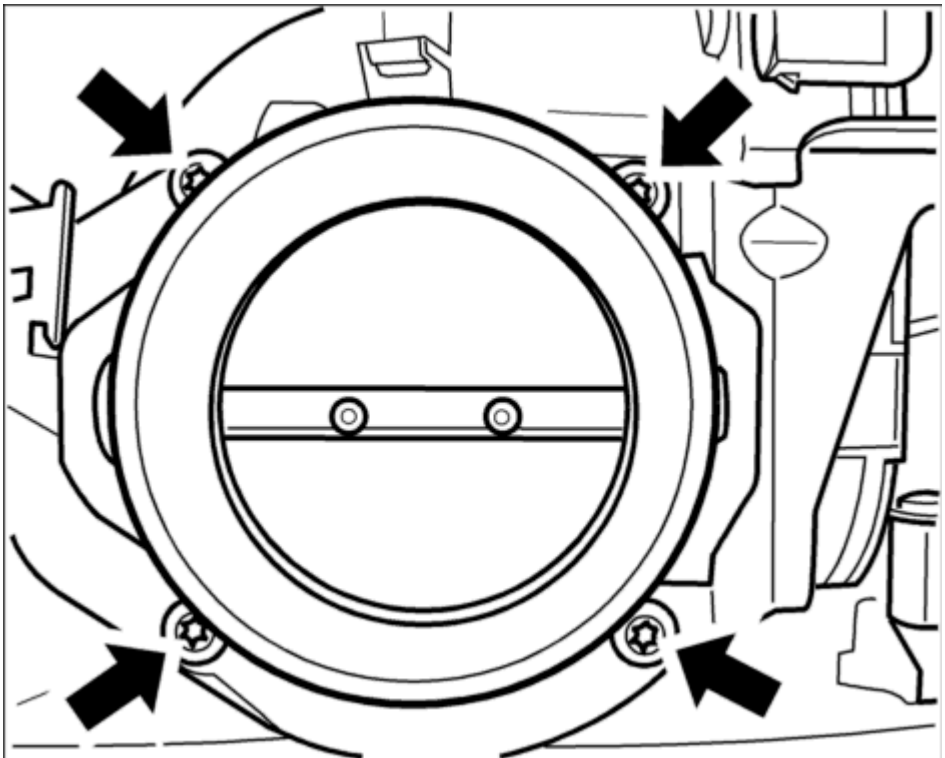


Fig. 116: Fastening screws on throttle adjuster
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Tighten the throttle adjuster with new seal. --> **Tightening torque: 17 ftlb.**

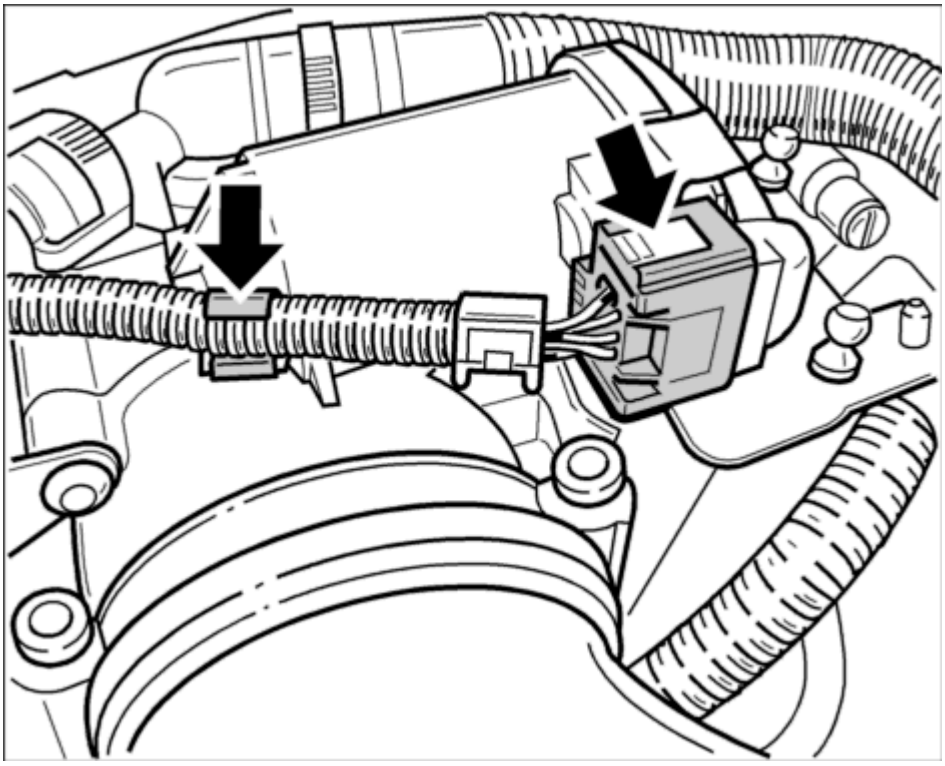


Fig. 117: Connecting cable to throttle adjuster
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Connect the throttle adjuster. The connector must engage audibly. Clip the connecting cable into the sheetmetal holder.

SUBSEQUENT WORK

Subsequent work

1. Install the radiator frame. **--> 192019 Removing and installing cooling fan housing (radiator frame) - chapter on "Installing"**

2. Fill and bleed the cooling system according to instructions. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

19 50 19 REMOVING AND INSTALLING COOLANT PUMP - AS OF MY 2004 (CAYENNE TIP, CAYENNE MAN)

PRELIMINARY WORK

Preliminary work

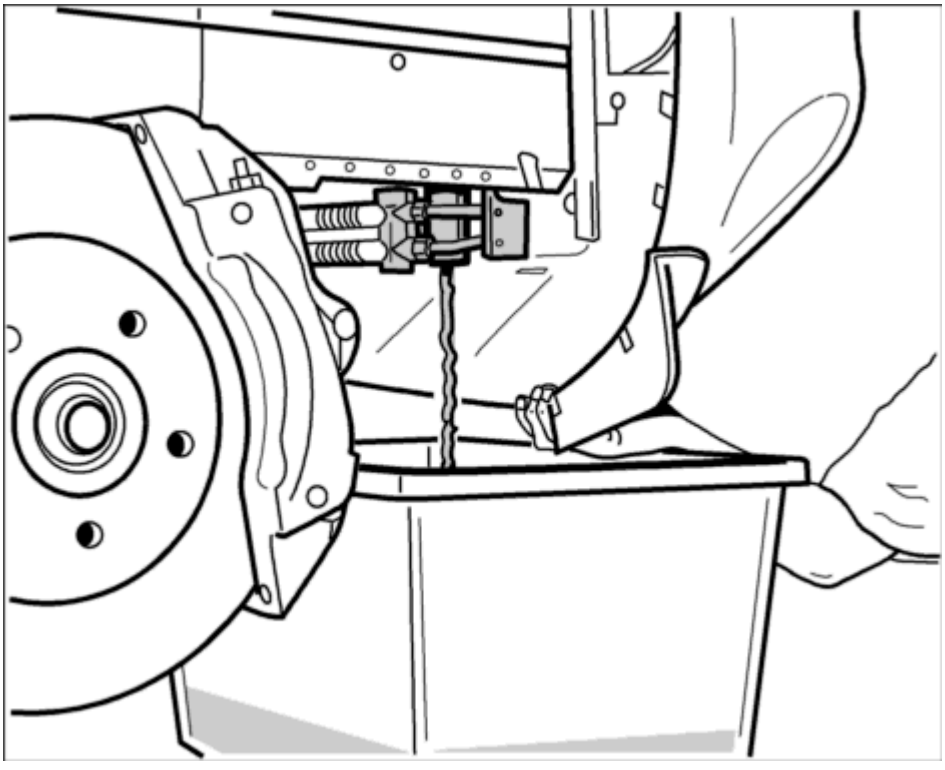


Fig. 118: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

INFORMATION

Coolant pump components

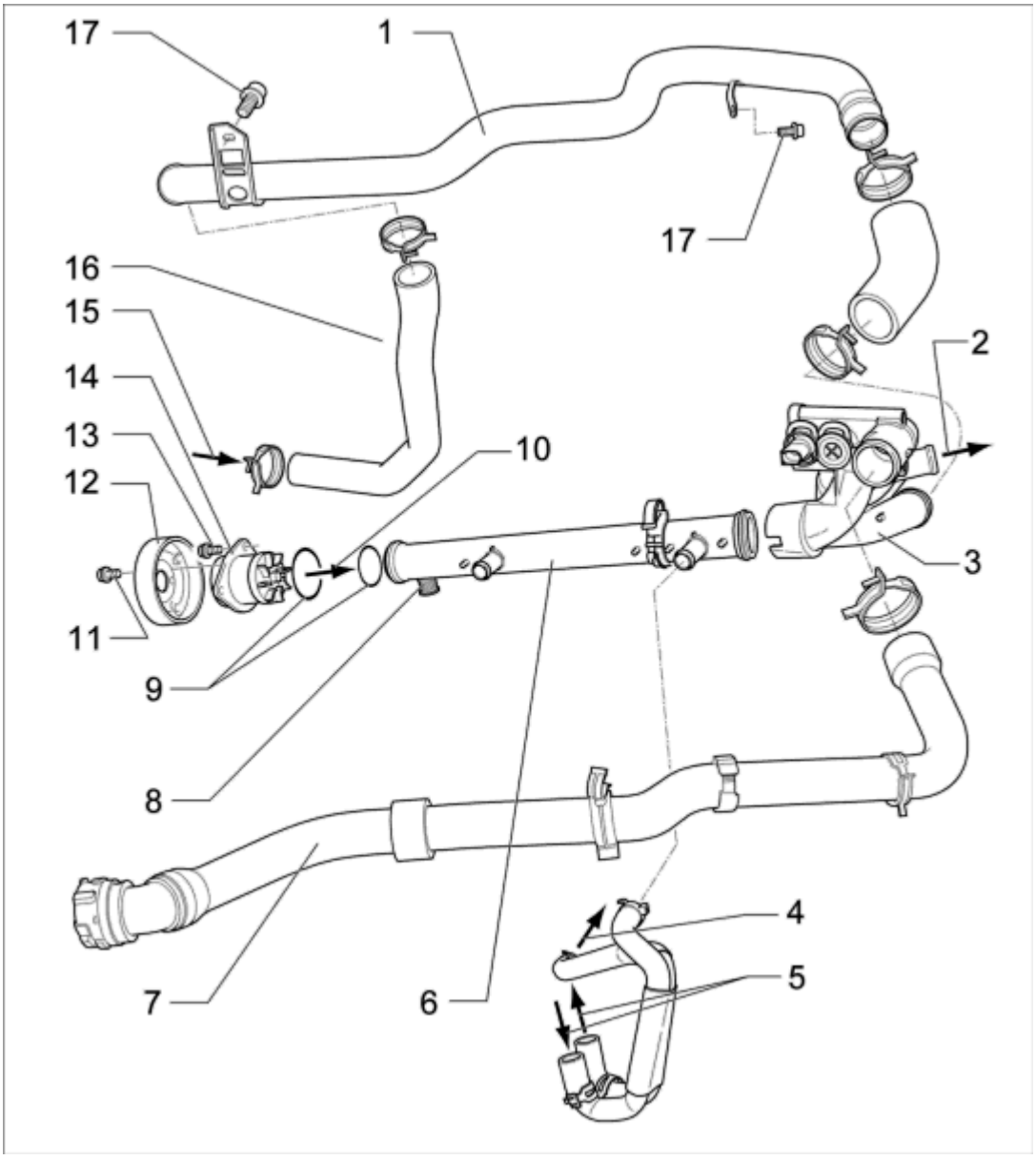


Fig. 119: Components
Courtesy of PORSCHE OF NORTH AMERICA, INC.

-1- - Coolant pipe. See **Fig. 119**.

-2- - Wiring for reservoir. See **Fig. 119**.

-3- - Thermostat housing. See **Fig. 119**.

-4- - Connection wires on cylinder block. See **Fig. 119**.

-5- - Connections on oil/water heat exchanger. See **Fig. 119**.

-6- - Coolant pipe. See **Fig. 119**.

-7- - Coolant hose; flange must engage with an audible click. See **Fig. 119**.

-8- - --> **Tightening torque: 2 ftlb.** . See **Fig. 119**.

-9- - O-ring; replacing. See **Fig. 119**.

-10- - Fuel feed direction of coolant pump. See **Fig. 119**.

-11- - --> **Tightening torque: 15 ftlb.** . See **Fig. 119**.

-12- - Pulley See **Fig. 119**.

-13- - --> **Tightening torque: 6 ftlb.** . See **Fig. 119**.

-14- - Coolant pump; check for smooth operation. See **Fig. 119**.

-15- - Direction of flow - coming from radiator. See **Fig. 119**.

-16- - Hose line - coming from radiator. See **Fig. 119**.

-17- - --> **Tightening torque: 6 ftlb.** . See **Fig. 119**.

REMOVING COOLANT PUMP

Removing coolant pump

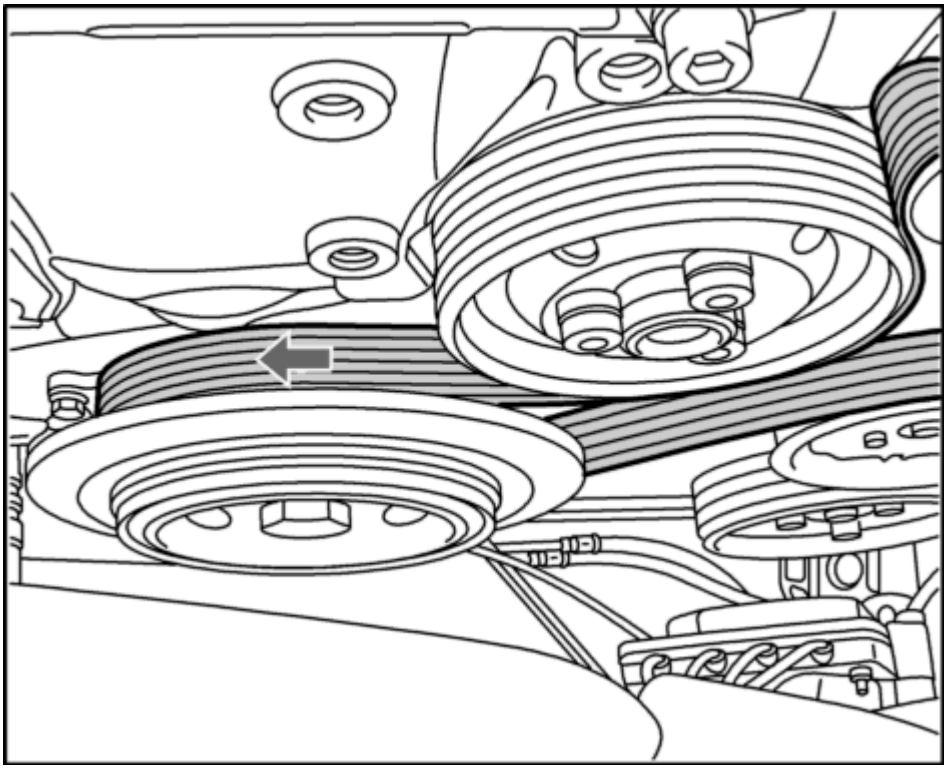


Fig. 120: Rolling direction marking
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Mark the rolling direction of the drive belt with chalk.

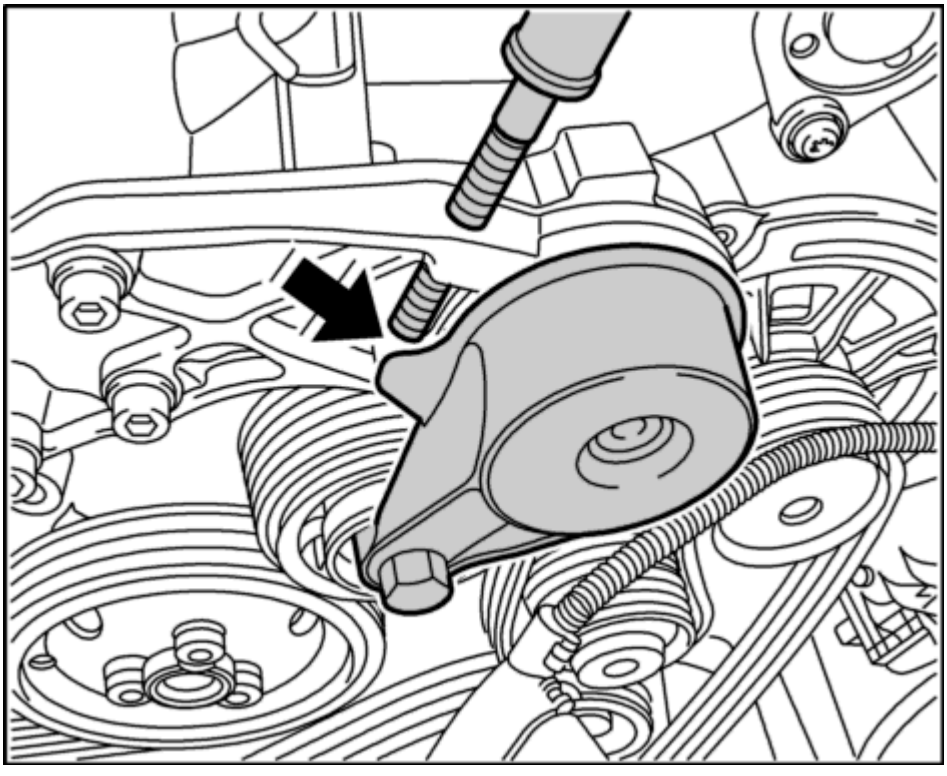


Fig. 121: Relieving drive belt
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Relieve and remove drive belt. To do this, screw an M8 screw into the belt tensioner.

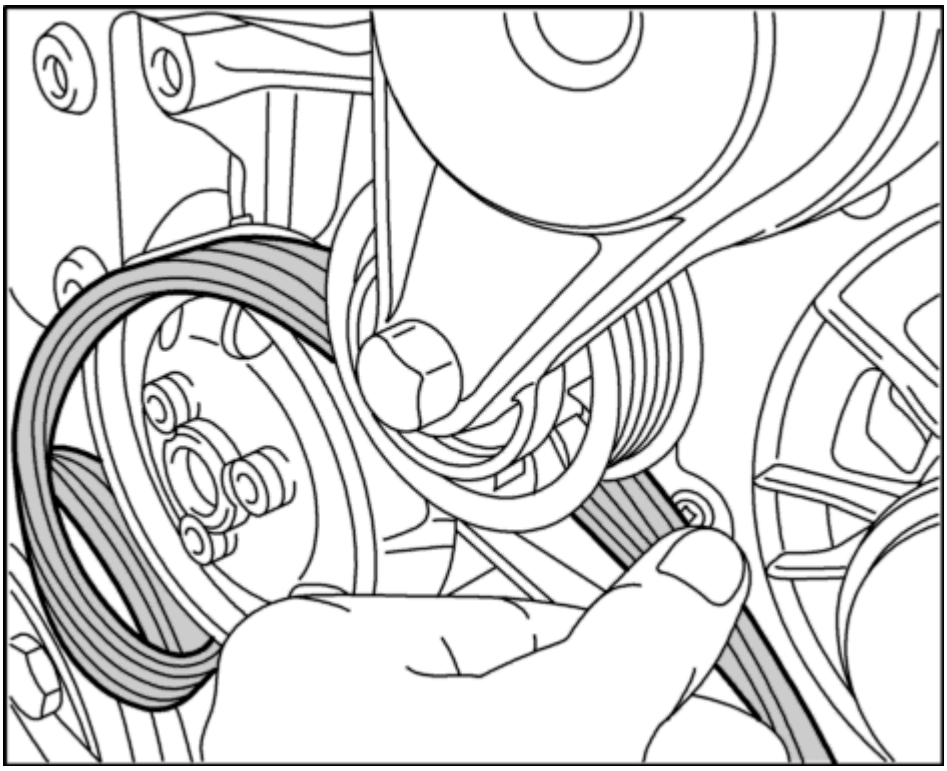


Fig. 122: Remove the drive belt from the tensioning roller.
Courtesy of PORSCHE OF NORTH AMERICA, INC.

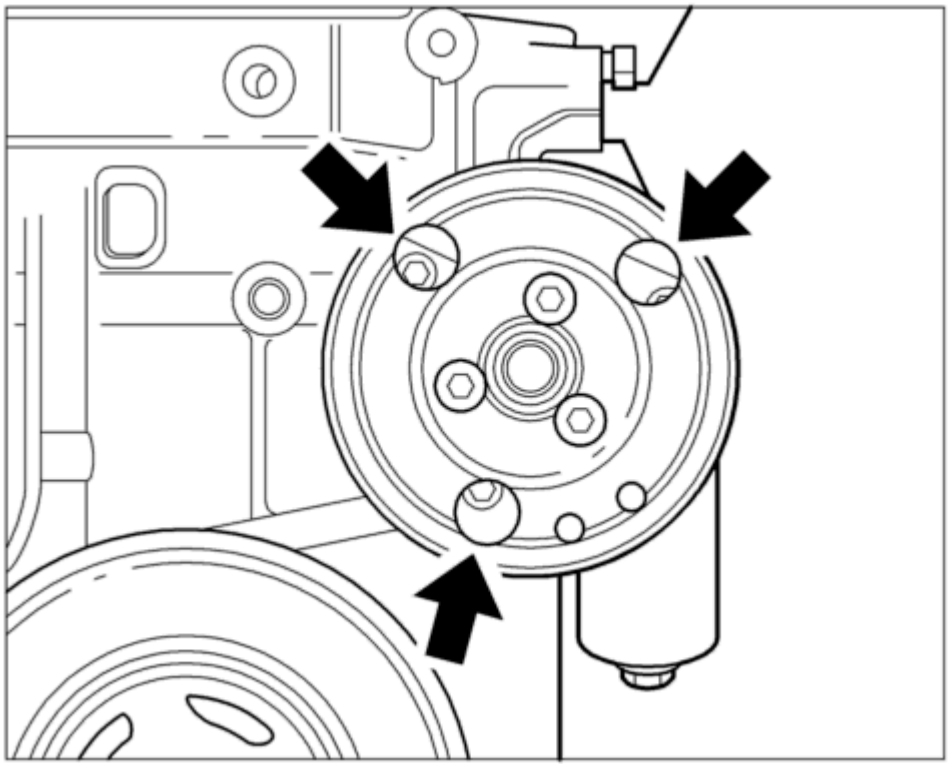


Fig. 123: Fastening screws for coolant pump

Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Turn the drive wheel for the coolant pump in such a way that the fastening screws can be reached through the holes in the belt pulley **-arrows-** . See **Fig. 123**.

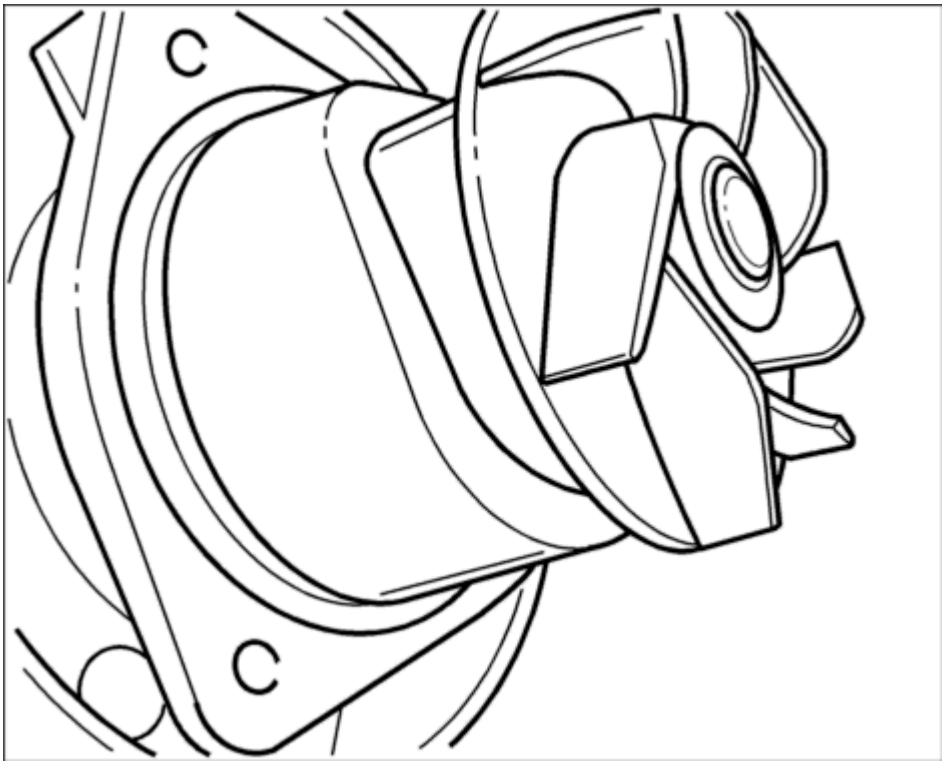


Fig. 124: Coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Pull coolant pump out of the crankcase.

