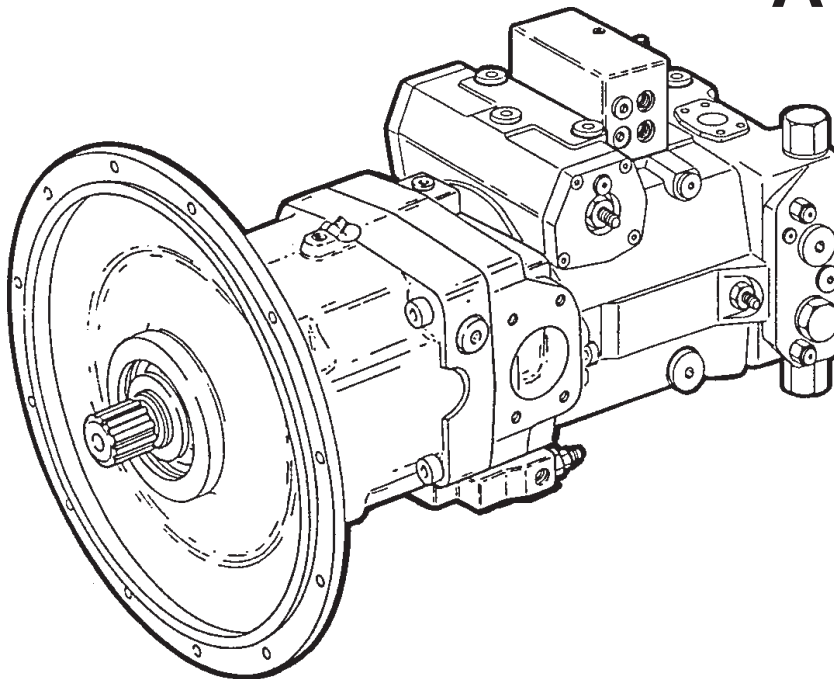


R

Reparaturanleitung Repair Instructions

A11VO ..190

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RDE 92500-05-R
02.97



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HINWEIS

Bezeichnungen, Beschreibungen und Darstellungen entsprechen dem Informationsstand zum Zeitpunkt der Drucklegung dieser Unterlage.

Änderungen können den Service am Produkt beeinflussen, Verpflichtungen entstehen uns daraus nicht.

Methoden und Vorrichtungen sind Empfehlungen, für deren Resultat wir keine Haftung übernehmen können.

BRUENINGHAUS HYDROMATIK- Baugruppen, mit Angabe der Fabrik-Nr. bestellt, sind die Basis guter Reparaturen.

Einstell- und Prüfarbeiten sind bei Betriebstemperatur auf dem Teststand vorzunehmen.

Schutz von Personen und Eigentum ist durch Vorkehrungen sicherzustellen.

Sachkenntnis, die Voraussetzung für jede Servicearbeit, vermitteln wir in unseren Schulungskursen.

NOTICE

Specifications, descriptions and illustrative material shown herein were as accurate as known at the time this publication was approved for printing.

BRUENINGHAUS HYDROMATIK reserves the right to discontinue models or options at any time or to change specifications, materials, or design without notice and without incurring obligation.

Optional equipment and accessories may add cost to the basic unit, and some options are available only in combination with certain models or other options.

For the available combinations refer to the relevant data sheet for the basic unit and the desired option.

Adjustment and tests have to be carried out on the test bench under operating temperatures.

Protection of personnel and property has to be guaranteed by appropriate measures.

Expert knowledge, the precondition of any service work, can be obtained in our training courses.

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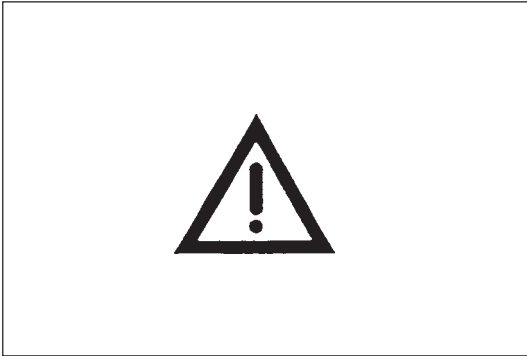
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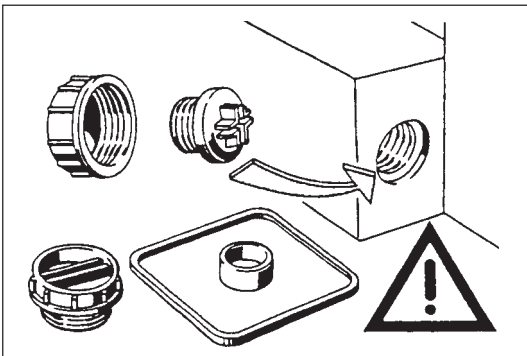
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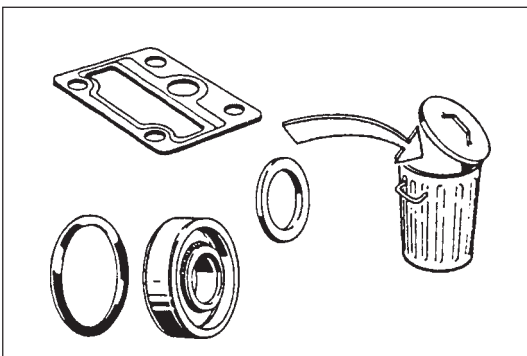
Achtung!
Nachfolgend Hinweise bei allen Reparaturarbeiten an Hydraulikaggregaten beachten!

Attention!
Observe the following notices when carrying out repair work at hydraulic aggregates!



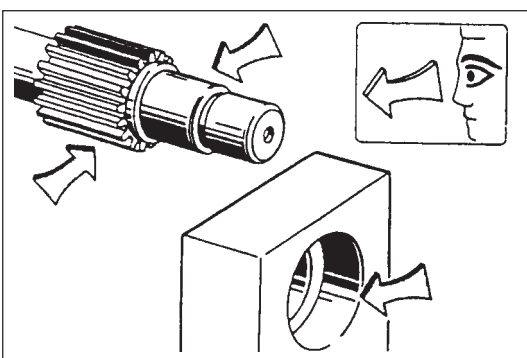
Alle Öffnungen der Hydraulikaggregate verschließen.

Close all ports of the hydraulic aggregates.



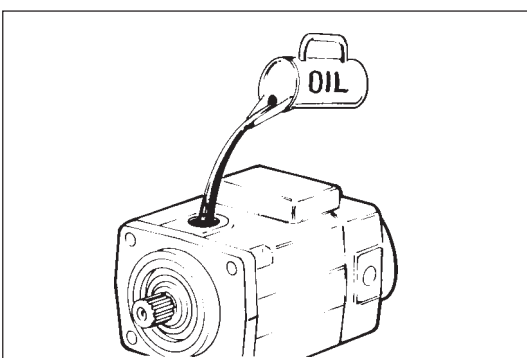
Alle Dichtungen erneuern.
Nur original Hydromatik-Ersatzteile verwenden.

Replace all seals.
Use only original Hydromatik spare parts.



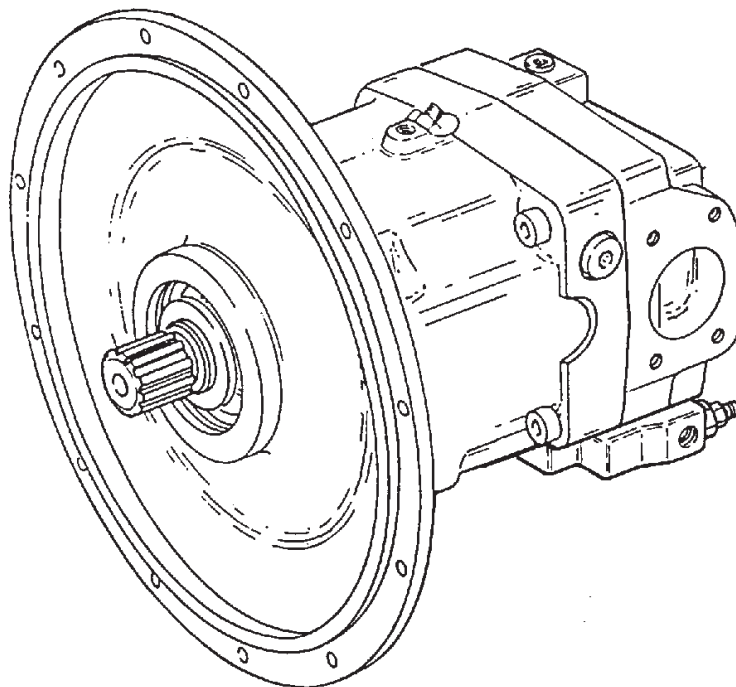
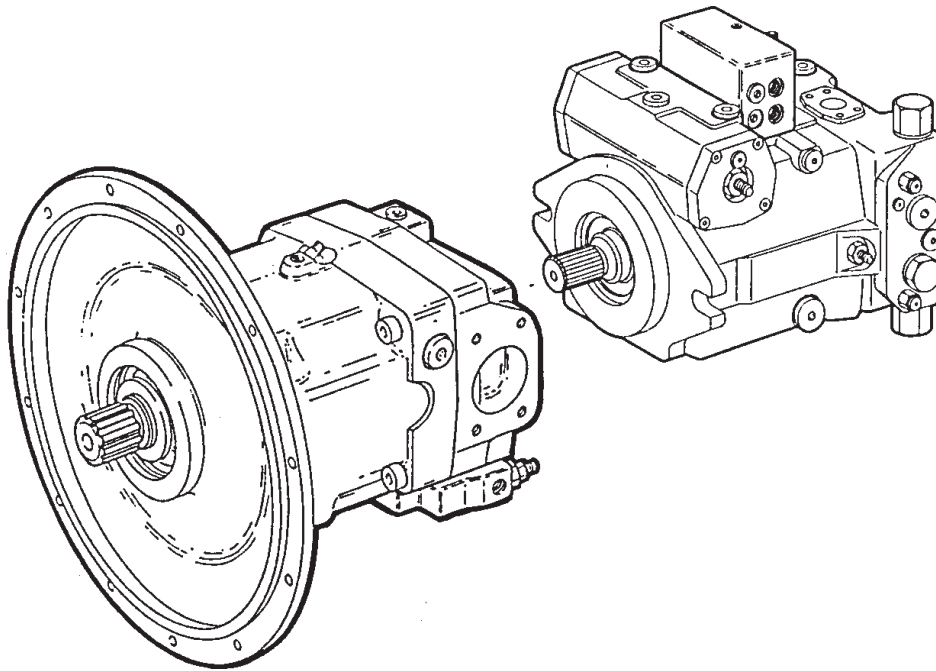
Alle Dicht- und Gleitflächen auf Verschleiß prüfen.
Achtung: Nacharbeiten an Dichtflächen z.B. durch Schleifpapier kann die Oberfläche beschädigen.

Check all seal and sliding surfaces for wear.
Attention: Rework of sealing area f. ex. with abrasive paper can damage surface.

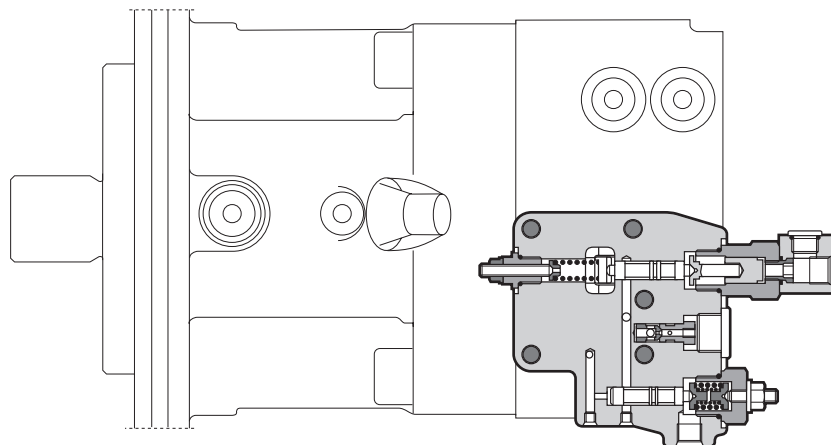
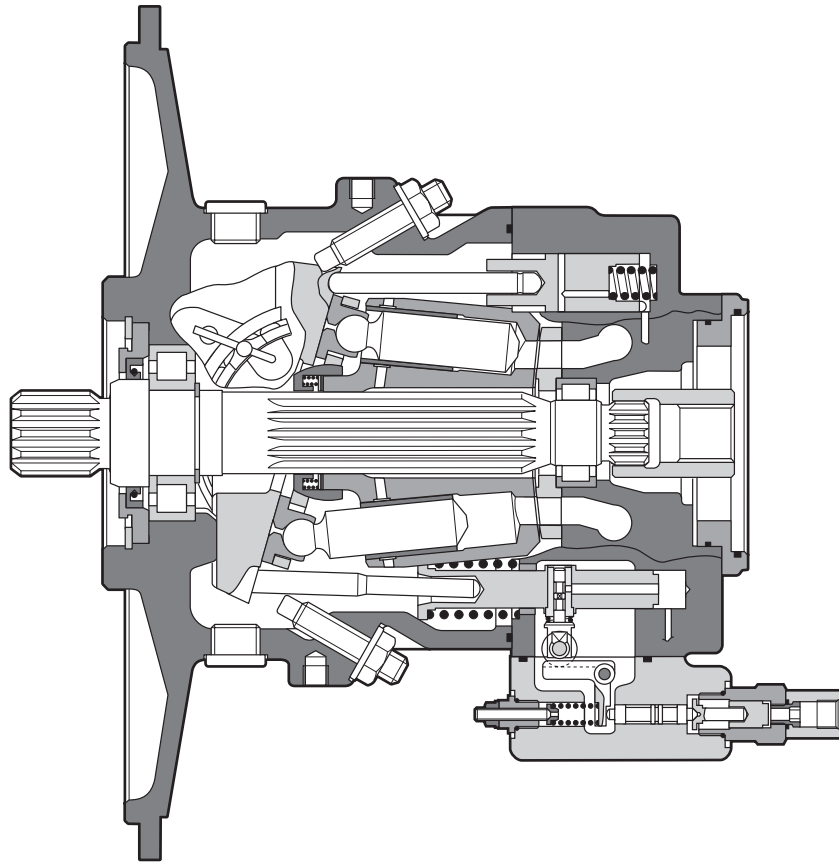


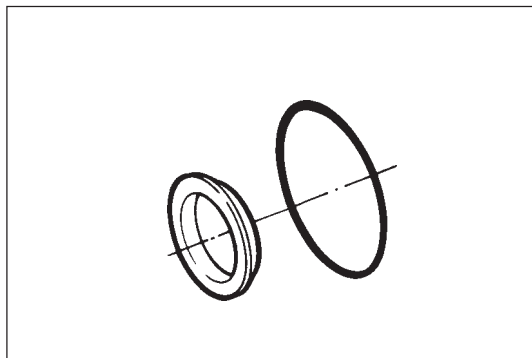
Hydraulikaggregate vor Inbetriebnahme mit Hydrauliköl befüllen.

Fill up hydraulic aggregates with hydraulic oil before start-up.



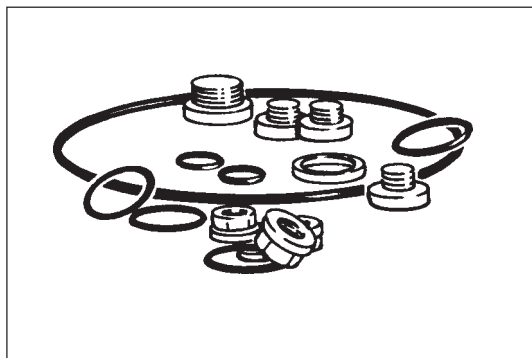
A11VO...LG2S





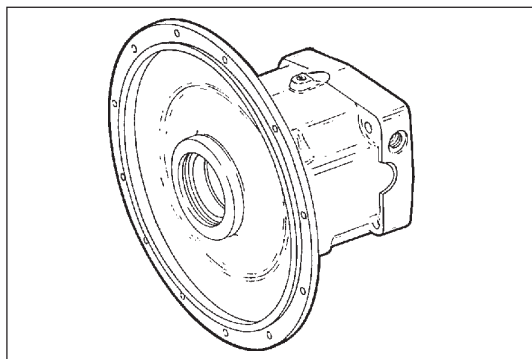
1 Dichtsatz für Triebwelle.

Seal kit for drive shaft.



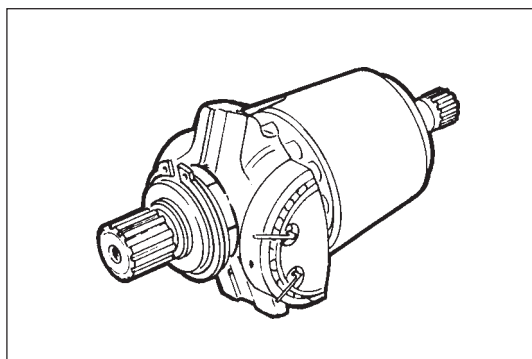
2 Äußerer Dichtsatz.

External seal kit.



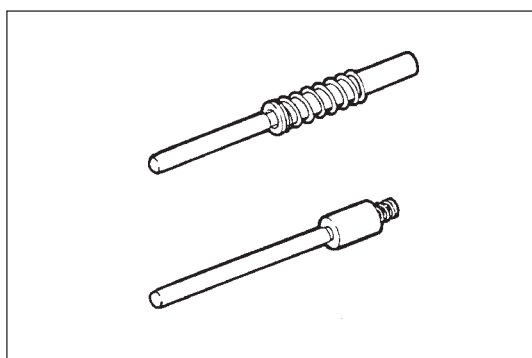
3 Gehäuse

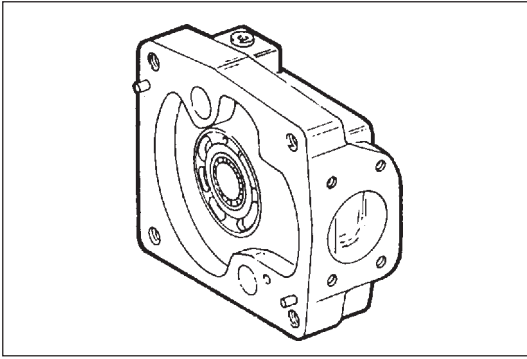
Housing



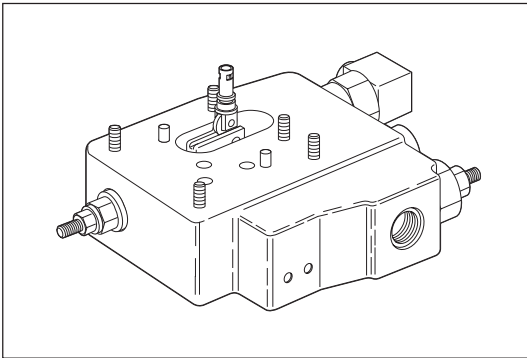
4 Triebwerk komplett.

Complete rotary group.

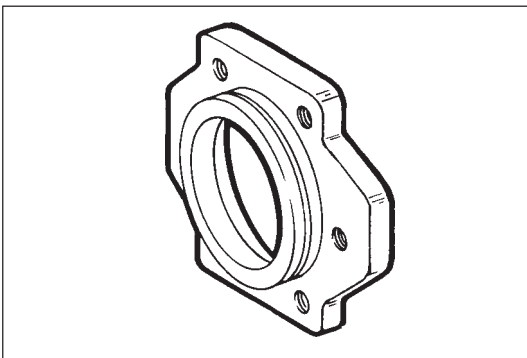
5 1. Verstellung klein
2. Verstellung groß1. Hydraulic control small size
2. Hydraulic control big size



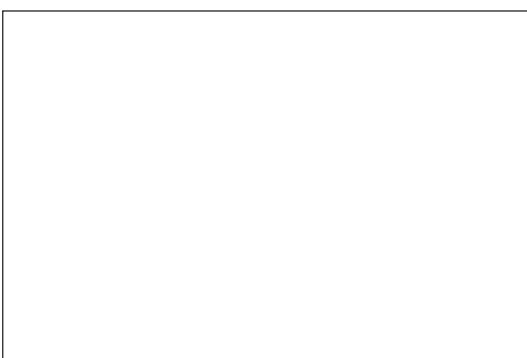
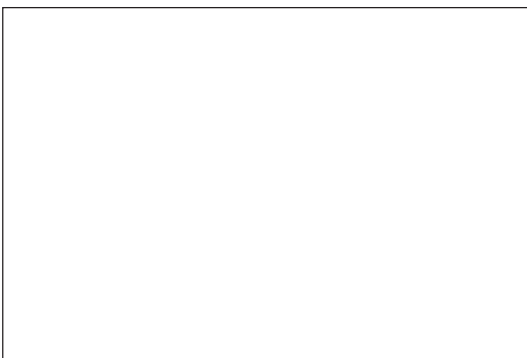
6 Anschlußplatte
Valve plate

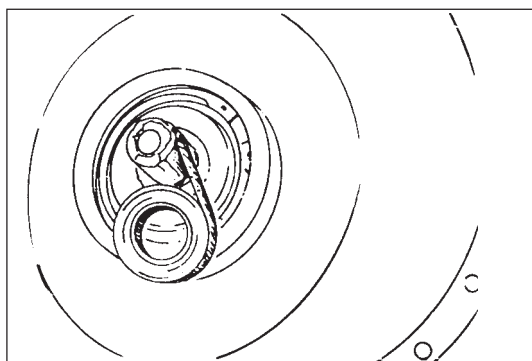
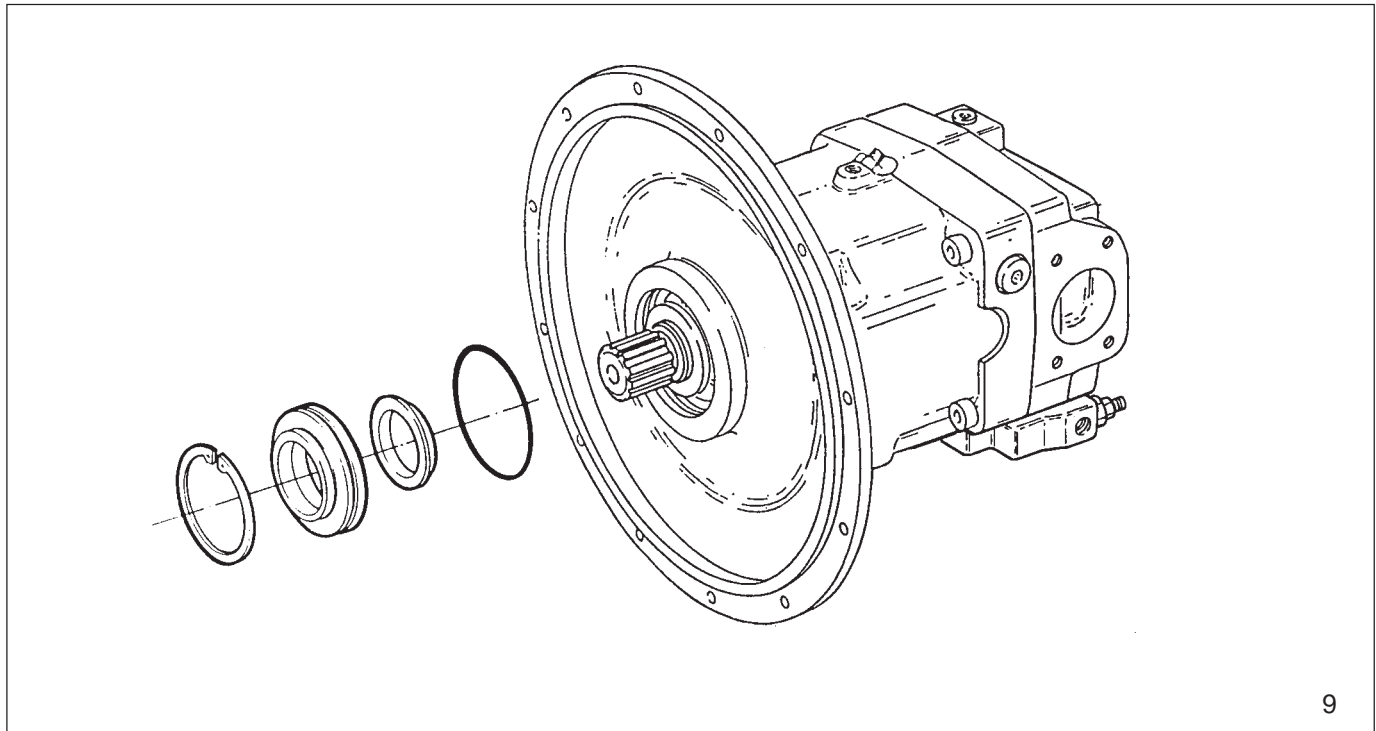


7 Regler komplett
Complete regulator

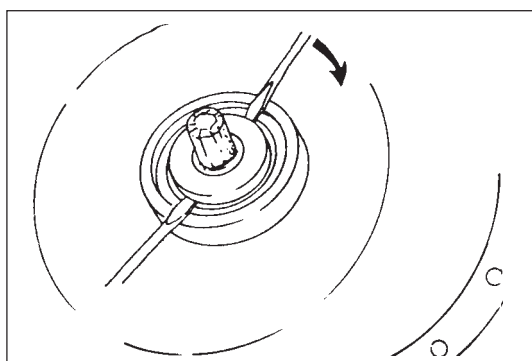


8 Pumpenträger
Pump support



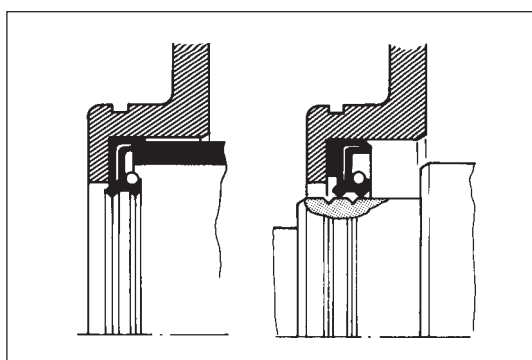


- 10 Triebwelle abkleben.
Protect drive shaft.



