







46-720 Disassembly/assembly P/S pump

Special tools

Puller for radial sealing ring (basic unit)		116 589 24 33 00
Claw 33 mm dia. for VT 27 2nd version VT 49 and ZF pump		116 589 06 34 00
Claw 30 mm dia. for 1st version VT 49		116 589 05 34 00
Installation mandrel 33 mm dia. for VT 27 2nd version VT 49 and ZF pump		116 589 14 15 00
Installation mandrel 30 mm dia. for 1st version VT 49		116 589 13 15 00
Puller for pulley		108 589 02 33 00

Self-made tools

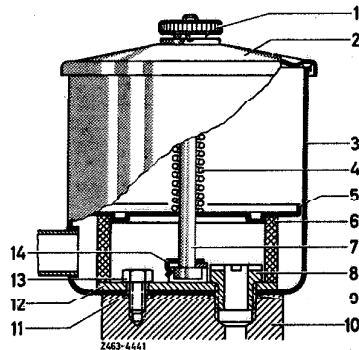
Punch	refer to section B item 19, remark
Assembly sleeve	refer to section B and C item 10, remark

A. Vickers power steering pump VT 27

Disassembly

Supply tank

1 On power steering pump with screwed-on supply tank unscrew knurled nut (1) and remove closing cover (2) with paper gasket. Remove compression spring (4), settling plate (5) and filter ring (6). Unscrew hex. screw (13) and hollow screw (8). Remove supply tank (3) and O-rings (9 and 11) from pump housing (10).

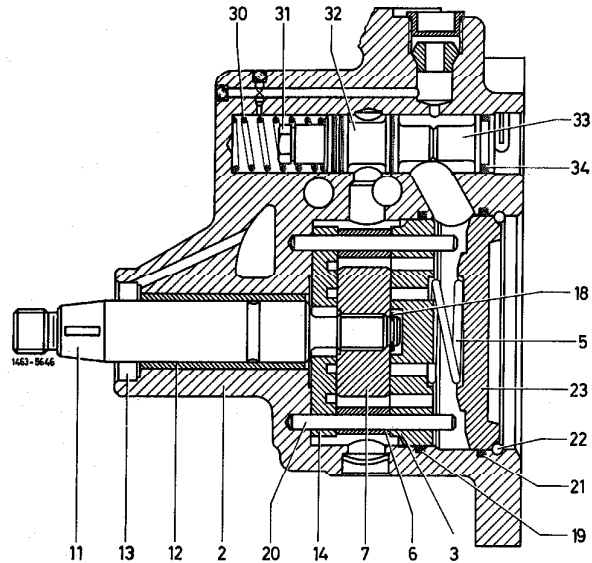


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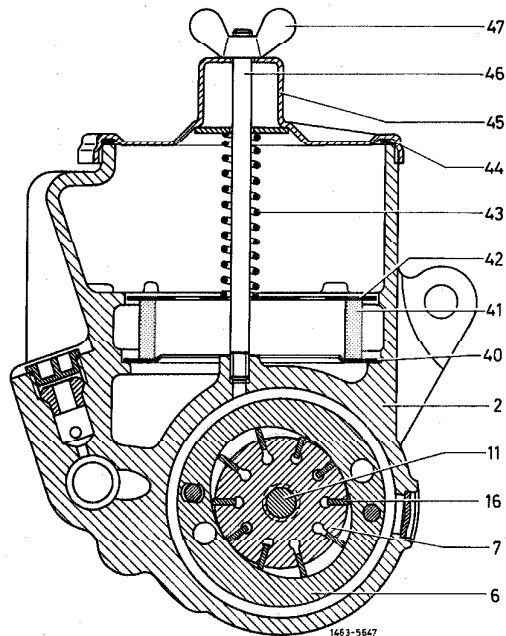
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B. Vickers power steering pump VT 49 (grey iron and light alloy version)
ZF power steering pump (light alloy version)

Disassembly



- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 33 Closing plug
- 34 O-ring
- 40 Steadying plate
- 41 Filter ring
- 42 Steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 47 Wing nut



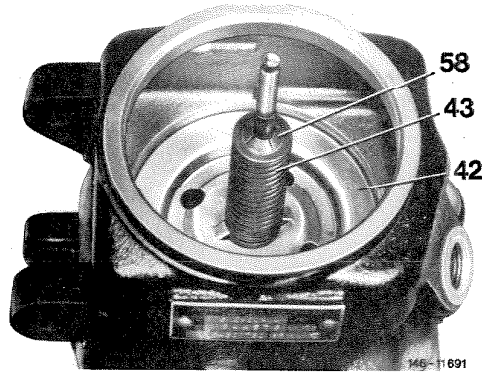
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Disassembly

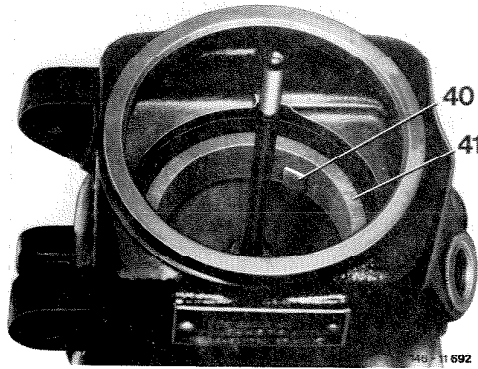
1 Remove wing nut or knurled nut as well as closing cover.

