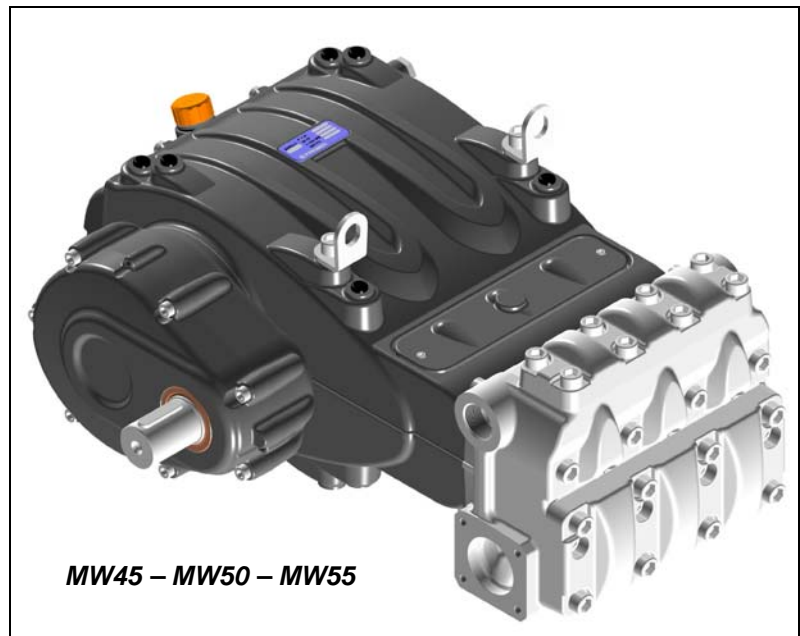
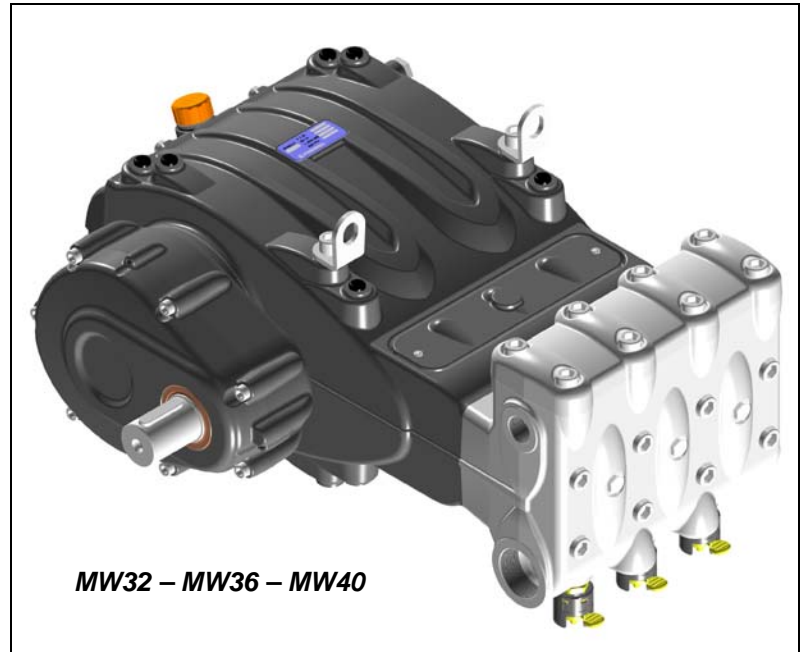


MW Series



Repair manual

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1. INTRODUCTION

This manual describes the instructions for repair of the MW pump family and should be carefully read and understood before any intervention on the pump.

Proper pump operation and duration depend on the correct use and maintenance.

Interpump Group disclaims any responsibility for damage caused by negligence or failure to observe with the standards described in this manual.

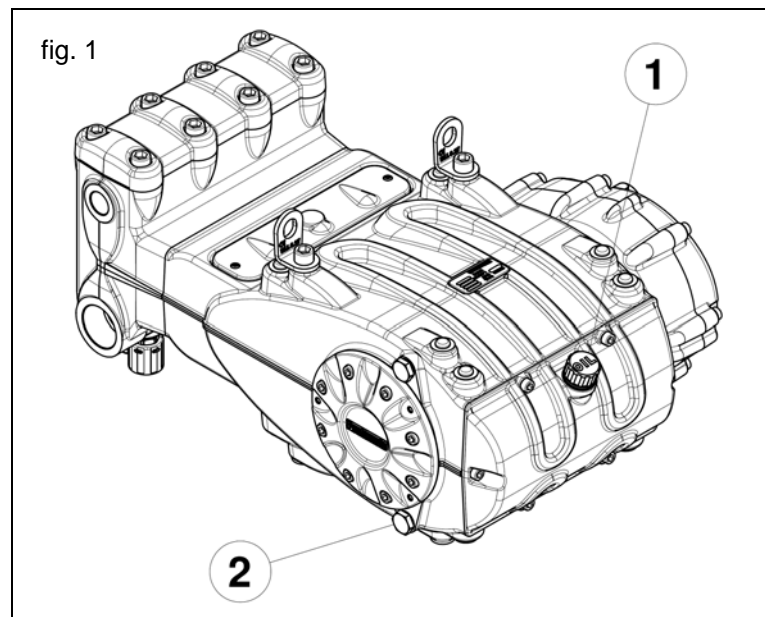
2. REPAIR GUIDELINES



2.1 Repairing mechanical parts

Mechanical parts repair must be performed after removal of oil from the casing.

To take out the oil, remove the oil dipstick pos. ①, fig. 1 and then the discharge plug pos. ②, fig.1

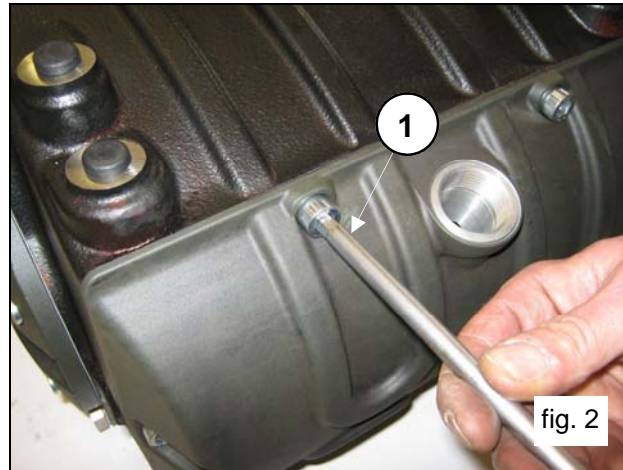


The oil must be placed in a suitable container and disposed of in special centres. It absolutely should not be discarded into the environment.

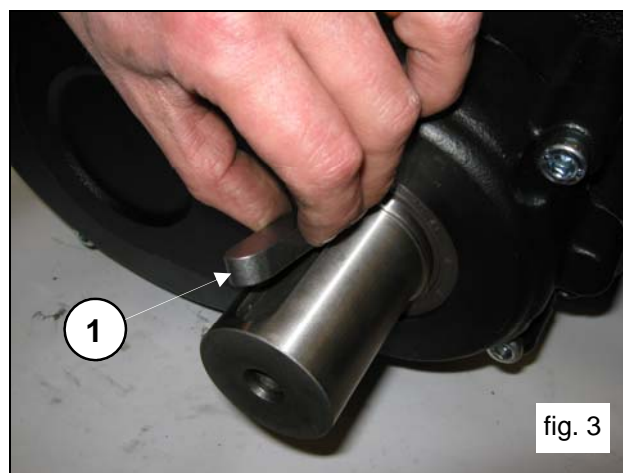
2.1.1 Disassembly of mechanical parts

The proper sequence is as follows:

Fully empty the oil from the pump, then disassemble the casing cover (and relative O-ring), unscrewing the 6 M10 screws (pos.①, fig.2).



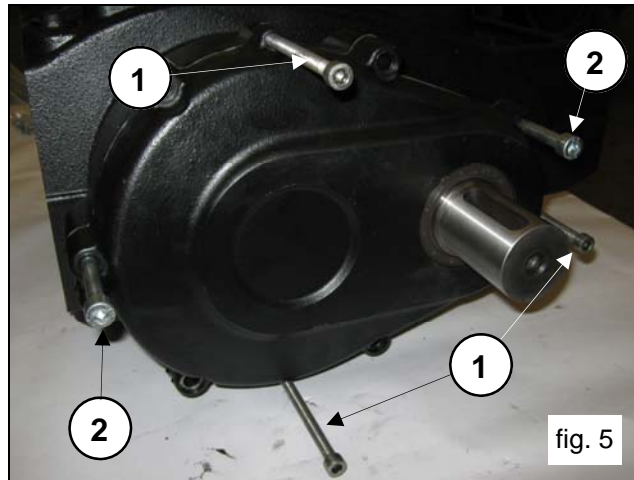
Remove the tab from the PTO shaft (pos.①, fig.3).



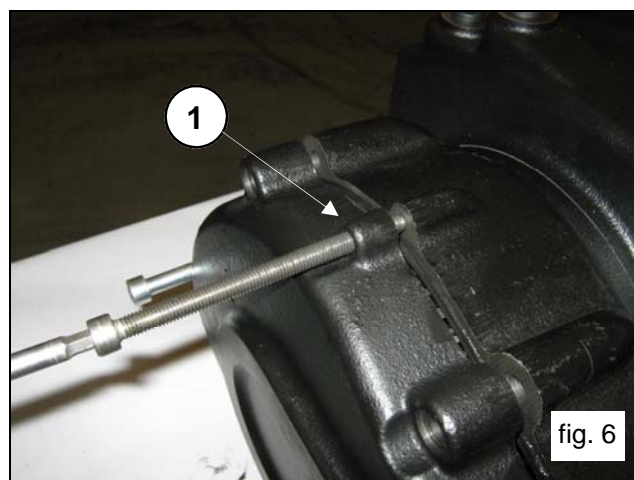
Unscrew the reduction gear cover fixing screws (pos.①, fig.4).



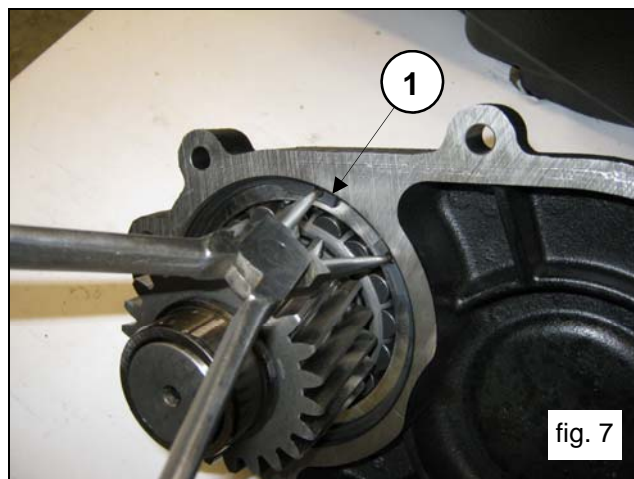
Position the 3 grub screws or M8 threaded screws (pos.①, fig.5) with the function of extractors in the holes and two sufficiently long M10 screws with the function of supporting the cover (pos.②, fig.5).



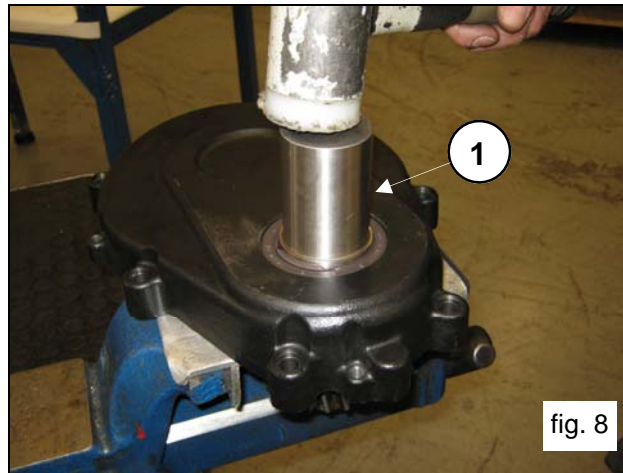
Slowly screw in the 3 M8 screws (pos.①, fig.6) with the function of extractors to fully remove the cover unit and pinion



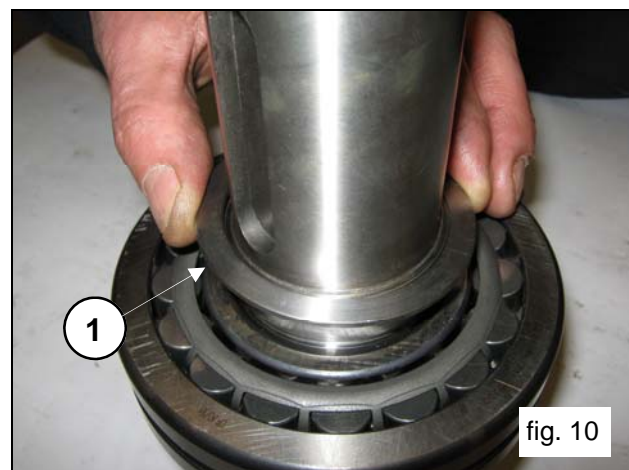
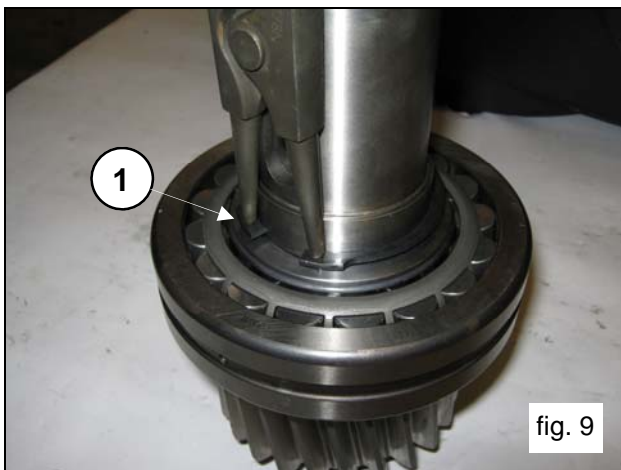
Complete disassembly of the reduction gear cover from the pinion is possible following these steps:
Remove the Seeger ring Ø120 (pos.①, fig.7)



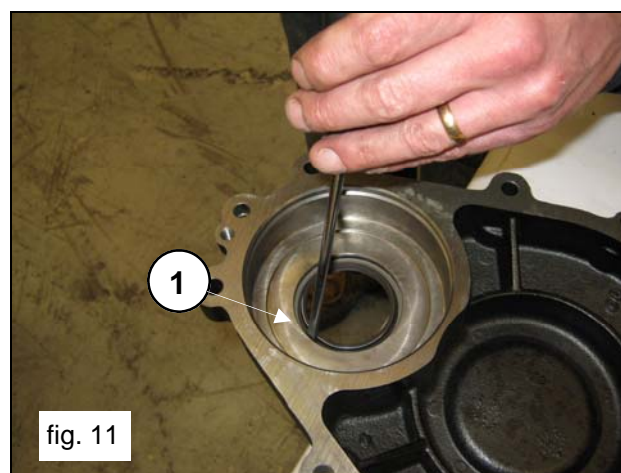
Separate the pinion from the cover, working with an extractor hammer on the pinion itself (pos.①, fig.8)



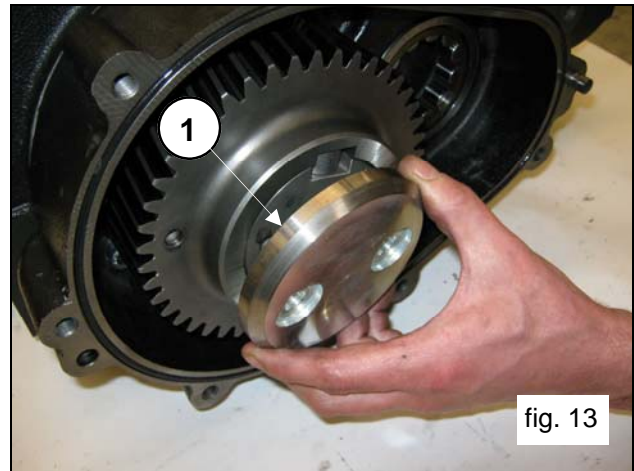
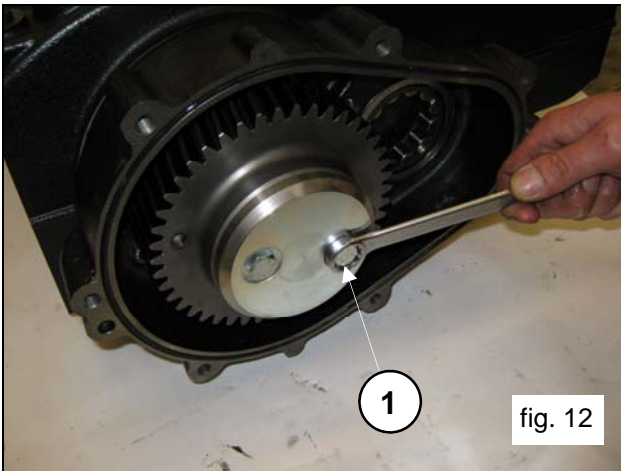
Remove the Seeger ring Ø55 (pos.①, fig.9) and the bearing support ring (pos.①, fig.10) from the pinion



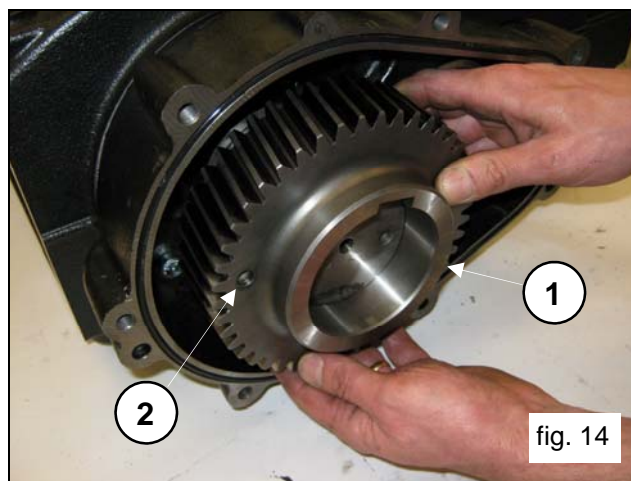
Extract the seal ring from the reduction gear cover, working from the inner side of the cover (pos.①, fig.11).



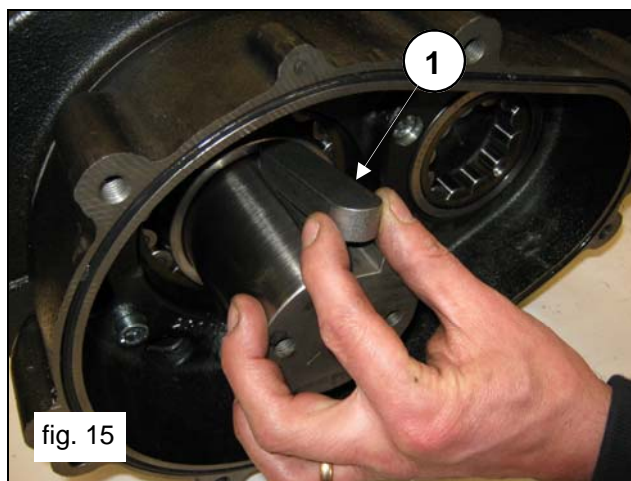
Unscrew the screws holding in the ring gear (pos.①, fig.12) and remove it (pos.①, fig.13).



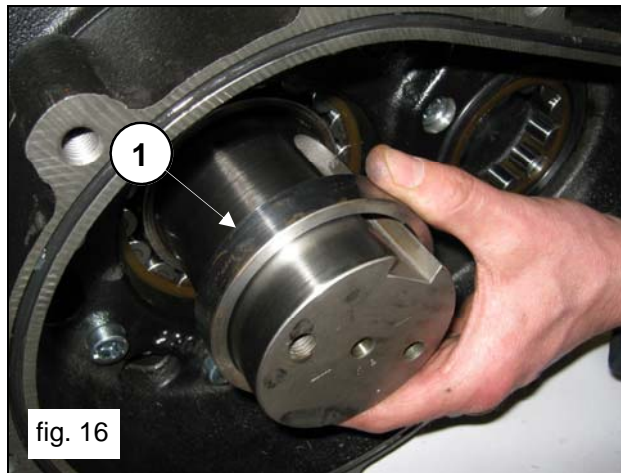
Remove the ring gear (pos.①, fig.14). Where necessary, it is possible to utilise an extractor hammer to be applied on the 2 M8 holes (pos.②, fig.14)



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



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



Unscrew the con-rod screws (pos. ①, fig.17).



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

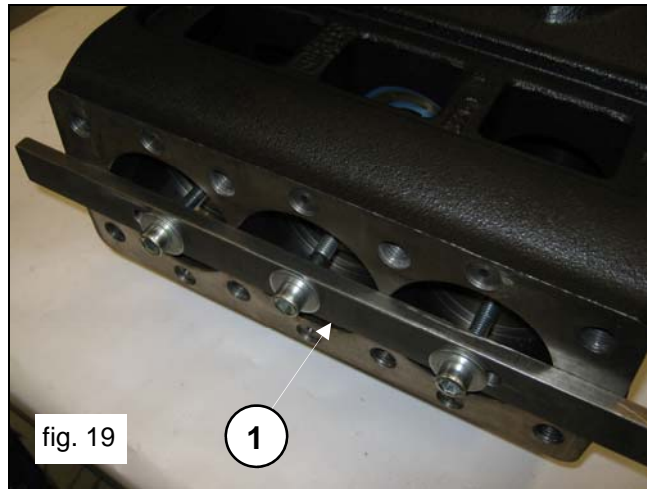


The con-rod caps and their relative half supports must be reassembled in exactly the same order and coupling with which they were disassembled.

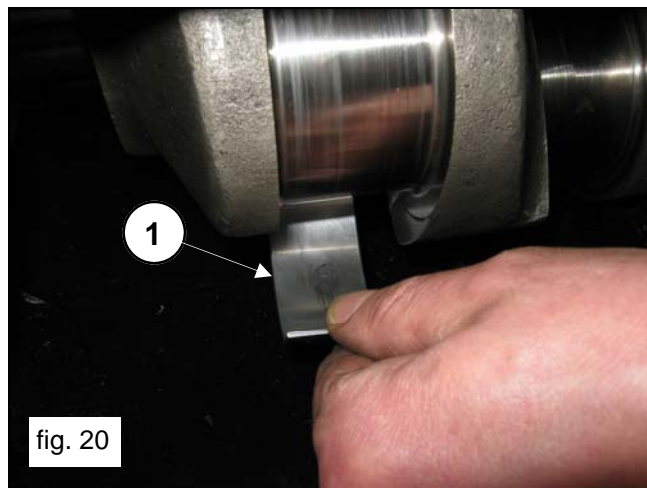
To avoid possible errors, caps and half supports have been numbered on one side (pos. ①, fig. 18) .



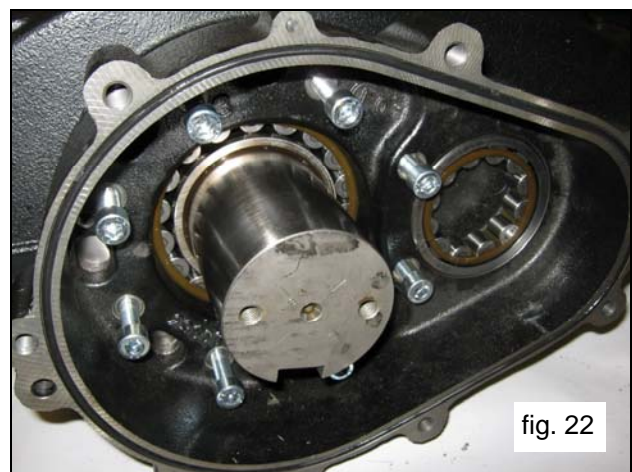
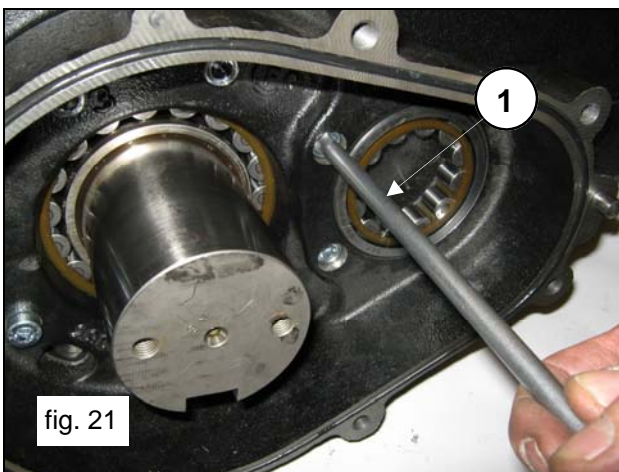
Advance the half supports completely in the direction of the hydraulic part to allow the bend shaft to come out. To facilitate this operation, use special tool (code 27566200), (pos.①, fig.19).



