

Service Bulletin

Fault tracing

Repairs

Maintenance

DATE
Apr. 1995

RE:
A/C system Retrofit conversion
from R12 to R134a

200

Page 1 of 28

REFERENCE: TP31120/1, SECTION 8 (82-88), BODY FITTINGS, INTERIOR, EXTERIOR, HEATING AND AC, 200 1975-19..

This service bulletin replaces the earlier service bulletin 87-217 dated August 1993, which should be discarded.
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Conversion of A/C system from R12 to R134a "Retrofit"

The retrofit of the A/C system applies to model years 1975-1992

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This bulletin describes the method for converting from R12 to R134a refrigerant A/C systems.

Service personnel: Please circulate, read and initial

Service Manager	Parts Manager	Workshop Manager	Workshop Foreman	Service Technicians							



Volvo is committed to improving the environment. Effective with the 1993 model year, all factory-installed air conditioning units no longer use chloroflourcarbon CFC-12 (Freon®). Instead, hydroflourocarbon R134a is the refrigerant used. R134a does not deplete the ozone layer as CFC's do.

As the next step toward elimination of CFC-12, Volvo now offers retrofit kits which convert an R12 A/C system to an R134a system.

When an evacuate and recharge is needed on an R12 A/C system on a vehicle listed above, the customer should be advised that a retrofit kit to convert the system to R134a is available. They should be given the opportunity to have this conversion done. Ask the customer about the A/C history. Have any alternative refrigerants already been used? Has retrofit work already been done?

This bulletin describes the method for converting an R12 system to an R134a system, on models listed above.

To allow simple and inexpensive retrofitting of R12 systems to R134a systems, use "ester oil".

This type of oil, which is part of a retrofit-kit, has a number of advantages - it mixes well with mineral oils and does not react with material in the O-rings. This means that not all A/C system O-rings have to be replaced.

The cooling performance between R12 and R134a after the "retrofit" conversion is comparable.

Important: Check which type of refrigerant the car A/C system is filled with. This is important to avoid mixing refrigerants which could damage the compressor and equipment. Look in the engine compartment for the A/C labels which indicate that an earlier retrofit conversion has been carried out. Inspect all the service valves. If there are valves other than the standard **R12**, this indicates that a conversion **has already been carried out**. **Never** re-use old O rings. Always lubricate the new O rings (**yellow** for **R134a**) with ester oil before installation.

Preparations for A/C system retrofit, 1975-1990

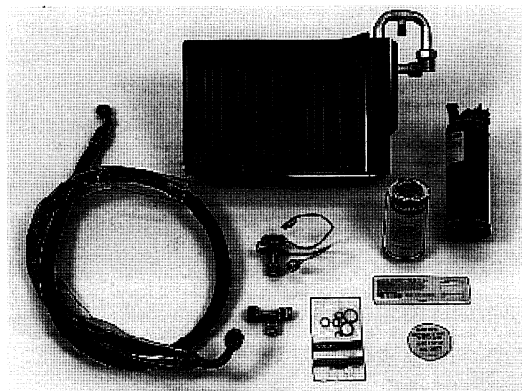
Move car into workshop

If it is cold outside, move the car into the workshop the night before, if possible, but at least two hours before starting work. The ambient temperature should be preferably 68° F (20° C).

Important! Before starting work: The safety precautions in Service Manual Section 8 (82-88) TP 31120/1 pages 156 and 157 must be followed at all times.

Equipment and materials for retrofitting A/C systems from R12 to R134a refrigerant 1975-1990

For 1991-1992, see page 12



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Equipment:

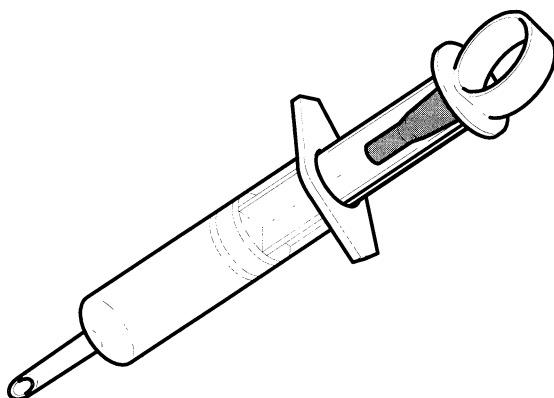
- R12 recycling/filling unit
- 134a recycling/filling unit
- leakage detector

Material:

Retrofit kit, **P/N 9134808-6** (see illustration)

NOTE!

On cars fitted with the **York** compressors (240 series up to 1984) and **Delco** (260 series up to 1985) the amount of ester oil used is **2 x 0.125** liters (2 x 4.23 fl.oz) (that is one more can of Ester than is supplied with the kit). **P/N 1394828-6**.

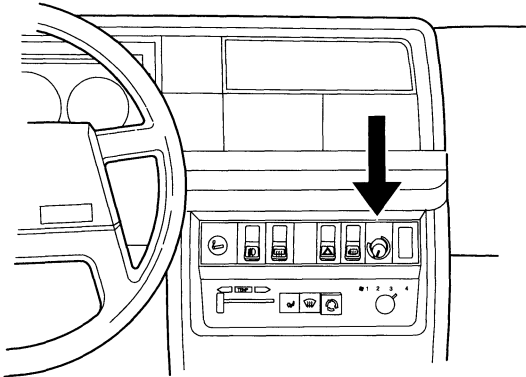


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A syringe is required for certain operations.
The syringe is reusable.

Checking the A/C system, 1975-1990

A1

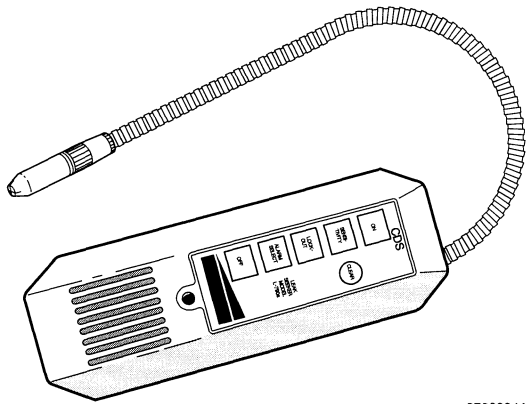


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Start engine

- Turn on A/C system, select highest blower speed, Max. cooling (not "REC" recirculation). Leave front doors or side windows open.
- Check if compressor starts. If it does not then the refrigerant might have leaked out. Refer to A3 for more information.

A2

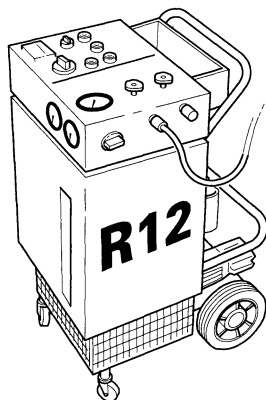


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If the compressor starts there is refrigerant in the system. Proceed as follows:

- turn off engine (after running for 40 minutes)
- leak detection. Use leakage detector.
- connect R12 recycling/filling unit. A general collection unit may also be used.
- evacuate the system on R12 unit until a vacuum has been created (approx. 10 minutes)
- disconnect the recycling/filling unit
- replace any components that are leaking but not if the equivalent parts are in the retrofit kit.

A3



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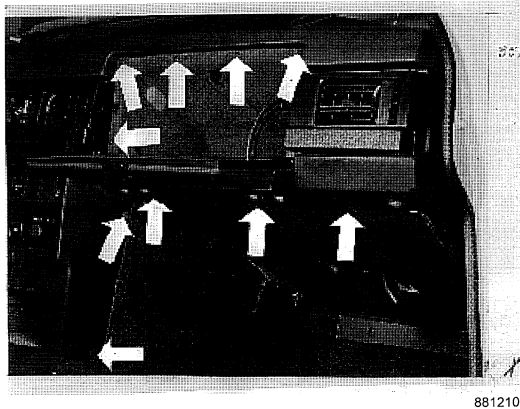
If the compressor does not start when checking A/C operation:

- check if there are any visible leaks or other faults on the system
- connect R12 recycling/filling unit. A general collection unit may also be used.
- evacuate the system on R12 unit until a vacuum has been created (approx. 10 minutes)
- disconnect the recycling/filling unit
- replace any components that are leaking but not if the equivalent parts are in the retrofit kit.

NOTE!

If the compressor still does not start, perform fault-tracing as per service manual Section 8 (82-88) TP 31120/1.

Conversion of A/C system from R12 to R134a "Retrofit" 1975-1990



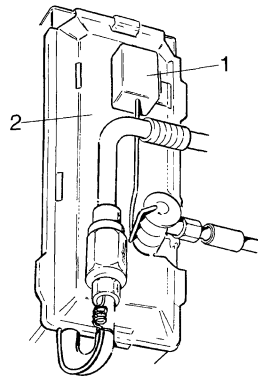
881210S

A4

Turn off radio, then;

Remove:

- battery negative lead
- glove compartment
- the panel under the glove compartment
- side panel to the heater
- right defroster outlet
- air duct.



