

© ELECTROLUX HOME PRODUCTS
ITALY S.p.A.
Spares Operations Italy
Corso Lino Zanussi, 30
I - 33080 PORCIA /PN (ITALY)

Fax +39 0434 394096

Edition: 2007-10-16

Publication
number

599 70 32-47

EN

Washing machines:

**Guide to diagnostics
ENV06 of electronic
controls**

EWM1100

Contents

1.1	Purpose of this manual	5
1.2	Procedure	5
2	CONTROL PANELS OF FRONT-LOADING APPLIANCES.....	6
3	CONTROL PANELS OF TOP-LOADING APPLIANCES.....	7
4	DIAGNOSTIC SYSTEM.....	8
4.1	ACCESS TO THE DIAGNOSTIC CYCLE	8
4.2	Exiting the diagnostic system	8
4.3	PHASES OF THE DIAGNOSTIC CYCLE	9
5	ALARMS	10
5.1	Displaying the alarms to the user	10
5.2	Reading the alarm codes.....	11
5.2.1	Alarm displaying.....	11
	AEG Version:	11
	Other versions:.....	11
5.2.2	Examples of alarm display	12
5.2.3	Operation of alarms during diagnostics	12
5.3	Rapid reading of alarm codes.....	13
5.4	Cancelling the last alarm	13
5.5	SUMMARY TABLE OF ALARMS	14
5.6	Notes concerning certain alarm codes	16
6	THE DIAGNOSTIC PROGRAMME CANNOT BE ACCESSED	17
6.1.1	All LEDs on the circuit are board switched off	17
6.1.2	Some of the LEDs of the circuit board light.....	17
7	TROUBLESHOOTING ACCORDING TO ALARM CODES	18
	E11: Difficulty in filling during wash phase	18
	E13: Water leakage	20
	E21: Difficulties in draining	22
	E23: Malfunction of the component (triac) that controls the drain pump	24
	E24: «Sensing» circuit of the component (triac) that controls the drain pump faulty.....	25
	E35: Water level too high	27
	E38: Pressure chamber blocked	28
	E3A: Problems with "Sensing" circuit of the heating element relay	29
	E41: Door open	30
	E42: Problems with door aperture.....	32
	E44: Door closure «sensing» circuit faulty	34
	E45: Problems with the «sensing» circuit of the triac that actions the door interlock	34
	E51: Motor power triac short-circuited	35
	E52: No signal from the motor tachometric generator (<i>first part</i>).....	36
	E52: No signal from the motor tachometric generator (<i>second part</i>).....	38
	Procedure for checking the commutator motors	39
	E53: Problems with the "Sensing" circuit of the triac which powers the motor	40
	E54: Motor relay contacts sticking.....	41
	E61: Insufficient heating during washing.....	42
	E62: Overheating during washing	43
	E66: The contacts of the heating element power relay are always closed	44
	E68: Washing heating element leaks current.....	45
	E69: Washing heating element interrupted	46
	E71: NTC washing sensor faulty	47
	E74: NTC sensor wrongly positioned	48
	E82: Error in reading the RESET/OFF position of the programme selector	49
	E83: Error in reading the programme selector code	50
	E93: Incorrect machine configuration.....	51
	E94: Incorrect configuration of washing cycle.....	51
	E97: Incongruence between selector version and configuration data	51
	EA1: Drum positioning system (DSP) faulty (<i>top-loaders</i>).....	52
	EA6: Drum flap faulty (<i>top-loaders</i>).....	53
	EH1: Incorrect mains frequency	54
	EH2: Mains voltage too high	54
	EH3: Mains voltage too low	54
	EF1: Drain hose blocked/throttled/too high; drain filter dirty/blocked.....	55
	EF2: Overdosing of detergent; drain hose blocked/throttled; drain filter dirty/blocked	55
	EF5: Load too unbalanced; skipping of spin phases.....	55

8	BASIC CIRCUIT DIAGRAM.....	56
8.1.1	Key to circuit diagram.....	57
9	CONNECTORS ON CIRCUIT BOARD.....	58
10	BURNING ON THE CIRCUIT BOARD EWM1100.....	59

INTRODUCTION

1.1 Purpose of this manual

The purpose of this Service Manual is to provide a simple and clear description of the procedure to be followed by service engineers when confronted by problems identified by the various alarm codes generated by appliances with the EWM1100 electronic control system.

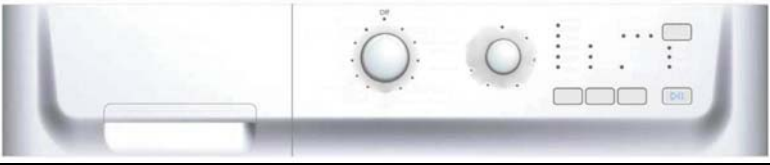
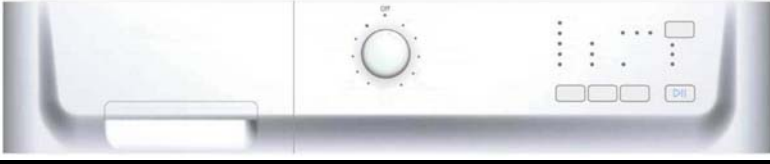






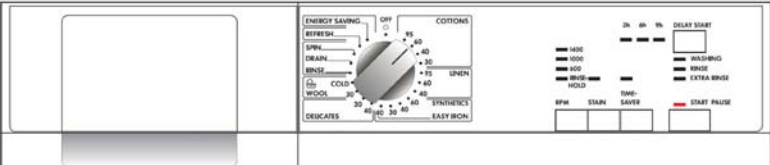
Depending on the configuration of the appliance, the alarm codes may be displayed partially or completely to the user (the alarm codes are generally displayed partially). The diagnostic system can be used by service engineers for the following purposes:

- ◆ To read the alarms
- ◆ To cancel alarm conditions stored in memory
- ◆ To test the operation of the appliance

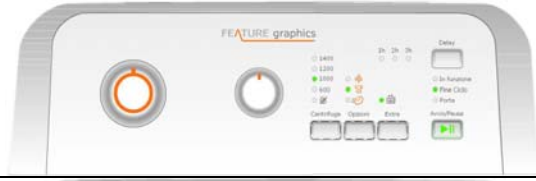



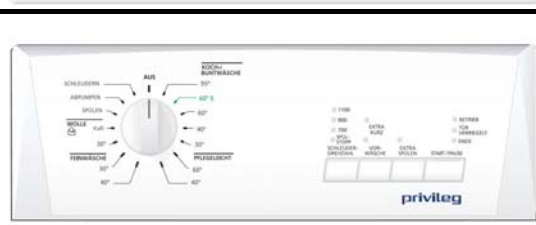
1.2 Procedure

1. Identify the type of control system (**page 6/7**) and access the diagnostic cycle (**See page 8**).
2. Read the alarm code stored in memory (**page 11**) and refer to the instructions for the corresponding alarm code, **page 14-15**.
3. Cancel the alarm stored in memory (**page 13**).
4. If access to the diagnostic cycle is not possible, refer to the section "Access to diagnostic system impossible" (**page 17**).
5. If the main PCB is replaced, check that there are no burned parts (**see page 59**).
6. After any repair, always check the operation of the appliance using the diagnostic cycle (**page 8**).
7. Cancel any alarms stored in memory during the diagnostic procedure (**page 13**).

2 CONTROL PANELS OF FRONT-LOADING APPLIANCES

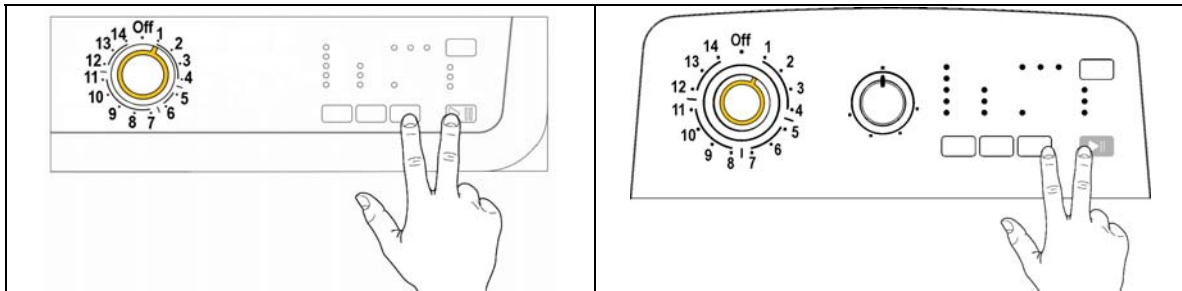
ELECTROLUX	TC5	
	TC6	
SMART ACTION	A5 AF1-A1.2	
	A6 AF2-A2.1	
SMART CATALOGUE	C6.2 CF1-CF2	
	C6.1	
SMART ZANUSSI	Z5	
	Z6	
AEG 07	SERIE5	

3 CONTROL PANELS OF TOP-LOADING APPLIANCES

ELECTROLUX	TC5	
	TC6	
SMART ACTION	A1.2	
	A2.0	
SMART CATALOGUE	C1.2	

4 DIAGNOSTIC SYSTEM

4.1 ACCESS TO THE DIAGNOSTIC CYCLE



1. Switch off the appliance.
2. Press and hold down the **START/PAUSE** button and the nearest **OPTION** button simultaneously (as represented in figure).
3. Holding down both buttons, switch the appliance on by turning the programme selector **one position clockwise**.
4. Continue to hold down the buttons until the LEDs begin to flash (at least 2 seconds).

In the first position, the cycle tests the operation of the buttons and the relative LEDs. If the selector is turned **clockwise**, the cycle performs the diagnostics for the various components and reads the alarm codes.









4.2 Exiting the diagnostic system

→ To exit the diagnostic system, switch off, switch on and switch off again the appliance.

4.3 PHASES OF THE DIAGNOSTIC CYCLE

Irrespective of the type of PCB and the configuration of the programme selector it is possible, after entering diagnostic mode, to perform diagnostics on the operation of the various components and to read the alarms by turning the programme selector **clockwise**.

All the alarms are enabled during the diagnostic cycle.

Position of selector	Components activated	Conditions of operation	Function tested
1 	- All the LEDs light in sequence - When a button is pressed, the corresponding LED lights (and the buzzer may sound)	Always enabled	Operation of the user interface
2 	- Door safety interlock - Washing solenoid valve	Door locked Water level lower than anti-overflow level Maximum time 5 minutes	Water ducted through washing compartment
3 	- Door safety interlock - Pre-wash solenoid valve	Door locked Water level lower than anti-overflow level Maximum time 5 minutes	Water ducted through pre-wash (bleach) compartment
4 	- Door safety interlock - Washing and pre-wash solenoid valves	Door locked Water level lower than anti-overflow level Maximum time 5 minutes	Water ducted through conditioner compartment
6 	- Door safety interlock - Wash solenoid (if the water in the tub is below 1st level) - Heating element	Door locked Water level > 1st level Maximum time 10 minutes or up to 90°C (*)	Heating
7 	- Door safety interlock - Wash solenoid (if the water in the tub is below 1st level) - Motor (55 rpm clockwise, 55 rpm anti-clockwise, impulse at 250 rpm)	Door locked Water level > 1st level	Check for leaks from the tub
8 	- Door safety interlock - Drain pump - Motor up to 650 rpm then at maximum spin speed (**)	Door locked Water level lower than anti-boiling level for spinning	Drain and spin
9 	- Only for top-loaders with drum positioning system: - Door safety interlock - Motor (25 rpm) - Drain pump	Door locked Water level lower than anti-boiling level Maximum time 2 minutes	Test for positioning of drum

(*) In most cases, this time is sufficient to check the heating. However, the time can be increased by repeating the phase without draining the water: pass for a moment to a different phase of the diagnostic cycle and then back to the heating control phase (if the temperature is higher than 80°C, heating does not take place).

(**) The check at the maximum speed occurs without control of the FUCS and no clothes have to be inserted inside the appliance.

5 ALARMS

5.1 Displaying the alarms to the user

The alarms displayed to the user are listed below:

- ↵ **Door open**
- ↵ **Drain difficulty (dirty filter)**
- ↵ **Water fill difficulty (closet tap)**

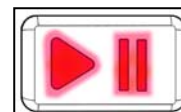
AEG Version

The alarms are represented through the flashing of the yellow LED, which is above the START-PAUSE button, and can be solved directly by the end user.



Other versions

The alarms are represented through the flashing of the red LED, which is inside the START-PAUSE button, and can be solved directly by the user.



The alarms listed below, instead:

- ↵ **Water leakage (Aqua Control System)**
- ↵ **Low electric voltage**
- ↵ **Irregular frequency of the electric network**

are displayed to the user, but for their solution it is necessary the intervention of the Service.

The alarms are enabled during the execution of the washing programme, with the exception of alarms associated with configuration and the power supply (voltage/frequency), which are also displayed during the programme selection phase.

The door can normally be opened (except where specified) when an alarm condition has occurred on condition that:

- The level of the water in the tub is below a certain level
- Water temperature lower than 55°C
- Motor stopped

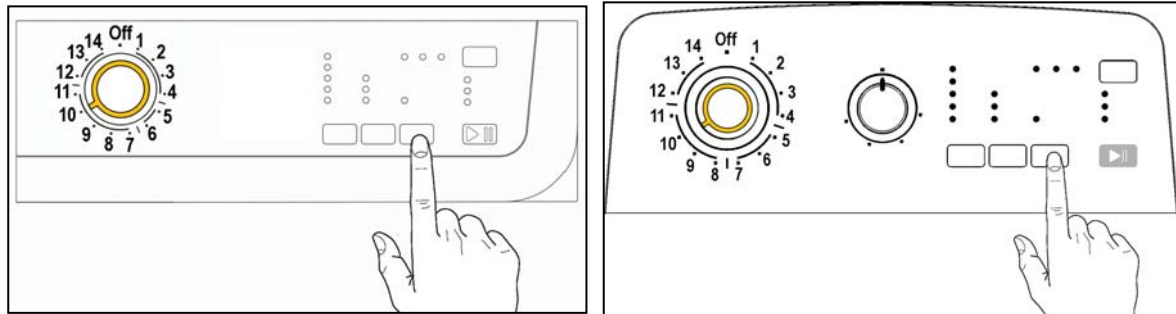
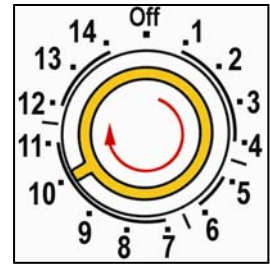
Certain alarm conditions require that a drain phase be performed before the door can be opened for safety reasons:

- Cooling water fill if the temperature is higher than 65°C
- Drain until the analogue pressure switch is on empty, during a max. 3-minute time.

5.2 Reading the alarm codes

It is possible to display the last three memorised alarms in the FLASH memory of the electronic board:

- Enter diagnostic mode (par. 4.1).
- Irrespective of the type of PCB and configuration, turn the programme selector **clockwise** to the **tenth position**.
- The last alarm is displayed.
- To display the previous alarms, press sequentially the left button of the START/PAUSE button (as represented in figure).



- To return to the last alarm, press the START/PAUSE button.

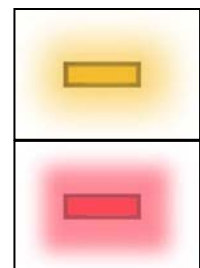
5.2.1 Alarm displaying

AEG Version:

The alarm is displayed by a repeated flashing sequence of the START / PAUSE button with yellow and red light (0,5 seconds on, 0,5 seconds off with a 2,5 second pause between the sequences).

- button indicator START / PAUSE with yellow light → indicates the first digit of the alarm code (family)
- button indicator START / PAUSE with red light → indicates the second digit of the alarm code (internal number of the family)

These two LEDs are featured in all models.

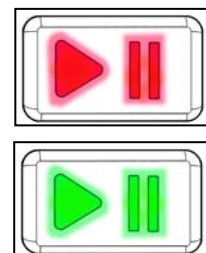


Other versions:

The alarm is displayed by a repeated flashing sequence of the START / PAUSE button with red and green light (0,5 seconds on, 0,5 seconds off with a 2,5 second pause between the sequences).

- LED indicator START / PAUSE with red light → indicates the first digit of the alarm code (family)
- LED indicator START / PAUSE with green light → indicates the second digit of the alarm code (internal number of the family)

These two LEDs are featured in all models.



Notes:

- The first letter of the alarm code “E” (Error) is not displayed, since this letter is common to all alarm codes.
- The alarm code “families” are shown in hexadecimal; in other words:
 - **A** is represented by **10** flashes
 - **B** is represented by **11** flashes
 - ...
 - **F** is represented by **15** flashes
- Configuration errors are shown by the flashing of all the LEDs (user interface not configured).

5.2.2 Examples of alarm display

Example: Alarm E43 (problems with the door interlock Triac) will display the following:

- the sequence of four flashes of the START / PAUSE button with red light, indicates the first number **E43**;
- the sequence of three flashes of the START / PAUSE button with green light, indicates the second number **E43**;

START / PAUSE button with red light				START / PAUSE button with green light			
ON/OFF	On/Off (Ver. AEG)	Time (Sec.)	Value	ON/OFF	On/Off (Ver. AEG)	Time (Sec.)	Value
		0.5	1			0.5	1
		0.5				0.5	
		0.5	2			0.5	2
		0.5				0.5	
		0.5	3			0.5	3
		0.5				0.5	
		0.5	4			2.5	Pause
		0.5					
		1.5	Pause				

5.2.3 Operation of alarms during diagnostics

All alarms are enabled during the components diagnostic phase.

5.3 Rapid reading of alarm codes

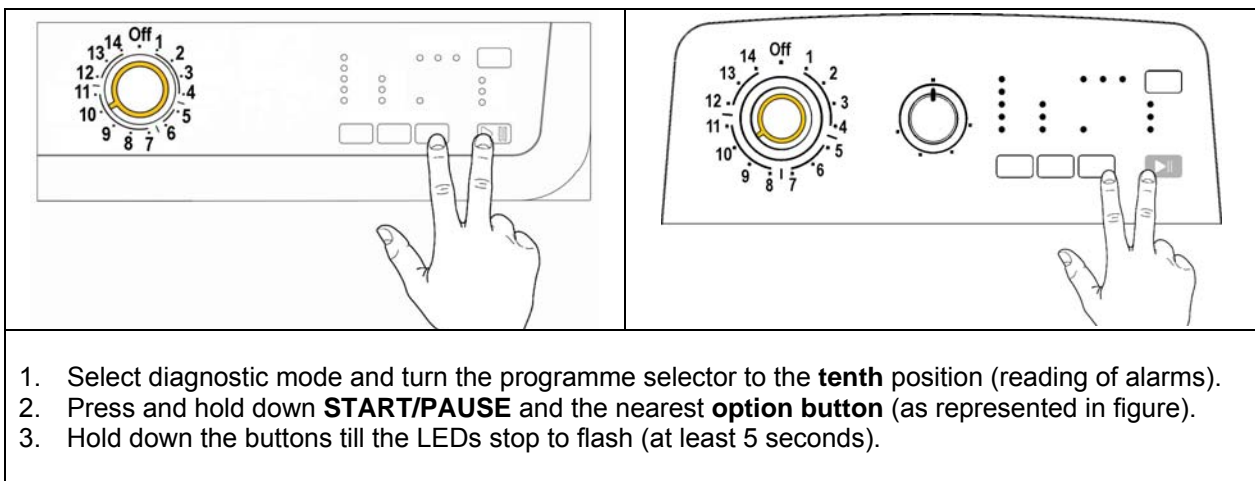
The last three alarm codes can be displayed even if the programme selector is not in the tenth position (diagnostics) or if the appliance is in normal operating mode (e.g. during the execution of the washing programme):

- Press and hold down **START/PAUSE** and the nearest **option button** (as to enter the DIAGNOSTICS), for at least two seconds: the LEDs initially switch off, and then display the flashing sequence indicating the last alarm.
- To display the previous alarms press the left button of the START/PAUSE button sequentially.
- To return to the last alarm, press the START/PAUSE button.
- The alarm sequence continues as long as the two buttons are held down.
- The alarm reading system is as described in paragraph 5.2.1.
- While the alarms are displayed, the appliance continues to perform the cycle or, if in the programme selection phase, maintains the previously-selected options in memory.

5.4 Cancelling the last alarm

It is good practice to cancel the last alarm:

- after reading the alarm code, to check whether the alarm re-occurs during diagnostics;
- after repairing the appliance, to check whether it re-occurs during testing.



N.B. With this operation all the memorised alarms are deleted.

5.5 SUMMARY TABLE OF ALARMS

Alarm	Possible fault	Action/machine status	Reset	Page
E11	Tap closed or water pressure too low; Drain tube improperly positioned; Water fill solenoid valve is faulty; Leaks from water circuit on pressure switch; Pressure switch faulty; Wiring faulty; PCB faulty.	Cycle is paused with door locked.	START/RESET	18
E13	Drain tube improperly positioned; Water pressure too low; Water fill solenoid valve is faulty; Water circuit on pressure switch is leaking/clogged; Pressure switch faulty.	Cycle is paused with door locked.	START/RESET	20
E21	Drain tube kinked/clogged/improperly positioned; Drain filter clogged/dirty; Drain pump faulty; Pressure switch faulty; Wiring faulty; PCB faulty; Electrical current leak between heating element and ground.	Cycle is paused (after 2 attempts).	START/RESET	22
E23	Drain pump faulty; Wiring faulty; PCB faulty.	Safety drain cycle - Cycle stops with door unlocked.	RESET	24
E24	PCB faulty.	Safety drain cycle - Cycle stops with door unlocked.	RESET	25
E31	Pressure switch; Wiring; Main PCB.	Cycle stops with door locked.	RESET	25
E32	Drain tube kinked/clogged/improperly positioned; Drain filter clogged/dirty; Drain pump faulty; Water circuit on pressure switch; pressure switch; Wiring; main board.	Cycle is paused.	START/RESET	26
E35	Water fill solenoid valve is faulty; Leaks from water circuit on pressure switch; Pressure switch faulty; Wiring faulty; PCB faulty.	Cycle stops. Safety drain cycle. Drain pump continues to operate (5 min. on, then 5 min. off, etc.).	RESET	27
E38	Water circuit on pressure switches; Pressure switches; Motor belt broken.	Heating phase is skipped.	RESET	28
E3A	PCB faulty.	Cycle stops with door locked.	RESET	29
E41	Door lock unit faulty; Wiring faulty; PCB faulty.	Cycle is paused.	START/RESET	30
E42	Door lock unit faulty; Wiring faulty; PCB faulty. Current leakage from heating element to ground.	Cycle is paused.	START/RESET	32
E43	Door lock unit faulty; Wiring faulty; PCB faulty.	(Safety drain cycle) Cycle stops.	ON/OFF RESET	33
E44	PCB faulty.	(Safety drain cycle) Cycle stops.	ON/OFF RESET	34
E45	PCB faulty.	(Safety drain cycle) Cycle stops.	ON/OFF RESET	34
E51	PCB faulty; current leakage from motor or from wiring.	Cycle blocked, door locked (after 5 attempts).	RESET	35
E52	Motor faulty; wiring faulty; PCB faulty.	Cycle blocked, door locked (after 5 attempts).	RESET	36
E53	PCB faulty.	Cycle blocked, door locked.	RESET	40

