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GLOBAL VENDING

AFTER-SALES SERVICE



SERVICE MANUAL

ESPRESSO COFFEE BREWER UNITS

" Z – 3000V "
(with variable brewing chamber)

N&WGLOBAL VENDING SPA – SERVICE MANUAL –H&C FUNCTIONAL UNITS

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ESPRESSO COFFEE BREWER UNITS Z 3000 V

ESPRESSO

The espresso coffee brewer unit Z3000 V is practically an evolution of the Z 3000 model, but with changes to the size of the brewing chamber (45 mm dia) to allow the development of the version with variable size chamber and for special applications.

The upper filter piston can change the protrusion of the filter holder, so as to vary the height of the brewing chamber.

In addition, the unit was designed for installation inside the machine leaning either to the left or to the right, allowing more option for present and future developments.

THE BREWER UNIT COMPRISES:

- 1) RIGHT AND LEFT SUPPORT
- 2) PISTONE MOBILE COMPLETO
- 3) GRUPPO CAMERA DI INFUSIONE E CONVOGLIATORE
- 4) SIDE SLIDES
- 5) ROTATING LEVER
- 6) OSCILLATING LEVER FOR EJECTING THE USED CAPSULE
- 7) RODS

Two handles are located on the two external sides for controlling the rods, connected to each other by a steel pin. And similarly to the previous model, a brewing chamber heating system is fitted for some specific applications. The new system differs slightly from the previous one, and its shape was changed to be able to adapt it to different models.

