Service Guide 2009

Treadmills

BREMSHEY SPORT®
Fit for Life

TUNTURI®

PLIANT®
HEALTH- & FITNESSEQUIPMENT

BREMSHEY SPORT®

Pliant Delta and Sigma

Bremshey Path & Tour

Service Guide

1.1 SERVICE MENUS

1.1.1 Engineering Mode

1 Enter the engineering mode after switching the treadmill POWER ON by pushing first „SELECT“ and then „SPEED + and hold buttons pressed simultaneously approximately 5 seconds

2 **Sigma**. The SPEED and DISTANCE windows shows the treadmill software version numbers, CALORIES and INCLINE/PULSE windows show the software design year and TIME window blank

1 **Delta**. The SPEED window shows the treadmill software version number, TIME window shows the software design information

2 Press „ENTER“ to show LDU version number (Display control software)

3 Press „ENTER“ to show ISP version number

4 Press „ENTER“ to enter **KM/MILE switch mode**, 1 for KM, 0 for MILE Switch between the KM or MILE setting by pressing SPEED +/-or ELEVATION +/-** Sigma will toggle between 0 and 1 – Delta will not. Delta + = 1, -= 0

5 Press „ENTER“ to show **total distance**

6 Press „ENTER“ to show **total usage hours**

7 Press „ENTER“ to return to the normal mode

1.1.2 Testing Mode

1 Enter the testing mode after switching the treadmill POWER ON by pushing first „SELECT“ and then „START“ and hold buttons pressed simultaneously

2 LED scanning mode for verifying display functionality

3 Press „ENTER“ to scan DATA LINES to verify display functionality

4 Press „ENTER“ to scan SACN LINES to verify display functionality

5 Press „ENTER“ to scan LED“ s to verify display functionality

6 After pressing „ENTER“ the INCLINE/PULSE window shows “test” and the keypad functionality can be tested (the value displayed changes when a button is being pressed)

6.**Delta** After pressing „ENTER“ the INCLINE/PULSE window shows “P” and the heart rate functionality can be tested (the value displayed changes when the pulse increases)

7. Press „ENTER“ to enter IO mode

Sigma:(INCLINE/PULSE display shows lift motor potentiometer value, SPEED reads speed from speed sensor)

Delta:(TIME display shows lift motor potentiometer value, SPEED reads speed from speed sensor)

Press ELEVATION +/-to vary elevation position and to test lift relay. This can also be used to lower lift motor if stuck in elevated position. **CAUTION**: DO NOT exceed potentiometer ranges as shown in Table 1 . Remove Safety Key from position before exceeding range.

Press „START“ to test lower board relay (a “click” sound)
Press „ENTER“ to repeat above test or remove safety key and replace to return to the normal mode

Table 1 Lift motor potentiometer value table for Pliant Centauri Delta and Sigma

Elevation	Lift Motor I/O
0%	100 + 30
1%	160 + 30
2%	280 + 30
3%	380 + 30
4%	500 + 30
5%	630 + 30
6%	800 + 30
7%	970 + 30
8%	1170 + 30
9%	1380 + 30
10%	1620 + 30

The values in Table 1 are reference information for trouble shooting only.

Lift motor calibration is needed if any of the following has taken place: The lift motor has been removed from the frame The actual and the displayed elevation angle does not match

-
-

1.1.2 Manual Lift motor calibration

The lift motor calibration is done manually by following the following steps:

1 Drive the lift motor to 0% from user interface (inclination display must be 0%)
2 Switch off the treadmill and unplug the power cable
3 Remove motor cover
4 Fold up the running deck
5 Loosen two screws (A) attaching the lift motor nut (B) to the incline frame (Figure 1)
6 Adjust the lift motor nut (B) so that there is 9 mm gap between the upper

end of the nut and the lift motor frame (Figure 2)
7 Tighten screws and verify correct elevation by measuring (Figure 3)

