## A. Engine 110

**Oil capacity**

Oil type cold-flowing oil (for approved cold-flowing oils refer to specifications for service products, page no. 361)

| Oil level | | min. | normal | max. |
|---|---|---|---|---|
| Oil quantity in cc | | 180 | 240 | 300 |
| Refrigerant compressor | Dipstick depth mm | 22 | 25 | 28 |

| Tightening torques | Nm | (kpm) |
|---|---|---|
| Suction or pressure hose to refrigerant compressor | 40–45 | (4.0–4.5) |
| Inch screw (7, 12) carrier to refrigerant compressor | 30 | (3) |
| Screw M 12 x 1.5 (13) carrier to cylinder head | 45–5 | (4.5–0.5) |
| Screw M 10 x 40 (14) carrier to cylinder head | 30–5 | (3–0.5) |
| Screw M 8 x 55 (17) carrier to water pump | 30 | (3) |
| Nut M 10 (22) carrier to intake pipe (gasoline engines) | 50 | (5) |
| Screw M 10 x 25 (18) carrier to intake pipe (diesel engines) | 50 | (5) |
| Necked-down screw (21) belt-tensioning roller | 45 | (4.5) |
| Inch screw (51) coupling to refrigerant compressor | 25 | (2.5) |
| Oil check screw | 6–8 | (0.6–0.8) |

**Special tool**

| | | |
|---|---|---|
| Pulling-off screw for pulley |  | 100 589 00 35 00 |

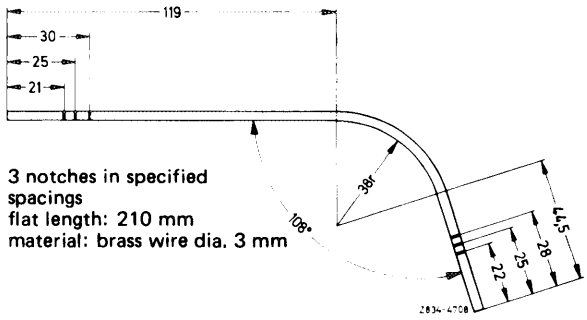
**Conventional tools**

Double open end wrench 1/2" x 9/16", 5/8" x 3/4", 7/8" x 15/16", 1" x 1 1/8"
Socket 1/2"

**Self-made tool**

Oil dipstick for refrigerant compressor

horizontal installation




vertical installation

**Note**

All threaded bores and screws on refrigerant compressor are in inches.

The refrigerant compressor is removed together with fastening plate (3).

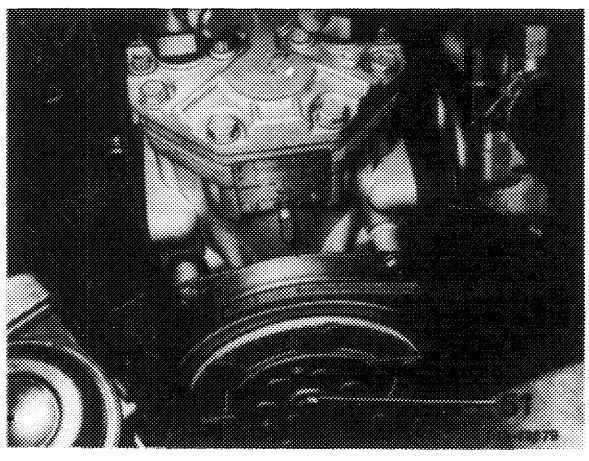
Check oil charge of refrigerant compressor each time prior to adding fresh refrigerant (83–520).

**Removal**

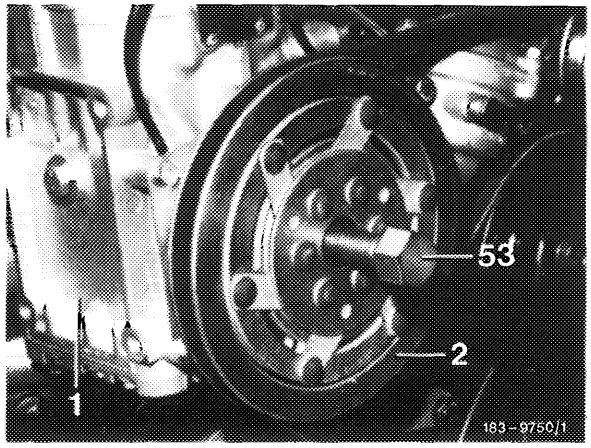
1 Cover righthand front fender.

2 Switch-on ignition, air conditioning system and blower (electromagnetic clutch will pull).

3 Unscrew screw (51).



4 Remove pulley of electromagnetic clutch (2) from crankshaft of refrigerant compressor (1) with puller screw (53).



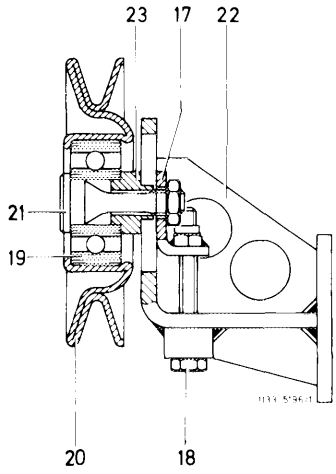

5 Switch-off ignition.

6 Disconnect battery.

7 Drain air conditioning system (83–516).

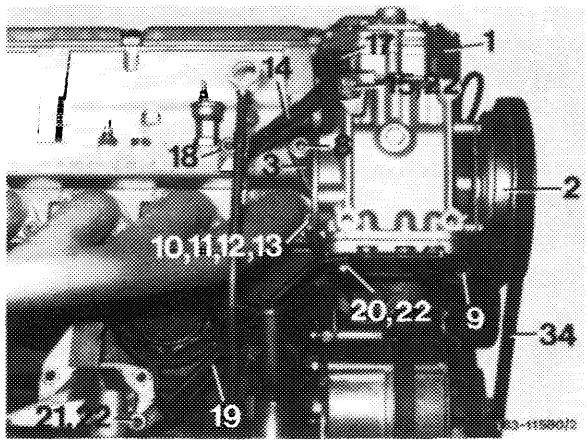
8 Loosen necked-down screw (21) for tensioning roller (20). Slacken V-belt (26) with adjusting screw (18) and remove V-belt.

9 Disconnect electric line on cable connector (17).

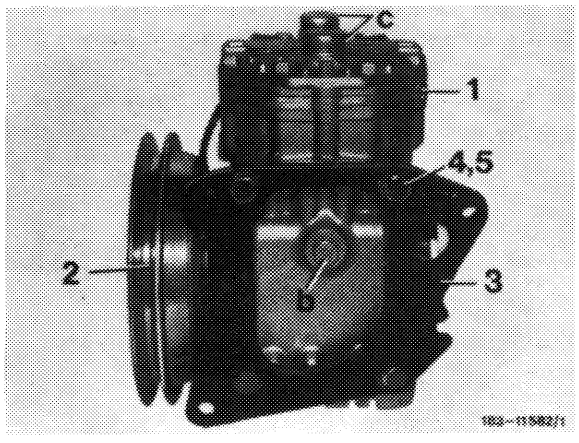



10 Unscrew struts (14 and 19) on compressor, cylinder head and engine carrier.

11 Loosen screws (8 and 9) as well as nut (12) and remove refrigerant compressor together with fastening plate (3).

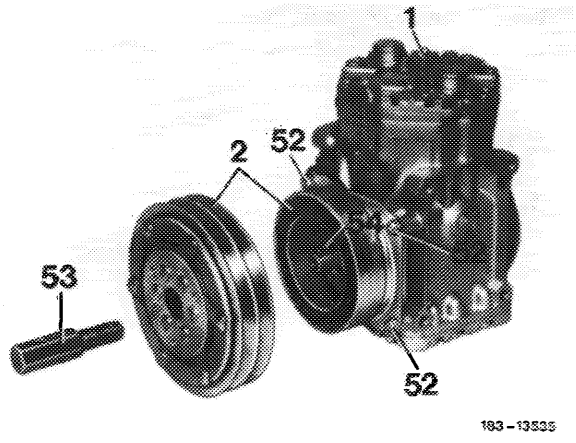



12 Loosen screws (4) and remove fastening plate (3) from refrigerant compressor.



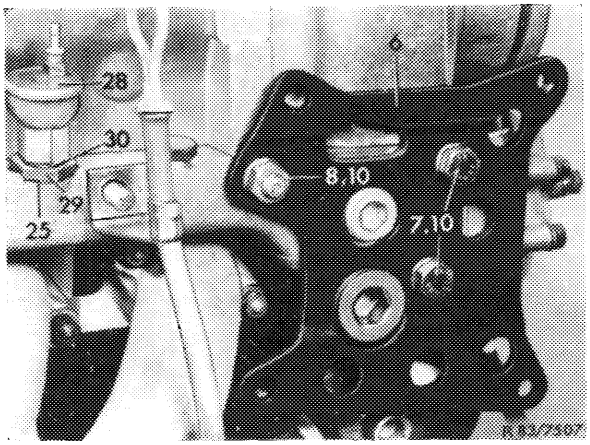
13 Remove pulley of electromagnetic clutch (2), paying attention to spring washer (54).