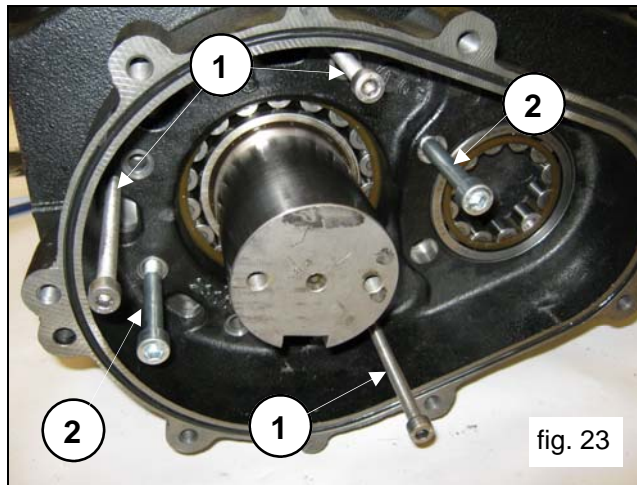
Remove the three upper half-bearings of the half supports (pos.①, fig.20).



Unscrew the reduction gear box fixing screws (pos.①, fig.21 and fig.22).

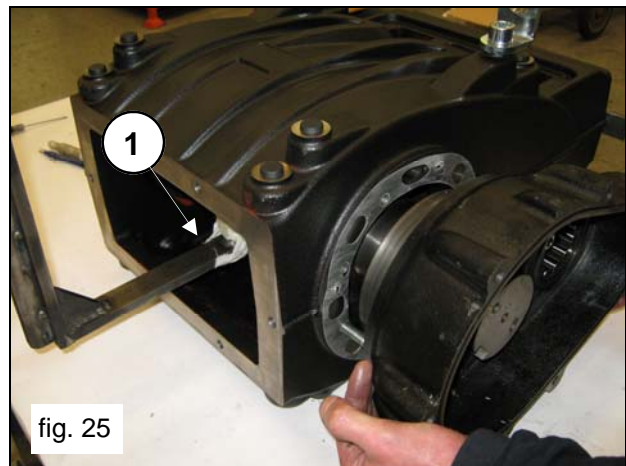
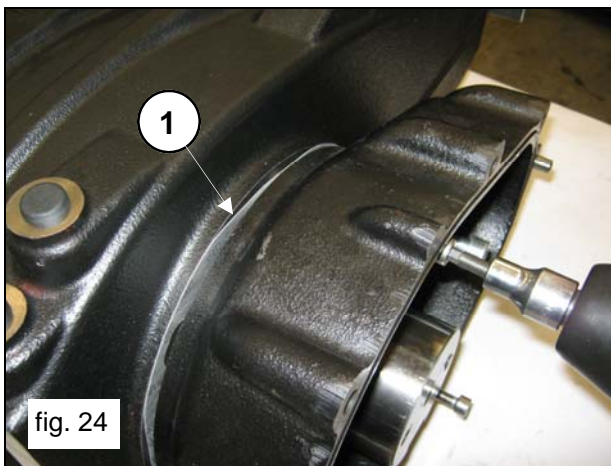


Position the 3 grub screws or M8 threaded screws (pos. ①, fig.23) with the function of extractors in the holes and two sufficiently long M10 screws with the function of supporting the reduction gear box (pos. ②, fig.23).

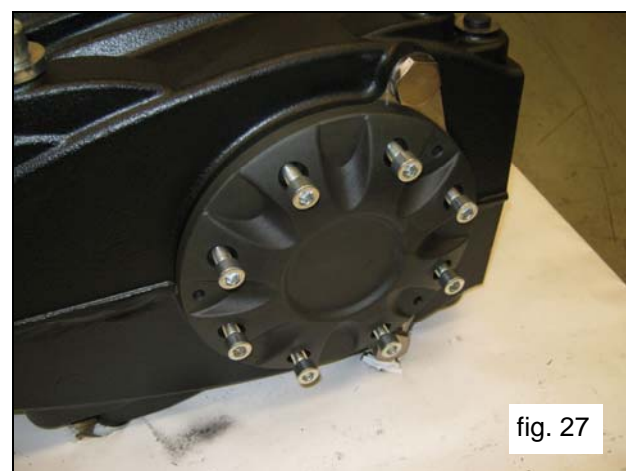
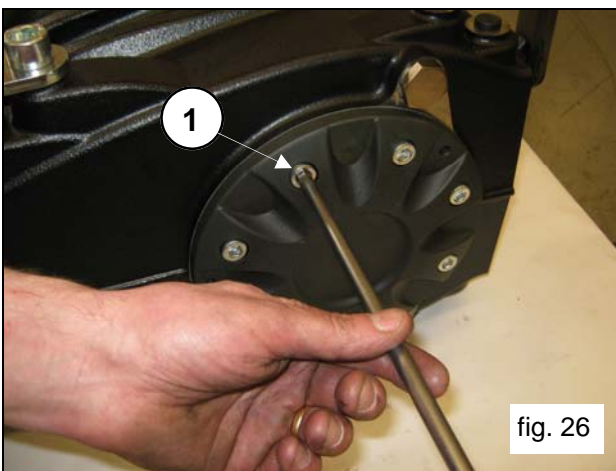


Slowly screw in the 3 M8 screws (pos. ①, fig.24) to prevent that the box can tilt too far and get locked in the housing.

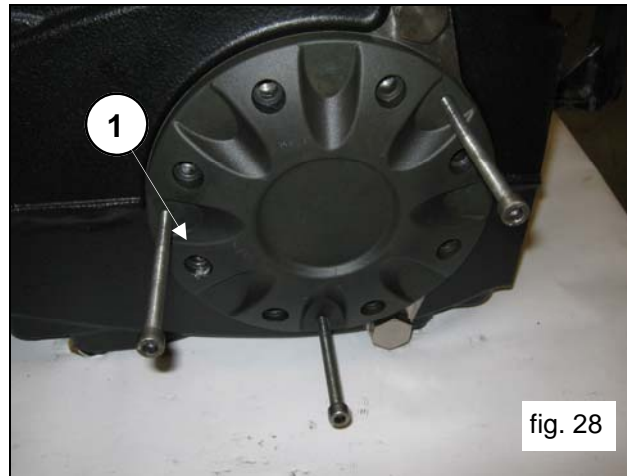
Remove the box while supporting the shaft to prevent damage (pos. ①, fig.25).



Unscrew the bearing cover fixing screws from the opposite side (pos. ①, fig.26 and fig.27).

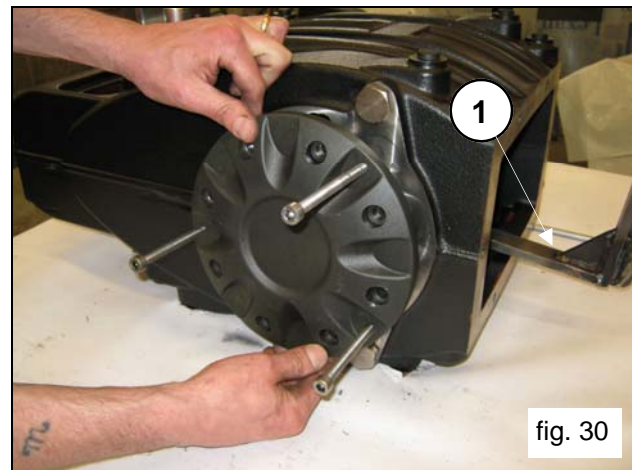
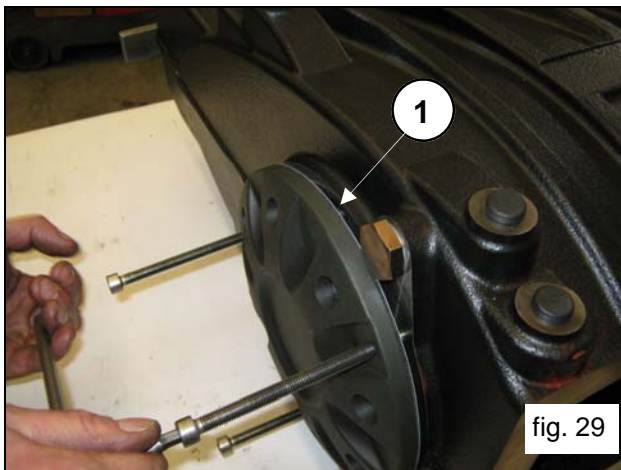


Position the 3 grub screws or M8 threaded screws (pos.①, fig.28) with the function of extractors in the holes

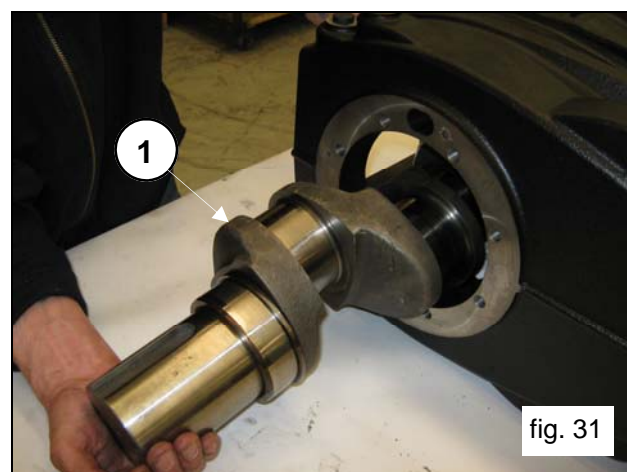


Slowly screw in the 3 M8 screws (pos.①, fig.29) to prevent that the cover can tilt too far and get locked in the housing.

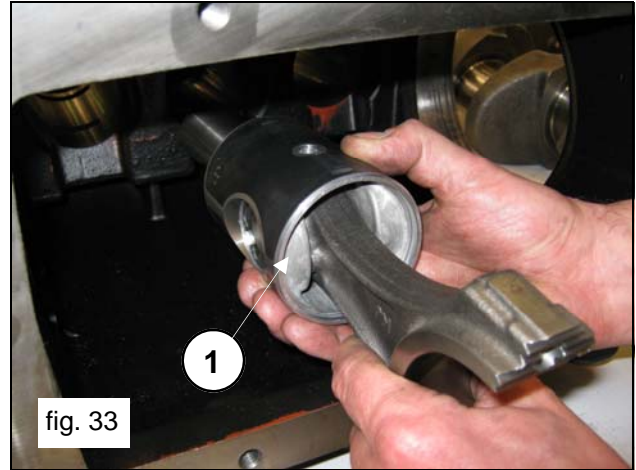
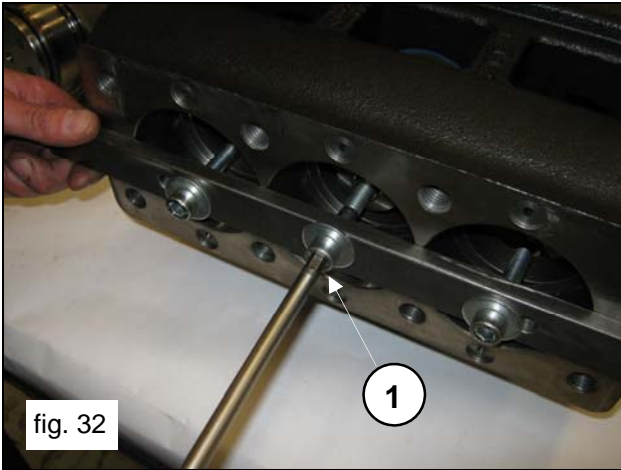
Remove the bearing cover while supporting the shaft to prevent damage (pos.①, fig.30).



Remove the bend shaft casing from the PTO side (pos.①, fig.31).



In the event that it is necessary to replace one or more con-rods or piston guides, operate as follows: Unscrew the screws with tool code 27566200 to unlock the con-rods (pos.①, fig.32) and then extract the con-rod-piston guide units from the back casing opening (pos.①, fig.33).

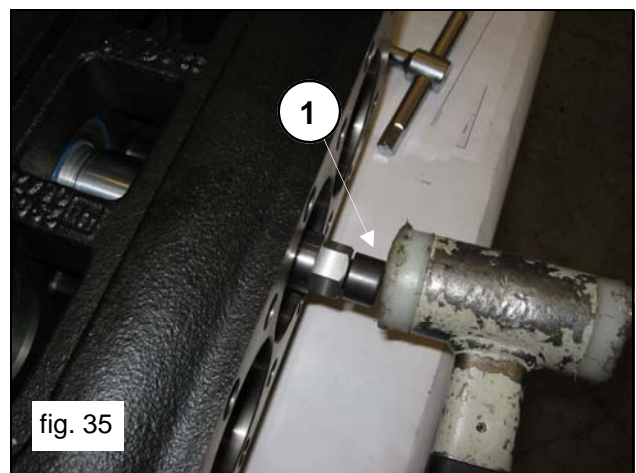


It is now possible to disassemble the piston guide seal rings, taking care to not damage the piston guide sliding rod.

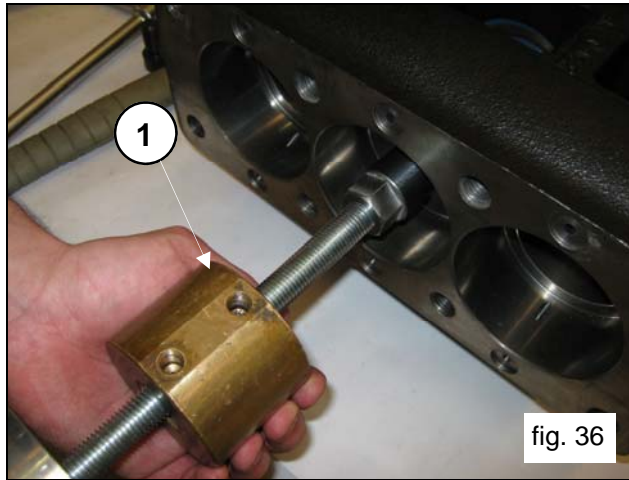


Whenever it becomes necessary to replace the piston guide seal rings without dismantling the entire mechanical part, it is possible to extract the seal rings with the use of tool code 27918500 operating as follows:

Insert the tool between the rod and the seal ring (pos.①, fig.34) and, with the extractor hammer, complete insertion of the tapered section inside the seal ring (pos.①, fig.35)



Extract the seal ring using the tool extractor hammer (pos.①, fig.36).



Remove the two spindle locking Seeger rings Ø120 (pos.①, fig.37).



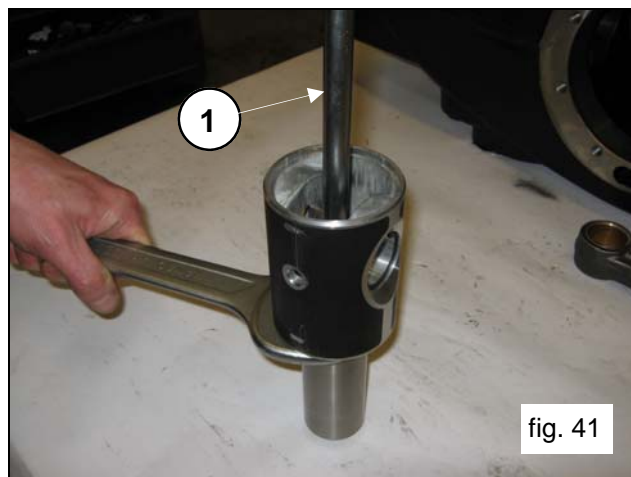
Remove the spindle (pos.①, fig.38) and extract the con-rod (pos.①, fig.39)



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



To separate the rod from the piston guide, unscrew the hexagonal head M10 screws with a 17 socket wrench (pos. ①, fig.41), blocking the rod with the 36 fork spanner.



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 piston guide.

Insert the elastic pin Ø5 in its hole on the piston guide (pos.①, fig.42) and join the rod to the piston guide by means of M10x35 screws (pos.①, fig.43).

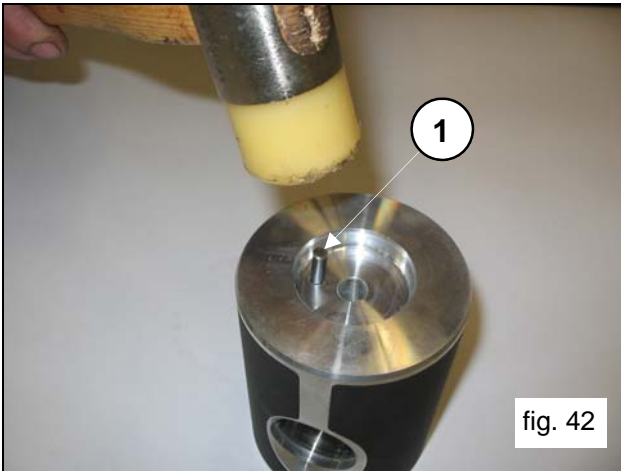


fig. 42

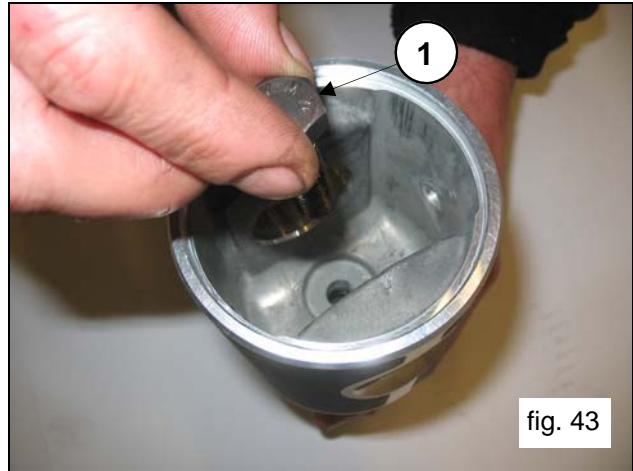


fig. 43

Lock in the rod in correspondence with the two planes with a 36 fork spanner (pos.①, fig.44) and proceed with calibration with a torque wrench (pos.①, fig.45) as indicated in paragraph 3 “Screw tightening calibration”.

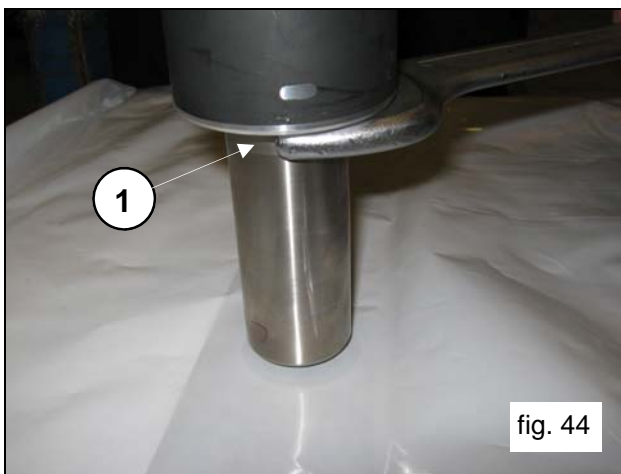


fig. 44

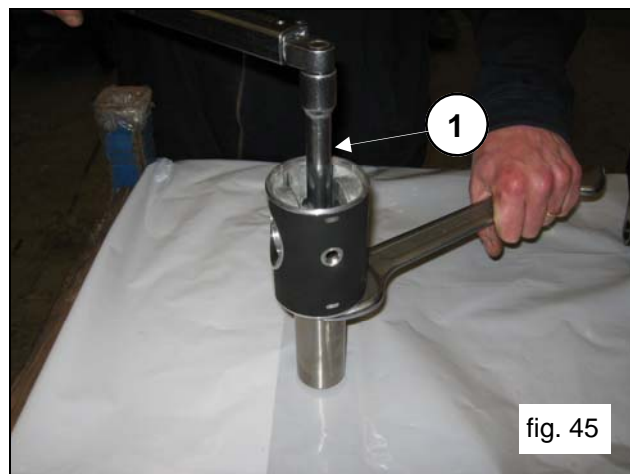


fig. 45

Insert the con-rod in the piston guide (pos.①, fig.39) and then insert the spindle (pos.①, fig.38). Apply the two shoulder Seeger rings (pos.①, fig.37).



Assembly has been carried out properly if the con-rod foot, piston guide and spindle rotate freely

Separate the caps from the half supports. Proper coupling can be verified by the numbering on the side (pos.①, fig.40).

After having checked casing cleaning, proceed with assembly of half support-piston guide unit inside casing rods (pos.①, fig.33).



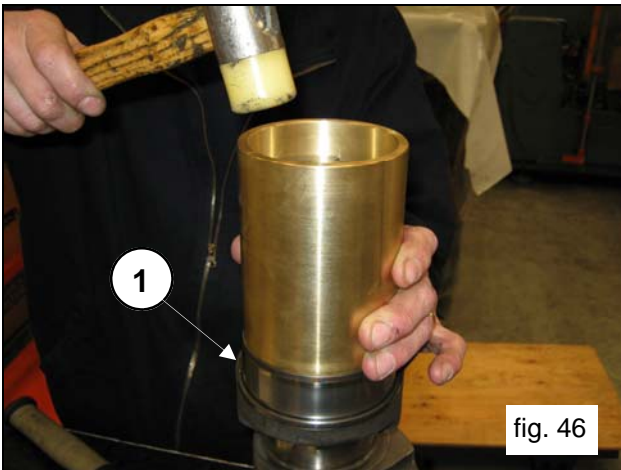
Insertion of the half support-piston guide unit in the casing must be made with the half bearings set in the direction in which numbers are visible from above

Block the three units with the use of special tool code 27566200 (pos.①, fig.32).

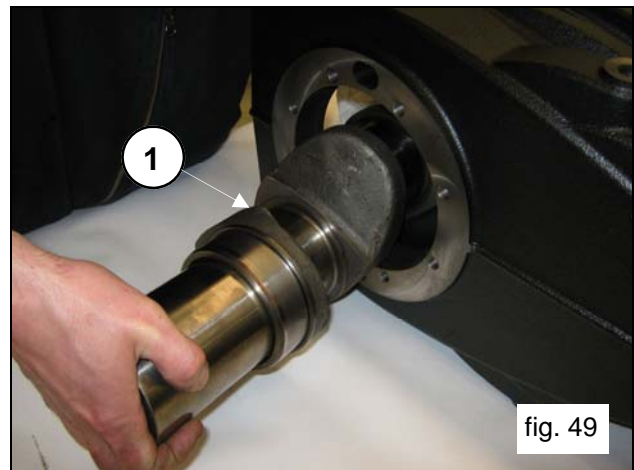
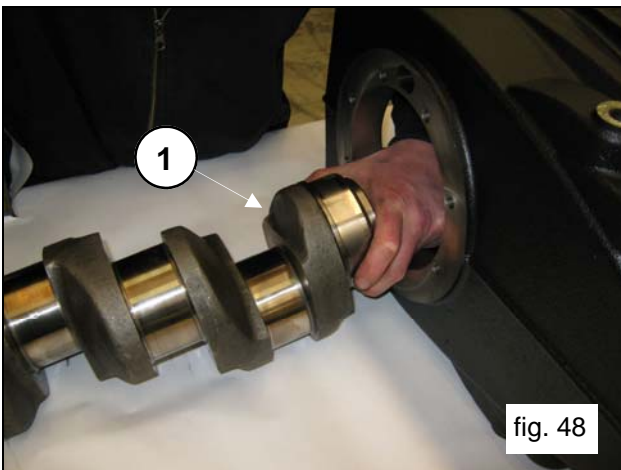
Pre-assemble the ring inside the bend shaft bearings (on both sides of the shaft down to the stroke) using special tool code 27604700 (pos.①, fig.46) (pos.①, fig.47).