INSTALLING COOLANT PUMP

Installing coolant pump

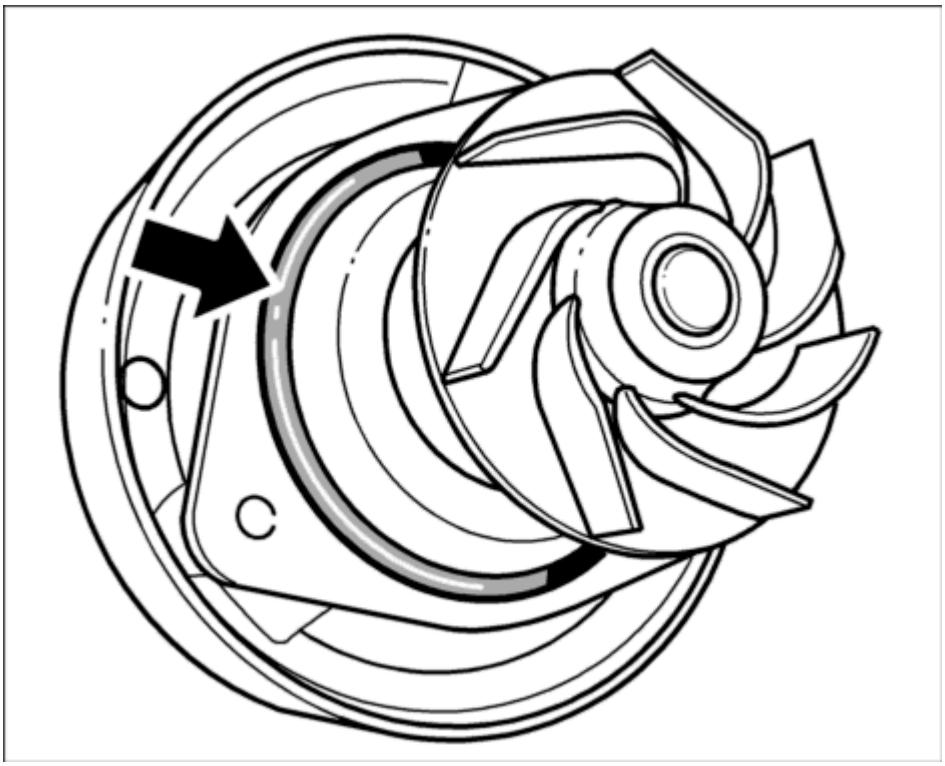


Fig. 125: O-ring for coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Clean sealing face and install new O-ring on coolant pump.

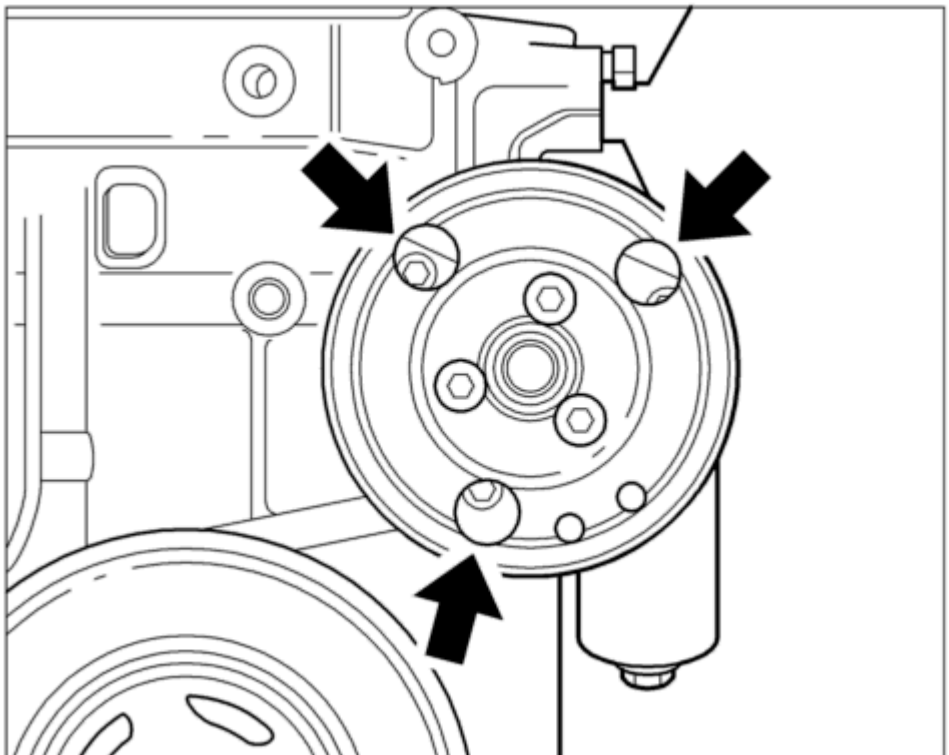


Fig. 126: Coolant pump fasteners
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Tighten the 3 fastening screws. **--> Tightening torque: 6 ftlb.**

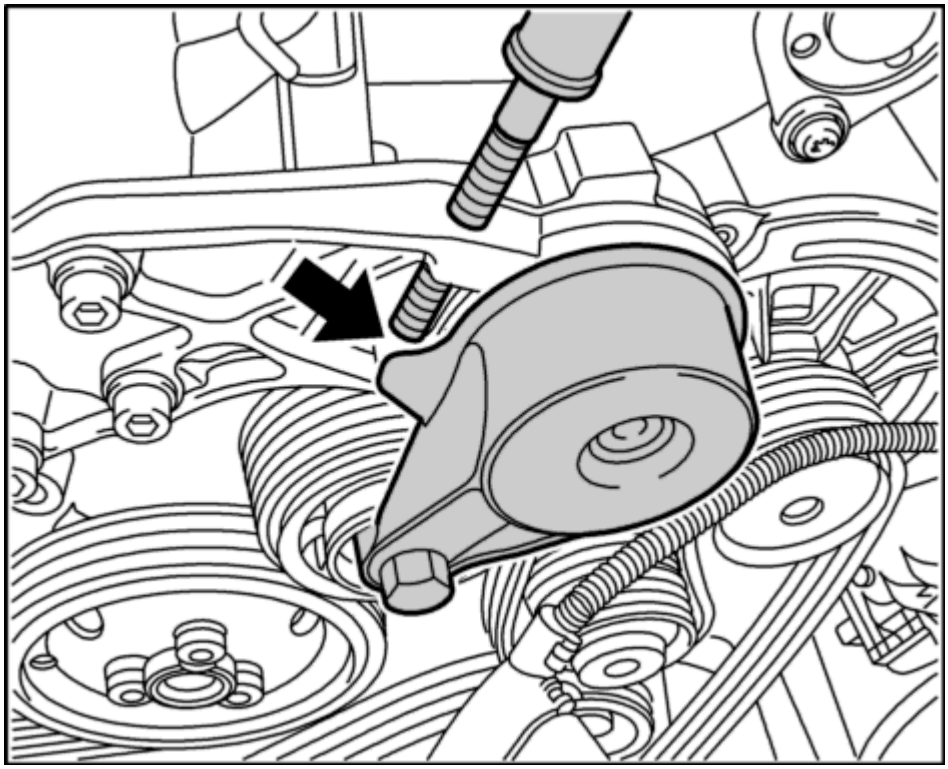


Fig. 127: Belt tensioner
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Fit drive belt. Refer to **13 78 19 Removing and installing drive belt - as of MY 2004 (Cayenne TIP, Cayenne MAN)** .; then remove the screw from the belt tensioner and tension the belt. Check whether the drive belt is correctly installed.

SUBSEQUENT WORK

Subsequent work

1. Fill and bleed cooling system according to regulations. **--> 193817 Draining and filling coolant (includes bleeding)**

19 58 19 REMOVING AND INSTALLING COOLANT REGULATOR (THERMOSTAT) - AS OF MY 2003 (CAYENNE S TIP, CAYENNE S MAN, CAYENNE TURBO, CAYENNE TURBO S, CAYENNE S TIO TITAN)

TOOLS

Designation	Type	Number	Explanation	
assembly aid	special tool	P 9627		

PRELIMINARY WORK

Preliminary work

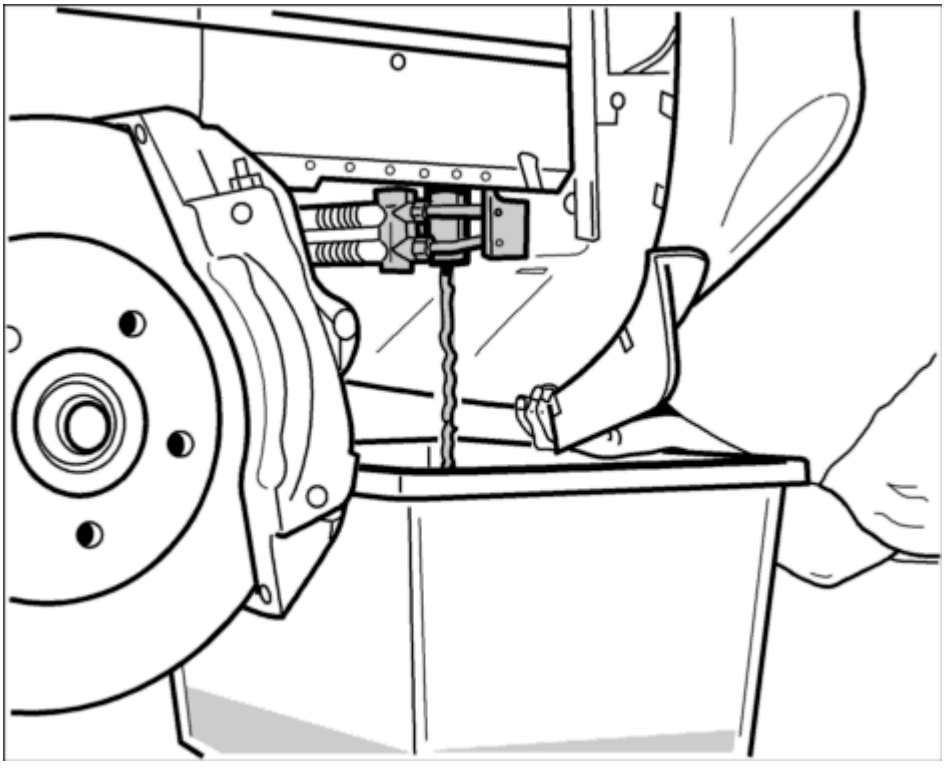


Fig. 128: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

2. Remove intake-air distributor. Refer to **24 46 19 Removing and installing intake-air distributor - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

INFORMATION

Component overview

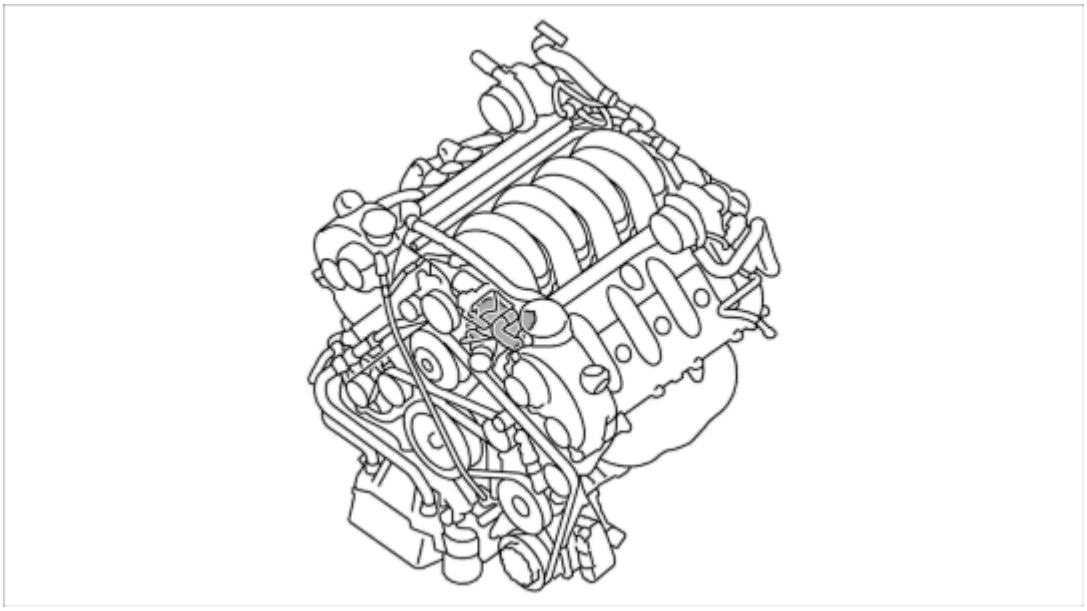


Fig. 129: Install location
Courtesy of PORSCHE OF NORTH AMERICA, INC.

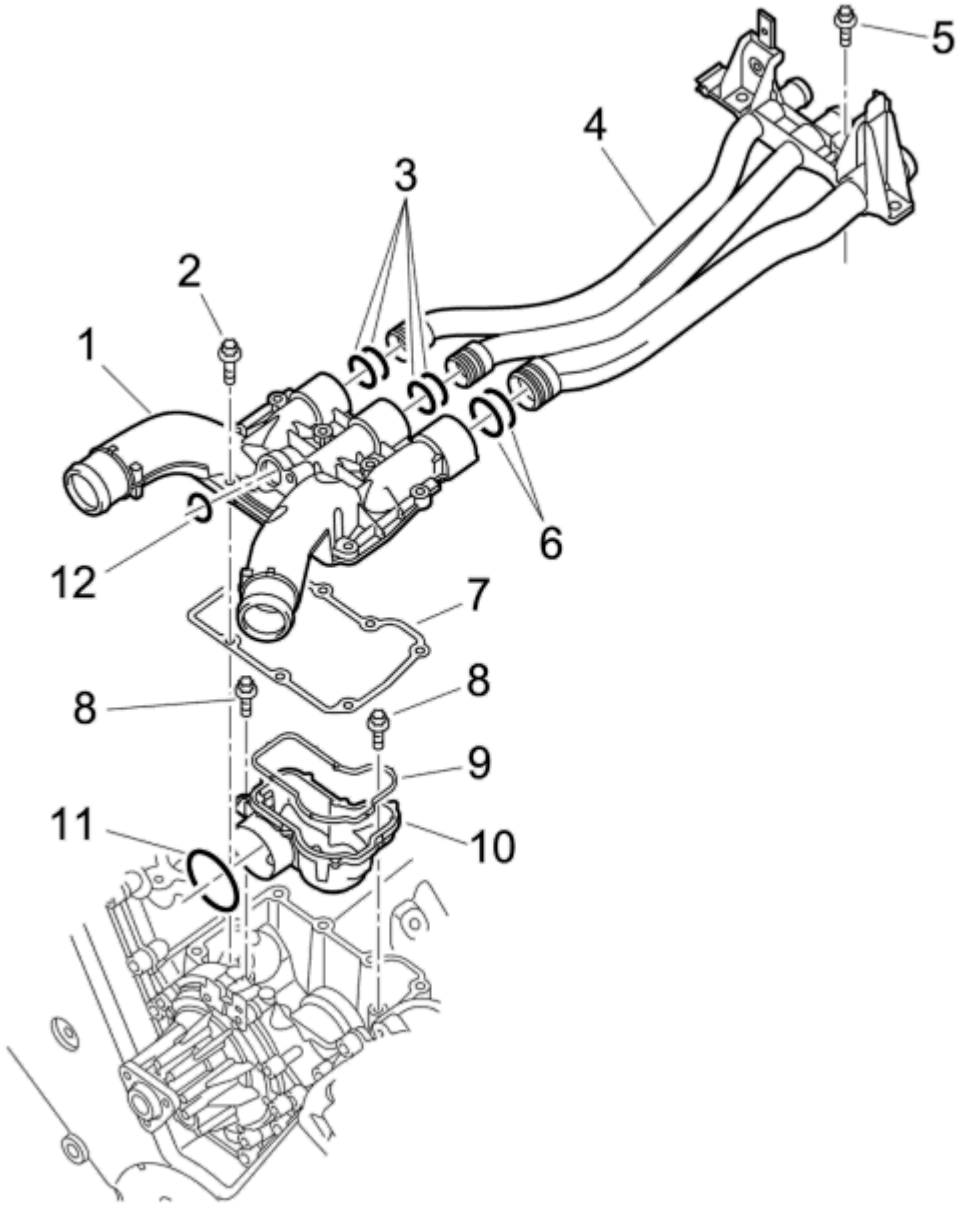


Fig. 130: Component overview
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1 - Thermostat housing (observe loosening and tightening sequence)

2 - Fastening screw M6 x 25

3 - O-rings, 22 x 3, replacing

4 - Coolant pipe for heater

5 - Fastening screw M6 x 16

6 - O-rings, 28 x 3, replacing

7 - Seal for thermostat housing; replacing

8 - Fastening screw M6 x 16

9 - Molded seal; replacing

10 - Thermostat well

11 - O-ring, 50 x 3, replacing

12 - O-ring, 20 x 2.65, replacing

REMOVING THERMOSTAT

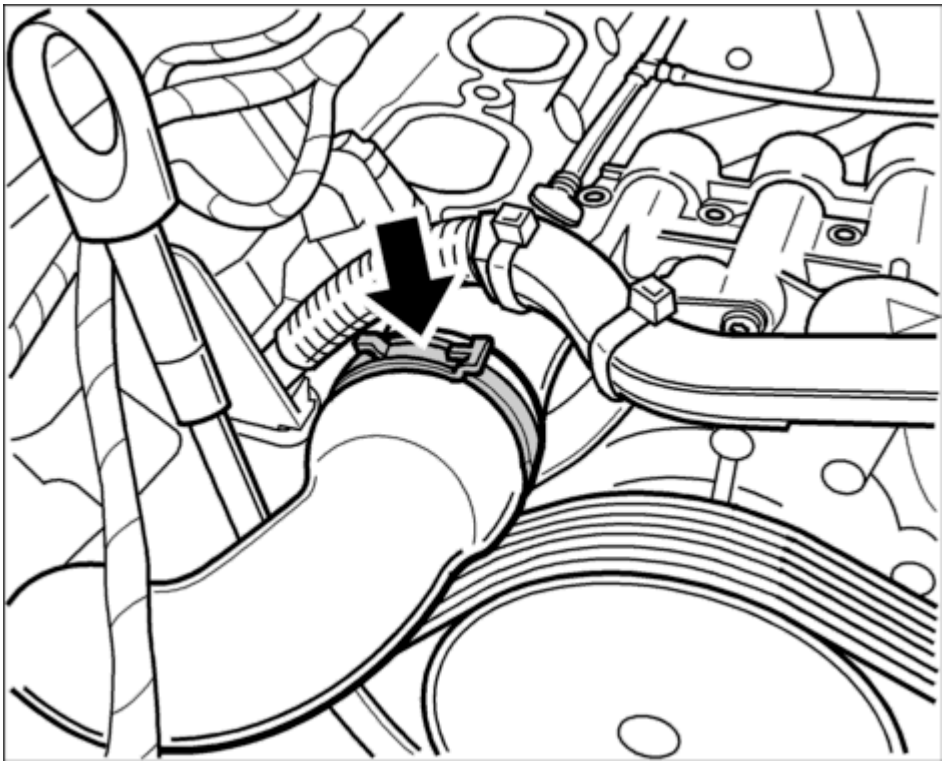


Fig. 131: Spring band clamps for coolant lines on thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Remove the two coolant lines on the thermostat housing cover. To do this, remove the spring-band clamps and pull off the hoses.

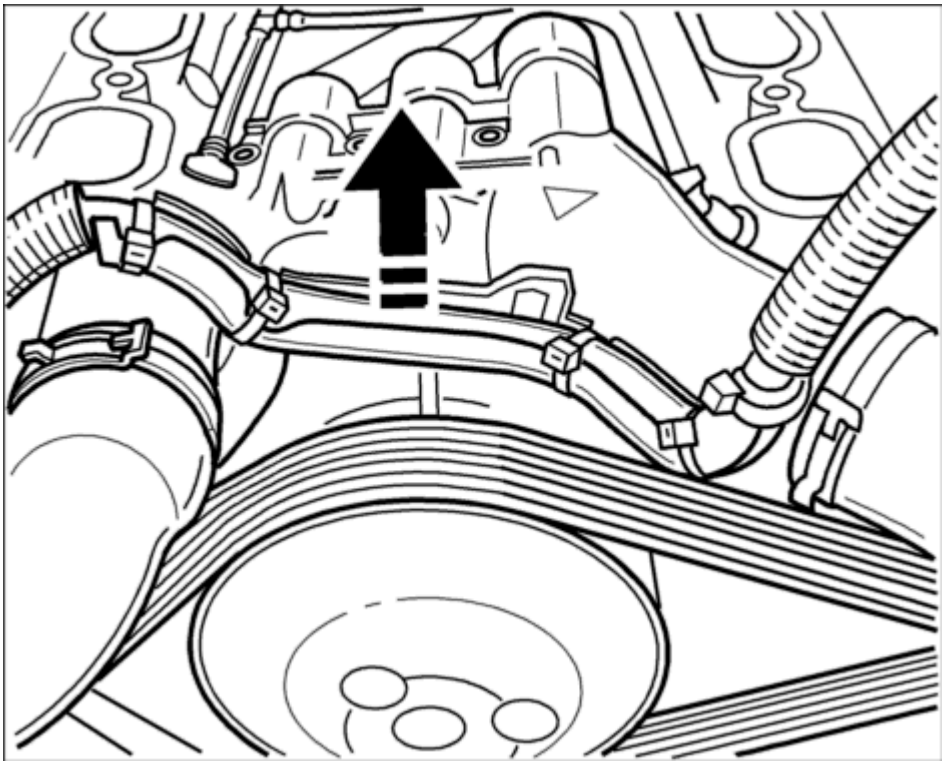


Fig. 132: Cable duct over coolant pump
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Pull off the cable duct upwards over the coolant pump.

3. Release the upper fastening screw of the oil dipstick.

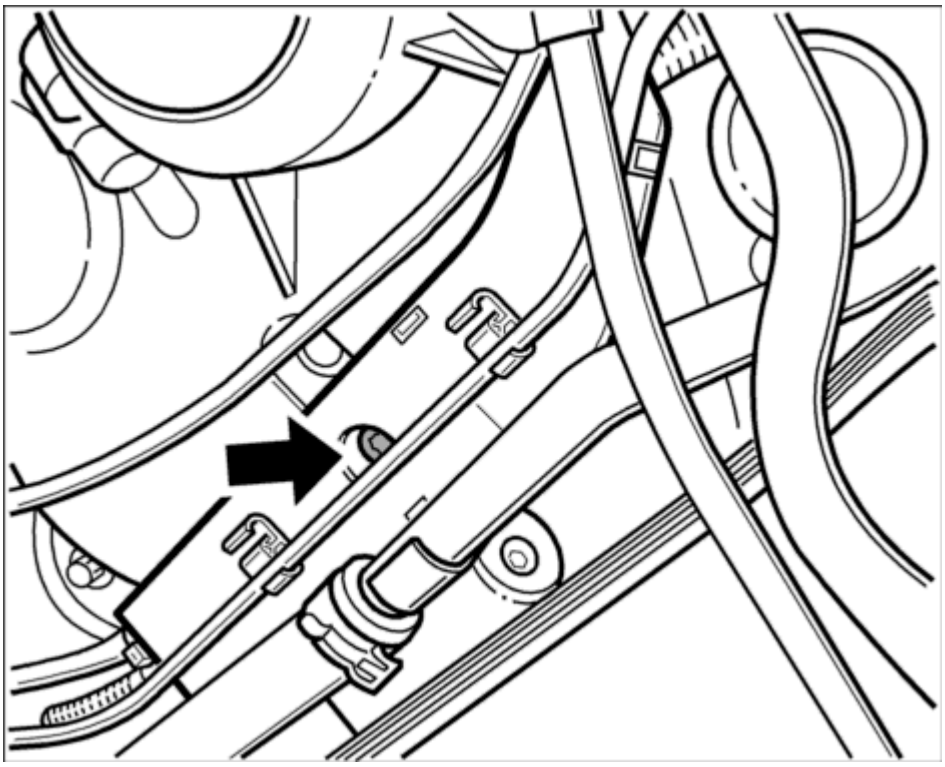


Fig. 133: Fastening screw on the cable duct
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Loosen the fastening screw on the cable duct.

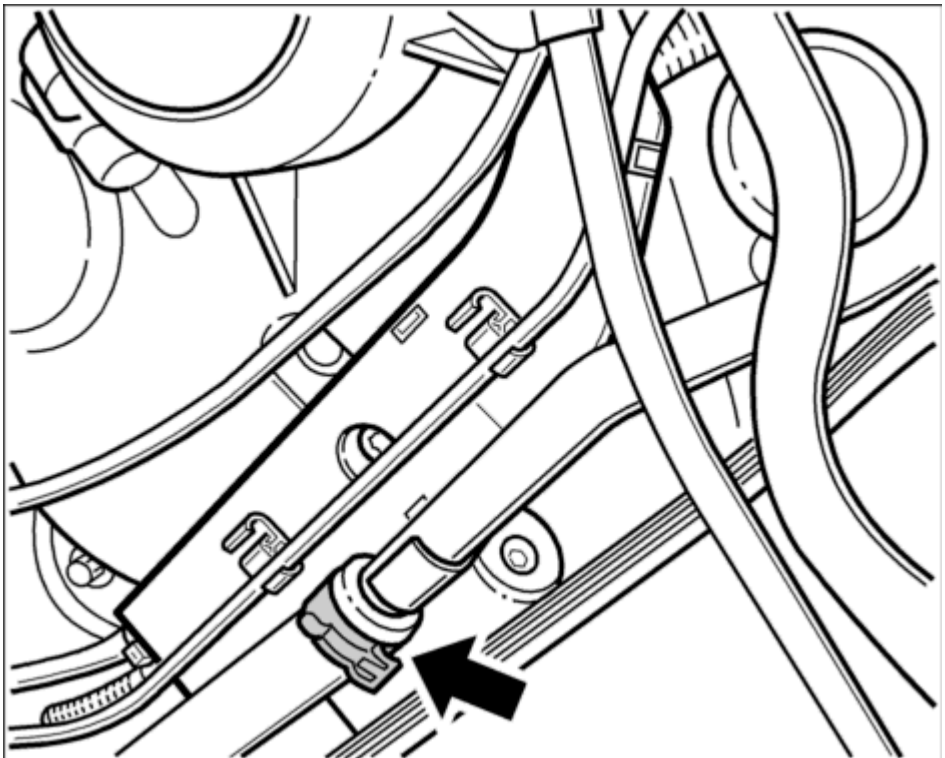


Fig. 134: Spring band clamp for coolant return to generator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Disconnect the coolant outlet on the generator. To do this, open the spring-band clamps and pull off the hose. Collect the draining coolant.

