

VOLVO AC R134 refit kit instructions for the 700 series

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CFC-Free A/C Retrofit Kit for Pre-1993 Volvos

Introduction; Kit Contents: Page 1

Written by Dave Urban. Caution: This information is giving for purely information only. No Warrantee is either given or implied. Only people who have the correct equipment should perform this task.

Years ahead of legislation, Volvo first introduced CFC-free air conditioning on all of its U.S. and Canadian 1993 model cars.

With the public's increasing concern about the environment, Volvo released a retrofit kit for older model Volvos in the spring of 1993. The kit allowed Volvos with existing R12 freon based air conditioning systems to be converted to use a CFC-free refrigerant. Volvo was the first automobile manufacturer in the world to offer such a conversion kit for older model cars.

When I purchased my kit from my local dealer, I was shocked to find that it did not include any type of instructions. They were kind enough to fax it to me. This is a web version of the instructions that I received. I have added some of my own comments in *italics*. This is not a job for the weekend mechanic . It does require special tools. Some of those tools can be used at the shop then the work done at the house.

[Editor] When the instructions mention "torque joint to 12 Nm" this means to tighten until snug. Don't overtighten: the seal is made by the o-ring, not the threads. Lubricate the o-ring before installation with compressor oil; use a backup wrench on all fittings; and test with soap solution (which will bubble in the presence of a leak) after

Supplementary Kit 1, mainly for cars not equipped

- with, factory-fitted valve,
- with pipes or where pipe has
- been removed as a service fix

Supplementary Kit 2

- Shaft seal kit for cars equipped with Sandan Compressor



					Replaces 9145664- 0		
740/940		9145660- 8	9145661- 6		9134032- 3	9134344- 2 (SD- 510/508)	9134345- 9 (SD- 709)
B23F	-	*	-		-	-	-
B230F	-92	*	-		*	-	-
D24T	-87	*	-		*	*	-
B234F	-	*	-		*	-	-
B230FT	940SE USA Turbo 1991	-	*		-	-	-

The basic kit comes with

- *New receiver/Dryer*
- *R134a filler valve*
- *Ester Oil*
- *O-rings*
- *R12 Filler permanent Caps*
- *Circlip*
- *Kit costs: 9145660-8 - \$57.00*
- *Supplement #1 - \$30.00*

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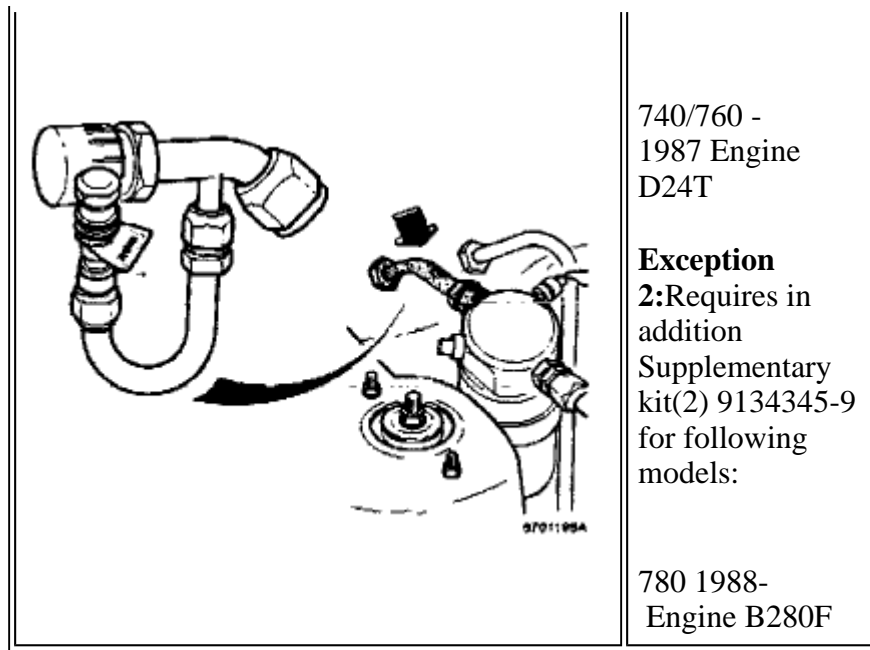
Contents of basic and supplementary kits from R12 to R134a

Note that both the basic and supplementary kits can have different part numbers. Some of the basic kits

may have different supplementary kits.

