Serie SK

Pratissoli

Manuale di riparazione
Repair Manual
Manuel de réparation
Reparaturanleitung
Manual de reparación
Manual de reparação

Sommario

1 INTRODUZIONE

Questo manuale descrive le istruzioni per la riparazione delle pompe famiglia SK e deve essere attentamente letto e compreso prima di effettuare ed eseguire qualsiasi intervento sulla pompa.
Dal corretto uso e dalle adeguate manutenzione dipende il regolare funzionamento e durata della pompa.
Interpump Group declina ogni responsabilità per danni causati da negligenza e mancata osservazione delle norme descritte in questo manuale.

1.1 DESCRIZIONE SIMBOLI

Leggere attentamente quanto riportato in questo manuale prima di ogni operazione.

Segnale di Avvertenza

Leggere attentamente quanto riportato in questo manuale prima di ogni operazione.

Segnale di Pericolo
Munirsi di occhiali protettivi.

Segnale di Pericolo
Munirsi di guanti protettivi prima di ogni operazione.

2 NORME DI RIPARAZIONE

2.1 RIPARAZIONE DELLA PARTE MECCANICA

Le operazioni di riparazione della parte meccanica devono essere eseguite dopo aver rimosso l'olio dal carter.
Per togliere l'olio occorre rimuovere il tappo di carico olio pos. ①, Fig. 1 e successivamente il tappo di scarico pos. ②, Fig. 1.

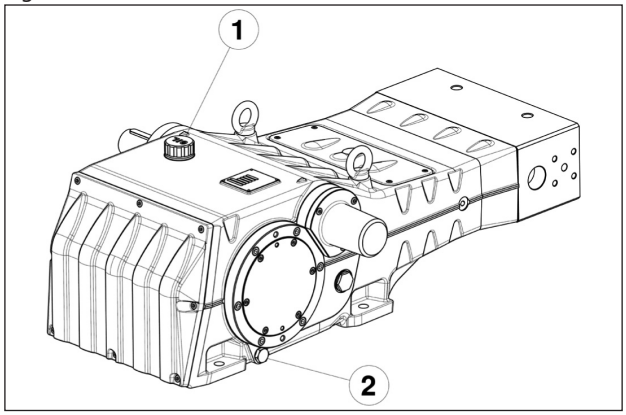


Fig. 1

L'olio esausto deve essere messo in un apposito recipiente e smaltito negli appositi centri. Non deve essere assolutamente disperso nell'ambiente.

2.1.1 Smontaggio della parte meccanica

La corretta sequenza è la seguente:
Svuotare completamente la pompa dall'olio, come indicato al par. 2.1.
Separare la testata e il distanziale per camicie dal carter pompa come indicato nel par. 2.2.1 (da Fig. 106 a Fig. 109).
Rimuovere il coperchio di ispezione superiore e il coperchio di ispezione inferiore svitando le 4+4 viti di fissaggio come indicato nel par. 2.2.3 (Fig. 120 e Fig. 121).
Sfilare gli O-ring e sostituirli qualora fosse necessario.
Rimuovere i tre pistoni mediante chiave a forchetta come indicato nel par. 2.2.3 (Fig. 122).
Rimuovere i tre paraspruzzi completi di O-ring (pos. ① e ②, Fig. 2).

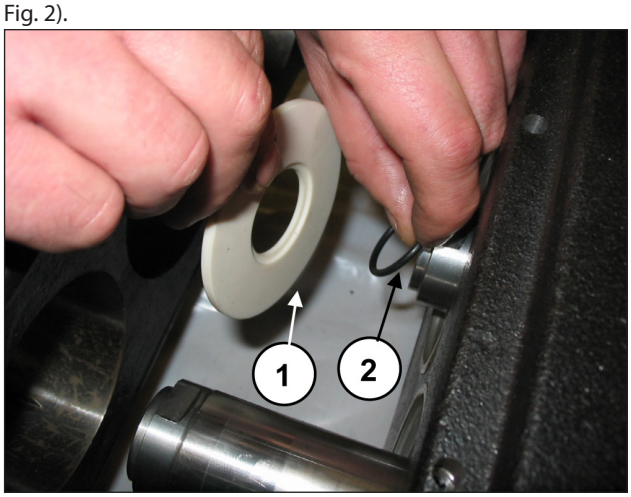


Fig. 2

Svitare i grani di bloccaggio M6 dei tre coperchi paraolio (pos. ①, Fig. 3).

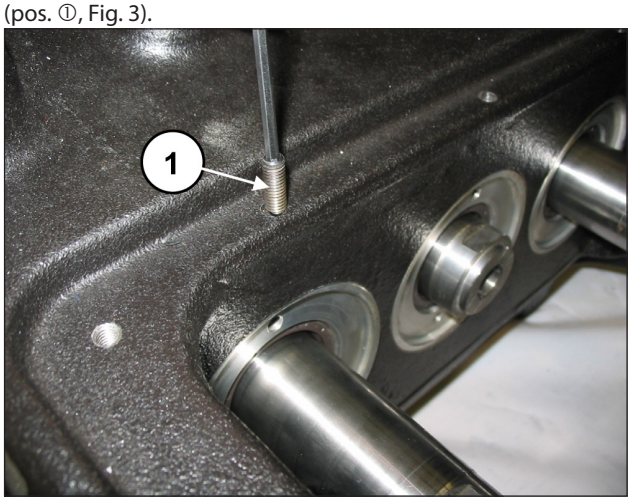


Fig. 3

Estrarre i coperchi paraolio avvitando una barra filettata o una vite M6 con funzione di estrattore negli appositi fori sul coperchio (pos. ①, Fig. 4) ed estrarre i coperchi dal gruppo pompa (pos. ①, Fig. 5).

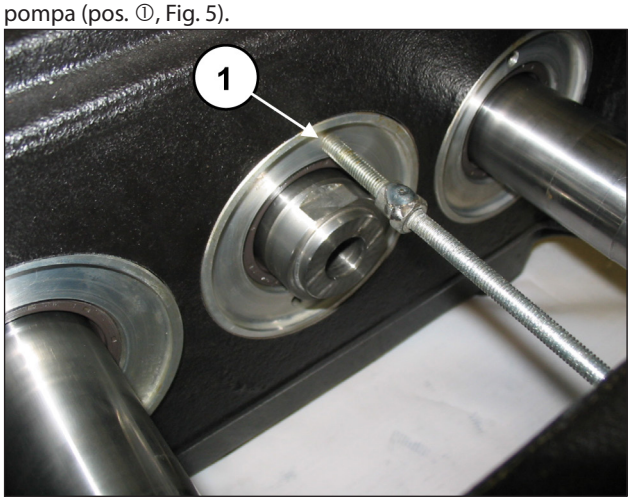


Fig. 4

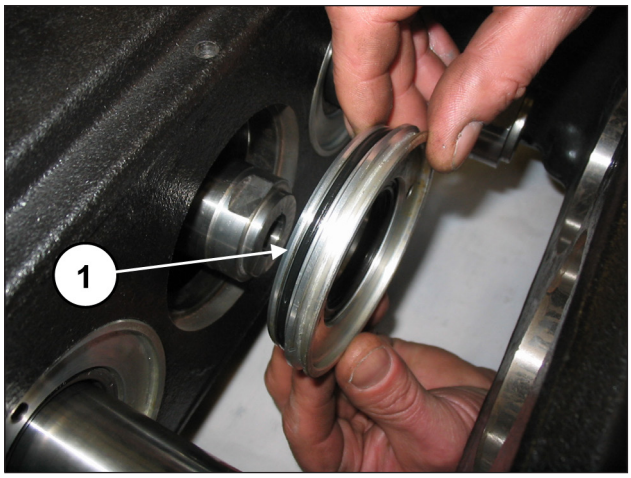


Fig. 5

Estrarre l'anello di tenuta radiale (pos. ①, Fig. 6) e l'O-ring esterno (pos. ①, Fig. 7).

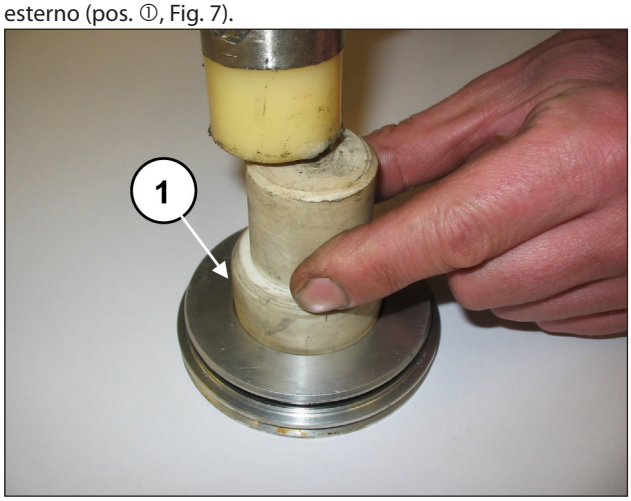


Fig. 6

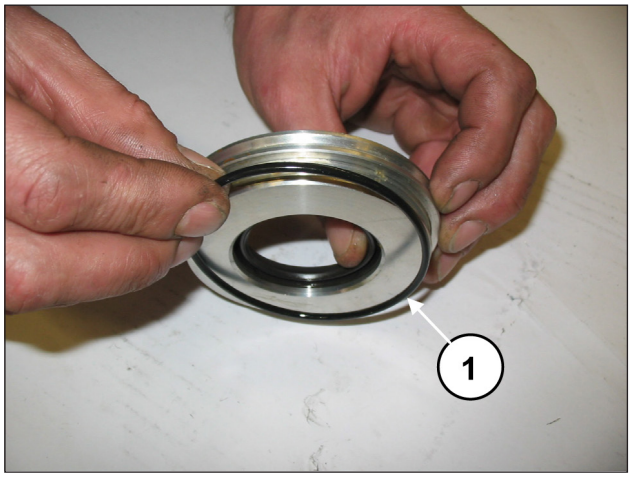


Fig. 7

Rimuovere la linguetta dall'albero PTO (pos. ①, Fig. 8).

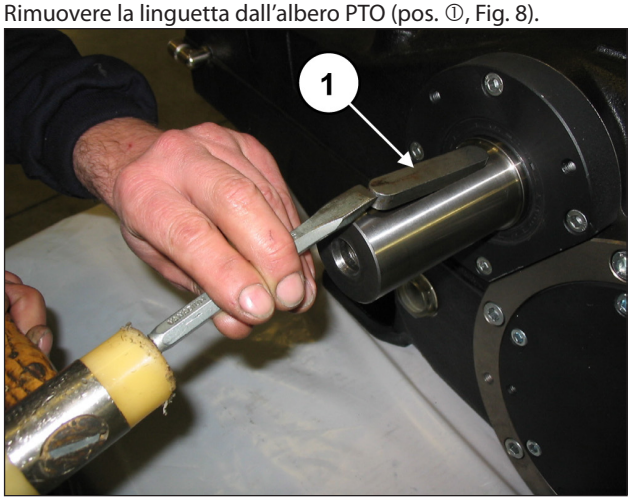


Fig. 8

Svitare le viti di fissaggio coperchio estremità albero (pos. ①, Fig. 9) e sfilare il coperchio dall'albero PTO.

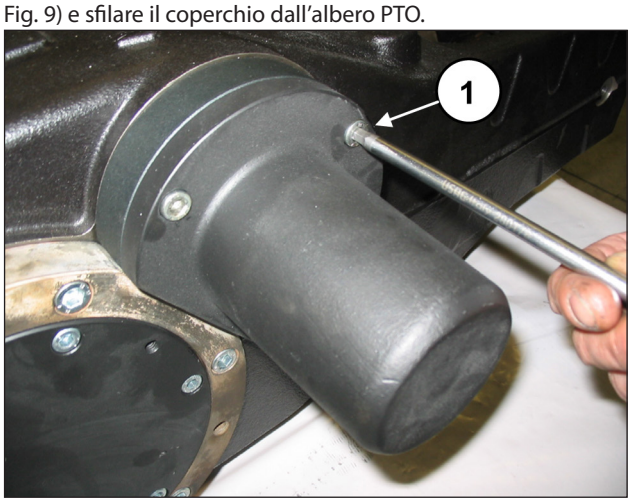


Fig. 9

Svitare le viti di fissaggio coperchio carter (pos. ①, Fig. 10) e rimuoverlo. Sfilare l'O-ring e sostituirlo qualora fosse necessario.

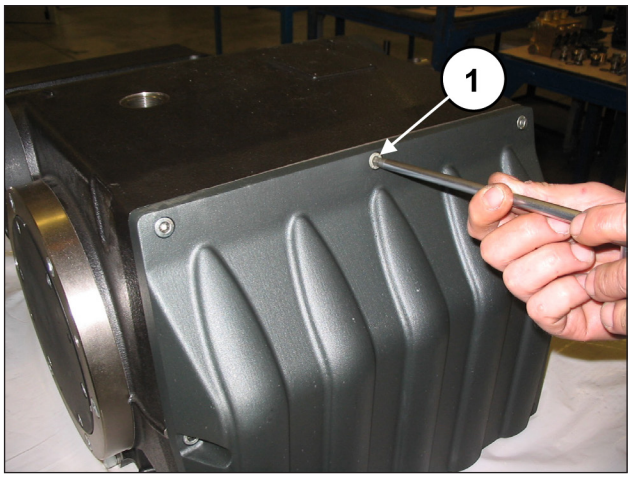


Fig. 10

Provvedere ora allo smontaggio dei due coperchi cuscinetto svitando le relative viti (pos. ①, Fig. 11).
Per agevolare lo smontaggio utilizzare n. 2 grani o viti M8 (pos. ①, Fig. 12) con la funzione di estrattori.
Sfilare l'O-ring e sostituirlo qualora fosse necessario.

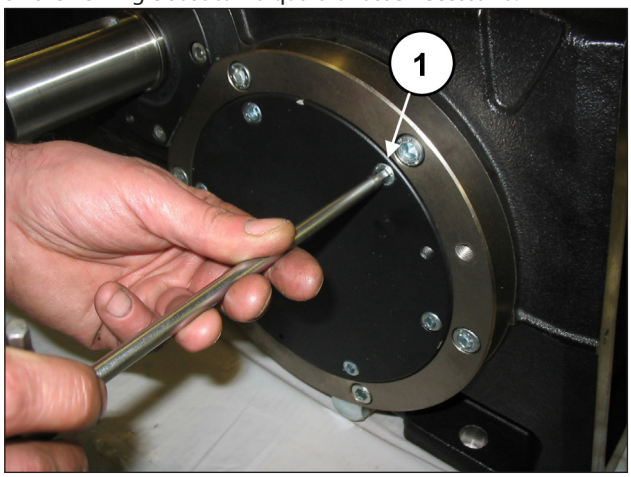


Fig. 11

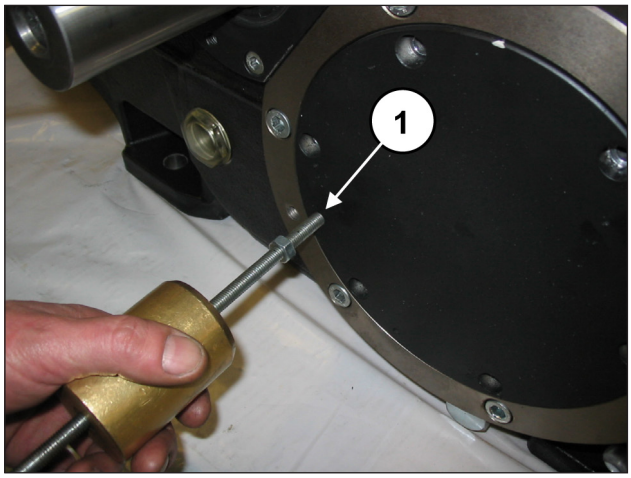


Fig. 12

Inserire uno spessore sotto al fusto della biella centrale per bloccare la rotazione dell'albero a gomiti (pos. ①, Fig. 13).

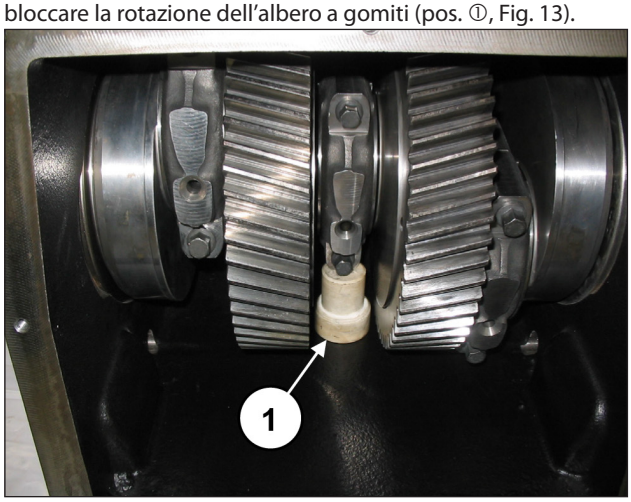


Fig. 13

Svitare ed estrarre le viti di fissaggio flangia bloccaggio bussola, da entrambi i lati (pos. ①, Fig. 14).
Le flangie bloccaggio bussola devono essere lasciate in sede (pos. ①, Fig. 15).

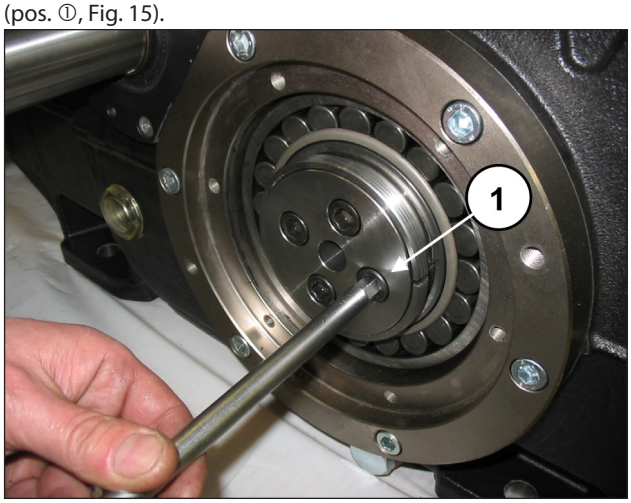


Fig. 14

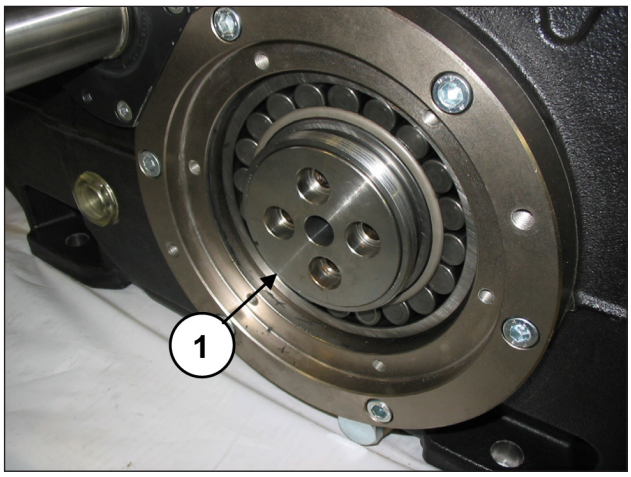


Fig. 15

Su di un lato avvitare una ghiera tipo SKF KM20 sulla bussola di pressione (pos. ①, Fig. 16), quindi sbloccare la bussola mediante massa battente (pos. ①, Fig. 17), senza estrarla.
Ripetere l'operazione dal lato opposto.

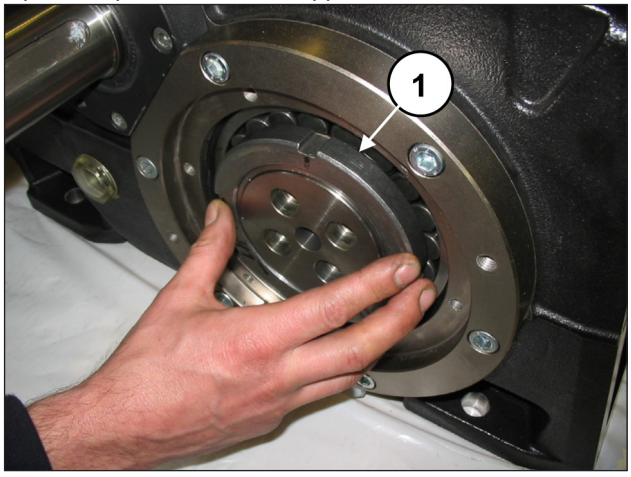


Fig. 16

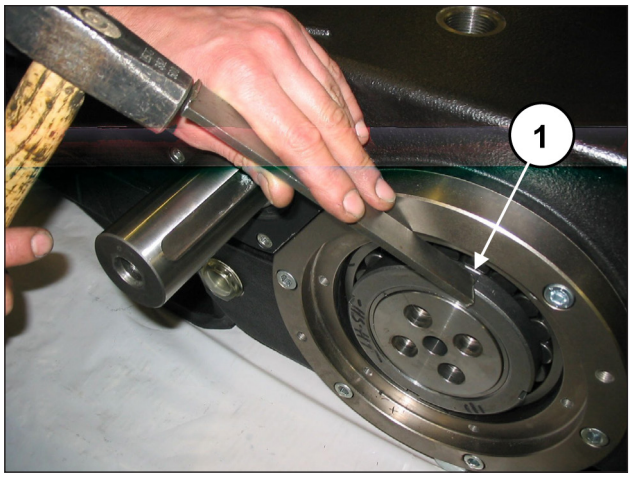


Fig. 17

Togliere lo spessore sotto al fusto della biella centrale.
Svitare le viti di biella (pos. ①, Fig. 18).

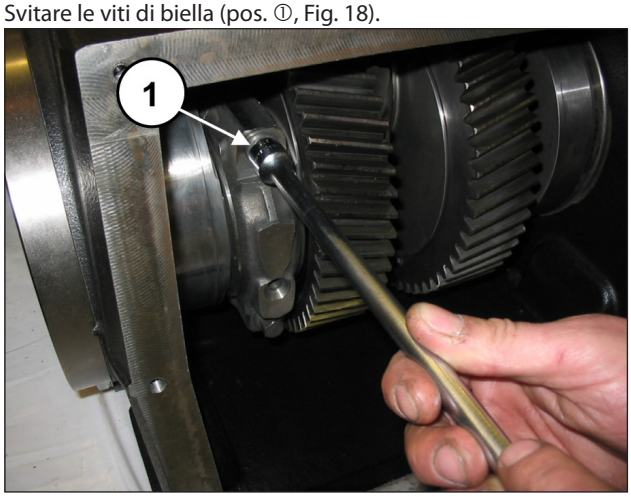
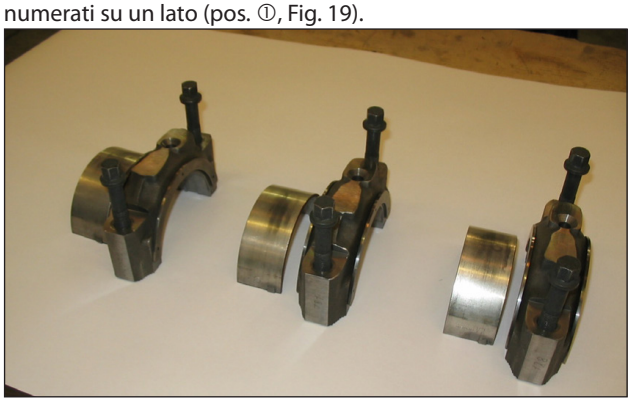


Fig. 18

Smontare i cappelli di biella con i semicuscinetti avendo particolare cura, durante lo smontaggio, dell'ordine in cui vengono smontati.

I cappelli di biella e le relative semibielle devono essere rimontati esattamente nello stesso ordine e accoppiamento in cui sono stati smontati.

Per evitare possibili errori cappelli e semibielle sono stati numerati su un lato (pos. ①, Fig. 19).



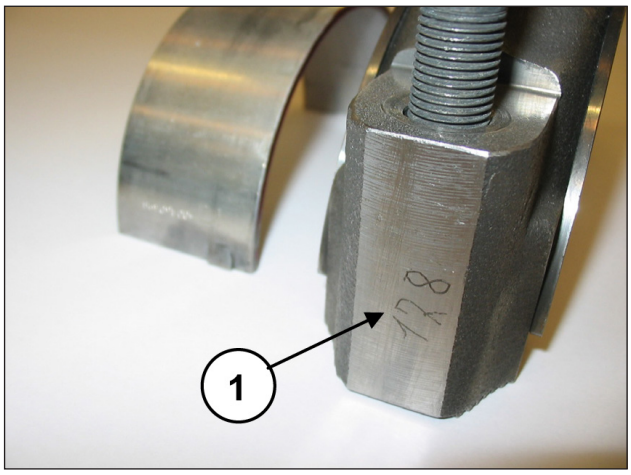


Fig. 19

Fare avanzare il più possibile le tre semibielle nella direzione della testata.
Sfilare i tre semicuscinetti superiori delle semibielle (pos. ①, Fig. 20).

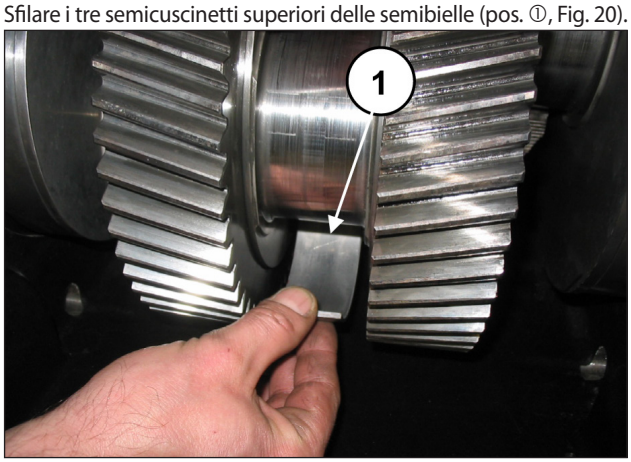


Fig. 20

Togliere entrambe le bussole di pressione (pos. ①, Fig. 21).

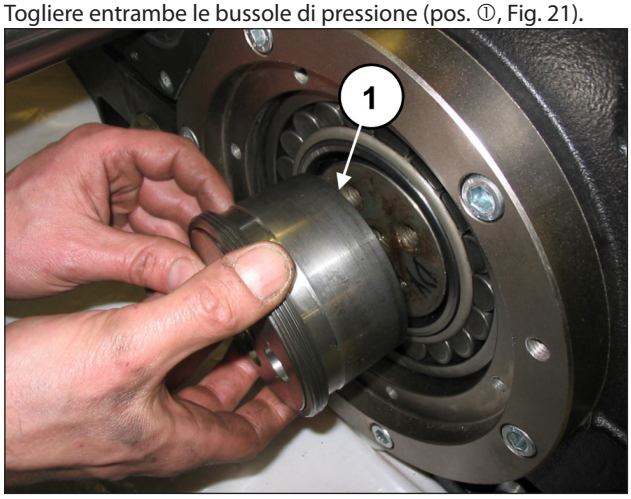


Fig. 21

Separare la flangia bloccaggio bussola dalla bussola di pressione (pos. ①, Fig. 22).

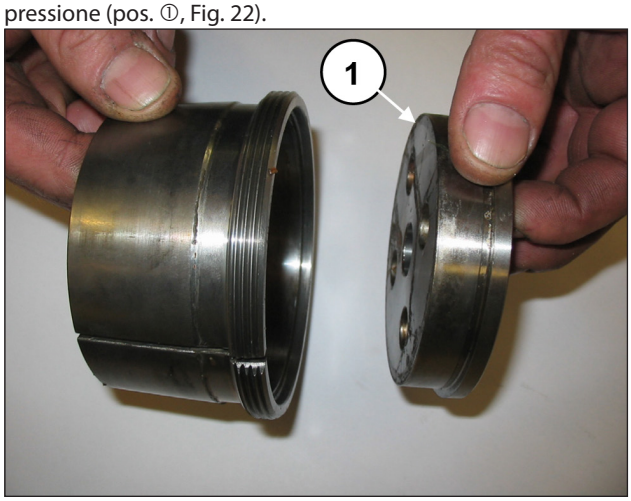


Fig. 22

Svitare le viti dei due coperchi portacuscinetto (pos. ①, Fig. 23).

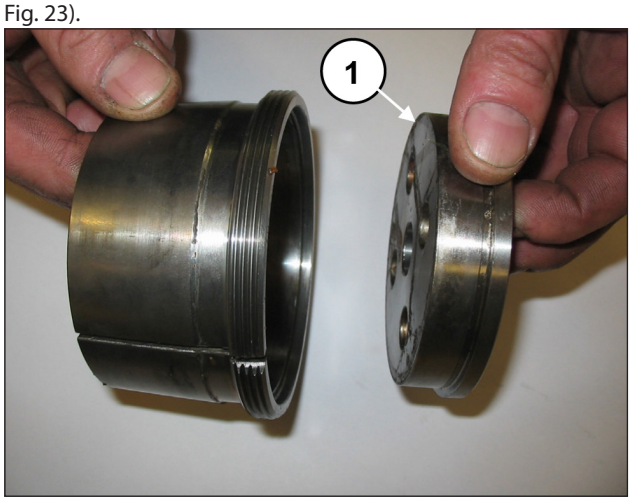


Fig. 23

Applicare un perno filettato M16 ad un'estremità dell'albero a gomiti (pos. ①, Fig. 24) e, tenendolo sollevato, estrarre il coperchio portacuscinetto completo di cuscinetto e O-ring (pos. ①, Fig. 25). Per agevolare lo smontaggio utilizzare n. 2 grani o viti M10 (pos. ②, Fig. 24) con la funzione di estrattori. Ripetere l'operazione dal lato opposto.

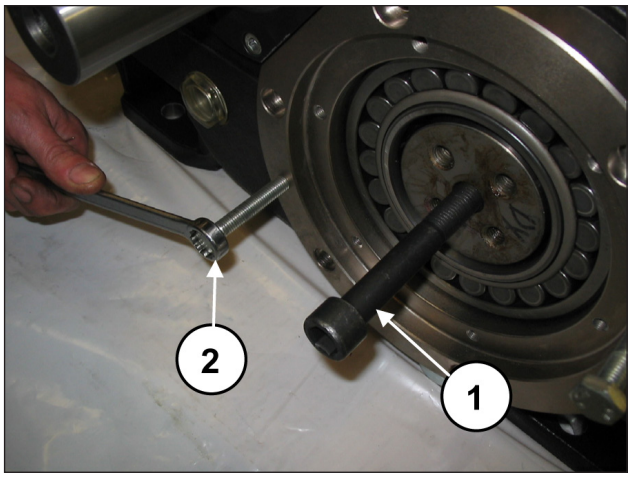


Fig. 24

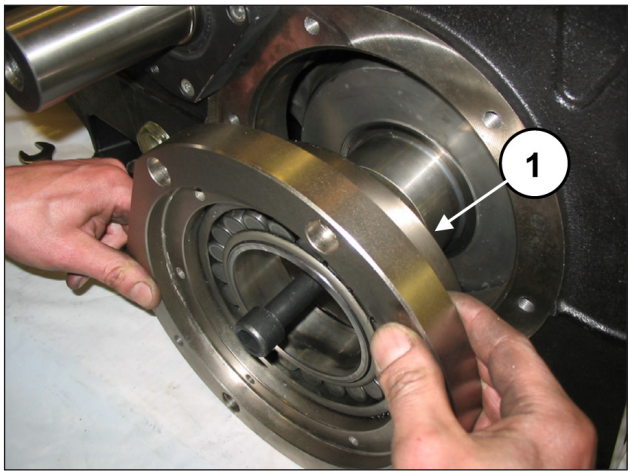


Fig. 25

Appoggiare l'albero a gomiti sul fondo del carter.
Separare il coperchio portacuscinetto dal cuscinetto mediante l'utilizzo di una massa battente (pos. ①, Fig. 26).

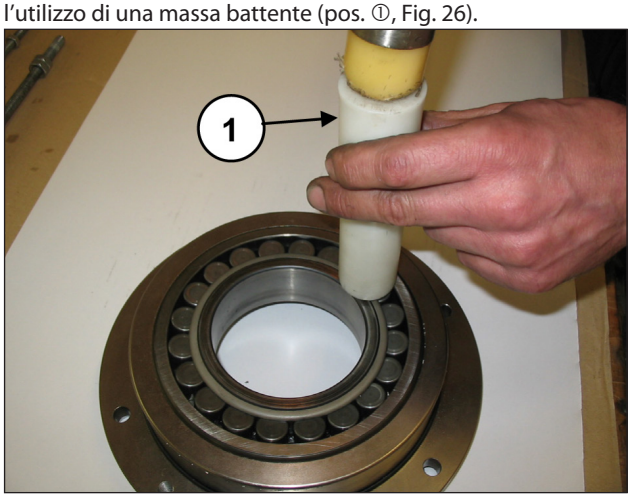


Fig. 26

Svitare le viti di fissaggio coperchio cuscinetto PTO destro e sinistro (pos. ①, Fig. 27) e sfilare i due coperchi dall'albero PTO. Per agevolare lo smontaggio utilizzare n. 3 grani o viti M8 (pos. ①, Fig. 28) con la funzione di estrattori.

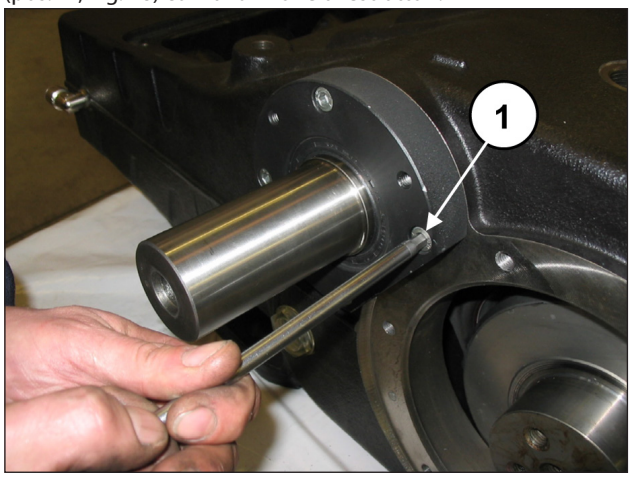


Fig. 27

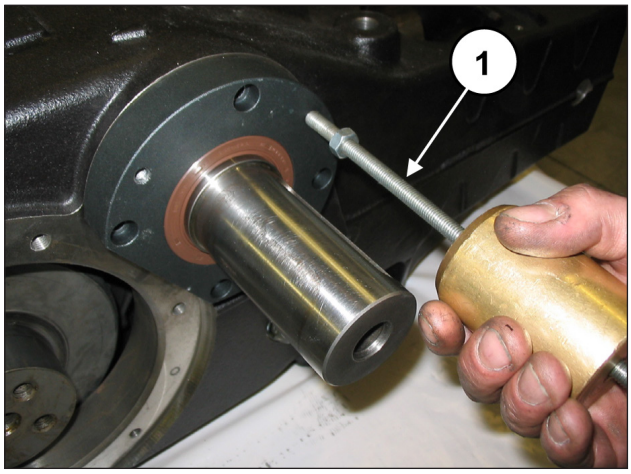


Fig. 28

Estrarre l'anello di tenuta radiale (pos. ①, Fig. 29), l'O-ring esterno (pos. ①, Fig. 30) e l'O-ring del foro di lubrificazione (pos. ①, Fig. 31).

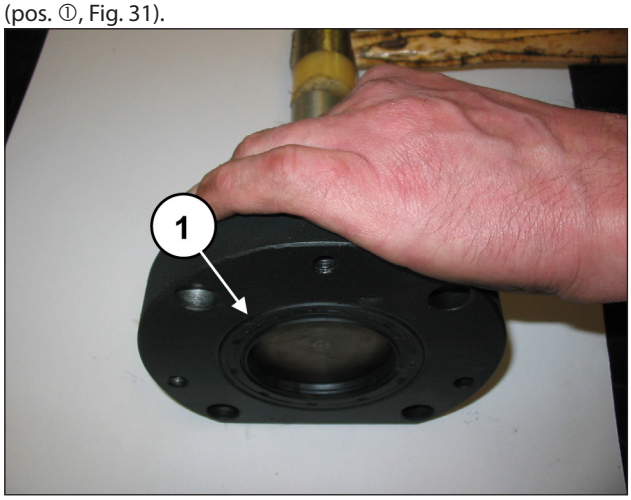


Fig. 29

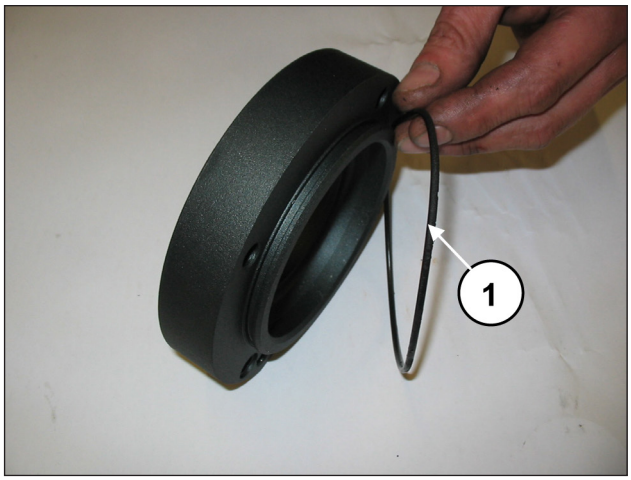


Fig. 30

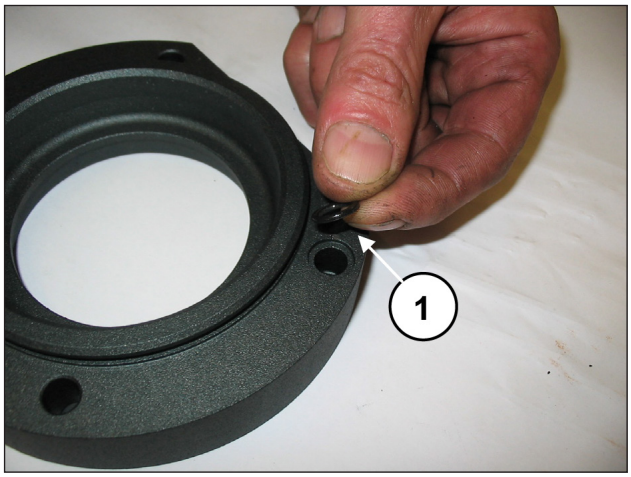


Fig. 31

Far indietreggiare il più possibile le tre bielle (portarle a contatto con l'albero a gomiti).
Mediante l'utilizzo di una massa battente (pos. ①, Fig. 32) estrarre l'albero PTO da uno qualsiasi dei due lati (pos. ①, Fig. 33).

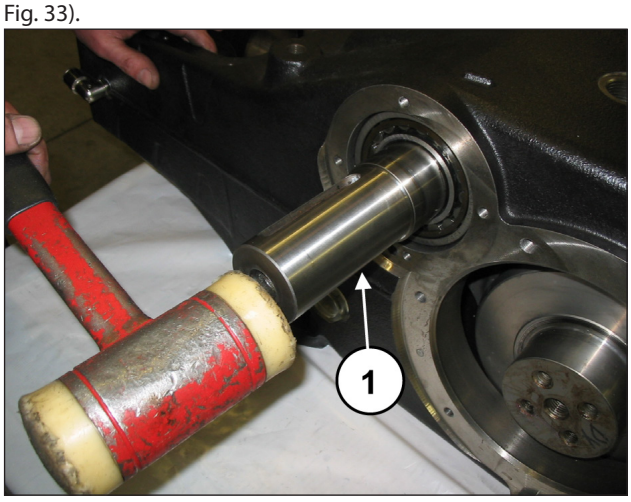


Fig. 32

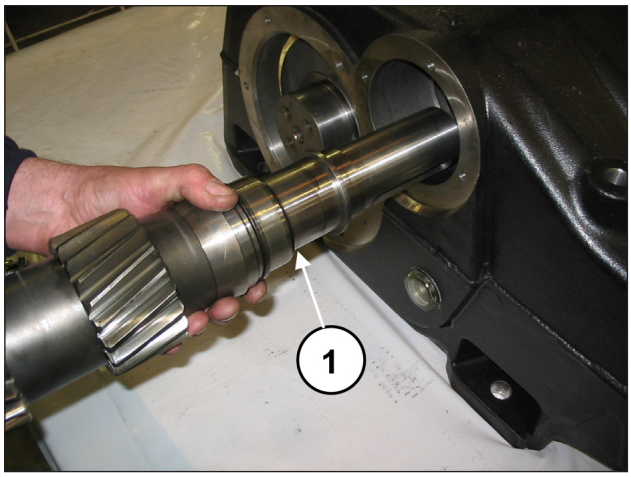


Fig. 33

Sfilare gli anelli interni dei cuscinetti dall'albero PTO (pos. ①, Fig. 34) e i due distanziali cuscinetto interno (pos. ②, Fig. 34).

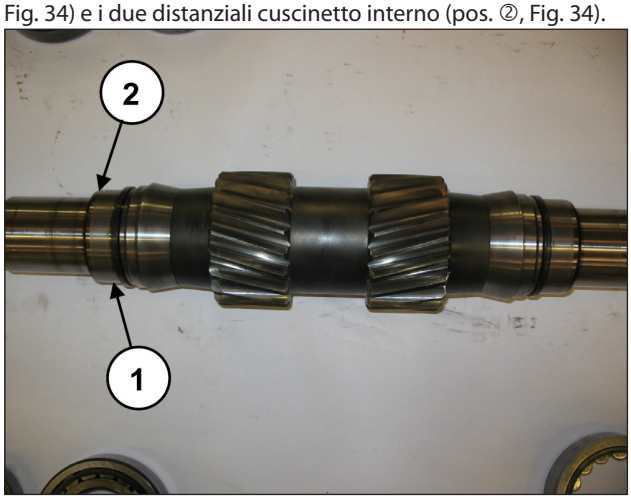


Fig. 34

Gli anelli interni ed esterni dei cuscinetti devono essere rimontati esattamente nello stesso ordine e accoppiamento in cui sono stati smontati.

Mediante l'utilizzo di una barra sufficientemente lunga (pos. ①, Fig. 36) e di una massa battente estrarre dal carter pompa gli anelli dei cuscinetti (pos. ①, Fig. 36), il distanziale cuscinetto esterno (pos. ①, Fig. 37) e la bussola di lubrificazione cuscinetti (pos. ①, Fig. 38).

Fig. 35

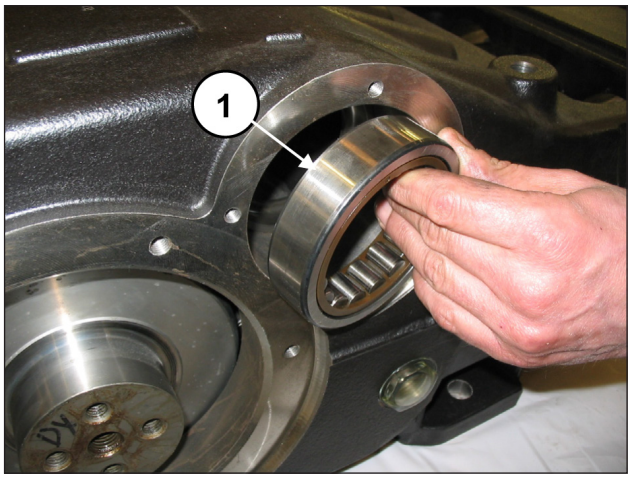


Fig. 36

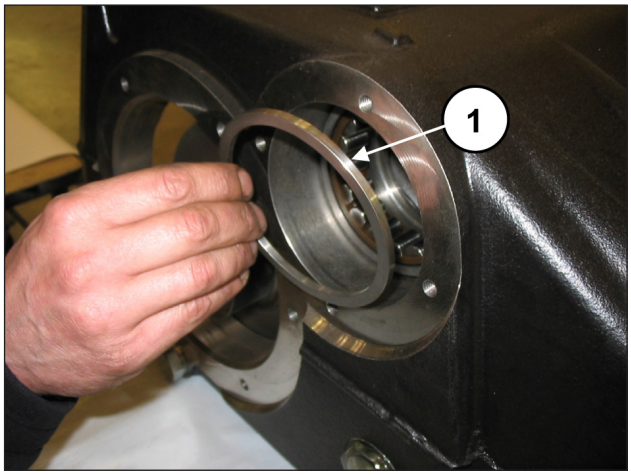


Fig. 37

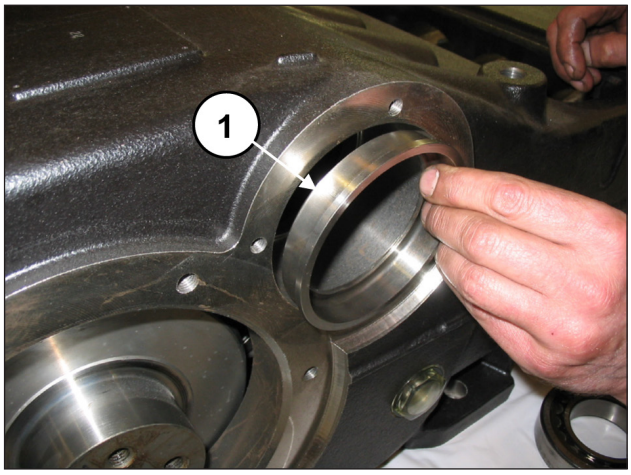


Fig. 38

Fare avanzare le semibielle nella direzione della parte idraulica e bloccarle mediante l'utilizzo dell'apposito attrezzo (cod. 27566200) (pos. ①, Fig. 39).

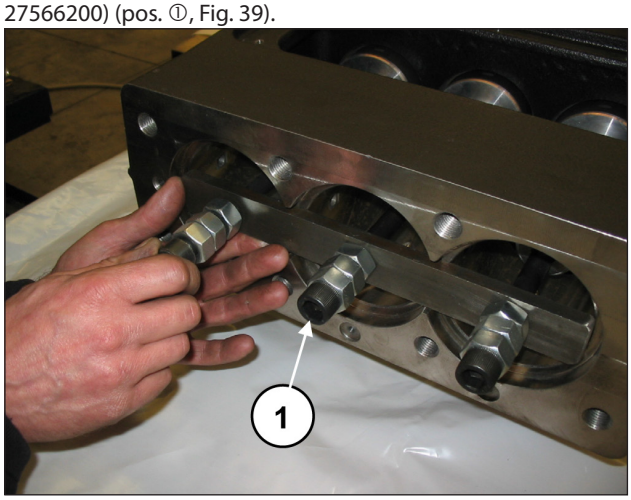


Fig. 39

Sfilare l'albero a gomiti dalla parte posteriore del carter (pos. ①pos. ①, Fig. 40).

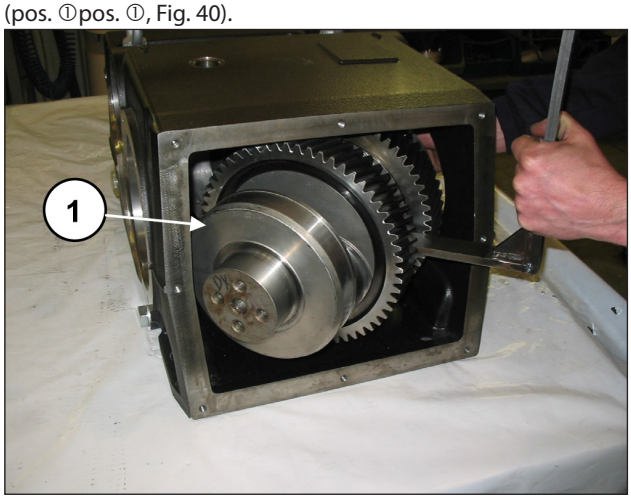


Fig. 40

Procedere a svitare le viti dell'attrezzo cod. 27566200 per sbloccare le bielle (pos. ①, Fig. 41) e successivamente estrarre i gruppi biella-guida pistone dall'apertura posteriore del carter (pos. ①, Fig. 42).

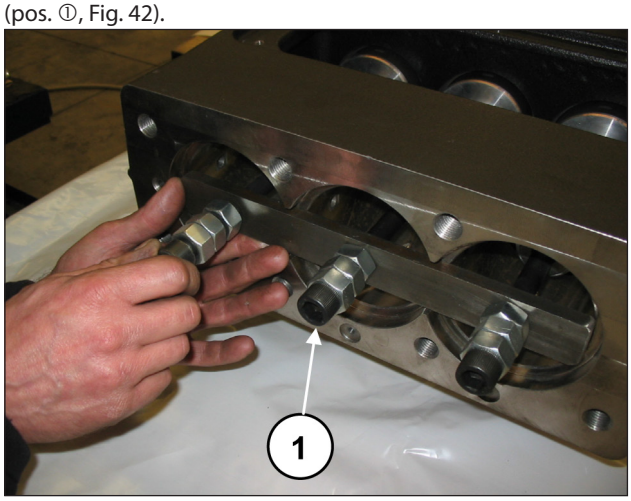


Fig. 41

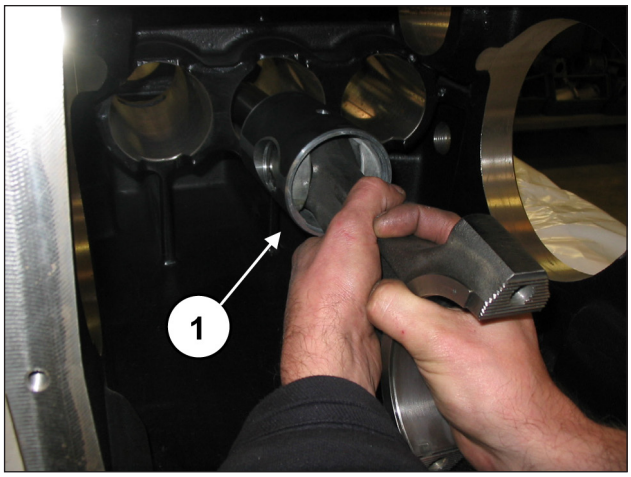
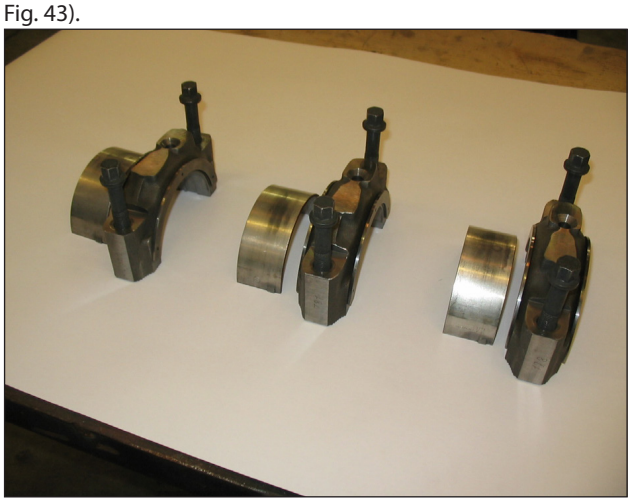


Fig. 42

Accoppiare le semibielle ai cappelli precedentemente smontati facendo riferimento alla numerazione (pos. ①, Fig. 43).



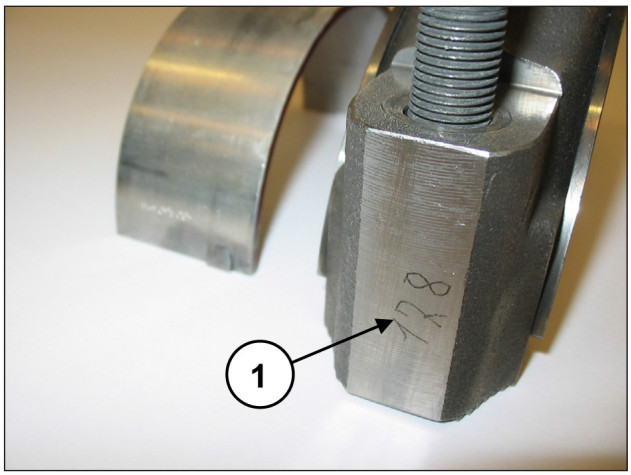


Fig. 43

Rimuovere i due anelli seeger di bloccaggio spinotto utilizzando un apposito attrezzo (pos. ①, Fig. 44).

Fig. 44

Sfilare lo spinotto (pos. ①, Fig. 45) e provvedere all'estrazione della biella (pos. ①, Fig. 46).

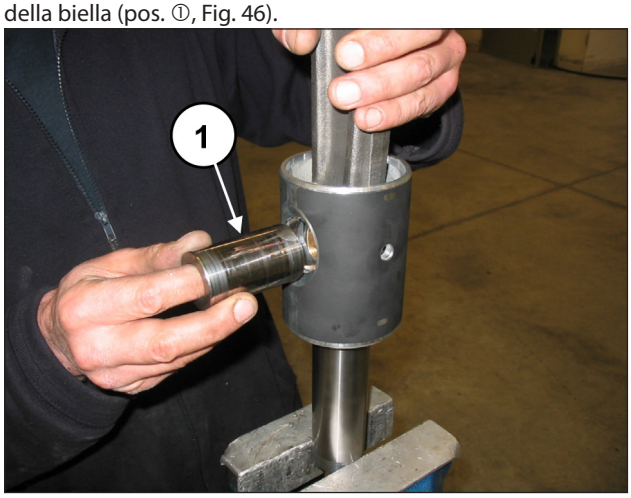


Fig. 45

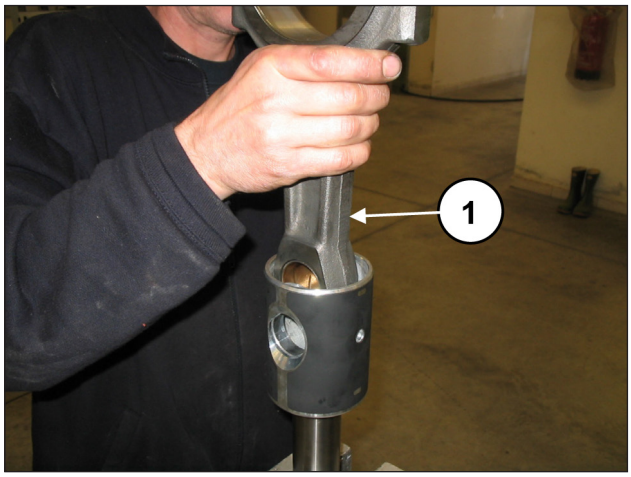


Fig. 46

Per separare lo stelo dal guida pistone occorre svitare le viti a testa cilindrica M6 mediante apposita chiave (pos. ①, Fig. 47).

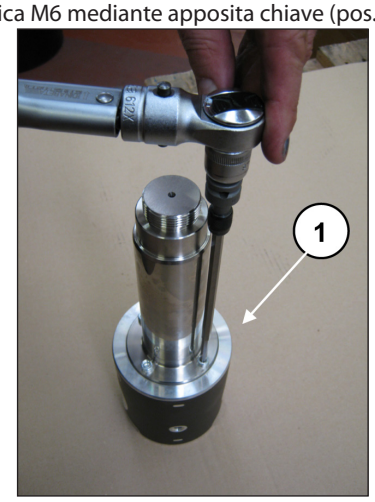


Fig. 47

Completare lo smontaggio della parte meccanica smontando le spie livello olio, i golfari e il raccordo con attacco rapido a 90°.

2.1.2 Montaggio parte meccanica

Procedere al montaggio seguendo il procedimento inverso indicato al par. 2.1.1.
La corretta sequenza è la seguente:
Montare le due spie livello olio, i due tappi scarico olio e il raccordo con attacco rapido a 90° (pos. ①, ② e ③ Fig. 48).

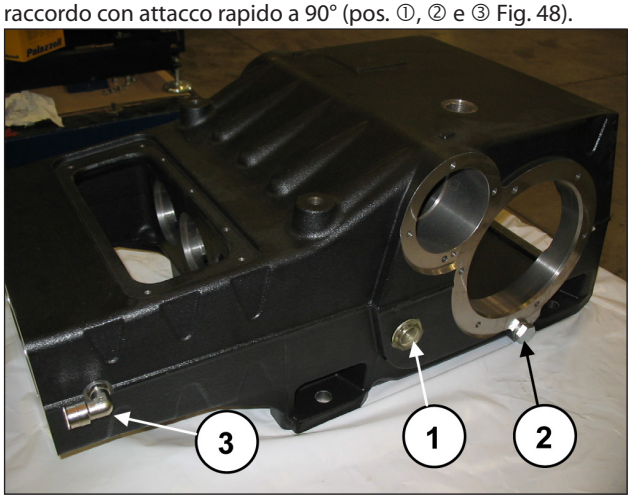


Fig. 48

Assemblare lo stelo al guida pistone.
Inserire lo stelo guida pistone nell'apposita sede sul guida pistone (pos. ①, Fig. 49) e fissarlo a quest'ultimo mediante le 4 viti a testa cilindrica M6x20 (pos. ①, Fig. 50).

Fig. 49

Fig. 50

Bloccare il guida pistone in morsa con l'ausilio di apposito attrezzo e procedere alla taratura delle viti con chiave dinamometrica (pos. ①, Fig. 51) come indicato nel capitolo 3.

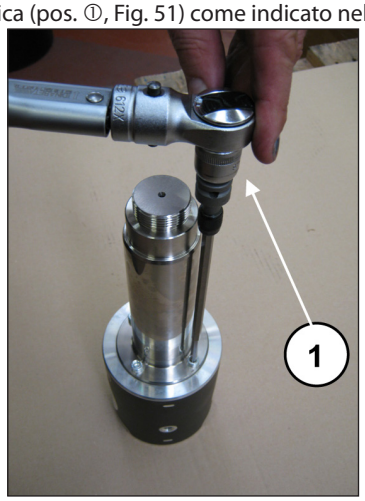


Fig. 51

Inserire la biella nel guida pistone (pos. ①, Fig. 46) e successivamente inserire lo spinotto (pos. ①, Fig. 45).
Applicare i due seeger di spallamento con l'apposito attrezzo (pos. ①, Fig. 44).
Separare i cappelli dalle semibielle; il corretto accoppiamento sarà garantito dalla numerazione posta su un lato (pos. ①, Fig. 43).
Dopo aver verificato la perfetta pulizia del carter inserire il gruppo semibiella-guida pistone all'interno delle canne del carter (pos. ①, Fig. 42).

L'inserimento del gruppo semibiella-guida pistone nel carter deve essere fatto orientando le semibielle con la numerazione visibile dall'alto.

Bloccare i tre gruppi utilizzando l'apposito attrezzo cod. 27566200 (pos. ①, Fig. 41).
Inserire l'albero a gomiti attraverso l'apertura posteriore del carter ed appoggiarlo sul fondo.

L'inserimento dell'albero a gomiti nel carter deve essere effettuato in modo che la dentatura delle corone risulti orientata come in Fig. 52.

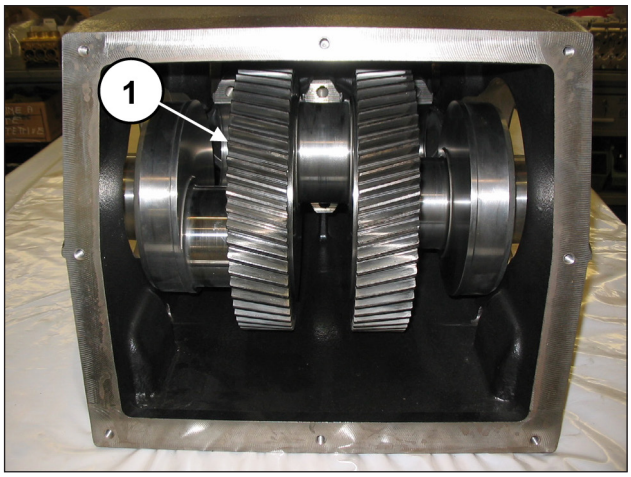


Fig. 52

Premontare l'albero PTO:
inserire sull'albero PTO i 2 anelli interni dei cuscinetti (uno per lato) (pos. ①, Fig. 53).

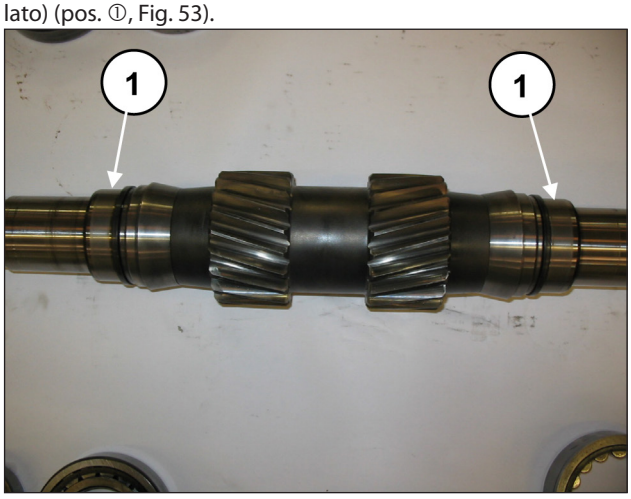


Fig. 53

Gli anelli interni ed esterni dei cuscinetti devono essere rimontati esattamente nello stesso ordine e accoppiamento in cui sono stati smontati.

Da un lato del carter inserire la bussola di lubrificazione cuscinetti (pos. ①, Fig. 54) e un anello esterno del cuscinetto (pos. ①, Fig. 55) mediante l'utilizzo di un tampone e massa battente.

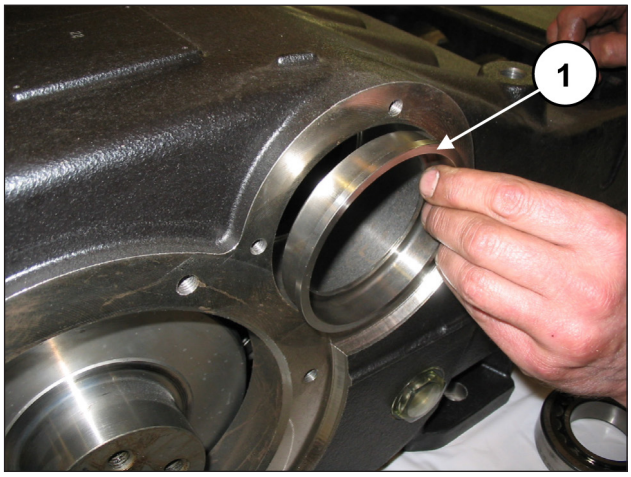


Fig. 54

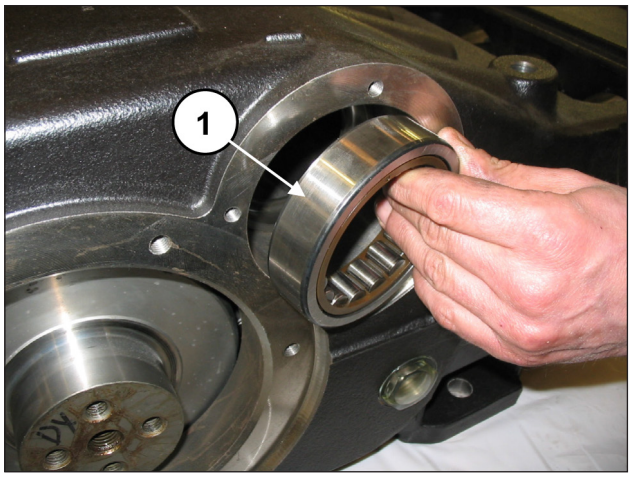


Fig. 55

Rimuovere l'attrezzo per il bloccaggio delle bielle cod. 27566200 (pos. ①, Fig. 41) e far scorrere le bielle all'indietro fino ad arrivare a contatto con l'albero a gomiti.
Inserire l'albero PTO premontato all'interno del carter (pos. ①, Fig. 56) inserendolo dalla parte opposta a quella in cui sono stati premontati l'anello esterno del cuscinetto e la bussola di lubrificazione cuscinetti.

L'inserimento dell'albero PTO nel carter deve essere effettuato in modo che la dentatura risulti orientata come in Fig. 56.

Per agevolare l'inserimento completo dell'albero PTO all'interno del cuscinetto utilizzare una vite M16 da applicare all'estremità dell'albero da inserire, allo scopo di mantenere sollevato l'albero stesso (pos. ①, Fig. 57).

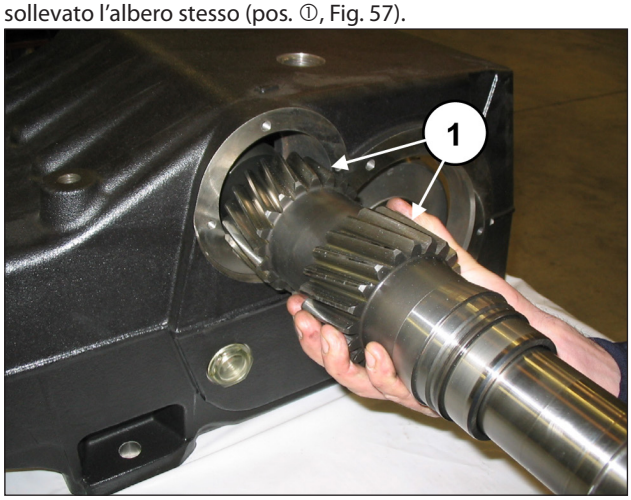


Fig. 56

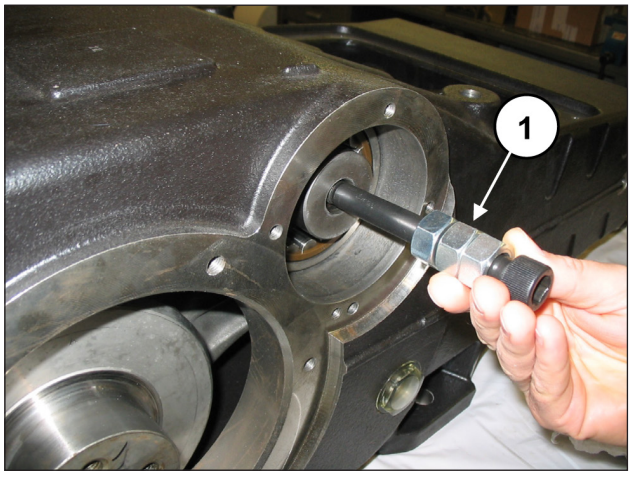


Fig. 57

Dal lato in cui si è inserito l'albero PTO procedere con l'Inserimento della bussola di lubrificazione cuscinetti (pos. ①, Fig. 58) e di un anello esterno del cuscinetto (pos. ①, Fig. 59) mediante l'utilizzo di un tampone e massa battente.

Fig. 58

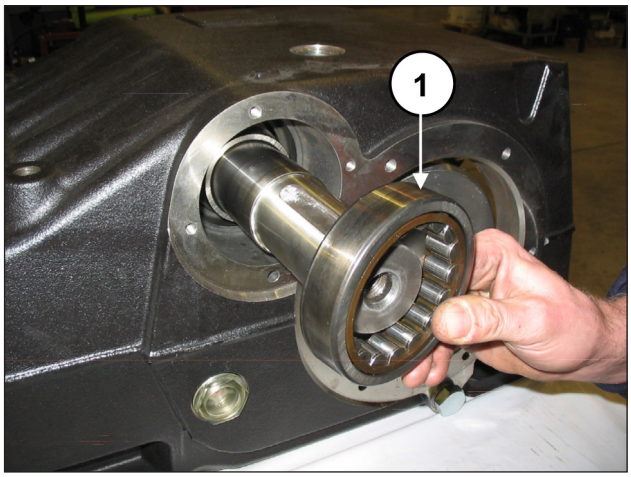


Fig. 59

Da entrambi i lati inserire i distanziali cuscinetto interno (pos. ①, Fig. 60) ed esterno (pos. ①, Fig. 61).

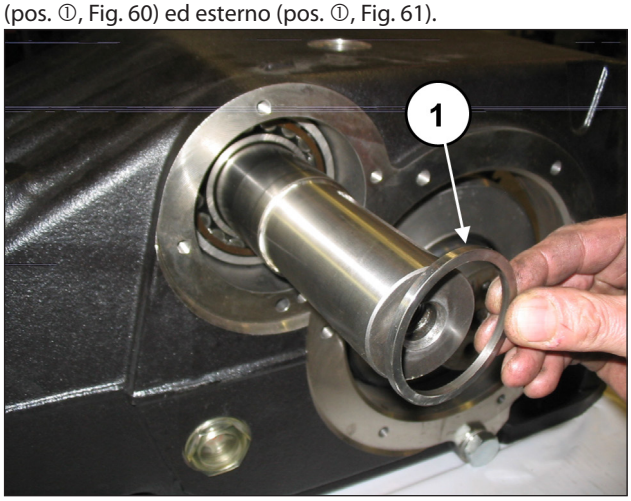


Fig. 60

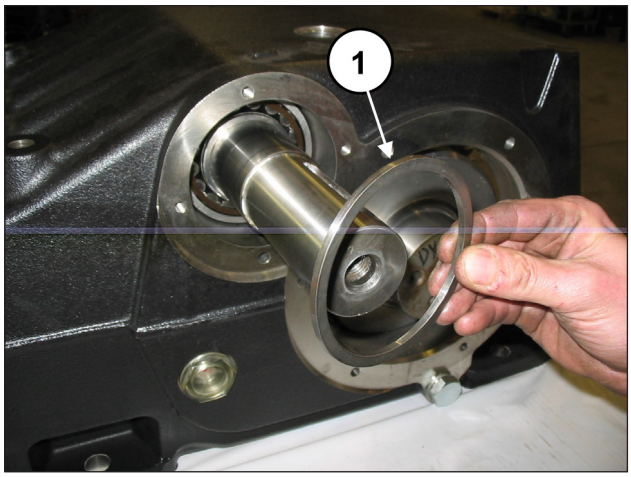


Fig. 61

Inserire l'anello interno (pos. ①, Fig. 62) e l'anello esterno (pos. ①, Fig. 63) di un cuscinetto da un solo lato della pompa.

Fig. 62

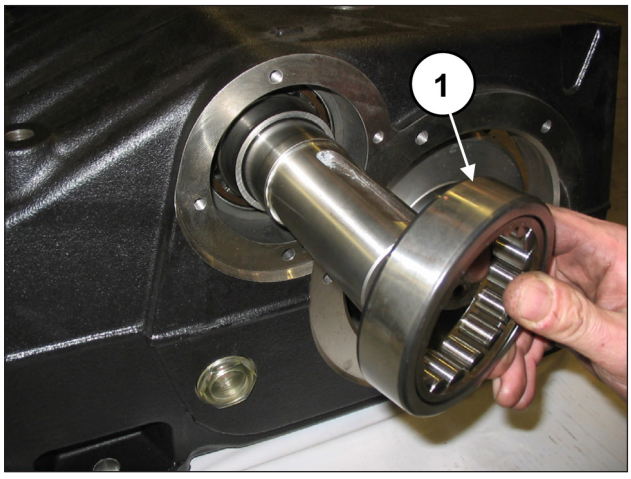


Fig. 63

Premontare i coperchi cuscinetto PTO destro e sinistro:
Inserire l'anello di tenuta radiale all'interno del coperchio cuscinetto PTO mediante l'utilizzo dell'attrezzo cod. 27539500 (pos. ①, Fig. 64).
Prima di procedere con il montaggio dell'anello di tenuta radiale verificare le condizioni del labbro di tenuta. Se si rende necessaria la sostituzione posizionare il nuovo anello come indicato in Fig. 65.

Qualora l'albero PTO presentasse una usura diametrale in corrispondenza del labbro di tenuta, per evitare l'operazione di rettifica si può posizionare l'anello in seconda battuta come indicato nella Fig. 65.

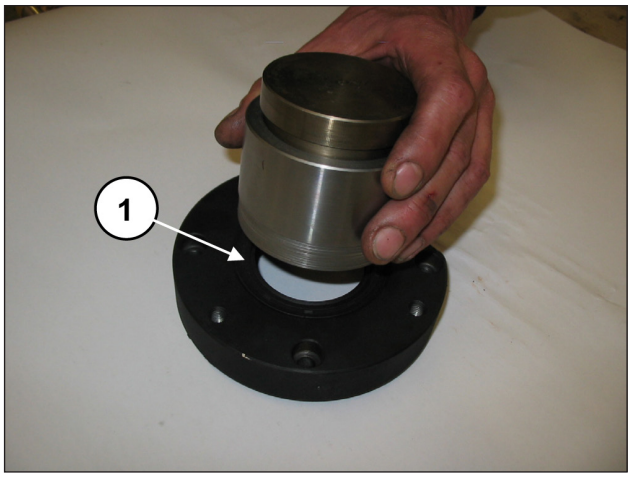


Fig. 64

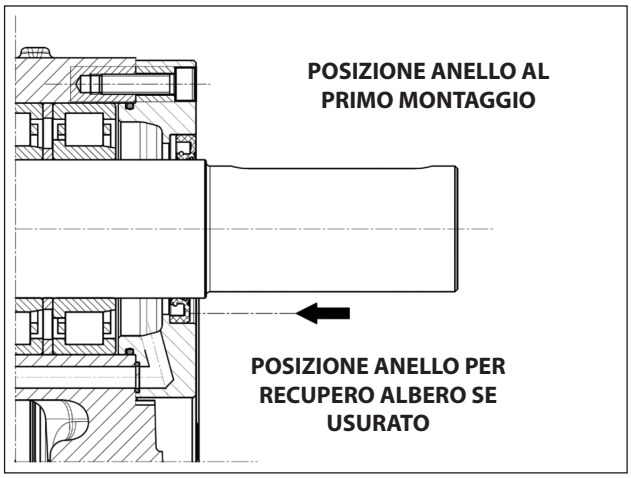


Fig. 65

Applicare ai coperchi cuscinetto PTO l'O-ring esterno (pos. ①, Fig. 66) e l'O-ring del foro di lubrificazione (pos. ①, Fig. 67).

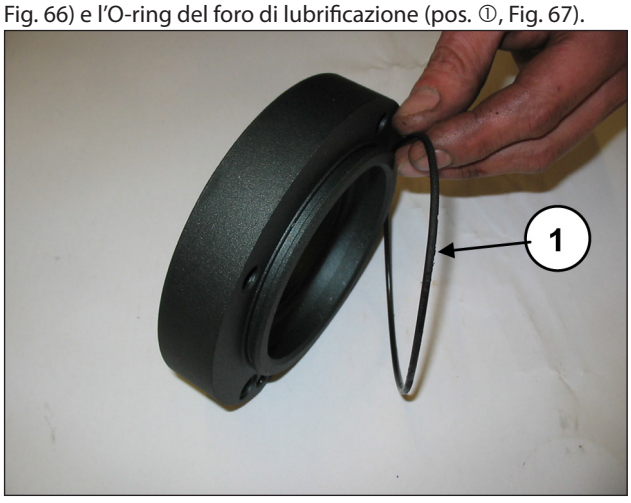


Fig. 66

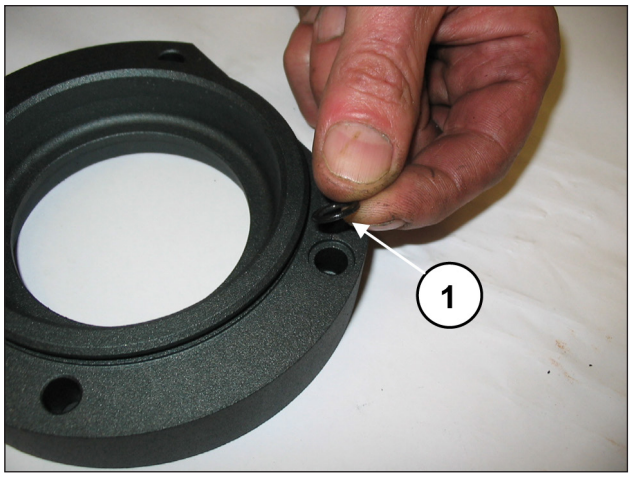


Fig. 67

Montare un primo coperchio cuscinetto PTO (destro o sinistro) al carter pompa (pos. ①, Fig. 68) e fissarlo mediante 4 viti M8x30 (pos. ①, Fig. 69).

Prestare attenzione al senso di montaggio del coperchio. Il foro di lubrificazione del coperchio deve trovarsi in corrispondenza del foro sul carter.

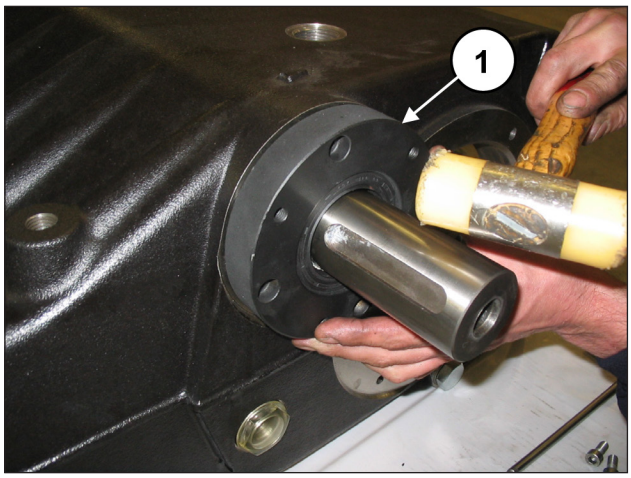


Fig. 68

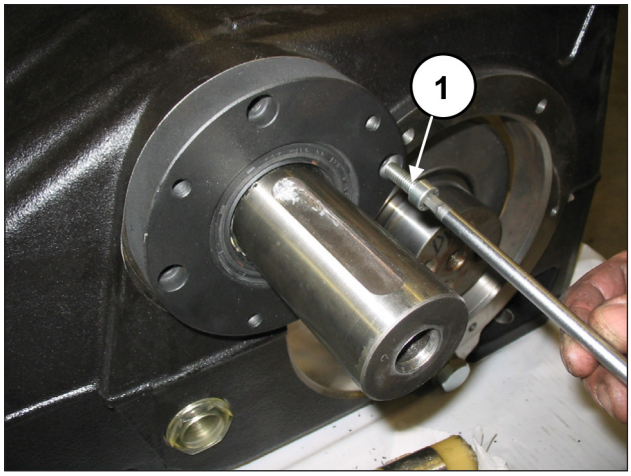


Fig. 69

Ripetere le operazioni dal lato opposto:
Inserire l'anello interno (pos. ①, Fig. 62) e l'anello esterno (pos. ①, Fig. 63) dell'ultimo cuscinetto.
Montare il coperchio cuscinetto PTO mancante sul carter pompa (pos. ①, Fig. 68) e fissarlo mediante 4 viti M8x30 (pos. ①, Fig. 69).
Tarare le 4+4 viti con chiave dinamometrica come indicato nel capitolo 3.

Premontare i due coperchi portacuscinetto:
inserire il cuscinetto utilizzando una massa battente (pos. ①, Fig. 70) fino ad ottenere una quota di 4÷4.5 mm come indicato in Fig. 71.

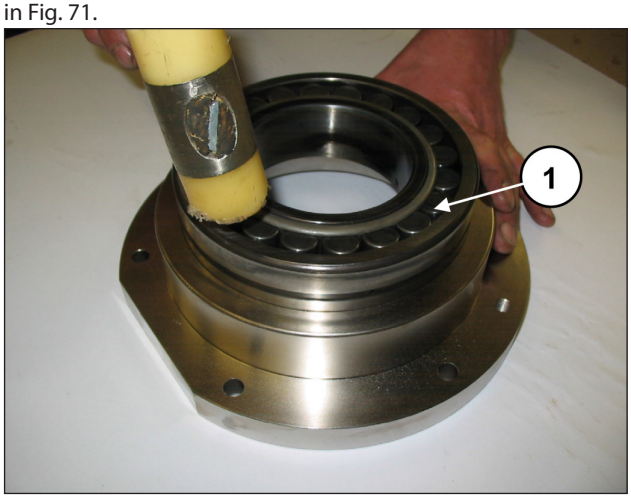


Fig. 70

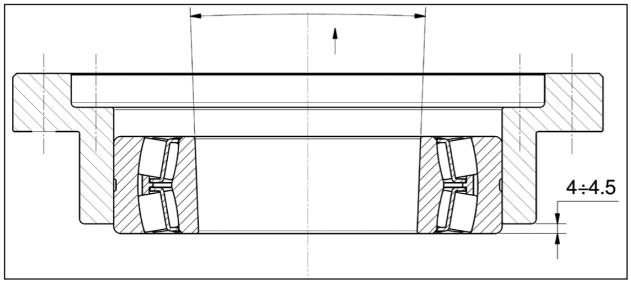


Fig. 71

Il cuscinetto in Fig. 71 ha l'anello interno conico. Verificare che la conicità sia dall'esterno all'interno per permettere il successivo inserimento della bussola.

Applicare l'O-ring all'esterno del coperchio portacuscinetto (pos. ①, Fig. 72).

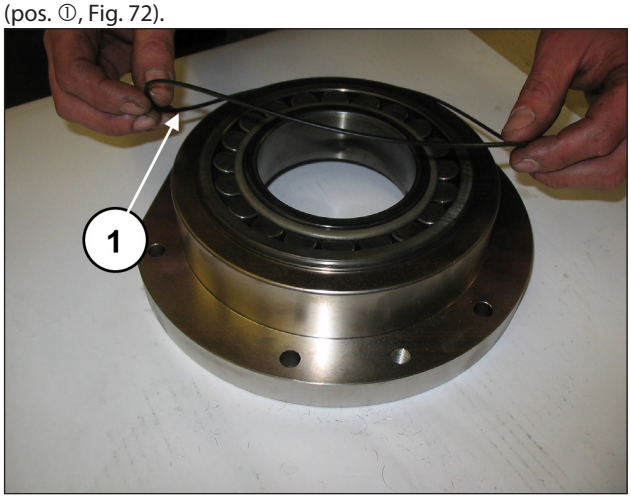


Fig. 72

Ripetere l'operazione con l'altro coperchio.

Bloccare i tre gruppi biella utilizzando l'apposito attrezzo cod. 27566200 (pos. ①, Fig. 41).
Applicare due perni filettati M16 all'estremità dell'albero a gomiti e, tenendolo sollevato (pos. ①, Fig. 73), inserire il coperchio portacuscinetto completo di cuscinetto e O-ring (pos. ①, Fig. 74) mediante l'utilizzo di una massa battente.
Ripetere l'operazione dal lato opposto

Fig. 73

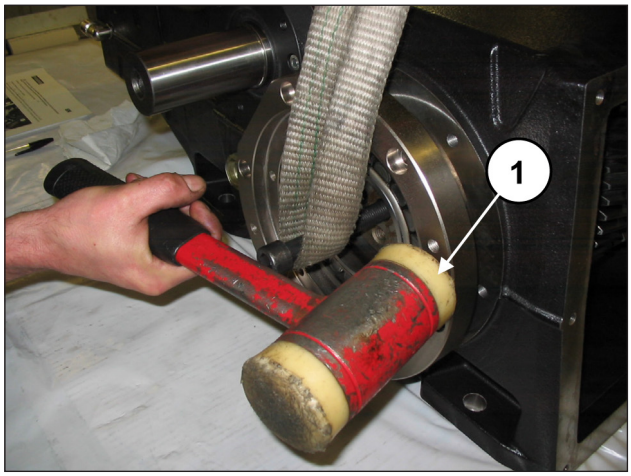


Fig. 74

Serrare i coperchi portacuscinetto mediante 6+6 viti M10x30 (pos. ①, Fig. 75).
Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

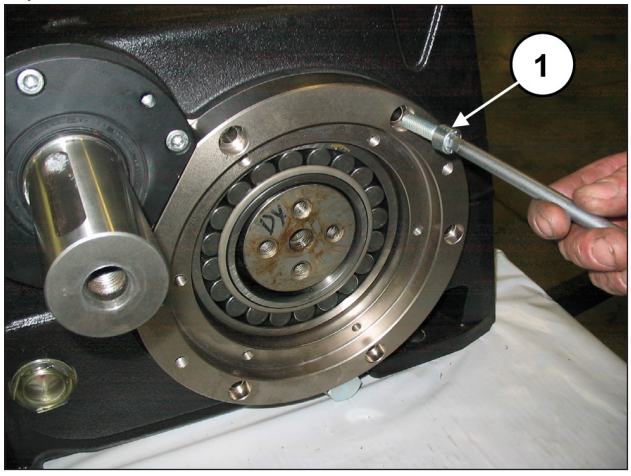


Fig. 75

Inserire parzialmente le due bussole di pressione mantenendo l'albero a gomiti sollevato mediante il perno M16 precedentemente montato (pos. ①, Fig. 76).

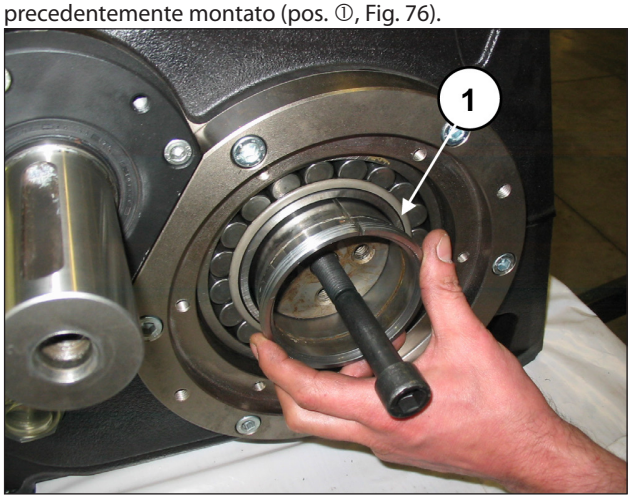


Fig. 76

Inserire completamente la bussola di pressione sull'albero a gomiti (pos. ①, Fig. 77 e Fig. 78) mediante l'utilizzo di una massa battente e di un tampone.

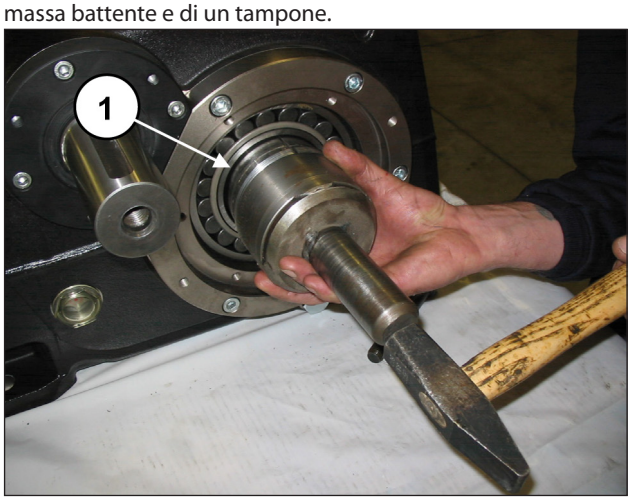


Fig. 77

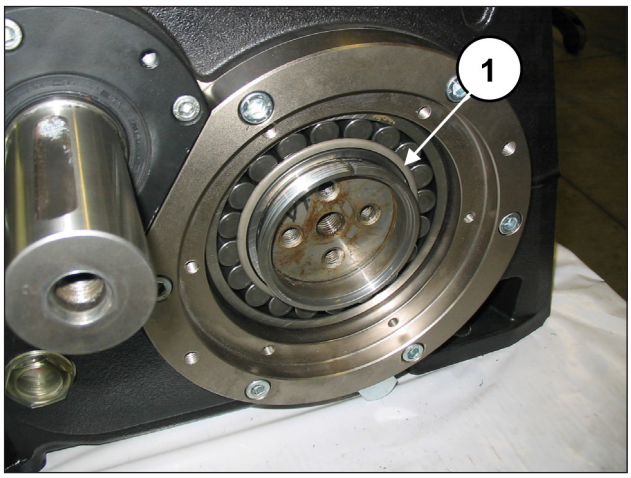


Fig. 78

L'inserimento della bussola di pressione deve essere effettuato a secco (senza oli o lubrificanti).

Inserire la bussola fino a che la superficie esterna (conica) arrivi ad accoppiarsi perfettamente con l'interno del cuscinetto.
Durante l'inserimento assicurarsi che il cuscinetto rimanga a contatto con lo spallamento dell'albero a gomiti.
Ripetere l'operazione dal lato opposto.

Inserire le flangie bloccaggio bussola all'interno delle bussole coniche (pos. ①, Fig. 79).
Applicare una vite M16 di adeguata lunghezza (35-40 mm) al foro M16 dell'albero a gomiti ed avvitare fino ad appoggiare la flangia contro la bussola (pos. ①, Fig. 80). Non serrare la vite.

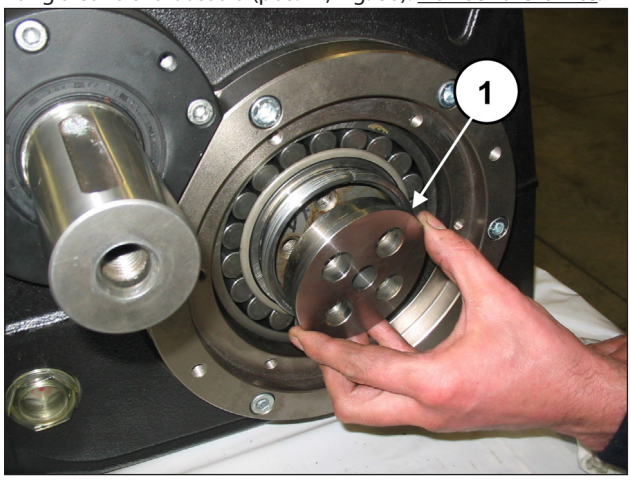


Fig. 79

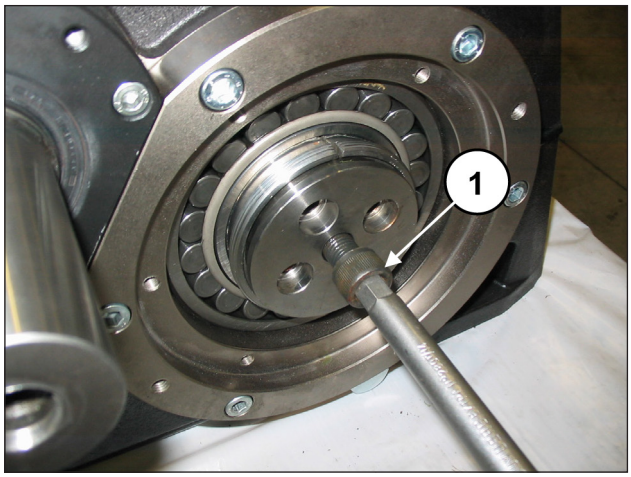


Fig. 80

Ripetere l'operazione dal lato opposto.
Rimuovere l'attrezzo per il bloccaggio delle bielle cod. 27566200 (pos. ①, Fig. 41).
Inserire i semicuscinetti superiori tra le bielle e l'albero a gomiti (pos. ①, Fig. 81).

Per un corretto montaggio dei semicuscinetti assicurarsi che la linguetta di riferimento dei semicuscinetti venga posizionata nell'apposito alloggiamento sulla semibiella (pos. ①, Fig. 82).

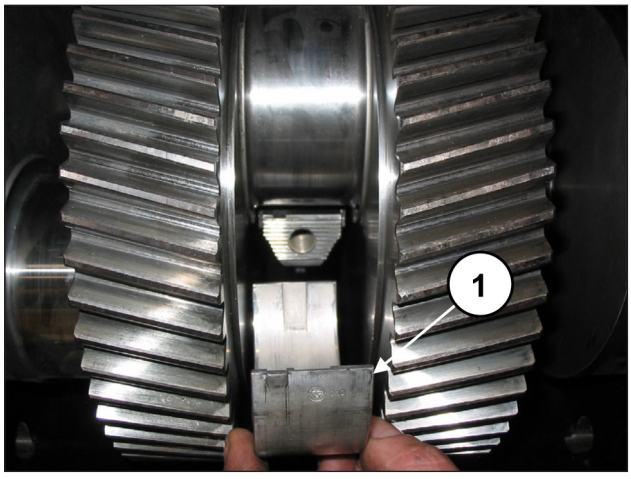


Fig. 81

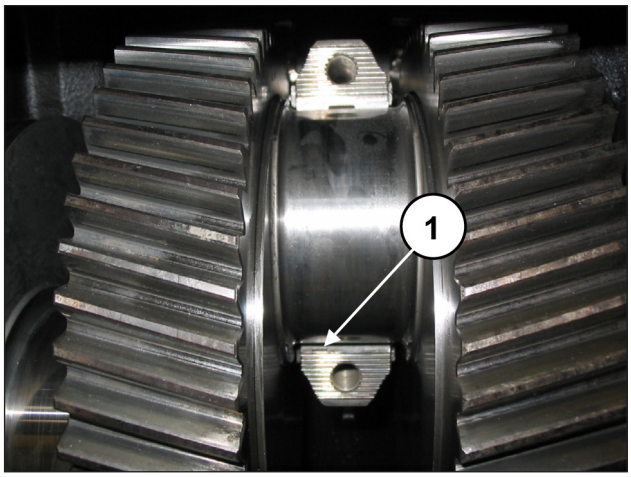


Fig. 82

Applicare i semicuscinetti inferiori ai cappelli (pos. ①, Fig. 83) assicurandosi che la linguetta di riferimento dei semicuscinetti venga posizionata nell'apposito alloggiamento sul cappello (pos. ②, Fig. 83).
Fissare i cappelli alle semibielle mediante le viti M12x1.25x87 (pos. ①, Fig. 84).
Tarare le viti con chiave dinamometrica come indicato nel capitolo 3 portando le viti alla coppia di serraggio contemporaneamente.

Prestare attenzione al corretto senso di montaggio dei cappelli. La numerazione deve essere rivolta verso l'alto.

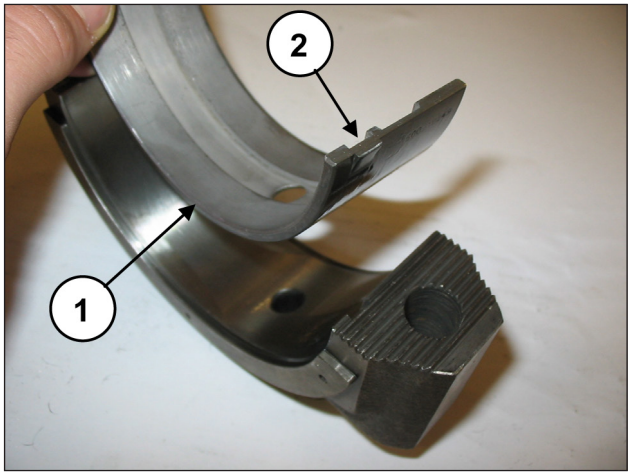


Fig. 83

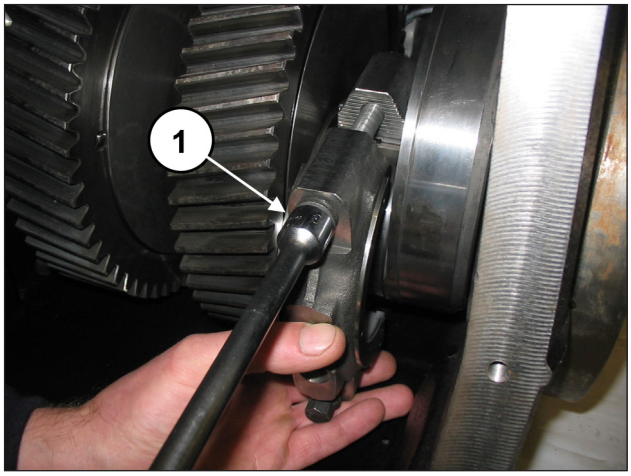


Fig. 84

Inserire uno spessore sotto al fusto della biella centrale per bloccare la rotazione dell'albero a gomiti (pos. ①, Fig. 85).

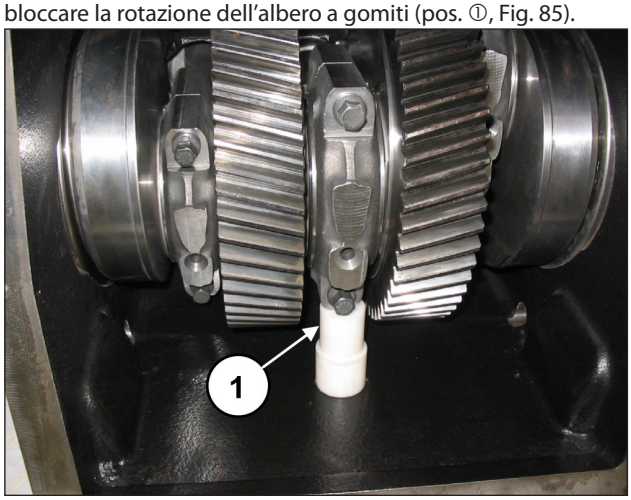


Fig. 85

Misurare la quota "X" indicata in Fig. 86 tra la bussola conica e il cuscinetto albero a gomiti.

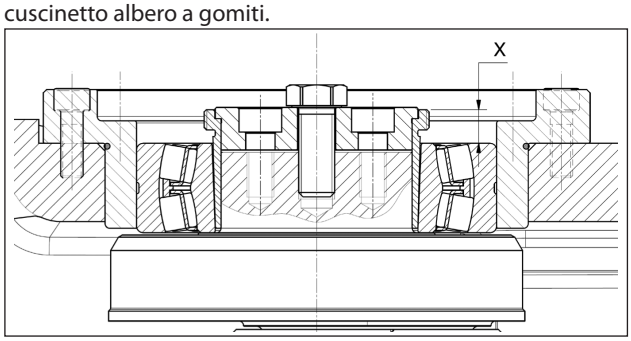


Fig. 86

Avvitare la vite M16 fino determinare una riduzione della quota "X" compresa tra 0.7 e 0.8 mm (Fig. 87).

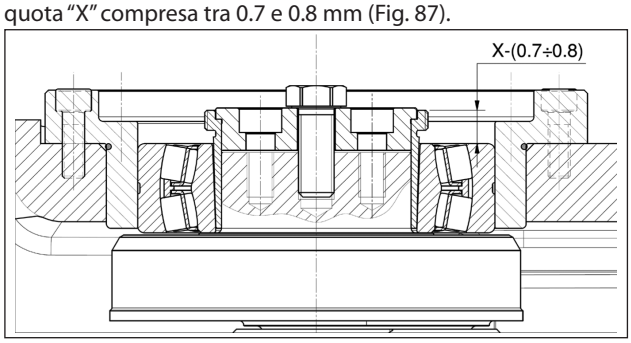


Fig. 87

Ripetere l'operazione dal lato opposto.
Rimuovere la vite M16 dall'albero a gomiti.
Avvitare le due flangie bloccaggio bussola all'albero a gomiti mediante 4+4 viti M12x25 (pos. ①, Fig. 89).

Applicare LOCTITE 243 ai filetti delle viti M12x25 (pos. ①, Fig. 88).

Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

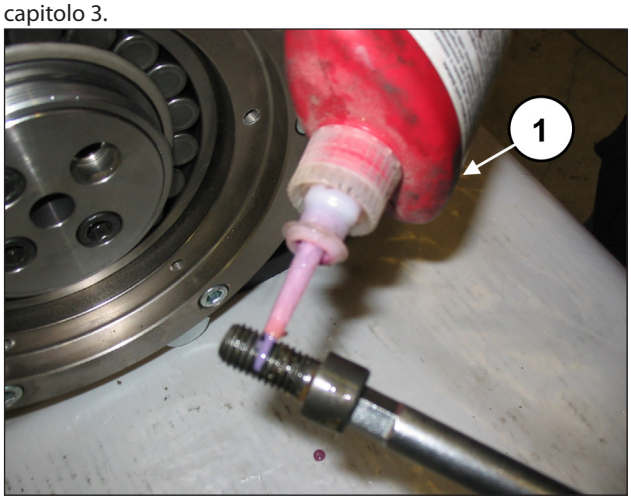


Fig. 88

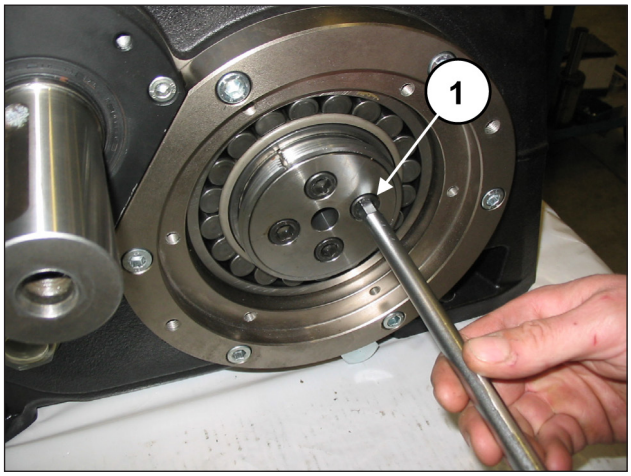


Fig. 89

Rimuovere lo spessore antirotazione sotto al fusto della biella centrale.
Montare i due coperchi cuscinetto (con relativi O-ring) (pos. ①, Fig. 90) mediante 6+6 viti M8x20 (pos. ①, Fig. 91).
Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

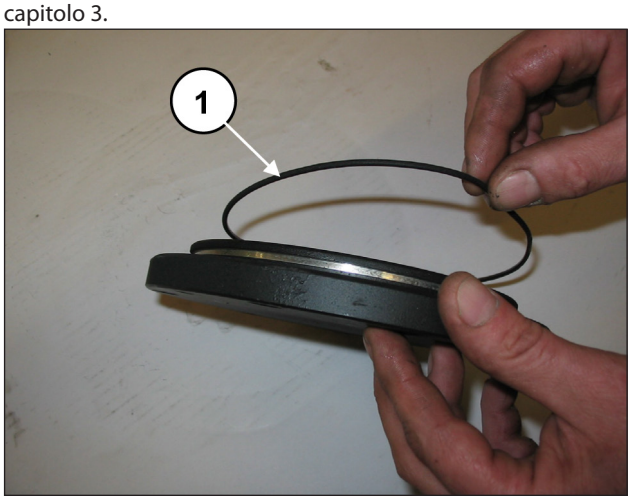


Fig. 90

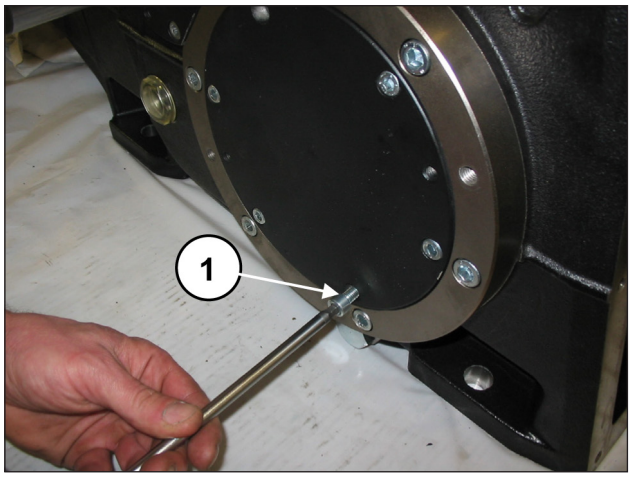


Fig. 91

Inserire l'O-ring nel coperchio posteriore (pos. ①, Fig. 92) e fissarlo al carter mediante 10 viti M8x20 (pos. ①, Fig. 93). Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

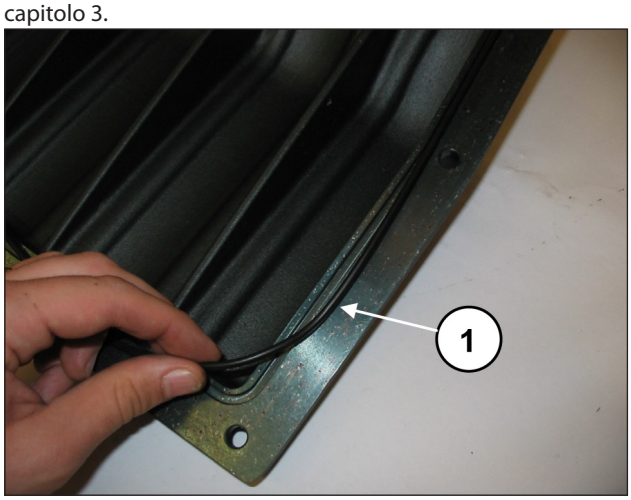


Fig. 92

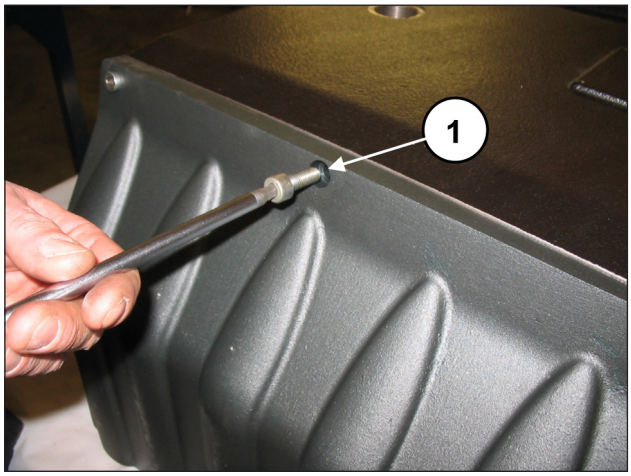


Fig. 93

Montare l'anello di tenuta radiale nel coperchio paraolio (pos. ①, Fig. 94) mediante l'utilizzo di un tampone cod. 27910900.

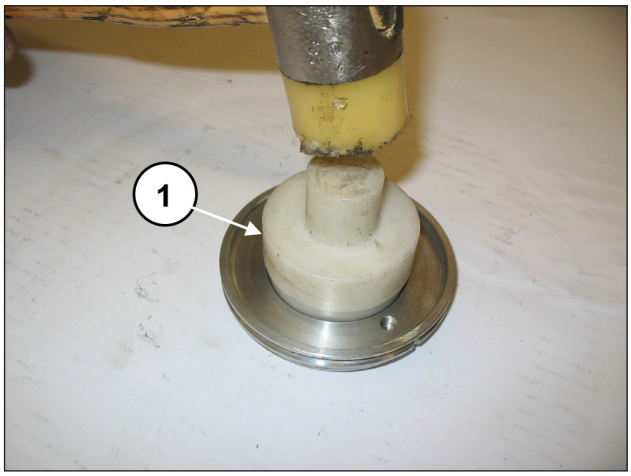


Fig. 94

Posizionare l'O-ring (pos. ①, Fig. 95) nella sede del coperchio paraolio ed inserire il gruppo montato all'interno del carter nell'apposita sede (pos. ①, Fig. 96).

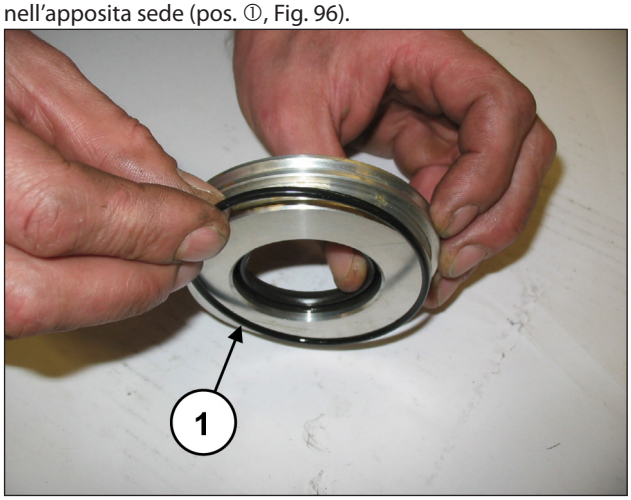


Fig. 95

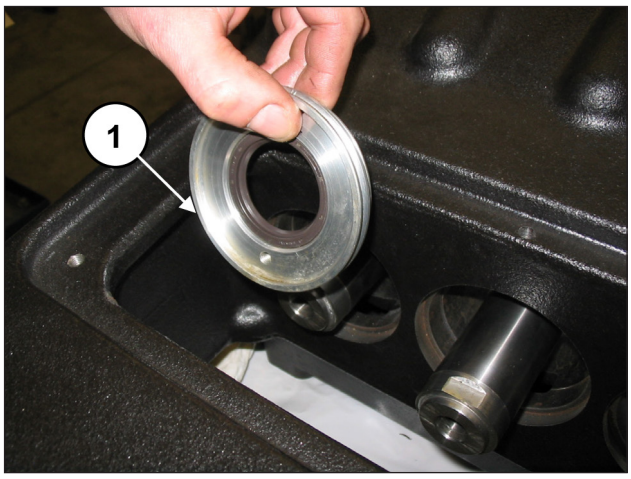


Fig. 96

Assicurarsi che il coperchio entri completamente in sede (pos. ①, Fig. 97) facendo attenzione a non danneggiare il labbro dell'anello di tenuta radiale. Avvitare i coperchi paraolio mediante 2 grani M6x30 (pos. ①, Fig. 98).

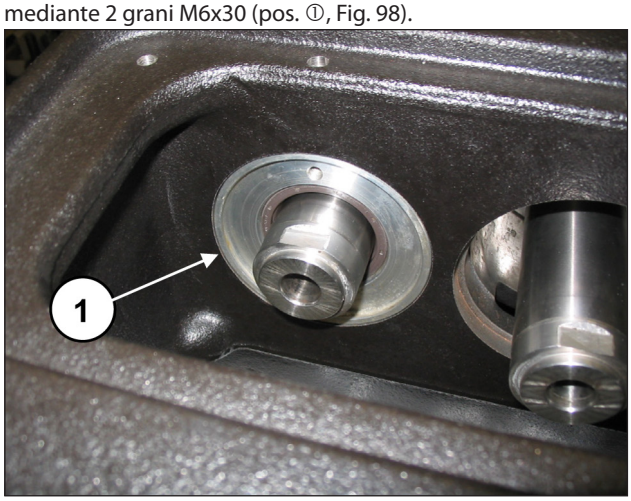


Fig. 97

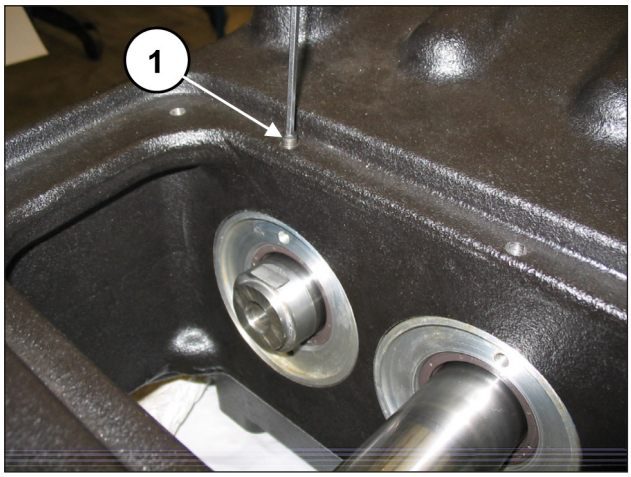


Fig. 98

Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.
Posizionare il paraspruzzi completo di O-ring nell'alloggiamento sul guida pistone (pos. ①, Fig. 99 e Fig. 100).

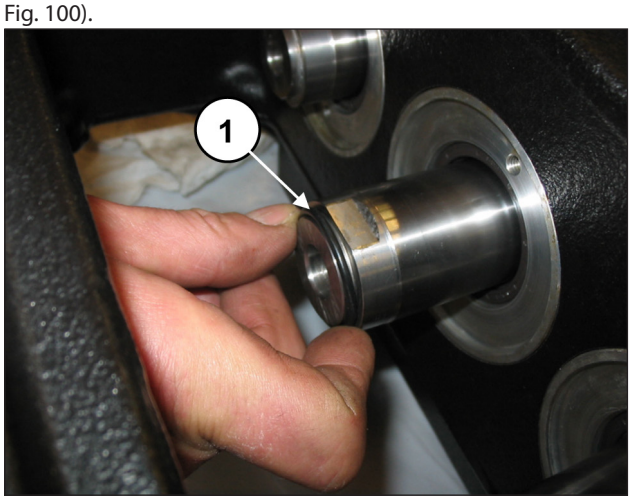


Fig. 99

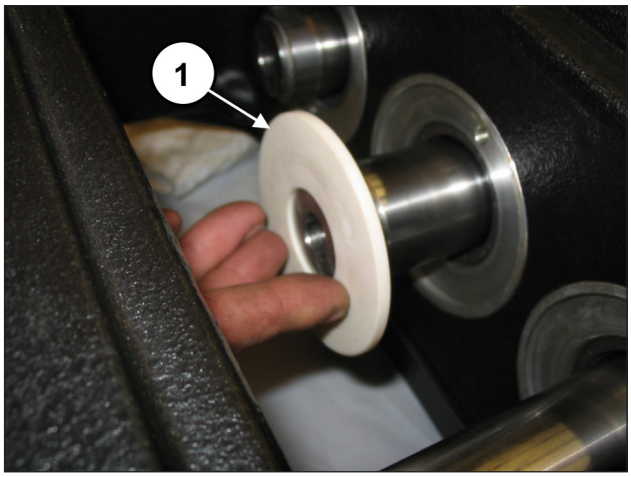


Fig. 100

Avvitare i tre pistoni (pos. ①, Fig. 101) e tarare mediante chiave a forchetta dinamometrica come indicato nel capitolo 3.

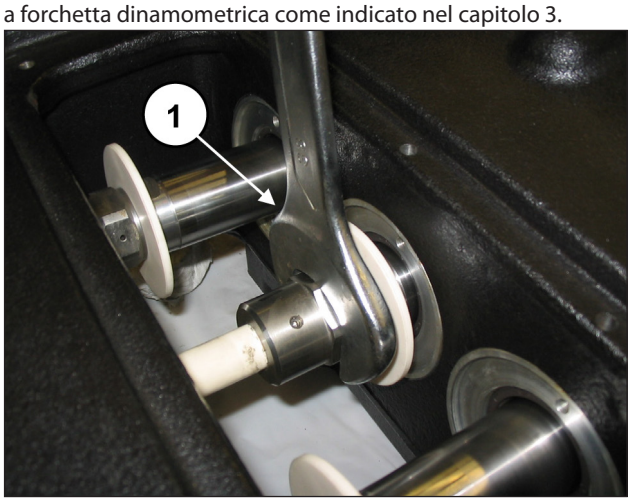


Fig. 101

Sui due coperchi ispezione inserire l'O-ring (pos. ①, Fig. 102) e montare i coperchi mediante l'utilizzo di 4+4 viti M6x14 (pos. ①, Fig. 103).

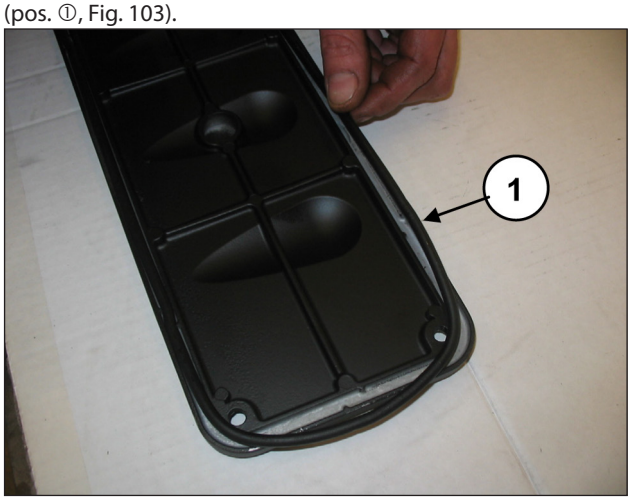


Fig. 102

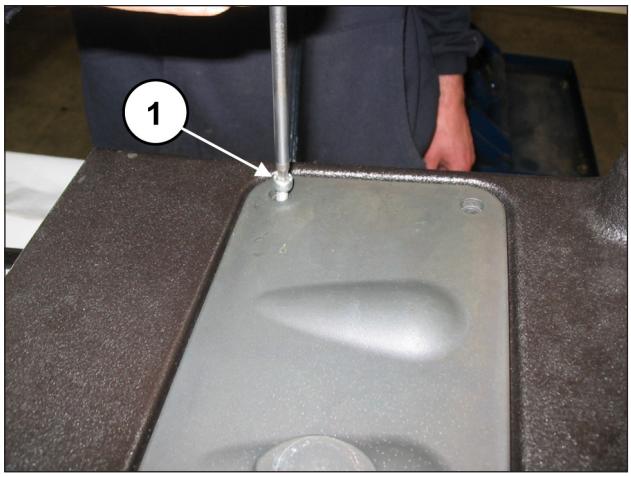


Fig. 103

Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

Montare il coperchio estremità albero e fissarlo al carter mediante 3 viti M8x20 (pos. ①, Fig. 104).
Tarare le viti con chiave dinamometrica come indicato nel capitolo 3.

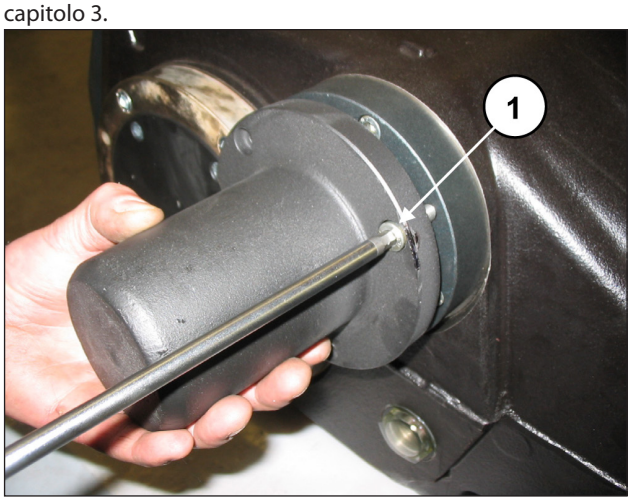


Fig. 104

Applicare la linguetta sull'albero PTO (pos. ①, Fig. 105).

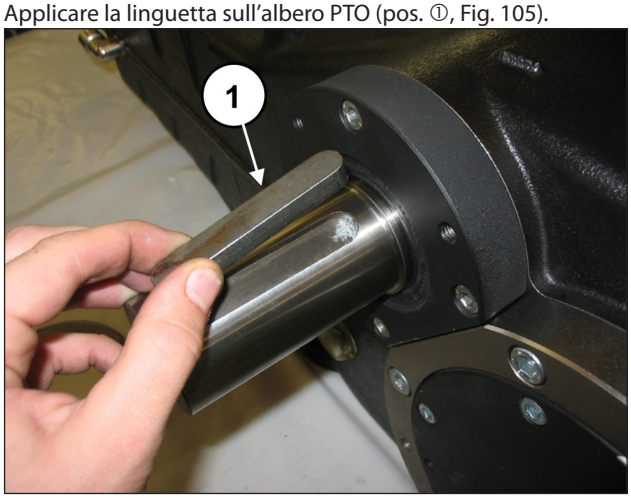


Fig. 105

2.1.3 Classi di maggiorazione previste

TABELLA MAGGIORAZIONE PER ALBERO A GOMITI E SEMICUSCINETTI DI BIELLA			
Classi di recupero (mm)	**Codice Semicuscinetto Superiore**	**Codice Semicuscinetto Inferiore**	**Rettifica sul diametro perno dell'albero (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

TABELLA MAGGIORAZIONE PER CARTER POMPA E GUIDA PISTONE		
Classi di recupero (mm)	**Codice Guida Pistone**	**Rettifica sulla sede Carter Pompa (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 RIPARAZIONE DELLA PARTE IDRAULICA

2.2.1 Smontaggio della testata - camicie - valvole

La testata non necessita di manutenzione periodica.
Gli interventi sono limitati all'ispezione o sostituzione delle valvole, qualora necessario.
Per l'estrazione dei gruppi valvola operare come segue:
Allentare, senza rimuovere, le viti M10x140 fissaggio camicie a testata (pos. ①, Fig. 106), in modo da renderle libere.

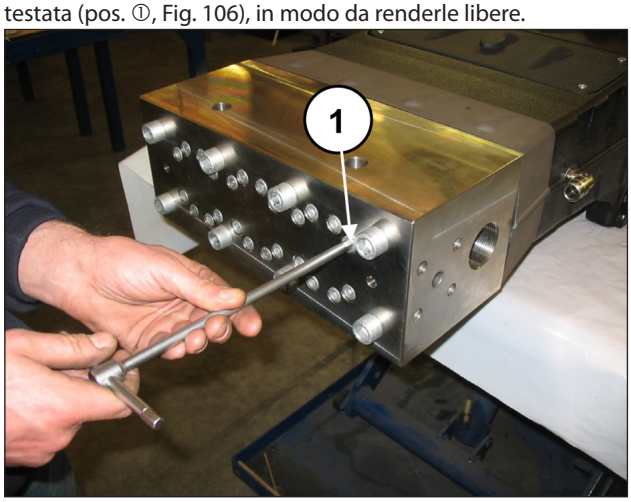


Fig. 106

Svitare due viti fissaggio testata M16x280 diametralmente opposte (pos. ① e ②, Fig. 107) sostituendole con due viti-spina di servizio (cod. 27540200) (pos. ①, Fig. 108), quindi procedere alla rimozione delle restanti viti.

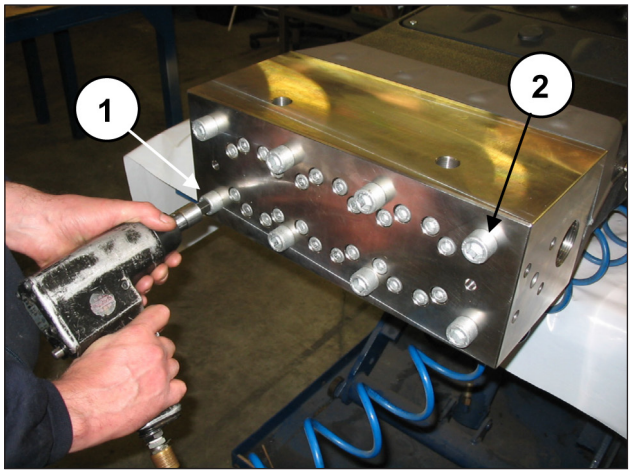


Fig. 107

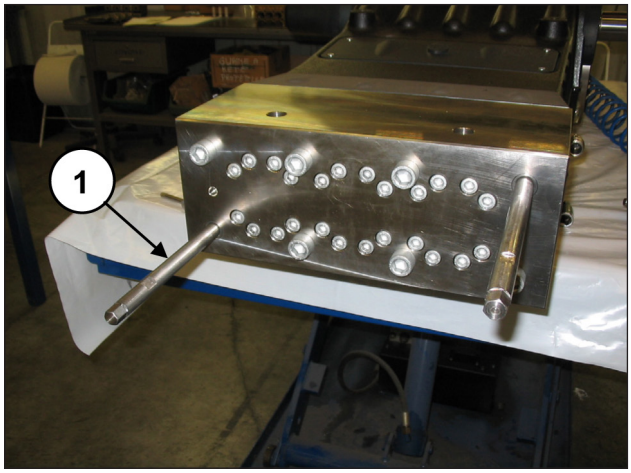


Fig. 108

Separare la testata e il distanziale per camicie dal carter pompa (pos. ①, Fig. 109).

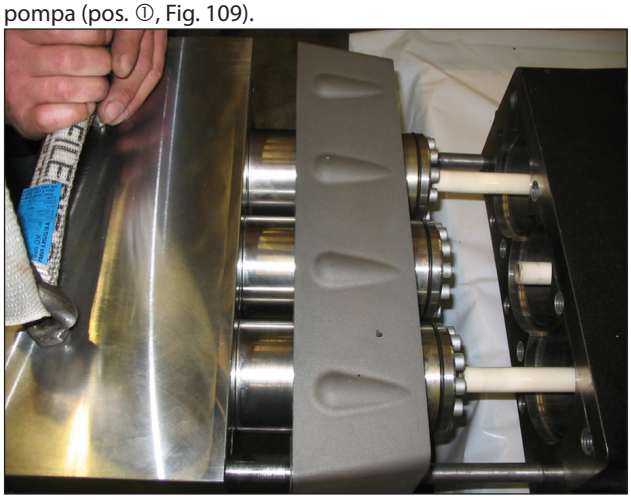


Fig. 109

Togliere gli O-ring dei supporti guarnizione (pos. ①, Fig. 110) e sfilare il distanziale per camicie dai gruppi camicie (pos. ①, Fig. 111).

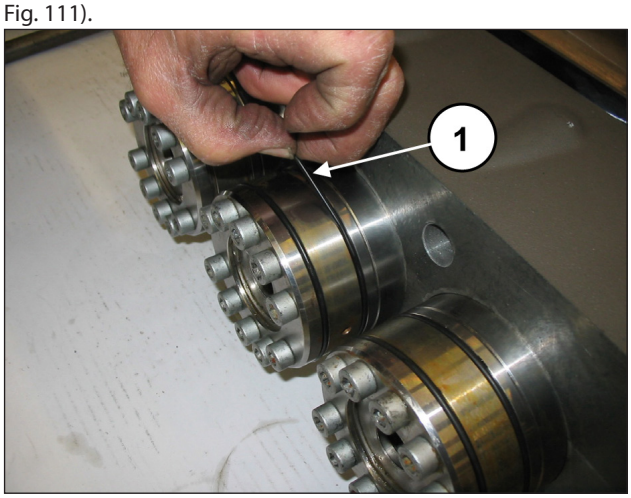


Fig. 110

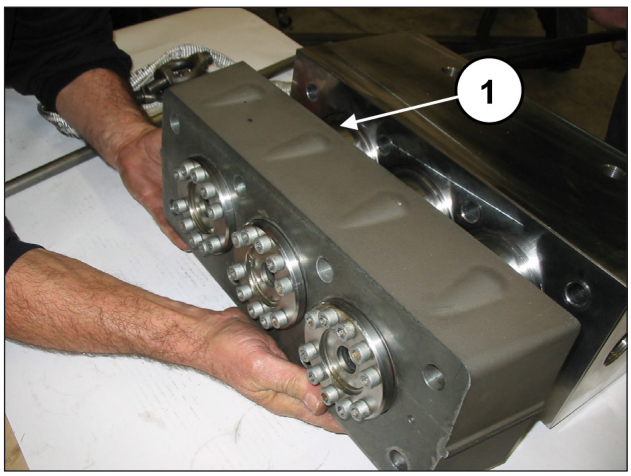


Fig. 111

Rimuovere le viti M10x140 fissaggio camicie a testata (pos. ①, Fig. 112) ed estrarre i gruppi camicie (pos. ①, Fig. 113).

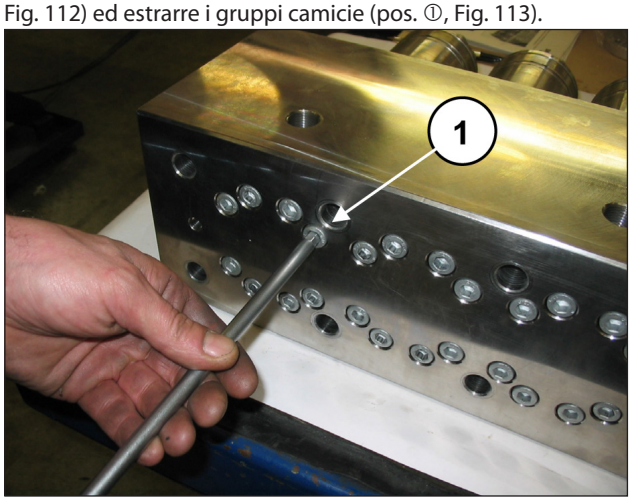


Fig. 112

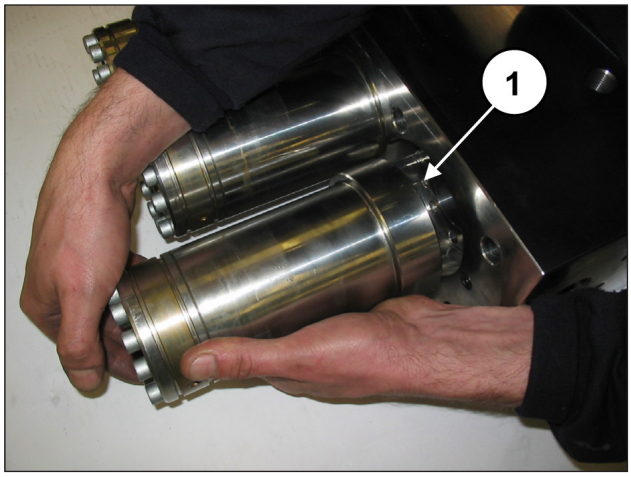


Fig. 113

Durante lo smontaggio delle camicie fare attenzione a non disperdere molle valvola e le valvole piane (pos. ① e ②, Fig. 114) in quanto essendo posizionate solo a battuta potrebbero cadere.

