Filling capacity	Model	kg
Refrigerant R 12	126	
Refrigerant bottle R 12		approx. 7.5
One-way bottle Frigen-Baby R 12		approx. 0.430

[1] For filling capacity of air-conditioning system refer to sticker on stiffening above condenser.

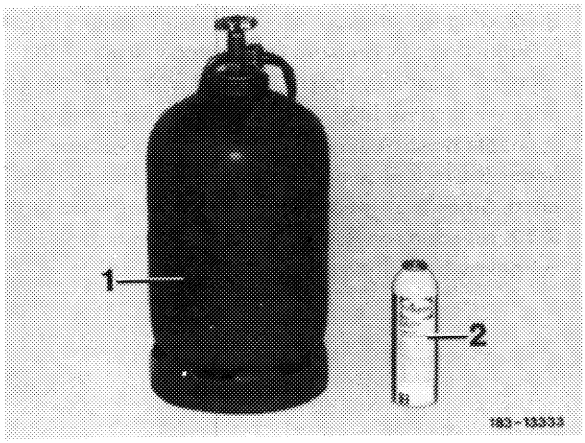
Conventional tools

Assembly tester with 3 filling hoses and vacuum pump or evacuating and filling unit (service unit) for air-conditioning system	
Line connection reduction piece 7/16"–1/4" for refrigerant bottle or tapping valve for Frigen-Baby bottle	e.g. made by Christof Fischer Augsburger Straße 289 D-7000 Stuttgart 60
Filling aid type CH 200 and angle piece 90° with rapid screw connection 7/16"	
Double open end wrench 1/2" x 9/16"	

Note

The jobs for refilling and filling up of air-conditioning system are in principle alike. When refilling, evacuate system first (83–512).

Note! Filling requires a supply bottle (1) with refrigerant, which is commercially available just like e.g. a supply bottle with oxygen or acetylene gas. In addition, there are small cans (2 [Frigen-Babies]), containing approx. 1/2 liter R 12. If hard to obtain, contact one of the specialist companies manufacturing or operating refrigerating units.



Since the refrigerant in the supply bottle is under pressure and liquid, and will flow in the shape of gas when filling the air-conditioning system without a filling cylinder or when refilling, it is recommended (at least when the supply bottle is already partially empty) to place the supply bottle in a water bath of **max. 40 °C.** If the system is completely empty, the refrigerant can also be filled-in in liquid shape via pressure end upon evacuation. Filling up can be done only in the shape of gas with the system switched on. **When filling the system from a refrigerant bottle of 10 kg or 20 kg capacity, a scale with 100 g graduation for the bottle or a filling cylinder will be required.**

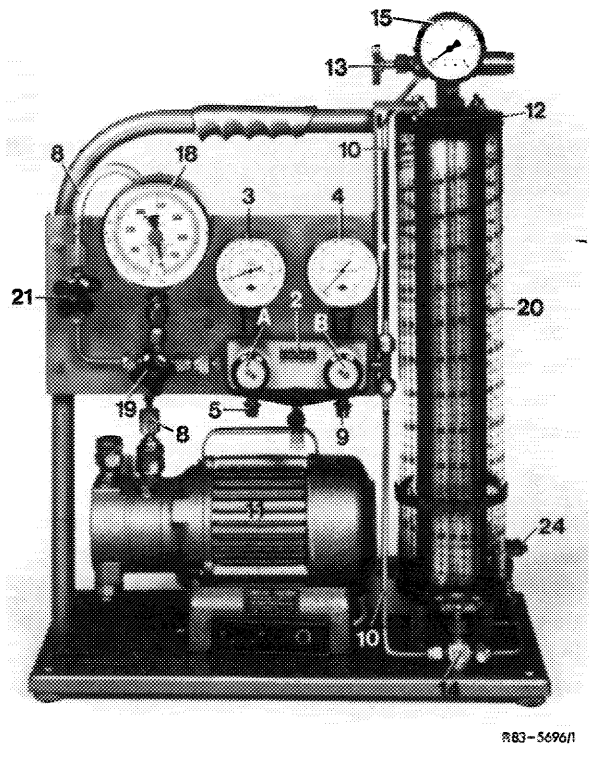
Attention!
If filling-up in the shape of gas, the supply bottle should always be set up with the lock in upward direction.

