

# ACP 28/28 G

# ACP 40/40 G

DRY PRIMARY PUMP



## Technical Reference Manual



Service of Vacuum Pump Systems  
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**adixen**  
by Alcatel Vacuum Technology

## ACP 28/ACP 40 Technical Reference Manual

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Note: In the present chapter, the letter M located at the top of the page indicates that the corresponding section does not exist in the User's Manual.

## Maintenance safety instructions

- The maintenance or the repairing of the pump must only be done by a technician trained by the manufacturer. Center Service address list at the last cover page.



***Before any maintenance operation performed by a technician who has not received safety training (EMC, electrical safety, chemical pollution, etc.), disconnect the pump from main power and nitrogen source before maintenance or repair.***



- ***The pump contains a frequency converter with capacitors. Before any intervention on the electric circuit, wait approximately 3 minutes, after power is removed.***
- ***The leak tightness of the products is guaranteed for normal operating conditions when they leave the factory. It is the user's responsibility to maintain the level of tightness particularly when pumping dangerous gases.***
- ***Before any operation, check the pumping conditions of the installation: toxicity, corrosion, possible radioactivity of pumped gases.***

- To wear gloves, protective glasses and, if necessary, a breathing mask.
- To ventilate the premises well.
- Not to dispose of residue but, if necessary, to have it destroyed by a qualified organization.
- Certain gases can become corrosive and toxic when trapped in oil. Always wear protective gloves when handling used and dirty pump gear oil, drain it into a closable container, and do not breathe the fumes of the oil. Always use a fully self-contained breathing apparatus.
- Always dispose of used dirty oil, or sub-products properly and in compliance with all local, state and federal environmental laws and regulations.

***After a maintenance operation on the pump or on the installation, it is necessary to perform a helium leak-tightness test. The manufacturer can provide specific training to know the tightness test method and supply helium leak detectors. Contact us.***

## Procedure for returning vacuum pumps

### No contaminated pump

- Close the inlet and exhaust pipe with black plastique cap, supply with the pump.

For a best analysis failure of your pump, it is recommended to fill in and send to the Customer Service:

- Safety Questionnaire (see model in **G 30**),
- Analysis Questionnaire (see model in **G 40**).

### Contaminated pump

- Close the inlet and exhaust pipe of the pump with the following connecting accessories (available in manufacturer's catalog):

Accessories	DN 16 ISO-KF	DN 25 ISO-KF	DN 40 ISO-KF
Centering ring with O-ring	068 193	068 189	068 194
Stainless steel blank flange	068 195	068 196	068 197
Clamp	083 333	083 264	087 163

For a best analysis failure of your pump, it is recommended to fill in and send to the Customer Service:

- Safety Questionnaire (see model in **G 30**),
- Analysis Questionnaire (see model in **G 40**).



**Remaining process gases in the pump may cause severe injury or death.**  
**Before removing the pump, keep N2 flow during 15 minutes. (G version).**  
**Nitrogen pressure at the inlet gas pipe, must be around 300 mbar (relative).**



**During pump removal, operator could be in contact with process residues on the exhaust which could cause severe injury or death.**  
**Ask your safety department for instructions according to the local statements.**



# M

Every 22 000 hours

### Maintenance operating chronology




The complete functional block maintenance operation has been broken down into several key steps.

They are described in detail in specific sections which are listed below.














Cover disassembly (STD and G model)	<b>E 30</b>
Cover disassembly (Leak detection model)	<b>E 31</b>
Gas line disassembly* (G model)	<b>E 40</b>
Gas line disassembly (Leak detection model)	<b>E 41</b>
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Functional block disassembly	<b>E 70</b>
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Filling with oil	<b>E 60</b>
First running and checking	<b>E 150</b>
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Silencer reassembly	<b>E 50/51</b>
Cover reassembly	<b>E 30/31</b>

\* Only for ACP 28 G / ACP 40 G models.

## Maintenance operating chronology

- Tools required**
- Complete maintenance kit  **F 10**
  - Part and materials required for maintenance  **F 30**
  - Recommended standard tools  **F 40**

### Icons used

-  Hexagonal key 2.5 mm  
(included in the specific tool kit)
-  Hexagonal key de 3 mm
-  Hexagonal key 4 mm
-  Hexagonal key 5 mm
-  Hexagonal key 8 mm
-  Open-end wrench 7, 14, 17 and 30 mm
-  Angled open-socket of 8 mm
-  Screwdriver for slotted-head screws
-  Special tool (included in the tool kit)
-  Philips screwdriver
-  Round-nose pliers
-  Multigrip plier
-  Ball bearing extractor

## Cover disassembly and reassembly (STD and G model)



*Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).*

### Spare part list

F 100

### Disassembly procedure

- Isolate the pump from the main: place the main power switch on "0" position.
- Disconnect the main power connector and remove the cable and its clip.
- Disconnect the variator cover plug (69).
- Remove the washers (146) and (148) around inlet and exhaust port, and the spray washer (147) (only for G model).
- Remove the two hoisting rings equipped with their spacers (33) and (34).
- Unscrew the 4 CBLZ M5-10 screws (149).
- Remove the upper cover (144).
- Disconnect the ground wire from the base (clip connector).
- Turn the pump on its side (oil sight glass towards operator). (see diagram on following page).
- Unscrew the 3 CHc M6-8 screws (153).
- Remove the low cover (150).
- Disconnect the 2 sensor connectors (on the stators) to facilitate the pump draining (see page 2/3).



**Gaz line disassembly/reassembly**  
(G model)

E 40

**Silencer disassembly/reassembly**  
(STD and G model)

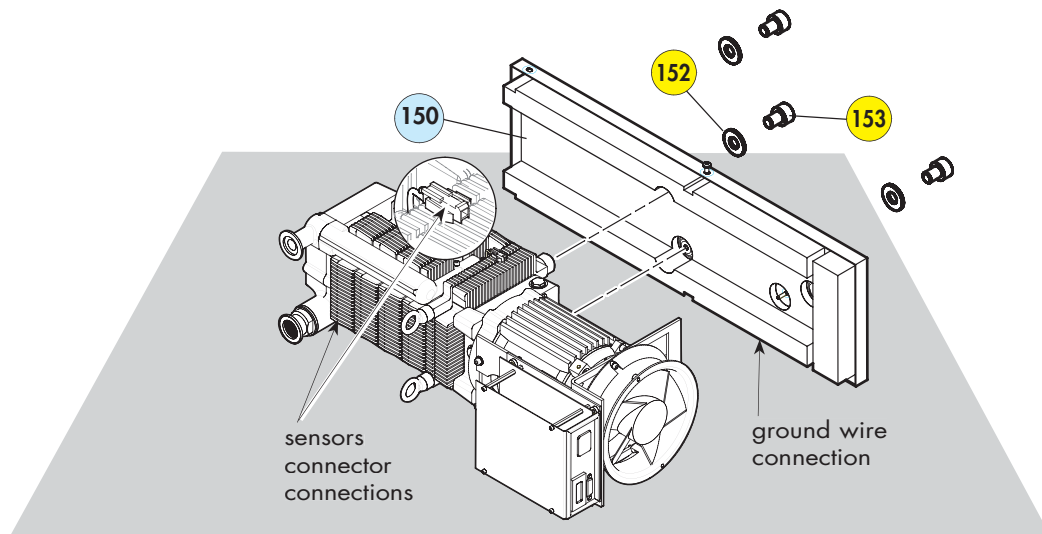
E 50

## Cover disassembly and reassembly (STD and G model)

### Reassembly

- Turn the pump on its side (oil level sight glass towards operator).
- Connect the 2 sensor connectors on the stators.
- Approach the lower cover (150) in front of the assembly holes.
- Install the 3 washers (152) and secure with the 3 CHc M6-8 screws (153) (clamping torque 6 N.m).

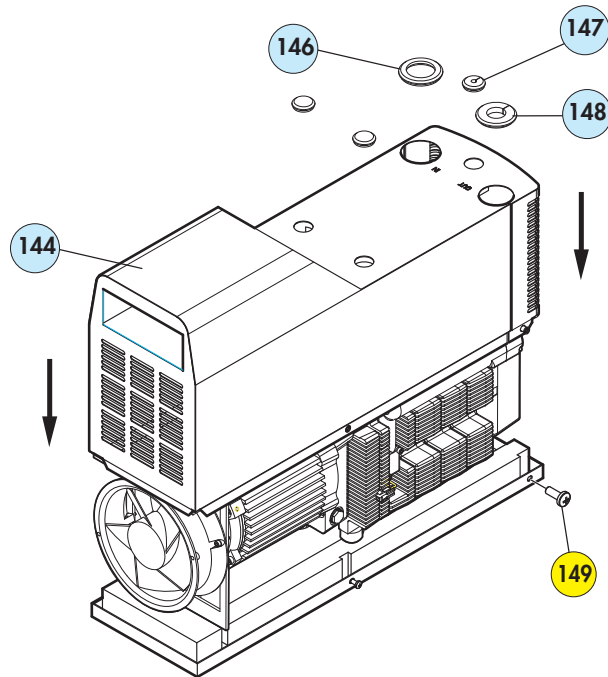
5



- Turn the pump base side down..
- Connect the ground wires to the base (clamping torque for the nut (173): 6 N.m).
- Put the upper cover (144) on the pump.
- Fasten the 4 screws CBLZ M5-10 (149) (clamping torque 3 N.m).
- Reinstall the hoisting ring equipped with their spacers (33) and (34).
- Install the washer (146) and (148) around inlet and exhaust, and the spray washer (147) on gas line port (on G model).
- Connect the variator plug connector (69) delivered with the pump.
- Reconnect the main power connector and put the clip back in place.



## Cover disassembly and reassembly (STD and G model)



Installation / Operation

chapters B and C

## Cover disassembly and reassembly (ACP 28 leak detection model)



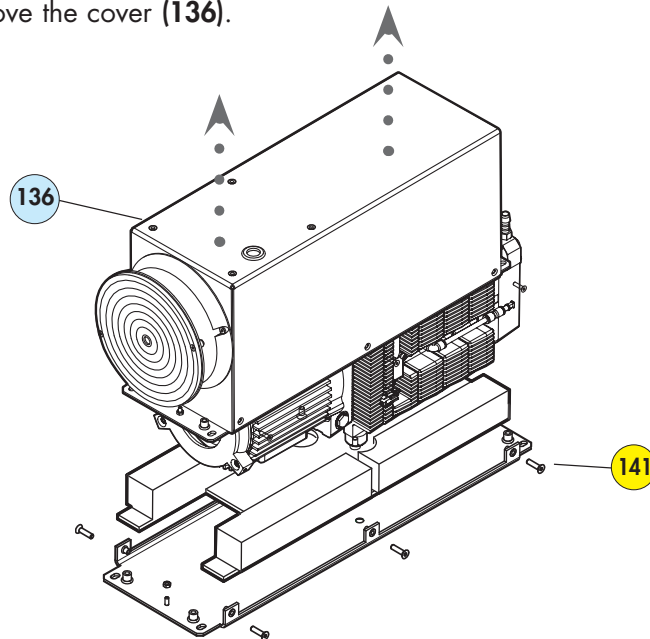
*Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).*

### Spare part list

F 100

### Disassembly procedure

- Disconnect the inlet from the pipe line.
- Disconnect the motor main connector and the sensor connector from the variator.
- Unscrew the pump assembly screws from the detector.
- Remove the pump from the detector.
- Unscrew the 6 FHc M4-16 screws (141).
- Remove the cover (136).



- Disconnect the ground contacts and all the electrical connections.
- Turn the pump on its side (oil sight glass face to the operator).



- Unscrew the 2 screws FHc M6-12 (142).
- Remove the base (140).
- Disconnect the 2 sensor connectors (on the stators) to facilitate the gearbox draining (see page 2/2).

## Cover disassembly and reassembly (ACP 28 leak detection model)

**Gas line disassembly/reassembly**  
(leak detection model)

**E 41**

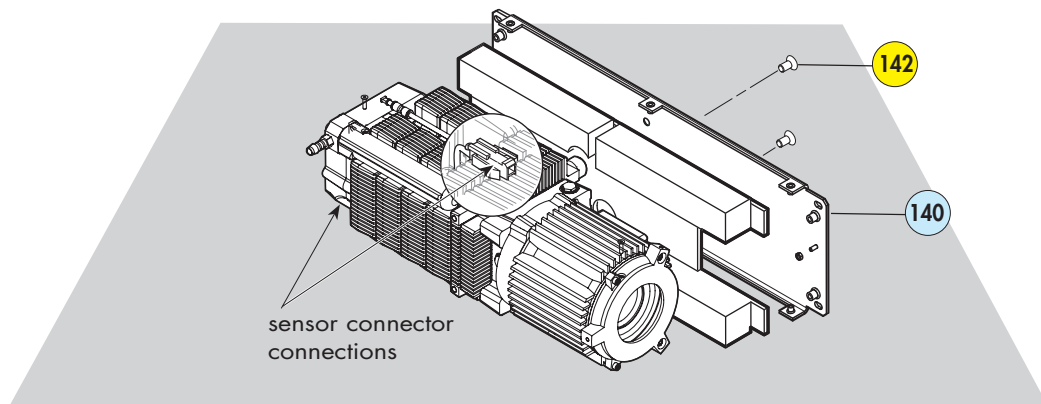
**Silencer disassembly/reassembly**  
(leak detection model)

**E 51**

### Reassembly procedure

- Connect the 2 sensor connectors on the stators.
- Turn the pump on its side (oil level sight glass towards operator).
- Approach the base (140) in front of the assembly holes.
- Screw the 2 screws FHc M6-12 (142) (clamping torque 6 N.m).