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A5

Remove thermostat from evaporator cover

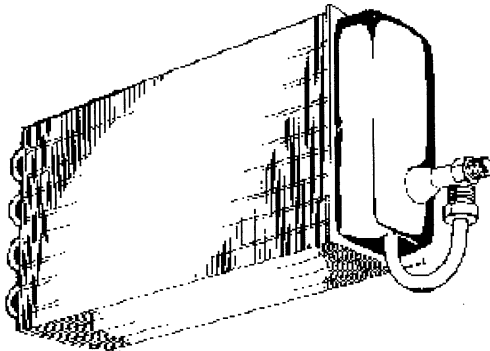
(Applies only to 240 cars, model years 1975-1978).

NOTE! The location of the thermostat (1) can vary. The capillary pipe on later model years (1979-) is located on the evaporator pipe.

A6

Remove:

- insulation sealant.
- the cover (2).



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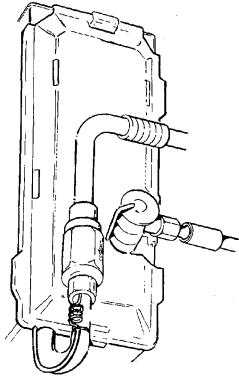
A7

Remove the old evaporator

NOTE! Plug all open pipe ends and connections to prevent moisture from entering the system.

Remove the screwed joints from the evaporator. Carefully pull the evaporator out.

NOTE! Do not forget to remove the thermostat sensor body which is located on the evaporator's outlet pipe (the thick pipe).



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Installation:

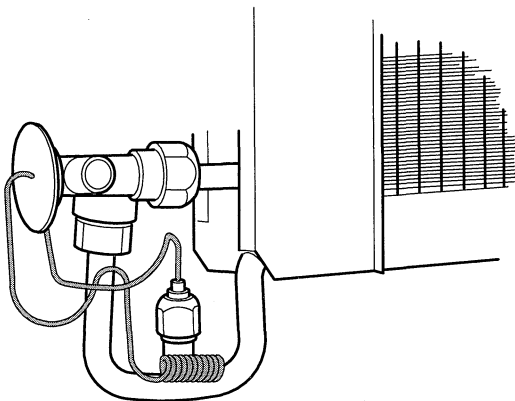
NOTE! Clean the old sealant from the inside of the housing. Inserting the new evaporator may be difficult if this is not done.

NOTE! Remove the backing paper from the butyl tape on the rear of the new evaporator.

A8

Install the new evaporator

NOTE! Use both thumbs to press down. Make sure the evaporator goes all the way into the housing.



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A9

Install the new expansion valve.

NOTE! To avoid the capillary pipes from breaking when they are bent, perform this procedure carefully.

A10

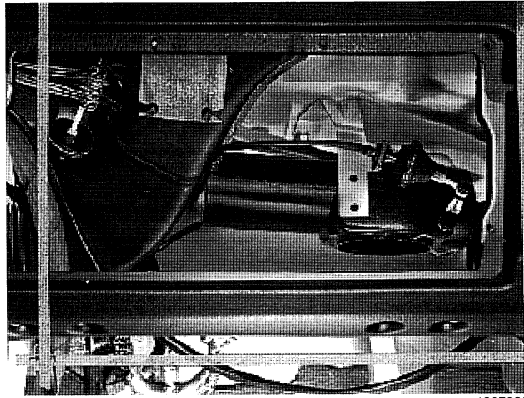
Connect the refrigerant hoses

Use new seals for O-rings. Lubricate with ester oil. Tighten to **30 Nm (22 ft. lbs)**.

A11

Insulate the evaporator pipes and screwed joints. Install the cover

NOTE! Do not insulate the expansion valve.



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A12

Install:

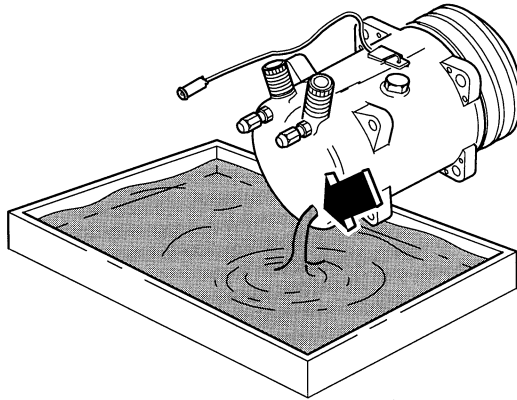
- defroster outlet
- air duct
- glove compartment
- the panels.

The method for replacement of the compressor is described in service manual Section 8 (82-88) TP 31120/1.

A13

Drain mineral oil from the compressor and replace with ester oil. Use the 0.125 liter (4.23 fl. oz) can of ester oil from the kit.

NOTE! On York and Delco compressors an additional 0.125 liters (4.23 fl. oz) is required.



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A14

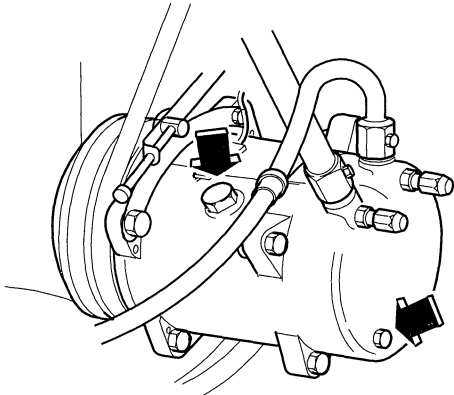
If the compressor must be replaced:

Drain oil. New compressors are always filled with mineral oil

After replacing the compressor: Fill with 0.125 liters (4.23 fl. oz) ester oil P/N 1394828-6.

A15

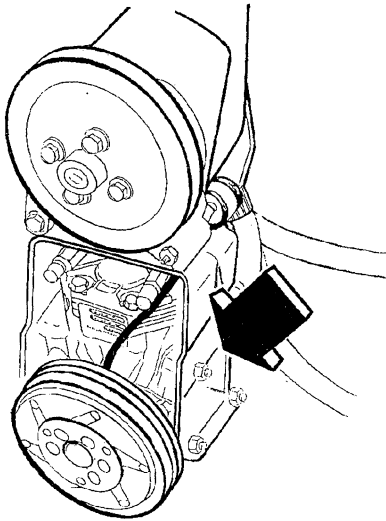
If the compressor is not to be replaced:



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On later model years with Diesel Kiki/Zexel compressor:

Remove plug at the rear of the compressor. Drain oil. Replace oil with 0.125 liters (4.23 fl. oz) ester oil. Fill oil through the plug in the upper section of the compressor. Use the syringe.

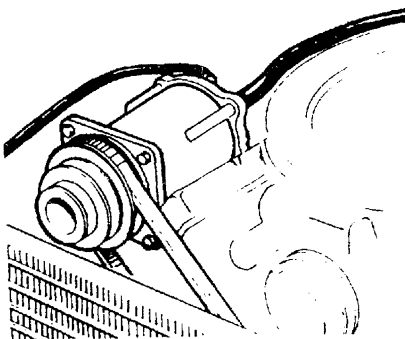


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On early models with York compressor:

Remove plug in the side of the compressor

Use the syringe to suck out the oil. Make sure the hose goes all the way down. If necessary turn the compressor crankshaft slightly. Fill with 2 x 0.125 liters (2 x 4.23 fl. oz) ester oil. Use the syringe.



129869S

On 260 models with B27/B28 engines and Delco compressor:

Release the compressor from its mounting. Lower the compressor.

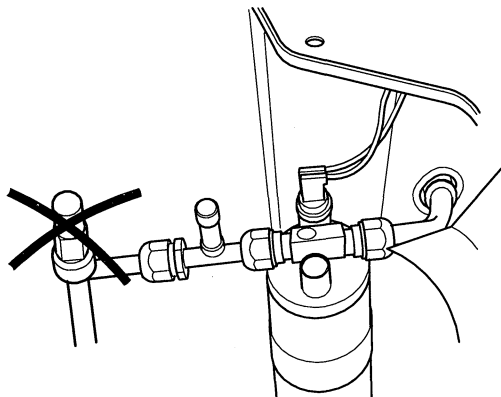
NOTE! The hoses can remain in place.

Empty mineral oil through the plug in the bottom. Fill with ester oil (2 x 0.125 liters, 2 x 4.23 fl. oz) using the same plug as for draining. Use the syringe.

NOTE! On 240 diesel cars up to model year 1989 with Sanden 508 or 510 compressors the compressor shaft seal must be replaced, see page 19. After replacing the seal continue to operation A16.