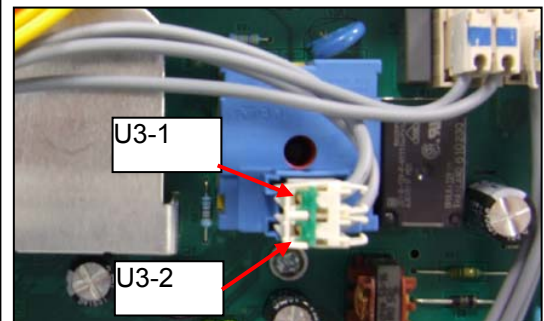
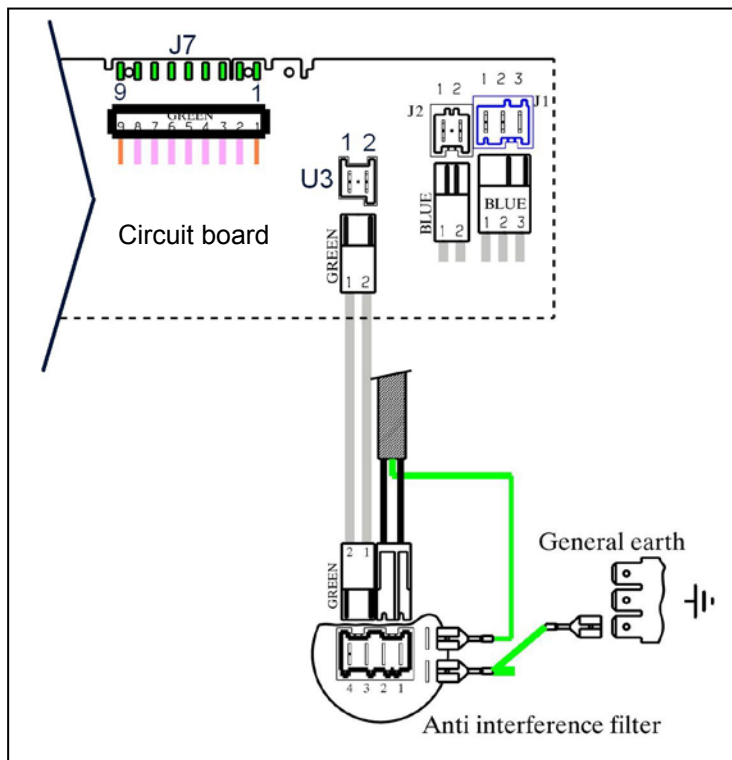
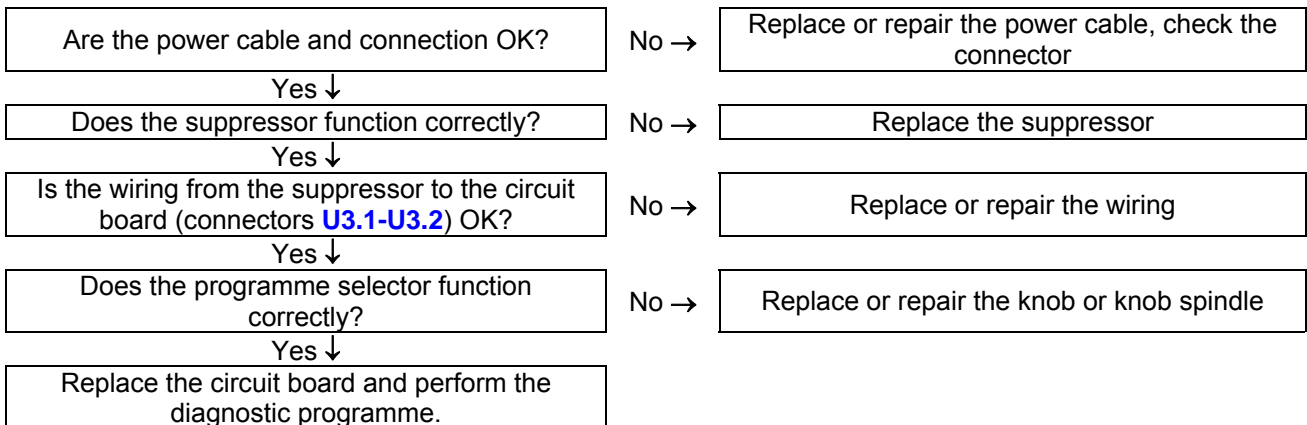
Alarm	Possible fault	Action/machine status	Reset	Page
E54	PCB faulty; current leakage from motor or from wiring.	Cycle blocked, door locked (after 5 attempts).	RESET	41
E61	NTC sensor faulty; heating element faulty; wiring faulty; PCB faulty.	The heating phase is skipped.	START/RESET	42
E62	NTC sensor faulty; heating element faulty; wiring faulty; PCB faulty.	Safety drain cycle – Cycle stopped with door open.	RESET	43
E66	PCB faulty.	Safety drain cycle – Cycle stopped with door open.	RESET	44
E68	Earth-leakage between heater and earth.	Cycle blocked with door open.	RESET	45
E69	Washing heating element interrupted (thermofuse open)	-----	START/RESET	46
E71	Faulty NTC sensor; Wiring faulty; PCB faulty.	Heating is skipped.	START/RESET	47
E74	NTC sensor improperly positioned; Faulty NTC sensor; Wiring faulty; PCB faulty.	Heating is skipped.	START/RESET	48
E82	PCB faulty (Wrong configuration data). Selector, wiring	-----	RESET	49
E83	PCB faulty (Wrong configuration data). Selector, wiring	Cycle cancelled.	START/RESET	50
E93	Incorrect configuration data; PCB faulty.	Cycle interrupted.	OFF/ON	51
E94	Incorrect configuration data; PCB faulty.	Cycle interrupted.	OFF/ON	51
E97	Faulty PCB (Wrong configuration data).	Cycle interrupted.	RESET	51
EA1	Wiring faulty; Circuit board faulty; DSP sensor faulty; Motor drive belt broken.	Drum positioning phase skipped.	ON/OFF RESET	52
EA6	Basket cover open. Motor faulty; Wiring faulty; PCB faulty.	Cycle interrupted.	ON/OFF RESET	53
EH1	Power supply problems (incorrect / disturbance); PCB faulty.	Wait for frequency nominal conditions.	OFF/ON	54
EH2	Power supply problems (incorrect / disturbance); PCB faulty.	Wait for voltage nominal conditions.	OFF/ON	54
EH3	Power supply problems (incorrect / disturbance); PCB faulty.	Wait for voltage nominal conditions.	OFF/ON	54
EF1	Drain tube blocked/kinked/too high; Drain filter dirty/blocked.	Warning displayed at the end of cycle (specific LED).	START/RESET	55
EF2	Excessive detergent dosing; drain tube kinked/blocked; Drain filter dirty/blocked.	Warning displayed after 5 attempts or by the specific LED.	RESET	55
EF3	Water leaks onto base frame; water control system defective.	Machine drains and cycle stops	RESET	55
EF5	Load too unbalanced; final spin phases skipped.	-----	START/RESET	55
E00	-----	-----	-----	

5.6 Notes concerning certain alarm codes

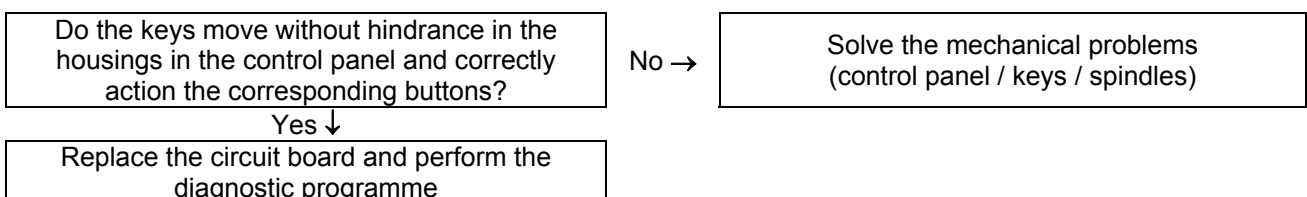
- **Configuration alarms E93:** If these alarms are generated (when the appliance is switched on), operation of the appliance is blocked and all the LEDs light. The diagnostic procedure cannot be accessed; the only option is to switch the appliance OFF (by turning the selector to position “0”).
- **Configuration alarm E94:** For this alarm code, only the family for alarm “9” is displayed; the diagnostic procedure cannot be accessed, and the “rapid alarm display” function cannot be used.
- **Alarms EH1-EH2-EH3:** In the event of problems with the mains power supply, the appliance remains in alarm mode until the mains frequency or voltage are restored to the correct value or the appliance is switched off (by turning the programme selector to “0”). The family of alarm “B” is displayed; the diagnostic procedure cannot be accessed, and the “rapid alarm display” function cannot be used. The complete alarm code can be read only when the abnormal situation has ceased.
- **Alarms E51- E52:** During the diagnostic test, all the alarms are displayed. Normally, when the programme selector is turned from one test phase to another, the appliance exits the alarm condition and performs the phase selected. This does not take place in the case of alarms E51 (power triac on motor short-circuited) and E52 (no signal from the tachometric generator on the motor): in these cases, the only option to exit the alarm condition is to switch the appliance OFF by turning the selector to position “0” (reset).

6 THE DIAGNOSTIC PROGRAMME CANNOT BE ACCESSED

6.1.1 All LEDs on the circuit are board switched off



6.1.2 Some of the LEDs of the circuit board light

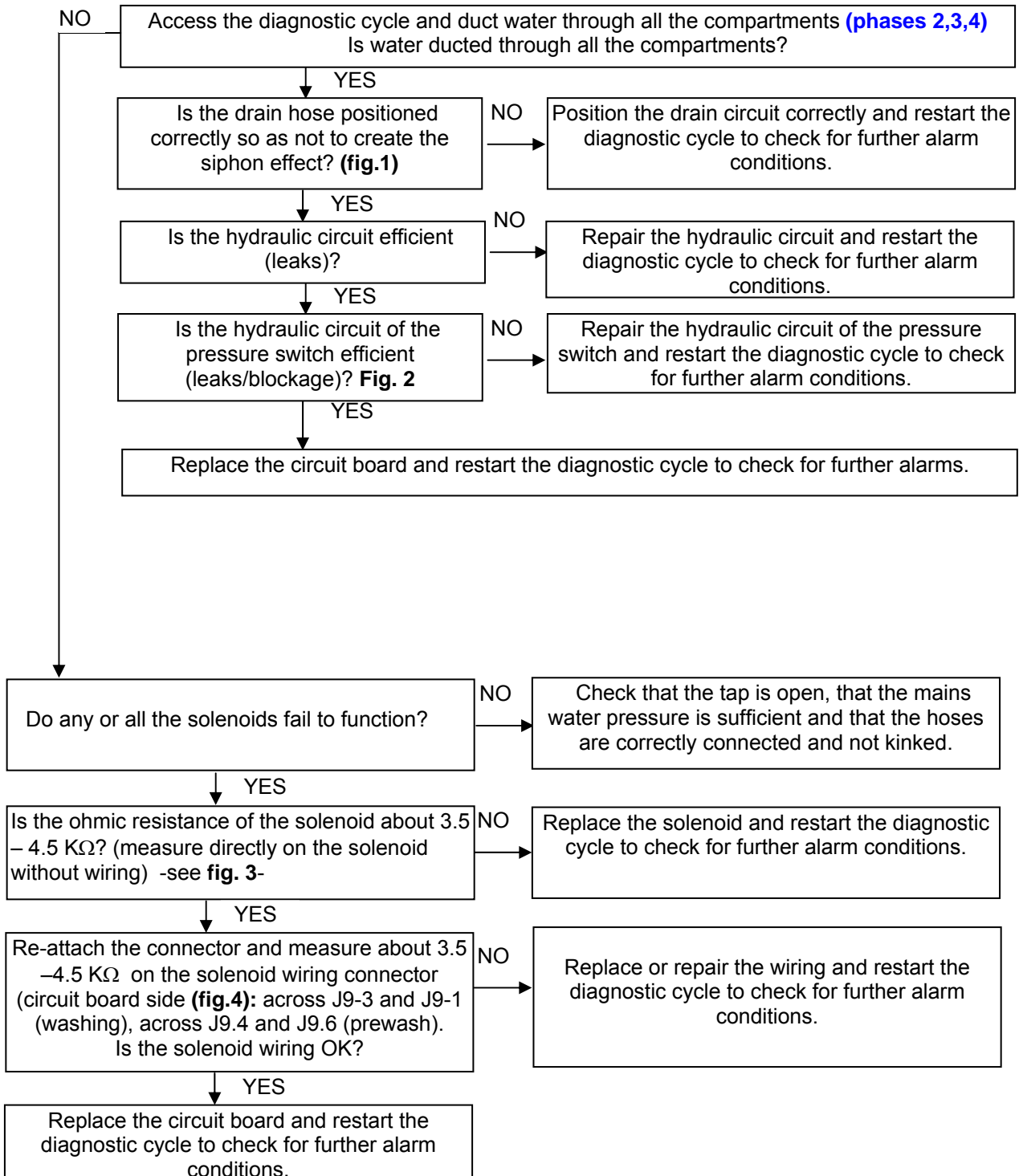


If there are traces of burning on the circuit board, refer to page 59

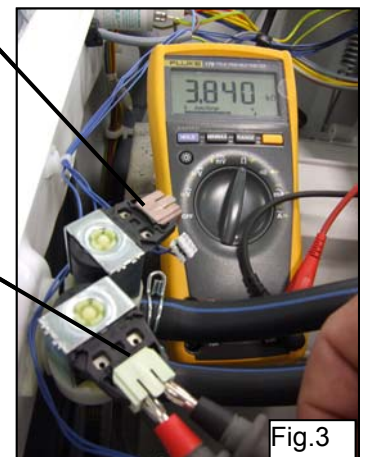
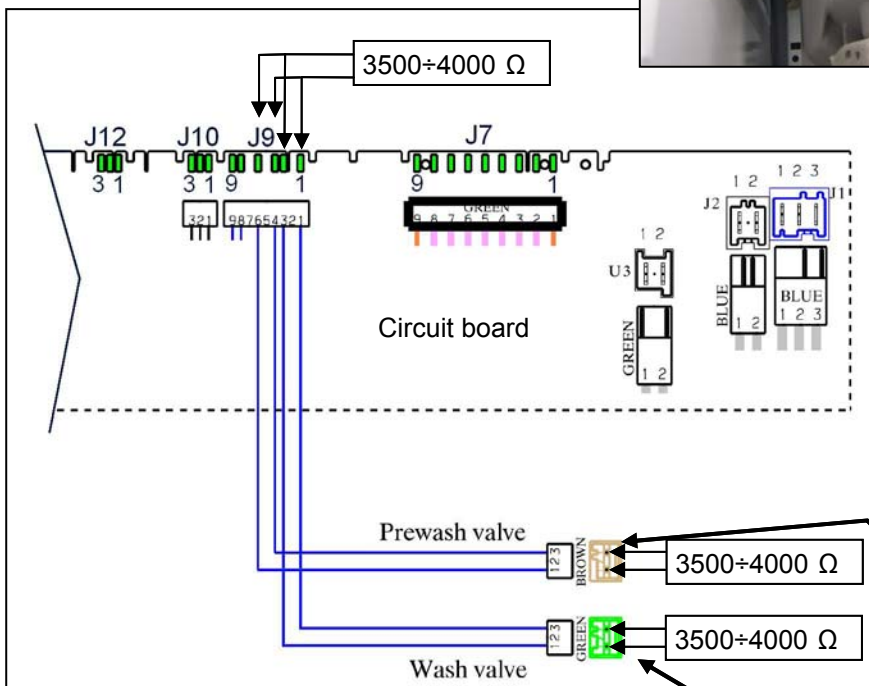
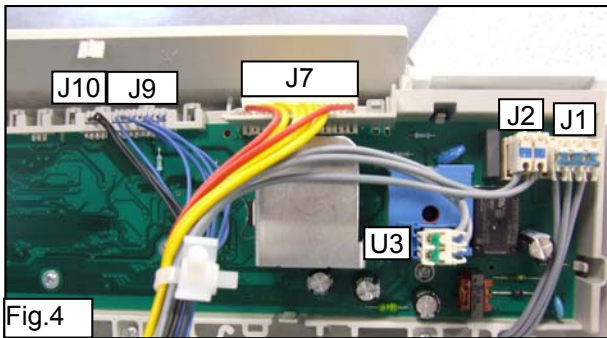
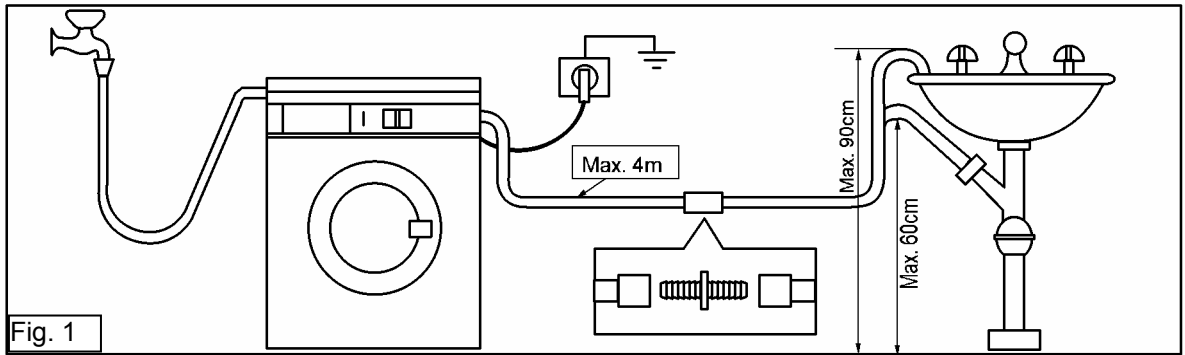
7 TROUBLESHOOTING ACCORDING TO ALARM CODES

E11	E11: Difficulty in filling during wash phase	E11
	Maximum water fill time for each pressure switch level (this time is reset to zero each time the level is reached)	

Tests to be performed:

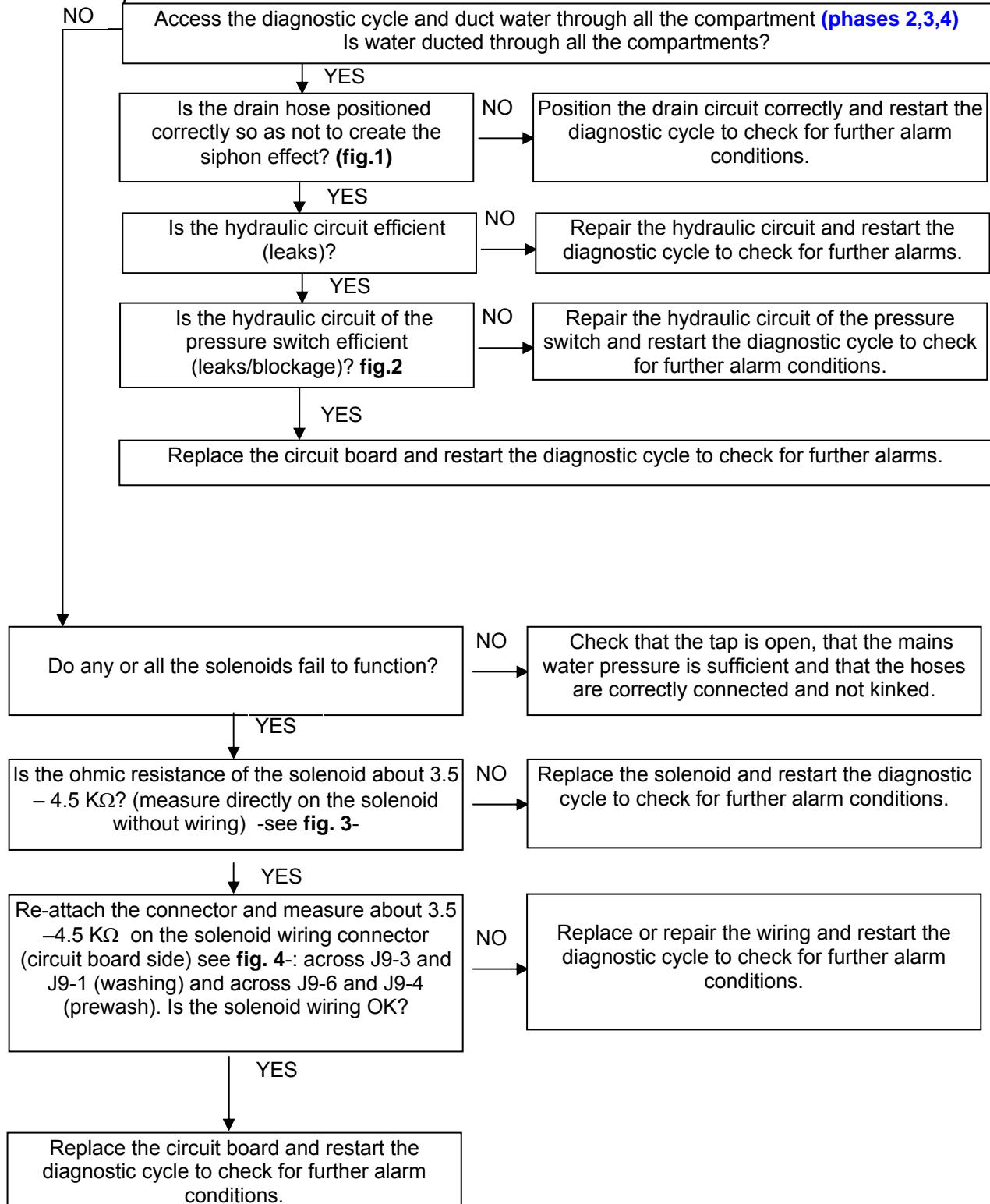


If there are traces of burning on the circuit board, refer to page 59



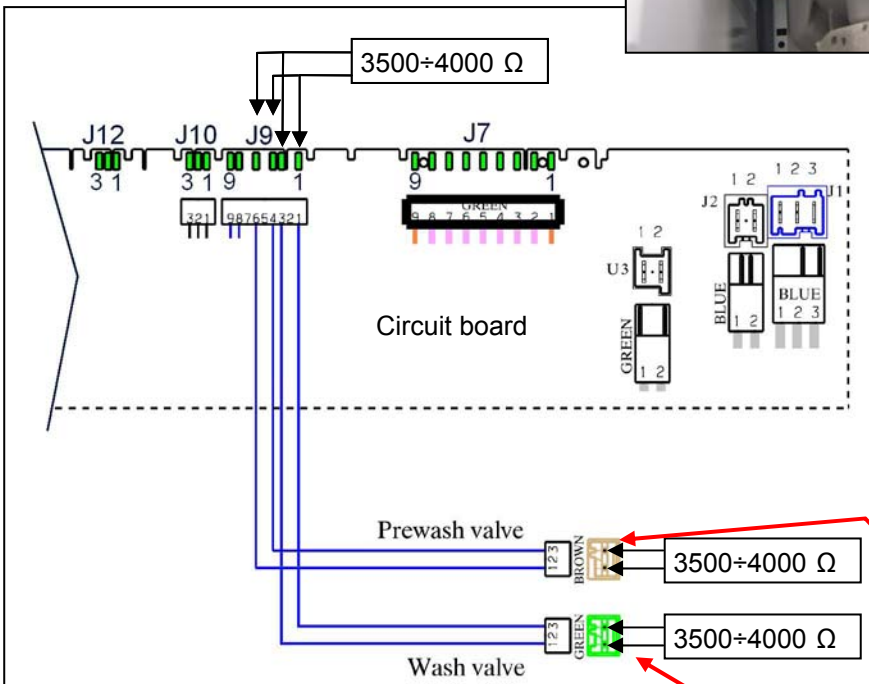
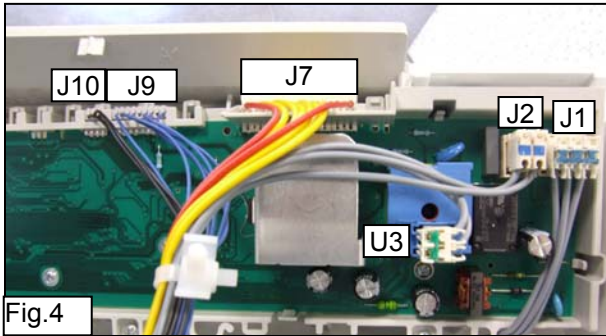
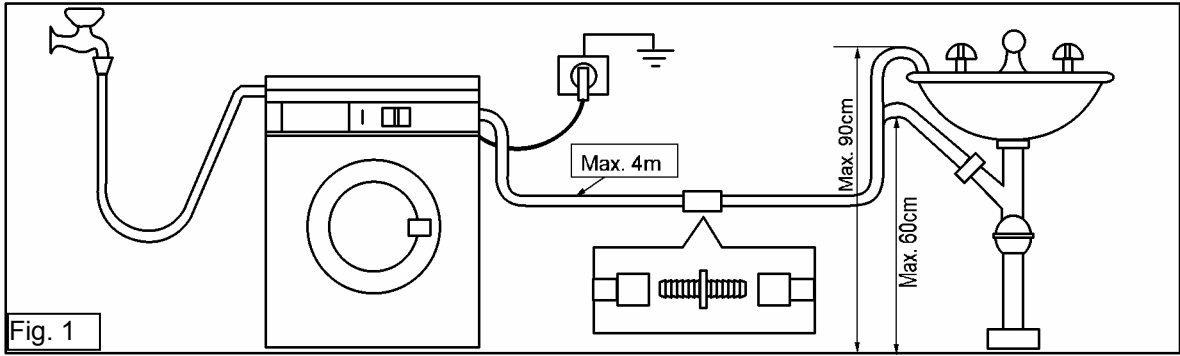
E13	E13: Water leakage	E13
	Overall maximum water fill time exceeded (the sum of all the water fills between one drain phase and the next, to avoid exceeding the maximum volume)	

Tests to be performed:



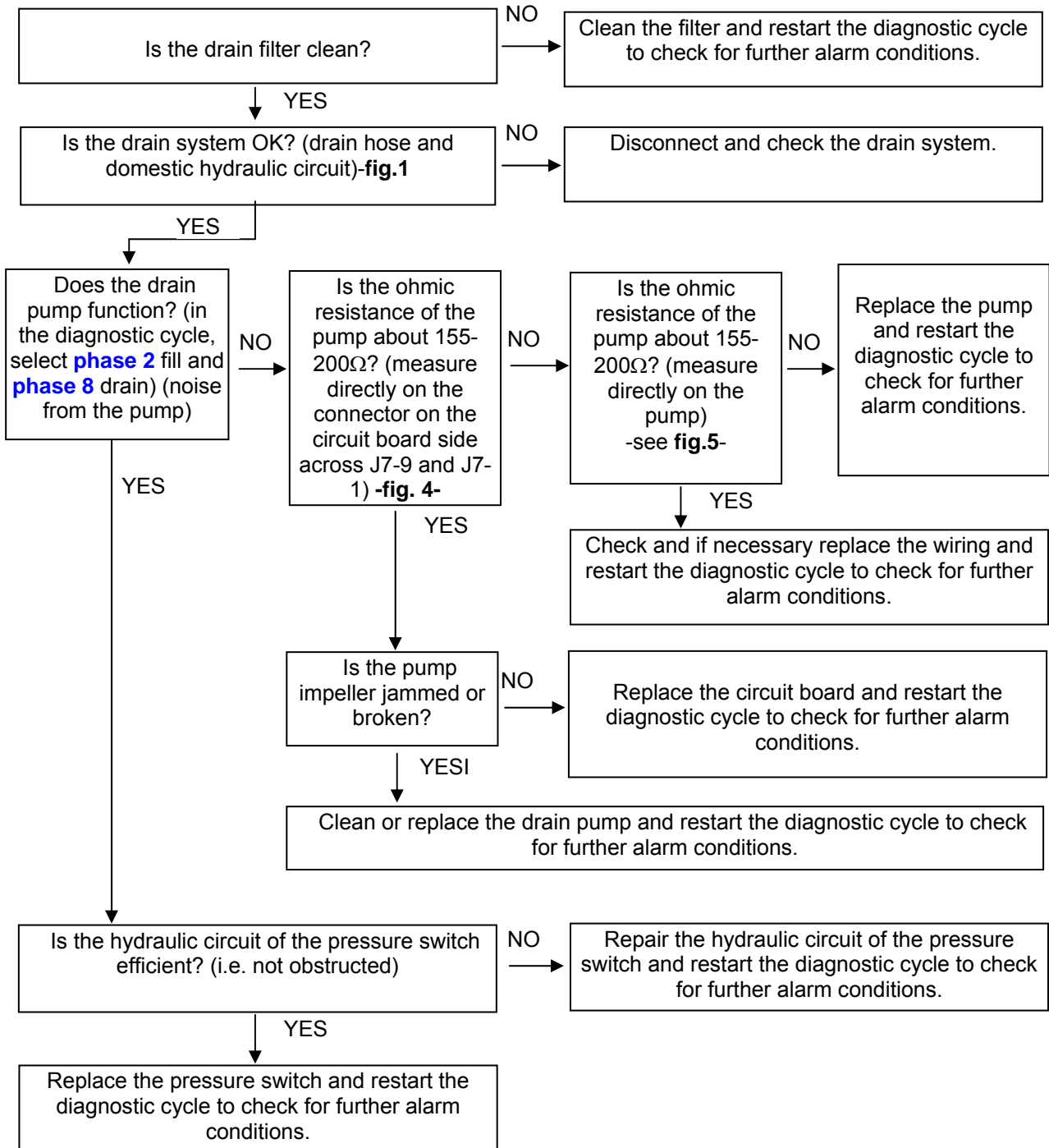
If there are traces of burning on the circuit board, refer to page 59