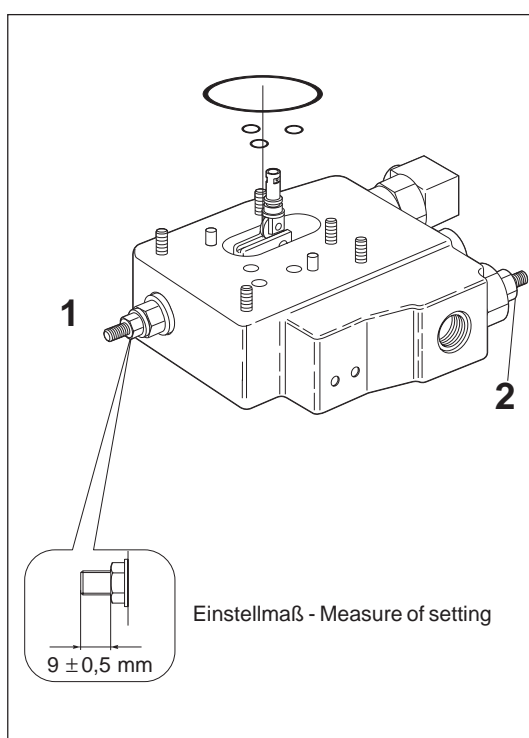
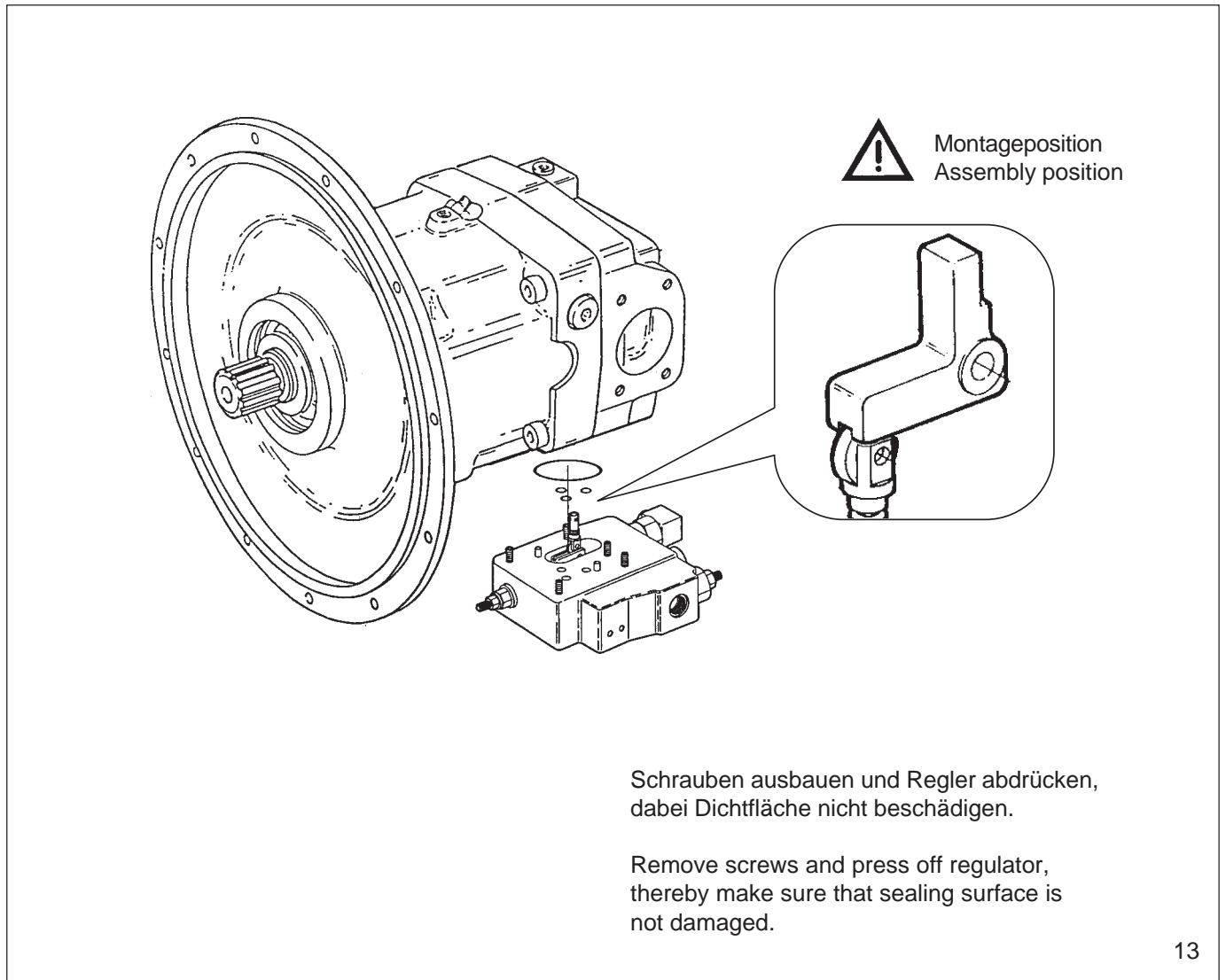
- 11 Sicherungsring lösen und ausbauen,
Verschlußring abdrücken.

Loosen retaining ring and remove it,
press away front cover.



- 12 1. Neuen Wellendichtring lagerichtig mit passender
Büchse einpressen.
2. Bei tiefer Laufrille Scheibe vor den
Wellendichtring einlegen.

1. Press-in new shaft seal into correct position with a
suitable bush.
2. Deep running groove! Insert shim before the shaft seal.

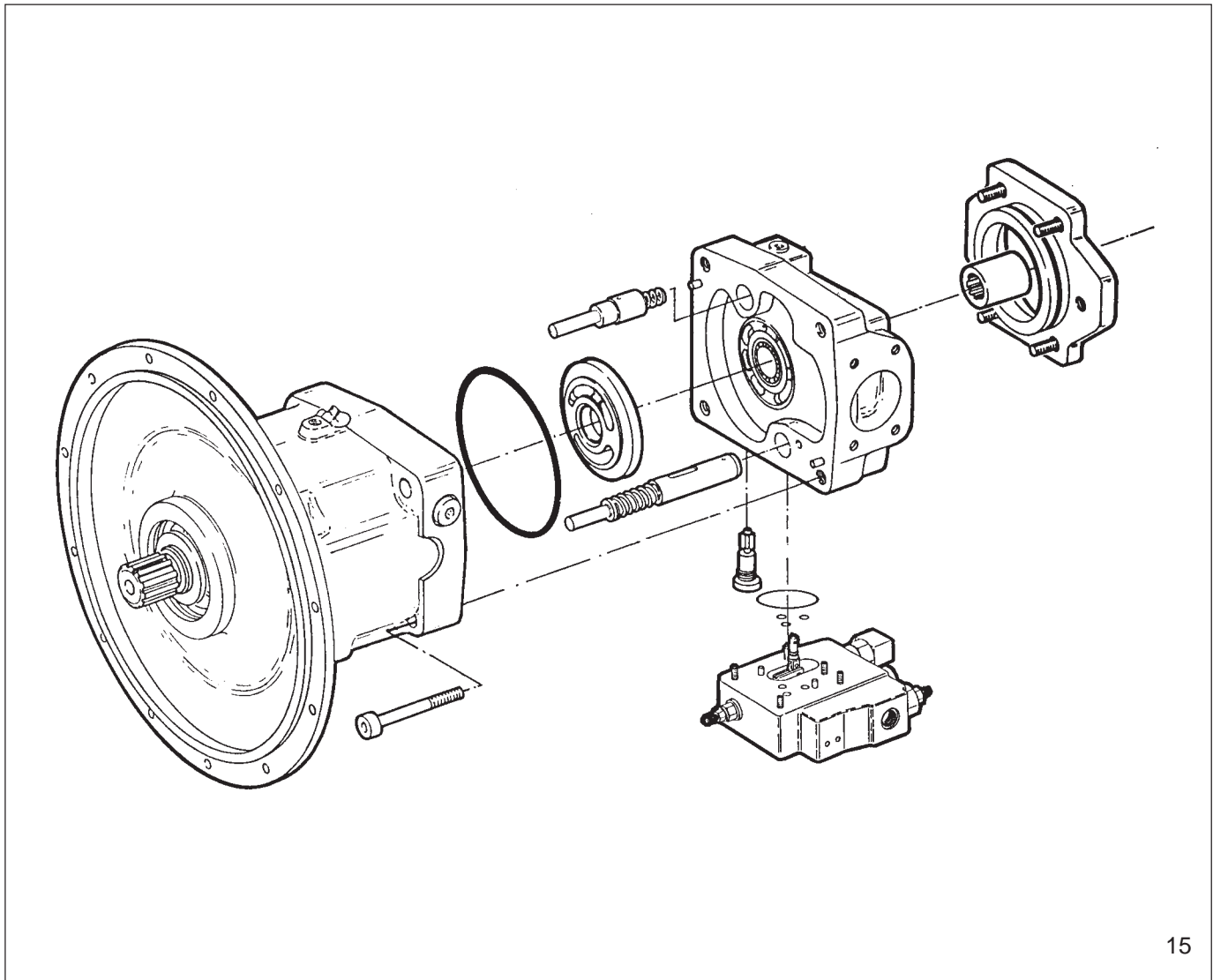


- 14
1. Leistungsregler mit Übersteuerung
 2. Load-Sensing-Regler

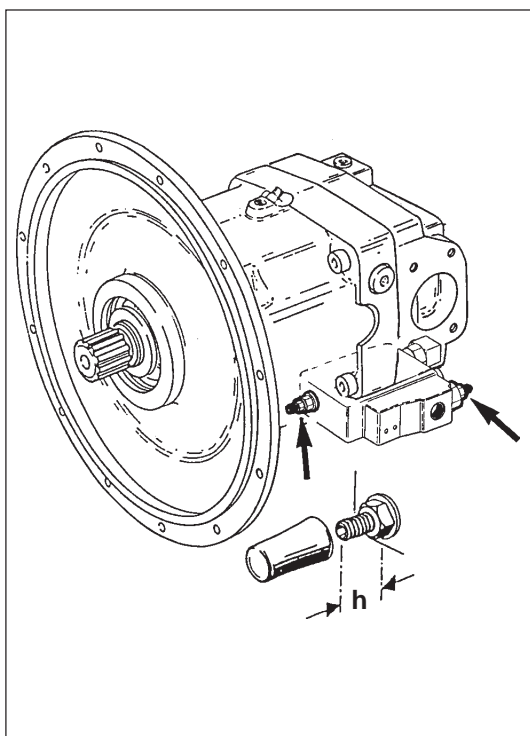
Achtung!
Einstellschrauben nicht verändern. Gewindehülse komplett mit Einstellschrauben ausbauen.

1. Power control with override by pilot pressure
2. Load-Sensing valve

Note:
Do not change position of adjustment screws. Remove complete set of threaded bush with adjustment screws.



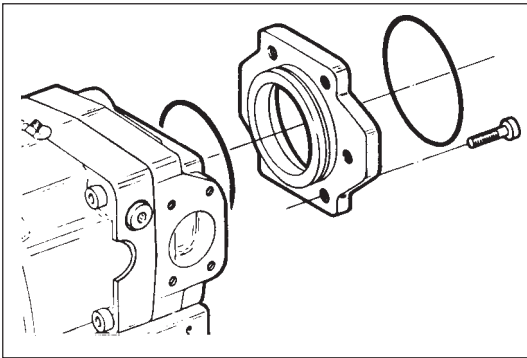
15



- 16 Schutzkappe abnehmen.
Einstellhöhe "h" messen und notieren.
- Remove protection cover.
Measure and note adjustment height "h".

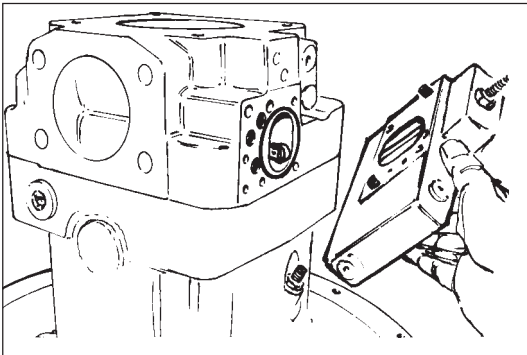
Anschlußplatte, Regler demontieren
Remove port plate, regulator

Reparaturanleitung A11VO-A4VG
Repair Instructions A11VO-A4VG



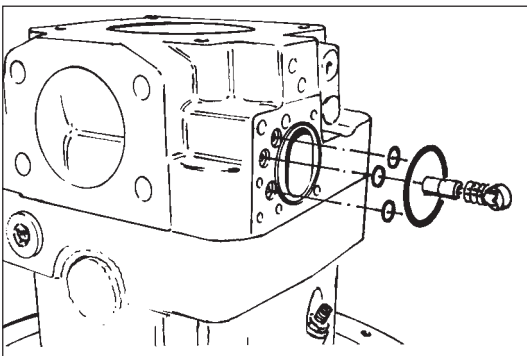
- 17 Pumpenträger abbauen.
Kontrolle: O-Ringe

Remove pump support.
Control O-rings.



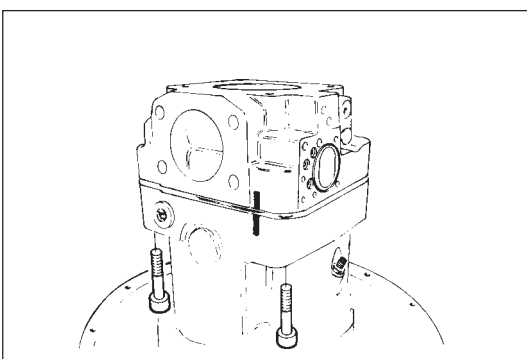
- 18 Reglergehäuse abbauen.

Remove regulator housing.



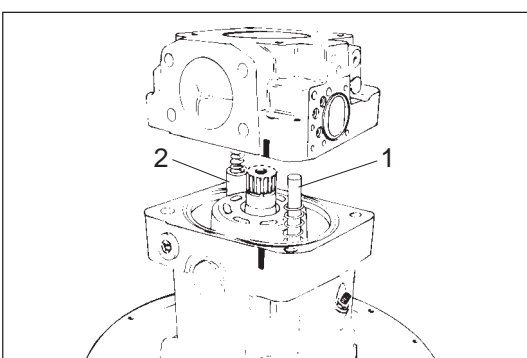
- 19 O-Ringe, Meßkolben mit Büchse und Feder ausbauen.

Remove O-ring, measuring piston
with bush and spring.



- 20 Lage der Anschlußplatte markieren.
Anschlußplattenbefestigung lösen.

Mark position of the connection plate.
Loosen connection plate fixation.



- 21 Anschlußplatte mit Steuerplatte abheben.
Verstellung ausbauen.
1. Hydr.- klein
2. Hydr.- groß

Remove port plate with control plate.
Disassemble regulator.
1. Hydr.- small
2. Hydr.- large



1

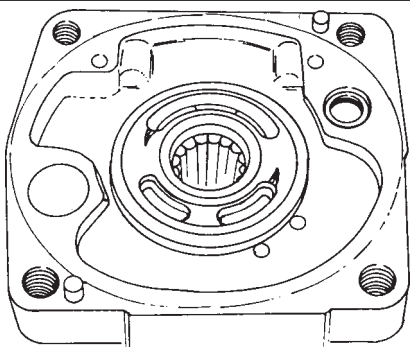


2

- 1. Hydraulische Verstellung - klein
- 2. Hydraulische Verstellung - groß

- 1. Hydraulic control rod - small size
- 2. Hydraulic control rod - big size

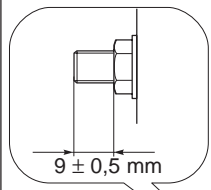
22



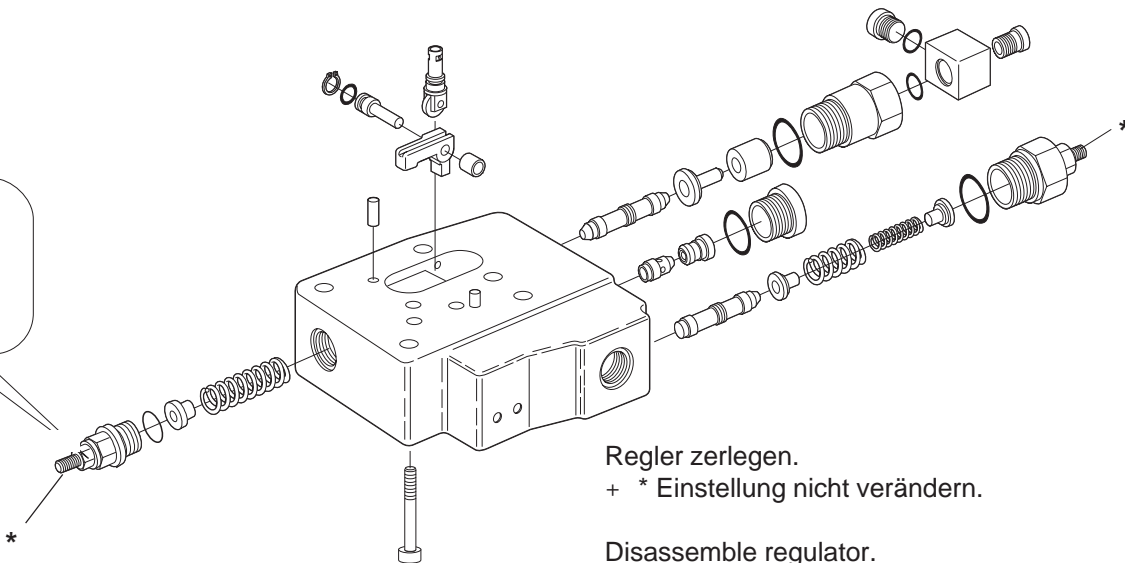
23

- Steuerplatte ausbauen.
- Lage kennzeichnen.

- Remove control plate.
- Mark position.



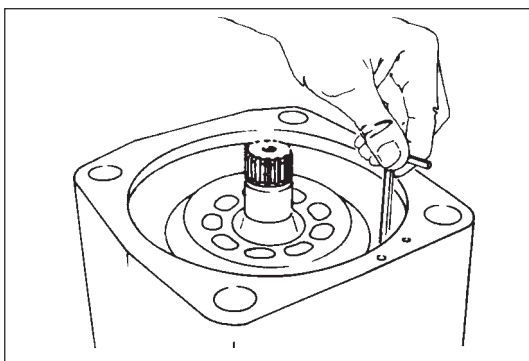
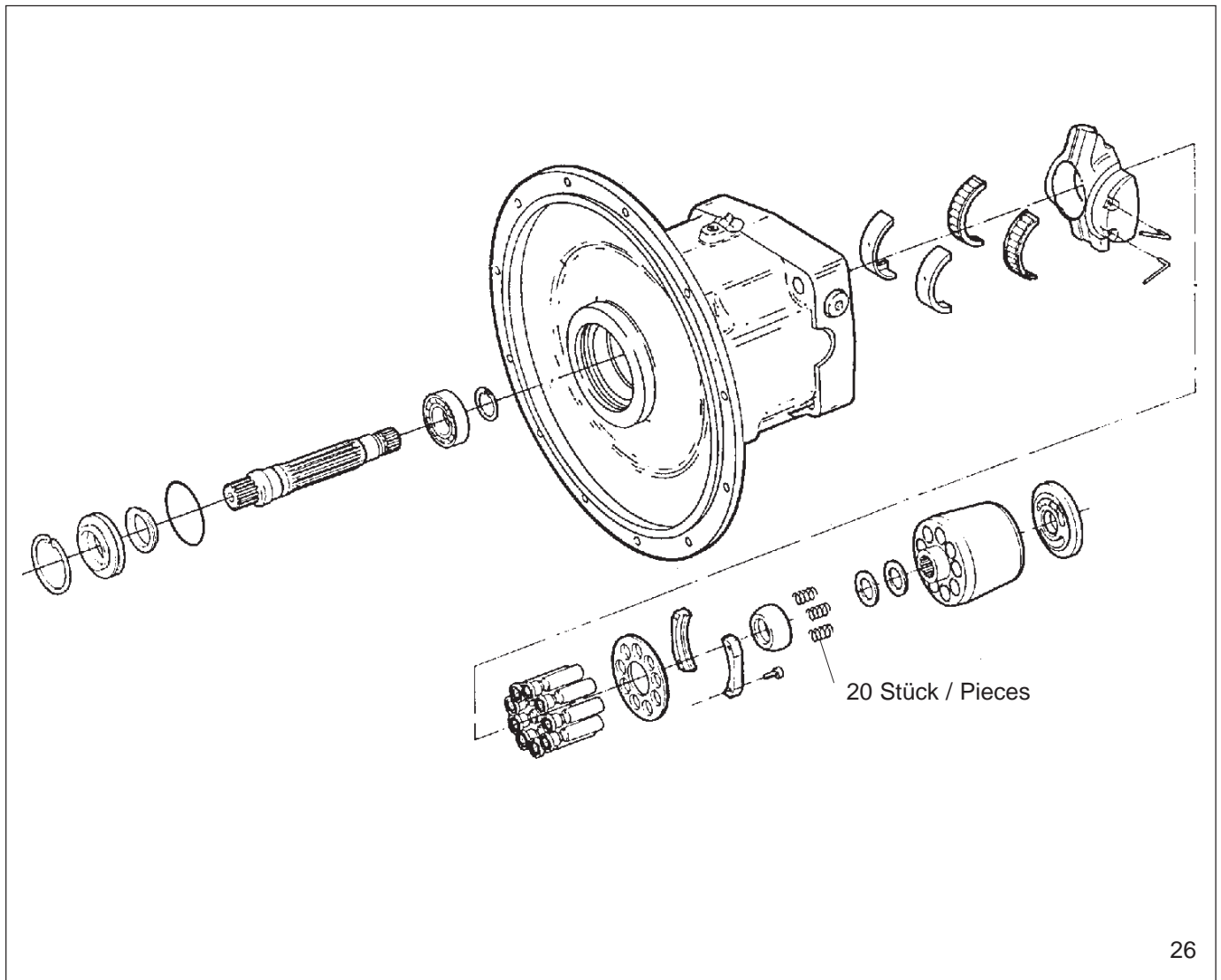
9 ± 0,5 mm



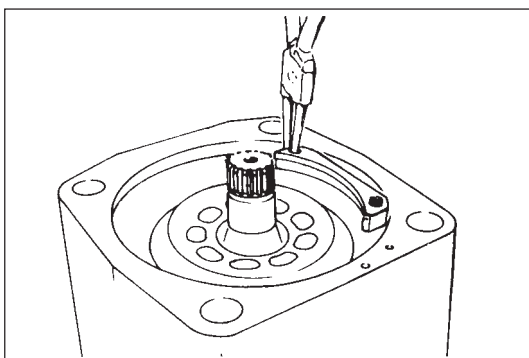
- Regler zerlegen.
- + * Einstellung nicht verändern.

- Disassemble regulator.
- + * Do not change setting values.

