ELECTROLUX
Technical Support Europe

SERVICE MANUAL

WASHING

"NEAT"
WASHING MACHINES

WITH EWM2000
ELECTRONIC CONTROL

Production: Porcia/PN (IT)

CONTENTS

GENERAL CHARACTERISTICS

Design: The cabinet is completely new, and is distinguished by the rounded front panel.

Inclined tub and bellows seal: The tub and the bellows seal are inclined at an angle of approximately 20°. The capacity of the drum is 46 litres (G20).

Large porthole door: The porthole door is larger than that fitted to current models, and can be opened to an angle of 180º.
The combination of an inclined tub and a larger porthole door makes introduction and removal of the washing easier; in addition, the washing load is more visible to the user.

"INPUT" control panel: Simplifies programme selection.

EWM2000 electronic control unit: Provides excellent washing efficiency.

JETSYSTEM washing

Spin speeds up to 1.600 rpm

CONTROL PANEL

The control panel fitted to the appliance may be different depending on:

$\Rightarrow$ the control/display board (2 versions)

$\Rightarrow$ the different design of the panel (on the number of buttons, LEDs)

$\Rightarrow$ the different configuration of the buttons
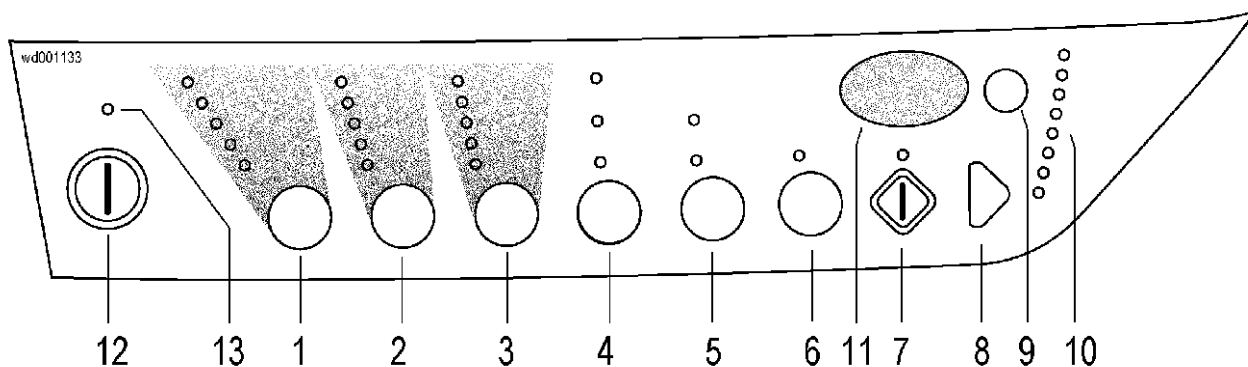
1.   **"FABRICS" button**

2.   **"TEMPERATURE" button**

3.   **"SPIN" button**

4.   **"OPTIONS" button**

5.   **"OPTIONS" button**

6.   **"OPTIONS" button**

7.   **"START/PAUSE" button**

8.   **"SKIP/RESET" button**

9.   **"DELAYED START" button**

10.   **Programme phase indicator LEDs**

11.   **Display window**

12.   **ON/OFF button**

13.   **Pilot lamp**

1. "FABRICS" button

Press this button to select the washing programme suitable for the fabrics to be washed.
The LED corresponding to the selected washing programme lights.
The machine proposes the standard programme for the type of fabric selected; a temperature and the maximum spin speed for the selected programme are displayed, as well as the normal soiling level. However, these parameters can be modified by pressing the corresponding buttons. The display will also show the duration of the selected programme, which is calculated according to the maximum load for each type of fabric, and the START/PAUSE LED begins to flash.

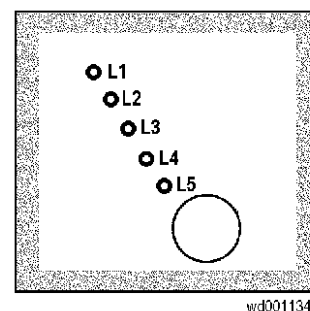The type of fabric can be modified at any time during the washing cycle; in this case, the phase currently being performed will restart from the beginning.

The table below shows the options that the user can select for each model.

LED	Type A	Type B	Type C
L1	Cotton	Cotton	Cotton
L2	Synthetics	Synthetics	Synthetics
L3	Delicate fabrics	Delicate fabrics	Delicate fabrics
L4	Wool	Hand wash	Wool
L5	Hand wash	Mini	------

Hand wash

If this programme is selected (certain models only), the washing cycle will be especially delicate, and can be used for fabrics labelled "Hand Wash".

2. "TEMPERATURE" button

If a temperature different from the standard temperature proposed by the appliance is desired, press this button repeatedly to increase of decrease the temperature. The corresponding LED will light.
The maximum temperature is 90°C for cotton, 60°C for synthetics, 40°C for delicate fabrics, wool and hand washing.
The temperature button is effective only after the type of fabric has been selected.
The temperature can be modified at any time during the washing cycle ("START/PAUSE"); in this case, the phase will restart from the beginning.
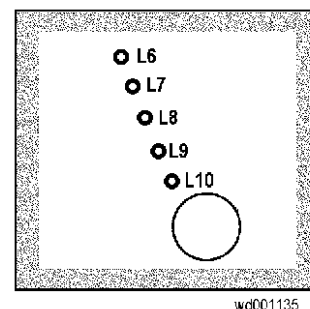
LED	Type A	Type B	Type C
L6	90° C	90° C	90° C
L7	60° C	60° C	60° C
L8	40° C	50° C	50° C
L9	30° C	30° C	40° C
L10	Cold wash	Cold wash	30° C

3. "SPINNING" button

Press this button to reduce the speed of the intermediate and final spin cycles as shown in the table below. This button is effective only after the type of fabric has been selected; the spin speed can be modified until the end of the rinses.

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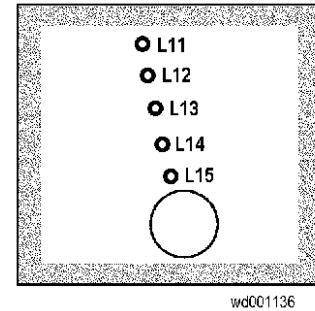| LED11	LED12	LED13	LED14	LED15
1600	900	700	500	
1600	1200	900	700	
1500	900	700	500	
1500	1200	900	700	
1400	900	700	500	NO SPIN
1400	1200	900	700	or
1300	900	700	500	RINSE HOLD
1300	1200	900	700	
1200	900	700	500	
1100	900	700	500	
1000	900	700	500	
900	700	600	500	

In <u>COTTON cycles</u>, the spin cycle cannot be excluded.

In COTTON cycles, this option also modifies the structure of the rinsing phases according to the speed of the intermediate spin:

| Intermediate spin (rpm)	Traditional washing			Jetsystem washing		
	1st rinse	2nd rinse	Last rinse	1st rinse	2nd rinse	Last rinse
<850	TR2	TR2	TR2	TR2	TR2	TR2
850-950	TR1	TR2	TR2	TE	TR2	TR2
1000-1150	TR1	TR1	TR2	TE	TE	TR2
>1150	TR1	TR1	TR1	TE	TE	TE

TR2   Traditional rinse at second level

TR1   Traditional rinse at first level

TE   "total exchange" (virtual tank) jetsystem rinse

4,5,6 "OPTIONS" buttons

The number and type of OPTIONS buttons vary according to the model. All OPTIONS buttons are effective during the programme selection phase, but only after the type of fabric has been selected. After the "START/PAUSE" button has been pressed, the options can generally be selected up until the start of the phase whose parameters are to be modified.
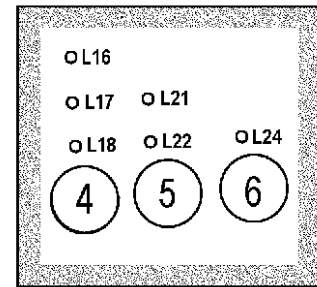
wd001137

"RINSE HOLD" button

The RINSE HOLD button is effective during the entire duration of the programme.
This function can be selected in COTTON, SYNTHETICS, DELICATE FABRICS and WOOL cycles; in certain models, it is combined with the SPIN button.
When this option is selected, the appliance will not drain the tub at the end of the final rinse (in order to prevent creasing the fabrics). At the end of the cycle, the LED corresponding to the START/PAUSE button (and, where applicable, the phase indicator LED) will begin to flash to indicate to the user that the water in the tub must be drained.

The following options can be selected to complete the programme:

⇒ **drain and spin:** Press START/PAUSE. The appliance will drain the tub and then perform a spin cycle at the maximum speed for the programme previously selected.
⇒ **select a spin speed** using the SPIN button and then press START/PAUSE.
⇒ **drain only:** Press SKIP/RESET **once**, until the DRAIN pilot lamp lights, then press START/PAUSE.

If the RINSE HOLD option is selected in a COTTON cycle, the water fill for the final rinse will take place at a higher level.

"PRE-WASH" button

This option adds a pre-wash phase at the beginning of the cycle. The PRE-WASH option can be selected only during the programme selection phase, and is not available in WOOL cycles.
The PRE-WASH option cannot be selected together with the STAINS or SOAK options.

"SOAK" button

This option can be selected in COTTON, SYNTHETICS and DELICATE FABRICS cycles (but only in the programme selection phase), and adds a pre-wash at the beginning of the cycle.
30 minutes after the start of the cycle, the water is drained and the appliance passes to the subsequent phase.
The DELAYED START button (if featured) can be used to select a SOAK time from 1 hour to 24 hours. The delay time will be shown in hours in the display window during the selection phase; after the cycle has been started, the delayed-start countdown will be shown in hours until it falls below 10 hours, after which the time will be shown in hours and minutes. At the end of the SOAK phase, the water is drained from the tub and the washing programme starts.
The SOAK option cannot be selected together with the STAINS and PRE-WASH options.

"STAINS" button

The STAINS option can be selected in COTTON, SYNTHETICS and DELICATE FABRICS cycles with temperatures of 40°C or higher, and can also be selected during the washing phase.
This option adds the STAINS phase, in which special additives are introduced into the tub from the pre-wash compartment after the BIO phase with heating to 40°C, and an additional 10 minutes of motor movement.
The STAINS option cannot be selected together with the PRE-WASH/SOAK, INTENSIVE and QUICK /DAILY options.

"INTENSIVE" / "HEAVY SOIL" button

This option can be selected during the entire duration of the washing programme, and is available only in cycles for COTTON and SYNTHETICS.
This option increases the phases of drum movement after the heating phases.
The INTENSIVE / HEAVY SOIL option cannot be selected together with the STAINS, QUICK CYCLE and ECONOMY options.

"QUICK CYCLE - LIGHT SOIL" / "DAILY" button

This option can be selected during the entire duration of the wash programme, and is available in cycles for COTTON, SYNTHETICS and DELICATE FABRICS: it reduces the duration of the cycle.
When this option is selected in COTTON cycles, it modifies the rinse sequence as well as reducing the times: one rinse is eliminated, and the water fill level in the remaining rinses is increased.
The QUICK CYCLE - LIGHT SOIL" / DAILY option cannot be selected together with the STAINS, INTENSIVE and ECONOMY options.

"LEVEL OF SOILING" button

This option can be selected during the entire duration of the washing programme.
The standard programme is set for NORMAL soiling. By pressing this button, the level of soiling can be modified:

$\Rightarrow$ HEAVY (this option can be selected only in cycles for COTTON and SYNTHETICS).
   LIGHT - QUICK CYCLE (this option can be selected only in cycles for COTTON, SYNTHETICS and DELICATE FABRICS).

The functions of these options are as described for the corresponding individual buttons.

"ECONOMY" button

This option can also be selected during the washing cycle, and is available only in cycles for COTTON and SYNTHETICS with temperatures of 40°C or higher.
The ECONOMY option reduces the temperature of the programme and increases the drum movement phases after the heating phases.
The ECONOMY option cannot be selected together with the INTENSIVE/HEAVY AND LIGHT SOILING and QUICK CYCLE / DAILY options.

"BIO" button

This option can be selected only after selecting the type of fabric, and can also be selected during the washing phase. The BIO option can be selected only in cycles for COTTON and SYNTHETICS with temperatures of 40°C or higher.
The BIO option adds a 10-minute phase of motor movement after heating to 40°C, and is designed to activate the enzymes contained in the detergent.


"EXTRA RINSE" button

The EXTRA RINSE option can be selected at any time up to the end of the washing phase, and adds one rinse phase in cycles for COTTON, SYNTHETICS and DELICATES.

7. "START/PAUSE" button

START: After selecting the programme and the desired options, press the START button to start the programme. The LED positioned above the button will cease flashing and remain lit. If a delayed start time has been selected, the countdown will commence; the countdown will be shown on the display.

PAUSE: When the button is pressed again, the programme currently being performed is interrupted. The LED above the button will start to flash. When the cycle is paused, the door LED switches off and the door can be opened on condition that:
- the machine is not performing a heating phase
- the water level is not high
- the drum is not in movement
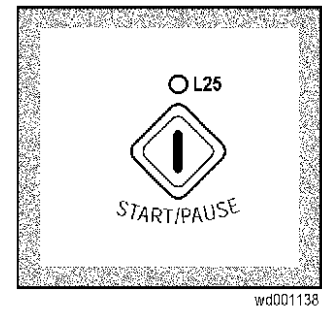
When the appliance is paused, the programmes can be modified as follows:

→ The structure can be changed or the programme cancelled (SKIP/RESET button). In this case, the water (and detergent) will not be drained and the new cycle will begin with water in the tub. If it is preferred to restart the new cycle without saving water and detergent, it is necessary first to select a drain phase and then the new programme.
→ The FABRICS and the TEMPERATURES can be modified only during the washing phase; in this case, the cycle will be restarted from the beginning.
→ The SPIN can be modified before the start of the final spin cycle.
→ All the cycle OPTIONS can be modified before the commencement of the phase to be modified.

To re-start the programme, press the button again.

DRAIN and **SPIN**: after programmes with the RINSE HOLD option.

8. "SKIP/RESET" button

Thus button performs two functions:

Cancels the programme: Press the button until the cycle LEDs switch off. The display will show three flashing hyphens.

Selects special programmes: In the programme **selection** and **execution** phases, this button can be used to cancel certain phases of the programme so that the appliance effectively performs a special cycle. In the programme execution phase, the appliance must be paused.

The cycle **normally** performed by the appliance consists of the following phases:
Wash - **Rinses** - **Spins**

⇒ When the button is pressed **once**: **Rinses** - **Spins**.

⇒ When the button is pressed **twice**: **Spin**

⇒ When the button is pressed **three times**: **Drain**.

⇒ When the button is pressed **four times**: **Cancel programme**.
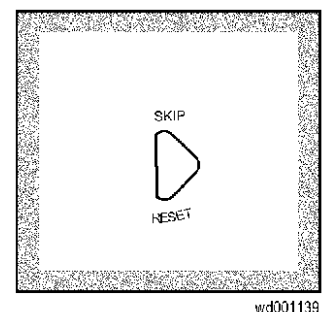
If the **PRE-WASH** option is selected, it can be cancelled by pressing this button, so that the appliance performs the wash only.

9. "DELAYED START" button

This button can be used to delay the start of the programme for up to 24 hours. The selected delay time is shown on the display for approximately 5 seconds, after which the duration of the programme is displayed.
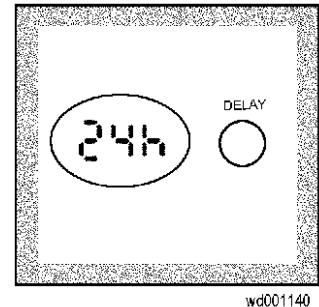The DELAYED START option must be selected **after** selecting the programme and **before** pressing START/PAUSE.
The delay countdown is decremented at intervals of one hour, and is shown on the display.

To modify or cancel the delayed-start time:
- press START/PAUSE to set the appliance to PAUSE.
- press the DELAYED START button until the display shows the new delay time or **0h**.
- press START/PAUSE again.
The porthole door remains locked during the entire delayed-start period (the door pilot lamp lights).
If it is necessary to open the porthole door, set the appliance to PAUSE mode. After re-closing the door, press START/PAUSE.
If the SOAK option has been selected, the delay time becomes the soak time.

10. Programme phase LEDs

When the programme has been selected, the LEDs corresponding to the various phases in the programme light. When the programme starts, only the LED corresponding to the current phase remains lit.

LED	Colour	Models with display	Models without display
L26	Green	--	Prewash
L27	Green	Prewash	Wash
L28	Green	Wash	Rinses
L29	Green	Rinses	Rinse Hold
L30	Green	Spin	Spin
L31	Green	Drain	Drain
L32	Orange	--	Filter Clogged
L33	Green	--	End
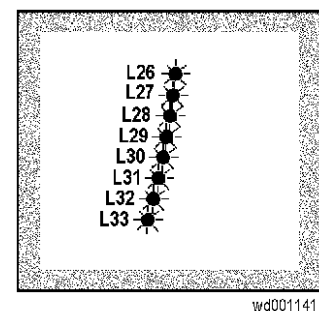
11. Display

The display shows the following information:

⇒ **Three flashing hyphens**: when a programme is cancelled by pressing the SKIP/RESET button. The hyphens will also be displayed when the ON/OFF button is pressed to switch the appliance on, but only if the cycle selected previously has been cancelled.
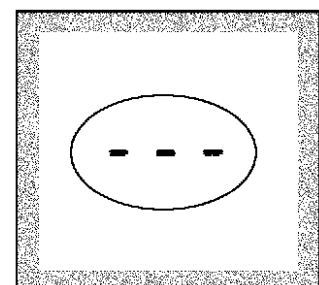
⇒ **The duration of the washing programme** is displayed when the programme has been selected. This time corresponds to the time necessary for the maximum wash load.
When the programme is started (i.e. after pressing START/PAUSE), the time is decremented at intervals of one minute.
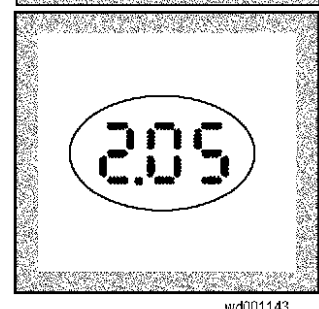
⇒ **Rinse hold**: the appliance stops with water in the tub at the end of programmes for which the RINSE HOLD option has been selected; the display shows a **zero** (fixed, not flashing).