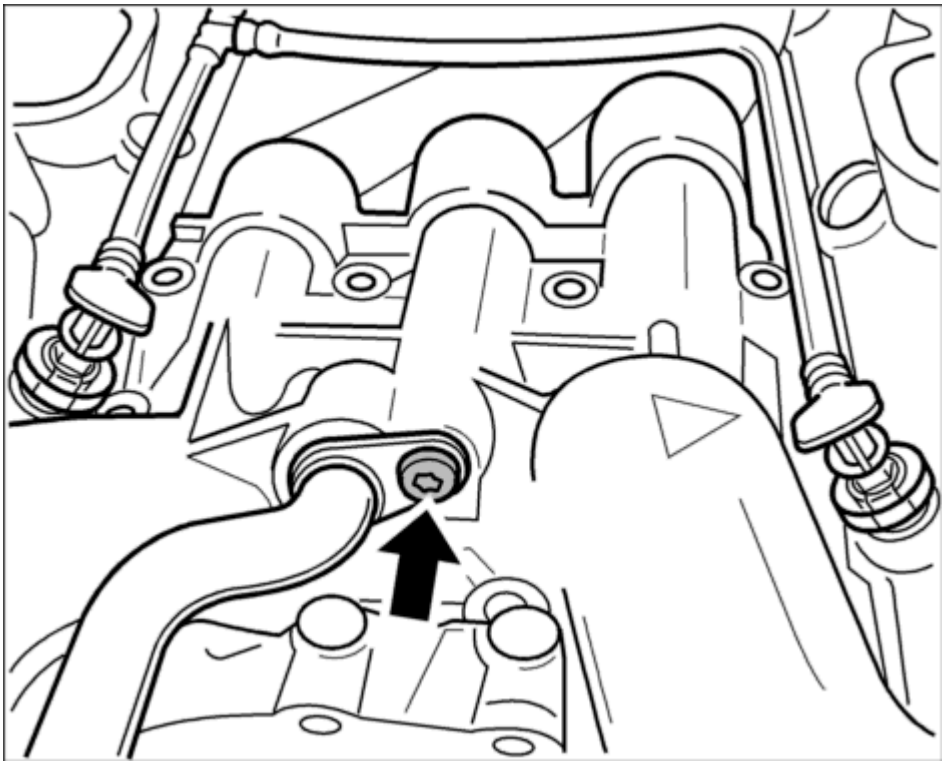


Fig. 135: Fastening screw for coolant return line to thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Remove the coolant return line on the thermostat housing. To do this, loosen the fastening screw and pull off the line.

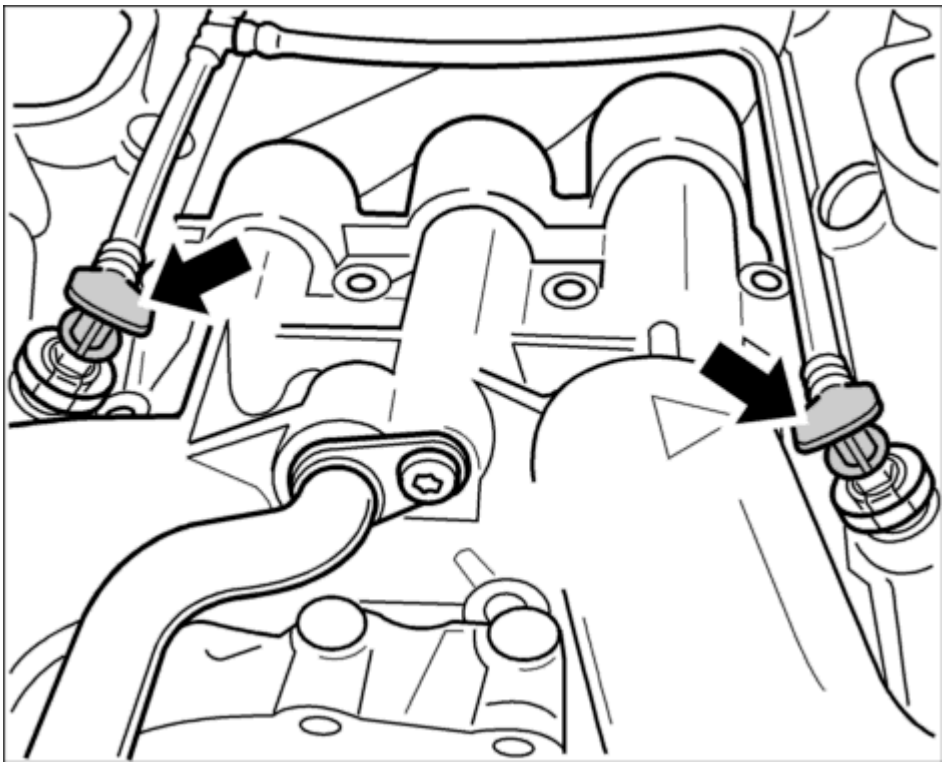


Fig. 136: Button on the vent lines of cylinder heads
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Disconnect vent line for cylinder heads. To do this, press the ribbed surfaces of the buttons and pull off the plugs.

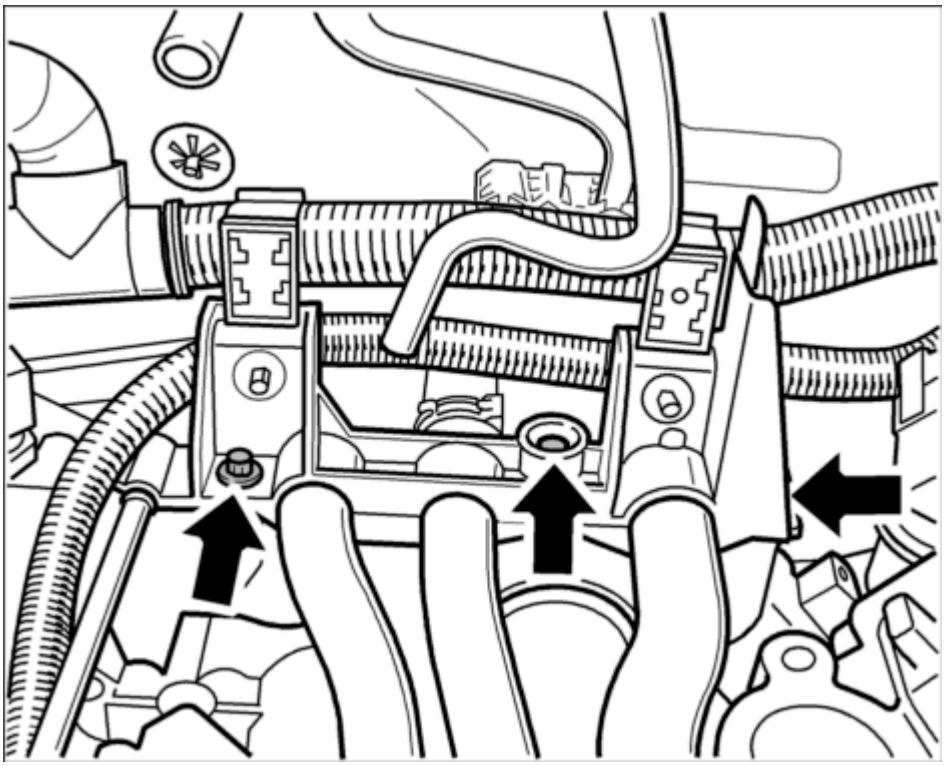


Fig. 137: Fastening screws of heater pipes
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Undo the 3 rear fastening screws of the heater pipes.

9. Undo the thermostat housing cover. The sequence shown must be observed when doing so.

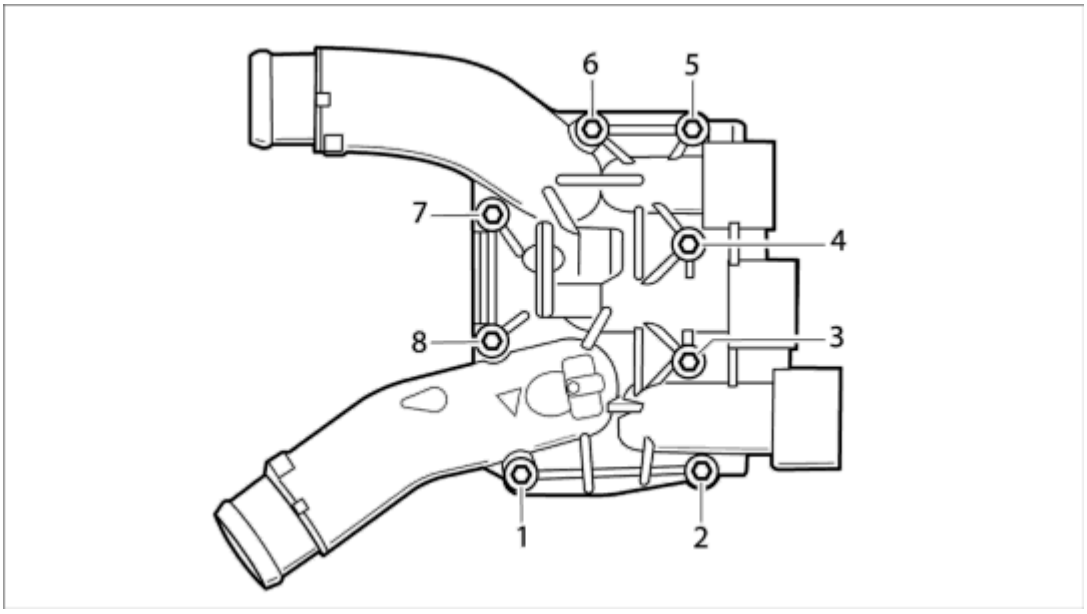


Fig. 138: Loosening sequence for thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

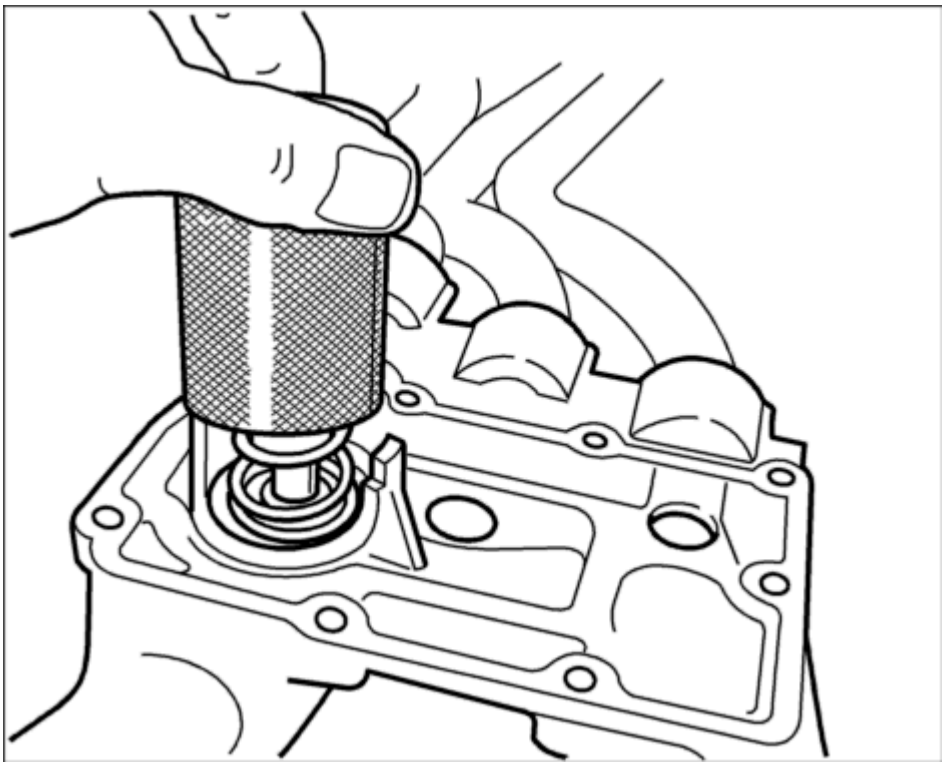


Fig. 139: Removing thermostat with assembly aid
Courtesy of PORSCHE OF NORTH AMERICA, INC.

10. Lift the housing cover. Remove the thermostat using **assembly aid P 9627**.

INSTALLING THERMOSTAT

NOTE:

- ***All seals between opened sealing surfaces must be replaced.***

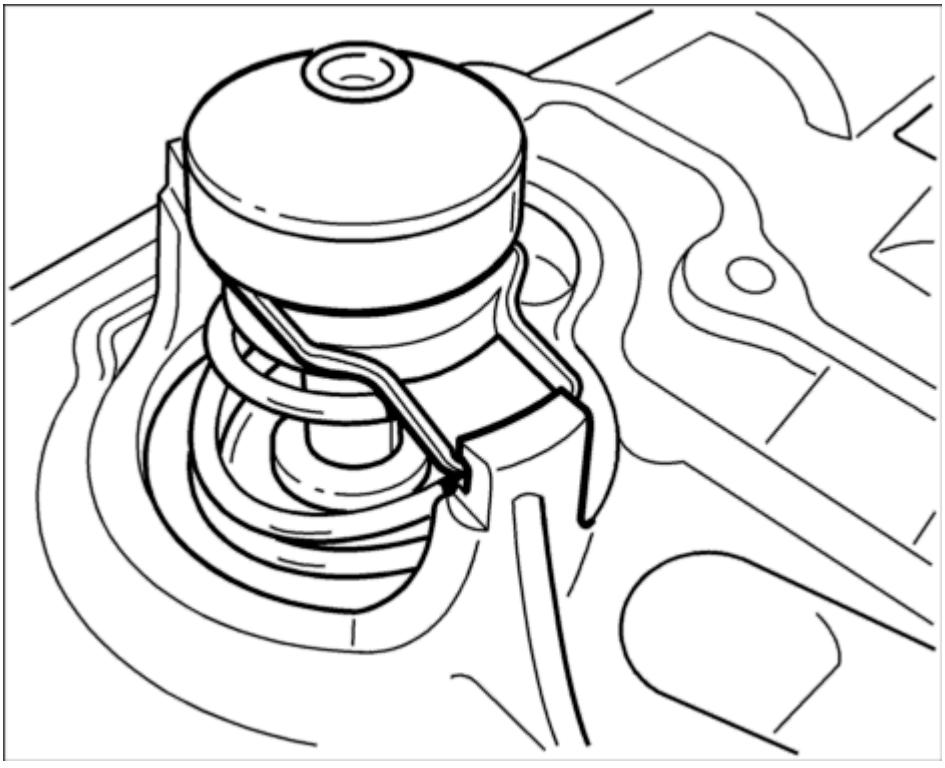


Fig. 140: Inserting thermostat into cover and twisting
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert thermostat in the cover and turn it until the two sheetmetal edges are lying to the left and right of the holder.

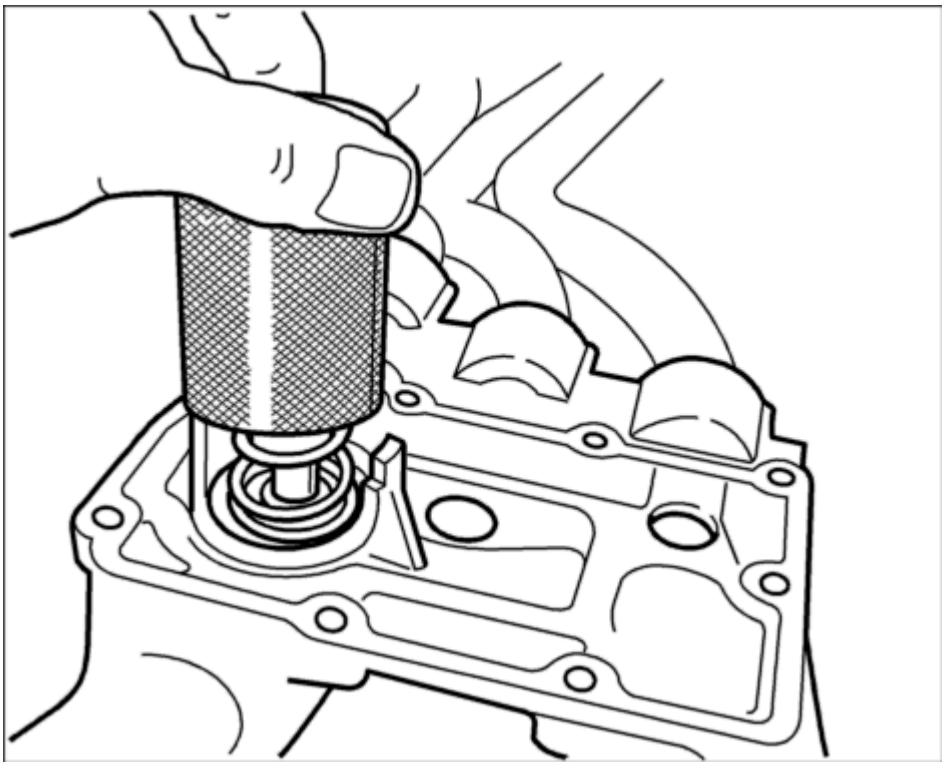


Fig. 141: View shows assembly using the special tool
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Replace inner and outer seal in thermostat housing cover.

3. Position thermostat housing cover and tighten the fastening screws (M6 x 25) according to the sequence shown. **--> Tightening torque: 7.5 ftlb.**

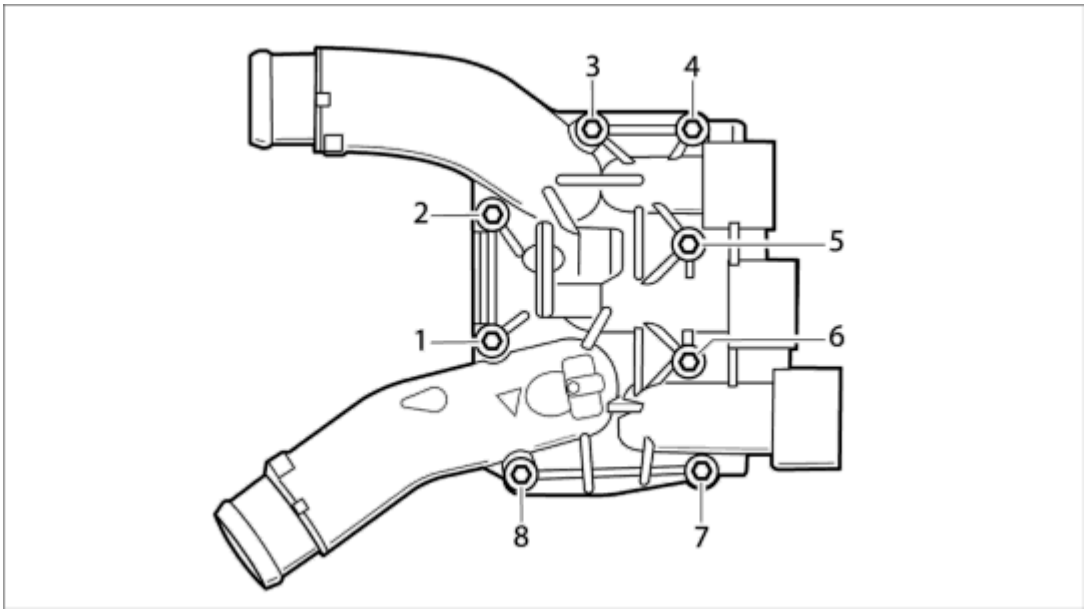


Fig. 142: Tightening sequence for thermostat housing fastening screw

Courtesy of PORSCHE OF NORTH AMERICA, INC.

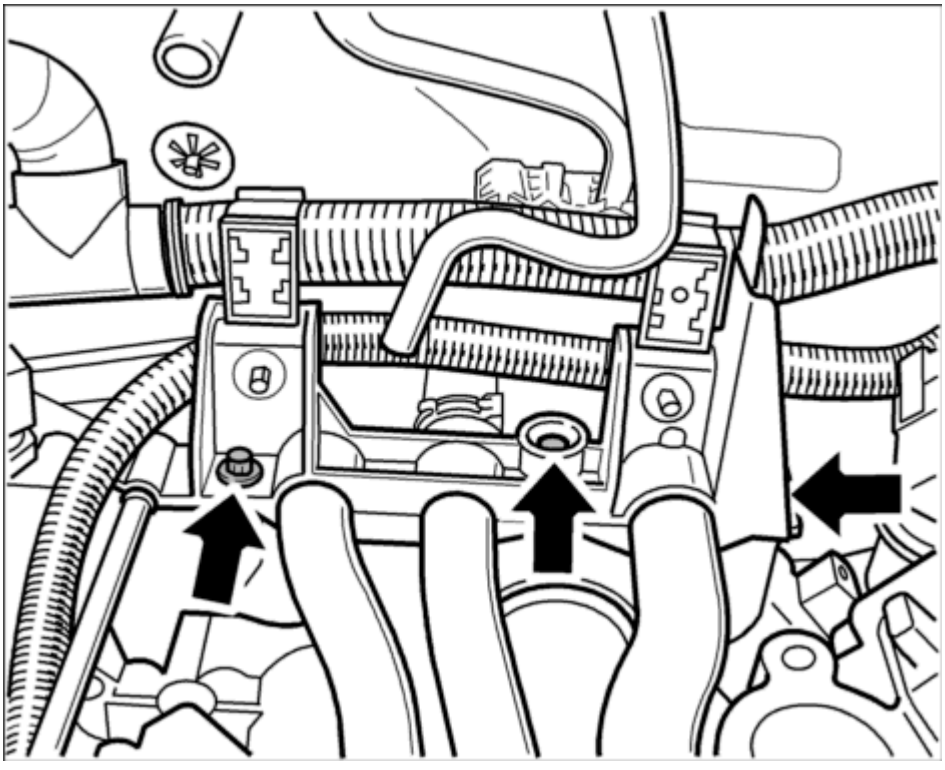


Fig. 143: Fastening screws of heater pipes
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Tighten the three rear fastening screws (M6 x 16) on the heater pipes. **--> Tightening torque: 7.5 ftlb.**

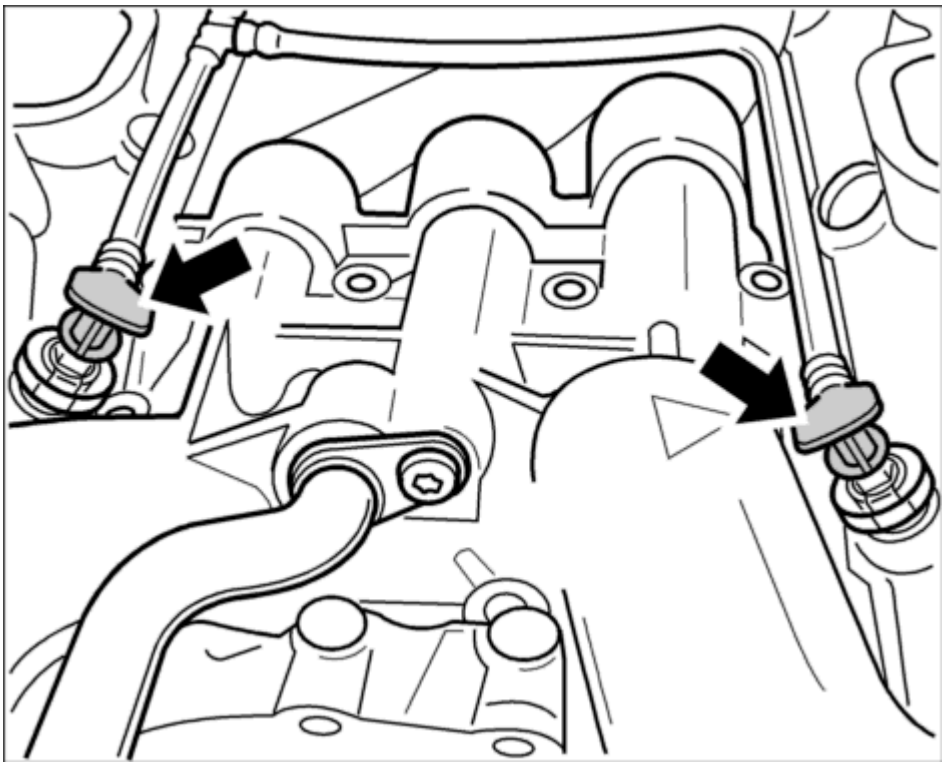


Fig. 144: Vent lines for cylinder heads
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Connect vent lines for cylinder heads. The connectors must engage audibly.