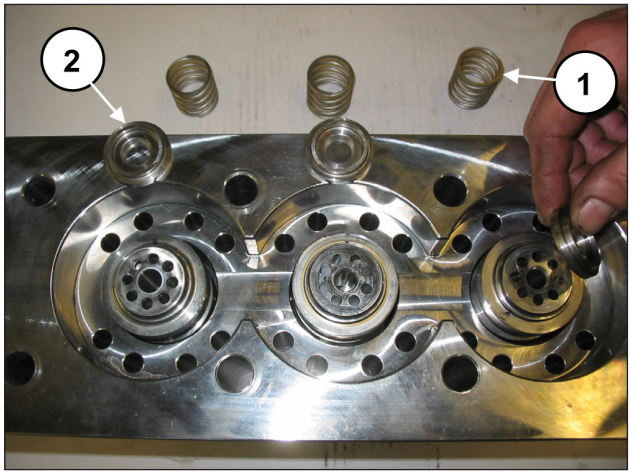


Fig. 114

Qualora le sedi valvola risultassero bloccate sulla testata a causa della formazione di calcare o di ossido devono essere sbloccate inserendo l'apposito attrezzo (cod. 034300020 per SK20-22-24 o cod. 034300010 per SK26-28-30) nel foro di mandata (pos. ①, Fig. 115).

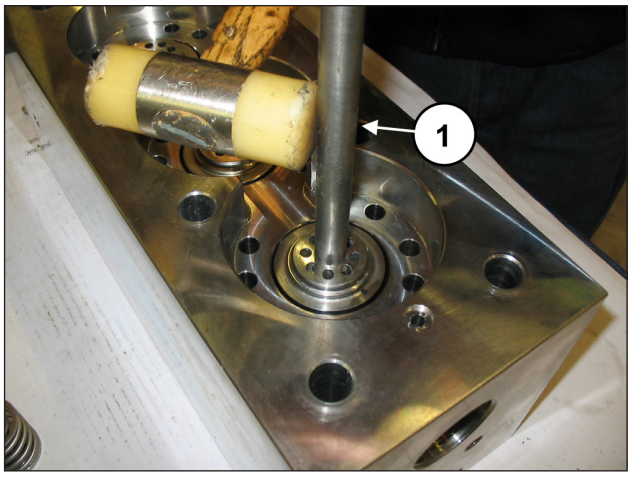


Fig. 115

Estrarre le sedi valvola e controllare lo stato di usura delle guarnizioni.
Se necessario eseguire eventuali sostituzioni (pos. ①, Fig. 116).

Fig. 116

Ad ogni ispezione delle valvole sostituire gli anelli di tenuta e i relativi O-ring di tenuta frontale tra camicia e testata, e tra testata e distanziale camicie nella zona del foro di ricircolo. Prima del rimontaggio pulire ed asciugare i vari componenti e tutti i relativi alloggiamenti all'interno della testata.

Estrarre i piattelli di mandata (pos. ①, Fig. 117), e le rispettive guide (pos. ①, Fig. 119), con relative molle (pos. ①, Fig. 118), controllare il loro stato di usura ed eseguire, se necessario, eventuali sostituzioni, e comunque negli intervalli indicati nel capitolo 11 del ***Manuale uso e manutenzione***.

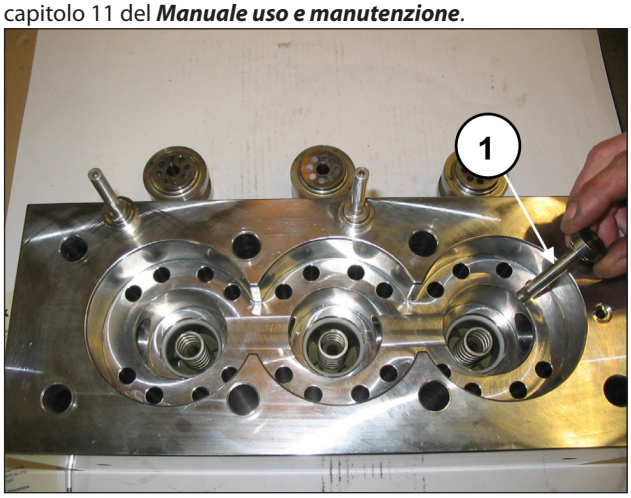


Fig. 117

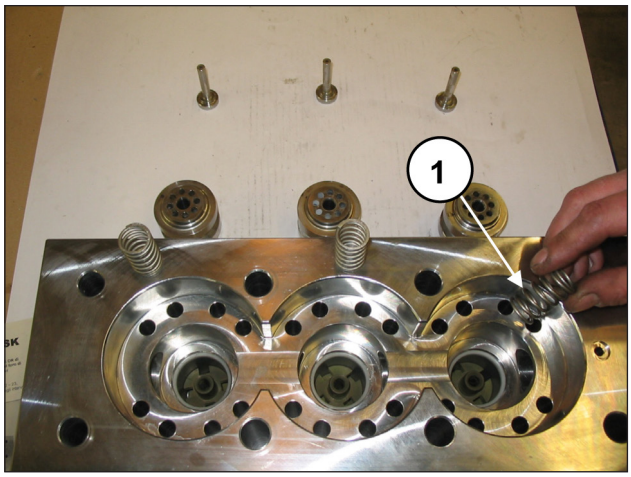


Fig. 118

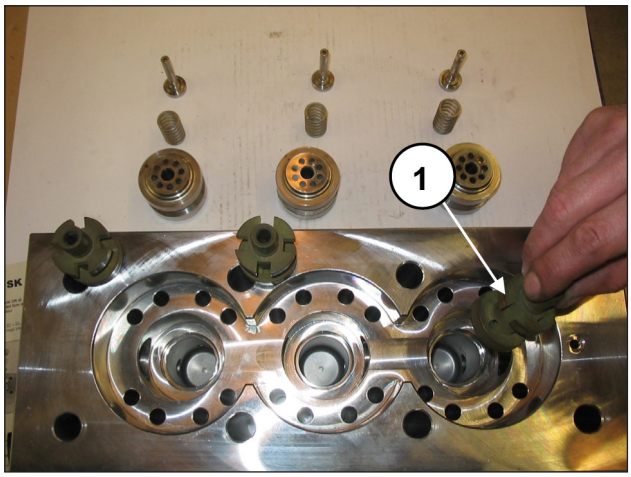


Fig. 119

2.2.2 Montaggio della testata - camicie - valvole

Per rimontare i vari componenti invertire le operazioni precedentemente elencate facendo particolarmente attenzione al montaggio corretto del distanziale per camicie: i due scarichi grezzi di fusione presenti su uno dei due fianchi a particolare montato devono risultare orientati verso la parte inferiore del carter (lato staffaggio pompa).

Testate - camicie: procedere al montaggio e alla taratura delle viti fissaggio testata e poi procedere alla taratura delle viti fissaggio camicie.

Per i valori delle coppie di serraggio e per la sequenza di serraggio delle viti rispettare le indicazioni riportate nel capitolo 3.

2.2.3 Smontaggio del gruppo pistone - supporti - tenute

Il gruppo pistone non necessita di manutenzione periodica. Gli interventi sono limitati al solo controllo visivo del drenaggio del circuito di raffreddamento. Qualora si presentassero anomalie / oscillazioni sul manometro di mandata o pulsazioni del tubo di drenaggio del circuito di raffreddamento (se elastico), sarà necessario procedere al controllo e alla eventuale sostituzione del pacco tenute.

Per l'estrazione dei gruppi pistone operare come segue:

Separare la testata e il distanziale per camicie dal carter pompa come indicato nel par. 2.2.1 (da Fig. 106 a Fig. 113).

Rimuovere il coperchio di ispezione superiore (pos. ①, Fig. 120) e il coperchio ispezione inferiore (pos. ①, Fig. 121) svitando le 4+4 viti di fissaggio. Sfilare gli O-ring e sostituirli qualora fosse necessario.

Fig. 120

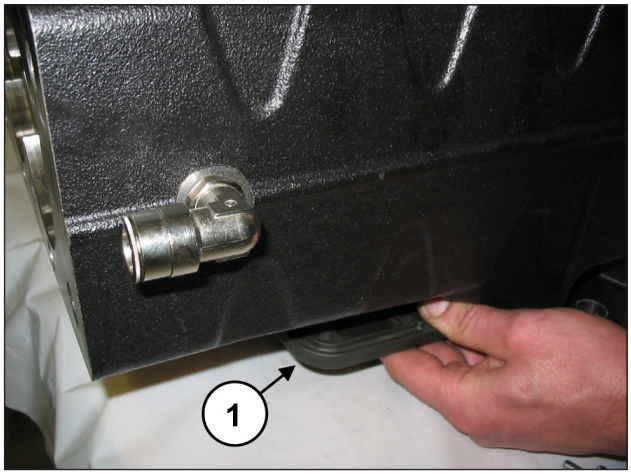


Fig. 121

Rimuovere i pompanti con una chiave a forchetta (pos. ①, Fig. 122) e controllare il loro stato di usura (pos. ①, Fig. 123). Sostituirli se necessario.

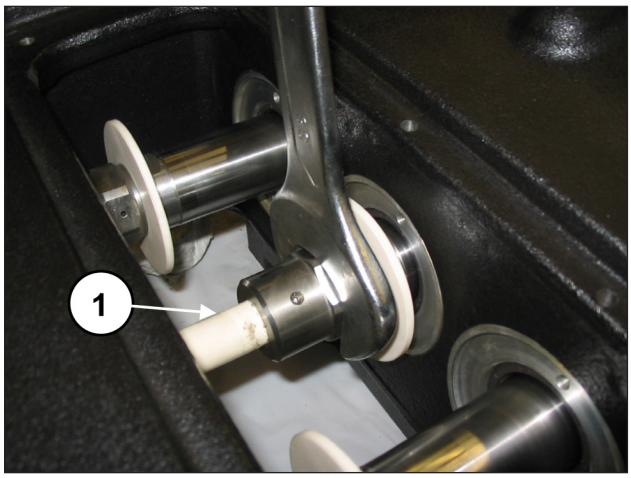


Fig. 122

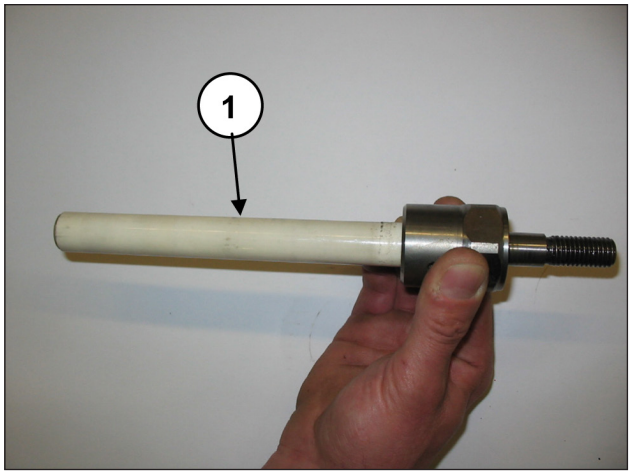


Fig. 123

Rimuovere le viti M8x50 fissaggio supporto a camicia (pos. ①, Fig. 124) e procedere alla separazione del supporto dalla camicia (pos. ①, Fig. 125).

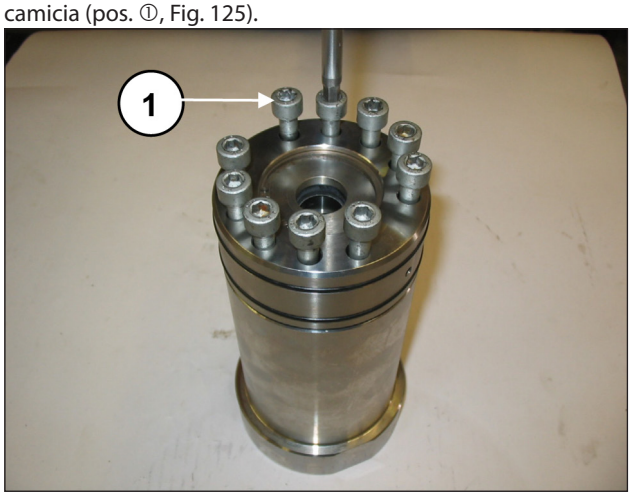


Fig. 124

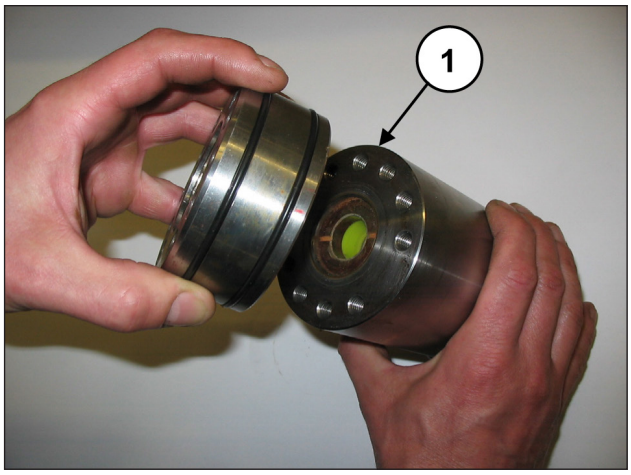


Fig. 125

Rimuovere l'anello seeger e l'anello di ritegno tenute (pos. ①, Fig. 126) e con una apposita spina in materiale plastico estrarre la guarnizione di tenuta LP (bassa pressione) (pos. ①, Fig. 127).

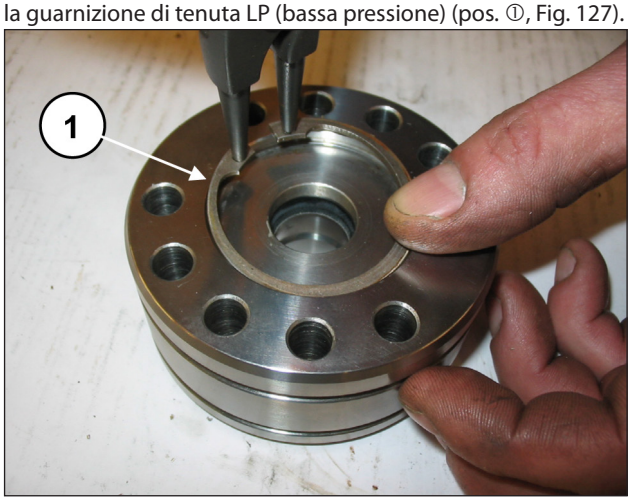


Fig. 126

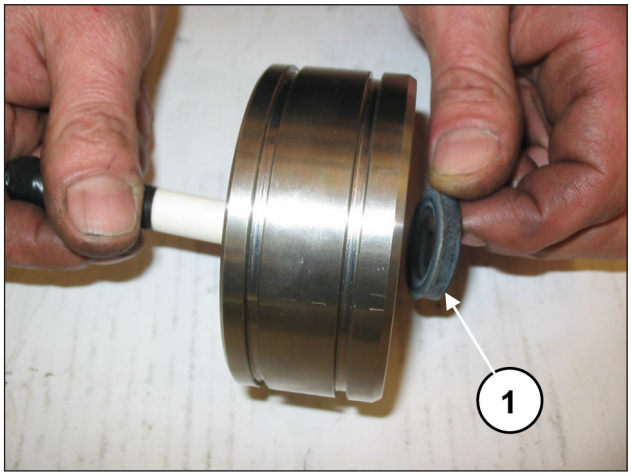


Fig. 127

Ad ogni smontaggio le tenute di bassa pressione e gli anelli O-ring devono essere sostituiti.

Con la camicia separata dal supporto tenute e con una apposita spina in materiale plastico (pos. ①, Fig. 128) fare fuoriuscire il pacco HP (alta pressione) (pos. ①, Fig. 129).

Ad ogni smontaggio il pacco HP (pos. ①, Fig. 129) dovrà essere sostituito.

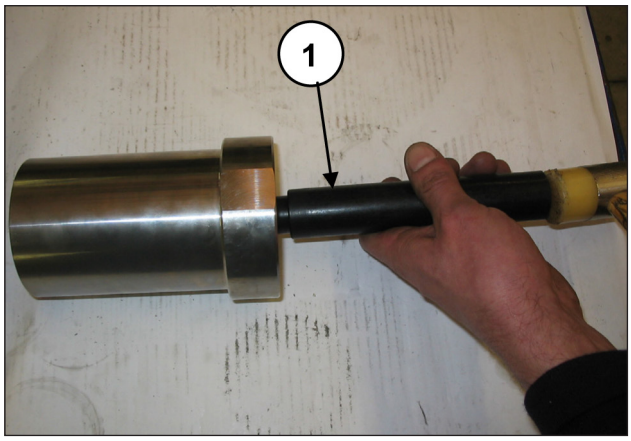


Fig. 128

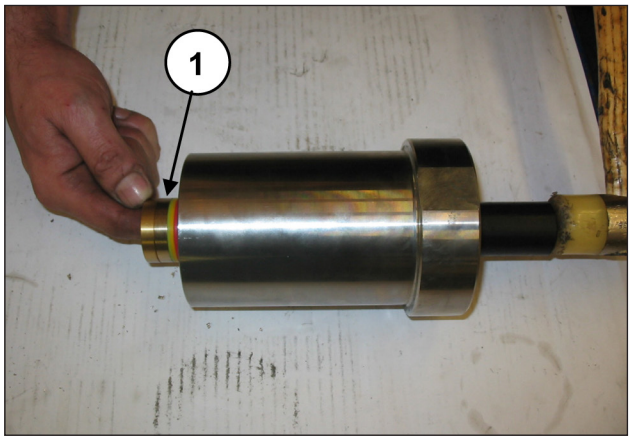


Fig. 129

2.2.4 Montaggio del gruppo pistone - supporti - tenute

Per il rimontaggio dei vari componenti invertire le operazioni facendo particolare attenzione alle sequenze sotto elencate; per i valori delle coppie di serraggio e per la sequenza di serraggio rispettare le indicazioni riportate nel capitolo 3. Inserire la bussola superiore nella camicia.

Per un corretto posizionamento assiale della bussola utilizzare l'apposito attrezzo (cod. 27911200 per SK20, cod. 27911400 per SK22, cod. 27911500 per SK24, cod. 27911600 per SK26, cod. 27911700 per SK28 e cod. 27911800 per SK30) (pos. ①, Fig. 130 e Fig. 131).

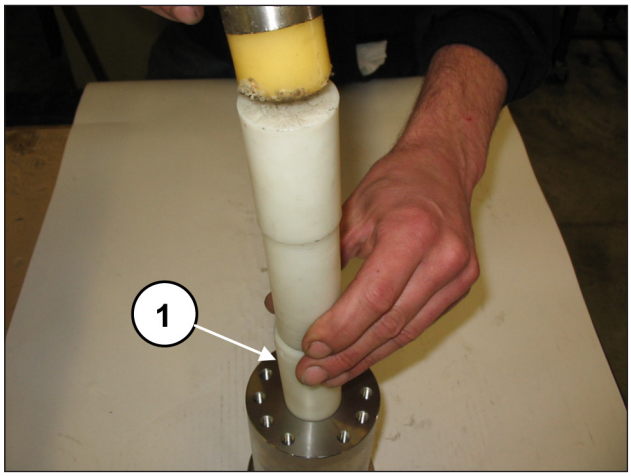


Fig. 130

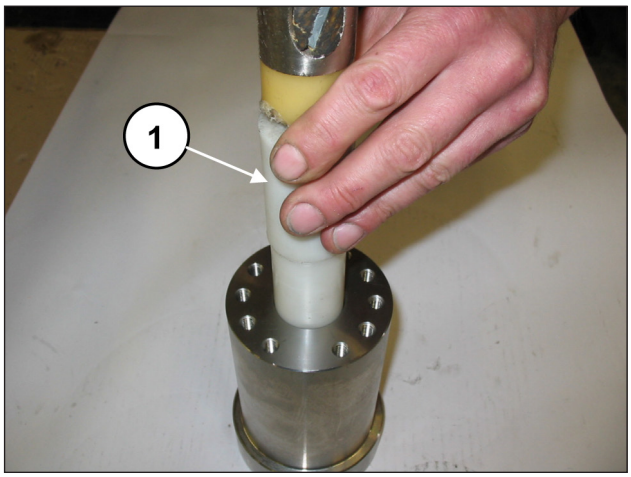


Fig. 131

Introdurre il pacco H.P. (alta pressione) (pos. ①, Fig. 132); data la leggera interferenza tra la tenuta e la camicia per evitare eventuali danneggiamenti si consiglia l'utilizzo dell'apposito attrezzo (cod. 27540100 per SK20, SK22 e SK24, cod. 27540900 per SK26, per SK28 e per SK30) (pos. ①, Fig. 133).

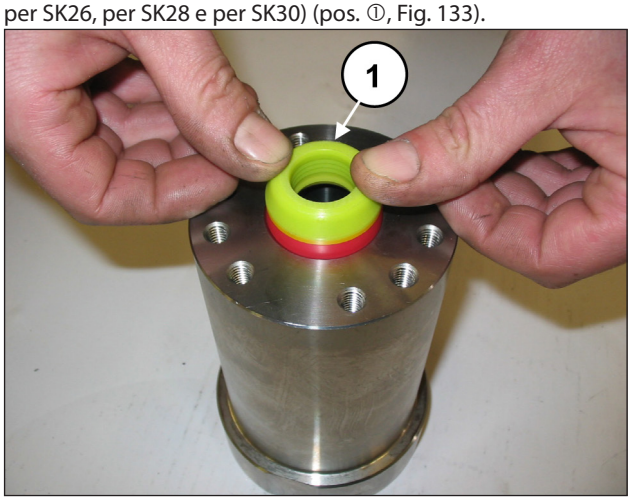


Fig. 132

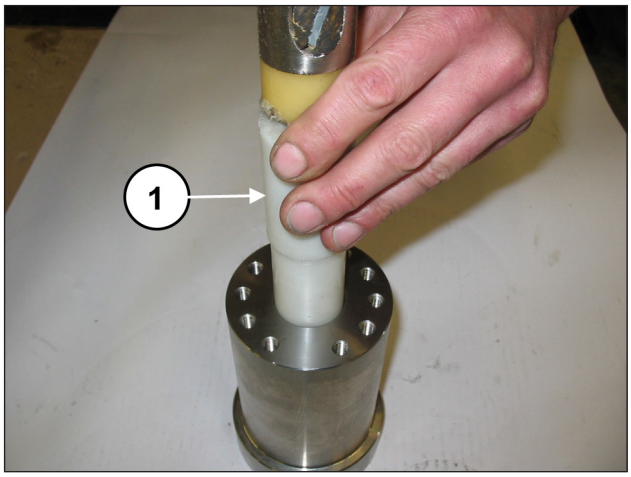


Fig. 133

La tenuta H.P. deve essere introdotta nella camicia come indicato in Fig. 132 e Fig. 134.

Prima del montaggio in sede le tenute di H.P. devono essere lubrificate con grasso al silicone tipo OKS 1110 attenendosi alle operazioni sotto indicate: Il diametro esterno deve risultare solo leggermente lubrificato.
Sul diametro interno il grasso deve essere applicato prestando particolare cura al riempimento di tutte le sacche comprese tra i labbri di tenuta come indicato in Fig. 135.

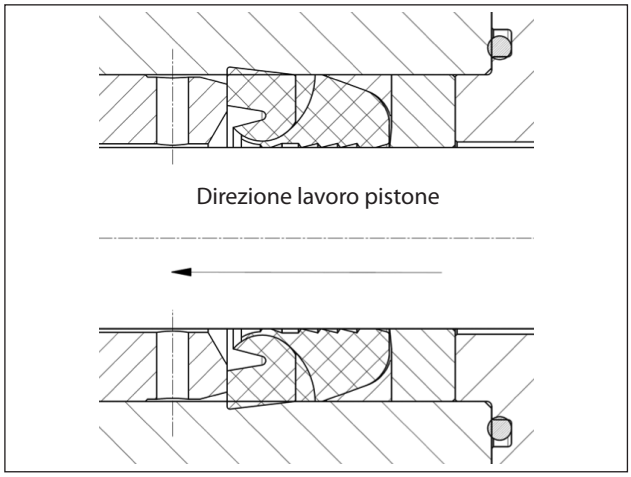


Fig. 134

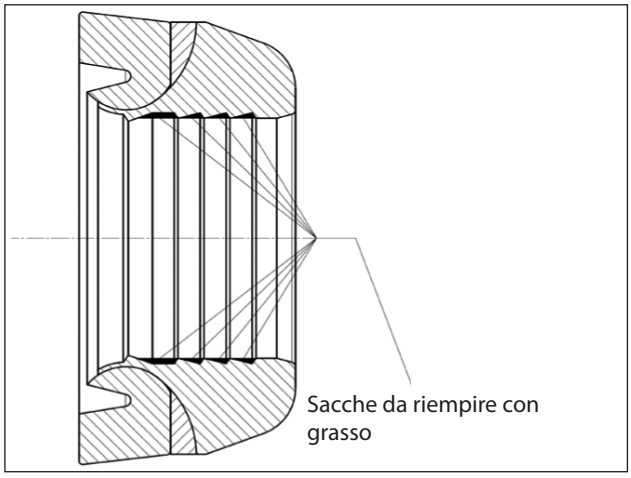


Fig. 135

Introdurre l'anello antiestrusore e la bussola guarnizioni (pos. ① e ②, Fig. 136, Fig. 137 e Fig. 138).

La bussola guarnizioni ② deve essere introdotta nella camicia con i due scarichi rivolti verso l'esterno (lato carter) come indicato in Fig. 137.

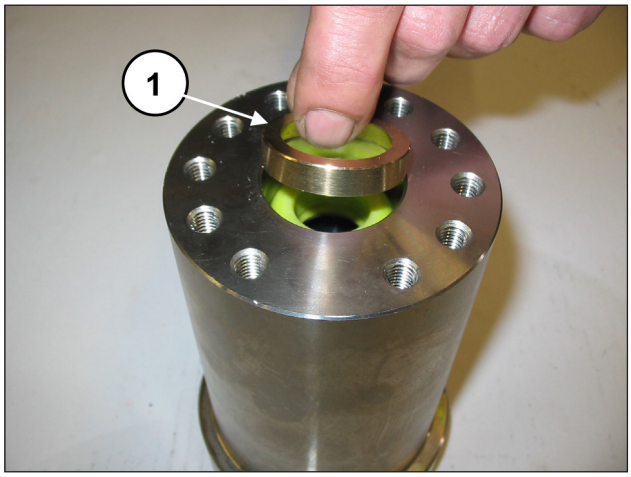


Fig. 136

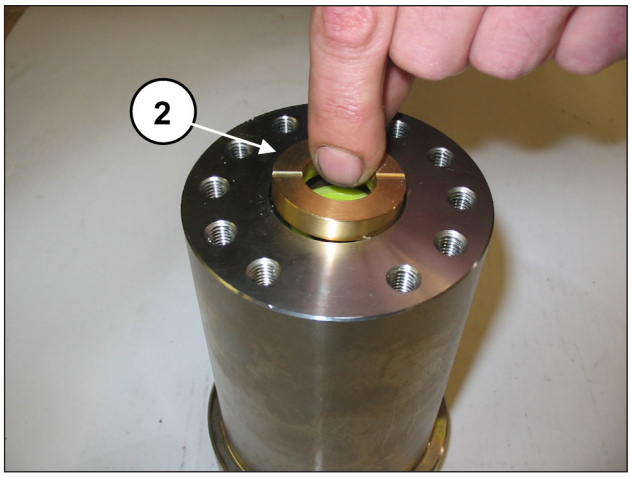


Fig. 137

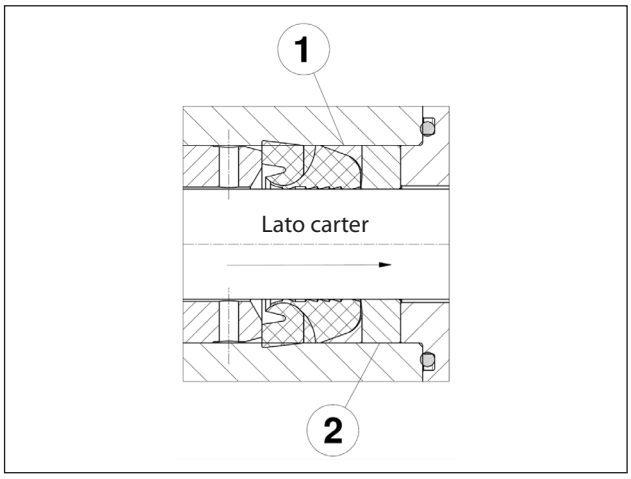


Fig. 138

La tenuta L.P. deve essere introdotta nella camicia con il labbro di tenuta nella direzione di lavoro del pistone (pos. ①, Fig. 139 e Fig. 140), lubrificando leggermente il diametro esterno con grasso al silicone tipo OKS 1110. Sostituire la tenuta L.P. qualora si presentasse usurata.

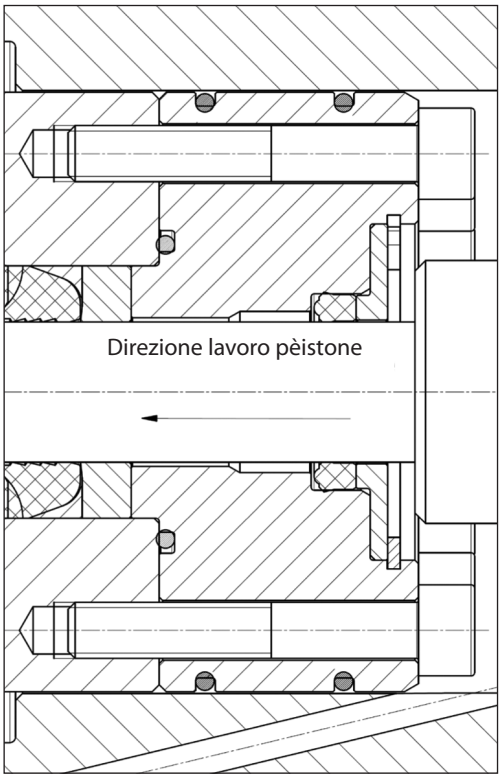


Fig. 139

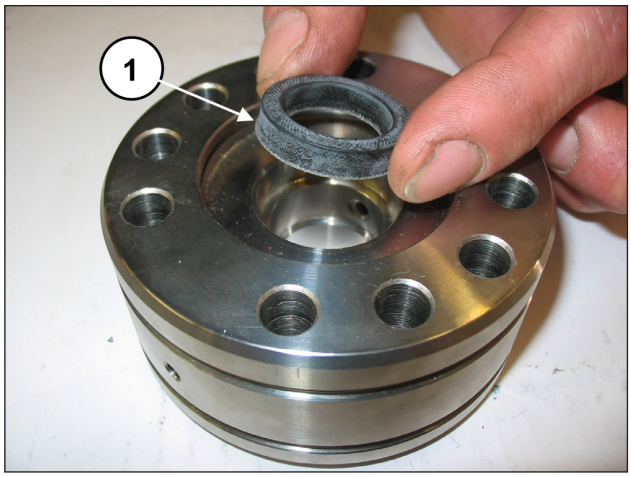


Fig. 140

Rimontare il gruppo supporto tenute (Fig. 141 e Fig. 142) sostituendo i componenti ① e ②.

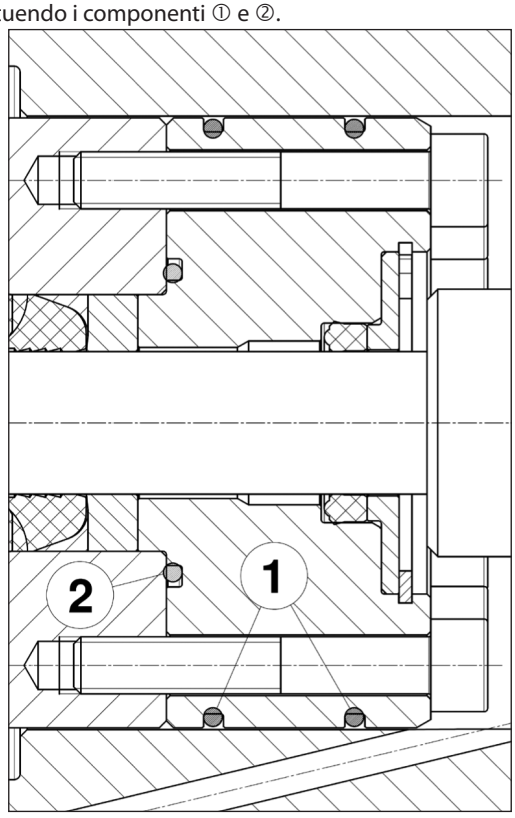


Fig. 141

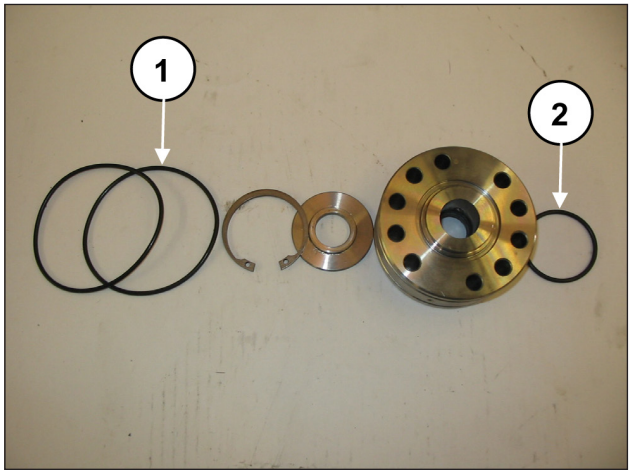


Fig. 142

Assemblare il gruppo supporto - camicia avvitando manualmente le viti M8x50 come indicato in Fig. 143, successivamente procedere alla taratura con chiave dinamometria come indicato nel capitolo 3.

Fig. 143

3 TARATURE SERRAGGIO VITI

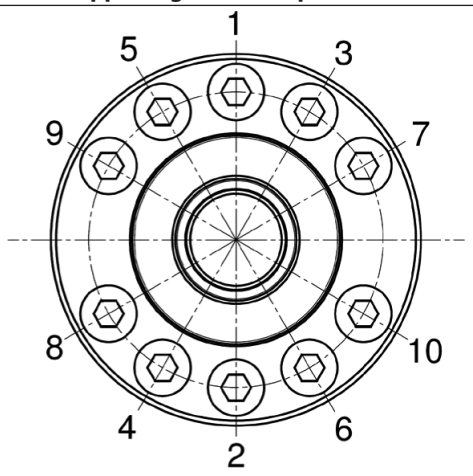
Il serraggio delle viti è da eseguirsi esclusivamente con chiave dinamometrica.

Descrizione	Posizione Esploso	Coppia Serraggio Nm
Vite M8x20 coperchio carter	42	25
Tappo G1/2x13 carter	66	40
Vite M8x30 coper. cuscinetto PTO	85	25
Vite M8x20 coper. estremità albero	42	25
Vite M10x30 coper. portacuscinetto	57	45
Vite M6x14 coperchi super. e infer.	70	10
Vite M8x20 coperchio cuscinetto	42	25
Vite M12x1.25x87 serraggio biella	40	75
Vite M6x20 guida pistone	37	10
Vite M12x25 flangia blocc. bussola	51	68.5
Pistone completo	16	50
Raccordo strozz. D.3 3/8M-3/8F	72	45
Vite M8x50 supporti	26	40*
Vite M16x280 testata	14	200**
Vite M10x140 camicie	13	83***

Le viti - pos. 13-14-26 devono essere serrate con la chiave dinamometrica lubrificando il gambo filettato con grasso al Bisolfuro di Molibdeno cod. 12001500.

* Le viti fissaggio supporti devono essere serrate rispettando le fasi e l'ordine riportato nello schema di Fig. 144.
** Le viti fissaggio testata devono essere serrate rispettando le fasi e l'ordine riportato nello schema di Fig. 145.
*** Le viti fissaggio camicie devono essere serrate rispettando le fasi e l'ordine riportato nello schema di Fig. 145.

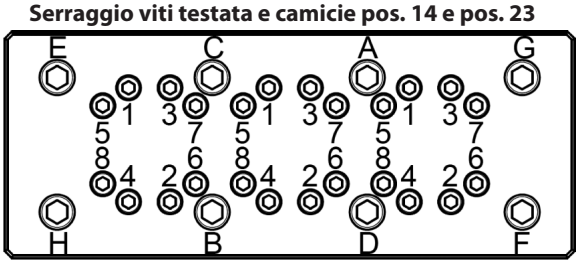
Serraggio viti supporto guarnizioni pos. 26



Serraggio viti M8x50 secondo la sequenza indicata (1-2-3-4-5-6-7-8-9-10) eseguita in un'unica fase della coppia indicata.

Fig. 144

Serraggio viti testata e camicie pos. 14 e pos. 23



OPERAZIONE 1: Serraggio viti M16x280 (pos. 14) in due fasi rispettando la sequenza indicata in figura: (A-B-C-D-E-F-G-H)
Fase 1 = 120 Nm
Fase 2 = 200 Nm
OPERAZIONE 2: Serraggio viti M10x140 (pos. 13) in quattro fasi rispettando la sequenza indicata in figura: (1-2-3-4-5-6-7-8)
Fase 1 = 40 Nm
Fase 2 = 65 Nm
Fase 3 = 83 Nm
Fase 4 = 83 Nm

Fig. 145

4 ATTREZZI PER LA RIPARAZIONE

La manutenzione della pompa può essere eseguita tramite semplice attrezzi per lo smontaggio e il rimontaggio dei componenti.
Sono disponibili i seguenti attrezzi:

Per il montaggio:

Anello di tenuta radiale guida pistone	cod. 27910900
Anello di tenuta radiale albero PTO	cod. 27539500
Bussola guarnizioni	cod. 27911200 (SK20)
	cod. 27911400 (SK22)
	cod. 27911500 (SK24)
	cod. 27911600 (SK26)
	cod. 27911700 (SK28)
	cod. 27911800 (SK30)
Pacco tenute HP	cod. 27540100 (SK20 - SK22 - SK24)
	cod. 27540900 (SK26 - SK28 - SK30)
Testata / distanziale camicie	cod. 27540200

Per lo smontaggio:

Sede valvola	cod. 034300020 (SK20-22-24)
	cod. 034300010 (SK26-28-30)
Testata / distanziale camicie	cod. 27540200
Albero (bloccaggio bielle)	cod. 27566200

5 SOSTITUZIONE DELLA BOCCOLA DI PIEDE BIELLA

Eseguire il piantaggio della boccola a freddo e le successive lavorazioni attenendosi alle dimensioni e tolleranze della sottostante Fig. 146.

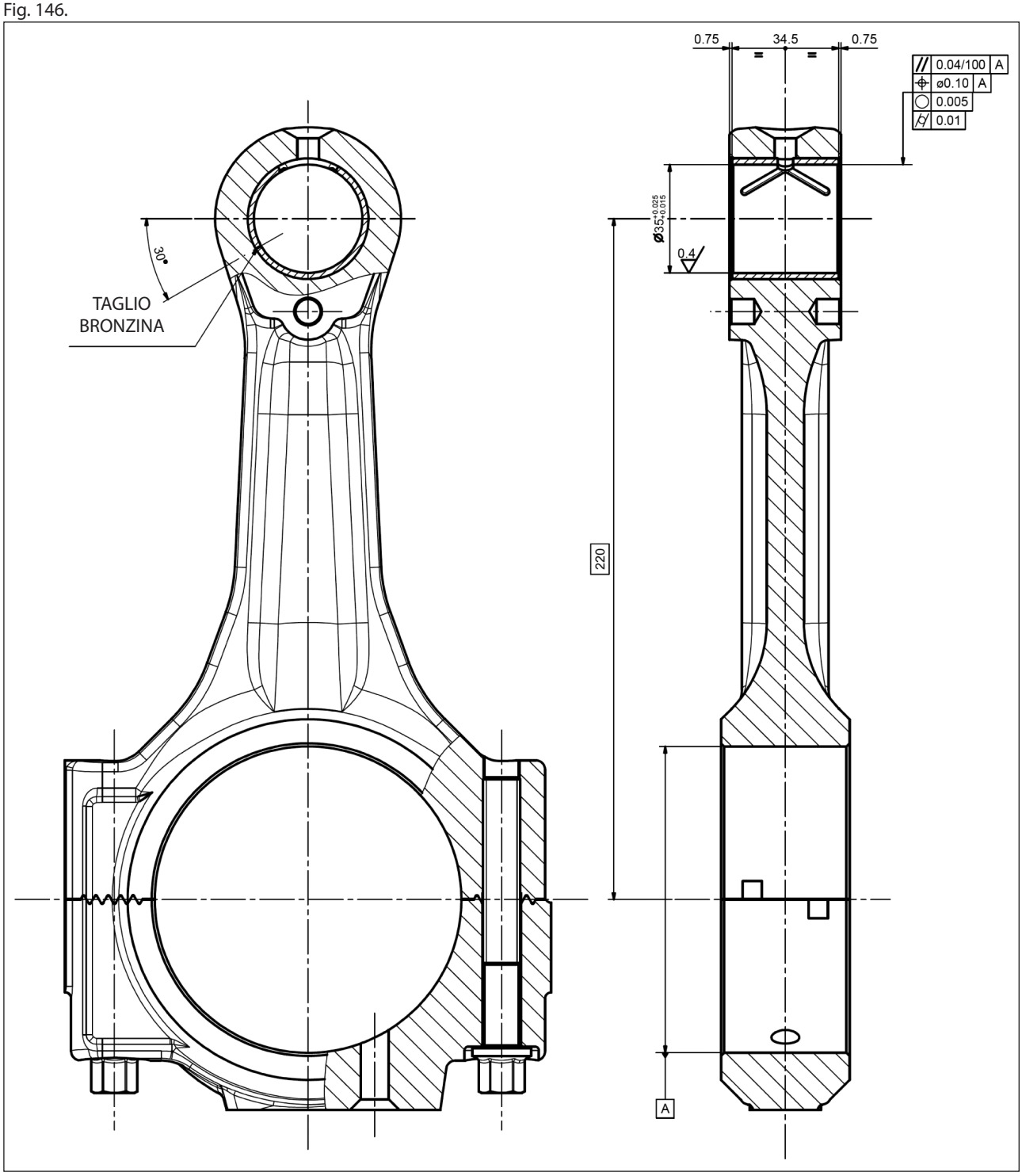


Fig. 146

Table of Contents

1 INTRODUCTION

This manual describes the instructions for repairing SK series pumps and should be carefully read and understood before any intervention on the pump.
Proper pump operation and duration depend on the correct use and maintenance.
Interpump Group disclaims any responsibility for damage caused by negligence or failure to observe the standards described in this manual.

1.1 DESCRIPTION OF SYMBOLS

Read the contents of this manual carefully before each operation.

Warning Sign

Read the contents of this manual carefully before each operation.

Danger Sign
Wear protective goggles.

Danger Sign
Put on protective gloves before each operation.

2 REPAIR GUIDELINES

2.1 REPAIRING MECHANICAL PARTS

Mechanical parts must be repaired after the oil has been removing from the casing.
To remove oil, you must remove the oil filler cap pos. ①, Fig. 1 and then the drain plug pos. ②, Fig. 1.

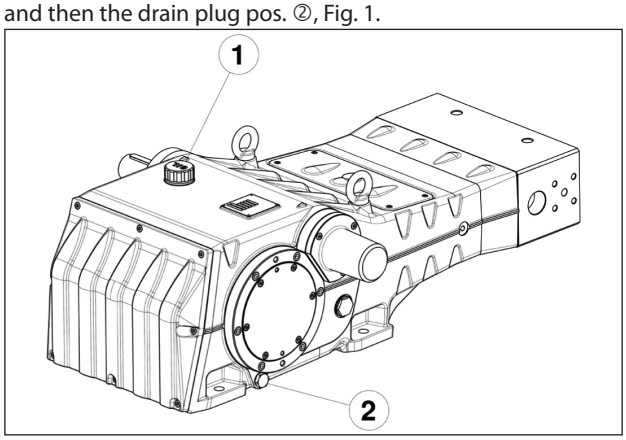


Fig. 1

The used oil must be placed in a suitable container and disposed of in special centres. It absolutely should not be discarded into the environment.

2.1.1 Disassembly of mechanical parts

The correct sequence is as follows:
Completely empty the pump of oil, as indicated in par. 2.1.
Separate the head and the spacer for the liners from the pump casing as shown in par. 2.2.1 (from Fig. 106 to Fig. 109).
Detach the upper inspection cover and the lower inspection cover by unscrewing the 4+4 attachment screws, as shown in par. 2.2.3 (Fig. 120 and Fig. 121).
Remove the O-rings and replace them if necessary.
Remove the three pistons with a fork wrench, as shown in par. 2.2.3 (Fig. 122).
Remove the three spray-guards together with the O-rings (pos. ① and ②, Fig. 2).

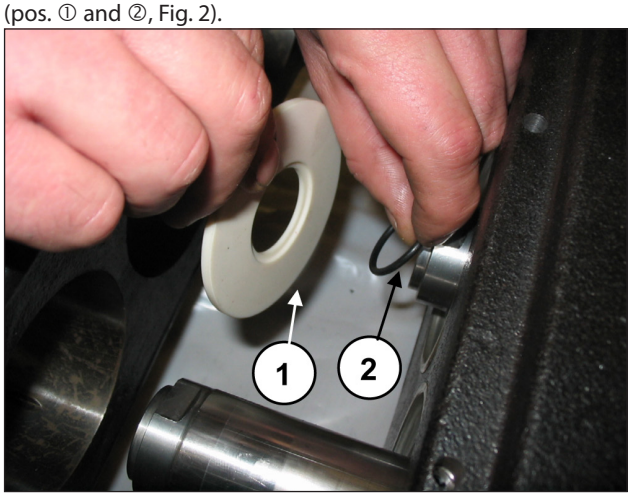


Fig. 2

Unscrew the M6 locking grub screws of the three oil seal covers (pos. ①, Fig. 3).

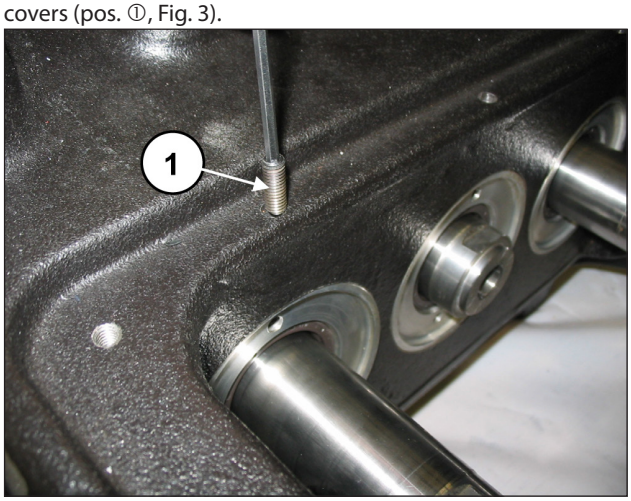


Fig. 3

Remove the oil seal covers, screwing in a threaded bar or an extractor M6 screw in the holes in the cover (pos. ①, Fig. 4) and remove the covers from the pump assembly (pos. ①, Fig. 5).

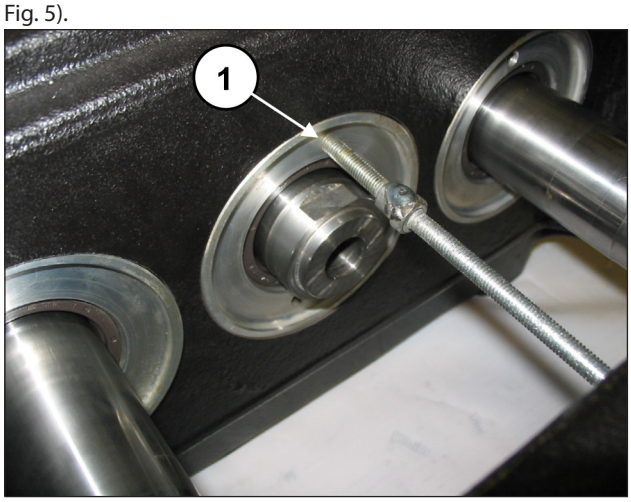


Fig. 4

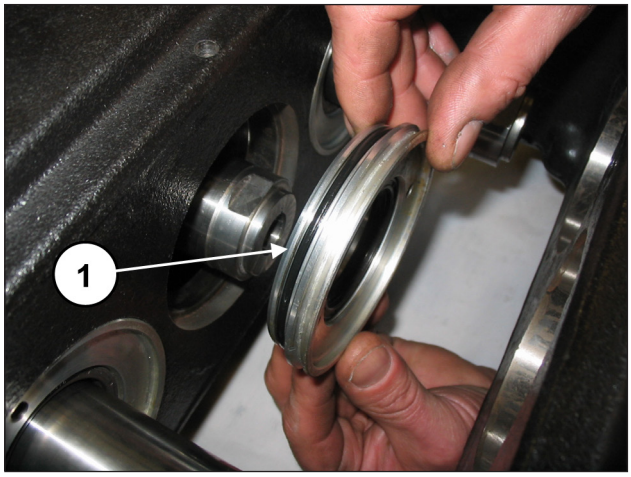


Fig. 5

Take out the radial seal ring (pos. ①, Fig. 6) and the outside O-ring (pos. ①, Fig. 7).

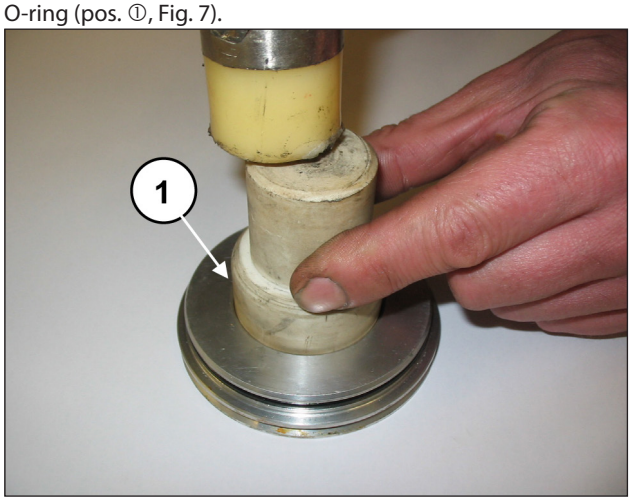


Fig. 6

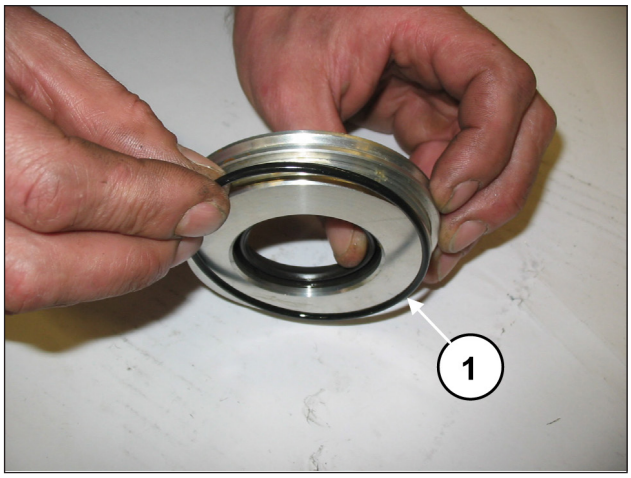


Fig. 7

Remove the tab from the PTO shaft (pos. ①, Fig. 8).

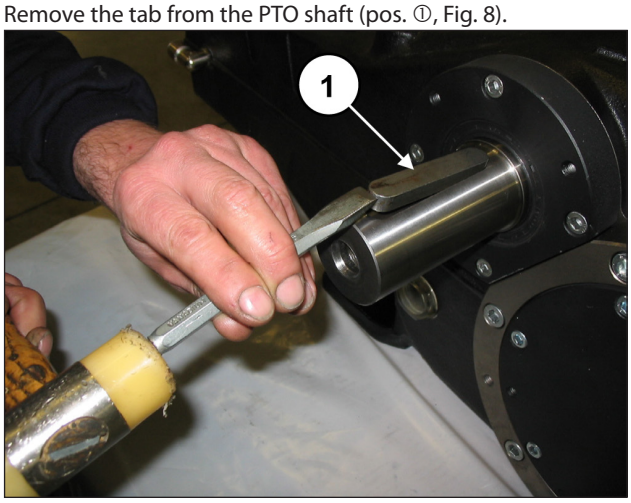


Fig. 8

Unscrew the attachment screws of the shaft end cover (pos. ①, Fig. 9) and take the cover off the PTO shaft.

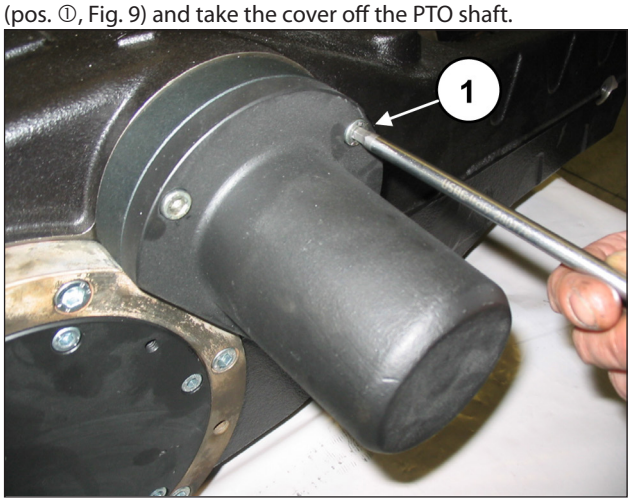


Fig. 9

Unscrew the casing cover attachment screws (pos. ①, Fig. 10) and remove it. Remove the O-ring and replace it if necessary.

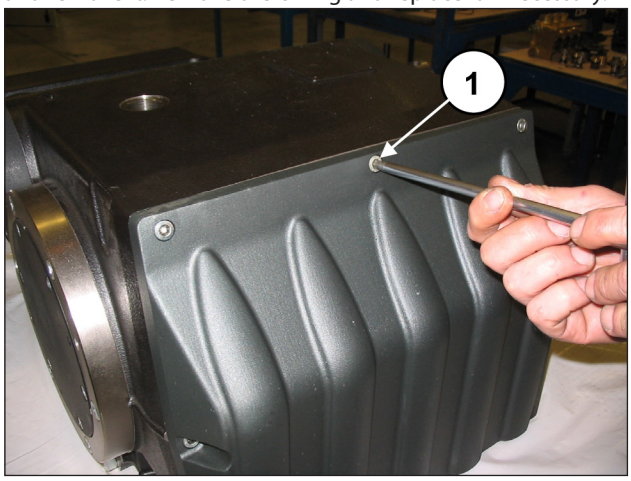


Fig. 10

Now remove the two bearing covers by unscrewing the screws (pos. ①, Fig. 11).
To help with their removal, use 2 x M8 grub screws or screws (pos. ①, Fig. 12) as extractors.
Remove the O-ring and replace it if necessary.

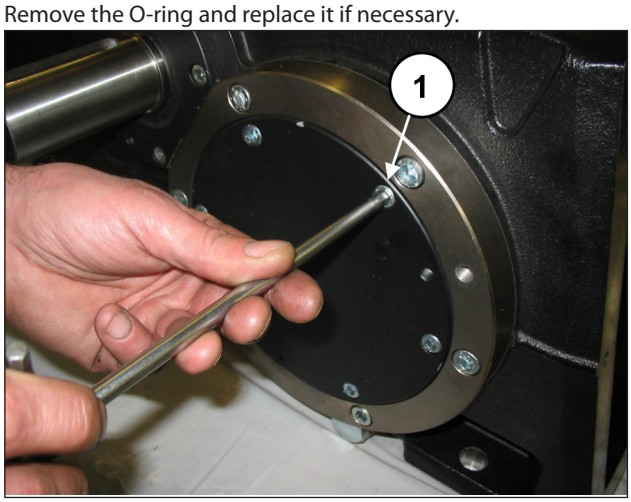


Fig. 11

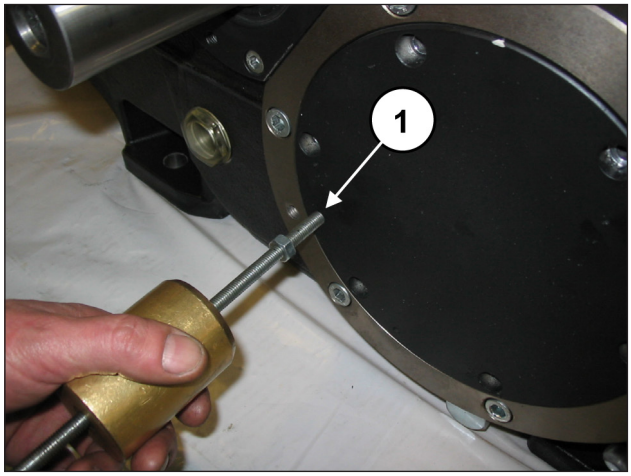


Fig. 12

Insert a shim under the shank of the central connecting rod, to stop the rotation of the bend shaft (pos. ①, Fig. 13).

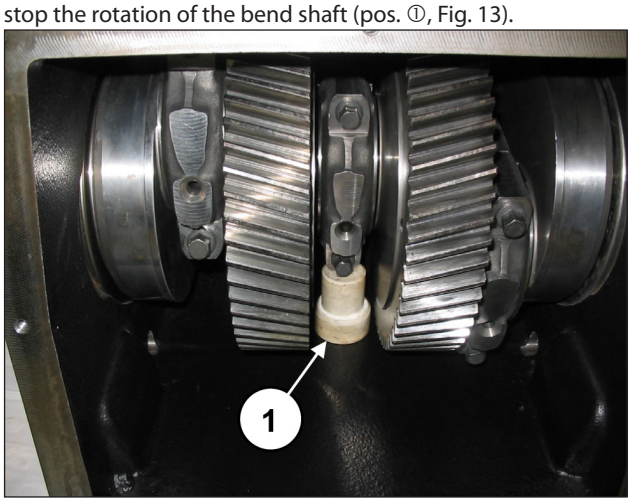


Fig. 13

Unscrew and take out the bush locking flange attachment screws, from both sides (pos. ①, Fig. 14).
The bush locking flanges must be left in position (pos. ①, Fig. 15).

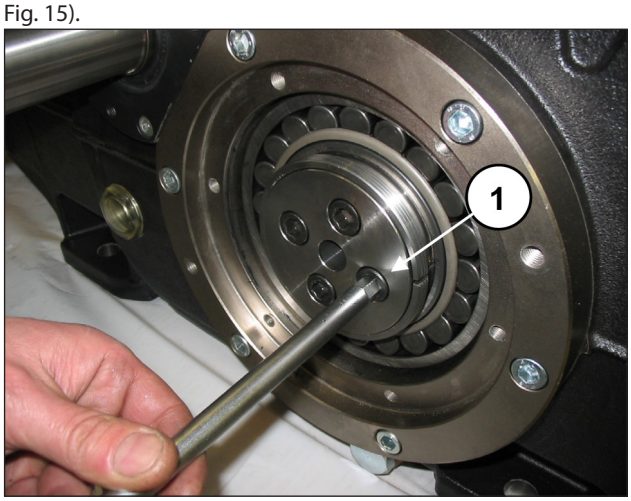


Fig. 14

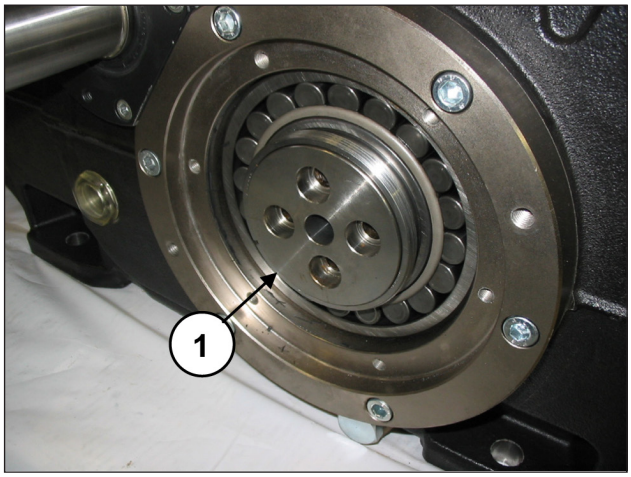


Fig. 15

On one side, screw a ring nut, type SKF KM20, onto the pressure bush (pos. ①, Fig. 16), and then unblock the bush using an extractor hammer (pos. ①, Fig. 17), but do not remove it.
Repeat the operation on the other side.

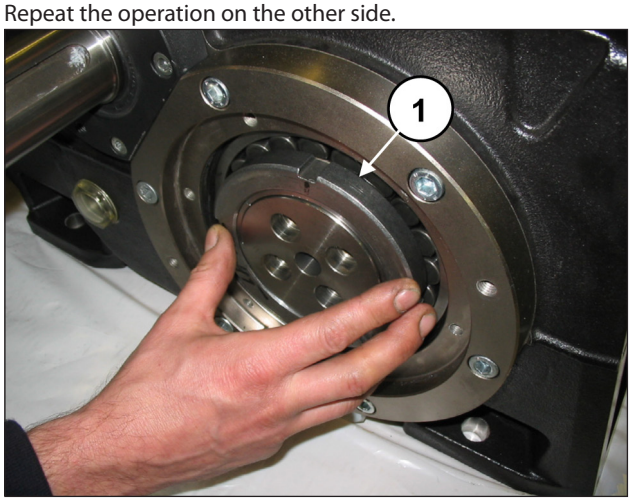


Fig. 16

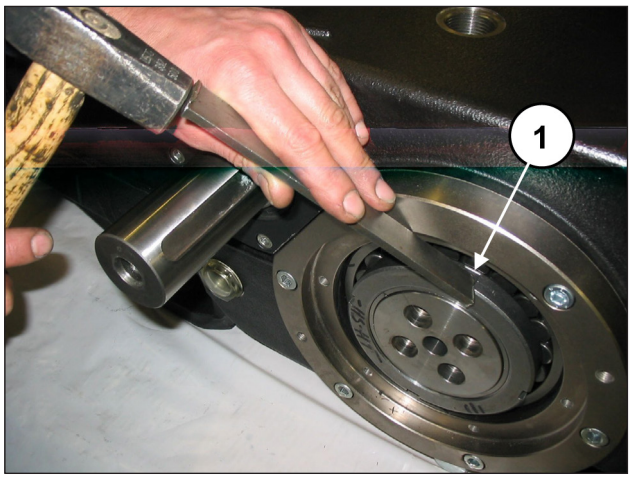


Fig. 17

Remove the shim from under the shank of the central connecting rod.
Unscrew the con-rod screws (pos. ①, Fig. 18).

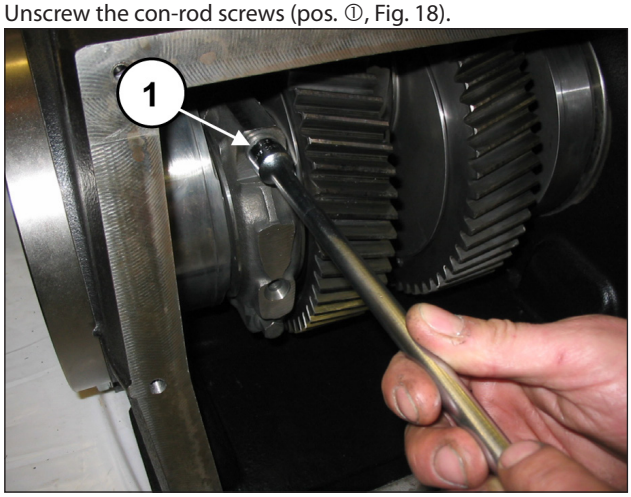
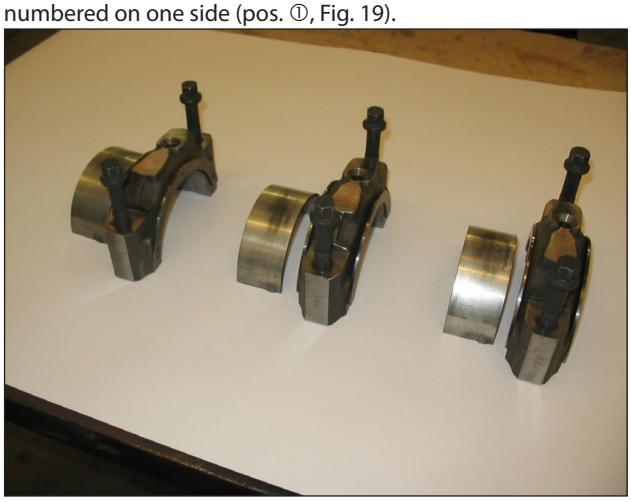


Fig. 18

Remove the con-rod caps with the semi-bearings, taking special care of the disassembly sequence during disassembly.

The con-rod caps and their relative half supports must be reassembled in exactly the same order and coupling with which they were disassembled.

To avoid possible errors, caps and half supports have been numbered on one side (pos. ①, Fig. 19).



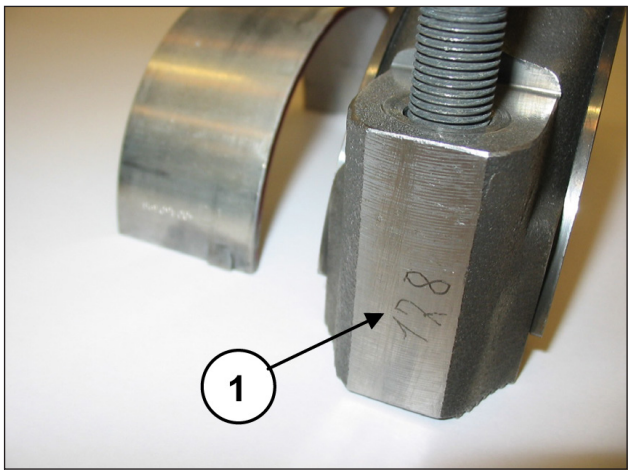


Fig. 19

Advance the three half supports as far as possible in the direction of the head.
Remove the three upper half-bearings of the half supports (pos. ①, Fig. 20).

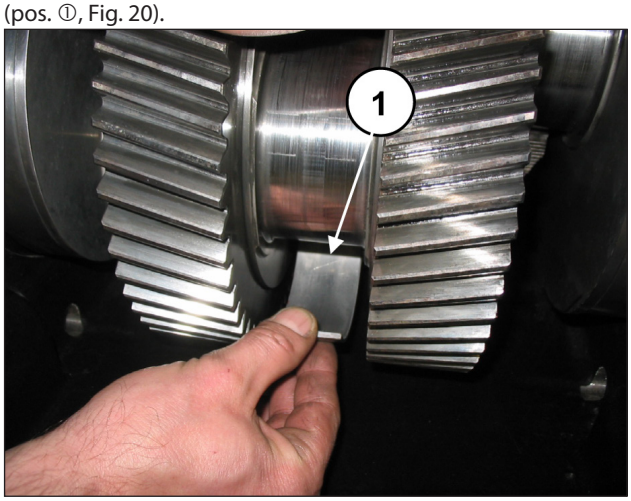


Fig. 20

Remove both pressure bushes (pos. ①, Fig. 21).

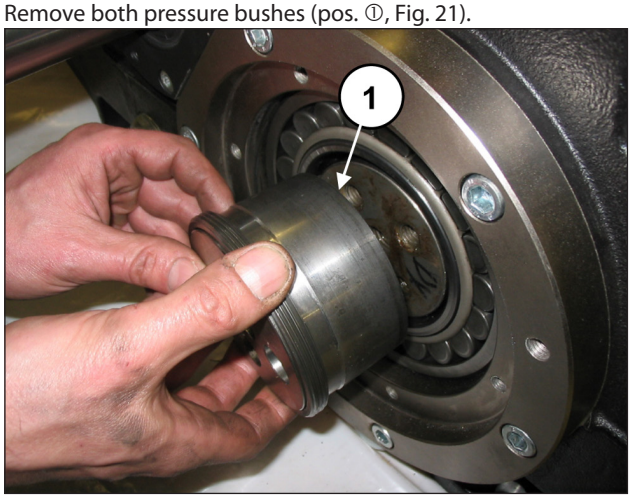


Fig. 21

Separate the bush locking flange from the pressure bush (pos. ①, Fig. 22).

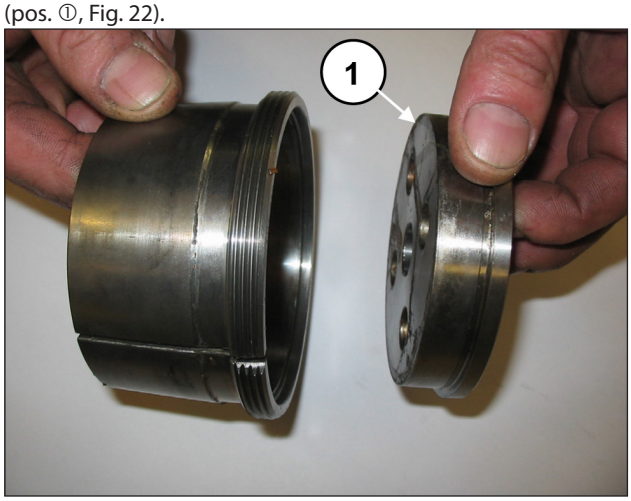


Fig. 22

Unscrew the screws of the two bearing support covers (pos. ①, Fig. 23).

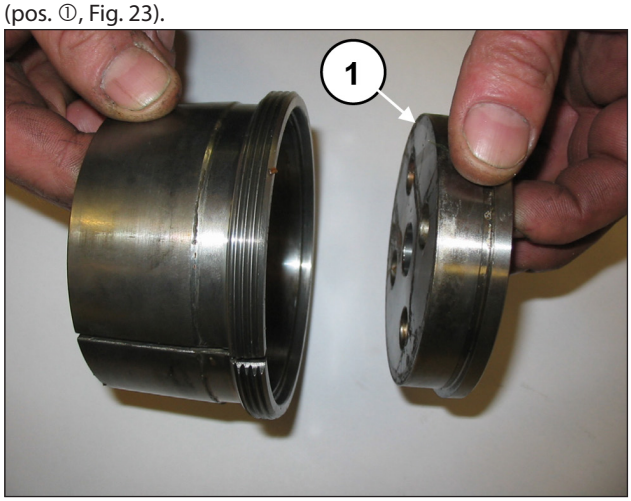


Fig. 23

Apply an M16 threaded pin to one end of the bend shaft (pos. ①, Fig. 24) and, while keeping it raised, take out the bearing support cover complete with bearing and O-ring (pos. ①, Fig. 25). To help with their removal, use 2 x M10 grub screws or screws (pos. ②, Fig. 24) as extractors.
Repeat the operation on the other side.

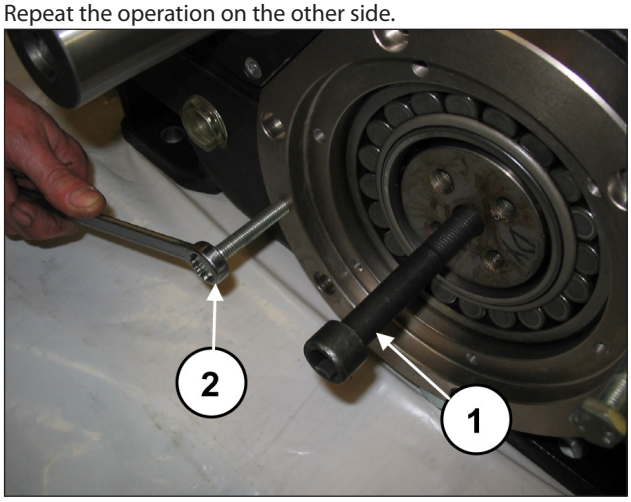


Fig. 24

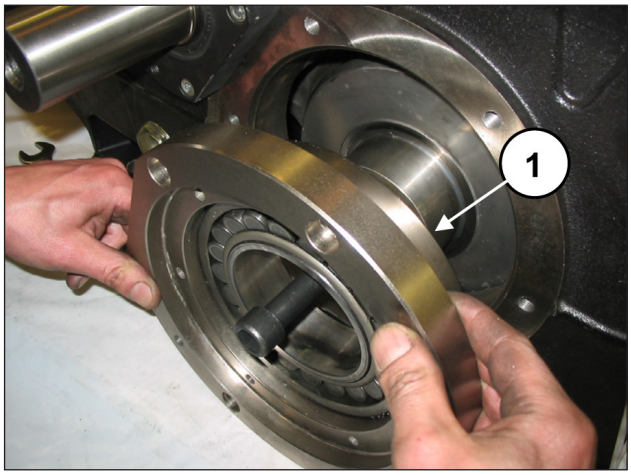


Fig. 25

Lay the bend shaft on the bottom of the casing.
Separate the bearing support cover from the bearing, using an extractor hammer (pos. ①, Fig. 26).

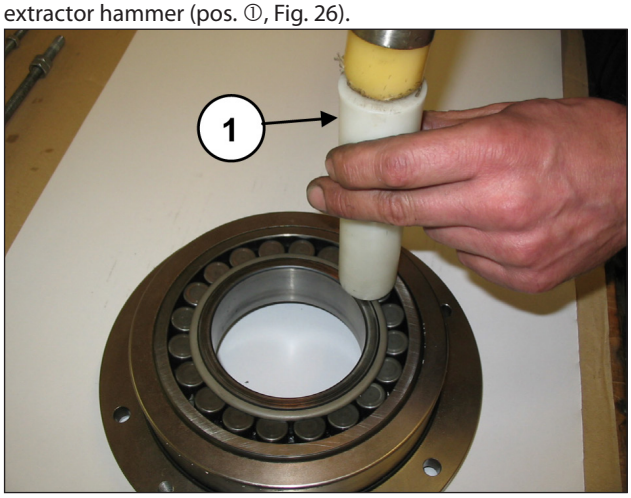


Fig. 26

Unscrew the attachment screws of the left and right PTO bearing cover (pos. ①, Fig. 27) and take the two covers off the PTO shaft. To help with their removal, use 3 x M8 grub screws or screws (pos. ①, Fig. 28) as extractors.

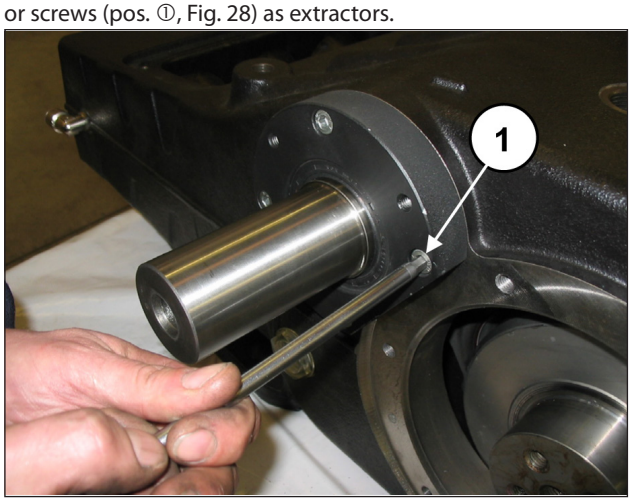


Fig. 27

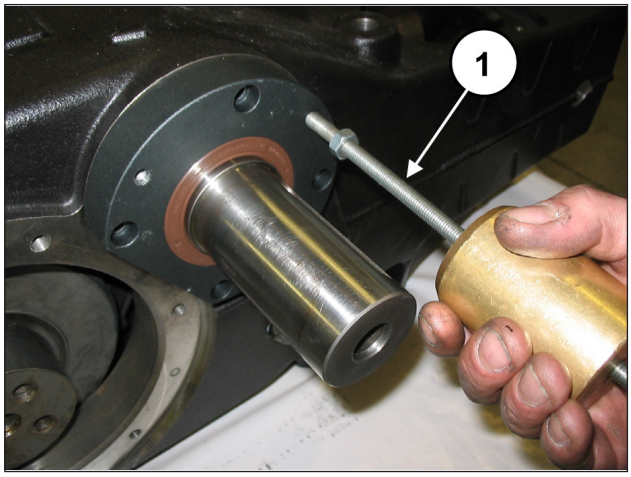


Fig. 28

Take out the radial seal ring (pos. ①, Fig. 29), the outside O-ring (pos. ①, Fig. 30) and the lubrication hole O-ring (pos. ①, Fig. 31).

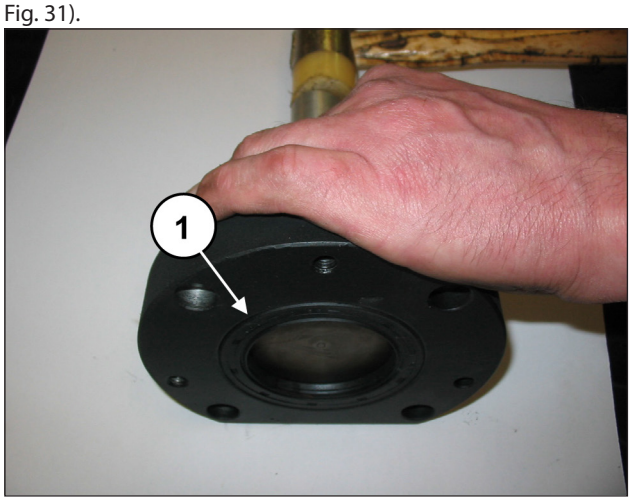


Fig. 29

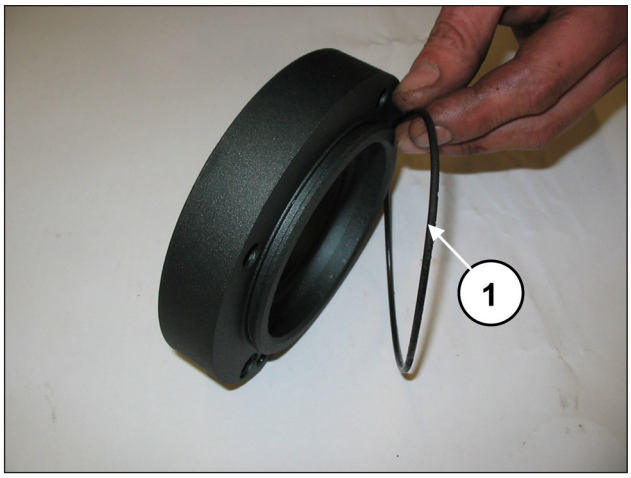


Fig. 30

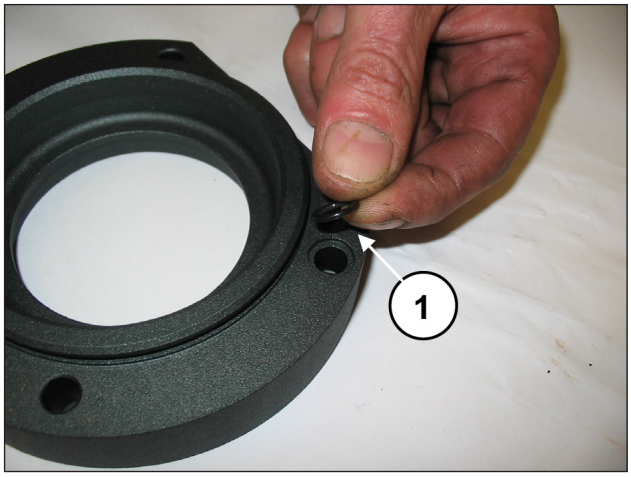


Fig. 31

Roll back the three connecting rods as far as possible (until they touch the bend shaft).
Using an extractor hammer (pos. ①, Fig. 32) take out the PTO shaft from either one of the two sides (pos. ①, Fig. 33).

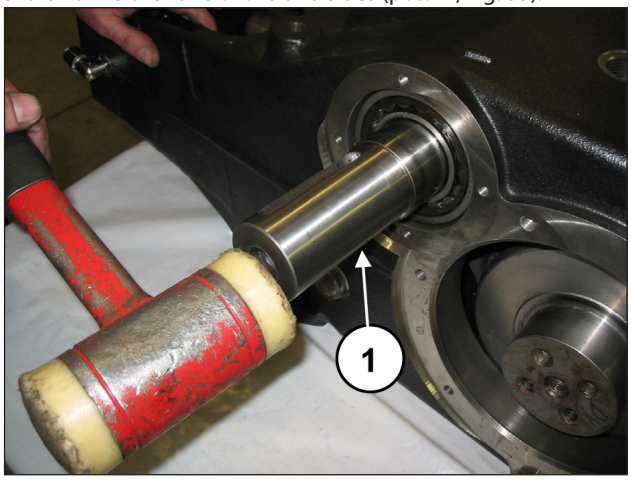


Fig. 32

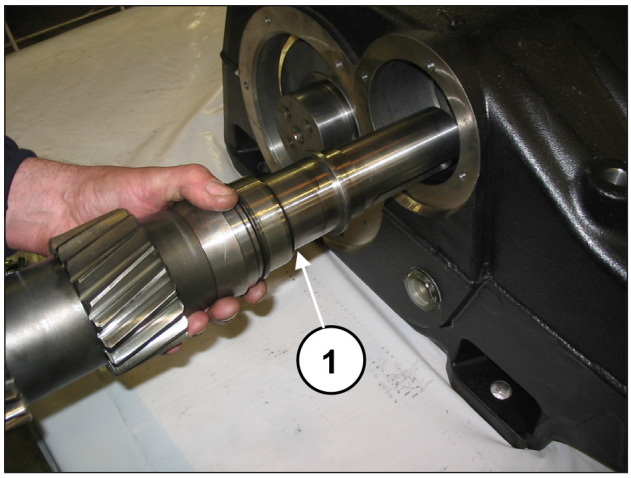


Fig. 33

Remove the internal bearing rings from the PTO shaft (pos. ①, Fig. 34) and also take out the two internal bearing spacers (pos. ②, Fig. 34).

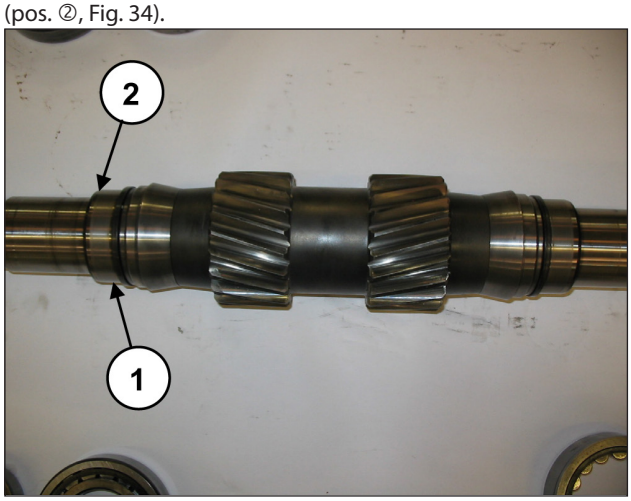


Fig. 34

The internal and external bearing rings must be reassembled in exactly the same order and pairings in which they were dismantled.

Using a sufficiently long bar (pos. ①, Fig. 36) and an extractor hammer, take the bearing rings out of the pump casing (pos. ①, Fig. 36), along with the external bearing spacer (pos. ①, Fig. 37) and the bearing lubrication bush (pos. ①, Fig. 38).

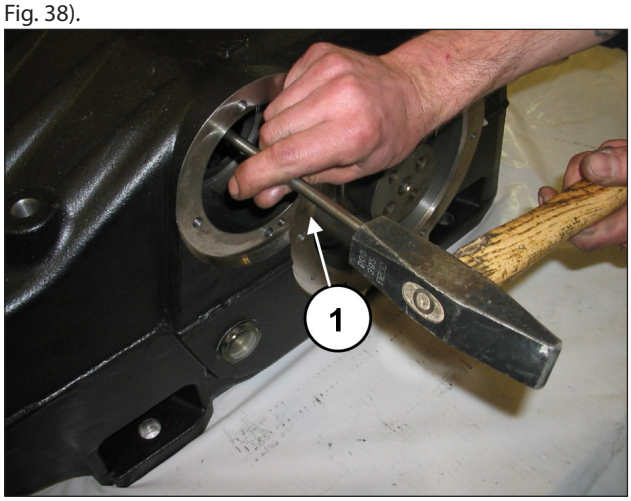


Fig. 35

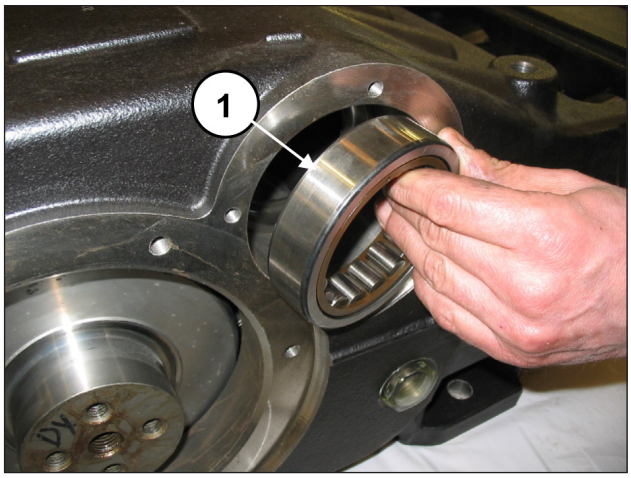


Fig. 36

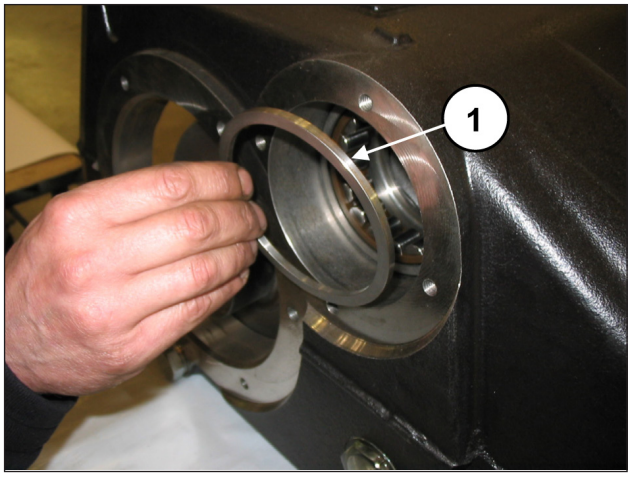


Fig. 37

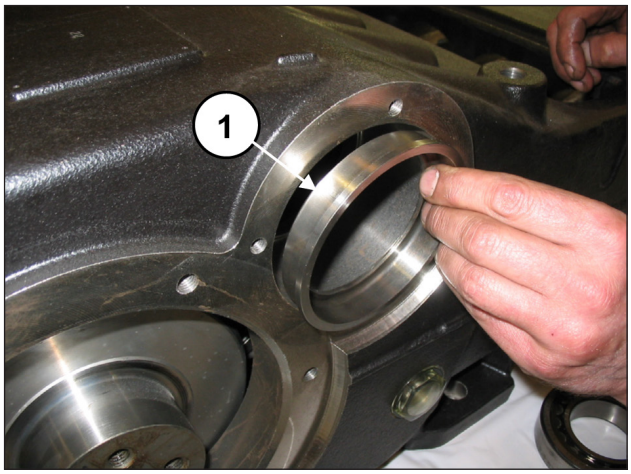


Fig. 38

Advance the half supports in the direction of the hydraulic part and lock them in place using the special tool (code 27566200) (pos. ①, Fig. 39).

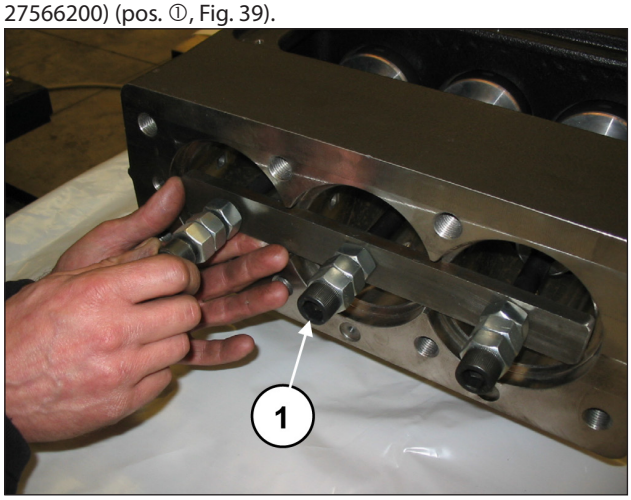


Fig. 39

Remove the bend shaft from the back of the casing (pos. ①pos. ①, Fig. 40).

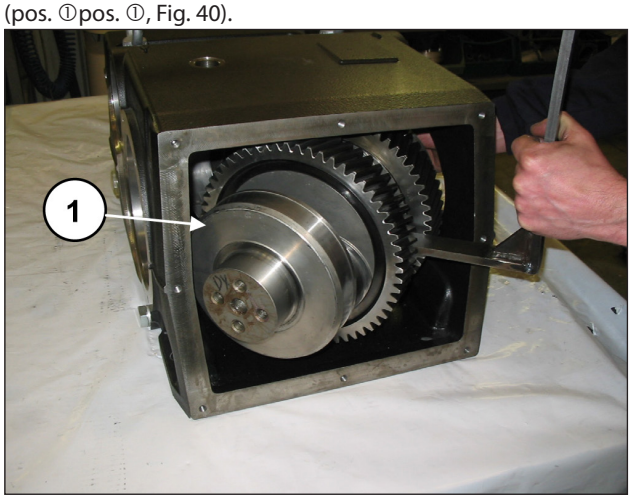


Fig. 40

Unscrew the screws with tool code 27566200 to unlock the con-rods (pos. ①, Fig. 41) and then extract the con-rod-piston guide units from the back casing opening (pos. ①, Fig. 42).

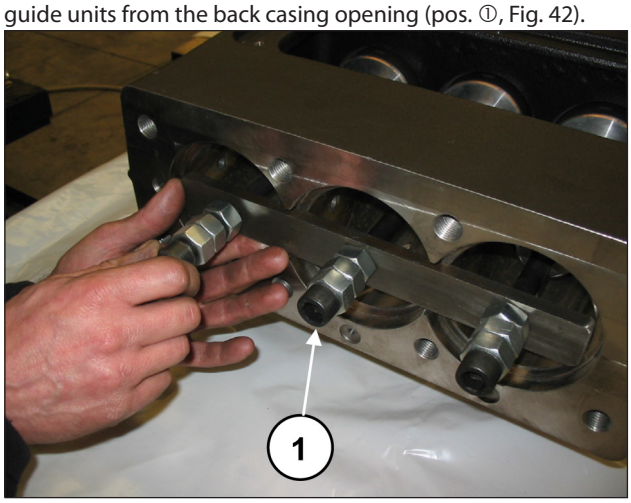


Fig. 41

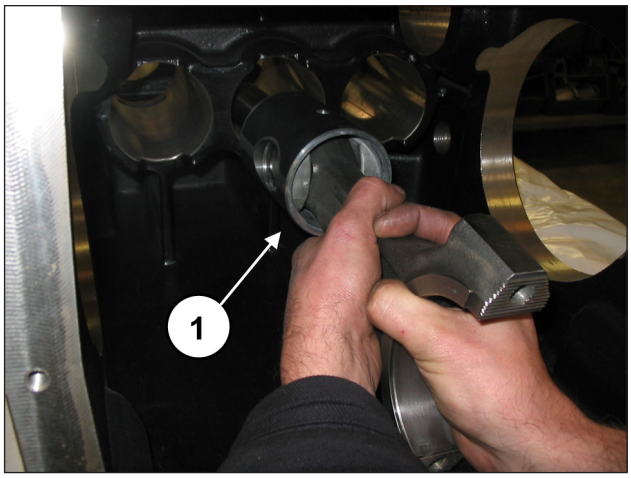
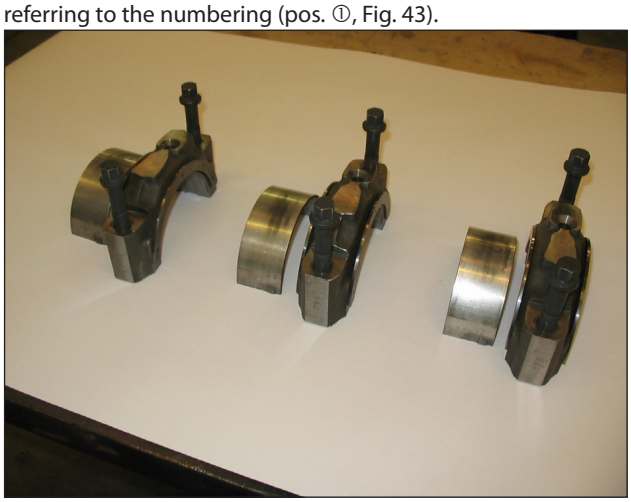


Fig. 42

Couple the half supports to the previously disassembled caps, referring to the numbering (pos. ①, Fig. 43).



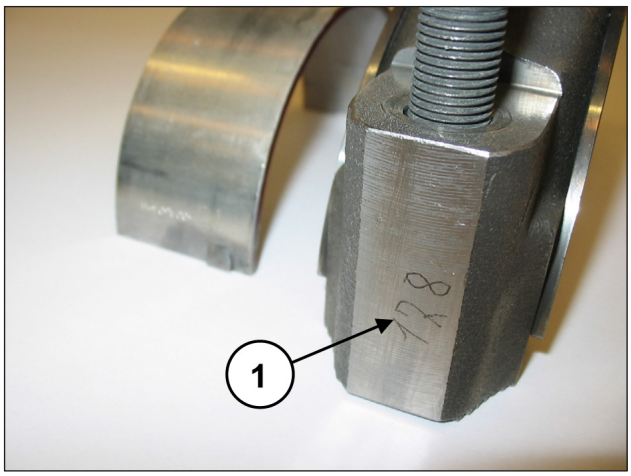


Fig. 43

Remove the two spindle locking Seeger rings using a special tool (pos. ①, Fig. 44).

Fig. 44

Remove the spindle (pos. ①, Fig. 45) and extract the con-rod (pos. ①, Fig. 46).

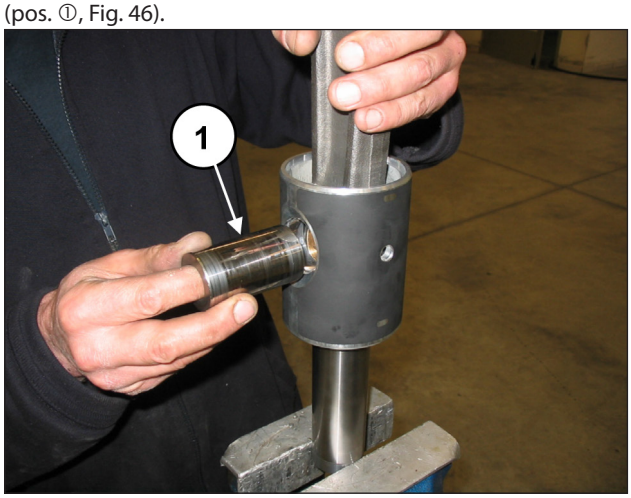


Fig. 45

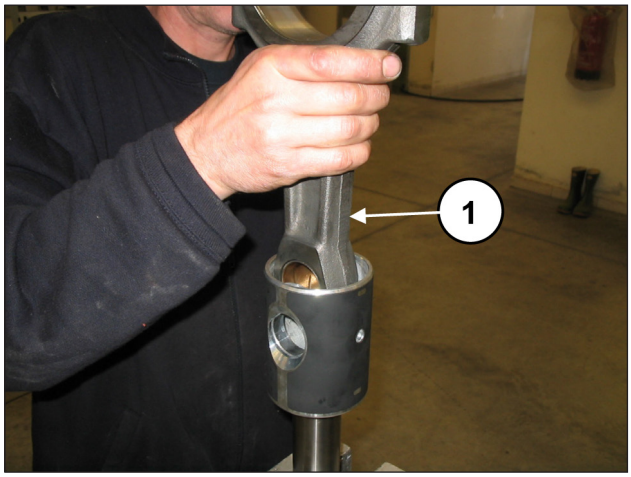


Fig. 46

To separate the rod from the piston guide, unscrew the hexagonal head M6 screws with a special wrench (pos. ①, Fig. 47).

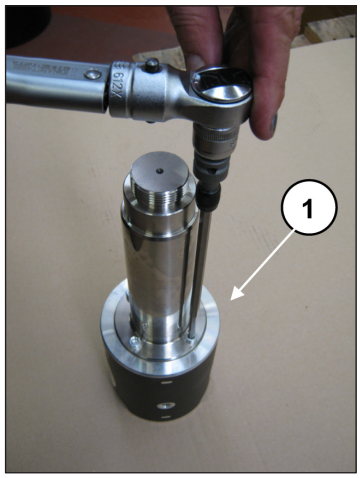


Fig. 47

Complete the disassembly of the mechanical part by removing the oil level indicators, the eyebolts and the 90° quick coupler.

2.1.2 Assembly of mechanical parts

Proceed with assembly following the reverse order indicated in par. 2.1.1.
The correct sequence is as follows:
Attach the two oil level indicators, the two oil drain plugs and the 90° quick coupler (pos. ①, ② and ③ Fig. 48).

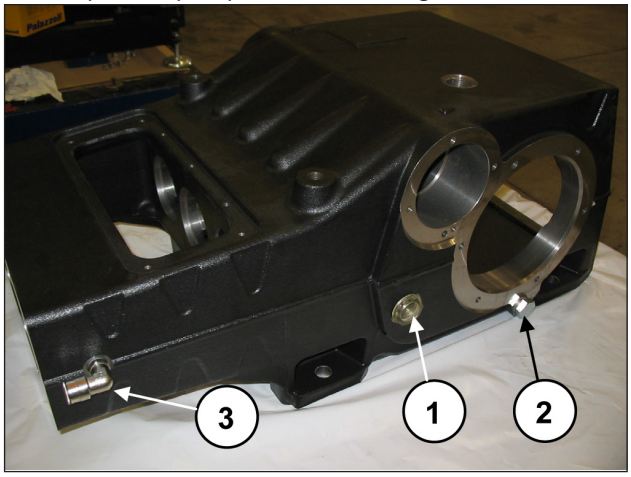


Fig. 48

Assemble the red to the piston guide.
Insert the piston guide rod into its seat on the piston guide (pos. ①, Fig. 49) and join the rod to the piston guide by means of the 4 M6x20 screws (pos. ①, Fig. 50).

Fig. 49

Fig. 50

Lock the piston guide in a vice with the aid of a special tool and calibrate the screws with a torque wrench (pos. ①, Fig. 51) as indicated in chapter 3.

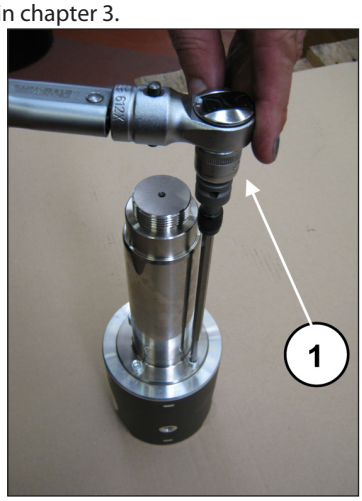


Fig. 51

Insert the con-rod in the piston guide (pos. ①, Fig. 46) and then insert the spindle (pos. ①, Fig. 45). Fit on the two Seeger rings with the special tool (pos. ①, Fig. 44).
Separate the caps from the half supports. Proper coupling can be verified by the numbering on the side (pos. ①, Fig. 43).
After having checked casing cleaning, proceed with assembly of half support-piston guide unit inside casing rods (pos. ①, Fig. 42).

Insertion of the half support-piston guide unit in the casing must be made with the half bearings set in the direction in which numbers are visible from above.

Block the three units with the use of special tool code 27566200 (pos. ①, Fig. 41).
Insert the bend shaft through the rear opening of the casing and lay it on the bottom.

The bend shaft must be inserted into the casing so that the teeth on the ring gears are oriented as shown in Fig. 52.

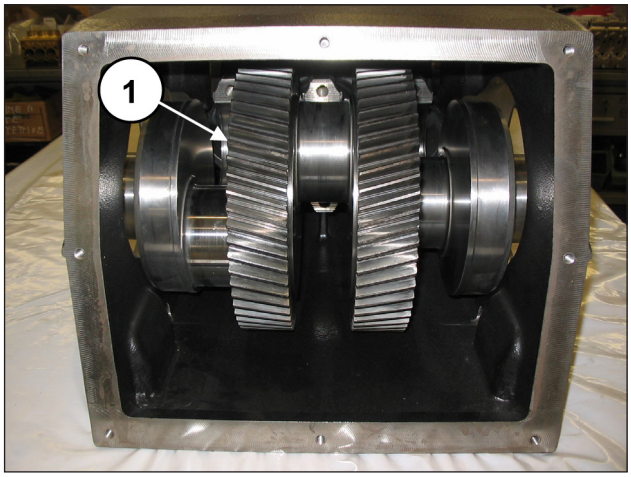


Fig. 52

Pre-assemble the PTO shaft:
Onto the PTO shaft, slip on the 2 internal rings of the bearings (one per side) (pos. ①, Fig. 53).

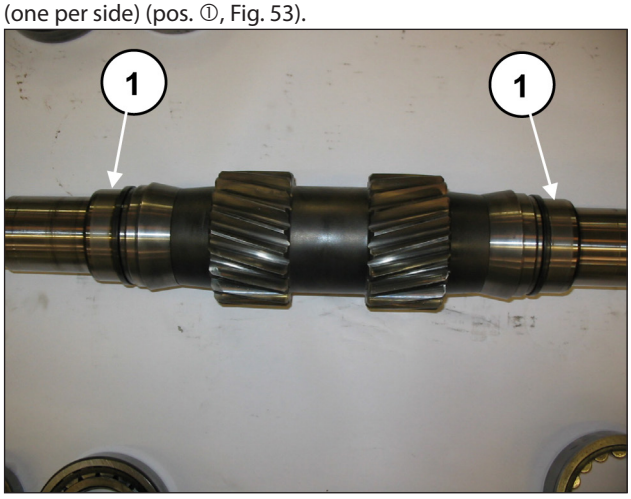


Fig. 53

The internal and external bearing rings must be reassembled in exactly the same order and pairings in which they were dismantled.

From one side of the casing, insert the bearing lubrication bush (pos. ①, Fig. 54) and an external bearing ring (pos. ①, Fig. 55) using a buffer and an extractor hammer.

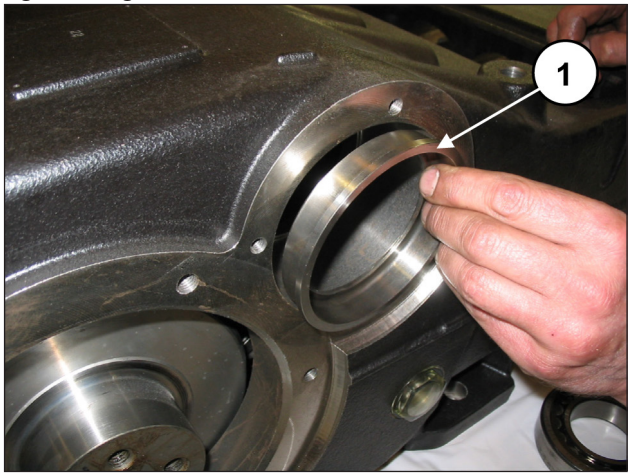


Fig. 54

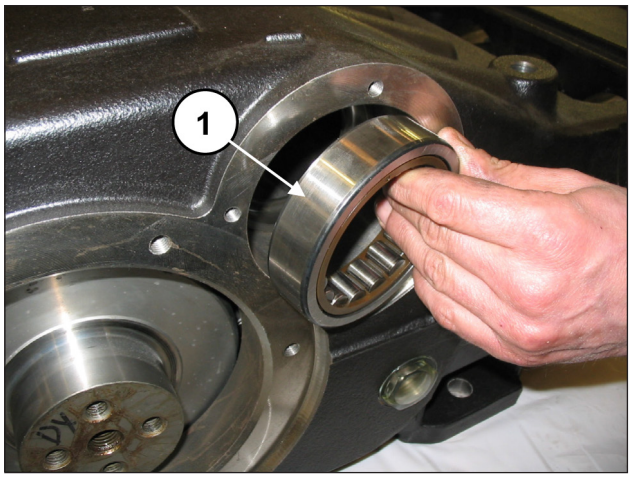


Fig. 55

Remove the tool for blocking the con-rods code 27566200 (pos. ①, Fig. 41) and roll back the connecting rods until they touch the bend shaft.
Insert the pre-assembled PTO shaft into the casing (pos. ①, Fig. 56). Insert it from the other side to the side where the external bearing ring and the bearing lubrication bush were inserted.

The PTO shaft must be inserted into the casing so that the teeth are oriented as shown in Fig. 56.

It is easier to insert the PTO shaft completely inside the bearing by applying an M16 screw to the end of the shaft being inserted, to keep the shaft lifted up (pos. ①, Fig. 57).

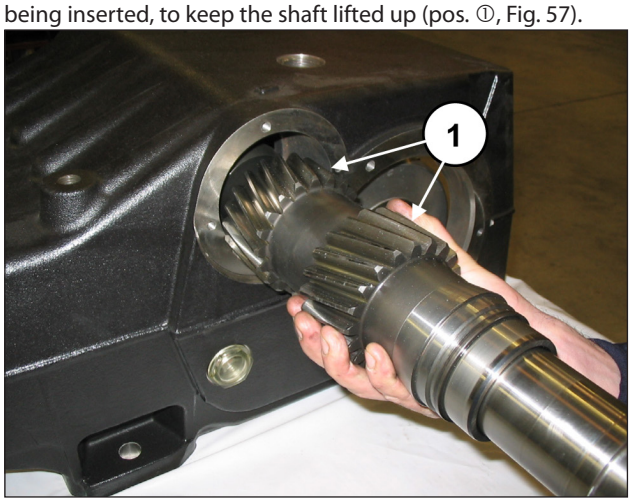


Fig. 56

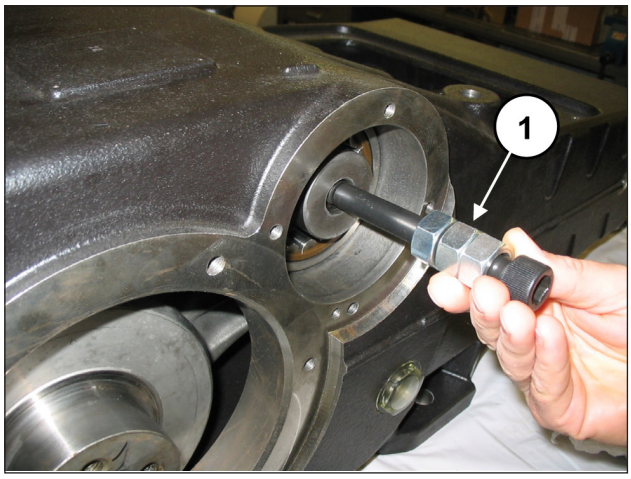


Fig. 57

From the side of the casing where the PTO shaft was inserted, proceed to insert the bearing lubrication bush (pos. ①, Fig. 58) and an external bearing ring (pos. ①, Fig. 59) using a buffer and an extractor hammer.

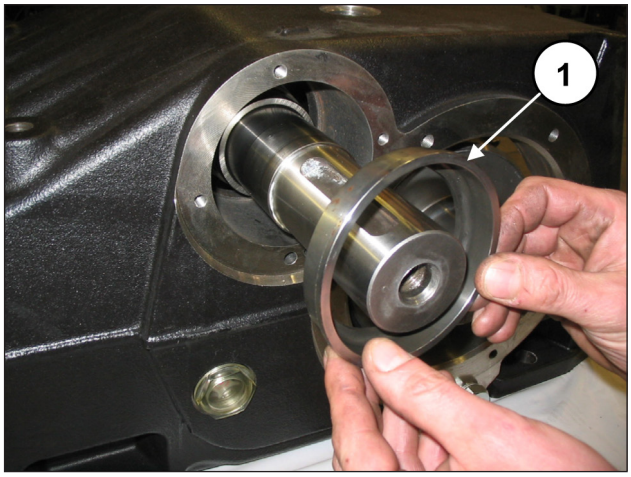


Fig. 58

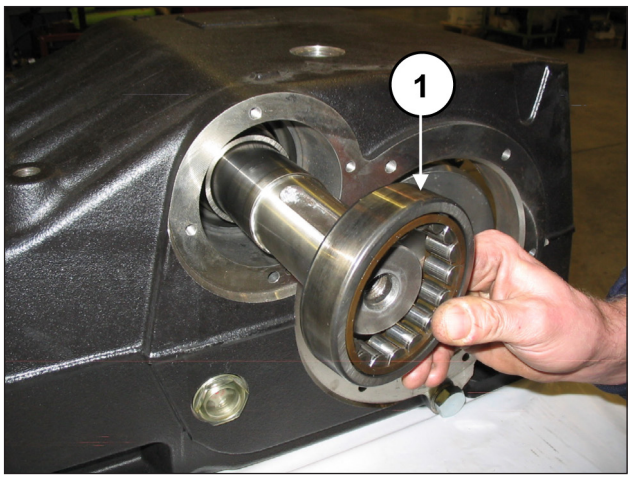


Fig. 59

At both sides, insert the internal bearing spacers (pos. ①, Fig. 60) and the external bearing spacers (pos. ①, Fig. 61).

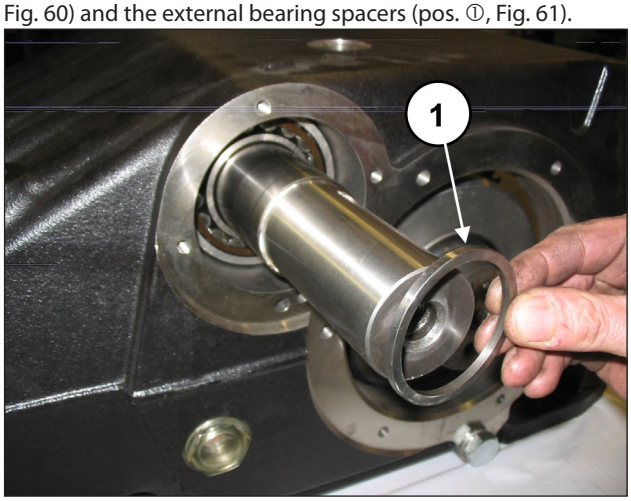


Fig. 60

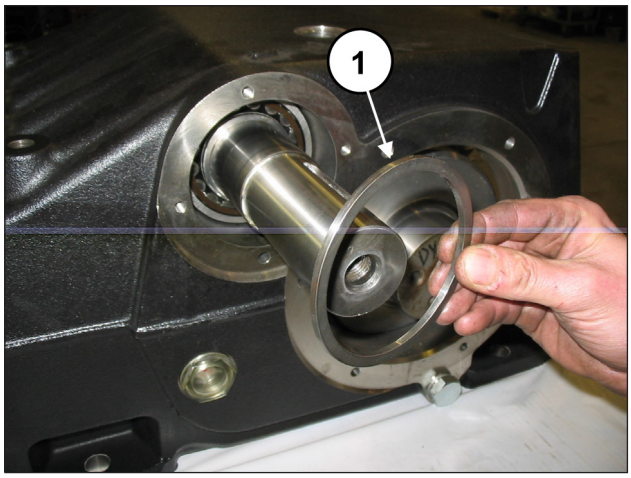


Fig. 61

Insert the internal ring (pos. ①, Fig. 62) and external ring (pos. ①, Fig. 63) of a bearing from one side of the pump only.

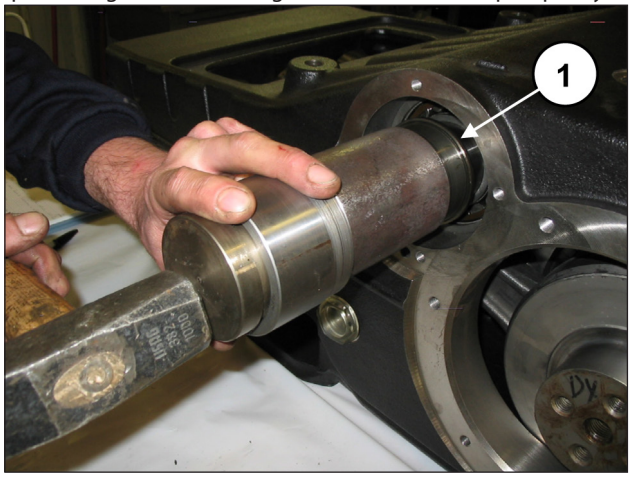


Fig. 62

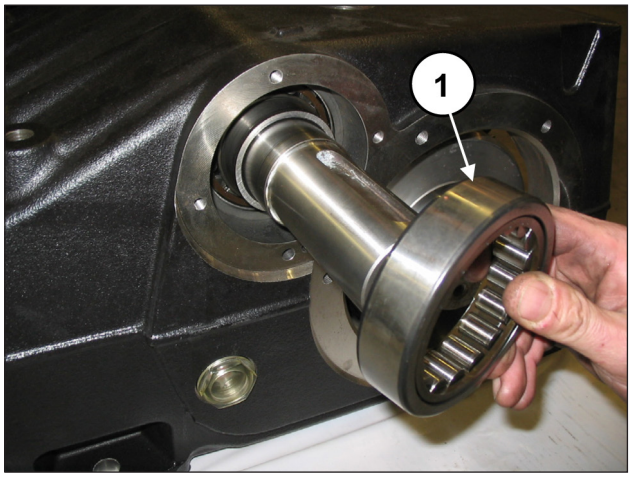


Fig. 63

Pre-assemble the left and right PTO bearing covers:

Insert the radial seal ring into the PTO bearing cover using the tool code 27539500 (pos. ①, Fig. 64).
Before proceeding with the assembly of the radial seal ring, verify the condition of the seal lip. If it is necessary to replace it, position the new ring as shown in Fig. 65.

If the PTO shaft shows diameter wear corresponding to the seal lip, then to avoid grinding you can position the ring as a second step as shown in Fig. 65.

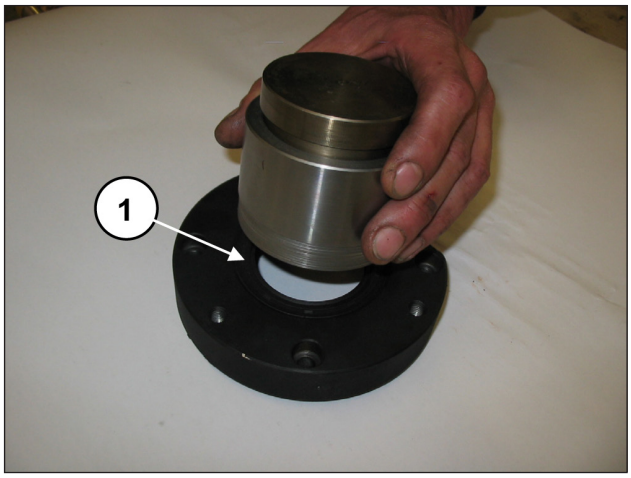


Fig. 64

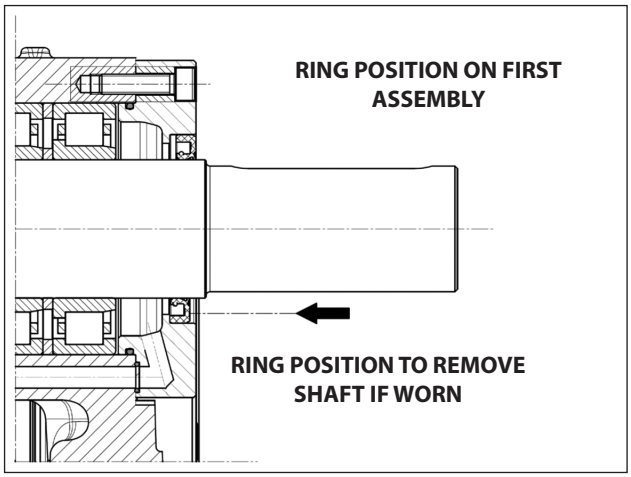


Fig. 65

Apply to the PTO bearing covers: the external O-ring (pos. ①, Fig. 66) and the lubrication hole O-ring (pos. ①, Fig. 67).

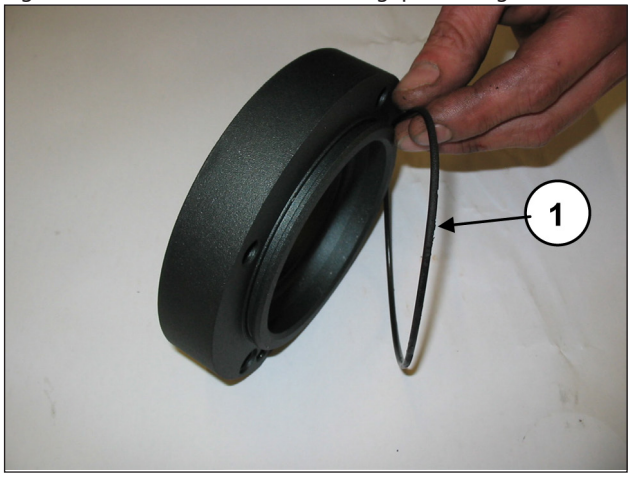


Fig. 66

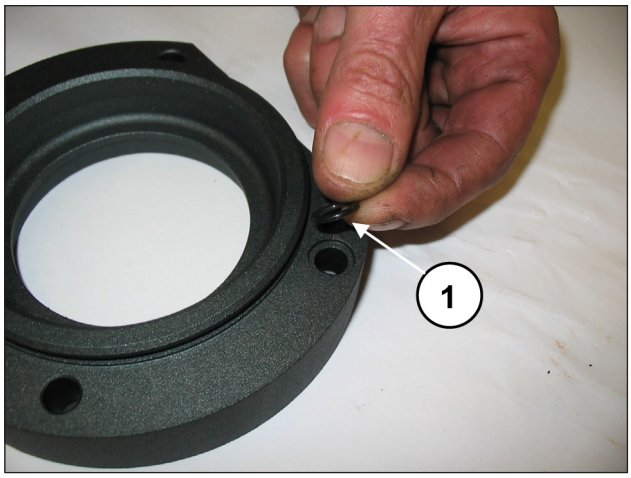


Fig. 67

Mount one of the PTO bearing covers (left or right) on the pump casing (pos. ①, Fig. 68) and fasten it with 4 M8x30 screws (pos. ①, Fig. 69).

Pay attention to the direction of assembly of the cover. The lubrication hole in the cover must correspond to the hole in the casing.

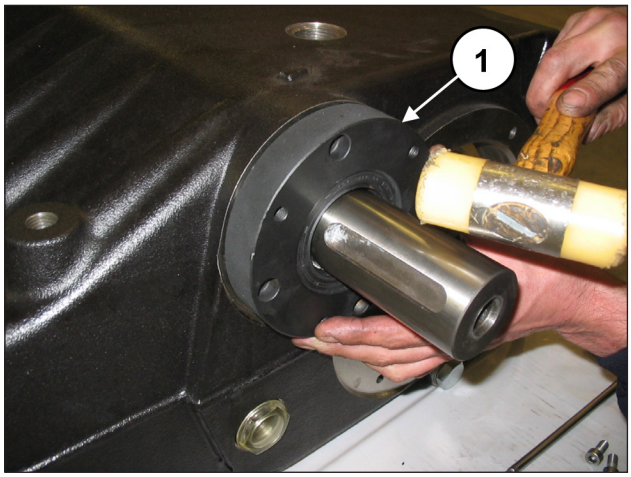


Fig. 68

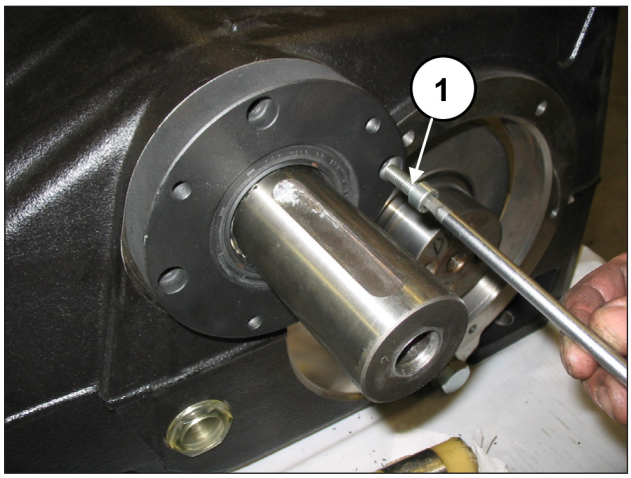


Fig. 69

Repeat the operation on the other side:
Insert the internal ring (pos. ①, Fig. 62) and external ring (pos. ①, Fig. 63) of the last bearing.
Mount the missing PTO bearing cover on the pump casing (pos. ①, Fig. 68) and fasten it with 4 M8x30 screws (pos. ①, Fig. 69).
Calibrate the 4+4 screws with a torque wrench, as shown in chapter 3.
Pre-assemble the two bearing support covers:

Insert the bearing using an extractor hammer (pos. ①, Fig. 70) until 4 to 4.5 mm of the bearing is still protruding, as shown in Fig. 71.

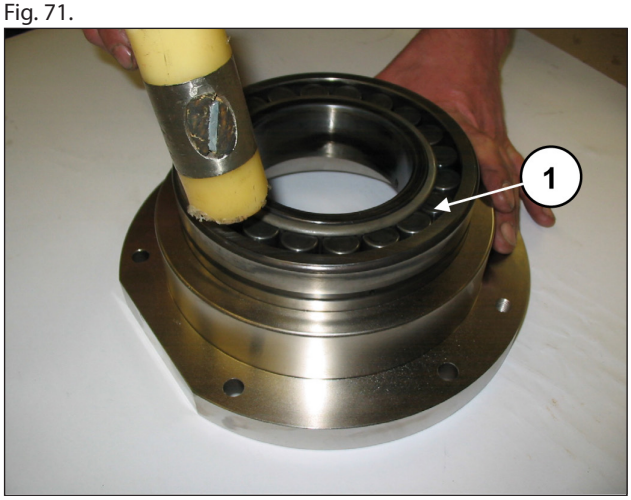


Fig. 70

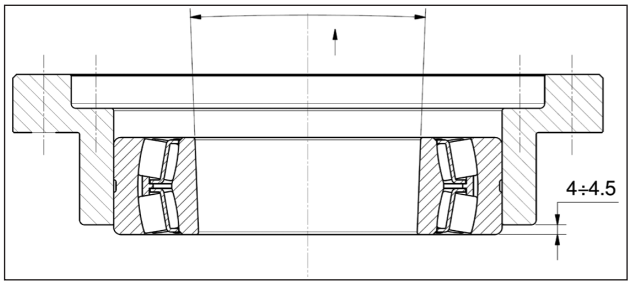


Fig. 71

The bearing in Fig. 71 has a tapered internal ring. Check that the taper goes from the outside inwards to allow inserting the bush.

Apply the O-ring to the outside of the bearing support cover (pos. ①, Fig. 72).

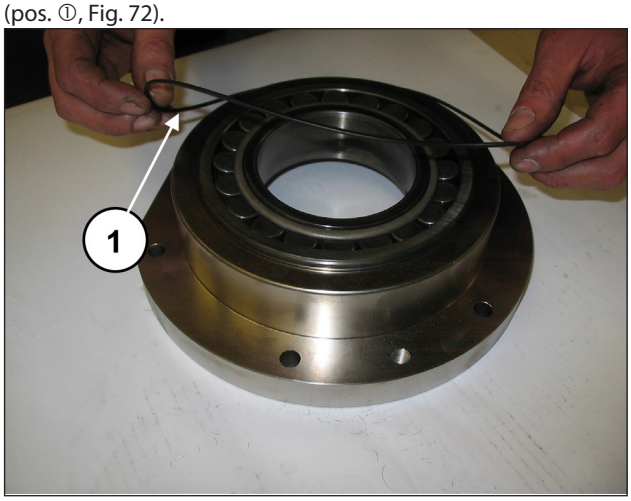


Fig. 72

Repeat the operation with the other cover.
Lock the three connecting rod assemblies, using the special tool code 27566200 (pos. ①, Fig. 41).

Apply two M16 threaded pins to the end of the crankshaft and, while keeping it raised (pos. ①, Fig. 73), insert the bearing support cover complete with bearing and O-ring (pos. ①, Fig. 74) using an extractor hammer. Repeat the operation on the other side

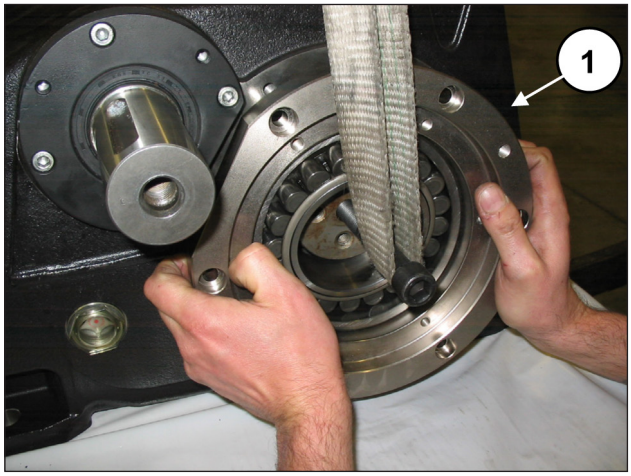


Fig. 73

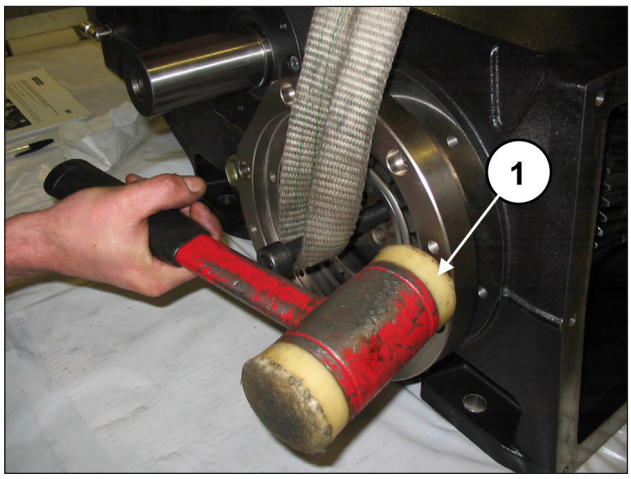


Fig. 74

Fasten the bearing support covers with 6+6 x M10x30 screws (pos. ①, Fig. 75).
Calibrate the screws with a torque wrench as indicated in chapter 3.

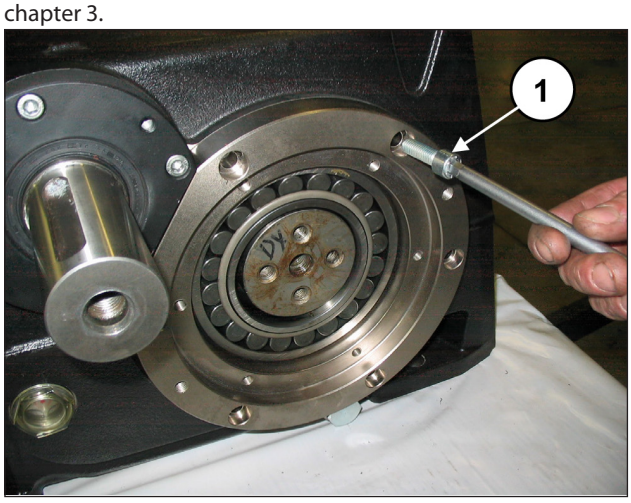


Fig. 75

Partly insert the two pressure bushes, keeping the bend shaft lifted up by means of the previously-mounted M16 pin (pos. ①, Fig. 76).

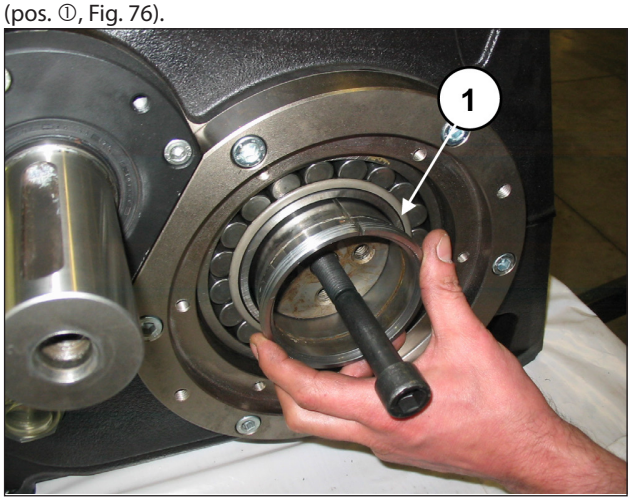


Fig. 76

Insert the pressure bush completely onto the bend shaft (pos. ①, Fig. 77 and Fig. 78) using an extractor hammer and a buffer.

