

Jog Excite

SERVICE & MAINTENANCE MANUAL

REV. 1.1



The information contained in this manual is intended for **QUALIFIED TECHNICIANS** who have completed a specific **TECHNOGYM** training course and are authorized to perform machine start-up and adjustment procedures as well as extraordinary maintenance or repairs which require a thorough knowledge of the machine, its operation, its safety devices and working procedures.

**CAREFULLY READ THE INFORMATION CONTAINED IN
THIS MANUAL BEFORE PERFORMING ANY MAINTENANCE
PROCEDURES ON THE MACHINE**



**DANGEROUS VOLTAGES
PRESENT**

NOTE

The information contained in this document is subject to change without notice.

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1. GENERAL NOTICES

1.1. INTRODUCTION

This document is reserved for Technogym Service technicians, and is intended to provide authorized personnel with the necessary information to correctly carry out repairs and maintenance. A thorough knowledge of the technical information contained in this manual is essential for completing the professional training of the operator.

In order to facilitate consultation, the paragraphs are accompanied by schematic drawings which illustrate the procedure being described.

This manual contains notices and symbols which have a specific meanings:



WARNING: non observance may result in accident or injury.



ATTENTION: non observance may cause damage to the machine.



Information about the operation in progress.



OBSERVE: observation about the operation in progress.

1.2. RECOMMENDATIONS

Technogym recommends the following steps for planning repair procedures:

- Carefully evaluate the customer's description of the machine malfunction and ask all the necessary questions to clarify the symptoms of the problem.
- Clearly diagnose the causes of the problem. This manual provides the fundamental theoretical basis, which must then be integrated by personal experience and attendance at the training courses periodically offered by Technogym.
- Rationally plan the repair procedure so as to minimize the downtime necessary for procuring spare parts, preparing tools, etc.
- Access the component to be repaired, avoiding any unnecessary operations. In this regard it will be useful to refer to the disassembly sequence described in this manual.

1.3. GENERAL RULES FOR REPAIR PROCEDURES

1. Always mark any parts or positions which may be confused with each other at the time of reassembly.
2. Use original Technogym spare parts and lubricants of the recommended brands.
3. Use special tools where specified.
4. Consult the Technical Newsletters, which may contain more up-to-date information on adjustments and maintenance than those contained in this manual.
5. Before starting the repair procedure, make sure that the recommended tools are available and in good condition.
6. For the procedures described in this manual, use only the specified tools.

■ ■ ■ OBSERVE: The tool sizes quoted in this manual are expressed in mm.

2. TECHNICAL CHARACTERISTICS

2.1. PRODUCT CODES

The machine codes take into account all the possible variants and options available for the products. The machine code, which does not include the Serial Number, consists of 16 alphanumeric characters arranged as follows:

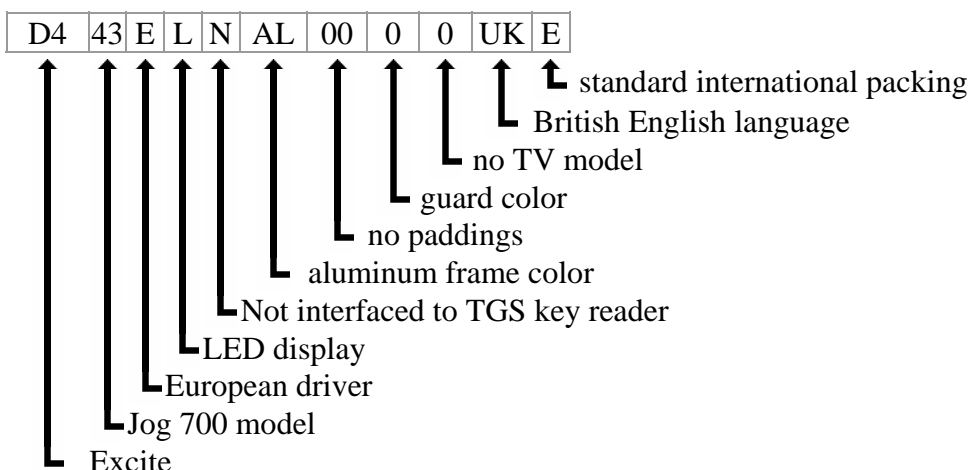
Characters	description	key to values
1,2	Machine type: Excite	D4
3,4	Product version	43 = Jog Excite 700
5	Type of power supply	E = European driver
6	Type of display	L = LED display
7	Device for downloading data used by the Wellness System	N = not available T = TGS
8, 9	Color of the frame	AL = aluminium
10, 11	Color of the paddings	00 = none
12	Color of the guards	0 = none
13	Type of TV model	0 = none
14,15	Language	BR = portuguese CN = chinese DE = german ES = spanish FR = franch IT = italian JP = japanese NL = dutch RU = russian UK = british english US = american english
16	Type of packaging	I = Italy E = international (standard) S = international (overseas) 0 = none

 The above coding is used for the entire Excite line. For this reason, options not relevant to the Jog machine have also been included.

For example, a possible product code would be:

D443ELNAL0000UKE

which is interpreted as follows:

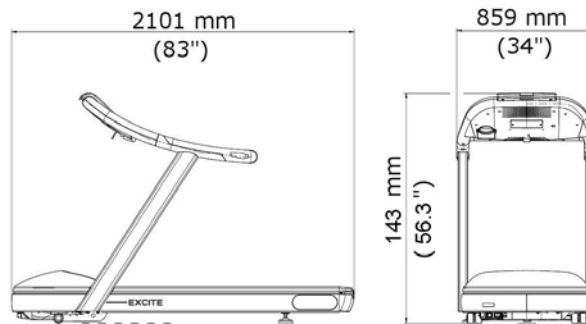


2.2. FEATURES AND FUNCTIONS.

		VERSION
		700
CHARACTERISTIC	Mains voltage	180-260 Vac
	Frequency	50-60 Hz
	Consumption	2200 W
	Speed	0.8-18 Km/h 0.5-12 mph
	Incline	0-15 %
	Fast track control	NO
	Hand sensor	YES
	Cardio receiver	HFU
	Ready to Run	YES
	Calorie coach	YES
	Runner Detection	YES
	Training programs	Quick Start Goal (Time, Distance, Calorie) 6 profiles CPR Test
Test functions	Fitness test	

2.3. MECHANICAL CHARACTERISTICS

Width	85.9 cm - 34 in
Length	210 cm - 83 in
Height	141.5 cm - 56 in
Running deck height from the floor	21.5 cm – 8.5 in
Weight	164 Kg - 361 lbs



2.4. CONFORMITY REGULATIONS

The machine conforms to the following standards:

	Europe	USA
Standards	EN60335-1 EN55014-1 EN55014-2 EN61000-3-2 EN61000-3-3 EN957-1 EN957-6 class SA	UL 60601-1
Directives	73/23/CEE 89/336/CEE 98/37/CEE	

In addition:

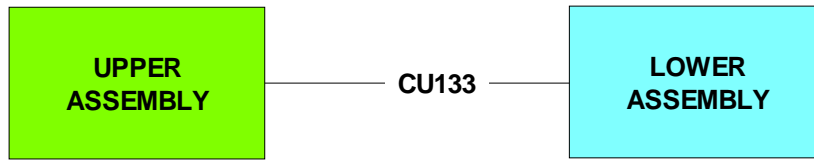
- Electrical isolation class under EN60335-1: **Classe I**;
- Protection rating: **IP20**.

2.5. AMBIENT SPECIFICATIONS

Temperature	Operating	from 10° to 25° C
	Storage	from -10 to 70° C
Humidity	Operating	from 20% to 90% non-condensing
	Storage	from 20% to 90% non-condensing

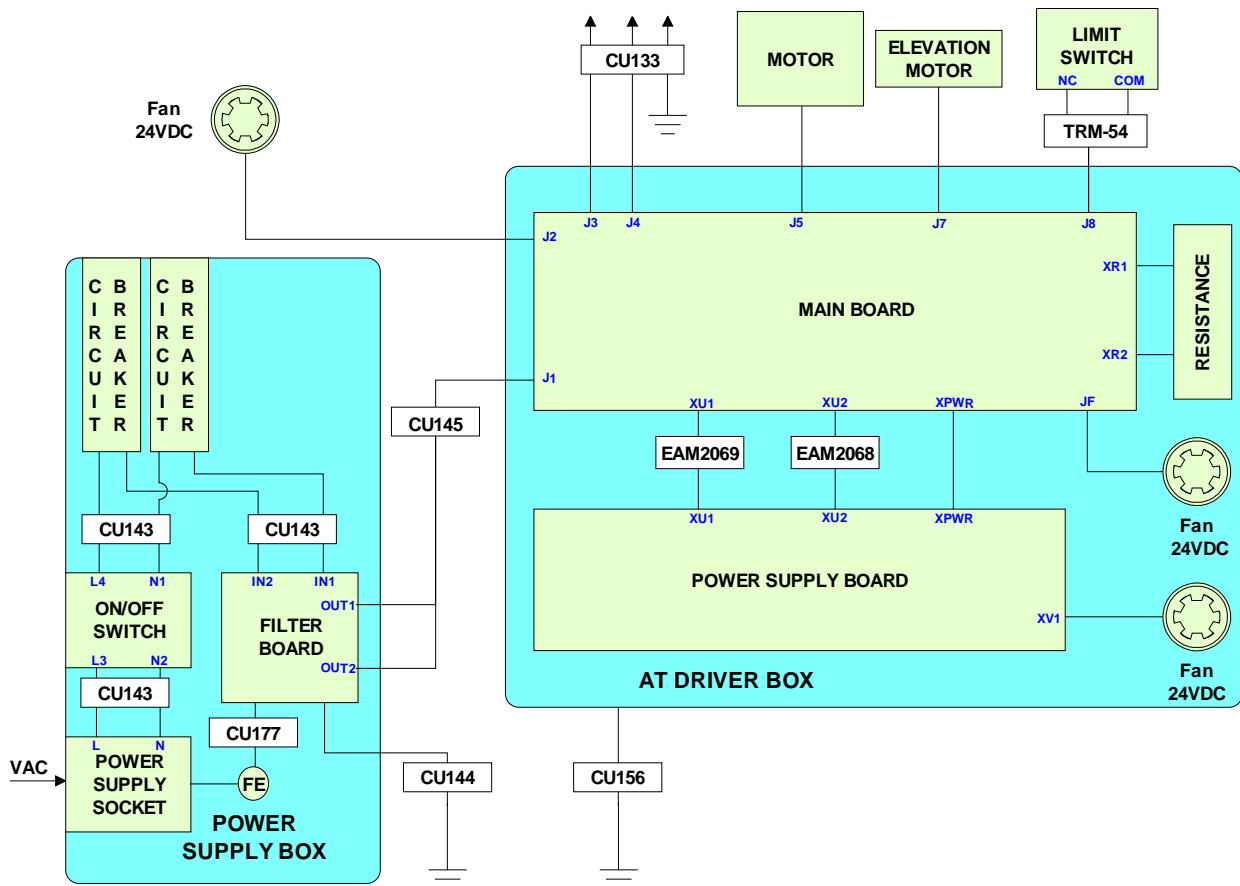
2.6. WIRING DIAGRAM

The machine consists of 2 assemblies which are connected together as illustrated below:

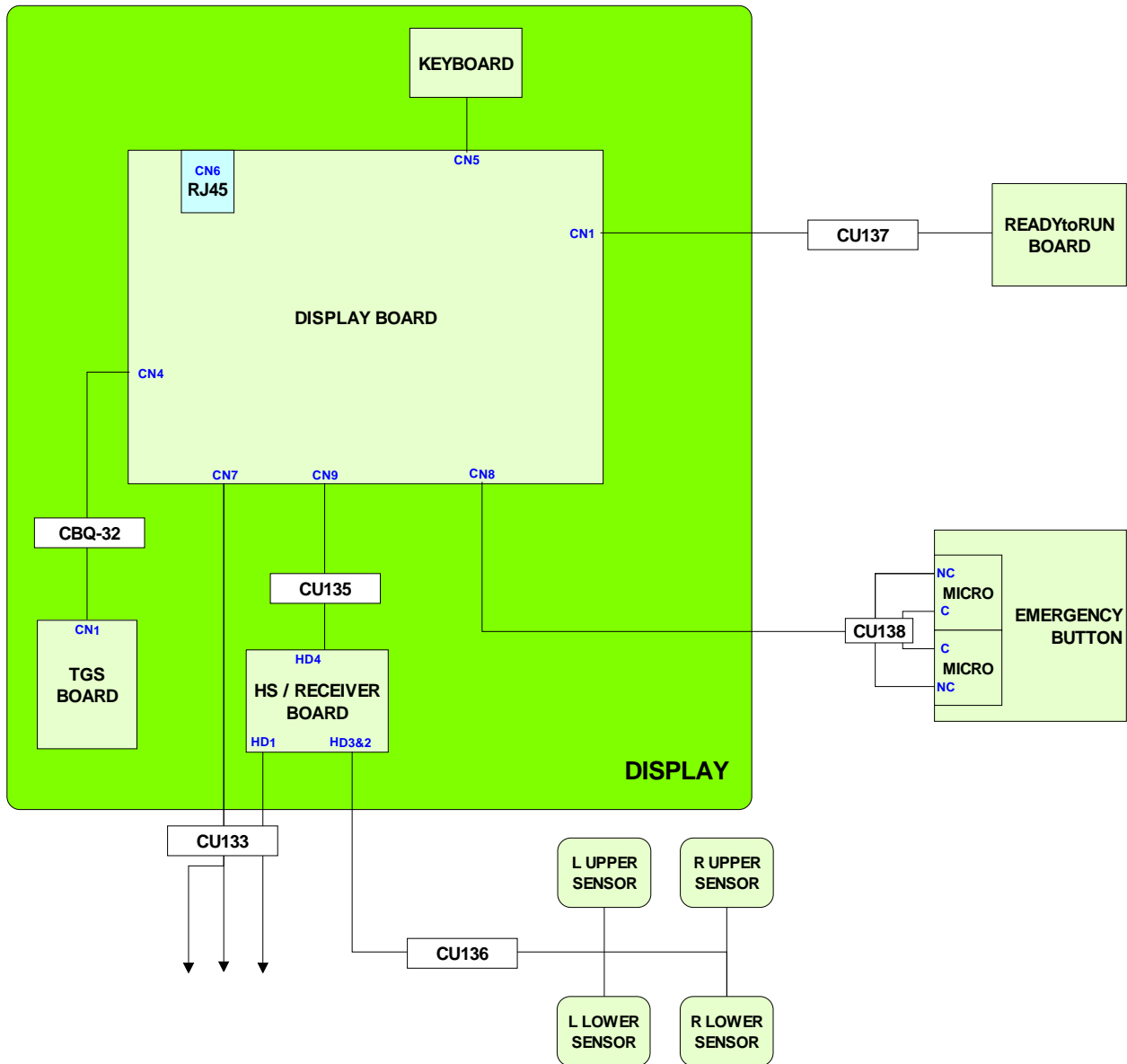


Depending on the model, these 2 assemblies can have the different configurations illustrated below.

2.6.1. LOWER ASSEMBLY



2.6.2. UPPER ASSEMBLY: LED ARM VERSION



2.7. WIRING

TRM-32: TGS Cable Display Board – TGS reader			
Display Board CN3	Signal	Color	TGS reader CN1
1	+12 Vdc power supply	Yellow	1
3	Rx	White	8
5	Tx	Green	7
9	Gnd	Brown	3

CU133: Cable connecting upper and lower assemblies Display board – AT driver board			
Display Board CN7	Signal	Color	AT driver board J3 or J4
1	Gnd +12 Vdc	Black	J3 – pin 2
2	<i>Not connected</i>	-	-
3	485 Tx/Rx +	White/brown	J4 – pin 7
4	485 Tx/Rx -	Brown	J4 – pin 8
5	+12 Vdc	Red	J3 – pin 6
6	Digital Gnd	Light orange	J4 – pin 6
7	Emergency	Orange	J3 – pin 9
8	Reset	Purple	J3 – pin 10

ATTENTION: The pins 1-2-3-4-5 on the **J4** connector are engaged by cables not connected anywhere.
The pins 3-4, 3-12, 6-11 and 7-8 are short-circuited each other.

CU135: HS / cardio receiver board cable Display board - HS / cardio receiver board			
Display Board CN9	Signal	Color	HS / receiver board HD4
1	+5 Vdc power supply	Brown	2
4	Pulse out	White	3
5	Reference	Green	1

CU136: Sensor Cable Hand Sensor Board - Sensors				
HS/receiver board	Signal	Color	Sensors	
			RH	LH
HD3&2				
1	Right sensor signal	Yellow	up	-
2	Sensor signal reference	White	down	-
4	Left sensor signal	Brown	-	up
5	Sensor signal reference	Green	-	down

CU137: Ready to Run board cable Display board – Ready to Run board.			
Display board CN1	Signal	Color	Ready to Run board
1	+5 Vdc power supply	Brown	1
4	Reference	White	2

CU138: Emergency button cable Display board – Microswitch				
Display board CN8	Signal	Color	Micro	Micro
1	Emergency	Brown	C	-
2	Reference	White	-	C
-	Bridge	Black	NC	NC

CU143: High voltage cable Power supply box – AT driver box			
Filter board	Signal	Color	AT driver board
OUT1	Neutral	Brown	1
OUT2	Line	Blue	2

TRM-05: Motor compartment fan cable AT driver board - Fan			
ATmain board J2	Signal	Color	Fan
1	24 Vdc power supply	Red	internally connected cable
2	Gnd	Black	

TRM-06: Belt motor cable AT driver board - Motor			
AT driver board J5	Signal	Color	Motor
1	U	Black 1	internally connected cable
2	V	Black 2	
3	W	Black 3	
4	thermal cutout +	Black 4	
5	thermal cutout -	Black 5	
6	GND	Black 6	

TRM-08: Elevation motor cable AT driver board – Elevation motor			
AT driver board J7	Signal	Color	Elevation motor
1	Motor -	Black	internally connected cable
2	Motor +	Black	
4	Gnd	Black	
5	+5 Vdc power supply for encoder	Red	
6	Pulses	White	

TRM-54: Limit switch cable AT driver board – Limit switch			
AT driver board J8	Signal	Color	Limit switch
3	Contact	White	COM
8	Reference	Brown	NC

EAM2068: AT Driver board connecting cable AT Power supply board – AT driver board			
AT Power supply board XU2	Signal	Color	AT driver board XU2
1	+12 Vdc power supply	Blue	1
2	Gnd +12 Vdc	Blue	2
3	+ Sensing +5 Vdc	Blue	3
4	- Sensing +5 Vdc	Blue	4
5	+5 Vdc power supply	Blue	5
6	Gnd +5 Vdc	Blue	6

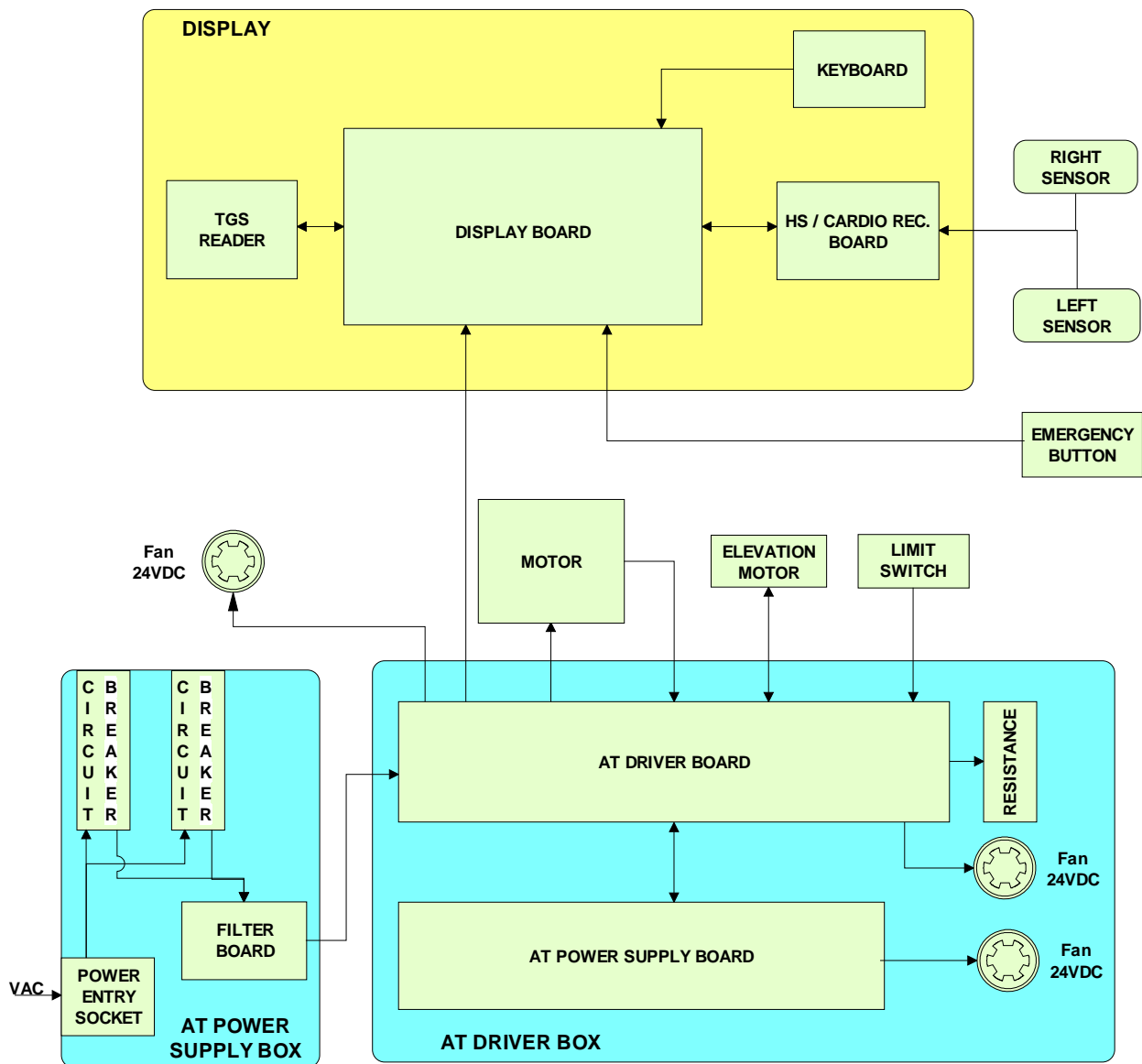
EAM2069: AT Driver board connecting cable AT Power supply board – AT driver board			
AT Power supply board XU1	Signal	Color	AT driver board XU1
1	+24 Vdc power supply	Blue	1
2	Gnd +24 Vdc	Blue	2
3	+5 Vdc power supply	Blue	3
4	Gnd +5 Vdc	Blue	4

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3. PRINCIPLES OF OPERATION

3.1. BLOCK DIAGRAM

The machine block diagram is illustrated in the figure below:



3.1.1. DISPLAY BOARD

This is the heart of the display: this is the circuit board which comprises the CPU, an ARM microprocessor, its logic circuits and a FLASH EPROM containing the operating program for the machine moreover, acts as the interconnection hub for all the components of the display and serves as the point of connection with the electrical box. In fact it receives and process signals from:

- Keyboard;
 - HS / Cardio receiver board;
 - TGS reader;
- > receives from the AT driver the +12 Vdc power supply, which is used to produce the +5 Vdc and then distributes the correct voltage to the various devices;
 - > Exchanges, over the RS-485 serial link to the AT driver box, commands for controlling the belt and elevation motors;
 - > Makes available a communication port, on 1 externally accessible connector, which can be used for connecting compatible CSafe devices such as the CardioTheater readers. This connector is situated on the back of the display.

These connector can also be interfaced, using a special cable, to an external PC for programming the FLASH EEPROM.

- > controls the LEDs and the 7-segment displays which provide feedback about the exercise session.

The board includes the following indicator LEDs:

LED name	Color	Description
LED1	green	if ON the +12 Vdc power supply from the AT Driver correctly reaches the board.

3.1.2. TGS READER

This board enables the machine to read the TGS key inserted by the user for performing workouts programmed with the Wellness System.

3.1.3. HS / CARDIO RECEIVER BOARD

This is the board which:

- > manages the hand sensors, interfacing them with the display board. It processes the analogue signal received from the sensors and outputs one positive logic pulse for each heart beat that is detected. The signal level is normally 5 Vdc; it goes to 0 Vdc when the user's hands are placed on the contacts, and a 5 Vdc pulse (having a width of approximately 30 msec) is output at each detected heart beat.
- > manages the signal received from the telemetric transmitter used by the person exercising. It receives the power supply signal from the display board and outputs a negative logic pulse for every heart beat that is detected: the signal level is normally 5 Vdc, with a pulse at 0 Vdc (having a width of approximately 30 msec) at each heart beat.

The receiver reception area is approximately a circle with a 1 m radius. If there is electromagnetic noise (produced by high voltage lines, radio transmitters, monitors, motors etc.) within this area, the receiver becomes saturated and no longer receives any signal.

3.1.4. EMERGENCY SWITCH

This is the user safety device. It consists of 2 microswitches connected in series, which can be tripped either by pressing the emergency button or by pulling a cord clipped to the garment of the person exercising.

The emergency switch, which provides a NC contact, acts on both the display board and the AT driver. When the emergency is tripped the AT driver disables the operation of the tread belt and elevation motors. The display board also detects tripping of the emergency switch, upon which it interrupts the exercise and shows the “PRESS ANY KEY...” message on the display.

To resume normal machine operation, it is necessary to press any key on the display.

3.1.5. BELT MOTOR

An asynchronous three-phase motor which, by means of a pulley and poly-v belt, turns the driving roller of the tread belt. Each motor phase is equipped with a normally-closed thermal cutout which opens when the temperature exceeds a preset threshold, in order to safeguard the integrity of the motor. The 3 thermal cutouts are connected in series and reach the AT driver as a NC external input signal. When this contact opens, the AT driver generates an alarm.

It is equipped with a high inertia flywheel, to permit more gradual deceleration of the tread belt in the event of a power outage or emergency stop.



ATTENTION: dangerous voltages are present at the motor, the flywheel and the metal plate on which the motor is fixed.

3.1.6. ELEVATION MOTOR

This is a linear actuator equipped with 24 Vdc motor, integral reduction gear and a rod that is pushed backward and forward by the motor. This rod acts upon a frame connected to the front wheels of the machine: when the rod moves so does the frame, thereby lowering raising the machine.

The actuator has a built-in Hall effect sensor which acts as an encoder, generating pulses when the motor moves. This furnishes a feedback signal on the motor movements, which is used for tracking the position of the rod and hence the elevation of the machine.

3.1.7. LIMIT SWITCH

This is a NC microswitch which defines the zero-reference position for the elevation mechanism: the switch is positioned so that it is pressed by the machine during the reset procedure, thereby defining the reference position.

3.1.8. AT DRIVER

This is the electronic device that acts as an interconnection hub for the main components of the lower assembly, and serves as the point of connection with the display. In fact:

- Controls the motors:
 - > it exchanges, over the RS-485 serial link to the display board, the commands for controlling the tread belt and elevation motors;

- > it supplies the tread belt motor with a variable-frequency sinusoidal voltage: varying the frequency varies the speed of rotation of the motor, and consequently the speed of the tread belt;
 - > it exchanges, over the RS-485 serial link to the display board, the error signals pertaining to the tread belt and elevation motors;
 - > it exchanges, over the RS-485 serial link to the display board, the commands for viewing and configuring the inverter parameters;
 - > it exchanges, over the RS-485 serial link to the display board, the commands for viewing the errors logged by the inverter.
- Receives the mains voltage at its inputs and outputs the DC supply voltages for the machine circuit boards listed below:

Supply voltage	Connector	Description
+24 Vdc	XU1	Power supply for the fans of the electrical box
+5 Vdc	XU1	Power supply for elevation motor encoder
+12 Vdc	XU2	Power supply for display

The board includes the following indicator LEDs:

LED name	Color	Description
H2	green	+5 Vdc
H3	green	+12 Vdc
H4	green	+24 Vdc
H5	red	400 Vdc

It contains:

- The AT driver board
- The AT power supply board
- 2 fans
- A breaking resistor

3.1.8.1. AT driver board

It is the upper board of the assembly and it is the heart of the driver: it does everything was described above for the AT driver except the function of the AT power supply board described below. In details:

- It receives the line voltage and, through a PFC module, it rectifies the voltage to the 400 Vdc used to generate the 3 phase voltage for the belt motor and to power up the AT power supply board.
- Internally it houses an inverter to control the belt motor;
- Internally it houses a DC driver to control the elevation motor.