Replacement of the drier

A16



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Install the new drier in the car

Remove factory fill and move A/C hose up to fitting on the new dryer.

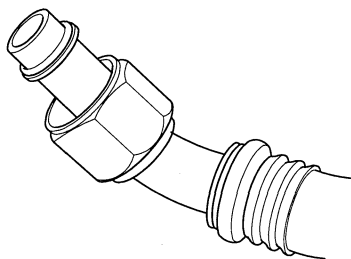
Use new O rings. Lubricate the O rings with a few drops of ester oil remaining in the can.

Connect:

- hoses from the condensor to the "in" connection on the drier
- the new filling valve between connections "out" on the drier and the hose to the evaporator.

Tighten connections to **25 Nm (18 ft. lbs)**.

Connect the connector to the pressure sensor.



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A17

Replace hose between compressor and condensor

Use new O rings. Lubricate rings with ester oil.

Tighten connections:

To condensor to **17 Nm (12 ft. lbs)**.

To compressor to **30 Nm (22 ft. lbs)**.

NOTE! On cars with B27/B28 engines.
DO NOT REPLACE HOSE.

Check the A/C system

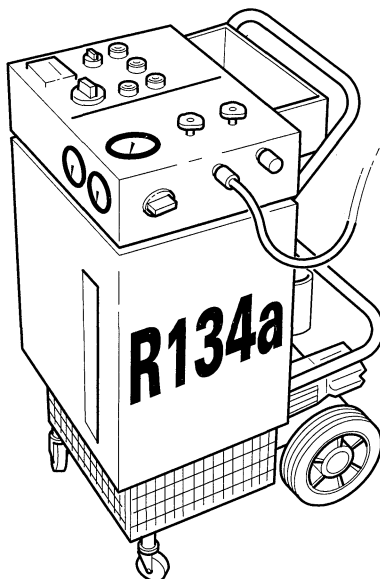
A18

Vacuum pump the A/C system

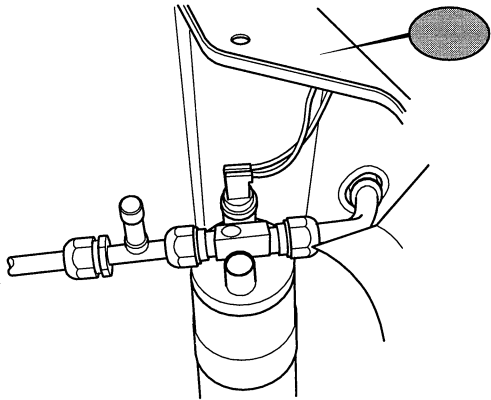
Connect R134a recycling/filling unit.
Start vacuum pumping and run for at least 45 minutes.

Check that system keeps a vacuum. The vacuum must not sink more than one line on the scale during a 4 minute period.

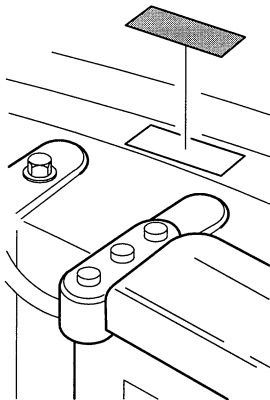
Refer to Service Manual Section 8 (82-88)
TP 31120/1



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Finalizing work

A19

The following work can be completed during the time required for the vacuum pumping:

Apply the new round R134a "RETROFIT" label next to the receiver.

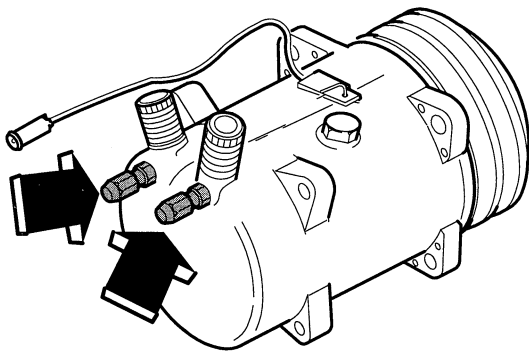
Fill in the oblong label before the backing paper is removed. Clean off the old R12 label on the chassis.

Apply the completed new light-blue R134a "RETROFIT" label over the R12 label. Make sure the old label is completely covered.

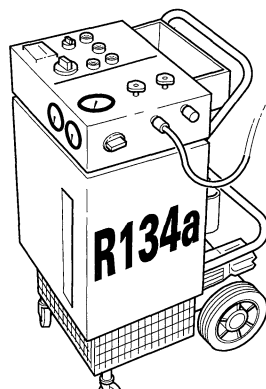
A20

Install blocking plugs on the service valves on the compressor which will not be used any more.

Use locking fluid P/N 1161075-5.



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A21

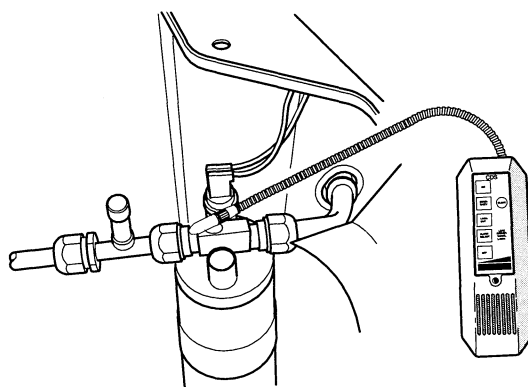
Refilling system with refrigerant

On completion of vacuum pumping, fill system with 200 gr. (7 oz) of R134a refrigerant.

For instructions on use of the units refer to SB 87-213 and 87-218.

Check for leakage detection with a leak detector after filling. Correct any leakage.

When no leakage is detected fill with remainder of refrigerant R134a to the amount stated on the label, (1000 grams, 35.3 oz.).



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A22

Verify A/C functions

Start engine and turn on the A/C system.

Check that the compressor starts and operates normally without noise.

Check that air in the car is cooled. Refer to Service Manual TP 31120/1, Section 8 (82-88), performance test, page 178-179. If the performance of the system is not to the stated levels, check that the hot water valve is closing completely.

Turn engine off.

Check for leakage detection with a leak detector. Repair any leaks.

**END OF RETROFIT PROCEDURE FOR
M/Y 1975-1990.**

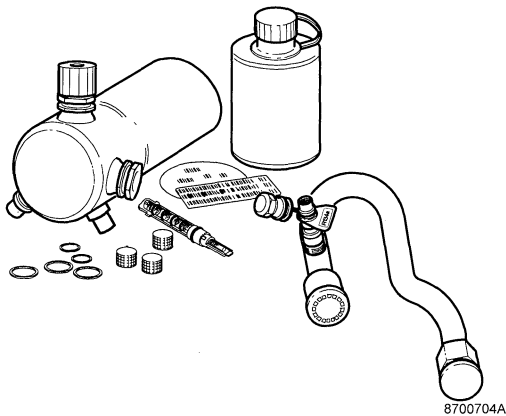
Preparations for A/C system retrofit, 1991-1992

Move car into workshop

If it is cold outside, move the car into the workshop the night before, if possible, but at least two hours before starting work. The ambient temperature should be preferably 68° F (20° C).

Equipment and materials for retrofitting A/C systems from R12 to R134a refrigerant 1991-1992

For 1975-1990, see page 3



Equipment required:

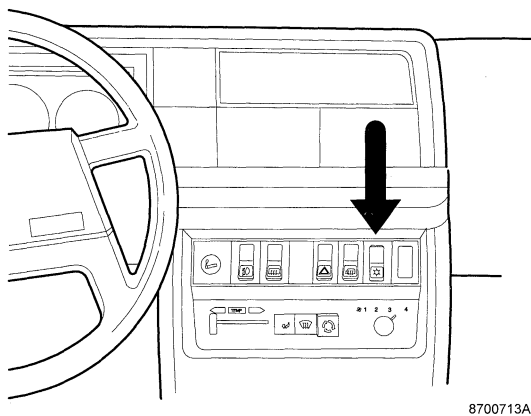
- Recovery/filling station for R12
- Recovery/filling station for R134a
- Leakage detector R12/R134a

Material:

Retrofit kit P/N 9145666-5 (see illustration)

Thread locking fluid P/N 1161351-0, (or commercially available).

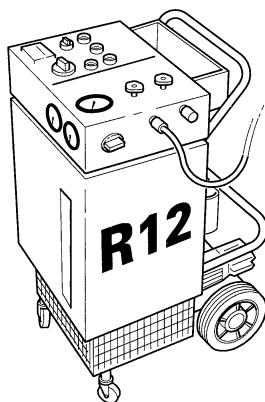
Checking the A/C system, 1991-1992



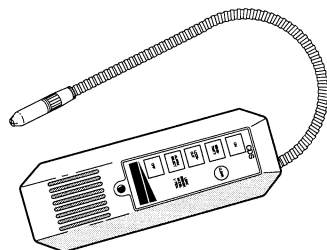
B1

Start engine

- Turn on A/C system, select highest fan speed, turn temperature selector to maximum cooling (not "REC" recirculation) and leave front doors or side windows open.
- Check that the compressor starts. If the compressor does not start, refrigerant may have leaked out.