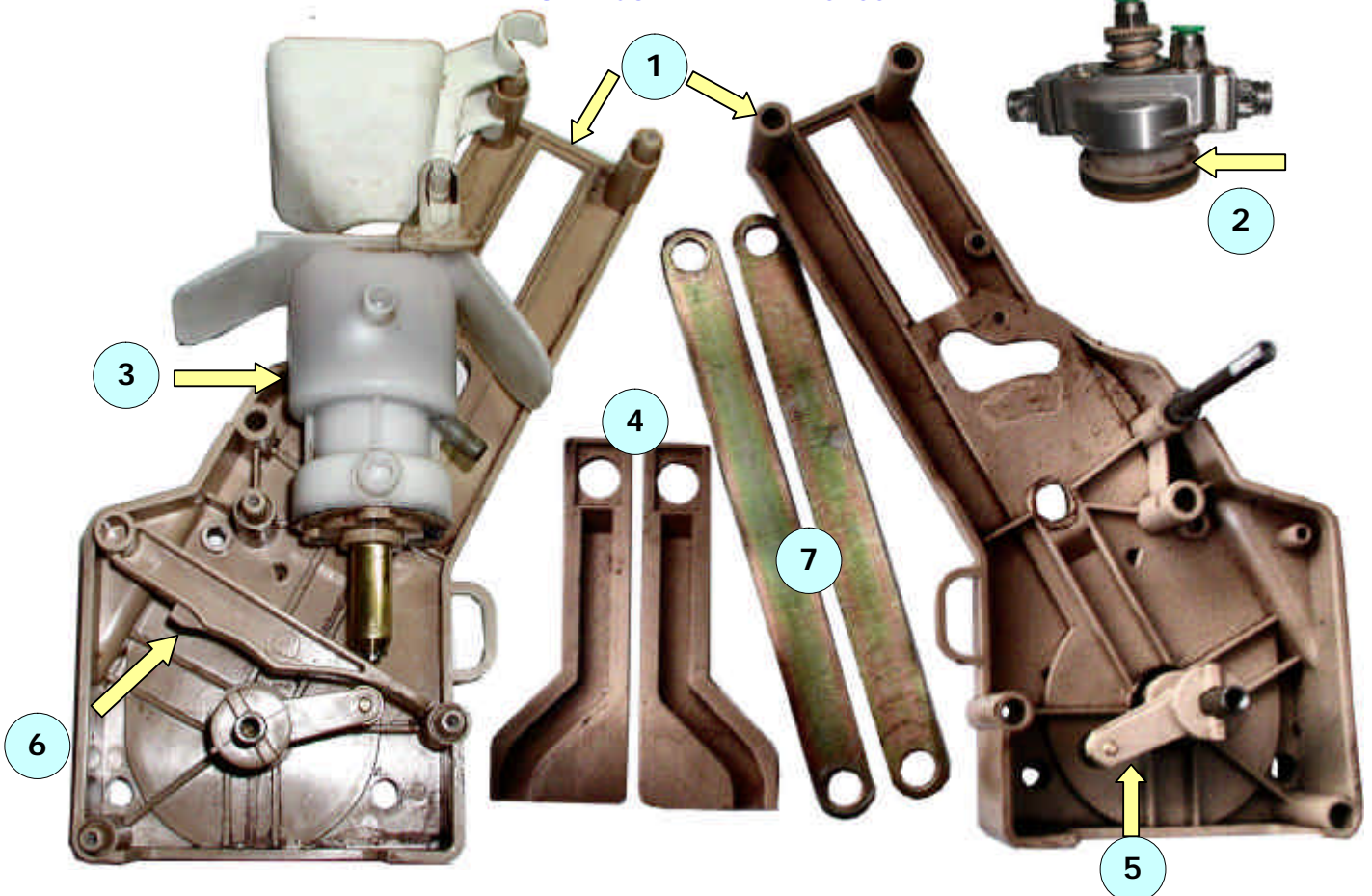
FIG 1

Perspective view of unit in brewing position



FIG 2

BREWER UNIT COMPLETELY DISASSEMBLED



DESCRIPTION OF BREWER UNIT OPERATION

In an espresso coffee brewer unit for automatic vending machines, in order to obtain coffee with taste and quality parameters that are as much as possible similar (if not better) than the drinks obtained with a machine used in the bar, as well as the intrinsic characteristics of the brewer unit, there must be some objective conditions to be met, and namely:

- 1) THE COFFEE QUALITY AND AMOUNT AND ITS GRADE OF GRINDING**
- 2) THE TEMPERATURE AND CHARACTERISTICS OF THE BOILER**
- 3) THE BREWING AND DISPENSING TIME**
- 4) THE WATER AMOUNT**

N.B.: The following reference information is valid exclusively for Italian espresso coffee selections; for other markets and other requirements refer to the information supplied with the machine.

1) THE COFFEE QUALITY AND AMOUNT AND ITS GRADE OF GRINDING

Coffee quality and amount are ensured by the grinder and doser assembly fitted to the unit, capable of preparing coffee with optimum grade of grinding. The Z3000 V unit can operate with doses of 5.5 to 12 g of ground coffee. In any case, in order to get an optimum espresso coffee in a single selection the dose of ground coffee must be between 6.5 and 7 g. The other available doses are for different versions and markets

2) THE TEMPERATURE AND CHARACTERISTICS OF THE BOILER

The boiler is adjusted to an optimum setting at the factory; however, in specific climate conditions or height from sea level, the setting can be adjusted through the software programming, keeping in mind that the boiler is set to approximately **94°C** by default and that it is advisable to carry out the testing after stabilising the temperature, achieved after two or three on/off cycles.

The boiler must be made of specific material and certified as being food-safe; N&W uses a special bronze alloy that is able to maintain the temperature constant, avoiding any temperature fluctuations and ensuring that the characteristics of the water are not altered, without the risk of toxic contamination.

3) THE BREWING AND DISPENSING TIME

The brewing and dispensing time depend on the water amount settings, the coffee dose and the grade of grinding. The optimum brewing time is between 15 and 18 seconds, which is a consequence of the different parameters and cannot be set directly.

The pre-brewing time is set to 1 second by default, and it refers to the time between opening the solenoid valve and starting the pump. The brewing time can be increased (within a certain range), keeping in mind that an excessive increase does not lead to improved quality and it lengthens the total dispensing time.

4) THE WATER AMOUNT :

For an Italian style "**Espresso**" coffee 40 c.c. must be set with a total amount in the cup of about 35 c.c., doses can vary for long coffee selections in other countries, but in this case the coffee **DOES NOT** have the characteristics of a typical "**Espresso coffee**".

It is however possible to dispense double doses for versions with double coffee selections.

For other markets or specific machines, refer in any case and always to the documentation supplied with the machine.

OPERATING CYCLE FOR DISPENSING ESPRESSO COFFEE

STANDBY AND COFFEE FILLING POSITION

In this position the coffee unit is in standby. The cycle starts when the grinder and doser device releases a coffee dose as set by the software in relation to the selection made.

The ratiomotor operates the brewer unit by rotating the handle 90°, the position is verified by the triggering of a micro-switch.

PHASE 1: DISPENSING POSITION

During the handle rotation, the connecting rods bring the upper piston down and at the same time the mechanism oscillates the brewing chamber to line up with the piston axis; continuing its movement the piston is inserted into the brewing chamber and the scraper is moved to the back of the chamber.

PHASE 2: START OF THE PISTON COMPRESSION PHASE

In this phase the water injection in the upper section of the mobile piston starts (an exchange solenoid valve and the pump perform such function - see hydraulic diagram). The pressure generated pushes the piston downwards and compensates the empty volumes according to the amount of ground coffee dispensed. The compression force is determined by a bypass valve and by a pressure switch (according to the hydraulic circuit of the machine).

PHASE 3: COFFEE BREWING

The pump is started and a dose of water (determined by the software), at a temperature of 95°C and pressure of 12 bar, is sent to the upper piston; water flows through the filter and enters the brewing chamber, wetting all the ground coffee, and exits from the lower section of the chamber, reaching the dispensing spouts through a silicone tube.

PHASE 4: DRYING AND SQUEEZING

As soon as the set dose is reached the pump stops, the pre-brewing spring returns to the initial position and squeezes the coffee dose, drying it.

