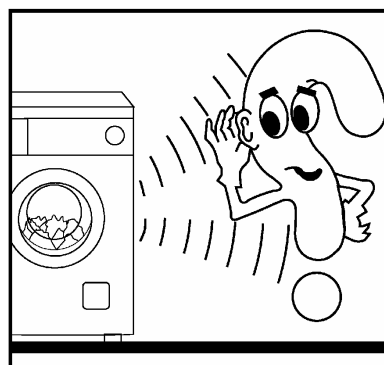
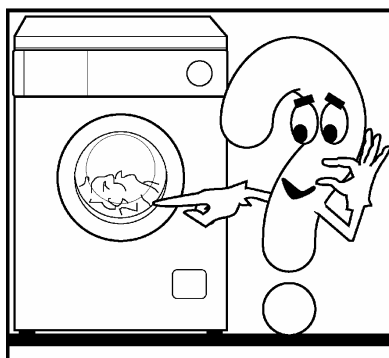




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**Washing machines:
guide to diagnostics for
EWM1000 electronic
control system**

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1 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 EWM1000 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 diagnostics system can be used by service engineers for the following purposes:

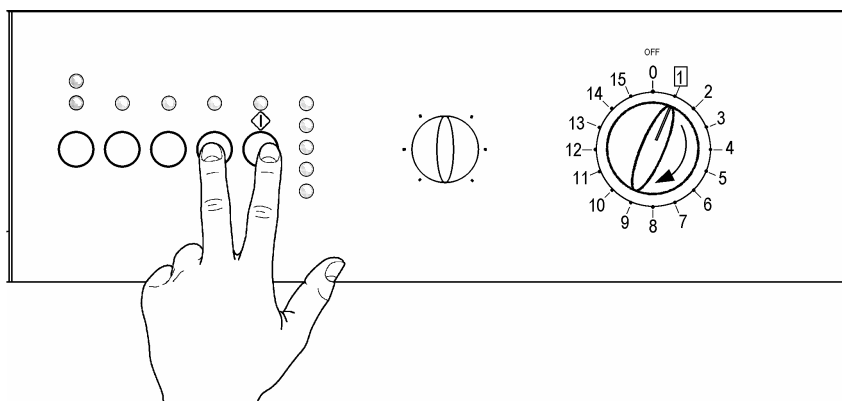
- ◆ To read the alarms
- ◆ To cancel alarm conditions stored in memory
- ◆ To test the operation of the appliance

1.2 Procedure

1. Identify the type of control system (i.e. with horizontal or vertical buttons) and access the diagnostics cycle ([see page 6](#))
2. Read the alarm code stored in memory ([page 9](#)) and refer to the instructions for the corresponding alarm code [page 12-13](#).
3. Cancel the alarm stored in memory ([page 11](#))
4. If access to the diagnostics cycle is not possible, refer to the section "Access to diagnostics system impossible" ([page 15](#))
5. If the main PCB is replaced, check that there are no burned parts ([see page 62 - 64](#))
6. After any repair, always check the operation of the appliance using the diagnostics cycle ([page 6](#))
7. Cancel any alarms stored in memory during the diagnostics procedure ([page 11](#))

2 DIAGNOSTICS SYSTEM

2.1 ACCESS TO THE DIAGNOSTICS CYCLE – version with horizontal pushbuttons

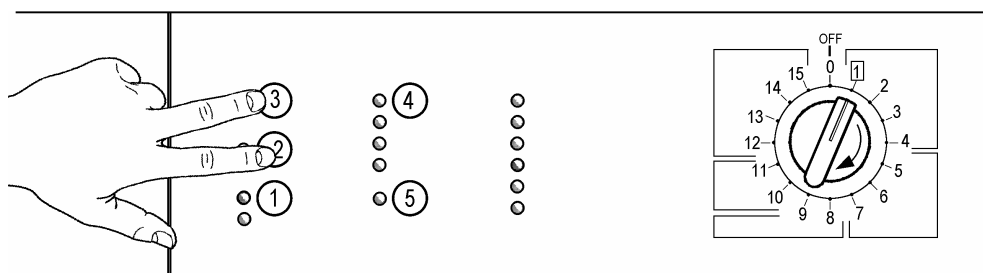


1. Switch off the appliance.
2. Press and hold down the **START/PAUSE** button and **any one of the OPTION** buttons simultaneously.
3. Holding down both buttons, switch the appliance on by turning the programme selector **one position clockwise**.
4. Continue to hold down the START/PAUSE button and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

IMPORTANT: The position of the START/PAUSE button varies according to the model, and is therefore not always the same.

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.

2.2 ACCESS TO THE DIAGNOSTICS CYCLE – version with vertical pushbuttons

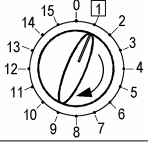
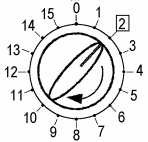
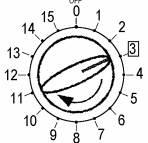
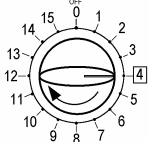
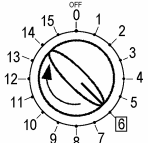
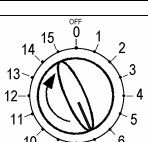
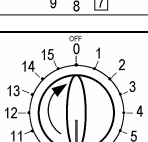
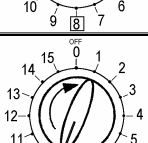


1. Switch off the appliance.
2. Press and hold down buttons **2** and **3**.
3. Holding down both buttons, switch the appliance on by turning the programme selector **one position clockwise**.
4. Continue to hold down buttons **2** and **3** until the LEDs begin to flash (at least 2 seconds).

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.

2.3 PHASES OF THE DIAGNOSTICS CYCLE

After accessing the diagnostics cycle, and irrespective of the type of control board fitted to the appliance (i.e. vertical or horizontal buttons) and the configuration of the selector, turn the programme selector **clockwise** to perform the diagnostics cycle for the various components and to read the alarms. All the alarms are enabled during the diagnostics 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 then anti-boiling level for spinning	Drain and spin, check for congruence in closure of pressure switch levels
9 	▪ Only for top-loaders with drum positioning system: - Door safety interlock - Motor (25 rpm) - Drain pump	Door locked Water level lower then anti-boiling level Maximum time 2 minutes	Test for positioning of drum

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

3 ALARMS

3.1 Displaying user alarms

Operation of the alarms is configurable. Therefore, depending on the model, the alarms may be displayed partially or entirely to the user.

Normally, all alarms except those shown below are displayed to the user:

- E61 (insufficient heating during the washing phase),
- E83 (error in reading the selector position)
- EA1 (error in positioning of the drum – top-loaders only)

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

Except where specified, the door can generally be opened when an alarm condition occurs on condition that:

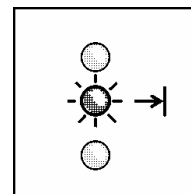
- The water in the tub is lower than 1st level
- The temperature of the water is lower than 40°C

Certain alarms require a drain cycle (for reasons of safety) before the door can be opened:

- Cooling water fill phase if the temperature is higher than 60°C
- Drain until both contacts of the pressure switch (1st level and anti-boiling) close on “EMPTY” in a maximum time of 5 minutes.

3.1.1 Alarm display during normal operation

The family of alarms is displayed to the user by a repeating sequence during which the END OF CYCLE LED flashes (0.4 seconds ON, 0.4 seconds OFF, with a pause of 2.5 seconds between each sequence) This LED is featured on all models, although it may be configured in different positions. Configuration errors are displayed flashing of all the LEDs.



For example, if the user should forget to close the door, alarm condition E41 will be displayed about 15 seconds after the cycle is started. The cycle is paused and the END OF CYCLE LED flashes repeatedly in the sequence shown in the table opposite.

The four flashes indicate the first two digits of alarm E41 (alarms relative to the same function are grouped into families).

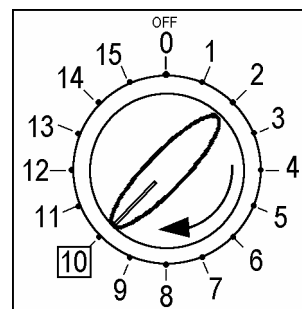
In this case, when the door is closed, it is sufficient to press START to resume the programme.

End of cycle LED		→
ON/OFF	Time (seconds)	Value
	0.4	1
	0.4	
	0.4	2
	0.4	
	0.4	3
	0.4	
	0.4	4
	0.4	
	2.5	Pause between sequences

3.2 Reading the alarms

Proceed as follows to read the last alarm condition stored in the EEPROM on the control board:

- Access diagnostics mode.
- Irrespective of the type of control board and configuration, turn the programme selector **clockwise** to the **tenth position**.

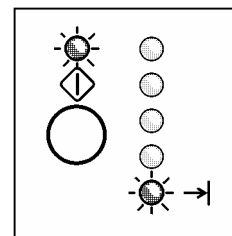


3.2.1 Displaying the alarm

The alarm is displayed by a repeated flashing sequence of the two LEDs (0.4 seconds ON, 0.4 seconds OFF, with a pause of 2.5 seconds between each sequence). The buzzer (if featured) sounds a series of “beeps” in synchronization with the flashing of the LEDs.

- **END OF CYCLE** indicator → indicates the first digit of the alarm code (family)
- **START/PAUSE** → indicates the second digit of the alarm code (number within the family).

These two LEDs are present on all models (though configured in **different positions**) and flash simultaneously.



Notes:

- The first letter of the alarm code “E” (Error) is not displayed since it is the same for all alarm codes.
- The alarm code families are expressed in hexadecimal form. In other words:
 - **A** is represented by **10** flashes
 - **B** is represented by **11** flashes
 - ...
 - **F** is represented by **15** flashes
- Configuration errors are displayed by the flashing of all the LEDs (user interface not configured).

3.2.2 Examples of alarm display

Example: Alarm **E43** (problems with the door safety interlock triac) will be displayed as follows:

- four flashes of the END OF CYCLE LED indicate the first digit **E43**;
- three flashes of the START/PAUSE LED indicate the second digit **E43**;

END OF CYCLE LED →			START/PAUSE LED ◇		
ON/OFF	Time (seconds)	Value	ON/OFF	Time (seconds)	Value
	0.4	1		0.4	1
	0.4			0.4	
	0.4	2		0.4	2
	0.4			0.4	
	0.4	3		0.4	3
	0.4			0.4	
	0.4	4		3,3	Pause
	0.4				
	2.5	Pause			

3.2.3 Status of alarms during the diagnostics cycle

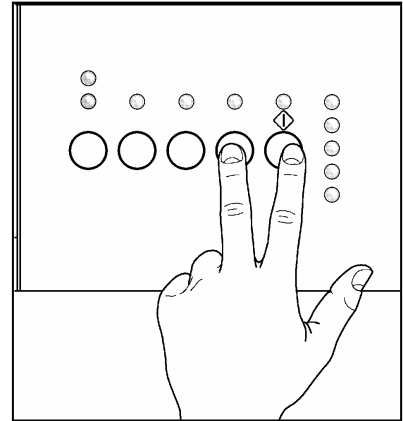
All the alarms are enabled during the components diagnostics test.

3.3 Rapid reading of alarms

The last alarm 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. while the washing programme is in operation):

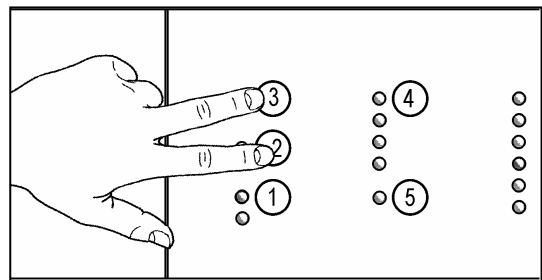
3.3.1 Version with horizontal pushbuttons

- Press **START/PAUSE** and **any one of the option buttons** simultaneously for at least two seconds: the LEDs first switch off, and then display the flashing sequence corresponding to the alarm condition.
- The alarm sequence continues as long as the two buttons are held down.
- The alarm reading procedure is as described in paragraph 3.2.1.
- While the alarms are displayed, the current cycle being performed continues or, if the appliance is in the programme selection phase, the options previously selected remain in memory.



3.3.2 Version with vertical pushbuttons

- Press buttons **3** and **2** for at least two seconds: the LEDs first switch off, and then display the flashing sequence corresponding to the alarm condition.
- The alarm sequence continues as long as the two buttons are held down.
- The alarm reading procedure is as described in paragraph 3.2.1.
- While the alarms are displayed, the current cycle being performed continues or, if the appliance is in the programme selection phase, the options previously selected remain in memory.

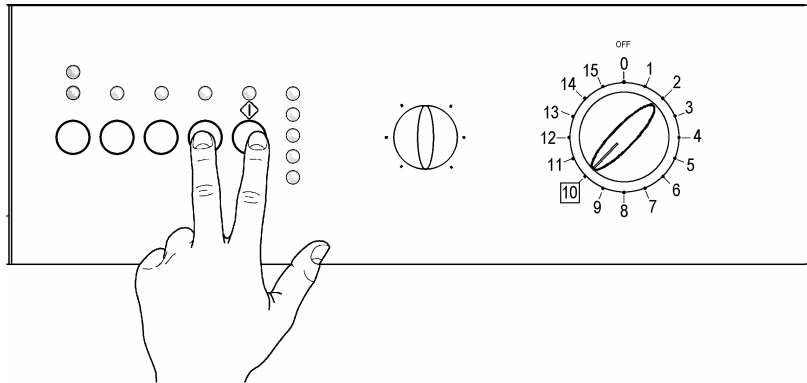


3.4 CANCELLING THE LAST ALARM

It is good practise to cancel the alarm condition stored in memory:

- after reading the alarm, in order to check whether it occurs again during the diagnostics test.
- after repairing the appliance, in order to check whether the alarm occurs again during testing.

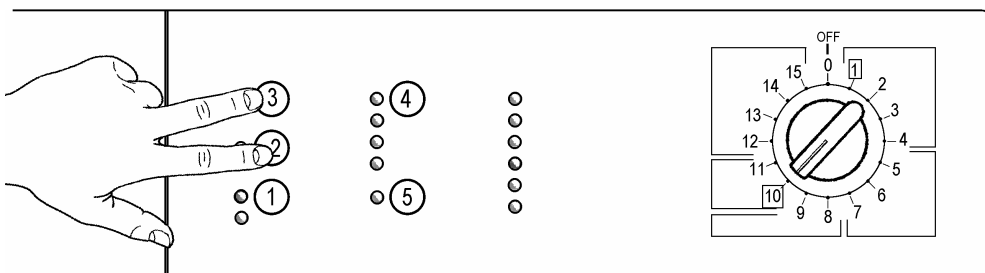
3.4.1 CANCELLING AN ALARM – VERSION WITH HORIZONTAL PUSHBUTTONS



1. Access alarm reading mode (**tenth selector position**, see [paragraph 3.2](#))
2. Press and hold down **START/PAUSE** and **any one of the option keys** simultaneously.
3. Hold the START/PAUSE and OPTION button down until the LEDs begin to flash (about 5 seconds)

IMPORTANT: The position of the START/PAUSE button varies according to the model, and is therefore not always the same.

3.5 CANCELLING AN ALARM – VERSION WITH VERTICAL PUSHBUTTONS



1. Access alarm reading mode (**tenth selector position**, see [paragraph 3.2](#))
2. Press and hold down buttons **3** and **2** simultaneously.
3. Hold down buttons **3** and **2** until the LEDs begin to flash (about 5 seconds)

3.6 TABLE OF ALARM CODES

Alarm	Description	Possible fault	Action/Machine status	Reset	Page
E11	Difficulty in filling during wash phase	Tap closed or water pressure insufficient; Drain hose incorrectly positioned; Water fill solenoid faulty; Leaks from pressure switch hydraulic circuit; Pressure switch faulty; Wiring faulty; Circuit board faulty.	Cycle paused, door closed	Start	16
E13	Water leakage	Drain hose incorrectly positioned; Water pressure insufficient; Water fill solenoid faulty; Leaks or blockage in pressure switch hydraulic circuit; Pressure switch faulty; Circuit board faulty.	Cycle paused, door closed	Start	18
E21	Difficulties in draining	Drain hose kinked/blocked/incorrectly positioned; Drain filter clogged or dirty; Drain pump faulty; Pressure switch faulty; Wiring faulty; Circuit board faulty; Current leakage from heating element to ground.	Cycle paused	Start	20
E23	Drain pump triac faulty	Drain pump faulty; Wiring faulty; Circuit board faulty.	Safety drain - Cycle stopped, door open	Selector on "0"	22
E24	Problems with «sensing» of drain pump triac	Circuit board faulty.	Safety drain – Cycle stopped, door released	Selector on "0"	22
E33	Incongruence between contact closure of anti-boiling and 1st level of pressure switch	Pressure switch faulty; Current leakage from heating element to ground; Heating element; Wiring faulty; Circuit board faulty.	Safety drain - Cycle stopped, door open	Selector on "0"	24
E35	Water overflow	Water fill solenoid faulty; Leaks from pressure switch hydraulic circuit; Pressure switch faulty; Wiring faulty; Circuit board faulty.	Cycle blocked, door closed. Safety drain. Drain pump (sequence 5 min. ON - 5 min. OFF)	Selector on "0"	26
E36	«sensing» circuit of anti-boiling pressure switch faulty	Circuit board faulty.	Cycle blocked, door closed	Selector on "0"	27
E37	«sensing» circuit of 1st level faulty	Circuit board faulty.	Cycle blocked, door closed	Selector on "0"	27
E39	HV «sensing» circuit of anti-flooding pressure switch faulty	Circuit board faulty.	Cycle blocked, door closed	Selector on "0"	27
E41	Door open	Door safety interlock faulty; Wiring faulty; Circuit board faulty.	Cycle paused	Start	28
E42	Problems with aperture of door	Door safety interlock faulty; Wiring faulty; Circuit board faulty	Cycle paused	Start or Selector on "0"	32
E43	Power triac on door interlock faulty	Door safety interlock faulty; Wiring faulty; Circuit board faulty.	Safety drain, door released	Selector on "0"	36
E44	Door interlock «sensing» faulty	Circuit board faulty.	Safety drain, door released	Selector on "0"	40
E45	«sensing» on door interlock triac faulty	Circuit board faulty.	Safety drain, door released	Selector on "0"	40
E51	Motor power triac short-circuited	Circuit board faulty; Current leakage from motor or wiring.	Cycle blocked, door closed (after 5 attempts in diagnostics or immediate during selection)	Selector on "0"	42
E52	No signal from motor tachimetric generator	Motor faulty; Wiring faulty; Circuit board faulty.	Cycle blocked, door closed (after 5 attempts in diagnostics or immediate during selection)	Selector on "0"	46

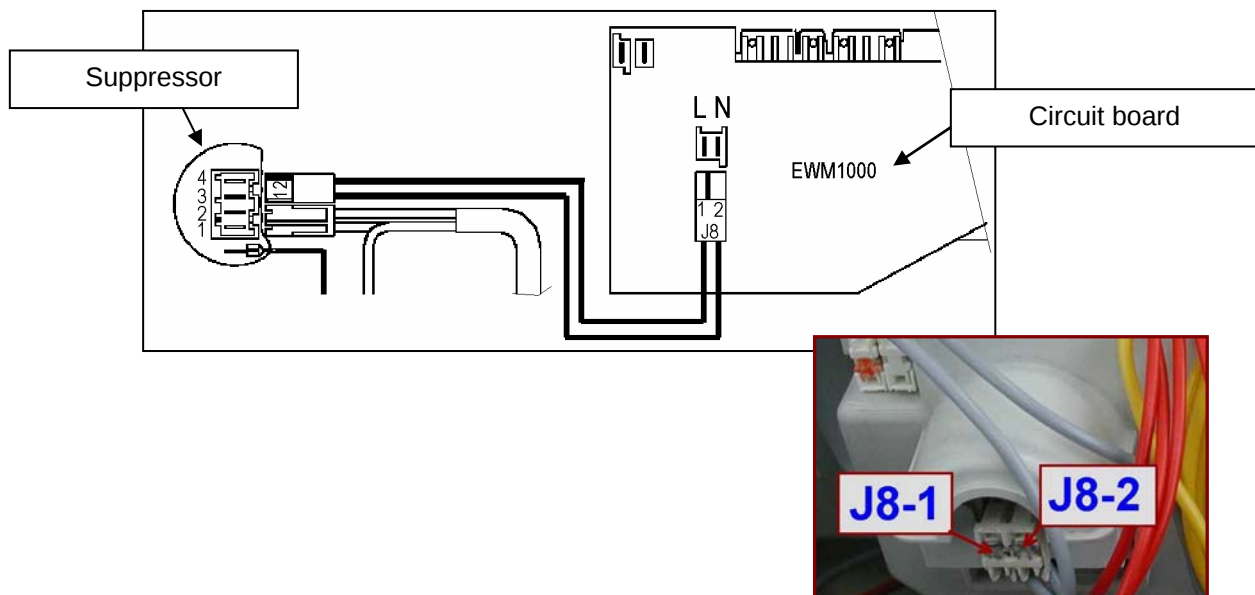
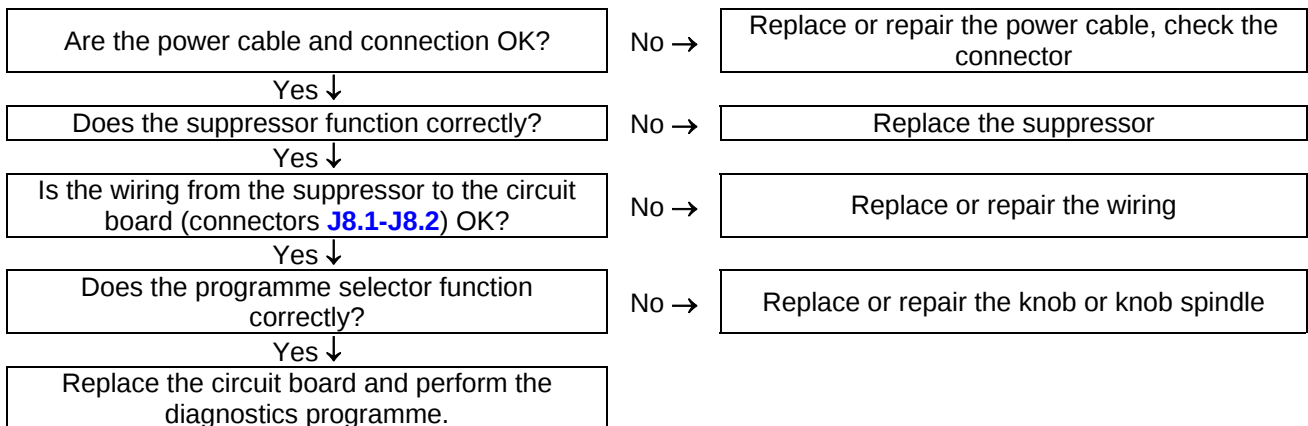
Alarm	Description	Possible fault	Action/Machine status	Reset	Page
E53	«sensing» circuit on motor triac faulty	Circuit board faulty.	Cycle blocked	Selector on "0"	47
E54	Motor relay contacts sticking	Circuit board faulty; Current leakage from motor or wiring.	Cycle blocked, door closed (after 5 attempts in diagnostics or immediate during selection)	Selector on "0"	48
E61	Insufficient heating during washing	NTC sensor faulty; Heating element faulty; Wiring faulty; Circuit board faulty.	Heating phase skipped	---	50
E62	Overheating during washing	NTC sensor faulty; Heating element faulty; Wiring faulty; Circuit board faulty.	Safety drain (with cooling water fill) - Stop with door open	Selector on "0"	52
E66	Power relay for heating element faulty	Circuit board faulty; Current leakage from heating element or wiring to ground.	Safety drain (with cooling water fill) - Stop with door open	Selector on "0"	53
E71	NTC washing sensor faulty	NTC sensor faulty; Wiring faulty; Circuit board faulty.	Heating phase skipped	---	54
E82	Error in reset position of selector	Circuit board faulty.	Cycle cancelled	Selector on "0"	54
E83	Error in reading selector position	Configuration data incorrect; Circuit board faulty.	During the cycle continues normally, switches off completely during selection	---	55
E93	Incorrect machine configuration	Configuration data incorrect; Circuit board faulty.	Appliance blocked	Selector on "0"	55
E94	Incorrect washing cycle configuration	Configuration data incorrect; Circuit board faulty.	Appliance blocked	Selector on "0"	55
E95	Communications error between microprocessor and EEPROM	Circuit board faulty.	Appliance blocked	Selector on "0"	55
E96	Incongruence between hardware version and configuration.	Configuration data incorrect; Circuit board faulty.	Appliance blocked	Selector on "0"	55
E97	Incongruence between programme selector and cycle configuration	Configuration data incorrect; Circuit board faulty.	Appliance blocked	Selector on "0"	55
EA1	Drum positioning system (DSP) faulty	Wiring faulty; Circuit board faulty; DSP sensor faulty; Motor drive belt broken.	Drum positioning phase skipped	Selector on "0"	56
EB1	Power supply frequency of appliance incorrect	Mains power supply problems (incorrect / interference); Circuit board faulty.	Cycle blocked until normal power supply conditions are restored	Selector on "0"	57
EB2	Voltage too high	Mains power supply problems (incorrect / interference); Circuit board faulty.	Cycle blocked until normal power supply conditions are restored	Selector on "0"	57
EB3	Voltage too low	Mains power supply problems (incorrect / interference); Circuit board faulty.	Cycle blocked until normal power supply conditions are restored	Selector on "0"	57

3.7 Notes concerning certain alarm codes

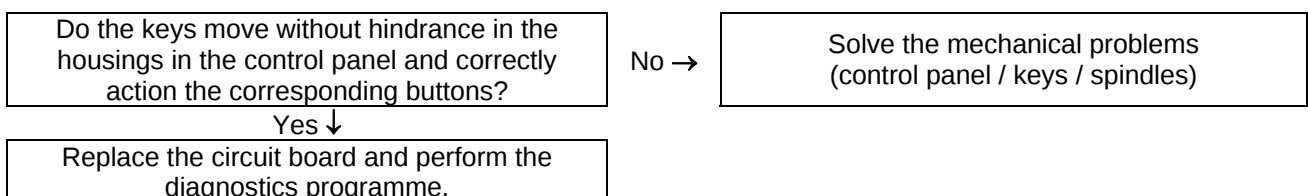
- **Configuration alarms E93-E96:** If these alarms are generated (when the appliance is switched on), operation of the appliance is blocked and all the LEDs light. The diagnostics procedure cannot be accessed; the only option is to switch the appliance OFF (by turning the selector to position "0").
- **Configuration alarm E94:** For this alarm code, only the family for alarm "9" is displayed; the diagnostics procedure cannot be accessed, and the "rapid alarm display" function cannot be used.
- **Alarms EB1-EB2-EB3:** 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 diagnostics 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 diagnostics 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 tachymetric 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).