2 On grey iron pump and on light alloy pump 2nd version, remove detent spring (58), compression spring (43) and upper steadying plate (42).

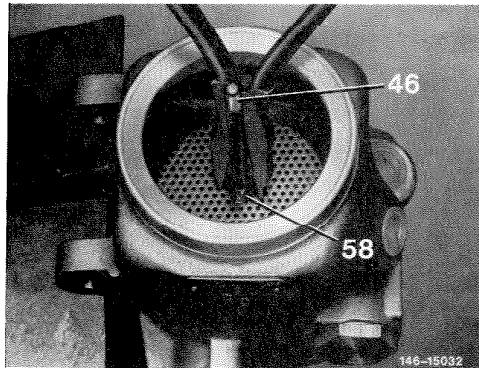
Note: On grey iron pump 1st version a washer is included between compression spring and closing cover, on second version this washer is attached to cover.



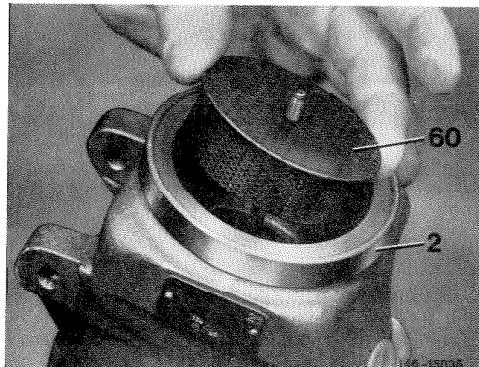
3 On grey iron pump and on light alloy pump 2nd version, remove filter ring (41) and lower steadying plate (40).



4 On light alloy pump 1st version, remove detent spring (58) from stud.

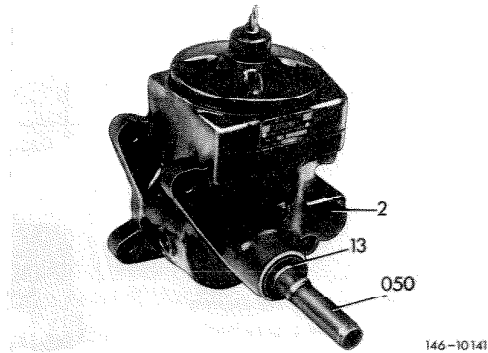


5 On light alloy pump 1st version, take steadying basket (60) out of pump housing.



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- 6 Remove Woodruff key from drive shaft.
- 7 Screw guide sleeve (050) on drive shaft.

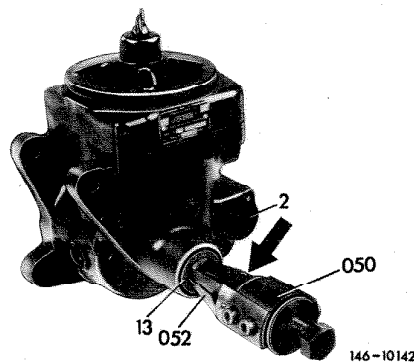


- 8 Turn hex. screw of puller (050) back and slip device on drive shaft, while punching through lips of radial sealing ring (13) by means of claws (052).

Note: Power steering pumps require the following claws for puller:

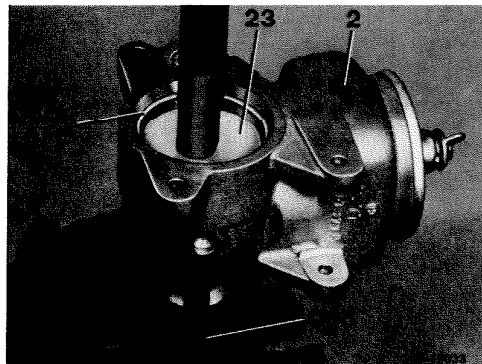
- VT 49 1st version 30 mm dia.
- VT 49 2nd version 33 mm dia.

Fasten respective claws to puller. The claw dia. is punched in.