PHASE 5: HYDRAULIC PISTON DISCHARGE

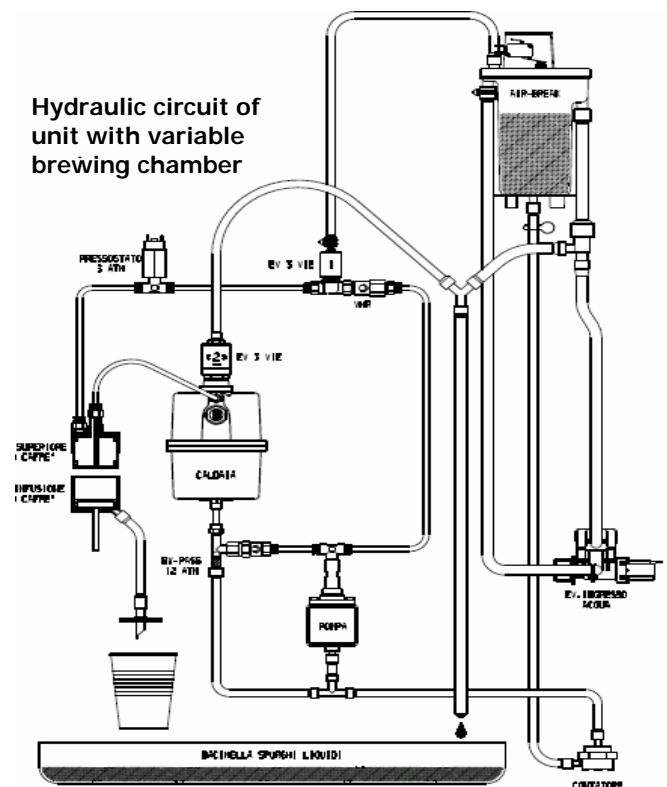
The exchange solenoid valve is triggered and the water used for the upper piston movement is discharged; the action of the return spring causes the upper piston to return to the start position.

PHASE 6: EJECTION

The handle controlled by the ratiomotor rotates and moves to the start position, the mechanisms move both the upper piston and the brewing chamber to the initial position; during this cycle a lower lever pushes the central rod of the brewing chamber, ejecting the spent coffee, while the scraper that also returns to the initial position brushes off the spent coffee, dropping it in the special compartment.



STANDBY AND GROUND COFFEE LOADING PHASE



STAND-BY POSITION
(stand-by Phase)

