

# VOLVO

**200**

SECTION 8      GROUP 87      NO. 217

## Service Bulletin

DATE  
Apr. 1996

Fault tracing

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

Repairs

200

Maintenance

Page 1 of 28

REFERENCE: TSP1120/1, SECTION 8 (82-88), BODY FITTINGS, INTERIOR, EXTERIOR, HEATING AND AC, 200 1975-192.

This service bulletin replaces the earlier service bulletin 87-217 dated August 1993, which should be discarded.  
XX

### Conversion of A/C system from R12 to R134a "Retrofit"

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

#### Contents

	Page
Preparations for retrofitting A/C systems . . . . .	2,12
Equipment and material for retrofit (1975-1990/1991-1992) . . . . .	3,12
Checking the A/C system (1975-1990/1991-1992) . . . . .	4,12
Conversion of A/C system from R12 to R134a (1975-1990/1991-1992) . . . . .	5,14
Shaft seal on compressor Sanden 508/510, replace . . . . .	19
Tightening torques for hose and pipe connections . . . . .	27,28

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 chlorofluorocarbon CFC-12 (Freon®). Instead, hydrofluorocarbon 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

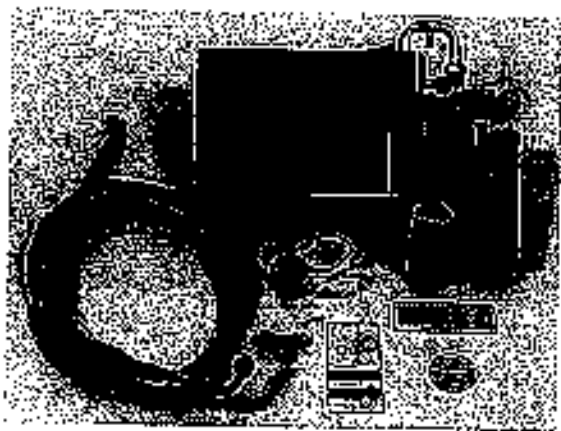
If it is cold outside, move the car into the workshop the night before, if possible, but at least two hours before starting work. The ambient temperature should be preferably 88° F (20° C).

**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.

**NOTE!** On conversion from R12 to R134a (Retrofit), it is very important that only refrigerant R134a is used. The results of using other refrigerants could be complete mechanical failure of the compressor, fire or explosion.

## 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:

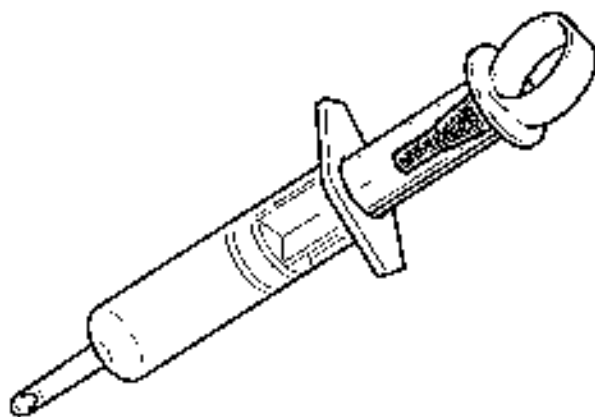
- R12 recycling/filling unit
- 134a recycling/filling unit
- leakage detector

### Material:

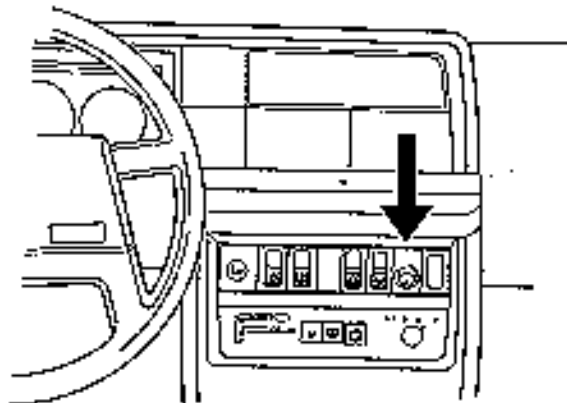
Retrofit kit, P/N 9134808-6 (see illustration)

### 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.



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



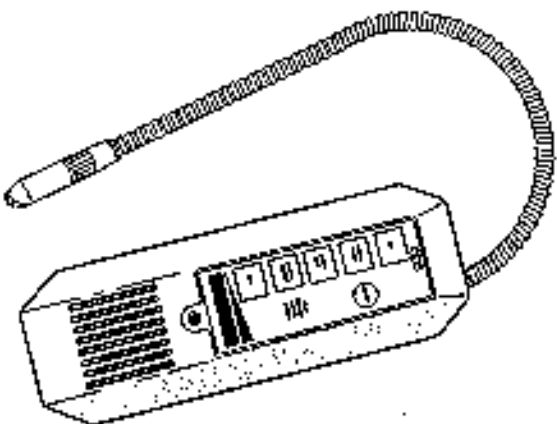
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### Start engine

- 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.