Figure 1 Loosen attaching screws at frame Figure 2 Adjusting Lift Motor to 0% position

10%: 10%: 70 + 10mm 195 + 10mm

Figure(s) 3 Measuring correct lift motor positions

3 ERROR TEXTS

To facilitate the maintenance, error codes on display refer to internally found malfunctions; error codes as such aren't malfunctions, they merely point to observed problem. As a general rule, when a source of malfunction is located, it should not be repaired, but instead replaced with a new component. Error texts can be removed from the display by disconnecting the treadmill power cable for about 10 seconds. When an error text occurs, the first thing to do, if not any obvious visible reasons found, is to try to repeat it after being switched off and on again.

E1

Instruction in the owner's manual:

> **"Speed sensor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The error will appear if the upper board cannot receive pulses from the speed sensor for 10 seconds.

Possible reasons:

SII

-
-
-
-
-

Speed sensor not properly assembled, the distance between the magnet and the speed sensor
should be less than 3mm.
Speed sensor cable disconnected Meter cable has a poor connection at some point

Magnet missing from the front roller pulley Front roller not rotating at all due to loose drive belt
Check the distance between the speed sensor and the flywheel and ensure that the speed sensor is properly attached to the motor frame. Check also speed sensor connections.

Error can be reset also by re-inserting the safety key.

E6

Instruction in the owner's manual:

" Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."

The error message appears when voltage is being supplied to the lift motor but it doesn’t move.

Possible reasons:

-
-

Lift motor power cable disconnected Lift motor electronically damaged preventing the movement

Error can be reset by removing and reattaching safety key.

E7

Instruction in the owner's manual:

"Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."

The values the lift motor potentiometer is sending are not within the preset limits. Check the potentiometer I/O value from the service menu (Chapter 1.1.2) and compare it to minimum and maximum reference values in Table 1. The potentiometer value is also displayed on the user interface when “error 7” appears.

If the readout from the potentiometer is **1** the software is not picking any signal from the potentiometer

Possible reasons:

Lift motor rotation sensor (potentiometer) cable disconnected Lift motor rotation sensor has poor internal contact thus providing incorrect values The second connection cable between user interface and lower board disconnected The potentiometer has lost its calibration and rotated to minimum

If the readout from the potentiometer has lost its calibration setting and it differs from reference values adjust potentiometer (Figure 5) to obtain correct value.

Figure 5 Lift motor potentiometer adjustment and how it affects on readout value

If the potentiometer has lost its position it can be lifted up after removing two attachment screws. Turn the potentiometer shaft to obtain correct setting and place the potentiometer back to the lift motor. To ensure that potentiometer maintains correct calibration setting a small amount of glue should be added to shaft before inserting it back to its counterpart.

Error can be reset also by re-inserting the safety key.

VER. 1.00

Service Manual

TREADLINE

Control **Trail**
Pacer **Ambition**

1 FOREWORD

This Service Manual contains instructions and advice on service procedures for the Bremshey Treadline treadmills Ambition, Trail, Pacer and Control.

The primary intention of this Service Manual is to enhance the reader's knowledge of the structures of the treadmills. Notice that in case of a fault or a malfunction, the component or unit of components in question, and especially the electronic components, are not to be repaired, instead they must be replaced with a new component.

The components of the product frame and their locations with the reference and spare part numbers can best be found in the exploded parts diagrams. Replacing the components does not require special tools, but assumes a certain level of technical competence and familiarity with basic hand tools.

NB! Always when servicing the treadmill be sure that the power has been switch off and the main cable is plugged off the power board. Big capacitors on the control board might retain high voltage level even for several hours after the unit has been plugged off from the power outlet.

VERSION HISTORY

Date	Version	Author	Change description
2006-08-7	1.00	PVI	Electronics, error codes, appendices, TOC – first public version available on the Extranet

2 ELECTRONICS

The main electrical components are user interface (B02), power board (B48), motor (B18), lift motor (B28) speed sensor (B30), and power cable (B27).

