

5.15 Removing and installing heat exchanger

⇒ [“5.15.1 Removing and installing heat exchanger for heater; manufacturer Valeo”, page 131](#)

⇒ [“5.15.2 Removing and installing heat exchanger for heater; manufacturer Denso”, page 136](#)

5.15.1 Removing and installing heat exchanger for heater; manufacturer Valeo



Note

*There are different designs and makes of heater and air conditioning unit. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ [page 1](#)). The combined fitting of different makes of component is therefore not permissible ⇒ *Electronic parts catalogue*.*

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Special tools and workshop equipment required

- ◆ Sealing cap set for engine - VAS 6122-
- ◆ Commercially available compressed-air gun

Removing

- Set the air outflow direction to “defroster vent” for windscreen.
- Move front seat to rearmost position.
- Switch off ignition and all electrical consumers.

Vehicles without access and start authorisation system

- Remove ignition key, if inserted.

Vehicles with access and start authorisation system

- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.

Continuation for all vehicles

- Disconnect battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and reconnecting battery .



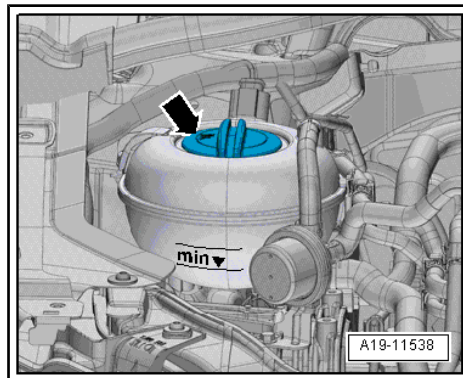
WARNING

Danger of scalding by steam and hot coolant.

- ◆ ***On a warm engine, the cooling system is under high pressure.***
- ◆ ***Cover filler cap on expansion tank with a cloth and open it carefully to release pressure.***

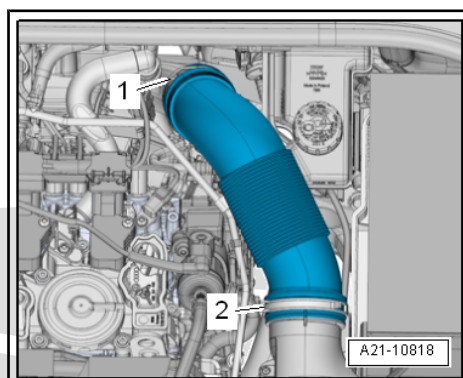
- Open filler cap -arrow- for coolant expansion tank.

Vehicles with petrol engine:



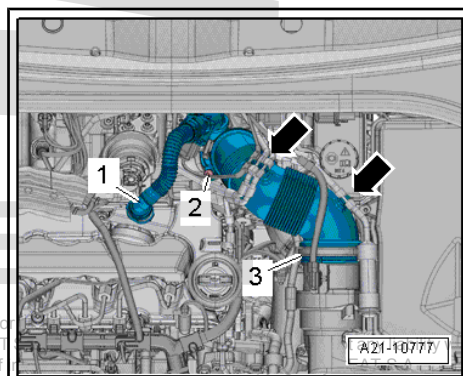
- Release hose clips -1- and -2- and remove air intake pipe.

Vehicles with diesel engine:



- Press the release buttons at the crankcase breather hose -1- and detach the hose from the cylinder head cover.
- Move clear vacuum hoses at air pipe -arrows-.
- Release hose clip -3-.
- Remove bolt -2-, swivel air pipe and connection to rear and detach from turbocharger.

Continuation for all vehicles



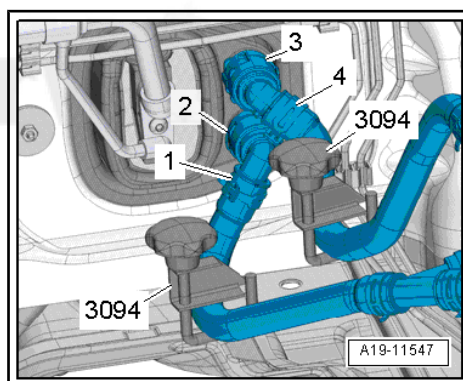
- Mark installation position of coolant hoses -1- and -4-.