4 THE DIAGNOSTICS PROGRAMME CANNOT BE ACCESSED

4.1.1 All LEDs on the circuit are board switched off.



4.1.2 Some of the LEDs on the circuit board light.

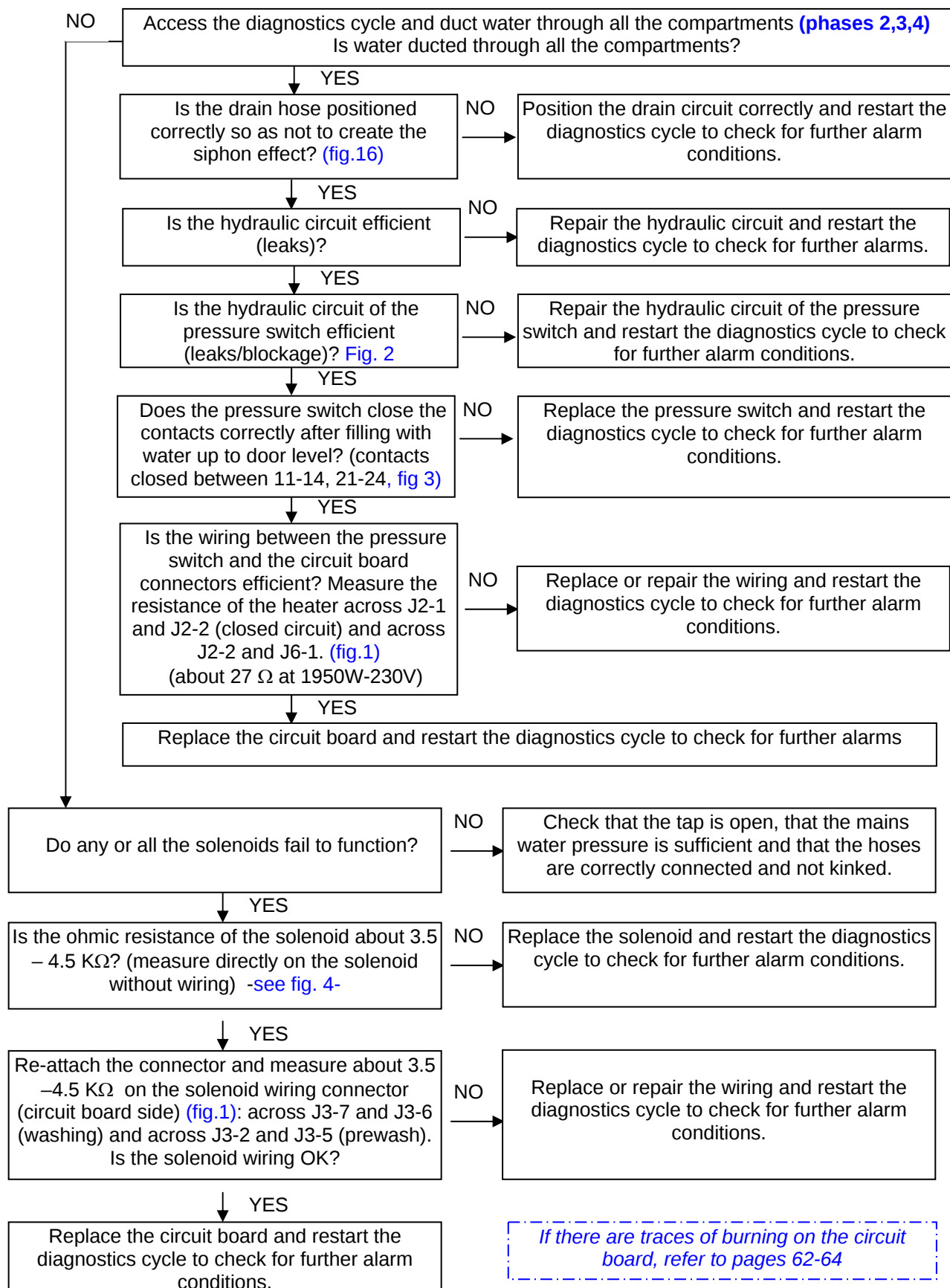


If there are traces of burning on the circuit board, refer to pages. 62-64

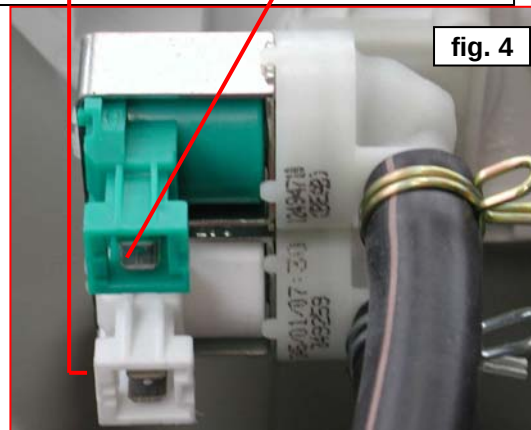
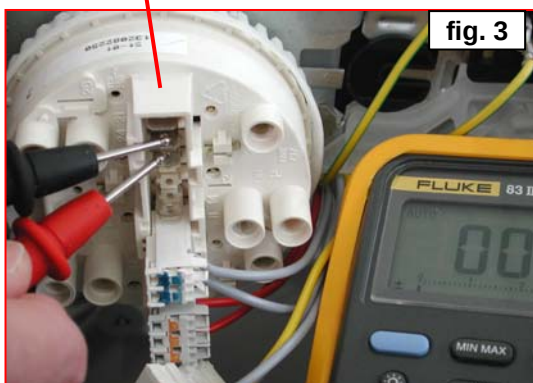
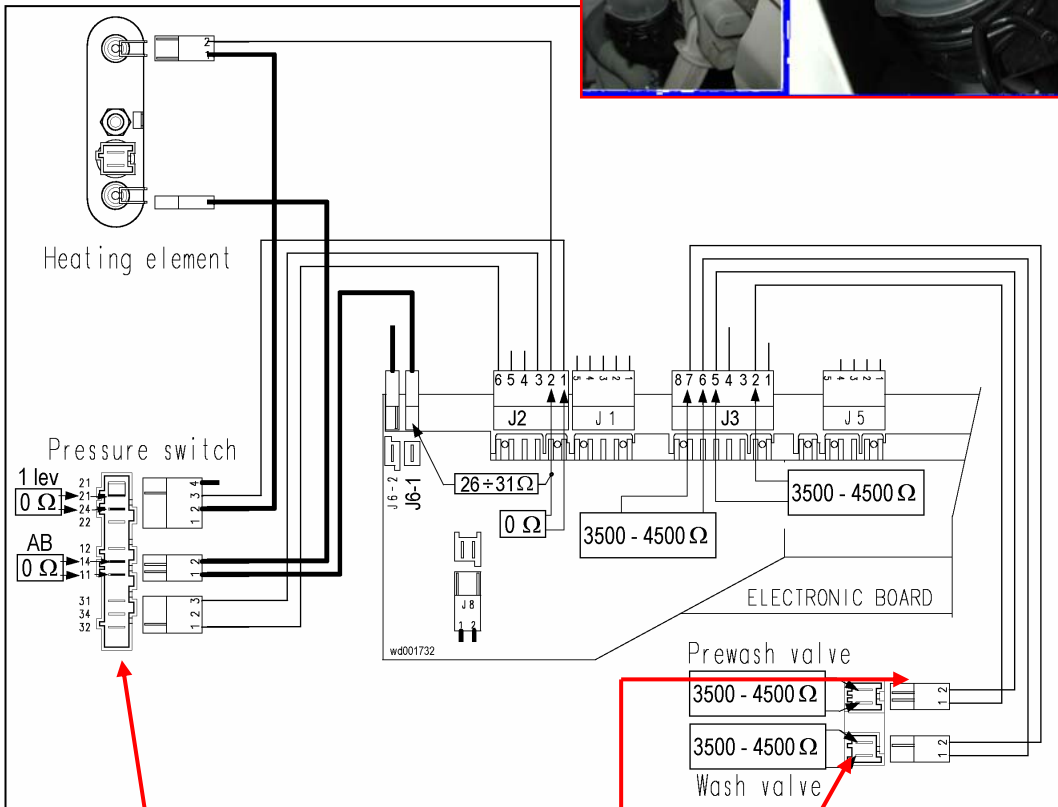
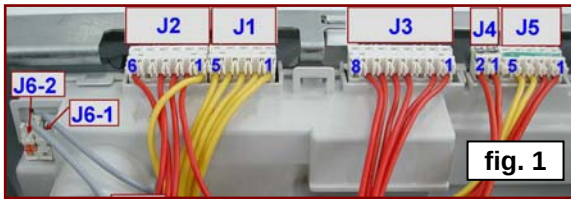
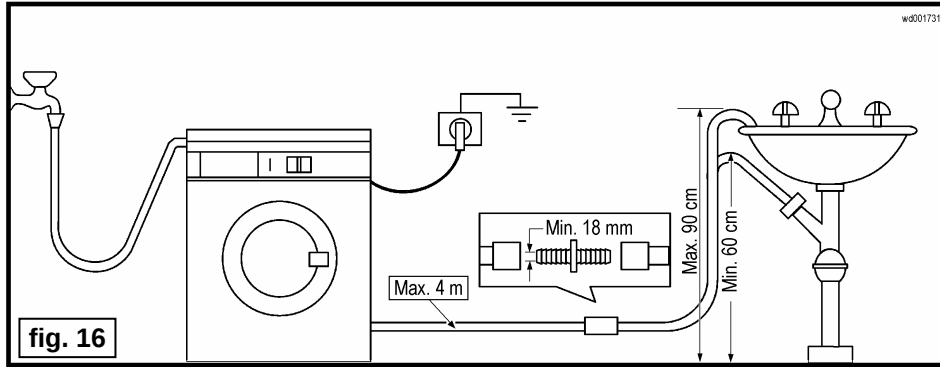
5 TROUBLESHOOTING ACCORDING TO ALARM CODES

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:

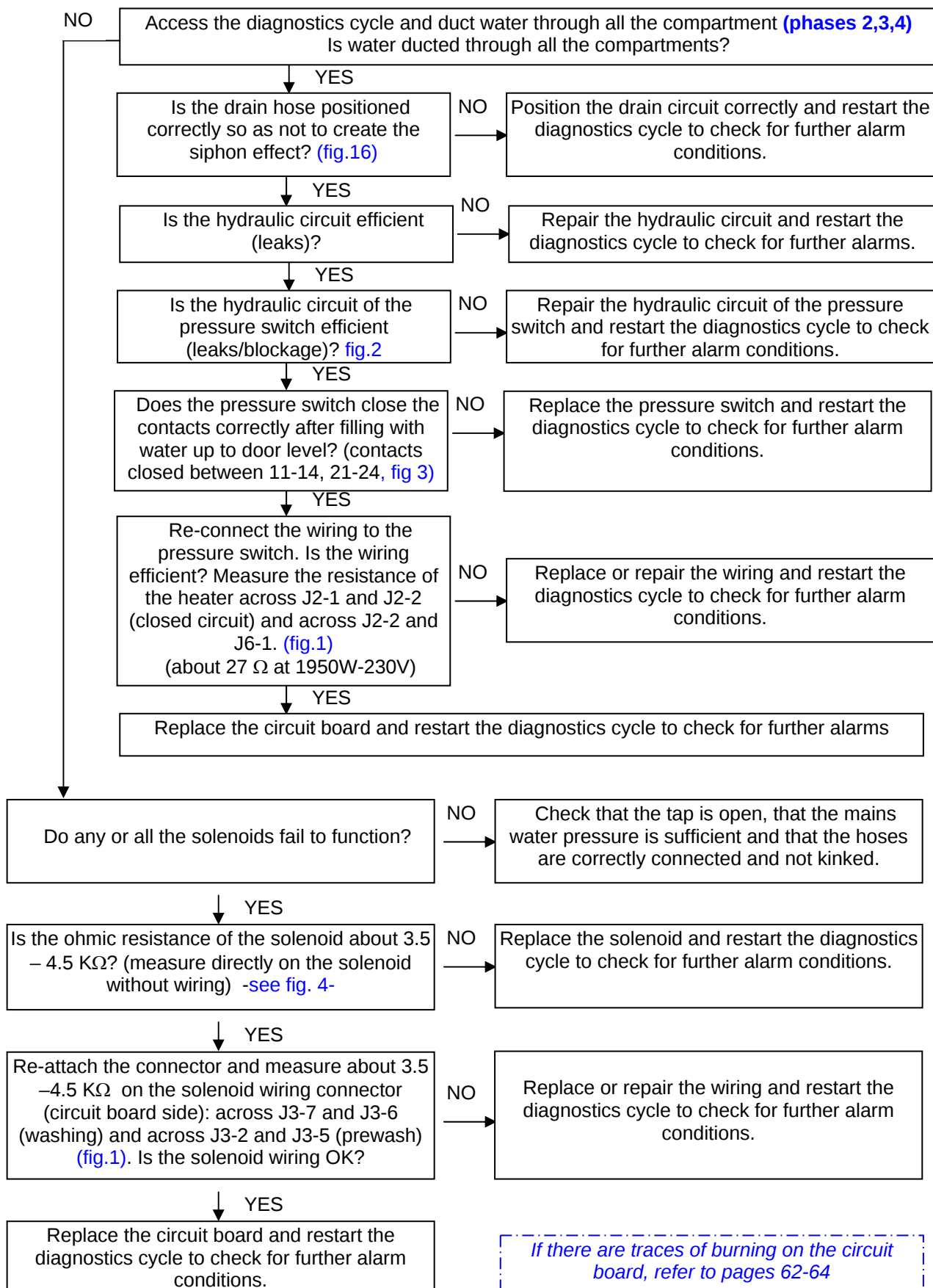


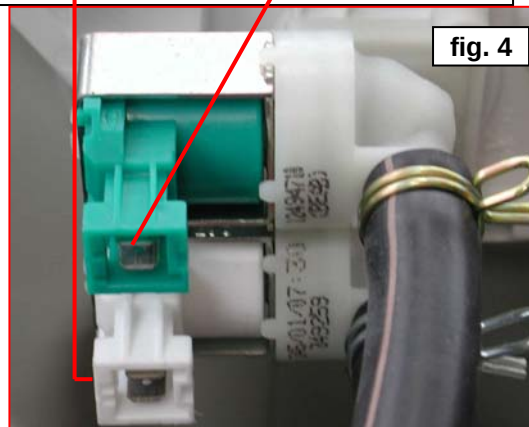
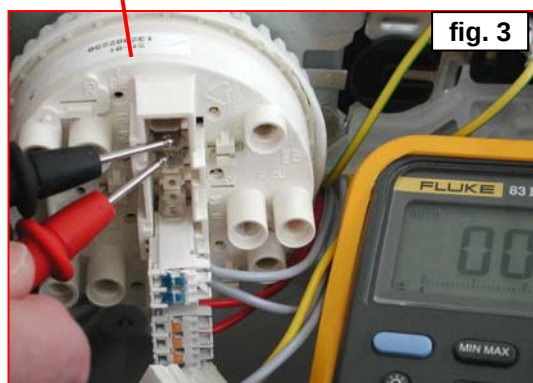
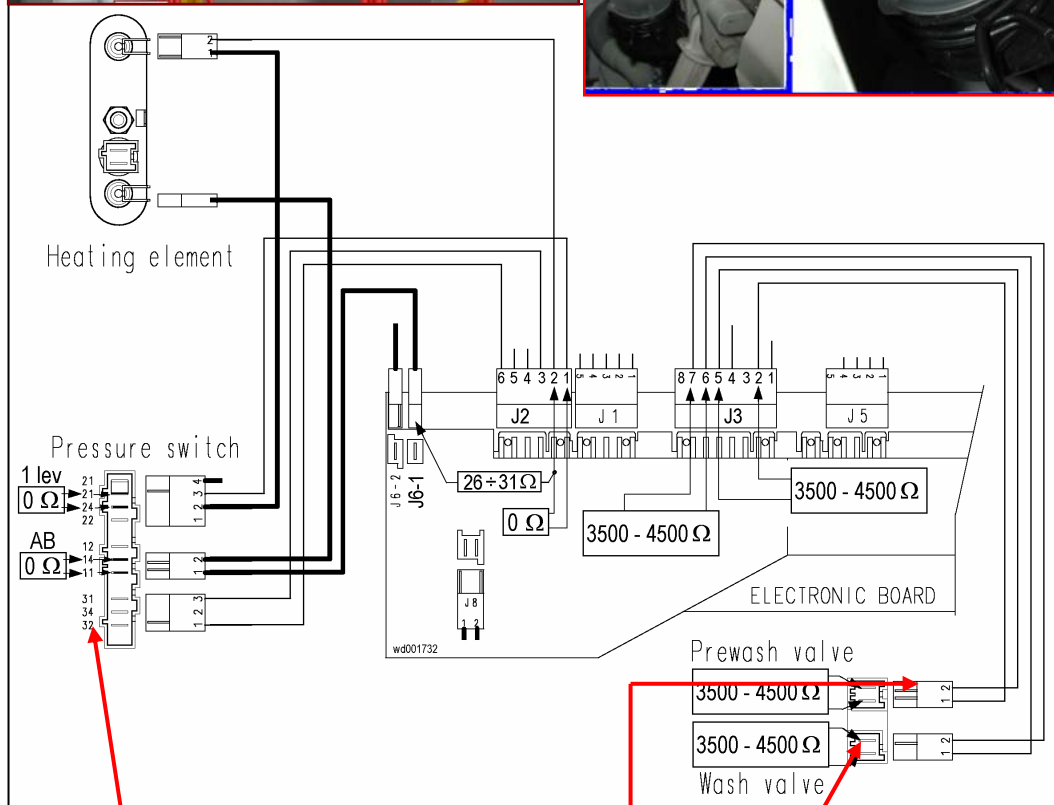
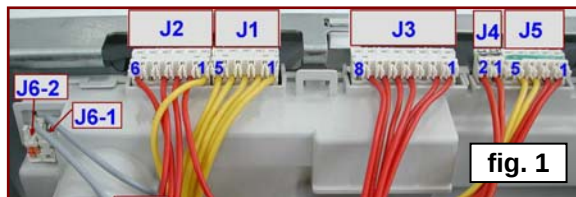
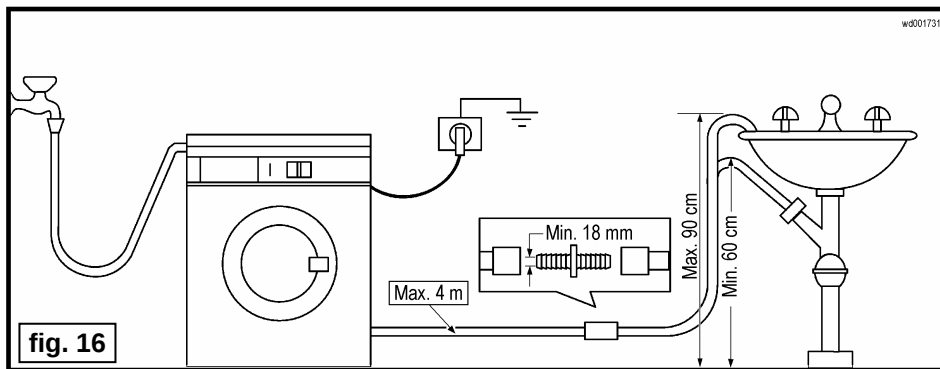
E11



E13	E13: Water leakage 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)	E13
------------	--	------------

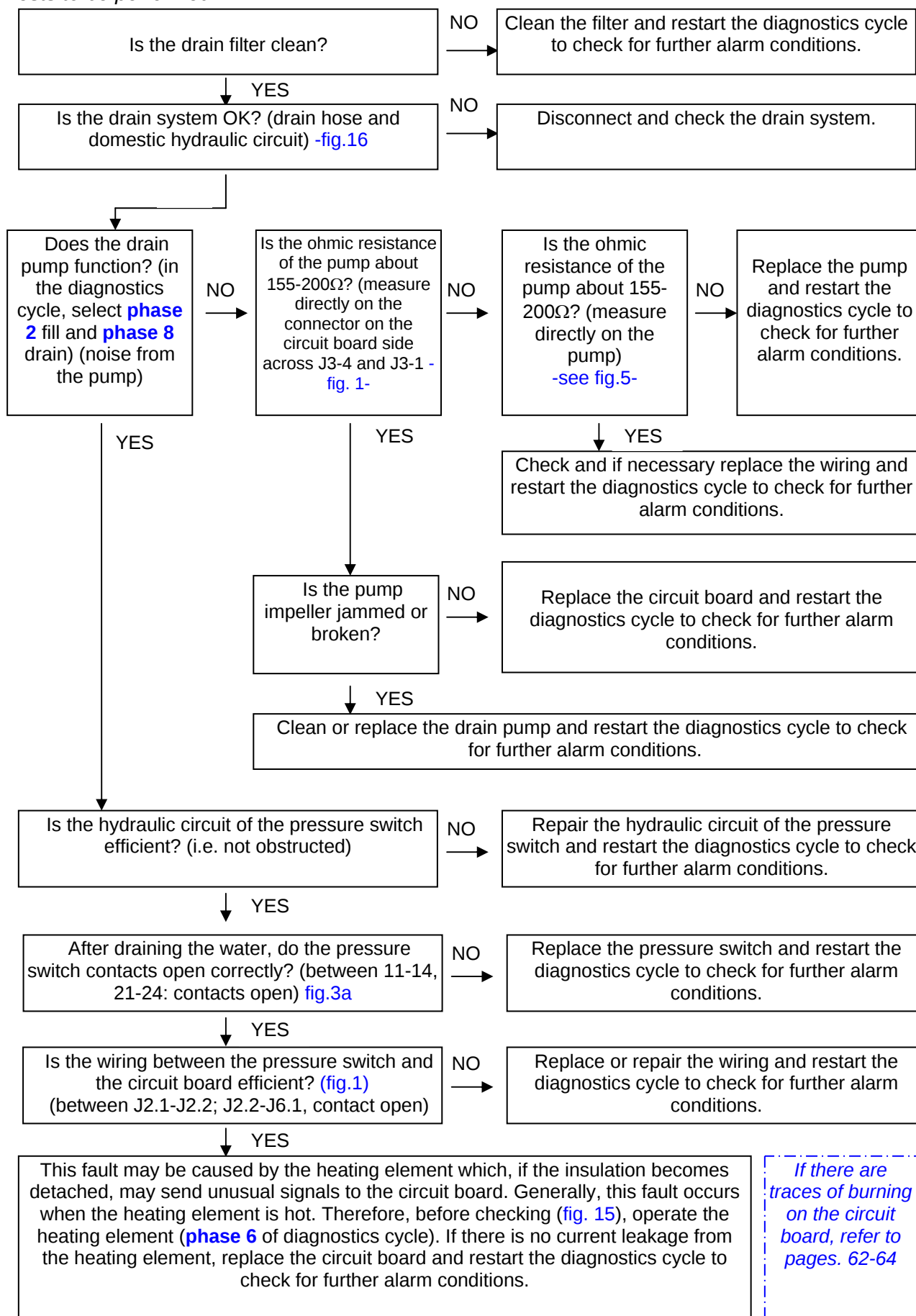
Tests to be performed:

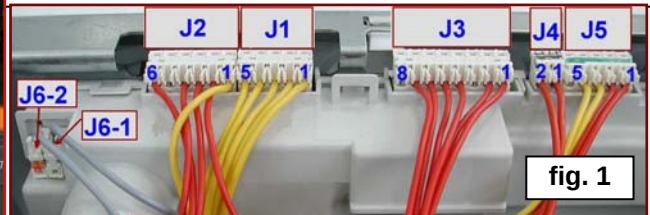
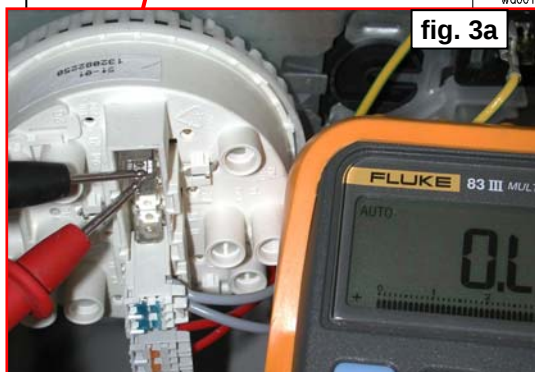
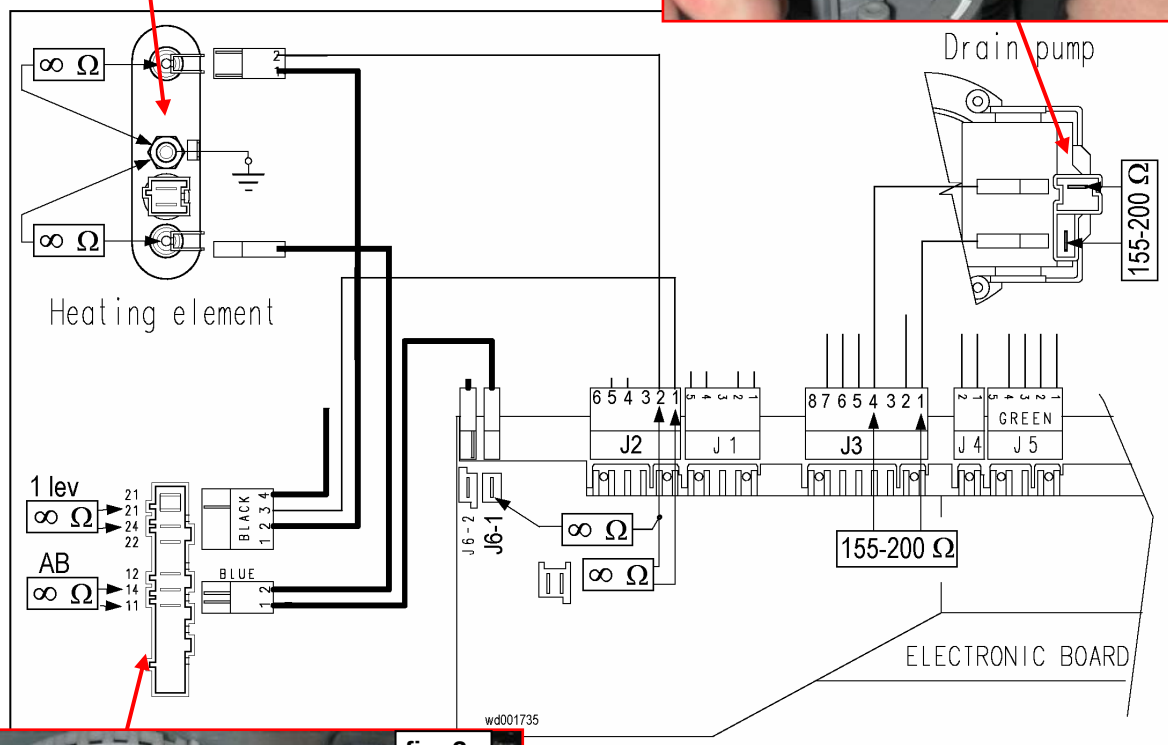
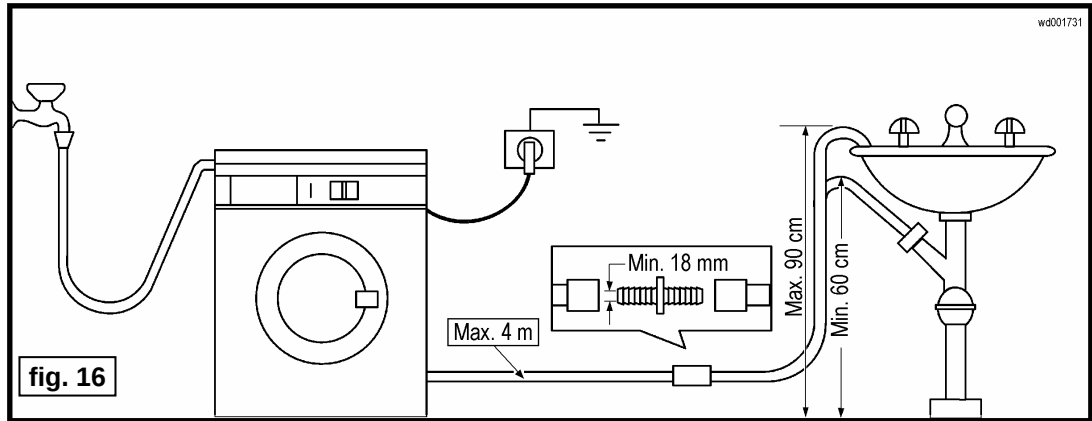