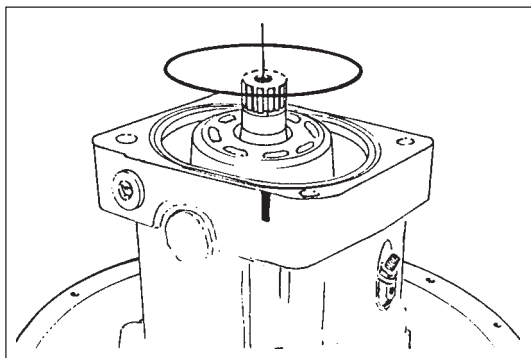
24



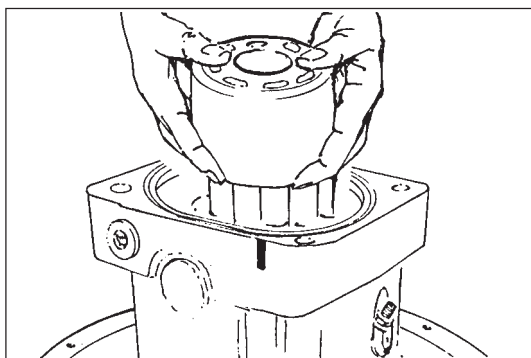
- 27 Haltesegmentbefestigung lösen.
Loosen fixing of the retaining segments.



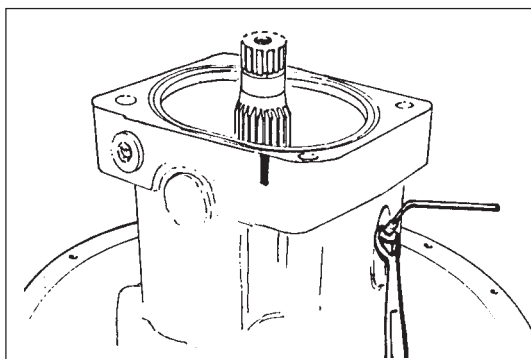
- 28 Haltesegmente mit Schrauben ausheben.
Remove retaining segments with the screws.



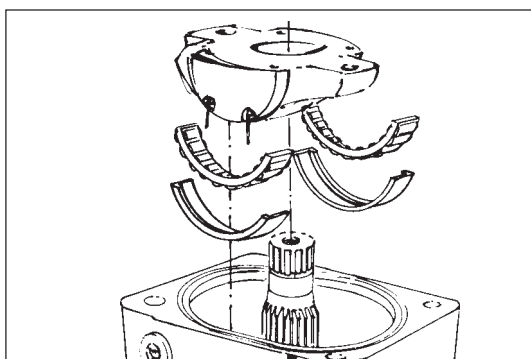
- 29 O-Ring ausbauen.
Remove O-ring.



- 30 Zylinder mit Kolben ausbauen.
Remove cylinder with pistons..



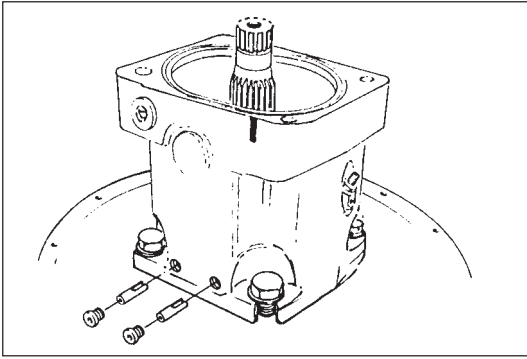
- 31 Q-min-, Q-max- Einstellschrauben ausbauen.
Remove Q-min-, Q-max adjustment screws.



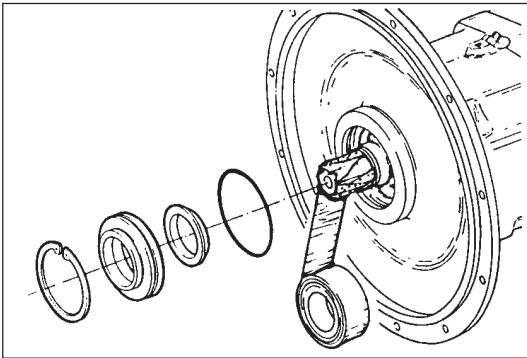
- 32 Schwenkwiege mit Lager
und Lagerschalen ausbauen.
Remove swivel cradle with bearing
as well as bearing case.

Triebwerk demontieren
Rotary group disassembly

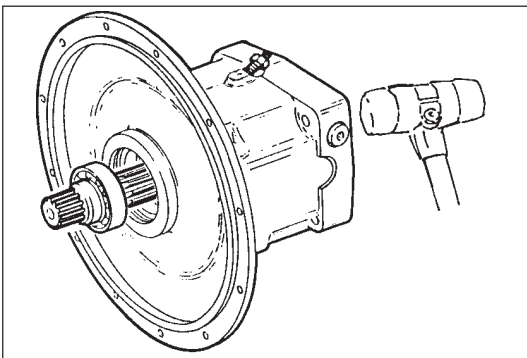
Reparaturanleitung A11VO-A4VG
Repair Instructions A11VO-A4VG



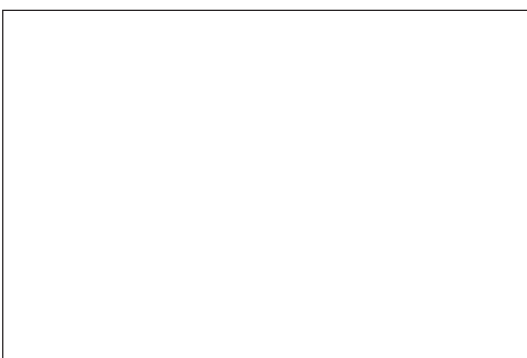
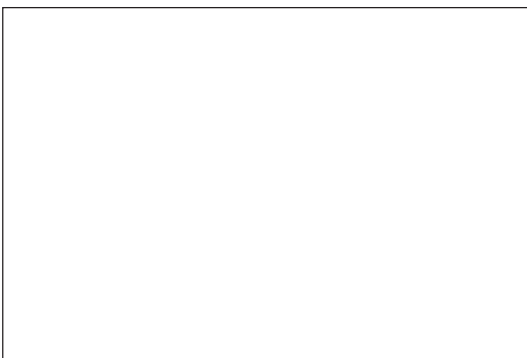
- 33 Gelenkstifte für Schwenklager ausbauen.
Remove joint pin for swivel cradle.

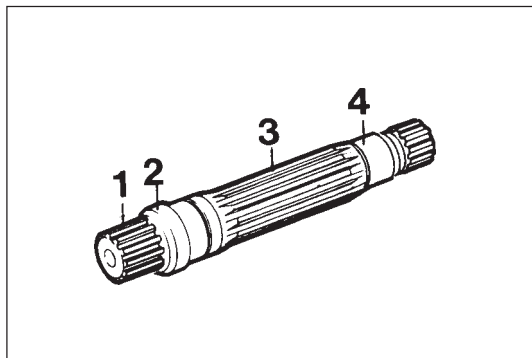


- 34 Verschlußring komplett ausbauen.
Remove completely cover ring.



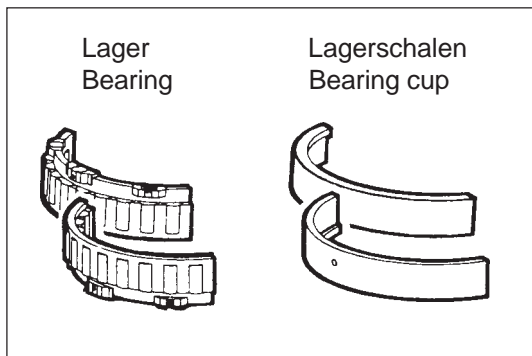
- 35 Triebwelle auspressen.
Press out drive shaft.





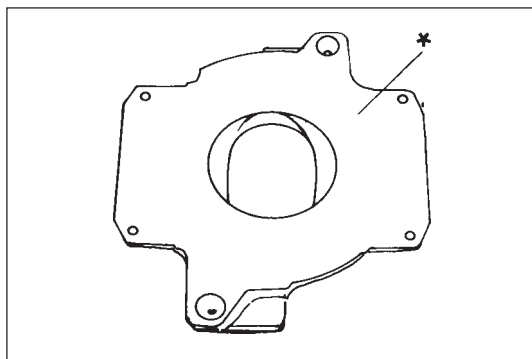
36 Kontrolle!
Verzahnung (1); Lauffläche WDR (2); Verzahnung (3);
Lagersitz (4).

Check!
Gears (1); Contact area shaft seal (2); Gears (3);
Bearing seat (4).



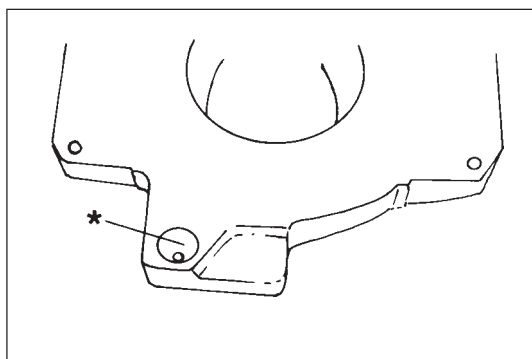
37 Kontrolle!
Käfig- Paar (1)
Lagerschalenpaar (2).

Check!
Cage set (1)
Bearing cup set (2).



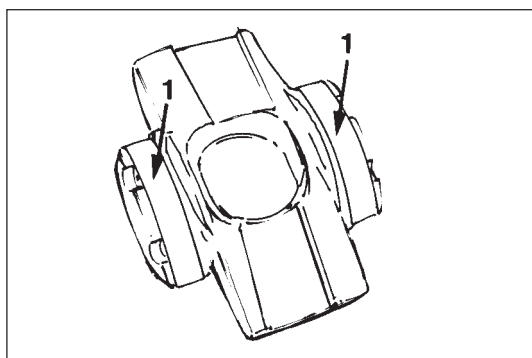
38 Kontrolle!
Gleitfläche (*).

Check!
Contact area (*).



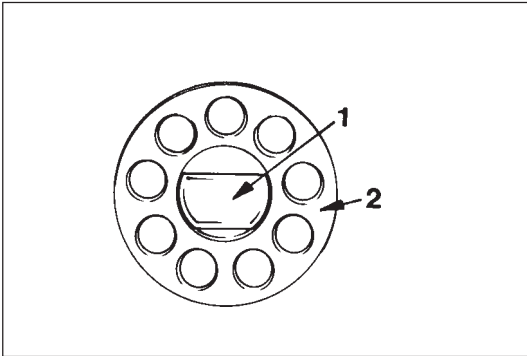
39 Kontrolle!
Kalotte für Regler (*).

Check!
Socket for regulator (*).

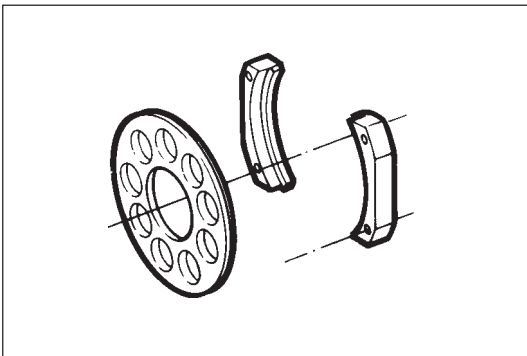


40 Kontrolle!
Lagerbahn (1).

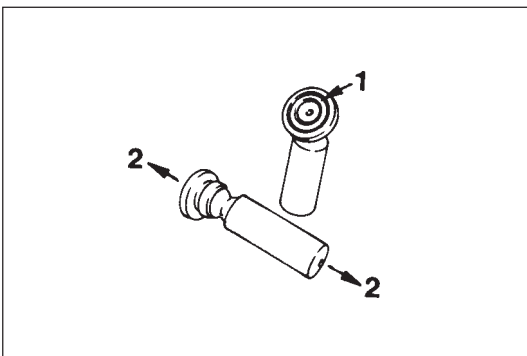
Check!
Contact area of bearing (1).



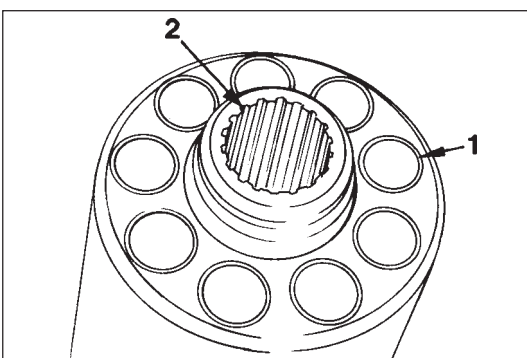
- 41 Kontrolle!
Rückzugkugel (1);
Rückzugplatte (2).
- Check!
Retaining ball (1);
Retaining plate (2).



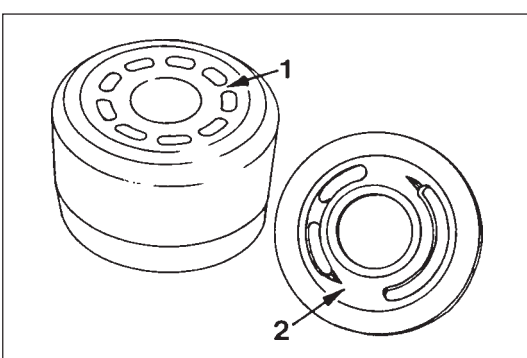
- 42 Kontrolle!
Haltesegmente.
- Check!
Fixing segments.



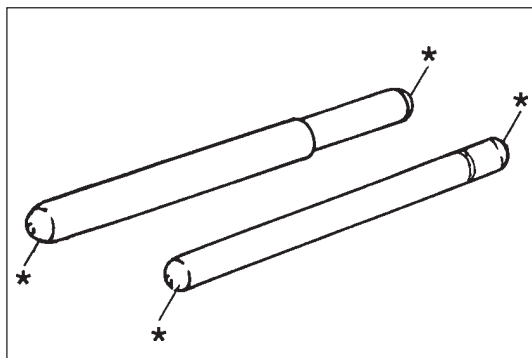
- 43 Kontrolle!
Gleitschuhe (1).
Axialspiel (2).
- Check!
Slipper pads (1).
Axial backlash (2).



- 44 Kontrolle!
Zylinderbohrung (1)
Verzahnung (2).
- Check!
Cylinder boring (1)
Gears (2).

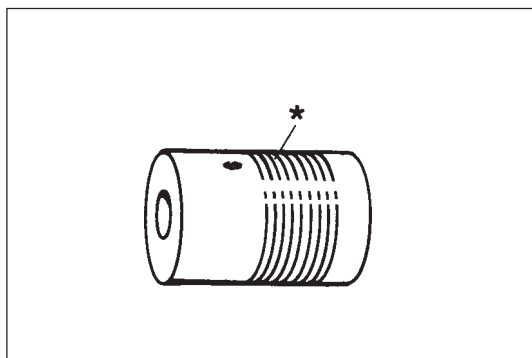


- 45 Kontrolle!
Zylindergleitfläche (1)
Gleitfläche Steuerplatte (2).
- Check!
Cylinder contact area (1)
Contact area control plate (2).



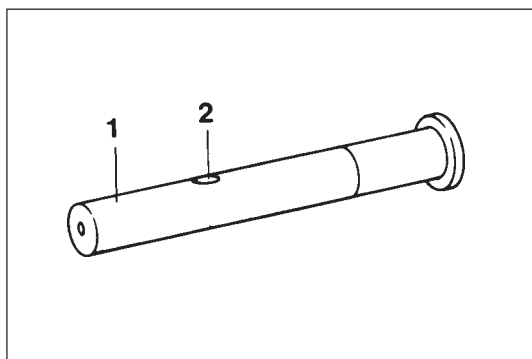
46 Kontrolle!
Kugelhöpfe (*).

Check!
Fixing segments (*).



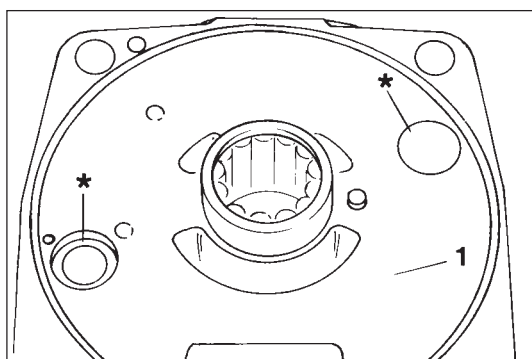
47 Kontrolle!
Kolben (*).

Check!
Pistons (*).



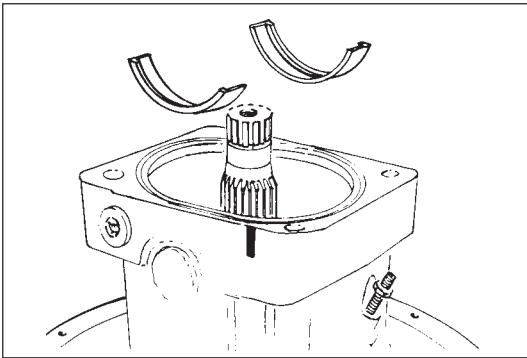
48 Kontrolle!
Stellkolben (1).
Bohrung - Steuerbüchse (2).

Check!
Positioning piston (1).
Boring - control bush (2).



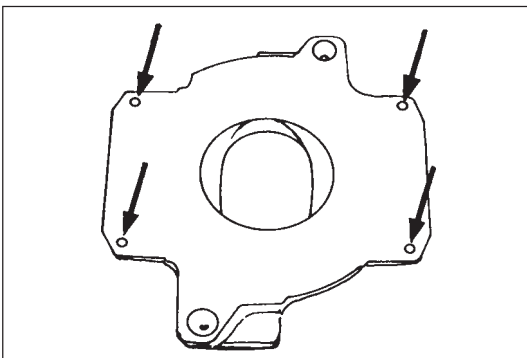
49 Kontrolle!
Bohrung (*)
Auflagefläche Steuerplatte (1).

Check!
Boring (*)
Contact area control plate (1).



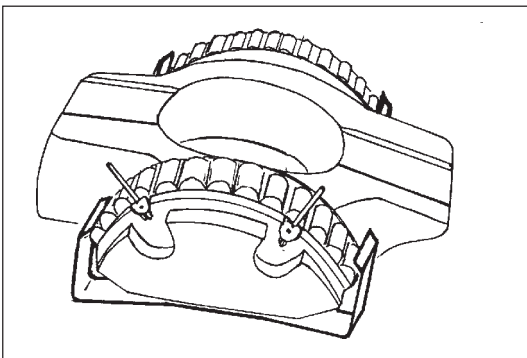
50 Lagerschalen einsetzen.

Insert bearing shell.



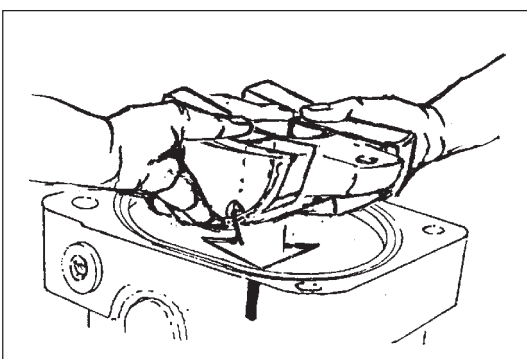
51 Gewindebohrungen reinigen.

Clean threaded borings.



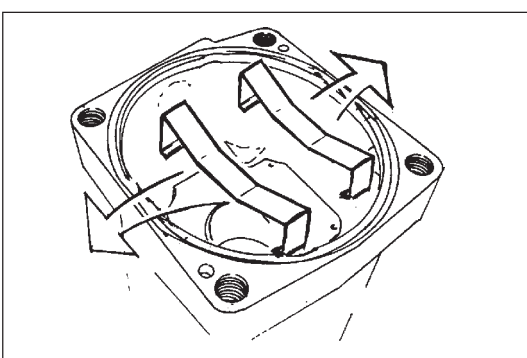
52 Lager mit Drahtführung auf Schwenkwiege montieren.
Mit Klammer festhalten.

Install bearings with wire guide
on swivel cradle.



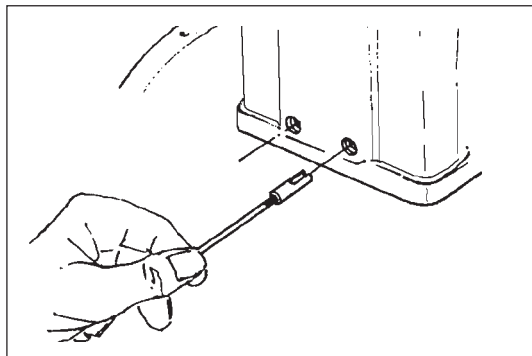
53 Schwenkwiege mit Lager in Lagerschalen
einsetzen.
Achtung! Einbaulage.

Place swivel cradle with bearing
into bearing shell.
Attention! Installation position.



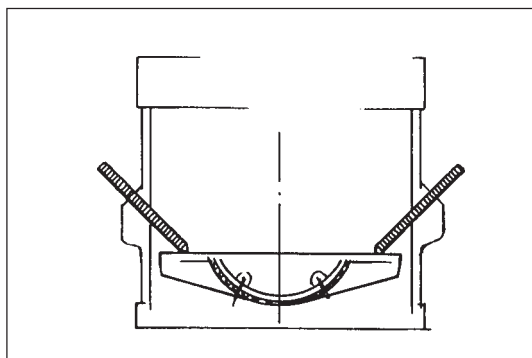
54 Klammer ausbauen
Achtung! Lagersitzkontrolle.

Remove clamp.
Attention! Check bearing seat.



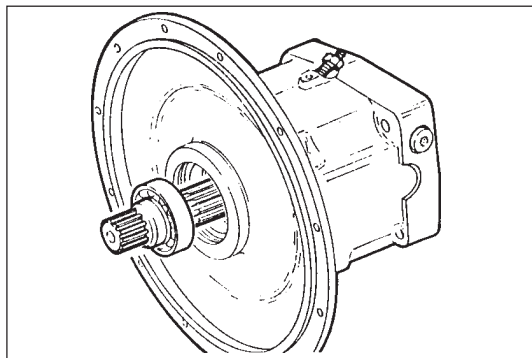
- 55 Führungsdraht ausrichten. Gelenkstifte einsetzen.
Verschlußschrauben einbauen.

Adjust guide wire. Install joint pins.
Install locking screws.



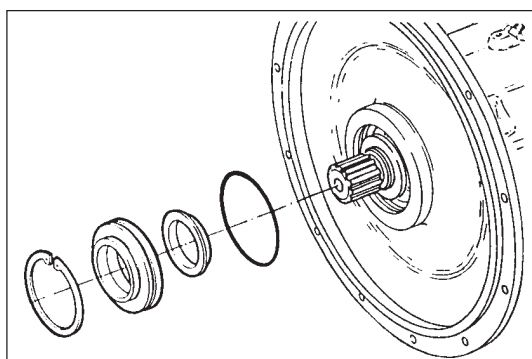
- 56 Schwenkwiege mit Gewindestift in Nulllage fixieren.

Fix swivel cradle with threaded pin
in zero position.



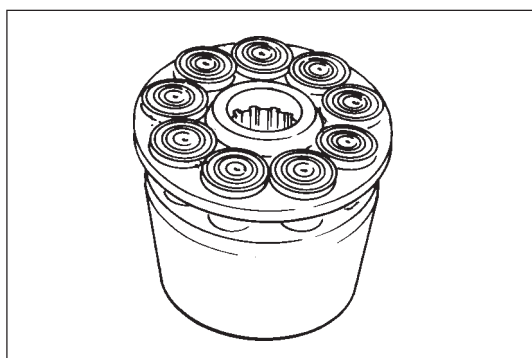
- 57 Triebwelle einsetzen.

Install drive shaft.



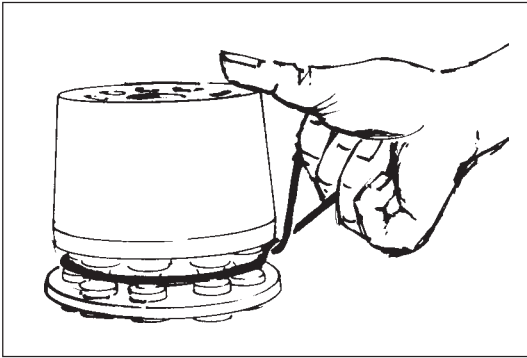
- 58 Verschlußring montieren.

Mount cover ring.

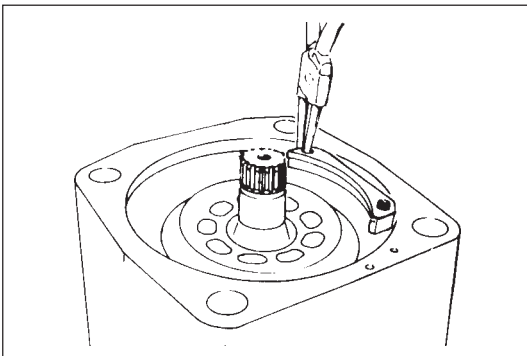


- 59 Rückzugeinrichtung mit Kolben
in Zylinder montieren.