5



3

7

- Turn the pump base side down (diagram page 1/2).
- Connect the ground wires to the base and all the electrical connections.
- Put the upper cover (136) on the pump.
- Fasten the 6 screws FHc M4-16 (141) (clamping torque 3 N.m).
- Install the pump in the leak detector and secure it.
- Reconnect all electrical connections.
- Connect the pump inlet to the pipe line.

3

**Installation / Operation**

**chapters B and C**

## Disassembly and reassembly of the gas line (G model)

### Spare part list

F 70 / F 75

### Gas line disassembly

- The gas line is equipped with three anti-suckback valve equipped with jets:
  - 2 jets dia. 0.08 mm (one after the other) in the anti-suckback valve **(103)** on the injection plate **(109)** or **(109a)**.
  - 1 jet dia. 0.3 mm in the anti-suckback **(91)** installed on the bearing block support **(115)**.
  - 1 jet dia. 0.3 mm in the anti-suckback valve **(111)** installed on the transfer stator HP **(90)**.

For the anti-suckback replacement, proceed as follows:

- Unscrew the 2 screws CHc M3-8 **(92 or 106 or 112)** on the purge cover.
- Screw a dia. 6 mm stator screw into the anti-suckback or use a round-nose plier, to remove the equipped anti-suckback from its hole.
- Replace the anti-suckback of a new one.



### Silencer disassembly/reassembly (STD and G model)

E 50



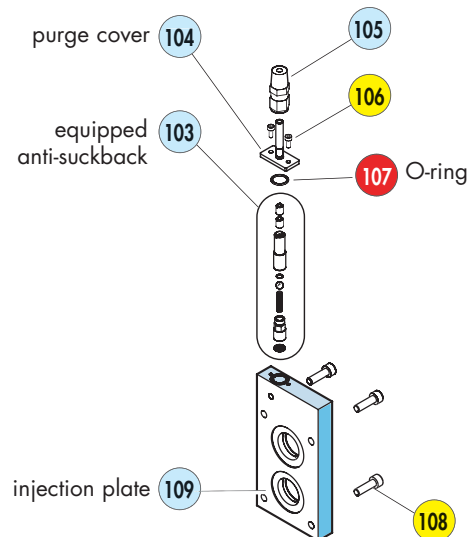
## Disassembly and reassembly of the gas line (G model)

### Gas line reassembly

- Install an anti-suckback valve into its housing.
  - the longer anti-suckback valve (103) is installed in the injection plate (109);
  - the others, shorter (91 and 111) are installed into the bearing block support and the transfer stator HP.
- Install a new O-ring C1,5 D11 (94, 107 and 113a) respectively in the stator, the injection plate and the bearing block support.
- Install on each anti-suckback a purge cover and secure with 2 screws CHc M3-8 (clamping torque 1 N.m).



**Example:**  
Equipped anti-suckback valve on injection plate (ACP 28 G)

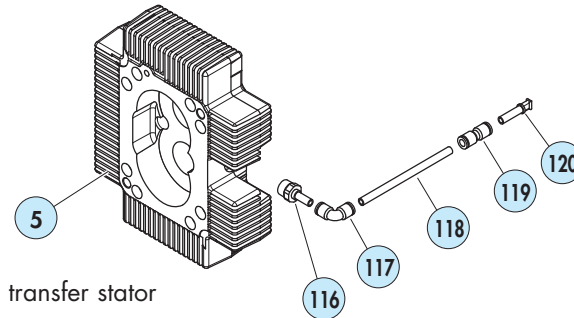


**Cover disassembly and reassembly**  
(STD and G model)

E 30

## Disassembly and reassembly of the gas line (ACP 28 leak detection model)

### Gas line disassembly



- Unscrew the right adaptor connector (116) and remove the gas line from the stator (5).
- Disassemble the line and clean the parts with compressed air.
- Fit the gas line (116 to 119) and seal it with the plug (120) enclosed in the tool kit (tool 9a).

**Silencer disassembly/reassembly**  
(Leak detection model)

**E 51**

### Gas line reassembly

- Screw the right adaptor connector of the line on the transfer stator (5).



**Cover disassembly/reassembly**  
(Leak detection model)

**E 31**

## Silencer disassembly/reassembly (STD and G model)

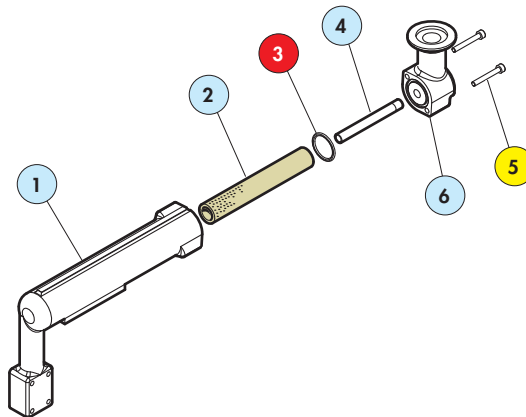
### Spare part list

F 90

### Filter replacement

- Unscrew the 2 screws CHc M4-30 (5) from the flange (6).
- Disassemble the inside pipe + flange (4 and 6).
- Replace the cartridge (2) if it's necessary.
- Replace the O-ring (3) and assemble the flange with the 4 screws CHc M4-30 (5).

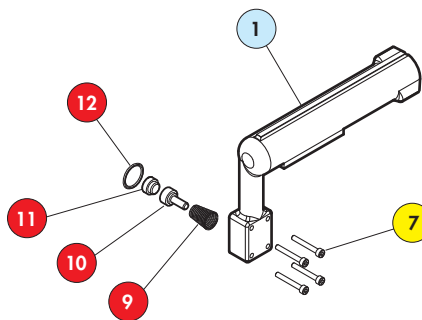
3



### Complete disassembly

- Disassemble the silencer body (1) by unscrewing the 4 screws CHc M4-30 (7).
- Remove the valve support (10), the valve (11), the spring (9) and the O-ring (12).

3



### Gearbox draining/filling

E 60

## Silencer disassembly/reassembly (STD and G model)

### Reassembly



- Install a new cartridge (2) in the body (F 90).
  - Secure the assembly flange + inside pipe (6 and 4) + O-ring (3) on the silencer body with 2 screws CHc M4-30 (5).
  - Install a new valve (11) into the valve support (10).
  - Position a O-ring (12) on the silencer.
  - Install the valve support equipped with a new spring (9) into the silencer body.
- 3 ■ Secure the assembly on the exhaust stator (1) using 4 screws CHc M4-30 (7).

**Disassembly and reassembly of the gas line**  
(G model)

**E 40**

**Cover disassembly and reassembly**  
(STD and G model)

**E 30**

## Silencer disassembly/reassembly (Leak detection model)

### Spare part list

F 90

### Filter replacement

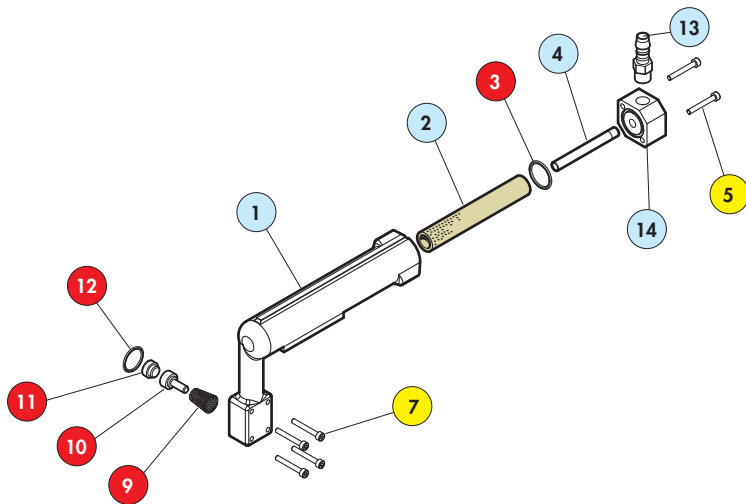
3

- Unscrew the 2 screws CHc M4-30 (5) from the silencer flange (14).
- Disassemble the inside pipe + the flange (4 and 14).
- Replace the cartridge (2) if it's necessary.
- For an overhaul, replace the O-ring (3) on the silencer flange (14) and proceed as follows:

### Complete disassembly

3

- Disassemble the body of the silencer (1) by unscrewing the 4 screws CHc M4-30 (7) from the valve support.
- Remove the valve support (10), the valve (11), the spring (9), and the O-ring (12).



### Gearbox draining/filling

E 60

## Silencer disassembly/reassembly (Leak detection model)

### Reassembly



- Install a new cartridge (2) in the body (F 90).
  - Secure the assembly flange + inside pipe (14 and 4) + O-ring (3) on the silencer body with 2 screws CHc M4-30 (5).
  - Install a new valve (11) into the valve support (10).
  - Position a O-ring (12) on the silencer.
  - Install the valve support equipped with a new spring (9) into the silencer body.
- Secure the assembly on the exhaust stator (1) using 4 screws CHc M4-30 (7).

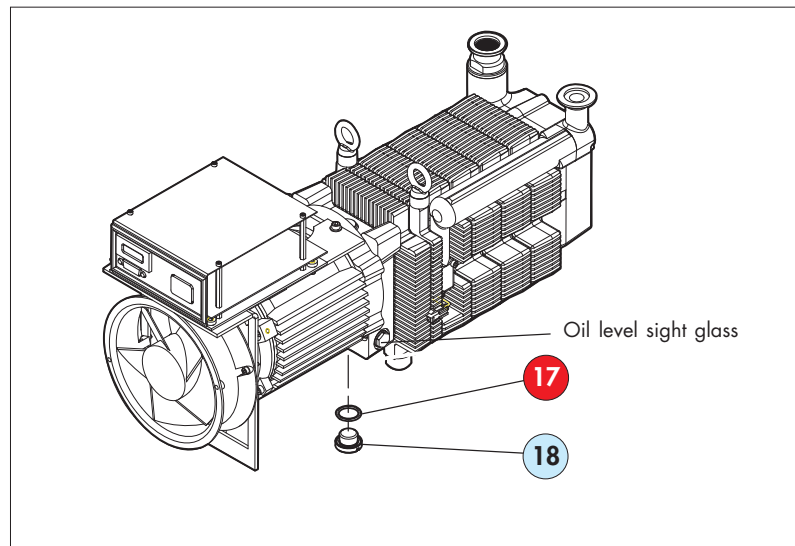
**Disassembly and reassembly of the gas line**  
(Leak detection model)

**E 41**

## Gearbox draining/filling



*Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).*



### Oil draining

- Rock the pump on its side.
- Untighten and remove the draining plug (18) with its O-ring (17).
- Position the functional block over a tray to recover the used oil.
- After the pump has been completely drained, refasten the draining plug correctly, replacing the used O-ring by a new one.

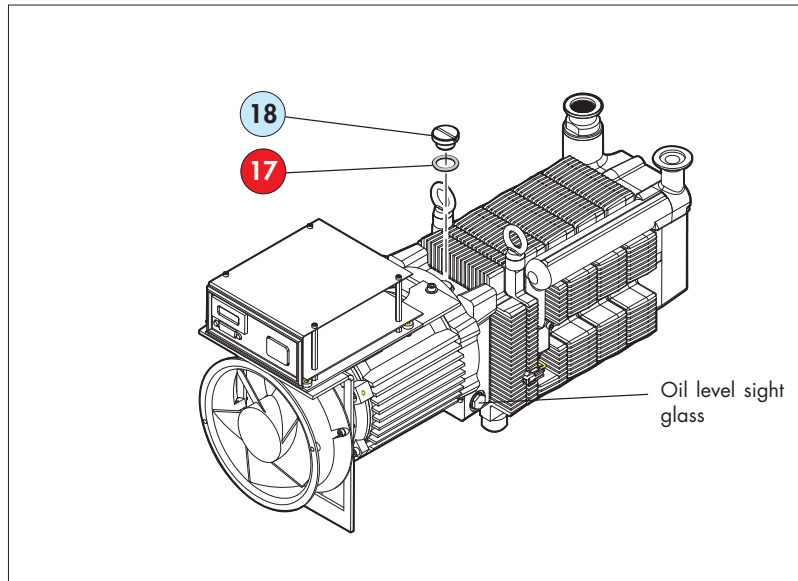


**Functional block disassembly**

**E 70**

## Gearbox draining/filling

### Filling with oil

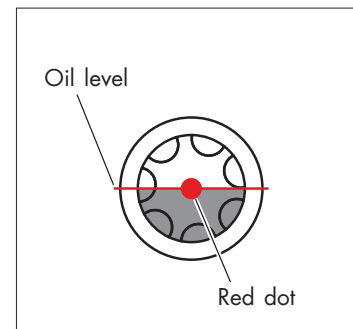


- Remove the oil filling (18) and the O-ring (17).
- Fill with the oil load: 25 cm<sup>3</sup>.



**FOMBLIN A113 included  
in the complete maintenance  
(see part number F 30).**

- When the pump is perfectly horizontal, the oil level should be as shown in the diagram opposite.
- Install a new O-ring (17) on the filling port.
- Refasten the filling plug.



