GENERAL PUMP

SMH

Repair Manual

General Pump is a member of the Interpump Group

Ref 300894 Rev. B
05-22

INDEX

1. INTRODUCTION

This manual describes the instructions for Repairing SMH Series pumps, and must be carefully read and understood before performing any repair intervention on the pump. Proper pump operation and longevity depend on the correct use and maintenance. General Pump declines any responsibility for damage caused by the misuse or the non-observance of the instructions described in this manual.

2. REPAIR INSTRUCTIONS

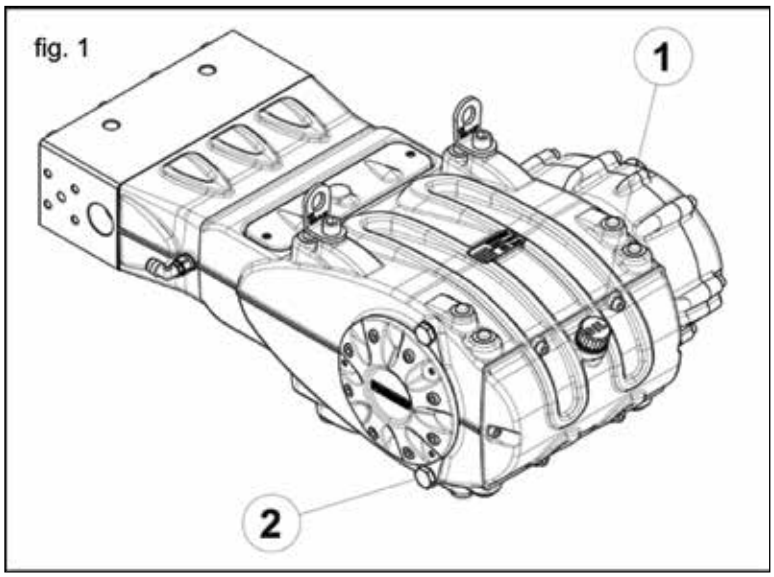
Read the contents of this manual carefully before each operation.

Danger Sign
Wear protective goggles.

Danger Sign
Put on protective gloves before each operation.

2.1 Repairing Mechanical Parts

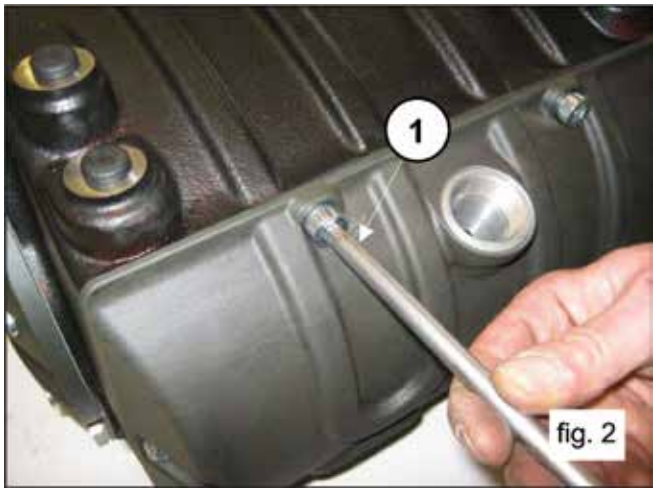
Mechanical parts repair must be performed after removal of oil from the casing. To drain the oil, remove the oil dipstick, (1, fig. 1) and then the draining plug (2, fig. 1).



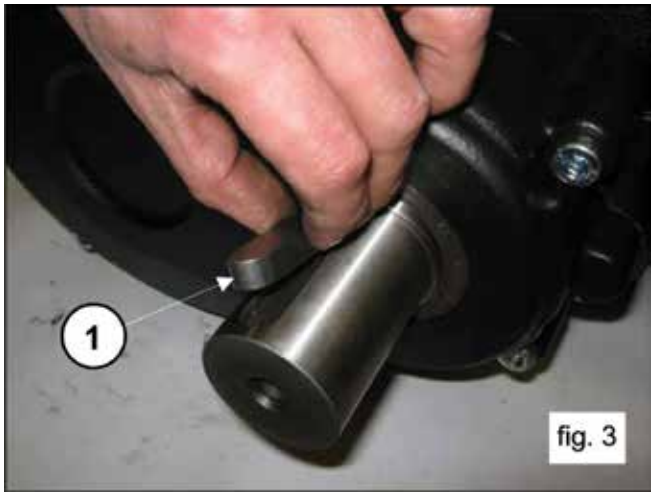
The oil must be placed in a suitable container and disposed of in special centers.
It absolutely must not be discarded into the environment.

2.1.1 Disassembly of Mechanical Parts
The correct sequence is the following:

Completely empty the pump of oil, then disassemble the casing cover (and relative o-ring), unscrewing the (6) M10 screws (1, fig. 2).



Remove the tab from the PTO shaft (1, fig. 3).



Unscrew the reduction gear cover fixing screws (1, fig. 4).

Position the 3 grub screws or M8 threaded screws (1, fig. 5) with the function of extractors in the holes and two sufficiently long M10 screws with the function of supporting the cover (2, fig. 5).

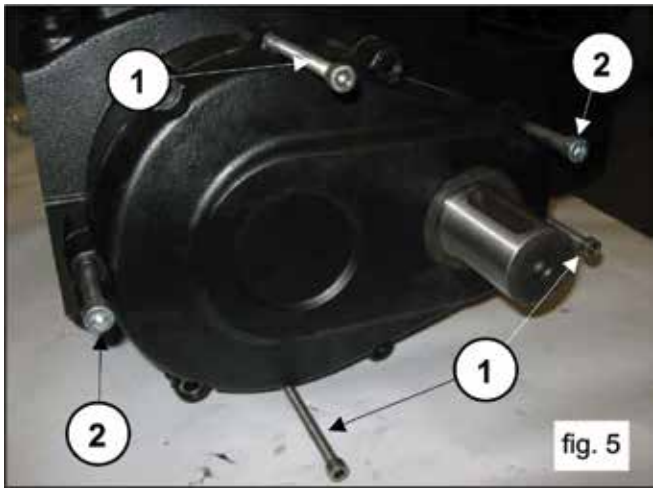


fig. 5

Slowly screw in the 3 M8 screws (1. fig. 6) with the function of extractors to fully remove the cover unit and pinion.

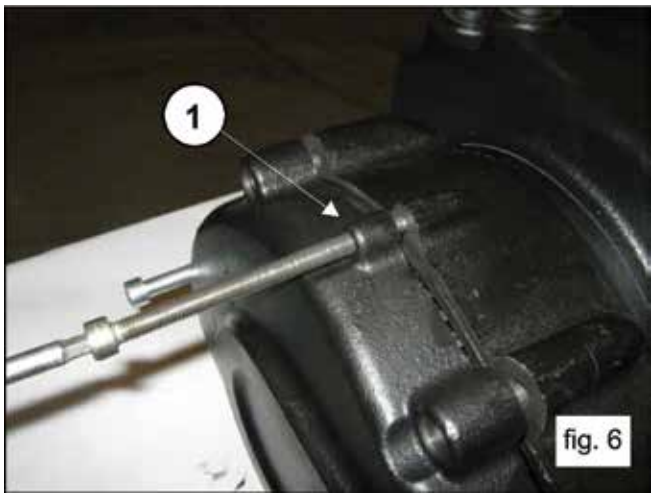


fig. 6

Complete disassembly of the reduction gear cover from the pinion is possible following these steps:
Remove the Seeger ring Ø 120 (1, fig. 7).

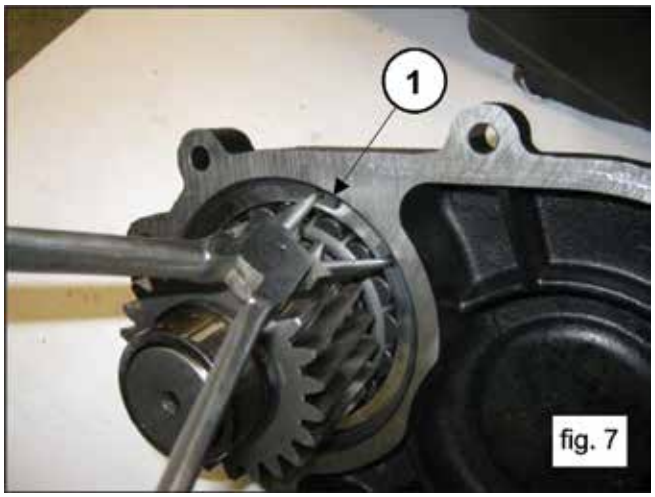
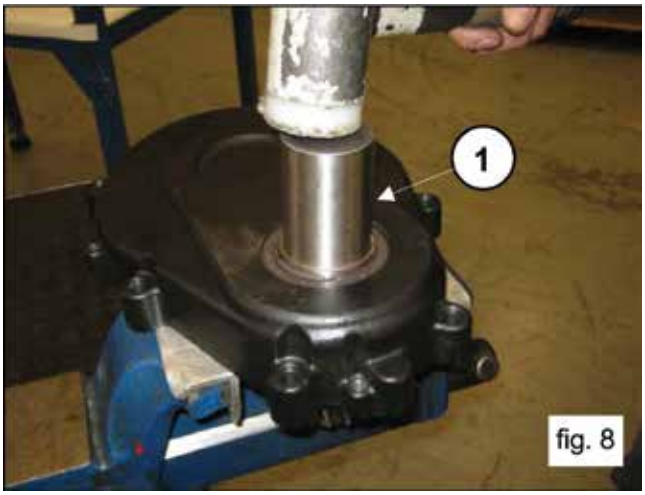
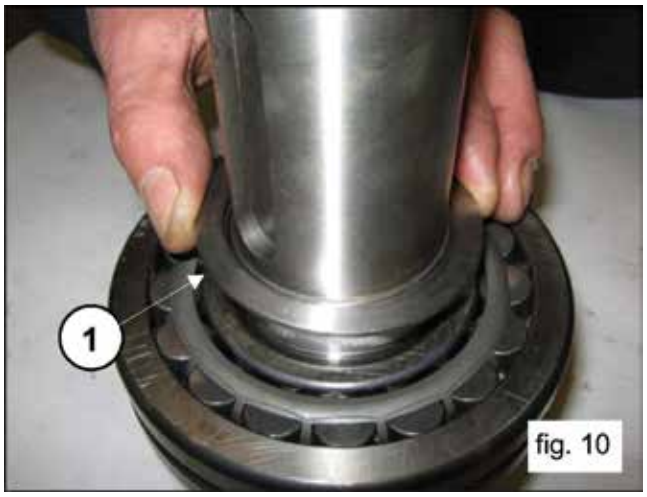


fig. 7

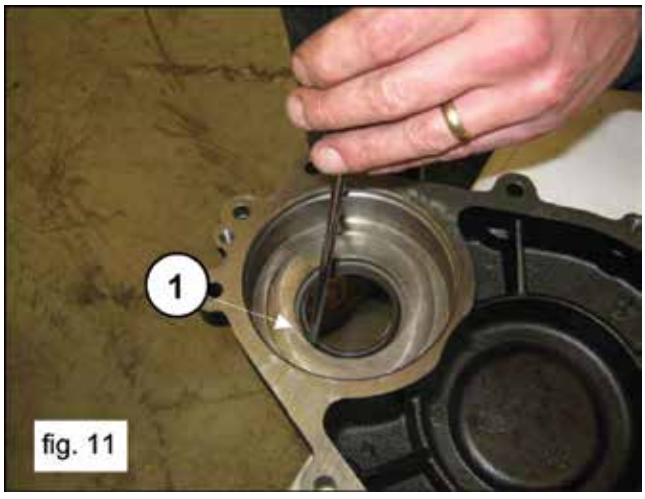
Separate the pinion from the cover, working with an extractor hammer on the pinion itself (1, fig. 8)



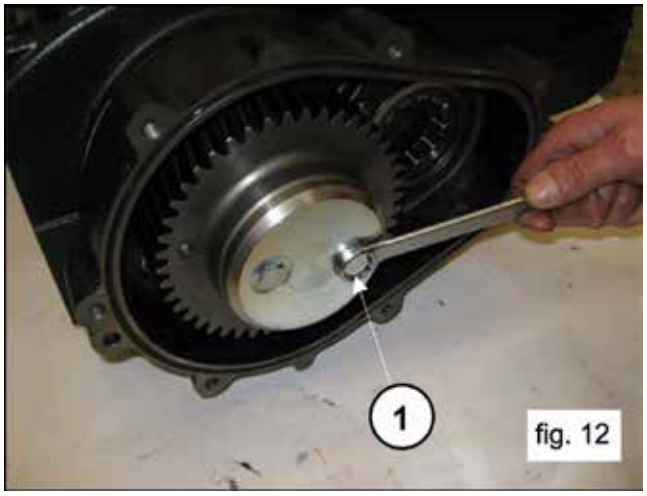
Remove the Seeger ring Ø 55 (1, fig. 9) and the bearing support ring (1, fig. 10) from the pinion.



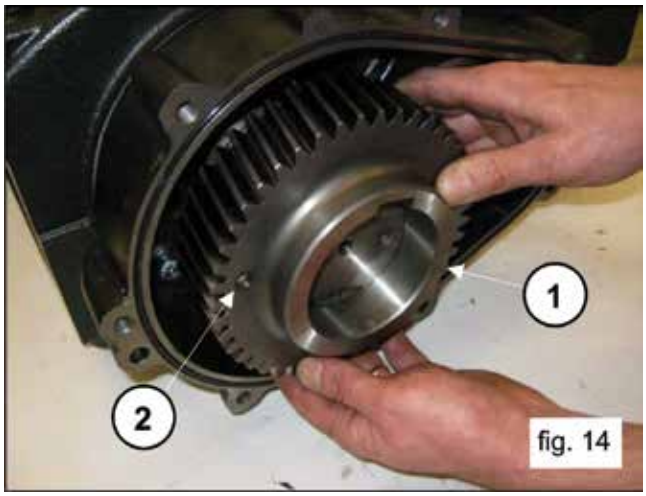
Extract the seal ring from the reduction gear cover, working from the inner side of the cover (1, fig. 11).



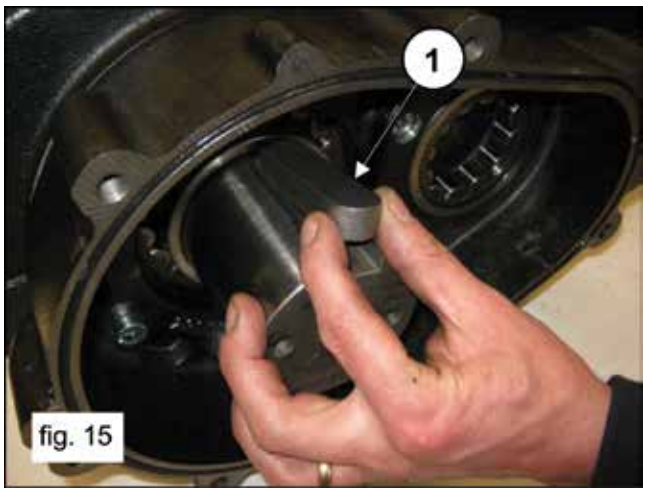
Unscrew the screws holding in the ring gear (1, fig. 12) and remove it (1, fig. 13).