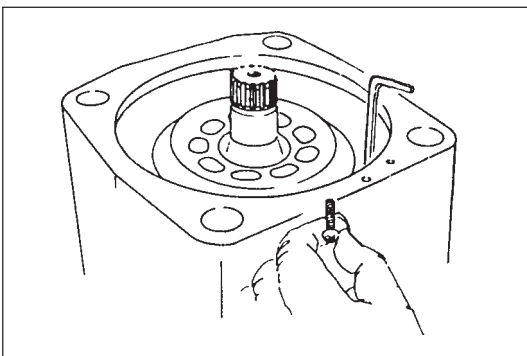
Place retaining plate with piston
into cylinder.



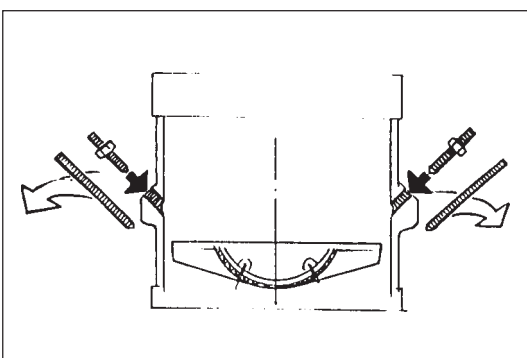
- 60 Zylinder komplett montieren.
Assemble cylinder completely.



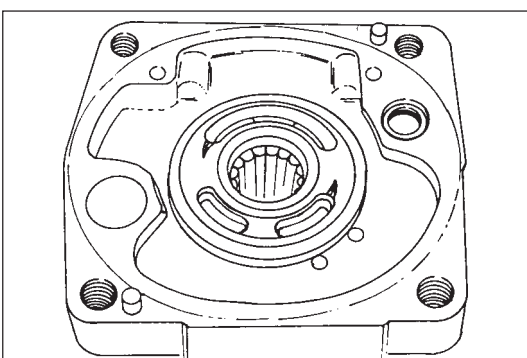
- 61 Haltesegmente einsetzen.
install holding segments.



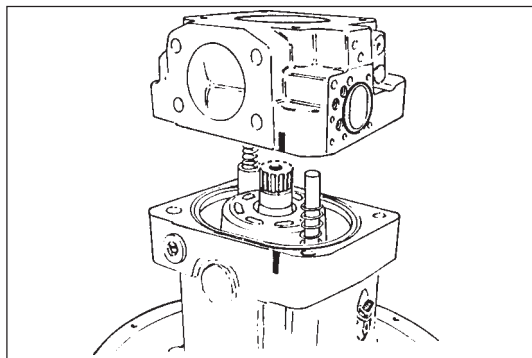
- 62 Schrauben mit Precote-Beschichtung einsetzen.
Hinweis: Gewinde fettfrei.
Schrauben nach Drehmoment anziehen
- Install screws with Precote.
Note: Thread to be free of grease
Tight screws with torque value.



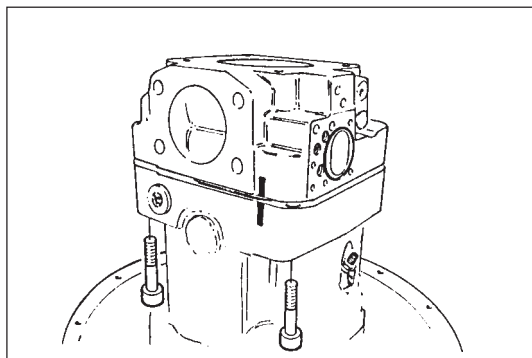
- 63 Gewindestifte ausbauen.
Q-min-, Q-max- Schrauben einbauen.
Achtung!
Einstellmaß.
- Remove threaded pins.
Install Q-min-, Q-max- screws.
Attention!
Adjustment measure.



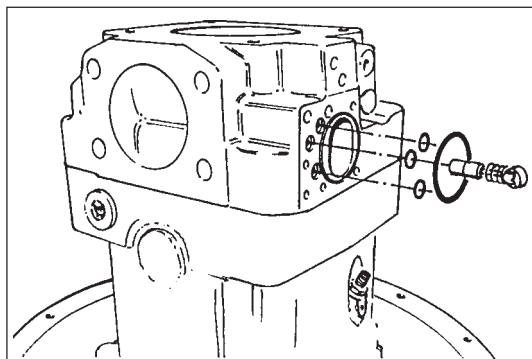
- 64 Steuerpatte einsetzen.
Achtung!
Einbaulage.
- Install control plate.
Attention!
Installation position.



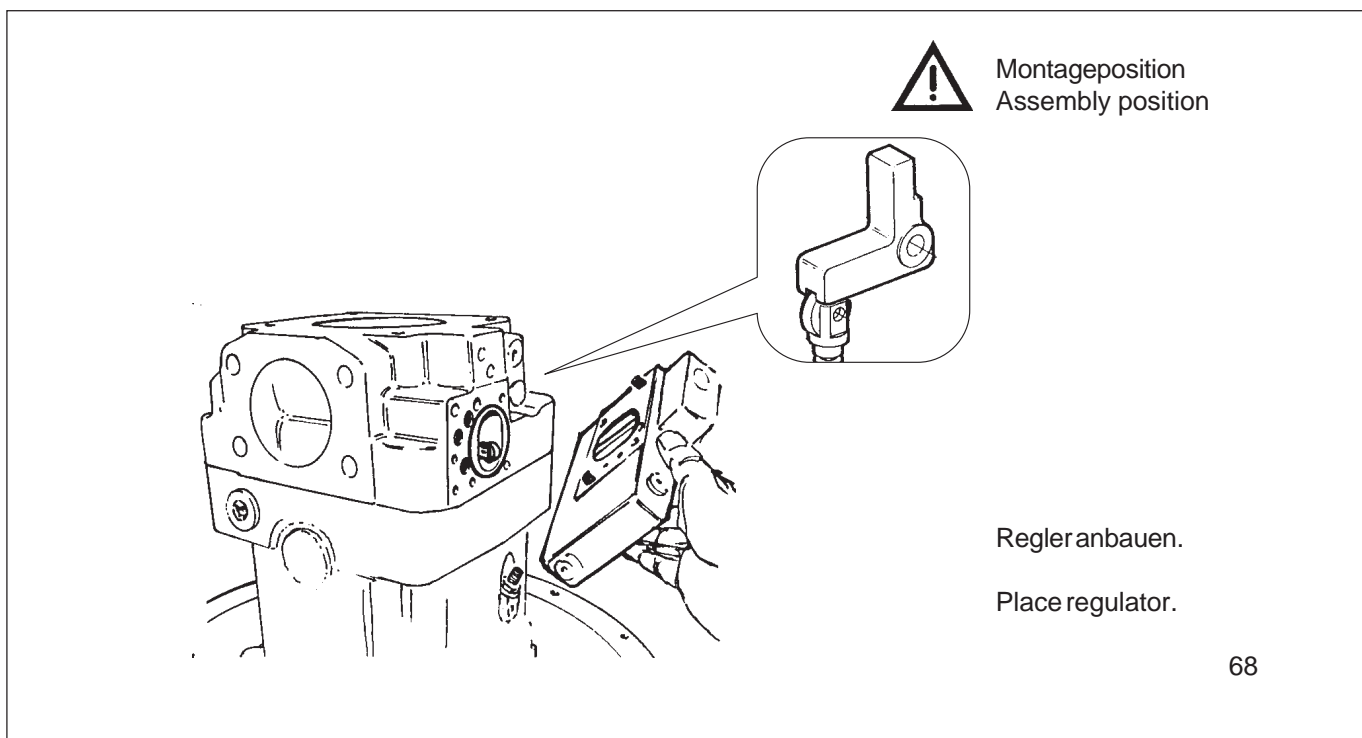
- 65 Hydraulische Verstellung einsetzen.
Place hydraulic control assembly.



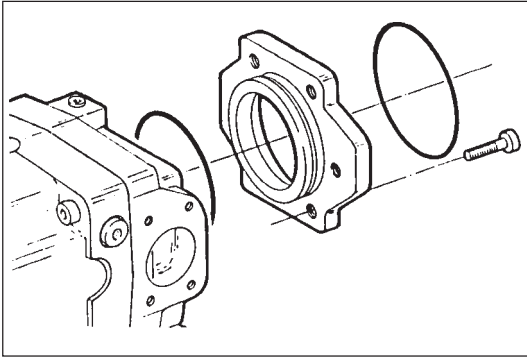
- 66 Anschlußplatte anbauen und mit Schrauben befestigen
Achtung!
Drehmoment - Schrauben.
Fix port plate, assembly with screws.
Attention!
Torque - screws.



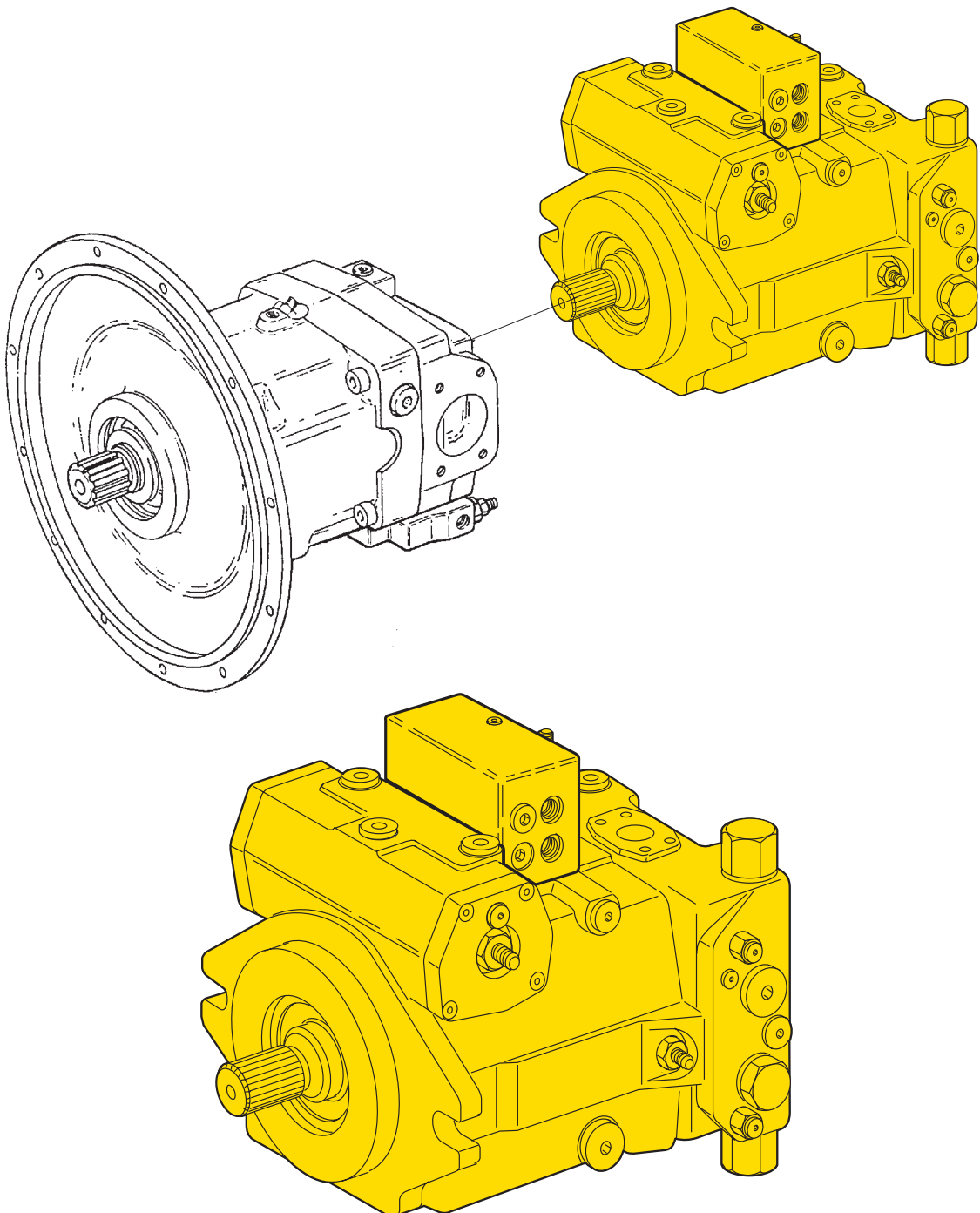
- 67 Meßkolben mit O-Ringen einbauen.
Install measuring piston with O-ring.



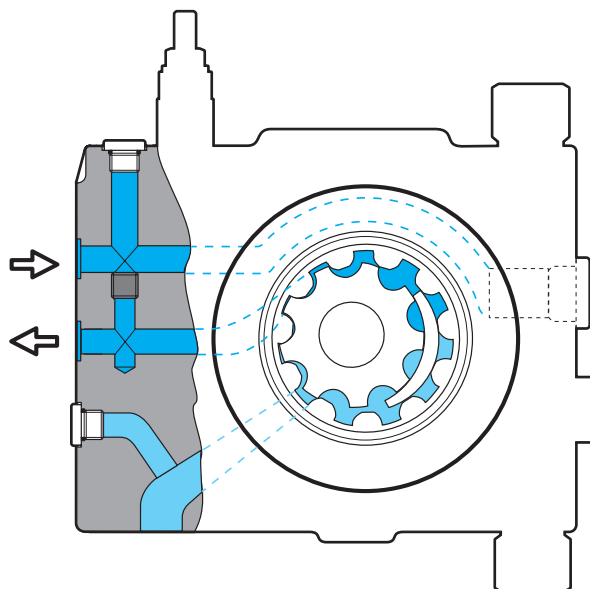
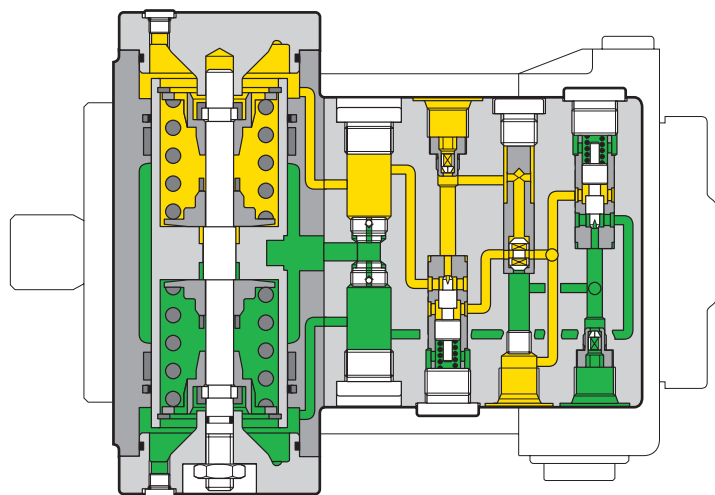
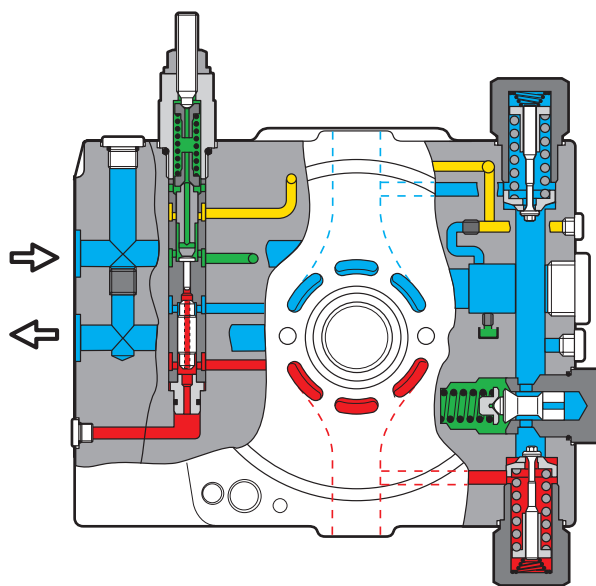
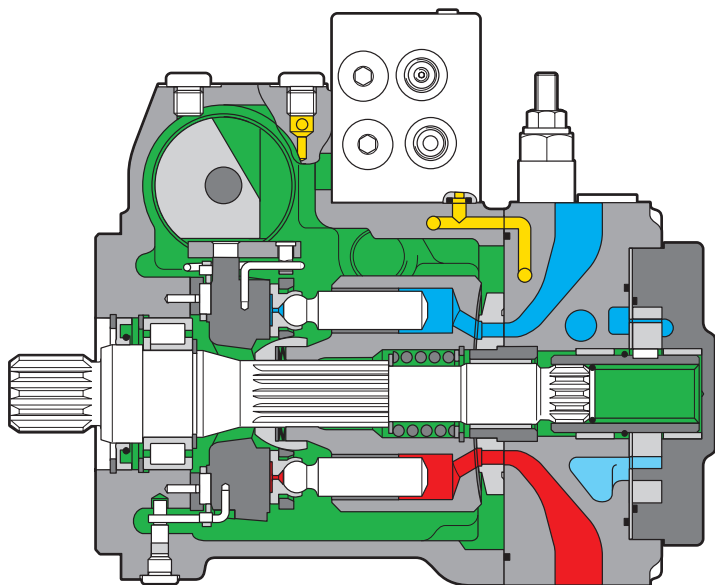
68

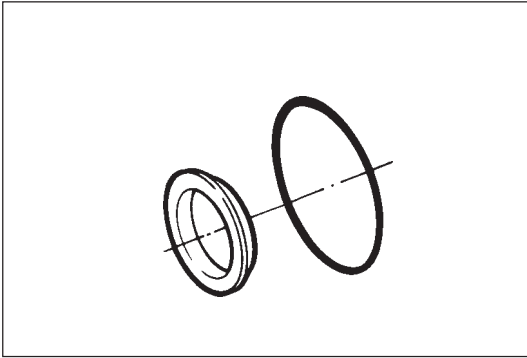


- 69 Pumpenträger montieren.
Place pump support.

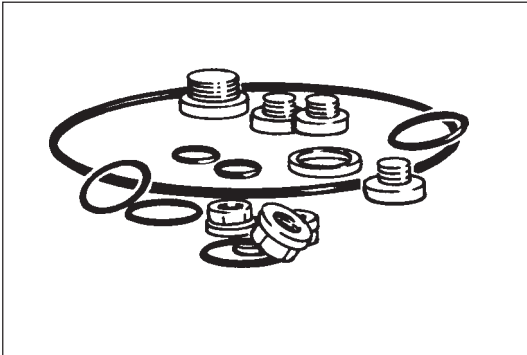


A4VG...DWD

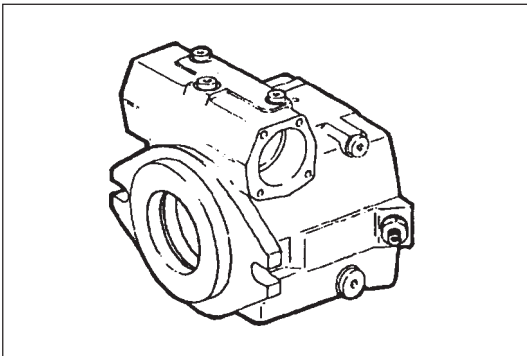




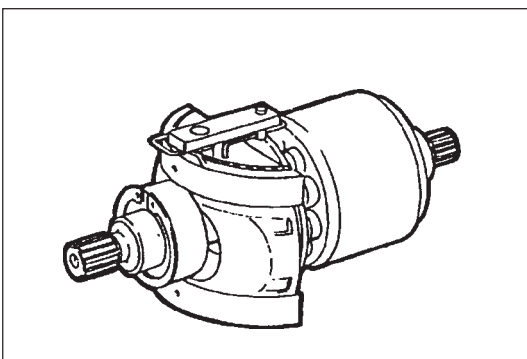
- 1 Dichtsatz für Triebwelle.
Seal kit for drive shaft.



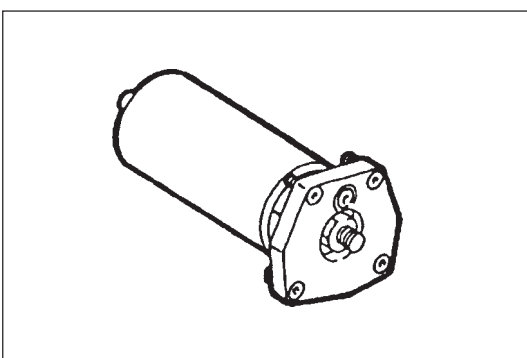
- 2 Äußerer Dichtsatz.
External seal kit.



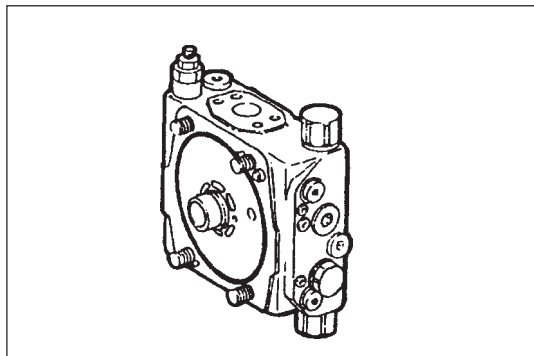
- 3 Gehäuse
Housing



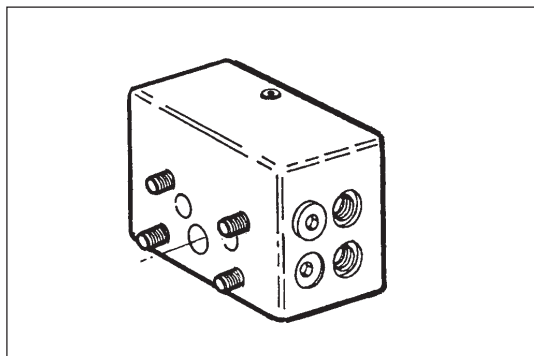
- 4 Triebwerk komplett.
Complete rotary group.