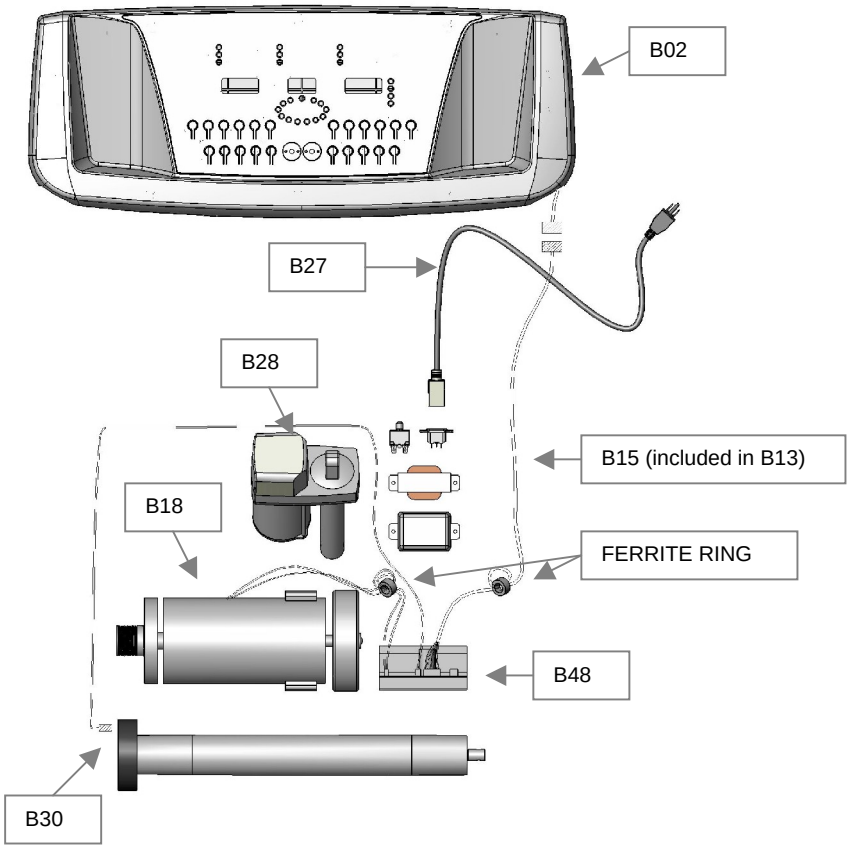


Figure 1 Eelectrical components and their connections (numbering refers to spare part diagram)

2.1 SERVICE MENUS

2.1.1 Engineering Mode

1. Enter the engineering mode after switching the treadmill POWER ON by pushing first ‘SELECT’ and then ‘ENTER’ and hold buttons pressed simultaneously
2. The SPEED window shows the treadmill software version number, TIME window shows the software design year and DISTANCE window shows the design date in “MM.DD” format
3. Press ‘ENTER’ to show LDU version number (Display control software)

4. Press ‘ENTER’ to show ISP version number
5. Press ‘ENTER’ to enter **KM/MILE switch mode**, 1 for KM, 0 for MILE
   - Switch between the KM or MILE setting by pressing SPEED +/- or ELEVATION +/-
6. Press ‘ENTER’ to show **total distance**
7. Press ‘ENTER’ to show **total usage hours**
8. Press ‘ENTER’ to return to the normal mode

2.1.2 Testing Mode

1. Enter the testing mode after switching the treadmill POWER ON by pushing first ‘SELECT’ and then ‘SPEED DOWN’ and hold buttons pressed simultaneously
2. LED scanning mode for verifying display functionality
3. Press ‘ENTER’ to scan DATA LINES to verify display functionality
4. Press ‘ENTER’ to scan SACN LINES to verify display functionality
5. Press ‘ENTER’ to scan LED’s to verify display functionality
6. After pressing ‘ENTER’ the TIME window shows “test” and the keypad functionality can be tested (the value displayed changes when a button is being pressed)
7. Press ‘ENTER’ to enter IO mode (TIME display shows lift motor potentiometer value, SPEED reads speed from speed sensor and DISTANCE shows heart rate pulse) See picture below.