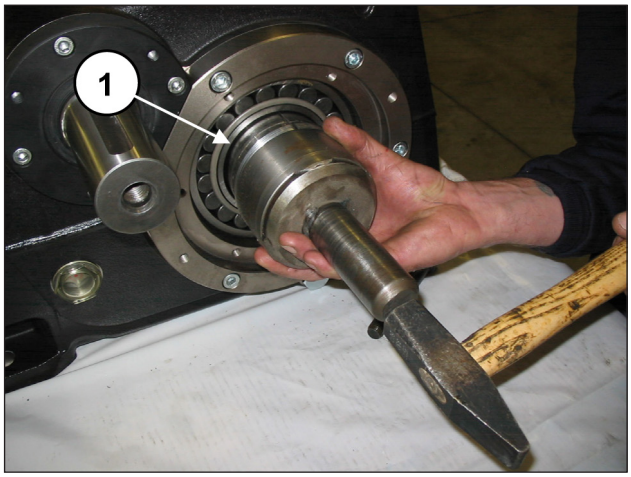


Fig. 77

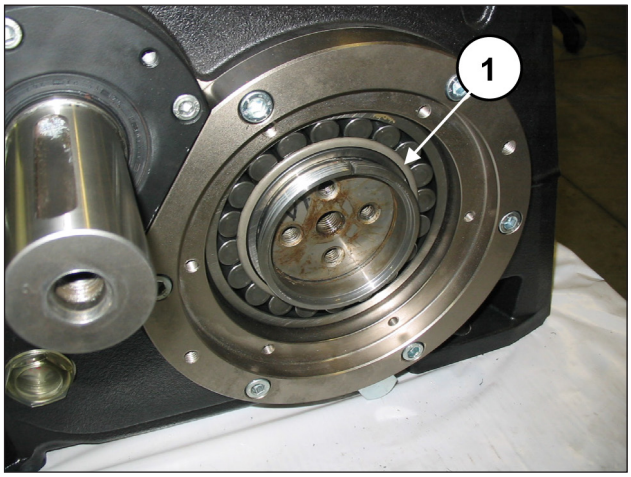


Fig. 78

The pressure bush must be inserted dry (no lubricant oils).

Insert the bush until the outside (conical) surface perfectly couples with the inside of the bearing. During insertion, make sure that the bearing stays in contact with the bend shaft shoulder.
Repeat the operation on the other side.

Insert the bush locking flanges into the conical bushes (pos. ①, Fig. 79).
Apply a sufficiently long (35-40 mm) M16 screw to the M16 hole on the bend shaft and screw it in, until the flange is touching the bush (pos. ①, Fig. 80). Do not tighten the screw.

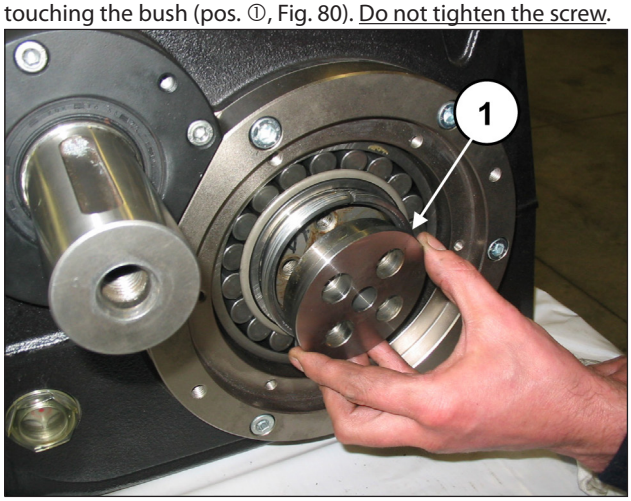


Fig. 79

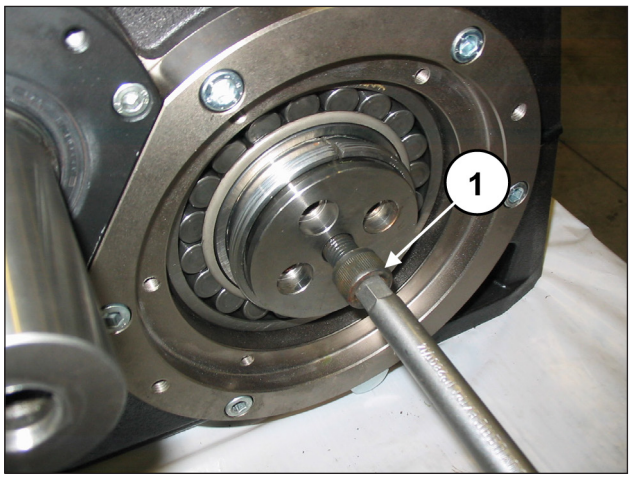


Fig. 80

Repeat the operation on the other side.
Remove the tool for blocking the con-rods code 27566200 (pos. ①, Fig. 41).
Insert the upper half-bearings between the con-rods and the bend shaft (pos. ①, Fig. 81).

For proper assembly of the half-bearings, ensure that the reference tab on the half-bearings are positioned in their housing on the half support (pos. ①, Fig. 82).

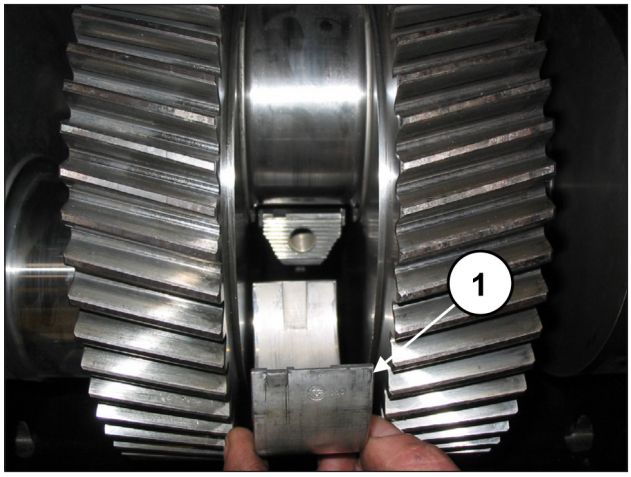


Fig. 81

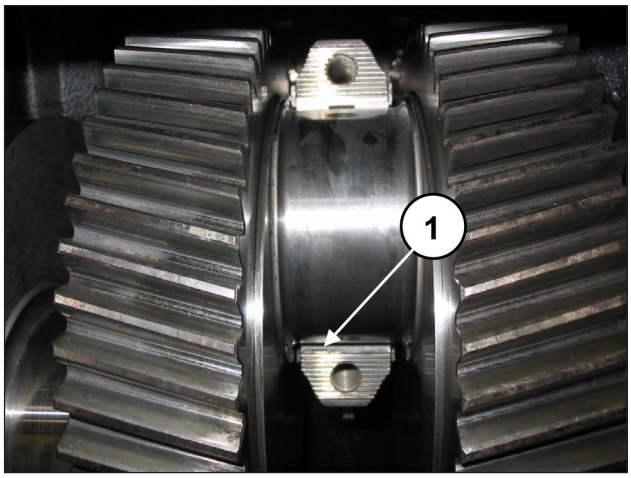


Fig. 82

Apply the lower half-bearings to the caps (pos. ①, Fig. 83) ensuring that the half-bearing reference notches are positioned in their housing on the cap (pos. ②, Fig. 83).
Fasten the caps to the half supports by means of M12x1.25x87 screws (pos. ①, Fig. 84).
Calibrate the screws with a torque wrench as indicated in chapter 3 bringing the screws to tightening torque at the same time.

Note the correct assembly direction of the caps. Numbering must be turned upward.

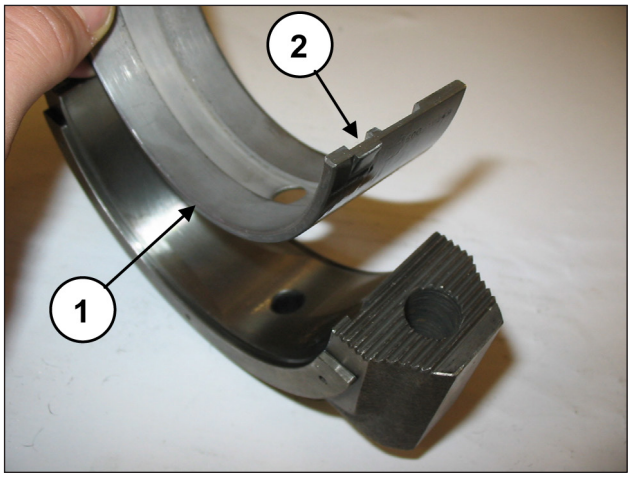


Fig. 83

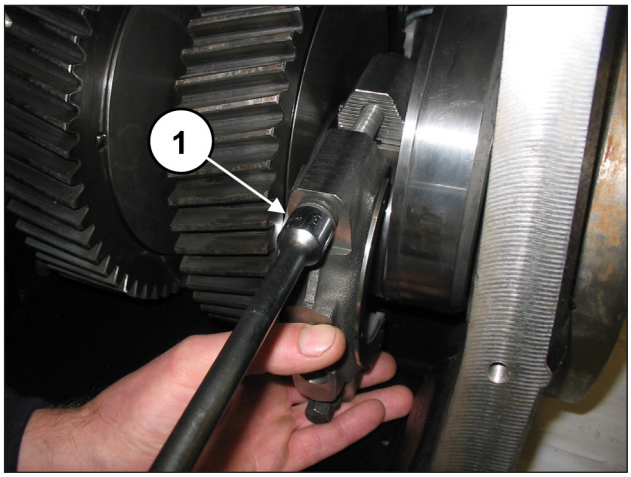


Fig. 84

Insert a shim under the shank of the central connecting rod, to stop the rotation of the bend shaft (pos. ①, Fig. 85).

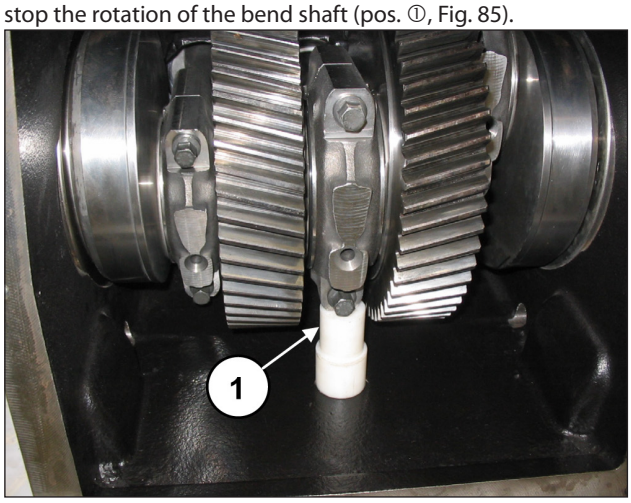


Fig. 85

Measure the distance X indicated in Fig. 86 between the conical bush and the bend shaft bearing.

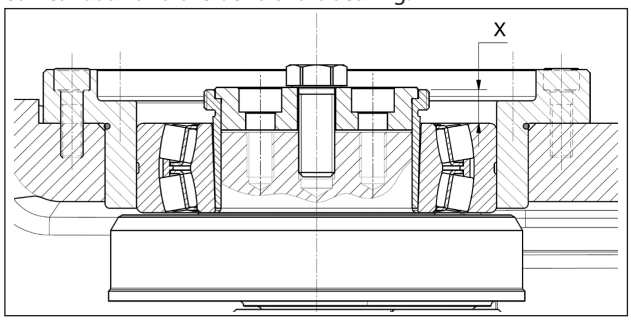


Fig. 86

Screw in the M16 screw until there is a reduction in the distance X of between 0.7 mm and 0.8 mm (Fig. 87).

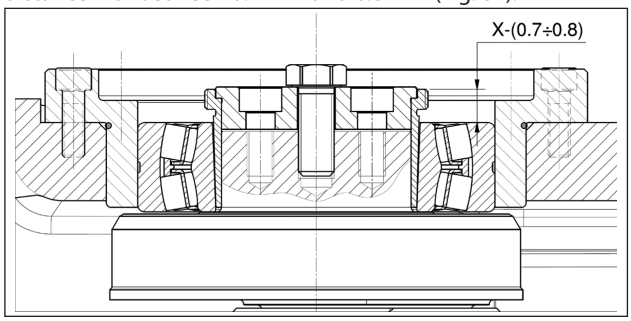


Fig. 87

Repeat the operation on the other side.
Remove the M16 screw from the bend shaft.

Screw the two bush locking flanges onto the crankshaft using 4+4 x M12x25 screws (pos. ①, Fig. 89).

Apply LOCTITE 243 to the threads of the M12x25 screws (pos. ①, Fig. 88).

Calibrate the screws with a torque wrench as indicated in chapter 3.

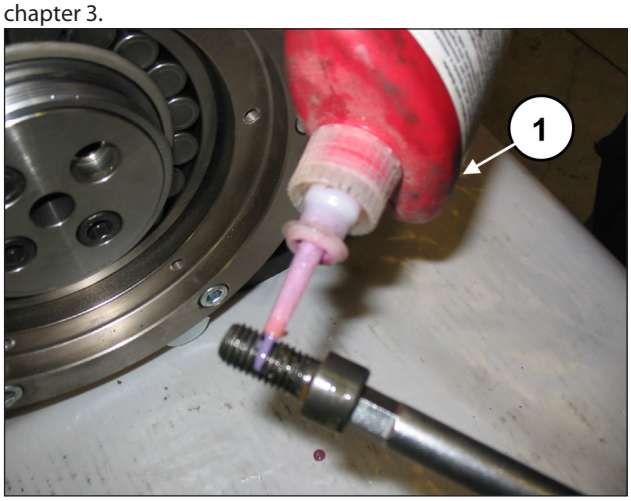


Fig. 88

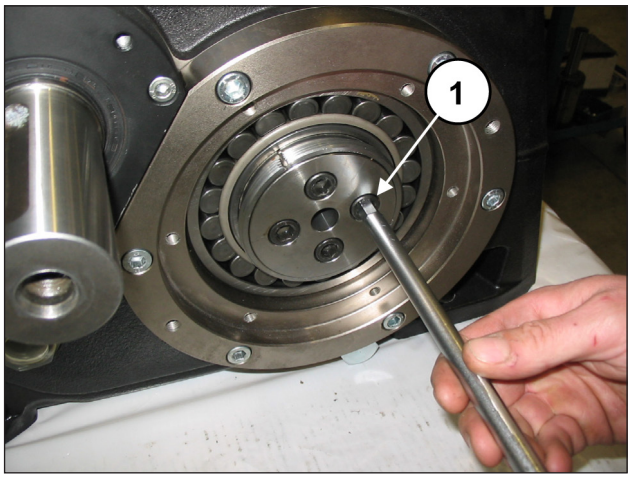


Fig. 89

Remove the anti-rotation shim from under the shank of the central connecting rod.
Mount the two bearing covers (with their O-rings) (pos. ①, Fig. 90) using 6+6 x M8x20 screws (pos. ①, Fig. 91).
Calibrate the screws with a torque wrench as indicated in chapter 3.

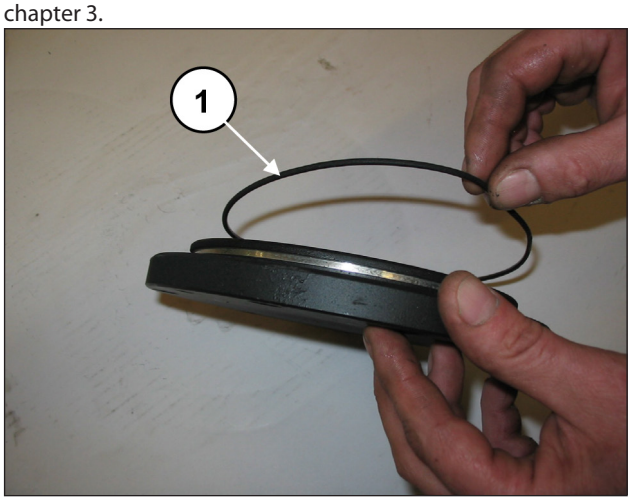


Fig. 90

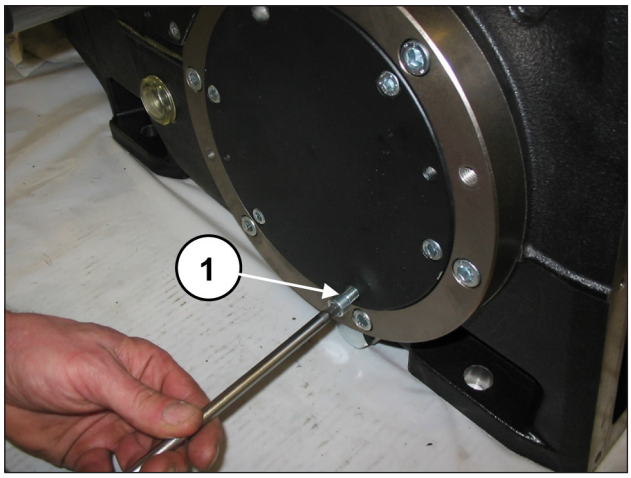


Fig. 91

Insert the O-ring on the rear cover (pos. ①, Fig. 92) and fasten it to the casing with 10 x M8x20 screws (pos. ①, Fig. 93). Calibrate the screws with a torque wrench as indicated in chapter 3.

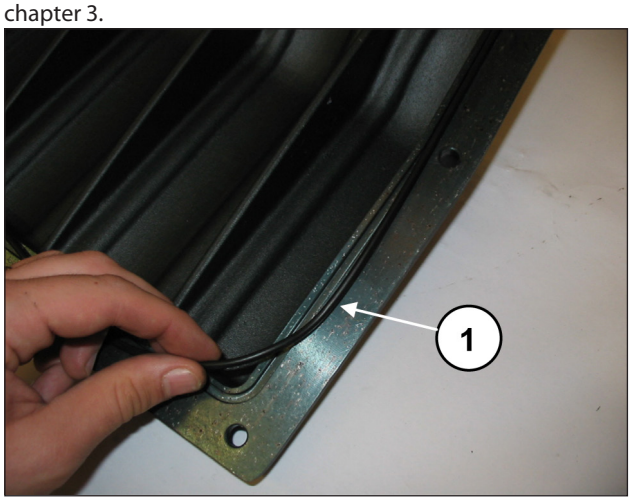


Fig. 92

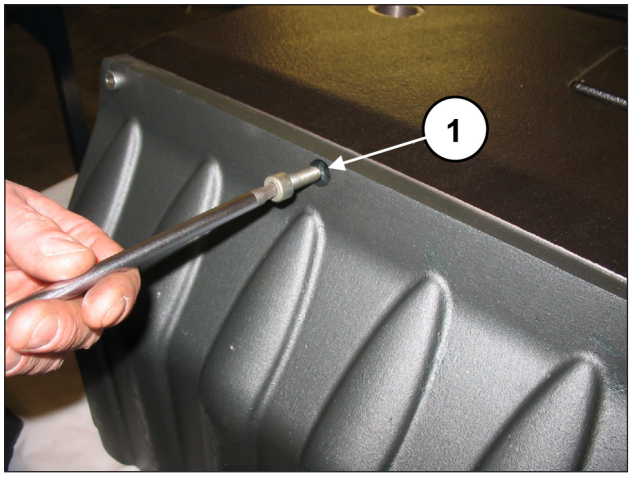


Fig. 93

Mount the radial seal ring onto the oil seal cover (pos. ①, Fig. 94) using a buffer code 27910900.

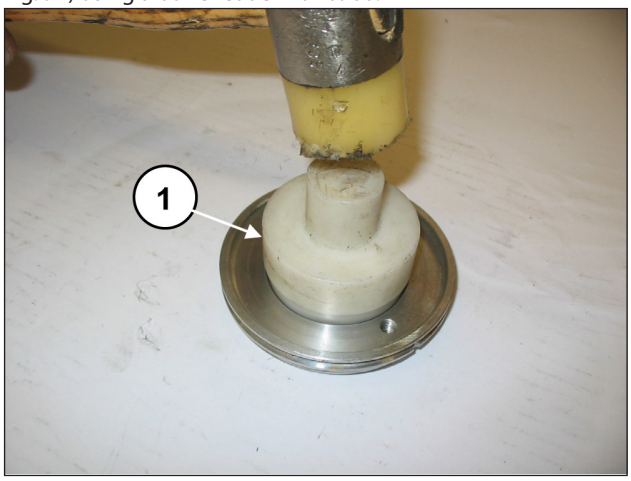


Fig. 94

Position the O-ring (pos. ①, Fig. 95) in the seat of the oil seal cover and insert the assembly mounted in the casing into the seat (pos. ①, Fig. 96).

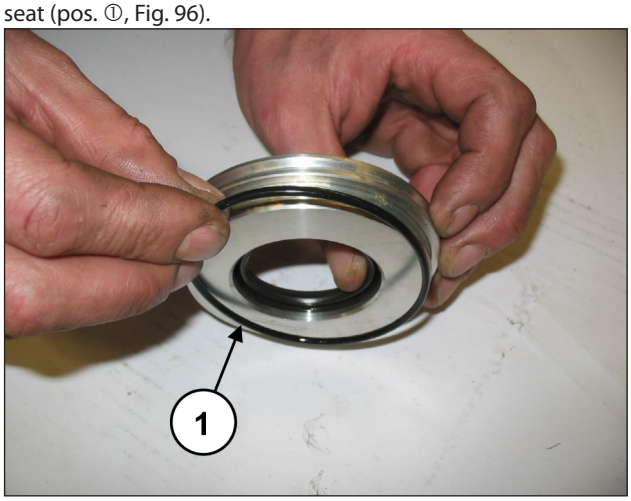


Fig. 95

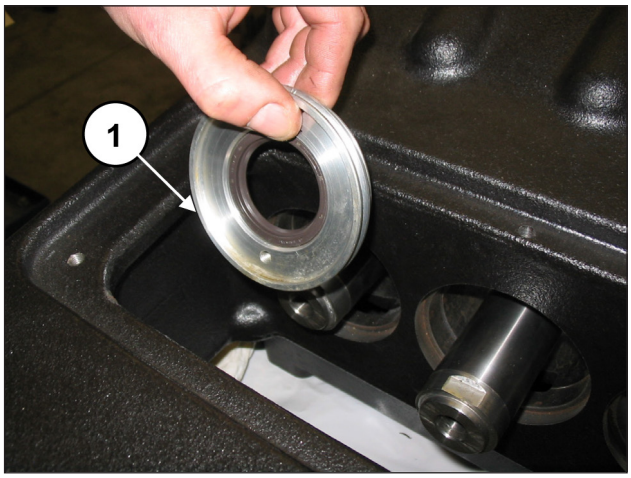


Fig. 96

Make sure that the cover completely enters its seat (pos. ①, Fig. 97) being careful not to damage the lip of the radial seal ring. Screw in the oil seal covers using 2 x M6x30 grub screws (pos. ①, Fig. 98).

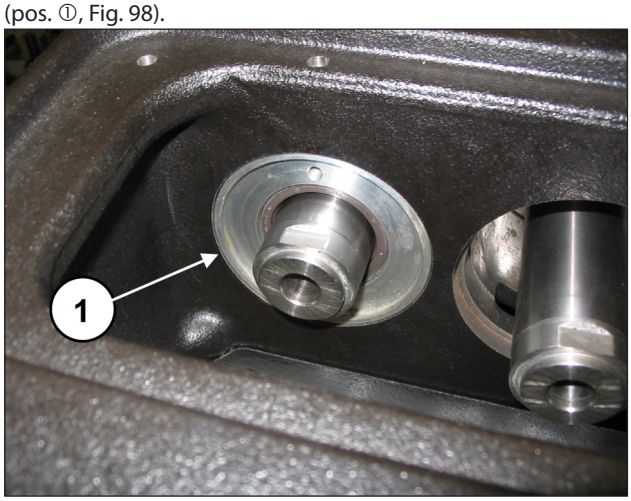


Fig. 97

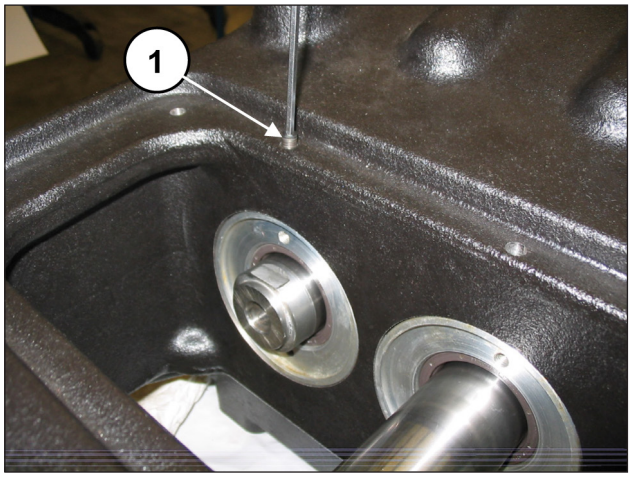


Fig. 98

Calibrate the screws with a torque wrench as indicated in chapter 3.
Position the spray-guard together with the O-ring in the housing on the piston guide (pos. ①, Fig. 99 and Fig. 100).

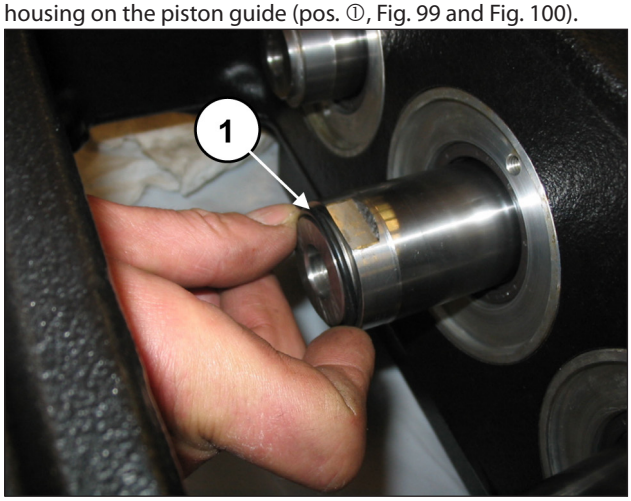


Fig. 99

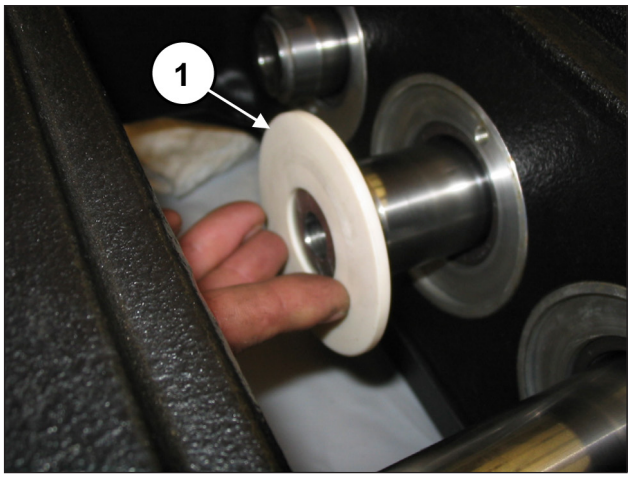


Fig. 100

Screw in the three pistons (pos. ①, Fig. 101) and calibrate with a torque wrench as indicated in chapter 3.

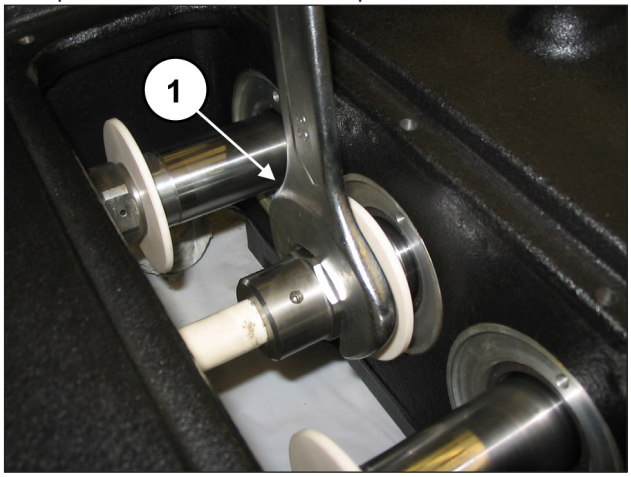


Fig. 101

Insert the O-ring on the two inspection covers (pos. ①, Fig. 102) and assemble the covers with the use of 4+4 M6x14 screws (pos. ①, Fig. 103).

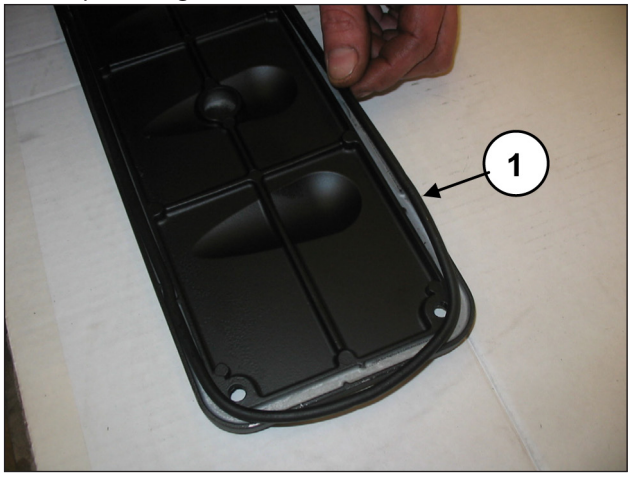


Fig. 102

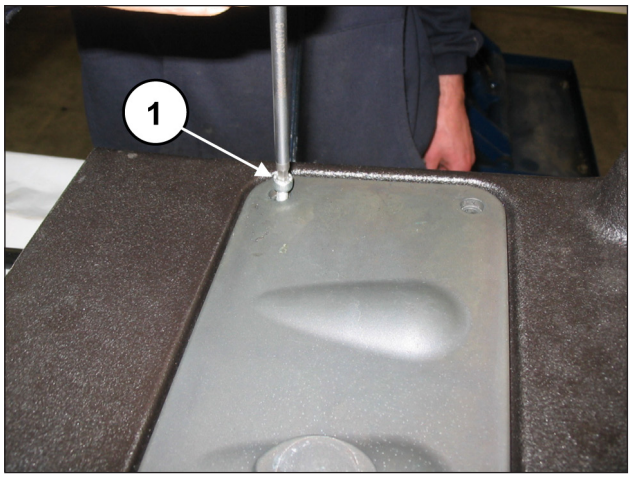


Fig. 103

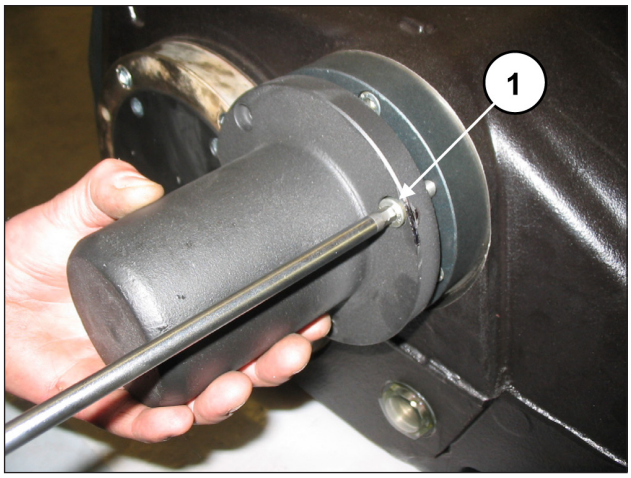


Fig. 104

Calibrate the screws with a torque wrench as indicated in chapter 3.
Mount the shaft end cover and affix it to the casing using 3 x M8x20 screws (pos. ①, Fig. 104).
Calibrate the screws with a torque wrench as indicated in chapter 3.

Apply the tab to the PTO shaft (pos. ①, Fig. 105).

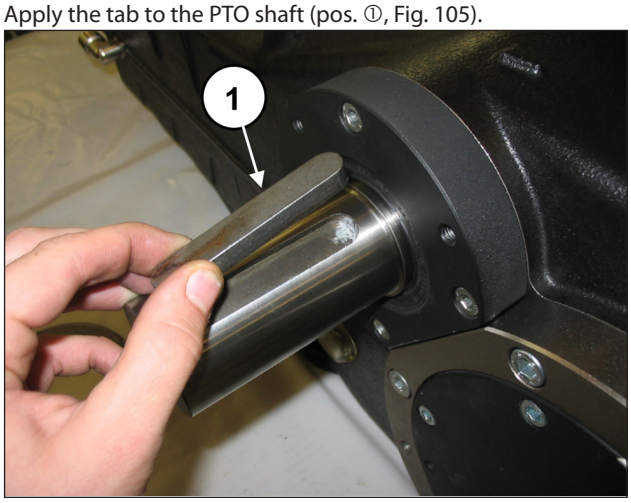


Fig. 105

2.1.3 Classes of increase

INCREASE TABLE FOR BEND SHAFTS AND CON-ROD HALF-BEARINGS			
Recovery classes (mm)	**Upper Half-Bearing Code**	**Lower Half-Bearing Code**	**Correction on the shaft pin diameter (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

INCREASE TABLE FOR PUMP CASING AND PISTON GUIDE		
Recovery classes (mm)	**Piston Guide Code**	**Adjustments on the Pump Casing housing (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 REPAIRING HYDRAULIC PARTS

2.2.1 Reassembling the head - liners - valves

The head does not require any routine maintenance.
Operations are limited to inspection or replacement of valves, if necessary.
Proceed as follows to remove the valve units:
Unscrew the M10x140 head liner fixing screws without removing them (pos. ①, Fig. 106), in such a way as to free them.

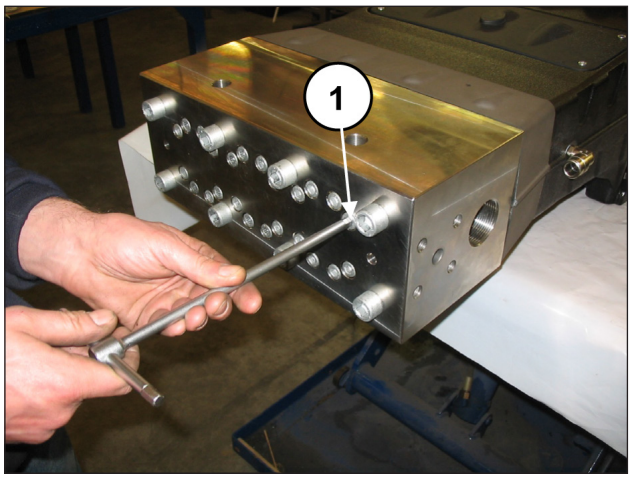


Fig. 106

Unscrew the two diametrically opposed M16x280 head fixing screws (pos. ① and ②, Fig. 107) and replace them with two screw-slave pins (code 27540200) (pos. ①, Fig. 108), then take out the remaining screws.

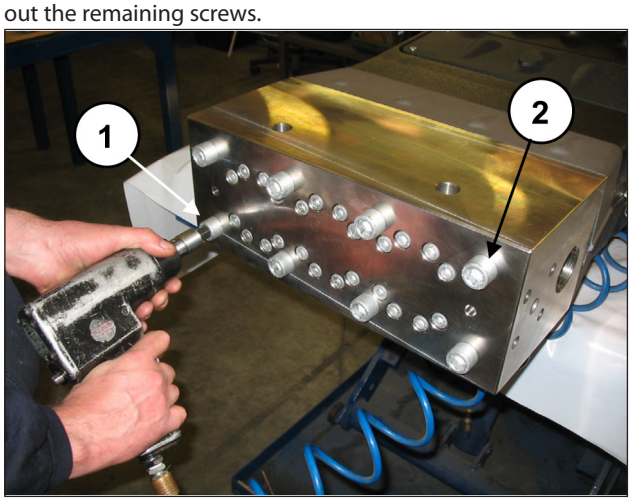


Fig. 107

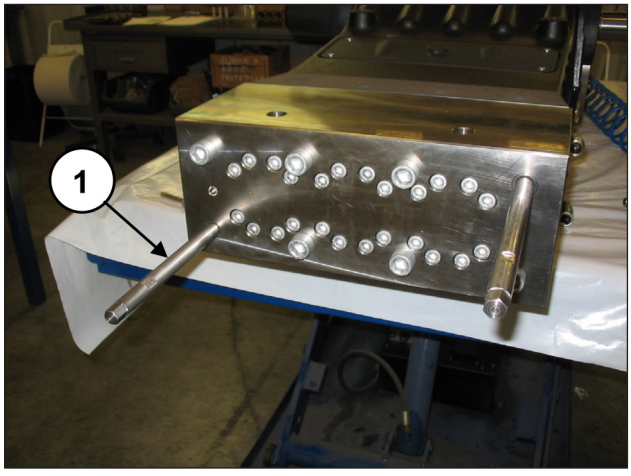


Fig. 108

Separate the head and the spacer for the liners from the pump casing (pos. ①, Fig. 109).

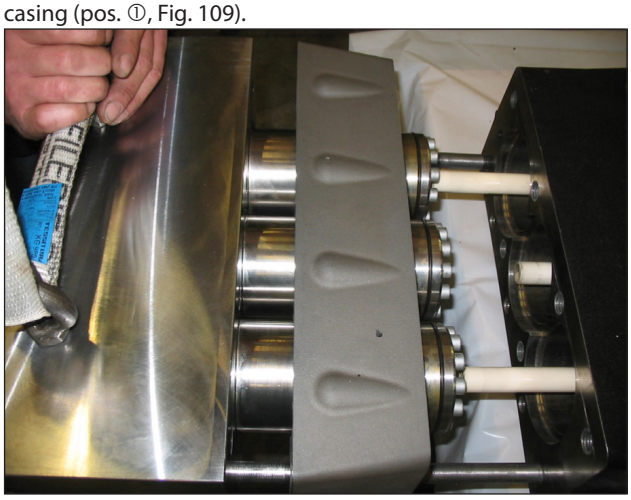


Fig. 109

Remove the O-rings of the gasket supports (pos. ①, Fig. 110) and remove the liner spacer from the liner units (pos. ①, Fig. 111).

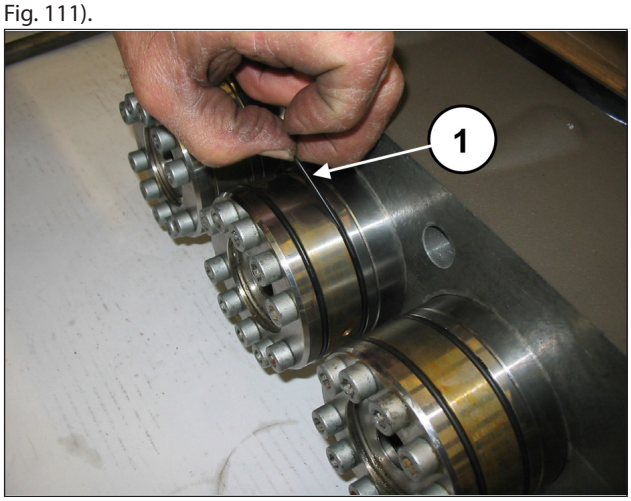


Fig. 110

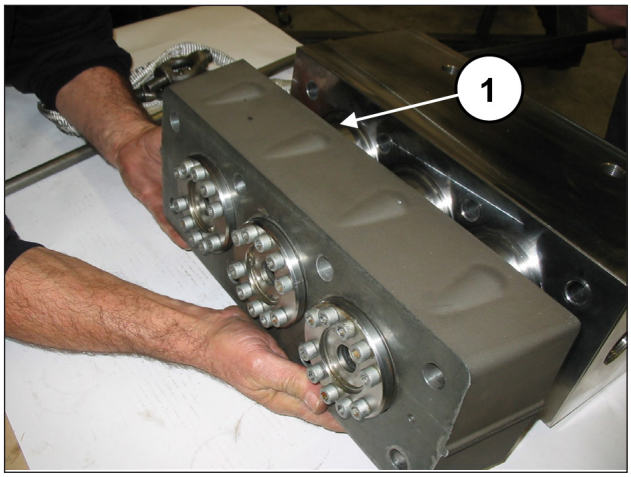


Fig. 111

Remove the M10x140 head liner fixing screws (pos. ①, Fig. 112) and remove the liner units (pos. ①, Fig. 113).

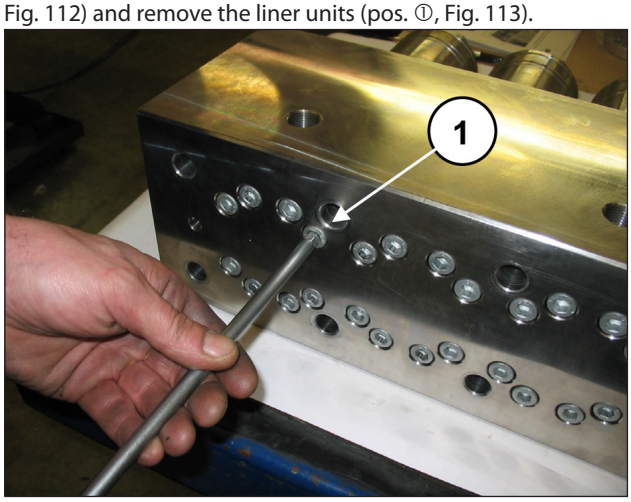


Fig. 112

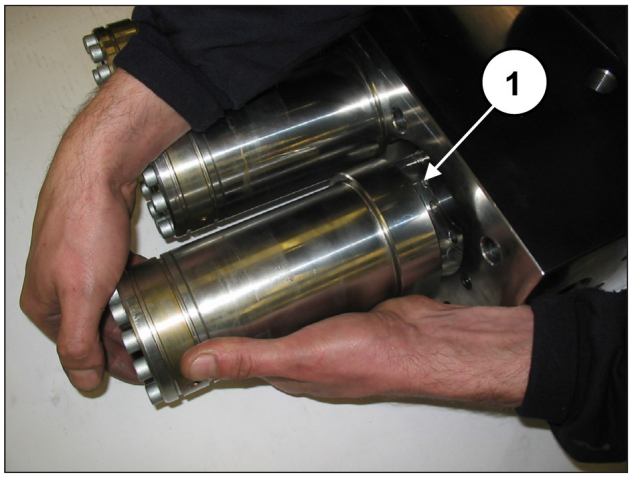


Fig. 113

During disassembly of the liners, take care not to disperse the valve springs and the flat valves (pos. ① and ②, Fig. 114) which, being only laid down, could fall.

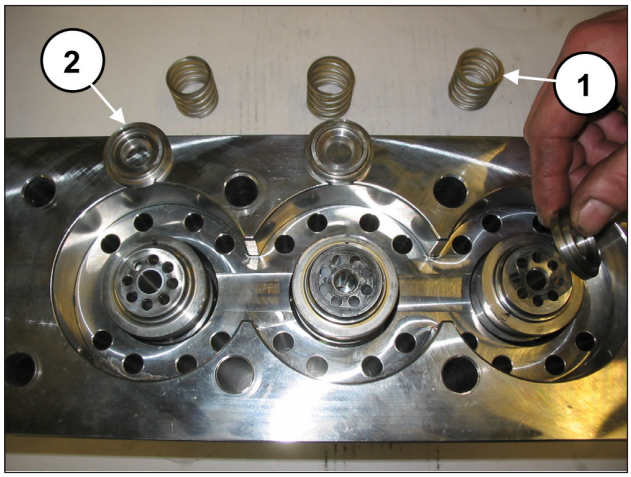


Fig. 114

If the valve seats are blocked on the head due to the formation of scale or oxide, they must be freed by inserting the tool (code 034300020 for SK20-22-24 or code 034300010 for SK26-28-30) in the outlet hole (pos. ①, Fig. 115).

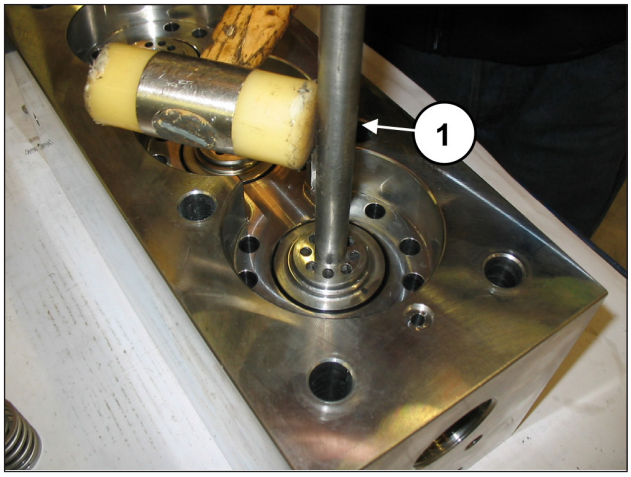


Fig. 115

Extract the valve housings and check the conditions of the various components.
If necessary, make any replacements (pos. ①, Fig. 116).

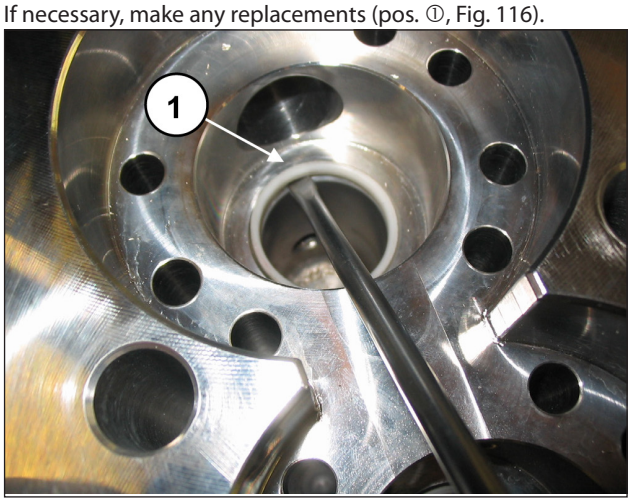


Fig. 116

At every valve inspection, replace the sealing rings and the O-rings between the liner and the head, between the head and the liner spacer in the area of the recirculation hole. Before reassembly, clean and dry off the components and all their seats inside the head.

Extract the outlet plates (pos. ①, Fig. 117), and their respective guides (pos. ①, Fig. 119), with their springs (pos. ①, Fig. 118). Check their conditions, replace if necessary and at the intervals necessary as indicated in chapter 11 in the **Use and maintenance manual**.

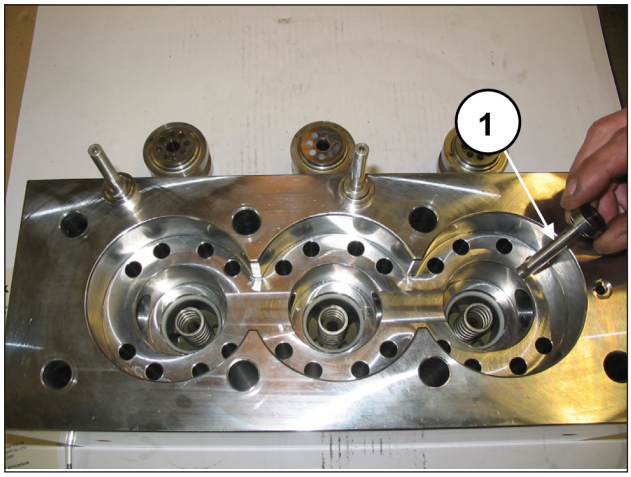


Fig. 117

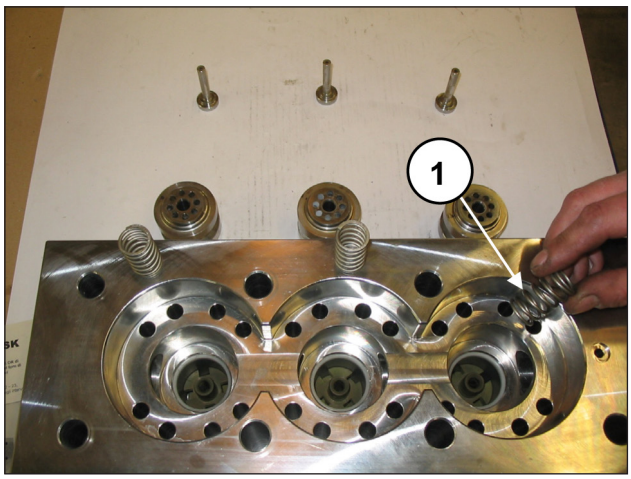


Fig. 118

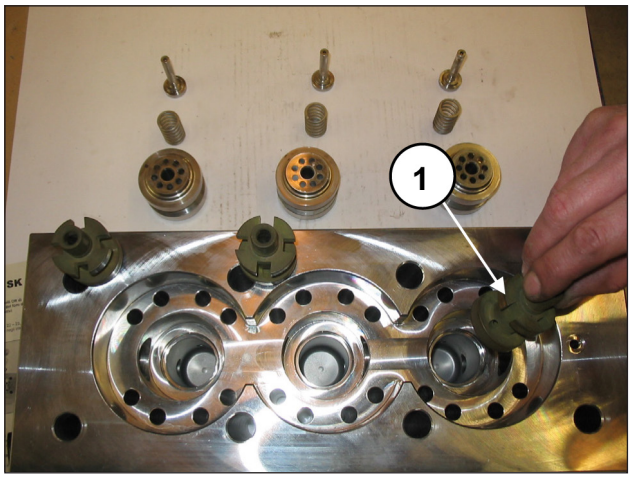


Fig. 119

2.2.2 Assembling the head - liners - valves

To reassemble the components, invert the previously listed operations, paying attention to the correct assembly of the liner spacer: when the component is mounted, the two rough casting exhausts present on one of the sides must be oriented towards the lower part of the casing (pump bracket side).
Heads - liners: proceed with assembly and head screw calibration, and then continue with the calibration of the liner fastening screws.
For the values of the screw tightening torques and sequences, follow the instructions contained in chapter 3.

2.2.3 Disassembly of the piston unit – supports – seals

The piston unit does not require any routine maintenance. Service operations are limited to the visual inspection of the cooling circuit's draining. In case of anomalies / oscillations on the delivery pressure gauge, or pulsating of the cooling circuit's draining pipe (if flexible), seal packings must be inspected and replaced if necessary.
Proceed as follows to remove the piston units:
Separate the head and the spacer for the liners from the pump casing as shown in par. 2.2.1 (from Fig. 106 to Fig. 113).
Remove the upper inspection cover (pos. ①, Fig. 120) and the lower inspection cover (pos. ①, Fig. 121) by unscrewing the 4+4 attachment screws. Remove the O-rings and replace them if necessary.

Fig. 120

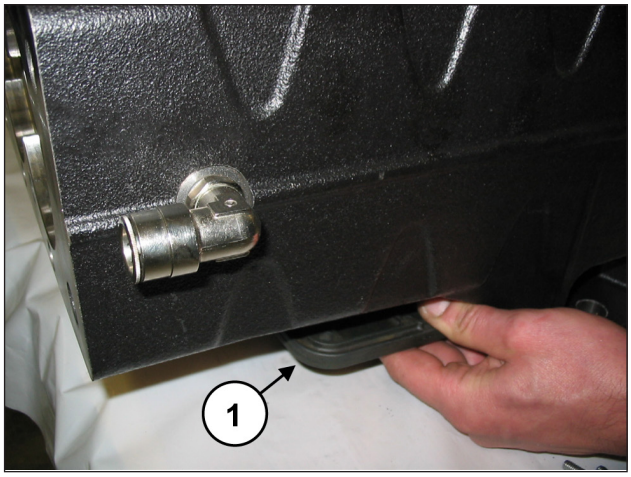


Fig. 121

Remove the pumping elements with a fork spanner (pos. ①, Fig. 122) and check their state of wear (pos. ①, Fig. 123). Replace them if necessary.

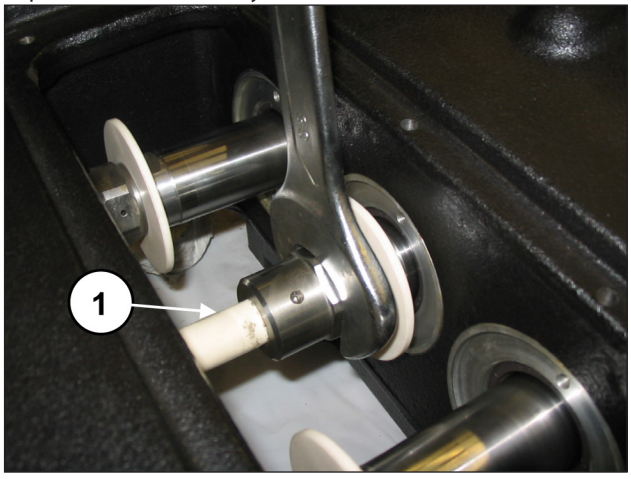


Fig. 122

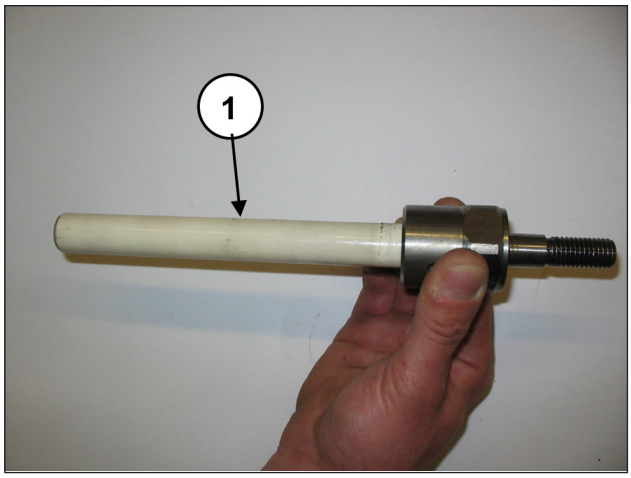


Fig. 123

Remove the M8x50 head liner fixing screws (pos. ①, Fig. 124) and separate the support from the liner (pos. ①, Fig. 125).

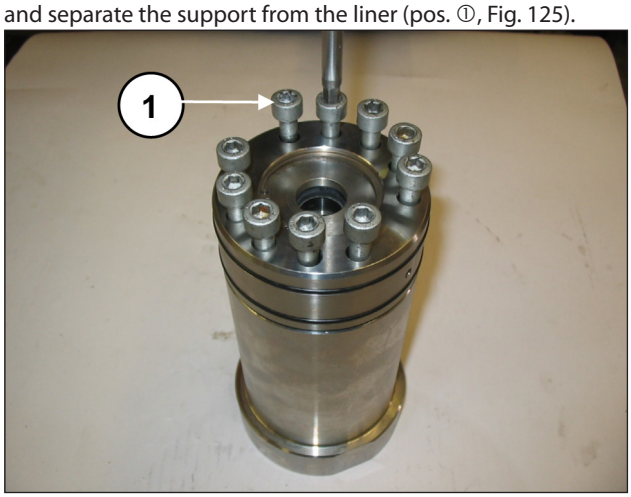


Fig. 124

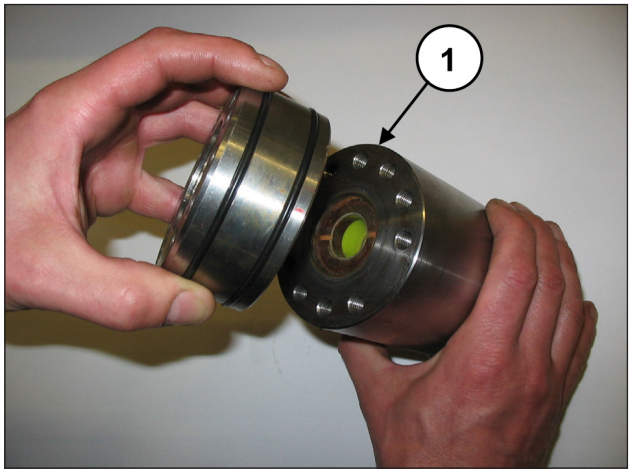


Fig. 125

Remove the Seeger ring and the seal ring (pos. ①, Fig. 126) and with a special plastic pin, remove the LP (low pressure) ring seal (pos. ①, Fig. 127).

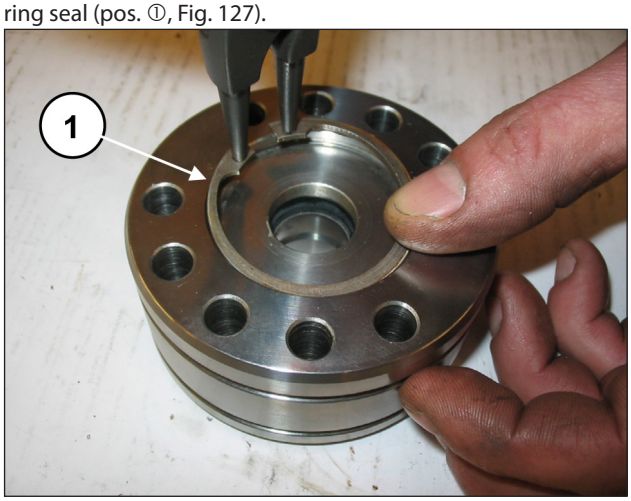


Fig. 126

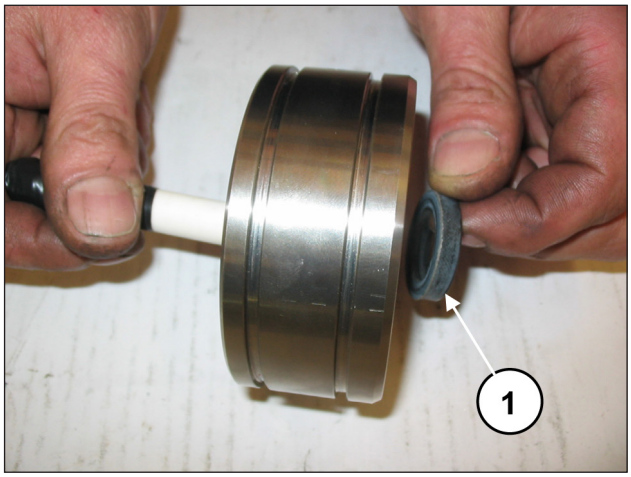


Fig. 127

The O-rings and the low pressure seals must be replaced at each disassembly.

With the liner separate from the seal support and with the special plastic pin (pos. ①, Fig. 128) have the HP (high pressure) pack come out (pos. ①, Fig. 129).

At each disassembly, the HP packing (pos. ①, Fig. 129) must be replaced.

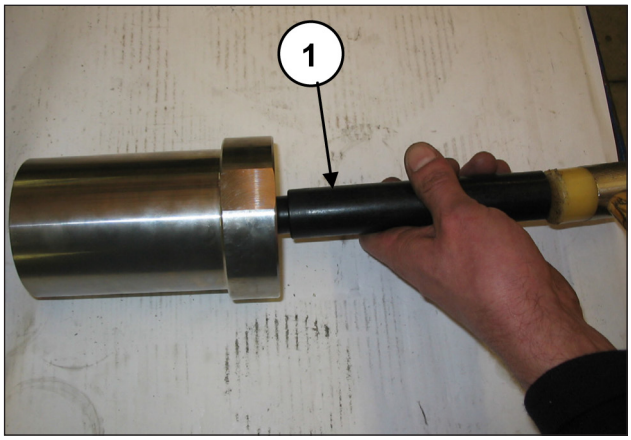


Fig. 128

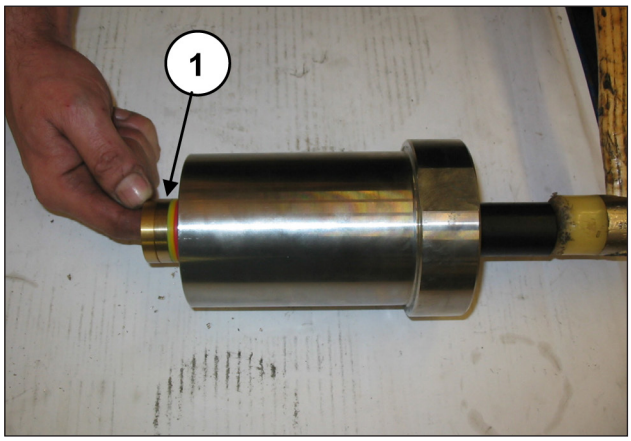


Fig. 129

2.2.4 Assembling the piston unit – supports – seals

To reassemble the various components, invert operations paying special attention to the sequences listed below.
For tightening torque values and sequences, follow the instructions contained in chapter 3.
Insert the upper bush into the liner.

For the correct axial positioning of the bush, use the special tool (code 27911200 for SK20, code 27911400 for SK22, code 27911500 for SK24, code 27911600 for SK26, code 27911700 for SK28 and code 27911800 for SK30) (pos. ①, Fig. 130 and Fig. 131).

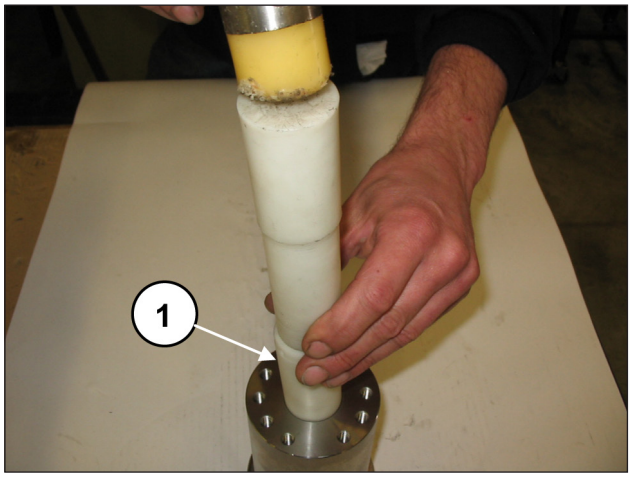


Fig. 130

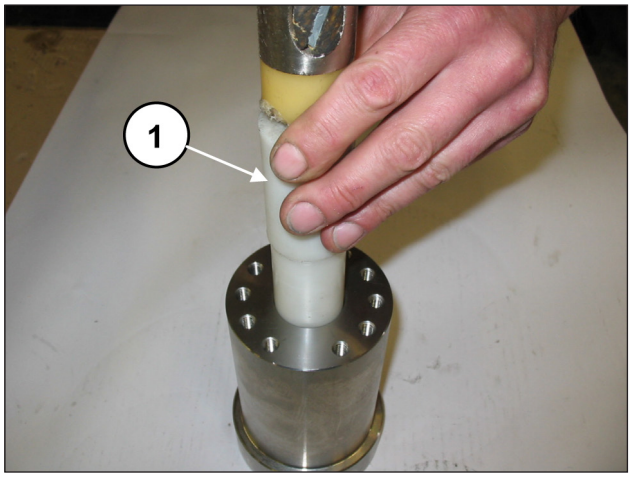


Fig. 131

Insert the H.P. pack (high pressure) (pos. ①, Fig. 132); considering the slight interference between the seal and the liner, to avoid damage we advise using the tool (code 27540100 for SK20, SK22 and SK24, code 27540900 for SK26, for SK28 and for SK30) (pos. ①, Fig. 133).

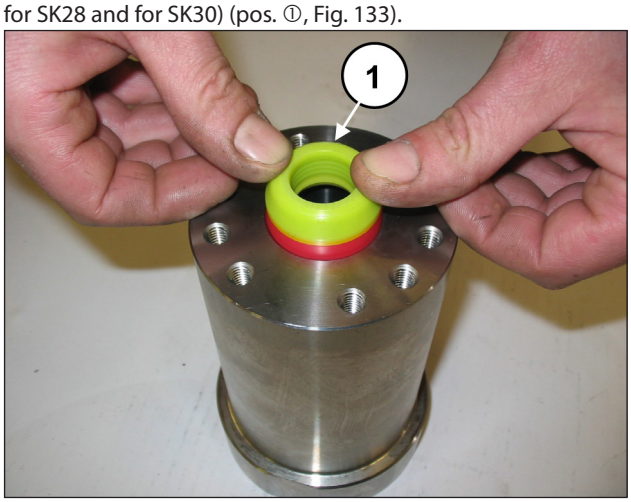


Fig. 132

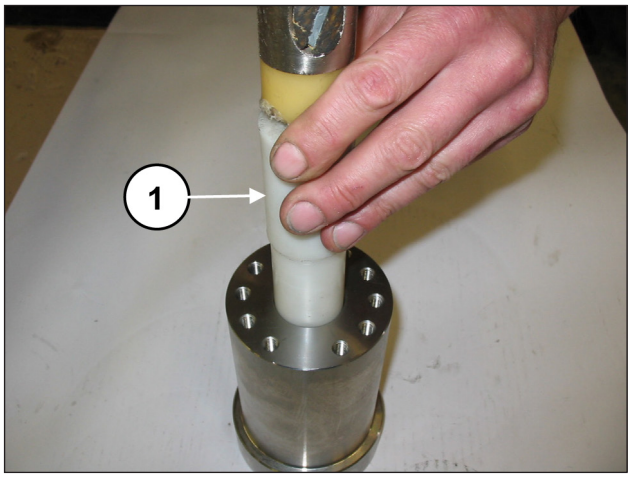


Fig. 133

The H.P. seal must be placed in the liner as indicated in Fig. 132 and Fig. 134.

Before inserting them into their seats, the H.P. seals must be lubricated with silicone grease Type OKS 1110, following the operations listed below: The external diameter must only be slightly lubricated.
On the internal diameter, grease must be applied paying great attention to filling all the pockets between the sealing lips as shown in Fig. 135.

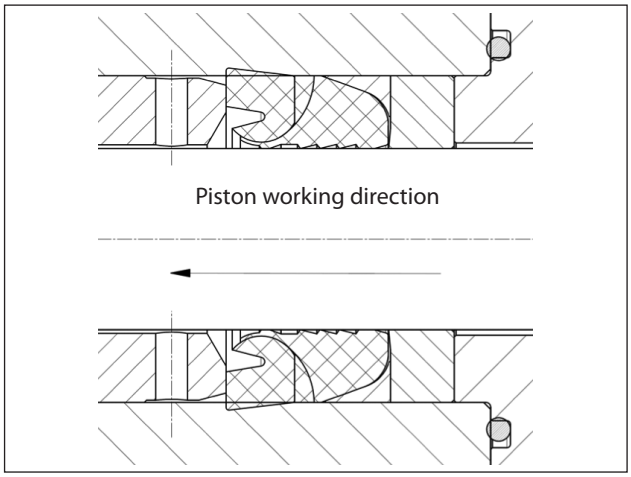


Fig. 134

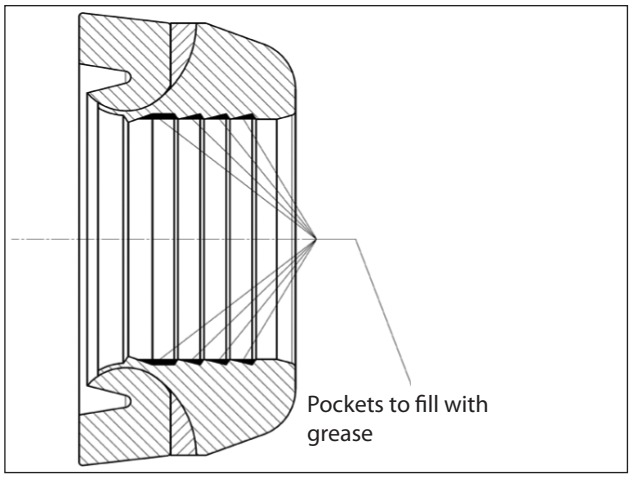


Fig. 135

Insert the anti-extruder ring and the seals bush (pos. ① and ②, Fig. 136, Fig. 137 and Fig. 138).

The gasket bush ② must be introduced into the liner with the two outlets facing outwards (casing side) as shown in Fig. 137.

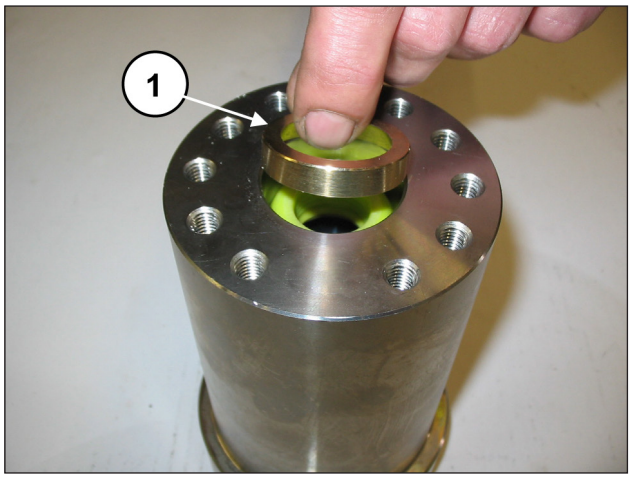


Fig. 136

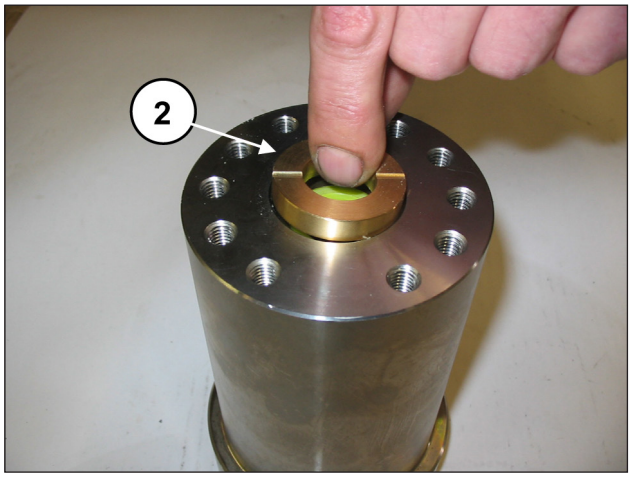


Fig. 137

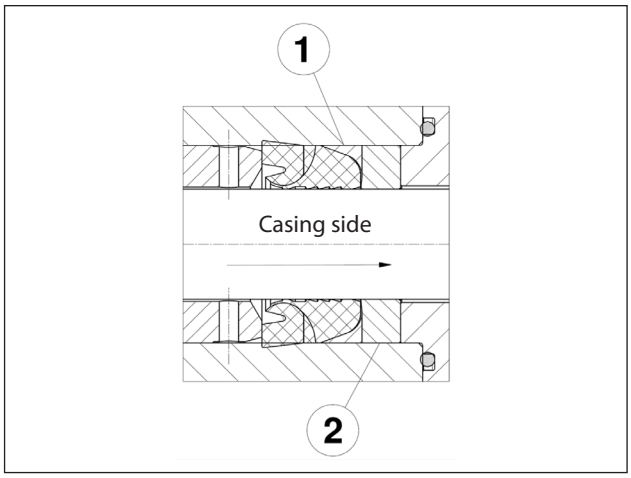


Fig. 138

The L.P. seal must be inserted in the liner with the lip seal in the direction of piston operation (pos. ①, Fig. 139 and Fig. 140), slightly lubricating the external diameter with OKS 1110 silicone grease. Replace the L.P. seal whenever wear is detected.

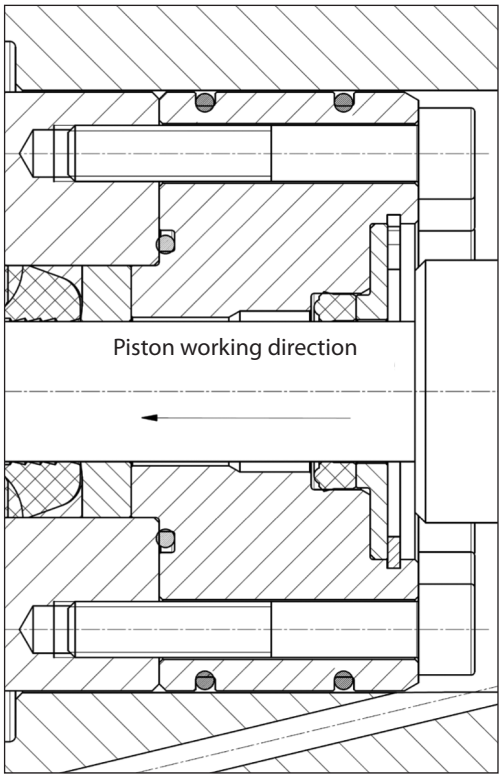


Fig. 139

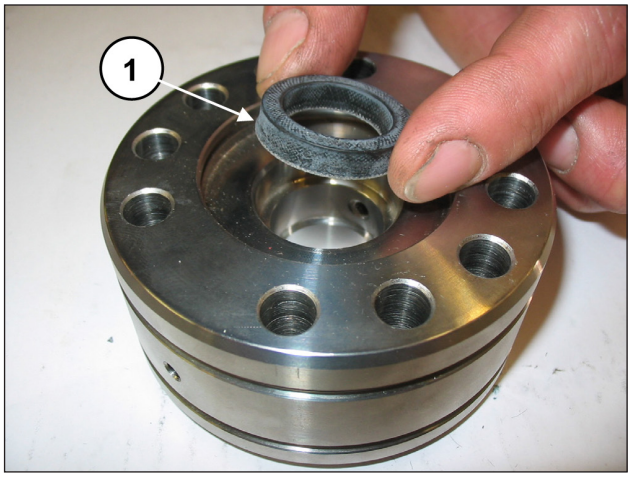


Fig. 140

Install the seal support unit (Fig. 141 and Fig. 142) replacing components ① and ②.

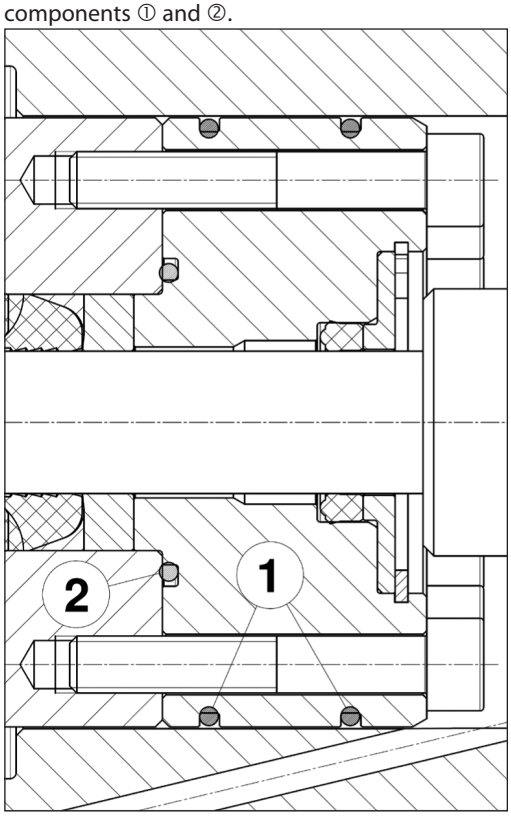


Fig. 141

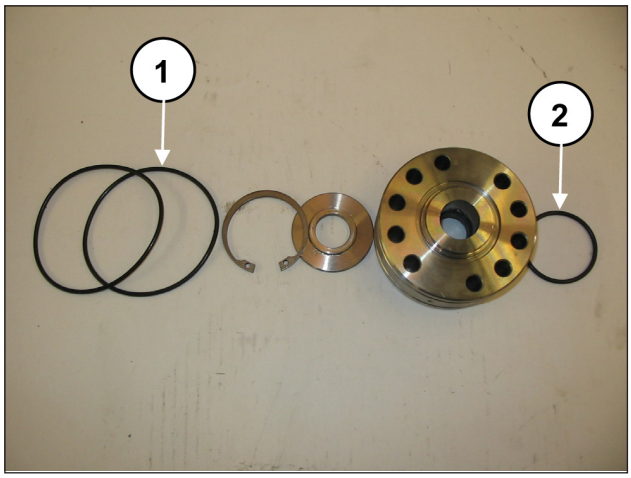


Fig. 142

Assemble the support - liner unit by manually screwing the M8x50 screws as shown in Fig. 143, then proceed with calibration using a torque wrench as indicated in chapter 3.

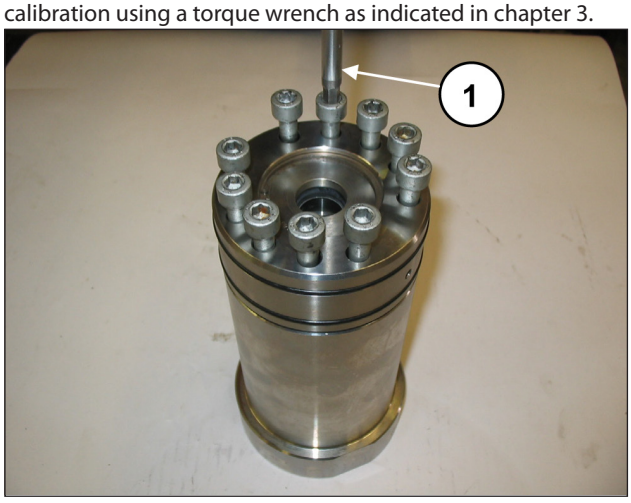


Fig. 143

3 SCREW TIGHTENING CALIBRATION

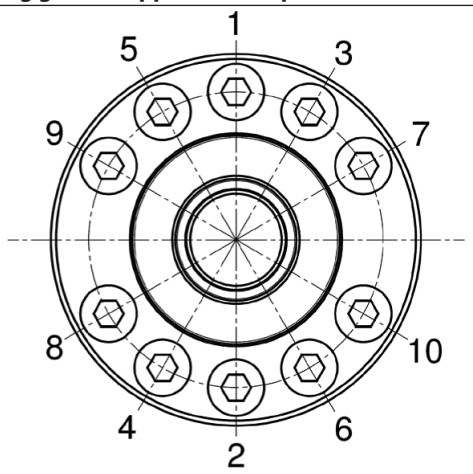
Screw tightening must only be performed with a torque wrench.

Description	Exploded Drawing Position	Tightening Torque Nm
Casing cover M8x20 screw	42	25
G1/2x13 casing plug	66	40
M8x30 screw, PTO bearing cover	85	25
M8x20 screw, shaft end cover	42	25
M10x30 screw, bearing support cover	57	45
Upper and lower cover M6x14 screw	70	10
M8x20 screw, bearing cover	42	25
M12x1.25x87 screw, connecting rod tightening	40	75
Piston guide M6x20 screw	37	10
M12x25 screw, bush locking flange	51	68.5
Piston assembly	16	50
Choke fitting D.3 3/8M-3/8F	72	45
M8x50 screw supports	26	40*
Head M16x280 screw	14	200**
Liner M10x140 screw	13	83***

The screws - pos. 13-14-26 must be tightened with a torque wrench, lubricating the threaded shank with Molybdenum Disulphide grease code. 12001500.

* The support fixing screws must be tightened respecting the phases and order shown in the diagram in Fig. 144.
** The head fixing screws must be tightened respecting the phases and order shown in the diagram in Fig. 145.
*** The liner fixing screws must be tightened respecting the phases and order shown in the diagram in Fig. 145.

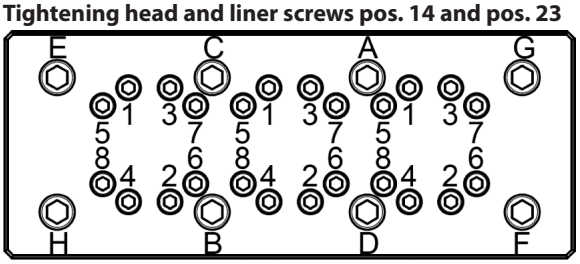
Tightening gasket support screws pos. 26



Tightening M8x50 screws in the indicated sequence (1-2-3-4-5-6-7-8-9-10) performed in a single phase of the indicated torque.

Fig. 144

Tightening head and liner screws pos. 14 and pos. 23



OPERATION 1: Tightening M16x280 screws (pos. 14) in two phases observing the sequence indicated in figure: (A-B-C-D-E-F-G-H)
Phase 1 = 120 Nm
Phase 2 = 200 Nm
OPERATION 2: Tightening M10x140 screws (pos. 13) in four phases observing the sequence indicated in figure: (1-2-3-4-5-6-7-8)
Phase 1 = 40 Nm
Phase 2 = 65 Nm
Phase 3 = 83 Nm
Phase 4 = 83 Nm

Fig. 145

4 REPAIR TOOLS

Pump maintenance can be carried out with simple component disassembly and reassembly tools. The following tools are available:

For assembly:

Piston head radial seal ring	code 27910900
PTO shaft radial seal ring	code 27539500
Seal bush	code 27911200 (SK20)
	code 27911400 (SK22)
	code 27911500 (SK24)
	code 27911600 (SK26)
	code 27911700 (SK28)
	code 27911800 (SK30)
H.P. seal packing	code 27540100 (SK20 - SK22 - SK24)
	code 27540900 (SK26 - SK28 - SK30)
Head / liner spacer	code 27540200

For disassembly:

Valve seat	code 034300020 (SK20-22-24)
	code 034300010 (SK26-28-30)
Head / liner spacer	code 27540200
Shaft (con-rod interlocking)	code 27566200

5 REPLACING THE CON-ROD FOOT BUSH

Perform cold-driving of the bush and the subsequent work bearing in mind the dimensions and tolerances shown in Fig. 146 below.

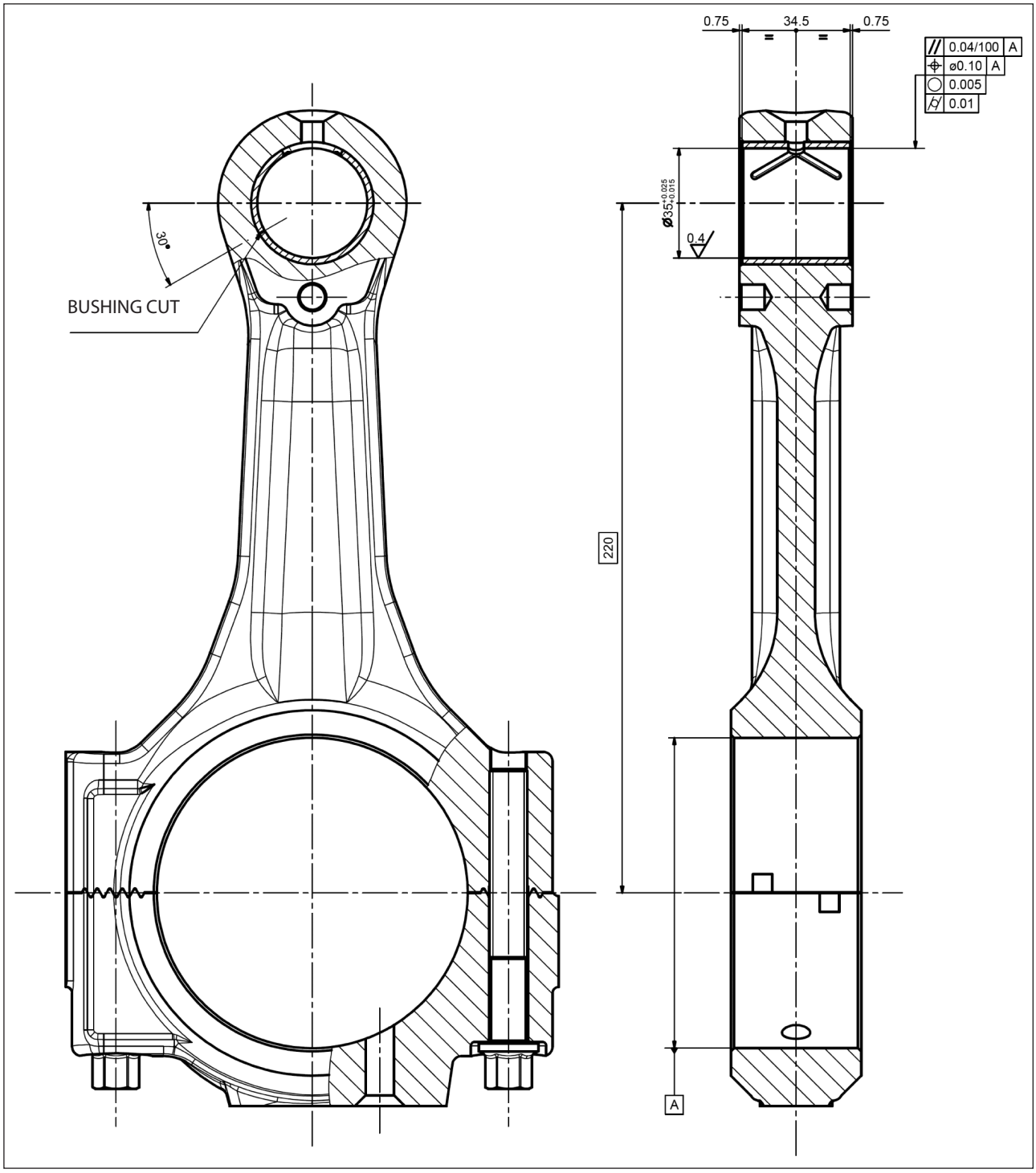


Fig. 146

Sommaire

1 INTRODUCTION

Ce manuel décrit les instructions pour la réparation des pompes de la série SK et doit être attentivement lu et compris avant d'effectuer et de réaliser toute intervention sur la pompe.
Le bon fonctionnement et la durée de la pompe dépendent de l'usage correct et de l'entretien approprié effectué sur celle-ci.
Interpump Group décline toute responsabilité concernant les dommages causés par négligence et inobservation des consignes décrites dans ce manuel.

1.1 DESCRIPTION DES SYMBOLES

Lire attentivement ce qui est indiqué dans ce manuel avant de commencer toute opération.

Signal de Mise en garde

Lire attentivement ce qui est indiqué dans ce manuel avant de commencer toute opération.

Signal de Danger
S'équiper de lunettes de protection.

Signal de Danger
S'équiper de gants de protection avant chaque opération.

2 CONSIGNES DE RÉPARATION

2.1 RÉPARATION DE LA PARTIE MÉCANIQUE

Les opérations de réparation de la partie mécanique doivent être effectuées après avoir éliminé l'huile du carter.
Pour vidanger l'huile, retirer le bouchon de remplissage rep. ①, Fig. 1 puis le bouchon de vidange rep. ②, Fig. 1.

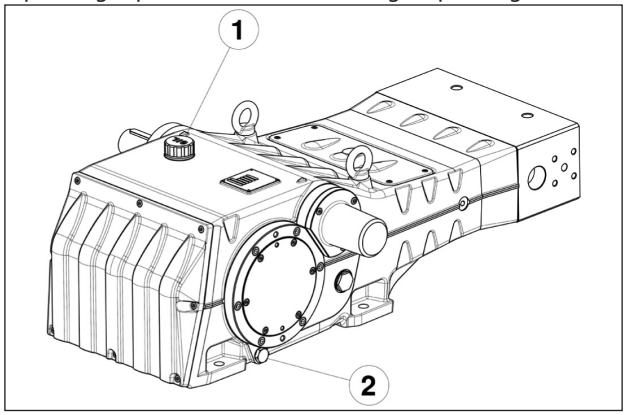


Fig. 1

Verser l'huile usagée dans un récipient spécial et l'éliminer auprès des centres autorisés.
Elle ne doit en aucun cas être déversée dans l'environnement.

2.1.1 Démontage de la partie mécanique

La séquence correcte est la suivante :
Vidanger l'huile de la pompe en suivant les explications au parag. 2.1.
Désassembler la tête et l'entretoise de chemises du carter de pompe en suivant les explications au parag. 2.2.1 (de Fig. 106 à Fig. 109).
Déposer le couvercle d'inspection supérieur et le couvercle d'inspection inférieur en dévissant les 4+4 vis de fixation en suivant les explications au parag. 2.2.3 (Fig. 120 et Fig. 121).
Dégager les joints toriques et les remplacer si nécessaire.
Déposer les trois pistons à l'aide d'une clé à fourchette en suivant les explications au parag. 2.2.3 (Fig. 122).
Déposer les trois joints anti-éclaboussures avec leur joint torique (rep. ① et ②, Fig. 2).

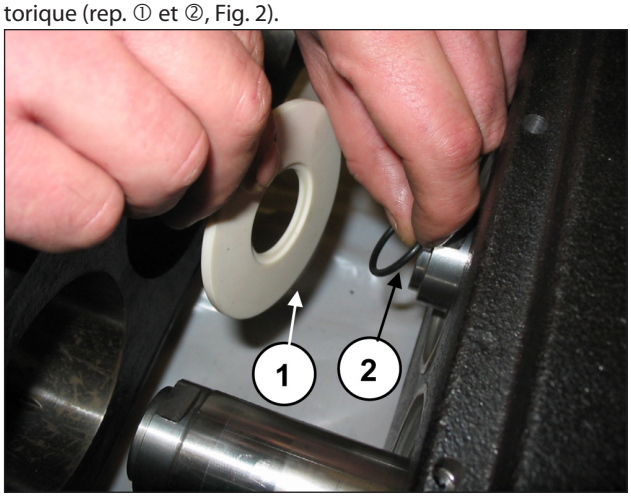


Fig. 2

Dévisser les goujons de retenue M6 des trois couvercles du joint d'huile (rep. ①, Fig. 3).

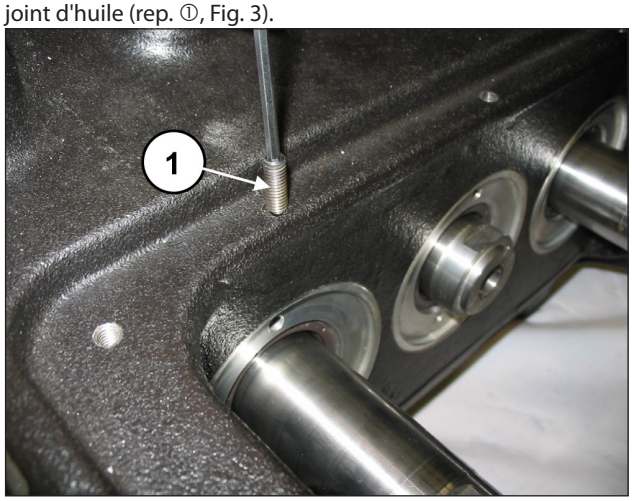


Fig. 3

Dégager les couvercles du joint d'huile en vissant une barre filetée ou une vis M6 faisant office d'extracteur, dans les orifices prévus à cet effet sur le couvercle (rep. ①, Fig. 4) et dégager les couvercles du groupe pompe (rep. ①, Fig. 5).

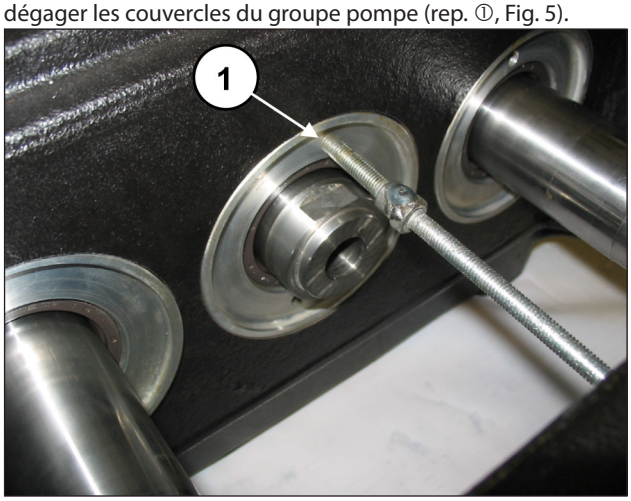


Fig. 4

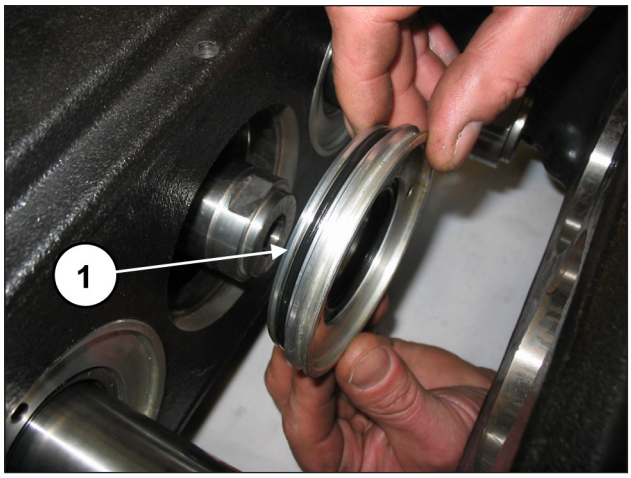


Fig. 5

Extraire la bague d'étanchéité radiale (rep. ①, Fig. 6) et le joint torique extérieur (rep. ①, Fig. 7).

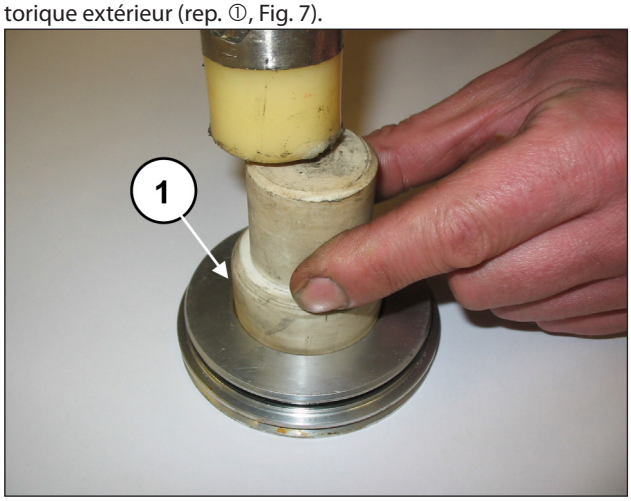


Fig. 6

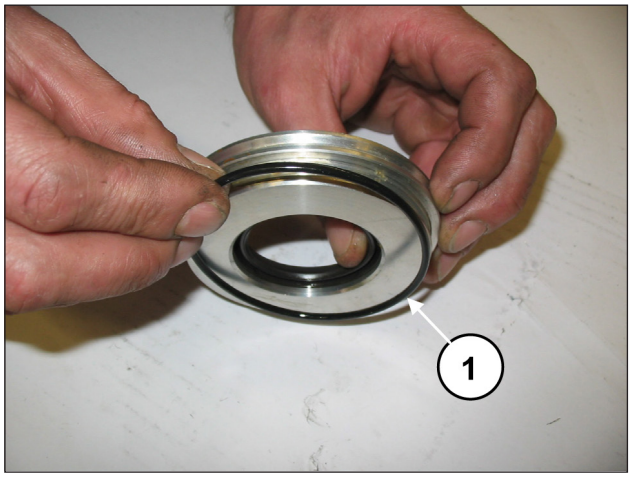


Fig. 7

Déposer la languette de l'arbre PTO (rep. ①, Fig. 8).

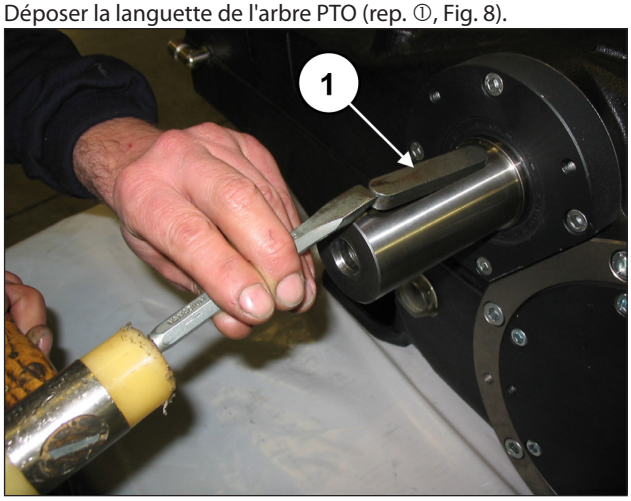


Fig. 8

Dévisser les vis de fixation du couvercle à l'extrémité de l'arbre (rep. ①, Fig. 9) et dégager le couvercle de l'arbre PTO.

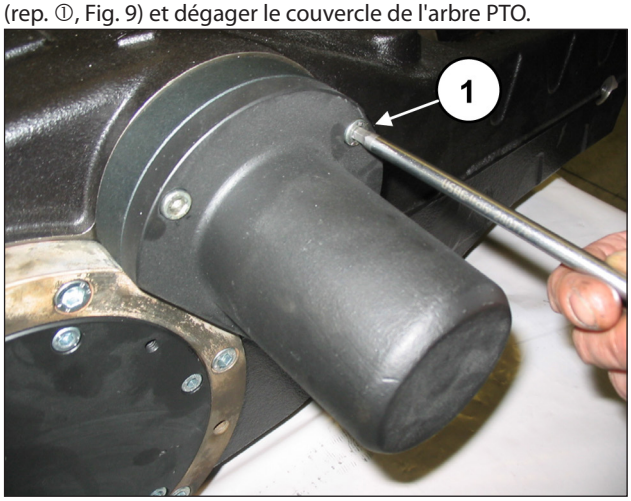


Fig. 9

Dévisser les vis de fixation du couvercle du carter (rep. ①, Fig. 10) et le déposer. Dégager le joint torique et le remplacer si nécessaire.

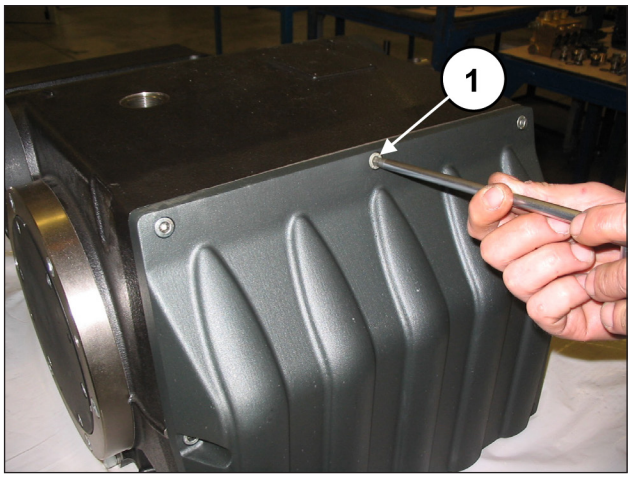


Fig. 10

Démonter ensuite les deux couvercles du coussinet en dévissant les vis correspondantes (rep. ①, Fig. 11).
Pour faciliter le démontage, utiliser 2 goujons ou vis M8 (rep. ①, Fig. 12) faisant office d'extracteurs.
Dégager le joint torique et le remplacer si nécessaire.

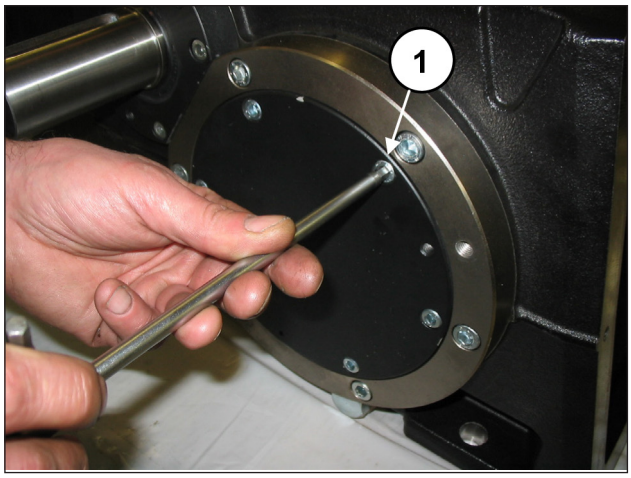


Fig. 11

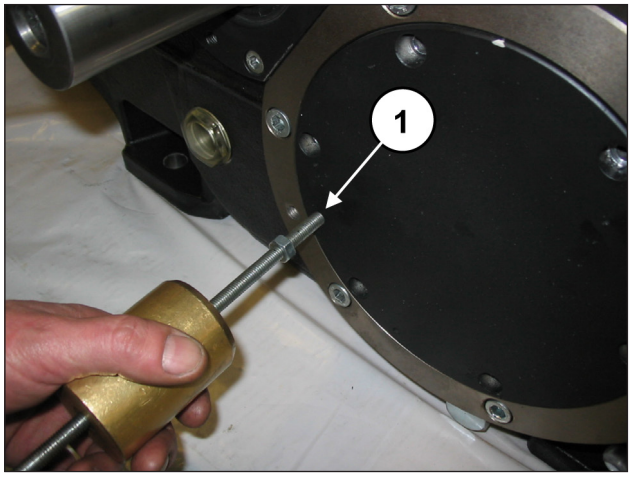


Fig. 12

Insérer une cale sous le corps de la bielle centrale pour empêcher le vilebrequin de tourner (rep. ①, Fig. 13).

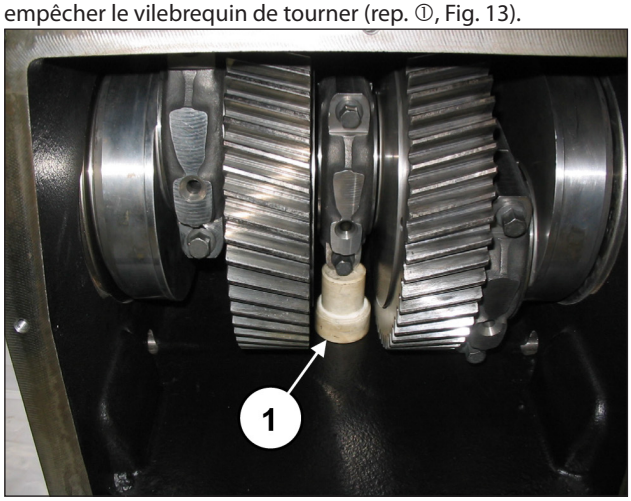


Fig. 13

Dévisser et enlever les vis de fixation du flasque de retenue de la douille, des deux côtés (rep. ①, Fig. 14).
Laisser les flasques de retenue de la douille dans leur siège (rep. ①, Fig. 15).

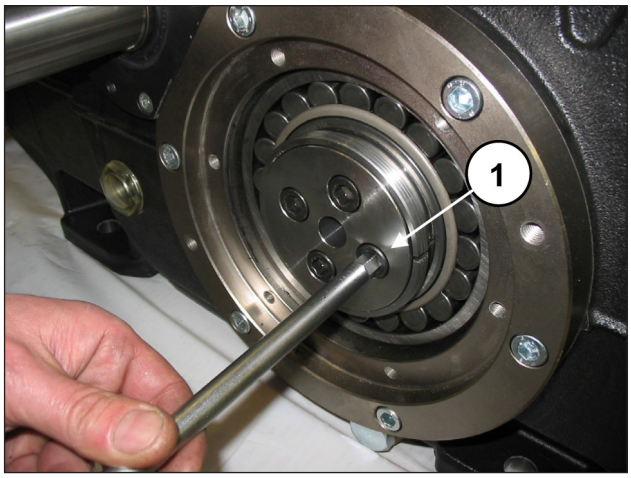


Fig. 14

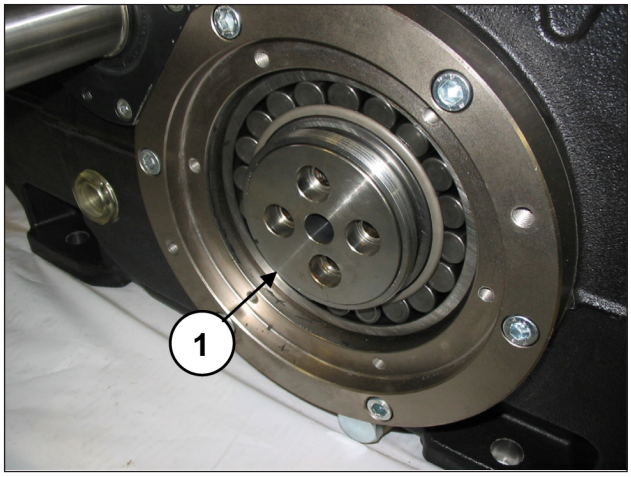


Fig. 15

Sur un côté, visser une bague type SKF KM20 sur la douille de pression (rep. ①, Fig. 16) puis débloquer la douille à l'aide d'un outil à inertie (rep. ①, Fig. 17) sans la dégager.
Répéter l'opération de l'autre côté.

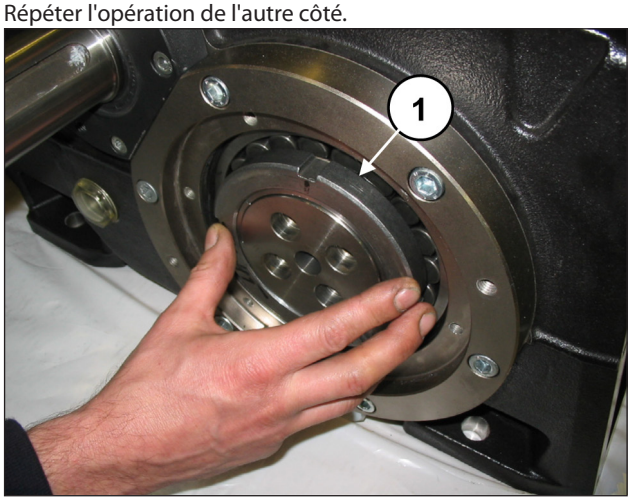


Fig. 16

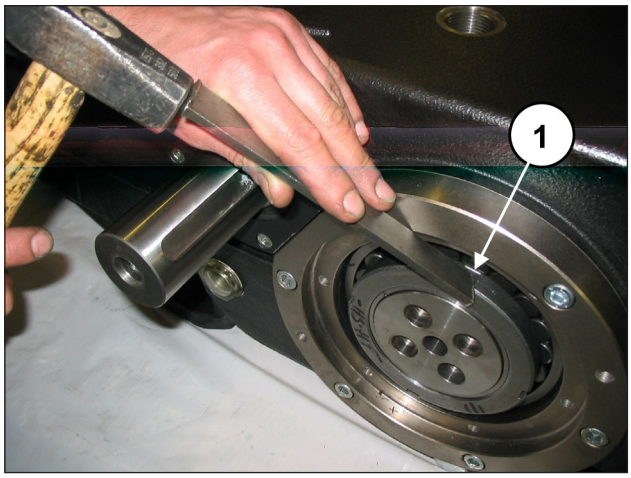


Fig. 17

Retirer la cale sous le corps de la bielle centrale.
Dévisser les vis de la bielle (rep. ①, Fig. 18).

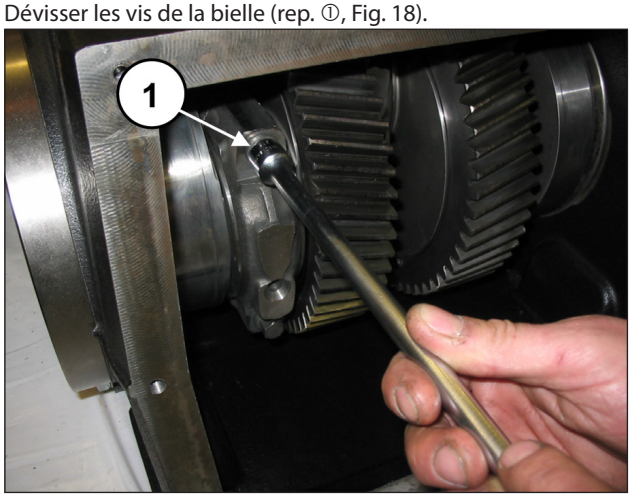
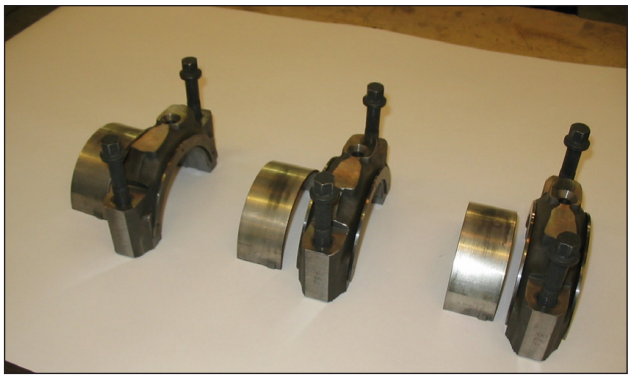


Fig. 18

Démonter les chapeaux de bielle avec les demi-coussinets en prenant note de l'ordre de démontage.

Remonter et accoupler les chapeaux de bielle et leurs demi-bielles dans l'ordre selon lequel ils ont été démontés.

Pour éviter toute erreur possible, les chapeaux et les demi-bielles ont été numérotés sur un côté (rep. ①, Fig. 19).



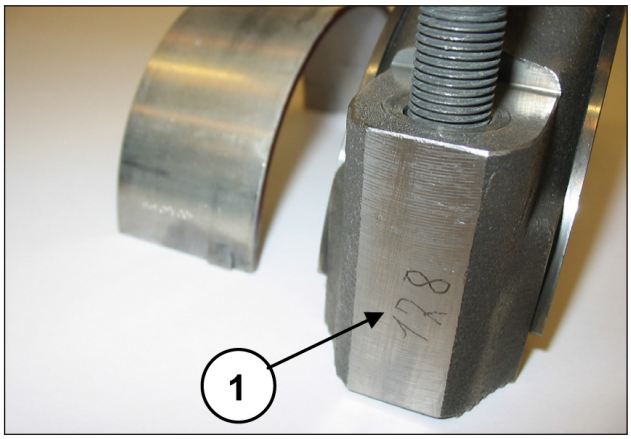


Fig. 19

Faire avancer le plus possible les trois demi-bielles dans la direction de la tête.
Dégager les trois demi-coussinets supérieurs des demi-bielles (rep. ①, Fig. 20).

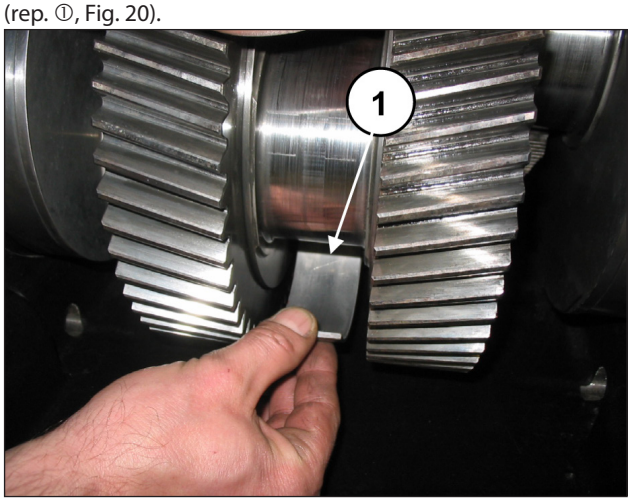


Fig. 20

Déposer les deux douilles de pression (rep. ①, Fig. 21).

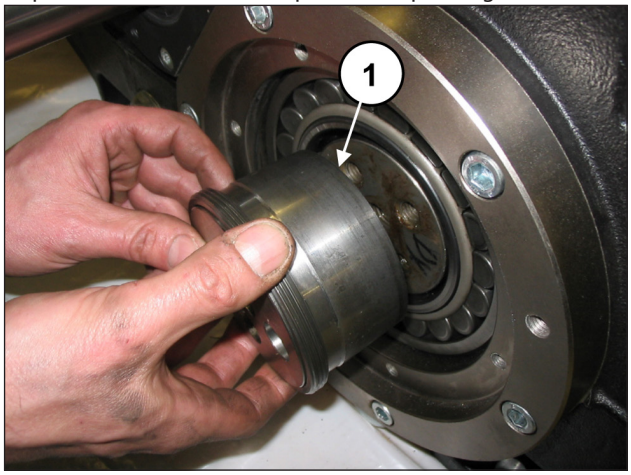


Fig. 21

Désassembler le flasque de retenue de la douille de pression (rep. ①, Fig. 22).

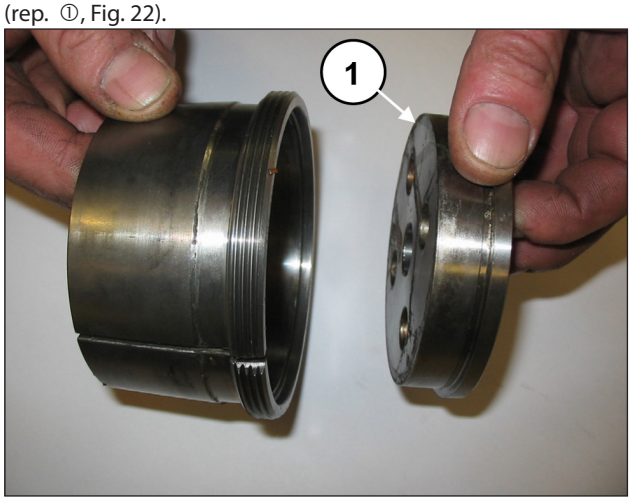


Fig. 22

Dévisser les vis des deux couvercles du support de coussinet (rep. ①, Fig. 23).

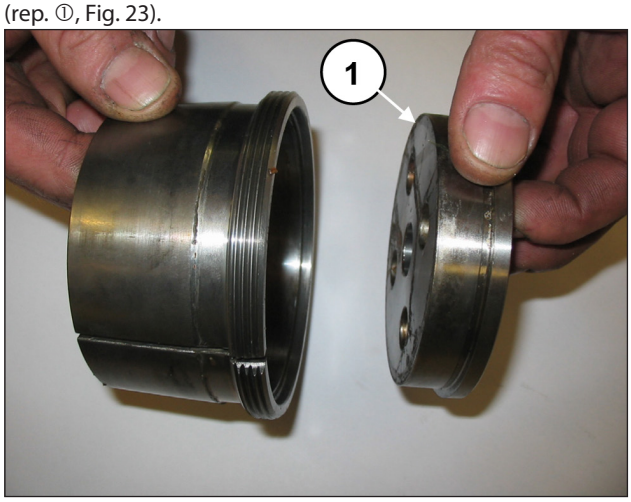


Fig. 23

Poser un axe fileté M16 sur une extrémité du vilebrequin (rep. ①, Fig. 24), soulever ce dernier et extraire le couvercle du support de coussinet avec le joint torique (rep. ①, Fig. 25). Pour faciliter le démontage, utiliser 2 goujons ou vis M10 (rep. ②, Fig. 24) faisant office d'extracteurs.
Répéter l'opération de l'autre côté.

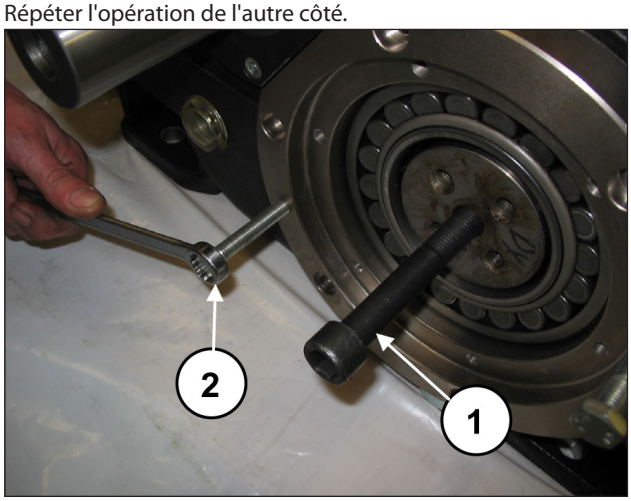


Fig. 24

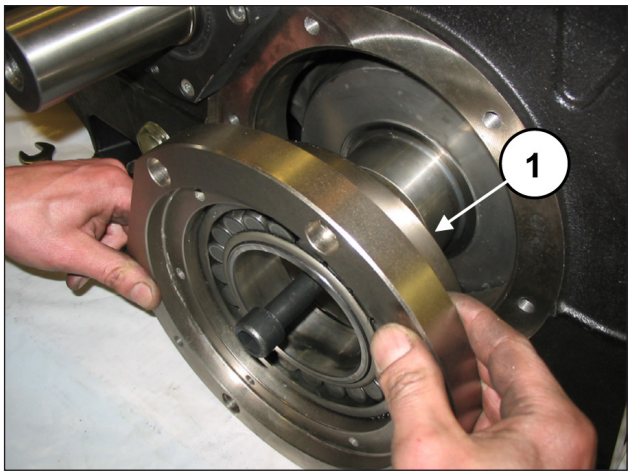


Fig. 25

Poser le vilebrequin sur le fond du carter.
Désassembler le couvercle du support de coussinet du coussinet à l'aide d'un outil à inertie (rep. ①, Fig. 26).

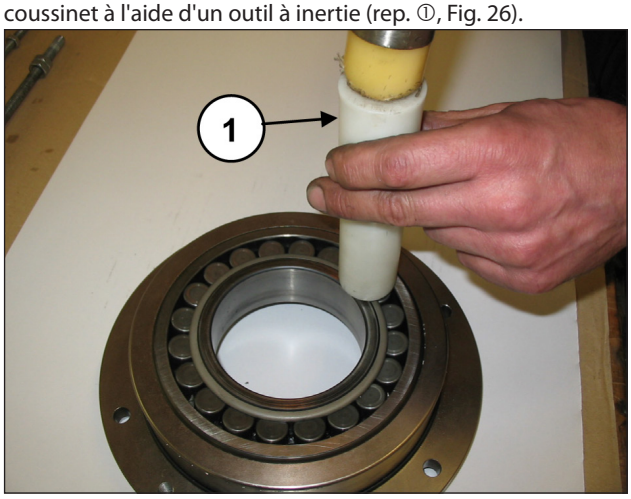


Fig. 26

Desserrer les vis de fixation du couvercle du coussinet de PTO droit et gauche (rep. ①, Fig. 27) et dégager les deux couvercles de l'arbre PTO. Pour faciliter le démontage, utiliser 3 goujons ou vis M8 (rep. ①, Fig. 28) faisant office d'extracteurs.

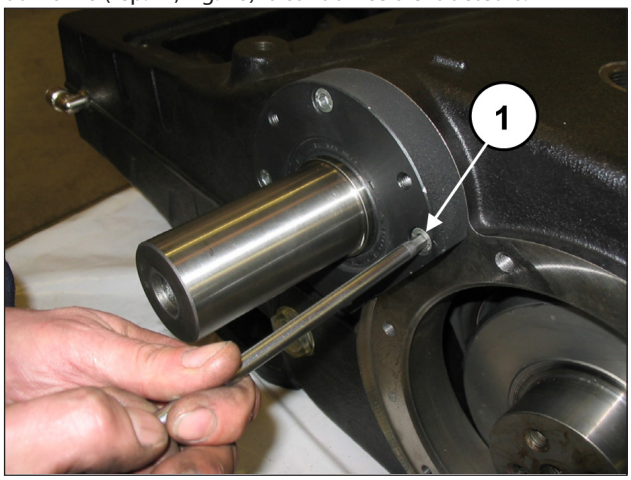


Fig. 27

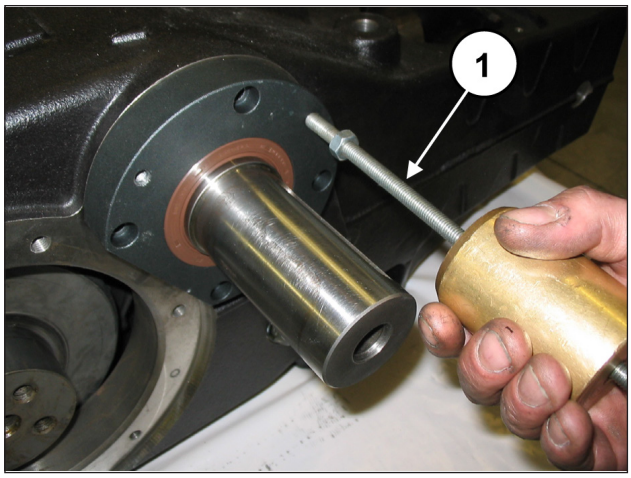


Fig. 28

Extraire la bague d'étanchéité radiale (rep. ①, Fig. 29), le joint torique extérieur (rep. ①, Fig. 30) et le joint torique de l'orifice de lubrification (rep. ①, Fig. 31).

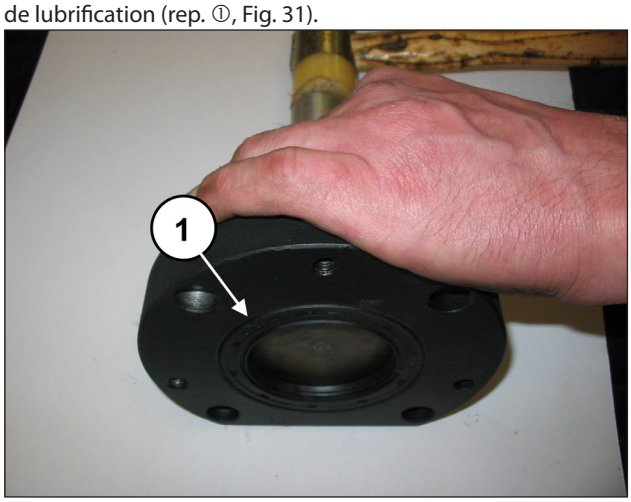


Fig. 29

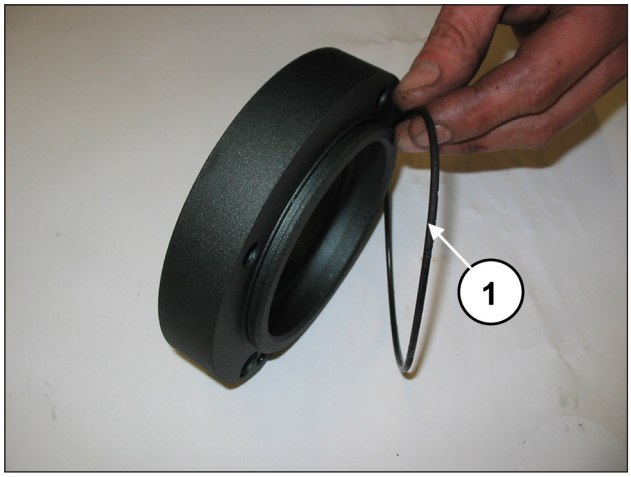


Fig. 30

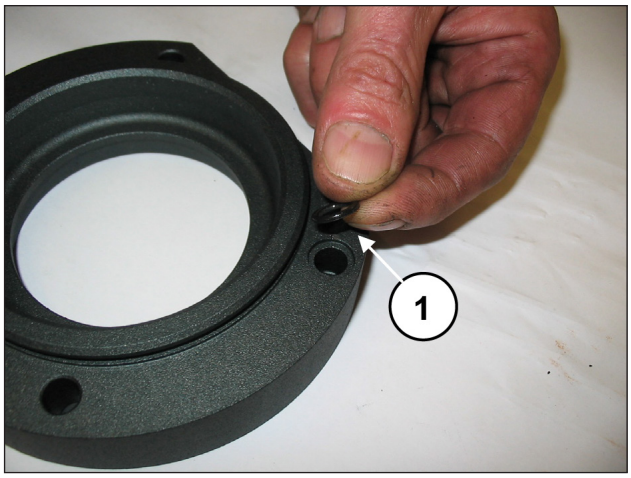


Fig. 31

Faire reculer le plus possible les trois bielles (les amener en contact avec le vilebrequin).
Utiliser un outil à inertie (rep. ①, Fig. 32) pour dégager l'arbre PTO d'un des deux côtés (rep. ①, Fig. 33).

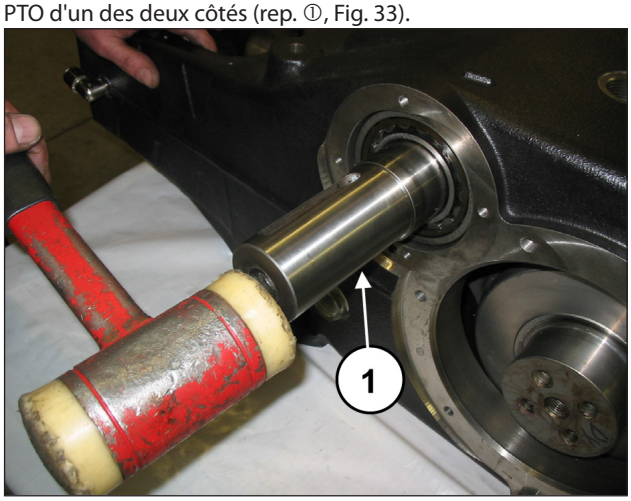


Fig. 32

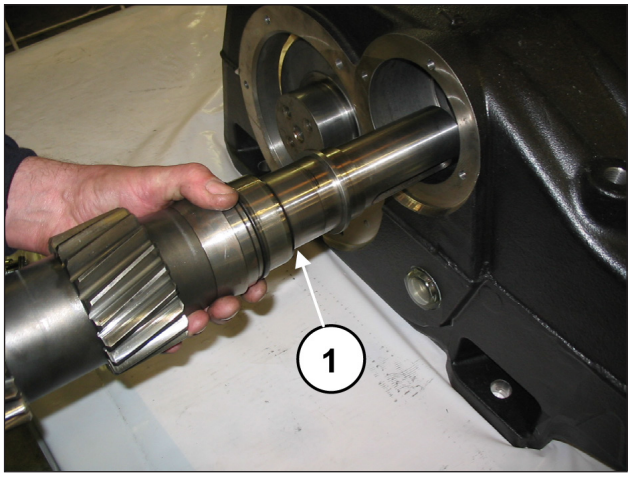


Fig. 33

Dégager les pistes intérieures des coussinets de l'arbre PTO (rep. ①, Fig. 34) et les deux entretoises du coussinet intérieur (rep. ②, Fig. 34).

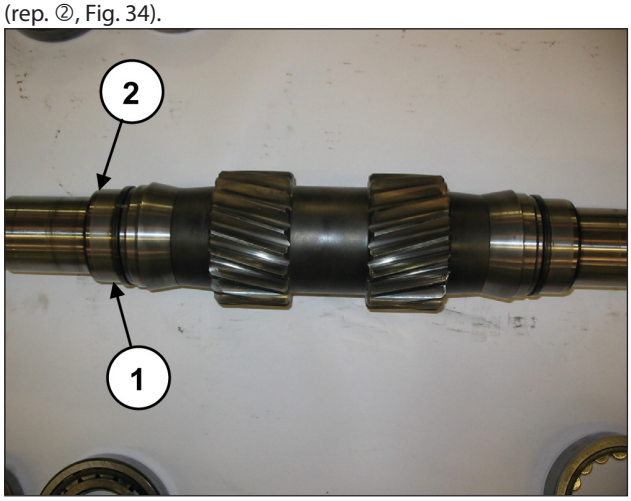


Fig. 34

Remonter les bagues internes et externes des coussinets selon le même ordre de couplage du démontage.

Utiliser une barre suffisamment longue (rep. ①, Fig. 36) et un outil à inertie pour dégager du carter de pompe les bagues des coussinets (rep. ①, Fig. 36), l'entretoise du coussinet extérieur (rep. ①, Fig. 37) et la douille de lubrification des coussinets (rep. ①, Fig. 38).