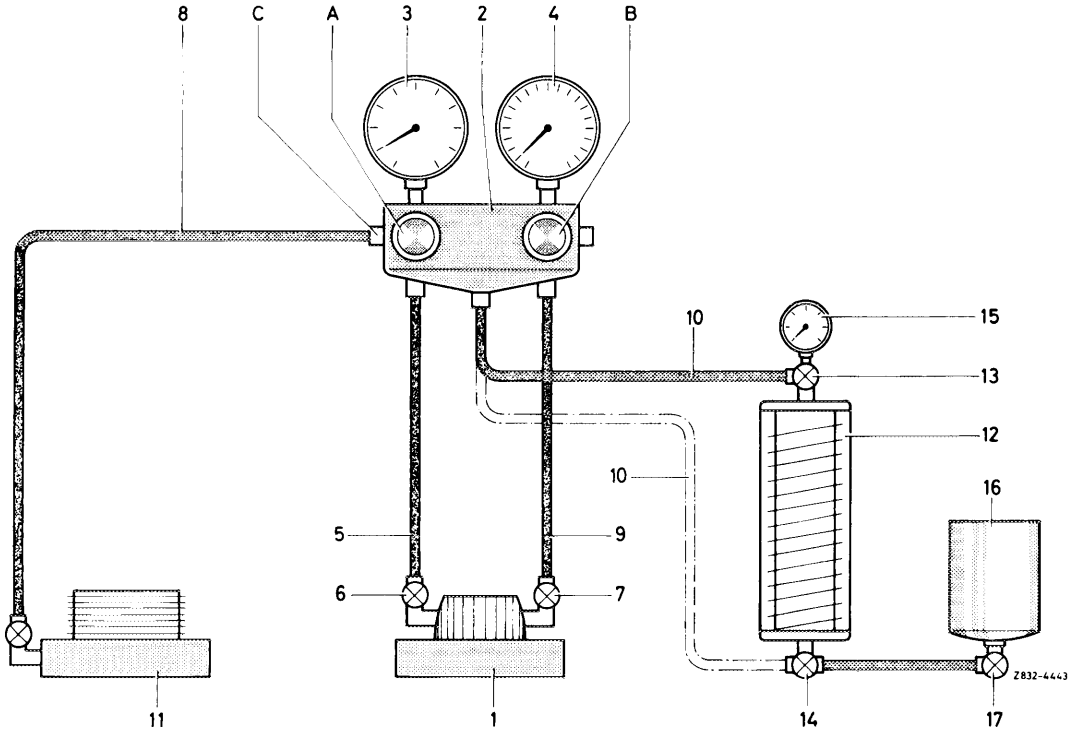
A. Filling system with filling cylinder or service unit

Note: The filling cylinder (12) serves for the accurate filling of the desired quantity by weight of refrigerant.

If the temperature of the refrigerant, which is inside the closed cylinder, is increased, the pressure and the specific volume of the liquid refrigerant will also be increased.
If an accurate quantity by weight is taken from a cylinder provided with a sight glass, it will be necessary to compensate the changes in specific weight caused by the changing temperature.

By reading the pressure on the pressure gauge (15) and by adjusting this pressure on the upper scale of the rotatable plastic cylinder (20), and with reference to refrigerant to be filled in as stated on lower rim of rotatable plastic cylinder, the changes in volume under the influence of temperature can be compensated. Since the air-conditioning system is filled with R 12, set scale for R 12 at lower rim of plastic cylinder when filling up.

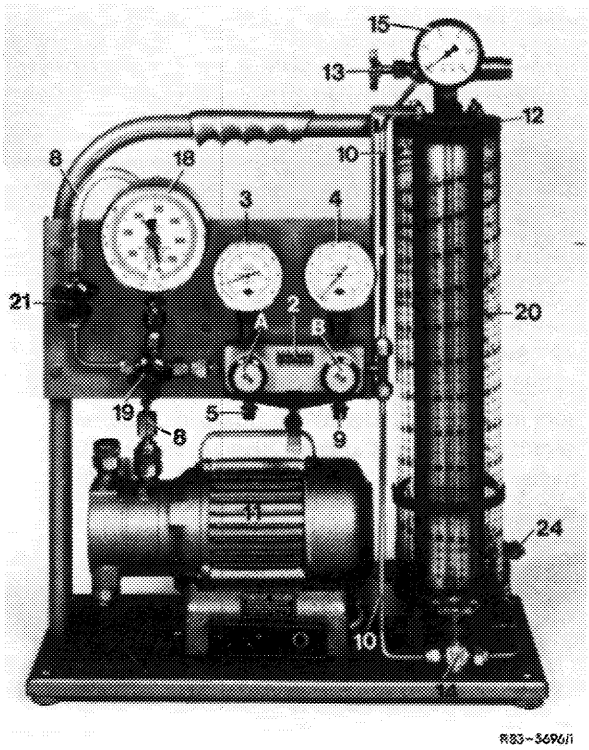




Assembly tester and filling cylinder with all connections

A Valve on suction pressure gauge
B Valve on high-pressure gauge
C Schrader valve on assembly tester
1 Refrigerant compressor
2 Assembly tester
3 Suction pressure gauge
4 High-pressure gauge
5 Hose line
6 Service valve (suction end)
7 Service valve (pressure end)
8 Hose line
9 Hose line
10 Hose line
11 Vacuum pump
12 Filling cylinder
13 Upper valve
14 Lower valve
15 Pressure gauge
16 Refrigerant bottle with R 12
17 Valve on refrigerant bottle