The board includes the following indicator LEDs visible when the AT driver cover is removed:

LED name	Colour	Description
ALARM	red	If ON indicates that the AT driver has detected an error (EdC) when it was moving the elevation motor. This LED stay ON for about 1 second and then goes OFF.
EN_UP	green	if ON indicates that the motor has received the supply voltage for movement in the upward direction
EN_DOWN	red	if ON indicates that the motor has received the supply voltage for movement in the downward direction
TACHO	green	functioning of elevation motor encoder: if blinking, indicates that the board is receiving the pulses from the encoder
DWN_SW	green	status of Limit switch contact: if ON indicates that the microswitch is pressed

3.1.8.2. AT power supply board

It is the lower board of the assembly and it receives the 400 Vdc from the AT driver board and outputs to the AT driver board the low voltages used by the machine.

3.1.8.3. Fans

There are 2 fans powered with 24 Vdc used to cool down the AT driver.

3.1.8.4. Breaking resistor

It is a 150 Ohm used by the AT driver board to dissipate the energy produced by the motor when it is working as a generator.

3.1.9. POWER SUPPLY BOX

It is a box that contains:

- Power entry socket;
- ON-OFF switch;
- 2 circuit breakers that check the overload on line and neutral;
- A filter board.

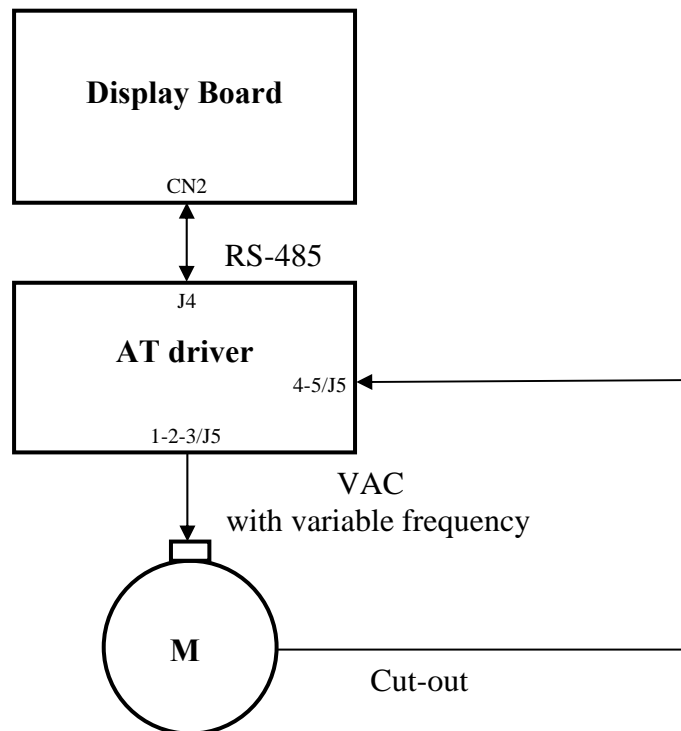
3.2. TREAD BELT MOTOR DRIVE

3.2.1. MECHANICS

The tread belt is actuated by the motor through a linkage consisting of the motor pulley, the driving roller and the belt which connects them. In this way, a given belt motor speed corresponds to a predetermined linear tread belt speed.

3.2.2. CONTROLS

The control block diagram is as follows:



To actuate the motor, the display board communicates with the AT driver via the RS-485 serial link. Based on the commands received, the AT driver drives the motor by applying a variable frequency sinusoidal voltage: the frequency determines the speed of rotation of the motor and hence the linear tread belt speed. The control may happen in “**Open loop**”, where the AT driver provides to the motor a sinusoidal voltage at a frequency that theoretically set the motor running at the selected speed.

During its movement, the AT driver continually checks the motor by monitoring its current draw. If any problems are detected (low voltage, overcurrent, SW or HW problems with the AT driver itself, etc....) it halts the motor and sends an alarm signal to the display board, which displays a “THE EQUIPMENT IS BLOCKED” error message which can be associated with different inverter error codes.

In addition, to protect the motor from overheating, each motor phase has a thermal cut-out connected in series. If the temperature exceeds the threshold value, the thermal cut-outs open and interrupt the circuit. The AT driver detects this condition as the opening of a NC external contact.

In such a case the AT driver halts the motor and outputs an alarm signal to the display board which displays the “THE EQUIPMENT IS BLOCKED” message.

3.2.3. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **RS-485 Signal**
This is a digital signal exchanged between the AT driver and the display board.
- **Variable frequency VAC signal**
This is the variable alternating-voltage signal output by the AT driver (pins 1-2-3 connector J5) to supply the motor. Increasing the frequency of this signal increases the motor speed.
- **Thermal cut-out signal**
Each motor phase is equipped with a normally-closed thermal cutout which opens when the temperature exceeds a preset threshold. The 3 thermal cutouts are connected in series and exit the motor via a 2-wire cable connected to the AT driver (pins 4-5 of connector J5).

When this input signal is an open contact, the AT driver detects the alarm, halts the motor and sends an alarm signal over the RS-485 line to the display board.

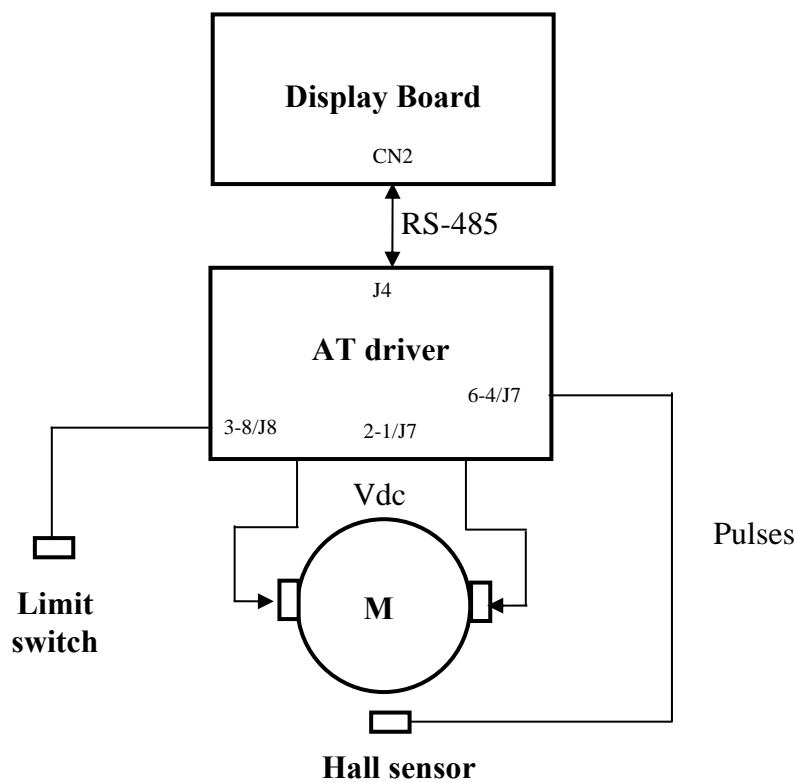
3.3. ELEVATION MOTOR DRIVE

3.3.1. MECHANICS

The machine incline is varied by moving a frame connected to the front wheels by means of the elevation motor rod. The motor movement is detected by a hall sensor which provides the motor motion control signal: each motor revolution generates a predetermined number of pulses and produces a known displacement of the rod and hence of the machine incline. The direction of rotation of the motor determines whether the machine moves up or down.

3.3.2. CONTROL

The control block diagram is as follows:



To actuate the motor, the display board communicates over the RS-485 serial link with the AT driver. Based on the commands received, the AT driver, by means of a relay on the board that switches, applies a +24 or -24 Vdc voltage to the motor. When the motor is powered, it starts turning.

To control the incline position, the machine reads the signals outputted by:

- a limit switch which defines a zero-reference position, acquired by the machine during its power-on reset procedure. In normal condition, the limit switch outputs a NC contact that goes open when it is pressed.

■ ■ ■ WARNING: when the limit switch outputs an open contact (limit switch pressed, broken or cable disconnected), the SW gives the pulses to move upward the machine

until the contact is closed again. If after some pulse the contact doesn't change its status, the elevation movement is disabled.

- an encoder consisting of a Hall effect sensor integrated into the elevation motor: when the motor is running it outputs train of pulses which represent the motor movement. The AT driver counts the pulses received and is thus able to determine the exact position of the incline. When the target position is reached, it disables the elevation motor movement.

If, during the elevation motor operation, the AT driver detects problems on these signals and in particular:

- if no pulses arrive to the AT driver for a time period of approximately 1.5 sec;
- if the limit switch outputs an open contact and it doesn't change if the elevation is moved upward more than 2%.

Then:

- the AT driver locks out with error code "EdC";
- the machine displays the error message "GRADIENT NOT WORKING" and halts all movements of both the elevation and tread belt motors;
- The parameter Par 07 is set to 1 to disable the usage of the elevation motor.

If an exercise is started, the machine will resume operation with only the tread belt motor enabled. Only if the machine is turned off and on again, it will reset the Par 07 to 0 and will restart using the elevation motor too.

3.3.3. THE RESET PROCEDURE

On power-up, the machine performs a reset procedure in order to determine the zero-reference position for the incline. The procedure consists of the downward movement of the machine until the limit switch is tripped then it moves upward until the contact on the limit switch is closed again. This defines the reference "zero position" for the incline: all movements for reaching different elevations will be variations relative to this reference.

3.3.4. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **RS-485 Signal**
This is a digital signal exchanged between the AT board and the display board.
- **Motor voltage signal (Vdc)**
This is the DC voltage generated by the AT driver (pins 2-1 of connector J7) for supplying the elevation motor. Its absolute value is 24 Vdc and, depending on its polarity, it causes the motor to rotate in either a clockwise or anticlockwise direction. The incline of the machine will increase or decrease accordingly.
- **Pulse signal**

This is a square wave signal with frequency 50 Hz ($T=20$ msec) and 50% duty cycle generated by the Hall sensor when the elevation motor moves. This signal enters the AT driver (pins 6-4 of connector J7) and provides the feedback of the motor movement.

This signal alternates between a low value of 0 Vdc and a high value of 5 Vdc. When measured with a multimeter, this signal is at either 0 or 5 Vdc when the motor is stopped, while during motor movements it is approximately 2.5 Vdc.

In order to function correctly, the Hall sensor requires a +5 Vdc supply voltage which it receives from the elevation board (pins 5-4 of connector J7).

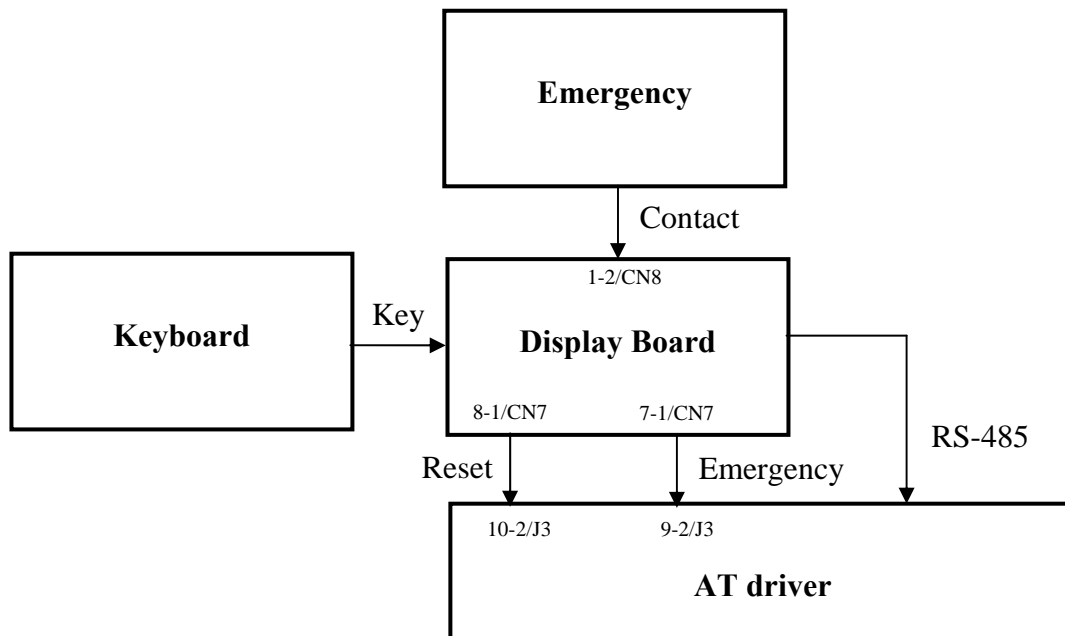
- **Limit switch signal**

The limit switch is a NC contact entering the AT driver (pins 3-8 of connector J8), which opens when the machine pressed it during the power-on reset procedure.

3.4. EMERGENCY STOP MANAGEMENT

3.4.1. CONTROL

The control block diagram is as follows:



When the user presses the emergency button, the display board stops the exercise, displays the message “PRESS ANY KEY ...” and sends to the AT driver the Emergency signal and the commands for halting the motors over the 485 serial link. When the AT driver receives these signals, it stops driving both the tread belt and elevation motors.

ATTENTION: the “PRESS ANY KEY...” message is displayed even in case the serial communication between the upper assembly and the lower assembly is lost.

If the AT driver receives the emergency only via the serial link and not via the Emergency signal, locks out with error code “EM” and the machine displays the error message “HW EMERGENCY ERROR”.

Once the AT driver has received an alarm signal, even if the emergency reverts to the non-tripped state, the alarm condition will persist until the display board sends the reset signal resulting from any key being pressed. This forces the AT driver to reinstate the serial communication to the display board and after that to redo the reset procedure.

If the serial communication fails, the machine will try several time to reinstate it. Each attempt is recorded increasing the value of the COM.FAUL counter that can be checked as indicated at paragraph 9.2.4.3 “COM.Fault”. After about 30 seconds it will interrupt and will display the error message “THE EQUIPMENT IS BLOCKED”.

3.4.2. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **Emergency contact**
This is the contact provided by the 2 emergency stop microswitches. They provide a NC contact which opens when the emergency is pressed. This signal enters the display board (pins 1-2 of connector CN8).
- **RS-485 Signal**
This is a digital signal exchanged between the inverter and the display board.
- **Emergency signal**
This is the signal generated by the display board (pins 7-1 of connector CN7), sent to the AT driver (pins 9-2 of connector J3). This signal is 0 Vdc under normal conditions, and goes to 11.9 Vdc in the emergency condition.
- **Reset signal**
This is the signal generated by the display board (pins 8-1 of connector CN7), sent to the AT driver (pins 10-2 of connector J3) to signal to the lower assembly the resumption of normal operation following an emergency condition. This signal is 0 Vdc under normal conditions and goes to approximately 8 Vdc for few seconds when the user presses a key.

When this happens, the display board resets the Emergency signal to 0 Vdc, thereby enabling the AT driver to operate.

4. ACCESSORIES

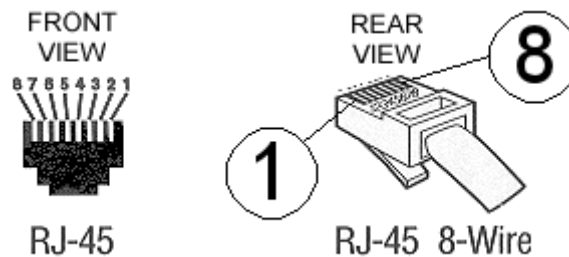
4.1. CARDIO THEATER CONNECTION

The machine can be connected to the CardioTheater by means of the RJ45 connector on the CSafe board. The CardioTheater unit must be provided with a power cable having the following pin-out:

RJ45 Connector	Signal
5	+5 Vdc
7	Ground



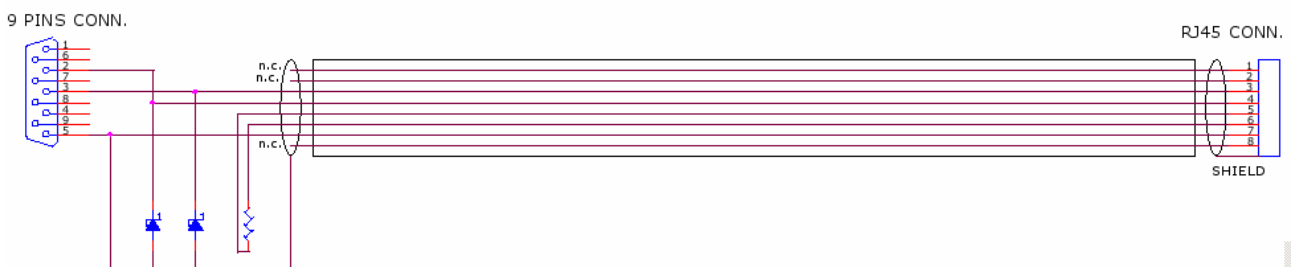
ATTENTION: for the numbering of the pins, on RJ45 connector, please refer to the diagram below:



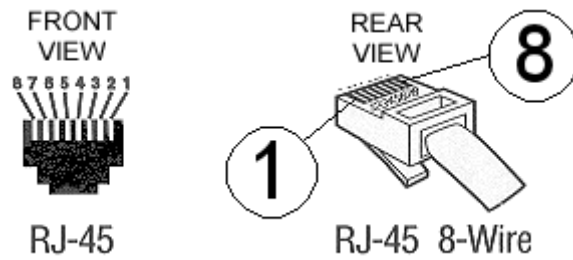
4.2. PC LINK FOR PROGRAMMING

The machine can be connected to a PC for programming by means of the RJ45 connector on the CSafe board.

The cable to use must be wired as follows:

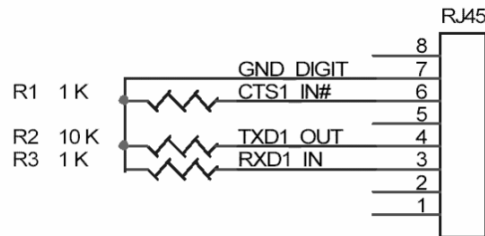


ATTENTION: for the numbering of the pins, on RJ45 connector, please refer to the diagram below:



When programming the machine sometimes it is necessary to fit plug into the free RJ-45 port on the back of the display, to avoid any type of interference during the operation.

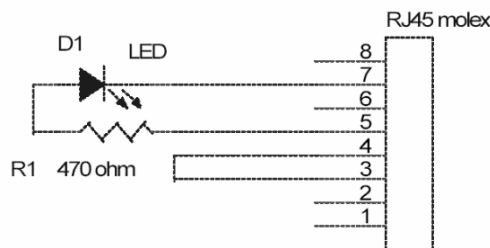
The wiring diagram of the RJ-45 plug is as follows:



Programming cable and plug can be ordered using the code H0002534AA.

4.3. MONITOR PLUG FOR CSafe PORT

When the plug code 0WC00639AA is fitted into any one of the CSafe ports on the machine, the corresponding LED should illuminate to indicate the presence of the 5 Vdc supply on the port. During the CSafe port test function, the plug connects the transmit channel directly to the receive channel, thereby producing a positive test outcome if the port is functioning correctly.

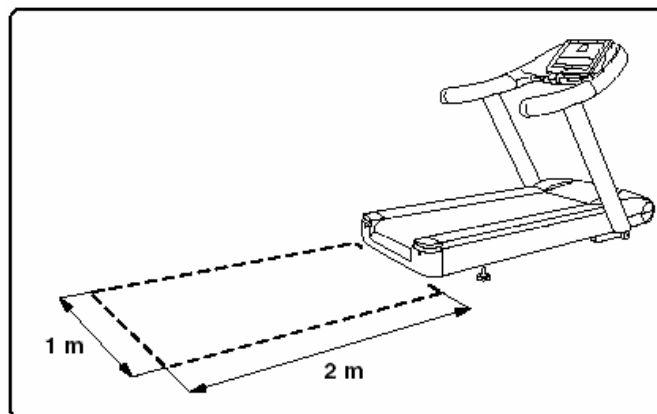


5. INSTALLATION INSTRUCTIONS

5.1. SPECIFICATIONS AND REQUIREMENTS

For correct machine installation, make sure that:

1. The machine is installed on a level surface that is free of vibrations and has sufficient carrying capacity for the combined weight of the machine and user.
2. The place of installation is free of dust and sand.
3. The place of installation meets the operating temperature and humidity conditions specified in paragraph 2.5. "Ambient specifications".
4. The machine is not positioned close to sources of heat, sources of electromagnetic noise (television sets, electrical motors, antennas, high voltage lines, household appliances, etc...) or medical equipment.
5. Each machine must have a dedicated supply line.
6. The socket outlet and other devices on the dedicated line should be appropriately sized for the required load of 16A.
7. The socket outlets must be earthed.
8. No multiple connections are permitted on the earth and/or the neutral cables.
9. The ratio between the length and cross section ratio of the cables must be sufficient to assure a maximum voltage drop of 4% of nominal value at full load (see table below) at the socket outlet.
10. Position the mains lead of the machine where it will not be underfoot.
11. There is plenty of free space around each item of equipment and a free space of 2x1 min front of the machine as shown in the picture:



12. To eliminate any interference with the cardio receiver, no transmitters should be placed less than 1 meter from the display.

5.2. INSTALLATION

To correctly install the machine, proceed as follows:

1. Ensure that the specifications and requirements for installation have been met (see paragraph 5.1. “Specifications and requirements”).
2. Position the machine as specified above, on a level surface that is free of vibrations and has sufficient carrying capacity for the combined weight of the machine and user.
3. The machine is shipped partially assembled and packed in a carton fixed to a wooden pallet. Follow the assembly procedure described in the “Operating and Service Instructions” supplied with each machine.
Follow the assembly operations described in the instruction sheets supplied with the machines.
4. Connect the mains lead to the power inlet socket on the machine.
5. Place the on/off switch in the “0” position.
6. Plug the mains lead into the wall outlet.

5.3. FIRST POWER-ON

After completing the installation procedure, the machine is ready to be powered up. To turn on the machine, simply toggle the on/off switch from the “0” position to the “1” position.

During power-up the machine resets the incline. After completing the power-on reset, the machine goes into standby, awaiting a keyboard command.

To check the correct operation of the machine:

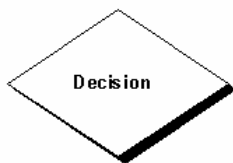
- get on the machine;
- press the “Quick Start” key to begin exercising and check that the tread belt motor starts;
- press the “+” and “-” keys on the keyboard and check that the tread belt speed varies accordingly;
- press the “↑” and “↓” keys and check that the incline varies accordingly;
- press the emergency button and check that the tread belt stops;
- put on the heart rate meter and check that the machine correctly reads the heart rate value;
- grasp the sensors and check that the machine correctly reads the heart rate value.

6. TROUBLESHOOTING

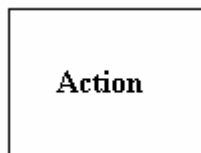
The troubleshooting procedures are shown in the form of flow charts. In order to facilitate consultation, the following standard box shapes are used.



This type of box is the **START** point of the troubleshooting procedure. It typically contains a description of the problem or malfunction.



This type of box represents a decision point in the troubleshooting procedure. It typically contains a description of the **CHECK** to be made, with an outcome that can be either a positive (**YES**) or negative (**NO**) response.



This type of box is a step in the troubleshooting procedure where an **ACTION** must be carried out. It typically contains a description of the **ACTION** necessary to resolve the problem. Therefore, after executing the specified **ACTION**:

1. Check whether the problem has been resolved;
2. If the problem persists, it is recommended to resume the troubleshooting procedure from the point before the action was carried out.



A circled number (such as that shown on the left) next to a box of the troubleshooting procedure indicates that detailed instructions for performing that particular check or action are provided below the flowchart.



A circled letter (such as that shown on the left) is used to highlight a point in the procedure. Typically, this indicator is used in page changes.

6.1. TROUBLESHOOTING SERVICE MENU

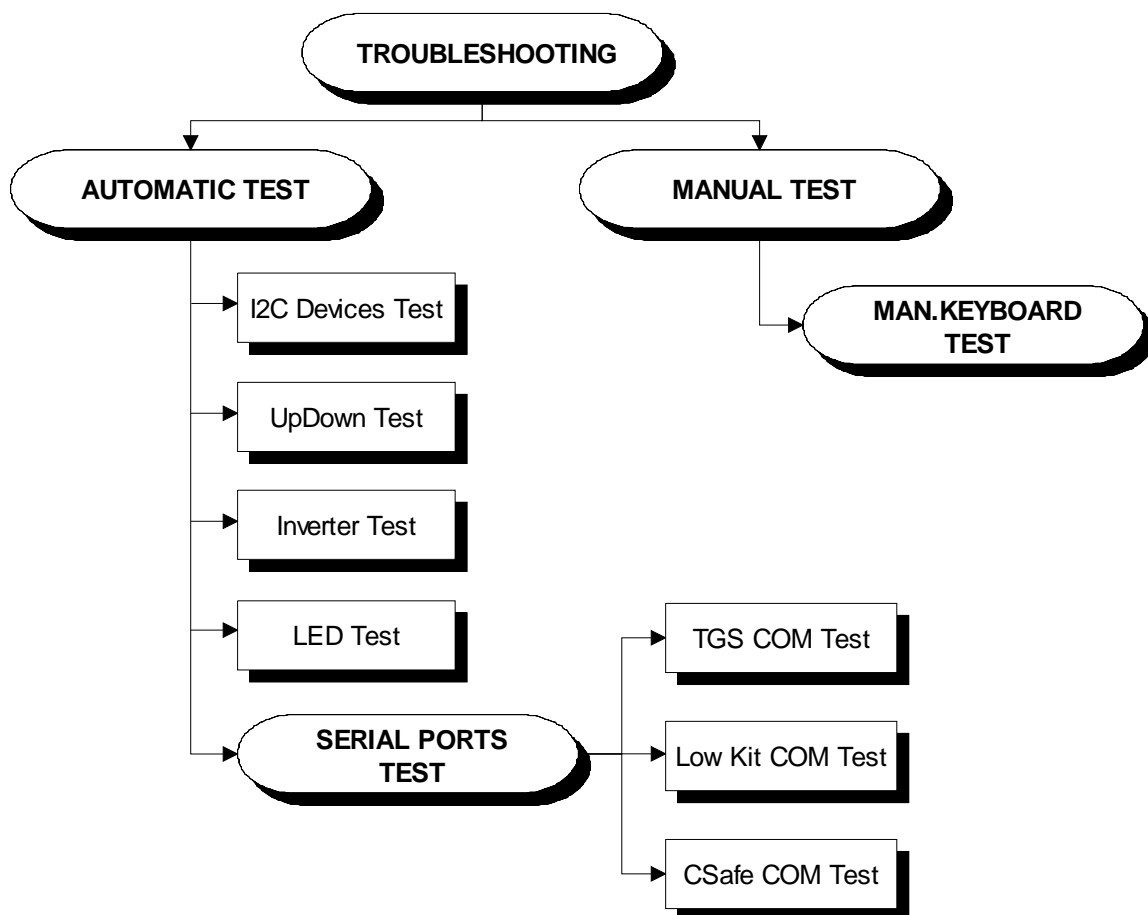
This section can be used to test the operation of certain machine components (AC/DC Motors, LED display, keyboard, serial ports, inverter). It is invoked, when the machine is in standby mode, by simultaneously pressing the keys **ENTER**, **↑**, **CLEAR**. The following prompt appears on the LED display:

ENTER PASSWORD:

To access the procedure, insert the password **2501** which protects against unauthorized access and press **ENTER** to confirm. To enter the password without the numeric keypad, enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character. At this point there are two options available:

↑ = Tech Config
↓ = Troubleshooting

Press the number key 2 to access the troubleshooting menu, which is structured as shown in the figure below.



To scroll through the list of available functions, press the **+** or **-** speed keys to display the next or previous item. Confirm the choice by pressing **ENTER**. To cancel the operation, press the **CLEAR** key for a few seconds.

The tests are divided into two groups: Automatic and Manual. The machine prompts for a choice immediately upon accessing the troubleshooting menu.

6.1.1. AUTOMATIC TESTS

The tests grouped under this section conduct checks on the machine's operation in a fully automatic manner. After selecting the desired test using the + and – speed keys, press **ENTER** to initiate the test and then await the result. Press **ENTER** again to continue, or press the **CLEAR** key for a few seconds to return to the higher menu level. The various tests are described below.