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

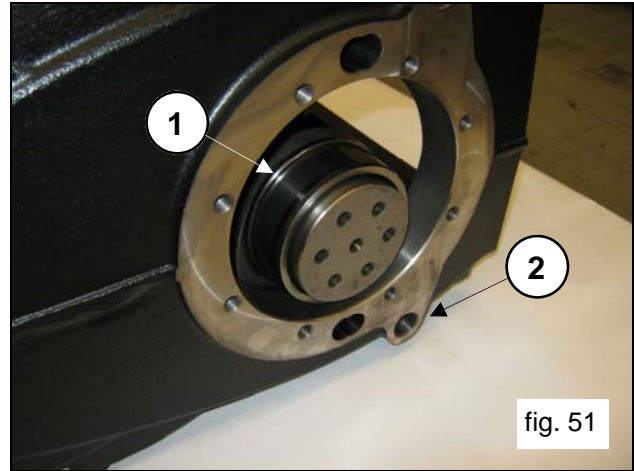
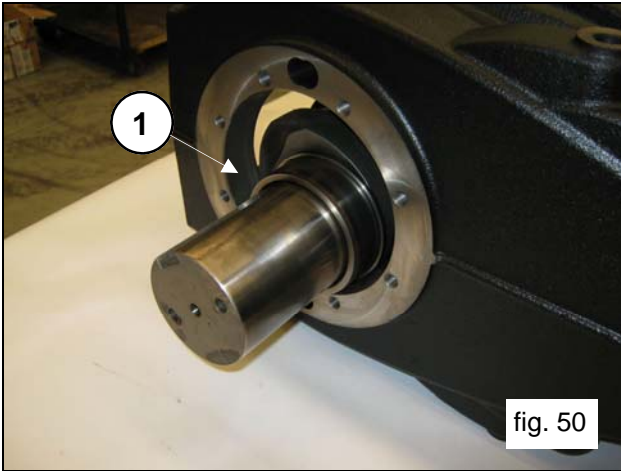


Insert the shaft from the PTO side, taking care not to hit the previously assembled con-rod shanks (pos.①, fig.48) and (pos.①, fig.49).

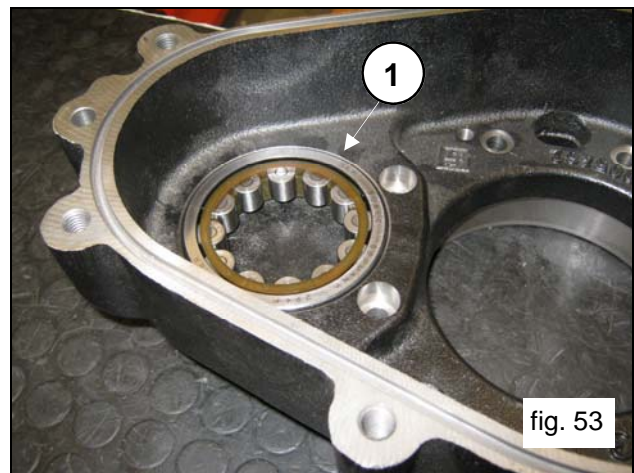
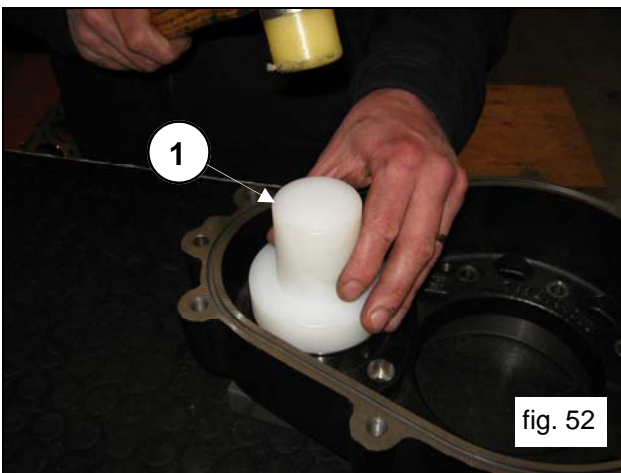


The bend shaft must always be assembled with the PTO on the opposite side with respect to the G1/2" holes for the oil discharge plugs on the pump casing (pos.②, fig.51).

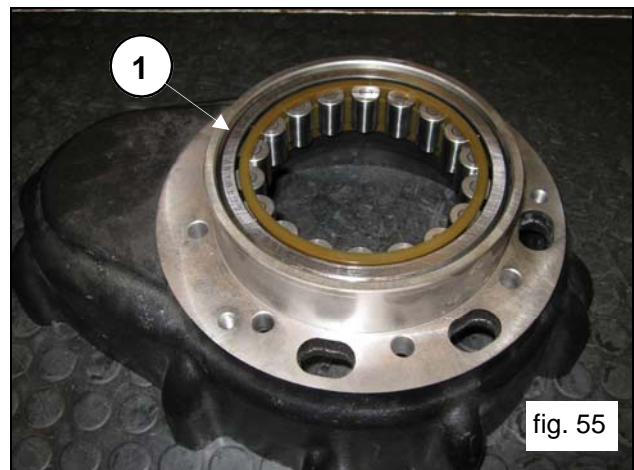
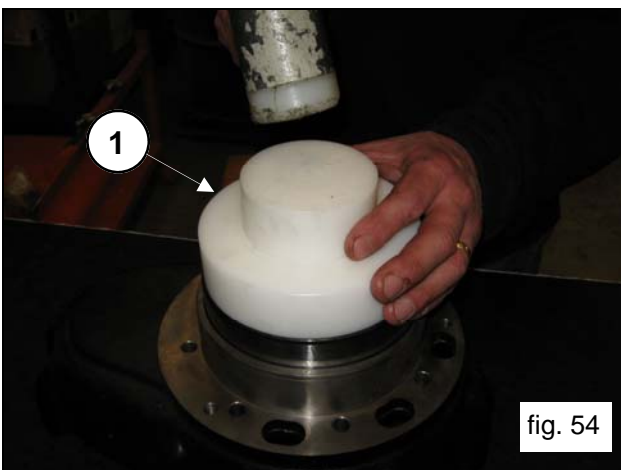
Fully insert the shaft in the casing (pos. ①, fig.50 and fig.51)



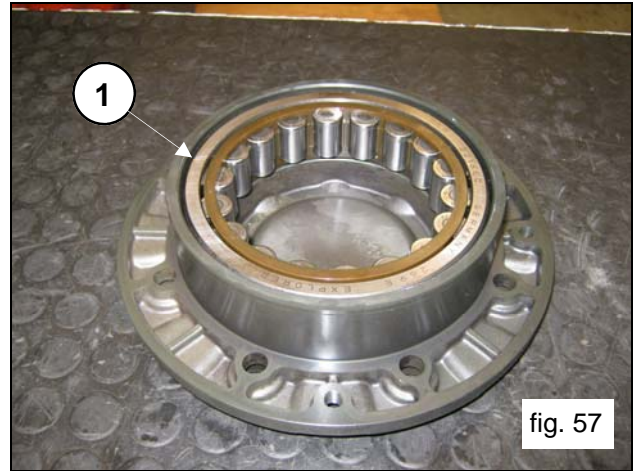
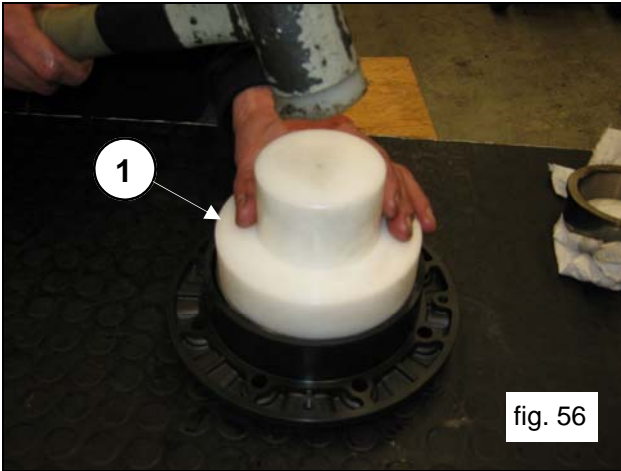
Pre-assemble the outer ring of the pinion bearing on the reduction gear with the aid of special tool code 27604900 (pos. ①, fig.52), inserting fully down to end stroke (pos. ①, fig.53)



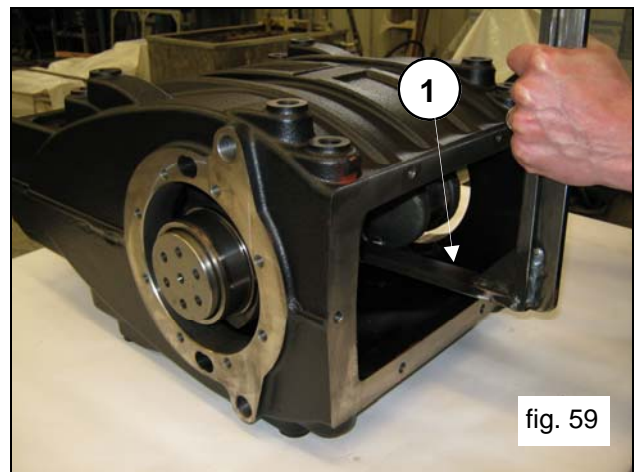
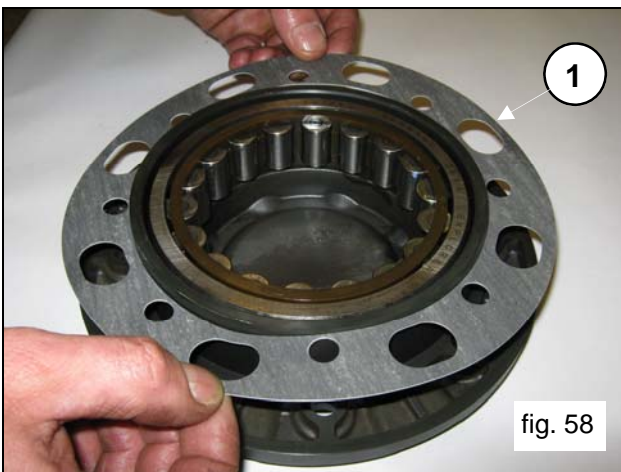
From the opposite side of the reduction gear box, pre-assemble the external ring of the bend shaft bearing with the use tool code 27605000 (pos. ①, fig.54), inserting fully down to end stroke (pos. ①, fig.55)



Repeat this operation on the bearing box, pre-assembling the external bend shaft bearing ring with the help of special tool code 27605000 (pos. ①, fig.56), inserting fully down to end stroke (pos. ①, fig.57)



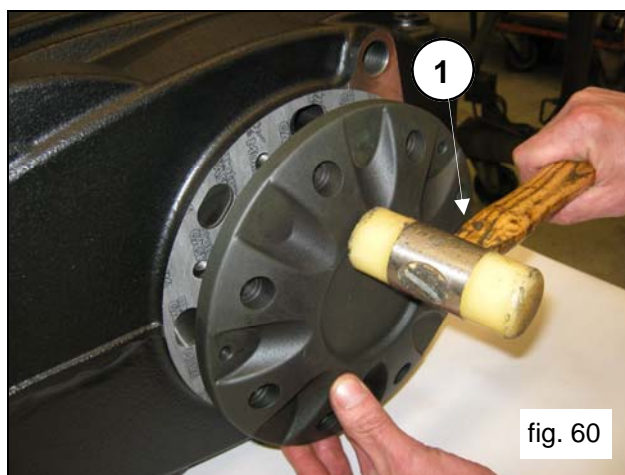
Insert the side seal on the bearing cover (pos. ①, fig.58) and lift the bend shaft to favour cover insertion (pos. ①, fig.59).



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

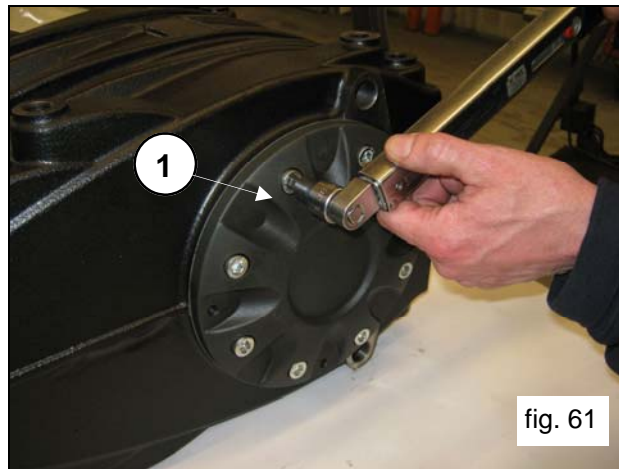


Position the bearing cover in such a way that the "Pratissoli" logo is perfectly horizontal

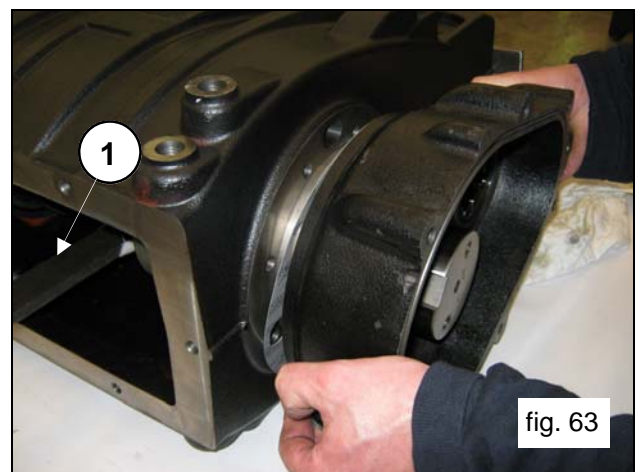
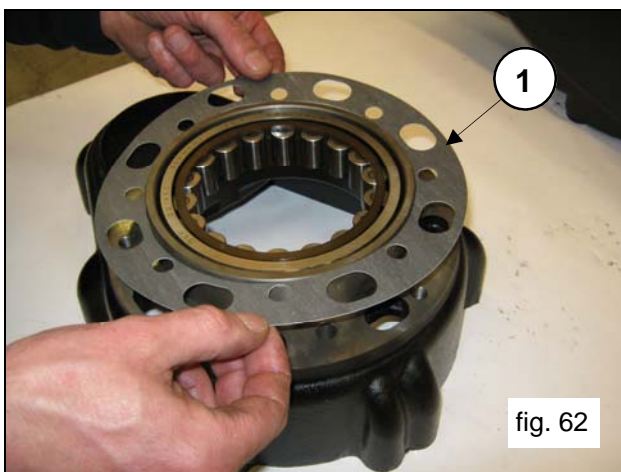


Tighten the 8 M10x30 screws (pos.①, fig.61).

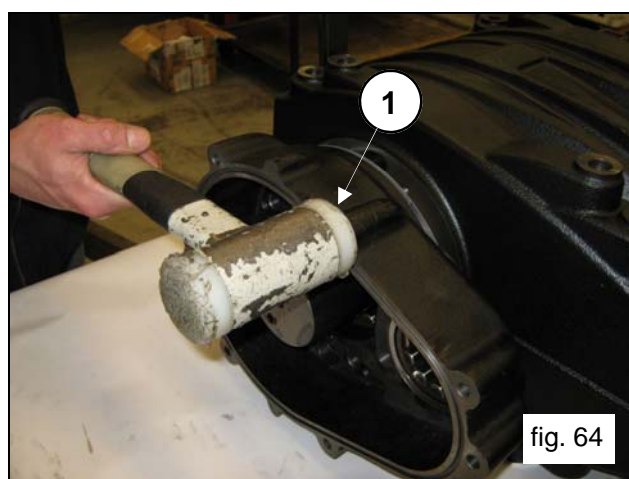
Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".



From the opposite side, insert the side seal on the reduction gear box (pos.①, fig.62) and lift the bend shaft to favour cover insertion (pos.①, fig.63).



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



Tighten the 8 M10x40 screws (pos.①, fig.56).

Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

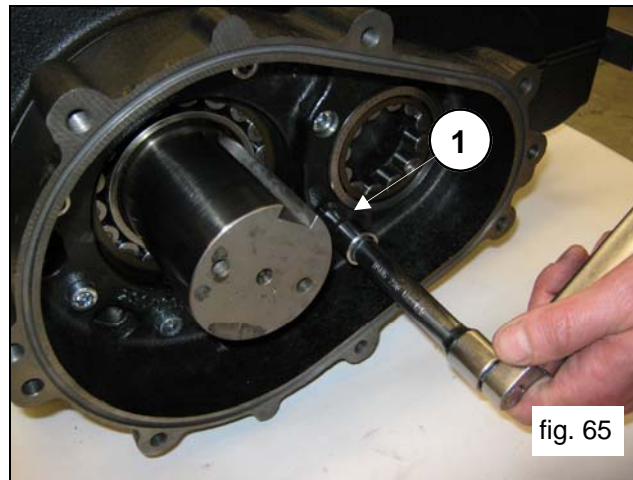


fig. 65

Remove the tool for blocking the con-rods code 27566200 (pos.①, fig.32).

Insert the upper half-bearings between the con-rods and the shaft (pos.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 (pos.①,fig.67).

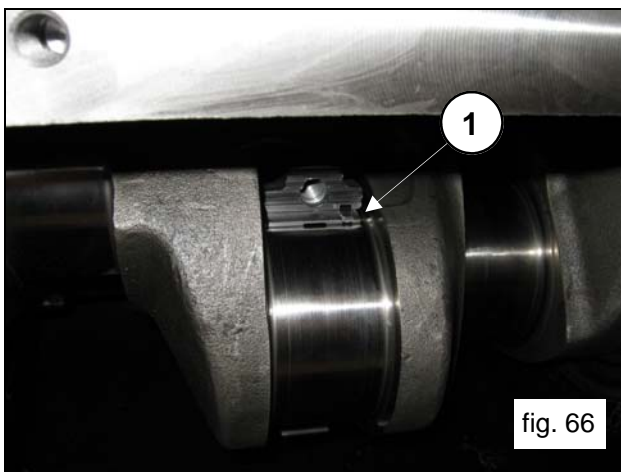


fig. 66

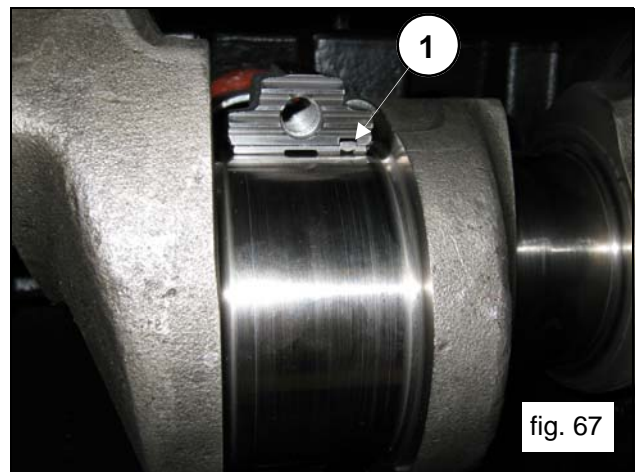


fig. 67

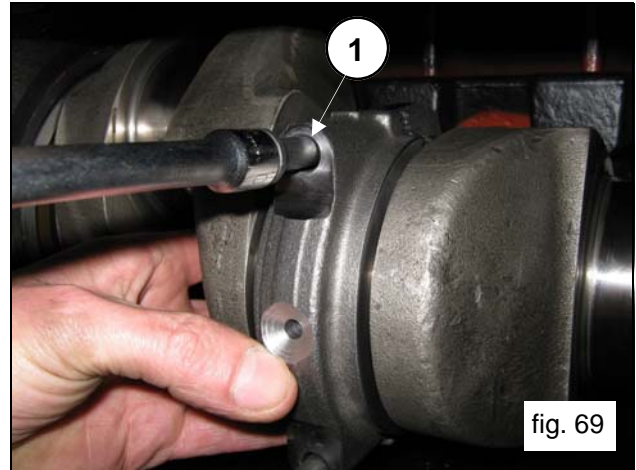
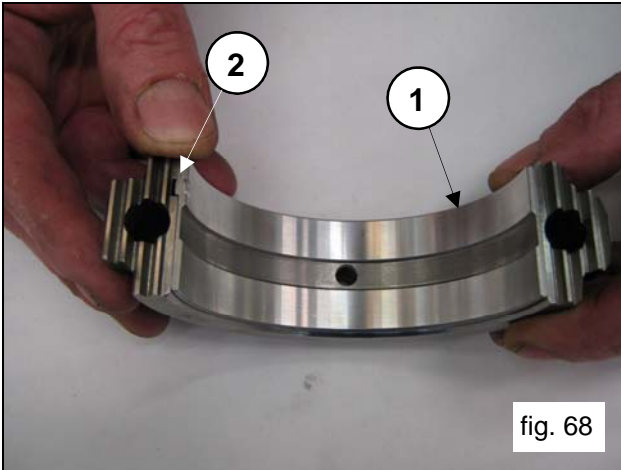
Apply the lower half-bearings to the caps(pos.①, fig.68) ensuring that the half-bearing reference notches are positioned in their housing on the cap (pos.②, fig.68).

Fasten the caps to the half supports by means of M10x1.5x80 screws (pos.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 paragraph 3 "Screw tightening calibration", bringing the screws to tightening torque at the same time.

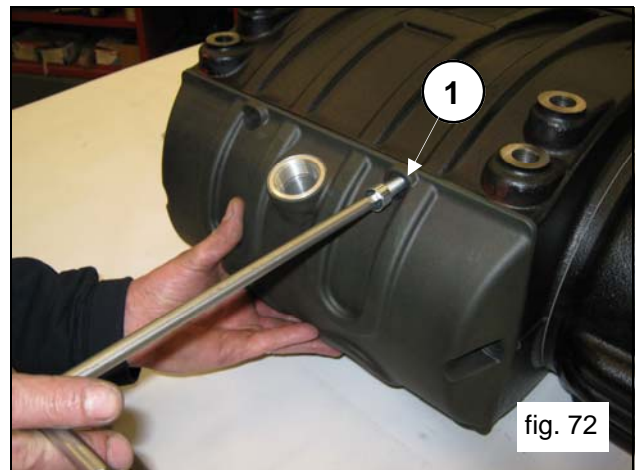


After finishing this operation, verify that the con-rods have axial clearance in both directions.

Insert the piston guide seal rings in their casing housing by means of a special tool code 27605300 (pos. ①, fig.70).



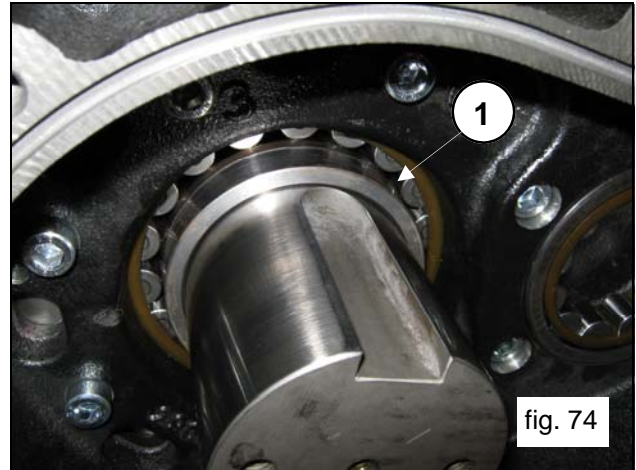
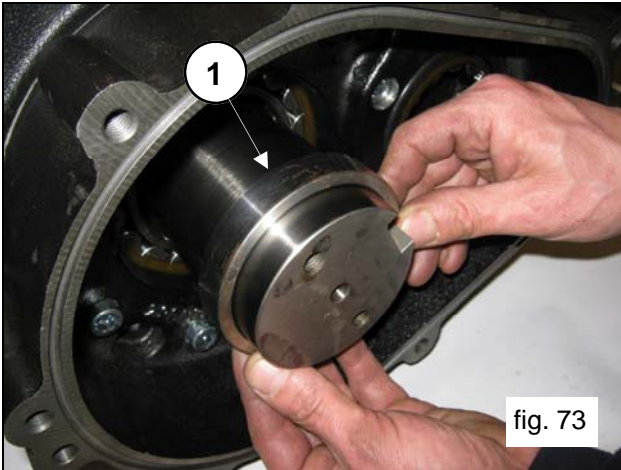
Insert the O-ring on the rear cover (pos. ①, fig.71) and assemble the cover on the casing with the aid of 6 M10x30 screws (pos. ①, fig.72).



