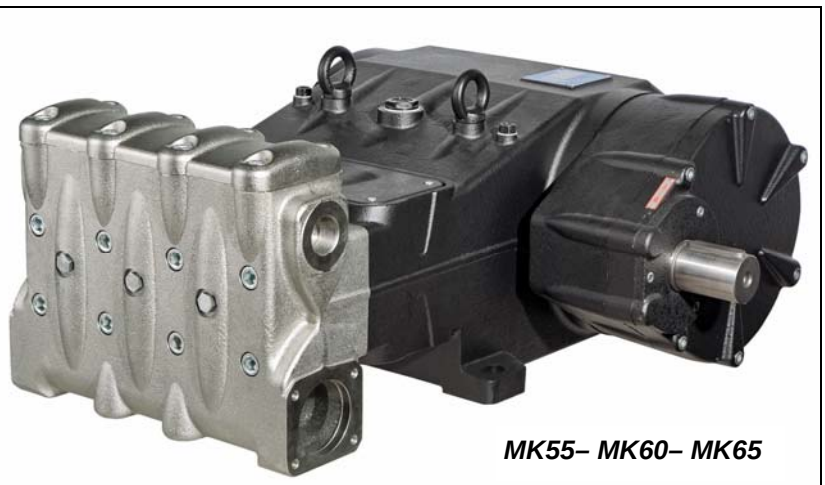
MK Series

MK40 – MK45 – MK50



MK55– MK60– MK65

Repair Manual

INDEX

1. INTRODUCTION

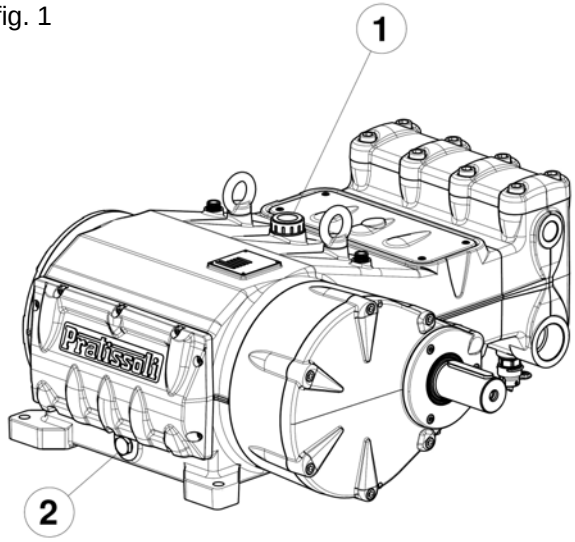
This manual describes the instructions for repairing MK series pumps, and must be carefully read and understood before performing any repair intervention on the pump.
Correct use and adequate maintenance is fundamental for the pump's regular operation and long duration.
The Interpump Group declines any responsibility for damage caused by misuse or the non-observance of the instructions described in this manual.

2. REPAIR INSTRUCTIONS

2.1 Crank Mechanism Repair

Crank mechanism repair operations must be carried out after draining the oil from the crankcase.
To drain the oil, remove the oil refill cap pos.①, fig.1, and then the draining plug, pos.②, fig.1.

fig. 1



Exhausted oil must be collected in an appropriate recipient and disposed of in apposite locations. In absolutely no case may it be dispersed in the environment.

2.1.1 Crank Mechanism Disassembly
The correct sequence is the following:

Completely drain the oil from the pump, then remove the key from the shaft (pos.①, fig.2).

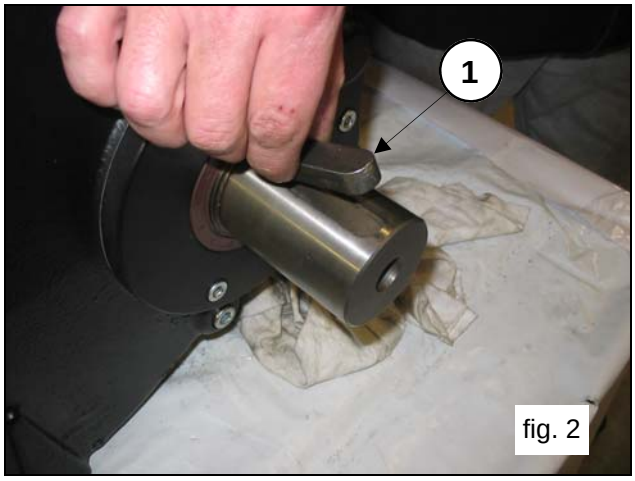


fig. 2

Unscrew the reducer flange fastening screws (pos.①, fig.3) and remove the flange from the shaft.

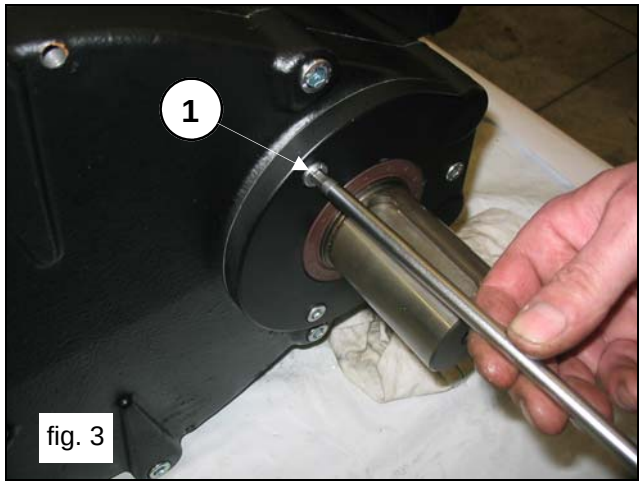


fig. 3

On the opposite side, unfasten the screws (pos.①, fig.4) and therefore remove the bearing cover.

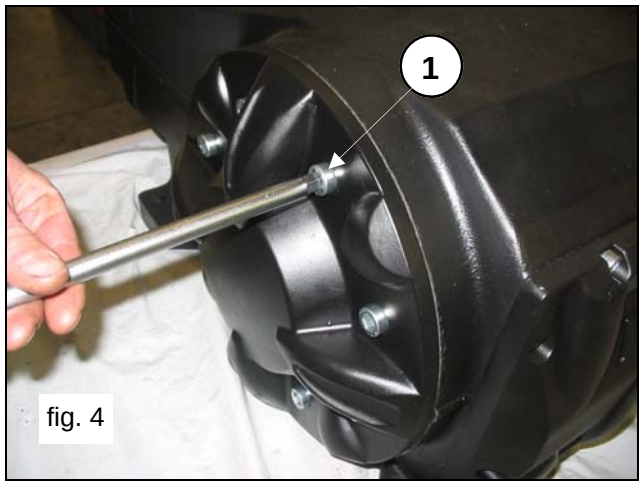


fig. 4

Disassemble the crankcase cover by unfastening the relevant screws (pos.①, fig.5).

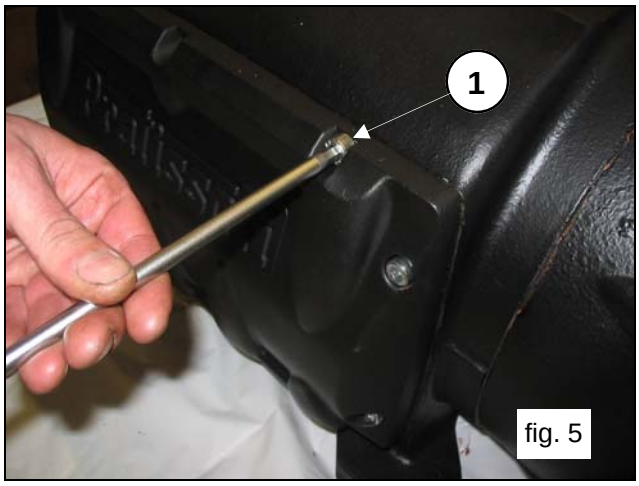


fig. 5

Unfasten the reducer cover screws (pos.①, fig.6).

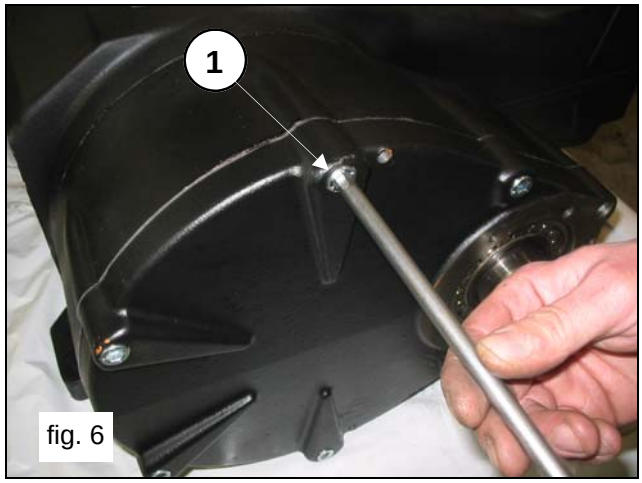


fig. 6

Insert n.3 dowels or M8 threaded screws (pos.①, fig.7) in the apposite holes to aid extraction, and two sufficiently long M10 screws in order to support the cover (pos.②, fig.7).

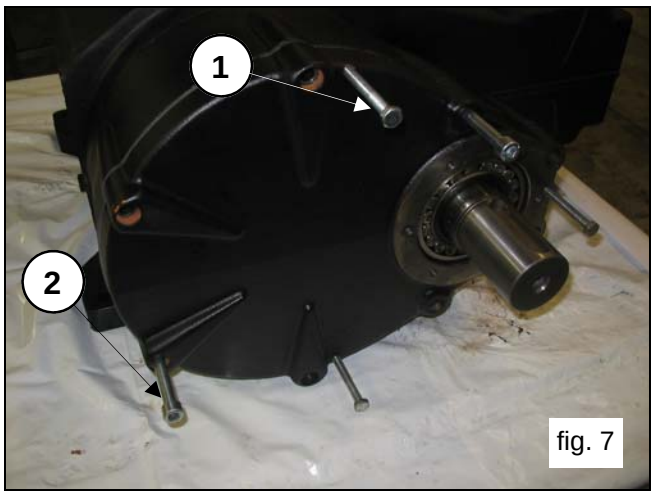


fig. 7

Screw on the 3 threaded dowels (pos.①, fig.8) and simultaneously, using the appropriate tool (cod. 27516700), hammer on the tool itself so that the bearing remains on the pinion when extracting the cover (pos.①, fig.9).

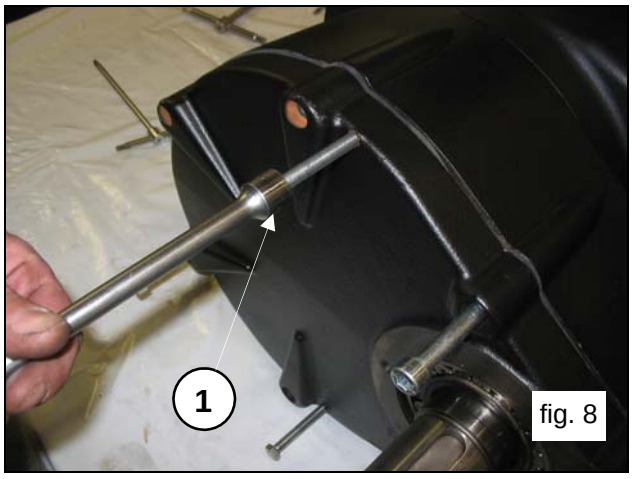


fig. 8

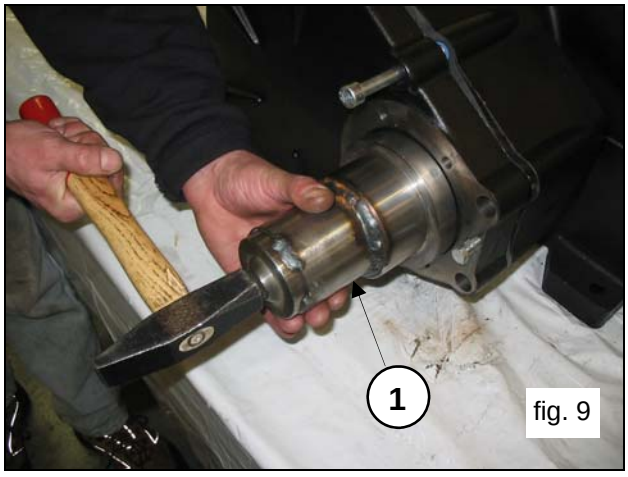


fig. 9

When this operation is complete, remove the reducer cover and then slip off the bearing from the pinion. Remove the screws that fasten the ring gear stopper (pos.①, fig.10), and remove the stopper itself (pos.①, fig.11).

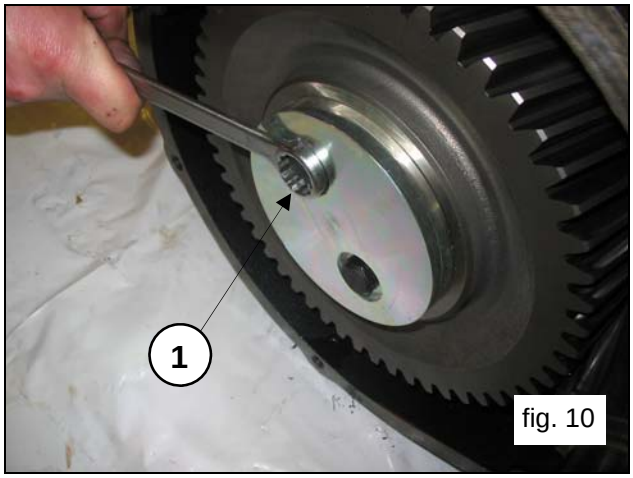


fig. 10

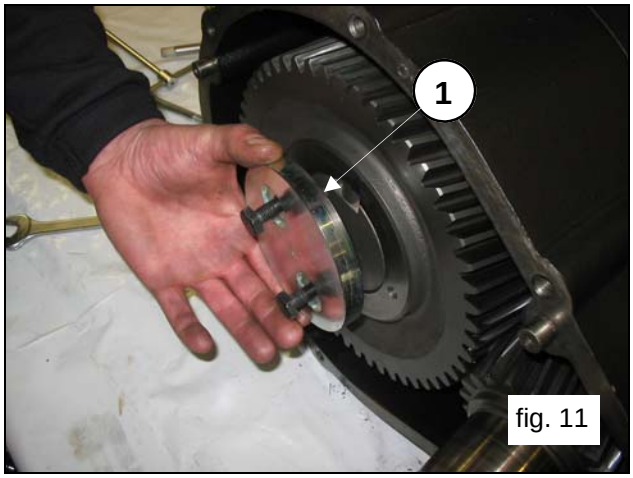


fig. 11

Remove the ring gear (pos.①, fig.12). If necessary, use a slide hammer applying it to the 2 M8 holes (pos.②, fig.12).

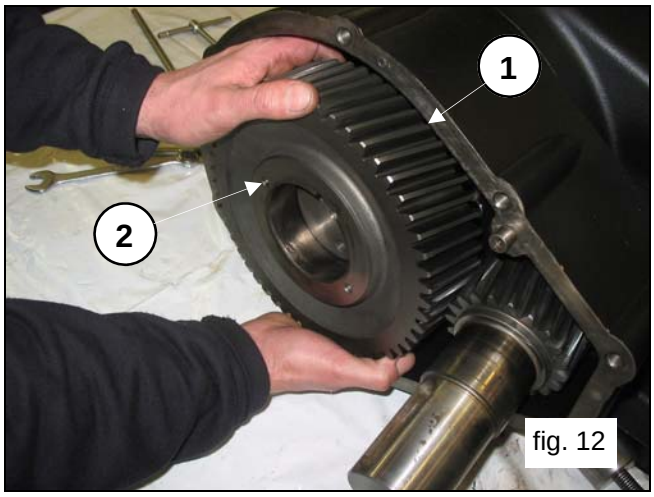


fig. 12

Remove the key from the shaft (pos.①, fig.13).

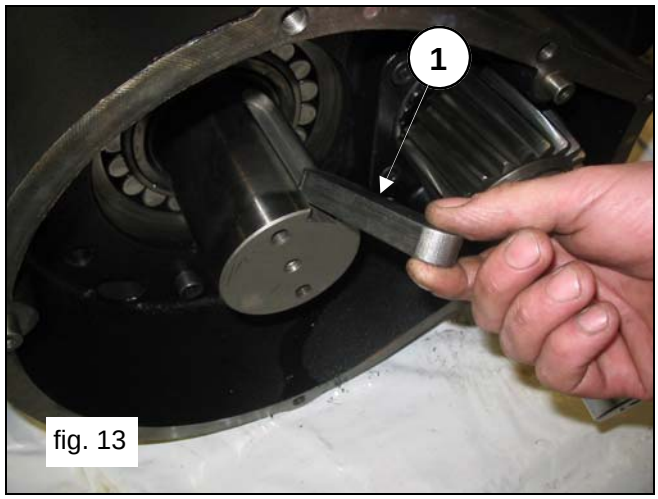


fig. 13

Remove the pinion by using a slide hammer applying it to the M14 hole (pos.①, fig.14).

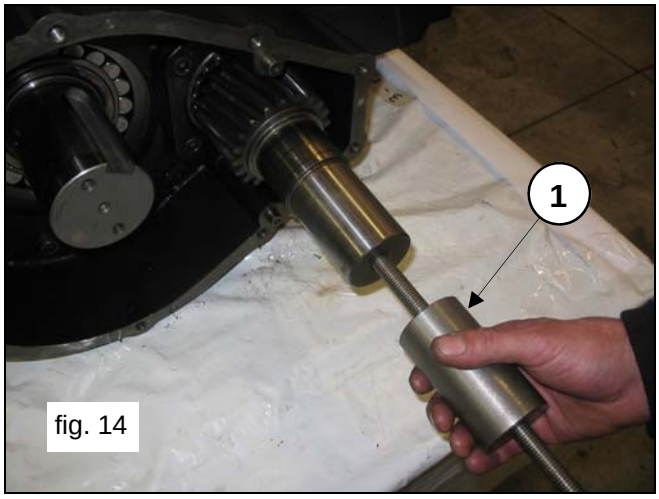


fig. 14

Lift the safety washer key (pos.①, fig.15).

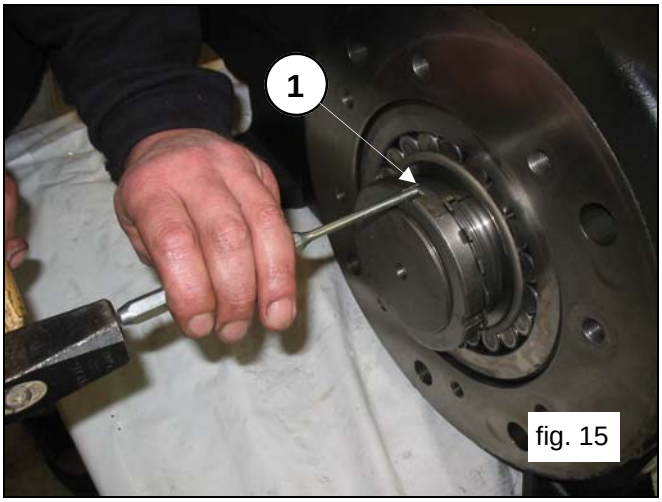


fig. 15

Insert a spacer under the connecting rod to block shaft rotation (pos.①, fig.16).

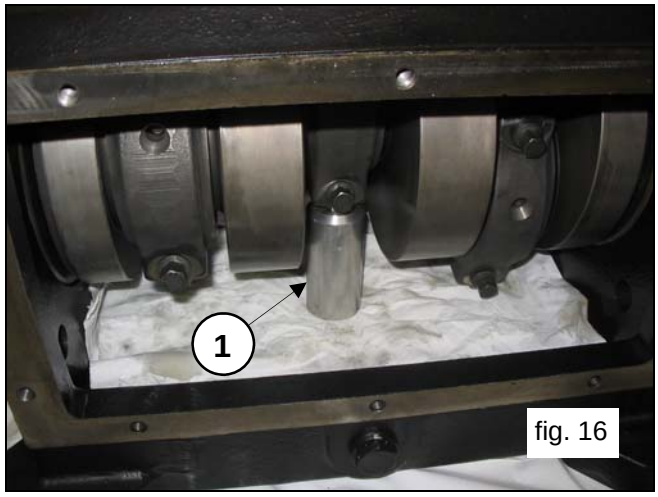


fig. 16

Using an apposite wrench, unscrew and remove the ring nut (pos.①, fig.17) and then remove the safety washer (pos.①, fig.18).

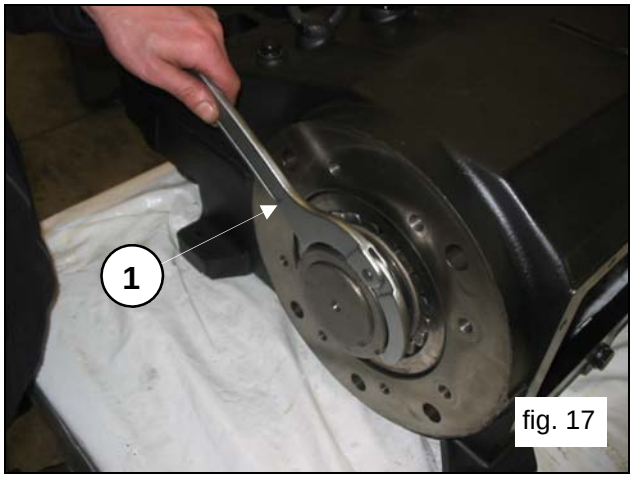


fig. 17

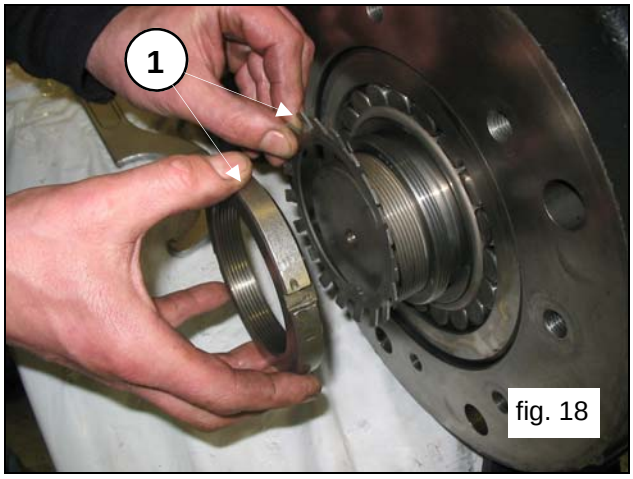


fig. 18

Screw a SKF KM19 type ring nut onto the pressure sleeve (pos.①, fig.19), therefore loosen the sleeve using an apposite wrench (pos.①, fig.20).