E13

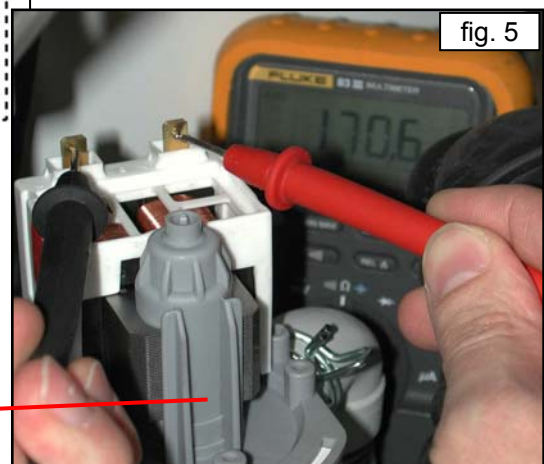
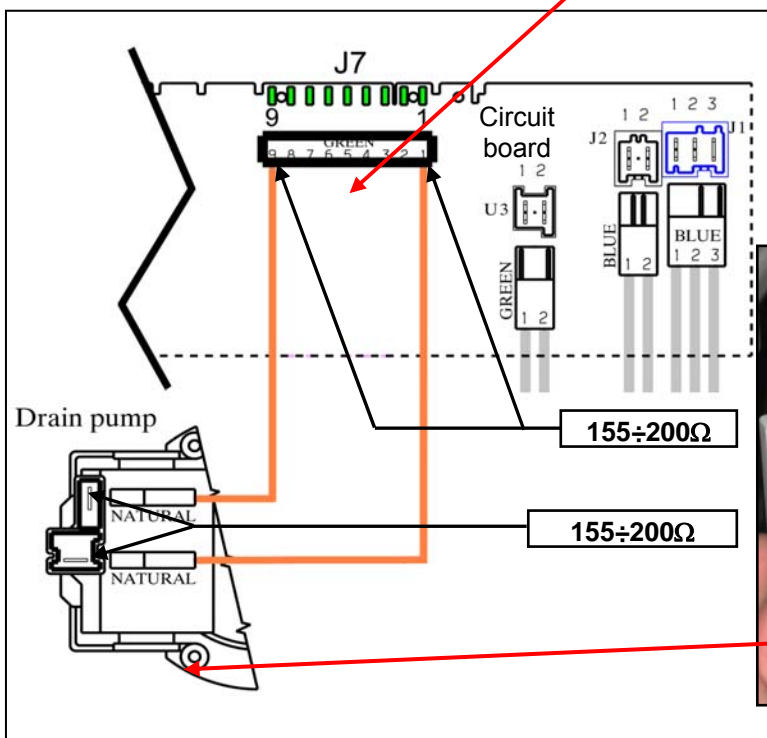
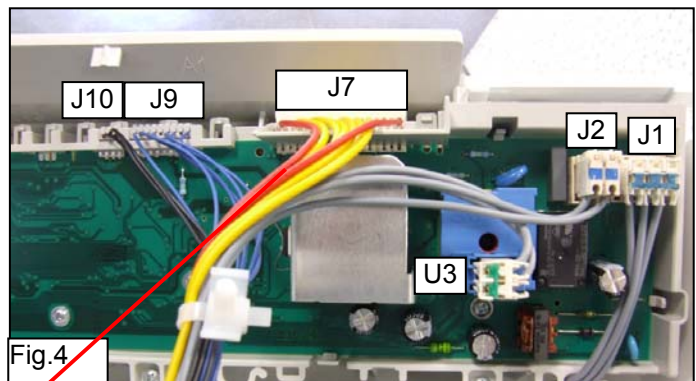
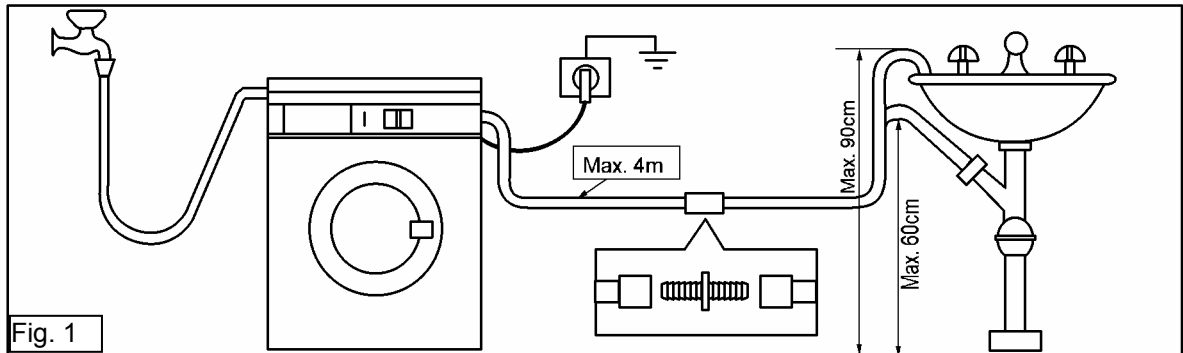


E21	E21: Difficulties in draining	E21
Maximum drain time exceeded (measured for each phase of the cycle)		

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



Tests to be performed:

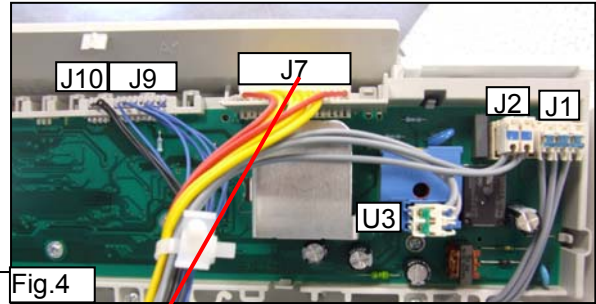
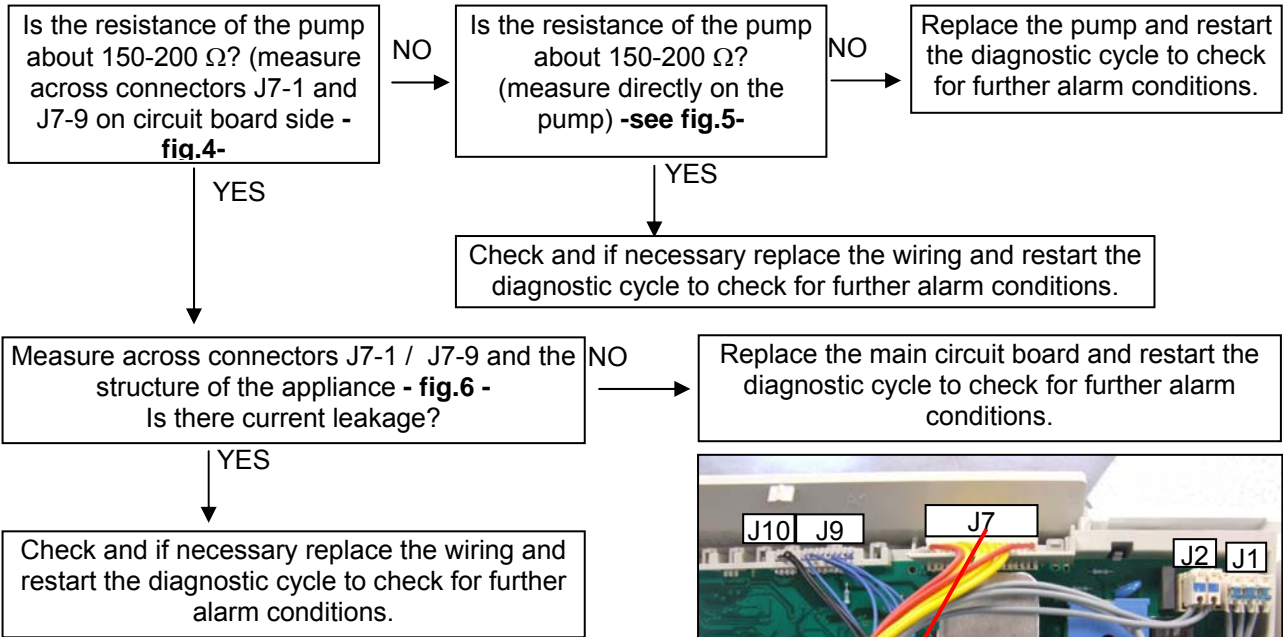


Fig.4

If there are traces of burning on the circuit board, refer to page 59

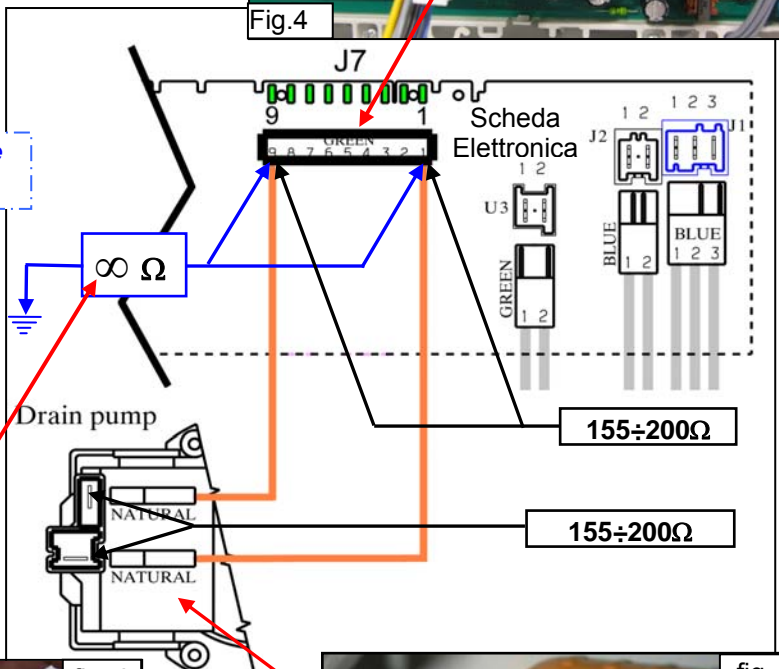


fig. 6

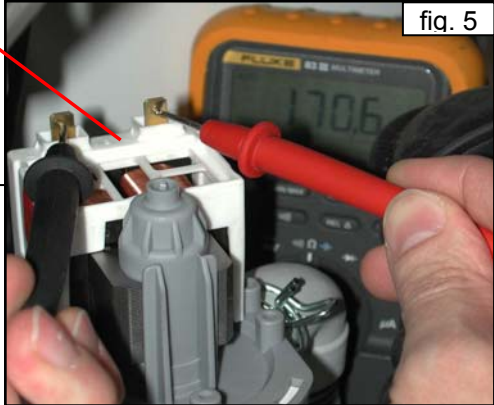


fig. 5

E24	E24: «Sensing» circuit of the component (triac) that controls the drain pump faulty	E24
------------	--	------------

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

If there are traces of burning on the circuit board, refer to page 59

E31	The analogic pressure switch is giving to the main board a signal outside the range	E31
------------	--	------------

Tests to be performed:

Measure a close circuit across J10-1,J10-2, J10-3 and the connector on analogic pressure switch (they are 3 independent connections see **fig. 7**).
Is the cable between main board and analogic pressure switch OK and connected correctly on both sides?

NO

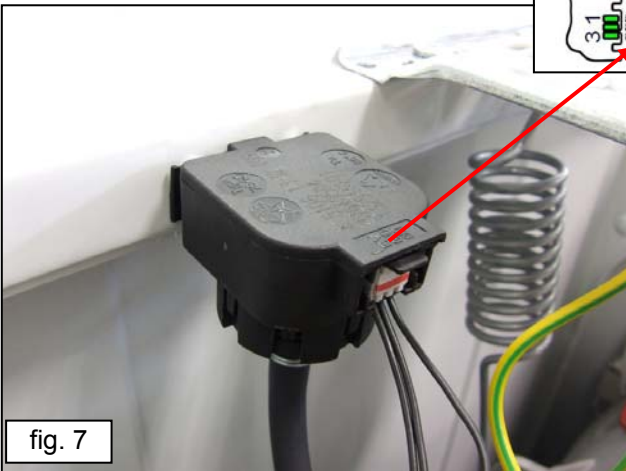
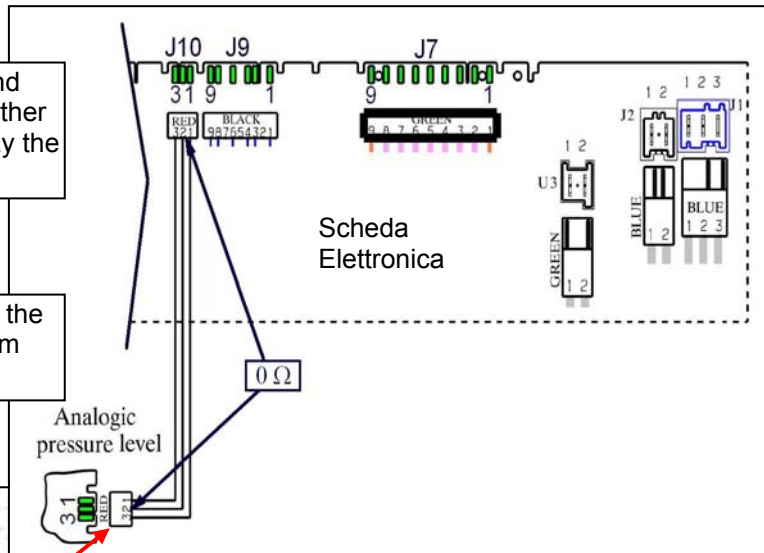
Reconnect and/or replace the cable and restart the diagnostic cycle to check for further alarm conditions.

YES

Replace the analogic pressure switch and restart the diagnostic cycle to check for further alarm conditions. Does the appliance display the alarm code again?

YES

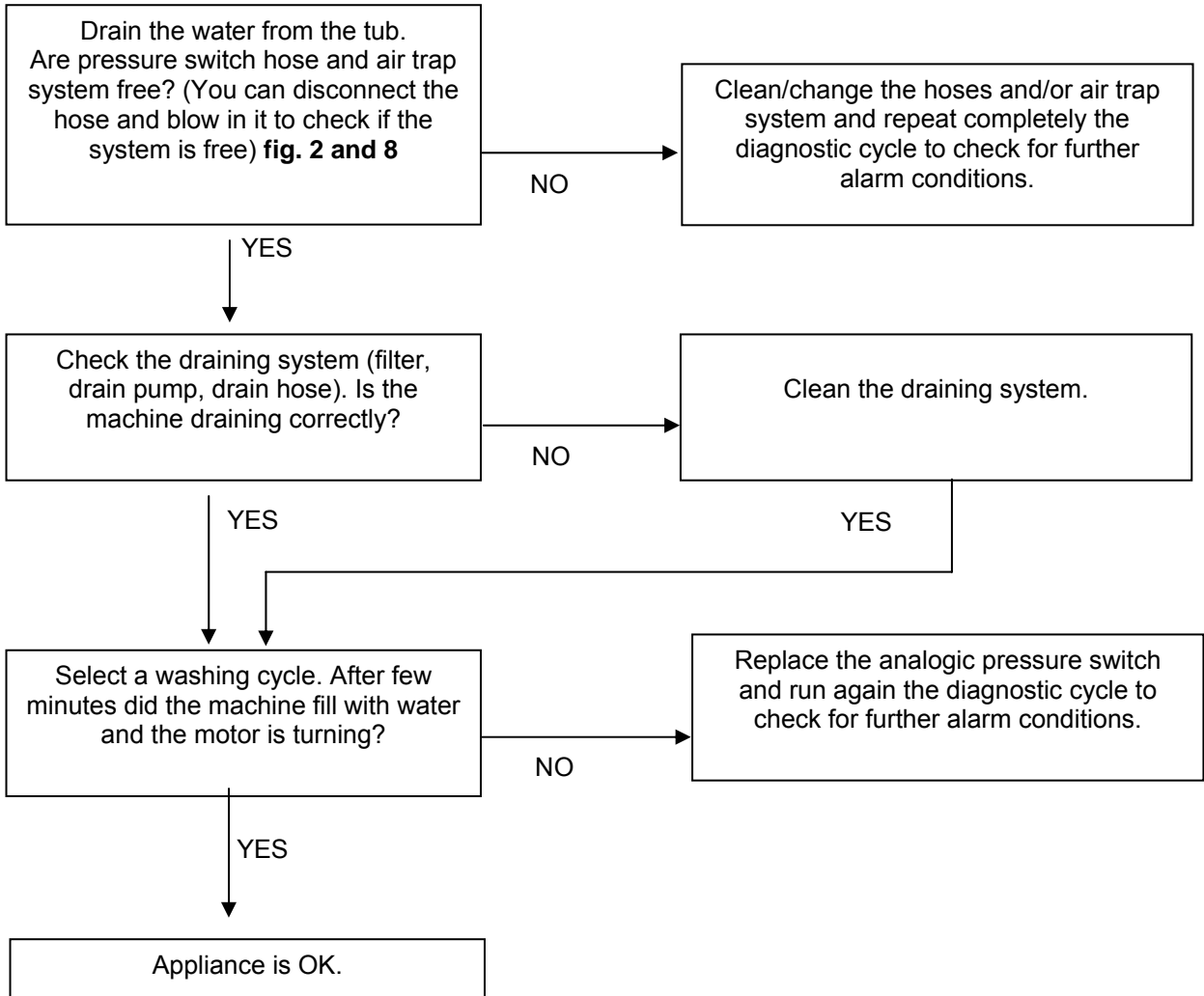
Replace the main circuit board and restart the diagnostic cycle to check for further alarm conditions.



If there are burn marks on electronic board, see page 59

E32	<p>The analogic pressure switch is giving an error during the calibration phase</p> <p>(At the beginning of each cycle the appliance drain to empty the tub and create a 0 level to verify the calibration of the analogic pressure switch)</p>	E32
------------	--	------------

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



Fig.2

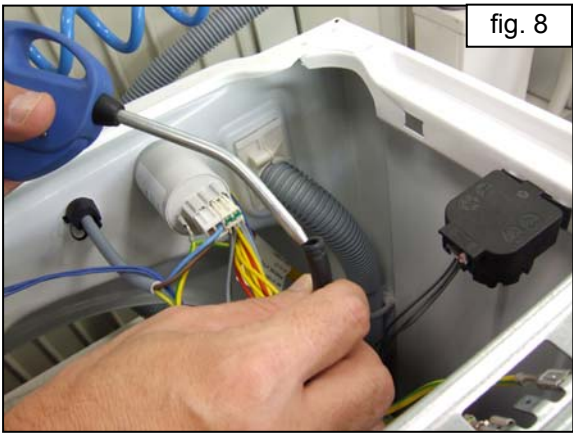
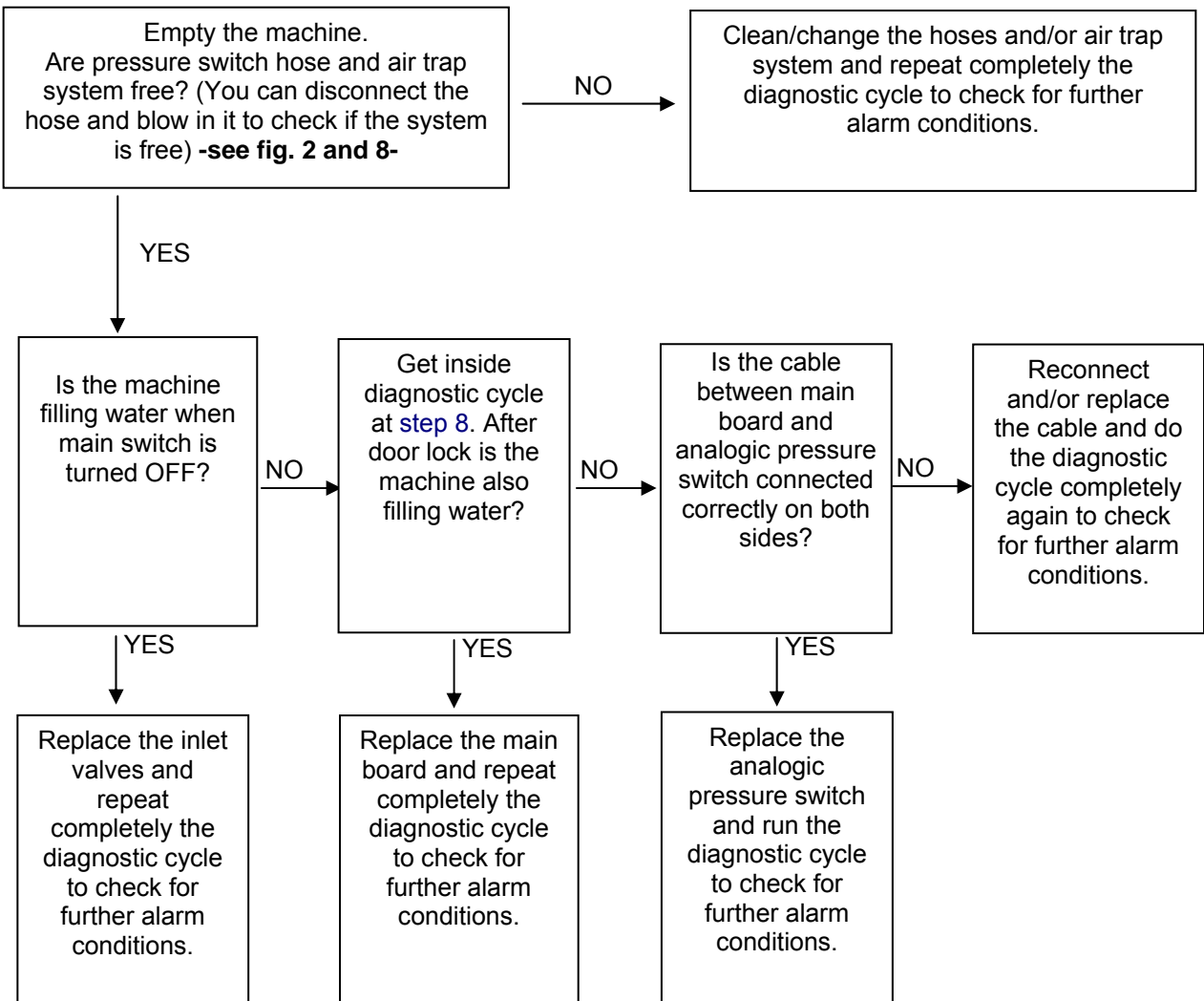


fig. 8

E35	E35: Water level too high	E35
	The electronic board measures a water level from analogic pressure switch higher then 300 mm for more then 15 seconds.	

