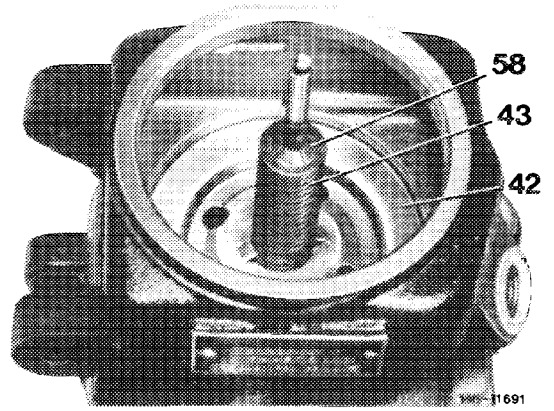
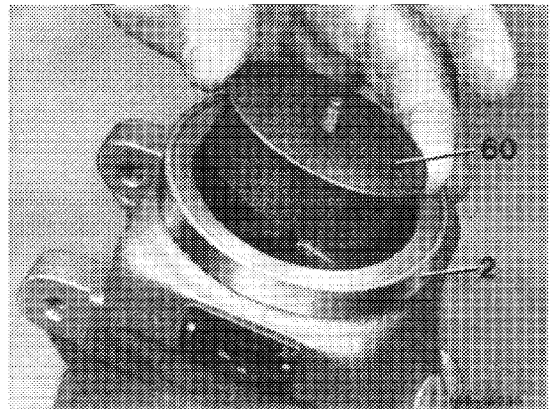


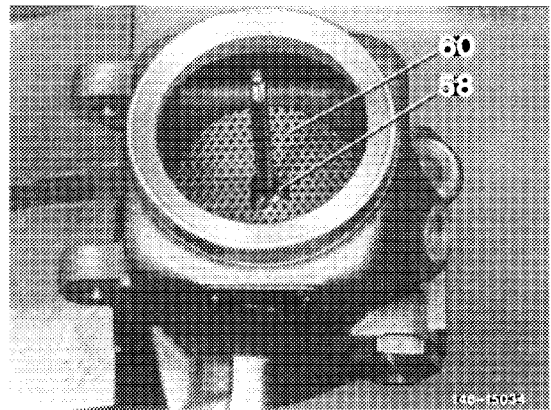
12 On grey iron power steering pump and on light alloy pump 2nd version, press detent spring (58) on stud and fasten closing cover together with paper gasket by means of wing nut.



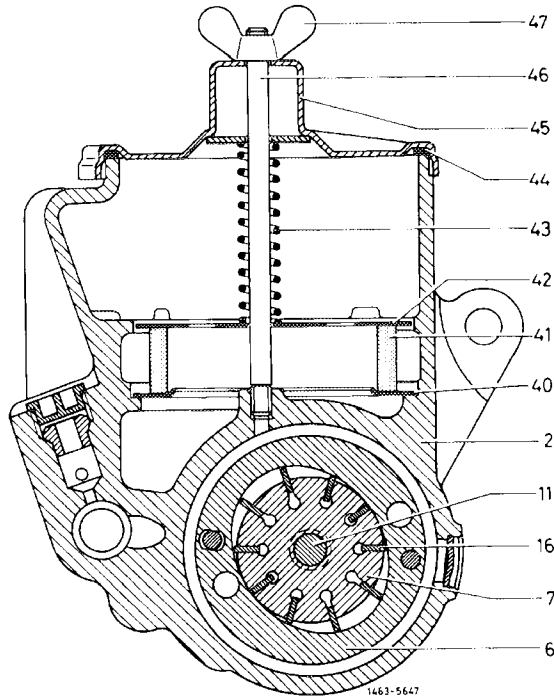
13 On light alloy power steering pump 1st version, place steadying basket (60) into housing.