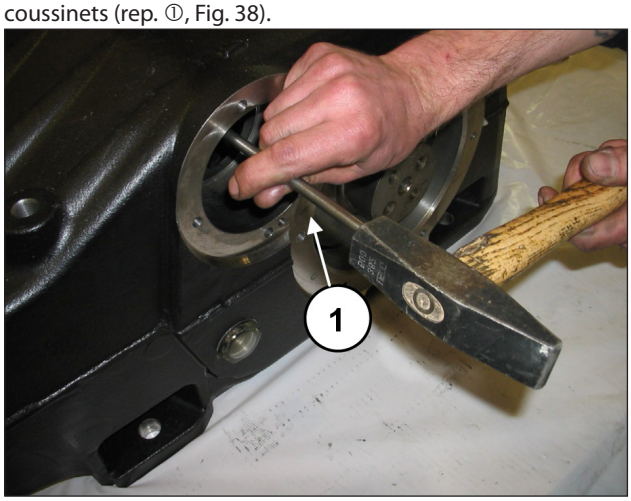


Fig. 35

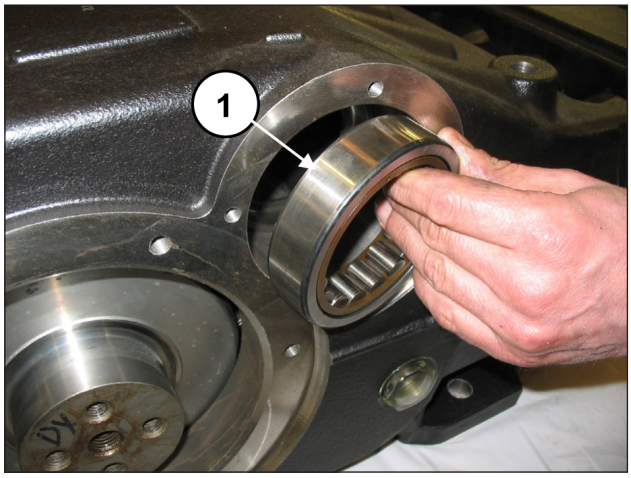


Fig. 36

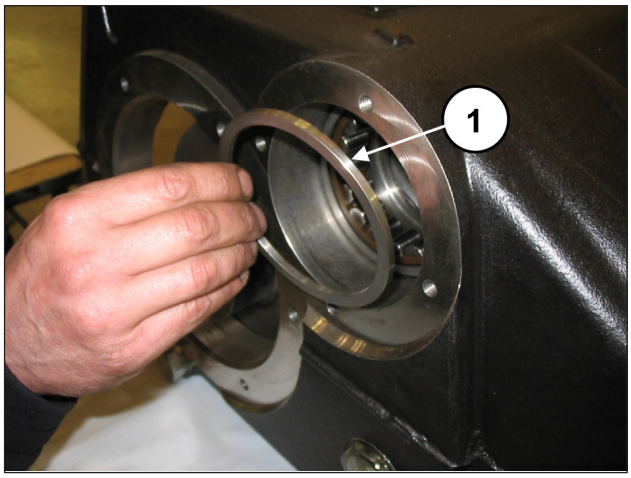


Fig. 37

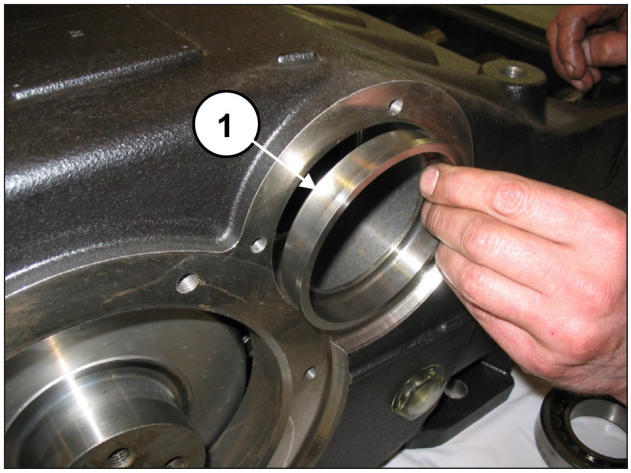


Fig. 38

Faire avancer les demi-bielles dans la direction de la partie hydraulique et les bloquer à l'aide de l'outil (réf. 27566200 (rep. ①, Fig. 39).

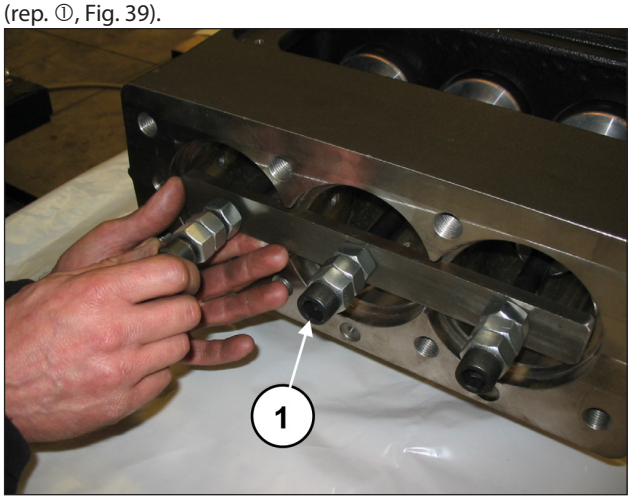


Fig. 39

Dégager le vilebrequin par l'arrière du carter (rep. ①, Fig. 40).

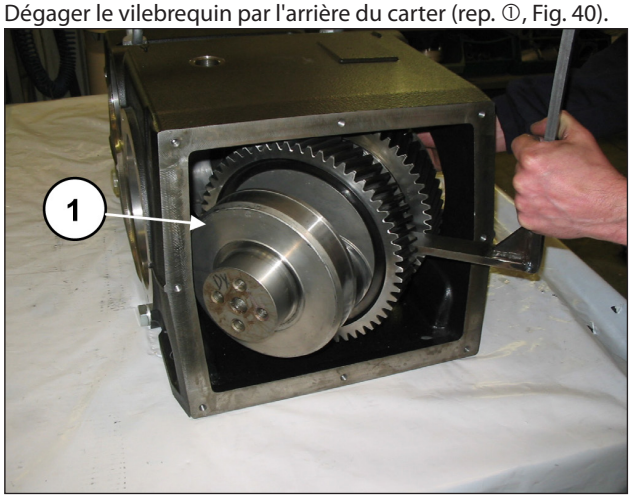


Fig. 40

Dévisser les vis de l'outil réf. 27566200 pour débloquer les bielles (rep. ①, Fig. 41) puis dégager les ensembles bielle-guide de piston par l'ouverture arrière du carter (rep. ①, Fig. 42).

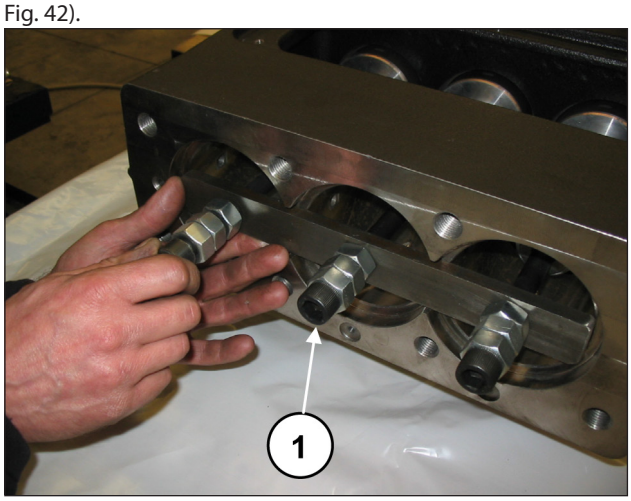


Fig. 41

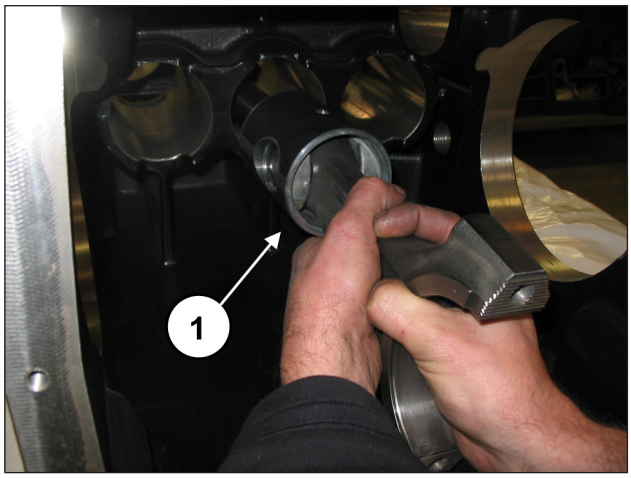
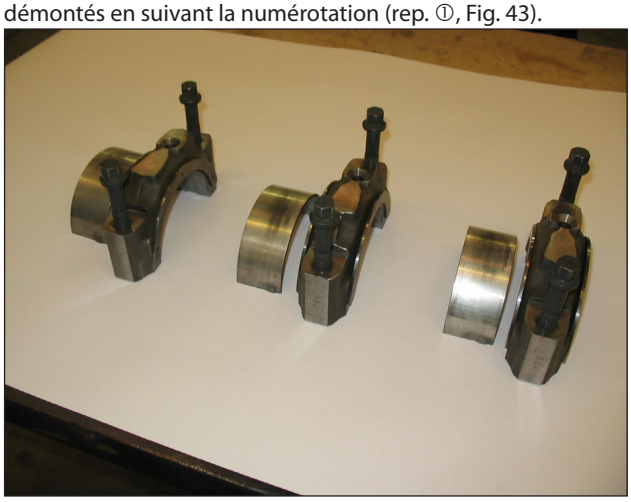


Fig. 42

Accoupler les demi-bielles avec les chapeaux préalablement démontés en suivant la numérotation (rep. ①, Fig. 43).



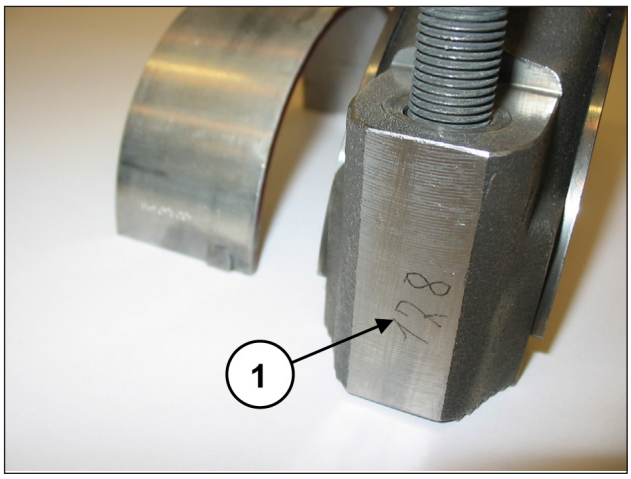


Fig. 43

Déposer les deux anneaux Seeger de retenue de la goupille à l'aide d'un outil approprié (rep. ①, Fig. 44).

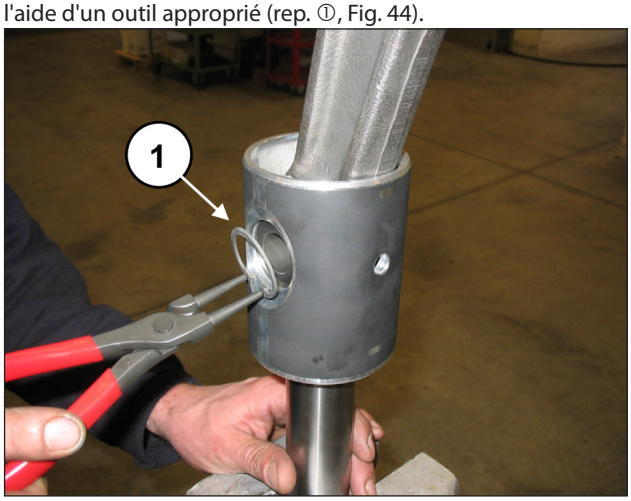


Fig. 44

Dégager la goupille (rep. ①, Fig. 45) et extraire la bielle (rep. ①, Fig. 46).

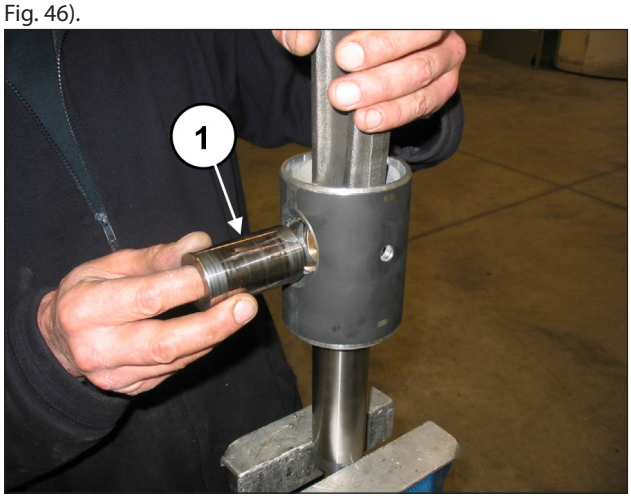


Fig. 45

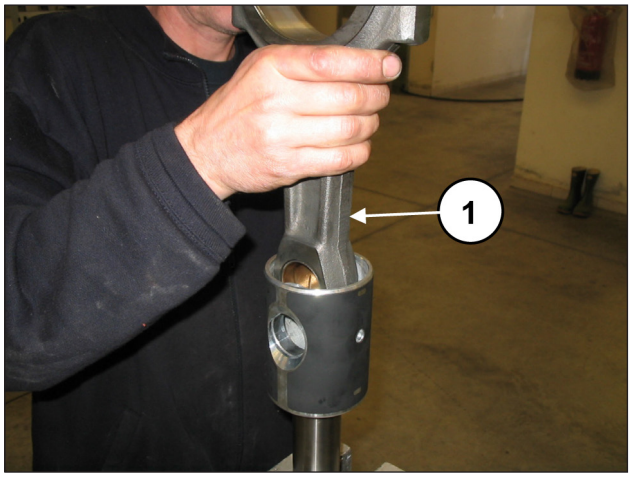


Fig. 46

Pour désassembler la tige du guide de piston, dévisser les vis à tête cylindrique M6 à l'aide d'une clé spéciale (rep. ①, Fig. 47).

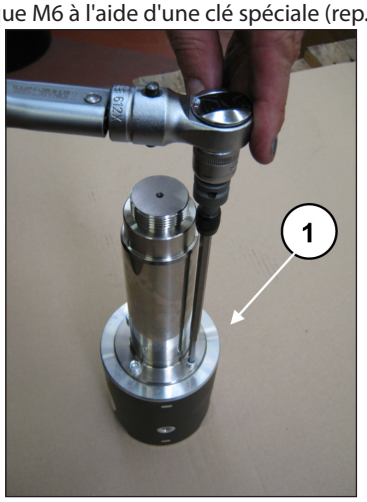


Fig. 47

Compléter le démontage de la partie mécanique en démontant les témoins de niveau d'huile, les œillets et le raccord rapide à 90°.

2.1.2 Remontage de la partie mécanique

Procéder au montage en inversant les opérations du parag. 2.1.1.
La séquence correcte est la suivante :
Remonter les deux témoins de niveau d'huile, les deux bouchons d'évacuation de l'huile et le raccord rapide à 90° (rep. ①, ② et ③ Fig. 48).

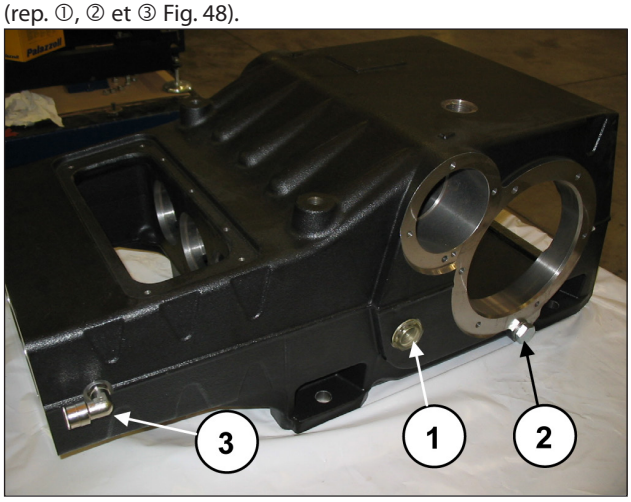


Fig. 48

Assembler la tige au guide de piston.
Insérer la tige du guide de piston dans le logement prévu à cet effet sur le guide de piston (rep. ①, Fig. 49) et le fixer sur ce dernier à l'aide des 4 vis à tête cylindrique M6x20 (rep. ①, Fig. 50).

Fig. 49

Fig. 50

Bloquer le guide de piston dans un étau à l'aide d'un outil spécial et serrer les vis à l'aide d'une clé dynamométrique (rep. ①, Fig. 51) selon les explications figurant au chapitre 3.

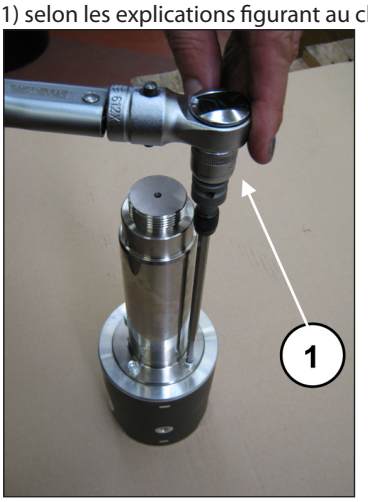


Fig. 51

Insérer la bielle dans le guide de piston (rep. ①, Fig. 46) puis insérer la goupille (rep. ①, Fig. 45). Appliquer les deux Seeger d'appui à l'aide de l'outil approprié (rep. ①, Fig. 44).
Désassembler les chapeaux des demi-bielles ; pour les accoupler correctement, suivre la numérotation présente sur un côté (rep. ①, Fig. 43).
Après s'être assuré que le carter est propre, insérer l'ensemble demi-bielle/guide de piston dans les tiges du carter (rep. ①, Fig. 42).

Insérer l'ensemble demi-bielle/guide de piston dans le carter en tournant les demi-bielles de sorte que la numérotation soit visible sur le dessus.

Bloquer les trois groupes à l'aide de l'outil réf. 27566200 (rep. ①, Fig. 41).
Insérer le vilebrequin à travers l'ouverture arrière du carter et le poser sur le fond.

Insérer le vilebrequin dans le carter de sorte que les dents des couronnes soient tournées comme le montre la Fig. 52.

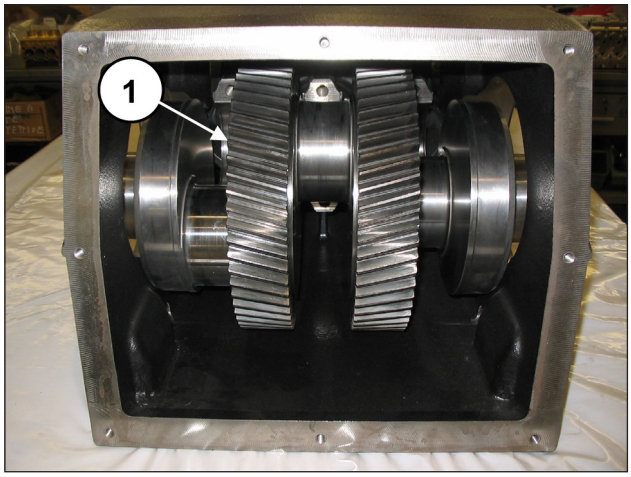


Fig. 52

Prémonter l'arbre PTO :
insérer sur l'arbre PTO les 2 bagues intérieures des coussinets (une de chaque côté) (rep. ①, Fig. 53).

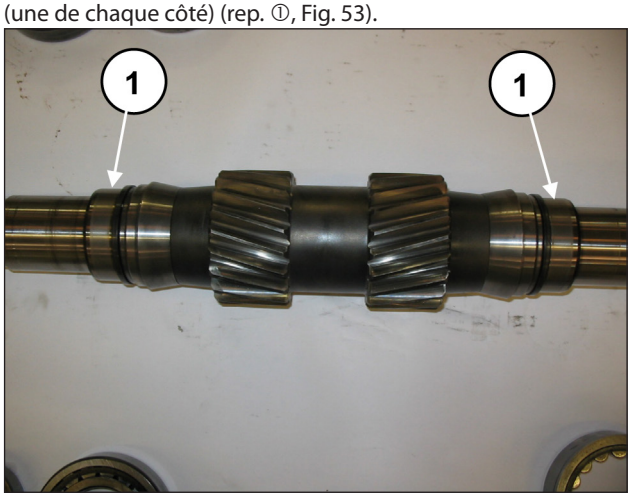


Fig. 53

Remonter les bagues internes et externes des coussinets selon le même ordre de couplage du démontage.

Sur un côté du carter, insérer la douille de lubrification des coussinets (rep. ①, Fig. 54) et une bague extérieure du coussinet (rep. ①, Fig. 55) à l'aide d'un tampon et d'un outil à inertie.

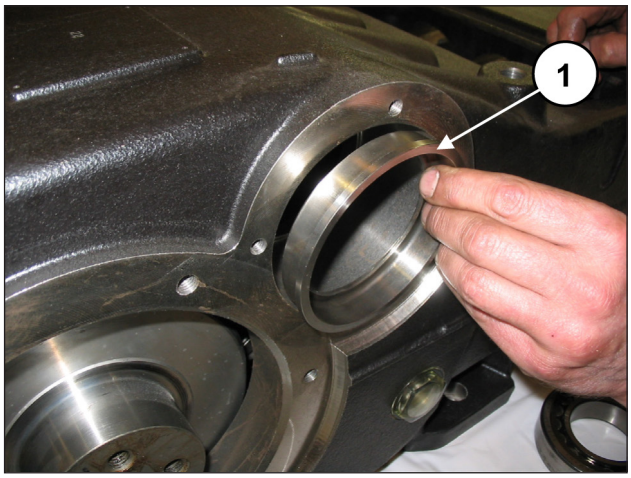


Fig. 54

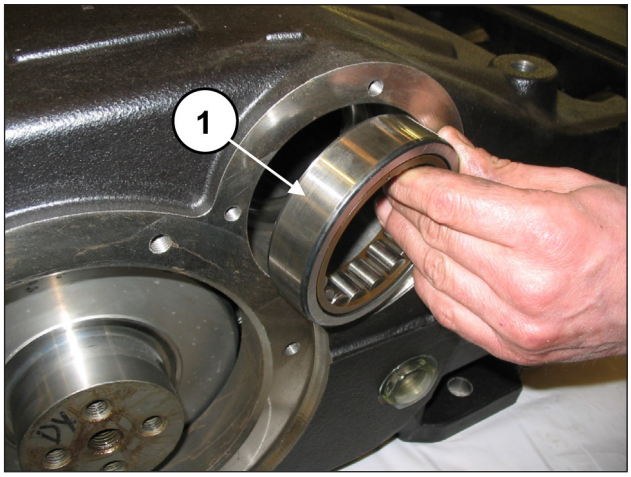


Fig. 55

Déposer l'outil de blocage des bielles réf. 27566200 (rep. ①, Fig. 41) et faire coulisser les bielles en arrière jusqu'à ce qu'elles entrent en contact avec le vilebrequin.

Insérer l'arbre PTO prémonté dans le carter (rep. ①, Fig. 56) en le faisant passer du côté opposé de celui où ont été prémontées la bague extérieure du coussinet et la douille de lubrification des coussinets.

Insérer l'arbre PTO dans le carter de sorte que les dents soient tournées comme le montre la Fig. 56.

Pour faciliter l'insertion de l'arbre PTO dans le coussinet, appliquer une vis M16 à l'extrémité de l'arbre dans le but de soulever ce dernier (rep. ①, Fig. 57).

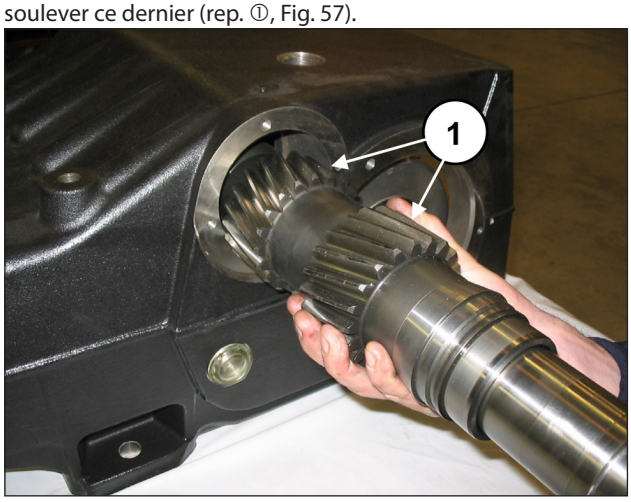


Fig. 56

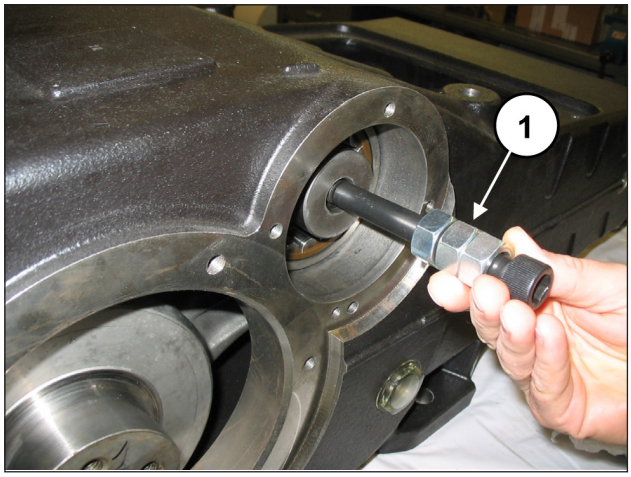


Fig. 57

Sur le côté d'insertion de l'arbre PTO, introduire la douille de lubrification des coussinets (rep. ①, Fig. 58) et une bague extérieure du coussinet (rep. ①, Fig. 59) à l'aide d'un tampon et d'un outil à inertie.

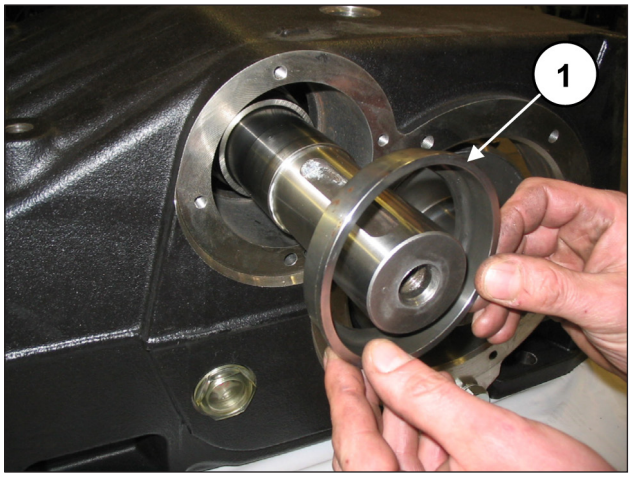


Fig. 58

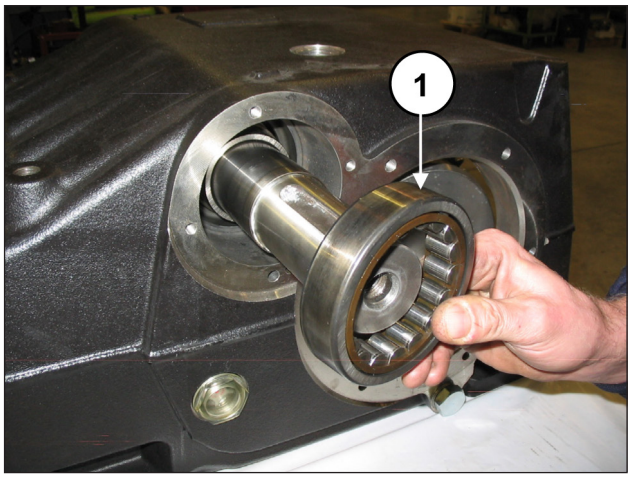


Fig. 59

Insérer les entretoises de coussinet intérieur (rep. ①, Fig. 60) et extérieur (rep. ①, Fig. 61) des deux côtés.

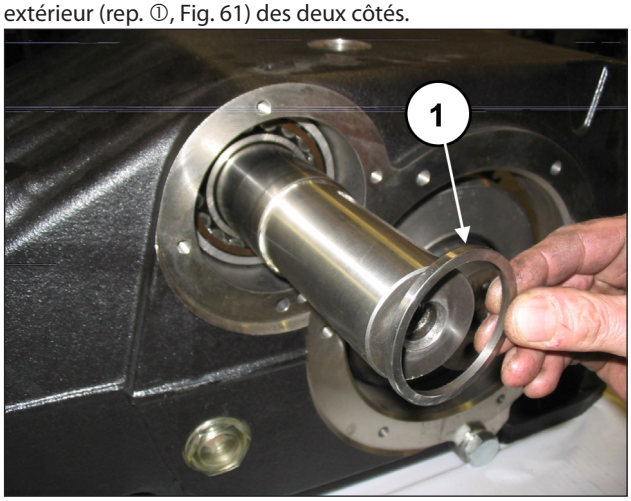


Fig. 60

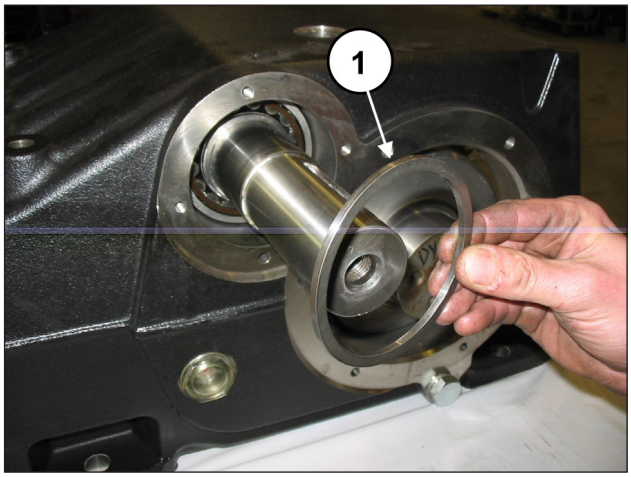


Fig. 61

Insérer la bague intérieure (rep. ①, Fig. 62) et la bague extérieure (rep. ①, Fig. 63) d'un coussinet d'un seul côté de la pompe.

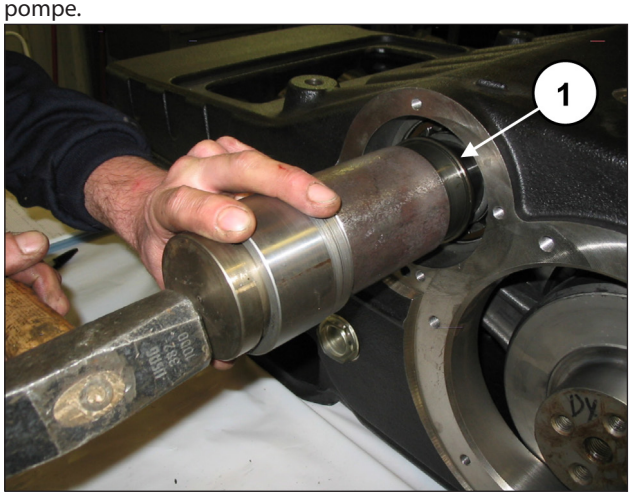


Fig. 62

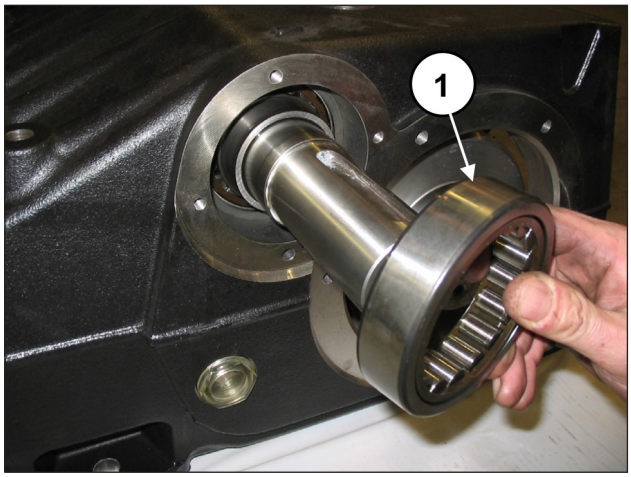


Fig. 63

Prémonter les couvercles du coussinet de PTO droit et gauche :
Insérer le joint d'étanchéité radial dans le couvercle du coussinet de PTO à l'aide de l'outil réf. 27539500 (rep. ①, Fig. 64).
Avant de procéder au montage du joint d'étanchéité radial, vérifier les conditions de la lèvre d'étanchéité. S'il s'avère nécessaire de remplacer le joint, placer le nouveau comme le montre la Fig. 65.

Si l'arbre PTO présente une usure diamétrale au niveau de la lèvre d'étanchéité, pour éviter la rectification, placer le joint en deuxième position, comme le montre la Fig. 65.

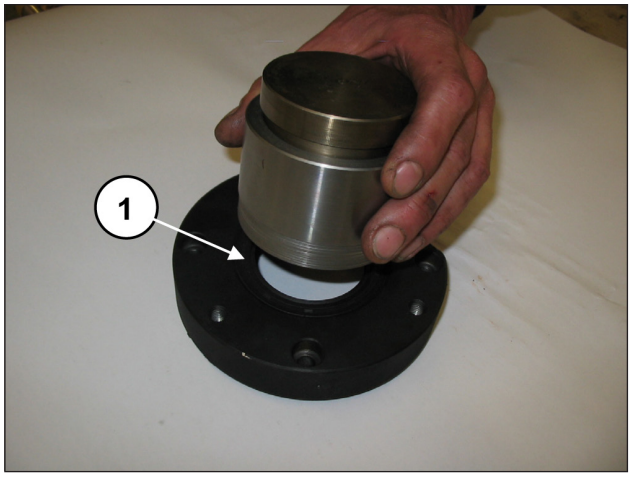


Fig. 64

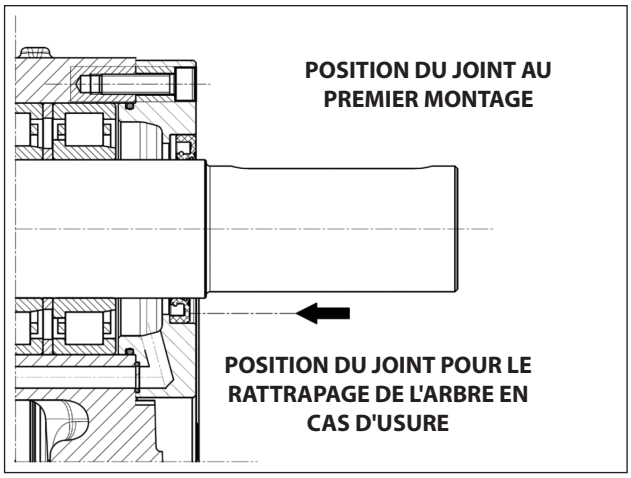


Fig. 65

Poser le joint torique extérieur (rep. ①, Fig. 66) et le joint torique de l'orifice de lubrification (rep. ①, Fig. 67) sur les couvercles du coussinet de PTO.

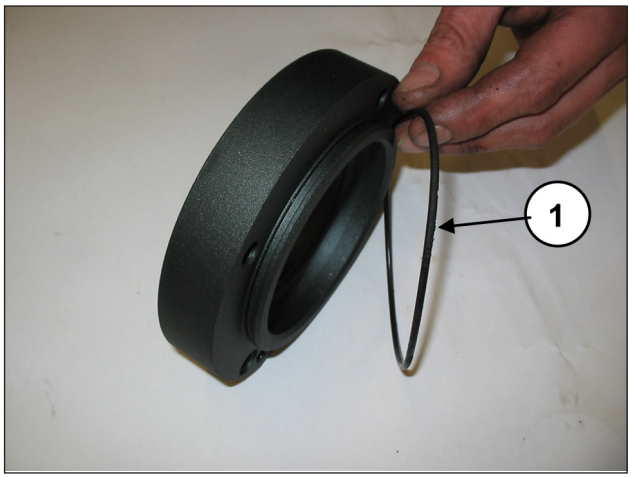


Fig. 66

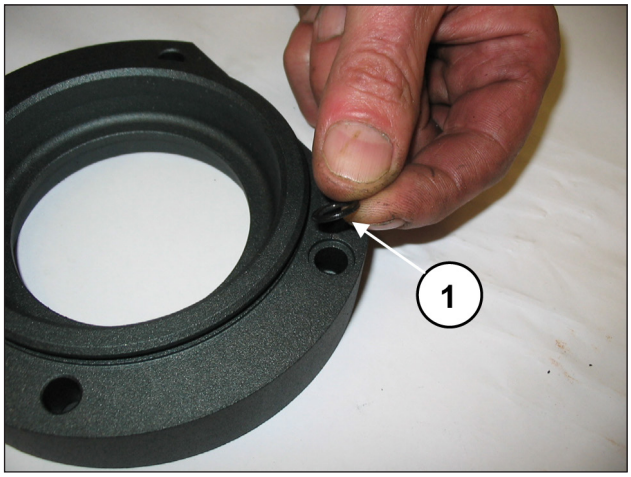


Fig. 67

Monter un premier couvercle de coussinet de PTO (droit ou gauche) sur le carter de pompe (rep. ①, Fig. 68) et le fixer à l'aide de 4 vis M8x30 (rep. ①, Fig. 69).

Faire attention au sens de montage du couvercle. L'orifice de lubrification du couvercle doit se trouver face à l'orifice présent sur le carter.

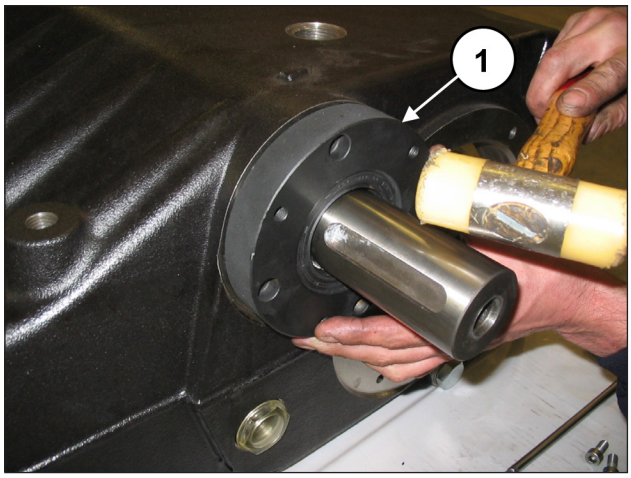


Fig. 68

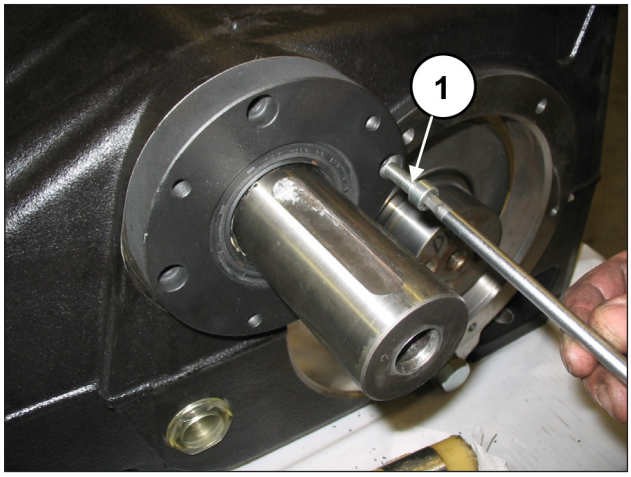


Fig. 69

Répéter les opérations de l'autre côté :
Insérer la bague intérieure (rep. ①, Fig. 62) et la bague extérieure (rep. ①, Fig. 63) du dernier coussinet.
Monter l'autre couvercle de coussinet de PTO sur le carter de pompe (rep. ①, Fig. 68) et le fixer à l'aide de 4 vis M8x30 (rep. ①, Fig. 69).
Serrer les 4+4 vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.
Prémonter les deux couvercles de support de coussinet : insérer le coussinet à l'aide d'un outil à inertie (rep. ①, Fig. 70) jusqu'à obtenir une cote de 4÷4,5 mm comme le montre la Fig. 71.

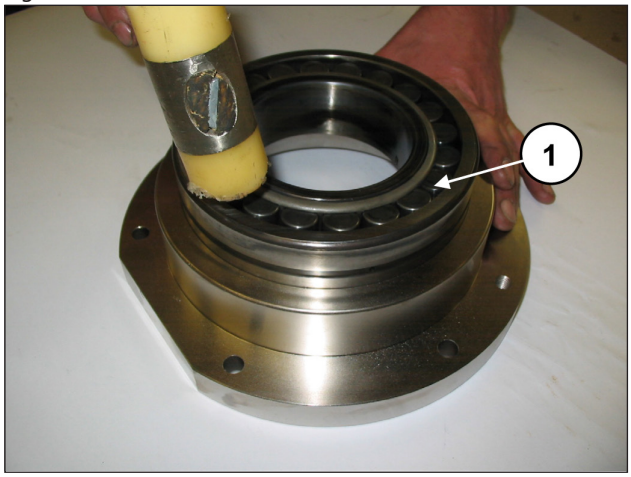


Fig. 70

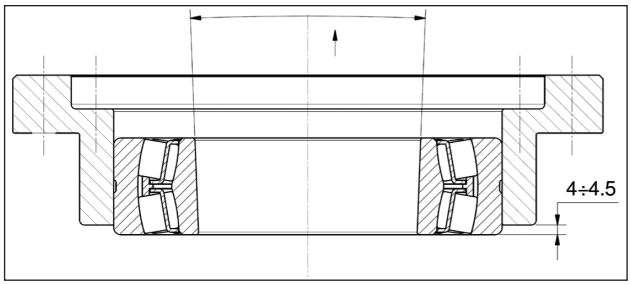


Fig. 71

La bague interne du coussinet Fig. 71 est conique. Vérifier que la conicité va de l'extérieur vers l'intérieur pour recevoir correctement la douille.

Appliquer le joint torique à l'extérieur du couvercle de support de coussinet (rep. ①, Fig. 72).

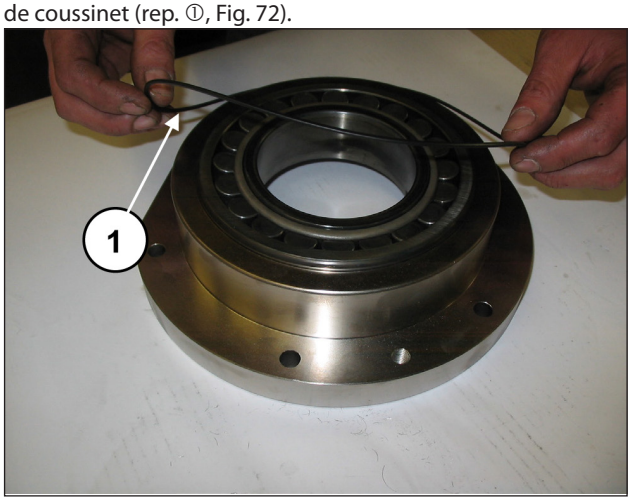


Fig. 72

Répéter l'opération sur l'autre couvercle.
Bloquer les trois groupes bielle à l'aide de l'outil réf. 27566200 (rep. ①, Fig. 41).
Poser deux axes filetés M16 à l'extrémité du vilebrequin, soulever ce dernier (rep. ①, Fig. 73) et insérer le couvercle du support de coussinet avec le coussinet et le joint torique (rep. ①, Fig. 74) à l'aide d'un outil à inertie. Répéter l'opération de l'autre côté.

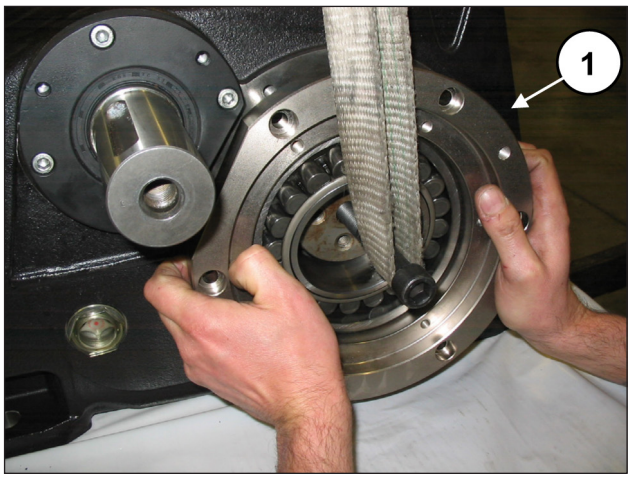


Fig. 73

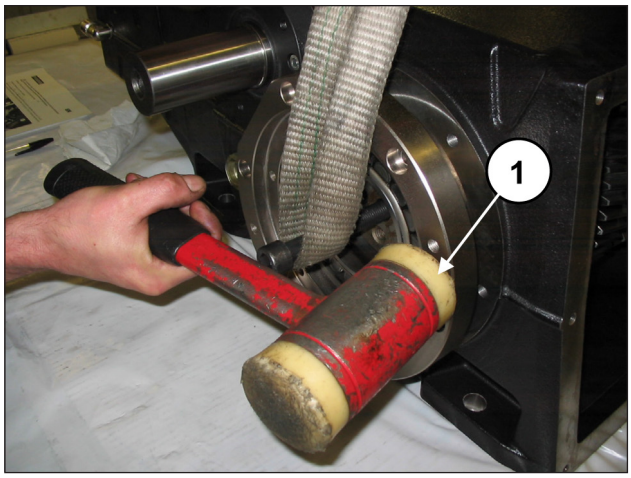


Fig. 74

Visser les couvercles de support de coussinet à l'aide de 6+6 vis M10x30 (rep. ①, Fig. 75).
Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

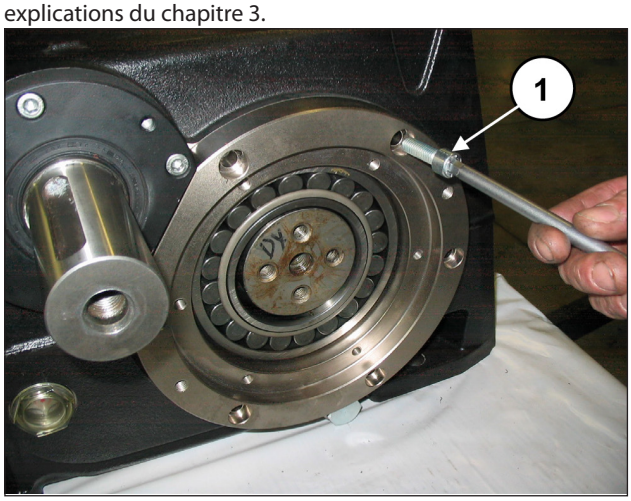


Fig. 75

Insérer une partie des deux douilles de pression tout en soulevant le vilebrequin à l'aide de l'axe M16 préalablement monté (rep. ①, Fig. 76).

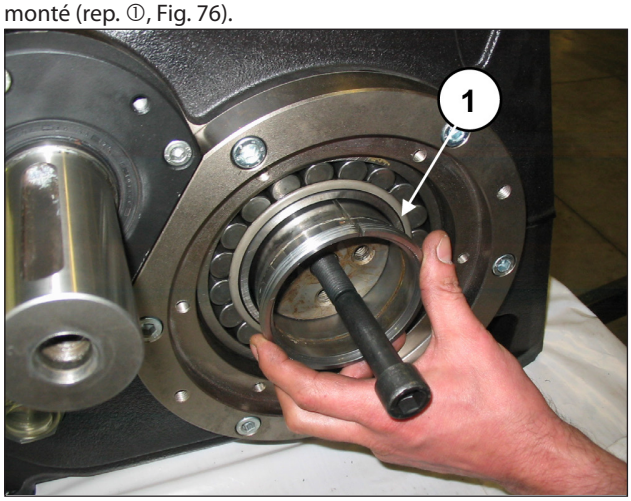


Fig. 76

Pousser à fond la douille de pression sur le vilebrequin (rep. ①, Fig. 77 e Fig. 78) à l'aide d'un outil à inertie et d'un tampon.

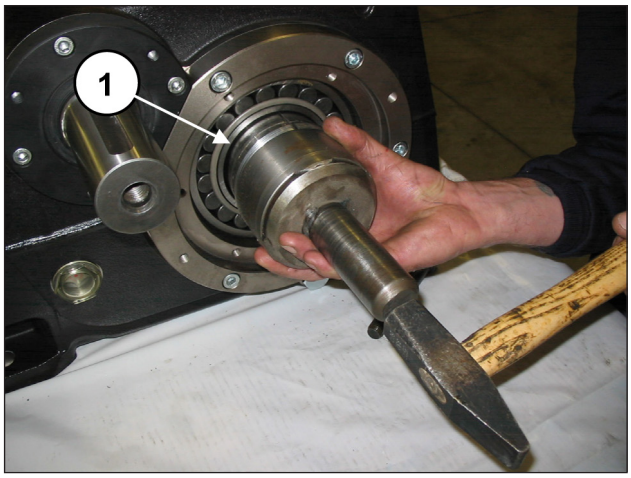


Fig. 77

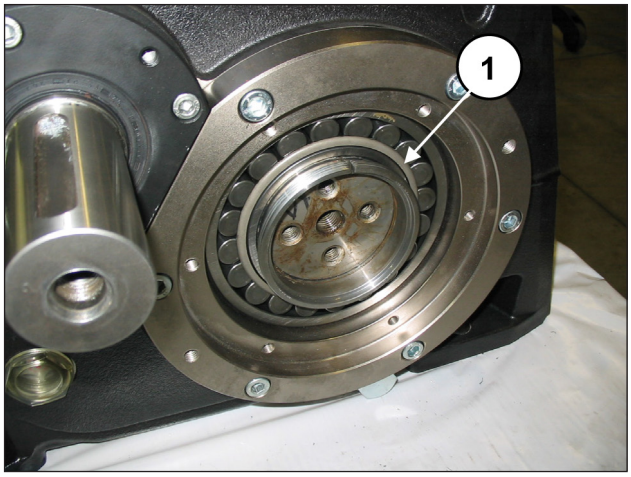


Fig. 78

Installer la douille de pression à sec (sans huile ni lubrifiant).

Insérer la douille jusqu'à ce que la piste extérieure (conique) s'accouple parfaitement avec la piste intérieure du coussinet. Durant la pose, s'assurer que le coussinet reste en contact avec la bague d'appui du vilebrequin.
Répéter l'opération de l'autre côté.
Insérer les flasques de retenue de la douille dans les douilles coniques (rep. ①, Fig. 79).
Poser une vis M16 d'une longueur suffisante (35-40 mm) dans l'orifice M16 du vilebrequin et visser jusqu'à ce que le flasque atteigne la douille (rep. ①, Fig. 80). Ne pas serrer la vis.

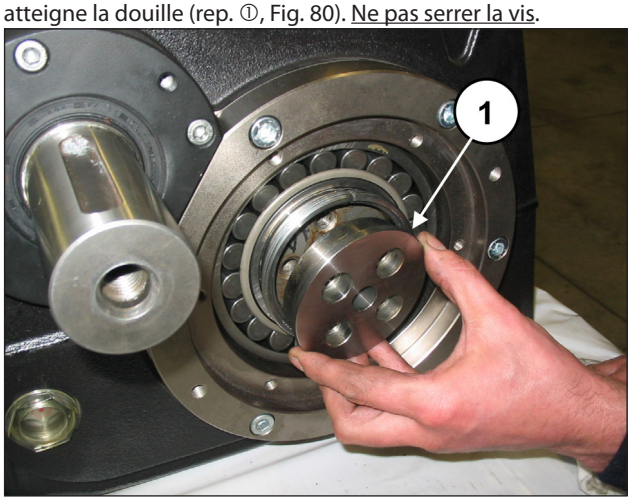


Fig. 79

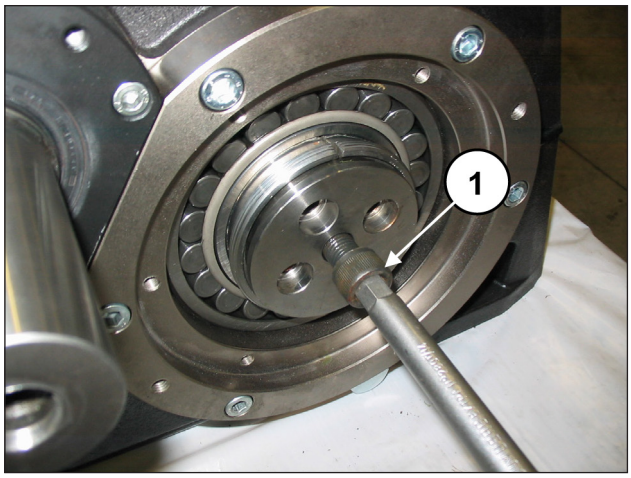


Fig. 80

Répéter l'opération de l'autre côté.
Déposer l'outil de blocage des bielles réf. 27566200 (rep. ①, Fig. 41).
Insérer les demi-coussinets supérieurs entre les bielles et le vilebrequin (rep. ①, Fig. 81).

Pour monter correctement les demi-coussinets, s'assurer que la languette de repère des demi-coussinets se trouve dans son logement sur la demi-bielle (rep. ①, Fig. 82).

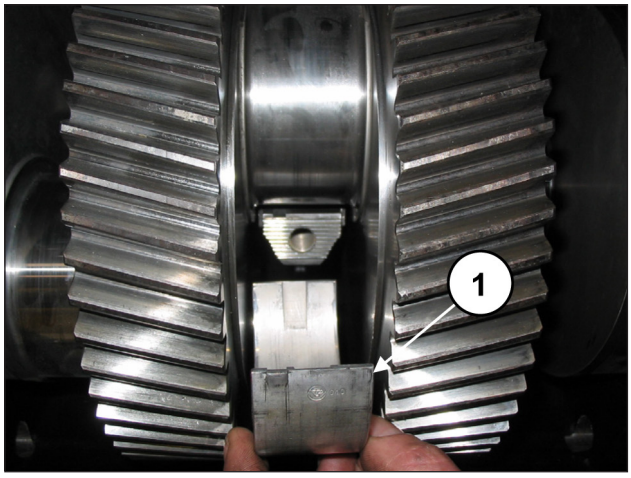


Fig. 81

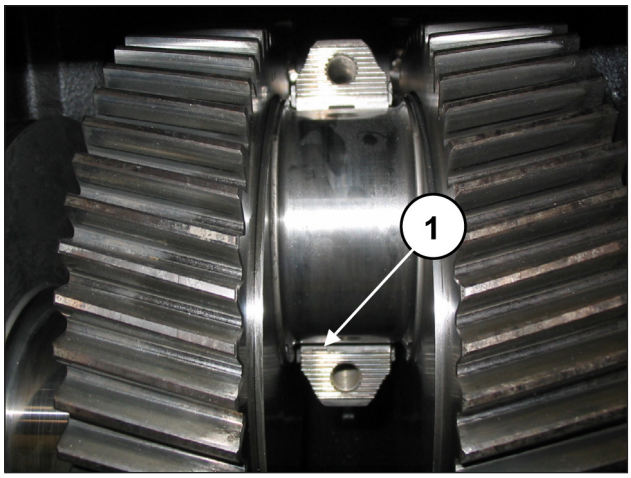


Fig. 82

Assembler les demi-coussinets inférieurs aux chapeaux (rep. ①, Fig. 83) en s'assurant que la languette de repère des demi-coussinets se trouve dans son logement sur le chapeau (rep. ②, Fig. 83).
Fixer les chapeaux sur les demi-bielles à l'aide des vis M12x1,25x87 (rep. ①, Fig. 84).
Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3 ; serrer les vis au couple préconisé simultanément.

Faire attention au sens de montage des chapeaux. La numérotation doit être tournée vers le haut.

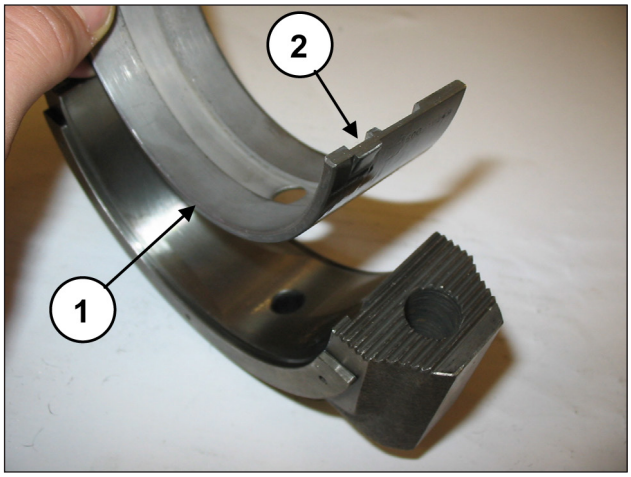


Fig. 83

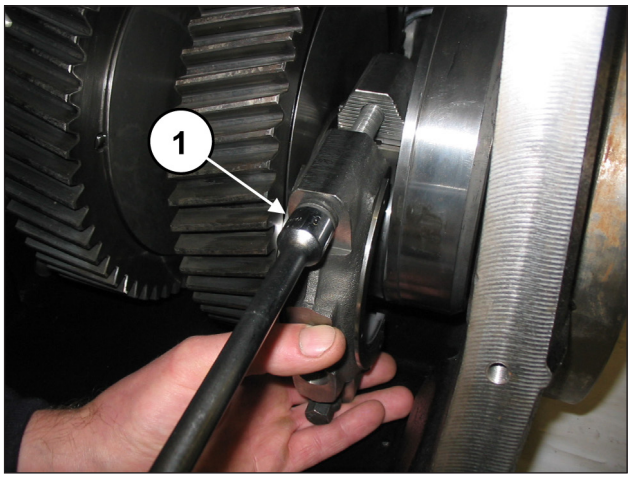


Fig. 84

Insérer une cale sous le corps de la bielle centrale pour empêcher le vilebrequin de tourner (rep. ①, Fig. 85).

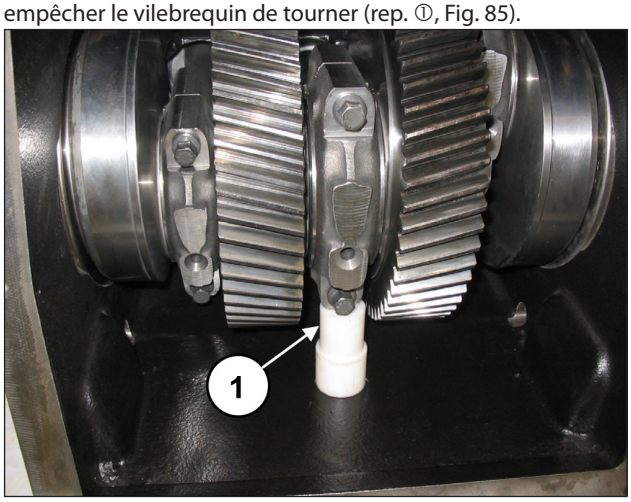


Fig. 85

Mesurer la cote « X » indiquée Fig. 86 entre la douille conique et le coussinet de vilebrequin.

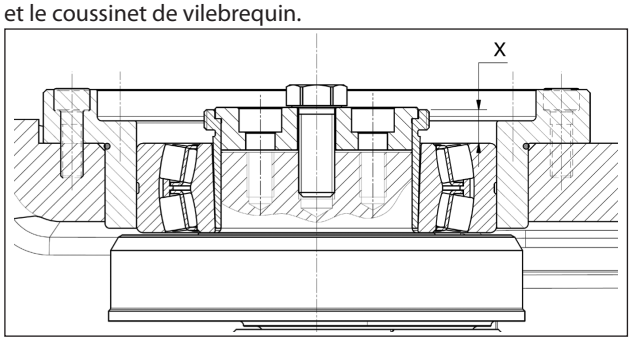


Fig. 86

Visser la vis M16 de sorte à déterminer une réduction de la cote « X » comprise entre 0,7 et 0,8 mm (Fig. 87).

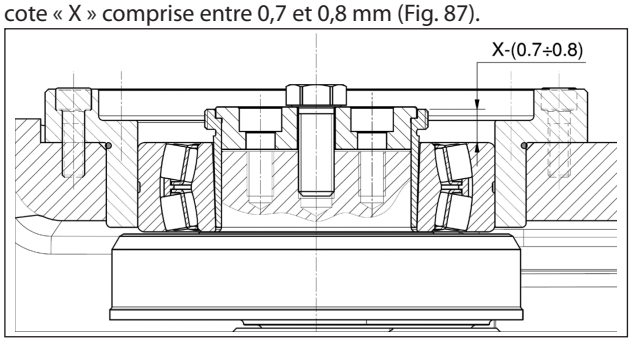


Fig. 87

Répéter l'opération de l'autre côté.
Déposer la vis M16 du vilebrequin.
Visser les deux flasques de retenue de la douille sur le vilebrequin à l'aide de 4+4 vis M12x25 (rep. ①, Fig. 89).

Appliquer LOCTITE 243 sur le filetage des vis M12x25 (rep. ①, Fig. 88).

Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

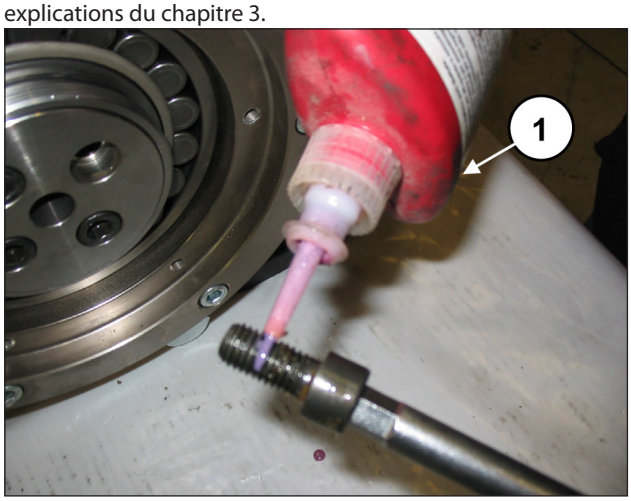


Fig. 88

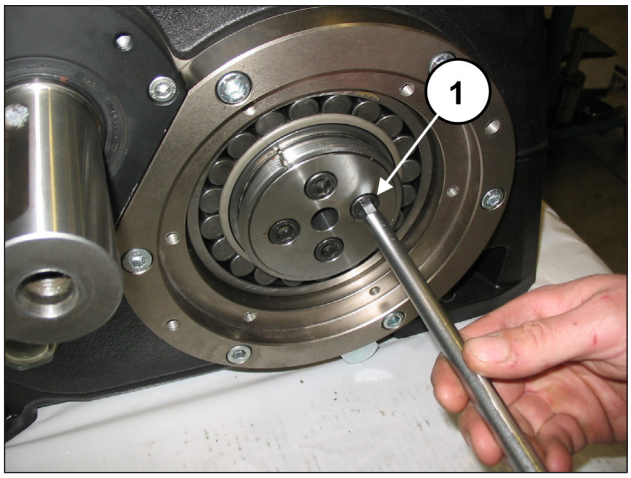


Fig. 89

Retirer la cale anti-rotation sous le corps de la bielle centrale.
Monter les deux couvercles de coussinet (avec leur joint torique) (rep. ①, Fig. 90) à l'aide de 6+6 vis M8x20 (rep. ①, Fig. 91).
Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

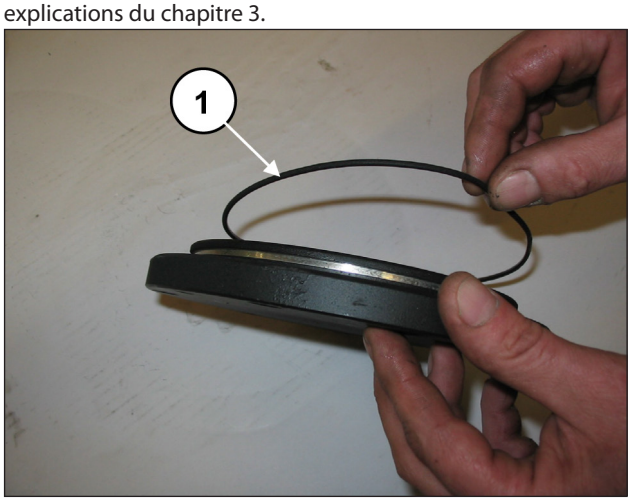


Fig. 90

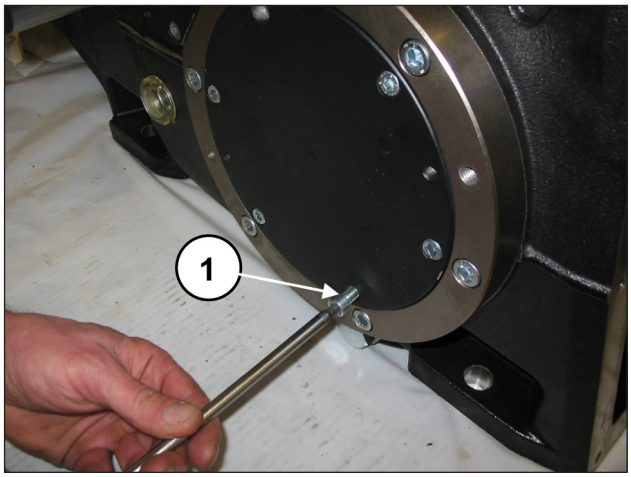


Fig. 91

Insérer le joint torique dans le couvercle arrière (rep. ①, Fig. 92) et le fixer au carter à l'aide de 10 vis M8x20 (rep. ①, Fig. 93).
Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

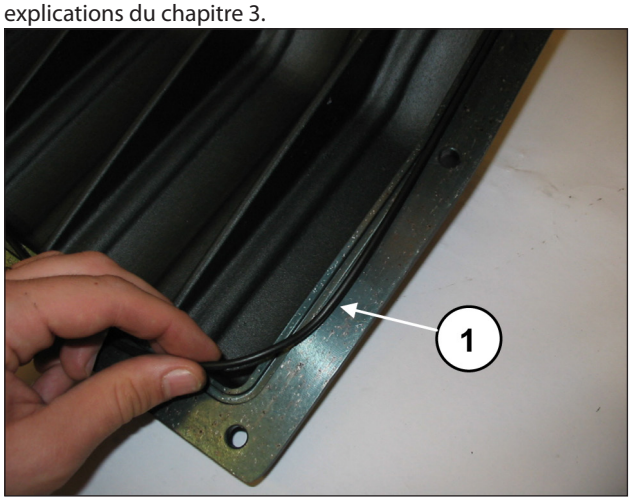


Fig. 92

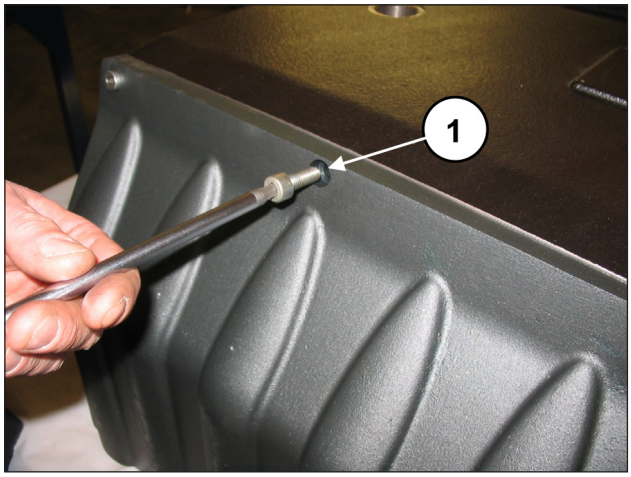


Fig. 93

Monter le joint d'étanchéité radial sur le couvercle du joint d'huile (rep. ①, Fig. 94) à l'aide d'un tampon réf. 27910900.

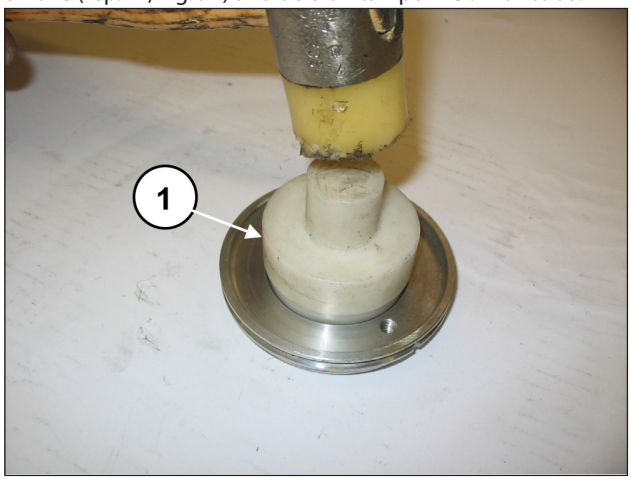


Fig. 94

Placer le joint torique (rep. ①, Fig. 95) dans le siège du couvercle du joint d'huile et insérer le groupe assemblé dans le siège prévu à cet effet sur le carter (rep. ①, Fig. 96).

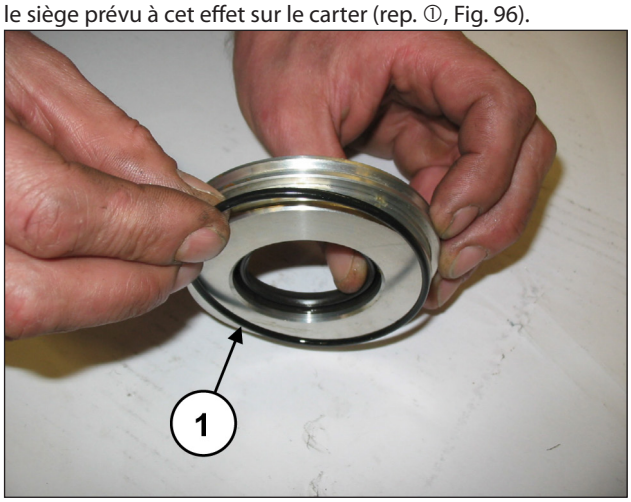


Fig. 95

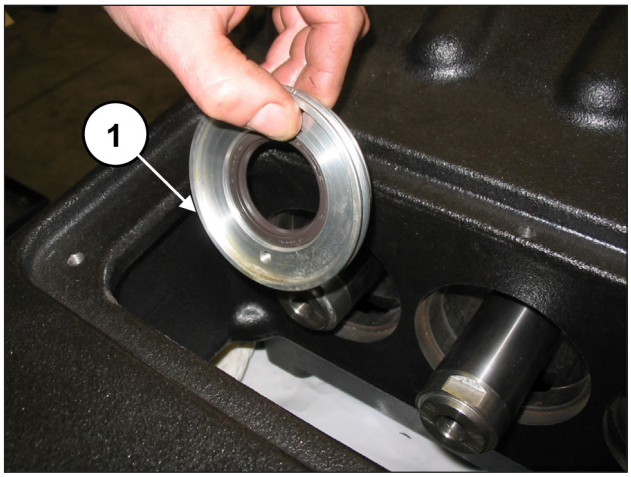


Fig. 96

S'assurer que le couvercle entre à fond dans le logement (rep. ①, Fig. 97) en ayant soin de ne pas endommager la lèvre du joint d'étanchéité radial. Visser les couvercles du joint d'huile à l'aide de 2 goujons M6x30 (rep. ①, Fig. 98).

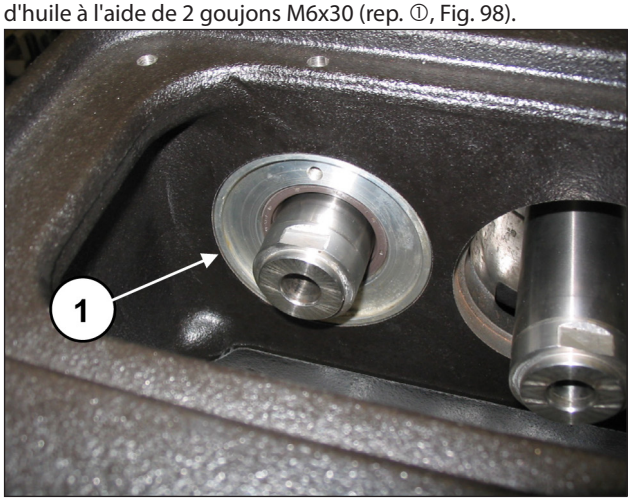


Fig. 97

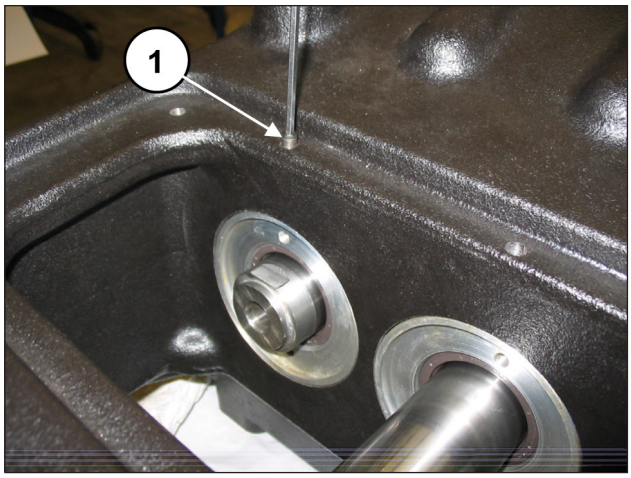


Fig. 98

Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.
Placer les bavettes avec leur joint torique dans le logement sur le guide du piston (rep. ①, Fig. 99 et Fig. 100).

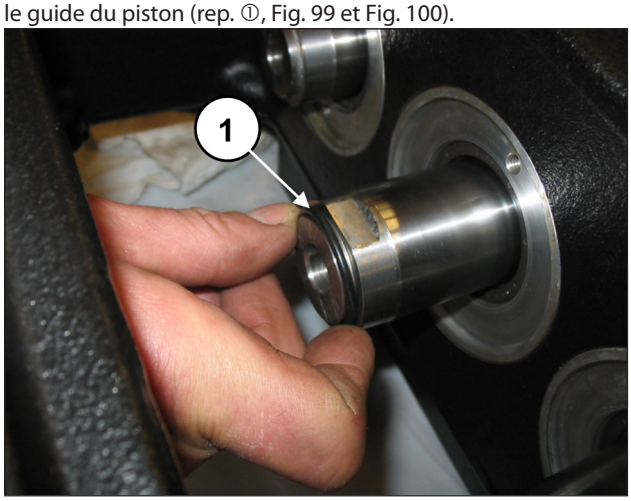


Fig. 99

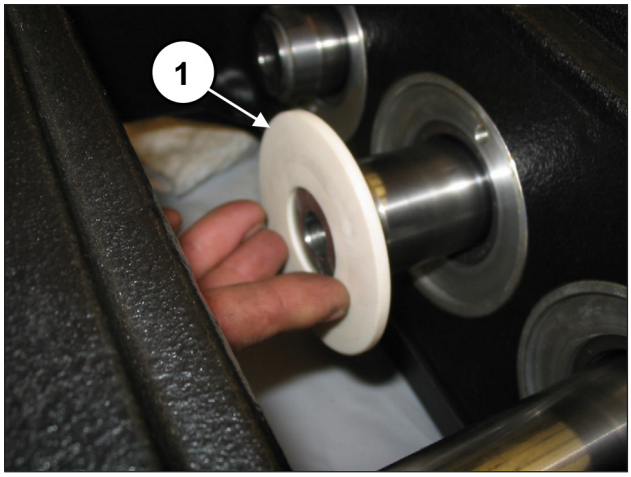


Fig. 100

Visser les trois pistons (rep. ①, Fig. 101) et régler à l'aide de la clé à fourchette dynamométrique, en suivant les explications au chapitre 3.

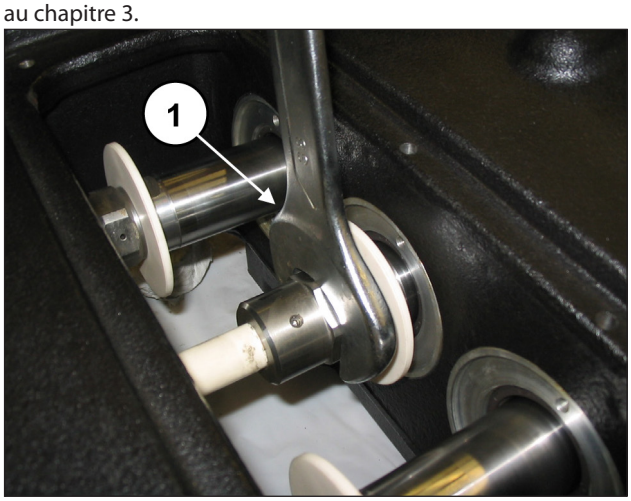


Fig. 101

Poser le joint torique (rep. ①, Fig. 102) sur les deux couvercles d'inspection et monter les couvercles à l'aide de 4+4 vis M6x14 (rep. ①, Fig. 103).

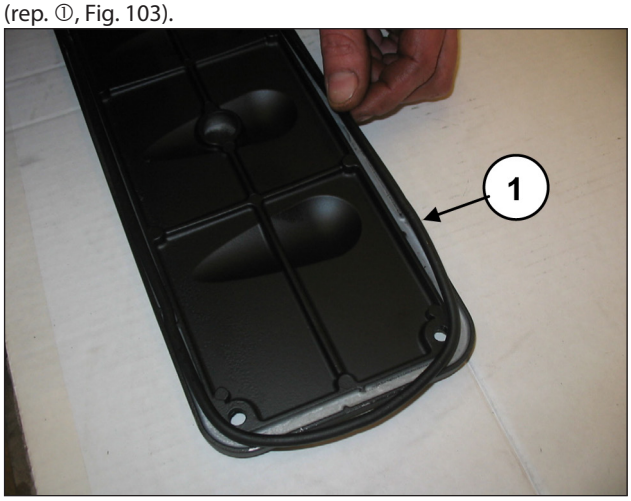


Fig. 102

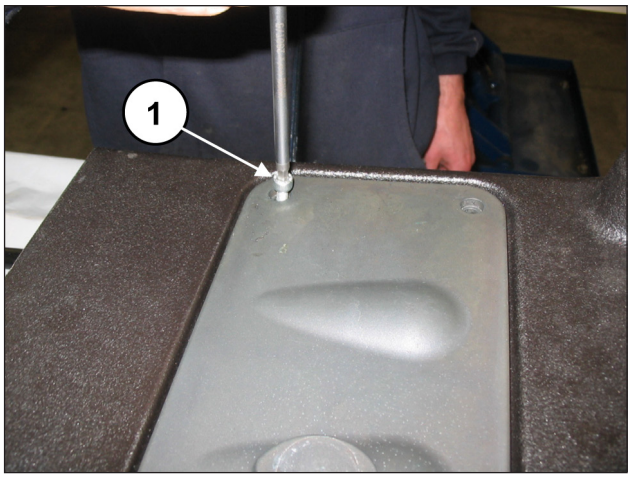


Fig. 103

Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

Monter le couvercle sur l'extrémité de l'arbre et le fixer au carter à l'aide de 3 vis M8x20 (rep. ①, Fig. 104).
Serrer les vis à l'aide d'une clé dynamométrique, en suivant les explications du chapitre 3.

Fig. 104

Poser la languette sur l'arbre PTO (rep. ①, Fig. 105).

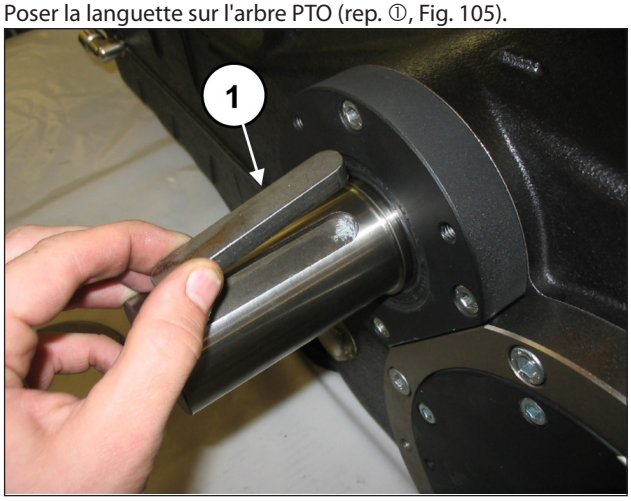


Fig. 105

2.1.3 Classes de majorations prévues

TABLEAU DE MAJORATIONS POUR VILEBREQUIN ET DEMI-COUSSINETS DE BIELLE			
Classes de rattrapage (mm)	**Code Demi-coussinet Supérieur**	**Code Demi-coussinet Inférieur**	**Rectification sur le diamètre du goujon de l'arbre (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

TABLEAU DES MAJORATIONS POUR CARTER DE POMPE ET GUIDE DE PISTON		
Classes de rattrapage (mm)	**Référence Guide de piston**	**Rectification sur le siège du carter de pompe (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 RÉPARATION DE LA PARTIE HYDRAULIQUE

2.2.1 Démontage de la tête - chemises - soupapes

La tête ne nécessite aucun entretien régulier.
Les interventions se limitent à l'inspection ou au remplacement des soupapes, en cas de besoin.
Pour l'extraction des groupes de la soupape, procéder de la façon suivante :
Desserrer, sans les déposer, les vis M10x140 de fixation des chemises sur la tête (rep. ①, Fig. 106) de sorte qu'elles résultent libres.

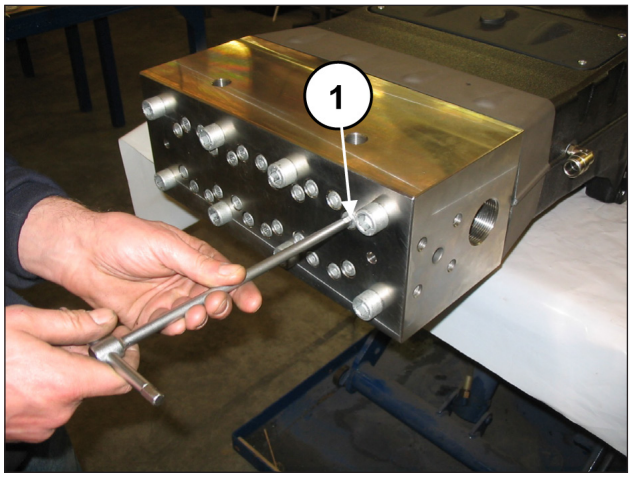


Fig. 106

Dévisser deux vis de fixation de la tête M16x280 diamétralement opposées (rep. ① et ②, Fig. 107) et les remplacer par deux goujons de service (réf. 27540200 (rep. ①, Fig. 108) puis enlever les autres vis.

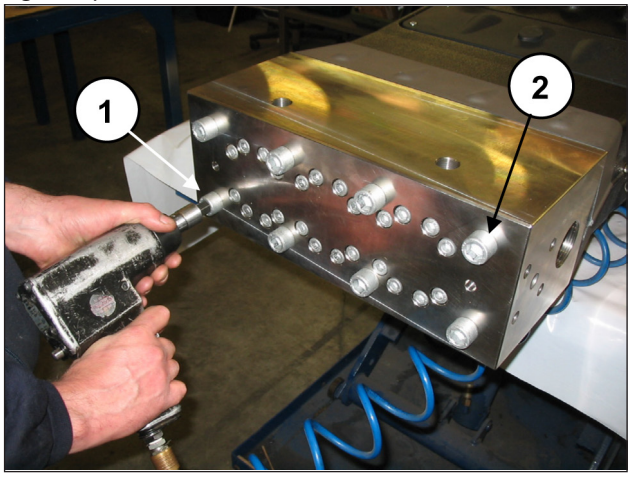


Fig. 107

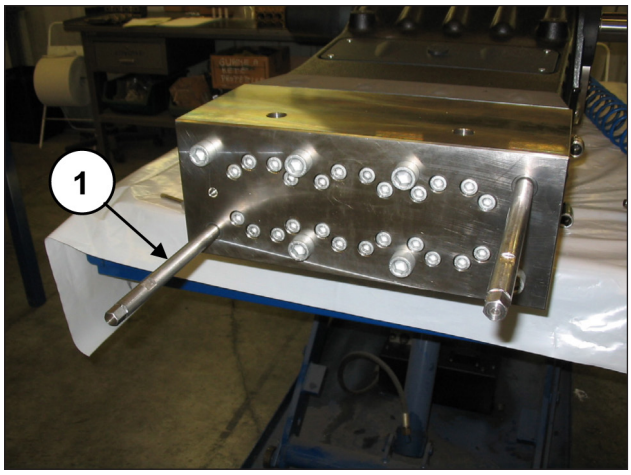


Fig. 108

Désassembler la tête et l'entretoise des chemises du carter de pompe (rep. ①, Fig. 109).

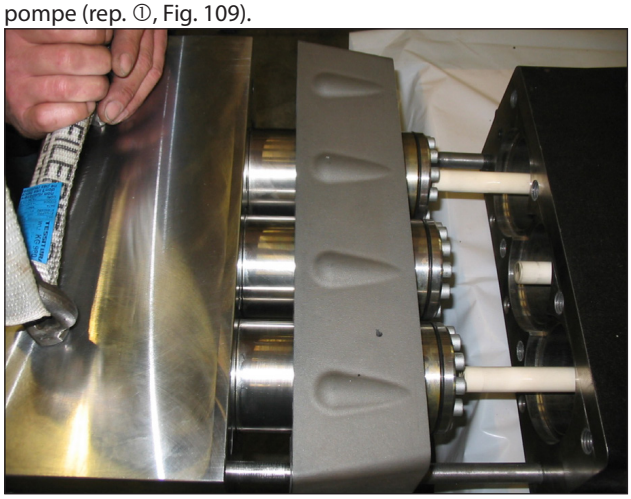


Fig. 109

Déposer les joints toriques des supports de joint (rep. ①, Fig. 110) et dégager l'entretoise des chemises des groupes chemises (rep. ①, Fig. 111).

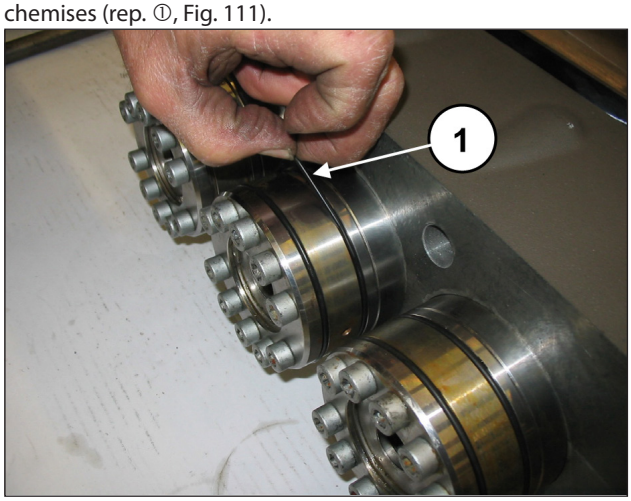


Fig. 110

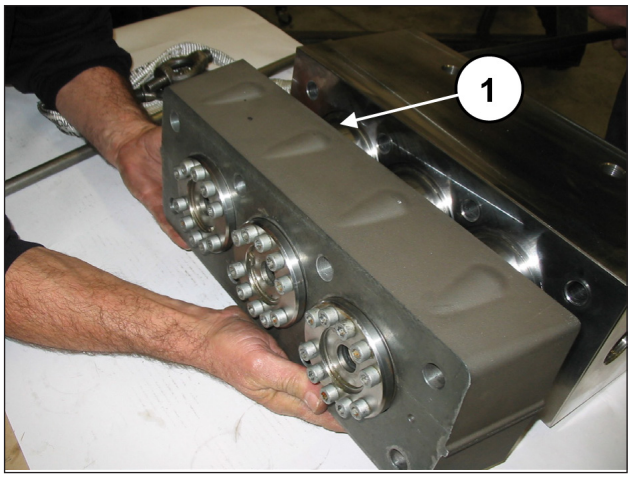


Fig. 111

Déposer les vis M10x140 de fixation des chemises sur la tête (rep. ①, Fig. 112) et dégager les groupes chemises (rep. ①, Fig. 113).

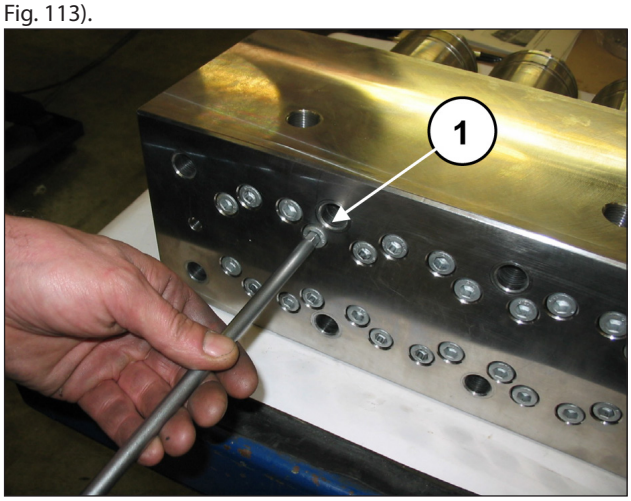


Fig. 112

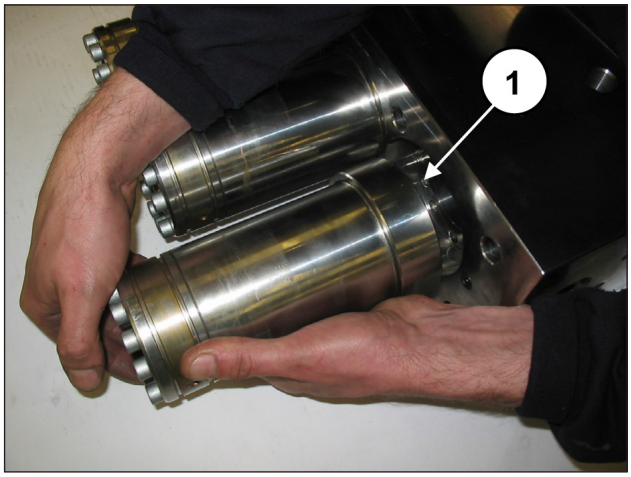


Fig. 113

Durant le démontage des chemises, ne pas perdre les ressorts de soupape ni les soupapes plates (rep. ① et ②, Fig. 114) car elles pourraient tomber du fait qu'elles sont juste posées sur le fond.

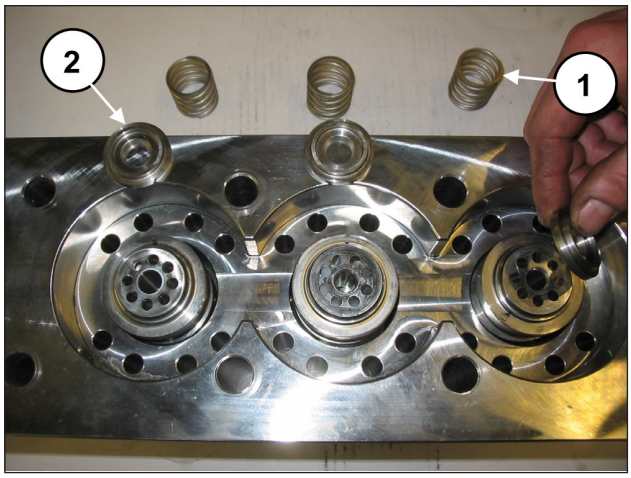


Fig. 114

Si les sièges de soupape résultent bloqués sur la tête à cause de la présence de calcaire ou s'ils sont oxydés, les débloquer en faisant passer l'outil (réf. 034300020 pour SK20-22-24 ou réf. 034300010 pour SK26-28-30) dans l'orifice de refoulement (rep. ①, Fig. 115).

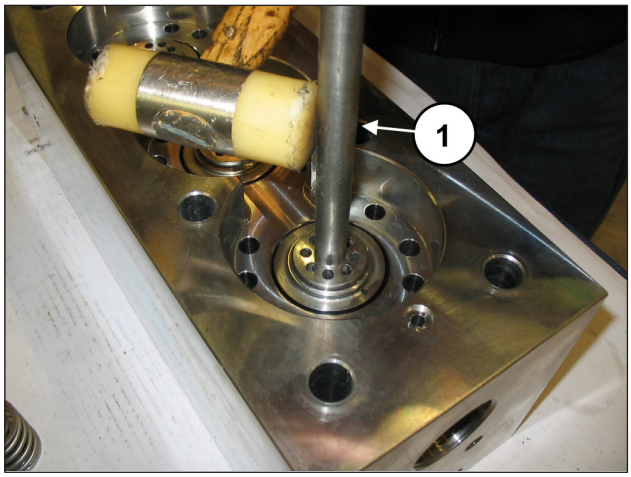


Fig. 115

Dégager les sièges de soupape et vérifier si les joints sont usés. Si nécessaire, procéder au remplacement (rep. ①, Fig. 116).

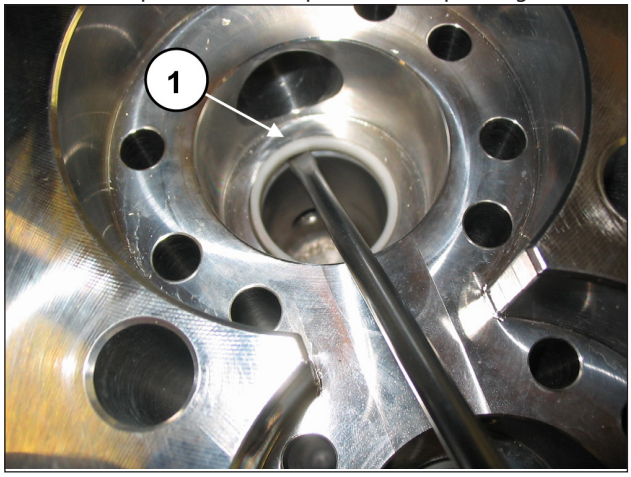


Fig. 116

Remplacer les joints d'étanchéité et les joints toriques correspondants à l'avant, entre la chemise et la tête, entre la tête et l'entretoise des chemises à proximité de l'orifice de recyclage, chaque fois que l'on procède au contrôle des soupapes. Avant de procéder au remontage, nettoyer et essuyer les différents composants et tous leurs logements à l'intérieur de la tête.

Extraire les plateaux de refoulement (rep. ①, Fig. 117) ainsi que leurs guides (rep. ①, Fig. 119), avec leurs ressorts (rep. ①, Fig. 118), vérifier s'ils sont usés et procéder au remplacement si nécessaire ; toujours les remplacer aux intervalles indiqués au chapitre 11 du ***Manuel d'utilisation et d'entretien***.

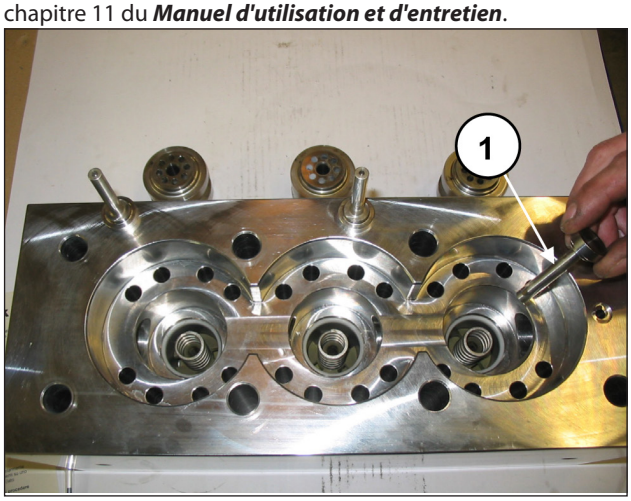


Fig. 117

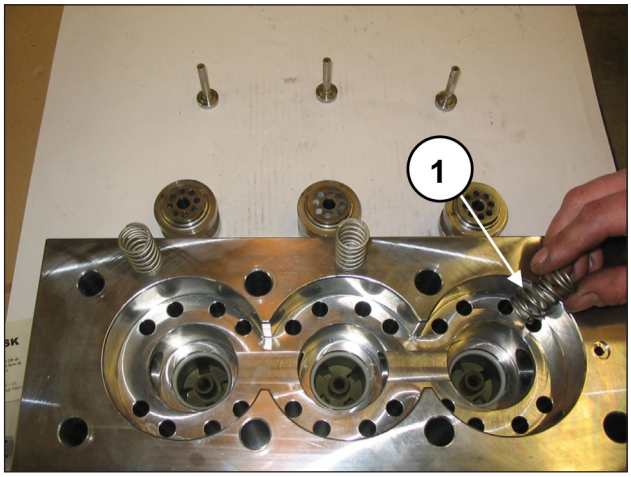


Fig. 118

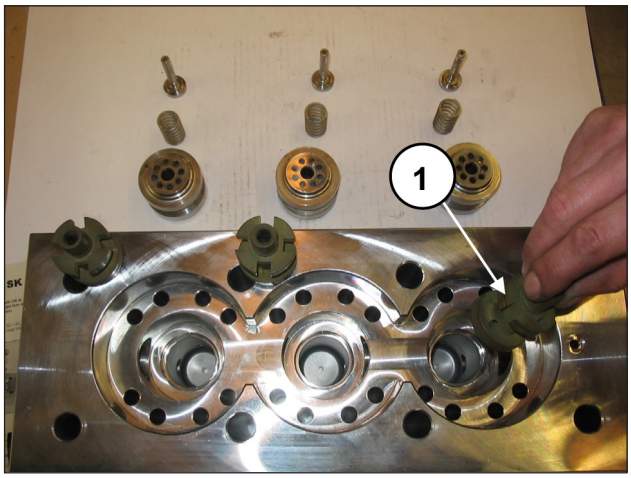


Fig. 119

2.2.2 Montage de la tête - chemises - soupapes

Pour remonter les différents composants, inverser les opérations précédentes en ayant soin de remonter correctement l'entretoise des chemises : les deux dispositifs d'évacuation en fonte présents sur l'un des deux flancs doivent, une fois le composant réassemblé, être tournés vers la partie inférieure du carter (côté étrier de pompe).

Têtes - chemises : procéder au remontage et au réglage des vis de fixation de la tête puis au réglage des vis de fixation des chemises.

Pour les valeurs des couples et les séquences de serrage, respecter les indications qui figurent au chapitre 3.

2.2.3 Démontage du groupe piston - supports - joints d'étanchéité

Le groupe du piston ne nécessite aucun entretien régulier. Les interventions se limitent au simple contrôle visuel du drainage du circuit de refroidissement. En cas d'anomalies / oscillations sur le manomètre de refoulement ou de pulsations sur le tuyau de drainage du circuit de refroidissement (s'il est élastique), procéder à un contrôle et remplacer éventuellement le lot de joints.

Pour l'extraction des groupes du piston, procéder de la façon suivante :

Désassembler la tête et l'entretoise de chemises du carter de pompe en suivant les explications au parag. 2.2.1 (de Fig. 106 à Fig. 113).

Déposer le couvercle d'inspection supérieur (rep. ①, Fig. 120) et le couvercle d'inspection inférieur (rep. ①, Fig. 121) en dévissant les 4+4 vis de fixation. Dégager les joints toriques et les remplacer si nécessaire.

Fig. 120

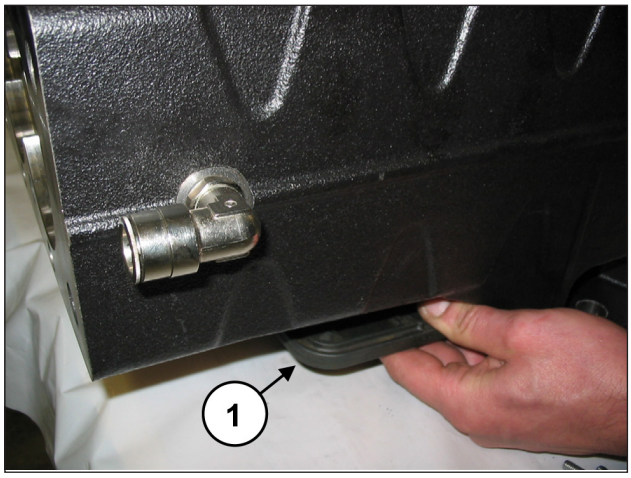


Fig. 121

Déposer les éléments de pompage à l'aide d'une clé à fourchette (rep. ①, Fig. 122) et vérifier s'ils sont usés (rep. ①, Fig. 123). Les remplacer si nécessaire.

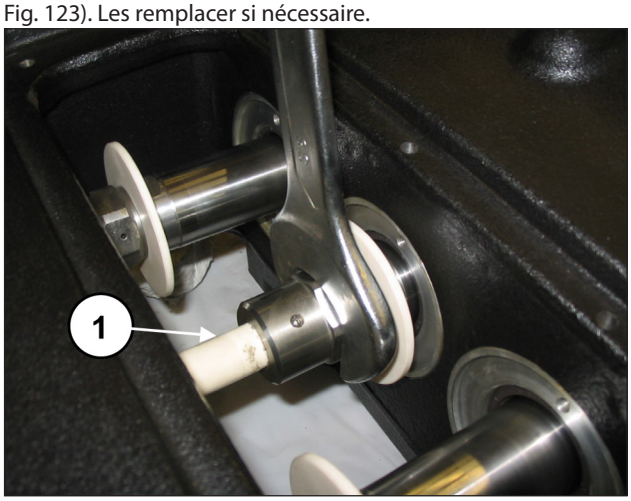


Fig. 122

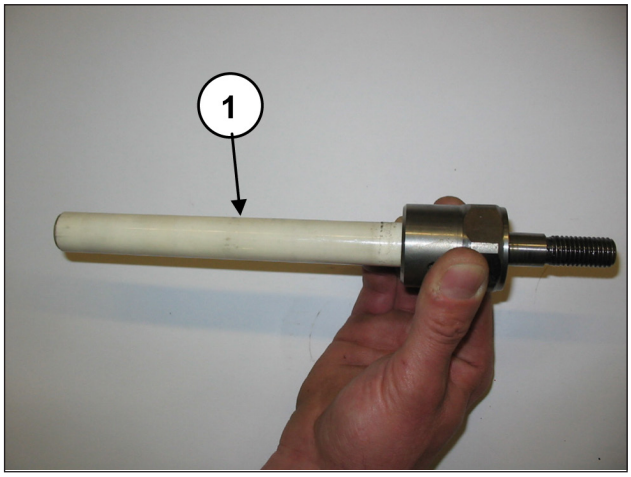


Fig. 123

Déposer les vis M8x50 de fixation du support de la chemise (rep. ①, Fig. 124) et désassembler le support de la chemise (rep. ①, Fig. 125).

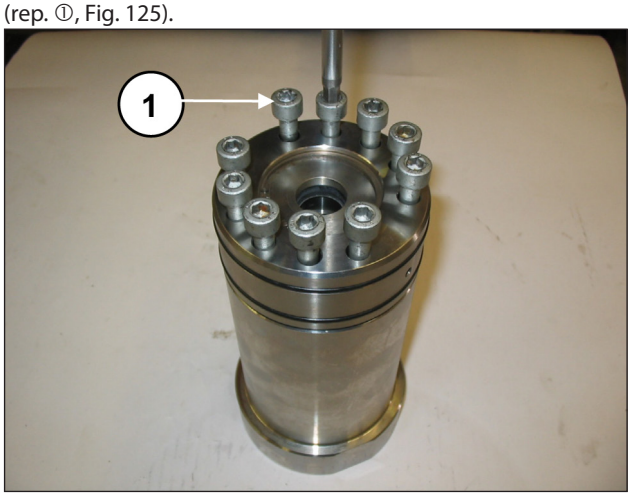


Fig. 124

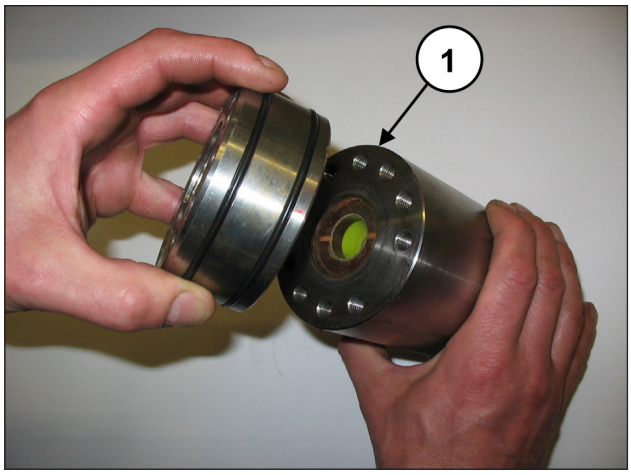


Fig. 125

Déposer l'anneau Seeger et l'anneau de retenue des joints d'étanchéité (rep. ①, Fig. 126) puis utiliser une goupille en plastique pour dégager le joint d'étanchéité LP (basse pression) (rep. ①, Fig. 127).

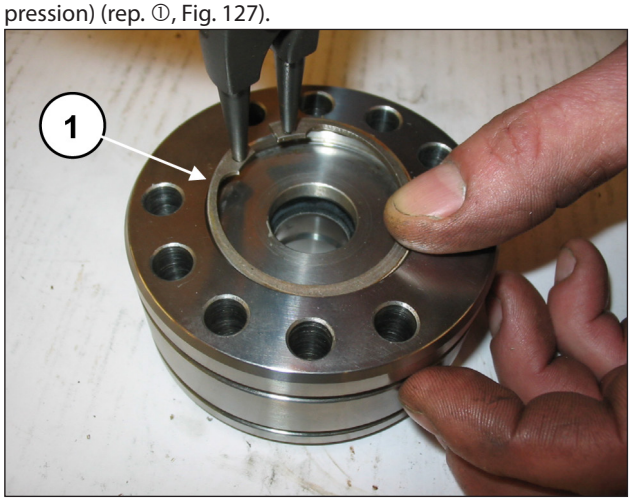


Fig. 126

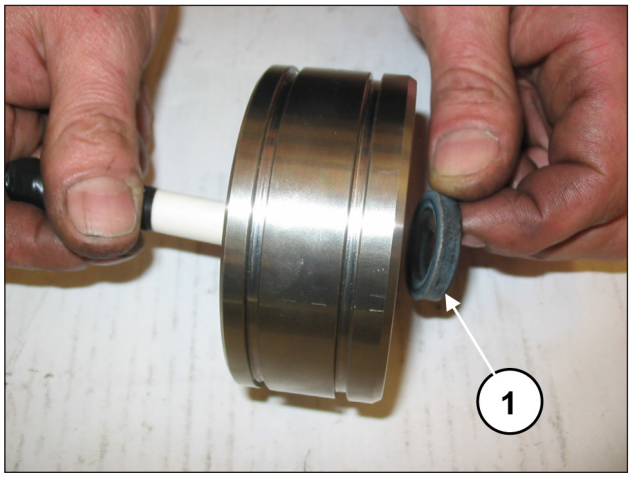


Fig. 127

Remplacer les joints de basse pression et les joints toriques à chaque opération de démontage.

Une fois la chemise désassemblée du support des joints, utiliser une goupille en plastique (rep. ①, Fig. 128) pour chasser le lot HP (haute pression) (rep. ①, Fig. 129).

Remplacer le lot HP (rep. ①, Fig. 129) chaque fois que l'on procède au démontage.

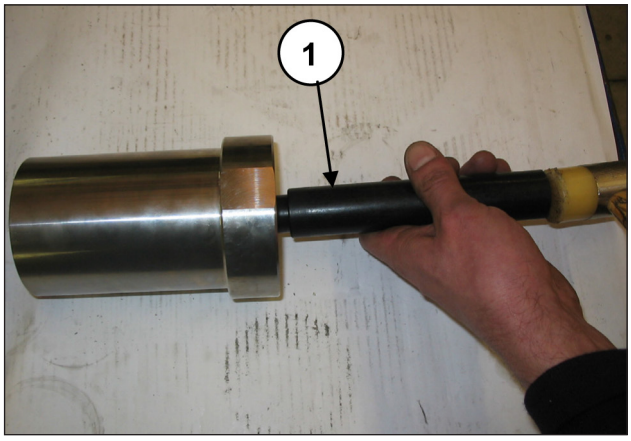


Fig. 128

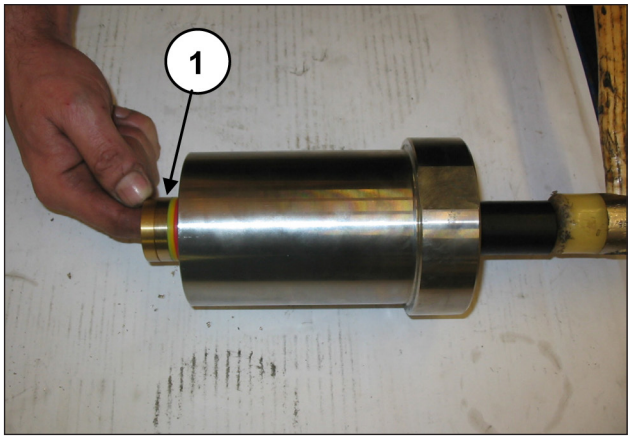


Fig. 129

2.2.4 Montage du groupe piston - supports - joints d'étanchéité

Pour le remontage des différents composants, inverser les opérations et faire particulièrement attention aux séquences décrites ci-après ; pour les valeurs des couples de serrage et la séquence de serrage, respecter les indications figurant au chapitre 3 ;

Insérer la douille supérieure dans la chemise.

Pour installer correctement la douille en position axiale, utiliser l'outil (réf. 27911200 pour SK20, réf. 27911400 pour SK22, réf. 27911500 pour SK24, réf. 27911600 pour SK26, réf. 27911700 pour SK28, réf. 27911800 pour SK30) (rep. ①, Fig. 130 et Fig. 131).

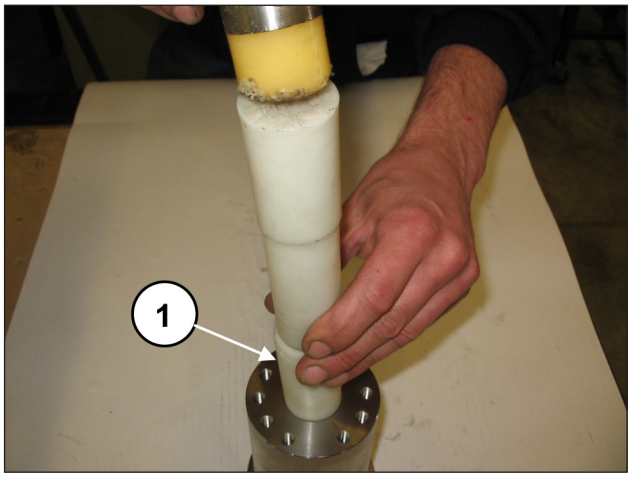


Fig. 130

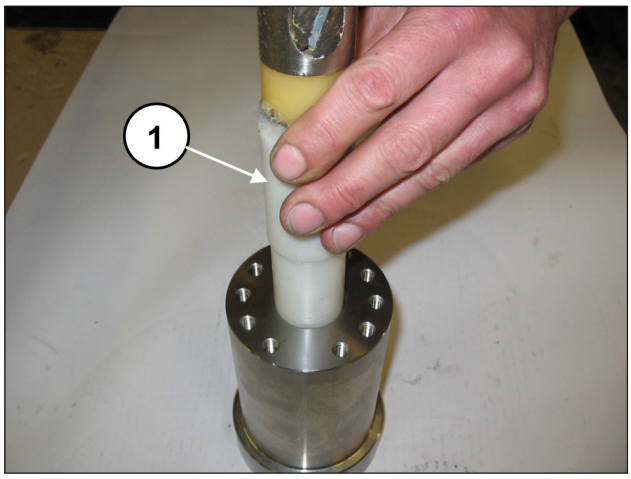


Fig. 131

Introduire le lot H.P. (haute pression) (rep. ①, Fig. 132 vu la légère interférence entre le joint et la chemise, pour éviter tout dommage, il est conseillé d'utiliser l'outil (réf. 27540100 pour SK20, SK22 et SK24, réf. 27540900 pour SK26, pour SK28 et pour SK30) (rep. ①, Fig. 133).

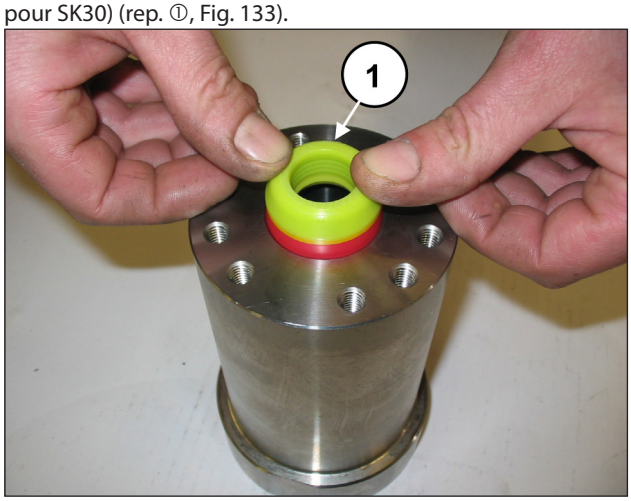


Fig. 132

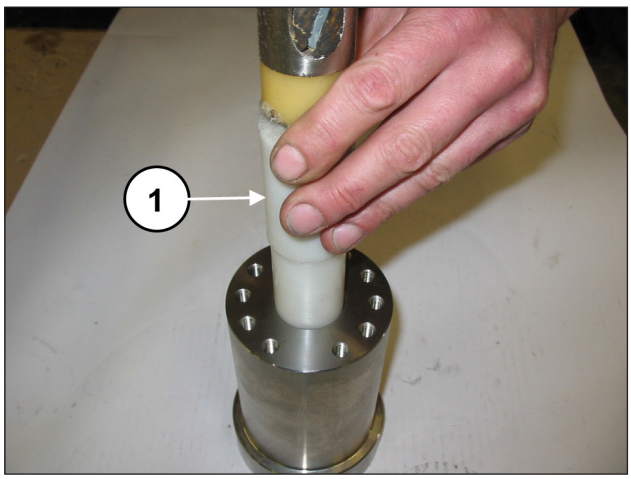


Fig. 133

Installer le joint H.P. dans la chemise comme le montrent les Fig. 132 et Fig. 134.

Avant de les remonter dans leur siège, lubrifier les joints H.P. avec de la graisse à base de silicone type OKS 1110, en respectant les opérations ci-après : Ne lubrifier que très légèrement le diamètre extérieur.
En enduisant le diamètre intérieur, s'assurer de bien remplir les gorges comprises entre les lèvres d'étanchéité comme le montre la Fig. 135.

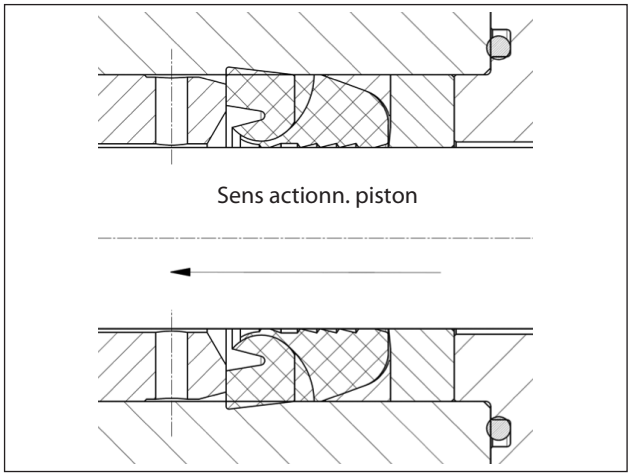


Fig. 134

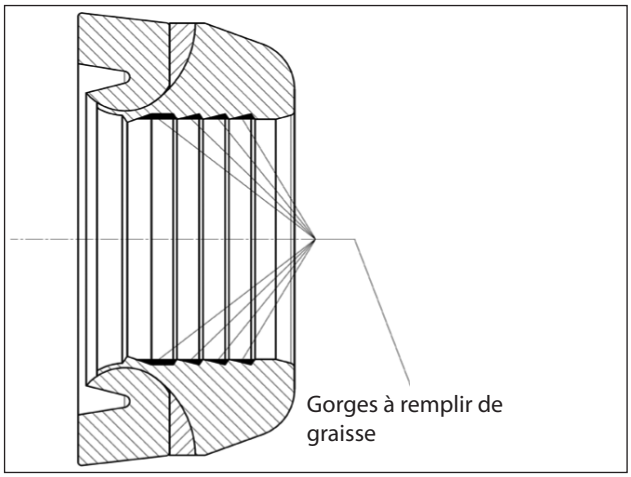


Fig. 135

Introduire la bague anti-extrusion et la douille des joints (rep. ① et ②, Fig. 136, Fig. 137 et Fig. 138).

Introduire la douille pour joints ② dans la chemise avec les deux orifices d'évacuation tournés vers l'extérieur (côté carter) comme le montre la Fig. 137.

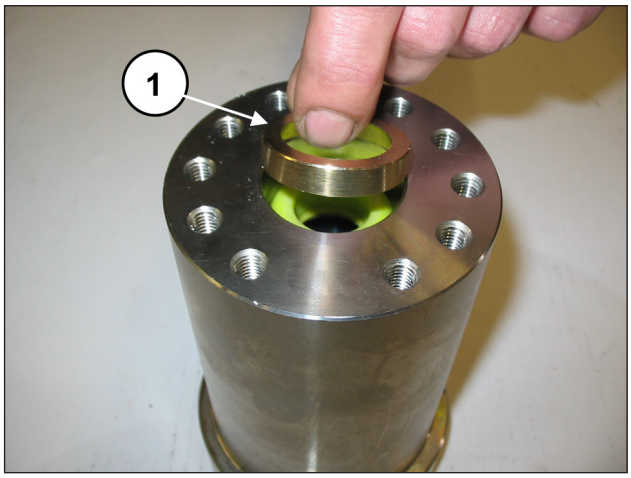


Fig. 136

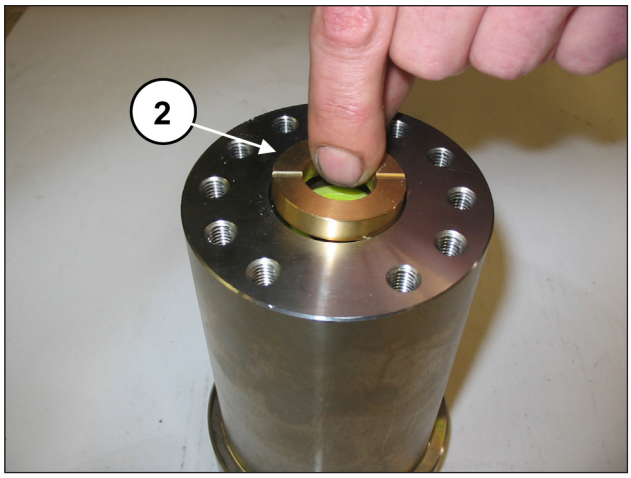


Fig. 137

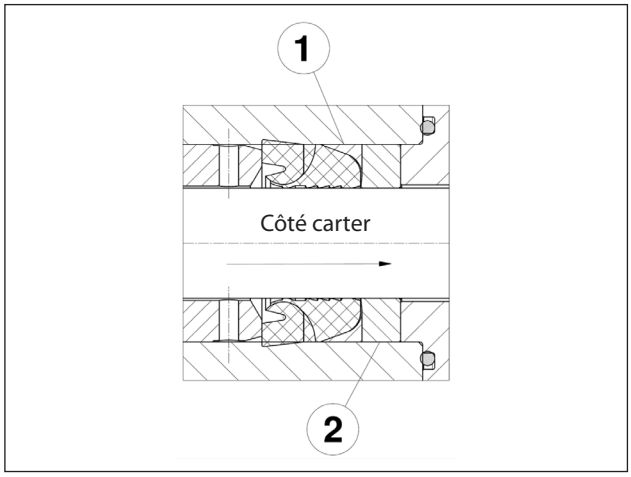


Fig. 138

Introduire le joint L.P. dans la chemise avec la lèvre d'étanchéité dans le sens d'actionnement du piston (rep. ①, Fig. 139 et Fig. 140) et lubrifier légèrement le diamètre extérieur avec de la graisse à base de silicone type OKS 1110. Remplacer le joint L.P. s'il s'avère usé.

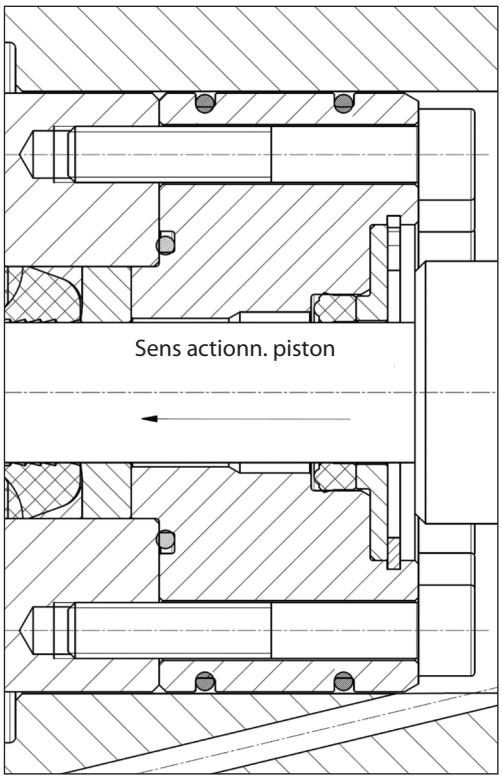


Fig. 139

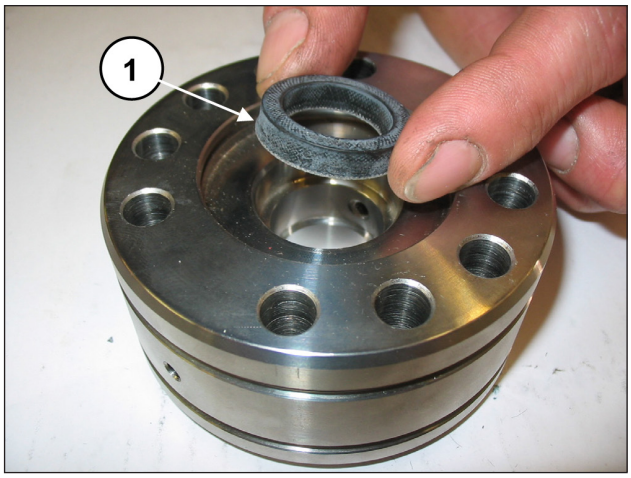


Fig. 140

Remonter le groupe de support des joints (Fig. 141 et Fig. 142) en remplaçant les composants ① et ②.

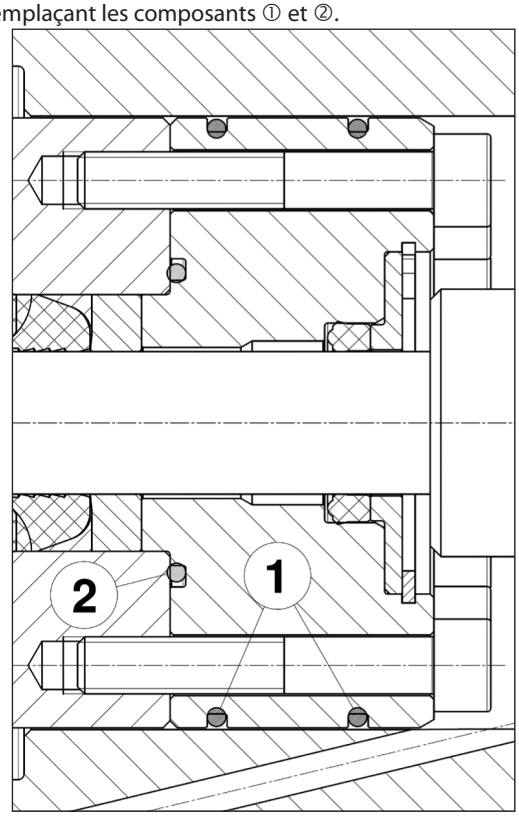


Fig. 141

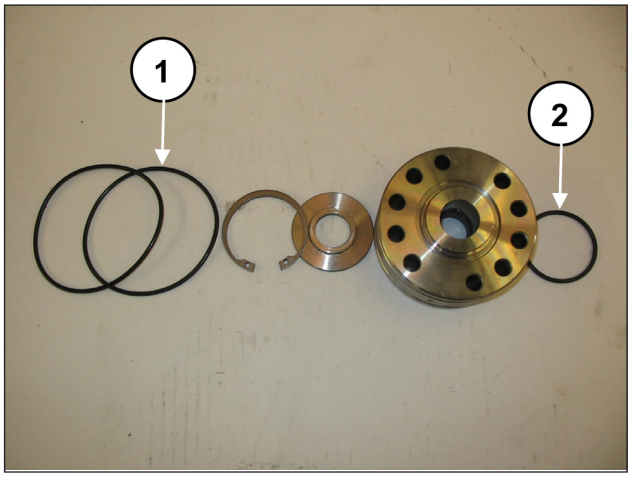


Fig. 142

Assembler le groupe support - chemise en vissant manuellement les vis M8x50 comme le montre la Fig. 143 puis serrer les vis avec une clé dynamométrique en suivant les explications figurant au chapitre 3.

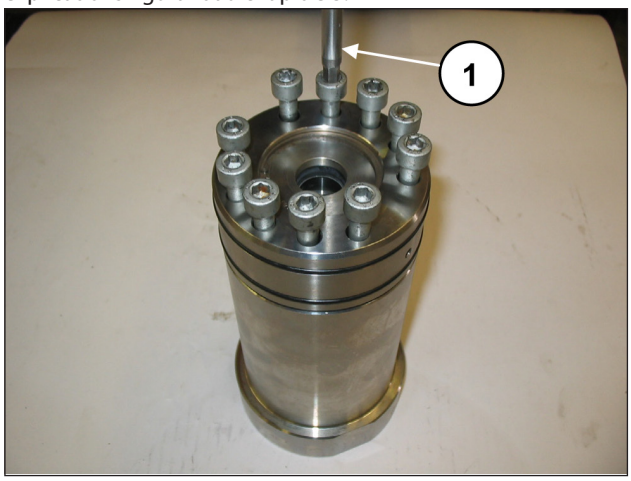


Fig. 143

3 FORCES DE SERRAGE DES VIS

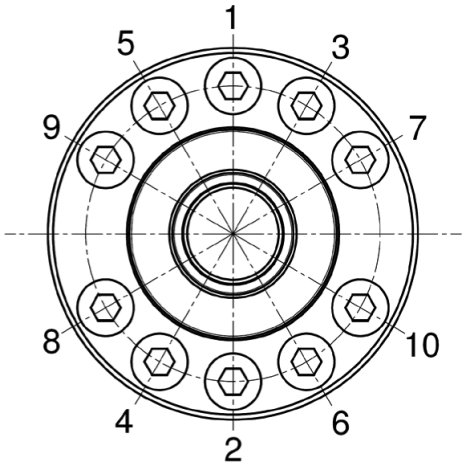
Pour serrer les vis, utiliser exclusivement une clé dynamométrique.

Description	Repère vue éclatée	Couple de serrage Nm
Vis M8x20 couvercle carter	42	25
Bouchon G1/2x13 carter	66	40
Vis M8x30 couv. coussinet PTO	85	25
Vis M8x20 couv. extrémité arbre	42	25
Vis M10x30 couv. support coussinet	57	45
Vis M6x14 couvercles sup. et inf.	70	10
Vis M8x20 couvercle coussinet	42	25
Vis M12x1,25x87 serrage bielle	40	75
Vis M6x20 guide piston	37	10
Vis M12x25 flasque ret. douille	51	68.5
Piston complet	16	50
Raccord étrangl. D.3 3/8M-3/8F	72	45
Vis M8x50 supports	26	40*
Vis M16x280 tête	14	200**
Vis M10x140 chemises	13	83***

Les vis - rep. 13-14-26 doivent être serrées avec la clé dynamométrique en lubrifiant la tige filetée avec de la graisse au bisulfure de molybdène réf. 12001500.

* Les vis de fixation des supports doivent être serrées en respectant les phases et l'ordre indiqué sur le schéma Fig. 144.
** Les vis de fixation de la tête doivent être serrées en respectant les phases et l'ordre indiqué sur le schéma Fig. 145.
*** Les vis de fixation des chemises doivent être serrées en respectant les phases et l'ordre indiqué sur le schéma Fig. 145.

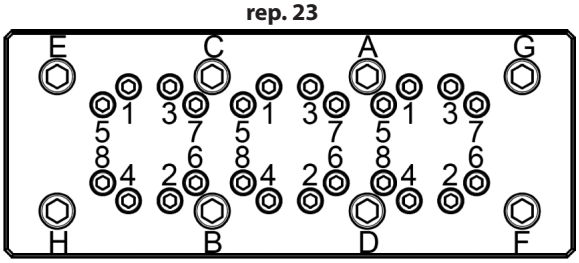
Serrage des vis du support des joints rep. 26



Serrage des vis M8x50 selon la séquence indiquée (1-2-3-4-5-6-7-8-9-10) effectuée en une seule phase au couple indiqué.

Fig. 144

Serrage des vis de la tête et des chemises rep. 14 et rep. 23



OPÉRATION 1 : Serrage des vis M16x280 (rep. 14) en deux phases, en respectant la séquence indiquée sur la figure : (A-B-C-D-E-F-G-H)
Phase 1 = 120 Nm
Phase 2 = 200 Nm
OPÉRATION 2 : Serrage des vis M10x140 (rep. 13) en quatre phases, en respectant la séquence indiquée sur la figure : (1-2-3-4-5-6-7-8)
Phase 1 = 40 Nm
Phase 2 = 65 Nm
Phase 3 = 83 Nm
Phase 4 = 83 Nm

Fig. 145

4 OUTILS POUR LA RÉPARATION

Pour l'entretien de la pompe, il est possible d'utiliser des outils traditionnels pour le démontage et le remontage des composants. Les outils suivants sont disponibles :

Pour le montage :

Bague d'étanchéité radiale guide piston	réf. 27910900
Bague d'étanchéité radiale arbre PTO	réf. 27539500
Douille joints	réf. 27911200 (SK20)
	réf. 27911400 (SK22)
	réf. 27911500 (SK24)
	réf. 27911600 (SK26)
	réf. 27911700 (SK28)
	réf. 27911800 (SK30)
Lot de joints HP	réf. 27540100 (SK20 - SK22 - SK24)
	réf. 27540900 (SK26 - SK28 - SK30)
Tête / Entretoise chemises	réf. 27540200

Pour le démontage :

Siège de soupape	réf. 034300020 (SK20-22-24)
	réf. 034300010 (SK26-28-30)
Tête / Entretoise chemises	réf. 27540200
Arbre (blocage des bielles)	réf. 27566200

5 REMPLACEMENT DE LA DOUILLE PIED DE LA BIELLE

Procéder au calage de la douille à froid et aux usinages suivants en respectant les dimensions et les tolérances de la Fig. 146 ci-dessous.