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59

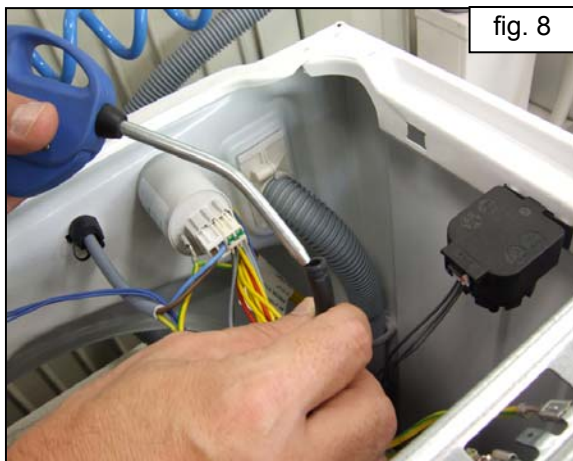


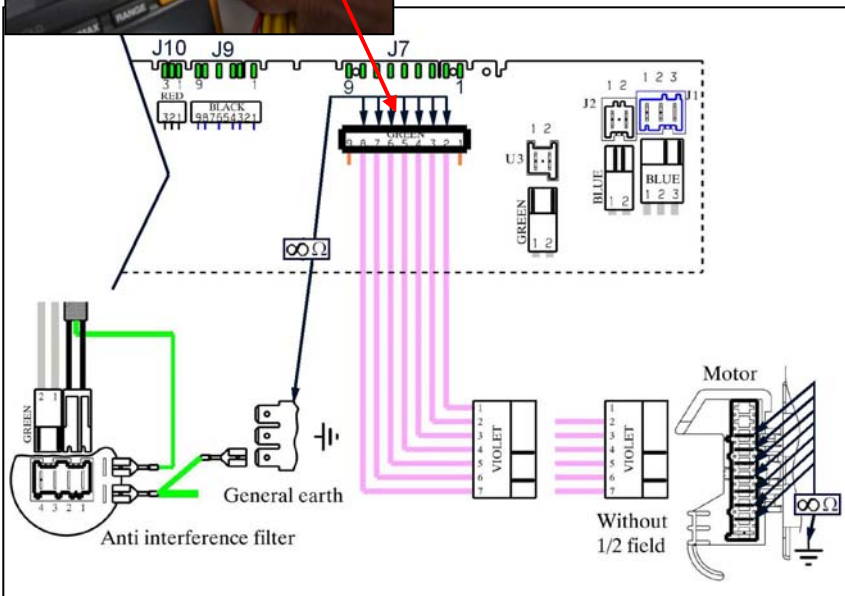
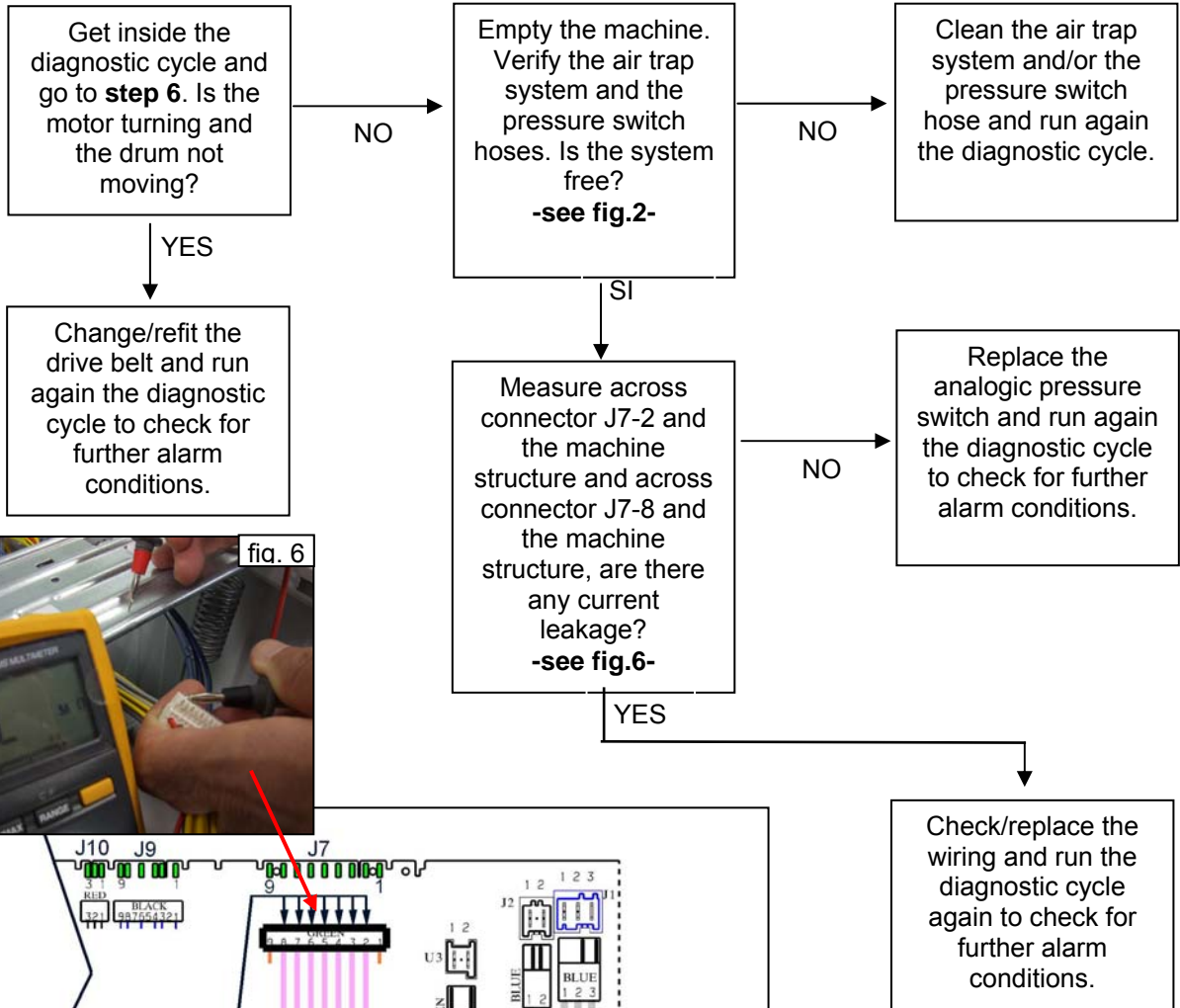
fig. 8



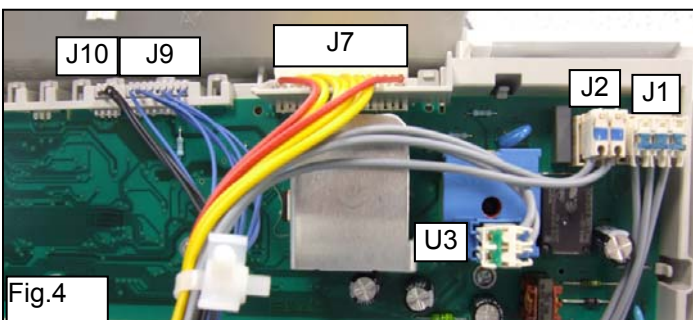
Fig.2

E38	E38: Pressure chamber blocked	E38
	The analogic pressure switch is not able to measure any variation of the water level for at least 30-sec. during drum movement.	

Tests to be performed:



If there are traces of burning on the circuit board refer to page 59



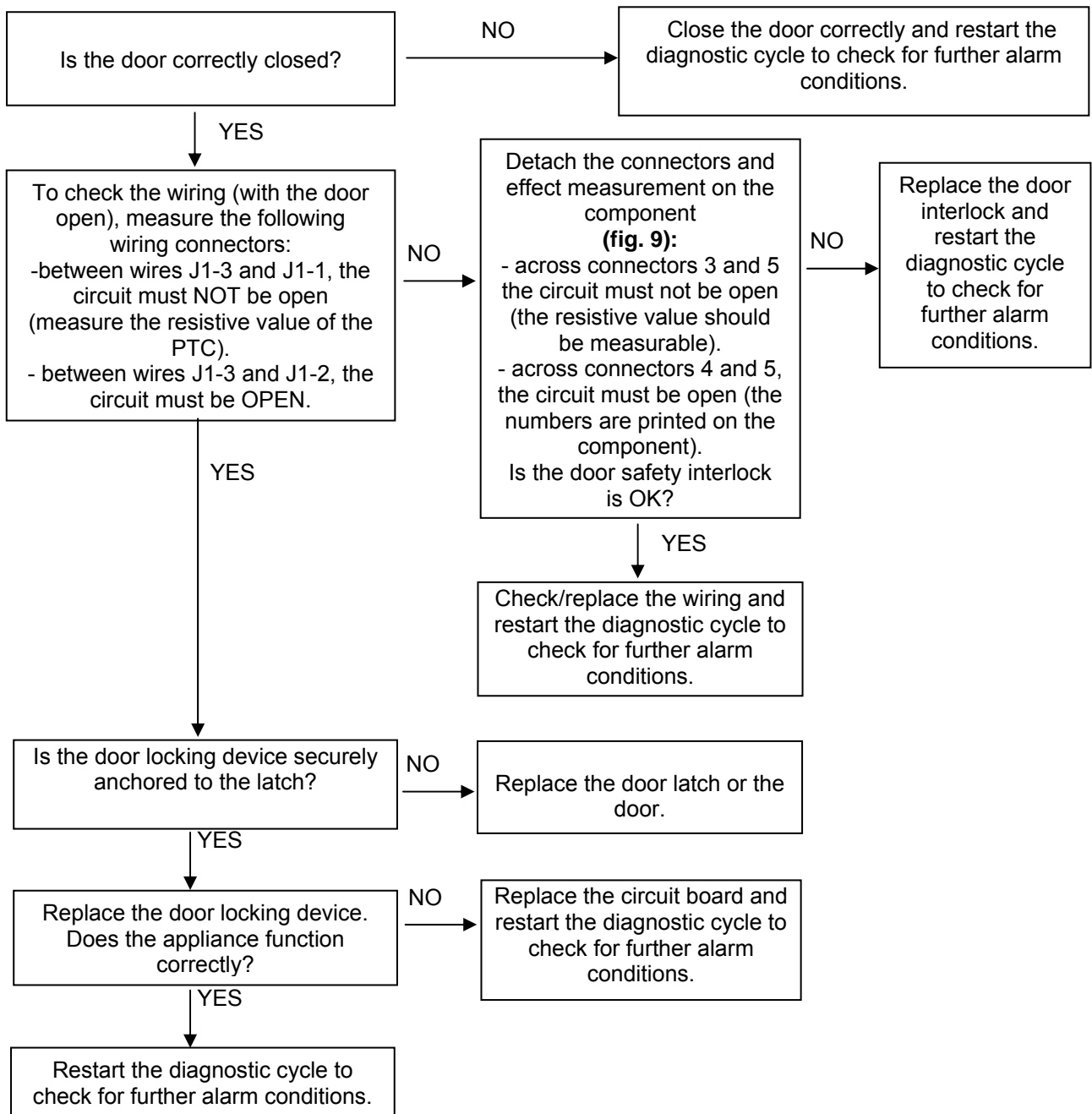
E3A	E3A: Problems with “Sensing” circuit of the heating element relay	E3A
------------	--	------------

Tests to be performed:

Replace the circuit board and run the diagnostic cycle again to check for further alarm conditions.

E41	E41: Door open	E41
	Maximum time exceeded (PTC = 15 seconds)	

Tests to be performed:



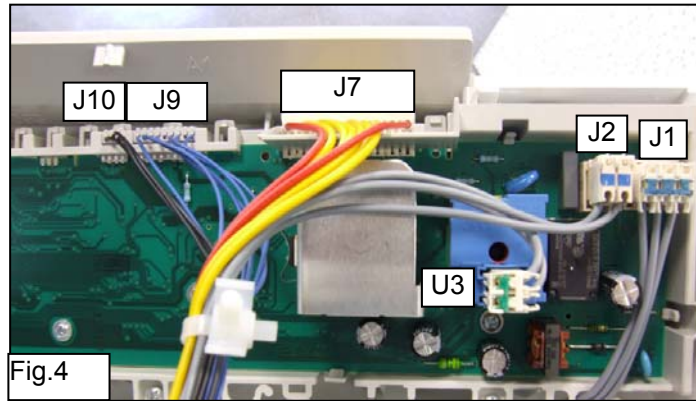


Fig.4

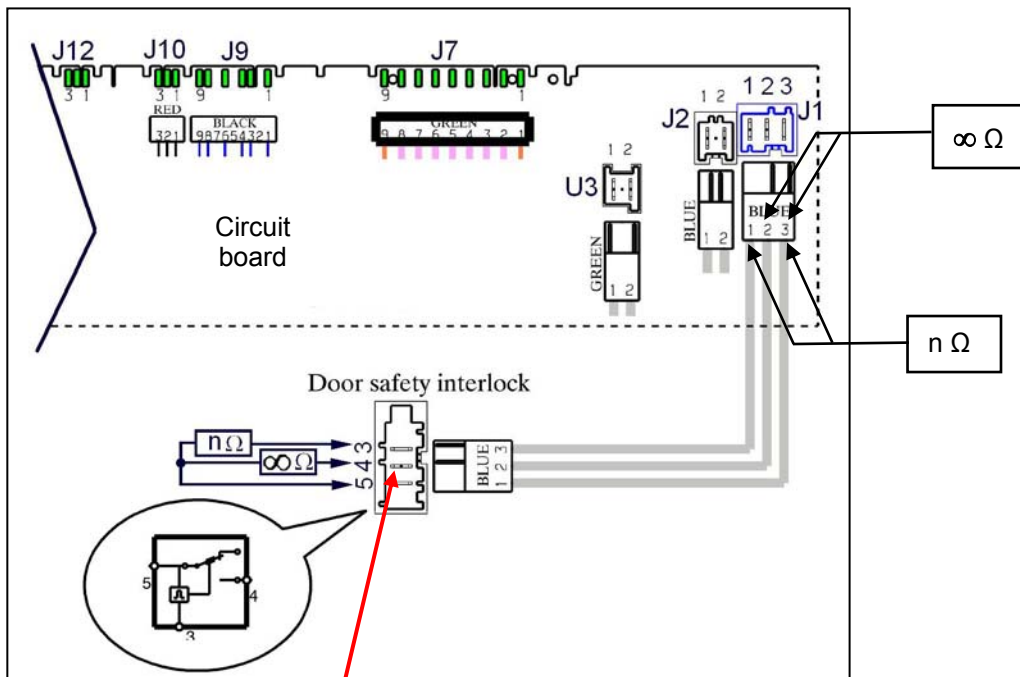


fig. 9

If there are traces of burning on the circuit board, refer to page 59

Tests to be performed:

To check the wiring (with the door open), measure the following wiring connectors (**fig. 4**):

- between wires J1-3 and J1-1, the circuit must NOT be open (measure the resistive value of the PTC).
- between wires J1-3 and J1-2, the circuit must be OPEN.

NO
→

Detach the connectors and effect measurement on the component (**fig. 9**):

- across connectors 3 and 5 the circuit must not be open (the resistive value should be measurable).
- across connectors 4 and 5, the circuit must be open (the numbers are printed on the component).

Is the door safety interlock OK?

NO
→

Replace the door interlock and restart the diagnostic cycle to check for further alarm conditions.

YES

YES

Check/replace the wiring and restart the diagnostic cycle to check for further alarm conditions.

Is the door locking device securely anchored to the latch?

NO
→

Replace the door latch or the door.

YES

Replace the door locking device. Does the appliance function correctly?

NO
→

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

If there are traces of burning on the circuit board, refer to page 59

YES

Restart the diagnostic cycle to check for further alarm conditions.

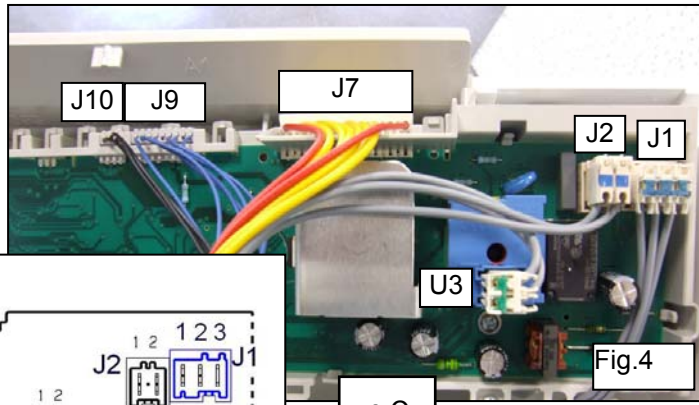
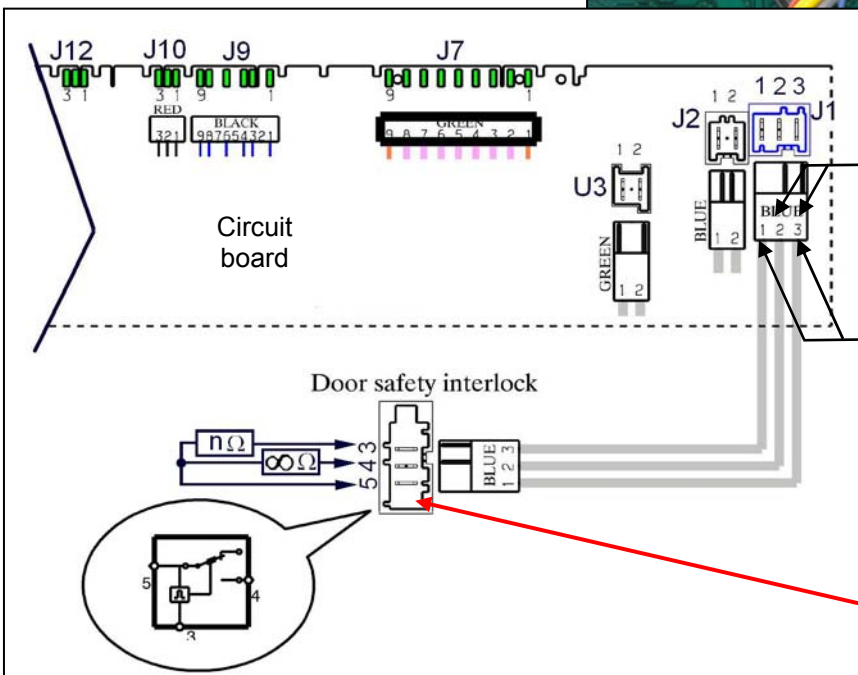


Fig.4



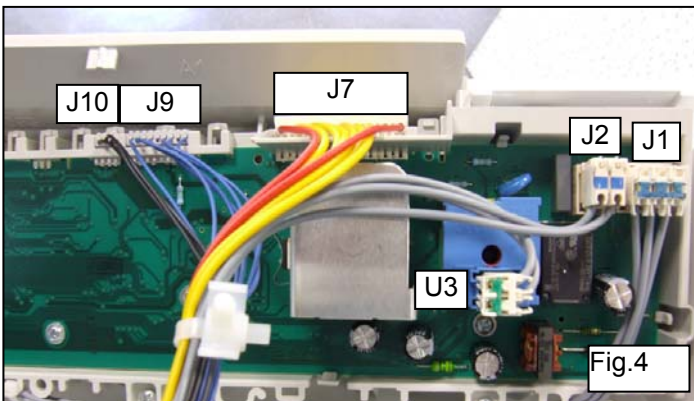
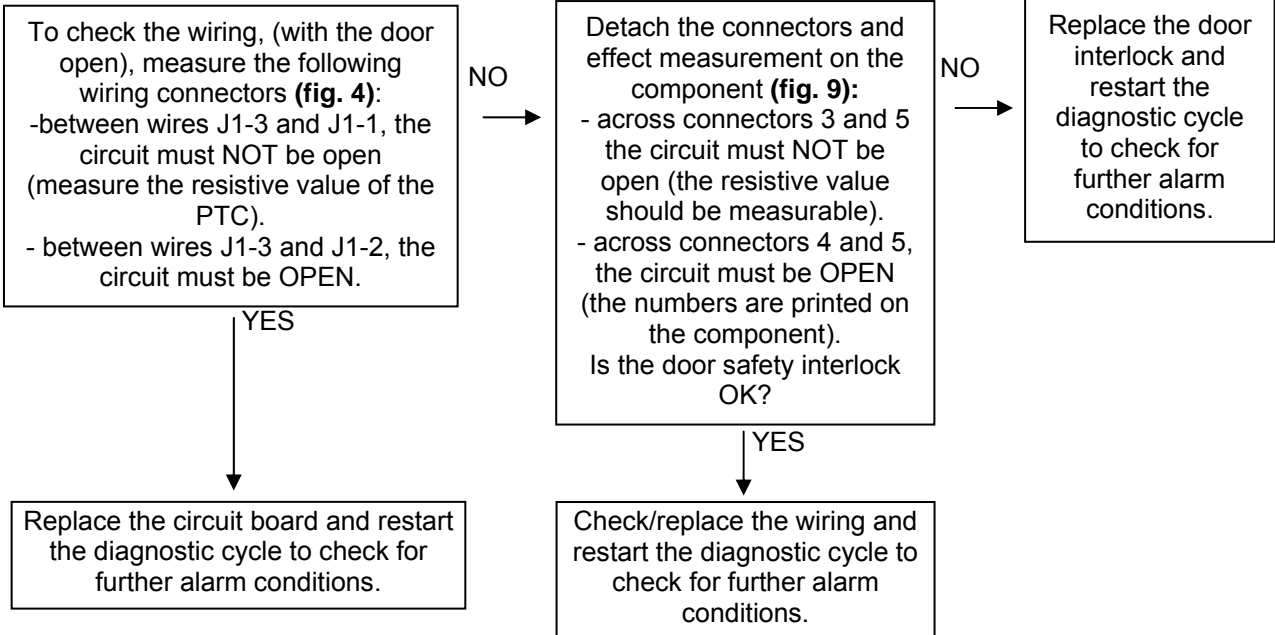
$\infty \Omega$

$n \Omega$

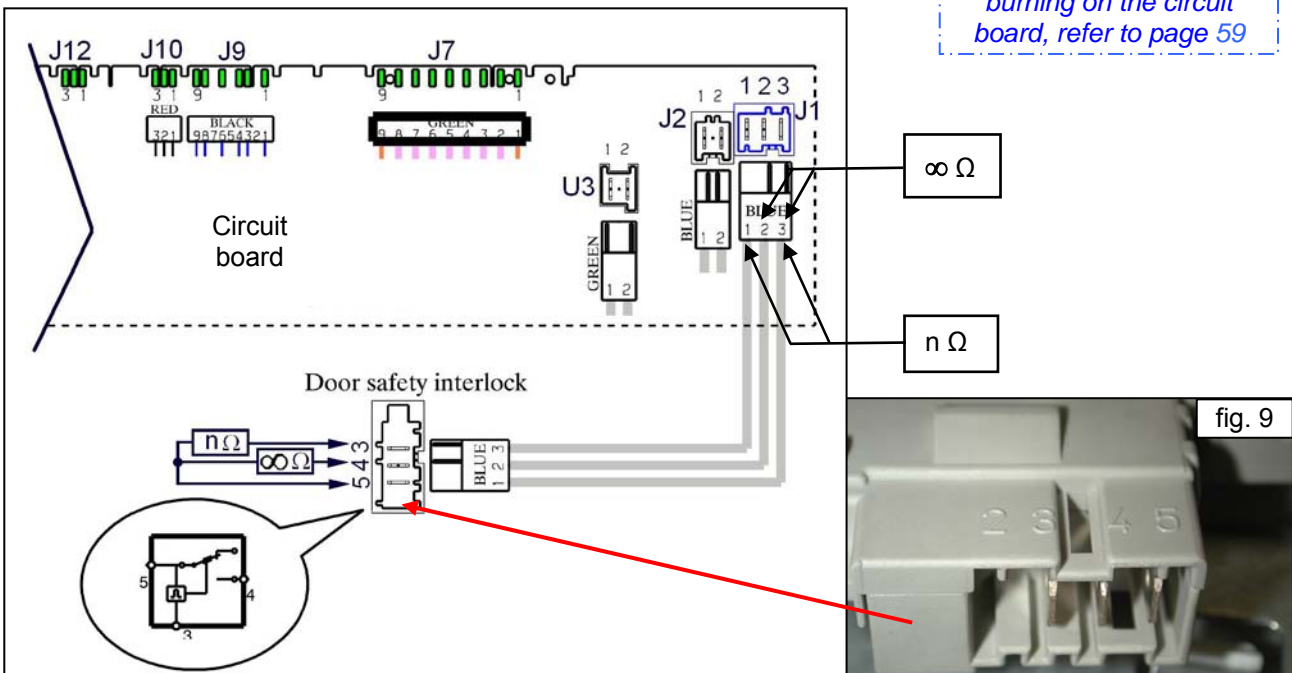


fig. 9

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



E44	E44: Door closure «sensing» circuit faulty	E44
------------	---	------------

Tests to be performed:

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

E45	E45: Problems with the «sensing» circuit of the triac that actions the door interlock	E45
------------	--	------------

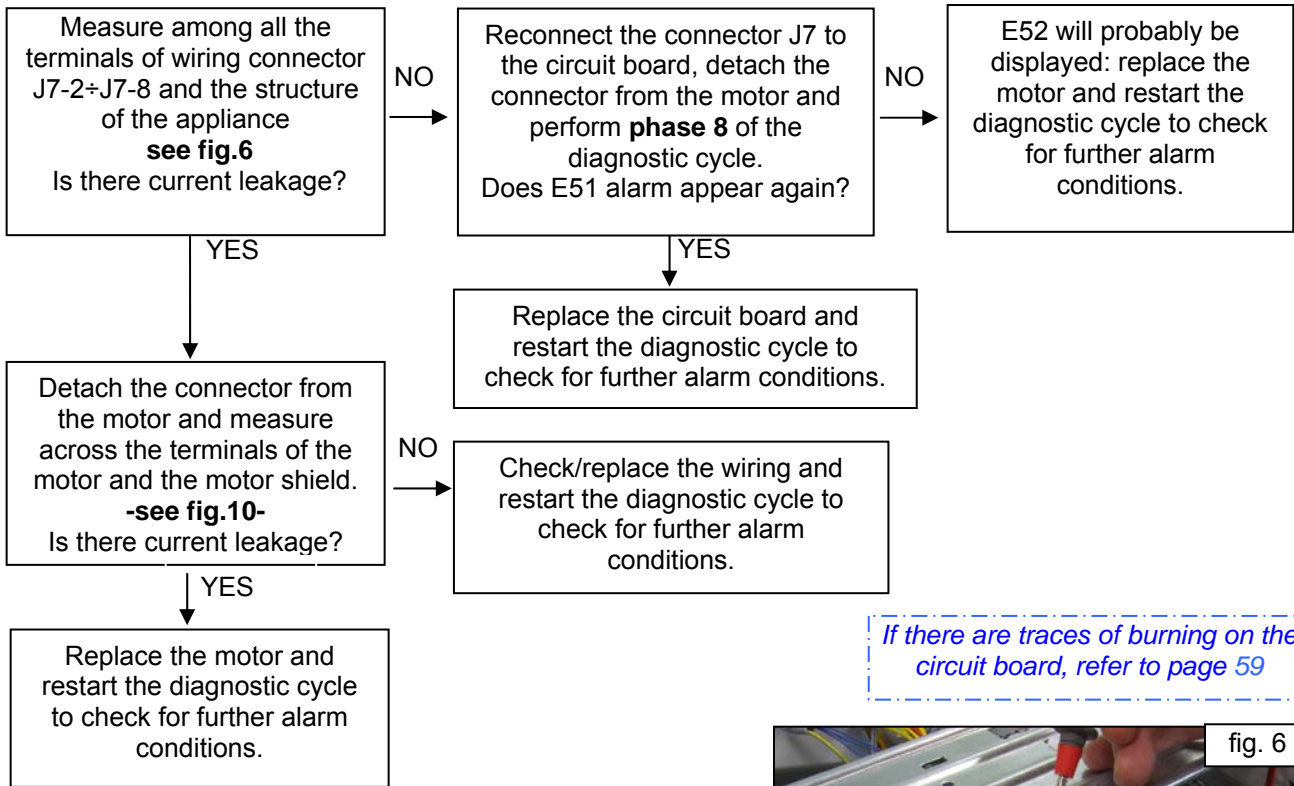
Tests to be performed:

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

If there are traces of burning on the circuit board, refer to page 59

E51	E51: Motor power triac short-circuited	E51
	Intervention of the safety system for short-circuiting of the triac (after 5 attempts during the cycle, immediately if detected at the start or during diagnostics)	

