



**INTERPUMP  
GROUP**

# **70SS *SERIES***



## **Repair manual**



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## 1. INTRODUCTION

This manual describes the instructions for repairing **SS7061-SS7091** 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 dipstick pos. ①, and then the plug, pos. ②, fig.1.

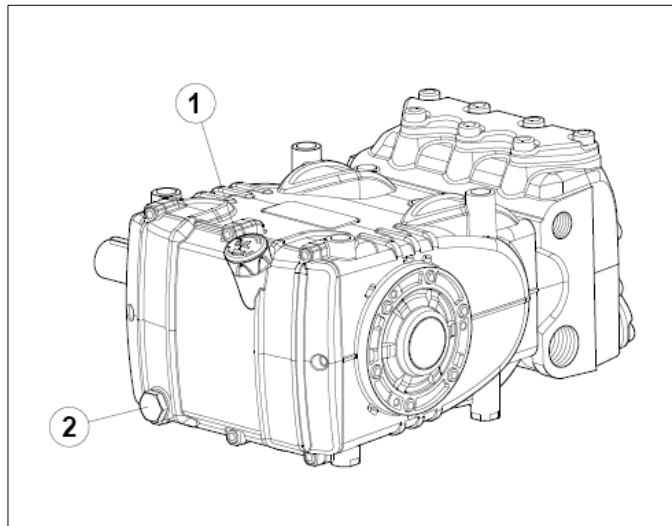


fig. 1



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:

A) Disassemble:

- pump shaft key
- rear cover
- connecting rod cap

- side covers, using n°3 wholly threaded M6x 50 screws, inserting them in the apposite holes as shown in fig. 2

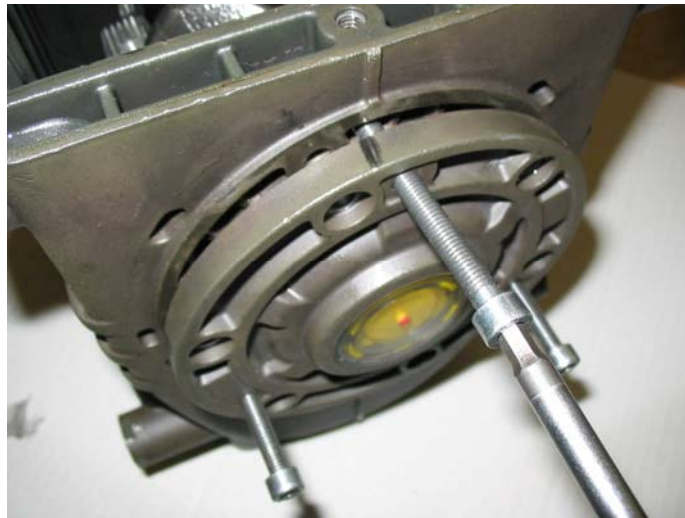


fig. 2

B) Push the piston guides and connecting rods forward in order to facilitate the lateral extraction of the crank shaft.

NB: to extract the piston guide it is necessary to remove the ceramic piston and wiper first.

C) Disassemble the crankshaft oil seals and the piston guides using standard tools.