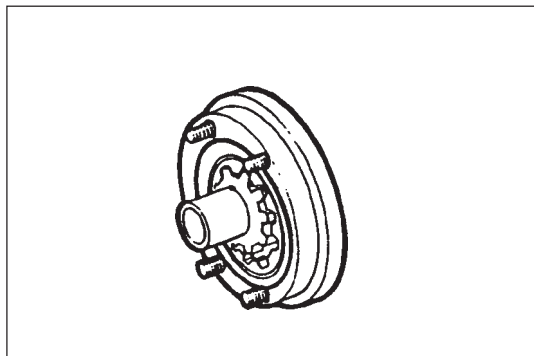
- 5 Stellkolben
Positioning piston



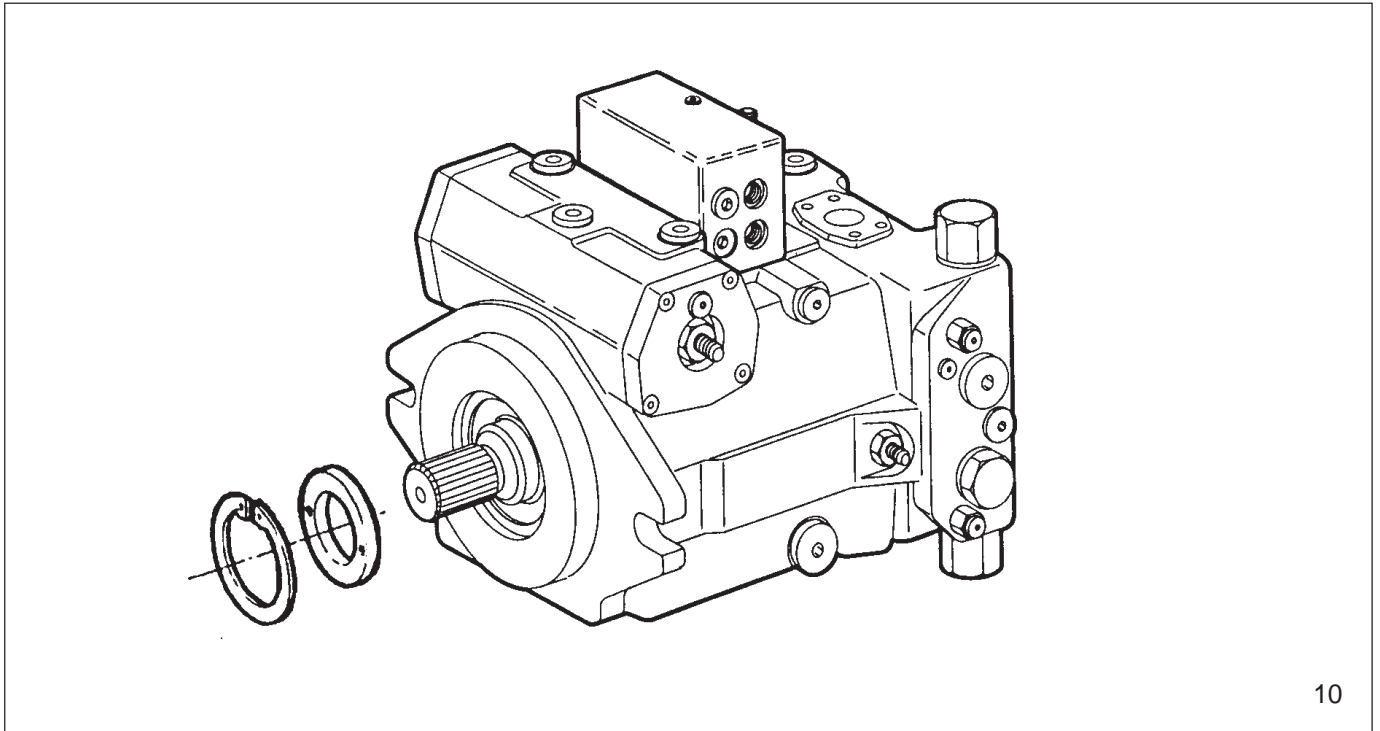
6 Anschlußplatte
Valve plate



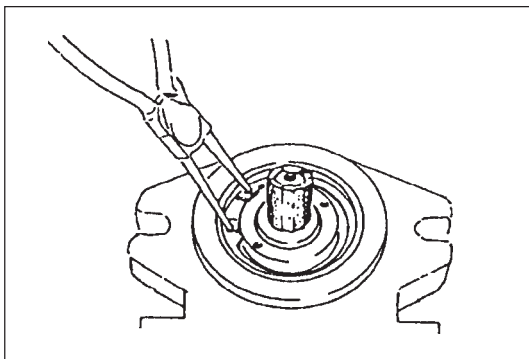
7 Ansteuergerät
Control modul



8 Hilfspumpe
Boost pump

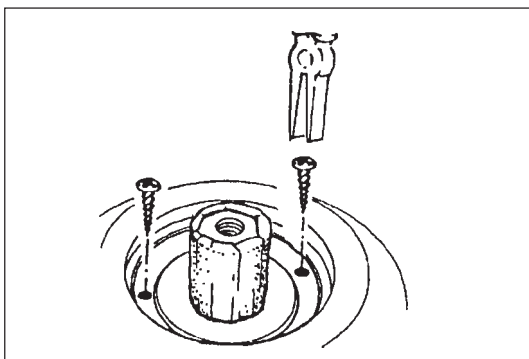


10



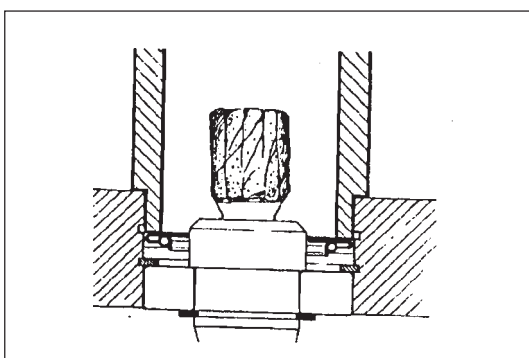
- 11 Triebwelle abkleben.
Sicherungsring ausbauen.

Protecting the drive shaft.
Remove retaining ring.



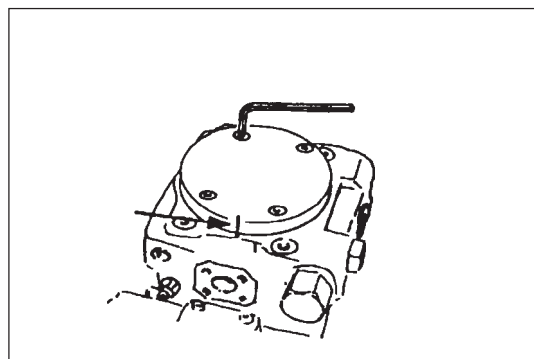
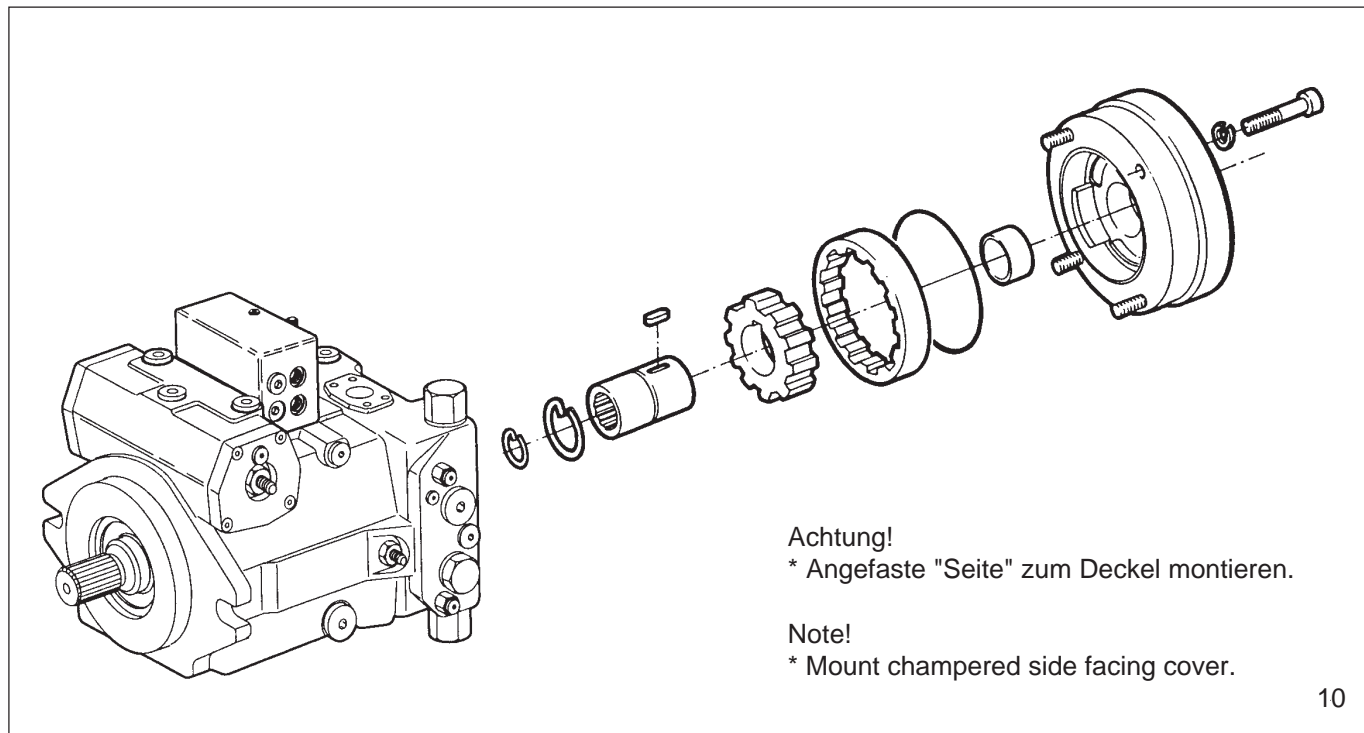
- 12 Blechschraube in die mit Gummi gefüllten
Löcher eindrehen.
Mit Zange WDR herausziehen.

Screw in sheet metal screw into the holes
fitted with rubber.
Pull out shaft seal with pliers.



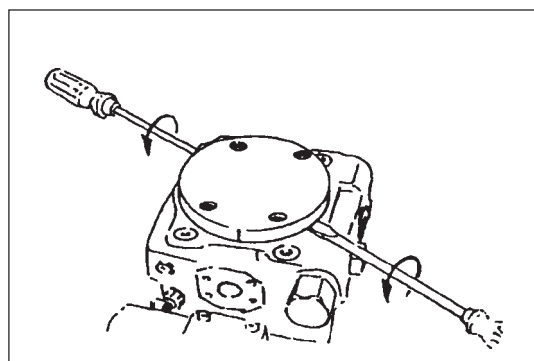
- 13 Wellendichtring mit Buchse auf
Anschlag einpressen.

Press-in shaft seal with bush to stop.



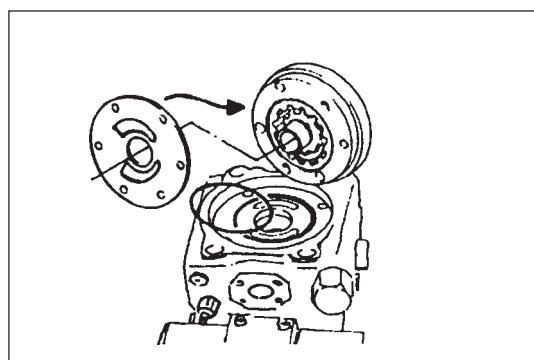
- 11 Lage kennzeichnen,
Befestigungsschrauben ausbauen.

Mark position,
remove fixing screws.



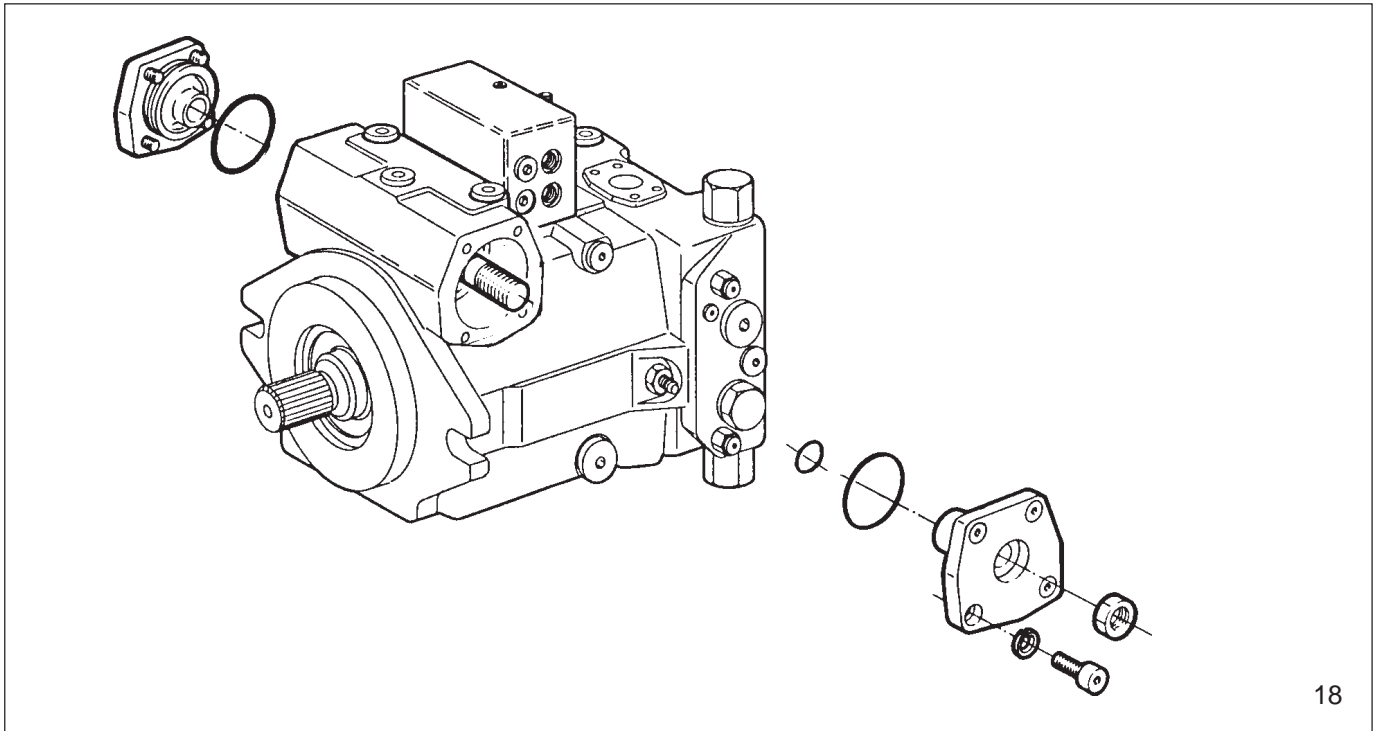
- 12 Deckel abdrücken.

Pry-off cover.

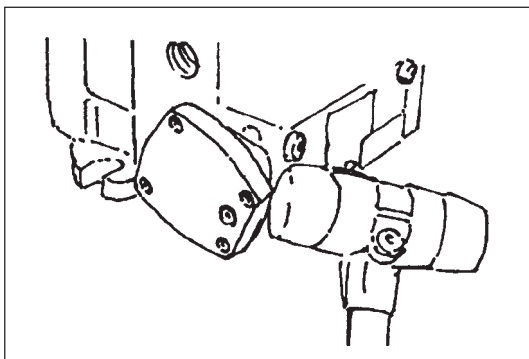


- 13 Teile der Hilfspumpe auf Verschleiß untersuchen.
Pumpe kann nur komplett ausgetauscht werden.

Inspect the parts of the boost pump and wear parts.
Boost pump can only be interchanged completely.

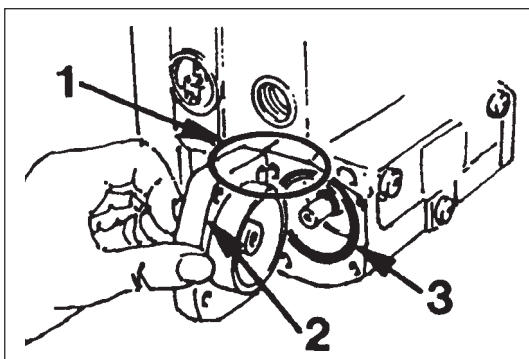


18



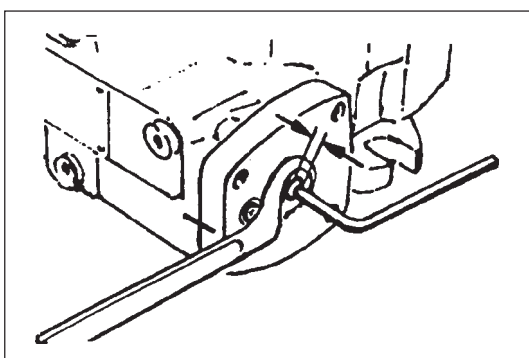
- 19 Befestigungsschrauben lösen.
Deckel verdrehen und mit leichten Hammerschlägen lösen.

Loosen mounting screws.
Rotate cover and release by tapping gently with hammer.



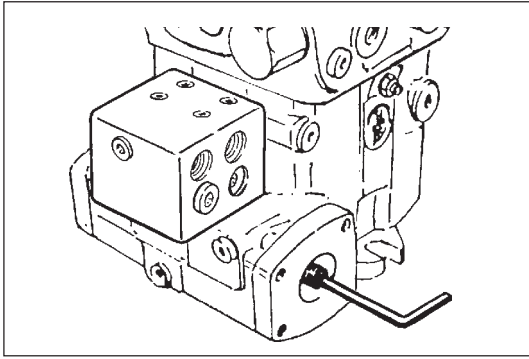
- 20 Kontrolle!
O-Ring (1), Nut (2), Gehäuse (3).

Check!
O-ring (1), groove (2), housing (3).

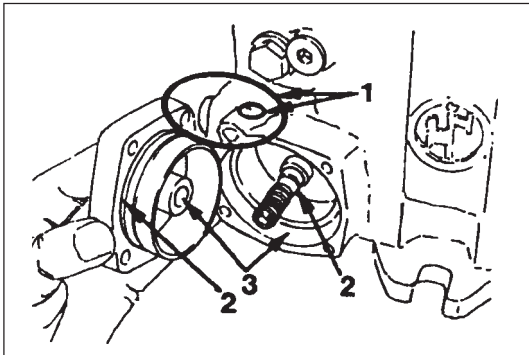


- 21 Kontermutter ausbauen, Stellschraube gegenhalten.
Deckel kennzeichnen. Maß festhalten, Kontermutter lösen.

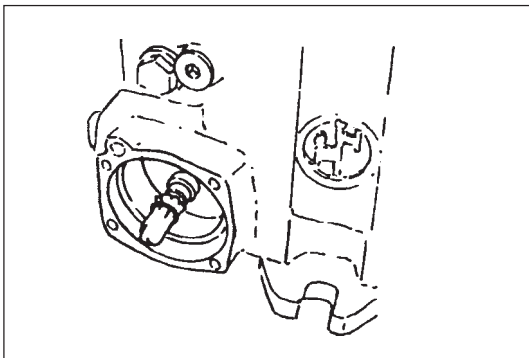
Remove locknut whilst holding setting screw.
Mark cover. Must be fixed, loosen counter nut.



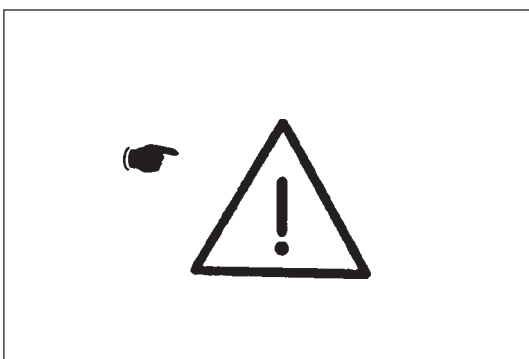
- 22 Über 0-Lagen-Einstellschraube Deckel abdrücken und drehen.
Pull cover off using zero position adjustment screw.



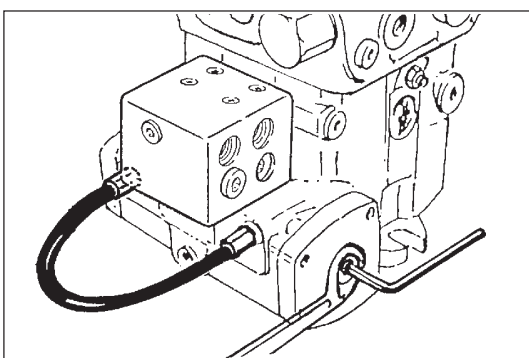
- 23 Kontrolle!
O-Ring (1), Nut (2), Gehäuse (3).
Check!
O-ring (19, groove (2), housing (3).



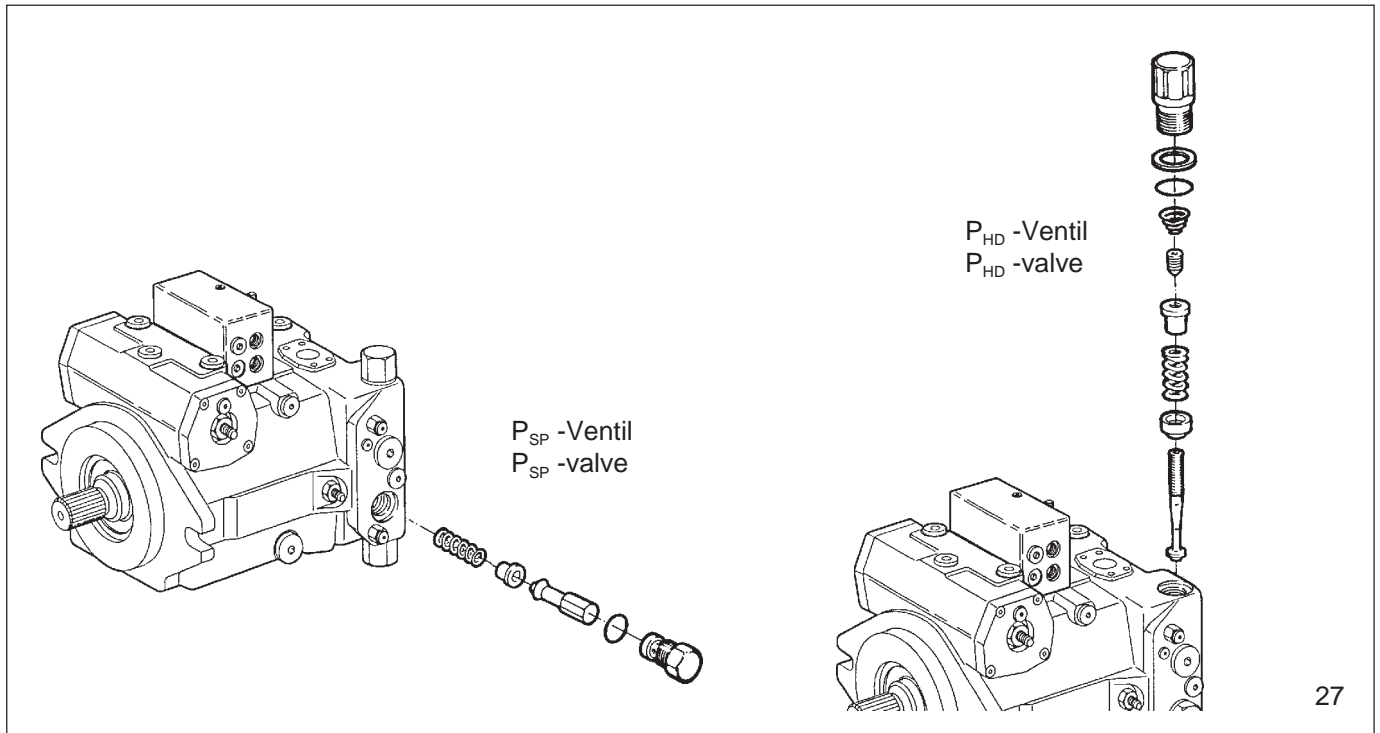
- 24 Gewinde abdecken, kleinen O-Ring aufschieben.
Montage in umgekehrter Reihenfolge.
Cover threads, push on small O-ring.
Assemble in reversed order.



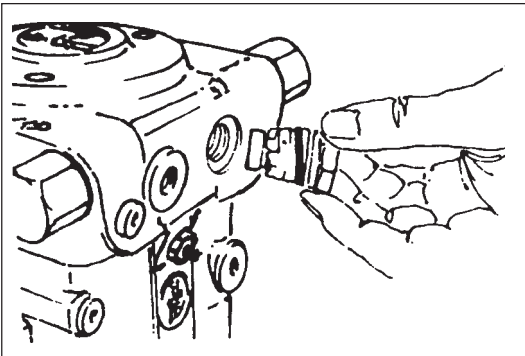
- 25 Achtung!
Korrekte mechanische Nullageneinstellung muß nach Einbau im Gerät bzw. Prüfstand erfolgen.
Attention!
Adjustment of the correct zero position to be carried out after installation into the machine or on the test bench.



- 26 Mechanische Nullage neu einstellen, dazu X_1 mit X_2 verbinden (>NW6).
Reset mechanical zero position. To do this, connect X_1 to X_2 (size > 6).

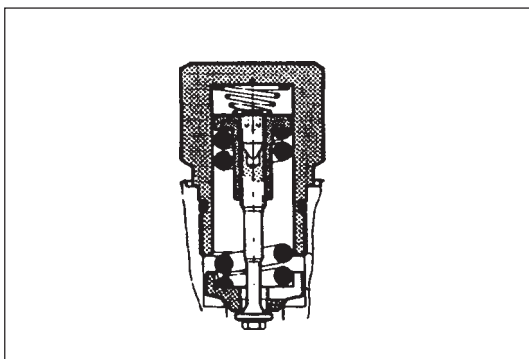


27



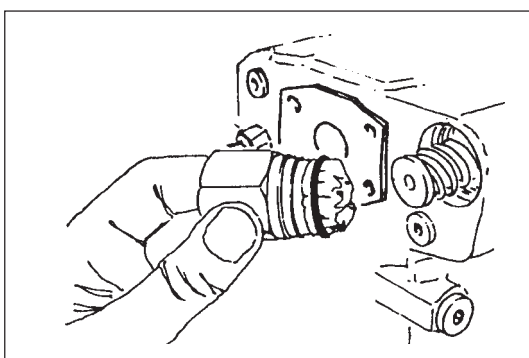
- 28 Gewinde vor Montage des neuen O-Ringes abkleben.
(Beschädigungsschutz).

Cover threads before fitting new O-rings.
(Damage protection).