Remove the ring gear (1, fig. 14). Where necessary, it is possible to utilize an extractor hammer to be applied on the (2) M8 holes (2, fig. 14).



Remove the tab from the shaft (1, fig. 15).



Remove the ring gear support ring (1, fig. 16).

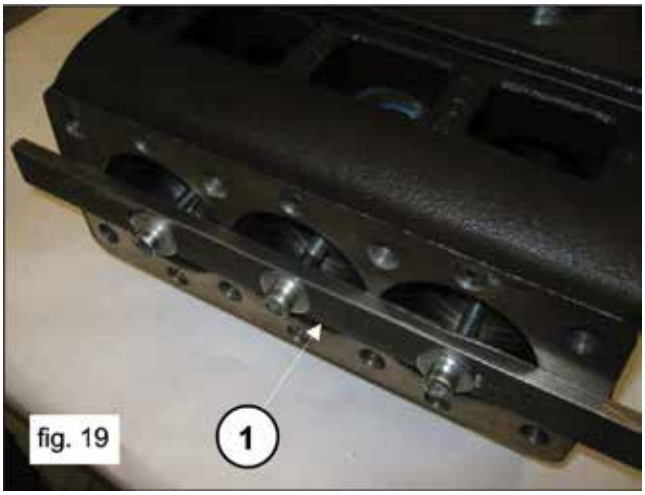
Unscrew the connecting rod screws (1, fig. 17).

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

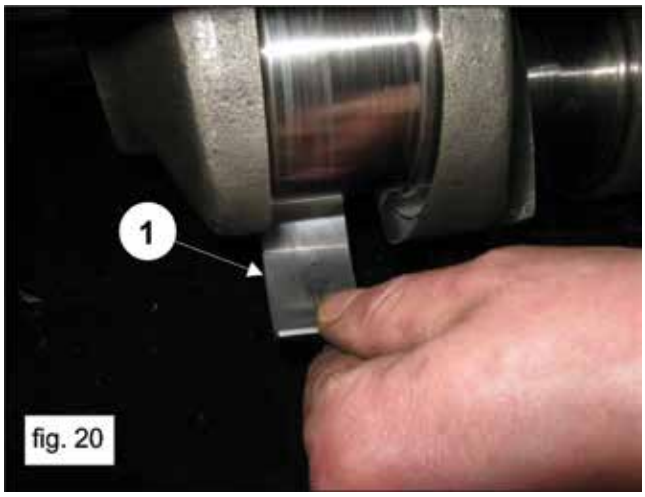
The connecting rod caps and their relative half supports must be reassembled in exactly the same order and coupling with which they were disassembled.

To avoid possible errors, caps and half supports have been numbered on one side (1, fig. 18).

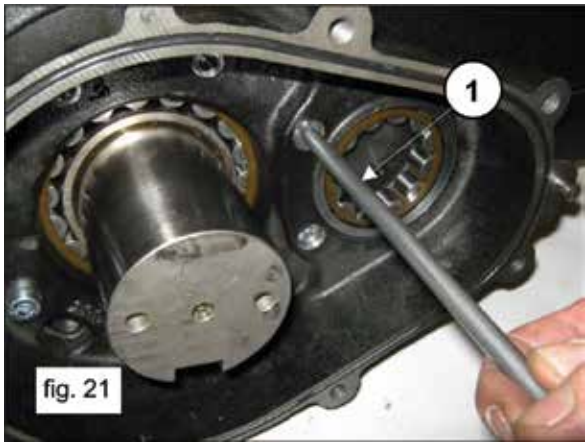
Advance the half supports completely in the direction of the hydraulic part to allow the crankshaft to come out. To facilitate this operation, use special too part #F27566200 (1, fig. 19).



Remove the three upper half bearings of the half supports (1, fig. 20).



Unscrew the reduction gear box fixing screws (1, fig. 22).



Position the 3 grub screws or M8 threaded screws (1, fig. 23) with the function of extractors in the holes and two sufficiently long M10 screws with the function of supporting the reduction gear box (2, fig. 23).

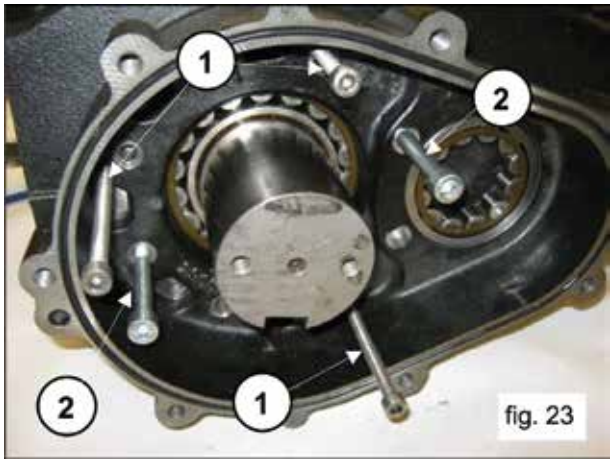


fig. 23

Slowly screw in the 3 M8 screws (1, fig. 24) to prevent the box from tilting too far and getting locked in the housing. Remove the box while supporting the crankshaft to prevent damage (1, fig. 25).

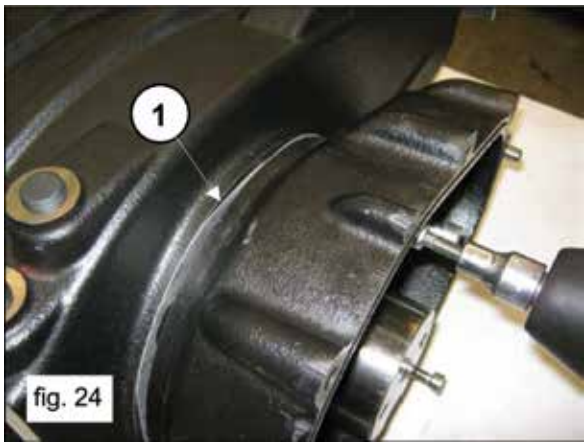


fig. 24

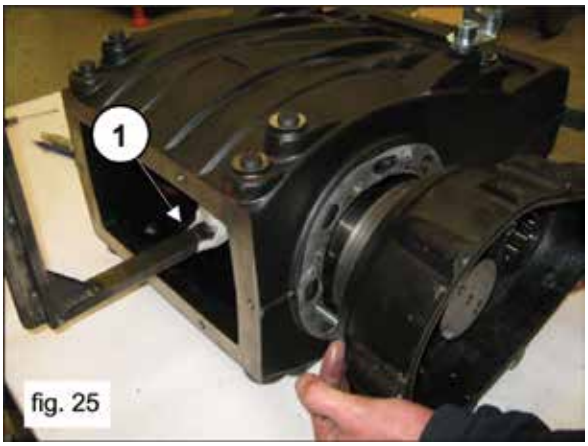


fig. 25

Unscrew the bearing cover fixing screws from the opposite side (1, fig. 27).

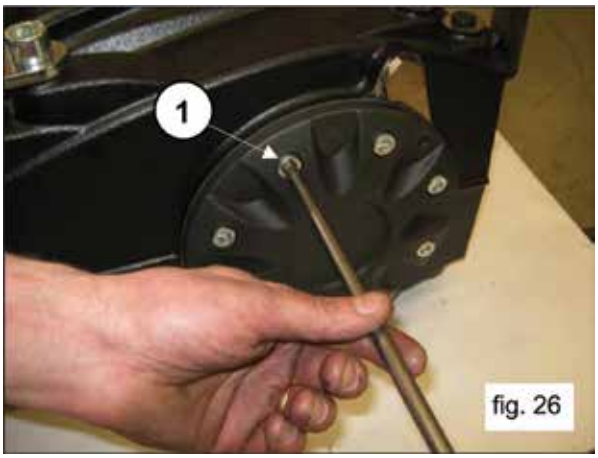


fig. 26

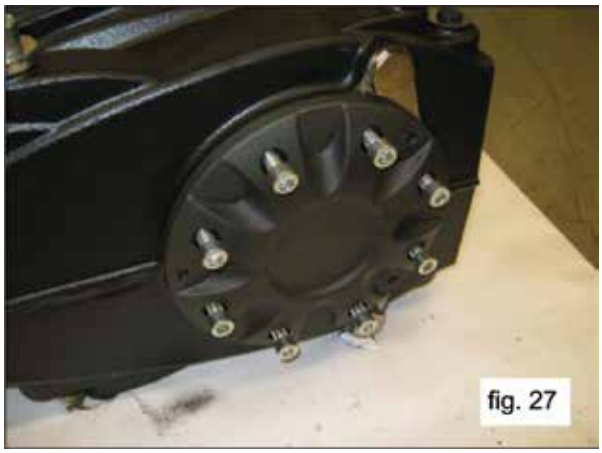
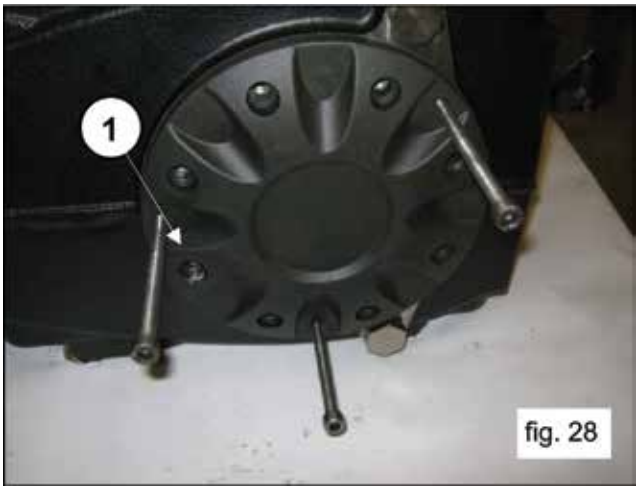
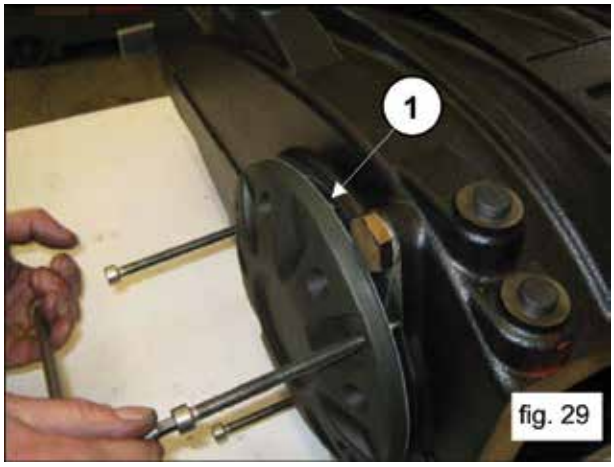


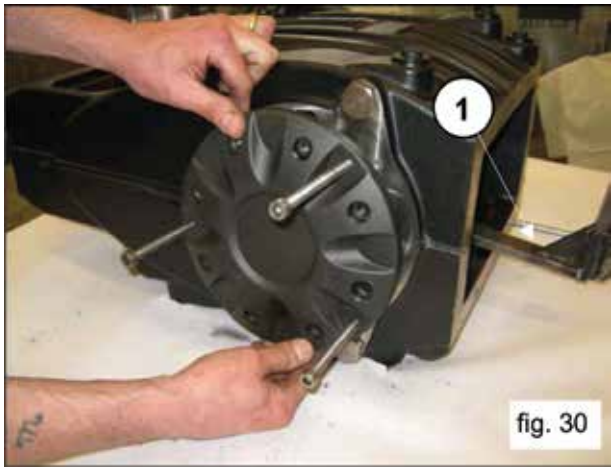
fig. 27

Position the 3 grub screws or M8 threaded screws (1, fig. 28) with the function of extractors in the holes.

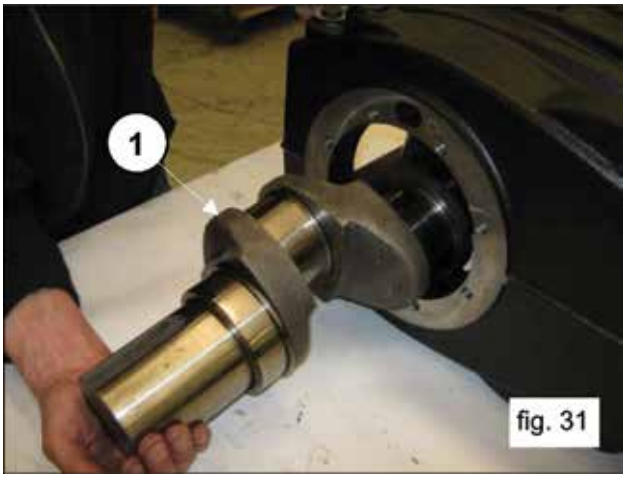


Slowly screw in the 3 M8 screws (1, fig. 29) to prevent the cover from tilting too far and getting locked in the housing. Remove the bearing cover while supporting the shaft to prevent damage. (1. fig. 30).





Remove the crankshaft casing from the PTO side (1, fig. 31).



In the event that it is necessary to replace one or more connecting rods or plunger guides, operate as follows: unscrew the screws with tool part #F27566200 to unlock the connecting rods (1, fig. 32) and then extract the connecting rod/plunger guide units from the back casing opening (1, fig. 33).

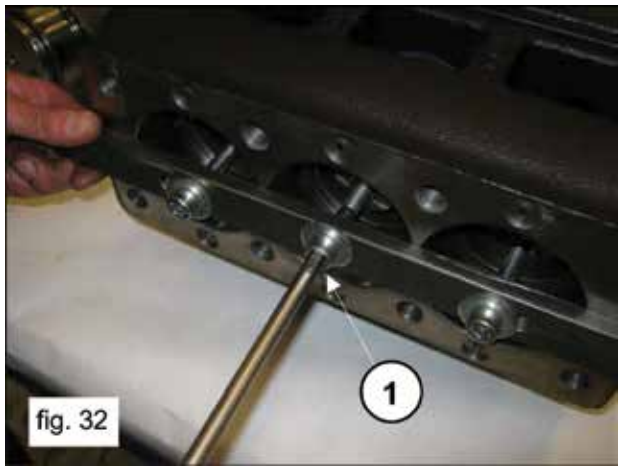


fig. 32

fig. 33

It is now possible to disassemble the plunger guide seal rings, taking care to not damage the plunger guide sliding rod.

Whenever it becomes necessary to replace the plunger guide seal rings without dismantling the entire mechanical part, it is possible to extract the seal rings with the use of tool part #F27644300 operating as follows:

Insert the tool (1, fig. 34) and screw it on the rod to end stroke (1, fig. 35).