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



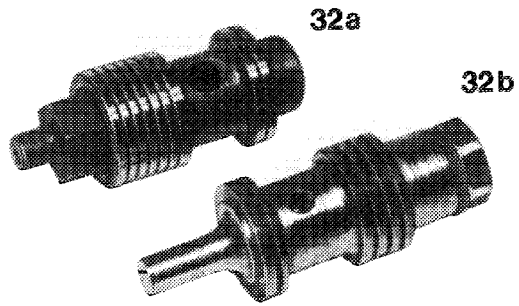
- 2 Pump housing
- 6 Cam ring
- 7 Rotor
- 11 Drive shaft
- 16 Blade
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 44 Gasket
- 45 Closing cover
- 46 Stud
- 47 Wing nut



1463-5647

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

- 32a = Vickers valve
- 32b = ZF valve



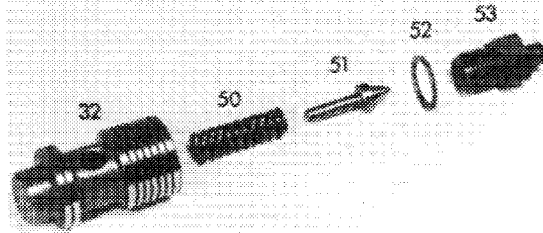
146-11708

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

17 Install pressure relief valve from respective repair set into volume control valve. Insert compression spring (50) first, then valve cone (51). Then place spacing washers (52) for adjusting opening pressure into valve screw (53).

**Attention!**

Use the same washers which were previously installed.

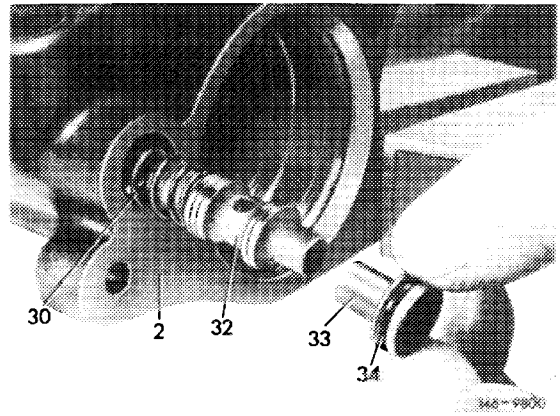


146-9989

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

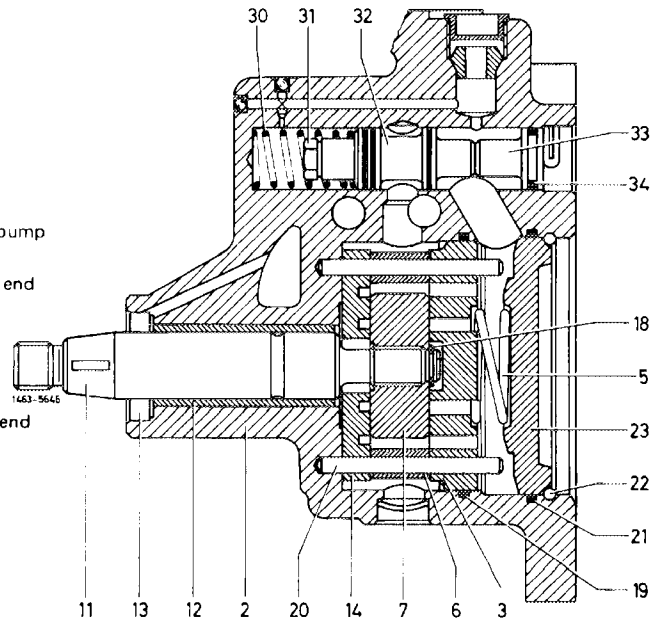
19 On grey iron power steering pump, insert compression spring (30) into bore of pump housing (2). Flush volume control valve once again, immerse in manual transmission oil and introduce into housing bore in such a manner that the valve screw is pointing inwards.

20 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.