Note

The heat exchanger is designed for a certain coolant flow direction. The coolant hoses must therefore be connected on the correct sides.

- Clamp off coolant hoses with hose clips -3094- .
- Lift the fasteners -2- and -3-, and detach the coolant hoses from the heating system heat exchanger.



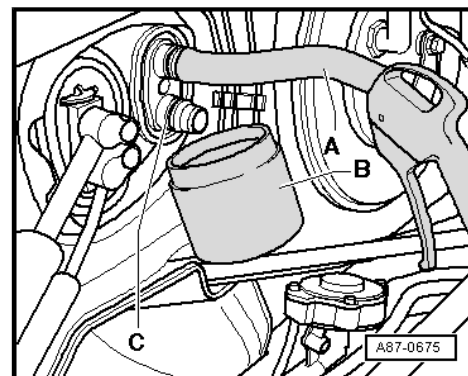
- Fit a short hose -A- to the upper connection.

Insert the compressed air gun in the end of the hose.

- Hold a collector -B- under the lower connection -C- and use the compressed air gun to carefully blow the coolant out of the heat exchanger.
- Seal off open pipes/lines and connections immediately with clean plugs from engine sealing cap set - VAS 6122- .

Vehicles with knee airbag

- Remove knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbag; Removing and installing knee airbag with igniter .



Continuation for all vehicles

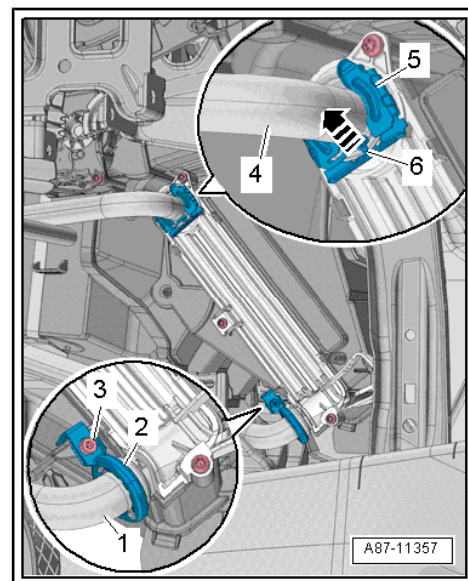
- Remove the side trim of the centre console and the lower dash panel trim ⇒ General internal body repairs; Rep. gr. 68 ; Centre console; Centre console trim, Removing and installing the front footwell .

Vehicles with supplementary air heater

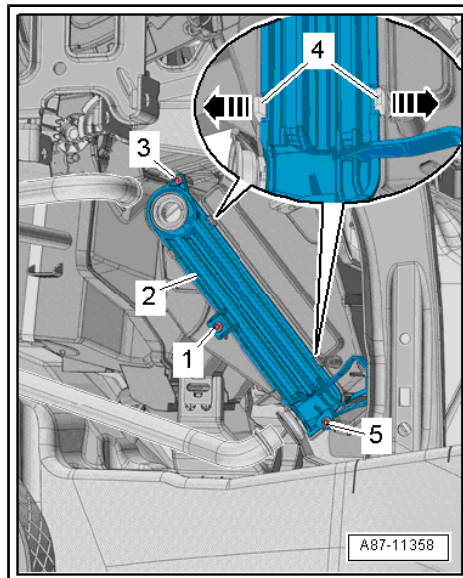
- Separate the plug from the heater element for supplementary air heater - Z35- ⇒ [page 118](#)

Continuation for all vehicles

- Cover the area beneath the connections for the coolant hoses in the plenum chamber with impermeable sheeting and absorbent paper, for example.
- Lift the locking element -6-, remove the clip -5- and detach the coolant line at the top -4- from the heat exchanger.
- Unscrew bolt -3-.
- Remove the screw-type clamp -2- and detach the coolant line at the bottom -1- from the heat exchanger.
- Seal off open pipes/lines and connections immediately with clean plugs from engine sealing cap set - VAS 6122- .



- Unscrew the bolts -1, 3, 5-.
- Release the retainer tabs -4- -arrows- and detach the cover -2-.



