

A. York refrigerant compressor (engine 110)

Data, test values

Designation:

Electromagnetic shutoff clutch 12 V

Pitts 6.7 inch

Power input

cold 3.5 amps

warm 2.8 amps

Tightening torques

Nm

(kpm)

Screws (52) for coupler on refrigerant compressor

14

(1.4)

Screw (51) for pulley on crankshaft

20–27

(2.0–2.7)

Special tool

Pulling screw for pulley

100 589 00 35 00

Conventional tool

Double open-end wrench 3/8" x 7/16", 1/2" x 9/16"

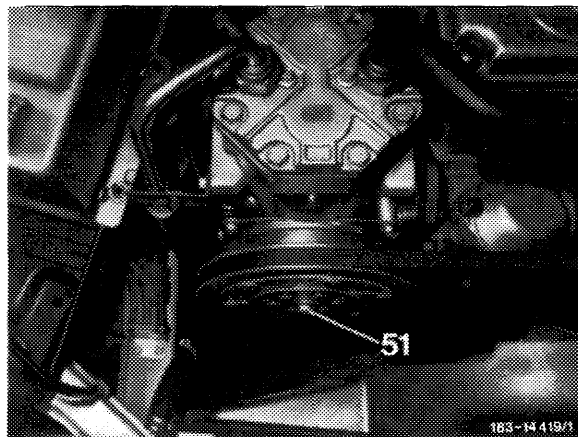
Note

For pulling pulley from crankshaft of refrigerant compressor (with V-belt in place) energize electromagnetic clutch (clutch pulling). With refrigerant compressor removed, hold pulley carefully in place with water pump pliers while supporting pliers against fastening screws of coupler.

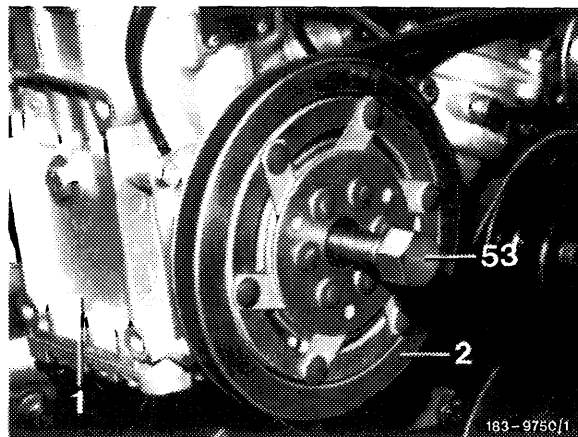
Prior to removing clutch, test power input on clutch. If power input exceeds 6.0 amps, replace clutch.

Removal

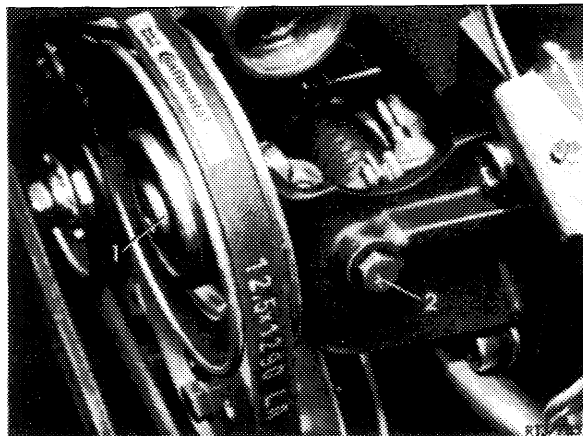
- 1 Actuate electromagnetic clutch by switching-on ignition, cooling blower and temperature switch.
- 2 Unscrew screw (51).



- 3 Push pulley of electromagnetic clutch (2) from crankshaft of refrigerant compressor (1) by means of pulling screw (53).
- 4 Switch off ignition.
- 5 Disconnect electric line on cable connector.

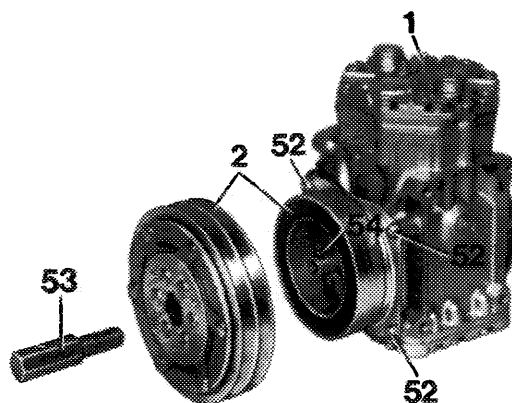


- 6 Remove V-belt for refrigerant compressor from electromagnetic clutch by releasing necked-down screw (1) and slackening V-belt by means of tensioning screw (2).



Belt tensioning roller engine 110

- 7 Remove belt tensioning roller of electromagnetic clutch (2), while paying attention to Woodruff key (54).
- 8 Unscrew 4 screws (52) and remove coupler.



Installation

Note: If the same clutch is reinstalled, check friction surfaces of clutch for damage. If the friction surfaces are showing score marks or burnt spots caused by overheating, replace complete clutch.

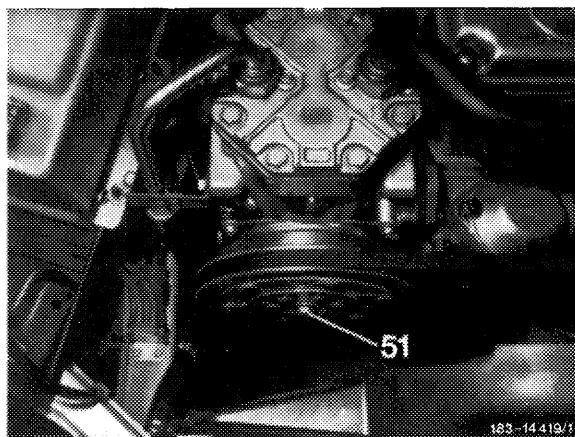
- 9 Rotate crankshaft of compressor in such a manner that the key groove is facing upwards.
- 10 Screw coupler with inch screws (52) to refrigerant compressor in such a manner that the electric line comes out at the top.
- 11 Insert Woodruff key (54) into crankshaft.
- 12 Mount pulley and slightly tighten by inch screw (51) together with washer.
- 13 Connect electric line of supplementary harness and electromagnetic clutch to cable connector. Mount grounding line between cable connector and refrigerant compressor.
- 14 Check V-belt and belt tensioning roller. Mount V-belt and tension.

Note: Low-stretch V-belts are correctly tensioned, if they can just be resiliently pushed down under thumb pressure.

New low-stretch V-belts are subject to a slight stretch, which becomes effective on these V-belts already after a few minutes of operation. It is therefore decisive for long operation to tension such belts once again after the running-in period (service manual item 756 and 757).