6.1.1.1. I2C Device Test

The I2C Device test checks the communication following the 32K and 256K memories. The test can have two outcomes:

- **“Test Successful, press Enter to continue”**: Signifies that data packets were successfully transmitted and received toward the display board.
- **“EEPROM Error, press Enter to continue”**: Signifies that the display board has communication problems with the memories.

6.1.1.2. UpDown Test

The UpDown test checks whether the number of pulses output by the encoder corresponds to the values of the UpDown table stored in the low kit. During the test, the machine incline is moved from 0 to 15% and then back to 0. Each incline position is converted into a number of pulses and compared with the value in the UpDown table.

Two messages appear during the test:

- **“Incline =15%”**: This message appears during the upward movement, when the machine incline reaches 15%.
- **“Incline =3%”**: This message appears during the downward movement, when the machine incline reaches 3%.

The test can have two outcomes:

- **“DC Error (Up/Down), press Enter to continue”**: The message indicates that the values do not correspond. The specific message (Up or Down) indicates whether the error occurred during the upward (Up) or downward (Down) movement of the test.
- **“Test Successful, press Enter to continue”**: This message indicates that the test was completed without errors.

6.1.1.3. Inverter Test

The inverter test checks the condition of the AT driver. The test can have two outcomes:

- **“Test Successful, press Enter to continue”**: This means that the test was completed successfully and the inverter is not in an error condition.
- **“Inverter Error, press Enter to continue”**: This means that the test was not completed successfully, i.e. that the serial link is inactive and/or the inverter is in an error condition.

6.1.1.4. LED Test

The LED test checks the functioning of the display by lighting all the LEDs in the matrix. It also tests the buzzer, varying the frequency to produce different tones of sound.

The test does not produce a result message, so the user must visually check the outcome.

6.1.1.5. Serial Ports Test

The serial ports test checks the following communication ports:

- CSafe COM test;
- Low Kit COM test;
- TGS COM test.

Using the + and – speed keys, select the desired test item and confirm by pressing **ENTER**. The test can have two outcomes:

- **“Test Successful, press Enter to continue”**: This means that the test was completed successfully, i.e. that serial communications on the selected port are correct.
- **“COMx Error, press Enter to continue”**: This means that the outcome of the test was negative: the message will specify COM1 in the case of the CSafe COM test, COM2 in the case of communications with the low kit, or COM3 in the case of the TGS COM test.

NOTE: The communication with the CSafe port and the TGS is not working if any device is not connected to the port.

6.1.2. MANUAL TEST

This section groups together tests for manually checking the operation of certain peripheral devices. After selecting the desired test item using the + and – speed keys, press **ENTER** to access the tests. To exit test mode, hold down the **CLEAR** key for a few seconds.

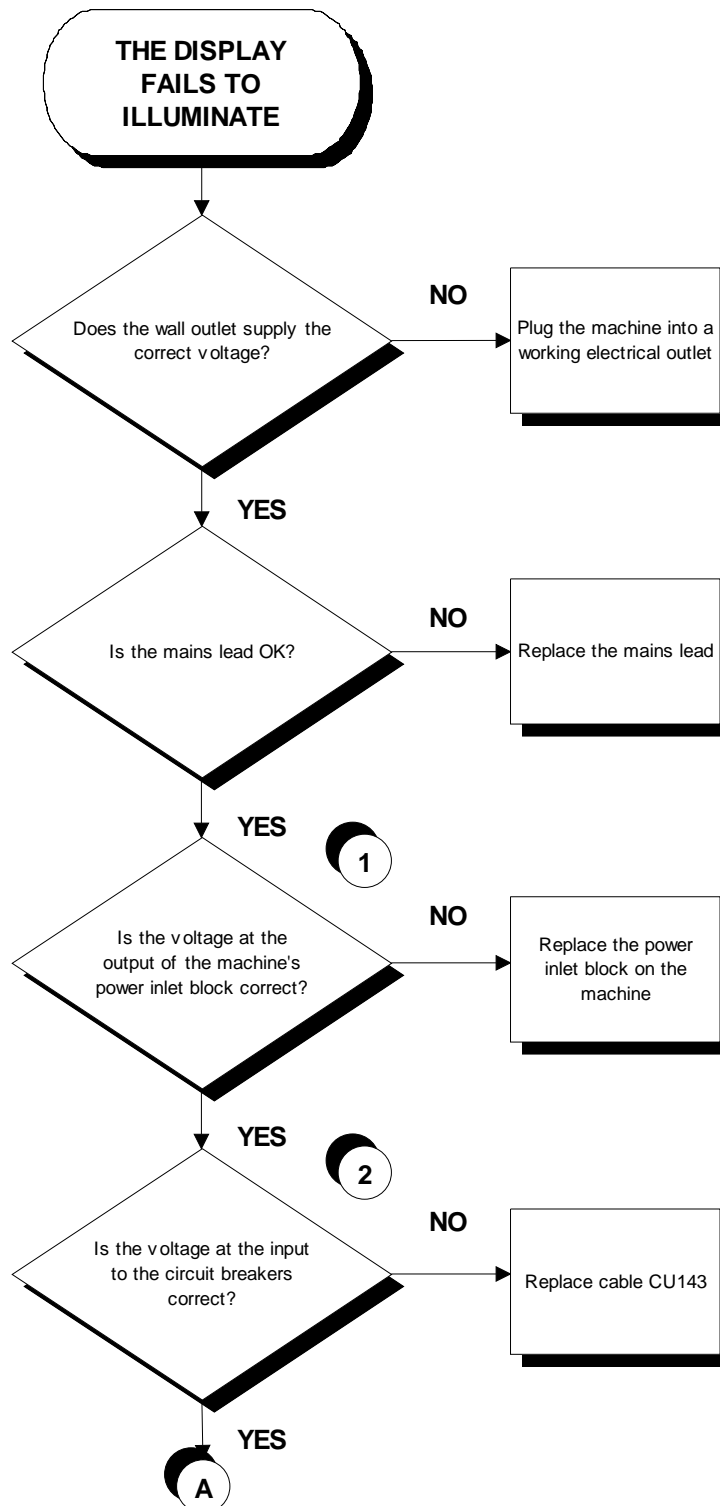
The various manual tests are described below.

6.1.2.1. Man. Keyboard Test

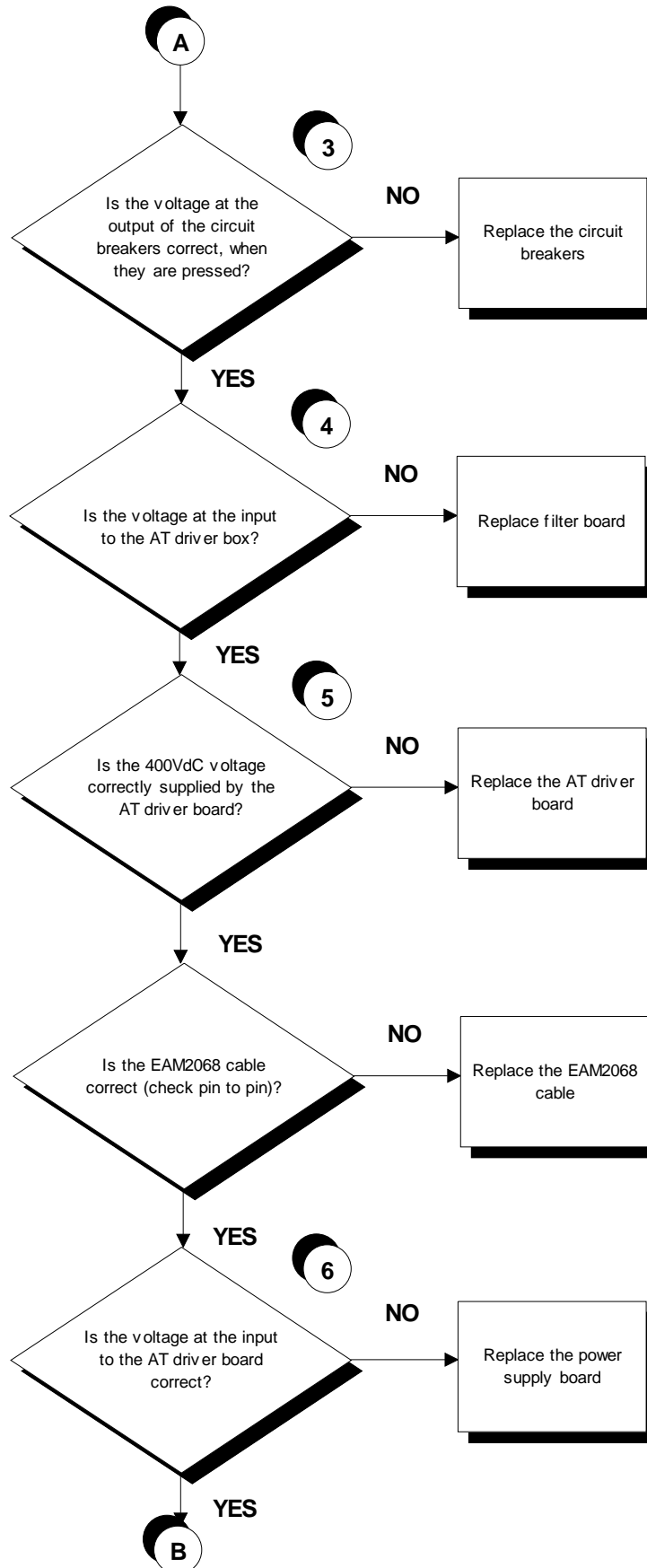
The manual keyboard test checks the functioning of all the keys on the keyboard. After accessing the test by pressing **ENTER**, the message **“Press all buttons (beep=OK)”** appears on the display. Pressing each key will produce an audible signal, if a key does not produce the “beep” it means it is not working properly.

6.2. THE DISPLAY FAILS TO ILLUMINATE

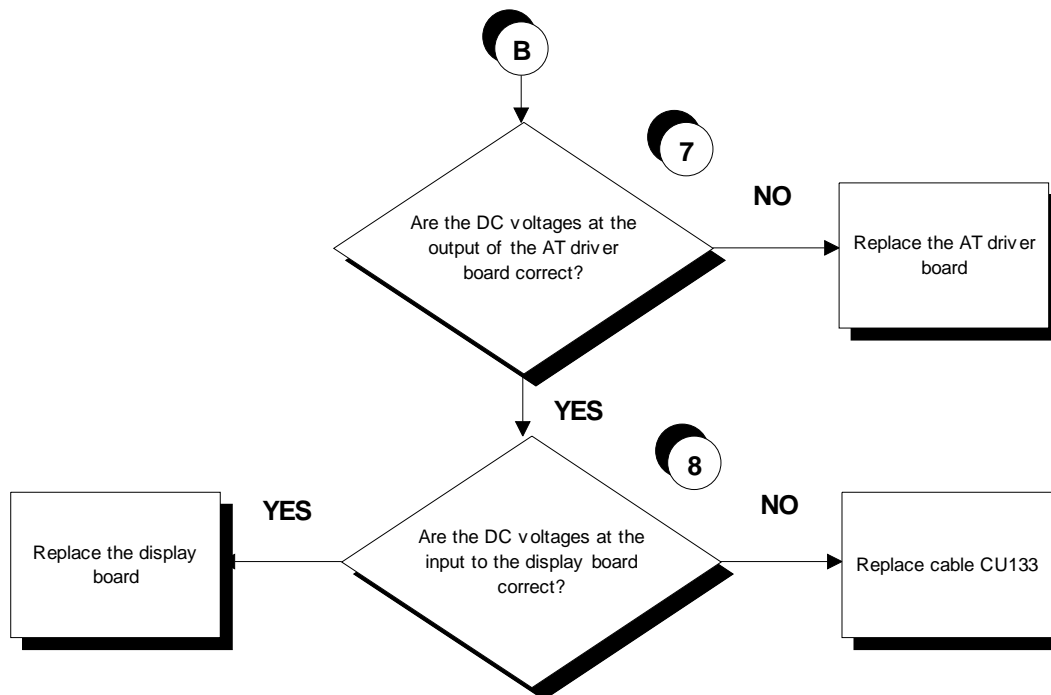
This error occurs when the power supply voltage does not reach the upper assembly.



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Continued on the following page.

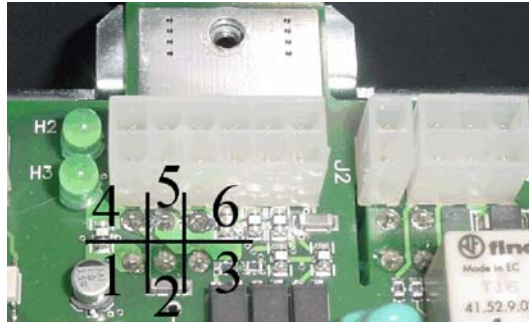


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:



To speed up the troubleshooting procedure, check the state of the power indicator LEDs on the various circuit boards.

- (1) Slightly lift the Faston connectors on the machine power inlet socket. Place the tester probes across the live and neutral pins on the same connector. The measured voltage should be approximately 220 VAC.
- (2) As for step (1) but across the input of the circuit breakers.
- (3) As for step (1) but across the output of the circuit breakers.
- (4) Unplug the cable coming from the filter board, from the connector J1 on the AT driver board. Place the tester probes on the same connector. The measured voltage should be approximately 220 VAC.
- (5) Check that the red LED H5, on the AT driver board is on.
- (6) Using a tester, check the voltages on the back of connector XU2 on the AT drive board, placing the probes on test points 1-2 to measure the +12 Vdc signal (see figure below).



- (7) Using a tester, check that the output voltage +12 Vdc on connectors J3 of the AT driver board are correct, by referring to paragraph 2.7. “Wiring”.
- (8) As for step (7) but on connector CN7 of the display board.

6.3. “PRESS A KEY” MESSAGE ON THE DISPLAY

This error message may appear when:

- loss of communication between the lower and upper assemblies;
- the user has pressed the emergency button;
- the emergency button is defective and has transiently opened the contact.

In order to reinstate normal operation, simply press any key. If communication between the upper and lower assemblies is not immediately re-established, the message will remain on the display while the machine continues trying for 30 seconds, after which the “THE EQUIPMENT IS BLOCKED” message will appear.

The machine keeps count of the attempts to reinstate communication by incrementing the COM.FAULT parameter, which can be viewed using the procedure described in paragraph 9.2.4.3 “COM.Fault”.

6.4. “THE EQUIPMENT IS BLOCKED” MESSAGE ON THE DISPLAY

This error message can be caused by:

- loss of communication between the lower and upper assemblies;
- the AT driver has detected an error condition, causing it to generate an alarm and store the error code in memory.
- problem on the emergency button.

To optimize the troubleshooting procedure, follow the steps below:

1. Access the item “**TROUBLESHOOTING→AUTOMATIC TEST→ SERIAL PORTS TEST→Low Kit COM Test**”. If the outcome of the test is negative, check the components of the link between the upper and lower kit, in particular:
 - check that the wiring of the cable (CU133) is not damaged, in particular the cables of the “emergency signal” and of the “reset” by referring to paragraph 2.7. “Wiring”, using the Test Box Excite.
 - try replacing each of the circuit boards in turn (display board or AT driver board) and check whether the communication works.

If the outcome of the test is OK move on to step 2.

2. Access the item “**TROUBLESHOOTING→AUTOMATIC TEST→Inverter Test**”. If the outcome of the test is negative, check the error code stored in the “**ERRORS LOG**” and perform the corresponding troubleshooting procedure, if the outcome is OK advance to step 3.
3. The machine lockout problem has to do with the handling of the emergency signal:
 - check that the emergency button is not pressed;
 - check that the cord, linked to the emergency button, is not too taut so that it keeps the emergency button contact open;
 - check that all the cables linked to the emergency device management are properly connected and in a good state of wear.



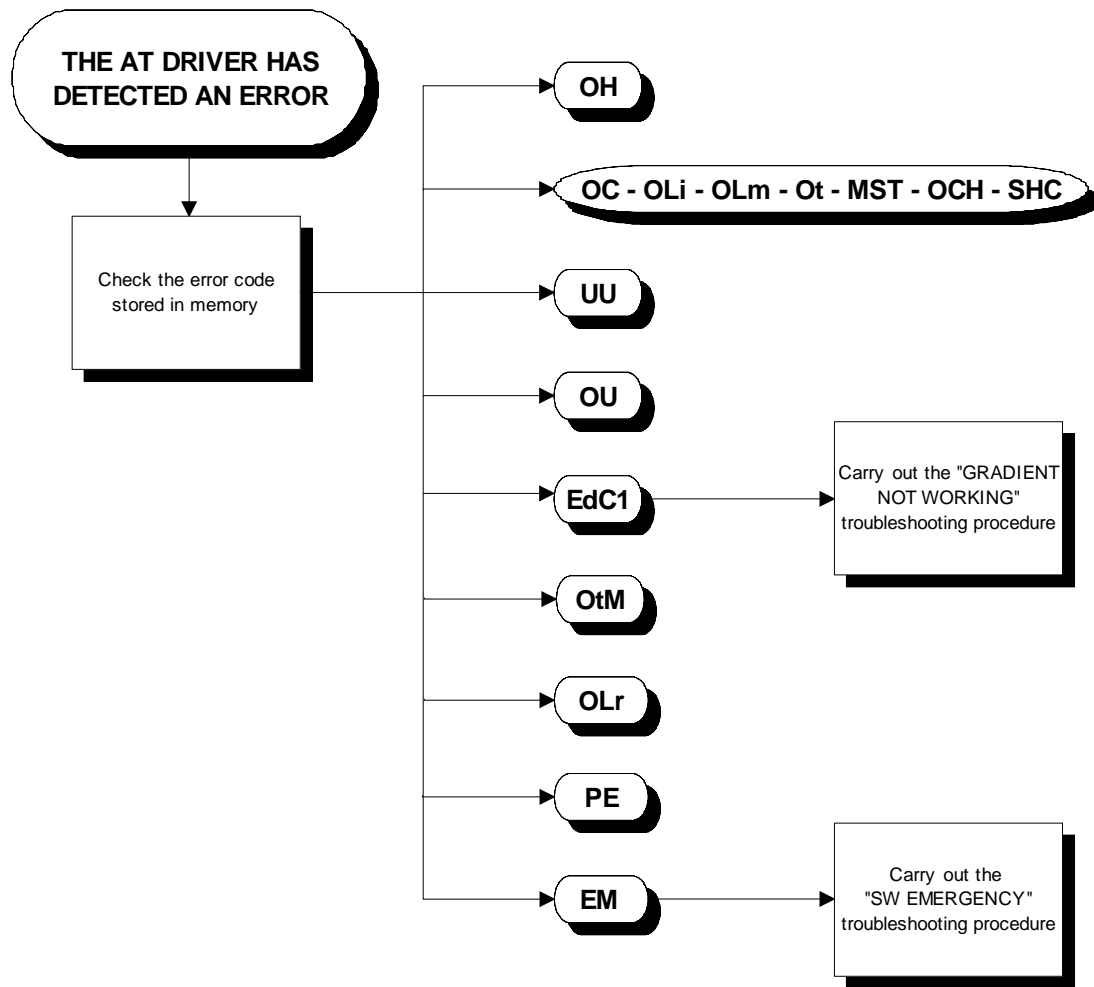
WARNING: if the display board detects an error condition during the tread belt motor movement, it displays the error message and turns off the AC motor by the AT driver.

6.5. AT DRIVER ERROR

When the AT driver detects an error, it stops and interrupts the power supply to the tread belt and elevation motor. An error code identifying the fault condition is saved in the error history log. In addition, it sends an error status signal to the display board via the serial link. Upon receiving this error signal, the display board halts the exercise and shows the “THE EQUIPMENT IS BLOCKED” message on the display.

The errors logged by the inverter can also be viewed as described in paragraph 9.2.4. “Errors log”. The following table shows the correspondence between the numbers and codes:

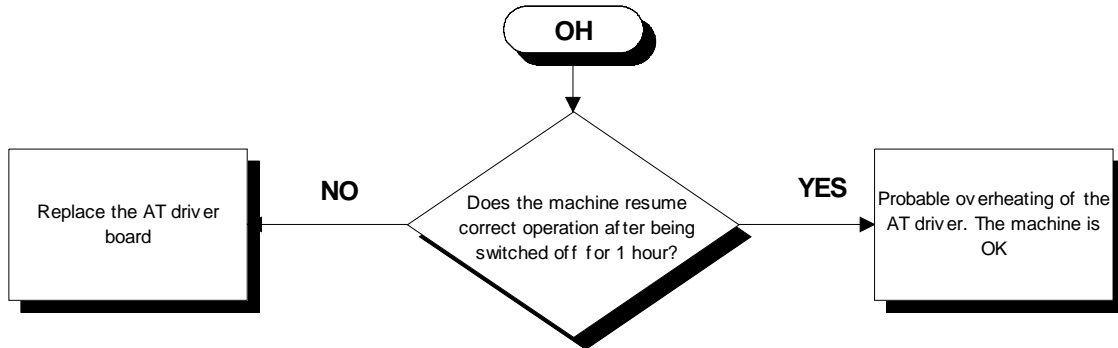
Error code	Error number	Description
OH	1	Overheating of the heat sinks of the AT drive and of the PFC.
OC	2	Overcurrent, even if only transient, on the inverter output.
UU	3	Undervoltage condition, due to an even transient drop in line voltage.
OU	4	Overvoltage.
PE	6	EEPROM error. Is generated when there is an error detected in the data stored on the EEprom.
EdC1	7	Elevation motor encoder error.
OtM	9	AC motor thermal cutout open.
Oli	10	Inverter overload caused by a DC current exceeding, for the maximum allowed time (I^2t), the maximum permissible threshold for the inverter.
OLm	11	Motor overload caused by a DC current exceeding, for the maximum allowed time (I^2t), the maximum permissible threshold for the motor in question.
OLr	12	Braking resistor overload.
Ot	13	Over-torque due to an even momentary overload of the inverter. Is generated when the torque output of the motor exceeds a pre-established limit for a pre-established time.
OCH	16	HW overcurrent.
MST	17	Motor lockout which occurs, operating in closed loop mode with the encoder active, if the inverter fails to reach the target speed even after attempting to reduce the reference frequency.
EM	19	Emergency. Is generated when the AT drive receives a software emergency signal that is not accompanied by a hardware emergency signal.
SHC	23	Short Circuit. Is generated in the event of a short circuit between a motor phase and earth.



The following paragraphs describe the troubleshooting procedures for these three cases.

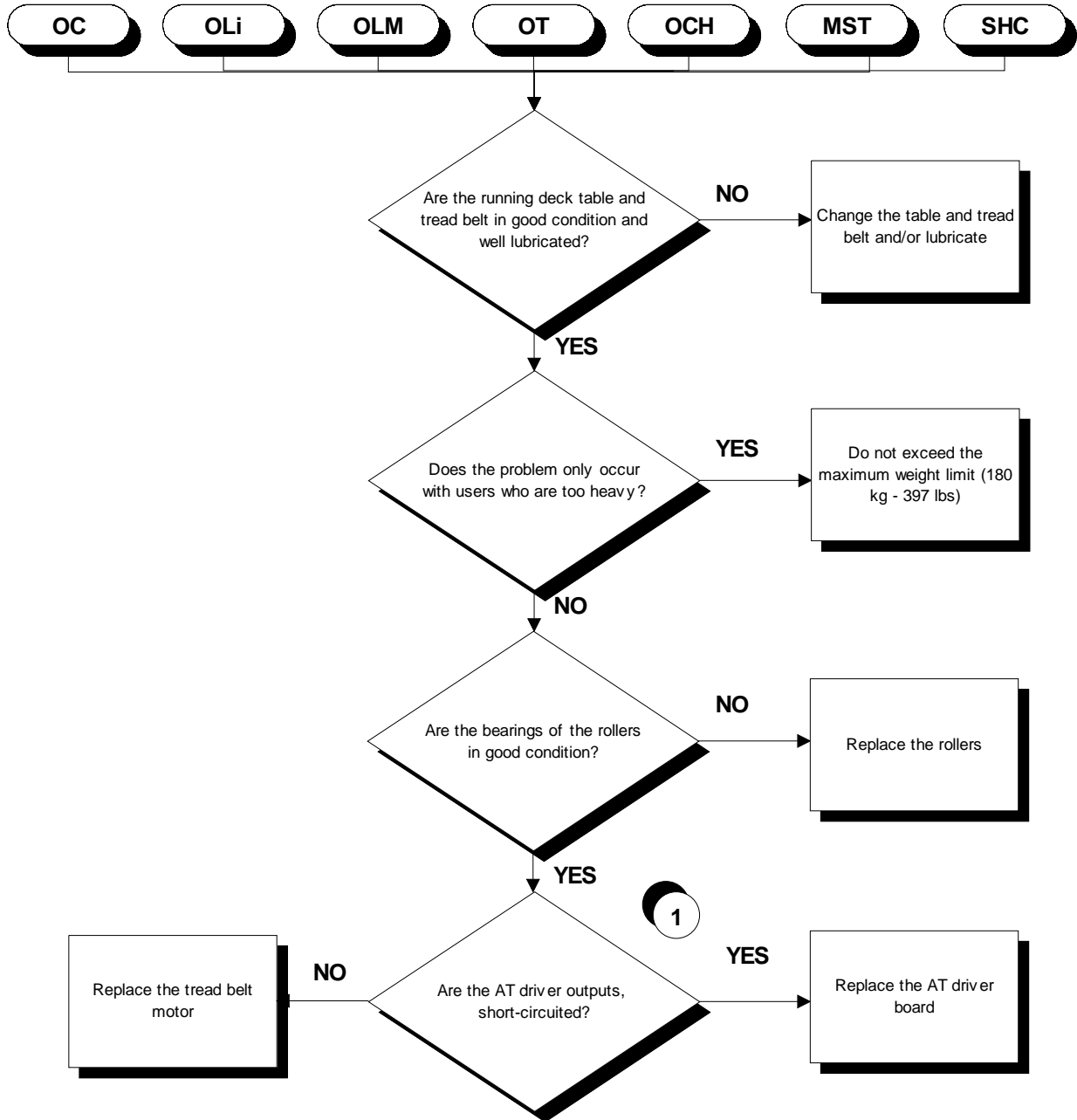
6.5.1. ERROR OH

This error indicates overheating of the heat sink on the AT driver board.



6.5.2. ERRORS OC - OLI - OLM - OT - OCH - MST - SHC

These errors are associated with overcurrent or overloading of the inverter and/or motor.

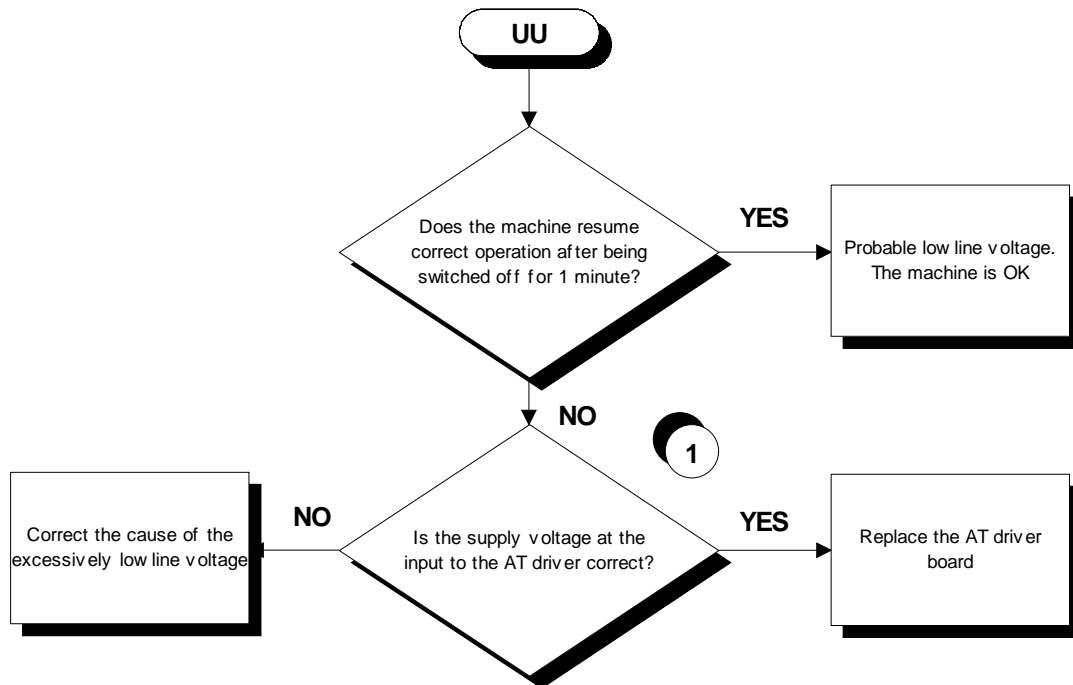


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Disconnect the motor cable from the AT driver box and place the tester probes across its terminals U-V, U-W and V-W. The measured resistance should be very high, in the order Mohms. Disconnect the motor cable from the AT driver box and place the tester probes across its terminals U-ground, V-ground and W-ground. The measured resistance value should be that of an open contact.

