

RUN PERSONAL *SERVICE & MAINTENANCE MANUAL*

REV. 3.1

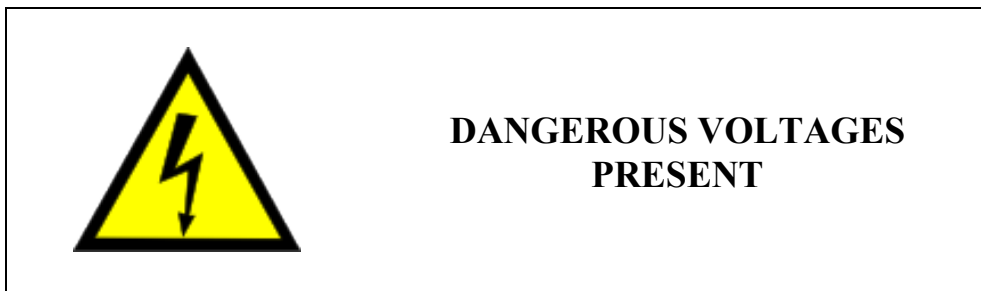


TECHNOGYM

The Wellness Company

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**



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.



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 disassembling 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.

 **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:

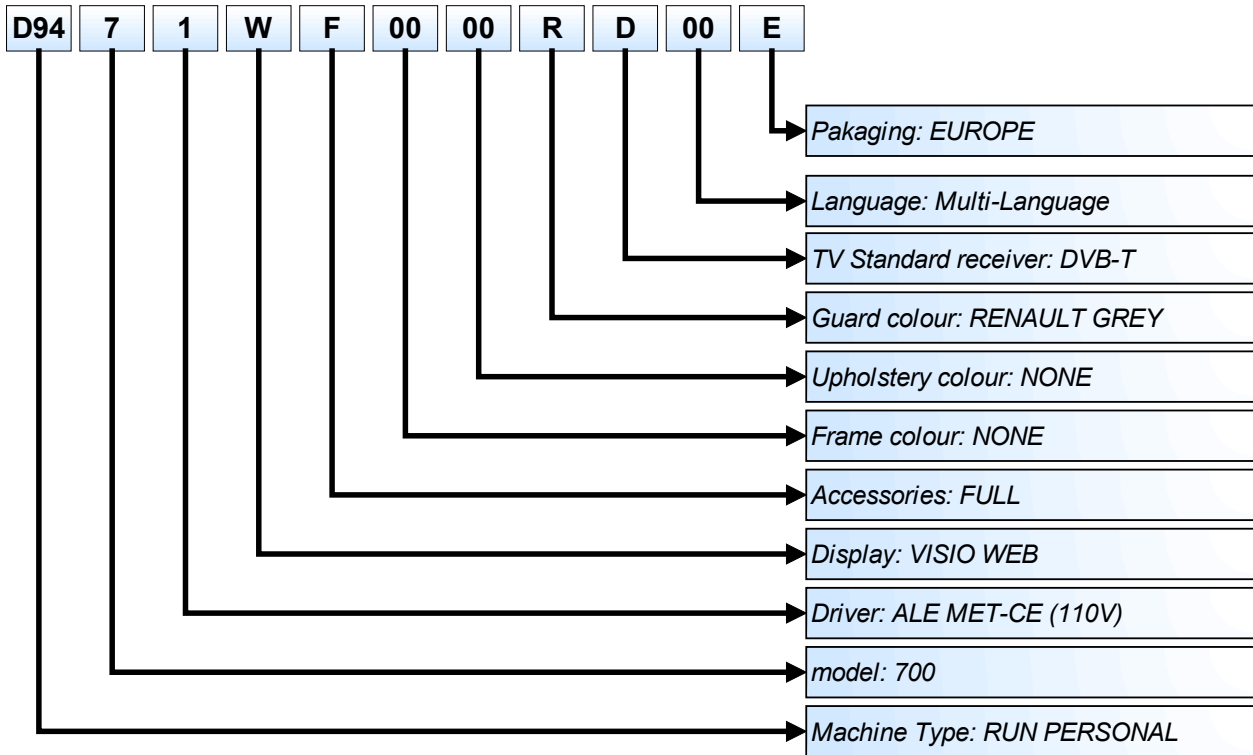
Characters	Description	key to values
1, 2, 3,	<i>Machine type</i>	D94 = Run Personal
4,	<i>Model</i>	7 = 700
5,	<i>Power supply type</i>	E = 200-240V - CE 1 = 100-120V – MET CE 2 = 200-240V – MET CE
6,	<i>Display type</i>	C = VISIO W = VISIOWEB
7,	<i>Accessories</i>	F = Full
8, 9,	<i>Colour of the frame</i>	00 = None
10, 11,	<i>Colour of the upholstery</i>	00 = None
12,	<i>Colour of the guards</i>	R = Renault Grey
13,	<i>TV standard receiver</i>	D = DVB-T A = ATSC I = ISDB-T
14, 15,	<i>Language</i>	00 = Visio
16.	<i>Type of packaging</i>	I = Italy E = Europe S = Overseas International U = Overseas US / JP

Continued on following page...

For example, a possible product code would be:

D9471WF0000RD00E

which is interpreted as follows:



2.2. SERIAL NUMBER STRUCTURE

The *Serial Number*, consists of 14 alphanumeric characters arranged as follows:

Characters	Description	key to values
1,2,3,4,5,6,	Product type,	D947 = Run Personal E =ALE Driver 1 =ALE MET-CE (110V) Driver 2 =ALE MET-CE (220V) Driver
7,8,	Year of production,	C = VISIO W = VISIO WEB
9,10,11,12,13,14.	Progressive.	10 = 2010 000001

For example, a possible product code would be:

D9471C10000001

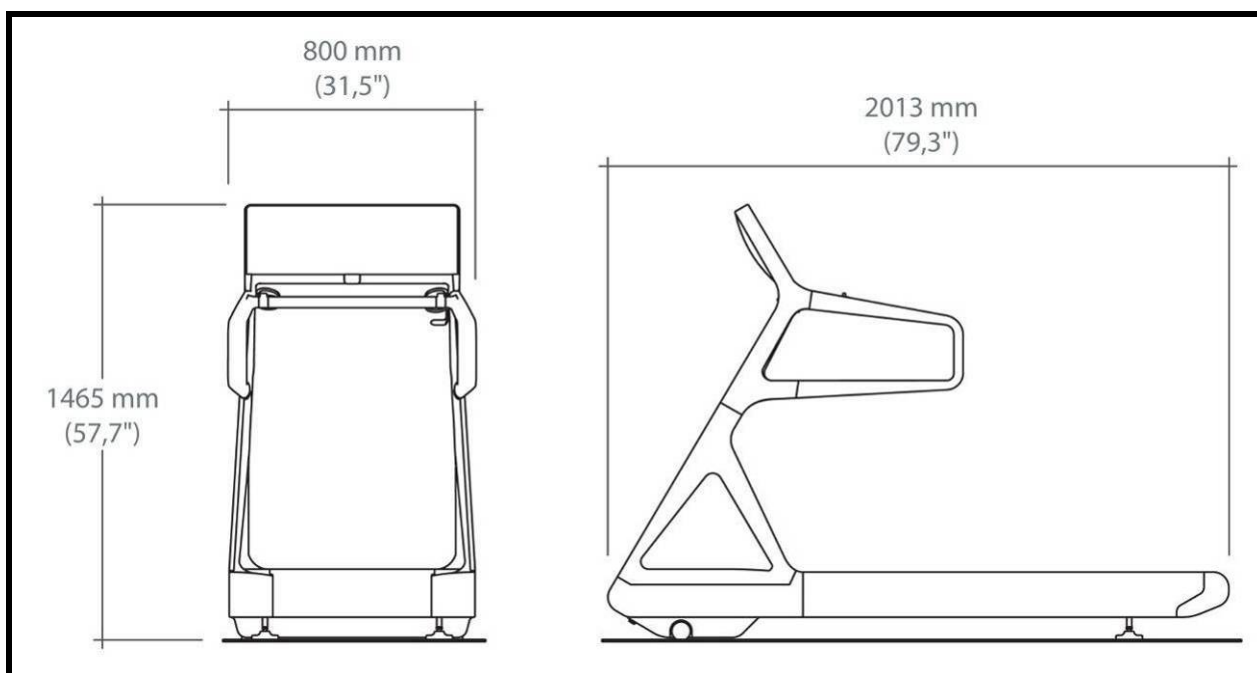
2.3. TECHNICAL SPECIFICATION

TECNICAL SPECIFICATIONS		
Equipment power requirement:	E = CE	(200-240V) 50-60Hz <i>(It is advisable 16A dedicated socket each machine)</i>
	1 = MET CE	(100-120V) 50-60Hz <i>(It is advisable 20A dedicated socket each machine)</i>
	2 = MET CE	(200-240V) 50-60Hz <i>(It is advisable 16A dedicated socket each machine)</i>
Power Engine:	2,45 HP (AC) – 1800 Watt	
Energy consumption:	1500W	
VISIO Stand-by consumption:	141,2 VA	
Speed (Km/h – mph):	0,4 Km/h - 18 Km/h ± 5% <i>(up to 2Km/h ± 0,1Km/h)</i>	
Max incline:	0 - 15 % ± 1%	
HR monitoring:	Hand sensor, Telemetry	
Calorie Coach:	YES	
Runner Detection System:	YES	
Wellness System:	YES	
Training Setup:	CRP, Training zone, Distance, Default profile, Personal Km/h, Personal min/h, Fitness Test, Weight Loss.	
Total number of program:	Quick-Start, Goal, CPR, Profile 6 +12 customizable, Customer Speed, Custom Pace, Interval Training, Training Zone, Weight Loss	
Submaximal test:	Fitness test	
Language available:	Italian, UK English, U.S. English, German, Spanish, French, Dutch, Portuguese, Japanese, Chinese, Russian, Turkish, Danish	

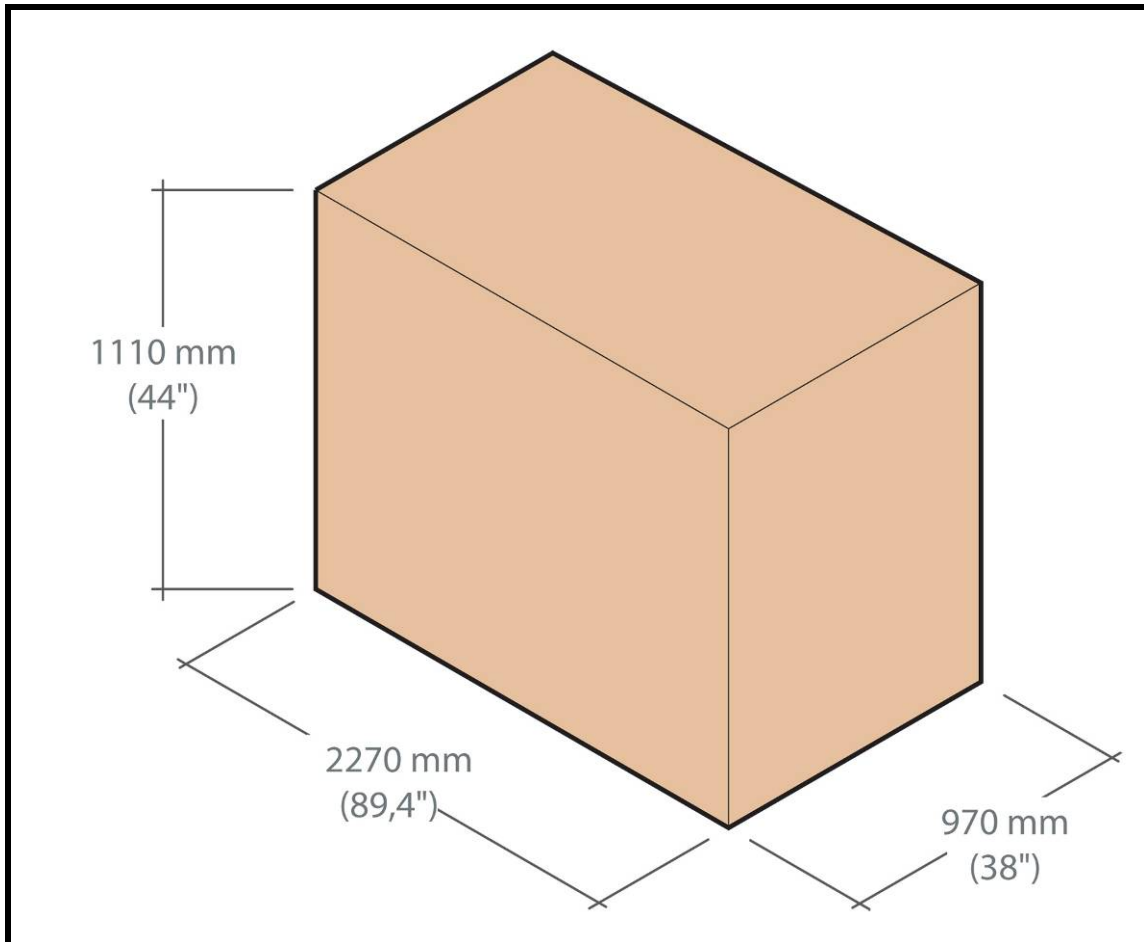
2.4. MECHANICAL CHARACTERISTICS

MECHANICAL CHARACTERISTICS	
Length (mm – in)	2013 mm – 79,3”
Width (mm – in)	800 mm – 31,5”
Height (mm – in)	1465 mm – 57,7”
Weight (Kg – lbs)	170 Kg – 374 lbs
Running surface (Width.) mm - in	510 mm 20,07”
Running surface (depth.) mm - in	1450 mm 57,08”
Max user weight (Kg – lbs)	160 kg – 353lbs
Running surface H from ground	195mm – 7,7”

2.5. DIMENSIONS



2.6. PACKING DIMENSIONS EUROPE AND OVERSEAS



2.7. AMBIENT SPECIFICATIONS

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

2.8. CONFORMITY TO REGULATIONS

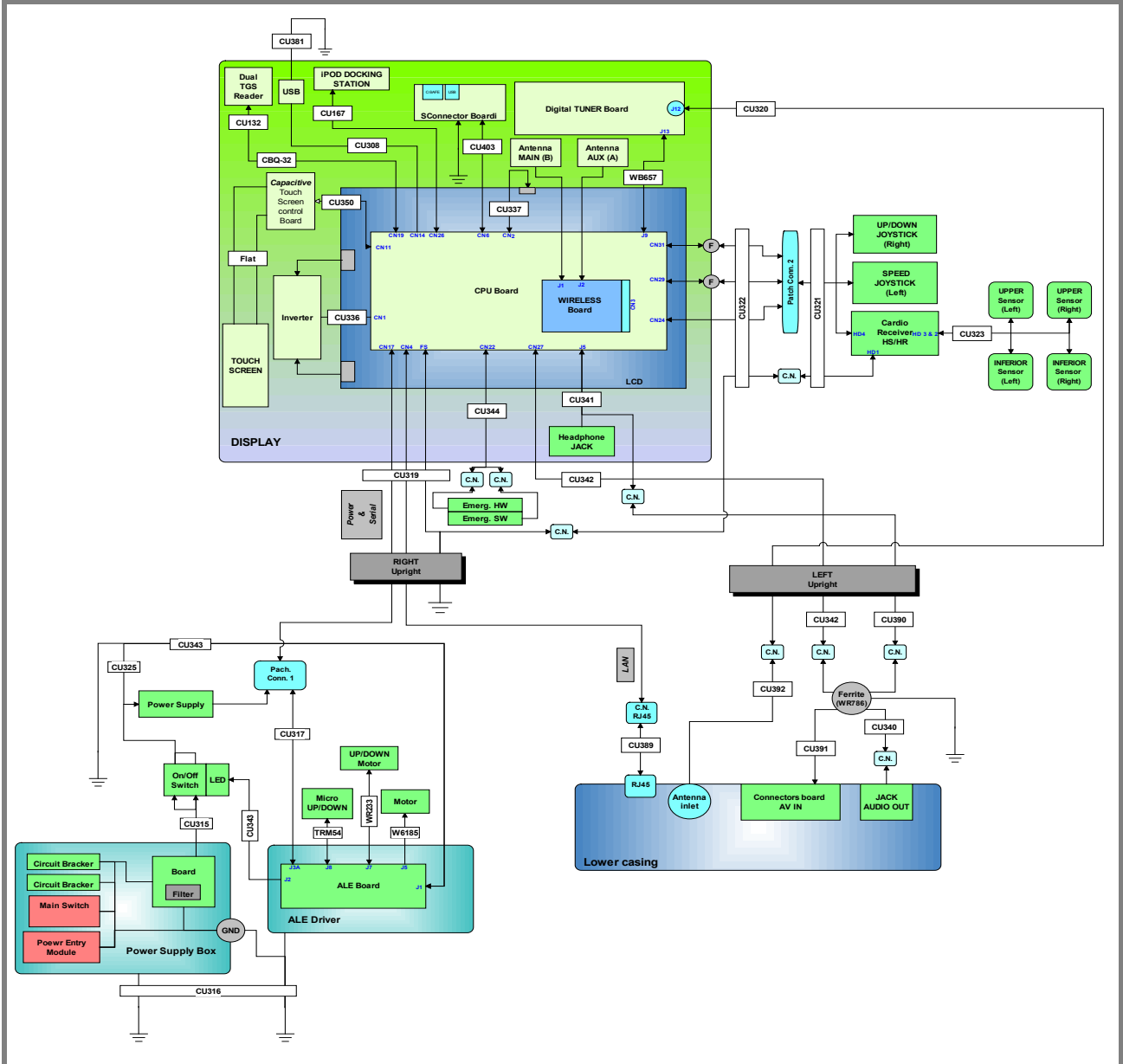
	EUROPE	USA
EMI regulations	<i>EN61000-6-1 (2007)</i> <i>EN61000-6-3 (2007)</i> <i>EN61000-3-2 (2007)</i> <i>EN61000-3-3 (2009)</i>	-
Electrical safety regulations	<i>EN 60335-1 (2008)</i>	<i>UL 1647</i> <i>FCC 15</i>
Mechanical safety regulations	<i>EN957-1 (2006)</i> <i>EN957-6 (2003)</i>	-
Directives	<i>2006/42/CE</i> <i>2004/108/CE</i> <i>2006/95/CE</i>	-

Moreover:




- *Electrical isolation class: **Class I**;*
- *Protection rating: **IP20**.*

2.9. WIRING DIAGRAMS

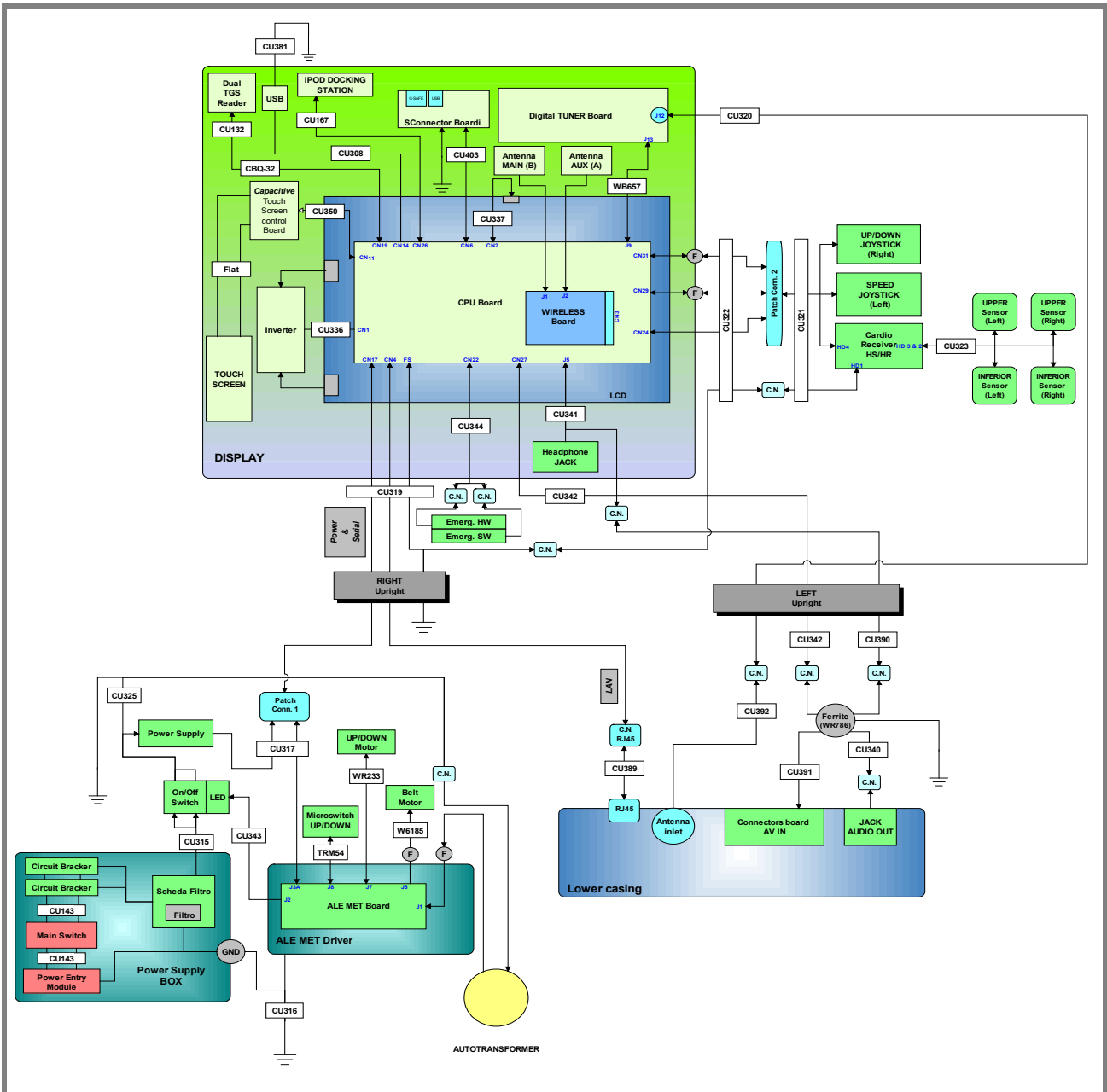
2.9.1. VISIONWEB AND ALE MET-CE (220VAC)



CAPTION:

-  = Connection
-  = Ferrite
-  = Ground

2.9.2. VISIONWEB AND ALE MET-UT (110VAC)



CAPTION:

- = Connection
- = Ferrite
- = Ground

2.10. CABLES



The colour of the cables can be changed, refer in particular to the Pin Out.

2.10.1. CBQ CABLES

CBQ32: TGS cable (Patch conn.– CPU Board)			
CPU Board CN19	Signal	Colour	Patch conn.
1	+12 Vdc power supply	Red	8
3	Rx	Brown	1
5	Tx	Blue	2
9	Gnd	Black	6

2.10.2. WB CABLES

WB657: Flat Tuner Board cable (CPU Board –TUNER Board)		
CPU Board J9	Signal	TUNER Board J13
1	Capacitive Signal	flat
...50	Capacitive Signal	flat

2.10.3. AUTOTRANSFORMER CABLE

AUTOTRANSFORMER cable (Autotransformer –ON/OFF Switch –ALE Driver)			
Autotransformer	Signal	ON/OFF Switch	ALE Driver
Cable internally connected	(PHASE) 110Vac Power Supply	1	
	(NEUTRAL) 110Vac Power Supply	2	
	(PHASE) 220Vac Power Supply		1
	(NEUTRAL) 220Vac Power Supply		2

2.10.4. CU CABLES

CU132: TGS signal cable (Patch conn. –TGS Dual reader)			
Patch conn.	Signal	Colour	TGS Dual reader CN1
8	+12Vdc power supply	Black	2
1	RX	Green	1
2	TX	Black	4
6	GND	Black	5

CU167: iPod signal cable (CPU Board– Docking Station)			
Scheda CPU CN26	Signal	Colore	Docking Station
1	+V bus USB	Black	14
2	GND bus USB	Black	13
3	TX - RX	Black	11
4	RX – TX	Black	12
5	CTS	Black	10
6	+5Vdc	Black	9
7	GND	Black	8
8	GND	Black	7
9	Video Gnd	Black	6
10	Video signal	Black	5
11	Audio L Gnd	Black	4
12	Audio L signal	Black	3
13	Audio R signal	Black	2
14	Audio R Gnd	Black	1

CU308: User USB port cable (CPU Board –USB Port)			
CPU Board CN14	Signal	Colour	USB Port
1	+5v	Red	1
2	USB-	White	2
3	USB+	Black	3
4	GND	Green	4
5	Shield	Blue	5

CU317: Power supply cable/ Run Personal signal (Patch Conn. 1 –ALE Driver/Power Supply)				
Patch Conn. 1	Signal	Colour	ALE Driver J3A	Power Supply
1	D+ 485	Black	1	-
2	GND +12V	Black	2	-
3	n.c.	Black	3	-
4	n.c.	Black	4	-
5	D- 485	Black	5	-
6	Vcc 12V	Black	6	-
7	n.c.	Black	7	-
8	n.c.	Black	8	-
9	Ext. Emergency	Black	9	-
10	Ext Emergency restoration	Black	10	-
11	Vcc 12V Suppl.	Black	-	2
12	GND 12V suppl.	Black	-	1

CU319: Run Personal signal power supply cable (CPU Board – CU317 cable/LAN)			
CPU Board CN17	Signal	Colour	Patch. Conn. 1
1	GND +12V	Black/Grey	2
2	n.c.	-	-
3	n.c.	-	-
4	EXT Emergency	White	9
5	GND 12V suppl.	Black	12
6	D- 485	White	5
7	Vcc 12V	Red/Orange	6
8	n.c.	-	-
9	Vcc 12V suppl.	Red	11
10	Ext Emergency restoration	Blue	10
11	n.c.	-	-
12	D+ 485	Brown	1
CPU Board CN4	Signal	Colour	RJ45
1	LAN	White/Green	1
2	LAN	Green	2
3	LAN	White/Orange	3
4	LAN	Blue	4
5	LAN	White/Blue	5
6	LAN	Orange	6
7	LAN	White/Brown	7
8	LAN	Brown	8
-	Signal	Colour	-
Eyelet	GND	Yellow/Green	yellow Faston Blue Faston

CU321: Central handlebar cable (Cardio receiver/ Joystick R – L – Patch Conn. 2)					
Patch Conn. 2	Signal	Colour	Cardio Receiver HD4	Joystick (R)	Joystick (L)
1	Joy.1	Black	-	-	2
2	Joy.2	Black	-	-	1
3	GND	Black	-	-	3
4	GND	Black	1	-	-
5	+5Vdc	Black	2	-	-
6	Joy.2	Black	-	1	-
7	Joy.1	Black	-	2	-
8	GND	Black	-	3	-
9	Cardio CH. 1	Black	3	-	-
10	n. c.	-	-	-	-

CU322: Central handlebar cable (Patch Conn. 2 – CPU Board)					
Patch Conn. 2	Signal	Colour	CPU Board		
			CN24 (Cardio Receiver)	CN31 Joystick (R)	CN29 Joystick (L)
1	Joy. 1	Black	-	-	4
2	Joy. 0	Black	-	-	2
3	GND	Black	-	-	1
4	GND	Black	6	-	-
5	+5Vdc	Black	1	-	-
6	Joy. 3	Black	-	4	-
7	Joy. 2	Black	-	2	-
8	GND	Black	-	1	-
9	Cardio CH. 1	Black	5	-	-
10	n.c.	-	-	-	-

CU323: Hand Sensor cable (Cardio receiver Board – (R) Hand Sensor –(L) Hand Sensor)						
Cardio receiver Board HD3&2	Signal	Colour	Hand Sensor (R) faston		Hand Sensor (L) faston	
1	Right hand signal input.	White	UP	-	-	-
2	Right hand contact ref.	Brown	-	DOWN	-	-
3	Shield GND	White	-	-	-	-
4	Left hand signal input.	White	-	-	UP	-
5	Left hand contact ref.	Brown	-	-	-	DOWN
6	Shield GND	White	-	-	-	-

CU325: Power Supply cable (Power Supply / ON-OFF Switch / ALE Driver)				
ON-OFF Switch	Signal	Colour	Power Supply	ALE Driver J1
<i>Faston 1</i>	<i>PHASE</i>	<i>Brown</i>	<i>light socket</i>	-
		<i>Brown</i>		<i>1</i>
<i>Faston 2</i>	<i>NEUTRAL</i>	<i>Blue</i>	<i>light socket</i>	-
		<i>Blue</i>	-	<i>2</i>
<i>Eyelet</i>	<i>GND</i>	<i>Yellow/Green</i>	<i>light socket</i>	-

CU336: LCD inverter (CPU Board–LCD Inverter)			
CPU Board CN1	Signal	Colour	LCD Inverter CN1
<i>11</i>	<i>+12Vdc Power Supply IN</i>	<i>Black</i>	<i>1</i>
<i>1</i>	<i>GND</i>	<i>Black</i>	<i>2 (*)</i>
<i>4</i>	<i>ON - OFF</i>	<i>Black</i>	<i>3</i>
<i>3</i>	<i>GND</i>	<i>Black</i>	<i>4</i>
<i>12</i>	<i>+12Vdc</i>	<i>Black</i>	<i>5 (*)</i>
<i>2</i>	<i>Save - lamp</i>	<i>Black</i>	<i>6</i>
<i>5</i>	<i>GND</i>	<i>Black</i>	<i>2 (*)</i>
<i>10</i>	<i>+12Vdc</i>	<i>Black</i>	<i>5 (*)</i>

(*) =Apply two wires on the same contact.

CU337: Display LCD power supply cable (CPU Board –LCD Display)			
CPU Board CN 2	Signal	Colour	LCD Display CN (A)
5	Vcc LCD	Black	1
6	Vcc LCD	Black	2
11	Vcc LCD	Black	3
17	Schield	Black	7
20	RxE3+	Black	8
22	RxE3-	Black	9
26	RxEc+	Black	10
28	RxEc-	Black	11
14	RxE2+	Black	12
16	RxE2-	Black	13
23	GND	Black	14
8	RxE1+	Black	15
10	RxE1-	Black	16
24	GND	Black	17
2	RxE0+	Black	18
4	RxE0-	Black	19
19	Rx03+	Black	20
21	Rx03-	Black	21
25	Rx0c+	Black	22
27	Rx0c-	Black	23
29	GND	Black	24
13	Rx02+	Black	25
15	Rx02-	Black	26
7	Rx01+	Black	27
9	Rx01-	Black	28
1	Rx00+	Black	29
3	Rx00-	Black	30

CU341: Audio OUT cable (CPU Board– Display Headphone Jack / CU390 cable)				
CPU Board J5	Signal	Colour	Display headphone Jack	CU390
1	Out R	Red	4	-
2	GND	Black	5	-
3	GND	Black	-	3
4	Out L	White	1	-
-	Out L	White	2	4
-	Out R	Red	3	1

CU342: AUDIO / VIDEO signal cable (CU391 cable–CPU Board)			
CU391	Signal	Colour	CPU Board CN27
1	<i>n. c.</i>	-	1
2	<i>In L</i>	<i>White</i>	2
3	<i>GND in L</i>	<i>Sheath</i>	3
4	<i>In R</i>	<i>Red</i>	4
5	<i>GND in R</i>	<i>Sheath</i>	5
6	<i>In VIDEO</i>	<i>Yellow</i>	6
7	<i>GND in VIDEO</i>	<i>Sheath</i>	7
8	<i>n. c.</i>	-	8

CU343: Secondary switch LED cable (ALE driver–LED Secondary switch)			
ALE driver J2	Signal	Colour	Additional LED switch
1	<i>17,5Vcc</i>	<i>Brown</i>	-
2	<i>GND</i>	<i>White</i>	-

CU344: Emergency “A” cable (CPU Board–Hardware reed contact / Software)				
CPU Board CN22	Signal	Colour	Hardware Emergency	Software Emergency
1	<i>SW Emergency</i>	<i>White</i>	-	1
2	<i>GND DIG</i>	<i>Brown</i>	2	2
3	<i>HW Emergency</i>	<i>Green</i>	1	-

CU389: LAN cable (CU319 cable– Low guard connector)			
CU319	Signal	Colour	LAN
1	<i>LAN Signal</i>	<i>White/Green</i>	1
2	<i>LAN Signal</i>	<i>Verde</i>	2
3	<i>LAN Signal</i>	<i>White/Orange</i>	3
4	<i>LAN Signal</i>	<i>Blue</i>	4
5	<i>LAN Signal</i>	<i>White/Blue</i>	5
6	<i>LAN Signal</i>	<i>Orange</i>	6
7	<i>LAN Signal</i>	<i>White/Brown</i>	7
8	<i>LAN Signal</i>	<i>Brown</i>	8

CU390: Jack Audio OUT (CU340 cable–CU341 cable)			
CU340	Signal	Colour	CU341
1	<i>Out R</i>	<i>Green</i>	1
2	<i>Schield</i>	<i>Yellow/Green</i>	2
3	<i>GND</i>	<i>Brown</i>	3
4	<i>Out L</i>	<i>White</i>	4

WR786: Ferrite group (AUDIO / VIDEO cable and headphone low guard cable)			
CU391: AUDIO / VIDEO signal cable (CU342 cable– low guard)			
CU342	Signal	Colour	Audio/Video IN Connectors Board
1	<i>n. c.</i>	-	1
2	<i>In L</i>	<i>White</i>	2
3	<i>GND in L</i>	<i>Sheath</i>	3
4	<i>In R</i>	<i>Red</i>	4
5	<i>GND in R</i>	<i>Sheath</i>	5
6	<i>In VIDEO</i>	<i>Yellow</i>	6
7	<i>GND in VIDEO</i>	<i>Sheath</i>	7
8	<i>n. c.</i>	-	8
CU340: Audio/Video OUT headphone cable (CU390 cable– low guard Headphone Jack)			
CU390	Signal	Colour	Headphone Jack
1	<i>Out R</i>	<i>Green</i>	1
2	<i>Shield</i>	<i>Yellow/Green</i>	<i>Eyelet</i>
3	<i>GND</i>	<i>Brown</i>	2
4	<i>Out L</i>	<i>White</i>	4
CU403: USB cable/ C-Safe (CPU Board–USB & C-Safe connector board)			
CPU Board CN6	Signal	Colour	Connector board J13
1	<i>Vcc</i>	<i>Orange</i>	1
2	<i>Vcc</i>	<i>Orange</i>	2
3	<i>USB-</i>	<i>White</i>	3
4	<i>USB+</i>	<i>Brown</i>	4
5	<i>Shield (GND)</i>	<i>Black</i>	5
6	<i>GND</i>	<i>Black</i>	6
7	<i>GND</i>	<i>Black</i>	7
8	<i>Af +bvdc csafe</i>	<i>Blue</i>	8
9	<i>Af +bvdc csafe</i>	<i>Blue</i>	9
10	<i>Rxd1 in</i>	<i>Red</i>	10
11	<i>Rxd1 in</i>	<i>Yellow</i>	11
12	<i>Cts1 in</i>	<i>Yellow</i>	12
13	<i>GND</i>	<i>Black</i>	13
14	<i>GND</i>	<i>Black</i>	14

2.10.5. TRM CABLES

TRM 54: UP / DOWN micro cable (ALE driver–UP/DOWN Micro)				
ALE Driver J6	Signal	Colour	COM 1	NC 2
3	GND	White	-	faston
8	Reference	Brown	faston	-

2.10.6. OTHER CABLES

CU350: USB cable Touch Screen interface Board (CPU Board– Touch Screen interface Board)			
CPU Board CN11	Signal	Colour	Touch Screen interface Board
1	+5v	Red	1
2	USB-	White	2
3	USB+	Black	3
4	-5V	Green	4
5	-5V Shield	Blue	5

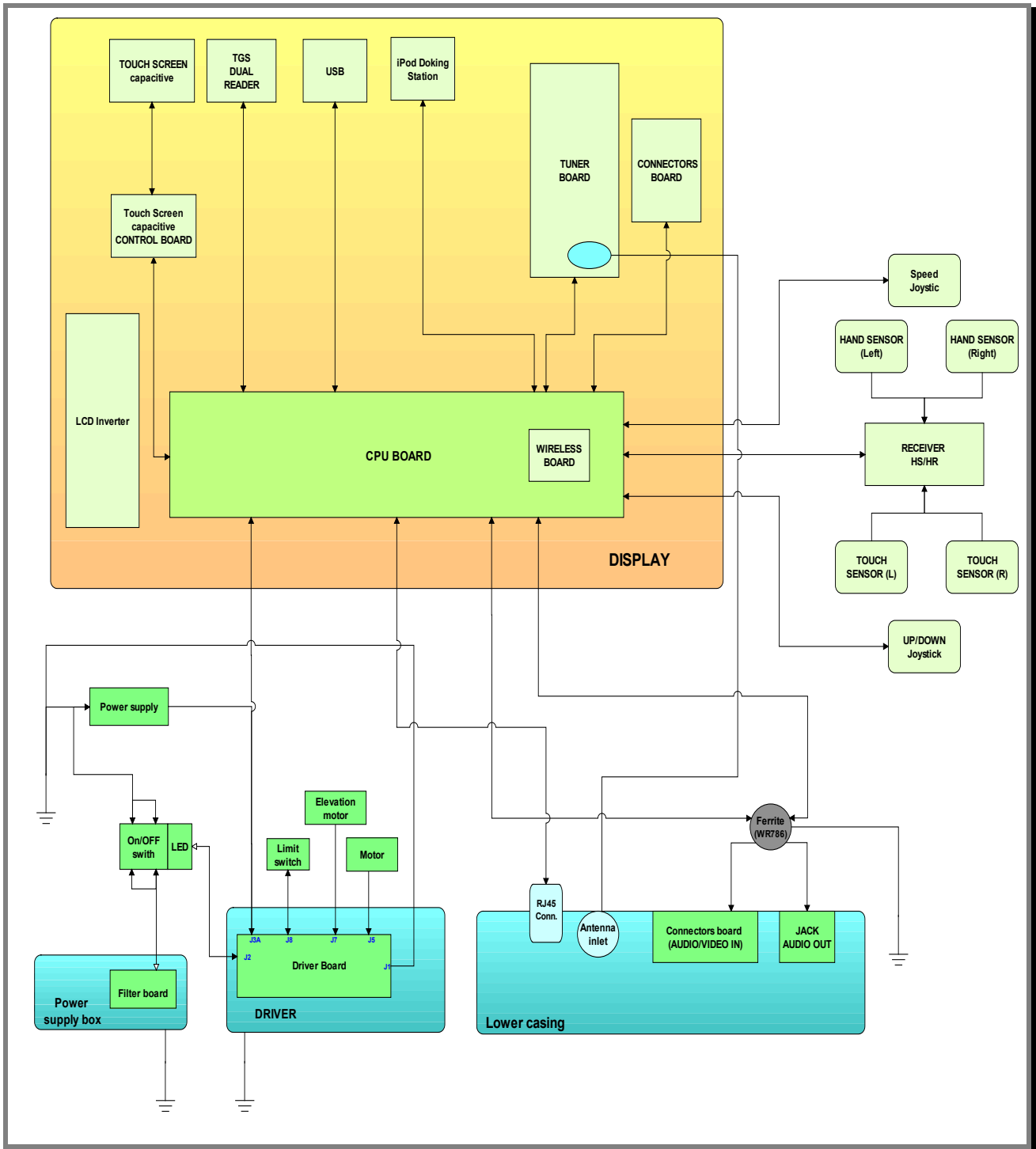
WR233: Elevation motor cable (Elevation motor –ALE driver)			
Elevation motor	Signal	Colour	ALE driver J7
<i>Cable internally connected</i>	+12Vdc Power supply	Black	1
	-12Vdc Power supply	Black	2
	n.c.	-	3
	GND	Black	4
	+5Vdc Power supply	Red	5
	OUT impuls	White	6

W6185: Belt motor cable (ALE driver– Belt motor)			
ALE driver J5	Signal	Colour	Belt motor
1	U	Nero 1	<i>Cable internally connected</i>
2	V	Nero 2	
3	W	Nero 3	
4	thermal +	Nero 4	
5	thermal -	Nero 5	
6	Gnd	Nero 6	

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3. PRINCIPLES OF OPERATION

3.1. BLOCK DIAGRAM: HIGH KIT AND LOW KIT



3.2. VISIOWEB DISPLAY OPERATION (HIGH KIT)

3.2.1. CPU BOARD

The Circuit Board includes: a microprocessor, its control logic, a first FLASH EPROM (containing the Operating System), a second FLASH EPROM, partitioned in two sections (HD1 and HD2) the first used for the training program of the machine, for storing video and other information/support material, the second partition for saving messages coming from the COMMUNICATOR and a third FLASH EPROM (HD3) used for a back-up process.