15 Actuate electromagnetic clutch by switching-on ignition, blower and air conditioning system. Then tighten screw (51).

16 Check electromagnetic clutch for function.





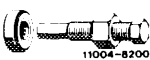
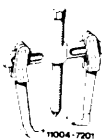




B. Frigidaire refrigerant compressor (engines 116 and 117)

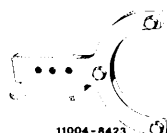
Data

Designation	Electromagnetic clutch 12 V, Frigidaire 5 5/8 inch or 5 inch	
Power input	cold 3.0 amps	warm 2.5 amps

Tightening torque	Nm	(kpm)
Counternut to shaft	20	(2.0)

Special tools

Pin spanner for counterholding spring plate		116 589 10 07 00
Pulling tool for spring plate		000 589 07 35 00
Installing tool for spring plate		000 589 49 43 00
Puller		000 589 88 33 00
Thrust piece for puller		116 589 05 63 00
Mandrel for pulley		115 589 02 35 02
Remover and installer for slip ring		000 589 21 61 00
Remover and installer for sealing ring		000 589 65 63 00



Conventional tools

Slip gauge 0.05–1.00 mm	Order no. 2147	
Pliers for internal lock	Order no. 1846b–2	e.g. made by Hazet
Pliers for outer lock	Order no. 1846d–2	5630 Remscheid 1

Note

Removal and installation of spring plate with pulley and clutch coupler, as well as of shaft seal, can be performed **without removal** of refrigerant compressor and refrigerant compressor carrier.

a) Spring plate

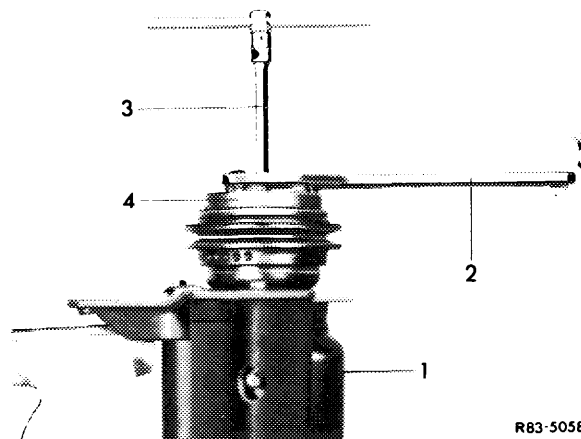
Removal

1 If the refrigerant compressor is removed, clamp refrigerant compressor with refrigerant compressor carrier into vise, without refrigerant compressor carrier into holding fixture for refrigerant compressor.

2 Prevent rotation of spring plate (4) by means of holding tool (2), unscrew counternut from shaft using 14 mm socket.

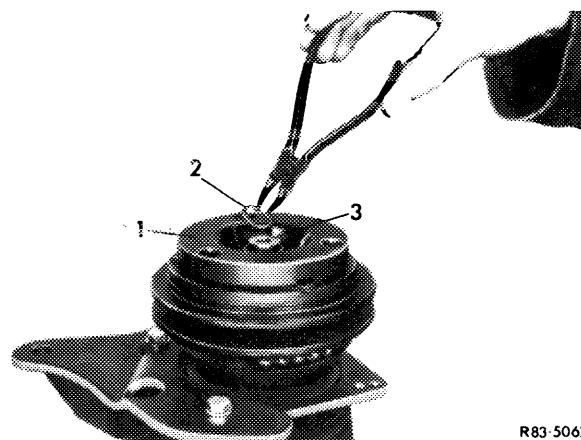
Unscrewing counternut from shaft end

- | | |
|--------------------------|----------------|
| 1 Refrigerant compressor | 3 Socket |
| 2 Holding tool | 4 Spring plate |



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3 Remove locking ring (2) and hub spacing washer (3) from spring plate (1).



Removing locking ring and spacing washer

- | | |
|----------------|------------------|
| 1 Spring plate | 3 Spacing washer |
| 2 Locking ring | |

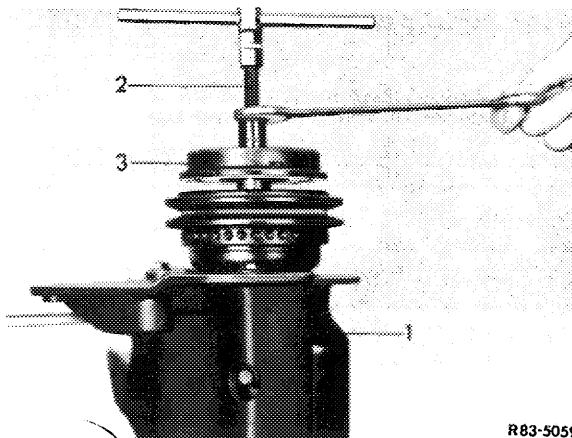
R83-5067

4 Screw remover (2) into hub. Hold tool in place with wrench and tighten central screw.

5 Remove Woodruff key from shaft.

Removing spring plate

- 1 Refrigerant compressor
- 2 Remover
- 3 Spring plate



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Installation

6 Insert Woodruff key into shaft.

7 Clean friction surface of spring plate and pulley.

8 Place spring plate on shaft so that key and key groove are in alignment.

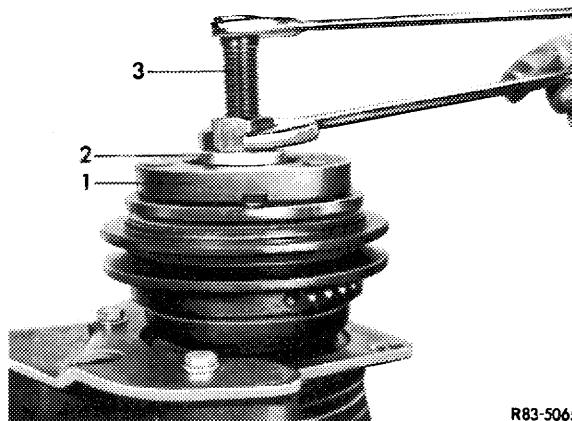
Attention!

To protect parts inside compressor against damage, do not knock on or against spring plate or shaft.

9 Place spacer (2) on spring plate (1). Insert installer (3) through spacer (2) and screw installer (3) to shaft end.

Installation of spring plate

- 1 Spring plate
- 2 Spacer
- 3 Installer



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10 Hold hexagon of tool in position and screw-in center screw by several turns to press spring plate in part on shaft.

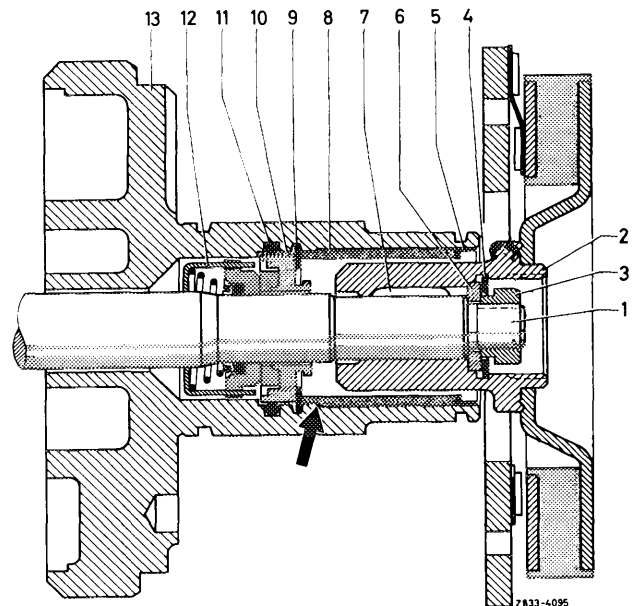
11 Remove installer (3) and spacer (2), check key and key groove for alignment. If both are correctly aligned, mount installer again and continue pressing spring plate (1) on shaft until a distance of approx. 1 mm to 1.5 mm is obtained between the friction surfaces of the pulley and the spring plate.