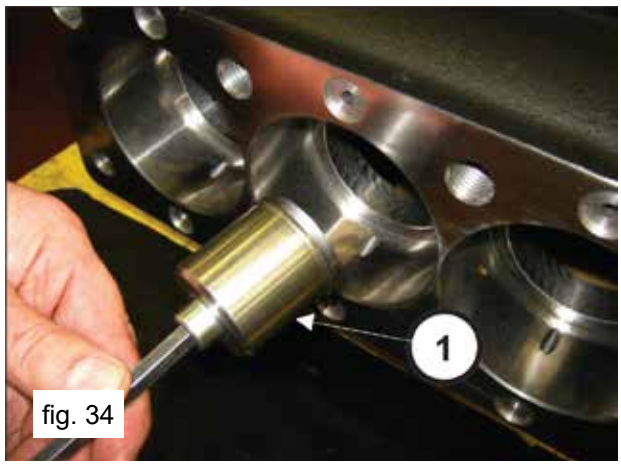


fig. 34

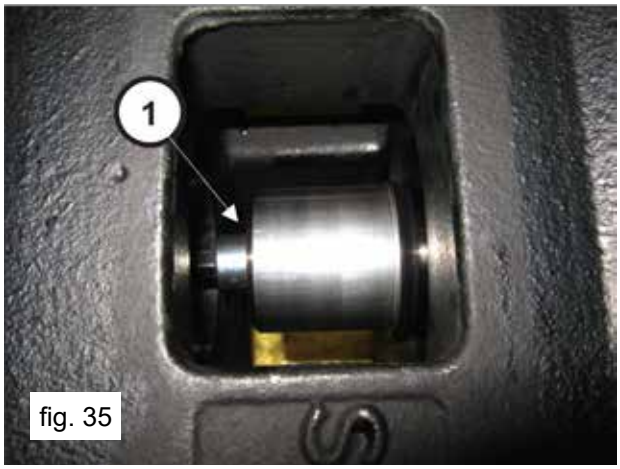


fig. 35

Insert the pinion until the tool tooth enters completely into the oil seal (1, fig. 36). Continue rotating the pinion until the oil seal is completely removed (1, fig. 36a)

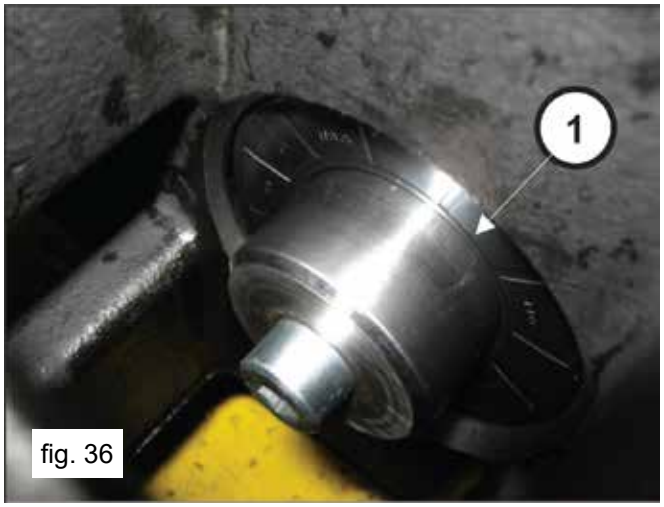


fig. 36

fig. 36a

Remove the tool and remove the oil seal (1, fig. 36b).

fig. 36b

Remove the two spindle locking Seeger rings Ø 120 (1, fig. 37).

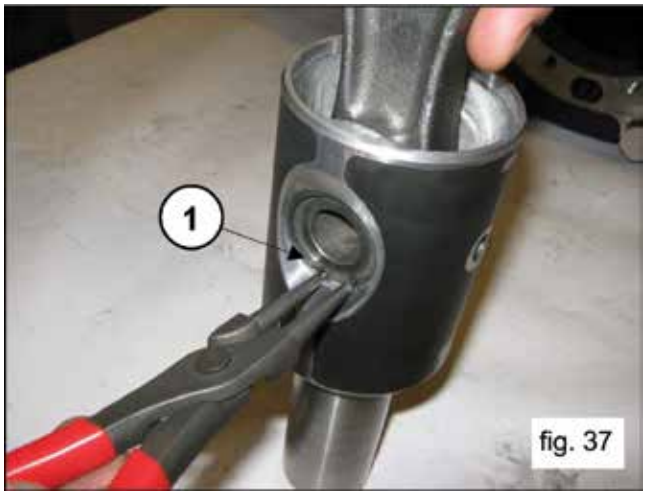
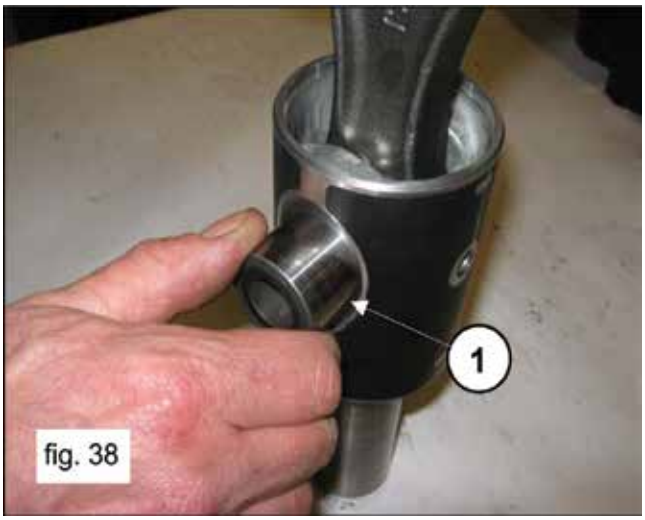


fig. 37

Remove the spindle (1, fig. 38) and extract the connecting rod (1, fig. 39).



Couple the half supports to the previously disassembled caps, referring to the numbering (1, fig. 40).

To separate the rod from the plunger guide, unscrew the hexagonal head M6 screws with a wrench (1, fig. 41).

2.1.2 Assembly of Mechanical Parts

Proceed with assembly following the reverse order indicated in point 2.1.1. The proper sequence is as follows:

Assemble the rod to the plunger guide. Insert the plunger guide rod into its seat on the plunger guide (1, fig. 42) and fix the rod to the plunger guide using the 4 M6x20 screws (1, fig. 43).

fig. 42

fig. 43

Lock the plunger guide in a vice with the aid of a special tool and calibrate the screws with a torque wrench (1, fig. 44) as indicated in chapter 3 “Screw Tightening Calibration”.

fig. 44

Insert the connecting rod in the plunger guide (1, fig. 39) and then insert the spindle (1, fig. 38). Apply the two shoulder Seeger rings (1, fig. 37).

Assembly has been carried out properly if the connecting rod foot, plunger guide and spindle rotate freely.

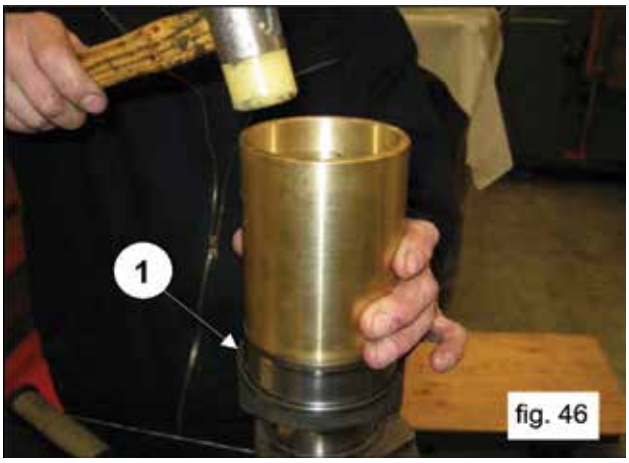
Separate the caps from the half supports. Proper coupling can be verified by the numbering on the side (1, fig. 40). After having checked casing cleaning, proceed with assembly of half support/plunger guide unit inside casing rods (1, fig. 33).

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

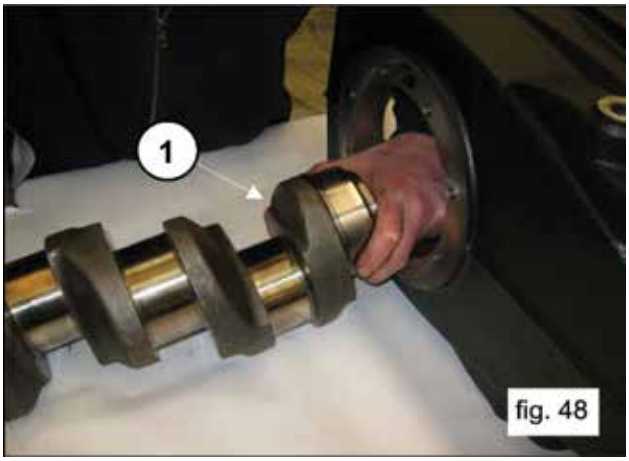
Block the three units with the use of special tool part #F27566200 (1, fig. 32)

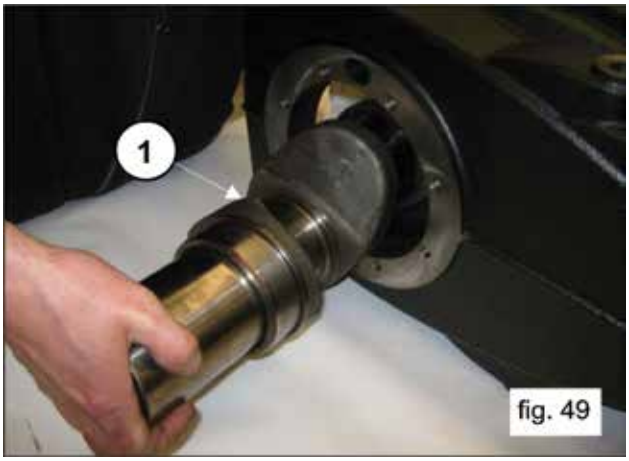
Pre-assemble the ring inside the crankshaft bearings (on both sides of the shaft down to the stroke) using special tool part #F27604700 (1, fig. 46) (1, fig. 47).

The inner and outer rings of the bearings must be reassembled keeping the same coupling with which they were disassembled.



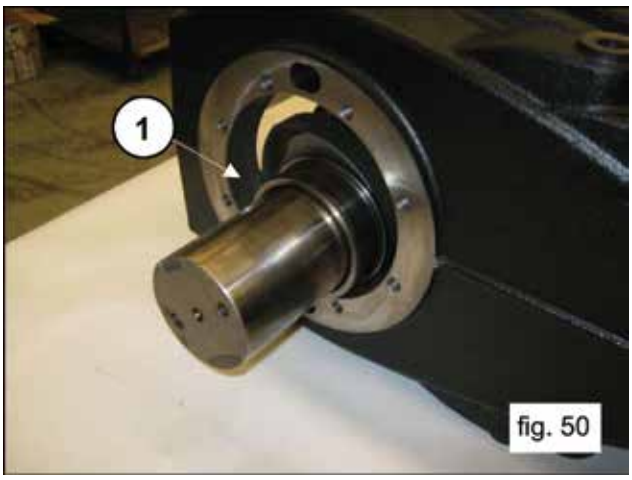
Insert the shaft from the PTO side, taking care not to hit the previously assembled connecting rod shanks (1, fig. 48) and (1, fig. 49).

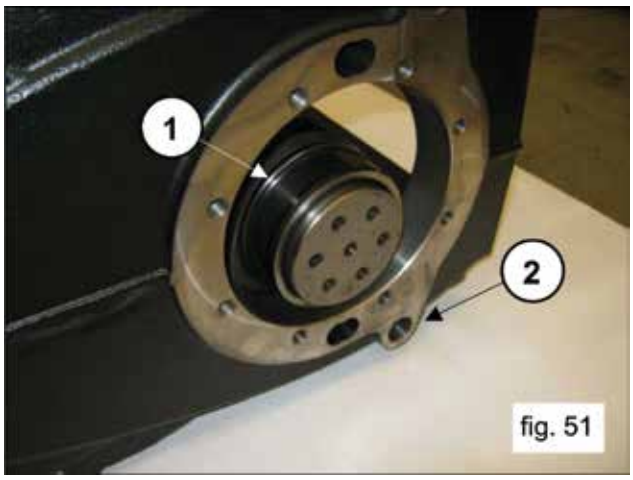




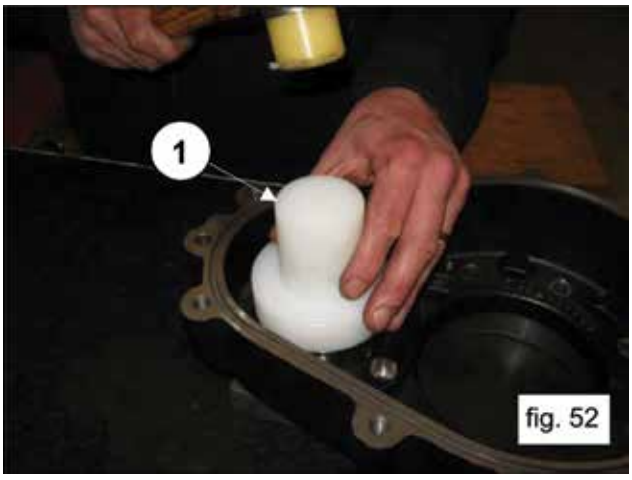
The crankshaft must always be assembled with the PTO on the opposite side with respect to the 1/2” holes for the oil discharge plugs on the pump casing (1, fig. 51).

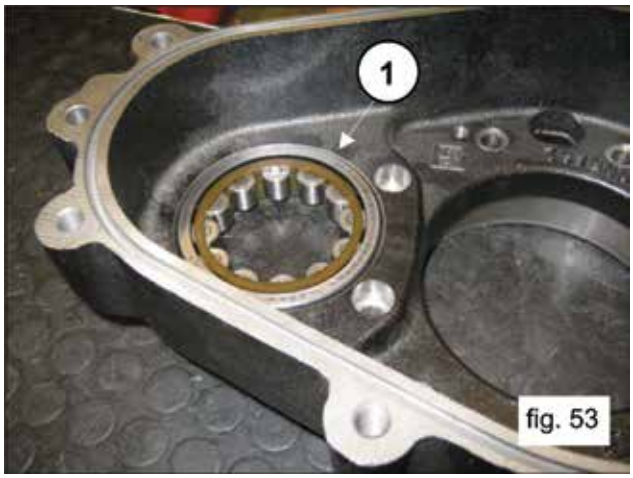
Fully insert the shaft in the casing (1, fig. 50 and fig. 51).