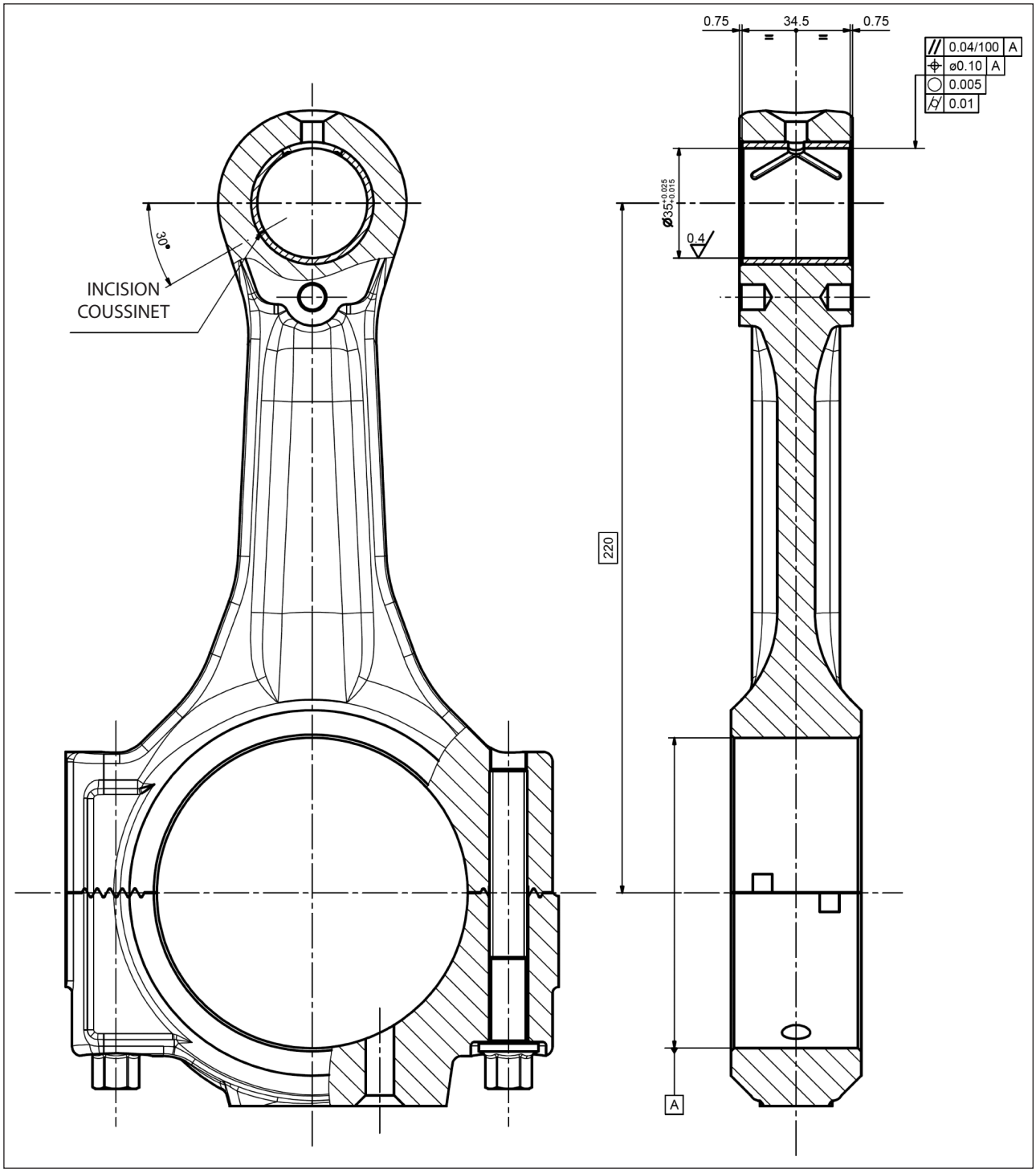


Fig. 146

Inhaltsverzeichnis

1 EINLEITUNG

Diese Anleitung enthält die Anweisungen für die Reparatur der Pumpen der Baureihe SK und muss vor jeglichen Arbeiten an der Pumpe sorgfältig gelesen und verstanden werden.
Der einwandfreie Betrieb und die lange Lebensdauer der Pumpe sind von der korrekten Verwendung und den angemessenen Wartungseingriffen abhängig.
Interpump Group haftet nicht für Schäden durch Nachlässigkeit oder Nichtbeachtung der in dieser Anleitung beschriebenen Vorschriften.

1.1 BESCHREIBUNG DER SYMBOLE

Lesen Sie vor jeder Arbeit stets aufmerksam die Anweisungen in dieser Anleitung.

Warnzeichen

Lesen Sie vor jeder Arbeit stets aufmerksam die Anweisungen in dieser Anleitung.

Gefahrenzeichen
Schutzbrille tragen.

Gefahrenzeichen
Vor jeder Arbeit Schutzhandschuhe anziehen.

2 REPARATURVORSCHRIFTEN

2.1 REPARATUR DER MECHANIK

Vor den Reparaturarbeiten an der Mechanik muss zunächst das Öl aus dem Kurbelgehäuse abgelassen werden.
Zum Ablassen des Öls den Öleinfüllverschluss Pos. ①, Abb. 1 und anschließend den Ölablassverschluss abnehmen, Pos. ②, Abb. 1.

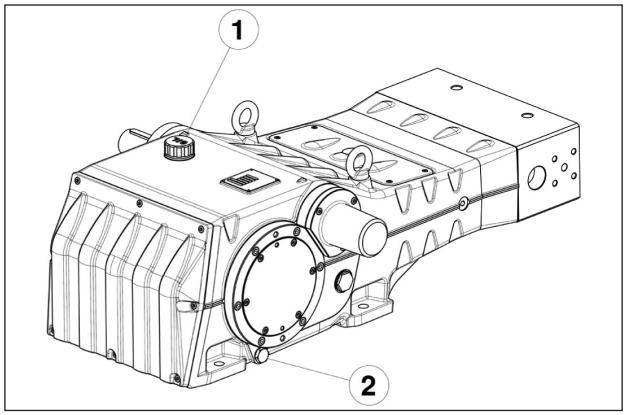


Abb. 1

Altöl muss in einem geeigneten Behälter gesammelt und den entsprechenden Wertstoffstellen zugeführt werden.
Es darf auf keinen Fall in die Umwelt abgeleitet werden.

2.1.1 Ausbau der Mechanik

Die vorgeschriebene Arbeitsabfolge lautet:
Lassen Sie die Ölfüllung der Pumpe vollständig ab, vgl. Abschn. 2.1.
Trennen Sie den Kopf und das Distanzstück der Buchsen vom Pumpengehäuse gemäß den Hinweisen in Abschn. 2.2.1 (von Abb. 106 bis Abb. 109).
Demontieren Sie den oberen und unteren Inspektionsdeckel durch Abdrehen der 4+4 Befestigungsschrauben gemäß Abschn. 2.2.3 (Abb. 120 und Abb. 121).
Ziehen Sie die O-Ringe ab und ersetzen Sie diese bei Bedarf.
Entfernen Sie die drei Kolben mithilfe eines Gabelschlüssels lt. Abschn. 2.2.3 (Abb. 122).
Entfernen Sie die drei Spritzschutzringe samt O-Ringen (Pos. ① und ②, Abb. 2).

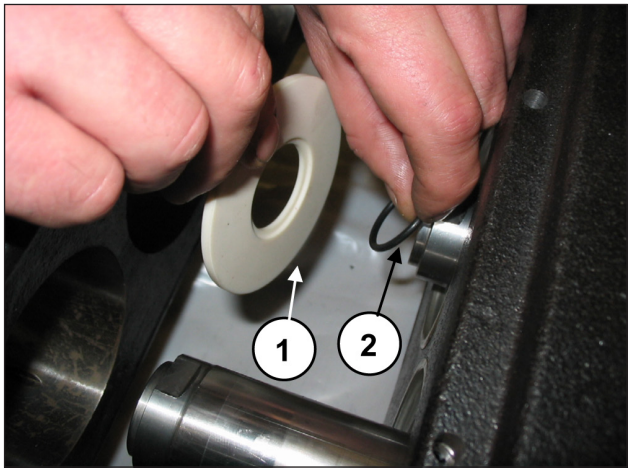


Abb. 2

Lösen Sie die Stiftschrauben M6 der drei Ölabstreifring-Deckel (Pos. ①, Abb. 3).

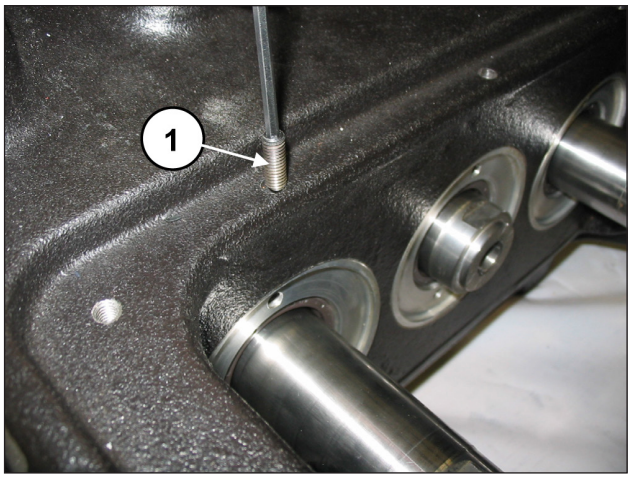


Abb. 3

Entnehmen Sie die Ölabstreifring-Deckel durch Eindrehen einer Gewindestange oder einer Schraube M6 als Abzieher in die entsprechenden Bohrungen am Deckel (Pos. ①, Abb. 4) und nehmen Sie die Deckel von der Pumpengruppe ab (Pos. ①, Abb. 5).

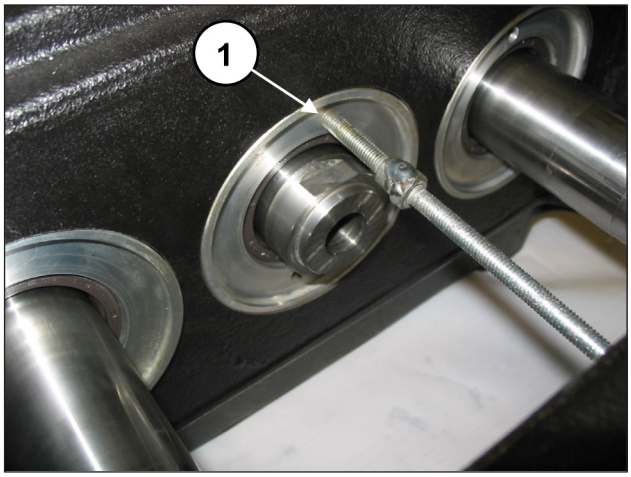


Abb. 4

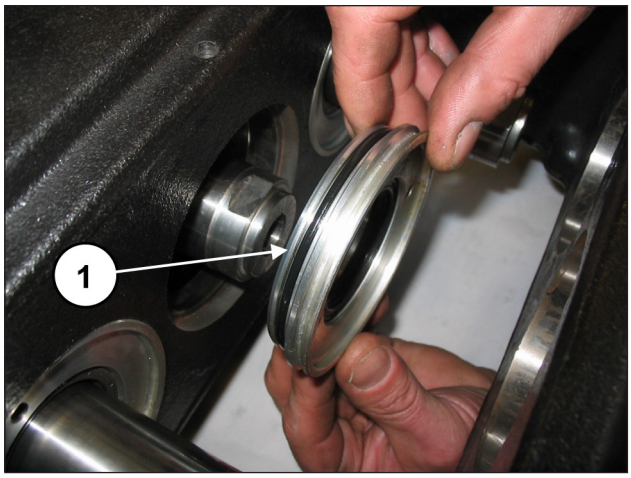


Abb. 5

Entfernen Sie den radialen Dichtring (Pos. ①, Abb. 6) und den äußeren O-Ring (Pos. ①, Abb. 7).

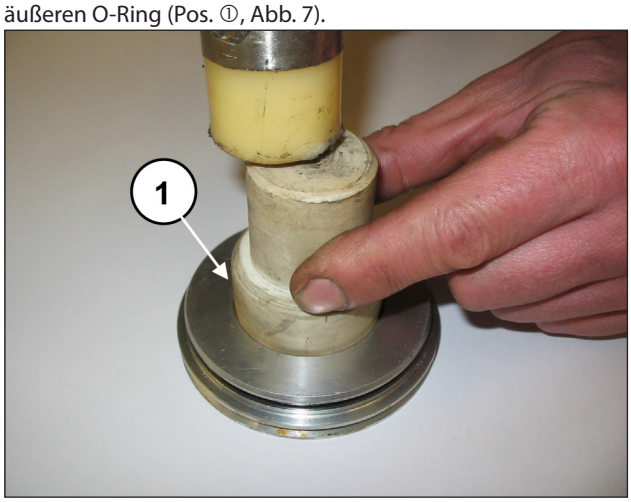


Abb. 6

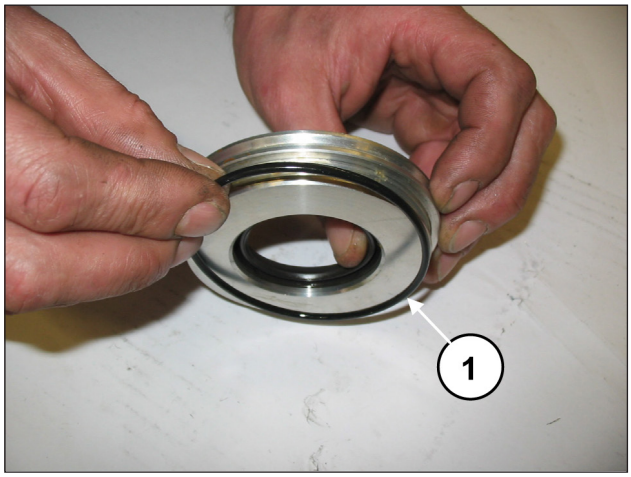


Abb. 7

Nehmen Sie die Passfeder von der Zapfwelle ab (Pos. ①, Abb. 8).

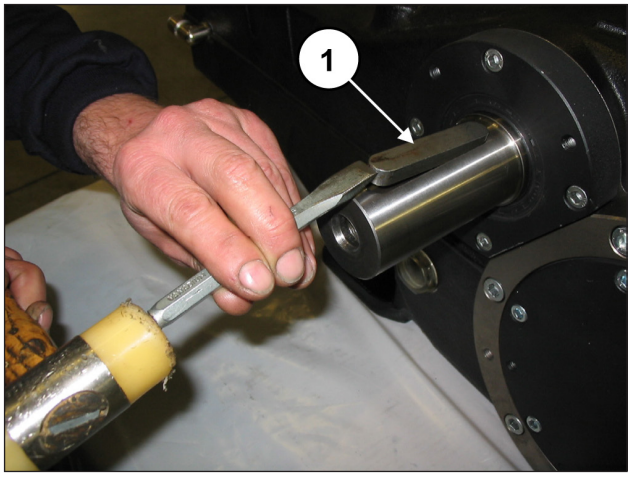


Abb. 8

Lösen Sie die Befestigungsschrauben des Wellenendendeckels (Pos. ①, Abb. 9) und ziehen Sie den Deckel von der Zapfwelle ab.

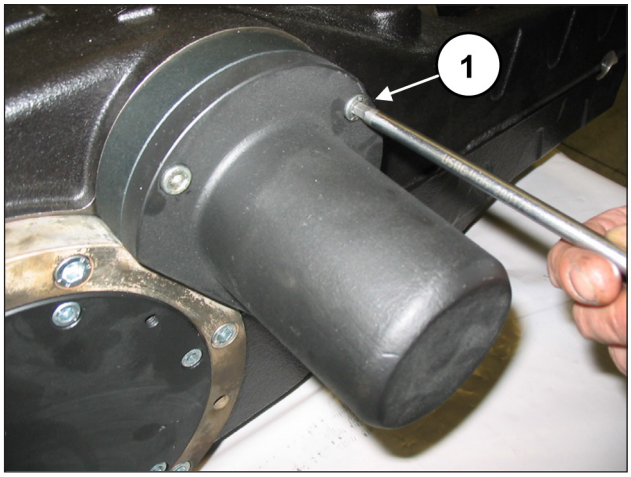


Abb. 9

Lösen Sie die Befestigungsschrauben des Gehäusedeckels (Pos. ①, Abb. 10) und entfernen Sie den Deckel. Ziehen Sie den O-Ring ab und ersetzen Sie diesen bei Bedarf.

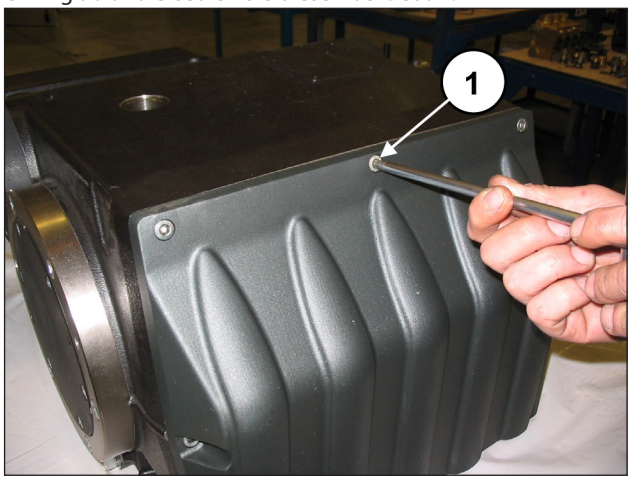


Abb. 10

Demontieren Sie die beiden Lagerdeckel und lösen hierzu die entsprechenden Schrauben (Pos. ①, Abb. 11).
Zum leichteren Ausbau verwenden Sie 2 Stiftschrauben oder Schrauben M8 (Pos. ①, Abb. 12) als Abzieher.
Ziehen Sie den O-Ring ab und ersetzen Sie diesen bei Bedarf.

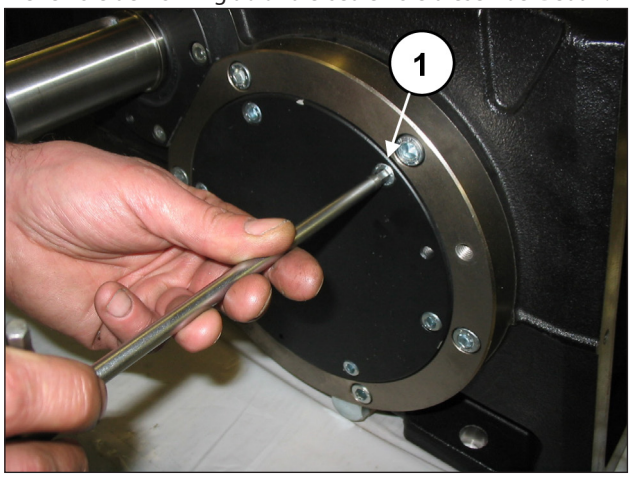


Abb. 11

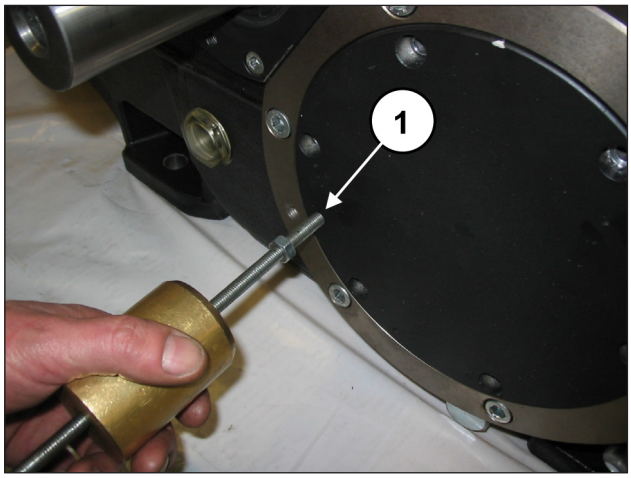


Abb. 12

Setzen Sie eine Passscheibe unter den Schaft der mittleren Pleuelstange, um die Drehung der Kurbelwelle zu kontern (Pos. ①, Abb. 13).

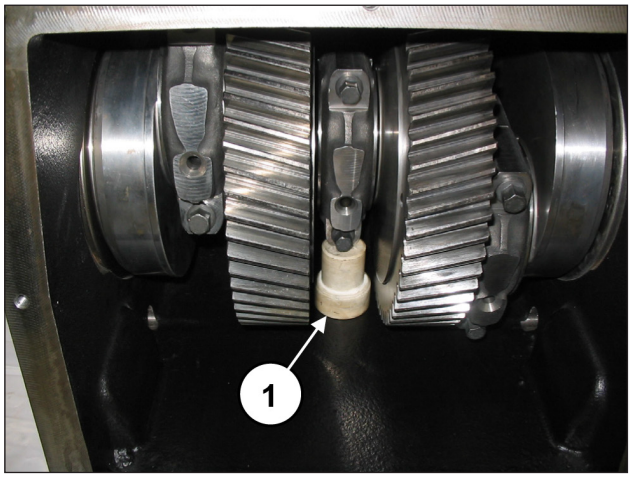


Abb. 13

Lösen Sie die Befestigungsschrauben des Buchsenflanschs auf beiden Seiten (Pos. ①, Abb. 14).
Belassen Sie die Buchsenflansche in ihrem Sitz (Pos. ①, Abb. 15).

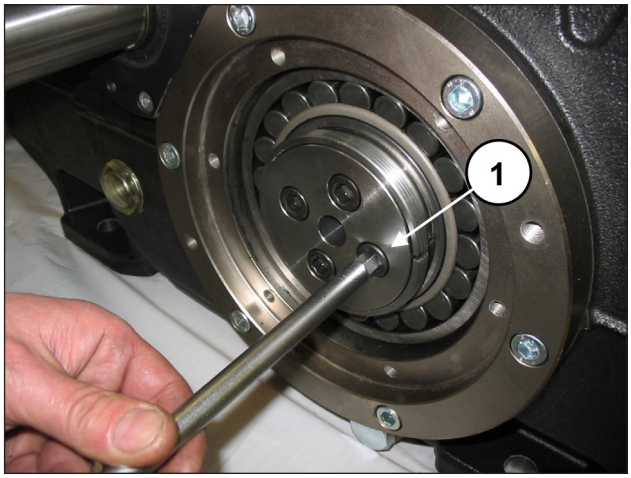


Abb. 14

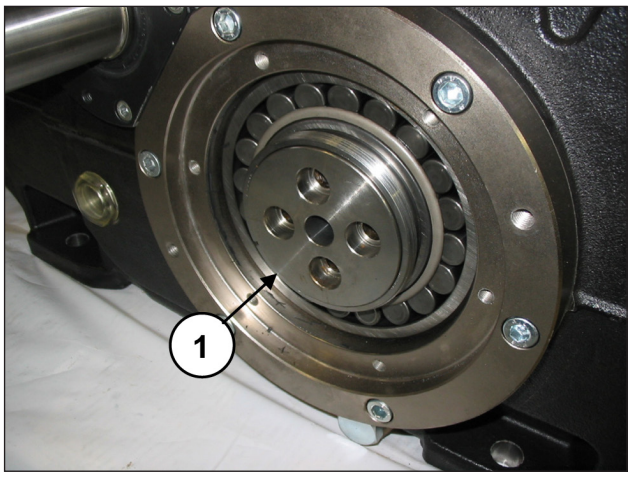


Abb. 15

Drehen Sie auf einer Seite eine Nutmutter Typ SKF KM20 auf die Druckbuchse (Pos. ①, Abb. 16), lösen Sie die Buchse dann mit einem Schlagwerk (Pos. ①, Abb. 17), ohne sie jedoch herauszuziehen.
Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.

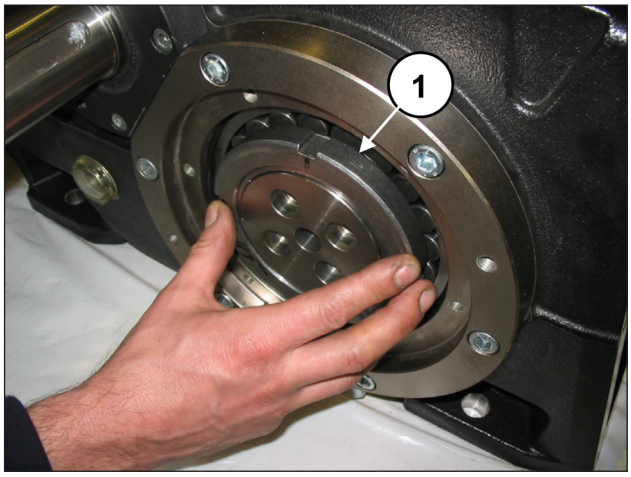


Abb. 16

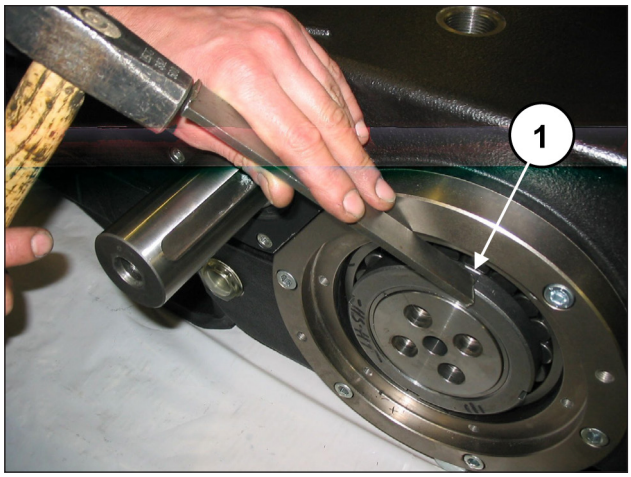


Abb. 17

Nehmen Sie die Passscheibe unter dem Schaft der mittleren Pleuelstange ab.
Lösen Sie die Schrauben der Pleuelstange (Pos. ①, Abb. 18).

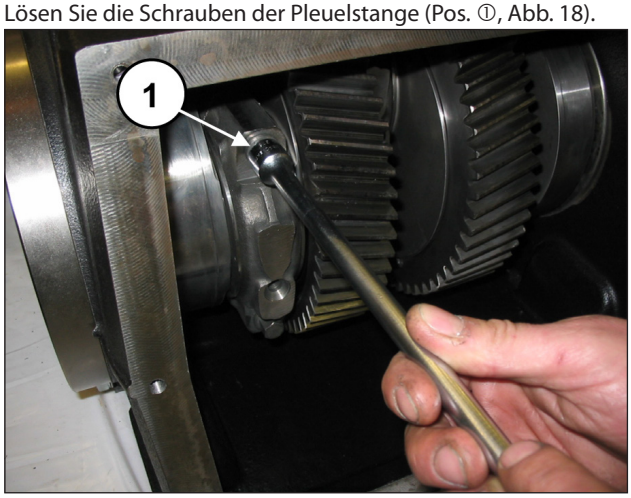
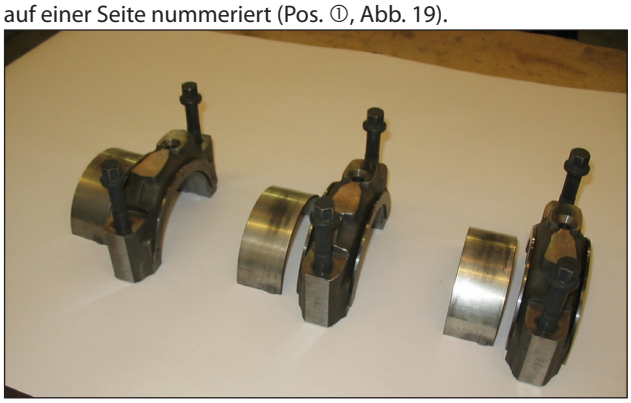


Abb. 18

Demontieren Sie die Pleueldeckel samt Lagerschalen und achten Sie dabei genau auf die Ausbaureihenfolge.

Pleueldeckel und Pleuelhälften müssen in der gleichen Paarungs- und Ausbaureihenfolge wieder eingebaut werden.

Um Fehler zu vermeiden, sind Pleueldeckel und Pleuelhälften auf einer Seite nummeriert (Pos. ①, Abb. 19).



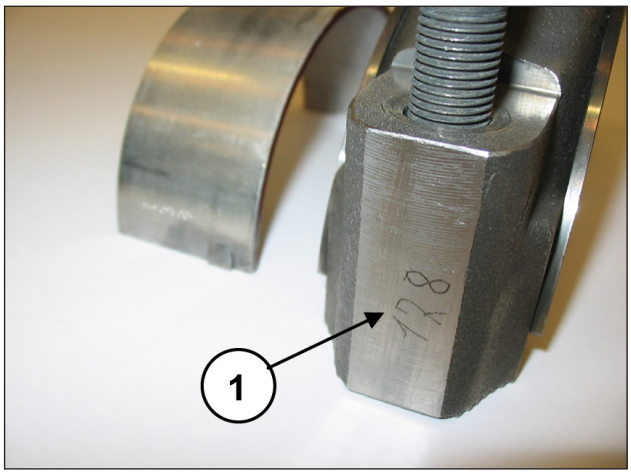


Abb. 19

Schieben Sie die drei Pleuelhälften soweit wie möglich in Richtung Kopf vor.
Ziehen Sie die drei Lagerschalen der Pleuelhälften ab (Pos. ①, Abb. 20).

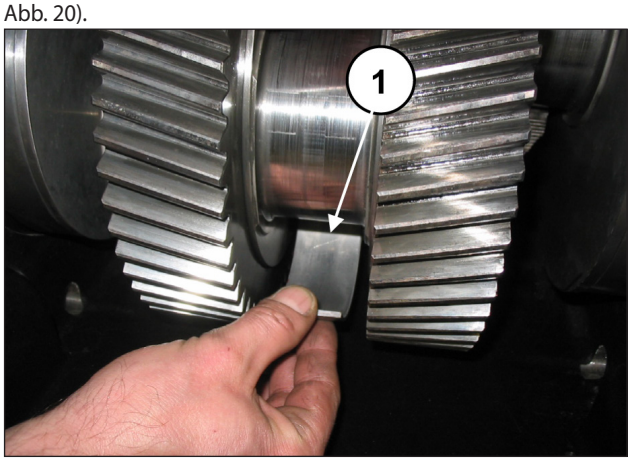


Abb. 20

Nehmen Sie beide Druckbuchsen ab (Pos. ①, Abb. 21).

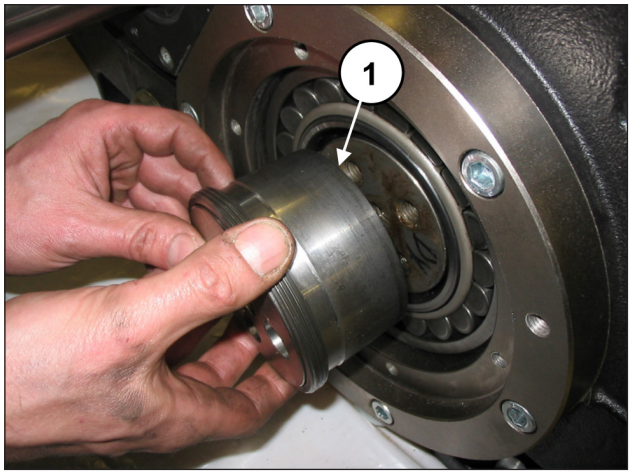


Abb. 21

Trennen Sie den Buchsenflansch von der Druckbuchse (Pos. ①, Abb. 22).

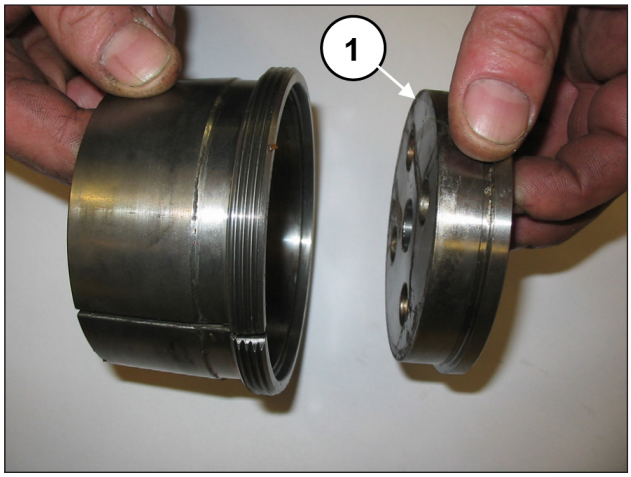


Abb. 22

Lösen Sie die Schrauben der zwei Lagerdeckel (Pos. ①, Abb. 23).

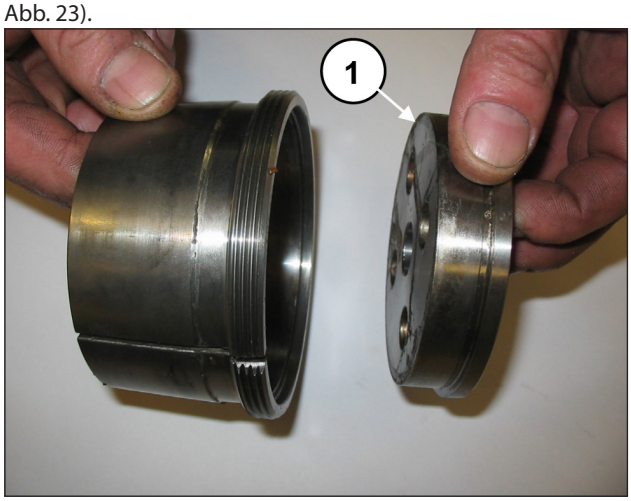


Abb. 23

Setzen Sie einen Gewindestift M16 an ein Ende der Kurbelwelle (Pos. ①, Abb. 24) und ziehen Sie bei angehobener Welle den Lagerdeckel samt Lager und O-Ring heraus (Pos. ①, Abb. 25). Zum leichteren Ausbau verwenden Sie 2 Stiftschrauben oder Schrauben M10 (Pos. ②, Abb. 24) als Abzieher.
Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.

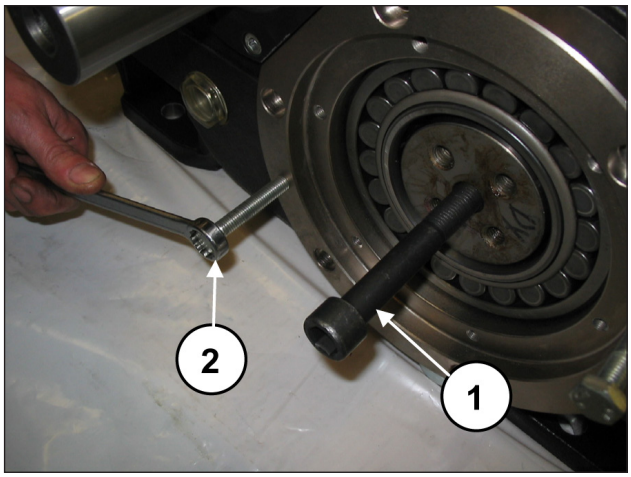


Abb. 24

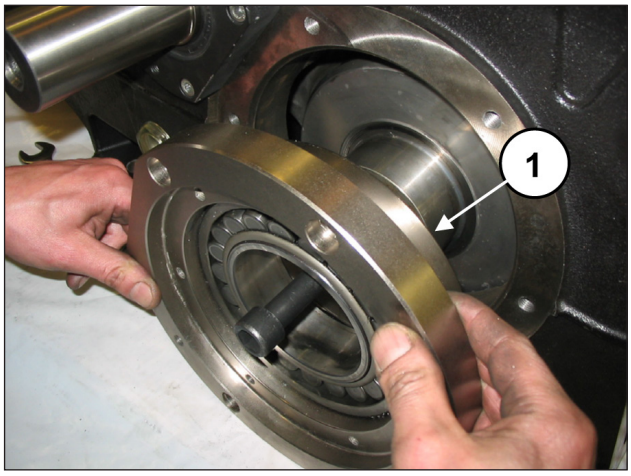


Abb. 25

Legen Sie die Kurbelwelle auf den Gehäuseboden ab. Trennen Sie den Lagerdeckel vom Lager mithilfe eines Werkzeugs mit Schlagwerk (Pos. ①, Abb. 26).

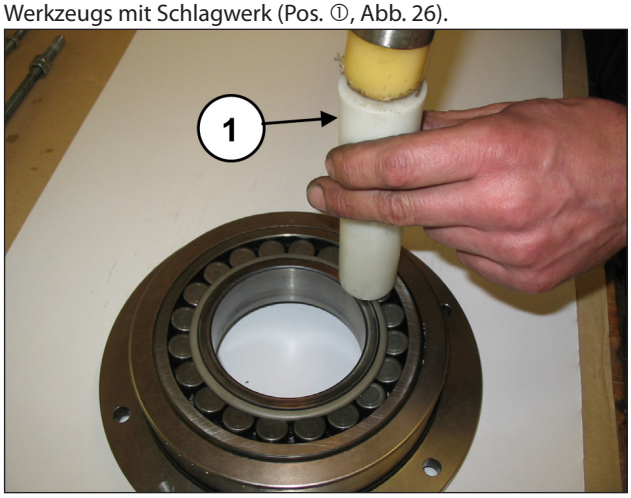


Abb. 26

Lösen Sie die Befestigungsschrauben des rechten und linken Zapfwellen-Lagerdeckels (Pos. ①, Abb. 27) und ziehen Sie die beiden Deckel von der Zapfwelle ab. Zum leichteren Ausbau verwenden Sie 3 Stiftschrauben oder Schrauben M8 (Pos. ①, Abb. 28) als Abzieher.

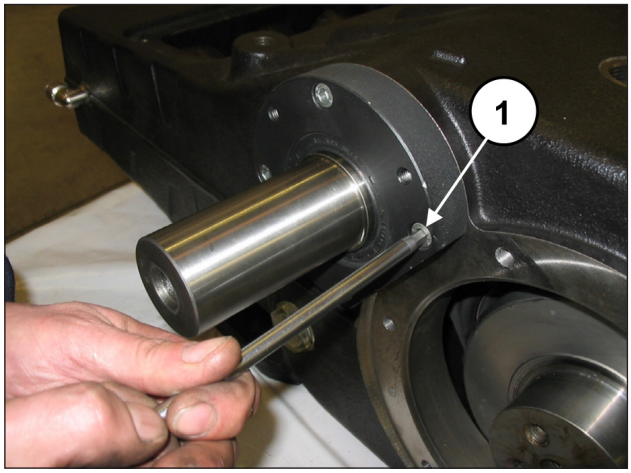


Abb. 27

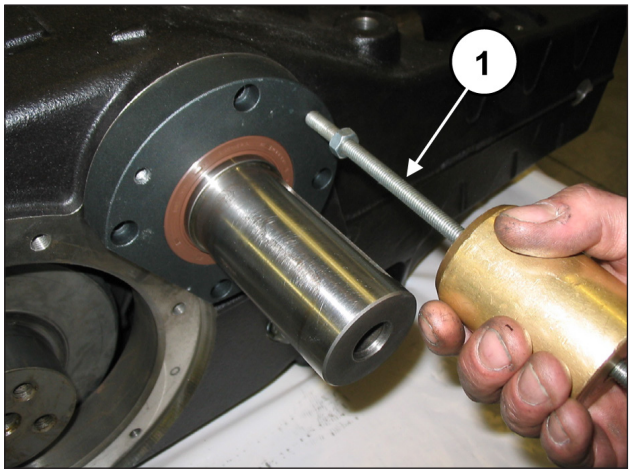


Abb. 28

Entfernen Sie den radialen Dichtring (Pos. ①, Abb. 29) den äußeren O-Ring (Pos. ①, Abb. 30) und den O-Ring der Schmierbohrung (Pos. ①, Abb. 31).

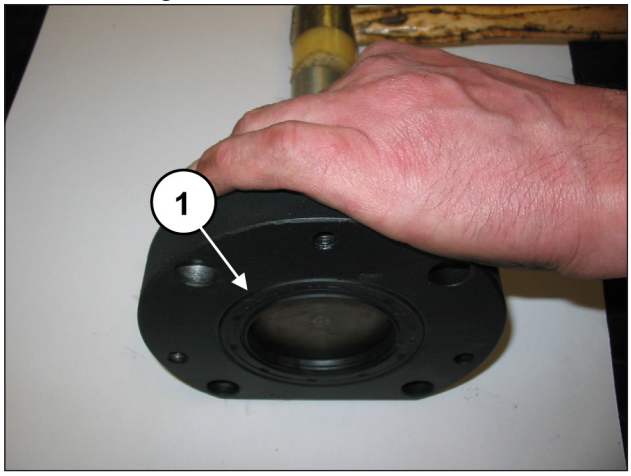


Abb. 29

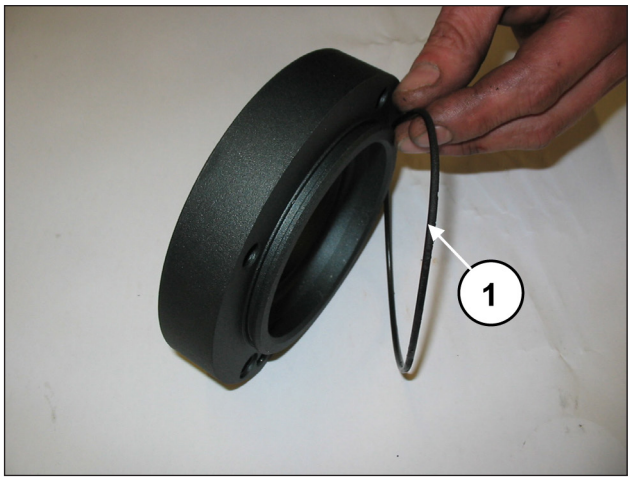


Abb. 30

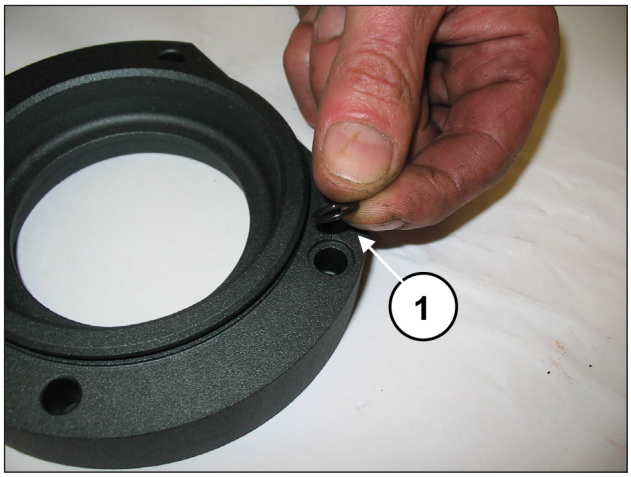


Abb. 31

Schieben Sie die drei Pleuelstangen so weit wie möglich zurück (auf Anschlag mit der Kurbelwelle).
Mithilfe eines Werkzeugs mit Schlagwerk (Pos. ①, Abb. 32) ziehen Sie die Zapfwelle wahlweise von einer der beiden Seiten heraus (Pos. ①, Abb. 33).

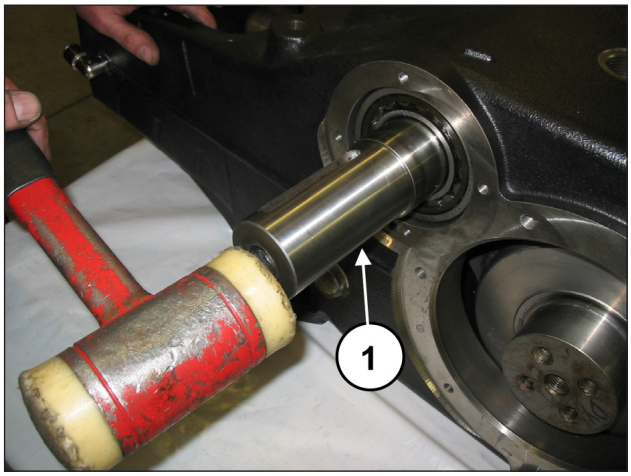


Abb. 32

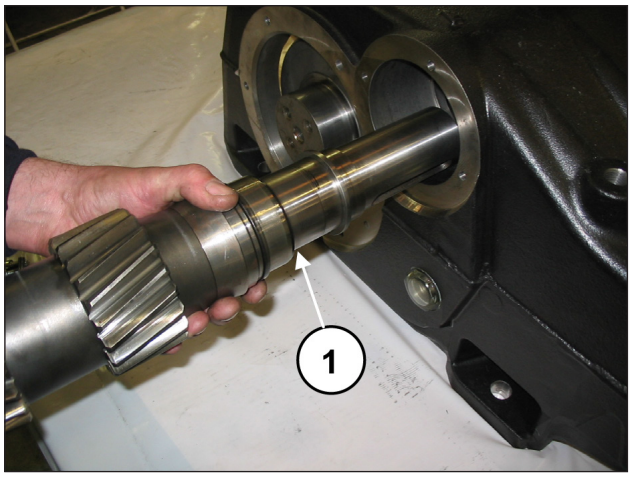


Abb. 33

Entfernen Sie die Innenringe der Lager von der Zapfwelle (Pos. ①, Abb. 34) und die beiden Distanzringe des Innenlagers (Pos. ②, Abb. 34).

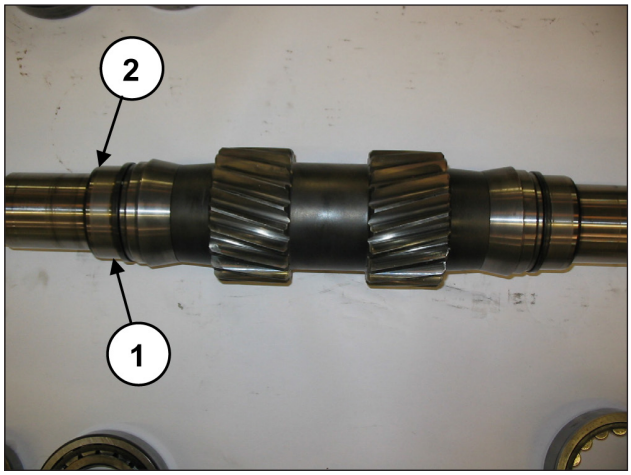


Abb. 34

Die Innen- und Außenringe der Lager müssen genau in der gleichen Reihenfolge und Ausbaupaarung wieder eingebaut werden.

Ziehen Sie mithilfe einer ausreichend langen Stange (Pos. ①, Abb. 36) und eines Schlagwerks die Lagerringe vom Pumpengehäuse (Pos. ①, Abb. 36), den Distanzring des Außenlagers (Pos. ①, Abb. 37) und die Schmierbuchse der Lager ab (Pos. ①, Abb. 38).

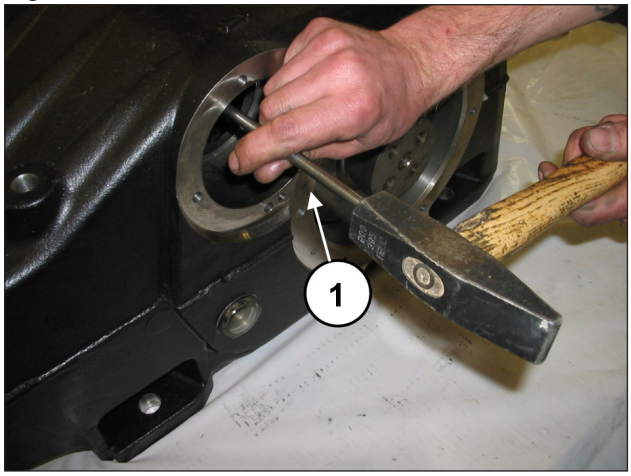


Abb. 35

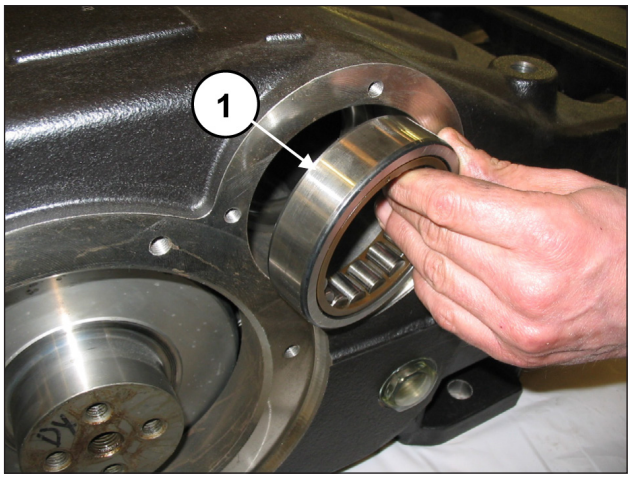


Abb. 36

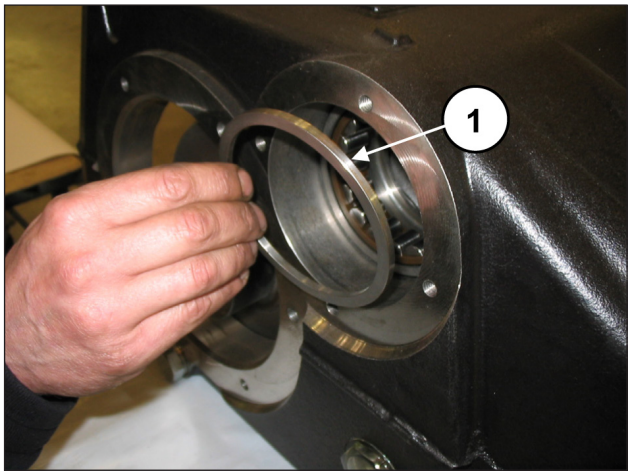


Abb. 37

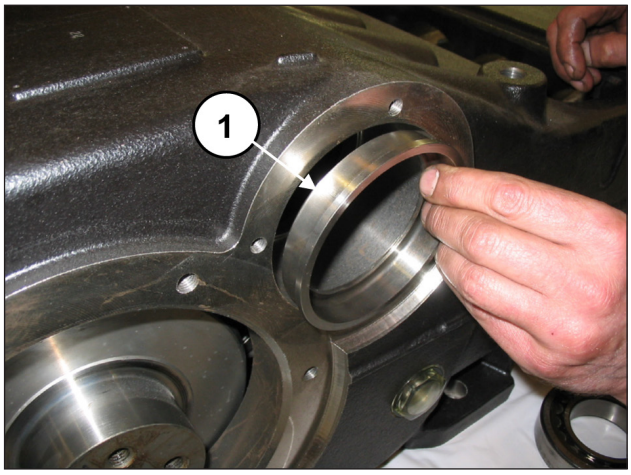


Abb. 38

Schieben Sie die Pleuelhälften in Richtung Hydraulik vor und sicheren Sie diese mit dem entsprechenden Werkzeug (Art. 27566200) (Pos. ①, Abb. 39).

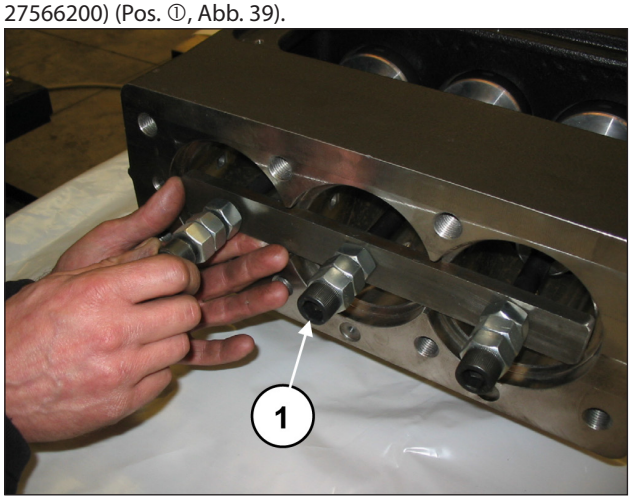


Abb. 39

Entnehmen Sie die Kurbelwelle von der Rückseite des Gehäuses (Pos. ①Pos. ①, Abb. 40).

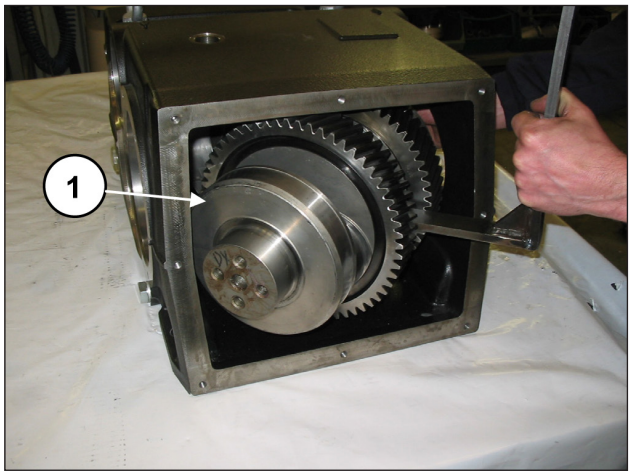


Abb. 40

Drehen Sie die Schrauben des Werkzeugs Art. 27566200 zum Lösen der Pleuelstangen ab (Pos. ①, Abb. 41) und ziehen Sie anschließend die Baugruppe Pleuelstange-Kolbenführung von der hinteren Gehäuseöffnung heraus (Pos. ①, Abb. 42).

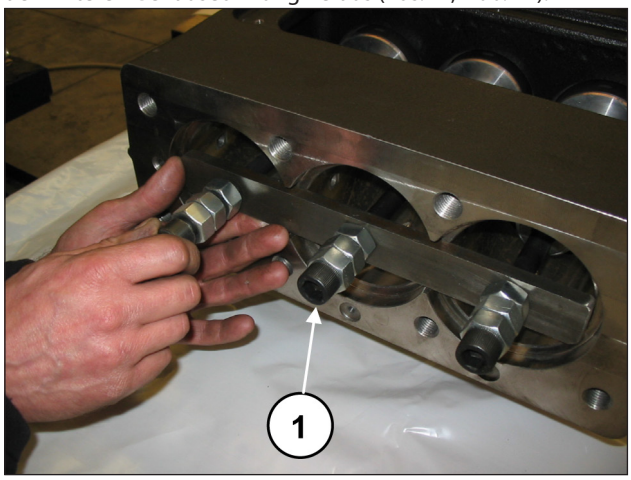


Abb. 41

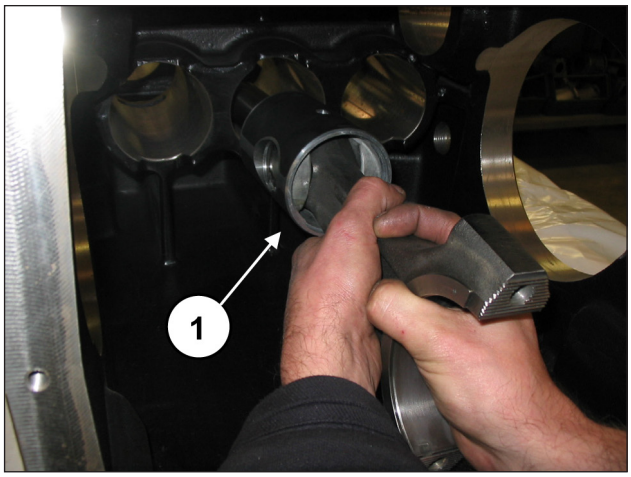
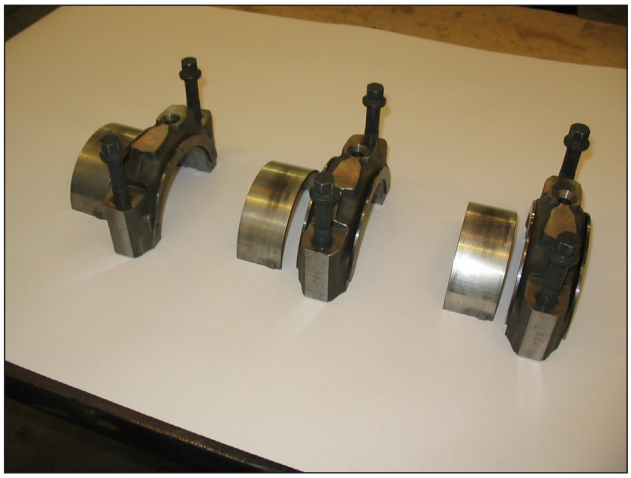


Abb. 42

Paaren Sie die Pleuelhälften mit dem vorab ausgebauten Pleueldeckeln unter Berücksichtigung der Nummerierung (Pos. ①, Abb. 43).



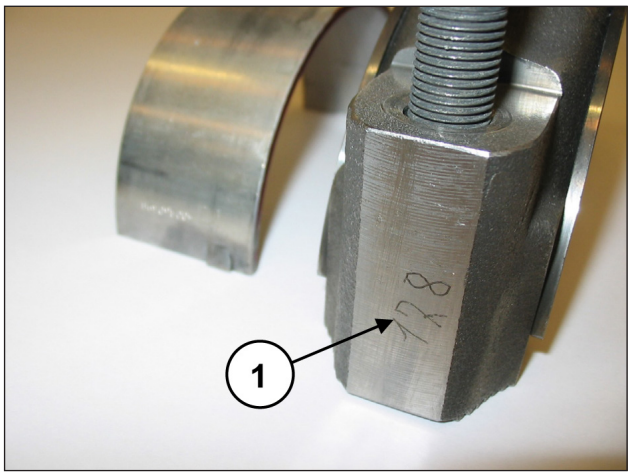


Abb. 43

Entfernen Sie die zwei Seegerringe zur Sicherung des Bolzens mit einem geeigneten Werkzeug (Pos. ①, Abb. 44).

Abb. 44

Streifen Sie den Bolzen ab (Pos. ①, Abb. 45) und ziehen Sie die Pleuelstange heraus (Pos. ①, Abb. 46).

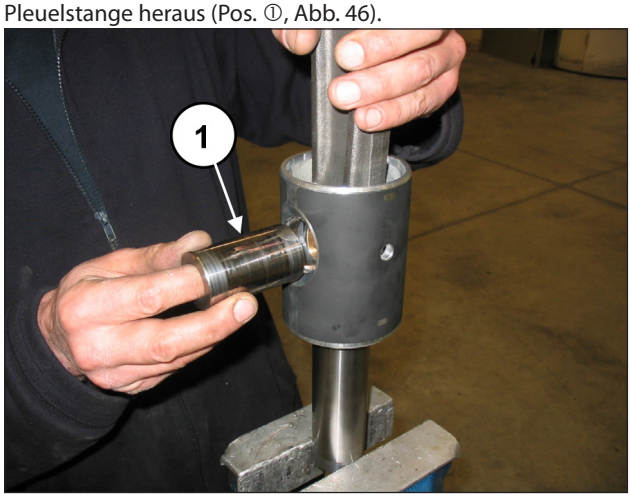


Abb. 45

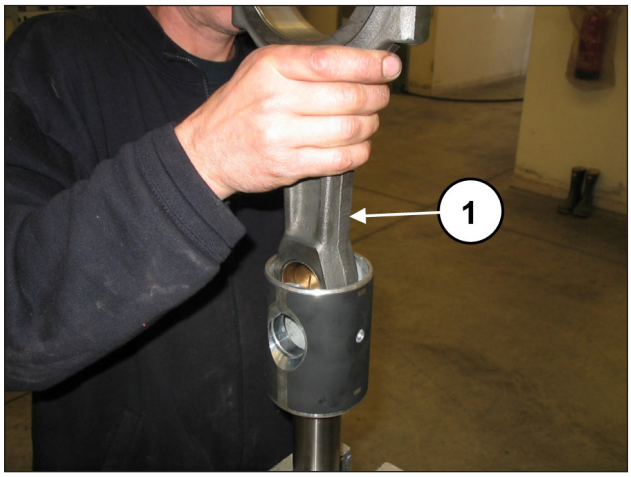


Abb. 46

Drehen Sie zum Trennen der Stange von der Kolbenführung die Zylinderkopfschrauben M6 mit dem entsprechenden Schlüssel ab (Pos. ①, Abb. 47).

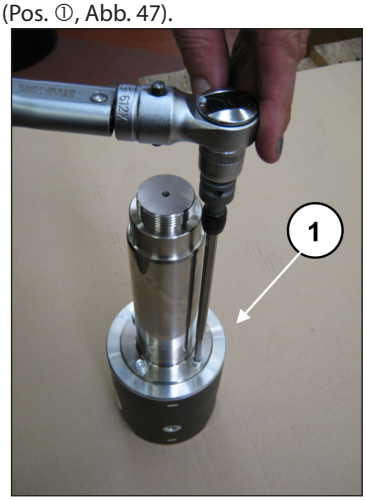


Abb. 47

Beenden Sie den Ausbau der Mechanik, indem Sie die Ölstand-Schaugläser, die Hubösen und den Anschluss mit 90° Steckkupplung abnehmen.

2.1.2 Einbau der Mechanik

Verfahren Sie für den Einbau in umgekehrter Reihenfolge zu den Angaben in Abschn. 2.1.1.
Die vorgeschriebene Arbeitsabfolge lautet:
Montieren Sie die beiden Ölstand-Schaugläser, die zwei Ölablassverschlüsse und den 90° Steckanschluss (Pos. ①, ② und ③ Abb. 48).

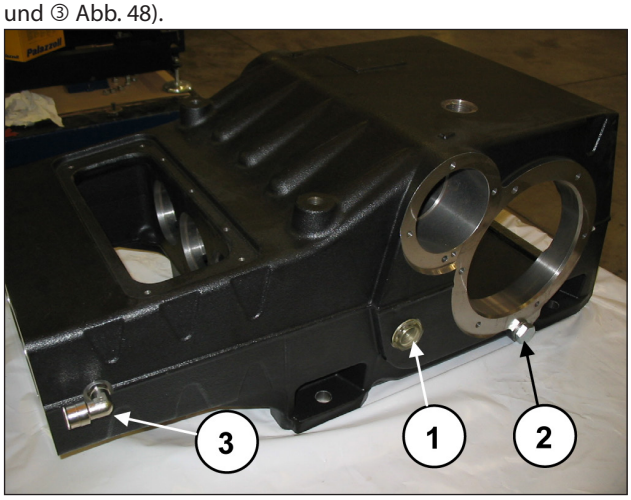


Abb. 48

Montieren Sie die Stange an die Kolbenführung.

Setzen Sie die Kolbenführungsstange in die entsprechende Aufnahme an der Kolbenführung ein (Pos. ①, Abb. 49) und befestigen Sie die Stange mit den 4 Zylinderkopfschrauben M6x20 (Pos. ①, Abb. 50).

Abb. 49

Abb. 50

Spannen Sie die Kolbenführung mithilfe des speziellen Werkzeugs in einen Schraubstock und eichen Sie die Schrauben mit einem Drehmomentschlüssel (Pos. ①, Abb. 51) gemäß Angaben in Kapitel 3.

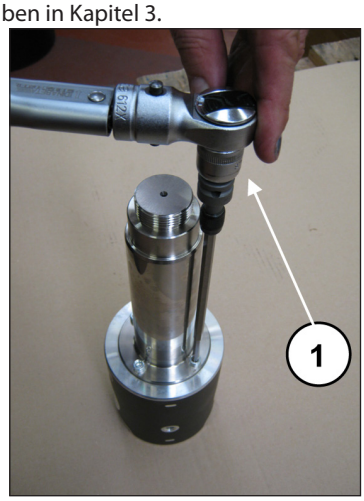


Abb. 51

Setzen Sie die Pleuelstange in die Kolbenführung ein (Pos. ①, Abb. 46) und anschließend den Bolzen (Pos. ①, Abb. 45).
Montieren Sie die zwei Seegerringe zur Sicherung mit dem entsprechenden Werkzeug (Pos. ①, Abb. 44).
Trennen Sie Pleueldeckel und Pleuelhälften; die vorschriftsmäßige Paarung wird durch die seitliche Nummerierung garantiert (Pos. ①, Abb. 43).

Nachdem Sie das Gehäuse auf perfekte Sauberkeit überprüft haben, setzen Sie die Baugruppe Pleuelhälfte-Kolbenführung in die Buchsen des Gehäuses ein (Pos. ①, Abb. 42).

Beim Einsetzen der Baugruppe Pleuelhälfte-Kolbenführung in das Gehäuse müssen die Pleuelhälften mit nach oben sichtbarer Nummerierung ausgerichtet werden.

Arretieren Sie die drei Baugruppen mit dem entsprechenden Werkzeug Art. 27566200 (Pos. ①, Abb. 41).
Führen Sie die Kurbelwelle durch die hintere Gehäuseöffnung ein und legen Sie diese auf dem Boden ab.

Achten Sie beim Einschieben der Kurbelwelle in das Gehäuse auf die Ausrichtung der Zahnkranz-Verzahnung lt. Abb. 52.

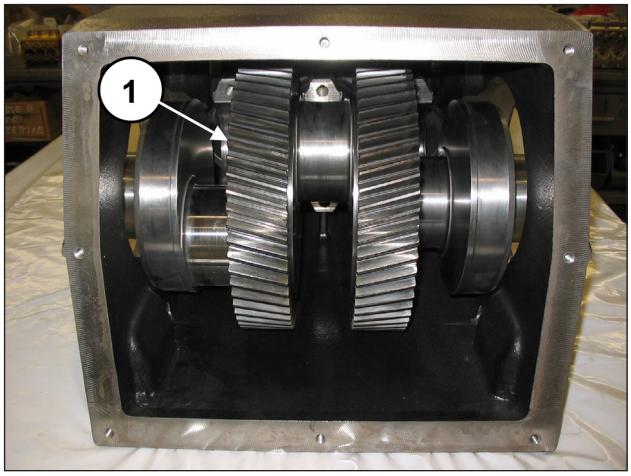


Abb. 52

Montieren Sie vorläufig die Zapfwelle:
setzen Sie die 2 Innenringe der Lager (einen pro Seite) auf die Zapfwelle (Pos. ①, Abb. 53).

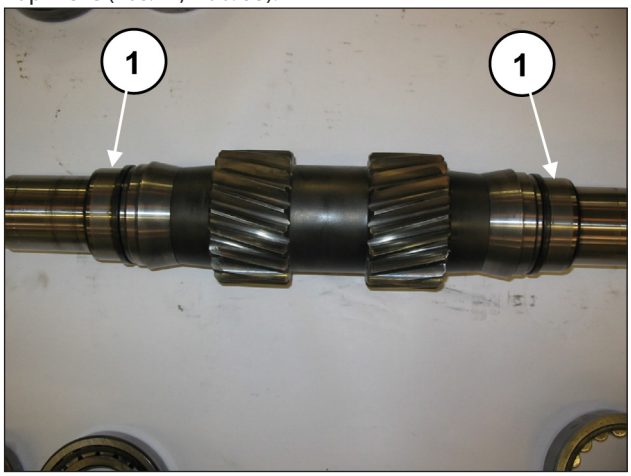


Abb. 53

Die Innen- und Außenringe der Lager müssen genau in der gleichen Reihenfolge und Ausbaupaarung wieder eingebaut werden.

Treiben Sie auf einer Gehäuseseite die Schmierbuchse der Lager (Pos. ①, Abb. 54) und einen Außenring des Lagers (Pos. ①, Abb. 55) mithilfe eines Dorns mit Schlagwerk ein.

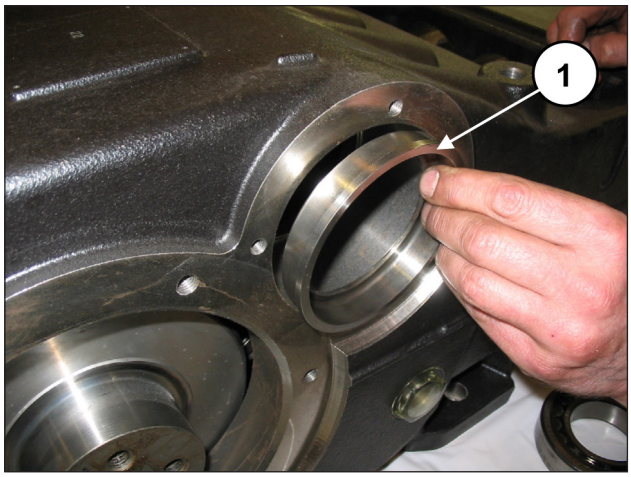


Abb. 54

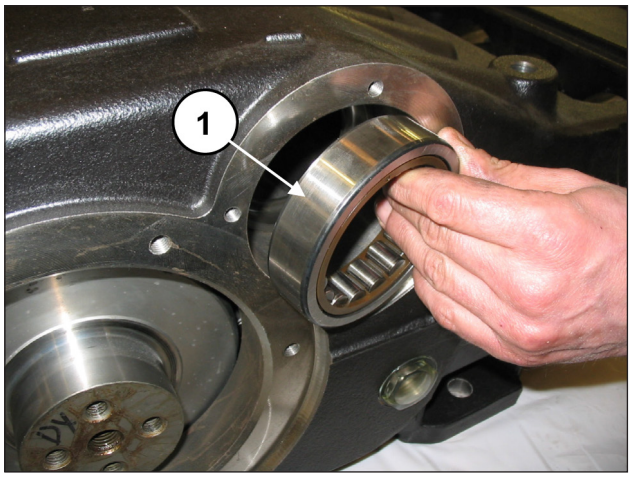


Abb. 55

Entfernen Sie das Werkzeug zur Sicherung der Pleuelstangen Art. 27566200 (Pos. ①, Abb. 41) und schieben Sie die Pleuelstangen bis auf Anschlag mit der Kurbelwelle zurück. Bauen Sie die vormontierte Zapfwelle in das Gehäuse ein (Pos. ①, Abb. 56), u.z. auf der entgegengesetzten Seite zum vorab montieren Außenring des Lagers und zur Schmierbuchse der Lager.

Achten Sie beim Einschieben der Zapfwelle in das Gehäuse auf die Ausrichtung der Verzahnung lt. Abb. 56.

Zum leichteren Einsetzen der Zapfwelle in das Lager können Sie eine Schraube M16 an das einzuführende Wellenende anbringen, um die Welle dadurch anzuheben (Pos. ①, Abb. 57).

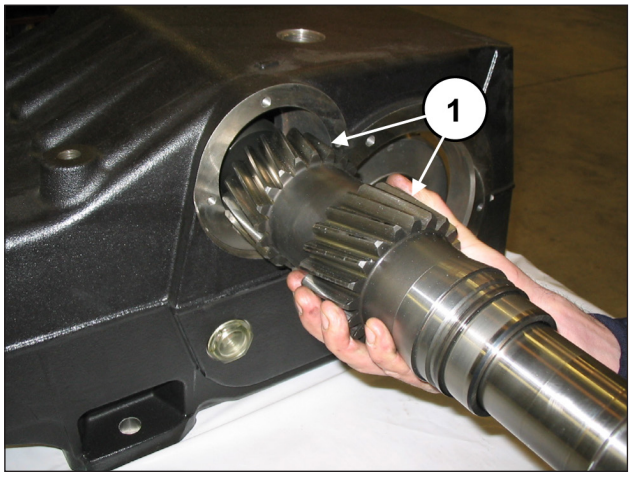


Abb. 56

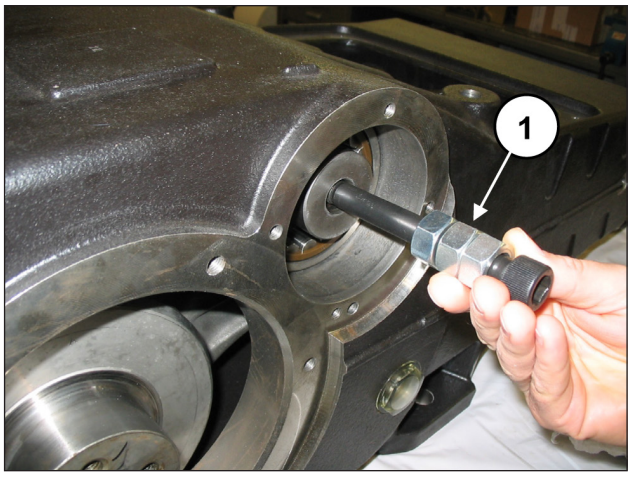


Abb. 57

Treiben Sie auf der Einbauseite der Zapfwelle die Schmierbuchse der Lager (Pos. ①, Abb. 58) und einen Außenring des Lagers (Pos. ①, Abb. 59) mithilfe eines Dorns mit Schlagwerk ein.

Abb. 58

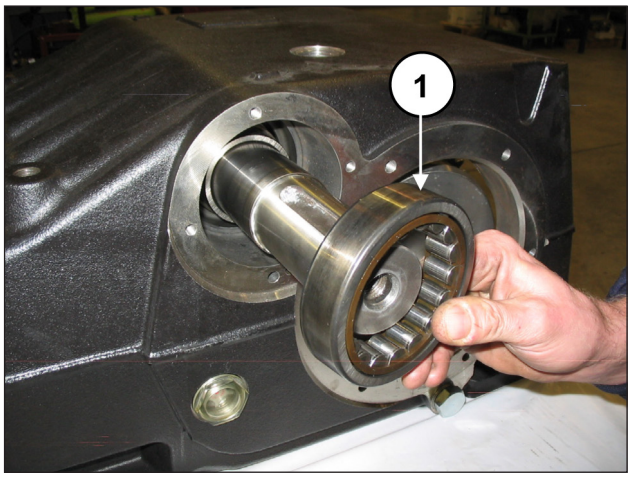


Abb. 59

Setzen Sie auf beiden Seite den inneren Distanzring des Lagers (Pos. ①, Abb. 60) und den äußeren Ring ein (Pos. ①, Abb. 61).

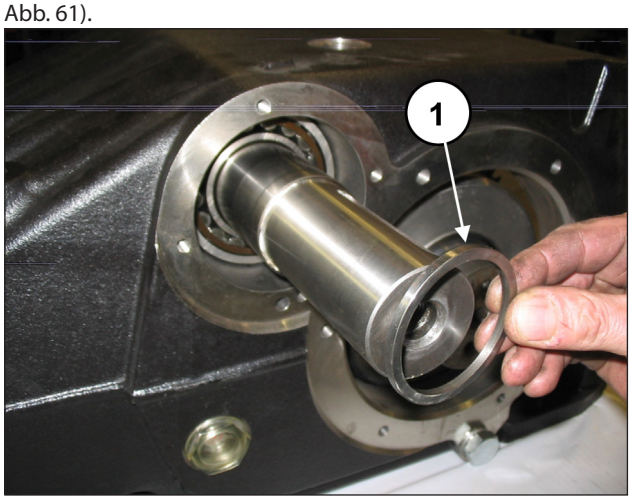


Abb. 60

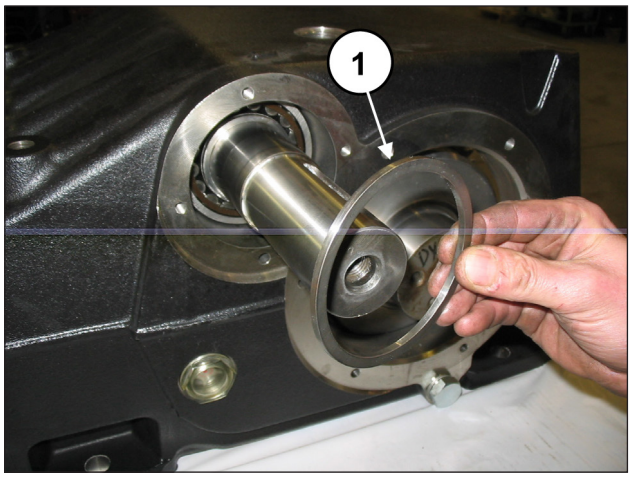


Abb. 61

Setzen Sie den Innenring (Pos. ①, Abb. 62) und den Außenring (Pos. ①, Abb. 63) eines Lagers nur auf einer Pumpenseite ein.

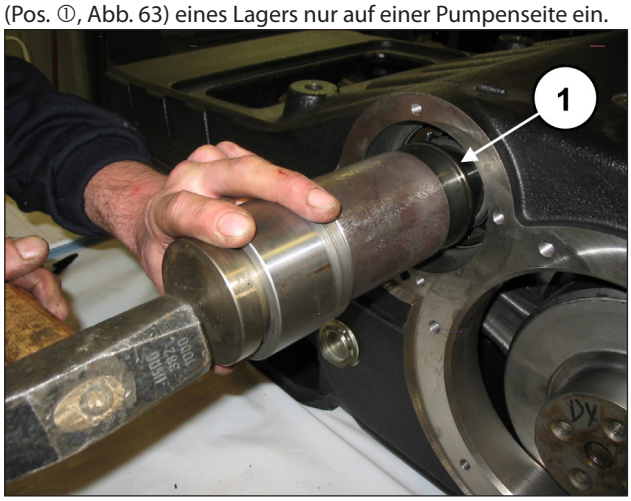


Abb. 62

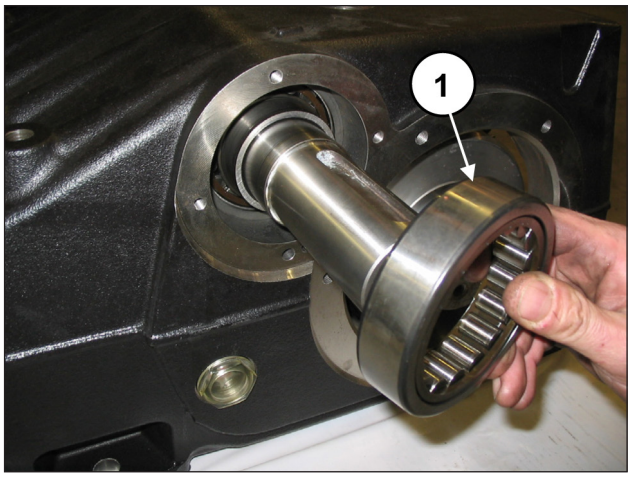


Abb. 63

Montieren Sie vorläufig den rechten und linken Zapfwellendeckel:
Setzen Sie den radialen Dichtring in den Zapfwellen-Lagerdeckel ein. Verwenden Sie hierfür das Werkzeug Art. 27539500 (Pos. ①, Abb. 64).
Überprüfen Sie vor Einbau des radialen Dichtrings den Zustand der Dichtlippe. Im Fall eines Austauschs montieren Sie den neuen Ring gemäß Abb. 65.

Sollte die Zapfwelle im Bereich mit der Dichtlippe einen Verschleiß am Durchmesser aufweisen, können Sie zur Vermeidung der Schleifbearbeitung den Ring auf Anschlag mit dem Deckel neu ausrichten, siehe hierzu Abb. 65.

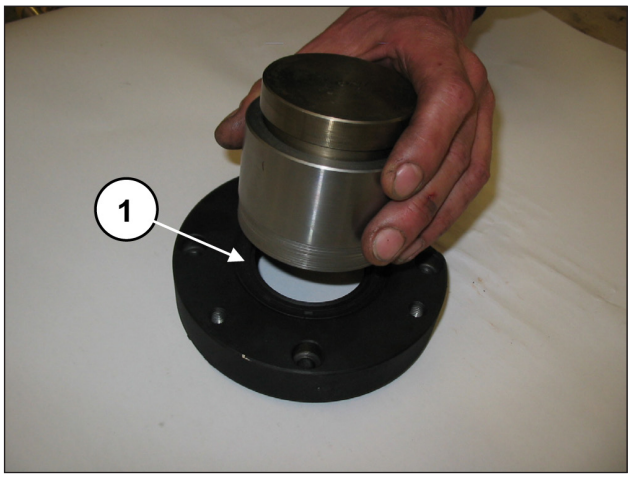


Abb. 64

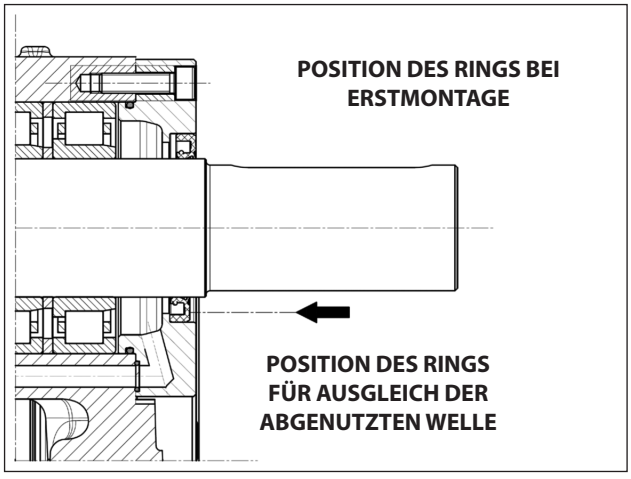


Abb. 65

Setzen Sie auf die Zapfwellen-Lagerdeckel den äußeren O-Ring (Pos. ①, Abb. 66) und den O-Ring der Schmierbohrung (Pos. ①, Abb. 67).

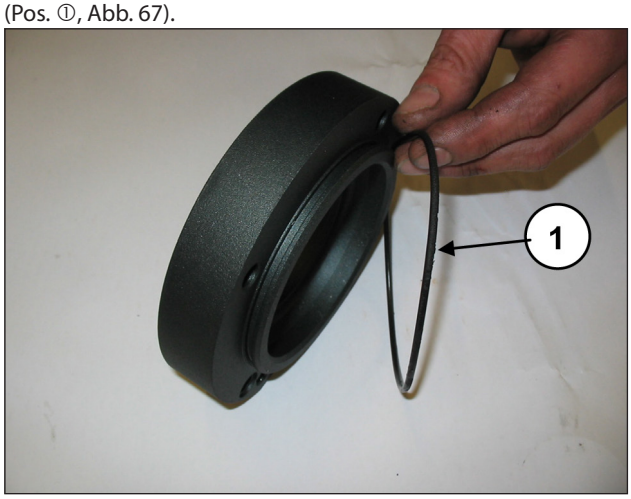


Abb. 66

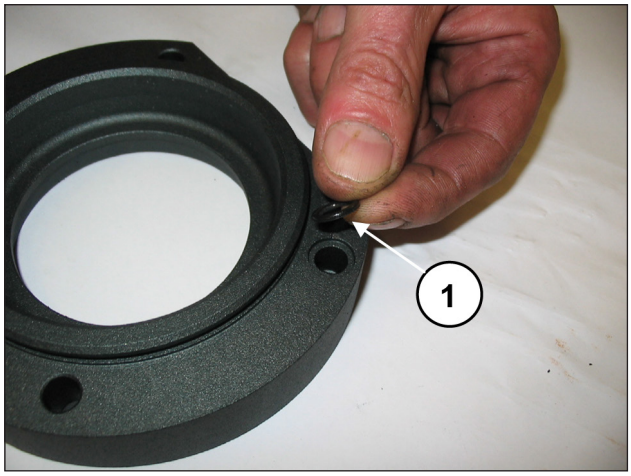


Abb. 67

Montieren Sie einen ersten Zapfwellen-Lagerdeckel (rechts bzw. links) an das Pumpengehäuse (Pos. ①, Abb. 68) und befestigen Sie den Deckel anhand von 4 Schrauben M8x30 (Pos. ①, Abb. 69).

Achten Sie auf den richtigen Einbausinn des Deckels. Die Schmierbohrung des Deckels muss mit der Bohrung am Gehäuse zusammenfallen.

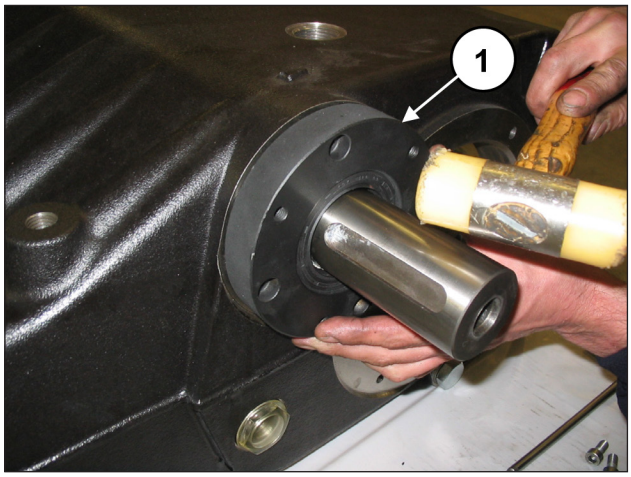


Abb. 68

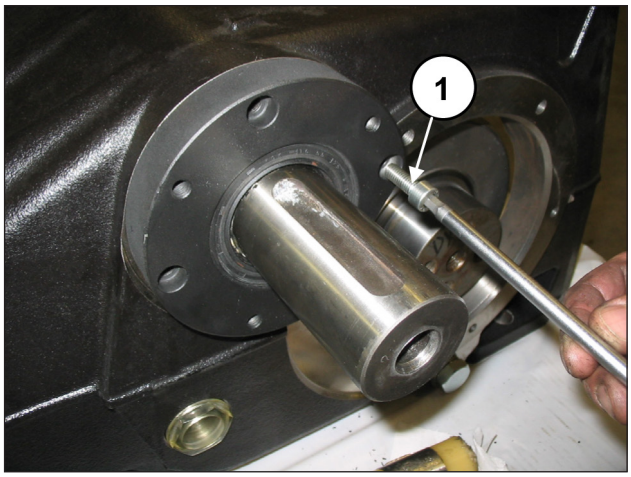


Abb. 69

Wiederholen Sie die Schritte an der gegenüberliegenden Seite.
Setzen Sie den Innenring (Pos. ①, Abb. 62) und den Außenring (Pos. ①, Abb. 63) des letzten Lagers ein.
Montieren Sie den fehlenden Zapfwellen-Lagerdeckel an das Pumpengehäuse (Pos. ①, Abb. 68) und befestigen Sie den Deckel anhand von 4 Schrauben M8x30 (Pos. ①, Abb. 69).
Eichen Sie die 4+4 Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.
Montieren Sie vorläufig die beiden Lagerdeckel:
setzen Sie das Lager mit dem Schlagwerk (Pos. ①, Abb. 70) bis auf ein Maß von 4÷4.5 mm ein, siehe Abb. 71.

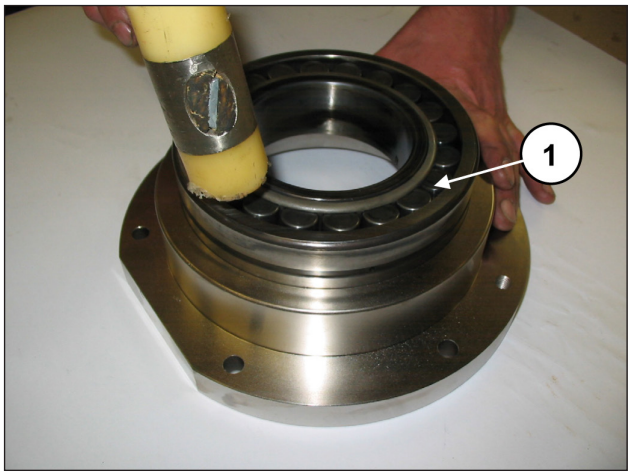


Abb. 70

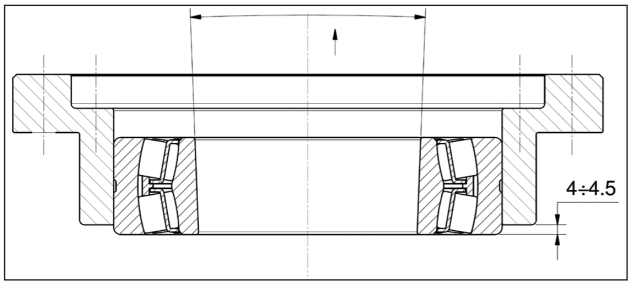


Abb. 71

Das Lager in Abb. 71 verfügt über einen konischen Innenring. Vergewissern Sie sich vor Einsetzen der Buchse, dass die Konizität von außen nach innen verläuft.

Montieren Sie den O-Ring außen am Lagerdeckel (Pos. ①, Abb. 72).

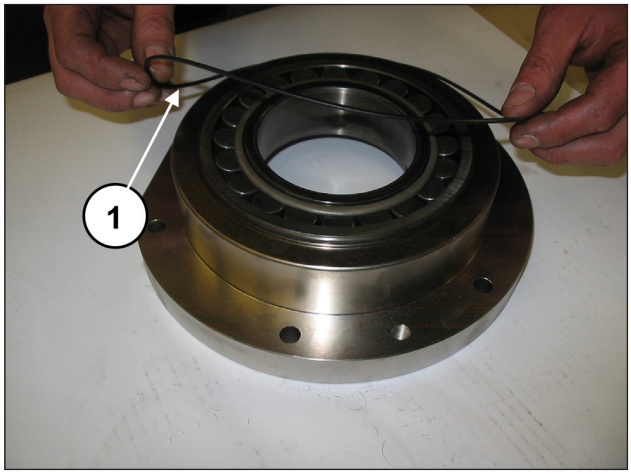


Abb. 72

Wiederholen Sie den Vorgang beim anderen Deckel. Arretieren Sie die drei Pleuelgruppen mit dem entsprechenden Werkzeug Art. 27566200 (Pos. ①, Abb. 41). Setzen Sie zwei Gewindestifte M16 an das Ende der Kurbelwelle und treiben Sie bei angehobener Welle (Pos. ①, Abb. 73) den Lagerdeckel samt Lager und O-Ring (Pos. ①, Abb. 74) mithilfe eines Schlagwerks ein. Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.

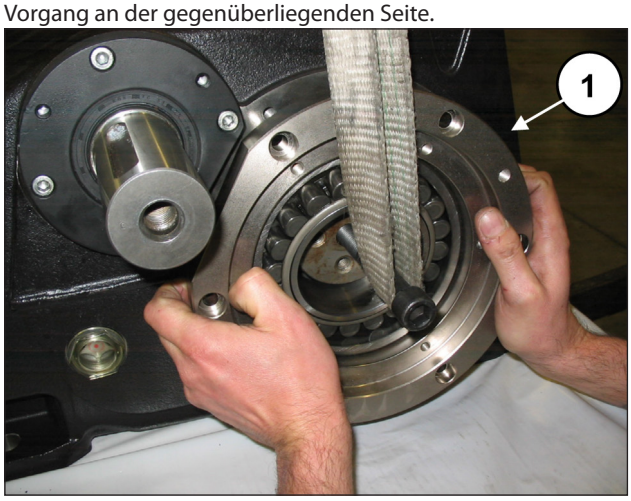


Abb. 73

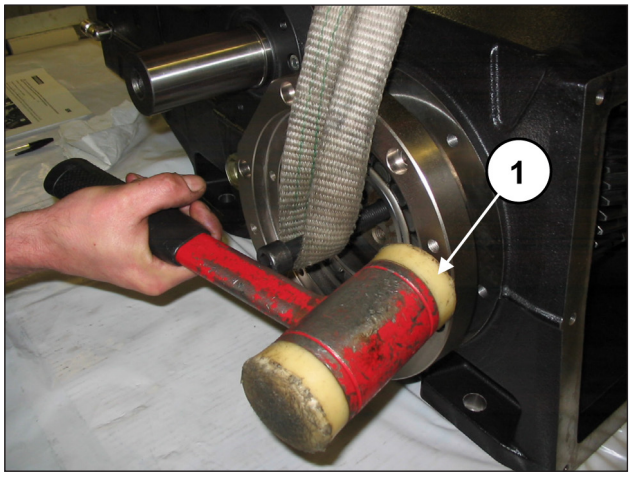


Abb. 74

Befestigen Sie die Lagerdeckel anhand von 6+6 Schrauben M10x30 (Pos. ①, Abb. 75).
Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

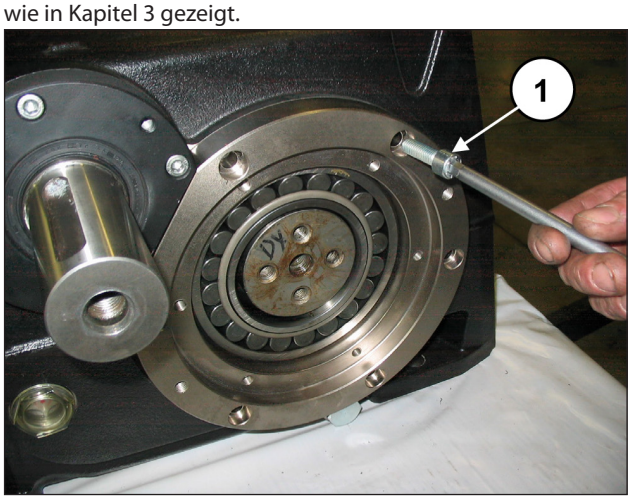


Abb. 75

Setzen Sie die zwei Druckbuchsen teilweise ein und halten Sie hierbei die Kurbelwelle mit dem vorab montierten Stift M16 angehoben (Pos. ①, Abb. 76).

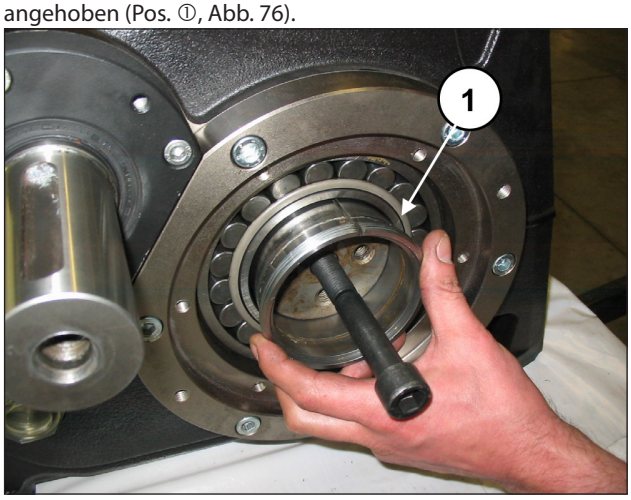


Abb. 76

Treiben Sie die Druckbuchse vollständig auf die Kurbelwelle (Pos. ①, Abb. 77 e Abb. 78) mithilfe eines Schlagwerks und eines Dorns ein.

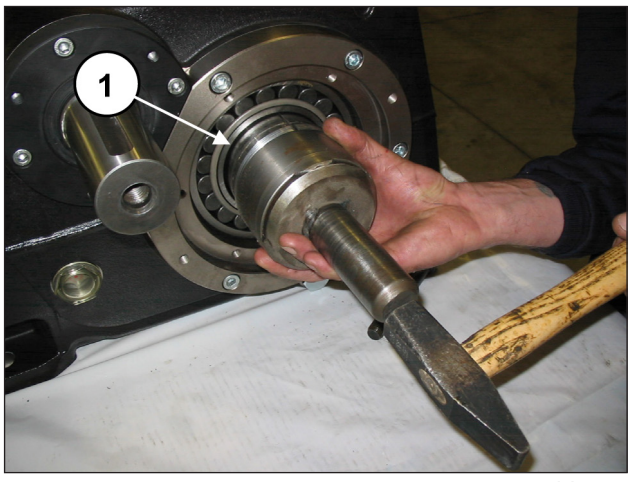


Abb. 77

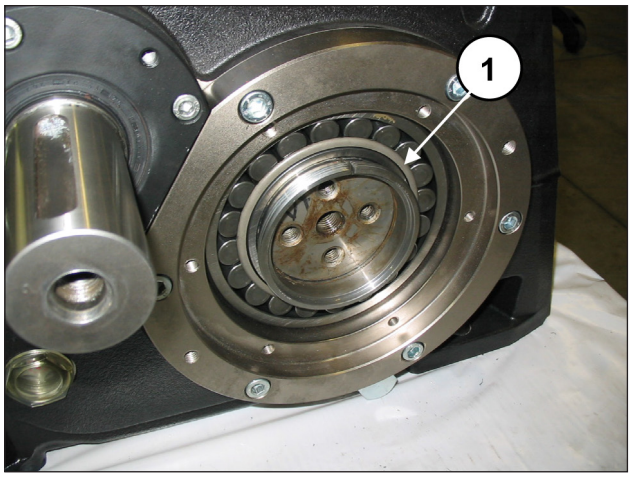


Abb. 78

Setzen Sie die Druckbuchse trocken (ohne Öl oder Schmierstoff ein).

Setzen Sie die Buchse soweit ein, bis sich die Außenfläche (konisch) perfekt mit der Innenseite des Lagers verbindet. Achten Sie beim Einsetzen darauf, dass das Lager mit dem Bund der Kurbelwelle in Kontakt bleibt.
Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.
Setzen Sie die Buchsenflansche in die konischen Buchsen ein (Pos. ①, Abb. 79).
Drehen Sie eine Schraube M16 ausreichender Länge (35-40 mm) in die Bohrung M16 der Kurbelwelle bis zur kompletten Auflage des Flanschs an der Buchse ein (Pos. ①, Abb. 80).
Ziehen Sie die Schraube nicht fest.

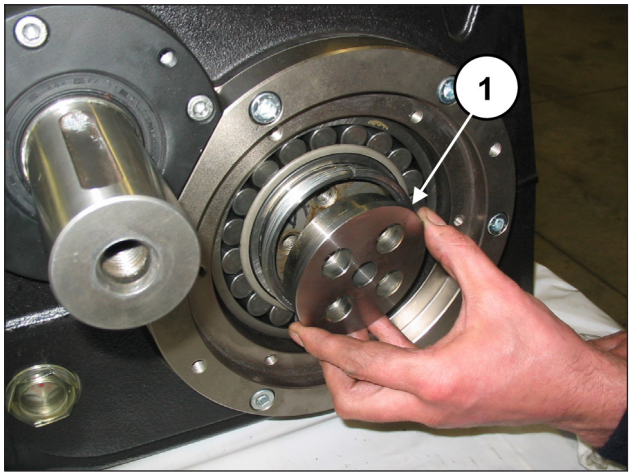


Abb. 79

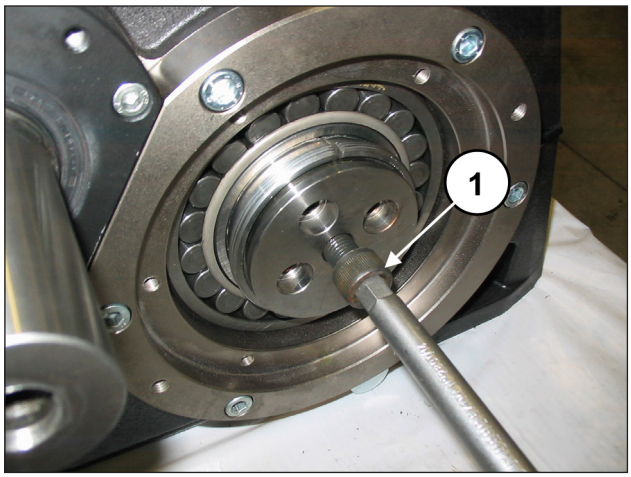


Abb. 80

Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.
Entfernen Sie das Werkzeug zur Sicherung der Pleuelstangen Art. 27566200 (Pos. ①, Abb. 41).
Setzen Sie die oberen Lagerschalen zwischen Pleuelstange und Kurbelwelle ein (Pos. ①, Abb. 81).

Stellen Sie für einen vorschriftsmäßigen Einbau der Lagerschalen sicher, dass die Bezugsmarkierung der Lagerschalen in der entsprechenden Aufnahme an der Pleuelhälfte zu liegen kommt (Pos. ①, Abb. 82).

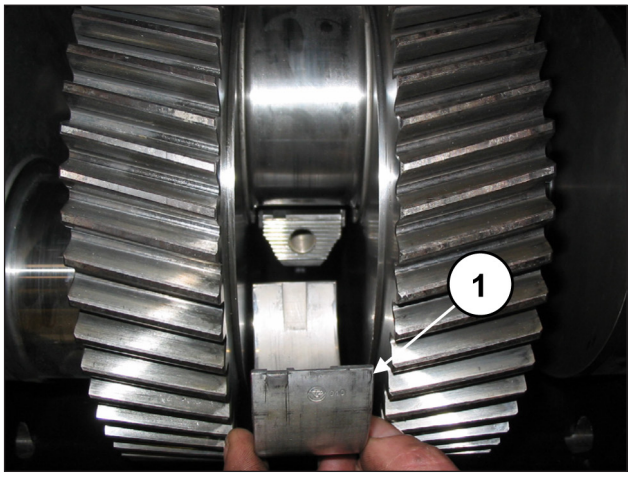


Abb. 81

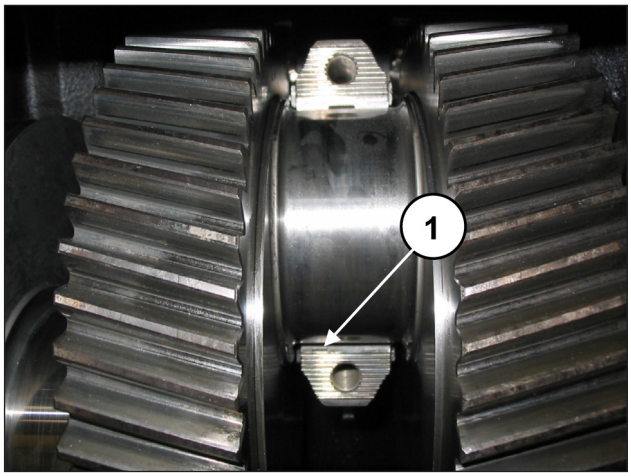


Abb. 82

Montieren Sie die unteren Lagerschalen an die Pleueldeckel (Pos. ①, Abb. 83) und vergewissern Sie sich dabei, dass die Bezugsmarkierung der Lagerschalen in der entsprechenden Aufnahme am Deckel zu liegen kommt (Pos. ②, Abb. 83).
Befestigen Sie die Pleueldeckel mit Pleuelhälften anhand der Schrauben M12x1.25x87 (Pos. ①, Abb. 84).
Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt, und ziehen Sie gleichzeitig die Schrauben auf Anzugsmoment fest.

Achten Sie auf den richtigen Einbausinn der Lagerdeckel. Die Nummerierung muss nach oben gerichtet sein.

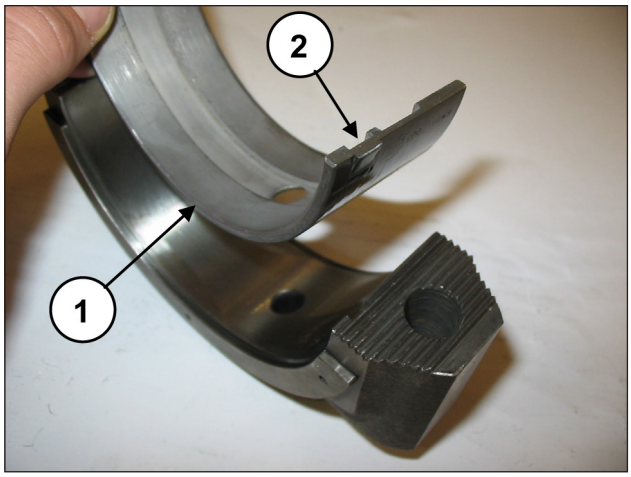


Abb. 83

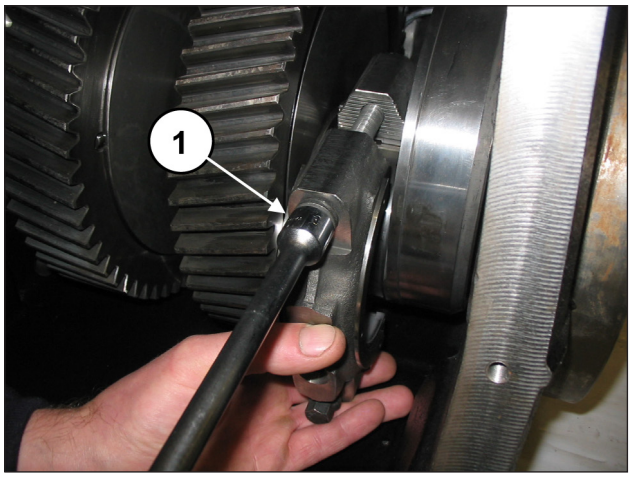


Abb. 84

Setzen Sie eine Passscheibe unter den Schaft der mittleren Pleuelstange, um die Drehung der Kurbelwelle zu kontern (Pos. ①, Abb. 85).

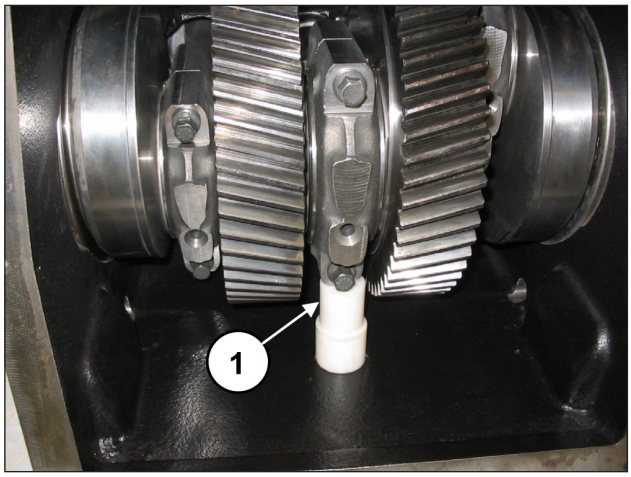


Abb. 85

Messen Sie das Maß "X" inAbb. 86 zwischen konischer Buchse und Kurbelwellenlager.

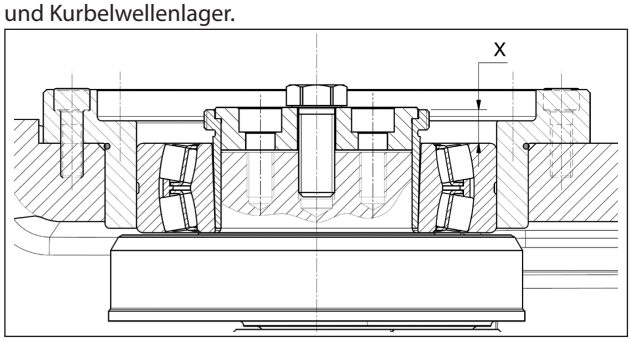


Abb. 86

Drehen Sie die Schraube M16 fest, bis eine Reduzierung des Maßes "X" zwischen 0,7 und 0,8 mm eintritt (Abb. 87).

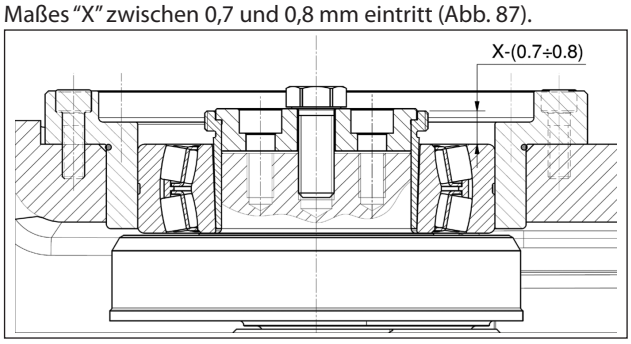


Abb. 87

Wiederholen Sie den Vorgang an der gegenüberliegenden Seite.
Nehmen Sie die Schraube M16 von der Kurbelwelle ab.
Drehen Sie die zwei Buchsenflansche mit den 4+4 Schrauben M12x25 an die Kurbelwelle (Pos. ①, Abb. 89).

Tragen Sie LOCTITE 243 auf das Gewinde der Schrauben M12x25 (Pos. ①, Abb. 88).

Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

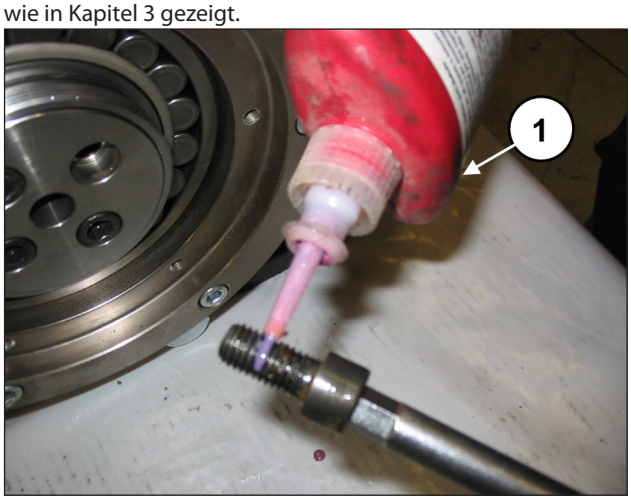


Abb. 88

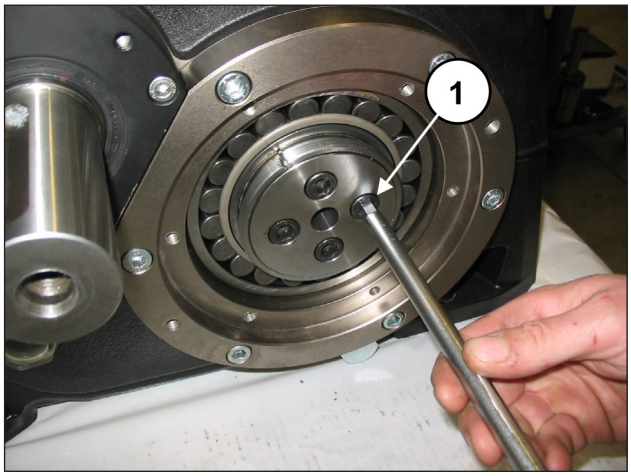


Abb. 89

Nehmen Sie die Drehsicherungsscheibe unter dem Schaft der mittleren Pleuelstange ab.
Montieren Sie die beiden Lagerdeckel (samt O-Ringen) (Pos. ①, Abb. 90), mit 6+6 Schrauben M8x20 (Pos. ①, Abb. 91). Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

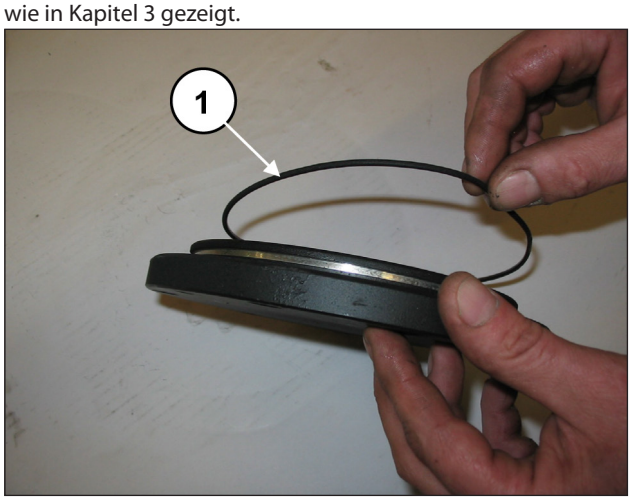


Abb. 90

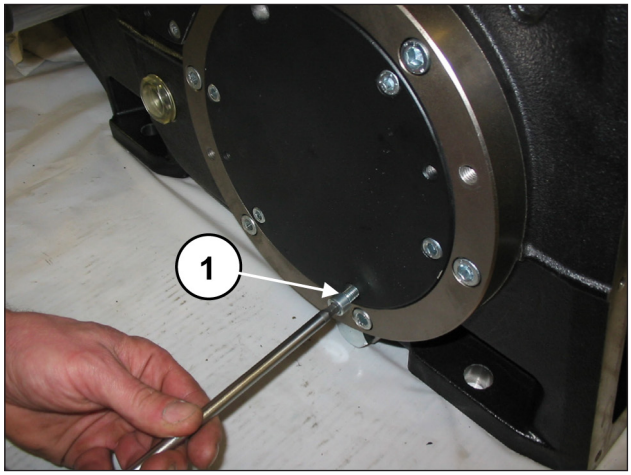


Abb. 91

Setzen Sie den O-Ring in den hinteren Deckel ein (Pos. ①, Abb. 92) und befestigen Sie den Deckel am Gehäuse anhand von 10 Schrauben M8x20 (Pos. ①, Abb. 93).
Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

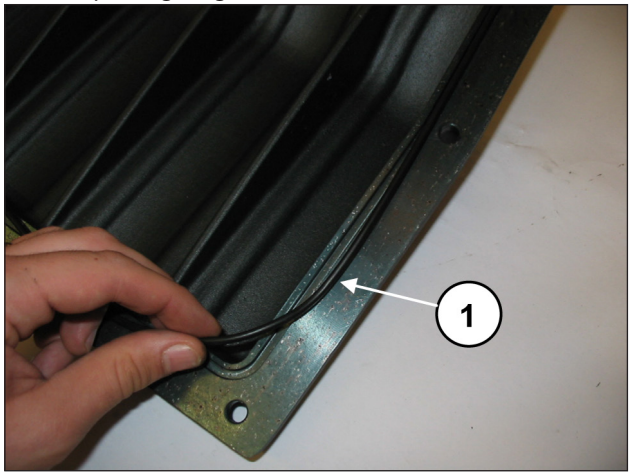


Abb. 92

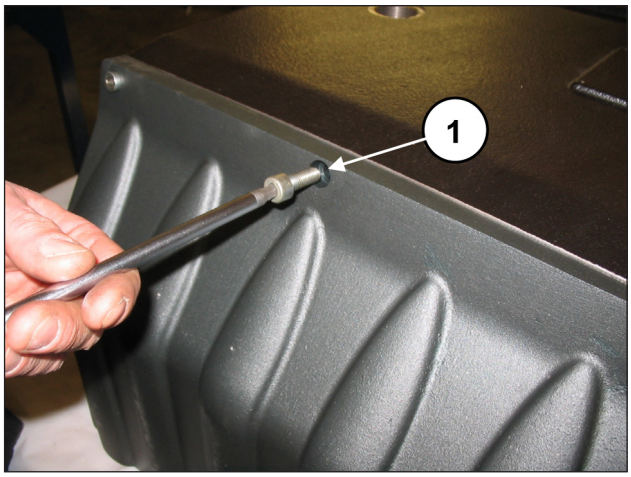


Abb. 93

Montieren Sie den radialen Dichtring in den Ölabstreifring-Deckel (Pos. ①, Abb. 94) mithilfe eines Dorns Art. 27910900.

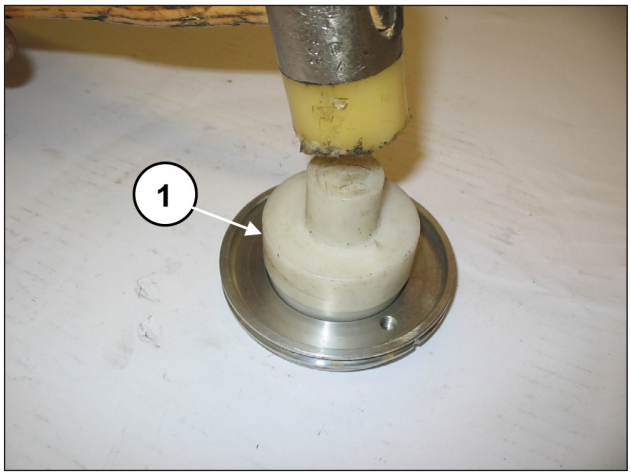


Abb. 94

Setzen Sie den O-Ring (Pos. ①, Abb. 95) in die Aufnahme des Ölabstreifring-Deckels ein und bringen Sie die montierte Gruppe in den Gehäusesitz an (Pos. ①, Abb. 96).

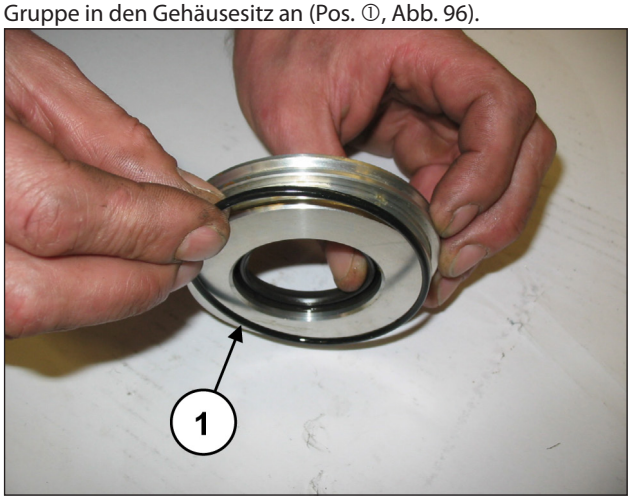


Abb. 95

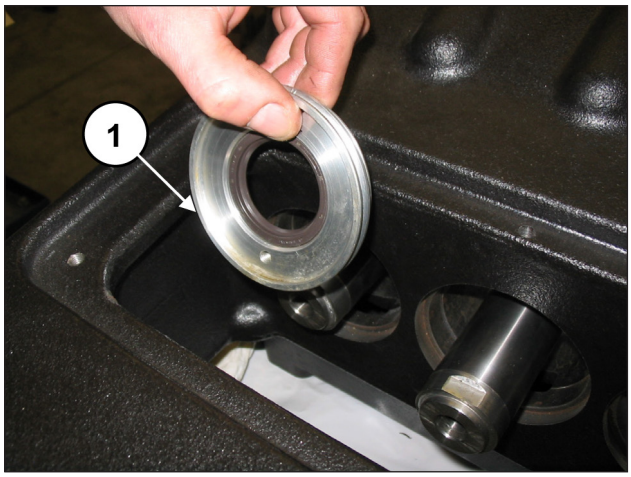


Abb. 96

Überprüfen Sie den passgerechten Sitz des Deckels (Pos. ①, Abb. 97) und achten Sie darauf, nicht die Dichtlippe des radialen Dichtrings zu beschädigen. Befestigen Sie die zwei Ölabstreifring-Deckel anhand von 2 Stiftschrauben M6x30 (Pos. ①, Abb. 98).

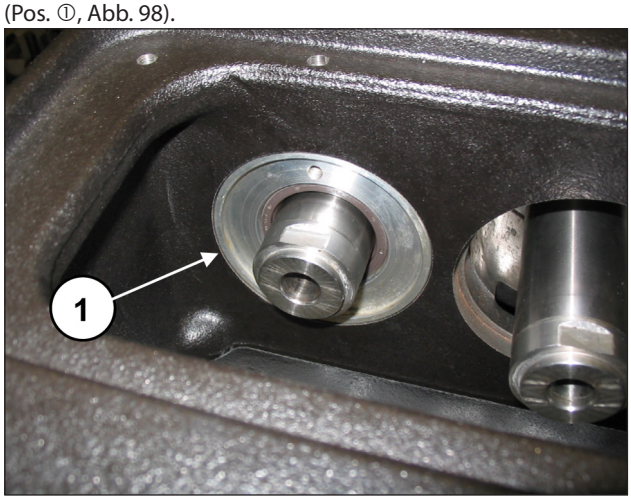


Abb. 97

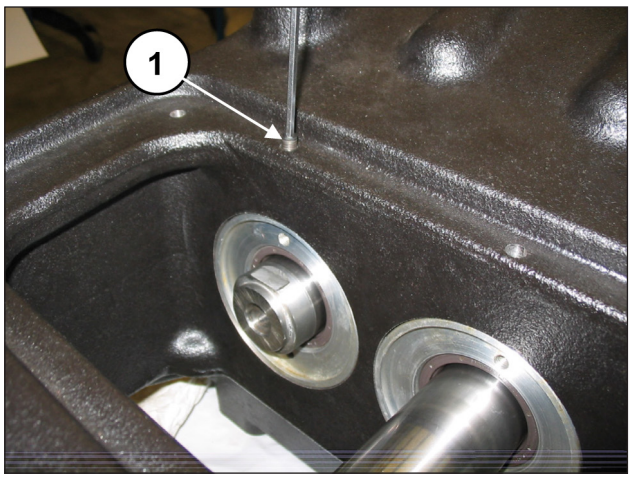


Abb. 98

Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

Montieren Sie den Spritzschutz samt O-Ring in die Aufnahme an der Kolbenführung (Pos. ①, Abb. 99 und Abb. 100).

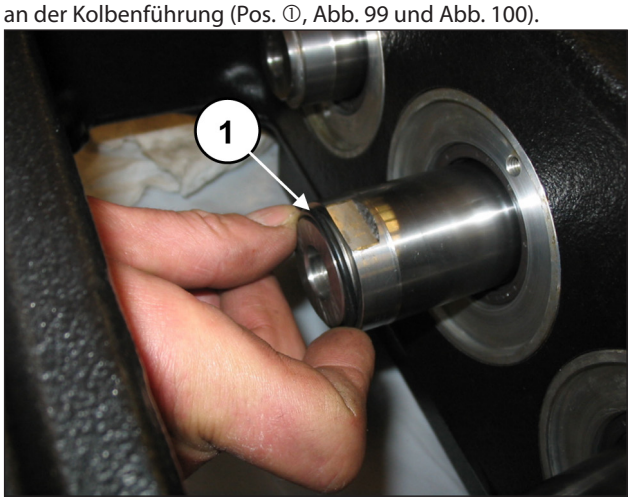


Abb. 99

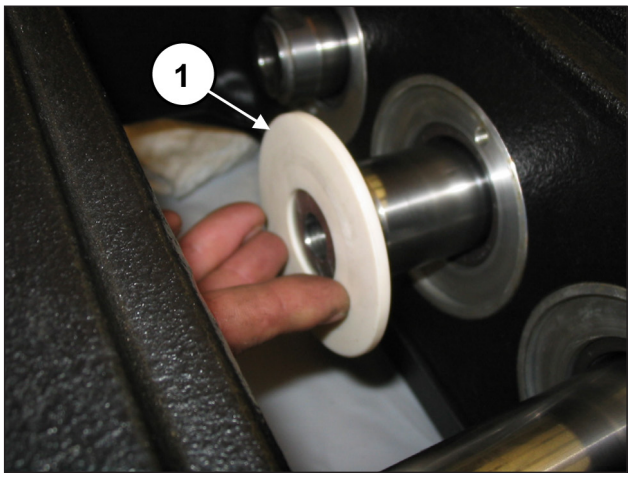


Abb. 100

Drehen Sie die drei Kolben ein (Pos. ①, Abb. 101) und eichen Sie mit einem Drehmomentschlüssel lt. Angaben in Kapitel 3.

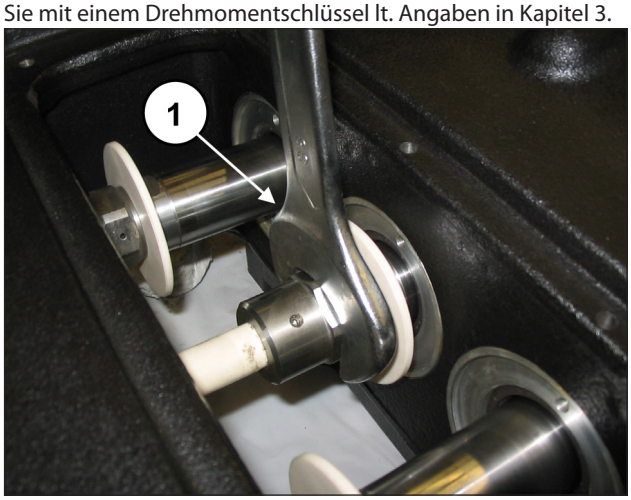


Abb. 101

Setzen Sie auf die beiden Inspektionsdeckel den O-Ring (Pos. ①, Abb. 102) und montieren Sie die Deckel anhand von 4+4 Schrauben M6x14 (Pos. ①, Abb. 103).

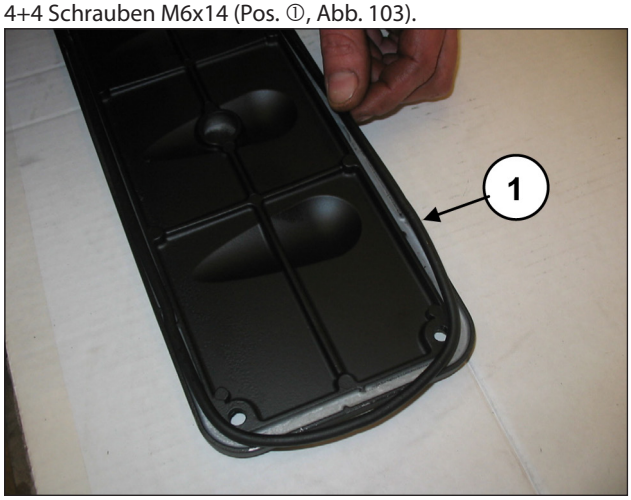


Abb. 102

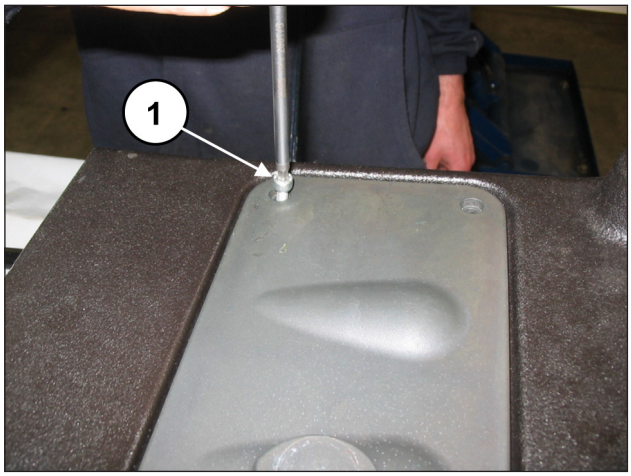


Abb. 103

Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

Montieren Sie den Wellenenddeckel und befestigen Sie den Deckel am Gehäuse anhand von 3 Schrauben M8x20 (Pos. ①, Abb. 104).
Eichen Sie die Schrauben mit einem Drehmomentschlüssel, wie in Kapitel 3 gezeigt.

Abb. 104

Setzen Sie die Passfeder auf die Zapfwelle ein (Pos. ①, Abb. 105).

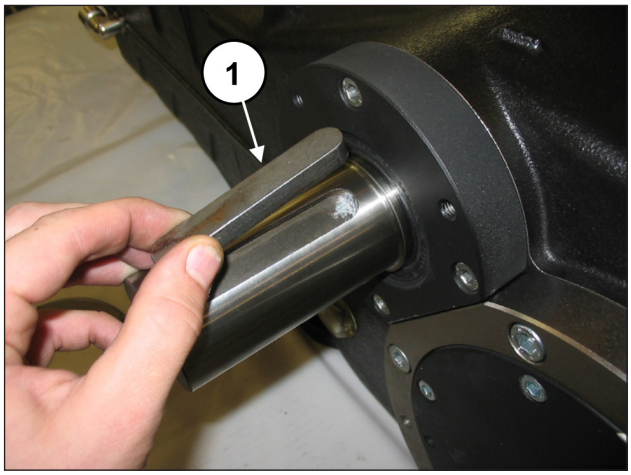


Abb. 105

2.1.3 Vorgesehene Übermaßklassen

ÜBERMASSTABELLE FÜR KURBELWELLE UND PLEUEL-LAGERSCHALEN			
Ausgleichklassen (mm)	**Art. obere Lagerschale**	**Art. untere Lagerschale**	**Schliff am Durchmesser des Wellenzapfens (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

ÜBERMASSTABELLE FÜR PUMPENGEHÄUSE UND KOLBENFÜHRUNG		
Ausgleichklassen (mm)	**Artikel Kolbenführung**	**Schliff am Sitz des Pumpengehäuses (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 REPARATUR DER HYDRAULIK

2.2.1 Ausbau des Kopfs - Buchsen - Ventile

Der Kopf bedarf keiner regelmäßigen Wartung.
Die Arbeiten beschränken sich auf die Inspektion oder den Austausch der Ventile im Bedarfsfall.
Verfahren Sie zur Abnahme der Ventilgruppen wie folgt:
Lockern Sie die Befestigungsschrauben M10x140 von Buchsen und Kopf (Pos. ①, Abb. 106), um sie freizulegen.