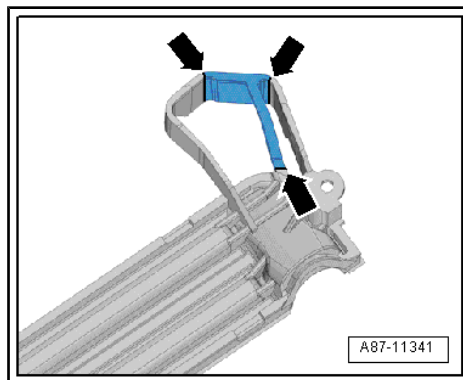
- Sever the tab at the cover -arrows-.
- Take out the heat exchanger to the left.

Installing

Installation is carried out in the reverse order. When installing observe the following:

Specified torques:

- ➔ [“5.1 Assembly overview - heater and air conditioning unit”, page 105](#)
- ➔ Rep. gr. 21 ; Turbocharger; Assembly overview - turbo-charger



Note

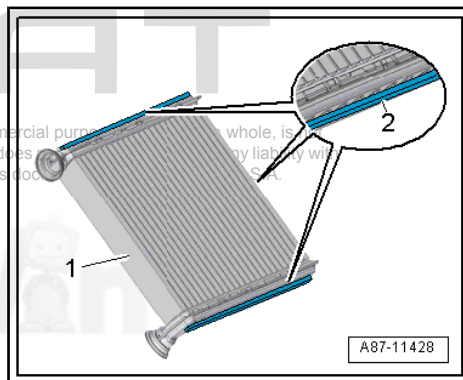
Replace the O-rings.

- Check the heater slot for contamination with the heat exchanger removed.
- Remove any dirt or residual coolant.
- Vehicles with diesel engine: with mounted heater element for supplementary air heater, check if the opening of the heating element is soiled and clean if necessary.
- Check foam seals -2-, if any, attached to heat exchanger -1- for damage, and replace if necessary.



Note

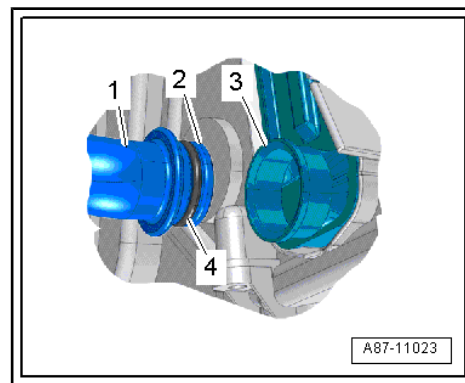
- ♦ *Foam seals -2- are not always present, depending upon the model and model year.*
- ♦ *The foam seal may curl up on insertion if not correctly bonded on.*
- ♦ *Cold air may flow past the heat exchanger if the foam seal is damaged or not properly fitted.*



- Check connection -3- of the heat exchanger and connection -2- of the coolant pipes for damage or contamination.
- Clean and smooth sealing surface for O-ring.
- Moisten the new O-ring -4- with coolant (or lubricate lightly with silicone grease) and attach to the coolant pipe -1-.
- Carefully slide home the heat exchanger in the heater/air conditioning unit.

i Note

On inserting the heat exchanger, take care not to damage the connections and coolant pipes.



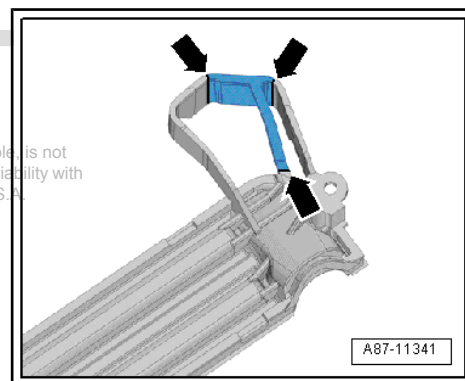
Caution

Risk of leaks at heat exchanger.

- ◆ **Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.**

- Insert the cover of the heat exchanger at the front first.
- If the cover cannot be attached to the heat exchanger, cuts must be made at the rubber support -arrows- as shown.
- Slide coolant pipes into heat exchanger as far as stop.