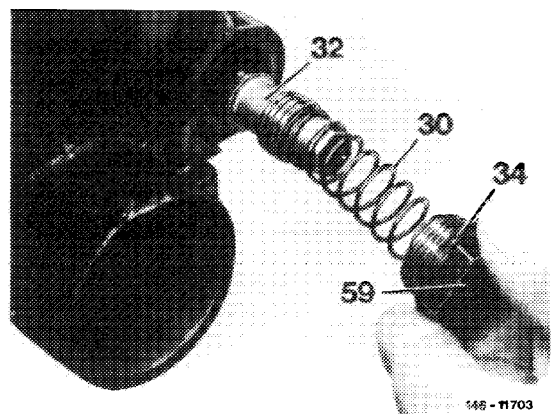
Grey iron power steering pump

- 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



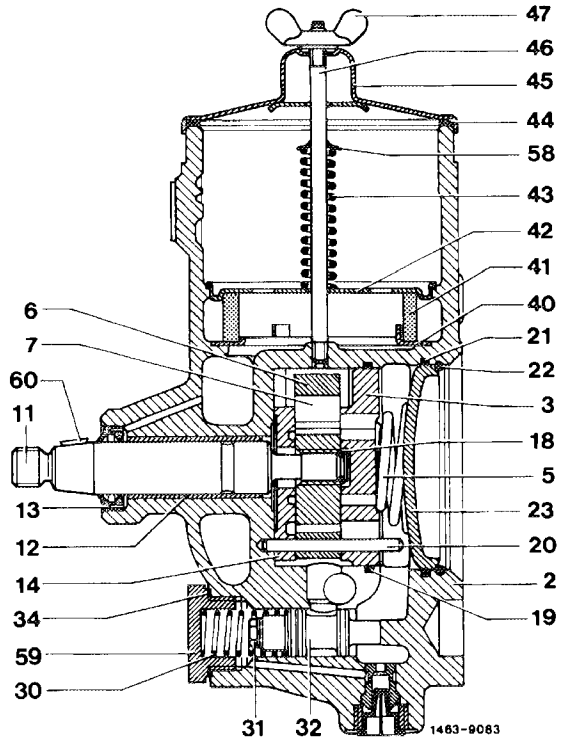
21 On light alloy power steering pump, insert volume control valve (32) and compression spring (30) into housing.

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

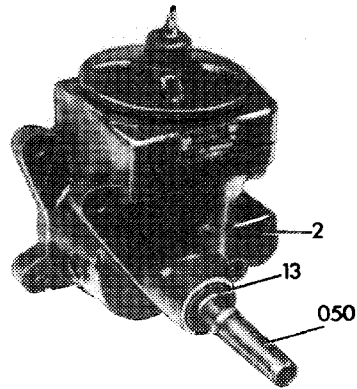


Light alloy power steering pump

- 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



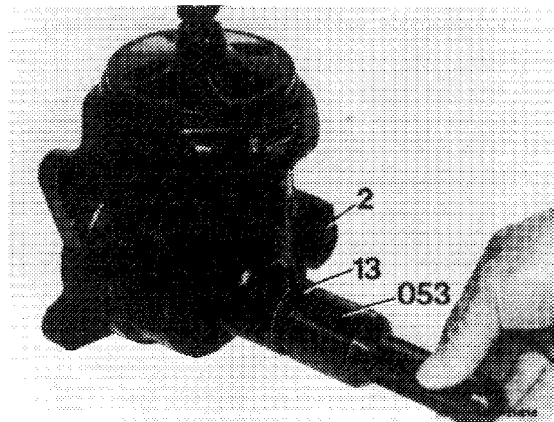
22 Screw guide sleeve from 116 589 24 33 00 (050) on drive shaft.



146-10141

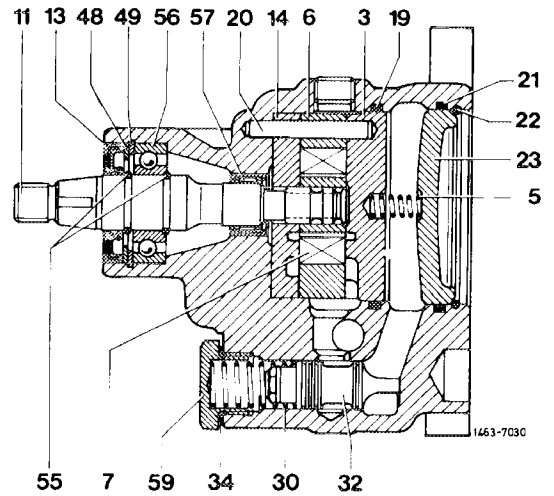
23 Press radial sealing ring (13) into housing by means of mandrel (053).