14 Unscrew 4 screws (52) and remove coil of electromagnetic clutch (2) from refrigerant compressor.

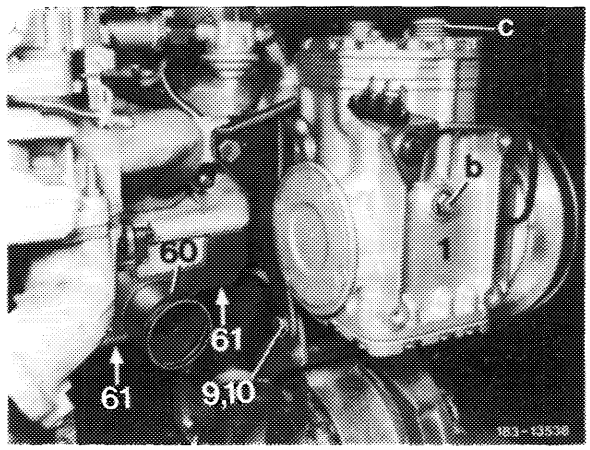



**Installation**

15 Check carrier (6) for cracks and screws (7) for tight seat.

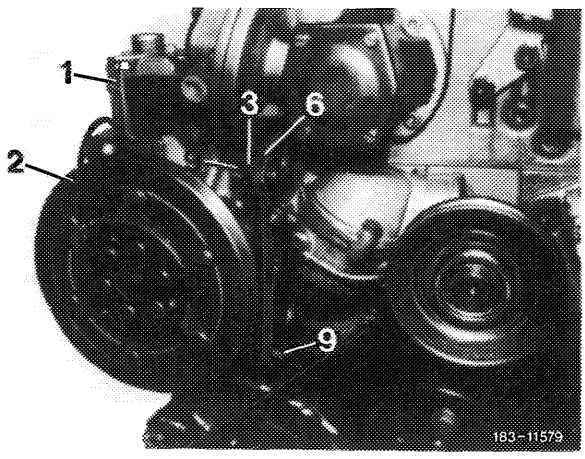



**Attention!**
New refrigerant compressors are filled with nitrogen. Remove closing caps (C) on connections only when the gas has been evacuated via **oil check screw (b).** For this purpose, unscrew oil check screw for a few threads until gas is heard to escape.




16 Screw fastening plate (3) to refrigerant compressor with inch screws (4) and snap rings or washers (5).

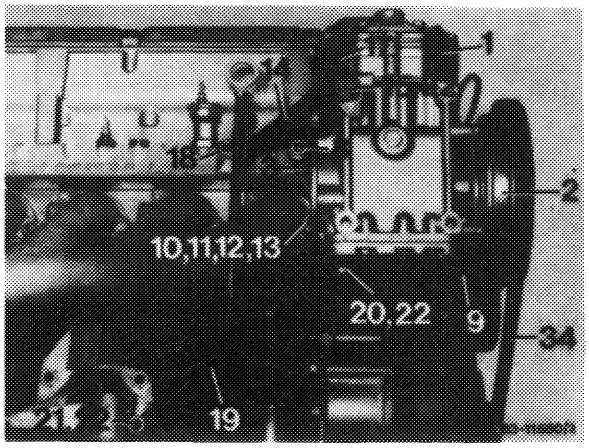
17 Mount electromagnetic clutch (2) to refrigerant compressor.



18 Slip spacer ring (11) to stud (10).

19 Screw refrigerant compressor (1) with fastening plate (3) to carrier (6) by means of screws (9).

20 Screw fastening plate (3) with screw (8) and washer (22) to cylinder head, as well as with nut (12) and washer (13) to stud (10).




21 Mount strut (14) with holder for cable connector (17) to refrigerant compressor as well as to cylinder head.

22 Mount strut (19).

23 Mount V-belt, tension with adjusting screw (18) and tighten necked-down screw (21).

24 Connect electric line of electromagnetic clutch and supplementary harness to cable connector.

25 Check oil level in refrigerant compressor (83–520).

26 Connect hose or pipe line to refrigerant compressor, while checking sealing rings and moistening threads with cold-flowing oil.

**Note:** Connections on refrigerant compressor are marked with "S" (suction end) or "D" (discharge end). Wrongly installed hose lines will result in failure of refrigerant compressor (fluid shocks).

27 Evacuate air conditioning system and fill up again (83–514).

28 Switch-on ignition, air conditioning system and blower and tighten screw (51).

29 Check air conditioning system for function (83–510).

**Oil capacity**

| Oil type cold-flowing oil (for approved cold-flowing oils refer to specifications for service products, page 361) | | | | |
|---|---|---|---|---|
| Oil level | | min. | normal | max. |
| Oil quantity in cc | | 180 | 240 | 300 |
| Refrigerant compressor | Dipstick depth mm | 22 | 25 | 28 |

| **Tightening torques** | Nm | (kpm) |
|---|---|---|
| Suction or pressure hose to service valve **with** Cu seal | 60 ± 5 | (6.0 ± 0.5) |
| **without** Cu seal | 70 ± 5 | (7.0 ± 0.5) |
| Suction and pressure hose or service valves to refrigerant compressor | 40–45 | (4.0–4.5) |
| Inch screw (7, 12) carrier to refrigerant compressor | 30 | (3) |
| Screw M 12 x 1.5 (13) carrier to cylinder head | 45–5 | (4.5–0.5) |
| Screw M 10 x 40 (14) carrier to cylinder head | 30–5 | (3–0.5) |
| Screw M 8 x 55 (17) carrier to water pump | 30 | (3) |
| Nut M 10 (22) carrier to intake pipe (gasoline engines) | 50 | (5) |
| Screw M 10 x 25 (18) carrier to intake pipe (diesel engines) | 50 | (5) |
| Necked-down screw (21) belt-tensioning roller | 45 | (4.5) |
| Inch screw (51) clutch to refrigerant compressor | 25 | (2.5) |
| Oil check screw | 6–8 | (0.6–0.8) |

**Special tool**

| | | |
|---|---|---|
| Pulling-off screw for pulley |  | 100 589 00 35 00 |

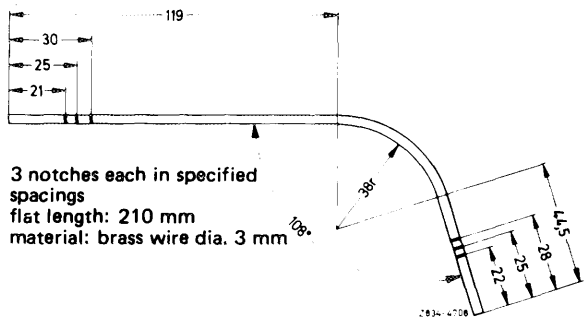
## Conventional tools

Double open end wrench 1/2" x 9/16", 5/8" x 3/4", 7/8" x 15/16", 1" x 1 1/8"
Socket 1/2"

## Self-made tool

Oil dipstick for refrigerant compressor

horizontal installation

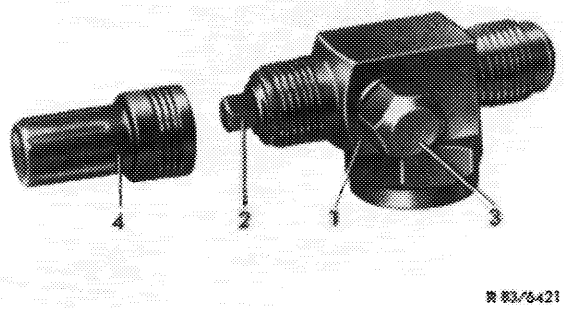



vertical installation

## Note

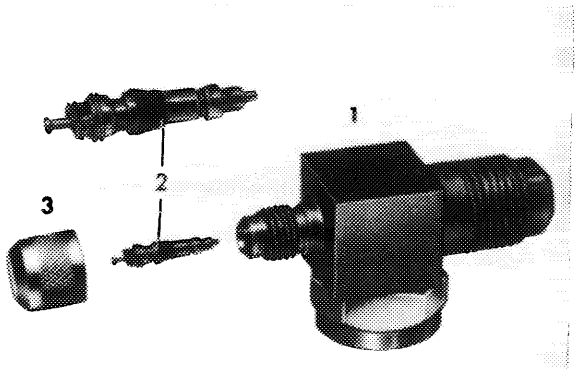
The refrigerant compressor can be removed together with refrigerant compressor carrier only.