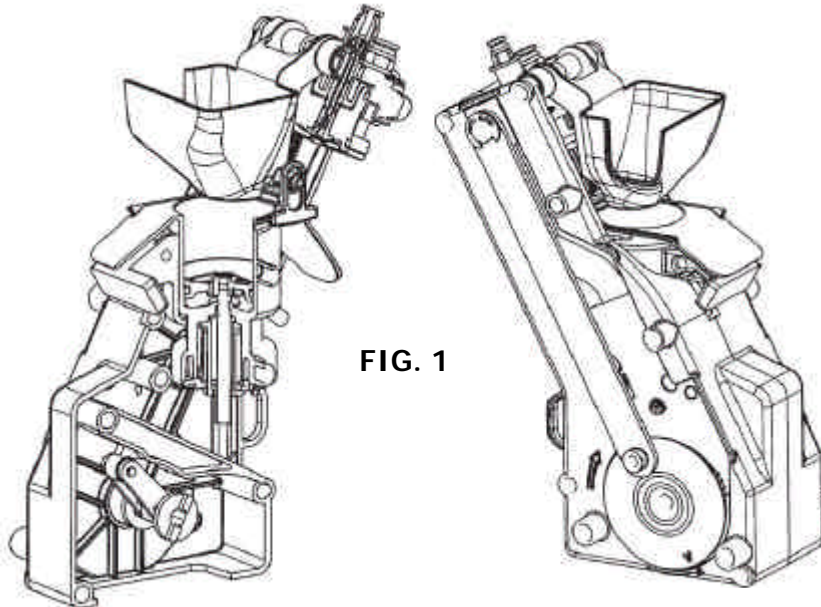


FIG. 1

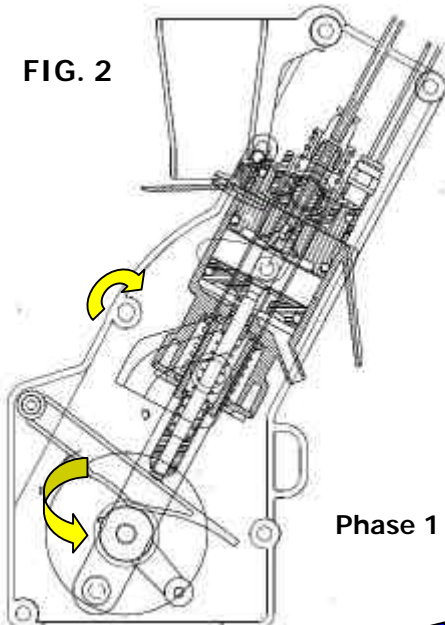


FIG. 2

Phase 1

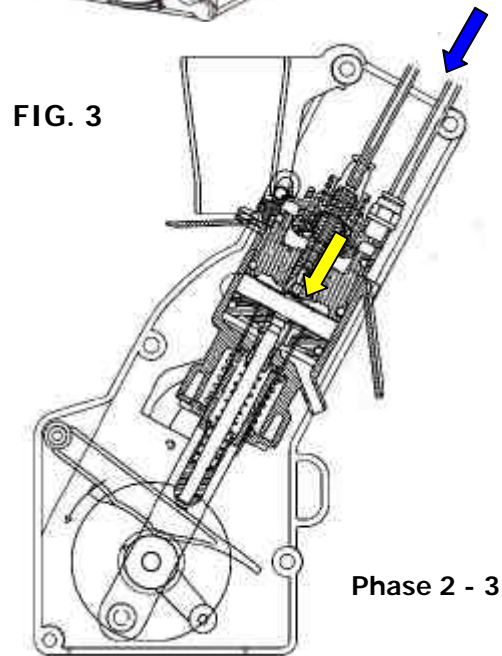
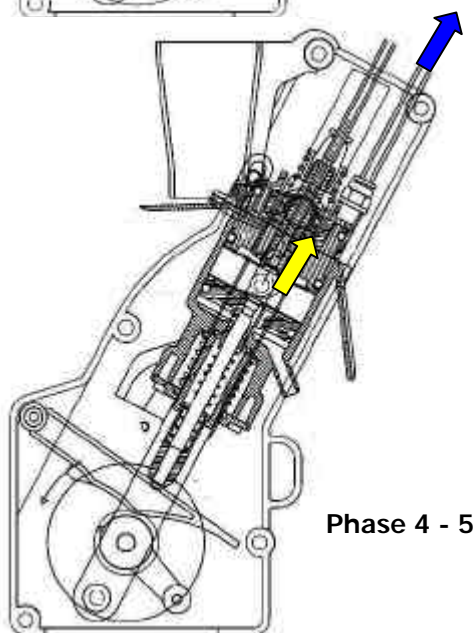
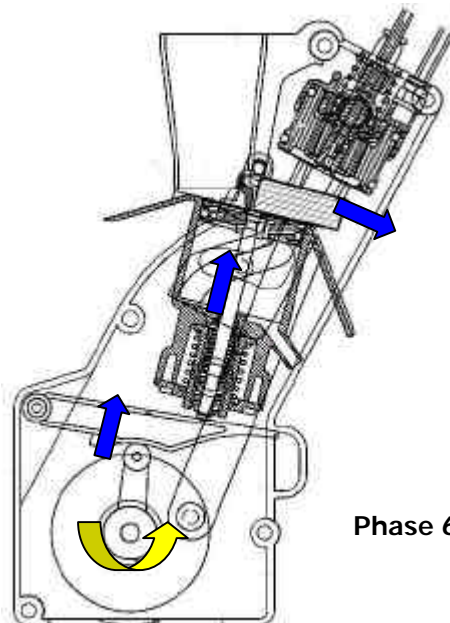