**Running-in and tests**

**E 150**



## Functional block disassembly



**Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).**

Refer to sections **F 50**

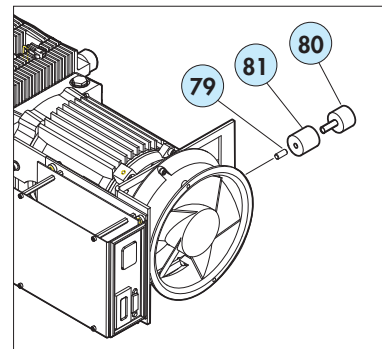
### Tools required

- Recommended standard tools **F 40**.
- Tool kit **F 10**.

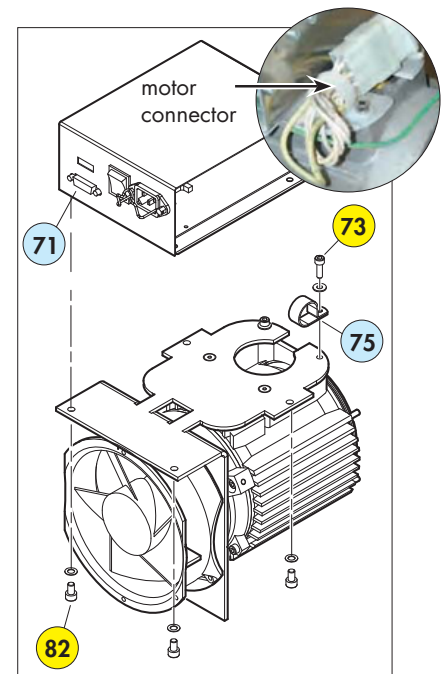
### Variator disassembly



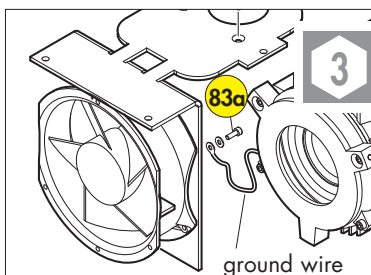
- Turn the pump on its side.
- Unscrew and remove the damper (80) + motor support (81).
- Recover the headless screw (79) located in the hole of the damper.



- Turn the pump base side down.
- Unscrew the screw (73) maintaining the cable clamp
- Disconnect the motor connector.



- Unscrew the 4 screws CHc M6-10 (82) maintaining the variator.
- Disconnect the fan connector and the temperature sensors.
- Unscrew the screw CHc M4-12 (83a) from the ground wire.
- Remove the variator (71).



## Functional block disassembly

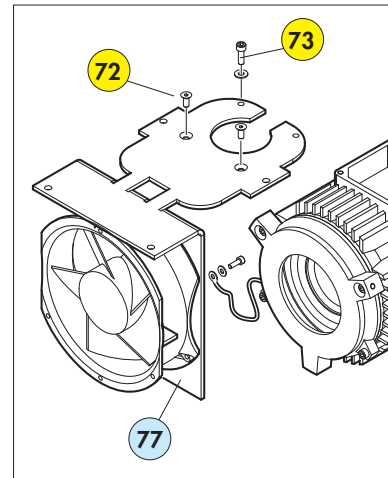
### Variator disassembly (continued)

4

■ Unscrew the screw CHc M5-16 (73) of the motor ground wire.

■ Unscrew the 2 screws (72) of the motor/variator support (77).

■ Remove the variator support (77).

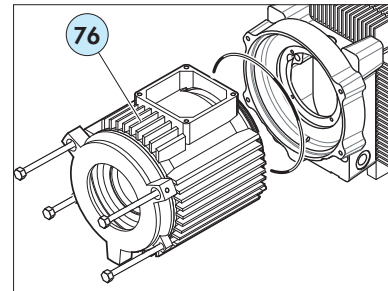


### Motor disassembly

8

■ Untighten the 4 tie rods on the motor and remove the stator (76) carefully so as not to damage the inner pump jacket.

Remove the O-ring. Keep it for reassembly.

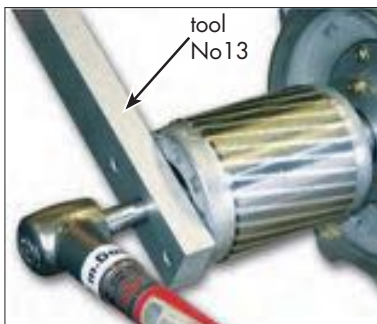
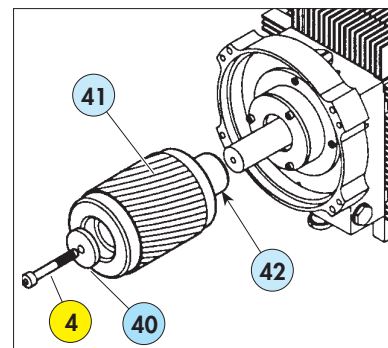


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■ Untighten the central screw (4) and remove the washer (40) and the rotor (41).

To lock the shaft, hold the rotor body using the spanner wrench (tool n° 13).

Remove the rotor and the motor spacer (42).



## Functional block disassembly

### Oil casing disassembly

3

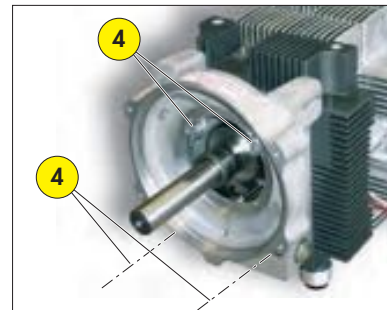
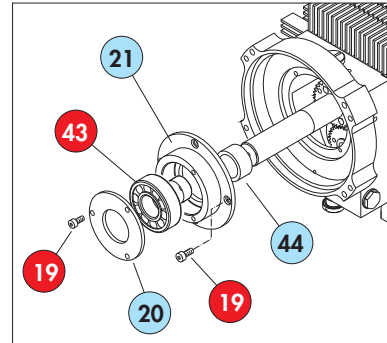
■ Untighten the 3 screws (19) from the flange (20).

■ Untighten the 4 screws (19), extract the bearing housing (21). The outside bearing ring (43) and the roll move with the bearing housing.

■ Remove the inside bearing ring (43) and pull of the spacer (44).

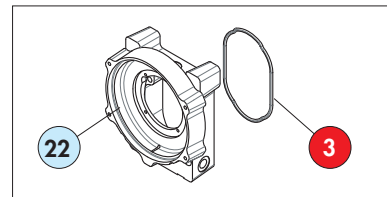
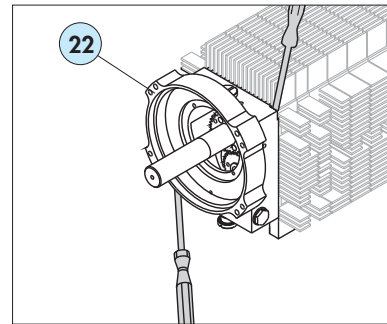
5

■ Unscrew the four gearbox assembling screws (4).



■ Release the gearbox casing (22) using 2 screwdrivers inserted in the provided as levers. (take care not to mark the seal bearing surface). For the subsequent stages of the functional block, place the screwdriver between the vanes next to the centering pins.

■ Remove the gearbox casing and remove the O-ring (3).



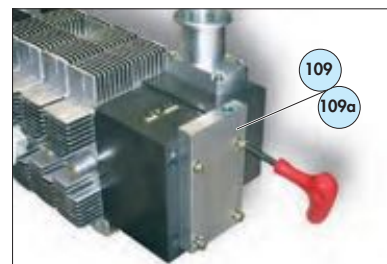
### Injection plate disassembly (except ACP 28 model)

5

■ Unscrew the connecting gas nipple (105) if it has not been removed **E 40** (Gas model only).

■ Remove the injection plate (109) or (109a).

■ Remove the O-ring (101) and (102).



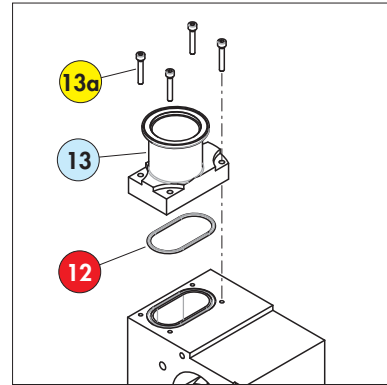
## Functional block disassembly

### Inlet port disassembly (ACP 40 / ACP 40 G Model)

■ Unscrew the 4 screws (13a)  
CHc M4 x 20.

■ Remove the inlet fitting (13)  
and the O-ring (12).

This operation is necessary if the  
inlet stator must be changed and  
cleaned.

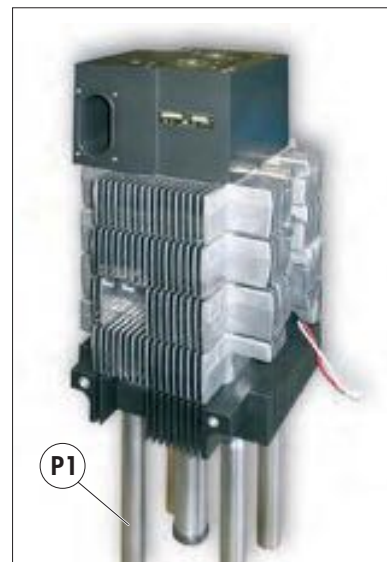
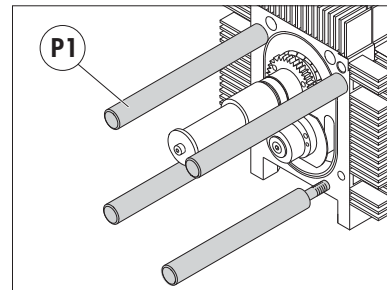


### Rods assembly

■ Fit manually the 4 assembly  
rods (P1) (tool No 15) on the  
ball bearing support.

**S**

■ Tilt the machine vertically,  
placing the driving shaft  
towards the operator.



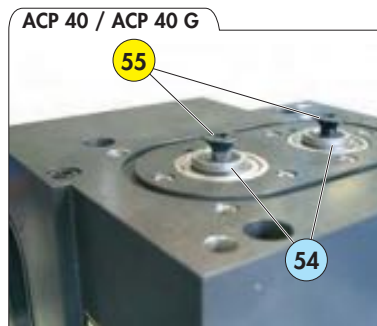
## Functional block disassembly

### Inlet stator disassembly (ACP 40 / ACP 40 G Model)

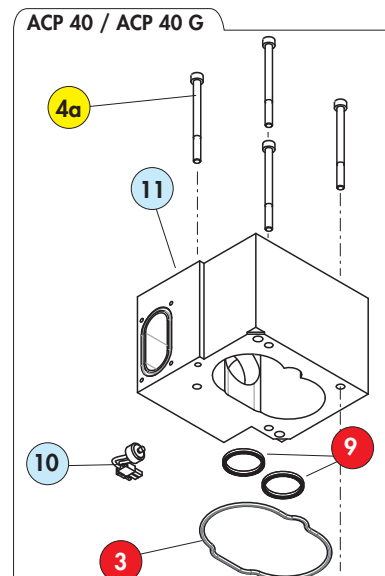
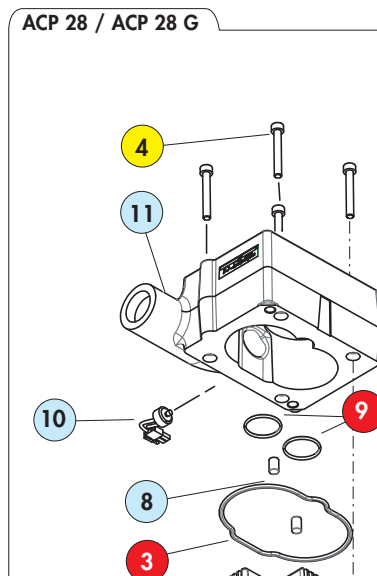
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Position the gear sector in contact with the gears to avoid the shaft rotation.

- Unscrew the two screws (55) at the end of the shaft, remove them and their washers (54).
- Unscrew the 4 screws CHc M6-80 (4a) of the inlet stator (11).



- All models**
- Unscrew the 4 screws CHc M6-45 (4) of the inlet stator (11).
  - Remove the inlet stator (11), the O-ring (3), and the centering ring (8).
  - Remove the 2 O-ring (9) of the bearings on ACP 28 model.
  - Unscrew the temperature sensor (10) if the inlet stator (11) must be changed and cleaned.



## Functional block disassembly

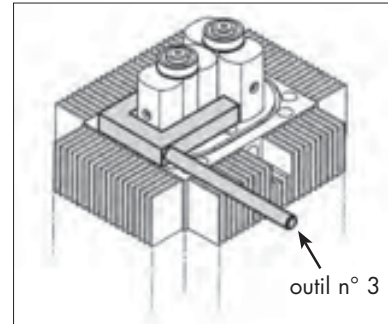
### LP bearing disassembly

ACP 28 / ACP 28 G Model



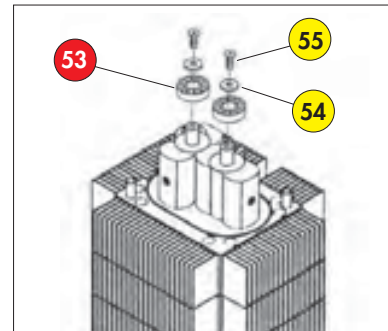
■ Unscrew the 2 FHc M6x12 shaft end screws (55), extract the two washers (54) and the two bearings (53).

■ To untighten the screws, the rotor locking tool may be used (tool n°3).



ACP 40 / ACP 40 G Model

■ Remove the bearing (53) and the O-ring (9).