### 2.1.2 Crank mechanism assembly

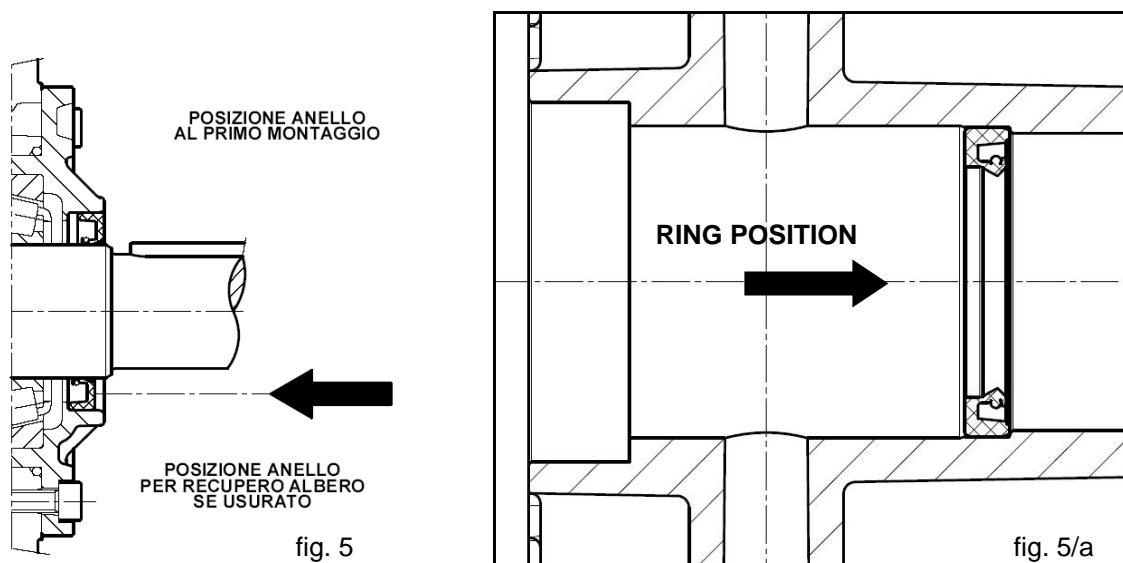
After cleaning the crankcase, reassemble the crankcase mechanism as follows:

- A) Fit the oil seals of guide pistons in the crankcase by sliding them all the way inside till they correctly seat in place (see fig.5/a). The use of the tool cod. 27904200 will facilitate the task.
- B) Introduce the pre-assembled piston guide / connecting rod units into their seat; to facilitate tightening of the connecting rod cap, we advise to position the connecting rod so you can easily read the number. To easily introduce the crankshaft, without the key, fully push in the piston guide / connecting rod unit, as indicated in section B, paragraph 2.1.1, and shown in fig. 4.



fig. 4

C) Before reassembly of the side covers, check the seal lips for wear. If replacement is necessary, position the new ring using the apposite tool (cod. 27904500) as shown in fig. 5.



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



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. 5.

To help the covers fit onto the crankcase, we advise to use N.3 screws M6x40, and then finish the operation with the screws supplied (M6x18) as shown in fig.6.



fig. 6



D) Install the connecting rod cap respecting numbering, and fasten the relevant bolts (lubricating both the head and the threaded stem) proceeding in three different steps, see fig. 7:



1. Approaching torque 6 - 8 Nm
2. Pre-fastening torque 25 - 28 Nm
3. Fastening torque 38 Nm



fig. 7

- E) After setting the torque, check that the big end of the connecting rod has a lateral play in both directions.  
F) Install the rear cover positioning the oil dipstick hole upward.  
G) Fill the crankcase with oil as indicated in the use and maintenance manual in paragraph 7.4.

### **2.1.3 Disassembly / Assembly of bearings and shims**

The type of bearings used (tapered roller bearings) ensures the absence of axial play on the crankshaft; the shims are to be determined to reach this purpose. To disassemble / assemble, or to replace them if needed, carefully follow the indications below.

#### **A) Disassembly / Assembly of the crankshaft without replacing the bearings**

After removing the side covers, as indicated in paragraph 2.1.1, check the rollers and their races for wear; if all parts are in good conditions, accurately clean the components with a suitable degreaser and grease them again evenly using the same oil used in the crankcase.

The same shims can be used again, being careful to fit them under the cover on the sight glass side.

After installing the complete unit (sight glass side flange + shaft + engine side flange), check that the shaft's rolling torque - with the connecting rods free - is at least 4 Nm, Max 6 Nm.

To position the two side covers on the crankcase, initially use N°3 screws M6x40 as shown in fig. 6, and then the fastening screws.

The shaft's rolling torque (with connecting rods coupled) must not exceed 8 Nm.