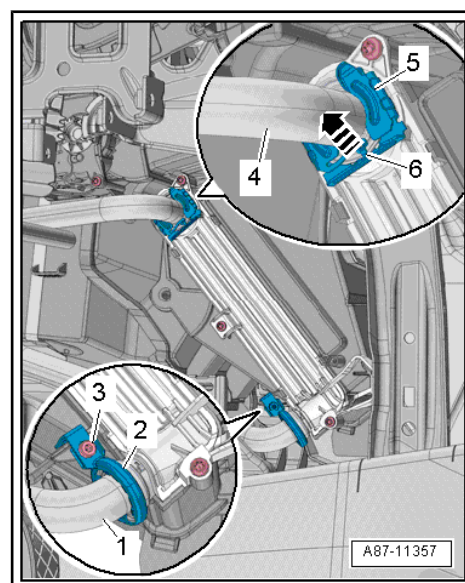
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- Fit a new clip -5- or screw-type clamp -2- at the coolant pipe / heat exchanger joint.

i Note

- ◆ *When performing repairs, a screw-type clamp can also be fitted instead of the clip -5-.*
- ◆ *Disregard -arrow-.*
- Tighten bolt -3-
⇒ ["5.1 Assembly overview - heater and air conditioning unit", page 105](#).
- Check that screw-type clips are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
- Fill coolant ⇒ Rep. gr. 19 ; Cooling system / coolant; Draining and filling coolant.



5.15.2 Removing and installing heat exchanger for heater; manufacturer Denso



Note

There are different designs and makes of heater and air conditioning unit. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ➔ [page 1](#)). The combined fitting of different makes of component is therefore not permissible ➔ Electronic parts catalogue.

Special tools and workshop equipment required

- ◆ Sealing cap set for engine - VAS 6122-
- ◆ Pliers - T40147-
- ◆ Commercially available compressed-air gun

Removing

- Set the air outflow direction to “defroster vent” for windscreen.
- Move front seat to rearmost position.
- Switch off ignition and all electrical consumers.

Vehicles without access and start authorisation system

- Remove ignition key, if inserted.

Vehicles with access and start authorisation system

- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.

Continuation for all vehicles

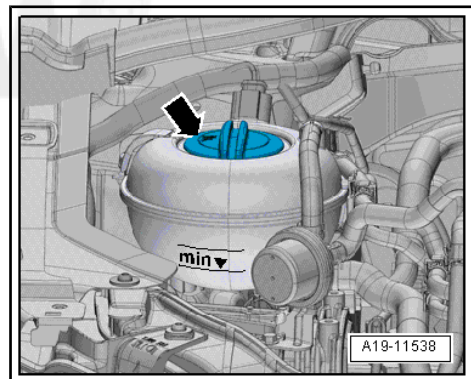


WARNING

Danger of scalding by steam and hot coolant.

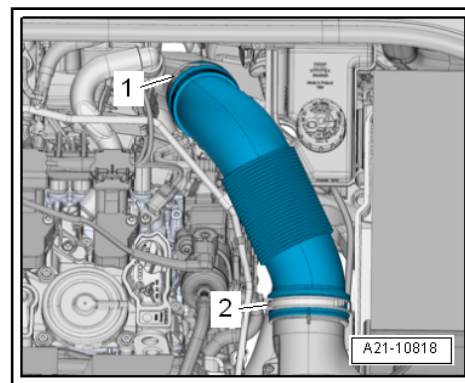
- ◆ ***On a warm engine, the cooling system is under high pressure.***
- ◆ ***Cover filler cap on expansion tank with a cloth and open it carefully to release pressure.***

- Open filler cap -arrow- for coolant expansion tank.



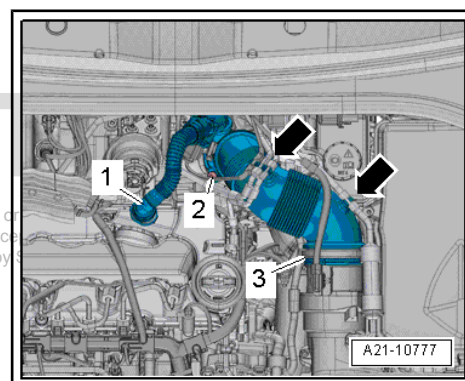
Vehicles with petrol engine:

- Release hose clamps -1, 2- and remove air pipe.



Vehicles with diesel engine:

- Press the release buttons at the crankcase breather hose -1- and detach the hose from the cylinder head cover.
- Move clear vacuum hoses at air pipe -arrows-.
- Release hose clip -3-.
- Remove bolt -2-, swivel air pipe and connection to rear and detach from turbocharger.