Use these pages a guidelines for the conversion of the A/C system

	<p>Basic Kit 9145660-8</p> <p>The illustration shows a car with the pipe runs and the factory filling valve installed.</p> <p>My car did not have this and need Sup kit#1.</p> <p>The basic kit has the new quick release valve that the R134a uses.</p>
	<p>This illustration shows a car not equipped with the factory filling valve. This can also occur if the A/C was installed as an accessory.</p> <p>In this case a Supplementary kit, PN 9134032-3 is also required which replaces the pipe shown in the upper part of the illustration.</p> <p>Exception 1: Requires in addition Supplementary kit (2) PN 9134344-2 for following models</p>

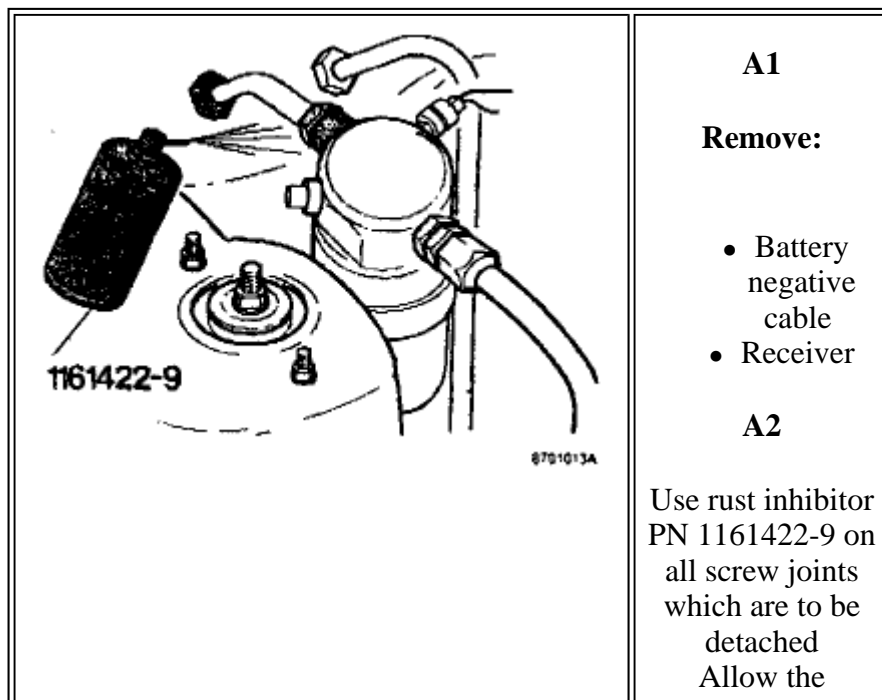


Conversion of A/C system form R12 to R134a Retrofit: Page 3

The method described below is for installing Basic kit PN 9145660-8. This is, in principle, the basic method for installing Basic PN 9145661-1 or supplementary kits according to the first two pages.

Empty refrigerant from System

This **MUST** be done by a licensed AC technician. The free release of freon R12 is a federal offense. Most places should do this for a small fee. This also helps remove the oil and the freon trapped in the oil that could cause problems later on because of the incompatibility between the two type of freon.

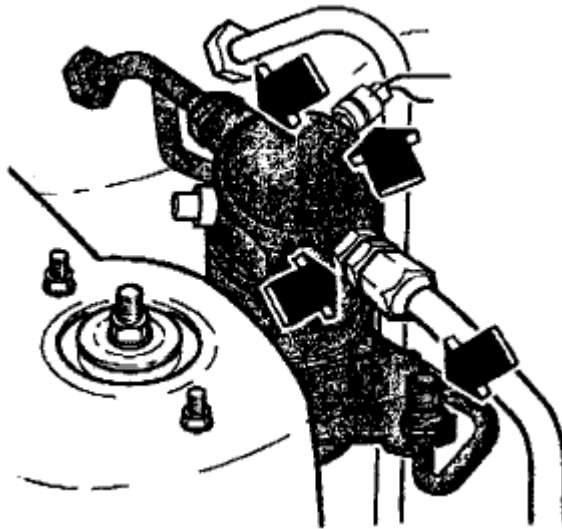


inhibitor several minutes to work before undoing screwed joints.

**NEVER USE
EXCESSIVE
FORCE**

Note: Under no circumstances use heat when removing

I didn't do this step and all went fine. I would say this is precautionary but not fully necessary



A3

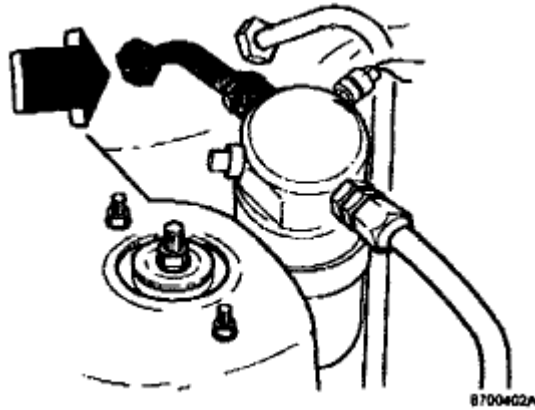
Detach:

- ETF/KRU valve bracket. Remove circlip and valve (where installed)
- pipe connections at the receiver inlet and outlet. *Be sure to use two wrenches when undoing connections so not to twist lightweight*

	<p><i>metal.</i></p> <ul style="list-style-type: none"> • the pressostat connector. Remove pressostat: this will be reused. This is the low pressure cutoff switch. <i>If defective you can purchase one at the local parts store for about \$12.</i> • Existing O rings (note sizes) Replace with new rings from kit on new equipment. <p>A4</p> <p>Remove screws holding the receiver clamp</p> <p>A5</p> <p>Lift out Receiver</p>
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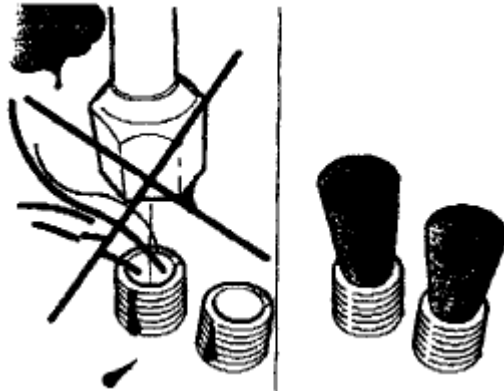
Conversion of A/C system form R12 to R134a Retrofit: Page 4

	<p>Remark:On older cars or cars where the A/C system was installed as an accessory, there is no EFT/KRU valve</p> <p>In this case remove the</p>
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pipe (see arrow) at the firewall. Then use Supplementary kit (1) PN 9134032-3 for installation.

Be sure to backup with a wrench both sides of the joint as no to twist the light metal.

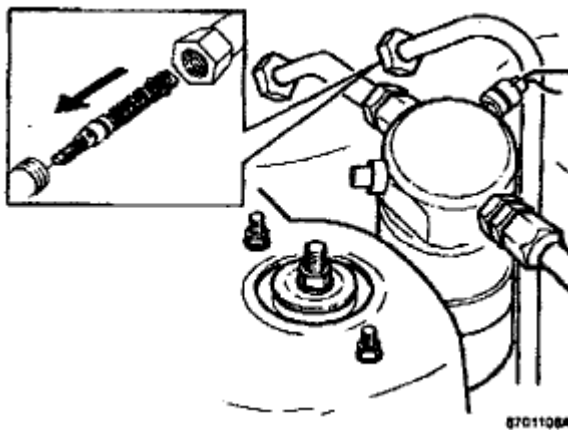


A6

Plug all open pipe ends to prevent moisture from entering the system.

A7

Wipe clean around all connections that have been opened.



A8

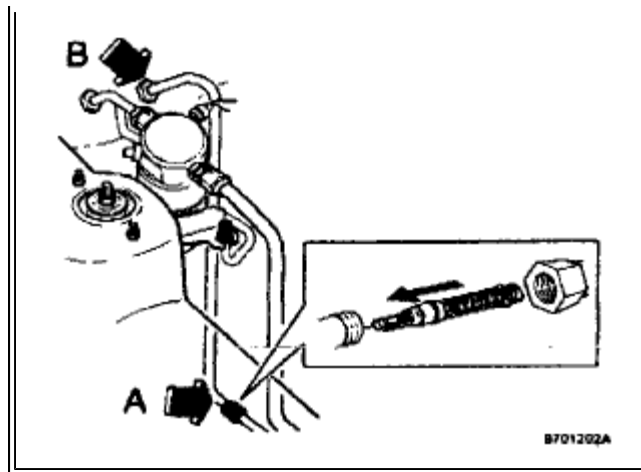
Expansion pipe (orifice) location:

On model years 1991 and earlier (780 -1990) the orifice is located in the receiver inlet at the firewall (see arrow).