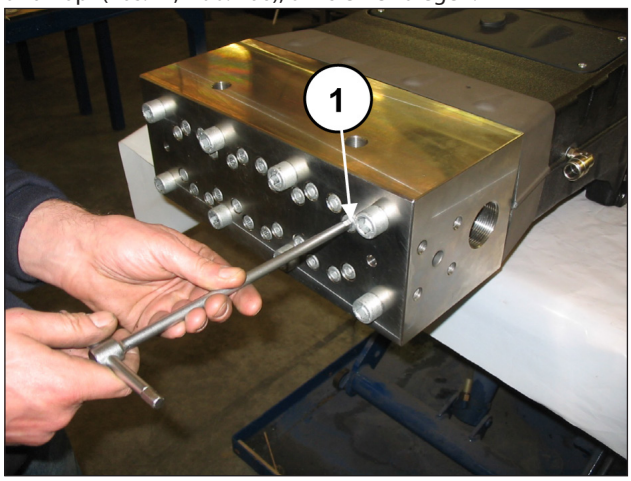


Abb. 106

Lösen Sie zwei diametral entgegengesetzte Befestigungsschrauben des Kopfs M16x280 (Pos. ① und ②, Abb. 107), ersetzen Sie diese durch zwei Wartungsschrauben - Stifte (Art. 27540200) (Pos. ①, Abb. 108), nehmen Sie dann die übrigen Schrauben ab.

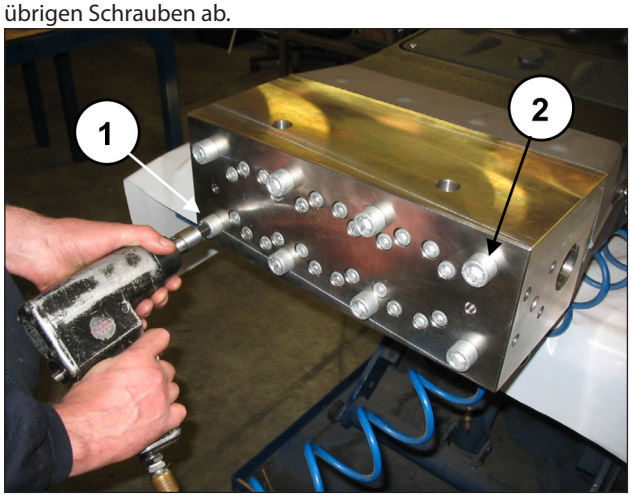


Abb. 107

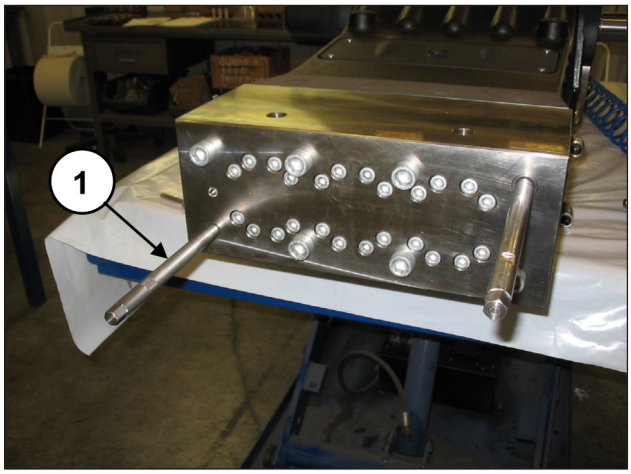


Abb. 108

Trennen Sie den Kopf und das Distanzstück der Buchsen vom Pumpengehäuse (Pos. ①, Abb. 109).

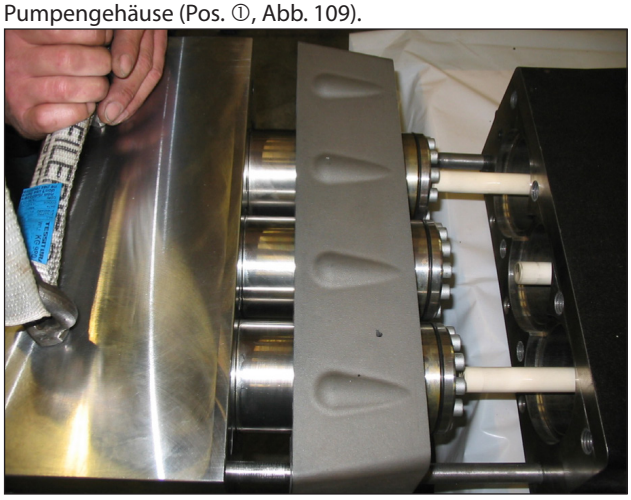


Abb. 109

Entfernen Sie die O-Ringe von den Dichtungshaltern (Pos. ①, Abb. 110) und ziehen Sie das Distanzstück der Buchsen von den Buchsengruppen ab (Pos. ①, Abb. 111).

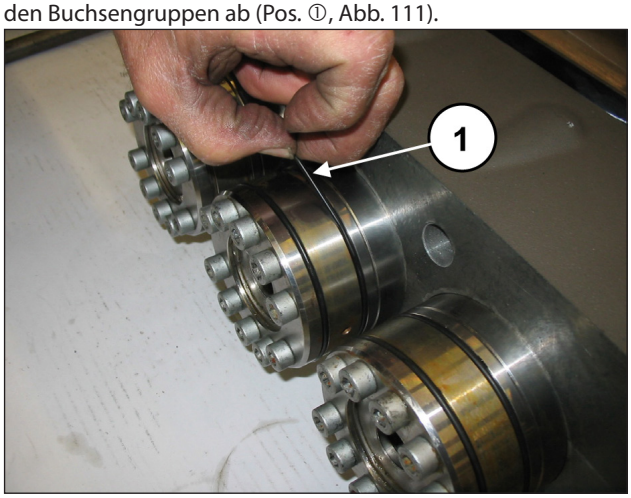


Abb. 110

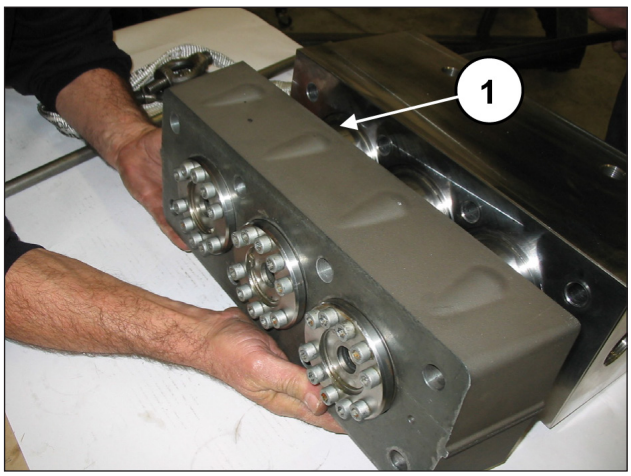


Abb. 111

Lösen Sie die Befestigungsschrauben M10x140 von Buchsen und Kopf (Pos. ①, Abb. 112) und ziehen Sie Buchsengruppen heraus (Pos. ①, Abb. 113).

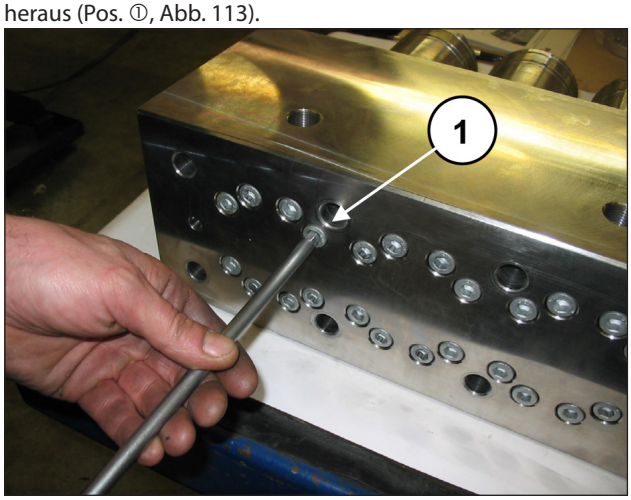


Abb. 112

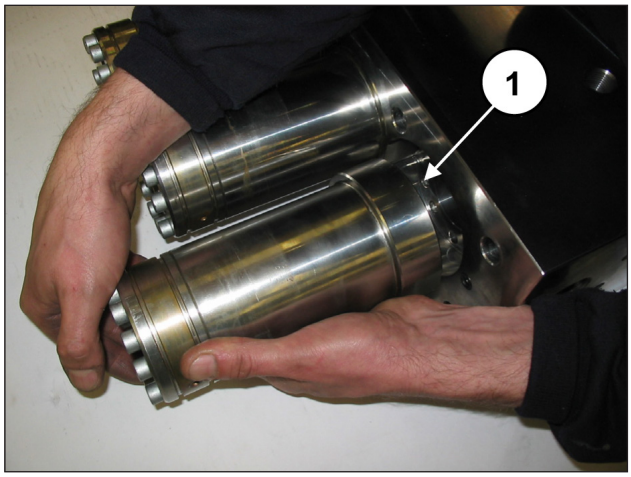


Abb. 113

Achten Sie beim Ausbau der Buchsen darauf, nicht die Ventilfeder und die Flachventile zu verlieren (Pos. ① und ②, Abb. 114), da diese nur bündig eingesetzt sind und herausfallen können.

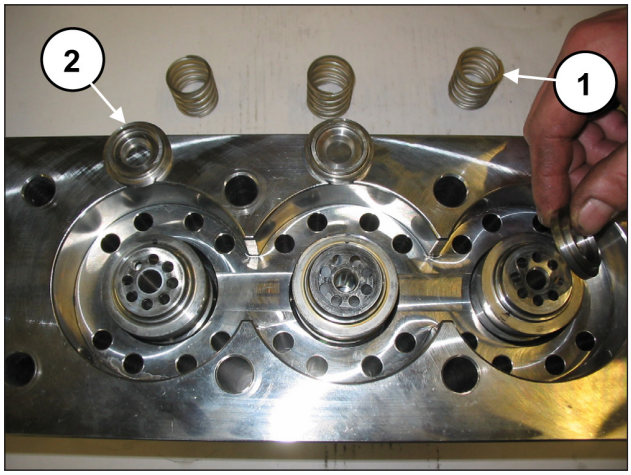


Abb. 114

Lösen Sie die ggf. durch Kalk oder Oxid am Kopf verklemmten Ventilsitze, indem Sie das entsprechende Werkzeug (Art. 034300020 für SK20-22-24 oder Art. 034300010 für SK26-28-30) in die Druckbohrung einsetzen (Pos. ①, Abb. 115).

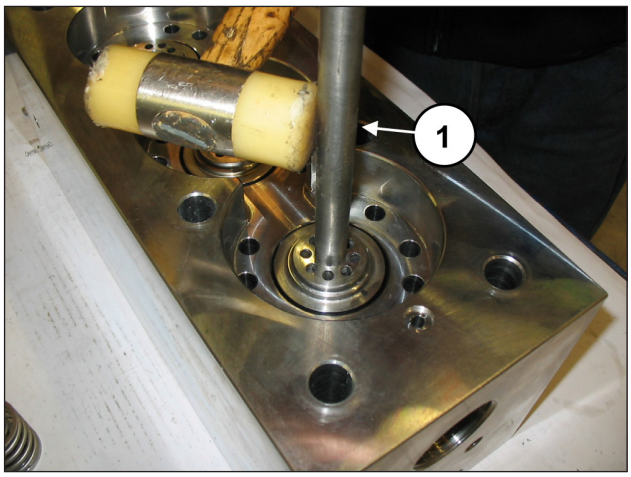


Abb. 115

Entfernen Sie die Ventilsitze und überprüfen Sie den Zustand der Dichtungen.
Ersetzen Sie bei Bedarf die abgenutzten Teile (Pos. ①, Abb. 116).

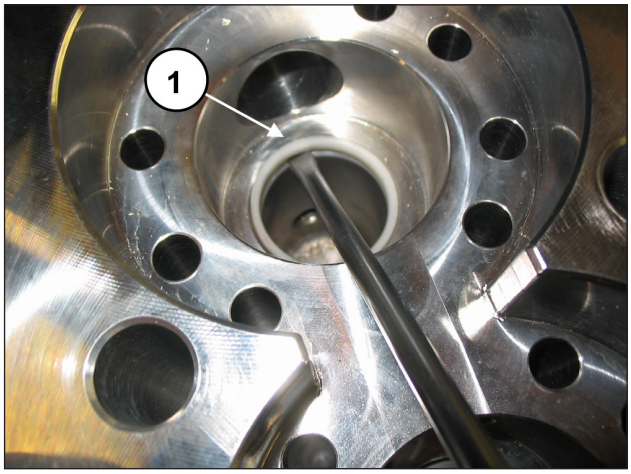


Abb. 116

Ersetzen Sie bei jeder Ventilinspektion stets die Dichtringe und die zugehörigen O-Ringe für die stirnseitige Abdichtung zwischen Buchse und Kopf und zwischen Kopf und Distanzstück im Bereich der Umlaufbohrung. Reinigen und trocknen Sie vor dem Wiedereinbau die einzelnen Bauteile und sämtliche Aufnahmen im Kopf.

Entfernen Sie die Druckteller (Pos. ①, Abb. 117), und die entsprechenden Führungen (Pos. ①, Abb. 119) samt Federn (Pos. ①, Abb. 118), überprüfen Sie den Verschleißzustand und ersetzen Sie die abgenutzten Teile bei Bedarf und auf jeden Fall in den Intervallen lt. Kapitel 11 der ***Betriebs- und Wartungsanleitung***.

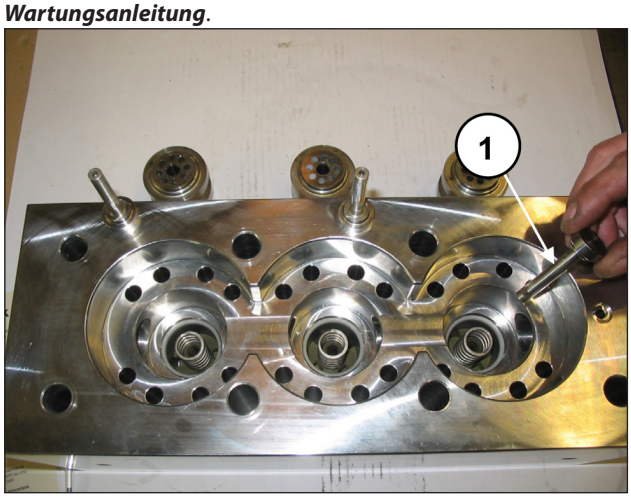


Abb. 117

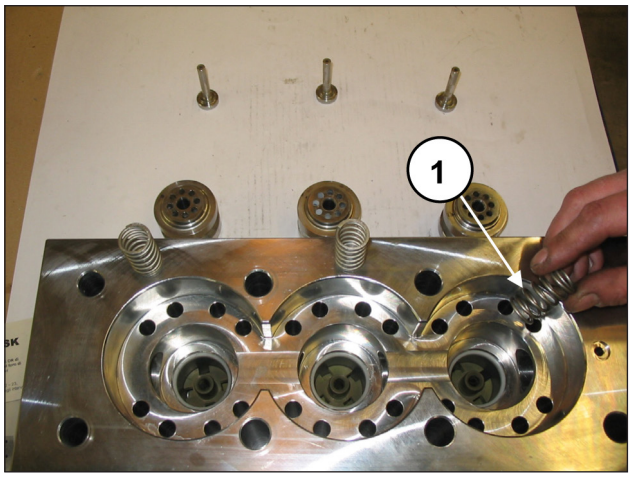


Abb. 118

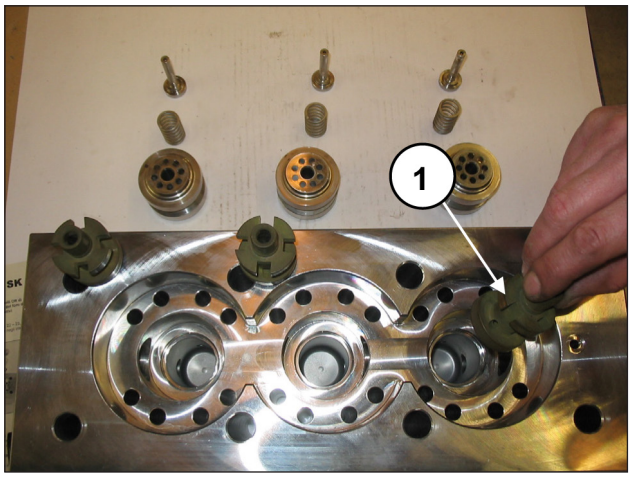


Abb. 119

2.2.2 Einbau des Kopfs - Buchsen - Ventile

Führen Sie zum Wiedereinbau der einzelnen Bauteile die vorgenannten Arbeiten in umgekehrter Reihenfolge aus und achten Sie auf den vorschriftsmäßigen Einbau des Distanzstücks für Buchsen: die zwei unbearbeiteten Aussparungen an einer der beiden Seiten müssen bei eingebautem Teil zur unteren Gehäuseseite ausgerichtet sein (Befestigungsseite der Pumpe).

Köpfe - Buchsen: Montieren und eichen Sie die Befestigungsschrauben des Kopfs und eichen Sie dann die Befestigungsschrauben der Buchsen.

Für die Anzugsmomente und die Anzugsreihenfolge der Schrauben beachten Sie die Angaben in Kapitel 3.

2.2.3 Ausbau der Kolbengruppe - Lager - Dichtungen

Die Kolbenbaugruppe bedarf keiner regelmäßigen Wartung. Die Eingriffe beschränken sich lediglich auf die Sichtinspektion des Kühlkreis-Ablasses. Sollten Störungen / Schwingungen am Druckmanometer oder Pulsationen in der Ablassleitung (Schlauch) des Kühlkreises auftreten, muss das Dichtungspaket überprüft und ggf. ausgetauscht werden.

Verfahren Sie zur Abnahme der Kolbenbaugruppen wie folgt: Trennen Sie den Kopf und das Distanzstück der Buchsen vom Pumpengehäuse gemäß den Hinweisen in Abschn. 2.2.1 (von Abb. 106 bis Abb. 113).

Demontieren Sie den oberen Inspektionsdeckel (Pos. ①, Abb. 120) und den unteren Inspektionsdeckel (Pos. ①, Abb. 121) durch Abdrehen der 4+4 Befestigungsschrauben. Ziehen Sie die O-Ringe ab und ersetzen Sie diese bei Bedarf.

Abb. 120

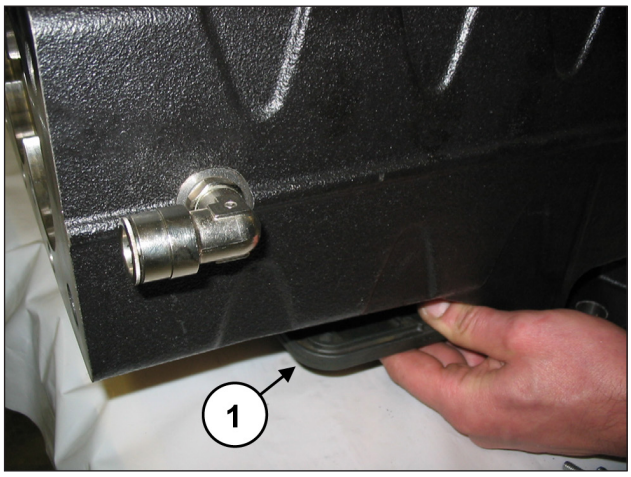


Abb. 121

Demontieren Sie die Pumpenelemente mit einem Gabelschlüssel (Pos. ①, Abb. 122) und überprüfen Sie ihren Verschleißzustand (Pos. ①, Abb. 123). Tauschen Sie diese bei Bedarf aus.

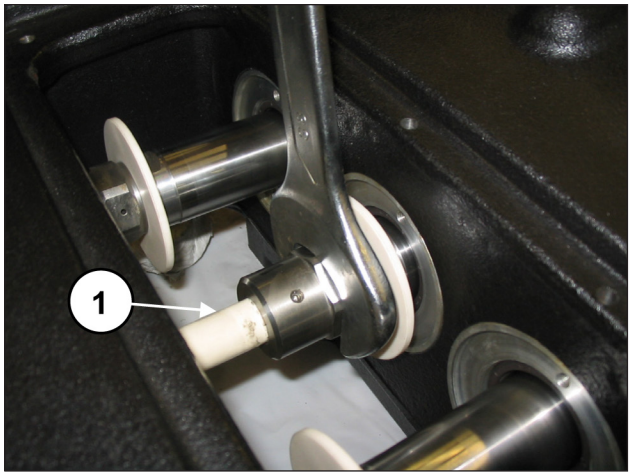


Abb. 122

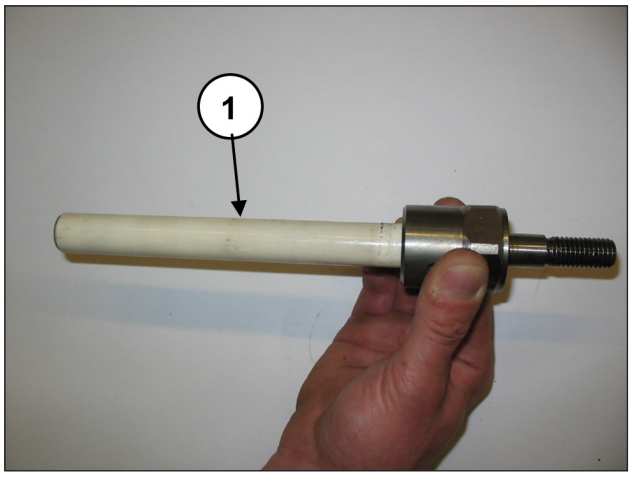


Abb. 123

Lösen Sie die Befestigungsschrauben M8x50 des Halters an der Buchse (Pos. ①, Abb. 124) und trennen Sie dann den Halter von der Buchse (Pos. ①, Abb. 125).

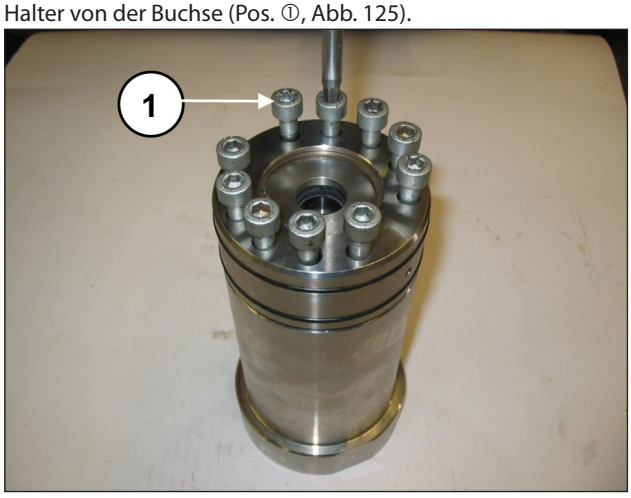


Abb. 124

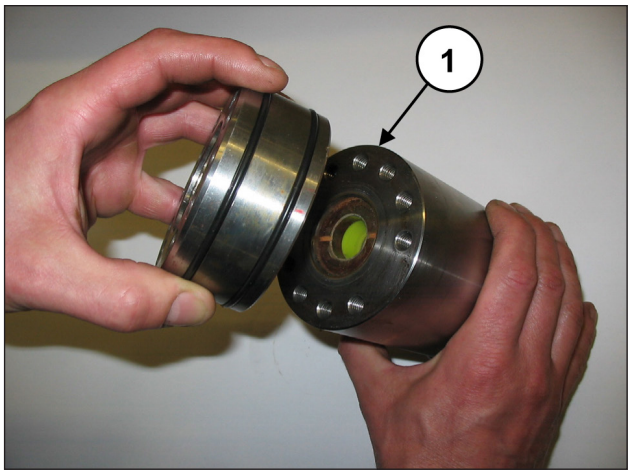


Abb. 125

Entfernen Sie den Seegerring und den Stützring der Dichtungen (Pos. ①, Abb. 126) und ziehen Sie mit einem speziellen Kunststoffdorn die ND (Niederdruck) Dichtung heraus (Pos. ①, Abb. 127).

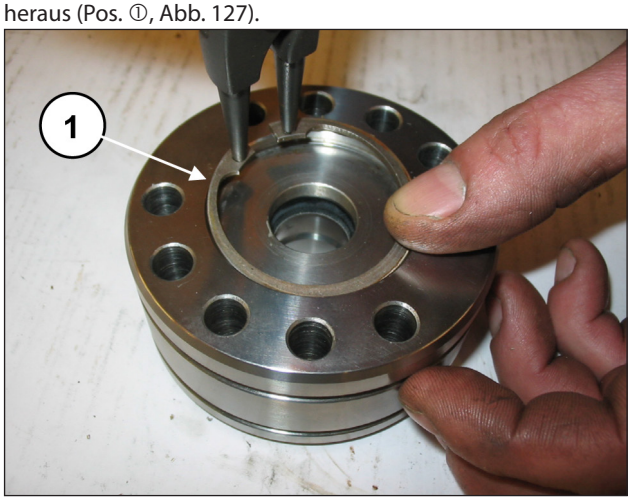


Abb. 126

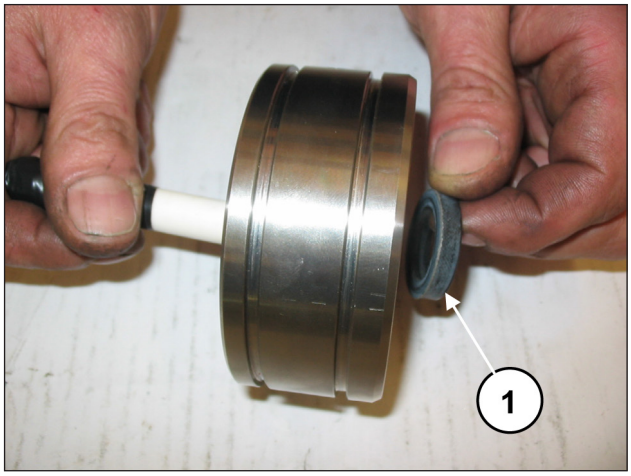


Abb. 127

Bei jedem Ausbau müssen die ND-Dichtungen und die O-Ringe ersetzt werden.

Entnehmen Sie nach Trennung der Buchse vom Dichtungshalter mit einem speziellen Kunststoffdorn (Pos. ①, Abb. 128) den HD (Hochdruck) Dichtungssatz (Pos. ①, Abb. 129).

Bei jedem Ausbau muss der HD-Dichtungssatz (Pos. ①, Abb. 129) ausgetauscht werden.

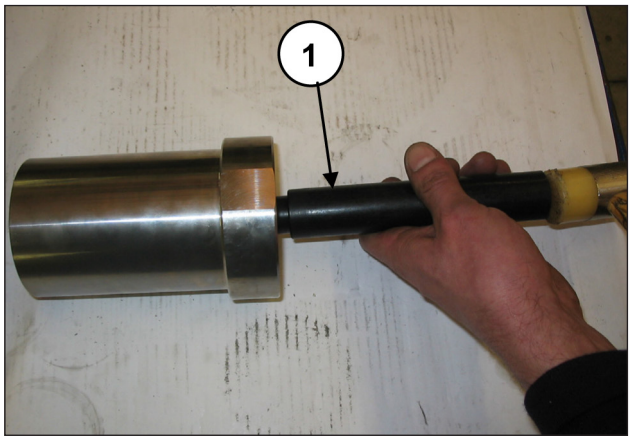


Abb. 128

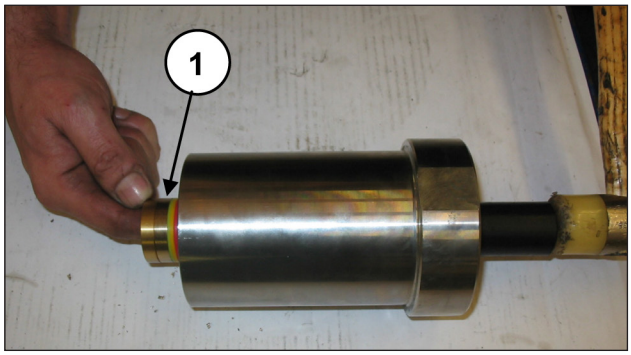


Abb. 129

2.2.4 Einbau der Kolbengruppe - Lager - Dichtungen

Führen Sie zum Wiedereinbau der einzelnen Bauteile die Schritte in umgekehrter Reihenfolge aus und achten Sie dabei auf die einzelnen Abfolgen, wie im Nachhinein geschildert. Für die Anzugsmomente und die Anzugsreihenfolge beachten Sie die Angaben in Kapitel 3.
Führen Sie die obere Hülse in die Buchse ein.

Verwenden Sie für die korrekte axiale Ausrichtung das entsprechende Werkzeug (Art. 27911200 für SK20, Art. 27911400 für SK22, Art. 27911500 für SK24, Art. 27911600 für SK26, Art. 27911700 für SK28 und Art. 27911800 für SK30) (Pos. ①, Abb. 130 und Abb. 131).

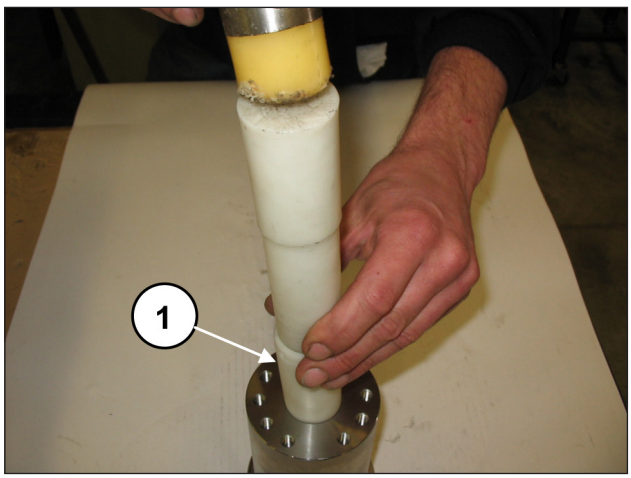


Abb. 130

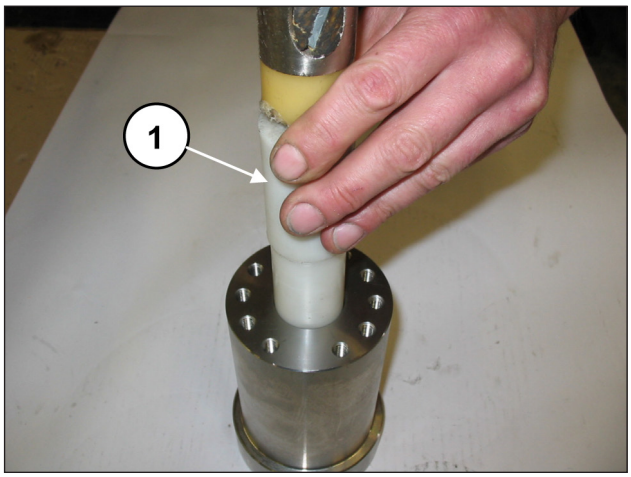


Abb. 131

Setzen Sie das HD-Dichtungspaket (Hochdruck) (Pos. ①, Abb. 132) ein; verwenden Sie aufgrund des leichten Übermaßes zwischen Dichtung und Buchse zur Vermeidung von Schäden das entsprechende Werkzeug (Art. 27540100 für SK20, SK22 und SK24, Art. 27540900 für SK26, SK28 und SK30) (Pos. ①, Abb. 133).

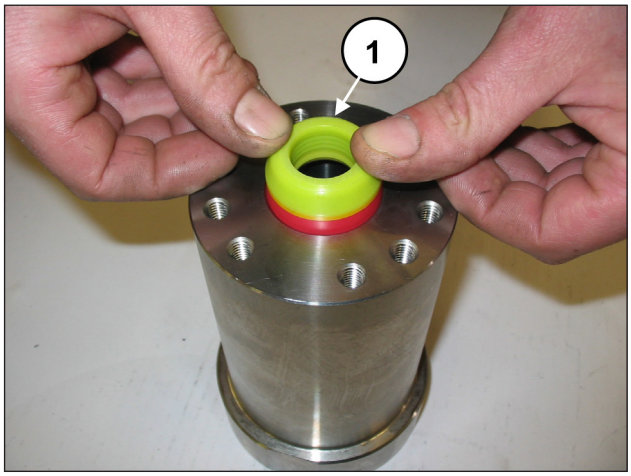


Abb. 132

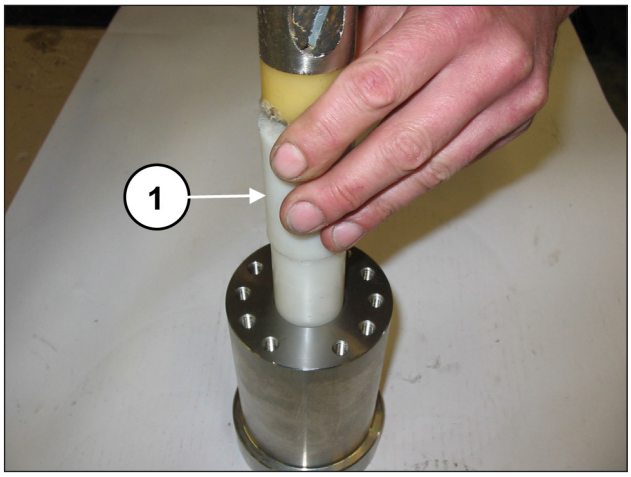


Abb. 133

Die HD-Dichtung muss lt. Abb. 132 und Abb. 134 eingesetzt werden.

Vor dem Einsetzen müssen die HD-Dichtungen mit Silikonfett der Sorte OKS 1110 wie folgt geschmiert werden: Schmieren Sie den Außendurchmesser nur leicht ein.
Tragen Sie das Fett so auf den Innendurchmesser auf, dass sämtliche Sicken zwischen den Dichtlippen einwandfrei gefüllt werden, siehe Abb. 135.

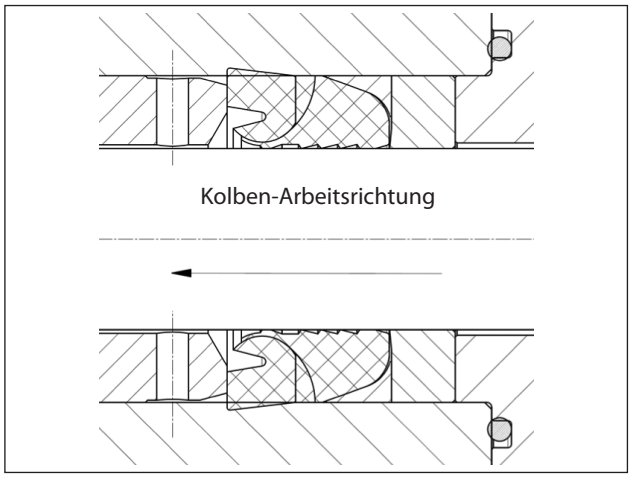


Abb. 134

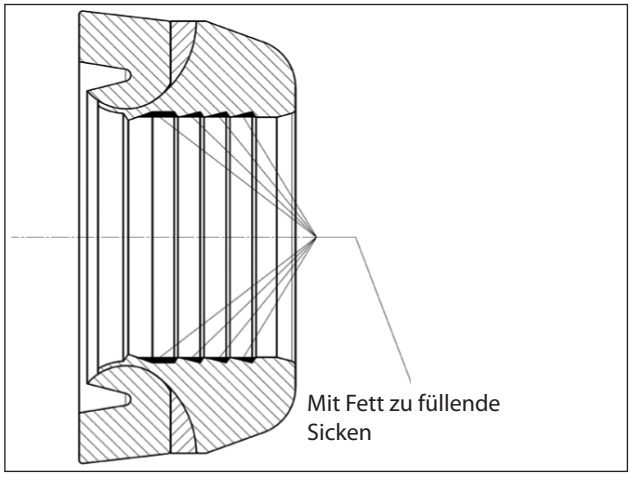


Abb. 135

Setzen Sie den Stützring und die Dichtungshülse ein (Pos. ① und ②, Abb. 136, Abb. 137 und Abb. 138).

Führen Sie die Dichtungshülse ② mit den zwei nach außen gerichteten Aussparungen (zur Gehäuseseite) gemäß Abb. 137 ein.

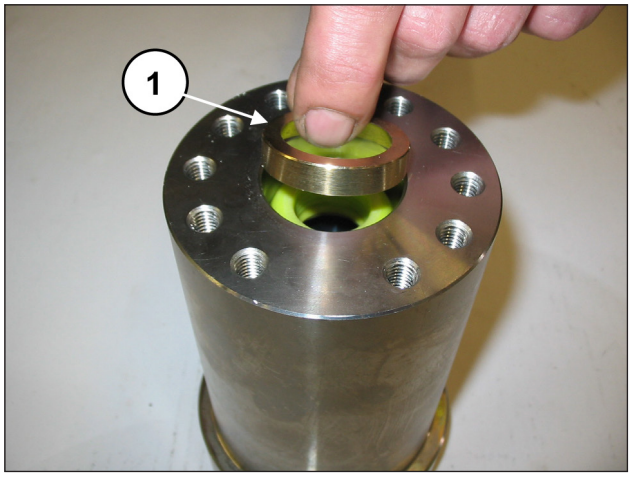


Abb. 136

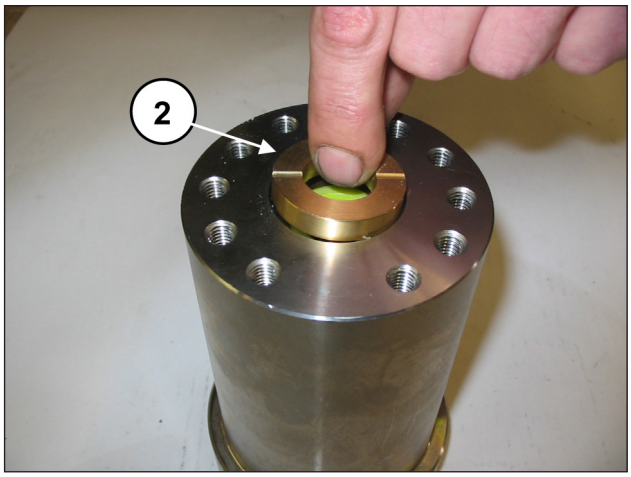


Abb. 137

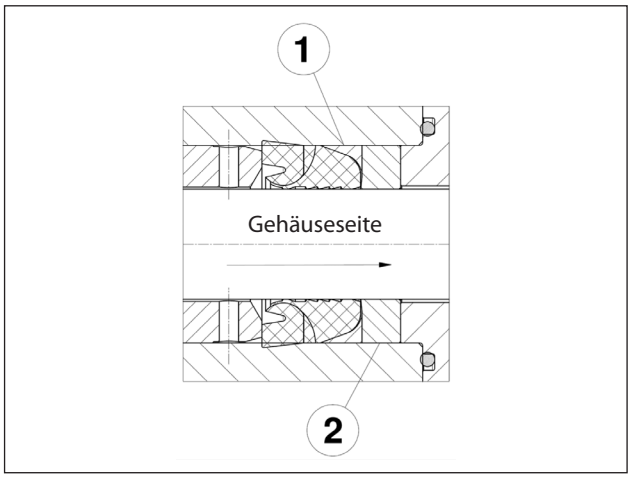


Abb. 138

Die HD-Dichtung muss mit Dichtlippe in Arbeitsrichtung des Kolbens in die Buchse eingesetzt werden (Pos. ①, Abb. 139 und Abb. 140), wobei der Außendurchmesser leicht mit Silikonfett der Sorte OKS 1110 zu schmieren ist. Tauschen Sie abgenutzte ND-Dichtungen aus.

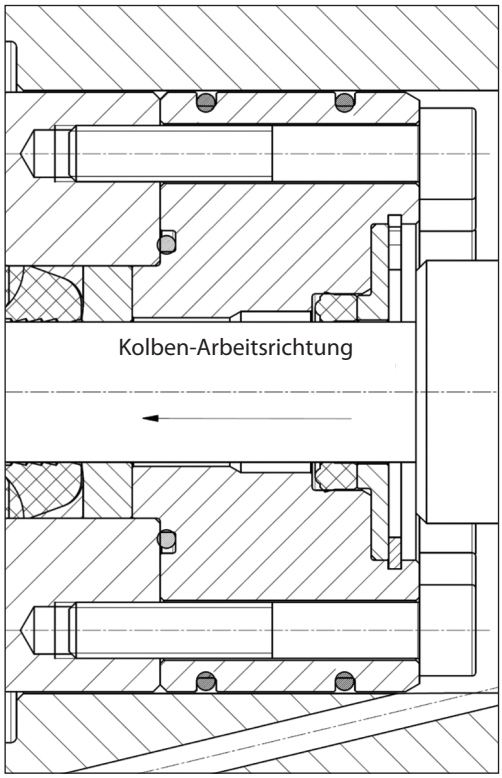


Abb. 139

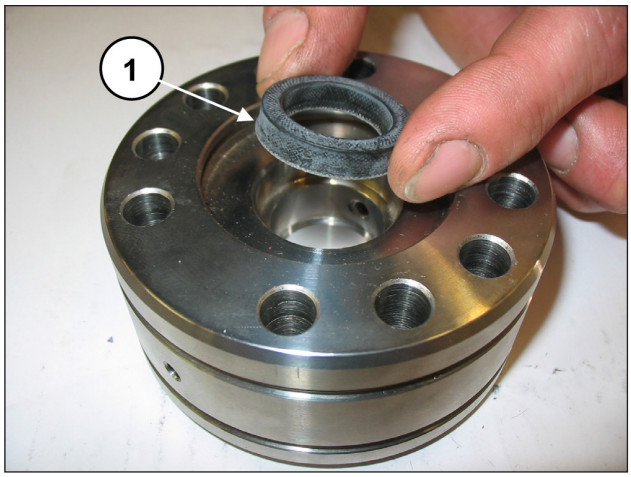


Abb. 140

Bauen Sie den Dichtungshalter (Abb. 141 und Abb. 142) ein und tauschen Sie die Bauteile ① und ② aus.

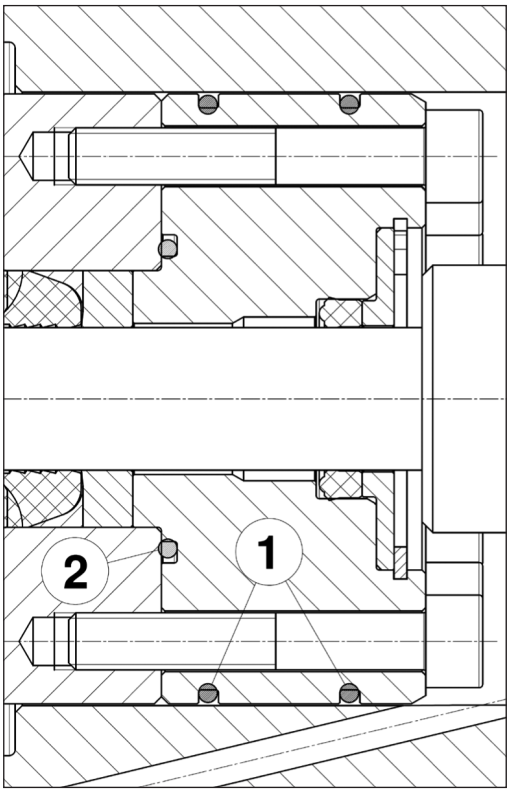


Abb. 141

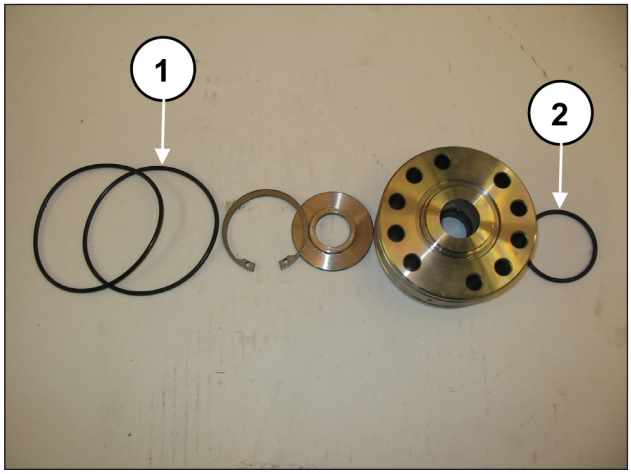


Abb. 142

Montieren Sie die Baugruppe Halter - Buchse durch Andrehen der Schrauben M8x50 von Hand gemäß Abb. 143, führen Sie dann die Eichung mit einem Drehmomentschlüssel aus, siehe hierzu die Angaben in Kapitel 3.

Abb. 143

3 EICHWERTE FÜR DEN SCHRAUBENANZUG

Ziehen Sie die Schrauben ausschließlich mit einem Drehmomentschlüssel fest.

Beschreibung	Position Explosionszeichnung	Anzugsmoment Nm
Schraube M8x20 Gehäusedeckel	42	25
Verschluss G1/2x13 Gehäuse	66	40
Schraube M8x30 Zapfwellen-Lagerdeckel	85	25
Schraube M8x20 Wellenenddeckel	42	25
Schraube M10x30 Lagerdeckel	57	45
Schraube M6x14 oberer und unterer Deckel	70	10
Schraube M8x20 Lagerdeckel	42	25
Schraube M12x1.25x87 Pleuelbefestigung	40	75
Schraube M6x20 Kolbenführung	37	10
Schraube M12x25 Buchsenflansch	51	68.5
Kompletter Kolben	16	50
Drosselanschluss D.3 3/8M-3/8F	72	45
Schraube M8x50 Halter	26	40*
Schraube M16x280 Kopf	14	200**
Schraube M10x140 Buchsen	13	83***

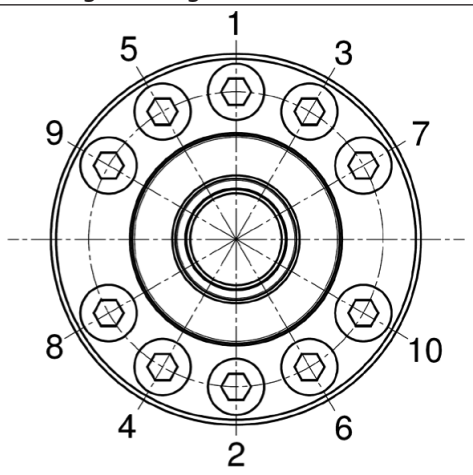
Die Schrauben - Pos. 13-14-26 - müssen mit einem Drehmomentschlüssel festgezogen werden bei Schmierung des Gewindeschafts mit Fett auf Basis Molybdändisulfid Art. 12001500.

** Die Befestigungsschrauben der Halter müssen in den Phasen und der Reihenfolge gemäß Schema in Abb. 144 festgezogen werden.

** Die Befestigungsschrauben des Kopfs müssen in den Phasen und der Reihenfolge gemäß Schema in Abb. 145 festgezogen werden.

**** Die Befestigungsschrauben der Buchsen müssen in den Phasen und der Reihenfolge gemäß Schema in Abb. 145 festgezogen werden.

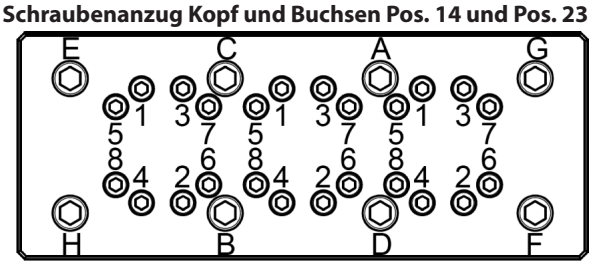
Schraubenanzug Dichtungshalter Pos. 26



Ziehen Sie die Schrauben M8x50 in der angegebenen Reihenfolge (1-2-3-4-5-6-7-8-9-10) in einer Phase auf das angegebene Anzugsmoment fest

Abb. 144

Schraubenanzug Kopf und Buchsen Pos. 14 und Pos. 23



SCHRITT 1: Anzug der Schrauben M16x280 (Pos. 14) in zwei Phasen und der Reihenfolge lt. Abbildung: (A-B-C-D-E-F-G-H)
Phase 1 = 120 Nm
Phase 2 = 200 Nm
SCHRITT 2: Anzug der Schrauben M10x140 (Pos. 13) in vier Phasen und der Reihenfolge lt. Abbildung: (1-2-3-4-5-6-7-8)
Phase 1 = 40 Nm
Phase 2 = 65 Nm
Phase 3 = 83 Nm
Phase 4 = 83 Nm

Abb. 145

4 REPARATURWERKZEUGE

Die Wartung der Pumpe kann durch einfache Aus- und Einbauwerkzeuge erfolgen. Folgende Werkzeuge sind verfügbar:

Für den Einbau:

Radialer Dichtring Kolbenführung	Art. 27910900
Radialer Dichtring Zapfwelle	Art. 27539500
Dichtungshülse	Art. 27911200 (SK20)
	Art. 27911400 (SK22)
	Art. 27911500 (SK24)
	Art. 27911600 (SK26)
	Art. 27911700 (SK28)
	Art. 27911800 (SK30)
HD-Dichtungspaket	Art. 27540100 (SK20 - SK22 - SK24)
	Art. 27540900 (SK26 - SK28 - SK30)
Kopf / Distanzstück Buchsen	Art. 27540200

Für den Ausbau:

Ventilsitz	Art. 034300020 (SK20-22-24)
	Art. 034300010 (SK26-28-30)
Kopf / Distanzstück Buchsen	Art. 27540200
Welle (Pleuelbefestigung)	Art. 27566200

5 AUSTAUSCH DER PLEUELAUGENBUCHSE

Führen Sie das Setzen der Buchse und die anschließenden Bearbeitungen im Kaltzustand aus und beachten Sie dabei die Maße und Toleranzen gemäß Abb. 146.

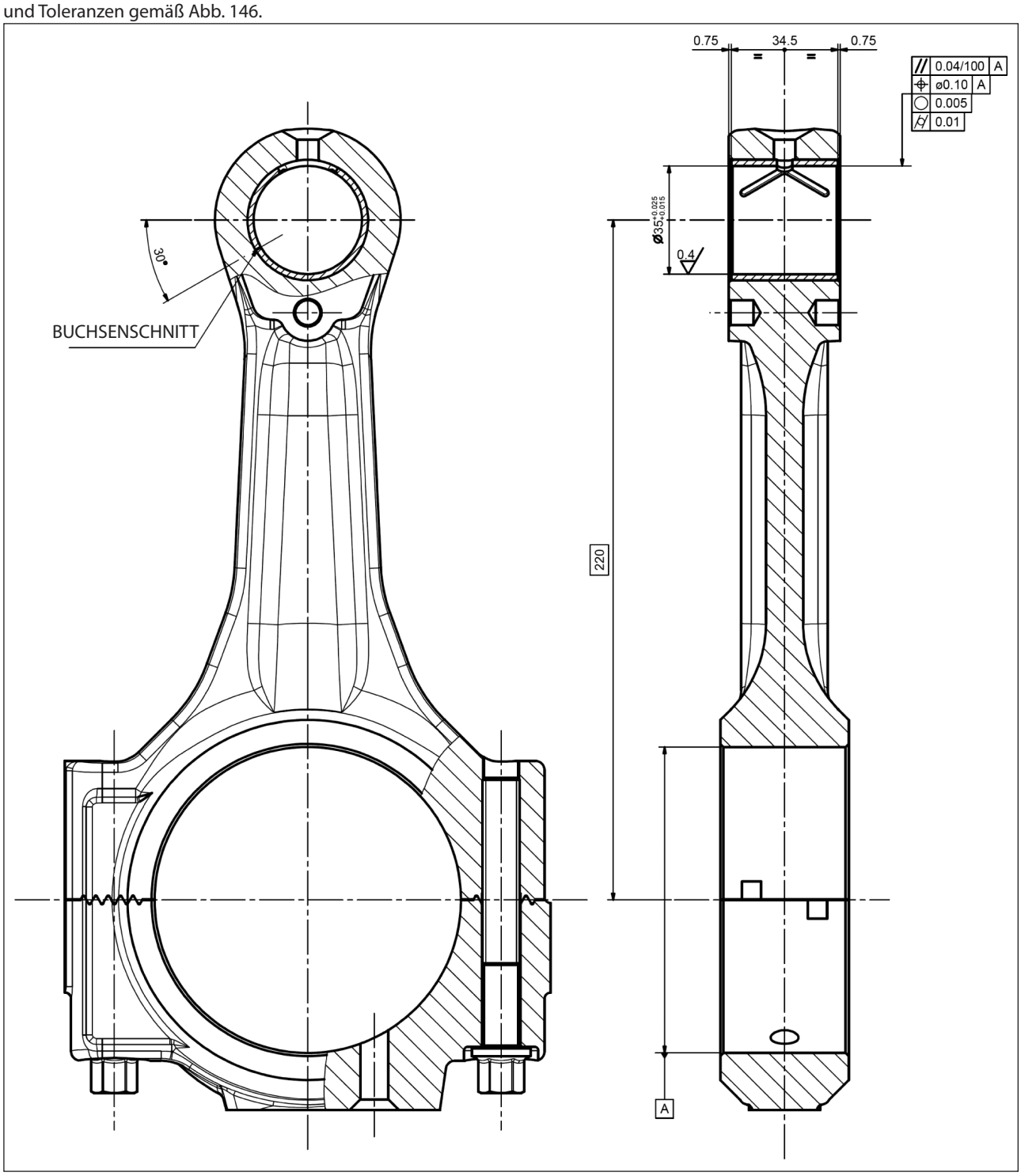


Abb. 146

Índice

1 INTRODUCCIÓN

Este manual describe las instrucciones para la reparación de las bombas SK y debe ser atentamente leído y comprendido antes de utilizar la bomba.
De un correcto uso y un mantenimiento adecuado depende el funcionamiento regular y la duración de la bomba.
Interpump Group no se responsabiliza de los daños causados por negligencia o falta de observación de las normas descritas sobre el presente manual.

1.1 DESCRIPCIÓN DE LOS SÍMBOLOS

Leer atentamente lo indicado en el presente manual antes de realizar cada operación.

Señal de advertencia

Leer atentamente lo indicado en el presente manual antes de realizar cada operación.

Señal de Peligro
Utilizar gafas de protección

Señal de Peligro
Utilizar guantes de protección para realizar cualquier tipo de operación

2 DECLARACIÓN DE REPARACIÓN

2.1 REPARACIÓN DE LA PARTE MECÁNICA

Las operaciones de reparación de la parte mecánica deben ser realizadas después de haber retirado todo el aceite del cárter.
Para eliminar el aceite es necesario quitar el tapón de llenado de aceite pos. ①, Fig. 1 y a continuación el tapón de descarga pos. ②, Fig. 1.

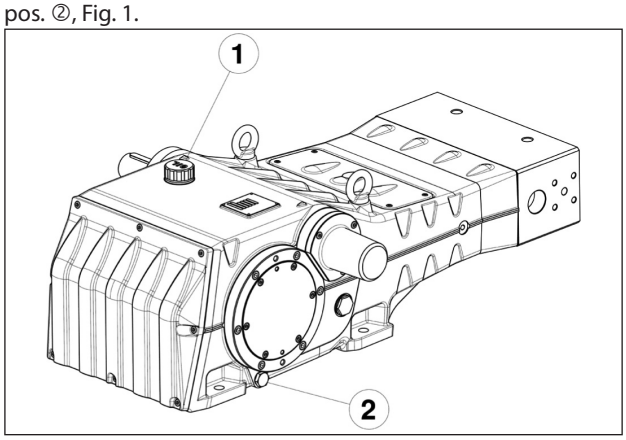


Fig. 1

El aceite agotado debe ser colocado en un recipiente adecuado y eliminado en los correspondientes centros.
No debe dispersarse en el ambiente.

2.1.1 Desmontaje de la parte mecánica

La secuencia correcta es la siguiente:
Vaciar el aceite contenido en la bomba, como se indica en el apart. 2.1.
Desmontar la cabeza y el distanciador de las camisas del cárter de la bomba como se indica en el apart. 2.2.1 (de Fig. 106 a Fig. 109).
Quitar las tapas de inspección superior e inferior aflojando los 4+4 tornillos de fijación como se indica en el apart. 2.2.3 (Fig. 120 y Fig. 121).
Extraer las juntas tóricas y sustituirlas si es necesario.
Desmontar los tres pistones con la llave de horquilla como se indica en el apart. 2.2.3 (Fig. 122).
Desmontar las tres protecciones contra salpicaduras junto con las juntas tóricas (pos. ① y ②, Fig. 2).

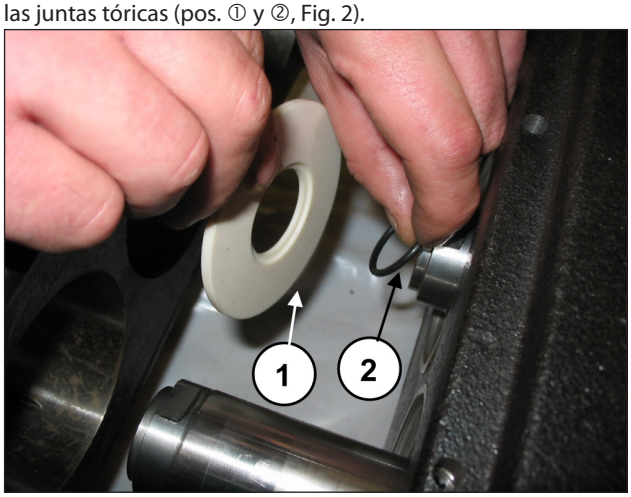


Fig. 2

Aflojar los tornillos prisioneros de bloqueo M6 de las tres tapas de retención (pos. ①, Fig. 3).

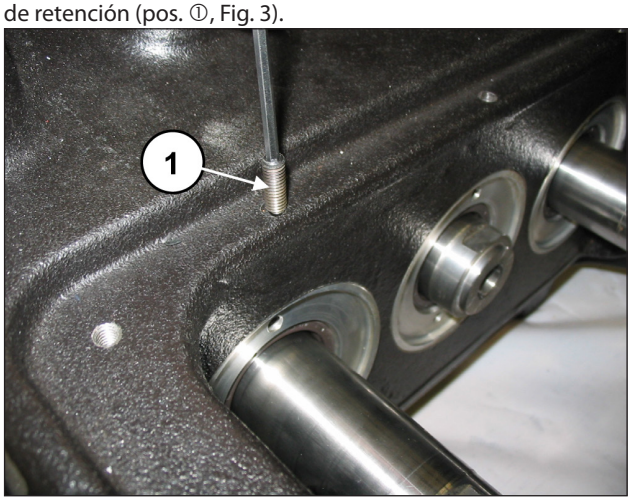


Fig. 3

Extraer las tapas de retención enroscando una barra roscada o un tornillo M6, para que actúe como extractor, en los orificios de la tapa (pos. ①, Fig. 4) y extraer las tapas del grupo de la bomba (pos. ①, Fig. 5).

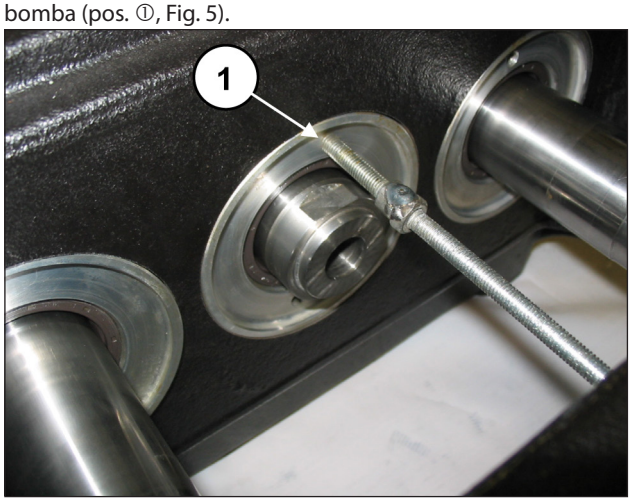


Fig. 4

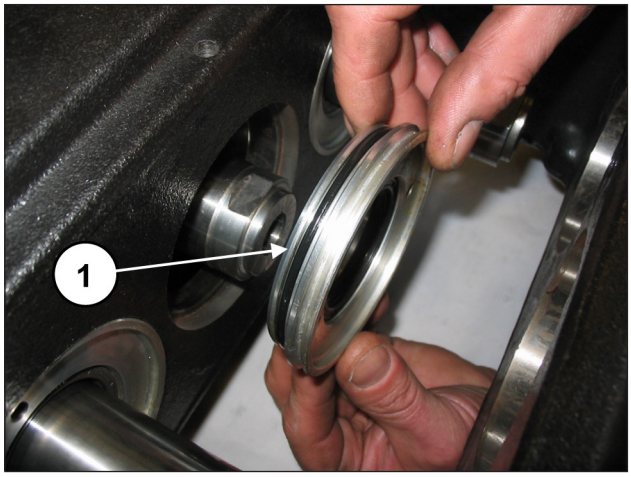


Fig. 5

Extraer la anilla de retención radial (pos. ①, Fig. 6) y la junta tórica externa (pos. ①, Fig. 7).

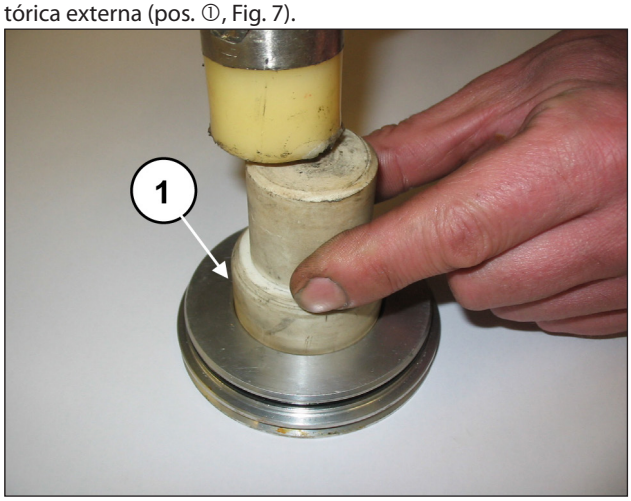


Fig. 6

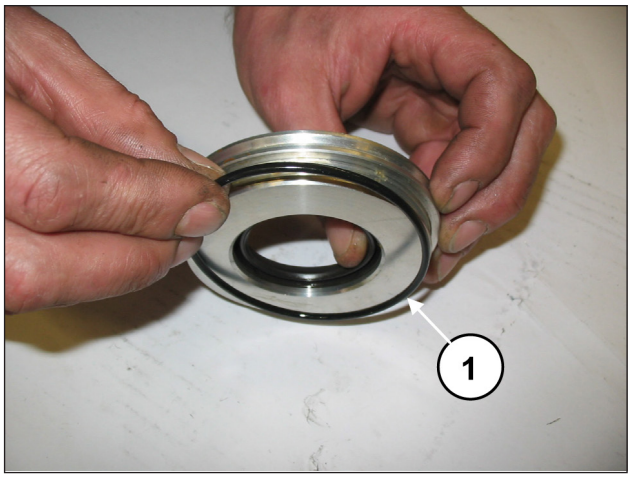


Fig. 7

Desmontar la lengüeta del eje PTO (pos. ①, Fig. 8).

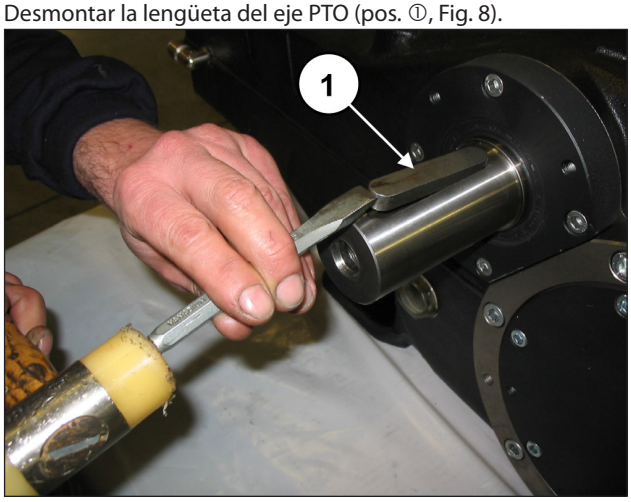


Fig. 8

Aflojar los tornillos de fijación de la tapa del extremo del eje (pos. ①, Fig. 9) y extraer la tapa del eje PTO.

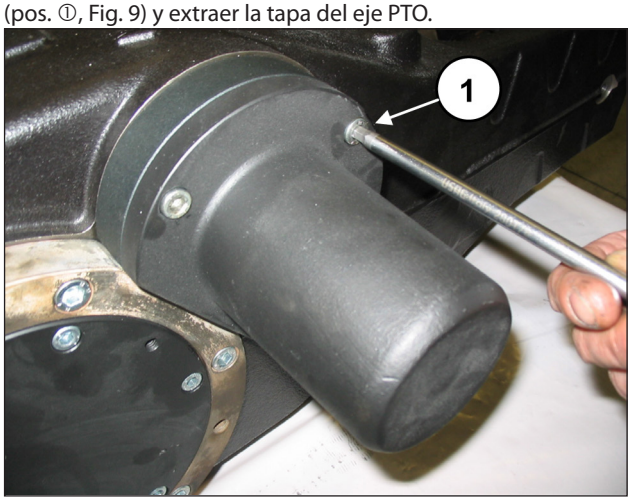


Fig. 9

Aflojar los tornillos de fijación de la tapa del cárter (pos. ①, Fig. 10) y desmontarlo. Extraer la junta tórica y sustituirla si es necesario.

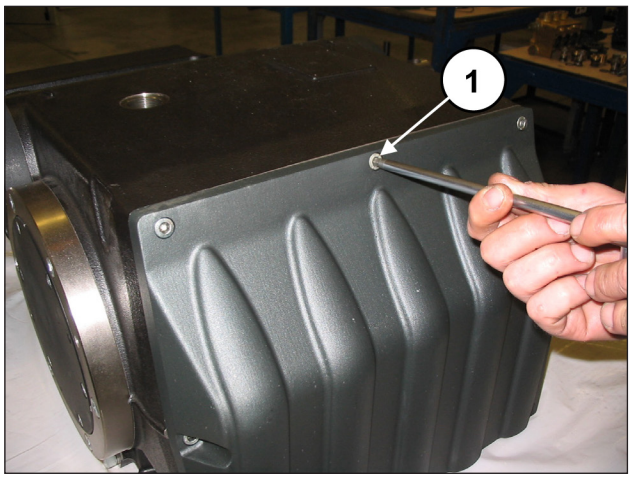


Fig. 10

Desmontar las dos tapas del cojinete aflojando los tornillos (pos. ①, Fig. 11).
Para facilitar el desmontaje, utilizar 2 tornillos prisioneros o tornillos M8 (pos. ①, Fig. 12) como extractores.
Extraer la junta tórica y sustituirla si es necesario.

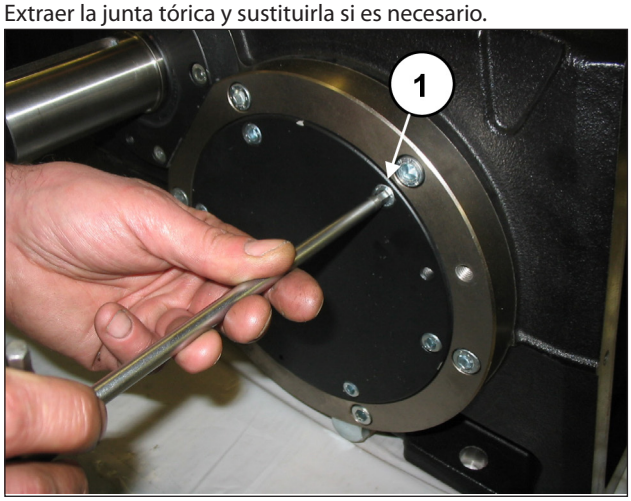


Fig. 11

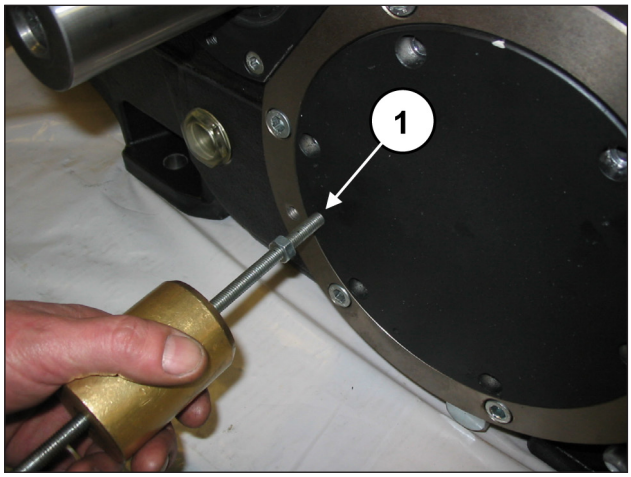


Fig. 12

Introducir un espesor debajo del cilindro de la biela central para bloquear la rotación del eje acodado (pos. ①, Fig. 13).

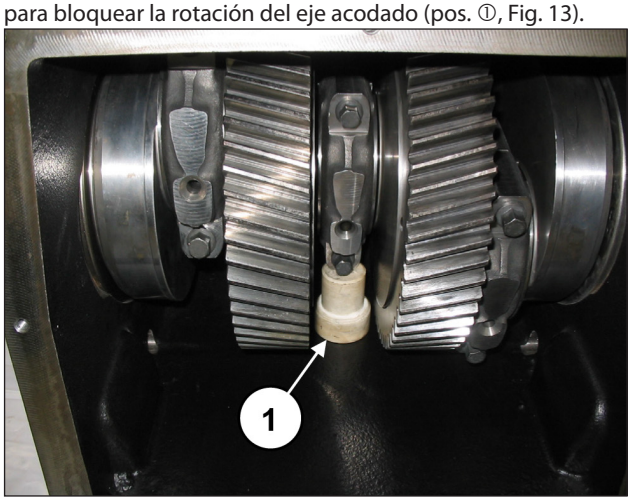


Fig. 13

Aflojar y extraer los tornillos de fijación de la brida de bloqueo del casquillo, en ambos lados (pos. ①, Fig. 14).
No desmontar las bridas de bloqueo del casquillo (pos. ①, Fig. 15).

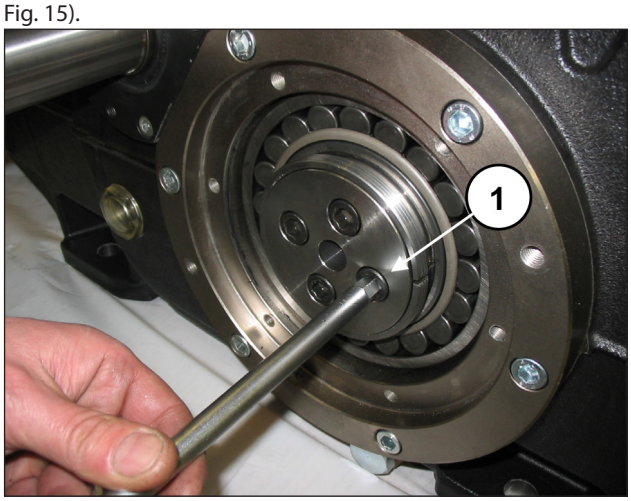


Fig. 14

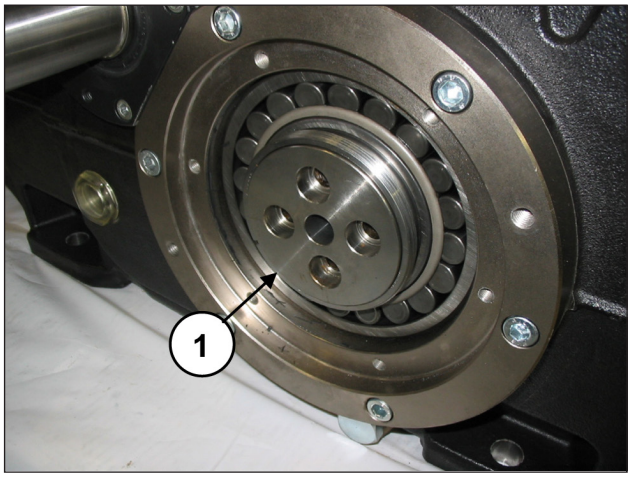


Fig. 15

En uno de los lados, enroscar una corona de tipo SKF KM20 en el casquillo de presión (pos. ①, Fig. 16) y desbloquear el casquillo con una herramienta de percusión (pos. ①, Fig. 17), sin extraerlo.
Repetir la operación en el lado opuesto.

Fig. 16

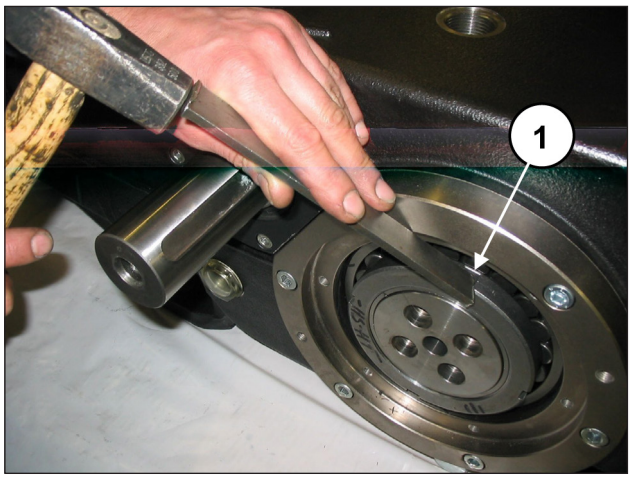


Fig. 17

Quitar el espesor que hay debajo del cilindro de la biela central.
Aflojar los tornillos de la biela (pos. ①, Fig. 18).

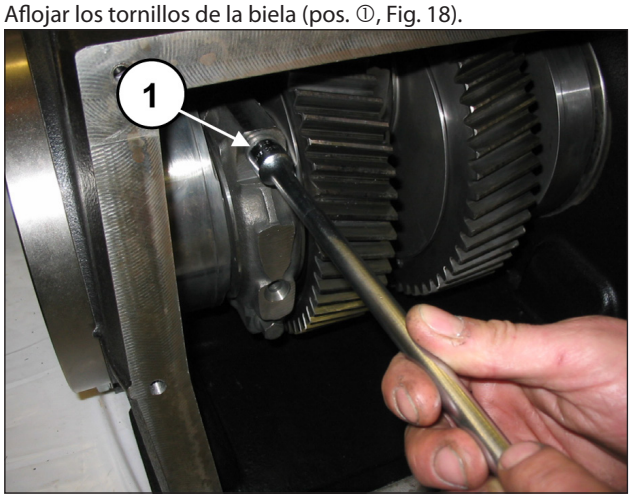


Fig. 18

Desmontar los sombreretes de la biela con los semicojinetes, controlando el orden de desmontaje.

Al montar los sombreretes de la biela y sus semibielas se deben respetar el orden y el emparejamiento de desmontaje.

Para evitar posibles errores, sombreretes y semibielas han sido enumerados en un lateral (pos. ①, Fig. 19).

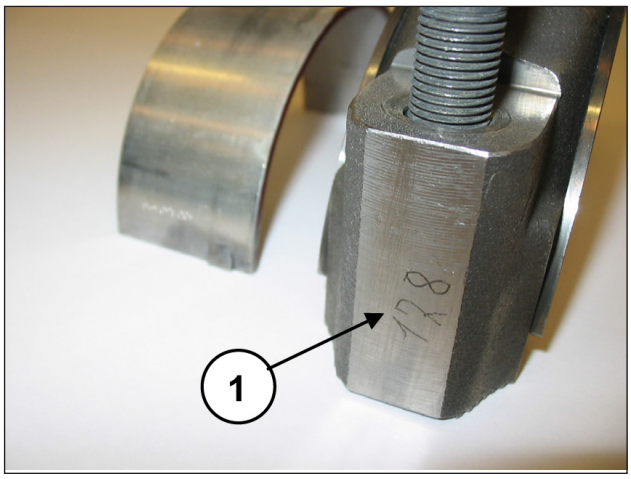


Fig. 19

Desplazar las tres semibielas en la dirección del cabezal hasta el final de carrera.
Extraer los 3 semicojinetes superiores de las semibielas (pos. ①, Fig. 20).

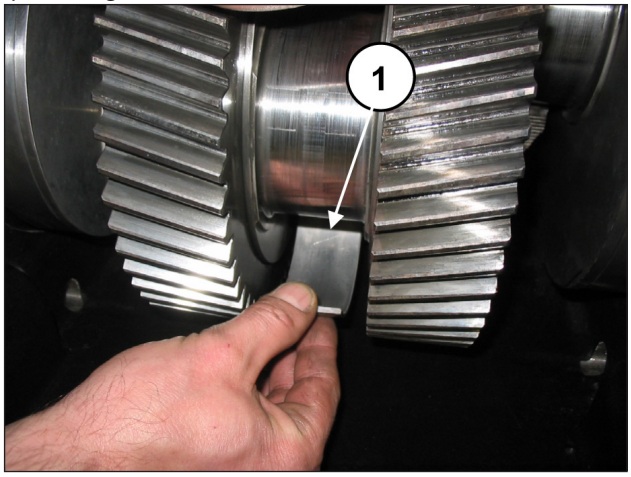


Fig. 20

Desmontar los dos casquillos de presión (pos. ①, Fig. 21).

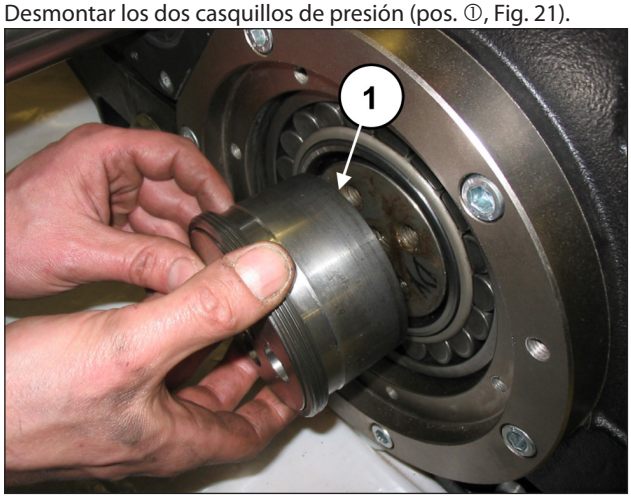


Fig. 21

Separar la brida que bloquea el casquillo del casquillo de presión (pos. ①, Fig. 22).

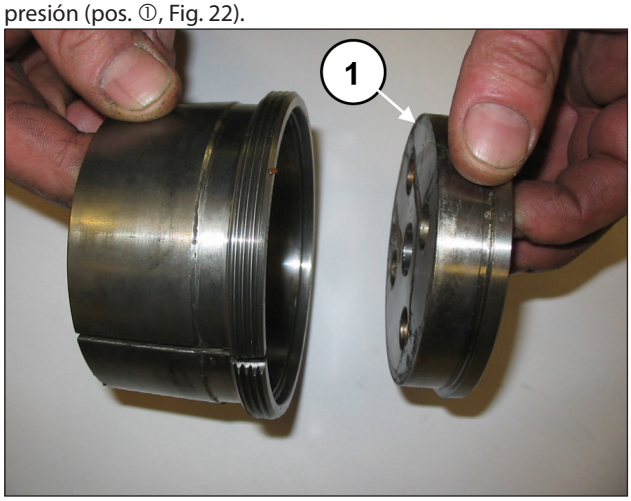


Fig. 22

Aflojar los tornillos de las dos tapas portacojinetes (pos. ①, Fig. 23).

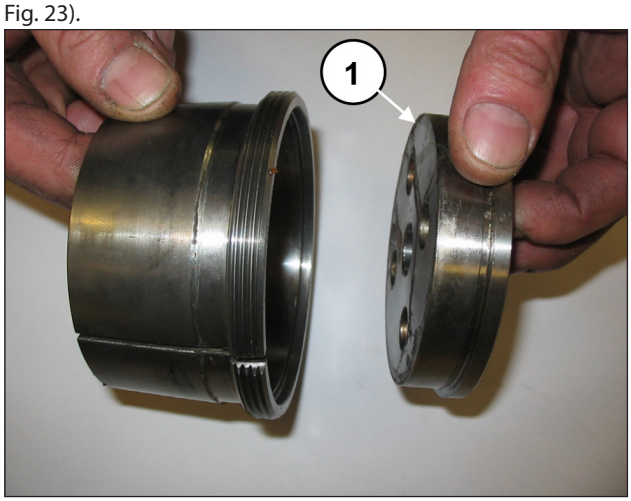


Fig. 23

Aplicar un perno roscado M16 en un extremo del eje acodado (pos. ①, Fig. 24) y, manteniéndolo levantado, extraer la tapa portacojinetes junto con la junta tóricas (pos. ①, Fig. 25). Para facilitar el desmontaje, utilizar 2 tornillos prisioneros o tornillos M10 (pos. ②, Fig. 24) como extractores.
Repetir la operación en el lado opuesto.

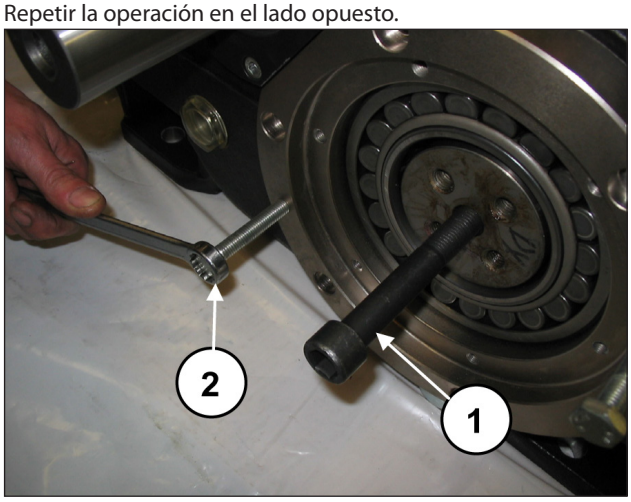


Fig. 24

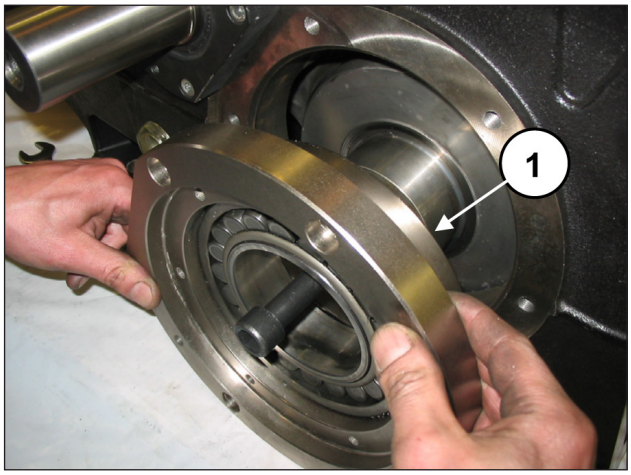


Fig. 25

Apoyar el eje acodado sobre el fondo del cárter.
Separar la tapa portacojinetes del cojinete utilizando una herramienta de percusión (pos. ①, Fig. 26).

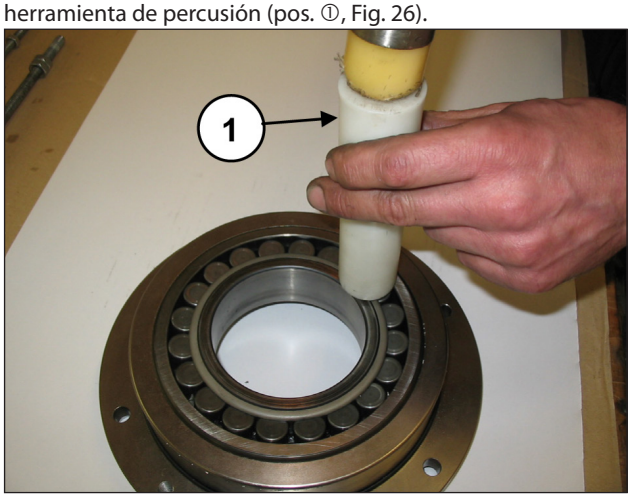


Fig. 26

Aflojar los tornillos de fijación de la tapa del cojinete PTO derecho e izquierdo (pos. ①, Fig. 27) y extraer las dos tapas del eje PTO. Para facilitar el desmontaje, utilizar 3 tornillos prisioneros o tornillos M8 (pos. ①, Fig. 28) como extractores.

Fig. 27

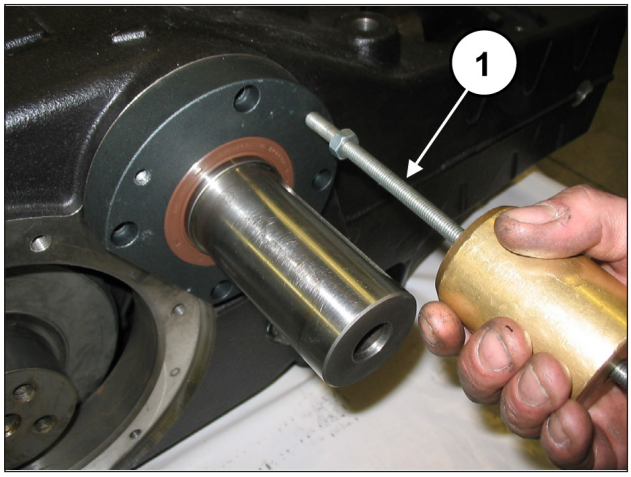


Fig. 28

Extraer la anilla de retención radial (pos. ①, Fig. 29), la junta tórica externa (pos. ①, Fig. 30) y la junta tórica del orificio de lubricación (pos. ①, Fig. 31).

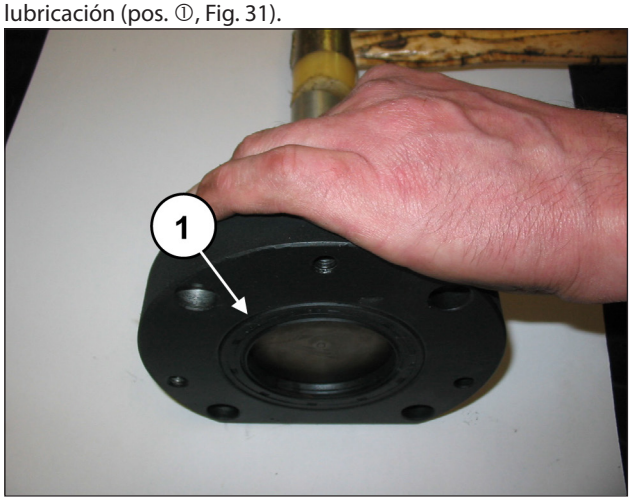


Fig. 29

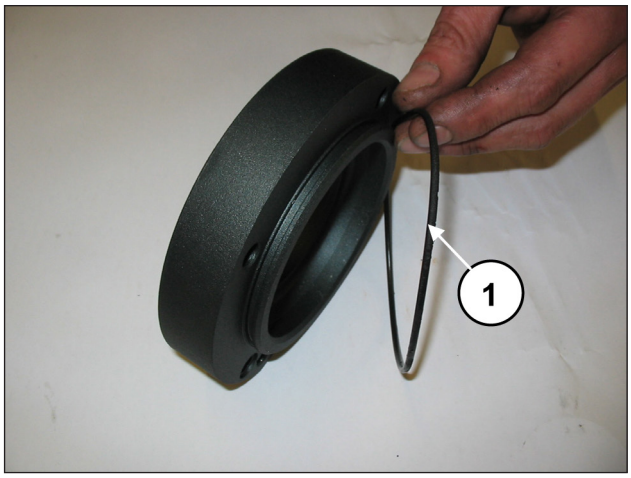


Fig. 30

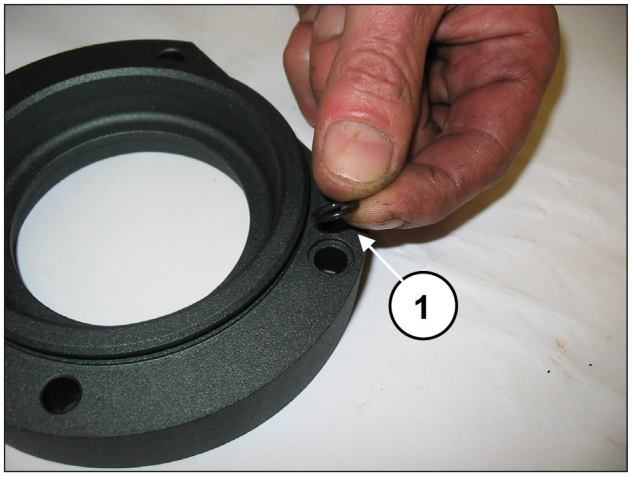


Fig. 31

Desplazar hacia atrás las tres bielas hasta el final de carrera, de manera que estén en contacto con el eje acodado.
Utilizando una herramienta de percusión (pos. ①, Fig. 32), extraer el eje PTO por uno de los dos lados (pos. ①, Fig. 33).

Fig. 32

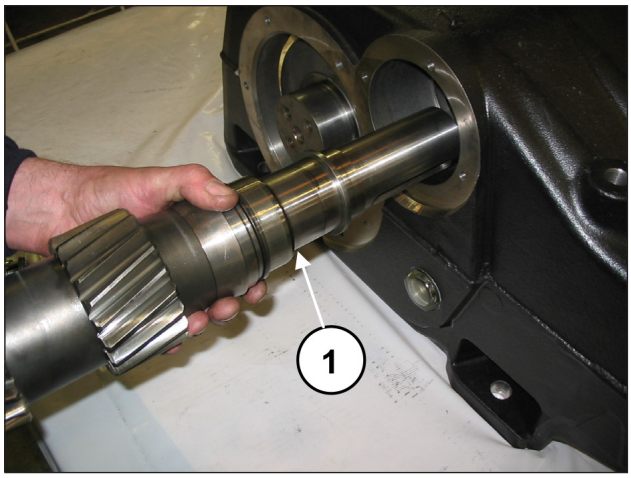


Fig. 33

Extraer las anillas internas de los cojinetes del eje PTO (pos. ①, Fig. 34) y los dos distanciadores del cojinete interno (pos. ②, Fig. 34).

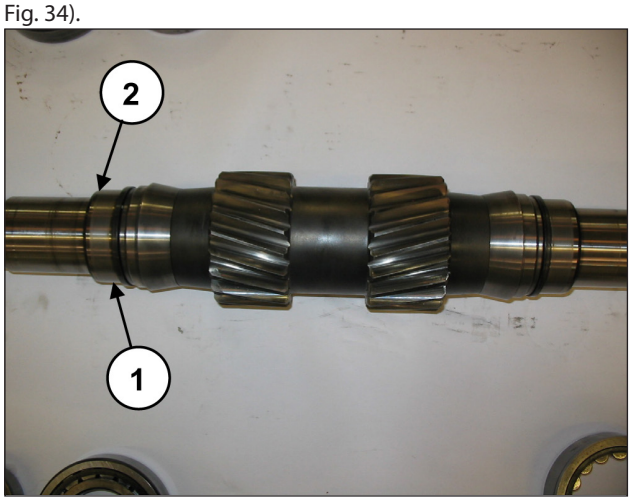


Fig. 34

Las anillas internas y externas de los cojinetes se han de montar exactamente en el mismo orden y con el mismo emparejamiento de desmontaje.

Utilizando una herramienta lo suficientemente larga (pos. ①, Fig. 36) y una herramienta de percusión, extraer las anillas de los cojinetes del cárter de la bomba (pos. ①, Fig. 36), el distanciador del cojinete externo (pos. ①, Fig. 37) y el casquillo de lubricación de los cojinetes (pos. ①, Fig. 38).

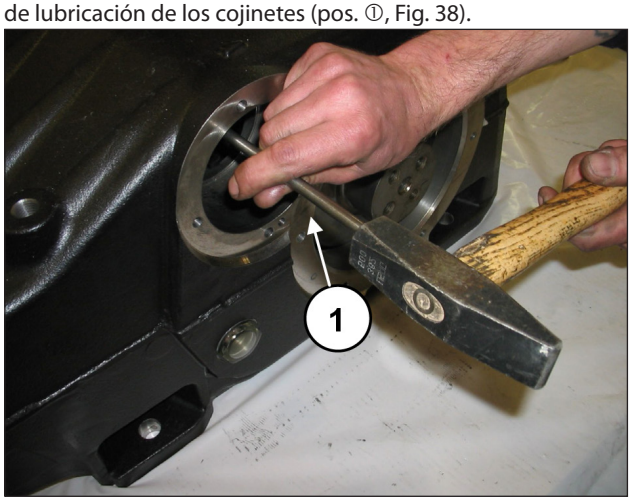


Fig. 35

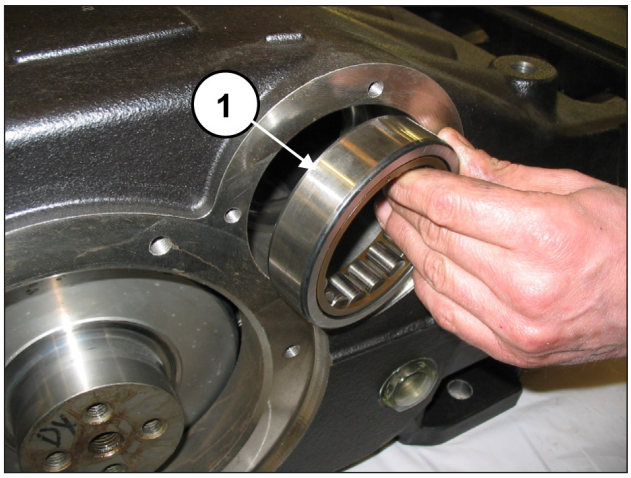


Fig. 36

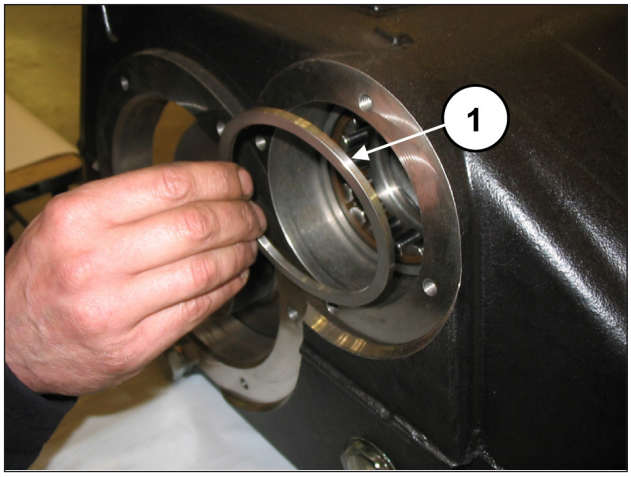


Fig. 37

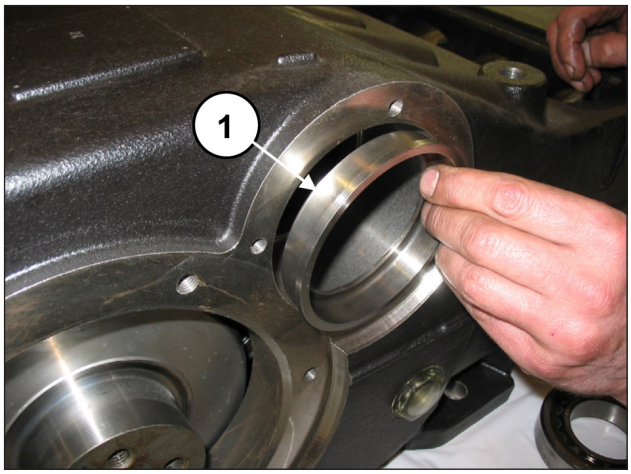


Fig. 38

Desplazar las semibielas hacia la parte hidráulica y bloquearlas con la herramienta específica (cód. 27566200) (pos. ①, Fig. 39).

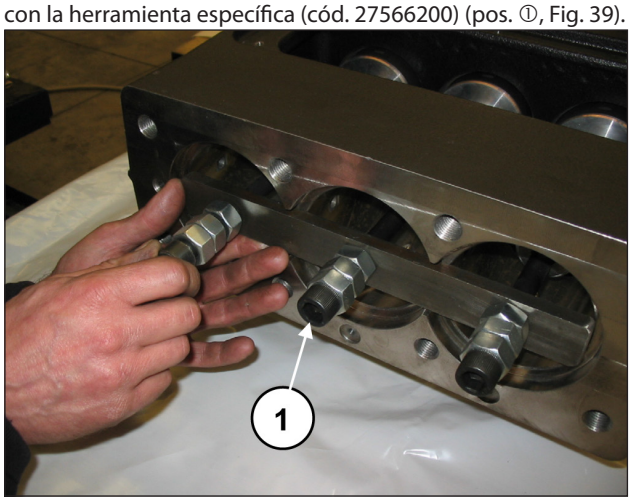


Fig. 39

Extraer el eje acodado por la parte posterior del cárter (pos. ①pos. ①, Fig. 40).

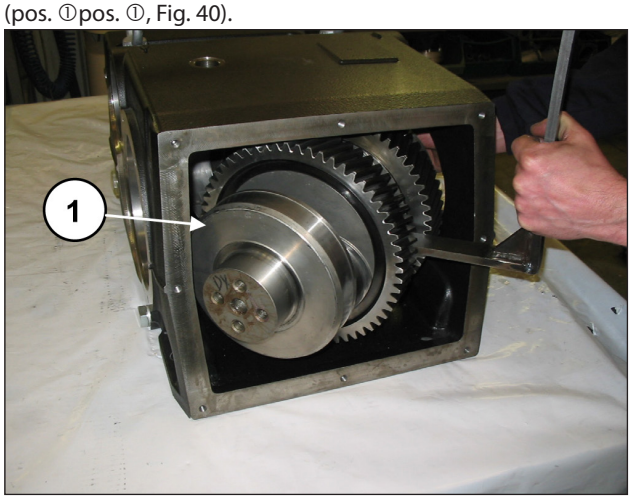


Fig. 40

Aflojar los tornillos de la herramienta cód. 27566200 para desbloquear las bielas (pos. ①, Fig. 41) y, a continuación, extraer los grupos biela-guía del pistón por la abertura posterior del cárter (pos. ①, Fig. 42).

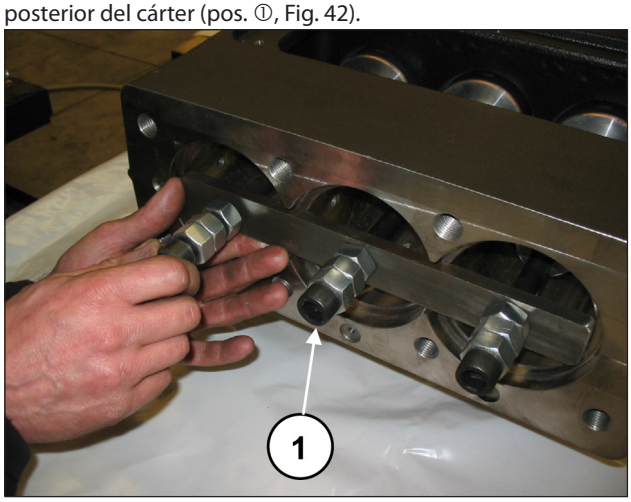


Fig. 41

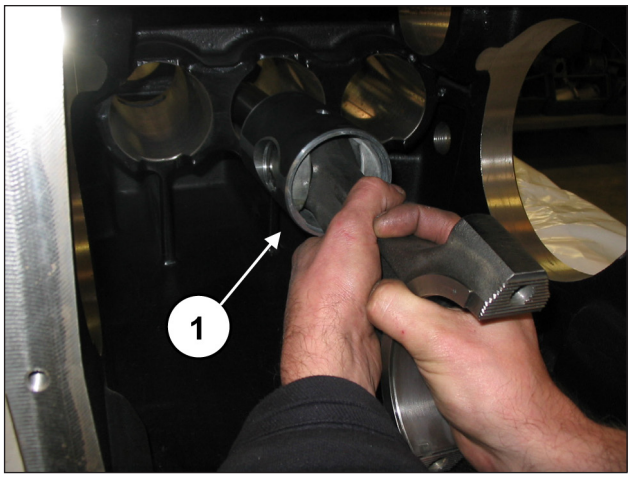
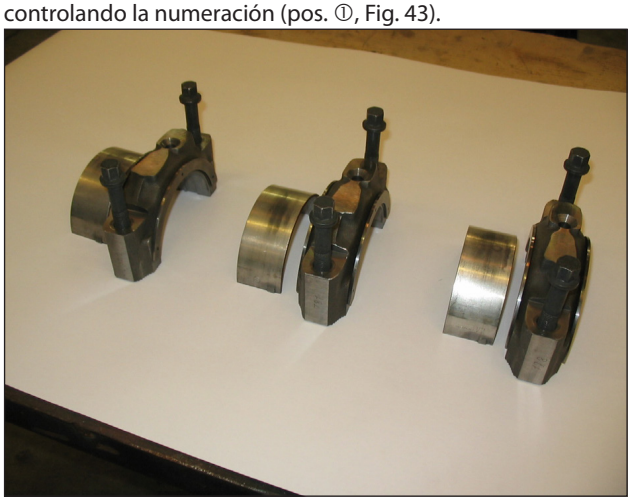


Fig. 42

Acoplar las semibielas en los sombreretes ya desmontados, controlando la numeración (pos. ①, Fig. 43).



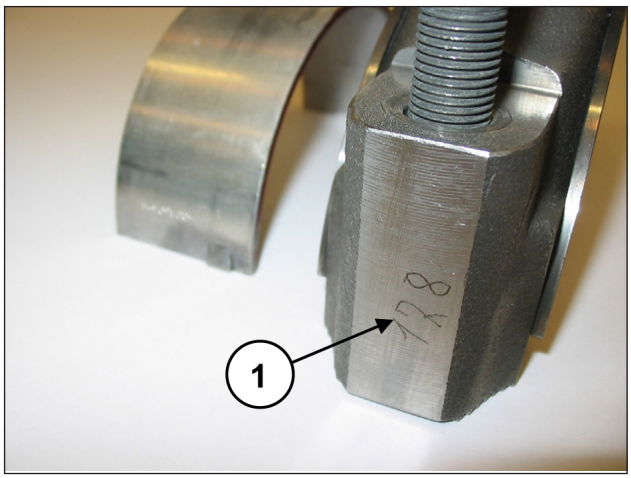


Fig. 43

Desmontar las 2 anillas seeger de bloqueo de la clavija utilizando la herramienta específica (pos. ①, Fig. 44).

Fig. 44

Extraer la clavija (pos. ①, Fig. 45) y, a continuación, la biela (pos. ①, Fig. 46).

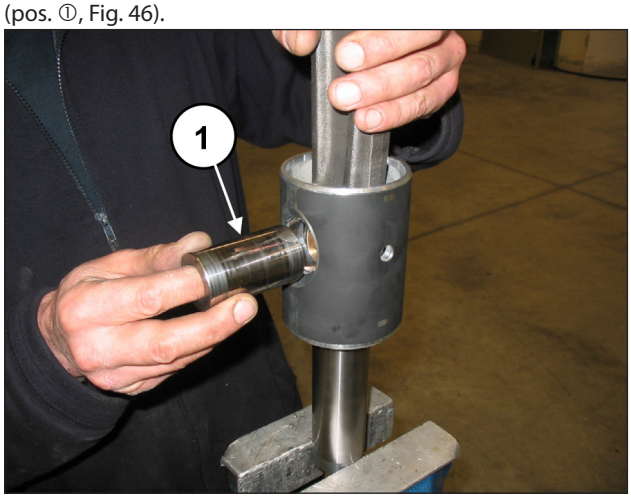


Fig. 45

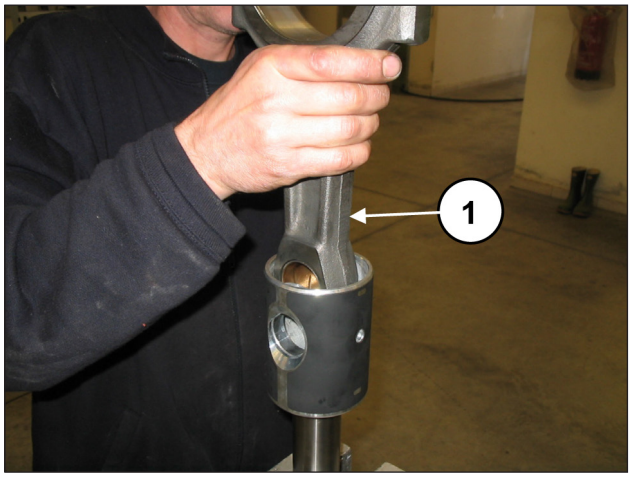


Fig. 46

Para separar el vástago de la guía del pistón, es necesario aflojar los tornillos de cabeza cilíndrica M6 con la llave específica (pos. ①, Fig. 47).

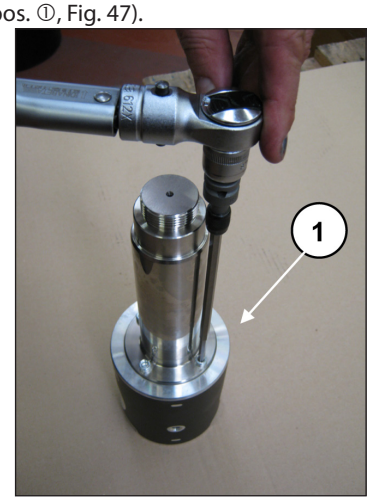


Fig. 47

Para terminar la fase de desmontaje de la parte mecánica, desmontar los testigos de nivel del aceite, los cáncamos y la conexión rápida a 90°.

2.1.2 Montaje de la parte mecánica

Seguir en orden contrario la secuencia de desmontaje descrita en el apart. 2.1.1.
La secuencia correcta es la siguiente:
Montar los dos testigos del nivel de aceite, los dos tapones de descarga del aceite y el racor con la conexión rápida a 90° (pos. ①, ② y ③ Fig. 48).

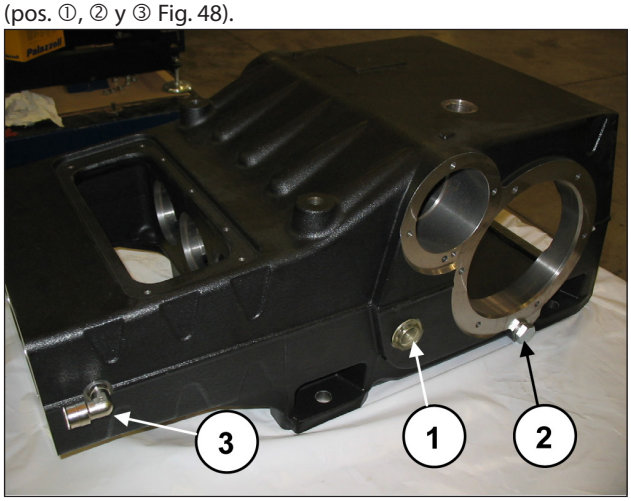


Fig. 48

Ensamblar el vástago en la guía del pistón.

Introducir el vástago de guía del pistón en el alojamiento de la guía del pistón (pos. ①, Fig. 49) y fijarlo con los 4 tornillos de cabeza cilíndrica M6x20 (pos. ①, Fig. 50).

Fig. 49

Fig. 50

Bloquear la guía del pistón con la herramienta específica y apretar los tornillos con la llave dinamométrica (pos. ①, Fig. 51) como se indica en el capítulo 3.

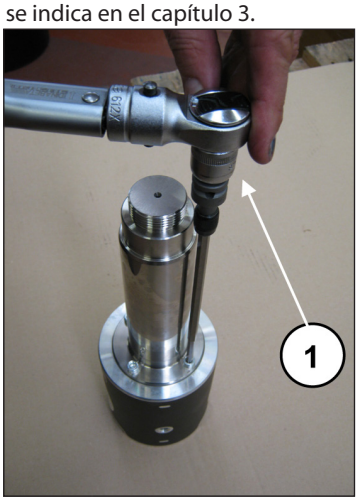


Fig. 51

Introducir la biela en la guía del pistón (pos. ①, Fig. 46) y, a continuación, la clavija (pos. ①, Fig. 45). Aplicar las dos anillas seeger de tope con la herramienta específica (pos. ①, Fig. 44).
Separar los sombreretes de las semibielas; controlar los números laterales para emparejarlos de manera correcta (pos. ①, Fig. 43).
Comprobar que el cárter esté limpio e introducir el grupo semibiela-guía pistón dentro de las levas del cárter (pos. ①, Fig. 42).

Introducir el grupo semibiela-guía del pistón en el cárter de manera que la numeración de las semibielas pueda verse desde arriba.

Bloquear los tres grupos con la herramienta cód. 27566200, (pos. ①, Fig. 41).
Introducir el eje acodado en la apertura posterior del cárter y apoyarlo en el fondo.

Introducir el eje acodado en el cárter de manera que los dientes de las coronas estén orientados como se indica en la Fig. 52.

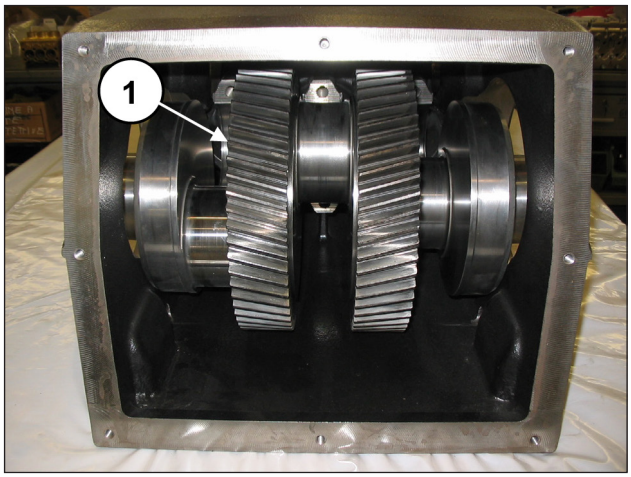


Fig. 52

Premontar el eje PTO:
introducir en el eje PTO las 2 anillas internas de los cojinetes (una por cada lado) (pos. ①, Fig. 53).

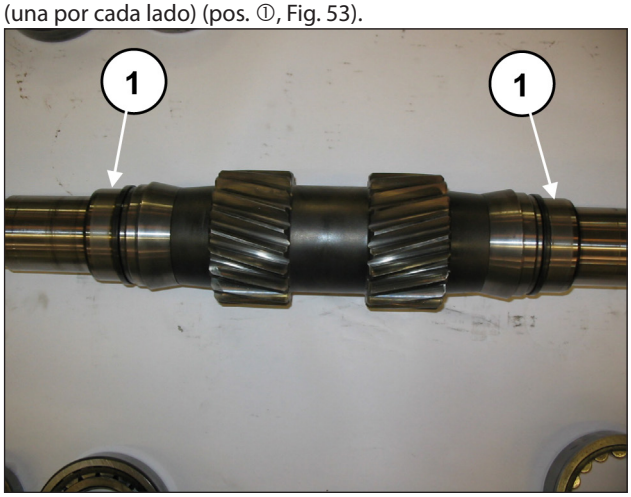


Fig. 53

Las anillas internas y externas de los cojinetes se han de montar exactamente en el mismo orden y con el mismo emparejamiento de desmontaje.

Desde uno de los lados del cárter, introducir el casquillo de lubricación de los cojinetes (pos. ①, Fig. 54) y la anilla externa del cojinete (pos. ①, Fig. 55) utilizando un tampón y una herramienta de percusión.

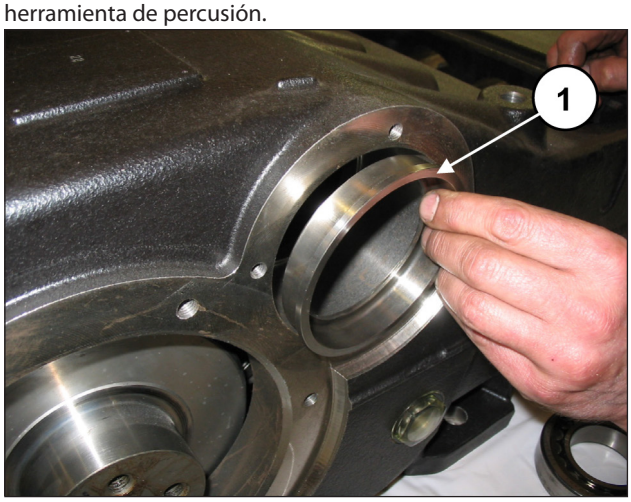


Fig. 54

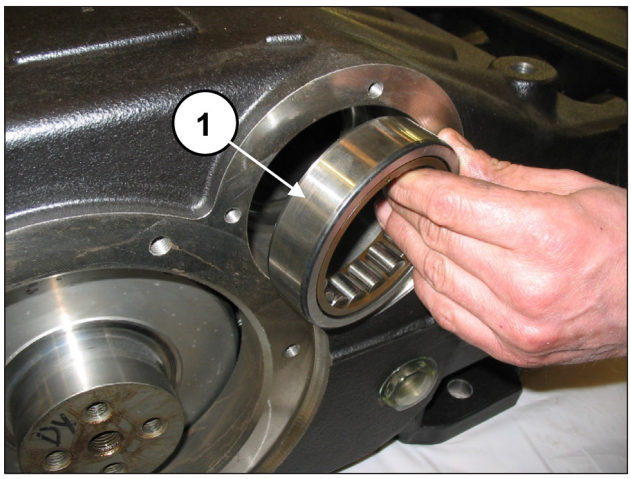


Fig. 55

Desmontar la herramienta que bloquea las bielas cód. 27566200, (pos. ①, Fig. 41) y deslizar las bielas hacia atrás hasta que hagan tope en el eje acodado.
Introducir el eje PTO premontato dentro del cárter (pos. ①, Fig. 56) desde la parte opuesta a la que se han premontado la anilla externa del cojinete y el casquillo de lubricación de los cojinetes.

Introducir el eje acodado PTO en el cárter de manera que los dientes estén orientados como se indica en la Fig. 56.

Para facilitar la introducción a fondo del eje PTO dentro del cojinete, aplicar un tornillo M16 en el extremo del eje que se ha de introducir para mantenerlo alzado (pos. ①, Fig. 57).

Fig. 56

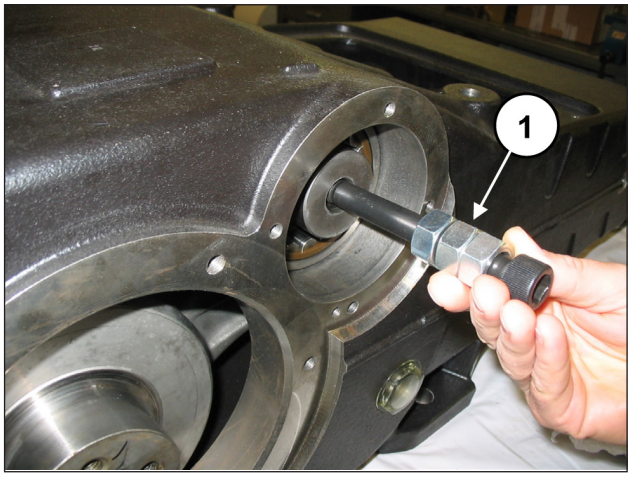


Fig. 57

Desde el lado de introducción del eje PTO, introducir el casquillo de lubricación de los cojinetes (pos. ①, Fig. 58) y la anilla externa del cojinete (pos. ①, Fig. 59) utilizando un tampón y una herramienta de percusión.

Fig. 58

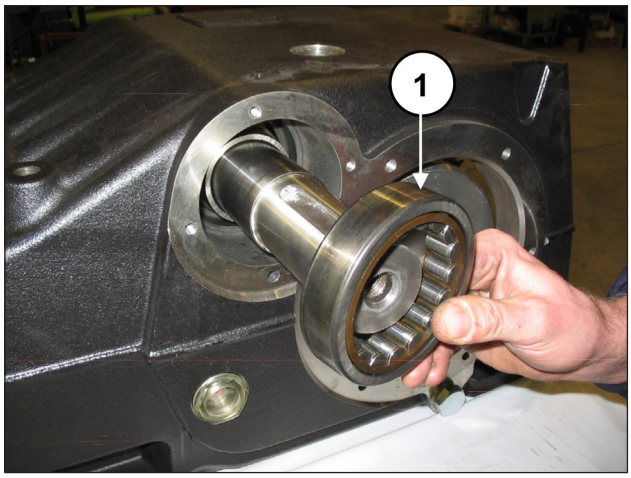


Fig. 59

Desde ambos lados, introducir los distanciadores de los cojinetes interno (pos. ①, Fig. 60) y externo (pos. ①, Fig. 61).

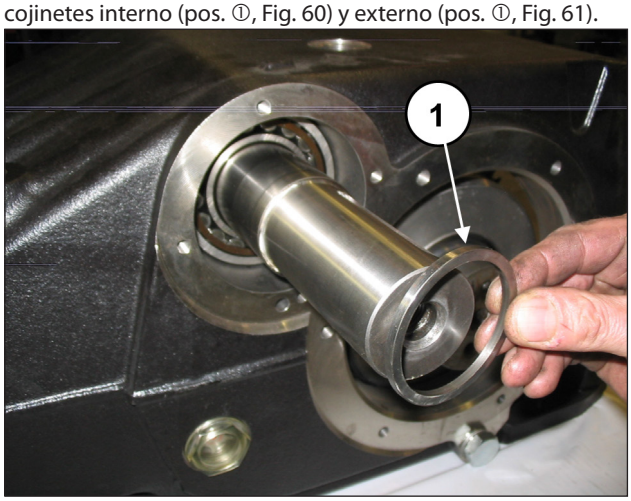


Fig. 60

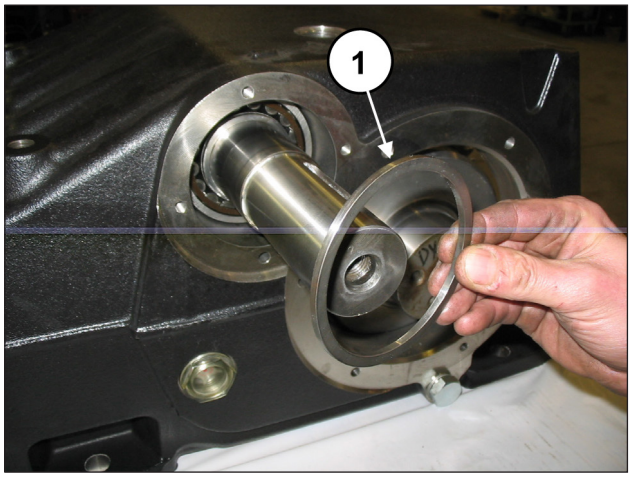


Fig. 61

Introducir la anilla interna (pos. ①, Fig. 62) y la anilla externa (pos. ①, Fig. 63) de un cojinete desde un único lado de la bomba.

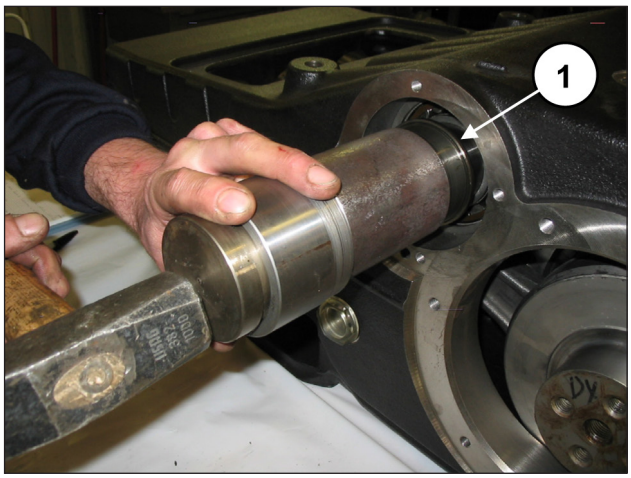


Fig. 62

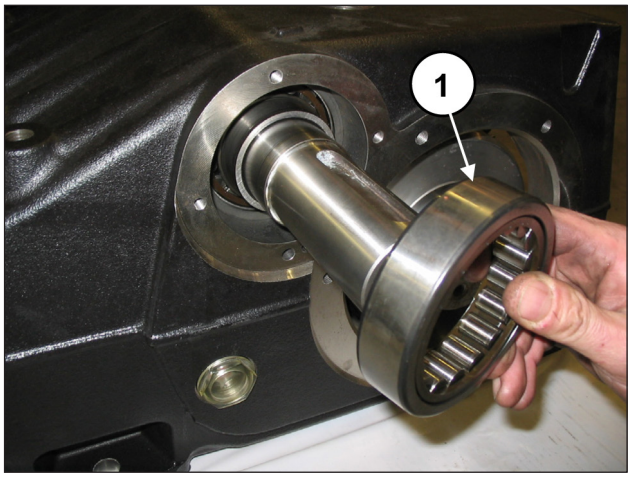


Fig. 63

Premontar las tapas del cojinete PTO derecha e izquierda: Introducir la anilla de retención radial dentro de la tapa del cojinete PTO utilizando la herramienta cód. 27539500, (pos. ①, Fig. 64).
Antes de montar la anilla de retención radial, comprobar las condiciones del labio de estanqueidad. Si se ha de sustituir, colocar una anilla nueva como se indica en la Fig. 65.

En el caso que el eje PTO presente un desgaste diametral en correspondencia con el labio de retención, con el fin de evitar tener que realizar la operación de rectificación, es posible volver a colocar la anilla en el segundo tope como se indica en la Fig. 65.

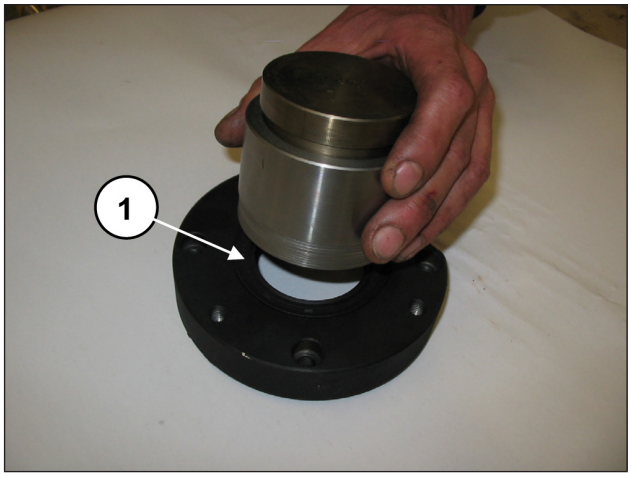


Fig. 64

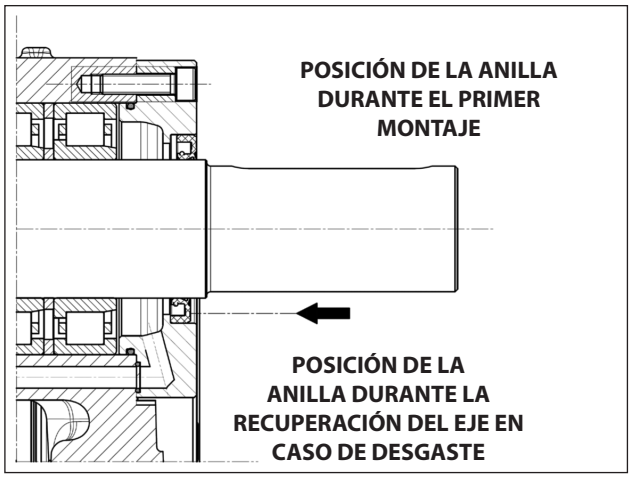


Fig. 65

Aplicar a las tapas del cojinete PTO, la junta tórica externa (pos. ①, Fig. 66) y la junta tórica del orificio de lubricación (pos. ①, Fig. 67).

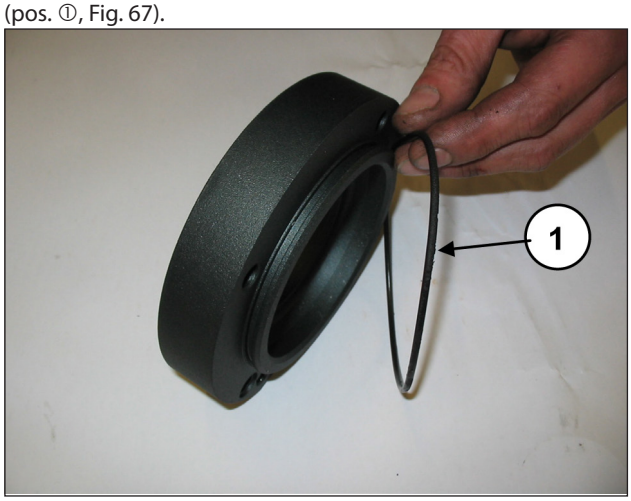


Fig. 66

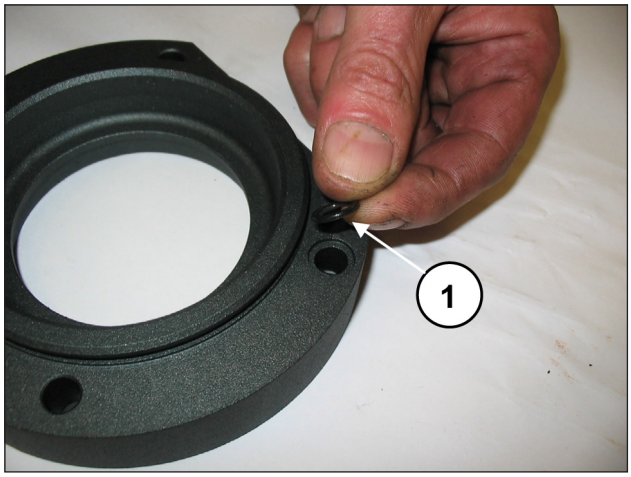


Fig. 67

Montar una de las tapas del cojinete PTO (derecha o izquierda) en el cárter de la bomba (pos. ①, Fig. 68) y fijarla con los 4 tornillos M8x30 (pos. ①, Fig. 69).

Prestar atención al sentido de montaje de la tapa. El orificio de lubricación de la tapa debe coincidir con el orificio del cárter.

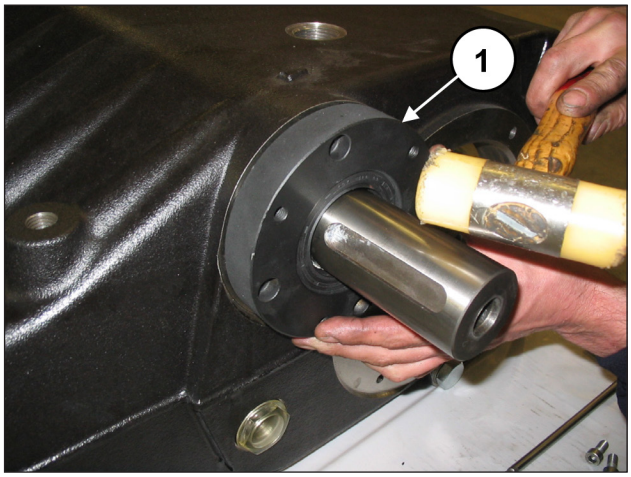


Fig. 68

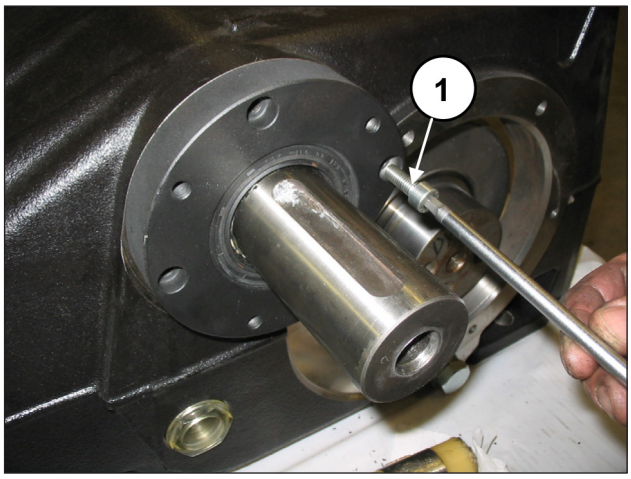


Fig. 69

Repetir las operaciones en el lado opuesto.
Introducir la anilla interna (pos. ①, Fig. 62) y la anilla externa (pos. ①, Fig. 63) del último cojinete.
Montar la segunda tapa del cojinete PTO en el cárter de la bomba (pos. ①, Fig. 68) y fijarla con los 4 tornillos M8x30 (pos. ①, Fig. 69).
Ajustar los 4+4 tornillos con la llave dinamométrica como se indica en el capítulo 3.
Premontar las dos tapas portacojinete:

insertar el cojinete utilizando una herramienta de percusión (pos. ①, Fig. 70) hasta obtener una cota de 4 - 4.5 mm como se indica en la Fig. 71.