- Press ‘START’ to test lower board relay (a “click” sound) and then press ‘ELEVATION UP’ for 2 seconds to increase the elevation to 8%. Press ‘ELEVATION DOWN’ to decrease the elevation to minimum percentage 0%
- Press ‘SPEED UP’ to increase speed value and ‘SPEED DOWN’ to decrease speed value.

Press ‘ENTER’ to repeat above test or ‘SELECT’ and ‘ SPEED DOWN’ buttons simultaneously to return to the normal mode

2.1.3 Lift motor calibration

The lift motor calibration is done manually by following the following steps:

1. Drive the lift motor to 0% from user interface (inclination display must be 0%)
2. Switch off the treadmill and unplug the power cable
3. Remove motor cover
4. Fold up the running deck
5. Loosen two screws (A) attaching the lift motor nut (B) to the incline frame (Figure 2)
6. Adjust the lift motor nut (B) so that there is 9 mm gap between the upper end of the nut and the lift motor frame (Figure 2)
7. Tighten the screws (A) and verify correct elevation by measuring (Figure 3)

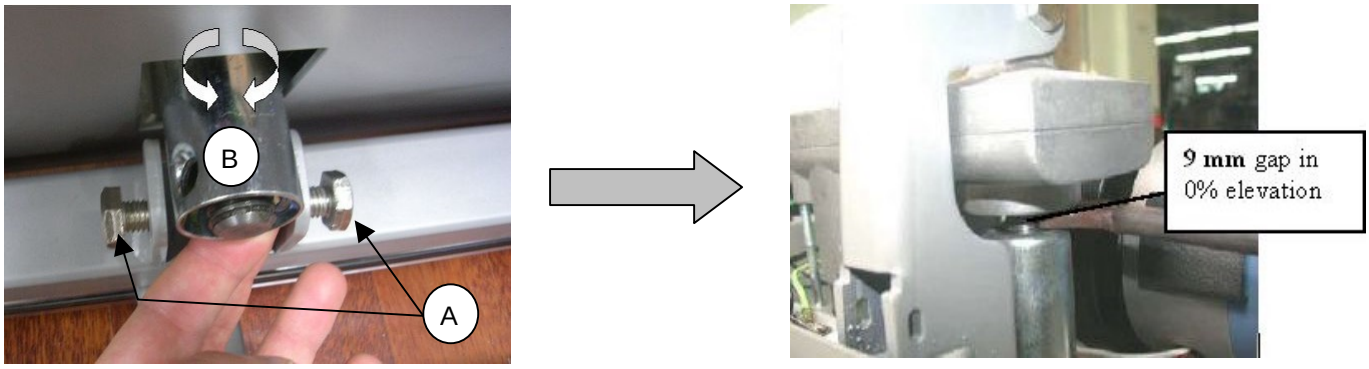


Figure 2 Adjusting lift motor to 0% position

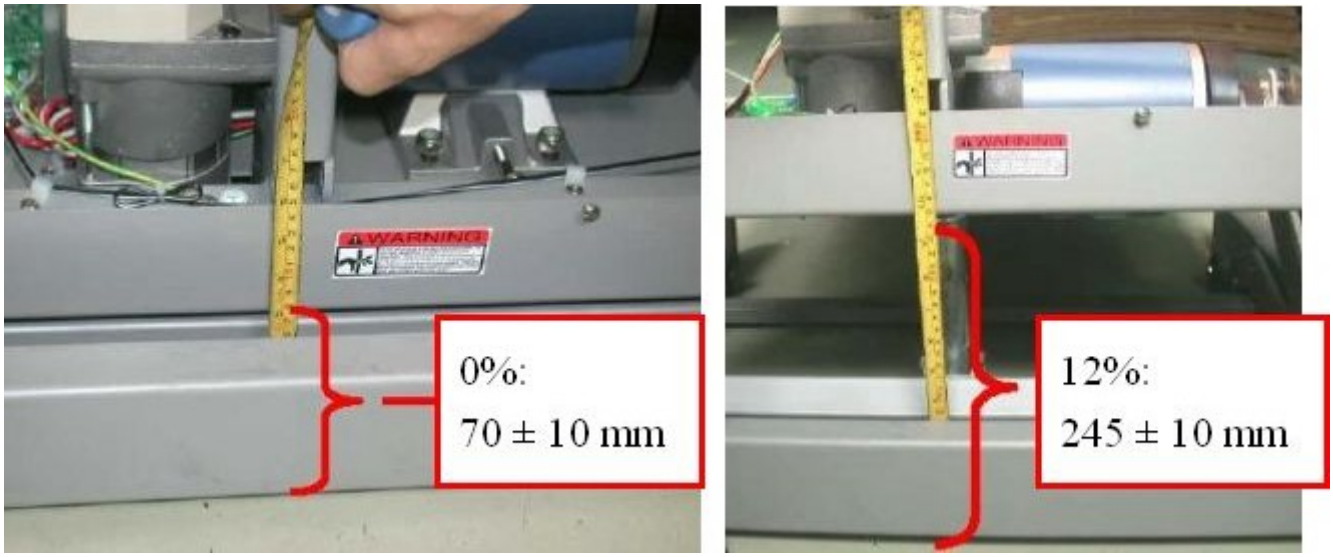


Figure 3 Measuring correct lift motor positions

Lift motor calibration is needed if any of the following has taken place:

- The lift motor has been removed from the frame
- The actual and the displayed elevation angle doesn't match

Table 1 Lift motor potentiometer value table

Elevation	Lift motor I/O
0 %	90 ± 30 (1,1 ± 0,1 kΩ)
1 %	170 ± 30
2 %	240 ± 30
3 %	320 ± 30
4 %	400 ± 30
5 %	490 ± 30
6 %	590 ± 30
7 %	700 ± 30
8 %	810 ± 30
9 %	940 ± 30
10 %	1090 ± 30
11 %	1240 ± 30
12 %	1420 ± 30 (8,54 ± 0,1 kΩ)

The values in the Table 1 are reference information for troubleshooting only. Resistance is measured from black and white wires (see picture below)

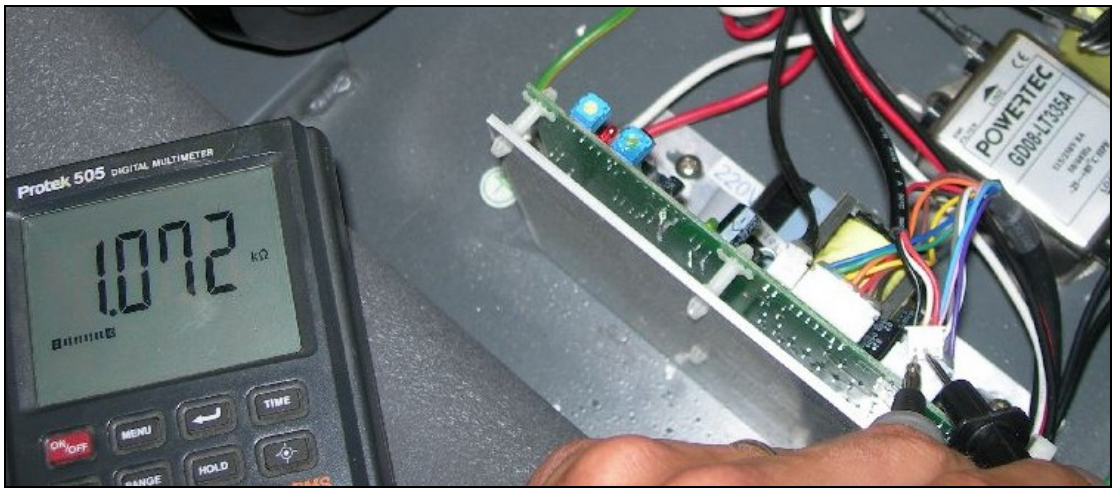


Figure 4 The lift motor potentiometer resistance at 0% inclination (measurement between black and white wire)