It is the Circuit Board that connects all components of the display and acts as point of connection to the driver.

The main functions of the board are:

- Manages and process signals from:
 - LCD;
 - LCD Inverter;
 - Touch screen control board;
 - Capacitive Touch Screen;
 - TUNER board;
 - C-Safe and USB connector board;
 - Dual TGS reader;
 - User USB port;
 - iPod docking station.
 - Wireless network Board ;
 - LAN network Board (integrated);
 - Emergency button;
 - HS/HR receiver;
 - Speed Joystick;
 - Elevation Joystick;
 - Audio/Video external device Connectors Board,
 - Headphone Jack.
- Distributes the voltages received from the driver;
- Exchanges, via the RS-485 serial link to the diver, the operating controls.
- Manage the display of images on the LCD.

The board includes the following indicator LED:

LED mane	Colour	Description
LED 1	GREEN	if ON, the +12 Vdc power supply from the Driver correctly reaches the board.

3.2.1.1. BackUp battery

The CPU board has a battery that act to maintain powered the internal clock when the machine is not connected to a power source.

3.2.2. LCD INVERTER

This device powers the LCD Display lamps. It receives DC power supplies (12 Vdc supply and 3.3Vdc enable signal) from the CPU Board, and generates the AC voltage (380 Vac) needed to power the LCD.

3.2.3. DIGITAL/ANALOG TUNER BOARD

This is the board for receiving and managing the **Audio/Video** signal incoming from the antenna; it receives both digital and analog signals.

It is directly connected to the antenna cable, whose signal is then amplified, split between a video and audio channel, encoded by the decoder and processed by a tuner that permits searching and tuning of both TV and radio channels.

The data is then sent to the **CPU Board** where it is processed and managed in order to correctly display it on the LCD Display.

LED name	Colour	Description
D4	RED	<p><i>ON</i> if the power supply reaches the board. <i>OFF</i> if the power supply does not reach the board. FLASHING:</p> <ul style="list-style-type: none"> ▪ if loading/starting the SW in the first seconds after it switch on; ▪ During the firmware upload; ▪ In case of HW/SW malfunctioning (and it continue to blink).

3.2.4. LAN NETWORK BOARD (INTEGRATED)

The CPU board integrate a **LAN network** (*Local Area Network*) which can be used to connect the VISIO device in a local network. The connection should be realised through a UTP cable, with RJ45 connectors cat.5e/6.

VISIO device is compatible with LAN networks, which have a max. transmission speed between 10 and 100 Mbps.



The integrated network is obligatory in case of use for receiving IPTV stream

3.2.5. WIRELESS NETWORK BOARD (WITHOUT CABLES)

This is a board connected directly to the CPU, which enables the VISIO device to connect to a **WLAN** (wireless local area network) as an alternative to a wired network.

The VISIO device has been constructed to be compatible with **Wi-Fi** technology (and in particular with the IEEE 802.11b/g standard), which offers a theoretical bandwidth capacity of up to 54Mbps over distances dependent on the characteristics of the setting where it is installed.

The typical indoor range is 30 m (open space):

- *Standard: IEEE 802.11b/g*
- *Frequency band: 2.4GHz*
- *Security protocol: WPA/WPA2 or also less recent ones (e.g. WEP).*

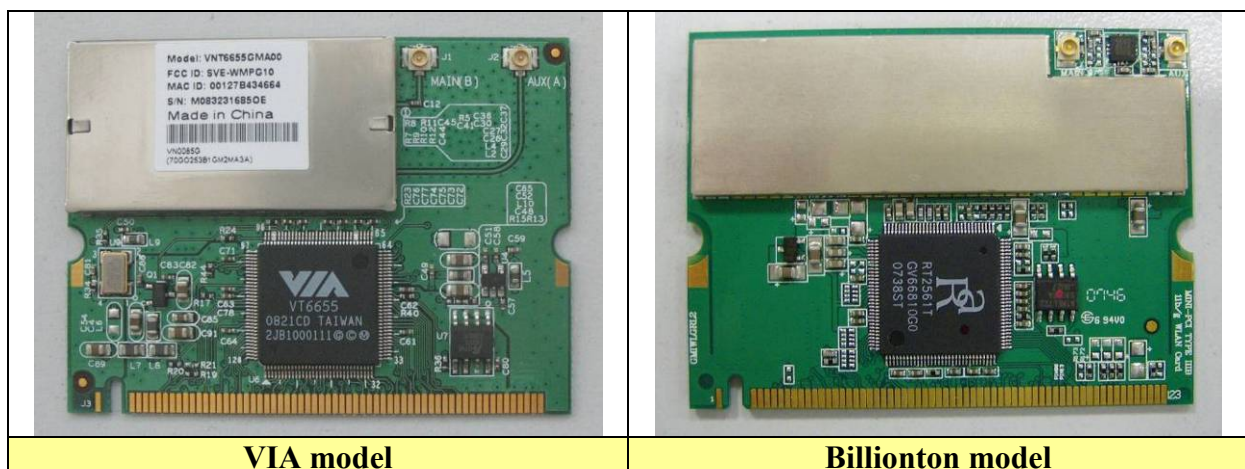


The WLAN connection may not guarantee the same performance as a wired network. The advantage of Wi-Fi is the absence of cables, but this is also a limitation in terms of protection against interference/disturbance, performance (*the stability of service and bandwidth may be intermittent*) and security (*vulnerability to attacks by hackers*). Where possible, it is in any case preferable to use the wired network. The possibility of using Wi Fi also depends greatly on the type of service/application that is to be used in VISIO.

In particular:

- **Technogym Communicator: usable with suitable Wi-Fi network**
- **IPTV: NOT usable with Wi-Fi network; for this application, use of a wired network is essential.**

There are 2 different models of Wi-Fi network board used by Technogym, one produced by *VIA* and the other by *Billinton*. The 2 boards, are physically different as shown below:



Whenever you replace the board with another that is not the same model, you always have to carry out the “*System recovery*” procedure using the Recovery USB stick.

3.2.6. AUDIO/VIDEO EXTERNAL DEVICE CONNECTOR BOARD

The board is positioned at the bottom of the lower guard of the equipment and makes available some connectors for connecting Audio / Video source and the external display on the base-band of LCD.

3.2.7. JACK CUFFIE

The machine display has one jack for connecting headphones. The jack is connected on a stereo output of the CPU Board.

3.2.8. SCHEDA C-SAFE (INTEGRATA)

It's a function that allows the connection using a appropriate cable for connecting other devices, such as: external PC suitably, programmed to control the machine (speed, level of difficulty, etc ...)

3.2.9. PORTA USB DI SERVIZIO (INTEGRATA)

It is used to connect USB keys for updates: High Kit, Low Kit, Digital TV Board, Dual TGS reader and the transfer of Radio and TV channels, from one VISIO device to another.

3.2.10. CAPACITIVE TOUCH SCREEN CONTROL BOARD

It's the board that manages the Touch Screen through 2 flat cables and connect it to the CPU board.

The board includes the following 2 LEDs indicator:

LED name	Colour	Description
LED 1	GREEN	<i>It light up when switch ON the machine then immediately turn off; it light up again every time you press on the Touch Screen.</i>
LED 2	RED	<i>If ON the power supply reaches the board. If OFF the power supply does not reach the board.</i>



ATTENTION: If the Green LED blinks continuously without anyone touching the Touch Screen, this might be because the capacitive Touch Screen control board is affected by interference from either the network supplying the machine, or from other outside sources such as: amplifiers, PCs, USB accessories, etc...

3.3. HAND SENSOR AND CARDIO RECEIVER

This board 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 with a 90 cm radius, but please have a look to paragraph 6.15. "The telemetric heart rate signal is incorrect" to study it in detail. 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. Moreover if other transmitters are working within this area (cross-talking), the signal received can be incorrect.

The board, manage both the telemetric transmitter and the **Hand Sensors** signals, in the same way.

Please note that the introduction of the Salutron 8500 receiver has been accompanied by the removal of the function for setting the heart rate data acquisition priority, previously accessed through the "Chest strap" or "Hand Sensor" items.

This because the priority is now determined by the HW position of a jumper (**JP1**) on the receiver itself:

JP1 **CLOSED** = Chest strap priority

JP1 **OPEN** = Hand Sensor priority

The standard configuration of the receiver is with chest strap priority.

3.4. JOYSTICK

These joysticks are used to adjust the speed and the elevation during the exercise. Each time they are pressed, forward or backward, they send a signal to the CPU board to change the speed or the elevation according to the joystick used.

3.5. EMERGENCY STOP

This is a safety device which allows the user to stop the machine in an emergency situation. It consists of 2 magnetic sensors fixed to the machine display, which form a NC contact when the emergency stop device is correctly positioned on the control panel during exercise.

If a user is in difficulty and detaches the emergency device from the control panel, the NC contact is opened. On detecting opening of the contact, the CPU Board shows the message *"Reposition the emergency stop device and touch the screen"* on the display and sends a signal to the Drive which cuts off the power supply to the tread belt motor, halting the machine.

3.6. 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. 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 thermal signal reaches the driver as a NC external input signal. When this contact opens, the 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 and flywheel.

Tread belt motor power see at the paragraph: 2.3. “Technical specification”.

3.7. ELEVATION MOTOR

This is a linear actuator equipped with 24Vdc 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.

3.8. 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.

3.9. IPOD DOCKING STATION



It is the device that allows to plug & store iPod models, in a safe docking station and to control it from the ACTIVE Wellness TV interface.

With the docking station, developed for the full compatibility with iPod, it is possible to power, recharge and fully control it from the touch screen of the machine.

In the following table, all the compatible iPod(APPLE) models:

<p><i>iPod 5st gen.</i></p> 	<p><i>iPod Classic</i></p> 	<p><i>iPod mini</i></p> 
<p><i>iPod Nano</i></p> 	<p><i>iPod Touch</i></p> 	<p><i>iPhone</i></p> 

3.10. CLIENT USB PORT



This is an additional port which can be installed on the VISIO Display, and makes available a USB port for connecting to external devices. The user can connect USB devices for playing a vast range of multimedia files, including: *mp3, wma, wav, wmv, MPEG2, MPEG4, DivX, XVID jpg*.

3.11. DUAL TGS READER

It's the device which allows the machine to interact with the Wellness System.

This board enables the machine to read the user's TGS key for performing workouts programmed with the proper SW of the Wellness System.

With Dual TGS reader it is possible to use both the Botom and the Mifare TGS keys.

3.12. ALE MET DRIVER OPERATION (LOW KIT)

3.12.1. ALE MET DRIVER

This is the electronic device that receives the line voltage and, through a PFC module, it rectifies the voltage to the 400Vdc used to generate the 3 phase voltage for the belt motor. It generates the DC voltages to power up all the other devices of the machine.

It's the 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:

- *it supplies the +12Vdc voltages to the display;*
- *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 commands for controlling 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.*

From the outside the following indicator LEDs are visible:

LED name	Colour	Description
H6	GREEN	+5Vdc (if ON proper functioning)
H3	GREEN	+12Vdc (if ON proper functioning)
H4	GREEN	+24Vdc (if ON proper functioning)
H5	BLUE	400Vdc (if ON proper functioning)

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

LED name	Colour	Description
ALARM	RED	<i>If ON indicates that the AT UL 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.</i>
EN_UP	GREEN	<i>if ON indicates that the motor has received the supply voltage for movement in the upward direction</i>
EN_DOWN	RED	<i>if ON indicates that the motor has received the supply voltage for movement in the downward direction</i>
TACHO	GREEN	<i>functioning of elevation motor encoder: if blinking, indicates that the board is receiving the pulses from the encoder</i>
DWN_SW	GREEN	<i>status of Limit switch contact: if ON indicates that the microswitch is pressed</i>

3.12.2. ALE POWER SUPPLY BOX

This is a box which contains:

- *The machine's power inlet socket.*
- *The on-off switch.*
- *2 resettable THERMAL CUTOUPS which monitor overloads on the phase and neutral.*
- *An inductor*
- *Filter Board*

This power supply box manages the power circuits of the machine: in particular, the input *high voltage*, which is then sent to the Drive, controlled through a second on-off switch.

3.12.3. SUPPLEMENTARY POWER SUPPLY

This provides a supplementary +12V line required for operation of the VISIO, which in particular uses it for powering the lights of the LCD.



ATTENTION If the LCD lights fail to illuminate, one reason could be that this supplementary power supply is not supplied or is not working, and thus in its turn fails to supply the LCD.

3.13. AUTOTRANSFORMER



Only for 110Vac version.

It is a toroidal Autotransformer, placed on a plate fixed to the frame in the bottom of the machine under the running deck. The Autotransformer is connected in series to the power supply of the equipment and allows to use the 110Vac power supply. It receives the 110Vac power supply and provide an output voltage of 220Vac for the Driver.

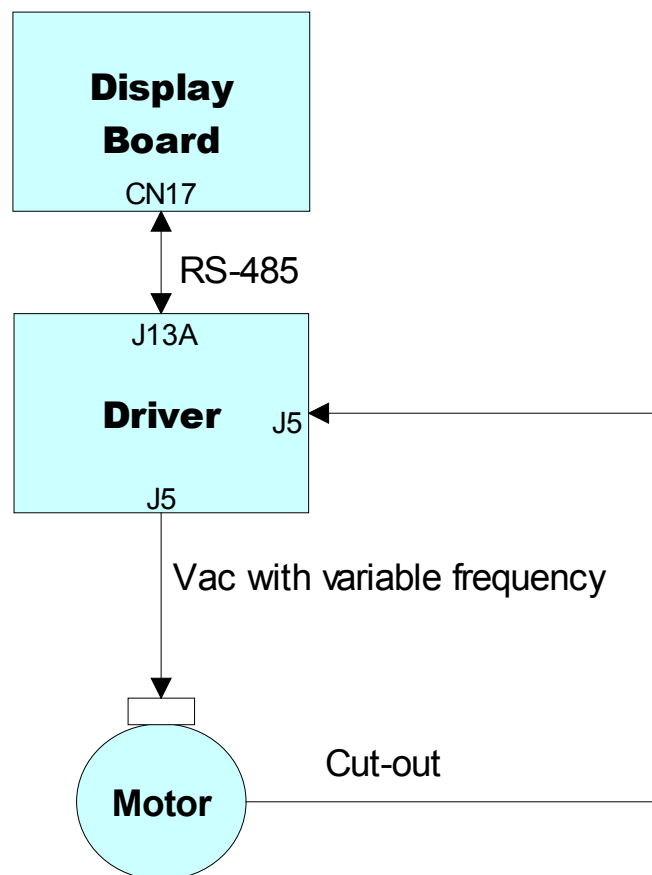
3.14. TREAD BELT MOTOR DRIVE

3.14.1. 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.

3.14.2. CONTROLS

The control block diagram is as follows:



To actuate the motor, the Display Board communicates with the driver via the RS-485 serial link. Based on the commands received, the 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.

During its movement, the driver continually checks the motor by monitoring its current draw as well. If any problems are detected (low voltage, overcurrent, SW or HW inverter, etc....) it halts the motor and sends an alarm signal to the Display Board, which displays a “THE EQUIPMENT IS BLOCKED” which may lead to different error codes stored by the Driver.

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 driver detects this condition as the opening of a NC external contact. In such a case the driver halts the motor and outputs an alarm signal to the Display Board which displays the “THE EQUIPMENT IS BLOCKED” message.

3.14.3. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **RS-485 Signal**
This is a digital signal exchanged between the driver and the Display Board.
- **VAC Signal with variable frequency:**
This is the variable alternating-voltage signal output by the driver (connector J5) to supply the motor. Increasing the frequency of this signal increases the motor speed. The frequency of the sinusoidal supply voltage sent by the driver to the motor can be viewed on the display using the inverter manual test described at the relevant paragraph of the Troubleshooting menu.
- **Cut-Out signal:**
Each motor phase is equipped with a normally-closed thermal cut-out which opens when the temperature exceeds a preset threshold. When this input signal is an open contact, the driver detects the alarm, halts the motor and sends an alarm signal over the RS-485 line to the Display Board.

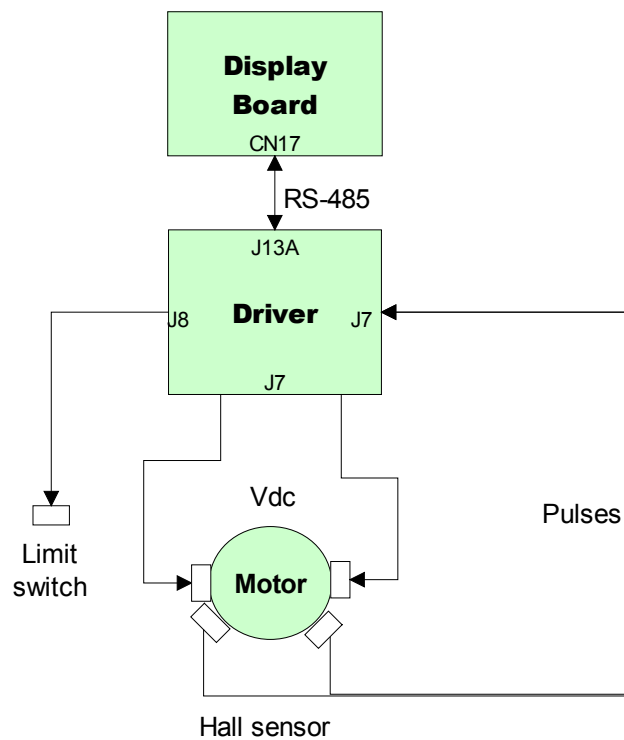
3.15. ELEVATION MOTOR DRIVE

3.15.1. 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.

3.15.2. CONTROL

The control block diagram is as follows:



To actuate the motor, the CPU Board communicates via the RS-485 serial link with the ALE Drive. Depending on the commands received, the Drive sends a +24 or -24Vdc power supply to the Up-Down motor, and in this way determines whether the actuator rod moves in or out. When the motor receives the voltage it begins to move.

To control the elevation position, the Drive uses the following input signals:

- *A travel limit microswitch which defines a zero-reference position, acquired by the machine during its power-on reset procedure and whenever the microswitch is pressed. The travel limit microswitch outputs a normally closed signal which becomes open when the microswitch is pressed.*



ATTENTION: when the travel limit microswitch outputs an open contact signal (pressed, microswitch broken or cable interrupted), the downward movement of the machine is disabled.

If the Drive detects problems with these signals during operation of the elevation motor, i.e.:

- *If it has not received any pulses during a previously defined time interval.*
- *If, when the travel limit microswitch outputs an open contact signal, this contact does not switch to closed when the elevation motor moves upward by a distance of 2%.*

Then:

- *The drive stops functioning with error code "EdC"*
- *The machine displays the "ELEVATION ERROR" message, and interrupts the exercise.*
- *The parameter Par 07 is switched to 1 to disable the elevation function.*

At this point the machine will only allow movements of the tread belt motor, but not of the elevation motor. To re-instate operation of the elevation motor, the machine must be turned off and on again, so as to automatically reset Par 07 to 0.

If the problem persists, the machine will again show the elevation error on the Display.

3.15.3. RESET PROCEDURE

On power-up, the machine performs a reset procedure in order to determine the zero-reference position for the elevation movements. The machine makes a downward movement until the travel limit microswitch is pressed, and then moves upward by the number of pulses (100 pulses) defined in the elevation table to reach the reference "horizontal position". All the movements for reaching different elevations will be variations relative to this reference.

3.15.4. THE SIGNALS INVOLVED

The machine uses the following control signals:

- **RS-485 Signal**

This is a digital signal exchanged between the Driver and the Display Board.

- **Motor voltage signal (Vdc)**

This is the DC voltage generated by the driver (*pins 2 and 1 of connector J7*) for supplying the elevation motor. Its absolute value is 24Vdc 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 Driver (*pins 6 and 4 of connector J7*) and provides the feedback of the motor movement.

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

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

- **Limit switch signal**

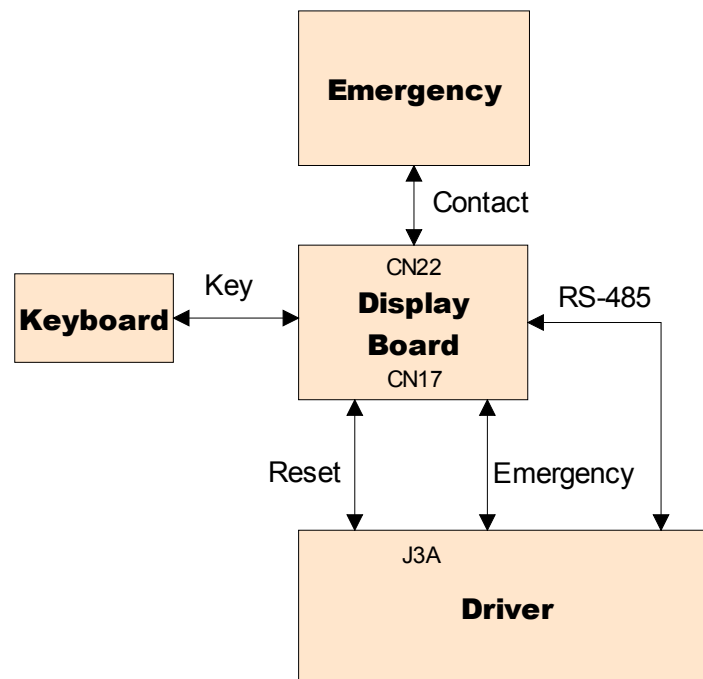
The limit switch is a NC contact entering the Driver (*pins 3 and 8 of connector J8*), which opens when the machine pressed it during the power-on reset procedure.

3.16. EMERGENCY STOP SIGNAL MANAGEMENT

The device consists of 2 magnetic sensors connected in parallel, fitted on the machine display, and a switch containing two magnets which, depending on whether or not it is positioned on the sensors, varies the state of the signals output by the sensors to the Display Board.

3.16.1. CONTROL LOGIC

The control block diagram is as follows:



When the user detaches the emergency stop device, the NC contact of the sensors is opened, changing the state of the two signals output by them to the Display Board. Each of the two sensors outputs a distinct signal, interpreted as follows: one is an “*SW Emergency*” signal, and one is an “*HW Emergency*” signal.

The two signals are managed as follows:

- **SW Emergency:** *The Display Board detects the emergency condition and signals it by displaying the message “Reposition the emergency stop device and touch the screen” and sends the information to the drive over the 485 serial link to halt the motors..*
- **HW Emergency:** *The Display Board sends the emergency signal directly to the drive to halt the motors.*

To reinstate the machine's operation, it is necessary to reposition the emergency stop device on the control panel and press any key on the display, as prompted.



The machine will not accept any commands until the emergency stop device has been correctly repositioned.

The two sensors connected in parallel provide redundant safety, outputting two distinct and independent signals to the Display Board, however the malfunction of any one of these two sensors causes the machine to stop functioning in an emergency condition.



ATTENTION: The message **“Reposition the emergency stop device and touch the screen”** appears on the display also if the serial communication between the high and low kit is interrupted.

Pressing a key initiates the procedure for reinstating operation of the Drive, which receives a reset signal from the Display Board. After this, the Drive attempts to re-establish serial communications with the Display, and then repeats the reset procedure again.

If serial communication cannot be established, the machine will make a number of attempts. Each failed connection attempt is recorded in the COM FAULT parameter, which can be viewed as described in the relevant paragraph of the Service menu. After approximately 30 seconds, it stops and displays the error message “MACHINE LOCKOUT (COM)”.

3.16.2. THE SIGNALS INVOLVED

The machine uses the following control signals:



Emergency contact:

This is the NC contact provided by the 2 magnetic sensors actuated when the emergency stop device is detached. This contact becomes open when the emergency stop device is detached. The signal enters the Display Board through connector CN22 (*pins 1 and 2*).



RS-485 Signal:

This is a digital signal exchanged between the Drive and the Display Board.



Emergency signal:

This is the signal generated by the Display Board (*pins 1 and 4 of connector CN17*) and sent to the Drive (*J3A*).

This signal is 0Vdc under normal conditions, and goes to 11.9Vdc in the emergency condition.



Reset signal:

This is the signal generated by the Display Board (*pins 1 and 10 of connector CN17*) and sent to the Drive (*J3A*) to signal to the low kit that normal operation has been reinstated after an emergency condition. This signal is 0Vdc under normal conditions and goes to approximately 8Vdc for a few seconds when the user presses a key.

When this happens, the Display Board resets the Emergency signal to 0Vdc, thus allowing the Drive to return to the normal operating condition.

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4. ACCESSORIES

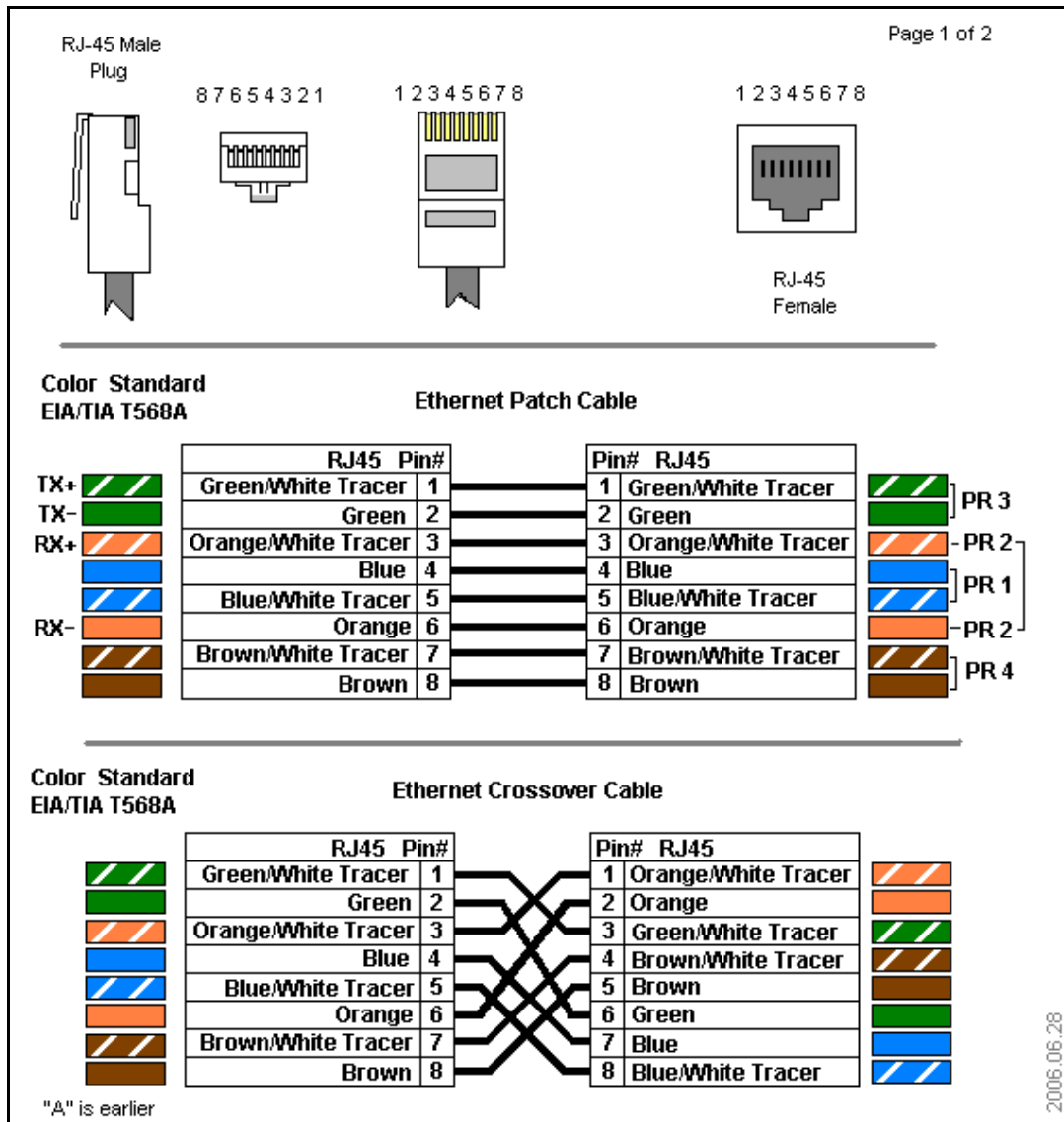
4.1. CARDIO THEATER CONNECTION

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

RJ45 Connector	Signal
5	+5Vdc
7	Ground

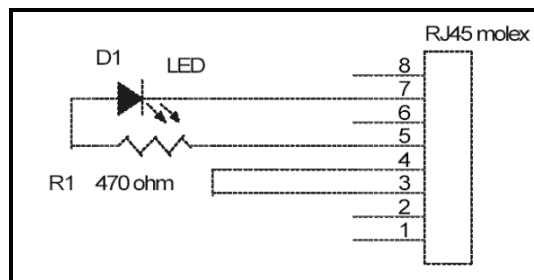


ATTENTION: for the numbering of the pins, on RJ45 connector, please refer to the diagram below:



4.2. MONITOR PLUG FOR C-SAFE PORT

When the plug code **0WC00639AA** is fitted into any one of the C-Safe ports on the machine, the corresponding LED should illuminate to indicate the presence of the 5 Vdc supply on the port. During the C-Safe 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.



4.3. UPGRADE VISIOWEB

4.3.1. VISIO vs VISIOWEB

The two product versions differ mainly for two reasons briefly detailed below. The first it's about its functionality while the second it's about a technical characteristic.

1. On **VISIOWEB** it is possible to use internet. On machines with **VISIOWEB** display it is possible for the user browsing and use internet services during the training session;
2. **VISIOWEB** has been developed on Linux instead of Windows CE used for **VISIO**. This difference can not be noticed by the final user because both the product versions have the same graphic interface and just few steps of the network configuration are different.

4.3.2. VISIOWEB UPGRADE KIT

It is possible to upgrade an equipment from VISIO to VISIOWEB through a specific SW upgrade procedure, using the proper USB recovery stick and a correct configuration for internet service (if the infrastructure has been properly arranged).

The Baan code to be used for this upgrade **ATS600**.



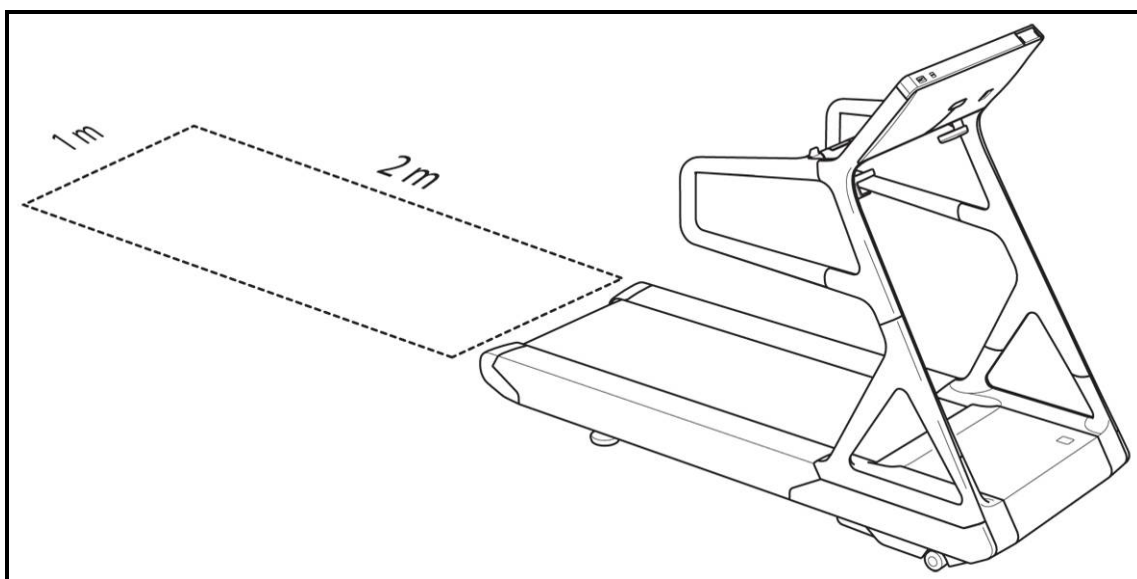
CAUTION: this procedure must mandatory be done by a **TECHNOGYM** qualified technician.

5. INSTALLATION INSTRUCTIONS

5.1. SPECIFICATIONS AND REQUIREMENTS

For correct machine installation, make sure that:

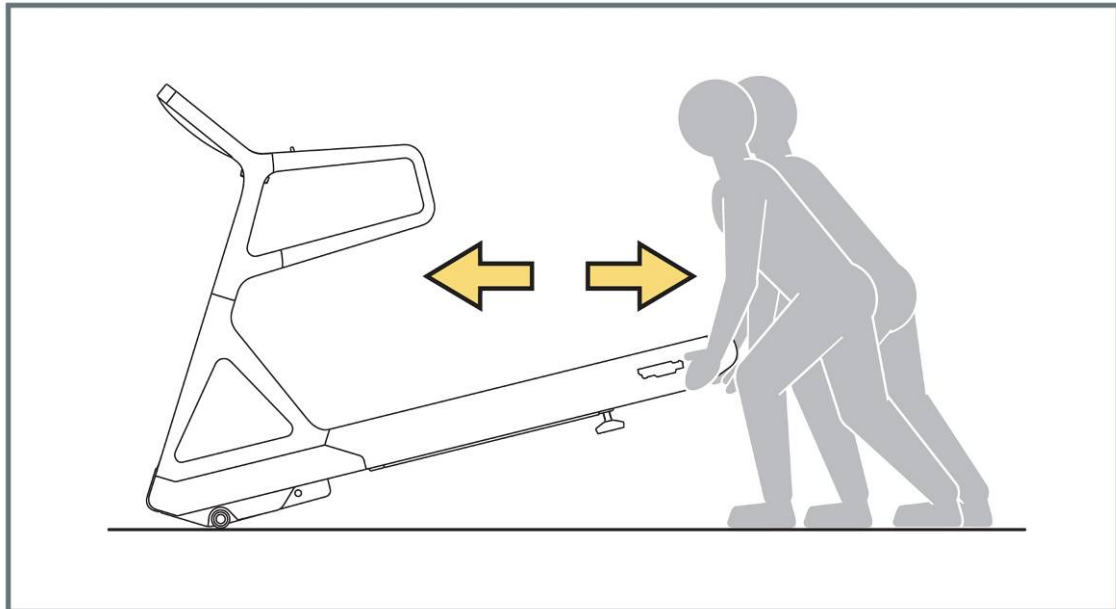
1. The machine is installed on a level surface that is free of vibrations and has sufficient carrying capacity for the combined weight of the machine and user;
2. The place of installation is free of dust and sand;
3. The place of installation meets the operating temperature and humidity conditions specified in paragraph: 2.7. “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 power supply line;
6. The socket outlet and other devices on the dedicated line should be appropriately sized for the required load 16A;
7. The socket outlets must be earthed;
8. No multiple connections are permitted on the ground 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 at the socket outlet;
10. Position the mains lead of the machine where it will not be underfoot;
11. To eliminate any interference with the cardio receiver, no transmitters should be placed less than 90 cm from the display.
12. 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:



5.2. MOVING

The equipment has two fixed front wheels.

To move the equipment, lift it up slightly, as shown in the illustration, and push it forwards and backwards. Given the weight of the equipment, we recommend 2 person be involved in lifting it.



After every moving, check if the equipment is on flat, adjust the left foot, as indicated at the paragraph: 8.6. “The machine is not flat”.

5.3. INSTALLATION

1. Ensure that the specifications and requirements for installation have been met (see paragraph 5.1. “Specifications and requirements”).
2. Depending on the destination country, the machine may be shipped partially disassembled, packed inside a special carton and fixed to a pallet, or fully assembled, wrapped in clear plastic and fixed to a wooden pallet. Follow the assembly operations described in the instruction sheets supplied with the machines
3. Connect the mains lead to the power inlet socket on the machine.
4. Place the on/off switch in the “0” position.
5. Plug the mains lead into the wall outlet.
6. Connect the antenna cable to the socket and respect the requirements by reference to the relevant chapter of the manual specific.

5.4. FIRST POWER-ON

1. After completing the installation procedure, the machine is ready for use.
2. To turn on the machine, simply toggle the on/off switch from the “0” position to the “1” position and press the secondary switch on button on the front guard.
3. During the power-up the machine performs a communication test between upper and lower electronics.
4. After the test, the machine enters the stand by mode, awaiting for a command.

5.5. CHECK THE CORRECT OPERATION OF THE MACHINE

1. Get on the machine;
2. Start exercising;
3. Press on the right joystick and check that the speed change;
4. Press on the left joystick and check that the incline change;
5. Put on the heart rate meter and check that the machine correctly reads the heart rate value;
6. Grasp the sensors and check that the machine correctly reads the heart rate value;
7. Carry out the “Touch Screen calibration” procedure described at the relevant paragraph of the Service menu.


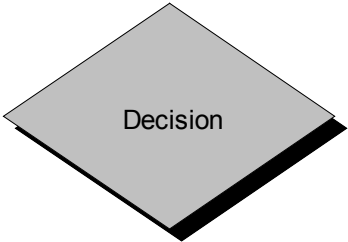

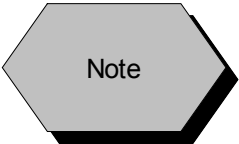


5.6. RECOMMENDED AERIAL ANTENNA REQUIREMENTS



All the information about the minimum requirements concerning the antenna signal are detailed in the proper manual “Electrical and antenna requirements” you can find and download into the Technogym Direct.

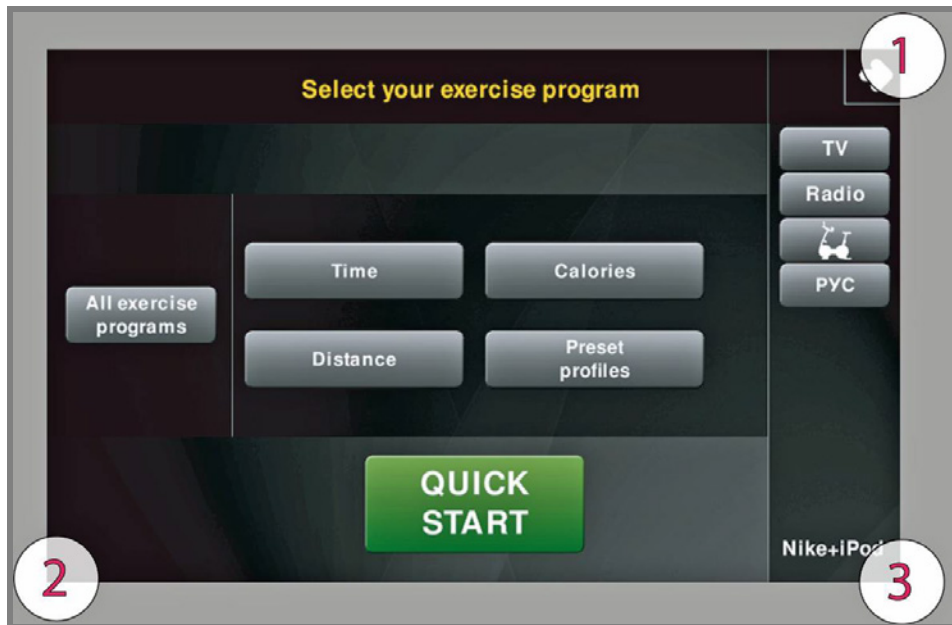
6. TROUBLESHOOTING

The troubleshooting procedures are illustrated by means of flow diagrams. To facilitate interpretation of these diagrams, the following standard box shapes are used:

	<p>This type of box is the START point of the troubleshooting procedure. It typically contains a description of the problem or malfunction.</p>
	<p>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 is either a positive (YES) or negative (NO) response.</p>
	<p>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:</p> <ol style="list-style-type: none"> 1. <i>Check whether the problem has been resolved;</i> 2. <i>If the problem persists, it is recommended to resume the troubleshooting procedure from the point before the action was carried out.</i>
	<p>Clarification of the operation in progress or that will be below</p>
	<p>A <u>circled number</u> (such as that shown on the left) next to a box of the troubleshooting procedure indicates that more detailed instructions for performing that particular check or action are provided below the flowchart.</p>
	<p>A <u>circled letter</u> (such as that shown on the left) is used to mark a point in the procedure. Typically, this indicator is used in page changes.</p>

6.1. TROUBLESHOOTING MENU

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence when the equipment is in Stand-By, as shown in the figure below.