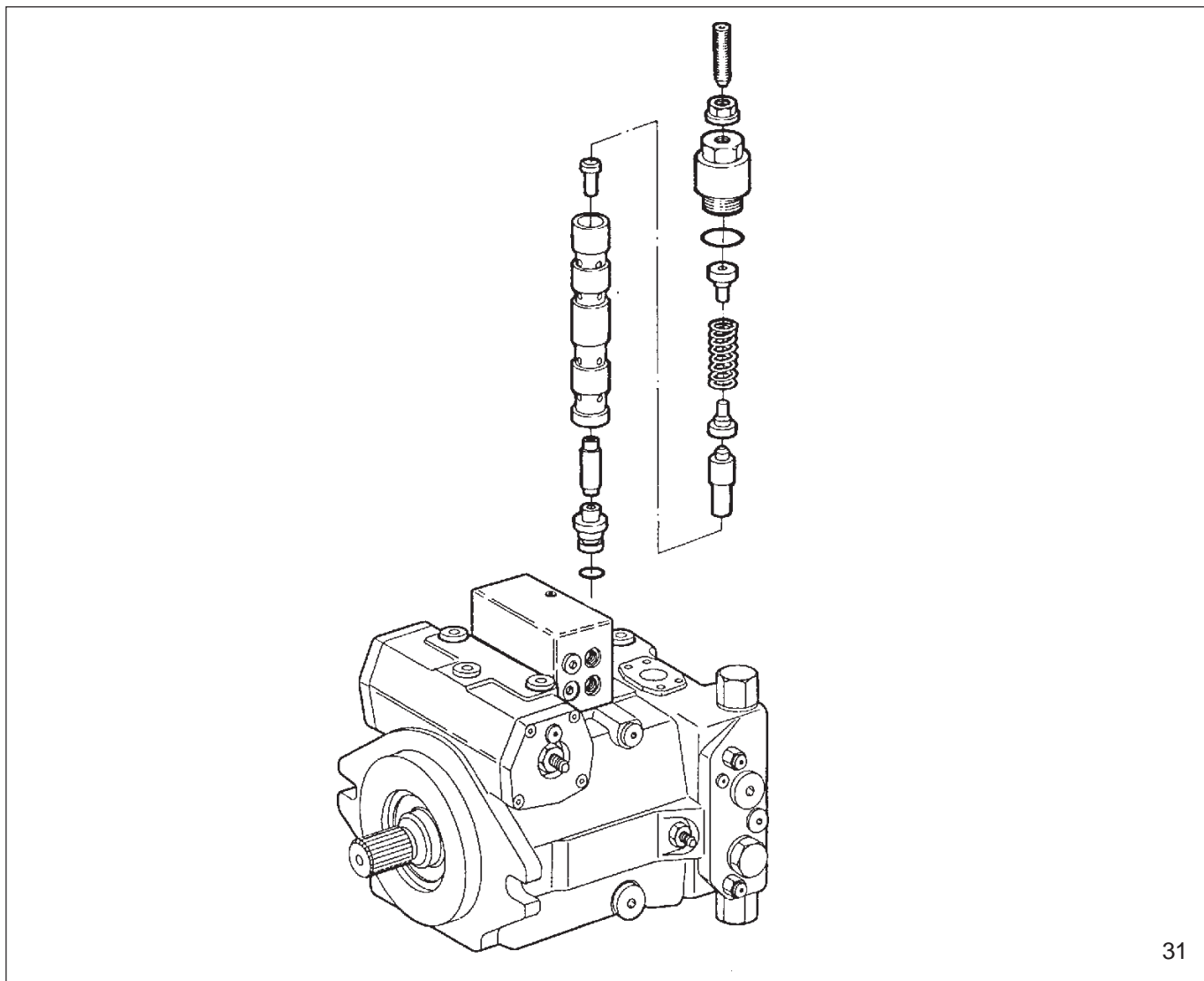
- 29 Ventilkegel mit Druckfeder ausbauen.

Remove valve poppet with spring.

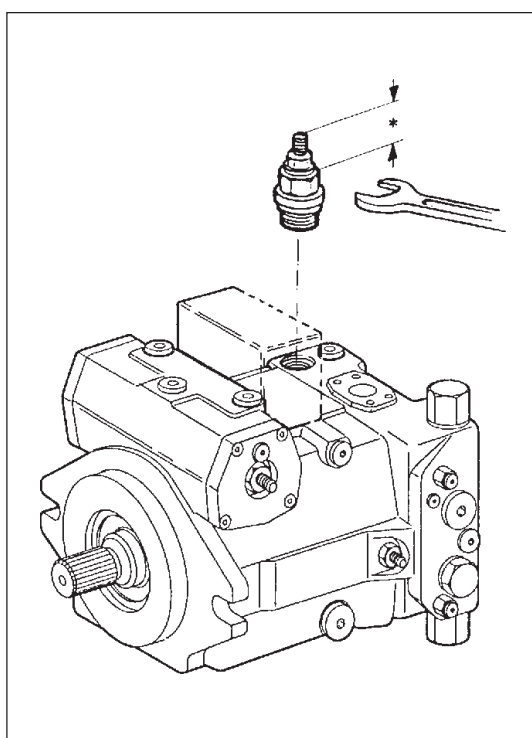


- 30 Gewinde vor Montage des neuen O-Ringes abkleben.
(Beschädigungsschutz).

Cover threads before fitting new O-rings.
(Damage protection).



31

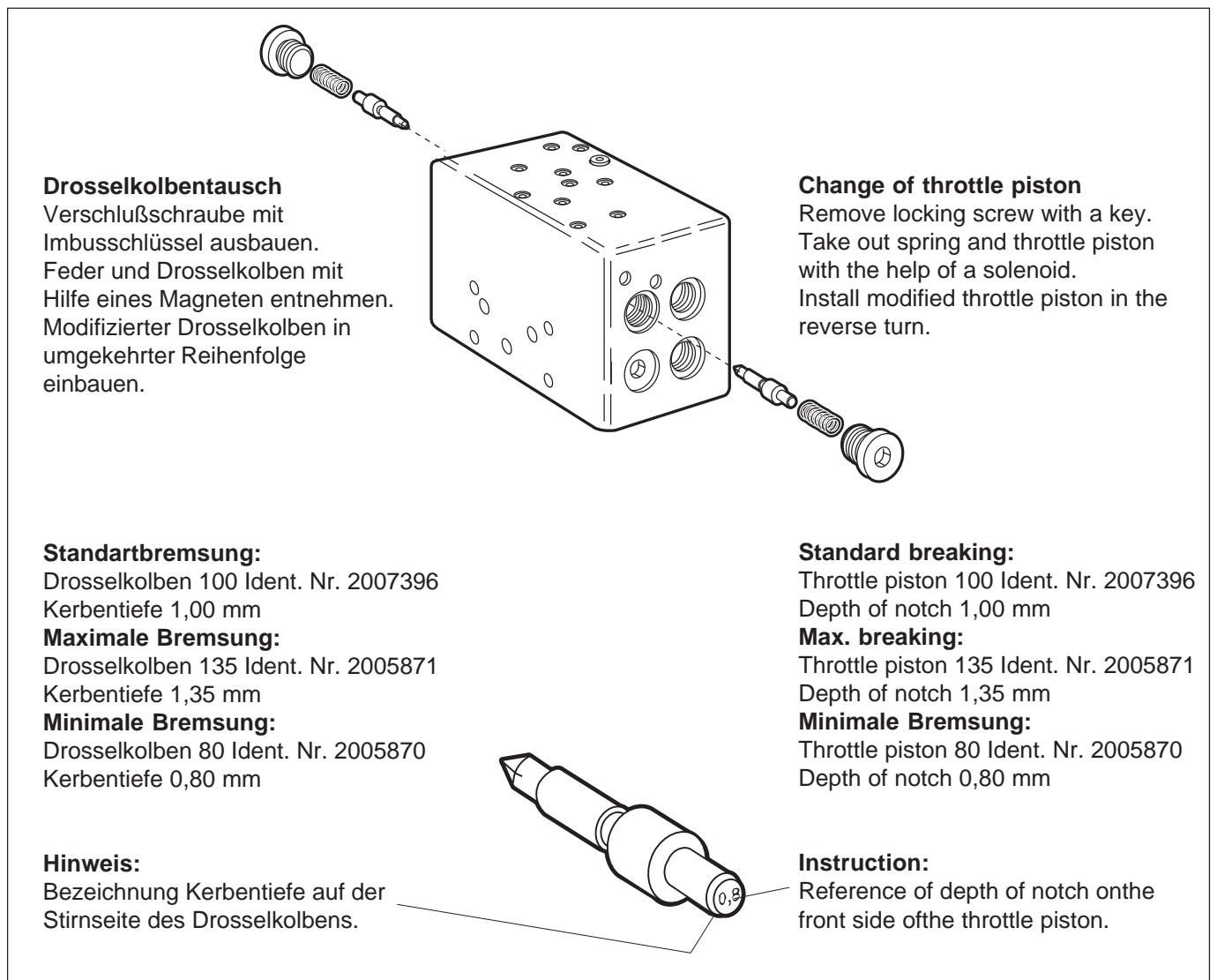
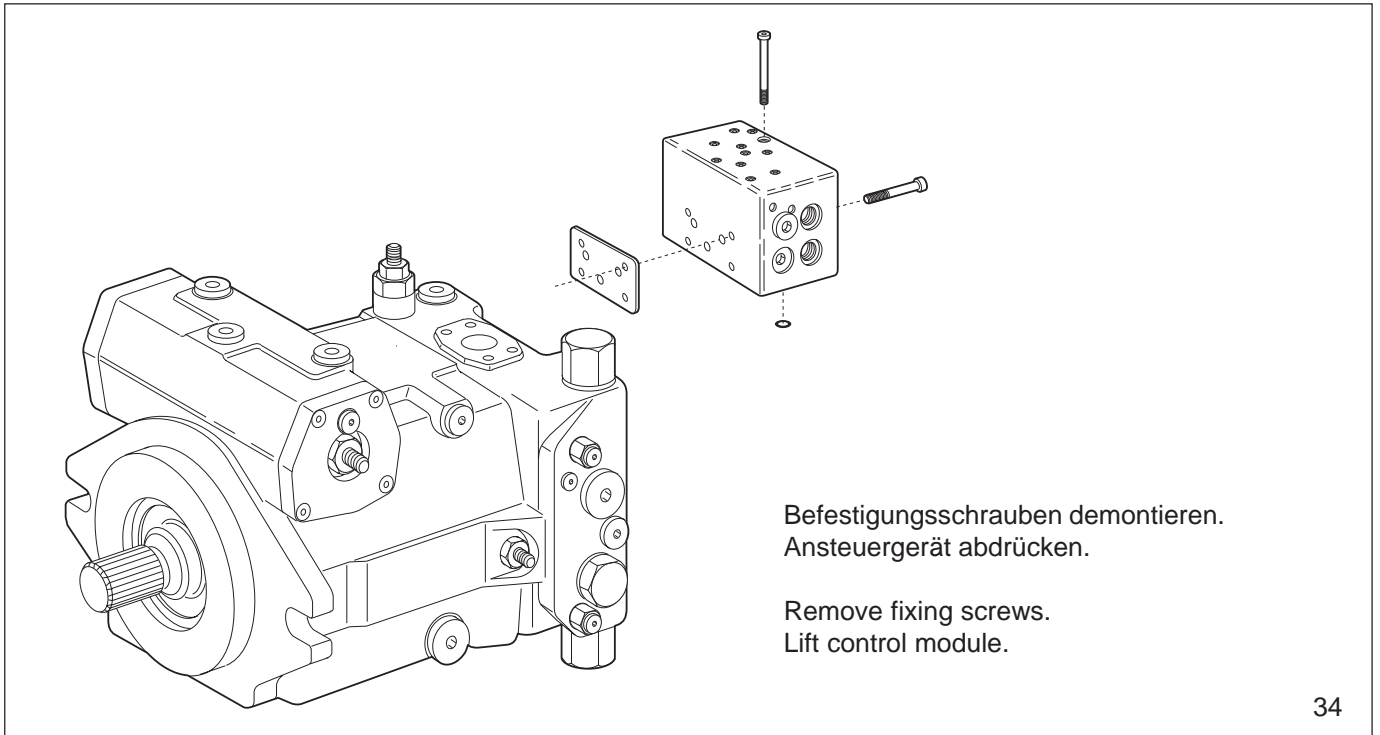


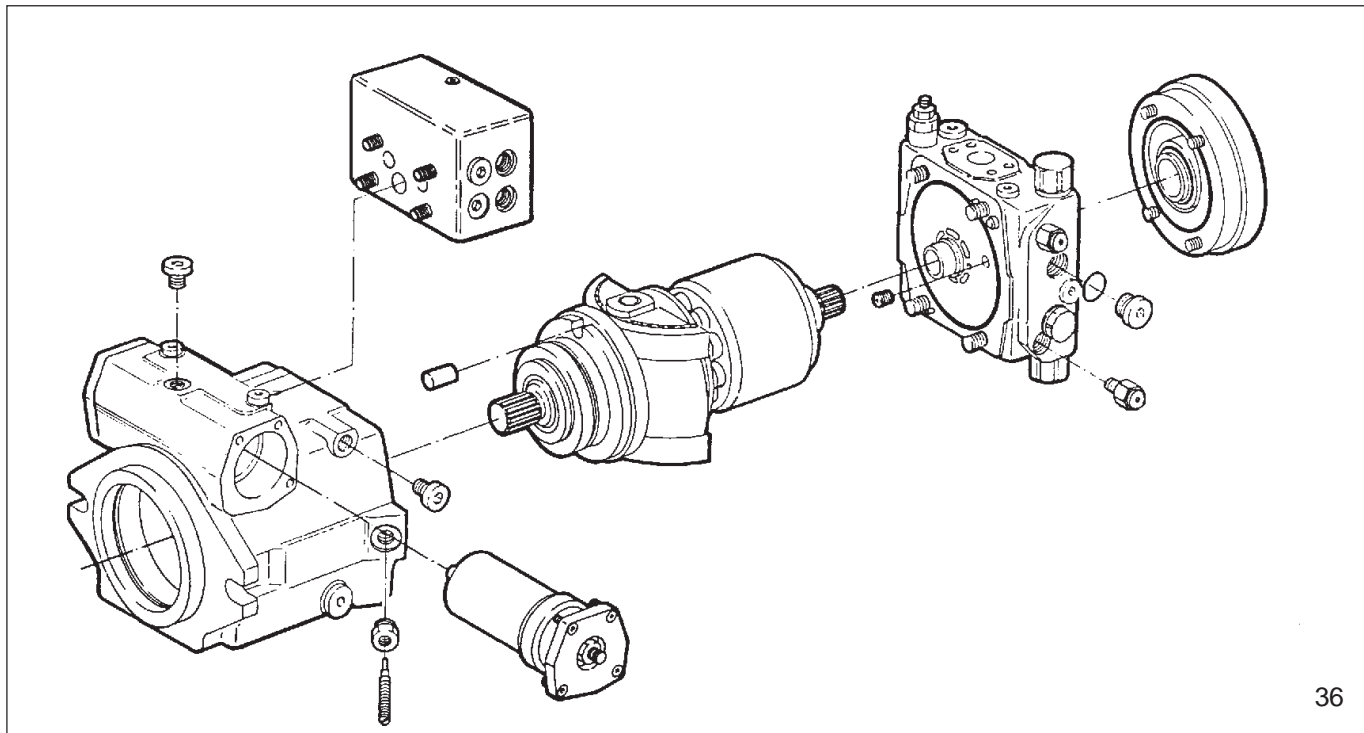
32 Wechsel der Dichtmutter.
Einstellmaß festhalten (*).

Change of the sealing nut.
Note setting measure (*).

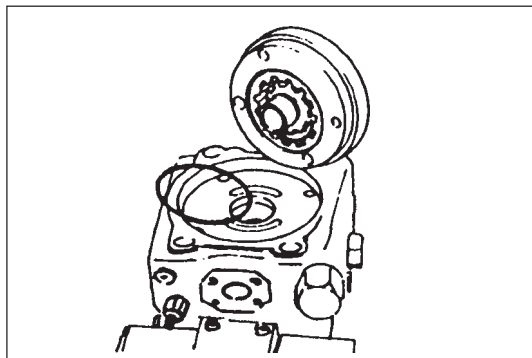
Achtung!
Nach Einbau "Ventileinstellung" überprüfen.

Attention!
After assembly check "valve setting".



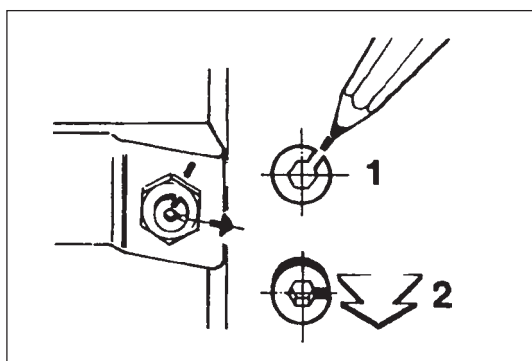


36



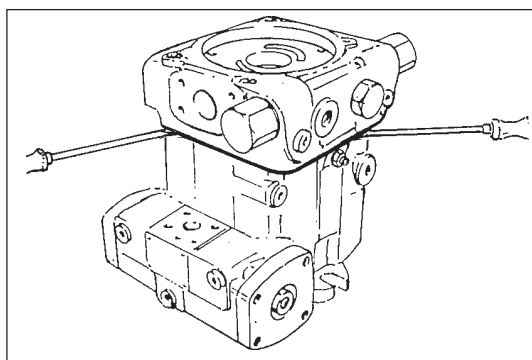
37 Lage der Hilfspumpe und Anschlußplatte markieren.
Hilfspumpe abbauen.

Mark position of the boost pump and the port plate.
Remove the boost pump.



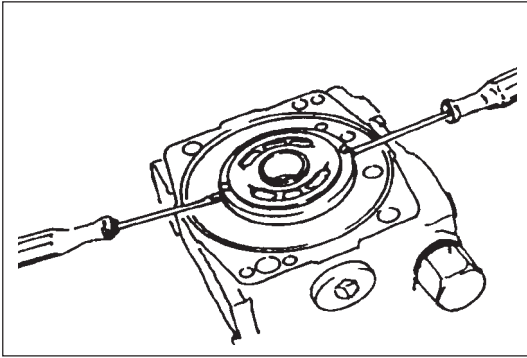
38 Lage der Verdrillschraube markieren (1).
Verdrillschraube auf Demontageposition stellen (2).

Mark the position of the indexing screw (1).
Set the indexing screw to disassembly position (2).



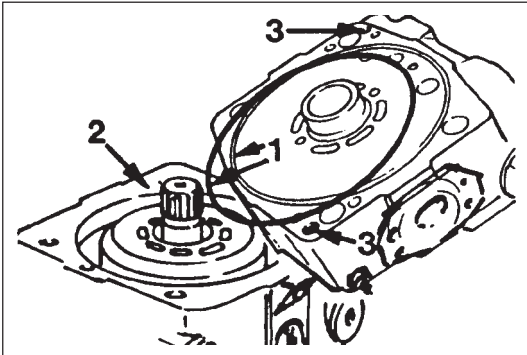
39 Anschlußplattenbefestigung lösen. Anschlußplatte abheben.
Achtung! Dichtfläche.

Release port plate fitting.
Take off port plate. If necessary, use screwdriver.
Attention! Sealing surface.



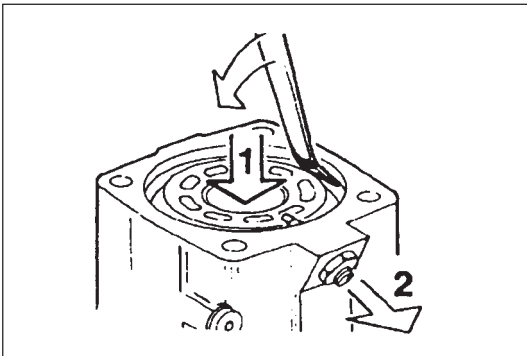
- 40 Steuerplatte abdrücken.
Lage notieren.

Lift off control plate.
Note position.



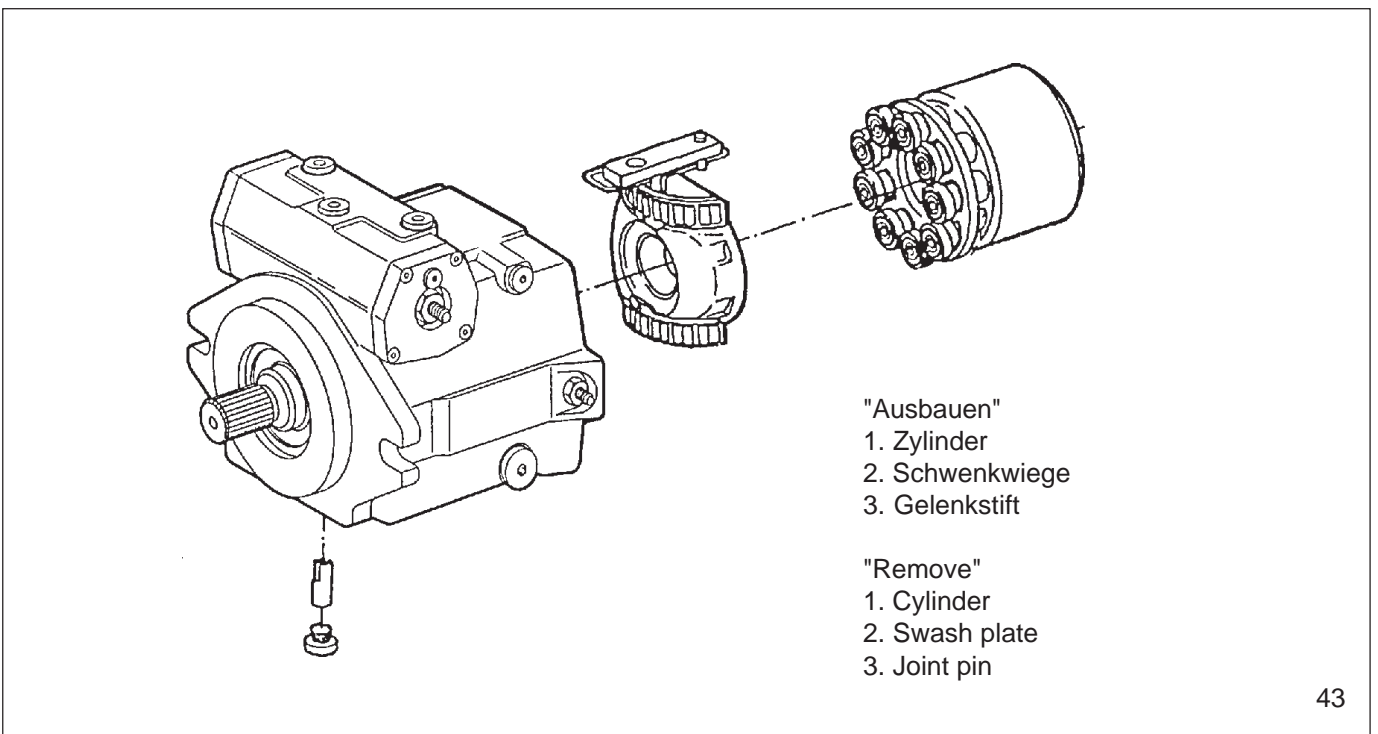
- 41 Kontrolle!
O-Ring mit Nut (1), Gehäuse (2), Quad-Ring und
Quad-Ring Nut (3).

Check!
O-ring and groove (1), housing (2), Quad-ring
and groove (3).



- 42 Zylinder nach unten drücken (1).
Verdrillschraube herausdrehen (2).
Triebwerk ausheben (3).

Press the cylinder to the bottom (1).
Remove fixing indexing screw (2).
Lift out rotary group (3).