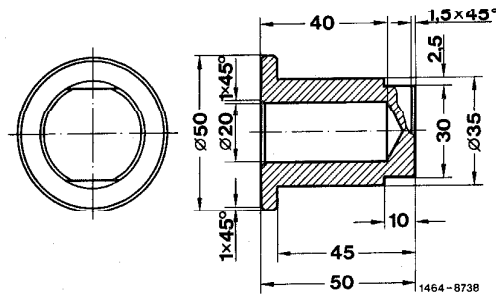
- 9 Turn clamping cone (arrow) of puller to the right up to stop, then pull sealing ring out of housing.

- 10 Place assembly sleeve (065) on power steering pump and push cover (23) slightly into housing by means of a hand press or a screw clamp.



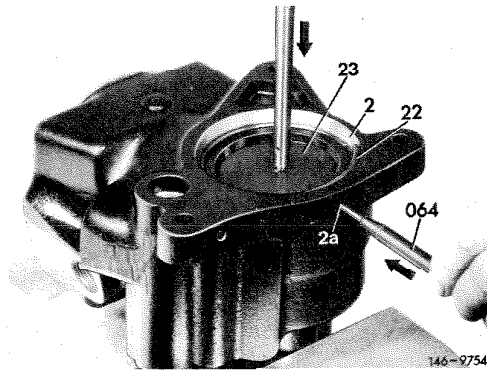
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Note: The assembly sleeve is self-made according to specified dimensions.



11 Remove circlip (22) from housing and take off cover.

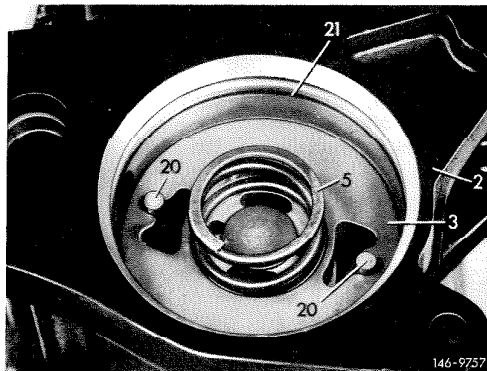
Note: On grey iron pump the circlip can be pushed out of steering case through bore (2a) by means of a punch.



12 Remove spring (5) and O-ring (21) from pump housing (2).

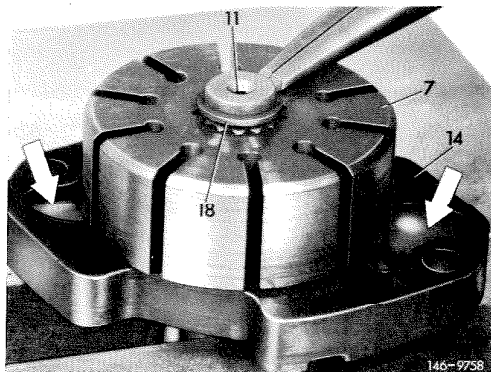
13 Push drive shaft complete with pressure plate at cover end, rotor, cam ring and pressure plate at drive end toward the rear out of housing.

14 Remove pressure plate, cam ring and blade (10 each).



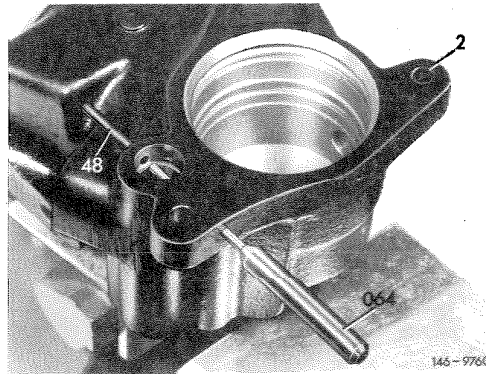
15 Remove locking ring (18) from drive shaft (11), then remove rotor (7) and pressure plate (14).

16 Take cyl. pins (20) out of pump housing.

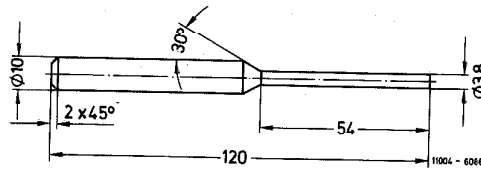


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17 On grey iron power steering pump, knock locking pin (48) out of pump housing (2) with punch (064).

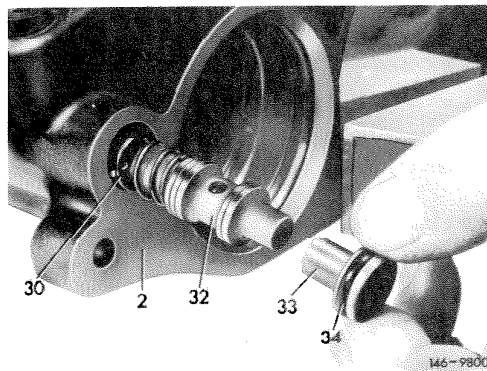


Note: The punch is self-made according to specified data.