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:

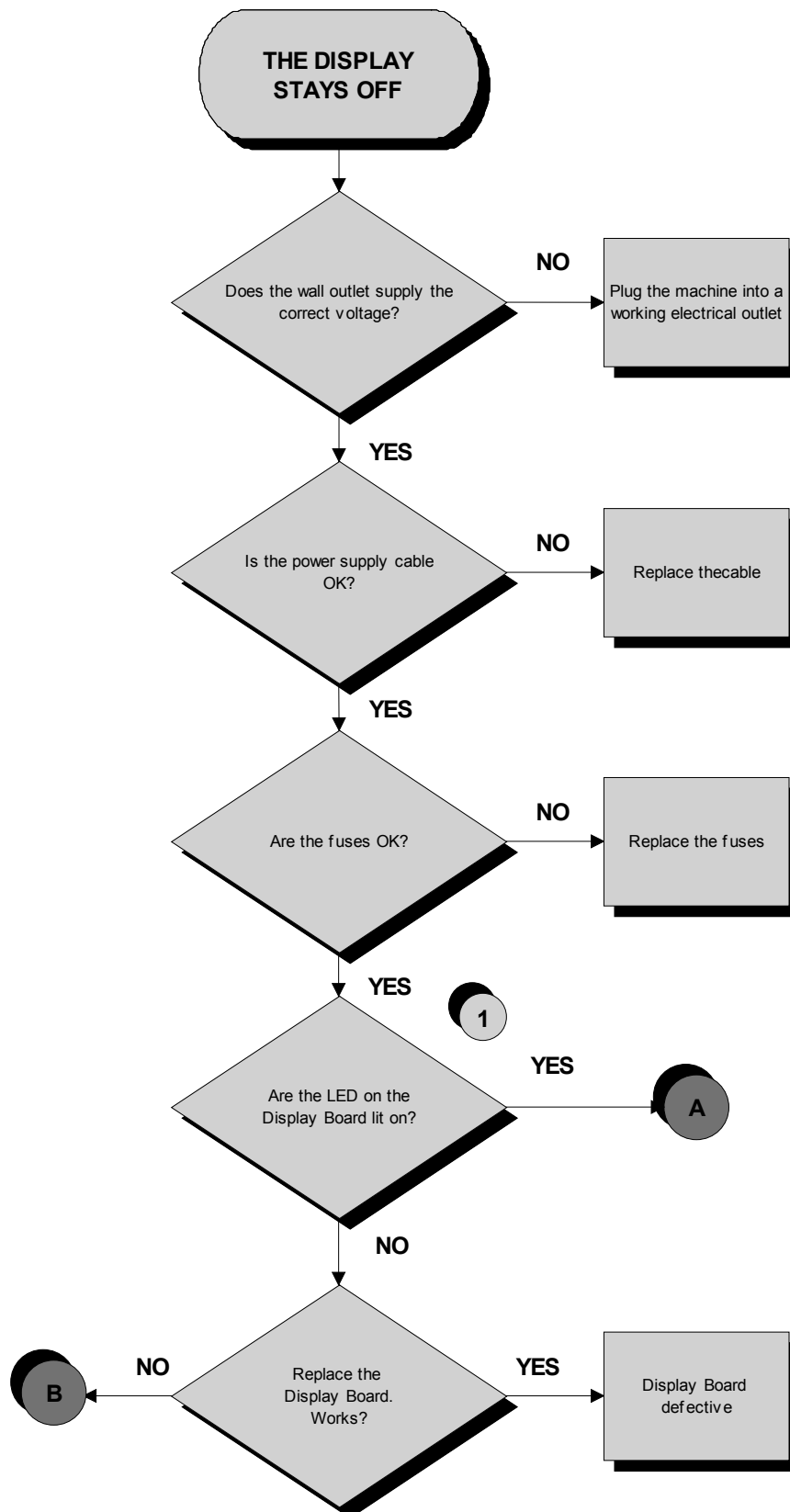
Enter the password **2501** and press the **ENTER** key to confirm or **EXIT** to quit.

*By selecting the key which is highlighted in red, you will gain access to the **TROUBLESHOOTING** menu:*

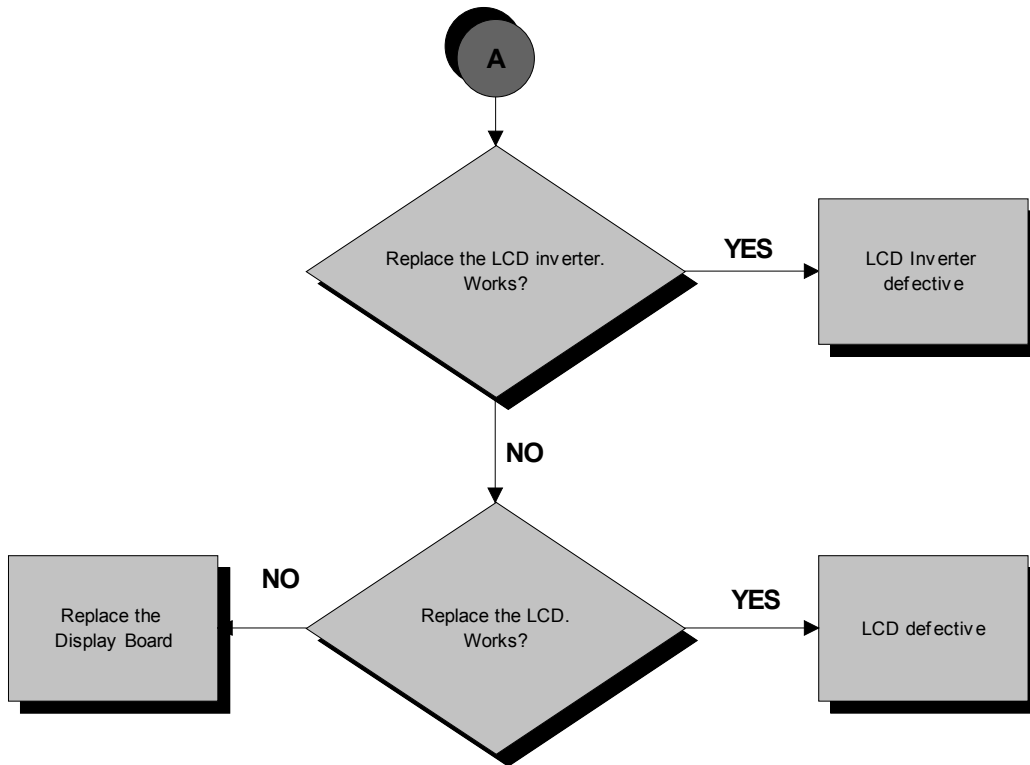


For the following menu, please refer to the relevant chapter in the VISIO manual.

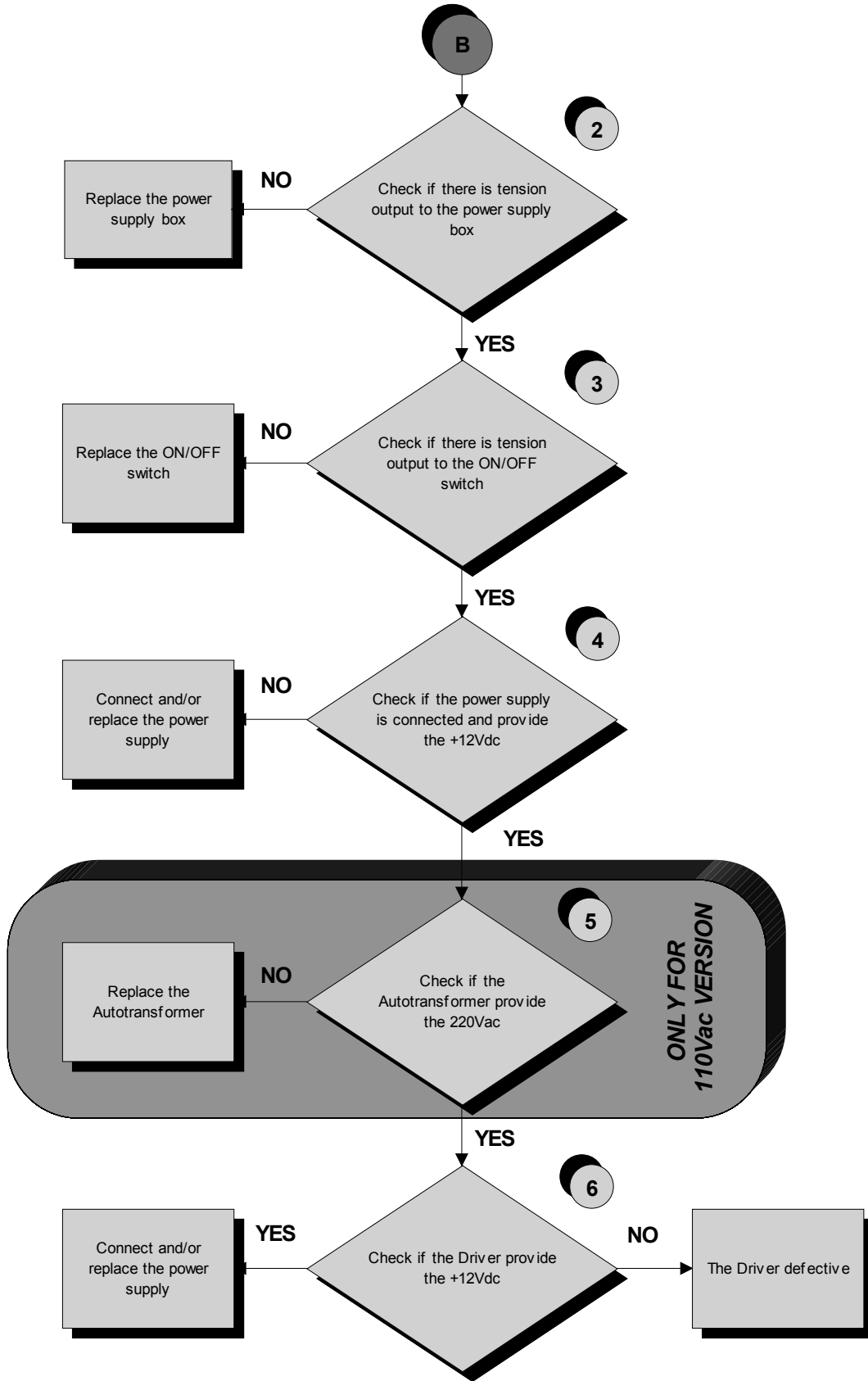
6.2. THE DISPLAY STAYS OFF



Continued on following page...



Continued on 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:

- (1) Check the **LED 1** (*green*) of the Display Board, is correctly lit on.
- (2) Check on the switch ON button's faston, connected to the cable output to power supply box, if there is the 220Vac voltage.
- (3) Switch ON the machine and check if on button's faston, connected to the cable going to the extra power supply and Driver, there is the 220Vac voltage.
- (4) Check if there is +12Vdc on **11** and **12** pins of **Patch connector 1**.
- (5) Check if there is 220Vac at the output of the Autotransformer, on the **J1** connector of the Driver.
- (6) Check if there is +12Vdc on **6** and **2** pins of **Patch connector 1**.



If you replace Display Board and/or Driver, check that its SW version is updated, otherwise install the last version.



TV and RADIO channels, are only stored in a file in the fixed memory of the board. So the channels will be re-store in case of replacing of the Display Board.

6.3. NO AUDIO SOUND



For the following menu, please refer to the relevant chapter in the VISIO manual.

6.4. NO TV PICTURE



For the following menu, please refer to the relevant chapter in the VISIO manual.

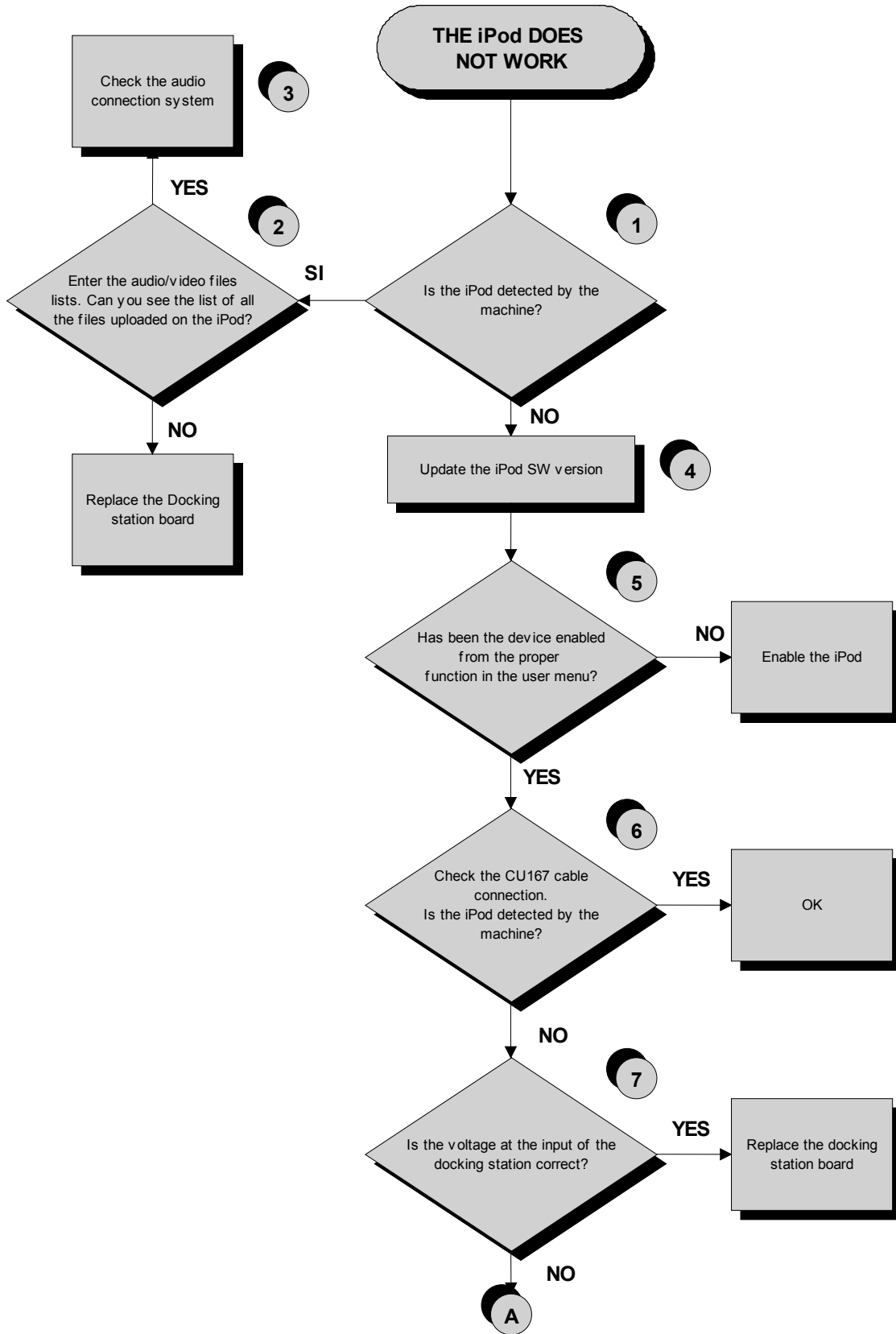
6.5. THE TOUCH SCREEN DOES NOT WORK / IT'S NOT CALIBRATED



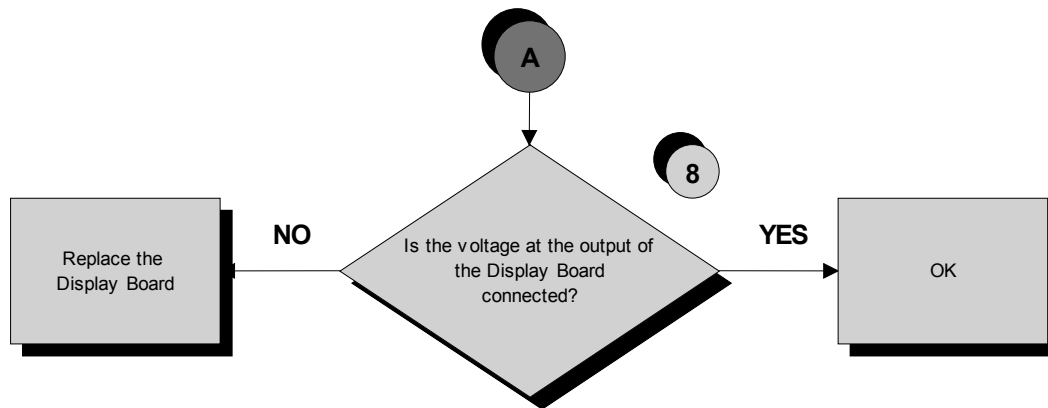
For the following menu, please refer to the relevant chapter in the VISIO manual.

6.6. THE RADIO DOES NOT PLAY

6.7. THE IPOD DOES NOT WORK



Continued on 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:

- (1) Switch on the machine, connect the iPod on the docking station and check that the device is correctly detected by the machine.
- (2) Check that the audio/video files uploaded in the iPod are visible and selectable through the VISIO interface.
- (3) Carry out the troubleshooting procedure: 5.6. “Recommended aerial antenna requirements”.
- (4) To update the iPod SW you just need to connect to iTunes and it automatically upgrades to the last version.
- (5) Enable the iPod control as detailed at the relevant paragraph of the User menu.
- (6) The CU167 cable has identical connectors on either end then it can sometimes be connected the wrong way round.
- (7) Place the tester probes across pins 8 and 9 of the connector on the docking station board where the CU167 cable is connected. The measured value should be 5Vdc.
- (8) As for step (7) but across pins 6 and 7 of the connector on the Display Board where CU167 is connected.



If you replace Display Board, check that its SW version is updated, otherwise install the last version.

6.8. THE DISPLAY SHOWS “PRESS A KEYS / TOUCH THE SCREEN”

This error message can be caused by:

- *loss of communication between the lower and upper assemblies;*
- *the user has pressed the emergency button;*
- *defective emergency button: the micro switch is opened.*

To 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 the relevant paragraph of the Service menu.

6.9. “THE EQUIPMENT IS LOCKED (COM)” MESSAGE ON DISPLAY



In case of the machine stops with error “The equipment is locked” check the cause of the problem, reported between parentheses:

- (COM), related to serial communication errors;
- (EMER), related to emergency button errors;
- (cod. error), related to Low Kit errors.

This error message can be caused by:

- Loss of communication between the lower and upper assemblies; (COM)
- The driver has detected an error condition, causing it to generate an alarm and store the error code in memory (cod. Error).
- Problem on the emergency button (EMER) or (COM).

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 various cables is not damaged, in particular the cables of the “emergency signal” and of the “reset” by referring to paragraph: 2.10. “Cables”; try replacing each of the circuit boards in turn (CPU/ARM board and driver box) and check whether the communication works.

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

2. Access the item 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 driver.

6.10. DRIVER ERRORS

When the 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 the relevant paragraph of the Service menu.

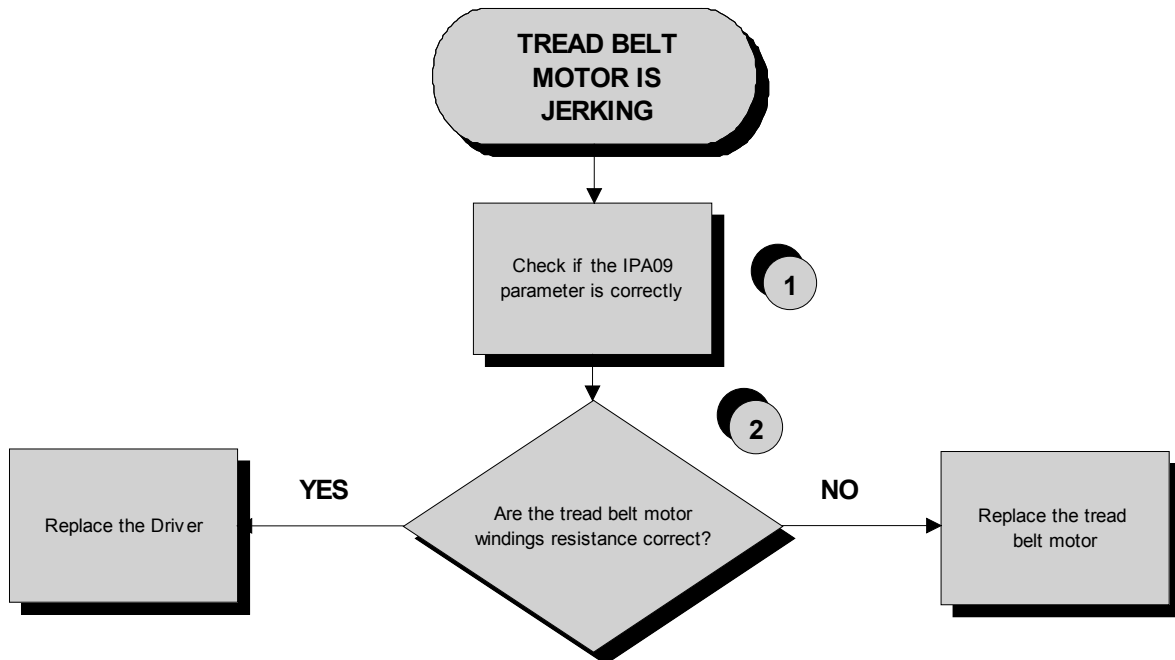
The following table shows the correspondence between the numbers, codes and possible solution:

Error code	Description	Possible solution
1/OH	OVERHEATING of the heat sinks of the low kit driver and of the PFC.	<ul style="list-style-type: none"> • Check the running belt • Check the running deck • Check the fans • low kit driver
2/OC	OVERCURRENT, even if only temporary, on the inverter output.	<ul style="list-style-type: none"> • Check the running deck • low kit driver • Check P409 (torque) = 100-115
3/UU	UNDERVOLTAGE condition, due to an even temporary drop in line voltage.	<ul style="list-style-type: none"> • Bad power distribution line of 110/220 V AC • Voltage NOT constant
4/OU	OVERVOLTAGE	<ul style="list-style-type: none"> • Voltage NOT constant • Braking resistor
5/ST	SERIAL TIMEOUT, there is no signals exchange between high kit and low kit	<ul style="list-style-type: none"> • Check the serial communication
6/PE	EEPROM error: is generated when there is an error detected in the data stored on the Eprom.	<ul style="list-style-type: none"> • low kit Driver
7/EdC1	ELEVATION MOTOR ENCODER error.	<ul style="list-style-type: none"> • Check Up/Down Troubleshooting
8/EdA	BELT MOTOR ENCODER error.	<ul style="list-style-type: none"> • Encoder • low kit Driver • Check P409 (torque) = 100-115
9/OtM	BELT MOTOR THERMAL CUT-OUT open.	<ul style="list-style-type: none"> • Update driver SW • Check motor casing fan • Check the running belt • Check the belt motor
10/Oli	Inverter overload caused by a DC current exceeding, for the maximum allowed time (I2t), the maximum permissible threshold for the inverter.	-
11/OLm	Motor overload caused by a DC current exceeding, for the maximum allowed time (I2t), the maximum permissible threshold for the motor in question.	-
12/OLr	Braking resistor overload.	<ul style="list-style-type: none"> • Check the resistor=150 Ω • low kit Driver

Error code	Description	Possible solution
19/EM	EMERGENCY. Is generated when low kit drive receives a software emergency signal that is not accompanied by a hardware emergency signal	-
20/SFAn	LOW KIT DRIVER COVER PLATE FAN. This error is generated if there is a malfunction on the fan mounted on the driver's cover plate, for at least 5 sec.	<ul style="list-style-type: none"> • <i>low kit driver cover plate fan</i>
21/PFAn	LOW KIT DRIVER INTERNAL FAN. This error is generated if there is a malfunction on the internal low kit driver fan, for at least 5 sec	<ul style="list-style-type: none"> • <i>low kit driver internal fan</i>
22/IMV	INVERTER POWER SUPPLY: This error is generated if a voltage <156 VAC for at least 1 sec. when the AC motor is working or for at least 10 sec. when AC motor is not working.	-
23/SHC	SHORT CIRCUIT. Is generated in the event of a short circuit between a motor phase and earth.	<ul style="list-style-type: none"> • <i>Check the belt motor</i>
24/OHS	OVERHEATING of the dissipator sensor: This error is generated if a malfunction of the dissipator sensor last more than 1 sec.	<ul style="list-style-type: none"> • <i>low kit driver</i>

6.11. TREAD BELT MOTOR IS JERKING

The probable cause is a disconnected phase either at the 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) Check parameter **IPA409** as detailed in the table at the paragraph: 9.2.3. "Inverter parameters".
- (2) 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.

6.12. “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 the relevant paragraph of the User menu.



Check parameter PAR 09 is set 15 (1,5 Sec.).

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.

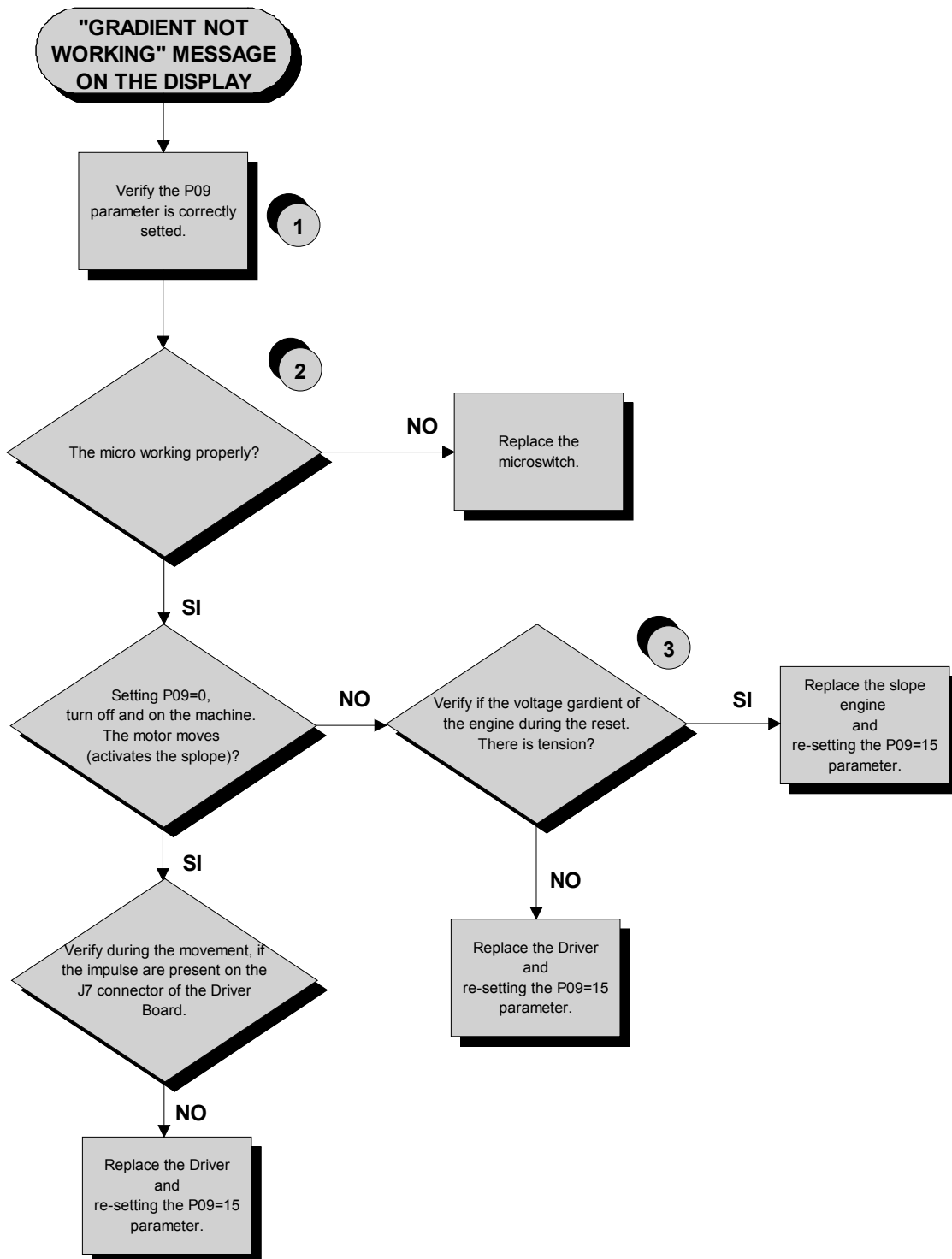
- 1. This error message indicates that the machine is unable to control the elevation motor. The error is produced when the inverter does not receive any pulses from the motor encoder after having enabled it. After this, the machine continues to function with the elevation motor disabled and parameter PAR 07 set to 1.*
- 2. The error message may be caused by a malfunction of the travel limit microswitch. If the microswitch breaks during use, the machine will enable an upward elevation movement, in an attempt to open the microswitch contact. If the microswitch fails to open after a predefined number of pulses, the machine generates an elevation error and halts the movement.*
- 3. The error message may be caused by a misalignment of the "HALL" effect sensor, if it is not correctly aligned with its magnet. In fact, if the encoder of the elevation motor is not correctly positioned, the motor will fail to output any pulses. At this point, the elevation movement will be disabled, 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: 3.15. “Elevation motor drive”.

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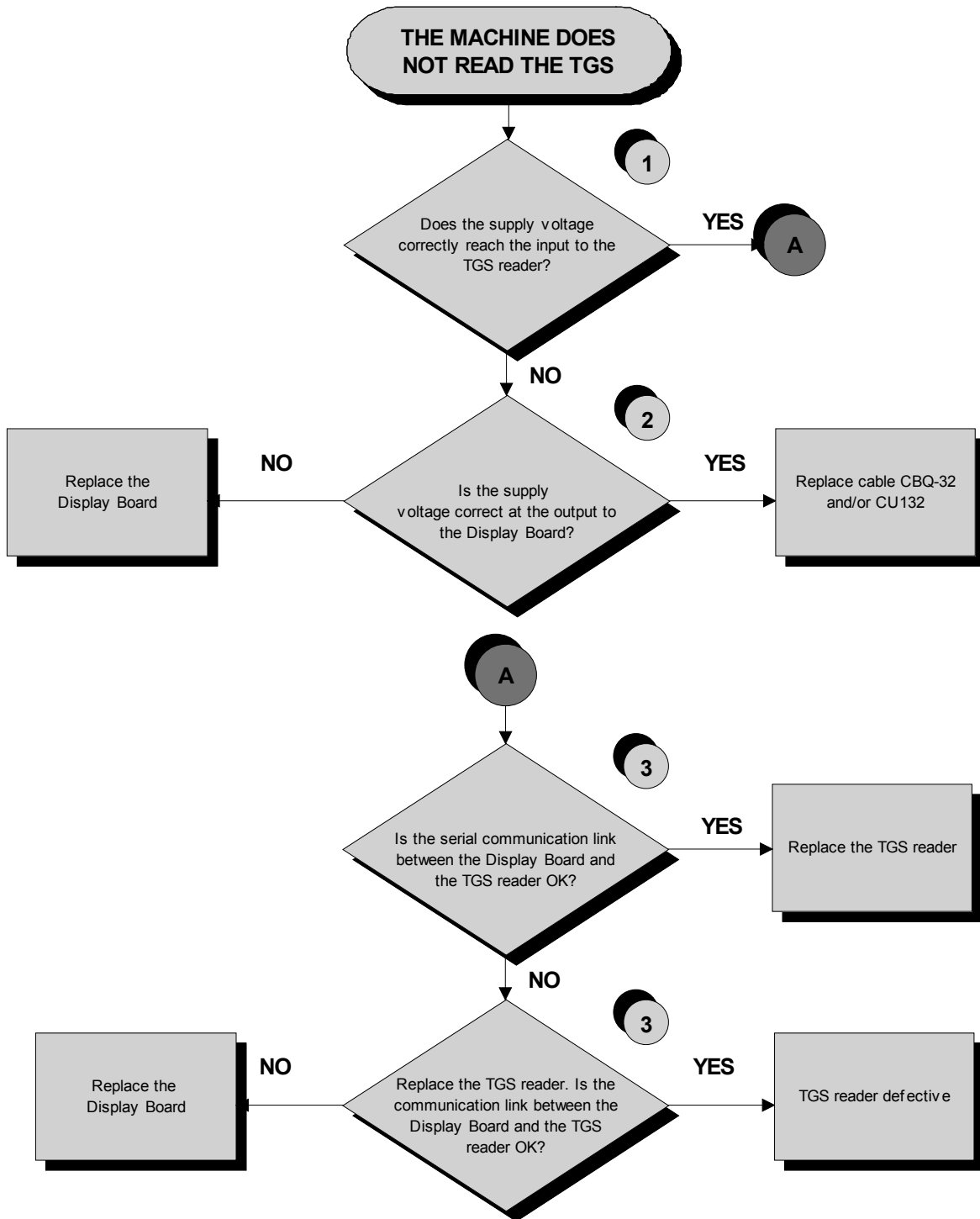


Follow the procedure step by step to correctly diagnose the problem. Take particular care with the checks highlighted by circled numbers, which are described in detail below:

- (1)** Check the parameter setting as detailed in the relevant paragraph of the Service menu, is enable.
- (2)** Open the ALE driver cover plate and press manually the limit switch. When the limit switch is pressed, **DWN-SW** LED has to be ON while has to be OFF if released.
- (3)** Place the tester probes across pins **6** and **4** of connector **J7** on the and Driver Board. The measured value should be approximately 2.5Vdc. If an oscilloscope is available, it is possible to view the pulses produced by the encoder itself.

6.13. THE MACHINE DOES NOT READ THE TGS KEY

The error is due to the fact 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 +12Vdc.
- (2) As for step (1) but across pins **1** and **9** of connector **CN19** of the Display Board.
- (3) Use the serial communications test described at the relevant paragraph of the troubleshooting menu.



If you replace Display Board, check that its SW version is updated, otherwise install the last version.

6.14. THERE IS NO HEART RATE SIGNAL

6.14.1. HAND SENSOR

SALUTRON 8500 (CHEST BELT/HS).



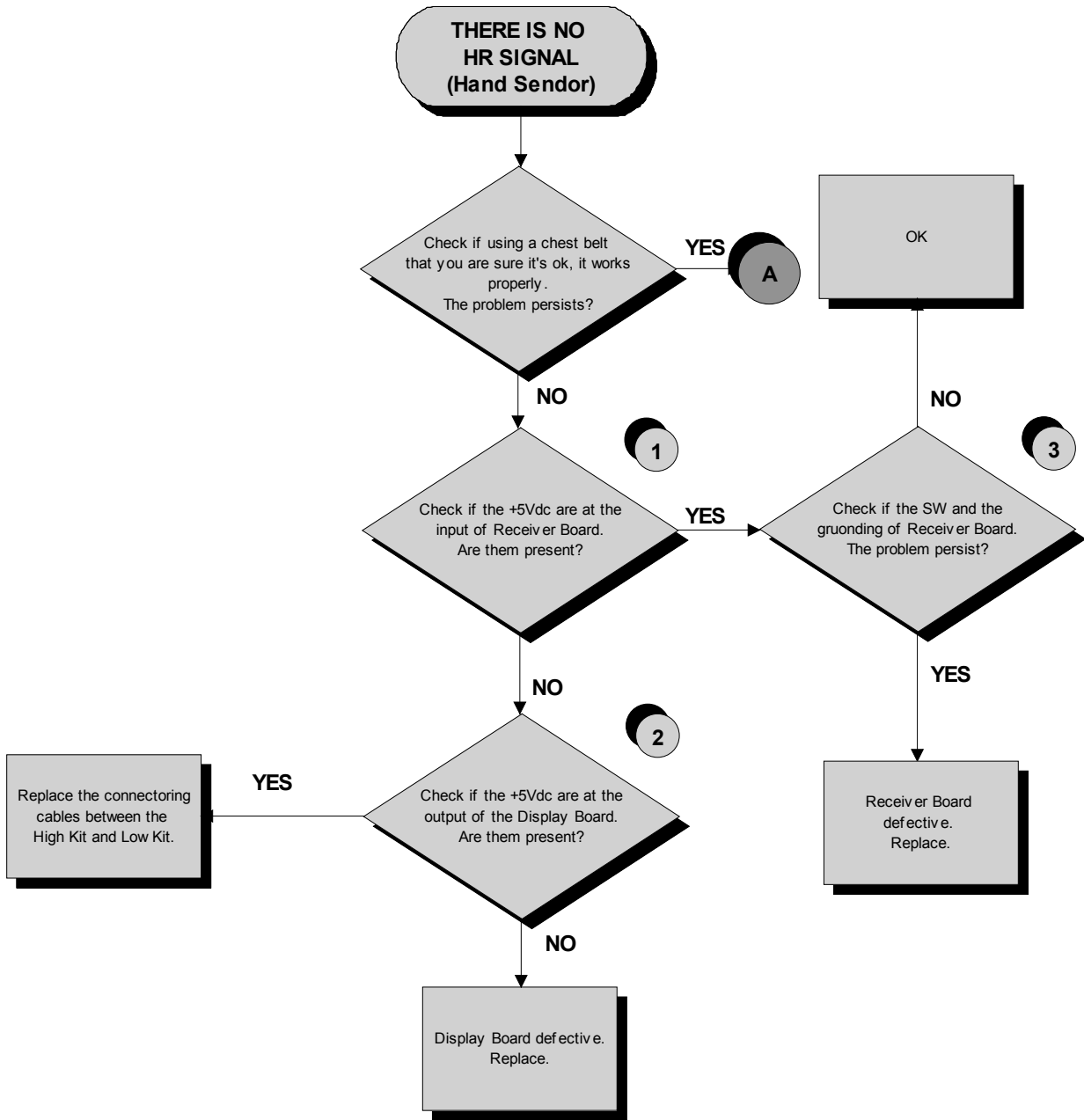
HUMAN BODY “CONTINUITY”: it’s well known that for somebody it’s very difficult, nearly impossible, to measure their HR using the hand sensors. This due to a lot of possible causes which could fake the “quality” of the contact between the human skin and the HS plates, as: hands only just washed or particularly dry, acidity of the skin and/or a particular body fat mass index. For these people it’s suggested to wear the chest belt transmitter.