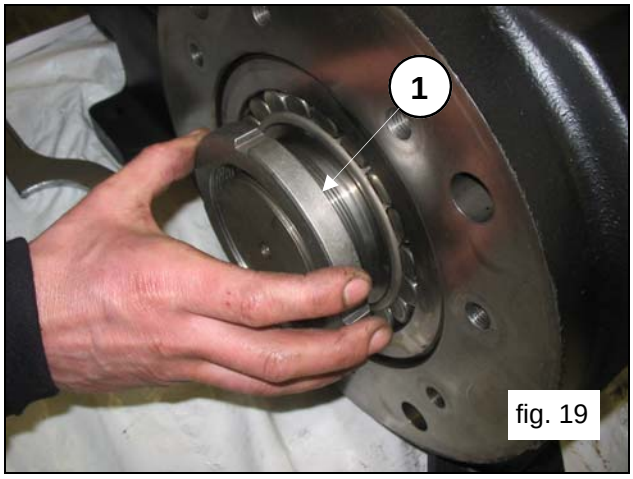


fig. 19

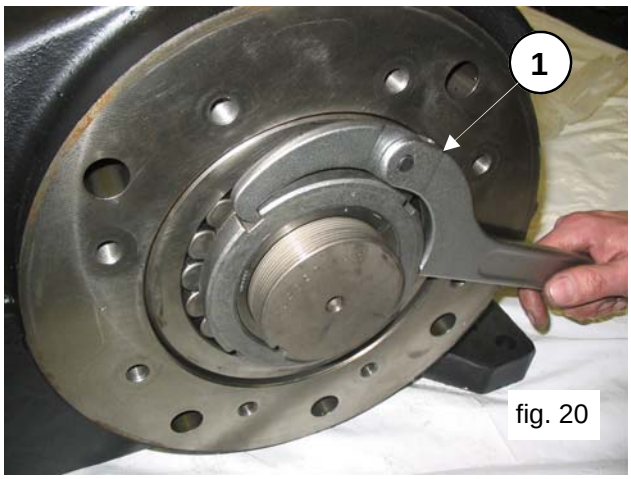


fig. 20

On the opposite side, unfasten the reducer case screws (pos.①, fig.21), and then remove the case (pos.①, fig.22).

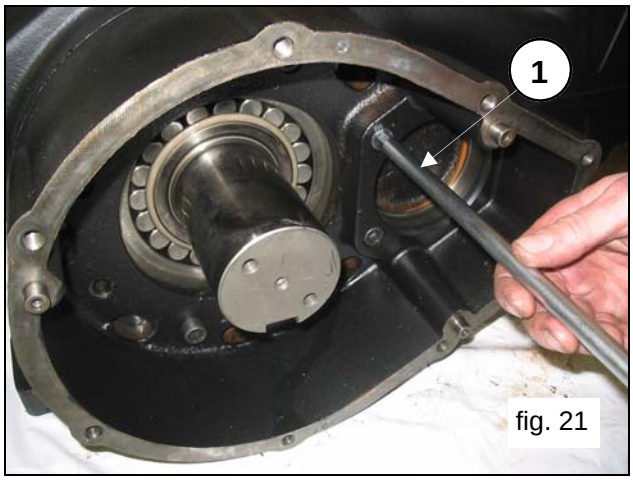


fig. 21

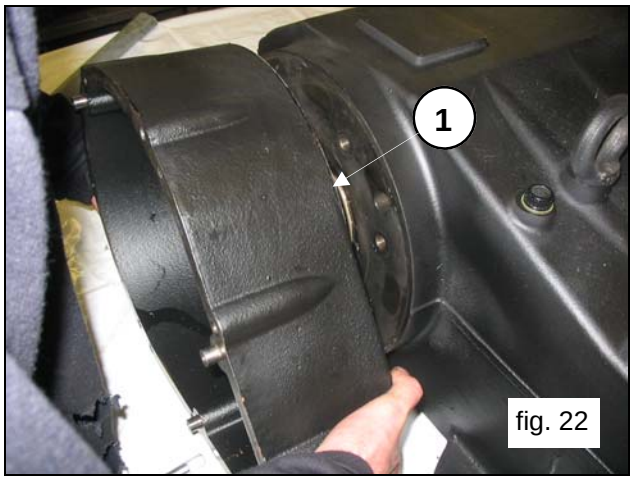


fig. 22

Unscrew the connecting rod screws (pos.①, fig.23).

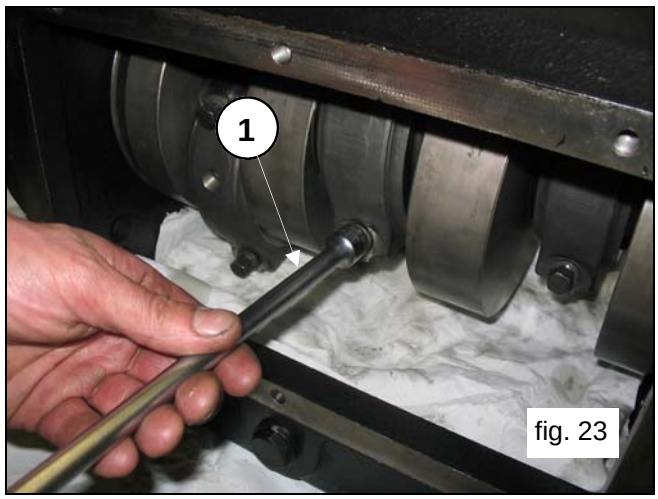


fig. 23

Disassemble the connecting rod caps with the split bearings; be particularly aware of disassembly order.

The connecting rod caps and the related connecting rods must be reassembled in the exact same order and coupling as during disassembly.

To avoid error, caps and connecting rods are numbered on one side (pos.①, fig.24).

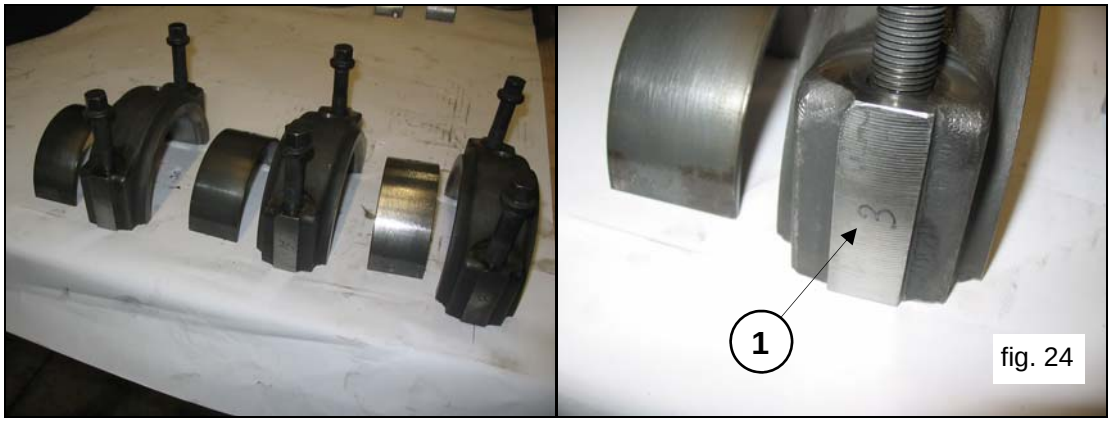


fig. 24

Push the connecting rods forward in the direction of the hydraulic side in order to push out the crankshaft. Use the apposite tool to facilitate this operation (cod. 27566200), (pos.①, fig.25).

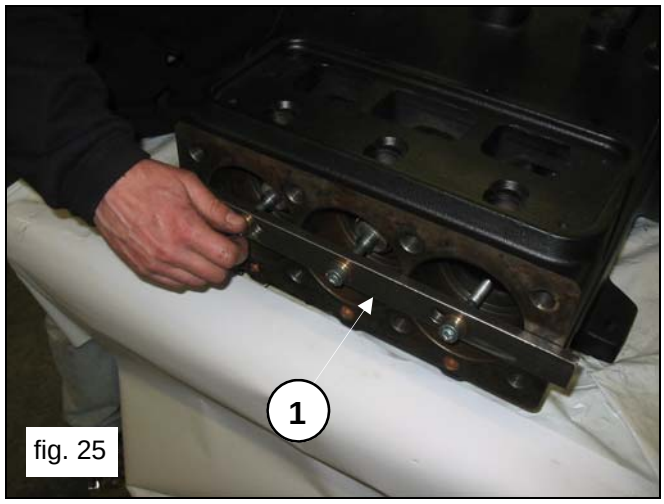


fig. 25

Remove the pressure sleeve (pos.①, fig.26).

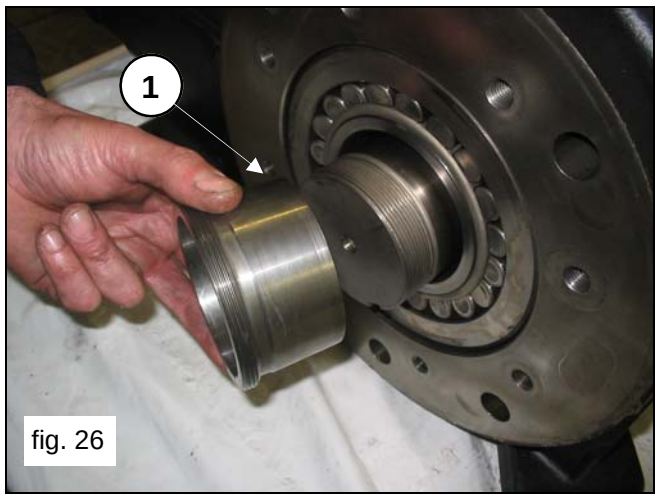


fig. 26

Remove the upper split bearing of the connecting rods (pos.①, fig.27).

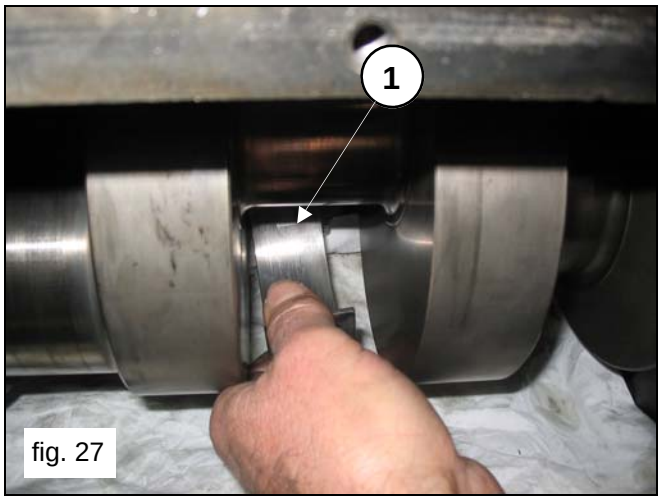


fig. 27

Remove the crankshaft with the help of a hammer on the PTO side (pos.①, fig.28).
Remove the shaft and the bearing (pos.①, fig.29).

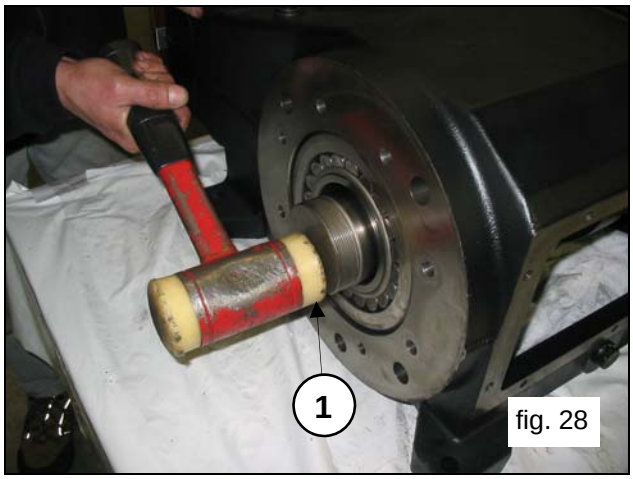


fig. 28

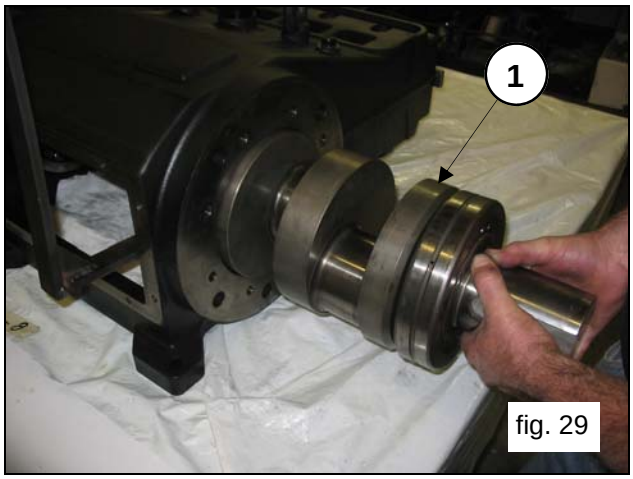


fig. 29

On the opposite side, extract the bearing (pos.①, fig.30)

fig. 30

If the replacement of one or more connecting rods or piston guides is necessary, please operate as follows: Unfasten the screws of the tool cod.27566200 to unlock the connecting rods (pos.①, fig.31) and therefore extract the connecting rod-piston guide units from the opening behind the crankcase (pos.①, fig.32).

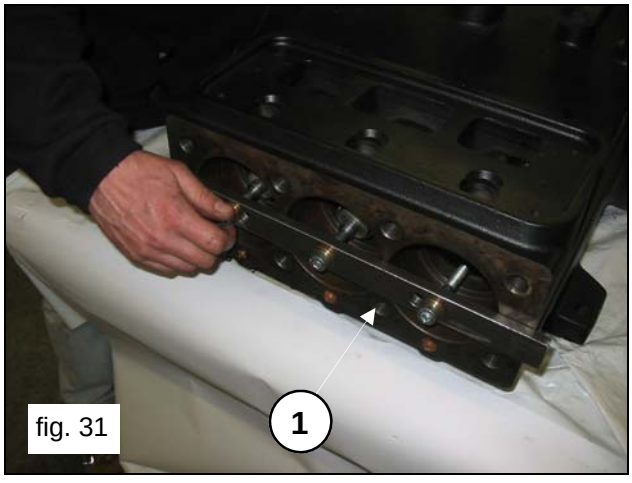


fig. 31

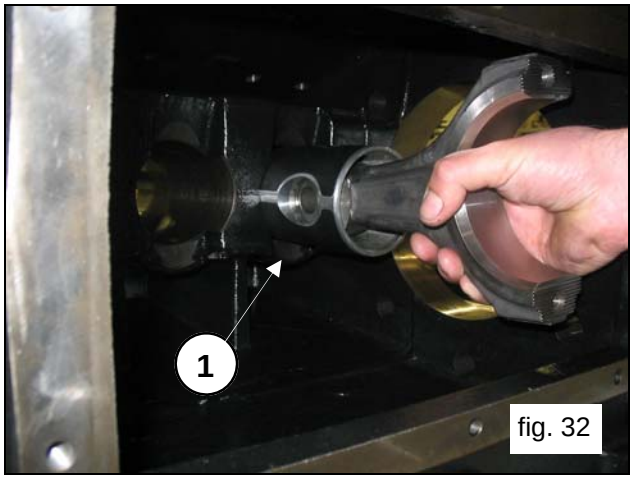


fig. 32

Couple the connecting rods with the previously disassembled caps; be sure to respect numbering (pos.①, fig.33).

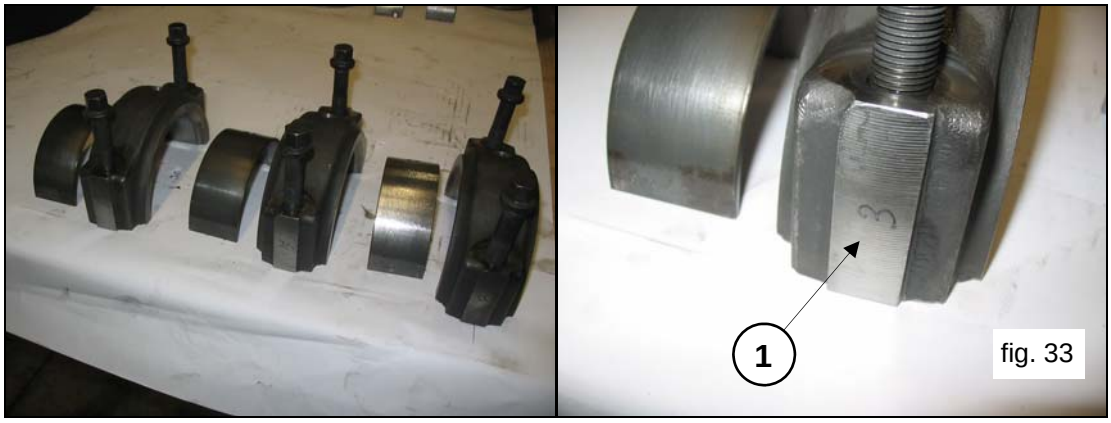


fig. 33

Remove the two seeger rings that block the piston pin by using the apposite tool (pos.①, fig.34).

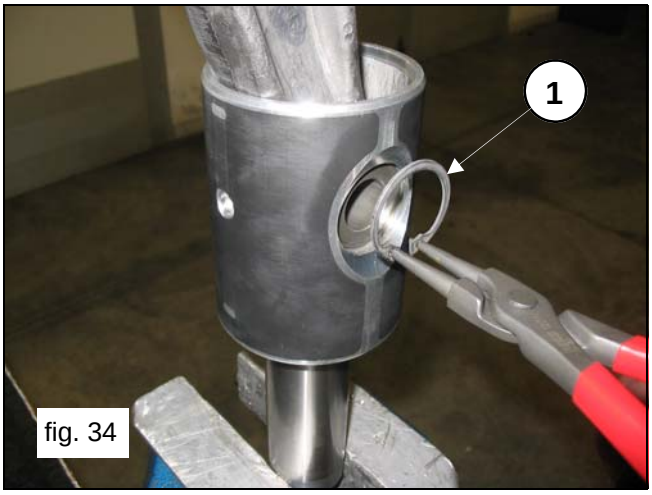


fig. 34

Remove the pin (pos.①, fig.35) and therefore remove the connecting rod (pos.①, fig.36)

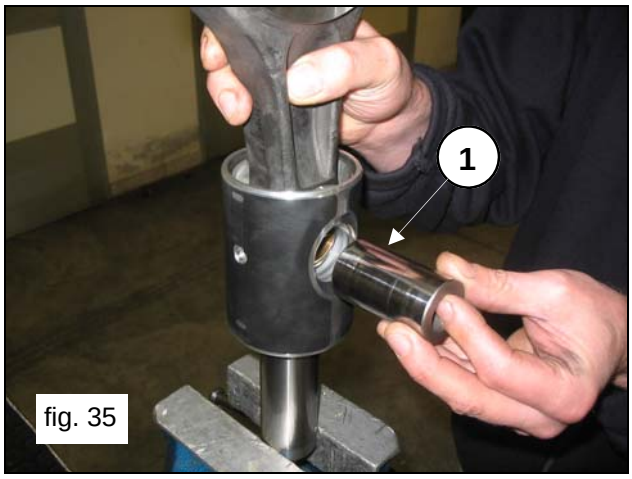


fig. 35

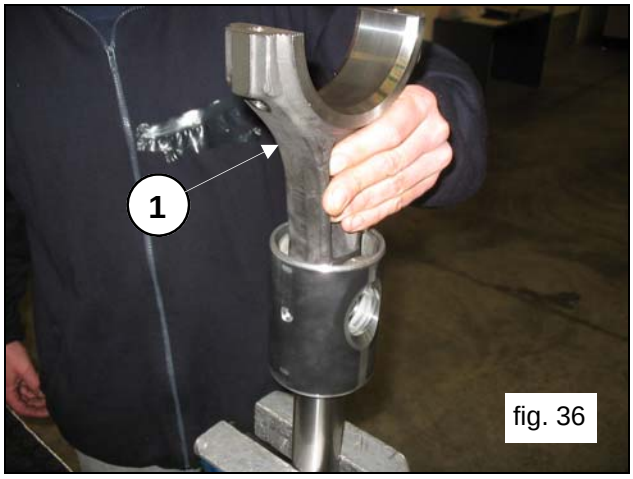


fig. 36

To separate the rod from the piston guide, unfasten the M10 hexagonal–head screws using a size 17 socket wrench (pos.①, fig.37).