24 Insert Woodruff key into groove of drive shaft.



## C. ZF power steering pump (grey iron version)

- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 13 Sealing ring
- 14 Pressure plate at drive end
- 19 O-ring
- 20 Cyl. pin
- 21 O-ring
- 22 Hooked circlip
- 23 Cover
- 30 Compression spring
- 32 Volume control valve
- 34 Sealing ring
- 48 Washer
- 49 Locking ring
- 55 Circlip
- 56 Radial ball bearing
- 57 Needle bearing
- 59 Closing plug

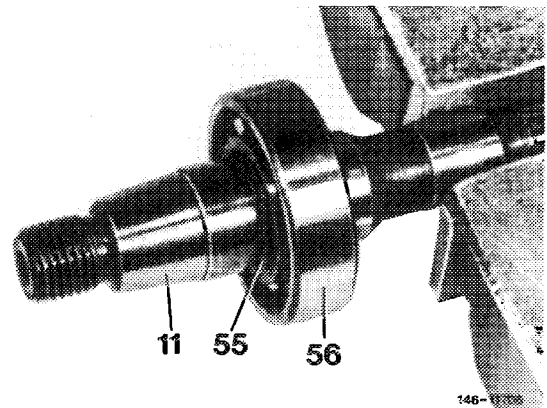


### Note

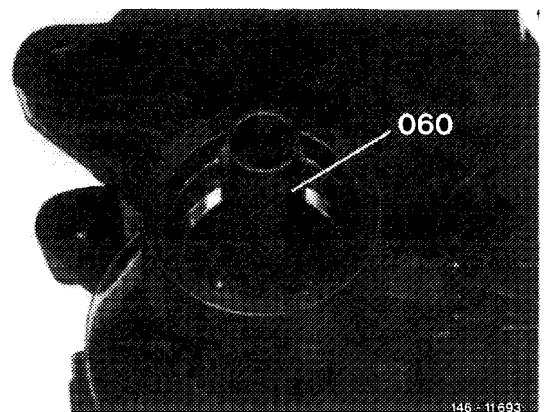
Coat all parts with manual transmission oil prior to assembly.

1 Insert front circlip (55) into groove of drive shaft (11). Press on radial ball bearing and insert 2nd circlip.

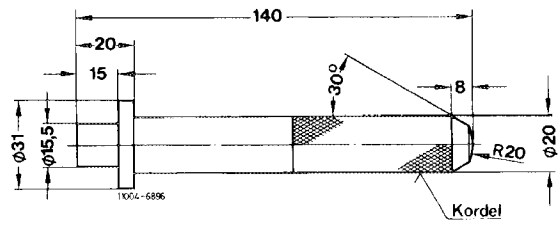
**Note:** Install all parts from splined end of drive shaft, to prevent damage to ground surface for radial sealing ring.



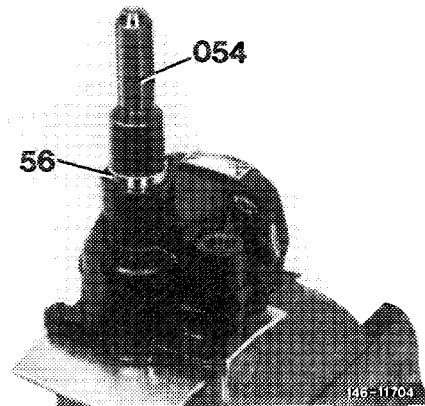
2 Press needle bearing into housing by means of assembly mandrel.



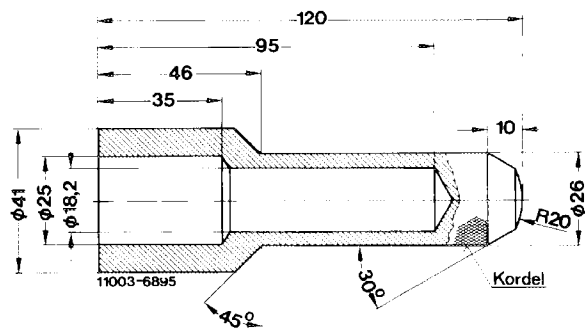
**Note:** The assembly mandrel is self-made according to specified dimensions.



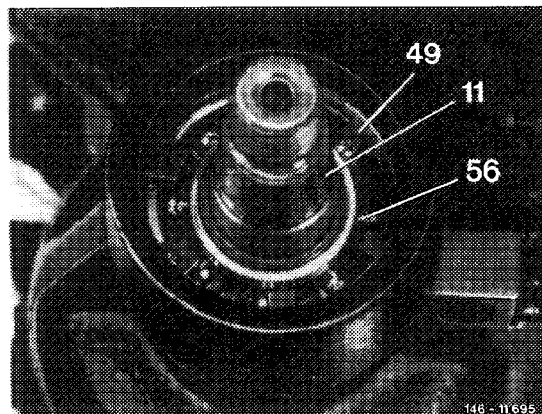
3 Press drive shaft into housing by means of pressing-in mandrel.