Continuation for all vehicles

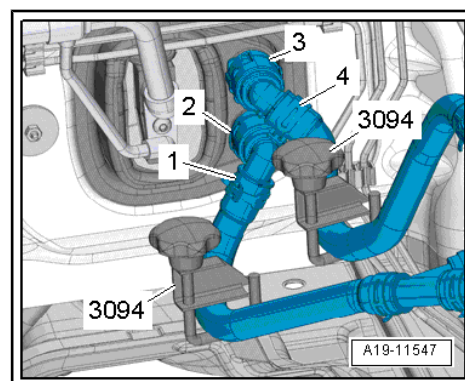
- Mark the installation position of the coolant hoses -1, 4-.



Note

The heat exchanger is designed for a certain coolant flow direction. The coolant hoses must therefore be connected on the correct sides.

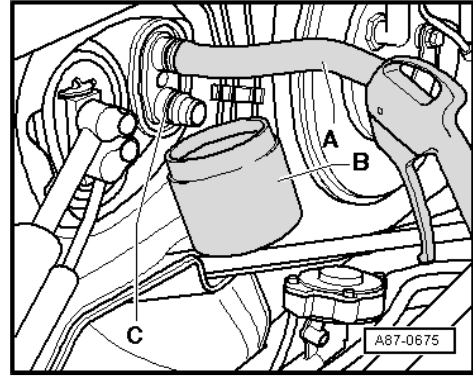
- Clamp off coolant hoses with hose clips -3094- .
- Lift the fasteners -2, 3- and detach the coolant hoses from the heating system heat exchanger.



- Fit a short hose -A- to the upper connection.
- Insert the compressed air gun in the end of the hose.
- Hold a collector -B- under the lower connection -C- and use the compressed air gun to carefully blow the coolant out of the heat exchanger.
- Seal off open pipes/lines and connections immediately with clean plugs from engine sealing cap set - VAS 6122- .

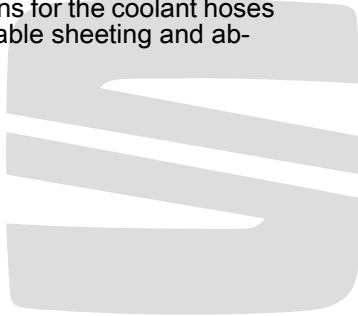
Vehicles with knee airbag

- Remove knee airbag on driver's side ⇒ General body repairs, interior; Rep. gr. 69 ; Knee airbag; Removing and installing knee airbag with igniter .



Continuation for all vehicles

- Remove the side trim of the centre console and the lower dash panel trim ⇒ General internal body repairs; Rep. gr. 68 ; Centre console; Centre console trim, Removing and installing the front footwell .
- Vehicles with supplementary air heater element: disconnect electrical connector ⇒ [page 118](#) .
- Cover the area beneath the connections for the coolant hoses in the plenum chamber with impermeable sheeting and absorbent paper, for example.



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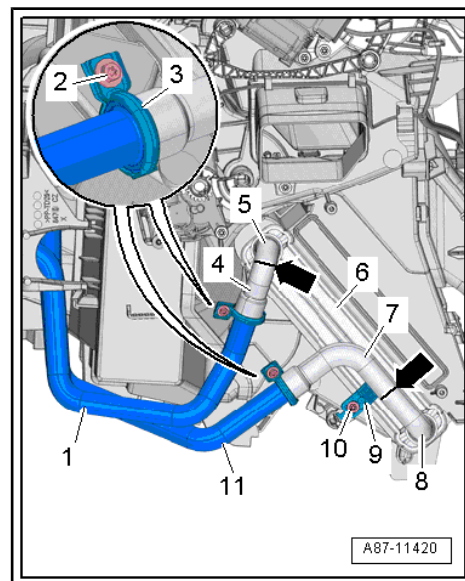
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- Screw out the bolts -2- and detach the screw-type clamps -3-.
- Separate the coolant pipes.

i Note

- ◆ *If they cannot be separated as the O-ring is gummed up, cut through the coolant pipes at the marked locations -arrows- using pliers - T40147- .*
- ◆ *Bend the rest of the coolant pipes -5, 8- at the heat exchanger to the rear in the direction of travel to enable the heat exchanger to be pulled out of the housing.*
- ◆ *Detach the severed coolant pipes -4, 7- of the heat exchanger from the coolant pipes -1, 11- to the engine.*
- Screw out the bolt -10- and detach the heat exchanger holder -9-.
- Pull out the heat exchanger -6- to the left.
- Seal off open pipes/lines and connections immediately with clean plugs from engine sealing cap set - VAS 6122- .