FIG. 3

Phase 2 - 3

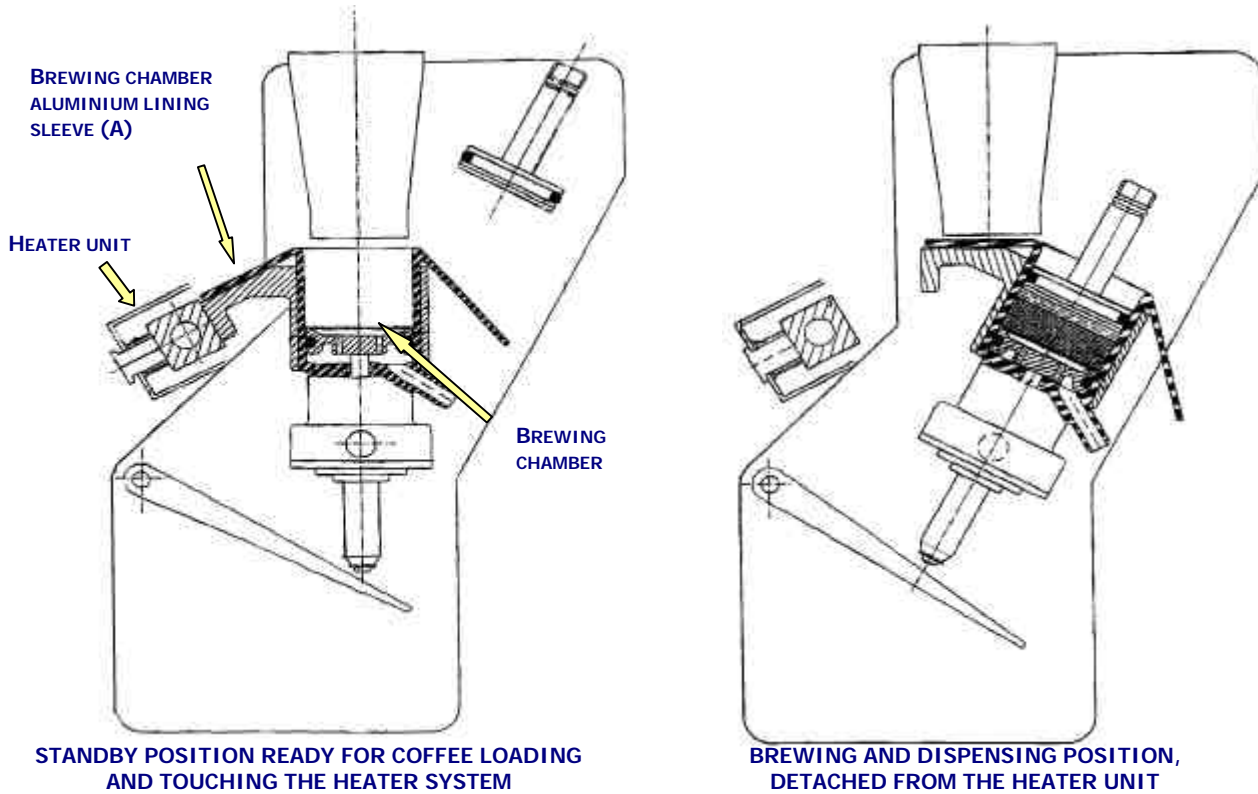


Phase 4 - 5



Phase 6

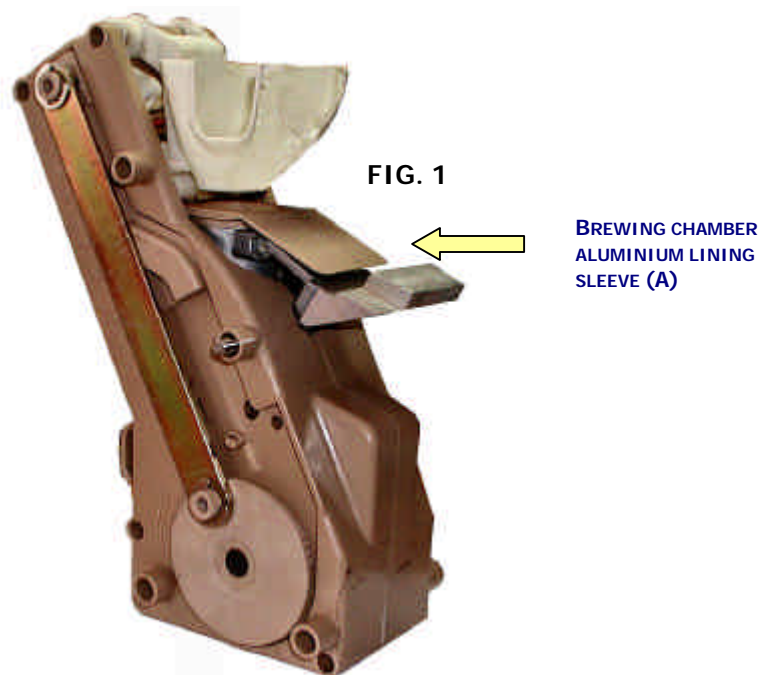
OPERATION DIAGRAM OF HEATING SYSTEM FOR FIRST COFFEE SELECTION



The heater system (standard feature in some versions and supplied as a Kit in others) is based on the use of a **230 V AC - PTC** type heating element with an absorption of approximately **25 W** at start-up and **5 W** under running conditions.

During the machine standby, the brewing chamber, which is lined with a die-cast aluminium sleeve **(A)** is brought into contact with the heating element positioned on the wall of the boiler assembly; the mechanical contact allows maintenance of the optimum temperature in the brewing chamber. During the brewing and dispensing stage, the aluminium sleeve is detached from the heating element; when the unit is brought back into standby position the thermal contact is resumed, again maintaining the correct temperature.

NB: The shape of the part in contact with the heating element may vary according to the machine in which the the brewer unit is installed.



DISASSEMBLY PROCEDURE FOR PERIODIC MAINTENANCE

FIG. 1



Remove the brewer unit from the machine and clean all coffee residue

FIG. 2



Release the seeger rings from the connecting rods

FIG. 3



Slide out the rods and lay them aside. Release the other seeger rings that secure the diverting slide

FIG. 4



FIG. 5



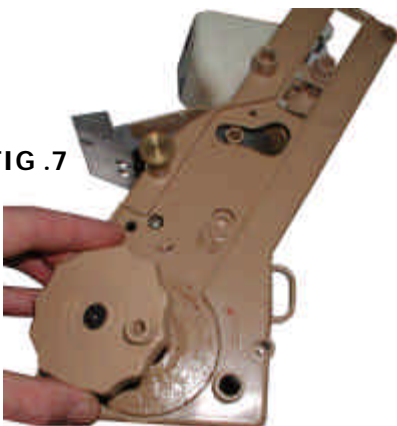
Remove the diverting levers (FIG 4- FIG 5)