 **Take care to fully and properly insert the O-ring in its housing on the cover to prevent these can become damaged during screw tightening**

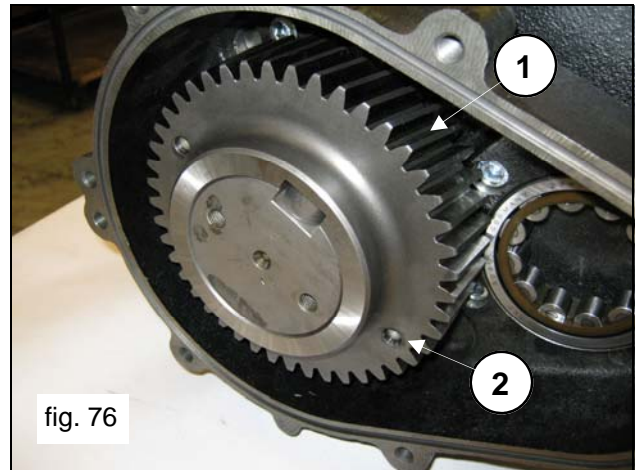
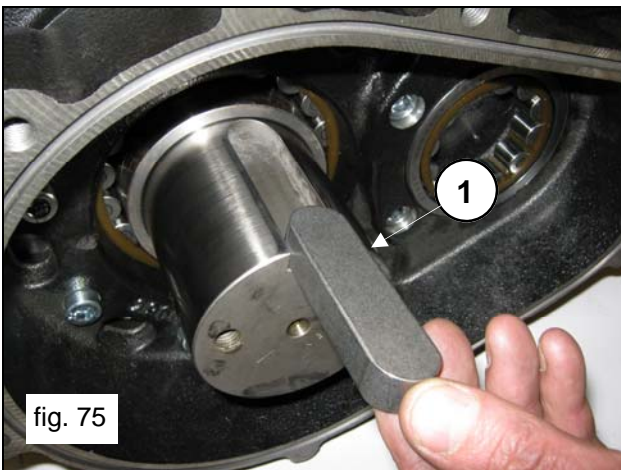
Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

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

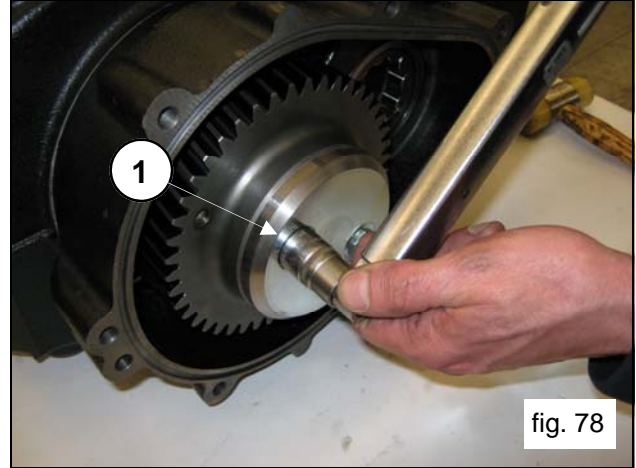
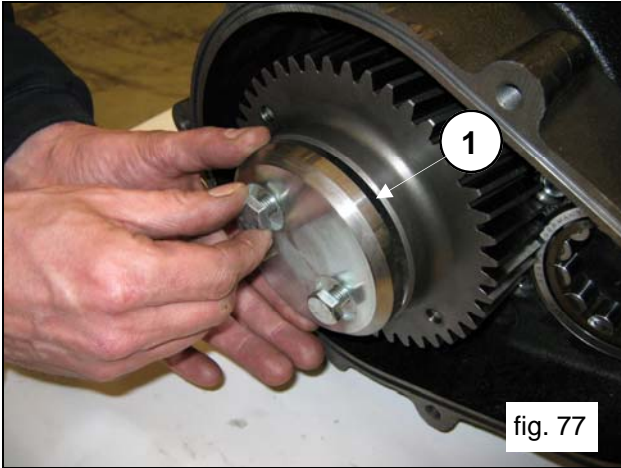


Apply tab 22x14x80 in the shaft housing (pos. ①, fig.75) and insert the ring gear on the shaft (pos. ①, fig.76).

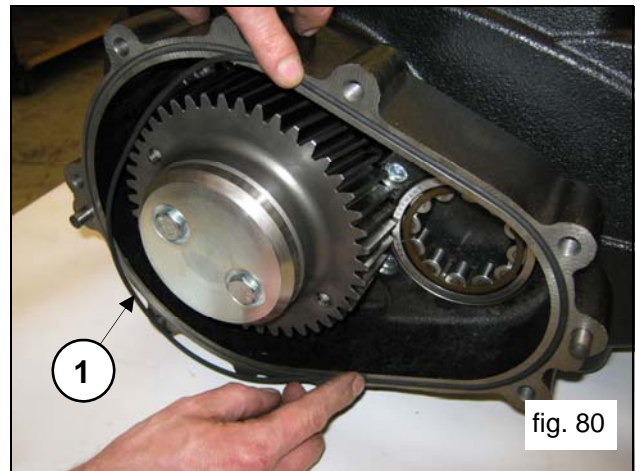
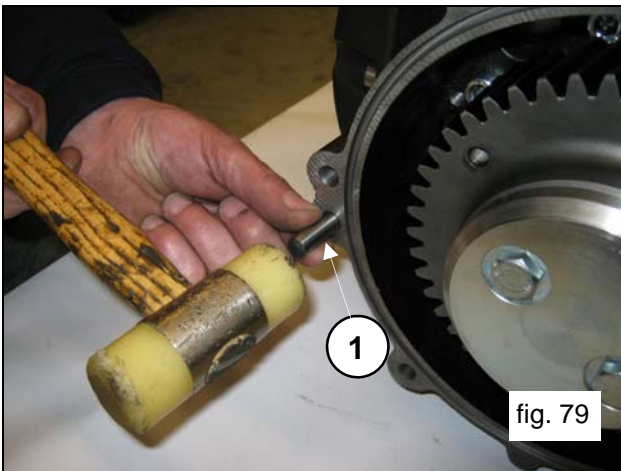
 **The ring gear must be assembled making sure that the two M8 holes (to be used for extraction) be turned outward of the pump (pos. ②, fig.76).**



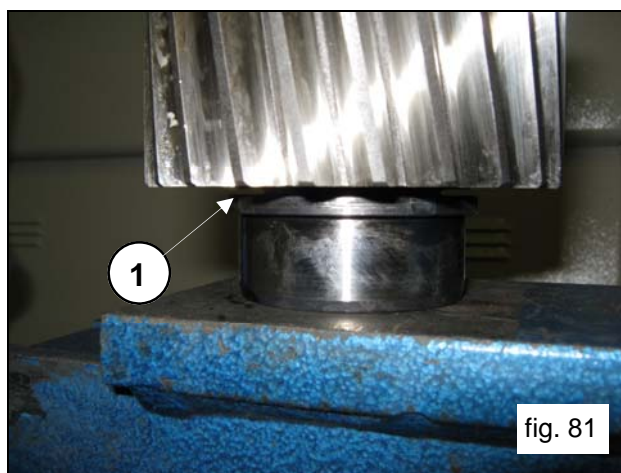
Fasten the ring gear stop (pos.①, fig.77) using 2 M10x25 screws.
 Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration" (pos.①, fig.78).



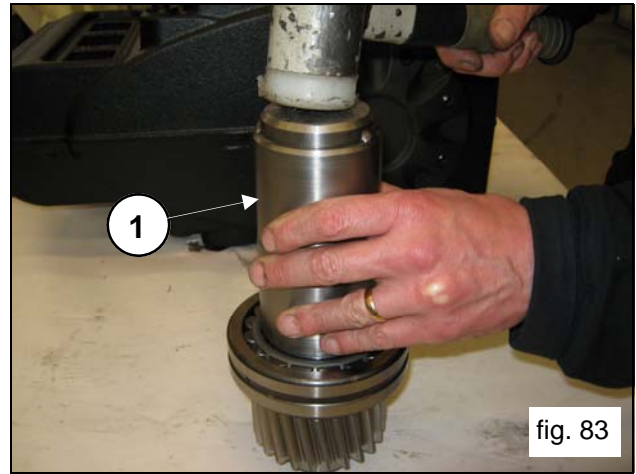
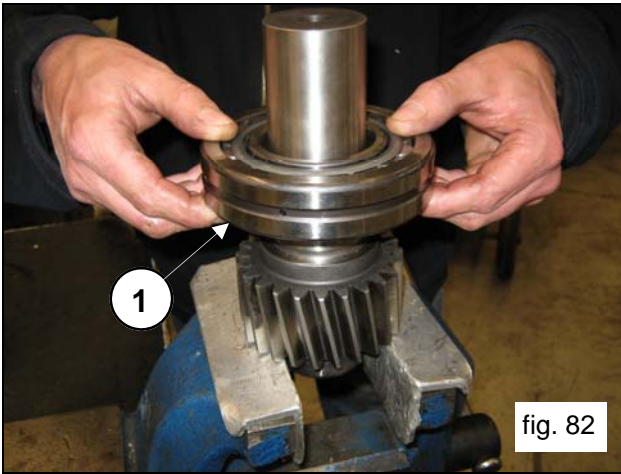
Apply the two Ø10x24 pins on the reduction gear box (pos.①, fig.79) and insert the O-ring (pos.①, fig.80).



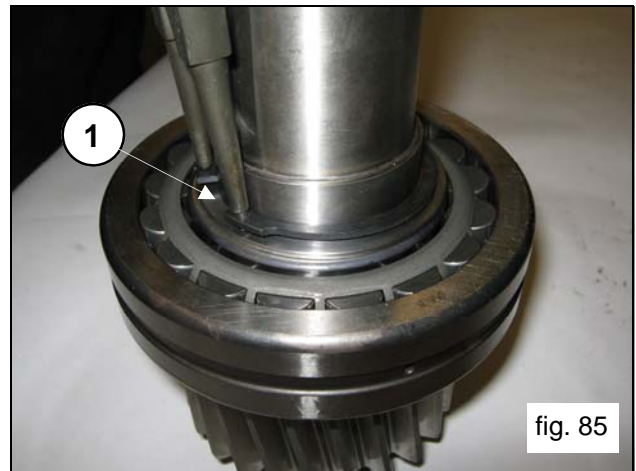
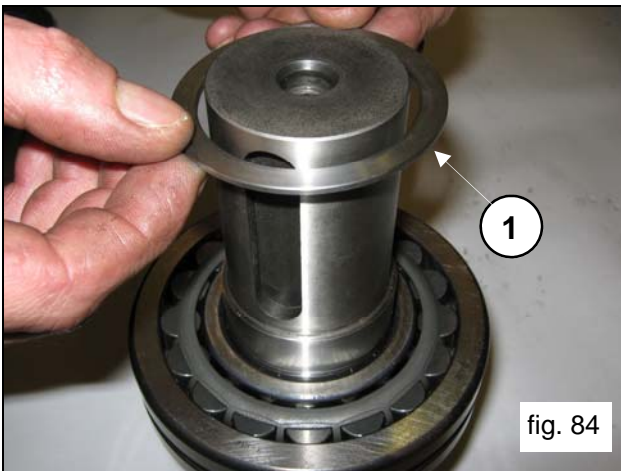
Complete assembly of the pinion on the reduction gear cover, proceeding as follows:
 Pre-assemble the inner bearing ring 40x90x23 on the pinion (pos.①, fig.81) positioning it to end stroke.



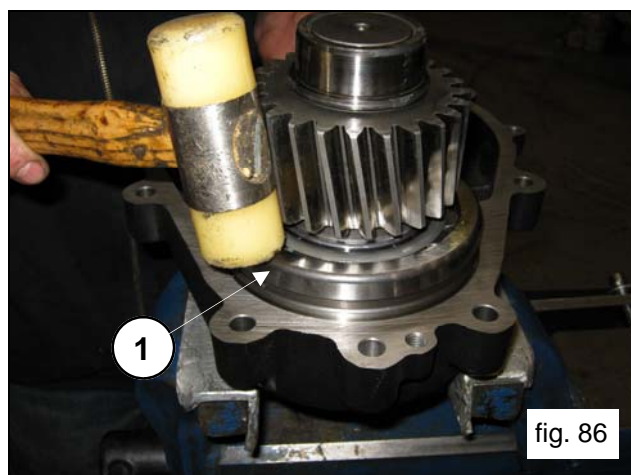
From the other side of the pinion, pre-assemble the bearing 55x120x29 (pos. ①, fig.82) positioning it to end stroke using tool code 27604800 (pos. ①, fig.83).



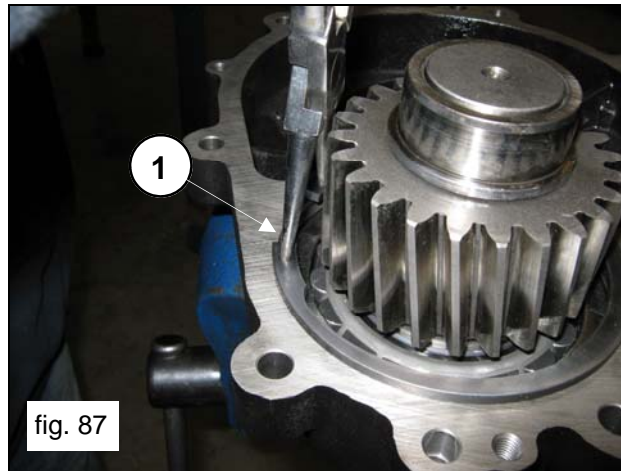
Insert the bearing support ring (pos. ①, fig.84) and position the Seeger ring Ø55 (pos. ①, fig.85)



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



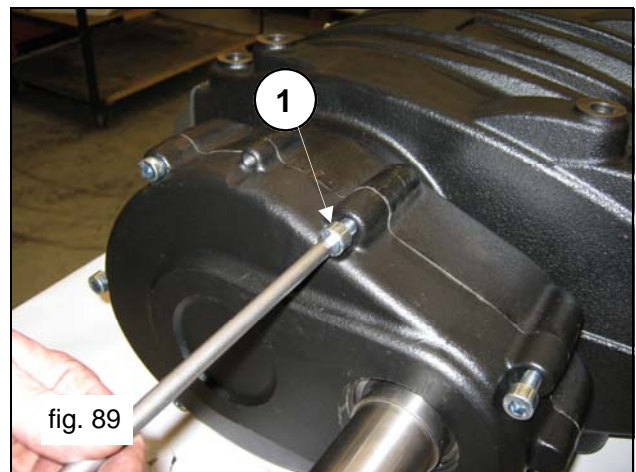
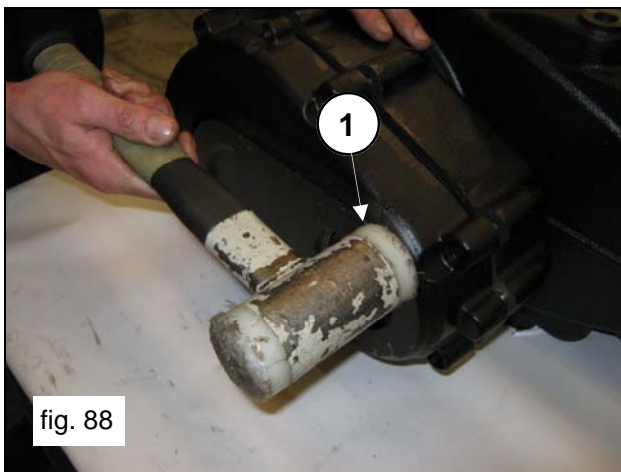
Insert the Seeger ring Ø120 in the housing (pos.①, fig.87)



Assemble the reduction gear cover with the aid of an extractor hammer (pos.①, fig.88) and fasten them with 7 M10x40 screws (pos.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 paragraph 3 "Screw tightening calibration".

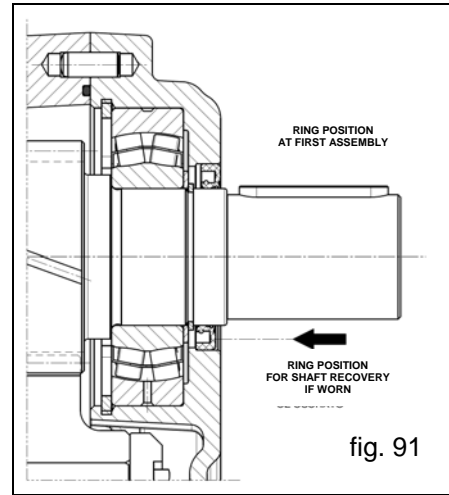


Insert the seal ring inside the reduction gear cover with the use of special tool code 27605200 (pos.①, fig.90).

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.

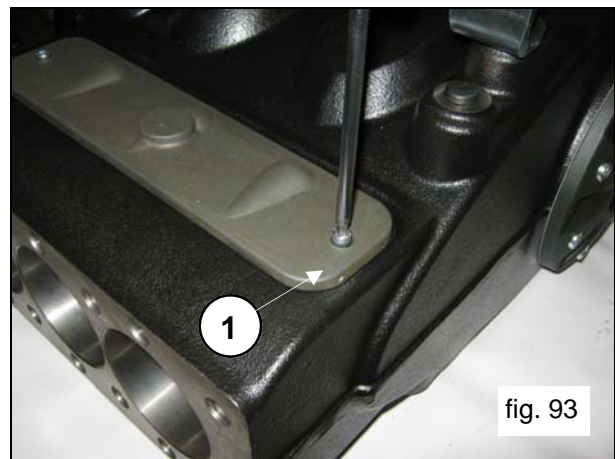
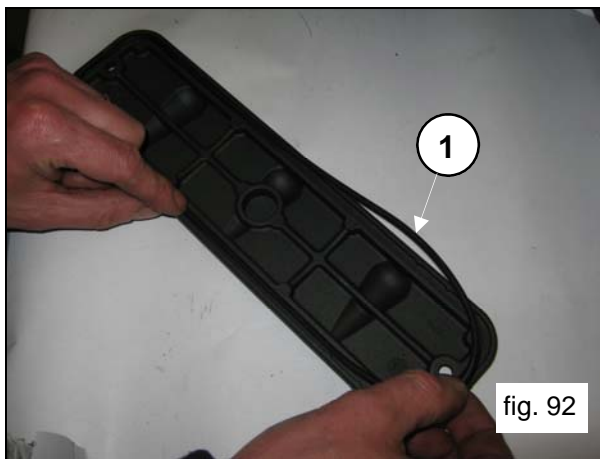


If the shaft should present a diameter wear corresponding to the lip seal, to prevent grinding, position the ring in the second stroke as indicated in fig. 91.

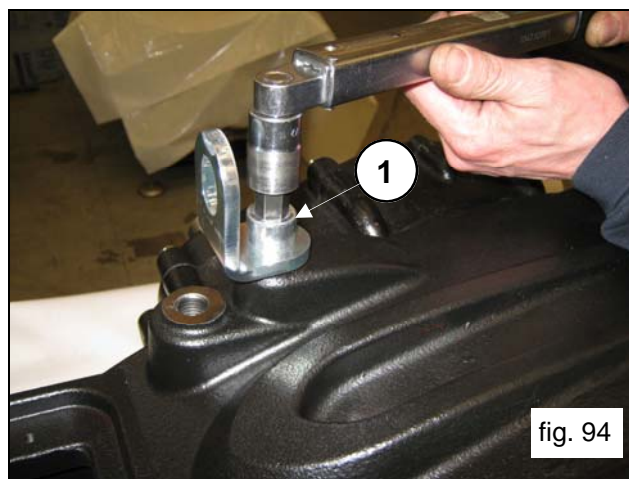


⚠ To prevent damage to the seal ring, take special care when inserting the seal ring on the pinion

Apply O-rings on the inspection covers (pos. ①, fig.92) and tighten with 2+2 M6x14 screws (pos. ①, fig.93). Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".



Insert the tab 14x9x60 on the pinion.
Apply plugs and lifting brackets with the use of M16x30 screws (pos. ①, fig.94).
Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".



Insert oil in the casing as indicated in the use and maintenance manual point 7.4.

2.1.3 Increase and reduction classes

TABLE OF REDUCTIONS FOR BEND SHAFTS AND CON-ROD HALF-BEARINGS			
Recovery classes (mm)	Code Half-bearing Upper	Code Half-bearing Lower	Correction on the shaft pin diameter (mm)
0.25	90928100	90928400	Ø79.75 0/-0.02 Ra 0.4 Rt 3.5
0.50	90928200	90928500	Ø79.50 0/-0.02 Ra 0.4 Rt 3.5

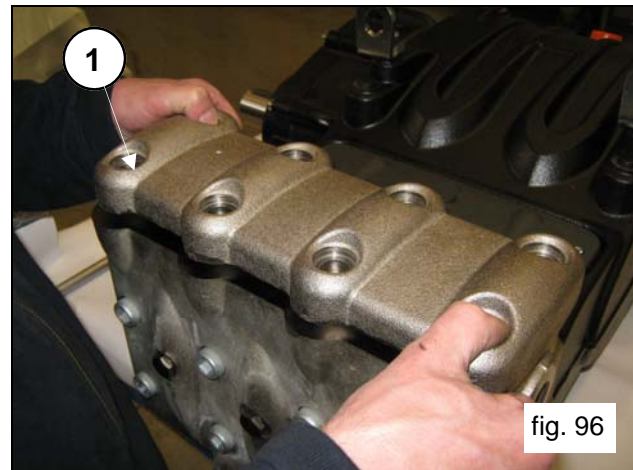
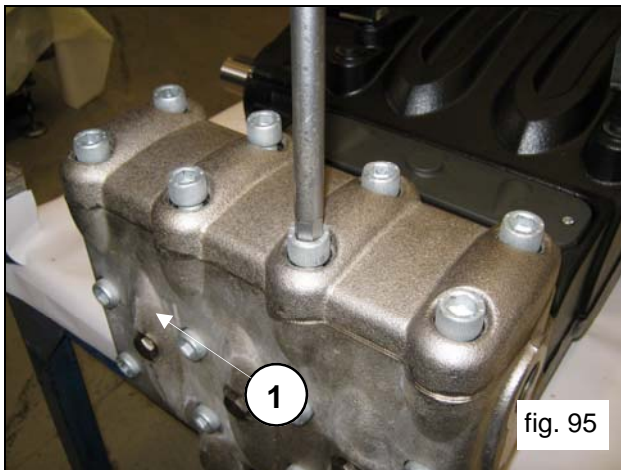
INCREASE TABLE FOR PUMP CASING AND PISTON GUIDE		
Recovery classes (mm)	Code Piston Guide	Adjustments on the Pump Casing housing (mm)
1.00	73050243	Ø71 H6 +0.019/0 Ra 0.8 Rt 6

2.2 Repairing hydraulic parts

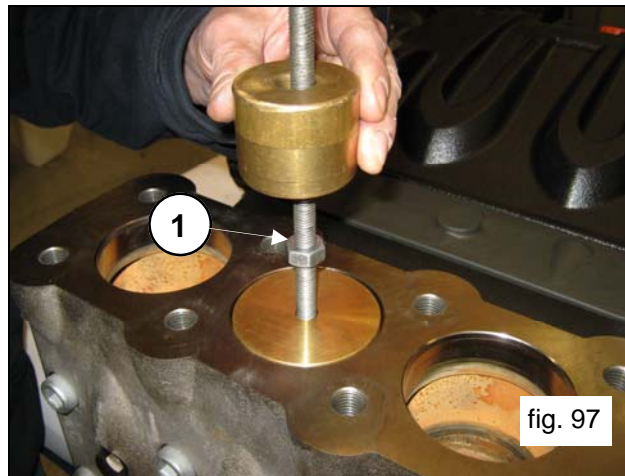
2.2.1 Dismantling the MW32 MW36 MW40 head – valve units

The head requires preventive maintenance as indicated in the use and maintenance manual. Operations are limited to inspection or replacement of valves, if necessary. Proceed as follows to extract valve groups:

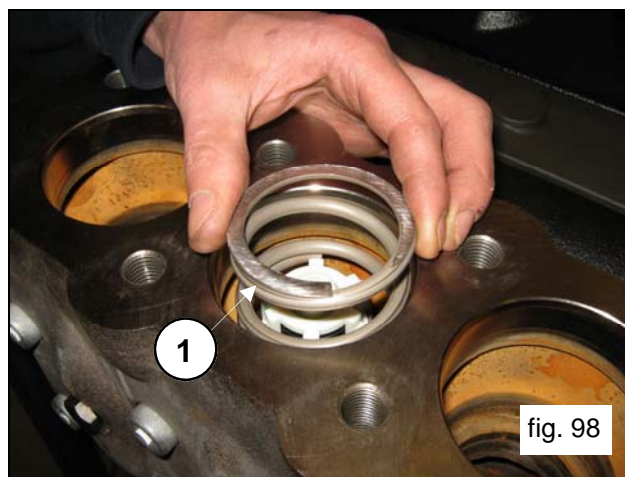
Unscrew the 8 M16x55 screws of the valve cover (pos.①, fig.95) and remove the cover (pos.①, fig.96).