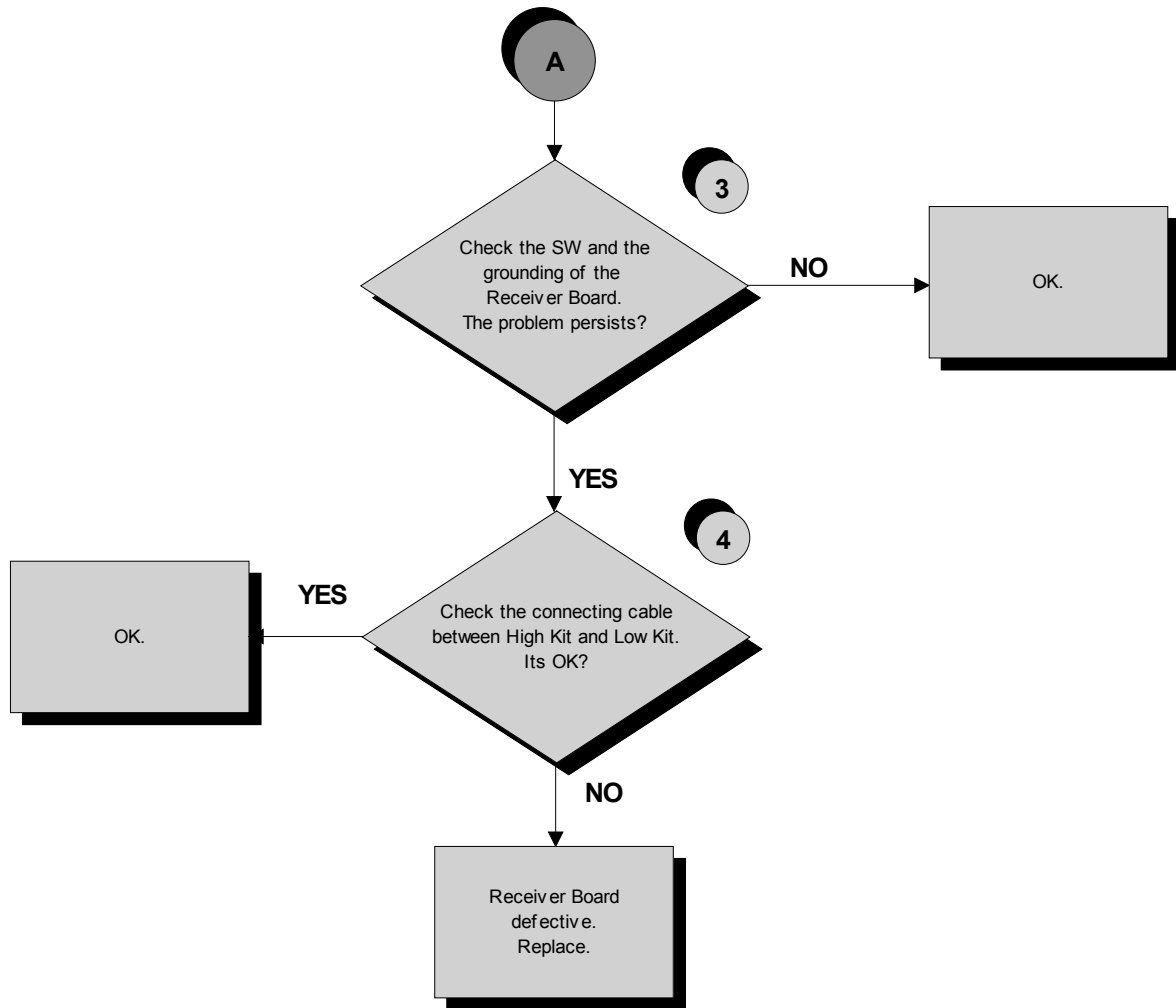
HS CORRECT USE: Grasp both the upper and lower plate avoiding to clench them too hardly. Avoid to wash the hands using soaps that can dry the skin too much.

The machine displays this error if the HR/HS receiver does not work or is not powered by the Display Board:

Continued on following page...



Continued on 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:

- (1) Place the tester probes across pins **1** and **2** of the **HD4** connector of the receiver on **CU319** cable. The measured value should be +5Vdc.
- (2) As at step (1) but on pin **1** and **5** on **CN22** connector of the Display Board.
- (3) Check the correct display SW version, according to the “EXCITE SW SMART TABLE” you can find in **TG Direct**, “NEWS” section.
Check the grounding of the **Receiver Board**, measuring the resistance value between:
 - a. *The ground faston of receiver board and the ground node on the Power supply box of the machine;*
 - b. *The ground node on the Power supply box of the machine and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).

Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N (phase – neutral) = 220Vac / 110 Vac
P – G (phase – ground) = 220Vac / 110 Vac
N – G (neutral – ground) = 0 Vac

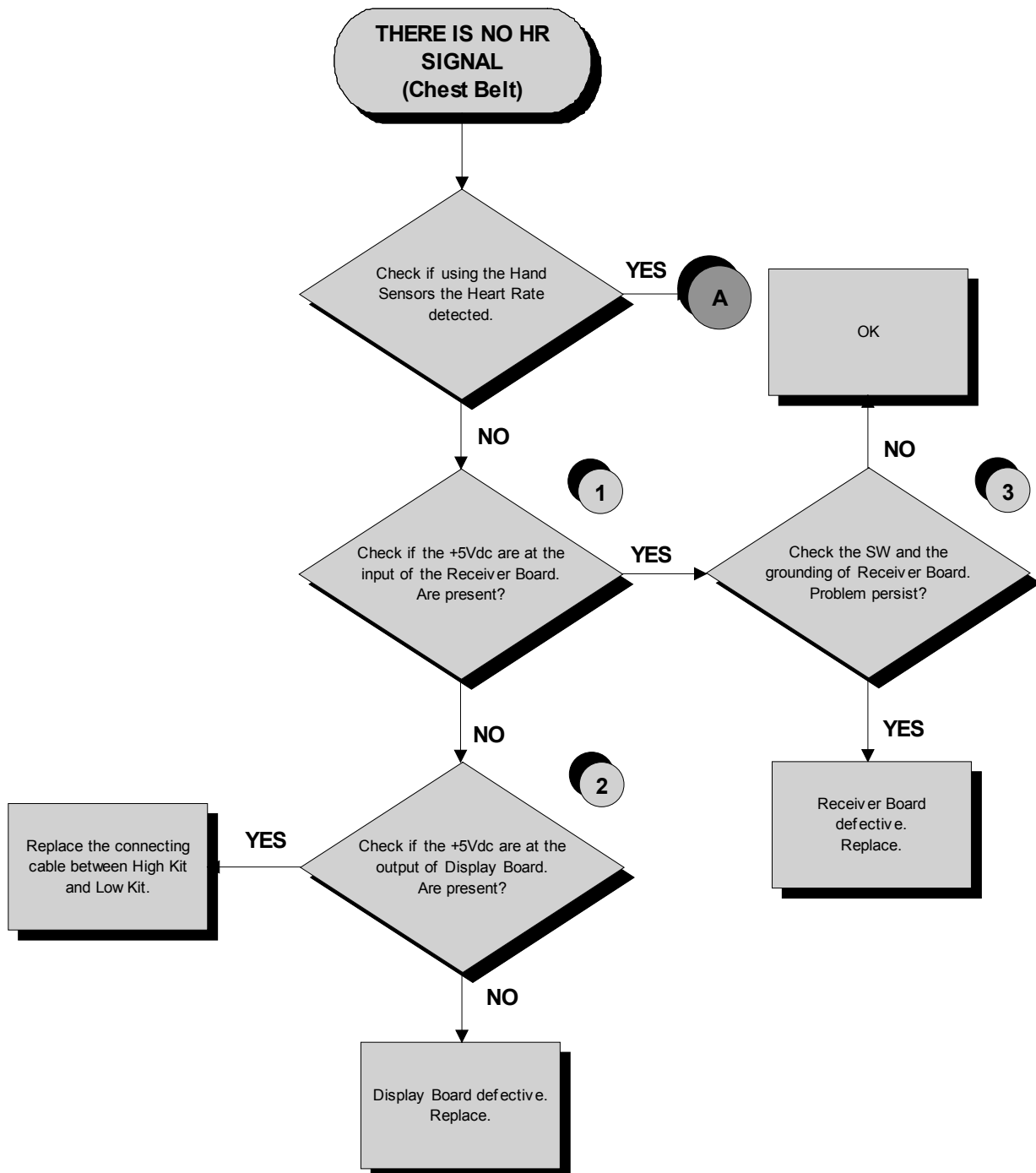
- (4) Check that:
 - a. *The faston of the cable are well connected to the Hand Sensor plates;*
 - b. *The signal continuity of the CU323 cable, which connect the HS plates to the HD3&2 connectors on the receiver, using a tester and referring to the paragraph: 2.10. “Cables”;*
 - c. *There is NO continuity between the Hand Sensor plates and the ground faston on the receiver (otherwise the signal are grounded).*

6.14.2. CHEST BELT

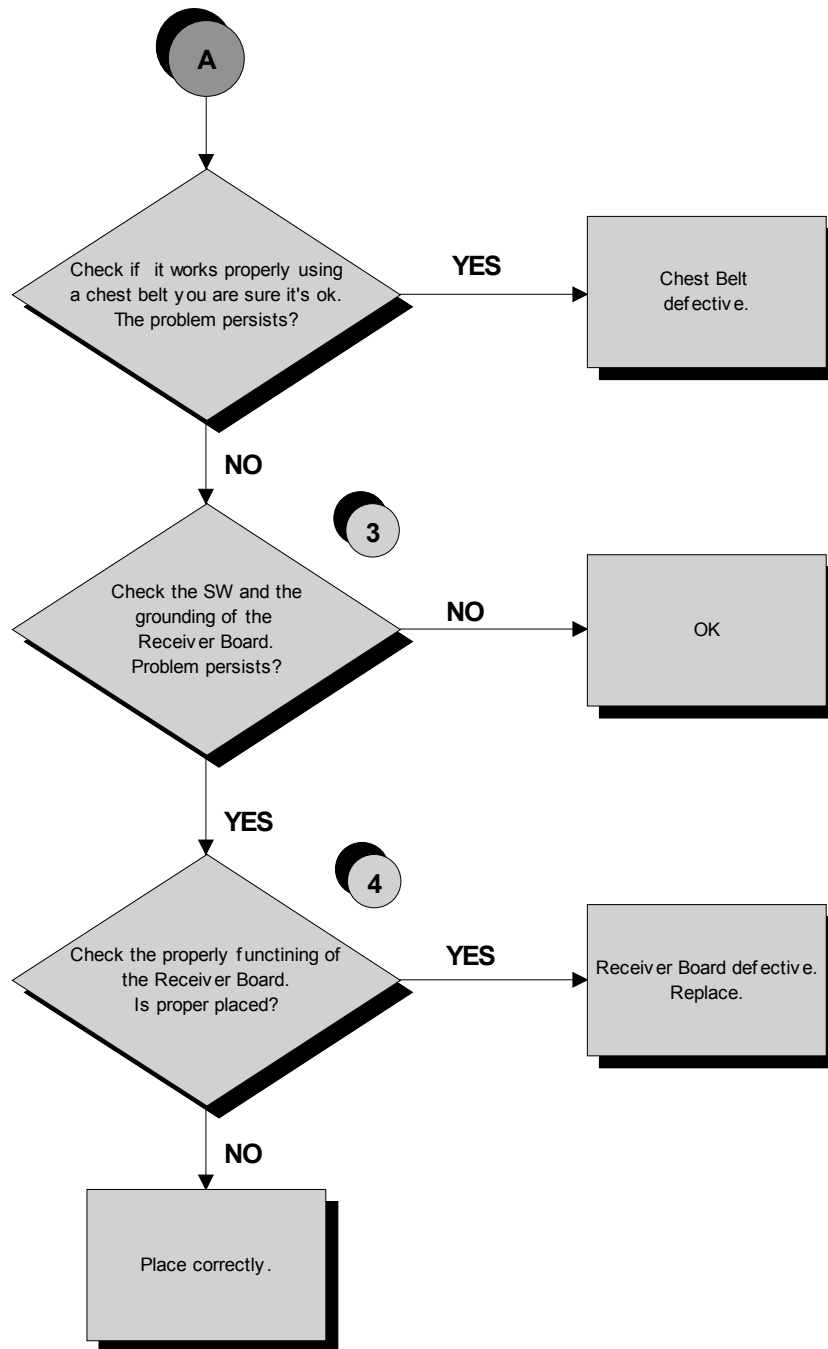
SALUTRON 8500 (Chest Belt /HS).



CORRECT USE OF THE CHEST BELT: Wear the chest belt taking care the area of contact with the body is humid in order to guarantee it proper works.



Continued on 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:

- (1) Place the tester probes across pins **1** and **2** of the **HD4** connector of the receiver on **CU319** cable. The measured value should be +5Vdc.
- (2) As at step (2) but on pin **1** and **5** on **CN22** connector of the Display Board.
- (3) Check the correct display SW version, according to the “EXCITE SW SMART TABLE” you can find in **TG Direct**, “NEWS” section.
Check the grounding of the **Receiver Board**, measuring the resistance value between:
 - a. *The ground faston of receiver board and the ground node on the Power supply box of the machine;*
 - b. *The ground node on the Power supply box of the machine and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).

Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N (phase – neutral) = 220Vac / 110 Vac
P – G (phase – ground) = 220Vac / 110 Vac
N – G (neutral – ground) = 0 Vac

- (4) Check if the receiver has been correctly mounted on the machine, as detail at paragraph: 7.7. “Disassembling the HS/HR receiver”.



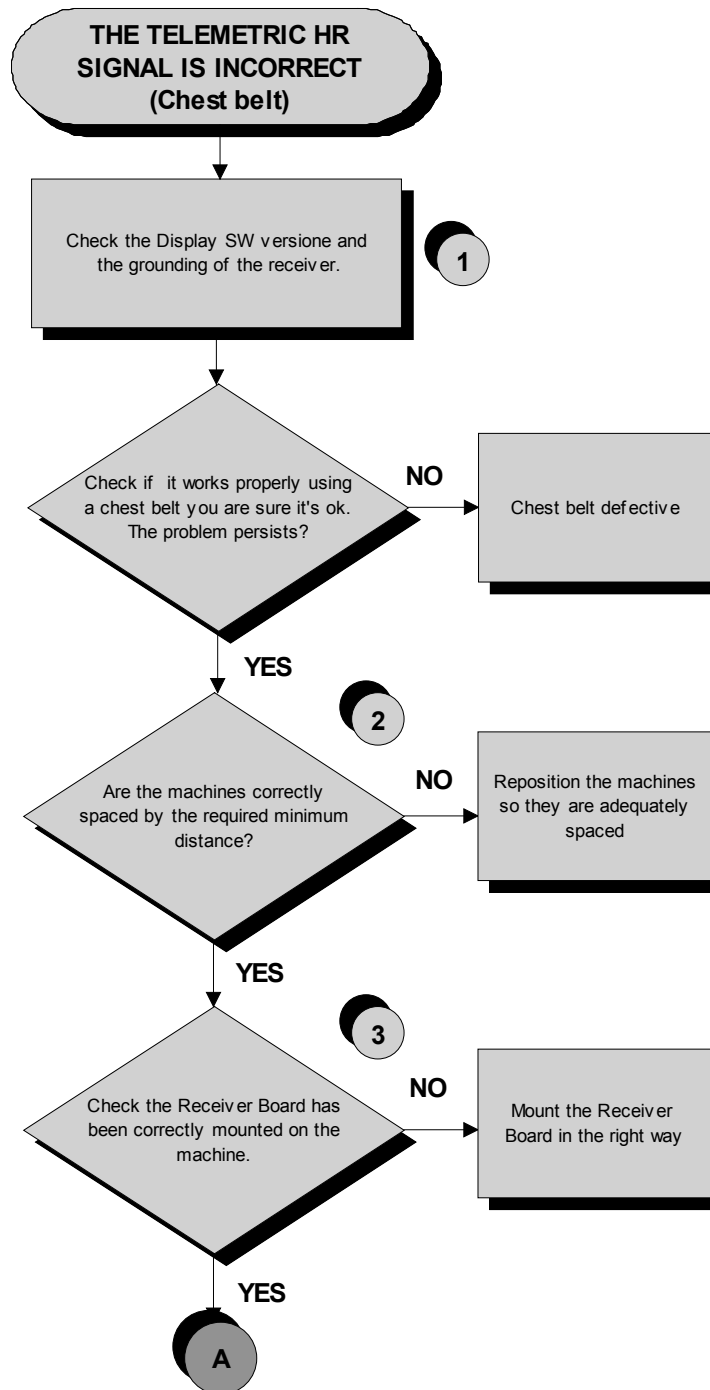
If you replace Display Board, check that its SW version is updated, otherwise install the last version.

6.15. THE TELEMETRIC HEART RATE SIGNAL IS INCORRECT

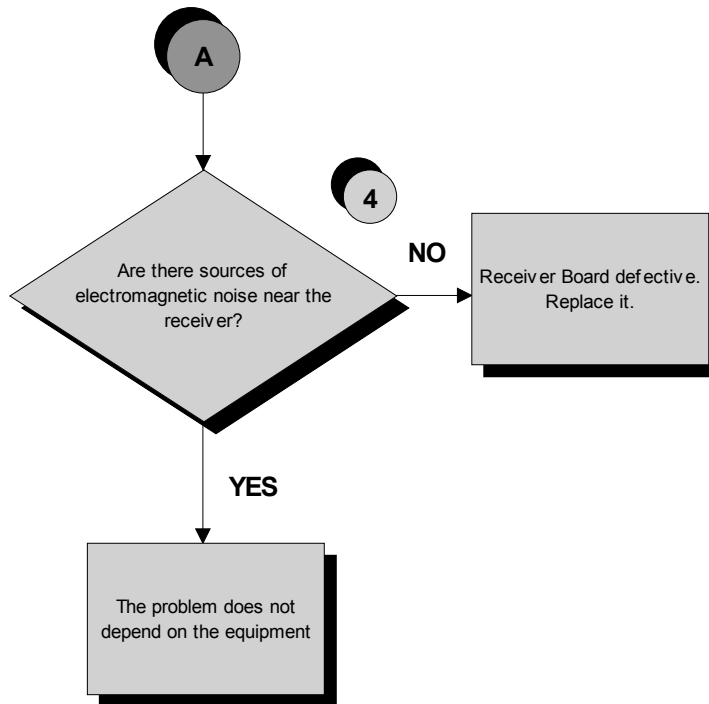
6.15.1. CHEST BELT



CORRECT USE OF THE CHEST BELT: Wear the chest belt taking care the area of contact with the body is humid in order to guarantee it proper works.



Continued on 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:

- (1) Check the correct display SW version, according to the “EXCITE SW SMART TABLE” you can find in **TG Direct** ,“NEWS” section.
 Check the grounding of the **Receiver Board**, measuring the resistance value between:
 - a. The ground faston of receiver board and the ground node on the Power supply box of the machine;
 - b. The ground node on the Power supply box of the machine and the main wall socket.

The measured value should be approximately lower than 1Ω (Ohm).
 Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N (phase – neutral) = 220Vac / 110 Vac
P – G (phase – ground) = 220Vac / 110 Vac
N – G (neutral – ground) = 0 Vac

- (2) Take care of the following diagram to correctly position the machines:

Continued on following page...

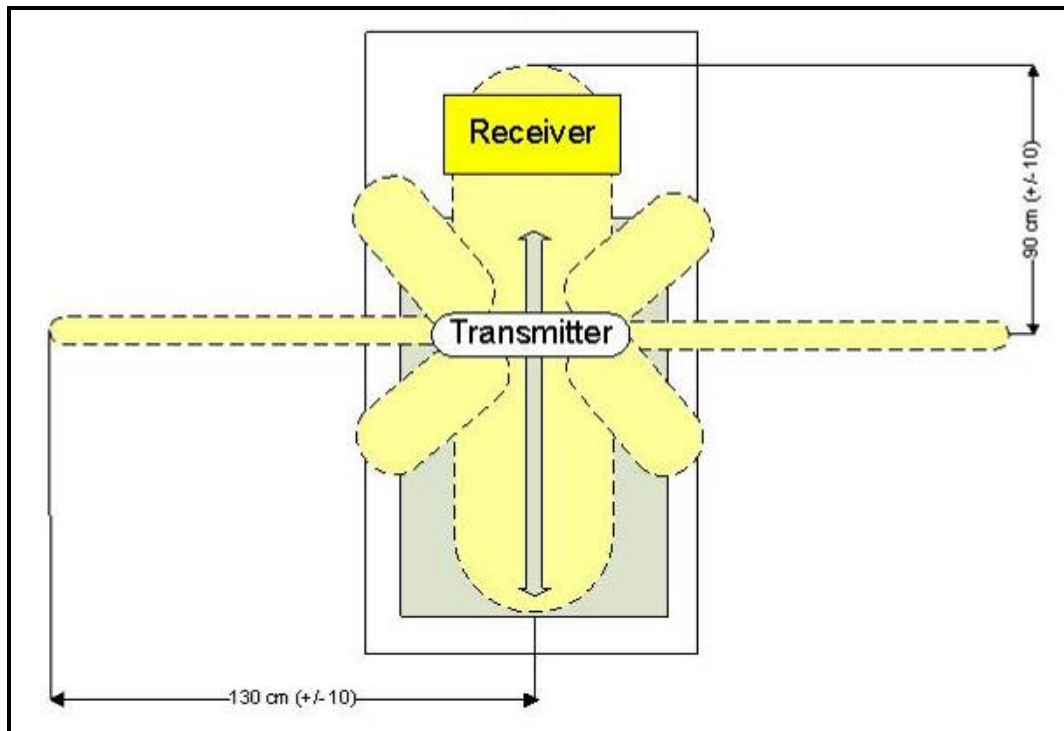


Figure 6-1



The active area of the transmitter is wider on the lateral side (130 cm) instead of the front or the back side (90cm). Take care of the following diagram:

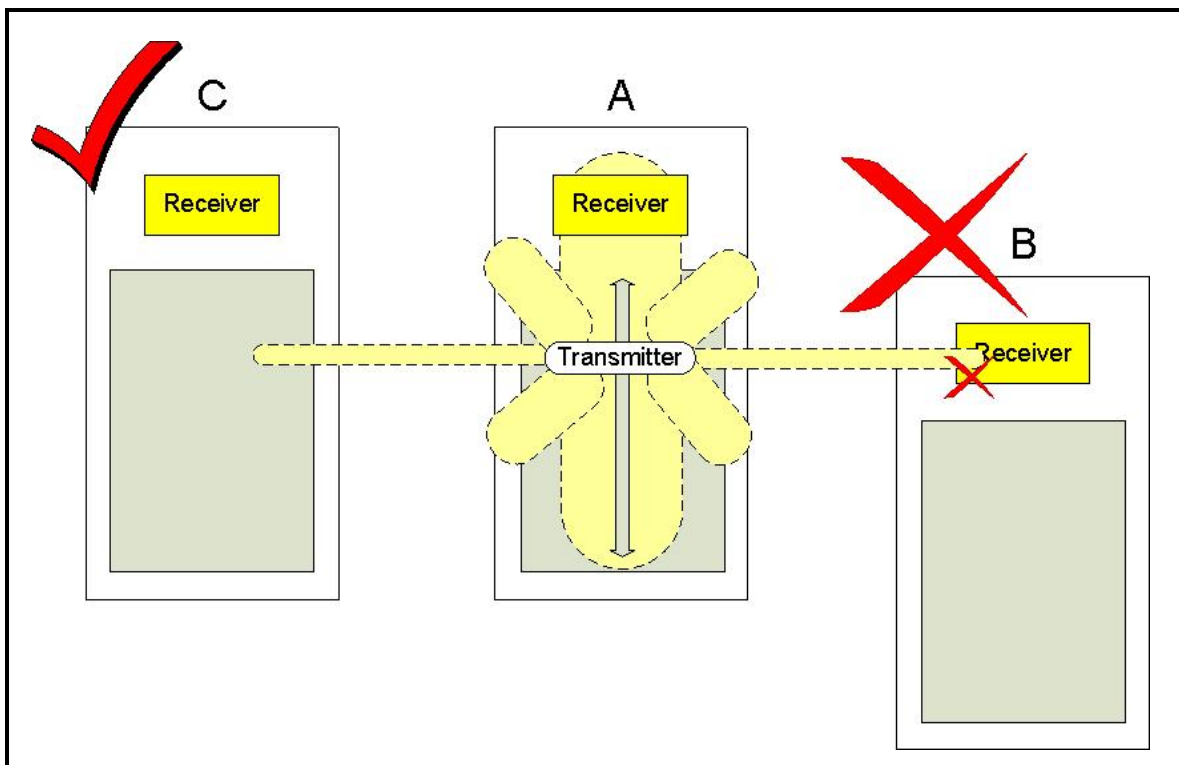
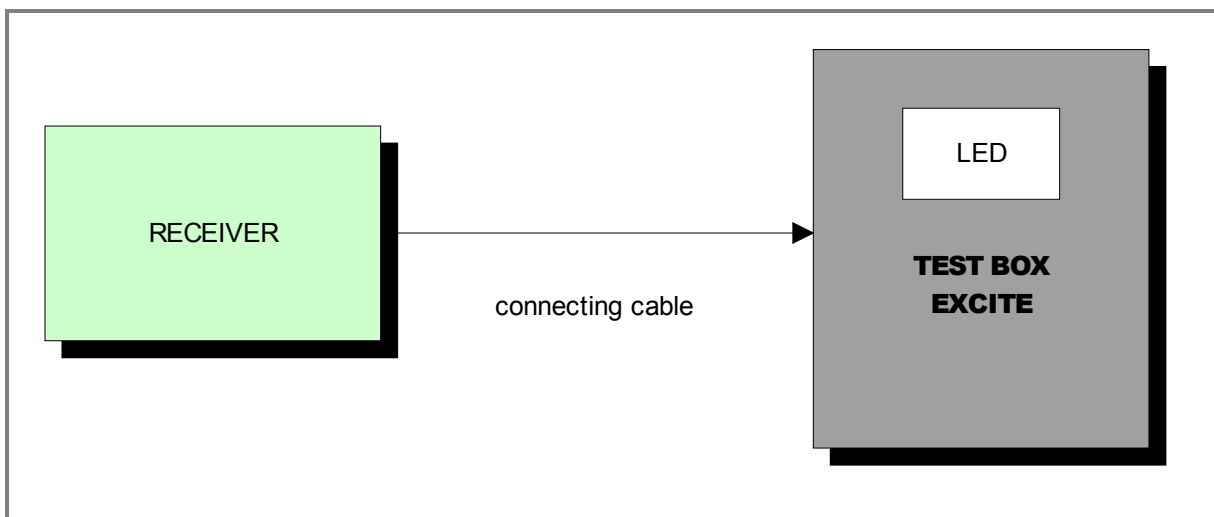


Figure 6-2

- (3) Check if the receiver has been correctly mounted on the machine, as detail at paragraph: 7.7. “Disassembling the HS/HR 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.

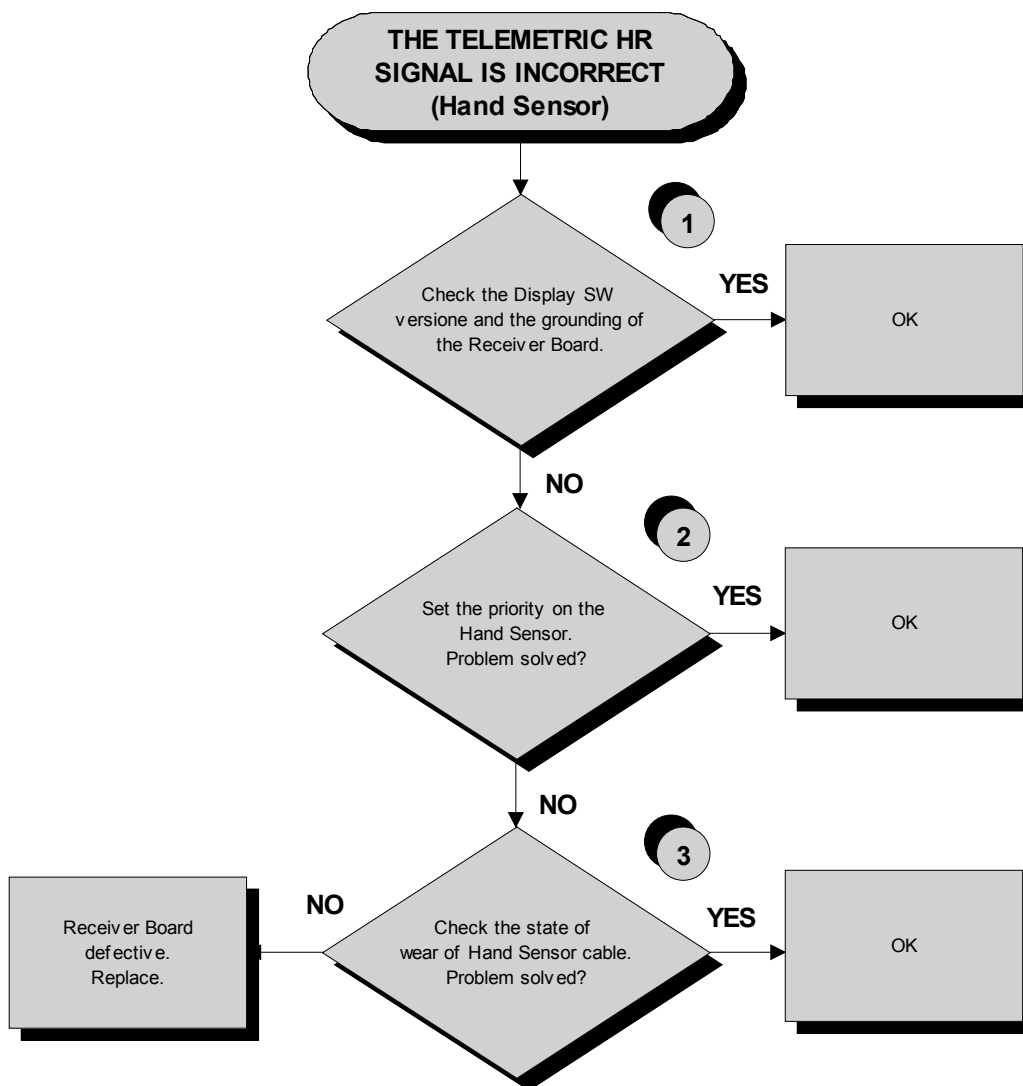
6.15.2. HAND SENSOR



HUMAN BODY “CONTINUITY”: it’s well known that for somebody it’s very difficult, nearly impossible, to measure their HR using the hand sensors. This due to a lot of possible causes which could fake the “quality” of the contact between the human skin and the HS plates, as: hands only just washed or particularly dry, acidity of the skin and/or a particular body fat mass index. For these people it’s suggested to wear the chest belt transmitter.



HS CORRECT USE: Grasp both the upper and lower plate avoiding to clench them too hardly. Avoid to wash the hands using soaps that can dry the skin too much.



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 correct display SW version, according to the “EXCITE SW SMART TABLE” you can find in **TG Direct**, “NEWS” section.
Check the grounding of the **Receiver Board**, measuring the resistance value between:

- a. *The ground faston of receiver board and the ground node on the Power supply box of the machine;*
- b. *The ground node on the Power supply box of the machine and the main wall socket.*

The measured value should be approximately lower than 1Ω (Ohm).

Check finally the grounding of the main wall socket, measuring that the following voltages are present:

P – N (phase – neutral) = 220Vac / 110 Vac
P – G (phase – ground) = 220Vac / 110 Vac
N – G (neutral – ground) = 0 Vac

- (2) Set the HR priority on the receiver board on “Hand Sensor”, by positioning the jumper (**JP1**) on the receiver itself:

- **JP1 CLOSED** = Chest strap priority
- **JP1 OPENED** = Hand Sensor priority



The standard configuration of the receiver is with chest strap priority.

- (3) Check that:

- a. *The faston of the cable are well connected to the Hand Sensor plates;*
- b. *The signal continuity of the CU323 cable which connect the Hand Sensor plates to the HD3&2 connectors on the receiver, referring to the paragraph: 2.10. “Cables”;*
- c. *There is NO continuity between the HS plates and the ground faston on the receiver (otherwise the signal are grounded).*

7. PART DISASSEMBLY

7.1. DISASSEMBLING THE TOUCH SCREEN

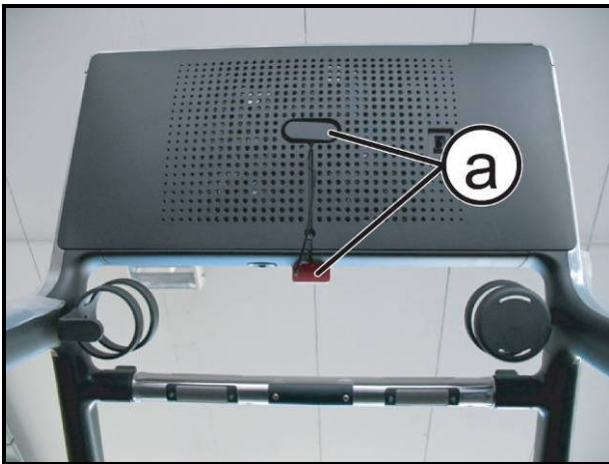


Figure 7.1-1

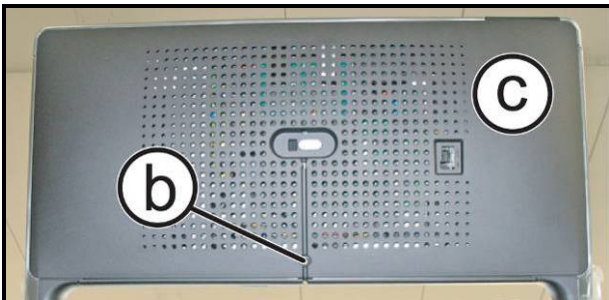


Figure 7.1-2



Figure 7.1-3

For the operations that follow: turn off the machine and unplug the mains lead from the wall outlet.

1. Remove the emergency stop magnet **(a)** and its clip from their seats.
2. Back off the screw **(b)** using a 4mm hex wrench.
3. Remove the rear guard **(c)**.
4. Exerting a slight pressure, pull the guard as indicated by the arrows in the figure, and remove it.

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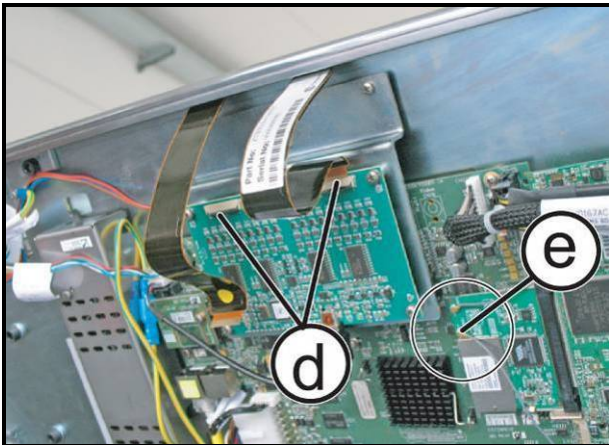


Figure 7.1-4

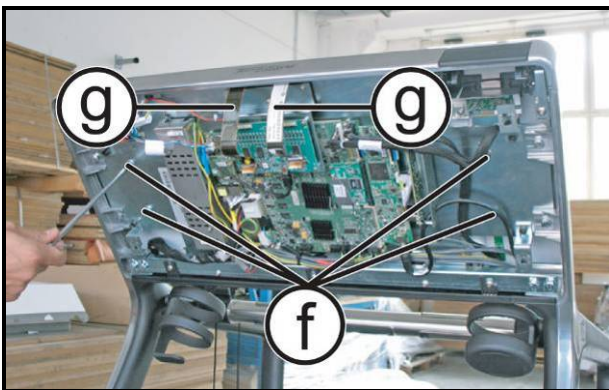


Figure 7.1-5

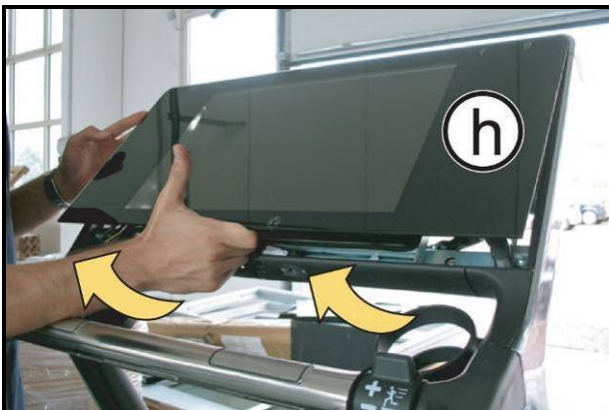


Figure 7.1-6

5. Unplug the 2 flat cables (**d**) by slightly lifting up the connector tab.

6. Unplug the wireless antenna connector (**e**) indicated in the figure.

7. Back off the 4 screws (**f**) securing the Touch Screen with a 5mm wrench.

8. Pull out the 2 flat cables (**g**) through the corresponding slots in the Display plate support.

9. Remove the Touch Screen (**h**) by carefully lifting it up as indicated by the arrows in the figure.

To reassemble the Touch Screen, follow the above steps in reverse order.

7.2. DISASSEMBLING THE LCD



Figure 7.2-1

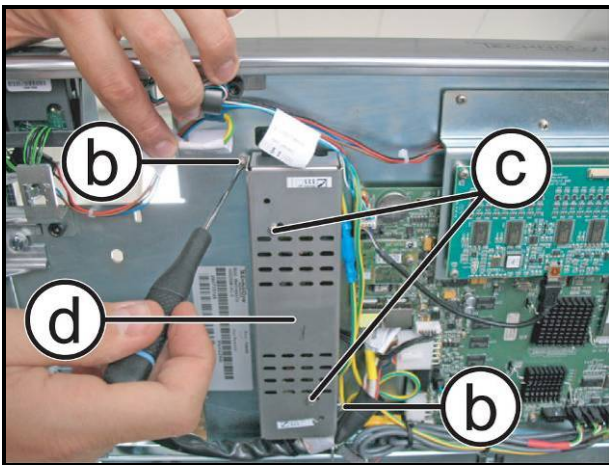


Figure 7.2-2

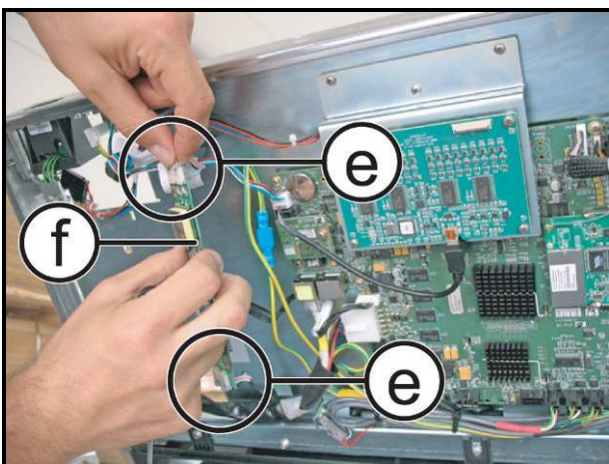


Figure 7.2-3

Carry out the procedure described in paragraph: 7.1. "Disassembling the touch screen".

1. Back off the 4 screws **(a)** using a small Phillips screwdriver.
2. Back off the 2 screws **(b)** using a small Phillips screwdriver.
3. Back off the 2 screws **(c)** using a small Phillips screwdriver.
4. Remove the LCD guard **(d)**.
5. Unplug the connectors **(e)** indicated in the figure and remove the inverter **(f)**.

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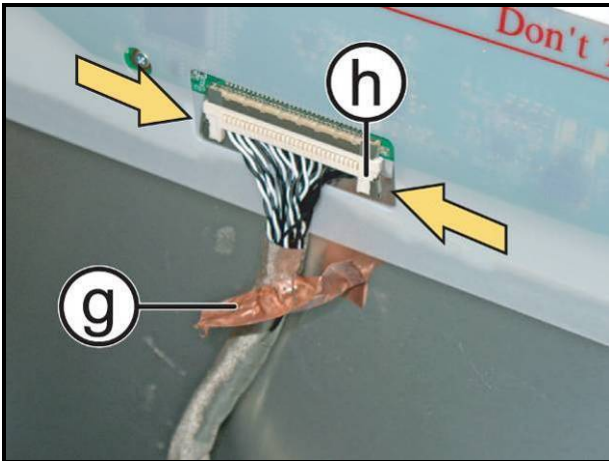


Figure 7.2-4

On the back of the LCD:

6. Remove the sticker **(g)** which holds the signal cable in place.
7. Press the outer tabs of connector **(h)** and simultaneously pull it downward to remove.
8. Remove the LCD.