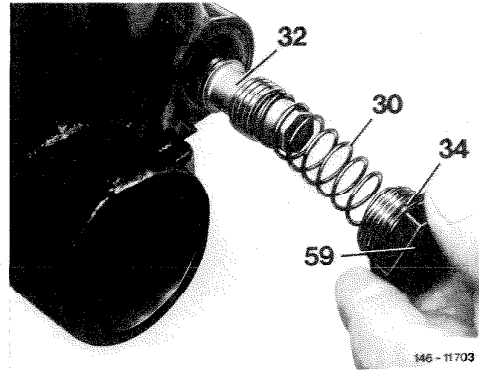
18 Remove closing plug (34), volume control valve (32) and compression spring (30) from housing.

Note: If closing plug remains seated in housing, loosen by means of light hammer blows against closing plug. Make sure that the volume control valve is not damaged.

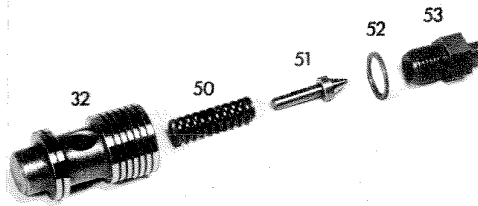


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19 On light alloy power steering pump, unscrew closing plug (59) from housing, remove compression spring (30) and volume control valve.



20 Clamp volume control valve (32) of both pump versions with its unground part into vise and unscrew valve screw (53) of pressure relief valve. Make sure that no spacing washer (52) is lost. Remove valve cone (51) and compression spring (50) from volume control valve.



Checking and reconditioning

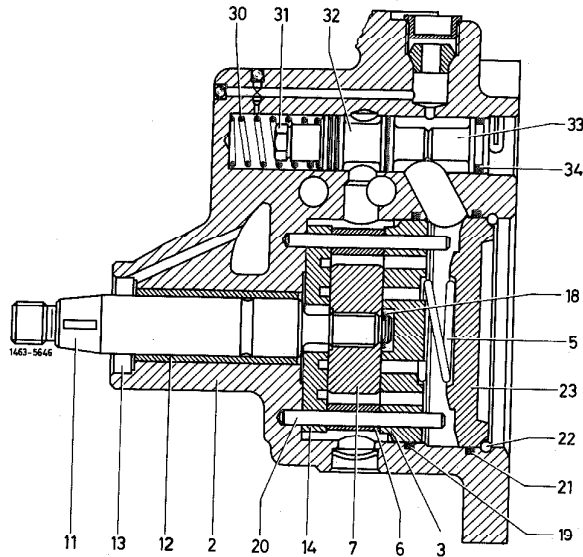
Repair sets

Designation	Power steering pump Vickers VT 49		ZF
	Grey iron	Light alloy	Light alloy
Set of seals	000 586 52 46		000 586 84 46
Pump insert	000 586 52 46		000 586 86 46
Drive shaft	000 586 53 46		000 586 85 46
Volume control valve	65 bar	000 586 70 46	000 586 87 46
	82 bar	000 586 69 46	000 586 88 46

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21 Check ground surface of pressure plates (3 and 14).
With score marks on pressure plates, recondition power steering pump by means of repair set "pump insert".

- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive en
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 33 Closing plug
- 34 O-ring

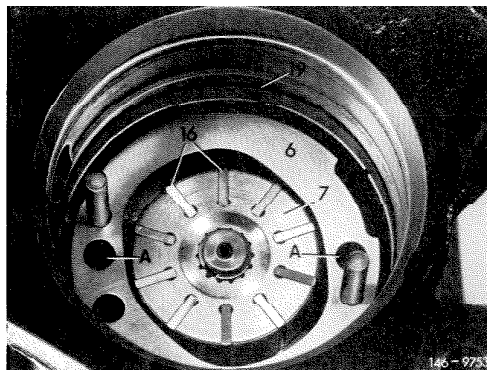


22 Check drive shaft (11) and bearing bushing (12) for wear. If required, install bushing from repair set "drive shaft".

Note: Install slotted bushing in such a manner that the slot is located opposite to pulling direction of V-belt.

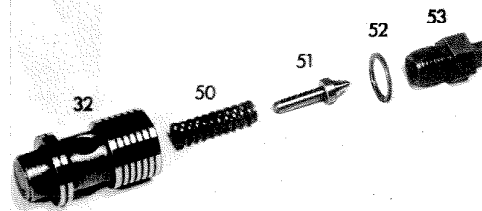
23 Check blades in grooves of rotor (7), they should slide easily in rotor. Check slide surface of blades on cam ring (6) for wear. If required, recondition power steering pump by using repair set "pump insert".

Note: No noticeable marks should show up at slide surface of cam ring, since delivery capacity and smooth running of power steering pump depend on that surface.