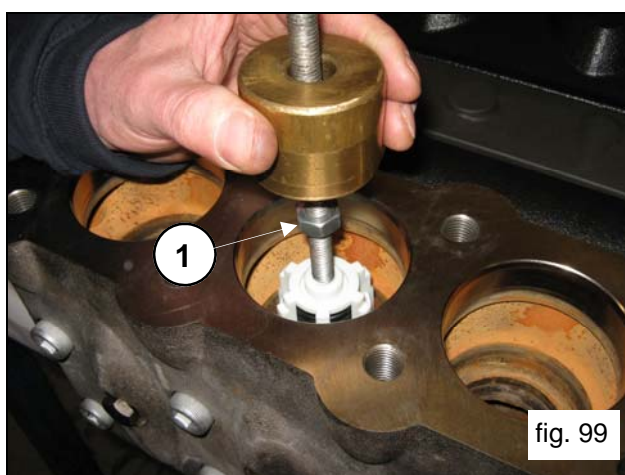
Extract the valve plug with the use of an extractor hammer to be applied on the M10 hole of the valve plug (pos.①, fig.97).



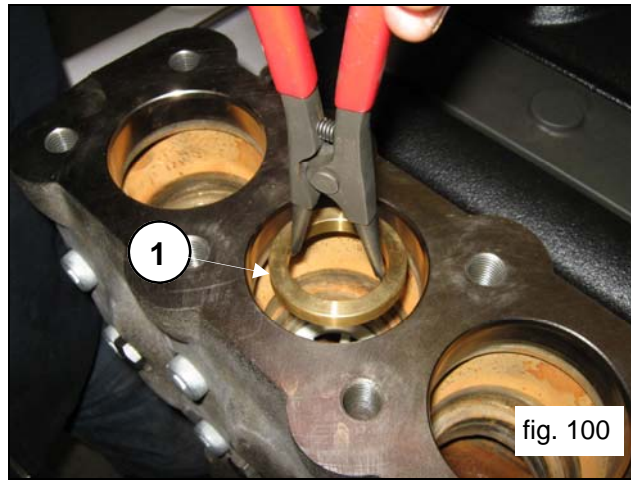
Remove the spring (pos.①, fig.98).



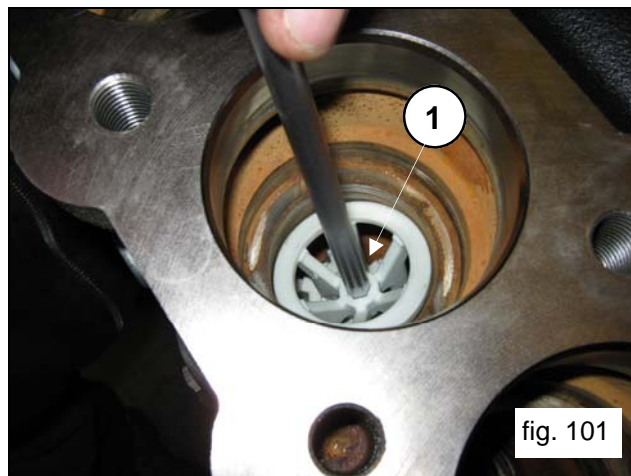
Extract the outlet valve unit with the use of an extractor hammer (code 27516400) to be applied on the M10 hole of the valve guide (pos.①, fig.99).



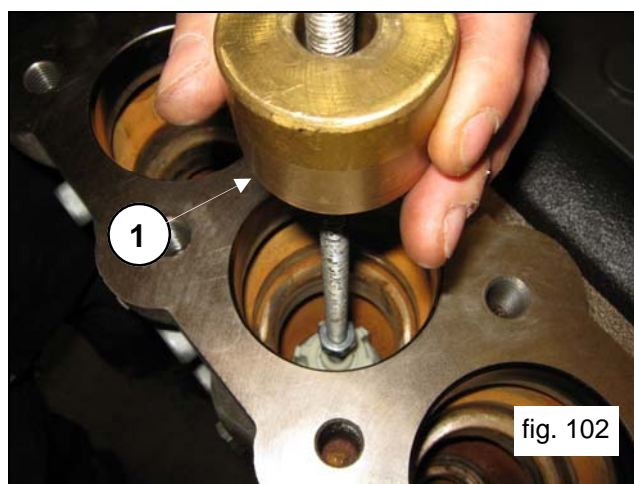
Remove the valve housing spacer ring (pos.①, fig.100)



Remove the valve guide spacer inserting a 8mm hexagon spanner in the housing and lifting it to facilitate removal (pos.①, fig.101)

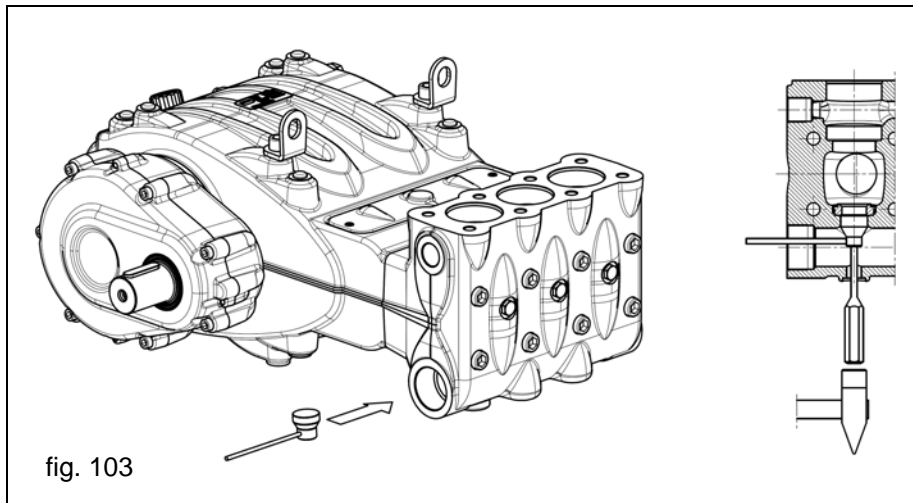


Extract the suction valve unit with the use of an extractor hammer (code 27516400) to be applied on the M10 hole of the valve guide (pos.①, fig.102).

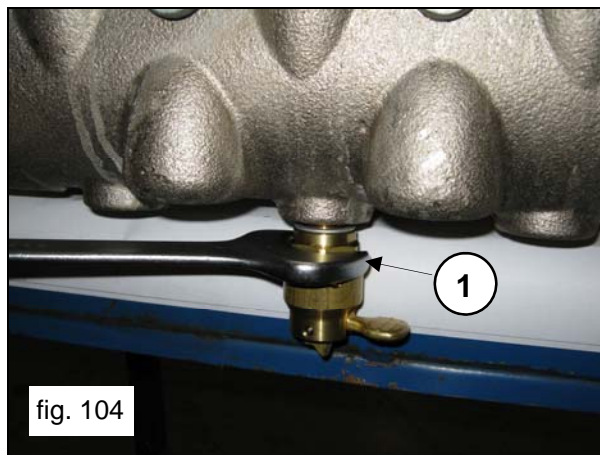




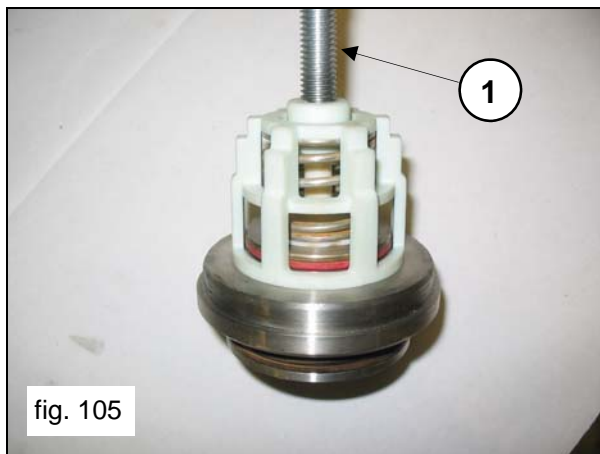
Where extraction of the suction valve unit is especially difficult (i.e. incrustations due to prolonged lack of use of the pump), use an extractor tool code 27516200 (pos.①, fig.103) as indicated.



Unscrew the valve opening device by means of a 30 mm spanner (pos.①, fig.104).



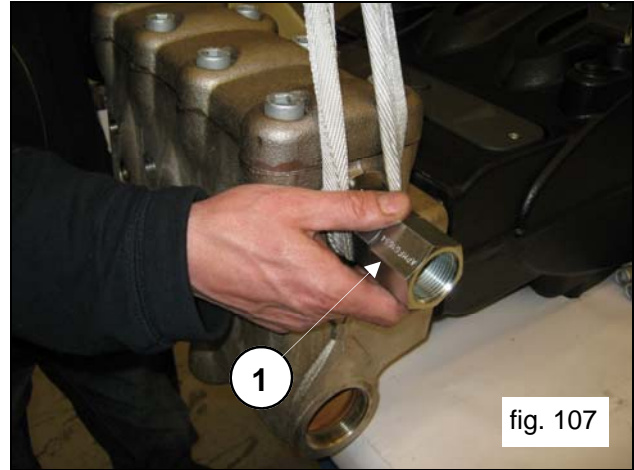
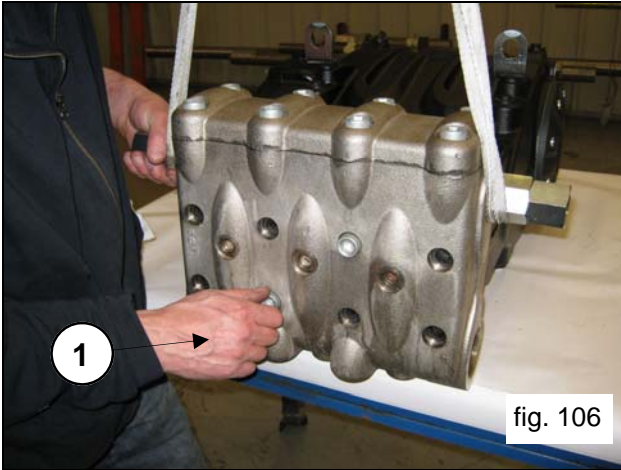
Remove the suction and outlet valve units, unscrewing an M10 screw in such a way to press on the inner guide and remove the valve guide from the valve housing (pos.①, fig.105).



Complete disassembly removing the G1/4" plugs on the front of the head.

It is now possible to remove the head from the pump casing, unscrewing the 8 M16x180 screws (pos. ①, fig.106).

During disassembly of the head, pay special attention not to hit the pistons (pos. ①, fig.107).



2.2.1 Dismantling the MW32 MW36 MW40 – valve units

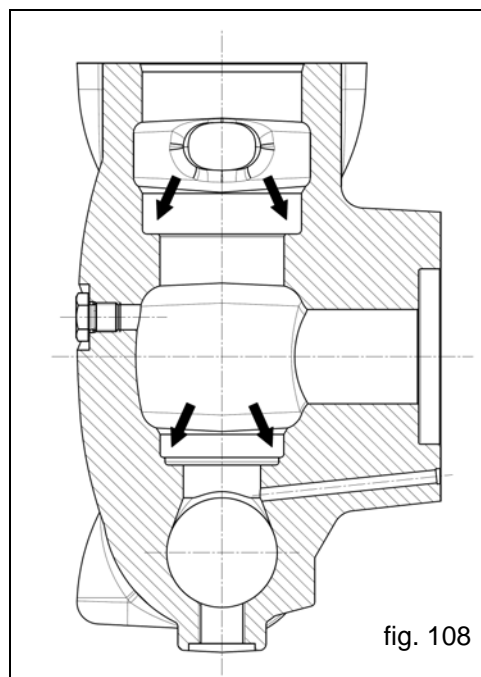


Pay particular attention to the conditions of the various components and replace if necessary.

At every valve inspection, replace all OR rings and both in the valve unit and in the valve plugs.



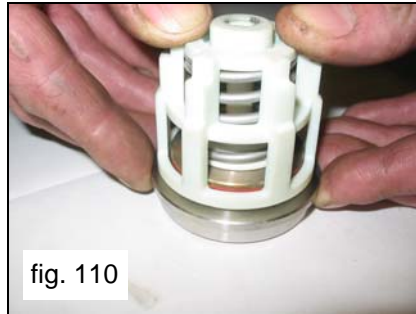
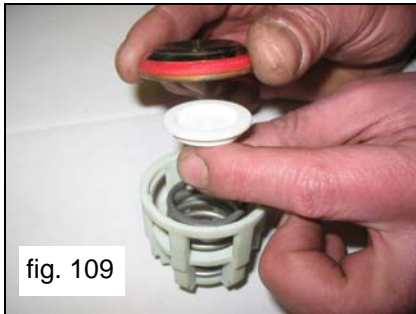
Before repositioning the valve unit, thoroughly clean and dry the relative housings on the head indicated by the arrows (pos. ①, fig.108).



Proceed with reassembly following the reverse order indicated in point 2.2.1.

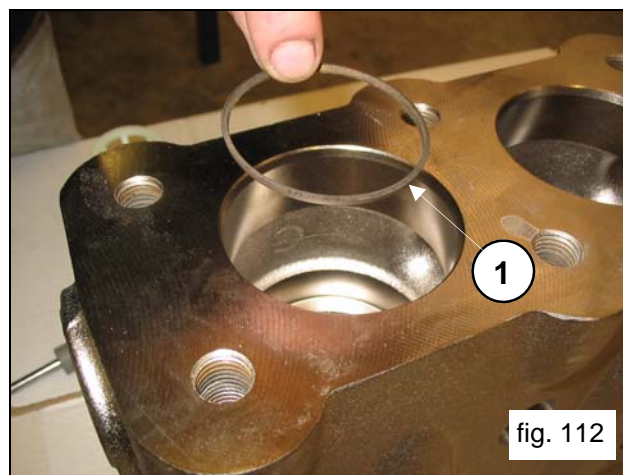
Assemble the suction and outlet valve units (fig.109 and fig.110), taking care not to invert the previously disassembled springs.

To facilitate insertion of the valve guide in its housing, you can use a pipe resting on the horizontal guide planes (fig.111) and use an extractor hammer acting on the whole circumference.

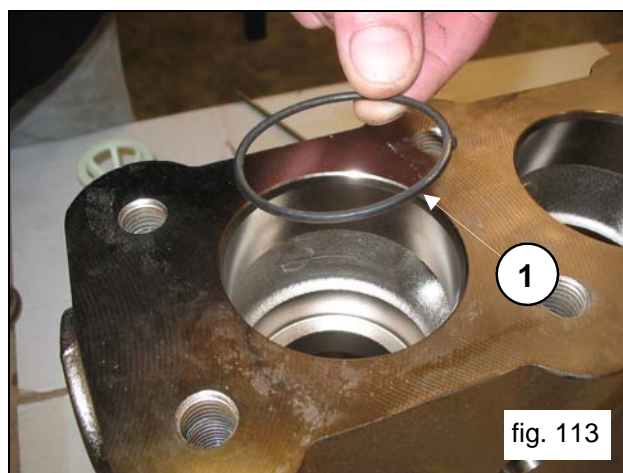


⚠ Proceed with insertion of the valve units (suction and outlet) in the head, taking care to follow the correct insertion sequence of O-rings and anti-extrusion rings.

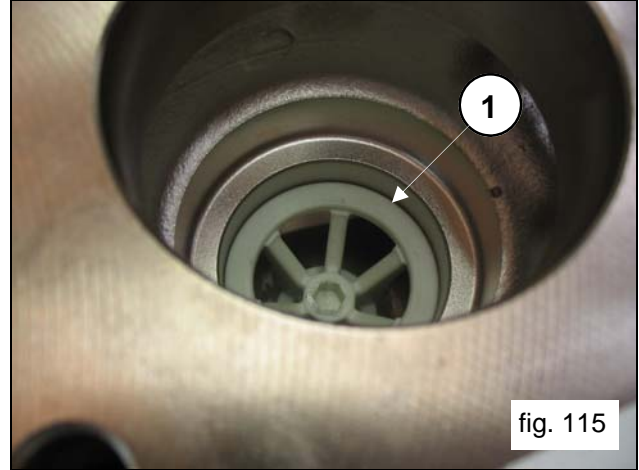
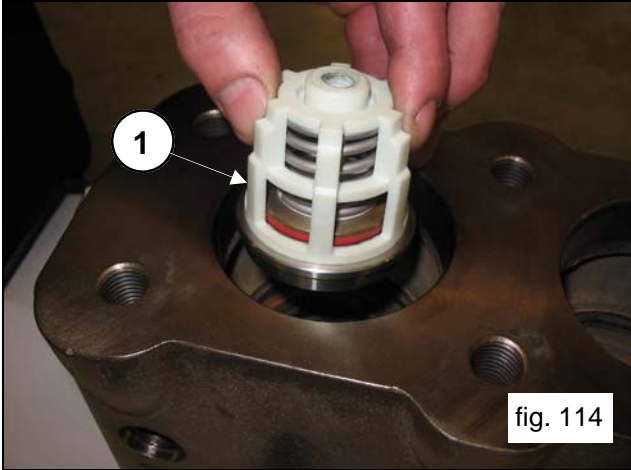
The proper sequence of valve unit assembly on the head is as follows:
Insert the anti-extrusion ring, explod. posit. 5 (pos. ①, fig.112).



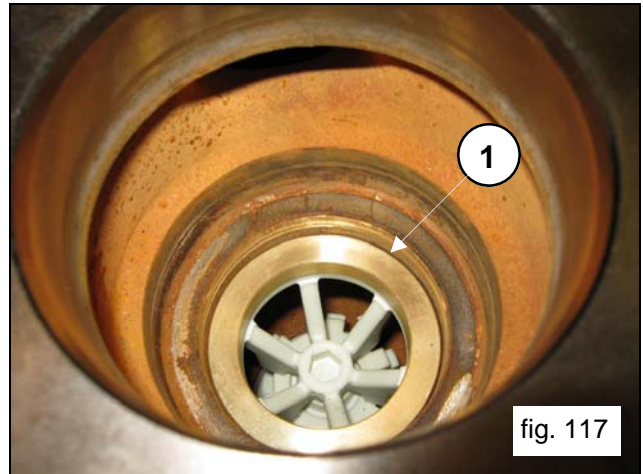
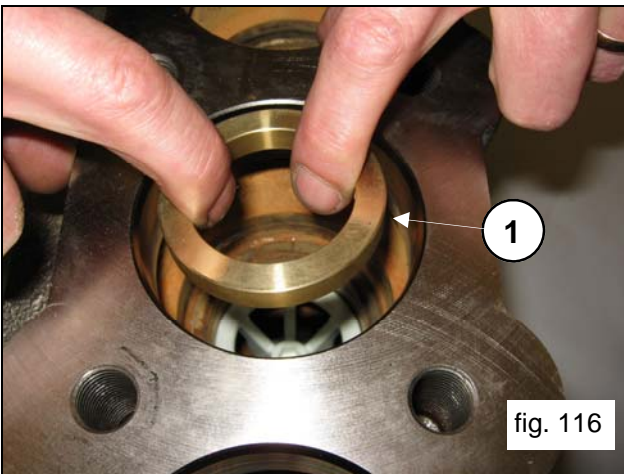
Insert the O-ring, explod. posit. 6 (pos. ①, fig.113).



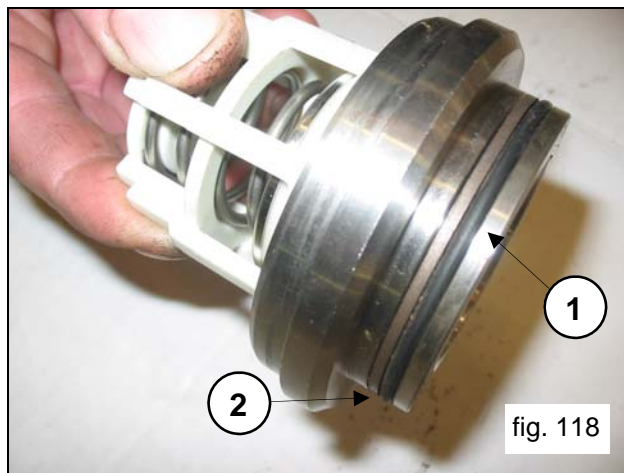
Ensure that the O-ring and anti-extrusion ring are perfectly placed in their housings.
 Insert the suction valve unit (pos. ①, fig.114) and then the spacer (pos. ①, fig.115).
 The complete valve unit must be fully inserted into the bottom and should look like the image in pos. ①, fig.115.



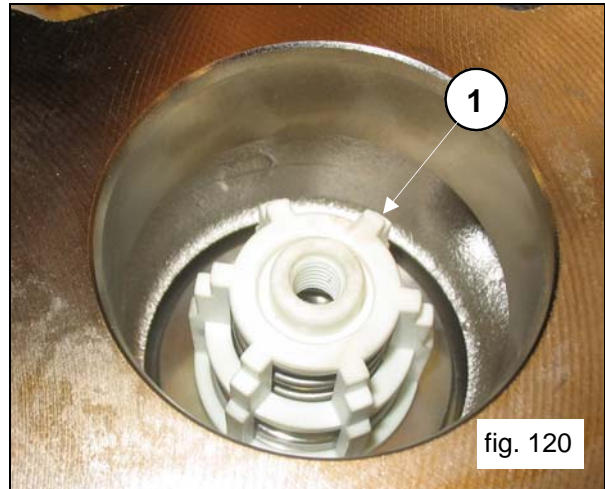
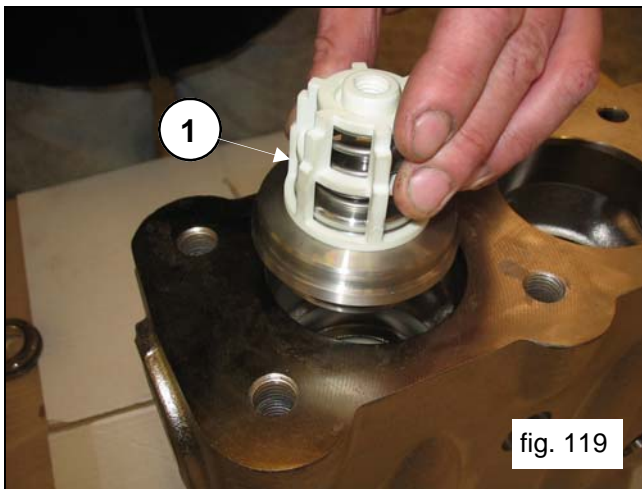
Insert the valve housing spacer ring (pos. ①, fig.116), resting on the spacer (pos. ①, fig.117)



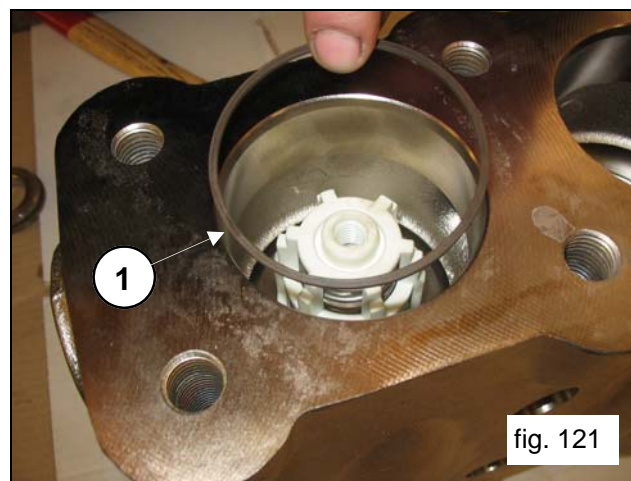
Assemble the O-ring, explod. posit. 6 (pos. ①, fig.118) and the anti-extrusion ring, explod. posit. 16 (pos. ②, fig.118) on the outlet valve housing.