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59

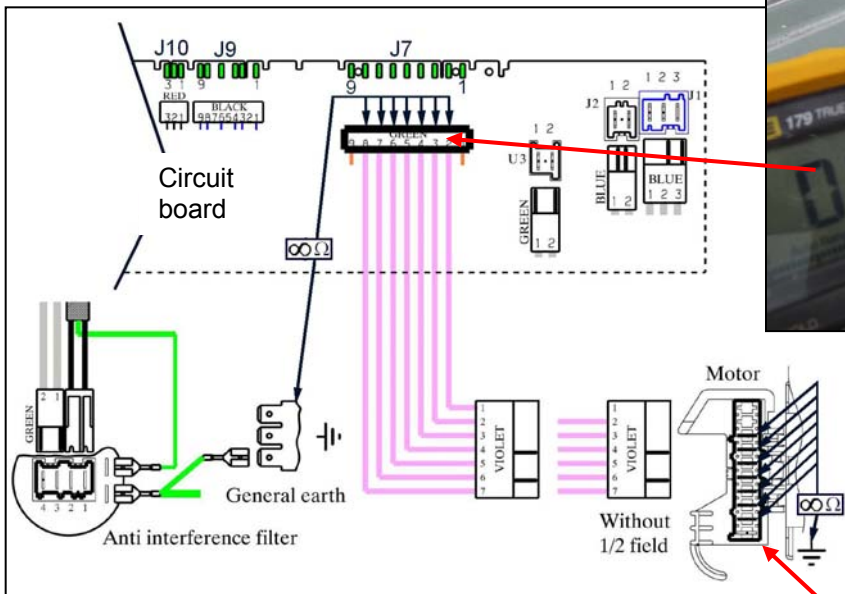


fig. 6

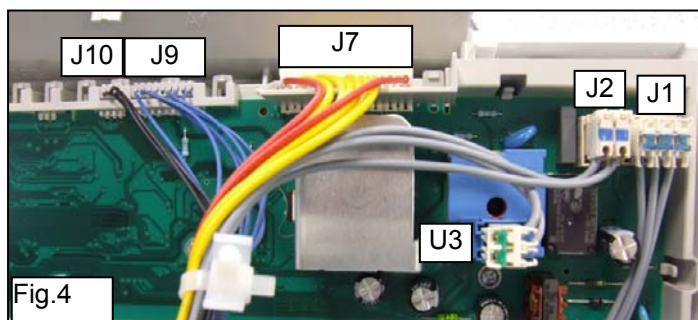


Fig.4

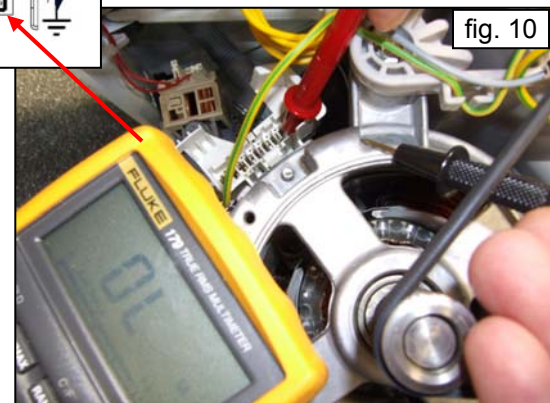
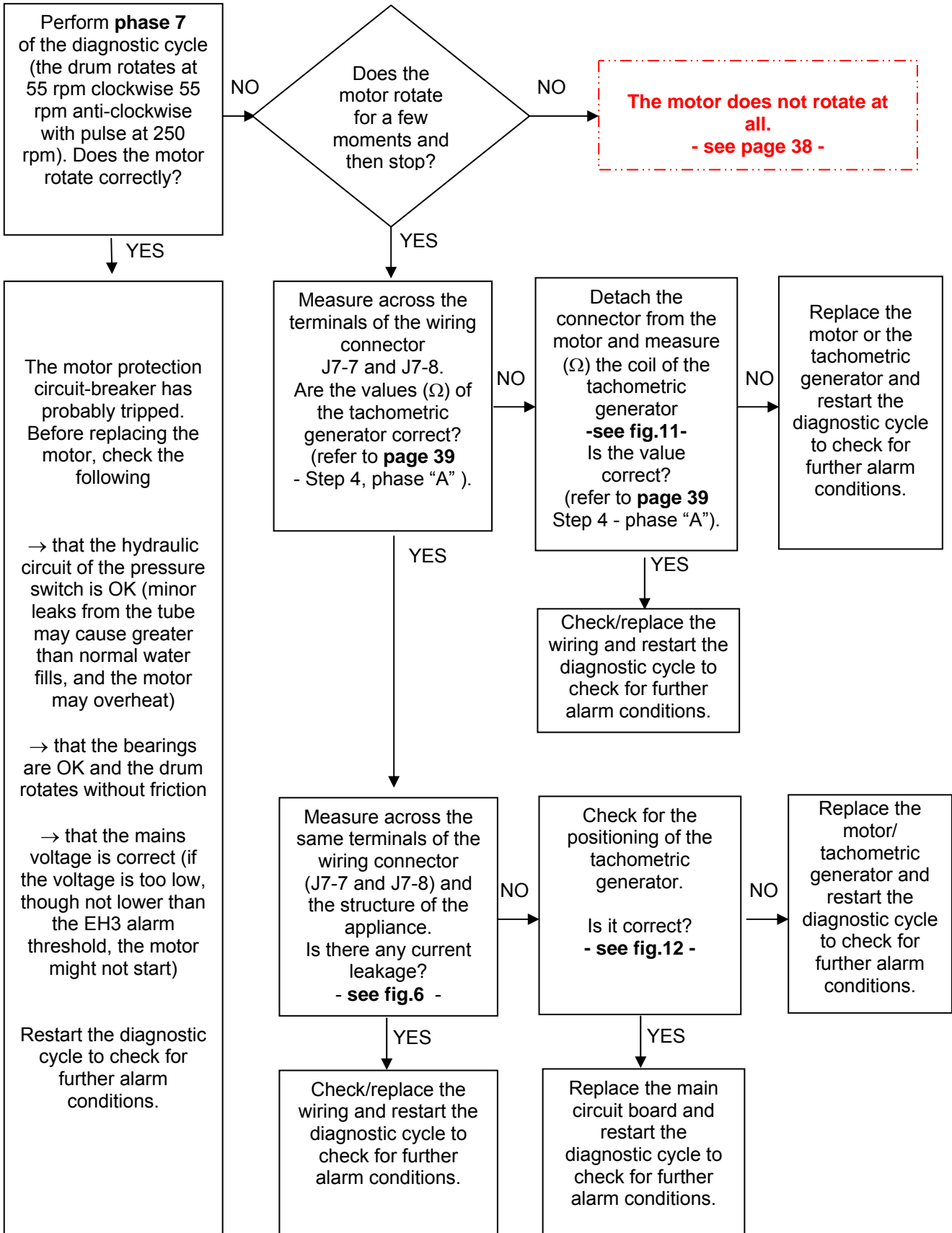


fig. 10

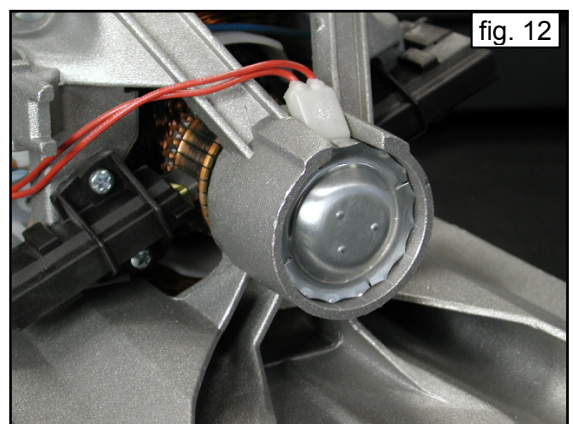
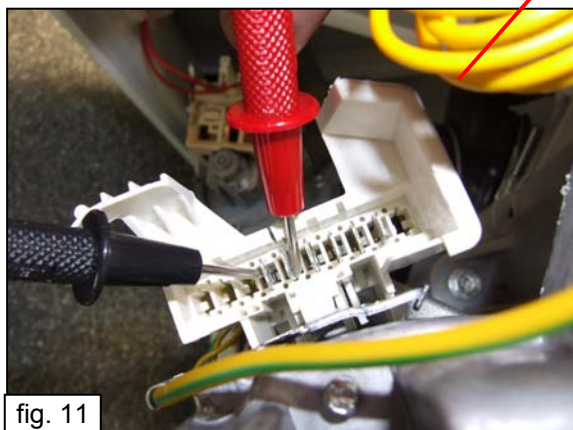
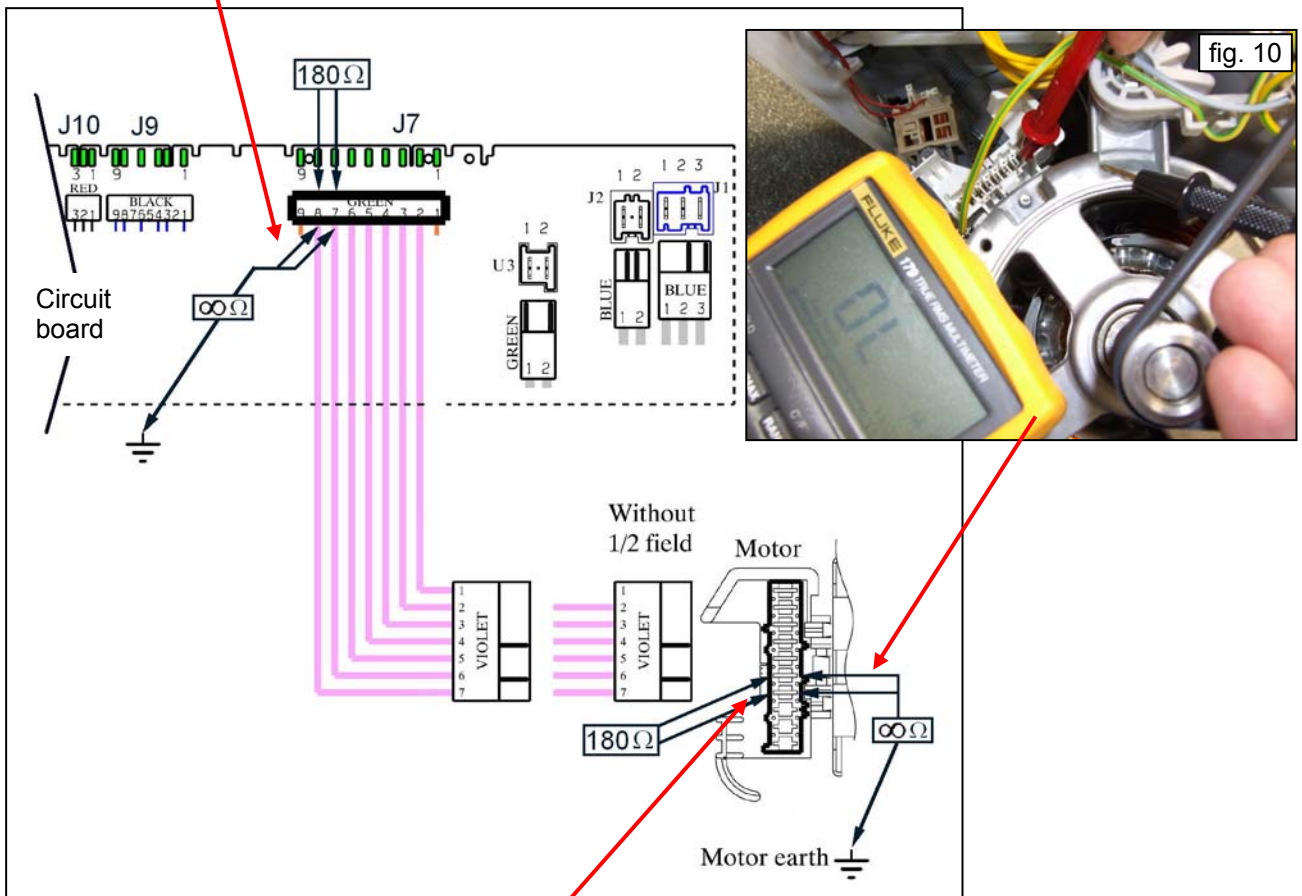
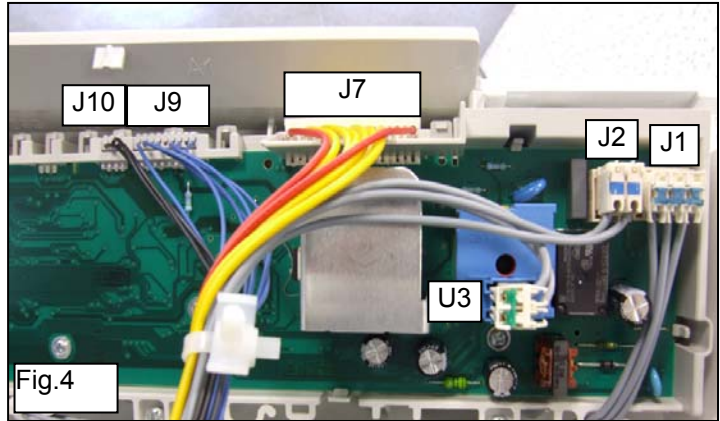
E52	E52: No signal from the motor tachometric generator (first part)	E52
	Cycle blocked after 5 attempts during the cycle or immediately if detected at the start or during diagnostics.	

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59

E52a



E52	E52: No signal from the motor tachometric generator (second part) Cycle blocked after 5 attempts during the cycle or immediately if detected at the start or during diagnostics.	E52
------------	--	------------

Tests to be performed:

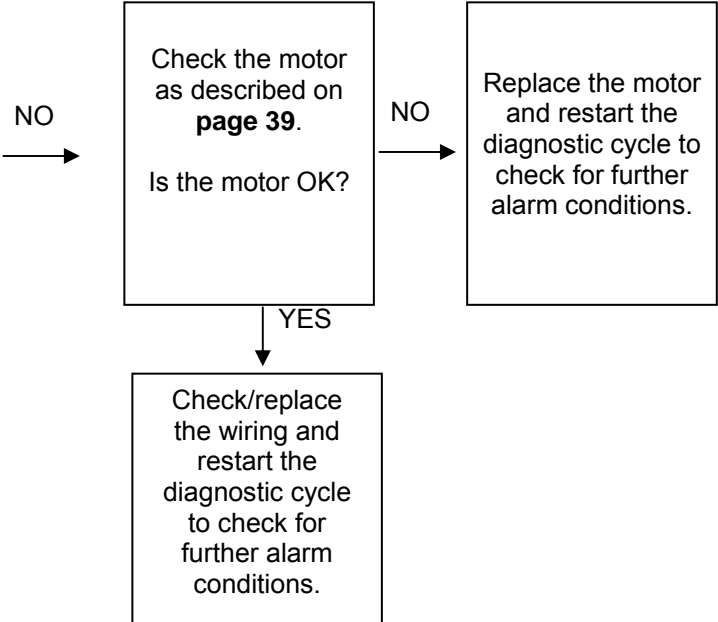
The motor does not rotate at all.

To check the wiring, measure (Ω) across the following terminals of the circuit board connector (**fig.4**) and compare with the correct values (**see page 39**: step 4 – motor parameters)

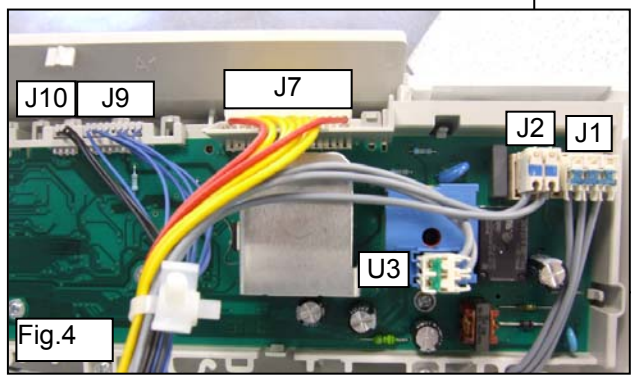
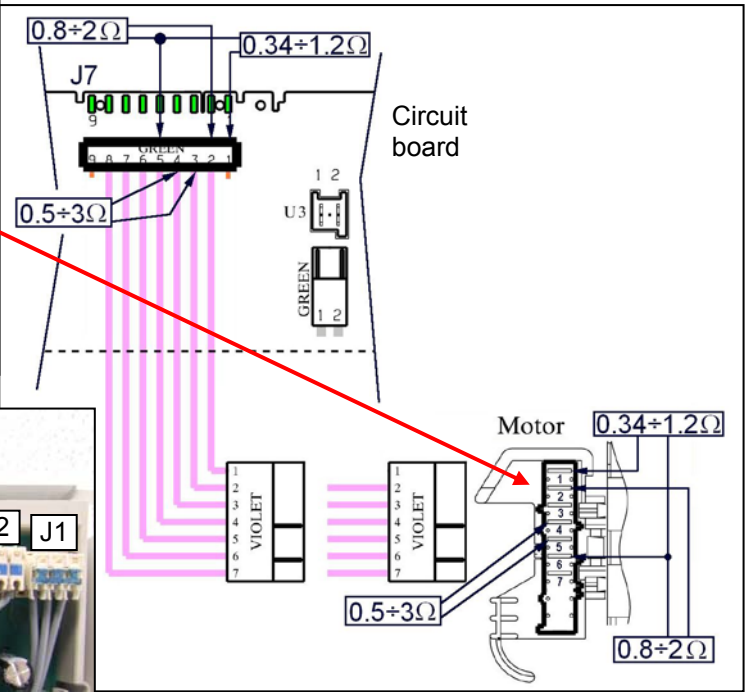
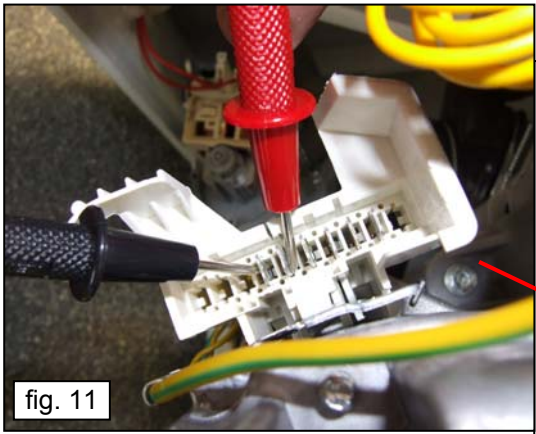
- across J7-2 and J7-5, the value must be as in 4 - **B** (Stator)
- across J7-1 and J7-5, if present, the value must be as in step 4 - **D** (stator $\frac{1}{2}$ range).
- across J7-2 and J7-4, the value must be as in step 4-**C** (rotor).
Are these values correct?

YES

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

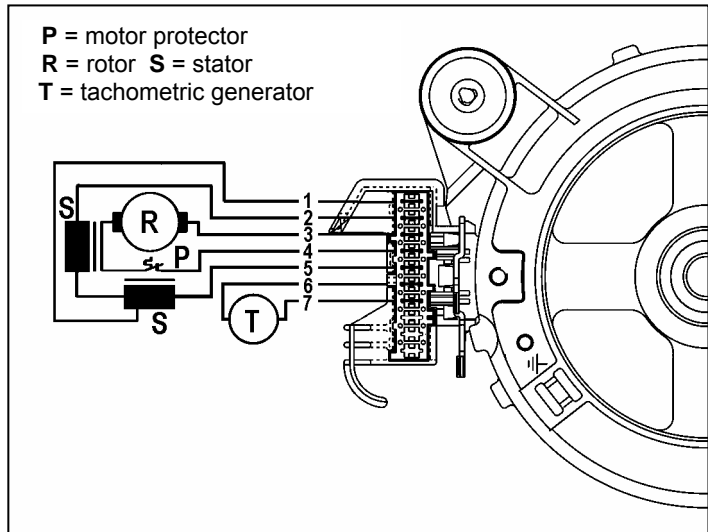


If there are traces of burning on the circuit board, refer to page 59



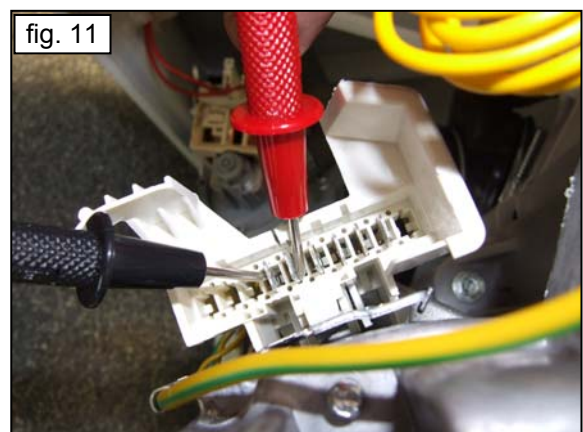
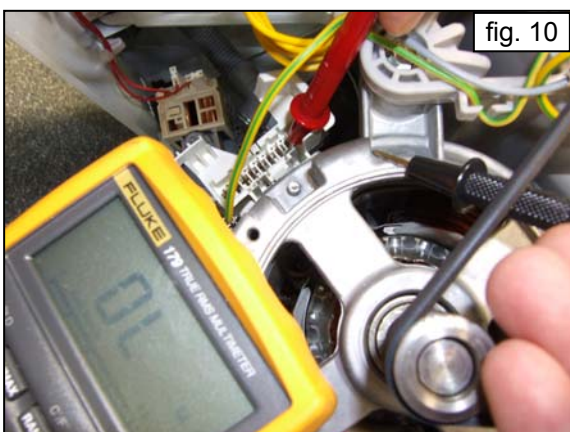
Procedure for checking the commutator motors

- 1) Check the connector blocks (wiring) and check for detached or bent terminals.
- 2) Check for traces, residue or deposits of water or detergent on the motor and identify the source.
- 3) Check for windings or other parts that may be grounded or poorly insulated. Use a tester with a minimum scale of 40 MΩ: between each terminal and the casing, this should read ∞ (fig. 10).
- 4) Check each winding against the values shown in the table below (fig. 11).



			MOTORS				
	TERMINALS ON MOTOR TERMINAL BLOCK	CHECKS:	C.E.SET. []	ACC (FHP)	ACC (SOLE)	BSH	ECM
A	6-7	Winding of tachymetric generator	63÷74	125÷145	468÷540 171÷197	14÷16	84÷98
B	2-5	Stator winding (full range)	1.0÷2.0	0.9÷3.2	0.8÷1.9	1.4÷1.9	1.3÷1.6
C	3-4	Rotor winding (overheating breaker)	1.6÷2.7	0.5÷3.0	1.4÷2.3	1.5÷1.9	1.8÷2.5
D	1-5	Stator winding (half range, presence of terminal 1)	0.34÷0.65	0.4÷1.2	0.4÷1.0	1.0÷1.2	0.6÷0.8

N.B.: When checking the rotor winding, the measurement must be effected over the entire surface, rotating the spindle very slowly and checking for short-circuits between visible plates. Also check the brushes for wear.



E53

E53: Problems with the "Sensing" circuit of the triac which powers the motor

E53

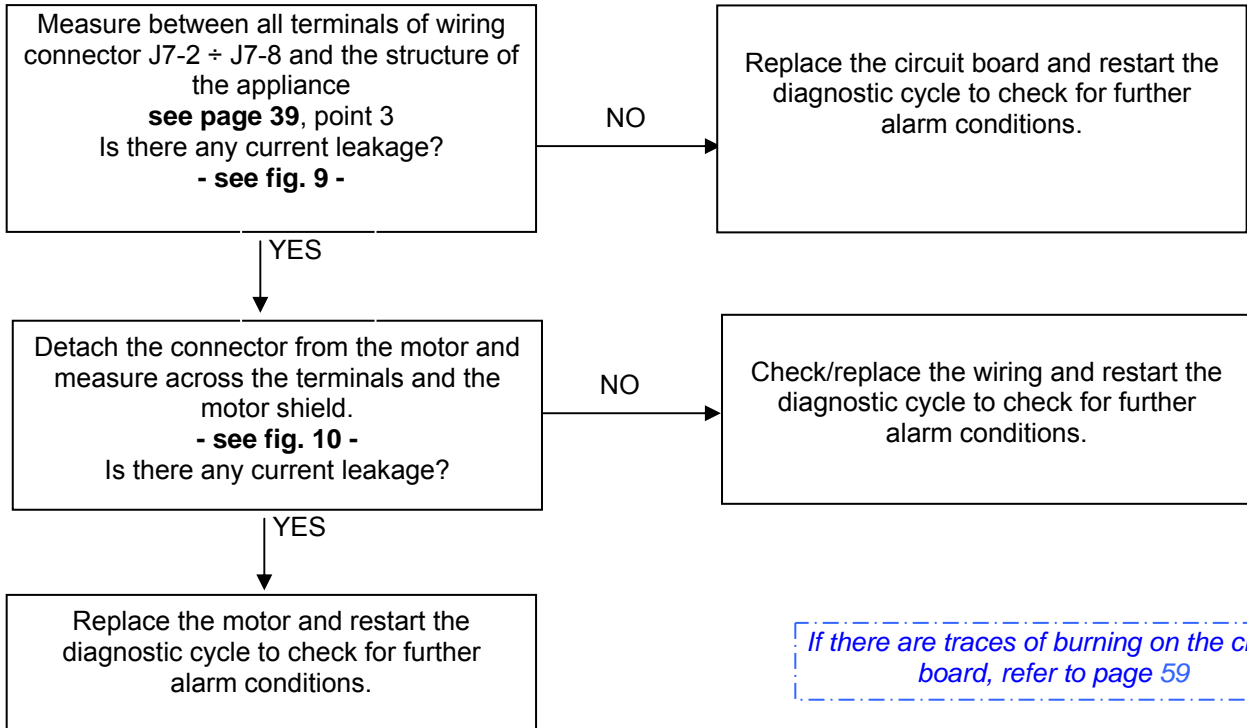
Tests to be performed:

Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.