12 Remove installer (3) and spacer (2).

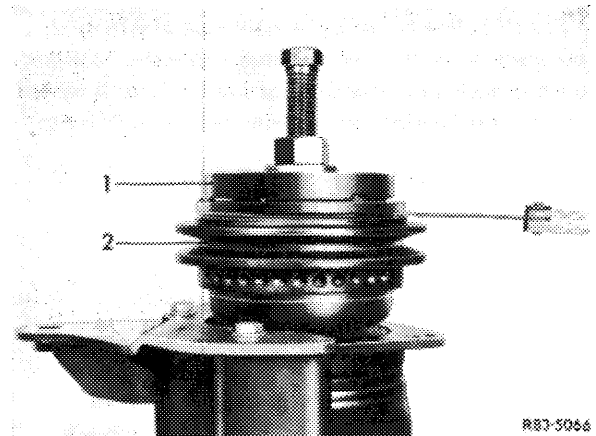
13 Insert spacing washer (6) into hub of spring plate (2) and insert locking ring (4) with flat side of ring in direction of spacing washer (6).

Sectional view of shaft seal and seat of seal

- | | |
|------------------|----------------------|
| 1 Shaft | 8 Felt ring |
| 2 Hub | 9 Locking ring |
| 3 Counternut | 10 Ceramic ring |
| 4 Locking ring | 11 O-ring |
| 5 Holding ring | 12 Shaft seal |
| 6 Spacing washer | 13 Front head member |
| 7 Woodruff key | |



14 Screw new shaft counternut (3) with shoulder (smaller dia of nut) in direction of spacing washer (6). Hold spring plate in place with holding tool (2) and tighten counternut. Distance between the two friction surface of the pulley and the spring plate should now amount to approx. 0.5 to 1.5 mm.



Checking distance between spring plate and pulley

- | | |
|----------------|----------|
| 1 Spring plate | 2 Pulley |
|----------------|----------|

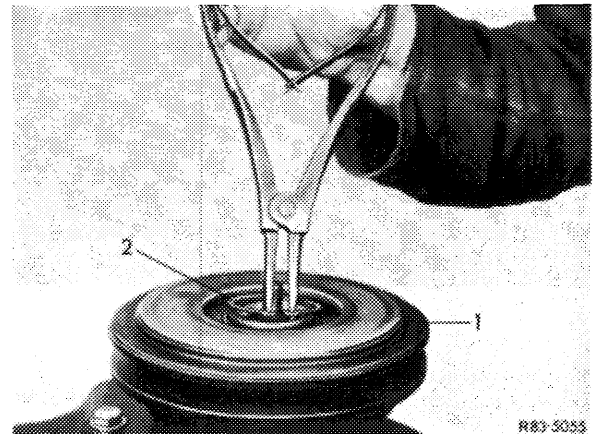
b) Pulley

Removal

- 1 Remove spring plate (section a item 1 to 5).
- 2 Remove locking ring (2) and holding ring (5).

Removing locking ring for pulley

- | | |
|----------|----------------|
| 1 Pulley | 2 Locking ring |
|----------|----------------|

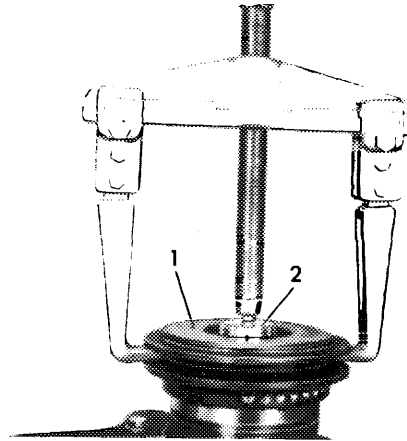


3 Insert guide piece (2) into bore in head member of compressor.

4 Pull-off pulley (1) with puller (3).

Removing pulley

1 Pulley 2 Guide piece



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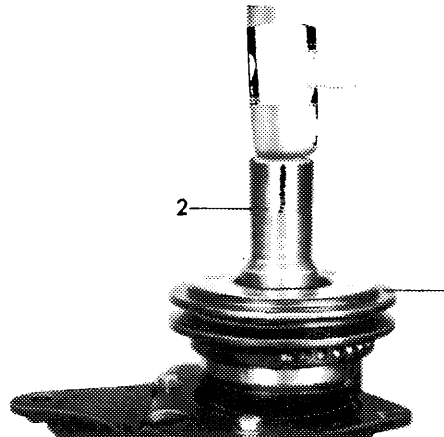
Installation

5 If the same pulley is reinstalled, clean friction surface of pulley. If friction surface is damaged, e.g. by overheating, replace pulley together with spring plate.

6 Knock pulley (1) with the assistance of punch (2) onto guide journal of refrigerant compressor. Position punch in such a manner that the impact force is guided against inner bearing race and the bearing itself is not damaged.

Installation of pulley

1 Pulley 2 Punch



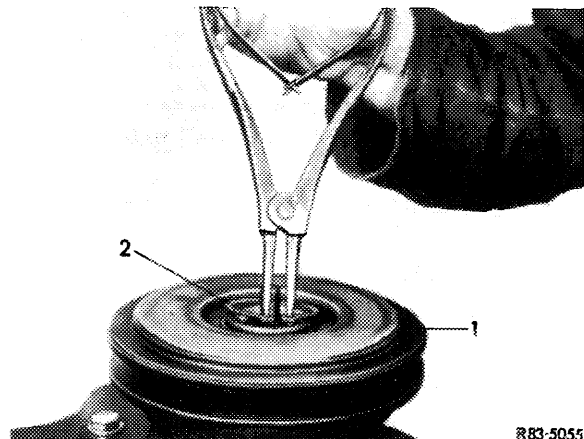
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7 Check pulley for unobstructed operation. Then insert locking ring (2) with flat side down.