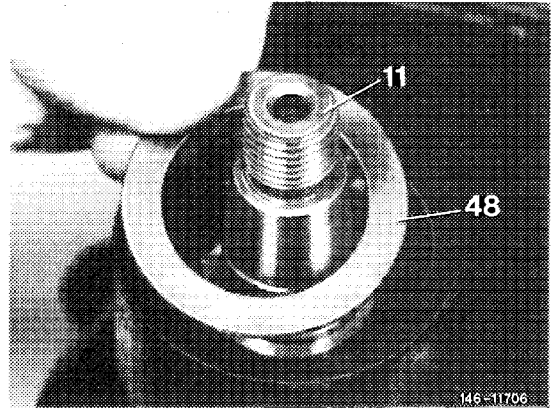
**Note:** The pressing-in mandrel is self-made according to specified dimensions.



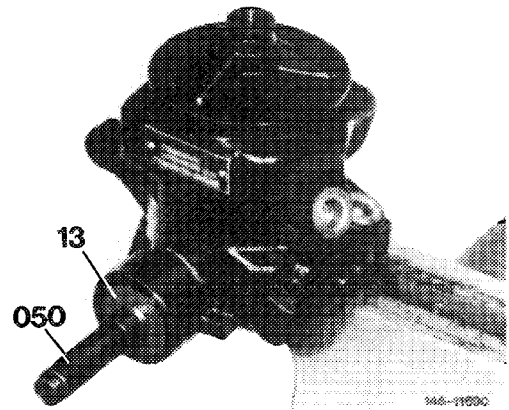
4 Insert locking ring (49), pay attention to correct seat of locking ring.



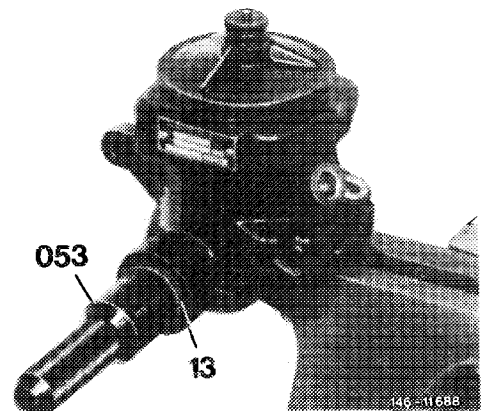
5 Place washer (48) on drive shaft.



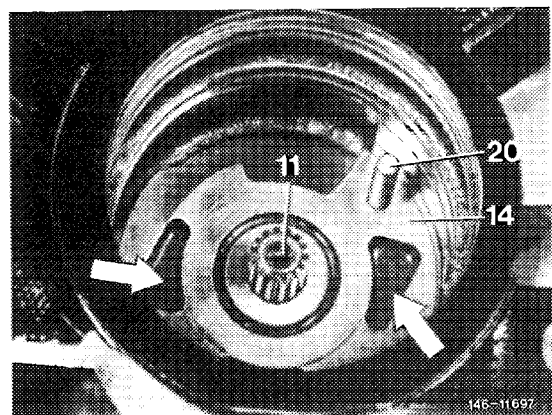
6 Screw guide sleeve from 116 589 24 33 00 (050) on drive shaft.



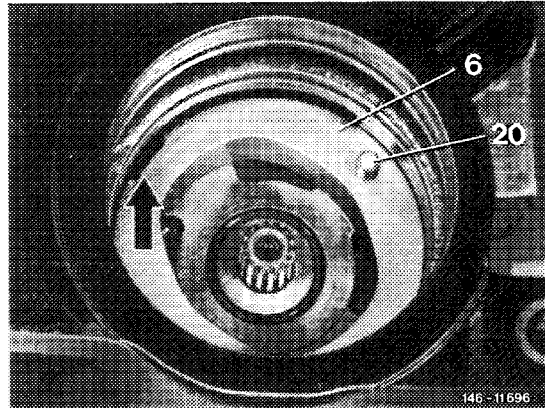
7 Press radial sealing ring (13) into housing by means of pressing-in mandrel. Insert Woodruff key into groove of drive shaft.