### Lobes disassembly on one stage

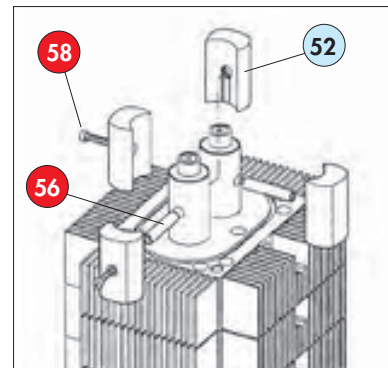


ACP 40 / ACP 40 G Model

■ Untighten the screws (58) from the lobes.

■ Remove the lobes (52) and the two worked pins (56)

The inlet stage includes 2 lobe stacking : remove also lobes (51).



*To easily reassemble the stators, it is recommended to mark them and store them successively in the order of disassembly. The HP transfer stator (5) has two notches but the LP1 stator (7) hasn't.*

## Functional block disassembly

### LP1 transfer stator disassembly

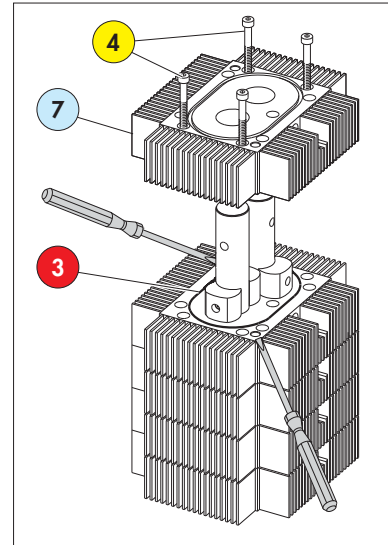


■ Untighten the 4 attachment (4) and remove the LP1 transfer stator (7) equipped with its 2 centering pins (2).

In the event of a disassembly problem: position 2 screwdrivers inserted next to the centering pins between the vanes.

■ Remove the O-ring (3) between the stators.

■ Remove the O-ring (95) on ACP 28 G, ACP 40 and ACP 40 G models.



### Disassembly of subsequent stages

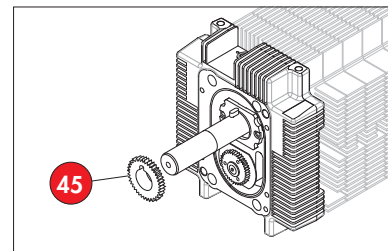
■ Repeat the lobe and stator disassembly operation in the same way for each stage, finishing with the disassembly of the exhaust stage lobes (1).

### Driving gear disassembly



■ Install the pump in horizontal position and remove the rods.

■ Pull the driving gear (45) with the extractor ( F 40).





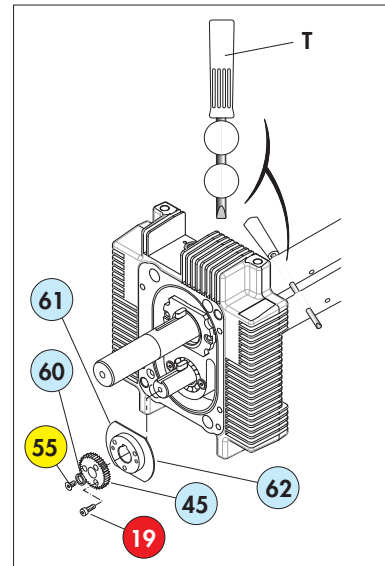
## Functional block disassembly

### Driven gear disassembly



■ Position a screwdriver (T) on the driven shaft to block its rotation (into the holes nearest of the stator).

■ Untighten the central screw (55), remove the washer (60) and remove the driven gear assembly (45) and lubrication plate (62) with the extractor.



*Take care to damage the lubrication plate.*



■ Untighten the 3 screws (19) securing the gear (45) on its ring (61).

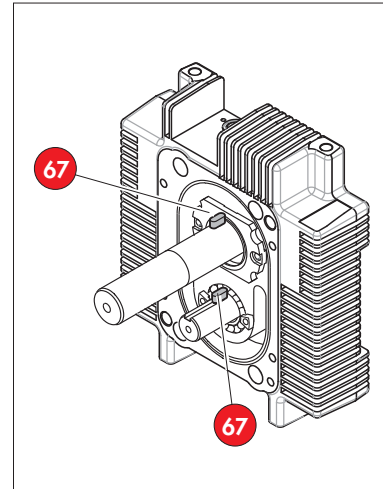
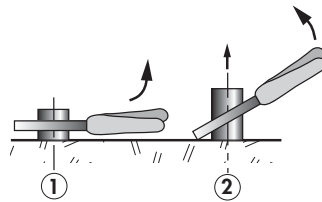


## Functional block disassembly

### Shaft disassembly

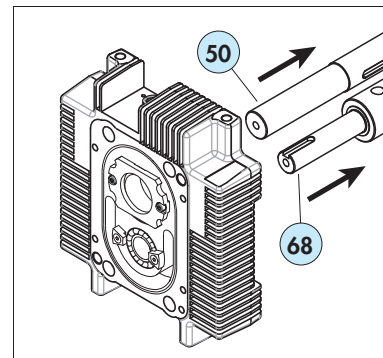
■ Remove the keys (67) (e.g. using a wire cutter) and throw them (news keys are included in the complete maintenance kit).

Grip and lift



**Do not mark the shaft. If not, fill up the line.**

■ Remove the driving shaft (50) and the driven shaft (68).



## Functional block disassembly

### HP bearing disassembly

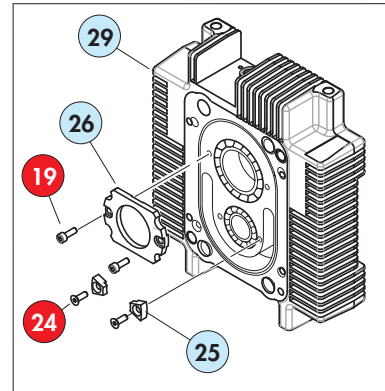
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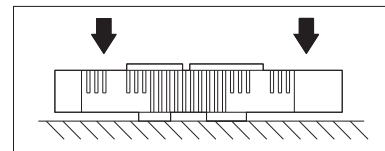


**Do not extract the 2 centering pins tightened on the bearing bloc support (29).**

■ Untighten the 4 screws (19) and (24) then remove the 2 flange sectors (25) and the flange (26).

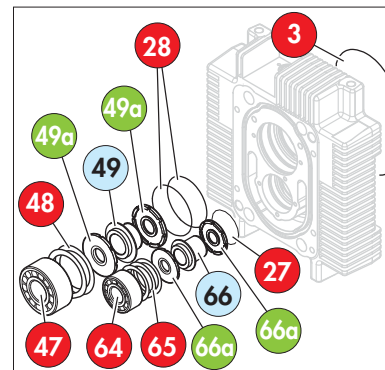


■ Lay the bearing support flat on the work surface, resting on the deflectors.



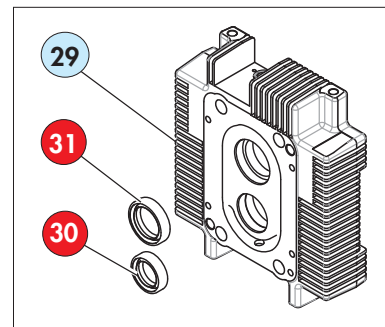
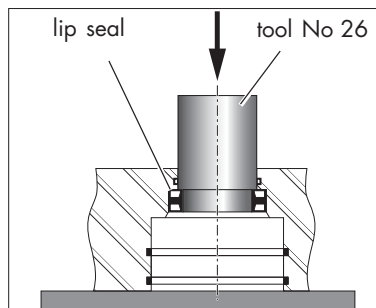
■ Press firmly to extract the bearings.

■ Remove the 2 bearings (47) and (64), the Borelly washers (48) and (65), the 2 dynamic deflectors (49) and (66), the 4 static deflectors (49a) and (66a).



■ Remove the O-rings (28) and (27) in the bearing housings and the O-ring (3).

■ Extract the lip seals (31) and (30) from the bearing bloc support (29) or (115) with tool No.26.




**Cleaning and preparation of spare parts E 80**

## Cleaning and preparation of spare parts



**Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).**

### Tools required

Spare parts and materials required (  F 30).

### Choice of solvents to be used for cleaning

The cleaning products used will be different according to the pumped gases and the condition of the parts: use mineral based solvents in compliance with current legislation. Use the appropriate industrial washing products.



**Do not use industrial washing solution.**

#### ■ For the parts:

- bearing support,
- stators, lobes,

observe the surface: in case of tiny roughness, grind lightly the flat surface, in case of too much important roughness, replace the damaged part. Clean all the surfaces with alcohol. Dry the parts with compressed air or in the air.

#### ■ For the parts:

- driving gear ring,
- deflectors,
- gear set,
- driven gear ring,
- lubrication plate,
- bearing flange,
- bearing housing,
- spacer,

grind if needed the functional surfaces, fill up the line, to remove the grease from the parts, dry them to compressed air or in the air.



Grind if needed the functional surfaces

## Cleaning and preparation of spare parts

■ Case of bearing on motor side:



*You must degrease the ball bearings before greasing them again with the same oil as thus filled in the pump. Avoid to keep any traces during cleaning.*

You must degrease the ball bearings before greasing them again with the same oil as thus filled into the pump.



*During ball bearing preparation, avoid to turn them: rotation without lubricant may damage them.*



*All the parts should be manipulated with care to avoid to soil or score them. Store them on a clean and flat surface.*

Instructions before reassembly

E 90

## Instructions before re-assembly



*Before any intervention, the user must study the safety instructions and the precautions for maintenance (see E 00).*



*The set value for the setting of the lobes and the synchronisation are available for a temperature between 20°C and 25°C. According to this note, reassemble the pump in a place where the temperature is between 20°C and 25°C.*



*Before any reassembly, the parts should be stored at less one hour between 20 and 25°C.*

**Tools required** Refer to the section **F 40**.

### Preparation before reassembly

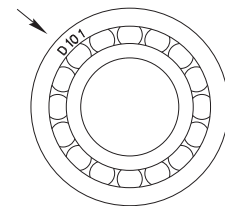
- Dispose on the desk all the cleaned parts and lubricated (see section **E 80** for cleaning).
- Replace the used parts by the news ones taken into the complete maintenance kit (see **F 10**).
- All the new O-rings should be lubricated during the re-assembly either with vacuum grease, either with **D 101** grease (indicated in the re-assembly instructions). For a better efficiency, stretch them very lightly to accord them to take place tightly on their groove.

**The lubrication should be really clean and light. Avoid as possible to put grease on the supporting parts.**

Single row ball bearing.  
The bearings are supplied lubricated and ready for use.

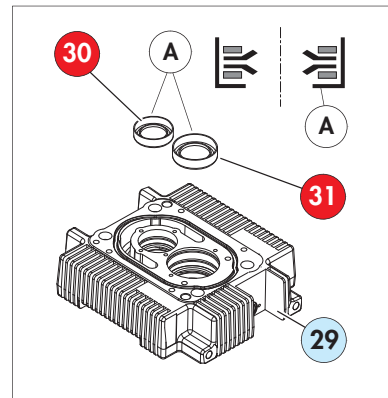
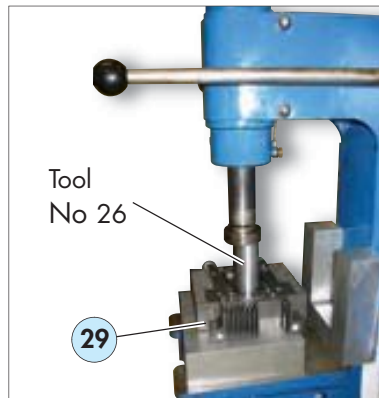
Check the D101 mark which is a guarantee.

D101



## Shaft reassembly

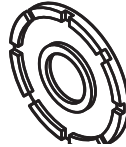
- Lip seals assembly** ■ Fit the lip seals (30) and (31) in the bearing bloc support (29) with the tools (No.26 and 27) (see F10) using a bench screw (Force 1.5 N).



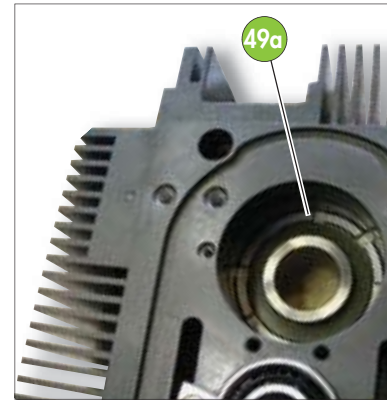
**Take care with the direction of assembly:  
(face A) directed towards exhaust stage.**

## Shaft reassembly

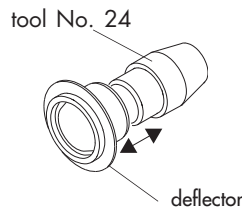
### Deflector assembly



■ Put the bearing bloc support (29) down on the workbench. Position the static deflectors (66a) and (49a) with the notches facing the operator.