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

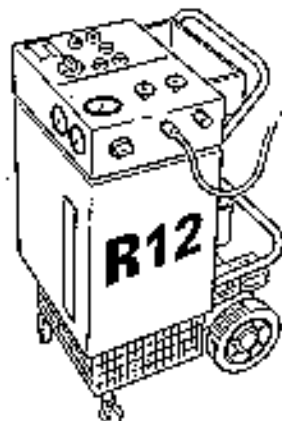
- turn off engine (after running for 40 minutes)
- leak detection. Use leakage detector.
- connect R12 recycling/filling unit. A general collection unit may also be used.
- evacuate the system on R12 unit until a vacuum has been created (approx. 10 minutes)
- disconnect the recycling/filling unit
- replace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



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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.

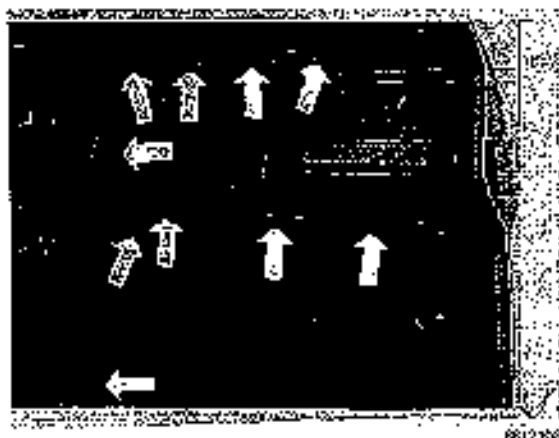


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#### NOTE!

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



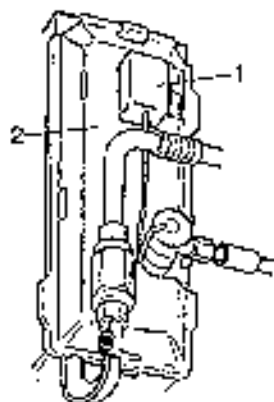
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A4

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

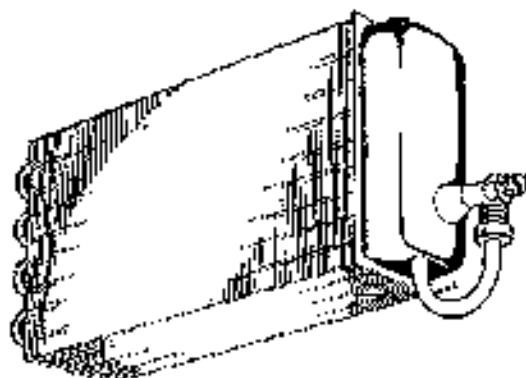
(Applies only to 240 cars, model years 1975-1978).

**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).



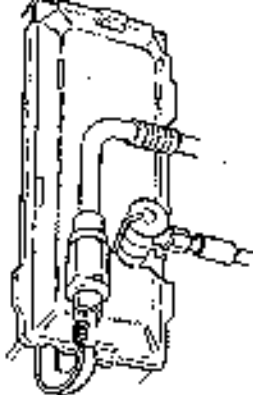
A7

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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**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.

A9

### Install the new expansion valve.

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

A10

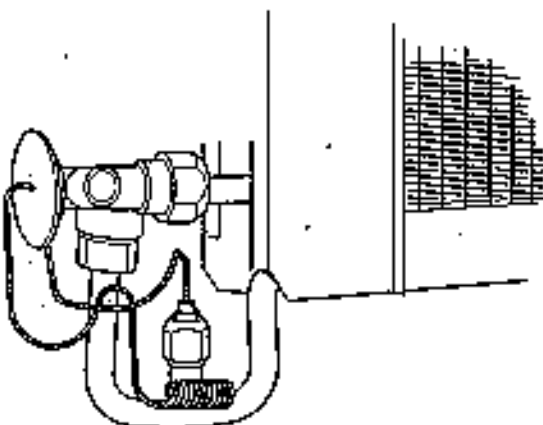
### Connect the refrigerant hoses

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



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**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.**