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B2

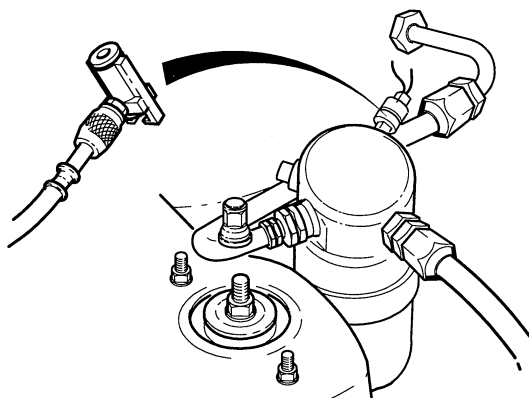
If the compressor starts, there is refrigerant in the system. Proceed as follows:

- Turn off engine.
- Carry out leak test with leak detector and note leaks.
- Connect recovery/recycling station for R12.
- Recover R12 from the A/C system. Evacuate A/C system until there is a vacuum.
- Disconnect recovery/recycling station.
- Repair/replace any leaking components (except for corresponding parts included in the kit).

B3

If the compressor does not start when tested:

- Turn engine off
- Carry out leak test with leak detector and note leaks.
- Check for visible leaks and other visible faults in the system, e.g., loose electrical connections, etc.
- Connect recovery/recycling station for R12.
- Recover R12 from the A/C system. Recover and evacuate A/C system until there is a vacuum or until system is empty.
- Disconnect recovery/recycling station.
- Repair/replace any leaking components (except for corresponding parts included in the kit).

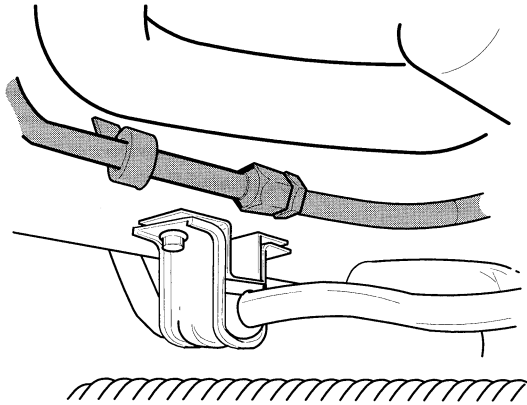


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NOTE: On certain cars there is not enough space to connect the recovery/recycling station to the service valve. If so, undo the low pressure switch and use that valve.

Conversion of A/C system from R12 to R134a "Retrofit" 1991-1992

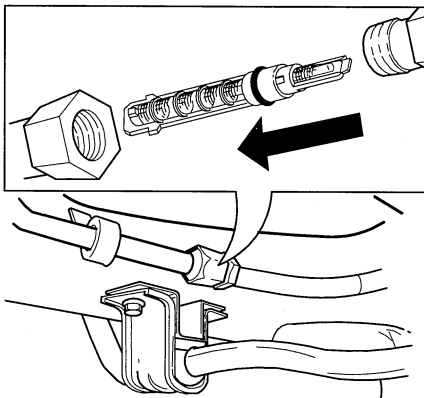
B4



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Location of orifice

The orifice is located in the high pressure pipe at the right sidemember under the generator. To get access to the orifice, the car must be put on a lift and the engine splash pan must be removed.

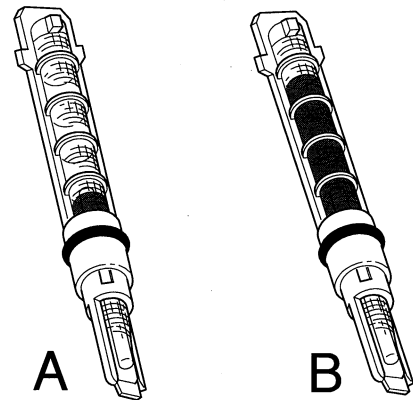


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Remove orifice

- Clean connection and surrounding body area thoroughly
- Undo nut on connection
- Pull or work out the orifice (it is not threaded.)
- Take care not to break it and ensure that the entire unit is removed.
- Remove joint O-ring.

B5



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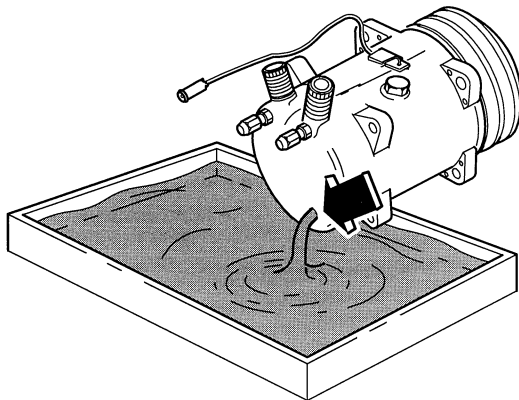
Inspect orifice filter:

Is the filter heavily clogged or heavily contaminated with metal particles? If so, the compressor may be in poor condition and should be replaced. (See illustration).

As a rule of thumb: If more than 3 of the 5 orifice filter sections are clogged (Fig. B) condition of the compressor oil should be inspected. If compressor oil is black, heavy contaminated or if compressor is dry, the compressor should be replaced (see page 15). Picture A is normal.

The orifice should not be reused once it has been inspected. There is a new orifice in the conversion kit.

B6



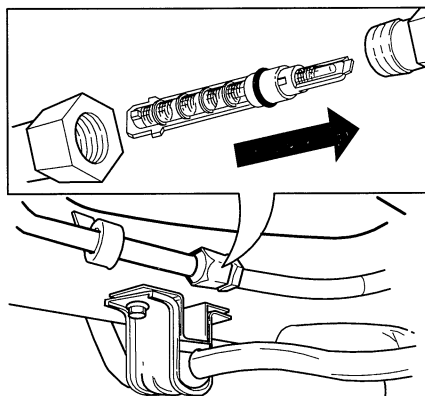
8701430A

B7

If the compressor needs replacing:

A new compressor is filled with **mineral** oil. Drain this oil and replace it with the all ester oil (200 ml, 6.8 fl.oz) from the conversion kit. Save residual oil in can to lubricate O-rings.

To replace the compressor, see Service Manual, Section 8 (82-88) TP31120/1.



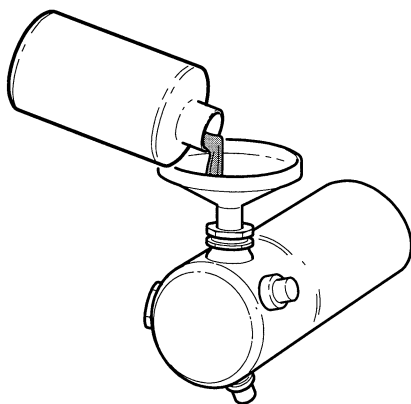
8701557A

B8

Install new orifice

If new orifice has a black O-ring installed, discard the black O-ring. Install new yellow, lubricated (use ester oil) O-ring, (inner dia 6.7 mm, 17/64") on the new orifice.

- Install a yellow lubricated O-ring, (inner dia. 10.8 mm, 27/64") in the pipe joint at the firewall or side member.
- Install orifice and connect pipes.
- Tighten the nut on the joint to 25 Nm (19 ft. lbs).



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B9

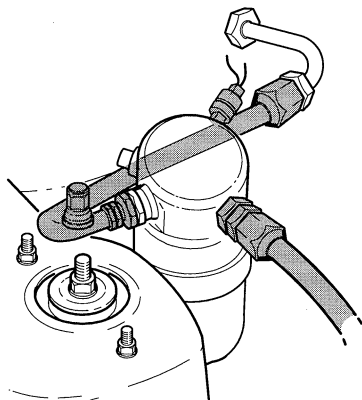
Prepare new accumulator

Fill accumulator with ester oil (200 ml, 6.8 fl oz) on the inlet side.

Replug accumulator.

Note: If compressor was replaced in previous step, no ester oil is needed for the accumulator.

Save residual oil in can to lubricate O-rings.