⇒ **End of cycle**: indicated by a **zero** (flashing) and, at the same time, the door pilot lamp switches off. The zero re-appears when the appliance is switched on again, if the previous programme has not been cancelled. It may occur, when the appliance is switched on for the first time, that a flashing zero is shown on the display and the acoustic signals are activated. This is due to the fact that the machine has performed a washing cycle during testing in the factory which has not been cancelled on completion.

⇒ **Delayed start**, which is selected using the DELAYED START button. The countdown starts when the START/PAUSE button is pressed, and is decremented at intervals of one hour.
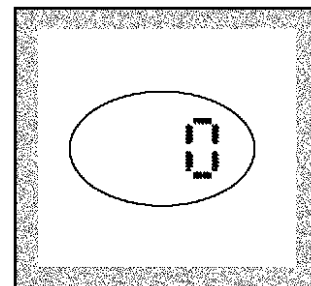
⇒ **An incorrect option selection** is signalled by **Err** on the display if the function selected is not compatible with the programme. The buzzer also sounds when an incorrect option is selected.

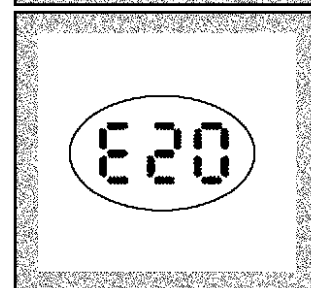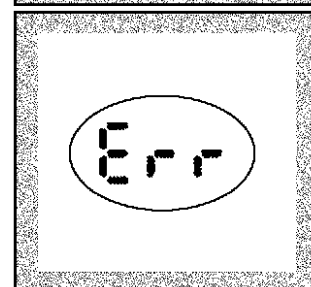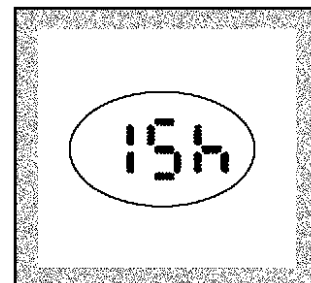⇒ **An alarm code** indicates a machine malfunction.

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12. ON/OFF button

Press the ON/OFF button to switch the appliance ON. The display shows three flashing hyphens or a flashing zero. Press the same button to switch the appliance OFF.

The ON/OFF button is an individual pushbutton, and is not part of the display board.

EXCLUSION OF THE BUZZER AT THE END OF THE PROGRAMME

By pressing the "TEMPERATURE" and "SPIN" buttons at the same time (or the temperature button with button 4) it is possible to disactivate the buzzer sound which indicates the end of the programme; by repeating this operation the buzzer will be activated again.
This function is always available and is memorized until it is modified.

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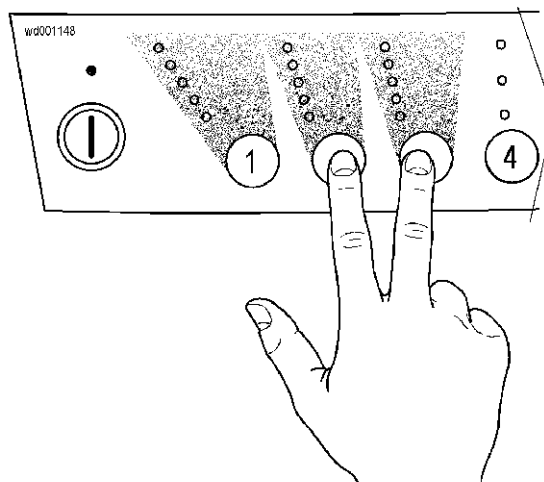
WASHING PROGRAMMES (SEQUENCE CHARTS)

KEY TO PROGRAMMES	
Description	
Calibration	Drain sub-phase for calibration of the electronic pressure switch
Levels	
WC	Level of water in the tub
RPC	Control level for circulation pump
DPC	Control level for drain pump
MC	Control level for motor
Pumps	
OFF	Pump off
ON	Pump on
LEV	Pump on from one level of pressure switch
Water inlet valves	
ELV2	Prewash
ELV3	Wash
ELV2 ELV3	Prewash + wash = softener
Refilling	
NR	Normal refilling
VT	"Total exchange" refilling (virtual tank)
WL	Electronic pressure switch
AB	Safety pressure switch
Dis	Level control disabled
En	Level control enabled
Movement (motor)	
OFF	Motor stopped
ON	Motor in operation
LEV	Level movement
Time	
Tout	Maximum time (timeout)

Motor movement			
Code	**Pause (sec)**	**Movement (sec)**	**Speed (rpm)**
D_MOV	12	4	55
E_MOV	3	10	55
E1_MOV	4	12	75
SE_MOV	4	24	55/40
N_MOV	8	8	55
PWL1_MOV	40	1	35
PWL3_MOV	12	1	35
SPARE_MOV	3	10	40
PWL4_MOV	57	1	35
COLD_MOV	4	12	40
CR3_MOV	Single-direction movement		80
DLD_MOV	Single-direction movement		40

SE Movement:

SE_MOV
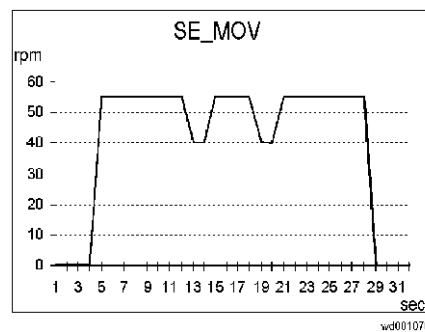
VT movement during rinses in "jetsystem total exchange" COTTON programmes (virtual tank):

During these phases, in which the motor rotates at high speed, if the electronic pressure switch detects that the water in the tub falls below a certain level, the following operations are performed:

spin at 470 rpm (VT_MOV_CODE) to remove the water from the fabrics and therefore to increase the level in the tub.

5 seconds pause, during which the level is again checked and, if necessary, the solenoid valve is activated in order to load water until the level is correct.

energetic movement (E) (with the circulation pump in operation).

These operations may be repeated up to a maximum of <u>three times for each rinse</u>.

VT MOV COD
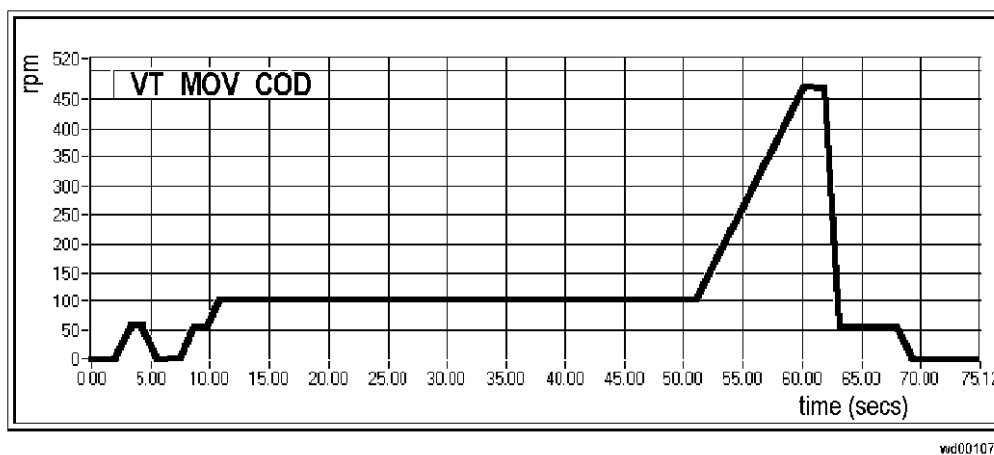
The parameters of the different programmes (levels, movements) vary according to the motor power supply system of the different models:

AC motor

DC motor

Step n.°	PHASE	Description	Levels (mm H20)				Rec. pump	Drain pump	Water inlet valves	Movement		Refilling			Temp. °C	Time	Time to end
			wc	rpc	dpc	mc				type	code	type	wl	ab			
1	**WASH**	CALIBRATION	35/15	35/15	35/15	35/15	OFF	ON		OFF	Motor Stopped	NR	Dis	Dis		Tout 10'	0.00.20
2		WATER LOAD	50/15					OFF	ELV2					En			Tout 15'	0.01.40
3		MOVEMENT								ON	PWL3_MOV					1'	0.01.00
4		WATER LOAD	55/30				LEV		ELV3		DLD_MOV					Tout 15'	0.01.40
5		MOVEMENT	45/15			45/15				LEV	COLD_MOV					4'	0.04.00
6		MOVEMENT					OFF				E_MOV					3'	0.03.00
7		HEATING	35/15			35/15					SPARE_MOV			En	40	Tout 40'	0.06.40
8		HEAT+MOVEMENT					OFF			ON			Dis	Dis	56	2'	0.02.00
9		HEATING								LEV			En	En	56	Tout 40'	0.07.00
10		MOVEMENT					ON			ON			Dis	Dis		2'	0.02.00
11		HEAT+MOVEMENT					OFF								56	2'	0.02.00
12		HEATING								LEV			En	En	56	Tout 40'	0.03.00
13		MOVEMENT					ON			ON	SE_MOV		Dis	Dis		18'	0.18.00
14		MOVEMENT									N_MOV					4'	0.04.00
15		MOVEMENT									SE_MOV					18'	0.18.00
16		MOVEMENT					OFF			OFF	Motor Stopped					22"	0.00.20
17		WATER DRAIN						Lev		ON	D_MOV					Tout 10'	0.00.20
18		SPINNING						ON			IMP6					Tout 20'	0.09.00
19	**1st RINSE**	MOVEMENT						OFF		ON	CR3_MOV					5"	0.00.10
20		WATER LOAD	75/20				LEV						En			Tout 15'	0.01.40
21		MOVEMENT	35/25				ON				E_MOV	VT				4'	0.05.30
22		MOVEMENT									E1_MOV	NR	Dis			2'	0.02.00
23		WATER DRAIN					OFF	Lev			D_MOV					Tout 10'	0.00.20
24		SPINNING						ON			IMP6_RINSE					Tout 20'	0.05.00
25	**2nd RINSE**	MOVEMENT	35/15					OFF		ON	CR3_MOV					5"	0.00.10
26		WATER LOAD	75/20				LEV						En			Tout 15'	0.01.40
27		MOVEMENT	35/25				ON				E_MOV	VT				4'	0.05.30
28		MOVEMENT									E1_MOV	NR	Dis			2'	0.02.00
29		WATER DRAIN					OFF	Lev			D_MOV					Tout 10'	0.00.20
30		SPINNING						ON			IMP6_RINSE					Tout 20'	0.05.00
31	**3rd RINSE**	MOVEMENT	35/15					OFF		ON	CR3_MOV					5"	0.00.10
32	**(softener)**	WATER LOAD	100/80				LEV		ELV2 ELV3		N_MOV		En			Tout 15'	0.01.40
33		MOVEMENT		100/80												6'	0.06.00
34		MOVEMENT					OFF			OFF	Motor Stopped		Dis			22"	0.00.20
35	**SPINNING**	WATER DRAIN	35/15	35/15				Lev		ON	D_MOV					Tout 10'	0.00.20
36		SPINNING						ON			IMPCF_01_AC					Tout 20'	0.07.00
37		MOVEMENT						OFF			N_MOV					2'	0.02.00

Cotton 60 JETSYSTEM - DC motor (G46I - intermediate spin 850 1000)

Step n.°	PHASE	Description	Levels (mm H20)				Rec. pump	Drain pump	Water inlet valves	Movement		Refilling			Temp. °C	Time	Time to end
			wc	rpc	dpc	mc				type	code	type	wl	ab			
1	**WASH**	CALIBRATION	15/5	15/5	15/5	15/5	OFF	ON		OFF	Motor Stopped	NR	Dis	Dis		Tout 10'	0.00.20
2		WATER LOAD	45/15					OFF	ELV2				En			Tout 15'	0.01.40
3		MOVEMENT								ON	PWL3_MOV					1'	0.01.00
4		WATER LOAD	55/30				LEV		ELV3		DLD_MOV					Tout 15'	0.01.40
5		MOVEMENT	45/15			45/15				LEV	COLD_MOV					4'	0.04.00
6		MOVEMENT					OFF				E_MOV					3'	0.03.00
7		HEATING	15/5			15/5					SPARE_MOV			En	40	Tout 40'	0.05.50
8		HEAT+MOV					OFF			ON			Dis	Dis	58	2'	0.02.00
9		HEATING								LEV			En	En	58	Tout 40'	0.06.20
10		MOVEMENT					ON			ON			Dis	Dis		2'	0.02.00
11		HEAT+MOV					OFF								58	2'	0.02.00
12		HEATING								LEV			En	En	58	Tout 40'	0.02.20
13		MOVEMENT								ON	SE_MOV		Dis	Dis		12'	0.12.00
14		MOVEMENT									N_MOV					4'	0.04.00
15		MOVEMENT									SE_MOV					14'	0.14.00
16		MOVEMENT					OFF			OFF	Motor Stopped					22"	0.00.20
17		WATER DRAIN						Lev		ON	D_MOV					Tout 10'	0.00.20
18		SPINNING						ON			IMP6					Tout 20'	0.09.00
19	**1st RINSE**	MOVEMENT						OFF		ON	CR3_MOV					5"	0.00.10
20		WATER LOAD	75/20				LEV						En			Tout 15'	0.01.40
21		MOVEMENT	25/15				ON				E_MOV	VT				5'	0.06.30
22		MOVEMENT									E1_MOV	NR	Dis			3'	0.03.00
23		WATER DRAIN					OFF	Lev			D_MOV					Tout 10'	0.00.20
24		SPINNING						ON			IMP6_RINSE					Tout 20'	0.05.00
25	**2nd RINSE**	MOVEMENT	15/5					OFF		ON	CR3_MOV					5"	0.00.10
26		WATER LOAD	75/20				LEV						En			Tout 15'	0.01.40
27		MOVEMENT	25/15				ON				E_MOV	VT				5'	0.06.30
28		MOVEMENT									E1_MOV	NR	Dis			3'	0.03.00
29		WATER DRAIN					OFF	Lev			D_MOV					Tout 10'	0.00.20
30		SPINNING						ON			IMP6_RINSE					Tout 20'	0.05.00
31	**3rd RINSE**	MOVEMENT	15/5					OFF		ON	CR3_MOV					5"	0.00.10
32	**(softener)**	WATER LOAD	95/20						ELV2 ELV3		N_MOV		En			Tout 15'	0.01.40
33		MOVEMENT		95/20												11'	0.11.00
34		MOVEMENT					OFF			OFF	Motor Stopped		Dis			22"	0.00.20
35	**SPINNING**	WATER DRAIN						Lev		ON	D_MOV					Tout 10'	0.00.20
36		SPINNING	15/5	15/5				ON			IMPCF_01_DC					Tout 20'	0.09.00
37		MOVEMENT						OFF			N_MOV					2'	0.02.00

Synthetics 60 JETSYSTEM   (G46I)

Step n.°	PHASE	Description	Levels (mm H20)				Rec. pump	Drain pump	Water inlet valves	Movement		Refilling			Temp. °C	Time	Time to end
			wc	rpc	dpc	mc				type	code	type	wl	ab			
1	**WASH**	CALIBRATION	35/15 *	35/15 *	35/15*	35/15*	OFF	ON		OFF	Motor Stopped	NR	Dis	Dis		Tout 10'	0.00.00
2		WATER LOAD	50/15 **					OFF	ELV2					En			Tout 15'	0.01.40
3		MOVEMENT									ON	PWL3_MOV					1'	0.01.00
4		WATER LOAD	100/65					LEV		ELV3	OFF	Motor Stopped					Tout 15'	0.01.40
5		MOVEMENT									LEV	N_MOV					7'	0.07.00
6		HEATING				100/65	ON					E_MOV			En	39	Tout 40'	0.10.50
7		MOVEMENT						LEV									8'	0.08.00
8		HEATING					ON									55	Tout 40'	0.09.40
9		MOVEMENT						LEV									8'	0.08.00
10		HEATING					ON									55	Tout 40'	0.00.00
11		MOVEMENT						LEV									8'	0.08.00
12		WATER LOAD	175/90								ON	N_MOV			Dis		Tout 1'	0.01.00
13		MOVEMENT												Dis			2'	0.02.00
14		MOVEMENT						OFF			OFF	Motor Stopped					22"	0.00.20
15		WATER DRAIN							Lev		ON	E_MOV					Tout 10'	0.00.20
16		TIME WATER DRAIN							ON								2'	0.02.00
17	**1st RINSE**	MOVEMENT	35/15 *			35/15 *		OFF		OFF	Motor Stopped					5"	0.00.10
18		WATER LOAD	175/90					LEV						En			Tout 15'	0.01.40
19		MOVEMENT									ON	N_MOV					2'	0.02.00
20		WATER DRAIN						OFF	Lev			E_MOV		Dis			Tout 10'	0.00.20
21		TIME WATER DRAIN							ON								2'	0.02.00
22	**2nd RINSE**	MOVEMENT	35/15						OFF		OFF	Motor Stopped					5"	0.00.10
23		WATER LOAD	175/90					LEV						En			Tout 15'	0.01.40
24		MOVEMENT						LEV			ON	N_MOV					2'	0.02.00
25		WATER DRAIN						OFF	Lev			E_MOV		Dis			Tout 10'	0.00.20
26		SPINNING							ON			IMP_C0					Tout 20'	0.03.00
27	**3rd RINSE**	MOVEMENT	35/15 *						OFF		OFF	Motor Stopped					5"	0.00.10
28	**(softener)**	WATER LOAD	175/90					LEV		ELV2 ELV3				En			Tout 15'	0.01.40
29		MOVEMENT									ON	N_MOV					5'	0.05.00
30		MOVEMENT						OFF			OFF	Motor Stopped		Dis			22"	0.00.20
31	**SPINNING**	WATER DRAIN	35/15 *						Lev		ON	D_MOV					Tout 10'	0.00.20
32		SPINNING							ON			IMP5					Tout 20'	0.02.00