FIG. 6



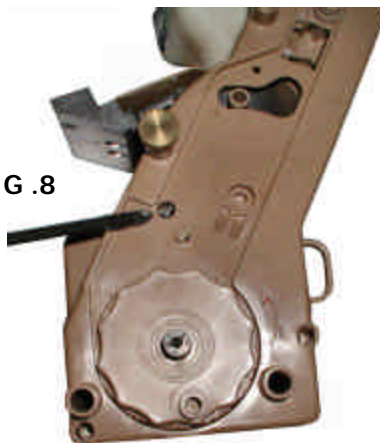
Using an Allen key, undo the central screw of the external handle

FIG. 7



Remove the external handle wheel

FIG. 8



Undo all screws that secure the two half shells and open the unit (FIG 8- FIG 9)

FIG. 9





FIG .10



FIG .11

Open the two half shells, removing all internal components

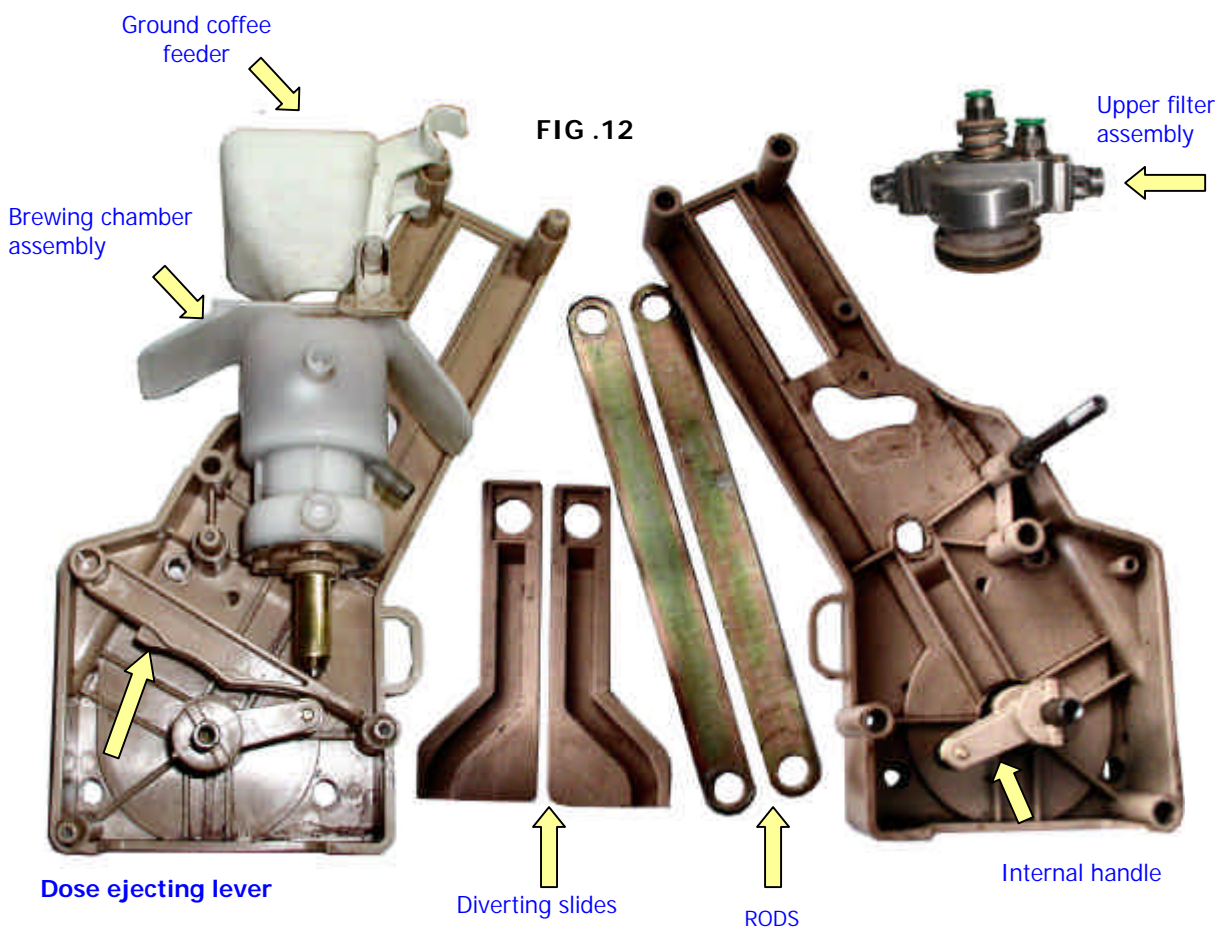


FIG .12

SCHEDULED MAINTENANCE OPERATIONS

The brewer unit Z2000 M is very reliable; however, in order to continue to have the initial features, some basic scheduled maintenance is necessary.

The number of cycles to reach before maintenance is only a guideline, as they depend on the type of coffee and its grade of grinding.