If the system is still filled and if the refrigerant compressor service valves are provided with spindles, the system need not be evacuated.




Version 1

1 Service valve
2 Spindle
3 Cap
4 Closing cap




Version 2

1 Service valve
2 Valve insert 2x enlarged (Schrader valve)
3 Cap

To close refrigerant compressor system, screw-in spindles of service valves up to stop.

All threads on refrigerant compressor are inch threads.

Check oil in refrigerant compressor each time prior to adding refrigerant (83–520).

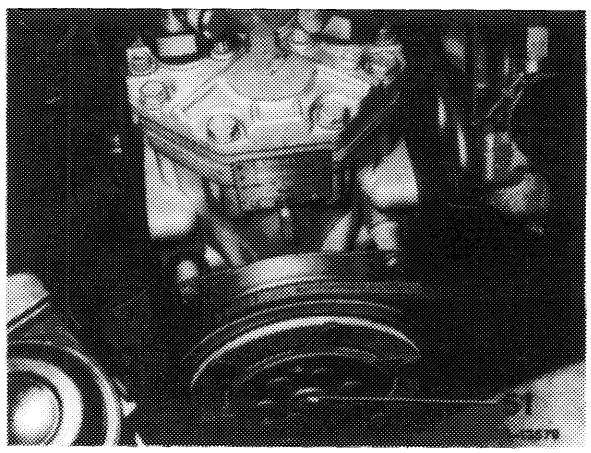
**Removal**

1 Cover righthand front fender.

2 Remove air filter. On diesel vehicles, loosen vacuum line on vacuum pump.

3 Engage ignition, air conditioning system and blower (electromagnetic clutch will pull).

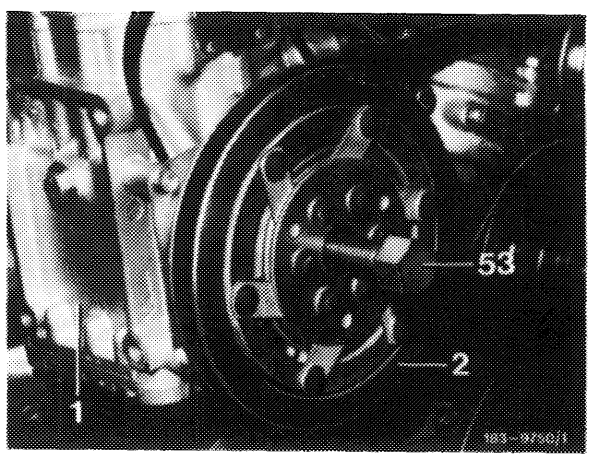
4 Unscrew screw (51).



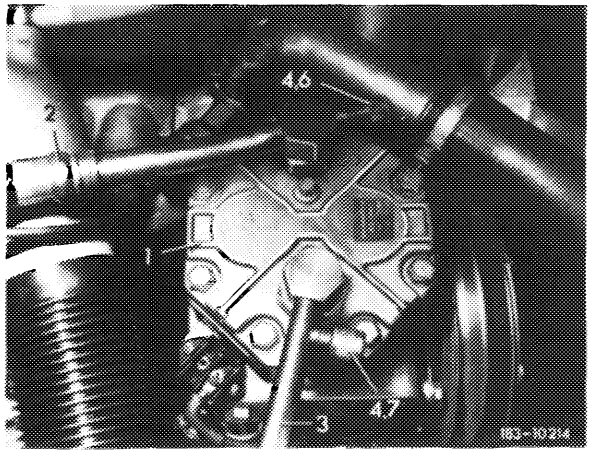
5 Remove pulley of electromagnetic clutch (2) from crankshaft of refrigerant compressor (1) by means of puller screw (53).

6 Switch-off ignition.

7 Disconnect ground connecting line of battery.

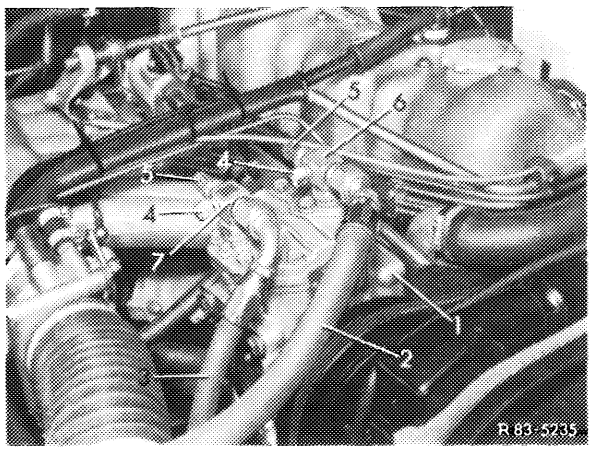


8 On service valves with Schrader valves, drain air conditioning system. On service valves with spindles, screw-in spindles up to stop. Then unscrew service valves with hose lines on compressor and close all connections with plugs (83–516).




Service valves with Schrader valve in pipe line (version 3)

1 Refrigerant compressor
2 Hose line from evaporator to compressor
3 Hose line from compressor to condenser
4 Closing cap
6 Service valve (suction end)
7 Service valve (pressure end)




Service valves with spindle (version 1)

1 Refrigerant compressor
2 Hose line from evaporator to compressor
3 Hose line from compressor to condenser
4 Closing cap
5 Cap
6 Service valve (suction end)
7 Service valve (pressure end)

9 Remove radiator.

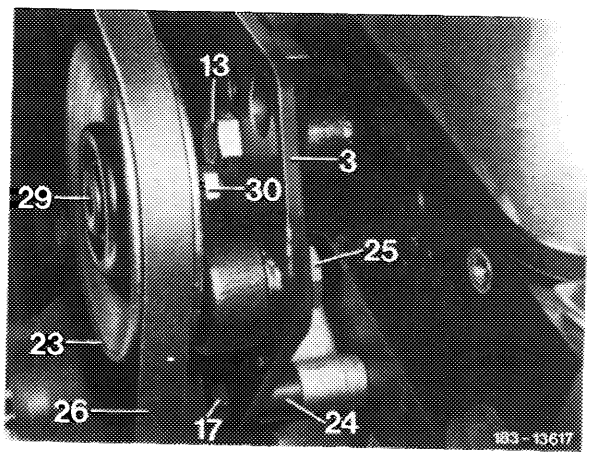
10 Remove fan or viscofan clutch.

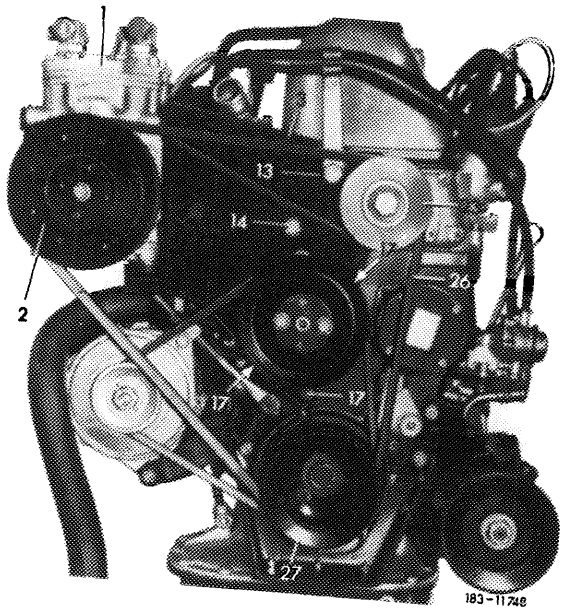
11 Loosen screw (25), swivel belt-tensioning roller (23) downward and remove V-belt (26).