Installing

Installation is carried out in the reverse order. When installing observe the following:

Specified torques:

- ⇒ ["5.1 Assembly overview - heater and air conditioning unit", page 105](#)
- ⇒ [Rep gr. 21; Turbocharger; Assembly overview - turbocharger](#)

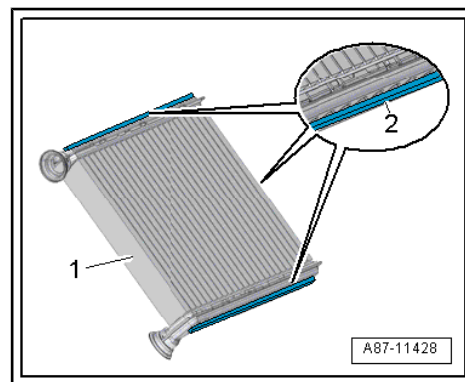
i Note

Replace the O-rings.

- Check the heater slot for contamination with the heat exchanger removed.
- Remove any dirt or residual coolant.
- Vehicles with diesel engine: with mounted heater element for supplementary air heater, check if the opening of the heating element is soiled and clean if necessary.
- Check the foam seals -2- attached to the heat exchanger -1- for damage and replace if necessary.

i Note

- ◆ *The foam seal may curl up on insertion if not correctly bonded on.*
- ◆ *Cold air may flow past the heat exchanger if the foam seal is damaged or not properly fitted.*
- ◆ *The illustration shows the heat exchanger for a "Valeo" heater and air conditioning unit.*

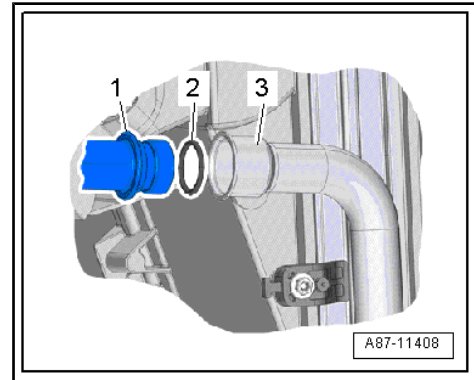


- Check connection -3- of the heat exchanger and the connection of the coolant pipes -1- for damage or dirt.
- Clean and smooth sealing surface for O-ring.
- Moisten the new O-ring -1- with coolant (or lubricate lightly with silicone grease) and attach to the coolant pipe.
- Carefully slide home the heat exchanger in the air conditioning unit.



Note

On inserting the heat exchanger, take care not to damage the connections and coolant pipes.



- Slide coolant pipes into heat exchanger as far as stop.

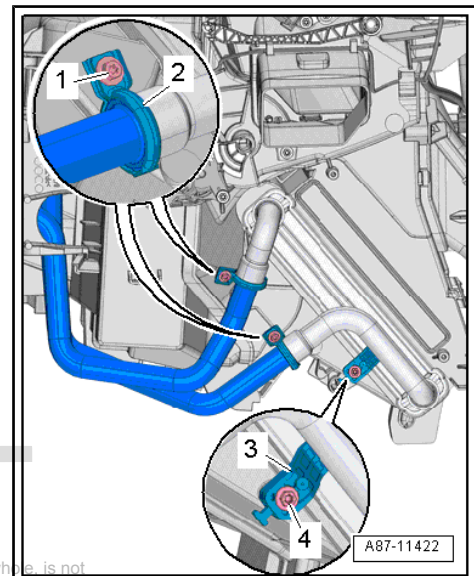


Caution

Risk of leaks at heat exchanger.