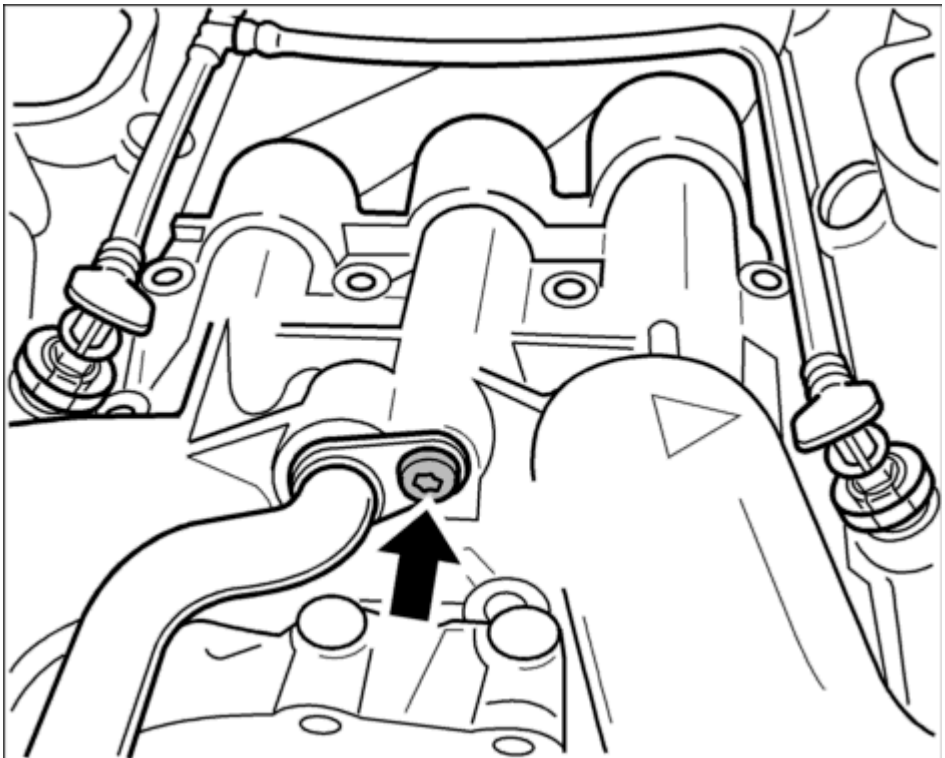


Fig. 145: Coolant line to generator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Fit coolant line leading to the generator. Insert the line in the thermostat housing cover and tighten the fastening screw. --> **Tightening torque: 7.5 ftlb.**

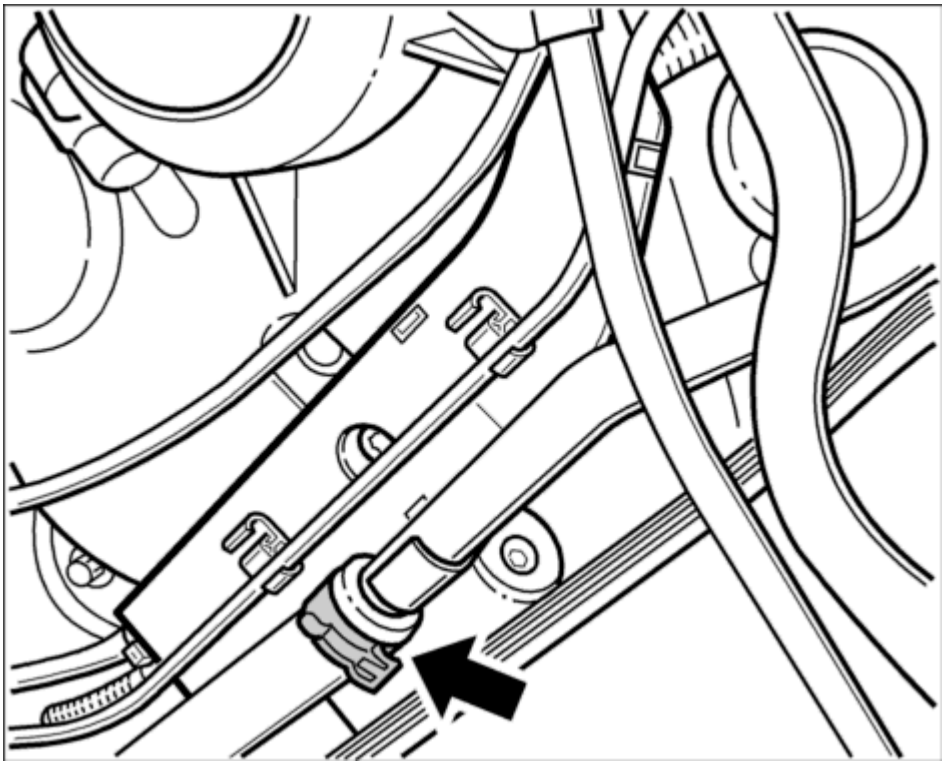


Fig. 146: Spring band clamp for coolant line to generator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Push coolant line onto generator and fit the spring-band clamp.

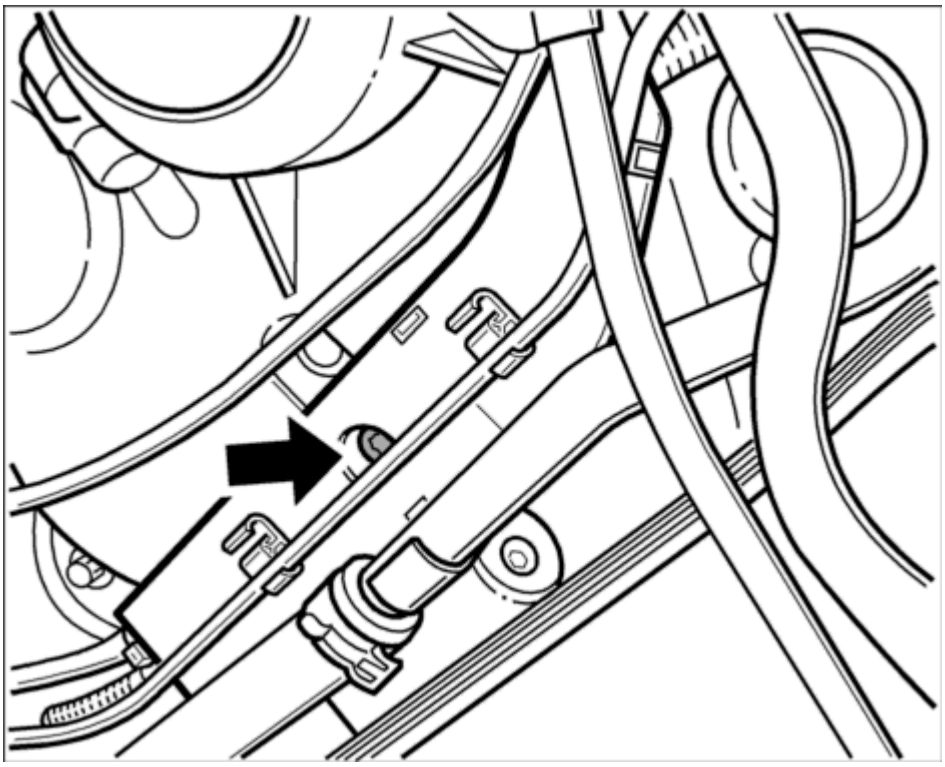


Fig. 147: Fastening screw, support to timing-case cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

8. Push the holder onto the timing case cover below the cable duct and tighten the fastening screw. -->
Tightening torque: 7.5 ftlb.

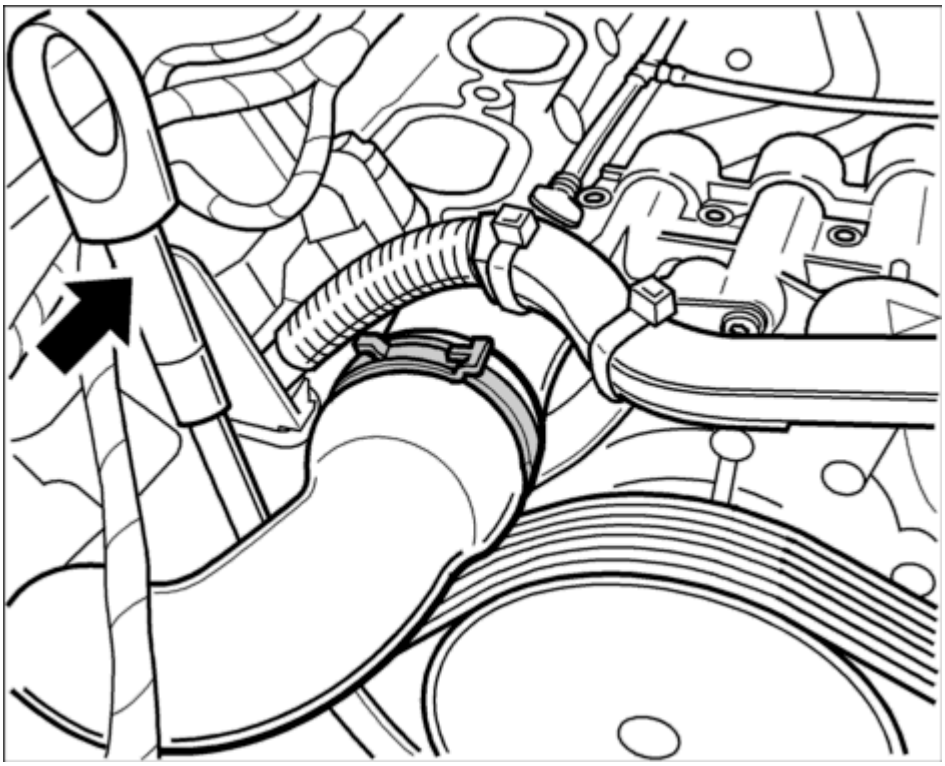


Fig. 148: Fastening screw for oil dipstick
Courtesy of PORSCHE OF NORTH AMERICA, INC.

9. Tighten the upper fastening screw of the oil dipstick. --> **Tightening torque: 7.5 ftlb.**

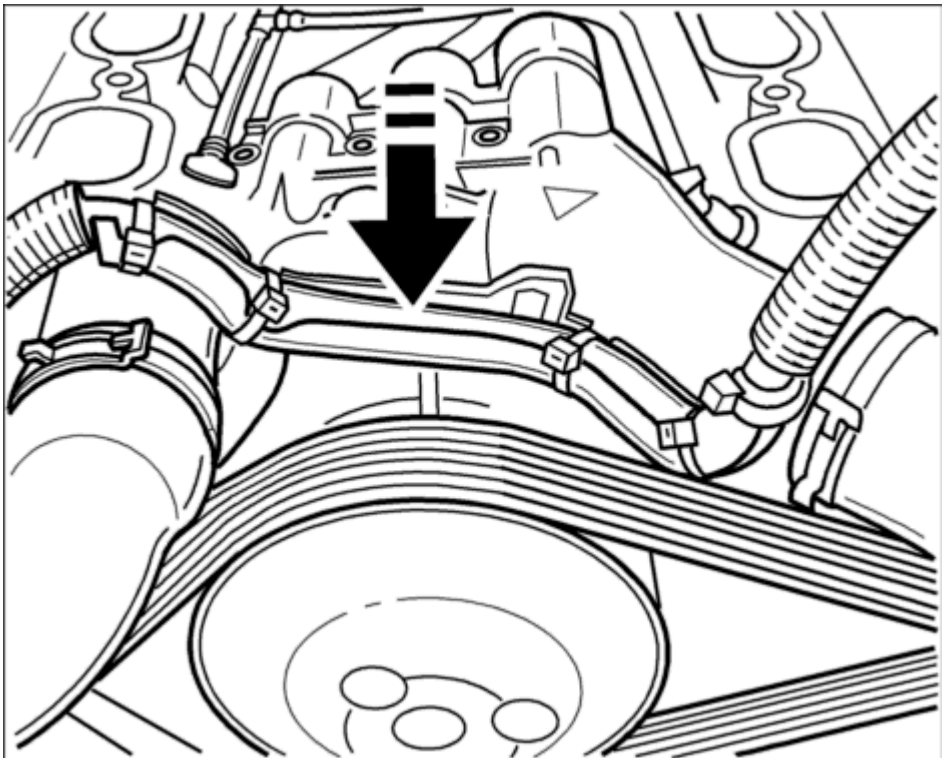


Fig. 149: Push the cable duct onto the retaining bracket over the coolant pump.
Courtesy of PORSCHE OF NORTH AMERICA, INC.

10. Push the cable duct onto the retaining bracket over the coolant pump.

11. Check whether the drive belt is correctly installed.

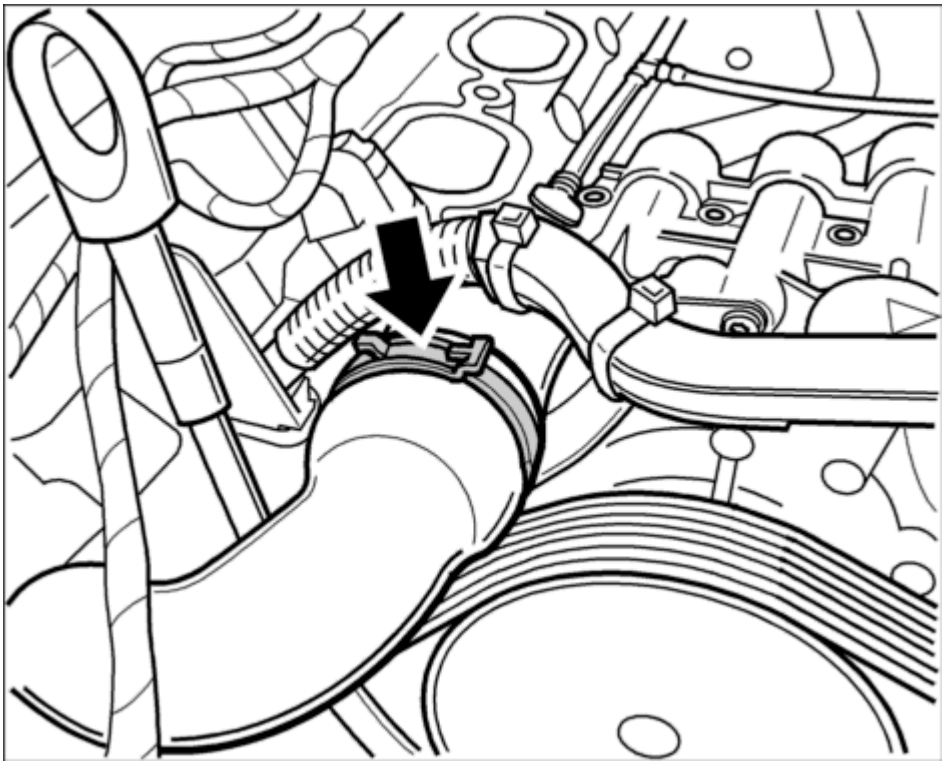


Fig. 150: Coolant hose and clamp
Courtesy of PORSCHE OF NORTH AMERICA, INC.

12. Fit coolant supply and return hose on thermostat housing cover.

SUBSEQUENT WORK

Subsequent work

1. Install intake distributor. Refer to **24 46 19 Removing and installing intake-air distributor - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

2. Fill coolant system and check for leaks. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

19 58 19 REMOVING AND INSTALLING COOLANT REGULATOR (THERMOSTAT) - AS OF MY 2004 (CAYENNE TIP, CAYENNE MAN)

PRELIMINARY WORK

Preliminary work

1. Remove transmission. Refer to **37 35 19 Removing and installing transmission - as of MY 2003 (Cayenne TIP)** or refer to **34 35 19 Removing and installing transmission - as of MY 2003 (Cayenne MAN)** .

2. Remove the front engine guard. Refer to **10 80 19 Removing and installing engine guard - as of MY 2003 (All Models)** .

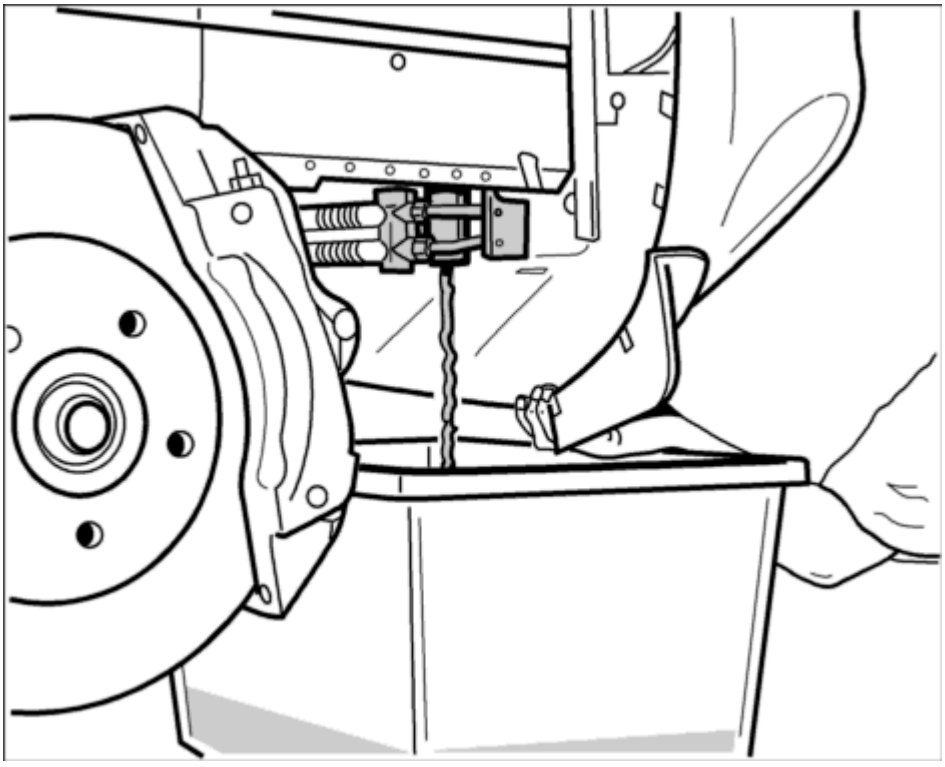


Fig. 151: Draining cooling system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Drain cooling system. **--> 193817 Draining and filling coolant (includes bleeding)**

INFORMATION

Component overview

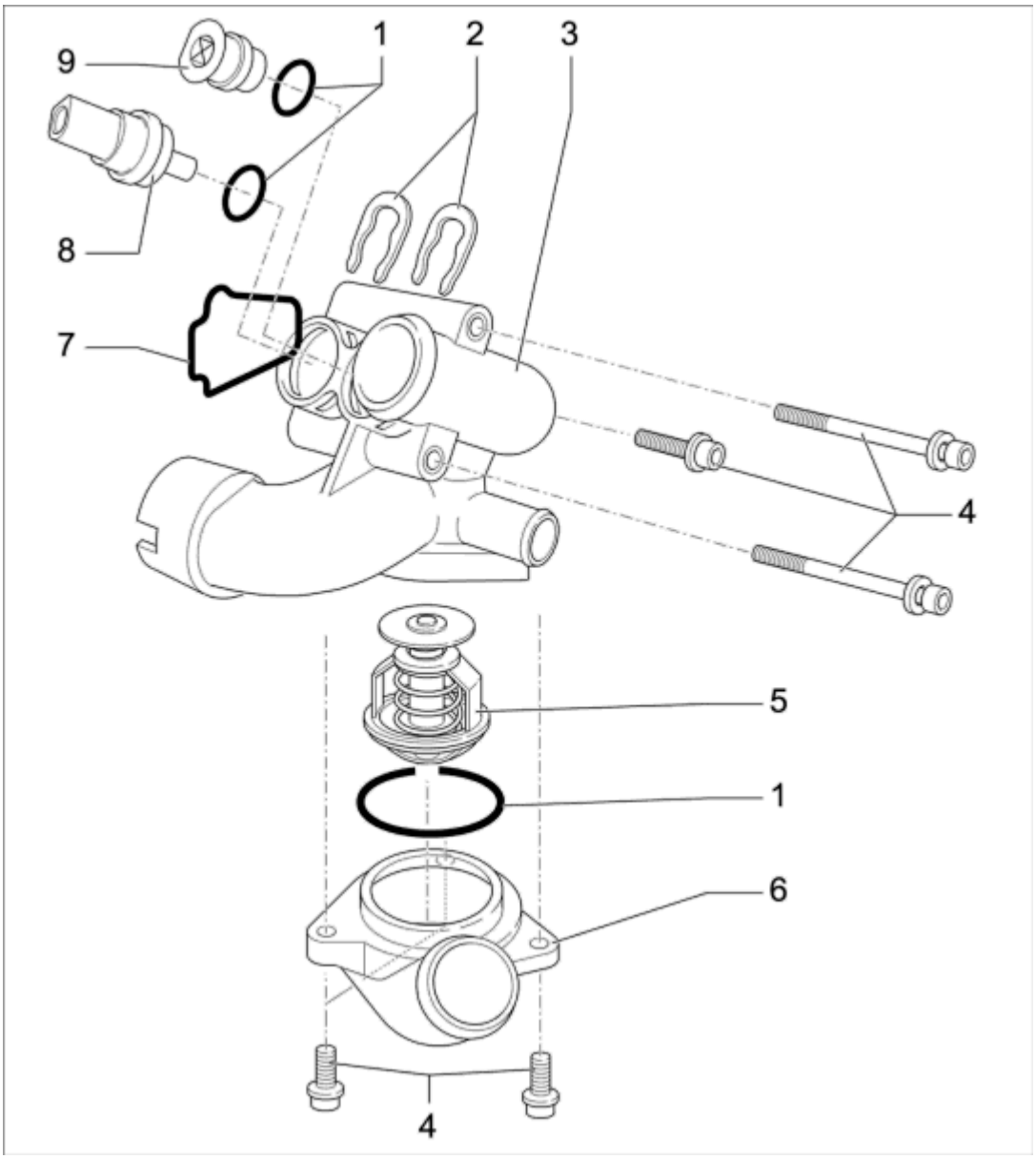


Fig. 152: Thermostat components
Courtesy of PORSCHE OF NORTH AMERICA, INC.

-1- - O-ring; replacing. See **Fig. 152**.

-2- - Clamp; replace if damaged. See **Fig. 152**.

-3- - Thermostat housing. See **Fig. 152**.

-4- - **--> Tightening torque: 6 ftlb.** fastening screw. See **Fig. 152**.

-5- - Coolant regulator; pay attention to the direction of installation **--> Start of opening temperature: 80 °C --> End of opening temperature: 107 °C --> Opening stroke: 7 mm** . See **Fig. 152**.

-6- - Adapter; pay attention to the installation position. See **Fig. 152**.

-7- - Molded seal; replacing. See **Fig. 152**.

-8- - Temperature sensor for coolant temperature. See **Fig. 152**.

-9- - Plug. See **Fig. 152**.

Coolant pump components

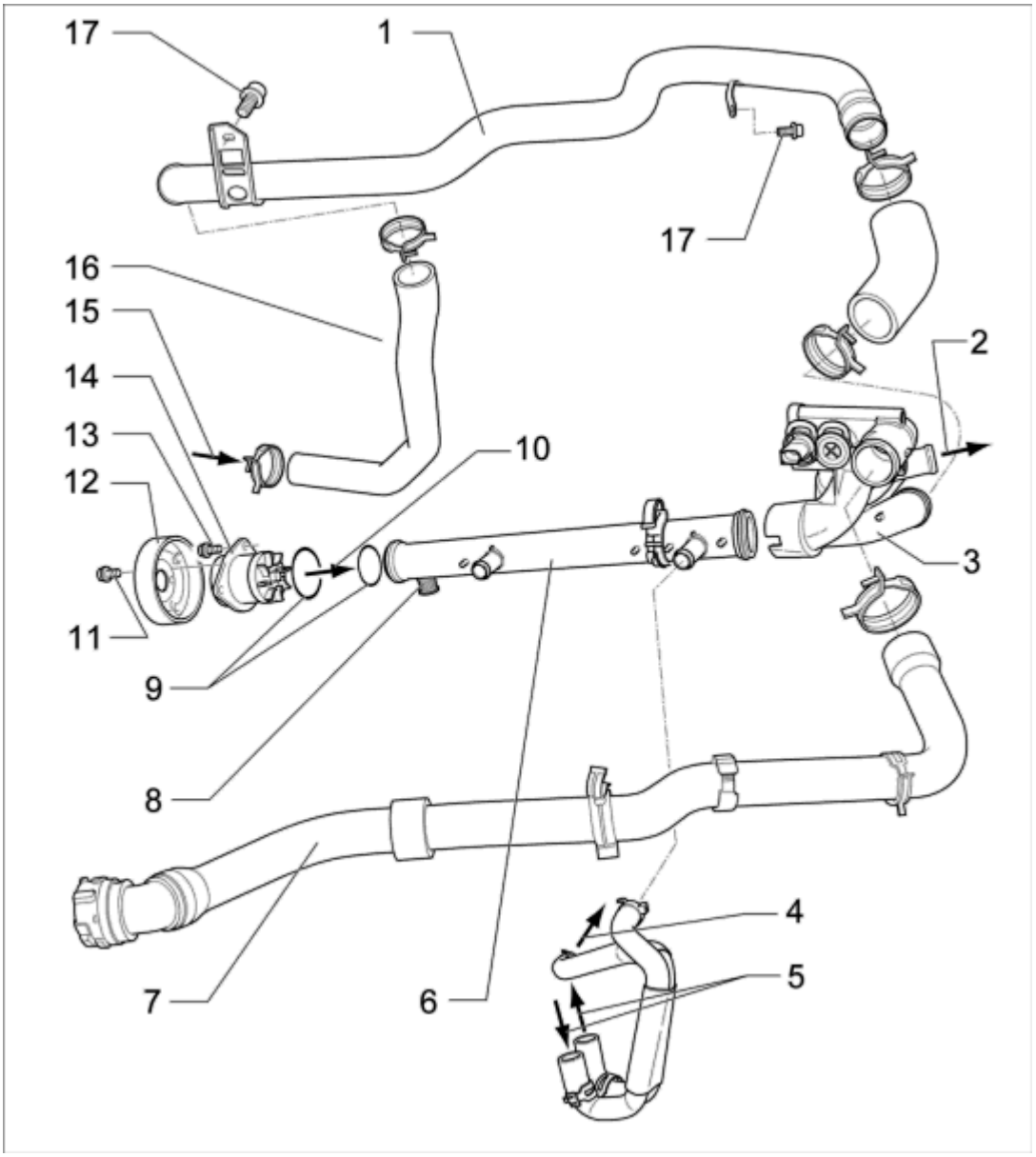


Fig. 153: Components
Courtesy of PORSCHE OF NORTH AMERICA, INC.