E21	E21: Difficulties in draining	E21
	Maximum drain time exceeded (measured for each phase of the cycle)	

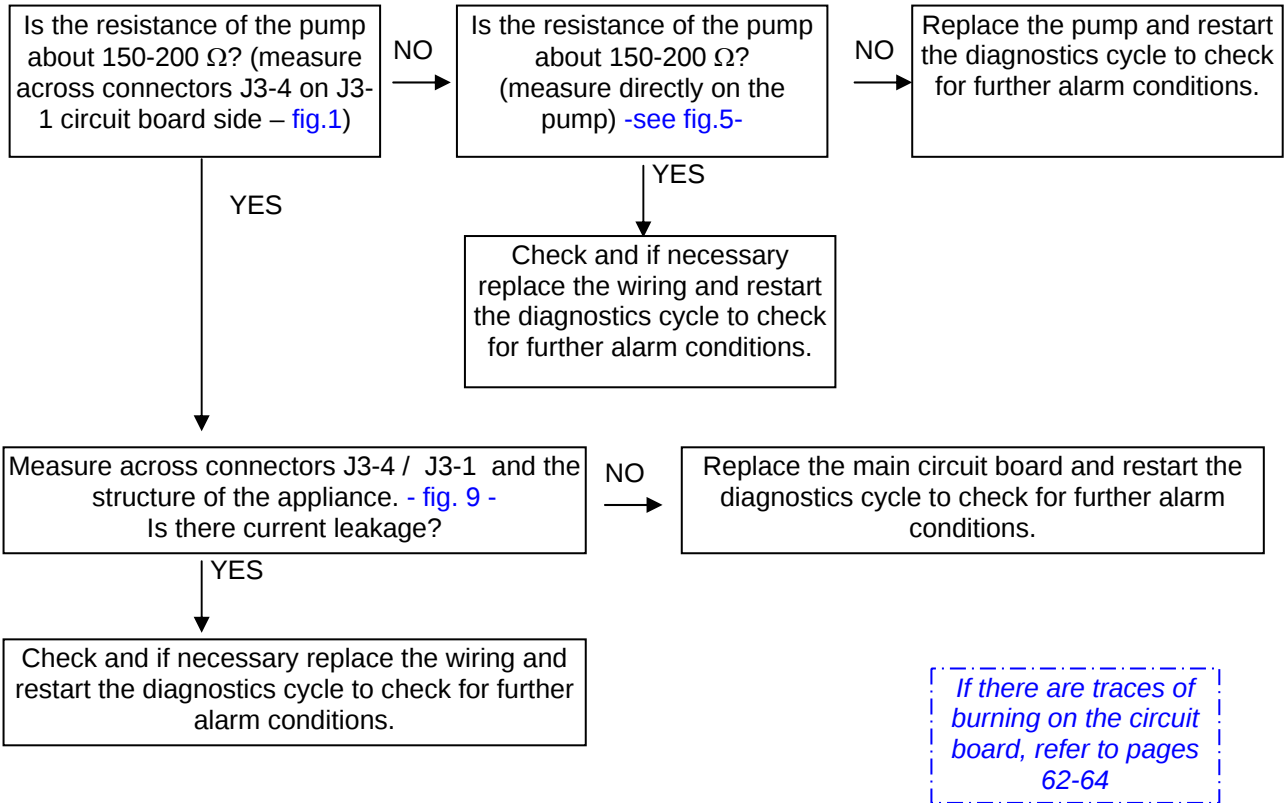
Tests to be performed:





E23	E23: Malfunction of drain pump triac	E23
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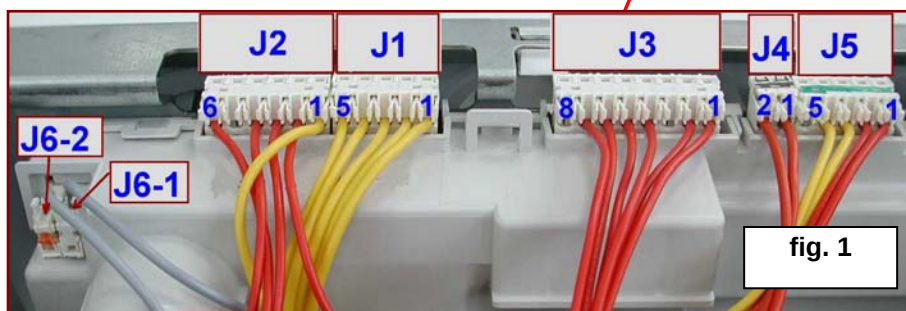
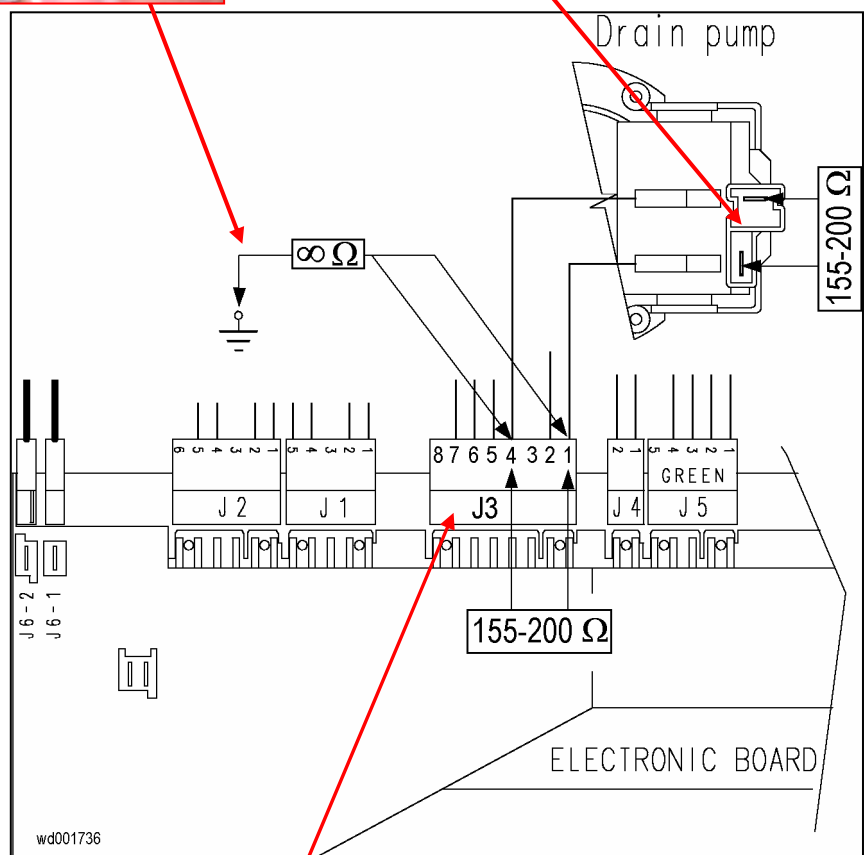
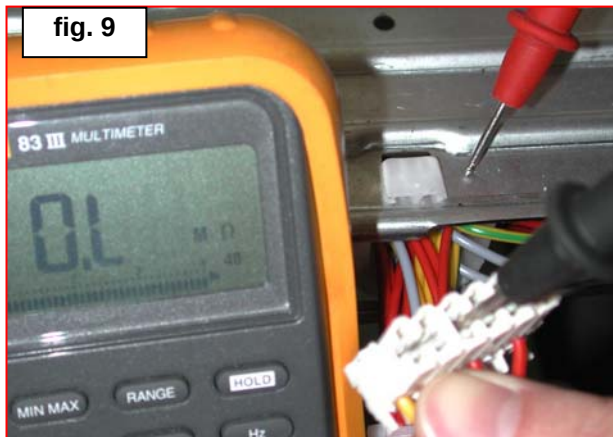
Tests to be performed:



E24	E24: «sensing» circuit of the component (triac) that controls the drain pump faulty	E24
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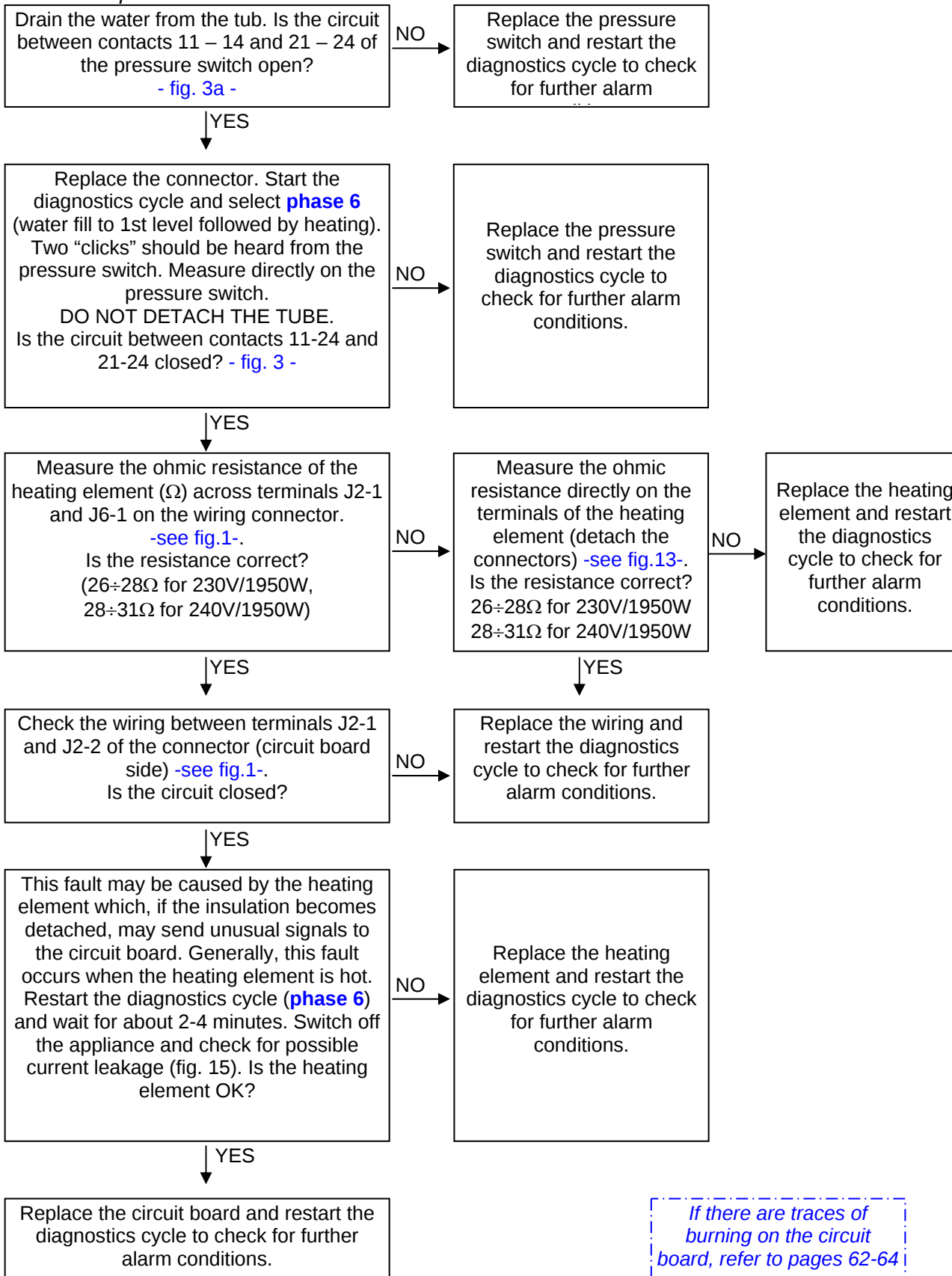
Replace the circuit board and restart the diagnostics cycle to check for further alarm conditions.

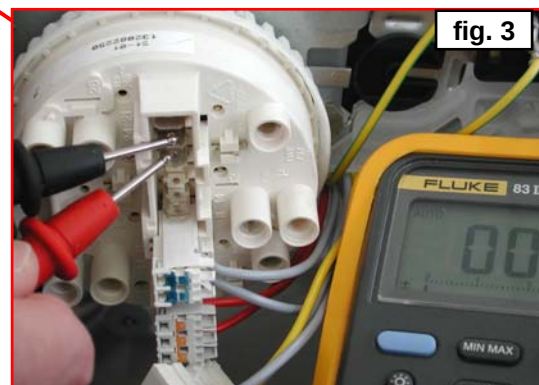
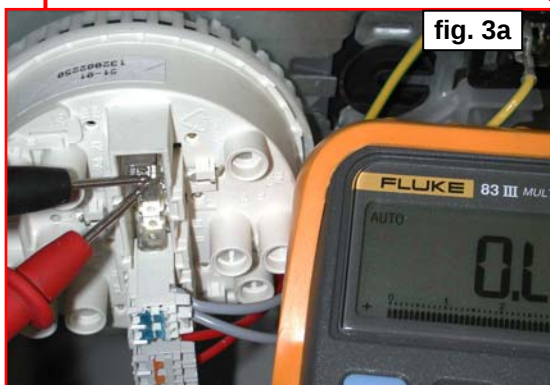
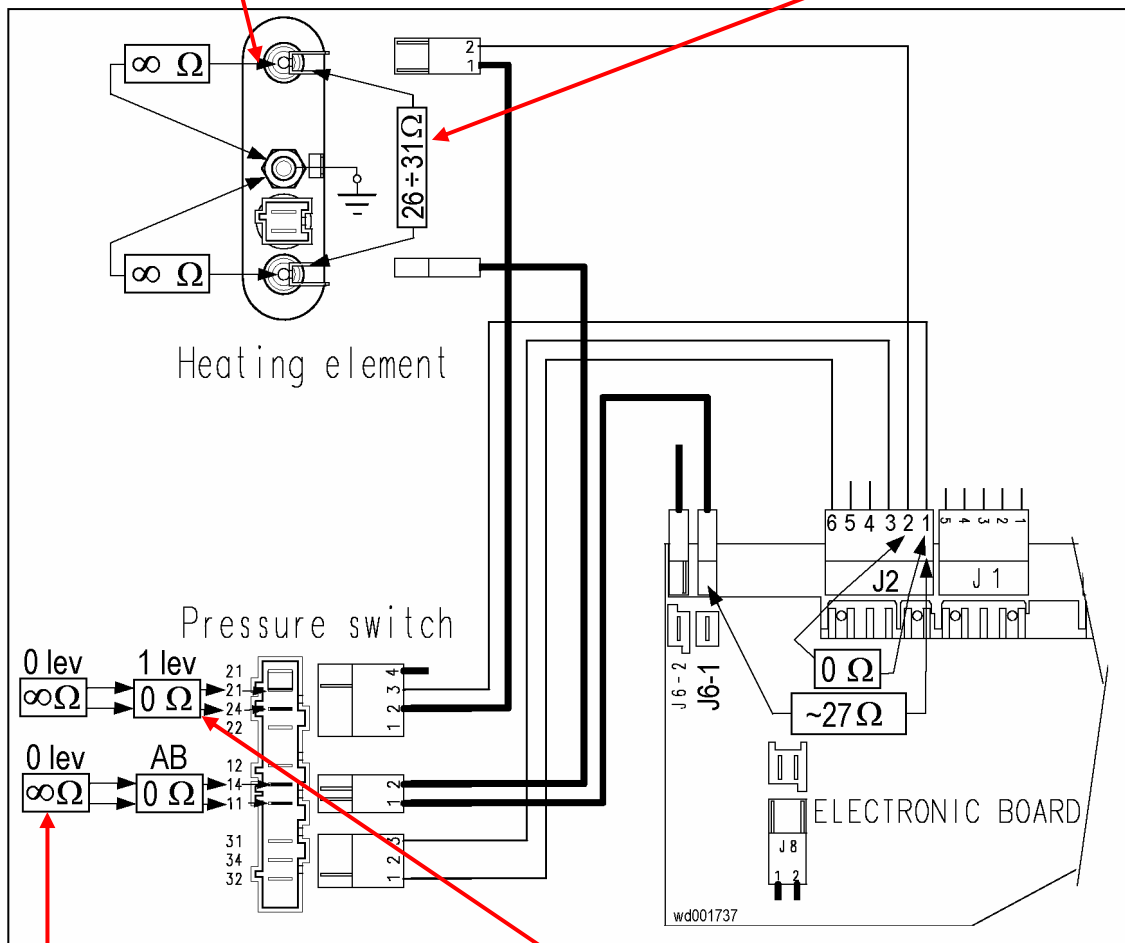
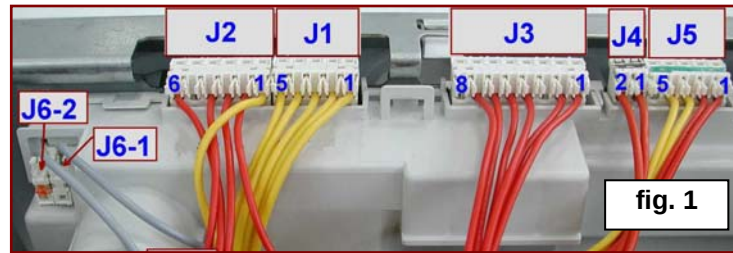
If there are traces of burning on the circuit board, refer to pages 62-64



E33	E33: Incongruence between contact closure of anti-boiling and 1st level contacts of pressure switch	E33
	The anti-boiling contact is open while the 1st level contact is closed, or other incongruence between the pressure switch levels for more than 3 seconds	

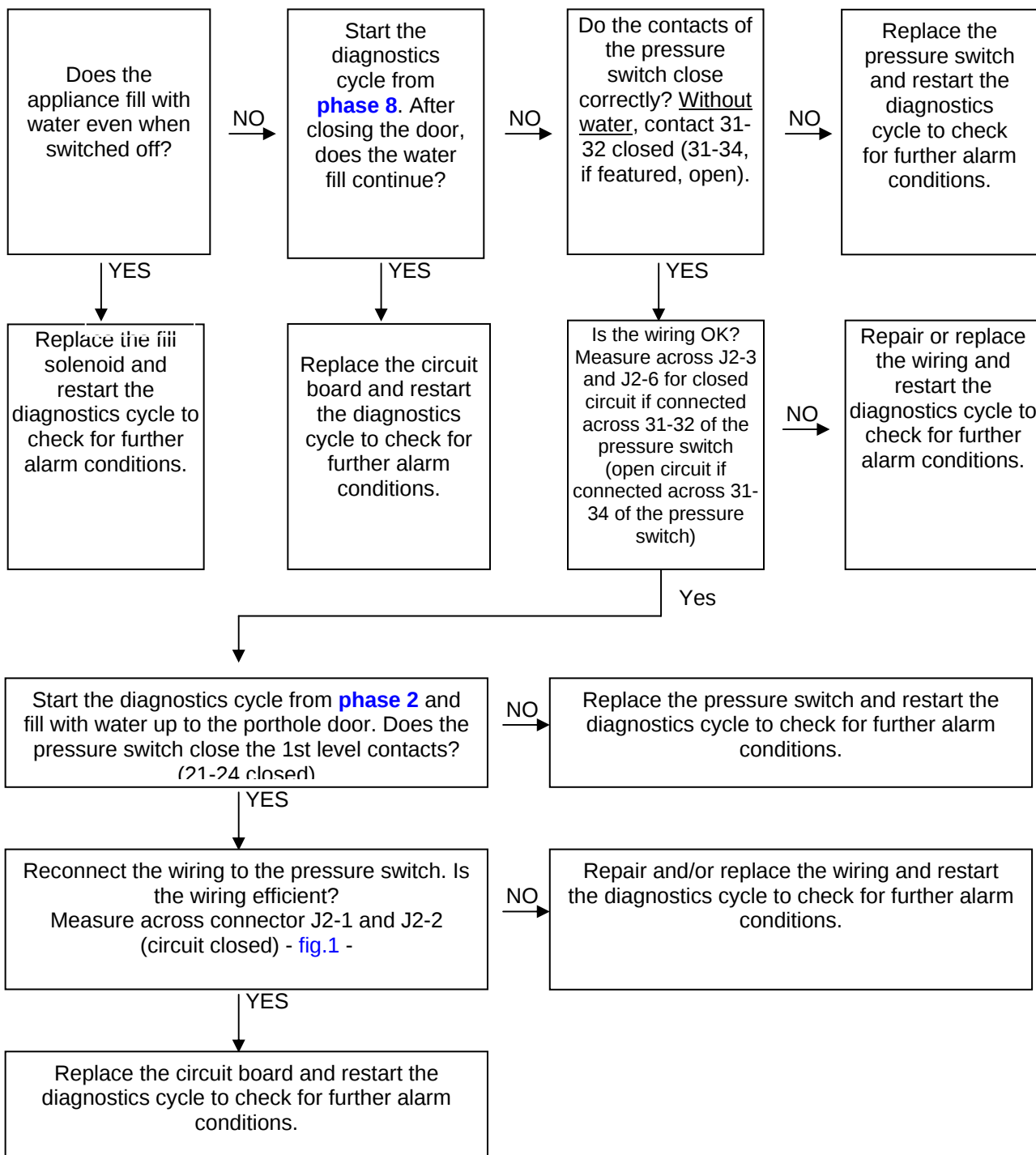
Tests to be performed:





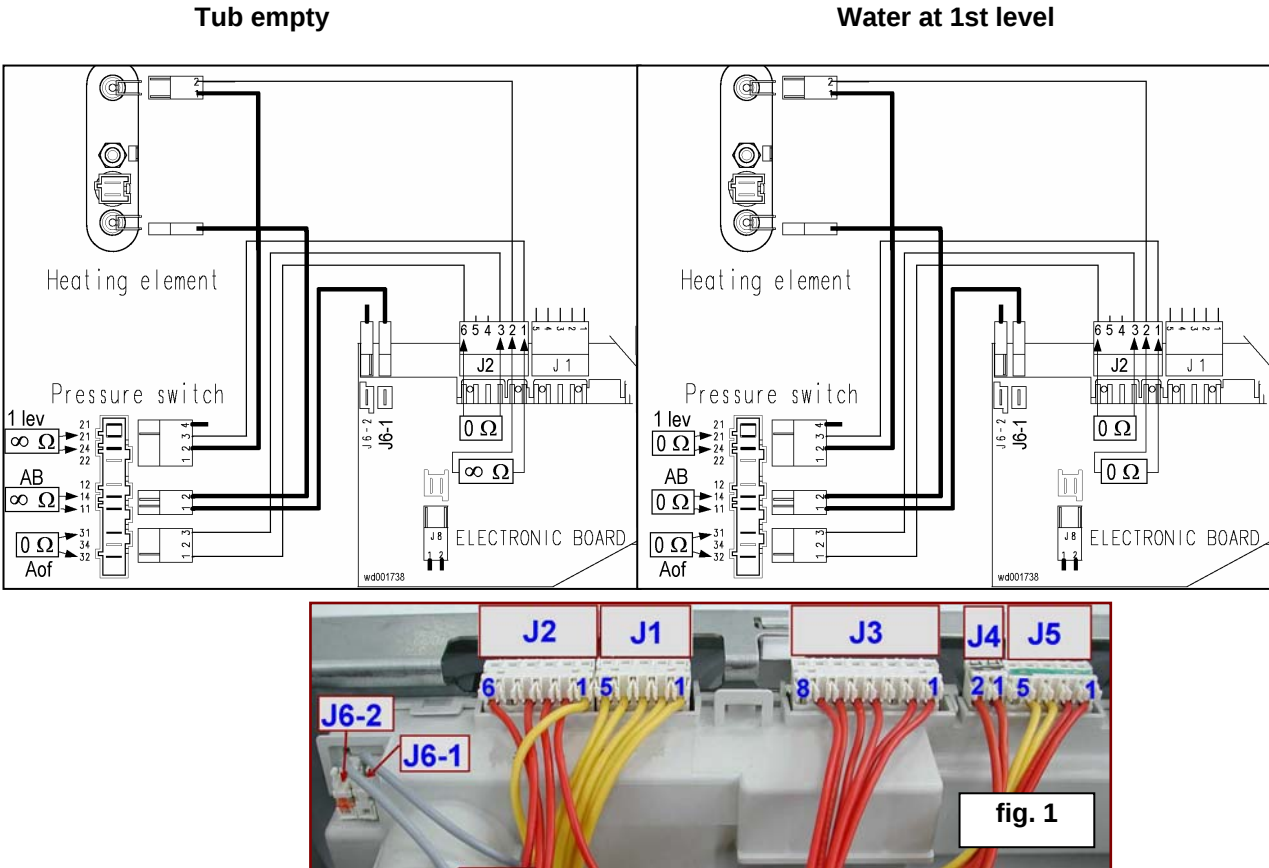
E35	E35: Water level too high	E35
	The anti-overflow safety pressure switch is on "FULL" for more than 15 seconds (if featured)	

Tests to be performed:



If there are traces of burning on the circuit board, refer to pages 62-64

E35



E36	E36: «sensing» circuit of anti-boiling pressure switch faulty	E36
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Tests to be performed:

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

E37	E37: «sensing» circuit of 1st level pressure switch faulty	E37
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Tests to be performed:

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

E39	E39: "HV" «sensing» circuit of anti-overflow pressure switch faulty	E39
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Tests to be performed:

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

If there are traces of burning on the circuit board, refer to pages 62-64

E41	E41: Door open (section 1: device with 3 contacts)	E41
	Maximum time exceeded (PTC = 15 seconds, instantaneous, 3 attempts every 2 seconds)	

Tests to be performed:



3 Contacts
Traditional door interlock
- fig. 6 -

Is the door correctly closed?