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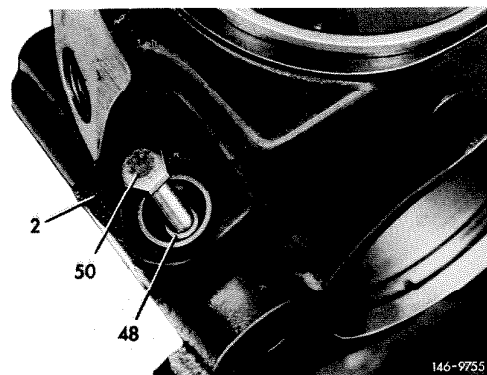
24 Check ground surfaces of volume control valve (32) and bore in pump housing for wear and damage. If the sliding surfaces are showing score marks, renew complete power steering pump. Never replace volume control valve only.



146-9289

25 Check both sealing cones (connection high-pressure expanding hose, return flow pipe). Replace distorted sealing cones. For this purpose, cut several 7 or 10 mm threads into sealing cone. Pull sealing cone out of housing by means of a 7 or 10 mm screw.

26 Position new sealing cones (48) in housing and push in by screwing high-pressure expanding hose or return flow pipe into housing.



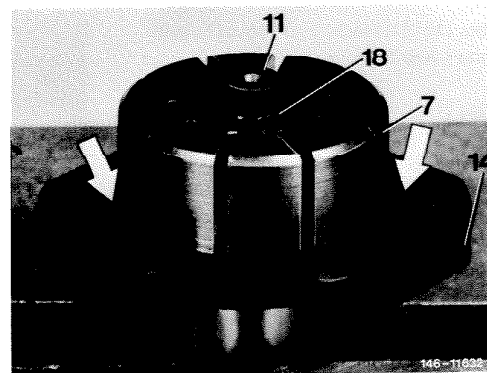
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Assembly

Note

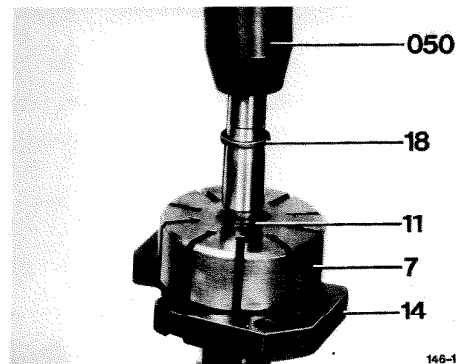
Prior to assembly, coat all parts with steering gear oil.

27 Place pressure plate at input end (14) with recesses (refer to arrow) toward splining on drive shaft (11). Place rotor (7) on splining of drive shaft (11).



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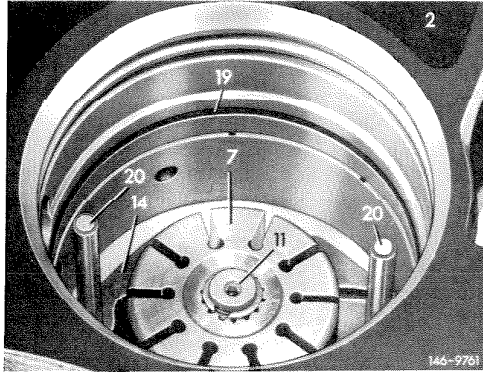
28 Insert locking ring (18) into groove of drive shaft (11) by means of assembly mandrel (050).



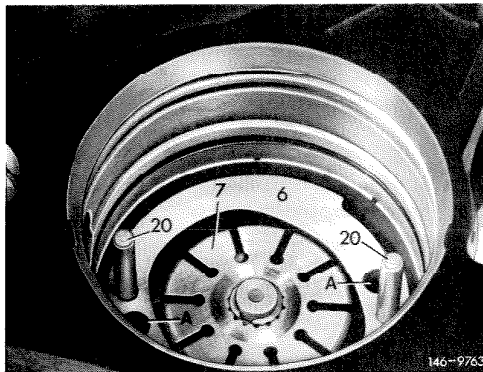
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46-720 Disassembly/assembly P/S pump

29 Insert both cyl. pins (20) into pump housing, then insert pre-assembled drive shaft.

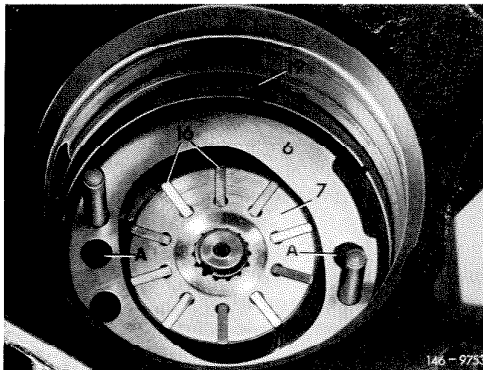


30 Place cam ring (6) with cast-in direction of rotation arrow in upward direction on cyl. pins (20). Pay attention to correct location of cam ring.