6.5.3. ERROR UU

This error indicates low voltage problems on the AT driver supply line.



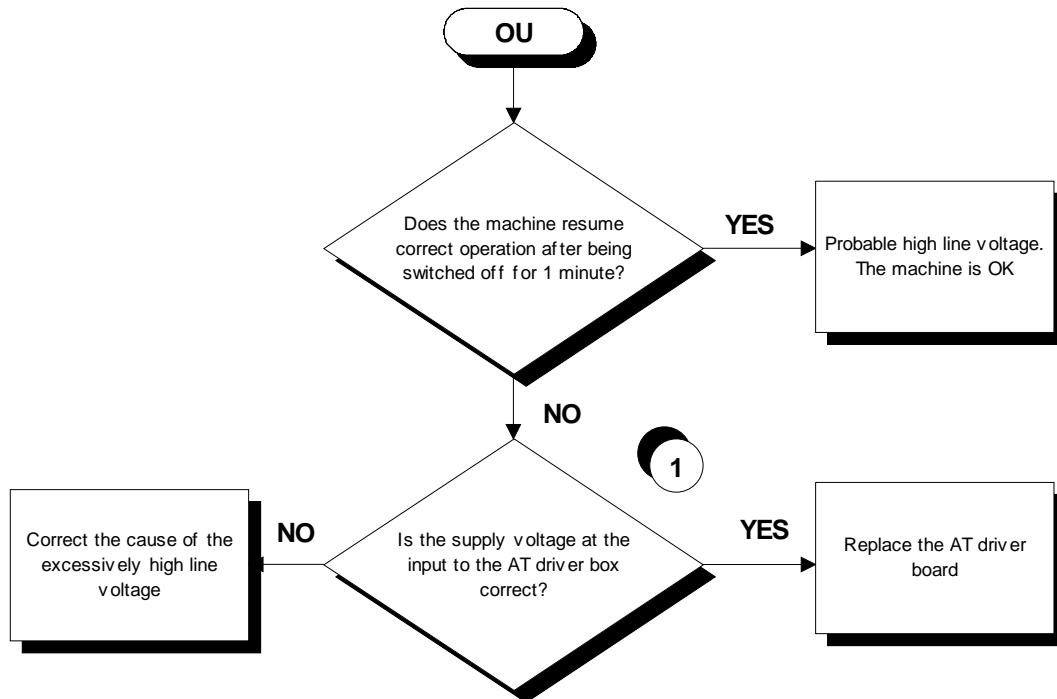
This error can be generated by even transient glitches in the mains supply due to overloading or other factors. Therefore it can be useful to check, in the inverter error log, the value of mains voltage recorded at the time when the error occurred.

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Place the tester probes across terminals of the connector J1 of the AT driver board. The measured voltage should be 220 VAC.

6.5.4. ERROR OU

This inverter error message indicates an overvoltage condition on the inverter supply line.



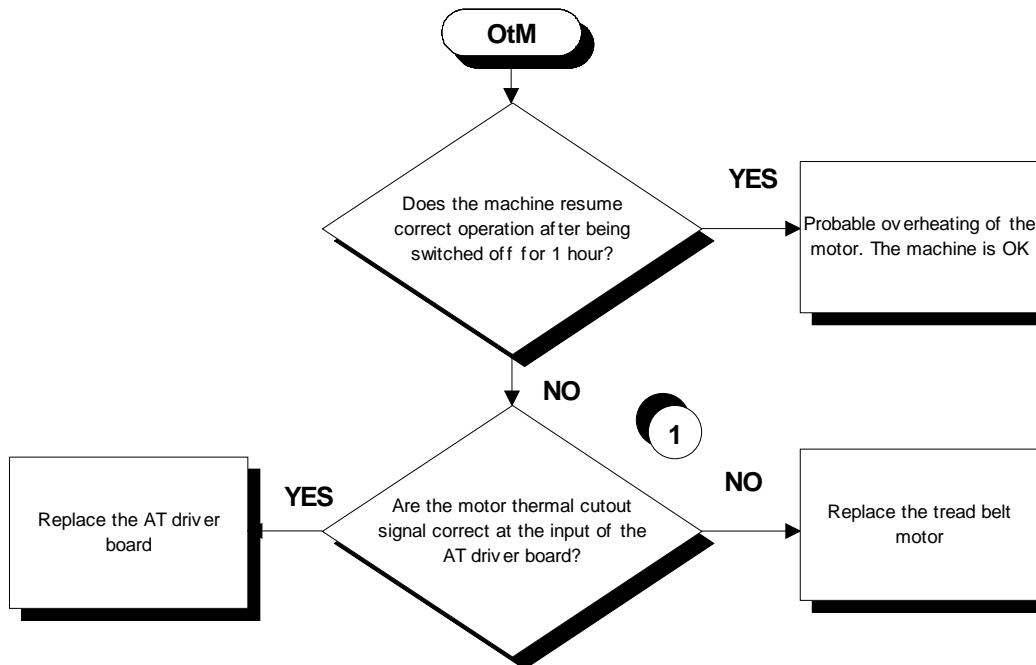
This error can be generated by even transient spikes in the mains voltage, resulting from overloading or other factors. Therefore, it can be useful to check, in the error log, the value of the mains voltage recorded at the time when the error occurred.

Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Place the tester probes across terminals of the connector J1 of the AT driver board. The measured voltage should be 220 VAC.

6.5.5. ERROR OTM

This error indicates that the thermal cutouts of the tread belt motor have been tripped.



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

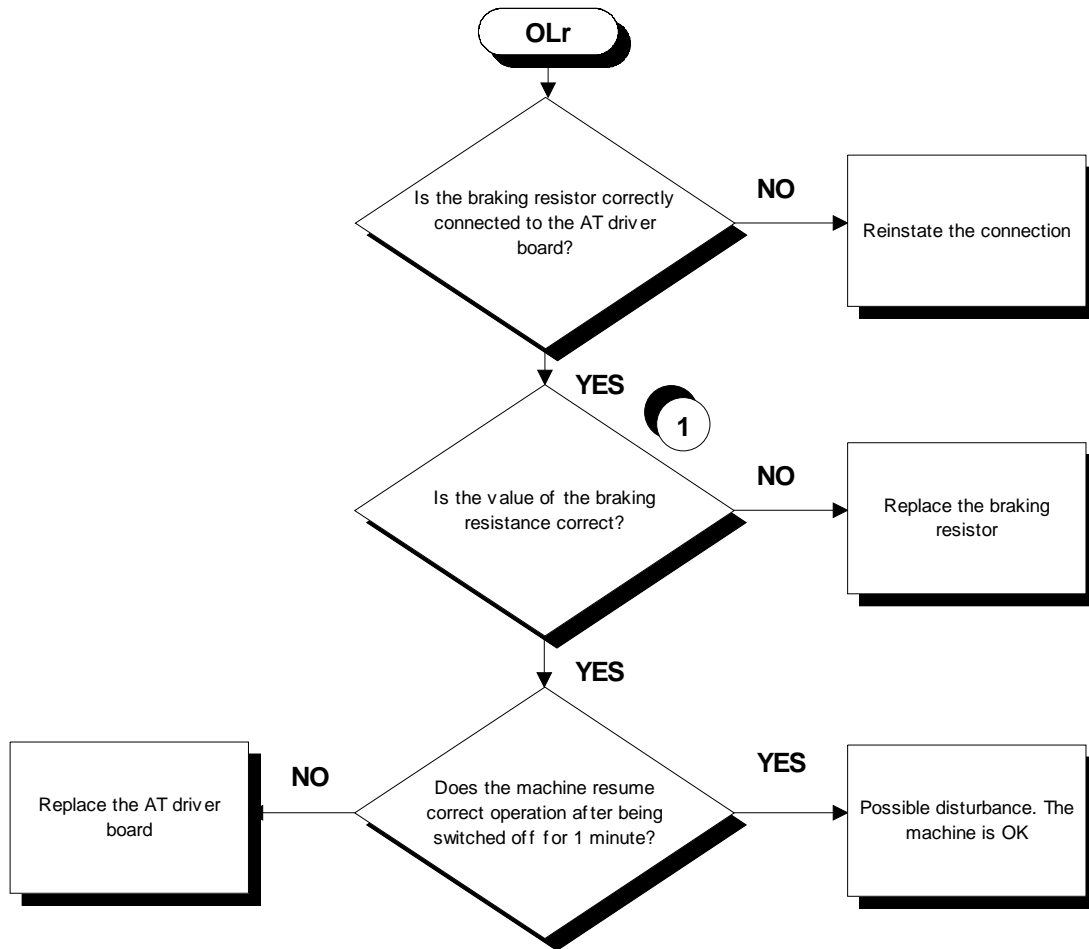
- (1) Disconnect the cable TRM-06 and place the tester probes across pins 4 and 5 of its connector. The measured value of the resistance should be less than 1 Ohm.



This value may be higher as a result of oxidation of the contacts. To reinstate correct operation it is necessary to perform a special procedure that will be communicated to you on contacting the Technogym Support Service.

6.5.6. ERROR OLR

This error indicate problem with the braking resistor.

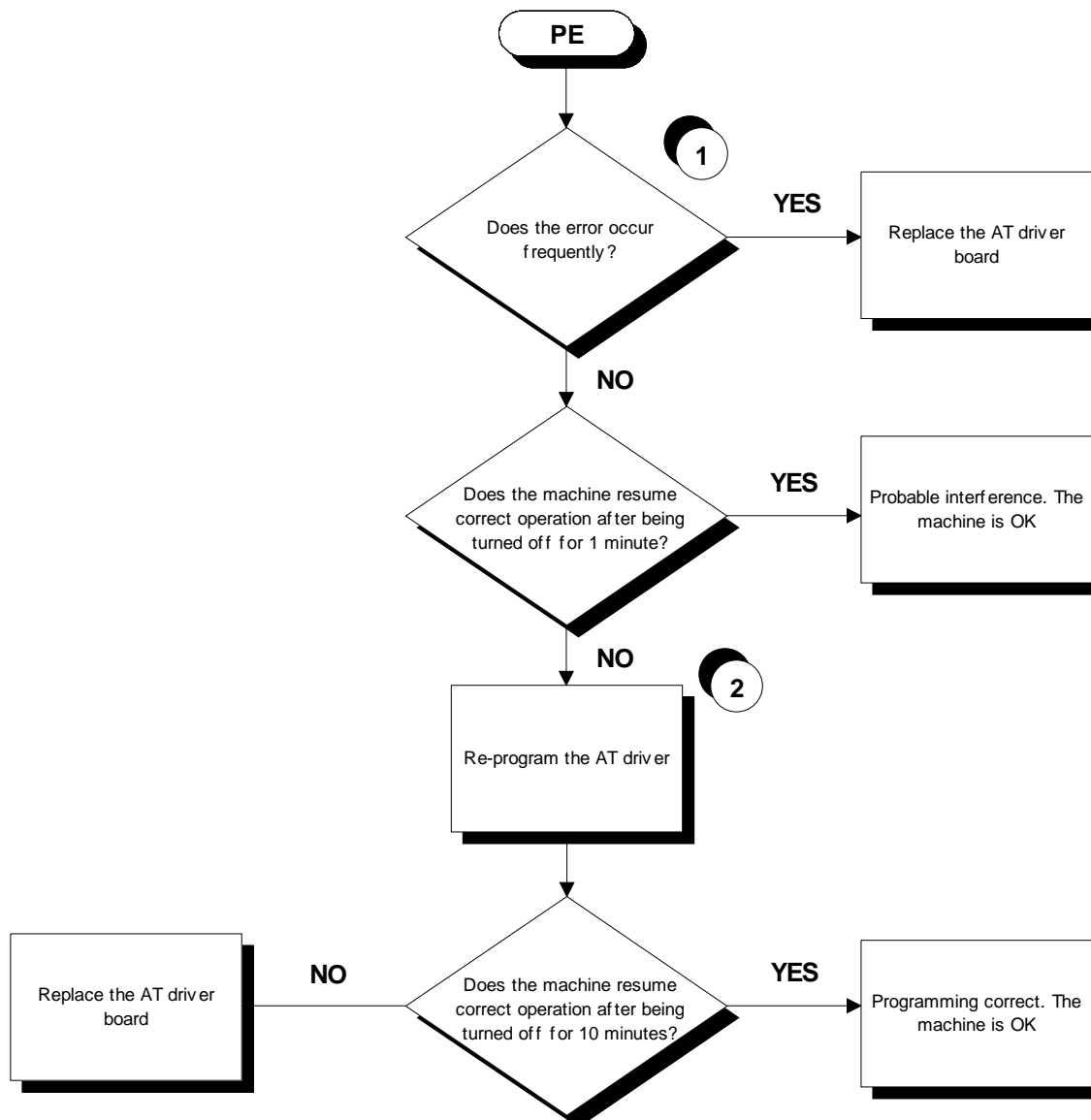


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) With the machine switched off, disconnect the fastons of the resistor from the AT driver board and place the tester probe across them. The measured value of the resistance should be 150 Ohm.

6.5.7. ERROR PE

This error indicate problem on the data of the Eeprom.

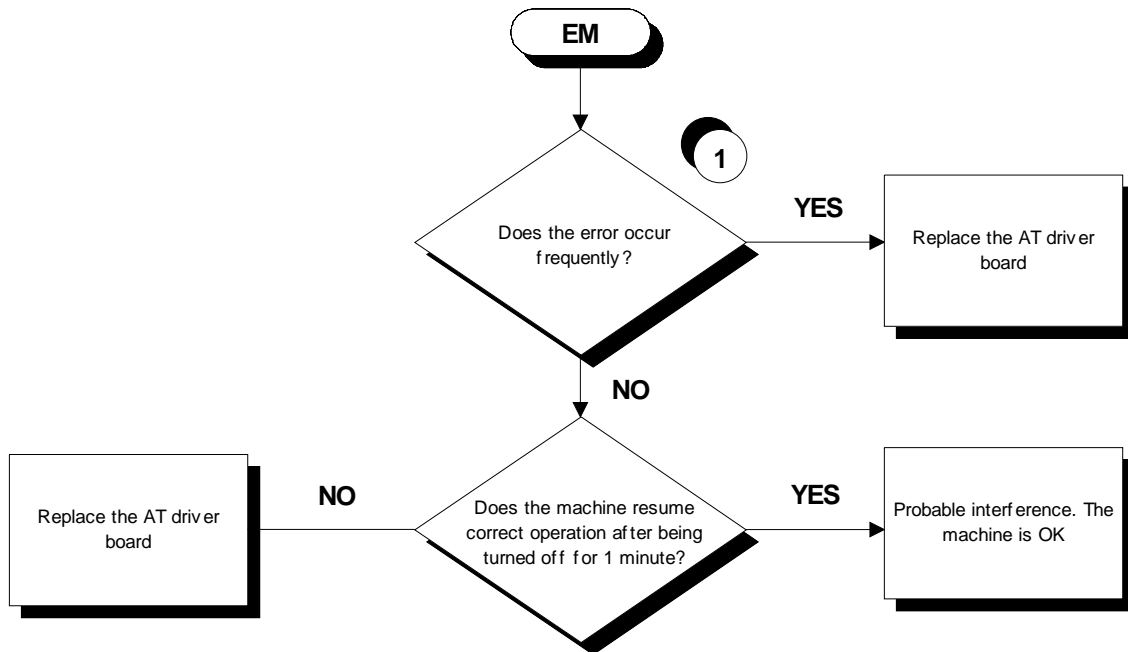


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Determine the frequency of the errors by counting the number of occurrences and by running targeted checks. An error is considered frequent if it occurs 2 or 3 times a day.
- (2) Re-program the AT driver following the procedure described in paragraph 9.5. “Default parameters”.

6.5.8. ERROR EM

The error is generated if the AT drive receives a software emergency signal via the 485 serial communications link between the upper and lower assemblies, but does not receive the corresponding emergency hardware signal via cables TRM-19 and TRM-20.



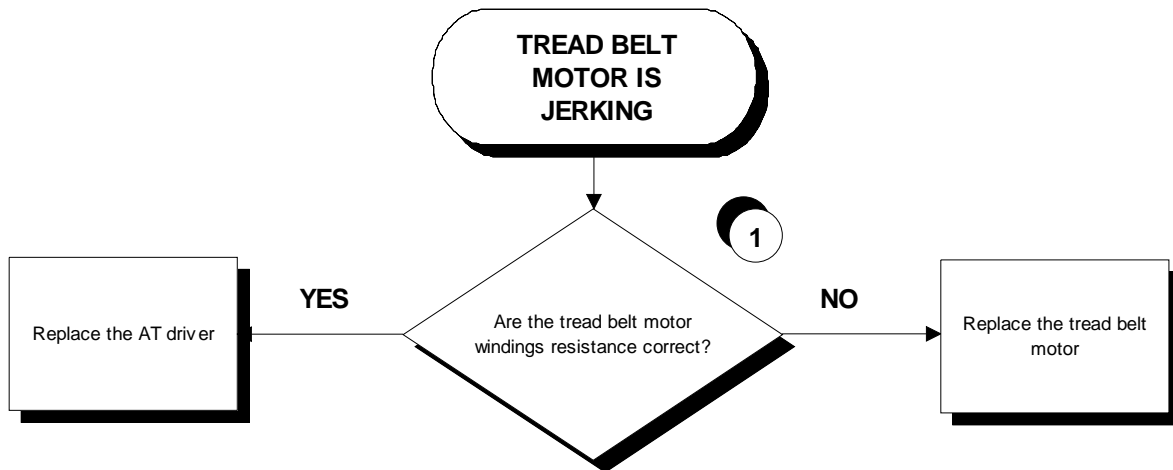
Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Determine the frequency of the errors by counting the number of occurrences and by running targeted checks. An error is considered frequent if it occurs 2 or 3 times a day.

6.6. TREAD BELT MOTOR IS JERKING

The probable cause is:

- a disconnected phase either at the AT driver board output or on the motor;



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Disconnect the cable from the motor and place a tester across its terminals U-V, U-W and V-W. The measured value of the resistance should be 1.9 Ohm.

6.7. “GRADIENT NOT WORKING” MESSAGE ON THE DISPLAY



If the elevation does not work and there is no error message on the display, the elevation movement may have been disabled in the configuration menu. For further details, refer to paragraph 9.1.14. “Enable up/down motor”.



Check parameter PAR 09 is 15.

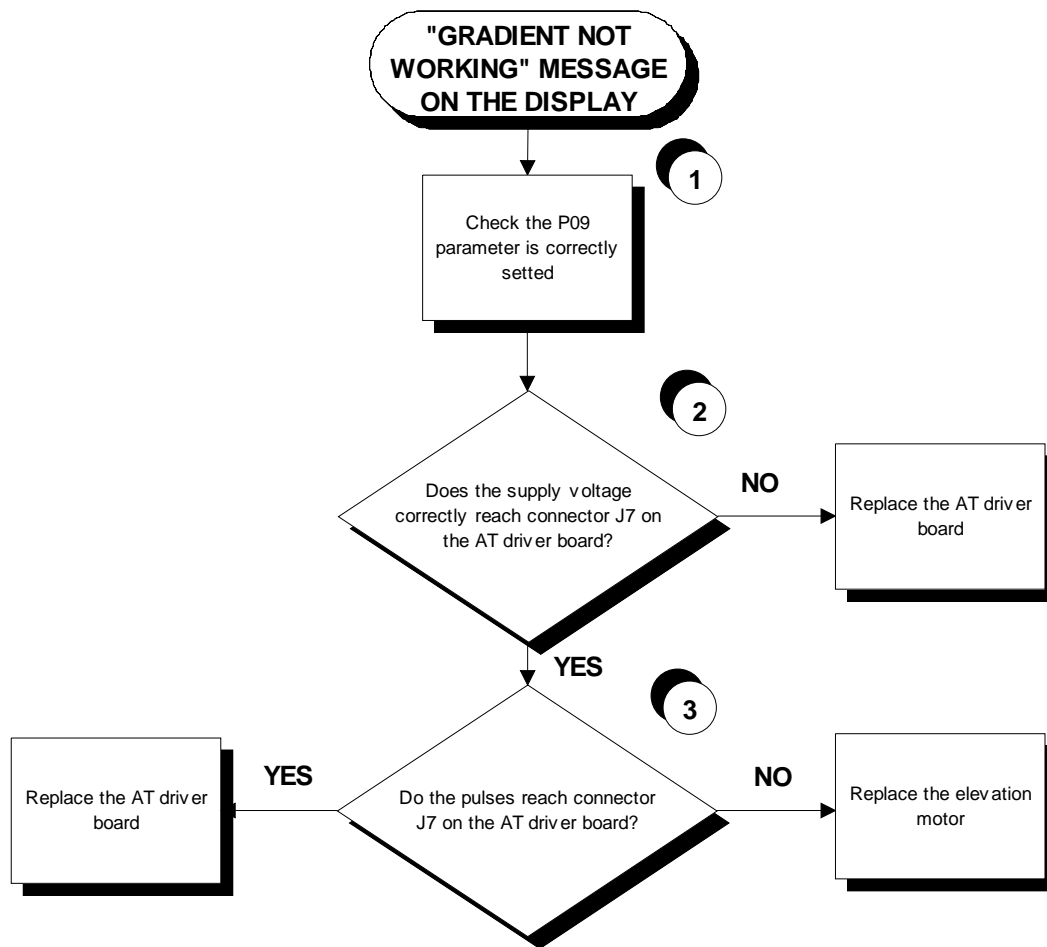
This parameter defines the time window within which the inverter expects to receive a sufficient number of pulses from the elevation motor, before generating an error condition.

1. This error message indicates that the machine is unable to control the elevation motor. The error is produced when the inverter does not receive pulses from the motor encoder, after having enabled it. In this case the machine disables any movement and sets the parameter PAR 07 to 1.
2. The error message may be caused by a problem with the lower limit switch. In fact if the limit switch malfunctions or accidentally remains in the open-contact state, rather than in the normally closed state, the error is not generated immediately but will occur as soon as the elevation is increased beyond 1%. At this point, the elevation function will be locked out and parameter PAR 07 set to 1.
3. The error message may be due to a misalignment of the elevation motor encoder. In fact, if the encoder of the elevation motor is not correctly positioned, the motor will fail to produce a pulse. At this point, the elevation function will be locked out and parameter PAR 07 set to 1.

When the machine is switched on again, the parameter PAR 07 is automatically reset to 0 and the machine performs the reset procedure. If the error does not happen anymore, supposing it was generated by a noise, the machine restarts to work properly.



It might also be helpful to refer to the theoretical explanation of the elevation control, provided in paragraph 3.3. “Elevation motor drive”.

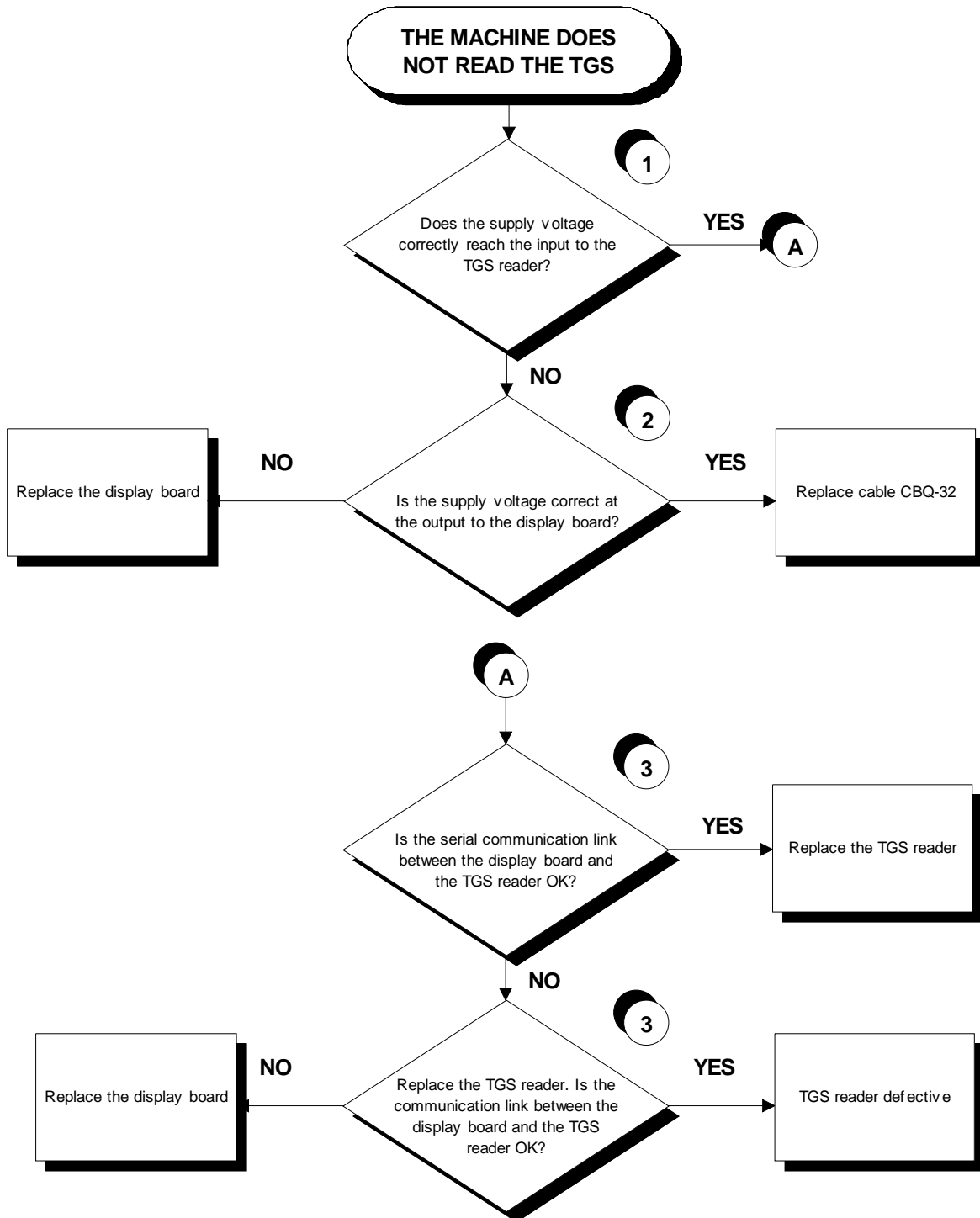


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Check the parameter setting as detailed in paragraph 9.2.1.4 “Table of configuration parameters”.
- (2) Place the tester probes across pins 1 and 2 of connector J7 on the AT driver board. The measured value should be approximately 24 Vdc.
- (3) Place the tester probes across pins 6 and 4 of connector J7 on the AT driver board. The measured value should be approximately 2.5 Vdc. If an oscilloscope is available, it is possible to view the pulses produced by the encoder itself.

6.8. THE MACHINE DOES NOT READ THE TGS

The machine displays this error if the TGS reader is not working properly, or if it is not supplied by the display board.



Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

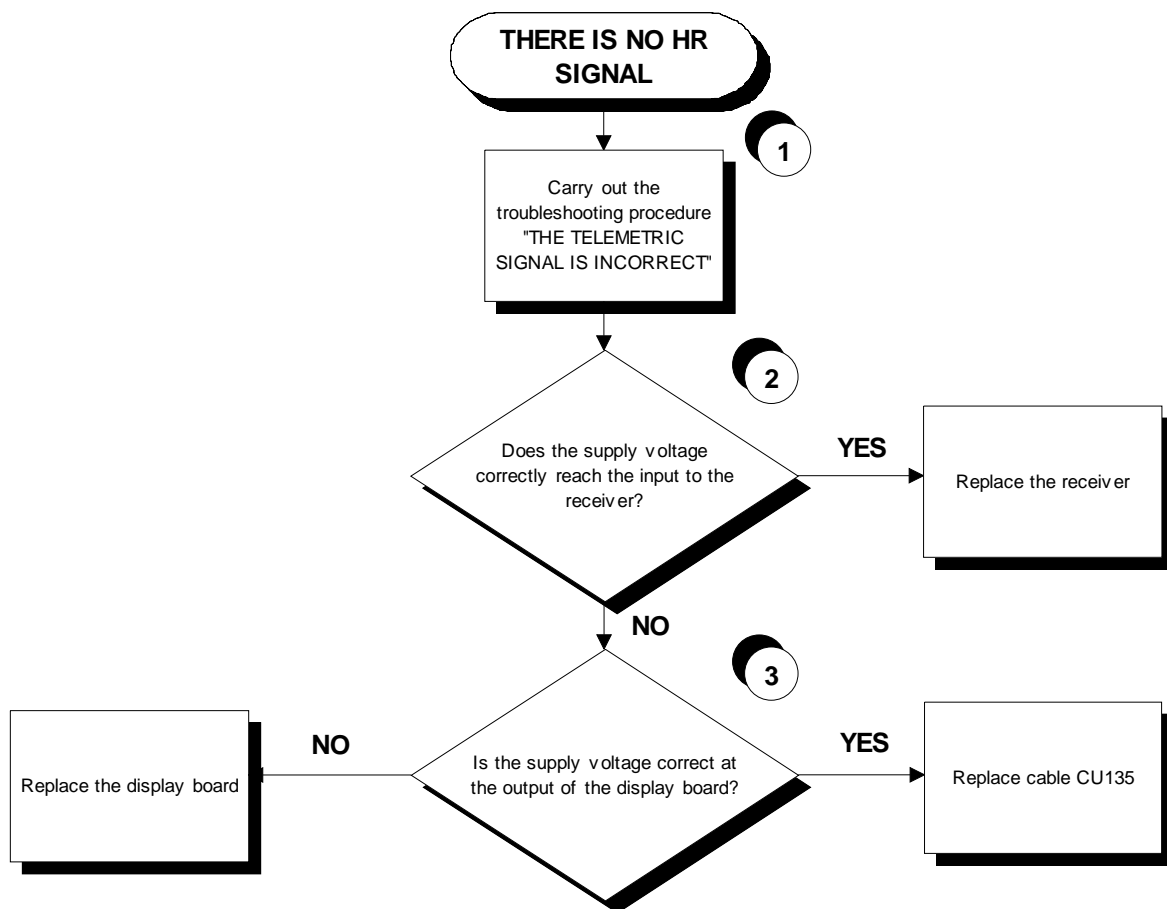
- (1)** Place the tester probes across pins 1 and 3 of connector CN1 of the TGS reader. The measured value should be +12 Vdc.
- (2)** As for step (1) but across pins 1 and 9 of connector CN3 on the display board.
- (3)** Use the serial communications test described in paragraph 6.1.1.5 “Serial Ports Test”.

6.9. THERE IS NO HEART RATE SIGNAL

6.9.1. TELEMETRIC RECEIVER HFU

The machine displays this error if:

1. electromagnetic noise saturate the HR receiver which does not display any value due to a specific SW filter which cut every signal, greater than 220 bpm;
2. the receiver is not working properly;
3. the receiver is not supplied by the display board.

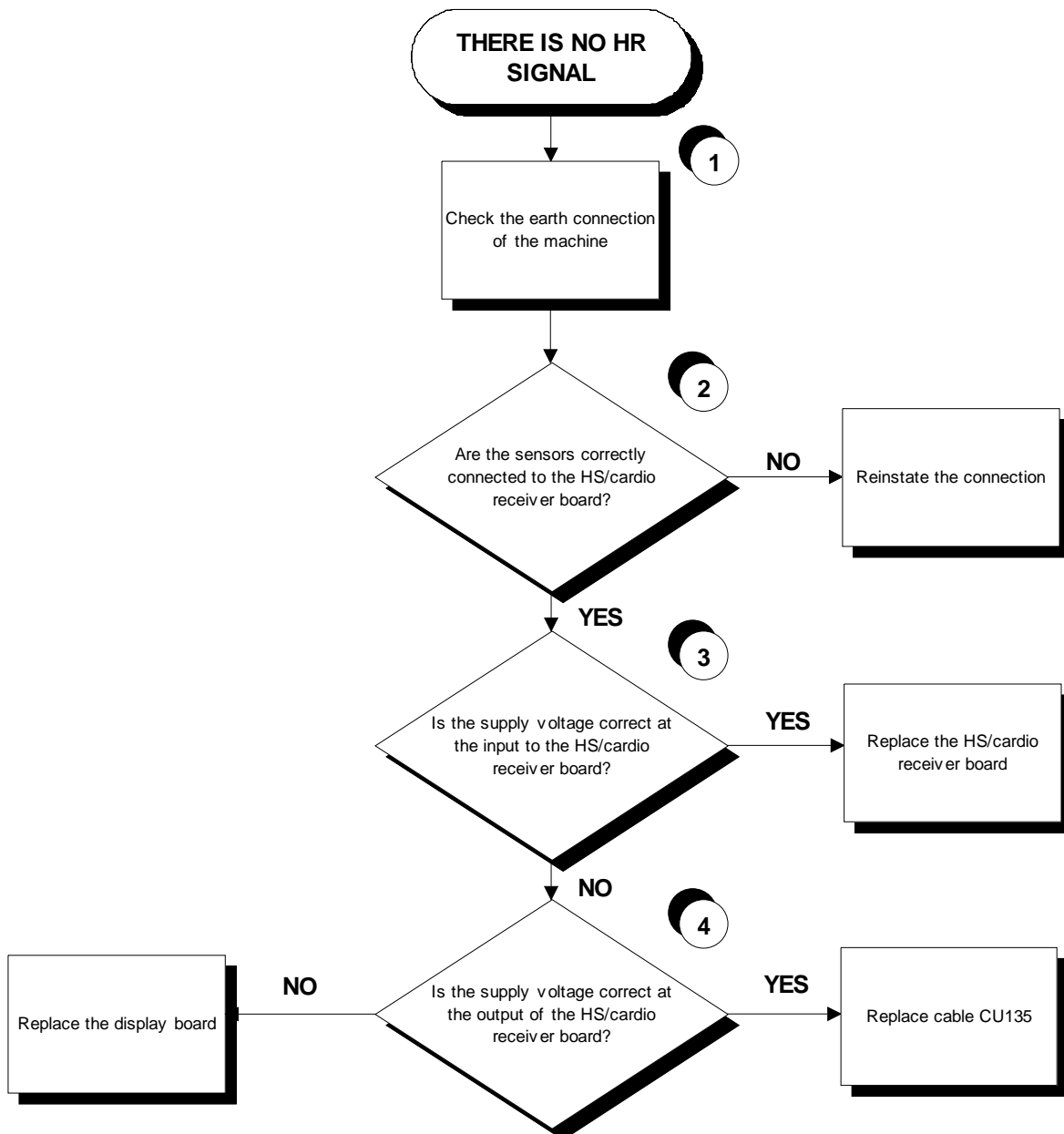


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Carry out the troubleshooting procedure 6.10. "The telemetric hr signal is incorrect".
- (2) Place the tester probes across pins 1 and 2 of connector HD4 of the HS / cardio receiver board. The measured value should be +5 Vdc.
- (3) As for step (2) but across pins 1 and 5 of connector CN9 on the display board.

6.9.2. HAND SENSOR

The machine displays this error if the HS / cardio receiver board is not working, or if it is not supplied by the display board.



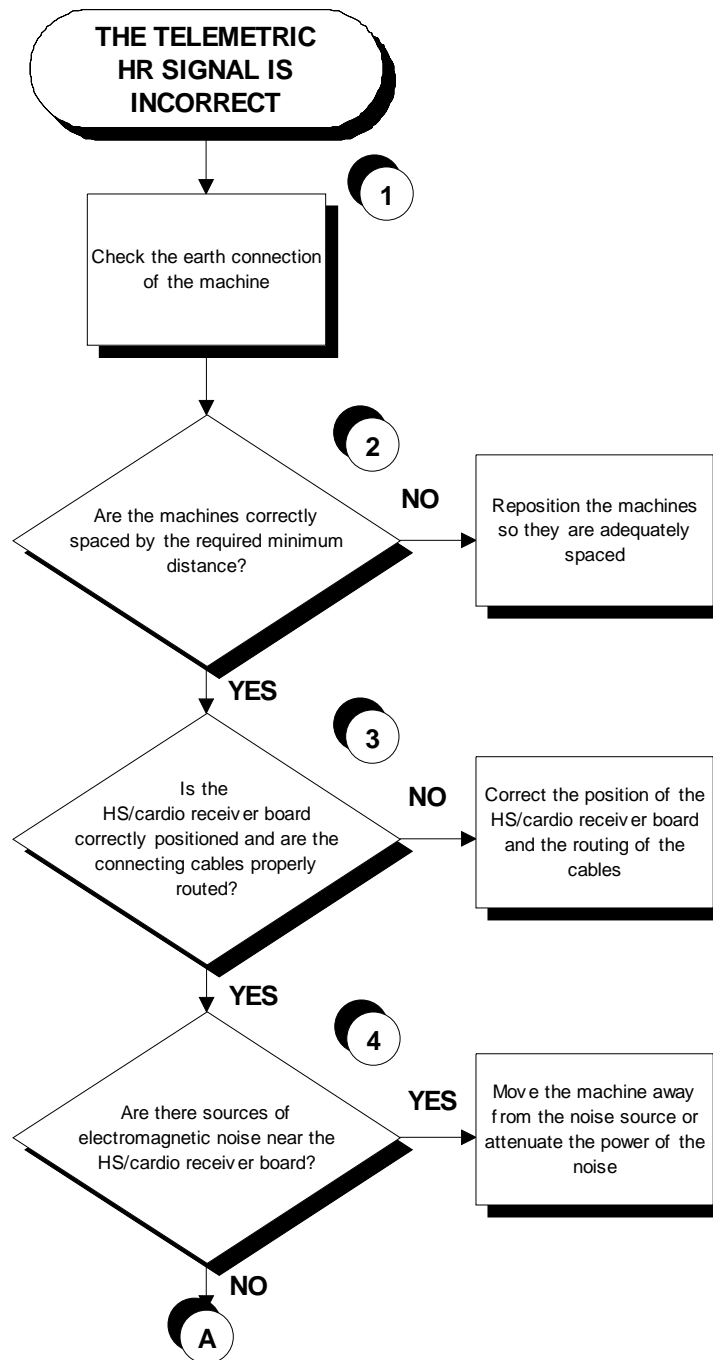
Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Check the earthing of the machine using a tester to measure the resistance between the ground pin on the power supply cable and the ground node to which the hand sensor are connected inside the display. The value must be less than 1 Ohm.
- (2) Check the connections, referring to paragraph 2.7. “Wiring”.

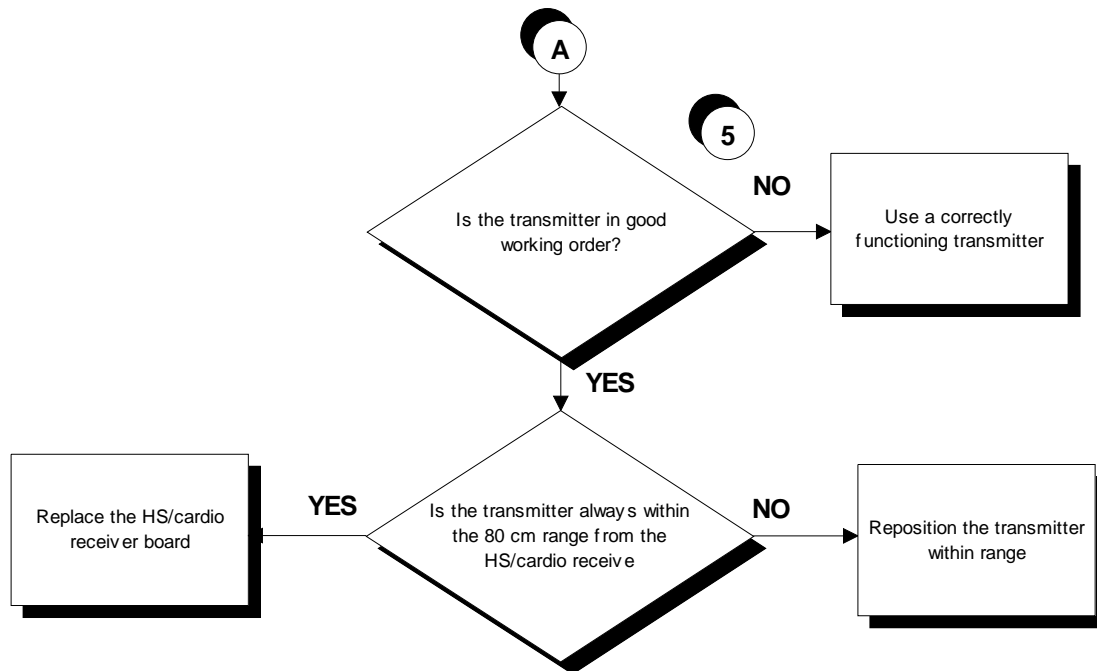
- (3) Place the tester probes across pins 2 and 1 of connector HD4 on the HS/cardio receiver board. The measured value should be +5 Vdc.
- (4) As for step (2) but across pins 1 and 5 of connector CN9 on the display board.

6.10. THE TELEMETRIC HR SIGNAL IS INCORRECT

The machine displays this error if the receiver is disturbed by sources of electromagnetic noise.

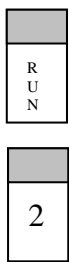
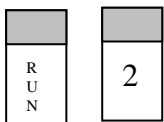
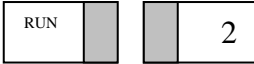



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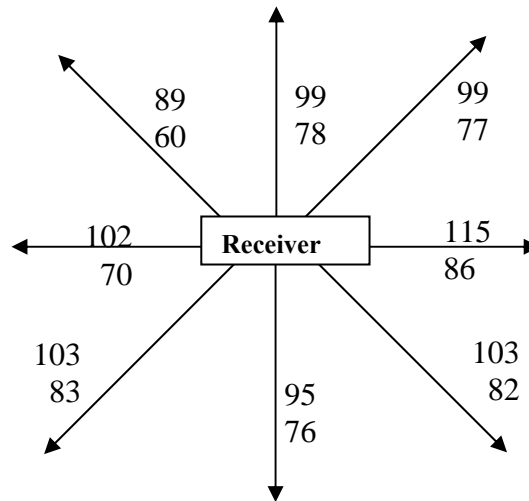


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1) Check the earthing of the machine using a tester to measure the resistance between the ground pin on the power supply cable and the ground node to which the receiver is connected inside the display. The value must be less than 1 Ohm.
- (2) In the table below , the minimum distances at which machines should be installed to avoid crosstalk problems.

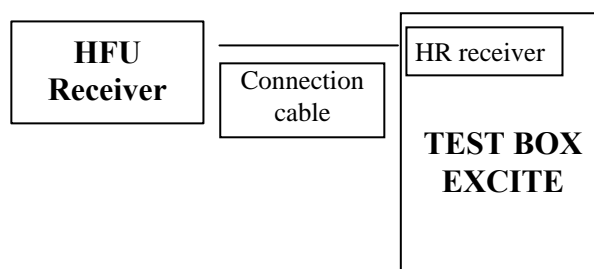
											
DISTANCE CASING-CASING											
machine 2			machine 2			machine 2			machine 2		
Bike	Recline	Run	Bike	Recline	Run	Bike	Recline	Run	Bike	Recline	Run
10	20	10	50	50	40	10	10	10	10	40	10
DISTANCE RECEIVER-RECEIVER											
machine 2			machine 2			machine 2			machine 2		
Bike	Recline	Run	Bike	Recline	Run	Bike	Recline	Run	Bike	Recline	Run
195	205	230	115	115	130	130	130	170	225	285	300

For machine positioning layouts different from those indicated above, use the following diagram as a reference.



where:

1. The distances are in centimeters.
 2. The smaller number indicates the maximum locking distance for signal reception at the start of the exercise.
 3. The higher number indicates the maximum reception distance during the exercise.
- (3) Check that the cardio receiver has been assembled properly as described in the procedure 7.5. “Disassembling the cardio receiver”.
- (4) To check for electromagnetic noise near the machine, use Test Box Excite as detailed here below. You can use one of the following cables ELT-16 (0WC00518AB), CBQ-28 (0WC00390AC) or TRM-28 (0WC00336AC) as connection cable.



The circuit lights the LED for each heart beat and/or disturbance received: in this way it is possible to determine whether there is any interference, and identify its sources.

- (5) Check the battery power level, using a tester if possible. Otherwise use a receiver or another “reference” machine to check the operation up to a distance of about 80 cm from the receiver.

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7. DISASSEMBLY OF COMPONENTS

7.1. DISASSEMBLING THE DISPLAY

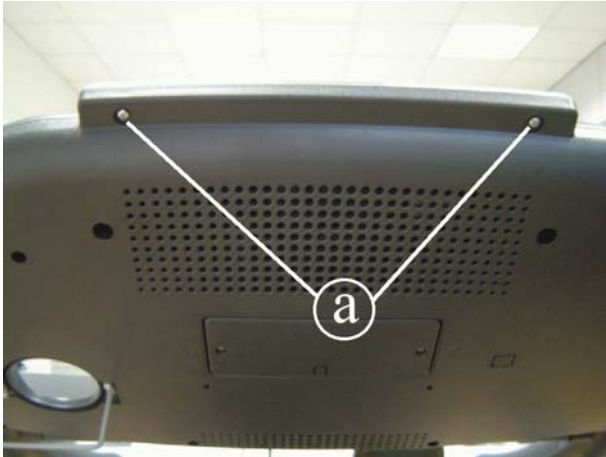


Figure 7.1-1

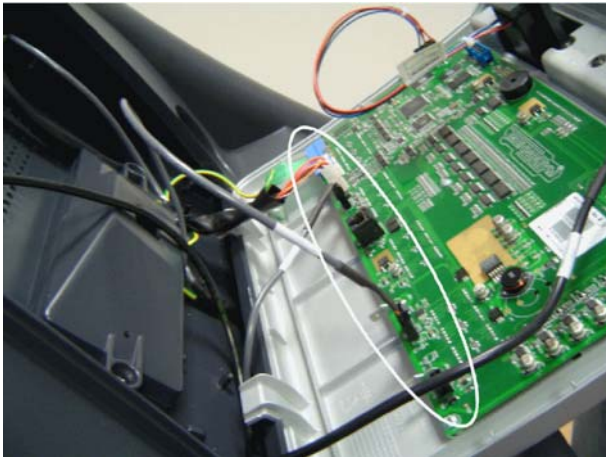


Figure 7.1-2

1. Turn off the machine and unplug the mains lead from the wall outlet.
2. Back off the 2 screws **a** using a medium Phillips screwdriver.

3. Open the display, leaving it attached to the machine as shown in the figure.

To remove the display:

4. Disconnect the connectors indicated.
5. Remove the display.

To reassemble the display, carry out the above steps in reverse order.

7.2. DISASSEMBLING THE CIRCUIT BOARDS OF THE DISPLAY

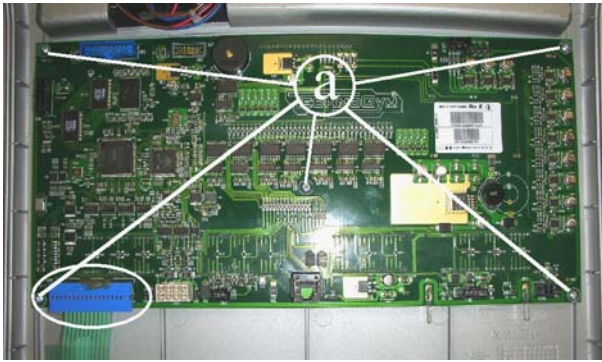


Figure 7.2-1

Carry out the procedure described in paragraph 7.1. “Disassembling the display”.

1. Place the display on a work bench.
2. Unplug the connector indicated in the figure.
3. Back off the 5 screws **a** using a small Phillips screwdriver.
4. Remove the circuit board.

To reassemble the circuit boards, carry out the above steps in reverse order.



After the reassembling of the board, remember to fix the keyboard connector using a drop of hot glue.

7.3. DISASSEMBLING THE KEYBOARD



Figure 7.3-1

Carry out the procedure described in paragraph 7.1. “Disassembling the display”.

1. Unplug connector from the keyboard.

With the display placed on a work bench:

2. Use a sharp tool to lift up and detach a corner of the keyboard.

To assemble a new keyboard, with the display on a work bench:

1. Remove the backing film which protects the adhesive.
2. Apply the adhesive part, starting from the left and working toward the right, without bending the keyboard.
3. Insert the connector in the special slot on the display and connect it to the display board.
4. Remove the protective film.



Figure 7.3-2

When reassembling the keyboard, make sure that none of the keys are bent or remain pushed in.

After the reassembling of the board, remember to fix the keyboard connector using a drop of hot glue.

The keyboard assembly procedure can only be carried out once, because disassembly damages the tracks and keys.

7.4. DISASSEMBLING THE EMERGENCY BUTTON

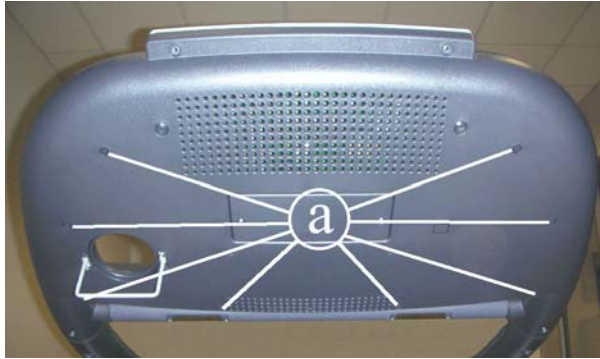


Figure 7.4-1

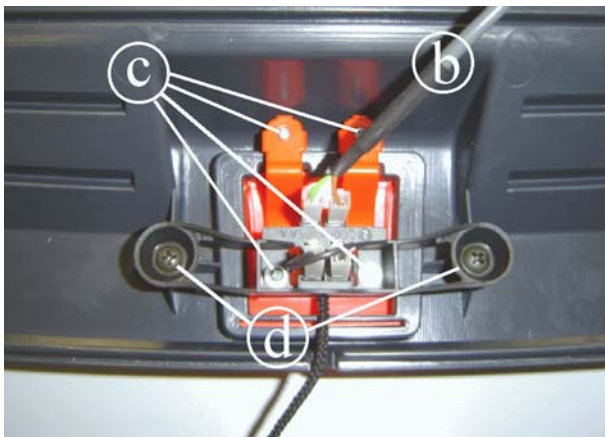


Figure 7.4-2

Carry out the procedure described in paragraph 7.1. “Disassembling the display”.

1. Back off the 8 screws **a** using a medium Philips screwdriver.
2. Remove the front display casing and place it on a work bench.
3. Disconnect the cable **b** from the two faston connectors on the emergency button.
4. Back off the 4 screws **c** using a small Philips screwdriver.
5. Remove the emergency button from the front side.
6. Back off the 2 screws **d** using a medium Philips screwdriver and remove the two microswitch.

To reassemble the emergency button, carry out the above steps in reverse order.

7.5. DISASSEMBLING THE CARDIO RECEIVER/HAND SENSOR BOARD

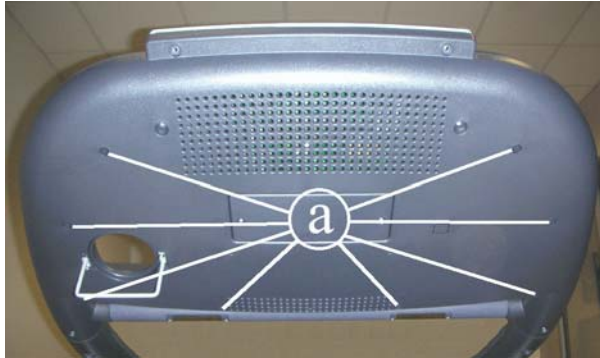


Figure 7.5-1

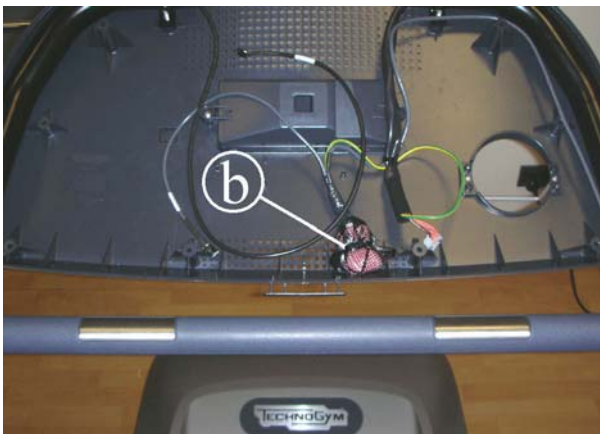


Figure 7.5-2

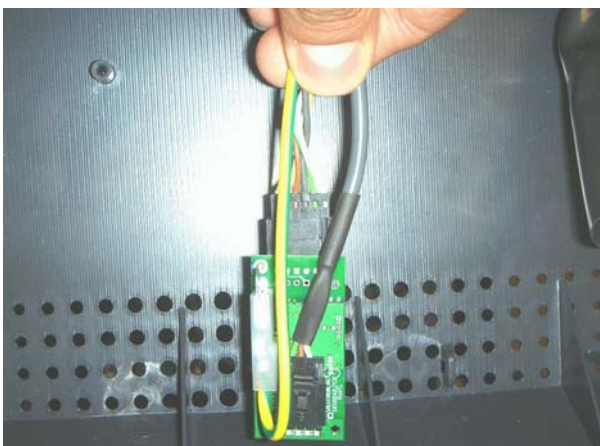


Figure 7.5-3

Carry out the procedure described in paragraph 7.1. “Disassembling the display”.

1. Back off the 8 screws **a** using a medium Philips screwdriver.
2. Remove the front display casing.
3. Cut the cable tie and remove the Receiver/hand sensor board from the nylon bag.

To assemble the new receiver:

1. Connect the cable to the board and bend the cables on the rear side of the board.

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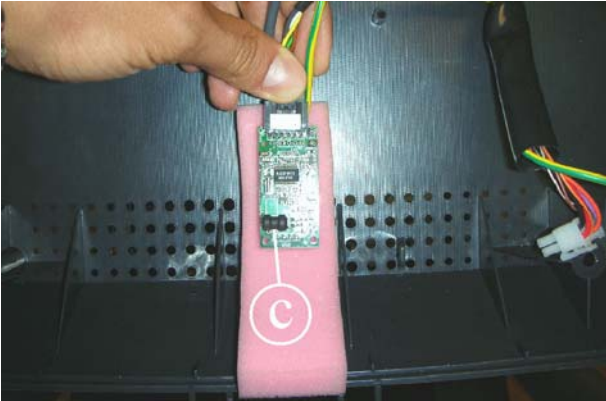


Figure 7.5-4

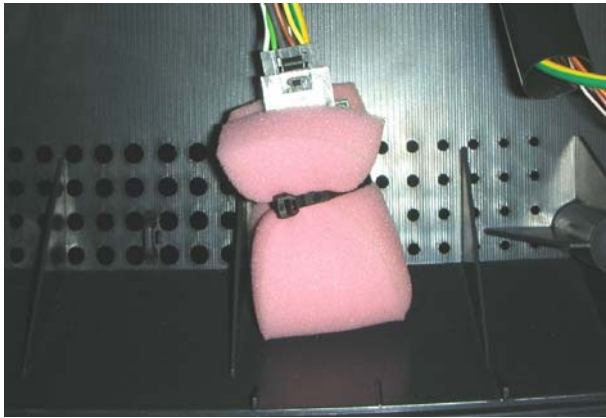


Figure 7.5-5

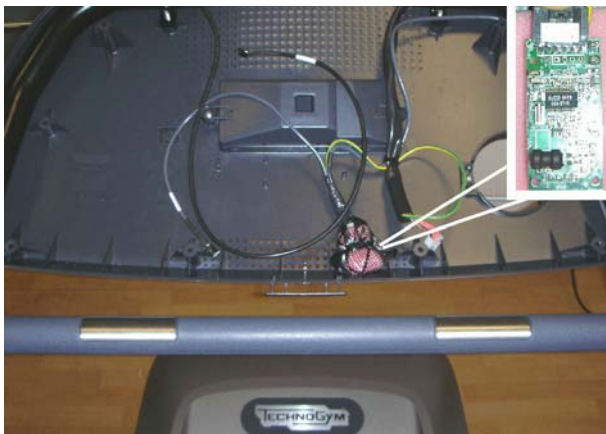


Figure 7.5-6

2. Place the board on the sponge taking care that the coil is upward.

3. Fold the sponge on the board as shown in the picture.

4. Secure the sponge on the board with some tape or with a cable tie. Make sure it is secured but not too fasten.

5. Encase the board in a plastic bag.

6. Close and secure the plastic bag with some tape on the cable as indicated in the figure.



the receiving coil must be oriented upwards and toward the user (as shown in the figure to side).