**B) Disassembly / Assembly of the crankshaft with bearing replacement**

After disassembling the side covers as indicated in paragraph 2.1.1, remove the outer ring nut of the bearings from their covers and the inner ring nut, with the remaining part of the bearing, from the two shaft extremities using a standard pin extractor or similar tool as indicated in figures 8 - 9.



fig. 8



fig. 9

The new roller bearing can be mounted at room temperature with a press or fly press; it is necessary to lay them on the lateral side of the relevant ring nuts with apposite rings. The driving operation can be facilitated by heating the relevant parts at a temperature ranging between 120° - 150° C (250° - 300° F), making sure that the ring nuts are correctly fitted into their seats.



**Never invert the parts of the two bearings.**

The shim pack must be redefined as follows:

- A) Insert the crankshaft in the crankcase, being sure that the P.T.O. shank comes out of the correct side.
- B) Fit the P.T.O. side flange to the crankcase paying great attention to the seal lip as indicated in paragraph 2.1.2, section C.
- C) Position the flange on the sight glass side as indicated in paragraph 2.1.2.
- D) Use a thickness gauge (see fig. 10)



Fig. 10

Determine the shim pack as indicated in the table below:

fig. 11

Measurement	Shim type	N° pieces
From: 0.05 to: 0.10	/	/
From: 0.11 to: 0.20	0.1	1
From: 0.21 to: 0.30	0.1	2
From: 0.31 to: 0.35	0.25	1
From: 0.36 to: 0.45	0.35	1
From: 0.46 to: 0.55	0.35 0.10	1 1
From: 0.56 to: 0.60	0.25	2
From: 0.61 to: 0.70	0.35 0.25	1 1



E) Insert the shims under the cover on the sight glass side (see fig. 11), fixing it to the crankcase using the appropriate screws, and verifying that the stall torque is between 4 Nm and 6 Nm.

F) If the torque value is correct, connect the rods to the crankshaft; otherwise, redefine the shims again repeating the operations from point "C".





## 2.2 Fluid End Repair

### 2.2.1 Disassembly of the head - valve units

Service operations are limited to valve inspection or replacement if needed.  
To extract the valve units proceed as follows:



fig. 12

- A) Unfasten the 7 M12x35 valve cover screws, and remove the cover( fig. 12).
- B) Remove the valve plugs with an M6 threaded bolt.(fig. 12).
- C) Remove the valve assemblies with a pair of pincers to grab the valve cages. (fig.13).



Should excessive scalings stuck the valve seats down in the manifold (example after inactivity for long period) then the use of the extractor tool p/n 26019400 is recommended (see fig.12/a).

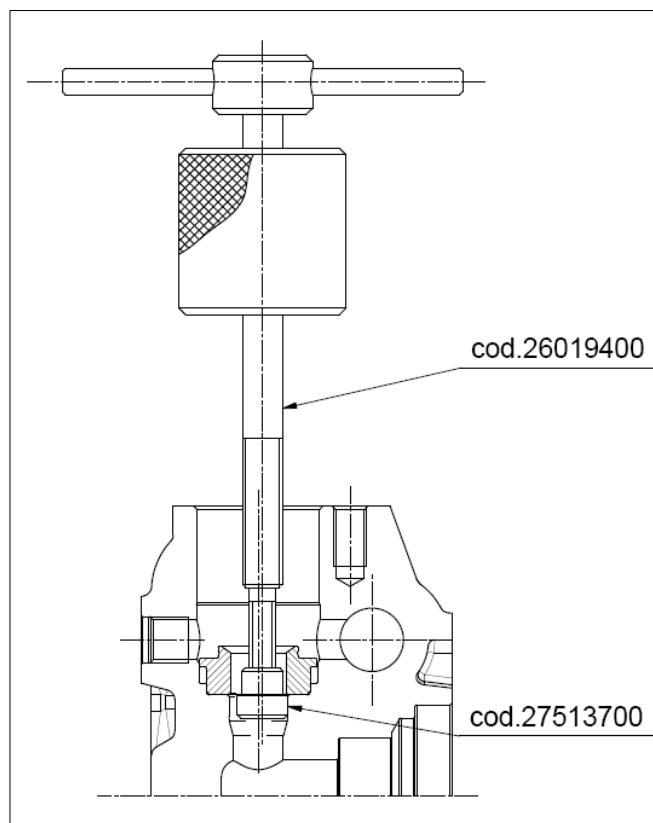


fig. 12/a



Disassemble the valve assemblies with simple tools – a couple of screw drivers would work more than fine. Components valve assemblies are pressed together with a minimal load, therefore the job results extremely easy to be carried out. Being the valve cage made of polymer, attention should be taken during service in order to prevent the cage ribs from being damaged.