3 ERROR TEXTS

To facilitate the maintenance, error codes on display refer to internally found malfunctions; error codes as such aren't malfunctions, they merely point to observed problem. As a general rule, when a source of malfunction is located, it should not be repaired, but instead replaced with a new component. Error texts can be removed from the display by disconnecting the treadmill power cable for about 10 seconds.

When an error text occurs, the first thing to do, if not any obvious visible reasons found, is to try to repeat it after being switched off and on again.

E1

Instruction in the owner's manual:

> **"Speed sensor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The error will appear if the upper board can not receive pulses from the speed sensor for 10 seconds.

Possible reasons:
- Speed sensor not properly assembled, the distance between the magnet and the speed sensor should be less than 3mm.
- Speed sensor cable disconnected
- Meter cable has a poor connection at some point
- Magnet missing from the front roller pulley
- Front roller not rotating at all due to loose drive belt

Check the distance between the speed sensor and the flywheel and ensure that the speed sensor is properly attached to the motor frame. Check also speed sensor connections.

Error can be reset also by re-inserting the safety key.

E6

Instruction in the owner's manual:

> **" Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The error message appears when voltage is being supplied to the lift motor but it doesn’t move.

Possible reasons:
- Lift motor power cable disconnected
- Lift motor electronically damaged preventing the movement

Error can be reset only by disconnecting the power cable.

E7

Instruction in the owner's manual:

> **"Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The values the lift motor potentiometer is sending are not within the preset limits. Check the potentiometer I/O value from the service menu (Chapter 2.1.2) and compare it to minimum and maximum reference values in chapter 2.1.3. The potentiometer value is also displayed on the user interface when “error 7” appears.

If the readout from the potentiometer is **1** the software is not picking any signal from the potentiometer
Possible reasons:

- Lift motor rotation sensor (potentiometer) cable disconnected
- Lift motor rotation sensor has poor internal contact thus providing incorrect values
- The second connection cable between user interface and lower board disconnected
- The potentiometer has lost its calibration and rotated to minimum

If the readout from the potentiometer has lost its calibration setting and it differs from reference values adjust potentiometer (Figure 5) to obtain correct value.