12 Remove V-belt for alternator and take off pulley for water pump.

13 Disconnect electric line on cable connector.

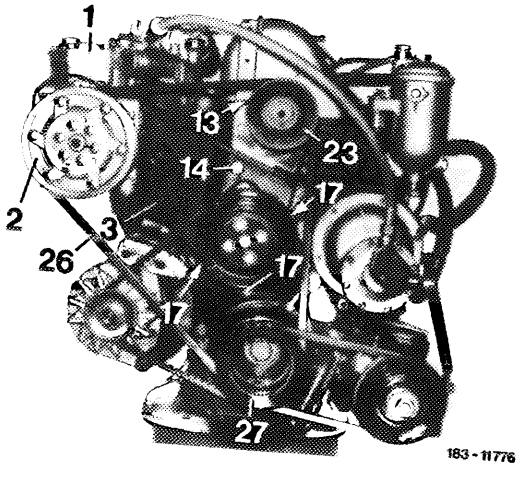
14 Unscrew screws or nuts (13 to 14 and 16 to 18) and remove refrigerant compressor (1) with carrier (3).





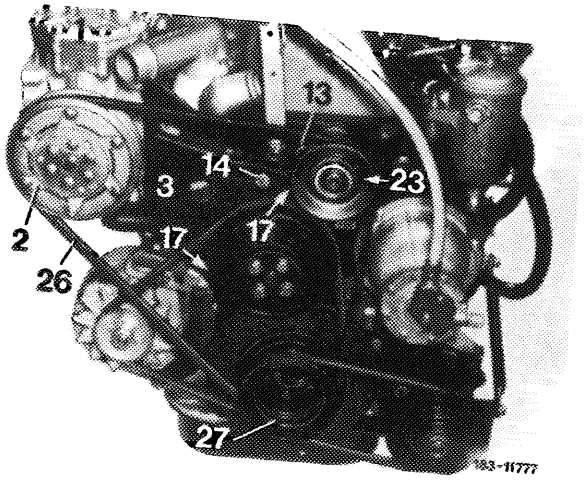

Layout of refrigerant compressor with carrier 4-cylinder engines with modified cooling water circuit

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 26 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



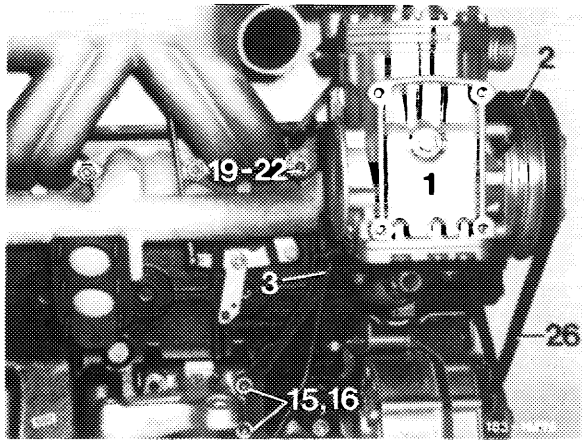

Layout of refrigerant compressor with carrier 4-cylinder engines starting from modified cooling water circuit

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Electromagnetic clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 26 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



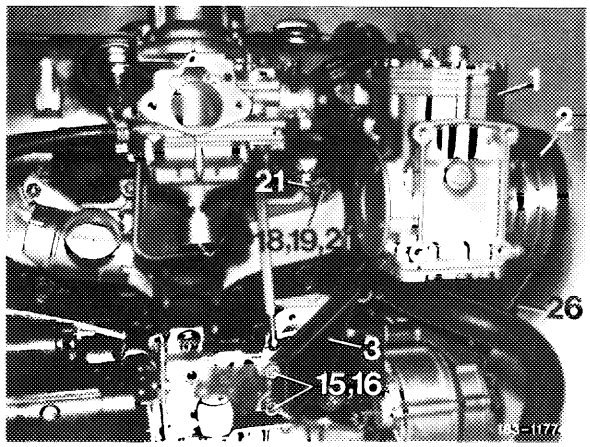

Layout of refrigerant compressor with carrier 5-cylinder engines

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 26 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



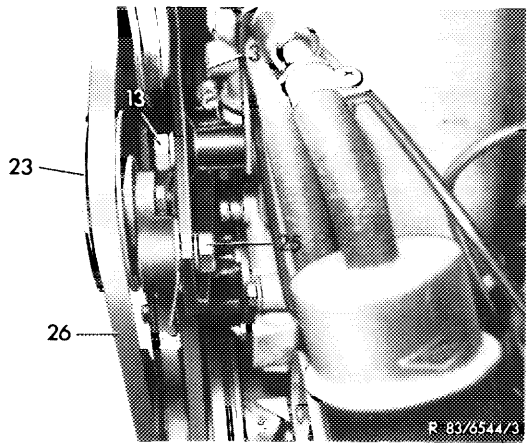

Layout of refrigerant compressor with carrier 4-cylinder diesel engines

1 Refrigerant compressor
2 Electromagnetic clutch
3 Carrier
15 Stud
16 Nut with washer
19 Washer
20 Stud
21 Spacing sleeve
22 Nut




Layout of refrigerant compressor with carrier 4-cylinder gasoline engines

1 Refrigerant compressor
2 Electromagnetic clutch
3 Carrier
15 Stud
16 Nut with washer
18 Screw
19 Washer
21 Threaded bushing
26 V-belt

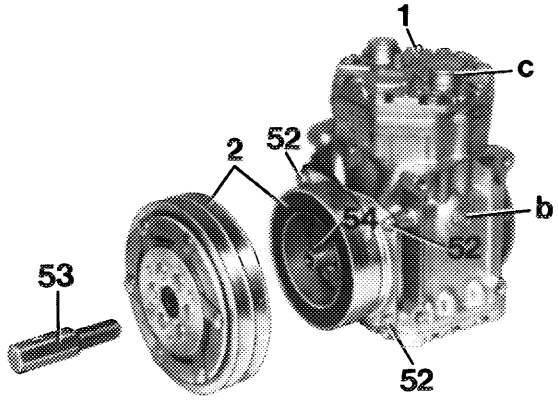



3 Carrier
13 Screw
23 Belt-tensioning roller
24 Compensating washer
25 Screw
26 V-belt

15 Unscrew cable connector with holder.

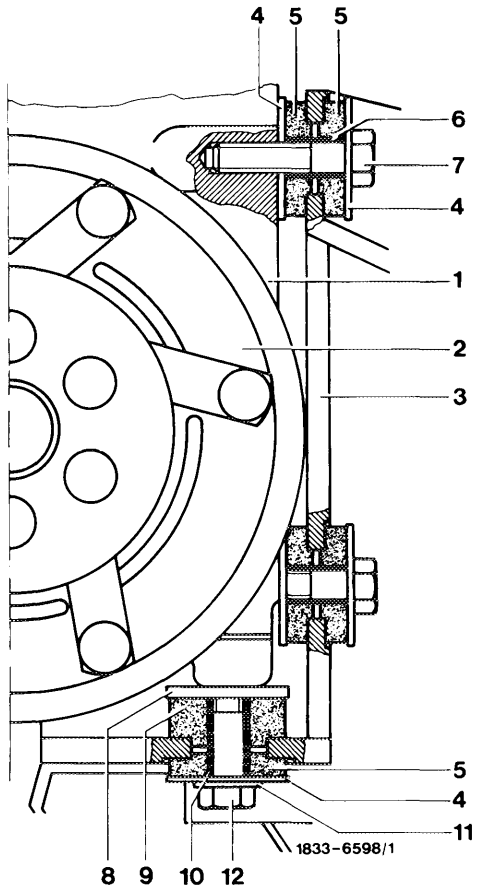
16 Remove pulley of electromagnetic clutch (2), paying attention to spring washer (54).