-1- - Coolant pipe. See **Fig. 153**.

-2- - Wiring for reservoir. See **Fig. 153**.

-3- - Thermostat housing. See **Fig. 153**.

-4- - Connection wires on cylinder block. See **Fig. 153**.

-5- - Connections on oil/water heat exchanger. See **Fig. 153**.

-6- - Coolant pipe. See **Fig. 153**.

-7- - Coolant hose; flange must engage with an audible click. See **Fig. 153**.

-8- - --> **Tightening torque: 2 ftlb.** . See **Fig. 153**.

-9- - O-ring; replacing. See **Fig. 153**.

-10- - Fuel feed direction of coolant pump. See **Fig. 153**.

-11- - --> **Tightening torque: 15 ftlb.** . See **Fig. 153**.

-12- - Pulley. See **Fig. 153**.

-13- - --> **Tightening torque: 6 ftlb.** . See **Fig. 153**.

-14- - Coolant pump; check for smooth operation. See **Fig. 153**.

-15- - Direction of flow - coming from radiator. See **Fig. 153**.

-16- - Hose line - coming from radiator. See **Fig. 153**.

-17- - --> **Tightening torque: 6 ftlb.** . See **Fig. 153**.

REMOVING COOLANT REGULATOR

Remove coolant regulator

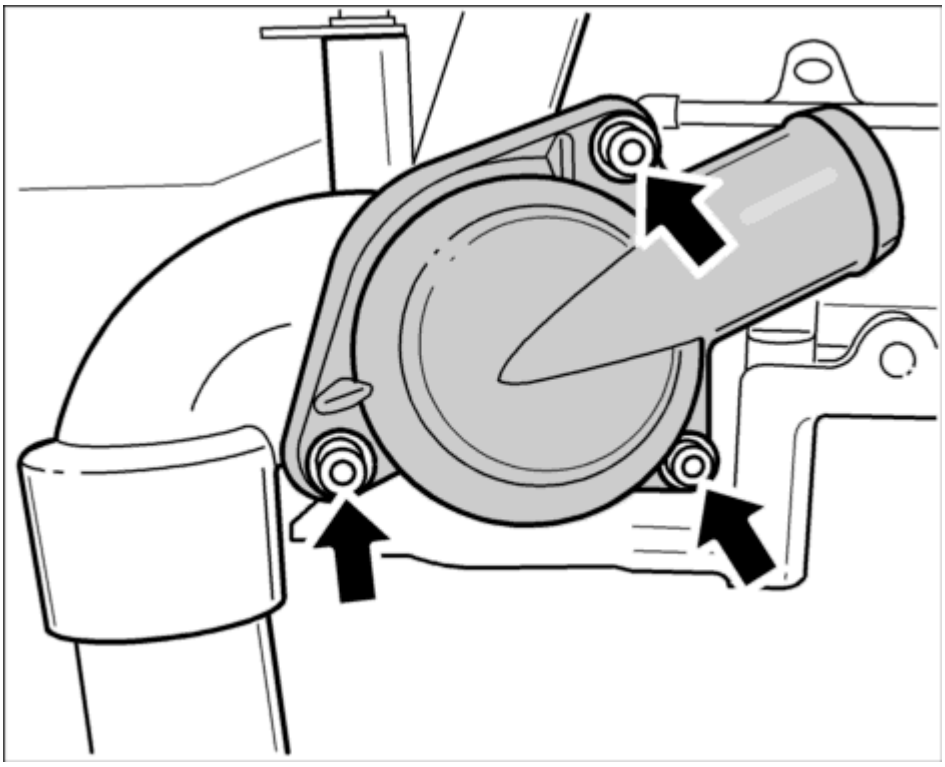


Fig. 154: Mount for thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Pull hoses off the thermostat housing from below (transmission area) and then loosen the **-3 fastening screws-** . See **Fig. 154**.

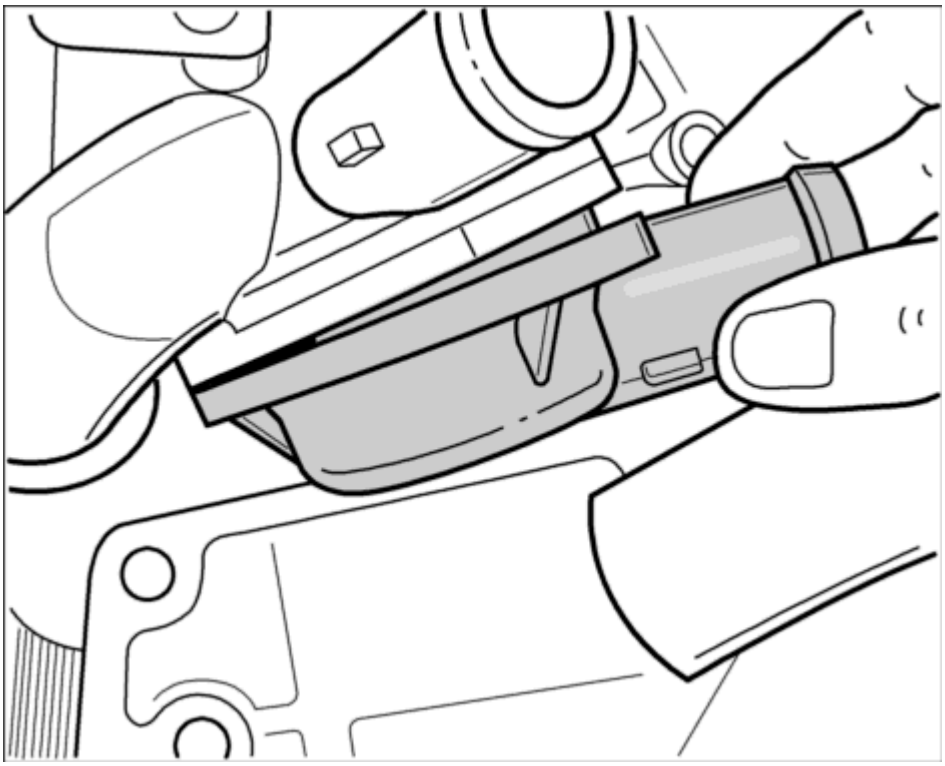


Fig. 155: Thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Carefully take off the cover. Coolant emerges.

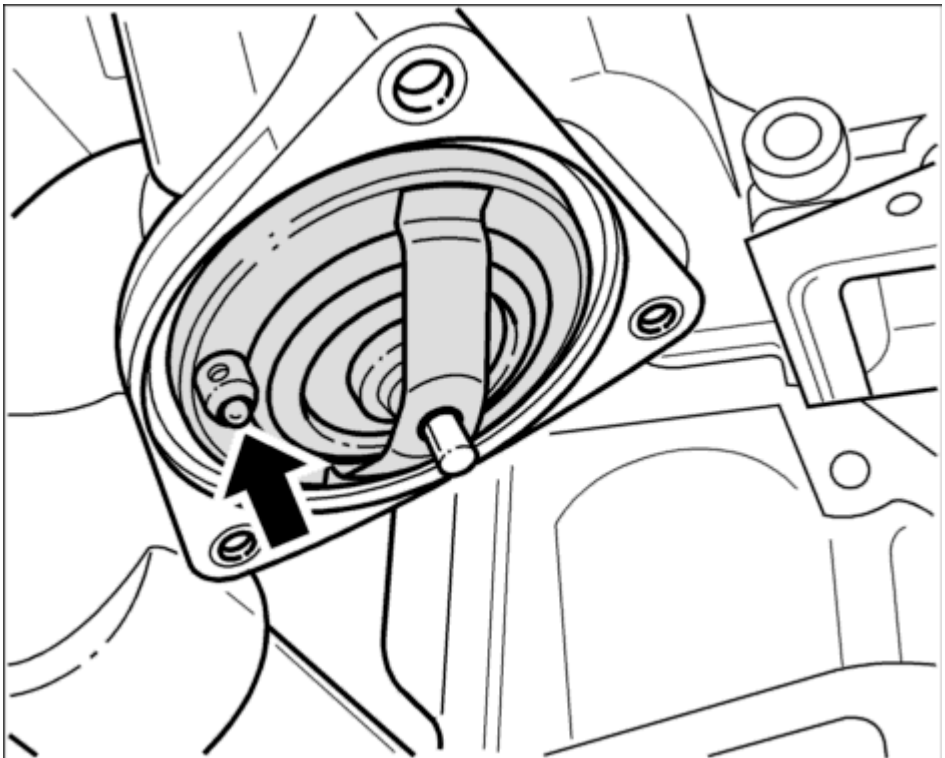


Fig. 156: Bleeder valve
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Note or mark position of bleeder valve **-arrow-** . See **Fig. 156**.

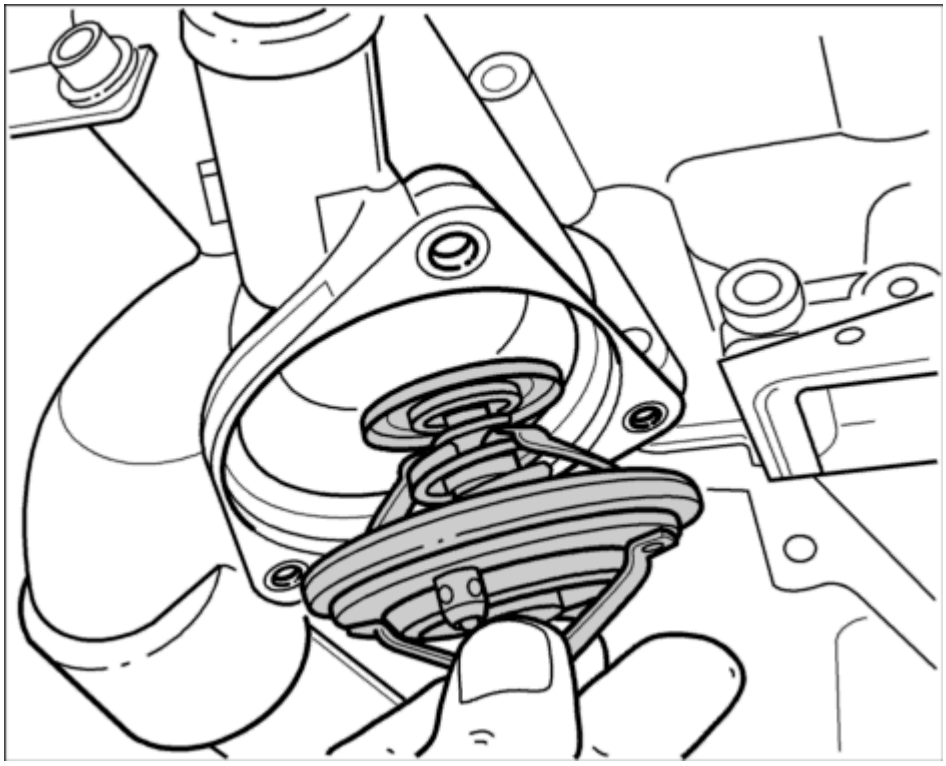


Fig. 157: Thermostat
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Remove thermostat from the housing.

INSTALLING COOLANT REGULATOR

Installing coolant regulator

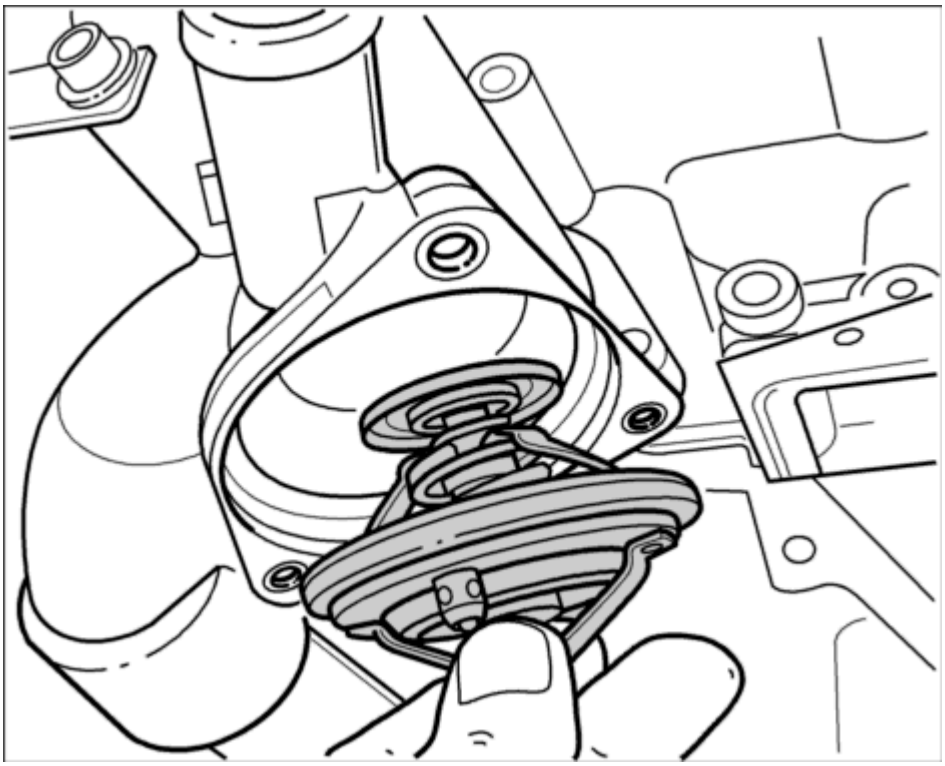


Fig. 158: Thermostat
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert thermostat with spring up into the housing.

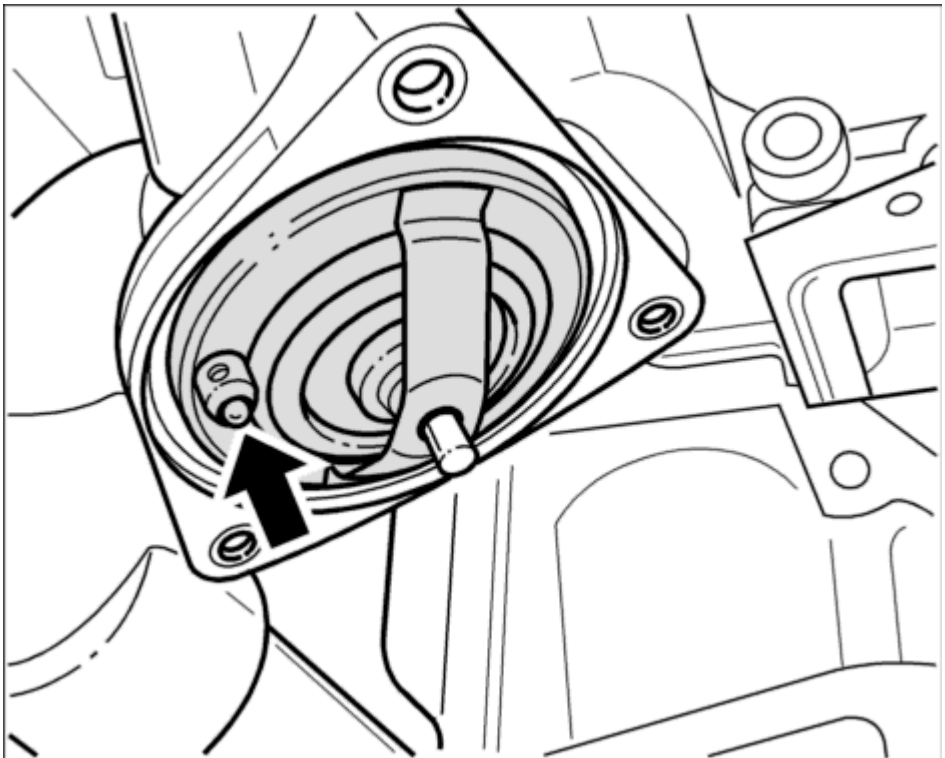


Fig. 159: Bleeder valve
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Align bleeder valve **-arrow-** . See **Fig. 159**.

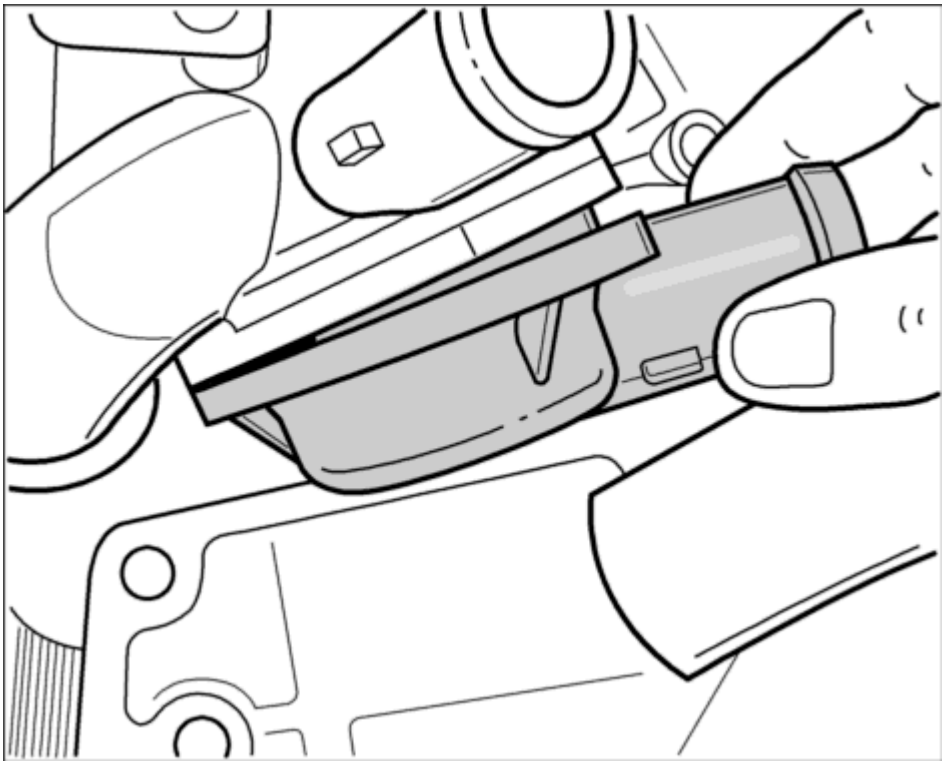


Fig. 160: Housing cover
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Position housing cover with new seal.

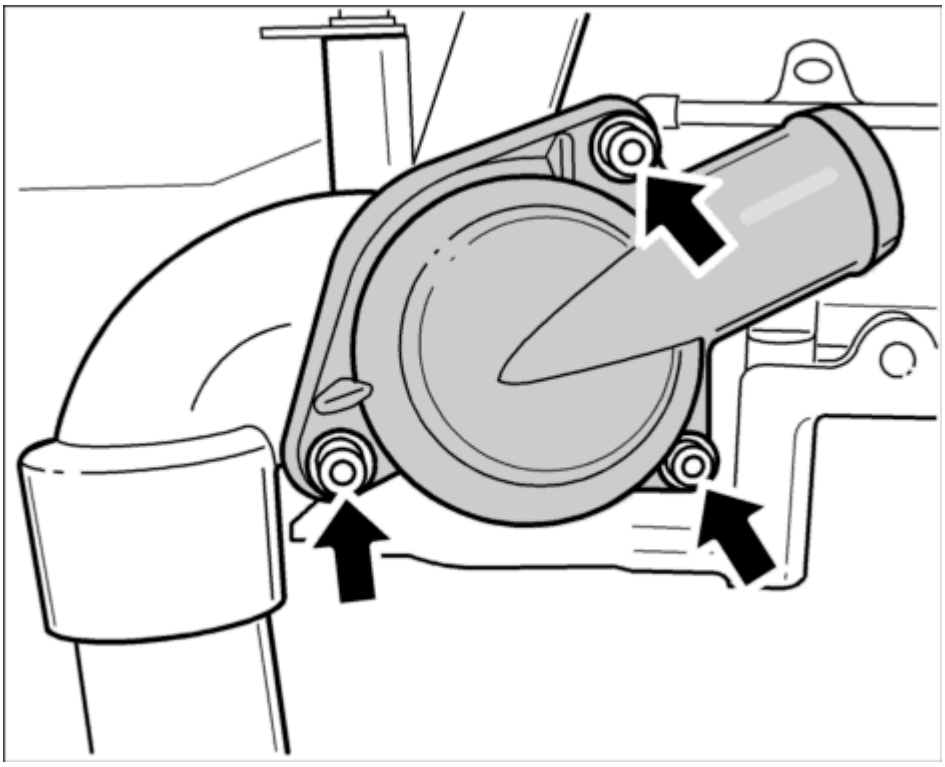


Fig. 161: Fastening screws for thermostat housing
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Tighten the 3 fastening screws **-arrows-** . **--> Tightening torque: 6 ftlb.** See **Fig. 161**.

5. Connect coolant hoses and fit spring-band clamps.

SUBSEQUENT WORK

Subsequent work

1. Install transmission. Refer to **37 35 19 Removing and installing transmission - as of MY 2003 (Cayenne TIP)** or refer to **34 35 19 Removing and installing transmission - as of MY 2003 (Cayenne MAN)** .