fig. 13

### 2.2.2 Head assembly - valve units



Pay careful attention to state of wear of the various components; replace them when necessary, and in any case within the intervals indicated in the table in fig.14, Chapter 11 of the use and maintenance manual.

At each valve inspection, replace all valve unit and valve plug OR rings and anti-extrusion rings.



Before repositioning the valve units, clean and perfectly dry the relevant seats in the head as indicated in fig. 14.

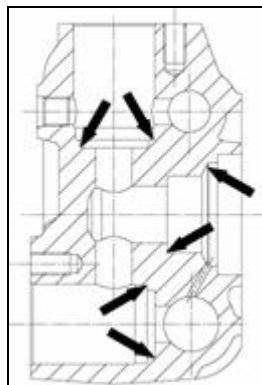


fig. 14

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



During the assembly of the suction and delivery valve units (fig. 15 - fig. 16) do not invert the suction springs with the previously disassembled delivery springs:

- a) Suction springs "white".
- b) Delivery springs "black".



To facilitate the insertion of the valve guide into its seat, use a pipe that lays on the horizontal shoulders of the guide (fig. 16/a) and use a hammer acting on the entire circumference.



fig. 15



fig. 16



fig. 16/a

Insert the suction and delivery valve units checking that they are thoroughly inserted in the head seat. Therefore apply the valve covers and proceed with calibrating the related M10x25 screws with a torque wrench as indicated in Chapter 3.

### **2.2.3 Disassembly of the head - seals**

The replacement of the seals is necessary if water leaks are detected from the draining holes located at the rear of the crankcase, and in any case within the intervals indicated in the table in fig.14, Chapter 11 of the use and maintenance manual.

A) Unfasten the M10x110 head screws as shown in fig. 17.

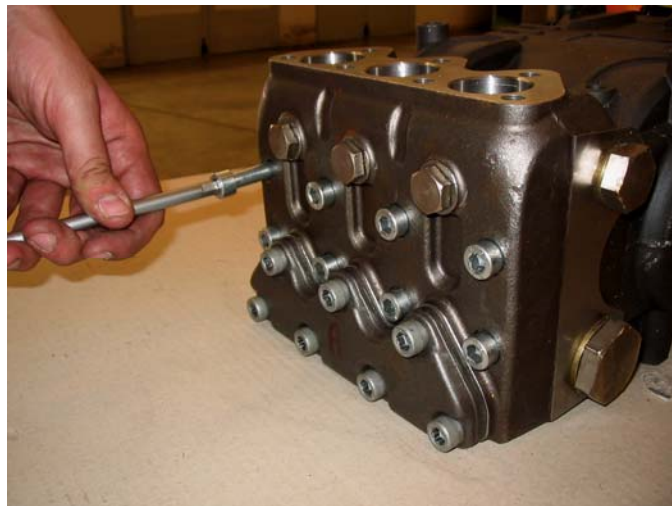


fig. 17



B) Remove the head from the crankcase.

C) Extract the high pressure seals from the head, and the low pressure seals from their related support by using standard tools as shown in fig. 18; be careful not to damage the seats.



Pay careful attention to the order of sealing pack disassembly as shown in fig. 19, composed of:

1. Anello di fondo
2. OR ring
3. Sealing ring L.P.
4. Anello intermedio
5. Sealing ring H.P.





#### **2.2.4 Piston unit disassembly**

The piston unit does not require periodical maintenance. Service interventions are limited to visual inspections only.

For piston unit extraction, operate as follows:

- A) Unfasten the piston screws as shown in fig. 20.



fig. 20

- B) Check for wear; replace them if necessary.