17 Unscrew 4 screws (52) and remove coil (coupler) of electromagnetic clutch (2).




183--13535/1

18 Unscrew refrigerant compressor (1) from carrier (3), while unscrewing inch screws (7 and 12).

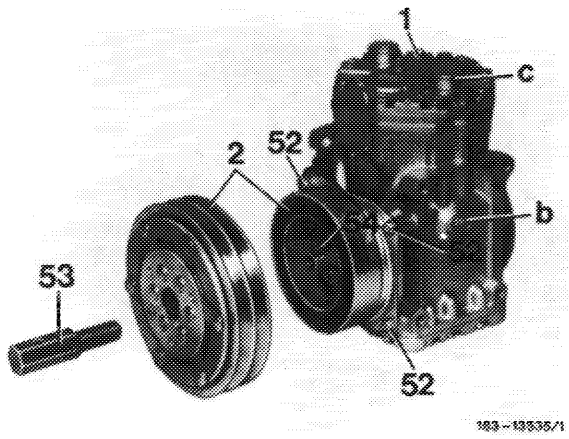



Attachment of refrigerant compressor to carrier

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 7 | Inch screw |
| 2 | Electromagnetic clutch | 8 | Washer (thick) |
| 3 | Carrier | 9 | Rubber disc (thick) |
| 4 | Washer (thin) | 10 | Sleeve (long) |
| 5 | Rubber disc (thin) | 11 | Washer |
| 6 | Sleeve (short) | 12 | Inch screw |

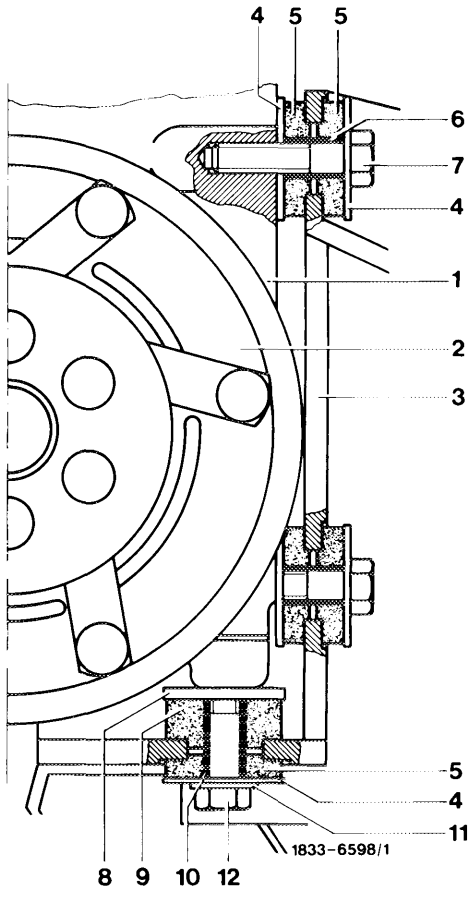
## Installation

**Attention!**
New refrigerant compressors are filled with nitrogen. Remove closing caps (C) on connections only, when the gas has been evacuated via **oil check screw (b)**. For this purpose, unscrew oil check screw for a few threads until gas is heard to escape.




19 Mount electromagnetic clutch to refrigerant compressor.

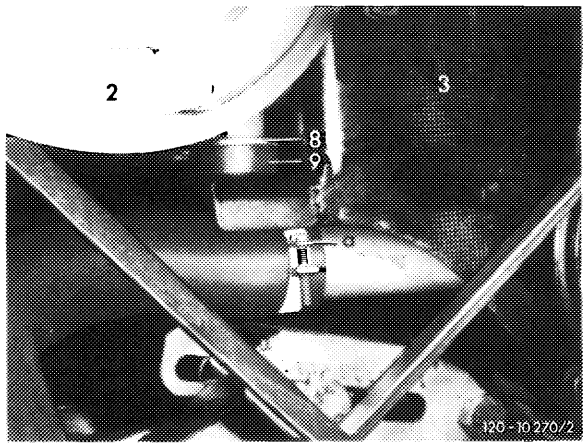
20 Always screw refrigerant compressor (1) to compressor carrier with new fastening members (repair kit 615 586 00 13) item 4 to 12. The thicker washers and rubber discs (8 and 9) are mounted to underside of compressor.




Attachment of refrigerant compressor to carrier

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 7 | Inch screw |
| 2 | Electromagnetic clutch | 8 | Washer (thick) |
| 3 | Carrier | 9 | Rubber disc (thick) |
| 4 | Washer (thin) | 10 | Sleeve (long) |
| 5 | Rubber disc (thin) | 11 | Washer |
| 6 | Sleeve (short) | 12 | Inch screw |

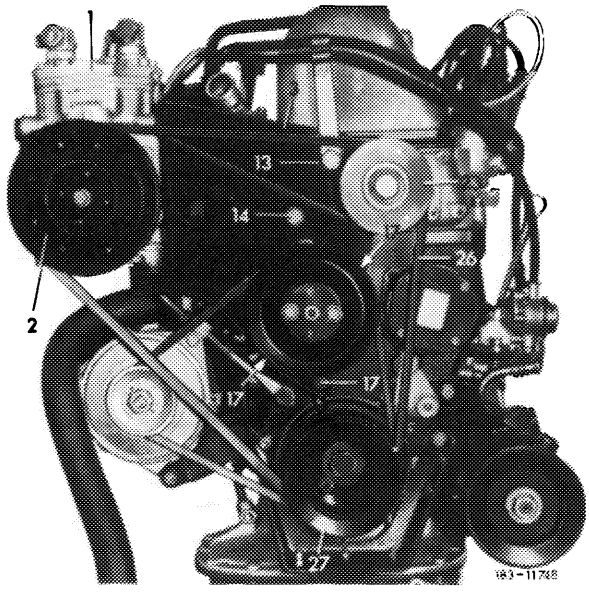
21 Mount cable connector with holder to refrigerant compressor.




22 Replace gasket between water pump housing and crankcase.

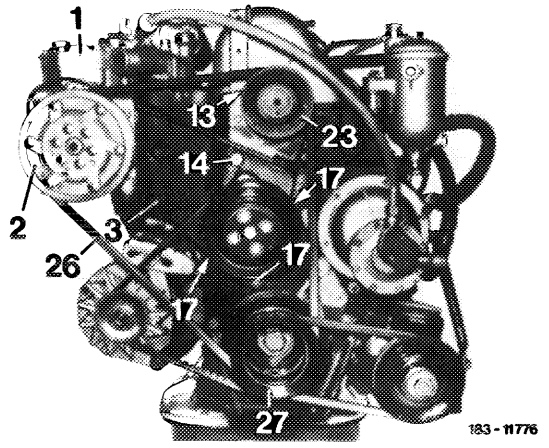
23 On engines M 115, mount hose strap (a).

24 Screw refrigerant compressor with carrier to crankcase, cylinder head and intake manifold.



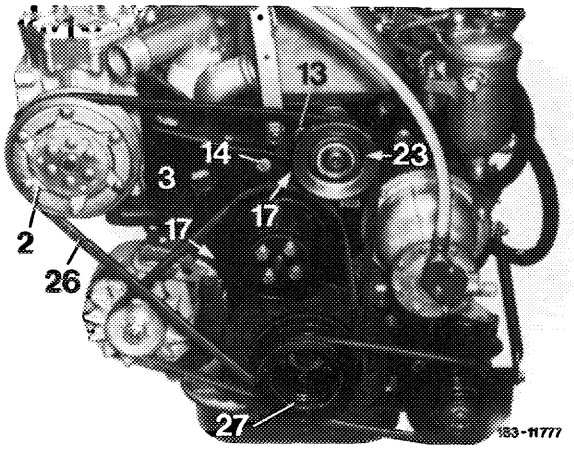

Layout of refrigerant compressor with carrier 4-cylinder engines up to modified cooling water circuit

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 16 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



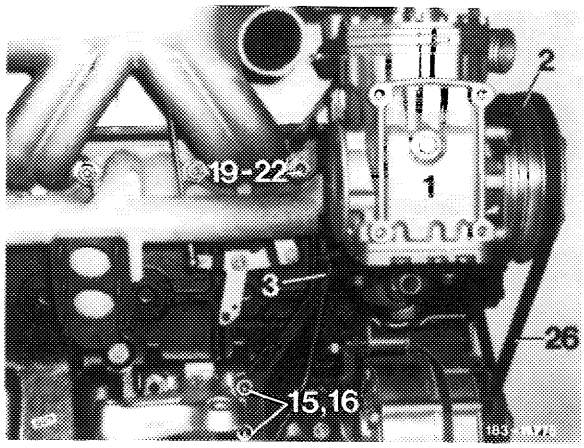

Layout of refrigerant compressor with carrier 4-cylinder engines starting from modified cooling water circuit

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Electromagnetic clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 26 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