If there are traces of burning on the circuit board, refer to page 59

E54	E54: Motor relay contacts sticking	E54
	Voltage in the motor circuit even when the motor should be inoperative	

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59

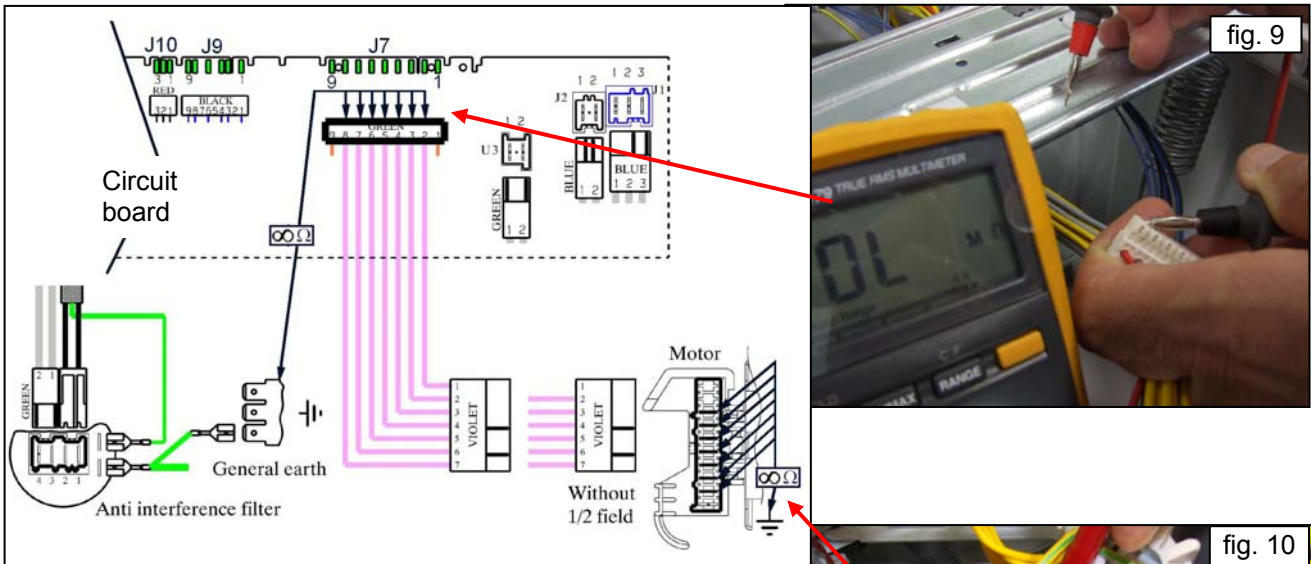


fig. 9

fig. 10

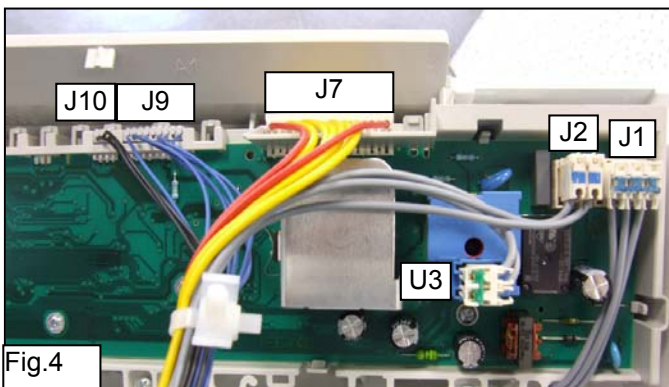
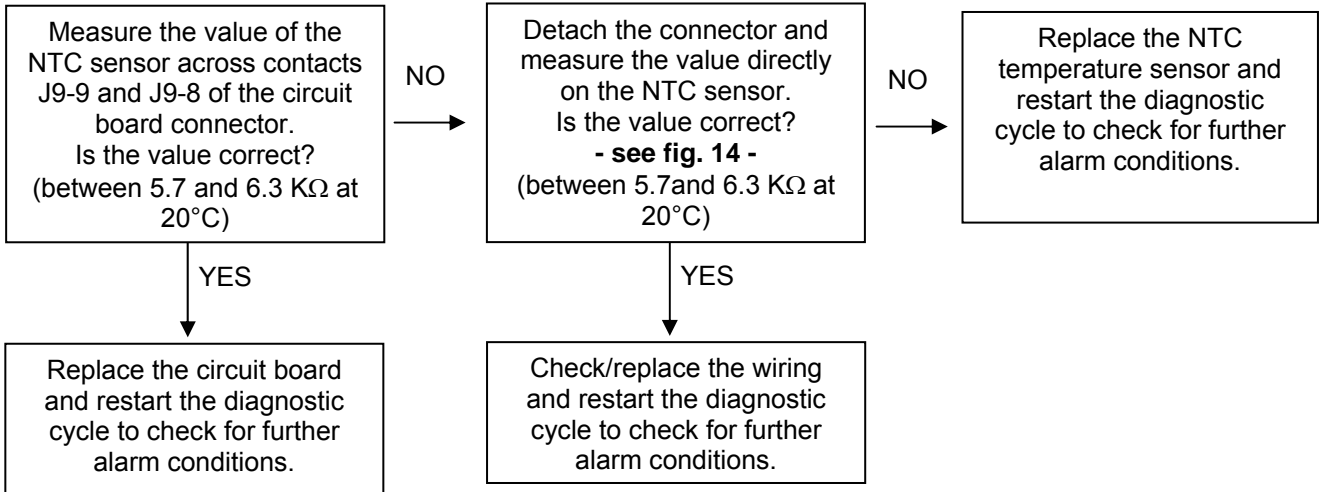


Fig.4

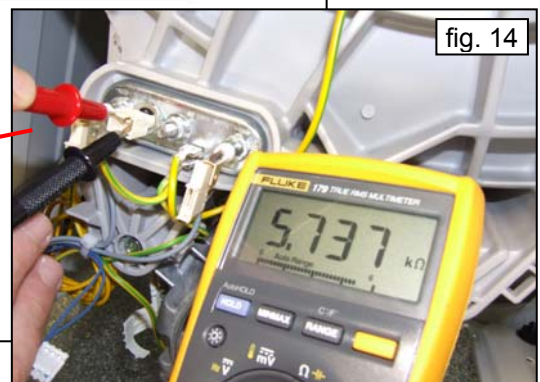
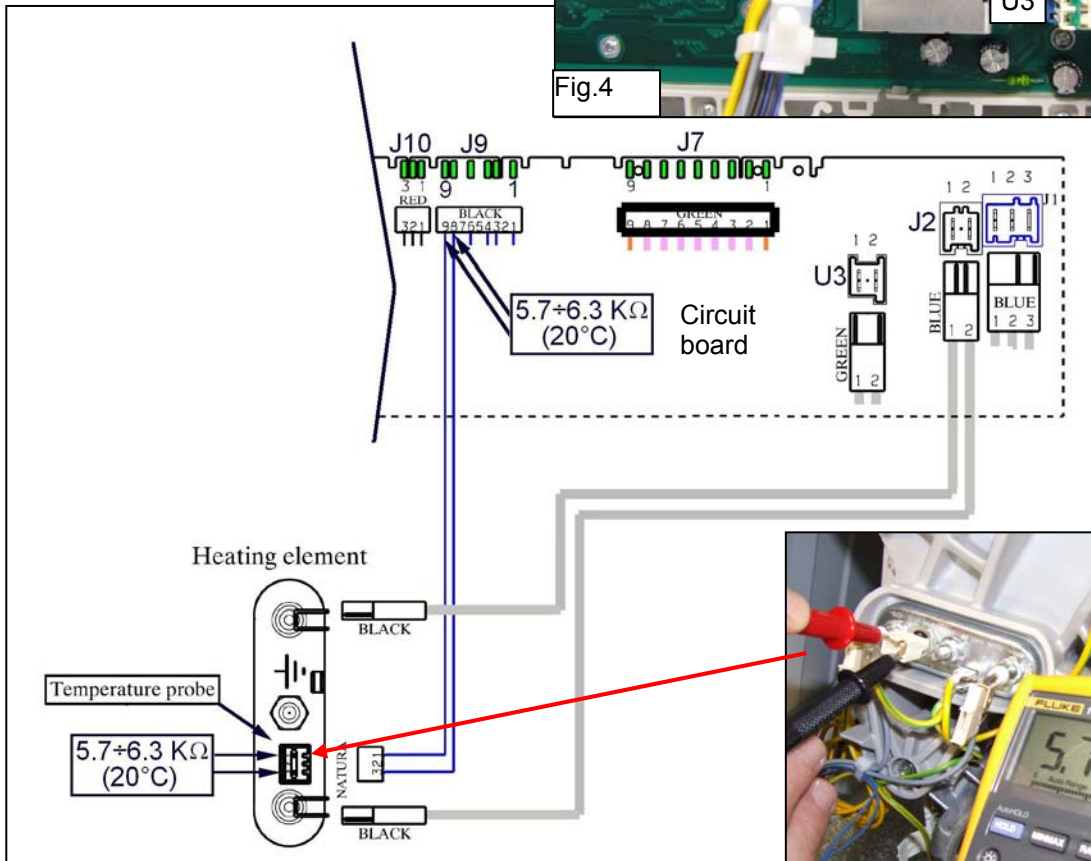
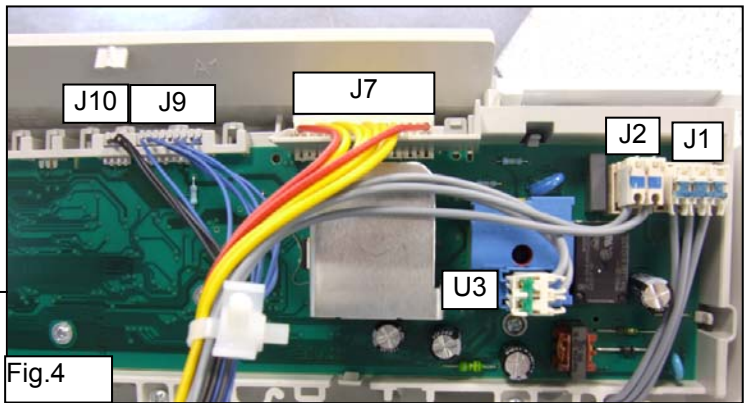


E61: Insufficient heating during washing		
E61	Maximum heating time exceeded	E61
➔ SOMETIMES THE ALARM CAN BE CAUSED BY THE POWER VOLTAGE TOO LOW!		

Tests to be performed:

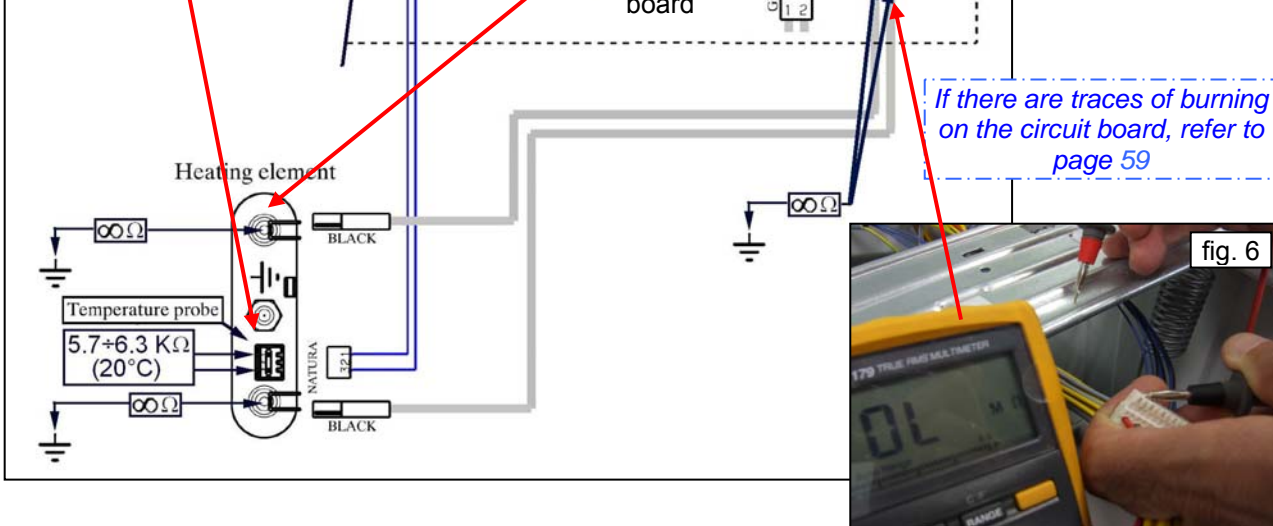
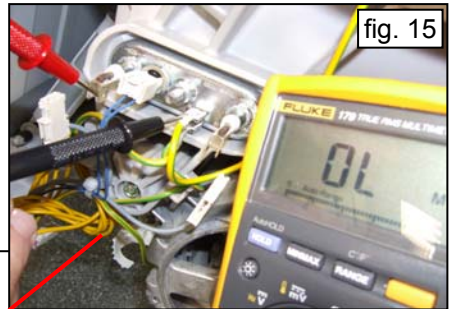
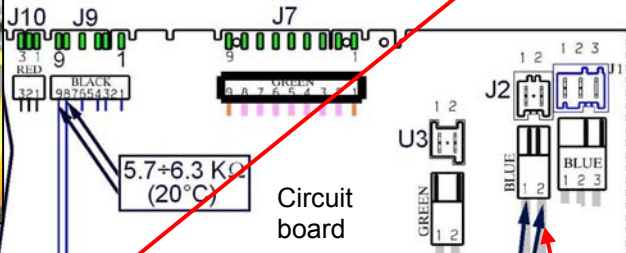
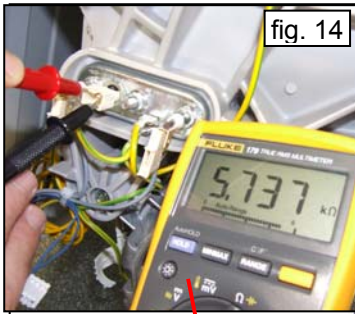
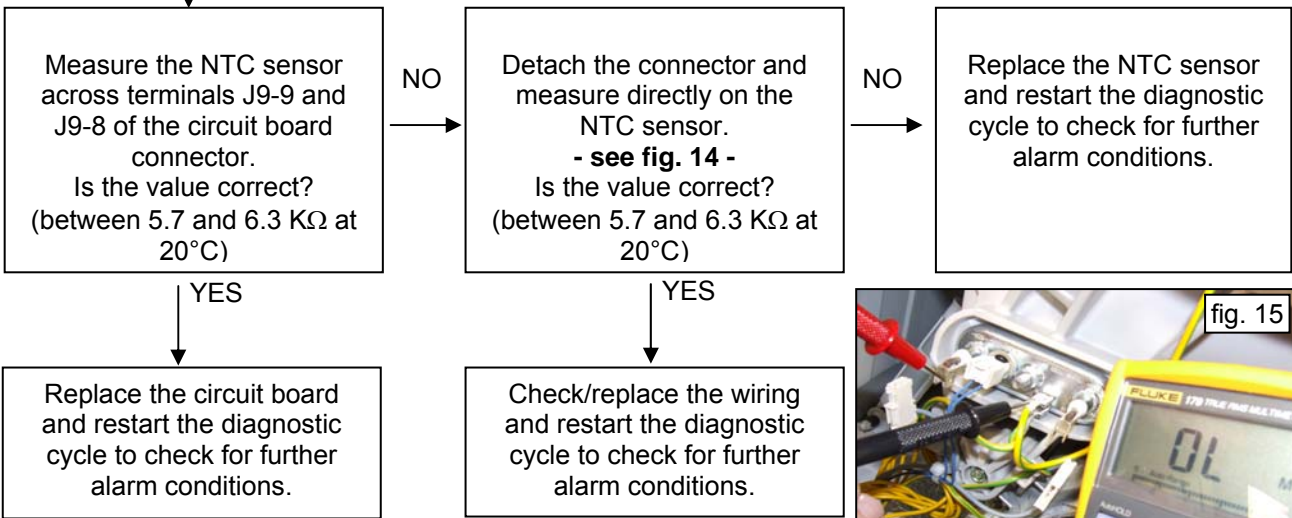
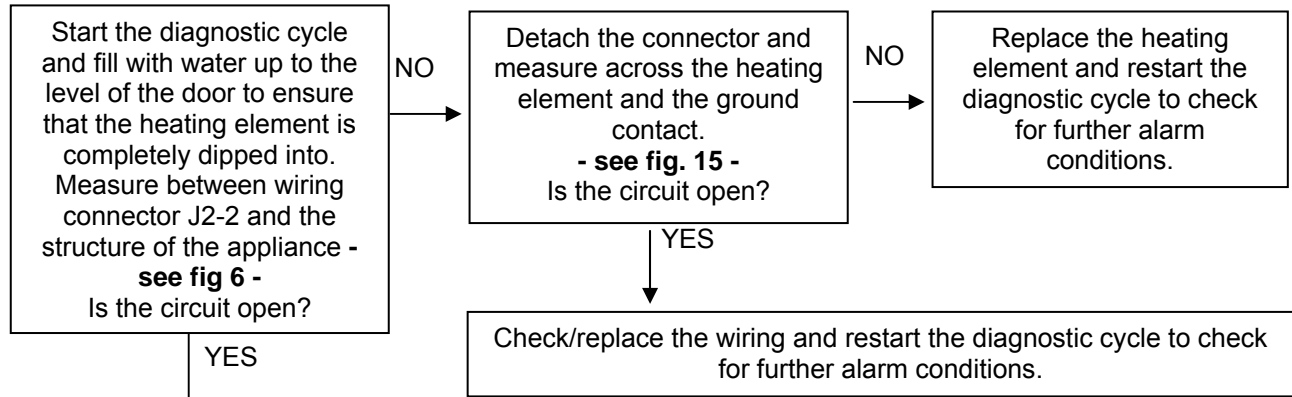


If there are traces of burning on the circuit board, refer to page 59



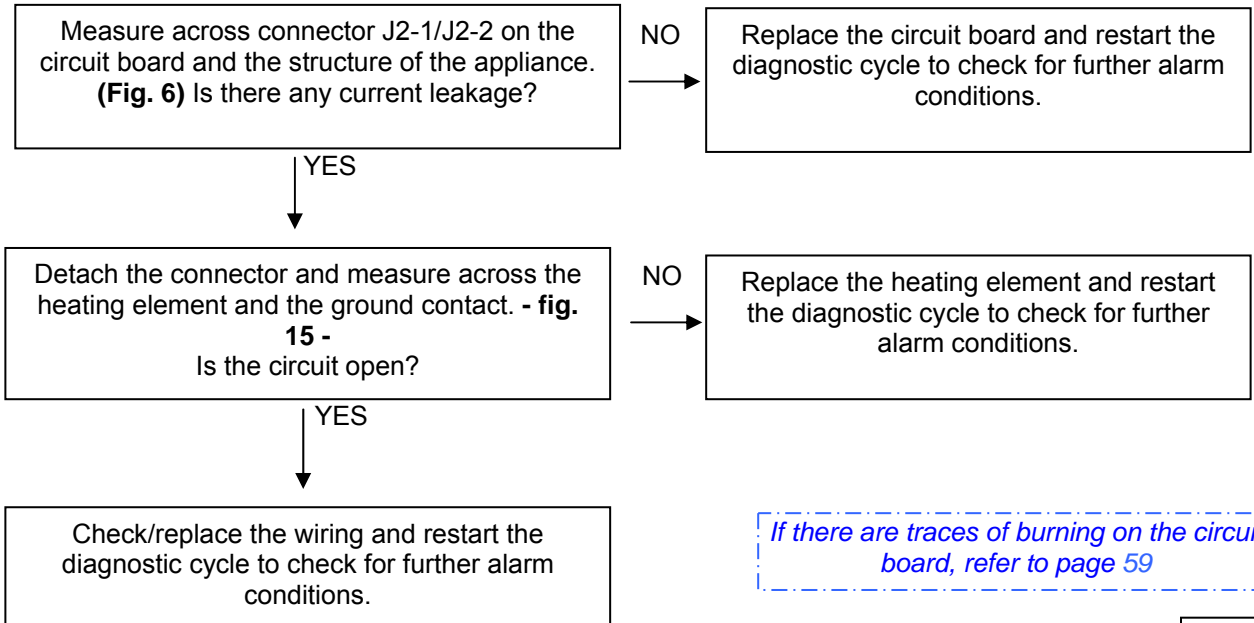
E62	E62: Overheating during washing	E62
The temperature of the NTC sensor exceeds 88°C for more than 5 minutes		

Tests to be performed:

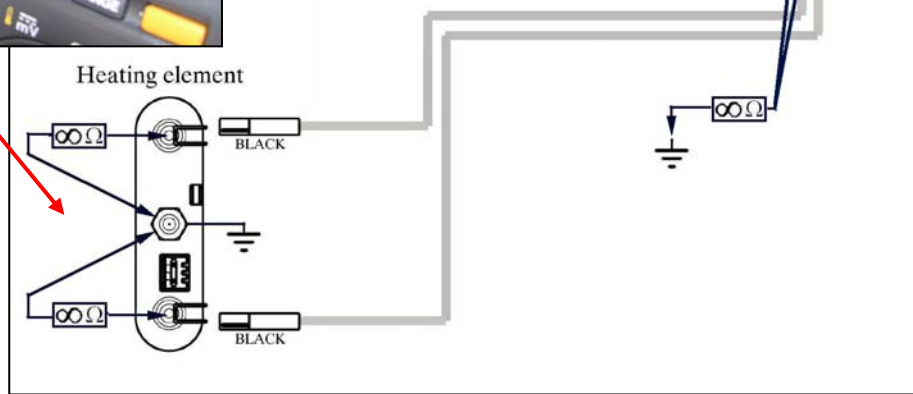
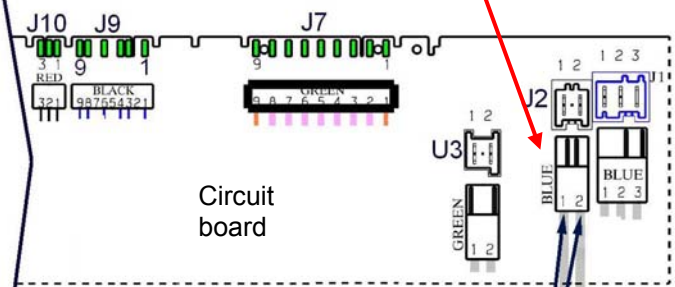
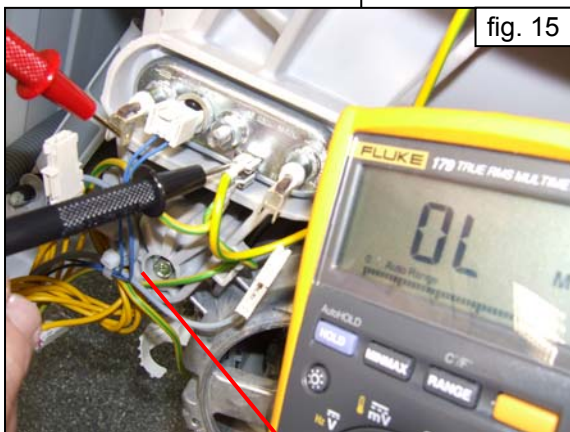
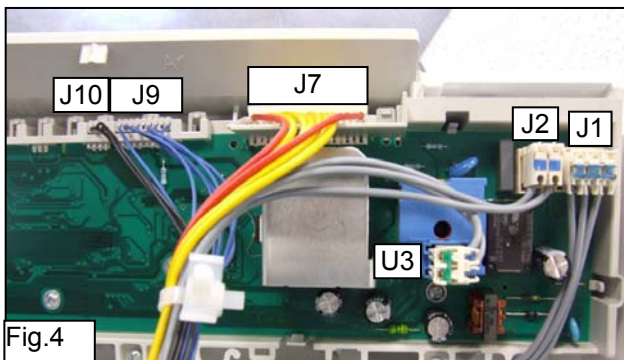


E66	E66: The contacts of the heating element power relay are always closed	E66
------------	---	------------