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

7.3. UPPER GUARD DISASSEMBLY: TGS, USB AND IPOD

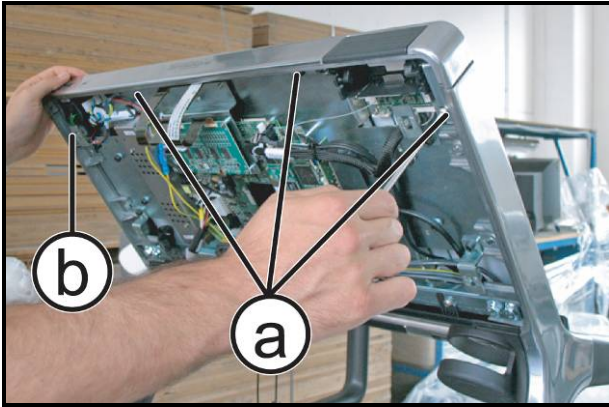


Figure 7.3-1

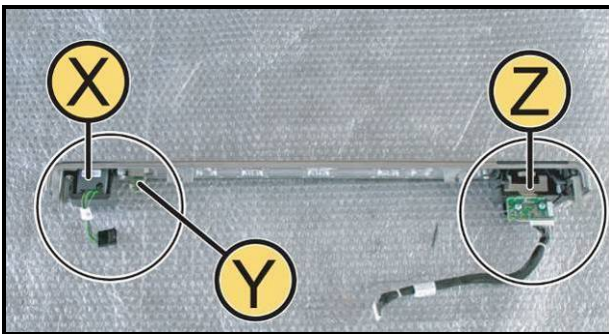


Figure 7.3-2

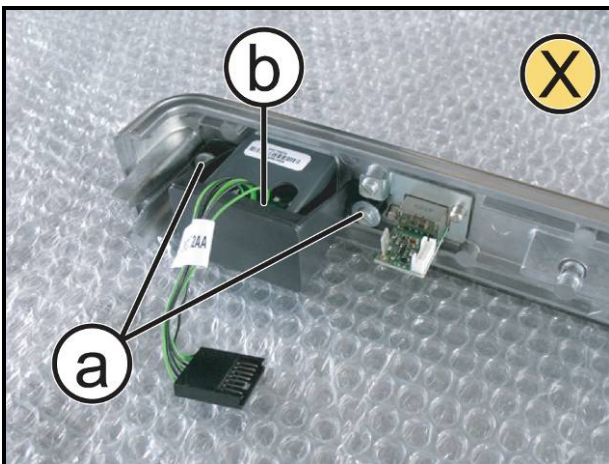


Figure 7.3-3

Remove the rear Display guard, following the instructions up to step (4) of paragraph: 7.1. "Disassembling the touch screen".

1. Disconnect the TGS, USB and iPod cables from the CPU board.
2. Back off the 3 screws **(a)** using a 4mm hex wrench.
3. Back off the screw **(b)** using a 10mm wrench.
4. Remove the upper guard.

Place the upper guard on a bench; it is now possible to remove the following components:

- Dual TGS reader **(X)**
- USB port **(Y)**
- iPod docking Station **(Z)**

Disassembling the TGS reader **(X)**:

1. Back off the 2 screws **(a)** using a flat blade screwdriver.
2. Remove the TGS reader **(b)**.

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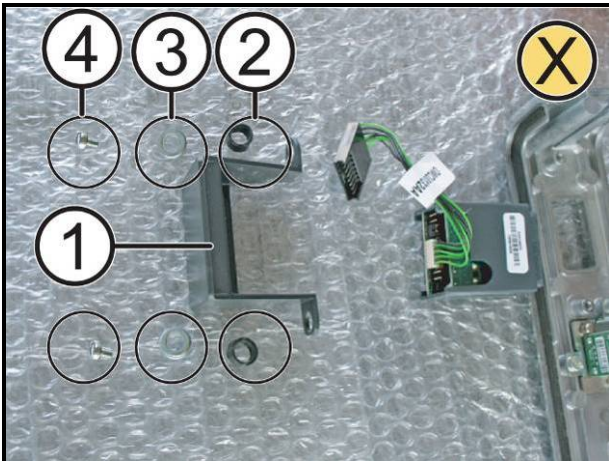


Figure 7.3-4



During reassembly, follow the sequence indicated in the figure at left.

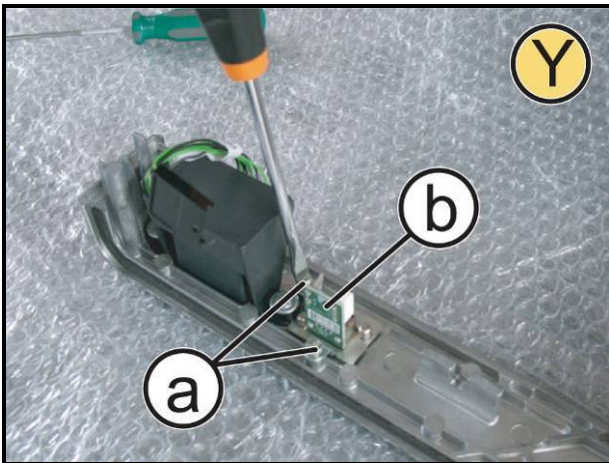


Figure 7.3-5

Removing the USB port (Y):

1. Back off the 2 screws (a) using a flat blade screwdriver.
2. Remove the USB port (b).

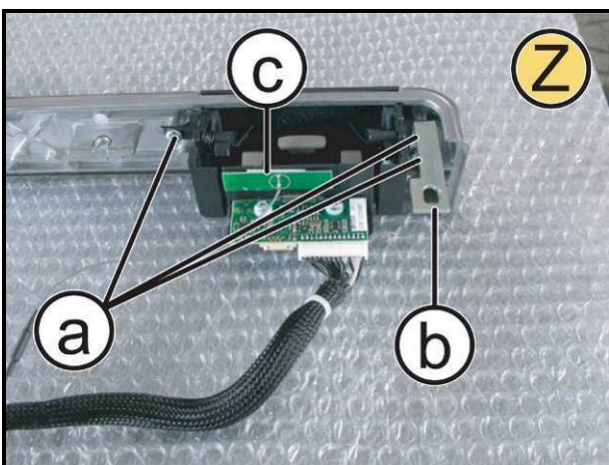


Figure 7.3-6

Removing the iPod docking station (Z):

1. Back off the 3 screws (a) using a medium Phillips screwdriver.
2. Remove the fixing plate (b).
3. Remove the iPod assembly (c).

To reassemble the TGS reader, USB port and iPod docking station, carry out the above steps in reverse order.

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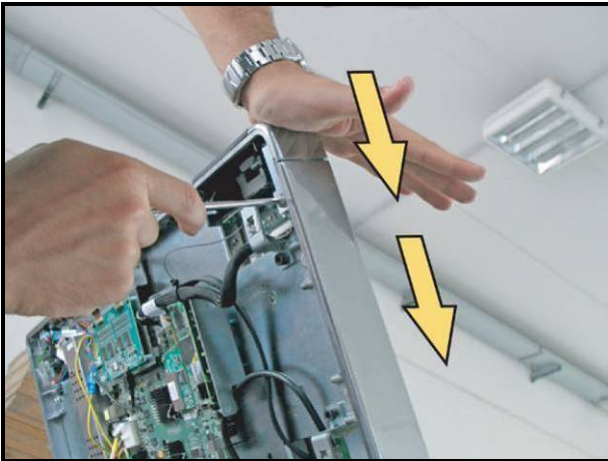


Figure 7.3-7



When reassembling the upper guard, push it in as shown in the figure to eliminate any play between the two guards on either side.

7.4. DISASSEMBLING THE DISPLAY

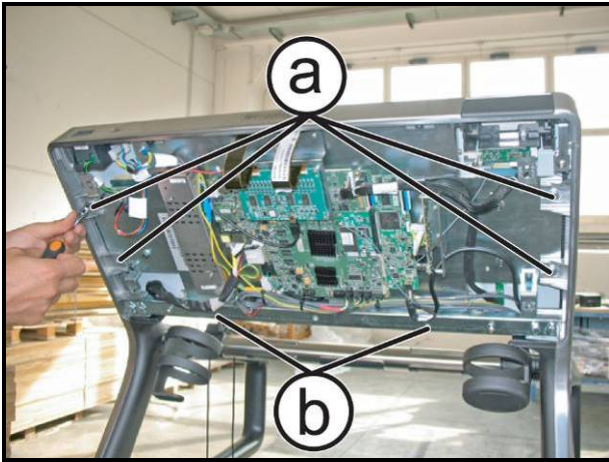


Figure 7.4-1

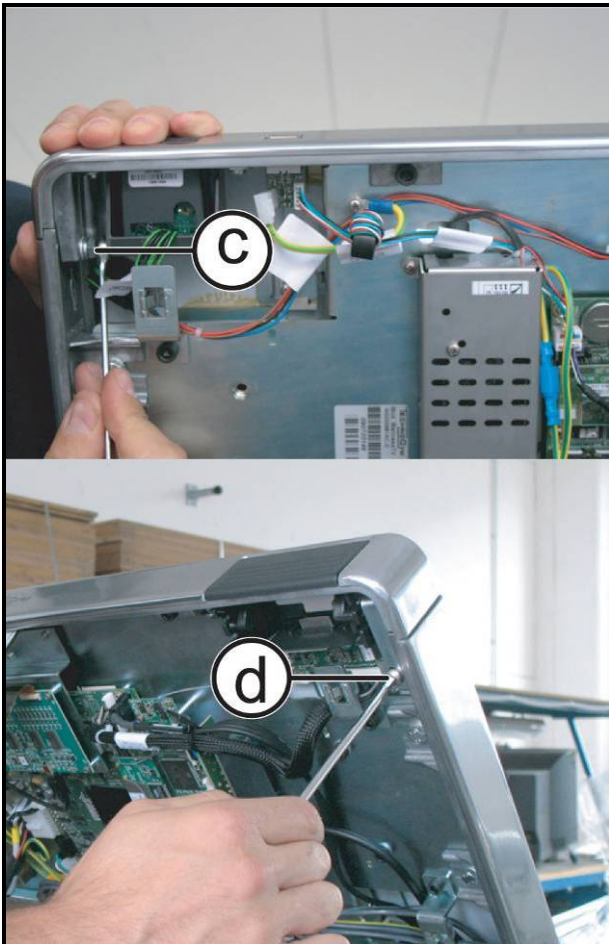


Figure 7.4-2

Carry out the operations up to step (4) of paragraph: 7.1. "Disassembling the touch screen".

1. Back off the 4 screws (a) using a 10mm wrench.

2. Unloose the screw (c) using a 10mm wrench.

3. Back off the screw (d) using a 4mm hex wrench.

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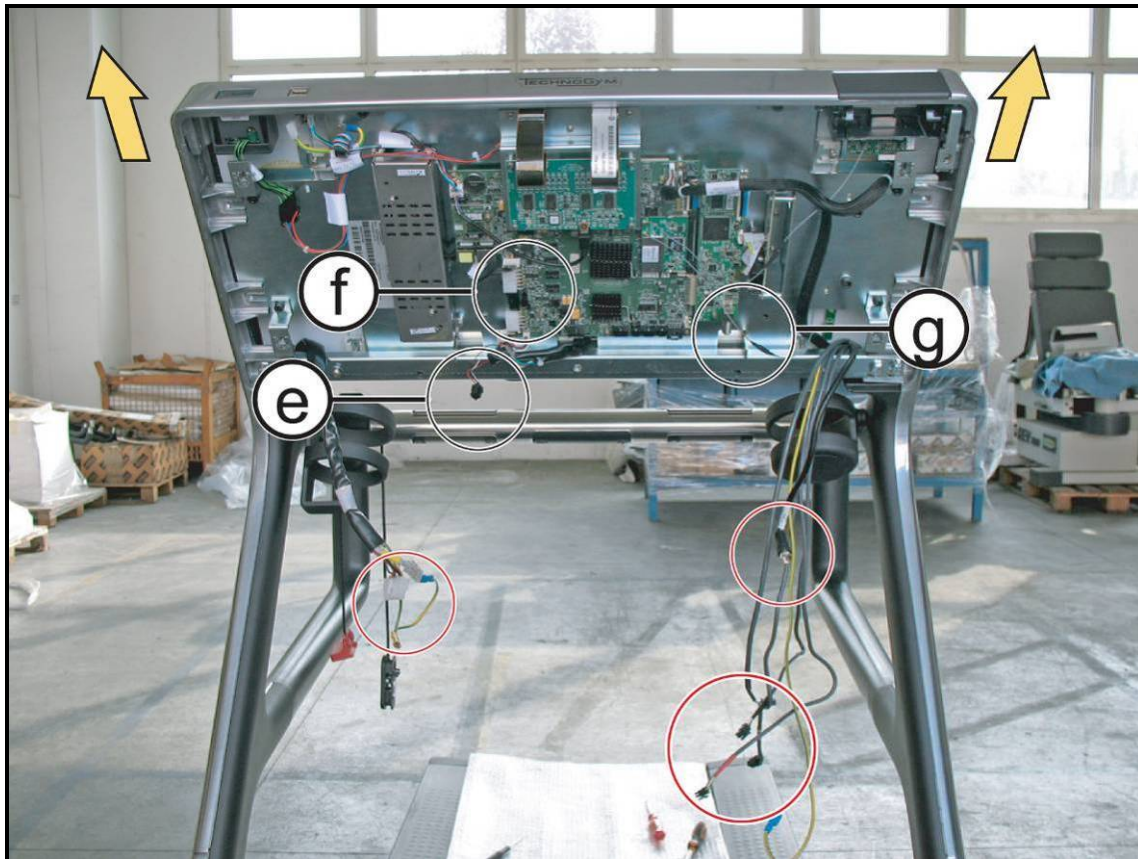


Figure 7.4-3

4. Remove the cable ties.
5. Unplug the following connectors: emergency stop (e), power supply (f) and TUNER Board antenna (g), indicated in the figure.
6. Carefully remove the Display in the direction of the arrows and place it on a work bench.

*To reassemble the Display
carry out the above steps in reverse order, observing the following cautions.*

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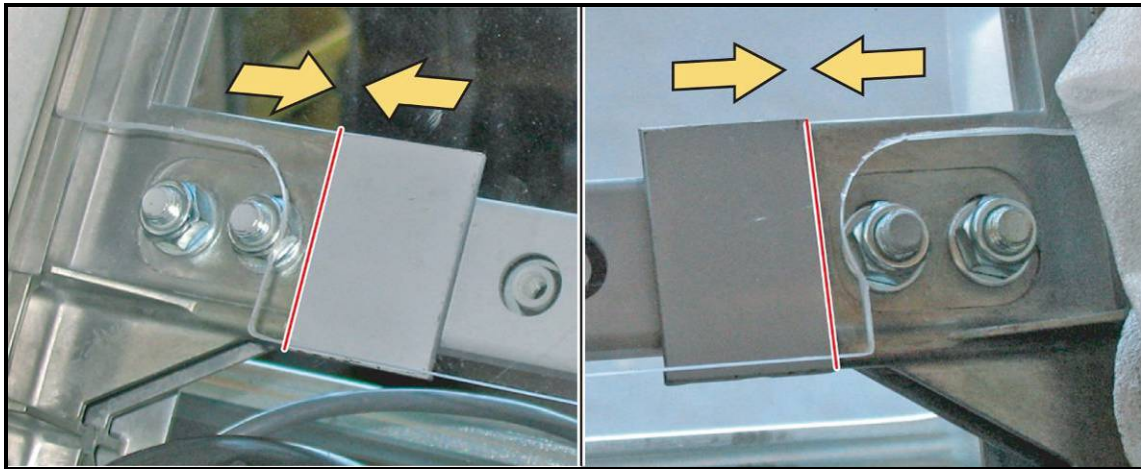


Figure 7.4-4

7. Adjust the position of the Display by pushing the uprights up against the alignment plates of the center crossbar, as indicated in the figure.

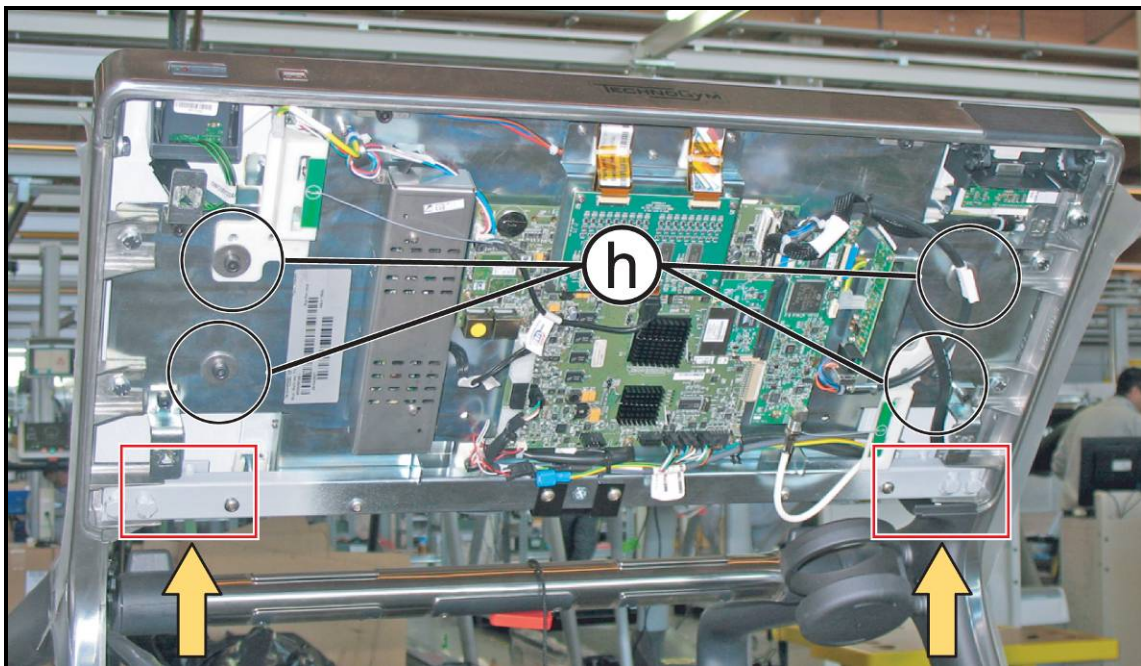


Figure 7.4-5

8. Adjust the position of the Display, backing off the 4 screws (**h**) using a 6mm hex wrench.



After reassembling the Display, check its position; ensure there are no excess gaps between the guard, the frame and the Touch Screen.

7.5. DISASSEMBLING THE DISPLAY BOARDS AND COMPONENTS

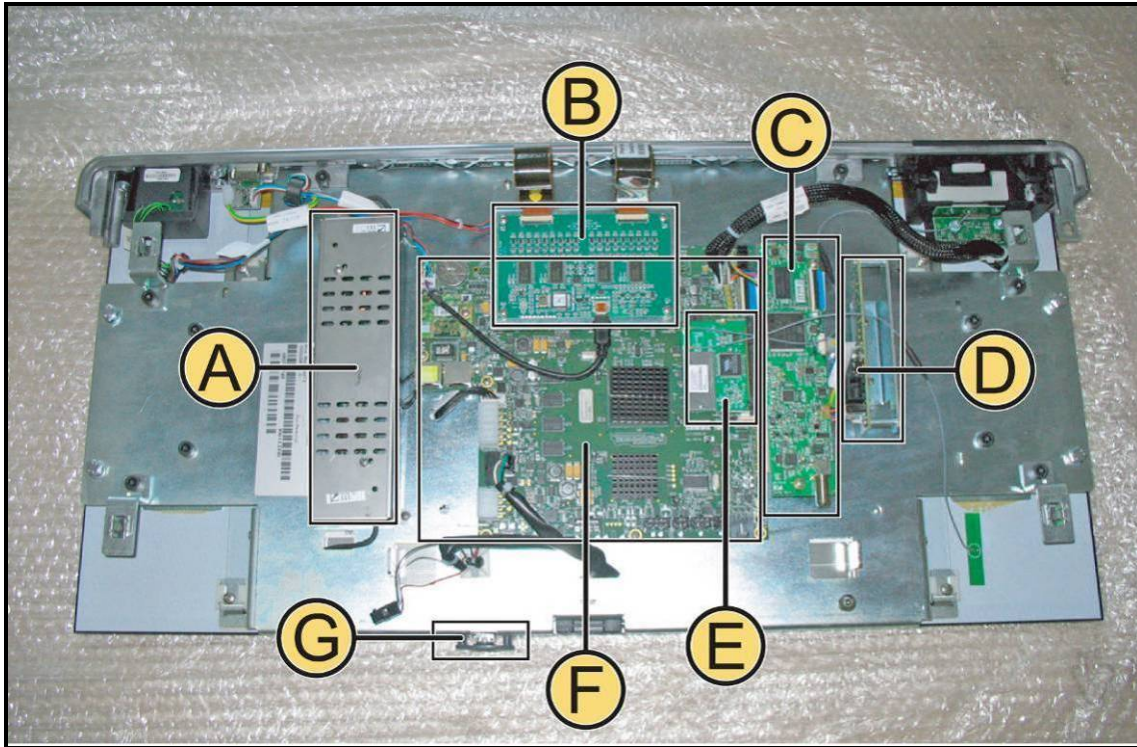


Figure 7.5-1

Carry out the procedure described in paragraph: 7.4. “Disassembling the display”.

Place the display on a work bench.

It is now possible to remove the following components:

- LCD inverter (A)
- Touch screen control board (B)
- TUNER board (C)
- C-Safe and USB connector board (D)
- Wireless Board (E)
- CPU Board (F)
- Headphone jack (G)

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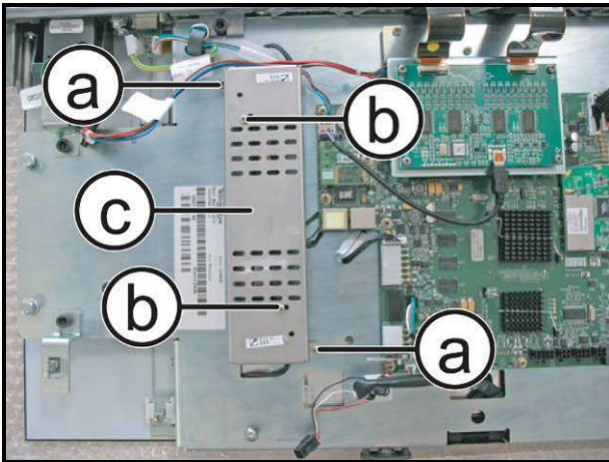


Figure 7.5-2

LCD inverter (A):

1. Back off the 2 screws (a) securing the inverter guard to the Display and the 2 screws (b) securing the Inverter board to the guard, using a small Phillips screwdriver.
2. Remove the inverter cover (c).

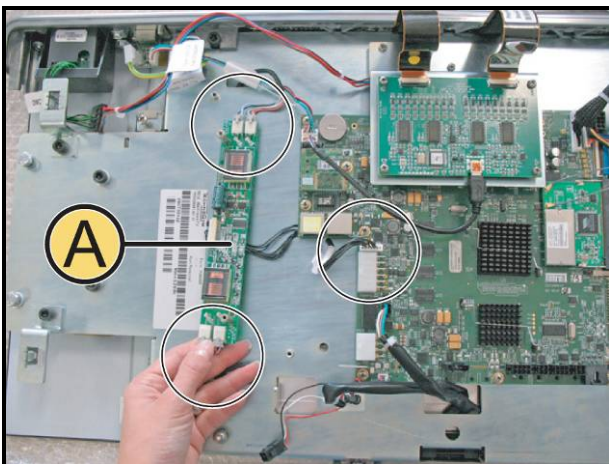


Figure 7.5-3

3. Unplug the 5 connectors indicated in the figure, and remove the Inverter Board (A).

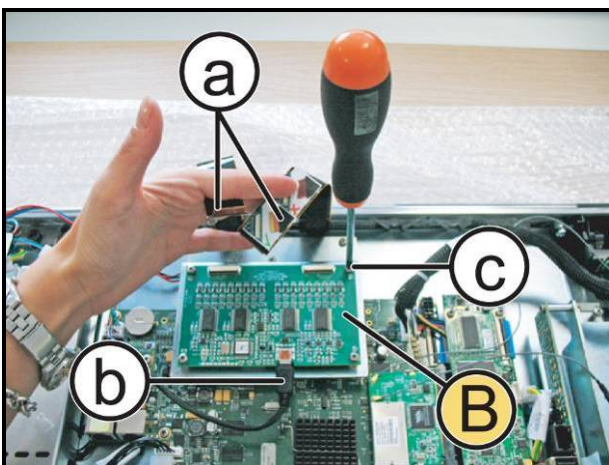


Figure 7.5-4

Touch screen control board (B):

1. Unplug the 2 flat cables (a) and the connector (b).
2. Back off the 4 screws (c) using a small Phillips screwdriver.
3. Remove the Touch Screen control board (B).

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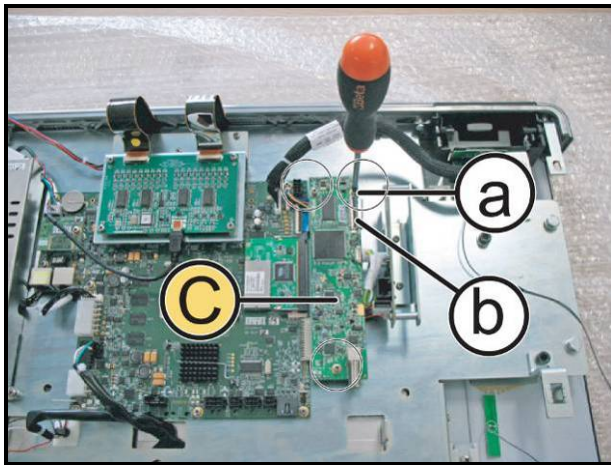


Figure 7.5-5

TUNER board (C):

1. Unplug the flat cable (a).
2. Back off the 3 screws (b) using a small Phillips screwdriver.
3. Remove the TUNER Board (C).

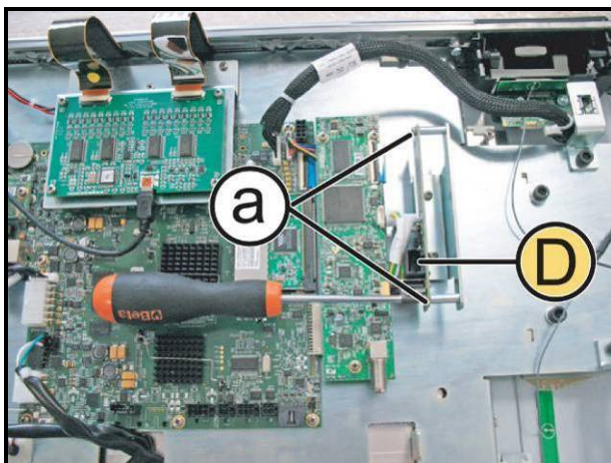


Figure 7.5-6

USB and C-Safe connector board (D):

1. Back off the 3 screws (a) using a small Phillips screwdriver.
2. Remove the USB and C-Safe board (D).



Figure 7.5-7

Wireless Board (E):

1. Unplug the 2 wireless antenna connectors indicated in the figure.



CAUTION: Be careful not to break the antenna cables.

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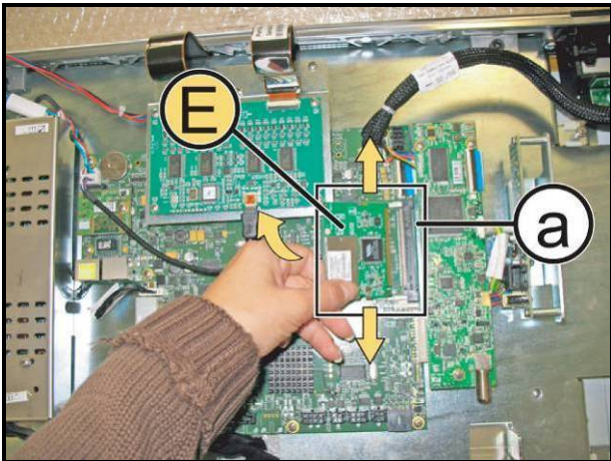


Figure 7.5-8

2. Push the 2 side tabs simultaneously outward, in the direction of the arrows.
3. The Wireless Board (E) will automatically lift up.
4. Remove it from its connector (a), as shown in the figure.

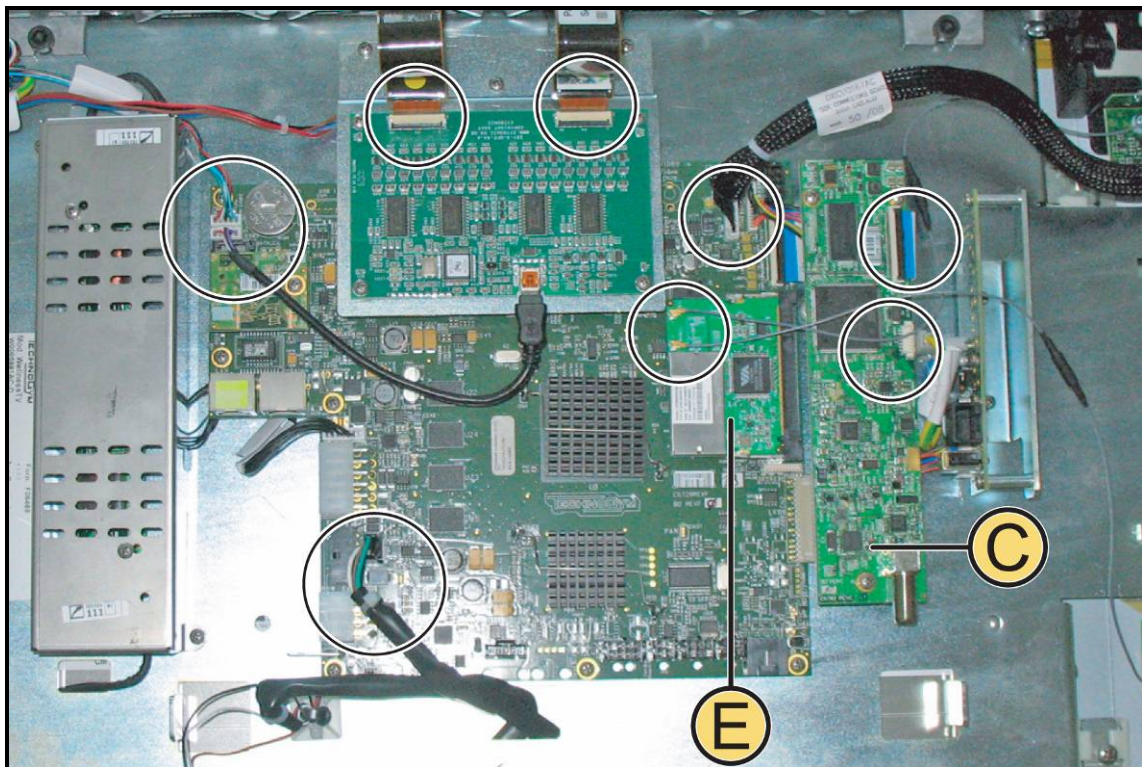


Figure 7.5-9

CPU Board (F):

1. Unplug all the connectors from the CPU board indicated in the figure.
2. Remove the TUNER board (C) as illustrated in Figure 7.5-5 onward.
3. Remove the Wireless Board (E) as indicated in Figure 7.5-7 onward.

Continued on following page...

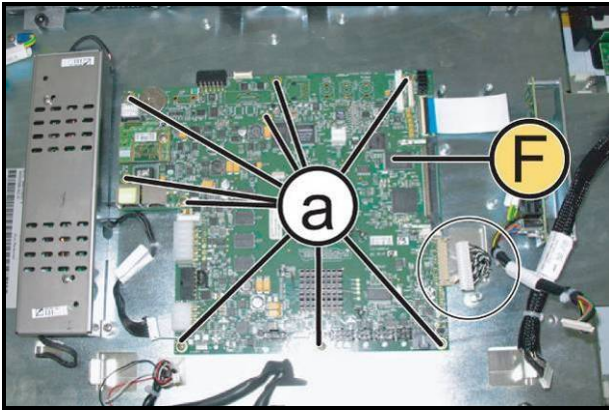


Figure 7.5-10

4. Back off the 9 screws (a) using a small Phillips screwdriver.
5. Remove the CPU Board (F).

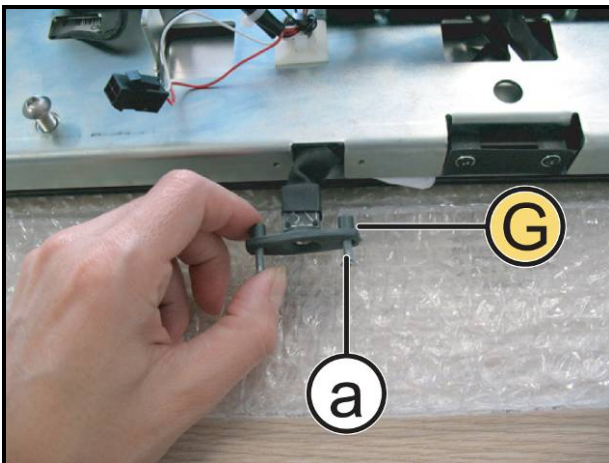


Figure 7.5-11

Headphone Jack (G):

1. Back off the 2 screws (a) using a small Phillips screwdriver.
2. Disconnect the cable from the CPU board.
3. Remove the Headphone Jack (G).

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

7.6. DISASSEMBLING THE EMERGENCY STOP

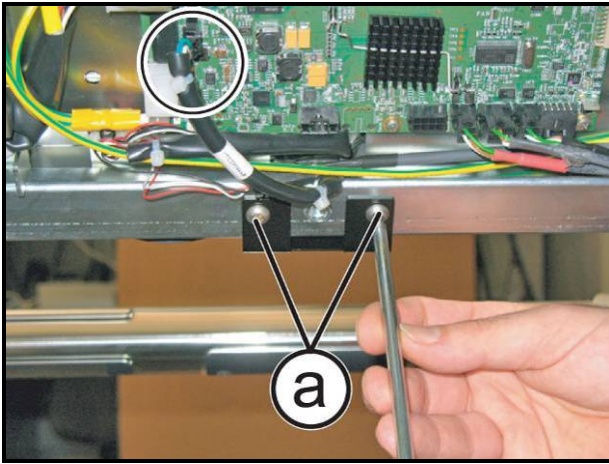


Figure 7.6-1

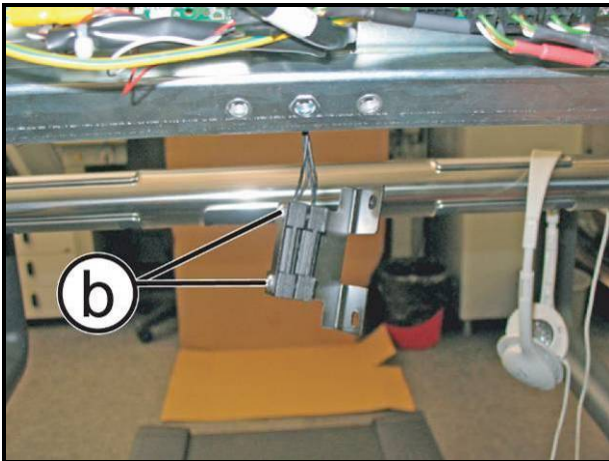


Figure 7.6-2

Carry out the procedure described in paragraph: 7.1. “Disassembling the touch screen”, up to step (4) of the Figure 7.1-3.

1. Disconnect the emergency cable indicated in the figure.
2. Back off the 2 screws **(a)** using a 4mm hex wrench.
3. Back off the 2 screws **(b)** using a small Phillips screwdriver.
4. Remove the two magnetic sensors.

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

7.7. DISASSEMBLING THE HS/HR RECEIVER

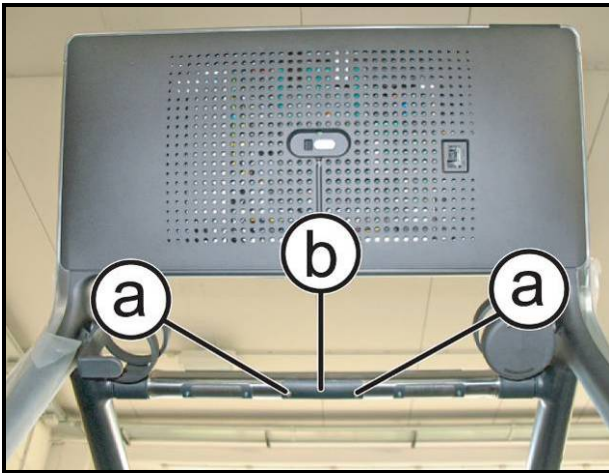


Figure 7.7-1

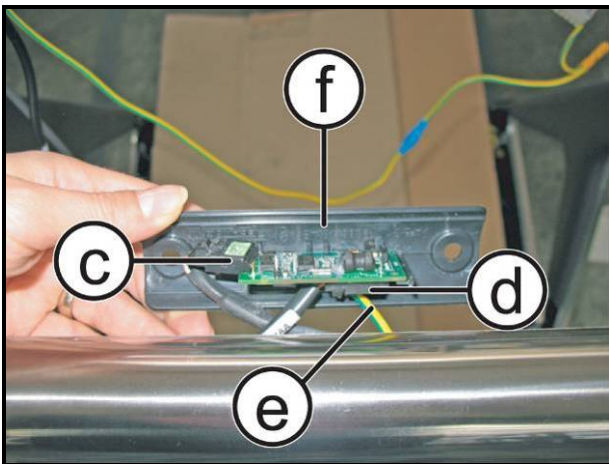


Figure 7.7-2

For the operations that follow: turn off the machine and unplug the mains lead from the wall outlet.

1. Back off the 2 screws **(a)** using a 4mm hex wrench.
2. Remove the small guard **(b)**.
3. Unplug the 2 connectors **(c)**, **(d)** and the earth connection Faston **(e)** from the receiver.
4. Remove the HS/HR receiver **(f)**.

To reassemble the HS/HR receiver, carry out the above steps in reverse order.

7.8. DISASSEMBLING THE HAND SENSOR

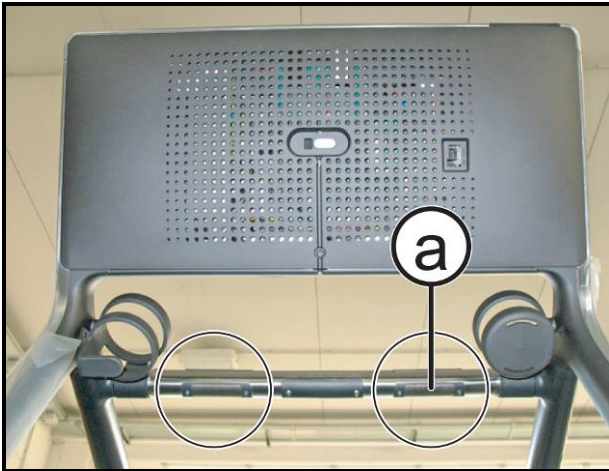


Figure 7.8-1

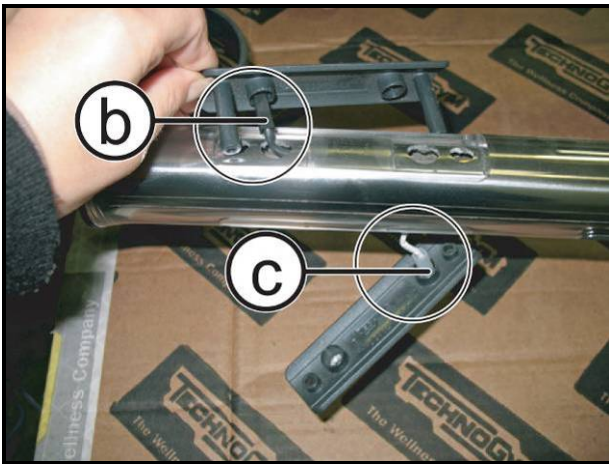


Figure 7.8-2

For the operations that follow: Turn off the machine and unplug the mains lead from the wall outlet.