8 Install spring plate (section a).

Removing locking ring for pulley

1 Pulley 2 Locking ring



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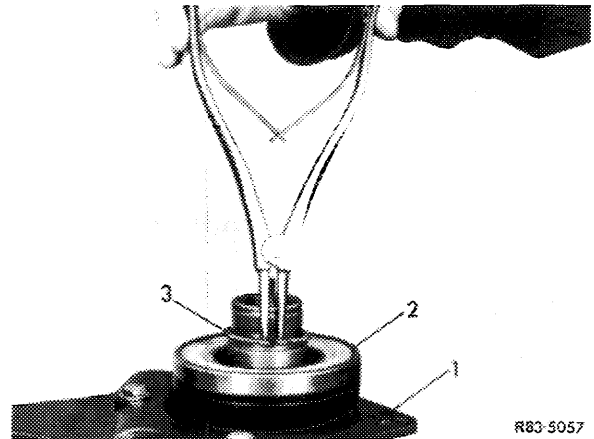
c) Clutch coupler

Removal

- 1 Remove spring plate and pulley (section a end b).
- 2 Mark position of electric connections on coupler housing on front head member of refrigerant compressor.
- 3 Remove locking ring (3).
- 4 Lift clutch coupler (2) from refrigerant compressor (1).

Removal and installation of clutch coupler

- | | |
|--------------------------|----------------|
| 1 Refrigerant compressor | 3 Locking ring |
| 2 Clutch coupler | |



R83-5057

Installation

- 5 Insert clutch coupler (2) on front head member of refrigerant compressor in such a manner that the electrical connections are in alignment with the markings previously made on refrigerant compressor.
- 6 Align guide pins at bottom on coupler housing with holes in front head member of refrigerant compressor.
- 7 Install locking ring (3) with flat side of ring in direction of coupler.
- 8 Install pulley and spring plate (section a and b).

d) Shaft seal of refrigerant compressor

Removal

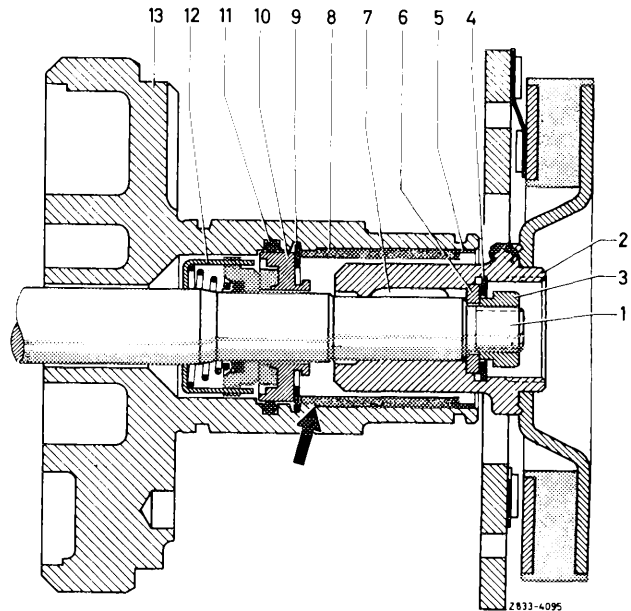
- 1 Remove spring plate (section a).

Note: Removal of pulley and clutch coupler is not necessary for removal and installation of shaft seal.

- 2 Remove holding ring (5) and felt ring (8).

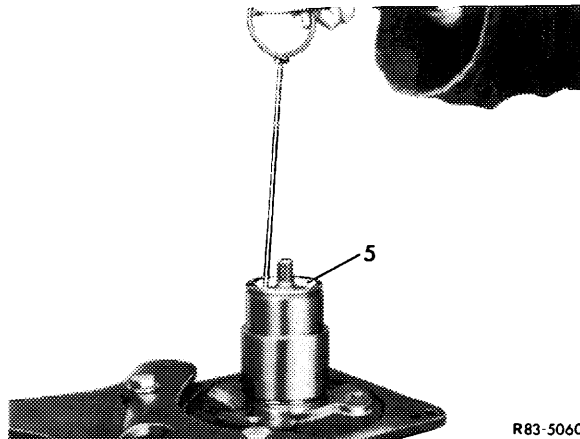
Sectional view of shaft seal and seat of seal

- | | |
|------------------|----------------------|
| 1 Shaft | 8 Felt ring |
| 2 Hub | 9 Locking ring |
| 3 Counternut | 10 Ceramic ring |
| 3 Locking ring | 11 O-ring |
| 5 Holding ring | 12 Shaft seal |
| 6 Spacing washer | 13 Front head member |
| 7 Woodruff key | |



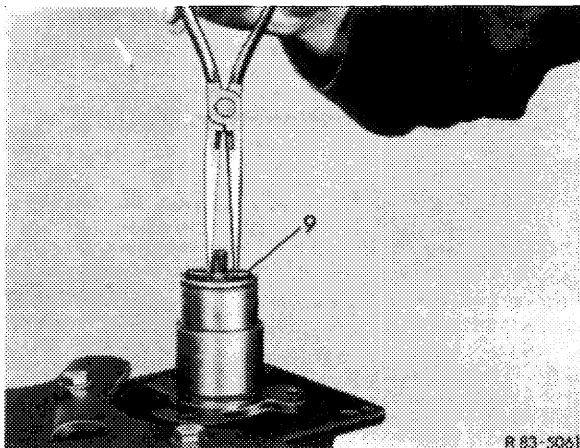
Note: Puller is self-made from 2.5 mm dia brass wire.

Removing holding ring
5 Holding ring



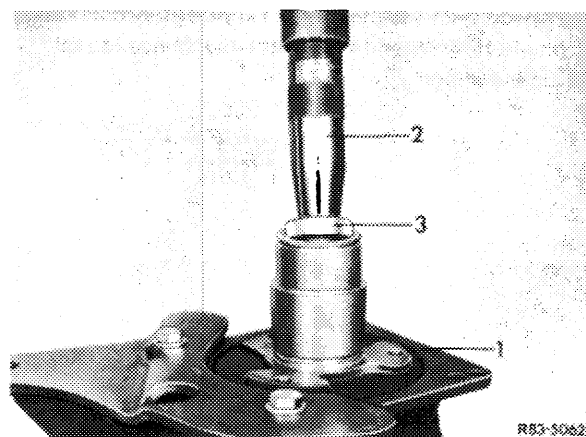
- 3 Remove locking ring (9) for shaft seal.
- 4 Remove slip ring (3 or 9) with assistance of remover and installer (2).

Removing locking ring for shaft seal
9 Locking ring



Removing ceramic slip ring

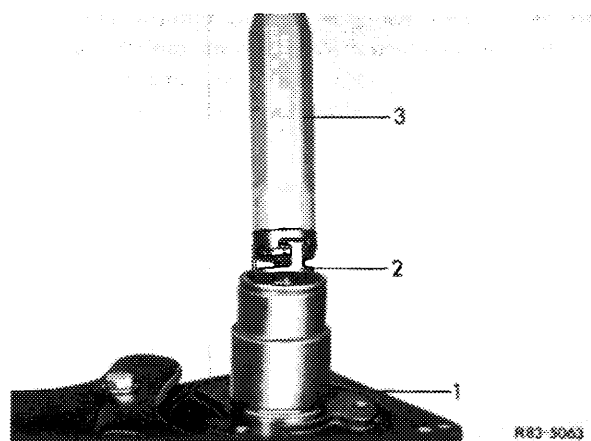
- 1 Refrigerant compressor
- 2 Remover and installer
- 3 Slip ring



5 Remove shaft seal (2 or 11) with assistance of tool (3). For this purpose, push on tool, turn tool clockwise to grip the lugs of the shaft seal with the locking tongues on tool. Remove complete shaft seal by pulling straight from shaft.