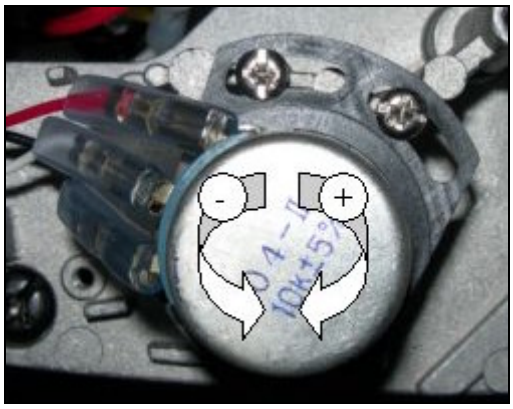


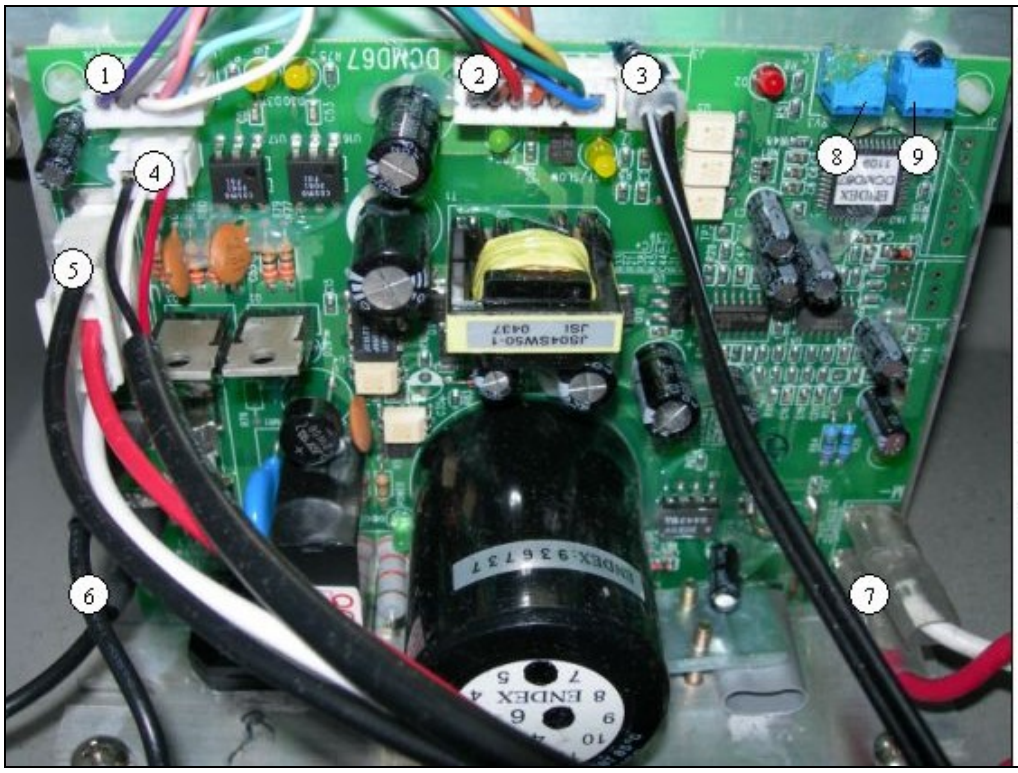
Figure 5 Lift motor potentiometer adjustment and how it affects on readout value

If the potentiometer has lost its position it can be lifted up after removing two attachment screws. Turn the potentiometer shaft to obtain correct setting and place the potentiometer back to the lift motor. To ensure that potentiometer maintains correct calibration setting a small amount of glue should be added to shaft before inserting it back to its counterpart.

Error can be reset also by re-inserting the safety key.

4 APPENDICES

1. LOWER BOARD AND CONNECTOR LOCATIONS



Connectors

1. User interface
2. User Interface #2
3. Speed sensor
4. Lift motor position (readout from potentiometer)
5. Lift motor power, VAC
6. Power IN, VAC
7. Motor power, VDC

Components

8. Adjustment of current supplied to the motor [torque]
9. Adjustment of voltage supplied to the motor [speed]

Figure 6 Lower board connectors and components

2. TECHNICAL DATA

Control

Length (storage position) ……190 cm (82 cm)
Height (storage position) .....144 cm (186 cm)
Width ..... 86 cm
Weight ..... 99 kg
Running surface ..... 51 x 141 cm
Speed ..... 0.8-20.0 km/h
Incline range .....0-12 %
Motor..... 3.0 HP

Pacer

Length (storage position) ……190 cm (82 cm)
Height (storage position) .....144 cm (186 cm)
Width ..... 86 cm
Weight ..... 99 kg
Running surface ..... 51 x 141 cm

Speed ..... 0.8-20.0 km/h
Incline range ..... 0-12 %
Motor..... 3.0 HP

Trail
Length (storage position) ..... 183 cm (82 cm)
Height (storage position) ..... 144 cm (186 cm)
Width ..... 82 cm
Weight ..... 94 kg
Running surface ..... 48 x 134 cm
Speed ..... 0.8-18 km/h
Incline range ..... 0-12 %
Motor..... 2.5 HP