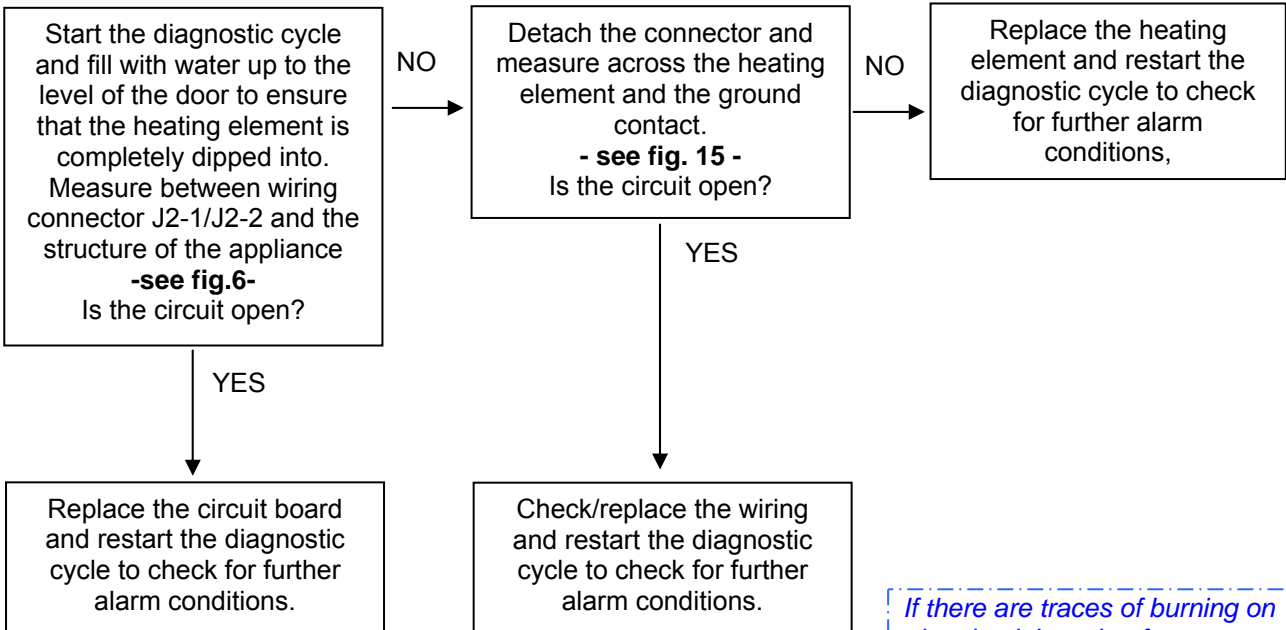
Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



fig. 6

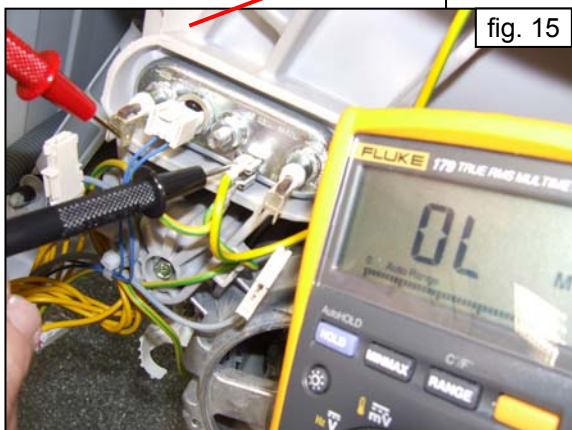
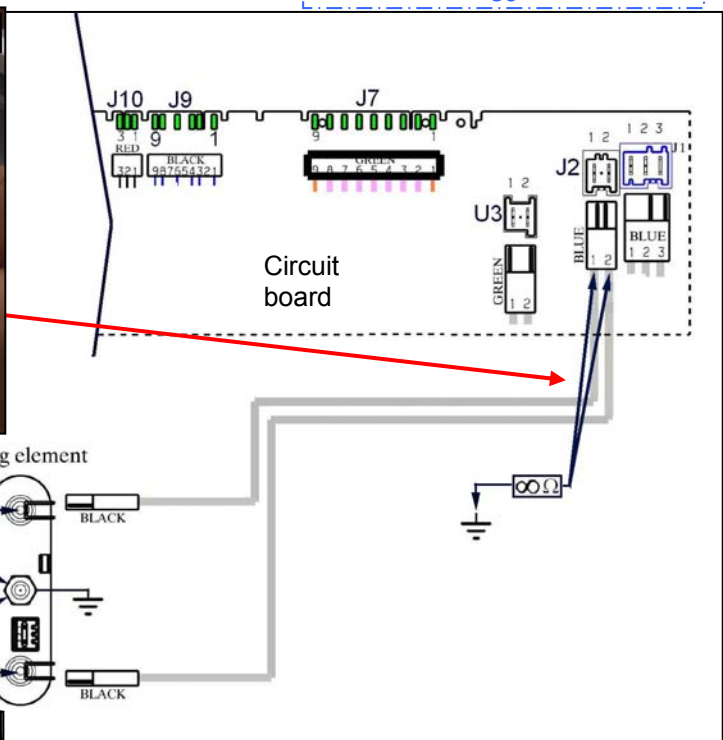


fig. 15

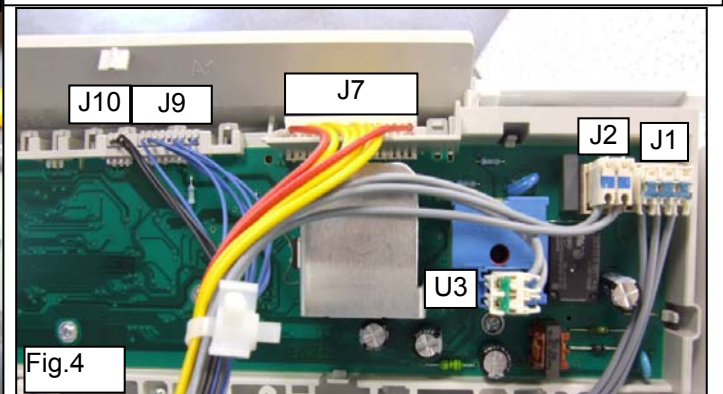
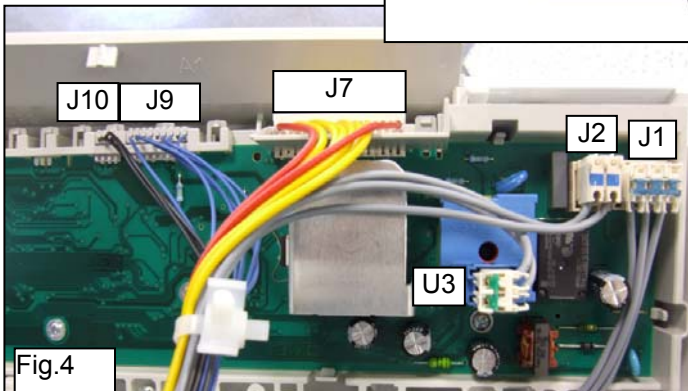
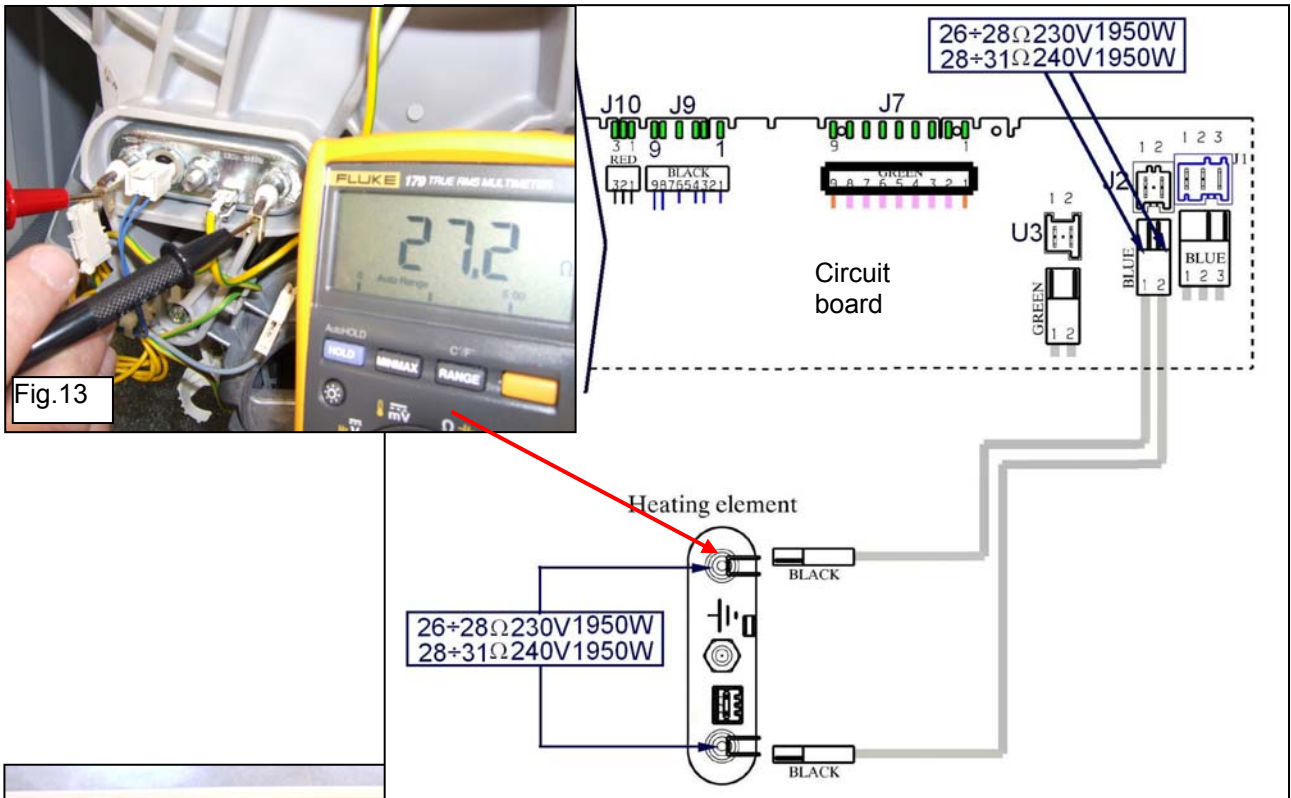
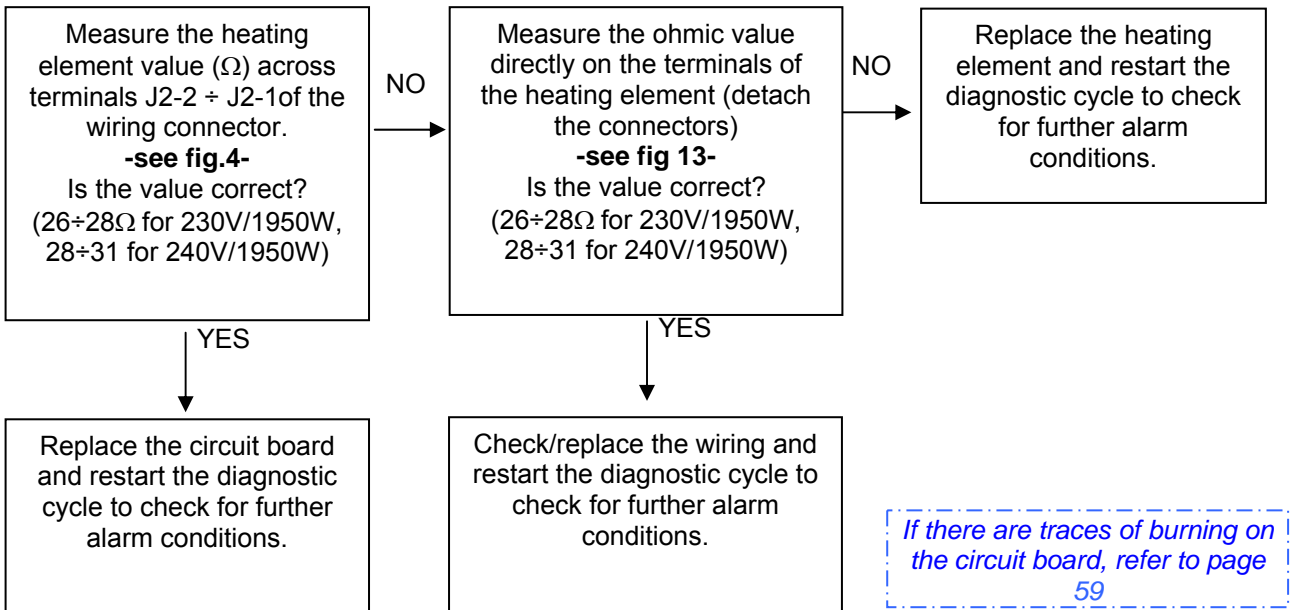


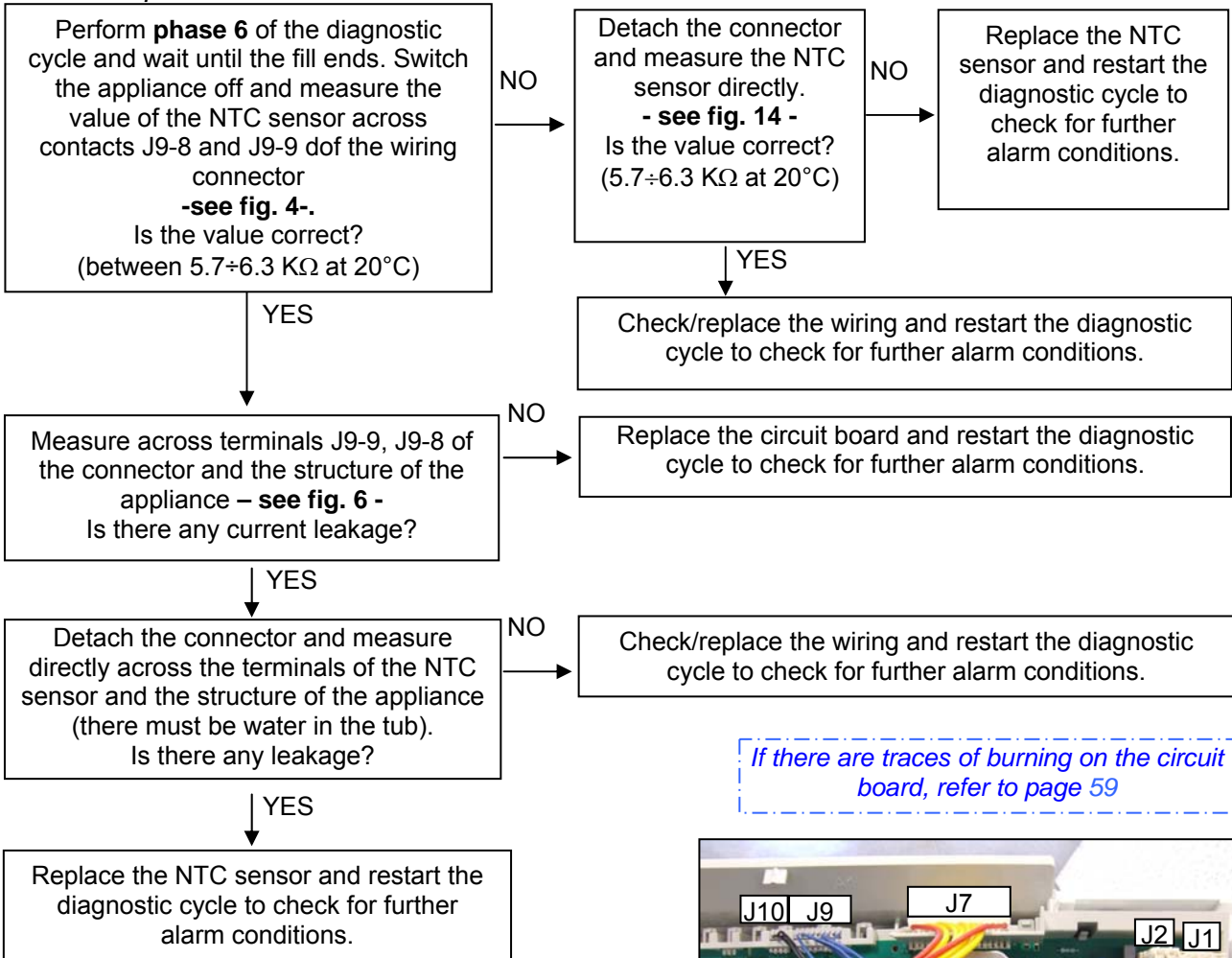
Fig.4

Tests to be performed:



E71	E71: NTC washing sensor faulty	E71
Voltage not within limits (short-circuited or open)		

Tests to be performed:



If there are traces of burning on the circuit board, refer to page 59



fig. 6

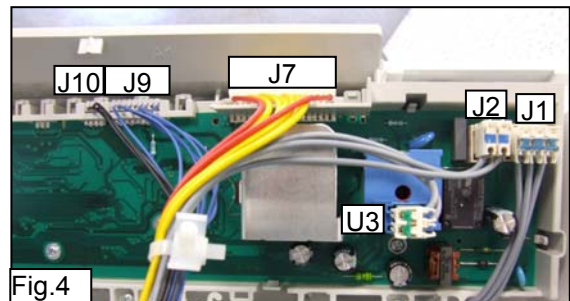


Fig.4

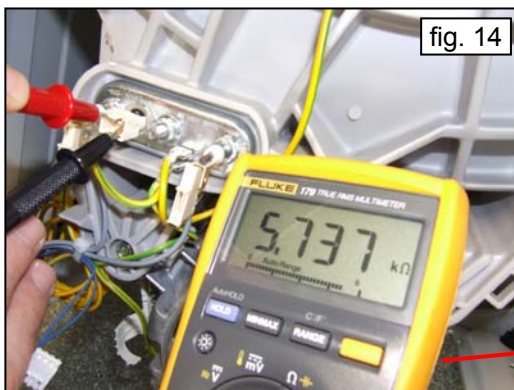
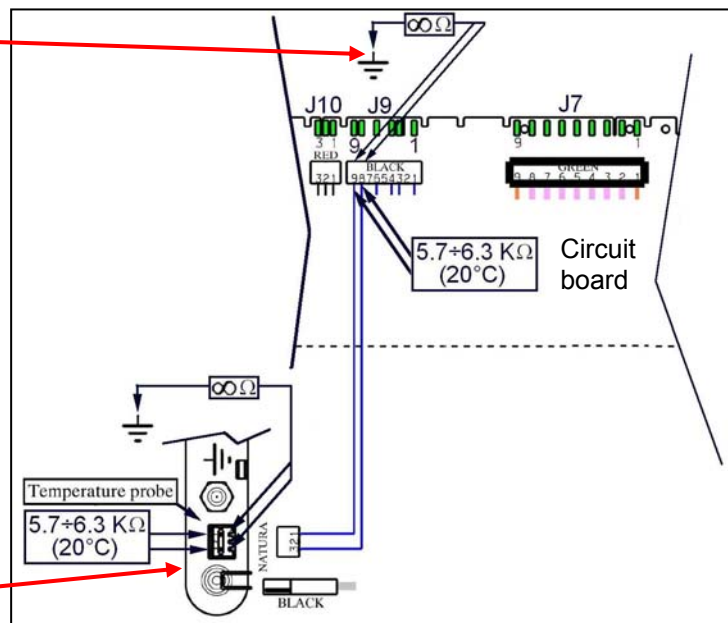
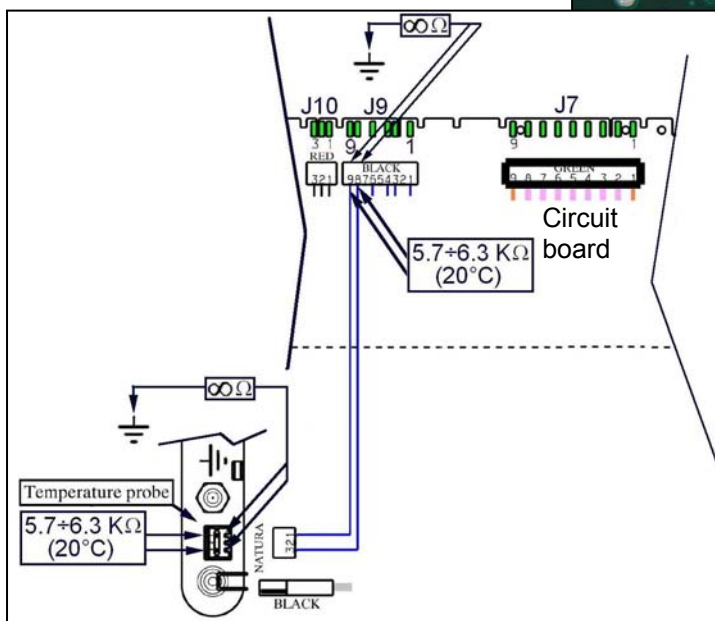
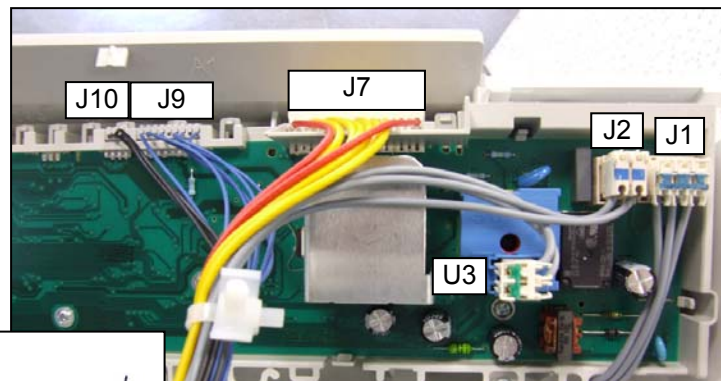
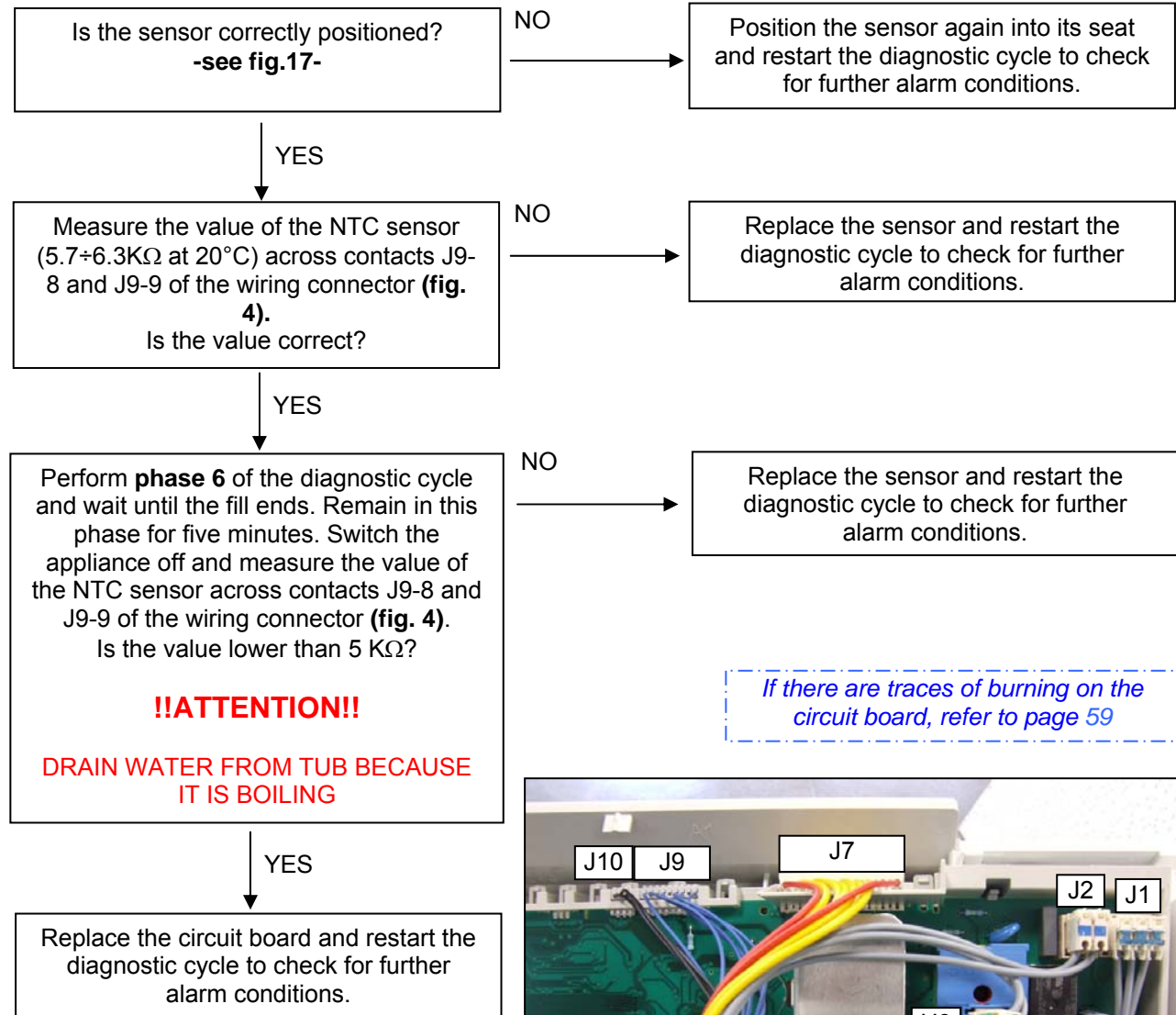


fig. 14

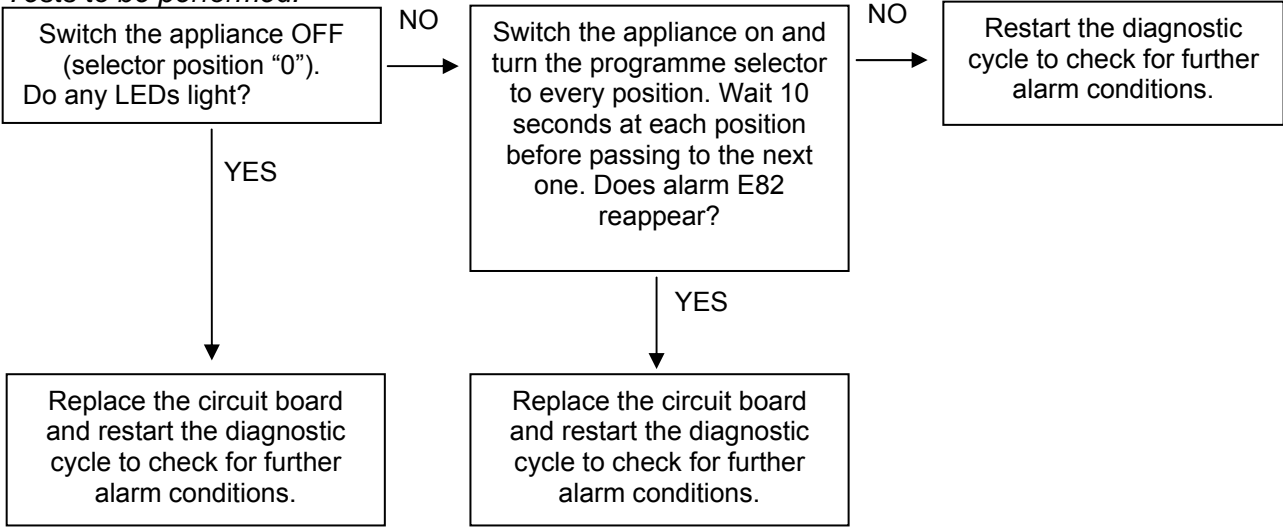


Tests to be performed:



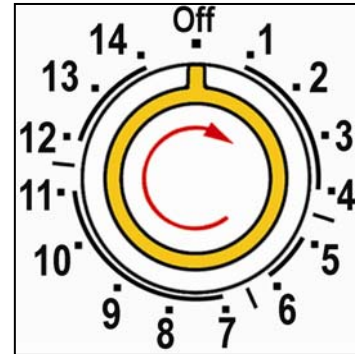
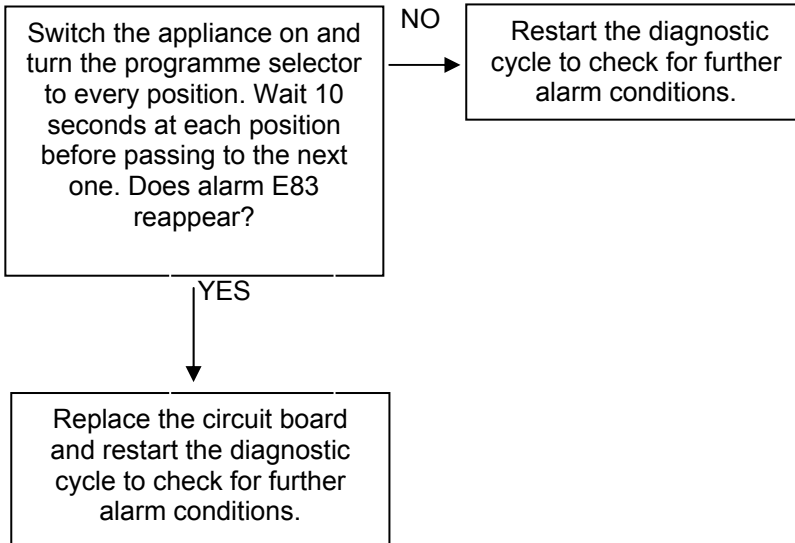
E82	E82: Error in reading the RESET/OFF position of the programme selector	E82
	Reading of position "0" of the selector when the appliance is switched on, or configuration error	

Tests to be performed:



E83	E83: Error in reading the programme selector code	E83
Code for the position of the selector not included in configuration data or configuration error		

Tests to be performed:



E93	E93: Incorrect machine configuration	E93
	Incongruence in configuration values when switching on	

Tests to be performed:

<p><i>Possible configuration error</i> Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.</p>

E94	E94: Incorrect configuration of washing cycle	E94
	Incongruence in configuration values when switching on	

Tests to be performed:

<p><i>Possible configuration error</i> Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.</p>