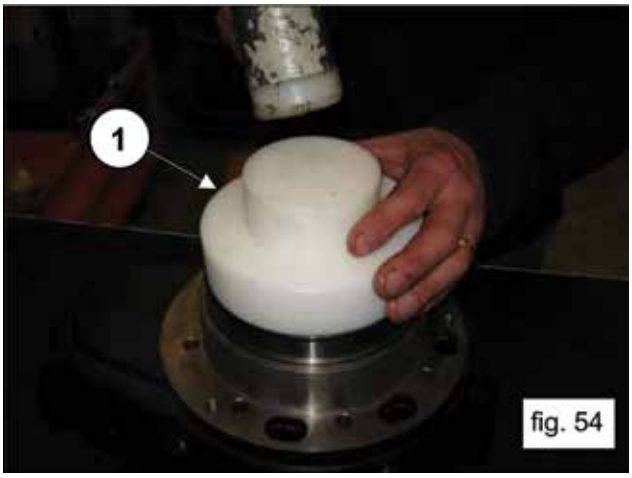


Pre-assemble the outer ring of the pinion bearing on the reduction gear with the aid of special tool part #F27604900 (1, fig. 52), inserting fully down to end stroke (1, fig. 53).

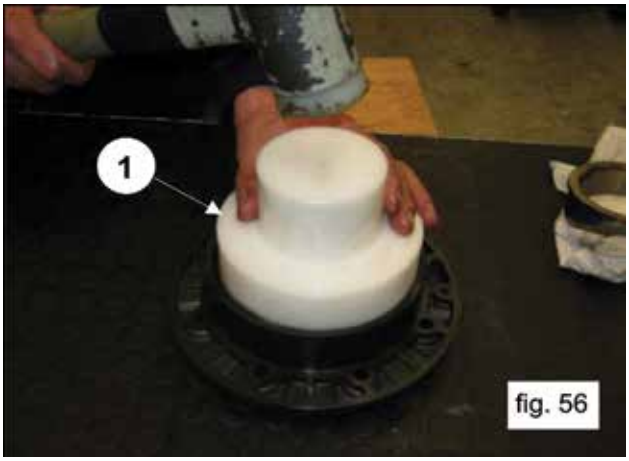




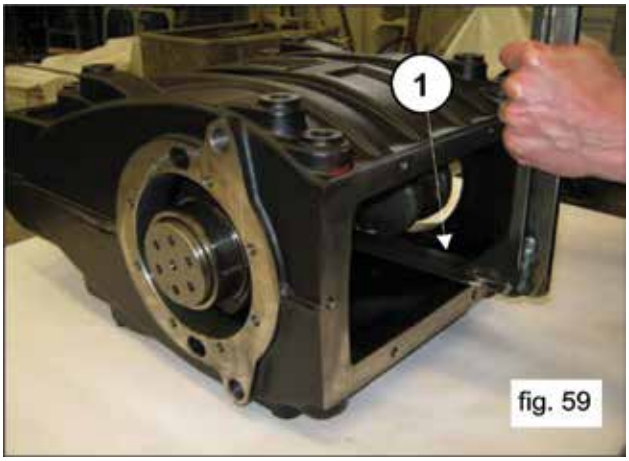
From the opposite side of the reduction gear box, pre-assemble the external ring of the crankshaft bearing with the use of tool part #F27605000 (1, fig. 54), inserting fully down to end stroke (1, fig. 55).



Repeat this operation on the bearing box, preassembling the external crankshaft bearing ring with the help of special tool part #F27605000 (1, fig. 56), inserting fully down to end stroke (1, fig. 57).

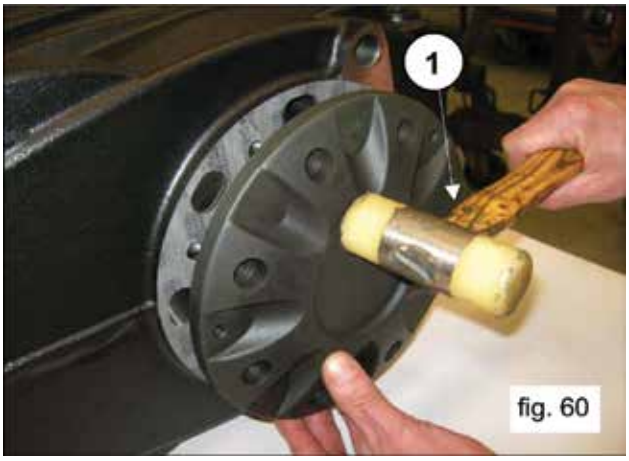


Insert the side seal on the bearing cover (1, fig. 58) and lift the crankshaft to favor cover insertion (1, fig. 59).



Assemble the bearing cover (and related seal) using an extractor hammer (1, fig. 60).

Position the bearing cover in such a way that the “Pratissoli” logo is perfectly horizontal.



Tighten the (8) M10x30 screws (1, fig. 61). Calibrate the screws with a torque wrench as indicated in Section 3 “Screw Tightening Calibration”.

fig. 61

From the opposite side, insert the side seal on the reduction gear box (1, fig. 62) and lift the crankshaft to favor cover insertion (1, fig. 63).

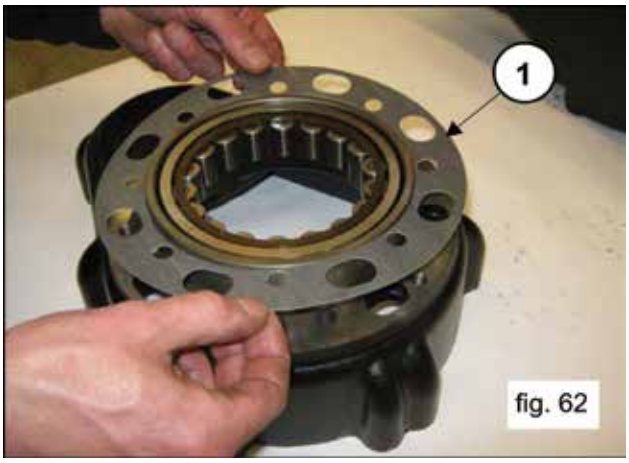


fig. 62

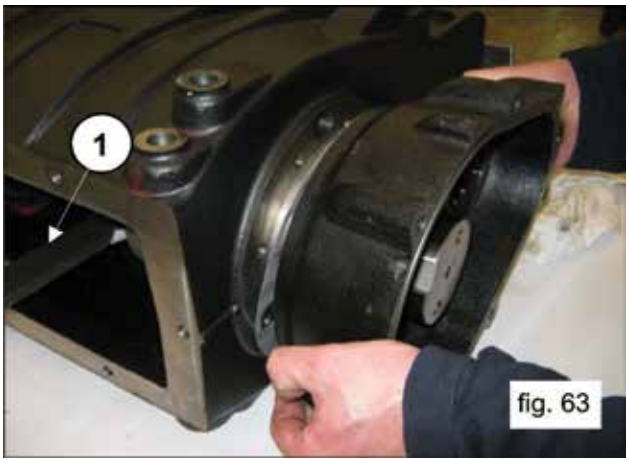


fig. 63

Assemble the reduction gear box (and related seal) using an extractor hammer (1. fig. 64).

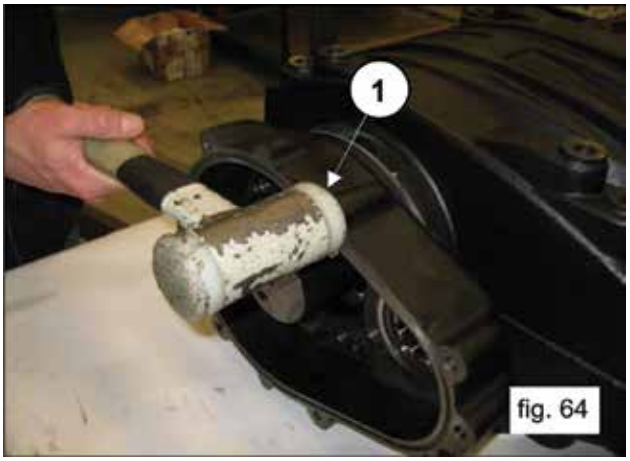
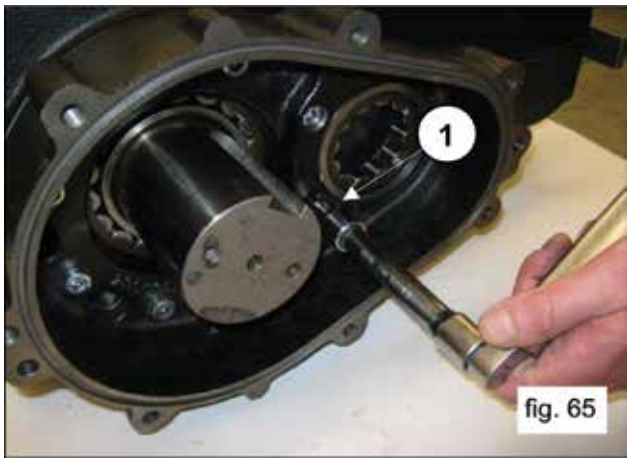


fig. 64

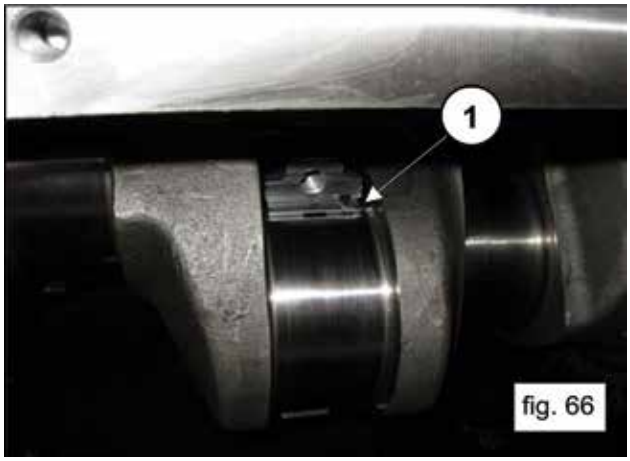
Tighten the (8) M10x40 screws (1, fig. 65). Calibrate the screws with a torque wrench as indicated in Section 3, “Screw Tightening Calibration”.

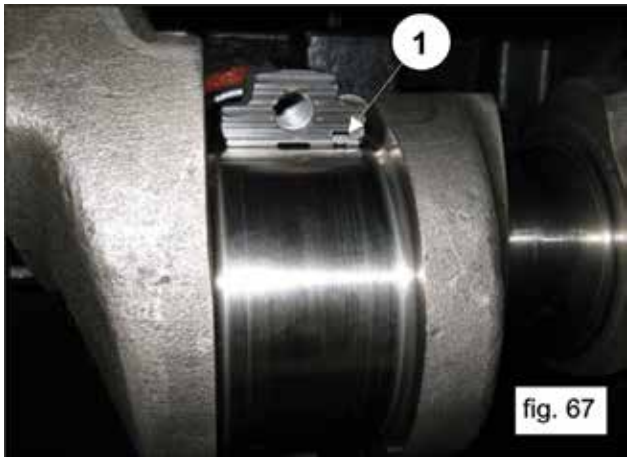


Remove the tool for blocking the connecting rods tool part #F27566200 (1, fig. 32)

Insert the upper half-bearings between the connecting rods and the shaft (1, fig. 66).

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 (1, fig. 67).



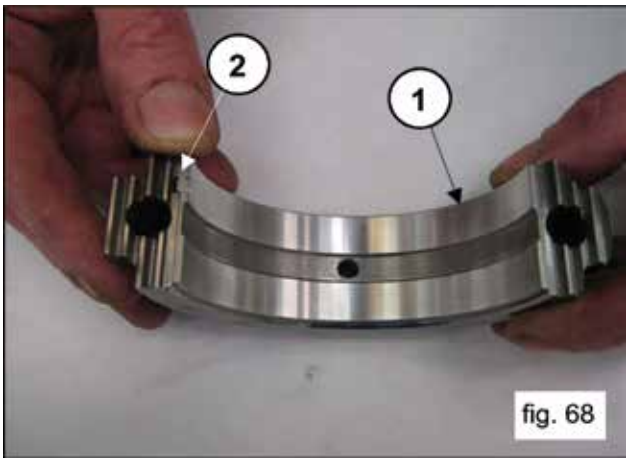


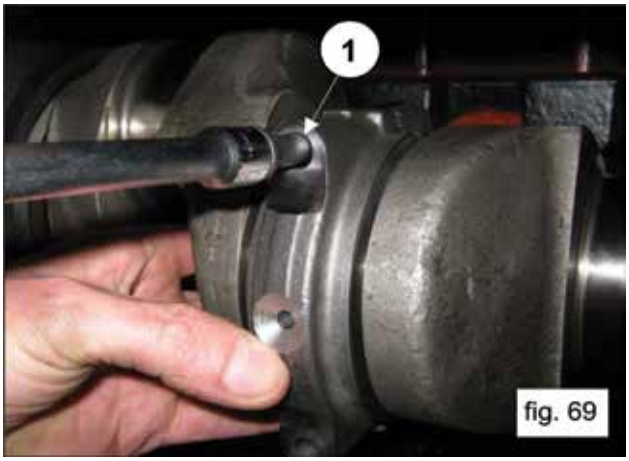
Apply the lower half-bearings to the caps (1, fig. 68) ensuring that the half-bearing reference notches are positioned in their housing on the cap (1, fig. 68).

Fasten the caps to the half supports by means of M10x1.5x80 screws (1, fig. 69).

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

Calibrate the screws with a torque wrench as indicated in Section 3 “Screw Tightening Calibration”, bringing the screws to tightening torque at the same time.

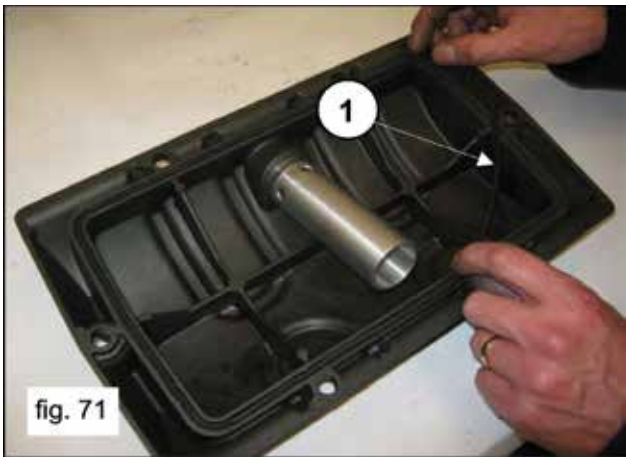


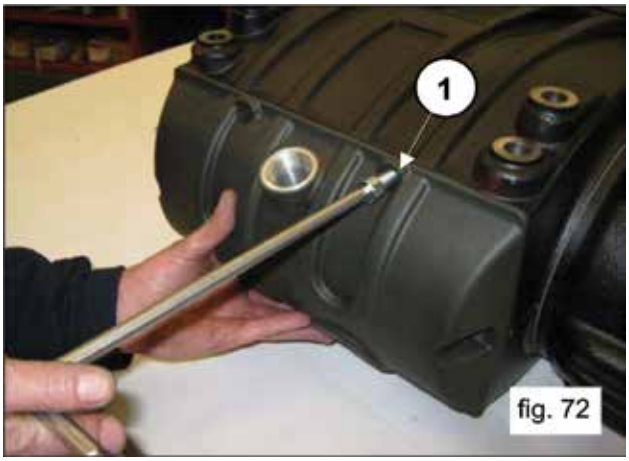


After finishing this operation, verify that the connecting rods have axial clearance in both direction.