Note: Make a point of noting how the orifice is sited in the pipe. Refer to this and the next illustration. Arrow B

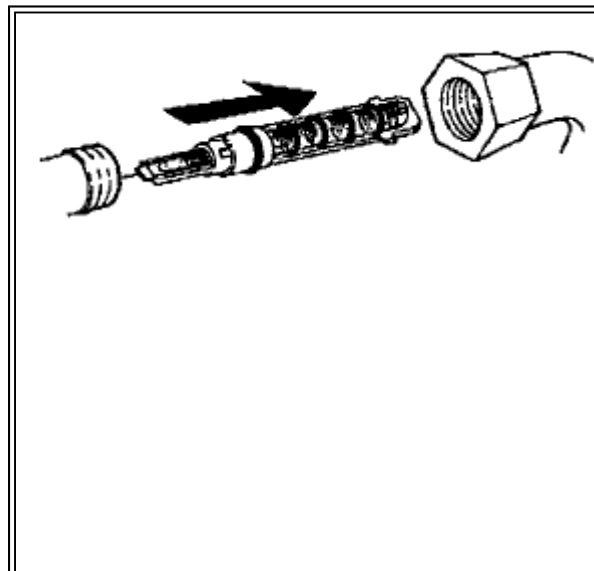
A9

On model year 1992 and later (780 1991-) the orifice is sited in the High-Pressure pipe at the pipe joint on the side member, Arrow A



Note: In some cases the work will be made easier if the pipe for the evaporator inlet is removed at the firewall (the right side pipe as shown at Arrow B). The O ring must then be replaced PN 3537503-9

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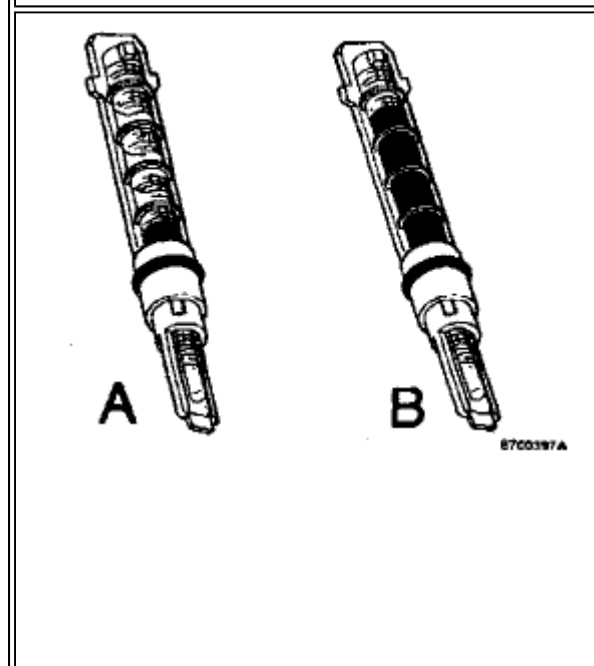
A10

Remove expansion pipe (orifice)

Clean the joint thoroughly

Remove the union nut

Pull or wiggle the expansion pipe out (it is not threaded). Take care not to break off the expansion pipe. Make sure the whole unit is removed.

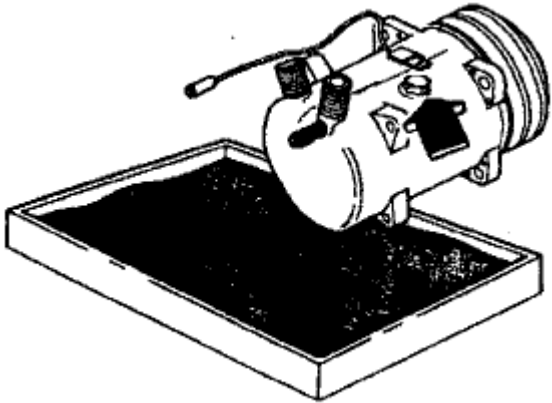



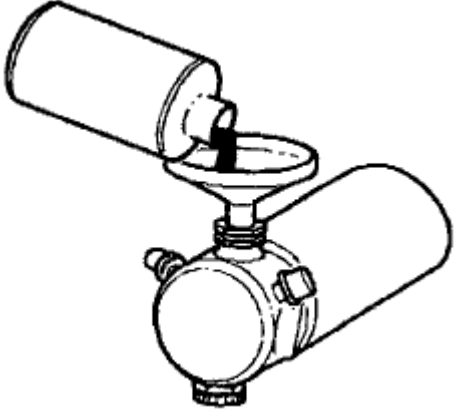
A11

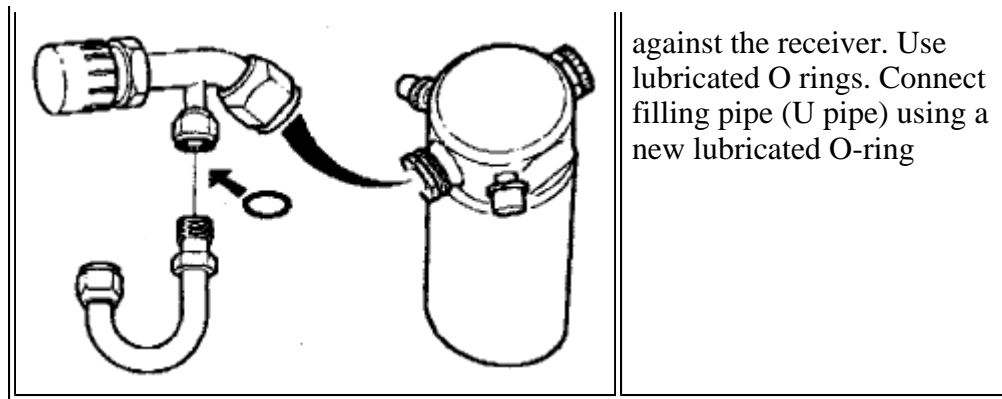
Inspect expansion pipes (opening's) filter section

