

## BULLETIN

MAKE / MODEL:

All

YEAR:

1994

ENGINE CODE:

All

SUBJECT / SYMPTOM / TROUBLE CODE:

A/C system - Oil, oil types, oil distribution, oil quantity

SOLUTION:

This shows the average distribution of oil in an air conditioning system.

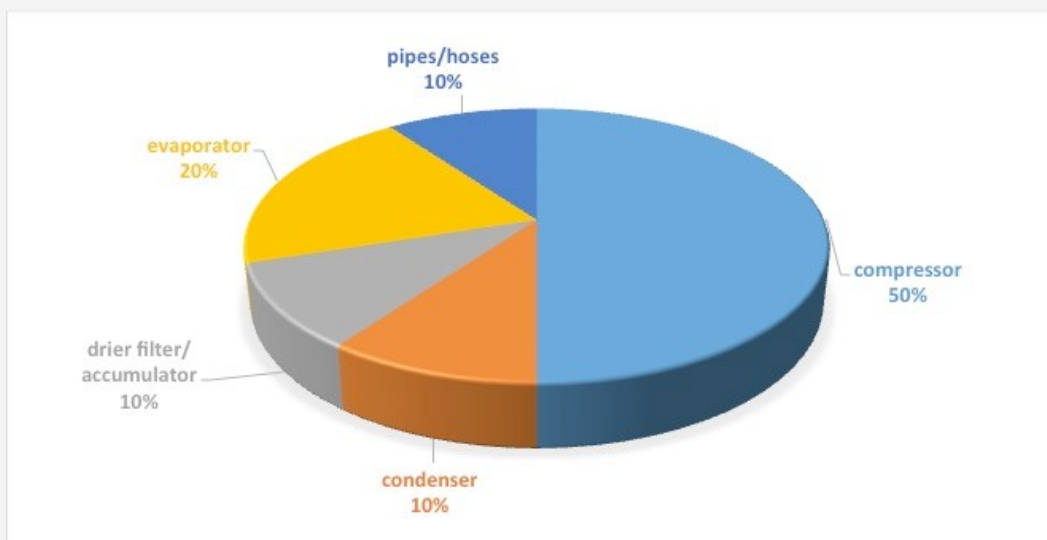
**Not applicable to electrical compressors (EV/Hybrid).**

This overview can be used to calculate how much oil you need to add to the air conditioning system when replacing various components.

You calculate % from the total quantity of oil, which is stated in the data of the car.

This is typically between 80-160 ml.

## Oil distribution



It is important to abide by the manufacturer's recommendations regarding:

- Oil type (may be available on the compressor)
- Oil quantity
- Viscosity

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## SOLUTION CONTINUED:

Normally, data for oil quantity is the total oil quantity filled in the entire A/C system when assembled in the factory.

This means that if data is 150 ml and you only replace the compressor, only 75 ml should be in the compressor (50 %).

Most compressors come with the total oil quantity (e.g. 150 ml).

In these cases, you must drain the oil quantity calculated from what is left in the components, which have not been replaced.

An example:

Data states 150 ml.

You replace compressor, drier filter, condenser.

This means that oil still remains in evaporator and pipes.

Evaporator 20 % = 30 ml

Pipes/hoses 10 % = 15 ml

So you must drain 45 ml from the new/reconditioned compressor, which came with 150 ml.

However, please note that you can never be certain that the oil quantity in the system corresponds to data.

**Therefore, it is important to drain the oil from the old compressor and compare this with 50 % of what data prescribes to be the total oil quantity.**

It is also a good idea to fill 10 ml extra.

In this case, we end up draining only 35 ml from the compressor.

Fitting instructions for the new compressor should be available.

If not, you should consult the manufacturer.

You may also want to flush the entire system (except drier filter and expansion valve) in order to remove oil from the components, which have not been replaced during the repair.

You can now fit the compressor with the total oil quantity of e.g. 150 ml.

Using this method, you are sure that the oil quantity is correct.

If the system has been flushed, e.g. in the evaporator, you must add the oil quantity, which was in evaporator and pipes, to the previously mentioned 50 %.

**Important! Fill the oil, which must be in the evaporator, into the pipe of the evaporator low-pressure side.**

Do like this because then the oil will start flowing in the system and lubricate the new compressor.

At full system operation, it will take approx. 1/2 hour for the oil to spread in the entire system.

When filling a small quantity of oil into the evaporator, you ensure that the new oil lubricates the compressor somewhat faster.

See example in bulletin No. 5759.



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SOLUTION CONTINUED:

The purpose of the oil is to:

- Lubricate the system
- Assist heat exchange in the refrigerant

It is important to use the correct type of oil and viscosity to the air conditioning system.

If you use incorrect viscosity, for example too thick, extra energy is required for the compressor to press it through the condenser.

It generates more heat, and consequently the compressor may be damaged.

### PAO:

Used in older systems. It does not mix with Ester oil or PAG.

It should be used only with R134a. Do not mix with PAG.

### POE/Ester Oil:

Was used to convert R12-R134a. It is very hygroscopic.

If in doubt, it can be mixed with PAG.

### PAG/PAG R1234yf:

This oil is most commonly used by car manufacturers.

**It is highly hygroscopic!** If it has been in atmospheric pressure for more than 1 hour, it is damaged.

**Therefore, it is important to seal open connections during repairs.**

It is available in 4 viscosities and 2 qualities.

Viscosity: R134a, 46 - 100 - 125 and 150

Single end-capped (inexpensive).

Double end-capped. High quality oil is used.

Furthermore, additives are added to improve:

- Quality
- Heat resistance
- Moisture absorption
- Thermal stability
- Viscosity at low temperatures

**We recommend to use only double end-capped oil in systems using R1234yf.**