Removing shaft seal

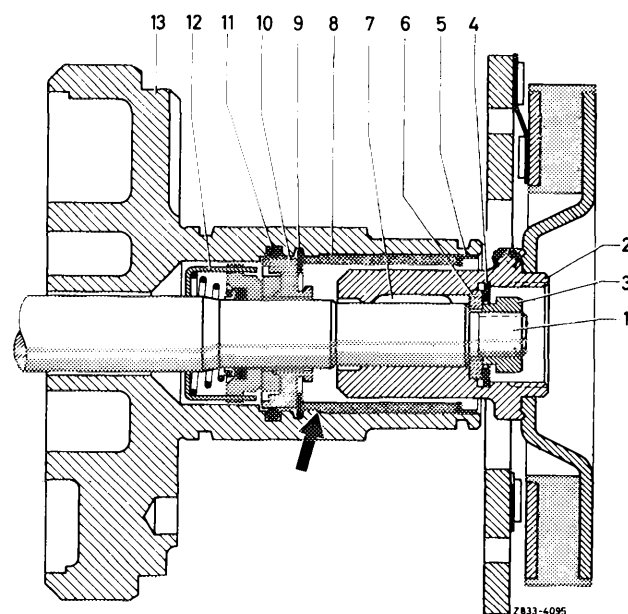
- 1 Refrigerant compressor
- 2 Shaft seal
- 3 Remover and installer



6 Remove O-ring (11) from inside bore in front head member of refrigerant compressor. This can be done by means of a piece of wire bent into a hook.

Sectional view of shaft seal and seat of seal

- | | |
|------------------|----------------------|
| 1 Shaft | 8 Felt ring |
| 2 Hub | 9 Locking ring |
| 3 Counternut | 10 Ceramic ring |
| 4 Locking ring | 11 O-ring |
| 5 Holding ring | 12 Shaft seal |
| 6 Spacing washer | 13 Front head member |
| 7 Woodruff key | |



Installation

7 Check whether parts of old seal are in bore of front head member. Clean bore prior to inserting a new seal.

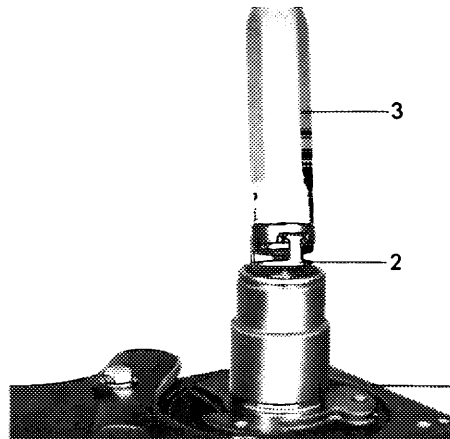
8 Insert new O-ring (11) into groove of bore in head member (13), making sure that the sealing ring is inserted in lower groove.

9 Provide shaft sealing ring (11) prior to installation with cold-flowing oil to prevent any damage to seal during insertion.

10 Insert shaft seal (2 or 12) into tool (3) and slip on shaft in compressor. Keep turning tool clockwise until shaft seal engages in shaft. Only then turn tool counterclockwise for disconnection and removal from lugs of shaft seal.

Installing shaft seal

- 1 Refrigerant compressor
- 2 Shaft seal
- 3 Remover and installer

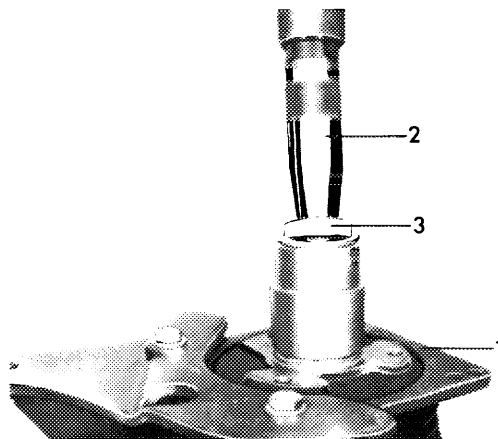


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11 Introduce slip ring (3 or 10) with assistance of tool (2) into bore of front head member until ring touches shaft seal. Make sure that the O-ring (11) is not pushed out of groove.

Installation of ceramic slip ring

- 1 Refrigerant compressor
- 2 Remover and installer
- 3 Slip ring



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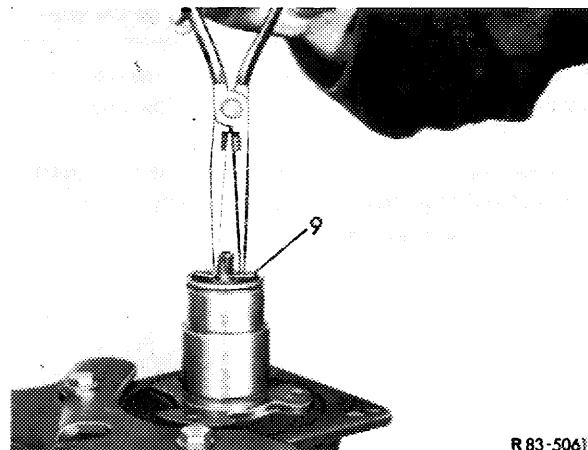
Attention!

Protect sealing surface of slip ring against any damage, such as scratches.

12 Introduce locking ring (9) with flat side down into bore until locking ring rests on slip ring. Then push against locking ring by means of locking ring pliers or a screwdriver until locking ring snaps into groove.

Installing locking ring for shaft seal

- 9 Locking ring



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Note: The shoulder (refer to arrow) seen from end of bore is a projection and not a groove.

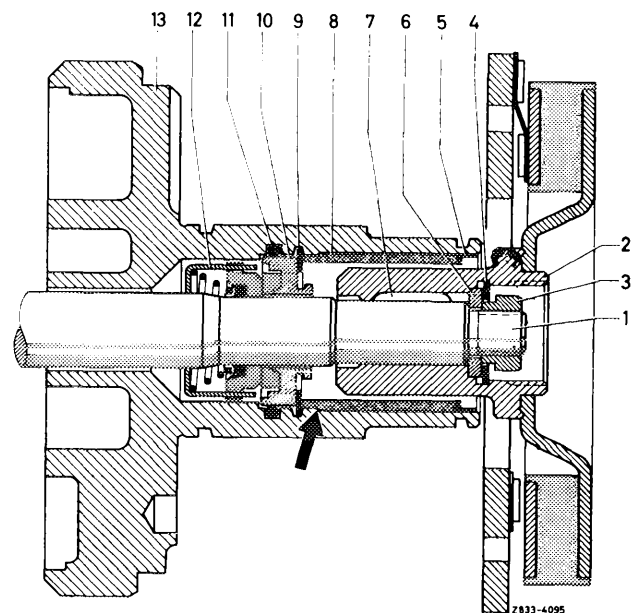
13 Install spring plate (section a).