At each disassembly, all piston unit OR rings must be replaced.

#### **2.2.5 Head assembly - seals - piston unit**

Reassemble the various components by inverting the operations previously listed in paragraph 2.2.3, paying careful attention to the following:

- A) Sealing pack: respect the same order followed during disassembly.
- B) Lubricate components ③⑤ with silicone grease type OCILIS 250 cod. 12001600 on out diameter only.
- C) For correctly assembling the HP seals in their related seats on the head, use the apposite tools as indicated in Chapter 4.
- D) Reassemble the pistons by fastening the screws with an apposite torque wrench, respecting the fastening torque value indicated in Chapter 3.
- E) Assemble the head: for fastening torque values and fastening sequences, respect the indications of Chapter 3.



### 3. SCREW CALIBRATION

Description	Exploded view position	Material	Fastening Torque Nm
Cover fastening screws	9	Stainless steel	10
Piston fastening screws	28	8.8	20
Conrod caps fastening screws	16	12 R	38 *
Valve cover screw	36	Stainless steel	35 **
Head fastening screws	35	Stainless steel	35 ***
Service plug	11	Nickel plated brass	40

\*The conrod caps fastening screws must be tightened respecting the phases indicated in "Point D" of page 6.

\*\* The valve cover screws, exploded position 36, must be fastened using a torque wrench, lubricating under the bolt's head, respecting the order shown in the scheme in fig.21.

\*\*\*The head fastening screws, exploded position 35, must be fastened using a torque wrench, lubricating under the bolt's head, respecting the order shown in the scheme in fig.21.

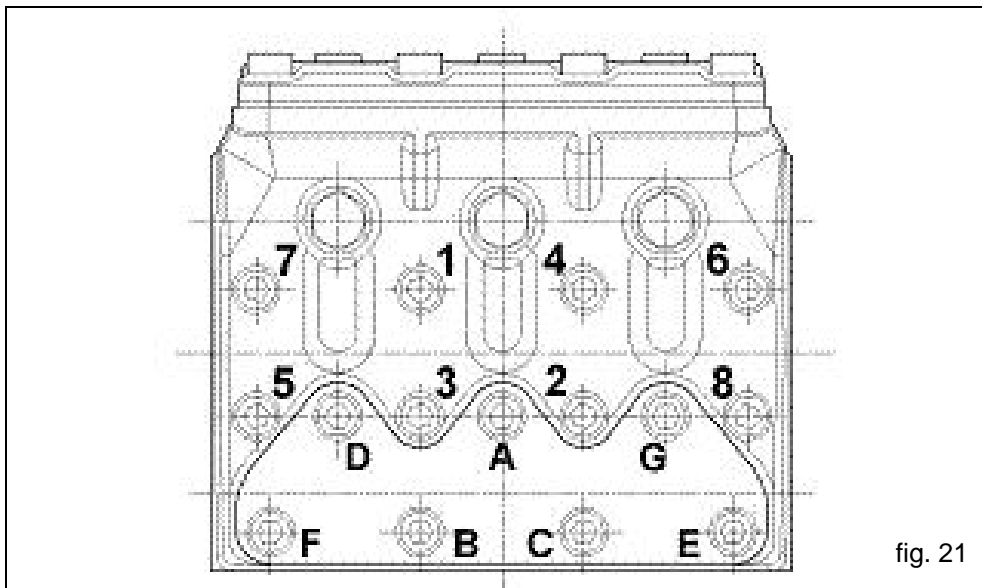


fig. 21



## 4. REPAIR TOOLS

Pump repair may be facilitated by using the apposite tools codified as follows:

### For assembly:

Packing insertion guide H.P. Ø 36x48x8

{ cod. 27465700  
cod. 26406300

Packing insertion guide H.P. Ø 28x45x9

{ cod. 27465800  
cod. 26406300

Pump shaft oil seal stopper

cod. 27904500

Piston guide oil seal stopper

cod. 27904200

### For disassembly:

Suction/delivery valves and seats

{ cod.26019400  
cod.27513700

Piston guide oil seal

{ cod. 26019400  
cod. 27503800



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