2. Fill and bleed the cooling system according to instructions. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**

19 70 21 REMOVING RADIATOR - AS OF MY 2003 (ALL MODELS)

PRELIMINARY WORK

Preliminary work

1. Disconnect battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

2. Drain cooling system. **--> 193817 Draining and topping up with coolant (includes bleeding) - chapter on "Draining"**

3. Remove lock mount. Refer to **50 38 19 Removing and installing lock carrier - as of MY 2003 (All Models)** .

4. Remove the radiator frame. **--> 192019 Removing and installing cooling fan housing (radiator frame) - chapter on "Removing"**

INFORMATION

Component overview

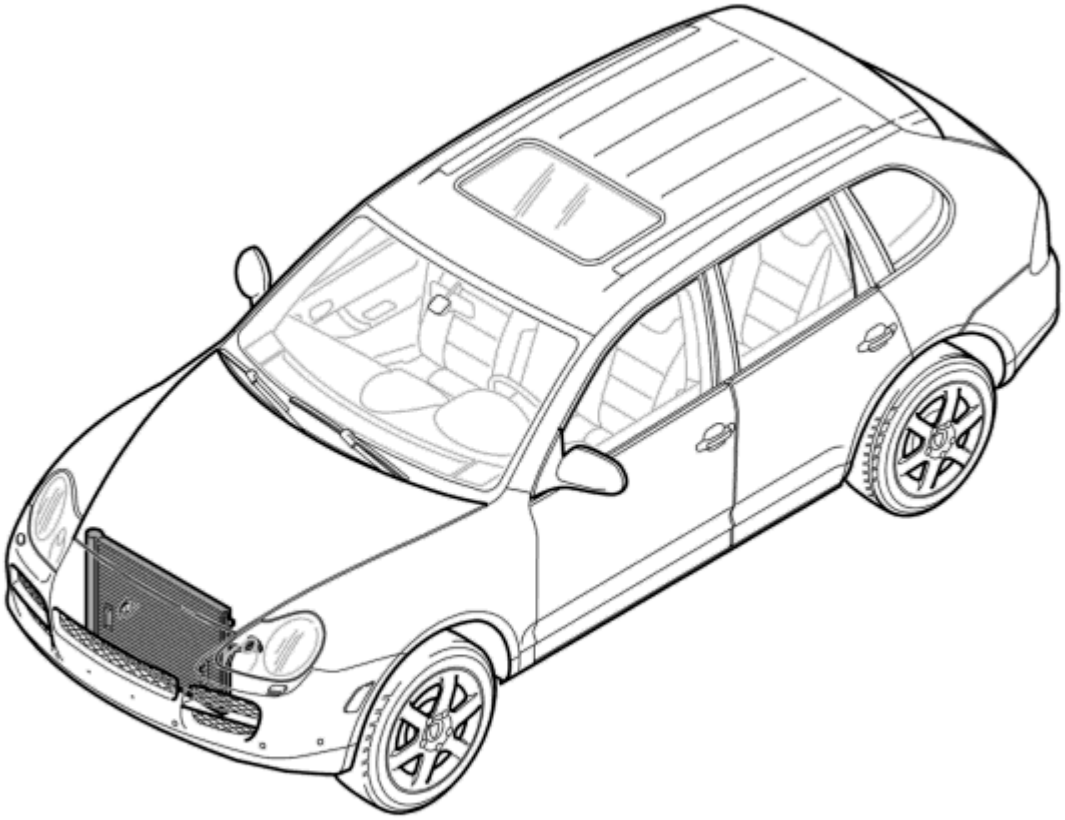


Fig. 162: Overview of radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

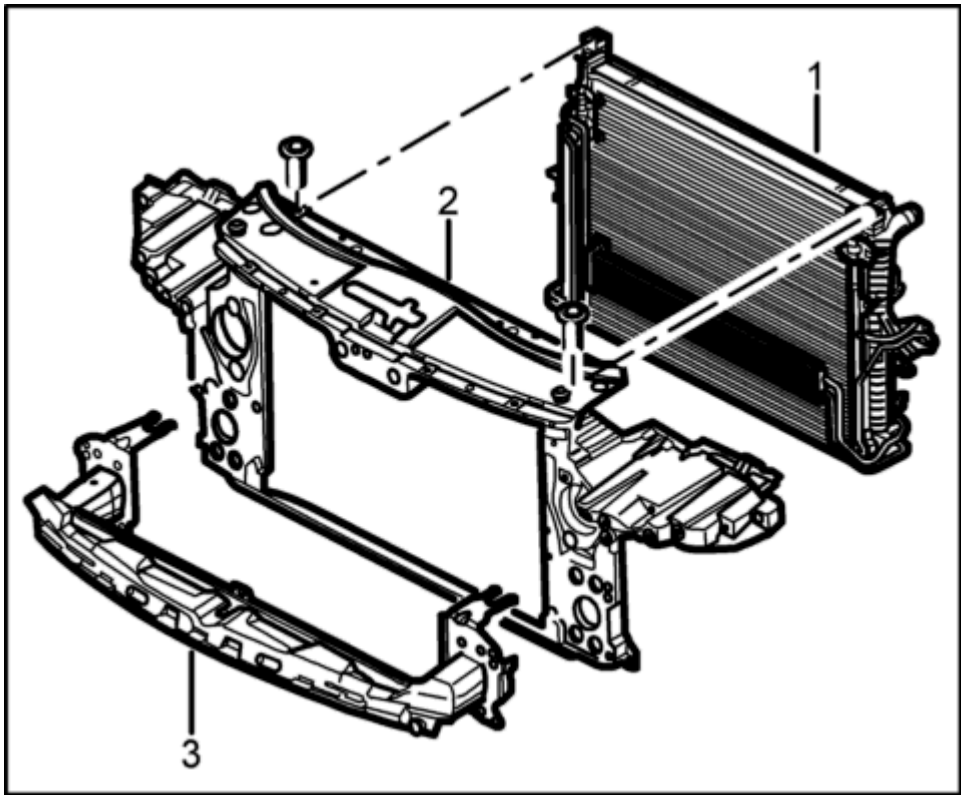


Fig. 163: Component overview for radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

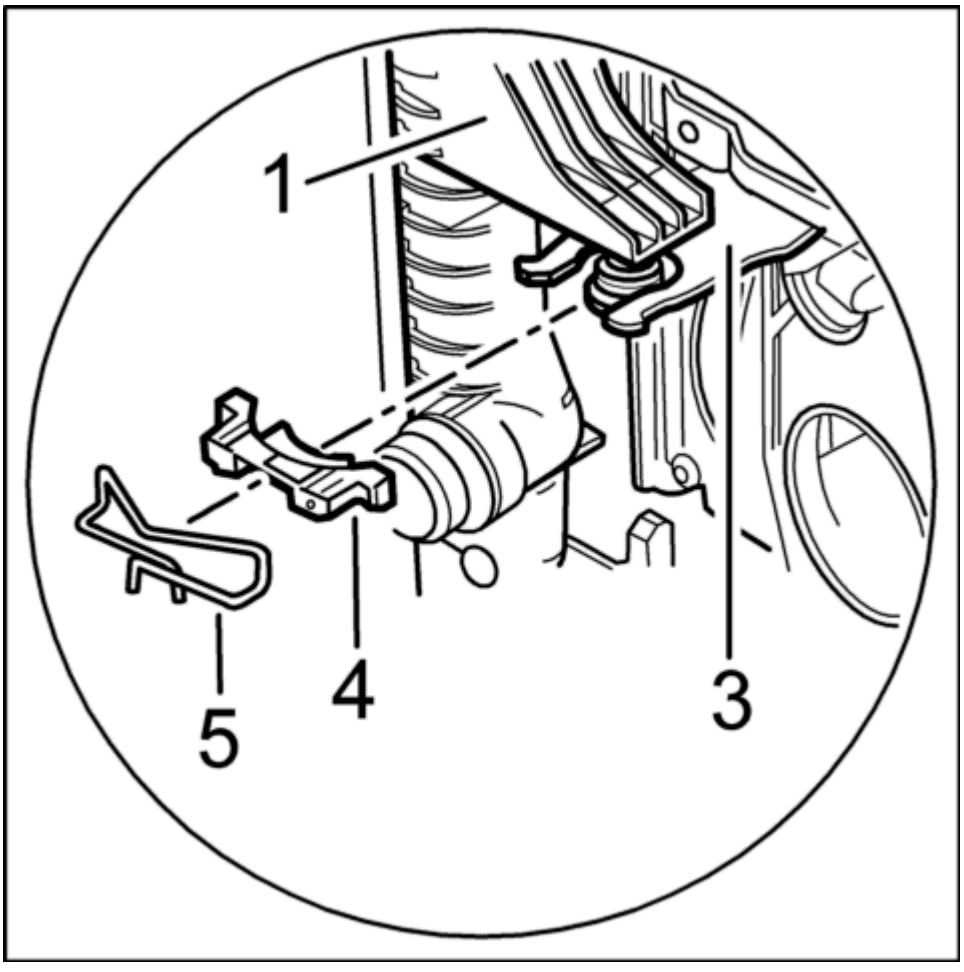


Fig. 164: Radiator mount
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1 - Radiator module (If at all possible, do not open the air-conditioning system. Do not bend the lines.

2 - Lock carrier

3 - Front bumper

4 - 2 clamps

5 - Safety clip

REMOVING RADIATOR

Do not open the air conditioner if at all possible when **removing the - radiator module** . Do not bend the lines

When **installing the - radiator module** do not bend the lines.

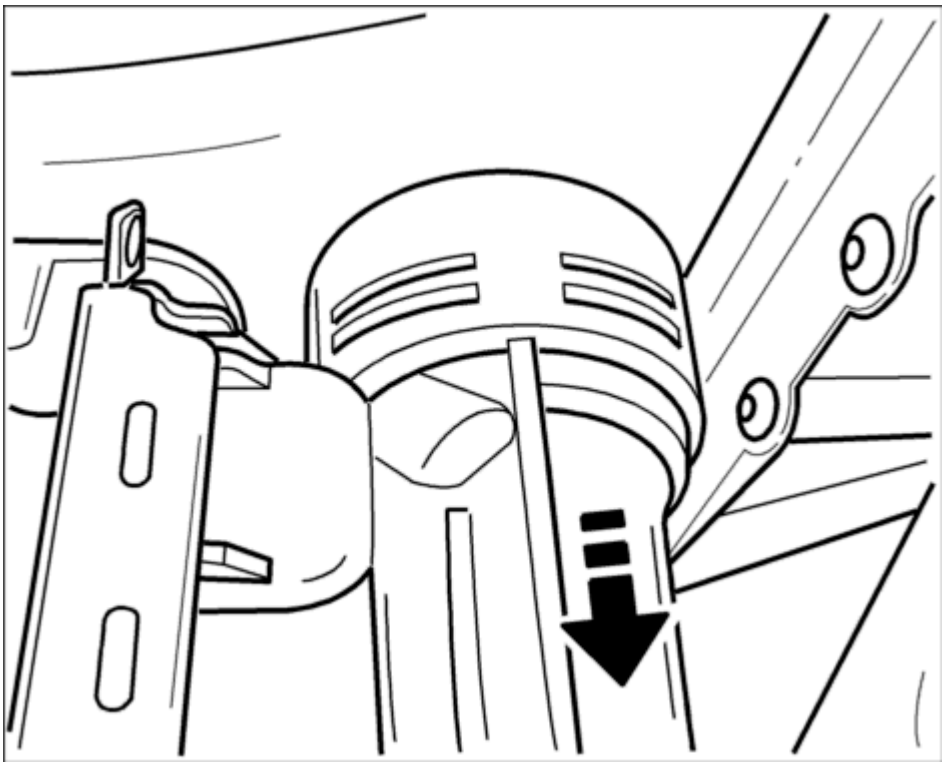


Fig. 165: Coolant hoses on the radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***The retaining clips should be mounted again immediately so that they are not confused.***

1. Remove coolant hoses on the radiator. To do this, pull out the retaining clips on the two coolant flanges and pull off the hoses. Then fit the retaining clips again so that they are not confused.

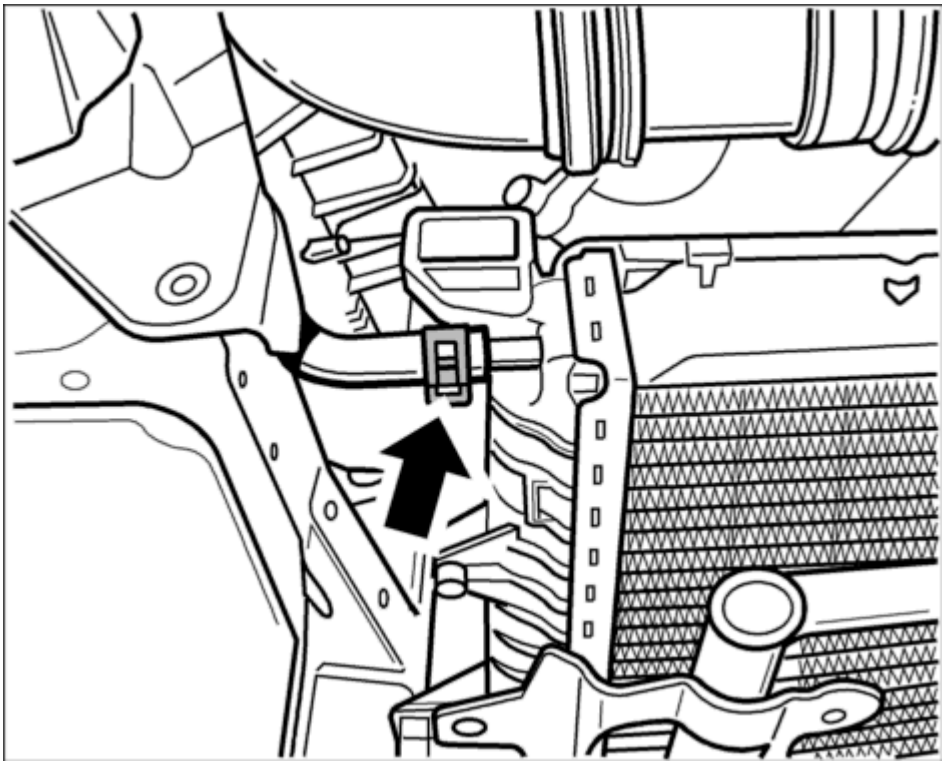


Fig. 166: Breather hose on the radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Pull off the top right vent hose on the radiator.

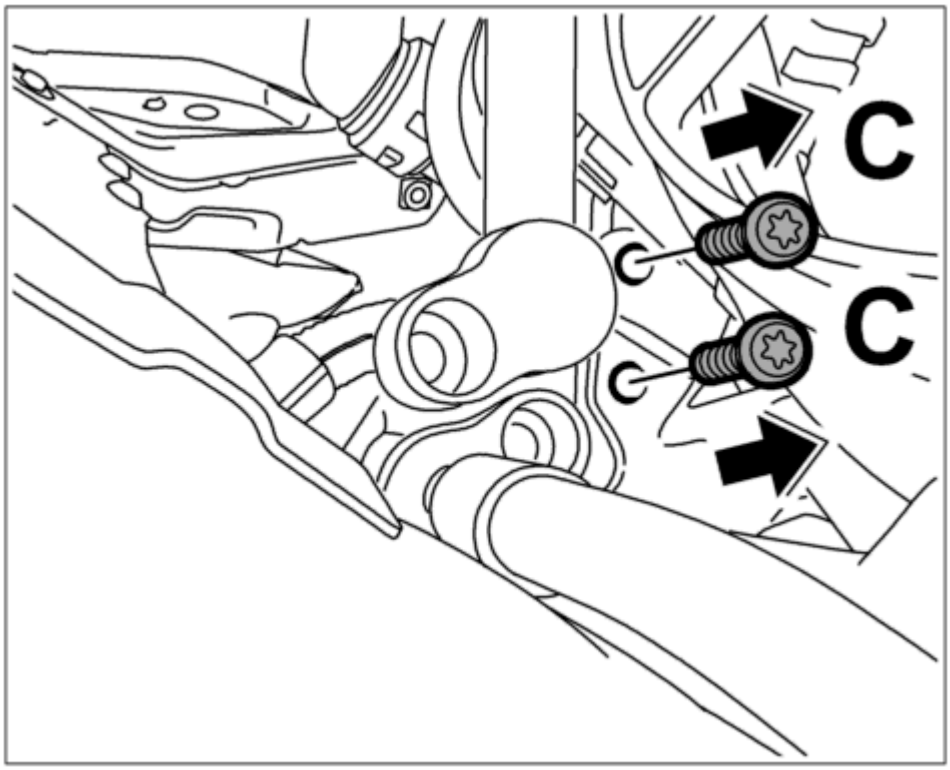


Fig. 167: Fastening screws for securing condenser to coolant radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Unscrew both fastening screws **-C-** for securing condenser to the coolant radiator (left direction of travel). See **Fig. 167**.

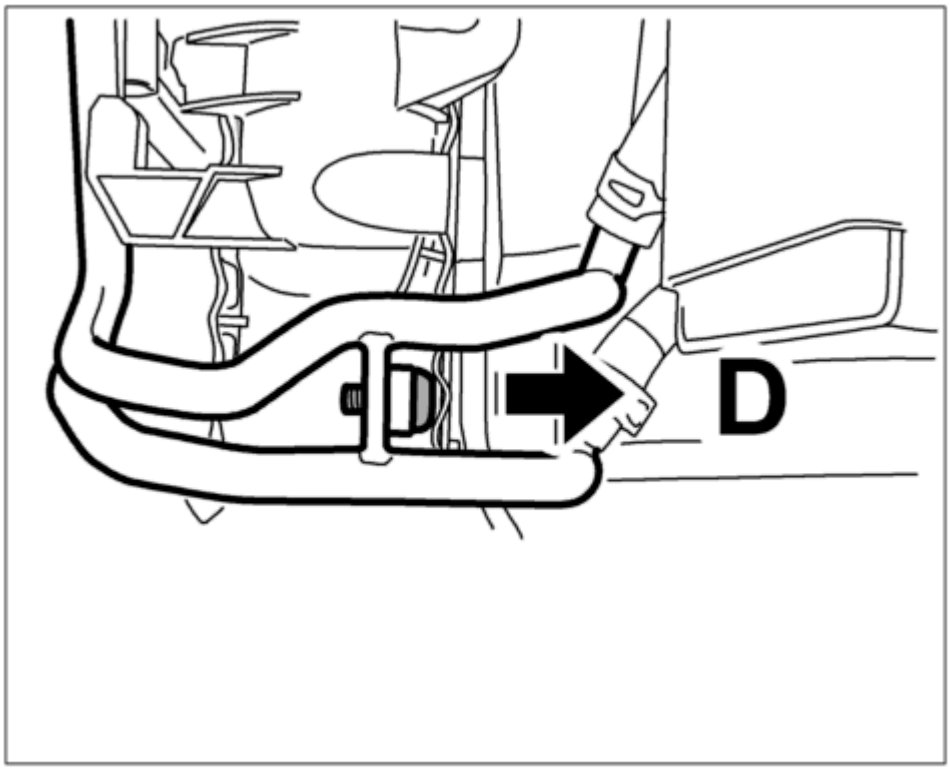


Fig. 168: Fastening screw for lines to radiator for power steering
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Unscrew the fastening screw **-D-** (left direction of travel) for securing power steering radiator lines to coolant radiator. See **Fig. 168**.

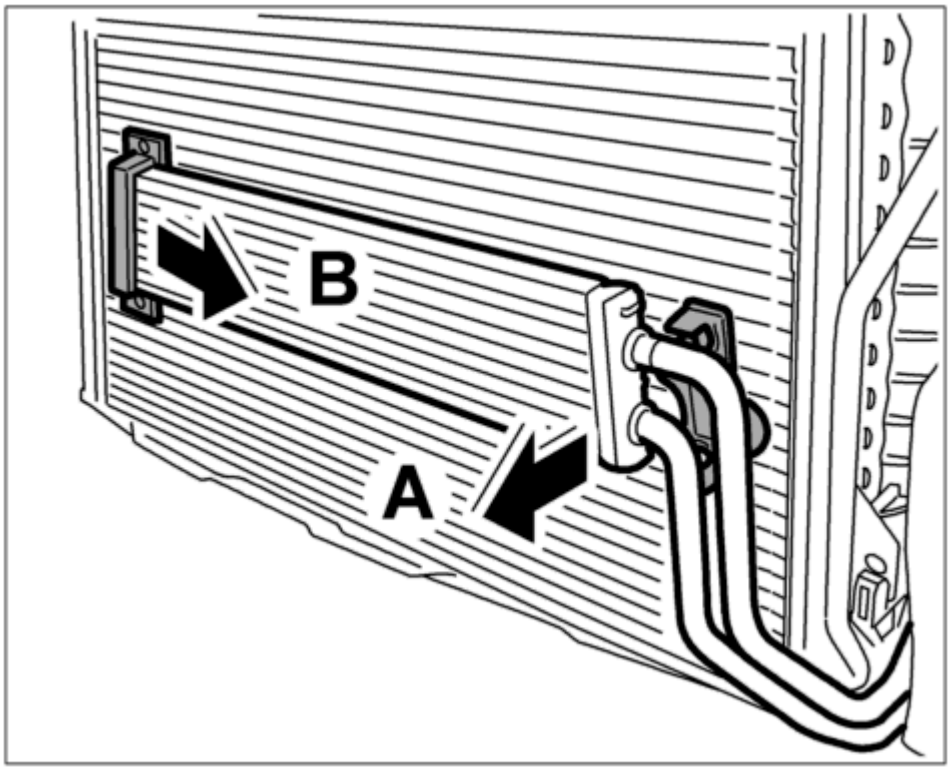


Fig. 169: Lines for power steering radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Unclip the radiator for the power steering system. To do this, unclip the wiring to the front out of the holder -**A-** and push it to the left out of the support -**B-** . Hang the radiator carefully downwards. See **Fig. 169**.

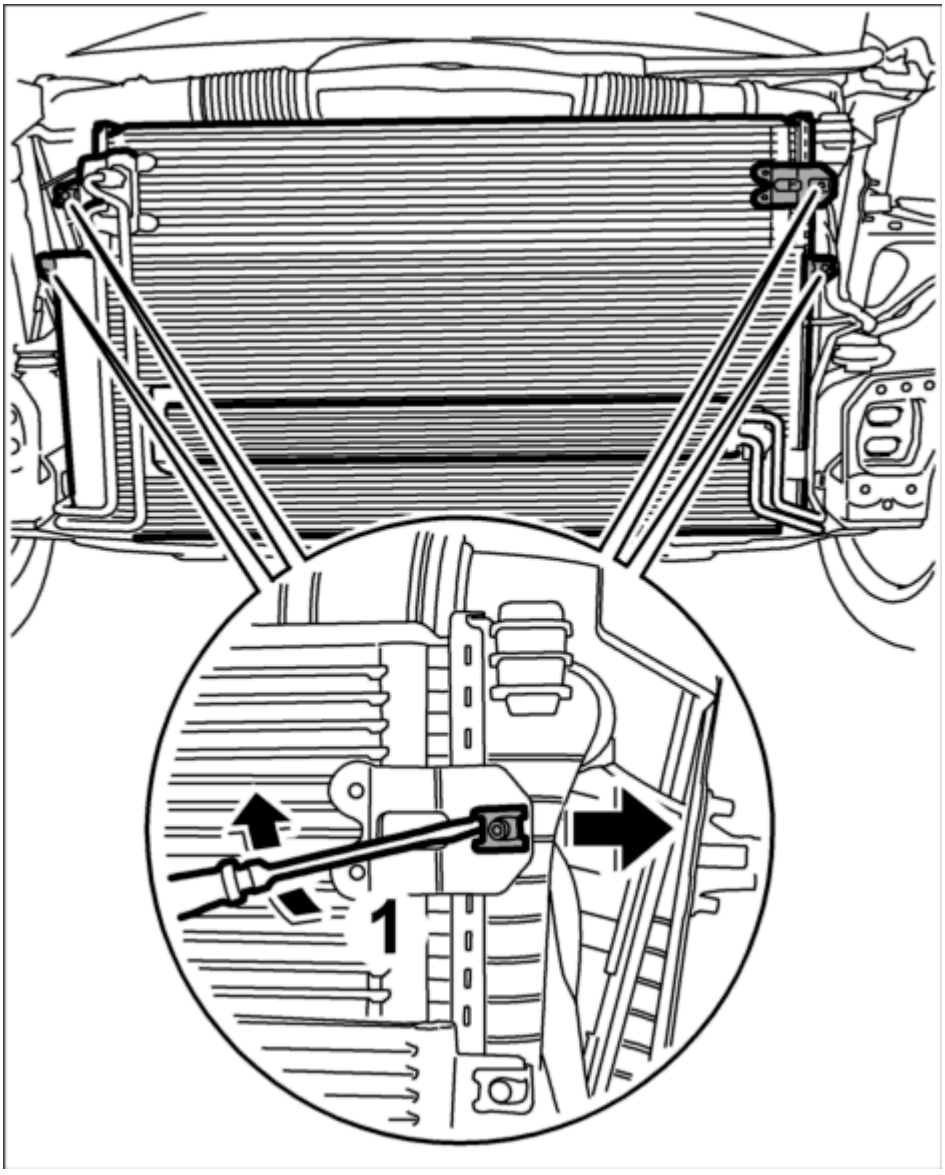


Fig. 170: Fuses for ATF cooler and on air-conditioning condenser
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Lift both locks for the ATF cooler and air-conditioning condenser with a screwdriver **-1-** and push down **-arrow-** . See **Fig. 170**.

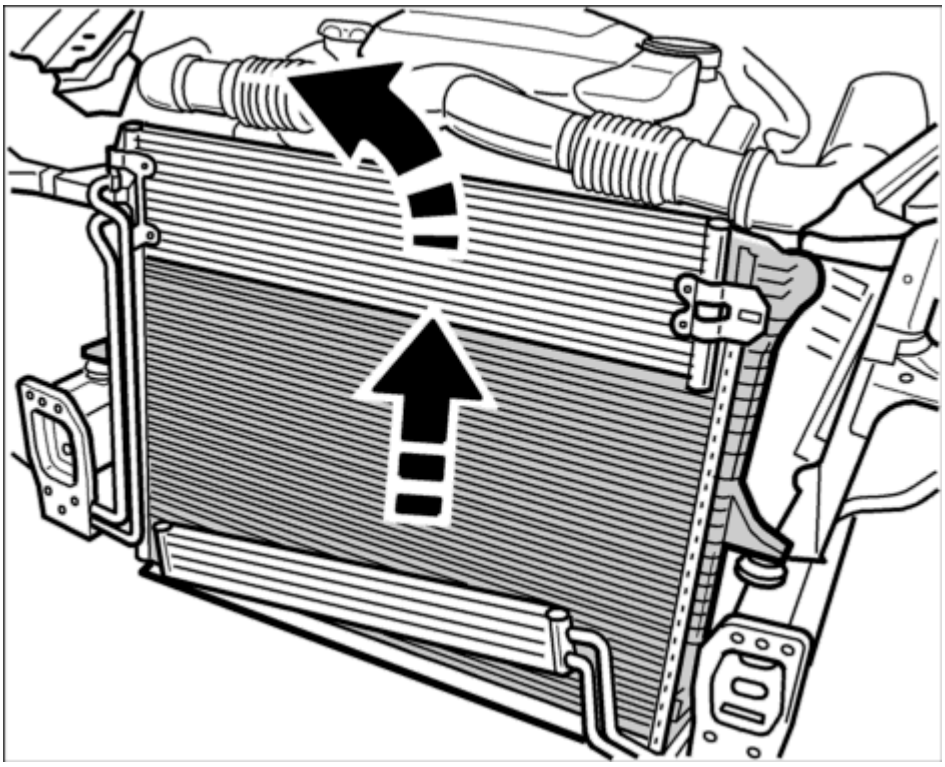


Fig. 171: Lifting the cooler
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***Fix the remaining radiators in the installation position using tie wraps.***

7. Lift up the radiator and take it out of the vehicle by moving it up and to the right. When doing this, watch out for the connection lines of the air-conditioning system on the left side.