1) EVERY 3000 - 4000 COFFEE DISPENSED (OR AFTER 2 MONTHS OF OPERATION)

REPLACE OR CLEAN THE UPPER FILTER

(TOTAL EXPECTED TIME FOR THE OPERATION IS 3 MINUTES)



FIG. 1



FIG. 2

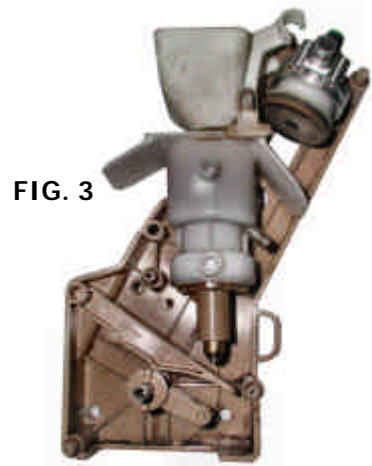


FIG. 3

Remove the brewer unit from the machine, disconnecting the hydraulic connections and undoing the knurled knob.

Slide out the connecting rods from the upper side, so as to free the upper piston assembly; it is not necessary to open completely the unit, but only slightly deflect the half-shells to be able to extract the piston assembly.



FIG. 4

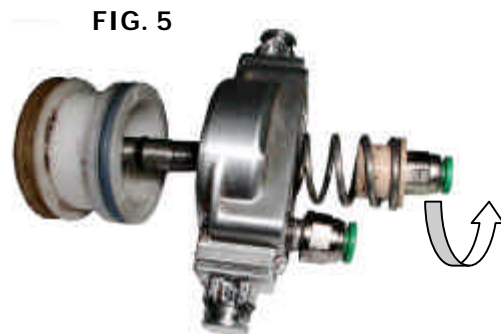


FIG. 5



FIG. 6

Undo the central hexagonal head screw, holding the spring, and free the mobile piston.
Undo the central filter fastening screw, remove the filter, remove the O-ring seals. Descale or replace the filter.

N.B.: in any case, it is advisable to carry out all operations at the workshop and replace the components subjected to maintenance with others already cleaned and descaled previously.

2) EVERY 6000 -8000 COFFEE DISPENSED (OR AFTER 6 MONTHS OF OPERATION)
PLANNED OPERATIONS: REPLACE OR CLEAN THE UPPER AND LOWER FILTER, CLEAN THE VENT HOLE
(TOTAL EXPECTED TIME FOR THE OPERATION IS 6 MINUTES)

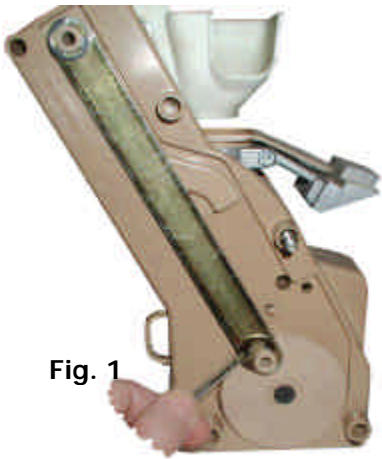


Fig. 1

Place the brewer unit on a surface and rotate the handle to the upper dead centre. Remove the "seeger" rings stopping the connecting rod



Fig. 2

Completely remove the upper steel connecting rod



Fig. 3

Completely undo the hexagonal head screw (using a special Allen key)

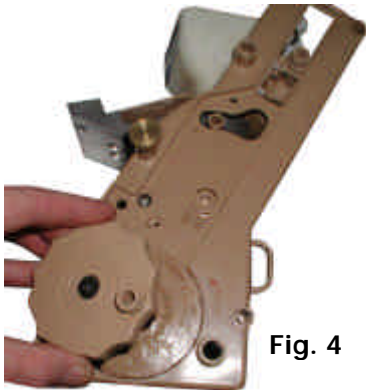


Fig. 4

Slide out the handle wheel and remove it from its seat

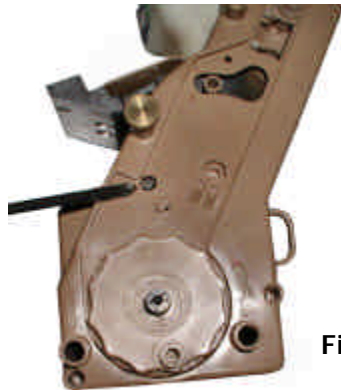


Fig. 5

Undo all screws (5 pcs) of the upper half-shell and open the two half-shells to access the internal brewing chamber
 Fig. 5 - 6



Fig. 6



Fig. 7

Remove the brewing chamber assembly and slide out the seeger ring in the lower part, freeing the lower piston

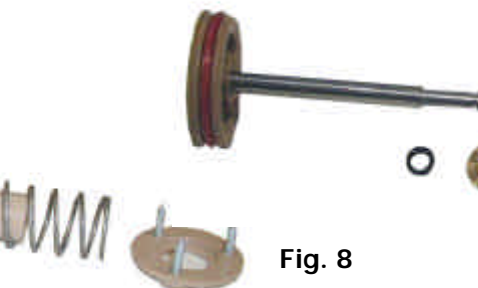


Fig. 8

Remove the lower piston, undo the filter fastening screw and remove the filter, remove the O-ring (Fig. 8 - 9)
 Descal the filter, or if necessary replace with a new one.



Fig. 9

Clean and lubricate the O-ring with specific grease (if damaged, replace).
 Clean and if necessary descale the internal chamber. Reassemble all parts proceeding in the reverse order.