*   DC motor: 15/5
**   DC motor: 45/15

Step n.°	PHASE	Description	Levels (mm H20)				Rec. pump	Drain pump	Water inlet valves	Movement		Refilling			Temp. °C	Time	Time to end
			Wc	rpc	dpc	mc				type	code	type	wl	ab			
1	**WASH**	CALIBRATION	35/15 *	35/15*	35/15*	35/15*	OFF	ON		OFF	Motor Stopped	NR	Dis	Dis		Tout 10'	0.00.00
2		WATER LOAD	50/15 **					OFF	ELV2					En			Tout 15'	0.01.10
3		MOVEMENT								ON	PWL3_MOV					1'	0.01.00
4		WATER LOAD	115/50				LEV		ELV3	OFF	Motor Stopped					Tout 15'	0.01.10
5		MOVEMENT								LEV	PWL1_MOV					4'	0.04.00
6		HEATING					ON							En	29	Tout 40'	0.08.00
7		MOVEMENT					LEV									2'	0.02.00
8		HEAT+MOV													37	14'	0.14.00
9		MOVEMENT					OFF			OFF	Motor Stopped		Dis	Dis		22"	0.00.20
10		WATER DRAIN						Lev								Tout 10'	0.00.20
11		TIME WATER DRAIN						ON								1'	0.01.30
12	**1st RINSE**	MOVEMENT	35/15 *					OFF		OFF	Motor Stopped					5"	0.00.10
13		WATER LOAD	175/90				LEV						En			Tout 15'	0.01.10
14		MOVEMENT								ON	PWL3_MOV					3'	0.03.00
15		WATER DRAIN					OFF	Lev		OFF	Motor Stopped		Dis			Tout 10'	0.00.20
16		TIME WATER DRAIN						ON								1'	0.01.30
17	**2nd RINSE**	MOVEMENT	35/15 *					OFF		OFF	Motor Stopped					5"	0.00.10
18		WATER LOAD	175/90				LEV						En			Tout 15'	0.01.10
19		MOVEMENT								ON	PWL1_MOV					3'	0.03.00
20		WATER DRAIN					OFF	Lev		OFF	Motor Stopped		Dis			Tout 10'	0.00.20
21		TIME WATER DRAIN						ON								1'	0.01.30
22	**3rd RINSE**	MOVEMENT	35/15 *					OFF		OFF	Motor Stopped					5"	0.00.10
23	**(softener)**	WATER LOAD	175/90				LEV		ELV2 ELV3				En			Tout 15'	0.01.10
24		MOVEMENT								ON	PWL1_MOV					5'	0.05.00
25		MOVEMENT					OFF			OFF	Motor Stopped		Dis			22"	0.00.20
26	**SPINNING**	WATER DRAIN	35/15 *					Lev		OFF	Motor Stopped					Tout 10'	0.00.20
27		SPINNING						ON		ON	IMP4					Tout 20'	0.01.00

*   DC motor: 15/5
**   DC motor: 45/15

"FUCS" (**F**ast **U**nbalance **C**ontrol **S**ystem)

The control procedure for unbalanced loads is performed dynamically, before each spin cycle, as follows:

The phase begins at a speed of 55 rpm; the speed can never fall below this threshold, otherwise the check is repeated.
At intervals of 400 ms, the balance is calculated and compared with predetermined limits. If the value is less than the lower limit, the speed of the drum is increased by 2 rpm; if the value is higher, the speed of the drum is reduced by 2 rpm. The reduction in the speed of the drum distributes the washing correctly; this procedure is repeated until the wash load is completely balanced.
Correct balancing of the wash load is achieved at a speed of 115 rpm, after which the spin cycle begins.

The Unbalancing Control function takes place in three steps:

Step 1: The first phase has a preset unbalancing threshold: if correct balancing is achieved, the appliance performs the spin cycle. If not, after a maximum of 60 seconds, a spin pulse at 470 rpm is performed and the function passes to step 2.

Step 2: In the second phase, the unbalancing threshold is variable: if correct balancing is not achieved within 180 seconds, the function passes to step 3.

Step 3: The third phase has a preset unbalancing threshold: if correct balancing is not achieved within 60 seconds, the spin cycle is performed at a lower speed. In this case, spinning may also start at 85 rpm.
If the unbalancing value remains excessive, the spin cycle is skipped.

Anti-foam control function

If the pressure switch detects an anti-foam level (i.e. excessive foam) at the beginning of the spin cycle, the spin is interrupted and the appliance resumes operation from the second phase of the unbalancing control procedure.

EXAMPLES OF OPERATION OF THE UNBALANCING CONTROL FUNCTION:

Load correctly balanced

A: low speed

B: FUCS phase 1
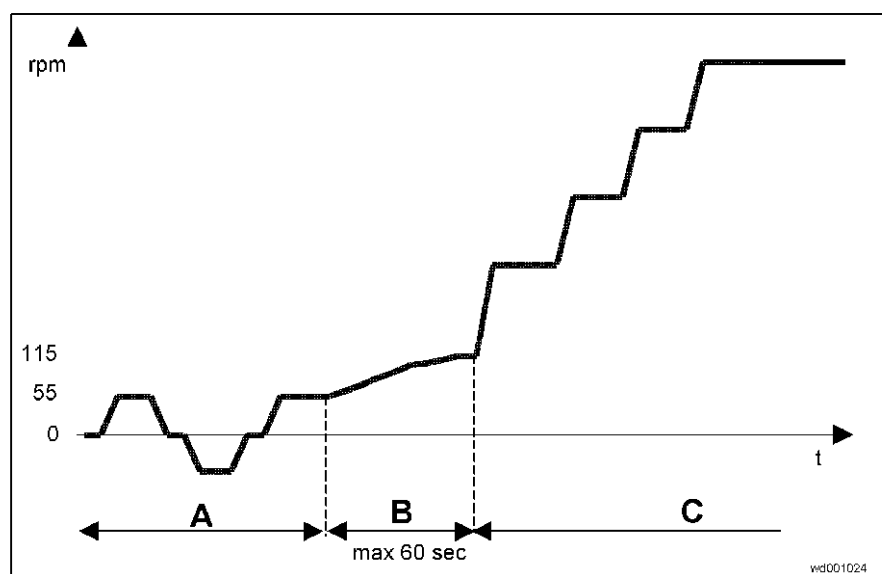
C: normal spin

Load balanced after few attempts:

A: low speed
B: FUCS phase 1
C: normal spin
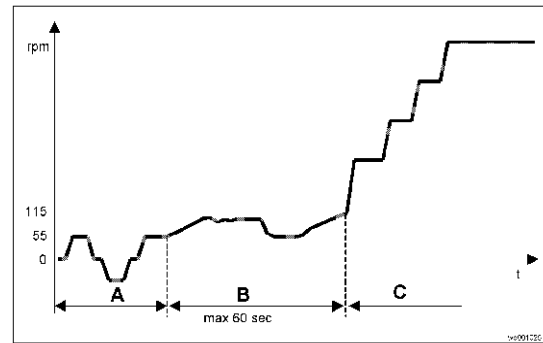
Load balanced after second phase:

A: low speed
B: FUCS phase 1 with pulse at 470 rpm
C: low speed
D: FUCS phase 2
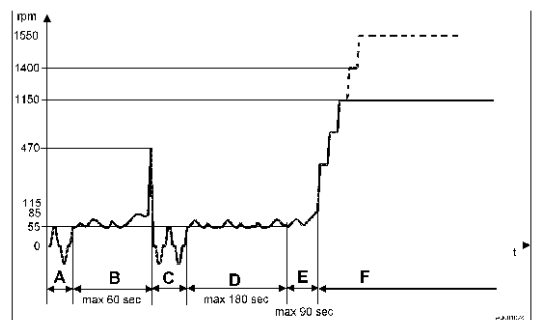**E**: normal spin
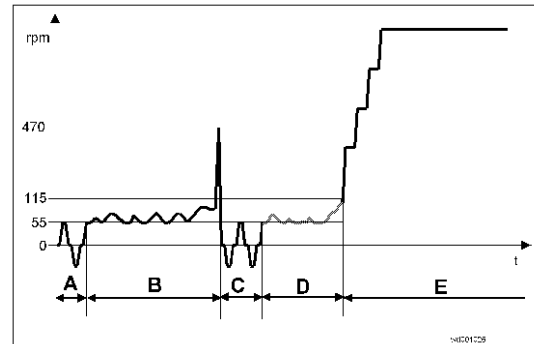
Load balanced after second phase and anti-foam control function:

A: low speed
B: FUCS phase 1 with pulse at 470 rpm
C: low speed
D: FUCS phase 2
E: spin with anti-foam function
F: low speed
G: FUCS phase 3
H: normal spin
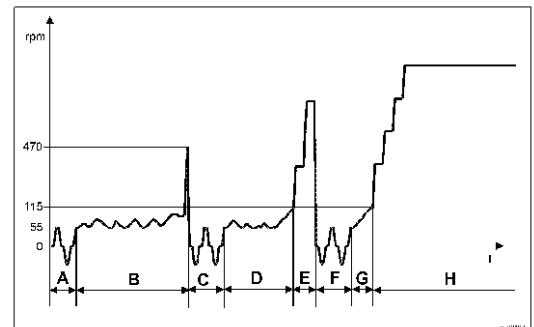
Load slightly unbalanced after third phase:

A: low speed
B: FUCS phase 1 with pulse at 470 rpm
C: low speed
D: FUCS phase 2
E: FUCS phase 3
F: reduced-speed spin

Load unbalanced after third phase:

A: low speed
B: FUCS phase 1 with pulse at 470 rpm
C: low speed
D: FUCS phase 2
E: FUCS phase 3
F: the spin phase is skipped and the appliance passes to the subsequent phase
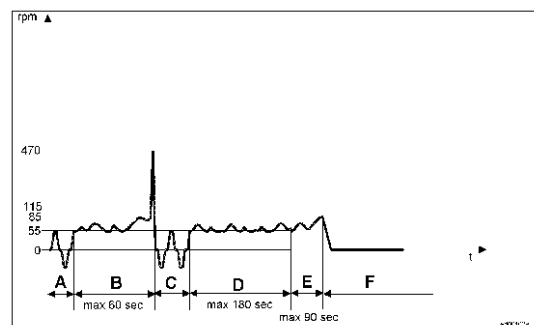
SPIN CYCLES

IMP_C0 spin: pre-wash - COTTONS and SYNTHETICS, penultimate rinse - SYNTHETICS
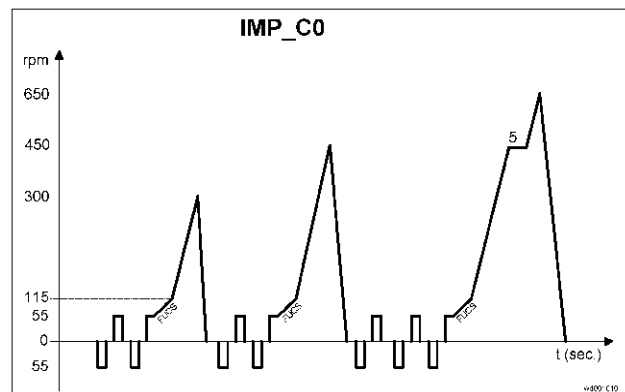
IMP5 spin: final - SYNTHETICS
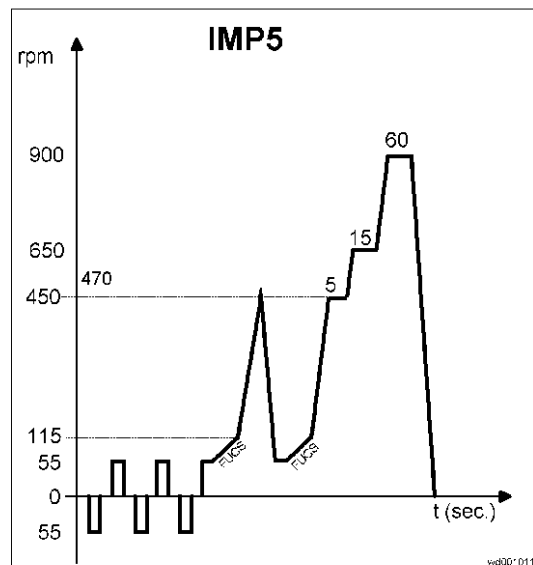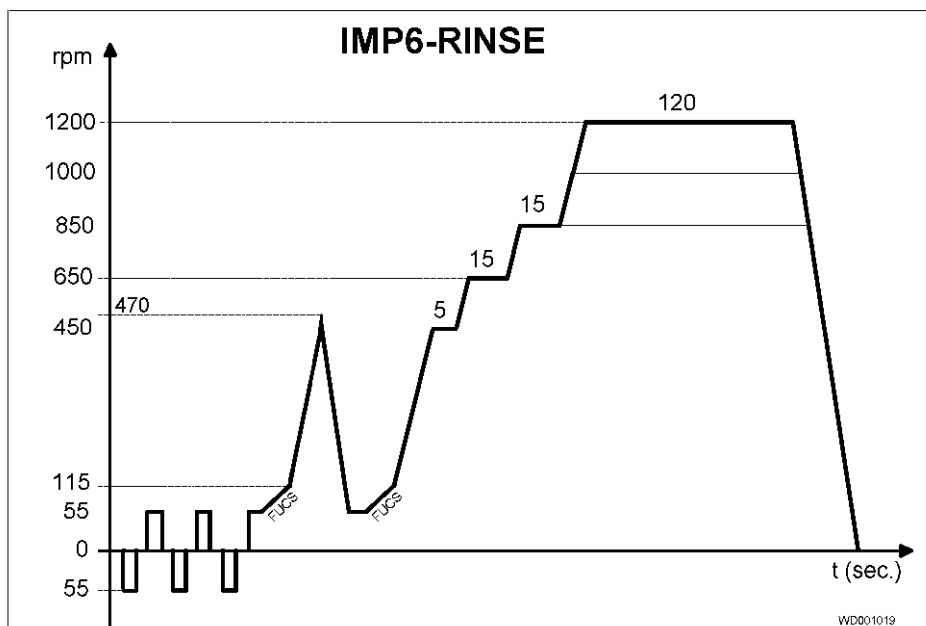

IMP7 spin: final - DELICATE FABRICS
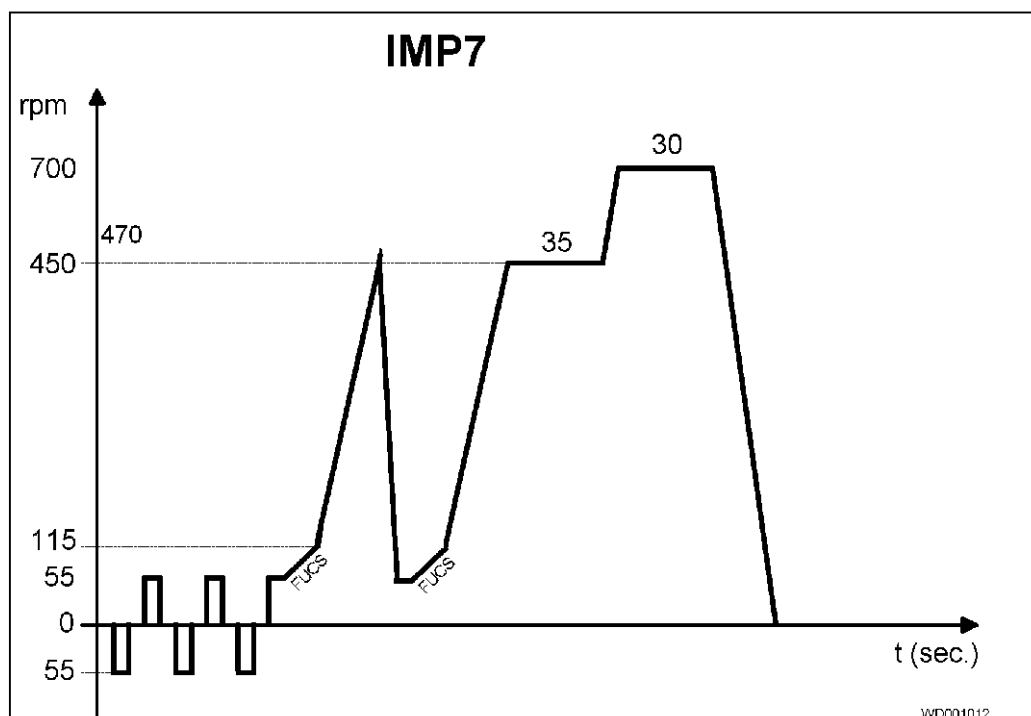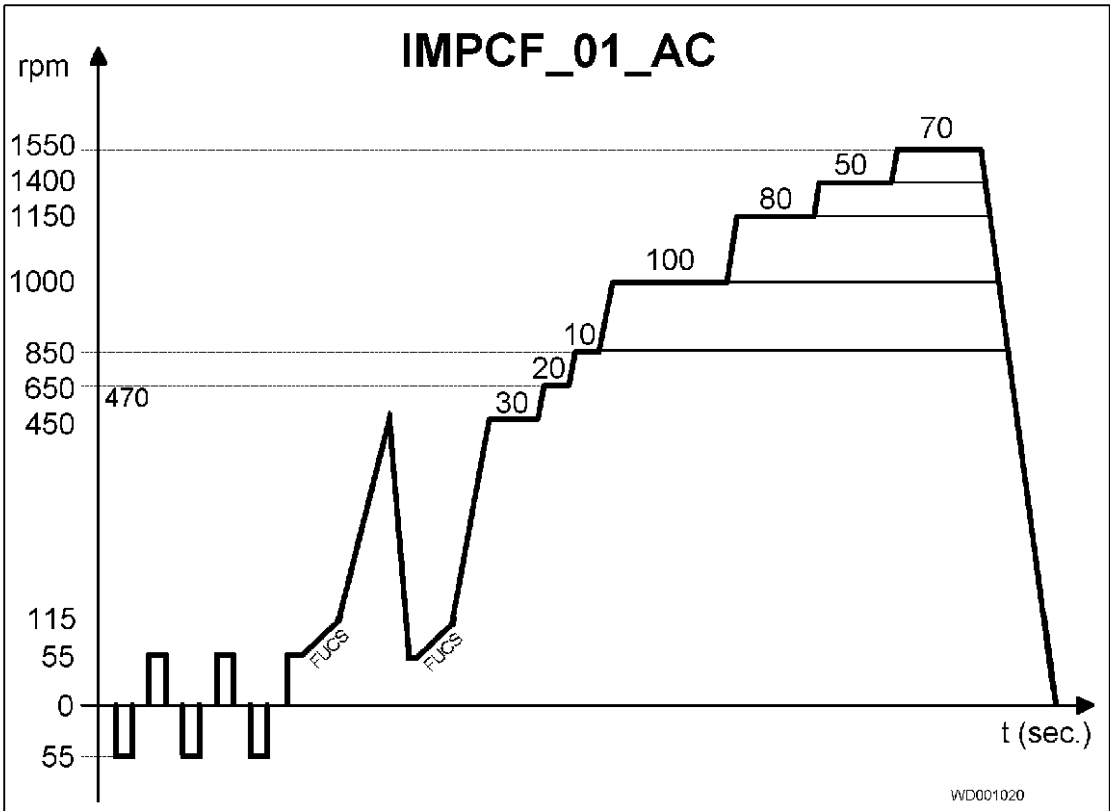
IMP4 spin: final - WOOL