If the filter is choked or there are a lot of metal particles in it (refer to illustration) then the compressor may be in poor condition and need replacing with a new unit.

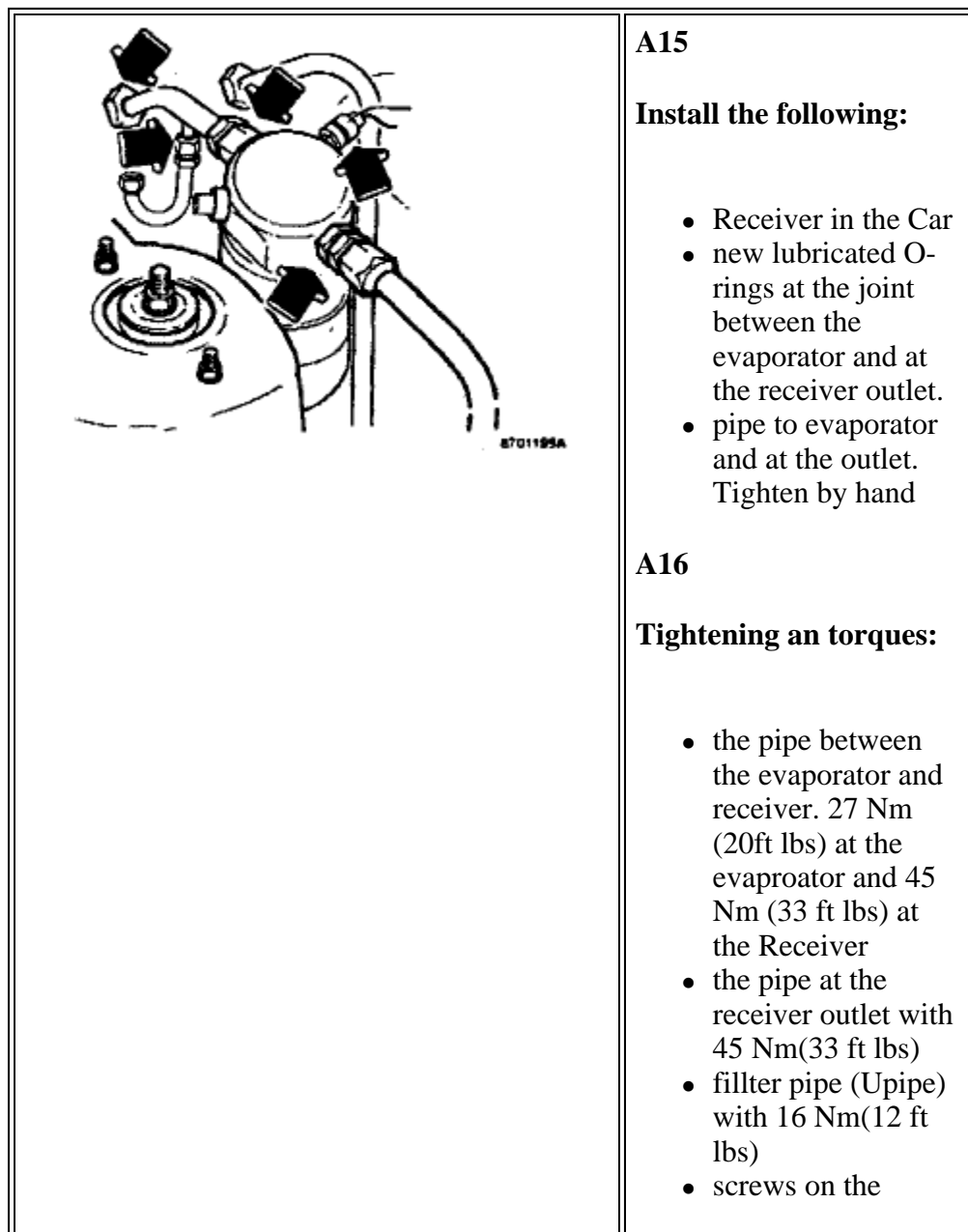
A rule of thumb: If more than 3 of the 5 filter sections are clogged (Fig. B) then the compressor oil