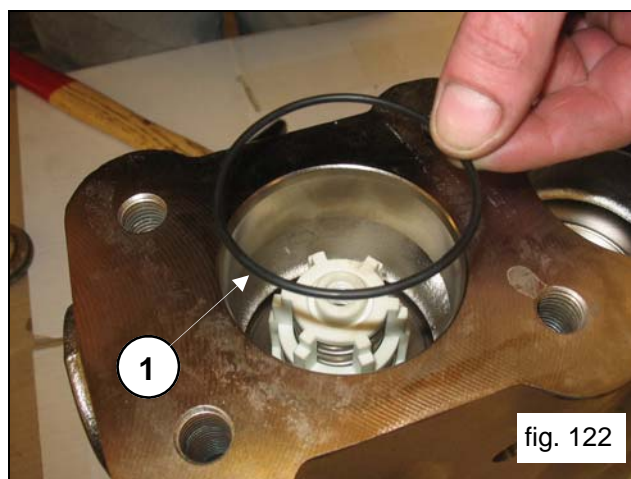
Insert the outlet valve unit (pos. ①, fig.119). The valve unit must be fully inserted into the bottom and should look like the image in pos. ①, fig.120.



Insert the anti-extrusion ring, explod. posit. 18 (pos. ①, fig.121).

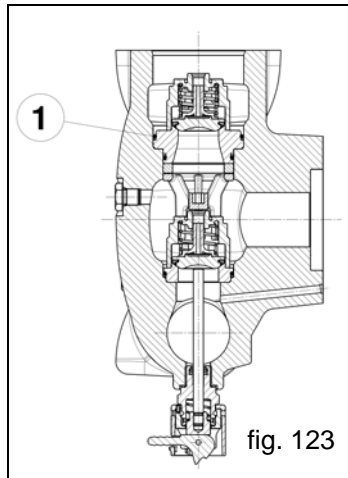


Insert the O-ring, explod. posit. 19 (pos. ①, fig.122).

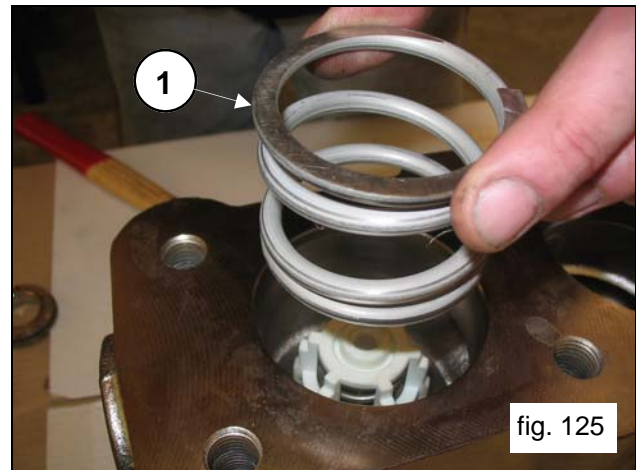
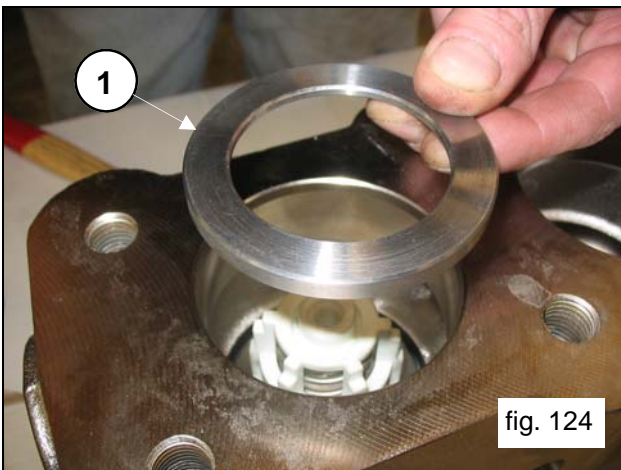




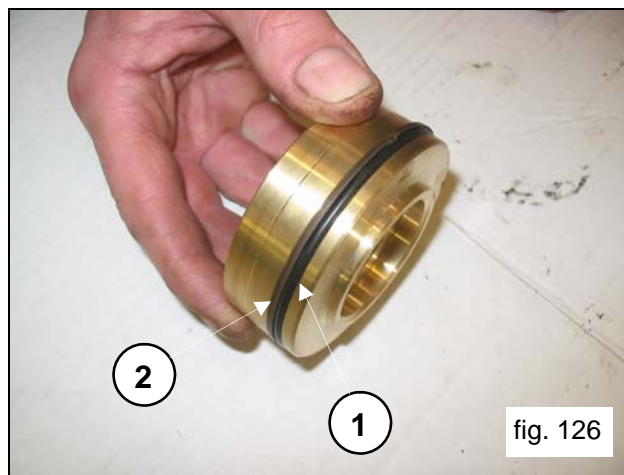
Pay special attention to O-ring insertion in pos. ①, fig.123.
Use a special tool code 27516000 to prevent that the O-ring can cut itself during insertion.



Insert the valve housing ring (pos. ①, fig.124) and the spring (pos. ①, fig.125).

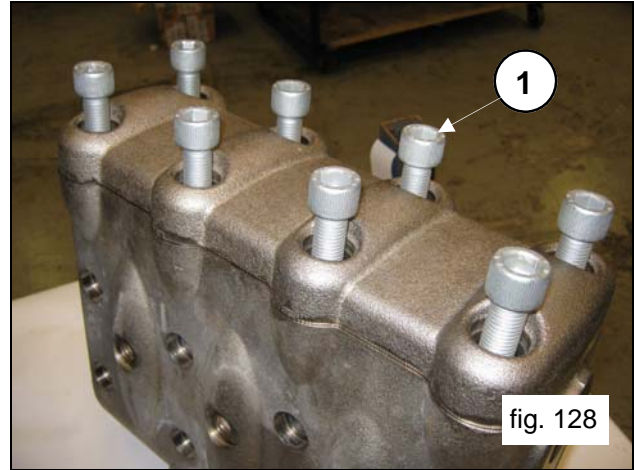
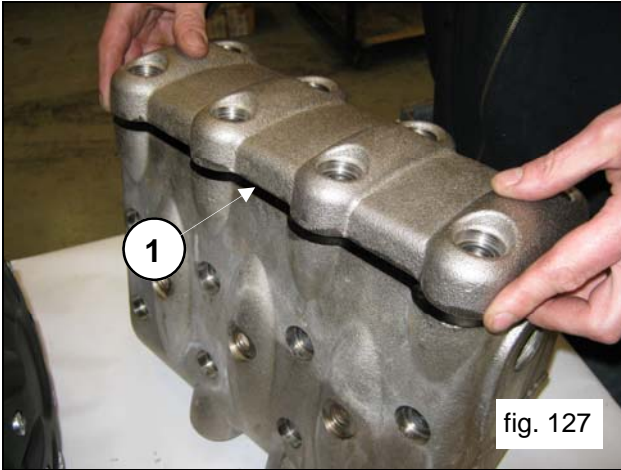


Assemble the O-ring, explod. posit. 19 (pos. ①, fig.126) and the anti-extrusion ring, explod. posit. 23 (pos. ②, fig.126) on the outlet valve plug.

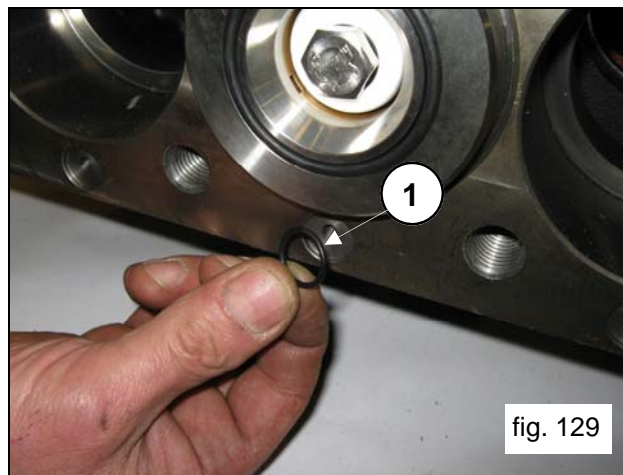


Insert the valve plug housing complete with O-ring and anti-extrusion rings.

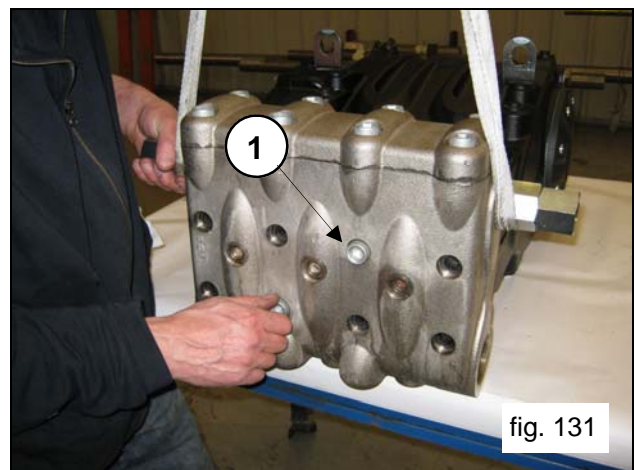
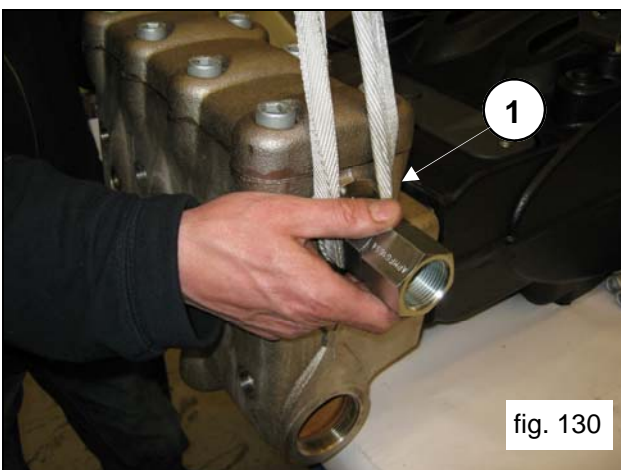
After having completed assembly of the valve units and the valve plug, apply the valve cover (pos.①, fig.127) and screw in the 8 M16x55 screws (pos.①, fig.128).



Apply 6 front O-rings on the pump casing (pos.①, fig.129).



Assemble the pump casing head (pos.①, fig.130) taking care not to hit the pistons and screw in the 8 M16x180 screws (pos.①, fig.131).



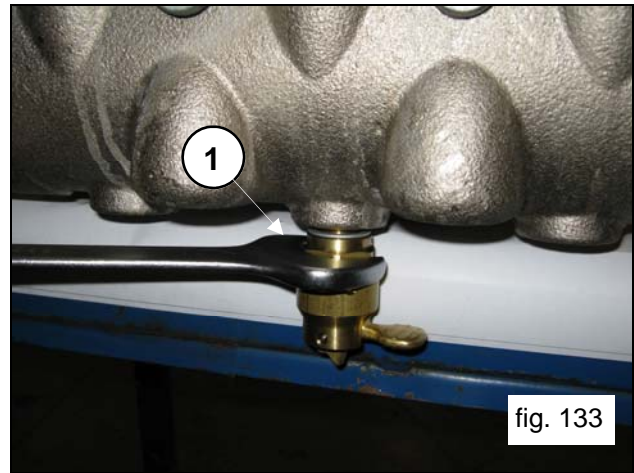
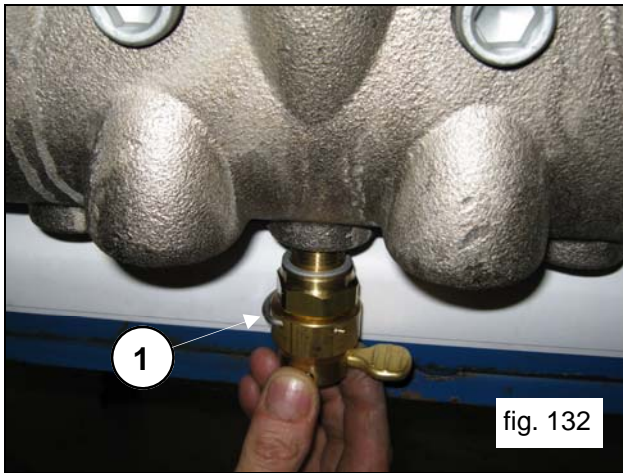
Proceed with calibration of the M16x180 screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".



Tighten the 8 M16x180 screws starting cross-wise from the 4 inner screws, to then continue with the 4 outer screws, always tightening cross-wise

Calibrate the M16x55 cover screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

Apply the valve opening devices (pos. ①, fig.132) and screw them in with the use of a 30 mm spanner (pos. ①, fig.133).

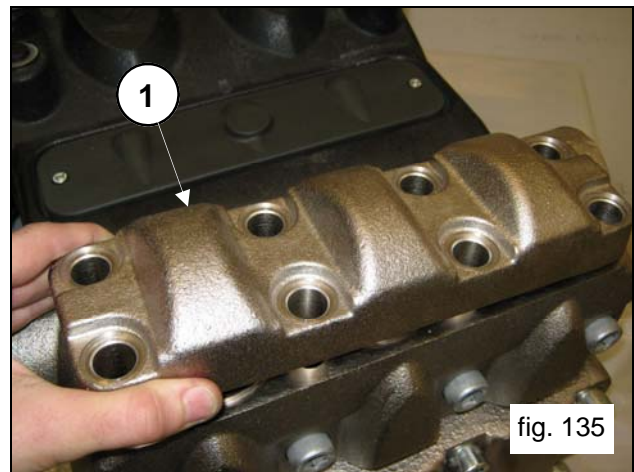
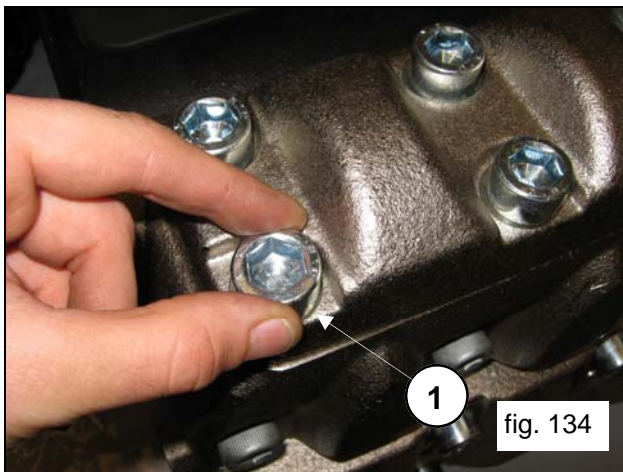


Apply the G1/4" plugs on the front of the head with relative O-rings. Proceed with calibration of the G1/4" plugs with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

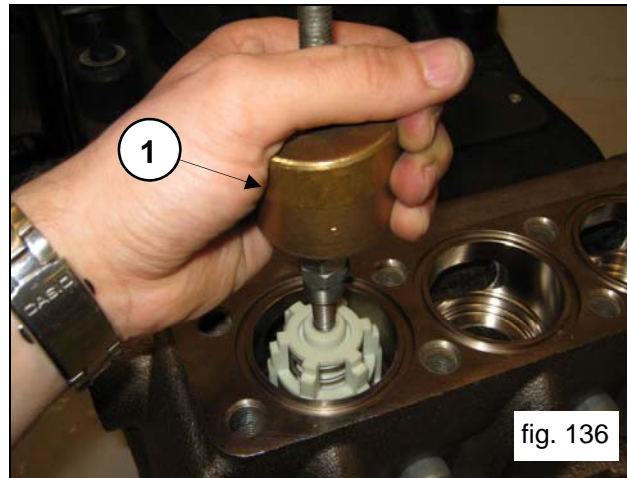
2.2.3 Dismantling the MW45 MW50 MW55 head – valve units

The head requires preventive maintenance as indicated in the use and maintenance manual. Operations are limited to inspection or replacement of valves, if necessary. Proceed as follows to extract valve groups:

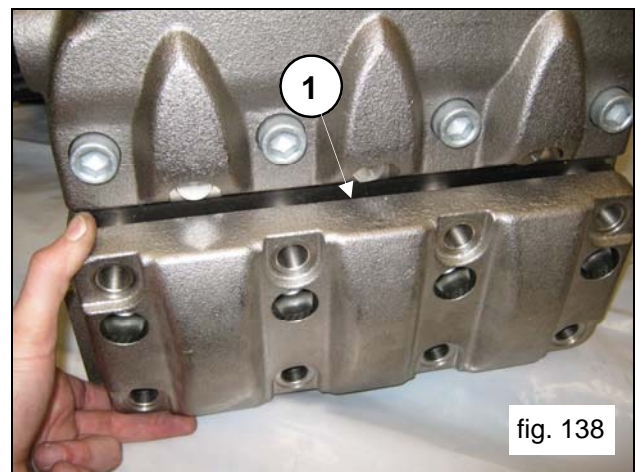
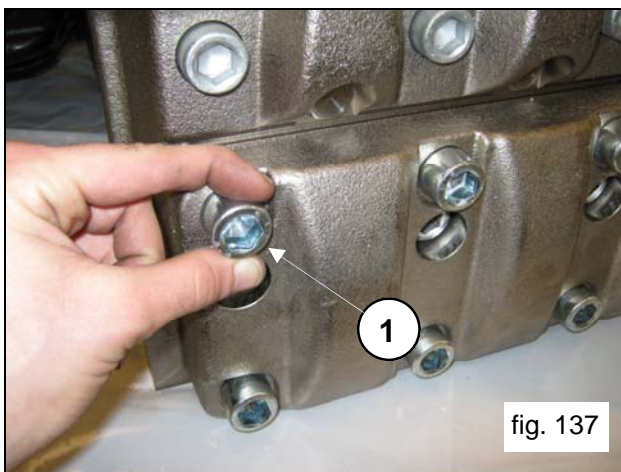
Unscrew the 8 M16x45 screws of the outlet valve cover (pos. ①, fig.134) and remove the cover (pos. ①, fig.135).



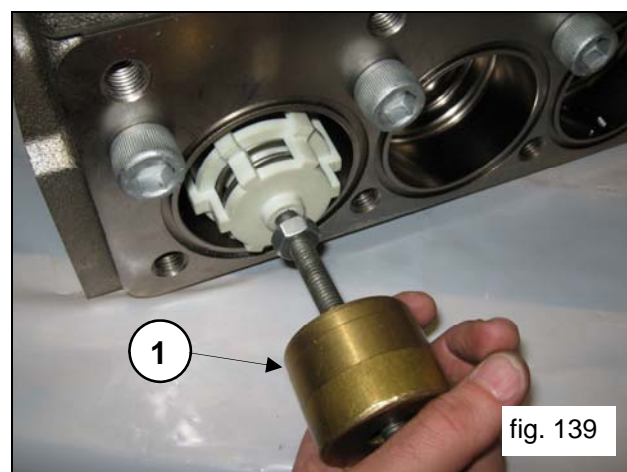
Extract the outlet valve unit with the use of an extractor hammer (code 27516400) to be applied on the M10 hole of the valve guide (pos. ①, fig.136).



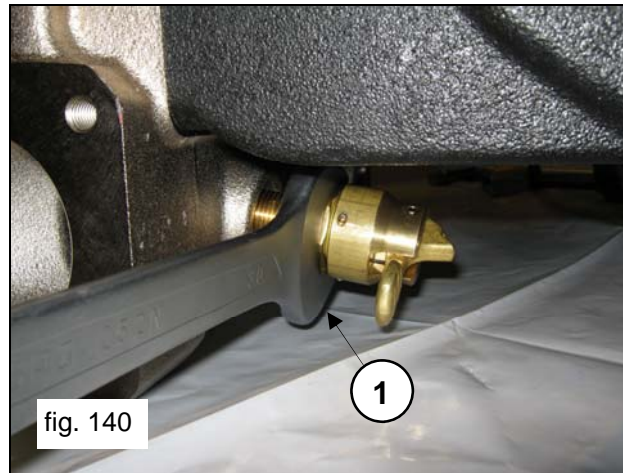
Unscrew the 8 M16x45 screws of the suction valve cover (pos. ①, fig.137) and remove the cover (pos. ①, fig.138).



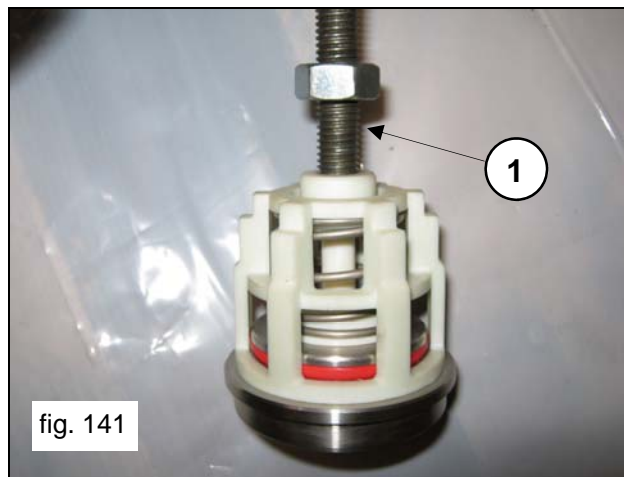
Extract the suction valve unit with the use of an extractor hammer (code 27516400) to be applied on the M10 hole of the valve guide (pos. ①, fig.139).



Unscrew the valve opening device by means of a 30 mm spanner (pos.①, fig.140).



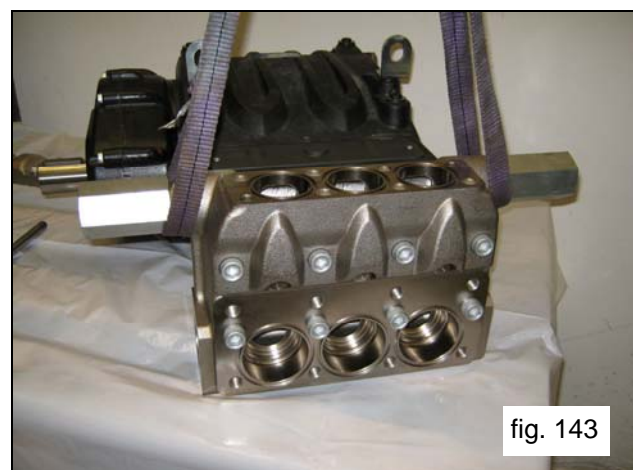
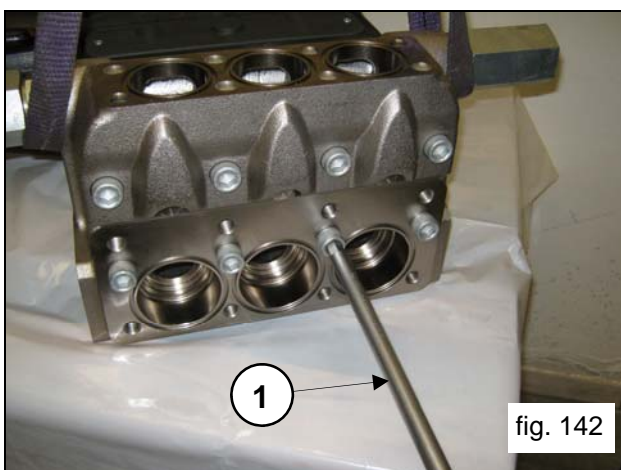
Remove the suction and outlet valve units, unscrewing an M10 screw in such a way to press on the inner guide and remove the valve guide from the valve housing (pos.①, fig.141).



Complete disassembly removing the G1/4" plugs on the front of the head and the G1/2" plugs on the lower part of the head.

It is now possible to remove the head from the pump casing, unscrewing the 8 M16x150 screws (pos.①, fig.142).

During disassembly of the head, pay special attention not to hit the pistons (fig.143).



2.2.4 Assembling the MW45 MW50 MW55 head – valve units



Pay particular attention to the conditions of the various components and replace if necessary.
 At every valve inspection, replace all OR rings and both in the valve unit and in the valve plugs.



Before repositioning the valve unit, thoroughly clean and dry the relative housings on the head indicated by the arrows (pos. ①, fig.144).

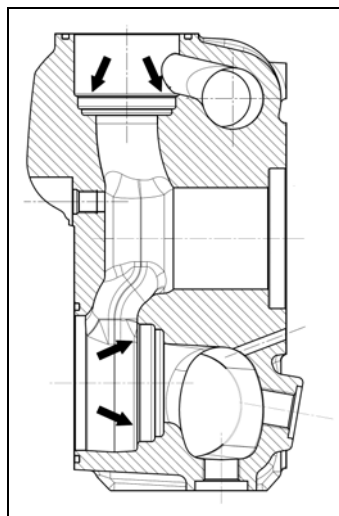


fig. 144

Proceed with reassembly following the reverse order indicated in point 2.1.3.

Assemble the suction and outlet valve units (fig.145 and fig.146).