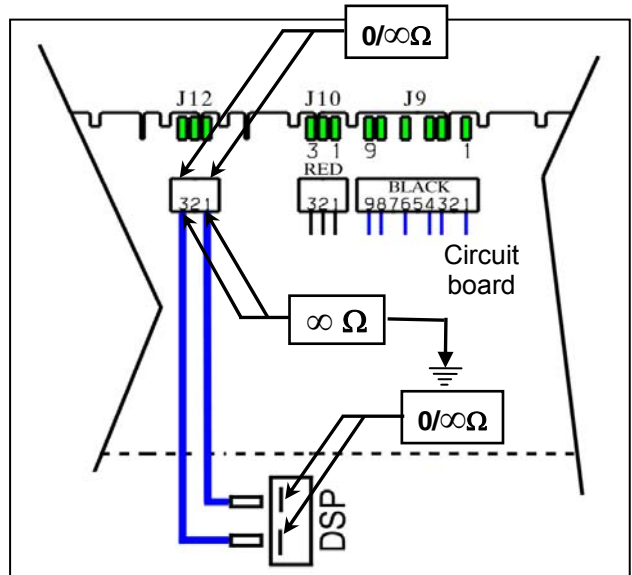
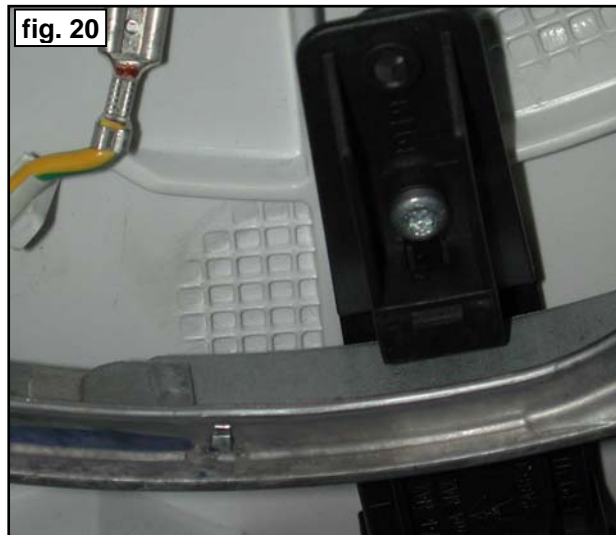
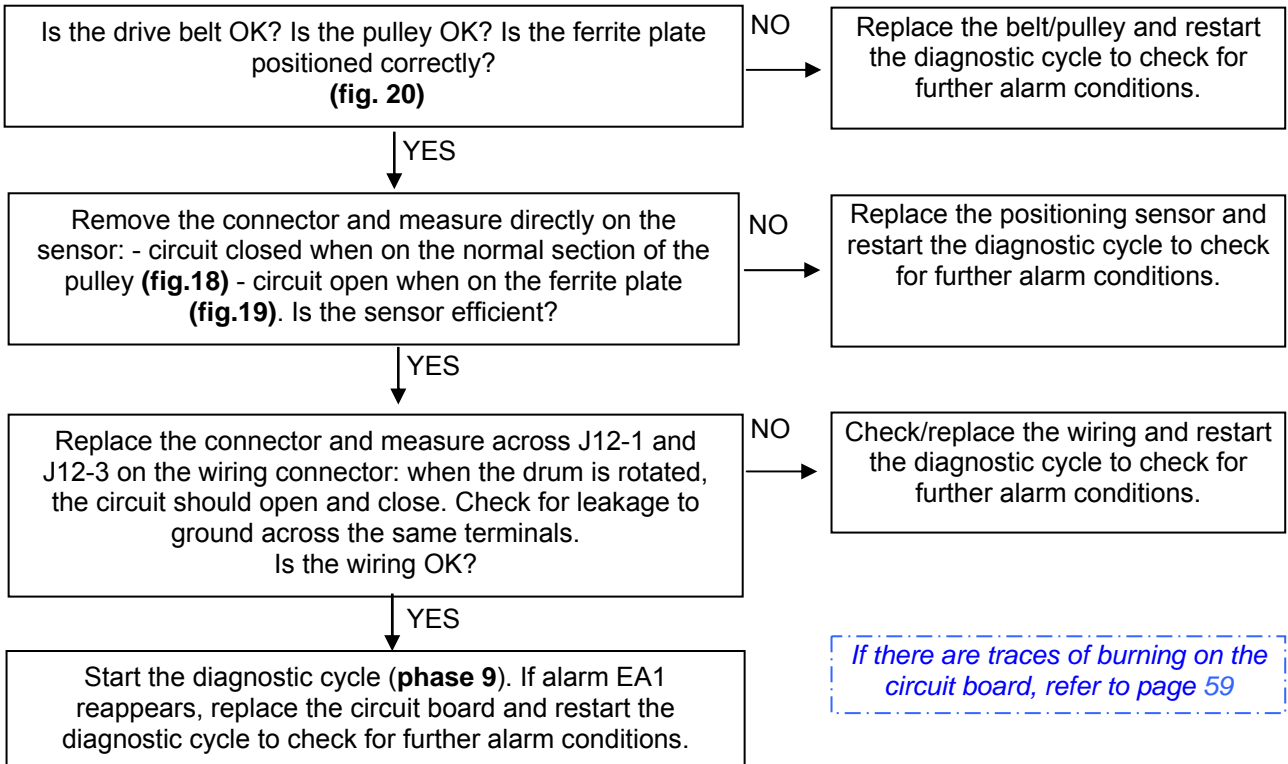
E97	E97: Incongruence between selector version and configuration data	E97
	Difference between the configuration data for the programmes and those for recognition of the selector	

Tests to be performed:

<p><i>Possible configuration error</i> Replace the circuit board and restart the diagnostic cycle to check for further alarm conditions.</p>

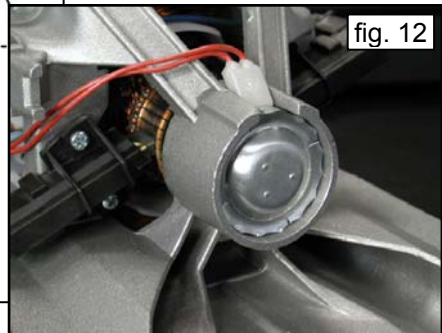
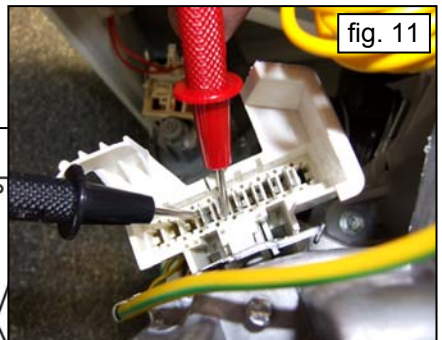
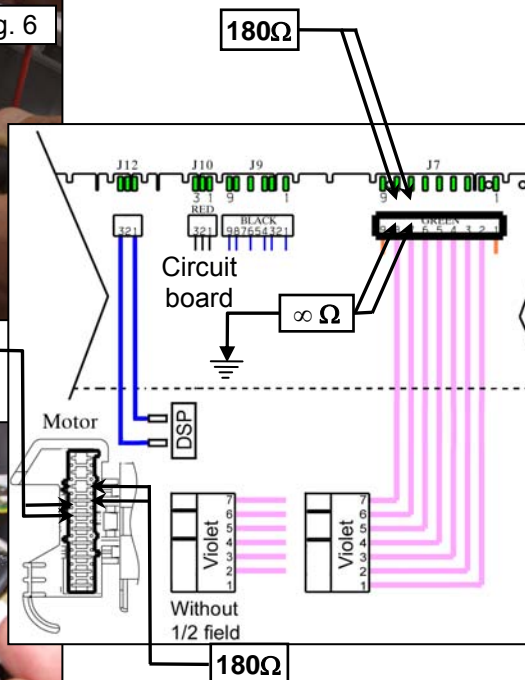
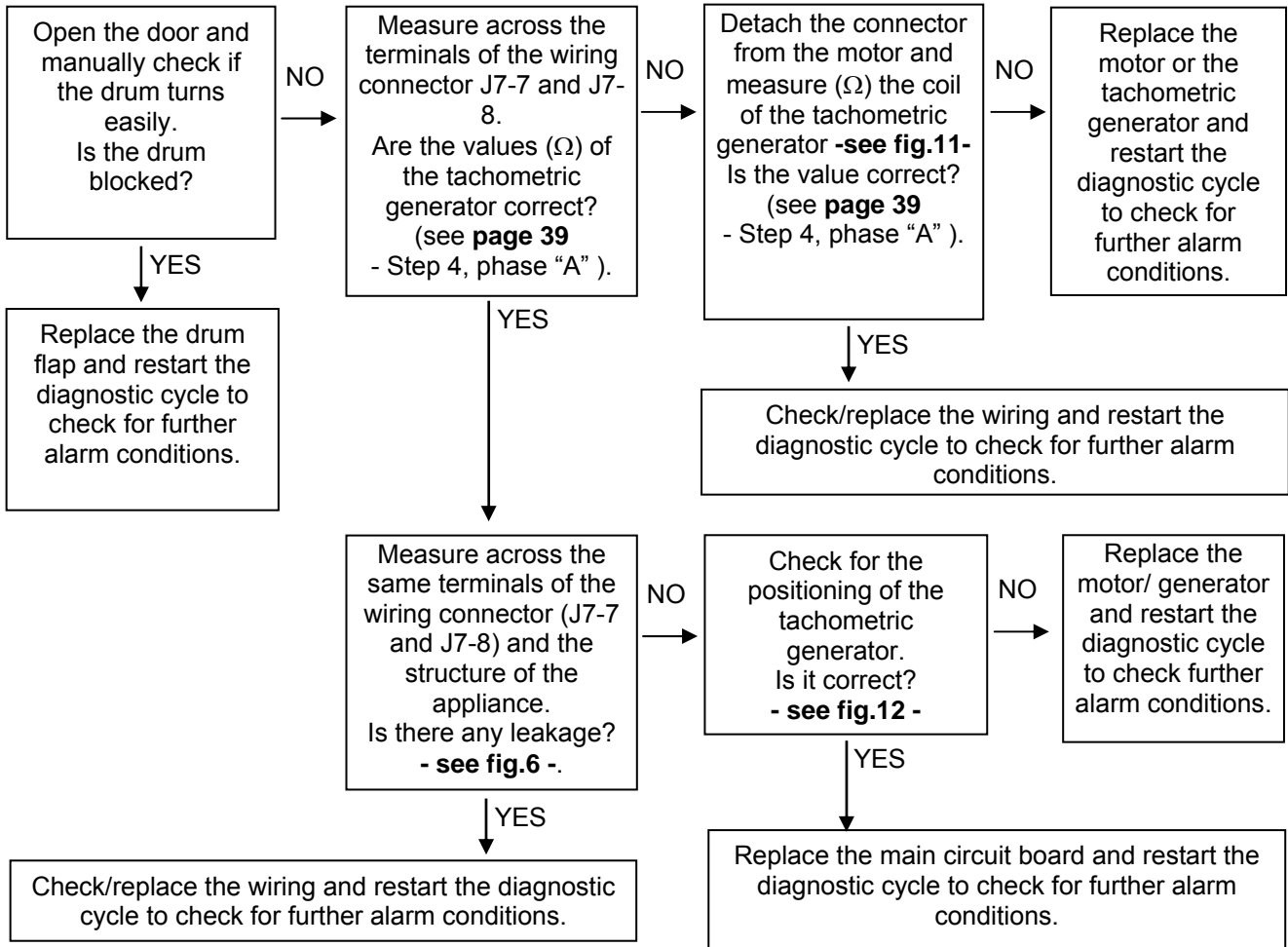
EA1	EA1: Drum positioning system (DSP) faulty (<i>top-loaders</i>)	EA1
	No signal or discontinuous signal from the sensor for more than 10 seconds during actioning of the motor to position the drum	

Tests to be performed:



EA6	EA6: Drum flap faulty (top-loaders)	EA6
	Cycle immediately blocked if a not correct tachometric signal is identified for at least 3 seconds.	

Tests to be performed:



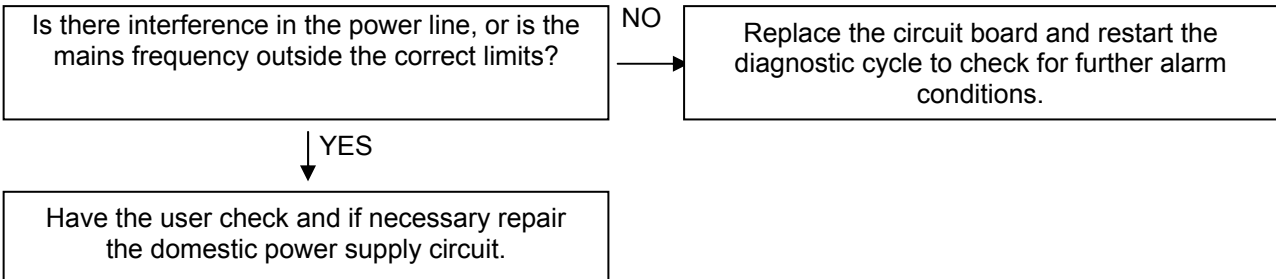
If there are traces of burning on the circuit board, refer to page 59

EH1	EH1: Incorrect mains frequency	EH1
	The power supply frequency is not within the configured limits	

Tests to be performed:

Important!

The appliance remains in alarm mode until the frequency returns to the correct value or the appliance is switched off (programme selector on "0"). Only the family of the alarm is displayed, and the diagnostic cycle cannot be started. The complete alarm can be read only when the alarm condition has ceased.

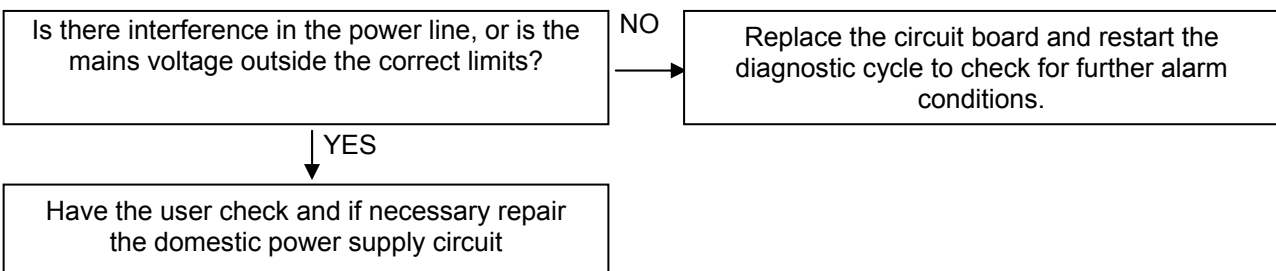


EH2	EH2: Mains voltage too high	EH2
	Mains voltage higher than configured voltage (for more than 10 seconds)	

Tests to be performed:

Important!

The appliance remains in alarm mode until the frequency returns to the correct value or the appliance is switched off (programme selector on "0"). Only the family of the alarm is displayed, and the diagnostic cycle cannot be started. The complete alarm can be read only when the alarm condition has ceased.

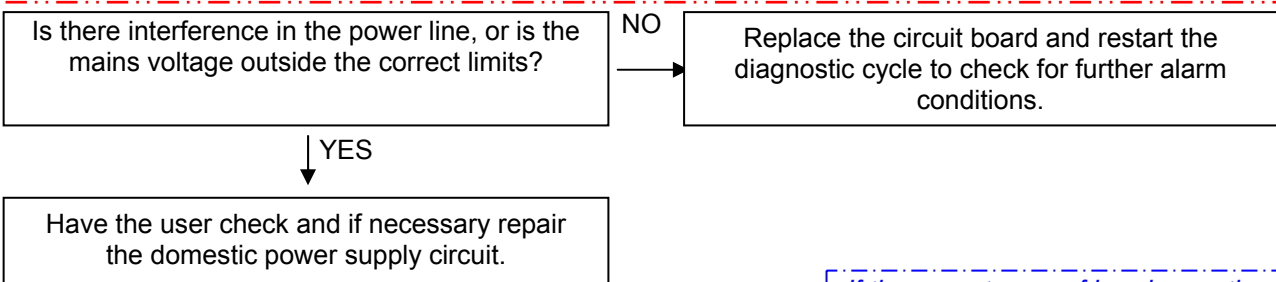


EH3	EH3: Mains voltage too low	EH3
	Mains voltage lower than configured voltage	

Tests to be performed:

Important!

The appliance remains in alarm mode until the frequency returns to the correct value or the appliance is switched off (programme selector on "0"). Only the family of the alarm is displayed, and the diagnostic cycle cannot be started. The complete alarm can be read only when the alarm condition has ceased.



If there are traces of burning on the circuit board, refer to page 59

EF1	EF1: Drain hose blocked/throttled/too high; drain filter dirty/blocked	EF1
------------	---	------------

It is a warning that appears only at the end of the cycle. The machine has detected long draining phases during the cycle (Es. More then 20 seconds during draining after rinsing phase). Check/clean the drain filter.

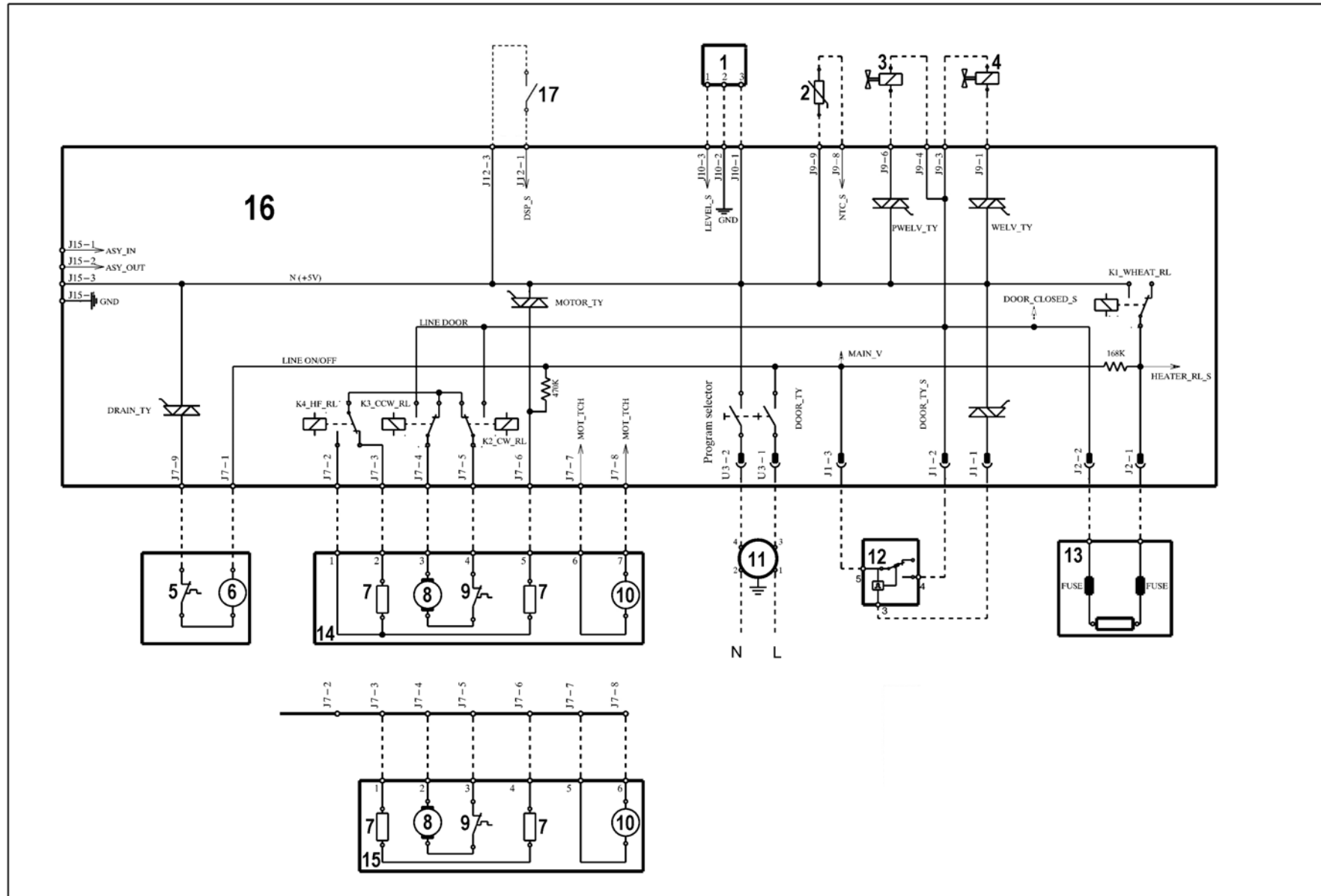
EF2	EF2: Overdosing of detergent; drain hose blocked/throttled; drain filter dirty/blocked	EF2
------------	---	------------

Overdosing of detergent. The system has detected an over foaming during draining phases. Advice Customer to use the right quantity of detergent and verify that drain filter and drain system are clean.

EF5	EF5: Load too unbalanced; skipping of spin phases	EF5
------------	--	------------

Load too unbalanced. The machine has detected an excessive unbalancing of the load during the spin phases. Advice Customer to load more clothes into the drum and not single clothes.

8 BASIC CIRCUIT DIAGRAM

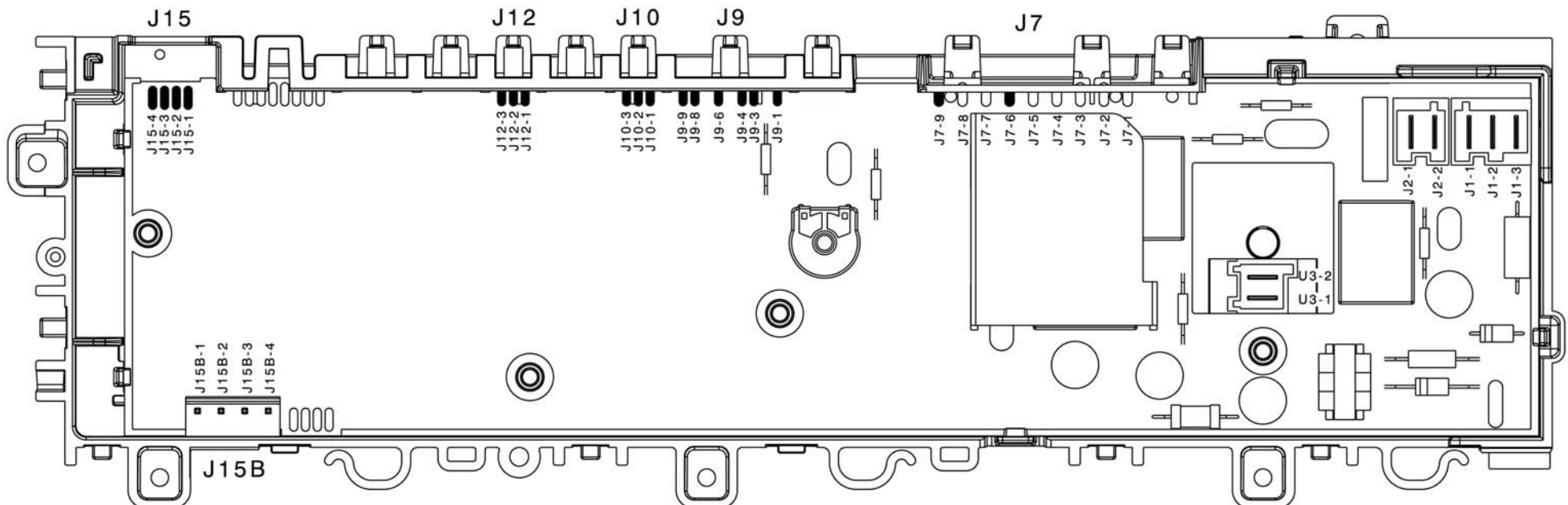


8.1.1 Key to circuit diagram

Electrical components on appliance	Components on main board	
<ol style="list-style-type: none"> 1. Analogue pressure switch 2. NTC temperature sensor 3. Solenoid valve for prewash 4. Solenoid valve for wash 5. Thermal cut-out (drain pump) 6. Drain pump 7. Stator (motor) 8. Rotor (motor) 9. Thermal cut-out (motor) 10. Tachometric generator (motor) 11. Interference filter 12. Door lock unit 13. Heating element (with thermal fuses) 14. Motor with half field 15. Motor without half field 16. Circuit board 17. Drum sensor position (DSP) 	DOOR_TY DRAIN_TY K1 K2 K3 K4 MOTOR_TY ON/OFF PWELW_TY WELV_TY	Door interlock Triac Drain pump Triac Heating element relay Motor relay: clockwise rotation Motor relay: anti-clockwise rotation Motor relay: half field power supply (some models) Motor Triac Main switch (programme selector) Pre-wash solenoid Triac Wash solenoid Triac

9 CONNECTORS ON CIRCUIT BOARD

J15/J15B	J12	J10	J9	J7	J2	J1
Serial interface: J15-1 ASY_IN J15-2 ASY_OUT J15-3 +5V J15-4 GND	J12-1 Drum position sensor (sensing) J12-2 not used J12-3 Drum position sensor DSP (+5V)	J10-1 Analogic pressure switch (+5V) J10-2 Analogic pressure switch (GND) J10-3 Analogic pressure switch (signal)	J9-1 Washing solenoid (triac) J9-3 Solenoids (line) J9-4 Solenoids (line) J9-6 Pre-wash solenoid (triac) J9-8 NTC temperature sensor J9-9 NTC temperature sensor	J7-1 Drain pump (line) J7-2 Motor (stator - ½ field) J7-3 Motor (stator full field) J7-4 Motor (rotor) J7-5 Motor (rotor) J7-6 Motor (triac) J7-7 Motor (tachometric generator) J7-8 Motor (tachometric generator) J7-9 Drain pump (triac)	J2-1 Heating element (Relay) J2-2 Heating element (Line)	J1-1 Door safety interlock (triac) J1-2 Door safety interlock (line-sensing) J1-3 Door safety interlock (Line)
U3						
U3-1 line U3-2 line (neutral)						



10 BURNING ON THE CIRCUIT BOARD EWM1100

In case of burning on the main circuit board, check that the problem is not caused by another electrical component (short-circuits, poor insulation, water leakage). Refer to the figures below in order to identify the component that might have caused the burning according to the position of the burned area.

The circuit board shown below is the version with the greatest number of components: other boards may not feature all these components.