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

15 Check compressor for leaks (83–525).

Sectional view of shaft seal and seat of seal

- | | |
|------------------|----------------------|
| 1 Shaft | 8 Felt ring |
| 2 Hub | 9 Locking ring |
| 3 Counternut | 10 Ceramic ring |
| 4 Locking ring | 11 O-ring |
| 5 Holding ring | 12 Shaft seal |
| 6 Spacing washer | 13 Front head member |
| 7 Woodruff key | |



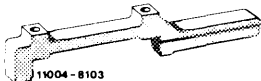

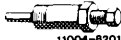
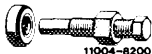

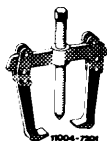

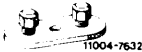
C. Delco refrigerant compressor (engine 617.950)

Data, test values

Designation	Engine 617.950
Electromagnetic shutoff clutch 12 V	Delco 4.9 inches
Power input in amps at 13.5 V	cold 3.9 warm 3.4

Tightening torques	Nm	(kpm)
Screws (8) pulley-clutch body	11	(1.1)
Screw M 10 x 30 pipe line to refrigerant compressor	50±3	(5±0.3)
Nut (1) to drive shaft	13	(1.3)
Screws (5 and 6) M 12 refrigerant compressor to carrier	60+10	(6+1)
Hose line (14) from evaporator to pipe line 7/8"	29–37	(2.9–3.7)
Hose line (15) from pipe line to condenser 3/4"	24–28	(2.4–2.8)

Special tools

Holding device for refrigerant compressor	 11004-8103	116 589 14 31 00
Holding wrench for clutch	 11004-8104	116 589 04 40 00
Remover for clutch plate	 11004-8201	000 589 07 35 00
Installer with spacer for spring plate	 11004-8200	000 589 49 43 00
Guide piece	 11004-8203	116 589 05 63 00
Double-claw puller	 11004-7501	000 589 88 33 00
Punch	 11004-6600	115 589 02 35 02
Pressure test plate for refrigerant compressor	 11004-7632	109 589 00 25 00

Conventional tools

Socket 14 mm, 3/8" square	e.g. made by Hazet, D-5630 Remscheid
Feeler gauge (set)	e.g. made by Hazet, D-5630 Remscheid Order no. 2147
Langbeck pliers 72 A (internal lock)	e.g. made by Hazet, D-5630 Remscheid Order no. 1846 a-1
Pliers for locking ring J 2 (external lock)	e.g. made by Hazet, D-5630 Remscheid Order no. 1846 c-2

Self-made tool

Remover for O-ring

Note

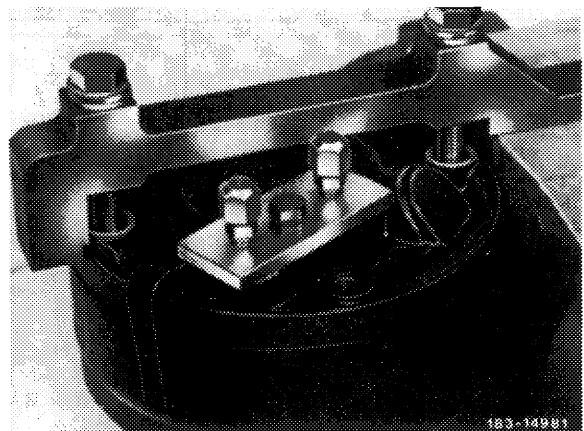
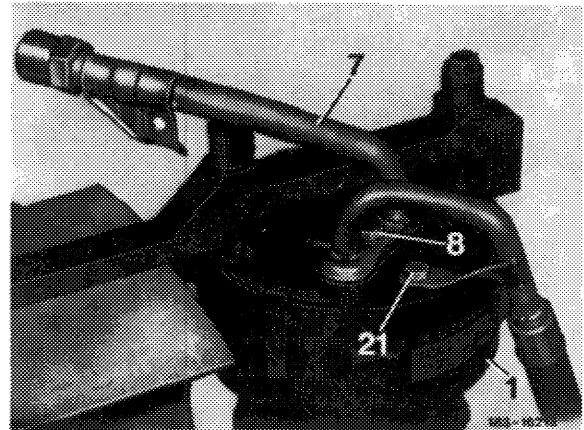
Removal and installation of spring plate, of clutch body with pulley and solenoid, as well as of shaft seal can be performed only with refrigerant compressor removed.

The clutch body with bearing, the pulley and the solenoid comprise one design group. If a part of this group must be replaced, remove entire design group (refer to 83—526, section b).

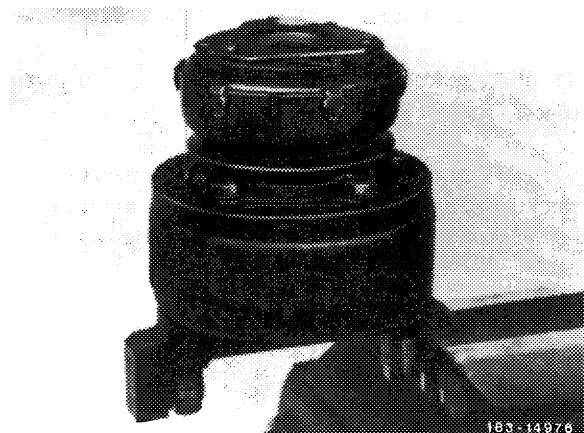
a) Removal and installation of spring plate

Removal

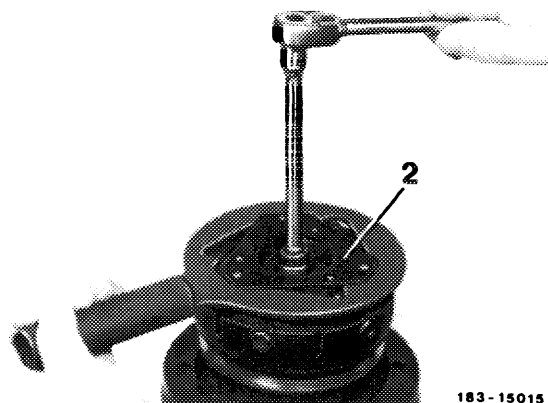
- 1 Drain air conditioning system (83—516).
- 2 Remove refrigerant compressor (83—522).
- 3 Attach holding device to refrigerant compressor and clamp into vise. Unscrew pipe line (7) from refrigerant compressor (1) while removing screw (8). Then close openings with pressure test plate.



- 4 Loosen refrigerant compressor from holding device and reattach with drive shaft in upward direction.