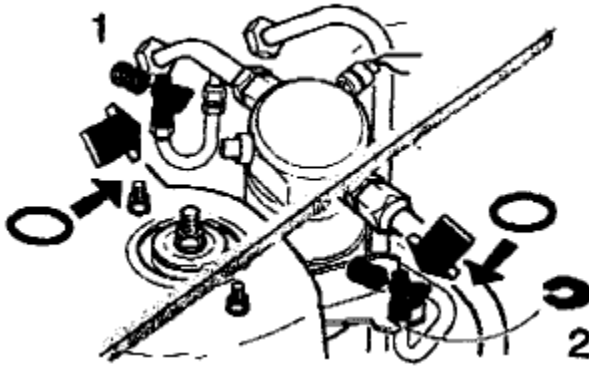
	<p>should be examined. If the compressor oil is black and heavily contaminated, or if the compressor is dry, then replace the compressor with a new unit. Fig A shows an orifice that is normal.</p> <p>After inspection the old orifice should be scrapped. The conversion kit contains a new one.</p>
	<p>A12</p> <p>If the compressor must be replaced:</p> <p>The new compressor unit as a replacement part is filled with mineral oil. Empty the oil and replace with ester oil (200 ml 6.76 fl oz) from the conversion kit</p> <p>Warning! Do not fill Receiver with oil if replacing the compressor. Only fill the compressor using the filler plug not through the inlet or outlet connections.</p> <p>Note! The O rings on the compressor inlet and outlet must always be replaced with new ones These Rings are not included in the kits and must be orded separatly</p> <p>For compressor replacement refer to the Service Manual Section 8 (82-88) Body Fittings, Interior, Climate Units 740, 760 1982-19...</p>

	<p>A13</p> <p>Install expansion pip (orifice).</p> <p>Install a new yellow lubricated O ring on the new expansion pipe. Compare size on the new O ring with the old one so they are the correct dimension.</p> <p>Install a lubricated O ring in the pipe joint at the firewall (or side member).</p> <p>Install expansion pipe (orifice).</p> <p>Tighten the joint to the evaporator (or the side member) to 12 Nm (9 ft. lbs).</p>
	<p>A14</p> <p>Top up the oil level in the new receiver</p> <p>Fill the receiver through the inlet side with ester oil supplied in the conversion kit (200ml).</p> <p>Note: If the compressor has been replaced and filled with ester oil in previous steps, no additional ester oil is needed in the receiver.</p>
	<p>A15</p> <p>Remarks: On older cars without pipes for ETF/KRU valve;</p> <p>Install pipes from Supplementary kit (1) PN 9134032-3 Finger tighten</p>



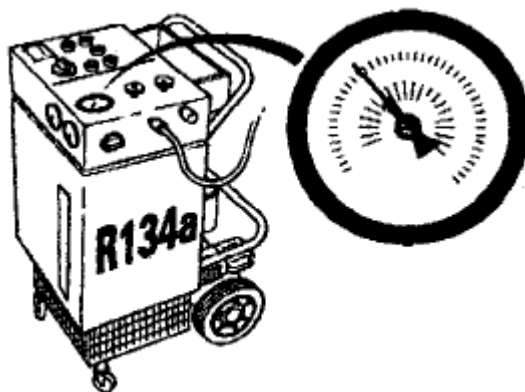
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	<p>receiver clamp</p> <p>A17</p> <p>Use a new O-ring for the old pressostat,(lubricate with ester oil) and install it on the receiver</p> <p>Compar size of the new O-ring with the old one to ensure correst dimension. Tighten the pressostat with 3.5 Nm(31 in. lb)</p> <p>A18</p> <p>Connect the connector to the pressostat</p>
	<p>A19</p> <p>Install the new SAE Filler valve for R134a</p> <p>Alternative 1: Use a new yellow lubricated O-ring and install on the filler pipe (U pipe). Insatll SAE filler valve. Tighten with 15 NM (12 ft. lbs)</p> <p>Alternative 2: Use a new yellow lubricated O-ring. Install on the filler pipe (U pipe). Insatll SAE filler valve and circlip (included in basic kit). Tighten with 15 NM (12 ft. lbs)</p>

Conversion of A/C system from R12 to R134a Retrofit: Page 8

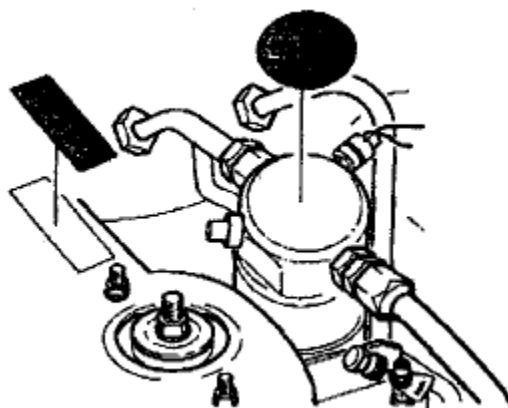
	<p>Inspect A/C System</p> <p>A20</p> <p>Vacuum pump the A/C system</p>
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Connect R134a recycling/filling unit. Start vacuum pumping and continue for at least **50**

min.