**S**

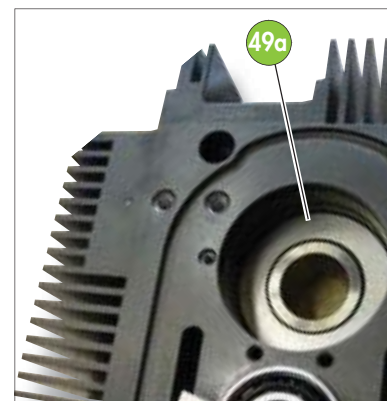
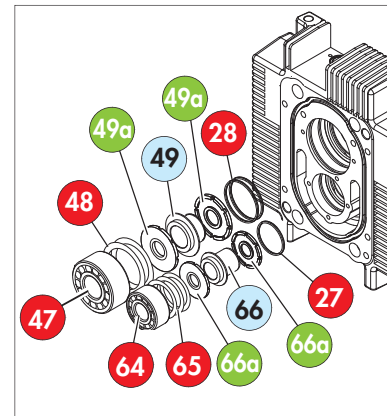


■ Using the sleeves (tool No. 24) insert the deflectors (49) and (66) in the bearing support.

■ Put the static deflectors (66a) and (49a) with notches not visible from the operator.

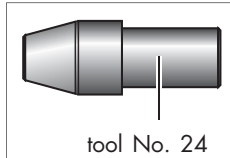
■ Grease (D101grease) and position the new O-rings (27) and (28) (included in the maintenance kit).

■ Position the 2 Borrelly washers (48) then the 3 Borrelly washers (65) in the housing, making sure that the washers **are correctly centered**.

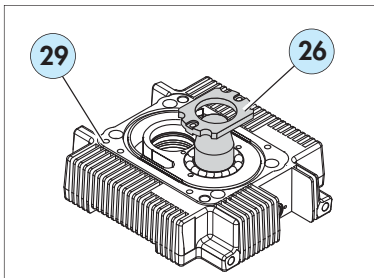


## Shaft reassembly

### Ball bearing assembly



**S**



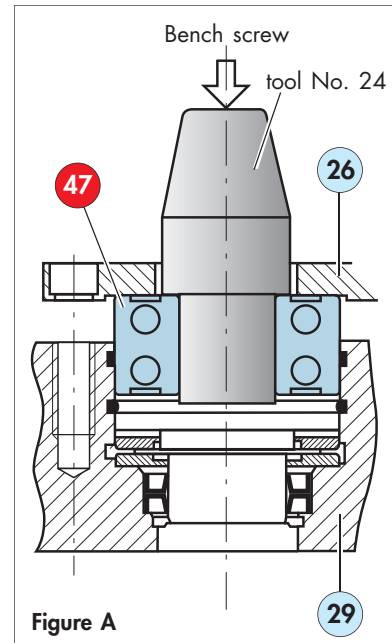
■ Grease generously the ball bearing outer ring (47) and (64) with D101 grease (white tube of grease included in the maintenance kit).

■ Insert the new bearings (47) and (64) in their housing, orienting their flange on the deflector side.

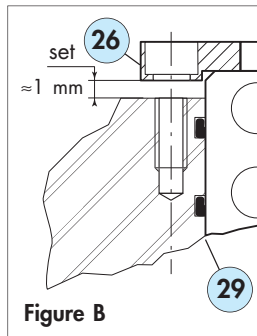
Take tools No. 24, use the bench screw:

■ In the inner ring of the bearing (47) insert tool No. 24 as shown in **figure A**.

■ Fit the flange (26) on the ball bearing: use the bench screw to press the bearing in stop.

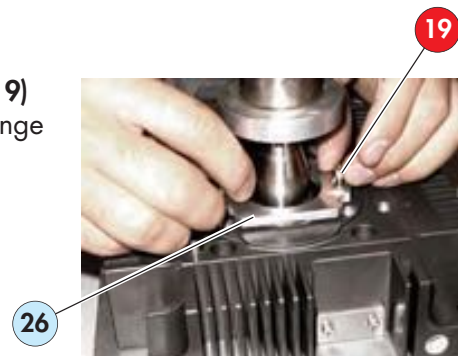


■ Then release the pressure, the ball bearing moves lightly from  $\approx 1$  mm (see **figure B**).



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■ Fit the two M4-12 CHc (19) (3 N.m), and tighten the flange (26).

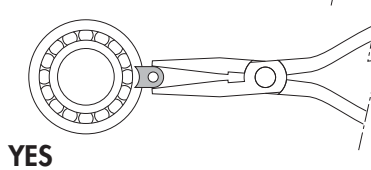
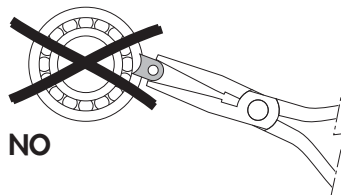
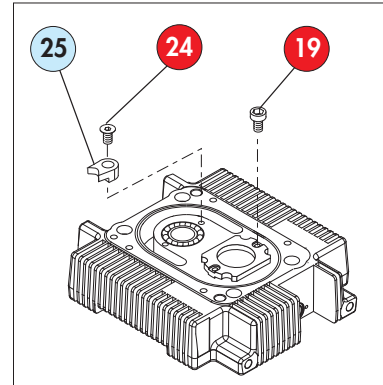




## Shaft reassembly

2,5

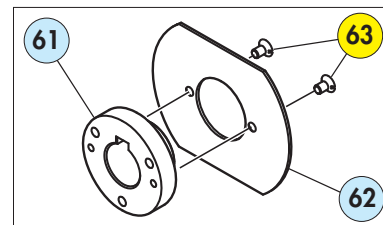
■ Proceed in the same way for the second bearing (64) and tighten the 2 flange sectors (25) with the two M4-12 FHC (24) (3 N.m), (screws included in the maintenance kit).



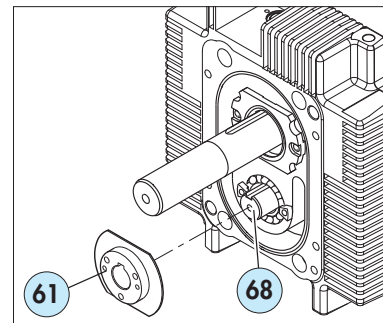
### Shaft and driven gear assembly

■ Insert the shafts (50) and (68) in the support. Tilt the assembly horizontally.

■ Install the driven gear ring (61) equipped with the lubrication plate on the driven shaft (68). Put the key groove of the gear support in correspondance with the driven shaft (68).



■ Position and secure the lubrication plate (62) on the driven gear ring (61) using the two screws CS M3 (63) (1 Nm)



**The lubrication plate doesn't have to be deformed : there is a risk of lubrication bad operating, or pump deterioration.**

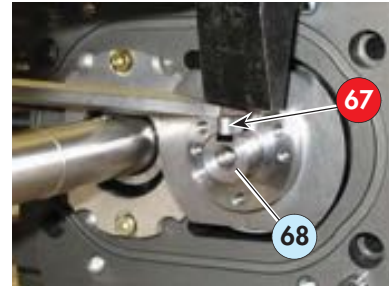
## Shaft reassembly

### Shaft and driven gear assembly (continued)



tool No 25

- Position the key (67) on the driven shaft (68) using a small hammer and by protecting the key (i.e. using a screwdriver) to avoid any destruction.



- Lock the driving shaft by inserting in a hole, a screwdriver (T). For this operation, choose the hole nearest of the support.



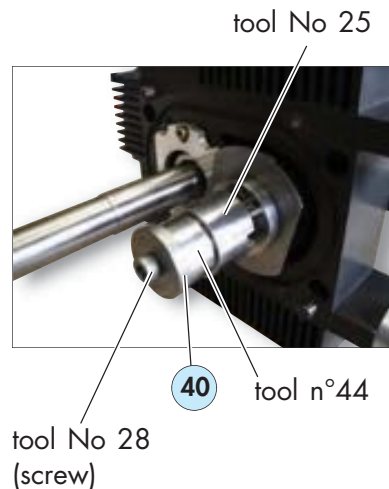
- Position the tool No 25 + spacer No 44 and washer (40) on the driven shaft (68), then tighten the screw No 28 (included in the maintenance kit).

- Unscrew the screw, remove the tool (No 25 + No 44), then change its position from - 1/4 of turn.

- Tighten again the screw clamping torque 4 Nm.

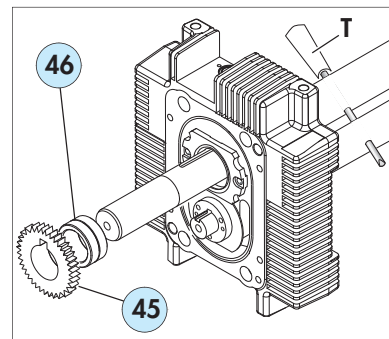
- Remove the chips done by the key.

- Remove the assembly tool No 25 + No 44 + (40) + the screw No 28.



### Driving gear assembly

- Install the ring (46) on the driving shaft and slide the driven gear (45) on the driving shaft. The 2 marks must be face to the operator



## Shaft reassembly

### Driving gear assembly (continued)

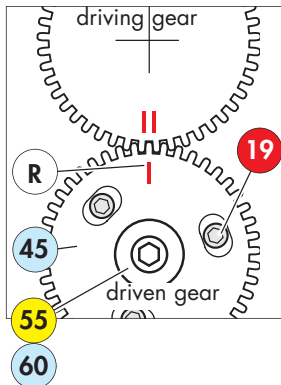
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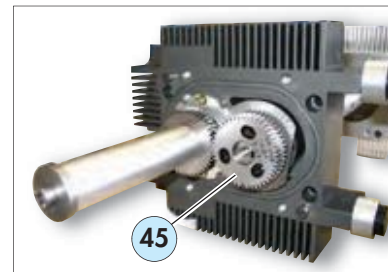
- Position the key (67) on the driving shaft using a small hammer and by protecting the key.
- Install the following assembly: tool No 18 + washer (40) and tighten with the screw No 28 included in the maintenance kit (clamping torque 14 Nm) to make slide the key under the gear.
- Remove the assembly.
- Remove the chips done by the key.

### Axial shaft positioning

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- The driven shaft is locked in rotation by a screwdriver (T). Install on a driven shaft the driven gear (45) indexing the tooth marks (R).

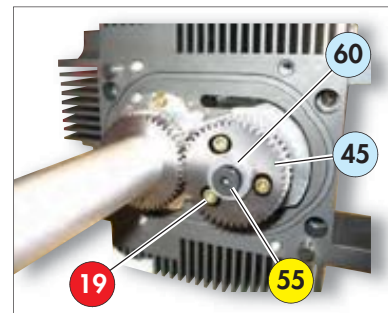


- Align the holes of the driven gear (45) with the holes on the ring (61): the holes must be centered.

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- Secure the gear with three screws M6 x 12 CHc (14 Nm) (19).
- Install the washer (60) and the screw (55).

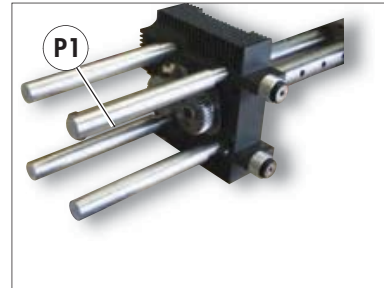


## Shaft reassembly

### Rods installation

- Fit manually the 4 assembly rods (P1) on the frame support.

S



- Tilt the machine vertically, placing the driving shaft towards the operator.
- Turn the shaft manually.
- Make sure the shafts are free of suspect frictions : the only sensitive is induced by the lip seals. The resistance is stronger for the driving shaft.

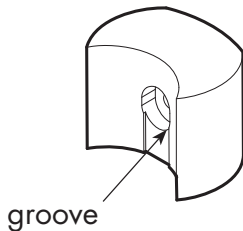
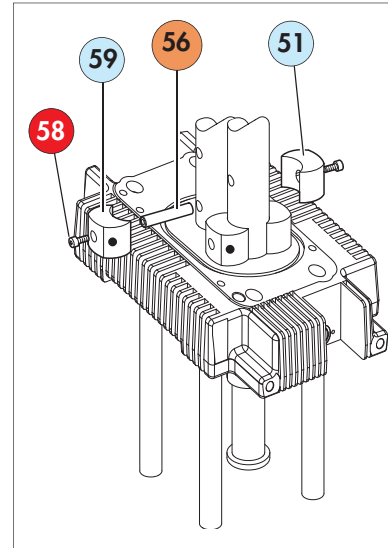


## Shaft synchronization

### Lobe reassembly on exhaust stator

■ Insert a threaded worked pin (56) in the positioning hole of the first stage to be assembled.

■ Take a worked lobe (59) and a threaded lobe (51) per shaft, hone the 2 faces and profile of each slightly, and check for the absence of impacts on the edges.



*If lobes are grooved, the groove is oriented motor side.*

3

■ Position one worked lobe and one threaded on each side of the shaft, indexing them on the worked pin.

■ Install the M4x50 CHc screw (58) inside the threaded lobe by raising it, and secure the screw (58) (screw included in the maintenance kit).

■ Proceed in the same way for the lobe assembly on the other shaft.



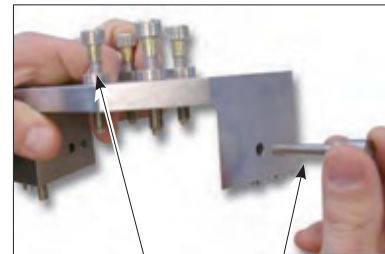
## Shaft synchronization

### Lobes position adjustment

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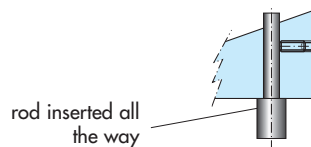
- Use the indexing tool n° 16.
- Unscrew the pressure screw.
- Install the blocking rod n°19 and secure it into the index tool.



Pressure screw    Blocking rod



**Make sure that the blocking rod hasn't moved during tightening.**



rod inserted all the way



- Install the index tool resting on the bearing block support passing it through the shafts. The blocking rod must be visible on the driven shaft side (damper side).