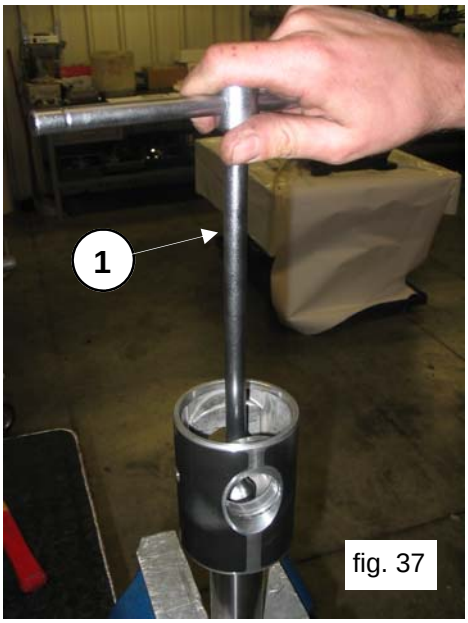


fig. 37

2.1.2 Crank Mechanism Assembly
Proceed with assembly by inverting the procedure indicated in paragraph 2.1.1.
The correct sequence is the following:

Connect the rod to the piston guide
Insert the Ø5 pin in the apposite hole on the piston guide (pos.①, fig.38) and connect the rod to the piston guide using M10x35 screws (pos.①, fig.39).

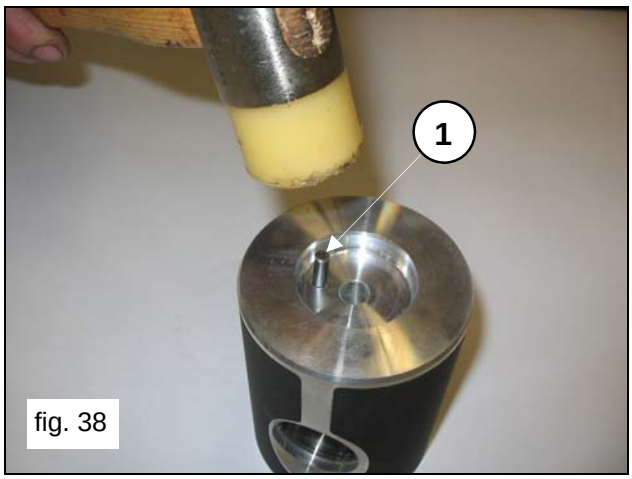


fig. 38

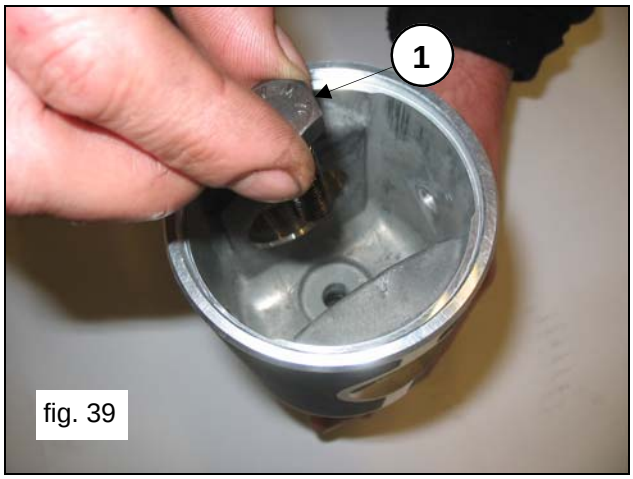


fig. 39

Block the rod using a clamp, and proceed with calibration using a torque wrench (pos.①, fig.40) as indicated in paragraph 3. “SCREW CALIBRATION”

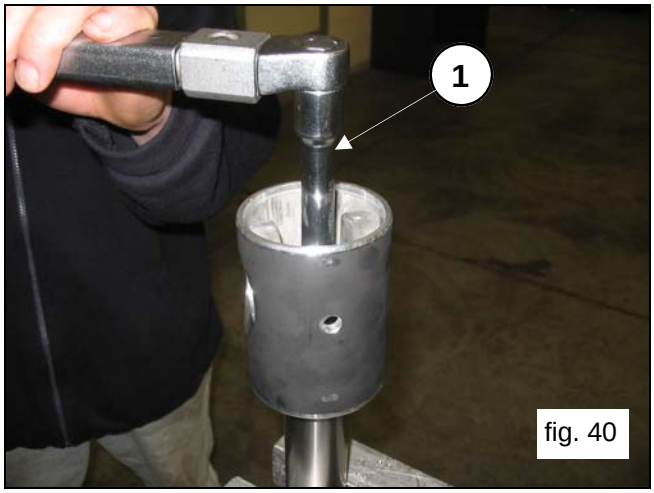


fig. 40

Insert the connecting rod in the piston guide (pos.①, fig.36) and then insert the pin (pos.①, fig.35). Apply the two seeger rings using the apposite tool (pos.①, fig.34).

Make sure that conrods piston guides and wrist pins can move free after being assembled together.

Separate the caps from the connecting rod; correct coupling is guaranteed by the numbering on the side (pos.①, fig.33).

After verifying the perfect cleaning of the crankcase, insert the connecting rod-piston guide unit inside the cylinders of the crankcase (pos.①, fig.32).

The insertion of the connecting rod-piston guide unit inside crankcase must be done by positioning the connecting rods with the numbering visible from above.

Block the three units using the apposite tool cod.27566200 (pos.①, fig.31).

Pre-assemble the bearing, PTO side, on the shaft (pos.①, fig.41) and assemble the bearing on the opposite side on the crankcase (pos.①, fig.42).

The bearing in fig.42 has a tapered internal ring. Verify that the taper goes from the outside towards the inside in order to allow the subsequent insertion of the sleeve.

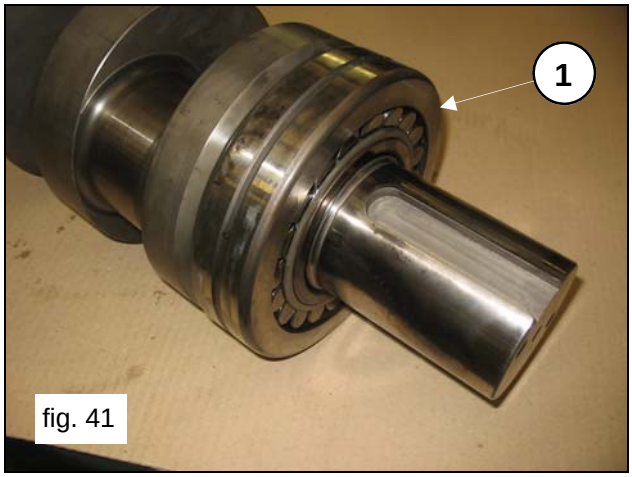


fig. 41

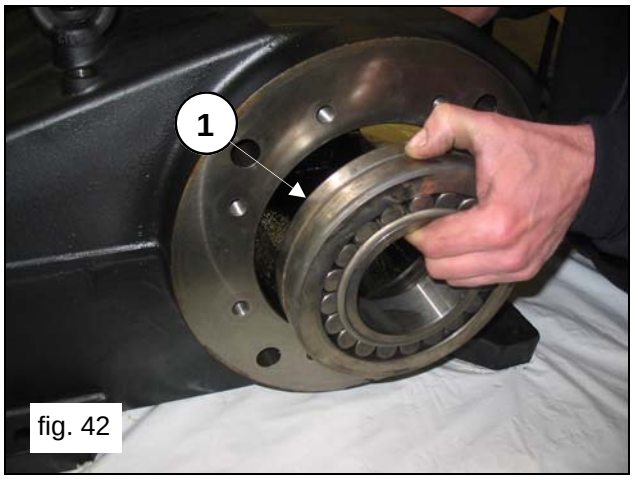


fig. 42

Insert the shaft (pos.①, fig.29) until the pre-assembled bearing is aligned with the edge of the crankcase (pos.①, fig.43).

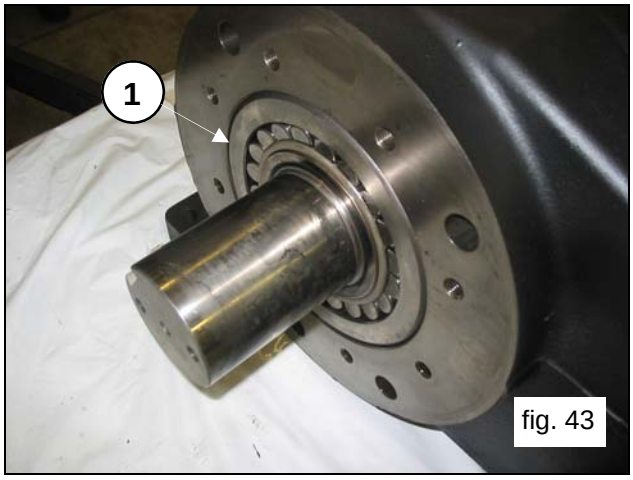


fig. 43

Manually insert the pressure sleeve to maintain the shaft aligned (pos.①, fig.44).

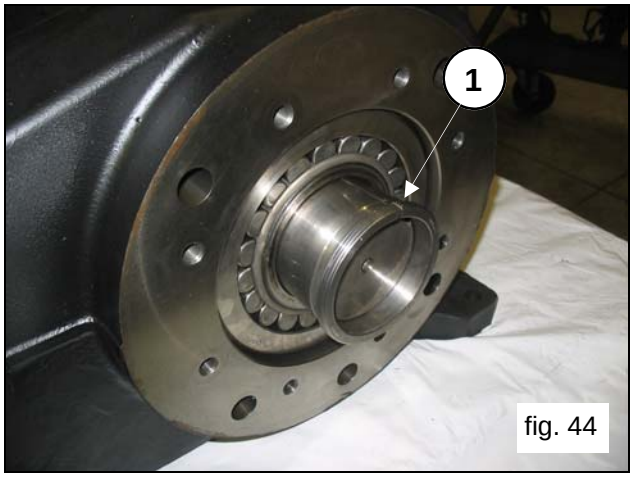


fig. 44

Assemble the reducer case (pos.①, fig.45) and the related gasket (pos.②, fig.45) using the 6 M12x40 screws (pos.①, fig.46), the 2 M12x50 screws (pos.①, fig.47) and the Ø12 Grower washers (pos.②, fig.46 and fig.47). Calibrate the screws with a torque wrench (pos.①, fig.48) as indicated in paragraph 3."SCREW CALIBRATION"

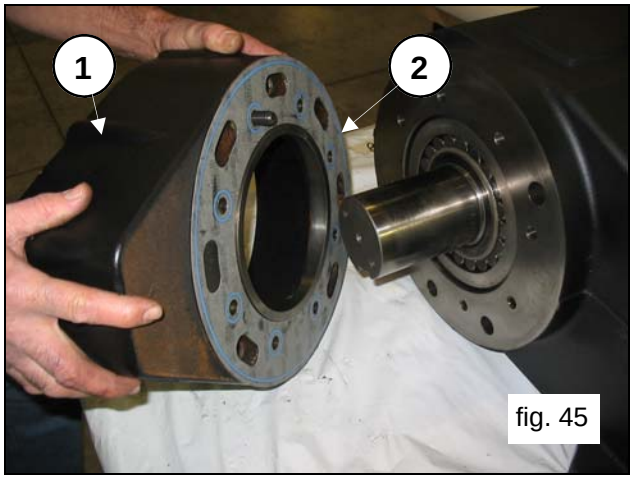


fig. 45

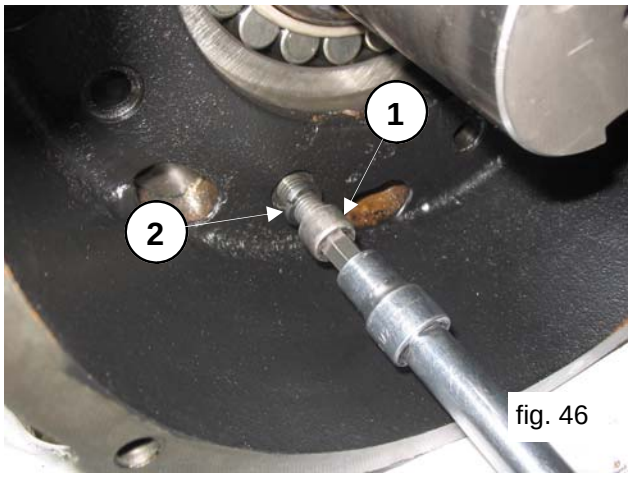


fig. 46

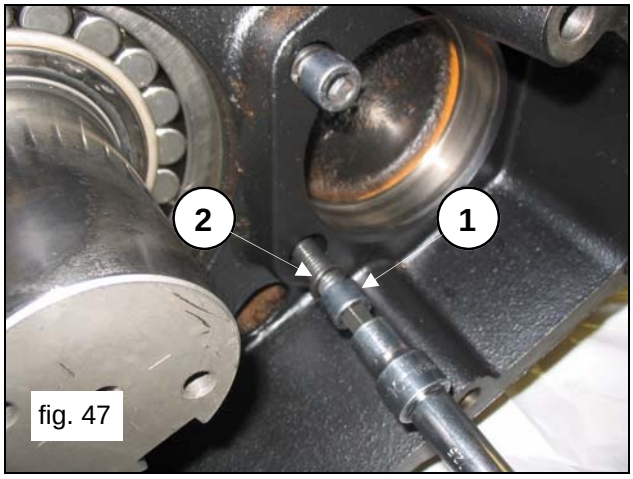


fig. 47

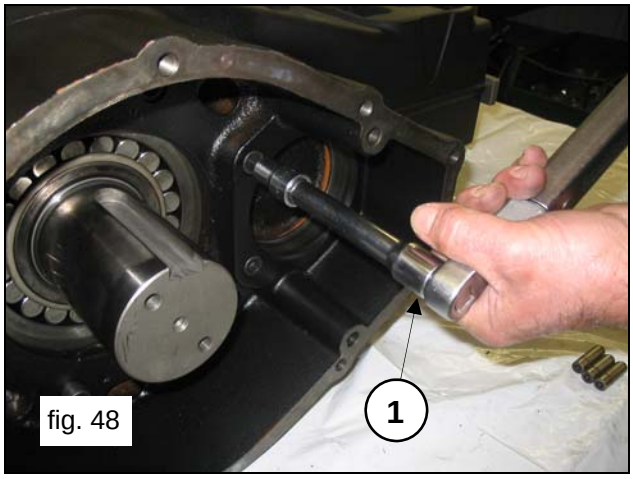


fig. 48

Completely insert the pressure sleeve on the shaft from the opposite side of the PTO (pos.①, fig.49 and fig.50).

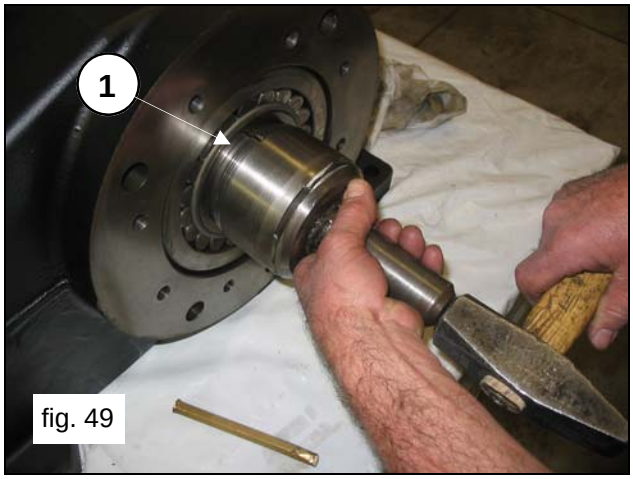


fig. 49

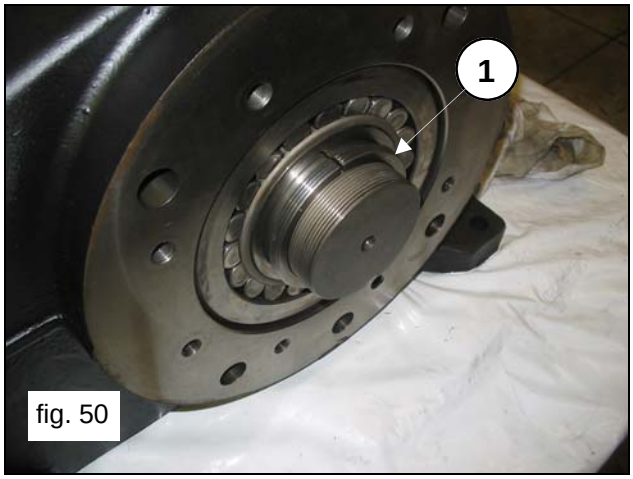


fig. 50

Pressure sleeve insertion must be done without oil or lubricants.

Insert the sleeve until the external surface (tapered) couples perfectly with the inside of the bearing. During insertion, be sure that the bearing remains in contact with the shaft shoulder.

Measure the dimension “X” indicated in fig.51.

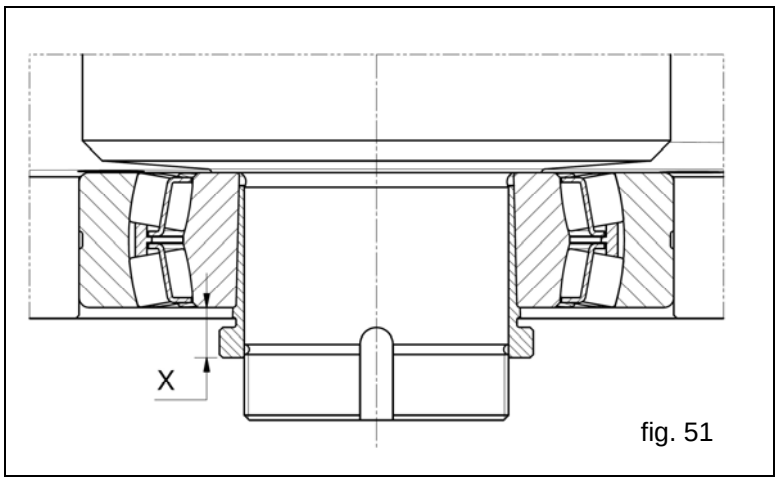


fig. 51

Screw the ring nut and fasten the sleeve until the dimension “X” is reduced by a value ranging between 0.7 and 0.8 mm (fig.52).

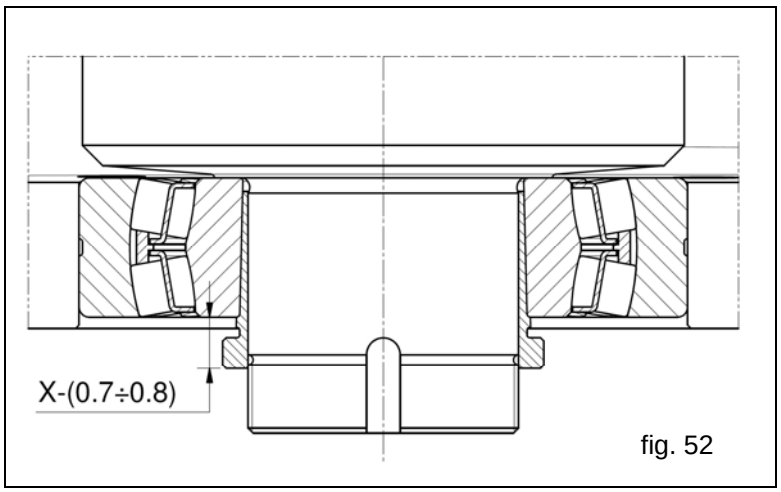


fig. 52

Unscrew the ring nut, insert the safety washer (pos.①, fig.53) and completely screw the ring nut (pos.①, fig.54); then fold the washer’s locking key (pos.①, fig.55).

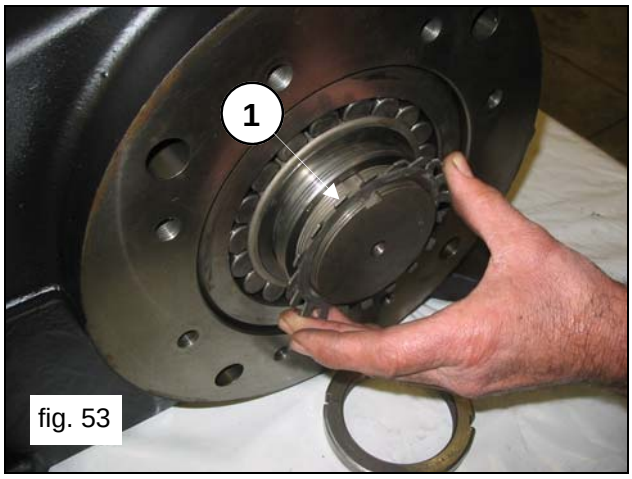


fig. 53

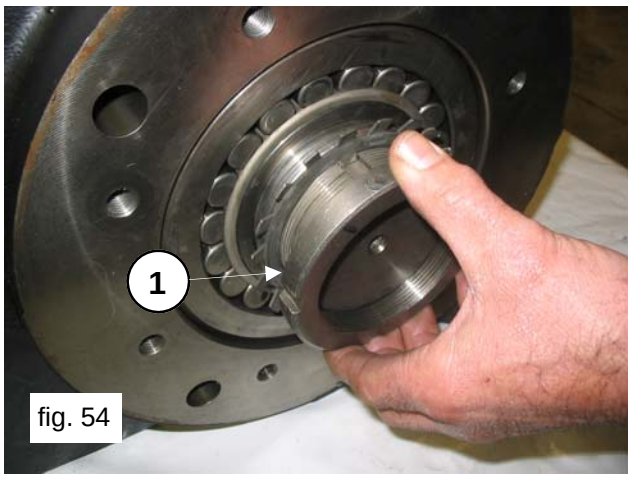


fig. 54

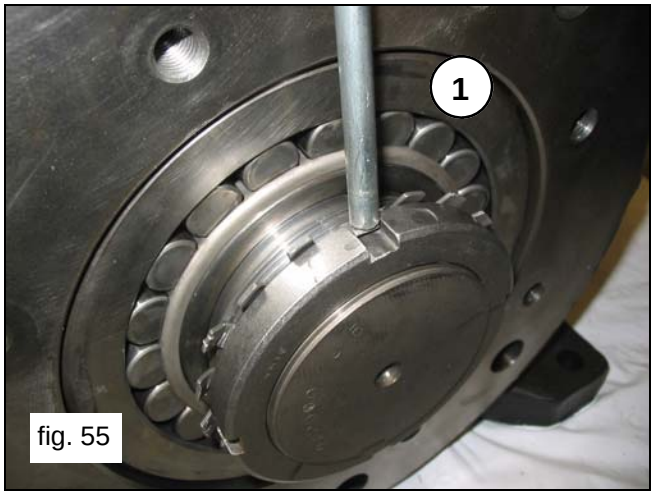


fig. 55

Remove the device that blocks the connecting rods cod.27566200 (pos.①, fig.31).