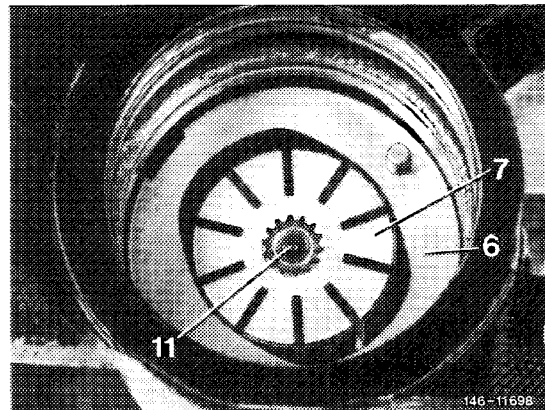
8 Place pressure plate (14) at drive end with groove (arrow) in upward direction over setpin into housing.



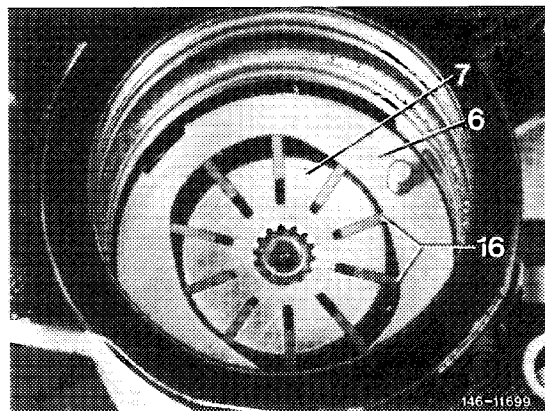
9 Insert cam ring (6) with direction of rotation arrow (arrow) in upward direction into housing.



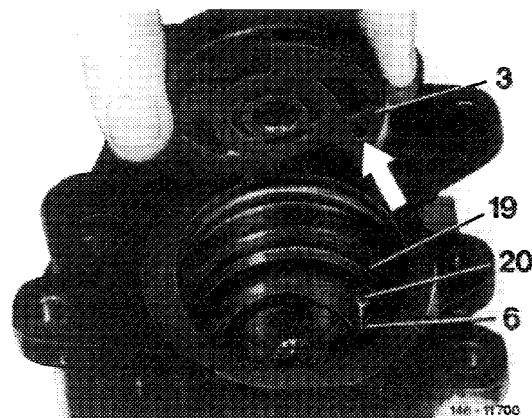
10 Slip rotor (7) on splining of drive shaft.



11 Insert blade (16) into grooves of rotor in such a manner that the rounded off sides are facing outwards toward cam ring.



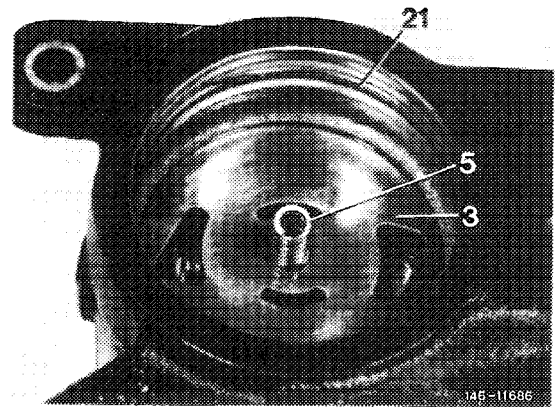
12 Insert O-ring (19), then pressure plate at cover end (3) into housing, making sure that blind hole of pressure plate slips over setpin.