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B10

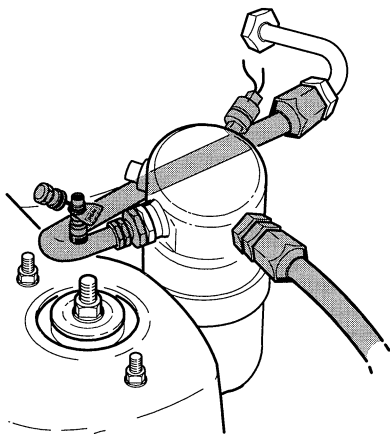
Remove accumulator

Undo:

- pipe connectors at the accumulator inlet, outlet and at thick/thin pipe joint between the accumulator and evaporator.
- pressure switch connector and remove the pressure switch.
- remove existing O-rings. Note which size goes where.
- accumulator.

Transfer foam padding to new accumulator.

If system is left open, cap/plug open pipes to avoid moisture in the system.

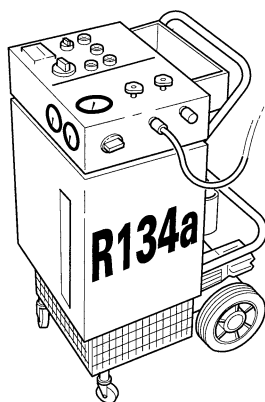


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B11

Install new accumulator

- Install accumulator, but do not tighten.
- Install new yellow O-rings, inner dia. 17.2 mm (11/16") (lubricated with ester oil residue in can) onto pipes, if not already done.
- Install new service valve pipe on accumulator inlet and evaporator pipe. Hand tighten.
- Tighten accumulator clamp.
- Connect the accumulator outlet pipe. Hand tighten.
- Tighten pipe connections (inlet and outlet) to **45 Nm (33 ft. lbs)**.
- Tighten pipe-joint to **33 Nm (24 ft. lbs)**.
- Using new O-ring, inner dia. 8.9 mm (11/32") (lubricated with ester oil), fit the pressure switch onto the accumulator. Tighten to **3.5 Nm (30 in. lbs)**.
- Connect the pressure switch connector.



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B12

Check the A/C system

Evacuate A/C system

- Connect R134a recovery/recycling station. Evacuate system for at least 50 min.
- Check that the system can hold a vacuum. The vacuum must not sink within 4 minutes.

Finalizing work

B13

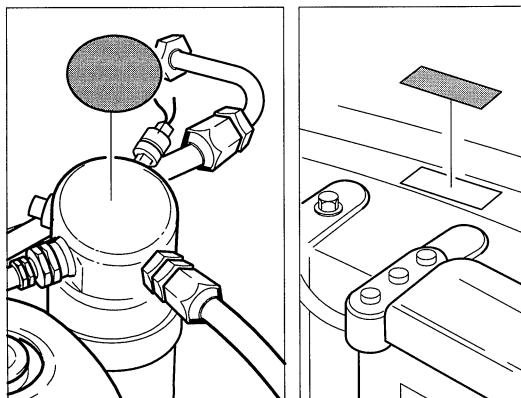
Install labels

While evacuating, the following can be carried out:

- Complete the light blue rectangular R134a “RETROFIT” label **before removing** carbon paper.

Using ball-point pen, note:

- technician initials,
- dealer number, if applicable, (or repair shop name, city state).
- date.
- Clean the old R12 label on the bodywork, remove carbon paper and stick the new, light blue rectangular R134a “RETROFIT” label over it. The old label should be completely covered.
- Using mineral spirits, clean top of accumulator, then stick the round R134a “RETROFIT” label onto it.

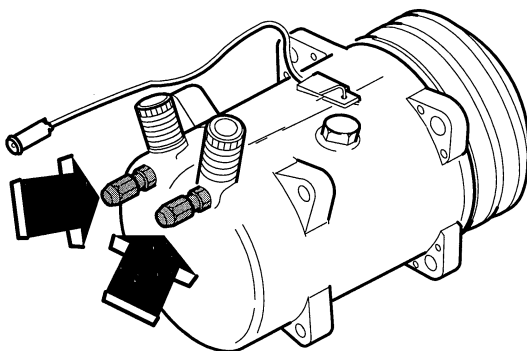


8700712A

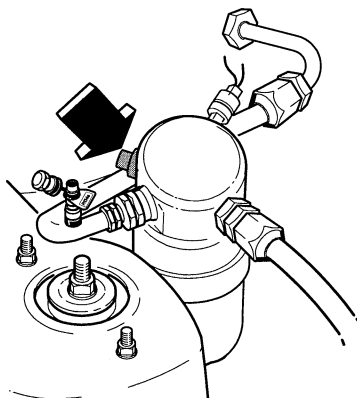
B14

Plug old service valves

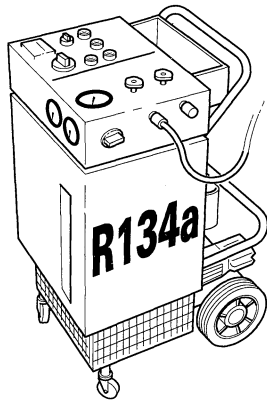
- Cap service valves which will not be used, two on the compressor (in some cases there are no valves) and one on the accumulator.
- Use caps provided in conversion kit.
- Use thread locking fluid, **P/N 1161351-0** or equivalent.



8700408A



8700711A



8701325A

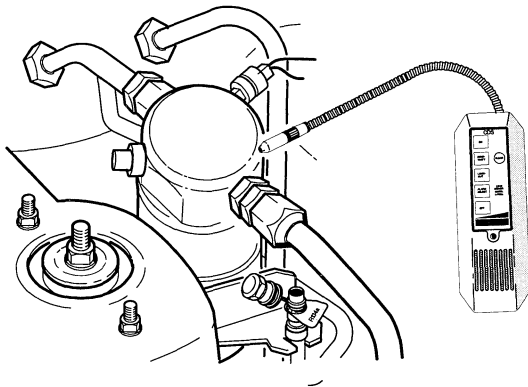
B15

Fill with refrigerant R134a

When evacuation is complete, fill with 200 grams (7 oz = 0.44 lbs.) of refrigerant R134a. Test for leaks with a leak detector. Repair any leaks.

When no leaks are found, **top up to total capacity** amount of refrigerant R134a specified on the enclosed label.

240	1991-1992	1000 grams (2.2 lbs.)
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8700406A

B16

Carry out a function test

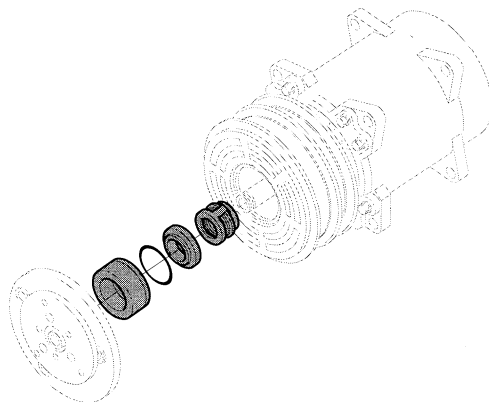
- Start engine.
- Start A/C
- Check that the compressor starts and runs normally without making any unusual noises. If compressor does not operate normally, fault trace according to normal procedure.
- Check that air from dashboard vents is cool.
- If not, check that heater valve closes fully.
- Switch off the engine.
- Re-test for leaks using leak detector. Repair any leaks found.

**END OF RETROFIT PROCEDURE FOR
M/Y1991-1992**

Shaft seal on Sanden 508/510 compressor, replace

If the ECC unit is retrofitted from R12 to R134a the shaft seal **must** be replaced with a seal suitable for use with R134a.

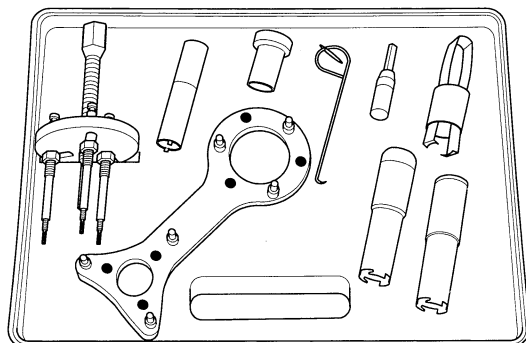
Volvo has produced a tool kit, **P/N 999 5602-1 / Robinair 18095**, for fast and simple replacement of the shaft seal. Other tools **must not** be used due to the risk of damage to sealing surfaces.



8701127A

Shaft seal. Sanden compressor

NOTE! Shaft seal must always be replaced on both **new** and **used** compressor units. The seal **must** be replaced because the original seal on the compressor units was not intended for use with R134a.



8701466A

Tool kit for shaft seal replacement

Use Volvo special tool 999 5602-1 / Robinair 18095

Material:

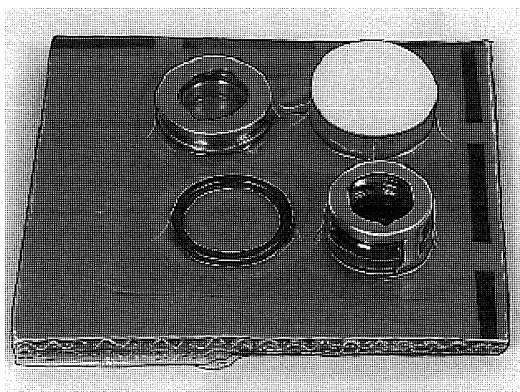
Shaft seal kit for Sanden 508/510 compressors adapted for use with refrigerant R134a
P/N 9134344-2.