Insert the upper split bearings between the connecting rods and the shaft (pos.①, fig.56).

In order to correctly assemble the split bearings, be sure that the split bearings' reference key is positioned in the appropriate seat on the connecting rod (pos.①, fig.57).

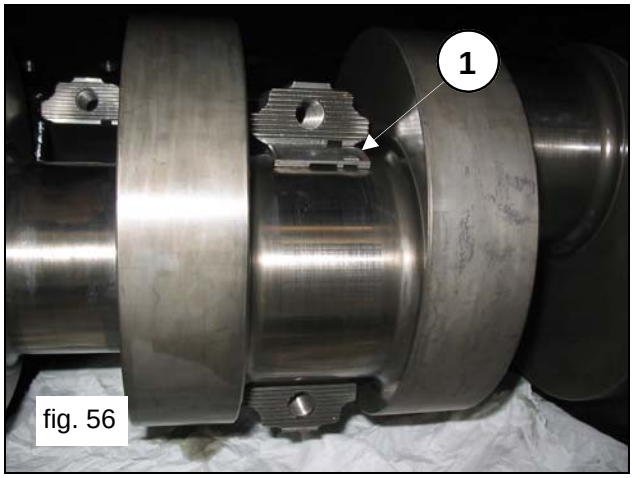


fig. 56

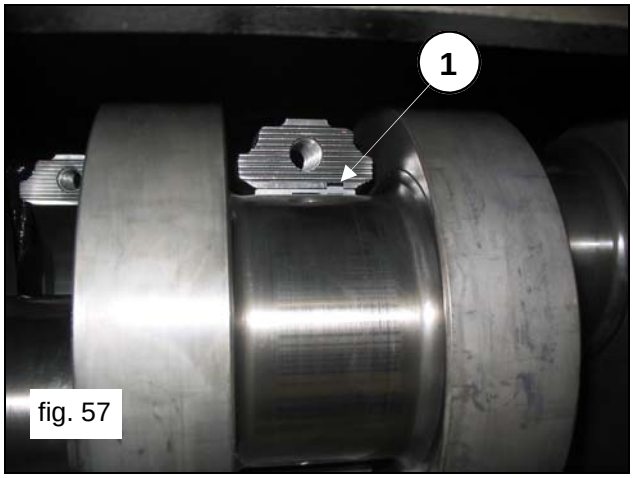


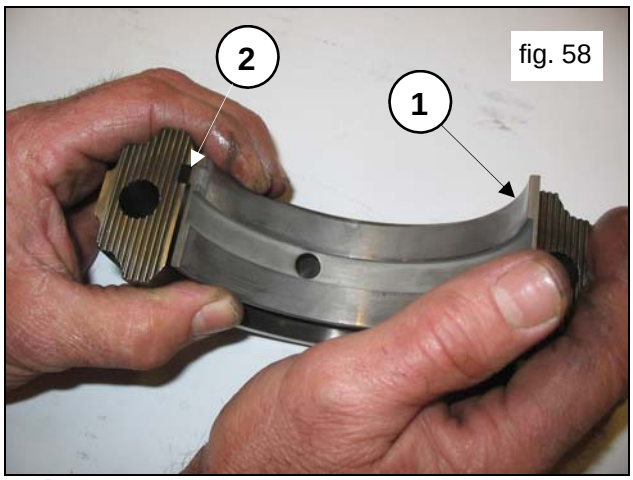
fig. 57

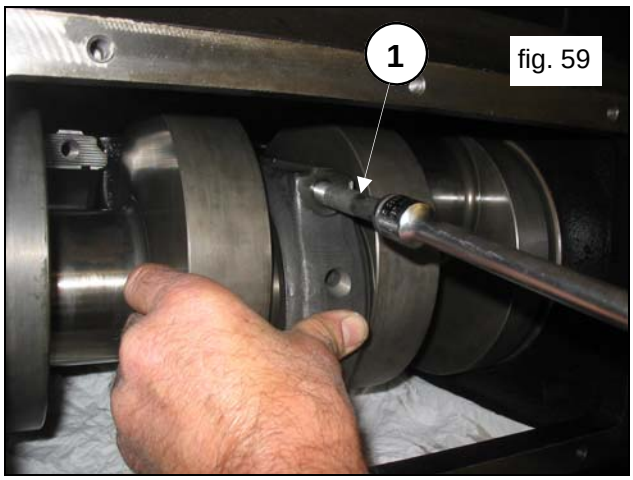
Apply the lower split bearings to the caps, (pos.①, fig.58) being sure that the split bearings' reference key is positioned in the appropriate seat on the cap (pos.②, fig.58).

Fasten the caps to the connecting rods using the M12x1.25x87 screws (pos.①, fig.59).

Pay attention to the correct assembly of the caps. The numbering must face upwards.

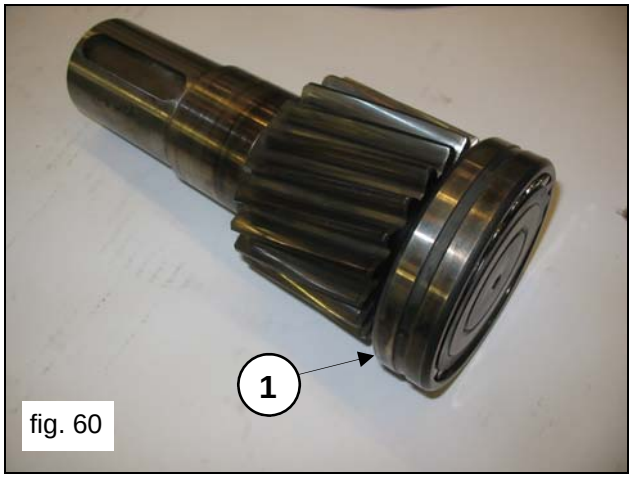
Tighten the screws with a torque wrench set as indicated in the SCREW CALIBRATION chart of paragraph 3. The conrod screws should be tightened at intermediate incremental values.

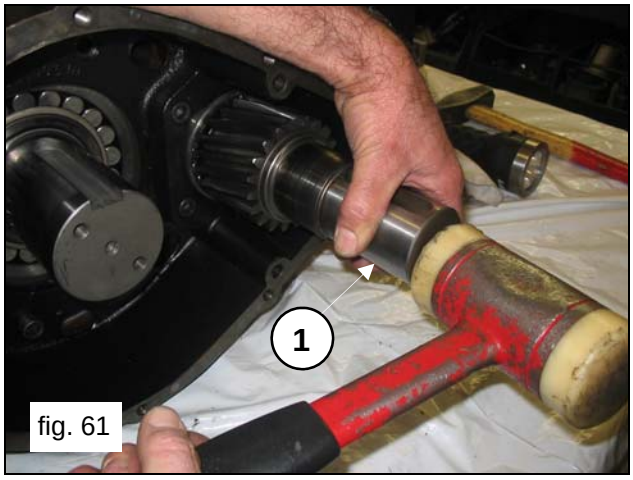




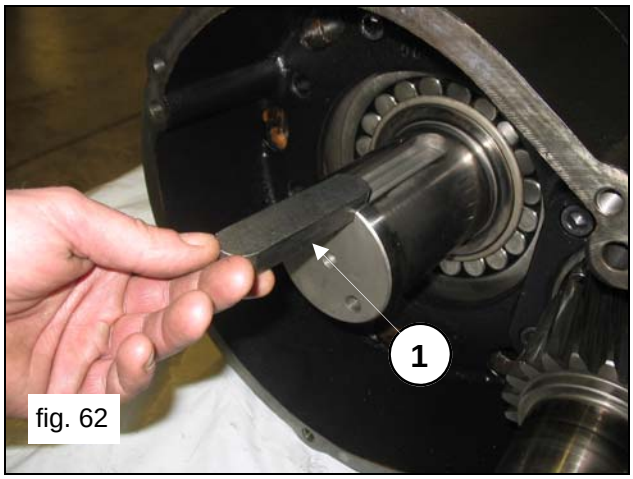
Once tightened on the crankshaft, make sure that conrods still have axial right-left endplay.

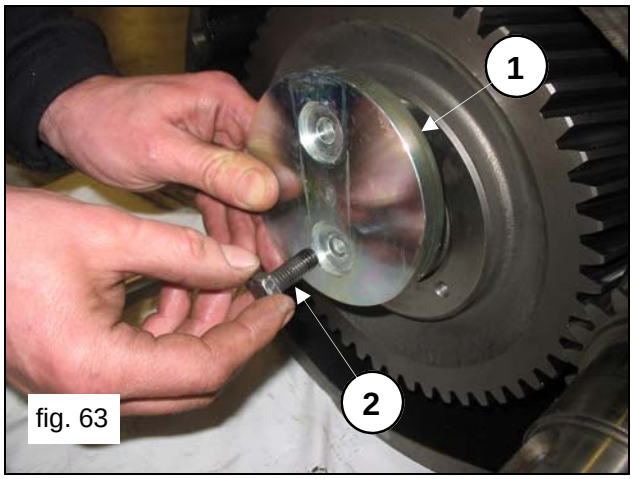
Preassemble the bearing on the pinion (pos.①, fig.60) and fully insert the pinion in the seat on the reducer case (pos.①, fig.61) by using a hammer.





Apply the 22x14x100 key in the seat on the shaft (pos.①, fig.62) and insert the ring gear on the shaft.
Fasten the ring gear stopper (pos.①, fig.63) using the two 2 M10x25 screws (pos.②, fig.63).
Calibrate the screws with the torque wrench as indicated in paragraph 3.”SCREW CALIBRATION”





Apply the 3 Ø12x40 pins to the reducer case (pos.①, fig.64) and insert the gasket (pos.①, fig.65).

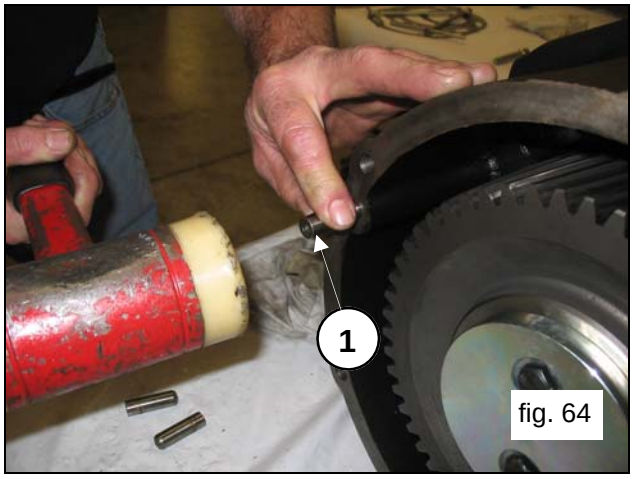


fig. 64

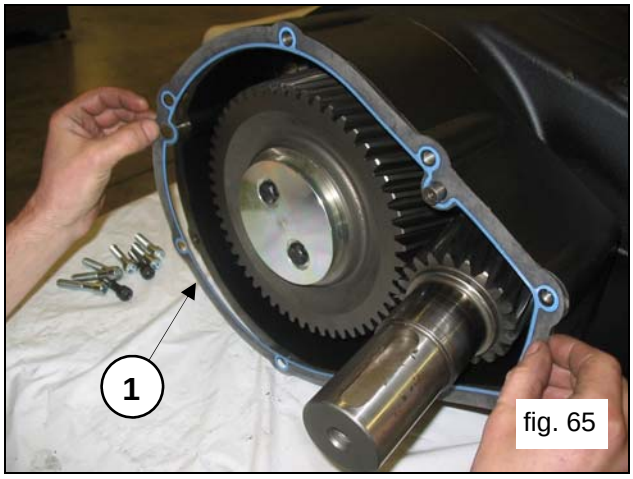


fig. 65

Assemble the bearing on the reducer cover (pos.①, fig.66).

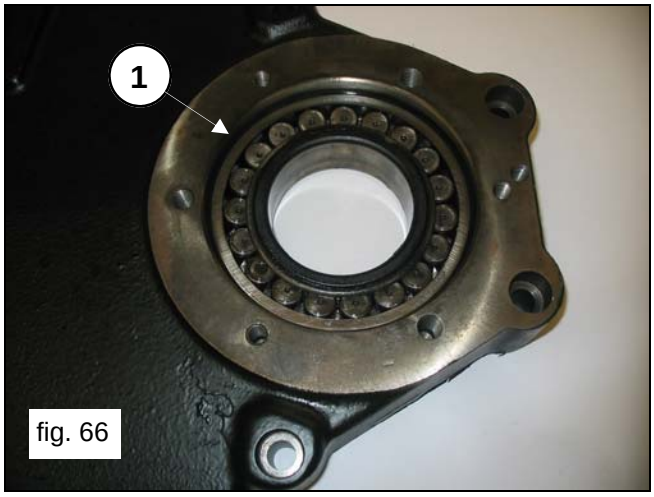


fig. 66

Assemble the reducer cover (pos.①, fig.67) and fasten it using 8 M10x50 screws (pos.①, fig.68). Use a stopper to avoid that the bearing comes out of its seat (pos.①, fig.69).
Calibrate the screws with the torque wrench as indicated in paragraph 3."SCREW CALIBRATION "

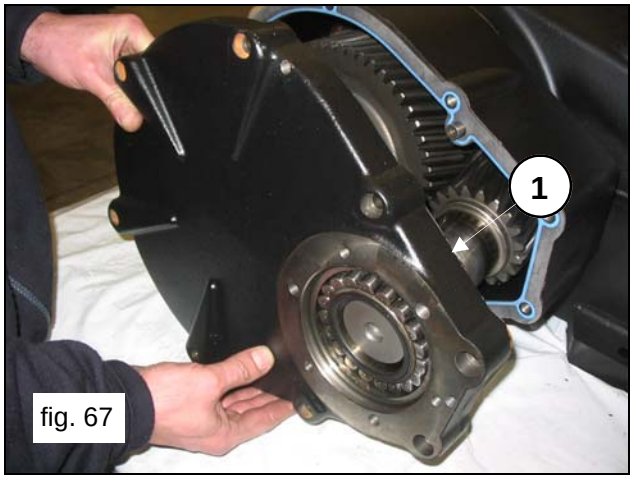


fig. 67

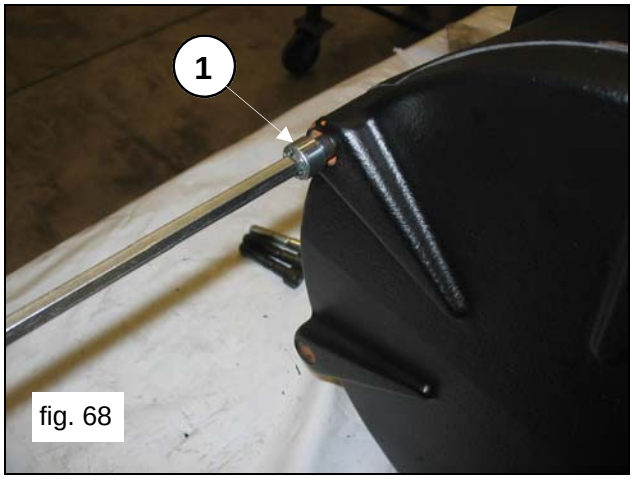


fig. 68

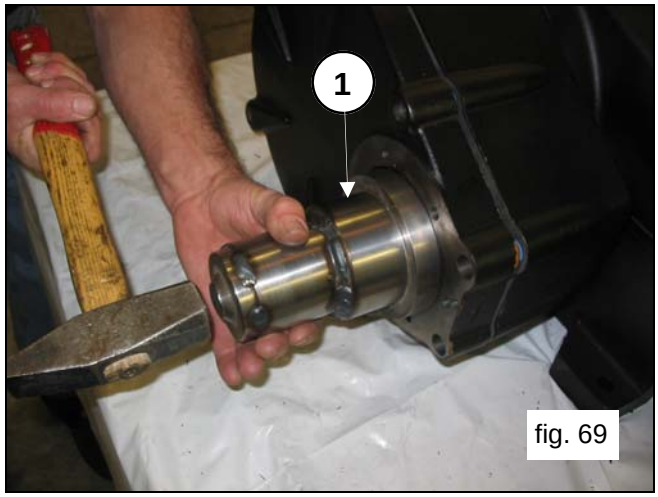


fig. 69

Insert the oil seal inside the reducer flange using the tools cod.27515900 and 27548200 (pos.①, fig.70). Before proceeding with oil seal assembly, verify the conditions of the sealing lip. If replacement is necessary, position the new ring as indicated in fig.71.

If the shaft presents diameter wear corresponding to the sealing lip, to avoid the need for grinding it's possible to position the ring as indicated in fig. 71.

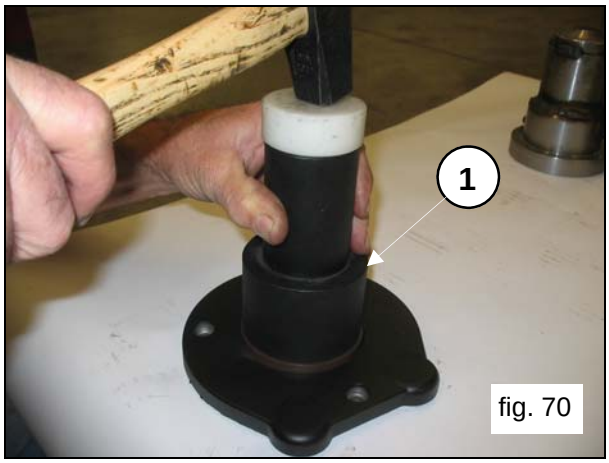


fig. 70

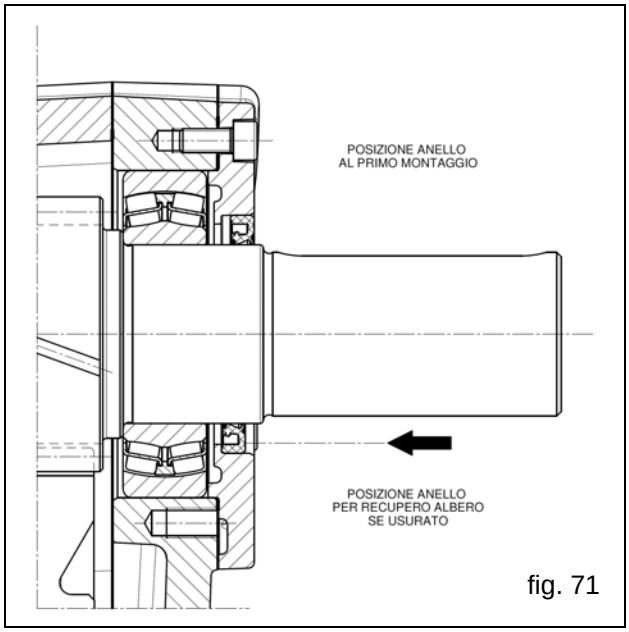


fig. 71

Posizione anello al primo montaggio	Ring position at first assembly
Posizione anello per recupero albero se usurato	Ring position for worn shaft recovery

Apply the reducer flange with its gasket to the reducer case (pos.①, fig.72) and fasten it using 3 M8x18 screws (pos.①, fig.73).

To avoid damaging the oil seal, pay particular attention when inserting the flange on the pinion.

Calibrate the screws with the torque wrench as indicated in paragraph 3. "SCREW CALIBRATION"

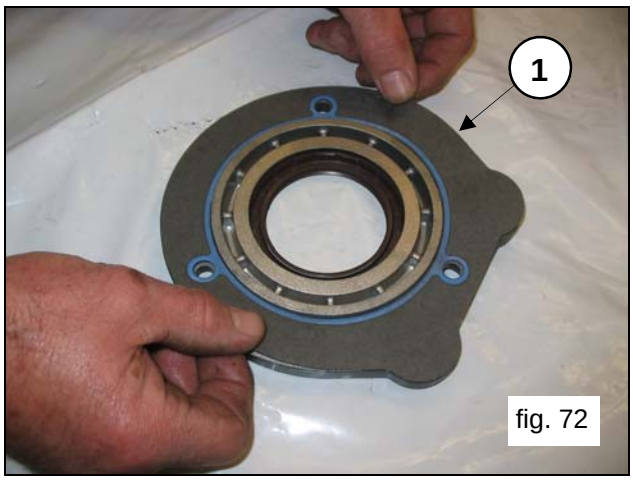


fig. 72

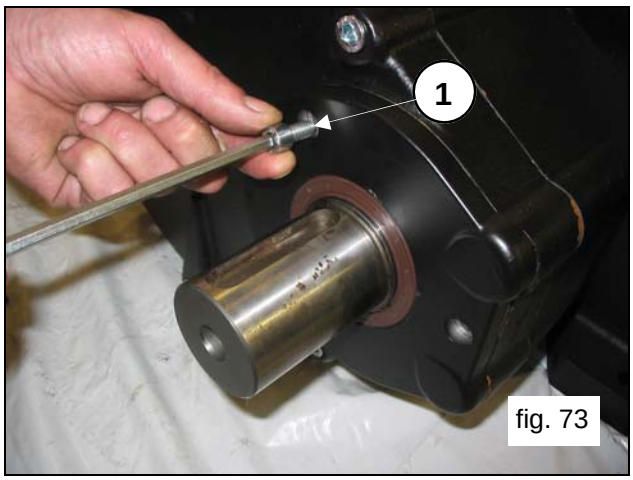


fig. 73

Insert the key 16x10x90 in the pinion.