5

- Secure the indexing tool on the bearing block support with two CHc M6x80 screws (tool n° 8).



Blocking rod driven shaft side

Dampers



## Shaft synchronization

### Lobes position adjustment (continued)

- Install the stator (anyone) to support the shaft and position the functional block horizontally.
- Remove the 4 rods.

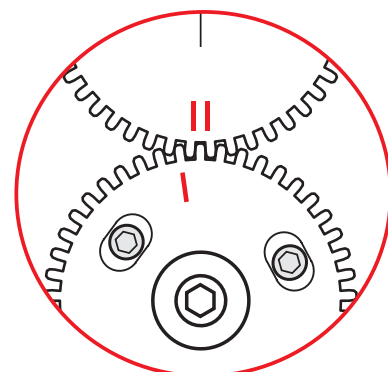
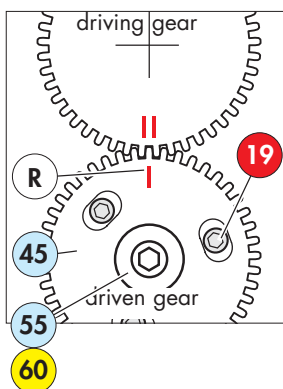
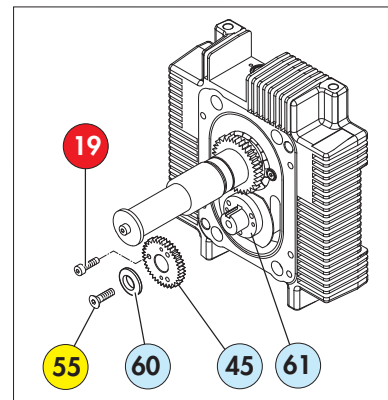


### Shaft synchronization

- Loosen the driven gear locking screw (55) and remove the washer (60).



- Align the holes on the drivegear (45) with the holes on the ring (61). For this,
  - Position the shafts perpendicularly
  - Respect the gear marks.
 If the holes are not aligned, change the position of the drivenshaft (one tooth left or right regarding the marks).



driven gear positioned one tooth left

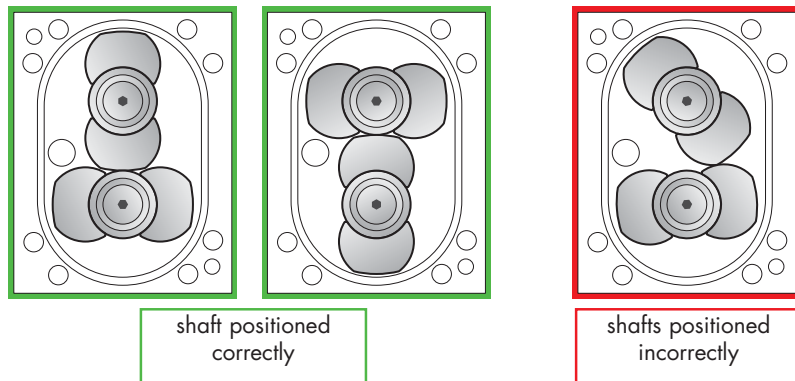


## Shaft synchronization

### Shaft synchronization (continued)

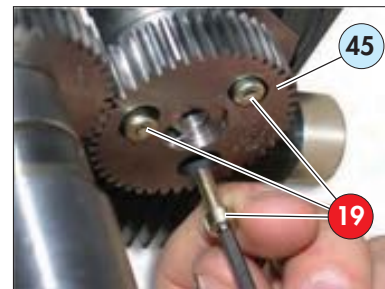
■ Turn the driving shaft to make sure that the shafts are correctly positioned.

When the driven gear is positioned correctly, the lobes should appear as shown below.

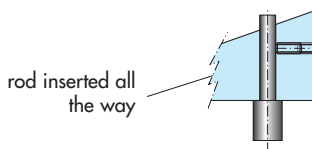


■ If the shafts are positioned incorrectly, neither will be able to turn all the way. Remove the screw (19) and turn the driven gear (45) until the shafts are in the right position.

■ Now insert the three screws CHc M4-12 (19) on the driven gear (45). **Do not tighten them.**



**Make sure that the blocking rod hasn't moved during tightening.**



■ Insert the large rod (tool No.19) on the assembly (tool No.16) and press until it stops.

■ Tighten the screw on tool No.16 to lock the rod in place.



Hexagonal male key for fastening rod in place



## Shaft synchronization

### Shaft synchronization (continued)

- Introduce the shim of 0.08 mm between the two lobes.

shim of 0.08 mm

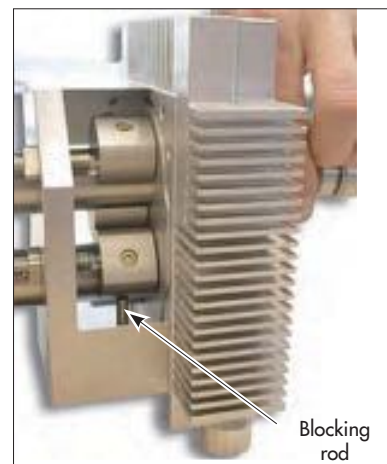


- Eliminate the backlash : with one hand, turn clockwise the driving shaft, by maintaining the driven gear with the index (play nul) and maintain the position.



4

- With the other hand, secure the screw (19) with an hexagonal key.
- Remove the shim of 0.08 mm.
- Turn clockwise the driving and the driven shafts to place the lobes in stop with the blocking rod.



Blocking rod

## Shaft synchronization

### Shaft synchronization (continued)

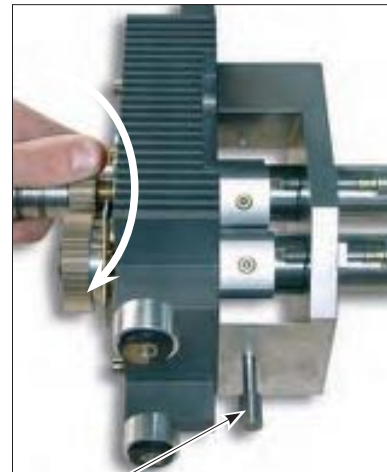
■ Check that the shim 0.08 mm doesn't pass.

■ Check that the shim 0.06 mm pass without play.



5

■ Free the blocking rod from the index tool to allow lobe rotation from 180°. Then secure it again into the index tool.



Blocking rod

■ After lobe rotation, install the blocking rod and secure it again.

■ Check that the shim 0.08 mm doesn't pass.

■ Check that the shim 0.06 mm pass without play.

## Shaft synchronization

### Shaft synchronization (continued)



■ If the synchronization is correct, block the two shafts using the gear sector n° 4.

■ Place the gear sector (**p**) (tool n° 4) between the gears then tighten the three screws (**19**) to a torque of 3Nm, and finally the scew (**55**) to a torque of 14 Nm



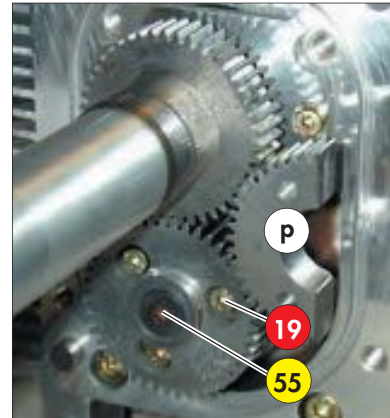
■ After driven gear fastening, check again that the 0.08 mm shim doesn't pass but the 0.06 mm pass without play.

■ Free the blocking pin from the index tool to allow lobe rotation from 180°. Then secure it again into the index tool.

■ Check that the shim 0.08 mm doesn't pass. Check that the shim 0.06 mm pass without play.



■ If not, it is necessary to unscrew the driven gear, and try again the synchronization up to obtain the correct play values.

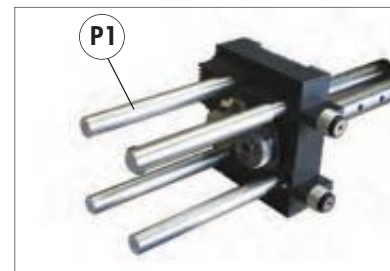


■ Fit manually the 4 assembly rods (**P1** – tool n° 15) on the ball bearing support. Tilt the machine vertically, placing the driving shaft towards the operator.

■ Remove tool n° 16.

■ Turn the shafts manually.

■ Check that they turn frictionless : the only one friction is due to lip seals resistance, more important on the driving shaft.



## Shaft synchronization

### Shaft synchronization (continued)

■ Remove the blocking rod, untight the lobes from  $\frac{1}{2}$  turn, check they are still free.

If new gears have been installed, it is necessary to control gear clearance.



**Gear clearance checking**

**E 106**

## Gear clearance checking

### Gear clearance checking

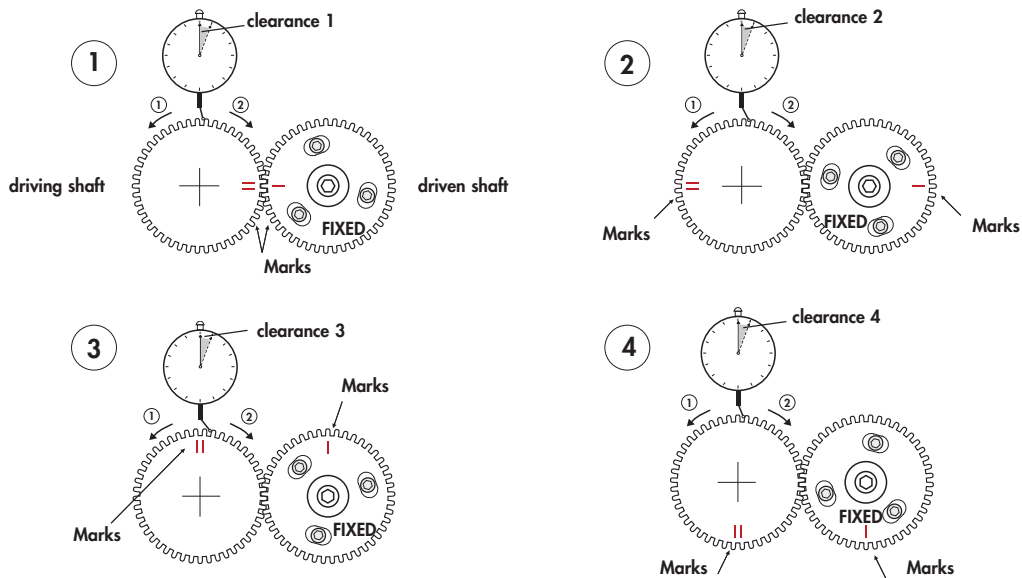
(Only when replacing the gears)

■ Measure the gear clearances using a dial gauge (0.01 mm to 0.06 mm):

Average out for measurements:  $C = \frac{C1+C2+C3+C4}{4}$

Clearance:  $0.01 < c < 0.06$  mm

If the clearances are over tolerance, change the gears.



## Exhaust, HP, LP<sub>1</sub>, LP<sub>2</sub> stage reassembly

### Lobe reassembly



■ Orient the two shafts so that the lobes are under the pressure screws (a).

■ Under the lobes, insert a shim (b) (tool No.1) corresponding to the stage concerned (see the data in table next sheet).

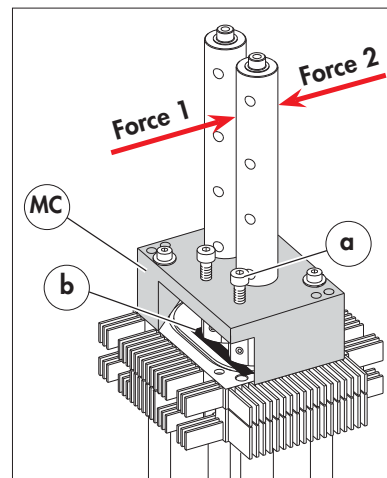
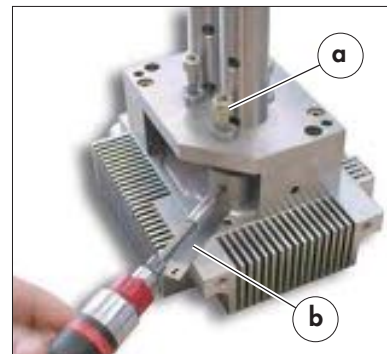
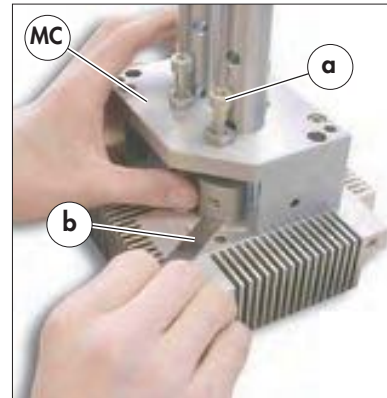
■ Tighten the four pressure screws (a) on the mounting tool in contact with the lobes and tighten them very slightly by hand, without using a screwdriver.

■ Tighten the screw on each lobe with a clamping torque of 5.5 Nm.

■ Untighten the four pressure screws (a) on the setting tool and check the setting by moving the shaft at either end of the machine axis by the value of play tolerated by the mounting tool:  
 -when the shaft is pulled against the operator, the lobe on the operator side pinches the shim and the opposite lobe frees it.

-when the shaft is pushed, the lobe on the operator side frees it and the opposite lobe pinches it.