Insert the plunger guide seal rings in their casing by means of special tool part #F27605300. Position the component on the rod (1, fig. 70a) and strike on the tool until the seal ring is fully inserted in the housing (1, fig. 70b).

Insert the o-ring on the rear cover (1, fig. 71 and assemble the cover on the casing with the aid of (6) M10x30 screws (1, fig. 72).

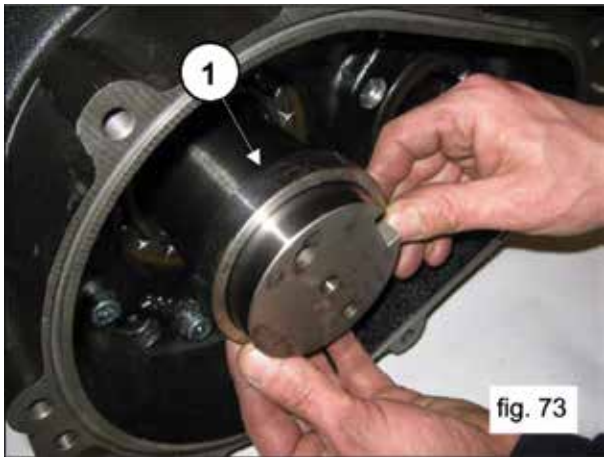




Take care to fully and properly insert the o-ring in its housing on the cover to prevent them from being damaged during screw tightening.

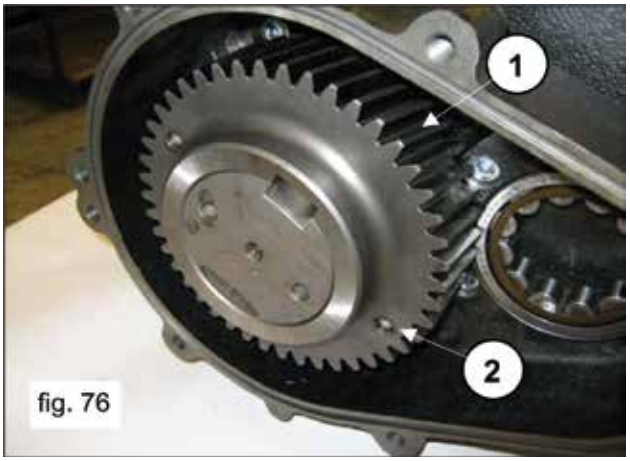
Calibrate the screws with a torque wrench as indicated in Section 3, “Screw Tightening Calibration”.

Insert the ring gear support ring in the crankshaft shank (1, fig. 73) to end stroke (1, fig. 74).

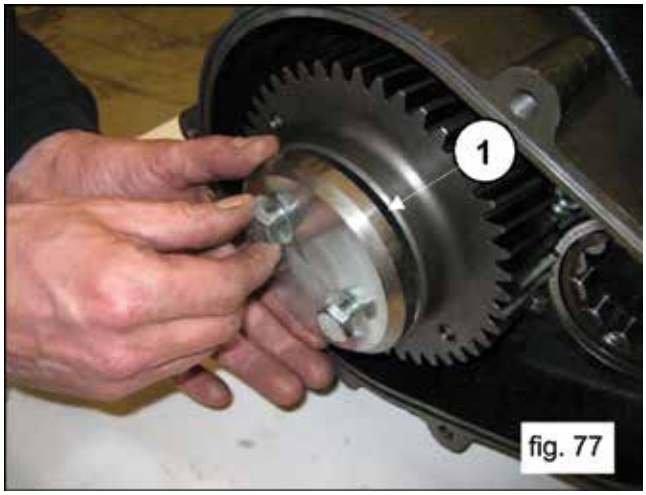


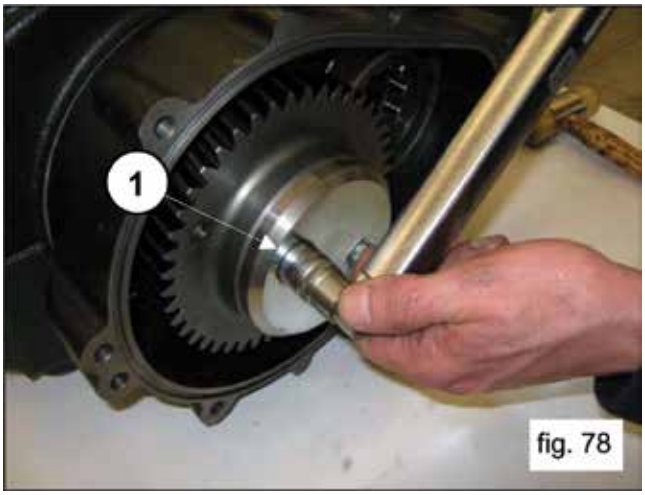
Apply tab 22x14x80 in the shaft housing (1, fig. 75) and insert the ring gear on the shaft (1, fig. 76).

The ring gear must be assembled making sure that the two M8 holes (to be used for extraction) be turned outward of the pump (2, fig. 76).

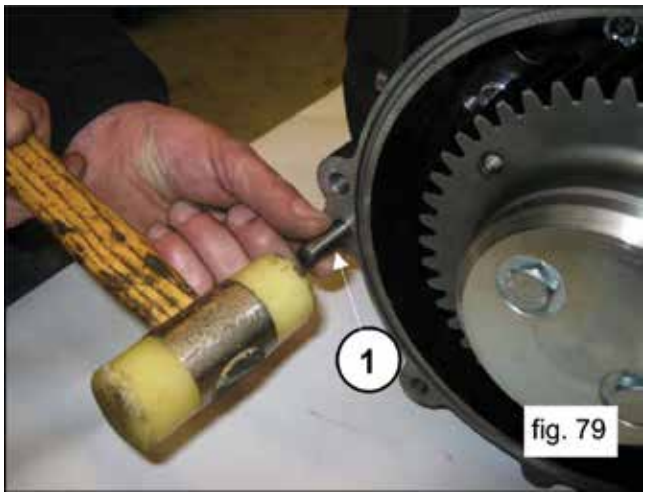


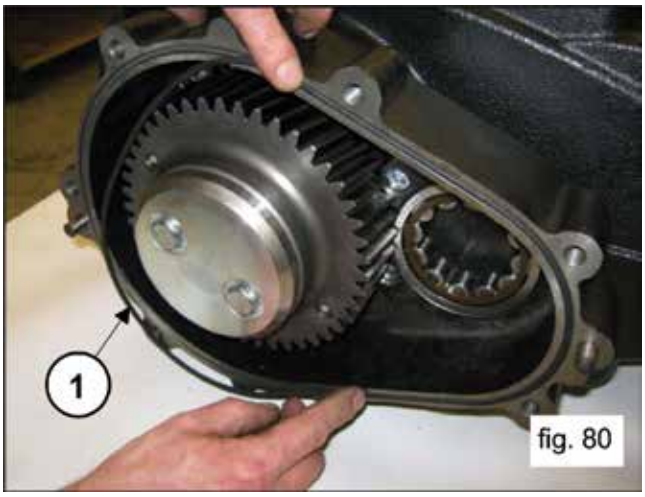
Fasten the ring gear stop (1, fig. 77) using (2) M10x25 screws. Calibrate the screws with a torque wrench as indicated in Section 3, “Screw Tightening Calibration” (1, fig 78).



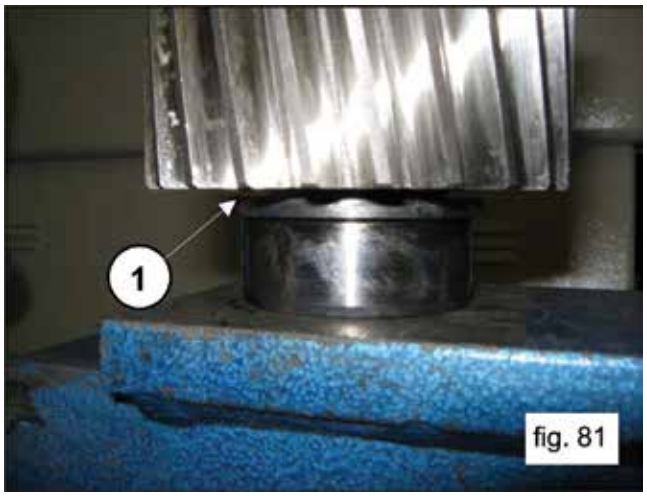


Apply the two Ø 10x24 pins on the reduction gear box (1, fig. 79) and insert the o-ring (1, fig. 80).

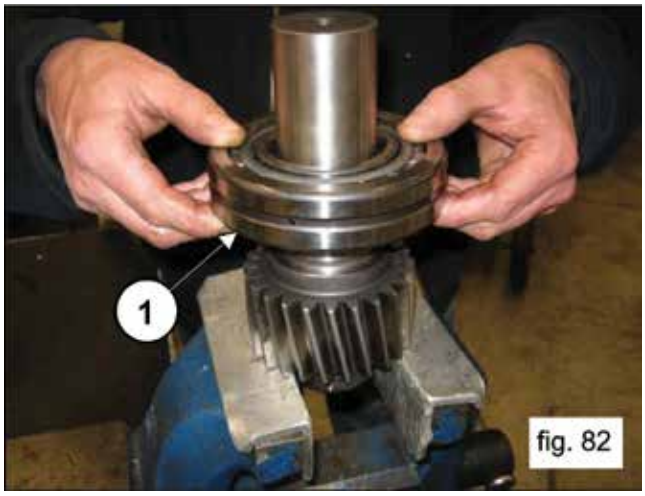


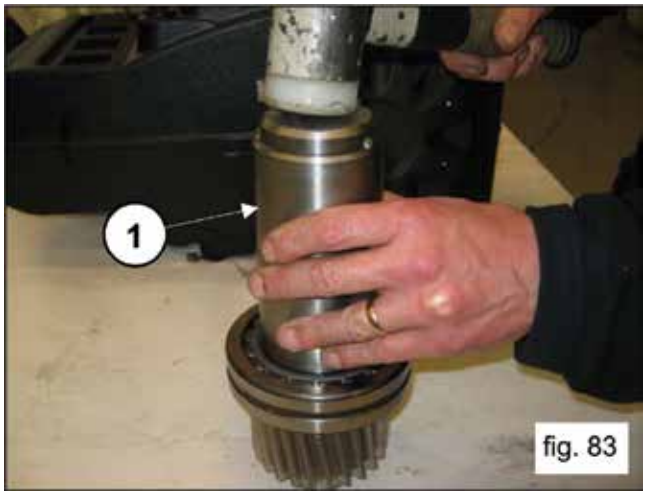


Complete assembly of the pinion on the reduction gear cover, proceeding as follows:
Pre-assemble the inner bearing ring 40x90x23 on the pinion (1, fig. 81) positioning it to end stroke.

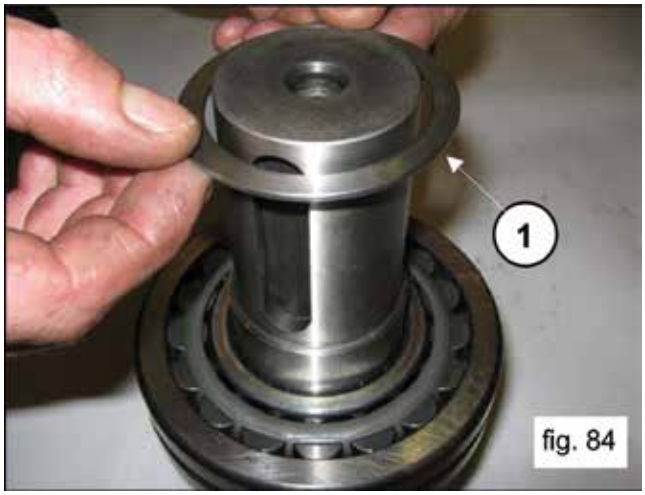


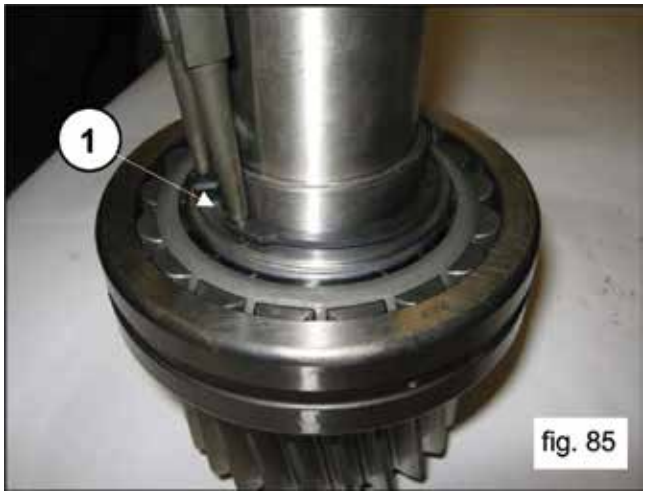
From the other side of the pinion, pre-assemble the bearing 55x120x29 (1, fig. 82) positioning it to end stroke using tool #F27604800 (1, fig. 83).



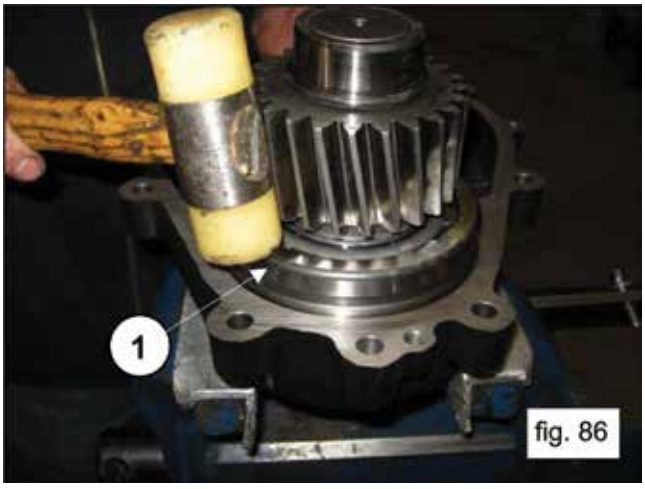


Insert the bearing support ring (1, fig. 84) and position the Seeger ring Ø 55 (1, fig. 85).





Insert the pinion pre-assembled inside its housing in the reduction gear cover, with the aid of an extractor hammer (1, fig. 86).



Insert the Seeger ring Ø 120 in the housing (1, fig. 87).

fig. 87

Assemble the reduction gear cover with the aid of an extractor hammer (1, fig. 88) and fasten them with (7) M10x40 screws (1, fig. 89). Take care to properly couple the two components on the bearing 40x90x23. Calibrate the screws with a torque wrench as indicated in Section 3 “Screw Tightening Calibration”.