Insert the O-Ring in the rear cover (pos.①, fig.74) and fasten it to the crankcase using 10 M8x18 screws (pos.①, fig.75).
Calibrate the screws with the torque wrench as indicated in paragraph 3."SCREW CALIBRATION".

fig. 74

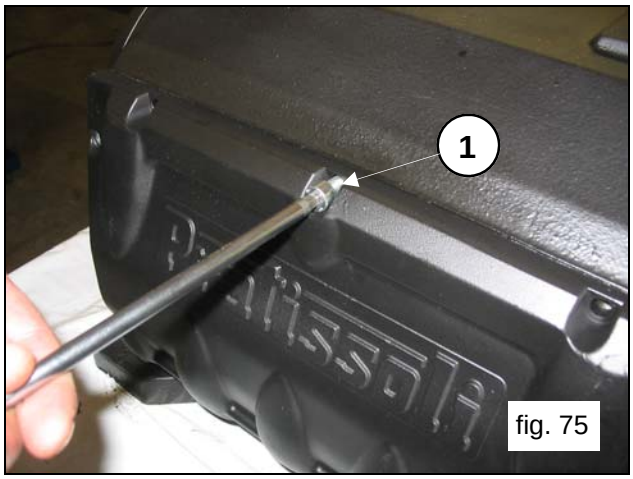


fig. 75

Assemble the bearing cover (and related gasket) (pos.①, fig.76) using 8 M12x30 screws (pos.①, fig.77).
Calibrate the screws with the torque wrench as indicated in paragraph 3."SCREW CALIBRATION".

fig. 76

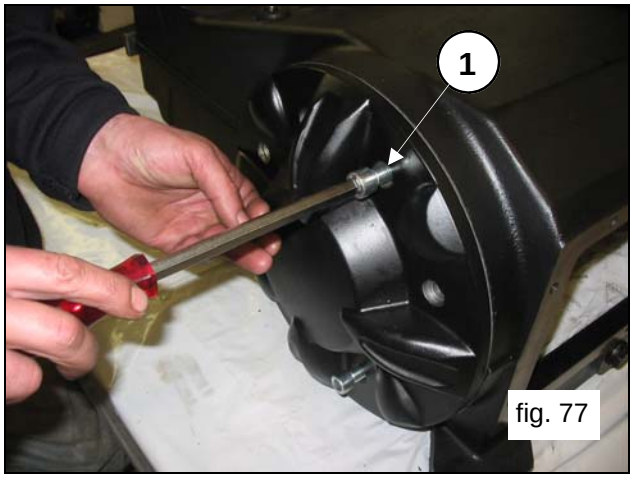


fig. 77

Complete the assembly of the crank mechanism by applying the plugs and the lifting eyebolts with the related sealing O-Ring.

Fill the crankcase with oil as indicated in the use and maintenance manual, paragraph 7.4.

2.1.3 Refurbishing the crankmechanism

TABLE UNDERSIZED DIAMETERS FOR CRANKSHAFT AND CONROD BUSHINGS			
Max undersize (mm)	**Upper half bushing p/n**	**Lower half bushing p/n**	**Crank pin grinding measures (mm)**
0.25	90931100	90930100	Ø 92.75 0/-0.03 Roughness Ra 0.4 Rt 3.5
0.50	90931200	90930200	Ø 92.50 0/-0.03 Roughness Ra 0.4 Rt 3.5

TABLE OVERSIZED DIAMETERS FOR CRANKCASE CYLINDER BORES AND PISTON GUIDES		
Max oversize (mm)	**Piston guide p/n**	**Crankcase cylinder bores grinding measures (mm)**
1.00	74050243	Ø81 H6 +0.022/0 Roughness Ra 0.8 Rt 6

2.2 Fluid End Repair

2.2.1 Head disassembly – valve units

The head requires preventive maintenance as indicated in the use and maintenance manual.
Interventions may be limited to valve inspection, or replacement if needed.
To extract the valve units operate as follows:

Unfasten the 8 M16x55 screws of the valve cover (pos.①, fig.78) and remove the cover (pos.①, fig.79).

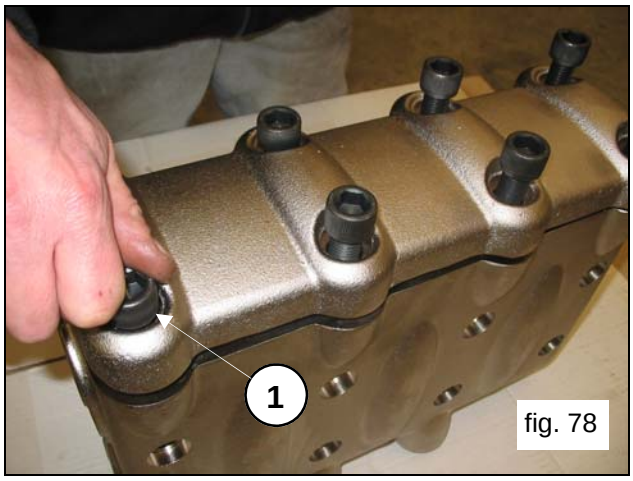


fig. 78

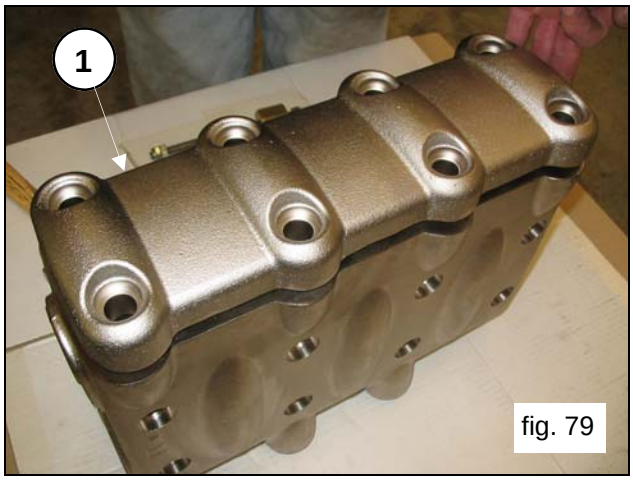


fig. 79

Extract the valve plug using a slide hammer applied to the M10 hole of the valve plug (pos.①, fig.80).

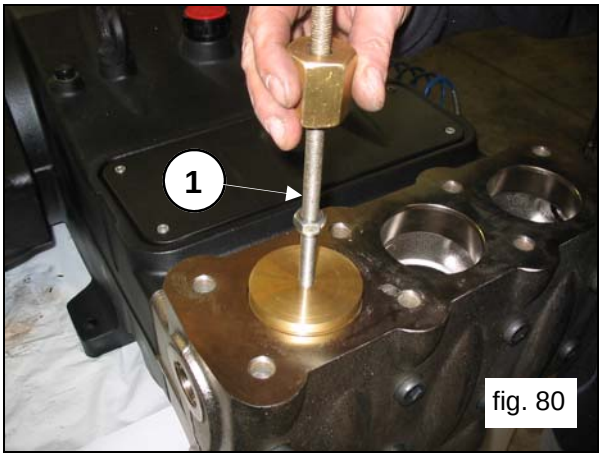


fig. 80

Remove the spring (pos.①, fig.81).

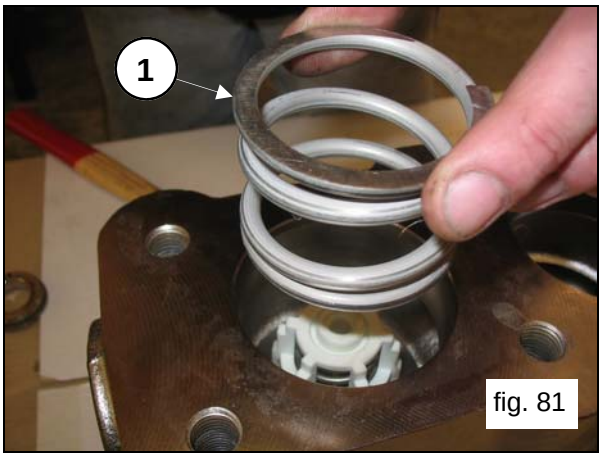


fig. 81

Extract the delivery valve unit using a slide hammer applied to the M10 hole of the valve guide (pos.①, fig.82).

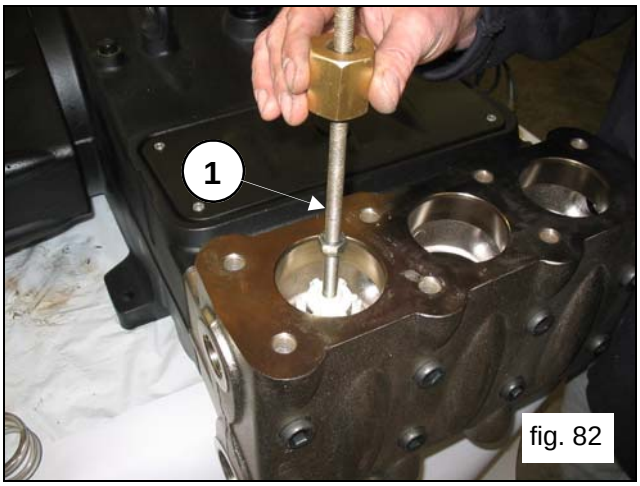


fig. 82

If the extraction of the delivery valve unit is particularly difficult, (for ex. due to incrustations caused by prolonged pump inactivity) use the extraction tool cod.27516400 (for MK40-MK45-MK50) or cod.27516500 (for MK55-MK60-MK65).

Unfasten the valve guide spacer using an 8 mm Allen wrench (pos.①, fig.83).

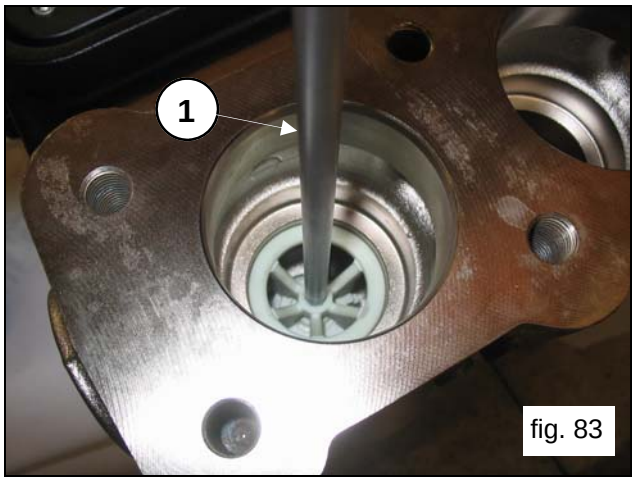


fig. 83

Remove the suction valve unit using a slide hammer applied to the M10 hole of the valve guide (pos.①, fig.84).

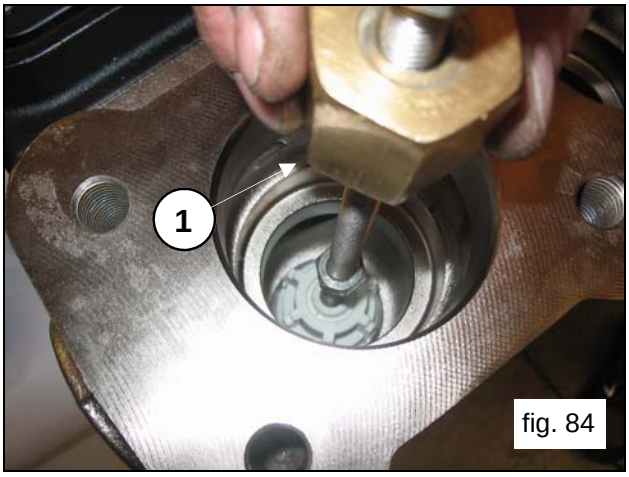


fig. 84

If the extraction of the suction valve unit is particularly difficult, (for ex. due to incrustations caused by prolonged pump inactivity) use the extraction tool cod.27516200 (for MK40-MK45-MK50) or cod.27516300 (for MK55-MK60-MK65) (pos.①, fig.85) and act as indicated.

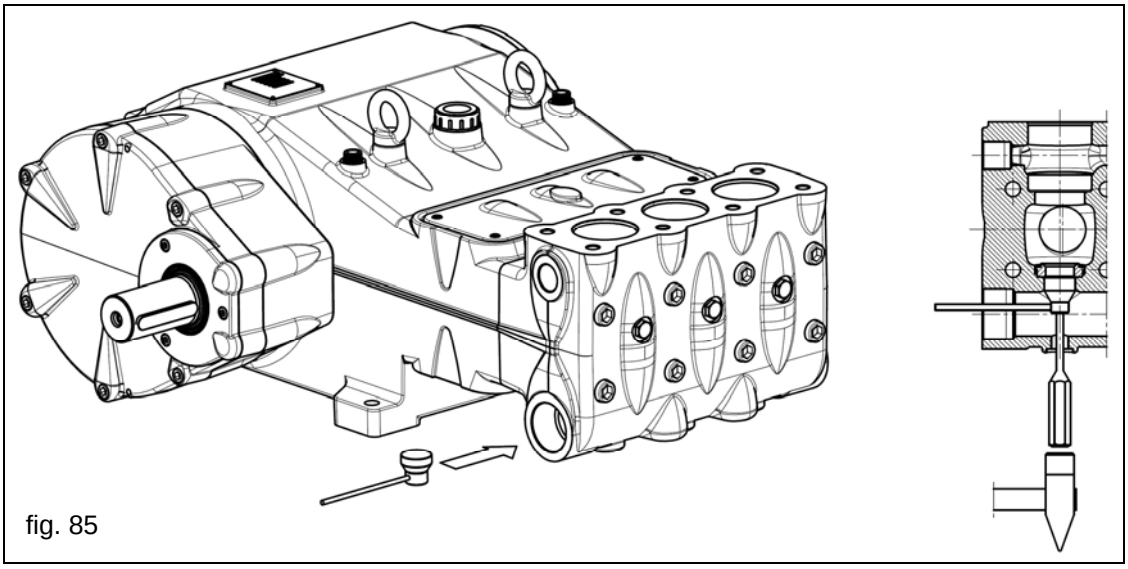


fig. 85

Unscrew the valve opening device using a 30 mm wrench (pos.①, fig.86).

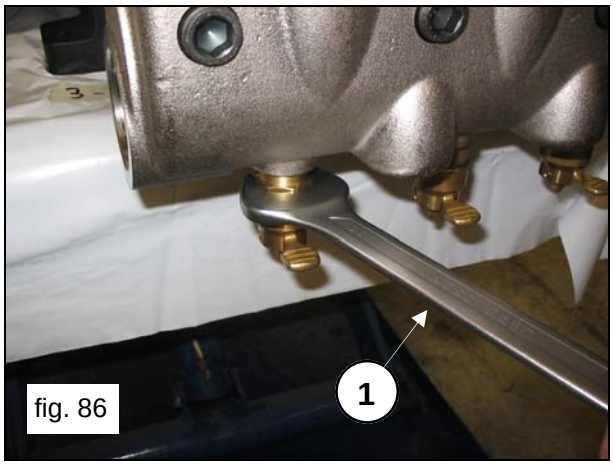


fig. 86

Disassemble the suction and delivery valve units by screwing on an M10 screw long enough to act on the valve and extract the valve guide from the valve seat (pos.①, fig.87).

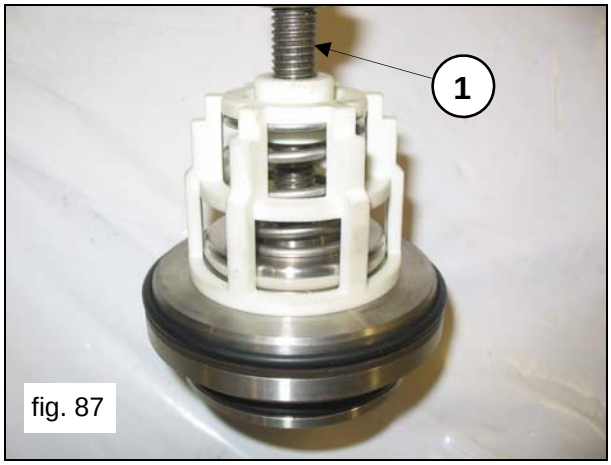


fig. 87

2.2.2 Head assembly – valve units

Pay careful attention to state of wear of the various components; replace them if necessary. At each valve inspection, replace all valve unit and valve plug OR rings.

Before repositioning the valve units, clean and perfectly dry the relevant seats in the head indicated by the arrows (pos.①, fig.88).

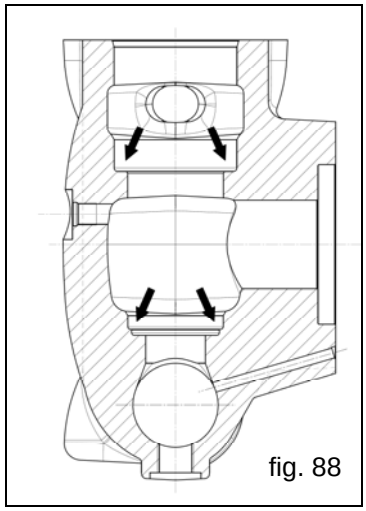


fig. 88

Proceed with reassembly by inverting the procedure indicated in paragraph 2.2.1.

Assemble the suction and delivery valve units (fig.89 and fig.90) paying attention not to invert the previously disassembled springs.

To facilitate the insertion of the valve guide in its seat, use a pipe that lays on the horizontal shoulders of the guide (fig.91), and use a hammer acting on the entire circumference.

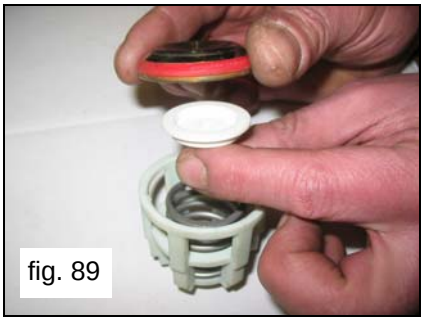


fig. 89

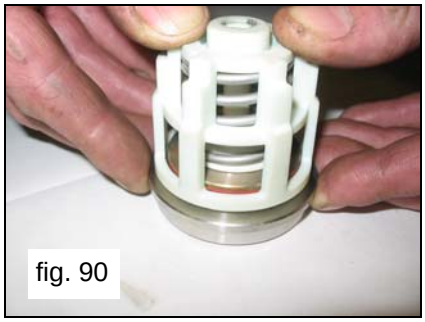


fig. 90

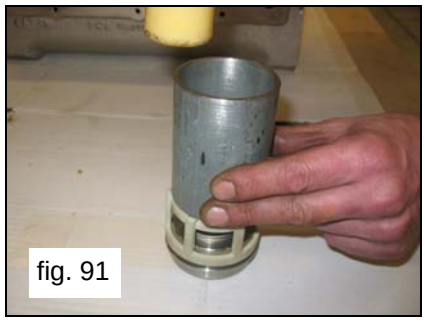


fig. 91

Proceed with the insertion of the valve units (suction and delivery) into the head, paying attention to the correct insertion sequence of the O-Rings and anti-extrusion rings.

The correct assembly sequence of the valve units in the head is the following:
Insert the anti-extrusion ring, exploded view position n.4 (pos.①, fig.92).

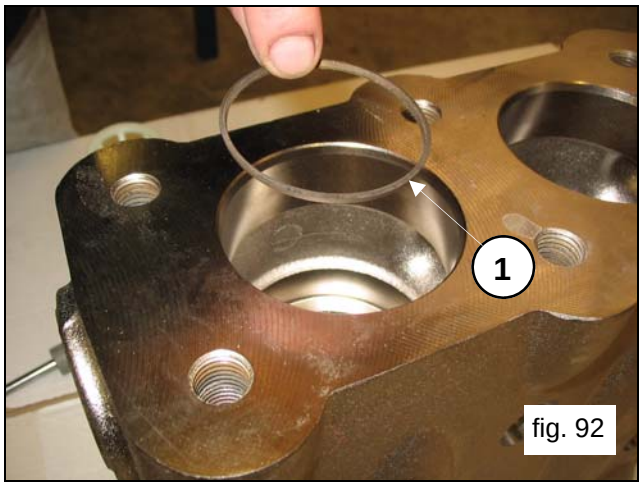


fig. 92

Insert the O-Ring, exploded view position n.5 (pos.①, fig.93).

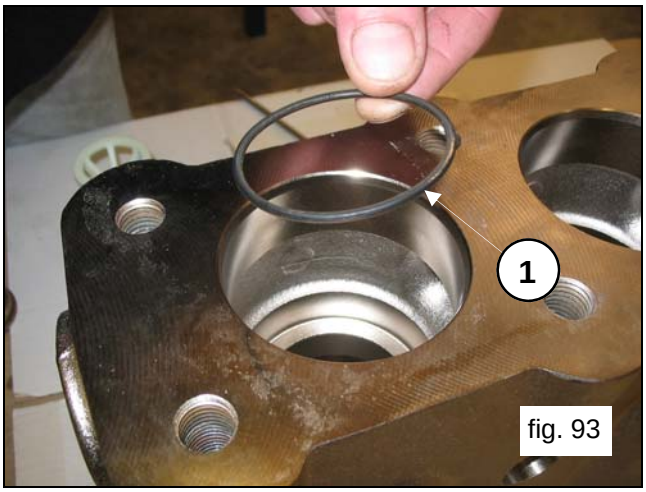


fig. 93

Be sure that the O-Ring and the anti-extrusion ring are perfectly fit into their seats.
Insert the suction valve unit together with the spacer (pos.①, fig.94). The valve unit must be fully inserted, as shown in pos.①, fig.95.