**Note:** It is preferable for the shim (b) to be slightly free rather than pinching when the shaft is pulled (F1).



## Exhaust, HP, LP<sub>1</sub>, LP<sub>2</sub> stage reassembly

### Lobe setting (cont.)

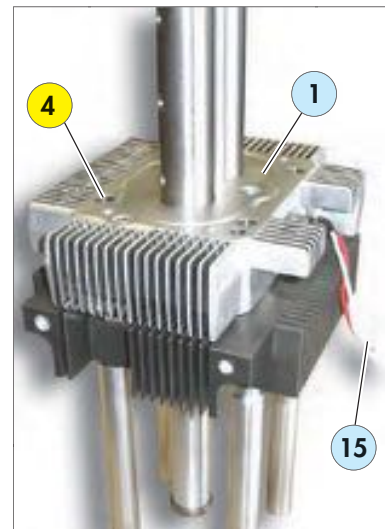
- To ensure the symmetry, perform the same inspection, turning the shafts by 180°.
- If the control is negative, untighten the marked side lobe screw, and do again the setting tightening more or less the pressure screws according to the considered default.
- Untighten the two screw (a) remove the setting tool (MC) (tool No.17).

**Wide shim used according to the stage (set under rotor) (tool No.1):**

Stage(mm)	Exhaust	HP Transfer	LP2Transfer	LP1Transfer	Inlet
1/100 <sup>ème</sup>	7	8	10	12	14


### Exhaust, HP, LP1, LP 2 stator assembly

- Fit a new O-ring (3).
- G and ACP 40 models:** install a O-ring (95) on each stage.
- The exhaust stator (1) is assembled with opening on the right side when the driving shaft is towards the operator. It is fitted with **four screws M6-45 (10 N.m) (4)**.



***On each stage, proceed by cross securing :  
First, secure the screws near the centering ring  
then, secure the other ones.  
Check that the shafts rotate freely at each stage  
assembly.***



- Place the largest temperature sensor (15) on the exhaust stator (1) and tighten by hand. Block carefully with a pair of pliers.
- Note: if the exhaust stator (1) has no threaded hole for the sensor installation, it is necessary to replace it  **F 60 and F 65.**



## Exhaust, HP, LP<sub>1</sub>, LP<sub>2</sub> stage reassembly

### Exhaust, HP, LP<sub>1</sub>, LP<sub>2</sub> stator assembly (continued)

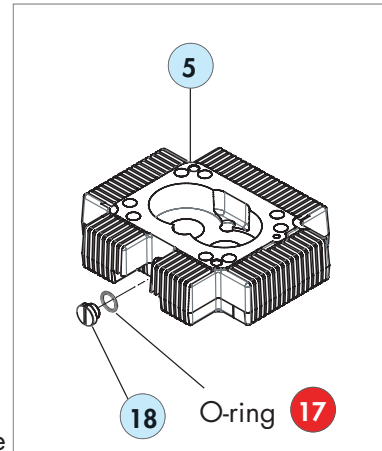
■ Grease slightly and insert two centering pins (2) in the housing until they come to a stop. If the centering pins don't penetrate freely, grind the borings or/and change the pins.

■ The lobes must be free in relation to each other.

■ The transfer stator HP (5) is differentiated from the others by a notch receiving a plug equipped with an O-ring. For the Leak detection pump model, there is no plug, but a hole for nitrogen gas line connection. **F 80**

Place the hole for the plug above the exhaust.

The stator is secured with **4 screws CHc M6-45 (4) (10 Nm)**.



**The part without vane must be above the exhaust port.**

■ The two other transfer stators BP are differentiated by the position of the screws. They are secured with **4 screws CHc M6-45 (4) (10 Nm)**.



■ Grease slightly and insert two centering pins (2) in the housing until they come to a stop. If the centering pins don't penetrate freely, grind the borings or/and change the pins.



**After the attachment of the LP1 transfer stator, insert a centering pin (8) in each centering hole (to compensate for the difference in the pin and stator stacking length).**

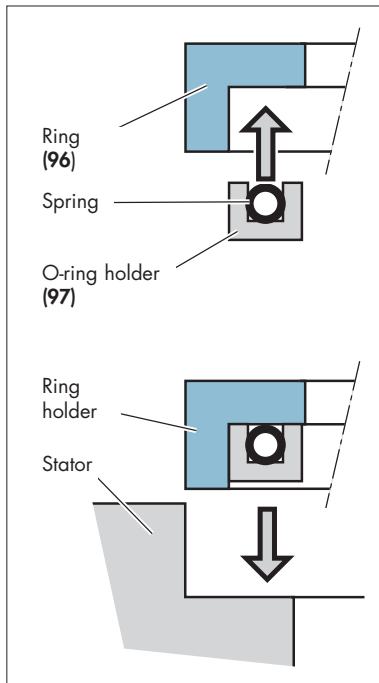
Inlet stage reassembly

E 120



## Inlet stator equipment on ACP 28 G, ACP 40, ACP 40 G models

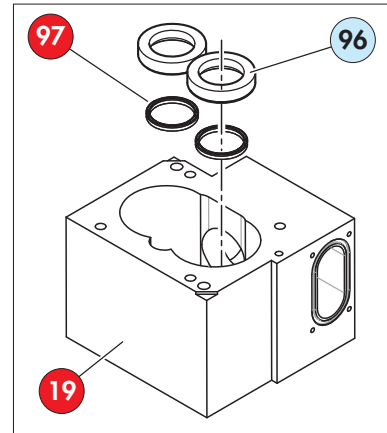
### PTFE O-ring assembly



■ Install the O-ring (97) in the ring holder (96).

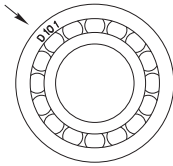
Check the position of the o-ring: installed in the ring holder, it musn't be outside visible.

■ Install the equipped ring holder (96) in to the stator: the ring (97) musn't be outside visible when the PTFE o-ring in installed in the stator.



## Inlet stage reassembly

### ACP 28 / 28 G ball bearings reassembly



- Fit the lobes on the inlet stage ( E 110).
- Reassemble the bearing as follows:
  - Check the D 101 mark on the new bearings.
  - Stop the rotation of the shaft using the gear sector,
  - Assemble them to the shafts orienting the visible mark towards the operator.
  - Fasten both bearings (53) with the 2 washers (54) and 2 screws FHc M6-12 (55) (torque of 14 Nm). Take care to stick the screw (55) with Loctite threadlocker low strength 222 (one drop maxi).

### ACP 40 / 40 G ball bearings reassembly

- Clean and grease slightly with D101 grease the O-rings (9) the ball bearing end housing on the inlet stator. Stretch lightly the 2 o-rings before installation.
- Grease also the outer ring of the ball bearings orienting the visible mark towards the outside of the housing.

### Lobe reassembly on inlet stage



- Adjust the play with tool No. 16 for ACP 40, and tool No 17 for ACP 28, fixed on the inlet stage with the two screws CHc M6-80.
- Adjust the lobe play with 0.14 mm shims in the same way as for the other lobes ( E 110).
- Remove the assembly and check the adjustment in the same way as for the previous stages ( E 110).

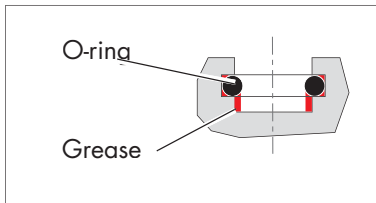


#### Models ACP 40 / 40 G

The inlet stage includes two stacking lobe. Proceed to the lobe (59) adjustment ( E 110), then install the other lobes (52) (torque 5.5 Nm). Take care to put the upper lobes in contact with the lower ones.

## Inlet stage reassembly

### ACP 28 Inlet stator assembly



5


■ Clean and lightly grease D101 the new O-rings and the bearing housings and the ball bearing outer ring on the inlet stator (**11, 98 or 128**). To facilitate the assembly, draw the two new O-rings (**9**) before installing them in their groove.

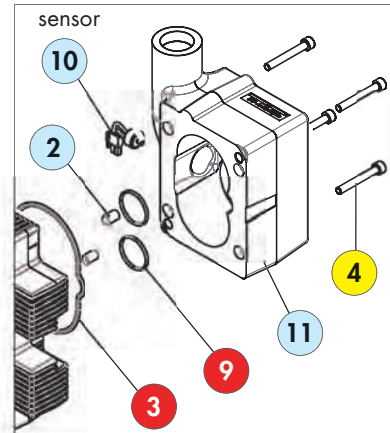
■ Insert one 8x37 mm pin (**2**) in each centering hole on the last stator.

■ Clean the O-ring groove on the pump body and fit a new seal (**3**).

■ Position the inlet stator (**11, 98 or 128**) on the pump body, with the opening oriented opposite those of the other stators and secure using four M6-45 CHc screws (10 N.m) (**4**).

■ Tighten the smallest temperature sensor (**10**) onto the inlet stator (**11**) by hand. Block carefully with pliers.

Nota: if the inlet stator (**11**) has no threaded hole for the sensor installation, it is necessary to replace it. (  **F 60**).



### ACP 40/ACP 40 G Inlet stator assembly

5

■ Insert the centering pin (**2**) in their holes on the last stator.

■ Position the inlet stator (**14**) on the pump body, with the inlet hole oriented towards the driving shaft. Secure it with four screw M6x80 CHc screw (**4a**) ( clamping torque 10 Nm).

■ Tighten the smallest temperature sensor (**10**) onto the inlet stator by hand. Block it carefully with pliers.

■ Install the inlet port (**13**), and a new o-ring (**12**), then tighten the screws (**13a**) (clamping torque 3 Nm).




## Inlet stage reassembly

### Inlet stator assembly (continued)

ACP 28 G  
ACP 40 G  
ACP 40



- Re-fit O-ring (101) and (102) and the injection plate (109) or (109a) and fasten with the four screws M6x20 CHc (108) (torque 10 N.m) (  F 70).
- Don't re-install the anti-suckback valve before having made the start-up tests.
- Perform a manual rotation test in both directions to check that the lobes do not strike each other.
- Install the pump in horizontal position and remove dampers.

**Gearbox casing assembly**

**E 130**

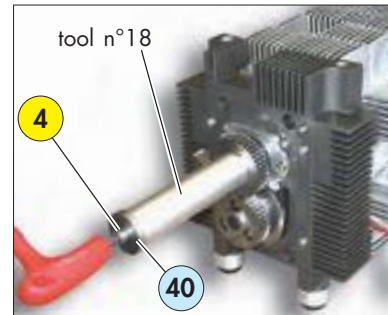
## Gearbox casing and motor reassembly

### Gearbox casing assembly

5

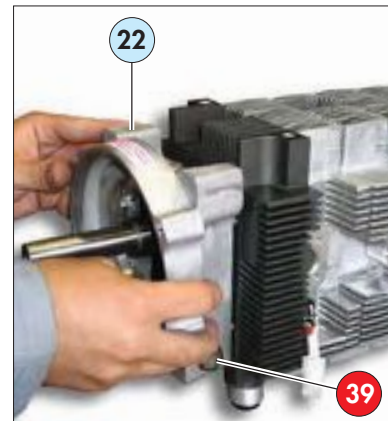
S

■ Remove the screw (4) at the shaft end then the washer (40). Remove the spacer (44), the inner ring of the bearing (43) and the tool No 18.



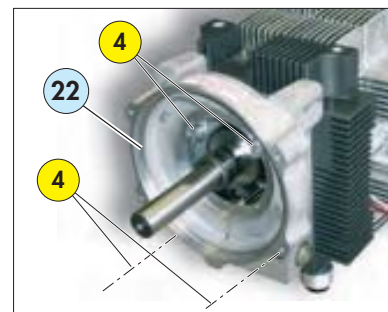
■ Clean the groove of the O-ring on the pump and fit a new seal (3).

■ Unscrew the oil sight glass (39) equipped with its O-ring and replace it by a new one.



5

■ Position the gearbox casing (22) and secure it using 4 M6-45 CHc screws (torque 10 N.m) (4).



## Gearbox casing and motor reassembly

### Roller bearing assembly

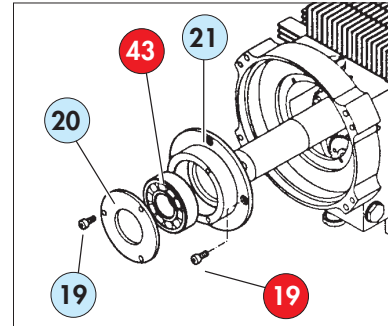
3

■ Fit the roller bearing ring (43) in the bearing housing (21).

■ Position the bearing (21) flange (20) and tighten the bearing ring with three screws CHc M4-12 (19) (3 Nm) (screws included into the maintenance kit).

■ Position the ball bearing inner ring and install 4 screws

CHc M4-12 (19) without tightening them in order to leave the housing free.