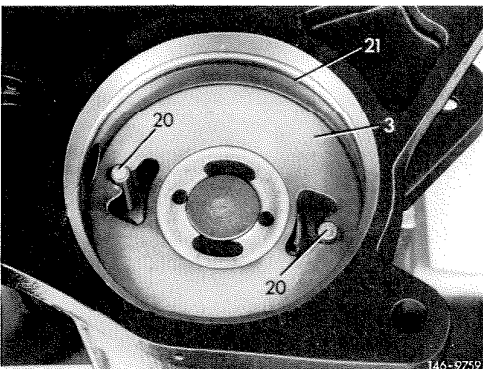


31 Insert blades (16) (10 each) into rotor (7) with rounded-off sides toward cam ring (6).

32 Insert O-ring (19) into housing.



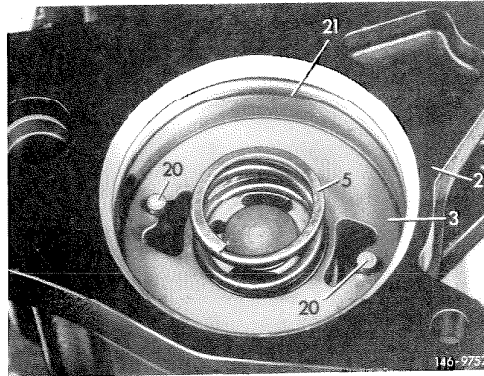
33 Insert pressure plate (30) into housing.



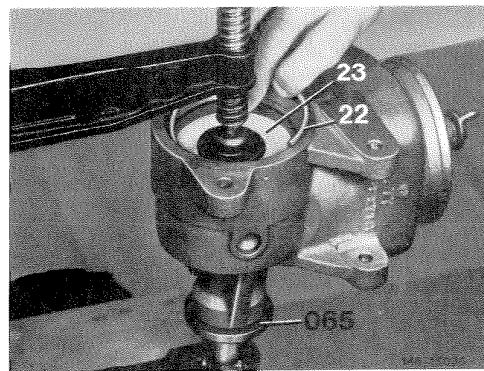
46-720 Disassembly/assembly P/S pump

34 Insert O-ring (21) into housing. Place compression spring (5) on pressure plate (3).

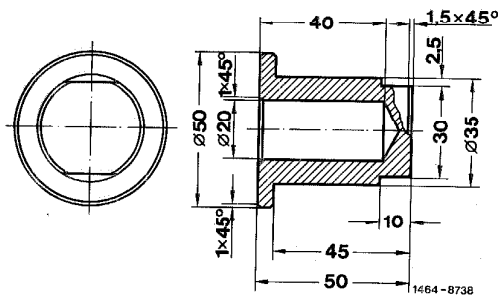
Note: O-rings (19) and (21) have different diameters. The O-ring (19) with the smaller diameter seals pressure plate (3), the larger O-ring (21) seals cover (23) in relation to housing.



35 Place assembly sleeve (065) on power steering pump and mount cover (23). Then press cover slightly into housing by means of a hand press. Insert circlip (22) into groove of housing, pay attention to correct location of ring.

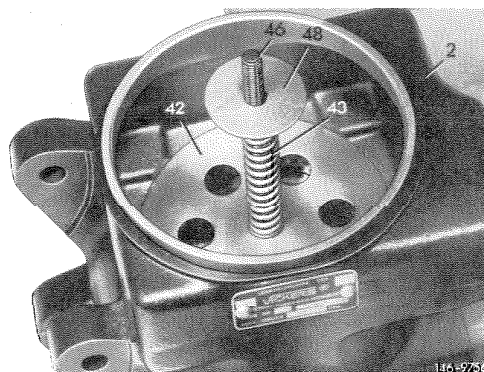


Note: The assembly sleeve is self-made according to specified dimensions.



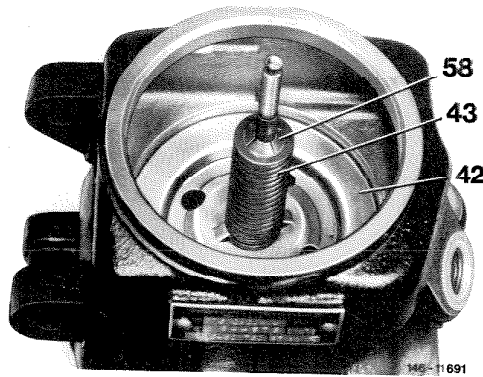
36 On grey iron pump, insert lower steadying plate (40), filter ring (41), upper steadying plate (42) and compression spring (43) into housing.

37 On grey iron power steering pump 1st version, place washer (48) on stud (46), fasten closing cover (45) together with paper gasket (44) by means of wing nut (47).