NO

Close the door correctly and restart the diagnostics cycle to check for further alarm conditions.

YES

Does the door inter-lock have 3 or 4 connectors?

4 Connectors
(Instantaneous door interlock)
-fig. 8, see page 30 -

YES

To check the wiring (with the door open), measure the following wiring connectors:

- between wires J2-4 and J6-2, the circuit must NOT be open (measure the resistive value of the PTC);
- between wires J6-2 and J2-1, the circuit must be OPEN.
- between connector J2-1 (PCB side) and the wire to connector 4 of the door interlock (fig. 7), the circuit must be CLOSED.

Is the system OK?

YES

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 diagnostics cycle to check for further alarm conditions.

YES

Restart the diagnostics cycle to check for further alarm conditions.

Detach the connectors and effect measurement on the component (fig 6):

- 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

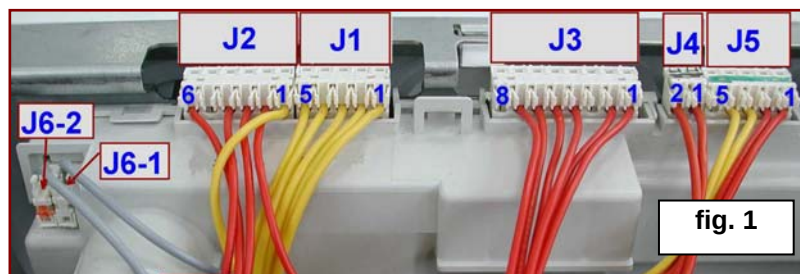
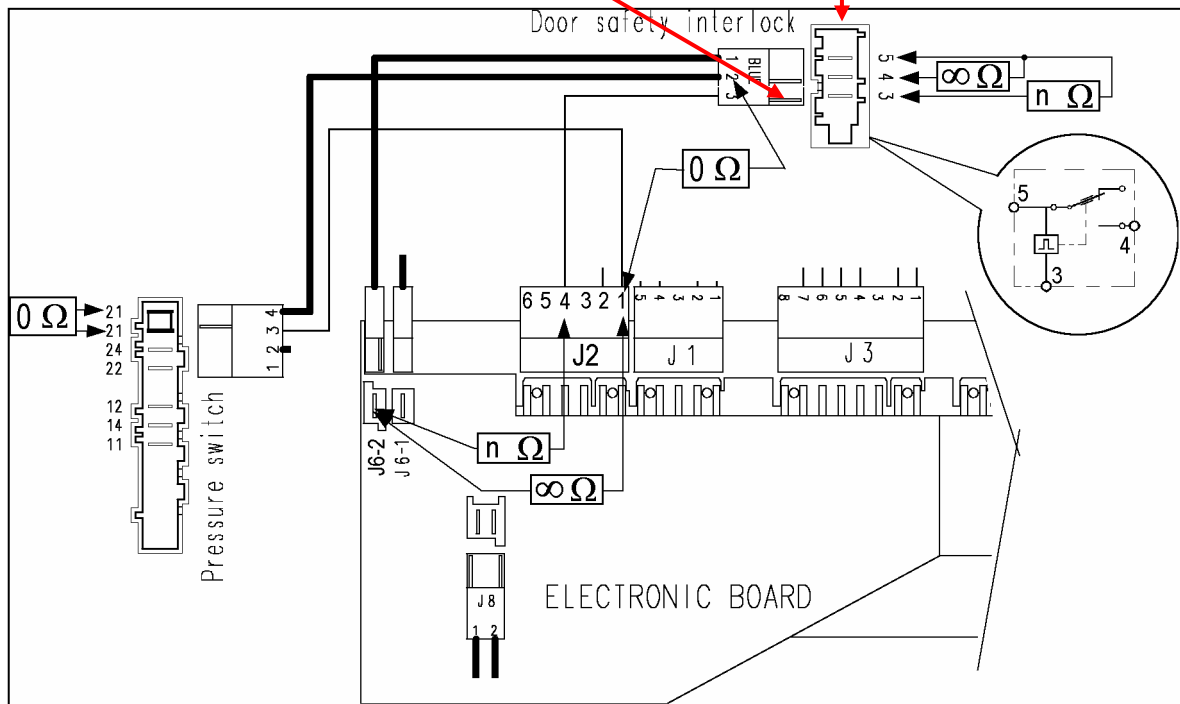
NO

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

YES

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

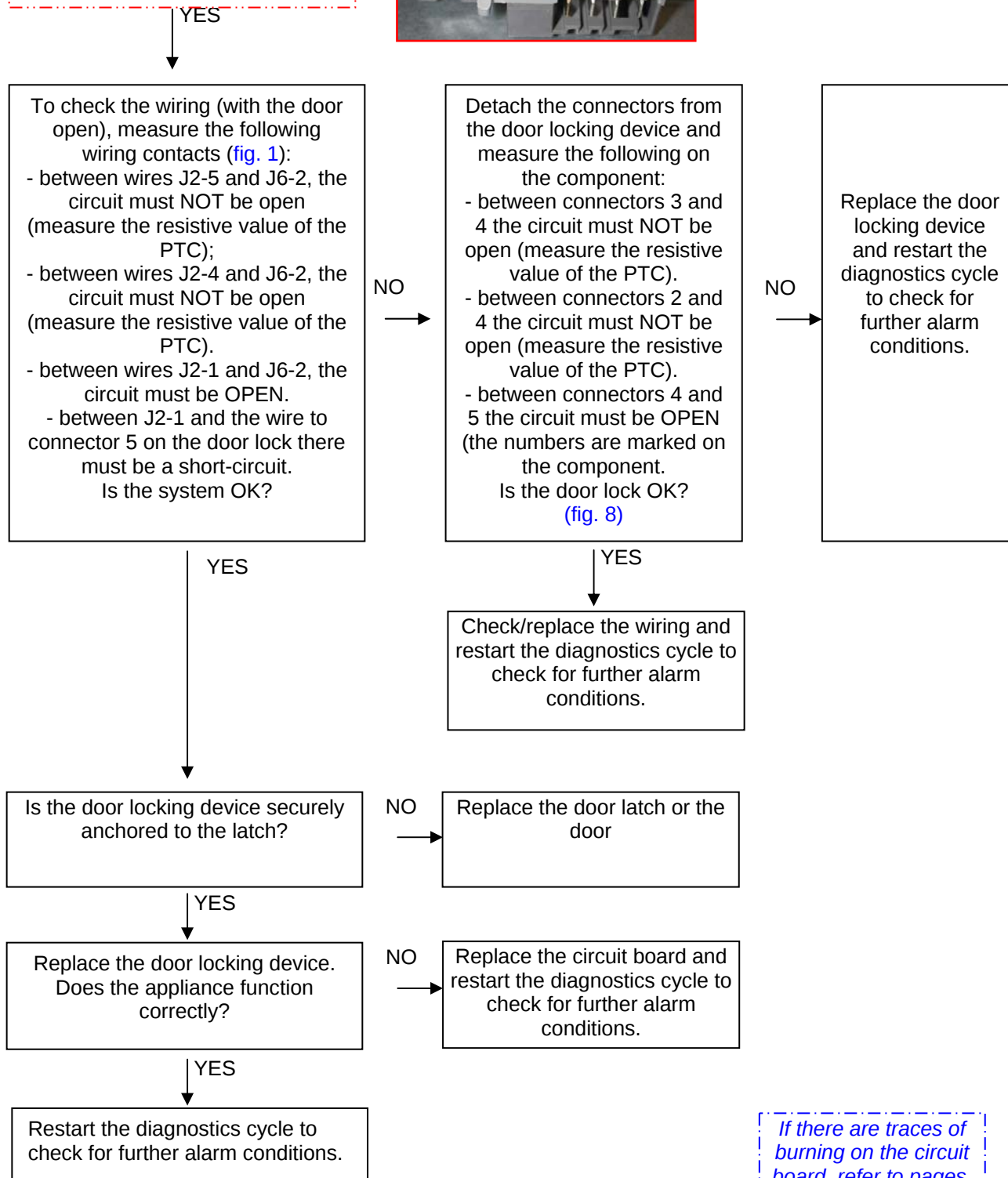
If there are traces of burning on the circuit board, refer to pages 62-64

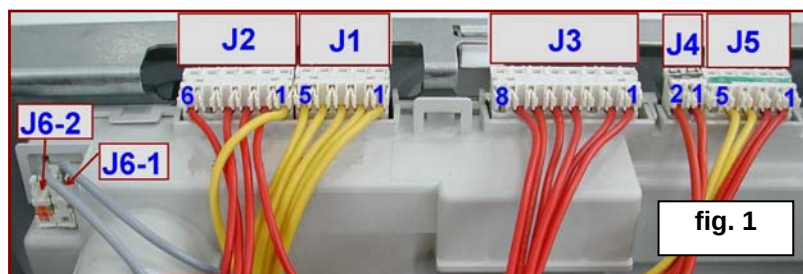
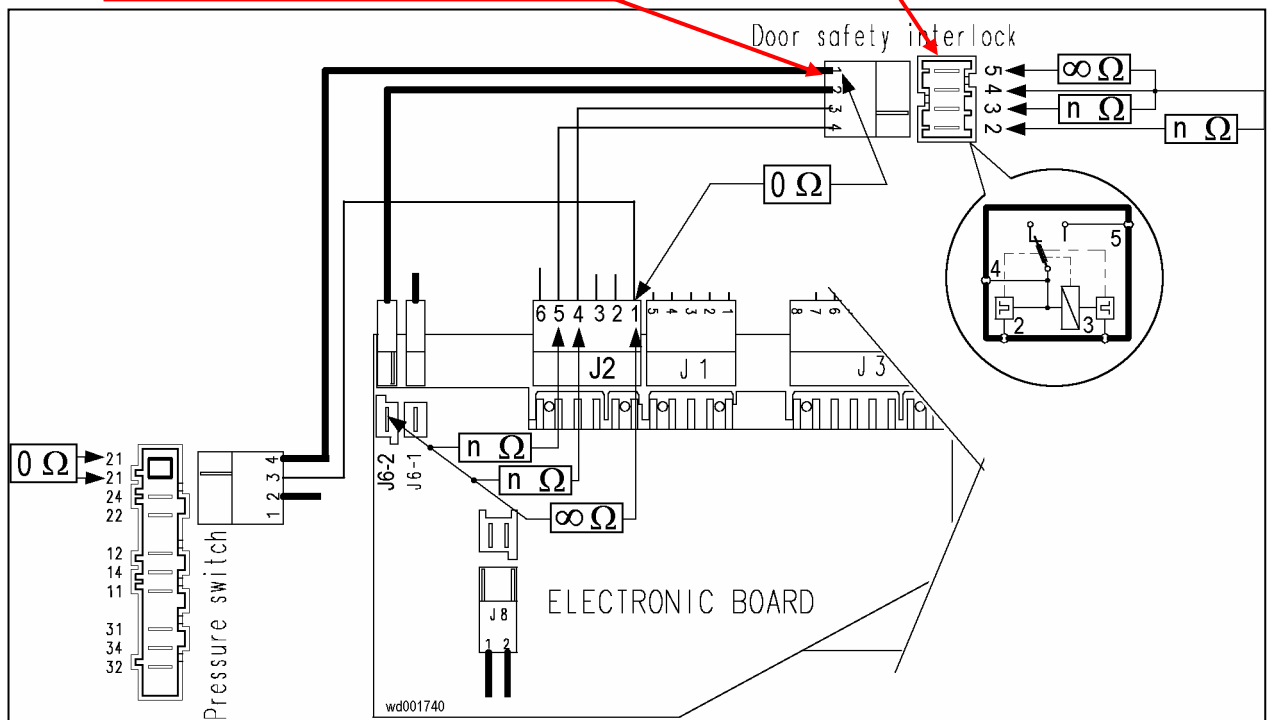


E41	E41: Problems with aperture of door (section 2 – device with 4 connectors)	E41
	Maximum time exceeded (255 seconds for version with PTC / 5 impulses for instantaneous)	

Tests to be performed:

4 Connections
Instantaneous door locking device
- fig 8 -



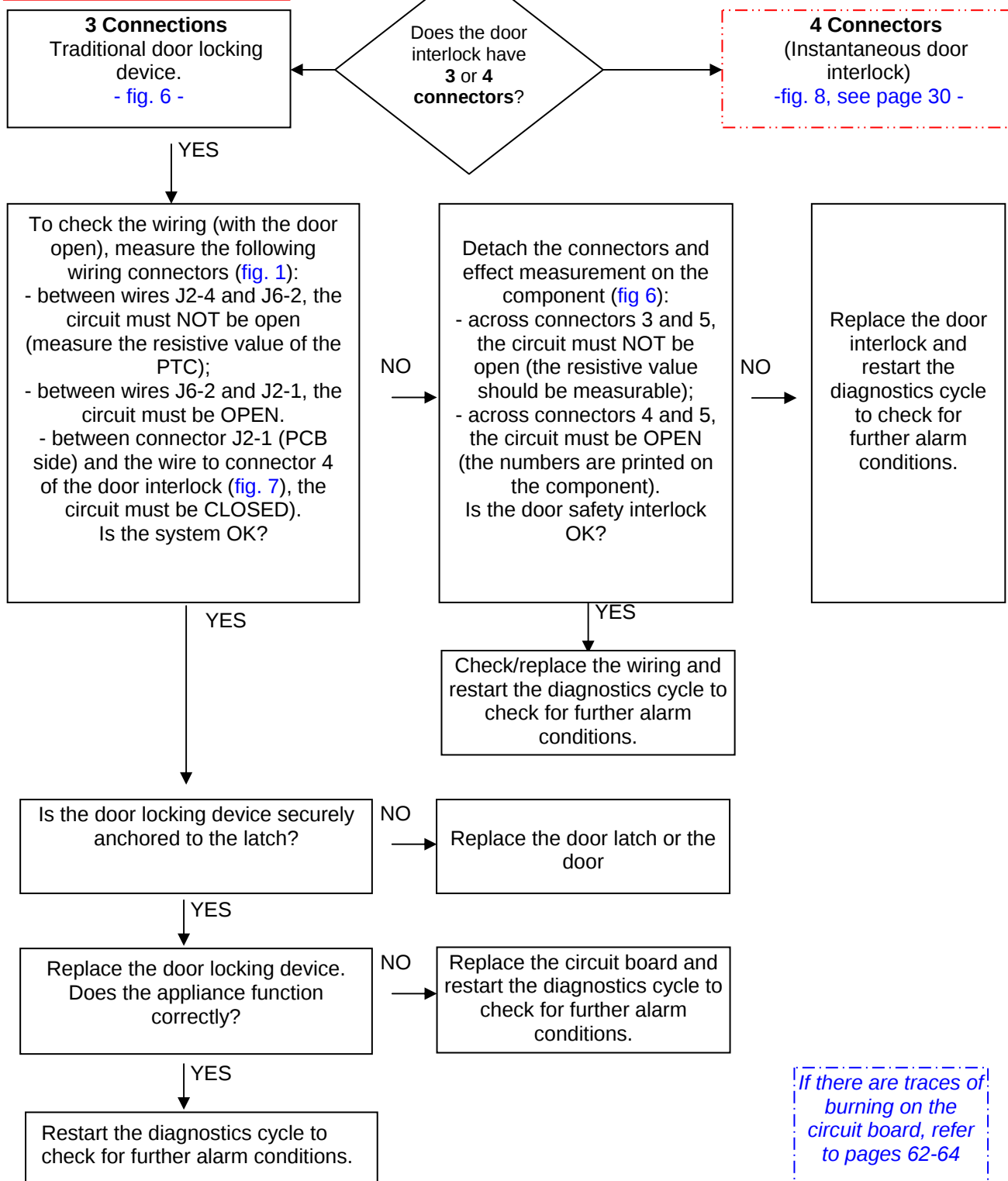


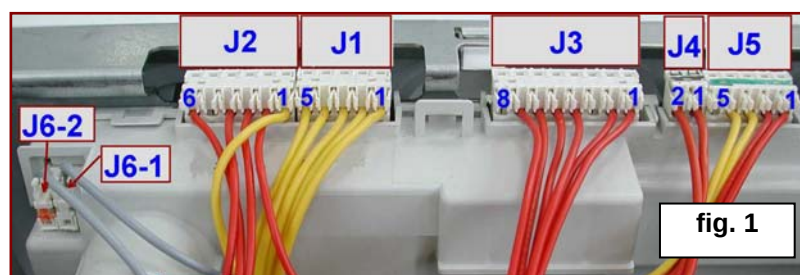
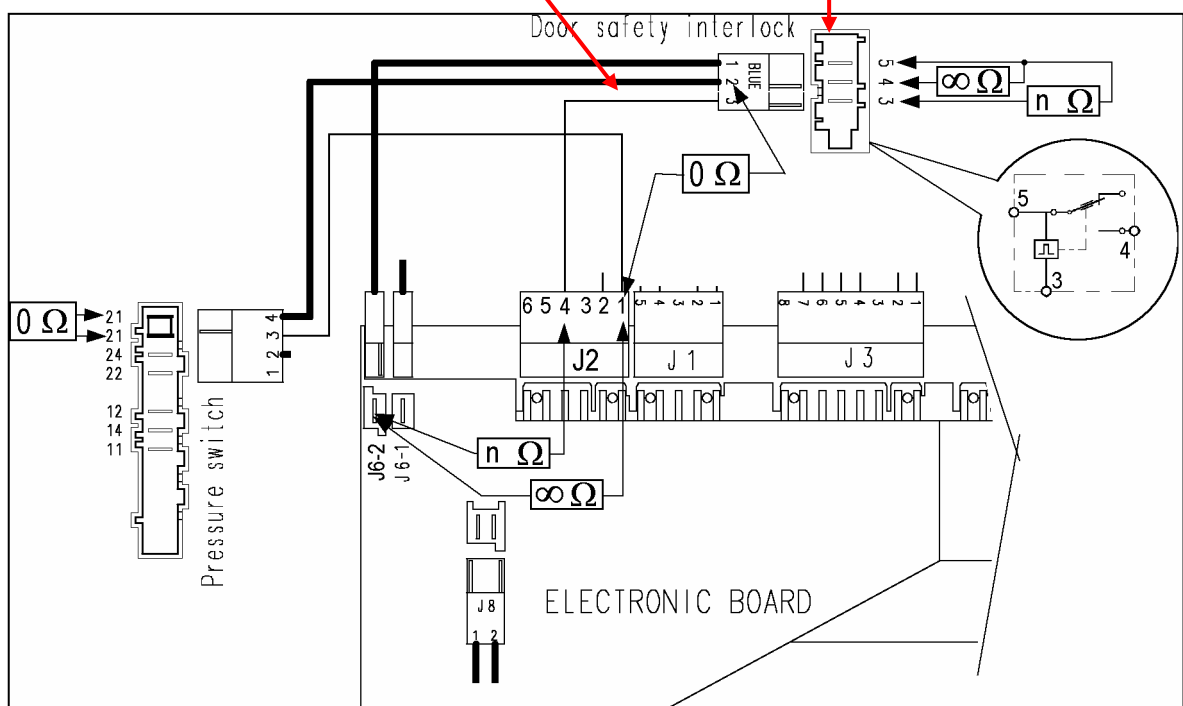
E42	E42: Problems with aperture of the door (section 1 – device with 3 contacts)	E42
	Maximum time exceeded (255 seconds for version with PTC / 5 impulses for instantaneous)	

Tests to be performed:



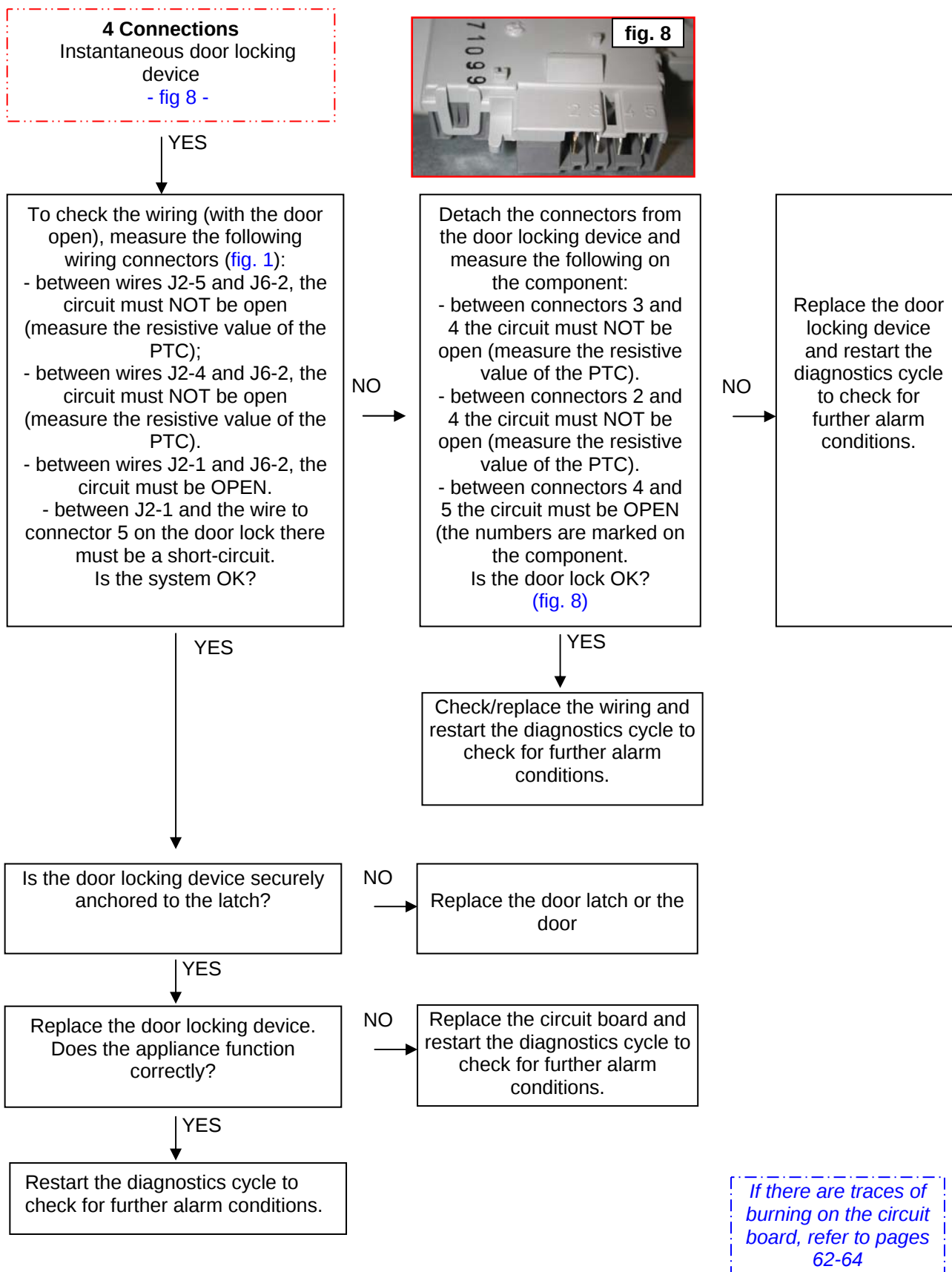
fig. 6

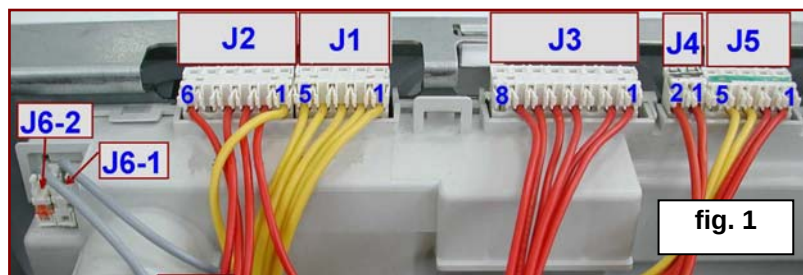
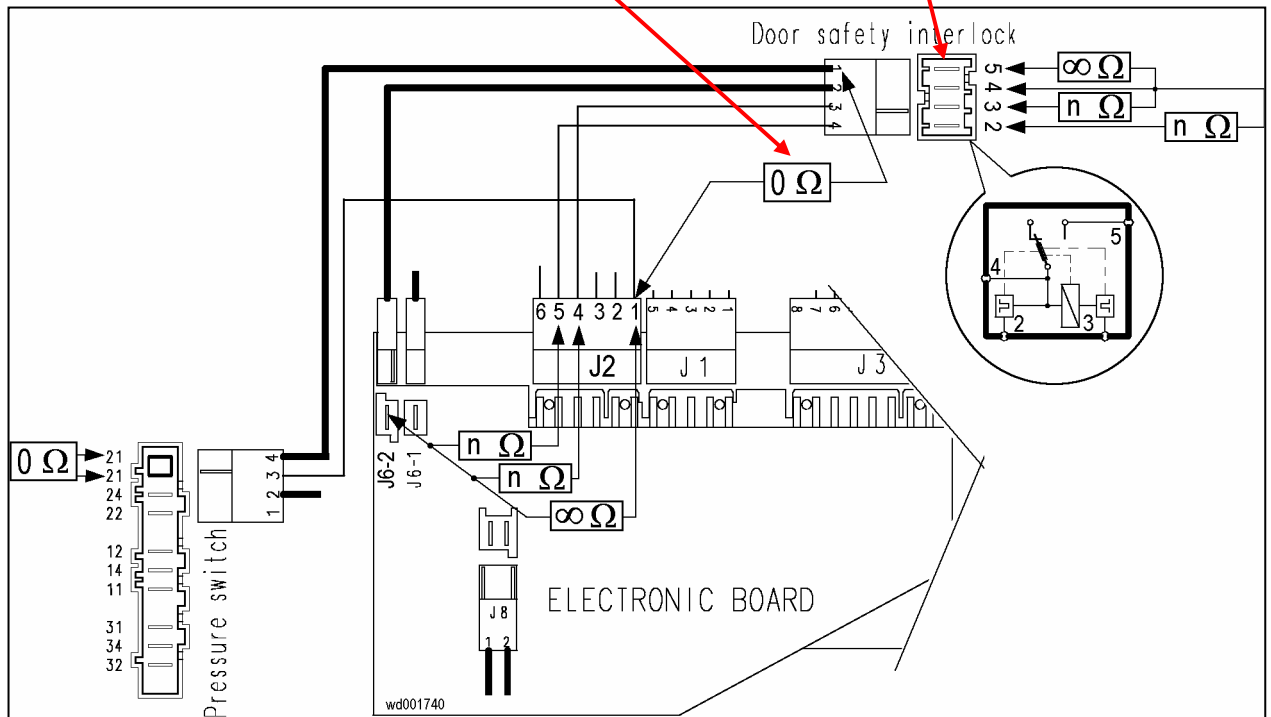
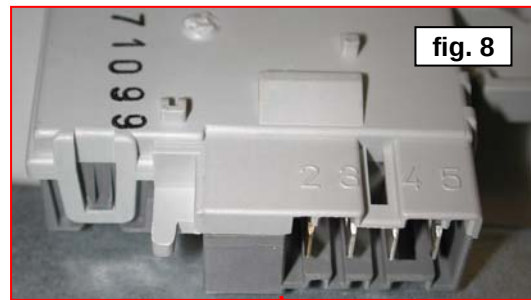