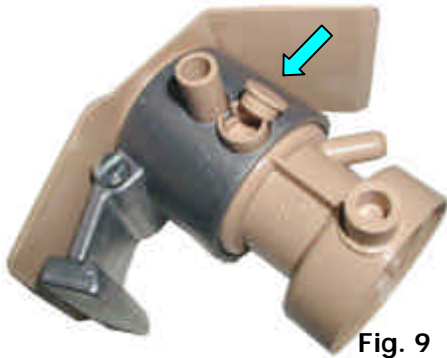


Fig. 9

Remove the small on the body of the brewing chamber, uncovering a small hole. Such hole communicates with the lower portion of the brewing chamber

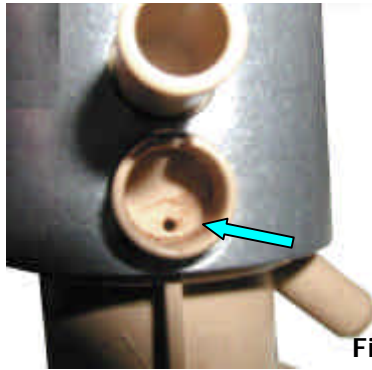


Fig. 10

Using a 0.5 mm bit free from any encrustations. Clean the internal side of the body and of the brewing chamber



Fig. 11

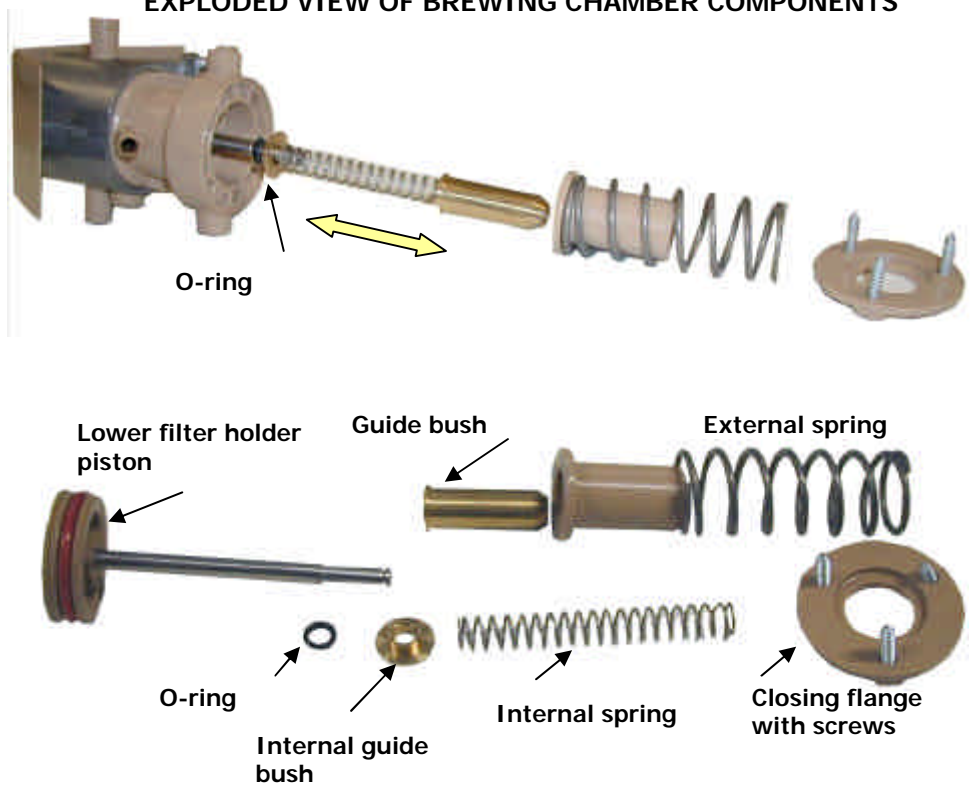
Reassemble all parts, making sure to carry out the operations in the reverse order to disassembly; reassemble the upper half-shell

3) EVERY YEAR (REGARDLESS OF THE NUMBER OF SELECTIONS MADE) PLANNED OPERATIONS: REPLACE OR CLEAN THE UPPER AND LOWER FILTER, DISASSEMBLING THE BREWING CHAMBER AND COMPLETELY DESCALING AND LUBRICATING. (EXPECTED TIME FOR THE OPERATION IS 14 MINUTES)



Fig. 13

EXPLODED VIEW OF BREWING CHAMBER COMPONENTS



In addition to the operations scheduled in the previous point, completely clean and ensure that all brewing chamber components are in working order. Remove the lower cover of the brewing chamber, undoing the three screws that keep it closed, making sure to hold the springs inside (it is advisable to use a holding clamp). Remove all components, paying attention to their position. Replace the O-ring, clean all parts, lubricate lightly and reassemble everything proceeding in the reverse order. When reassembling, use the clamp to compact the springs before tightening the screws

Reassemble all parts, reassemble completely the brewing chamber, refit onto the machine and make some test selections.