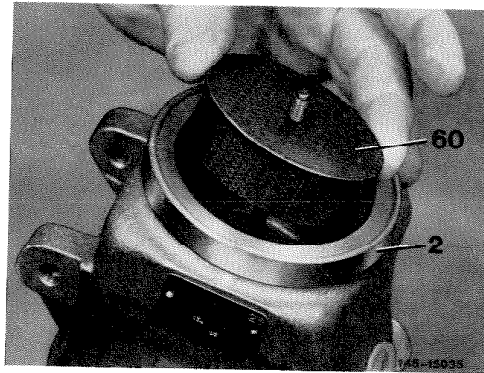


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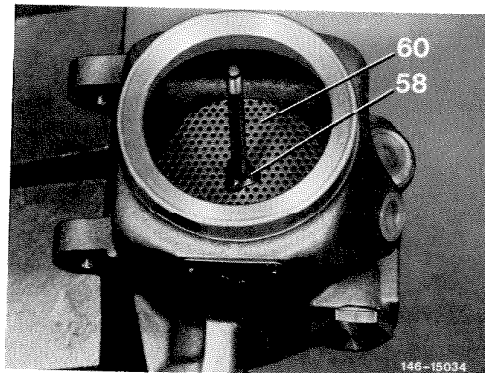
38 On grey iron power steering pump and on light alloy pump 2nd version, press detent spring (58) on stud and fasten closing cover together with paper gasket by means of wing nut.



39 On light alloy power steering pump 1st version, place steadying basket (60) into housing.

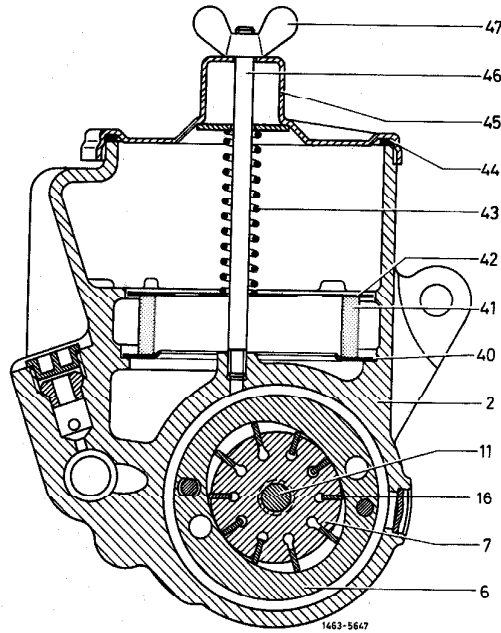


40 On light alloy power steering pump 1st version, press detent spring (58) on stud.



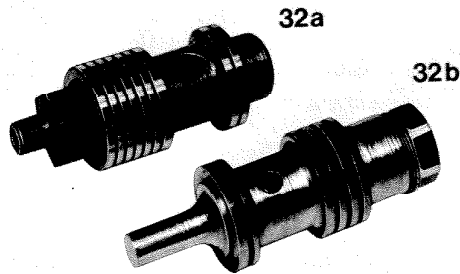
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- 2 Pump housing
- 6 Cam ring
- 7 Rotor
- 11 Drive shaft
- 16 Blade
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 47 Wing nut



When a new volume control valve is installed, make certain that a valve with correct opening pressure of the relief valve is installed. In addition, pay attention to manufacturer of volume control valve:

- Vickers valve
- ZF valve

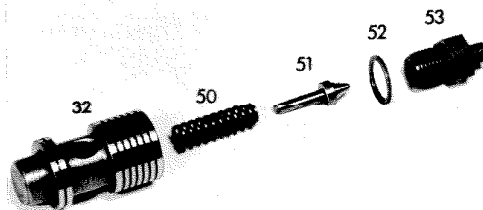


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Clean volume control valve prior to assembly, immerse in manual transmission oil and introduce into housing bore. Valve should slide easily in housing bore.

Install pressure relief valve from respective repair kit of volume control valve. Insert compression spring (50) first, then valve cone (51). Then place gaskets (52) for adjusting opening pressure of valve screw (53).

Caution:
Use the same washers which were previously installed.