E42	E42: Problems with aperture of the door (section 2 – device with 4 contacts)	E42
	Maximum time exceeded (255 seconds for version with PTC / 5 impulses for instantaneous)	

Tests to be performed:



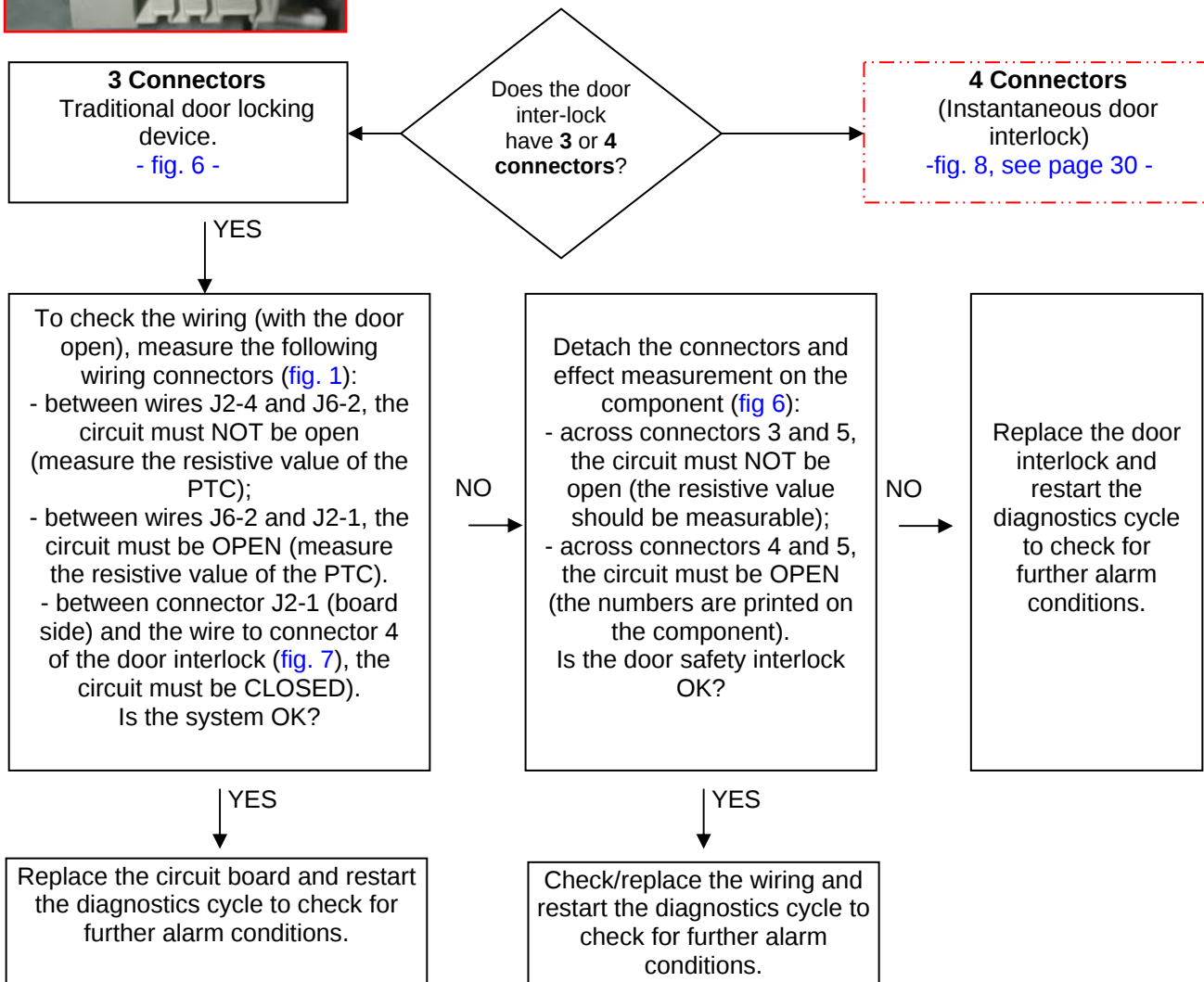


E43	E43: Problems with the triac which actions the door interlock – section 1 - device with 3 contacts	E43
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Tests to be performed:

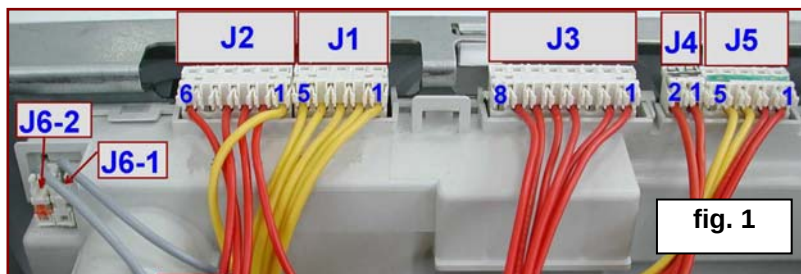
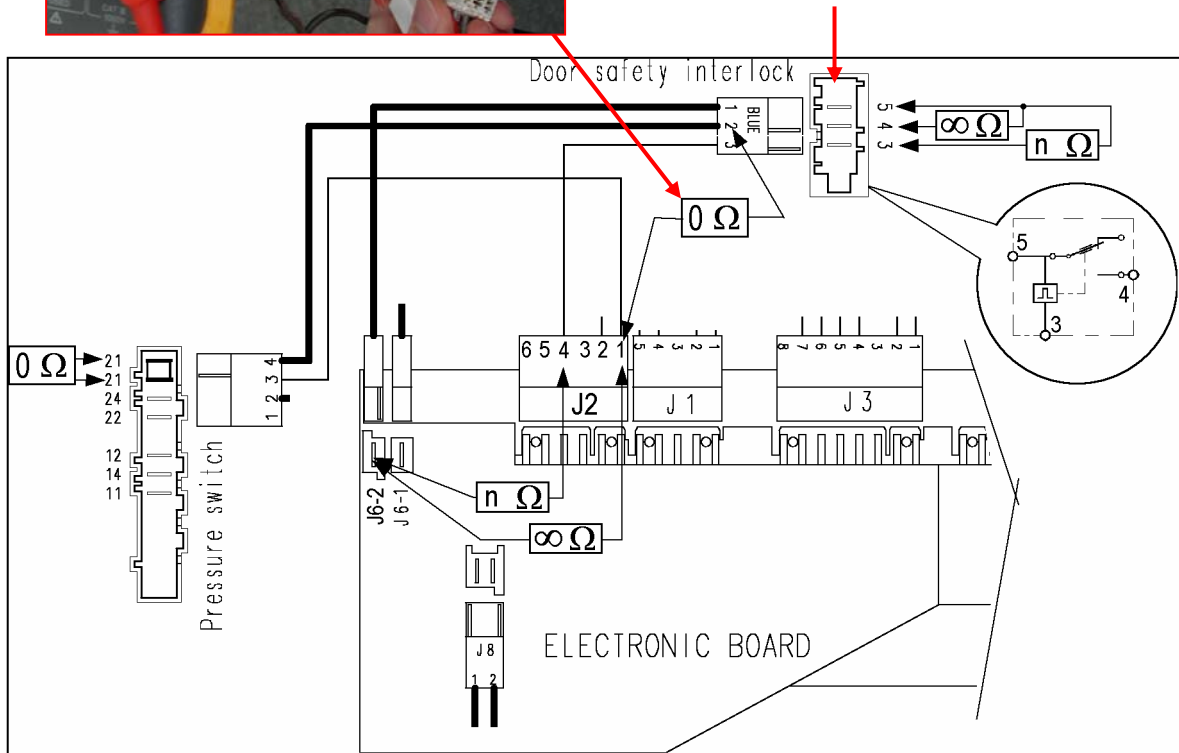


fig. 6



If there are traces of burning on the circuit board, refer to pages 62-64

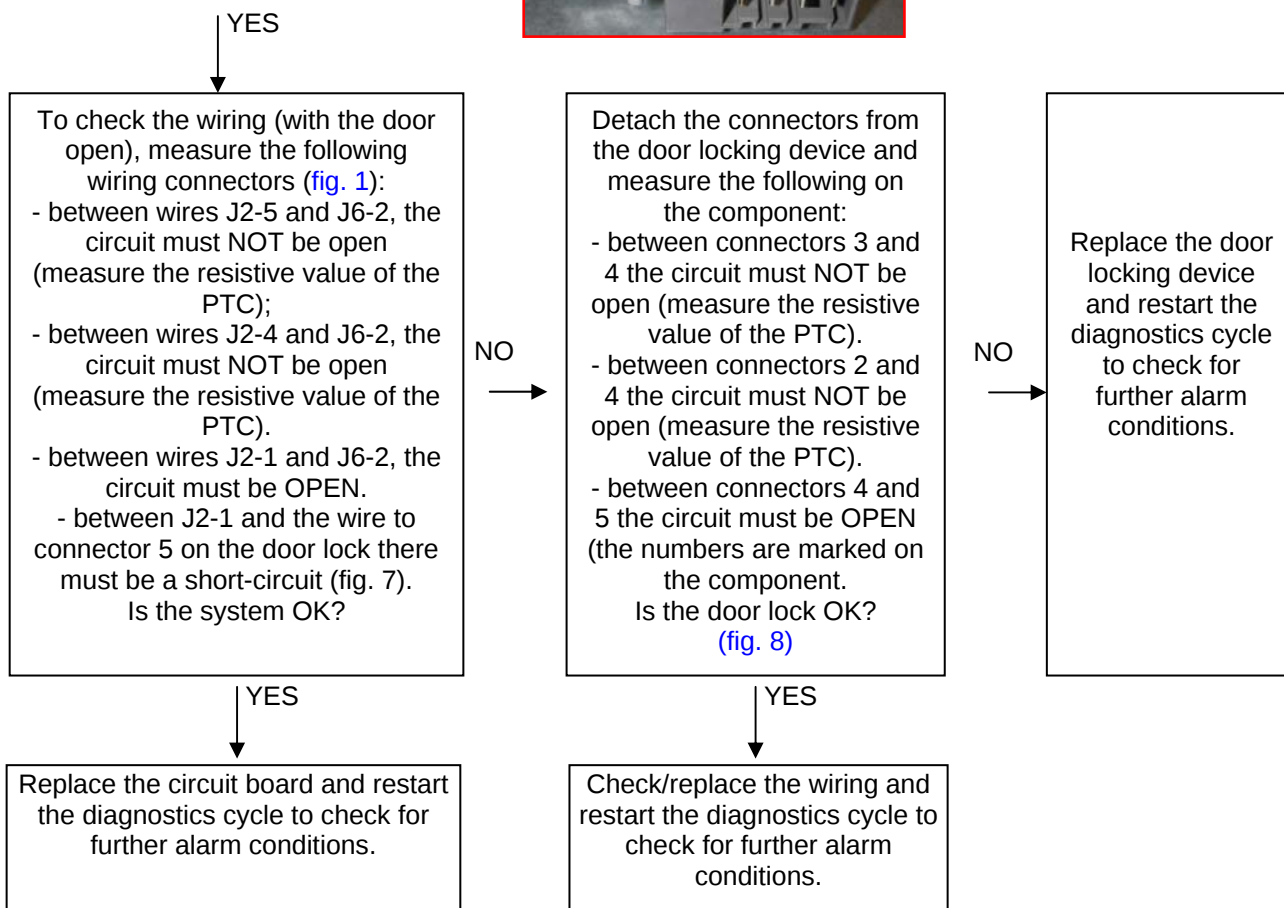
E43a



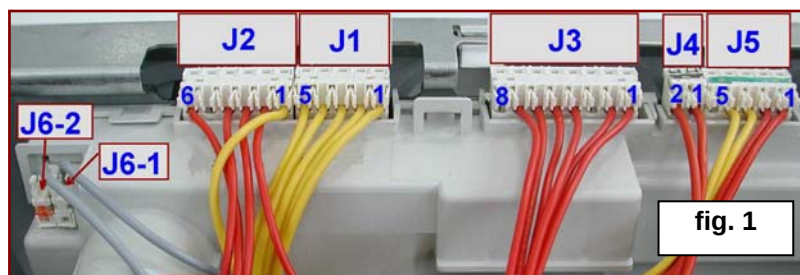
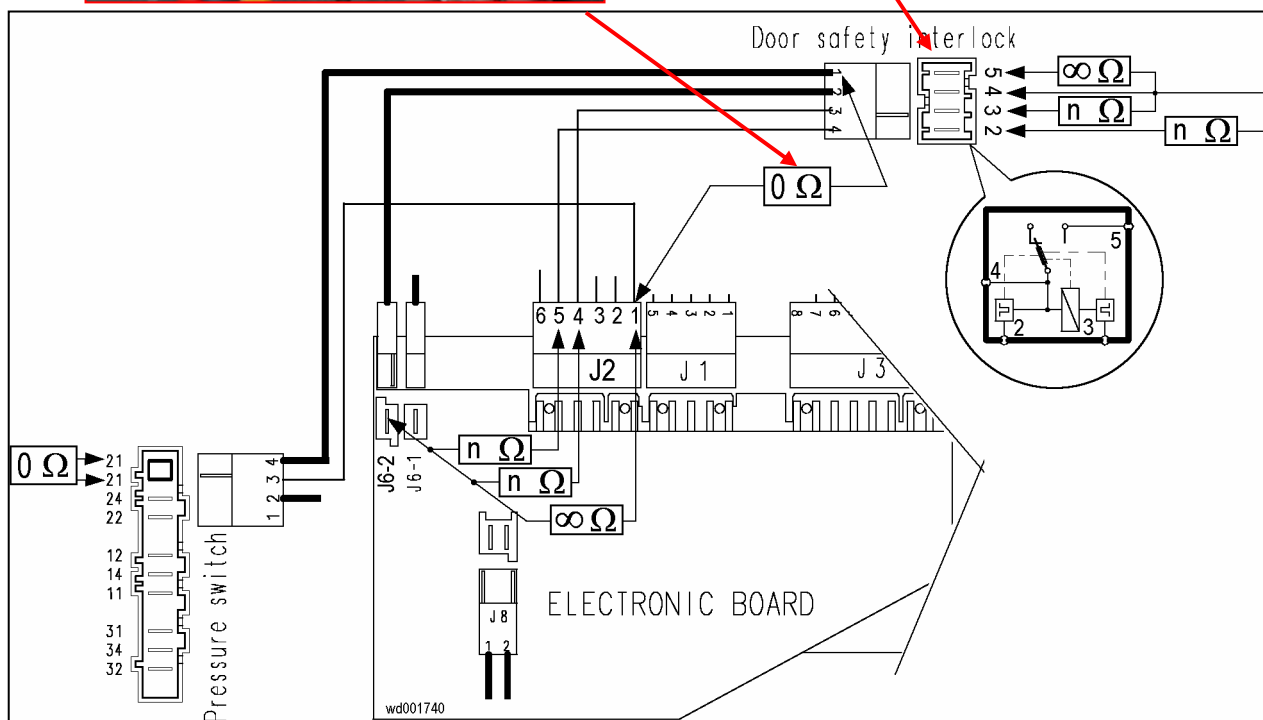
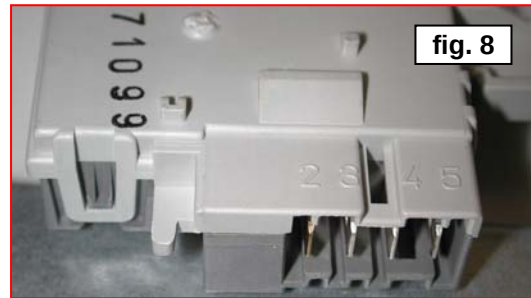
E43	E43: Problems with the triac which actions the door interlock – section 2 - device with 4 contacts	E43
------------	---	------------

Tests to be performed:

4 Connections
Instantaneous door locking device
- fig 8 -



If there are traces of burning on the circuit board, refer to pages 62-64



E44	E44: Door closure «sensing» circuit faulty	E44
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Tests to be performed:

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

E45	E45: Problems with the «sensing» circuit of the triac that actions the door interlock	E45
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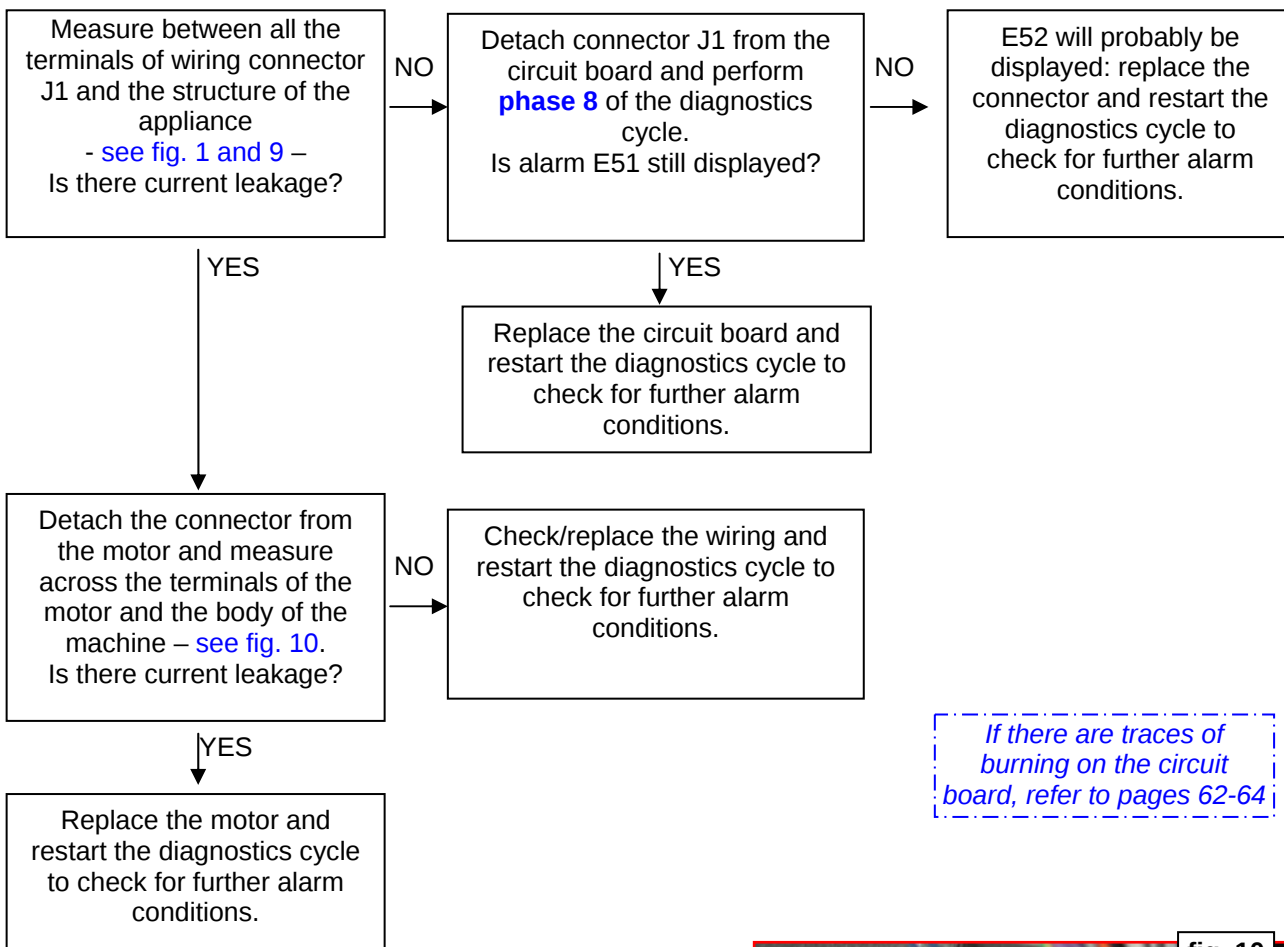
Tests to be performed:

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

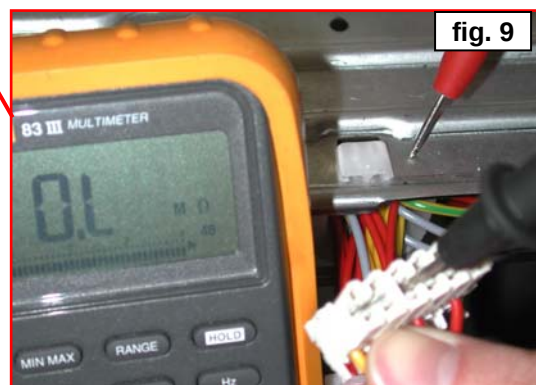
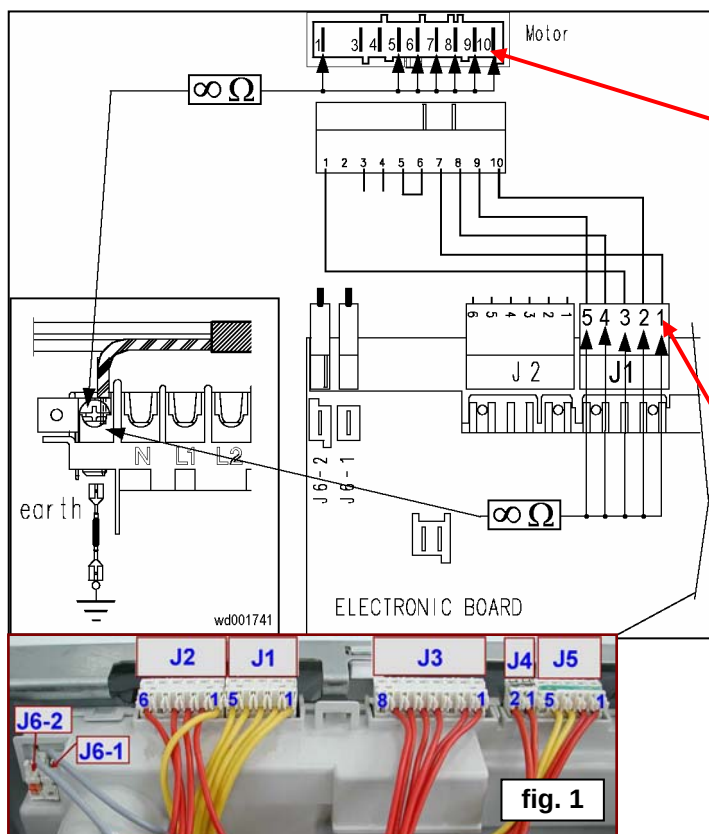
If there are traces of burning on the circuit board, refer to pages 62-64

E51	E51: Motor power triac short-circuited 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)	E51
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Tests to be performed:

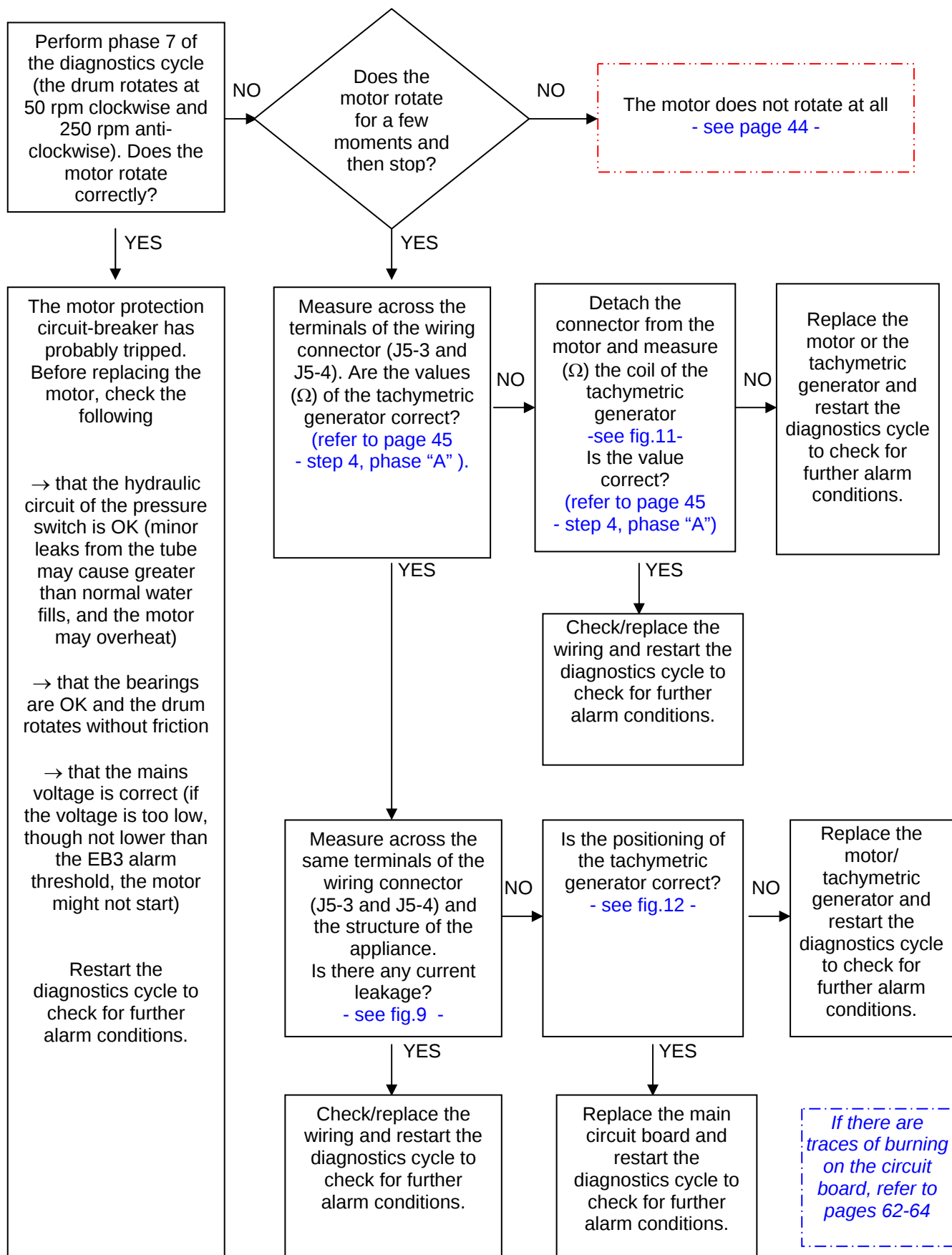


If there are traces of burning on the circuit board, refer to pages 62-64

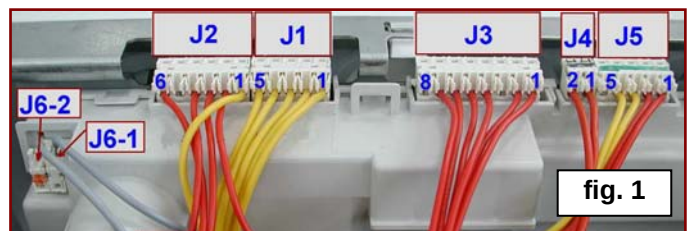
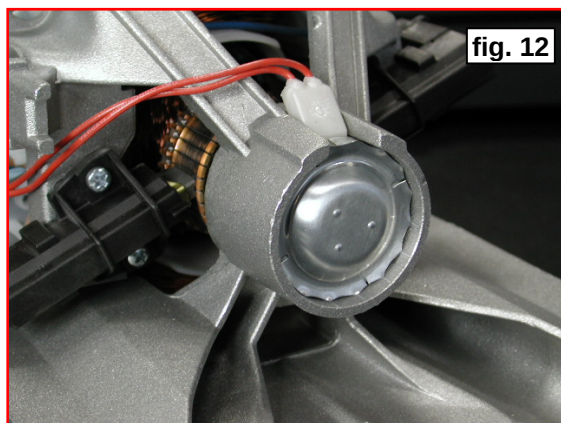
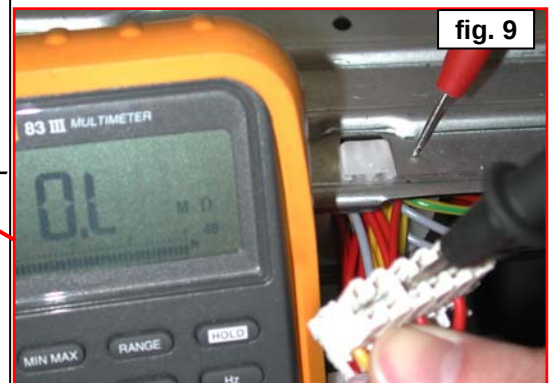
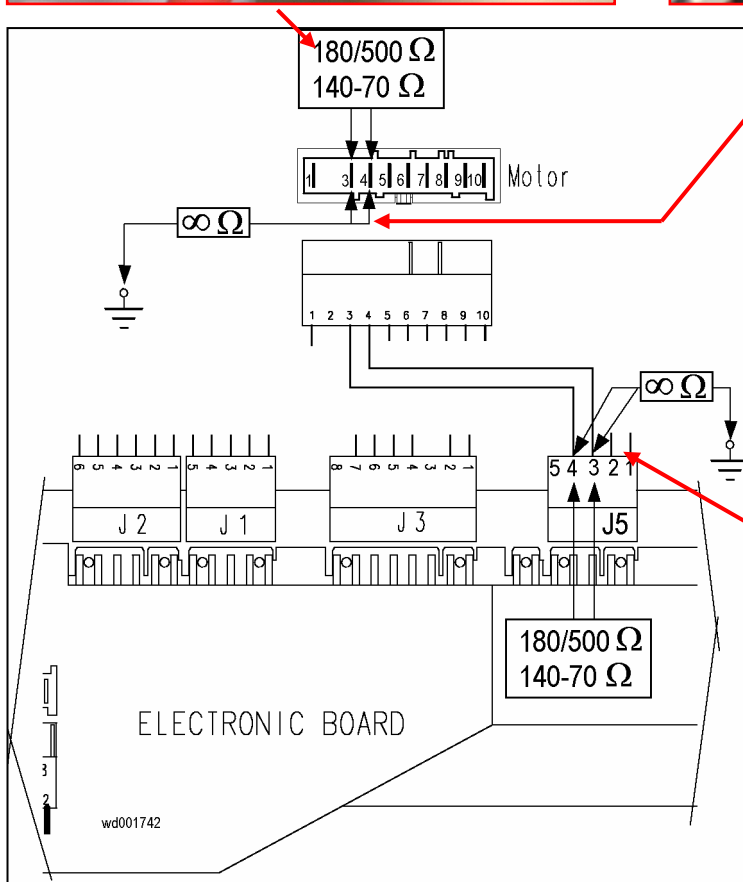
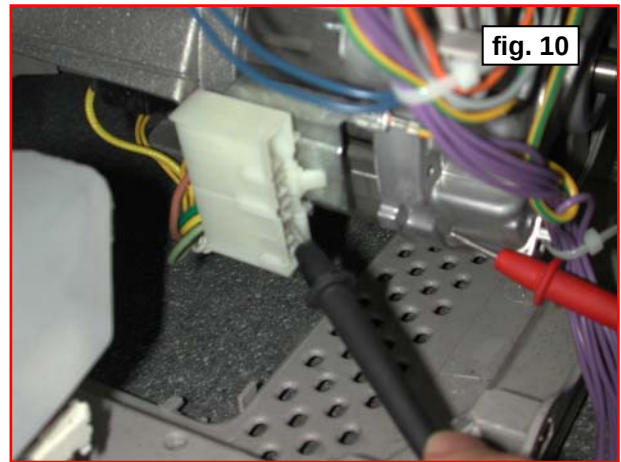
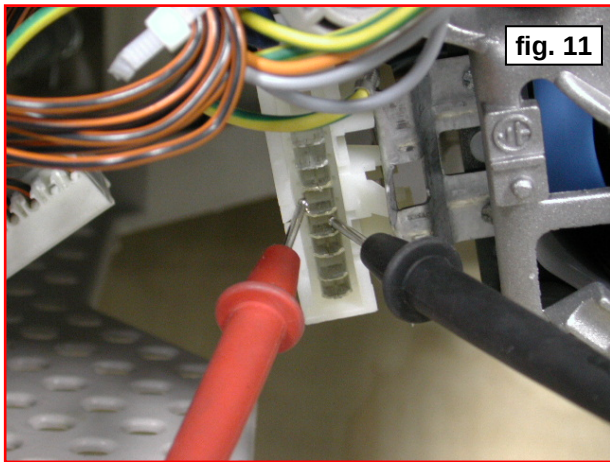


E52	E52: No signal from the motor tachymetric generator (section 1)	E52
	Cycle blocked after 5 attempts during the cycle or immediately if detected at the start or during diagnostics	

Tests to be performed:



E52a



E52	E52: No signal from the tachymetric generator (section 2)	E52
	Cycle blocked after 5 attempts during the cycle or immediately if detected at the start or during diagnostics	

Tests to be performed:

The motor does not rotate at all

To check the wiring, measure (Ω -fig. 11) across the following terminals of the circuit board connector (fig.1) and compare with the correct values (see page 45: step 4 – motor parameters)

- across J1-1 and J1-2, the value must be as in step 4 - B (Stator)
 - across J1-1 and J1-3, if present, the value must be as in step 4 - E (stator $\frac{1}{2}$ range).
 - across J1-4 and J1-5, the value must be as in step 4-D (rotor).
- Are these values correct?

YES

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

NO

Check the motor as described on page 45.

Is the motor OK?

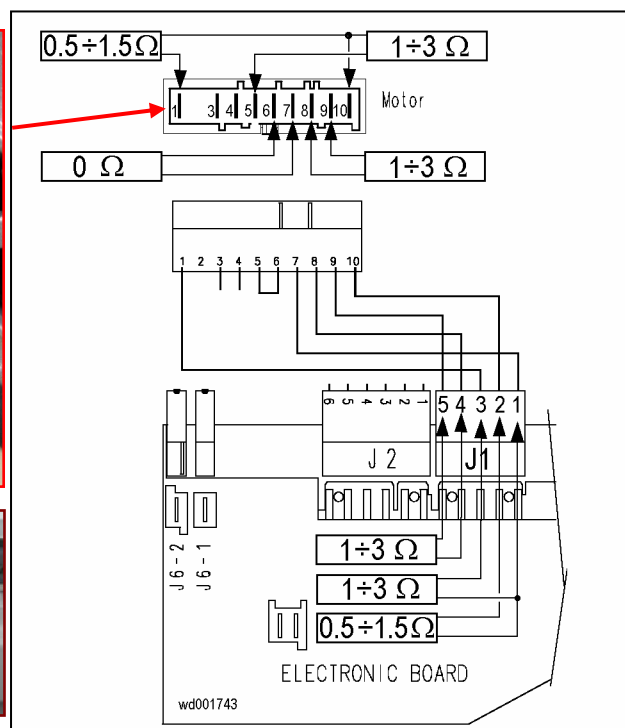
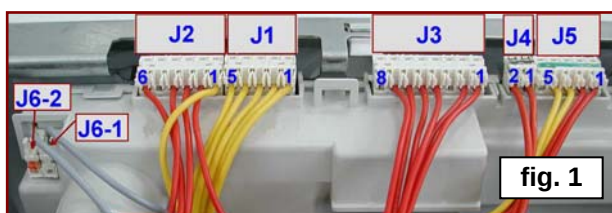
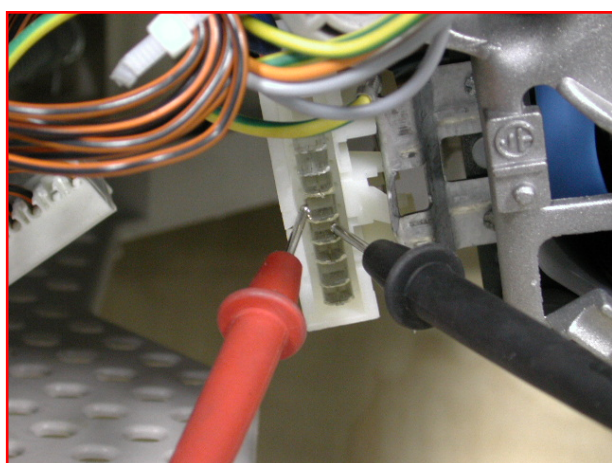
NO

Replace the motor and restart the diagnostics cycle to check for further alarm conditions.

YES

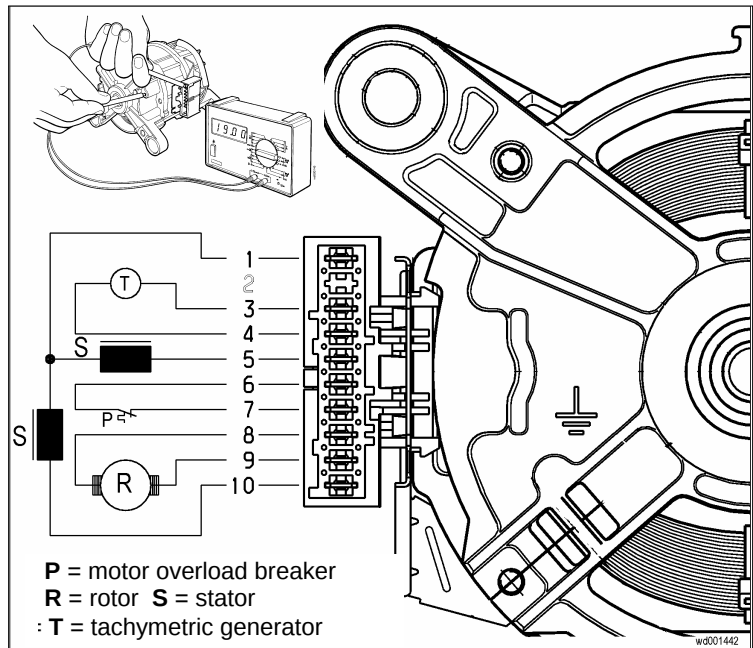
Check/replace the wiring and restart the diagnostics cycle to check for further alarm conditions.

If there are traces of burning on the circuit board, refer to pages 62-64



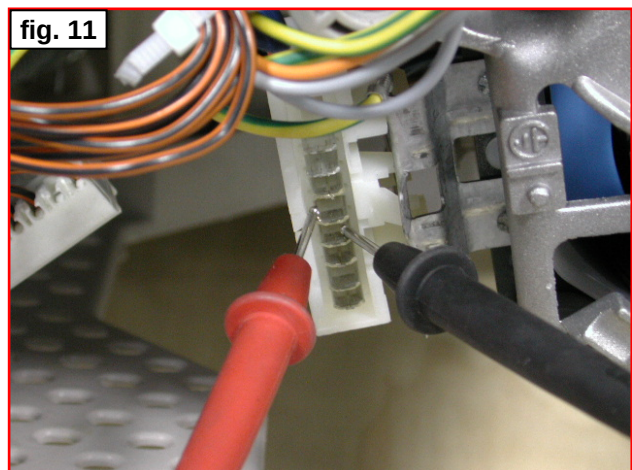
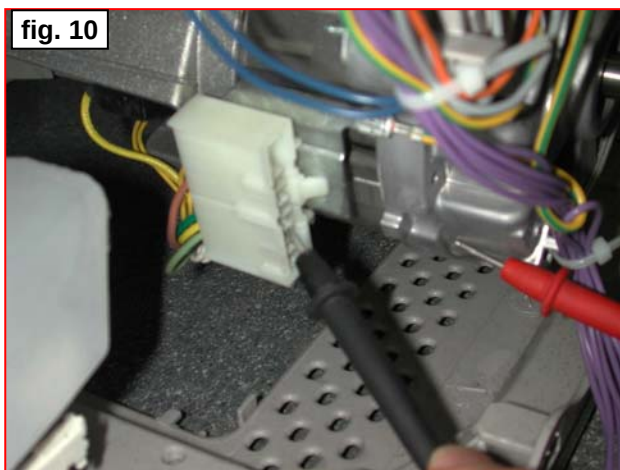
Procedure for checking commutator motors

- 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).



	Terminals on motor terminal block	Checks	SOLE Motor [Ω]	F.H.P. Motor [Ω]	CE.SE.T. Motor [Ω]
A	3 - 4	Winding of tachymetric generator	171 ÷ 196	126 ÷ 147	64 ÷ 73
			469 ÷ 540		
B	5 - 10	Stator winding (full range)	1.0 ÷ 2.2	1.0 ÷ 3.0	1.0 ÷ 2.0
C	6 - 7	Overheating breaker	0	0	0
D	8 - 9	Rotor winding	1.5 ÷ 3.0	1.5 ÷ 3.0	1.5 ÷ 3.0
E	1 - 10	Stator winding (half range, presence of terminal 1)	0.5 ÷ 1.0	0.5 ÷ 1.5	0.5 ÷ 1.0

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
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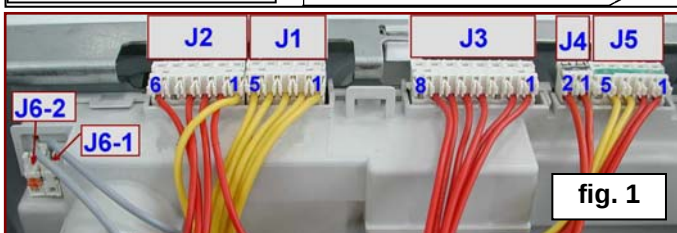
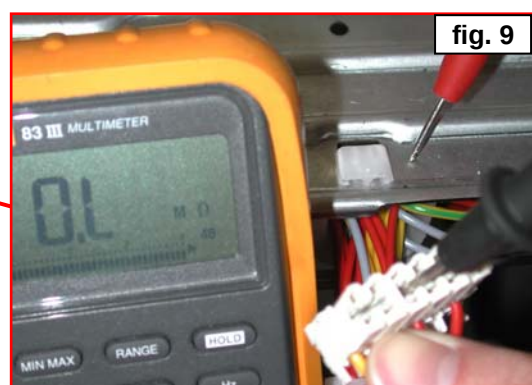
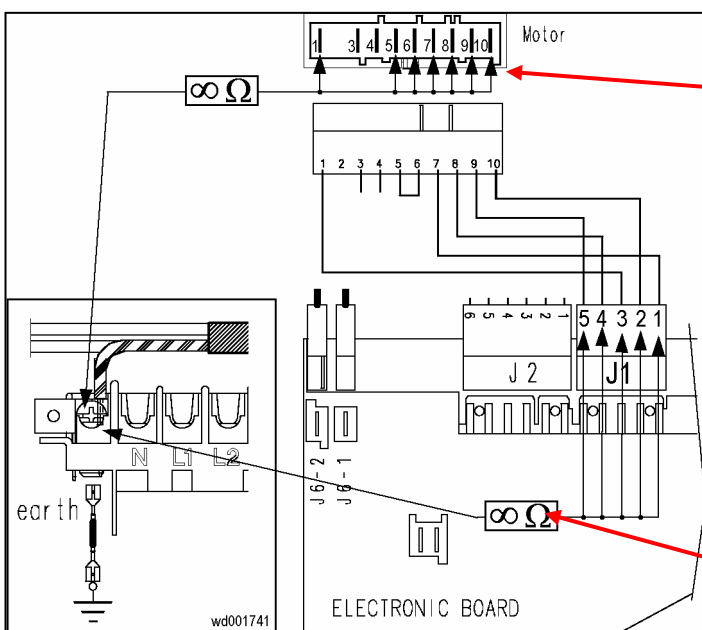
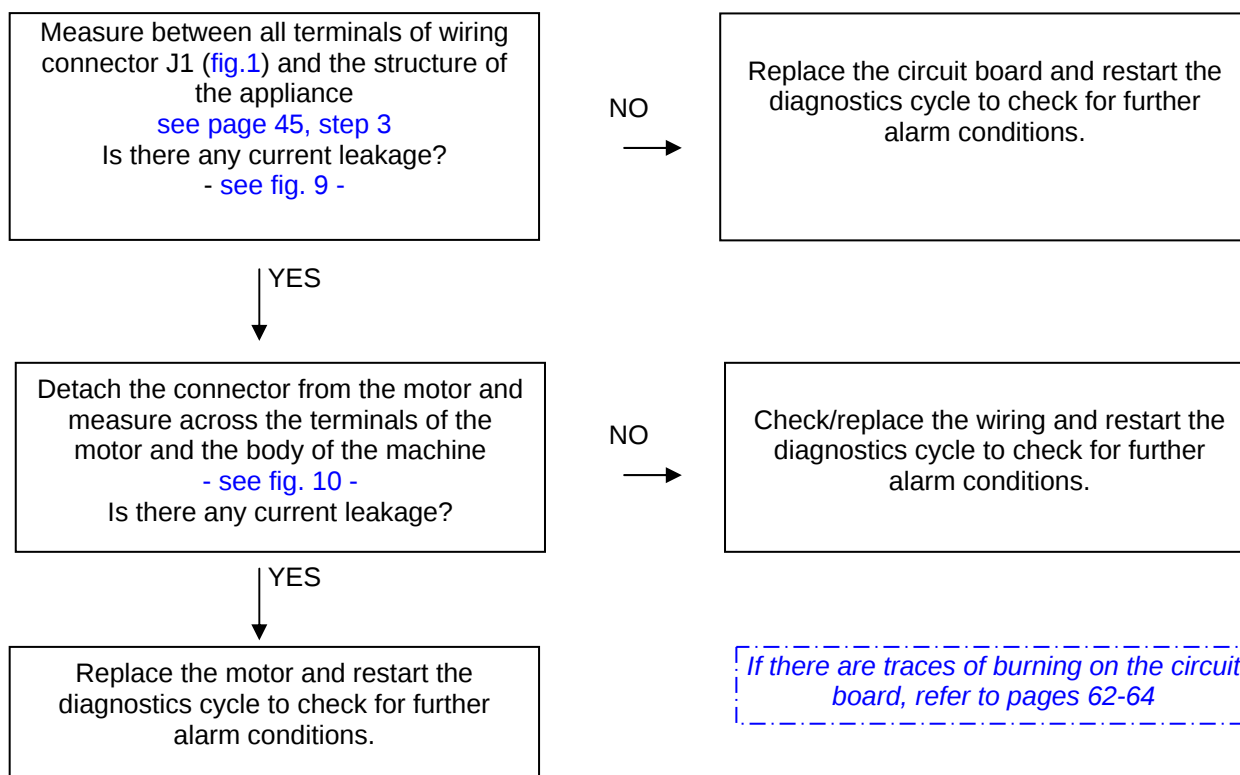
Tests to be performed:

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

If there are traces of burning on the circuit board, refer to pages 62-64

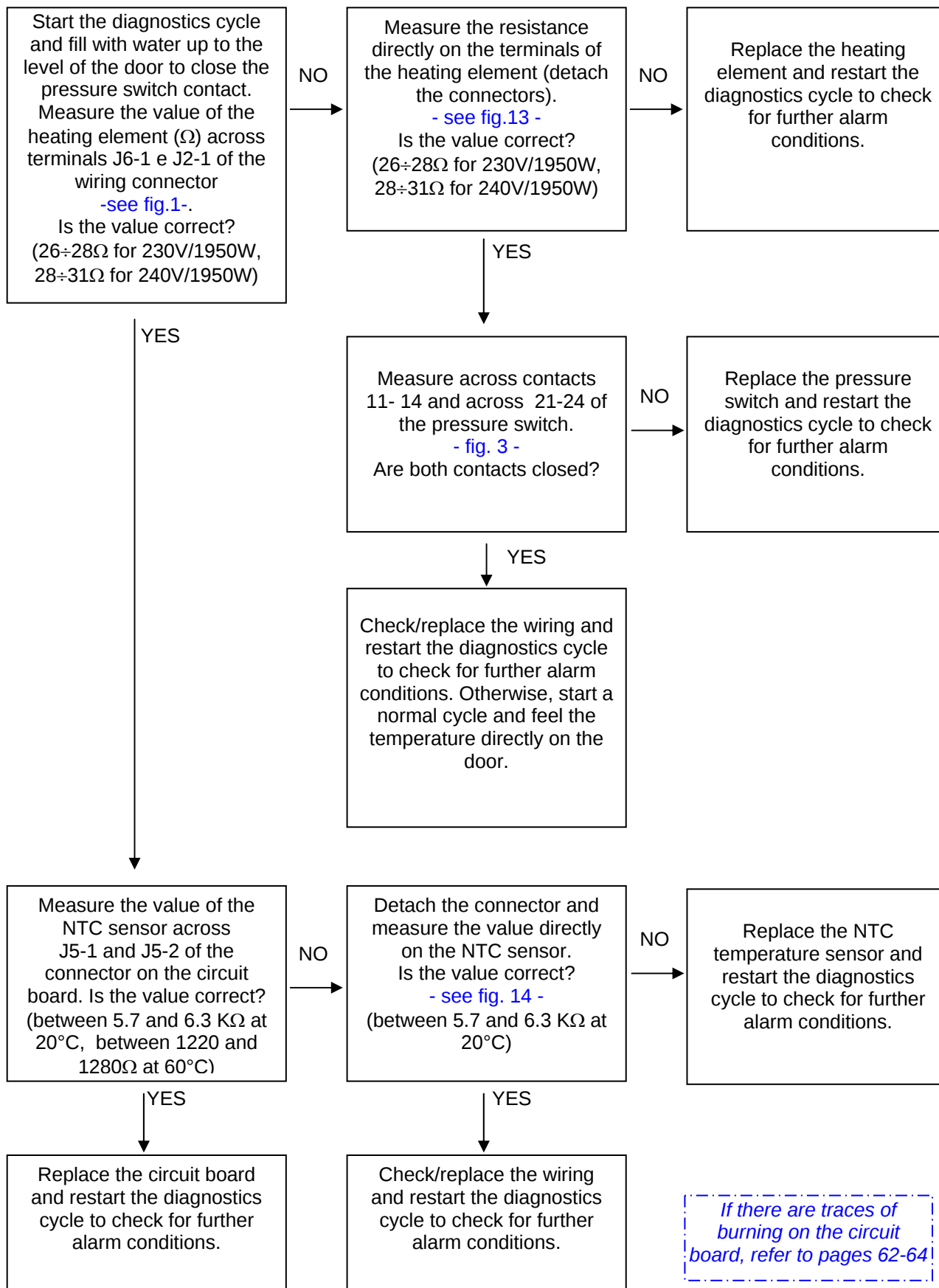
E54	E54: Motor relay contacts sticking	E54
	Voltage in the motor circuit even when the motor should be inoperative	