Compressor oil for O-ring lubrication and lubricating the sealing surfaces (ester oil)
P/N 1394828-6 (0.125 liters).

NOTE! The O-rings on the compressor's in- and outlet must always be replaced.

P/N: 3537507-0 and 3537503-9.

These O-rings are **not** part of the kit and must be ordered separately.



8701054S

C1

Empty system of refrigerant (if not done earlier). Remove compressor from the car

For compressor removal refer to service manual Section 8 (82-88) TP 31120/1.

NOTE! Before starting work on replacing seals, drain oil from compressor units through filler hole and pipe connections.

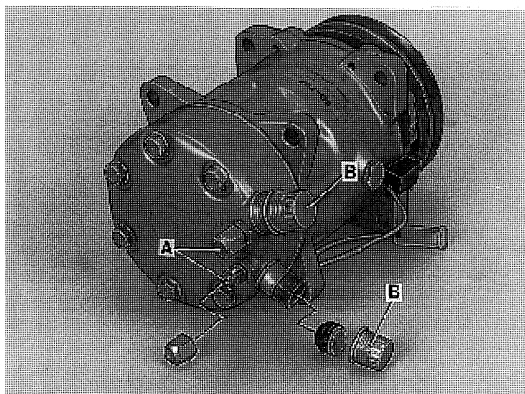
Then continue with operation C3.

C2

If the compressor must be replaced with a new factory unit, carry out a pressure equalization as described below.

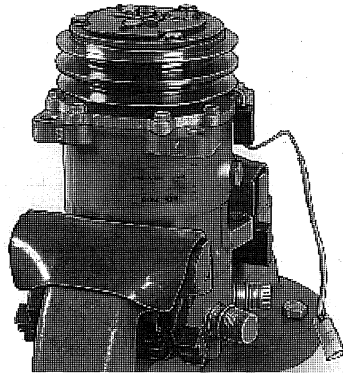
The compressor is filled with a protective gas (nitrogen) during the manufacturing process. A pressure equalization is necessary before the seals can be removed due to the fact that the gas is under pressure in the compressor. Equalize pressure by carefully opening one of the valves (A) or pipe connections (B) and tighten them again afterward. If (B) was opened check to make sure the gaskets (black and white) are in place.

NOTE! The gas is not poisonous but oil can be blown out easily and squirt in the eyes. Cover connections with a shop rag.



8701056S

Then continue with operation C3.

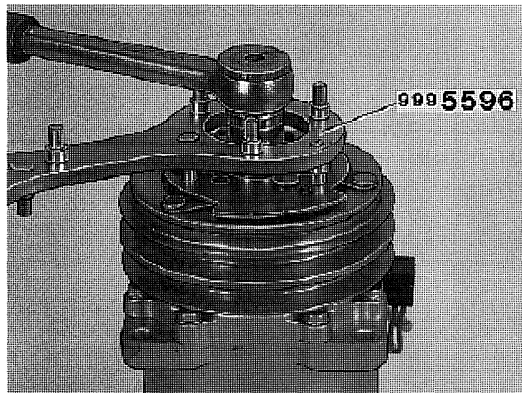


8701057S

C3

Install the compressor in a vise

Use protectors so the unit is not damaged.



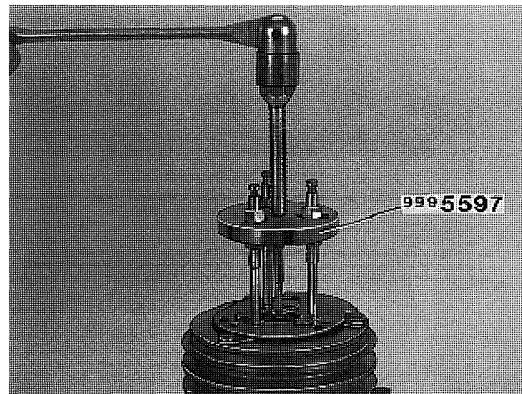
8701463S

C4

Remove the nut retaining the clutch plate

Use the counterhold **999 5596** (10204) from the tool kit and one 19 mm (3/4") jointed wrench (or ratchet handel with 19 mm (3/4") socket).

NOTE! During disassembly: Line up the different parts on the work bench in order as they are removed. This makes the reassembly process considerably easier.

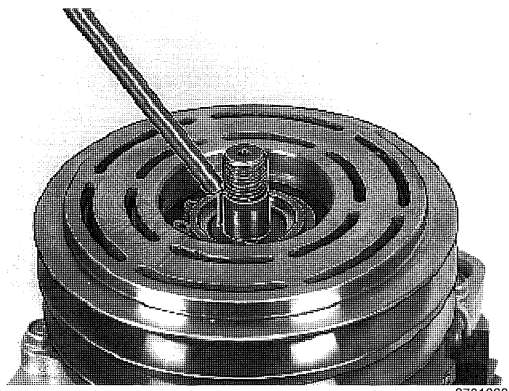


8701462S

C5

Remove clutch plate

User the puller **999 5597** (40749) from the tool kit.

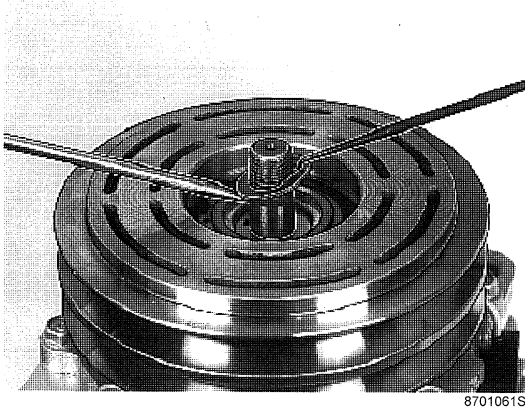


8701060S

C6

Remove woodruff key

Carefully tap the wedge loose with a bronze or copper drift. A screwdriver can sometimes be easier to use, but be very careful so that neither the wedge or the shaft are damaged.



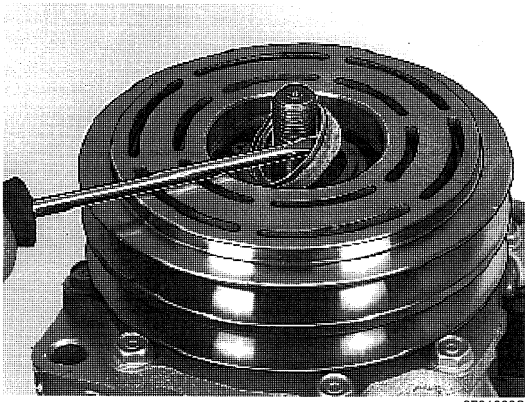
8701061S

C7

Remove 2 spacer washers

Use a screwdriver and the tool with a small hook.

Take note of the order in which the spacers are installed; they must be reassembled in the same order.



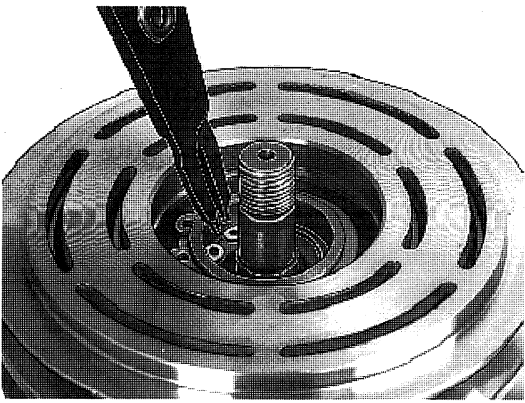
8701062S

C8

Remove holder with the felt ring.

Use a screwdriver.

Wipe clean using a non-linting wiping cloth and blow clean carefully with compressed air.

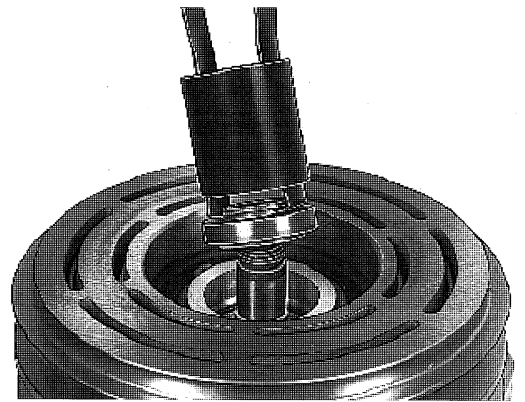


8701063S

C9

Remove inner circlip

Use circlip pliers.