IMP4

WD001013
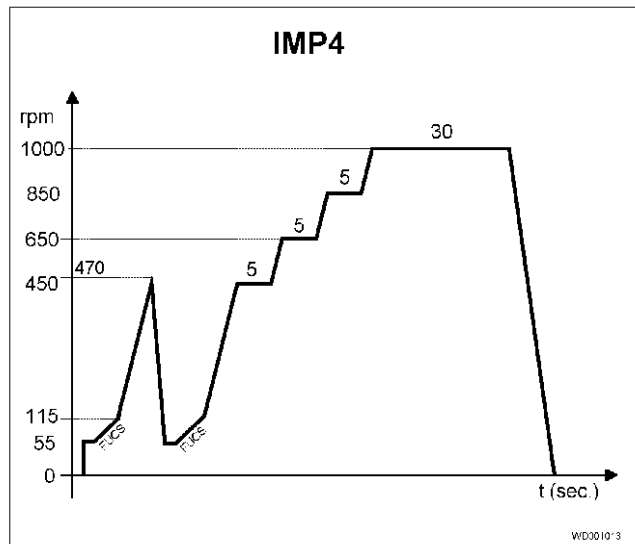
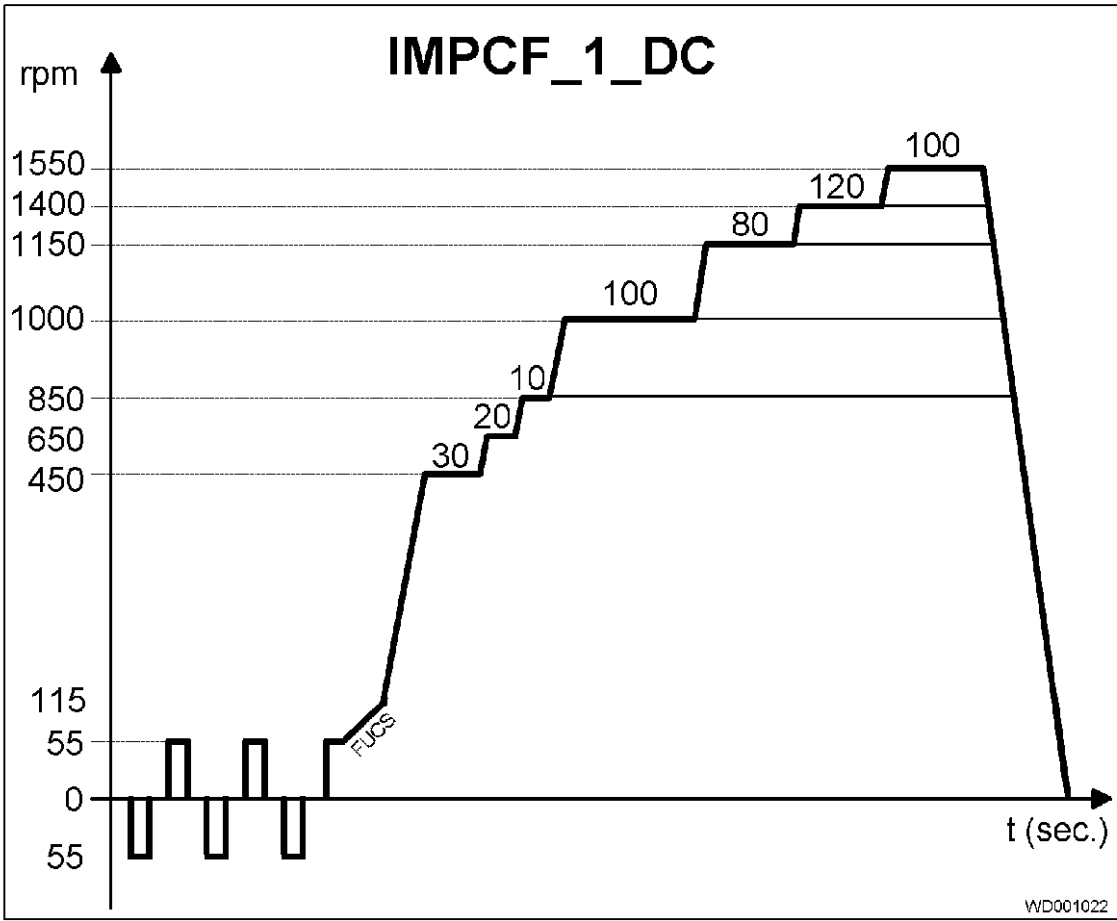**IMP6 spin: first intermediate spin - rinses – COTTON (maximum speed can be configured)**

IMP6

wd001017
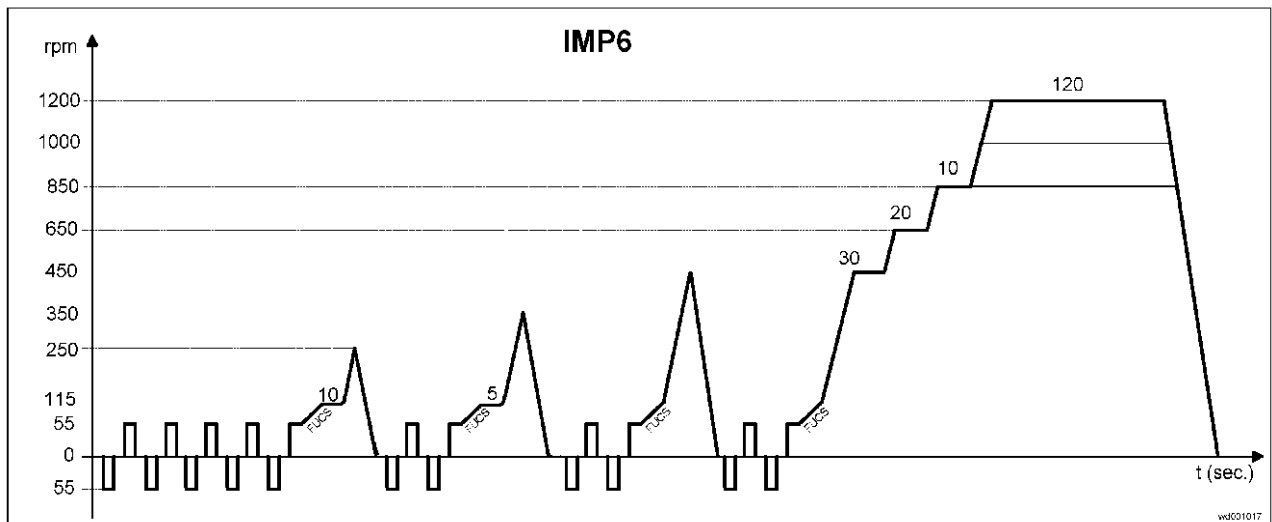
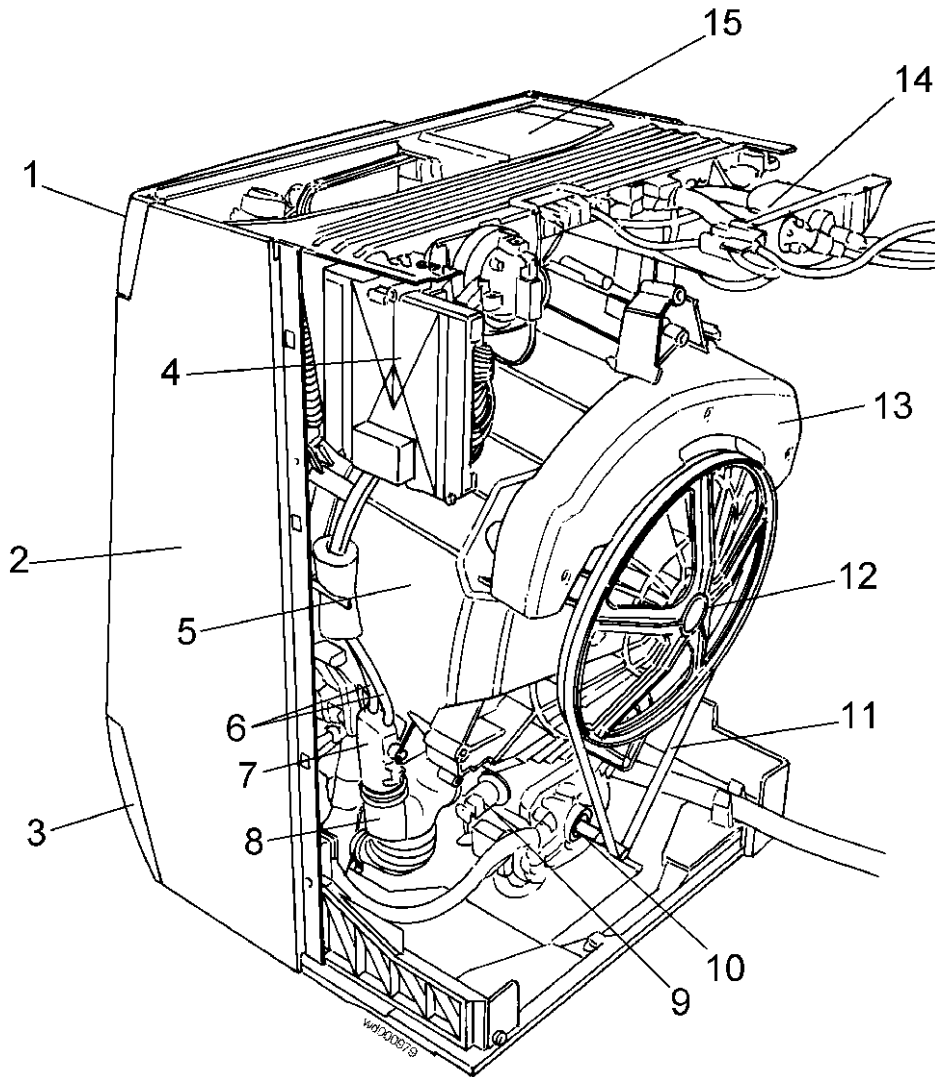**IMP6-RINSE spin: intermediate rinses COTTON (maximum speed can be configured)**

IMP6-RINSE

WD001019

IMPCF_1_AC spin: final – COTTON (AC motors)

IMPCF_01_AC

rpm

1550
1400
1150
1000
850
650
450
470
115
55
0
55

70
50
80
100
10
20
30

FUCS
FUCS

t (sec.)

WD001020

IMPCF_1_AC spin: final – COTTON (DC motors)

IMPCF_1_DC

rpm

1550
1400
1150
1000
850
650
450
115
55
0
55

100
120
80
100
10
20
30

FUCS

t (sec.)

WD001022

STRUCTURAL CHARACTERISTICS

1. Control panel
2. Front cabinet shell
3. Plinth
4. Main electronic board
5. Carboran tub
6. Pressure switch tubes
7. Pressure chamber
8. Tub/filter body hose

9. Temperature sensor
10. Motor
11. Drive belt
12. Drum pulley
13. Rear counterweight
14. Solenoid valve
15. Detergent dispenser drawer

Although their shapes are different, the characteristics of the components in these new washing machines are the same as those used in other models in the P6000 range.

HYDRAULIC CIRCUIT

The hydraulic circuit has been modified with respect to current production models.

New filter body
New pressure chamber
New detergent drawer (similar to those fitted to other models with EWM2000 control system).
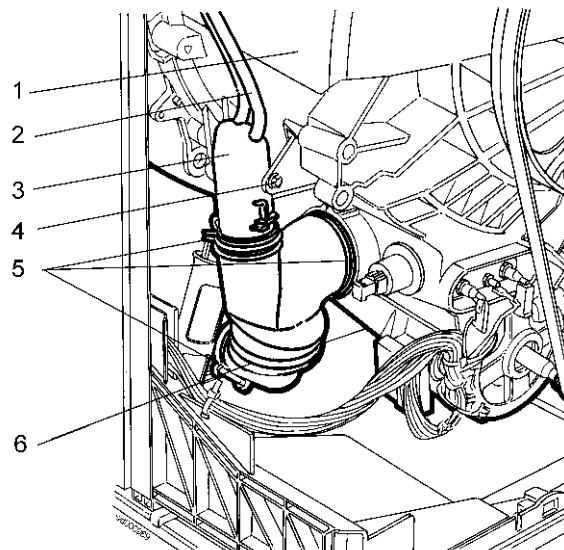
FILTER BODY

1. *Filter drain cap*
2. *Drain tube*
3. *Hinged filter cover*
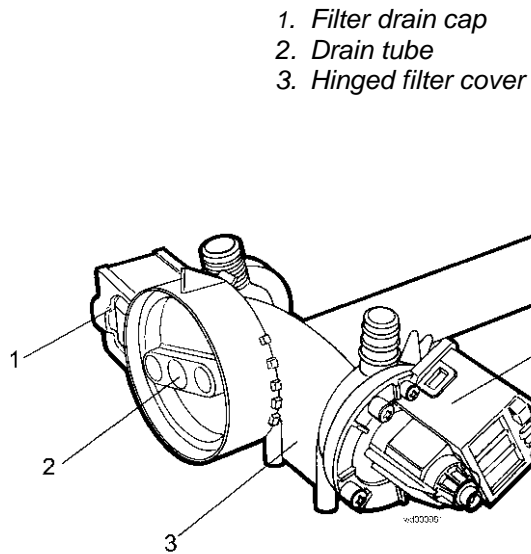
1. *Drain pump*
2. *Drain filter*
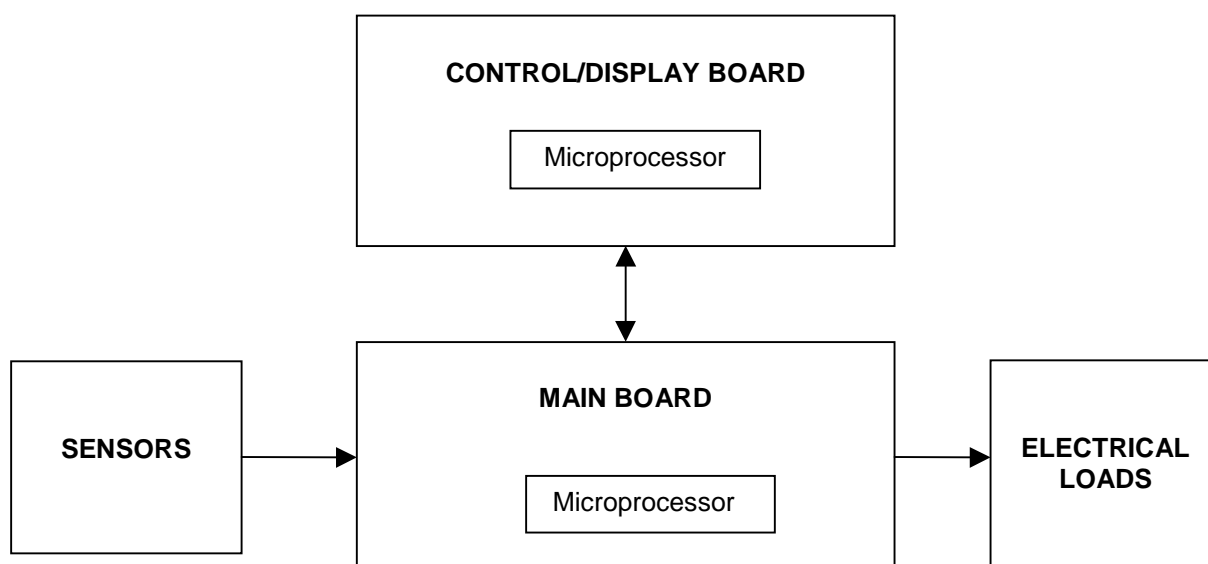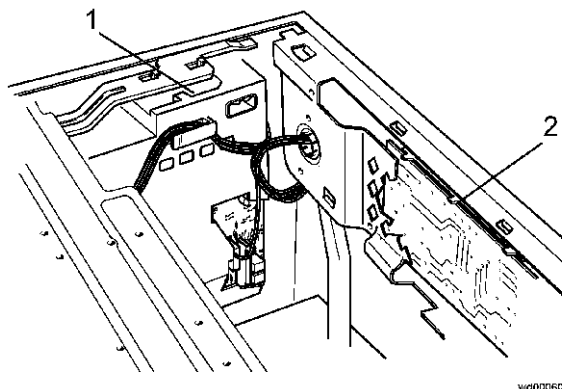3. *Filter body*
4. *Circulation pump*
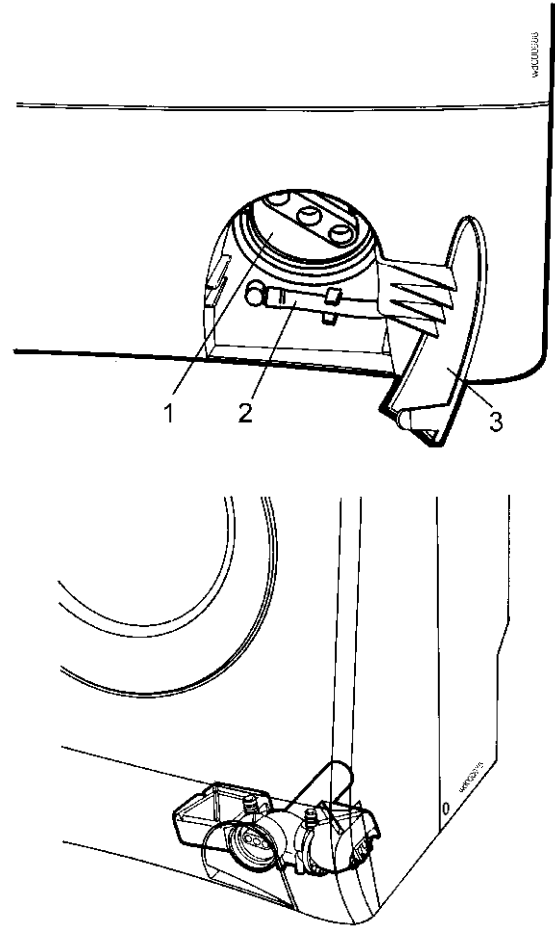
PRESSURE CHAMBER