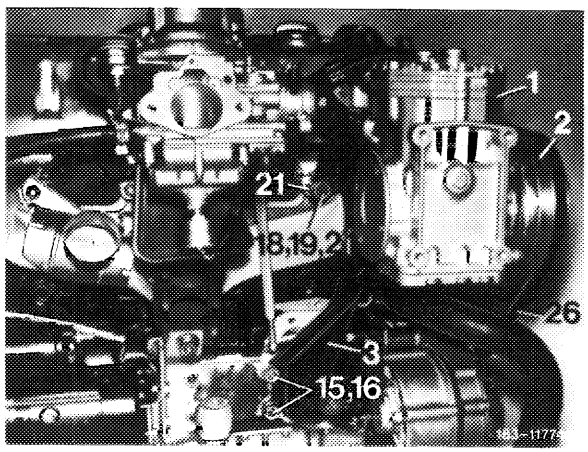

Layout of refrigerant compressor with carrier 5-cylinder engines

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 17 | Screw |
| 2 | Clutch | 23 | Belt-tensioning roller |
| 3 | Carrier | 26 | V-belt |
| 13 | Screw | 27 | Pulley |
| 14 | Screw | | |



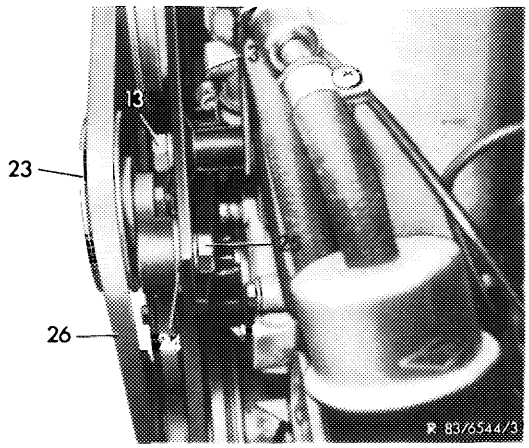

Layout of refrigerant compressor with carrier 4-cylinder diesel engines

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 19 | Washer |
| 2 | Electromagnetic clutch | 20 | Stud |
| 3 | Carrier | 21 | Spacing sleeve |
| 15 | Stud | 22 | Nut |
| 16 | Nut with washer | | |




Layout of refrigerant compressor with carrier 4-cylinder gasoline engines

| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 18 | Screw |
| 2 | Electromagnetic clutch | 19 | Washer |
| 3 | Carrier | 21 | Threaded bushing |
| 15 | Stud | 26 | V-belt |
| 16 | Nut with washer | | |




3 Carrier
13 Screw
23 Belt-tensioning roller
24 Compensating washer
25 Screw
26 V-belt

25 Install V-belt for alternator.

26 Mount V-belt (26) and tension with belt-tensioning roller (23).

**Note:** Check alignment of pulley-compressor in relation to pulley-crankshaft and tensioning roller and correct by means of compensating washers (24) between tensioning roller and carrier, if required.

27 Install fan or viscofan clutch and radiator.

28 Connect service valves or hose lines to refrigerant compressor and moisten threads with cold-flowing oil.

29 Connect grounding line of battery.

30 Check oil level in refrigerant compressor (83–520).

31 With system filled, unscrew oil check screw for approx. two threads and open spindle of service valve (suction end) for a short period.

**Note:** The refrigerant flowing-in, will displace the air in compressor.

32 Tighten oil check screw and unscrew spindle of service valves up to stop.

33 With system drained, evacuate air conditioning system and fill up again (83–512 and 514).

34 Check air conditioning system for function (83–510).

## C. Engines 114, 130, 180.954

**Oil capacity**

| Oil type cold-flowing oil (for approved cold-flowing oils refer to specifications for service products page no. 361) | | | | |
|---|---|---|---|---|
| Oil level | | min. | normal | max. |
| Oil quantity in cc | | 180 | 240 | 300 |
| Refrigerant compressor | Dipstick depth mm | 22 | 25 | 28 |

| **Tightening torques** | | Nm | (kpm) |
|---|---|---|---|
| Suction or pressure hose on service valves | **with** Cu seal | 60 ± 5 | (6.0 ± 0.5) |
| | **without** Cu seal | 70 ± 5 | (7.0 ± 0.5) |
| Suction and pressure hose or service valves to refrigerant compressor | | 40–45 | (4.0–4.5) |
| Inch screw (7, 12) carrier to refrigerant compressor | | 30 | (3) |
| Screw M 12 x 1.5 (13) carrier to cylinder head | | 45–5 | (4.5–0.5) |
| Screw M 10 x 40 (14) carrier to cylinder head | | 30–5 | (3–0.5) |

| | | |
|---|---|---|
| Screw M 8 x 55 (17) carrier to water pump | 30 | (3) |
| Nut M 10 (22) carrier to intake pipe (gasoline engines) | 50 | (5) |
| Screw M 10 x 25 (18) carrier to intake pipe (diesel engines) | 50 | (5) |
| Necked-down screw (21) belt-tensioning roller | 45 | (4.5) |
| Inch screw (51) clutch to refrigerant compressor | 25 | (2.5) |
| Oil check screw | 6–8 | (0.6–0.8) |

**Special tool**

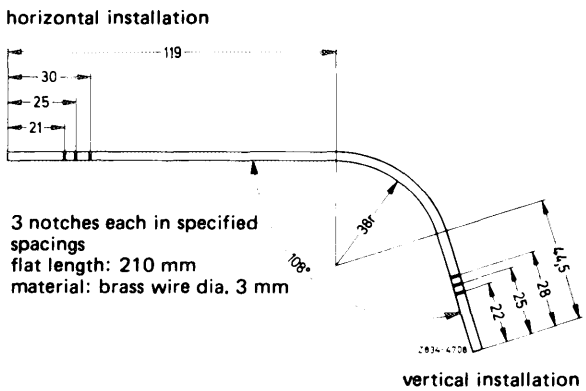
| | | |
|---|---|---|
| Pulling-off screw for pulley |  | 100 589 00 35 00 |

**Conventional tools**

Double open end wrench 1/2" x 9/16", 5/8" x 3/4", 7/8" x 15/16", 1" x 11/8"
Socket 1/2"

**Self-made tool**

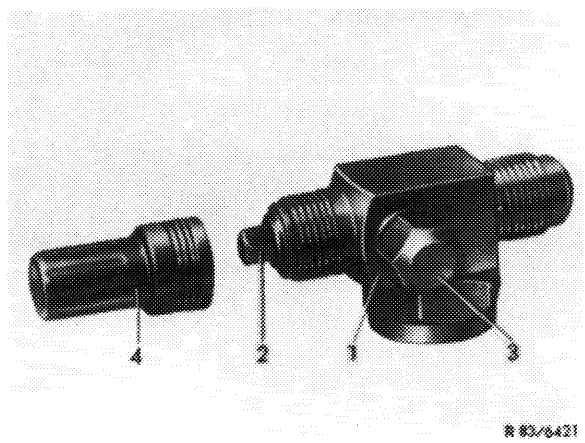
Oil dipstick for refrigerant compressor




**Note**

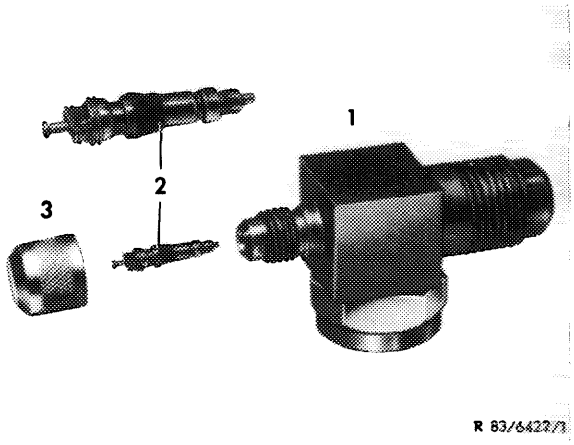
The refrigerant compressor can be removed together with refrigerant compressor carrier only.

If the system is still filled and if the refrigerant compressor service valves are provided with spindles, the system need not be evacuated.




Version 1

1 Service valve
2 Spindle
3 Cap
4 Closing cap




R 83/6422/1

Version 2

1 Service valve
2 Valve insert 2x enlarged (Schrader valve)
3 Cap

To close refrigerant compressor system, screw-in spindles of service valves up to stop.

All threads on refrigerant compressor are inch threads.

Check oil in refrigerant compressor each time prior to adding refrigerant (83–520).