Check that system keeps a vacuum. The vacuum must not sink during a 4 min period. (This is with the vacuum turned off) The recycling/filling unit is not required for this step. I used a standard AC vacuum from a R12 system. and connected it to the other R12 charging port opposite the pressostat (See arrow in the bottom picture) and ran the vacuum for the 50 min.



Finalizing work

A21

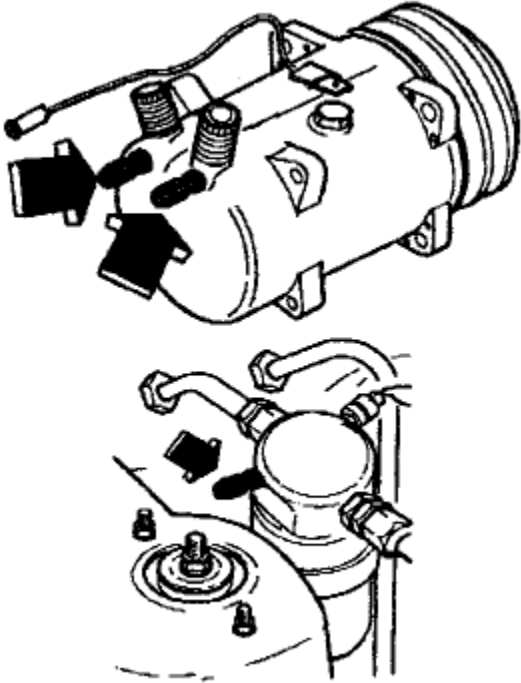
While evacuating, the following work can be carried out:

Complete the light blue rectangular R134a RETROFIT label before the protective paper and carbon is removed

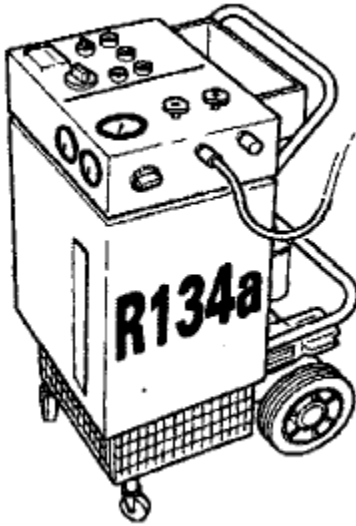
Using ball-point pen, note:

- technician initials
- dealer number, if applicable (or repair shop name, city, state)
- Date

Carefully clean off the old r12 decal on the body work, remove the carbon paper and stick the new, light-blue R134a RETROFIT lable over it. Make sure the old label is

	<p>completely covered.</p> <p>Using mineral spirits, clean top of accumulator, then stick the round R134a RETROFIT decal on the receiver.</p>
	<p>A22</p> <p>Install the caps (included in kit) in the service valves which are no longer used.</p> <p>Two on the compressor (in certain cases there are none on the compressor) and one on the receiver (see illustration below)</p> <p>Use locking fluid PN 1161351-0 or equivalent on the caps.</p>

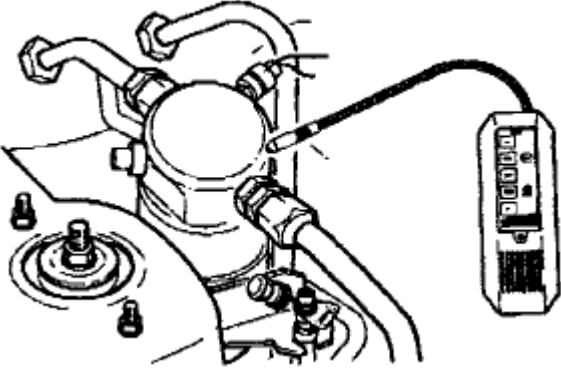
Conversion of A/C system from R12 to R134a Retrofit: Page 9

	<p>A23</p> <p>Refilling system with refrigerant</p> <p>On completion of vacuum pumping, fill system with max. 200 grams (0.44 lbs) refrigerant R134a</p> <p>Leakage testing after filling. Use leakage detector.</p> <p>Repair any leaks.</p> <p>When no leakage is detected fill with remainder of refrigerant R134a to the</p>
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[amount stated below](#). (the link refers to a table of refrigerant capacities)