1. *Tub*
2. *Pressure switch tubes*
3. *Pressure chamber*
4. *Anchor screw*
5. *Hose clamps*
6. *Tub/filter body hose*

TECHNICAL CHARACTERISTICS

EWM 2000 ELECTRONIC CONTROL UNIT

1. Main PCB
2. Control/Display Board

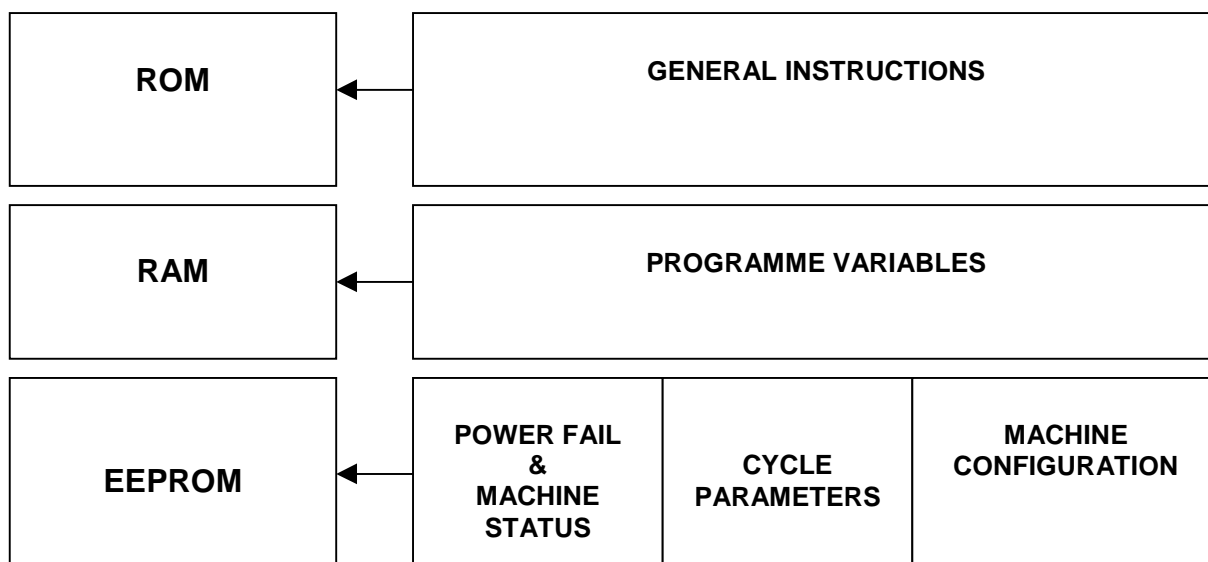The main PCB performs the following functions:

- acquisition of the wash cycle settings via the control/display board.
- control of the water level in the tub via the electronic pressure switch and the safety pressure switch.
- control of the temperature of the washing solution via an NTC sensor.
- control of the speed of rotation of the motor via a signal from the tachometric generator.
- powering of all the electrical components in the washing machine and control of the wash cycle.

Two basic versions of the main PCB are available:

one for washing machines with AC motors

one for washing machines with DC motors

MICROPROCESSOR MEMORY (MAIN PCB)

ROM	GENERAL INSTRUCTIONS		
RAM	PROGRAMME VARIABLES		
EEPROM	POWER FAIL & MACHINE STATUS	CYCLE PARAMETERS	MACHINE CONFIGURATION

The overall structure of the microprocessor memory on the main PCB is subdivided into three sections:

ROM   This area of memory contains the software with the general instructions that control the operation of the appliance, such as those of the electrical components and alarms. The ROM is set up by the manufacturer of the microprocessor, and cannot be modified.

RAM   This part of memory contains all the variables used during the execution of the wash programme, which are written in dynamic format. The RAM can be read using a DAAS interface.

EEPROM This area of memory contains:

    → the data necessary to restart the appliance in case of a power failure.

    → the parameters for the wash cycle, such as water fill level, speed and type of motor movement, and the temperature during the various phases of the wash cycle. Once written, this data is protected and, normally, can be read only using a DAAS interface

    → data relative to the configuration of the appliance, such as the speed of the final spin phase, the volume of the tub, the type of washing system, etc. This data may be entered either via a DAAS interface or via the control/display board.

ENTERING DATA INTO THE EEPROM

All the data is entered into the EEPROM on the production line using a computer with a DAAS interface.

In the field, the configuration only can be modified using a combination of buttons on the control/display board.

ELECTRONIC PRESSURE SWITCH

The electronic pressure switch is an nalogic device that controls the water level in the tub. It is directly connected to the main electronic PCB.

1. air inlet hose
2. diaphragm
3. coil
4. electronic circuit (oscillator)
5. core
6. spring
7. calibration screw
8. connector

The pressure switch is connected by a hose to the pressure chamber.
When the tub is filled with water, the pressure created inside the hydraulic circuit expands the diaphragm. This in turn modifies the position of the core inside the coil, thus changing the inductance and the frequency of the oscillating circuit.
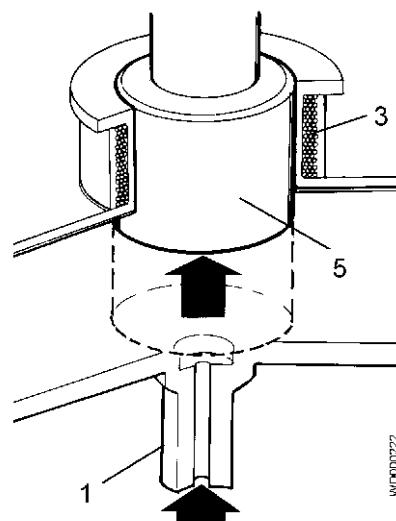The electronic PCB, according to the frequency, recognizes the quantity of the water in the tub.
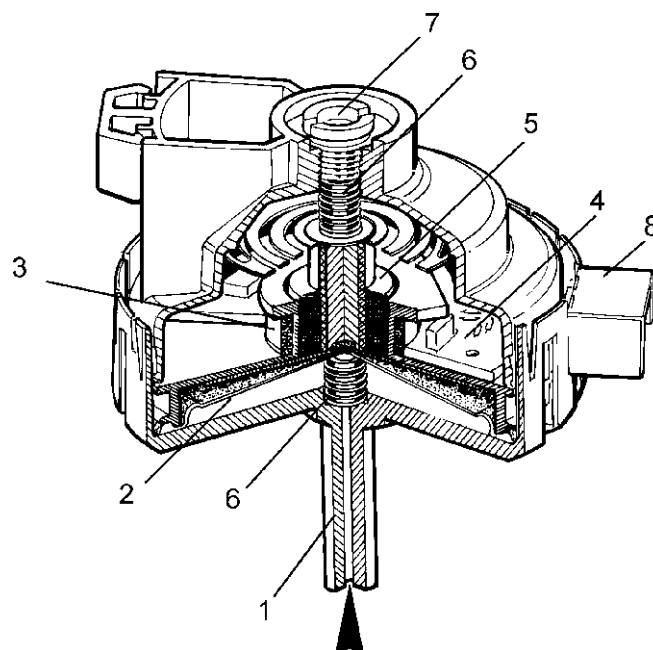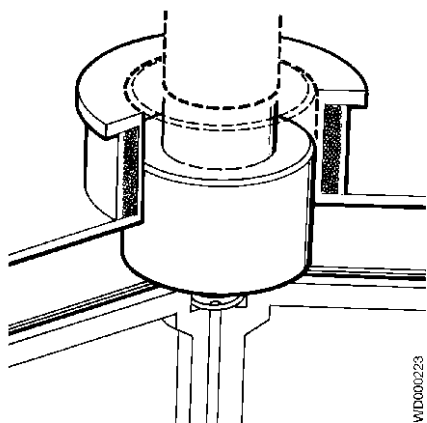
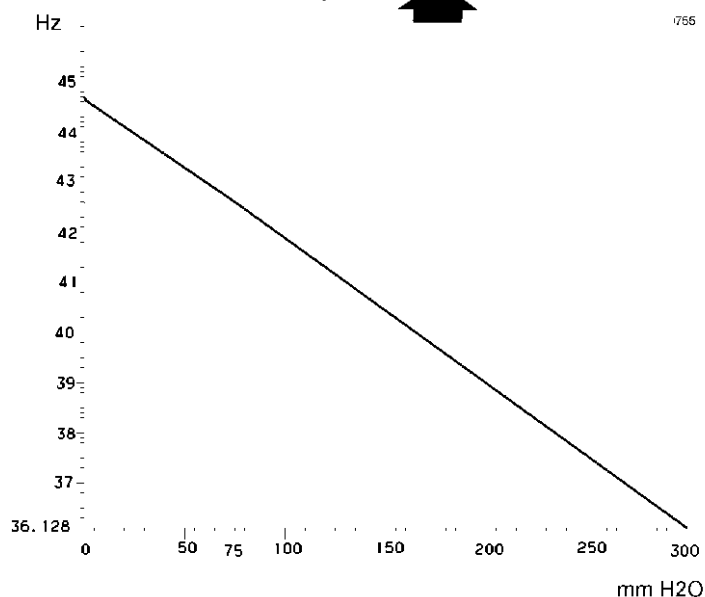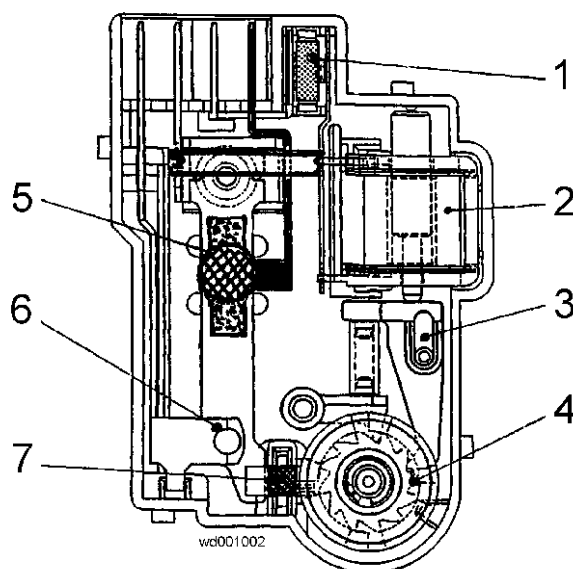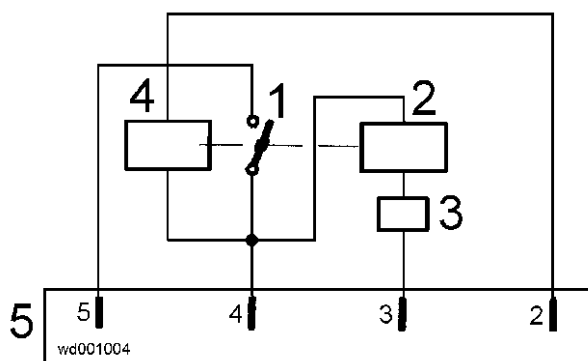**Frequency variation according to pressure:**

INSTANTANEOUS DOOR SAFETY DEVICE

Certain models are fitted with an instantaneous door safety device; this means that the door can be opened as soon as the drum stops rotating.

1. PTC solenoid protector
2. Solenoid
3. Lever mechanism
4. Cam
5. PTC - bimetal
6. Electrical contacts (main switch)
7. Latch

wd001002

1.   Main switch
2.   Solenoid
3.   PTC solenoid protection
4.   Bimetal PTC
5.   Connector

wd001004

Operating principles
→ When the ON/OFF button is pressed to switch the appliance on, the bimetal PTC is powered; the cam is in a position which prevents the latch from moving outwards.
→ When the START/PAUSE button is pressed to start the programme, the main PCB transmits a signal (duration 20 msec) to the solenoid (at least 6 seconds after the appliance is switched on). The solenoid causes the cams to rotate one position. This raises the latch which holds the cursor of the door safety device in position and, at the same time, closes the contacts of the main switch, which thus powers all the components in the appliance.
→ At the end of the programme, the board transmits two signals (at an interval of 200 msec and having the same 20 msec duration):
  - the first signal moves the cams a further position, though without releasing the latch.
  - the second signal (which is transmitted only if the system functions correctly) moves the cams another position, which causes the latch to retract, thus releasing the safety device. At the same time, the contacts of the main switch are opened.

Conditions for door aperture
Before transmitting the door aperture signal, the main PCB checks that the following conditions are observed:
   the drum must be stationary (i.e. no signal received from the tachometric generator)
   the water must not be above the lower lip of the door
   the temperature of the water must be not more than 40°C.

Automatic release device
In case of a power failure, or if the appliance is switched off using the ON/OFF button, or if the solenoid should malfunction, the bimetal PTC cools over a period varying from 55 seconds to 4 minutes (at a temperature of 65°C), after which the door lock is released.

Solenoid protection
A PTC is connected in series with the solenoid with the purpose of limiting the current (and thus possible overheating) in the following cases:
- TRIAC on the main PCB short-circuited
- Repeated actioning of the START/PAUSE button (more than 10 times)

DETERGENT DISPENSER

Water is ducted into the detergent dispenser by a solenoid valve with one inlet and two or three outlets. Some models are fitted with a second solenoid valve for hot water fill.

The same detergent dispenser is used in all models; the only difference lies in the water intake nozzle. The detergent dispenser may consist of three or four compartments.

1. *Solenoid valve*
2. *Detergent dispenser*
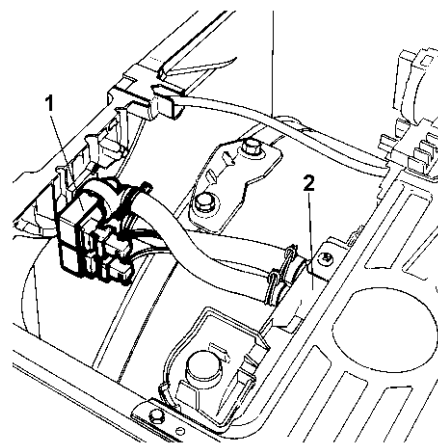
The various combinations of detergent dispenser / nozzle for the various models are as follows:

   3 compartments: pre-wash, wash, conditioners (1 two-way solenoid valve)

   3 compartments + hot water: pre-wash, wash, conditioners (1 two-way solenoid valve + 1 solenoid valve for hot water fill)

   4 compartments: pre-wash, wash, conditioners, bleach (1 three-way solenoid valve)

Water fill to pre-wash compartment (pre-wash solenoid)
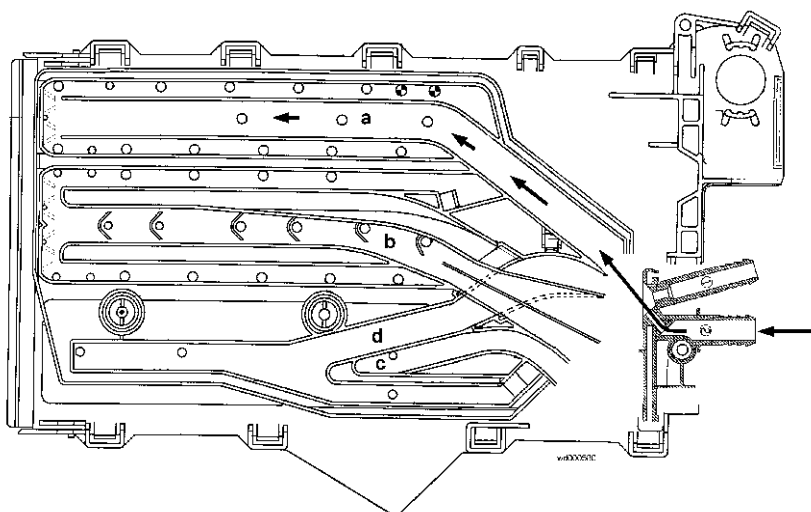
Water fill to wash compartment (wash solenoid)
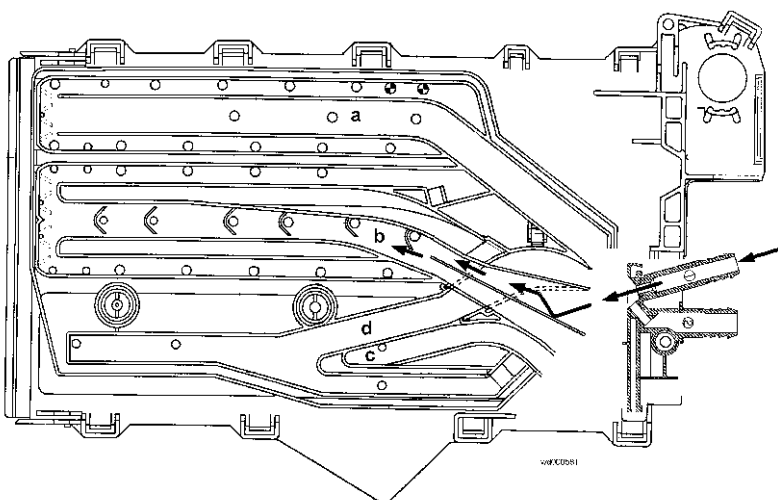
Water fill to conditioner compartment (pre-wash and wash solenoids)