- ◆ **Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.**

- Position the heat exchanger holder -3- at the air distribution housing and tighten the bolt -4- to torque (tightening torque 2 Nm).
- Fit new screw-type clamps -2- at the coolant pipe/heat exchanger joint.
- Tighten bolt -1-
⇒ ["5.1 Assembly overview - heater and air conditioning unit", page 105](#).
- Check that screw-type clips are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
- Fill coolant ⇒ Rep. gr. 19 ; Cooling system / coolant; Draining and filling coolant.



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5.16 Removing and installing coolant pipes on heat exchanger

⇒ [“5.16.1 Removing and installing coolant pipes at heat exchanger \(Valeo\)”, page 141](#)

⇒ [“5.16.2 Coolant pipes on the heat exchanger: Removing and installing”, page 142](#)

5.16.1 Removing and installing coolant pipes at heat exchanger (Valeo)



Note

There are different designs and makes of heater and air conditioning unit. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ⇒ [page 1](#)). The combined fitting of different makes of component is therefore not permissible ⇒ Electronic parts catalogue.

Removing

- Set the air outflow direction to “defroster vent” for windscreen.
- Move front seat to rearmost position.
- Switch off ignition and all electrical consumers.

Vehicles without access and start authorisation system

- Remove ignition key, if inserted.

Vehicles with access and start authorisation system

- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.

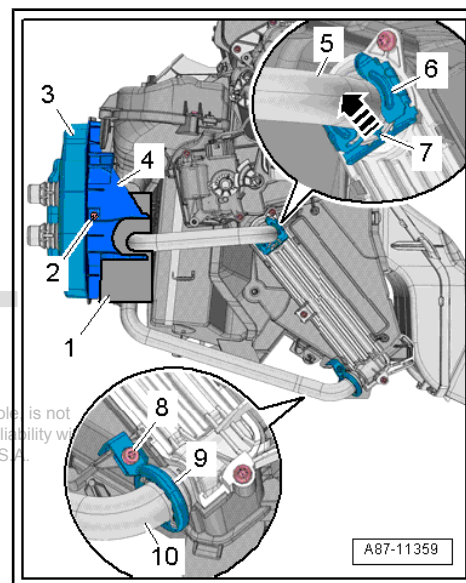
Continuation for all vehicles

- Remove heater and air conditioner unit ⇒ [page 119](#).
- Detach the sealing collar -3- to the plenum chamber bulkhead.
- Remove bolt -2-.
- Detach the coolant pipe holder -4- to the left.
- Detach the foam -1-.
- Lift the locking element -7-, remove the clip -6- and detach the coolant line at the top -5- from the heat exchanger.
- Unscrew bolt -8-.
- Remove the screw-type clamp -9- and detach the coolant line at the bottom -10- from the heat exchanger.
- Detach the coolant pipes.

Installing

Installation is carried out in the reverse order. When installing observe the following:

- Specified torque
⇒ [“5.1 Assembly overview - heater and air conditioning unit”, page 105](#)



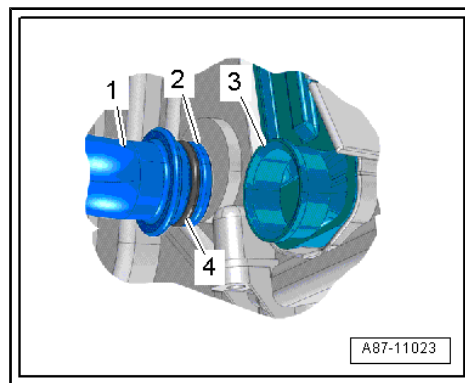
- Check connection -3- of the heat exchanger and connection -2- of the coolant pipes for damage or contamination.
- Clean and smooth sealing surface for O-ring.
- Moisten the new O-ring -4- with coolant (or lubricate lightly with silicone grease) and attach to the coolant pipe -1-.
- Slide coolant pipes into heat exchanger as far as stop.



Caution

Risk of leaks at heat exchanger.

- ◆ **Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.**



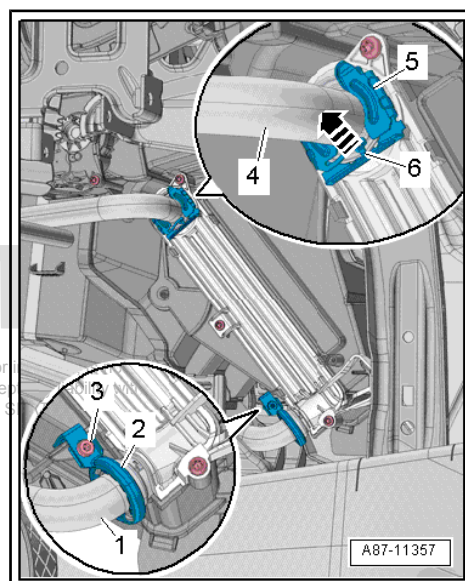
- Fit a new screw-type clamp -2- at the coolant pipe/heat exchanger joint.