7.6. DISASSEMBLING THE SENSORS

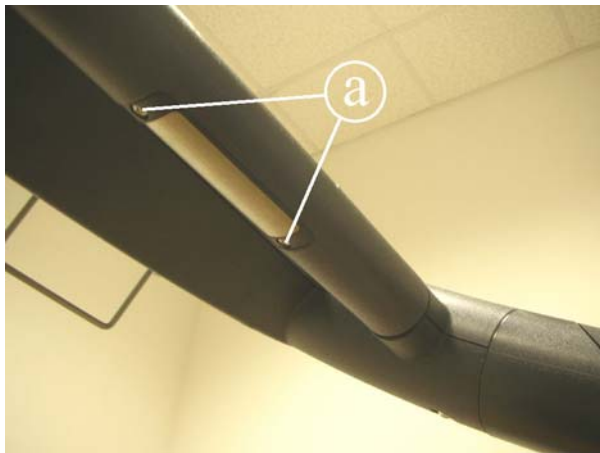


Figure 7.6-1

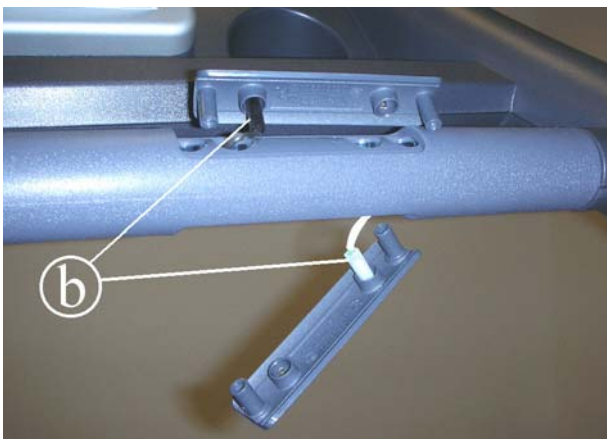


Figure 7.6-2

1. Turn off the machine and unplug the mains lead from the wall outlet.

For each sensor:

2. Back off the 2 screws **a** using a small Phillips screwdriver.

3. Lift up the top sensor.

4. Remove the lower sensor.

5. To disconnect the sensors, unplug the two fastons **b**.

To reassemble the sensors, carry out the above steps in reverse order.

7.7. DISASSEMBLING THE READY TO RUN BOARD



Figure 7.7-1

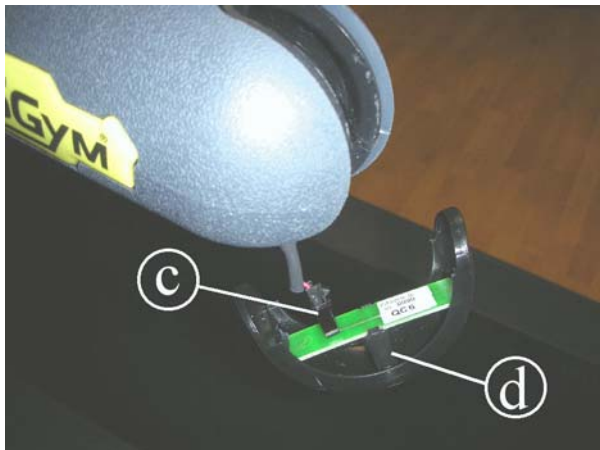


Figure 7.7-2

1. Turn off the machine and unplug the mains lead from the wall outlet.
2. Back off the screw **a** using a small Phillips screwdriver.
3. Remove the plastic cover **b** from the handlebar.
4. Disconnect the connector **c** from the board.
5. Remove the board from the plastic cover.

To reassemble the board, carry out the above steps in reverse order.

During the reassembling procedure do not forget to place again the light conveyor “d” between the board and the cover.

7.8. SMONTAGGIO MANIGLIONI



Figure 7.8-1

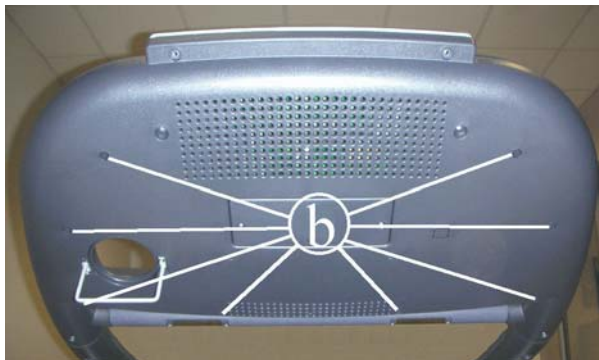


Figure 7.8-2

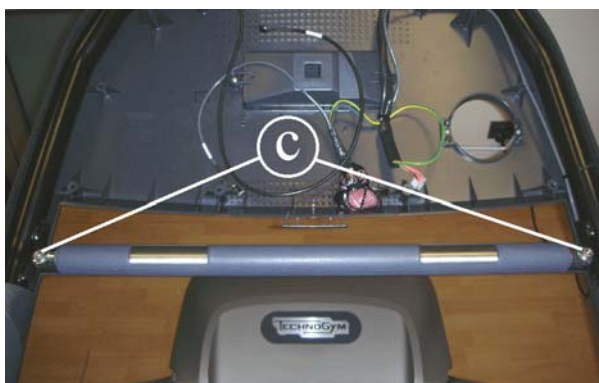


Figure 7.8-3

Carry out the procedure described in paragraph 7.1. “Disassembling the display”.

1. Back off the 2 screws **a** using a medium Phillips screwdriver.
2. Remove the handlebar pulling it out from the rear side.

To disassemble the central handlebar:

3. Carry out the procedure described in paragraph 7.1. “Disassembling the display”.
4. Back off the 8 screws **b** using a medium Phillips screwdriver.
- 5.

6. Back off the 2 screws **c** using a 6-mm hex wrench.
7. Remove the handlebar taking care of the cable coming from the hand sensor.

To reassemble the handlebars, carry out the above steps in reverse order.

7.9. DISASSEMBLING THE MOTOR GUARD

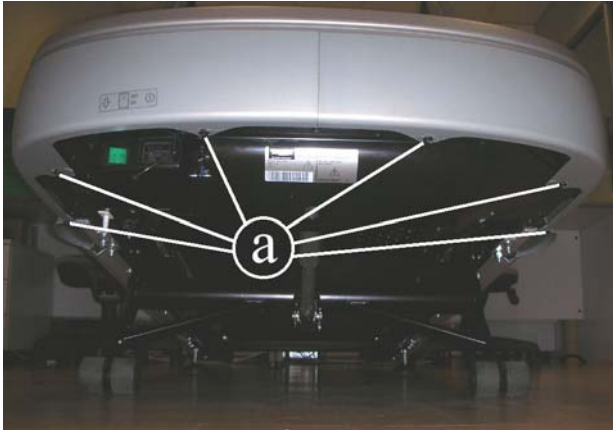


Figure 7.9-1

Turn off the machine and unplug the mains lead from the wall outlet.

1. If possible, lift up the machine at the elevation of 10%, to make the procedure easier.
2. Back off the 6 screws **a**, using a 4-mm hex wrench.
3. Remove the motor casing pulling it out from the front side of the machine.

To reassemble the motor guard, carry out the above steps in reverse order.

7.10. DISASSEMBLING THE MOTOR COMPARTMENT FAN

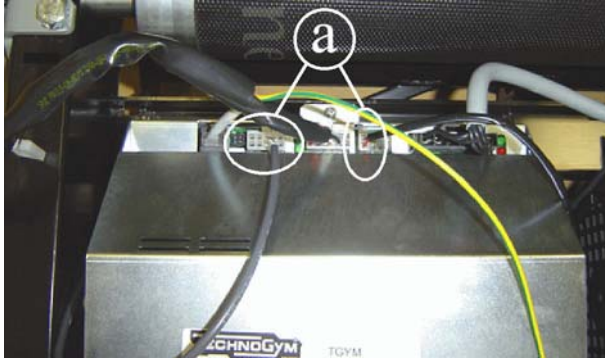


Figure 7.10-1

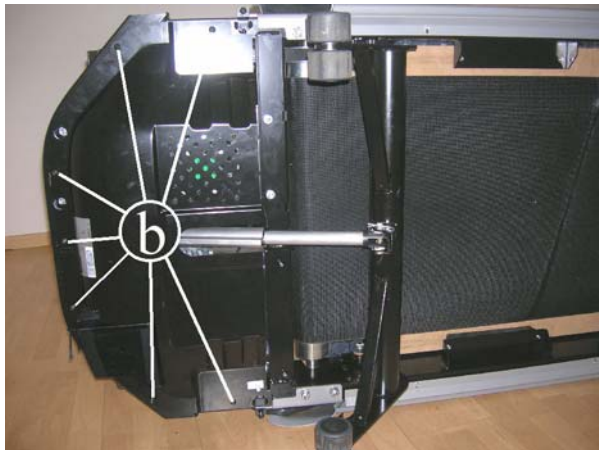


Figure 7.10-2



Figure 7.10-3

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Disconnect from the AT driver the 2 connectors **a** indicated in the figure, of the fan and of the limit switch.
2. Turn the machine over on one side.
3. Back off the 7 screws **b** using a 4-mm hex wrench.
4. Remove the lower casing plate.
5. Back off the 4 screws **c** using a medium Phillips screwdriver.
6. Remove the fan from the lower casing plate.

To reassemble the fan, carry out the above steps in reverse order.



Remember to connect again the limit switch cable.

7.11. DISASSEMBLING THE LIMIT SWITCH



Figure 7.11-1

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Disconnect the connector of the limit switch cable from the AT driver.
2. Press on both the sides of the limit switch and pull it out from the lower side of the machine.

To reassemble the limit switch, carry out the above steps in reverse order.

7.12. DISASSEMBLING THE ELECTRICAL BOX

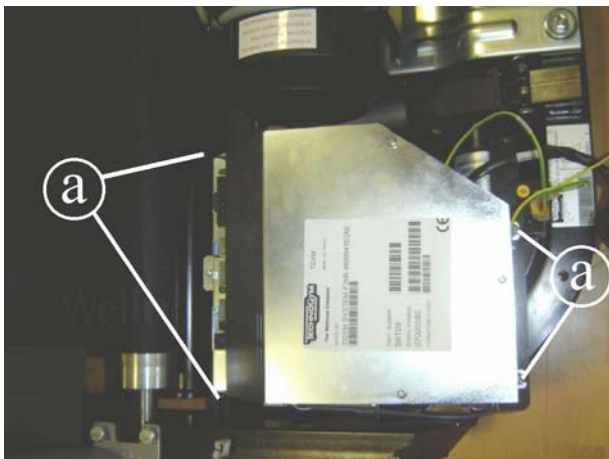


Figure 7.12-1

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Back off the screws **a** using a medium Phillips screwdriver.
2. Disconnect the cables entering the electrical box:
 - Power supply cable from the power supply box;
 - Cable connecting upper and lower assemblies;
 - Limit switch cable;
 - Ground connection cable;
 - Fan cable;
 - Tread belt motor cable;
 - Elevation motor cable (TRM-08).
3. Remove the entire box from its compartment in the machine.

To reassemble the electrical box, carry out the above steps in reverse order.

7.13. DISASSEMBLING THE ELECTRONICS BOARDS



Figure 7.13-1

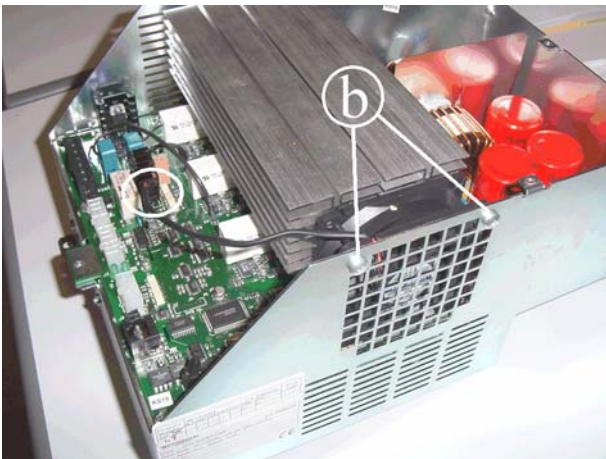


Figure 7.13-2

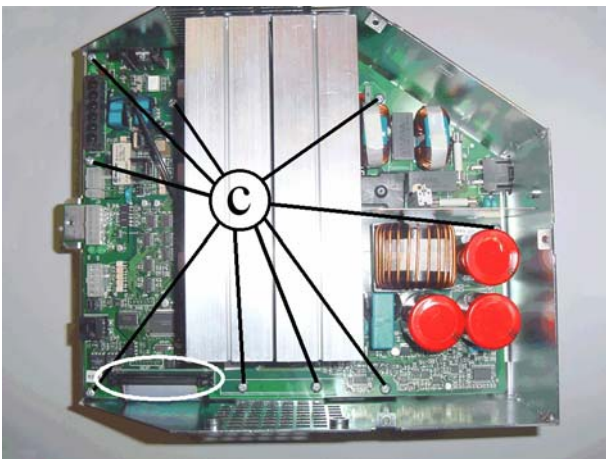


Figure 7.13-3

Carry out the procedure described in paragraph 7.12. “Disassembling the electrical box”.

1. Back off the 4 screws **a** using a medium Phillips screwdriver.
2. Lift up the cover.

1. Unplug the fan cable from the AT driver board.
2. Unscrew the two screws **b** using a medium Phillips screwdriver.
3. Remove the fan.

AT driver board:

1. Unplug the flat cable coming from the AT power supply board, shown in the picture.
2. Unscrew the screw **c** using a medium Phillips screwdriver.
3. Lift up the board paying attention to the cables connected on the lower side.

Continued on following page →

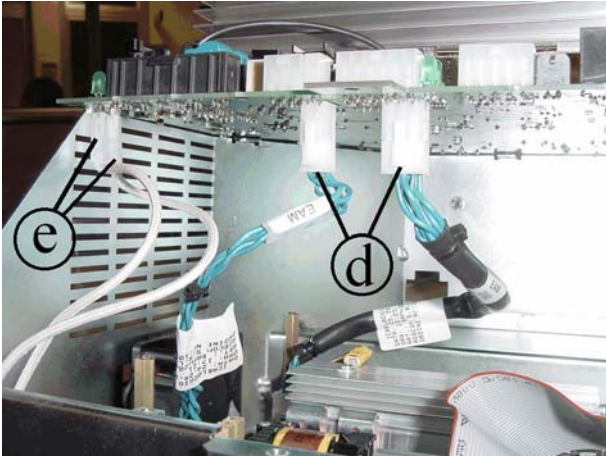


Figure 7.13-4

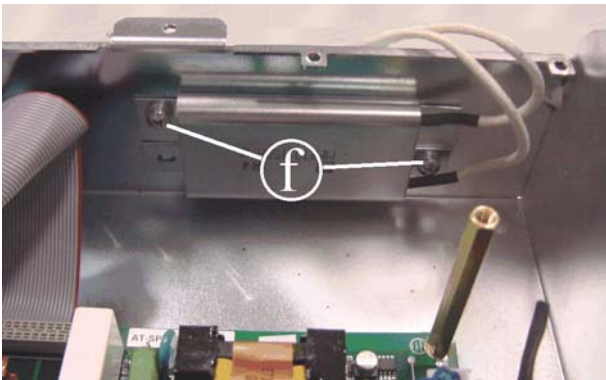


Figure 7.13-5

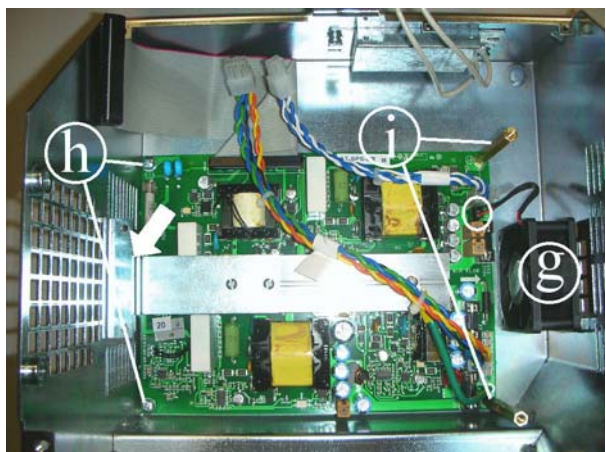


Figure 7.13-6

4. Unplug the two cables **d** coming from the AT power supply board.
5. Unplug the faston **e** of the two cables coming from the resistance.
6. Remove the AT driver board.

Resistance:

1. Unscrew the two screw **f** using a Phillips screwdriver.
2. Remove the resistance.

AT power supply board:

1. Unplug the cable coming from the fan **g** and disassembling the fan.
2. Unscrew the screws **h** using a Phillips screwdriver.
3. Unscrew the spacers **i** using a 7-mm wrench.
4. Remove the board, detaching the adhesive tape which fix the bracket, indicated by the arrow on the box metal casing.

To reassemble the electronics boards, carry out the above steps in reverse order.

7.14. DISASSEMBLING THE POWER SUPPLY BOX

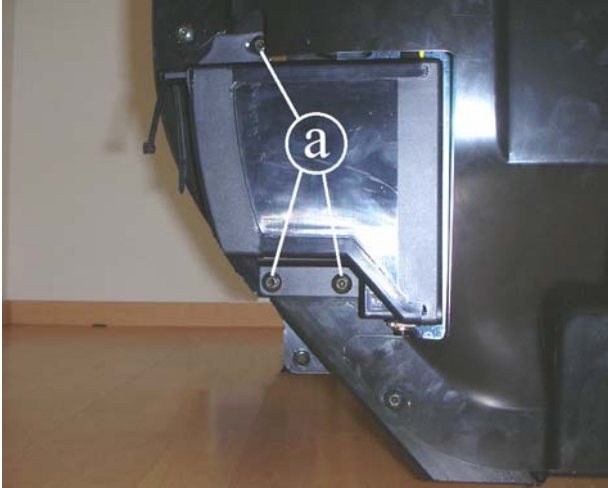


Figure 7.14-1

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Unplug the power supply cable from the AT driver box.
2. Unplug the ground cable from the frame.
3. Back off the 3 screws **a** using a 4-mm hex wrench.
4. Remove the power supply box.

To reassemble the power supply box, carry out the above steps in reverse order.

7.15. DISASSEMBLING THE TREAD BELT MOTOR



Figure 7.15-1



Figure 7.15-2

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Release the spring **a** of the tensioning mechanism between the drive-belt and the front roller of the tread belt.
2. Unplug connector of the tread belt motor cable on the AT driver.
3. Use a 13-mm wrench to back off the 4 nuts **b** locking down the screws on the lower side with a 6-mm hex wrench.
4. Remove from the machine the plate on which is mounted the tread belt motor and disassemble it.

To reassemble the tread belt motor, carry out the above steps in reverse order.

7.16. DISASSEMBLING THE ELEVATION MOTOR

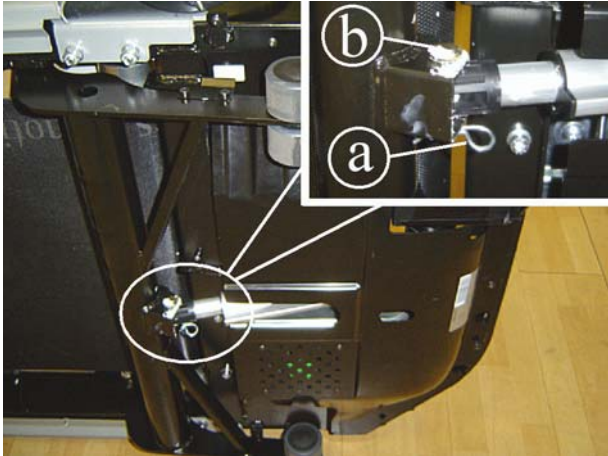


Figure 7.16-1



Figure 7.16-2

Carry out the procedure described in paragraph 7.12. “Disassembling the electrical box”.

1. Turn the machine over on one side.
2. Remove the split pin **a** and then the pin **b** securing the elevation motor assembly to the elevation frame.
3. Remove the split pin **c** and then the pin **d**.
4. Remove the elevation motor **e**.

To reassemble the elevation motor, carry out the above steps in reverse order.

7.17. DISASSEMBLING THE TREAD BELT GROUP

With these operations it is possible to disassemble:

- footrest;
- driving roller;
- tread belt motor drive-belt;
- running deck;
- driven roller;
- tread belt;
- shock absorbers.



In order to carry out these operations, it is necessary to slacken the tread-belt tension. If the belt is to be used again, follow the instructions given in paragraph 8.2. “Tensioning a used tread belt” to correctly re-tension the belt.



Figure 7.17-1

Carry out the procedure described in paragraph 7.9. “Disassembling the motor guard”.

1. Back off the screw **a** using a 3-mm hex wrench.
2. Back off the 2 screw **b** using a 3-mm hex wrench.
3. Remove the rear cover by pulling it toward the back.

Continued on following page →

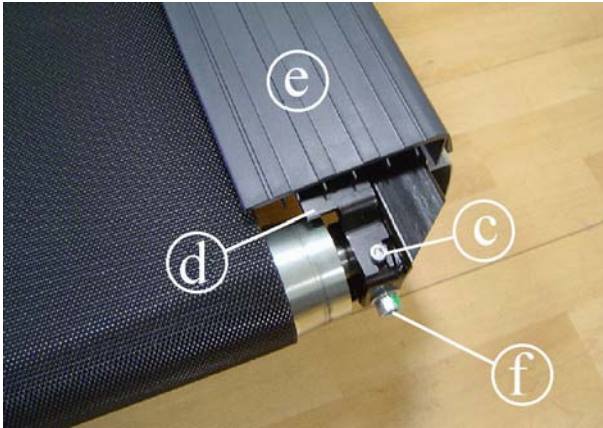


Figure 7.17-2



Figure 7.17-3

4. Back off the screw **c** using a 5-mm hex wrench.
5. Remove the footboard stop **d**.
6. Remove the footboard **e** by pulling it toward the back.

Carry out the above steps on both the sides of the machine.

7. Slacken the belt tension by backing off the two screws **f** which act on the rear machine roller, using an 8-mm hex wrench.

● Slacken the screws acting by turns on both the sides of the machine so that the rear roller is always parallel to the front one and to avoid to damage the roller bearings.

8. Release the spring **g** of the tensioning mechanism between the drive-belt and the front roller of the tread belt.

Continued on following page →



Figure 7.17-4

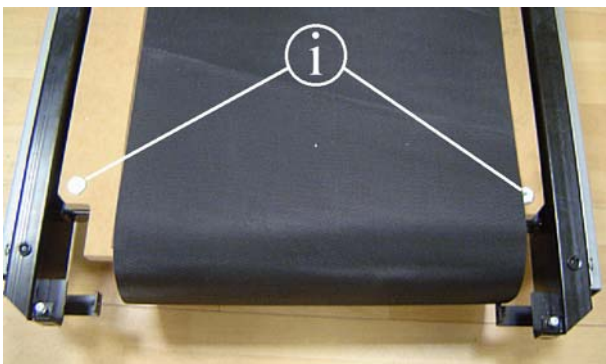


Figure 7.17-5

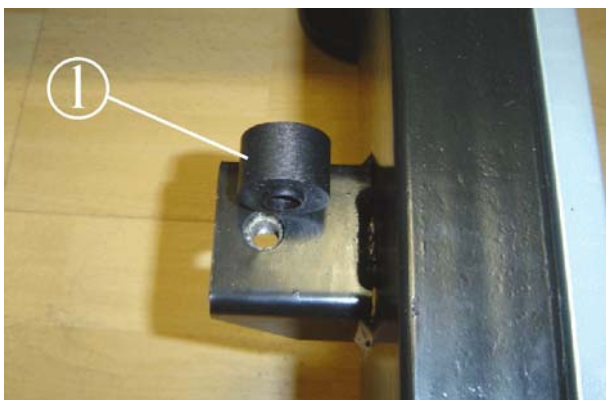



Figure 7.17-6

9. Disengage the motor drive belt from the pulley **h** on the front roller.
10. Remove the driving roller, extracting it from the top on the right side and pulling it out axially from the left.
11. Remove the motor drive belt from the motor pulley.
12. Back off the 2 screws **i** which are fixing the running deck to the frame of the machine, using a 6-mm hex wrench.
13. Remove the running deck from the side.
14. Fully back off the screws which release the tension of the rear roller.
15. Remove the rear roller.
16. Remove the tread belt.

 **When reassembling the running deck, remember to insert the plastic bushing “l” on the rear supports.**

Continued on following page →

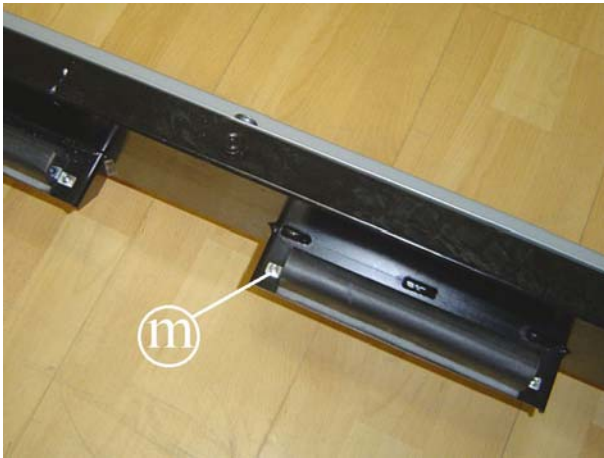


Figure 7.17-7

To disassemble the shock absorbers:

17. Lock down the nuts **m** using a 7-mm wrench and back off the screws using a 3-mm hex wrench, accessing it from below.

To reassemble the various components, carry out the above steps in reverse order.



At the end of the procedure, check the tension and alignment of the tread belt as detailed at paragraph 8.1. “Tensioning a new tread belt” or 8.2. “Tensioning a used tread belt” and 8.3. “Centering the tread belt”.

8. ADJUSTMENTS

8.1. TENSIONING A NEW TREAD BELT



Figure 8.1-1

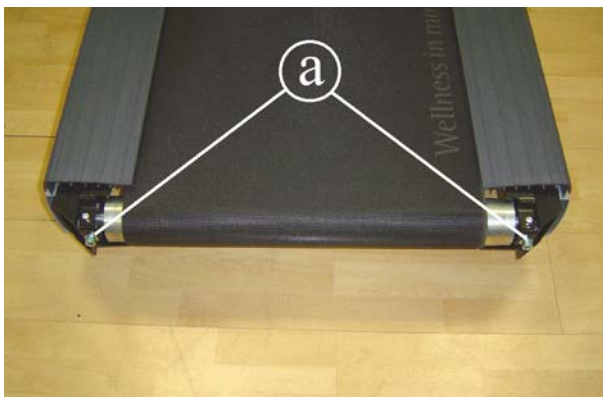




Figure 8.1-2

1. After replacing the tread belt, place a tape measure along the centre of the tread belt and use a pen to make two reference marks spaced exactly 1 meter apart.

2. Lock down by turns the screws **a** until the distance between the reference marks increases by **7 mm**. Take care that the roller is always approximately parallel with the one on the front, to counteract the tension exerted by the belt on the roller bearings.

 After completing this procedure, any further adjustments should be performed using only the left-hand alignment screw.

 After completing this procedure, check the centering of the tread belt as instructed in paragraph 8.3. .

8.2. TENSIONING A USED TREAD BELT



Figure 8.2-1



Figure 8.2-2

1. Before slackening a used tread belt that needs to be re-tensioned, place a tape measure along the centre of the tread belt and use a pen to make two reference marks spaced exactly **1 meter** apart.

2. After reassembling the used tread belt, lock down by turns the screws **a** until the distance between the two reference marks made previously on the tread belt are once again spaced 1 meter apart.



Take care that the roller is always approximately parallel with the one on the front, to counteract the tension exerted by the belt on the roller bearings.