For each sensor:

1. Back off the 2 screws (a) using a small Phillips screwdriver.
2. Raise the upper and lower sensors, and disconnect the 2 Fastons (b) and (c).
3. Remove the sensors.



When reassembling the sensors, use the two guide posts to avoid pinching the cables.

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

7.9. DISASSEMBLING THE CENTER HANDLEBAR AND JOYSTICK

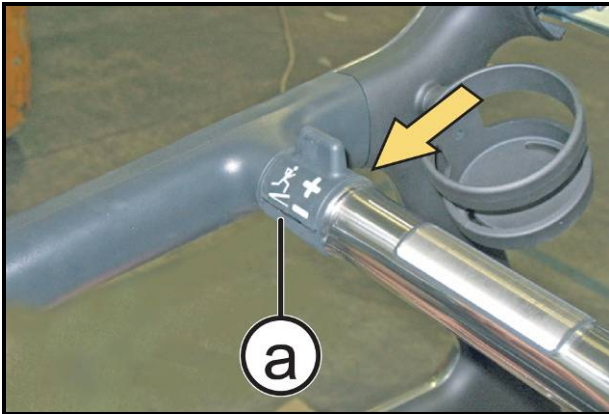


Figure 7.9-1

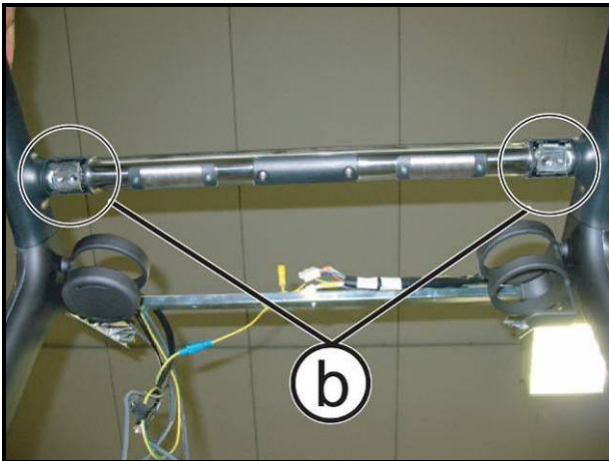


Figure 7.9-2

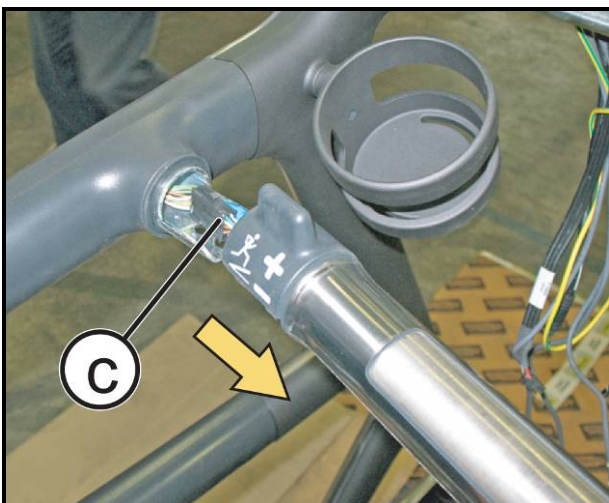


Figure 7.9-3

1. Slightly force the lower joystick cover in the direction of the arrow on the front, using a small flat-blade screwdriver.
2. Remove the cover (a) pulling it downward.
3. Back off the 4 screws (b) using a 5mm hex wrench.
4. Unplug the Joystick connector (c) and the earthing Faston.
5. Remove the handlebar and the joystick.

To reassemble the joystick and the handlebar, carry out the above steps in reverse order.

7.10. DISASSEMBLING THE MOTOR GUARD AND SIDE UPRIGHTS

7.10.1. DISASSEMBLING THE LOW KIT GUARD

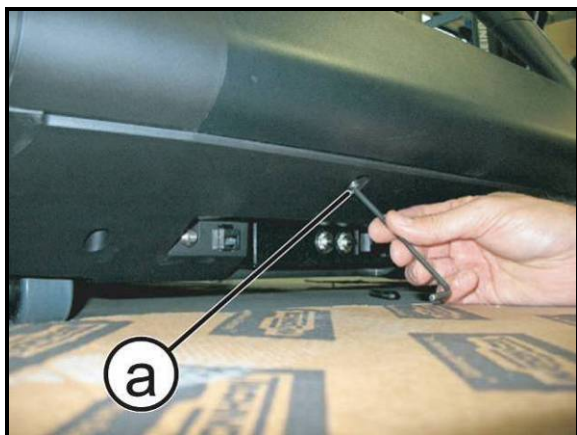


Figure 7.10-1



Figure 7.10-2

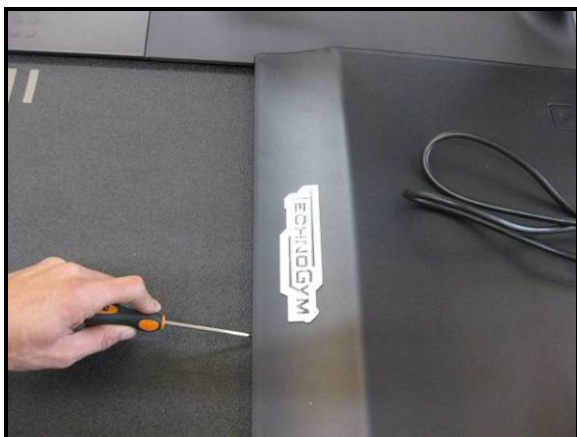


Figure 7.10-3

For the operations that follow: turn off the machine and unplug the mains lead from the wall outlet.

1. Back off the 2 screws **(a)** on the bottom of the guard using a 3mm hex wrench.
2. Remove the guard **(b)**, lifting it in the direction of the arrow, taking care to disconnect the LED connector of the secondary on-off switch.



During reassembly, if necessary, hold the dust guard in place with a flat blade screwdriver and snap the motor guard in place as shown in the figure.

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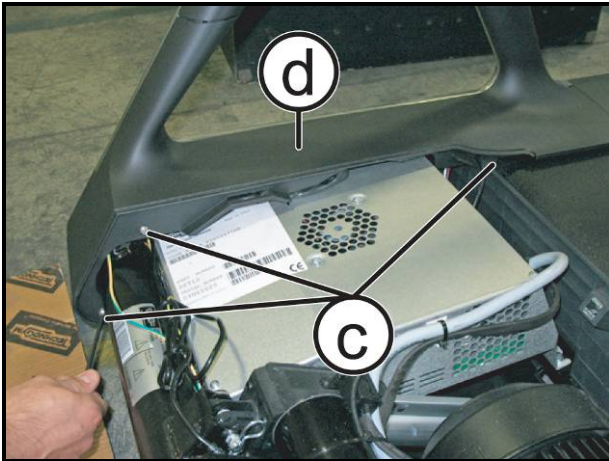


Figure 7.10-4

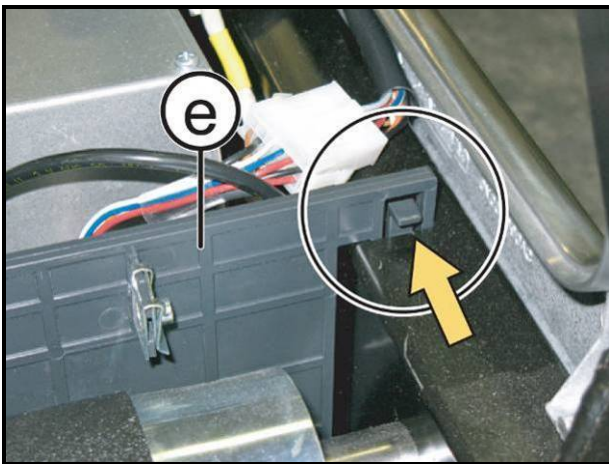


Figure 7.10-5

3. Back off the 3 screws (c) using a 3mm hex wrench.

4. Remove the side guard (d) from either side.

5. Press the 2 levers of the dust guard (e) in the direction of the arrow and remove it.

7.10.2. DISASSEMBLING THE SIDE UPRIGHTS:

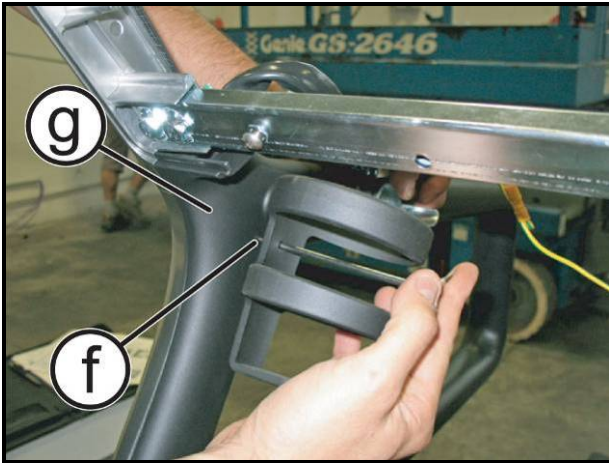


Figure 7.10-6

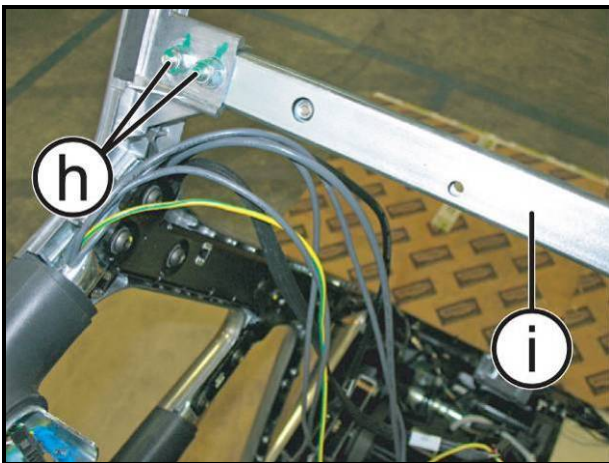


Figure 7.10-7

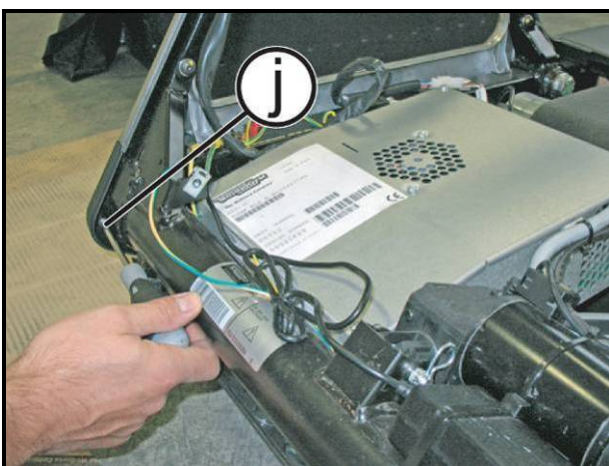


Figure 7.10-8

At this point, carry out the operations described in paragraph: 7.4. "Disassembling the display" and 7.9. "Disassembling the center handlebar and joystick".

On the upper part:

6. Back off the screw **(f)** using a 2.5mm hex wrench, passing through the hole of the bottle holder, as shown in the figure.
7. Remove the guard **(g)** by snapping it off.

8. Back off the 2 nuts **(h)** using a 13mm wrench on either side.
9. Remove the bar **(i)**.

On the lower part:

10. Back off the screw **(j)** using a medium Phillips screwdriver.

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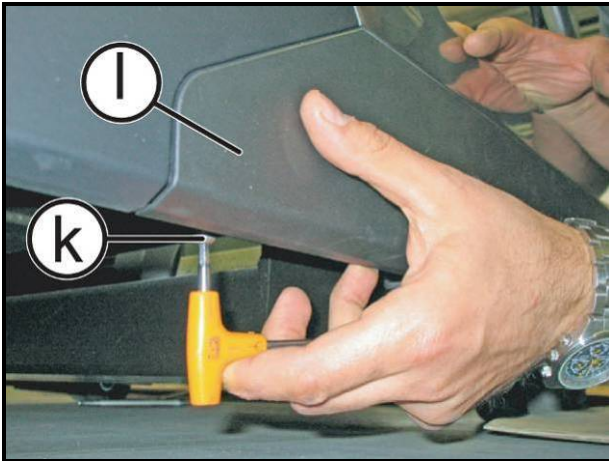


Figure 7.10-9

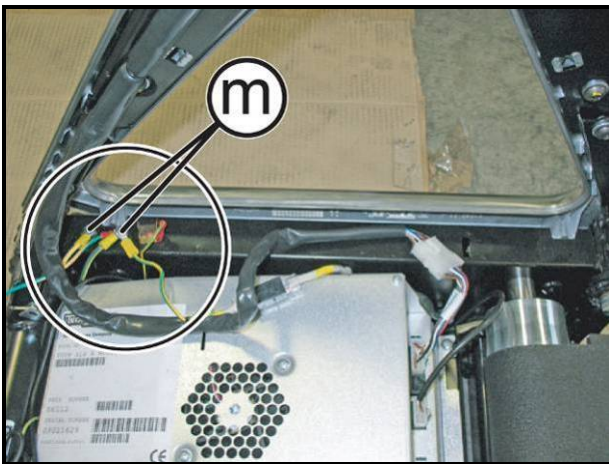


Figure 7.10-10



Figure 7.10-11

11. Back off the screw **(k)** using a 4mm hex wrench.

12. Remove the guard **(l)**.

13. Back off the 2 bolts **(m)** using an 8mm wrench and disconnect the earth.

For each upright:

14. Unloosen the 3 screws **(n)** using a 6mm hex wrench.

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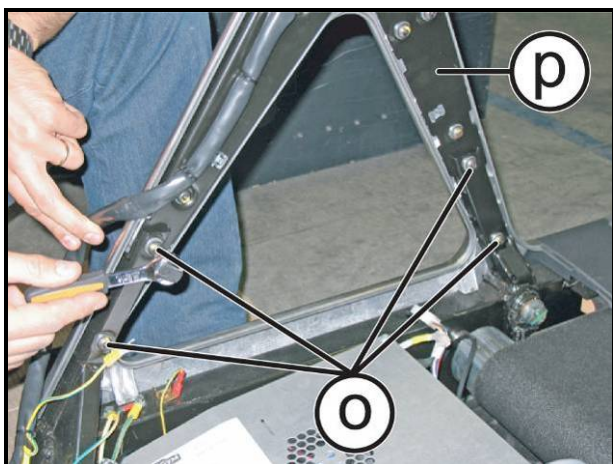


Figure 7.10-12

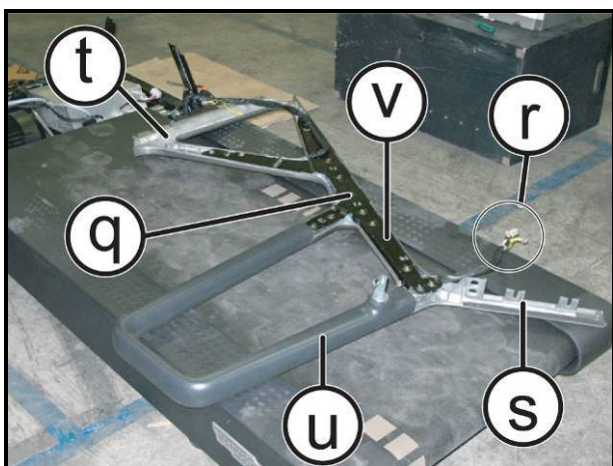


Figure 7.10-13

15. Back off the 4 screws (o).
16. Remove the upright (p) by pulling it outward and then lifting it upward.

17. Back off the 15 screws (q) using a 5mm hex wrench to remove and/or replace: the cables (r), the side guards (s) and (t), the handlebar (u) and the frame (v).



If the cables passing through the side uprights need to be replaced, note that they are distributed as follows:

- **Right upright:**
Power supply cable for CU319 and CU317 panels.
- **Left upright:**
Audio/Video and AUDIO OUT signal cables.

To reassemble the guard and the side uprights, carry out the above steps in reverse order taking special care to correctly match up the guards as before.

7.10.3. DISASSEMBLING THE CLOSING LOWER GUARDS

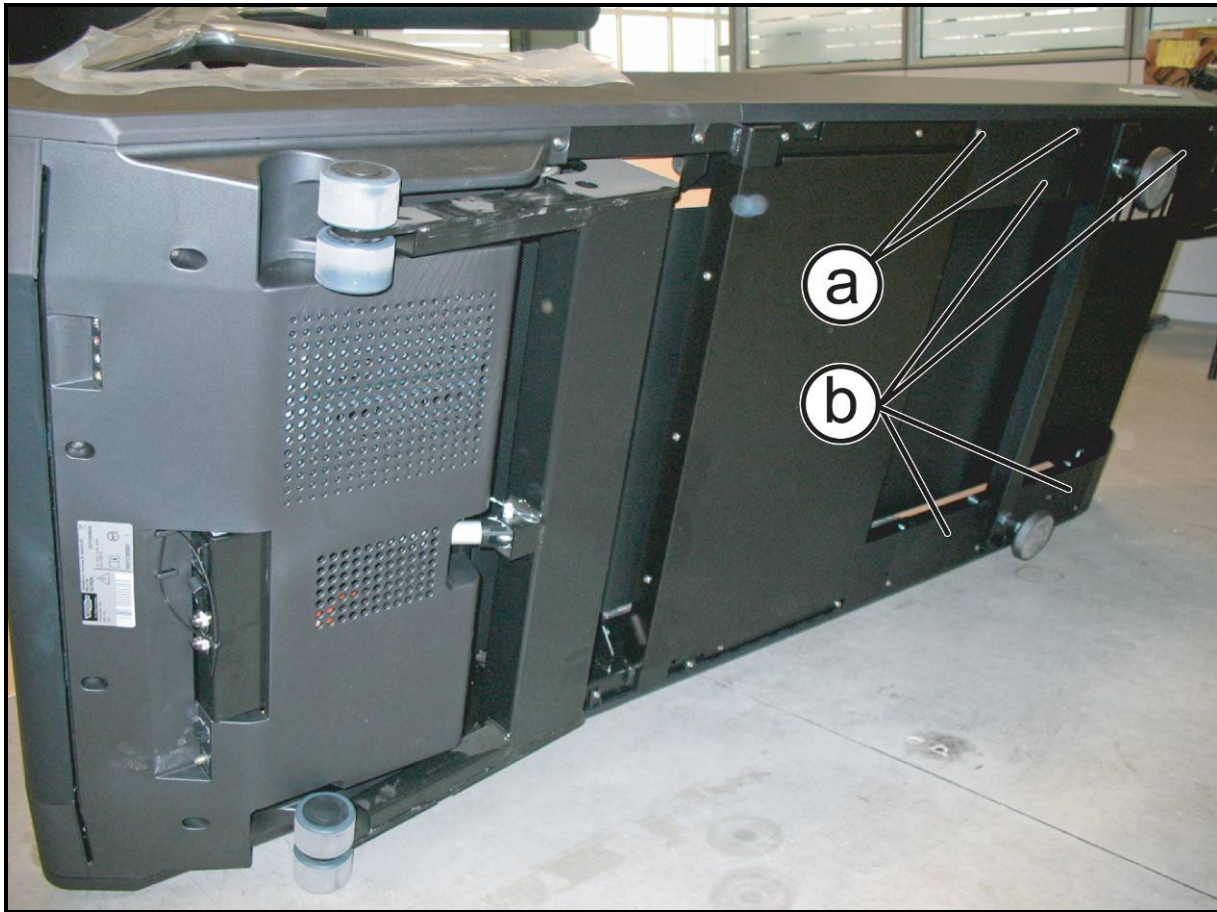


Figure 7.10-14



Before to proceed, place some cartons or protective stuff to avoid damage the lateral casings and upright of the machine.

Carefully turn the machine over on one side, to have a better access to the lower zone.

For each guard:

1. Back off the 2 screws **(a)** using a 4mm hexagonal wrench.
2. Remove the 4 guards **(b)**.

7.11. DISASSEMBLING THE LOWER COMPONENTS

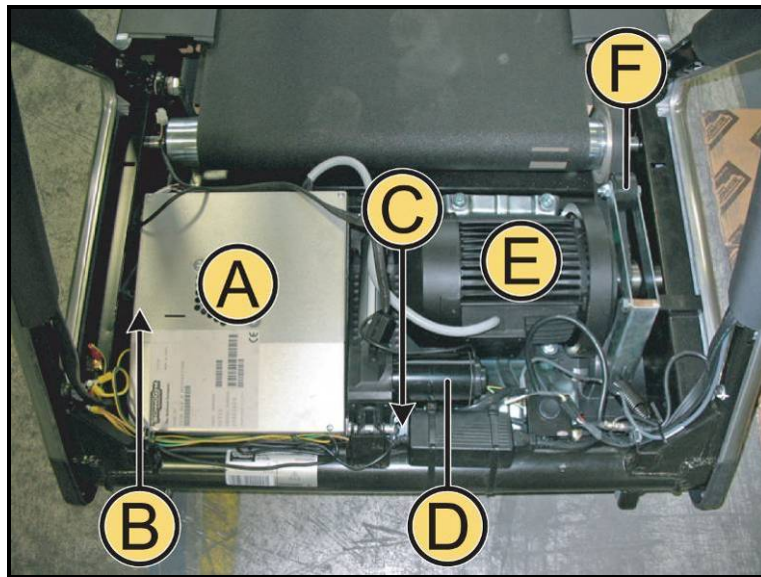


Figure 7.11-1

Carry out the operations up to step (2) of paragraph: 7.10. “Disassembling the motor guard and side uprights”.

At this point it is possible to disassemble the following internal components:

- *ALE Drive (A);*
- *Elevation microswitch (B);*
- *Power supply box (C);*
- *Elevation motor (D);*
- *Tread-belt motor (E);*
- *Belt tension adjustment assembly (F).*

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7.11.1. DISASSEMBLING THE ALE DRIVE

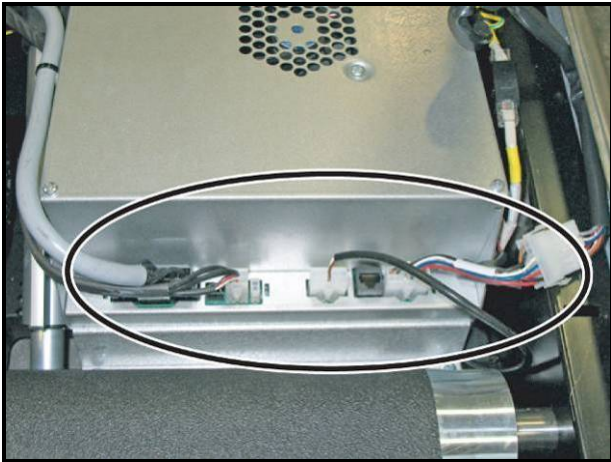


Figure 7.11-2

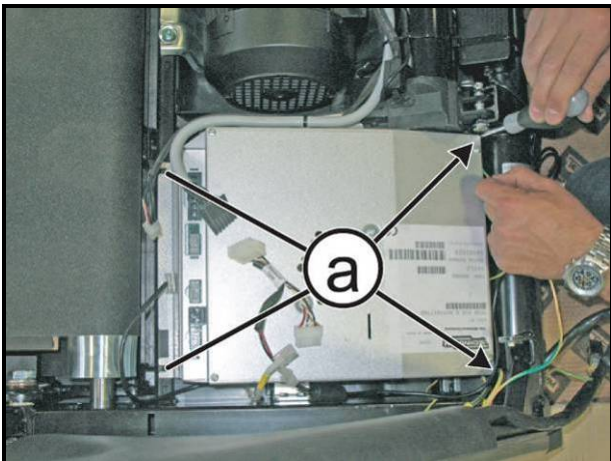


Figure 7.11-3

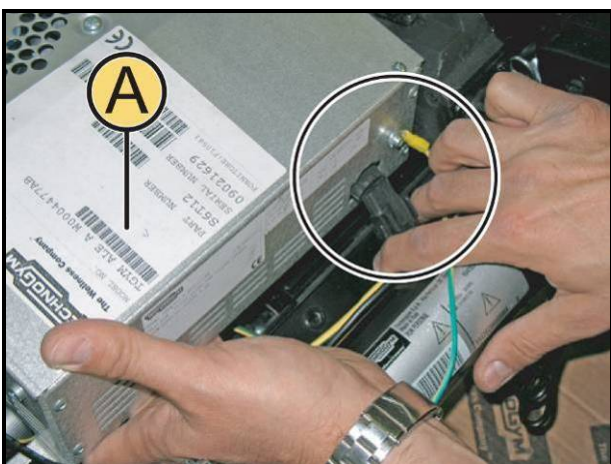


Figure 7.11-4

1. Unplug the 3 connectors indicated in the figure.

2. Back off the 4 screws (a) using a medium Phillips screwdriver.

3. Raise the ALE drive box (A) slightly and unplug the connector and the earth node as shown in the figure.

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

7.11.2. DISASSEMBLING THE ELEVATION MICROSWITCH AND THE AUDIO/VIDEO CONNECTORS BOARD (B)

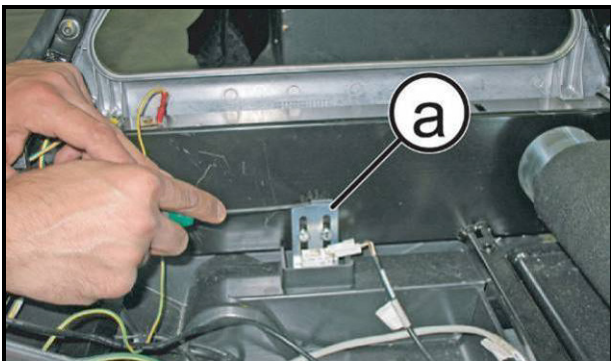


Figure 7.11-5

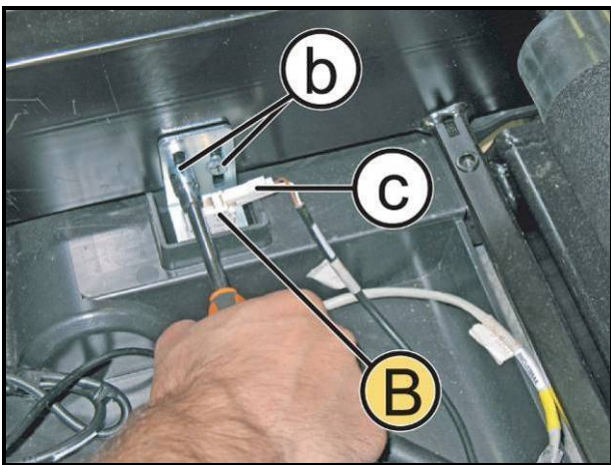


Figure 7.11-6

Disassembling the elevation microswitch without ALE Drive:

Carry out the procedure described in paragraph: 7.11.1. "Disassembling the ALE Drive".

1. Using a screwdriver, mark the position on the frame of the elevation microswitch support bracket (a).
2. Back off the 2 bolts (b) using a 10mm wrench.
3. Unplug the connector (c) if necessary.
4. Remove the elevation microswitch (B).

CAUTION: After reassembly, check the position of the microswitch as described in paragraph: 8.5. "Travel limit microswitch position".

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

Disassembling the elevation microswitch with the machine on one side:

Carry out the procedure described in paragraph: 7.10. "Disassembling the motor guard and side uprights" up to step (4).

Before to proceed, place some cartons or protective stuff to avoid damage the lateral casings and upright of the machine.

Carefully turn the machine over one side, taking care that the elevation carriage is not touching on the floor then it's free to move.

1. Remove the R-clip (a) and pull out the pin (b).

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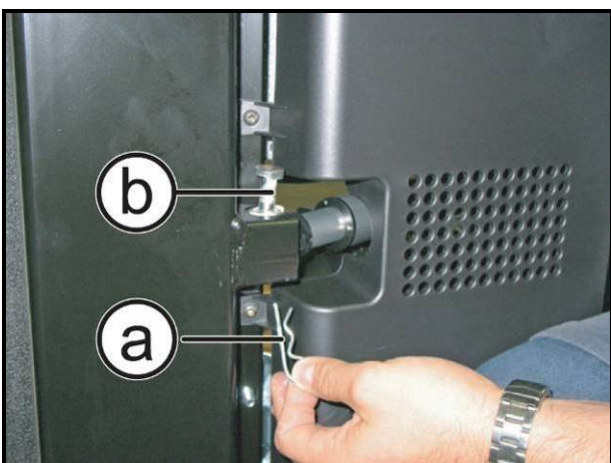


Figure 7.11-7

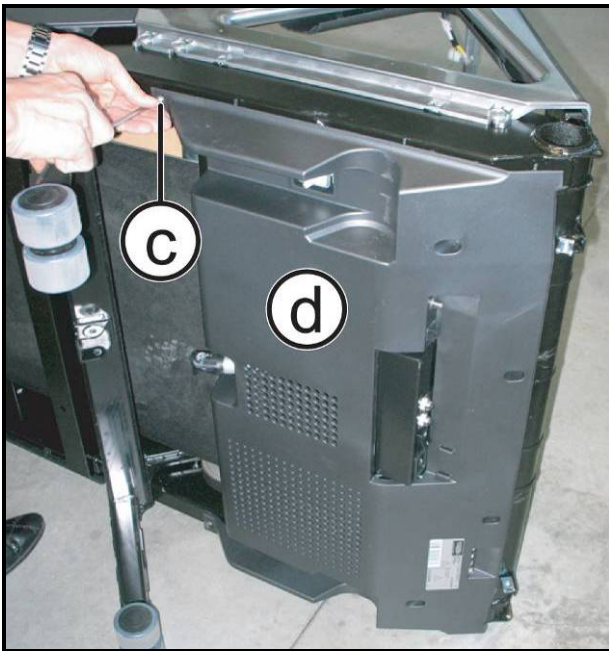


Figure 7.11-8

2. Back off the 5 screws (c) using a 5mm wrench and remove the lower guard (d).

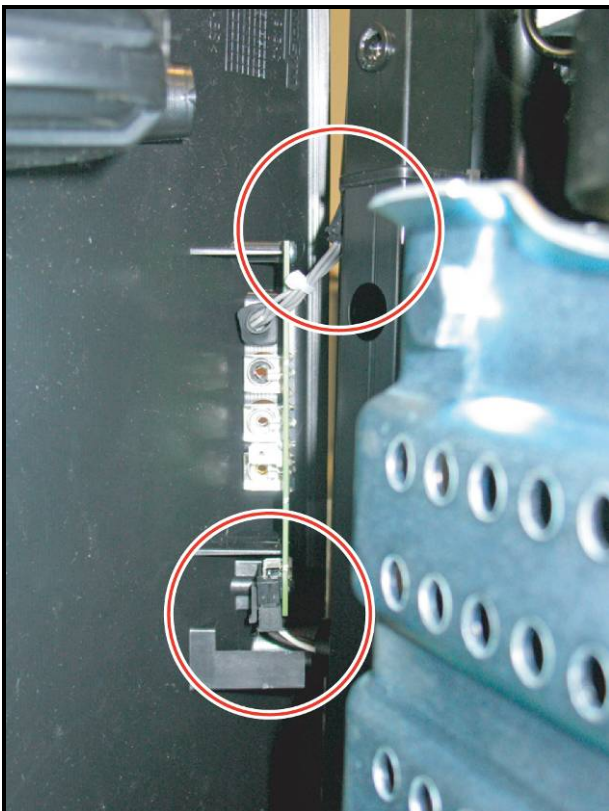


Figure 7.11-9

3. Disconnect the connectors highlighted in the figure at the side, from the connectors board.

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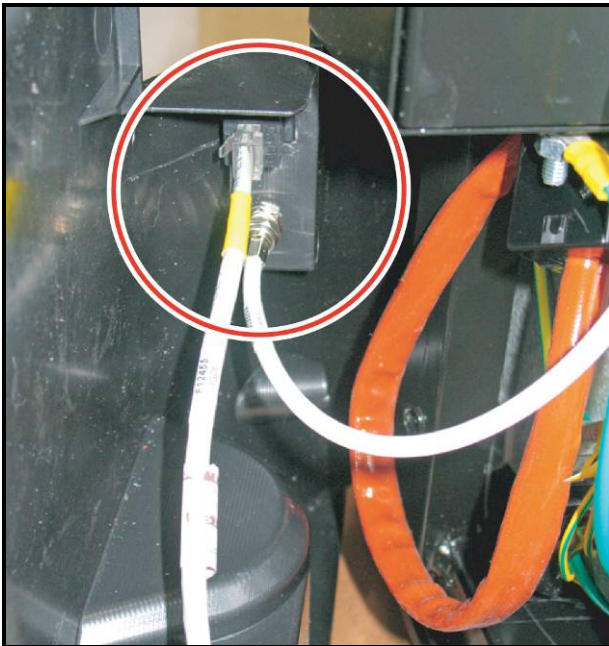


Figure 7.11-10

4. Disconnect the LAN cable and the antenna cable from the connectors on the guard.
5. Now it is possible to remove the lower guard.

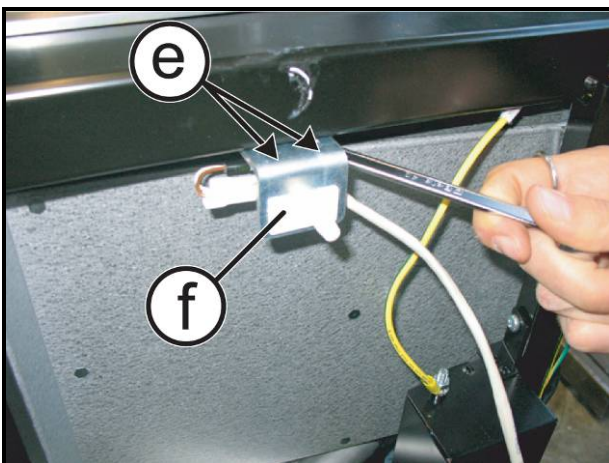


Figure 7.11-11

6. Back off the 2 bolts using a 10mm wrench and remove the bracket and the elevation microswitch (f).

CAUTION: After reassembly, check the position of the microswitch as described in paragraph: 8.5. “Travel limit microswitch position”.

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

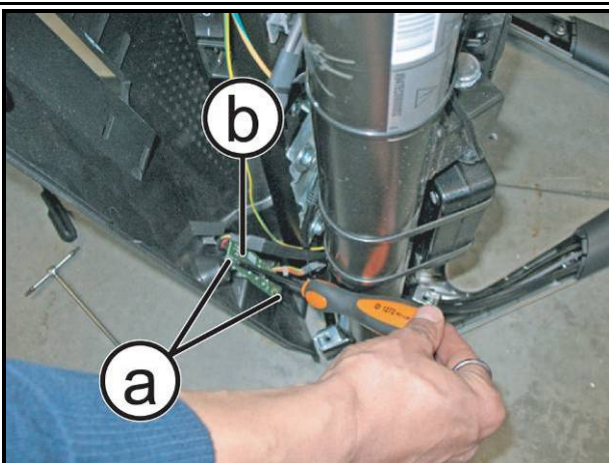


Figure 7.11-12

Disassembling the Audio/Video connector board:

7. Back off the 2 screws (a) using a medium Phillips screwdriver.
8. Remove the connector board (b).

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

7.11.3. DISASSEMBLING THE POWER SUPPLY BOX (C)

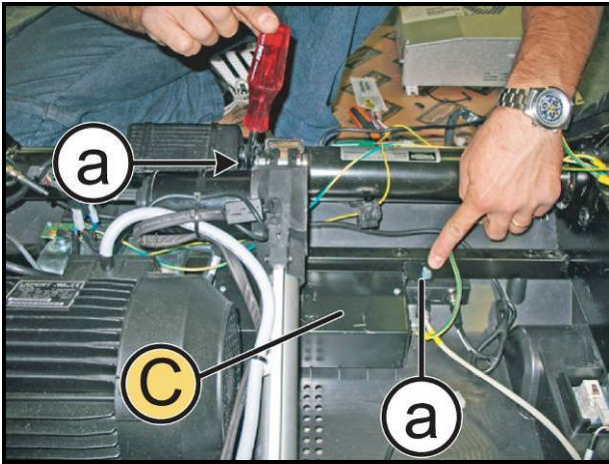


Figure 7.11-13

Carry out the procedure described in paragraph: 7.11.1. "Disassembling the ALE Drive".

1. Back off the 2 screws (a) using a large Phillips screwdriver.
2. Remove the power supply box (C)

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

7.11.4. DISASSEMBLING THE ELEVATION MOTOR (D)

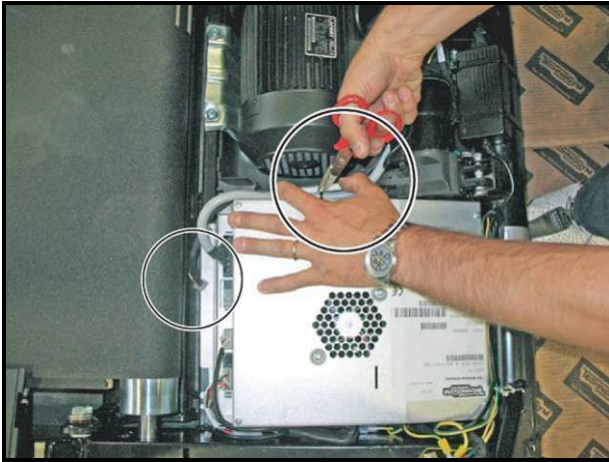


Figure 7.11-14



Cut the tie securing the motor cable at the Drive and unplug the connector, as shown in the figure.

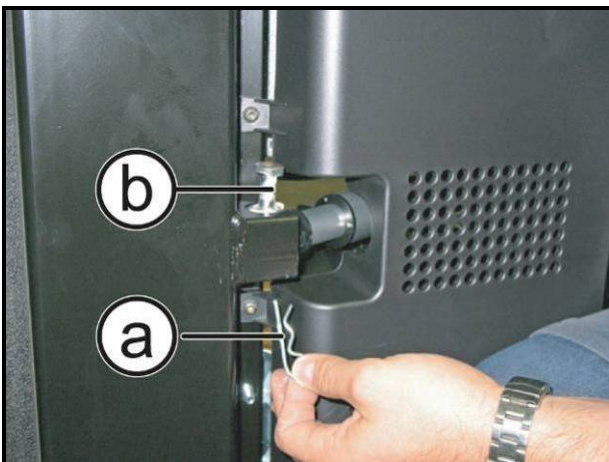


Figure 7.11-15



Before to proceed, place some cartons or protective stuff to avoid damage the lateral casings and upright of the machine.



Carefully turn the machine over one side, taking care that the elevation carriage is not touching on the floor then it's free to move.

On the lower part of the machine:

5. Remove the R-clip (a) and pull out the pin (b).

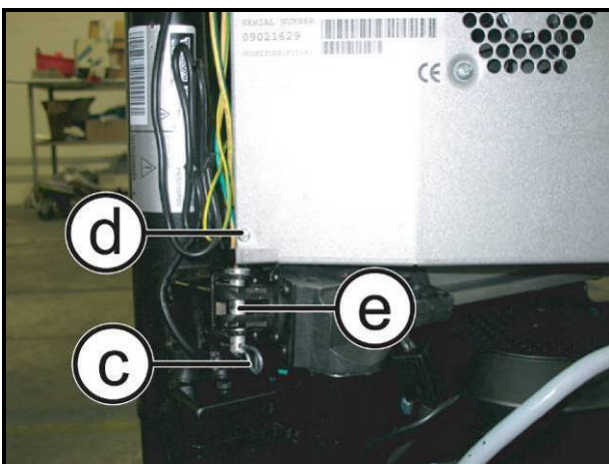


Figure 7.11-16

Inside the machine lower guard:

6. Remove the split pin (c).
7. Back off the screw (d) using a medium Phillips screwdriver.
8. Remove pin (e) from the top.