Attention!
When filling with the service unit, make sur that valve (19) for torr meter (vacuum meter) is closed. If the torr meter is under a pressure of above 1.2 bar, meter is defective and can no longer be used.



a) Filling with filling cylinder

11 Connect a hose line to valve (24) at bottom on filling cylinder (12) and to valve (17) on refrigerant bottle. Then place refrigerant bottle (16) on its head (with valve in downward direction).

12 Open valves (14, 17 and 24) on filling cylinder and on refrigerant bottle. Open valve (13) at top on filling cylinder for a short moment so that air and gas can escape from filling cylinder.

Note: Heating of refrigerant bottle in water bath up to **max. 40 °C** (for safety reasons other heat sources may not be used) will considerably accelerate the filling procedure.

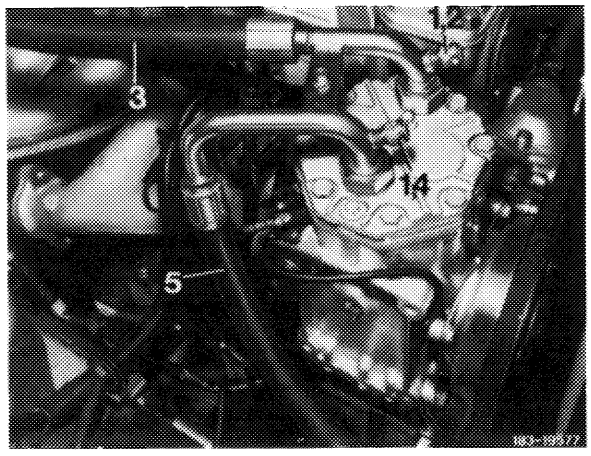
13 As soon as liquid refrigerant shows up in sight glass, close valve (14). Turn plastic cylinder in such a manner that the reading on its upper pressure scale agrees with pressure indication on pressure gauge (15), using graduated scale for R 12.

14 Open valve (14) again and add specified quantity of refrigerant. Then close valves (14, 17 and 24).

15 Unscrew hose line from refrigerant bottle.

16 When working with filling cylinder and assembly tester, connect hose line (10) to center connection of assembly tester (2). When filling-in gas (via suction end) connect hose line (10) to valve (13), when filling-in liquid (via pressure end) connect hose line (10) to valve (14).

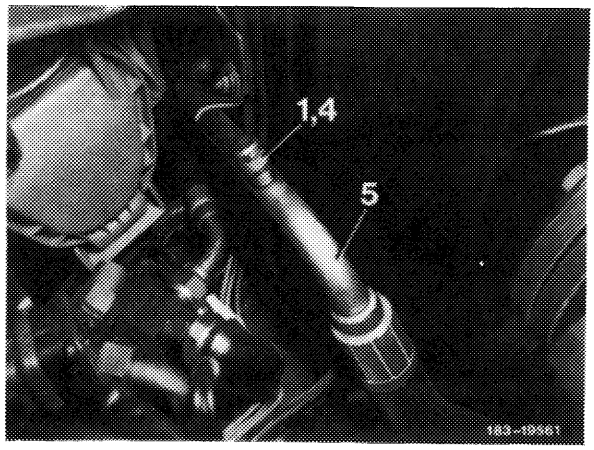
17 Switch-on electric heater installed in filling cylinder (12). The electric heat will increase the pressure in filling cylinder. When filling-in liquid refrigerant a pressure of at least 7 bar is required. The higher the pressure, the faster and more complete will the liquid refrigerant flow into system.



York refrigerant compressor
Engine 110

18 Remove closing caps (1) from service valves and connect hose lines (5 and 9).

19 Evacuate air-conditioning system (83–512).



Delco refrigerant compressor
Engines 116 and 117

b) Filling-in liquid refrigerant

20 Close valve (A and 19). Open valve (B) on assembly tester (2) and open valve (14) on filling cylinder (12).

21 Watch refrigerant level in sight glass of filling cylinder until the specified quantity of refrigerant is completely in system. Open valve (A).

22 Switch-on air-conditioning system and set to full refrigerant capacity.

23 As soon as the increased pressure in pressure gauge is identical with pressure in suction pressure gauge, close valves (A and B) again. Opening of valve (A) will deliver the refrigerant still in hose line (10) into system.