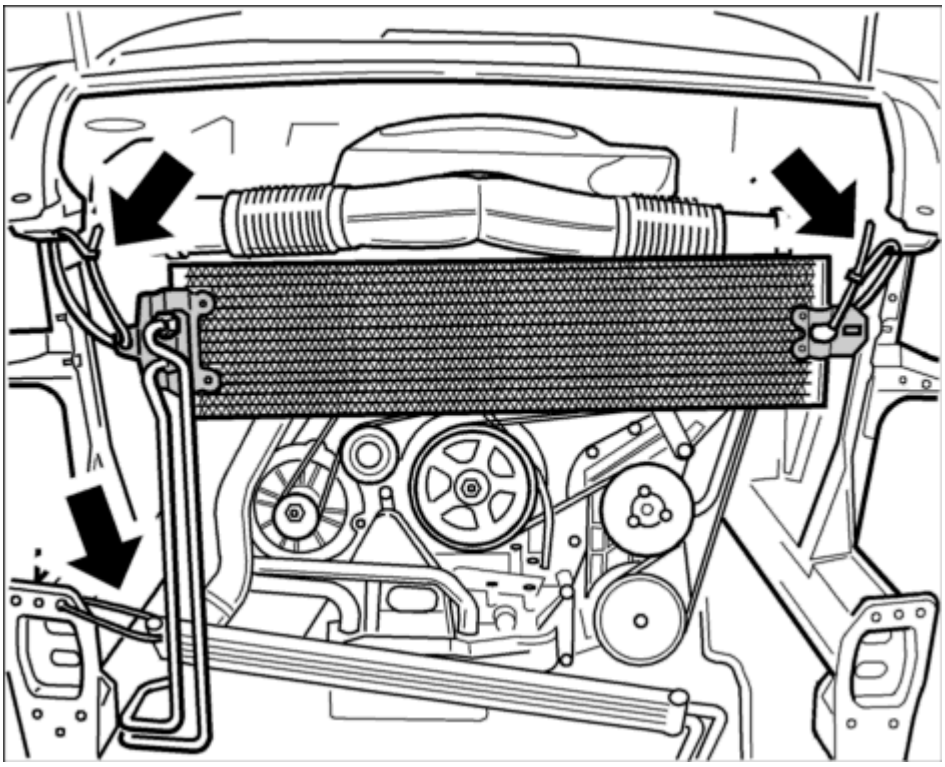


Fig. 172: Secured ATF cooler and radiator for power steering system
Courtesy of PORSCHE OF NORTH AMERICA, INC.

19 70 23 INSTALLING RADIATOR - AS OF MY 2003 (ALL MODELS)

INFORMATION

Component overview

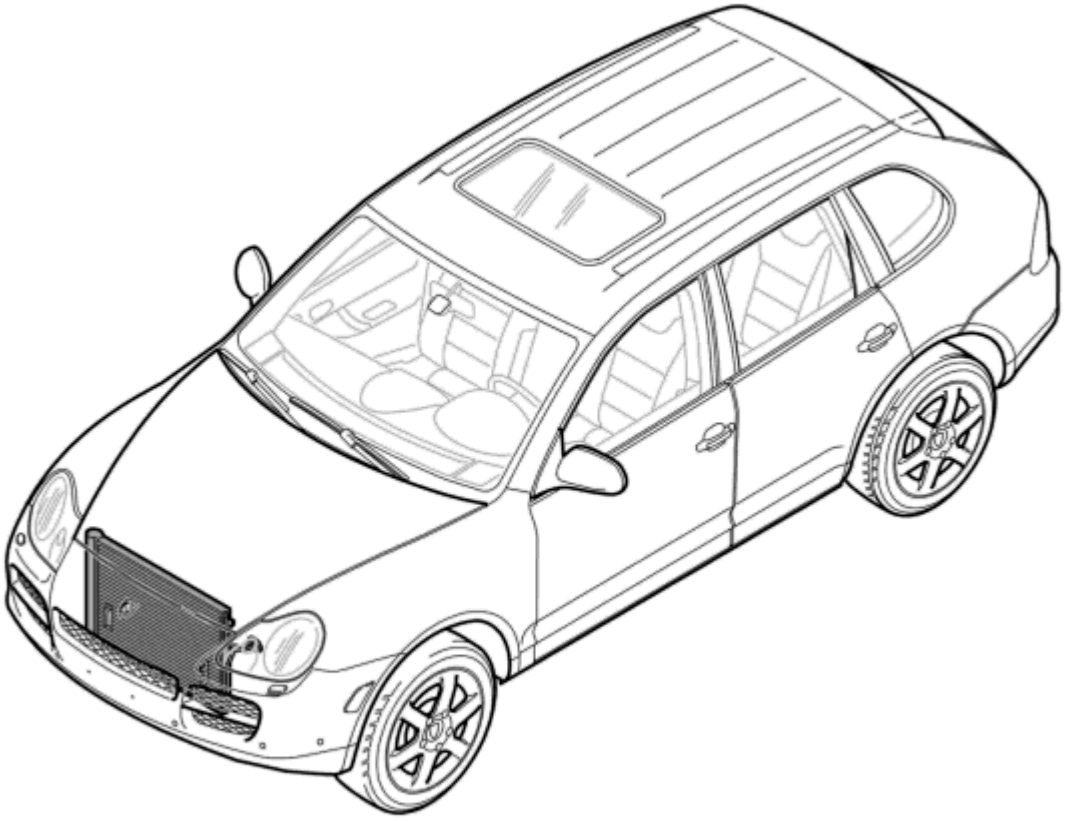


Fig. 173: Overview of radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

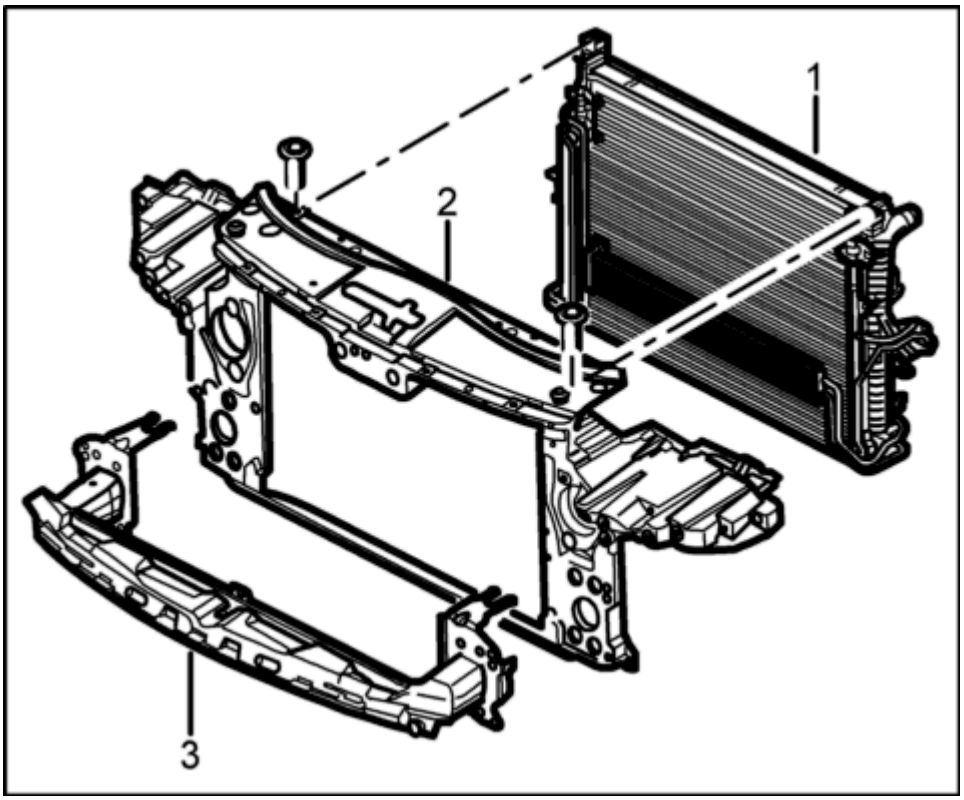


Fig. 174: Component overview for radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

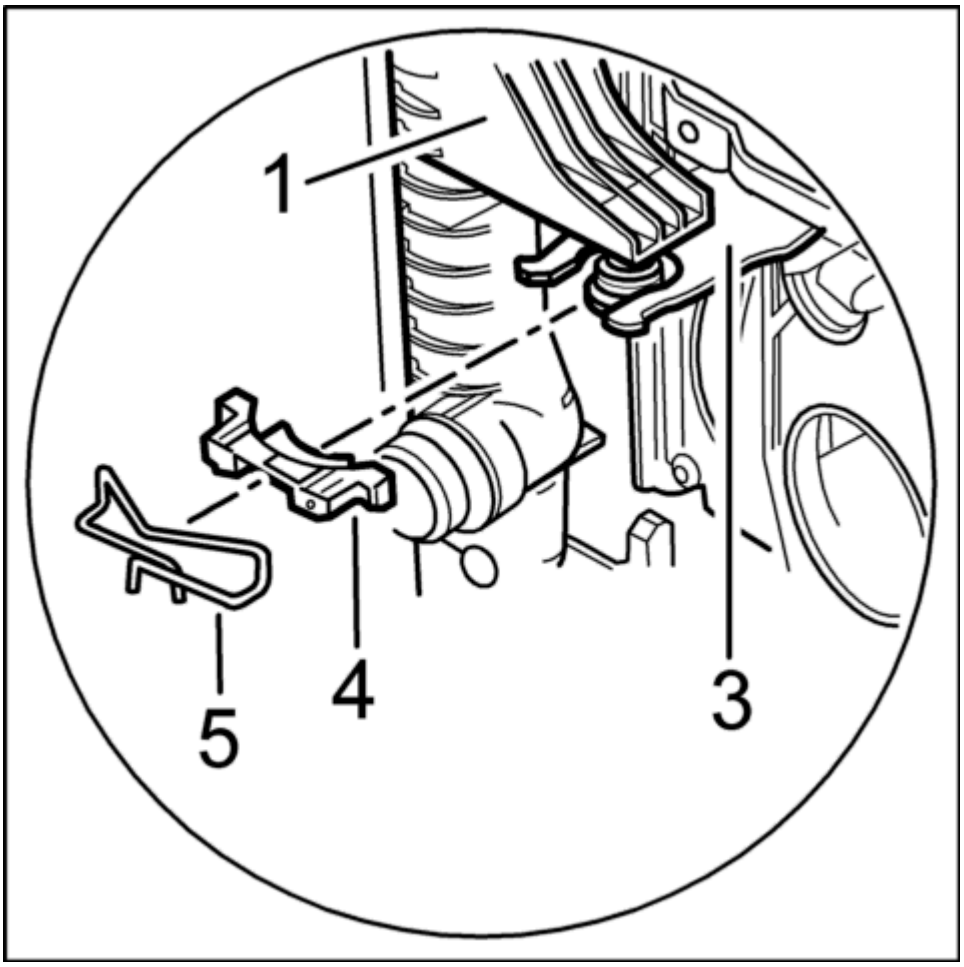


Fig. 175: Radiator mount
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1 - Radiator module (If at all possible, do not open the air-conditioning system. Do not bend the lines.

2 - Lock carrier

3 - Front bumper

4 - 2 clamps

5 - Safety clip

INSTALLING RADIATOR

NOTE:

- ***The retaining clips should be mounted again immediately so that they are not confused.***

Do not open the air conditioner if at all possible when **removing the - radiator module** . Do not bend the lines

When **installing the - radiator module** do not bend the lines.

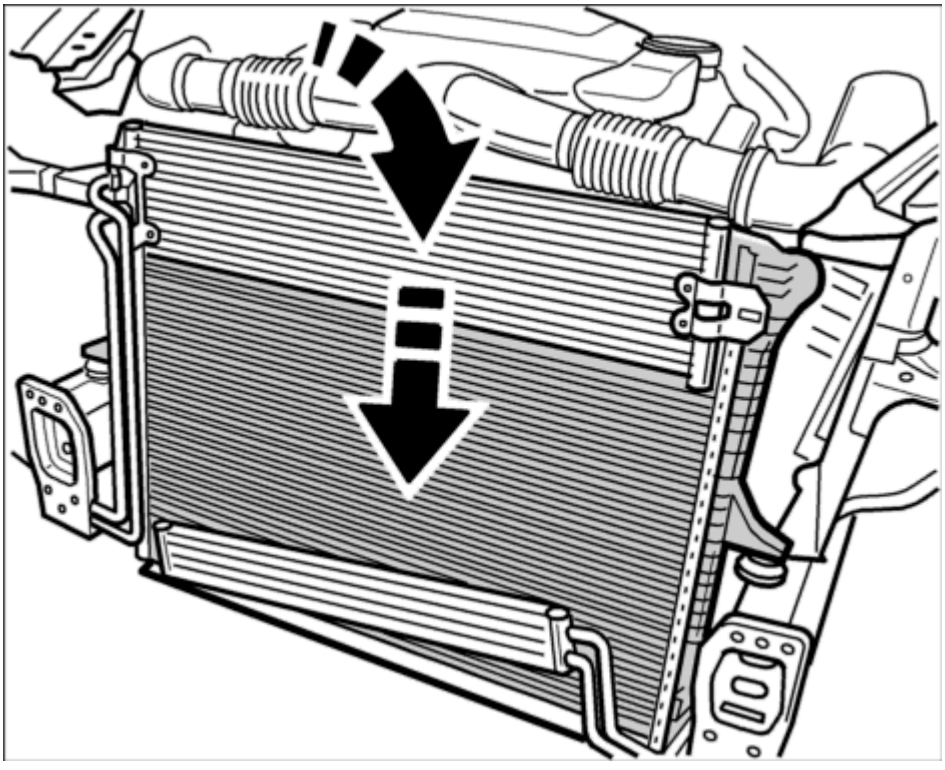


Fig. 176: Inserting the radiator between ATF cooler and air-conditioning condenser
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Insert the radiator from above on the right between the ATF cooler and the air-conditioning condenser.

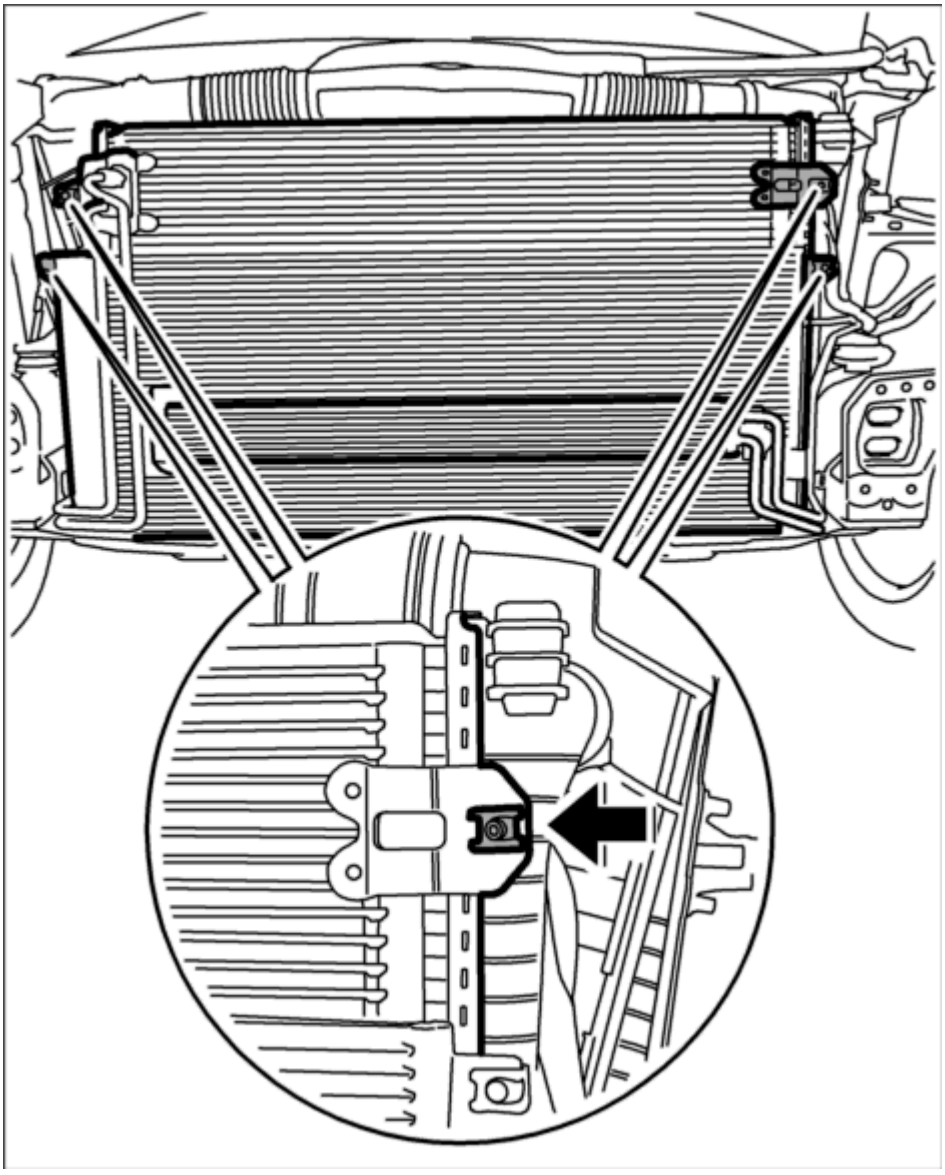


Fig. 177: Fastening ATF cooler with metal clips
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Move the ATF cooler into the installation position and push on the metal clips to fasten it.

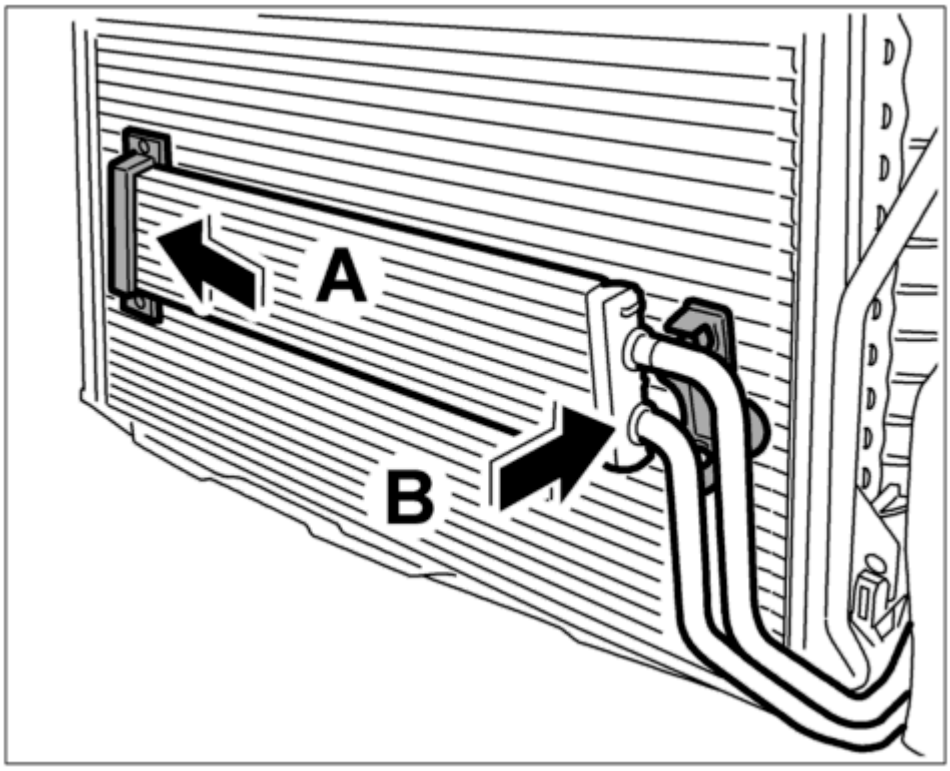


Fig. 178: Lines in the support on the servo radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

3. Fasten servo oil cooler. To do this, push the servo oil cooler from left to right into the support **-A-** and clip the lines into the support **-B-** . See **Fig. 178**.

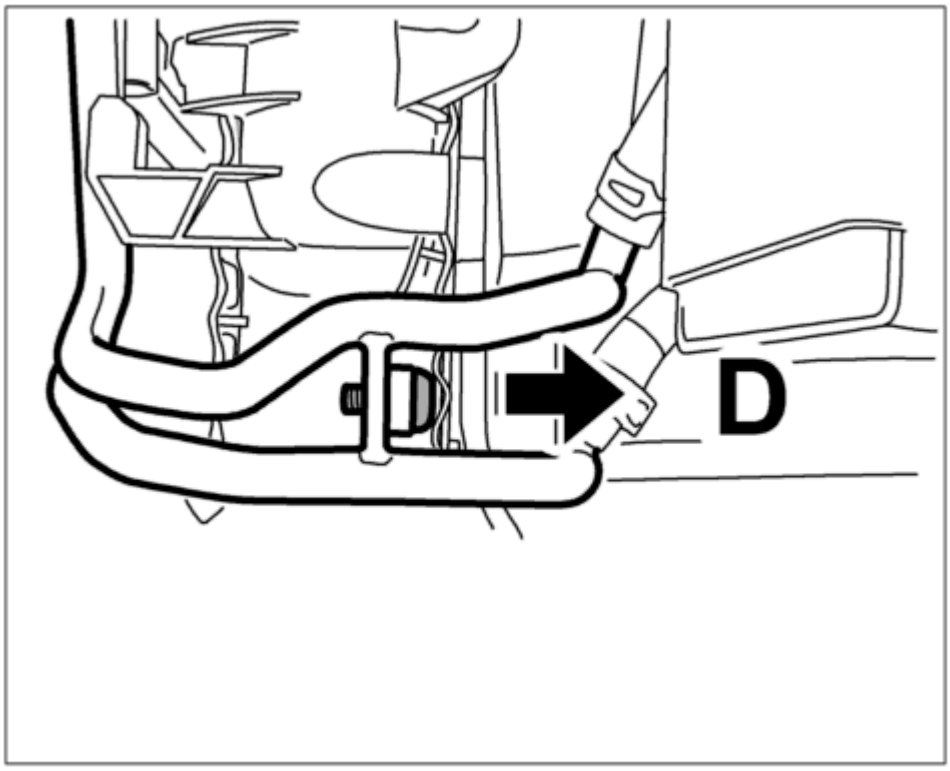


Fig. 179: Fastening screw for servo oil coolant line
Courtesy of PORSCHE OF NORTH AMERICA, INC.

4. Tighten the fastening screw on the servo oil cooler line with a fastening screw. --> **Tightening torque: 7.5 ftlb.**

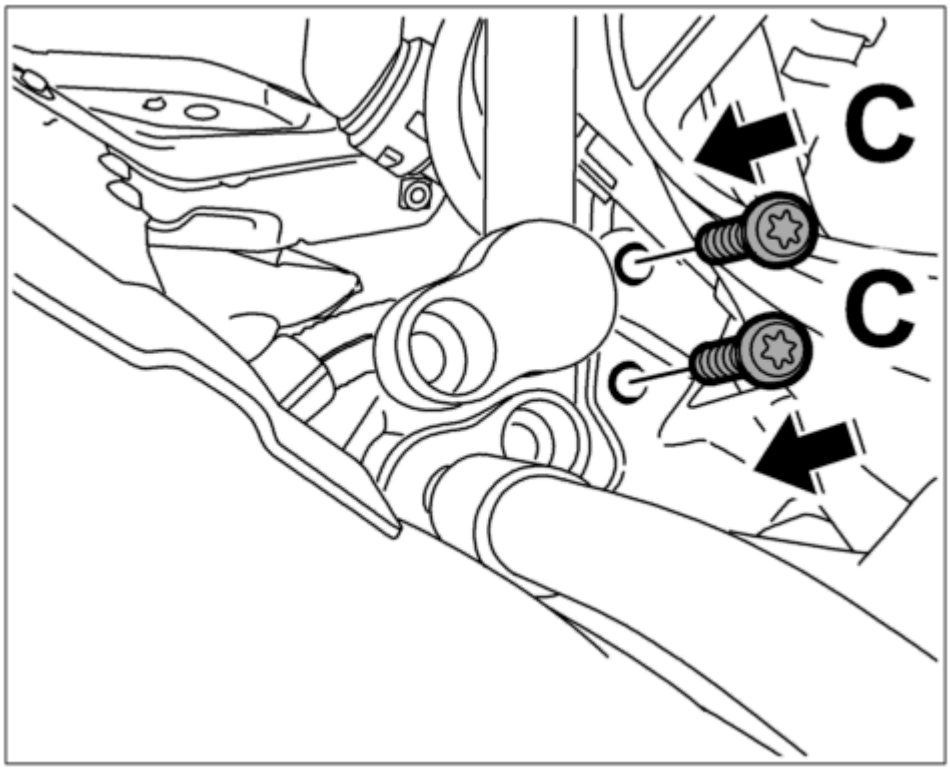


Fig. 180: Fastening screws for securing condenser to coolant radiator
Courtesy of PORSCHE OF NORTH AMERICA, INC.

5. Screw in both fastening screws **-C-** for securing condenser to the coolant radiator (left direction of travel). --> **Tightening torque: 6 ftlb.** See **Fig. 180**.