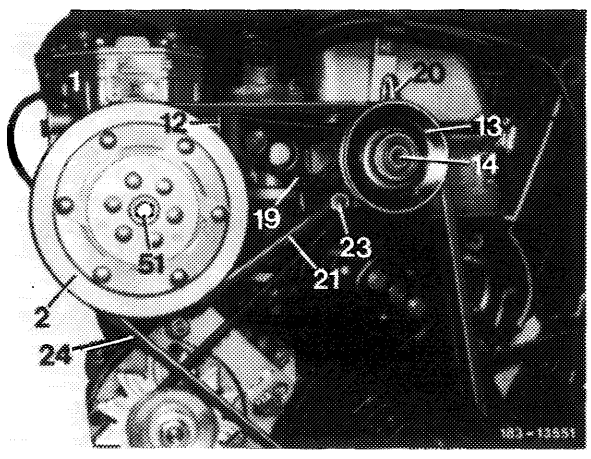
**Removal**

1 Cover righthand front fender.

2 Remove air filter.

3 Engage ignition, air conditioning system and blower (electromagnetic clutch will pull).

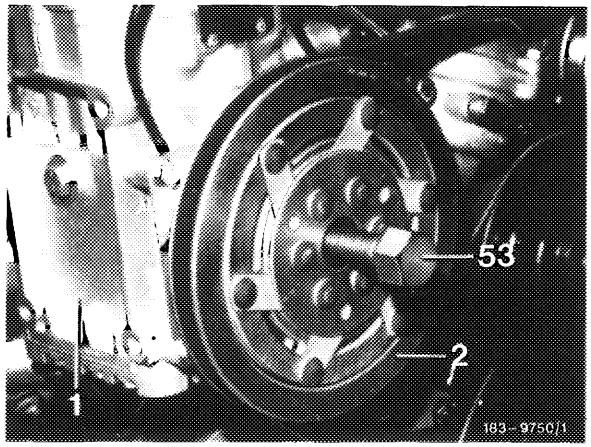
4 Unscrew screw (51).



5 Remove pulley of electromagnetic clutch (2) from crankshaft of refrigerant compressor (1) by means of puller screw (53).

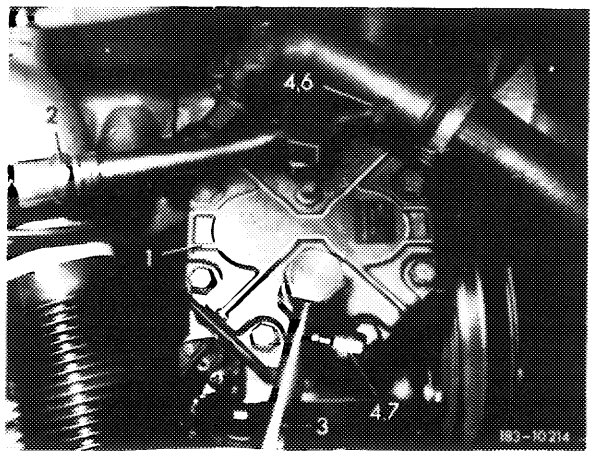
6 Switch-off ignition.

7 Disconnect ground connecting line of battery.



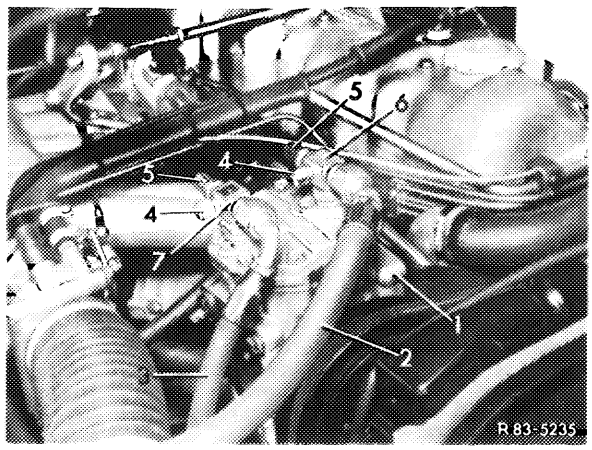

8 On service valves with Schrader valves, drain air conditioning system. On service valves with spindles, screw-in spindles up to stop. Then unscrew service valves with hose lines on compressor and close all connections with plugs (83–516).

9 Remove viscofan clutch.




Service valves with Schrader valve (version 3)

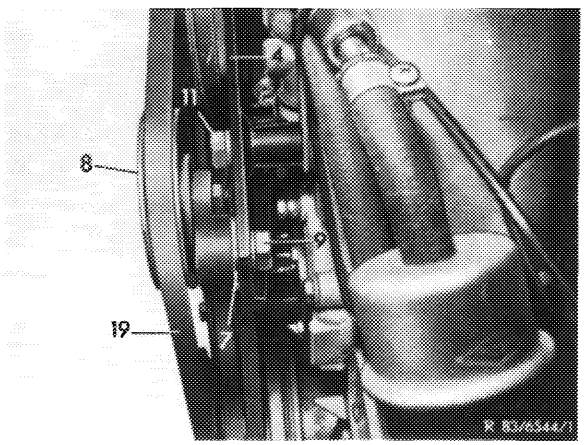
1 Refrigerant compressor
2 Hose line from evaporator to compressor
3 Hose line from compressor to condenser
4 Closing cap
6 Service valve (suction end)
7 Service valve (pressure end)




Service valves with spindle (version 1)

1 Refrigerant compressor
2 Hose line from evaporator to compressor
3 Hose line from compressor to condenser
4 Closing cap
5 Cap
6 Service valve (suction end)
7 Service valve (pressure end)

10 Loosen screw (9) for tensioning roller (8) and remove V-belt (19).



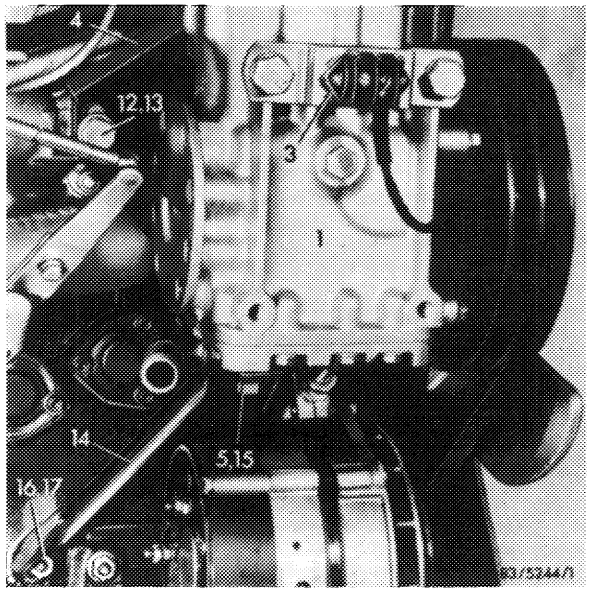

Belt tensioning roller on carrier

4 Carrier
7 Washer
8 Tensioning roller
9 Screw
19 V-belt

11 Disconnect electric line on cable connector (3).

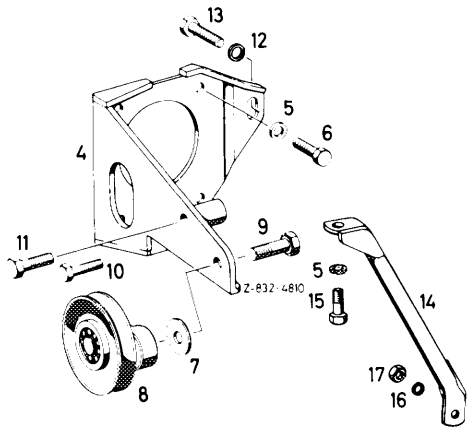
12 Unscrew support (14) from crankcase and refrigerant compressor.