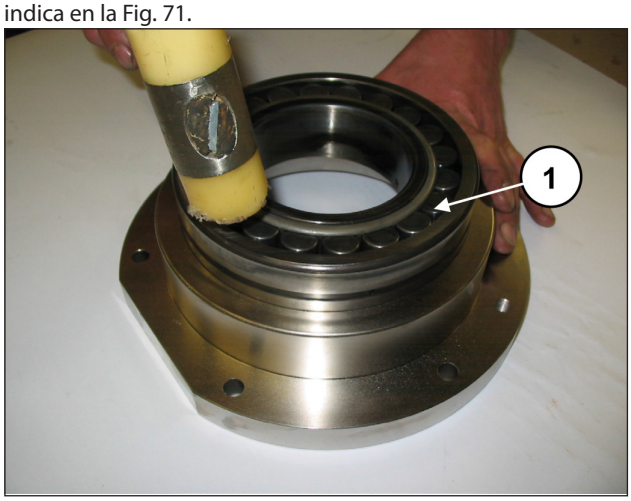


Fig. 70

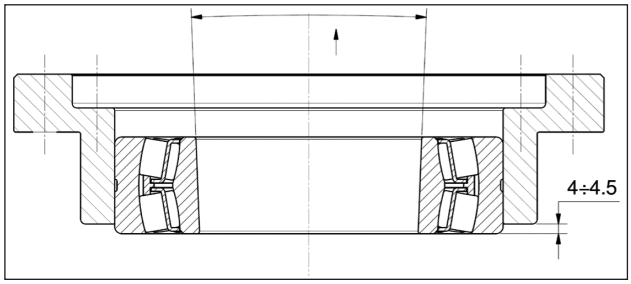


Fig. 71

El cojinete de la Fig. 71 posee una anilla interna cónica. Comprobar que tanto la parte interna como la externa de la anilla sean cónicas, para permitir la introducción del casquillo.

Aplicar la junta tórica en el extremo de la tapa portacojinete (pos. ①, Fig. 72).

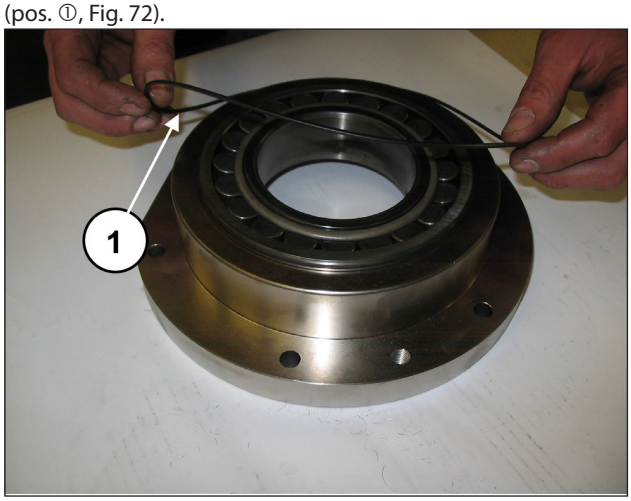


Fig. 72

Repetir la operación en la otra tapa.
Bloquear los tres grupos de biela con la herramienta cód. 27566200, (pos. ①, Fig. 41).

Aplicar los dos pernos roscados M16 en el extremo del eje acodado y, manteniéndolo levantado, (pos. ①, Fig. 73), introducir la tapa portacojinetes junto con la junta tóricas (pos. ①, Fig. 74) utilizando la herramienta de percusión.
Repetir la operación en el lado opuesto.

Fig. 73

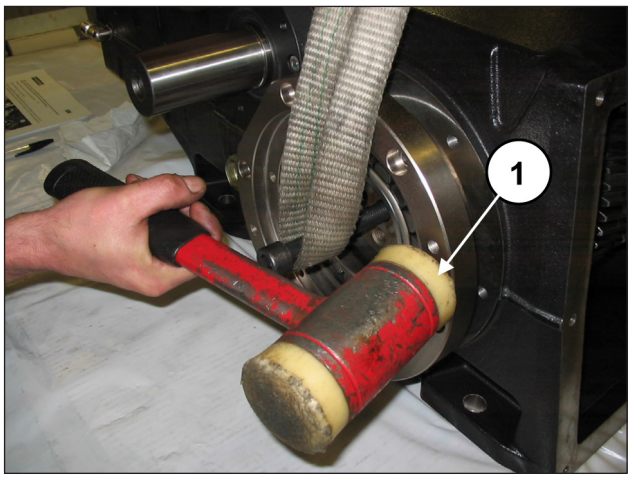


Fig. 74

Bloquear las tapas portacojinete con los 6+6 tornillos M10x30 (pos. ①, Fig. 75).
Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.

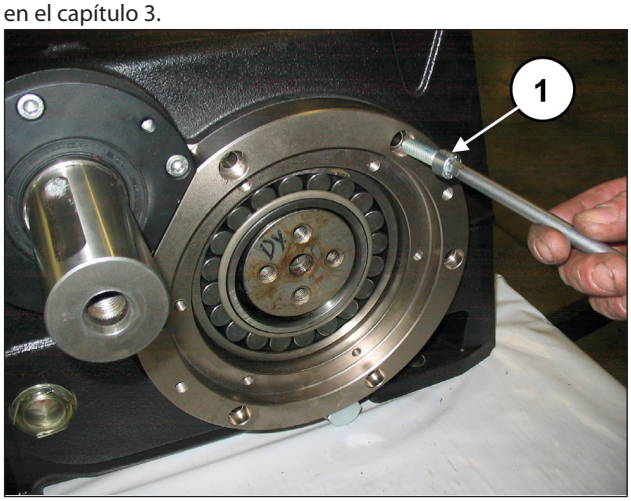


Fig. 75

Introducir parcialmente los dos casquillos de presión manteniendo el eje acodado levantado con el perno M16 montado anteriormente (pos. ①, Fig. 76).

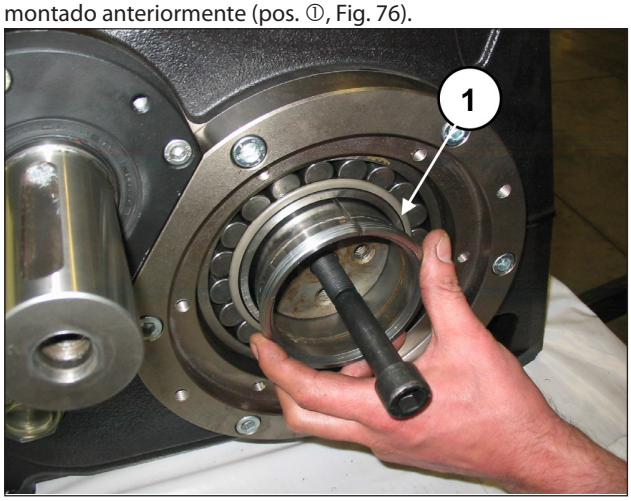


Fig. 76

Introducir a fondo el casquillo de presión en el eje acodado (pos. ①, Fig. 77 y Fig. 78) utilizando una herramienta de percusión y un tampón.

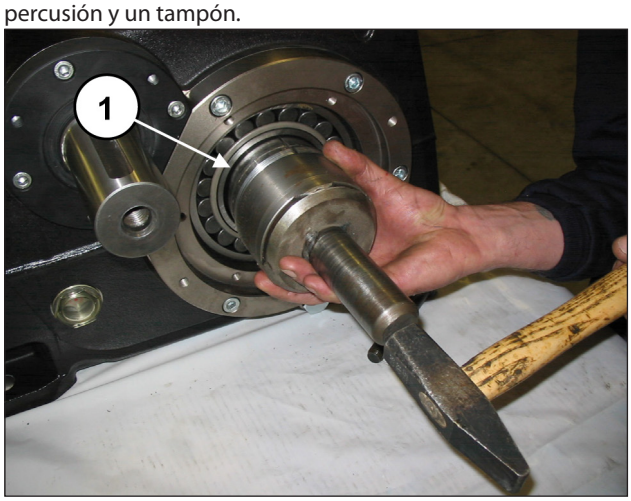


Fig. 77

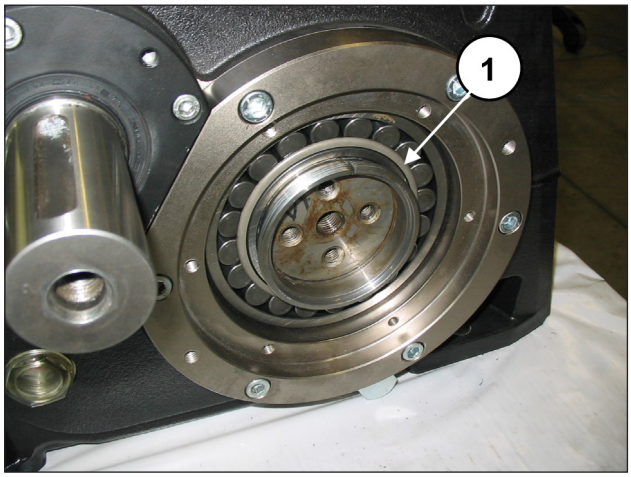


Fig. 78

El casquillo de presión se debe introducir en seco (sin aceites ni lubricantes).

Introducir el casquillo hasta que la superficie externa (cónica) acople perfectamente en la parte interna del cojinete.
Durante la fase de introducción, comprobar que el cojinete permanezca en contacto con el tope del eje acodado.
Repetir la operación en el lado opuesto.

Introducir las bridas de bloqueo del casquillo dentro de los casquillos cónicos (pos. ①, Fig. 79).
Aplicar un tornillo M16 con la longitud adecuada (35-40 mm) en el orificio M16 del eje acodado y atornillarlo hasta que la brida se apoye en el casquillo (pos. ①, Fig. 80). No apretar el tornillo.

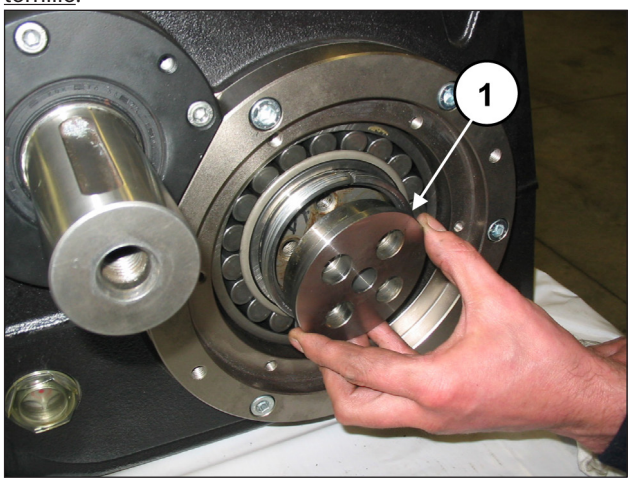


Fig. 79

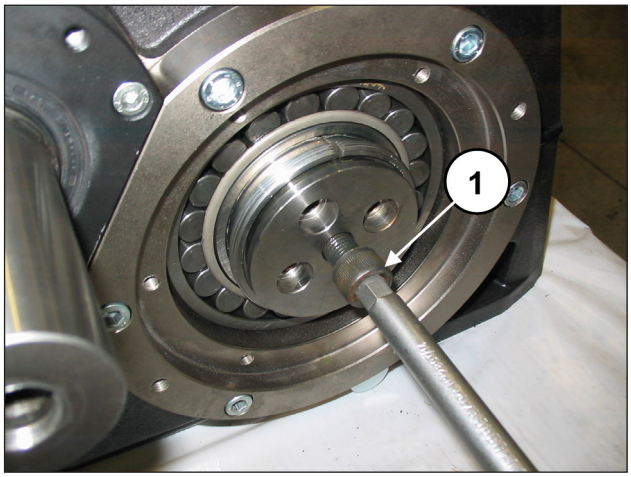


Fig. 80

Repetir la operación en el lado opuesto.
Desmontar la herramienta que bloquea las bielas cód. 27566200, (pos. ①, Fig. 41).
Introducir los semicojinetes superiores entre las bielas y el eje acodado (pos. ①, Fig. 81).

Para montar correctamente los cojinetes, la lengüeta de referencia de los semicojinetes debe encajar en el alojamiento de la semibiela (pos. ①, Fig. 82).

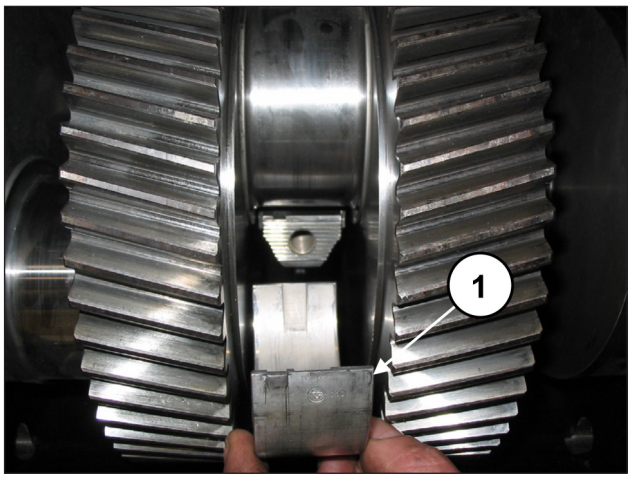


Fig. 81

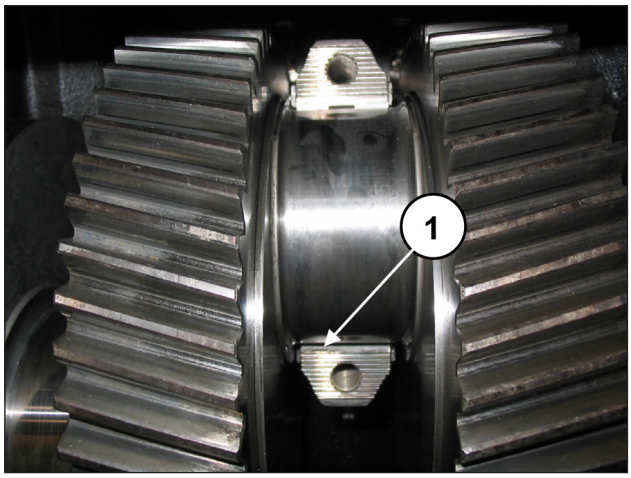


Fig. 82

Montar los semicojinetes inferiores en los sombreretes (pos. ①, Fig. 83). Comprobar que la lengüeta de referencia de los semicojinetes esté dentro del alojamiento del sombrerete (pos. ②, Fig. 83).
Fijar los sombreretes a las semibielas con los tornillos M12x1.25x87 (pos. ①, Fig. 84).
Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3, aplicando el parte de apriete a los tornillos de manera simultánea.

Prestar atención al sentido correcto de montaje de los sombreretes. La numeración debe estar orientada hacia arriba.

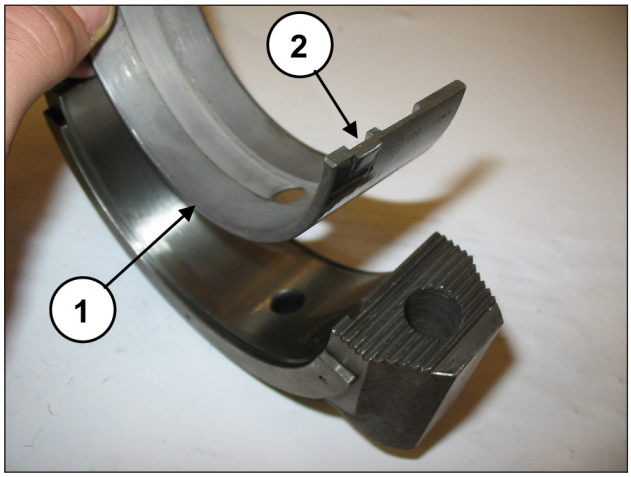


Fig. 83

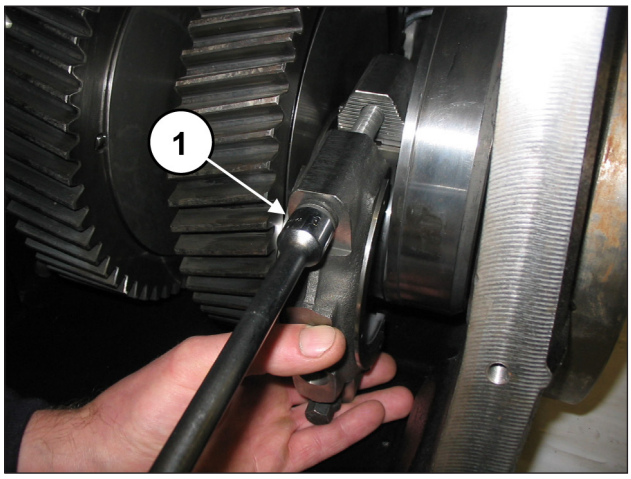


Fig. 84

Introducir un espesor debajo del cilindro de la biela central para bloquear la rotación del eje acodado (pos. ①, Fig. 85).

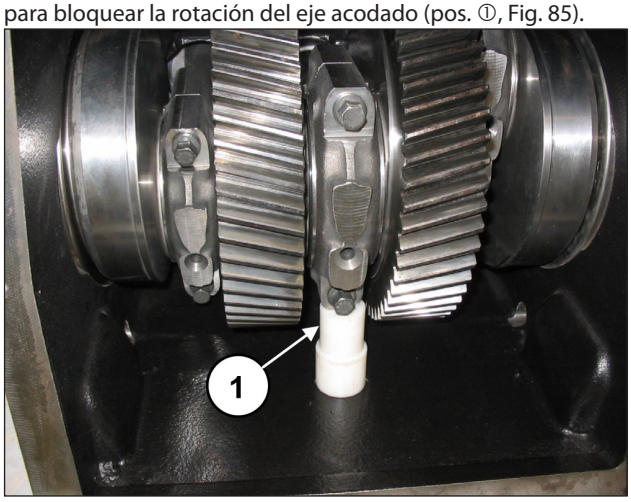


Fig. 85

Medir la cota "X" indicada en la Fig. 86 entre el casquillo cónico y el cojinete del eje acodado.

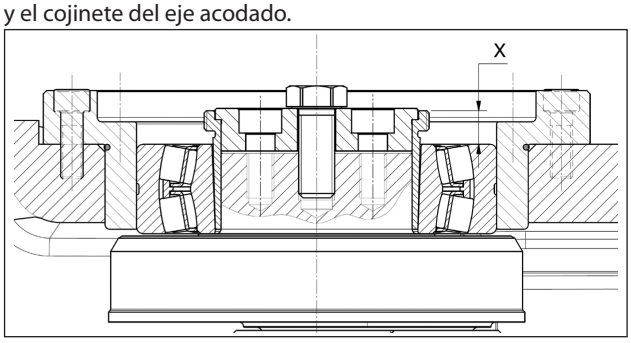


Fig. 86

Apretar el tornillo M16 hasta obtener una reducción de la cota "X" entre 0,7 y 0,8 mm (Fig. 87).

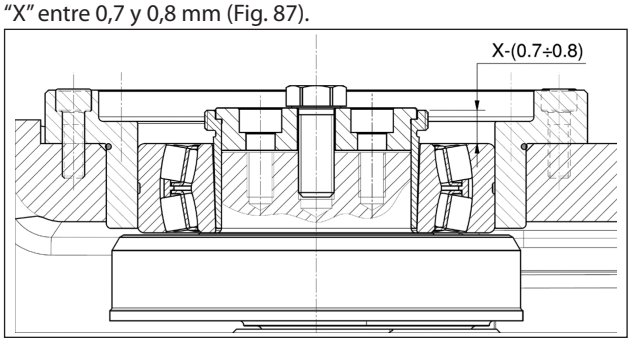


Fig. 87

Repetir la operación en el lado opuesto.
Extraer el tornillo M16 del eje acodado.
Fijar las dos bridas que bloquean el casquillo al eje acodado con 4+4 tornillo M12x25 (pos. ①, Fig. 89).

Aplicar LOCTITE 243 a las roscas de los tornillos M12x25 (pos. ①, Fig. 88).

Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.

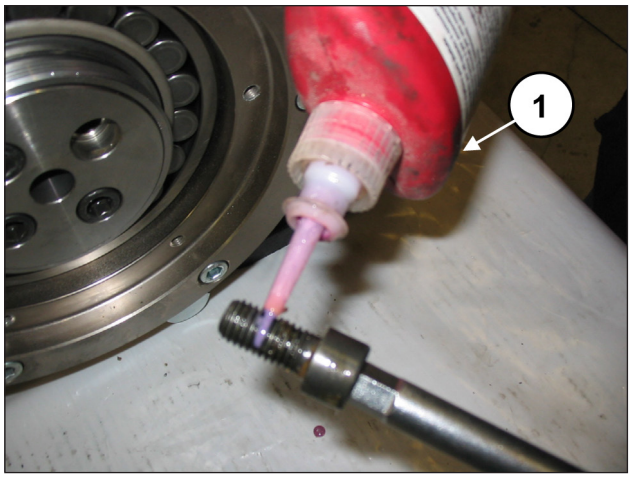


Fig. 88

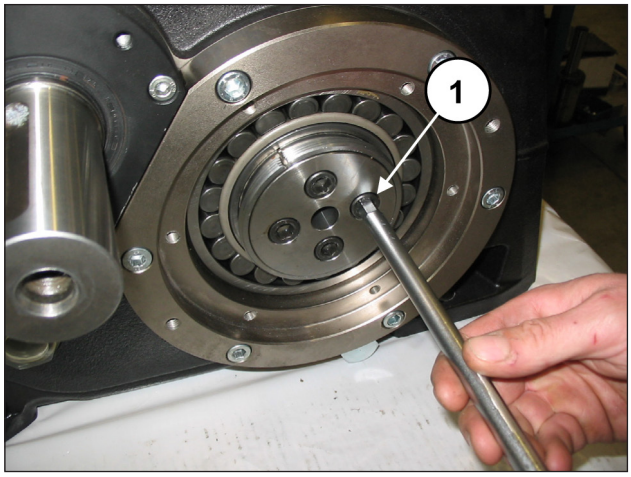


Fig. 89

Quitar el espesor anti-rotación que hay debajo del cilindro de la biela central.
Montar las dos tapas del cojinete junto con las juntas tóricas (pos. ①, Fig. 90) y fijarlas con los 6+6 tornillos M8x20 (pos. ①, Fig. 91).
Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.

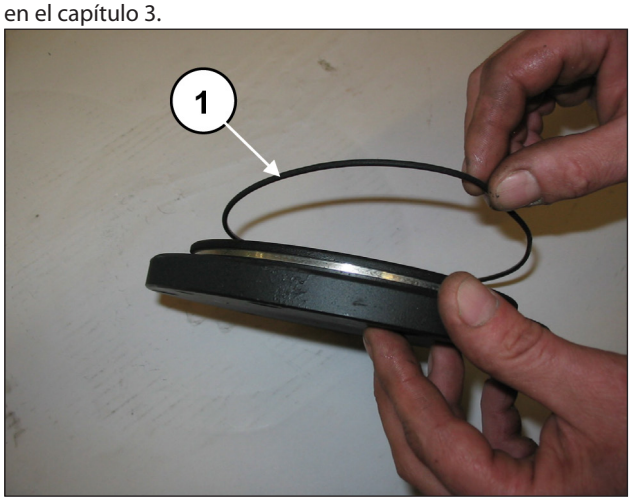


Fig. 90

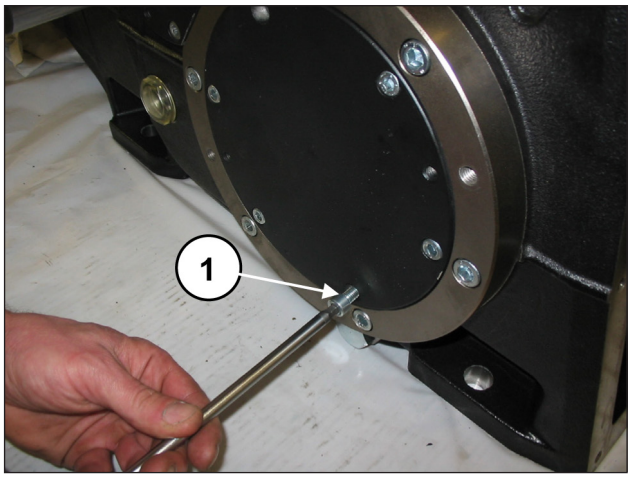


Fig. 91

Introducir la junta tórica en la tapa posterior (pos. ①, Fig. 92) y fijarla al cárter con los 10 tornillos M8x20 (pos. ①, Fig. 93).
Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.

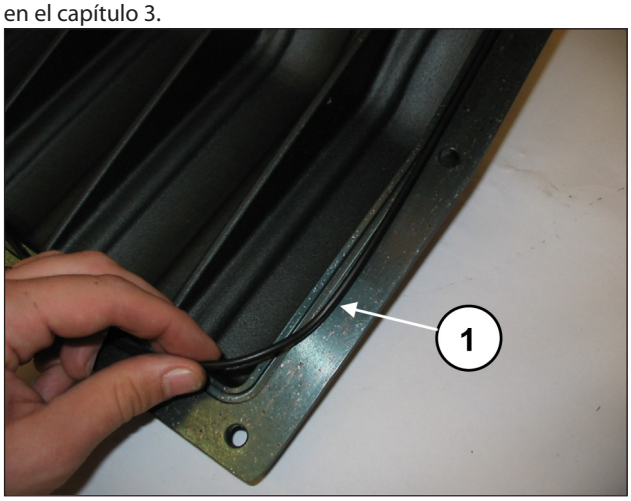


Fig. 92

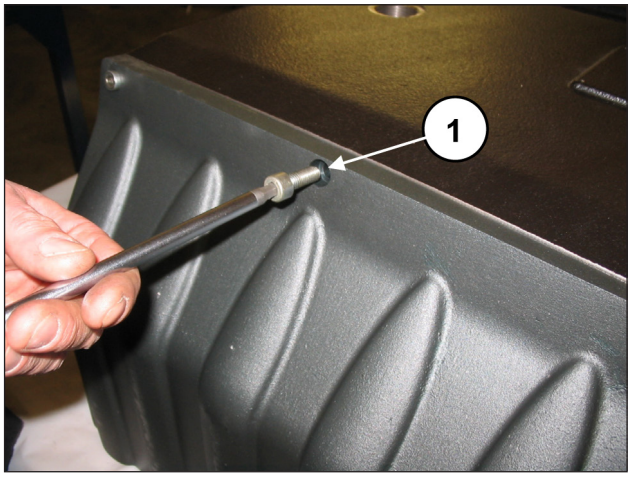


Fig. 93

Montar la anilla de retención radial en la tapa de retención (pos. ①, Fig. 94) utilizando un tampón cód. 27910900.

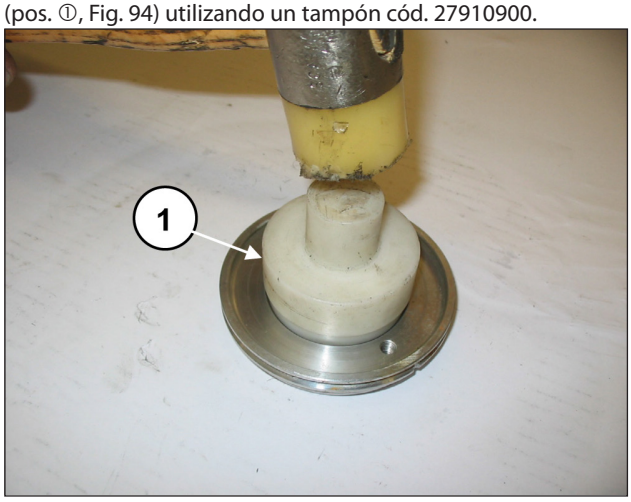


Fig. 94

Colocar la junta tórica (pos. ①, Fig. 95) en el alojamiento de la tapa de retención e introducir el grupo montado dentro del cárter en el alojamiento específico (pos. ①, Fig. 96).

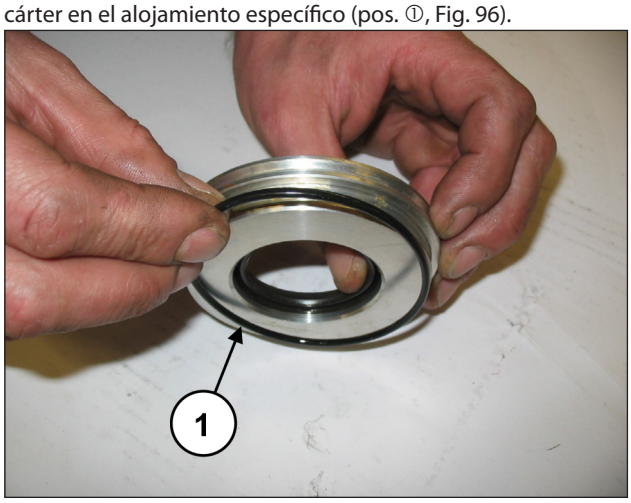


Fig. 95

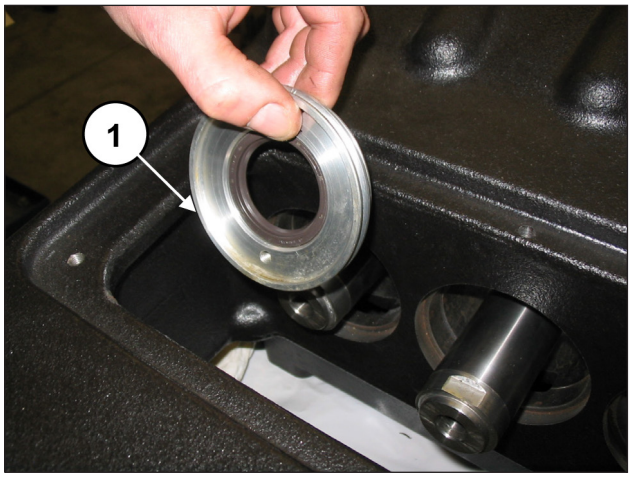


Fig. 96

Comprobar que la tapa entre a fondo en el alojamiento (pos. ①, Fig. 97), sin dañar el labio de la anilla de retención radial. Fijar las tapas de retención con 2 tornillos prisioneros M6x30 (pos. ①, Fig. 98).

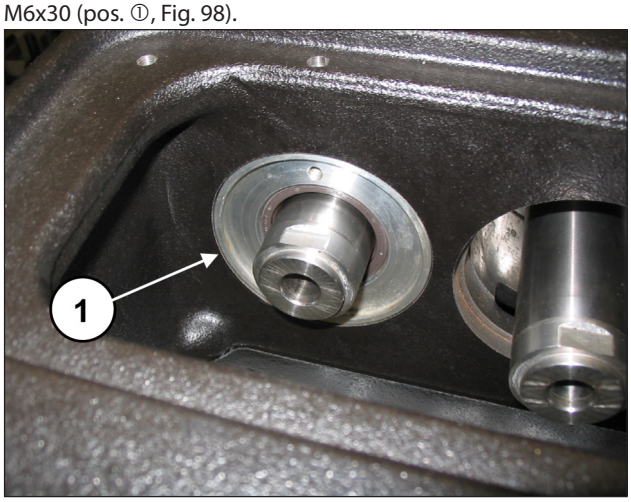


Fig. 97

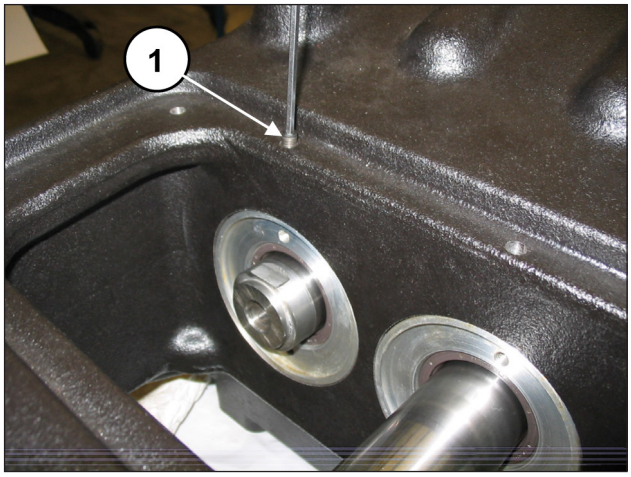


Fig. 98

Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.
Colocar los protectores contra salpicaduras junto con las juntas tóricas en el alojamiento de la guía del pistón (pos. ①, Fig. 99 y Fig. 100).

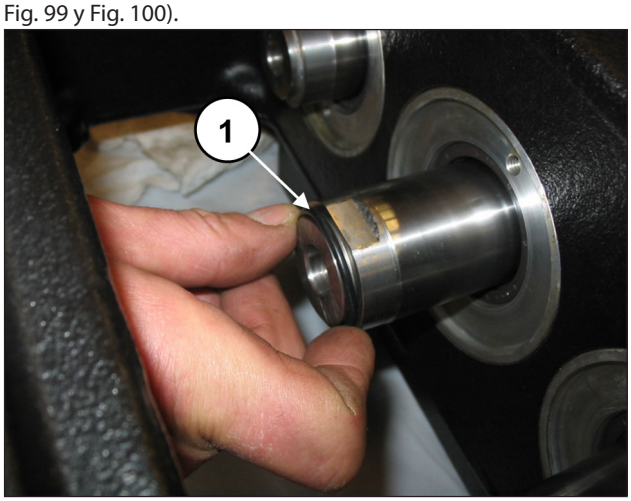


Fig. 99

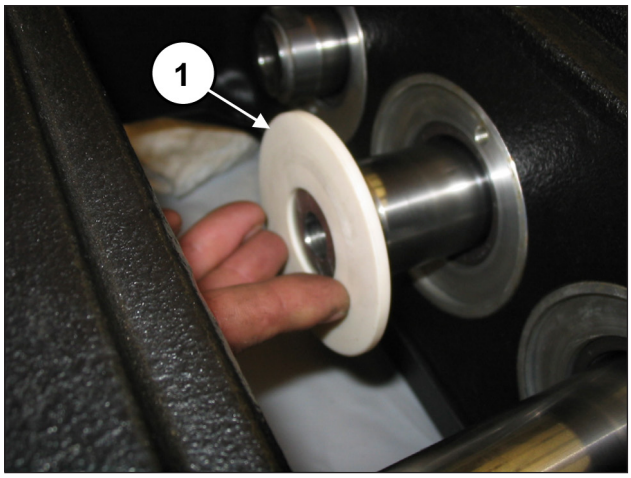


Fig. 100

Enroscar los tres pistones (pos. ①, Fig. 101) y ajustar con la llave de horquilla dinamométrica como se indica en el capítulo 3.

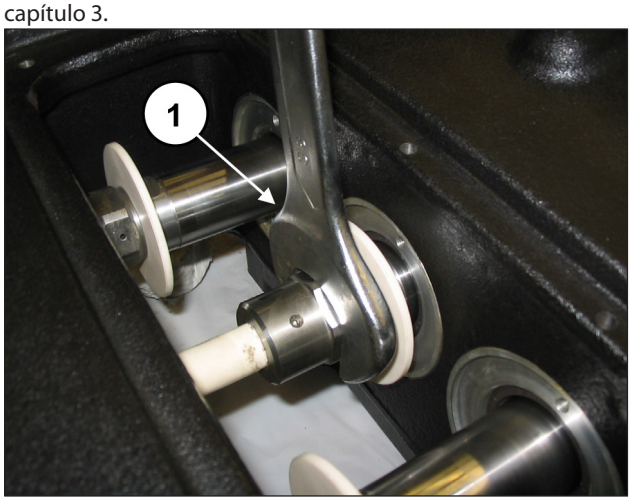


Fig. 101

Introducir la junta tórica (pos. ①, Fig. 102) en las tapas de inspección y montar las tapas con 4+4 tornillos M6x14 (pos. ①, Fig. 103).

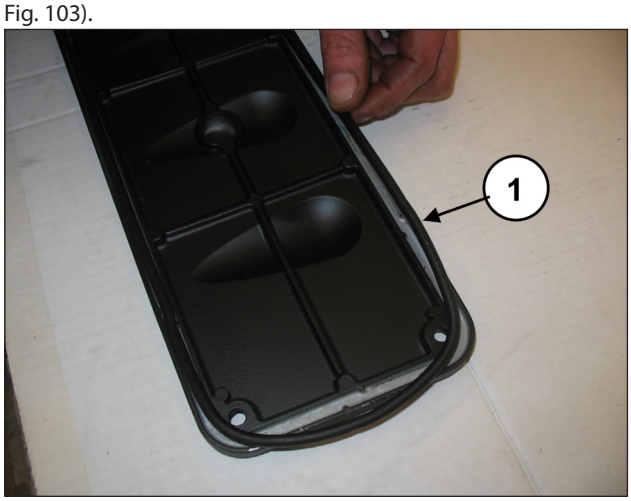


Fig. 102

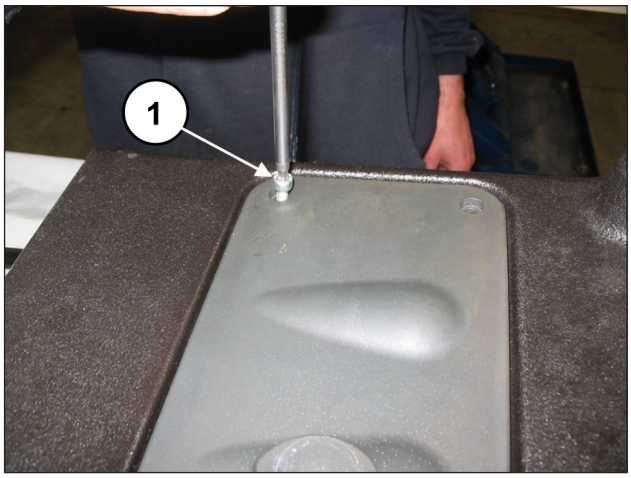


Fig. 103

Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.
Montar la tapa del extremo del eje y fijarla al cárter con los 3 tornillos M8x20 (pos. ①, Fig. 104).
Ajustar los tornillos con la llave dinamométrica como se indica en el capítulo 3.

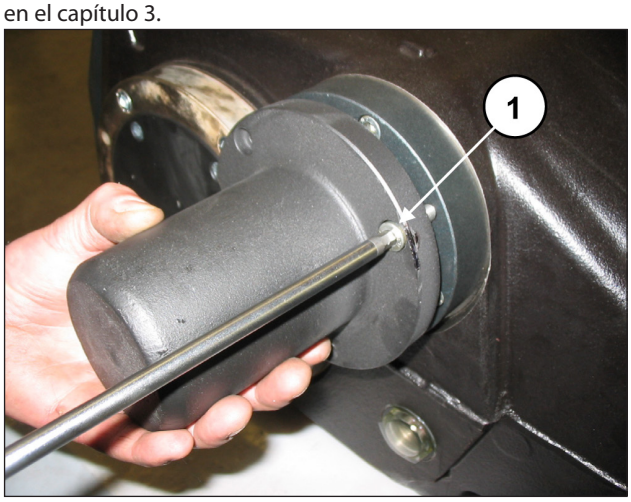


Fig. 104

Introducir la lengüeta en el eje PTO (pos. ①, Fig. 105).

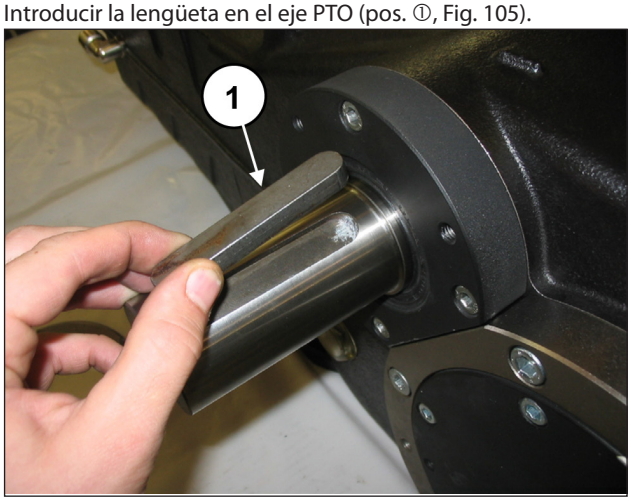


Fig. 105

2.1.3 Clases de mayoraciones previstas

TABLA DE MAYORACIONES PARA EJE ACODADO Y SEMICOJINETES DE LA BIELA			
Clases de recuperación (mm)	**Código semicojinete superior**	**Código semicojinete inferior**	**Rectificación sobre el diámetro del perno del eje (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

TABLA DE MAYORACIONES PARA CÁRTER DE LA BOMBA Y GUÍA DEL PISTÓN		
Clases de recuperación (mm)	**Código de la guía pistón**	**Rectificación en alojamiento del cárter de la bomba (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 REPARACIÓN DE LA PARTE HIDRÁULICA

2.2.1 Montaje de cabeza – camisas - válvulas

La cabeza no requiere un mantenimiento periódico.
Las intervenciones se limitan a la inspección o sustitución de las válvulas, en el caso que sea necesario:
Para extraer los grupos de válvula operar del siguiente modo:
Aflojar, sin extraerlos, los tornillos M10x140 que fijan las camisas a la cabeza (pos. ①, Fig. 106) para liberarlas.

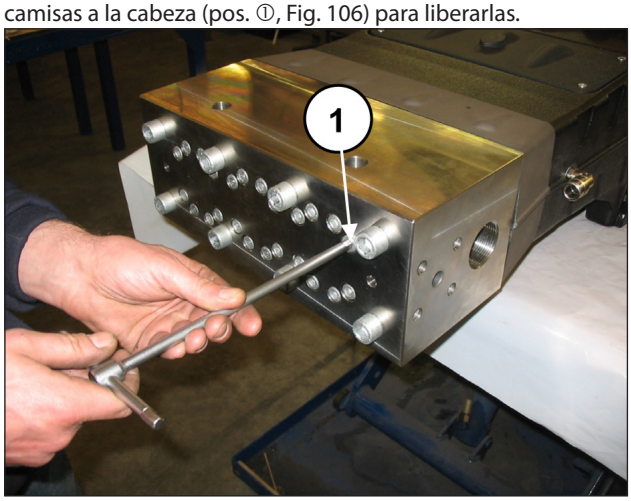


Fig. 106

Aflojar los dos tornillos diametralmente opuestos de fijación de la cabeza M16x280 (pos. ① y ②, Fig. 107) sustituyéndolos con dos tornillos - clavija de servicio (cód. 27540200) (pos. ①, Fig. 108). A continuación, extraer los tornillos restantes.

Fig. 107

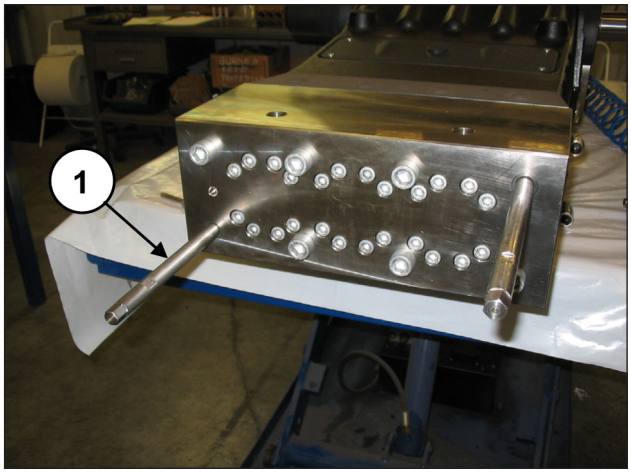


Fig. 108

Desmontar la cabeza y el distanciador de las camisas del cárter de la bomba (pos. ①, Fig. 109).

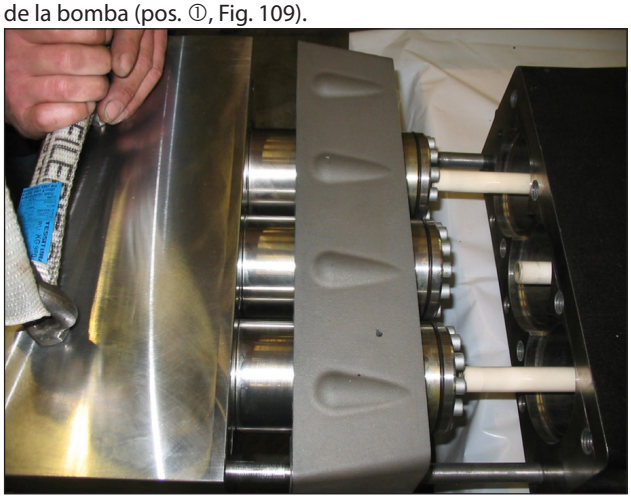


Fig. 109

Desmontar las juntas tóricas de los soportes de las juntas (pos. ①, Fig. 110) y extraer el distanciador de las camisas de los grupos de camisas (pos. ①, Fig. 111).

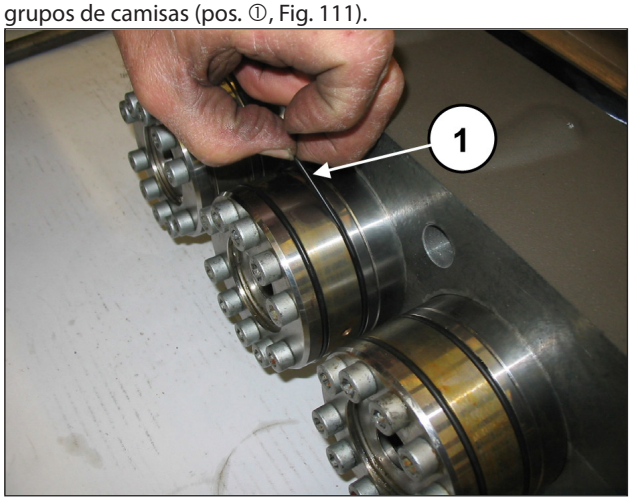


Fig. 110

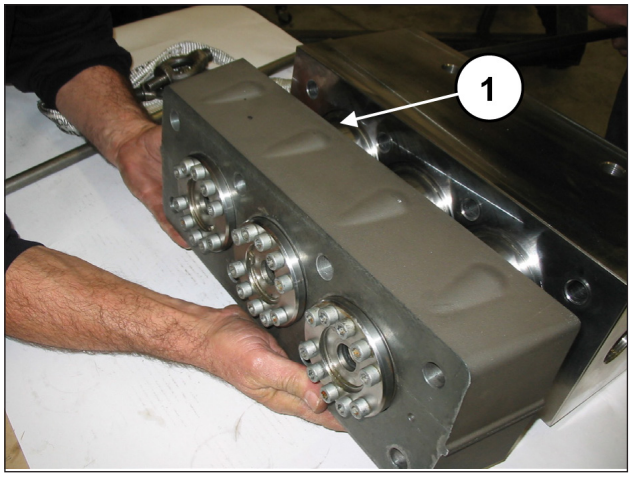


Fig. 111

Extraer los tornillos M10x140 que fijan las camisas a la cabeza (pos. ①, Fig. 112) y extraer los grupos de camisas (pos. ①, Fig. 113).

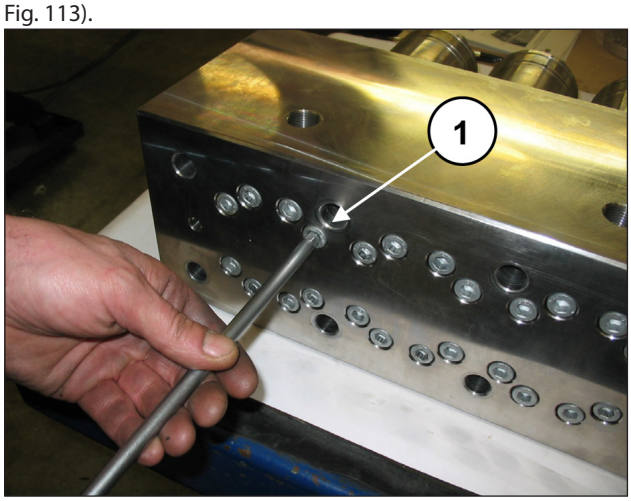


Fig. 112

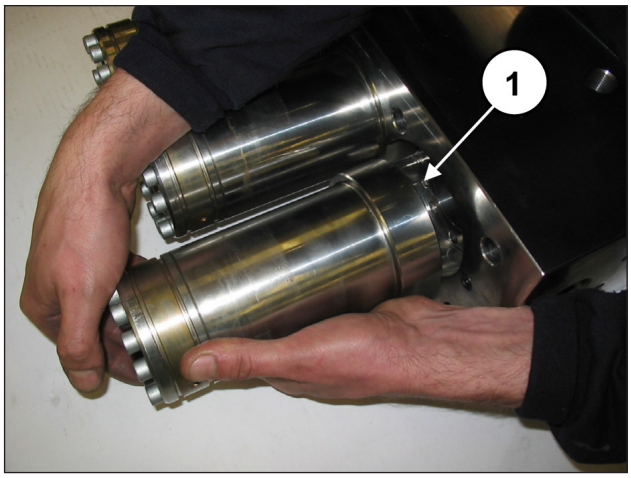


Fig. 113

Durante el desmontaje de las camisas es importante no perder los muelles de la válvula ni las válvulas planas (pos. ① y ②, Fig. 114) ya que al estar montadas sólo por contacto podrían caerse.

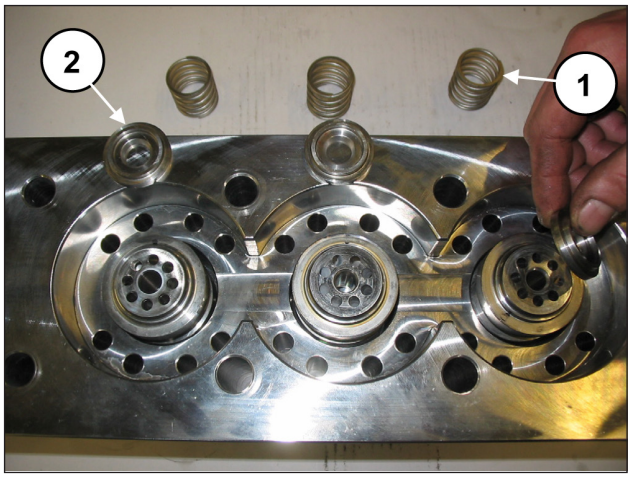


Fig. 114

Si las sedes de la válvula están bloqueadas en la cabeza debido a los depósitos de cal o al óxido, desbloquearlas introduciendo la herramienta adecuada (cód. 034300020 para SK20-22-24 o cód. 034300010 para SK26-28-30) en el orificio de envío (pos. ①, Fig. 115).

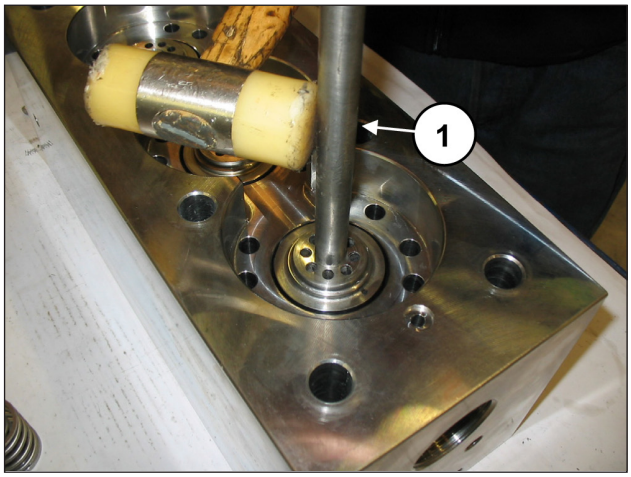


Fig. 115

Extraer los alojamientos de la válvula y controlar el desgate de las juntas.

Si es necesario, sustituirlas (pos. ①, Fig. 116).

Fig. 116

Cada vez que se inspeccionan las válvulas, se deben sustituir todas las anillas de retención y las juntas tóricas de retención frontal situadas entre la camisa y la cabeza, y entre la cabeza y el distanciador de las camisas de la zona del orificio de recirculación. Antes de volver a montar los componentes, limpiar y secar tanto los componentes como los alojamientos internos de la cabeza.

Extraer los platillos de envío (pos. ①, Fig. 117), y sus guías (pos. ①, Fig. 119), con los muelles (pos. ①, Fig. 118). Controlar el desgaste y, si es necesario, sustituirlos respetando, en cualquier caso, los intervalos indicados en el capítulo 11 del ***Manual de uso y mantenimiento***.

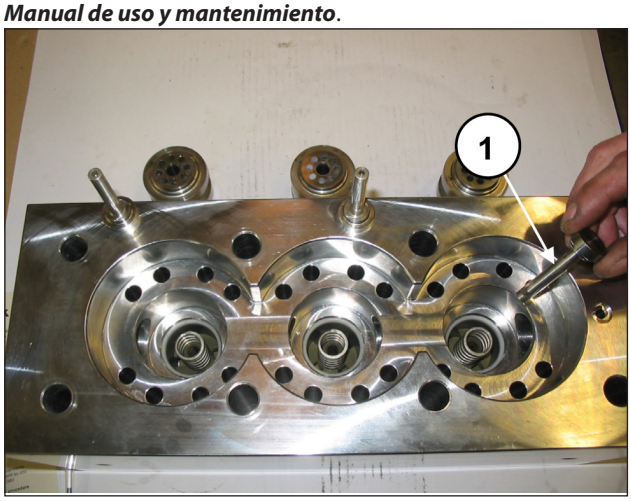


Fig. 117

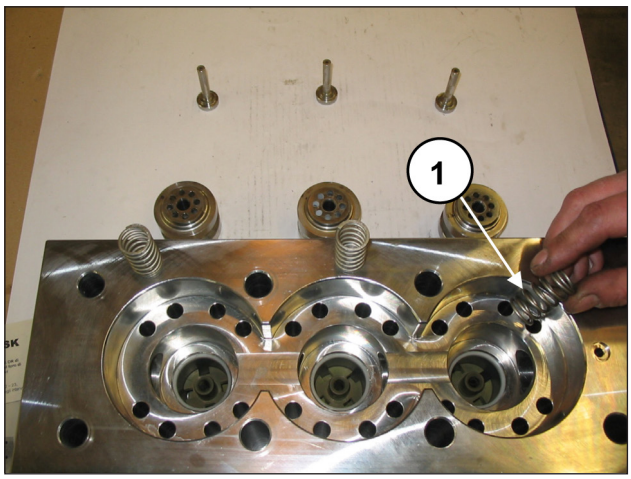


Fig. 118

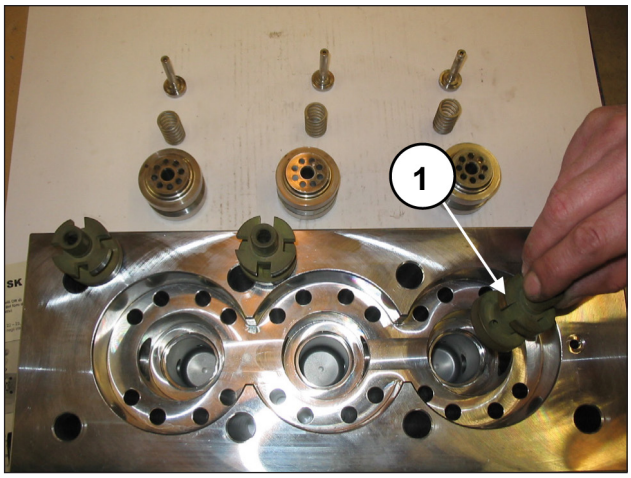


Fig. 119

2.2.2 Montaje de cabeza – camisas - válvulas

Para volver a montar los componentes repetir las operaciones arriba descritas en orden contrario, poniendo atención a montar correctamente el distanciador de las camisas: cuando la pieza está ya montada, las dos descargas de fusión situadas a los dos lados deben estar orientadas hacia la parte inferior del cárter (lado de fijación de la bomba).

Cabezas - camisas: montar y ajustar los tornillos de fijación de la cabeza y ajustar los tornillos de fijación de las camisas.

Para los valores de los pares de apriete y las secuencias de ajuste de los tornillos respetar las indicaciones contenidas en el capítulo 3.

2.2.3 Desmontaje del grupo pistón - soportes - juntas

El grupo pistón no requiere un mantenimiento periódico. Sólo es necesario inspeccionar el drenaje del circuito de refrigeración. Si se detectan anomalías y oscilaciones en el manómetro de envío o pulsaciones en el tubo de drenaje del circuito de refrigeración (si es elástico), controlar y sustituir el paquete de juntas.

Para extraer los grupos de pistón operar del siguiente modo: Desmontar la cabeza y el distanciador de las camisas del cárter de la bomba como se indica en el apart. 2.2.1 (de Fig. 106 a Fig. 113).

Desmontar la tapa de inspección superior (pos. ①, Fig. 120) y la tapa de inspección inferior (pos. ①, Fig. 121) aflojando los 4+4 tornillos de fijación. Extraer las juntas tóricas y sustituirlas si es necesario.

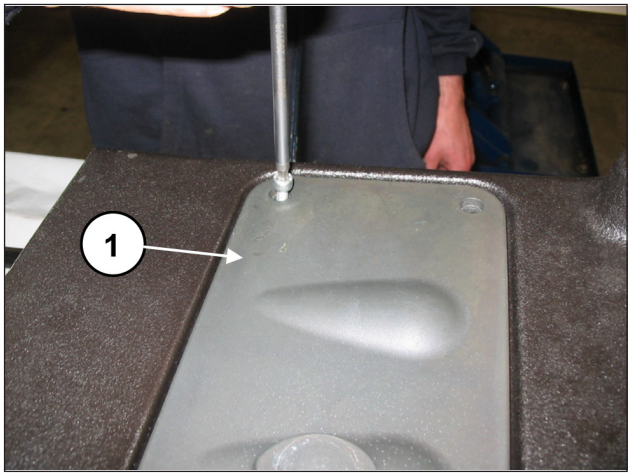


Fig. 120

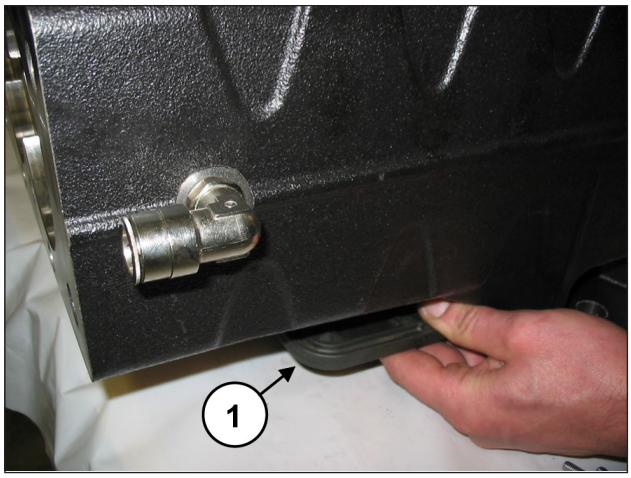


Fig. 121

Desmontar las bombas con una llave de horquilla (pos. ①, Fig. 122) y controlar su desgaste (pos. ①, Fig. 123). Sustituirlas si es necesario.

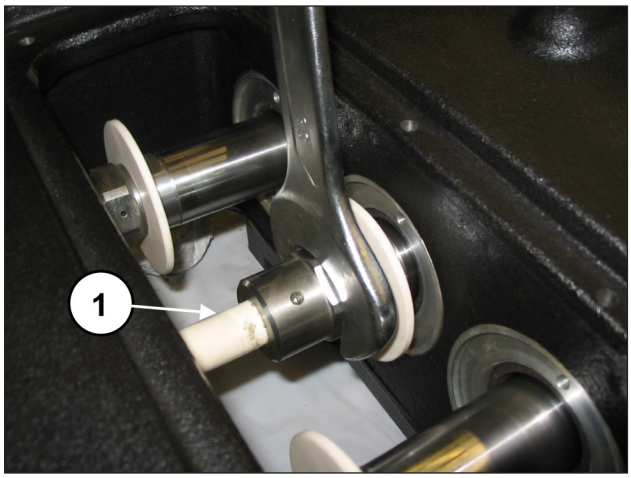


Fig. 122

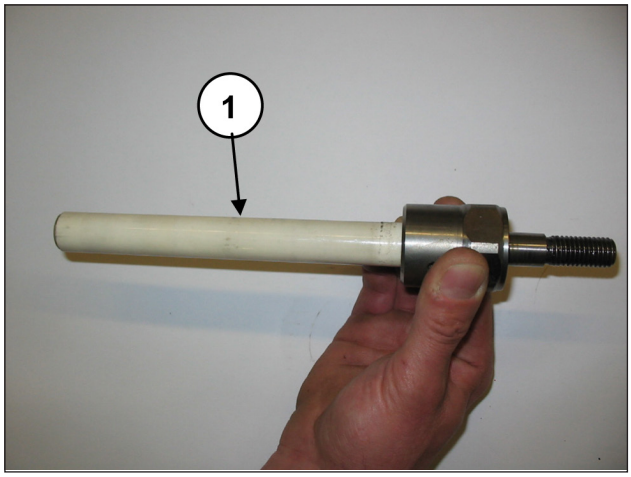


Fig. 123

Extraer los tornillos M8x50 que fijan el soporte a la camisa (pos. ①, Fig. 124) y separar el soporte de la camisa (pos. ①, Fig. 125).

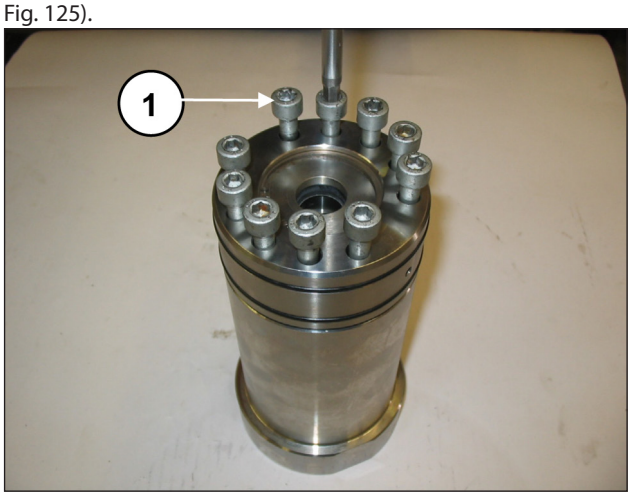


Fig. 124

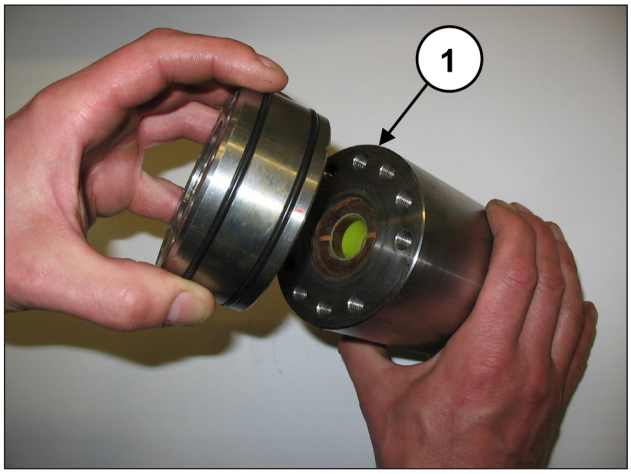


Fig. 125

Desmontar la anilla seeger y la anilla de retén de las juntas (pos. ①, Fig. 126) y extraer con una clavija de plástico la junta de retén LP (baja presión) (pos. ①, Fig. 127).

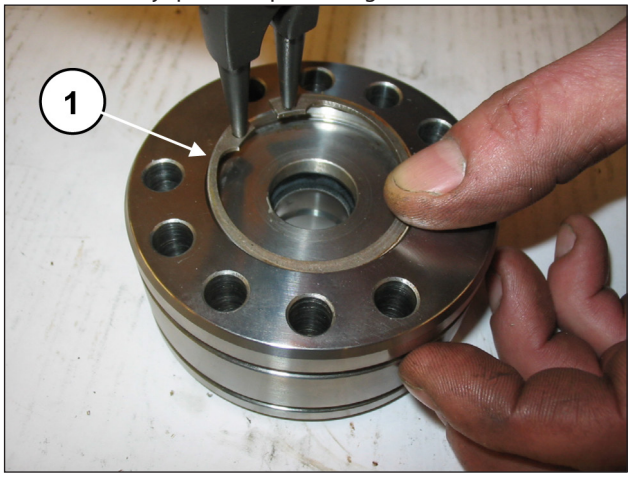


Fig. 126

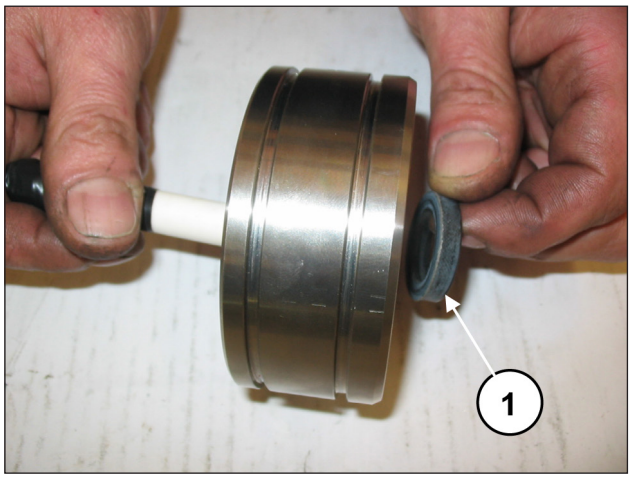


Fig. 127

Sustituir las juntas de baja presión y las juntas tóricas cada vez que se realicen operaciones de desmontaje.

Con la camisa separada del soporte de juntas y utilizando una clavija de plástico (pos. ①, Fig. 128) extraer el paquete HP (alta presión) (pos. ①, Fig. 129).

Sustituir el paquete HP (pos. ①, Fig. 129) cada vez que se realicen operaciones de desmontaje.

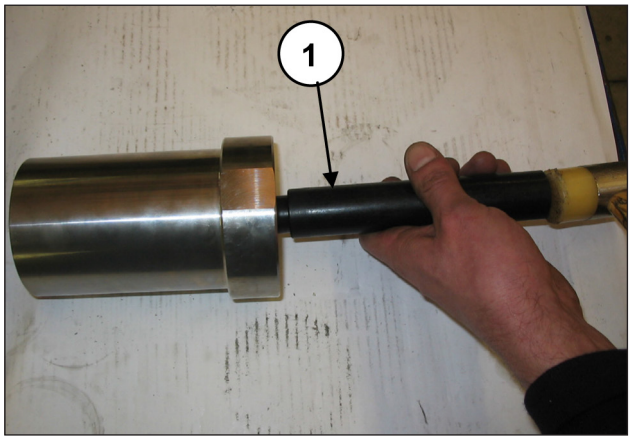


Fig. 128

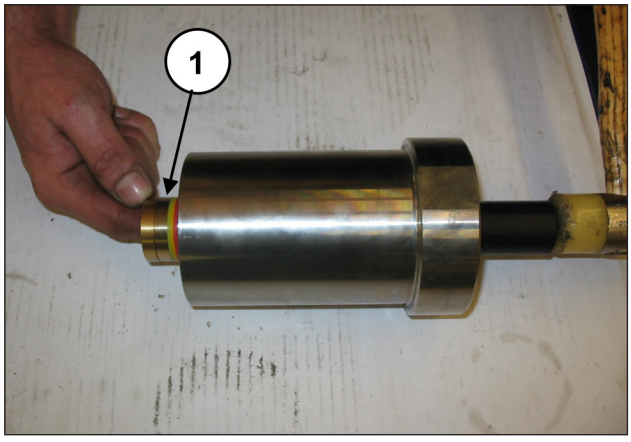


Fig. 129

2.2.4 Montaje del grupo pistón - soportes - juntas

Para montar los componentes realizar las operaciones arriba descritas en orden contrario respetando las secuencias indicadas a continuación; para los valores de los pares de apriete y las secuencias de ajuste, respetar las indicaciones contenidas en el capítulo 3.
Introducir el casquillo superior en la camisa.

Para garantizar una correcta posición axial del casquillo utilizar la herramienta (cód. 27911200 para SK20, cód. 27911400 para SK22, cód. 27911500 para SK24, cód. 27911600 para SK26, cód. 27911700 para SK28 y cód. 27911800 para SK30) (pos. ①, Fig. 130 y Fig. 131).

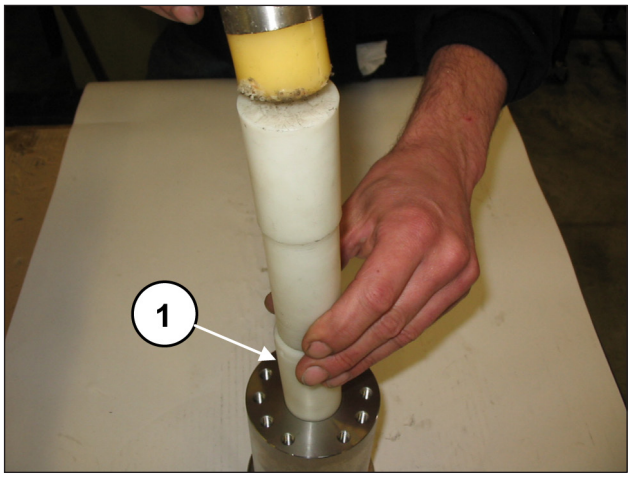


Fig. 130

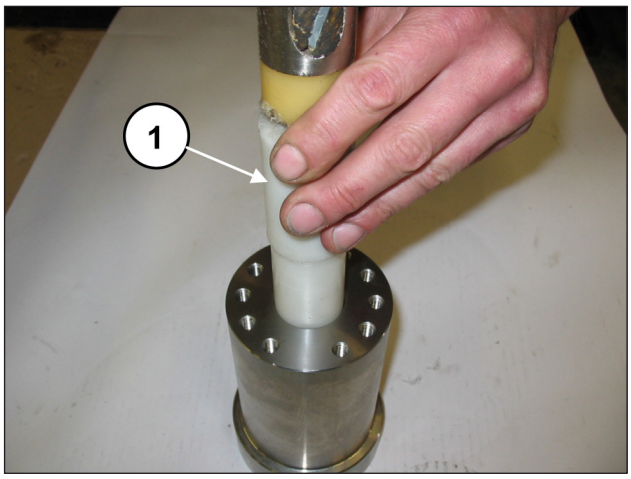


Fig. 131

Introducir el paquete H.P. (alta presión) (pos. ①, Fig. 132); para evitar daños debido a la ligera interferencia entre la junta y la camisa, se recomienda utilizar la herramienta (cód. 27540100 para SK20, SK22 y SK24, cód. 27540900 para SK26, SK28 y SK30) (pos. ①, Fig. 133).

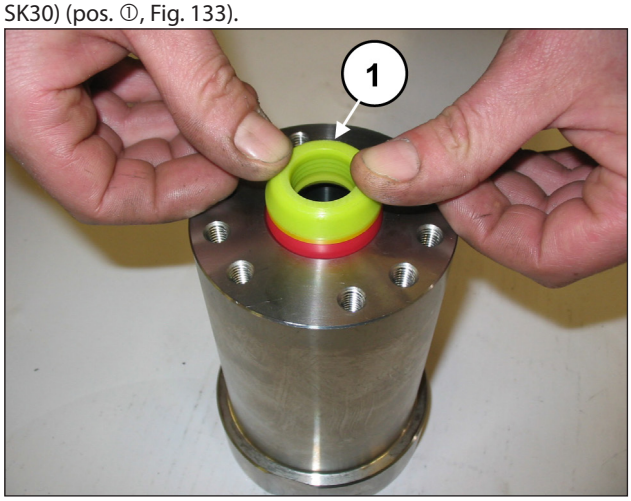


Fig. 132

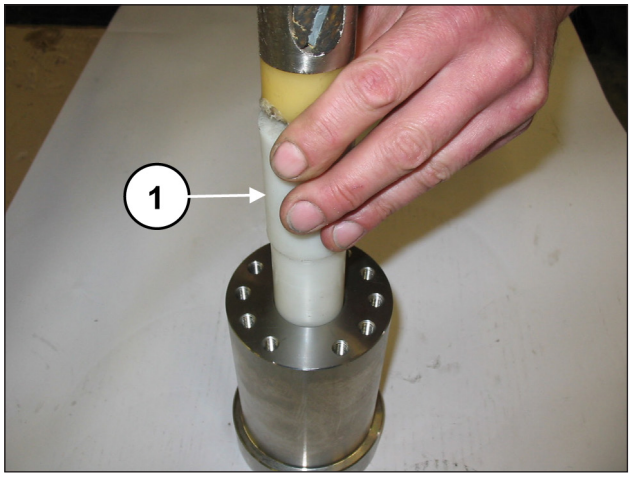


Fig. 133

La junta H.P. se ha de introducir en la camisa como se indica en la Fig. 132 y Fig. 134.

Antes de montarlas en la sede, las juntas de H.P. se deben lubricar con grasa de silicona de tipo OKS 1110 como se indica a continuación: Lubricar el diámetro externo ligeramente. Aplicar la grasa en el diámetro interno rellenando con cuidado todos los intersticios comprendidos entre los labios de retención, como se indica en la Fig. 135.

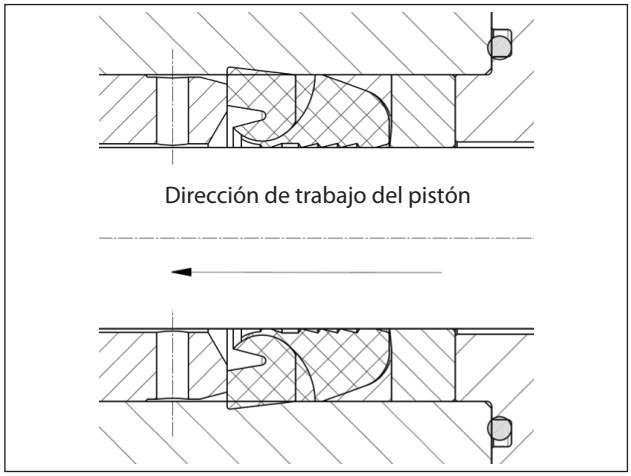


Fig. 134

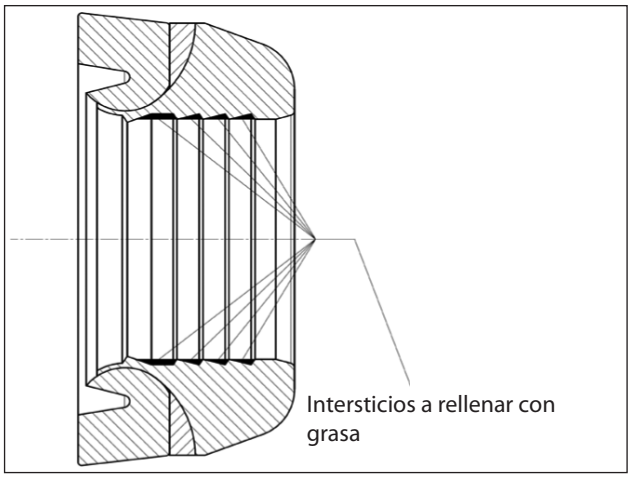


Fig. 135

Introducir la anilla anti extrusora y el casquillo de juntas (pos. ① y ②, Fig. 136, Fig. 137 y Fig. 138).

El casquillo de las juntas ② se ha de introducir en la camisa con las dos descargas orientadas hacia el exterior (lado cárter) como se indica en la Fig. 137.

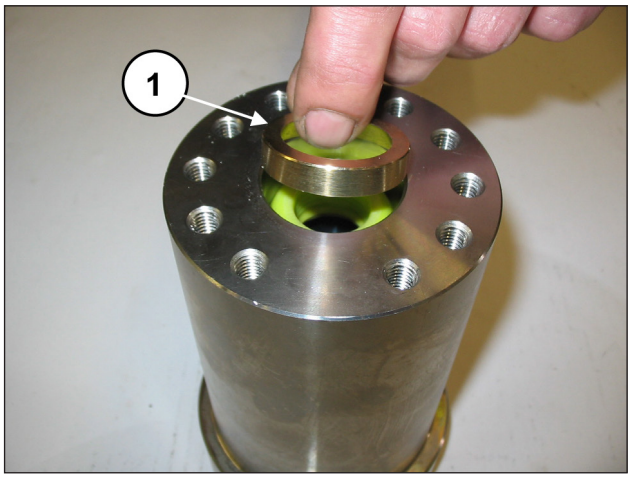


Fig. 136

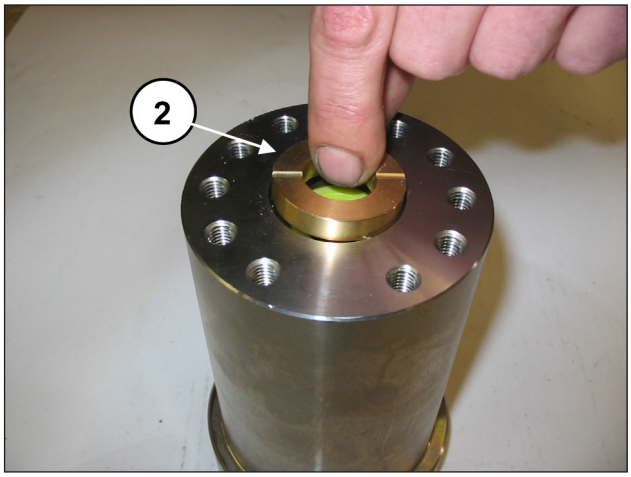


Fig. 137

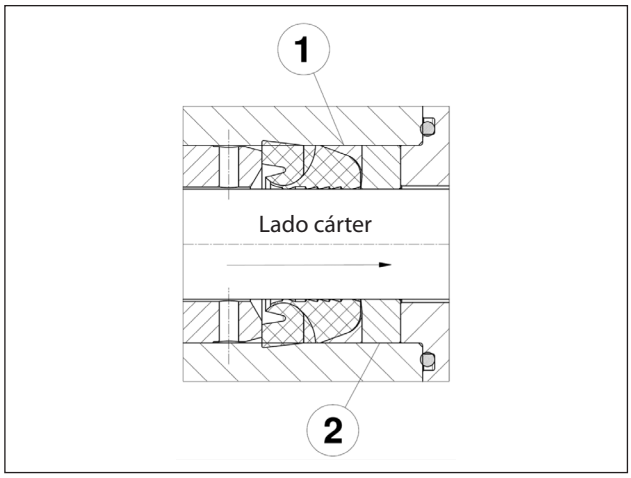


Fig. 138

La junta L.P. se ha de introducir en la camisa con el labio de retención orientado hacia la dirección de trabajo del pistón (pos. ①, Fig. 139 y Fig. 140), lubrificando ligeramente el diámetro externo con grasas de silicona de tipo OKS 1110. Sustituir la junta L.P. si está desgastada.

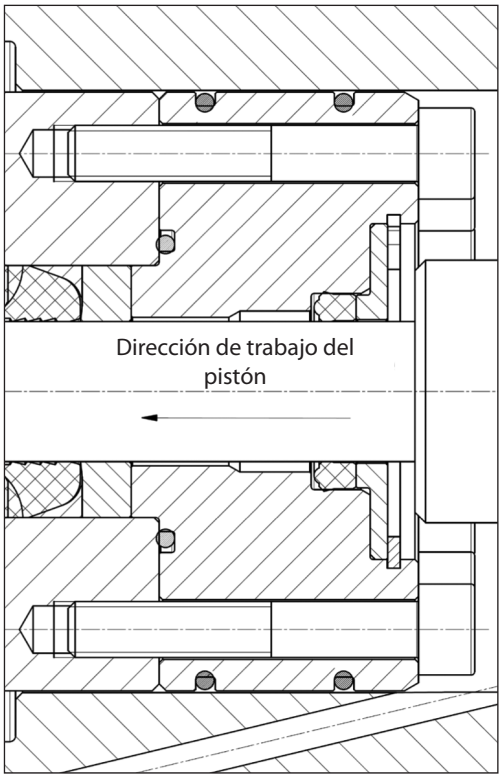


Fig. 139

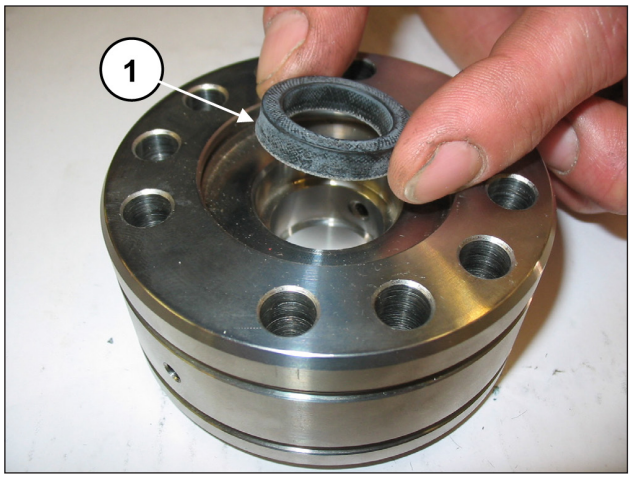


Fig. 140

Montar el grupo de soporte de las juntas (Fig. 141 y Fig. 142) y sustituir los componentes ① y ②.

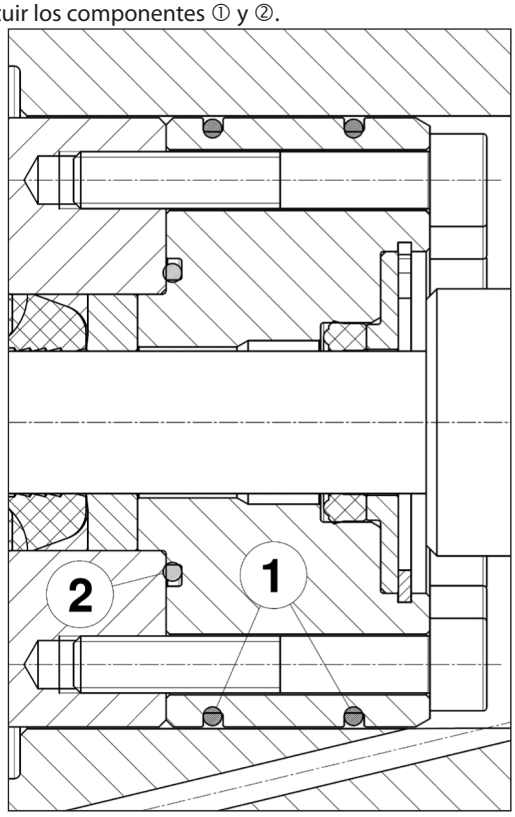


Fig. 141

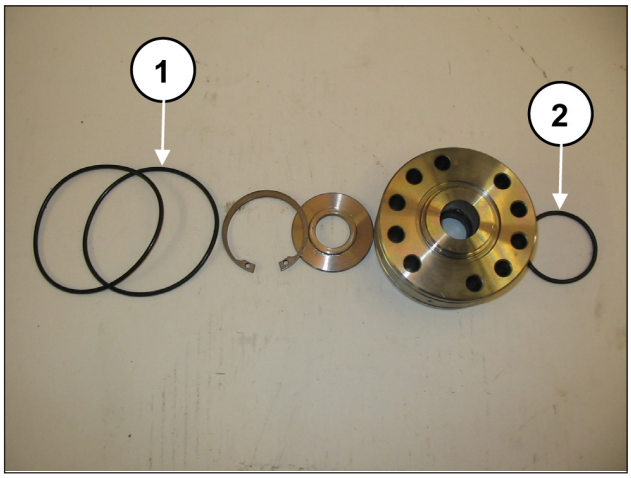


Fig. 142

Ensamblar el grupo soporte - camisa y apretar a mano los tornillos M8x50 como se indica en la Fig. 143. A continuación, apretar con la llave dinamométrica como se indica en el capítulo 3.

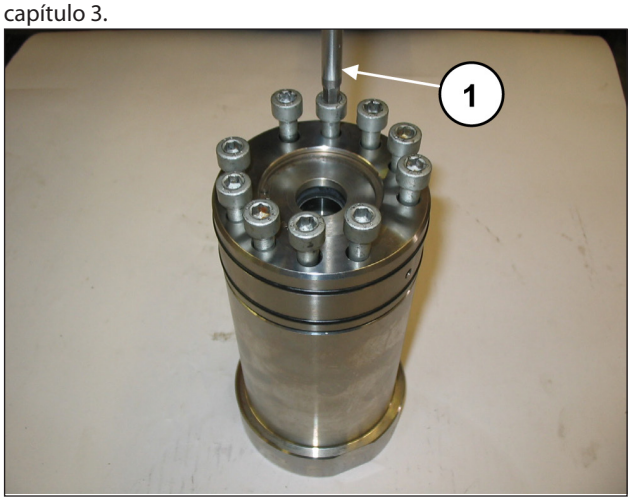


Fig. 143

3 CALIBRACIÓN DE AJUSTE DE LOS TORNILLOS

El ajuste de los tornillos debe realizarse exclusivamente con una llave dinamométrica.

Descripción	Posición dibujo desglosado	Par de apriete Nm
Tornillo M8x20 de la tapa del cárter	42	25
Tapón G1/2x13 del cárter	66	40
Tornillo M8x30 tapa cojinete PTO	85	25
Tornillo M8x20 tapa extremo eje	42	25
Tornillo M10x30 tapa portacojinete	57	45
Tornillo M6x14 de las tapas superior e inferior	70	10
Tornillo M8x20 de la tapa del cojinete	42	25
Tornillo M12x1.25x87 de apriete de la biela	40	75
Tornillo M6x20 de la guía del pistón	37	10
Tornillo M12x25 brida bloqueo casquillo	51	68.5
Pistón completo	16	50
Racor estrang. D.3 3/8M-3/8F	72	45
Tornillo M8x50 de los soportes	26	40*
Tornillo M16x280 de la cabeza	14	200**
Tornillo M10x140 de las camisas	13	83***

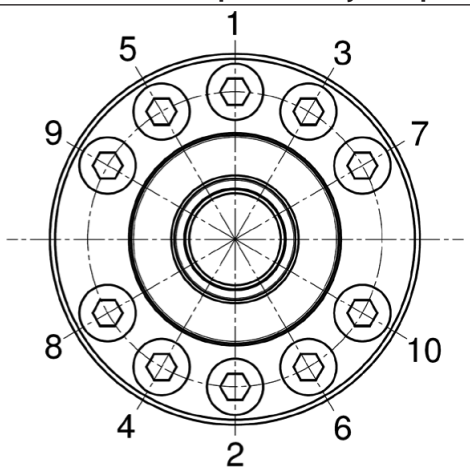
Los tornillos -pos. 13-14-26 se deben apretar con la llave dinamométrica lubricando el pie roscado con grasa de disulfuro de molibdeno cód. 12001500.

* Los tornillos de fijación de los soportes deben ser ajustados respetando las secuencias y el orden indicado en el esquema de la Fig. 144.

** Los tornillos de fijación del cabezal deben ser ajustados respetando las secuencias y el orden indicado en el esquema de la Fig. 145.

*** Los tornillos de fijación de las camisas deben ser ajustados respetando las secuencias y el orden indicado en el esquema de la Fig. 145.

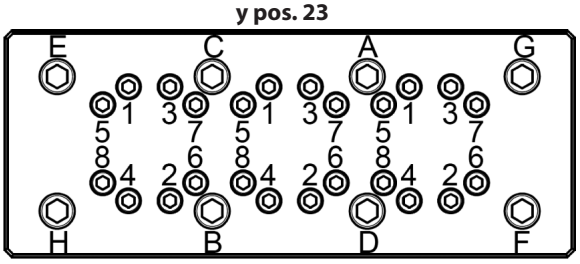
Apriete de los tornillos de soporte de las juntas pos. 26



Apretar los tornillos M8x50 respetando la secuencia indicada (1-2-3-4-5-6-7-8-9-10) efectuando en una única fase el par indicado.

Fig. 144

Apriete de los tornillos de la cabeza y las camisas pos. 14 y pos. 23



OPERACIÓN 1: Apriete tornillos M16x280 (pos. 14) en dos fases respetando la secuencia indicada en la figura: (A-B-C-D-E-F-G-H)

Fase 1 = 120 Nm

Fase 2 = 200 Nm

OPERACIÓN 2: Apriete tornillos M10x140 (pos. 13) en cuatro fases respetando la secuencia indicada en la figura: (1-2-3-4-5-6-7-8)

Fase 1 = 40 Nm

Fase 2 = 65 Nm

Fase 3 = 83 Nm

Fase 4 = 83 Nm

Fig. 145

4 HERRAMIENTAS DE REPARACIÓN

El mantenimiento de la bomba se puede llevar a cabo utilizando herramientas estándar para el montaje y el desmontaje de los componentes. Están disponibles las siguientes herramientas:

Para el montaje:

Anilla de retención radial de la guía del pistón	cód. 27910900
Anilla de retención radial del eje PTO	cód. 27539500
Casquillo de juntas	cód. 27911200 (SK20)
	cód. 27911400 (SK22)
	cód. 27911500 (SK24)
	cód. 27911600 (SK26)
	cód. 27911700 (SK28)
	cód. 27911800 (SK30)
Paquete de juntas HP	cód. 27540100 (SK20 - SK22 - SK24)
	cód. 27540900 (SK26 - SK28 - SK30)
Cabeza / distanciador camisas	cód. 27540200

Para el desmontaje:

Sedes de la válvula	cód. 034300020 (SK20-22-24)
	cód. 034300010 (SK26-28-30)
Cabeza / distanciador camisas	cód. 27540200
Eje (bloqueo de las bielas)	cód. 27566200

5 SUSTITUCIÓN DEL CASQUILLO PIE DE LA BIELA

Realizar la conexión del casquillo en frío y los trabajos necesarios respetando las dimensiones y las tolerancias indicadas en la Fig. 146.

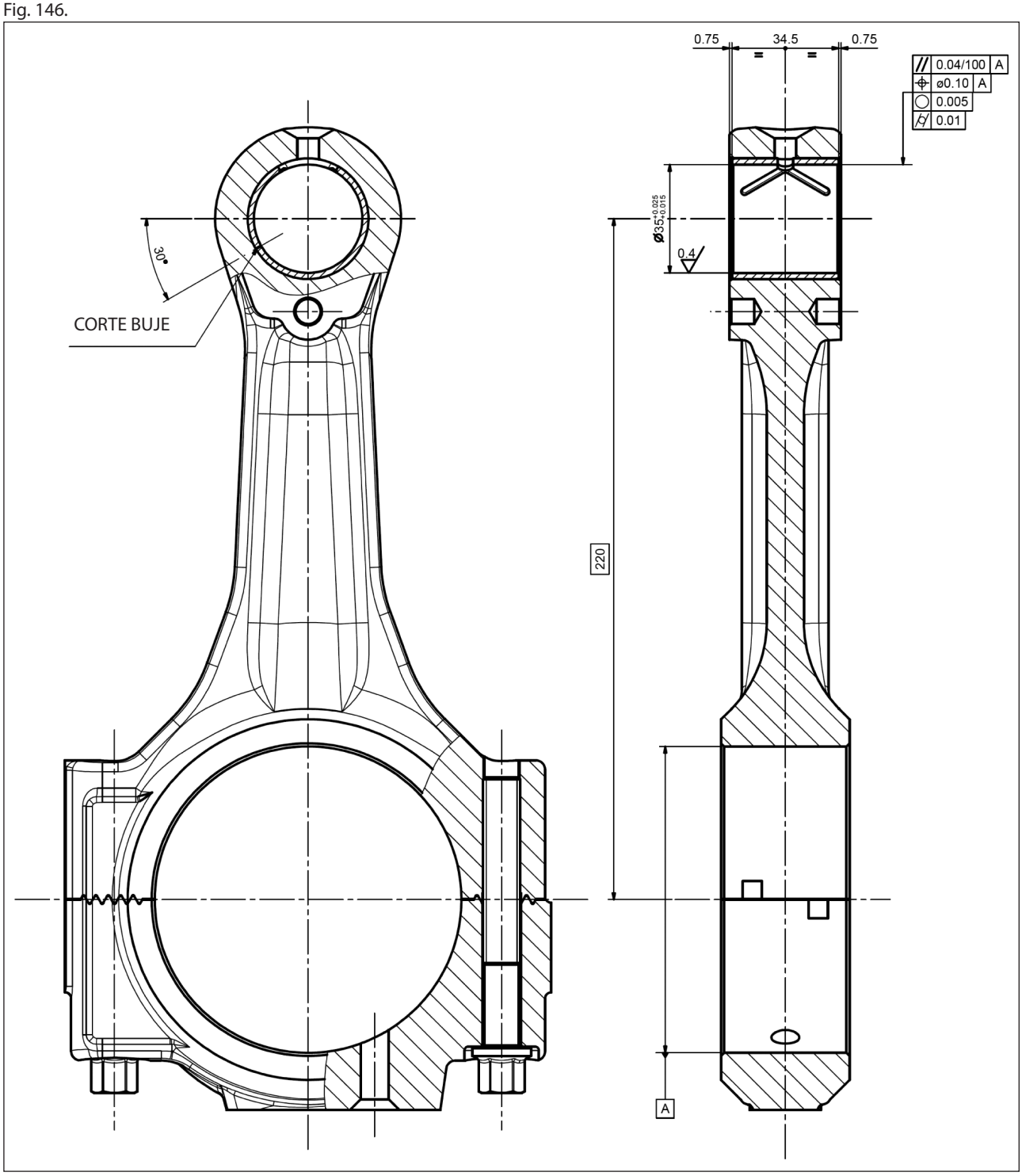


Fig. 146

Resumo

1 INTRODUÇÃO

Este manual descreve as instruções para a reparação das bombas da família SK e deve ser atentamente lido e compreendido antes de realizar qualquer intervenção na bomba.
O uso correto e manutenção adequada depende o funcionamento e duração regular da bomba.
A Interpump Group não se responsabiliza por qualquer dano causado por mau uso ou pelo não cumprimento das regras descritas neste manual.

1.1 DESCRIÇÕES DOS SÍMBOLOS

Leia atentamente as instruções contidas neste manual antes de qualquer operação.

Sinal de Advertência

Leia atentamente as instruções contidas neste manual antes de qualquer operação.

Sinal de Perigo
Use óculos de proteção.

Sinal de Perigo
Use luvas de proteção antes de cada operação.

2 NORMAS DE REPARAÇÃO

2.1 REPARAÇÃO DA PARTE MECÂNICA

As operações de reparação da parte mecânica devem ser realizadas depois de ter removido o óleo do carter.
Para retirar o óleo, é preciso remover a tampa de carga do óleo pos. ①, Fig. 1 e em seguida, a tampa de descarga pos. ②, Fig. 1.

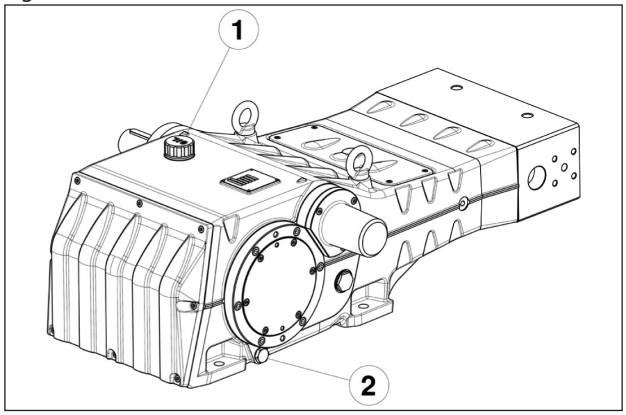


Fig. 1

O óleo esgotado deve ser colocado em um recipiente adequado e disposto em centrais adequadas.
Não deve ser, de forma nenhuma, disposto no meio ambiente.

2.1.1 Desmontagem da parte mecânica

A sequência correta é a seguinte:
Esvazie completamente o óleo da bomba, conforme indicado no parág. 2.1.
Separe o cabeçote e o espaçador para camisas do carter da bomba, conforme indicado no parág. 2.2.1 (da Fig. 106 a Fig. 109).
Remova a cobertura de inspeção superior e de inspeção inferior, soltando os 4+4 parafusos de fixação, conforme indicado no parág. 2.2.3 (Fig. 120 e Fig. 121).
Solte os anéis circulares e substitua-os, se for necessário.
Remova os três pistões, mediante chave fixa, conforme indicado no parág. 2.2.3 (Fig. 122).
Remova as três proteções contra respingo completas do anel circular (pos. ① e ②, Fig. 2).

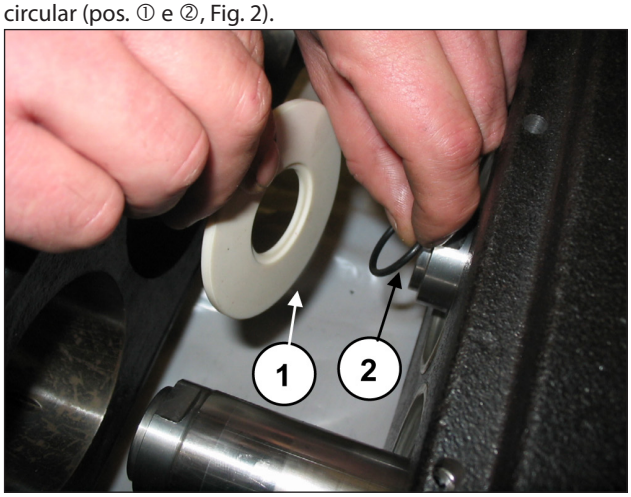


Fig. 2

Solte os grãos de bloqueio M6 das três coberturas da vedação do óleo (pos. ①, Fig. 3).

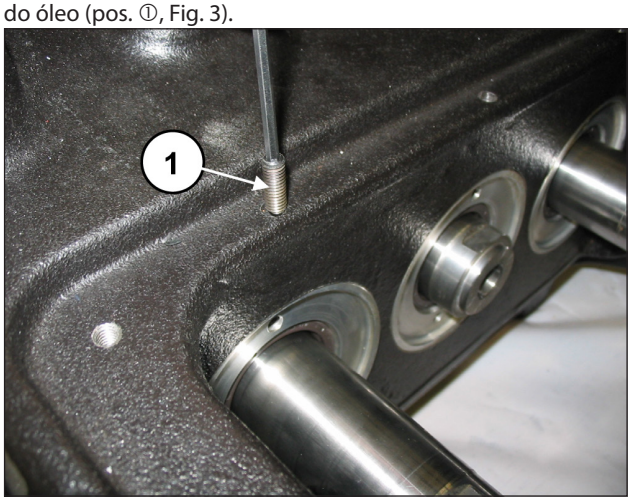


Fig. 3

Extraia as coberturas da vedação do óleo, apertando uma haste rosqueada ou um parafuso M6, com função de extrator nos furos adequados na cobertura (pos. ①, Fig. 4) e extraia as coberturas do grupo da bomba (pos. ①, Fig. 5).

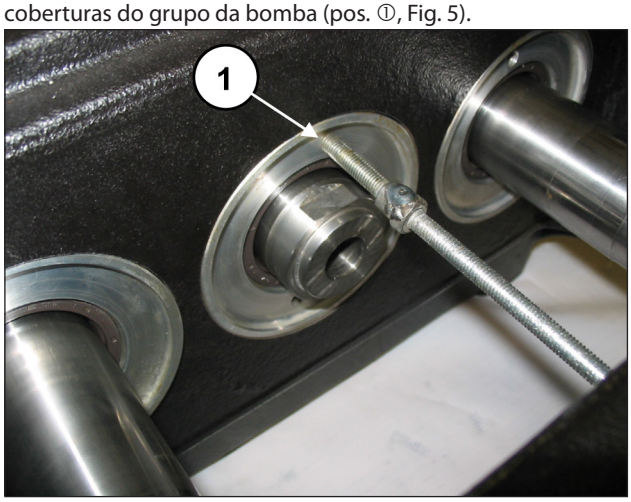


Fig. 4

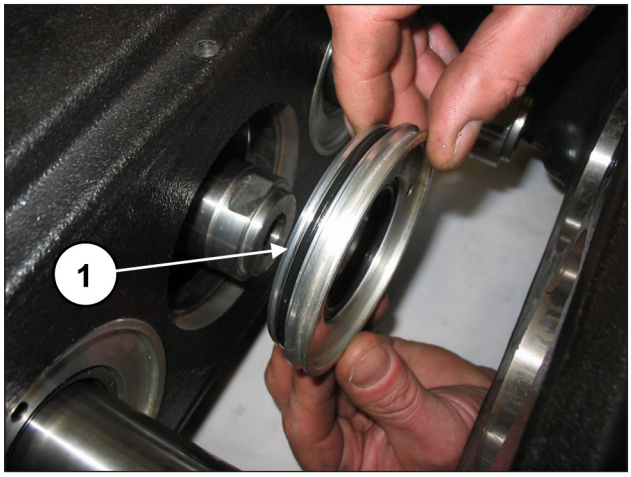


Fig. 5

Extraia o anel de vedação radial (pos. ①, Fig. 6) e o anel circular externo (pos. ①, Fig. 7).

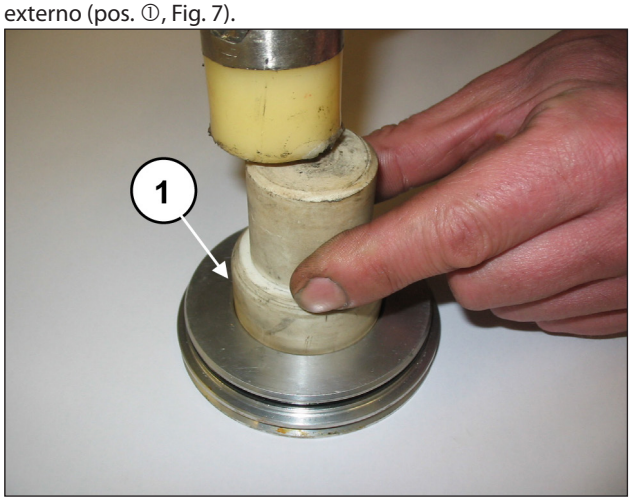


Fig. 6

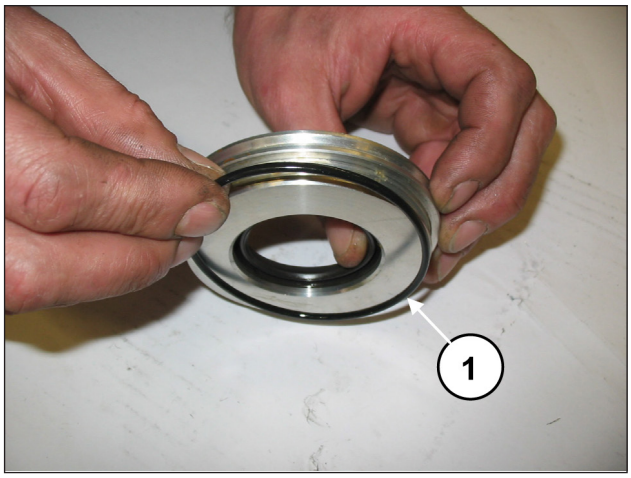


Fig. 7

Remova a lingueta do eixo PTO (pos. ①, Fig. 8).

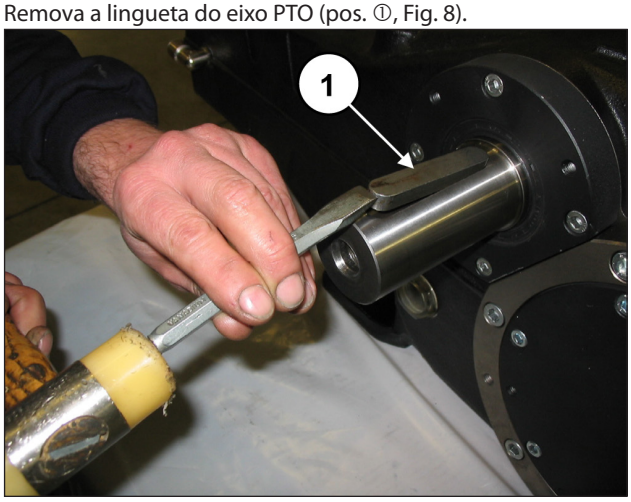


Fig. 8

Solte os parafusos de fixação da cobertura da extremidade do eixo (pos. ①, Fig. 9) e retire a cobertura do eixo PTO.

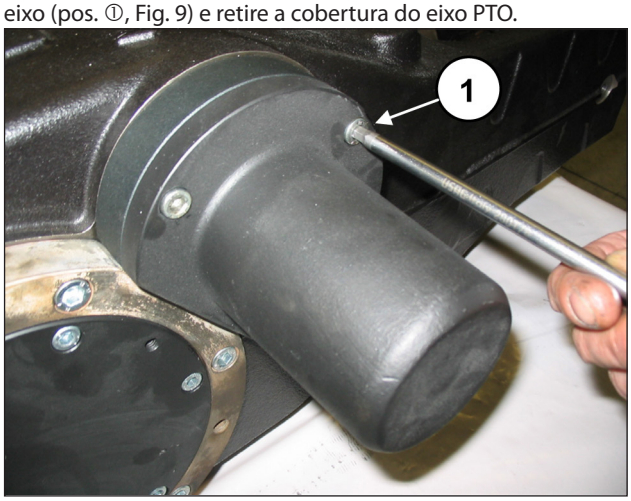


Fig. 9

Solte os parafusos de fixação da cobertura do carter (pos. ①, Fig. 10) e remova-o. Retire o anel circular e substitua-o, se for necessário.

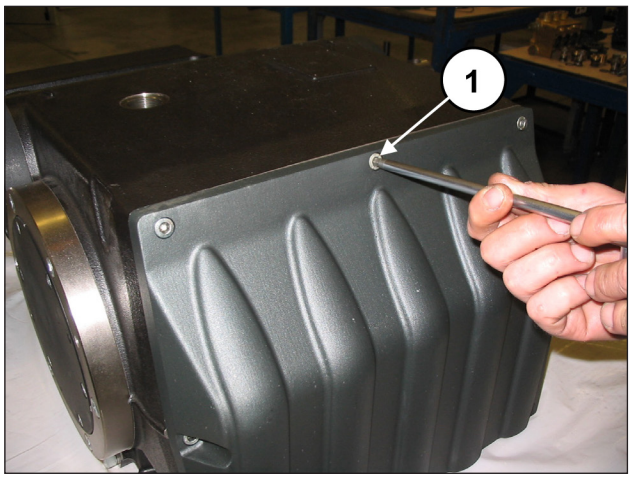


Fig. 10

Proporcione agora a desmontagem das duas coberturas do rolamento, soltando os parafusos relativos (pos. ①, Fig. 11).
Para facilitar a desmontagem, use dois grãos ou parafusos M8 (pos. ①, Fig. 12), com a função de extratores.
Retire o anel circular e substitua-o, se for necessário.

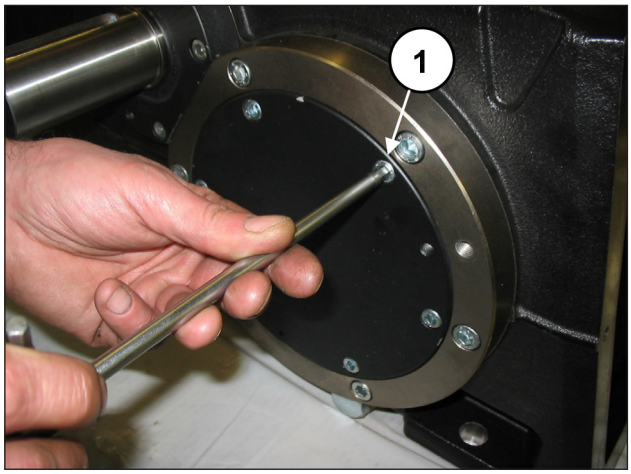


Fig. 11

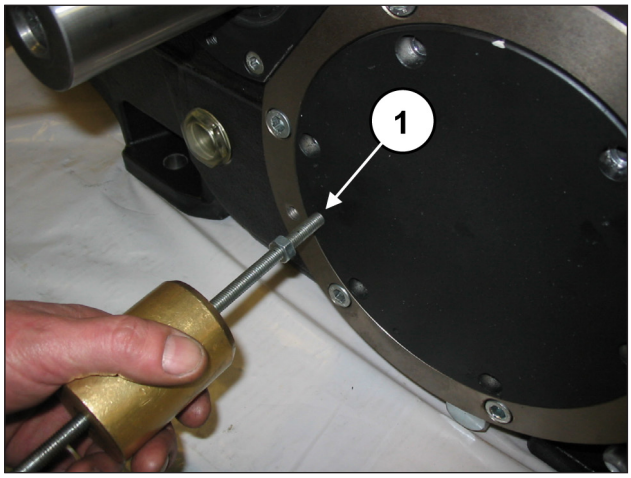


Fig. 12

Insira uma espessura sob o corpo da haste central para bloquear a rotação do eixo de manivela (pos. ①, Fig. 13).

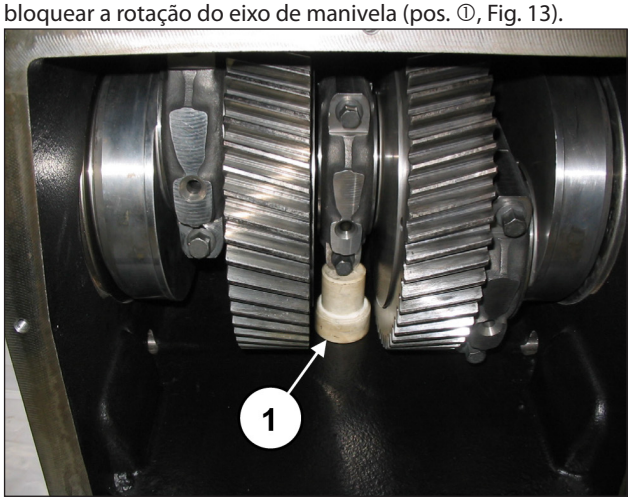


Fig. 13

Solte e extraia os parafusos de fixação da flange de bloqueio da bússola, de ambos os lados (pos. ①, Fig. 14).
A flange de bloqueio da bússola deve ser deixada no local (pos. ①, Fig. 15).

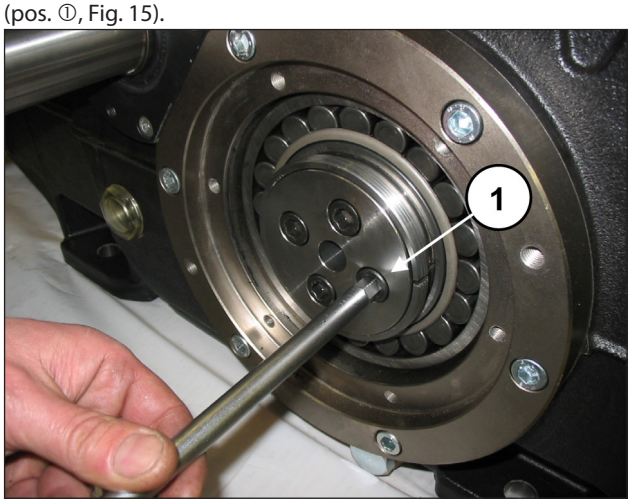


Fig. 14

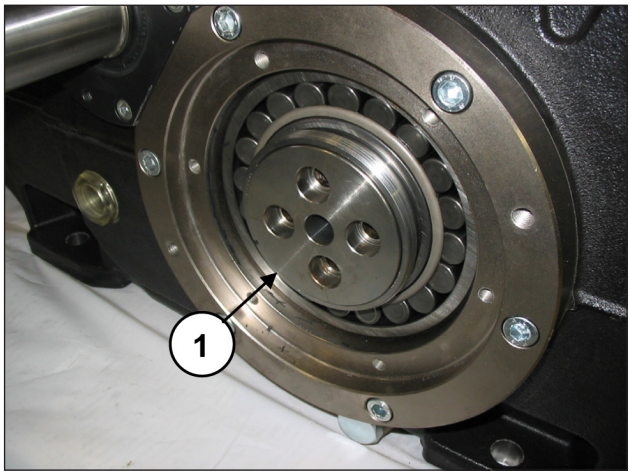


Fig. 15

Se um lado, aperte um anel do tipo SKF KM20 na bússola de pressão (pos. ①, Fig. 16), em seguida, desbloqueie a bússola mediante o mecanismo de percussão (pos. ①, Fig. 17), sem extraí-la.
Repita a operação do lado oposto.

Fig. 16

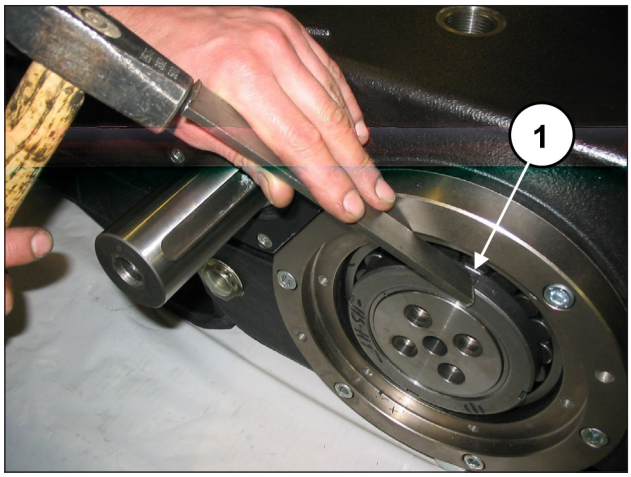


Fig. 17

Retire a espessura sob o corpo da haste central.
Solte os parafusos da haste (pos. ①, Fig. 18).

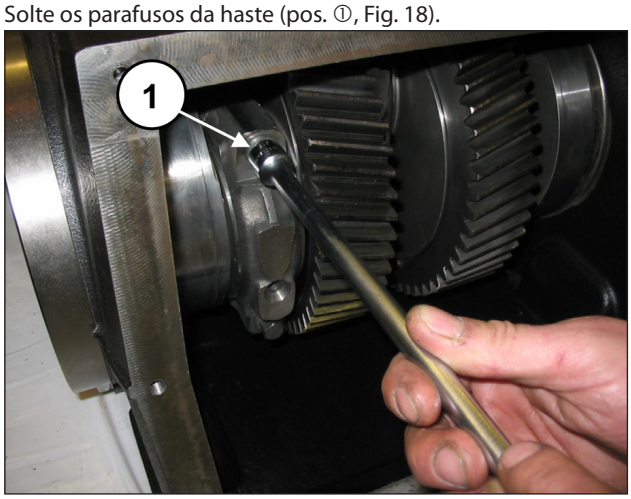
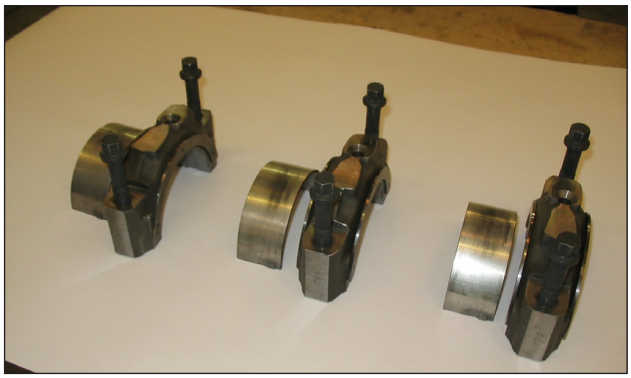


Fig. 18

Desmonte os chapéus da haste com os semi-rolamentos tendo cuidado especial durante a desmontagem, da ordem em que são desmontados.

Os chapéus da haste e as semi-hastes relativas devem ser remontados exatamente na mesma ordem e acoplamento em que foram desmontados.

Para evitar possíveis erros do chapéu e semi-hastes, foram numerados em um lado (pos. ①, Fig. 19).



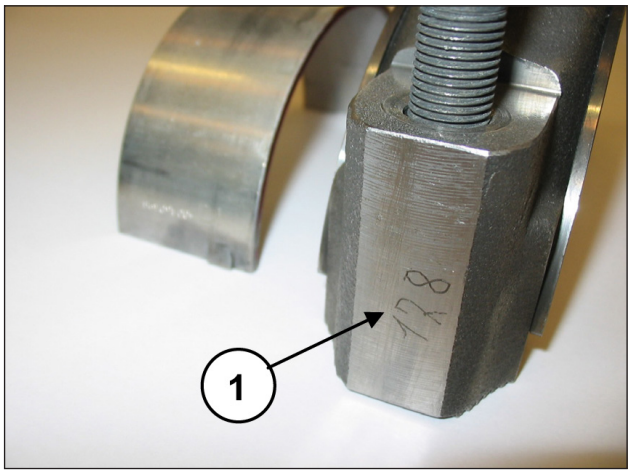


Fig. 19

Avance o máximo possível as três semi-hastes na direção do cabeçote.
Solte os três semi-rolamentos superiores das semi-hastes (pos. ①, Fig. 20).

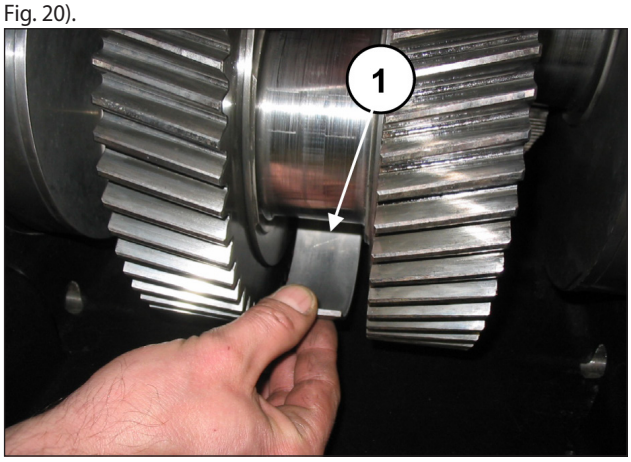


Fig. 20

Retire em ambas as bússolas de pressão (pos. ①, Fig. 21).

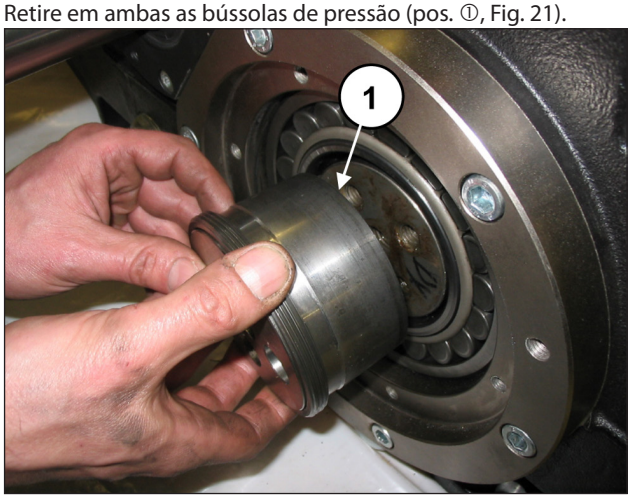


Fig. 21

Separe a flange de bloqueio da bússola de pressão (pos. ①, Fig. 22).

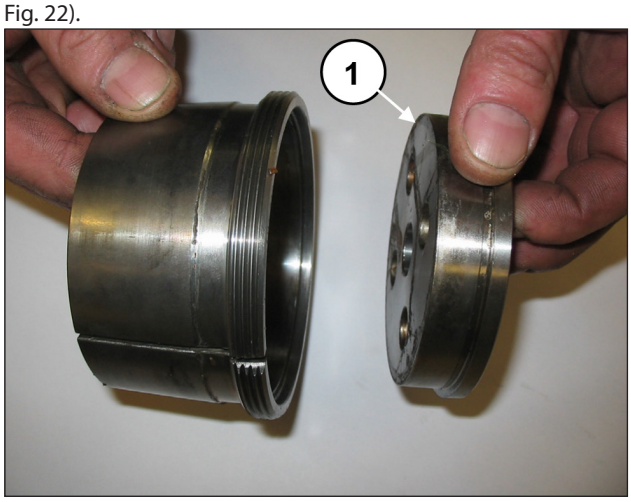


Fig. 22

Solte os parafusos das duas coberturas do porta-rolamento (pos. ①, Fig. 23).

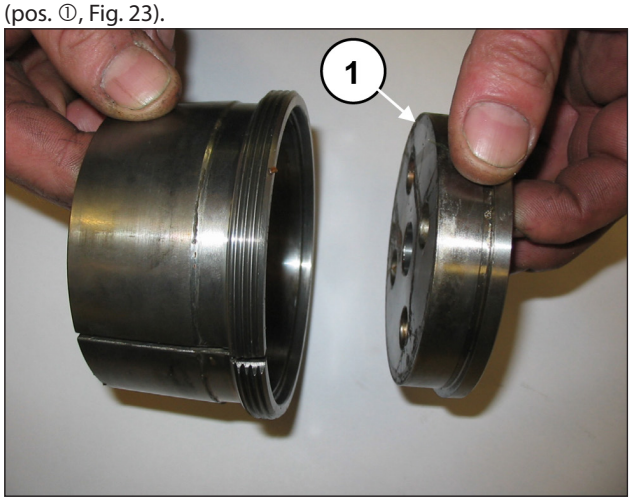


Fig. 23

Aplique um pino rosqueado M16 em uma extremidade do eixo de manivela (pos. ①, Fig. 24) e, mantendo-o elevado, extraia a cobertura do porta-rolamento completo do rolamento e anel circular (pos. ①, Fig. 25). Para agilizar a desmontagem, use dois grãos ou parafusos M10 (pos. ②, Fig. 24), com a função de extratores.
Repita a operação do lado oposto.

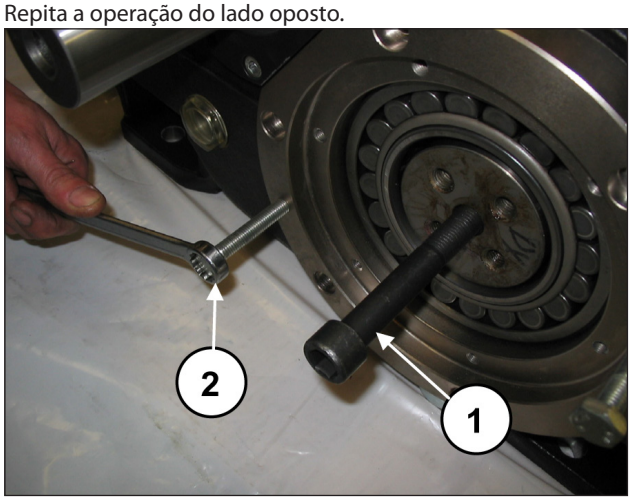


Fig. 24

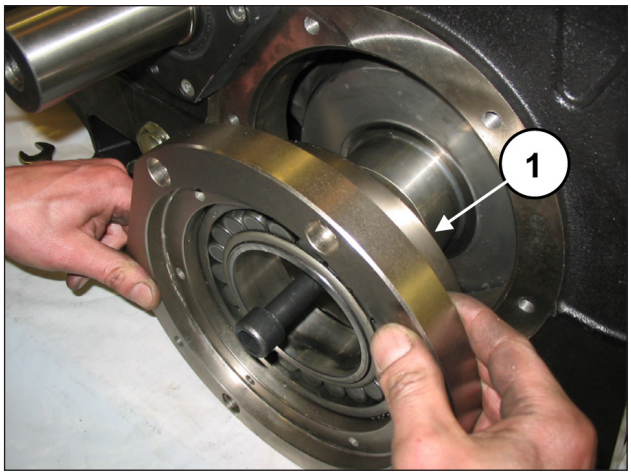


Fig. 25

Apoie o eixo de manivela no fundo do carter.
Separe a cobertura do porta-rolamento do rolamento, mediante o uso de um mecanismo de percussão (pos. ①, Fig. 26).

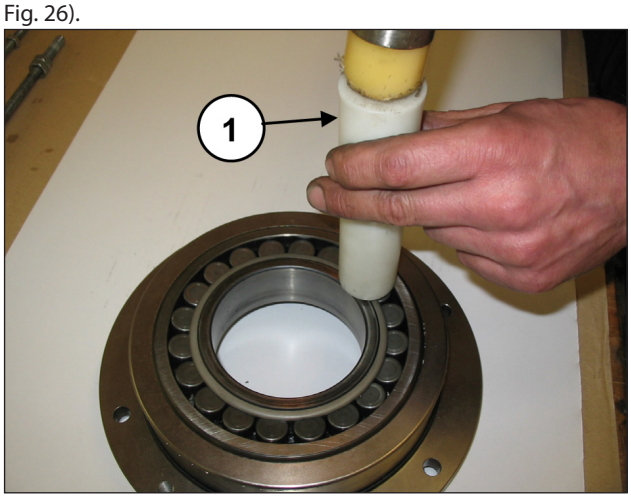


Fig. 26

Solte os parafusos de cobertura do rolamento PTO direito e esquerdo (pos. ①, Fig. 27), e solte as duas coberturas do eixo PTO. Para agilizar a desmontagem, use três grãos ou parafusos M8 (pos. ①, Fig. 28), com a função de extratores.

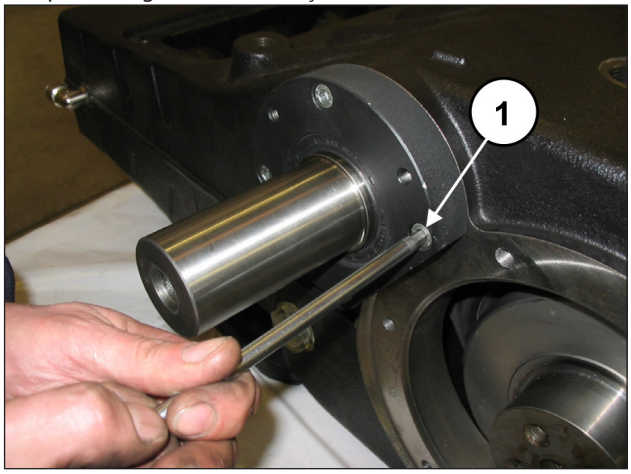


Fig. 27

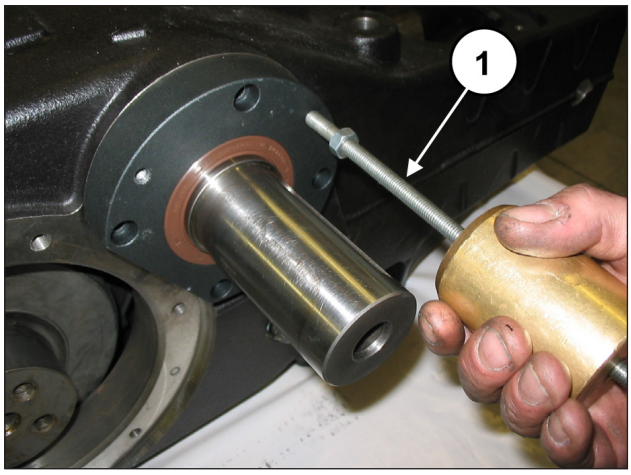


Fig. 28

Extraia o anel de vedação radial (pos. ①, Fig. 29), o anel circular externo (pos. ①, Fig. 30), e o anel circular do furo de lubrificação (pos. ①, Fig. 31).

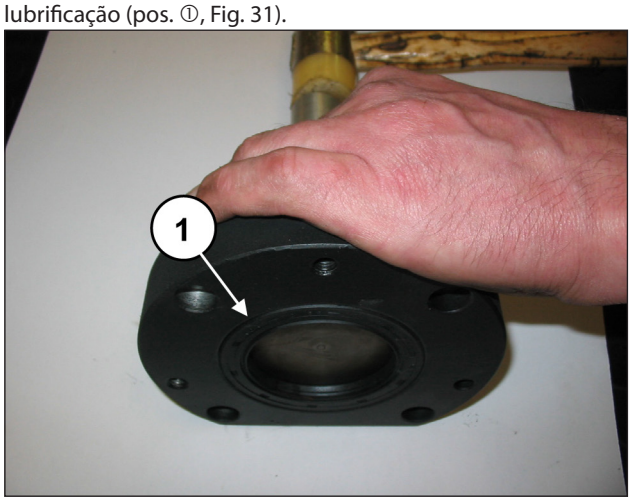


Fig. 29

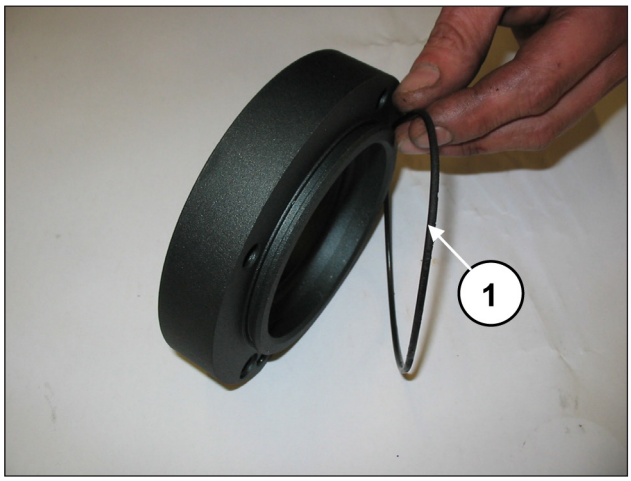


Fig. 30

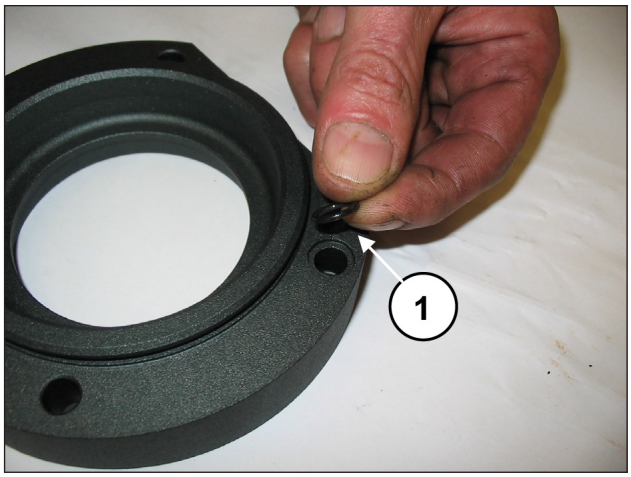


Fig. 31

Volte atrás as três hastes o máximo possível (traga-as em contato com o eixo de manivela).
Mediante o uso de um mecanismo de percussão (pos. ①, Fig. 32), extraia o eixo PTO de qualquer um dos dois lados (pos. ①, Fig. 33).