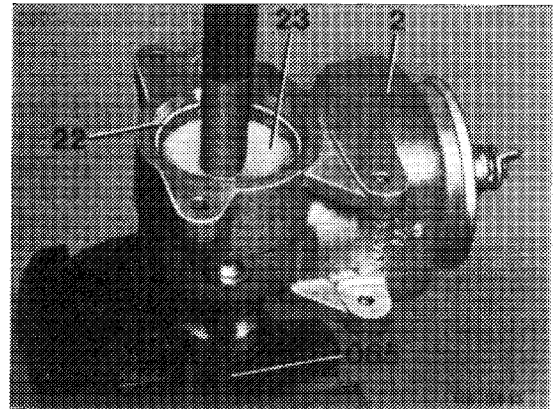


13 Insert O-ring (21) into housing, place compression spring (5) on pressure plate.

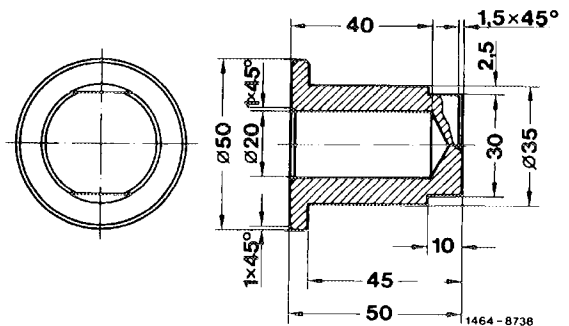
**Note:** The O-rings (19) and (21) have different diameters. The O-ring with the small diameter seals the pressure plate, the larger O-ring the cover in relation to housing.



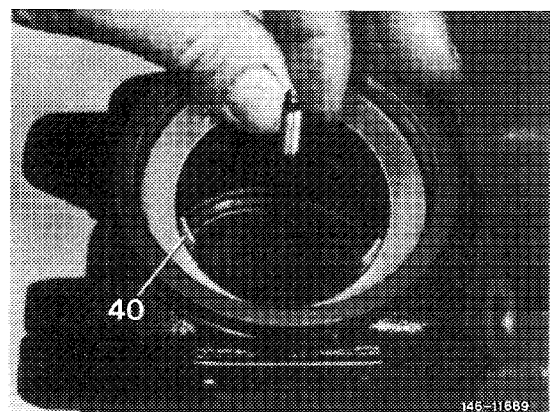
14 Place assembly sleeve (065) on power steering pump and mount cover (23). Then force cover slightly into housing by means of a hand press and insert hooked circlip (22). Pay attention to correct location of ring



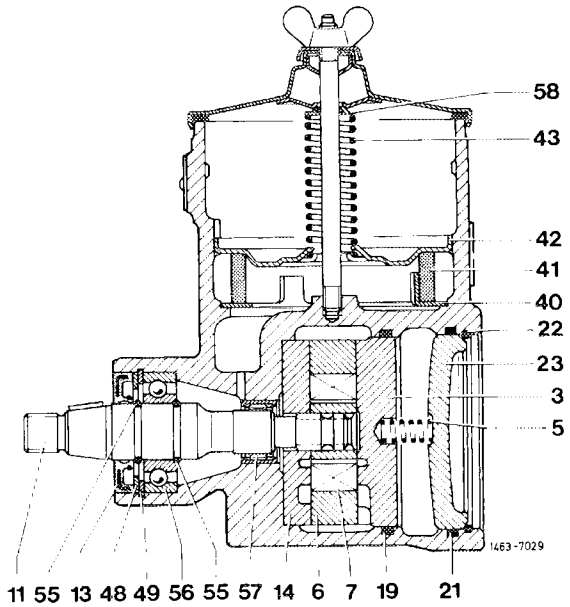
**Note:** The assembly sleeve is self-made according to specified dimensions.



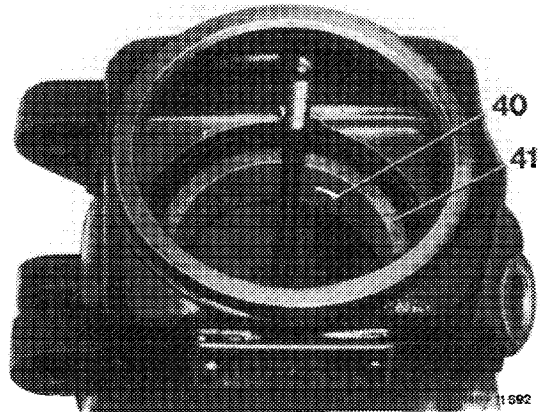
15 Insert lower steadying plate into housing.