To facilitate insertion of the valve guide in its housing, you can use a pipe resting on the horizontal guide planes (fig.147) and use an extractor hammer acting on the whole circumference.



fig. 145



fig. 146

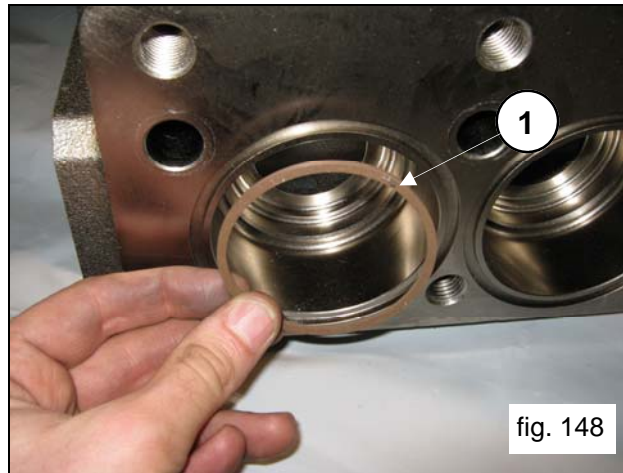


fig. 147

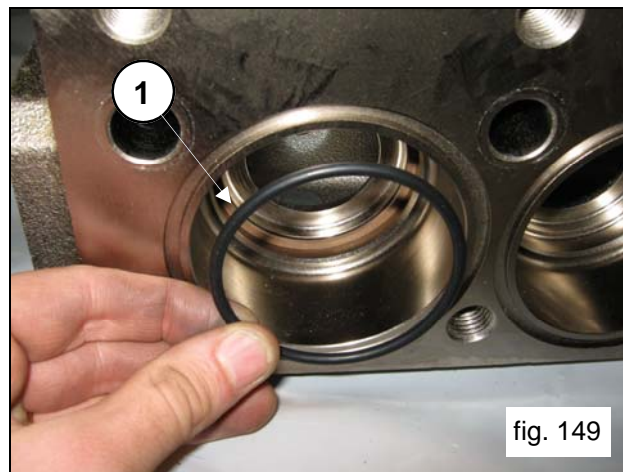


Proceed with insertion of the valve units (suction and outlet) in the head, taking care to follow the correct insertion sequence of O-rings and anti-extrusion rings.

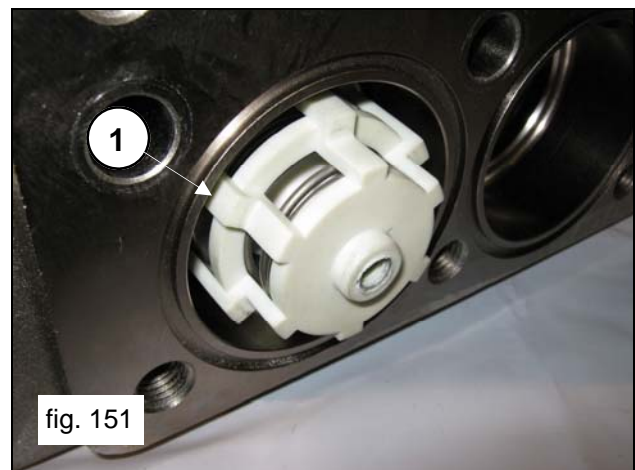
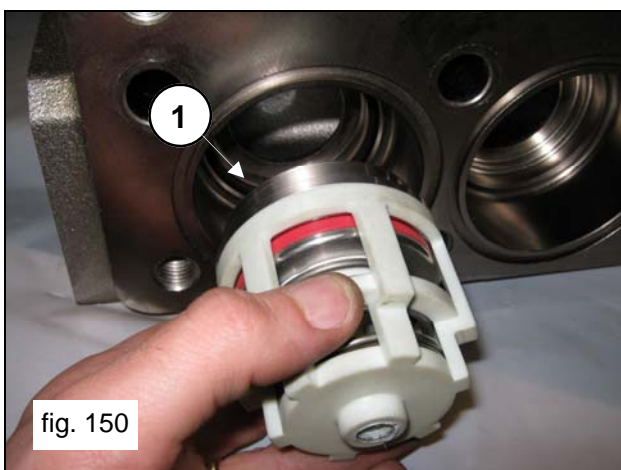
The proper sequence of valve unit assembly on the head is as follows:
During suction, insert the anti-extrusion ring, explod. posit. 6 (pos. ①, fig.148).



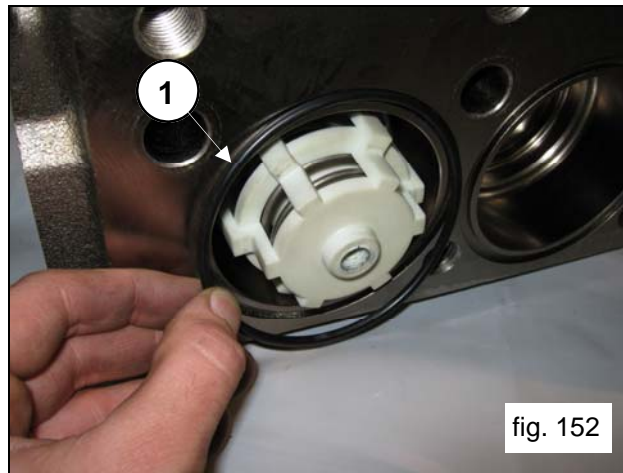
Insert the O-ring, explod. posit. 7 (pos. ①, fig.149).



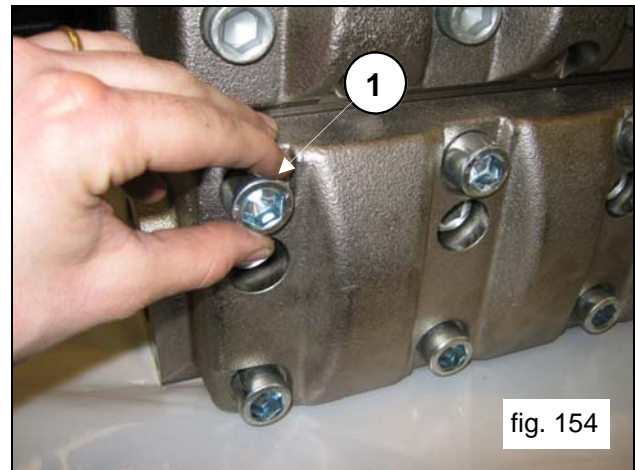
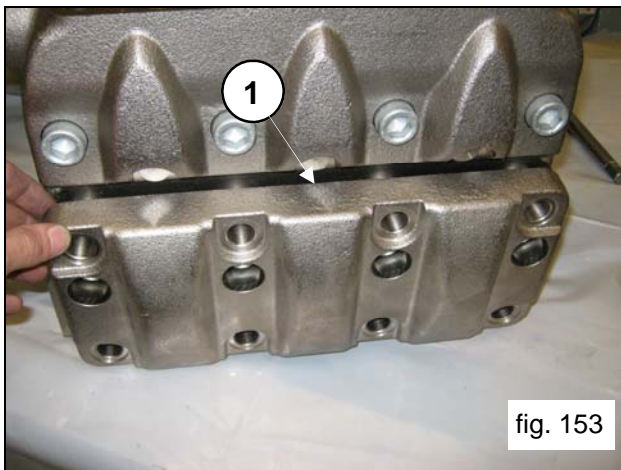
Ensure that the O-ring and anti-extrusion ring are perfectly placed in their housings.
Insert the suction valve unit (pos. ①, fig.150).
The complete valve unit must be fully inserted into the bottom and should look like the image in pos. ①, fig.151.



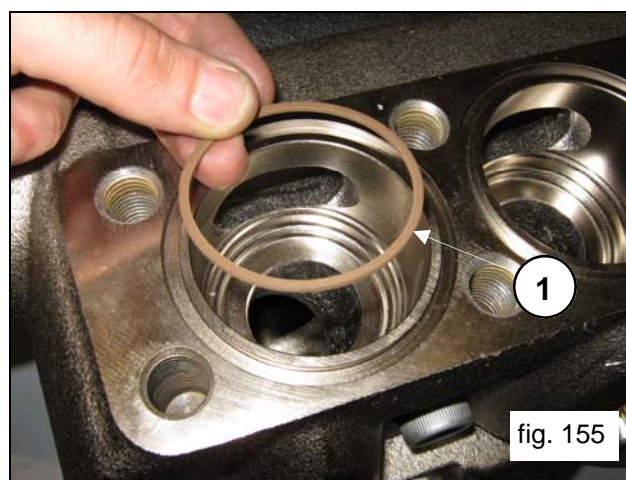
Insert the front O-ring in the suction valve (pos.①, fig.152).



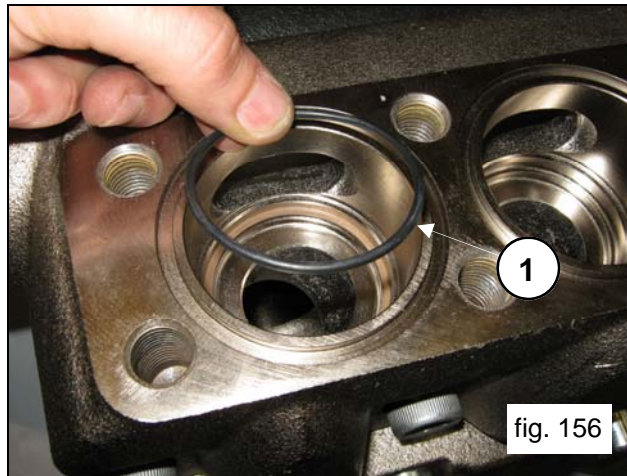
After having completed assembly of the suction valve units, apply the suction valve cover (pos.①, fig.153) and screw in the 8 M16x45 screws (pos.①, fig.154).



Proceed with outlet valve units assembly:
Insert the anti-extrusion ring, explod. posit. 23 (pos.①, fig.155).



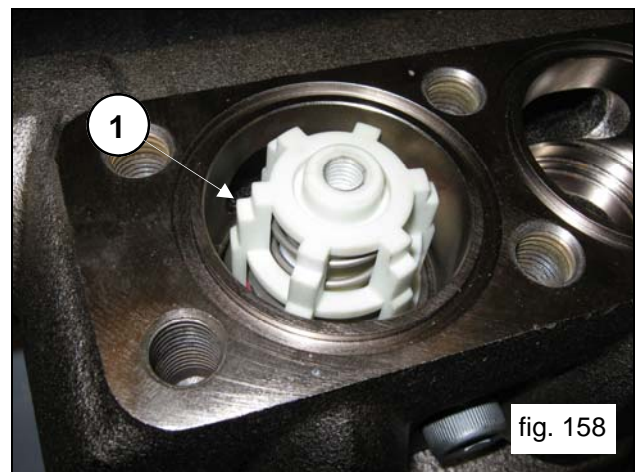
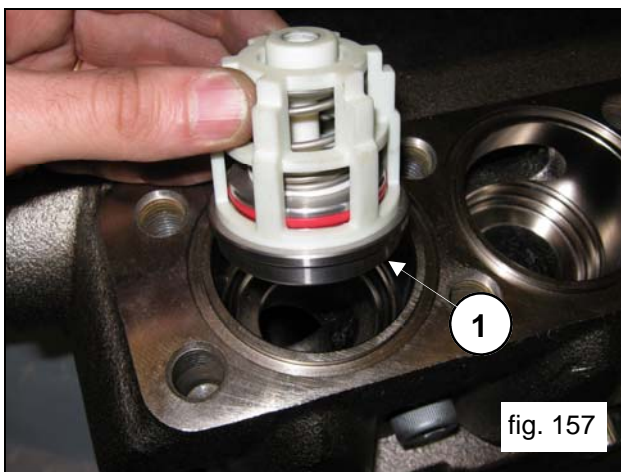
Insert the O-ring, explod. posit. 24 (pos. ①, fig.156).



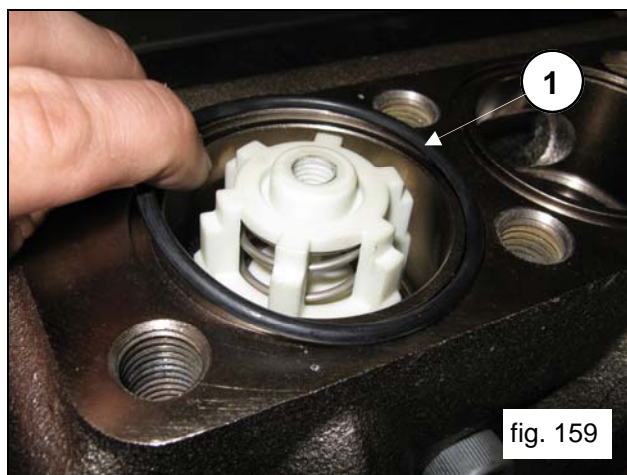
Ensure that the O-ring and anti-extrusion ring are perfectly placed in their housings.

Insert the outlet valve unit (pos. ①, fig.157).

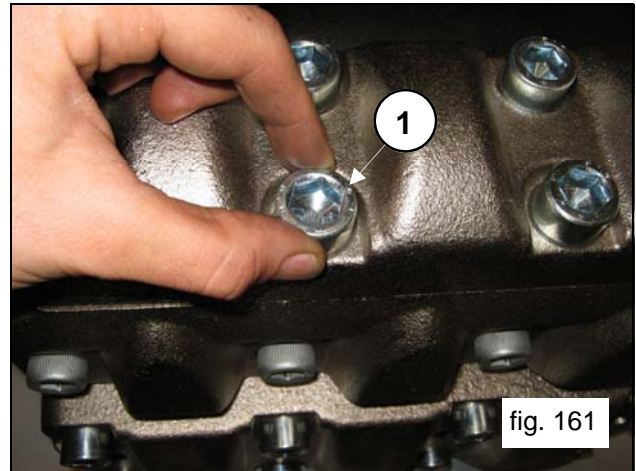
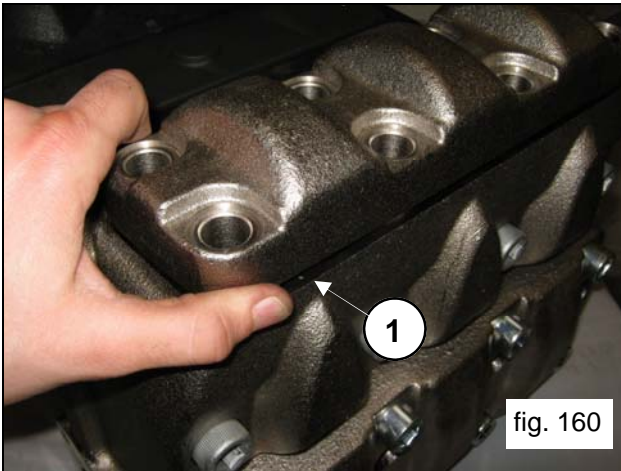
The complete valve unit must be fully inserted into the bottom and should look like the image in pos. ①, fig.158.



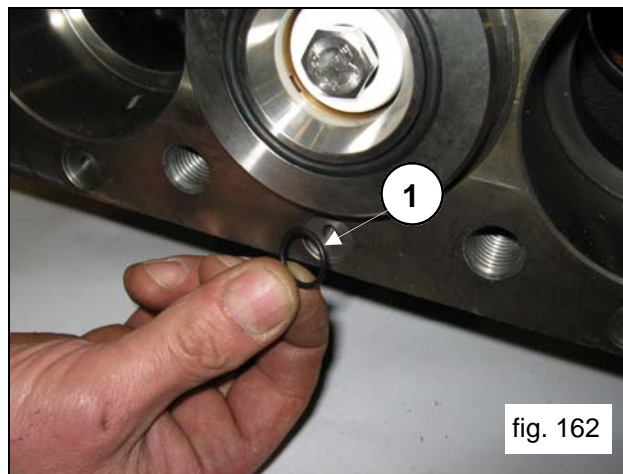
Insert the front O-ring in the outlet valve (pos. ①, fig.159).



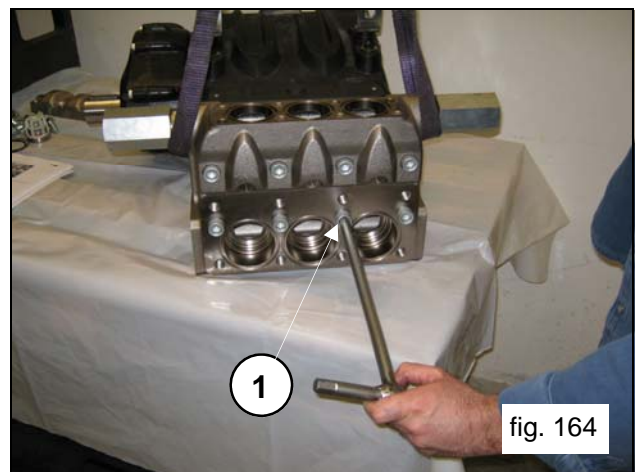
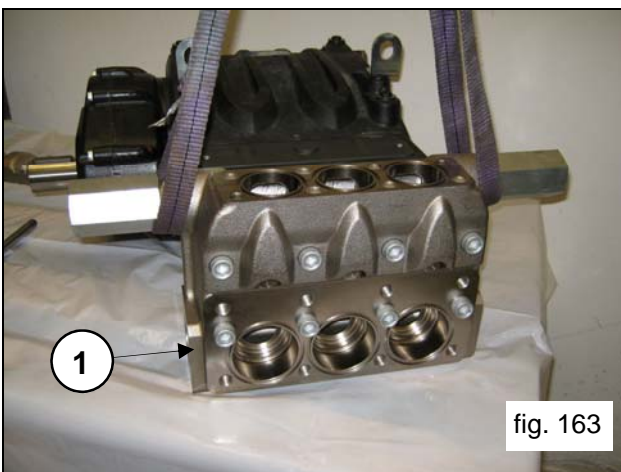
After having completed assembly of the outlet valve units, apply the outlet valve cover (pos.①, fig.160) and screw in the 8 M16x45 screws (pos.①, fig.161).



Apply 6 front O-rings on the pump casing (pos.①, fig.162).



Assemble the pump casing head (pos.①, fig.163) taking care not to hit the pistons and screw in the 8 M16x150 screws (pos.①, fig.164).



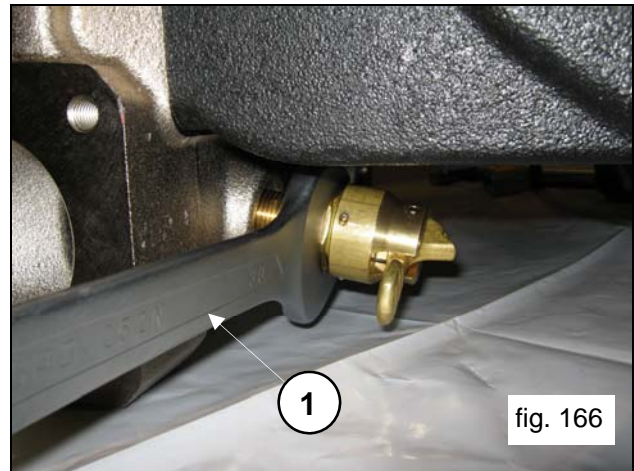
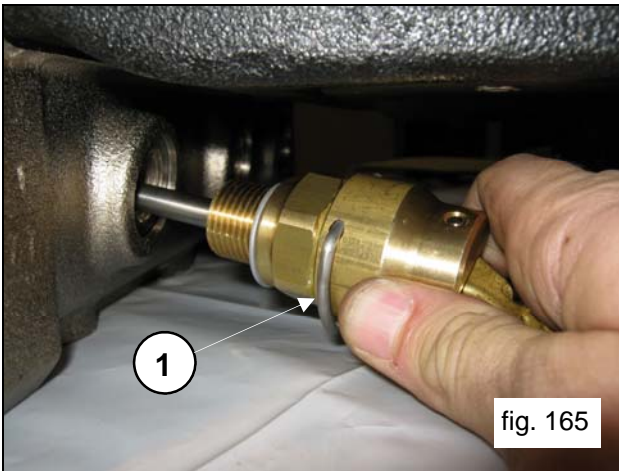
Proceed with calibration of the M16x150 screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".



Tighten the 8 M16x150 screws starting cross-wise from the 4 inner screws, to then continue with the 4 outer screws, always tightening cross-wise

Calibrate the M16x45 suction and outlet cover screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

Apply the valve opening devices (pos. ①, fig.165) and screw them in with the use of a 30 mm spanner (pos. ①, fig.166).



Apply the G1/2" plugs on the lower part of the head with relative washers. Proceed with calibration of the G1/2" plugs with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

Apply the G1/4" plugs on the front of the head with relative O-rings. Proceed with calibration of the G1/4" plugs with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

2.2.5 Dismantling the piston unit – supports – seals

The piston unit requires preventive checks as indicated in the preventive maintenance table in the use and maintenance manual.

Maintenance is limited to visual inspection of any drainage from the hole present on the lower inspection cover. If abnormalities / variations on the outlet pressure gauge or dripping from the drainage hole circuit are detected, the seal pack will have to be checked and replaced.

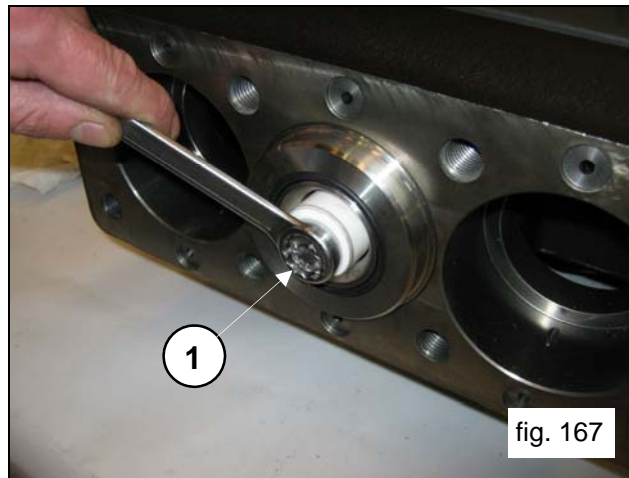
Proceed as follows to extract piston units:

To access the piston unit, unscrew the M18x180 screws (for MW32-MW36-MW40) or M16x150 screws (for MW45-MW50-MW55) and remove the head.

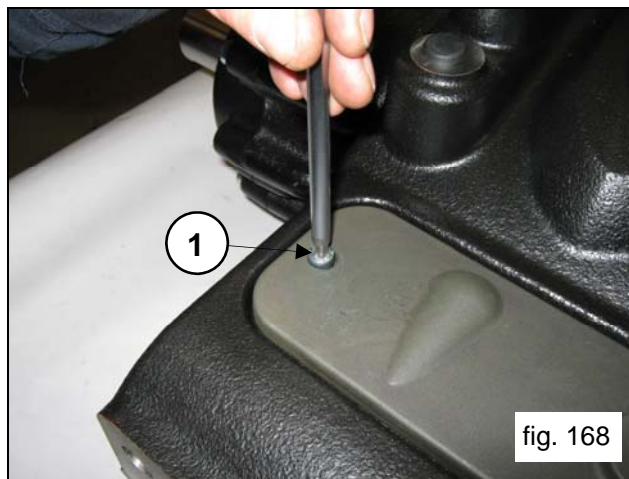


Remove the head taking care to avoid hitting the pistons

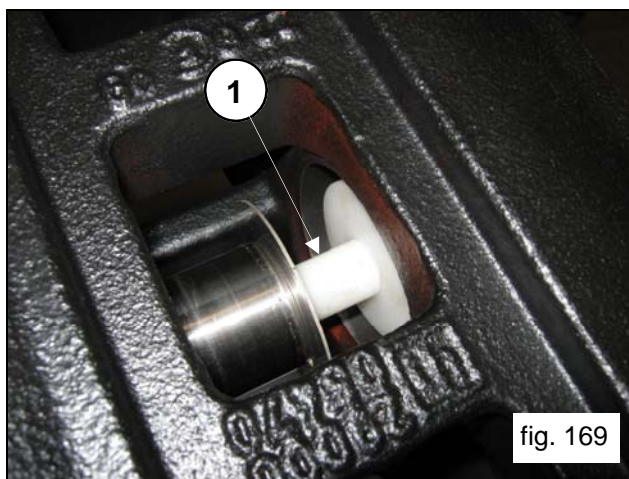
Disassemble pistons unscrewing the fixing screws (pos.①, fig.167).
Remove the piston from the seal support and check that its surfaces do not present any scratches, signs of wear or cavitation



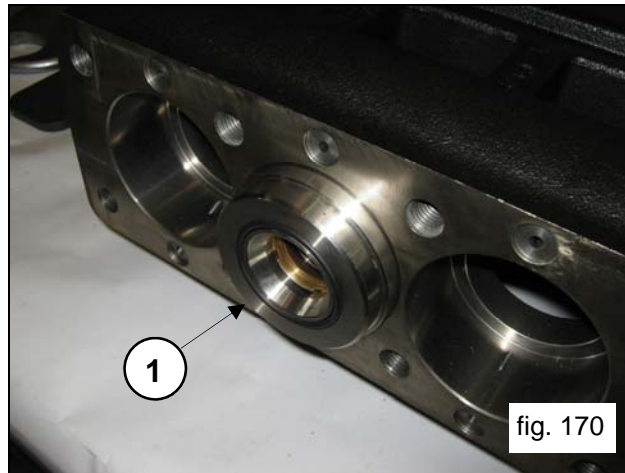
Remove the upper inspection cover, unscrewing the 2 fixing screws (pos.①, fig.168).