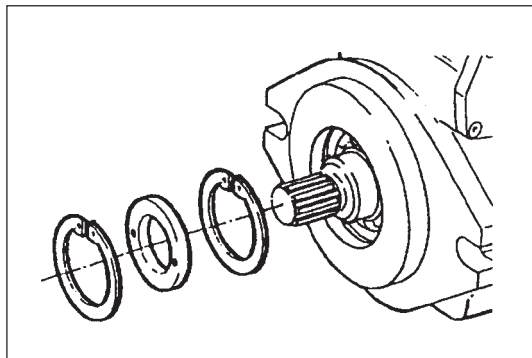


"Ausbauen"

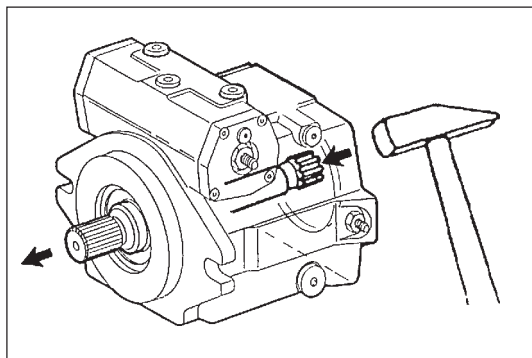
1. Zylinder
2. Schwenkwiege
3. Gelenkstift

"Remove"

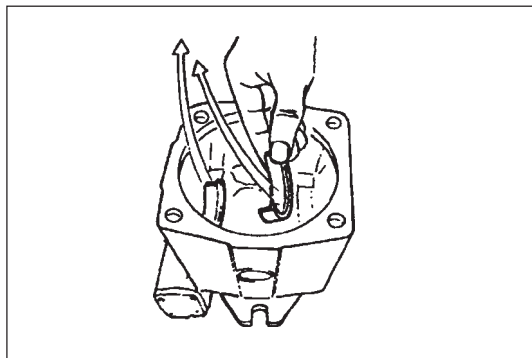
1. Cylinder
2. Swash plate
3. Joint pin



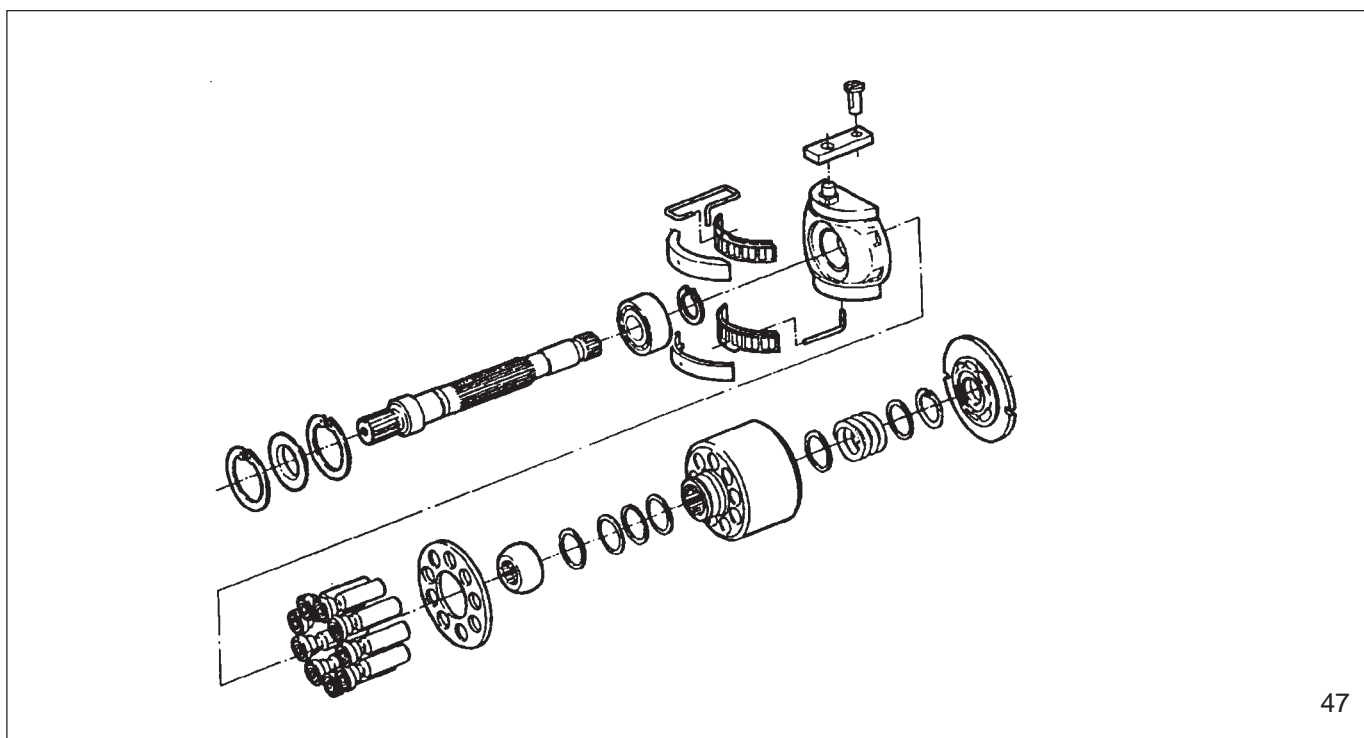
- 44 Seegerring, WDR ausbauen.
Remove retaining ring, radial seal ring.



- 45 Triebwelle mit leichten Hammerschlägen austreiben.
Remove drive shaft with slight hammer strokes.

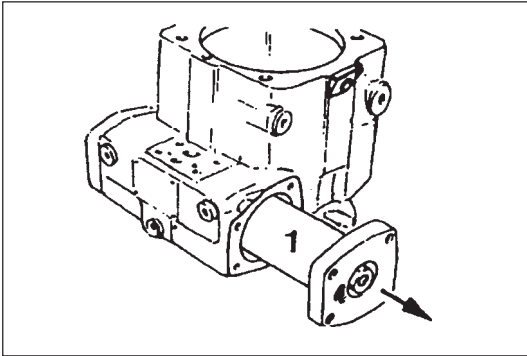


- 46 Lagerschalen ausbauen.
Remove bearing cups.

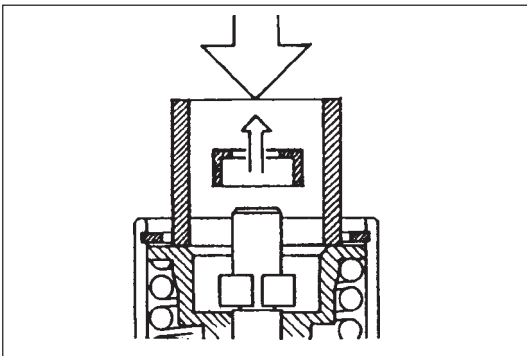


Stellkolben demontieren
Disassembly of the positioning piston

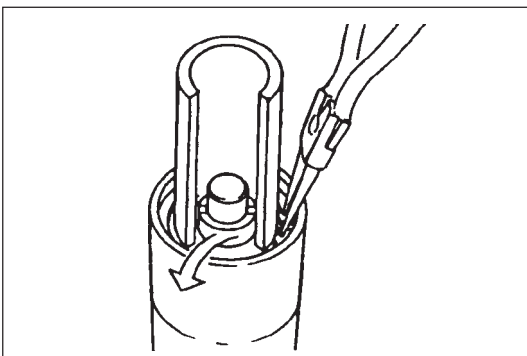
Reparaturanleitung A11VO-A4VG
Repair Instructions A11VO-A4VG



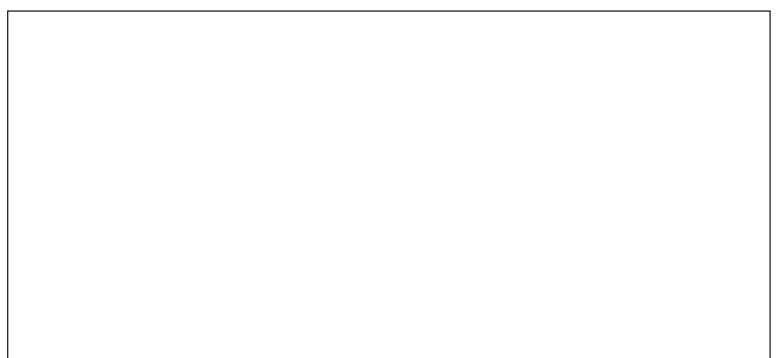
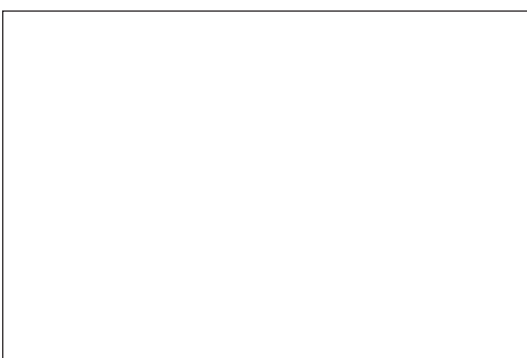
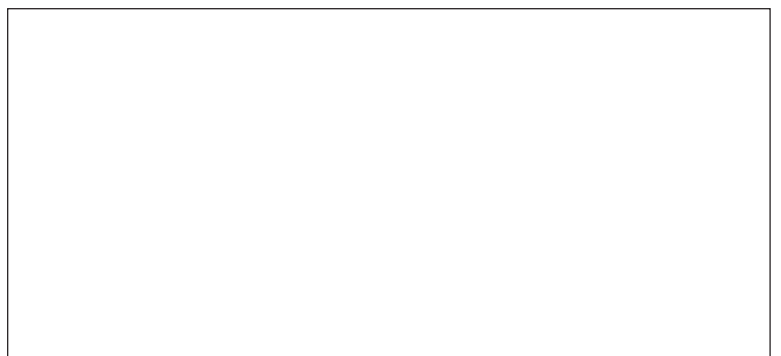
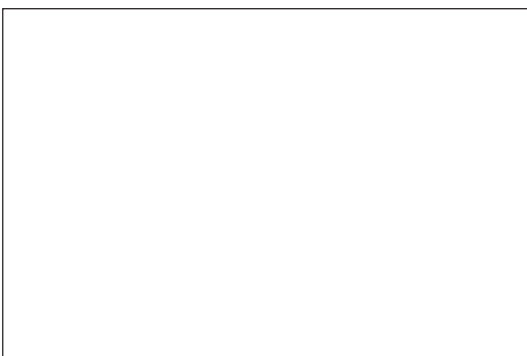
- 48 Stellkolben (1) ziehen.
Pull out control piston (1).

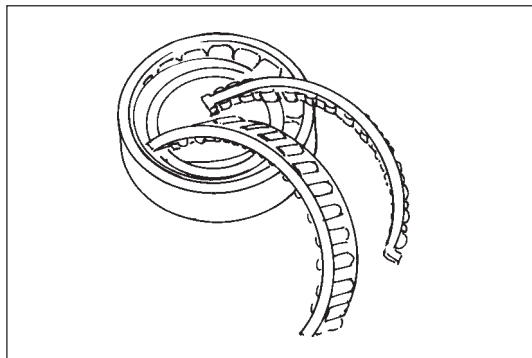


- 49 Vorrichtung aufsetzen und Feder vorspannen.
Aufnahmering ausbauen.
Mount fixture and tension spring.
Remove receiving ring.



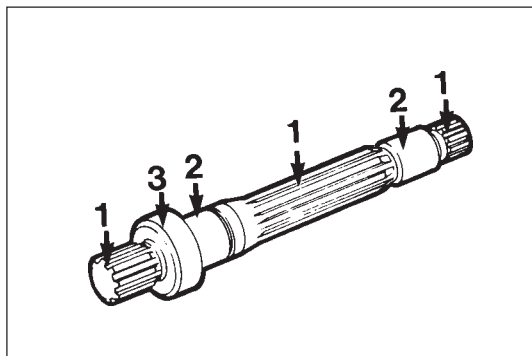
- 50 Ringe ausbauen.
Sicherungsring ausbauen.
Achtung! Teile stehen unter Federvorspannung.
Take out rings.
Remove retaining ring.
Note! Parts are spring loaded.





51 Alle Lager erneuern.

Replace all bearings.

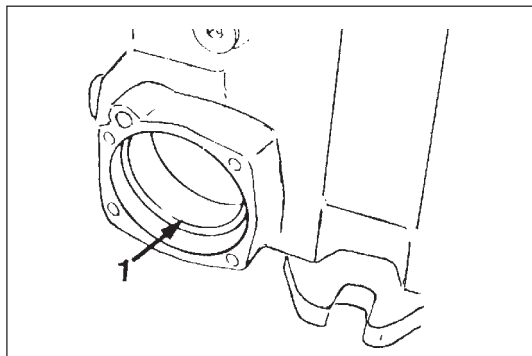


52 Kontrolle!

1. Verzahnung, ausgeschlagen, Passungsrost.
2. Lauffläche.
3. Einlaufrillen vom Wellendichtring.

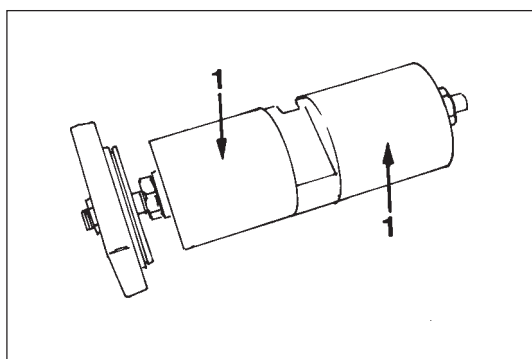
Check!

1. Splines for damage or fretting.
2. Running surfaces.
3. Groove cut by shaft seal.



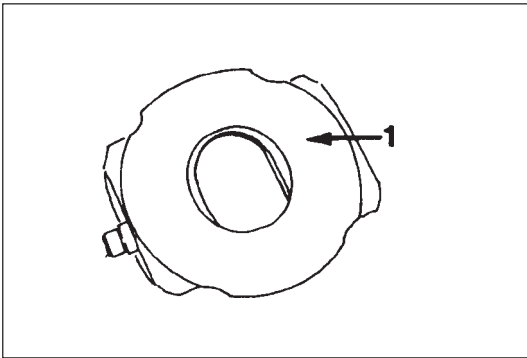
53 Stellkolbenlaufbüchse (1) riefenfrei, nicht ausgelaufen.

Check that the control piston guide bush (1) is free of grooves and has not worn out.

54 Kontrolle!
Stellkolben (1) riefenfrei.

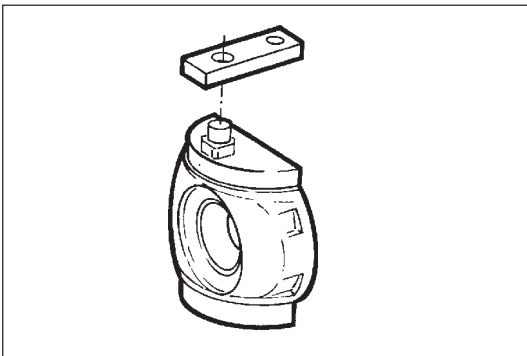
Check!

Control piston (1) is not scored.



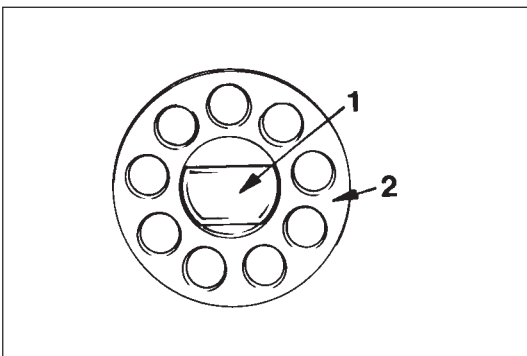
- 55 Kontrolle!
Gleitfläche riefenfrei.

Check!
Sliding surface free of grooves.



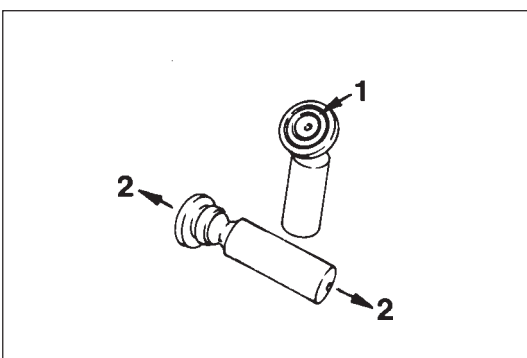
- 56 Kontrolle!
Verbindung Gleitstein/Schwenzapfen spielfrei.

Check!
Make sure sliding ring/swivel pin are free of play.



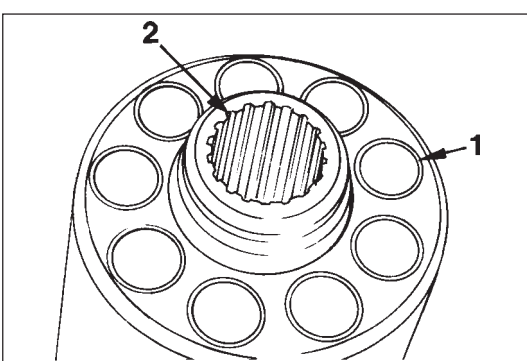
- 57 Kontrolle!
Rückzugeinrichtung riefenfrei (1), keine Einlaufspuren (2)
im Gleitschuhbereich.

Check!
Check that return device is free of grooves (1) no wear
in slipper pad area.



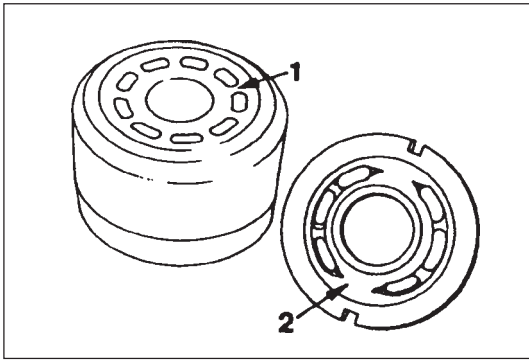
- 58 Kontrolle!
Lauffläche (1) keine Kratzer, keine Metalleinlagerungen,
kein Axialspiel (2), (Kolben nur satzweise tauschen).

Check!
Check that there are no scratches or metal deposits on
sliding surface (1), and there is no axial play (2),
(otherwise: pistons must be replaced in sets).



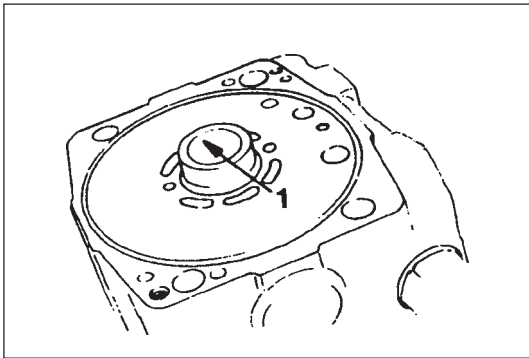
- 59 Kontrolle!
Zylinderbohrungen (1), Verzahnungen (2).

Check!
Cylinder bores (1), splines (2).



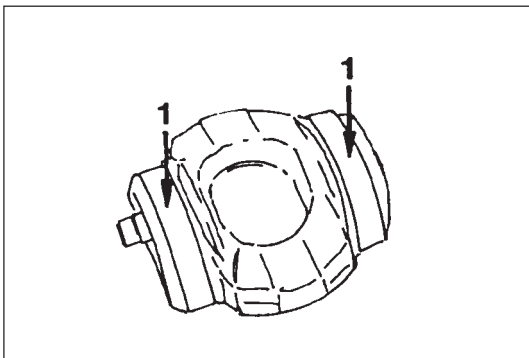
- 60 Kontrolle!
Zylindergleitfläche (1) riefenfrei, nicht eingelaufen, keine Einlagerungen, Steuerplatte (2) nicht riefig (nur satzweise austauschen).

Check!
Cylinder gilding surface (1) free of scratches, no traces of wear and no embedded foreign particles. No scratches on the valve plate (2). (Replace ONLY in sets).



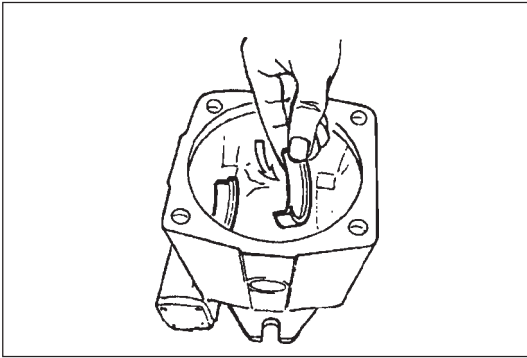
- 61 Kontrolle!
DU-Lagerbuchse (1) nicht ausgelaufen.

Check!
DU-bearing bush (1) is not worn out.



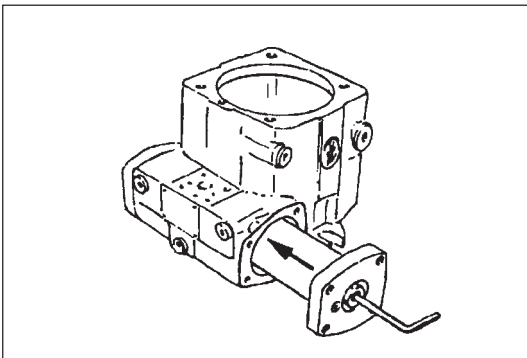
- 62 Kontrolle!
Lagerbahnen (1)

Check!
Bearing surfaces (1)



63 Lagerschalenpaar einsetzen.

Insert bearing cup set.

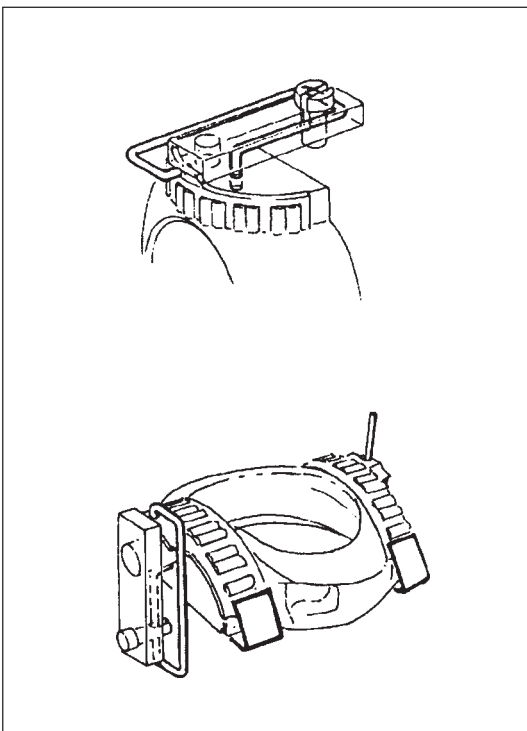


64 Stellkolben ins Gehäuse einsetzen.

Hinweis:
Stellkolben vor Einbau einölen.

Insert positioning piston into the housing.

Instruction:
Oil positioning piston before assembly.

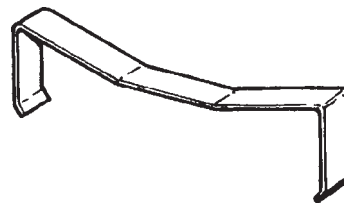


Lager, Draht, Gleitstein und Gelenkstift montieren.

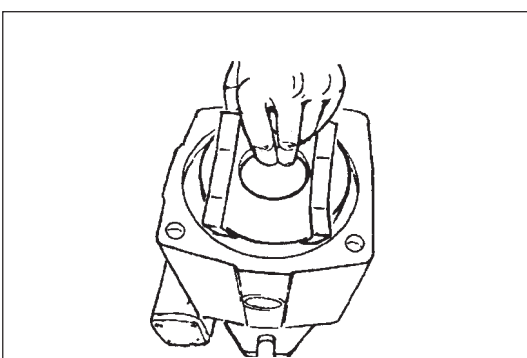
Montagehilfe: z.B. - Klammer / Gummiringe / Fett

Assemble bearing, wire, gliding stone and articulating pin.

Assistance: Devices e.g. - Clamp / rubber rings / grease

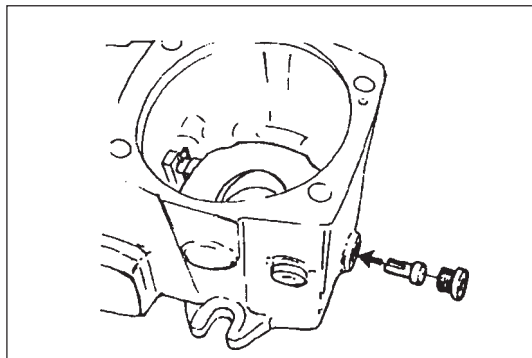


65

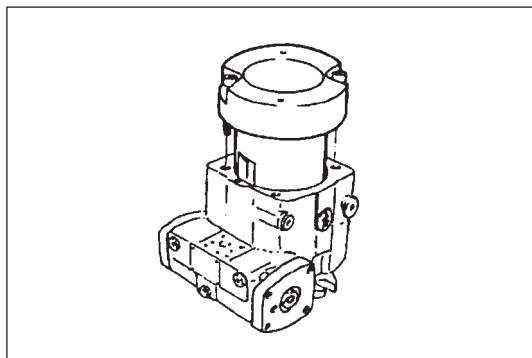


66 Schwenkwiege komplett ins Gehäuse einsetzen.
Auf korrekten Sitz der Schwenklager im Gehäuse "achten".
Montagehilfe ausbauen.

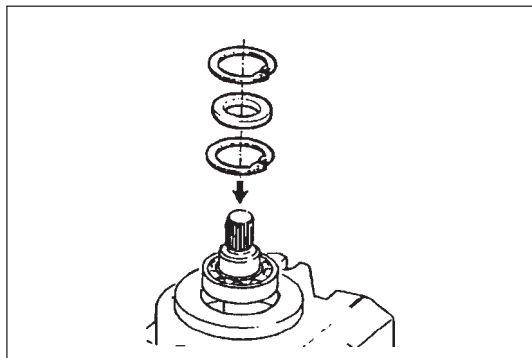
Insert completely swivel cradle into the housing.
Pay attention for correct seat of the swivel cradle in the housing.
Remove auxiliary device.