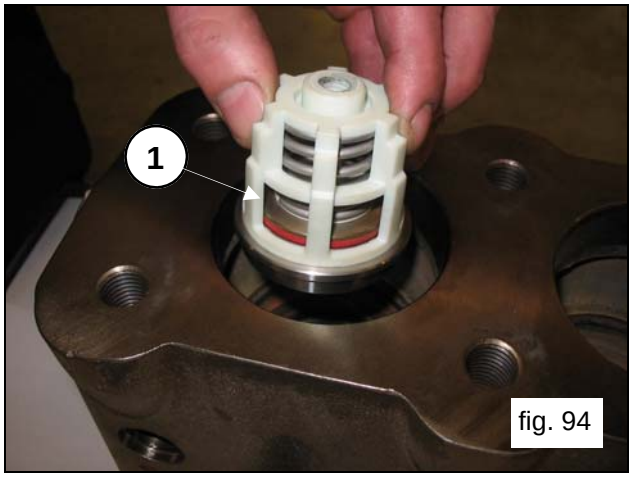


fig. 94

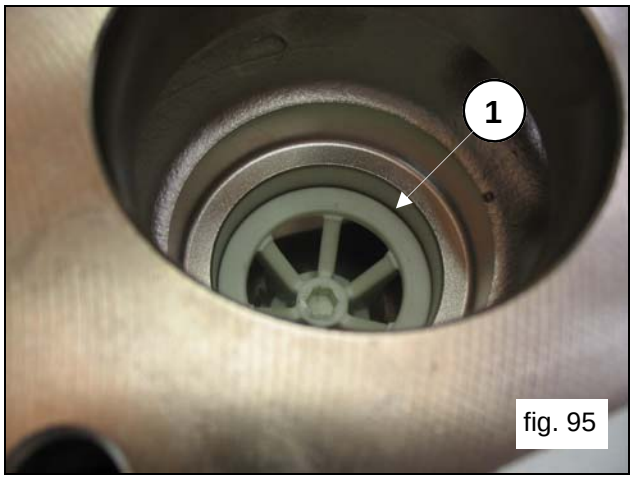


fig. 95

Mount the O-Ring, exploded view position n.5 (pos.①, fig.96) and the anti-extrusion ring, exploded view position n.15 (pos.②, fig.96) on the delivery valve seat.

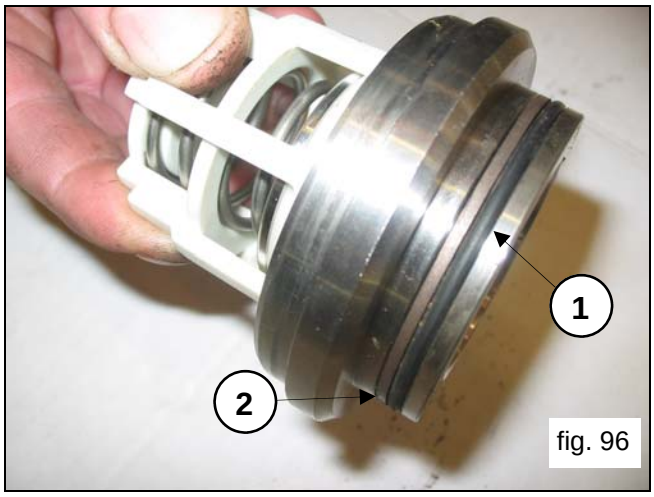


fig. 96

Insert the delivery valve unit (pos.①, fig.97). The valve unit must be fully inserted as shown in pos.①, fig.98.

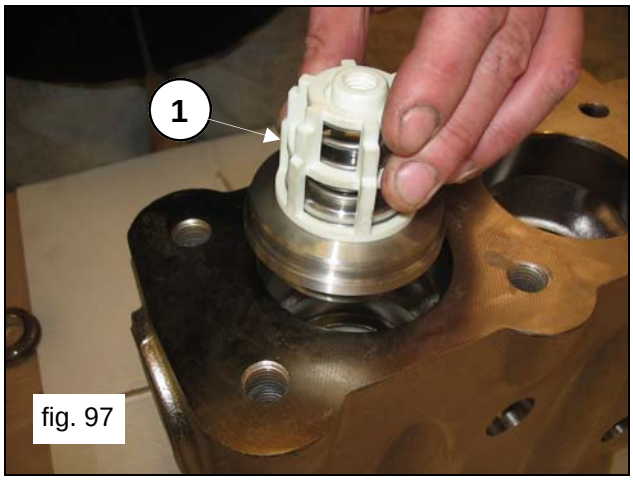


fig. 97

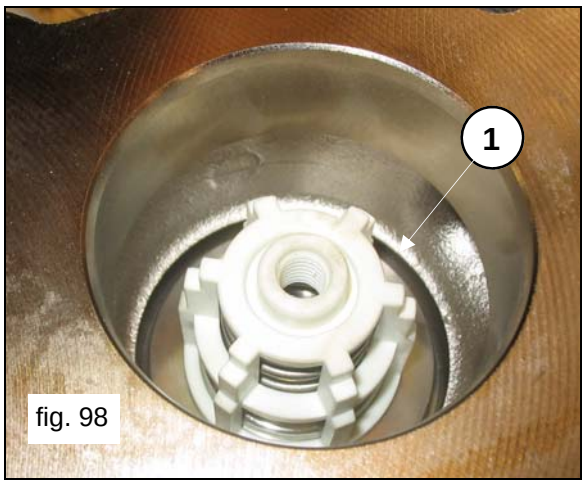


fig. 98

Insert the anti-extrusion ring, exploded view position n.16 (pos.①, fig.99).

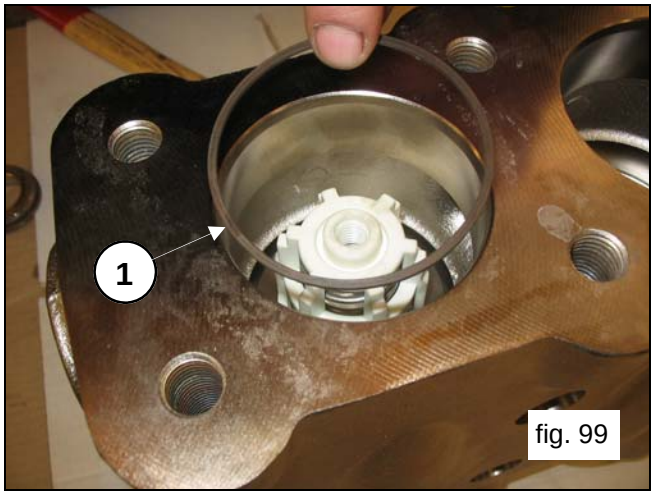


fig. 99

Insert the O-Ring, exploded view position n.17 (pos.①, fig.100).

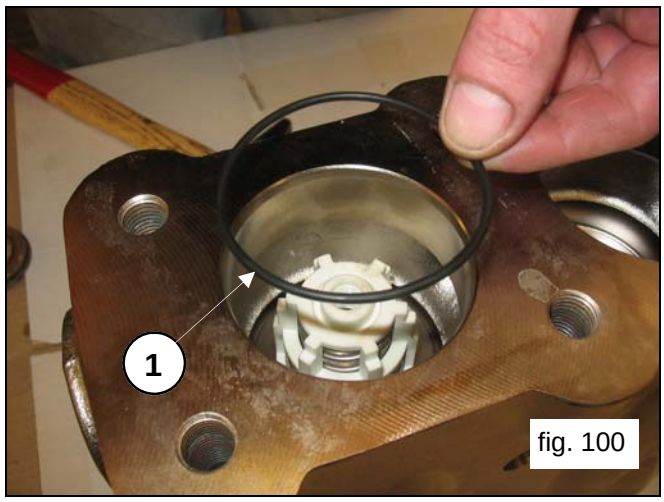


fig. 100

Pay particular attention when inserting the O-ring indicated in pos.①, fig.101.
We advise to use the appropriate tool cod. 27516000 (for MK40-MK45-MK50) or cod.27516100 (for MK55-MK60-MK65) in order to avoid cutting the O-Ring during insertion.

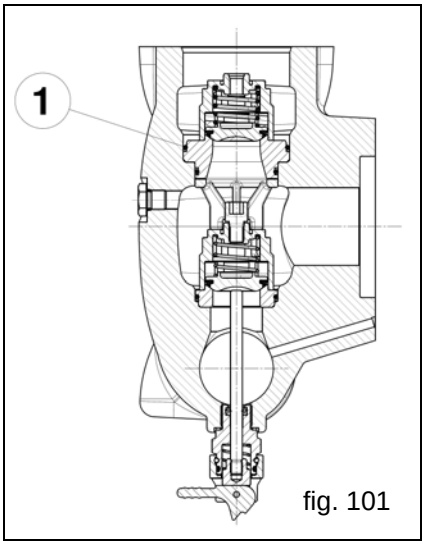


fig. 101

Insert the valve seat ring (pos.①, fig.102) and the spring (pos.①, fig.103).

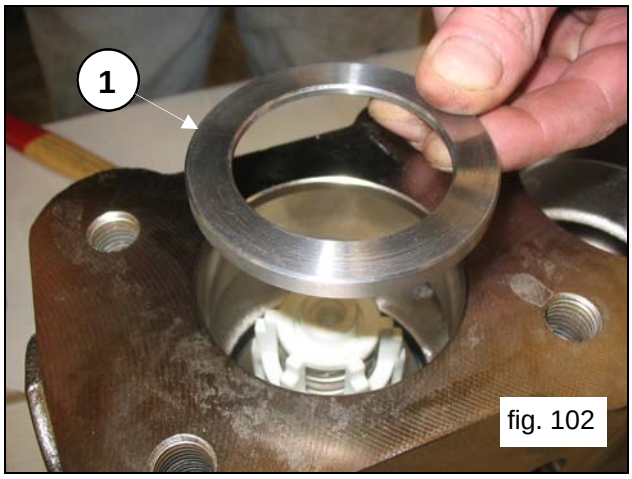


fig. 102

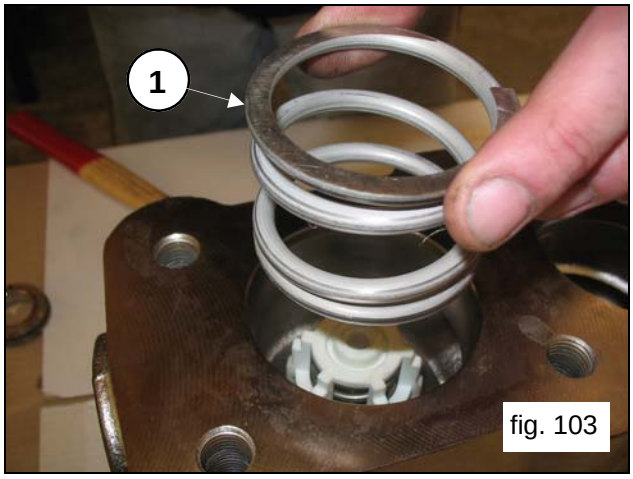


fig. 103

Assemble the O-Ring, exploded view position n.17 (pos.①, fig.104) and the anti-extrusion ring, exploded view position n.21 (pos.②, fig.104) on the delivery valve plug.

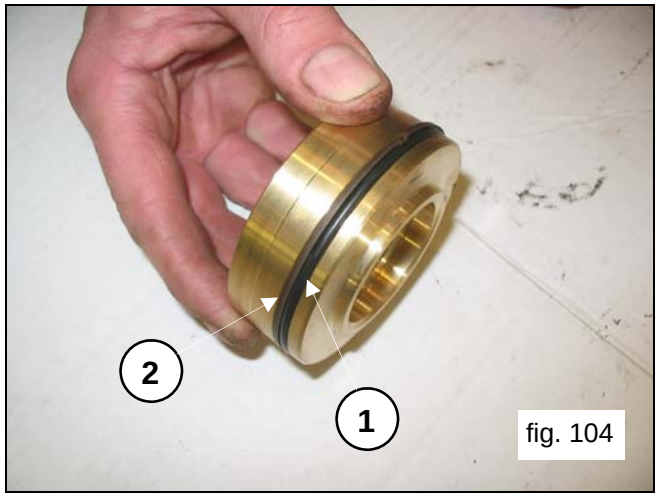


fig. 104

Insert the valve plug complete with O-Rings and anti-extrusion ring.

After assembling the valve unit and the valve plug, apply the valve cover (pos.①, fig.105) and screw on the M16x55 8 screws (pos.①, fig.106).

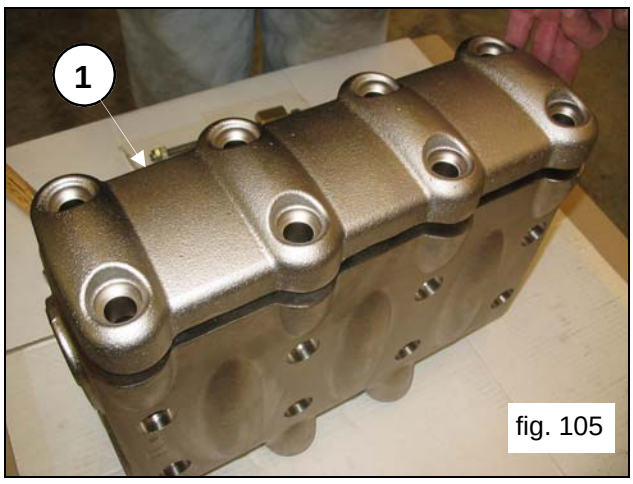


fig. 105

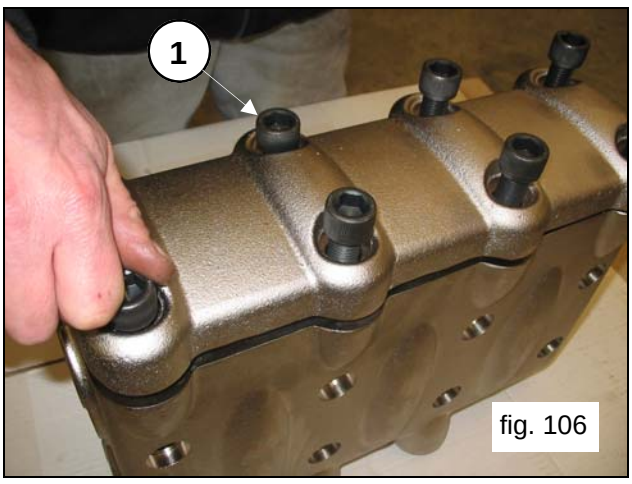


fig. 106

Assemble the head on the pump casing (pos.①, fig.107) being careful not to bump against the pistons, and fasten the 8 M16x180 screws (pos.①, fig.108).

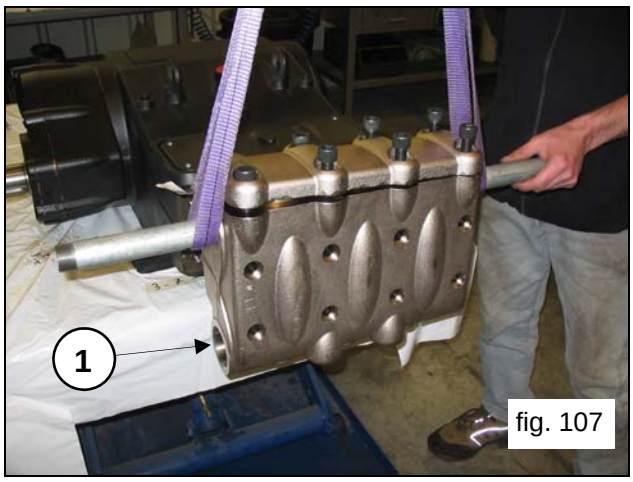


fig. 107

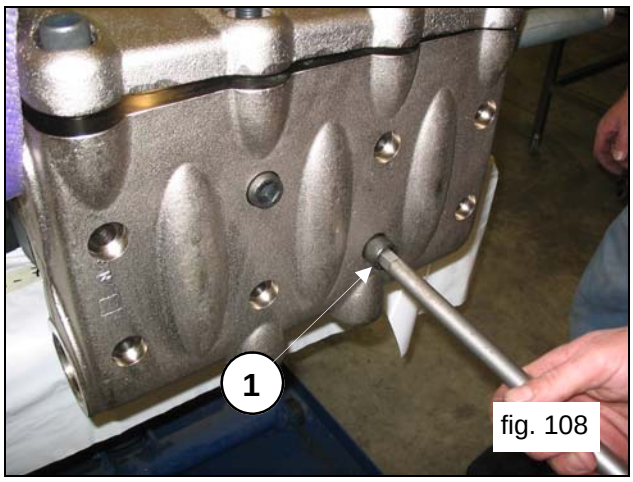


fig. 108

Proceed with calibrating the M16x180 screws with the torque wrench as indicated in paragraph 3. “SCREW CALIBRATION”

Fasten the M16x180 screws starting from the 4 internal screws cross-wise (see fig.107), and then proceed with the 4 external screws, again fastening cross-wise.

Calibrate the M16x55 cover screws with the torque wrench as indicated in paragraph 3. “SCREW CALIBRATION”

Apply the valve opening devices (pos.①, fig.109) and fasten them using a 30 mm wrench (pos.①, fig.110).

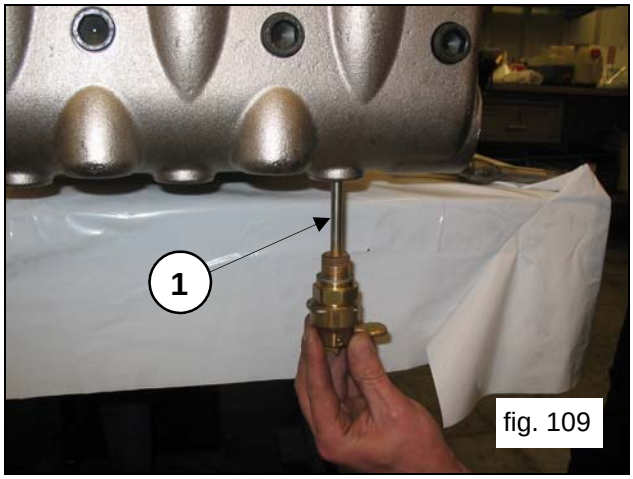


fig. 109

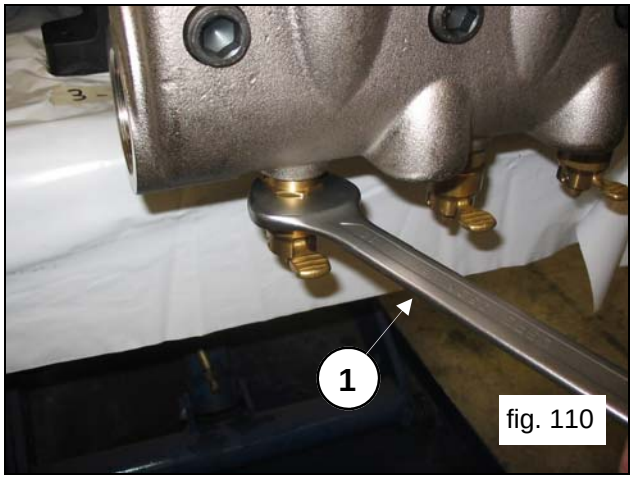


fig. 110

2.2.3 Disassembling the piston unit – supports – seals
The piston unit requires a periodical inspection as indicated in the preventive maintenance table of the use and maintenance manual.
Interventions only regard visual inspections of the draining from the hole on the lower cover. In case of anomalies / oscillations on the delivery pressure gauge, or leaking from the draining hole, proceed with seal inspection and replacement if necessary.
Operate as follows to extract the piston units:

To access the piston unit, unscrew the M16x180 screws and disassemble the head.

Remove the head with great care in order to avoid bumping against the pistons.

Disassemble the pistons by unfastening the screws (pos.①, fig.111).
Remove the piston from the packing support and check that there are no scratches, or signs of wear or cavitation.

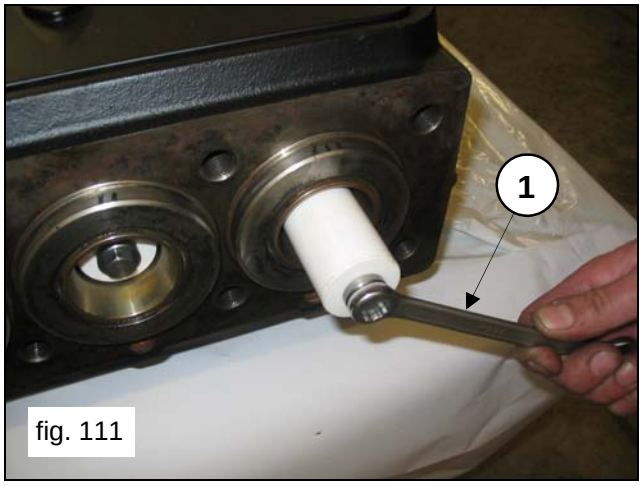


fig. 111

Remove the upper inspection cover by unscrewing the 4 fastening screws (pos.①, fig.112).

fig. 112

Manually rotate the shaft so that the 3 pistons are in the top dead centre position.
Insert the stopper tool cod.27516600 between the piston guide and the piston (pos.①, fig.113).