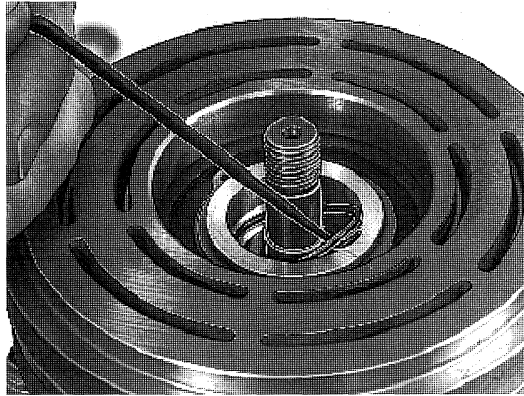


8701070S

C10

Remove sealing washer

Use the claw tool with the sleeve.



C11

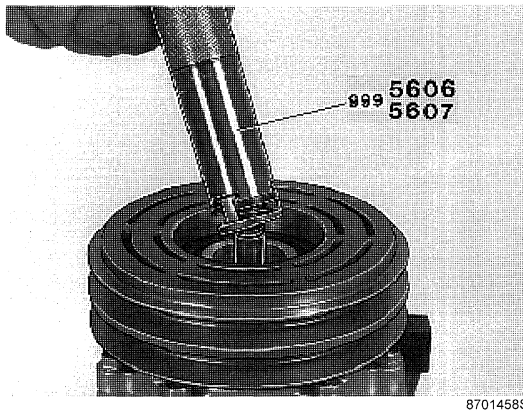
Remove O ring located in the casting

Use tool with small hook.

NOTE! Do not scratch the O-ring groove.

Check that the O-ring groove is free of contaminants.
Wipe clean if needed using a non-linting shop rag.

NOTE! Do not use compressed air.



C12

Remove carbon seal

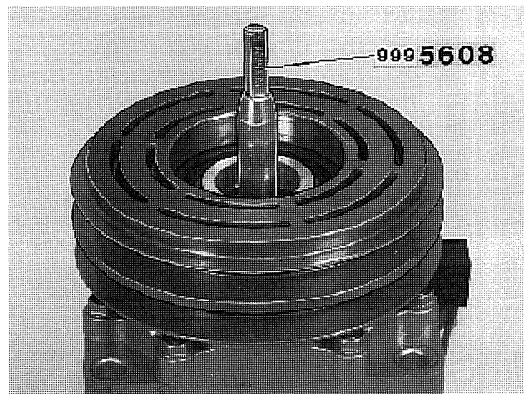
Use tool **999 5607** (10507) with the **black** grip.
Press down the tool, turn clockwise and lift the
carbon seal.

C13

**Check that no particles or other contaminants
have come loose from the carbon seal.**

Wipe clean with a non-linting shop rag.

NOTE! Do not use compressed air for blowing
clean.

**Reassembly**

NOTE! Do not touch the sealing surfaces with
your fingers when opening the package

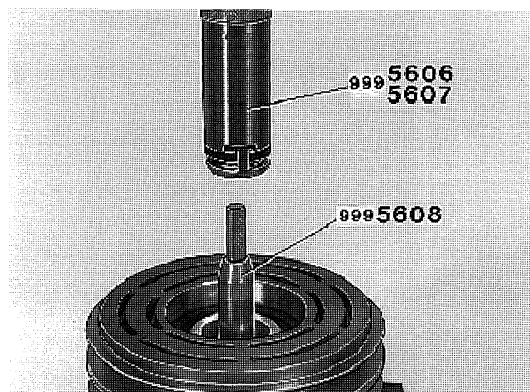
C14

Install shaft protection **999 5608** (10786). The
protection is to prevent damage to the carbon seal's
O-ring during installation

Lubricate the outside of the shaft protection with
compressor oil (ester oil) **P/N 1394828-6**.

C15

Install carbon seal



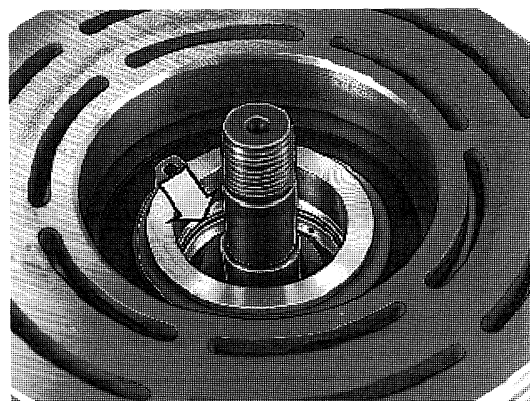
8701459S

NOTE! Do not touch the sealing surface with your fingers.

Drop a small amount of oil on inside and outside of the sealing surface. (Oil type, see C14).

NOTE! Turn the carbon seal's metal surface down toward the compressor. Insert the carbon seal in drift 999 5607 (10785) with **black** shaft. Press seal carefully down over the shaft. Make sure that the carbon seal metal retainer goes completely down in the shaft groove. Detach the tool counter-clockwise.

NOTE! It is **very important** that the metal retainer is located correctly. Operations B16 and B18 cannot be carried out if this is not done.

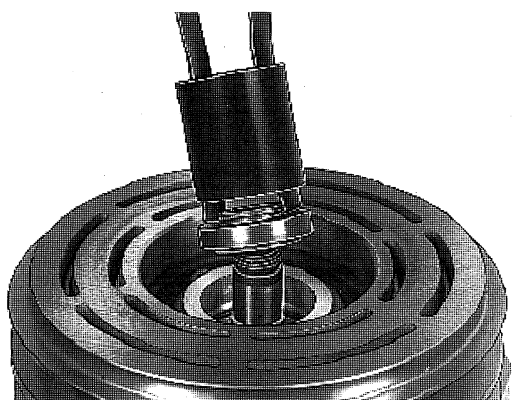


8701072S

C16

Install O-ring in compressor housing

Lubricate O-ring with ester oil P/N 1394828-6



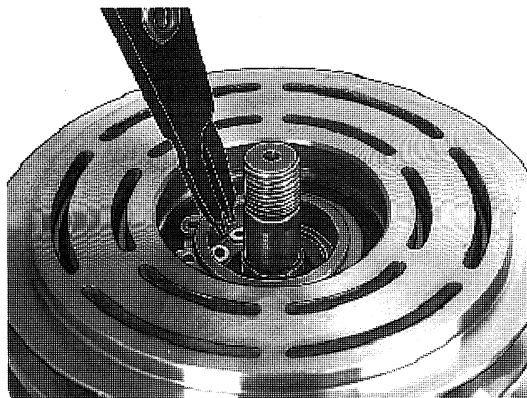
8701070S

C17

Install sealing washer

NOTE! Do **not** touch the sealing surface to the carbon seal (lower surface) with your fingers.

Press the sealing washer into place with the claw tool.



8701063S

C18**Install circlip**

Press down circlip and seal until the ring snaps into position.

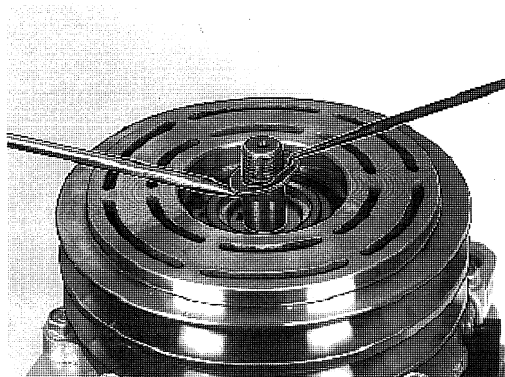


8701073S

C19**Install retainer with felt ring (felt surface down)**

Use a socket that matches the retainer (e.g. 20 mm, 13/16") to press with.

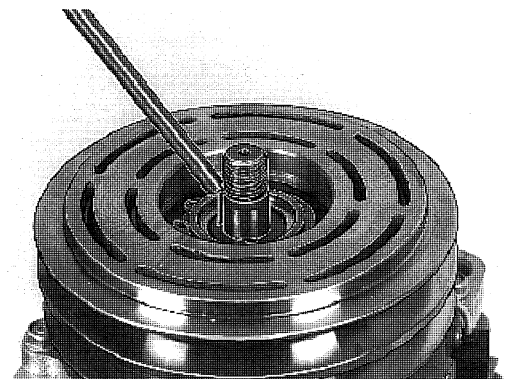
The upper edge of the retainer should be just under the upper edge of the neck of the compressor.