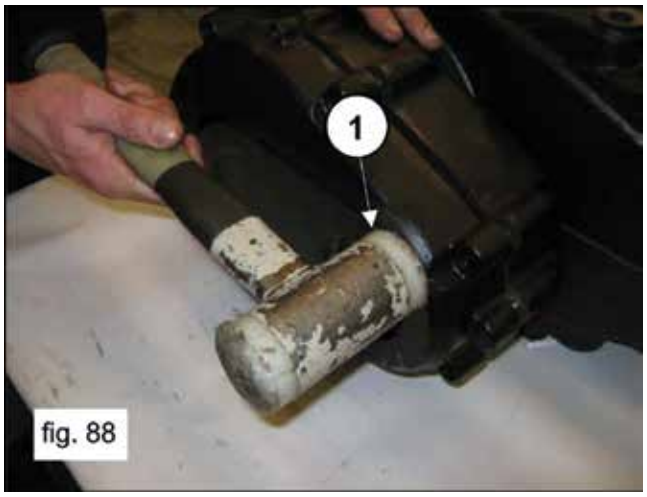


fig. 88

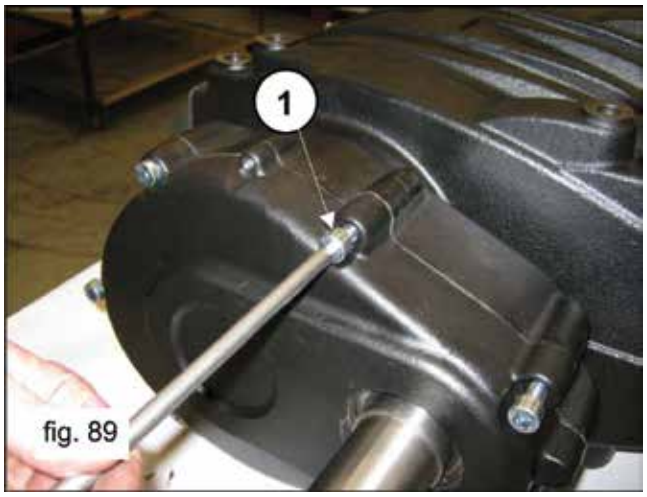
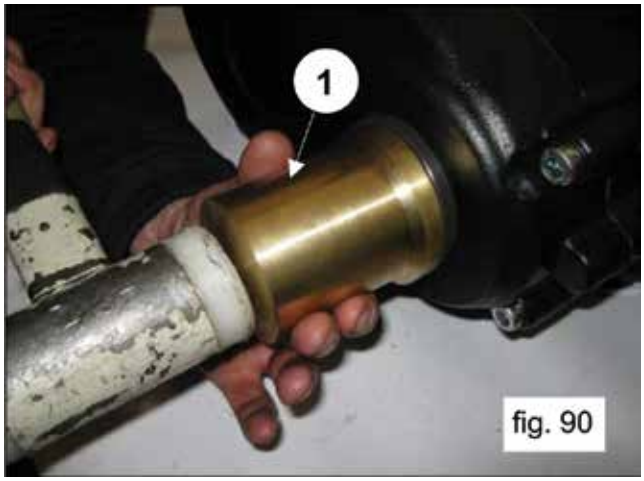
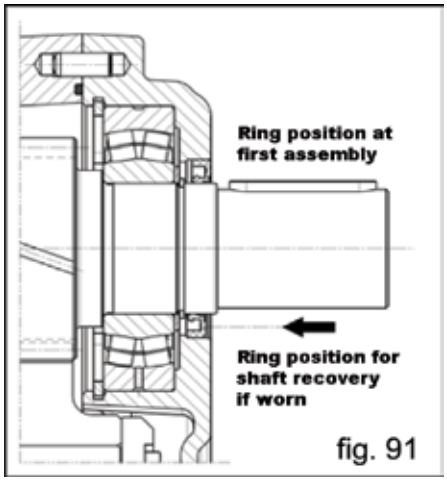


fig. 89

Insert the seal ring inside the reduction gear cover with the use of special tool #F27605200 (1, fig. 90). Before proceeding with seal ring assembly, check lip seal conditions. If replacement is necessary, position the new ring on the bottom of the groove as indicated in fig. 91.

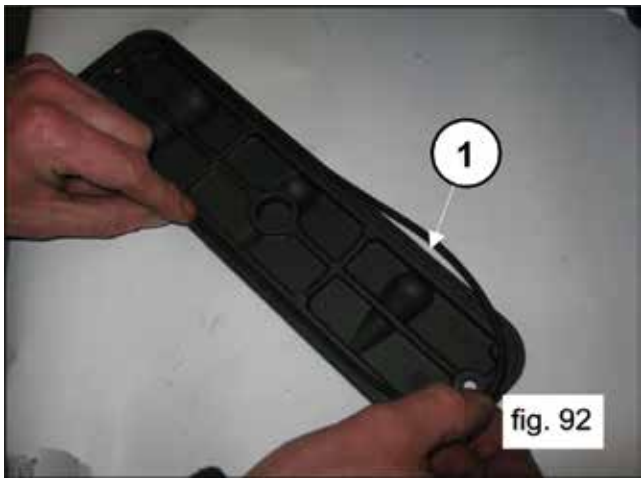
If the shaft should present a diameter wear corresponding to the lip seal, to prevent griding, position the ring in the second spoke as indicated in fig. 91.

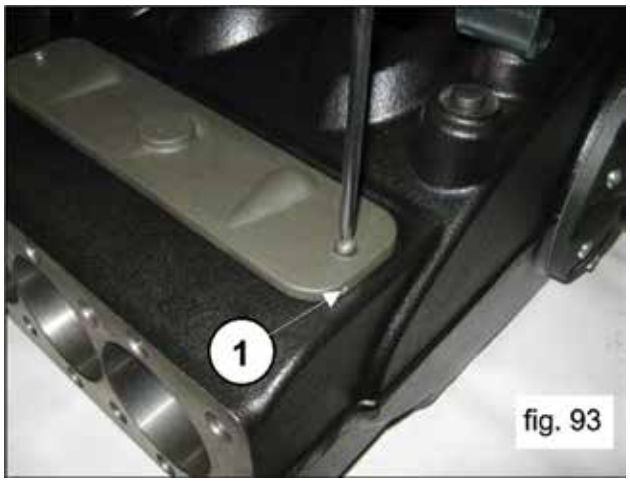




To prevent damage to the seal ring, take special care when inserting the seal ring on the opinion.

Apply o-rings on the inspection covers (1, fig. 92) and tighten with (2) M6x14 screws (1, fig. 93). Calibrate the screws with a torque wrench as indicated in Section 3 “Screw Tightening Calibration”.





Insert the tab 14x9x60 on the pinion. Apply plugs and lifting brackets with the use of M16x30 screws (1, fig. 94). Calibrate the screws with a torque wrench as indicated in Section 3 “Screw Tightening Calibration”.

Insert oil in the casing as indicated in the Owner’s Manual, Section 7.4.

2.1.3 Increase and Reduction Classes

INCREASE TABLE FOR CRANKSHAFT AND CONNECTION ROD HALF-BEARINGS			
Recovery classes (mm)	**P/N Half-bearing Upper**	**P/N Half-bearing Lower**	**Correction on the shaft pin diameter (mm)**
0.25	F90928100	F90928400	Ø79.75 0/0.02 Ra 0.4 Rt 3.5
0.50	F90928200	F90928500	Ø79.50 0/0.02 Ra 0.4 Rt 3.5

INCREASE TABLE FOR PUMP CASING AND PLUNGER GUIDE		
Recovery classes (mm)	**P/N Plunger Guide**	**Adjustments on the Pump Casing housing (mm)**
1.00	F73050243	Ø71 H6 +0.019/0 Ra 0.8 Rt 6

2.2 Repairing Hydraulic Parts

2.2.1 Dismantling the Head-Liners-Valves

The head does not require periodic maintenance.
Operations are limited to inspection or replacement of the valves, when necessary. To extract the valve assemblies work as follows:

Unscrew the M10x140 head liner fixing screws without removing them (1, fig. 95) in such a way as to free them.

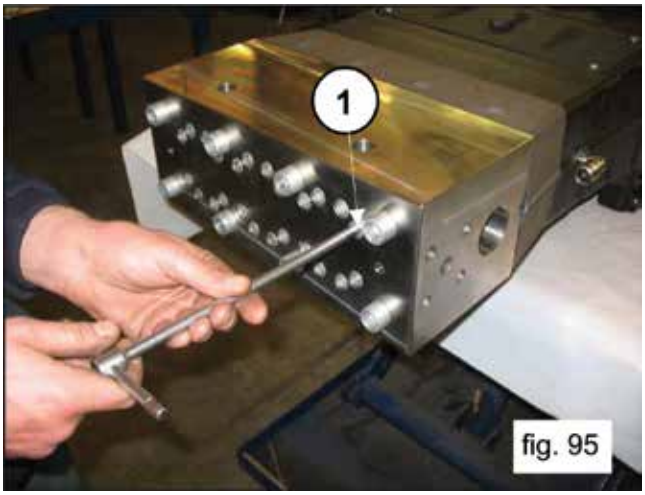
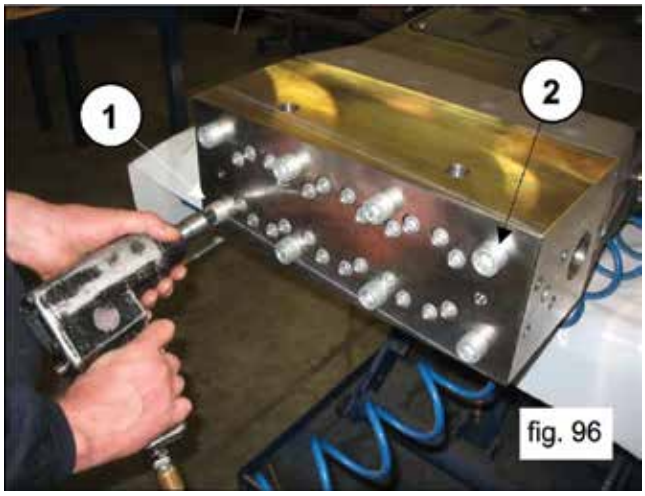
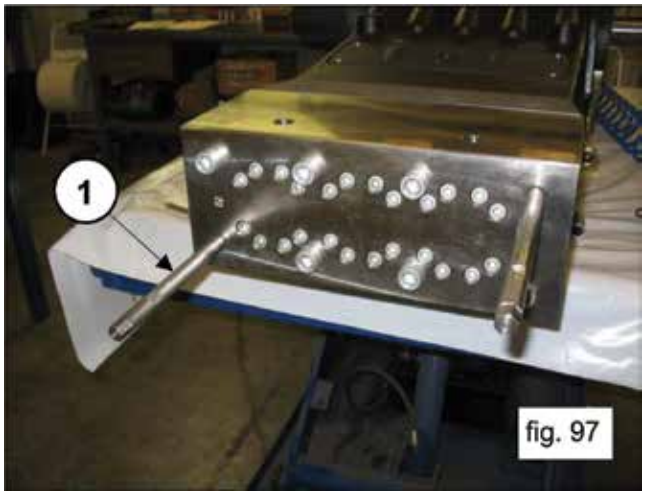


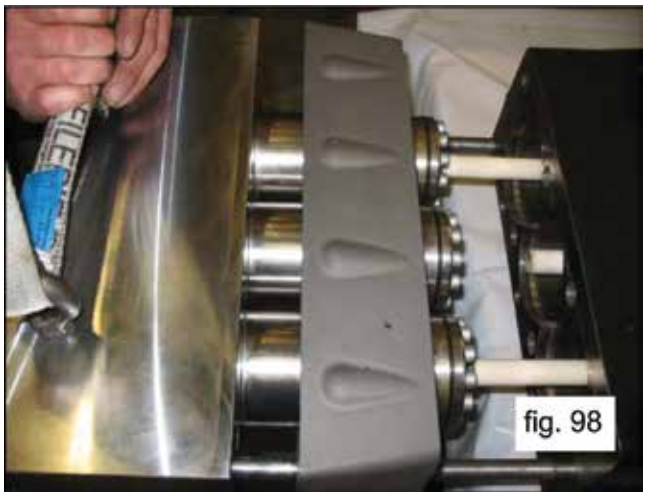
fig. 95

Unscrew two diametrically-opposite M16 x 80 head fixing screws (1 and 2, fig. 96) and replace them with two service pin-screws (part #F27540200)(1, fig. 97), and then proceed to remove the remaining screws.

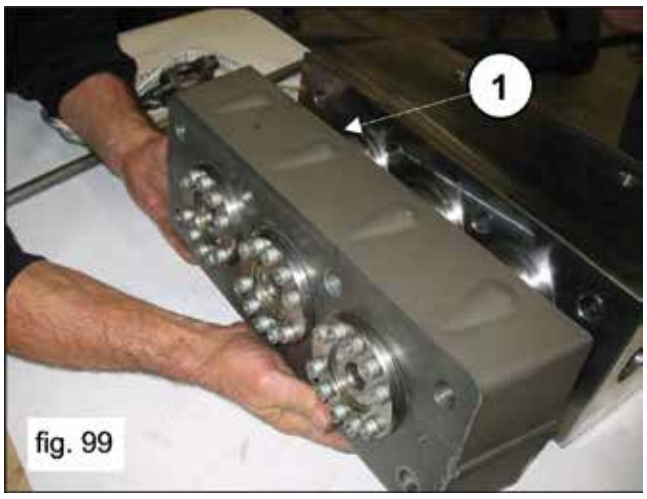




Separate the head and the spacer from the pump casing liners (1 fig. 98).



Remove the spacer for pump casing liner from the liner units (1, fig. 99).



Remove the M10x140 head liner fixing screws (1, fig. 100) and remove the liner units (1, fig. 101).

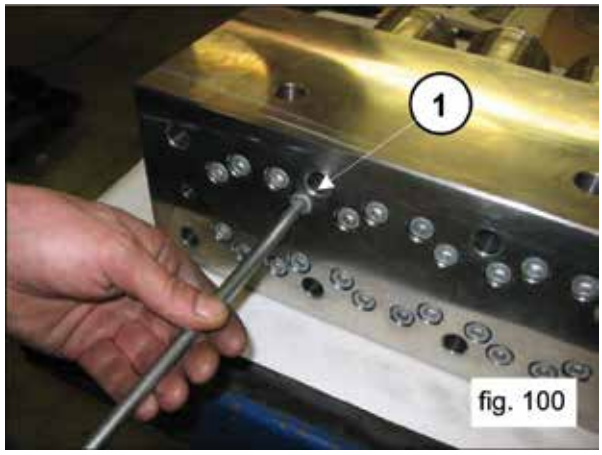


fig. 100

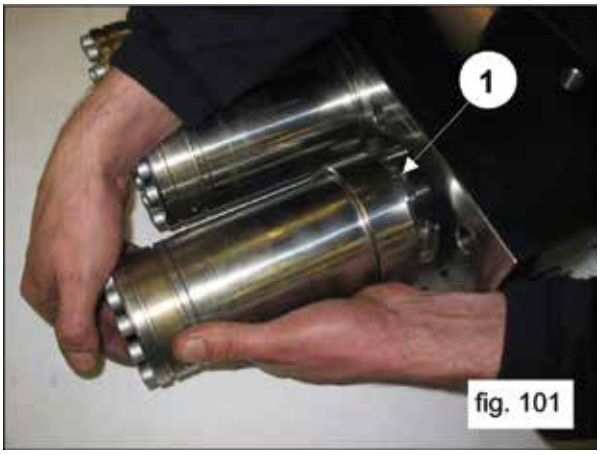


fig. 101

During assembly of the liners, take care not to disperse the valve springs and the flat valves (1 and 2, fig. 102) as, not being locked, they could fall.

fig. 102

If the valve housings should become blocked on the head due to the forming of limestone or oxide, they must be unblocked by inserting a special tool part #F034300020 in the outlet hole.