Water fill to bleach compartment (bleach solenoid)
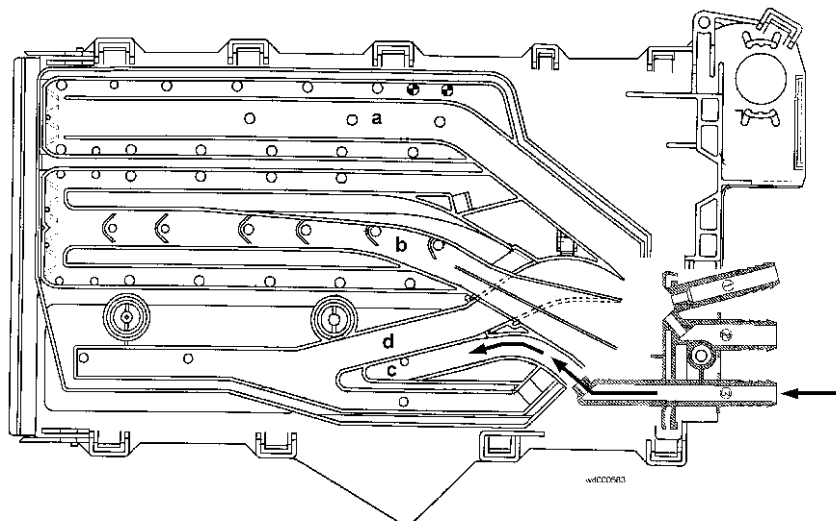
Hot water fill (hot water/wash solenoids)

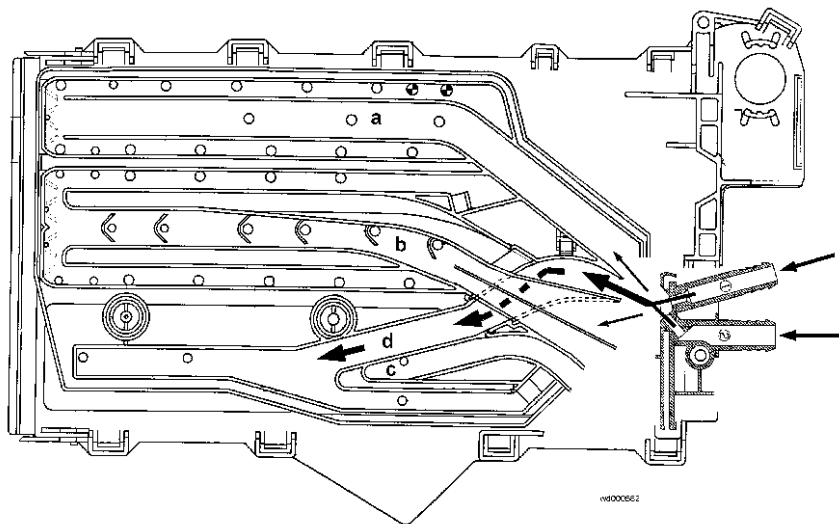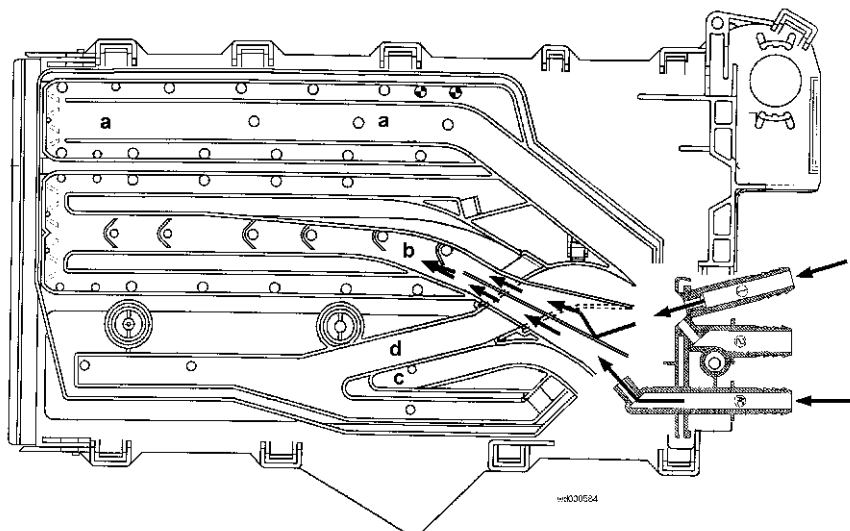**Power supply to the motor**

The main PCB powers the motor directly via a TRIAC. Reversal of the direction of the motor is effected by two relays that vary the connection between the rotor and the stator.
A third relay powers the stator in half- or full-range operation, depending on the spin speed.

The speed of the motor is controlled by a signal received from the tachometric generator.

During the spin cycles, the microprocessor checks for an <u>unbalanced load</u> and for <u>anti-foam</u>.

<u>AC/DC converter</u>

This component, which is fitted to <u>certain models only</u>, serves to convert the alternating current generated by the TRIAC on the main PCB into a direct current to power the drum motor.

WD000417

WD000226
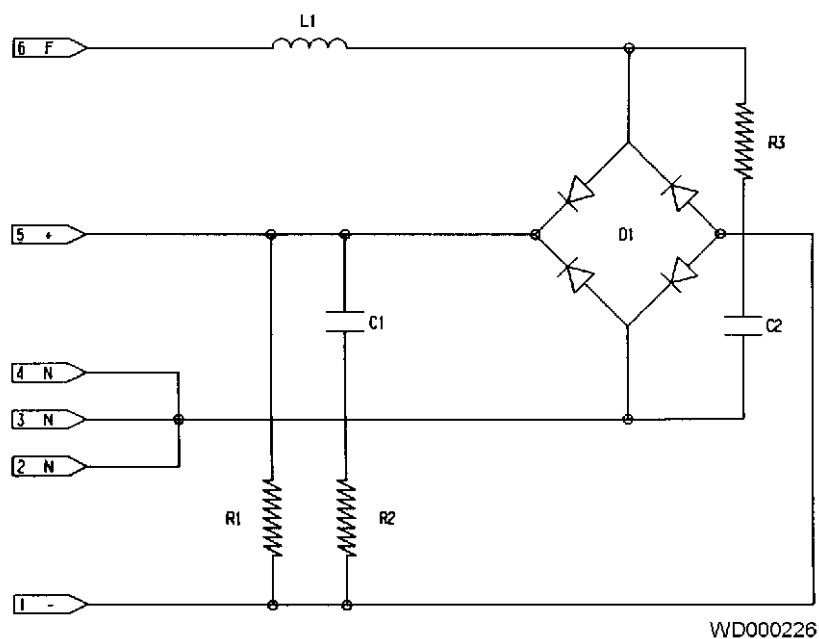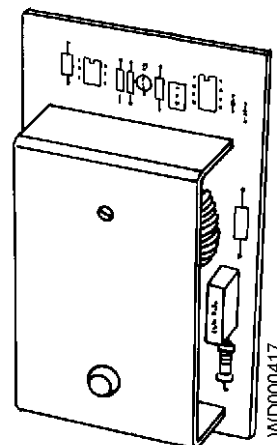
L1	1.2 mH	R1	68 KΩ
D1	25A/600V	R2-R3	100
C1-C2	47 F		

Circulation pump

In Jetsystem models, the circulation pump is powered directly by the main PCB via a TRIAC

Heating

The heating element is powered directly by the main PCB via a relay.
As a safety feature, a traditional dual-level pressure switch (anti-boiling 1 and anti-boiling 2) is connected in series to the heating element.

The temperature is controlled directly by the main PCB via an NTC temperature sensor. Two versions of the NTC sensor exist, depending on the type of tub; their shape is different, but their characteristics are identical.

1. Plastic casing
2. Metallic capsule
3. NTC resistor
4. Terminals
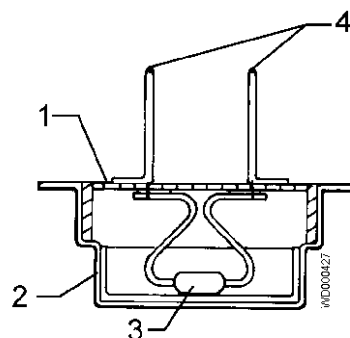
1. NTC resistor
2. Metallic capsule
3. Terminals
4. Plastic casing
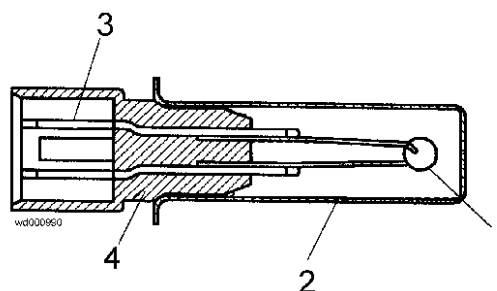
TEMPERATURE (°C)	RESISTANCE (Ω)		
	Rated	Maximum	Minimum
20	6050	6335	5765
60	1250	1278	1222
80	640	620	660

Drain cycle

The drain pump is powered directly by the main PCB via a TRIAC.

DIAGNOSTICS / CONFIGURATION SYSTEM

ACCESS TO THE DIAGNOSTICS / CONFIGURATION SYSTEM

Using a single procedure, it is possible to access both the diagnostics and configuration systems. After accessing this function, the following operations can be performed:

- control of the operation of each of the components in the appliance.
- analysis of alarm conditions
- configuration of the main PCB

To access the system:

 press the SKIP/RESET button to cancel the programme previously selected and switch off the appliance.
 press the START/PAUSE button together with the SKIP/RESET button and then, holding down both buttons, press the ON/OFF button to switch on the appliance.
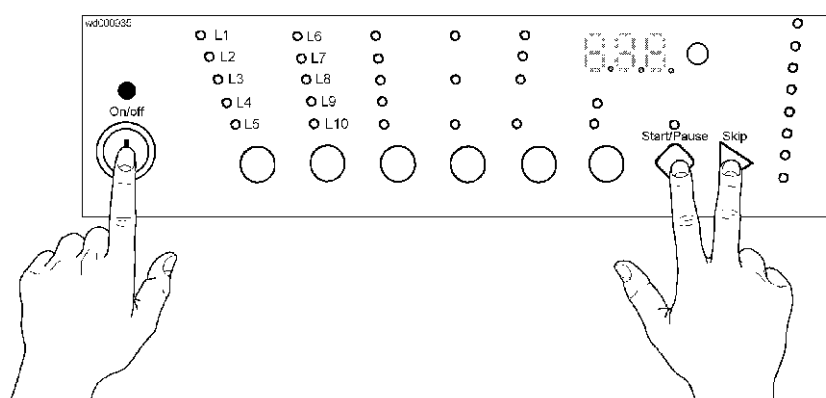
 hold both buttons (START/PAUSE and SKIP/RESET) down until the buzzer sounds and the LEDs begin to flash (about 4 seconds)
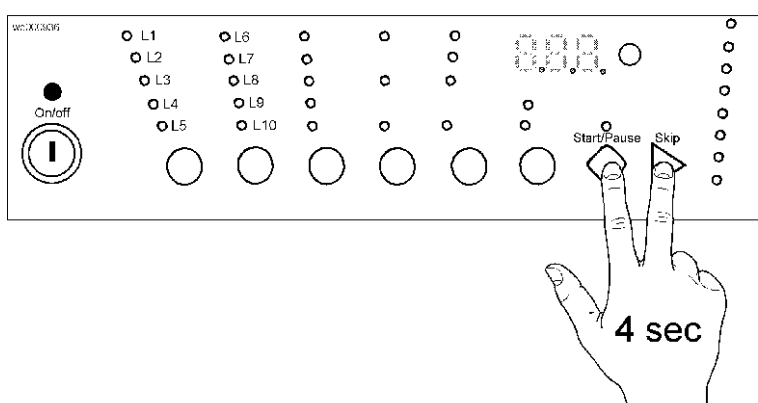
At this point, the display board is checked and the LEDs (and, if featured, the display window) light in sequence.
If the main PCB has not been configured, it is possible only to perform the test on the display board and the configuration procedure.

DIAGNOSTICS SYSTEM

The diagnostics system can be used to check the correct operation of all the components in the washing machine.

After accessing the diagnostics routine, the display board is checked for correct operation. All the LEDs (and, if featured, the display) light in sequence.

Press the FABRICS button to pass to the subsequent phase of the test (LED L1 lights).
Press the FABRICS button again to increment the number of the phase controlled. After the last phase, the display returns to its normal condition. The LED corresponding to the phase being tested lights (L1 → L10).

Press the TEMPERATURE button to decrement the number of the phase controlled. After the last phase, the display returns to its normal condition(L1 → L1).
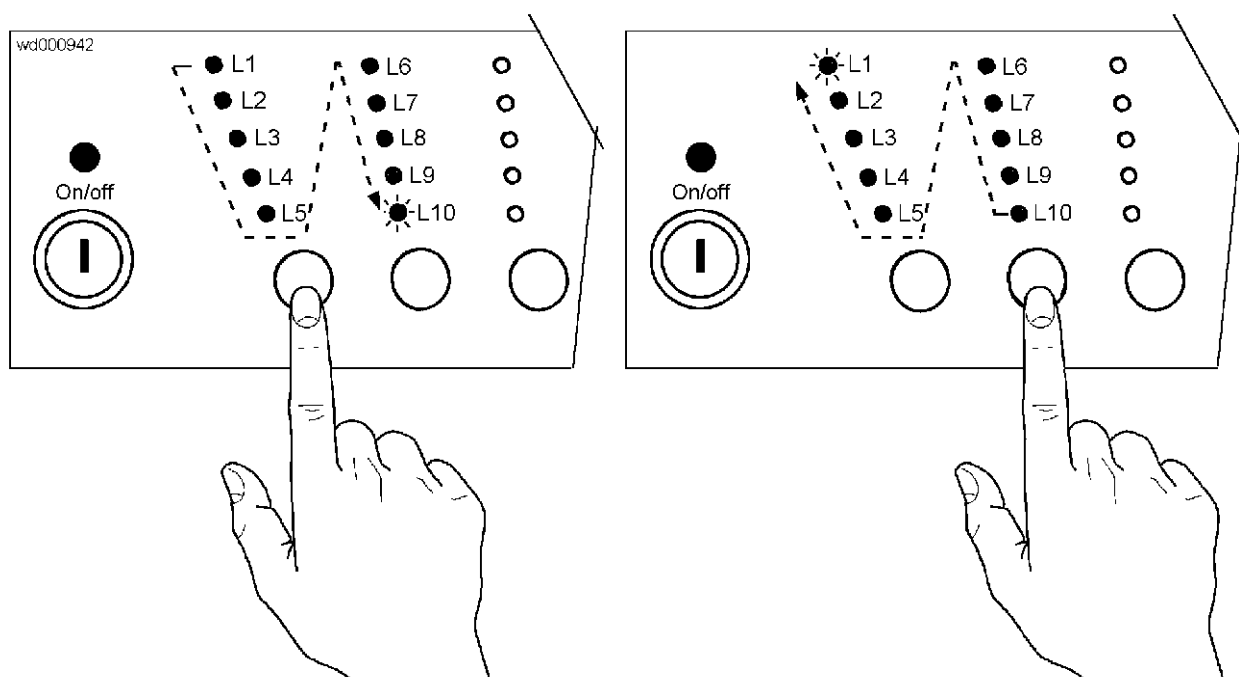
DIAGNOSTIC CONTROL SYSTEM		
PHASE	**LED lit**	**Function tested**
0	**All (in sequence)**	Tests the display board
1	L1	Water fill to wash compartment in the dispenser
2	L2	Water fill to pre-wash compartment in the dispenser
3	L3	Water fill to conditioner compartment in the dispenser
4	L4	Hot water fill or cold water fill to bleach compartment (certain models only)
5	L5	Heating (and, in Jetsystem models, circulation pump)
6	L6	Rotation of drum at 250 rpm with water in the tub (test for leaks from tub)
7	L7	Drain and spin at maximum speed; pressure switches.
8	L8	Drying (washer/dryers only)
9	L9	Displays the last alarm
10	L10	Configuration of the main electronic board

DISPLAY BOARD DIAGNOSTICS
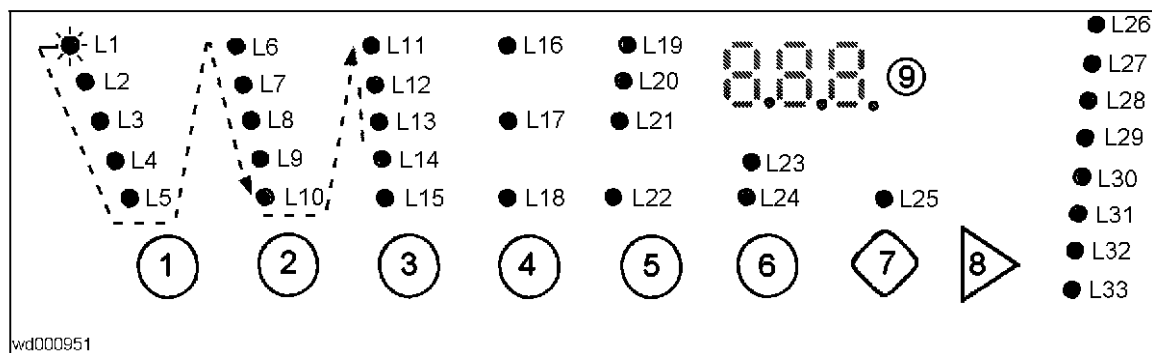
After accessing the diagnostics system, the display board is checked for correct operation. All the LEDs (and, if featured, the display) light in sequence.