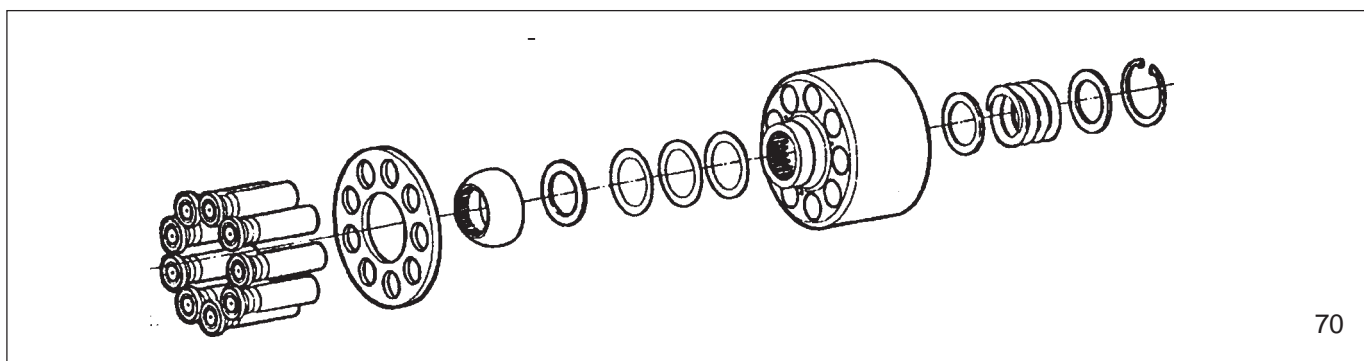
- 67 Gelenkstift montieren.
Assemble articulating pin.



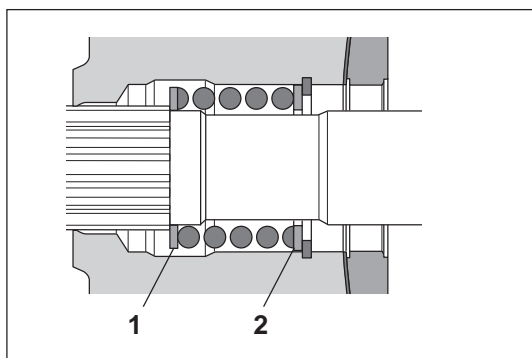
- 68 Vorrichtung zum Fixieren der Schwenkwiege montieren.
Assemble device for fixation of the swivel cradle.



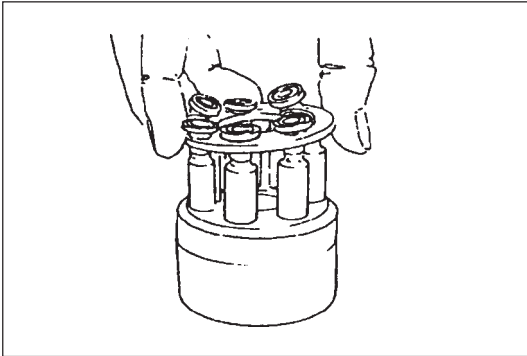
- 69 Neue Montageposition!
Triebwelle mit Lager und Wellendichtring einbauen.
Assemble drive shaft with bearings and radial seal rings.



70

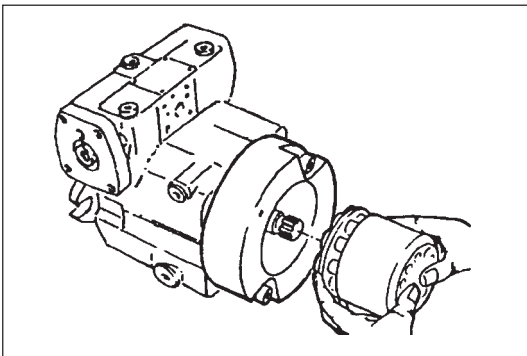


- 71 Montagelage beachten!
Kleine Scheibe (1), große Scheibe (2).
Observe assembly position!
Little Disc (1), big disc (2).



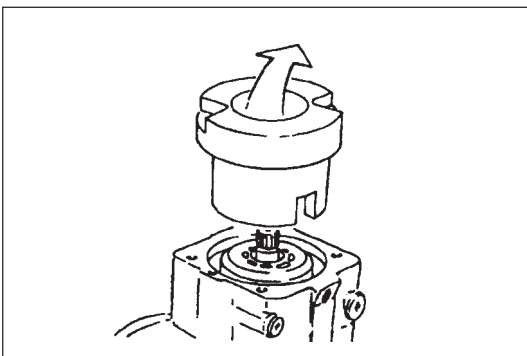
- 72 Kolben mit Rückzugeinrichtung montieren.
Hinweis:
Kolben, Gleitschuhe einölen.

Assemble piston with retaining plate.
Note:
Oil piston and piston pad.



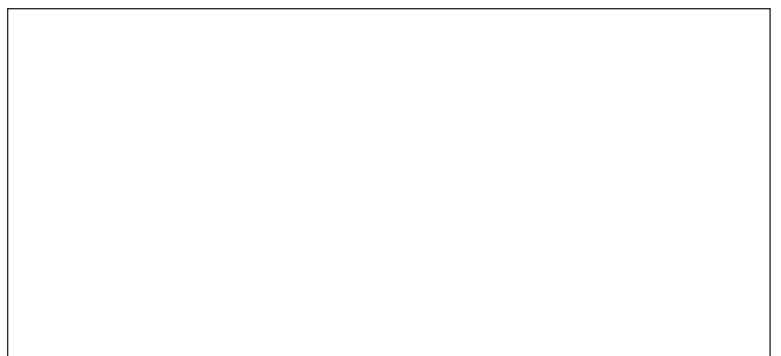
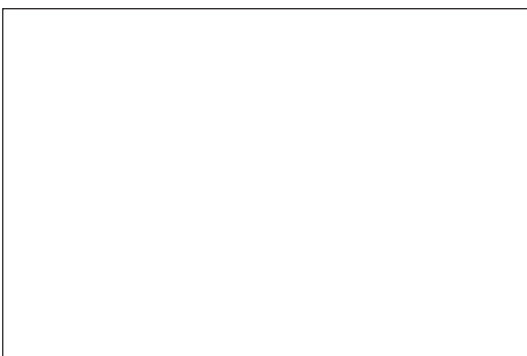
- 73 Zylinder komplett einbauen.

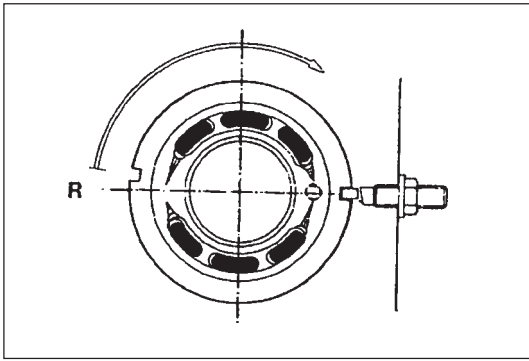
Assemble cylinder completely.



- 74 Vorrichtung ausbauen.

Remove assembly device.

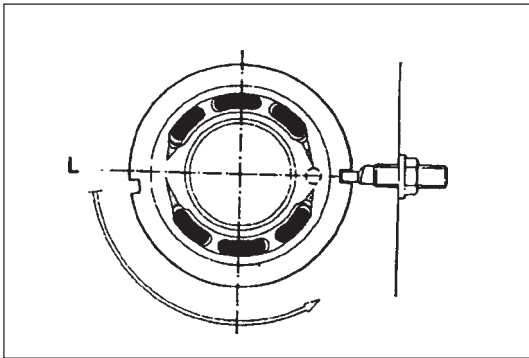




- 75 Steuerplatte Rechtslauf - in Drehrichtung verdreht.
Achtung!
Geräuschkerben sind drehrichtungsbezogen eingeschliffen.

Control plate clockwise rotation - indexed in the direction of rotation.

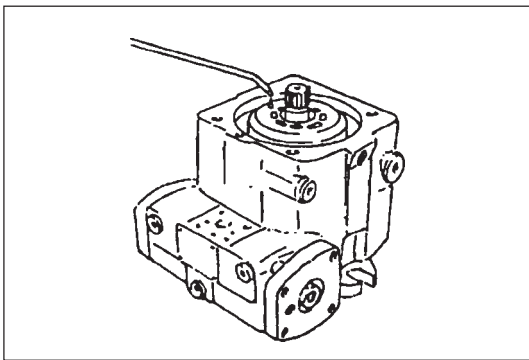
Note!
Noise grooves are machined - in based on direction of rotation.



- 76 Steuerplatte Linkslauf - in Drehrichtung verdreht.
Achtung!
Geräuschkerben sind drehrichtungsbezogen eingeschliffen.

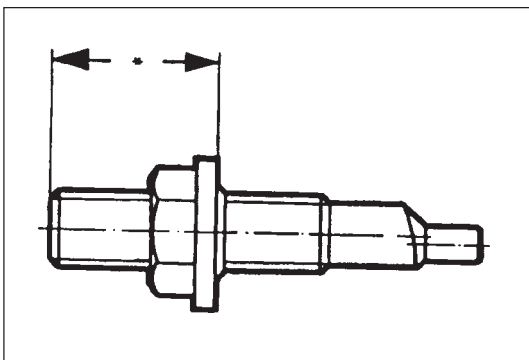
Control plate counter clockwise rotation - indexed in the direction of rotation.

Note!
Noise grooves are machined - in based on direction of rotation.



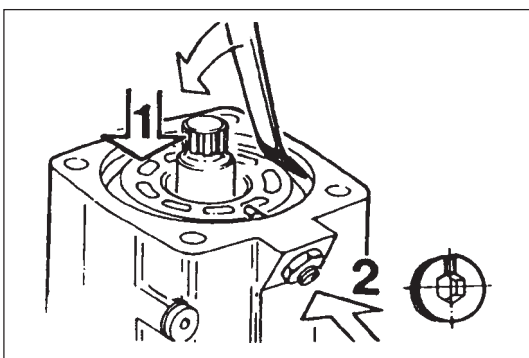
- 77 Zylinderflächen und DU-Lager einölen, neue O-Ringe mit Fett einreiben und einsetzen.

Oil the running surfaces of the cylinder barrel and the DU- bearing. Grease the O-rings and insert in grooves.



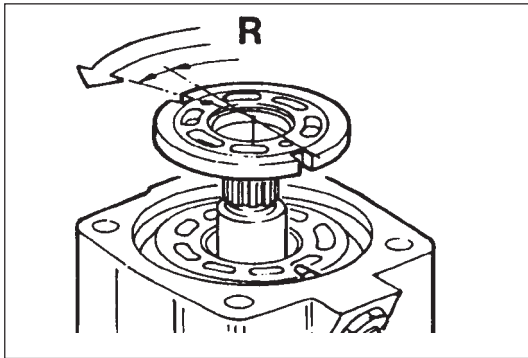
- 78 Grundeinstellung - Verdrillschraube
A4VG...40 * = $24 \pm 0,75$ mm.
A4VG...56 * = $21 \pm 0,75$ mm.

Basic setting - indexing screw
A4VG...40 * = $24 \pm 0,75$ mm.
A4VG...56 * = $21 \pm 0,75$ mm.

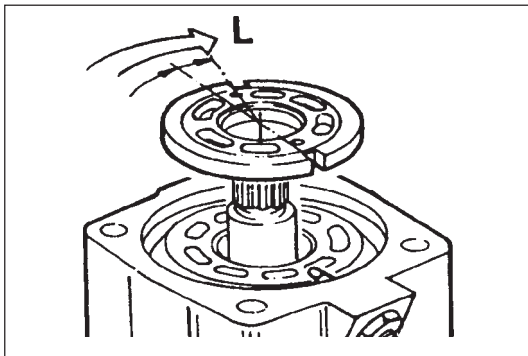


- 79 Zylinder nach unten drücken (1).
Verdrillschraube einbauen (2).
Kerbe in Montageposition.

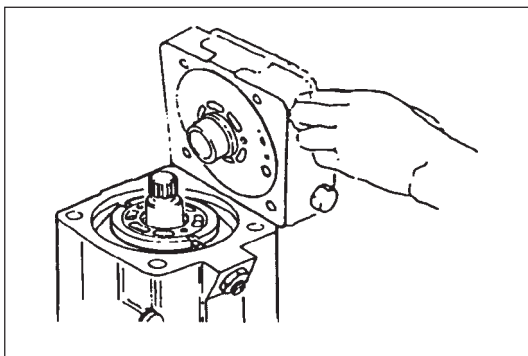
Press the cylinder to the bottom (1).
Screw in the indexing screw (2).
Groove in mounting position.



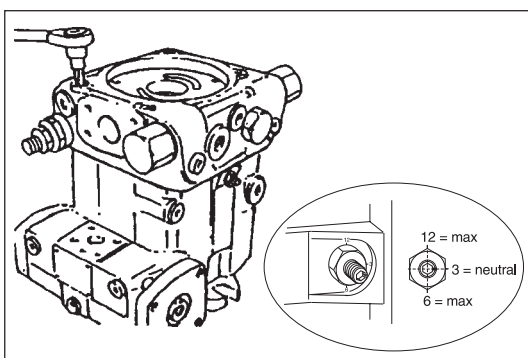
- 80 Steuerplatte einsetzen - Rechtslauf.
 Insert the control plate - clockwise rotation.



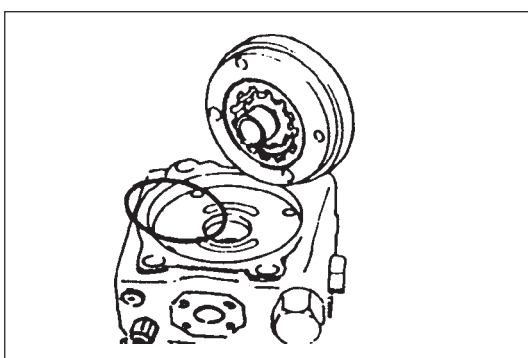
- 81 Steuerplatte einsetzen - Linkslauf.
 Insert the control plate - Counter-clockwise rotation.



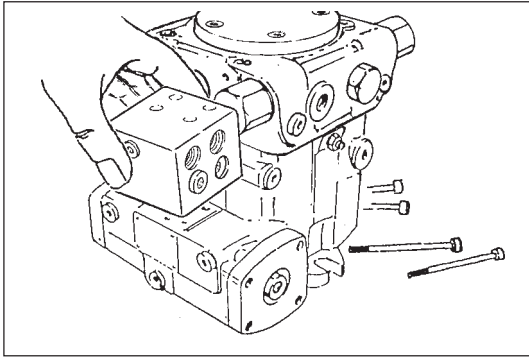
- 82 Lagerichtig aufsetzen.
 Place in correct position..



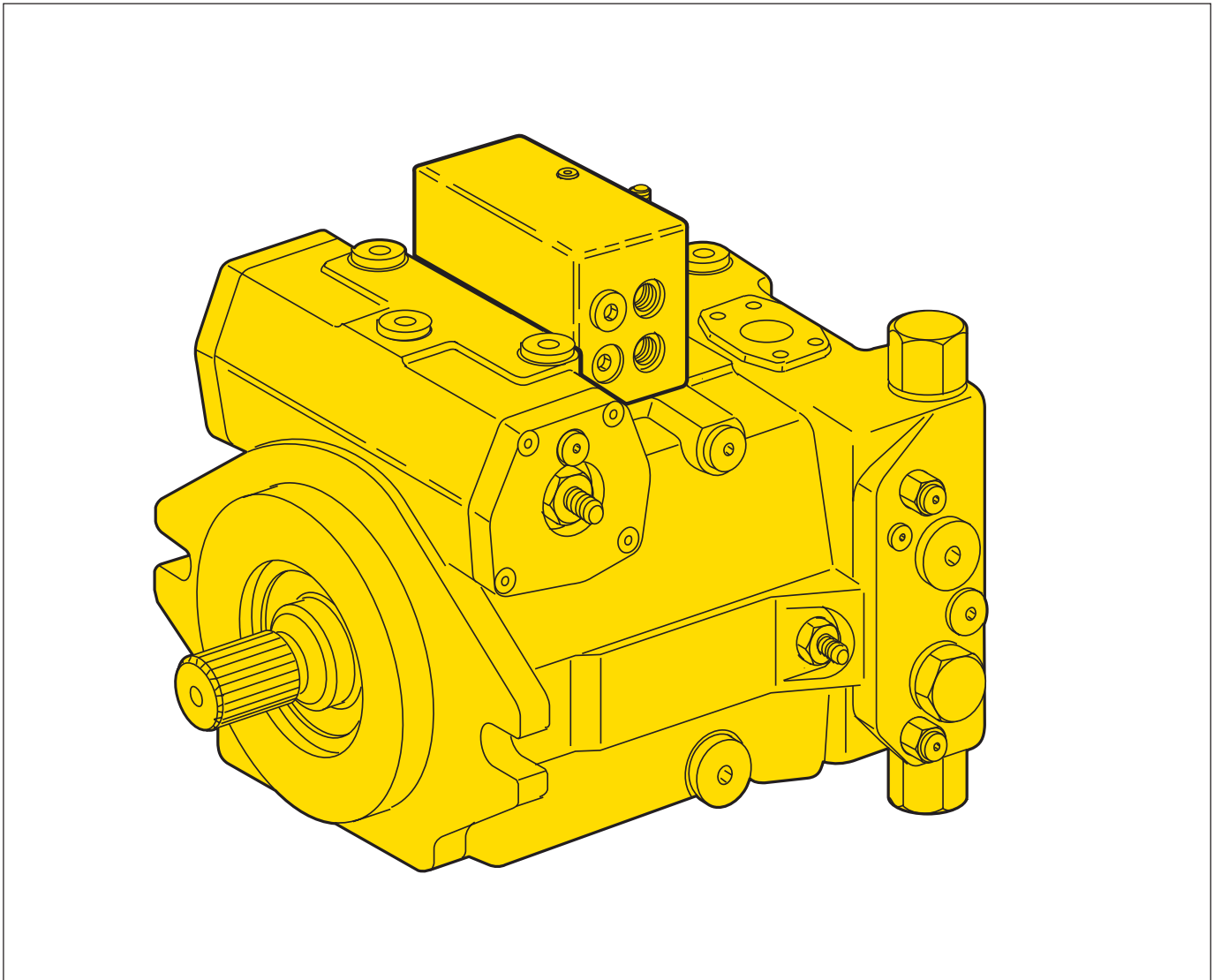
- 83 Schrauben über Kreuz anziehen.
 Verdrillschraube auf Markierung drehen.
 Tighten screws (Cross-corner).
 Turn the indexing screw to marking.



- 84 Hilfspumpe montieren.
 Assemble boost pump.



85 Ansteuergerät montieren.
Mount control module.



Anziehdrehmomente
Tightening torques

Reparaturanleitung A11VO-A4VG
Repair Instructions A11VO-A4VG

**Anziehdrehmomente für Schaftschrauben
(Metrisches ISO-Regelgewinde)**

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Schaftschrauben mit metrischem ISO-Regelgewinde und Kopfaufmaß nach DIN 912, DIN 931 und DIN 933. Außerdem gelten diese Werte nur für leicht oder nicht geölte, unbehandelte Oberflächen, sowie nur bei Verwendung von Drehmoment- und Kraftbegrenzungsschlüsseln.	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
		Anziehdrehmoment(Nm)		
M 3	1,3	2,0	2,3	
M 4	3,1	4,5	5,3	
M 5	6,1	8,9	10,4	
M 6	10,4	15,5	18,0	
M 8	25	37	43	
M10	51	75	87	
M12	87	130	150	
M14	140	205	240	
M16	215	310	370	
M18	300	430	510	
M 20	430	620	720	
M 22	580	830	970	
M 24	740	1060	1240	
M 27	1100	1550	1850	
M 30	1500	2100	2500	

**Tightening torques for shaft bolts
(Metric ISO Standard Thread)**

The values for tightening torques shown in the table are valid only for shaft bolts with metric ISO-standard threads and head support surface dimensions in accordance with DIN 912, DIN 931 and DIN 933. These values are also valid only for light or uncoiled, untreated surface as well as for use only with torque-indicating wrenches and force limiting tools.	Thread size	Strength Classes		
		8.8	10.9	12.9
		Tightening Torque(lb.ft)		
M 3	1,3	2,0	2,3	
M 4	3,1	4,5	5,3	
M 5	6,1	8,9	10,4	
M 6	10,4	15,5	18,0	
M 8	25	37	43	
M10	51	75	87	
M12	87	130	150	
M14	140	205	240	
M16	215	310	370	
M18	300	430	510	
M 20	430	620	720	
M 22	580	830	970	
M 24	740	1060	1240	
M 27	1100	1550	1850	
M 30	1500	2100	2500	

**Anziehdrehmomente für Verschlusschrauben VSTI
(Metrisches Feingewinde)**

Gewindegröße	Bezeichnung	Anziehdrehmoment(Nm)
M 8 x 1	VSTI 8 x 1 -ED/SA	= 5
M 10 x 1	VSTI 10 x1 -ED	= 10
M 12 x 1,5	VSTI 12 x 1,5 -ED	= 20
M 14 x 1,5	VSTI 14 x 1,5 -ED	= 30
M 16 x 1,5	VSTI 16 x 1,5 -ED/SA	= 30
M 18 x 1,5	VSTI 18 x 1,5 -ED/SA	= 40
M 20 x 1,5	VSTI 20 x 1,5 -ED/SA	= 50
M 22 x 1,5	VSTI 22 x 1,5 -ED	= 60
M 26 x 1,5	VSTI 16 x 1,5 -ED/SA	= 70
M 27 x 2	VSTI 27 x 2 -ED	= 90
M 30 x 1,5	VSTI 30 x 1,5 -ED/SA	= 100
M 33 x 2	VSTI 33 x 2 -ED/SA	= 120
M 42 x 2	VSTI 42 x 2 -ED/SA	= 200
M 48 x 2	VSTI 48 x 2 -ED	= 300

**Tightening torques for locking screws VSTI
(Metric ISO fine thread)**

Thread size	Designation	Tightening torques (lb.ft)
M 8 x 1	VSTI 8 x 1 -ED/SA	= 4
M 10 x 1	VSTI 10 x1 -ED	= 7
M 12 x 1,5	VSTI 12 x 1,5 -ED	= 15
M 14 x 1,5	VSTI 14 x 1,5 -ED	= 22
M 16 x 1,5	VSTI 16 x 1,5 -ED/SA	= 22
M 18 x 1,5	VSTI 18 x 1,5 -ED/SA	= 29
M 20 x 1,5	VSTI 20 x 1,5 -ED/SA	= 37
M 22 x 1,5	VSTI 22 x 1,5 -ED	= 44
M 26 x 1,5	VSTI 16 x 1,5 -ED/SA	= 51
M 27 x 2	VSTI 27 x 2 -ED	= 66
M 30 x 1,5	VSTI 30 x 1,5 -ED/SA	= 74
M 33 x 2	VSTI 33 x 2 -ED/SA	= 88
M 42 x 2	VSTI 42 x 2 -ED/SA	= 147
M 48 x 2	VSTI 48 x 2 -ED	= 220

**Anziehdrehmomente für Seal-Lock Bundmuttern
(Metrisches ISO-Regelgewinde)**

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Seal-Lock Bundmuttern der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde.	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
		Anziehdrehmoment (Nm)		
M 6	10			
M 8	22			
M 10	40			
M 12	69			
M 14	110			
M 16	170			

**Tightening torques for seal-lock nuts
(Metric ISO-Standard Thread)**

The values for tightening torques shown in the table are valid only for seal-lock nuts of the strength class 8.8 and with metric ISO-standard thread.	Thread size	Strength classes		
		8.8	10.9	12.9
		Tightening torque (lb.ft)		
M 6	7,4			
M 8	16,2			
M 10	29,5			
M 12	50,9			
M 14	81,1			
M 16	125,3			

**Anziehdrehmomente für Linsenschrauben mit Kreuzschlitz DIN 7985
(Metrisches ISO-Regelgewinde)**

Die nebenstehenden Werte für Anziehdrehmomente gelten nur für Linsenschrauben mit Kreuzschlitz DIN 7985 der Festigkeitsklasse 8.8 mit metrischem ISO-Regelgewinde	Gewindegröße	Festigkeitsklassen		
		8.8	10.9	12.9
		Anziehdrehmoment(Nm)		
M 3	1,1			
M 4	2,9			
M 5	6			
M 6	10			
M 8	25			
M10	49			

**Tightening torques for cross-slotted lens head screws
DIN 7985
(Metric ISO- Standard Thread)**

The values for tightening torques shown in the table are valid only for cross-slotted lens head screws DIN 7985 of the strength class 8.8 and with metric ISO-standard thread.	Thread size	Strength classes		
		8.8	10.9	12.9
		Tightening torques (lb.ft)		
M 3	0,8			
M 4	2,1			
M 5	4,4			
M 6	7,4			
M 8	18,4			
M10	36,1			