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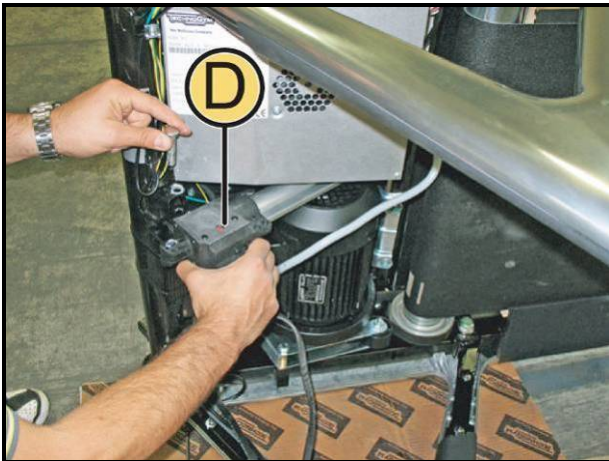


Figure 7.11-17

9. Remove the elevation motor (D).

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

7.11.5. DISASSEMBLING THE TREAD BELT MOTOR (E)

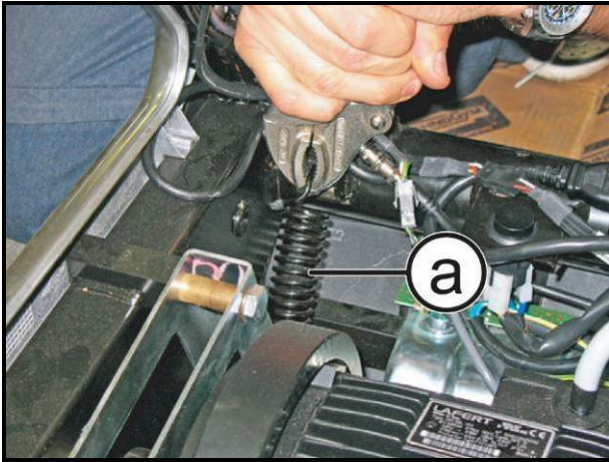


Figure 7.11-18

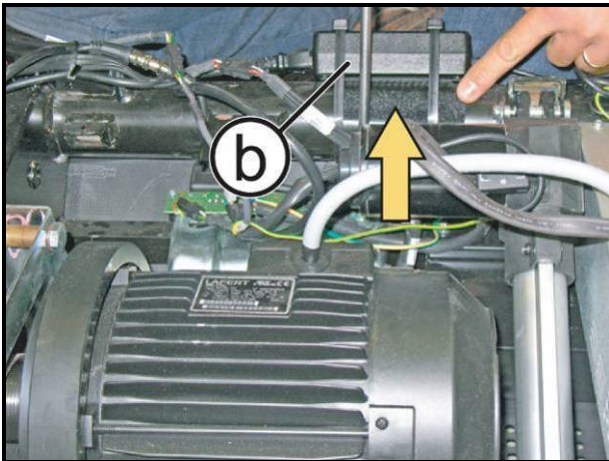


Figure 7.11-19

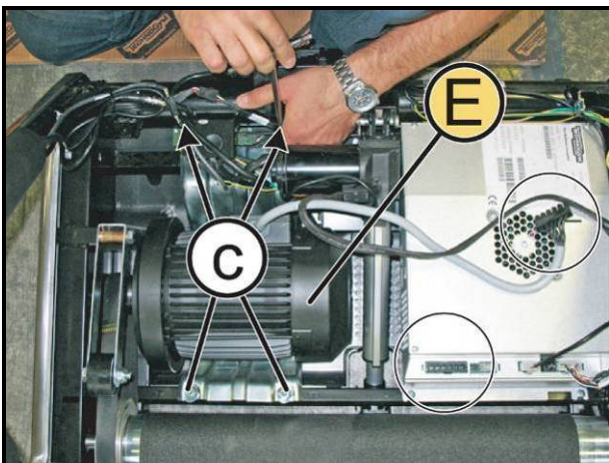


Figure 7.11-20

1. Remove the belt tension system spring (a), releasing it with the help of a pair of pliers.

2. Rotate the power supply (b) on the frame without cutting the ties.

3. Mark the position of the tread-belt motor plate support on the frame.
4. Unplug the cable of the ALE drive as shown in the figure.
5. Back off the 4 screws (c) using a 6mm hex wrench.
6. Remove the tread-belt motor (E).

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



CAUTION: After reassembly, check the alignment of the motor drive-belt, as described in paragraph: 8.4. "Aligning the tread – belt motor drive-belt".

7.11.6. DISASSEMBLING THE BELT TENSIONER (F)

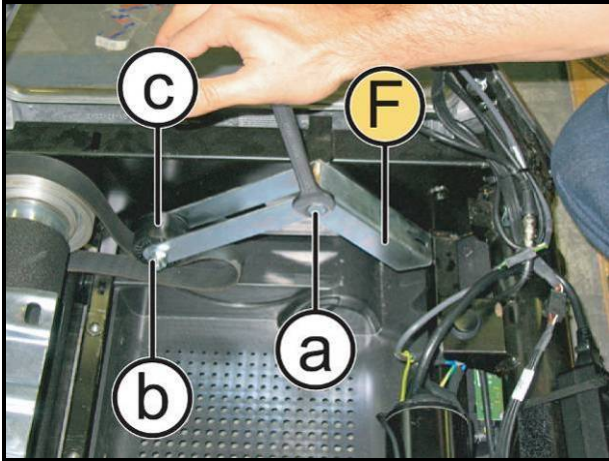


Figure 7.11-21

Carry out the procedure described in paragraph: 7.11.5. “Disassembling the Tread belt motor (E)”.

1. Back off the screw (a) using a 17mm wrench.
2. Remove the lever of the tension system (F).

To remove the roller:

3. Back off the nut (b) and the bolt on the opposite side using two 17mm wrenches.
4. Remove the wheel (c).

To reassemble the belt tension system, follow the above steps in reverse order

7.12. DISASSEMBLING THE TREAD BELT, RUNNING DECK AND MOTOR DRIVE-BELT

With these operations it is possible to disassemble the following internal components:

- *Foot rests*
- *Driving roller*
- *Driven roller*
- *Tread belt motor drive-belt*
- *Deck*
- *Tread belt*
- *Shock absorbers*
- *Rear feet*
- *Front feet*



In order to carry out these operations, it is necessary to slacken the tread-belt tension. If the tread-belt is to be re-used, follow the instructions for its correct re-tensioning in paragraph: 8.2. “Tensioning a used tread belt”.

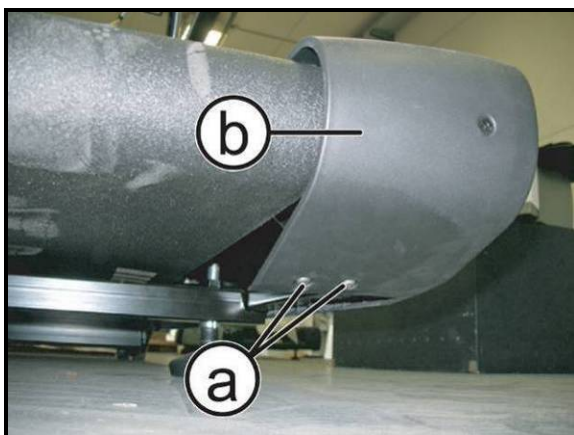


Figure 7.12-1

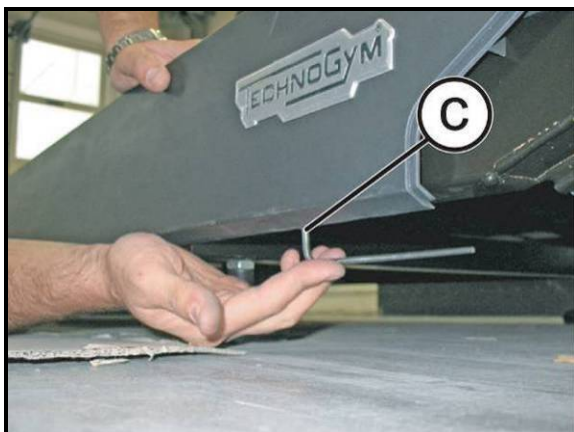


Figure 7.12-2

Carry out the operations up to step (5) of paragraph: 7.10. “Disassembling the motor guard and side uprights” and 7.10.3. “Disassembling the closing lower guards”.

To remove the foot-rests:

1. Back off the 2 screws **(a)** using a 4mm hex wrench.
2. Remove the guard **(b)**.

On either side:

3. Back off the 3 screws **(c)** using a 4mm hex wrench.

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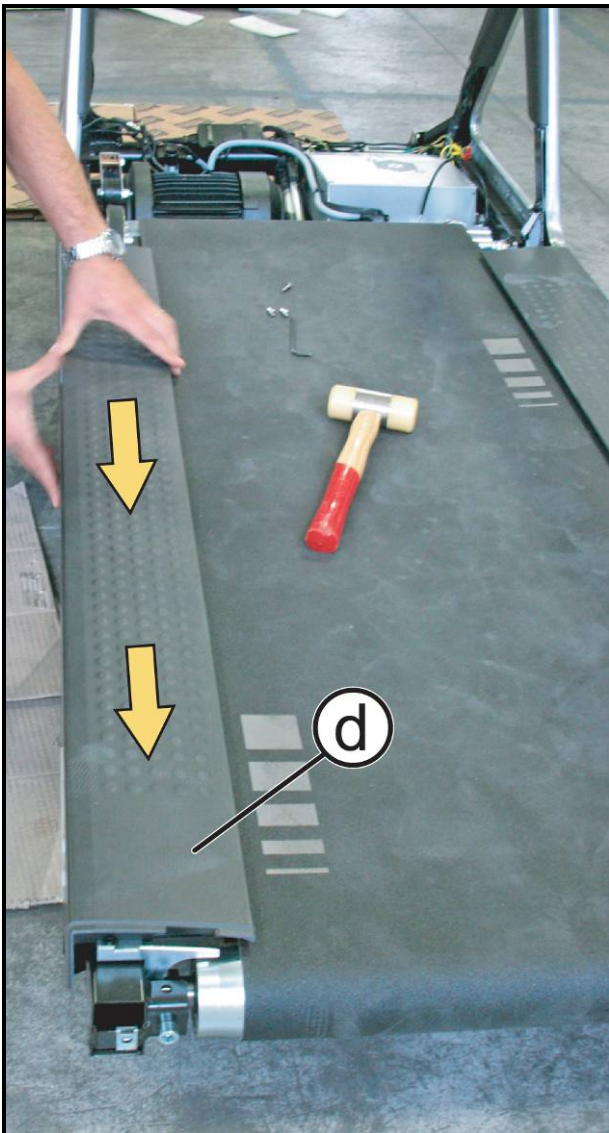


Figure 7.12-3

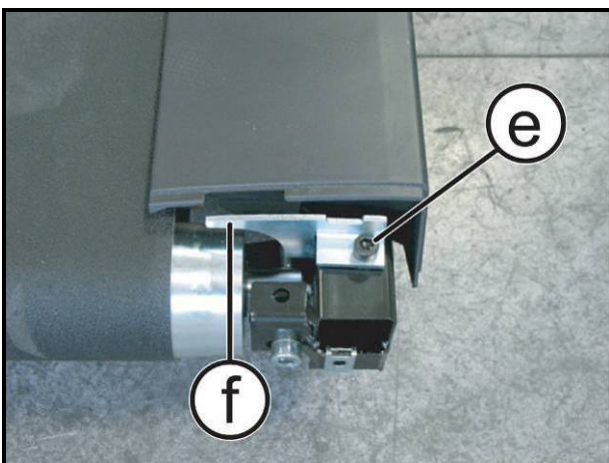


Figure 7.12-4

4. Pull out the foot rests (**d**), moving them slightly back and forth to match up the notches on the guard with the screws on the frame.

5. Back off the screw (**e**) using a 6mm hex wrench.
6. Remove the protection limit stop (**f**).

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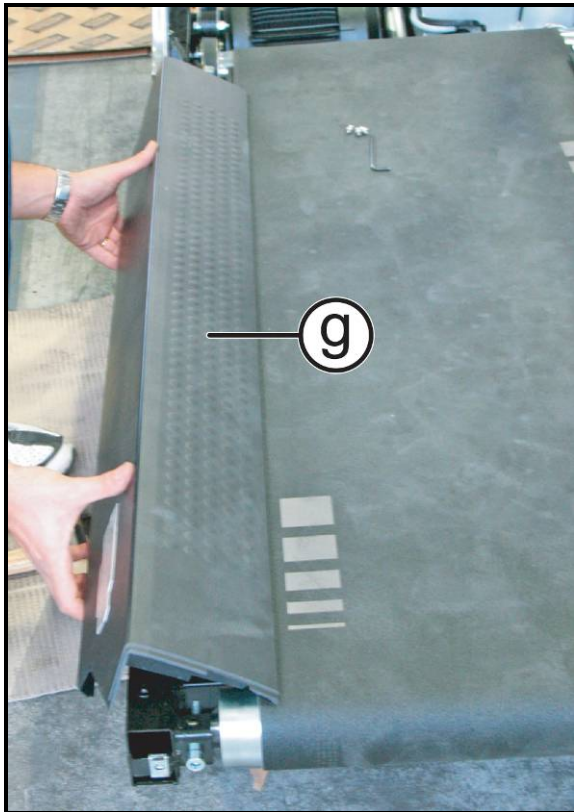


Figure 7.12-5

7. Remove the foot-rest (g) by rotating it upward, as shown in the figure.

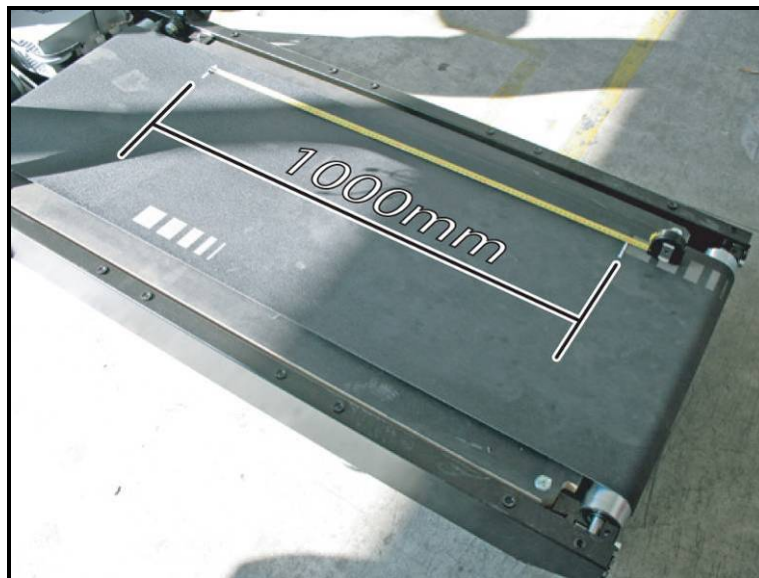


Figure 7.12-6



Before slackening the belt tension, make 2 REFERENCE marks spaced 1000 mm apart in order to later adjust its tension correctly.

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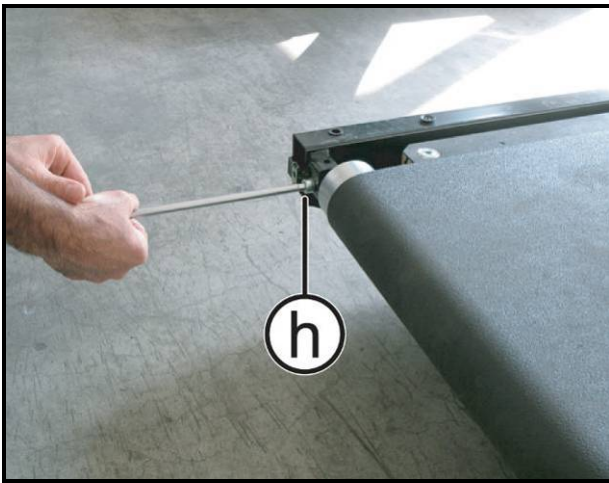


Figure 7.12-7



Figure 7.12-8

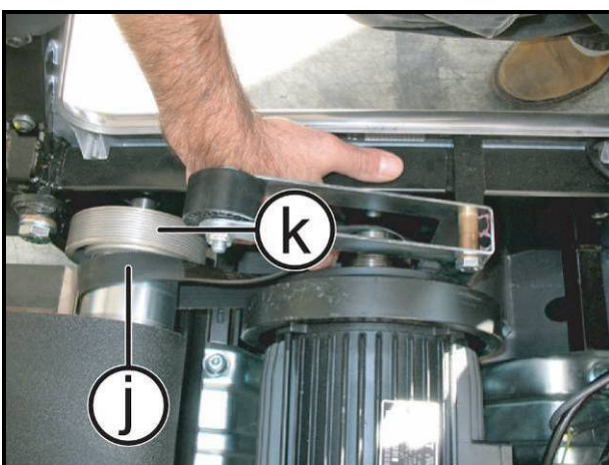


Figure 7.12-9

To remove the driven roller, driving roller, motor drive-belt, tread belt and deck:

8. Slacken the belt tension by backing off the screws (**h**) on each side, which act on the rear machine roller, using an 8 mm hex wrench.



Carry out this operation by alternately backing off the left and right screw to avoid overloading the roller bearings.

9. Lift up the driven roller (**i**) and remove it.

10. Release the spring of the belt tension system as described in paragraph: 7.11.5. “Disassembling the Tread belt motor (E)”, at the point (**1**).

11. Pull out the belt (**j**) from the driving roller (**k**) as shown in the figure.

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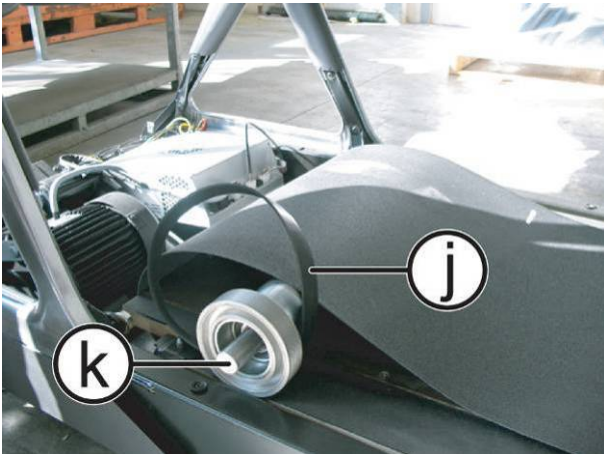


Figure 7.12-10

12. Pull out the driving roller (**k**) and remove the belt (**j**).

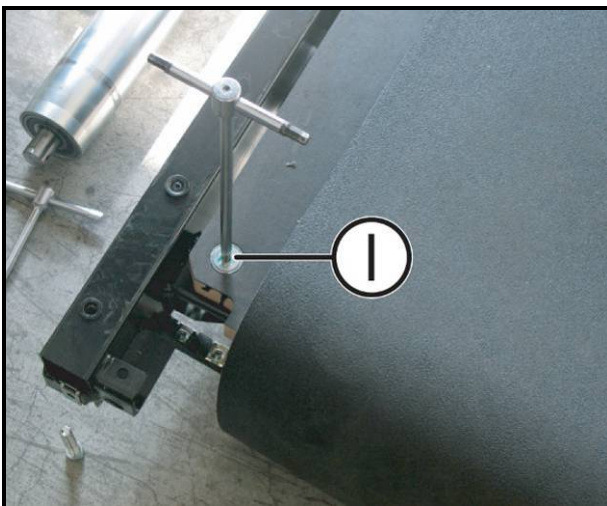


Figure 7.12-11

13. Back off the 2 screws (**l**) securing the running deck using a 6mm hex wrench.



Figure 7.12-12

14. Pull the deck toward yourself to remove it as shown in the figure.

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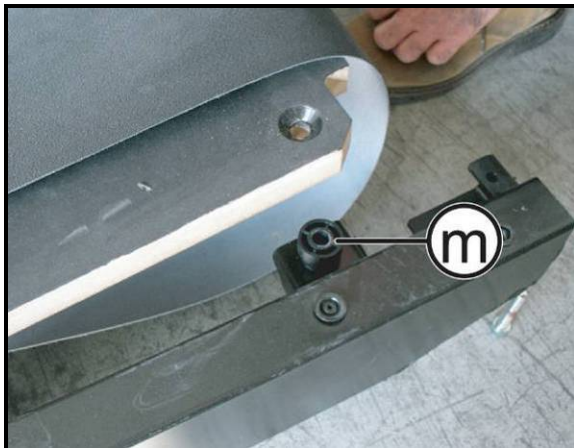


Figure 7.12-13

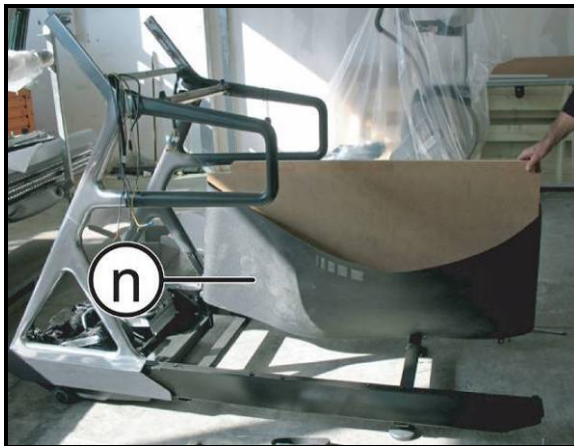


Figure 7.12-14

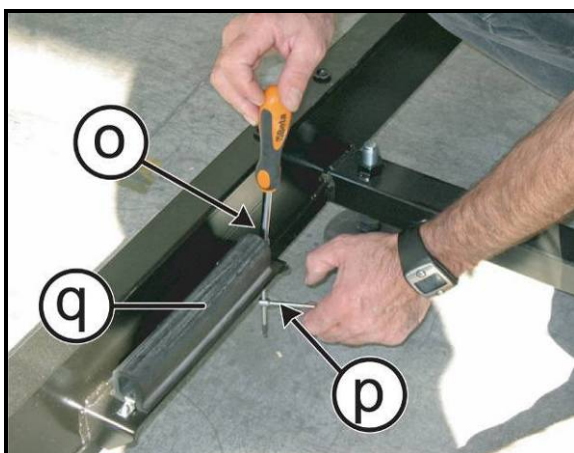


Figure 7.12-15

15. Remove the spacers (m), making a note of their position for subsequent reassembly.

16. Lift up the deck and remove the belt (n) as shown in the figure.

■ **CAUTION:** Be careful to reassemble the belt in the same direction, because it cannot operate backwards.

■ **CAUTION:** At the end of the procedure, check the alignment of the driving belt, the tension and alignment of the tread belt as described in paragraphs: 8.1. Tensioning a new tread belt”, 8.3. “Centering and adjusting the ” and 8.4. Aligning the tread – belt motor drive-belt”.

To remove the shock absorbers:

17. Back off the 2 nuts (o) using a 7mm wrench, clamping the bolt on the opposite side (p) with a 3mm hex wrench.

18. Remove the shock absorber (q).

■ **CAUTION:** Re-insert the spacers during reassembly.

Continued on following page...

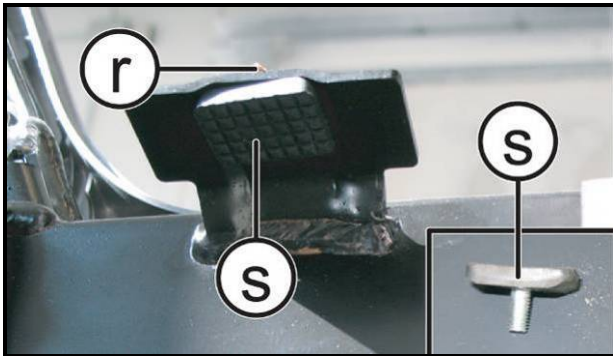


Figure 7.12-16

To remove the front deck limit stops:

19. Back off the screw (**r**) and remove deck limit stop (**s**).

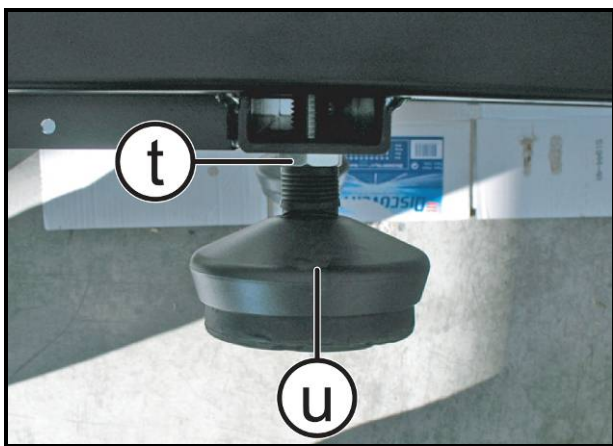


Figure 7.12-17

For the left adjusting foot:

20. Turn the machine over on one side.
21. Back off the nut (**t**) using a 24mm wrench.
22. Remove the foot (**u**).

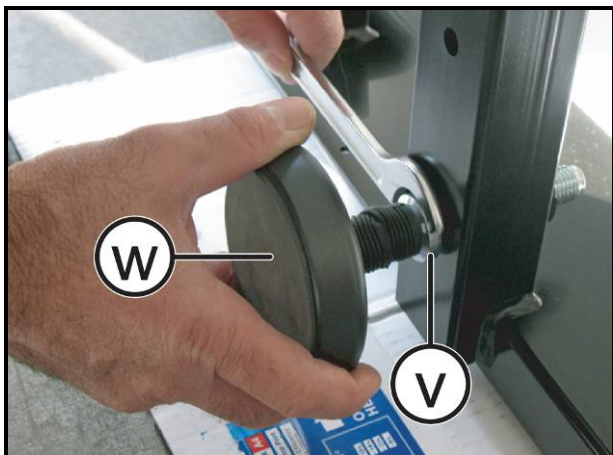


Figure 7.12-18

For the right foot:

23. Back off the nut (**v**) using a 24mm wrench.
24. Remove the foot (**w**).

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

7.13. DISASSEMBLING THE FRONT WHEELS



This operation can be carried out by placing the machine at a 3 or 4% incline before turning it over on one side; or, alternatively, by resting the machine on one side and removing the elevation motor pin and clip, as described in paragraph: 7.11.4. “Disassembling the elevation motor (D)”, up until step (2), so as to release the elevation carriage from the frame.



Figure 7.13-1

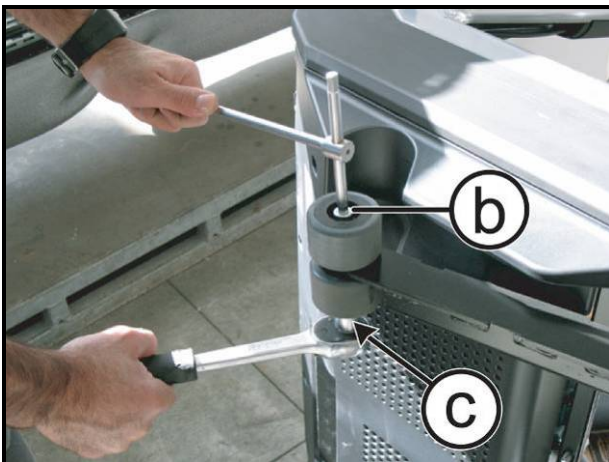


Figure 7.13-2



Before to proceed, place some cartons or protective stuff to avoid damage the lateral casings and upright of the machine.



Carefully turn the machine over one side, taking care that the elevation carriage is not touching on the floor then it's free to move.

1. Pull the incline frame slightly toward yourself.
2. Remove the caps (a) using a flat screwdriver as a lever.
3. Back off the screw (b), using an 8mm hex wrench and holding the nut (c) underneath in place with a 17mm socket wrench.

Continued on following page...

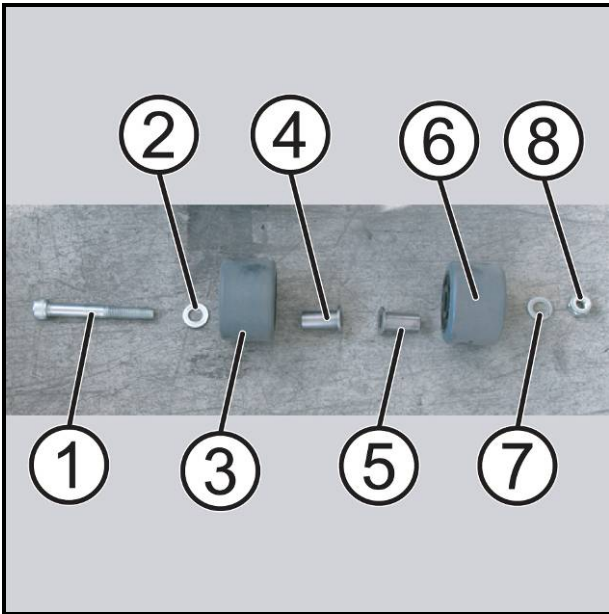


Figure 7.13-3



During reassembly, follow the sequence indicated in the figure at left.

7.14. DISASSEMBLING THE AUTOTRANSFORMER (VER. 110V)

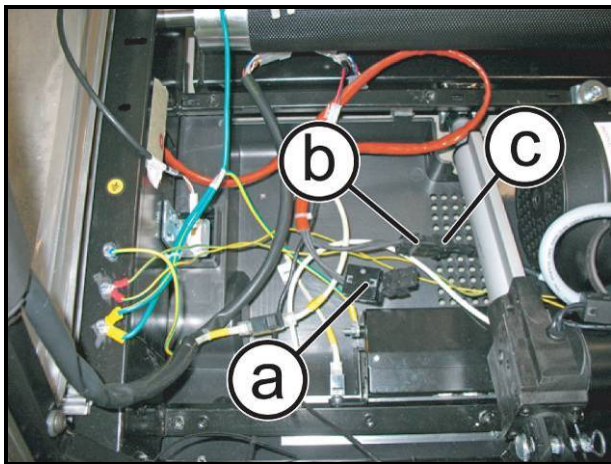


Figure 7.14-1

TIPOLOGY 1

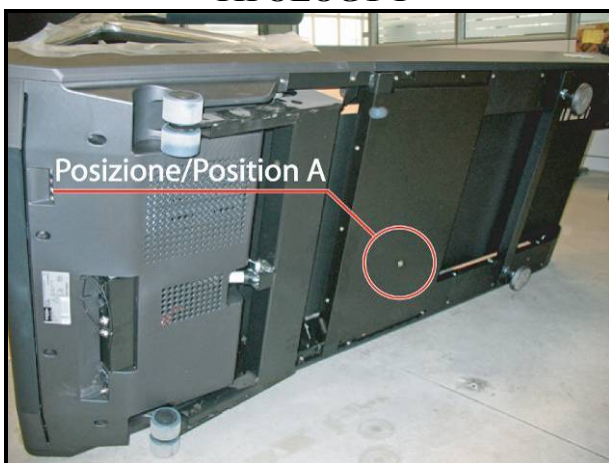


Figure 7.14-2

TIPOLOGY 2

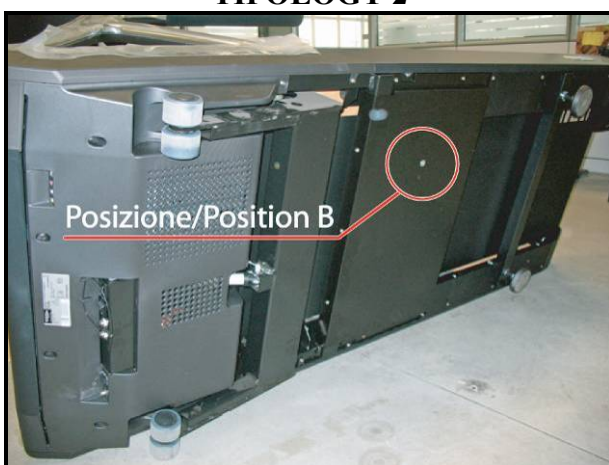


Figure 7.14-3

For the operations that follow: turn off the machine and unplug the mains lead from the wall outlet.

Carry out the procedure described in paragraph: 7.10.1. “Disassembling the low kit guard” and 7.11.1. “Disassembling the ALE Drive”.

1. Remove the ferrite (a) from the Driver connecting cable.
2. Disconnect the two connectors (b) and (c).



Before to proceed, place some cartons or protective stuff to avoid damage the lateral casings and upright of the machine.



Turn the equipment on the right side. If the Autotransformer is in the A POSITION, as shown in the figure at the side, carry out as indicated at the procedure: 7.14.1. “Position A”.



If on the contrary, the Autotransformer is in B POSITION, it is strongly suggested to turn the machine on left side and carry out the procedure: 7.14.2. “Position B”.

Continued on following page ...

7.14.1. POSITION A

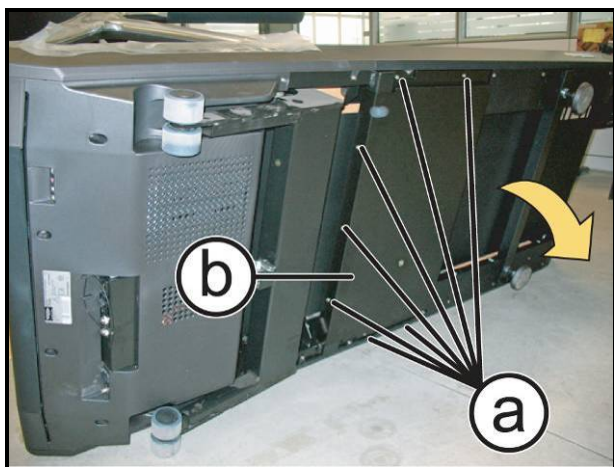


Figure 7.14-4

1. Back off the 7 screws **(a)** using a 4mm hexagonal wrench.
2. Open lightly the autotransformer guard **(b)**, with caution.



ATTENTION: Take particular attention when move the Autotransformer, because it is easily broken, also a little impact can damage it.

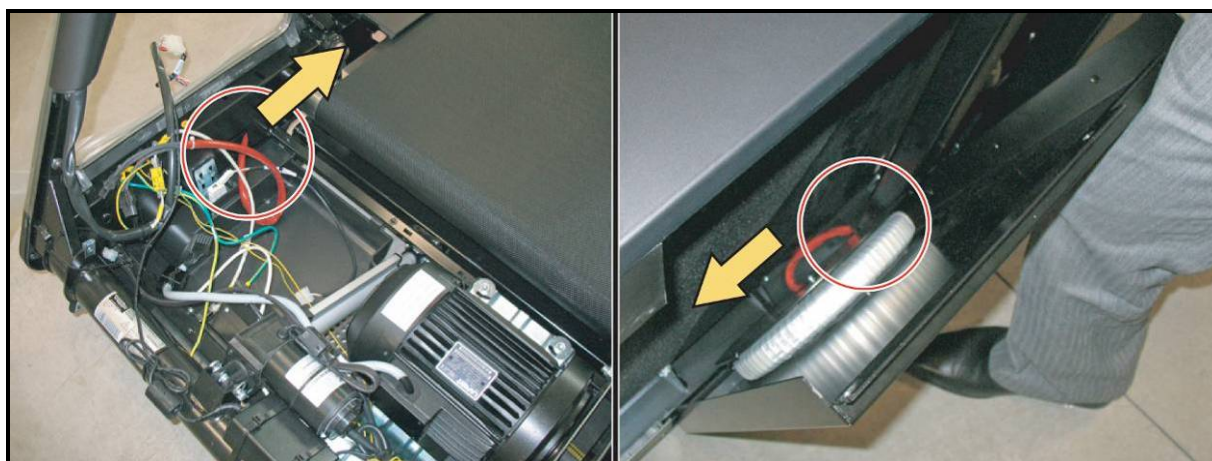


Figure 7.14-5

3. Pull out the autotransformer cable from the frame, trough the holes highlighted in the figure, in direction of the yellow arrows.
4. Remove the autotransformer assembly.

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

Continued on following page ...

7.14.2. POSITION B

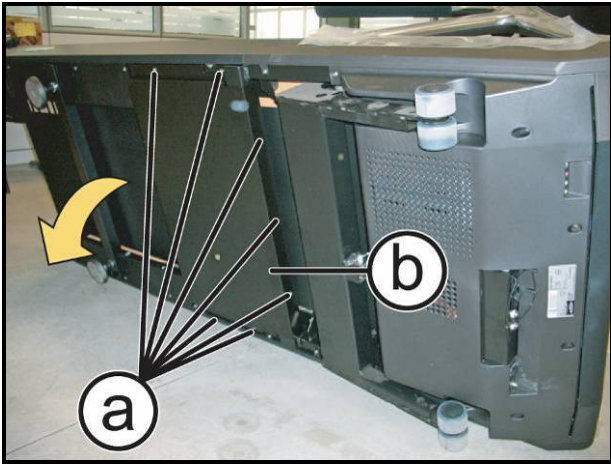


Figure 7.14-6



With the autotransformer in the lower position, proceed as follows:

1. Back off the 7 screws (a) using a 4mm hexagonal wrench.
2. Open lightly and with caution the autotransformer guard (b).



ATTENTION: Take particular attention when move the Autotransformer, because it is easily broken, also a little impact can damage it.



Figure 7.14-7

3. Cut the three cable-tie highlighted in the figure using a pair of scissors, paying attention to not damage the cable.
4. Pull out the autotransformer cable through the frame, follow the yellow arrows
5. Remove the autotransformer assembly.

To reassemble the Autotransformer, carry out the above steps in reverse order, paying attention to the notes below:

Continued on following page ...



Figure 7.14-8

6. Close the cable into the three cable tie, as highlighted in the figure and insert it as much as possible inside of the frame, so that it shouldn't be loose.



A loose cable could get in contact with the belt during the exercise and produce noise or damage.

7. Draw the guard up to the frame and look down the cable tie, then cut the part of the cable ties not needed.
8. Reassembly the guard and look down again the 7 screws backing off previously in Figure 7.14-6.

8. ADJUSTMENTS

8.1. TENSIONING A NEW TREAD BELT

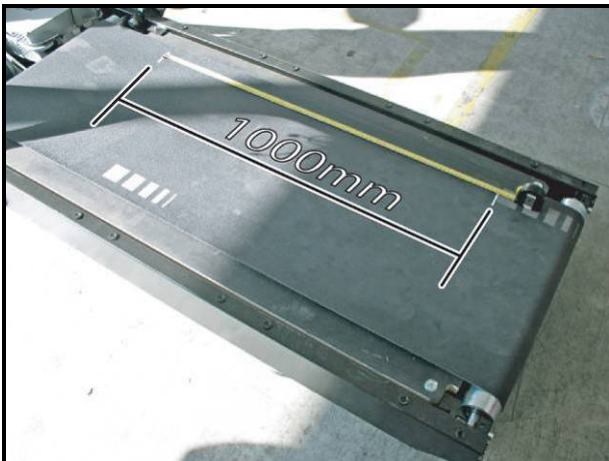


Figure 8.1-1

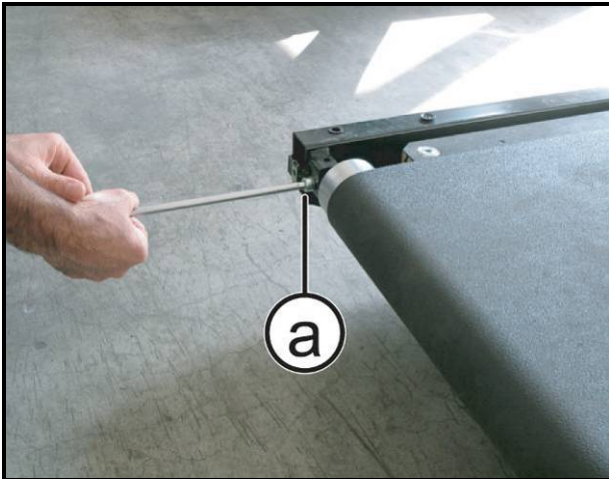


Figure 8.1-2

1. After replacing the tread belt, place a tape measure along the centre of the tread belt and use a pen (or white corrector fluid) to make two reference marks spaced exactly **1m** meter apart.
2. Alternately lock down the 2 tension adjusting screws (**a**) so as to balance the tension exerted by the belt on the roller bearings, until the distance between the reference marks increases by **7mm**.