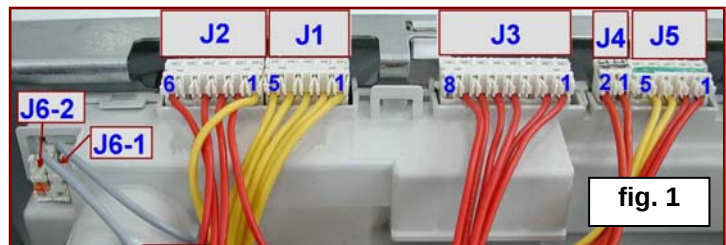
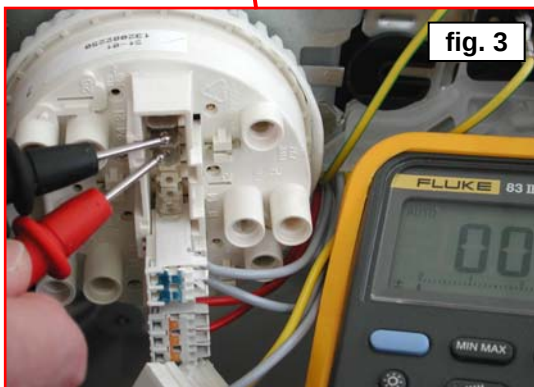
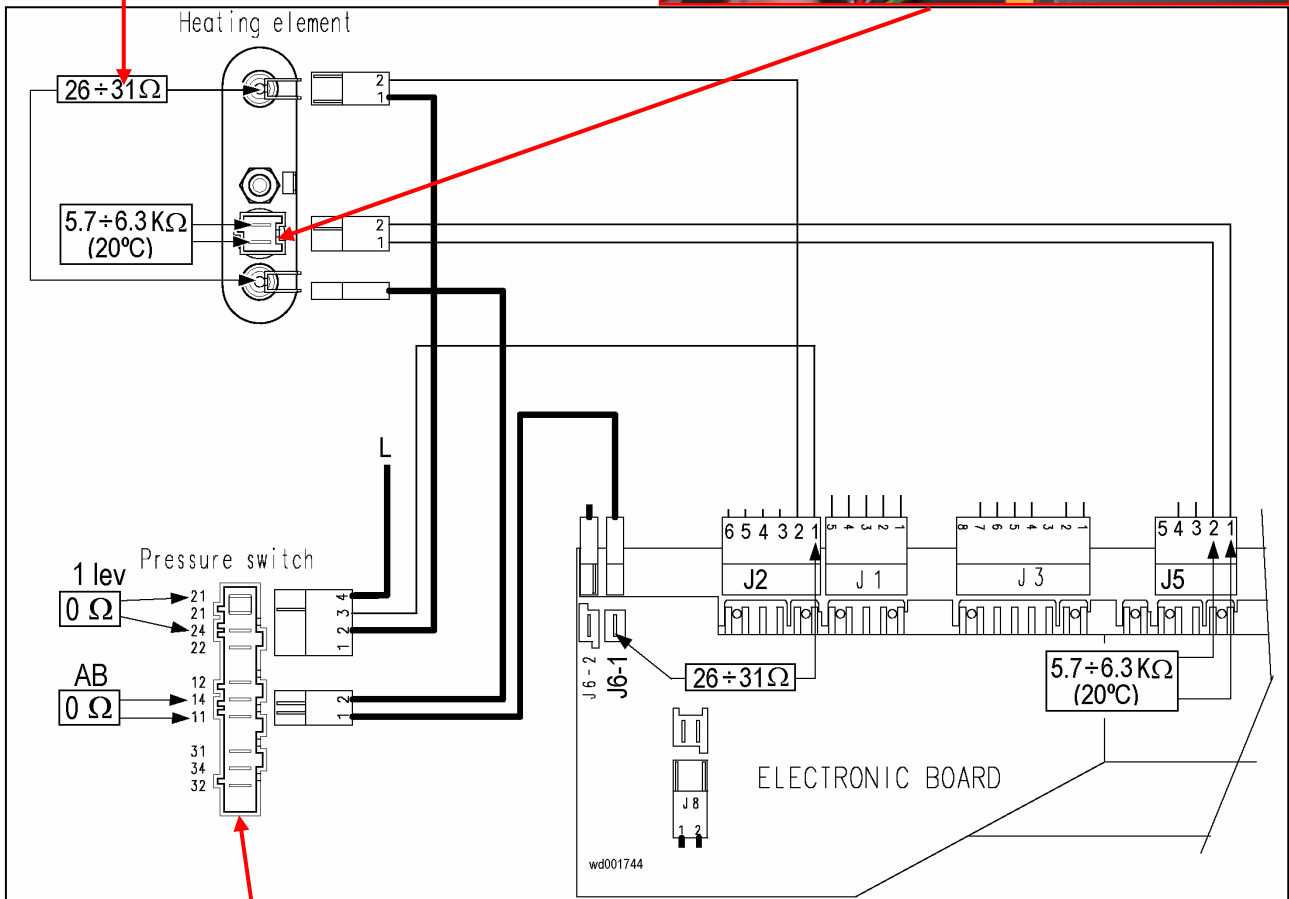
Tests to be performed:



E61	E61: Insufficient heating during washing	E61
	Maximum heating time exceeded	

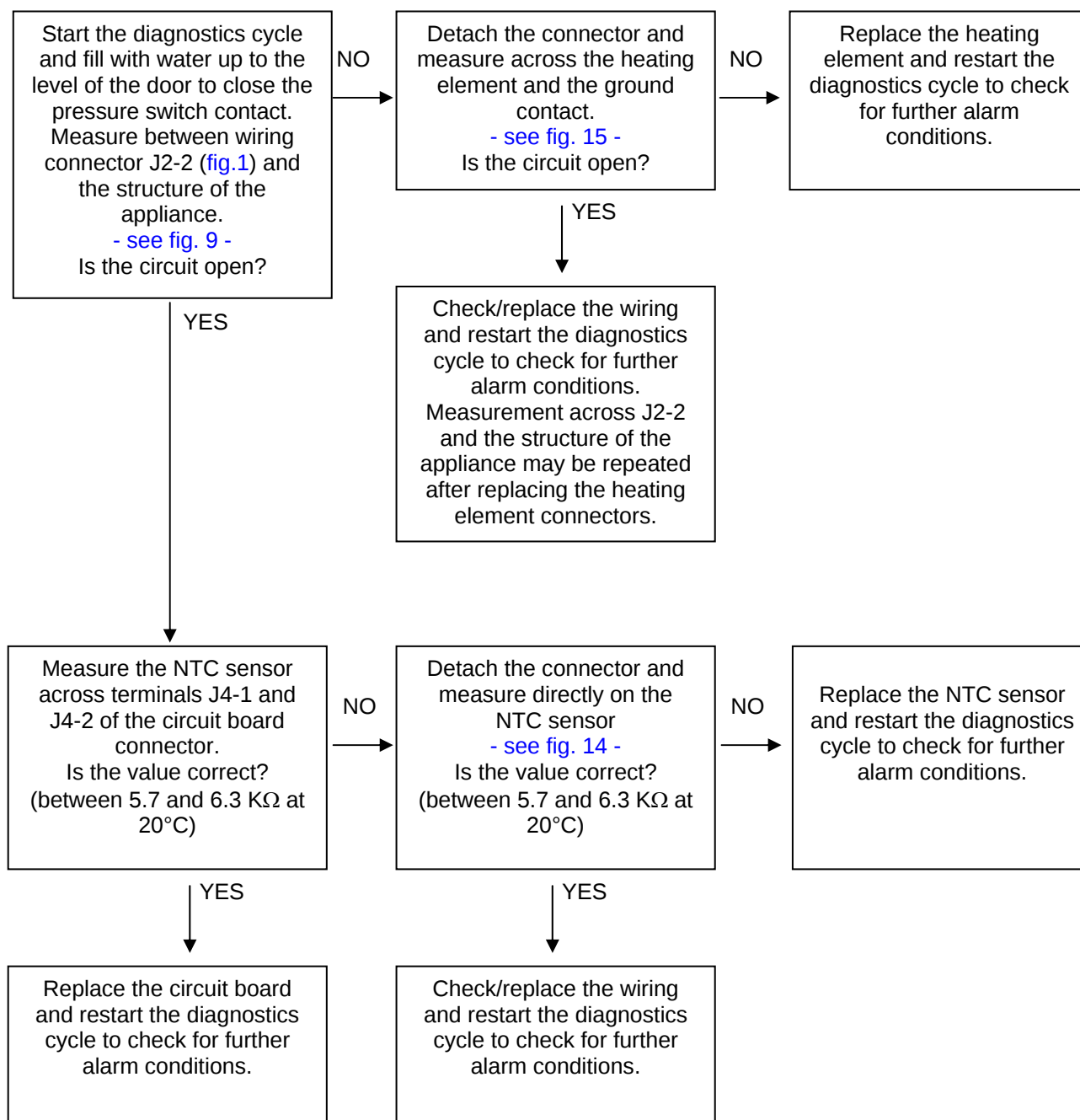
Tests to be performed:



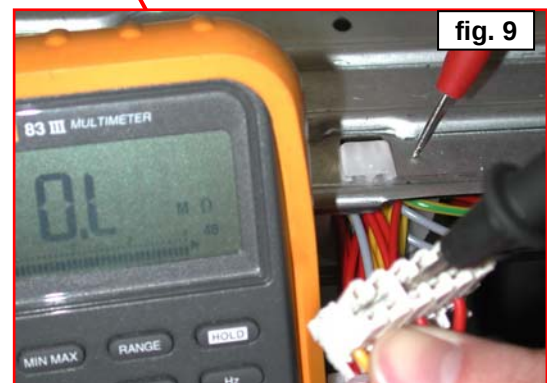
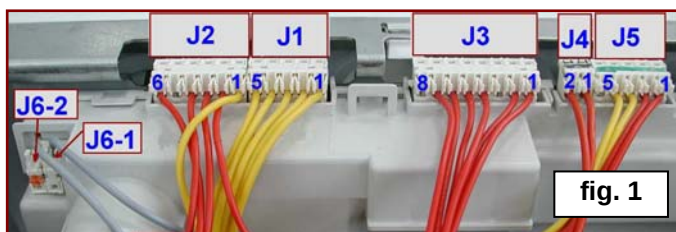
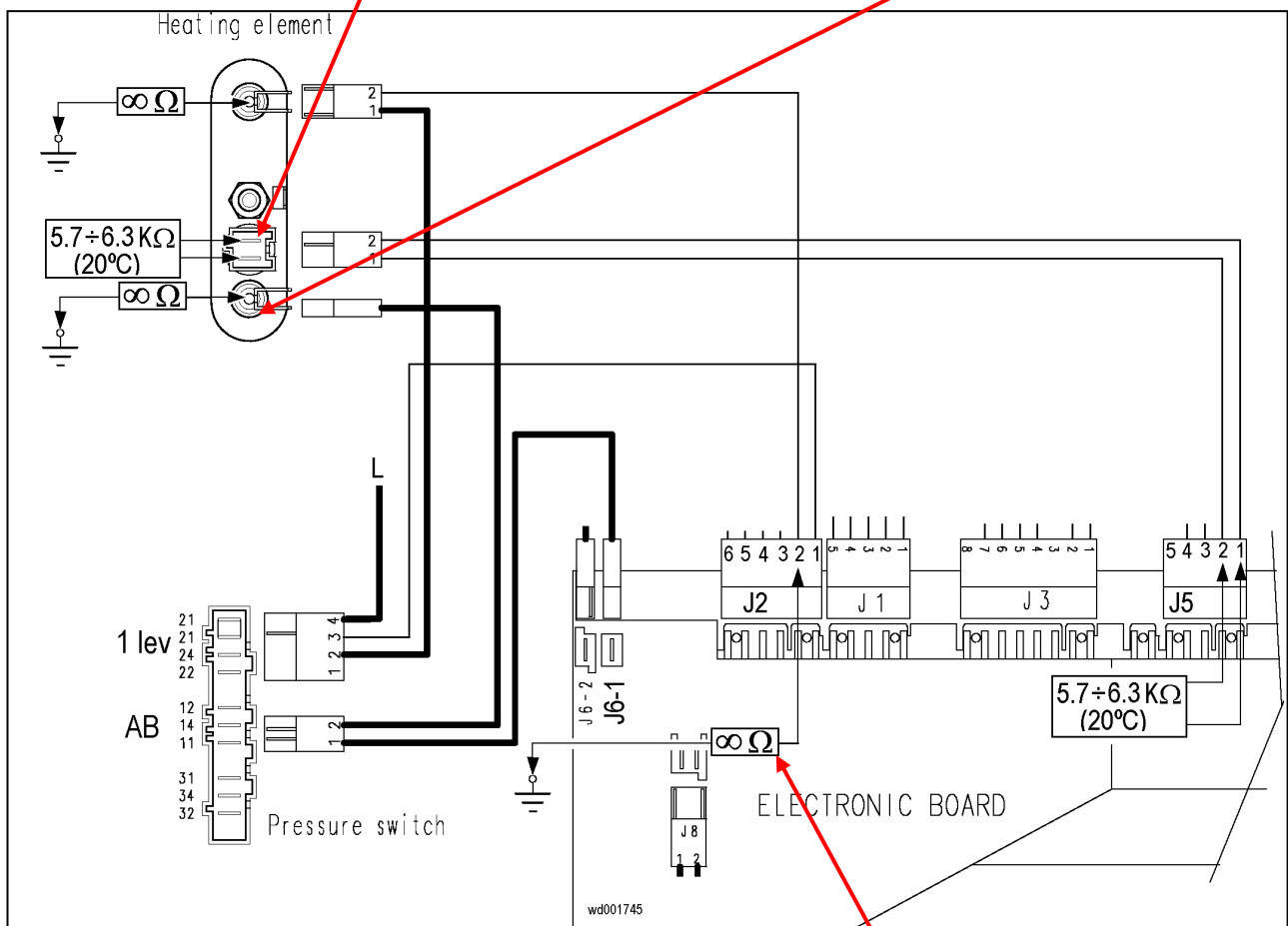
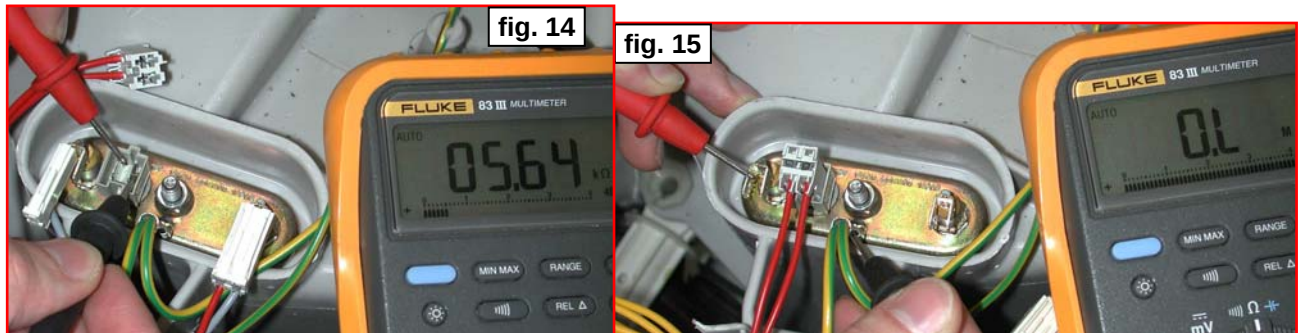


E62	E62: Overheating during washing	E62
	The temperature of the NTC sensor exceeds 88°C for more than 5 minutes	

Tests to be performed:



If there are traces of burning on the circuit board, refer to pages 62-64



Tests to be performed:

Measure across connector J2-2 on the circuit board and the structure of the appliance
(Fig. 1 and 9)
Is there any current leakage?

NO
→

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

YES
↓

Detach the connector and measure across the heating element and the ground contact.
- fig. 15 -
Is the circuit open?

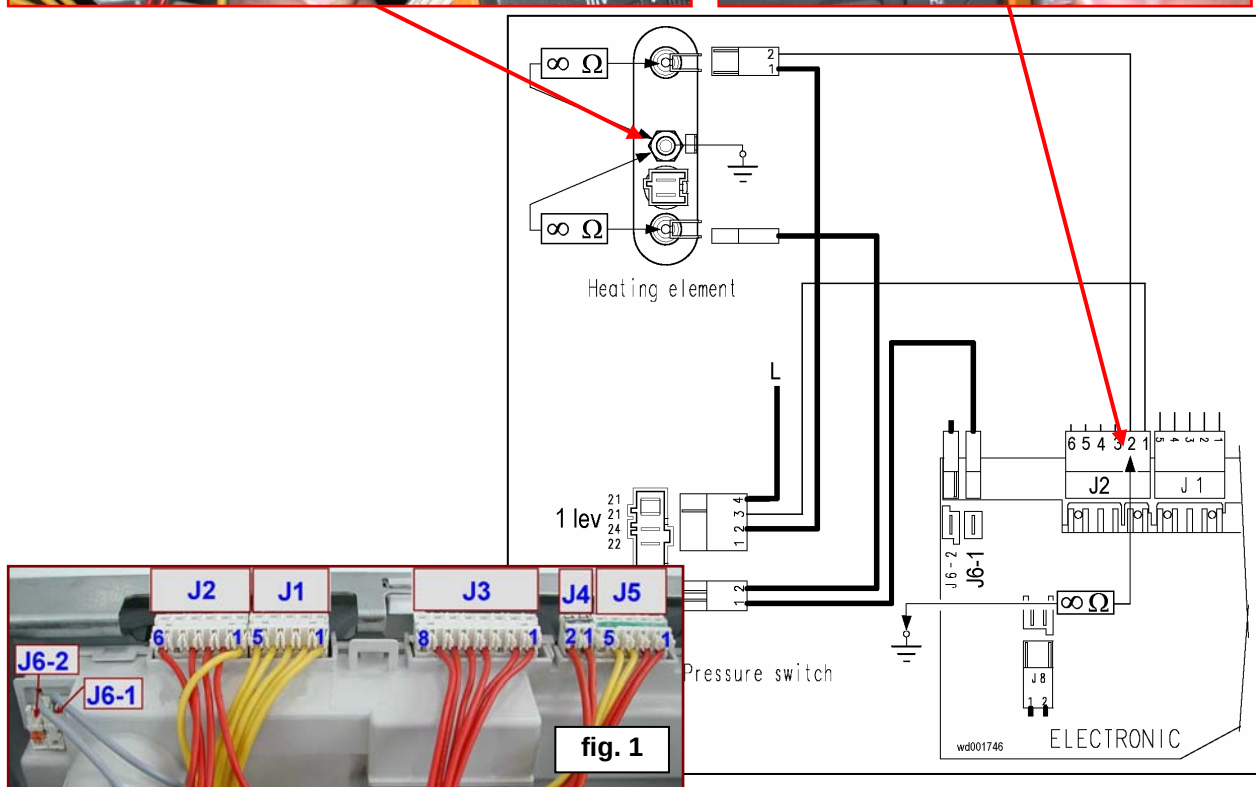
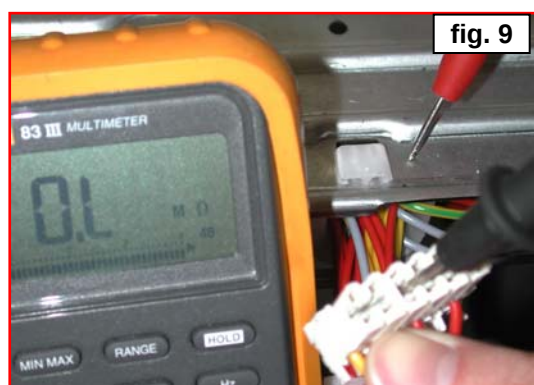
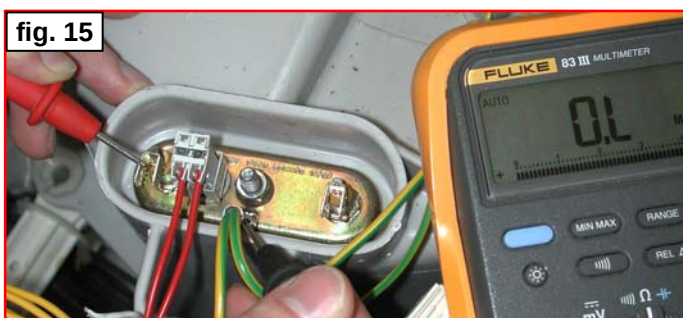
NO
→

Replace the heating element and restart the diagnostics cycle to check for further alarm conditions.

YES
↓

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

If there are traces of burning on the circuit board, refer to pages 62-64



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

Tests to be performed:

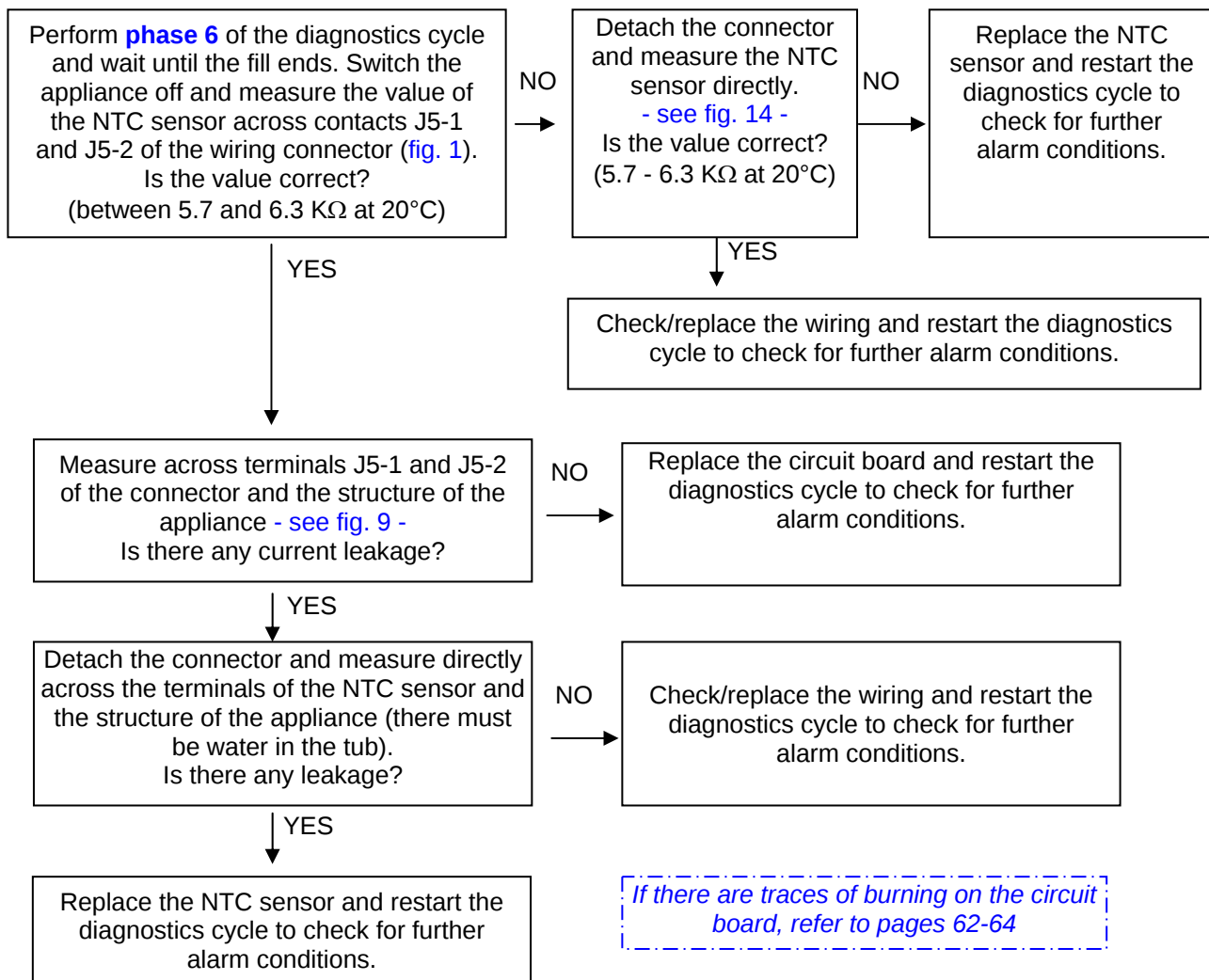


fig. 14



fig. 9

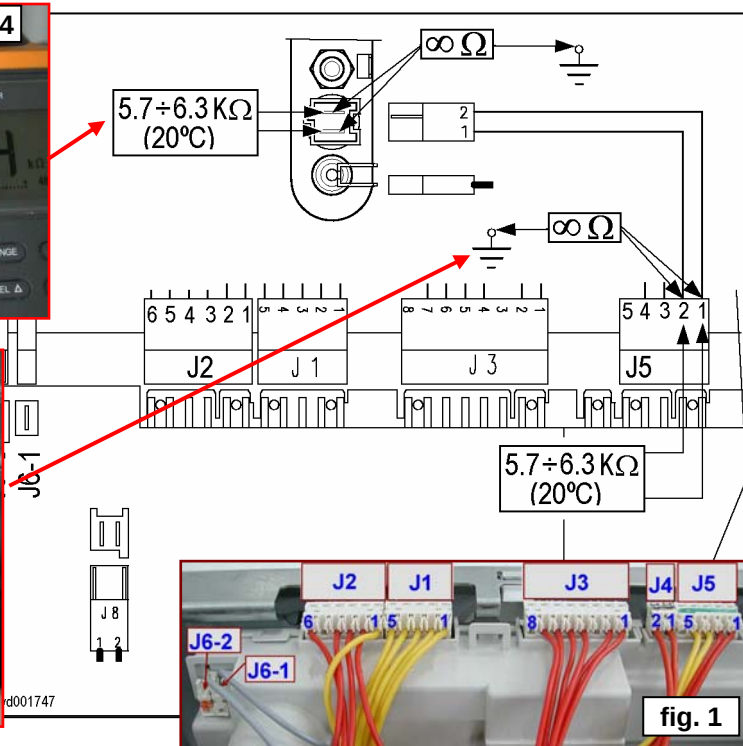
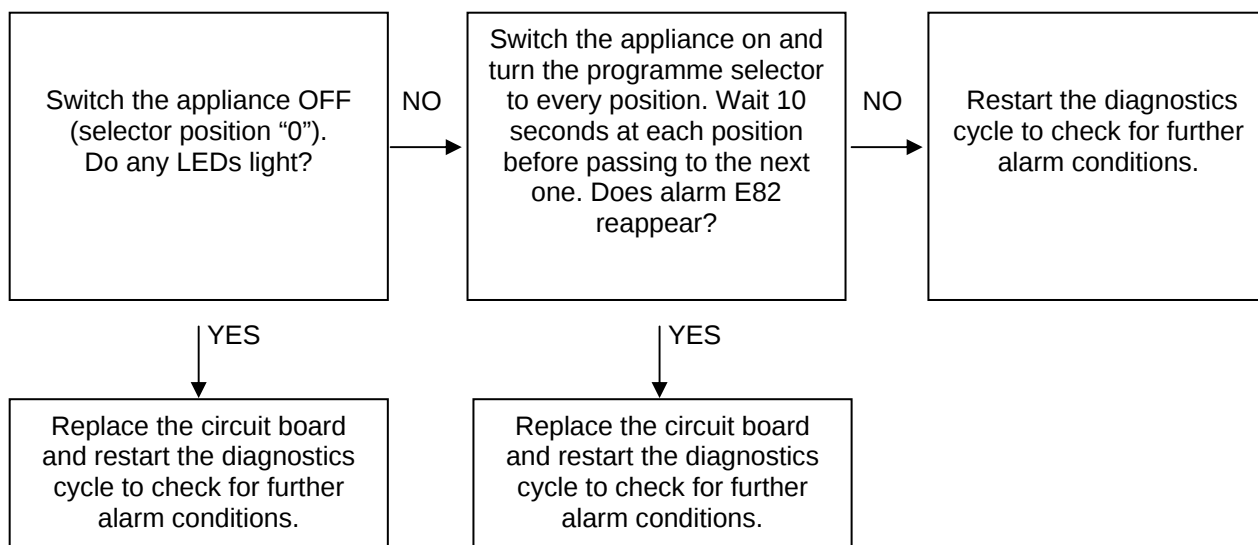


fig. 1

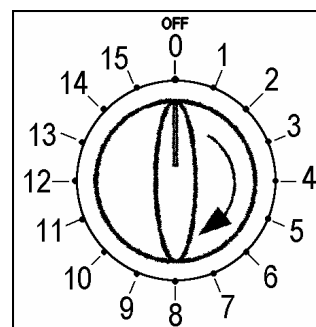
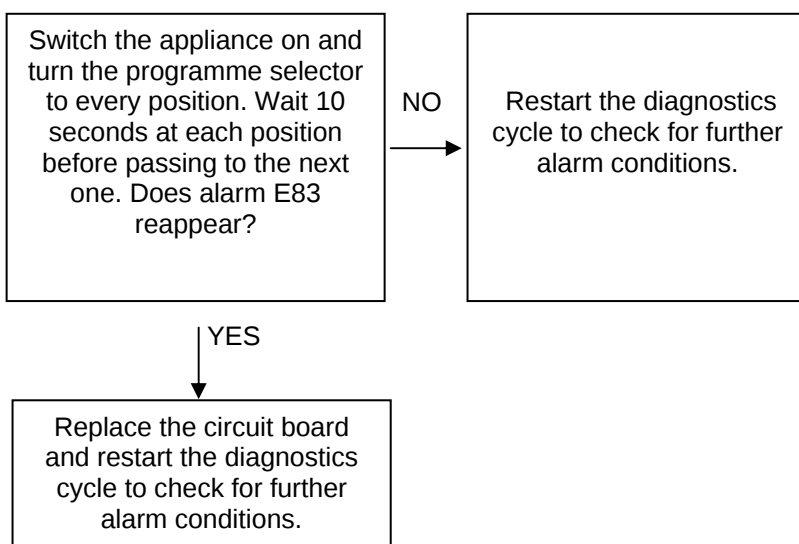
E82	E82: Error in reading the RESET/OFF position of the programme selector	E82
	Reading of position "0" of the selector when the appliance is switched on, or configuration error	