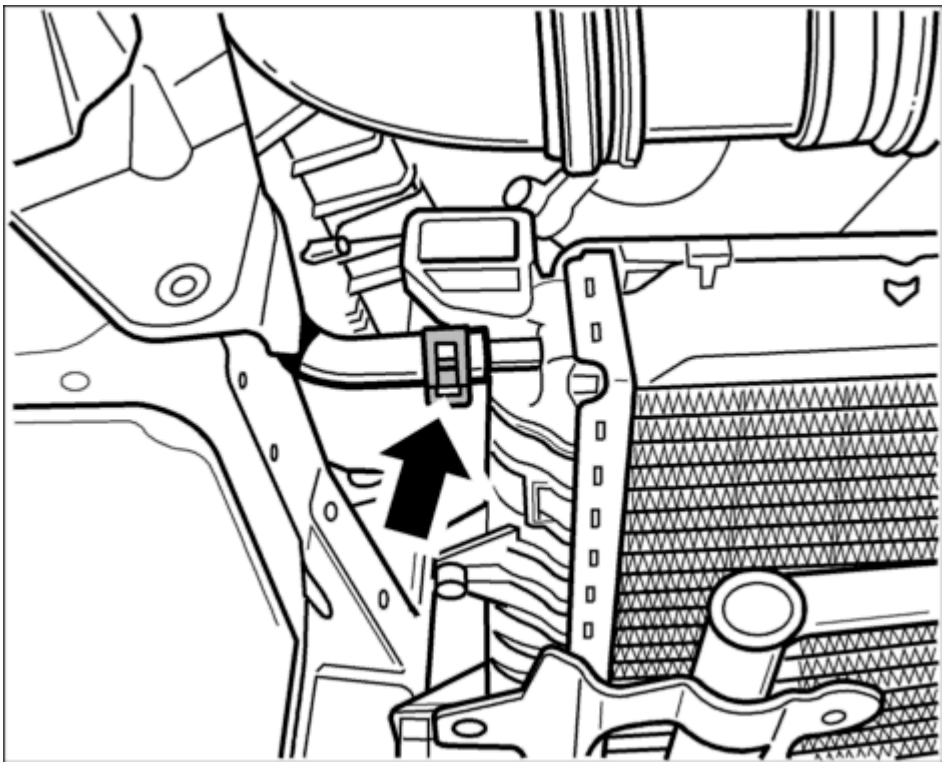


Fig. 181: Spring band clamp for cooler vent line
Courtesy of PORSCHE OF NORTH AMERICA, INC.

6. Push on the cooler vent line onto the right radiator side and fit the spring-band clamp.

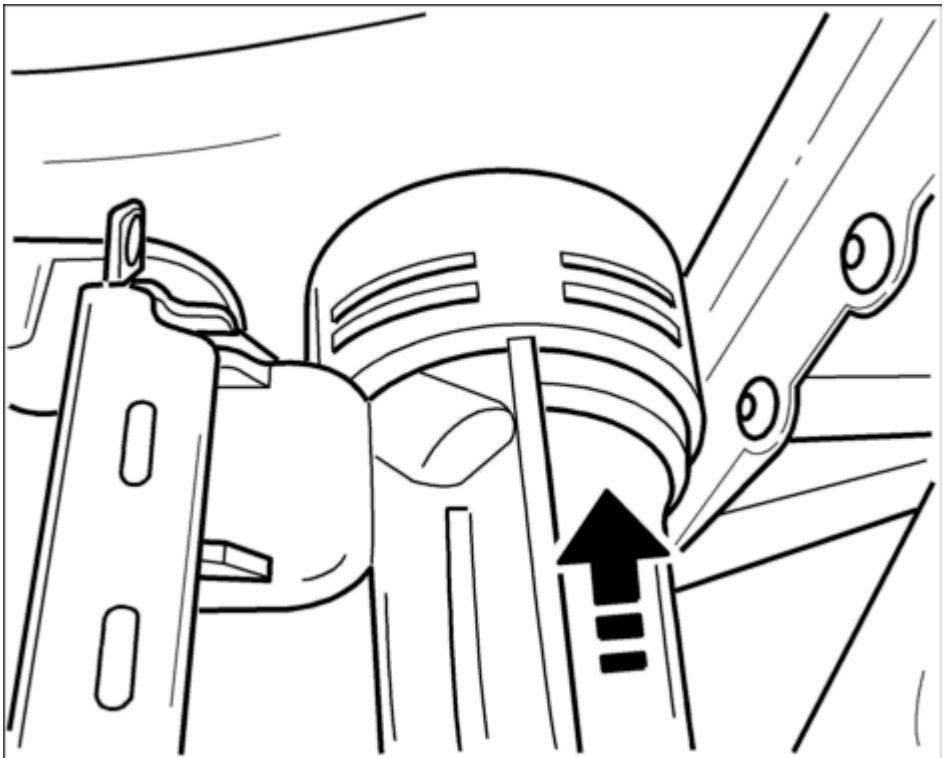


Fig. 182: Pushing on coolant lines
Courtesy of PORSCHE OF NORTH AMERICA, INC.

7. Push on the two coolant lines. The retaining clips on the flange must engage audibly.

SUBSEQUENT WORK

Subsequent work

1. Install the radiator frame. **--> 192019 Removing and installing cooling fan housing (radiator frame) - chapter on "Installing"**

2. Install lock mount. Refer to **50 38 19 Removing and installing lock carrier - as of MY 2003 (All Models)** .

3. Fill and bleed the cooling system. **--> 193817 Draining and filling in coolant (includes bleeding) - chapter on "Filling in"**

4. Fit engine guard. Refer to **10 80 19 Removing and installing engine guard - as of MY 2003 (All Models)** .

5. Connect the battery. Refer to **90 IN Work instructions after disconnecting the battery - as of MY 2003 (All Models Except Cayenne S TIO Titan)** .

19 78 19 REMOVING AND INSTALLING COOLANT TEMPERATURE SENSOR - AS OF MY 2003 (CAYENNE S TIP, CAYENNE S MAN, CAYENNE TURBO, CAYENNE TURBO S, CAYENNE S TIO TITAN)

PRELIMINARY WORK

Preliminary work

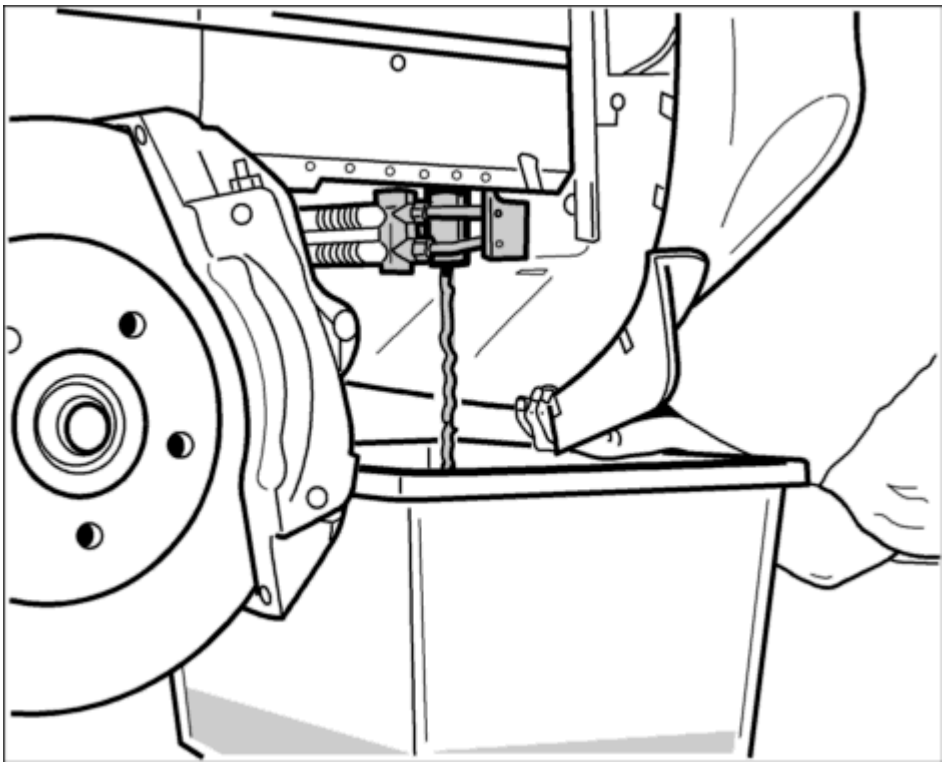


Fig. 183: Draining coolant
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Drain coolant completely. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Draining"**

2. Remove intake-air distributor. Refer to **24 46 19 Removing and installing intake-air distributor - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

INFORMATION

Component overview

Installation Location:

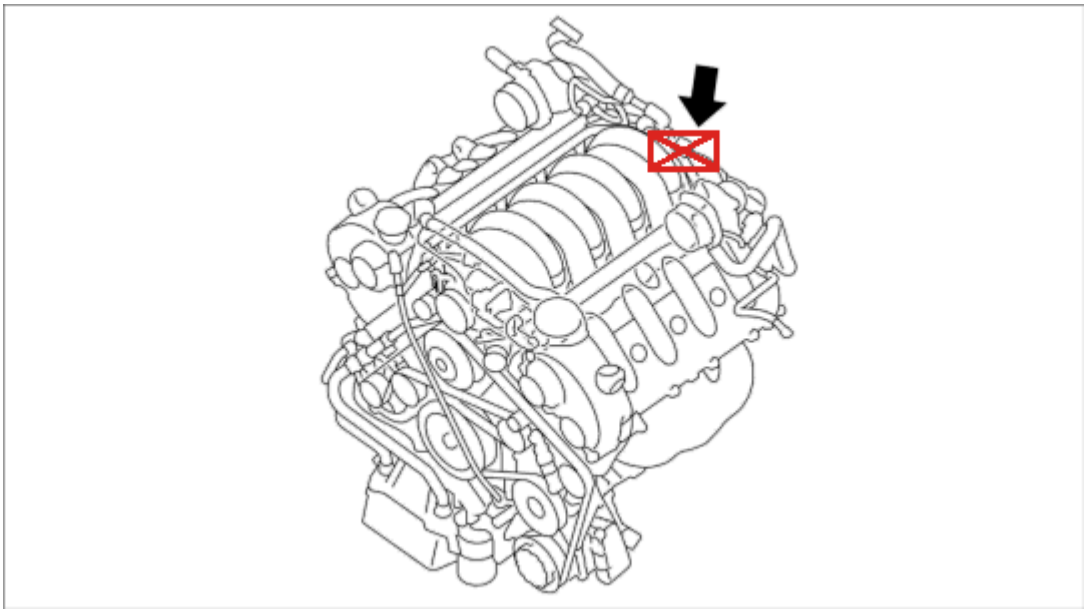


Fig. 184: Installation position of coolant temperature sensor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

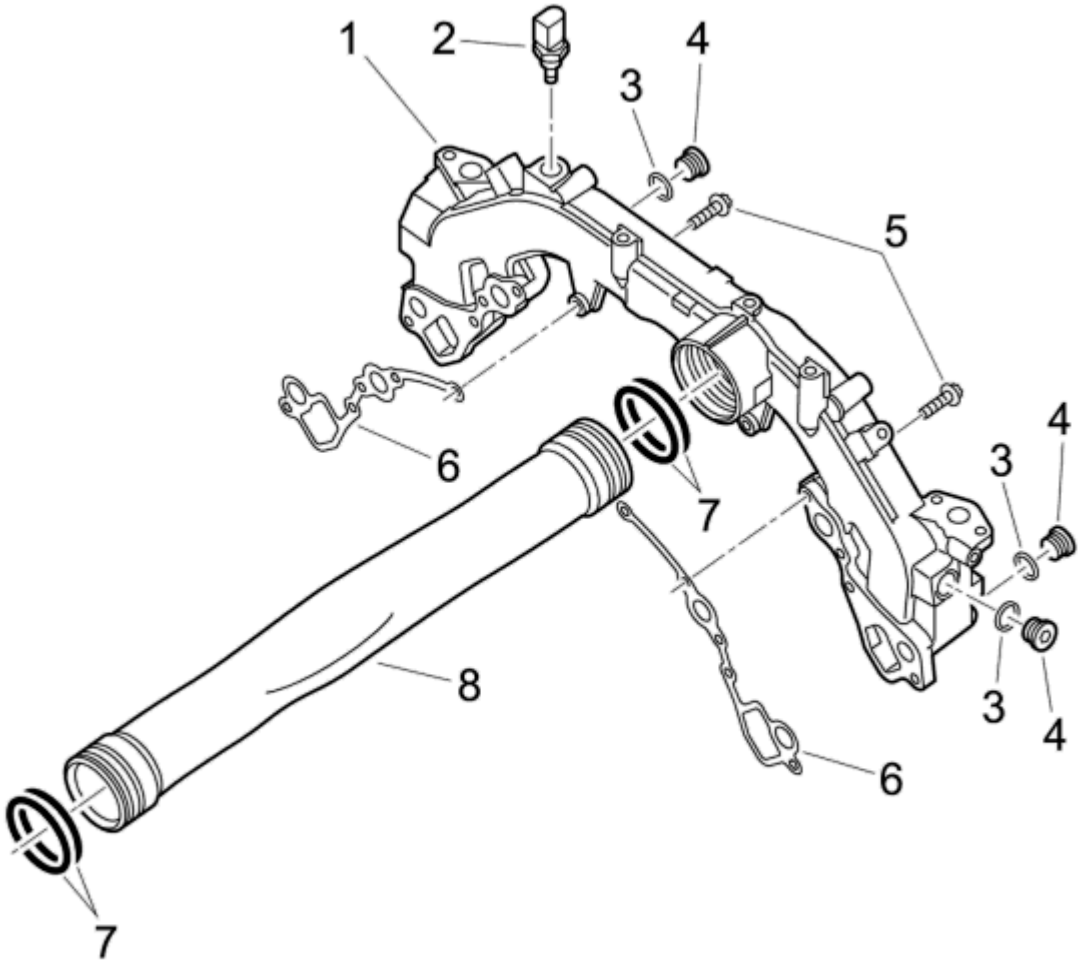


Fig. 185: Component overview
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1 - Distributor pipe

2 - Coolant temperature sensor (when removing, collect emerging coolant, when installing, replace sealing ring)

3 - Sealing ring (replace when installing)

4 - 3 screw plugs, M16x1 (when removing, collect emerging coolant, when installing, replace sealing ring)

5 - 10 hexagon-head bolts M6x25

6 - 2 seals for distributor pipe (when installing, clean sealing faces and replace seal)

7 - 4 sealing rings (when installing, grease with Kluber Syntheso GLEP 1

8 - Lower cooling water tube

REMOVING COOLANT TEMPERATURE SENSOR

CAUTION: Danger of poisoning!

- **Coolant additives and cleaning liquids are toxic.**

--> Swallowing coolant additives and cleaning liquids must be urgently avoided.

--> Do not consume any food or drink while working (danger of accidental mixing).

--> If swallowed, observe the warning information on the containers and contact a doctor. If necessary, show the doctor the warning information on the packaging.

CAUTION: Danger of scalding with hot coolant!

--> Never open the cooling system when it is hot. Emerging coolant may be very hot and can cause scalding.

--> The cooling system must be depressurized before being opened.

--> Allow engine to cool down.

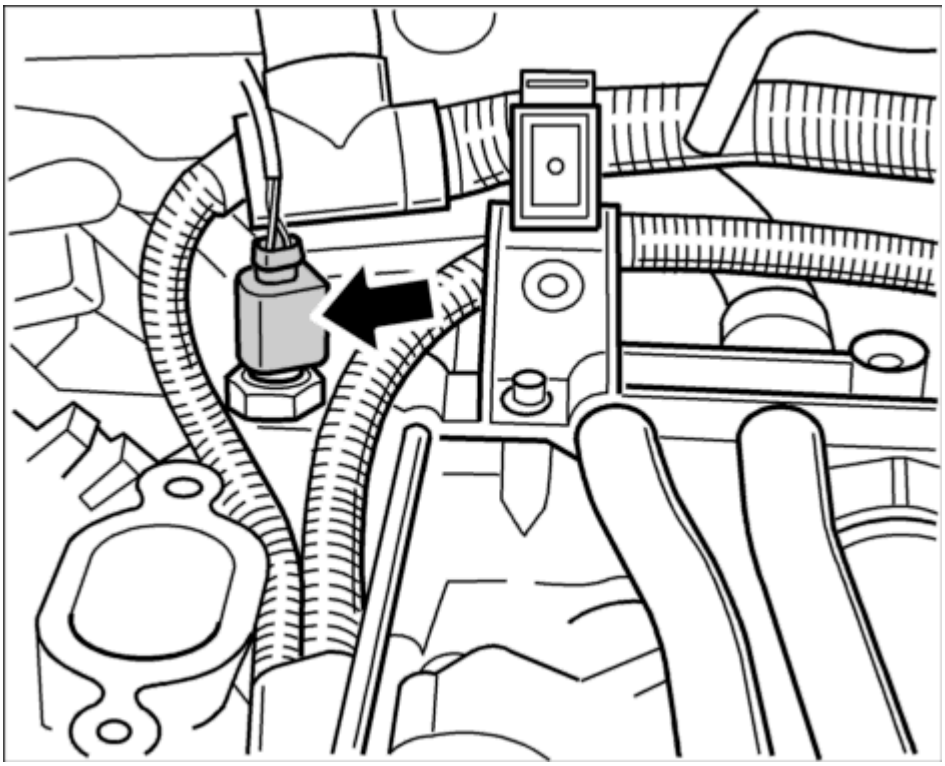


Fig. 186: Cable plug of the coolant temperature sensor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Pull off cable plug of the coolant temperature sensor **-arrow-** . See **Fig. 186**.

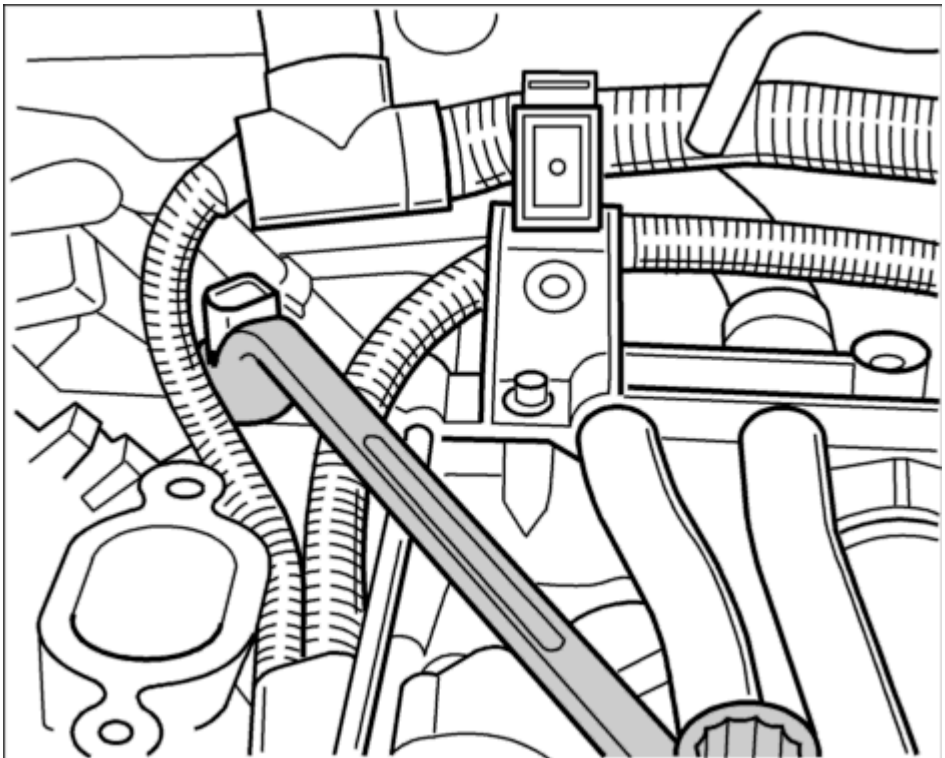


Fig. 187: Unscrewing the coolant temperature sensor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

NOTE:

- ***Even when the coolant has been completely drained, coolant emerges from the open bore on the coolant temperature sensor!***

2. Unscrew the coolant temperature sensor using a ring wrench (a/f 22). Absorb emerging coolant. See **Fig. 187**.

INSTALLING COOLANT TEMPERATURE SENSOR

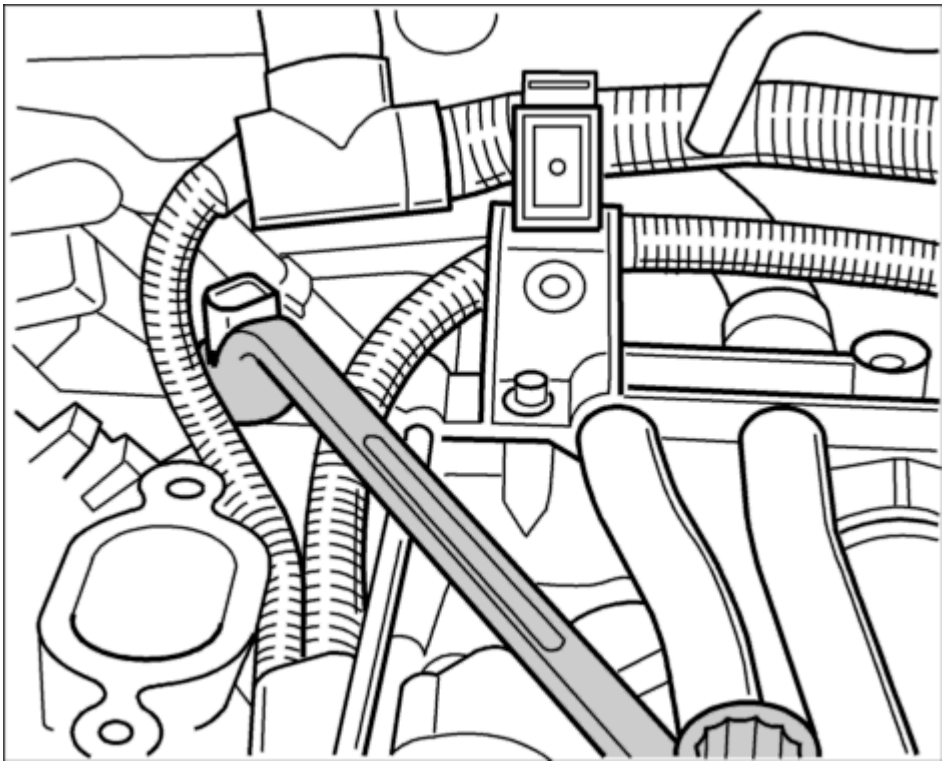


Fig. 188: Screwing in the coolant temperature sensor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

1. Clean sealing surfaces and screw in coolant temperature sensor with a new sealing ring into the distributor pipe. **--> Tightening torque: 22 ftlb.**

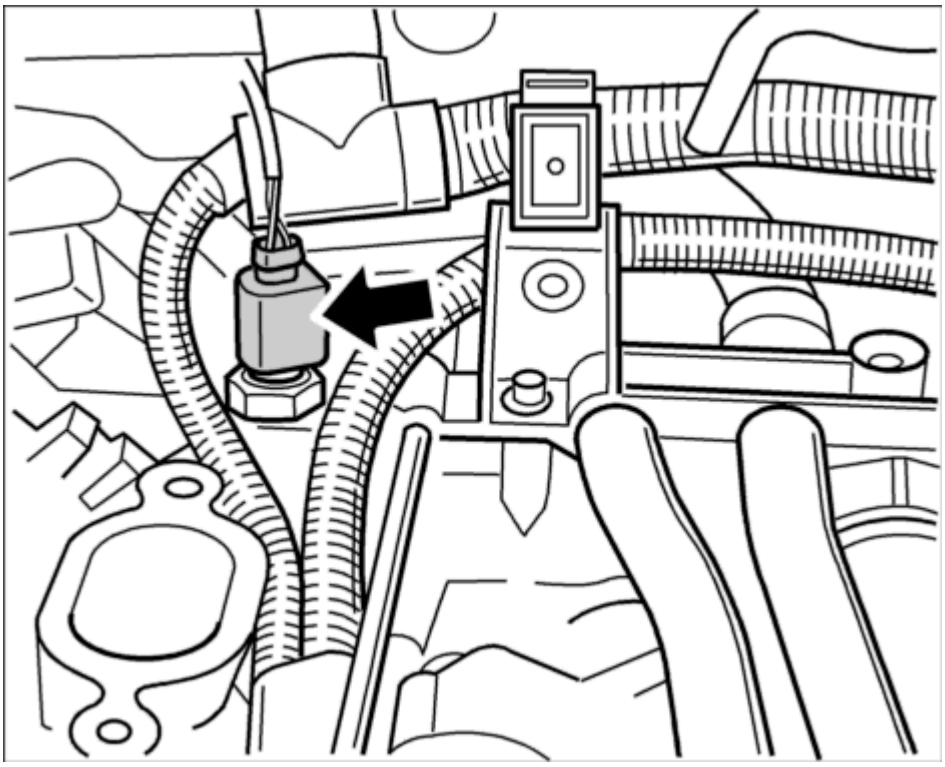


Fig. 189: Cable plug of the temperature sensor
Courtesy of PORSCHE OF NORTH AMERICA, INC.

2. Fit cable plug again **-arrow-** . See **Fig. 189**.

SUBSEQUENT WORK

Subsequent work

1. Install intake-air distributor. Refer to **24 46 19 Removing and installing intake-air distributor - as of MY 2003 (Cayenne S TIP, Cayenne S MAN, Cayenne Turbo, Cayenne Turbo S, Cayenne S TIO Titan)** .

2. Fill up completely with coolant and bleed system. **--> 193817 Draining and filling coolant (includes bleeding) - chapter on "Filling"**.