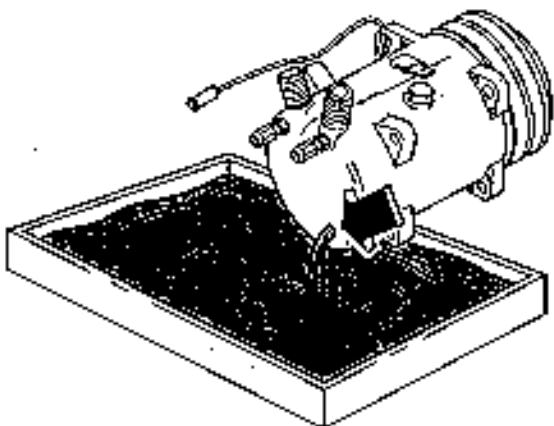
**NOTE!** On York and Delco compressors an additional 0.125 liters (4.23 fl. oz) is required.

A14

**If the compressor must be replaced:**

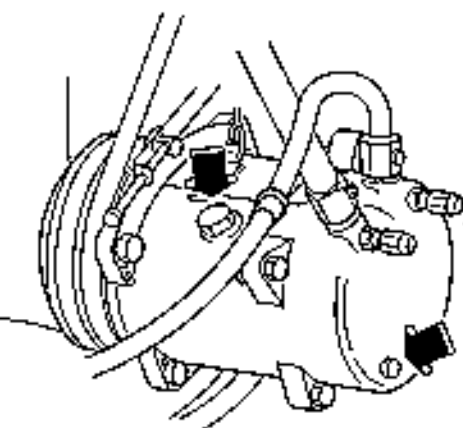
**Drain oil. New compressors are always filled with mineral oil**

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



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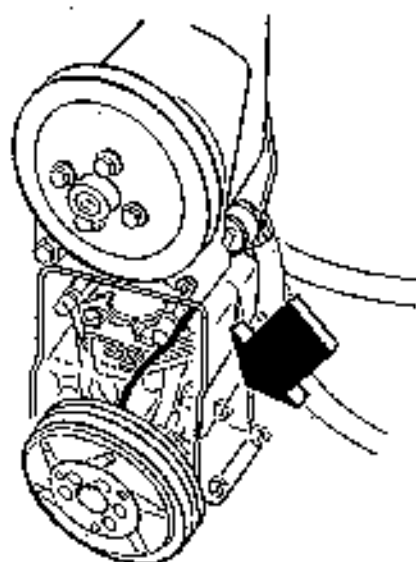
If the compressor is not to be replaced:



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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.



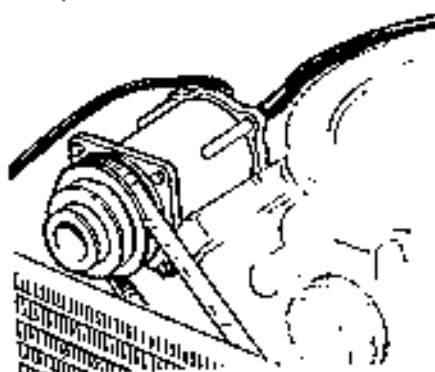
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**On early models with York compressor:**

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.



**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

### Install the new drier in the car

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

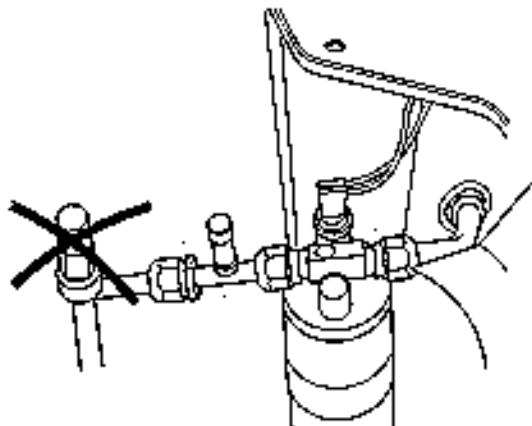
Use new O rings. Lubricate the O rings with a few drops of ester oil remaining in the can.

#### 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

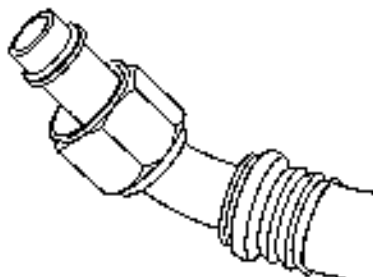
### Replace hose between compressor and condensor

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).