Manually turn the shaft in such a way to bring the 3 pistons to the upper dead centre position.
Insert the buffering tool code 27632500 between the piston guide and the piston (pos.①, fig.169).

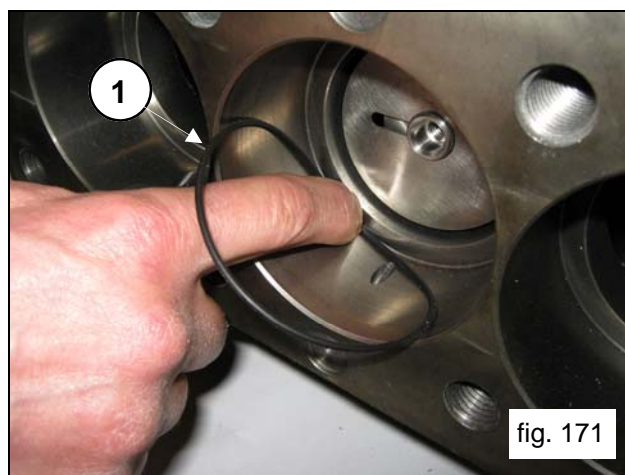


Turning the shaft, have the piston guide move forward so that the buffer, moving ahead, can expel the seal support and the entire piston unit (pos.①, fig.170).

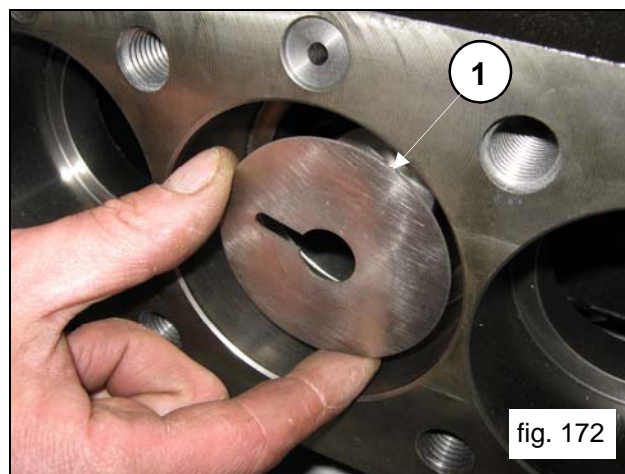


Extract the seal support unit and the buffering tool.

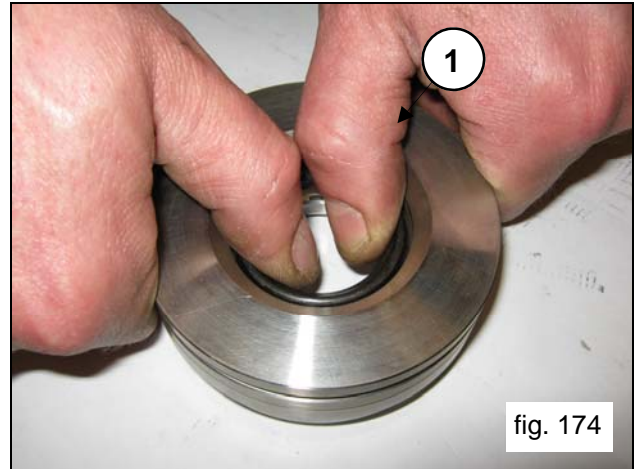
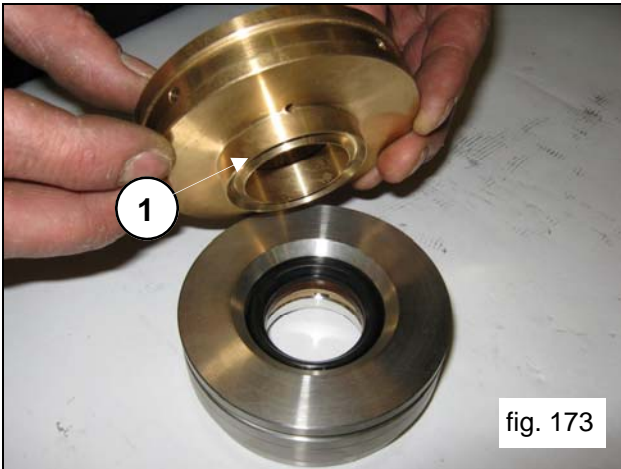
Remove the seal support bottom O-ring should it remain inside the pump casing (pos.①, fig.171).



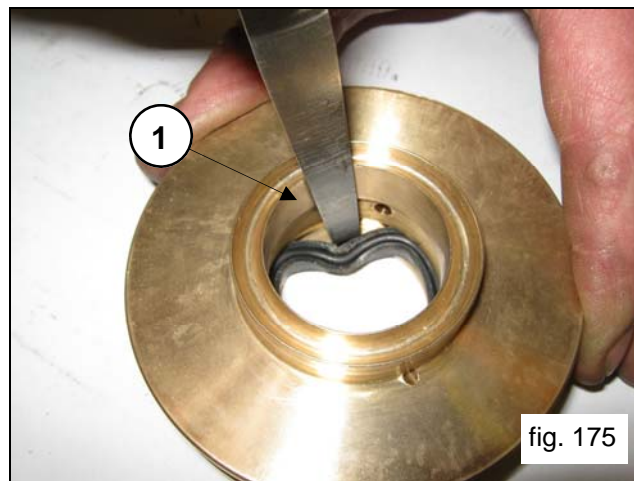
Remove the spray rings from the piston guides (pos.①, fig.172).



Separate the seal support from the liner (pos. ①, fig.173) to access the pressure seals (pos. ①, fig.174).



To remove the low pressure seal, use a thickness gauge or another tool which will not damage the seal support housing (pos. ①, fig.175).



2.2.6 Dismantling the piston unit – supports – seals

Proceed with reassembly following the reverse order indicated in point 2.2.5.

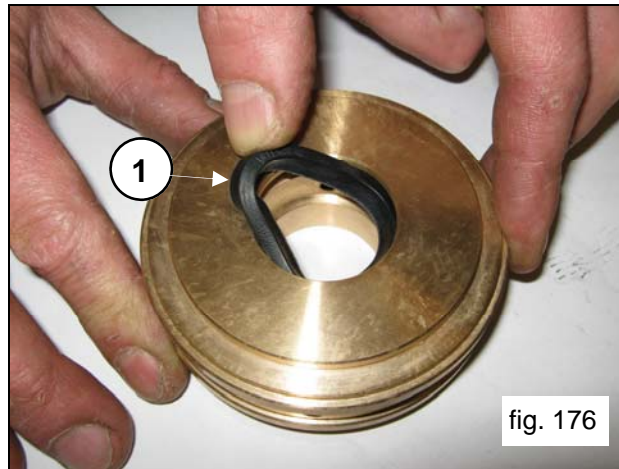


Replace the pressure seals moistening the lips with silicone grease (without spreading it), taking extra care not to damage them during liner insertion.

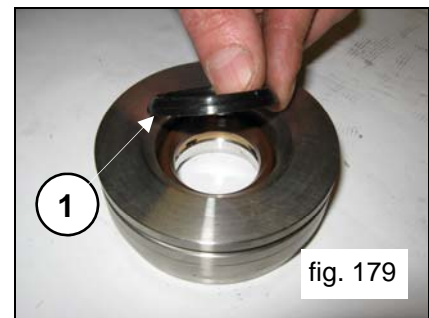
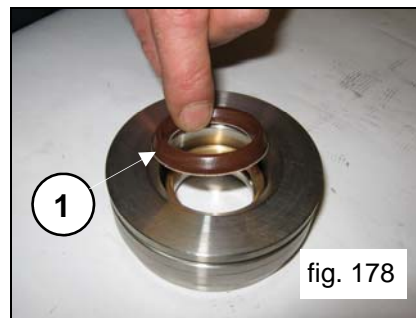
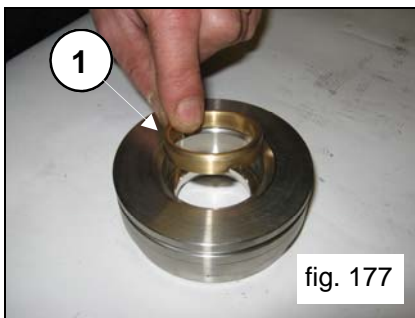


The O-rings and the low pressure seals must be replaced at each disassembly.

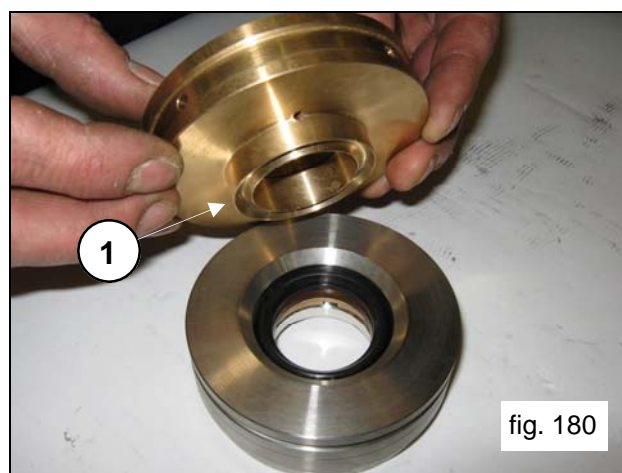
Insert the low pressure seal in the seal support (pos. ①, fig.176) paying attention to the mounting direction which requires that the sealing lip be set forward (towards the head)



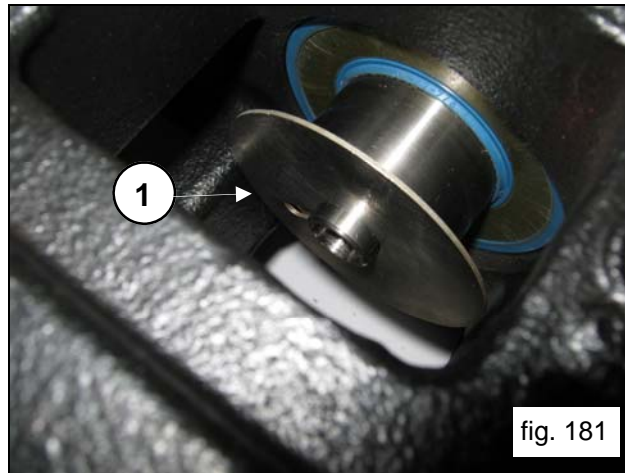
Install the head ring (pos. ①, fig.177), the high pressure seal (pos. ①, fig.178) and the restop ring (pos. ①, fig.179)



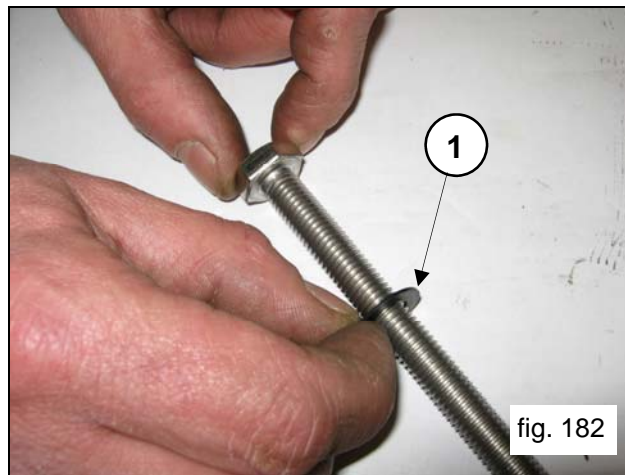
Join the seals support to the liner (pos. ①, fig.180).



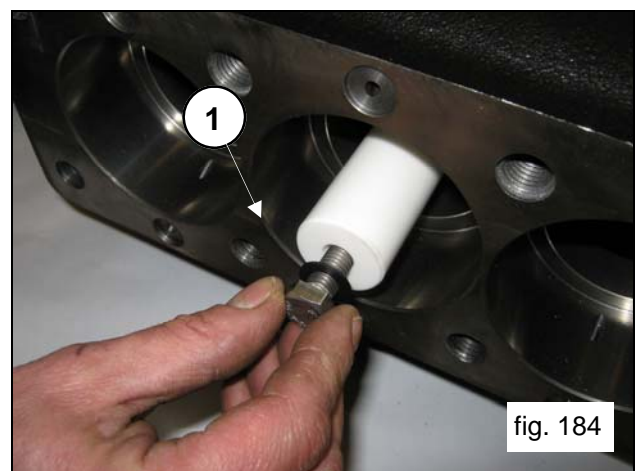
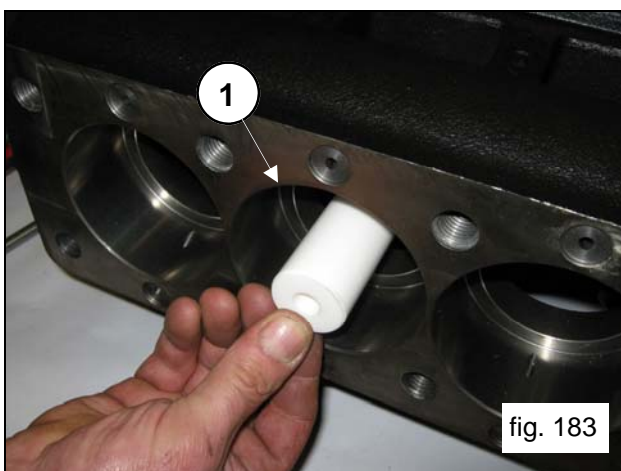
Position the spray hood in the piston guide housing (pos.①, fig.181).



Insert the Ø10x18x0.9 washer in the piston fixing screw (pos.①, fig.182).

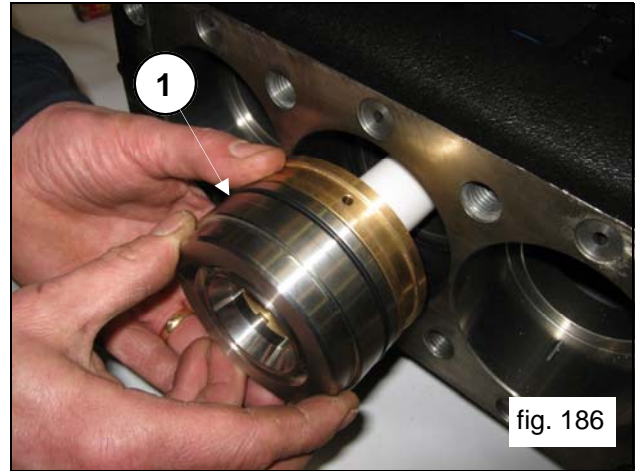
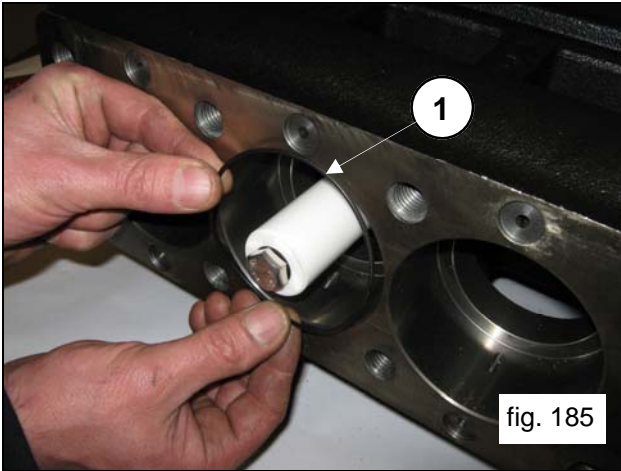


Install the pistons on their respective guides (pos.①, fig.183) and fasten them as per pos.①, fig.184.

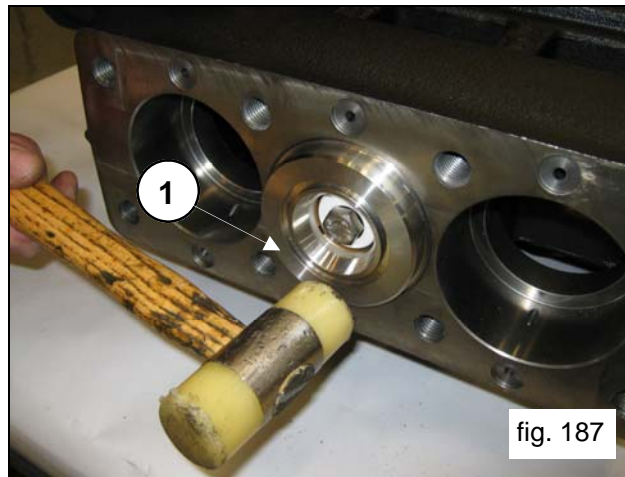


Calibrate the screws with a torque wrench as indicated in paragraph 3 "Screw tightening calibration".

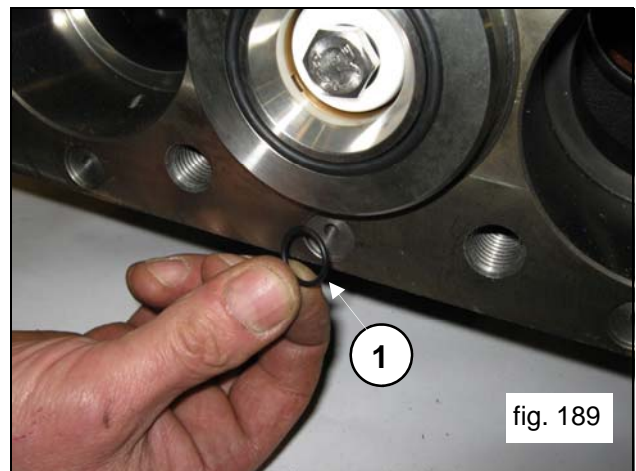
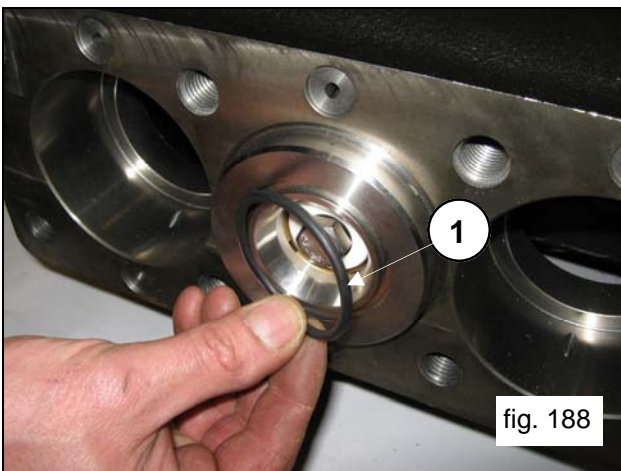
Insert the O-ring inside the pump casing (pos. ①, fig.185) and then the previously-assembled liner-seal support block (complete with the same O-ring) to end stroke (pos. ①, fig.186).



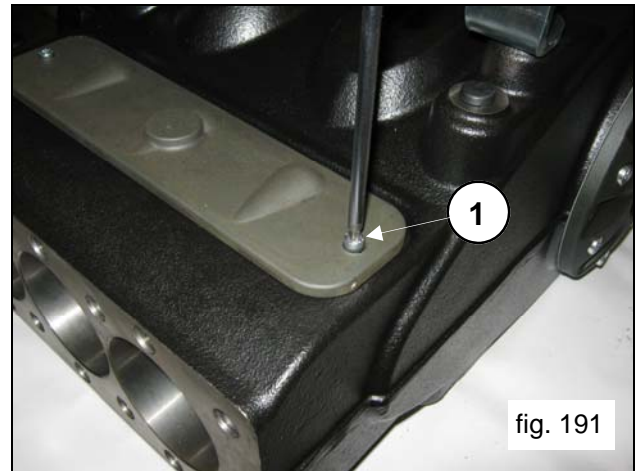
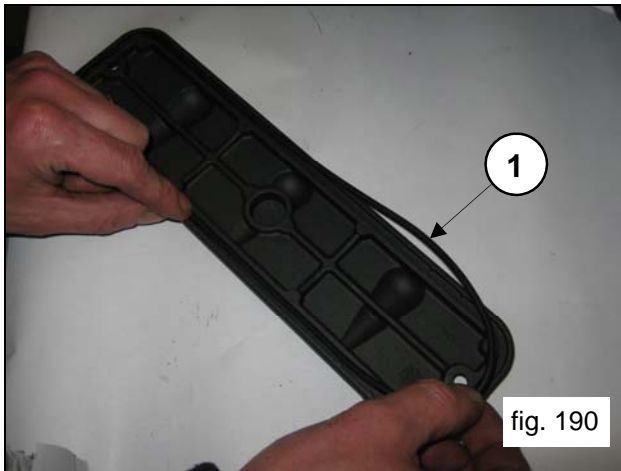
Ensure that the liner-support block is positioned correctly down to the bottom of the housing (pos. ①, fig.187).



Install the front O-ring in the liner (pos. ①, fig.188) and the recirculation hole O-ring (pos. ①, fig.189).



Insert the O-ring on the inspection covers (pos.①, fig.190) and assemble the covers with the use of 2+2 M6x14 screws (pos.①, fig.191).



Calibrate the screws with a torque wrench as indicated in paragraph 3 “Screw tightening calibration”.

3. SCREW TIGHTENING CALIBRATION

Screw tightening must only be performed with a torque wrench.

Description	Exploded Drawing Position	Tightening Torque Nm
Casing cover M10x30 screw	89 H.P. – 91 L.P.	45
G1/2x13 casing plug	91 H.P. – 93 L.P.	40
Lifting bracket M16x30 screw	51 H.P. – 53 L.P.	200
Reduction gear cover M10x40 screw	81 H.P. – 83 L.P.	45
Ring gear stop M10x25 screw	76 H.P. – 78 L.P.	45
Reduction gear box M10x40 screw	81 H.P. – 83 L.P.	45
Upper and lower cover M6x14 screw	60 H.P. – 62 L.P.	10
Bearing cover M10x30 screw	89 H.P. – 91 L.P.	45
Con-rod fixing M10x1.5x80 screw	53 H.P. – 55 L.P.	65 *
Piston guide M10x35 screw	48 H.P. – 50 L.P.	60
Piston fixing M10x140 screw	30 H.P. – 18 L.P.	40
HP Valve cover M16x55 screw	26	333
LP Valve cover M16x45 screw	19	333
LP head G1/2" plug	4	40
G1/4"x13 head plug	14 H.P. – 21 L.P.	40
HP head M16x180 screw	28	333 **
HP head M16x150 screw	43	333 **
Valve opening device	2	40

* Achieve coupling torque tightening screws at the same time

** Tighten the screws starting cross-wise from the 4 inner screws, then continue with the 4 outer screws, always tightening cross-wise.

4. REPAIR TOOLS

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

For assembly:

- | | |
|--|---------------|
| - Shaft (con-rod interlocking) | cod. 27566200 |
| - Bearing on bend shaft | cod. 27604700 |
| - Pinion bearing on reduction gear box | cod. 27604900 |
| - Bend shaft bearing on the reduction gear box | cod. 27605000 |
| - Bend shaft bearing on the bearing cover | cod. 27605000 |
| - Piston guide oil seal | cod. 27605300 |
| - Bearing on pinion | cod. 27604800 |
| - Pinion seal ring | cod. 27605200 |
| - Outlet valve housing O-ring MW32-MW36-MW40 | cod. 27516000 |

For disassembly:

- | | |
|--|---------------|
| - Piston guide oil seal | cod. 27918500 |
| - Shaft (con-rod interlocking) | cod. 27566200 |
| - Outlet and suction valve unit | cod. 27516400 |
| - Suction valve housing MW32-MW36-MW40 | cod. 27516200 |
| - Liner block + seals support | cod. 27632500 |

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