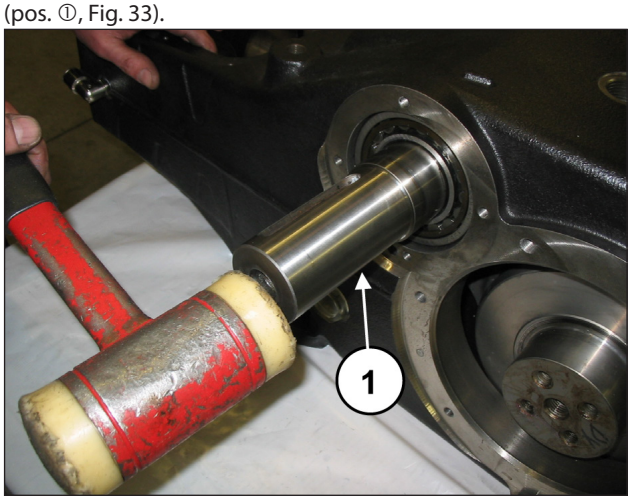


Fig. 32

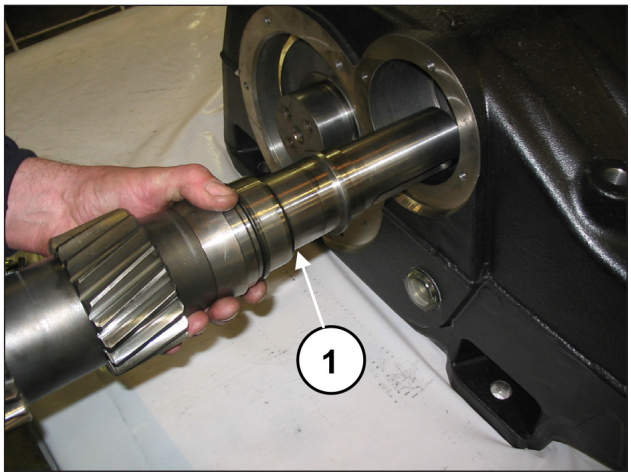


Fig. 33

Solte os anéis internos dos rolamentos do eixo PTO (pos. ①, Fig. 34), e os dois espaçadores do rolamento interno (pos. ②, Fig. 34).

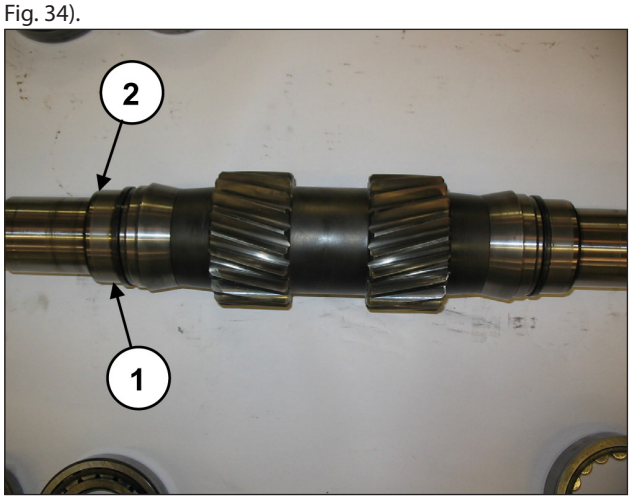


Fig. 34

Os anéis internos e externos dos rolamentos devem ser remontados exatamente na mesma ordem e acoplamento em que foram desmontados.

Mediante o uso de uma barra suficientemente longa (pos. ①, Fig. 36) e de um mecanismo de percussão, extraia do carter da bomba os anéis dos rolamentos (pos. ①, Fig. 36), o espaçador do rolamento externo (pos. ①, Fig. 37) e a bússola de lubrificação dos rolamentos (pos. ①, Fig. 38).

Fig. 35

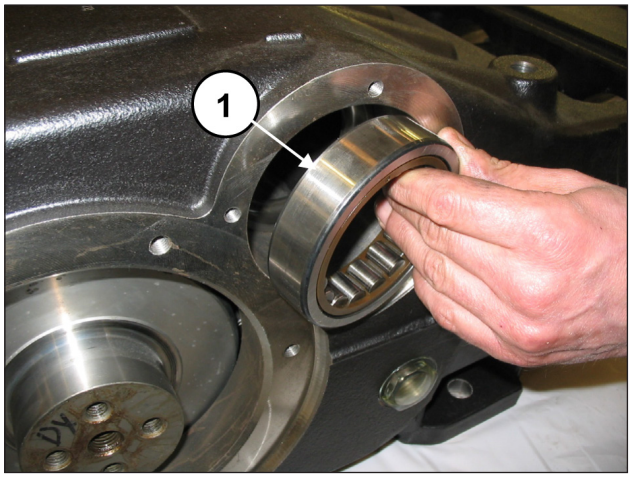


Fig. 36

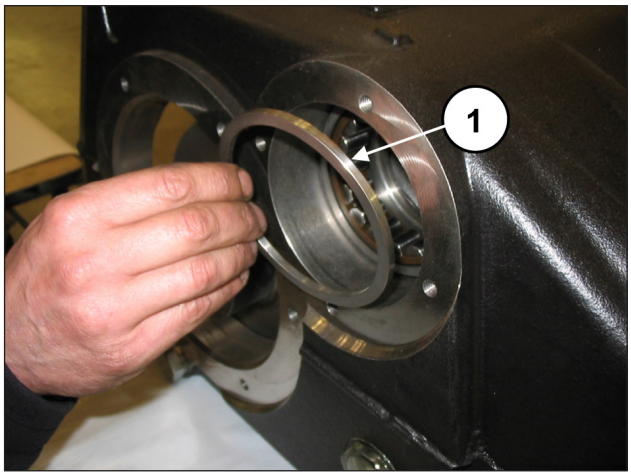


Fig. 37

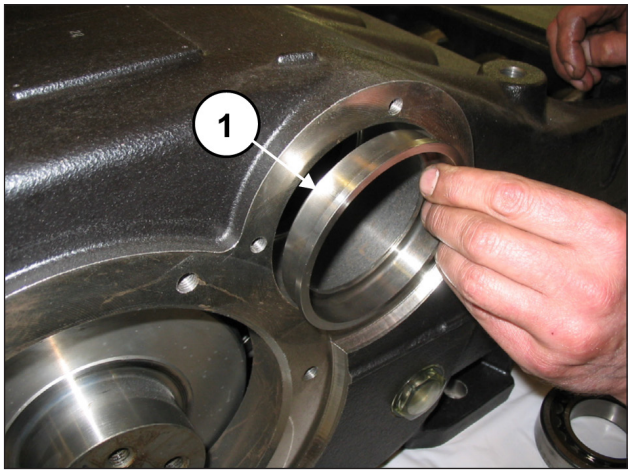


Fig. 38

Avance as semi-hastes na direção da parte hidráulica e bloqueie-as, mediante o uso da ferramenta adequada (cód. 27566200) (pos. ①, Fig. 39).

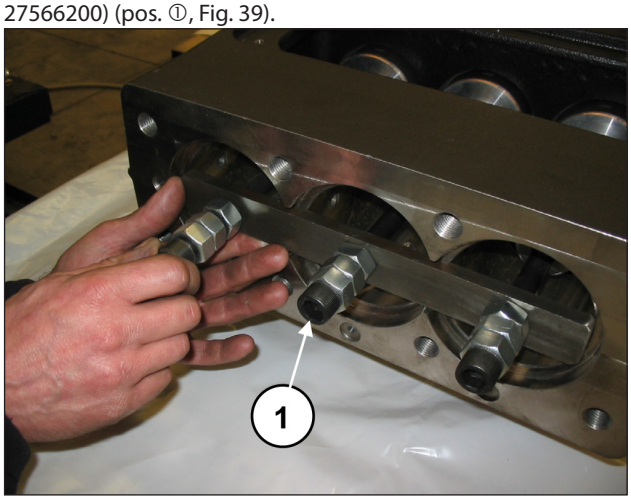


Fig. 39

Retire o eixo de manivela da parte posterior do carter (pos. ① pos. ①, Fig. 40).

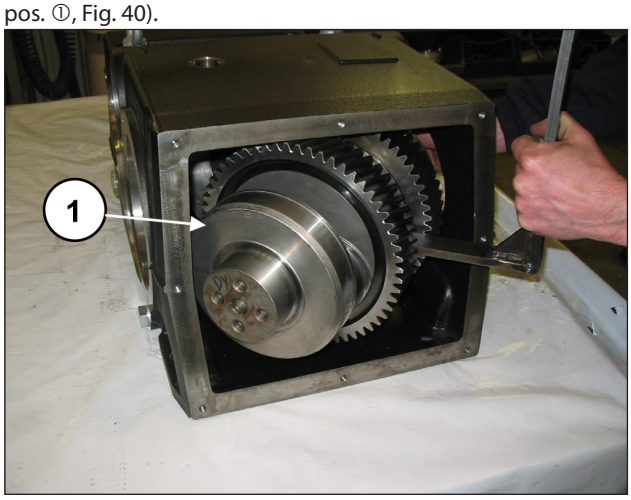


Fig. 40

Prossiga com o desapertar dos parafusos da ferramenta, cód. 27566200, para desbloquear as hastes (pos. ①, Fig. 41) e, em seguida, extraia os grupos da haste-guia do pistão da abertura posterior do carter (pos. ①, Fig. 42).

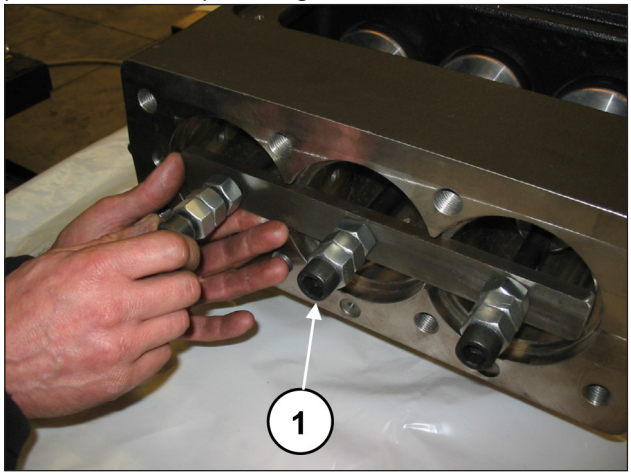


Fig. 41

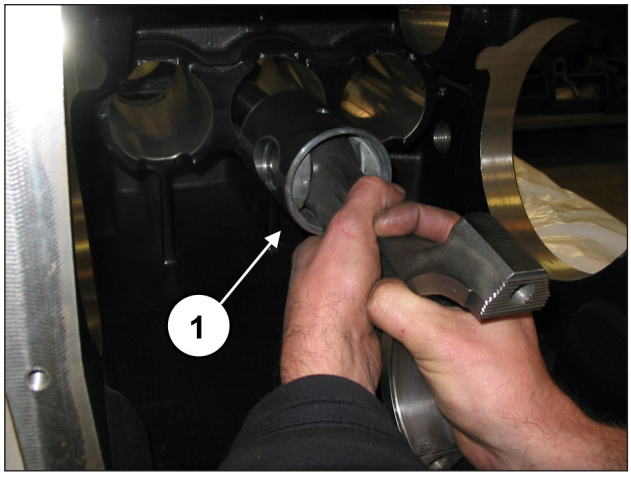
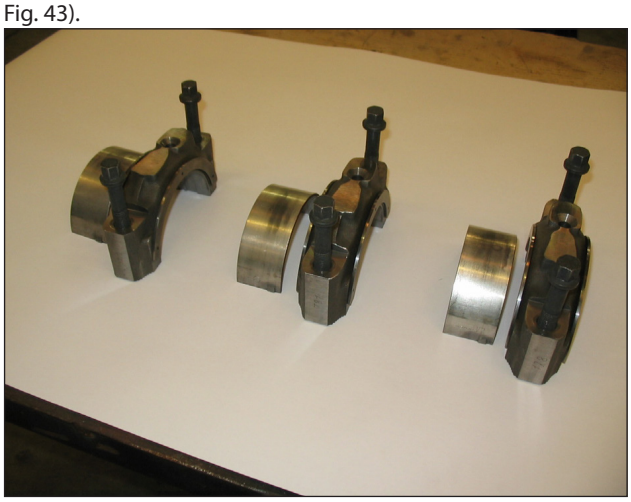


Fig. 42

Acople as semi-hastes aos chapéus anteriormente desmontados, fazendo referência à numeração (pos. ①, Fig. 43).



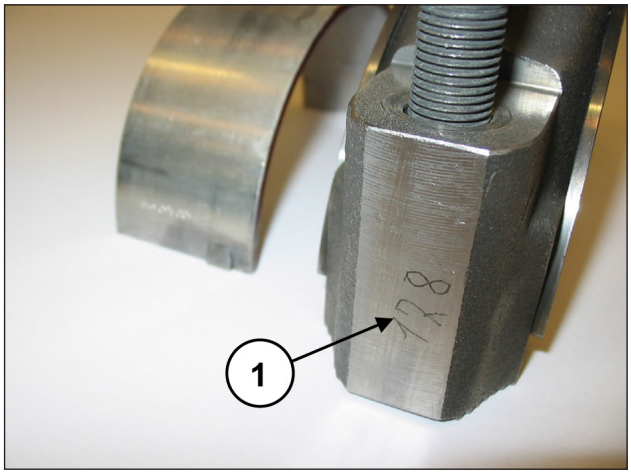


Fig. 43

Remova os dois anéis elásticos de bloqueio do pino, usando uma ferramenta adequada (pos. ①, Fig. 44).

Fig. 44

Solte o pino (pos. ①, Fig. 45) e forneça a extração da haste (pos. ①, Fig. 46).

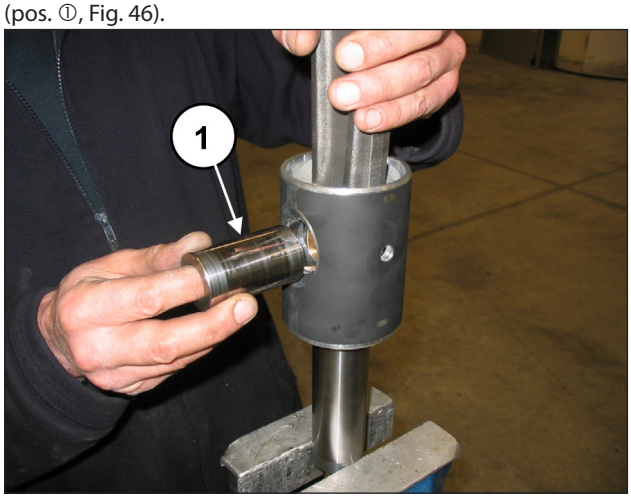


Fig. 45

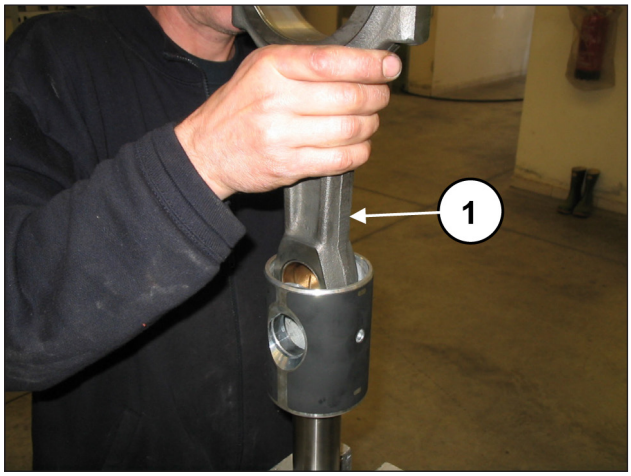


Fig. 46

Para separar a haste da guia do pistão, solte os parafusos do cabeçote cilíndrico M6, mediante a chave especial (pos. ①, Fig. 47).

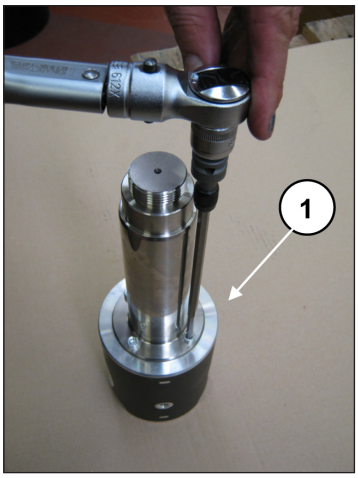


Fig. 47

Complete a desmontagem da parte mecânica, desmontando as duas luzes do nível do óleo, os terminais e a ligação com engate rápido de 90°.

2.1.2 Montagem da parte mecânica

Proceda com a montagem, seguindo o procedimento inverso ao indicado no parág. 2.1.1.
A sequência correta é a seguinte:
Monte as duas luzes do nível do óleo, as duas tampas de descarga do óleo e a ligação com engate rápido de 90° (pos. ①, ② e ③ Fig. 48).

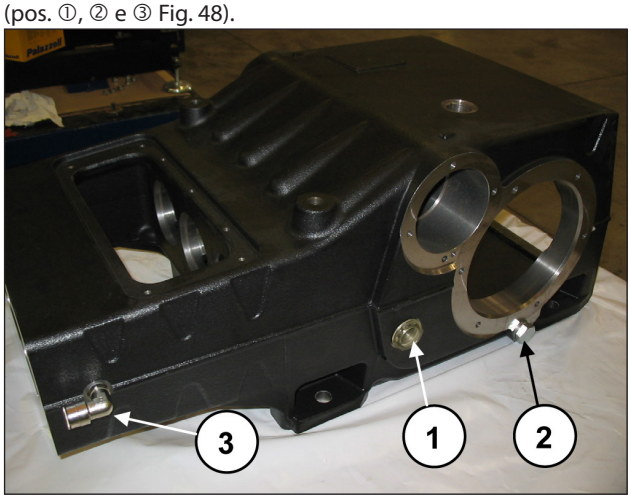


Fig. 48

Monte o mesmo na guia do pistão.
Insira a mesma guia do pistão no local especial da guia do pistão (pos. ①, Fig. 49) e fixe-a a este último com os quatro parafusos do cabeçote cilíndrico M6x20 (pos. ①, Fig. 50).

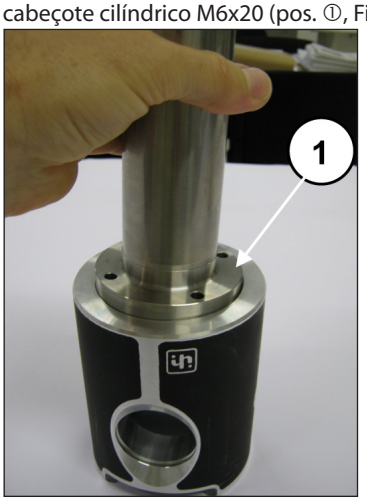


Fig. 49

Fig. 50

Bloqueie a guia do pistão no gancho com ajuda de ferramenta adequada e proceda com a calibragem dos parafusos com chave dinamométrica (pos. ①, Fig. 51), conforme indicado no capítulo 3.

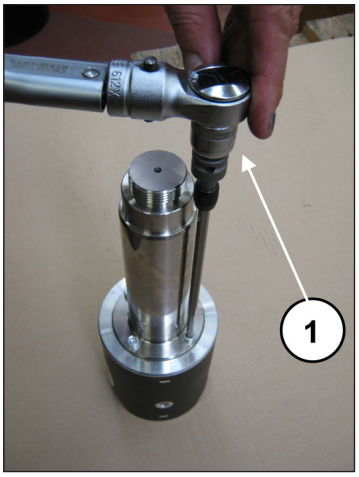


Fig. 51

Insira a haste na guia do pistão (pos. ①, Fig. 46) e, em seguida, insira o pino (pos. ①, Fig. 45). Aplique os dois anéis elásticos do ombro com a ferramenta adequada (pos. ①, Fig. 44).
Separe os chapéus das semi-hastes. O acoplamento correto será garantido pela numeração colocada em um lado (pos. ①, Fig. 43).
Depois de ter verificado a limpeza correta do carter, insira o grupo da semi-haste-guia do pistão no interior das varas do carter (pos. ①, Fig. 42).

A inserção do grupo da semi-haste-guia do pistão no carter deve ser feita orientando as semi-hastes com a numeração visível para cima.

Bloqueie os três grupos da ferramenta adequada, cód. 27566200 (pos. ①, Fig. 41).
Insira o eixo de manivela através da abertura posterior do carter e o apoie no fundo.

A inserção do eixo de manivela no carter deve ser efetuada de modo que os dentes da coroa fiquem voltados, como na Fig. 52.

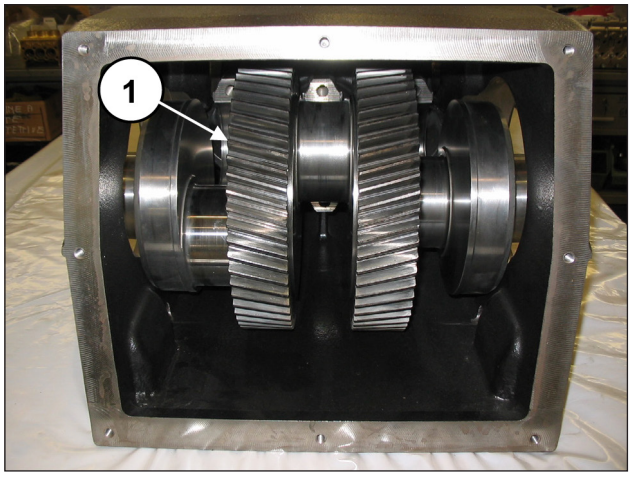


Fig. 52

Pré-monte o eixo PTO:

insira no eixo PTO os dois anéis internos dos rolamentos (um em cada lado) (pos. ①, Fig. 53).

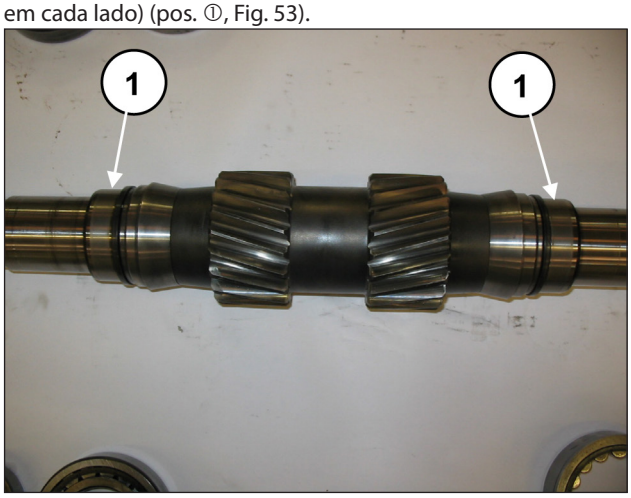


Fig. 53

Os anéis internos e externos dos rolamentos devem ser remontados exatamente na mesma ordem e acoplamento em que foram desmontados.

De um lado do carter, insira a bússola de lubrificação dos rolamentos (pos. ①, Fig. 54), e um anel externo do rolamento (pos. ①, Fig. 55), mediante o uso de uma tampa e do mecanismo de percussão.

Fig. 54

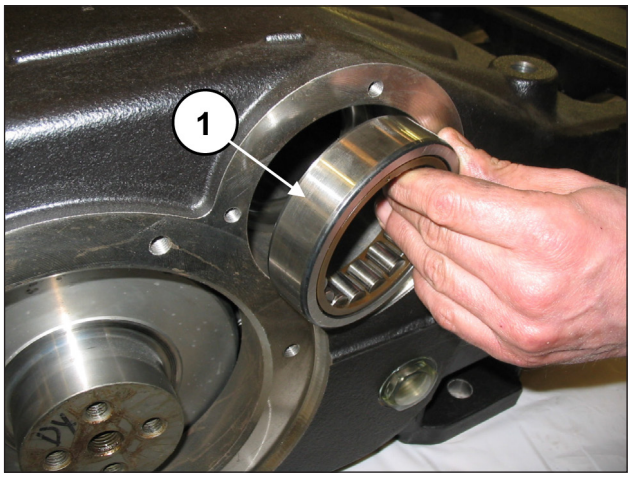


Fig. 55

Remova a ferramenta para o bloqueio da haste, cód. 27566200 (pos. ①, Fig. 41) e deslize as hastes para dentro até entrar em contato com o eixo de manivela.

Insira o eixo PTO pré-montado no interior do carter (pos. ①, Fig. 56), inserindo-o do lado oposto em que foram pré-montados no anel externo do rolamento e a bússola de lubrificação dos rolamentos.

A inserção do eixo PTO no carter deve ser efetuada, de modo que os dentes fiquem voltados como na Fig. 56.

Para agilizar a inserção completa do eixo PTO no interior do rolamento, use um parafuso M16 a aplicar na extremidade do eixo a ser inserido, com o objetivo de manter elevado o mesmo eixo (pos. ①, Fig. 57).

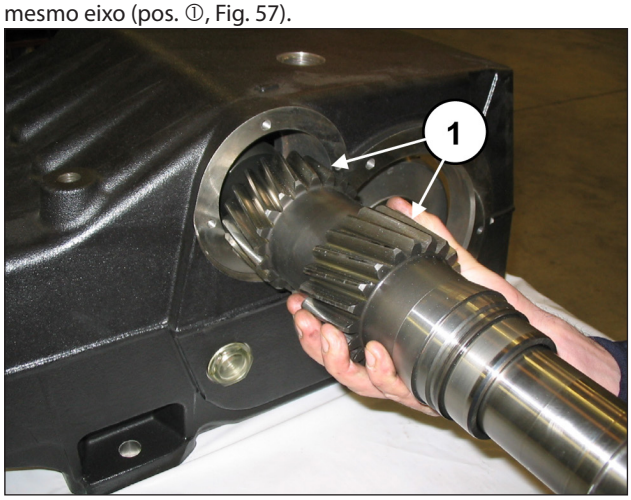


Fig. 56

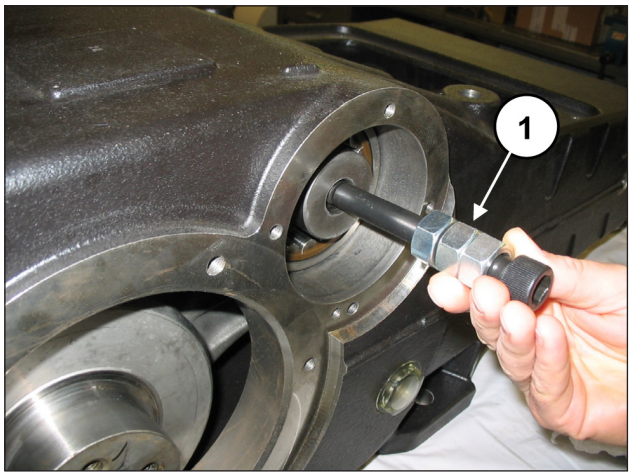


Fig. 57

Do lado em que é inserido o eixo PTO, proceda com a inserção da bússola de lubrificação dos rolamentos (pos. ①, Fig. 58), e de um anel externo do rolamento (pos. ①, Fig. 59), mediante o uso de uma tampa e do mecanismo de percussão.

Fig. 58

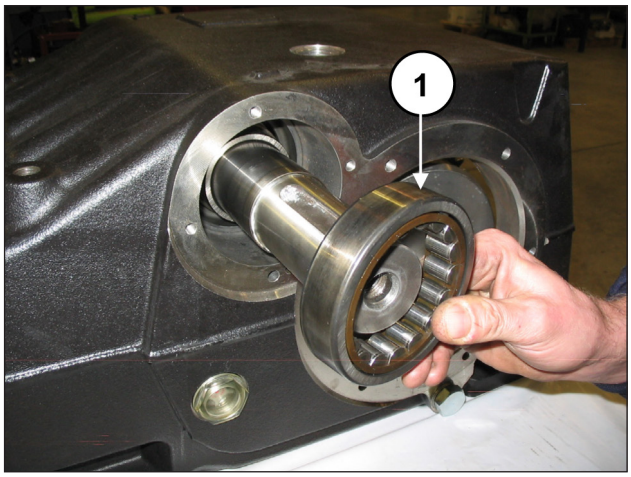


Fig. 59

Enm ambos os lados, insira os espaçadores do rolamento interior (pos. ①, Fig. 60) e exterior (pos. ①, Fig. 61).

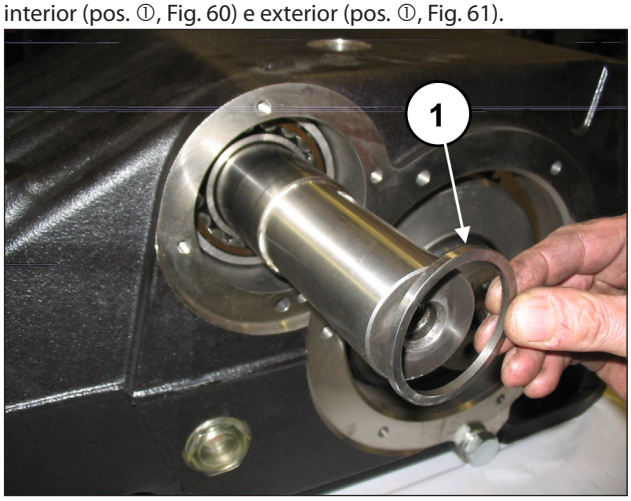


Fig. 60

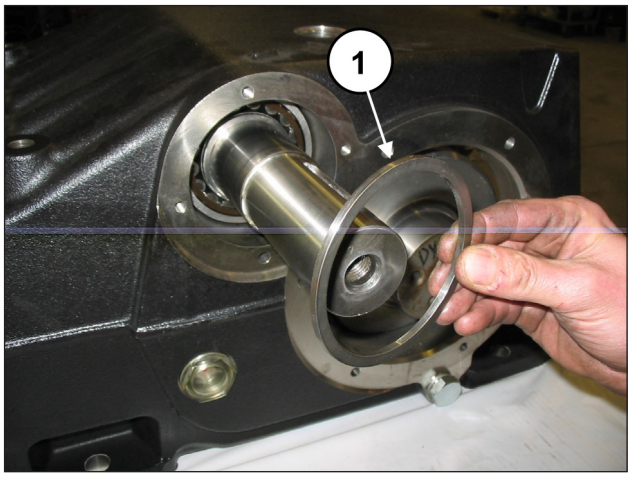


Fig. 61

Insira o anel interno (pos. ①, Fig. 62), e o anel externo (pos. ①, Fig. 63) de um rolamento de somente um lado da bomba.

Fig. 62

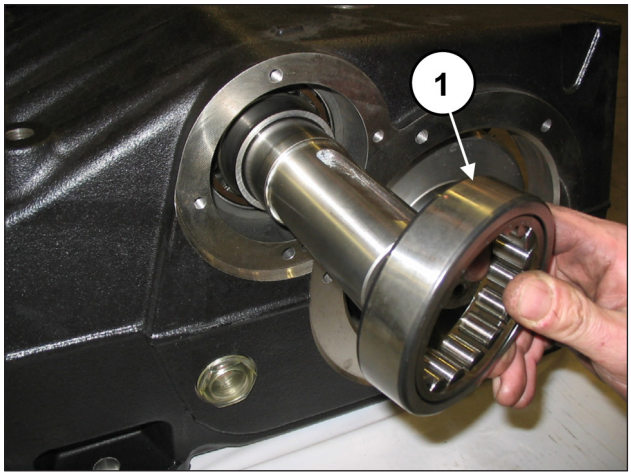


Fig. 63

Pré-monte as coberturas do rolamento PTO direito e esquerdo: Insira o anel de vedação radial no interior da cobertura do rolamento PTO, mediante o uso da ferramenta, cód. 27539500 (pos. ①, Fig. 64).
Antes de proceder com a montagem do anel de vedação radial, verifique as condições da borda de vedação. Se for necessária a substituição, posicione o novo anel, conforme indicado na Fig. 65.

Sempre que o eixo PTO apresentar um desgaste no diâmetro, em relação à borda de vedação, para evitar a operação de retificação, pode-se posicionar o anel na segunda passagem, conforme indicado na Fig. 65.

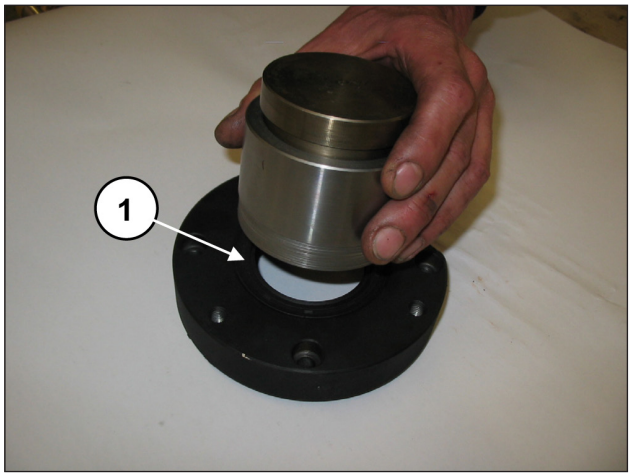


Fig. 64

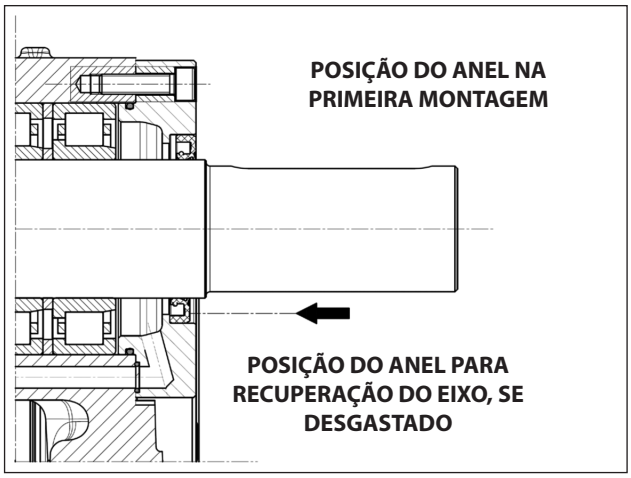


Fig. 65

Aplique o anel circular externo nas coberturas do rolamento PTO (pos. ①, Fig. 66), e o anel circular do furo de lubrificação (pos. ①, Fig. 67).

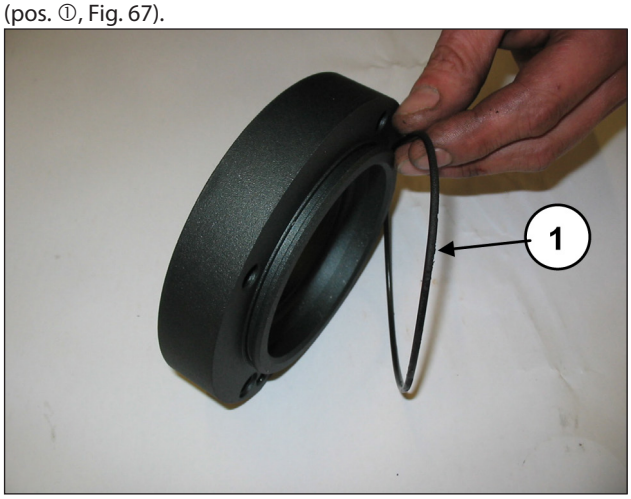


Fig. 66

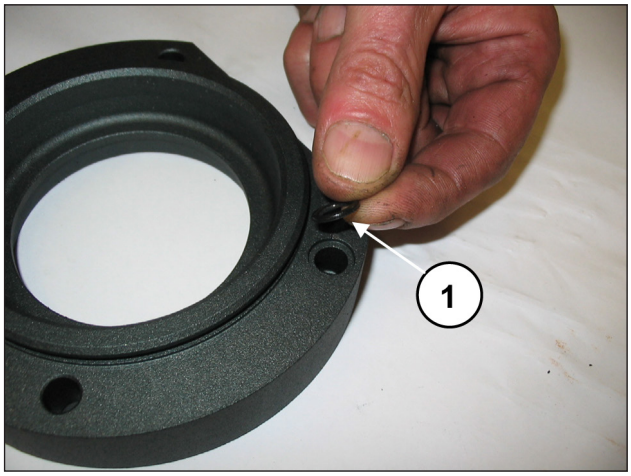


Fig. 67

Monte uma primeira cobertura do rolamento PTO (direito ou esquerdo) no carter da bomba (pos. ①, Fig. 68), e fixe-a mediante quatro parafusos M8x30 (pos. ①, Fig. 69).

Preste atenção para o sentido da montagem da cobertura. O furo de lubrificação da cobertura deve se encontrar em correspondência do furo no carter.

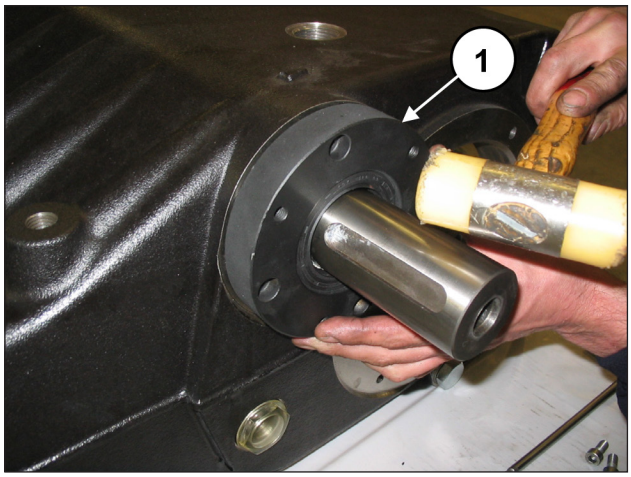


Fig. 68

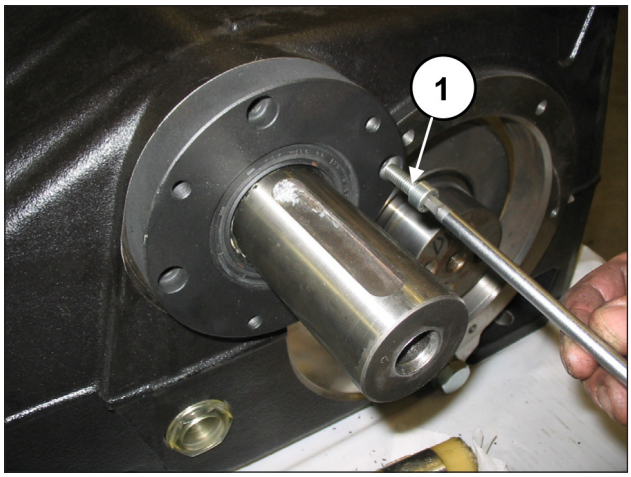


Fig. 69

Repita as operações do lado oposto:
Insira o anel interno (pos. ①, Fig. 62), e o anel externo (pos. ①, Fig. 63) do último rolamento.
Monte a cobertura do rolamento PTO que falta no carter da bomba (pos. ①, Fig. 68), e fixe-a mediante quatro parafusos M8x30 (pos. ①, Fig. 69).
Calibre os 4+4 parafusos com chave dinamométrica, conforme indicado no capítulo 3.
Pré-monte as duas coberturas porta-rolamento:
insira o rolamento, usando um mecanismo de percussão (pos. ①, Fig. 70), até obter uma cota de 4÷4.5 mm, conforme indicado na Fig. 71.

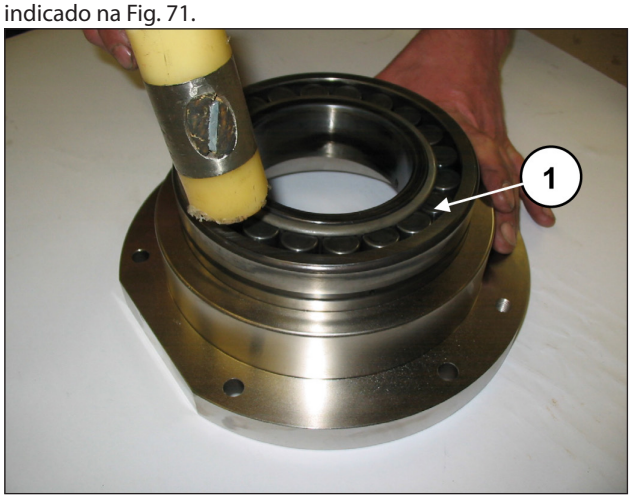


Fig. 70

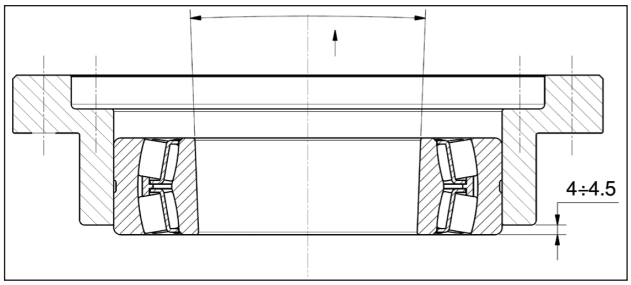


Fig. 71

O rolamento na Fig. 71 tem o anel interno cônico. Verifique se a conicidade esteja na parte interna para permitir a inserção seguinte da bússola.

Aplique o anel circular no exterior da cobertura do porta-rolamento (pos. ①, Fig. 72).

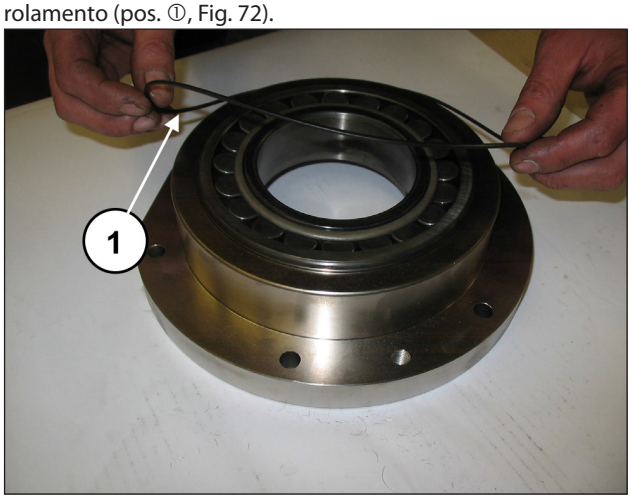


Fig. 72

Repita a operação com outra cobertura.
Bloqueie os três grupos da haste, usando a ferramenta adequada, cód. 27566200 (pos. ①, Fig. 41).
Aplique os dois pinos rosqueados M16 na extremidade do eixo de manivela e, mantendo-os elevados (pos. ①, Fig. 73), insira a cobertura do porta-rolamento completo do rolamento e do anel circular (pos. ①, Fig. 74), mediante o uso de um mecanismo de percussão. Repita a operação do lado oposto

Fig. 73

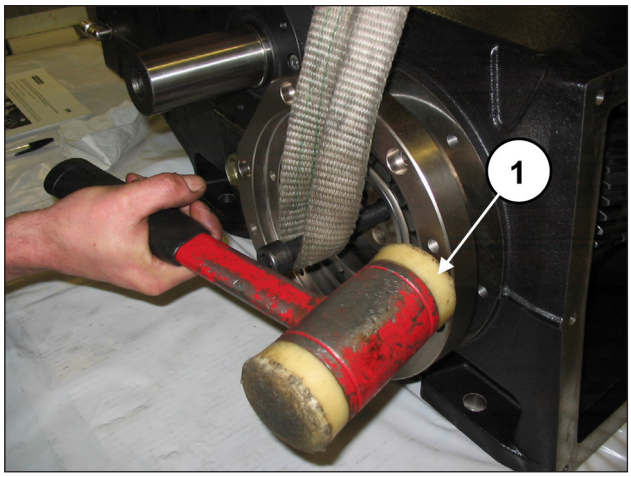


Fig. 74

Aperte as coberturas do porta-rolamento, mediante 6+6 parafusos M10x30 (pos. ①, Fig. 75).
Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

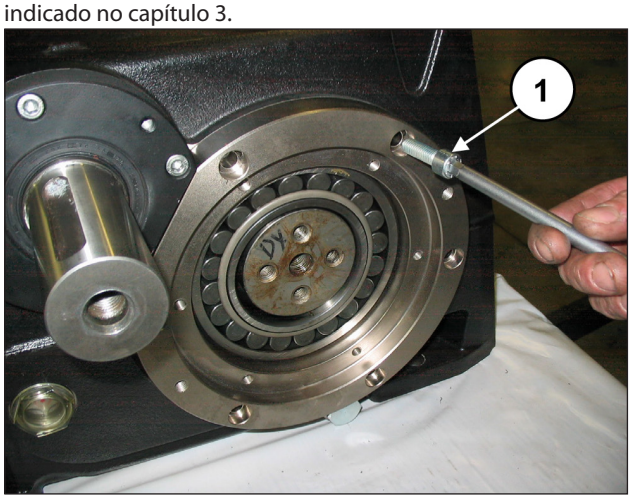


Fig. 75

Insira parcialmente as duas bússolas de pressão, mantendo o mecanismo de percussão elevado, mediante o pino M16 anteriormente montado (pos. ①, Fig. 76).

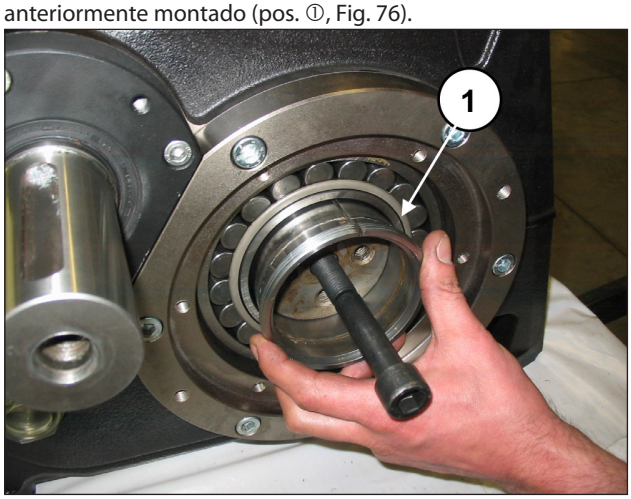


Fig. 76

Insira completamente a bússola de pressão no eixo de manivela (pos. ①, Fig. 77 e Fig. 78), mediante o uso de um mecanismo de percussão e de uma tampa.

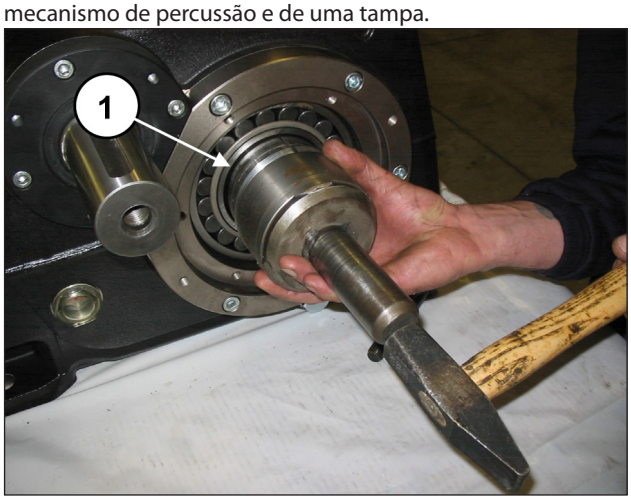


Fig. 77

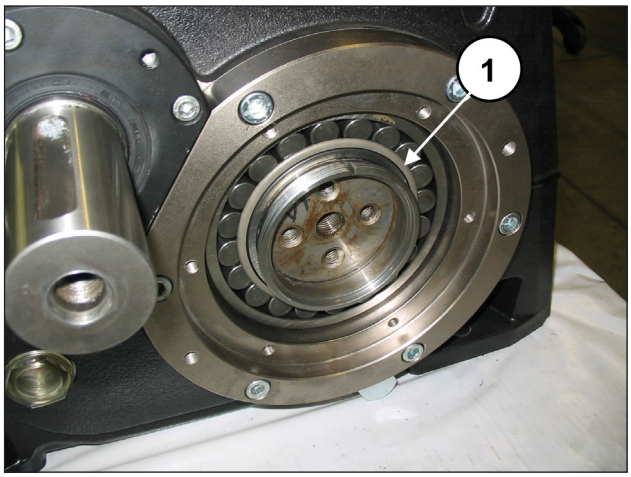


Fig. 78

A inserção da bússola depressão deve ser realizada a seco (sem óleos ou lubrificantes).

Insira a bússola até que a superfície externa (cônica) se acople perfeitamente no interior do rolamento. Durante a inserção, certifique-se de que o rolamento permaneça em contato com o ombro do eixo de manivela.
Repita a operação do lado oposto.
Insira a flange de bloqueio da bússola no interior das bússolas cônicas (pos. ①, Fig. 79).
Aplique um parafuso M16 de comprimento adequado (35-40 mm) no furo M16 do eixo de manivela e aperte até apoiar a flange contra a bússola (pos. ①, Fig. 80). Não aperte os parafusos.

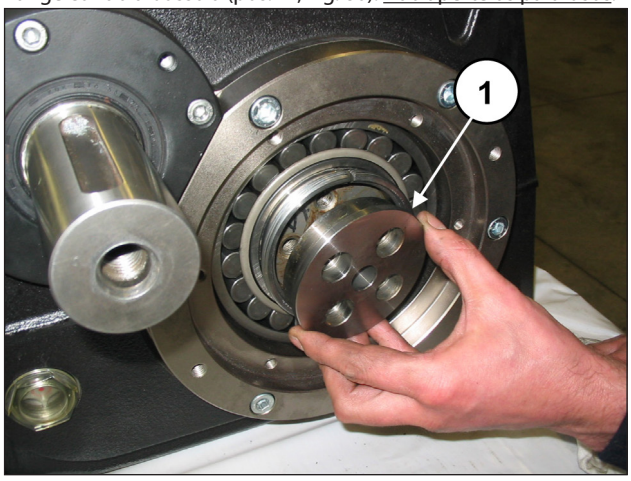


Fig. 79

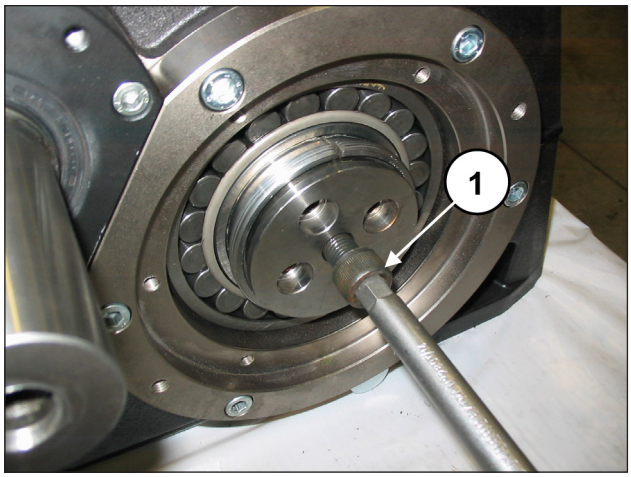


Fig. 80

Repita a operação do lado oposto.
Remova a ferramenta para o bloqueio da haste, cód. 27566200 (pos. ①, Fig. 41).
Insira os semi-rolamentos superiores entre as hastes e o eixo de manivela (pos. ①, Fig. 81).

Para uma montagem correta dos semi-rolamentos, certifique-se de que a lingueta de referência dos semi-rolamentos esteja posicionada na caixa adequada sobre a semi-haste (pos. ①, Fig. 82).

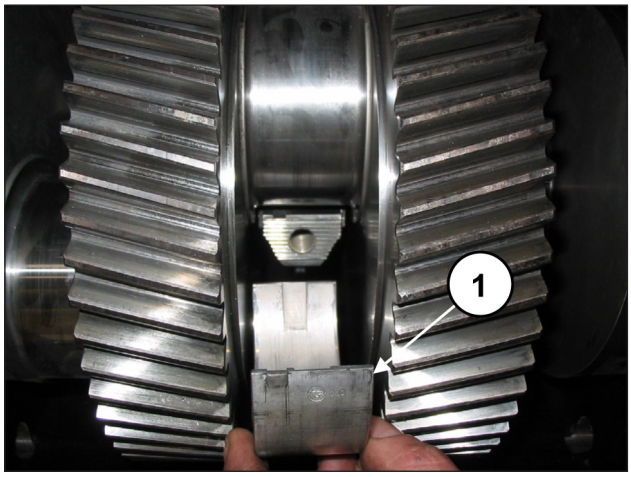


Fig. 81

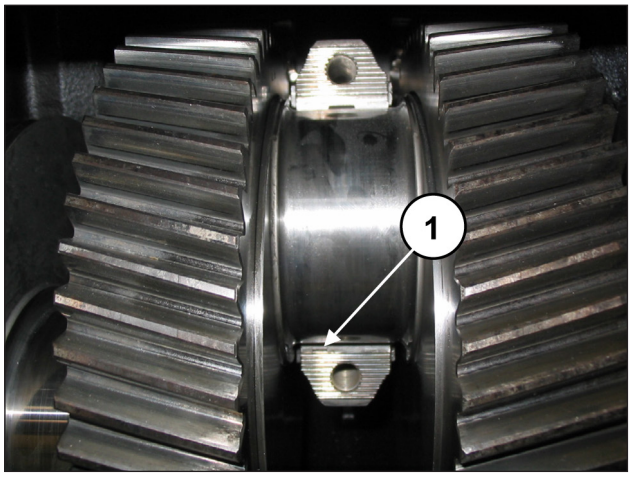


Fig. 82

Aplique os semi-rolamentos inferiores aos chapéus (pos. ①, Fig. 83), certificando-se que a lingueta de referência dos semi-rolamentos esteja posicionada na caixa sobre o chapéu (pos. ②, Fig. 83).
Fixe os chapéus nas semi-hastes mediante os parafusos M12x1.25x87 (pos. ①, Fig. 84).
Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3, trazendo os parafusos ao torque de aperto simultaneamente.

Preste atenção na direção correta da montagem dos chapéus. A numeração deve ser virada para cima.

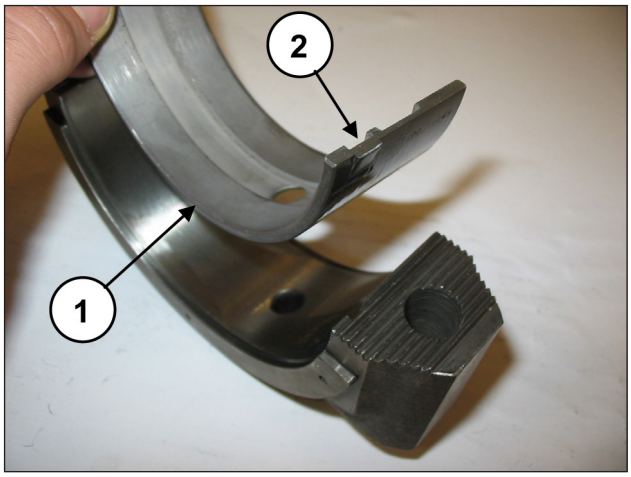


Fig. 83

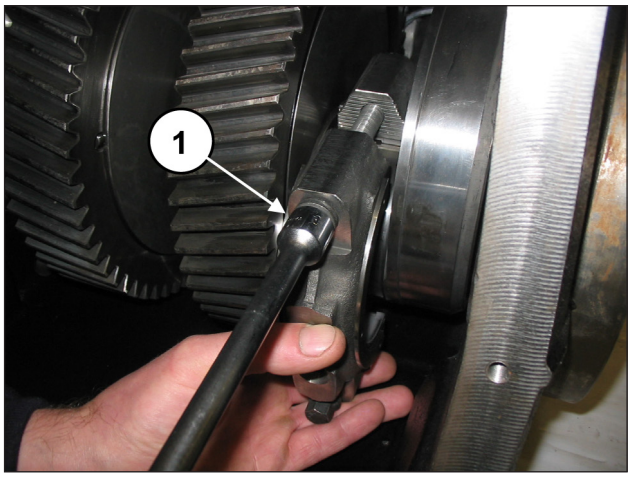


Fig. 84

Insira uma espessura sob o corpo da haste central para bloquear a rotação do eixo de manivela (pos. ①, Fig. 85).

Fig. 85

Meça a cota "X", indicada na Fig. 86 entre a bússola cônica e o rolamento do eixo de manivela.

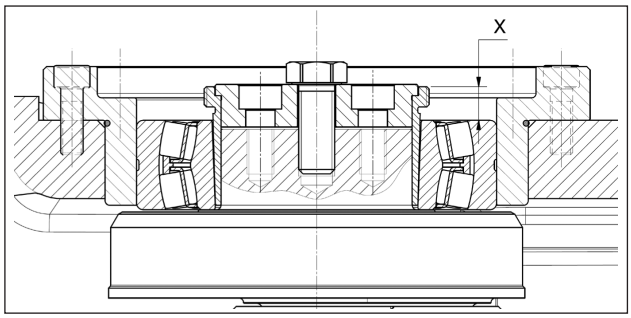


Fig. 86

Solte o parafuso M16, até determinar uma redução da cota "X", entre 0.7 e 0.8 mm (Fig. 87).

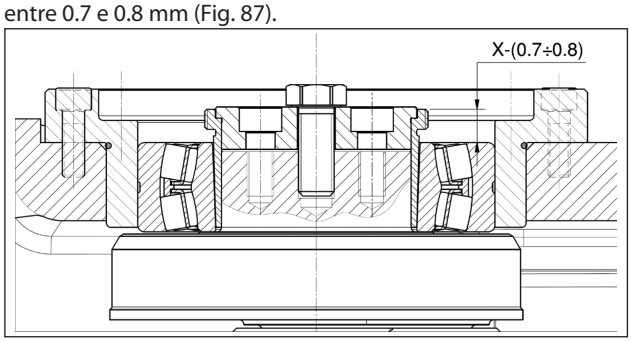


Fig. 87

Repita a operação do lado oposto.
Remova o parafuso M16 do eixo de manivela.
Solte as duas flanges de bloqueio do eixo de manivela, mediante 4+4 M12x25 (pos. ①, Fig. 89).

Aplique o LOCTITE 243 nas roscas dos parafusos M12x25 (pos. ①, Fig. 88).

Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

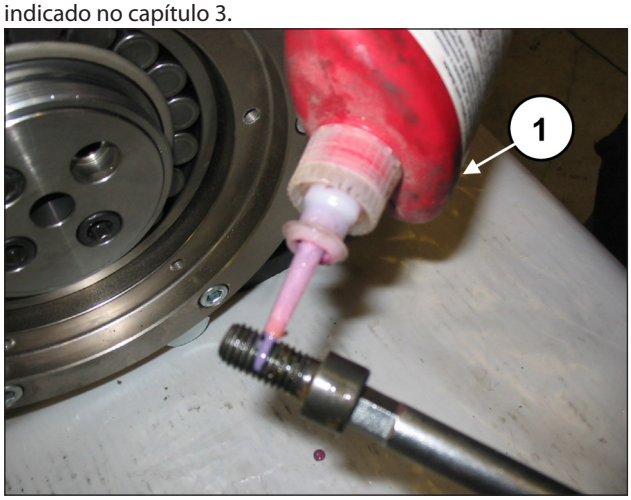


Fig. 88

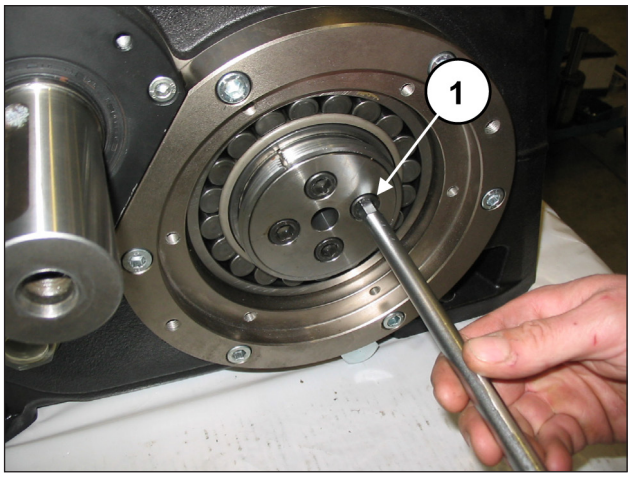


Fig. 89

Remova a espessura anti-rotação sob o corpo da haste central.
Monte as duas coberturas do rolamento (com anel circular relativo) (pos. ①, Fig. 90), mediante 6+6 parafusos M8x20 (pos. ①, Fig. 91).
Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

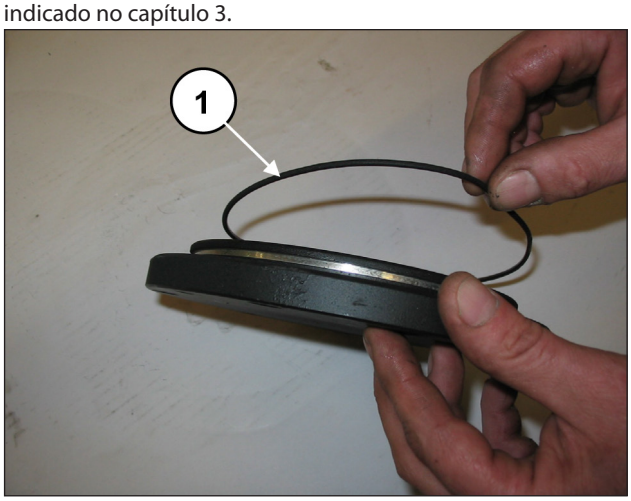


Fig. 90

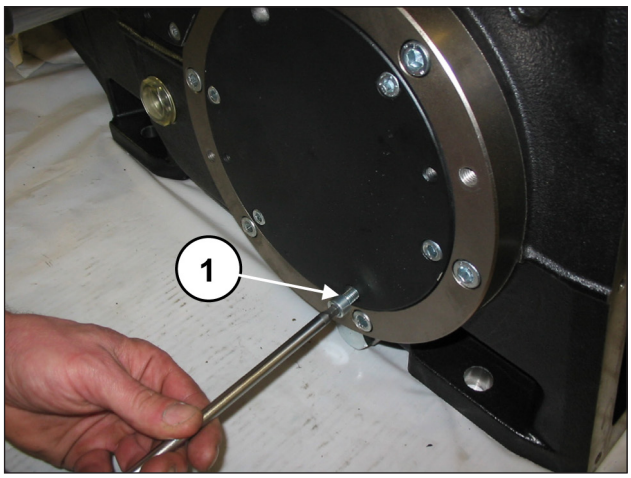


Fig. 91

Insira o anel circular na cobertura posterior (pos. ①, Fig. 92), e fixe-os no carter, mediante 10 parafusos M8x20 (pos. ①, Fig. 93).
Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

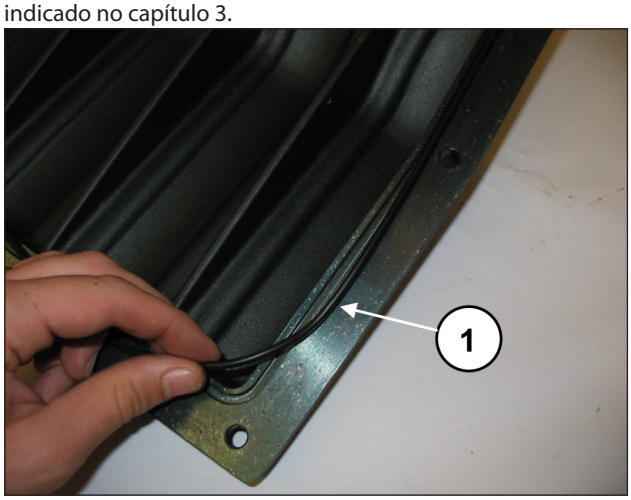


Fig. 92

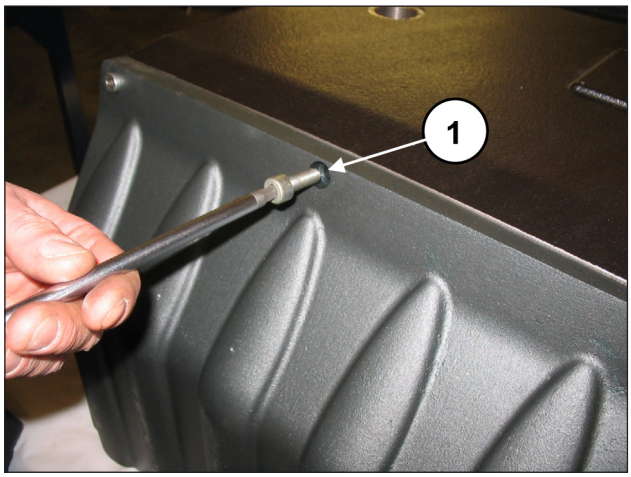


Fig. 93

Monte o anel de vedação radial na cobertura da vedação do óleo (pos. ①, Fig. 94), mediante o uso de uma tampa, cód. 27910900.

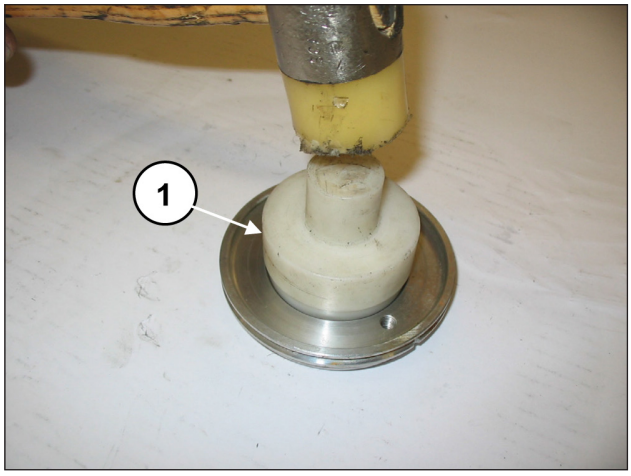


Fig. 94

Posicione o anel circular (pos. ①, Fig. 95) no local da cobertura da vedação do óleo e insira o grupo montado no interior do carter no local adequado (pos. ①, Fig. 96).

Fig. 95

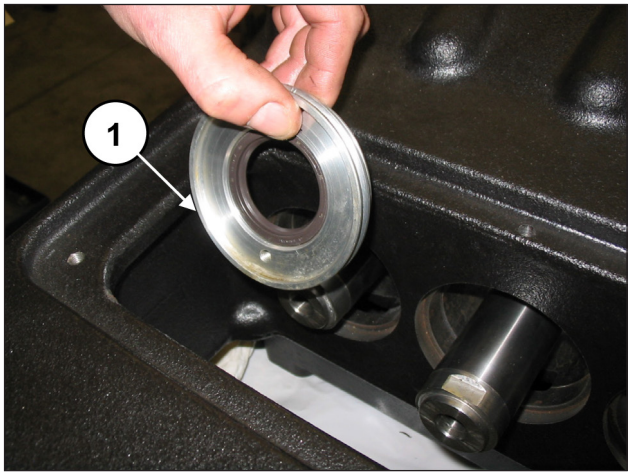


Fig. 96

Certifique-se de que a cobertura entre completamente no local (pos. ①, Fig. 97), prestando atenção para não danificar a borda do anel de vedação radial. Solte as coberturas da vedação do óleo, mediante dois grãos M6x30 (pos. ①, Fig. 98).

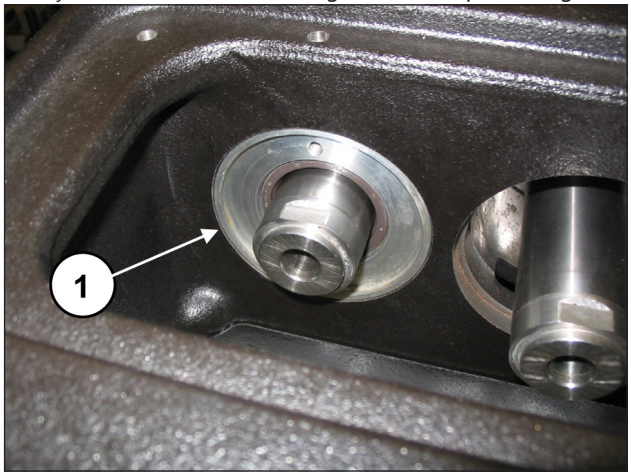


Fig. 97

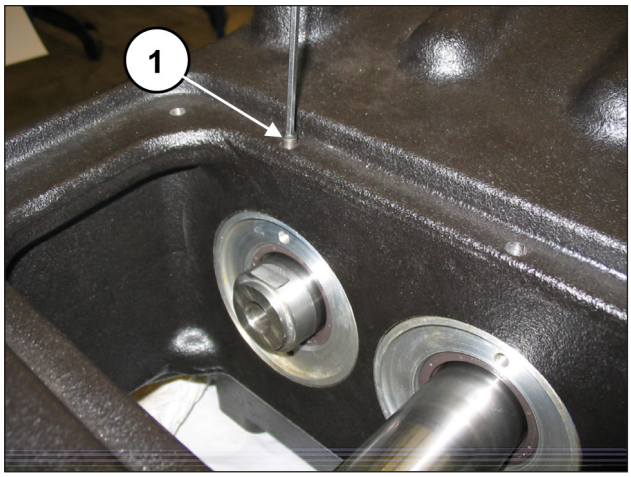


Fig. 98

Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.
Posicione a proteção contra respingos completa do anel circular no compartimento da guia do pistão (pos. ①, Fig. 99 e Fig. 100).

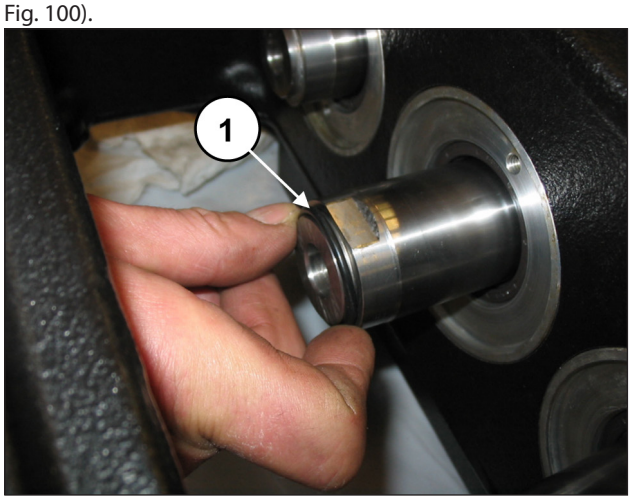


Fig. 99

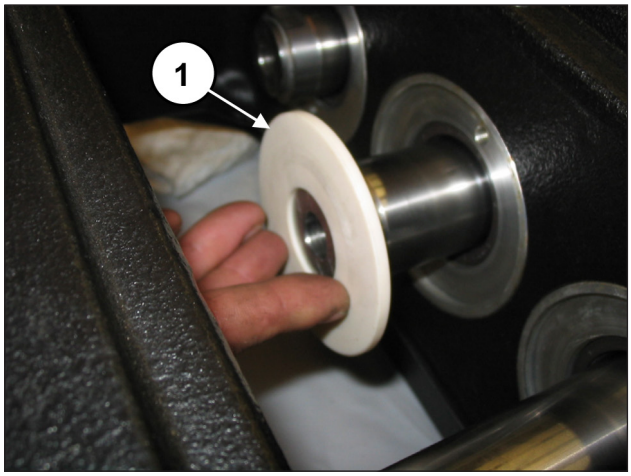


Fig. 100

Aperte dos três pistões (pos. ①, Fig. 101) e calibre mediante a chave fixa dinamométrica, conforme indicada no capítulo 3.

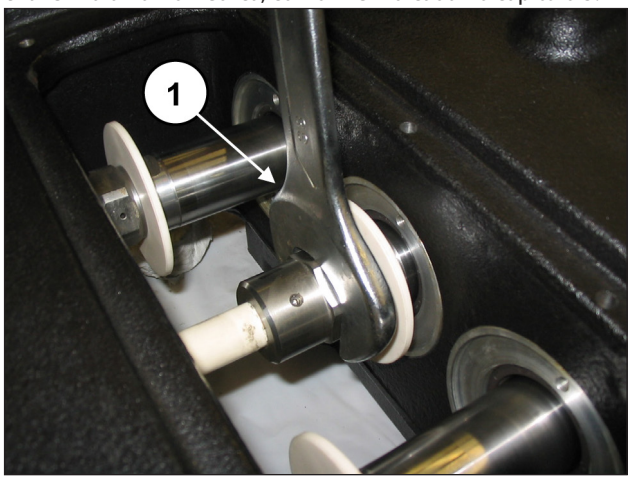


Fig. 101

Nas duas coberturas, inspecione a inserção do anel circular (pos. ①, Fig. 102) e monte as coberturas mediante o uso de 4+4 parafusos M6x14 (pos. ①, Fig. 103).

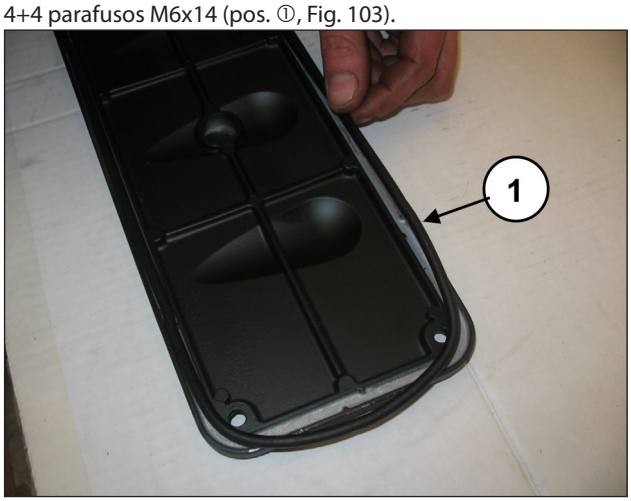


Fig. 102

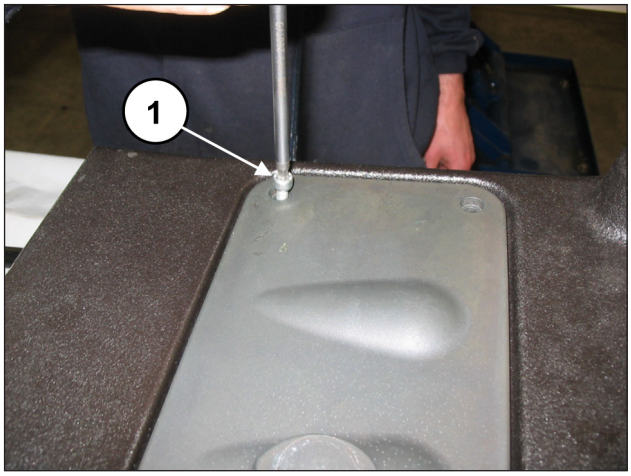


Fig. 103

Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

Monte a cobertura da extremidade do eixo e fixe-a no carter, mediante três parafusos M8x20 (pos. ①, Fig. 104).
Calibre os parafusos com chave dinamométrica, conforme indicado no capítulo 3.

Fig. 104

Aplique a lingueta no eixo do PTO (pos. ①, Fig. 105).

Fig. 105

2.1.3 Classes de aumento previstas

TABELA DE AUMENTO PARA O EIXO DE MANIVELA E SEMI-ROLAMENTOS DA HASTE			
Classe de recuperação (mm)	**Código do semi-rolamento superior**	**Código do semi-rolamento inferior**	**Correção do diâmetro do pino do eixo (mm)**
0.25	90931100	90930100	Ø92.75 0/-0.03 Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø92.50 0/-0.03 Ra 0.4 Rt 3.5

TABELA DE AUMENTO PARA O CARTER DA BOMBA E GUIA DO PISTÃO		
Classe de recuperação (mm)	**Código da guia do pistão**	**Correção do local do carter da bomba (mm)**
1.00	79050543	Ø81 H6 +0.022/0 Ra 0.8 Rt 6

2.2 REPARAÇÃO DA PARTE HIDRÁULICA

2.2.1 Desmontagem do cabeçote - camisas - válvulas

O cabeçote não precisa de manutenção periódica.
As intervenções são limitadas à inspeção ou substituição da válvula, quando necessário.
Para a extração dos grupos da válvula, opere como mostra a seguir:
Solte, sem remover, os parafusos M10x140 de fixação das camisas do cabeçote (pos. ①, Fig. 106), de modo a ficarem livres.

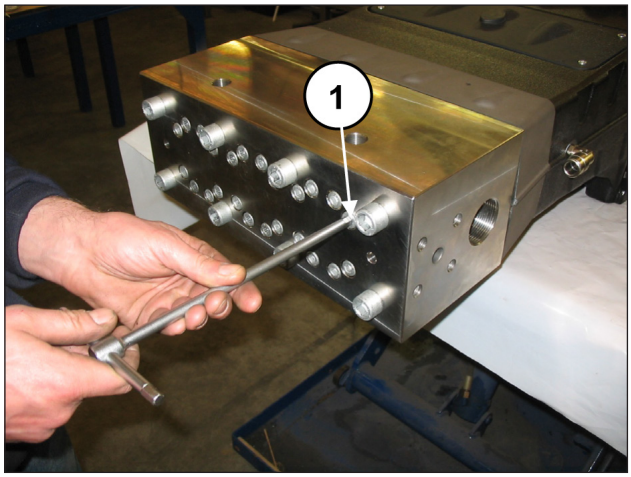


Fig. 106

Solte dois parafusos de fixação do cabeçote M16x280 de forma diametral oposta (pos. ① e ②, Fig. 107), substituindo-os com dois parafusos-pino de serviço (cód. 27540200) (pos. ①, Fig. 108), e assim, proceda com a remoção dos parafusos restantes.

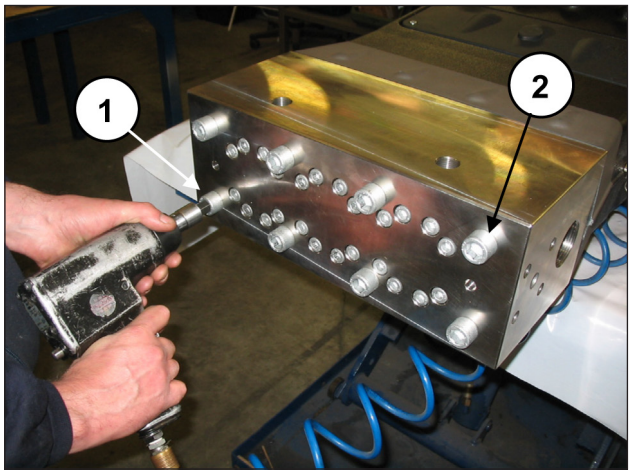


Fig. 107

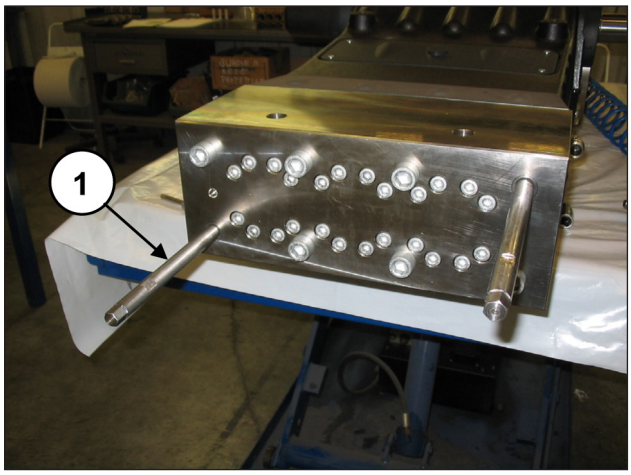


Fig. 108

Separe o cabeçote e o espaçador para camisas do carter da bomba (pos. ①, Fig. 109).

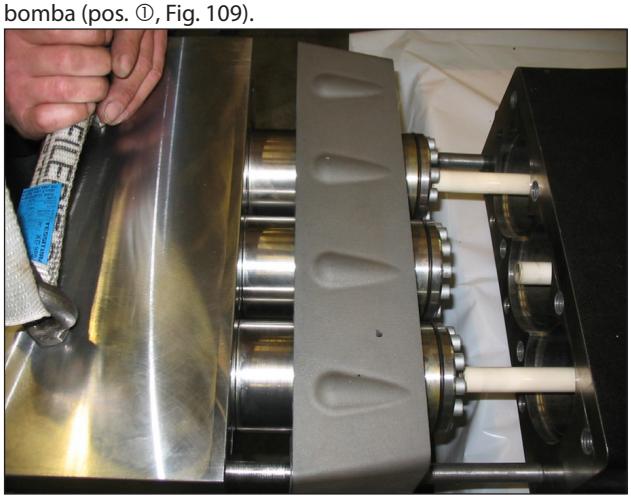


Fig. 109

Retire os anéis circulares dos suportes do forro (pos. ①, Fig. 110) e retire o espaçador para camisas dos grupos das camisas (pos. ①, Fig. 111).

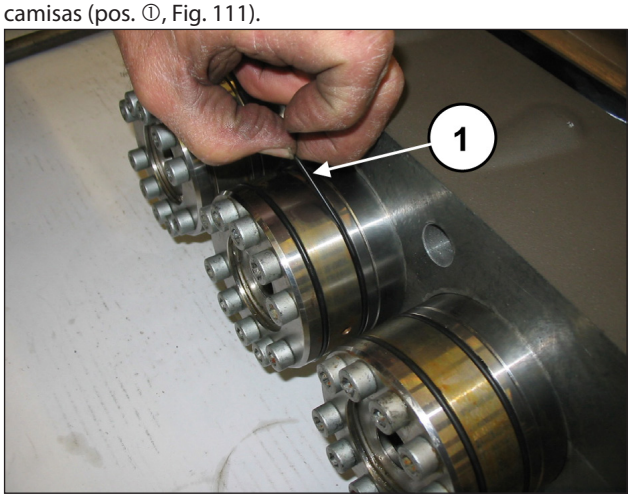


Fig. 110

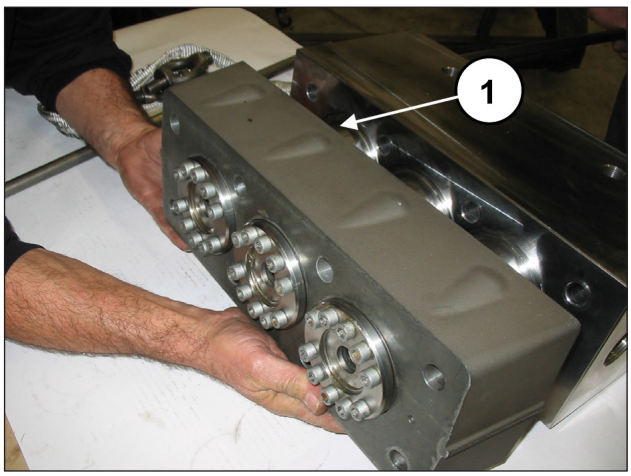


Fig. 111

Remova os parafusos M10x140 de fixação das camisas do cabeçote (pos. ①, Fig. 112) e extraia os grupos das camisas (pos. ①, Fig. 113).

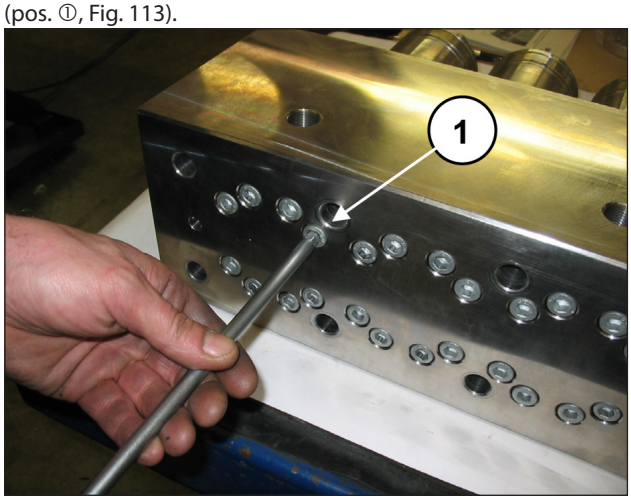


Fig. 112

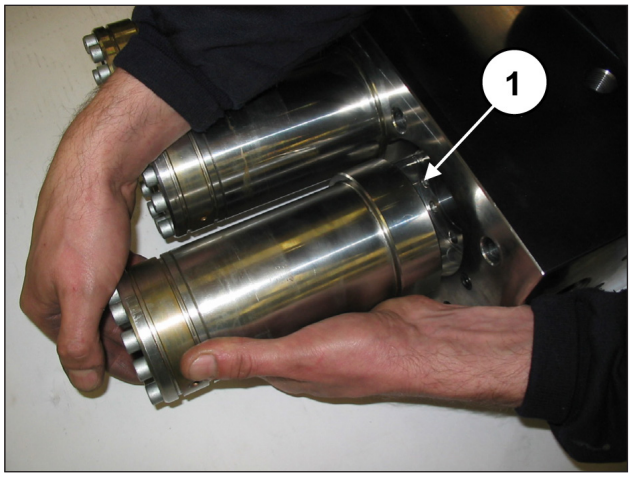


Fig. 113

Durante a desmontagem das camisas, preste atenção para não soltar as molas da válvula e a válvula plana (pos. ① e ②, Fig. 114) como sendo posicionado somente uma passagem, podendo cair.

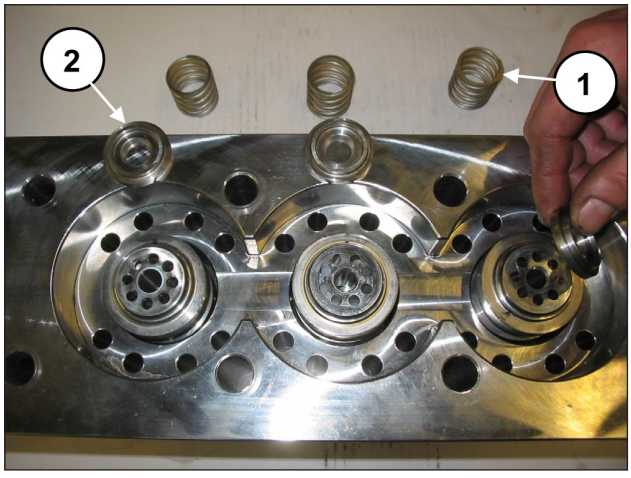


Fig. 114

Se os locais da válvula estiverem bloqueados no cabeçote, a causa da formação de calcário ou de óxido deve ser retirada, inserindo a ferramenta adequada (cód. 034300020 para SK20-22-24 ou cód. 034300010 para SK26-28-30) no furo de fluxo (pos. ①, Fig. 115).

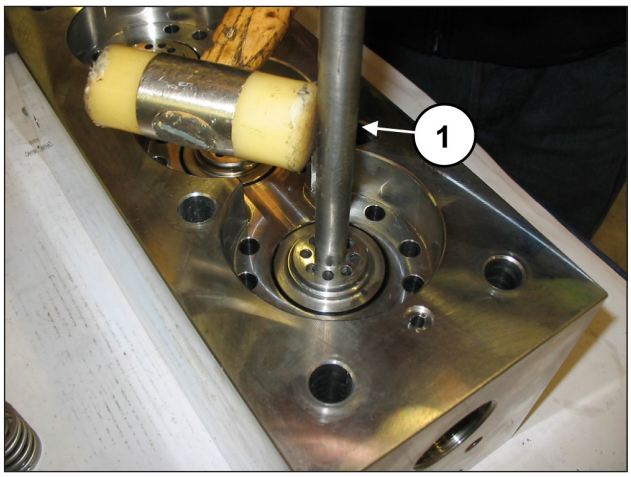


Fig. 115

Extraia os locais da válvula e verifique o estado de desgaste das vedações.
Se necessário, realize eventuais substituições (pos. ①, Fig. 116).

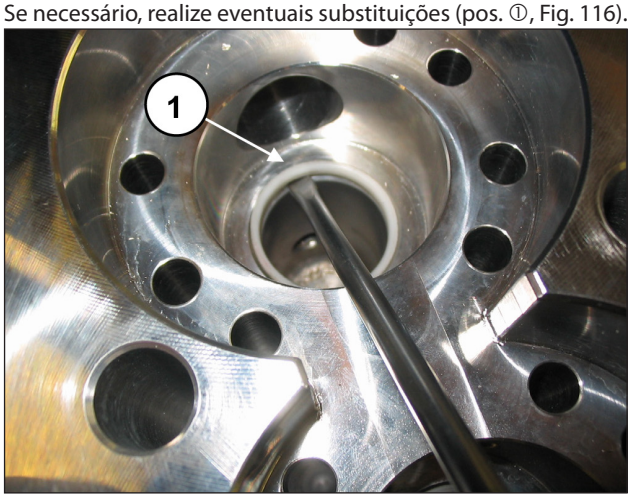


Fig. 116

A cada inspeção da válvula, substitua os anéis de vedação e os relativos anéis circulares de vedação frontal entre a camisa e o cabeçote, e entre o cabeçote e o espaçador da camisa na zona do furo de recirculação. Antes de remontar, limpe e enxugue os vários componentes e todas as relativas ranhuras no interior do cabeçote.

Extraia as placas de fluxo (pos. ①, Fig. 117), e as respectivas guias (pos. ①, Fig. 119), com as respectivas molas (pos. ①, Fig. 118), verifique o seu estado de desgaste e execute, se necessário, eventuais substituições, e se necessário, nos intervalos indicados no capítulo 11 do ***Manual de uso e manutenção***.

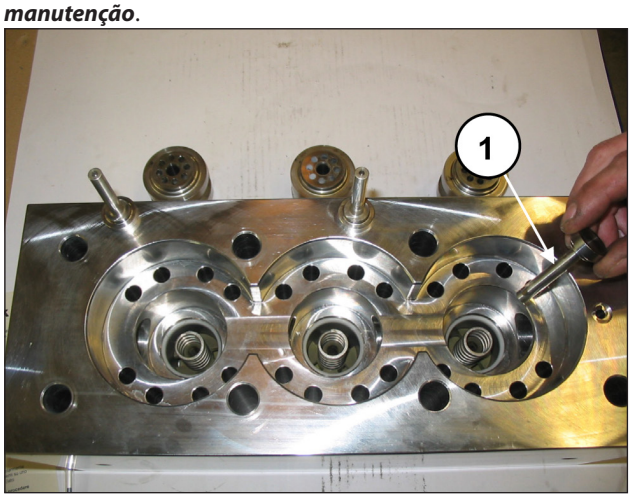


Fig. 117

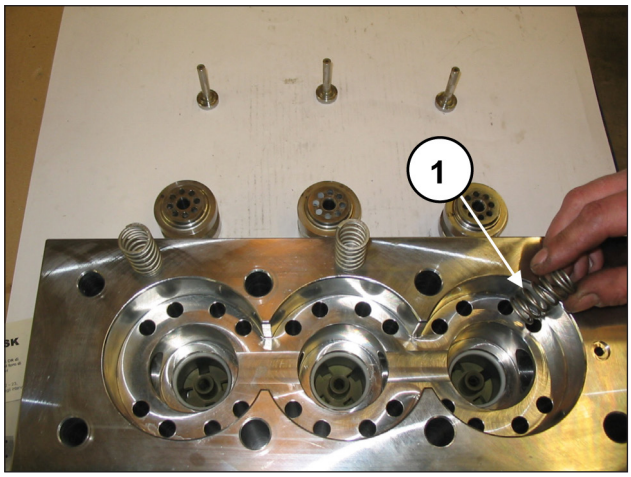


Fig. 118

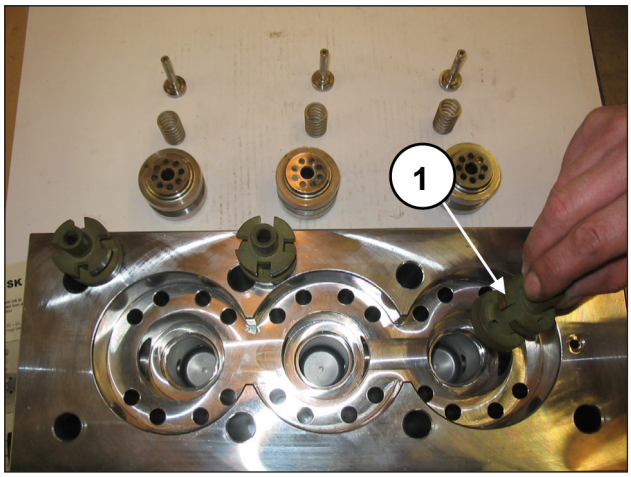


Fig. 119

2.2.2 Montagem do cabeçote - camisas - válvulas

Para remontar os vários componentes, inverta as operações listadas anteriormente com especial atenção para a montagem correta do espaçador para as camisas: as duas descargas aproximadas de fusão presentes em um dos dois lados, montadas especialmente devem ser orientadas para a parte inferior do carter (lateral de aperto da bomba).

Cabeçote - camisa: proceda com a montagem e a calibragem dos parafusos de fixação do cabeçote e depois, proceda com a calibragem dos parafusos de fixação das camisas.

para os valores do torque de aperto e para a sequência de aperto dos parafusos, respeite as indicações relacionadas no capítulo 3.

2.2.3 Desmontagem do grupo do pistão - suportes - vedação

O grupo de pistão não precisa de manutenção periódica. As intervenções são limitadas somente ao controle visual de drenagem do circuito de resfriamento. Se for apresentado falhas/oscilações no manômetro de fluxo ou pulsações do tubo de drenagem do circuito de resfriamento (se elástico), será necessário proceder com o controle e com eventual substituição do pacote de vedação.

Para a extração dos grupos de pistão, opere como a seguir: Separe o cabeçote e o espaçador para camisas do carter da bomba, conforme indicado no parág. 2.2.1 (da Fig. 106 a Fig. 113).

Remova a cobertura de inspeção superior (pos. ①, Fig. 120) e a cobertura de inspeção inferior (pos. ①, Fig. 121) soltando os 4+4 parafusos de fixação. Solte os anéis circulares e substitua-os, se for necessário.

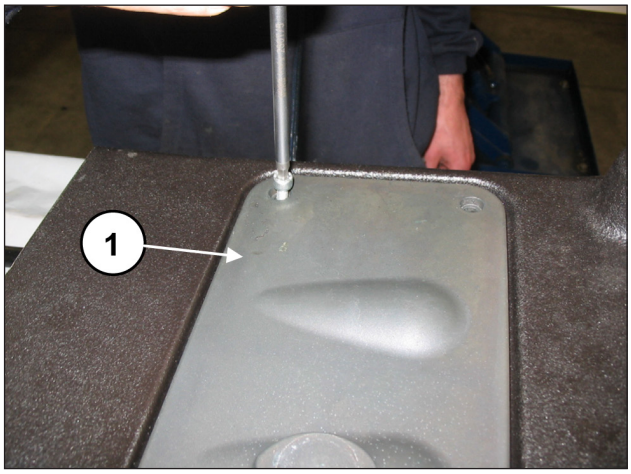


Fig. 120

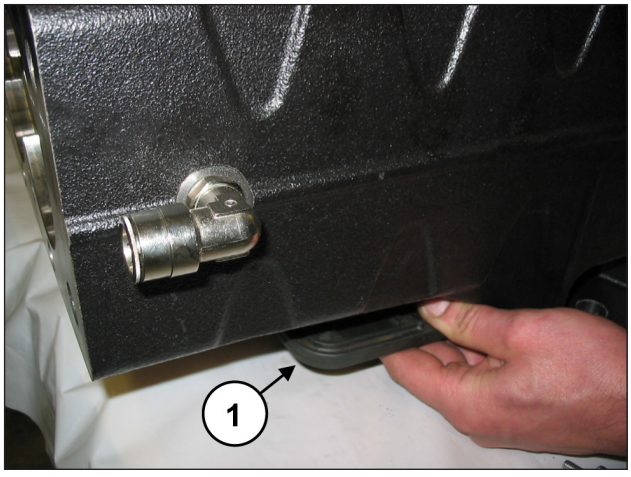


Fig. 121

Remova os pistões com uma chave fixa (pos. ①, Fig. 122) e controle o seu estado de desgaste (pos. ①, Fig. 123). Substituí-los, se necessário.

Fig. 122

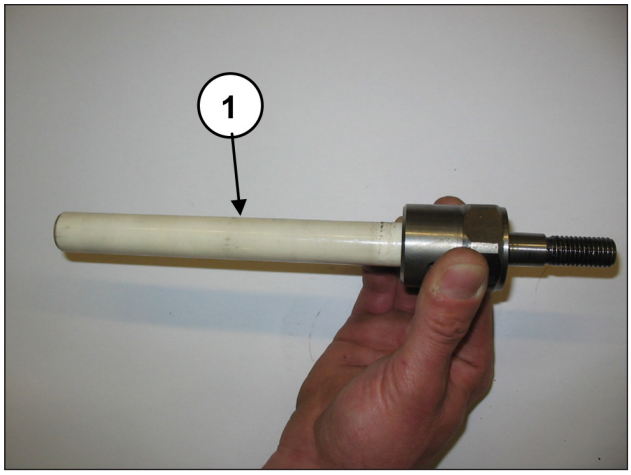


Fig. 123

Remova os parafusos M8x50 de fixação do suporte da camisa (pos. ①, Fig. 124) e proceda com a separação do suporte da camisa (pos. ①, Fig. 125).

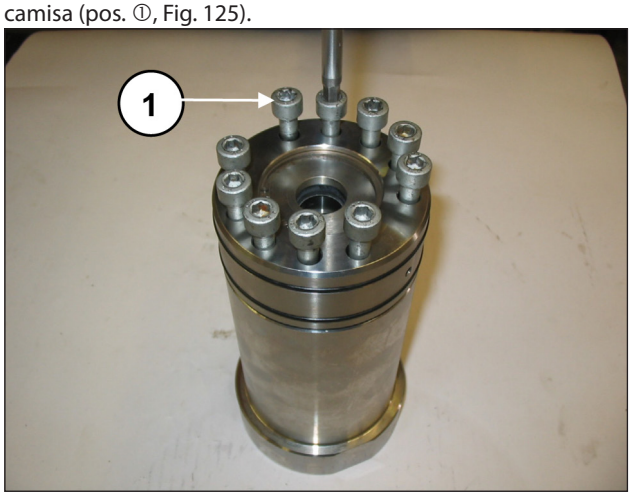


Fig. 124

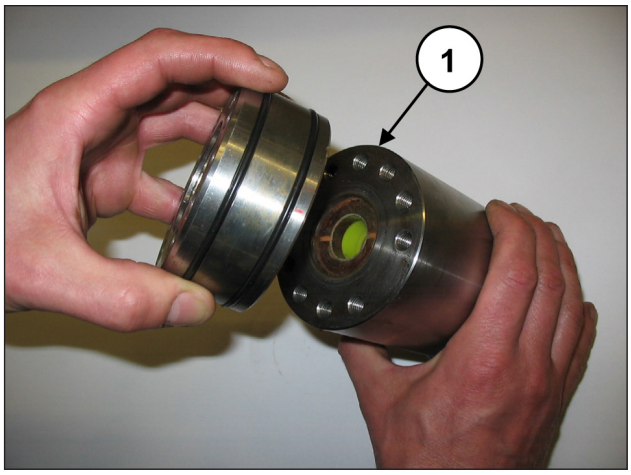


Fig. 125

Remova o anel elástico e o anel de retenção da vedação (pos. ①, Fig. 126) e com um pino especial, em material plástico, extraia a guarnição da vedação LP (baixa pressão) (pos. ①, Fig. 127).

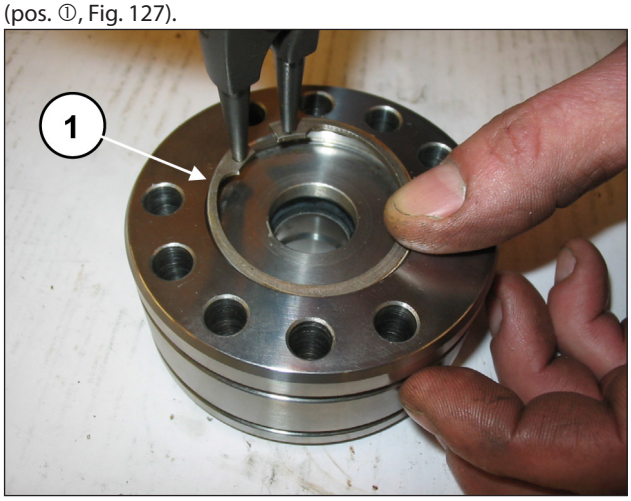


Fig. 126

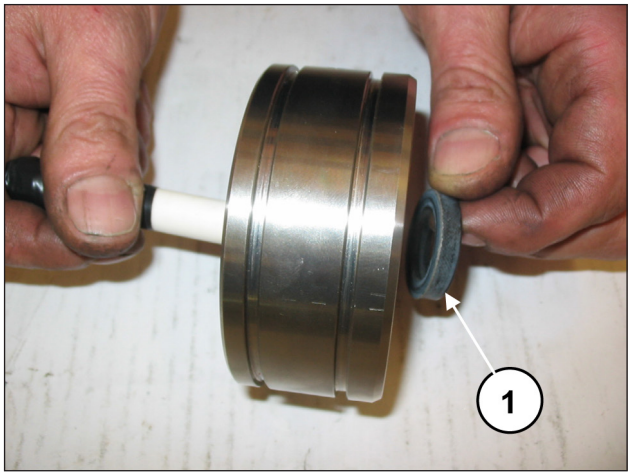


Fig. 127

A cada desmontagem, a vedação de baixa pressão e os anéis circulares devem ser substituídos.

Com a camisa separada do suporte de vedação e com um pino especial em material plástico (pos. ①, Fig. 128) faça sair o pacote HP (alta pressão) (pos. ①, Fig. 129).

A cada desmontagem, o pacote HP (pos. ①, Fig. 129) deverá ser substituído.

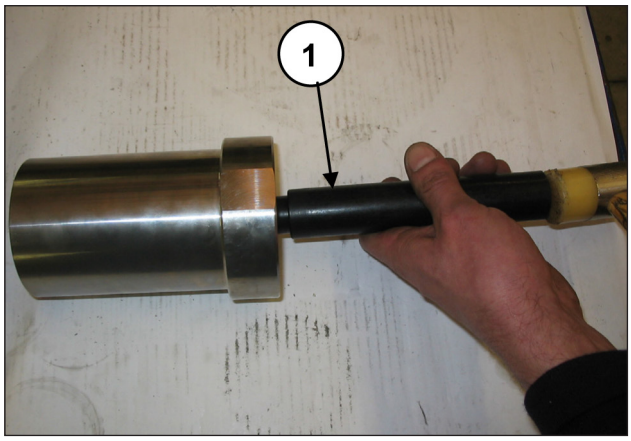


Fig. 128

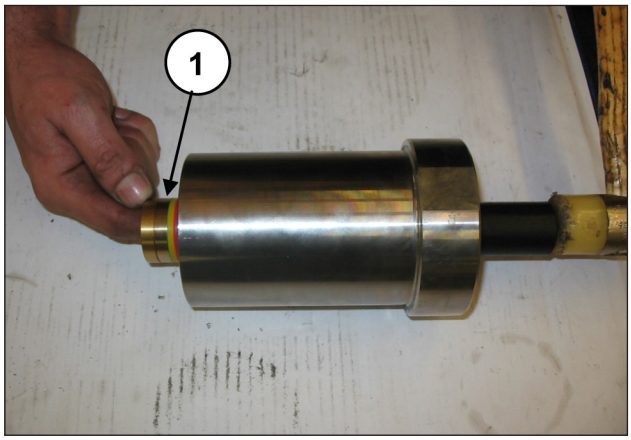


Fig. 129

2.2.4 Montagem do grupo do pistão - suportes - vedação

Para a remontagem dos vários componentes, inverta as operações, prestando atenção particular à sequência abaixo listadas. Para os valores do torque de aperto e para a sequência de aperto, respeite as indicações relacionadas no capítulo 3.

Insira a bússola superior na camisa.

Para um posicionamento axial correto da bússola, use a ferramenta especial (cód. 27911200 para SK20, cód. 27911400 para SK22, cód. 27911500 para SK24, cód. 27911600 para SK26, cód. 27911700 para SK28 e cód. 27911800 para SK30) (pos. ①, Fig. 130 e Fig. 131).

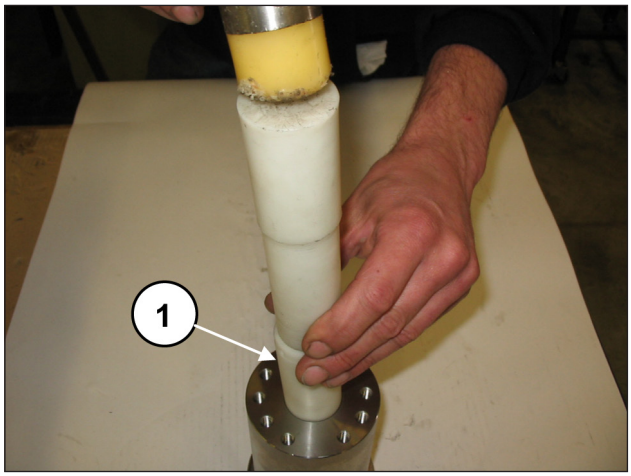


Fig. 130

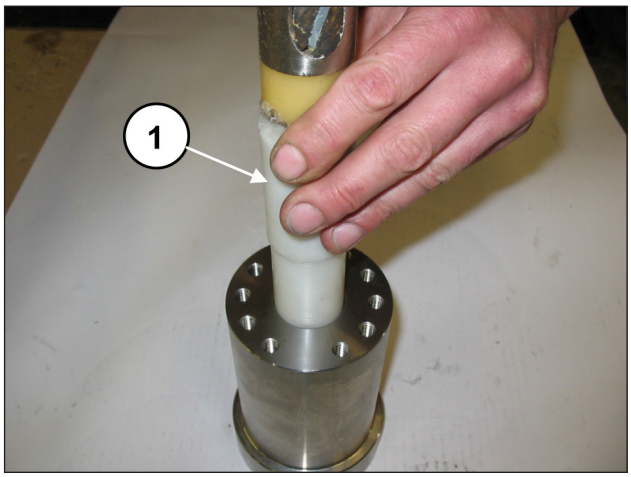


Fig. 131

introduza o pacote H.P. (alta pressão) (pos. ①, Fig. 132); dada a leve interferência entre a vedação e a camisa para evitar eventuais danos, aconselha-se o uso da ferramenta especial (cód. 27540100 para SK20, SK22 e SK24, cód. 27540900 para SK26, para SK28 e para SK30) (pos. ①, Fig. 133).

Fig. 132

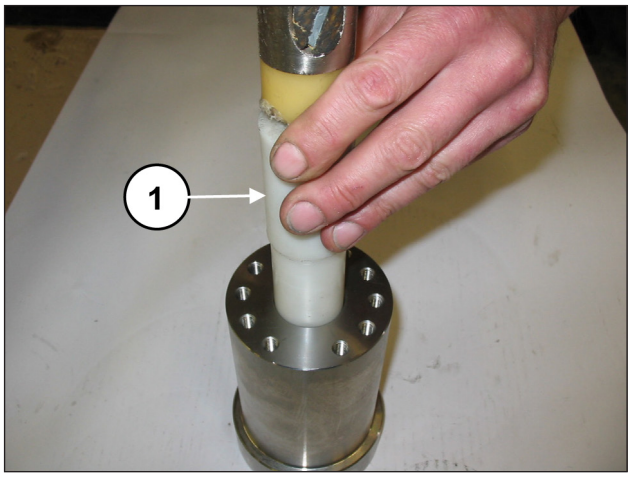


Fig. 133

A vedação H.P. deve ser introduzida na camisa, conforme indicado na Fig. 132 e Fig. 134.

Antes da montagem no local da vedação do H.P., deve ser lubrificado com lubrificante de silicone do tipo OKS 1110, seguindo as operações listadas abaixo: O diâmetro externo deve resultar somente levemente lubrificado.
No diâmetro interno, o lubrificante deve ser aplicado prestando cuidado especial para o preenchimento de todas as bolsas entre as bordas de vedação, conforme indicado na Fig. 135.

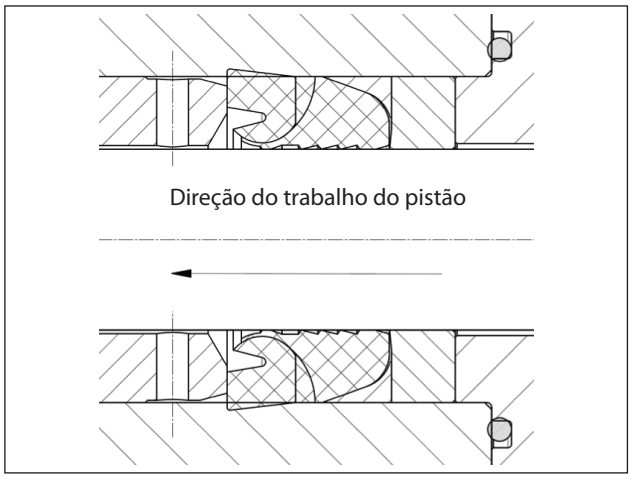


Fig. 134

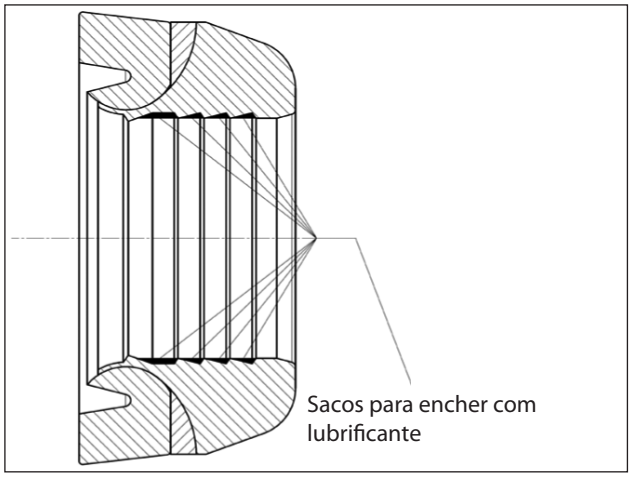


Fig. 135

Introduza o anel anti-extrusão e a bússola do forro (pos. ① e ②, Fig. 136, Fig. 137 e Fig. 138).

A bússola das vedações ② deve ser introduzida na camisa com as duas descargas de frente para a parte exterior (lateral do carter), conforme indicado na Fig. 137.

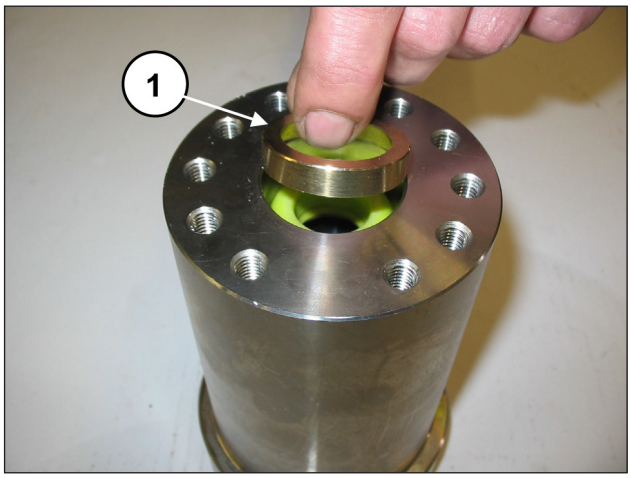


Fig. 136

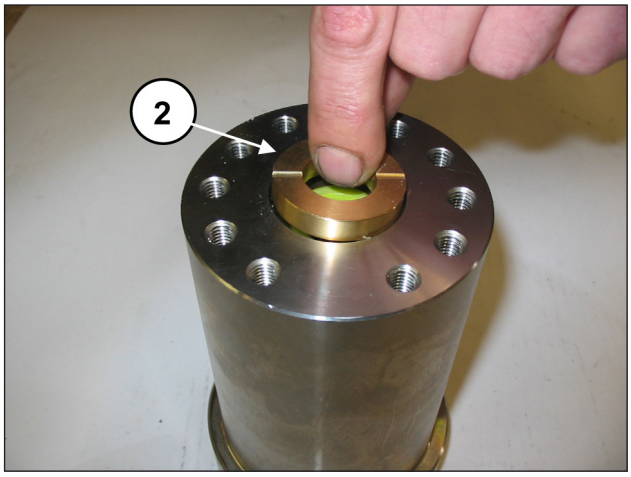


Fig. 137

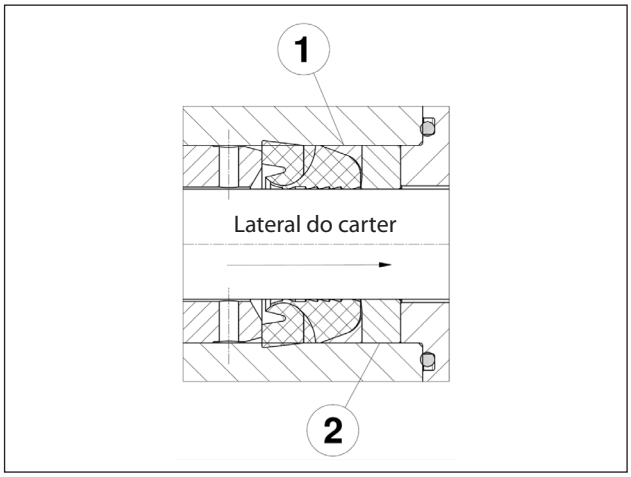


Fig. 138

A vedação L.P. deve ser introduzida na camisa com a borda de vedação na direção do trabalho do pistão (pos. ①, Fig. 139 e Fig. 140), lubrificando ligeiramente o diâmetro externo com lubrificante de silicone tipo OKS 1110. Substitua a vedação L.P., quando se apresentar desgastada.

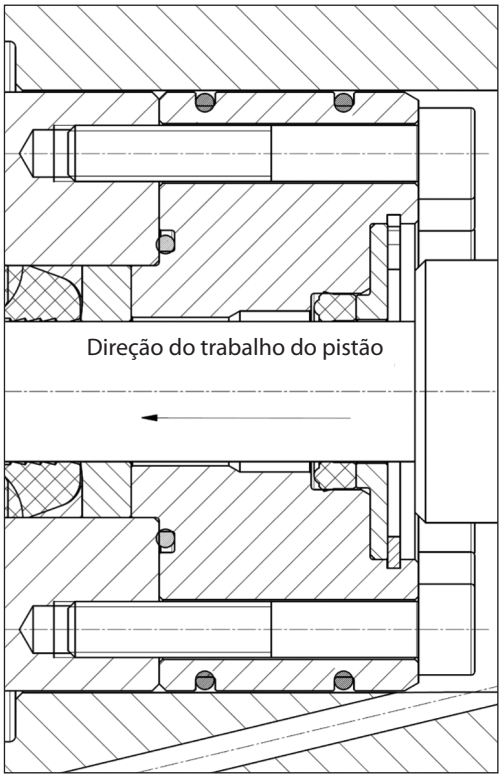


Fig. 139

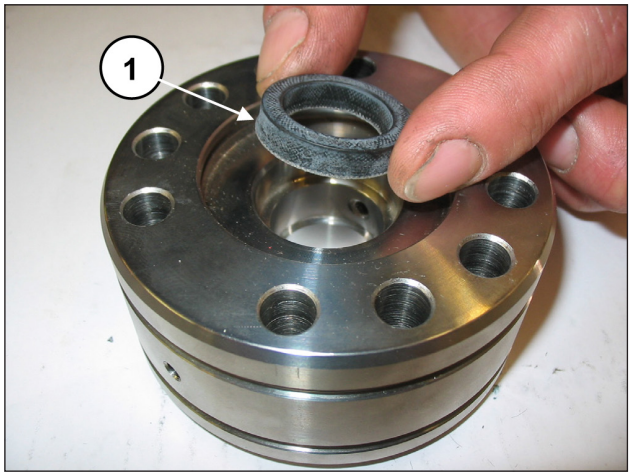


Fig. 140

Remonte o grupo de suporte de vedação (Fig. 141 e Fig. 142), substituindo os componentes ① e ②.

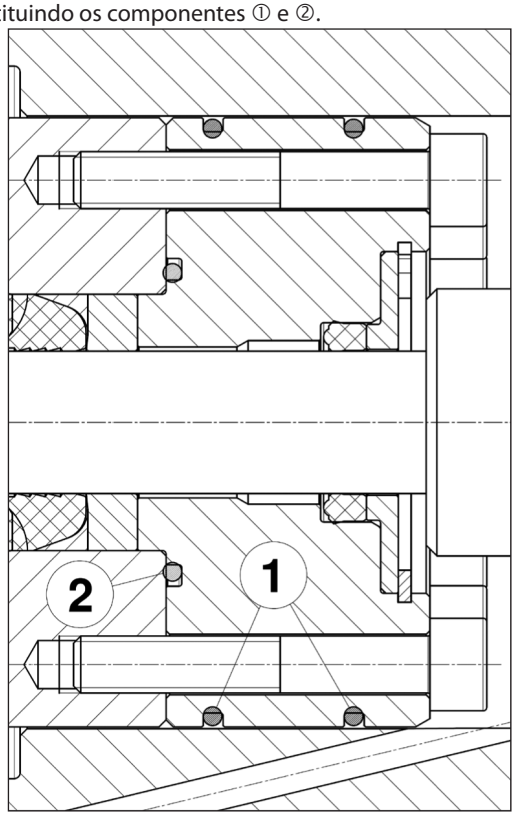


Fig. 141

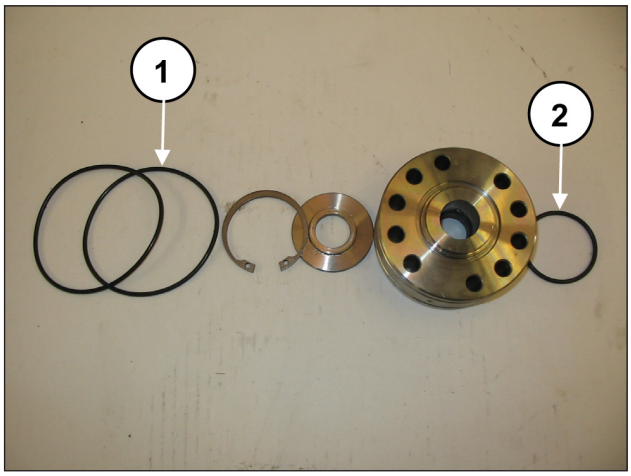


Fig. 142

Monte o grupo do suporte - camisa soltando manualmente os parafusos M8x50, conforme indicado na Fig. 143, em seguida, proceda com a calibragem com chave dinamométrica, conforme indicado no capítulo 3.

Fig. 143

3 CALIBRAGEM DO APERTO DOS PARAFUSOS

O aperto dos parafusos é para ser executado exclusivamente com chave dinamométrica.

Descrição	Posição de explosão	Torque de aperto Nm
Parafuso M8x20 da cobertura do carter	42	25
Tampa G1/2x13 do carter	66	40
Parafuso M8x30 da cobertura do rolamento PTO	85	25
Parafuso M8x20 da cobertura da extremidade do eixo	42	25
Parafuso M10x30 da cobertura do porta-rolamento	57	45
Parafuso M6x14 das coberturas superior e inferior	70	10
Parafuso M8x20 da cobertura do rolamento	42	25
Parafuso M12x1.25x87 de aperto da haste	40	75
Parafuso M6x20 da guia do pistão	37	10
Parafuso M12x25 da flange de bloqueio da bússola	51	68.5
Pistão completo	16	50
Montagem das bobinas D.3 3/8M-3/8F	72	45
Parafuso M8x50 dos suportes	26	40*
Parafuso M16x280 do cabeçote	14	200**
Parafuso M10x140 da camisa	13	83***

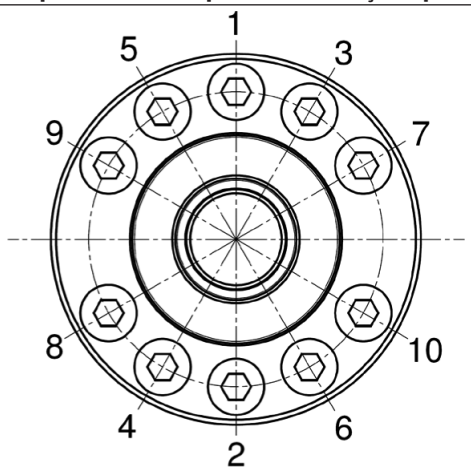
Os parafusos - pos. 13-14-26 devem ser apertados com a chave dinamométrica, lubrificando a haste rosqueada com lubrificante de dissulfeto de molibdênio, cód. 12001500.

* Os parafusos de fixação do suporte devem ser apertados, respeitando as fases e a ordem relacionados no esquema da Fig. 144.

** Os parafusos de fixação do cabeçote devem ser apertados, respeitando as fases e a ordem relacionada no esquema da Fig. 145.

*** Os parafusos de fixação da camisa devem ser apertados, respeitando as fases e a ordem relacionados no esquema da Fig. 145.

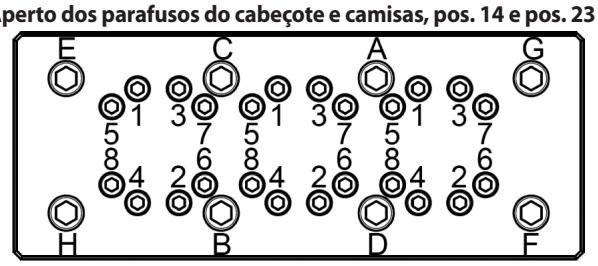
Aperto dos parafusos de suporte das vedações, pos. 26



Aperto dos parafusos M8x50, segundo a sequência indicada (1-2-3-4-5-6-7-8-9-10), realizada em uma única fase do torque indicado.

Fig. 144

Aperto dos parafusos do cabeçote e camisas, pos. 14 e pos. 23



OPERAÇÃO 1: Aperto dos parafusos M16x280 (pos. 14) em duas fases respeitando a sequência indicada na figura: (A-B-C-D-E-F-G-H)

Fase 1 = 120 Nm

Fase 2 = 200 Nm

OPERAÇÃO 2: Aperto dos parafusos M10x140 (pos. 13) em quatro fases, respeitando a sequência indicada na figura: (1-2-3-4-5-6-7-8)

Fase 1 = 40 Nm

Fase 2 = 65 Nm

Fase 3 = 83 Nm

Fase 4 = 83 Nm

Fig. 145

4 FERRAMENTAS PARA A REPARAÇÃO

A manutenção da bomba pode ser realizada através de ferramentas simples para a desmontagem e remontagem dos componentes. As seguintes ferramentas estão disponíveis:

Para a montagem:

Anel de vedação radial da guia do pistão	cód. 27910900
Anel de vedação radial do eixo PTO	cód. 27539500
Bússola dos forros	cód. 27911200 (SK20)
	cód. 27911400 (SK22)
	cód. 27911500 (SK24)
	cód. 27911600 (SK26)
	cód. 27911700 (SK28)
	cód. 27911800 (SK30)
Pacote de vedação HP	cód. 27540100 (SK20 - SK22 - SK24)
	cód. 27540900 (SK26 - SK28 - SK30)
Cabeçote/espaçador da camisa	cód. 27540200

Para a desmontagem:

Local da válvula	cód. 034300020 (SK20-22-24)
	cód. 034300010 (SK26-28-30)
Cabeçote/espaçador da camisa	cód. 27540200
Eixo (bloqueio da haste)	cód. 27566200

5 SUBSTITUIÇÃO DA BUCHA DO PÉ DA HASTE

Martele a bucha a frio e os trabalhos seguintes, prestando atenção às dimensões e a tolerância da Fig. 146 abaixo.

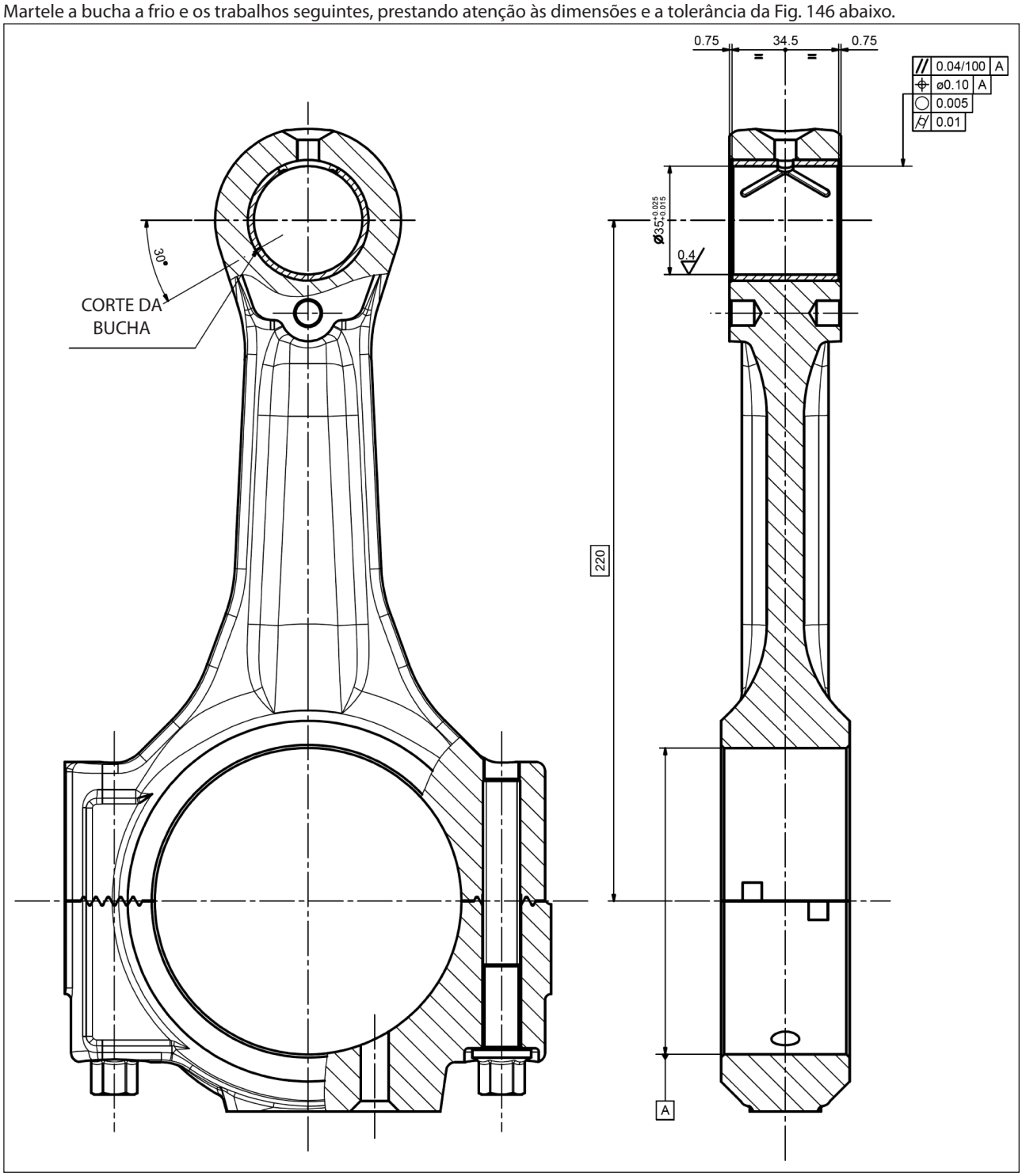


Fig. 146

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42049 S.Ilario—Reggio Emilia (Italy)
Tel. +39-0522-904311
Fax +39-0522-904444
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