This procedure is normally carried out after replacing the rear or driving roller, or in cases where a used tread belt needs to be reassembled: it is not possible to carry out the procedure described in paragraph 8.1. because the tread belt is not elastic.



After completing this procedure, check the centering of the tread belt as instructed in paragraph 8.3.

8.3. CENTERING THE TREAD BELT

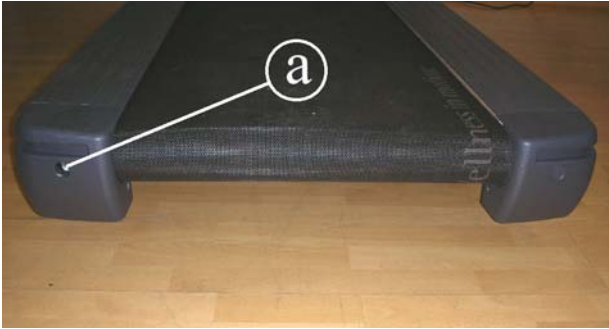


Figure 8.3-1

1. Start the machine at a speed of 10 km/h.
2. Observe the movement of the tread belt, correcting any tendency to shift to the right or left exclusively by adjusting the left tension screw **a**. Locking down this screw favors shifting of the belt to the right and vice versa.
3. Gradually increase the speed to 16 km/h, making any small adjustments that are necessary until the tread belt is perfectly centered.

8.4. POSITION OF THE LIMIT SWITCH

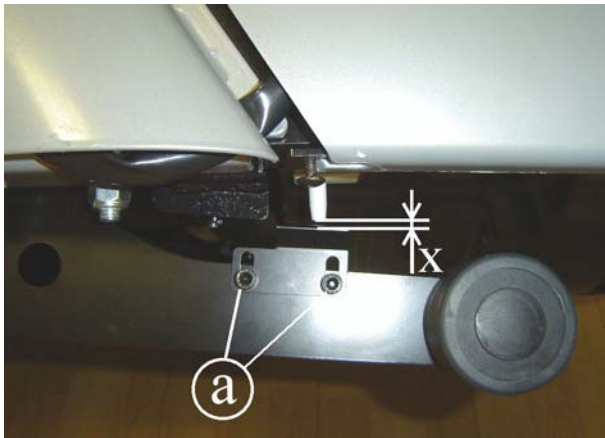


Figure 8.4-1

1. Back off the 2 screws **a** fixing the limit switch stop plate.
2. Adjust the position of the plate so that setting 0% of elevation, the distance **x** from the microswitch and the plate is about 5 mm.
3. After making the adjustment, lock down the screws **a** backed off previously.

9. MACHINE CONFIGURATION

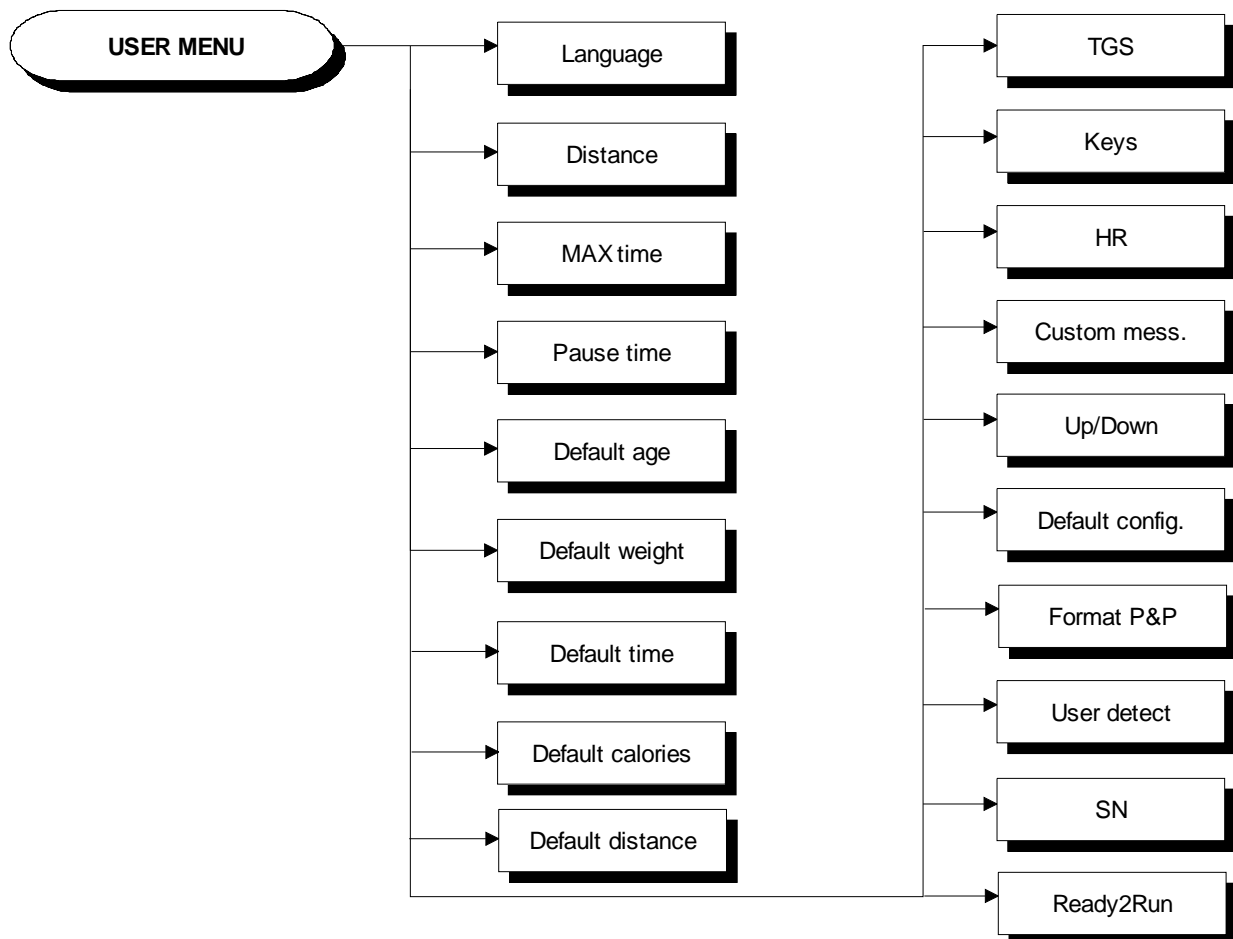
9.1. USER MENU CONFIGURATION

The machine configuration procedure is invoked by simultaneously pressing the keys **ENTER**, **↑**, **CLEAR** when the machine is in standby mode. The following prompt appears on the LED display:

ENTER PASSWORD:

To access the procedure, insert the password **2406** and press **ENTER** to confirm. To enter the password without the numeric keypad, enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

At this point the machine display begins showing the current configuration, structured as in the diagram below:



9.1.1. LANGUAGE

After selecting a language from the list of those available, all messages subsequently displayed by the machine will be in the chosen language. To change the selection, when the LED matrix shows the current setting:

LANGUAGE : xxx

Press the +/- **GOAL** keys to select the desired language from the options available. Press **ENTER** to confirm the choice, use the + or – speed keys to move to the next or previous parameter.

9.1.2. DISTANCE

It is possible to choose between EUROPEAN units (kg and km) or IMPERIAL units (pounds and miles). To change the selection, when the LED matrix shows the current setting:

DISTANCE : xxx

Press the +/- **GOAL** keys to select the desired unit of measurement from the options listed in the table below:

DISTANCE	
KM	<default>
MLS	

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or preceding parameter.

9.1.3. MAXIMUM EXERCISE TIME

It is possible to set a maximum duration for the exercise in minutes, with values ranging from 1 to 9999. To change the setting, when the LED matrix shows the current maximum time limit:

MAX TIME: xxx

Press the **ENTER** key to modify the parameter: when the current value of the parameter starts to blink, press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or preceding parameter.

The default value of this parameter is 9999.

9.1.4. PAUSE TIME

It is possible to set a maximum duration of the pause for every exercise in seconds, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current maximum pause time:

PAUSE TIME : xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the + or – speed keys to move to the next or preceding parameter.

The default value of this parameter is 60.

9.1.5. DEFAULT AGE

It is possible to set the default age for a generic user, with values ranging from 10 to 99. To change the setting, when the LED matrix shows the current setting:

DEFAULT AGE : xx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the **+** or **-** speed keys to move to the next or preceding parameter.

The default value of this parameter is 30.

9.1.6. DEFAULT WEIGHT

It is possible to set the default weight of a generic user in KG, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT WEIGHT : KG xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the **+** or **-** speed keys to move to the next or preceding parameter.

The default value of this parameter is 70.

9.1.7. DEFAULT TIME

It is possible to set the default duration of the exercise in minutes, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current time:

DEFAULT TIME : MIN. xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the **+** or **-** speed keys to move to the next or preceding parameter.

The default value of this parameter is 15.

9.1.8. DEFAULT CALORIES

It is possible to set the calories for every exercise, with values ranging from 10 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT CALORIES : xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the **+** or **-** speed keys to move to the next or preceding parameter.

The default value of this parameter is 300.

9.1.9. DEFAULT DISTANCE

It is possible to set the distance for every exercise in Km, with values ranging from 1 to 999. To change the setting, when the LED matrix shows the current setting:

DEFAULT DISTANCE : KM xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the **↑** and **↓** keys to change the value and the **+/- GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the **+** or **-** speed keys to move to the next or preceding parameter.

The default value of this parameter is 10.

9.1.10. ENABLE TGS

It is possible to enable or disable the use of the TGS reader. To change the selection, when the LED matrix shows the current setting:

TGS: xxx

Press the **+/- GOAL** keys to select the desired option from those listed in the table below:

TGS	
ENABLED	<default>
DISABLED	

Press **ENTER** to confirm the selection, use the **+** or **-** speed keys to move to the next or preceding parameter.

9.1.11. ENABLE KEYBOARD

It is possible to disable the keyboard so that the machine can only be used with the TGS. To change the setting, when the LED matrix shows the current one:

KEYS: xxx

Press the +/- **GOAL** keys to select the desired option out of those listed in the table below:

KEYS	
ENABLED	<default>
DISABLED	

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or preceding parameter.

9.1.12. MODIFIABLE TARGET HEART RATE

It is possible to enable or disable modification of the target heart rate during a constant heart rate exercise. To change the selection, when the LED matrix shows the current value:

HR: xxx

Press the +/- **GOAL** number keys to select the desired option out of those listed in the table below:

HR	
MODIFIABLE	<default>
NOT MODIFIABLE	

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or preceding parameter.

9.1.13. ENABLE CUSTOM MESSAGES

It is possible to configure whether a custom message is displayed when the machine is in the standby state. To change the selection, when the LED matrix shows the current setting:

CUSTOM MESS. : xxx

Press the +/- **GOAL** number keys to select the desired option out of those listed in the table below:

CUSTOM MESS.	
YES	<default>
NO	

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or preceding parameter.

9.1.14. ENABLE UP/DOWN MOTOR

This parameter enables or disables use of the machine incline. To change the selection, when the LED matrix shows the current setting:

UP-DOWN: xxx

Press the +/- **GOAL** keys to select the desired option out of those listed in the table below:

UP-DOWN	
ENABLED	<default>
DISABLED	

Press **ENTER** to confirm the selection, use the + or – speed keys to move to the next or previous parameter.

9.1.15. RESETTING PARAMETERS TO DEFAULT VALUES

It is possible to reset the user menu parameters to their default values. To select the function, when the LED matrix shows:

DEFAULT CONFIG.

Press **ENTER** to confirm the operation, use the + or – speed keys to move to the next or preceding parameter. If the **ENTER** key is pressed the LED matrix will show:

CONFIRM ?

press **ENTER** to confirm, or cancel by pressing the **CLEAR** key for a few seconds.

9.1.16. FORMAT P&P

This function formats a TGS key for Plug&Play mode operation. To select the function, when the LED matrix shows:

FORMAT P&P

Press **ENTER** to confirm the operation, use the + or – speed keys to move to the next or preceding parameter.

At the end of the format procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.1.17. USER DETECT

This function is able to detect the presence of a user running on the tread belt during an exercise session. It is possible to configure a minimum speed at which the machine will determine that the user has stopped running on the treadmill, and interrupt the exercise session if the condition persists for one minute. To change the setting, when the LED matrix shows the current duration:

USER DETECT: xxx

Press the **ENTER** key to change the parameter: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value.

Press **ENTER** to confirm the selection; use the + or – speed keys to move to the next or preceding parameter.

The default value of this parameter is 5.0 km/h



The minimum threshold speed for the user detect function is 3.0 km/h. Entering any value lower than this will have the effect of disabling the user-detect function.



If the unit of measurement is setted to IMPERIAL units (miles / pound), the default value for this parameter is 3 mph while the minimum speed is 2 mph.

At the end of the format procedure, hold down the **CLEAR** key for a few seconds to exit. The **CLEAR** key can be pressed at any time to interrupt the procedure and revert to standby mode.

9.1.18. SN

This parameter shows the serial number of the machine.

9.1.19. READY2RUN

It is possible to set how many time (in minutes) before the end of the exercise, the green light on the handlebar, should starts blinking to indicate the soon end of the exercise. Ready2Run function is managed in minutes, with values ranging from 0 to 5. To change the setting, when the LED matrix shows the current time:

Ready2Run (min): xxx

Press the **ENTER** key to change the parameter: the current value of the parameter will start to blink, at this point press the **CLEAR** key to erase the current value and then enter one digit at a time using the ↑ and ↓ keys to change the value and the +/- **GOAL** keys to scroll to the next character.

Press **ENTER** to confirm the changes made, and use the + or – speed keys to move to the next or preceding parameter.

The default value of this parameter is 1.



Setting “0” this parameter will have the effect of disabling the function.

9.2. SERVICE MENU CONFIGURATION

The configuration procedure is invoked when the machine is in standby mode. Simultaneously press the **ENTER**, **↑**, **CLEAR** keys. The following prompt appears on the LED display:

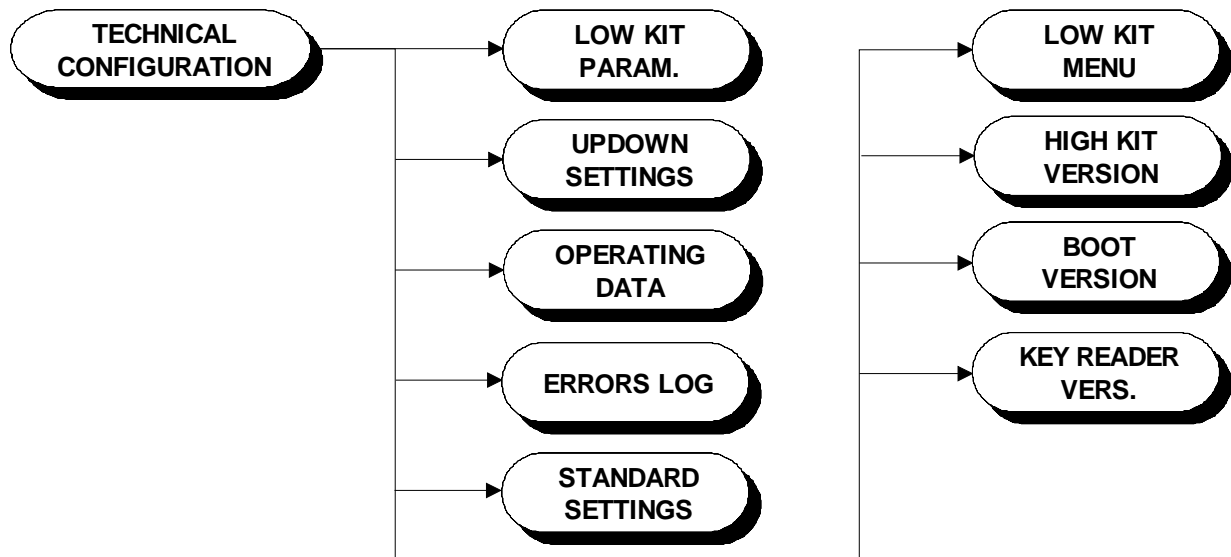
ENTER PASSWORD:

To access the procedure, type in the password **2501** which protects against unauthorized access and press “Enter” to confirm. To enter the password, increase or decrease the displayed value using the **↑** and **↓** keys, or use the **+/- GOAL** keys to scroll through and modify the individual digits. At this point there are two options available:

↑ = Tech Config
↓ = Troubleshooting

Press numeric key **↑** to access the menu for configuring technical parameters; the machine display will begin showing the current configuration, structured as in the diagram below:

- **Configuration**



Scroll through the parameter list using the **+** or **-** speed keys to move the next or previous parameter.

To modify a parameter value, it is necessary to press the **ENTER** key: when the current parameter value starts to blink, press the **CLEAR** key to erase the current value and then use the number keys to enter the desired new value. Save the changes made by pressing the **ENTER** key.

To cancel the operation, press the **CLEAR** key for a few seconds.

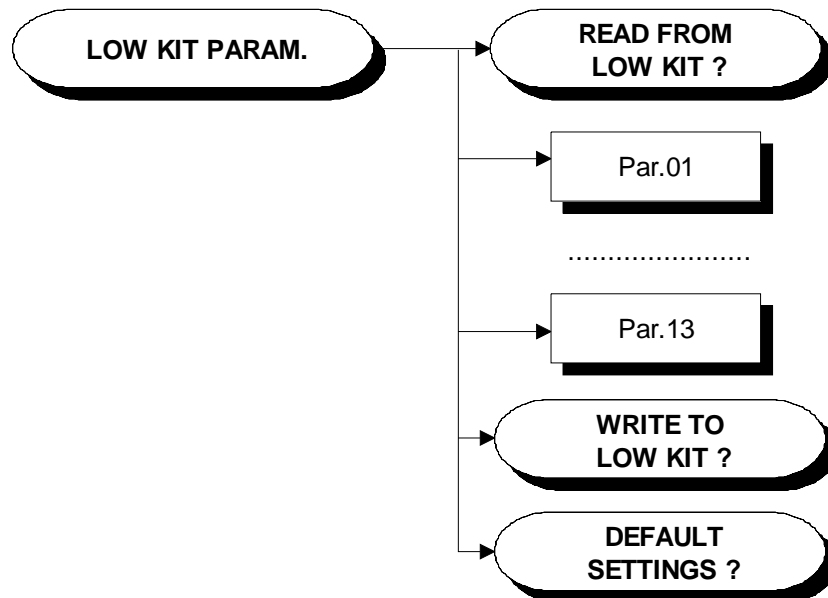
The various parameters are described below.

9.2.1. LOW KIT PARAMETER

This function provides access to parameters used for modifying certain settings of the lower assembly, or for monitoring the state of the machine. To access this menu, when the LED display shows:

LOW KIT PARAM.

press **ENTER**. This function is structured as follows:



In addition to the 13 configuration parameters, this function also includes the 3 sub-functions described below:

9.2.1.1. Read from low kit

To read the parameter values from the low kit memory to view them on the display, scroll using the +/- keys until the LED display shows:

READ FROM LOW KIT ?

press **ENTER** to read the parameters from the low kit, then return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.1.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the LED display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the parameters to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.1.3. Default setting

To load the default parameter values to the display, scroll using the +/- keys until the LED display shows:

DEFAULT SETTING ?

press **ENTER** to load the default parameter values, and return to the upper menu level by pressing **CLEAR** for a few seconds.



To write these parameters to the low kit, use the “Write to low kit” function.

9.2.1.4. Table of configuration parameters

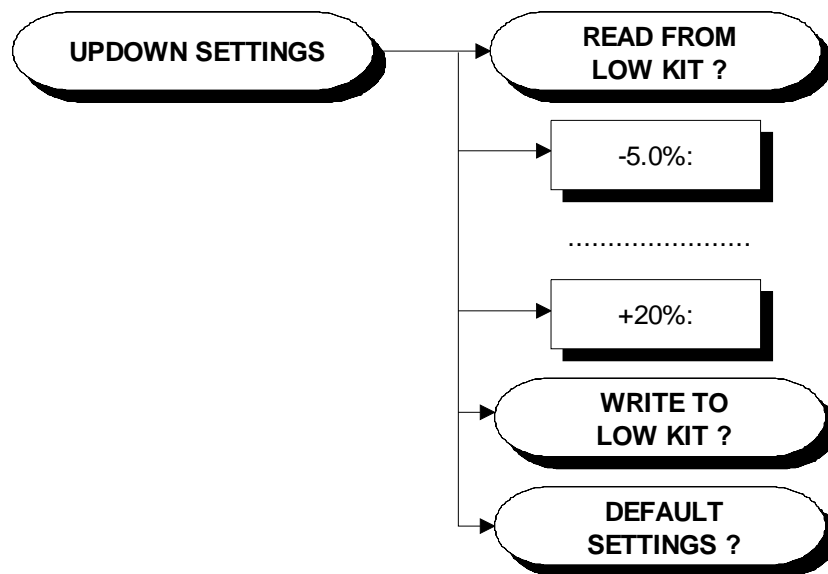
Parameter	Description	Range	Default value
Par 01	Default speed for Quick Start workout. [Km/h*10]	0 - 300	8
Par 02	Default acceleration and deceleration for tread belt motor. [Km/h*100/sec]	0 - 3000	100
Par 03	Default zero reference position for tread-belt incline. [*2]	-10 - +40	0
Par 04	PID proportional gain. [*100]	0 - 9999	7
Par 05	PID Integral gain. [*100]	0 - 9999	150
Par 06	Ramp Type	0 - 100	0
Par 07	Error status on DC motor encoder	0 - 1	0
Par 08	Serial communication timeout [10*msec]	0 - 255	0
Par 09	DC motor encoder error timeout. [msec]	0 - 255	15
Par 10	FREE	-	0
Par 11	Driving roller diameter. [mm]	0 - 1000	74
Par 12	Pulley ratio	0 - 9000	211
Par 13	Error status on AC motor encoder	0 - 1	0

9.2.2. UPDOWN SETTINGS

This function allows access to the parameters in the UpDown table which define the number of encoder pulses that correspond to different machine incline positions. To access this menu, when the LED display shows:

UPDOWN SETTINGS

press **ENTER**. This function is structured as follows:



In addition to the 50 configuration parameters, this function also includes the 3 sub-functions described below:

9.2.2.1. Read from low kit

To read the parameter values from the low kit memory to view them on the display, scroll using the +/- keys until the LED display shows

READ FROM LOW KIT ?

press **ENTER** to read the parameters from the low kit, then return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.2.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the LED display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the parameters to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.2.3. Default setting

To load the default parameter values to the display, scroll using the +/- keys until the LED display shows:

DEFAULT SETTING ?

press **ENTER** to load the default parameter values, and return to the upper menu level by pressing **CLEAR** for a few seconds.



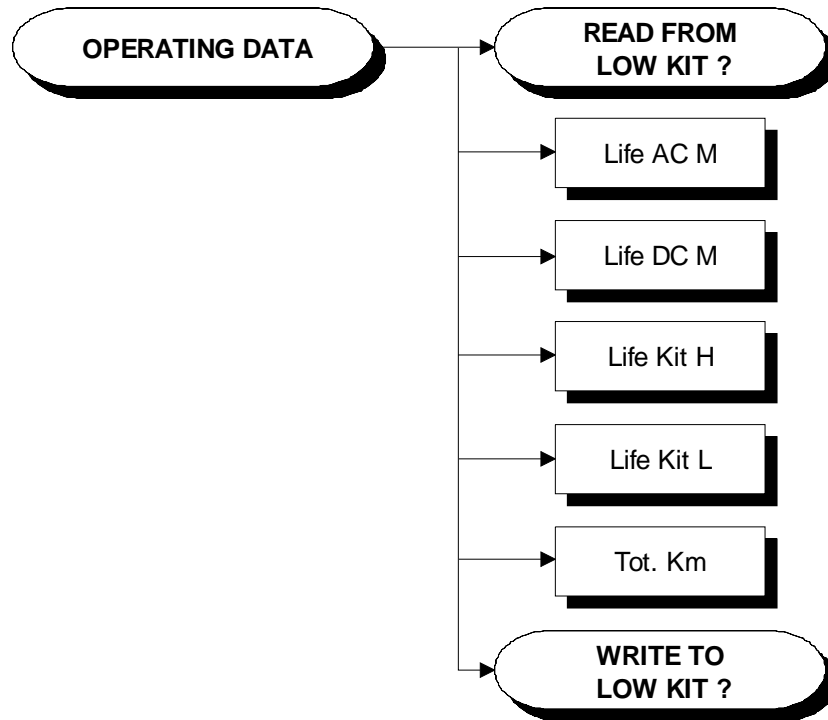
To write these parameters to the low kit, use the “Write to low kit” function.

9.2.3. USAGE DATA

This function makes it possible to access the machine usage data stored in the low kit. To access this menu, when the LED display shows:

USAGE DATA

press **ENTER**. This function is structured as follows:



In addition to the machine usage data, this function also includes the 2 sub-functions described below:

9.2.3.1. Read from low kit

To read the parameter values from the low kit memory to view them on the display, scroll using the +/- keys until the LED display shows:

READ FROM LOW KIT ?

press **ENTER** to read the parameters from the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.3.2. Write to low kit

To write the values of the currently displayed parameters to the low kit, scroll using the +/- keys until the LED display shows:

WRITE TO LOW KIT ?

press **ENTER** to write the parameters to the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.3.3. Machine usage data

The machine usage data on the display is updated every 10 minutes. This means that, whenever the machine is switched off, any changes after the last memory update will be lost.

MESSAGE ON DISPLAY	DESCRIPTION
Life AC M:	Minutes x 10 of tread belt motor operation
Life DC M:	Minutes of elevation motor operation
Life Kit H:	Minutes x 10 of operation of the upper assembly
Life Kit L:	Minutes x 10 of operation of the lower assembly
Tot. Km:	Total km travelled

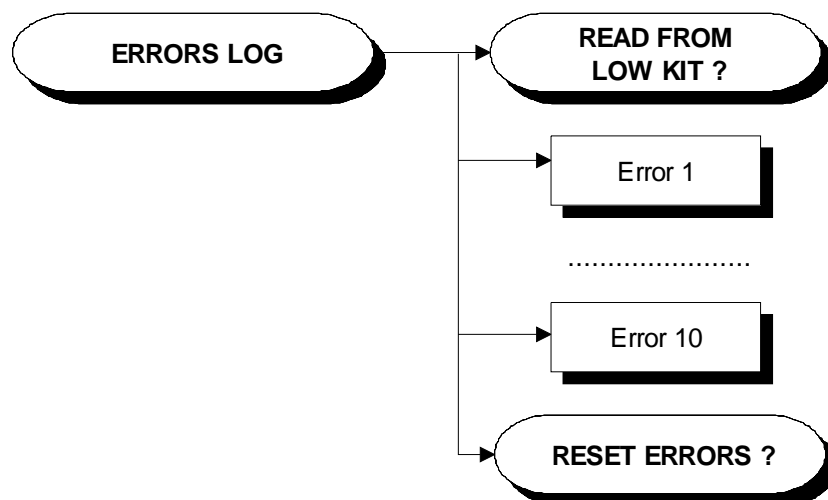
By selecting one of the items in the above table it is possible to modify its content, but only after having cleared its value. When the **ENTER** key is pressed the message “Reset life...” appears, followed by the name of the selected item; pressing **ENTER** again resets the value of the selected item, while pressing **CLEAR** reverts to the old value.

9.2.4. ERRORS LOG

This function accesses the machine’s error history log. To access this menu, when the LED display shows:

ERRORS LOG

press **ENTER**. This function is structured as follows:



In addition to the error history log, this function also includes the 2 sub-functions described below:

9.2.4.1. Read from low kit

To read the error history log from the low kit memory to view it on the display, scroll using the +/- keys until the LED display shows:

READ FROM LOW KIT ?

press **ENTER** to read the errors from the low kit, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.4.2. Reset errors

To clear the error history log in both the low and high kit, scroll using the +/- keys until the LED display shows:

RESET ERRORS ?

press **ENTER** to clear the error history log, and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.4.3. COM.Fault

This is a counter that display the number of errors in serial communication between the upper and the lower kit. This counter increase each time a communication fault is detected. Scroll using the +/- keys until the display shows:

COM.FAULT X

To reset it press **ENTER**, the LED display shows:

RESET COM.FAULT?

press **ENTER** to reset and return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.4.4. View Errors

For every error generated by the machine, the error history log records the information in the table below:

- Counter;
- Error Code;
- Voltage when the error occurred;
- Current * 10 when the error occurred;
- Speed km/h when the error occurred.