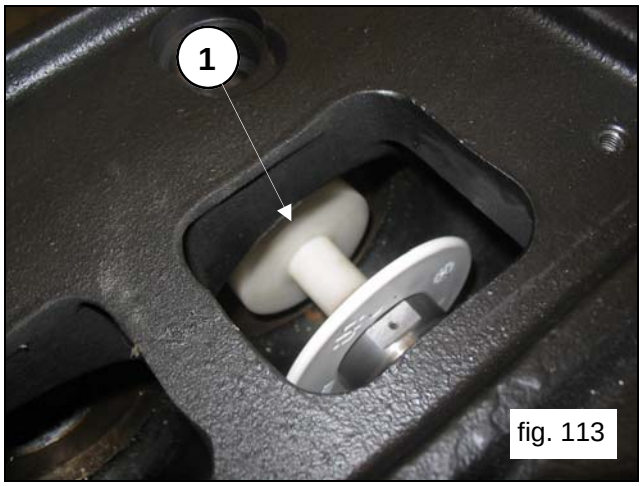


fig. 113

Turning the shaft, move the piston forward so that the stopper, moving forward itself, can push out the packing support and the entire piston unit (pos.①, fig.114).

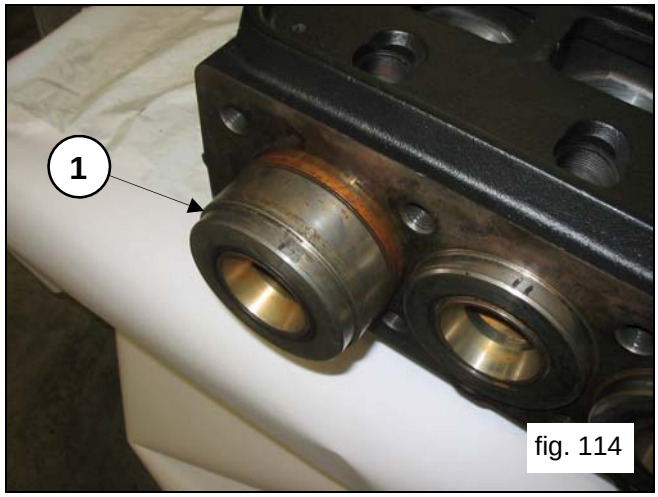


fig. 114

Extract the packing support and the stopper tool.

Remove the packing support O-Ring if it remains inside the pump case (pos.①, fig.115).

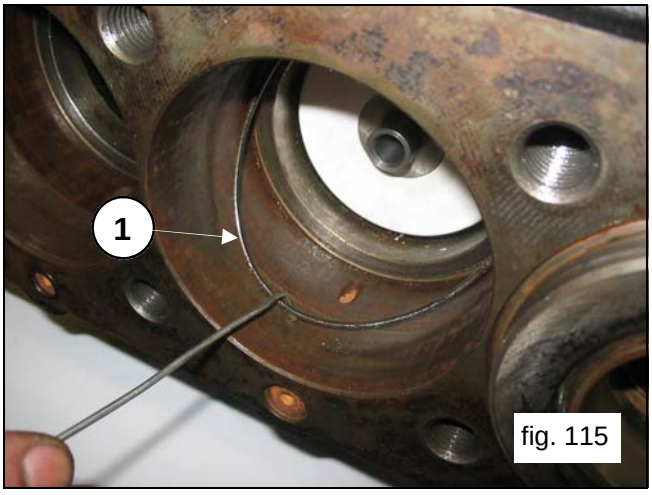


fig. 115

Remove the wiper rings from the piston guides (pos.①, fig.116).

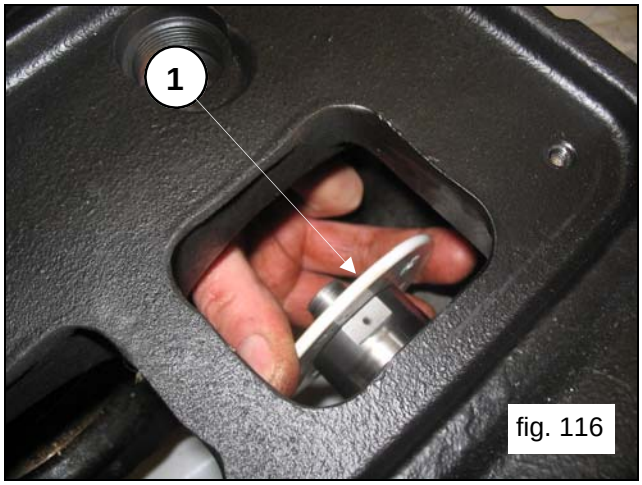


fig. 116

If replacement of the piston guide oil seal is needed, disassemble the oil seal cover by operating as follows: Unfasten the two screws of the oil seal cover (pos.①, fig.117).

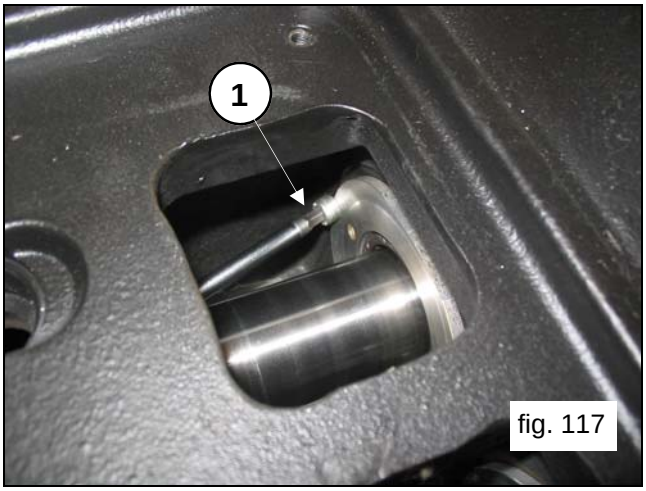


fig. 117

Extract the oil seal cover by screwing a threaded M5 bar or screw into the apposite holes on the cover (pos.①, fig.118); extract the oil seal cover from the pump unit (pos.①, fig.119).

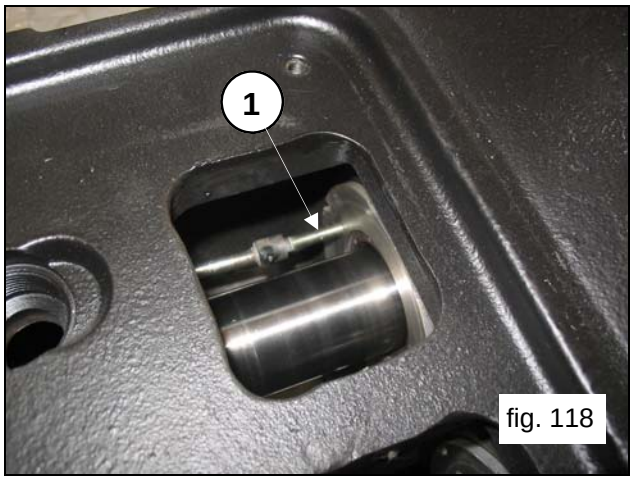


fig. 118

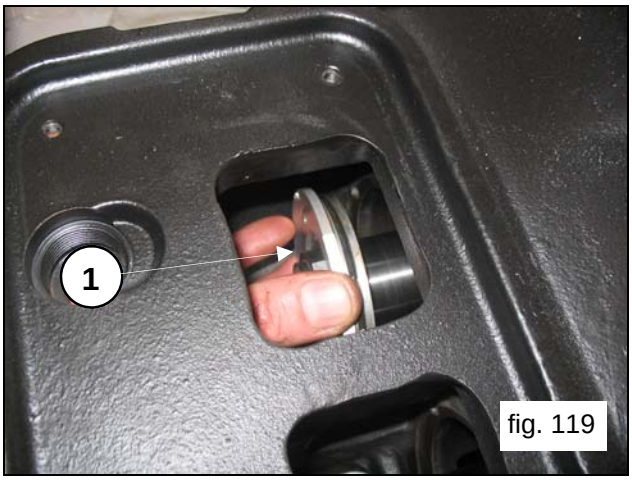


fig. 119

Replace the oil seal (pos.①, fig.120) and the external O-Ring (pos.②, fig.120).

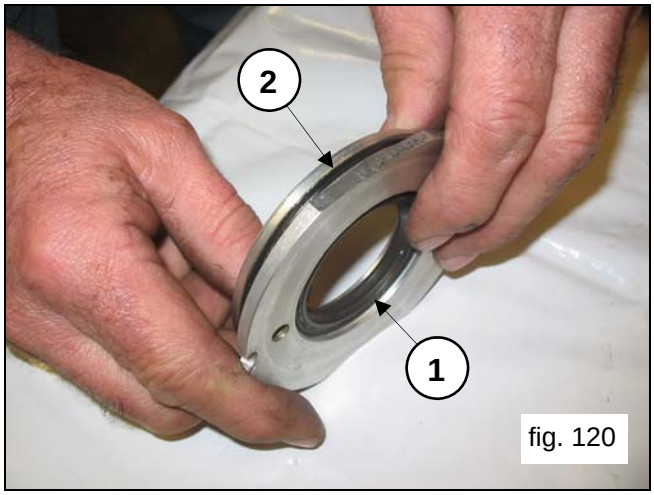


fig. 120

Separate the packing support from the liner (pos.①, fig.121) to access the pressure packings (pos.①, fig.122).

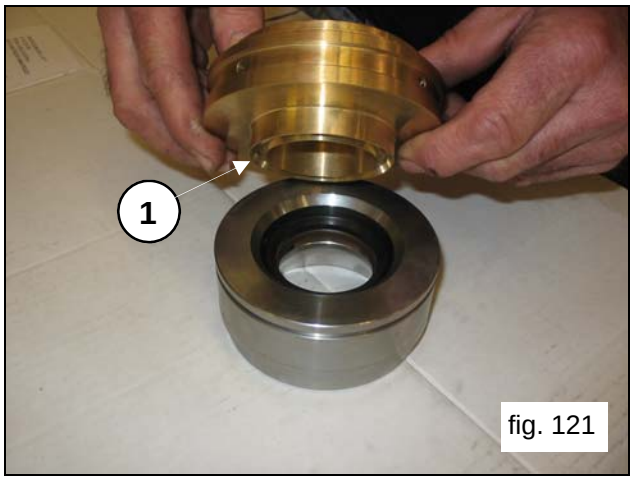


fig. 121

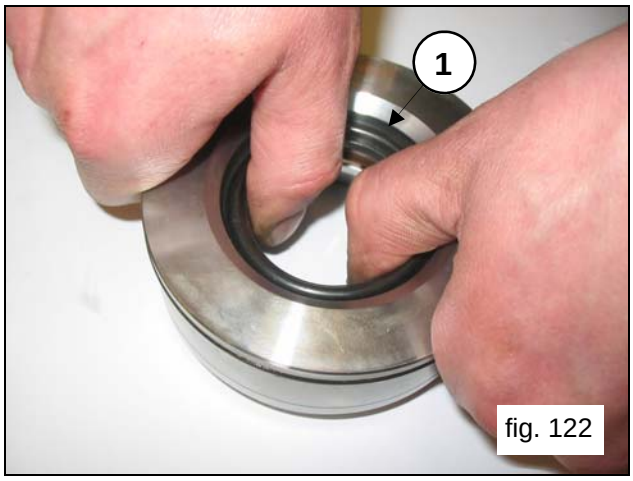


fig. 122

To remove the low pressure packing, use a shim or another tool that doesn't damage the seat of the packing support (pos.①, fig.123).

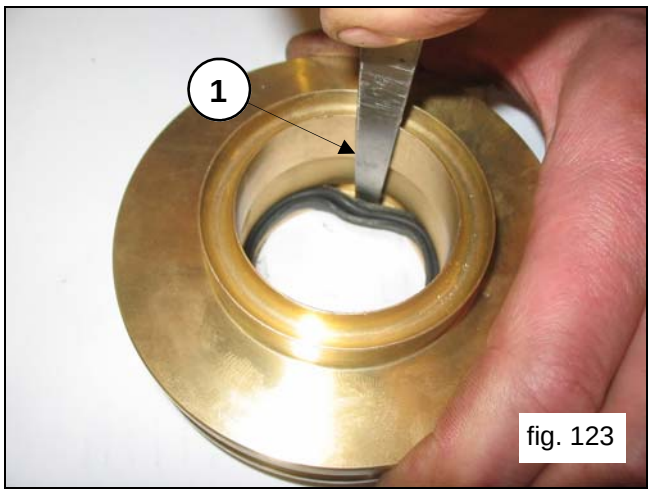


fig. 123

2.2.4 Assembly of the piston unit – supports – seals
Proceed with reassembly by inverting the disassembly procedure indicated in paragraph 2.2.3.

Replace the pressure packings by applying a small amount of silicone grease to the lips, being careful not to damage them when inserting the liner.

At each disassembly, the pressure packings must be always replaced together with all the OR rings.

Insert the low pressure packings in the packing support (pos.①, fig.124), being careful that the sealing lips are facing frontwards (towards the head).

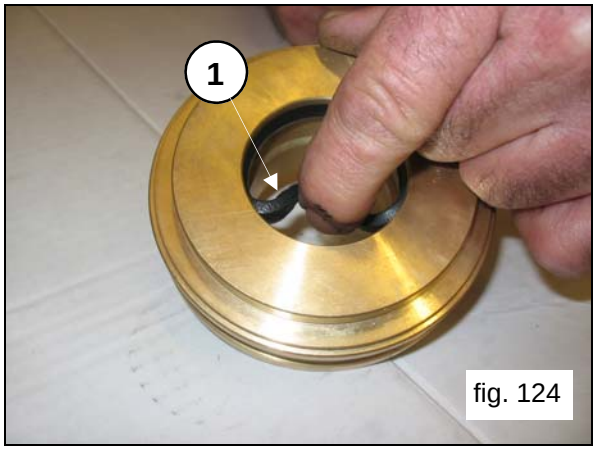


fig. 124

Assemble the head ring (pos.①, fig.125), the high pressure packing (pos.①, fig.126) and the Restop ring (pos.①, fig.127)

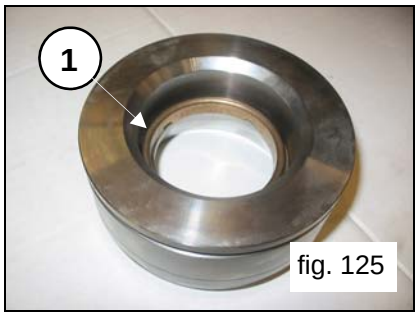


fig. 125

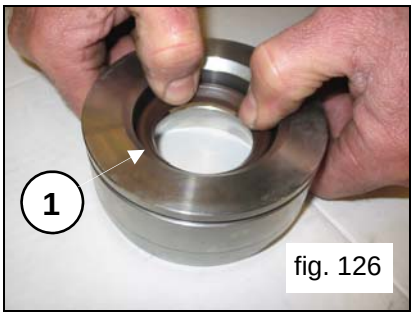


fig. 126

fig. 127

Couple the packing support to the liner (pos.①, fig.128).

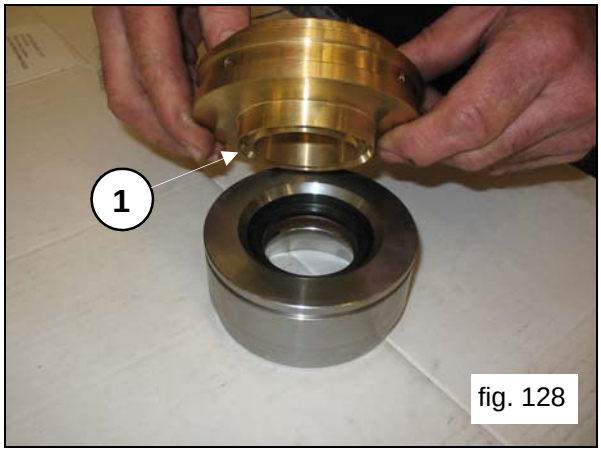


fig. 128

Insert the oil seal in its cover (pos.①, fig.129) using a stopper cod.27515800.

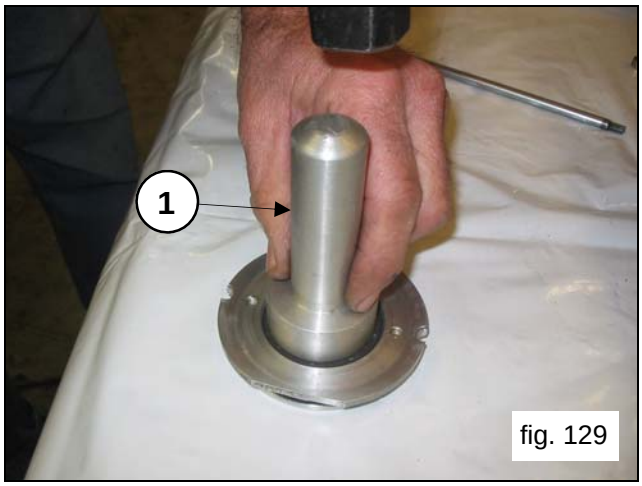


fig. 129

Position the O-Ring (pos.①, fig.130) in its seat on the oil seal cover, and insert the assembled unit inside the crankcase in the apposite space (pos.①, fig.131).

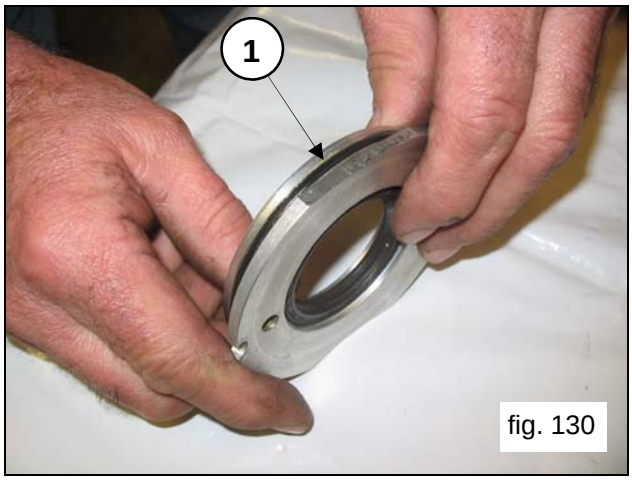


fig. 130

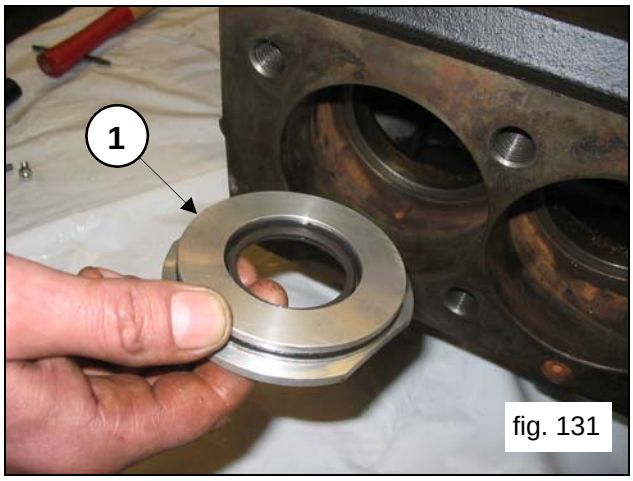


fig. 131

Perfectly insert the cover into its seat (pos.①, fig.132) being careful not to damage the oil seal lip. Fasten the oil seal cover with 2 M6x14 screws (pos.①, fig.133).

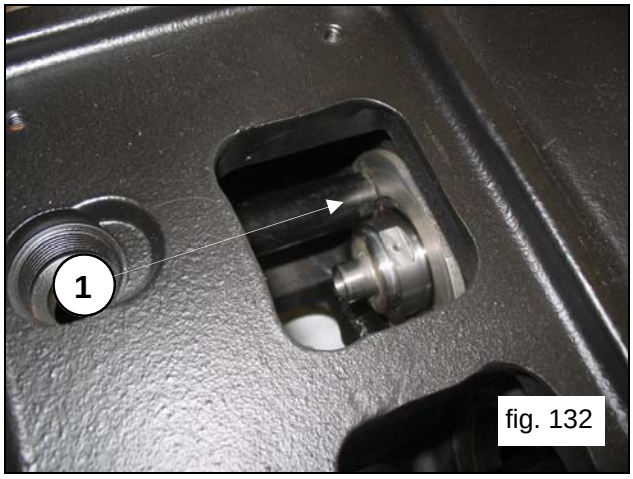


fig. 132

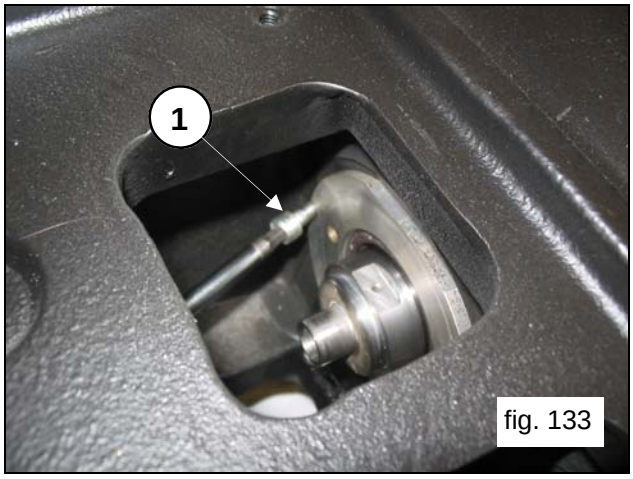


fig. 133

Calibrate the screws using the torque wrench as indicated in paragraph 3.”SCREW CALIBRATION”

Position the wiper complete with its O-Ring in its seat on the piston guide (pos.①, fig.134 e 135).