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:

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

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

Tests to be performed:

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

E95	E95: Communications error between microprocessor and the programme memory stored in the board (EEPROM)	E95
	Error detected during reading or writing of the EEPROM	

Tests to be performed:

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

E96	E96: Incongruence between control panel version and configuration data	E96
	Difference between the configuration data and the data that identify the type of control panel when the appliance is switched on (vertical or horizontal buttons)	

Tests to be performed:

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

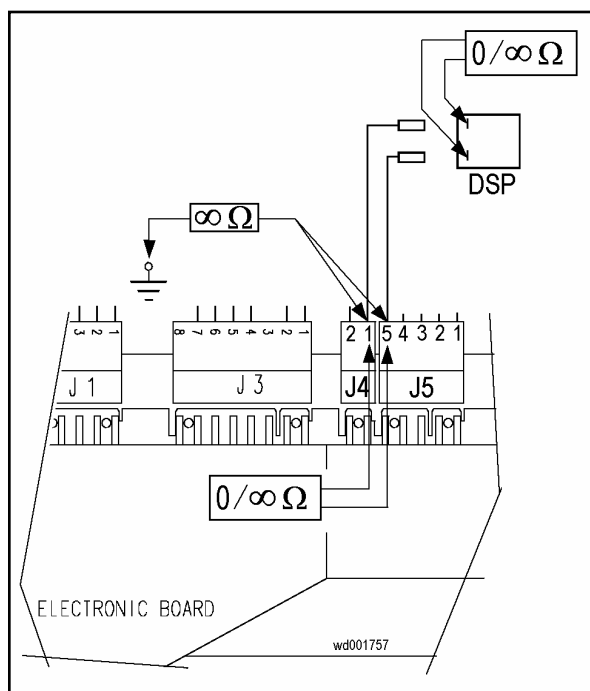
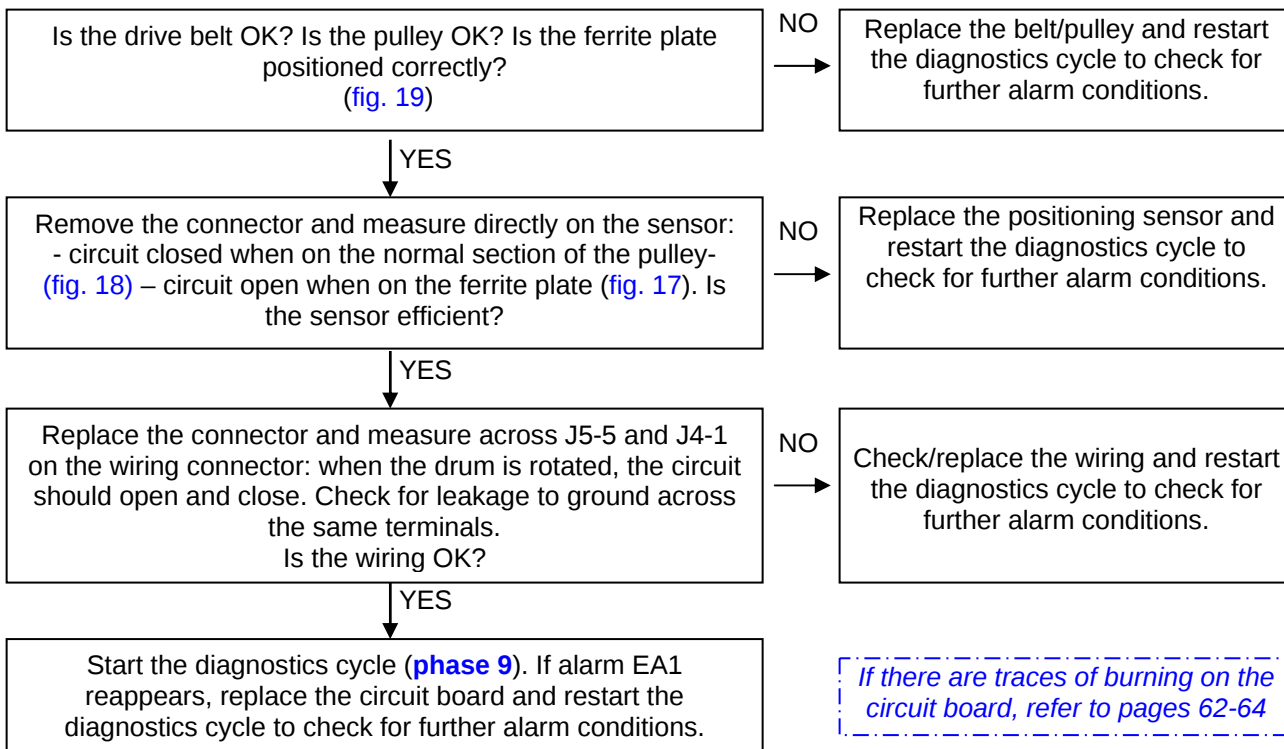
E97	E97: Incongruence between selector version and configuration data	E97
	Difference between the configuration data for the programmes and those for recognition of the selector	

Tests to be performed:

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

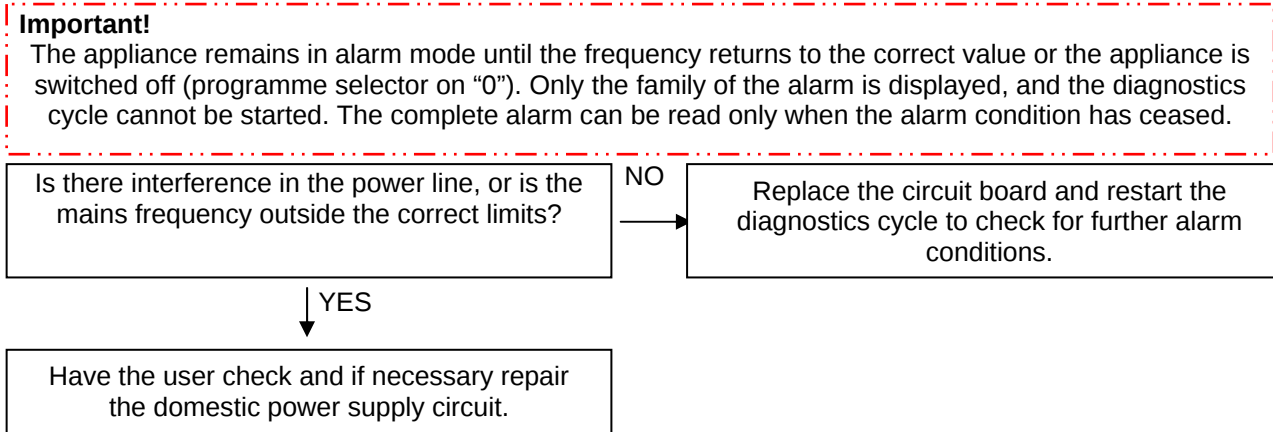
EA1	EA1: Drum positioning system (DSP) faulty (<i>top-loaders only</i>)	EA1
	No signal or discontinuous signal from the sensor for more than 10 seconds during actioning of the motor to position the drum	

Tests to be performed:



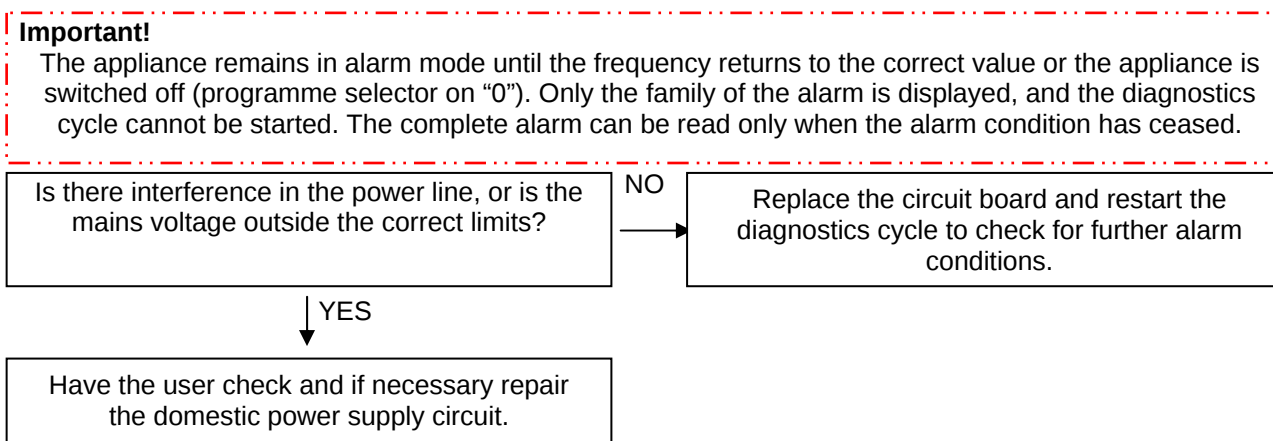
EB1	EB1: Incorrect mains frequency	EB1
	The power supply frequency is not within the configured limits	

Tests to be performed:



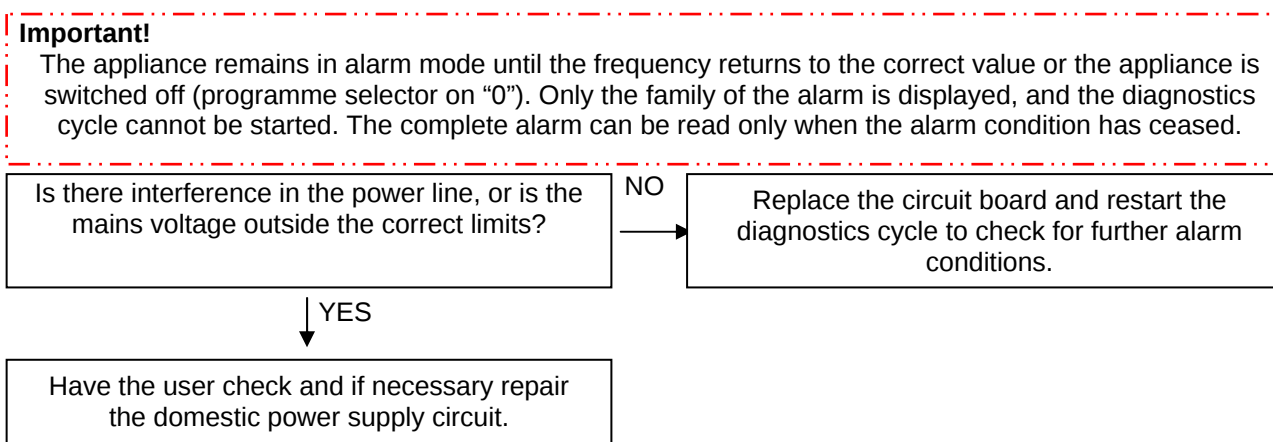
EB2	EB2: Mains voltage too high	EB2
	Mains voltage higher than configured voltage (for more than 10 seconds)	

Tests to be performed:

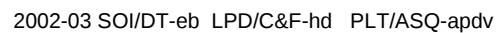


EB3	EB3: Mains voltage too low	EB3
	Mains voltage lower than configured voltage	

Tests to be performed:



6.1 With instantaneous door locking device



2002-03 SOI/DT-eb LPD/C&F-hd PLT/ASQ-apdv

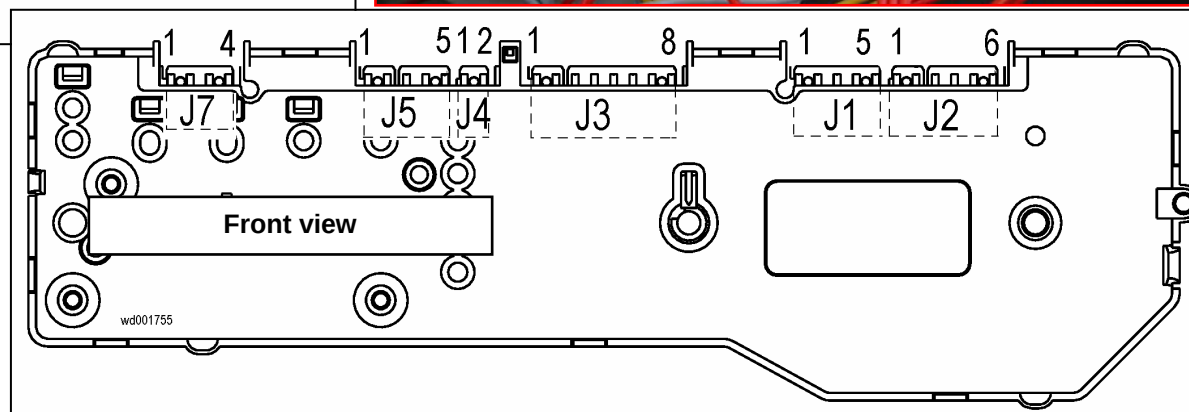
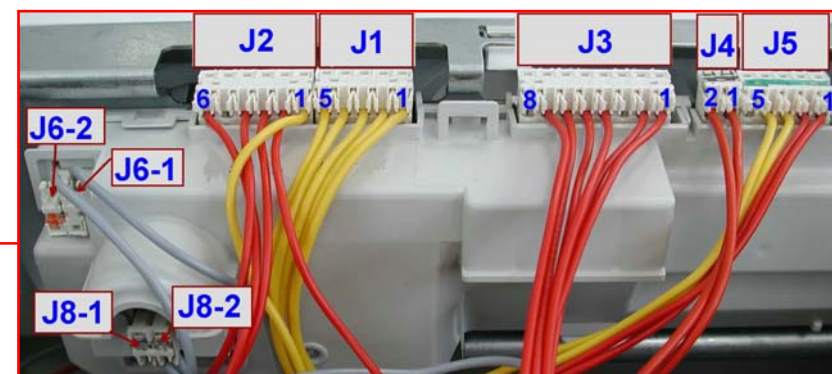
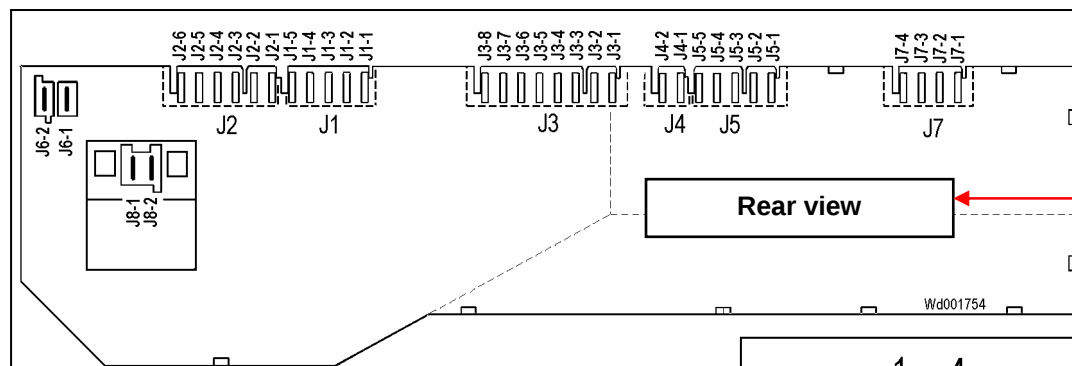


6.2.1 Key to circuit diagram

Electrical components – appliance	Components of electronic circuit board
1. Circuit board	DOOR_TY Triac for door safety interlock
2. Suppressor	DRAIN_TY Triac for drain pump
3. Main switch (on programme selector)	K1 Heating element relay
4. Door safety interlock	K2 Motor relay: clockwise rotation
5. 1st level pressure switch	K3 Motor relay: anti-clockwise rotation
6. Anti-boiling pressure switch	K4 Motor relay: half-range power (certain models only)
7. Anti-overflow pressure switch (certain models only)	MOTOR_TY Motor triac
8. Heating element	ON/OFF Main switch (programme selector)
9. Stator (motor)	PWELW_TY Triac for pre-wash solenoid valve
10. Overload circuit-breaker (motor)	Serial interface Asynchronous serial interface
11. Tachymetric generator (motor)	WELV_TY Triac for washing solenoid valve
12. Rotor (motor)	
13. Drain pump	
14. Pre-wash solenoid valve	
15. Washing solenoid valve	
16. “Door closed” lamp (certain models only)	
17. Drum positioning system (DSP) (top-loaders – certain models only)	

7 CONNECTORS ON CIRCUIT BOARD

J6	J2	J1	J3	J4	J5	J7
J6-1: Heating element (relay) J6-2: Door safety interlock (line)	J2-1 Door safety interlock (line-sensing) J2-2 1st level(sensing) J2-3 (Anti-overflow pressure switch) J2-4 Door safety interlock (triac) J2-5 (Door safety interlock) J2-6 (Anti-overflow pressure switch)	J1-1 Motor (triac) J1-2 Motor (stator – full range) J1-3 Motor (stator - 1/2 range) J1-4 Motor (rotor) J1-5 Motor (rotor)	J3-1 Drain pump (line) J3-2 Solenoids (line) J3-3 (line) J3-4 Drain pump (triac) J3-5 Pre-wash solenoid (triac) J3-6 Washing solenoid (triac) J3-7 Solenoids (line) J3-8 (Not used)	J4-1 “Door closed” pilot lamp J4-2 “Door closed” pilot lamp	J5-1 NTC temperature sensor J5-2 NTC temperature sensor J5-3 Motor (tachymetric generator) J5-4 Motor (tachymetric generator) J5-5 (DSP drum positioning system)	Serial interface: J7-1 ASY_IN J7-2 ASY_OUT J7-3 5V J7-4 GND
J8						
J8-1 line J8-2 line (neutral)						

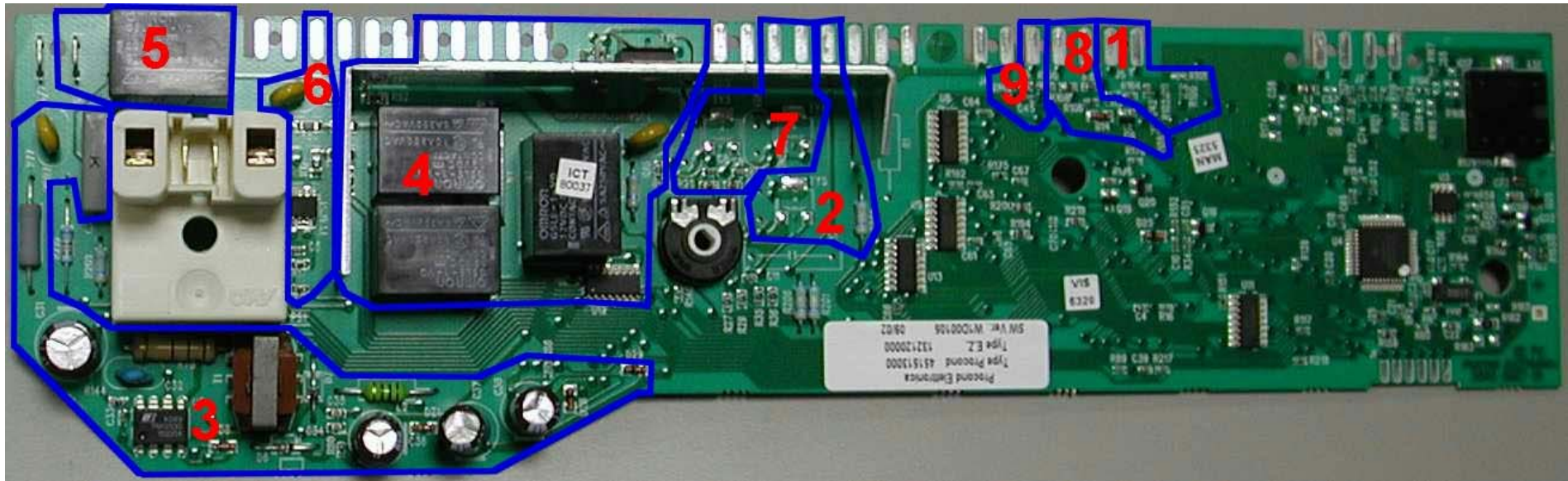


8 BURNING ON THE CIRCUIT BOARD

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.

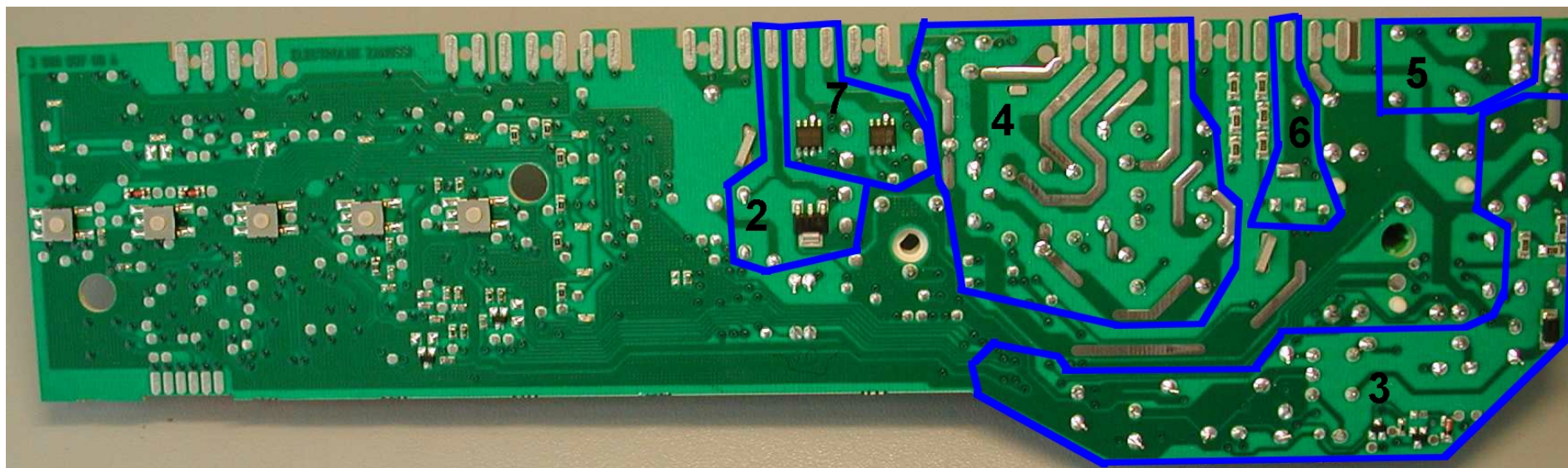
The circuit board shown below is the version with the greatest number of components: other boards may not feature all these components (relay K4 and buzzer).

8.1 COMPONENTS SIDE (common)



- | | |
|--|---|
| <ol style="list-style-type: none">1. NTC washing temperature sensor2. Drain pump3. Power supply4. Motor | <ol style="list-style-type: none">5. Heating element6. Door safety interlock7. Water fill solenoids8. Tachymetric generator (motor)9. Drum positioning system (top-loaders) |
|--|---|

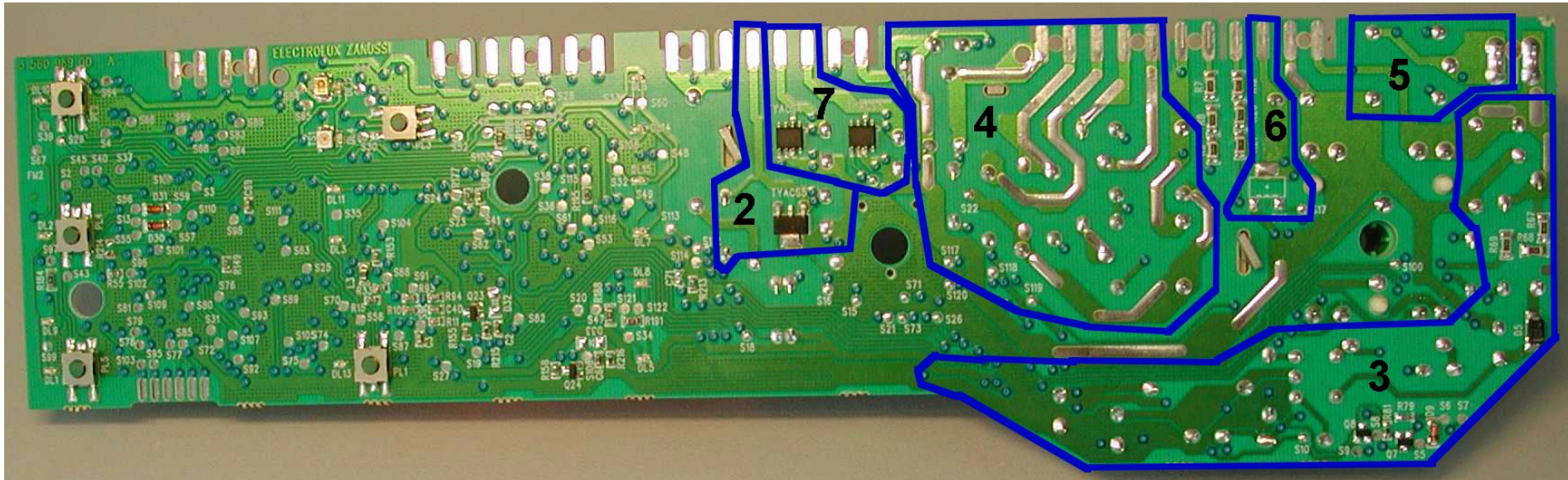
8.2 PUSHBUTTON – LED SIDE (HORIZONTAL BUTTONS)



- 1. ---
- 2. Drain pump
- 3. Power supply
- 4. Motor

- 5. Heating element
- 6. Door safety interlock
- 7. Water fill solenoids
- 8. Tachymetric generator (motor)
- 9. Drum positioning system (top-loaders)

8.3 PUSHBUTTON – LED SIDE (VERTICAL BUTTONS)



1. ---
2. Drain pump
3. Power supply
4. Motor

5. Heating element
6. Door safety interlock
7. Water fill solenoids
8. Tachymetric generator (motor)
9. Drum positioning system (top-loaders)