The correspondence between error codes and descriptions is given in the table below:

Error code	Error number	Description
OH	1	Overheating of the heat sinks of the AT drive and of the PFC.
OC	2	Overcurrent, even if only transient, on the inverter output.
UU	3	Undervoltage condition, due to an even transient drop in line voltage.
OU	4	Overvoltage.
PE	6	EEPROM error. Is generated when there is an error detected in the data stored on the EEprom.
EdC1	7	Elevation motor encoder error.
OtM	9	AC motor thermal cutout open.
Oli	10	Inverter overload caused by a DC current exceeding, for the maximum allowed time (I^2t), the maximum permissible threshold for the inverter.
OLm	11	Motor overload caused by a DC current exceeding, for the maximum allowed time (I^2t), the maximum permissible threshold for the motor in question.

Error code	Error number	Description
OLr	12	Braking resistor overload.
Ot	13	Over-torque due to an even momentary overload of the inverter. Is generated when the torque output of the motor exceeds a pre-established limit for a pre-established time.
OCH	16	HW overcurrent.
MST	17	Motor lockout which occurs, operating in closed loop mode with the encoder active, if the inverter fails to reach the target speed even after attempting to reduce the reference frequency.
EM	19	Emergency. Is generated when the AT drive receives a software emergency signal that is not accompanied by a hardware emergency signal.
SHC	23	Short Circuit. Is generated in the event of a short circuit between a motor phase and earth.

Use the + speed key to advance to the next error, otherwise the message with the details of the current error will continue to reappear.

9.2.5. STANDARD SETTINGS

This function simultaneously resets the User menu, low kit, UpDown table parameters to their default values and the operating data of the machine. To access this menu, when the LED display shows:

STANDARD SETTING

press **ENTER**, the following message appears:

CONFIRM ?

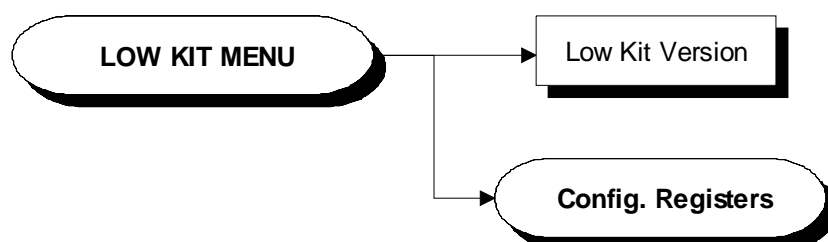
Press **ENTER** again to reset all parameters to their default values, or return to the upper menu level by pressing **CLEAR** for a few seconds.

9.2.6. LOW KIT MENU

This function directly accesses the firmware of the inverter. To access this menu, when the LED display shows:

LOW KIT MENU

press **ENTER**. This function is structured as follows:



9.2.6.1. Low kit version

This function displays the inverter firmware version. To access this menu, when the LED display shows:

LOW KIT VERSION

press **ENTER**, the following message appears:

H:x L:x B:x

Which identifies the firmware version.

9.2.6.2. Config. registers

This function displays the parameter values of type b, C, D, F, P, H and S. To access this menu, when the LED display shows:

CONFIG REGISTERS

press **ENTER**, the following message appears:

ADDRESS: X

where X is the address identifying an AT driver parameter, as detailed in the tables at the end of the paragraph.

Press **ENTER** to change the address and select a different parameter, or press + to read the value of the currently selected parameter, the following message will appear:

READ FROM LOW KIT ?

press **ENTER** to load the parameter value, the following message will appear:

VALUE: Y

press **ENTER** to begin editing the parameter value. When finished, press + and the following message will appear:

WRITE TO LOW KIT ?

press **ENTER** to confirm writing the changes to the low kit; at the end of this operation the following message reappears:

ADDRESS: X



Although the changes made to the parameters come into effect immediately, they are not automatically stored in permanent memory; this requires a specific write operation effected using the command C-0: at address 800 write the value “1”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.

To return to the upper menu level press **CLEAR** for a few seconds.



MENU -A-							
Par.	Address	Description	Value	Par.	Address	Description	Value
A-0	1200	PID mode (700/900)	1	A-59	1218	PID min neg err	50
		PID mode (500)	0	A-100	1219	Set Linear speed	0
A-1	1201	PID ref sel	5	A-101	1220	Set Acc Dec	100
A-2	1202	PID fbk sel	4	A-102	1221	Set Incline ref	0
A-3	1203	PID digital ref	0	A-105	1222	Def Linear speed	8
A-4	1204	PID activat mode	0	A-106	1223	Def Acc Dec	100
A-5	1205	PID-Encoder sync	1	A-107	1224	Def Incline ref	0
A-6	1206	PID err sign rev	0	A-110	1225	Pulley Ratio	200
A-7	1207	PID Integ init en	0	A-111	1226	Roller Diameter	91
A-8	1208	PID update time	0	A-115	1227	DCMot EncTimeout	15
A-50	1209	PID Prop gain 1	7			(AT driver SW ≥ 2.07)	
A-51	1210	PID Int tconst 1	150	A-116	1228	Fan command dly	30
A-52	1211	PID Deriv gain 1	0	A-117	1229	ACMot EncToller	50
A-53	1212	PID Prop gain 2	0			0(OFF)	
A-54	1213	PID Int tconst 2	9999	A-118	1230	Check RunnerBand	10
A-55	1214	PID Deriv gain 2	0	A-119	1231	Check RunnerSpd	50
A-56	1215	PID high limit	80	A-120	1232	Curr clamp thr	200
A-57	1216	PID low limit	-80	A-121	1233	Check RunnerDly	60
A-58	1217	PID max pos err	50				

MENU -C-							
Par.	Address	Description	Value	Par.	Address	Description	Value
C-0	800	Save parameters	0	C-41	805	Save pars to key	0
C-1	801	Recall param	0	C-100	806	Measure stator R	0
C-2	802	Load default	0	C-200	807	Reset AC Flag	0
C-20	803	Alarm clear	0	C-201	808	Reset DC Flag	0
C-40	804	Recall key prog	0				

MENU -D-							
Par.	Address	Description	Value	Par.	Address	Description	Value
D-0	1	Output frequency	0	D-200	26	An in 1 cnf mon	0
D-1	2	Frequency ref	0	D-201	27	An in 1 monitor	0
D-2	3	Output current	0	D-202	28	An in 1 term mon	0
D-3	4	Output voltage	0	D-210	29	An in 2 cnf mon	0
D-4	5	DC link voltage	400	D-211	30	An in 2 monitor	0
D-5	6	Power factor	100	D-212	31	An in 2 term mon	0
D-6	7	Power [kW]	0	D-220	32	An in 3 cnf mon	0
D-7	8	Output speed	0	D-221	33	An in 3 monitor	0
D-8	9	Speed ref	0	D-222	34	An in 3 term mon	0
D-20	57	Actual speed	0	D-300	35	EncPulse/Sample	0
D-21	58	Actual incline user	0	D-301	36	Encoder freq	0
D-22	59	Actual ENC1 pos	0	D-302	37	Encoder speed	0
D-23	60	Crossed distance	0	D-350	38	Option 1 state	0
D-24	61	Reserved	-	D-351	39	Option 2 state	0
D-25	62	Flag status	0	D-352	40	Par port state	0
D-26	63	Actual ENC2 pos	0	D-400	41	PID reference	0
D-27	64	Actual speed from Fenc	0	D-401	42	PID feedback	0
D-30	70	Reserved	-	D-402	43	PID error	0
D-50	10	Heatsink temp	0	D-403	44	PID integr comp	0
D-51	11	Drive OL	0	D-404	45	PID output	0
D-52	12	Motor OL	0	D-800	46	Error 1	0
D-53	13	Brake res OL	0	D-801	47	Error 2	0
D-100	14	Dig inp status	0	D-802	48	Error 3	0
D-101	15	Term inp status	0	D-803	49	Error 4	0
D-102	16	Vir dig inp stat	0	D-950	50	Drive rated cur	100
D-120	17	Exp dig inp stat	0	D-951	51	SW version 1\2	200h

MENU -D-							
Par.	Address	Description	Value	Par.	Address	Description	Value
D-121	18	Exp term inp	0	D-952	52	SW version 1\2	80h
D-122	19	Exp Vir dig inp stat	0	D-953	53	power ident code	0h
D-150	20	Dig out status	0	D-954	54	param ident code	0h
D-151	21	Drv dig out sta	0	D-955	55	regul ident code	3/8h
D-152	22	Vir dig out sta	0	D-956	56	Startup id code	0h
D-170	23	Exp Drv dig out status	0	D-957	71	Drive type	2
D-171	24	Exp Drv dig out sta	0	D-999	99	Display test	-
D-172	25	Exp Vir dig out sta	0				

MENU -F-							
Par.	Address	Description	Value	Par.	Address	Description	Value
F-0	300	Motorpot ref	0	F-110	321	Frequency ref 10	0
F-10	301	Acc/Dec time mp	50	F-111	322	Frequency ref 11	0
F-11	302	Motorpot offset	0	F-112	323	Frequency ref 12	0
F-12	303	Mp output mode	0	F-113	324	Frequency ref 13	0
F-13	304	Mp auto save	1	F-114	325	Frequency ref 14	0
F-20	305	Max ref freq	1150	F-115	326	Frequency ref 15	0
F-21	306	Min ref freq	0	F-116	327	Jog frequency	10
F-50	307	Ref 1 channel	8	F-200	328	Ramp resolution	0
F-51	308	Ref 2 channel	0	F-201	329	Acc time 1	3000
F-60	309	MltFrq channel 1	3	F-202	330	Dec time 1	3000
F-61	310	MltFrq channel 2	3	F-203	331	Acc time 2	50
F-100	311	Frequency ref 0	0	F-204	332	Dec time 2	50
F-101	312	Frequency ref 1	0	F-205	333	Acc time 3	50
F-102	313	Frequency ref 2	0	F-206	334	Dec time 3 / FS	50
F-103	314	Frequency ref 3	0	F-207	335	Acc time 4 / Jog	50
F-104	315	Frequency ref 4	0	F-208	336	Dec time 4 / Jog	50
F-105	316	Frequency ref 5	0	F-250	337	Ramp S-shape	0
F-106	317	Frequency ref 6	0	F-260	338	Ramp extens src	0
F-107	318	Frequency ref 7	0	F-270	339	Jump amplitude	0
F-108	319	Frequency ref 8	0	F-271	340	Jump frequency 1	0
F-109	320	Frequency ref 9	0	F-272	341	Jump frequency 2	0

MENU -I-							
Par.	Address	Description	Value	Par.	Address	Description	Value
I-0	100	Dig input 1 cfg	1	I-313	140	An out 2 filter	0
I-1	101	Dig input 2 cfg	0	I-350	141	Exp an out 1 cfg	0
I-2	102	Dig input 3 cfg	0	I-351	142	Exp AnOut 1 offs	0
I-3	103	Dig input 4 cfg	0	I-352	143	Exp AnOut 1 gain	100
I-4	104	Dig input 5 cfg	0	I-353	144	Exp AnOut 1 filt	0
I-5	105	Dig input 6 cfg	0	I-400	145	Inp by serial en	0
I-6	106	Dig input 7 cfg	0	I-410	146	Exp in by ser en	0
I-7	107	Dig input 8 cfg	0	I-420	147	Out by serial en	0
I-50	108	Exp dig in 1 cfg	0	I-430	148	Exp OutBySer en	0
I-51	109	Exp dig in 2 cfg	0	I-450	149	An out by ser en	0
I-52	110	Exp dig in 3 cfg	0	I-500	150	Encoder enable	1
I-53	111	Exp dig in 4 cfg	0	I-501	151	Encoder ppr	720
I-100	112	Dig output 1 cfg	48	I-502	152	Enc channels cfg	1
I-101	113	Dig output 2 cfg	48	I-503	153	Enc spd mul fact	100
I-102	114	Dig output 3 cfg	48	I-504	154	Enc update time	0
I-103	115	Dig output 4 cfg	48	I-600	155	Serial link cfg	6
I-150	116	Exp DigOut 1 cfg	48	I-601	156	Serial link bps	4
I-151	117	Exp DigOut 2 cfg	48	I-602	157	Device address	1
I-200	118	An in 1 Type	1	I-603	158	Ser answer delay	1
I-201	119	An in 1 offset	0	I-604	159	Serial timeout	0
I-202	120	An in 1 gain	100	I-605	160	En timeout alm	1
I-203	121	An in 1 minimum	0	I-700	161	Option 1 type	0
I-204	122	An in 1 filter	1	I-701	162	Option 2 type	0



MENU -I-							
Par.	Address	Description	Value	Par.	Address	Description	Value
I-210	123	An in 2 Type	1	I-750	163	SBI address	3
I-211	124	An in 2 offset	0	I-751	164	CAN baudrate	0
I-212	125	An in 2 gain	100	I-752	165	SBI Profibus mod	2
I-213	126	An in 2 minimum	0	I-753	166	SBI CAN mode	0
I-214	127	An in 2 filter	1	I-760	167	SBI to Drv W 0	0
I-220	128	An in 3 Type	1	I-761	168	SBI to Drv W 1	0
I-221	129	An in 3 offset	0	I-762	169	SBI to Drv W 2	0
I-222	130	An in 3 gain	100	I-763	170	SBI to Drv W 3	0
I-223	131	An in 3 minimum	0	I-764	171	SBI to Drv W 4	0
I-224	132	An in 3 filter	1	I-765	172	SBI to Drv W 5	0
I-300	133	Analog out 1 cfg	0	I-770	173	Drv to SBI W 0	1
I-301	134	An out 1 offset	0	I-771	174	Drv to SBI W 1	2
I-302	135	An out 1 gain	100	I-772	175	Drv to SBI W 2	3
I-303	136	An out 1 filter	0	I-773	176	Drv to SBI W 3	4
I-310	137	Analog out 2 cfg	2	I-774	177	Drv to SBI W 4	5
I-311	138	An out 2 offset	0	I-775	178	Drv to SBI W 5	6
I-312	139	An out 2 gain	100				

MENU -P-							
Par.	Address	Description	Value	Par.	Address	Description	Value
P-0	400	Cmd source sel	3	P-281	446	Brake res value	150
P-1	401	RUN input config	0	P-282	447	Brake res power	5
P-2	402	Reversal enable	1	P-283	448	Br res thermal K	160
P-3	403	Safety	1	P-300	449	DC braking level	0
P-20	404	Mains voltage	220	P-301	450	DCB lev fac src	0
P-21	405	Mains frequency	60	P-302	451	DC braking freq	0
P-40	406	Motor rated curr	70	P-303	452	DC braking start	0
P-41	407	Motor pole pairs	2	P-304	453	DC braking stop	0
P-42	408	Motor power fact	78	P-320	454	Autocapture mode	0
P-43	409	Motor stator R	100	P-321	456	Autocapture Ilim	120
P-44	410	Motor cooling	1	P-322	457	Demagnetiz time	8
P-45	411	Motor thermal K	30	P-323	458	Autocap f scan	10
P-60	412	V/f shape	1	P-324	459	Autocap V scan	2
P-61	413	Max out voltage	230	P-325	460	Enc for FlyRes	0
P-62	414	Base frequency	600	P-326	461	Fre for FlyRes	0
P-63	415	V/f interm volt	115	P-340	462	Undervoltage thr	50
P-64	416	V/f interm freq	300	P-341	463	Max pwrloss time	0
P-80	417	Max output freq	100	P-342	464	UV alarm storage	1
P-81	418	Min output freq	0	P-360	465	OV prevention	0
P-100	419	Slip compensate	90	P-380	466	Autoreset attmps	0
P-101	420	Slip comp filter	3	P-381	467	Autoreset clear	10
P-120	421	Manual boost [%]	50	P-382	468	Autoreset delay	50
P-121	422	Boost factor src	0	P-383	469	Autoreset flt rly	1
P-122	423	Auto boost en	1	P-400	470	Ext fault mode	0
P-140	424	Magn curr gain	30	P-420	471	Volt reduc mode	0
P-160	425	Osc damping gain	10	P-421	472	V reduction fact	100
P-180	426	SW clamp enable	1	P-422	473	V fact mult src	0
P-200	427	Ramp CurLim mode	0	P-440	474	Frequency thr 1	0
P-201	428	Curr lim in ramp	170	P-441	475	Freq prog 1 hyst	5
P-202	429	En lim in steady	0	P-442	476	Frequency thr 2	0
P-203	430	Curr lim steady	-	P-443	477	Freq prog 2 hyst	5
P-204	431	Curr ctrl P-gain	-	P-460	478	Const speed tol	5
P-205	432	Curr ctrl I-gain	-	P-461	479	Const speed dl	1
P-206	433	Curr ctr feedfwd	-	P-480	480	Heatsnk temp lev	70
P-220	434	En DC link ctrl	-	P-481	481	Heatsnk temp hys	5
P-221	435	DC-lnk ctr Pgain	-	P-500	482	Switching freq	9
P-222	436	DC-lnk ctr Igain	-	P-501	483	Sw freq reduc en	0
P-223	437	DC-link ctr FF	-	P-520	484	Overmod max lev	0

MENU -P-							
Par.	Address	Description	Value	Par.	Address	Description	Value
P-240	438	OverTorque mode	-	P-540	485	Out Vlt auto adj	0
P-241	439	OT curr lim thr	-	P-560	486	Deadtime cmp lev	8
P-242	440	OT level fac src	-	P-561	487	Deadtime cmp slp	35
P-243	441	OT signal delay	-	P-580	488	Startup display	1
P-260	444	Motor OL prot en	-	P-600	489	Speed dsply fact	100
P-280	445	Brake res OL en	-	P-999	490	Param prot code	0

9.2.7. HIGH KIT VERSION

This function displays the SW version of the display. To do this, when the LED display shows:

HIGH KIT VERSION

press **ENTER**, the message that identifies the SW version, will appear.

9.2.8. BOOT VERSION

This function displays the BOOT version. To do this, when the display shows:

BOOT VERSION

press **ENTER** to display the message which identifies the BOOT version.

9.2.9. KEY READER VERSION

This function displays the SW version of the TGS reader. To do this, when the LED display shows:

KEY READER VERS.

press **ENTER**, the message that identifies the SW version, will appear.

9.3. DRIVER AUTOTUNING

Whenever the AT driver is first connected to the motor, for example when one of the two components is replaced, it is necessary to launch an autotuning function which analyses its phase resistance.

Carry out the operation by setting parameter **C-100** (address 806) to “1”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.



Although the changes made to the parameters come into effect immediately, they are not automatically stored in permanent memory; this requires a specific write operation effected using the command C-0: at address 800 write the value “1”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.



Incorrect programming of the AT driver may cause serious damage to the machine, or result in malfunctions potentially dangerous to the user. Therefore, only attempt to program the inverter if you are certain of performing the procedure correctly.

9.4. RECALL PARAMETERS

It is possible to restore all the parameters to the values they had at the last save operation.

Carry out the operation by setting parameter **C-1** (address 801) to “1”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.



Although the changes made to the parameters come into effect immediately, they are not automatically stored in permanent memory; this requires a specific write operation effected using the command C-0.

Save the data by setting parameter **C-0** (address 800) to “1”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.



Incorrect programming of the AT driver may cause serious damage to the machine, or result in malfunctions potentially dangerous to the user. Therefore, only attempt to program the inverter if you are certain of performing the procedure correctly.

9.5. DEFAULT PARAMETERS

It is possible to restore all the parameters to the default factory values.

Carry out the operation by setting parameter **C-2** (address 802) to “**1**”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.



Although the changes made to the parameters come into effect immediately, they are not automatically stored in permanent memory; this requires a specific write operation effected using the command C-0.

Save the data by setting parameter **C-0** (address 800) to “**1**”, following the detailed instructions provided in paragraph 9.2.6.2 “Config. registers”.

10. SCHEDULED MAINTENANCE

To keep the machine in perfect working order and forestall possible problems it is necessary to carry out the scheduled maintenance operations described below. The maintenance operations can essentially be classified according to the frequency with which they need to be performed:

- Daily maintenance operations;
- Weekly maintenance operations;
- Monthly maintenance operations;
- Twice yearly maintenance operations.

The operations require different levels of operator qualification. The following paragraphs describe the recommended procedures.

10.1. DAILY MAINTENANCE OPERATIONS



These operations can be carried out by the machine owner and do not require any special skills.

The **daily** machine maintenance consists of simple external cleaning, for the purposes of general hygiene.

For the daily maintenance of the machine, proceed as follows:

10.1.1. SETTING UP THE OPERATION

1. Turn off the machine by placing the switch in position 0 (OFF).
2. Unplug the mains lead from the wall outlet.

10.1.2. EXTERNAL CLEANING OPERATIONS

1. Using a cloth moistened with a neutral detergent (non acidic), clean the entire machine, taking care not to rub too vigorously, especially on the keys of the display.



Never spray the cleaning product directly on the machine.



WARNING: do not use alcohol, petrol or other chemical products.

10.2. WEEKLY MAINTENANCE OPERATIONS



These operations can be carried out by the machine owner and do not require any special skills.

The **weekly** machine maintenance operations consists of simple cleaning, lubrication and checking the emergency stop to ensure the correct and safe functioning of the machine.

For the weekly maintenance operations, proceed as follows:

10.2.1. CHECKING THE “EMERGENCY STOP”

1. With the machine turned on and moving at a speed of approximately 5 km/h (3 mph), trip the emergency stop and check that the machine halts, displaying the “PRESS A KEY” message.

10.2.2. COMPLETE OPERATION

1. When the machine is switched on, check that it performs the power-on self test procedure which:

- sounds the buzzer;
- resets the incline.

At the end of which the machine goes into standby, awaiting a keyboard command.

2. To check the correct operation of the machine:
 - get on the machine;
 - press the “Start” key to begin the exercise and check that the tread belt motor starts;
 - press the “+” and “-” keys on the keyboard and check that the tread belt speed varies accordingly;
 - press the “↑” and “↓” keys and check that the incline varies accordingly;
 - put on the heart rate meter and check that the machine correctly reads the heart rate value;
 - grasp the sensors and check that the machine correctly reads the heart rate value.

10.3. MONTHLY MAINTENANCE OPERATIONS



These operations can be carried out by the machine owner and do not require any special skills.

The **monthly** machine maintenance operations consists of simple cleaning, lubrication and checking the state of wear to ensure the correct and safe functioning of the machine.

For the monthly maintenance of the machine, proceed as follows:

10.3.1. INTERNAL CLEANING OPERATIONS

1. Turn off the machine by placing the switch in position 0 (OFF).
2. Unplug the mains lead from the wall outlet.
3. Open the motor guard.
4. Use a vacuum cleaner to clean the interior, paying particular attention to the tread belt motor and the electronic circuit boards.



WARNING: when carrying out these operations, be careful not to damage the cables.

5. Move the machine and clean the floor underneath using a vacuum cleaner.

10.3.2. CHECKING THE STATE OF WEAR

1. With the machine stopped, check the state of wear of the entire surface of the tread belt, turning it by hand. If any anomalies are found, call in an authorized Technogym service technician.

10.3.3. CHECKING THE OPERATION OF THE CARDIOTESTER RECEIVER

1. Using a separate heart rate monitor, put on the transmitter band and check that the machine and the separate monitor both measure the same heart rate, and that when the band is disconnected the machine does not receive any signal.
2. Using a heart rate frequency simulator, check that the machine detects the variations in the heart rate.

10.3.4. CHECKING THE OPERATION OF THE HAND SENSOR RECEIVER

1. Using a separate heart rate monitor, grasp the hand sensors and check that the machine and the separate monitor both measure the same heart rate, and that when the sensors are released the machine does not receive any signal.

10.4. TWICE-YEARLY MAINTENANCE OPERATIONS



These operations can only be carried out by a qualified technician specifically trained by Technogym and authorized to carry out machine installation and adjustments, as well as special maintenance operations or repairs which require special knowledge of the machine, its operation, safety systems and working procedures.

The **six-monthly** maintenance operations involve checking the functioning, wear and tension of the mechanical components so as to ensure the correct and safe operation of the machine.

For the six-monthly maintenance of the machine, proceed as follows:

10.4.1. CARRYING OUT THE MONTHLY MAINTENANCE PROCEDURE

1. Carry out the procedure described in paragraph 10.3. “Monthly maintenance operations”.

10.4.2. CHECKING THE WORKING CONDITIONS

1. Check that the machine is connected directly to the wall outlet, without any extension cords, and that the outlet is correctly earthed.
2. Using a multimeter, check that the machine earth node is correctly connected to earth.

10.4.3. CHECKING THE WIRING AND CONNECTIONS

1. Open all the machine guards.
2. Check the condition of all the cables:
 - External conditions;
 - Possible rusting of the connectors;
 - Electrical continuity of the individual wires;
 - Isolation of the individual wires toward ground.

Repair and/or replace any non-conforming wires.

3. Check the condition of the fuses using a tester.

10.4.4. CHECKING THE WEAR AND LUBRICATION OF THE TREAD BELT AND RUNNING DECK

1. Disassemble the rear and driving rollers, the running deck and the tread belt.
2. Check the state of wear of both the running deck and the tread belt. Replace if there are evident signs of wear.
3. Using a clean cloth, wipe the entire surface of the running deck and the underside of the tread belt.



WARNING: NOT lubricate.

4. After reassembling the machine, start walking on it at a speed of approximately 3 km/h, being careful to tread on the full width of the belt so as to distribute the oil over its entire surface.

10.4.5. CHECKING THE WEAR OF THE DRIVING ROLLER

1. With the rear and driving rollers, running deck and tread belt disassembled, check the state of wear of the driving roller. Replace if there are evident signs of wear.
2. With the machine in motion, check the noisiness of the bearings. Replace in the event of excessive noise.

10.4.6. CHECKING THE WEAR OF THE REAR ROLLER

1. With the front and rear rollers, running deck and tread belt disassembled, check the state of wear of the rear roller. Replace if there are evident signs of wear.
2. With the machine in motion, check the noisiness of the bearings. Replace in the event of excessive noise.

10.4.7. CHECKING THE SHOCK ABSORBERS

1. With the front and rear rollers, running deck and tread belt disassembled, check the condition of the shock absorbers on either side of the running deck. Replace if they are cracked or show signs of breakage.

10.4.8. CHECKING THE TREAD BELT MOTOR DRIVE-BELT

1. Turn off the machine by placing the switch in position 0 (OFF).
2. Unplug the mains lead from the wall outlet.
3. Open the motor guard.
4. Check the state of wear of the tread belt motor drive-belt, turning it by hand using the motor flywheel. Replace if there are evident signs of wear.

10.4.9. CHECKING AND CENTERING THE TREAD BELT

1. With the machine stopped, check the tension over the entire surface of the tread belt, turning it by hand. If any anomalies are found, call in an authorized Technogym service technician.
2. With the machine moving at a speed of approximately 10 km/h, check the centering of the tread belt. If any anomalies are found, call in an authorized Technogym service technician or make the adjustment.

10.4.10. CHECKING THE DISPLAY

1. Check the operation of all the keys on the keyboard.
2. Check the operation of all the LEDs and the buzzer.

11. APPENDIX

11.1. UPDATING THE SW

The machine SW is updated by writing to the contents of the FLASH EPROM on the ARM board from an external PC connected to the CSAFE port on the machine, situated on the lower part of the display panel.



The PC can only update the FLASH EPROM during machine power up, before the self-test sequence begins.



After the Display SW update it is necessary to restore all the parameters to the default values following the detailed instructions provided in paragraph 9.1.15. “Resetting parameters to default values”.



After the lower electronic SW update it is necessary to restore all the parameters to the default values following the detailed instructions provided in paragraph 9.2.1.3 “Default setting”.

11.2. TOOLS TO USE

The following tools are necessary to carry out all disassembly, adjustment and maintenance operations on the machines:

- Small Phillips screwdriver;
- Medium Phillips screwdriver;
- Flat head screwdriver;
- 7-gauge wrench;
- 13-gauge wrench;
- 17-gauge wrench;
- 3-gauge hexagonal T-wrench;
- 4-gauge hexagonal T-wrench;
- 4-gauge hexagonal T-wrench;
- 6-gauge hexagonal T-wrench;
- 8-gauge hexagonal T-wrench;
- Torque wrench.

 **CAUTION: Tool measurements are expressed in mm.**



TECHNOGYM S.p.A.

Via G. Peticari, 20
47035 Gambettola (FC)
ITALIA

Tel.: +39-0547-650638

Fax: +39-0547-650150

e-mail: service@technogym.com