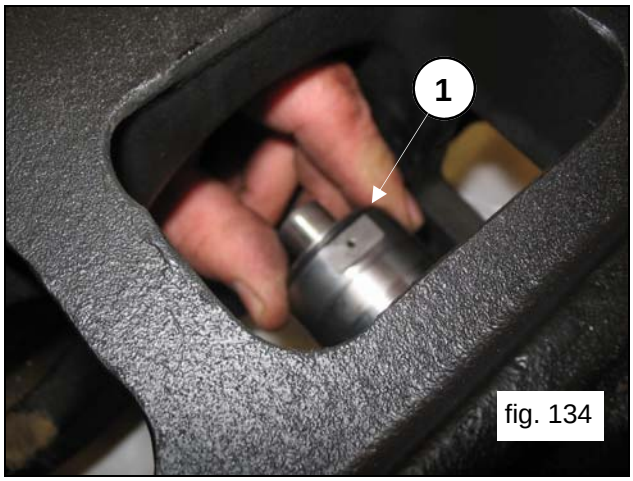


fig. 134

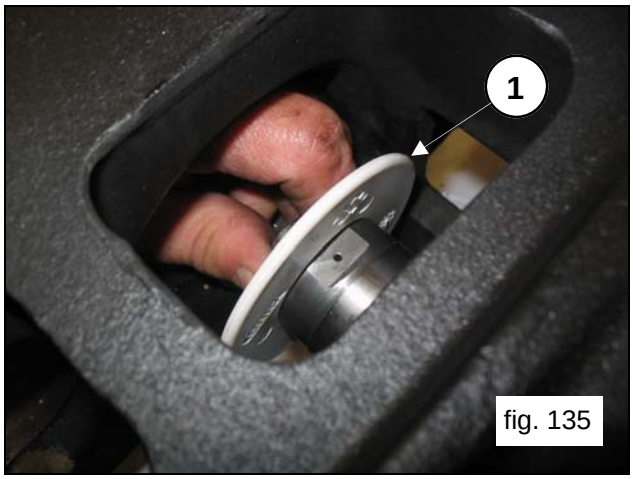


fig. 135

Insert the (14x2) O-Ring in its apposite seat on the piston bolt (pos.①, fig.136).

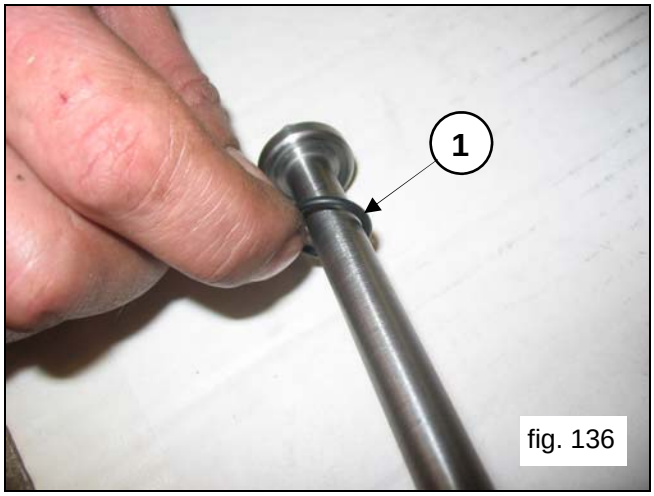


fig. 136

Assemble the pistons on their respective guides (pos.①, fig.137) and fasten them as in pos.①, fig.138.

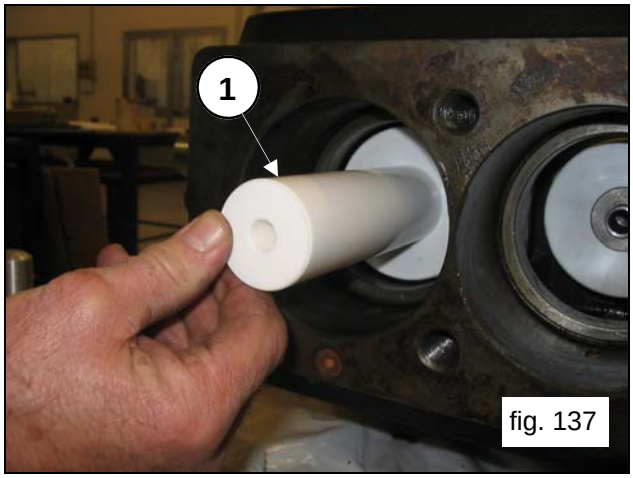


fig. 137

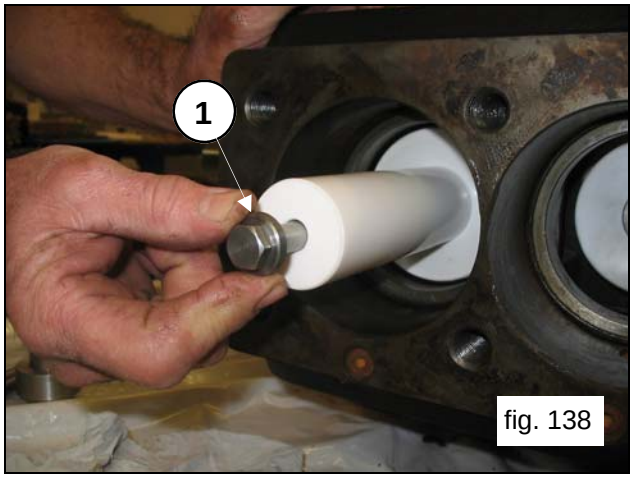


fig. 138

Calibrate the screws using the torque wrench as indicated in paragraph 3. “SCREW CALIBRATION”

Insert the O-Ring inside the pump case (pos.①, fig.139), followed by the previously assembled liner-packing support unit (complete with the O-Ring) (pos.①, fig.140).

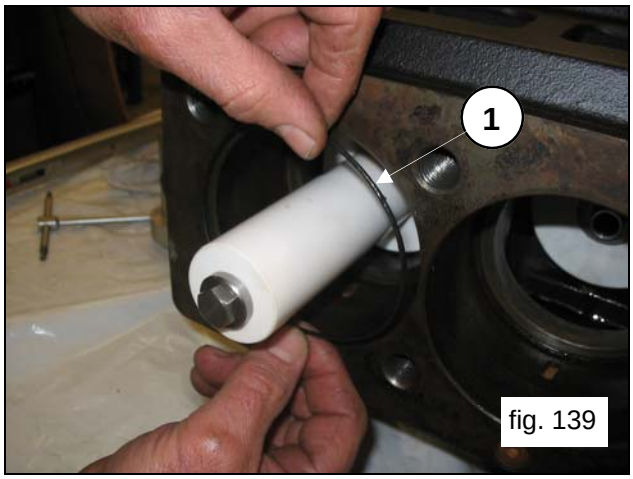


fig. 139

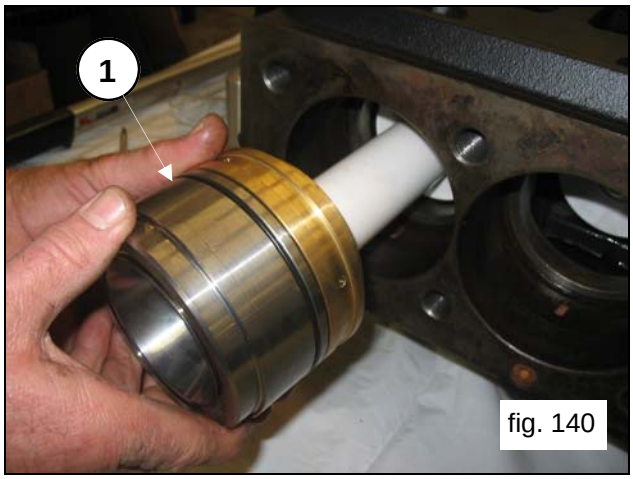


fig. 140

Be sure that the liner-support unit is correctly positioned in its seat (pos.①, fig.141).

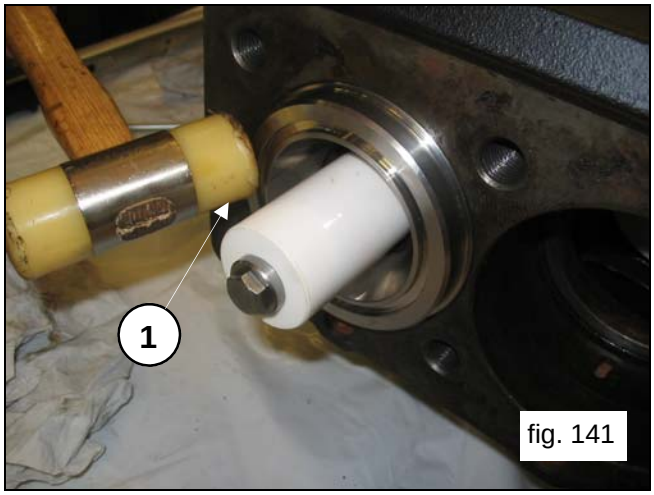


fig. 141

Assemble the liner's front O-Ring (pos.①, fig.142) and the O-Ring of the recirculation hole (pos.①, fig.143).

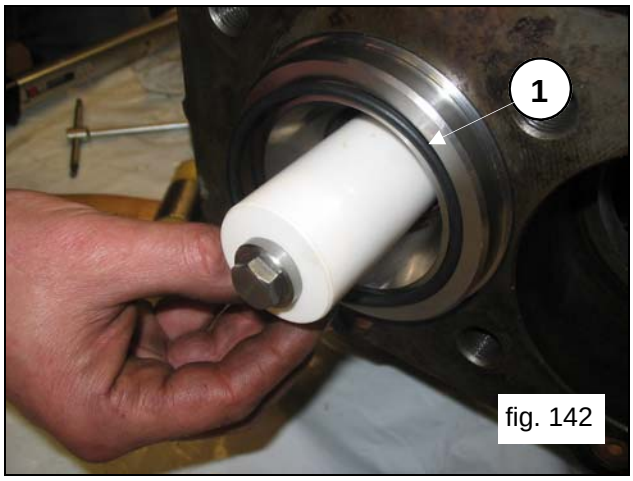


fig. 142

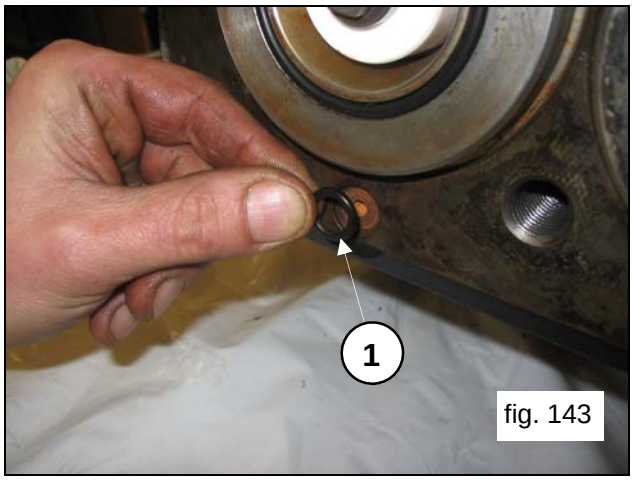


fig. 143

Insert the O-Ring on the inspection covers, (pos.①, fig.144) and mount the covers using 4+4 M6x14 screws (pos.①, fig.145).

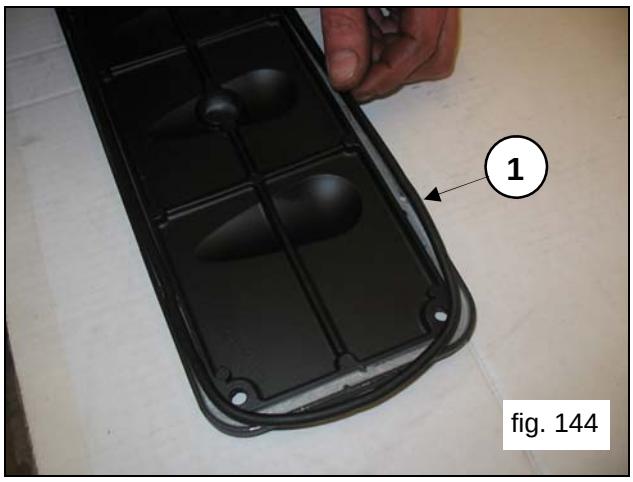


fig. 144

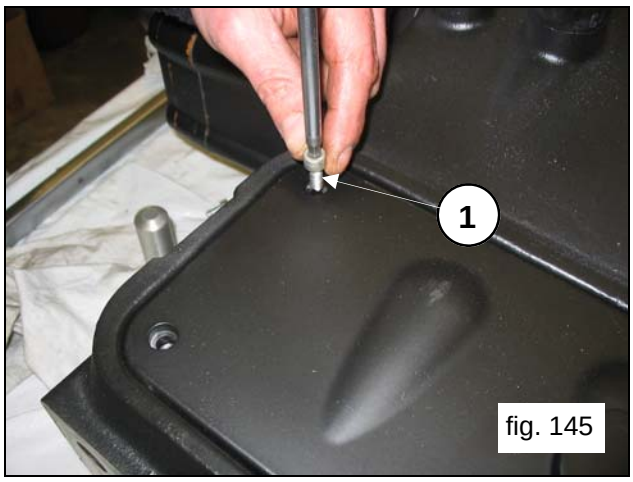


fig. 145

Calibrate the screws with the torque wrench as indicated in paragraph 3."SCREW CALIBRATION"

2.2.5 Manifold refurbishment

Manifold cavitation damages around the three cylinder bores can be fixed by re-tooling them damaged bores to a large diameter (see fig.146—for MK40-45-50 and fig.147—MK55-60-65).

fig. 146

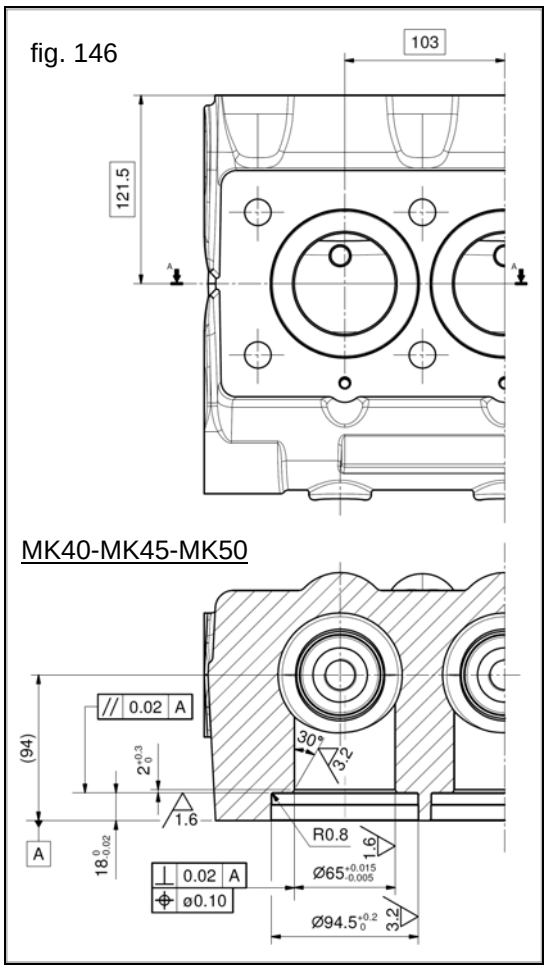
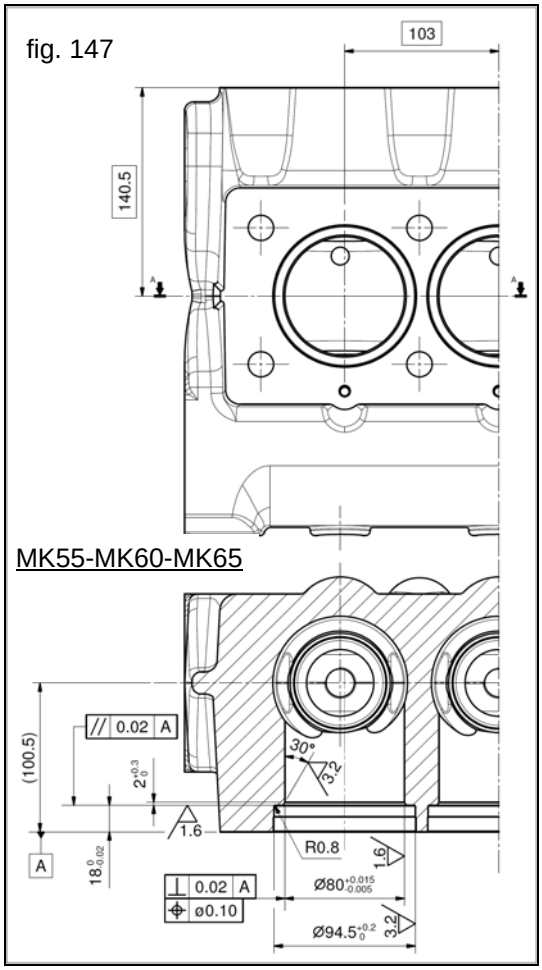


fig. 147



After re-tooling, three steel bushings designed to restore the original bores have to be driven in the manifold along with relevant O'rings and anti-extrusion rings as shown in fig. 148 and 149.

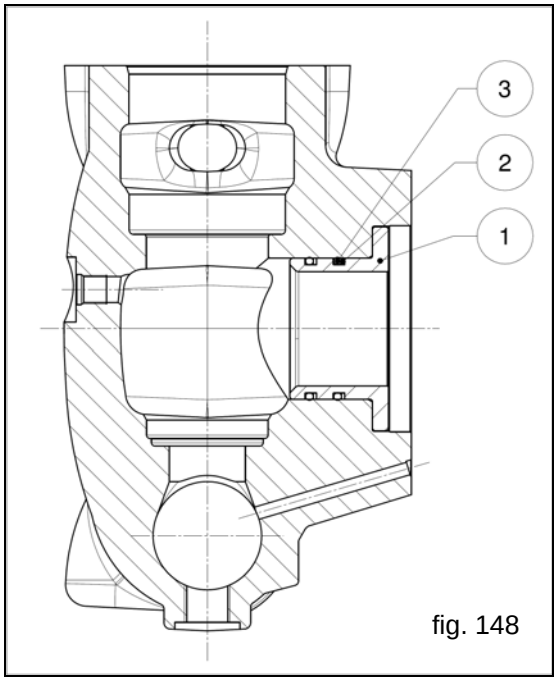


fig. 148

① – n.3 pcs x p/n 74215156 bushings MK40-45-50

② – n.6 pcs x p/n 90526880 antiextrusion rings

③– n.6 pcs x p/n 90410200 O'rings

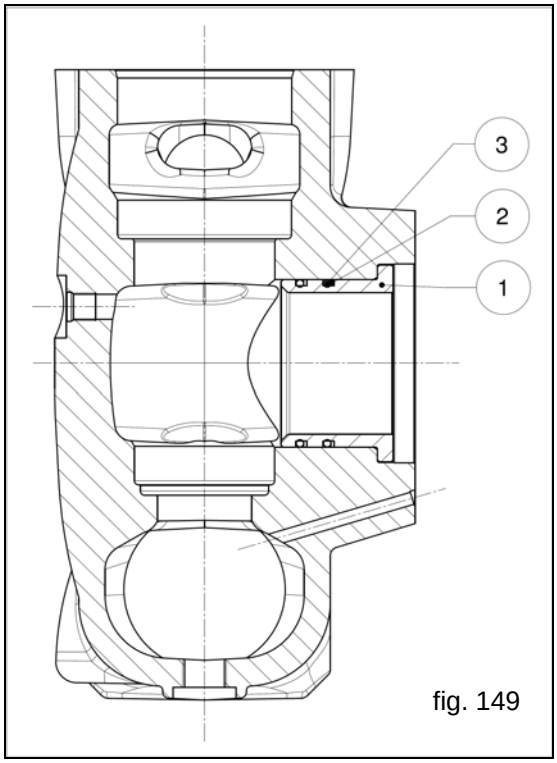


fig. 149

① – n.3 pcs x p/n 74215056 bushings MK55-60-65

② – n.6 pcs x p/n 90528500 antiextrusion rings

③– n.6 pcs x p/n 90412900 O'rings

3. SCREW CALIBRATION

Screws are to be fastened exclusively using a torque wrench.

Description	Exploded view position	Fastening Torque Nm
Crankcase cover screws M8x18	54	20
Crankcase Plug G1/2x13	55	40
Reducer flange screw M8x18	54	20
Reducer cover screw M10x50	70	45
Ring gear stopper screw M10x25	65	45
Reducer case screw M12x40	75	73.5
Reducer case screw M12x50	64	73.5
Upper and lower cover screw M6x14	41	10
Bearing cover screw M12x30	90	40
Connecting rod screw M12x1.25x87	53	75 *
Piston Guide screw M10x35	50	60
Oil seal cover screw M6x14	41	10
Piston screw M10x160	27	40
M16x55 Valve cover screw	26	333
Head plug G1/4”x13	13	40
Head screw M16x180	25	333 **
Valve opening device	2	40

* Screws should be tightened at intermediate incremental values.

** Tightening sequence always cross-wise starting from the 4 internal screws then the 4 external screws (see fig.108)

4. REPAIR TOOLS

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

For assembly:

- Piston guide oil seal — cod. 27910900
- Pinion oil seal — cod. 27515900 and 27548200
- Delivery valve O-ring seat MK40-MK45-MK50 — cod. 27516000
- Delivery valve O-ring seat MK55-MK60-MK65 — cod. 27516100

For disassembly:

- Suction valve seat MK40-MK45-MK50 — cod. 27516200
- Suction valve seat MK55-MK60-MK65 — cod. 27516300
- Delivery valve seat MK40-MK45-MK50 — cod. 27516400
- Delivery valve seat MK55-MK60-MK65 — cod. 27516500
- Liner + packings support unit — cod. 27516600
- Reducer cover — cod. 27516700
- Shaft (connecting rod blocking) — cod. 27566200

Cod. 74980103 -rev.2 - Cod.IE 2860000009 – 12/ 06/ 2009
I dati contenuti nel presente documento possono subire variazioni senza preavviso.

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