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



CAUTION: After completing this procedure, check the centering of the tread belt as instructed in paragraph: 8.3. “Centering and adjusting the belt”

8.2. TENSIONING A USED TREAD BELT

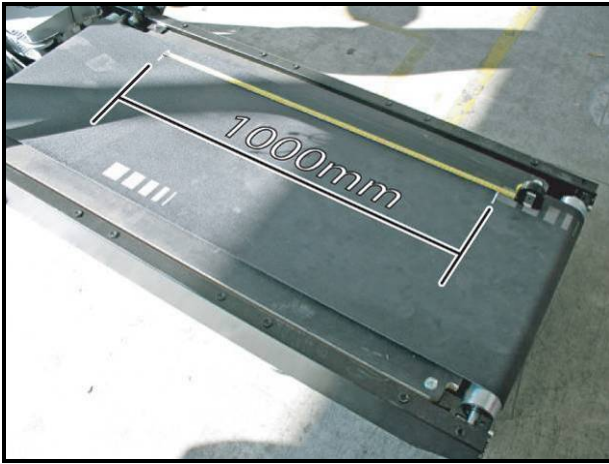


Figure 8.2-1

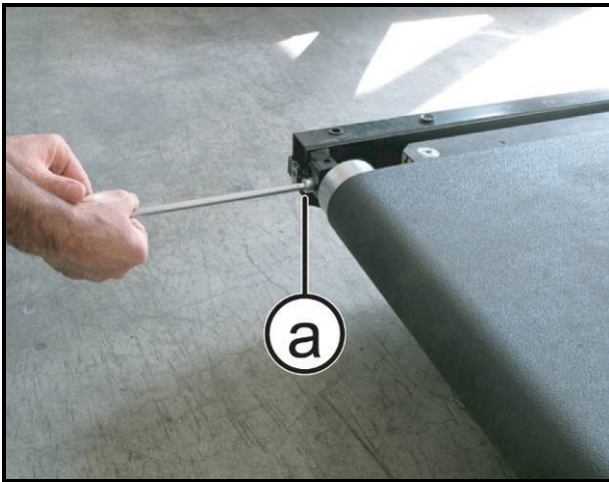


Figure 8.2-2

- a. Before slackening a used tread belt that needs to later be re-tensioned, place a tape measure along the center of the tread belt and use a pen to make two reference marks spaced exactly **1m** meter apart.
- b. After reassembling the used tread belt, alternately lock down the 2 rear screws (**a**) until the two marks made previously on the tread belt are once again spaced **1 meter** apart.



CAUTION: After completing this procedure, check the centering of the tread belt as instructed in paragraph: 8.3. “Centering and adjusting the belt”.



This procedure is normally carried out after replacing the driving roller or rear roller, or in cases where a used tread-belt cannot be reassembled with the procedure of paragraph: 8.1. “Tensioning a new tread belt”, because the belt is not elastic.

8.3. CENTERING AND ADJUSTING THE BELT

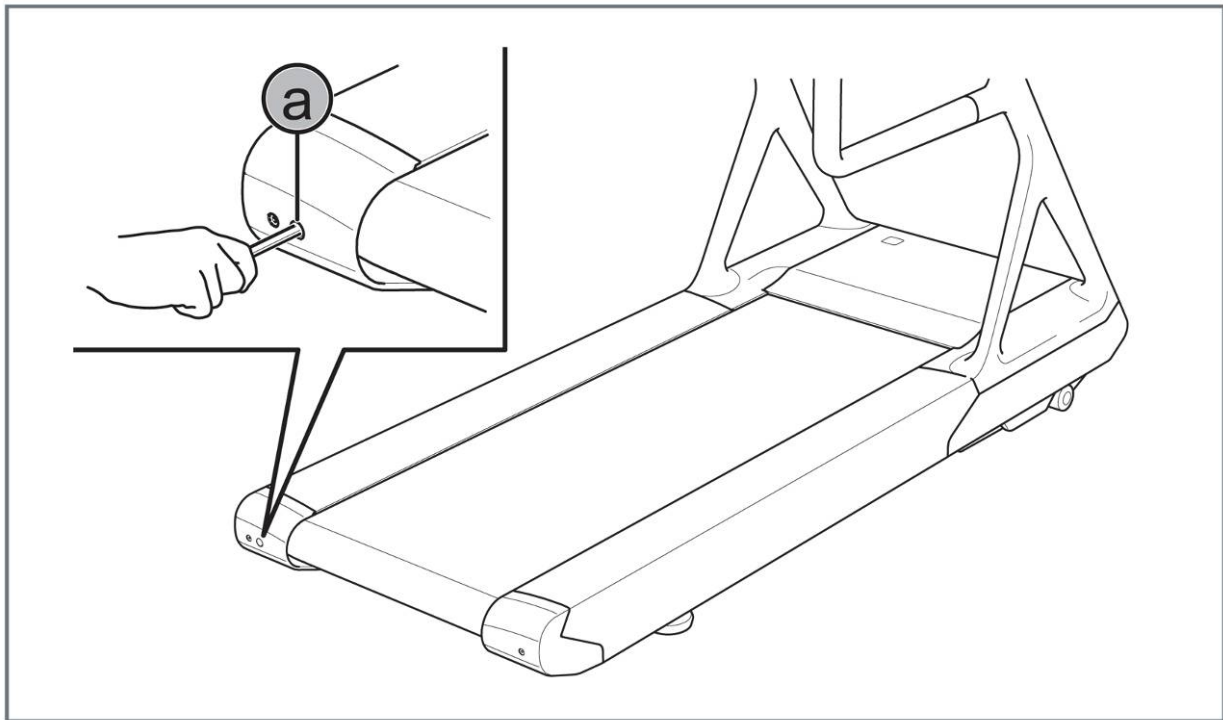


Figure 8.3-1

1. Start the machine at a speed of 10 km/h.
2. Check that the graphics on the tread belt remain equidistant from the edges, correcting any tendency to shift to the right or left exclusively by adjusting the left tension screw (a). Locking down this screw the belt shift 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. ALIGNING THE TREAD – BELT MOTOR DRIVE-BELT

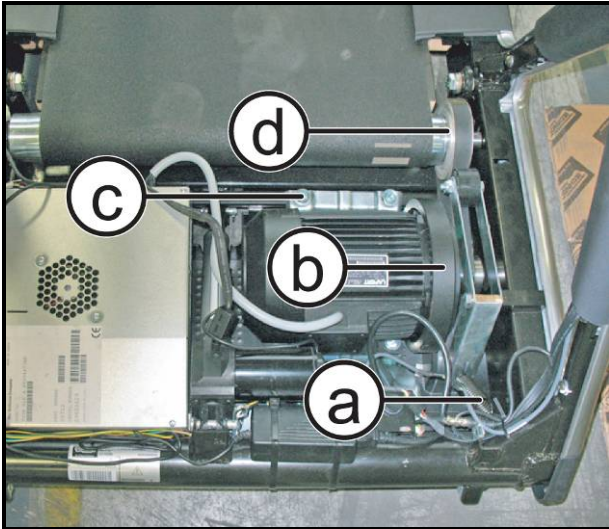


Figure 8.4-1

Carry out the operations up to step (2) of paragraph: 7.10. “Disassembling the motor guard and side uprights”.

1. Remove the dust guard.
2. Release the spring (a) of the belt tensioning mechanism.
3. Align the motor flywheel (b), using the 4 screws (c), with the pulley (d).
4. Align the motor drive-belt by shifting it within the races of the pulley (d).
5. After completing the alignment, re-engage the spring (a) of the tensioning mechanism and lock down the screws (c) of the motor support.

8.5. TRAVEL LIMIT MICROSWITCH POSITION

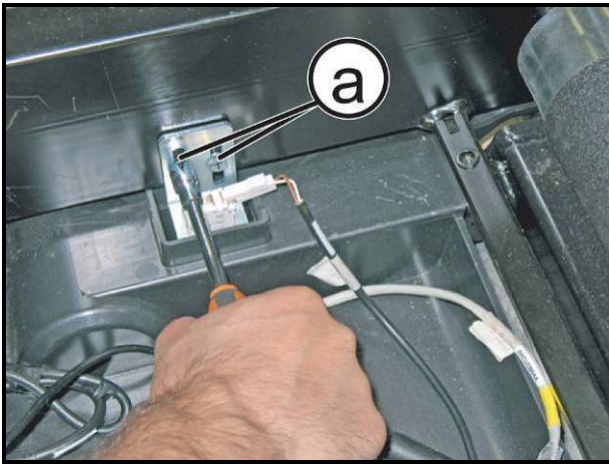


Figure 8.5-1

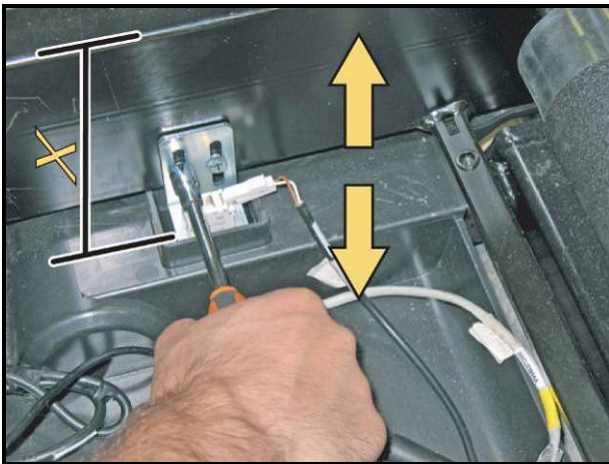


Figure 8.5-2



Adjust the position of the microswitch support as indicated by the arrows, in such a way that it intercepts the carriage frame at the 0% incline position.

1. Unloosen the 2 screws (a) securing the travel limit microswitch support.



The correct distance "X" is approximately 130mm.

1. After making the adjustment, lock down the screws (a) backed off previously.

8.6. THE MACHINE IS NOT FLAT

This problem may be due to the positioning of the machines on a not flat surface.
To level the machine, you may adjust the height of the levelling foot as illustrated below:

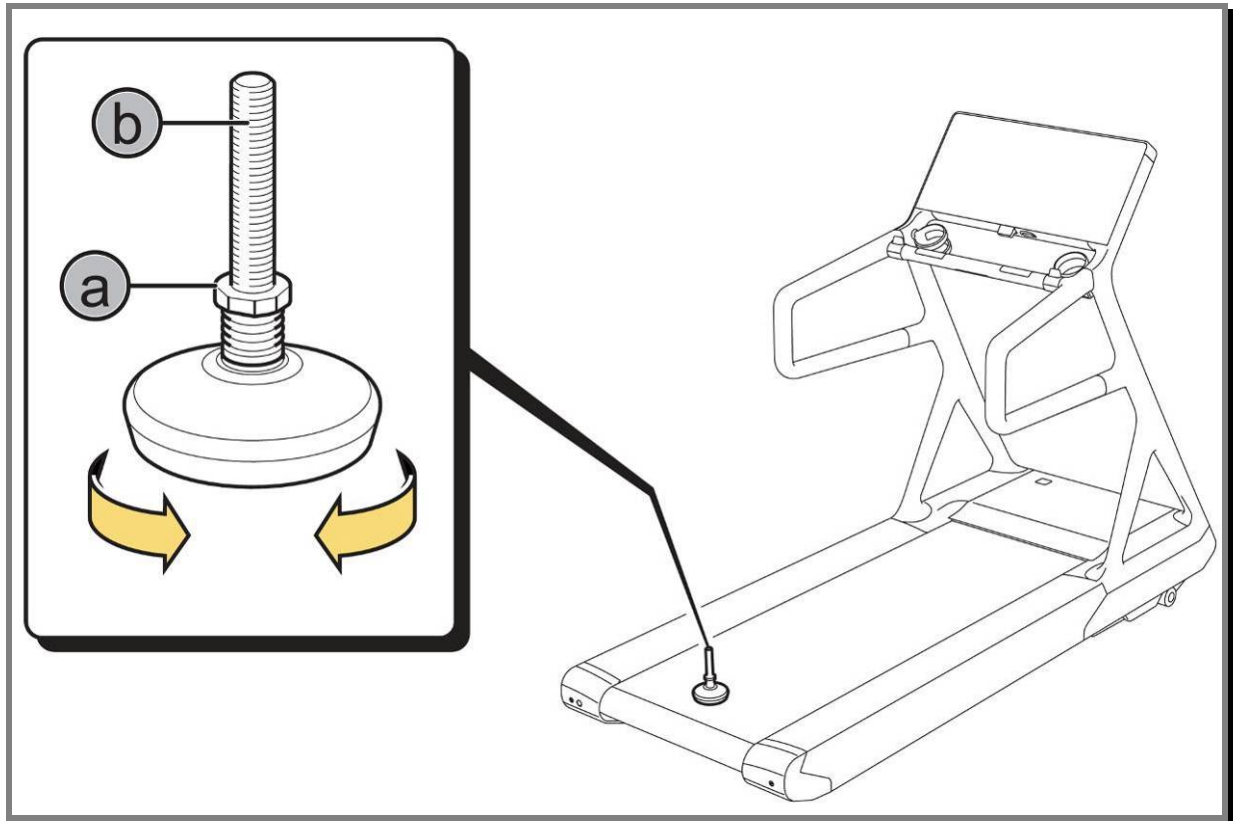


Figure 8.6-1

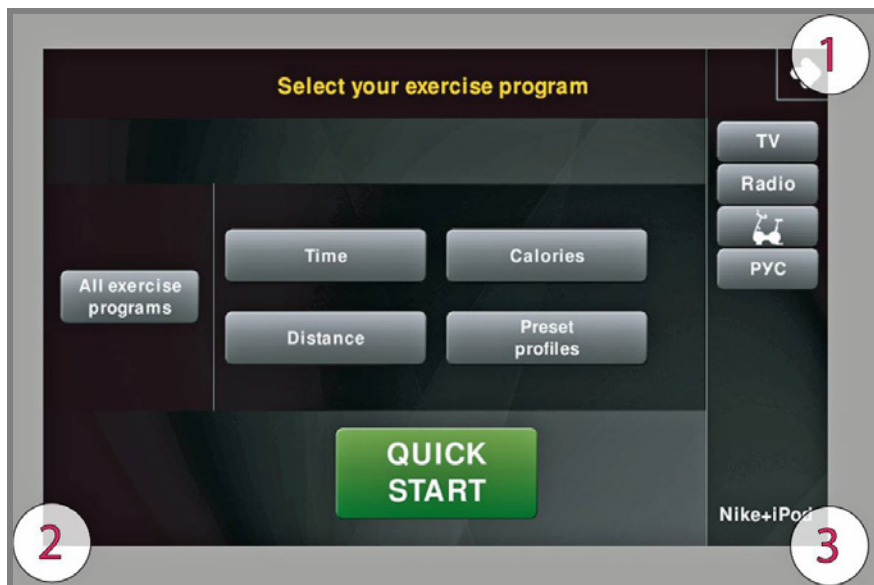
For the levelling adjustment, carry out the operation on the rear LEFT foot, as shown in figure:

1. Loosen the nut **(a)** of fixing.
2. Screw or unscrew the foot **(b)**, to bring the frame in a flat and stable position.
3. At adjustment made, lock down the nut **(a)** again.

9. EQUIPMENT CONFIGURATION

9.1. USER MENU CONFIGURATION

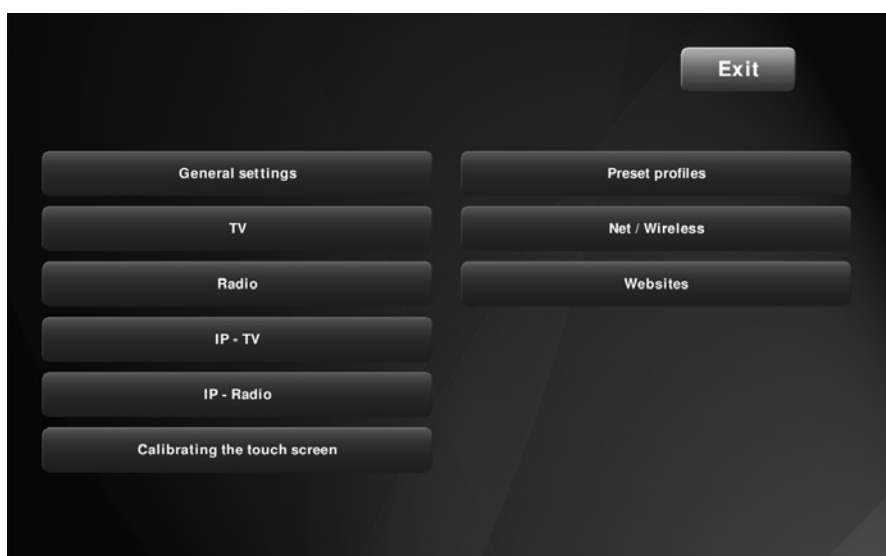
The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence, in Stand-By, as shown in the figure below:



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:

Enter the password **2406** and press the **ENTER** key to confirm or **EXIT** to quit.

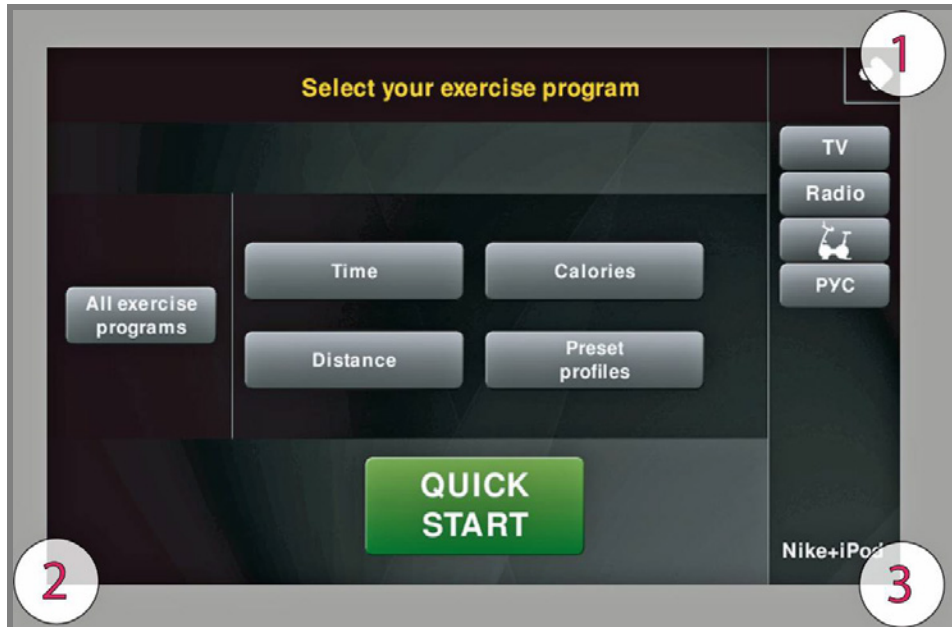
A menu will then appear which will provide access to the following sub-menus:



For the following menu, please refer to the relevant chapter in the VISIO manual.

9.2. SERVICE MENU CONFIGURATION

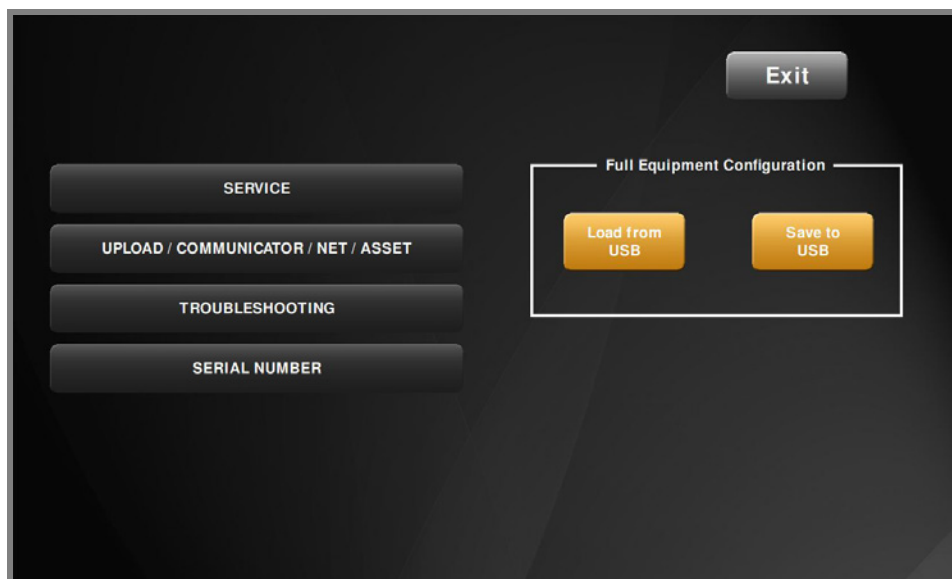
The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence, in Stand-By, as shown in the figure below:



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:

Enter the password **2501** and press the **ENTER** key to confirm or **EXIT** to quit.

A menu will then appear which will provide access to the following sub-menus:



For the following menu, please refer to the relevant chapter in the VISIO manual.

9.2.1. TABLE OF CONFIGURATION PARAMETERS



To correctly display the parameter values, you need to load them from the low kit, using the “Read from low kit” function.



After any changes to the parameter values, you need to save them in the low kit using the “Write to low kit” function.

Display parameter	Unit of measure	Description	Default values
P01	<i>Kmh*10</i>	<i>Default linear speed</i>	8
P02	<i>(Kmh*100)/sec</i>	<i>Default acceleration and deceleration</i>	100
P03	<i>%*2</i>	<i>default slope set point</i>	0
P04	<i>Numerical Constant</i>	<i>PID proportional gain</i>	7
P05	<i>Numerical Constant</i>	<i>PID Integral gain</i>	150
P06	<i>Numerical Constant</i>	<i>S Ramp Type</i>	0
P07	<i>on/off</i>	<i>Flag DC motor encoder signal alarm action</i>	0
P08	<i>10msec</i>	<i>Watchdog serial communication</i>	0
P09	<i>1msec</i>	<i>DC motor encoder error timeout 1 cnt = 100 msec</i>	15
P10	<i>on/off</i>	<i>Flag signal receiving Sw Emergency and not receiving Emergency Hw</i>	0
P11	<i>mm</i>	<i>roll diameter</i>	74
P12	<i>Numerical constant*100</i>	<i>roller diameter</i>	211
P13	<i>on/off</i>	<i>Flag posting warning signal AC motor encoder</i>	0

I.e.

- *P01 = kmh = 8 / 10 is the 0.8kmh of start, (as if the unit was hundreds of meters times).*
- *P02 = 100 means the acceleration expressed in kmh/sec is 100 / 100 = 1 where the 100 is the value of the numerator and the denominator is the default 100 of formula. (cents of kmh/sec)*
- *P03multiplication by two is to take steps to 0.5%, this basically 2 means 1%.*
- *Numerical Constant: P04-P05-P06 is a pure number, multiplicative constant used by the firmware.*
- *P07, P10, P13 is a Boolean flag, yes or not.*
- *P08 is expressed in tens of msec: if P08 = 100 will be a second.*
- *P12 = 211 means that the transmission ratios is 2.11.*

9.2.2. REGISTER ADDR.

This button allows to select a specific parameter of the inverter, which then can be read using the function described below: “Read from low kit”.



☛ On the Display will appear a Numeric Keypad which allows to enter and/or modify the numerical value of the parameter. Press CLEAR to delete the old value and insert the new one, then press CONFIRM to save it.

The parameters are listed in tables at paragraph: 9.2.3. “Inverter parameters”.

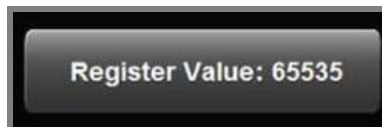
9.2.2.1. Read from low kit

This button allows to read from Low Kit the value of the parameter set previously and displayed in the display.



9.2.2.2. Register Value

This button allows to modify the value of the parameters. Press the button:



☛ On the Display will appear a Numeric Keypad which allows to enter and/or modify the numerical value of the parameter. Press CLEAR to delete the old value and insert the new one, then press CONFIRM to save it.

The parameters are listed in the table of paragraph: 9.2.3. “Inverter parameters”.



After any changes to the parameter values, you need to save them in the low kit using the “Write to low kit” function.

9.2.2.3. Write to low kit.

To write the values of the currently displayed parameters to the low kit, press the button:



Allows to write on the ALE inverter register, in case you have changed the data.

9.2.3. INVERTER PARAMETERS

Menu	Code	Ipa	Descrizione	Unità Keypad	Default Keypad	Default Seriale
M_d	0	1	"Output frequency"	Hz	0.00	0
M_d	1	2	"Frequency ref"	Hz	0.00	0
M_d	2	3	"Output current"	A	0.0	0
M_d	3	4	"Output voltage"	V	0	0
M_d	4	5	"DC link voltage"	V	400	400
M_d	5	6	"Power factor"		1.00	100
M_d	6	7	"Power [kW]"	kW	0.00	0
M_d	20	57	"Actual speed"	Km/h	0.0	0
M_d	21	58	"Actual incline user"	%*2	0	0
M_d	22	59	"Actual ENC1 pos"	cnt	0	0
M_d	23	60	"Crossed distance"	Km/h	0.00	0
M_d	25	62	"Flag status"		0b	0
M_d	26	63	"Actual ENC2 pos"	cnt	0	0
M_d	27	64	"Actual speed from Fenc"	Km/h	0.0	0
M_d	30	70	"Reserved"			
M_d	31	72	"TimeOut Ck Pr"	sec	0.0	0
M_d	32	73	"Conter Ck Pr"		0	0
M_d	51	11	"Drive OL"	%	0.0	0
M_d	52	12	"Motor OL"	%	0.0	0
M_d	53	13	"Brake res OL"	%	0.0	0
M_d	100	14	"Dig inp status"		0b	0
M_d	150	20	"Dig out status"		0b	0
M_d	151	21	"Drv dig out sta"		0b	0
M_d	152	22	"Vir dig out sta"		0b	0
M_d	300	35	"EncPulse/Sample"		0.000	0
M_d	301	36	"Encoder freq"	Hz	0.00	0
M_d	302	37	"Encoder speed"	Hz	0.00	0
M_d	400	41	"PID reference"	%	0.0	0
M_d	401	42	"PID feedback"	%	0.0	0
M_d	402	43	"PID error"	%	0.0	0
M_d	403	44	"PID integr comp"	%	0.0	0
M_d	404	45	"PID output"	%	0.0	0
M_d	800	46	"Error 1"		0	0
M_d	801	47	"Error 2"		0	0
M_d	802	48	"Error 3"		0	0
M_d	803	49	"Error 4"		0	0
M_d	950	50	"Drive rated cur"	A	10.0	100
M_d	951	51	"SW version 1\2"		02.00h	200h
M_d	952	52	"SW version 1\2"		00.80h	80h
M_d	957	71	"Drive type"		2	2

Continued on following page ...

M_I	0	100	"Dig input 1 cfg "		0	0
M_I	100	112	"Dig output 1 cfg"		3	3
M_I	420	147	"Out by serial en"		0	0
M_I	500	150	"Encoder enable "		1	1
M_I	501	151	"Encoder ppr "		720	720
M_I	502	152	"Enc channels cfg"		1	1
M_I	503	153	"Enc spd mul fact"		1.00	100
M_I	504	154	"Enc update time "	sec	0.0	0
M_I	603	158	"Ser answer delay"	msec	1	1
M_I	604	159	"Serial timeout "	Sec	0.00	0
M_I	605	160	"En timeout alm "		1	1

M_F	20	305	"Max ref freq "	Hz	115.0	1150
M_F	21	306	"Min ref freq "	Hz	0.0	0
M_F	201	329	"Acc time 1 "	sec	30.00	3000
M_F	202	330	"Dec time 1 "	Sec	30.00	3000
M_F	250	337	"Ramp S-shape "	Sec	0.0	0

Continued on following page ...

M_P	20	404	"Mains voltage "	V	220	220
M_P	21	405	"Mains frequency "	Hz	60	60
M_P	40	406	"Motor rated curr"	A	7.0	70
M_P	41	407	"Motor pole pairs"		2	2
M_P	42	408	"Motor power fact"		0.78	78
M_P	43	409	"Motor stator R "	Ohm	1.00	100
M_P	44	410	"Motor cooling "		1	1
M_P	45	411	"Motor thermal K "	Min	30	30
M_P	61	413	"Max out voltage "	V	230	230
M_P	62	414	"Base frequency "	Hz	60.0	600
M_P	100	419	"Slip compensat "	%	90	90
M_P	101	420	"Slip comp filter"	sec	0.3	3
M_P	120	421	"Manual boost [%]"	%	6.0	60
M_P	122	423	"Auto boost en "		1	1
M_P	140	424	"Magn curr gain "	%	3.0	30
M_P	160	425	"Osc damping gain"	%	10	10
M_P	180	426	"SW clamp enable "		1	1
M_P	260	444	"Motor OL prot en"		1	1
M_P	261	491	"Inv Prot Mode "		1	1
M_P	280	445	"Brake res OL en "		1	1
M_P	281	446	"Brake res value "	Ohm	150	150
M_P	282	447	"Brake res power "	Kw	0.05	5
M_P	283	448	"Br res thermal K"	sec	160	160
M_P	340	462	"Undervoltage thr"	%	50	50
M_P	460	478	"Const speed tol "	Hz	0.5	5
M_P	461	479	"Const speed dly "	Hz	0.1	1
M_P	500	482	"Switching freq "		9	9
M_P	540	485	"Out Vlt auto adj"		0	0
M_P	560	486	"Deadtime cmp lev"		8	8
M_P	561	487	"Deadtime cmp slp"		35	35

M_C	0	800	"Save parameters "		Off	0
M_C	1	801	"Recall param "		Off	0
M_C	2	802	"Load default "		Off	0
M_C	20	803	"Alarm clear "		Off	0
M_C	200	807	"Reset AC Flag "		Off	0
M_C	201	808	"Reset DC Flag "		Off	0

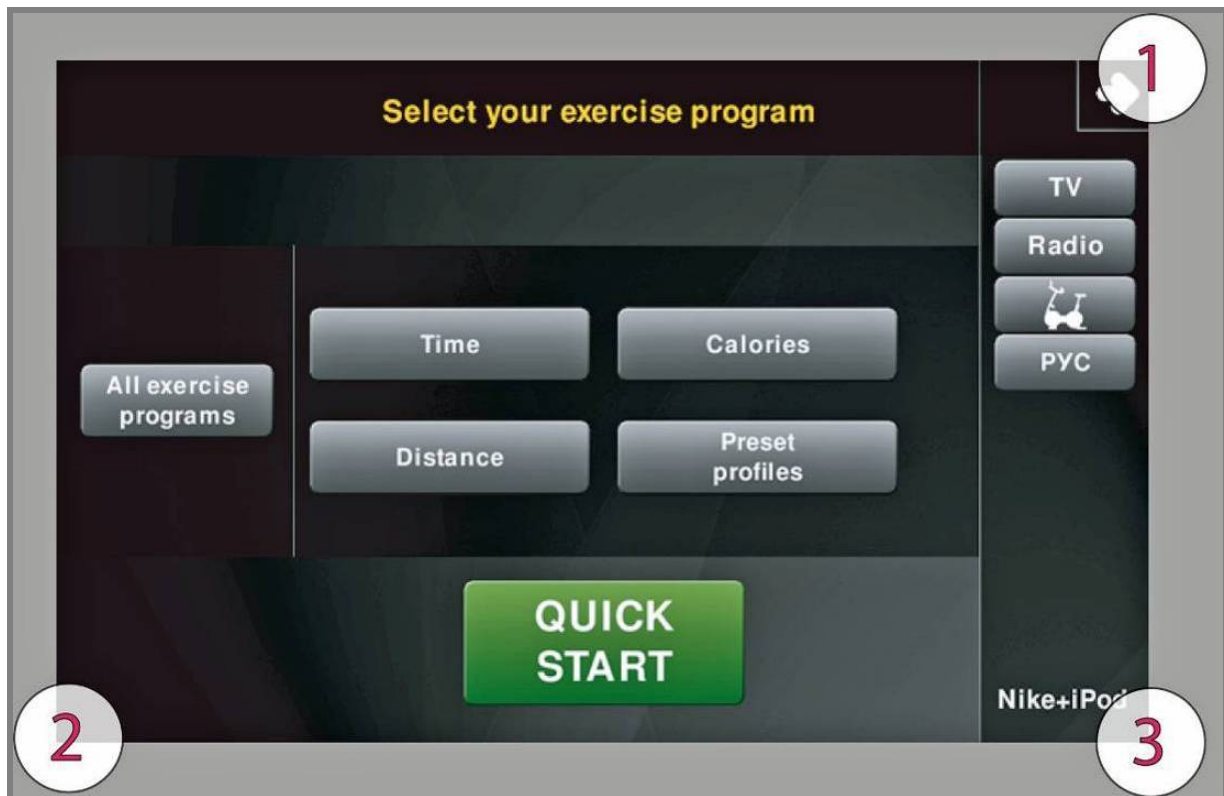
Continued on following page ...

M_A	0	1200	"PID mode "		1	1
M_A	50	1209	"PID Prop gain 1 "		0.07	7
M_A	51	1210	"PID Int tconst 1"		1.50	150
M_A	56	1215	"PID high limit "	%	8.0	80
M_A	57	1216	"PID low limit "	%	-8.0	-80
M_A	100	1219	"Set Linear speed"	Km/h	0.0	0
M_A	101	1220	"Set Acc Dec "	Km/h/sec	1.00	100
M_A	102	1221	"Set Incline ref "	%*2	0	0
M_A	105	1222	"Def Linear speed"	Km/h	0.8	8
M_A	106	1223	"Def Acc Dec "	Km/h/sec	1.00	100
M_A	107	1224	"Def Incline ref "	%*2	0	0
M_A	110	1225	"Pulley Ratio "		2.00	200
M_A	111	1226	"Roller Diameter "	mm	91	91
M_A	115	1227	"DCMot EncTimeout"	Msec	100	100
M_A	116	1228	"Fan command dly "	sec	30	30
M_A	117	1229	"ACMot EncToller."		50	50
M_A	118	1230	"Check RunnerBand"	%	10	10
M_A	119	1231	"Check RunnerSpd "	Km/h	5.0	50
M_A	120	1232	"Curr clamp thr "	%	200	200
M_A	121	1233	"Check RunnerDly "	sec	60	60

Table9-1

10. UPDATING THE SW

The procedure is activated by pressing the top right-hand corner, the bottom left-hand corner and the bottom right-hand corner of the screen in that sequence when the equipment is in Stand-By, as shown in the figure below.



A new display will appear from which you can gain access to the various configuration menus, by entering the password on the number keyboard:

In order to access the menu, enter the password **2502** and press the **ENTER** key in order to confirm, **ESCI** in order to quit.



For the following menu, please refer to the relevant chapter in the VISIO manual.

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11. 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 type of service and to who they need to be performed:

- **ORDINARY maintenance operation:**
The ORDINARY maintenance operations can be performed by the club manager. They do not require any kind of technical knowledge, they only consist of simple external cleaning, for the purposes of general hygiene.
- **EXTRAORDINARY maintenance operation:**
*The EXTRAORDINARY maintenance operations have to be performed by a **TG qualified technician** specially trained by Technogym. They consist of the set up, the start up, all the inspections and service operations and the adjustments the machine can need to guarantee a good state of wear and the proper functioning conditions.*

11.1. ORDINARY MAINTENANCE OPERATIONS


11.1.1. WORKING CONDITIONS SET UP (DAILY)

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

11.1.2. EXTERNAL CLEANING OPERATIONS (DAILY)


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.**

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

11.1.3. INTERNAL CLEANING OPERATIONS (MONTHLY)

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.

 **ATTENTION: 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.

11.1.4. CHECKING THE “EMERGENCY STOP” (MONTHLY)

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

11.1.5. COMPLETE OPERATION (SIX-MENTHLY)

1. To check that the switch, the tool maintains the reset procedure
2. To check the correct operation of the machine:
 - *get on the machine;*
 - *press the “Quick Start” key to begin the exercise and check that the tread belt motor starts;*
 - *press the right Joystick and check that the tread belt speed varies accordingly;*
 - *press the left Joystick 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.*

11.2. EXTRA-ORDINARY MAINTENANCE OPERATIONS

11.2.1. 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 variations in the heart rate.

11.2.2. 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.

11.2.3. 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.

11.2.4. 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.*
3. Repair and/or replace any non-conforming wires.
4. Check the condition of the fuses using a tester.

11.2.5. CHECKING THE STATE OF WEAR OF 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.

11.2.6. CHECKING THE WEAR OF THE MOTOR 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.

11.2.7. CHECKING THE STATE OF WEAR OF THE DRIVING 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.

11.2.8. 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.

11.2.9. 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.

11.2.10. 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. Replace if there are evident signs of wear.

12. APPENDIX

12.1. MENU PASSWORD TABLE

The configuration menus available and their corresponding access passwords are shown below:


PASSWORD LIST				
Assistenza Service	2501 VisioWEB	2501	Configurazione tecnica; Technical configuration;	LED VISIO
		2502	Upload/ Network page;	VISIO
		2503	Scrivi il Serial Number; Write Serial Number;	VISIO
		2512	Accesso ambiente Windows; Windows screen;	VISIO
		2612	Selezione tipo macchina; Machine type selection;	VISIO
		2411	Troubleshooting;	LED VISIO
Utente User	2406 VisioWEB	2404	Configurazione IP-TV; IP-TV configuration;	VISIO
		2405	Configurazione IP- Radio; IP-Radio configuration;	VISIO
		2406	Configurazione Utente + letture Serial Number; User Configuration + Serial number reading;	LED VISIO
		2407	Sintonizzazione canali Analogici e Digitalli TV; Analog and Digital TV channels tuning;	VISIO
		2408	Sintonizzazione canali Analogici e Digitalli Radio; Analog and Digital Radio channels tuning;	VISIO
		2409	Calibrazione Touch Screen; Touch Screen calibration;	VISIO
		2412	Menù personalizzazione profile utente; Training profile menù (to add and customize personal profiles);	LED VISIO
		2413	Configurazione Network; Network configuration;	VISIO
		-	Configurazione VISIOWEB Bookmarks; VISIOWEB Bookmarks configuration;	-

 The menus **NOT** detailed in this manual, are described in the VISIO/VISIOWEB manual, since they refer to the device on the machine.

12.2. REQUIRED TOOLS

The following tools are required for carrying out the various disassembly, adjustment and maintenance action on the machine:

- *Small Phillips screwdriver;*
- *Medium Phillips screwdriver;*
- *Big Phillips screwdriver;*
- *Small flat Phillips screwdriver;*
- *Medium flat Phillips screwdriver;*
- *8mm wrench;*
- *10mm wrench;*
- *13mm wrench;*
- *17mm wrench;*
- *3mm Allen-T wrench;*
- *4mm Allen -T wrench;*
- *5mm Allen -T wrench;*
- *6mm Allen -T wrench;*
- *8mm Allen -T wrench;*
- *Torque wrench,*
- *Scissors.*

 **You can order a complete set of hexagonal wrenches consisting of 7 pieces: 2, 2.5, 3, 4, 5, 6 and 8 mm. The code to be used is R0003677AA.**

- *Excite Test box (cod.**H0003180AA-UK**).*



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