When the various buttons are pressed, the corresponding LEDs light. The display shows a binary code corresponding to the code of the button pressed and the buzzer sounds.
When the FABRICS or TEMPERATURE buttons are pressed, the corresponding LED lights for a moment and the binary code is displayed. On completion of the test, the buzzer sounds and the system passes to the previous or subsequent phase of the diagnostics cycle.

Table of button codes

On models which do not feature a display window, the code is displayed by the washing phase LEDs in binary format.

BUTTON No.		0	1	2	3	4	5	6	7	8
LED	L5	❍	❍	❍	❍	❍	❍	❍	❍	●
	L6	❍	❍	❍	❍	●	●	●	●	❍
	L7	❍	❍	●	●	❍	❍	●	●	❍
	L8	❍	●	❍	●	❍	●	❍	●	❍

❍   LED off
●   LED lit

The display board test is performed automatically even if the board is powered while not connected to the main PCB and the programme selector.

DIAGNOSTICS CYCLE

When the FABRICS or TEMPERATURE buttons are pressed, the system passes to the previous or subsequent phase of the diagnostics cycle. The LED corresponding to the phase of the diagnostics cycle lights.
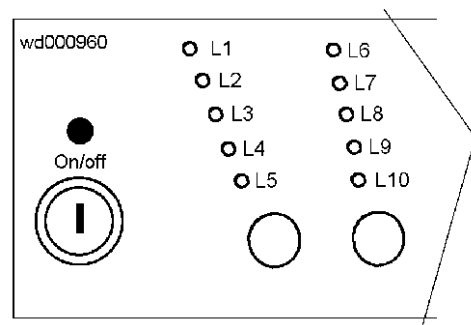
LED lit	Function tested	Components actioned	Operating conditions	Parameters displayed
L1	Water fill to wash compartment	- door interlock - wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
L2	Water fill to prewash compartment	- door interlock - pre-wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
L3	Water fill to softener compartment	- door interlock - pre-wash solenoid - wash solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
L4	Hot water fill or fill to bleach compartment (certain models only)	- door interlock - hot water or bleach solenoid	Door closed, water fill to anti-overflow level for max. 10 min	Water level in mm
L5	Heating and recirculation	- door interlock - (wash solenoid if level is lower than the anti-boiling device) - recirculation pump - heating element	Door closed, water fill to above anti-boiling level if not yet reached, heating for max. 10 min or to 90°C	Water temperature in °C
L6	Check for leaks from tub	- door interlock - (wash solenoid if level is <150mm) - motor	Door closed, water fill above 150mm level if not yet reached, motor until the drum reaches 250 rpm	Motor speed (rpm)
L7	Drain and spin, check for pressure switch congruency	- door interlock - drain pump - motor	Door closed, water drain, motor movement (from lower level to anti-foam level), until maximum spin speed is reached	Motor speed (rpm ÷ 10)

If an alarm condition occurs during the diagnostics cycle, operation of the appliance is interrupted, and the LEDs (and display) show the corresponding alarm code (flashing).

ALARMS
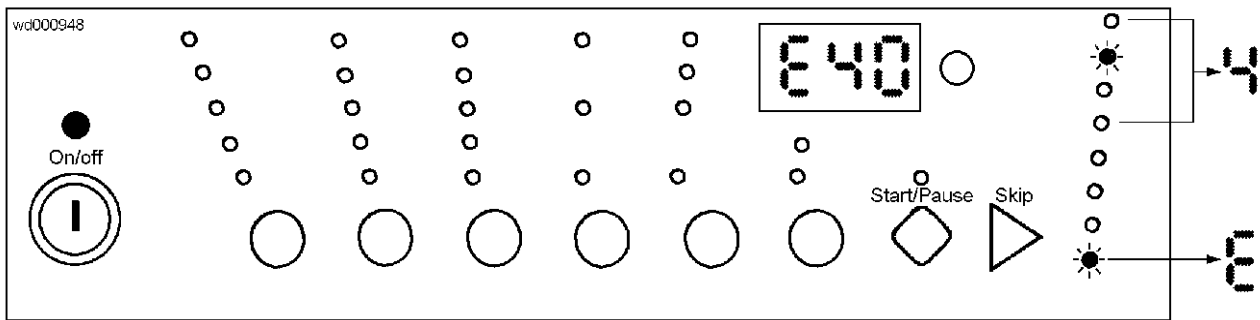
The electronic control unit detects and recognizes any malfunctions in the operation of the appliance, in which case an alarm condition is generated. Alarm conditions may be of three types:

- cycle paused
- cycle blocked
- current phase skipped

Only four alarm conditions are normally displayed to the user:

- problems with water fill
- problems with drain
- door open
- communication error between the electronic boards, or configuration error.

In the first three cases, the cycle is paused so that the user can, if possible, solve the problem. The code showing the type of alarm flashes on the display.
In models without a display window, the last wash phase LED (end) flashes; the code relative to the type of alarm flashes on the first four LEDs (and on the display).

For example, in the case of alarm *E41* (door open), the display will show *E40*. In models not featuring a display window, as well as the end-of-cycle LED which indicates error "*E*", the second LED indicates *4* in binary code.
As can be seen from the general alarm code table, *E4..* alarm conditions include all alarms relative to door closure problems:

- *E41:*   door open
- *E42:*   door interlock malfunction
- *E43, E44, E45:*   problems with main PCB or wiring

In the case of communication or configuration errors, the alarm is displayed immediately when the appliance is switched on; in the event of configuration errors, the only possible action is to access the diagnostics system.

The FILTER BLOCKED alarm is signalled by the corresponding LED (if featured) only at the end of the cycle; *EF0* flashes on the display.

To exit the alarm condition, press START/PAUSE if the cycle is paused (this enables the appliance to attempt to complete the operation under the control of the user) or, if the cycle has been interrupted, switch off the appliance.

READING THE LAST ALARM CONDITION

The diagnostics system makes it possible to identify the last alarm condition which occurred during the operation of the appliance. To read this alarm condition, after accessing the diagnostics system (see "Access to the diagnostics / configuration system), press the FABRICS or TEMPERATURE buttons until LED **L9** lights.
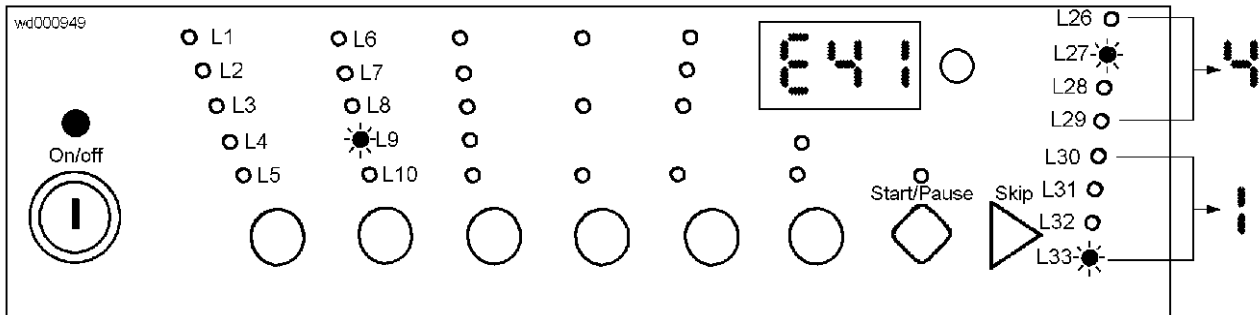
The alarm condition is shown on the display, or the corresponding binary code flashes on the wash phase LEDs.

The first four LEDs indicate the first digit of the alarm code

The second four LEDs indicate the second digit of the alarm code

For example, if an **E41** alarm condition (door open) is generated, the display will show **E41** or (if the appliance does not feature the display window) the second LED in the first group (equivalent to **4** in binary code) and the fourth LED in the second group (equivalent to **1** in binary code) will flash.

If no alarm condition has occurred, **E00** is displayed.

DIAGNOSTICS CYCLE ALARMS

If a malfunction should occur during the course of the diagnostics cycle, the relative alarm codes are displayed. In this case, too, the wash phase LEDs (or the display) show the error code (flashing).

BINARY CODES

The table below shows how to convert the binary code displayed by the LEDs into the corresponding decimal number.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										A	b	C	d	E	F
○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●

○   LED off
●   LED lit

ALARM CODES

0:*LED off*   **1**: *LED flashing*

Alarm code	LED L26÷29	LED L30÷33	Description of fault	User code	Effect	Possible causes
E11	0 0 0 1	0 0 0 1	Problems with water fill in wash phase (maximum 10 minutes for each fill phase)	E10	Cycle PAUSED	Tap closed or mains pressure insufficient; solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E21	0 0 1 0	0 0 0 1	Problems with water drain in wash phase (maximum 10 minutes for each drain phase)	E20	Cycle PAUSED	Drain hose obstructed; filter blocked; drain pump; pressure switches; wiring; main PCB
E31	0 0 1 1	0 0 0 1	Electronic pressure switch circuit faulty (frequency of pressure switch signal out of limits)	---	Cycle blocked with door closed	Electronic pressure switch; wiring; main PCB
E32	0 0 1 1	0 0 1 0	Incorrect calibration of electronic pressure switch (electronic pressure switch level different from 0-66 mm after initial calibration drain and anti-boiling pressure switch on "empty")	---	Cycle PAUSED	Tap closed or mains pressure insufficient; solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E33	0 0 1 1	0 0 1 1	Incongruency between level of electronic pressure switch and level of anti-boiling pressure switch 1 (duration of fault at least 60 seconds)	---	Cycle blocked with door closed	Hydraulic circuit of pressure switches; electronic pressure switch; pressure switch; wiring; main PCB
E34	0 0 1 1	0 1 0 0	Incongruency between level of electronic pressure switch and level of anti-boiling pressure switch 2 (duration of fault at least 60 seconds)	---	Cycle blocked with door closed	Hydraulic circuit of pressure switches; electronic pressure switch; pressure switch; wiring; main PCB
E35	0 0 1 1	0 1 0 1	Water level too high (level of electronic pressure switch higher than 300mm for more than 15 seconds)	---	Cycle blocked with door closed and water drain to 120mm	Solenoid valve; hydraulic circuit of pressure switches; pressure switches; wiring; main PCB
E36	0 0 1 1	0 1 1 0	"Sensing" circuit of anti-boiling pressure switch 1 faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E37	0 0 1 1	0 1 1 1	"Sensing" circuit of anti-boiling pressure switch 2 faulty (input signal to microprocessor always 0 - 5V)	---	Cycle blocked with door closed	Main PCB

Code			Description	Alt	Status	Possible causes
E38	0 0 1 1	1 0 0 0	Pressure chamber blocked (water level does not vary for at least 30 sec. during drum rotation)	---	Heating phase skipped	Pressure switch hydraulic circuit; pressure switches, motor drive belt broken
E41	0 1 0 0	0 0 0 1	Door open (door delay interlock does not close after 15 seconds)	E40	Cycle paused	Door open; door delay interlock; wiring; main PCB
E42	0 1 0 0	0 0 1 0	Problems with door closure (door open during cycle for more than 15 sec. or door closed after cycle for more than 3 min.)	E40	Cycle paused	Door delay interlock; wiring; main PCB
E43	0 1 0 0	0 0 1 1	TRIAC which powers the door interlock faulty (incongruency between status of door interlock "sensing" circuit and status of TRIAC)	E40	Cycle paused	Wiring; main PCB
E44	0 1 0 0	0 1 0 0	"Sensing" circuit of door delay interlock faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked	Main PCB
E45	0 1 0 0	0 1 0 1	"Sensing" circuit of door delay interlock triac faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E51	0 1 0 1	0 0 0 1	TRIAC which powers the motor short-circuited (TRIAC short-circuit cut-out activated or motor speed more than maximum speed)	---	Cycle blocked with door closed (after 5 attempts)	Loss of insulation on motor winding/wiring; main PCB
E52	0 1 0 1	0 0 1 0	No signal from tachometric generator on motor (no signal after maximum time)	---	Cycle blocked with door closed (after 5 attempts, the last after 20 sec)	Motor; tachometric generator; wiring; main PCB
E53	0 1 0 1	0 0 1 1	"Sensing" circuit of motor TRIAC faulty (input signal to microprocessor always 0V or 5V)	---	Cycle blocked with door closed	Main PCB
E54	0 1 0 1	0 1 0 0	Relays contacts sticking (voltage on "sensing" circuit when the relays should be open)	---	Cycle blocked with door closed (after 5 attempts)	Loss of insulation on motor windings/wiring; main PCB
E55	0 1 0 1	0 1 0 1	Motor circuit open	---	Cycle blocked with door closed (after 5 attempts)	Motor; wiring; main PCB

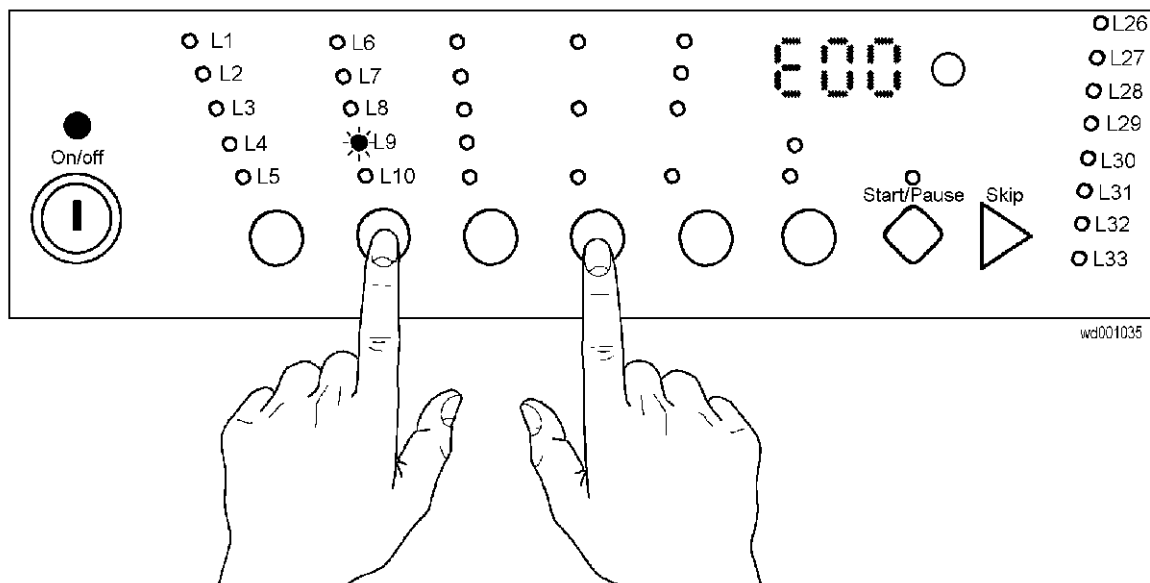| Code			Description		Status	Possible causes
E61	0 1 1 0	0 0 0 1	Insufficient heating during washing (maximum heating time exceeded)	---	Heating phase skipped	NTC sensor incorrectly calibrated; heating element; wiring; main PCB
E62	0 1 1 0	0 0 1 0	Overheating during washing (temperature >88°C for more than 5 minutes)	---	Drain, cycle blocked	Heating element (earthed); NTC sensor faulty; wiring; main PCB
E66	0 1 1 0	0 1 1 0	Power relay to heating element faulty (incongruency between closure of anti-boiling pressure switch 2 and status of relay K3)	---	Drain, cycle blocked	Anti-boiling pressure switch 2; wiring; main PCB
E71	0 1 1 1	0 0 0 1	NTC wash sensor faulty (voltage not within limits = short-circuit or open)	---	Heating phase skipped	Wash NTC sensor; wiring; main PCB
E84	1 0 0 0	0 1 0 0	"Sensing" circuit on circulation pump triac faulty (input signal to microprocessor always 0V or 5V)	---	Drain, cycle blocked (door open)	Main PCB
E85	1 0 0 0	0 1 0 1	Circulation pump faulty (incongruency between status of "sensing" circuit on circulation pump and status of TRIAC)	---	Drain, cycle blocked (door open)	Circulation pump; wiring; main PCB
E91	1 0 0 1	0 0 0 1	Communications error between main PCB and display board	**E90**	---	Wiring; main PCB; display board
E92	1 0 0 1	0 0 1 0	Communications incongruency between main PCB and display board (versions not compatible)	**E90**	---	Main PCB; display board
E93	1 0 0 1	0 0 1 1	Configuration error (incongruency of configuration values when appliance is switched on)	**E90**	Cycle blocked	Configuration error; main PCB
E94	1 0 0 1	0 1 0 0	Incorrect configuration of washing cycle	**E90**	Cycle blocked	Cycle software error; main PCB
EF1	1 1 1 1	0 0 0 1	Drain filter blocked (drain phase too long)	Specific LED (**EF0**)	---	Drain hose obstructed/kinked; drain filter dirty/blocked

EF2	**1**	**0**	Excessive detergent (too much foam during drains)	Specific LED (**EF0**)	---	Excessive detergent introduced; drain hose obstructed/kinked; drain filter dirty
	1	**0**				
	1	**1**				
	1	**0**				
EF3	**1**	**0**	Water leakage: intervention of Aqua Control system	---	Water drain to 120mm, cycle blocked	Leaks from base; drain pump; wiring; main PCB
	1	**0**				
	1	**1**				
	1	**1**				

0:*LED off*   **1**: *LED flashing*

CANCELING THE LAST ALARM CONDITION

To cancel the last memorized alarm condition, press button no. **2** and no. **4** at the same time during the course of the diagnostics cycle.

The alarm is cancelled also when a new configuration is given to the main PCB.

CONFIGURATION OF THE MAIN PCB

A standard main PCB is available as a spare part. This PCB contains only data relative to the wash cycle.

After replacing the main PCB, it is necessary to perform the configuration procedure in order to operate the washing machine.

Configuration of the board consists of entering a 16-digit code which contains information which varies from model to model (type of washing system, type of tub, spin speed, etc.).