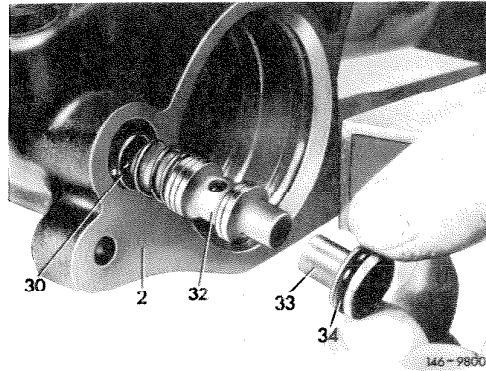
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46-720 Disassembly/assembly P/S pump

44 Clamp volume control valve (32) with its unground part into vise, screw in valve screw (53) and tighten.

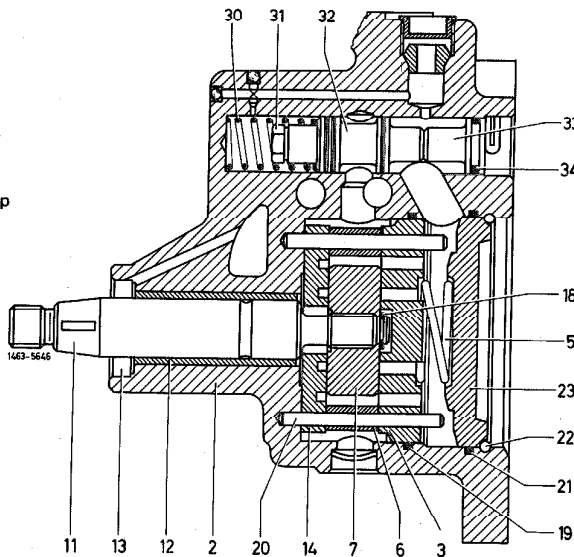
45 On grey iron power steering pump, insert compression spring (30) into bore of pump housing (2). Flush volume control valve once again, immerse in manual transmission oil and introduce into housing bore in such a manner that the valve screw is pointing inwards.

46 Fit a new O-ring (34) on closing plug (33). Force closing cover with bolt inwards into housing bore and secure by knocking in setpin.



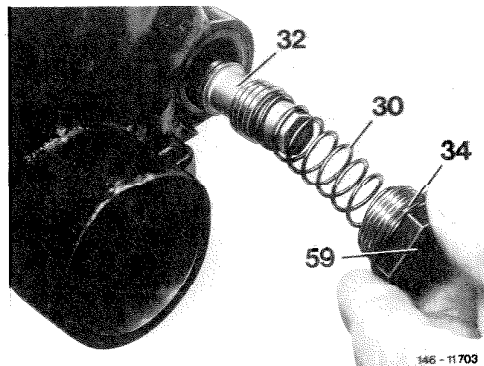
Grey iron power steering pump

- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 33 Closing plug
- 34 O-ring



47 On light alloy power steering pump, insert volume control valve (32) and compression spring (30) into housing.

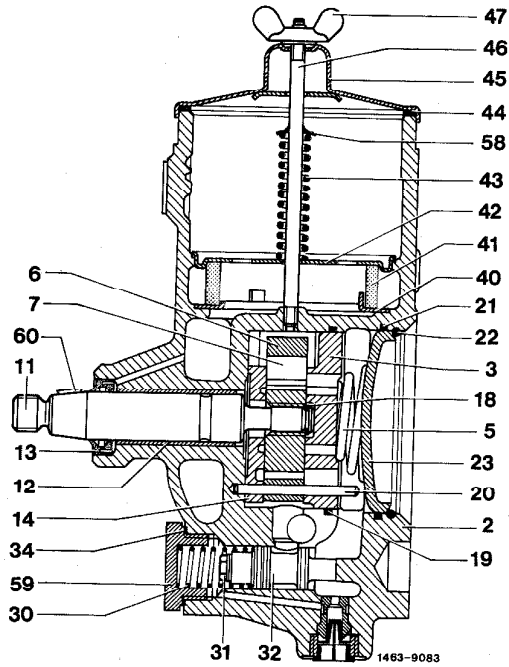
Note: Install volume control valve in such a manner that valve screw of pressure relief valve is pointing toward closing plug.



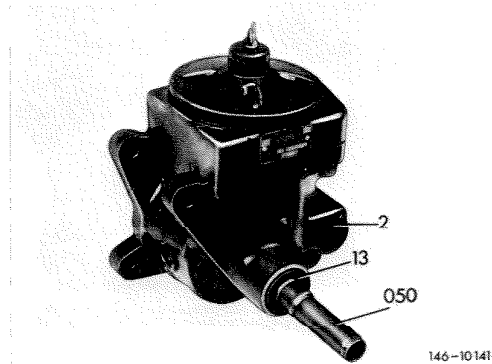
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Light alloy power steering pump

- 2 Pump housing
- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 12 Bearing bushing
- 13 Radial sealing ring
- 14 Pressure plate at drive end
- 18 Locking ring
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Circlip
- 23 Cover
- 30 Compression spring
- 31 Valve screw
- 32 Volume control valve
- 34 Closing plug
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 47 Wing nut
- 58 Detent spring
- 59 Closing plug
- 60 Woodruff key



Remove guide sleeve from 116 589 24 33 00 (050) drive shaft.



Press radial sealing ring (13) into housing by using mandrel (053).

Insert Woodruff key into groove of drive shaft.