740	- 1990	2.4 lb
760	- 1987	2.4 lb
780	- 1991	2.4 lb
740/940	91- 92	2.1 lb
940SE/760/960	88- 92	2.0 lb

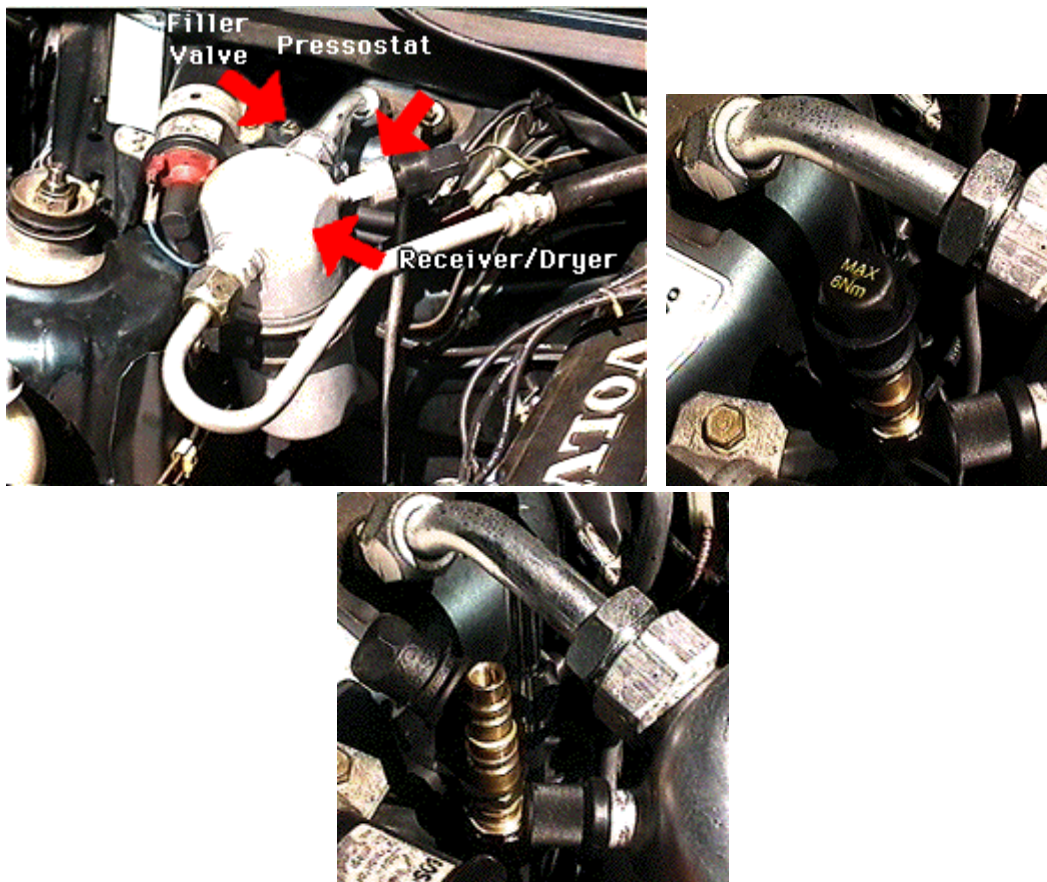
I applied the small amount of freon from a filler hose that I purchased at a local parts store where I purchased the freon cans. One end screws onto the can and the other snaps onto the filler cap installed previously. Hold the can upright so gas, not liquid, is sucked into the system. I then opened the valve and let the vacuum suck the initial freon into the system and then the can provided enough pressure to trigger the pressostat switch to turn on the compressor. I started the car and turned the A/C system on to max cool and raised the idle and made the compressor suck the freon out of the can. I have a 88 740 which requires 2.4 lb or 38 oz. The cans are 12 oz. I put in 36 oz and saved the other can for a spare. Once freon is added check for proper cooling, and your done. The remainder is if you could pump the correct amount in the system.

	<p>Verify Functions</p> <p>A24</p> <p>Start:</p> <ul style="list-style-type: none">• Engine• A/C System <p>Check that:</p> <ul style="list-style-type: none">• Compressor starts and operates normally without unusual noise• In car air is cooled. <p>Stop engine</p> <p>Check for leakage with leakage detector Repair and leaks indicated.</p>
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This is my 1988 745 Volvo which has had the AC RETROFIT



Here are some pictures of the retrofitted parts. Looks about the same.



Here is the filler cap and the filler cap opened. Notice that the filler is a quick release connection. You can also see the U joint from supplementary kit (1)

Here is a picture of the notice stickers you put on the car.