13 Unscrew screws (10, 11 and 13) and remove refrigerant compressor together with carrier.




Compressor with carrier and support (version 1)

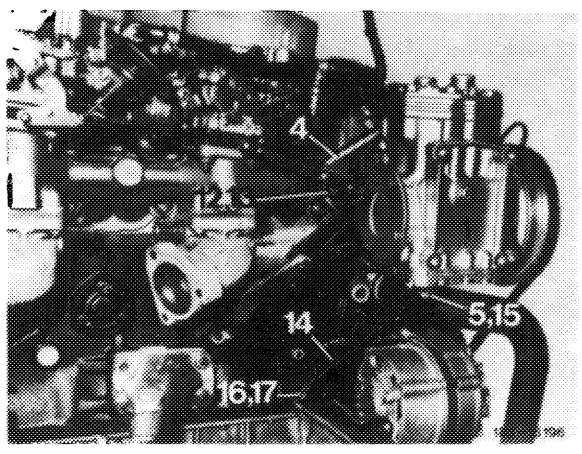
| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 13 | Screw |
| 3 | Cable connector | 14 | Support |
| 4 | Carrier | 15 | Screw |
| 5 | Washer | 16 | Washer |
| 12 | Washer | 17 | Nut |




Attachment of compressor to carrier

| | | | |
|---|---|---|---|
| 4 | Carrier | 11 | Screw |
| 5 | Washer | 12 | Washer |
| 6 | Inch screw | 13 | Screw |
| 7 | Compensating washer | 14 | Support |
| 8 | Tensioning roller | 15 | Inch screw |
| 9 | Screw | 16 | Washer |
| 10 | Screw | 17 | Nut |

14 Unscrew cable connector (3) with holder.

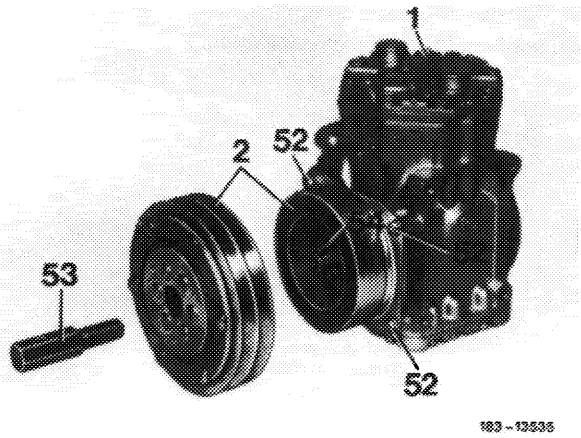



Compressor with carrier and support (version 2)

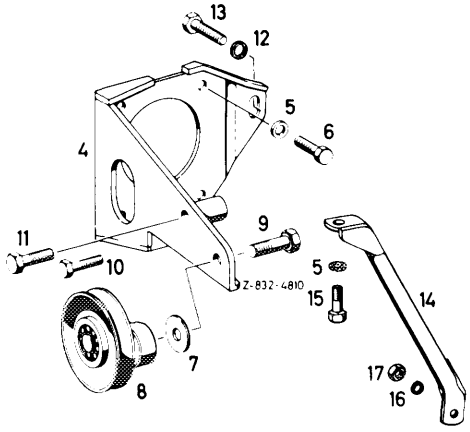
| | | | |
|---|---|---|---|
| 1 | Refrigerant compressor | 14 | Support |
| 4 | Carrier | 15 | Screw |
| 5 | Washer | 16 | Washer |
| 12 | Washer | 17 | Nut |
| 13 | Screw | | |

15 Remove pulley of electromagnetic clutch (2), paying attention to spring washer (54).

16 Unscrew 4 screws (52) and remove coil (coupler) of electromagnetic clutch (2).




17 Unscrew refrigerant compressor from carrier (4), while unscrewing inch screws (6).

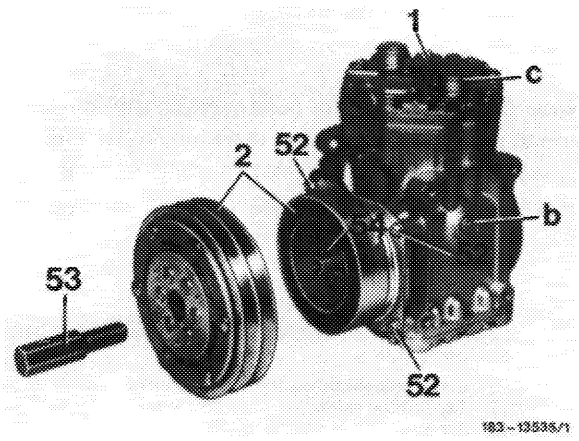



Attachment of compressor to carrier

| | | | |
|---|---|---|---|
| 4 | Carrier | 11 | Screw |
| 5 | Washer | 12 | Washer |
| 6 | Inch screw | 13 | Screw |
| 7 | Compensating washer | 14 | Support |
| 8 | Tensioning roller | 15 | Inch screw |
| 9 | Screw | 16 | Washer |
| 10 | Screw | 17 | Nut |

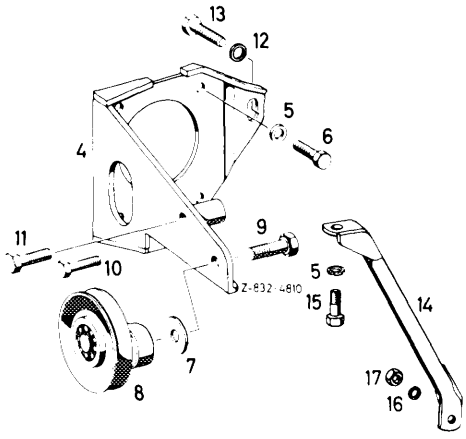
## Installation

**Attention!**
New refrigerant compressors are filled with nitrogen. Remove closing caps (C) on connections only, when the gas has been evacuated via **oil check screw (b).** For this purpose, unscrew oil check screw for a few threads until gas is heard to escape.




18 Mount electromagnetic clutch to refrigerant compressor.

19 Screw refrigerant compressor with inch screws (6) and washers (5) to compressor carrier.




Attachment of compressor to carrier

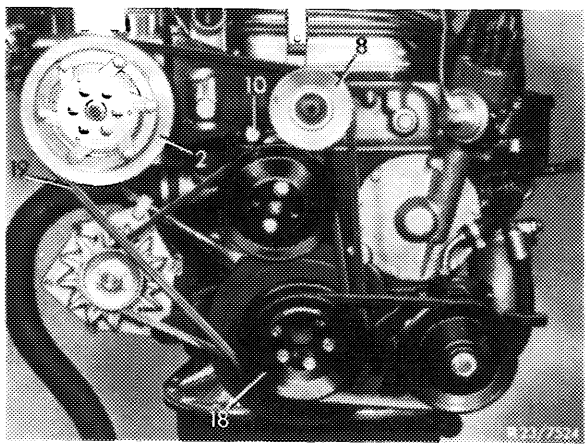
| | | | |
|---|---|---|---|
| 4 | Carrier | 11 | Screw |
| 5 | Washer | 12 | Washer |
| 6 | Inch screw | 13 | Screw |
| 7 | Compensating washer | 14 | Support |
| 8 | Tensioning roller | 15 | Inch screw |
| 9 | Screw | 16 | Washer |
| 10 | Screw | 17 | Nut |

20 Mount cable connector with holder (3) to refrigerant compressor.

21 Screw support (14) with parts items 5, 15 to 17 to compressor and to crankcase.

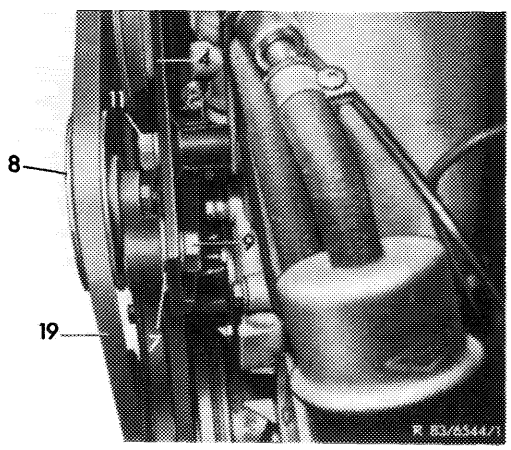
22 Mount V-belt (19) and tension with tensioning roller (8).

**Note:** Check alignment of pulley-compressor in relation to pulley-crankshaft and tensioning roller and correct by means of compensating washers (7) between tensioning roller and carrier, if required.




Layout of refrigerant compressor with carrier and belt tensioning roller

| | | | |
|---|---|---|---|
| 2 | Electromagnetic clutch | 18 | Pulley |
| 8 | Tensioning roller | 19 | V-belt |
| 10 | Screw | | |




Belt tensioning roller on carrier

| | | | |
|---|---|---|---|
| 4 | Carrier | 9 | Screw |
| 7 | Washer | 19 | V-belt |
| 8 | Tensioning roller | | |

23 Install viscofan clutch.

24 Connect service valves or hose lines to refrigerant compressor, while moistening threads with cold-flowing oil.

25 Connect grounding line to battery.

26 Check oil level in refrigerant compressor (83–520).

27 With system filled, unscrew oil check screw for approx. two threads and open spindle of service valve (suction end) for a short period.

**Note:** The flowing-in refrigerant will displace the air in compressor.

28 Tighten oil check screw and unscrew spindles of service valves up to stop.

30 With system drained, evacuate air conditioning system and fill up again (83–512 and 514).

31 Check air conditioning system for function (83–510).