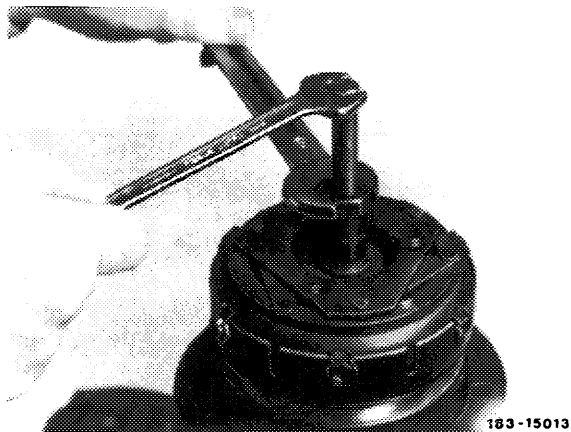


5 Prevent turning of spring plate (2) by means of holding wrench, unscrew nut from shaft, using socket 14 mm for this purpose.



6 Screw remover into hub, hold tool in place with wrench and tighten central screw.

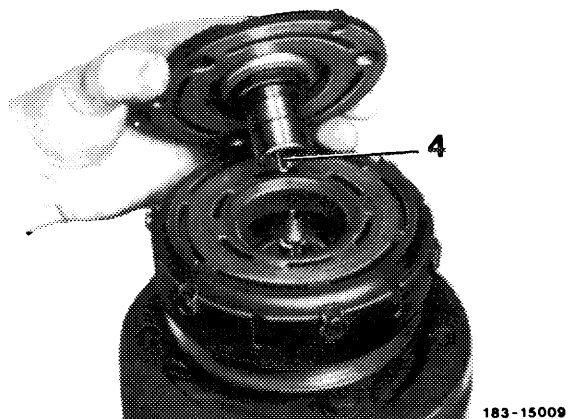
7 Remove key from shaft.



Installation

8 Clean friction surface of spring plate and clutch body.

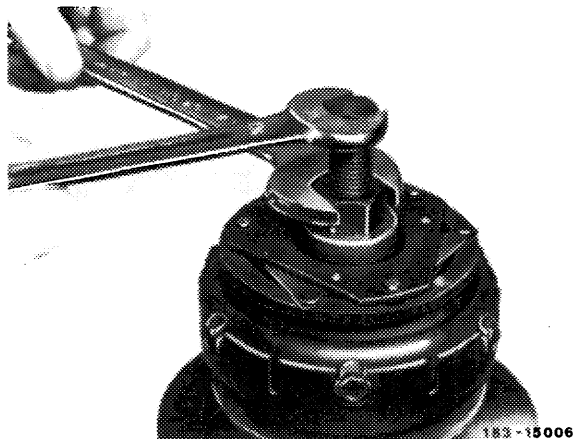
9 Place key (4) into groove of hub to project approx. 5 mm.



10 Place spring plate on shaft with key and key groove in alignment.

11 Place spacer on spring plate. Insert installer through spacer to screw installer on shaft end.

12 Hold hex. head of tool in place to screw-in center screw until a clearance of approx. 0.5–1 mm is provided between friction surfaces of spring plate and clutch body.



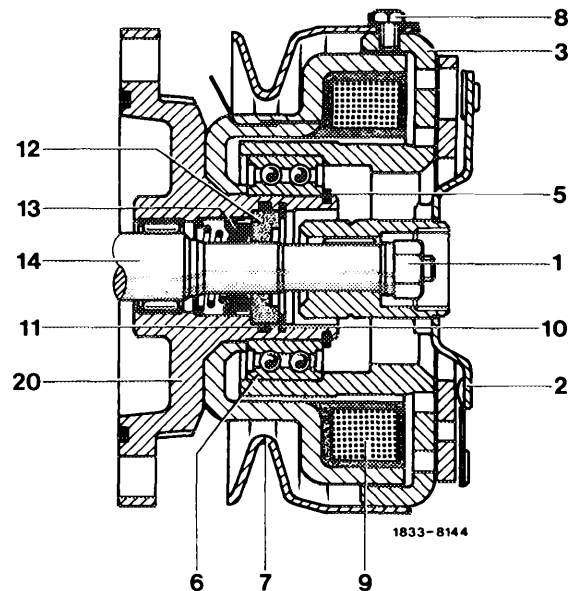
13 Remove installer and spacer.

14 Screw new nut on shaft (smaller diameter of nut in direction of shaft shoulder) and tighten. Check clearance once again.

15 Install refrigerant compressor (83-522).

1 Nut on drive shaft
2 Spring plate
3 Clutch body
5 Locking ring
6 Bearing for clutch body
7 Pulley
8 Screw with lock

9 Solenoid
10 Locking ring
11 O-ring
12 Slip ring
13 Shaft seal
14 Drive shaft
20 Housing cover

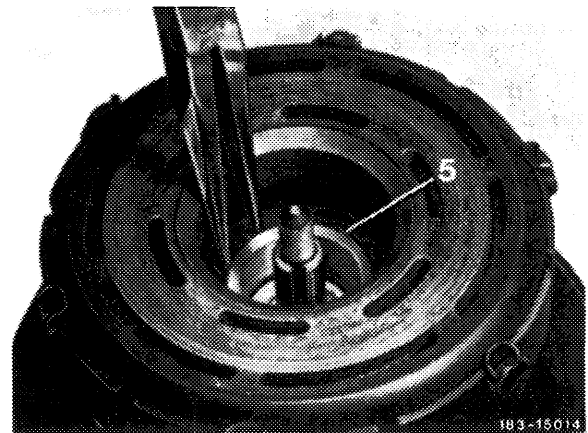


b) Removal and installation of clutch body with pulley, solenoid and bearing.

Removal

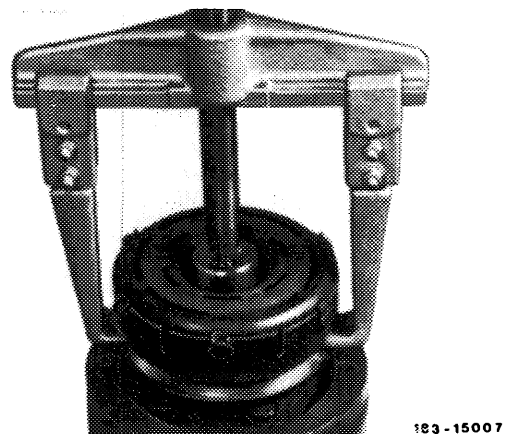
16 Remove spring plate (83-526, section a, items 1 to 7).