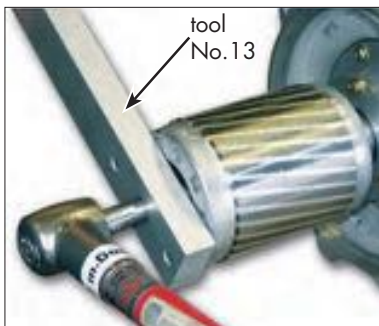
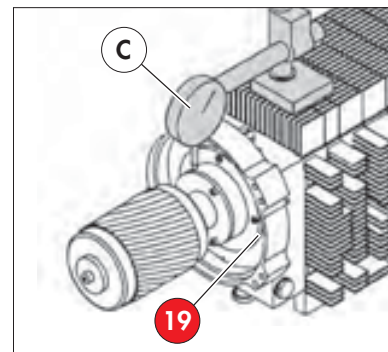
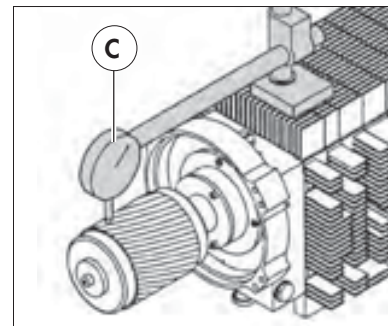
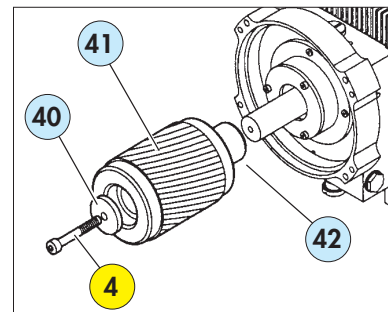
### Motor assembly

5

■ Position on the shaft, the spacer (42), the motor rotor (41) equipped with its sleeve. Secure it with the screw CHc M6-45 (4) and the washer (40) (torque 17 Nm). (To lock the shaft, hold the rotor body using the spanner wrench, tool No.13).

■ Check the radial deviation of the rotor body by placing a dial gauge (C) on the furthest functional part from the gearbox casing (default value 0.10 mm of max. reading).

■ Using a dial gauge (C), positioned on the roller bearing casing, locate the lower point by rotating the driving shaft. Then, push lightly downwards on the casing and tighten the M4-12 screw (3 N.m) (19). This the rollers are always in contact with the shaft.



S 5

3

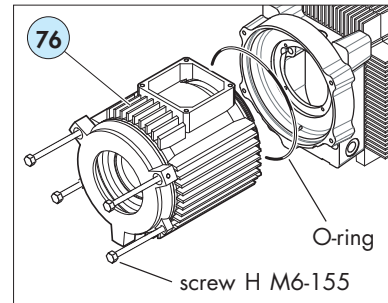
*Check again: lobes must be free in relation to each other.*

## Gearbox casing and motor reassembly

### Motor assembly (continued)




■ Position the O-ring in the gearbox casing, fit the motor stator (76) and secure it using the four screws (torque 10 N.m) and their washers.



## Variator reassembly



**Before any intervention, the user must study the safety instructions and the precautions for maintenance (  E 00).**

### Tools required

- Recommended standard tools  **F 40**.
- Tool kit:  **F 10**.

### Variator reassembly

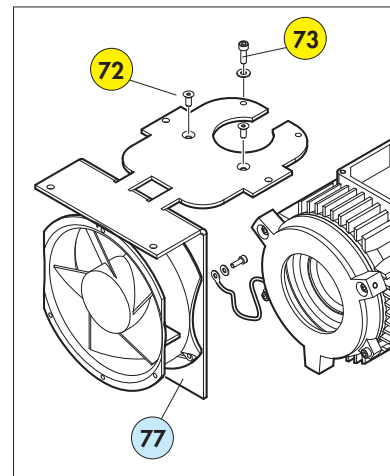
3

- Fit the motor/variator support (77) with 2 screws FHc M5-12 (72) (torque 6 Nm).

4

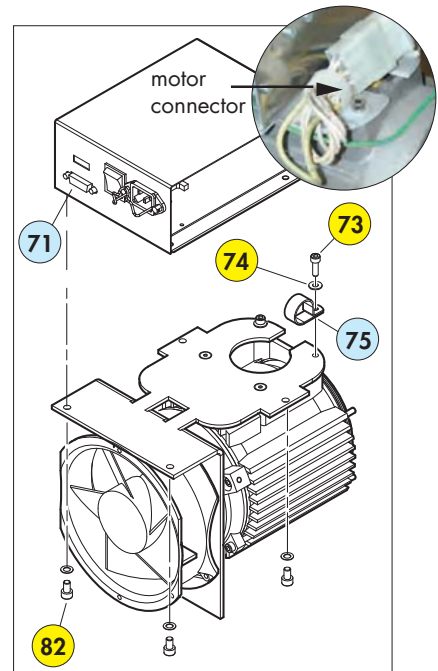
- Fit to the support (77) the motor ground wire with the screw CHc M6-16 (73).

- Connect the fan and the temperature connectors.



5

- Attach the variator (71) on its support (77) using the four screws CHc M6-10 (82).





## Variator reassembly

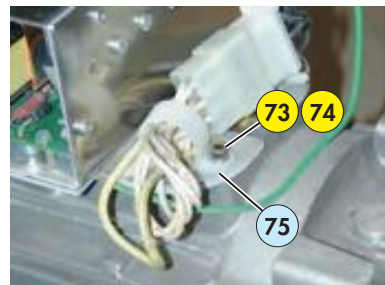
### Variator reassembly (continued)

- Connect the motor connector.



4

- Fit the clamp cable and secure it with the screw CHc M5-16 (73) and its washer (74).
- Position the connector along the variator.



- Tilt the pump on its side.
- Secure the assembly damper + motor support .



- Install the pump in horizontal position resting on its dampers.

---

## First running and checking

---



**Never operate the pump without:**


- Oil
  - Ventilation
- 

To perform these tests, use the variator and the exhaust flange of the pump (not workshop accessories).

## Running-in and burn-in



**Test conditions**

Spare part list see  F 70, F 75, F 90

**Standard model: Valve (11) + valve support (10) + spring (9) and silencer, not installed on pump.**

**Modèle G : Valve (11) + valve support (10) + spring (9) + silencer + anti-suckback (91, 103 et 111), not installed on pump. Purge cover +O-ring installed on the nitrogen injection holes (93 + 94, 104 + 107, 113 + 113a).**

**Model for leak detection system: Valve (11) + valve support (10) + spring (9) + silencer + gas line not installed on pump.**

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## First running and checking

### Running-in and burn-in (continued)

Running-in is necessary to flush out dust made by the lip seals when the pump was turned on.

- Place the pump on its base without fastening it.
- Hand tighten the annealed flange fitted with the PVC hose (tool No. 22) on the needle valve support (tool No. 21).
- Fasten the assembly (tools No. 21 and 22) to the exhaust orifice with the two screws CHc M4x30 (5).
- Install the cover. Do not fasten into place.
- Run the pump at 4800 rpm for 6 hours at atmospheric pressure. For this, **use the cover plug (69) delivered with the pump.**



**Then perform the following tests:**

- a - Stop the pump 5 min (stop it using the remote plug).
- b - Run the pump for 10 minutes at normal speed (4800 rpm), at atmospheric pressure.
- c - Stop the pump for 15 minutes.
- d - Run the pump for 30 minutes at normal speed (4800 rpm), at atmospheric pressure.
- e - Repeat three times the tests a to d , then stop the pump for 1 hour.

After these tests, check that the time counter has runned.

Complete maintenance kit

F10

## First running and checking

### Cycling



#### Test conditions

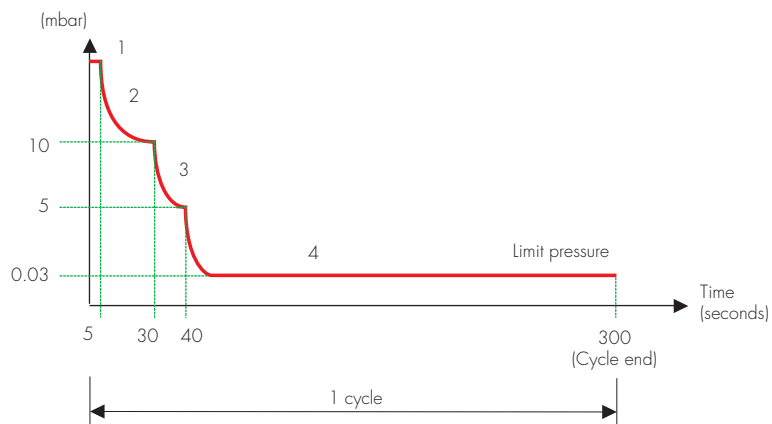
Spare part list see  F 70, F 75, F 90

**Standard model:** Valve (11) + valve support (10) + spring (9) and silencer, not installed on the pump. Tools No. 21 and 22 installed on exhaust. Cover plug delivered with pump (4800 rpm) connected on remote-control connector.

**G model:** Valve (11) + valve support (10) + spring (9) + silencer + anti-retour (91, 103, 111), not installed on pump. Purge cover + O-ring installed on the nitrogen injection holes. (93 + 94, 104 + 107, 113 + 113a).

**Model for leak detection system:** Valve (11) + valve support (10) + spring (9) + silencer + gas line not installed on pump.

Cycling consists of simulating draining a volume of 50 litres. A cycle is run every five minutes, from atmospheric pressure to limit pressure, over a two-hour stretch.



Pumping phase	Pumping conditions	Pumping time
1	Run pump at atmospheric pressure	5 s
2	Run pump using a 10 mbar calibrated valve	30 s
3	Run pump using a 0.5 mbar calibrated valve	10 s
4	Run pump at limit pressure	Until end of cycle

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## First running and checking

---

### Cleaning

**Test conditions**

Spare part list see  F 70, F 75, F 90

**Standard model: Valve (11) + valve support (10) + spring (9) et silencer, not installed on pump.**

**Tools No. 21 and 22 installed on exhaust. Cover plug delivered with pump (4800 rpm) connected on remote-control connector.**

**G model: Valve (11) + valve support (10) + spring (9) + silencer + suckback (91, 103, 111), not installed on pump. Purge cover + O-ring installed on the nitrogen injection holes (93 + 94, 104 + 107, 113 + 113a).**

**Model for leak detection system: Valve (11) + valve support (10) + spring (9) + silencer + gas line not installed on pump.**

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■ To flush out seal particles given off after running-in, let the pump run at normal speed (48000 rpm):

a - during 30 minutes

b - then stop the pump for 5 minutes

c - then start it again for 15 minutes.

■ Clean the exhaust port with a lintfree swab.

## First running and checking

### Functional block leak test (continued)

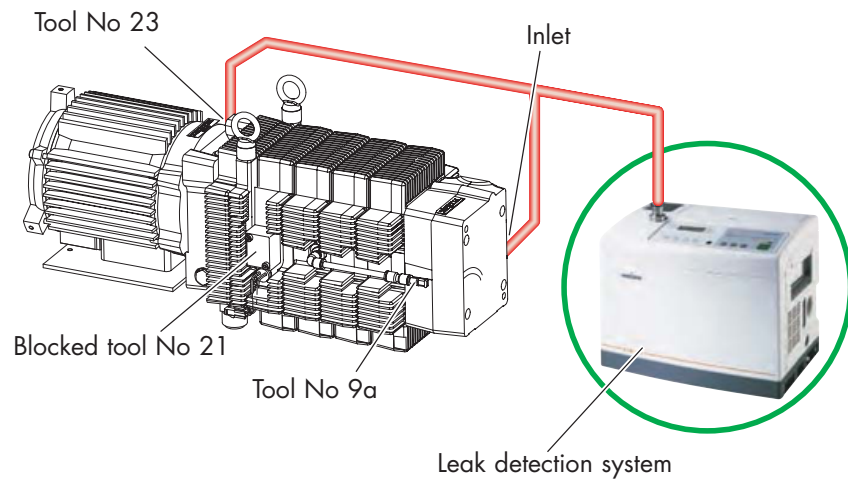


*Take tools 21 and 22 off the exhaust. Re-install the gas line (see E 41), but leave the valve and silencer off ( E 41).*

- Cover the gas line orifice with tool No. 9a and the exhaust orifice with tool No. 21. Check that the plug is on tool No. 21.
- Fit adapter DN 25-ISO-KF (tool No. 23) and pump via the inlet and oil filling hole.
- Spray the pump with helium.

**Q must be less than or equal to  $5.10^{-7}$  mbar.l/s**

Q = leak rate.



---

## First running and checking

**Limit pressure test** ■ Test the pump under **Pneurop** conditions, and at limit pressure and nominal speed (4800 rpm).

■ Results:

**Model ACP 28 for leak detection system:**

Block the gas line and use tool

No. 9 (no drain)..... noise level < 67 dBA

**Modèles ACP 28 G, ACP 40 G :**

Block the gas line and use tool utiliser l'outil n°9

No. 9 (no drain)..... noise level < 65 dBA

**ACP 28 standard model:**

..... noise level < 65 dBA

## Technical Reference Manual ACP 28/ACP 40

### Components

■ Spare parts - Instructions of use . . . . .	■ F 00
■ Complete maintenance kit . . . . .	■ F 10
■ Screw kit - Pin kit - Deflector kit . . . . .	■ F 20
■ Parts and materials required for maintenance . . . . .	■ F 30
■ Recommended standard tools . . . . .	■ F 40
■ Spare parts . . . . .	■ F 50
■ ACP 28 functional block spare part list . . . . .	■ F 60
■ ACP 28 - ACP 40 - ACP 40 G	
Rotor spare part list . . . . .	■ F 61
■ Motor/variator spare part list . . . . .	■ F 62
■ ACP 40 functional block spare part list . . . . .	■ F 65
■ ACP 28 G specific spare part list . . . . .	■ F 70
■ ACP 40 G specific spare part list . . . . .	■ F 75
■ ACP 28 for leak detection spare part list . . . . .	■ F 80
■ Silencer spare part list . . . . .	■ F 90
■ Cover spare part list . . . . .	■ F 100

Note: In the present chapter, the letter M located at the top of the page indicates that the corresponding section does not exist in the User's Manual.