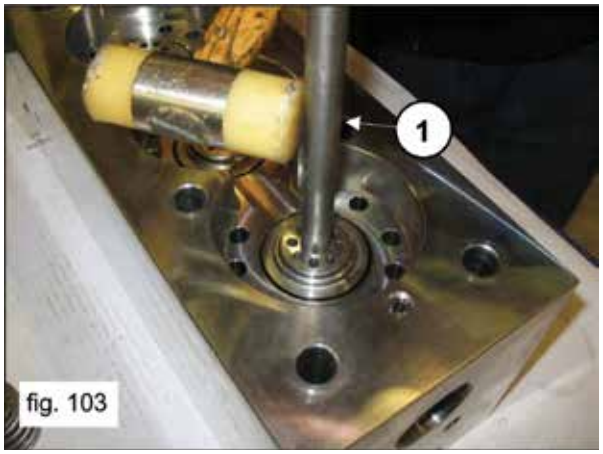


fig. 103

Extract the valve housings and check the conditions of the various components. If necessary, make any replacements (1, fig. 104).

fig. 104

At every valve inspection, always replace all seal rings and relative o-rings between the liner and head, between the head and liner spacer in the recirculation inlet area. Clean and dry components and all relative housings inside the head before replacing.

Extract the outlet plates (1, fig. 105) and their respective guides (1, fig. 107) with their springs (1, fig. 106). Check their conditions, replace if necessary and at the intervals necessary as indicated in Chapter 11 of the Owner's Manual.

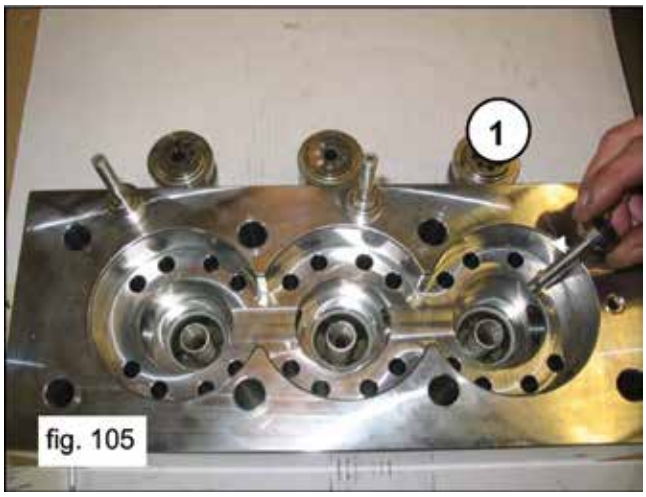


fig. 105

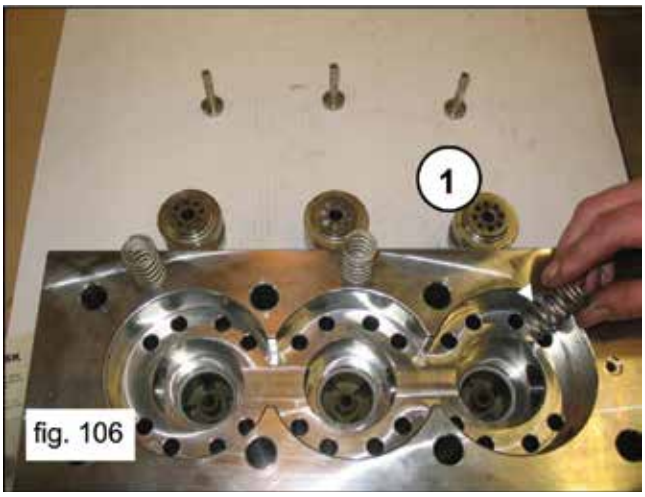


fig. 106

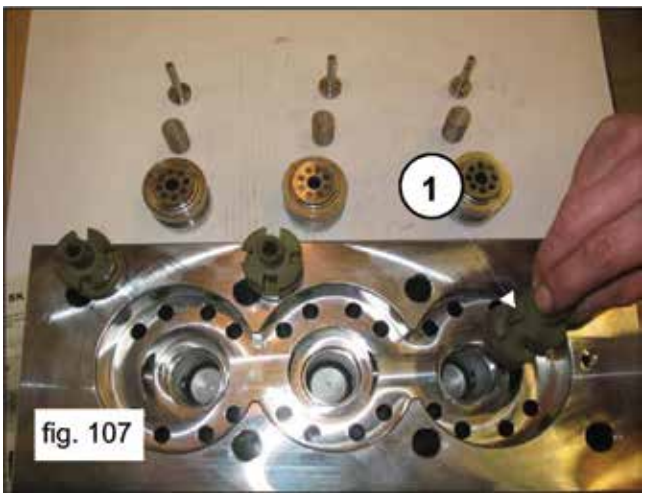


fig. 107

2.2.2 Assembling the Head-Liners-Valves

To reassemble the various components, reverse the operations listed previously, paying particular attention to the correct assembly of the spacer for liners: the hole Ø6 (seal cooling circuit) must correspond to the same hole for the head (with o-ring).

Heads - liners: proceed with assembly and calibration of the head fixing screws and then with calibration of the liner fixing screws.

For the values of the screw tightening torques and sequencing, follow the instructions contained in Section 3 “Screw Tightening Calibration”.

2.2.3 Dismantling The Plunger Unit - Supports - Seals

The plunger unit does not require any routing maintenance. Maintenance is limited to visual inspection of cooling circuit drainage. If abnormalities/variations on the outlet pressure gauge or cooling circuit draining hose pulsing (if flexible) are detected, the seal packings will have to be checked and replaced.
Proceed as follows to extract plunger groups:

Separate the head and the spacer for the pump casing liners as indicated in point 2.2.1 (from fig. 95 to fig 101).

Remove the inspection cover, unscrewing the 2 fixing screws (1, fig. 108).

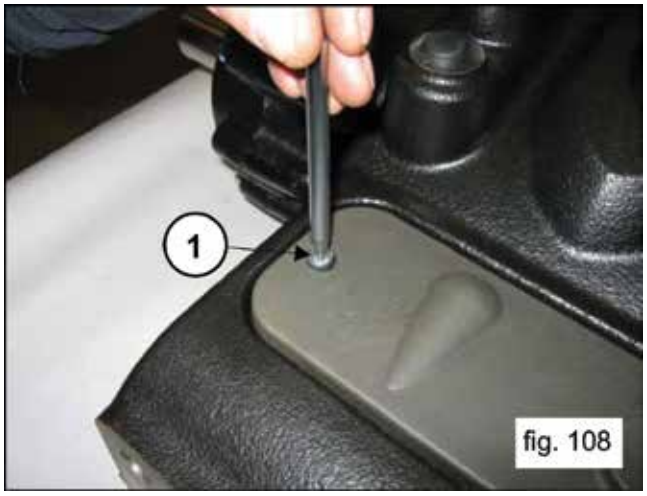


fig. 108

Remove the pumps with a fork spanner (1, fig. 109) and check conditions (1, fig. 110). Replace if necessary.

fig. 109

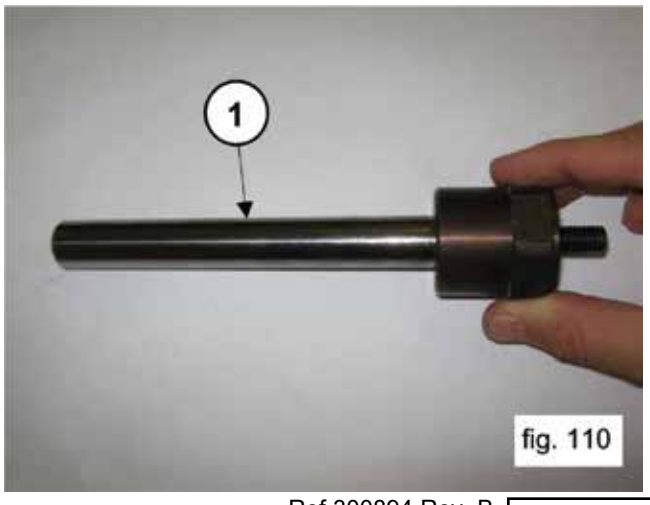


fig. 110

Remove the M8x100 screws that fix the LP seals supports, HP seals support and liner as shown in fig. 111 , and proceed to the separation of all the components as indicated in fig. 112 and fig. 112a.


fig. 111

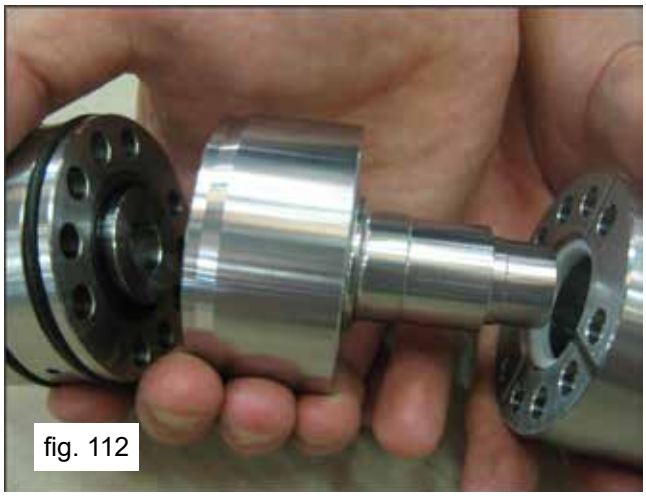


fig. 112


fig. 112a

Remove the seeger ring and the seal retainer ring as shown in fig. 113 and using a special plastic pin extract the LP (low pressure) seal as shown in (1,fig. 114).


fig. 113

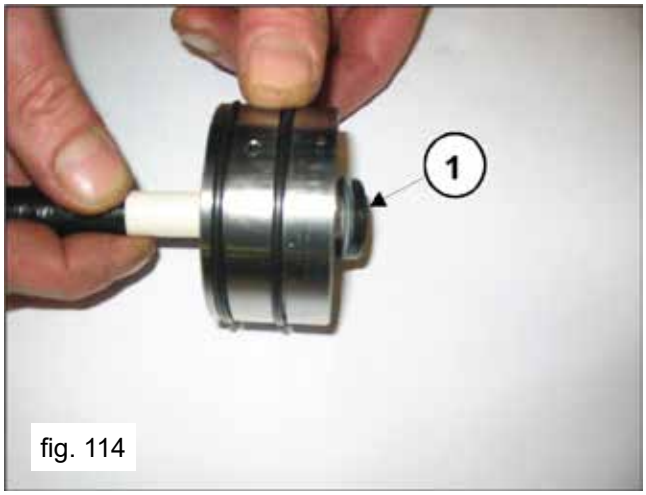


fig. 114

At each disassembly, the low pressure seals and all the O-rings must be replaced.

With separate HP seals support and a special pin (3, fig. 115), make the H.P. (high pressure) packing come out (4, fig. 116) finally extract the head ring (fig. 117).

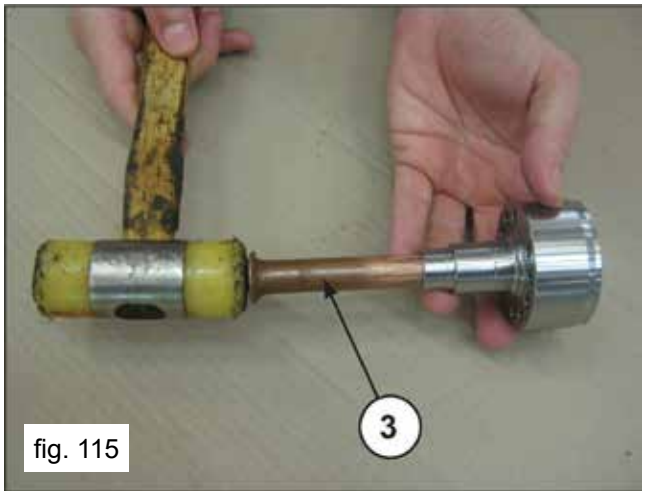


fig. 115

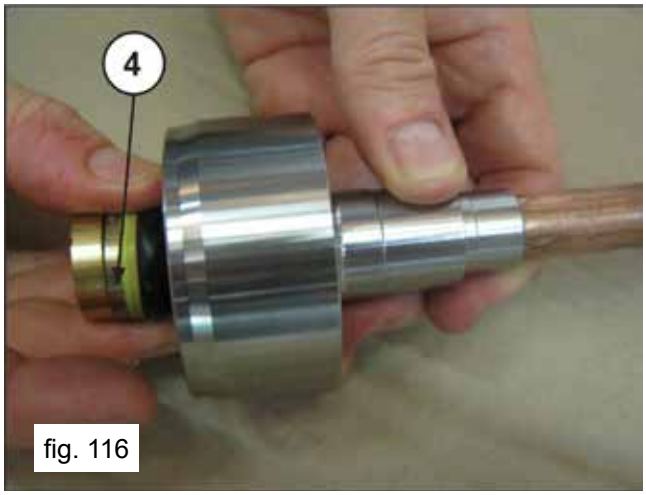


fig. 116


fig. 117

At each disassembly, the HP packing (4, Fig. 116) must be replaced.

2.2.4 Assembling the Plunger Unit - Supports - Seals

To reassemble the components, invert the operations described above, paying attention to the sequences listed below; for the fastening torque values and phases, observe the instructions given in Section 3 “Screw Tightening Calibration”.

- Insert the seal into the liner (1, fig. 118).