- 3 Pressure plate at cover end
- 5 Compression spring
- 6 Cam ring
- 7 Rotor with blade
- 11 Drive shaft
- 13 Sealing ring
- 14 Pressure plate at drive end
- 19 O-ring
- 21 O-ring
- 22 Hook circlip
- 23 Cover
- 40 Lower steadying plate
- 41 Filter ring
- 42 Upper steadying plate
- 43 Compression spring
- 48 Washer
- 49 Locking ring
- 55 Circlip
- 56 Radial ball bearing
- 57 Needle bearing
- 58 Detent spring

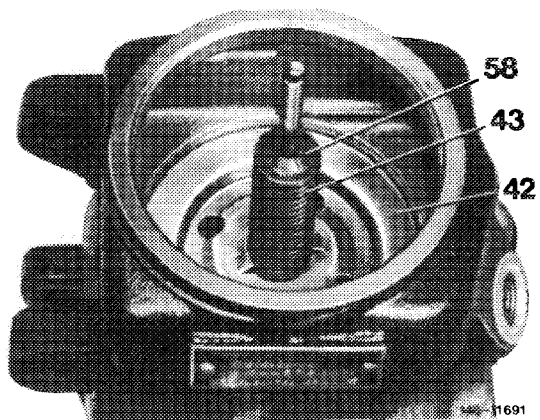


16 Place filter ring (41) on lower steadying plate.



17 Insert upper steadying plate (42) including compression spring (43) into housing and press detent spring (58) on stud.

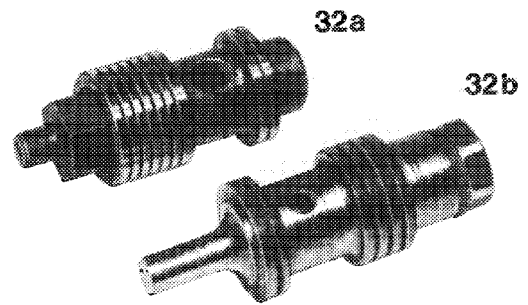
18 Mount closing cover including paper gasket, screw on knurled nut.



19 If a new volume control valve is installed, make sure that the pressure relief valve has the correct opening pressure. Also pay attention to manufacturer of volume control valve.

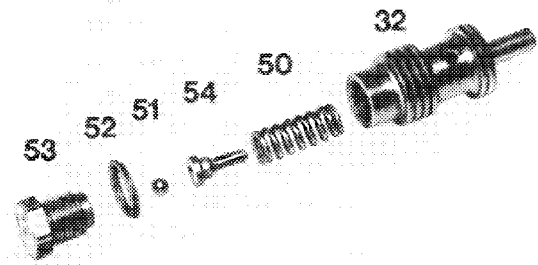
32a = Vickers valve

32b = ZF valve



146 - 11706

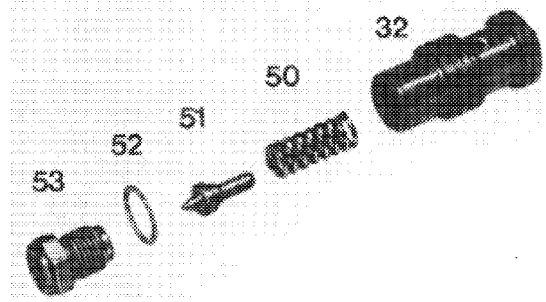
20 Install pressure relief valve into volume control valve. Insert compression spring (50) with pressure pin (54) first, then insert valve ball (51) on volume control valve 1st version. Place spacing washers (52) on valve screw (53) and screw valve screw into volume control valve.



146 - 11707

21 On 2nd version, insert compression spring (50), then valve cone (51). Then insert spacing washers (52) for adjusting opening pressure into valve screw (53).

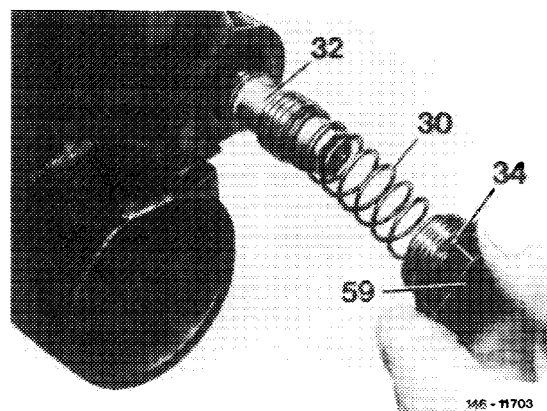
**Note:** Always use the same washers which were previously installed.



146-16436

22 Clamp volume control valve (32) with its unground part into vise and tighten valve screw.

23 Insert volume control valve and compression spring (32) into housing, screw in closing plug (59) with new sealing ring (34) and tighten.



146 - 11703