8701061S

C20**Replace the spacer washers**

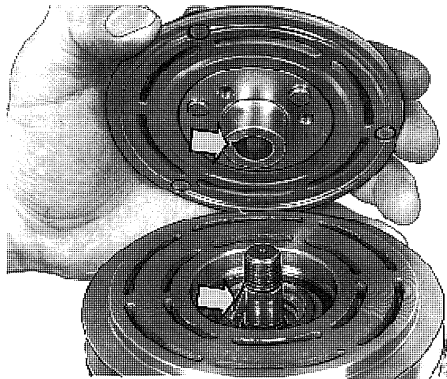
Replace in the same order in which they were removed. (see C7).



8701060S

C21**Install woodruff key**

Very carefully tap the locking wedge into position. Use a drift or screwdriver.



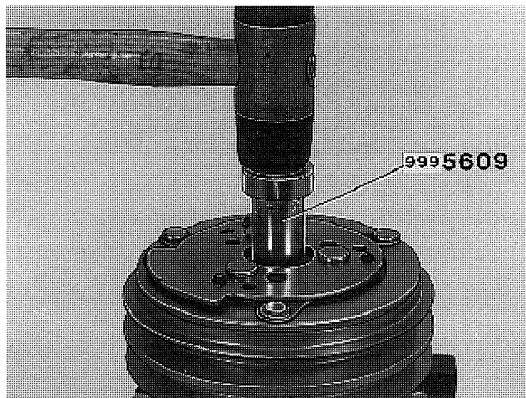
8701067S

C22

Install clutch plate

Ensure that the groove in the plate lines up exactly with the wedge. Use fingers to feel whether the clutch plate is located correctly.

Press the clutch plate down by hand as far as it will go.



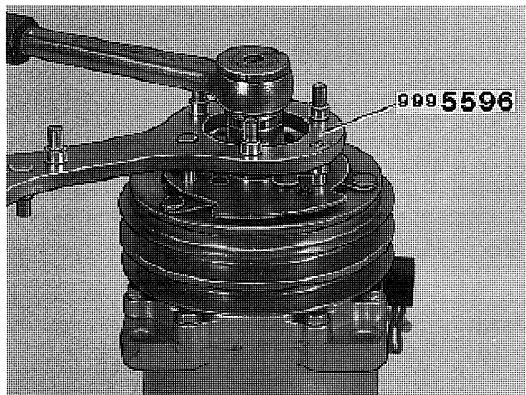
8701461S

C23

Very carefully tap the clutch plate into position

Use the puller **999 5609** (10787) from the tool kit.

Check that the locking wedge is visible in the groove and has not slipped down.



8701463S

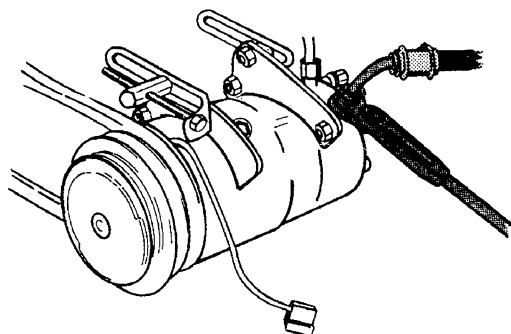
C24

Install and tighten the clutch plate retaining nut.

Use the counterhold **999 5596** (10204) and tighten to **38 Nm (28 ft. lbs.)**.

C25

Fill with 0.125 liters (4.23 fl. oz) ester oil



144233S

C26

Reinstall compressor in car

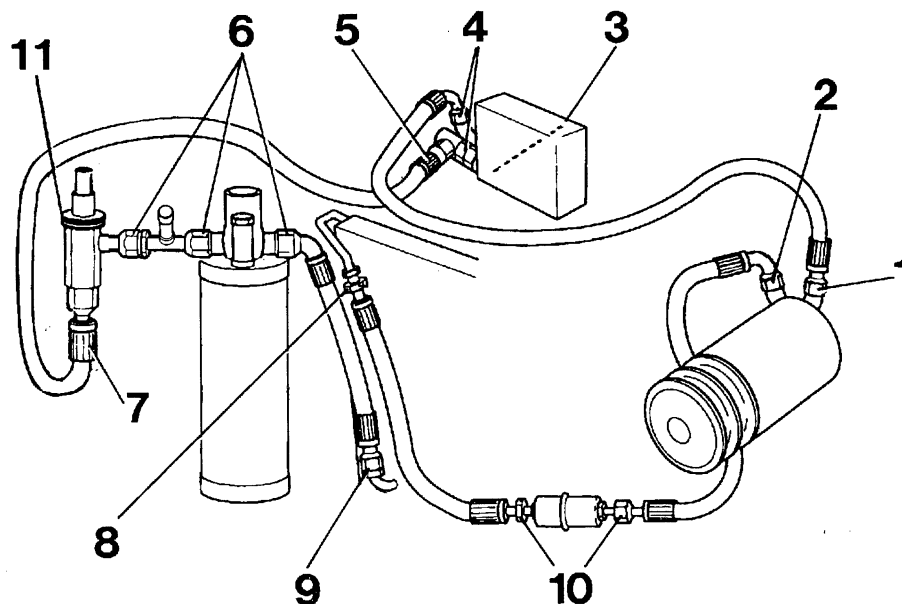
Refer to service manual Section 8 (82-88) TP 31120/1.

The tightening torques for the pipe connections can be found on page 27 and 28.

C27

Return to operation A16 and continue work

Tightening torques for hose and pipe connections on A/C unit 1975-1990

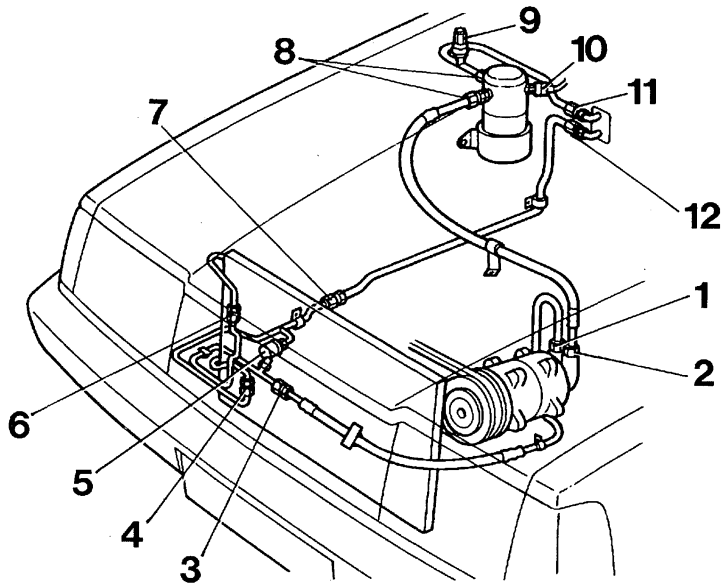


8701263S

1. Connection to compressor	30 Nm.	22 ft. lbs
2. Connection from compressor	30 Nm.	22 ft. lbs
3. Capillary pipes to expansion valve	17 Nm.	12 ft. lbs
4. Connection to and from evaporator	30 Nm.	22 ft. lbs
5. Connection to expansion valve.	30 Nm.	22 ft. lbs
6. Connection to and from drier and intermediate section with new filler valve	25 Nm.	18 ft. lbs
7. Connection from Filler valve	25 Nm.	18 ft. lbs
8. Connection to condensor	17 Nm.	12 ft. lbs
9. Connection from condensor	17 Nm.	12 ft. lbs
10. Connection to and from muffler*	17 Nm.	12 ft. lbs
11. Protective cap for filler valve	5 Nm.	3 ft. lbs

* The muffler is not available as a replacement part. If the muffler is defective, install **one** hose between the compressor and the condensor.

Tightening torques for hose and pipe connections on A/C unit 1991-1992



8701260S

1. Connection from compressor	27 Nm.	19 ft. lbs
2. Connection to compressor	39 Nm.	28 ft. lbs
3. Joint between hose and pipe, Compressor/condensor	24 Nm.	17 ft. lbs
4. Connection from condensor	20 Nm.	14 ft. lbs
5. Connection high pressure switch	12 Nm.	8 ft. lbs
6. Connection to condensor	24 Nm.	17 ft. lbs
7. Pipe between condensor and vaporizer/evaporator.	25 Nm.	18 ft. lbs
8. Connection to and from receiver.	45 Nm.	33 ft. lbs
9. Protective cap for filler valve.	5 Nm.	3 ft. lbs
10. Connection to low pressure switch (pressostat)	3.5 Nm.	30 in. lbs
11. Connection from vaporizer/evaporator	33 Nm.	24 ft. lbs
12. Connection to vaporizer/evaporator	25 Nm.	18 ft. lbs

WARRANTY STATEMENT: Claims may be submitted under the New Car Limited Warranty when a manufacturing defect is present using claim type: 01

Operation No.	Labor description	Time allowance	
87927-2	A/C Retrofit from R12 to R134a with high performance kit	1975-90	4.3 hr
		1991-92	3.3 hr