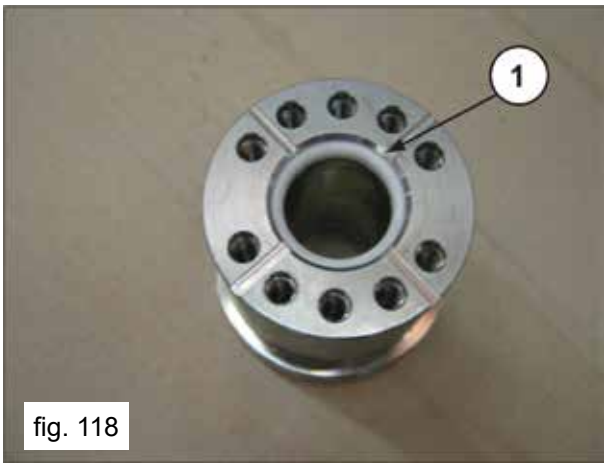


fig. 118

- Insert in the H.P. seals support, the head ring (1, fig. 119) and then the H.P. (high pressure) packing; considering the slight interference between the seal and the H.P. seals support, to avoid damage we advise using a plastic pad (1, fig. 120 and fig. 121).

fig. 119

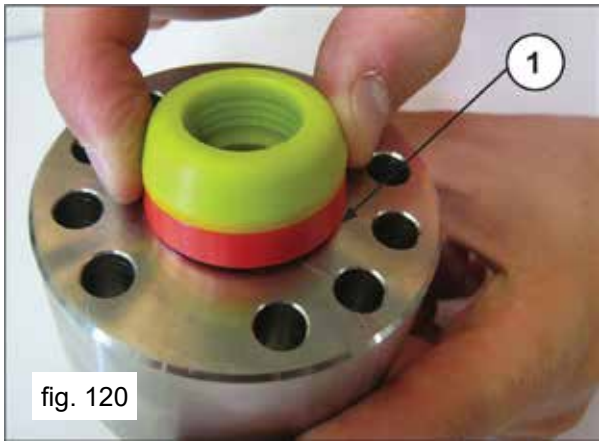


fig. 120

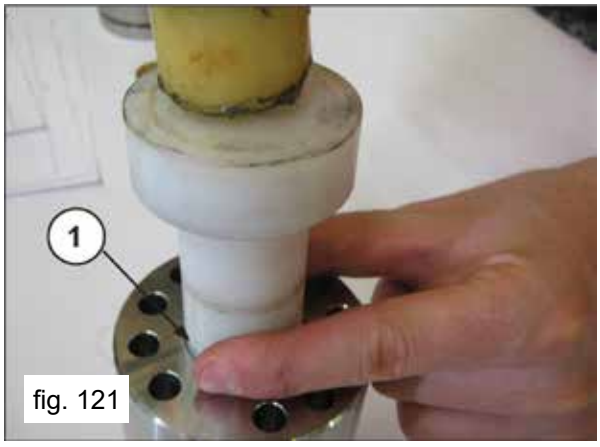


fig. 121

The H.P. seal must be placed in the support as indicated in fig. 120 and 122.

Before mounting the HP seals in their housing, they must be lubricated with OKS 1110 silicone grease following the steps below:

A) The external diameter must only be slightly greased;
B) On the internal diameter, grease must be applied paying great attention to filling all the pockets between the sealing lips as shown in fig. 122a.

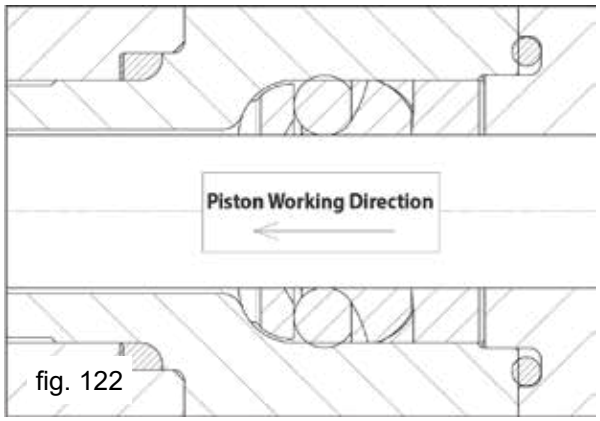


fig. 122

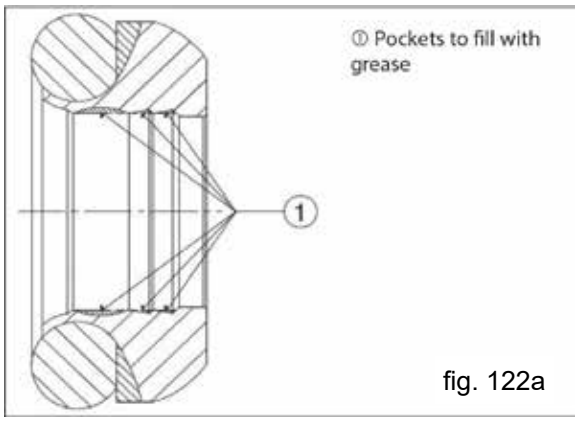


fig. 122a

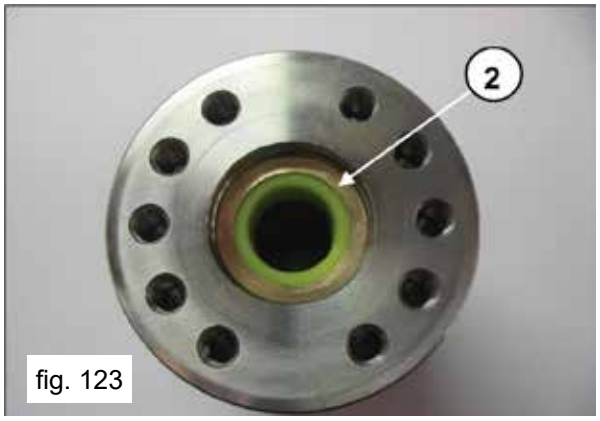


fig. 123

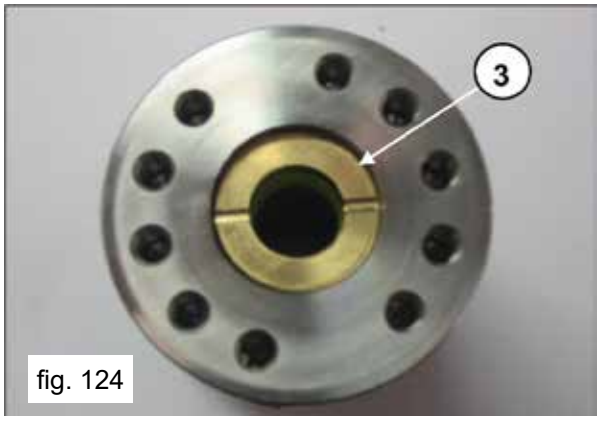


fig. 124

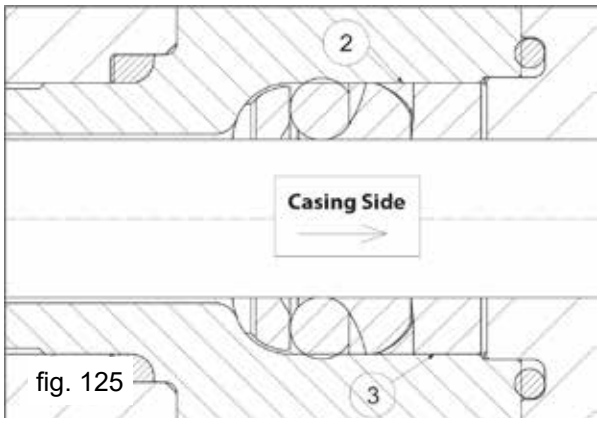


fig. 125

Insert the anti-extrusion ring (2, fig. 123) and the gasket bush (3, fig. 124) arranged as shown in fig. 125.

The gasket bush pos. 3 must be introduced into the support with the outlets facing outwards (casing side) as shown in fig. 124 and in fig. 125.

The L.P. seal must be inserted into the support with the sealing lip in the piston working direction as shown in fig. 126 and fig. 127, slightly lubricating the external diameter with silicone grease type OKS 1110.

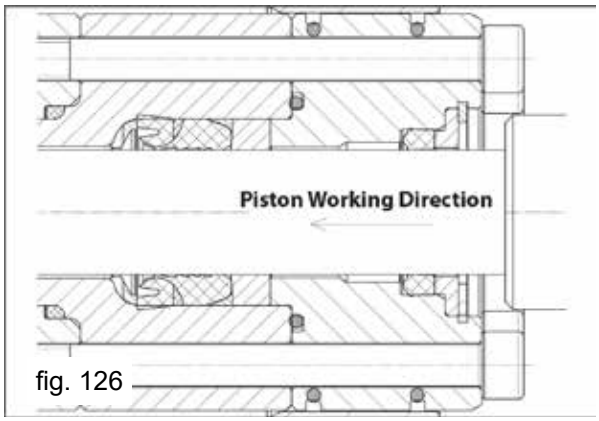


fig. 126


fig. 127

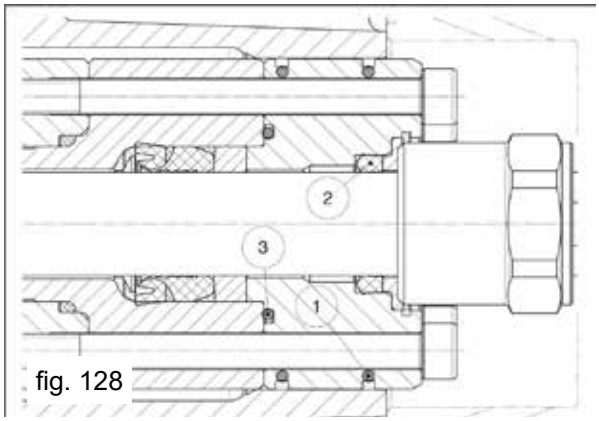


fig. 128

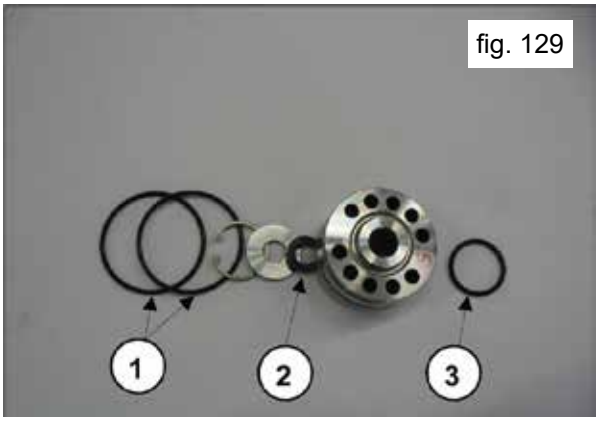


fig. 129

Reassemble the seals support unit as shown in Fig. 128 and 129 replacing components pos. 1, 2, 3.


fig. 130

Assemble the L.P. and H.P. seals support units. – liner manually screwing the screws M8x100 as indicated in Fig. 131. Then proceed with calibration using a torque wrench as indicated in Section 3 “Screw Tightening Calibration”.

3. SCREW CALIBRATION

Screws are to be fastened exclusively using a torque wrench.

Description	Exploded View Position (From Owner's Manual)	Fastening Ft. Lbs.	Fastening Nm
Casing cover M10x30 screw	79	33.2	45
G1/2x13 casing plug	81	29.5	40
Lifting bracket M16x30 screw	44	147.5	200
Reduction gear cover M10x40 screw	72	33.2	45
Ring gear stop M10x25 screw	67	59.0	80
Reduction gear box M10x40 screw	72	33.2	45
Upper cover M6x14 screw	52	7.4	10
Bearing cover M10x30 screw	79	33.2	45
M10x1.5x80 screw for conrod tightening	46	47.9	65*
Plunger guide screw M6x20	40	7.4	10
Plunger assembly	15	29.5	40
Choke fitting D.3 3/8M-3/8F	29	33.2	45
Supports screw M8x100	22	29.5	40**
Head M16x280 screw	1	206.5	280***
Liner M10x140 screw	26	61.2	83***8
Lower cover M6x40 screw	86	7.4	10

* Achieve coupling torque tightening screws at the same time.

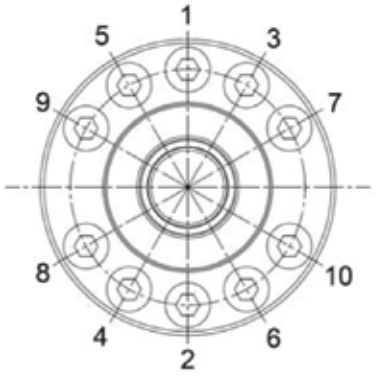
The screws in positions 1, 22 and 26 must be tightened with a torque wrench and the Threaded shaft must be lubricated with molybdenum disulphide grease, part #F12001500

** The supports diagram fixing screws fig. 131 must be tightened in two steps:
1st step = 29.5 ft. lbs. (40 Nm) according to the sequence indicated;
2nd step= 29.5 ft. lbs. (40 Nm) (calibration check repeating the sequence indicated)

*** The head fixing screws must be tightened respecting the phases and order shown in the diagram in Fig. 132.

**** The liner fixing screws must be tightened respecting the phases and order shown in the diagram in Fig. 132.

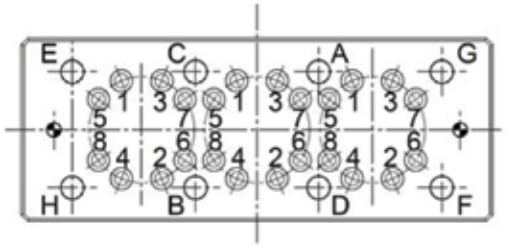
Gasket support screw tightening pos. 22



M80x50 screw tightening according to the following sequence:
(1-2-3-4-5-6-7-8-9-10) performed in a single phase at the indicated torque

fig. 131

Head screw and liner screw tightening, pos. 1 and 26



Operation 1: M16x320 screw tightening , (pos. 1) in 2 phases

Complying with the sequence indicated in the figure (A-B-C-D-E-F-G-H)

1st Phase: 158 Ft. Lbs./200 Nm

2nd Phase: 207 Ft. Lbs./280 Nm

Operation 2: M10x140 screw tightening , (pos. 26) in 4 phases

Complying with the sequence indicated in the figure (1-2-3-4-5-6-7-8)

1st Phase: 30 Ft. Lbs./40 Nm

2nd Phase: 48 Ft. Lbs./65 Nm

3rd Phase: 61 Ft. Lbs./83 Nm

4th Phase: 61 Ft. Lbs./83 Nm

fig. 132

4. REPAIR TOOLS

Pump maintenance may be carried out using simple tools for assembling and disassembling components. The following tools are available:

For Assembly:

- Shaft (connecting rod interlocking) F27566200
- Bearing on crankshaft. F27604700
- Pinion bearing on reduction gear box F27604900
- Crankshaft bearing on reduction gear box F27605000
- Plunger guide oil seal F27605300
  . . . . . F27634400
- Bearing on pinion F27604800
- Pinion oil seal F27634900
  . . . . . F27635000
- Heads / Liners spacers F27540200

For Disassembly:

- Plunger guide oil seal F27644300
- Shaft (connecting rod interlocking) F27566200
- Valve housing F34300020
- Heads / Liners spacer F27540200
- Plunger F25047400

5. MAINTENANCE LOG

	HOURS & DATE						
OIL CHANGE							
GREASE							
PACKING REPLACEMENT							
PLUNGER REPLACEMENT							
VALVE REPLACEMENT							

GENERAL PUMP

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