17 Remove lock (5). Mark location of solenoid terminals.

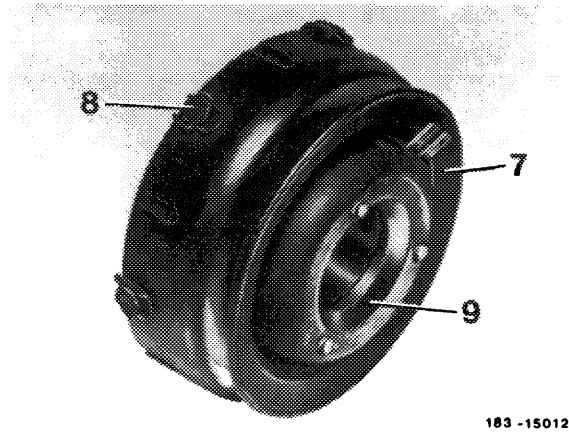


18 Insert guide piece over shaft on head piece of refrigerant compressor.

19 Pull-off assembly group with puller.

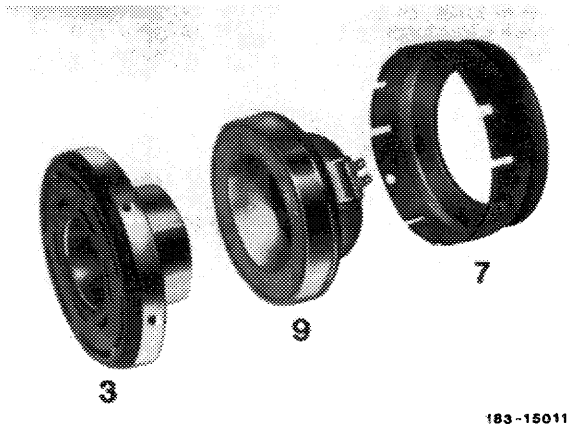


20 Unbend locks on hex. screws and remove the six screws (8) together with locks.



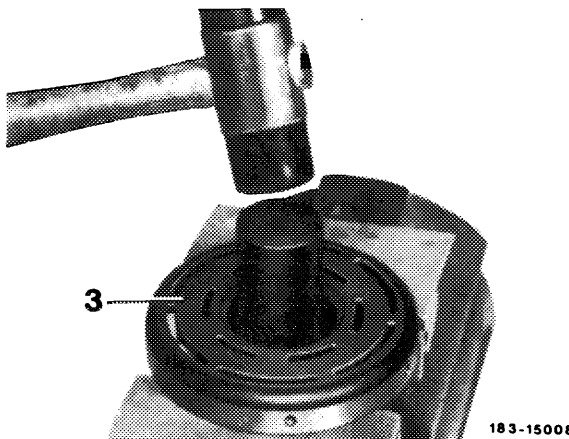
21 Remove pulley from clutch body and take solenoid out of pulley.

Note: If bearing (6) of clutch body (3) must be renewed, perform items 22 to 24.



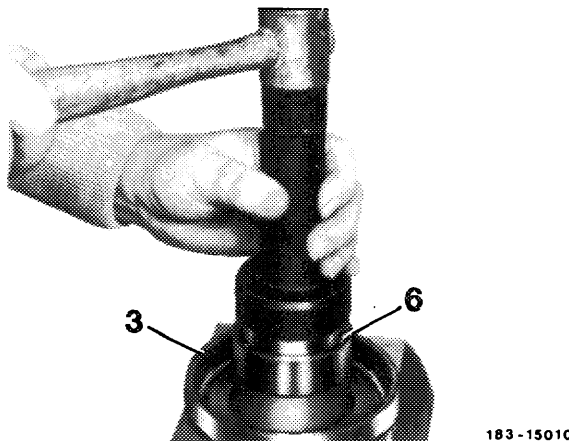
Removing bearing

22 Place clutch body (3) on wooden supports and press-out bearing (6). Notches need not be removed for removal of bearing.

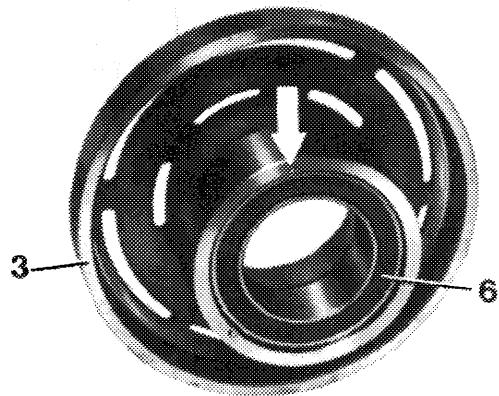


Installing bearing

23 Align new bearing (6) accurately to bore of hub and then press-in.



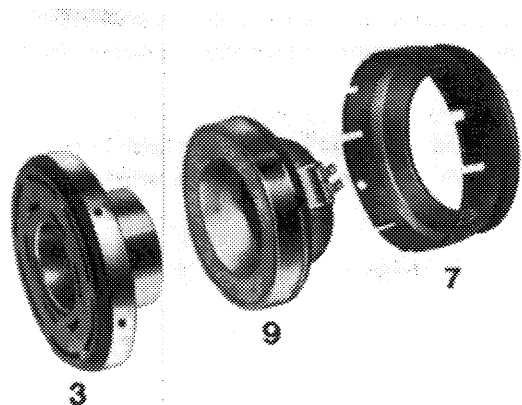
24 Punch-mark bearing at three points located 120° from each other. Do not punch too deep, since otherwise the outer race of bearing may be distorted. Do not use old notches again.



183-15010

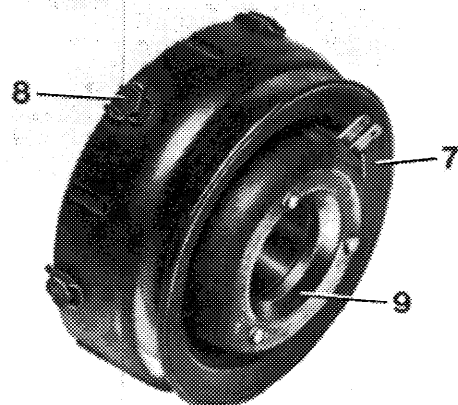
Installation

25 Insert solenoid (9) into pulley (7).



183-15011

26 Slip clutch body (3) into pulley (7) and provisionally screw-on with new locks and screws (8). Provide threads of screws with loctite.



183-15012

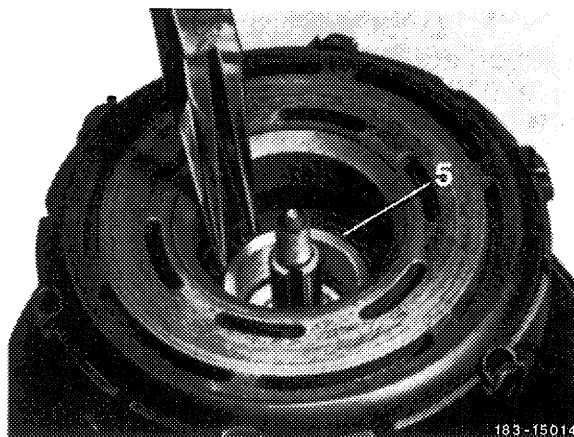
27 Place complete assembly group on front housing cover. Before pressing-on assembly group completely, make sure that the terminals of solenoid are correctly located in relation to refrigerant compressor and that the three projections on back of solenoid are in alignment with the three cavities in housing cover.



183-15021

28 Insert locking ring (5) for assembly group.

29 Clean friction surface of spring plate and clutch body.



30 Turn pulley with clutch body to see whether pulley is in alignment and slightly readjust pulley, if required.

31 Tighten screws (8) of pulley — clutch body. Lock screw heads the same way they were secured prior to removal.

32 Install refrigerant compressor (83—522).