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

## Check the A/C system

A18

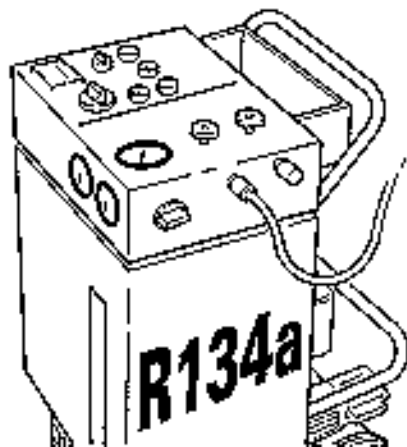
### Vacuum pump the A/C system

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



## Finalizing work

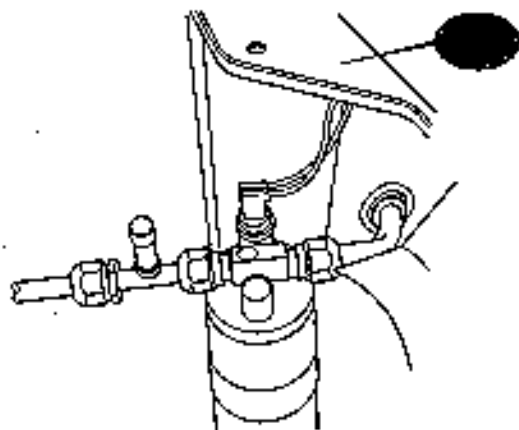
A19

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

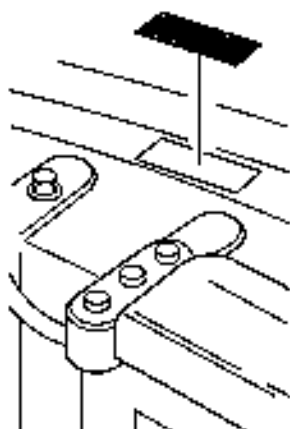
Apply the new round R134a "RETROFIT" label next to the receiver.

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.



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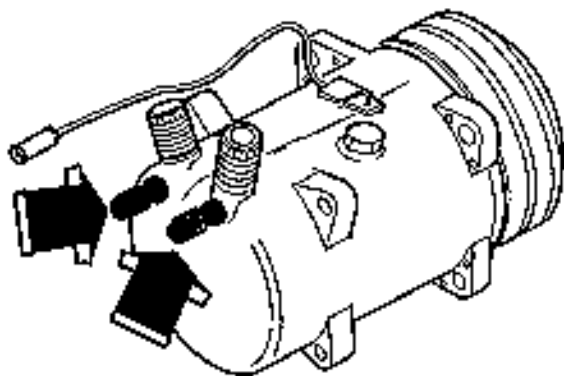
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A20

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

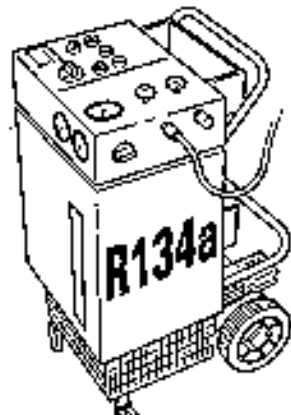
Use locking fluid P/N 1161075-5.

*\* Leave Low Pressure Side open so you can install a R134a Low Side adapter for filling. Available from Napa, per boys, etc.*



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A22



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### 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 manufacturer's instructions.

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.).

A22

### Verify A/C functions

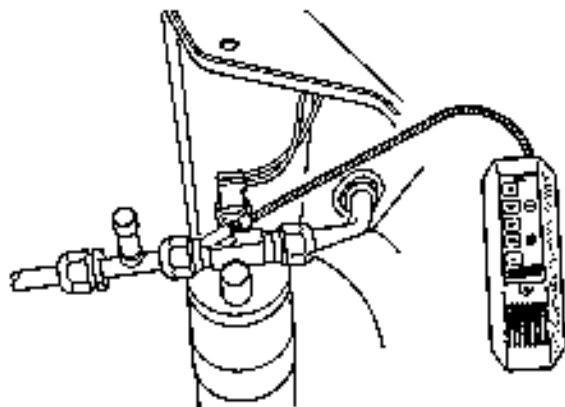
Start engine and turn on the A/C system.

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 176-179. 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.



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**END OF RETROFIT PROCEDURE FOR  
MY 1976-1990.**