Note

When performing repairs, a screw-type clamp can also be fitted instead of the clip -5-, ignore -arrow-.

- Tighten the bolt -3- to torque.
- Check that screw-type clips are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
- Fit the heater and air conditioning unit ➔ [page 119](#)



5.16.2 Coolant pipes on the heat exchanger: Removing and installing



Note

There are different designs and makes of heater and air conditioning unit. The individual components of the various heaters and air conditioning units are similar but not identical (distinguishing features ➔ [page 1](#)). The combined fitting of different makes of component is therefore not permissible ➔ Electronic parts catalogue .

Removing

- Switch off ignition and all electrical consumers.

Vehicles without access and start authorisation system

- Remove ignition key, if inserted.

Vehicles with access and start authorisation system

- Store the ignition key outside the vehicle to prevent the ignition from being switched on unintentionally.

Continuation for all vehicles

- Remove heater and air conditioner unit ➔ [page 119](#) .
- Detach the sealing collar -3- to the plenum chamber bulkhead.
- Unscrew bolt -2-.
- Detach the coolant pipe holder -4- to the left.
- Detach the foam -1-.
- Screw out the bolt -5- and detach the screw-type clamp -6-.
- Detach the coolant pipes -7, 8- from the heat exchanger.

Installing

Installation is carried out in the reverse order. When installing observe the following:

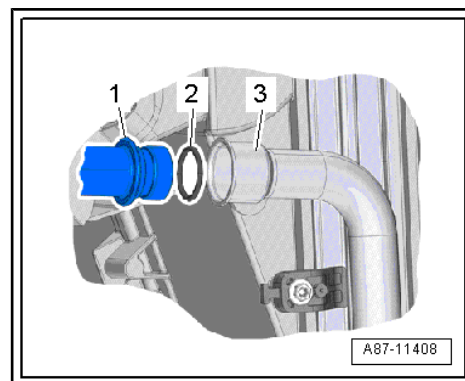
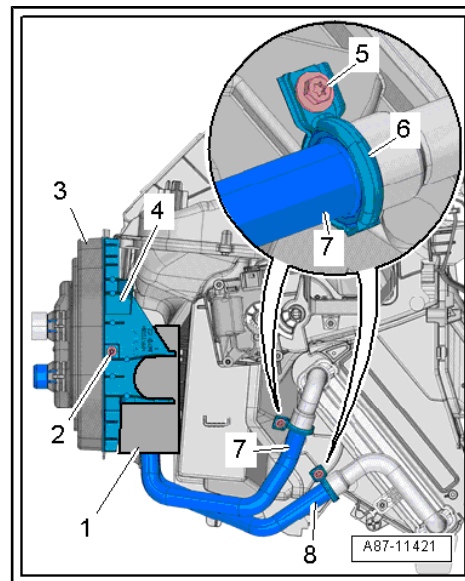
- Specified torque
➔ ["5.1 Assembly overview - heater and air conditioning unit", page 105](#)
- Check connection -3- of the heat exchanger and the connection of the coolant pipes -2- for damage or dirt.
- Clean and smooth sealing surface for O-ring.
- Moisten the new O-ring -4- with coolant (or lubricate lightly with silicone grease) and attach to the coolant pipe -1-.
- Slide coolant pipes into heat exchanger as far as stop.



Caution

Risk of leaks at heat exchanger.

- ◆ ***Crushed O-rings and coolant pipes that are not fitted straight or are not attached fully will lead to leaks.***



- Fit new screw-type clamps -2- at the coolant pipe/heat exchanger joint.
- Tighten the bolt -1- to torque.
- Check that screw-type clips are seated correctly on connections of heat exchanger and coolant pipes. They must not make contact with air distribution housing or other components.
- Fit the heater and air conditioning unit ➔ [page 119](#)