To access the machine configuration procedure, first enter the diagnostics system, and then:

press the FABRICS or TEMPERATURE buttons until LED **L10** lights; the code relative to the first of the 16 digits of the configuration code (position 0) is displayed.
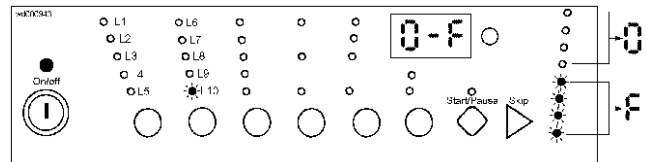

when the SKIP/RESET button is pressed, all the digits which make up the configuration code are displayed in sequence.
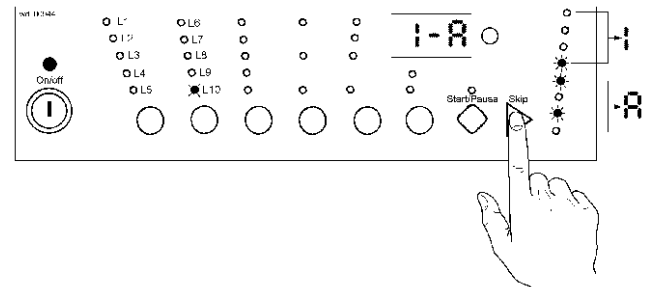
press the START/PAUSE button to modify the configuration code (digit by digit).
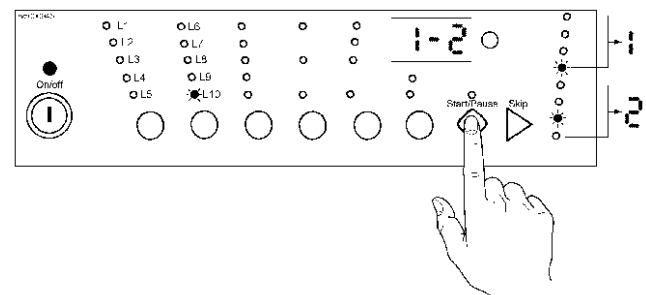
when all 16 digits have been entered, check that the code is correct, then memorize the code by pressing the START/PAUSE and SKIP/RESET buttons at the same time; these buttons should be held down for at least 4 seconds (i.e. until the buzzer sounds).
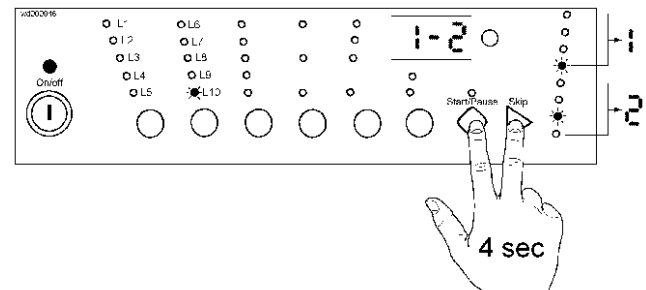

When configuration has been completed, perform the diagnostics routine in order to check that the appliance functions correctly. In case of an error, the display window will show error code E93 and the machine stops.

CONFIGURATION CODE

The configuration code (16 alphanumeric digits) is shown on a label affixed to the casing of the main PCB and in the Service Notes describing the various models.

It is advisable to note the configuration code on the casing of the new PCB fitted to the washing machine.
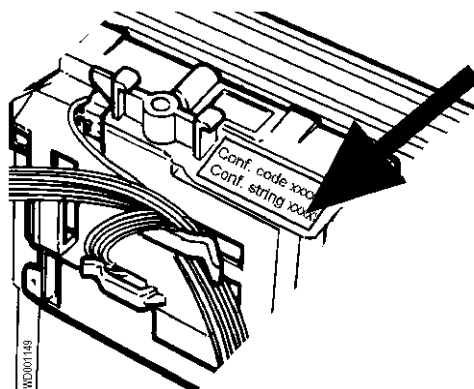
READING THE CONFIGURATION CODE

The configuration code is shown, one character at a time, on the display (if featured) or on the washing phase display LEDs.
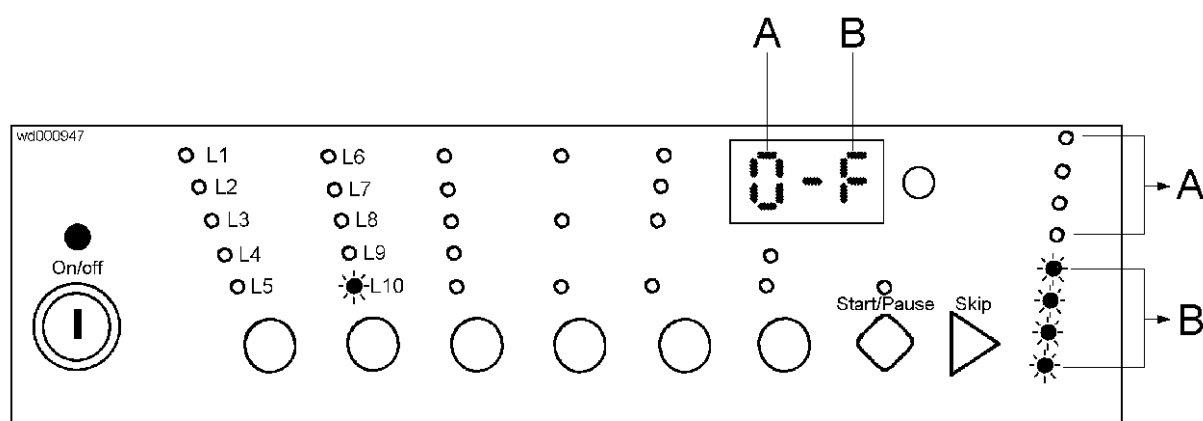
A = The first digit shown on the display (if featured) indicates the **position** of the value to be entered. On models not fitted with a display window, the same information is displayed in binary format on the first four washing phase LEDs. To **read** the various positions, press the SKIP/RESET button repeatedly (the first position displayed is "0").

B = The last digit on the display (if featured) indicates the **value** of the configuration character to be entered in a given position. On models not fitted with a display window, the same information is displayed in binary format on the second set of four washing phase LEDs. To **modify** the value of the character displayed, press the START/PAUSE button repeatedly as necessary.

BINARY CODES

The table below can be used to convert the binary code shown by the LEDs into the corresponding letter or decimal number.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
										A	b	C	d	E	F
○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●

○   LED off
●   LED lit

EXAMPLES OF CONFIGURATION

Configuration code: **A2A7808080E691F2**

| POSITION:	0	1	2	3	4	5	6	7	8	9	10 (A)	11 (B)	12 (C)	13 (D)	14 (E)	15 (F)
	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
VALUE:	A	2	A	7	8	0	8	0	8	0	E	6	9	1	F	2

TABLE OF CYCLE PHASE LEDs

On models not featuring the display window, it is advisable, before beginning the configuration procedure, to convert the digits of the configuration code into binary format. To do this, prepare a table of the values to be entered, which will be displayed by the second group (B) of washing phase LEDs (the positions, indicated by the second group of 4 LEDs, are not modified).

|	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
POSITION											A	b	C	d	E	F
	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●
	○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
	○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●
VALUE	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○
	○	○	○	●	○	○	○	○	○	○	●	●	○	○	●	○
	●	●	●	●	○	○	○	○	○	○	●	●	○	○	●	●
	○	○	○	●	○	○	○	○	○	○	○	○	●	●	●	○
	A	2	A	7	8	0	8	0	8	0	E	6	9	1	F	2

CONFIGURATION

1. Access the diagnostics system.

2. Press the FABRICS or TEMPERATURE buttons until LED **L10** lights. The code relative to the first of the 16 characters of the configuration code is displayed (position zero).

3. Press the START/PAUSE button sequentially to enter the letter **A** in position **0**. If the appliance features a display window, this will show **0-A**; if not, the wash cycle LEDs should light as shown in column 0 of the table (i.e. the fifth and seventh LEDs).

4. Press the SKIP/RESET button to pass to the second position, and enter **2** by pressing START/PAUSE as necessary. The display should now show **1-2**, and the LEDs should light as shown in column 1 of the table (fourth and seventh).

5. Repeat this procedure to enter the remaining configuration digits. When all the digits have been entered, press the SKIP/RESET button to check that the configuration code is correct.

6. Memorize the configuration code by pressing the START/PAUSE and SKIP/RESET buttons at the same time for at least 4 seconds, so that the configuration code is memorized by the main PCB.

7. Perform the diagnostics cycle to check that the appliance operates correctly. In case of a configuration error, error **E93** is displayed and the operation of the appliance is interrupted.
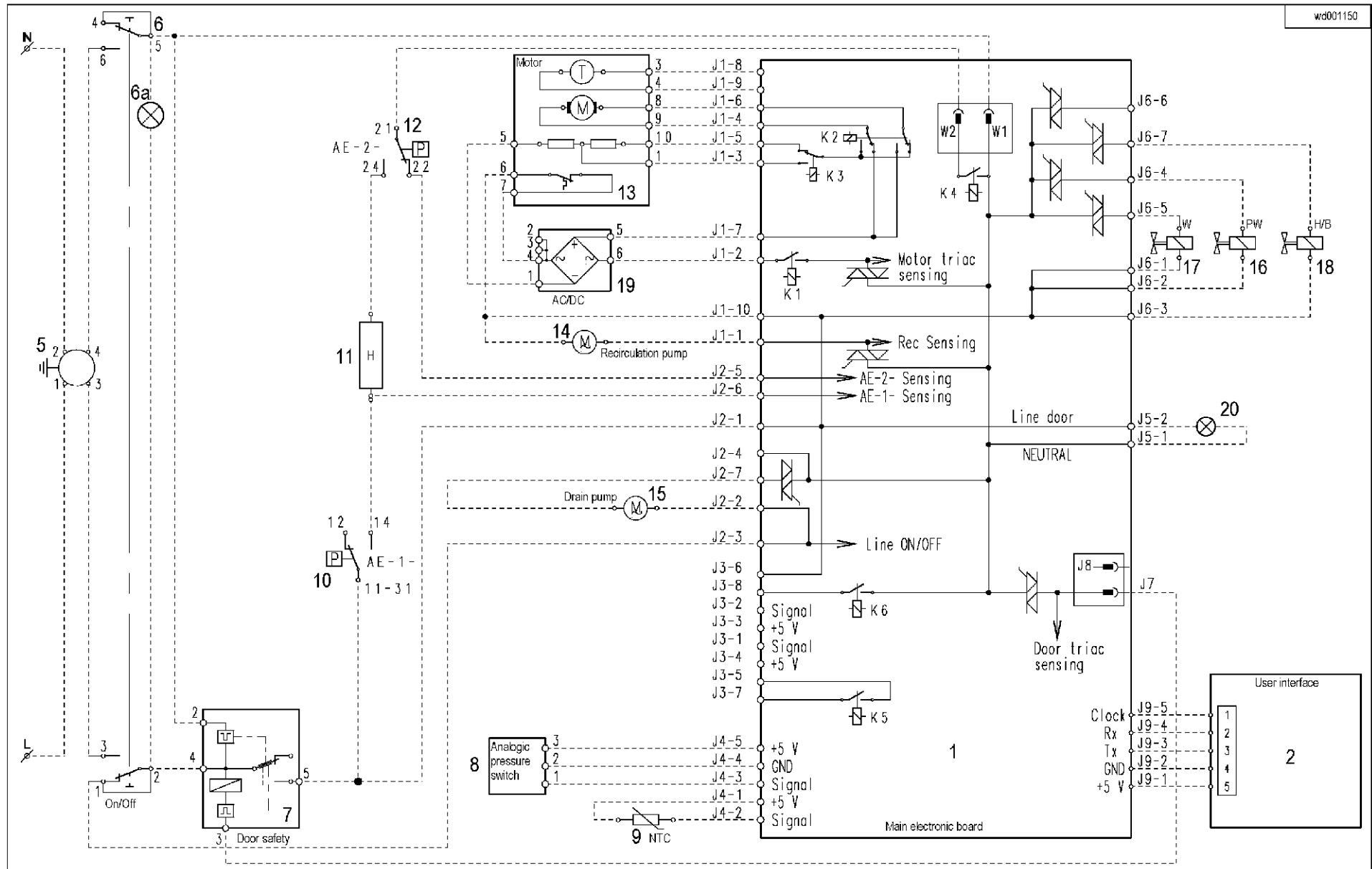
EXITING THE DIAGNOSTICS CYCLE
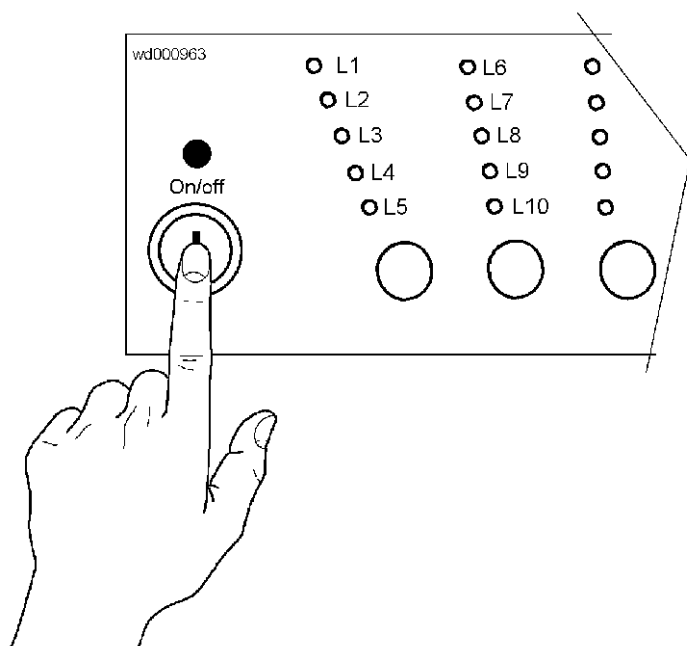
To exit the diagnostics cycle, switch the appliance off, then on, then off again.

BASIC CIRCUIT DIAGRAM (AC motor)
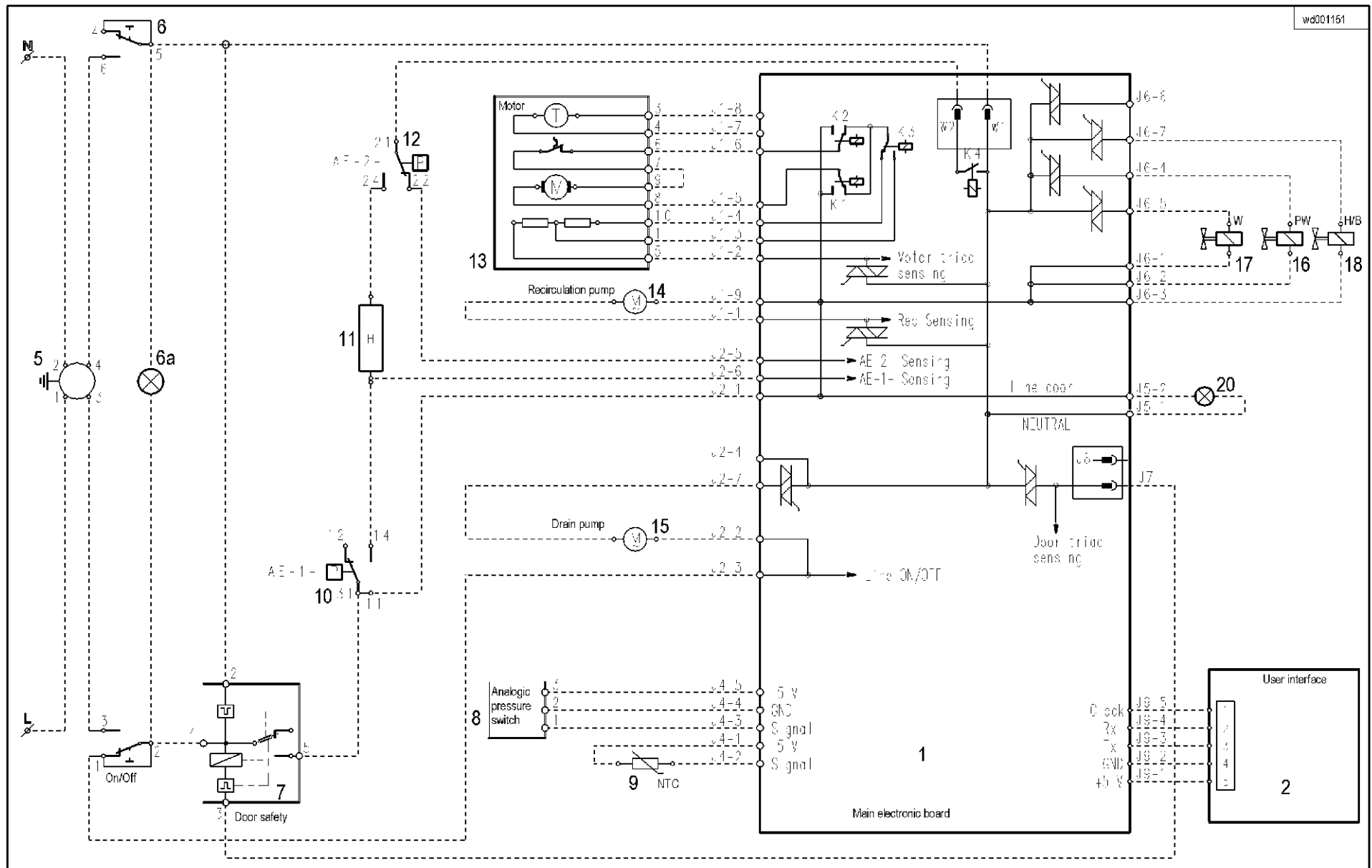
BASIC CIRCUIT DIAGRAM (DC motor)

Key to circuit diagram

1. Main PCB
2. Control/display board
5. Anti-interference filter
6. ON/OFF button
6a.Pilot lamp
7. Door interlock
8. Electronic pressure switch
9. NTC temperature sensor (washing)
10. Anti-boiling pressure switch 1
11. Heating element (washing)
13. Motor
12. Anti-boiling pressure switch 2
14. Recirculation pump
15. Drain pump
16. Pre-wash solenoid
17. Wash solenoid
18. Bleach solenoid or hot water solenoid (certain models only)
19. AC/DC converter (certain models only)
20. Door lamp