Ambition
Length (storage position) ..... NA
Height (storage position) ..... NA
Width ..... NA
Weight ..... NA
Running surface ..... 51 x 135 cm / 20” x 53”
Speed ..... 0.8-16 km/h
Incline range ..... 0-10 %
Motor..... 2.5 HP

The Control, Pacer, Trail and Ambition treadmills meet the requirements of the EU’s EMC Directives on electromagnetic compatibility (89/336/EEC) and electrical equipment designed for use within certain voltage limits (73/23/EEC). This product therefore carries the CE label.

The Control, Pacer, Trail and Ambition treadmills meet EN precision and safety standards (EN-957).

3. TROUBLESHOOTING

- Treadmill is making knocking noise
  - he best way to start finding the root cause of the problem is to listen to the frequence of the noise. For example, the running belt seam overlaps a roller twice per revolution, should this be the frequency of the noise, the belt needs to be adjusted or replaced. If the noise has significantly higher frequency it is likely to be caused by a damaged front or rear roller bearing.
  - Adjust the rear foot to make the treadmill deck even with the floor

- Heart rate readings are inaccurate
  - The motor wires needs to be wrapped through a ferrite ring and twisted around each other in order to prevent possible heart rate reading interference
  - Home appliances, e.g. TV and mobile phone, and electric network can generate interference. Try using equipment in different environment

- Circuit breaker (10A) trips repeatedly
  - Check that the treadmill is running mechanically free
  - Check belt lubrication

- If the wall outlet voltage is lower than normal the required current is higher and might cause the breaker to trip

- Static electricity
  - Lubricate deck according to instructions in owner's manual
  - Eliminate static electricity generators; user should not use nylon clothing and/or should try another pair of different type of training shoes
  - Ensure that the frame grounding wires are contacting steel by removing possible paint between the wire connector and frame (see picture)

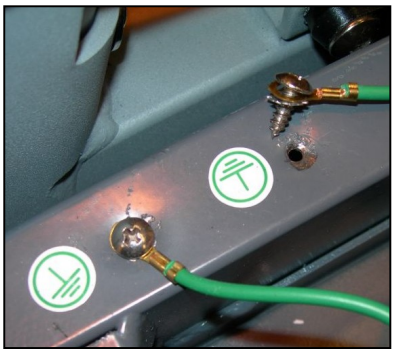


Figure 7 Proper grounding eliminates static electricity

4. SPARE PART DIAGRAMS

Please refer to the next page.

TUNTURI®
THE MOTOR – *it's you.*

T10
T20

VER. 0.30

Service Manual

Tunturi T10, T20 & T30

1 FOREWORD

This Service Manual contains instructions and advice on service procedures for Tunturi treadmills T10 and T20.

The primary intention of this Service Manual is to enhance the reader's knowledge of the structures of the T10 and T20 treadmills. Notice that in case of a fault or a malfunction, the component or unit of components in question, and especially the electronic components, are not to be repaired, instead they must be replaced by a new component.

The components of the product frame and their locations with the reference and spare part numbers can best be found in the exploded parts diagrams. Replacing the components does not require special tools, but assumes a certain level of technical competence and familiarity with basic hand tools.

The Manual is divided into two sections: Mechanics and Electronic Functions

NB! Always when servicing the treadmill be sure that the power has been switch off and the main cable is plugged off the power board. Big capacitors on the control board might retain high voltage level even for several hours after the unit has been plugged off from the power outlet.

VERSION HISTORY

Date	Version	Author	Change description
2006-01-16	0.30	PVI	Electronics, error codes, appendices, TOC – first public version available on the Extranet

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2 ELECTRONICS

The main electrical components of the Tunturi T10 and T20 are user interface (B02), power board (B44), motor (B18), lift motor (B25) speed sensor (B23), and power cable (B29).

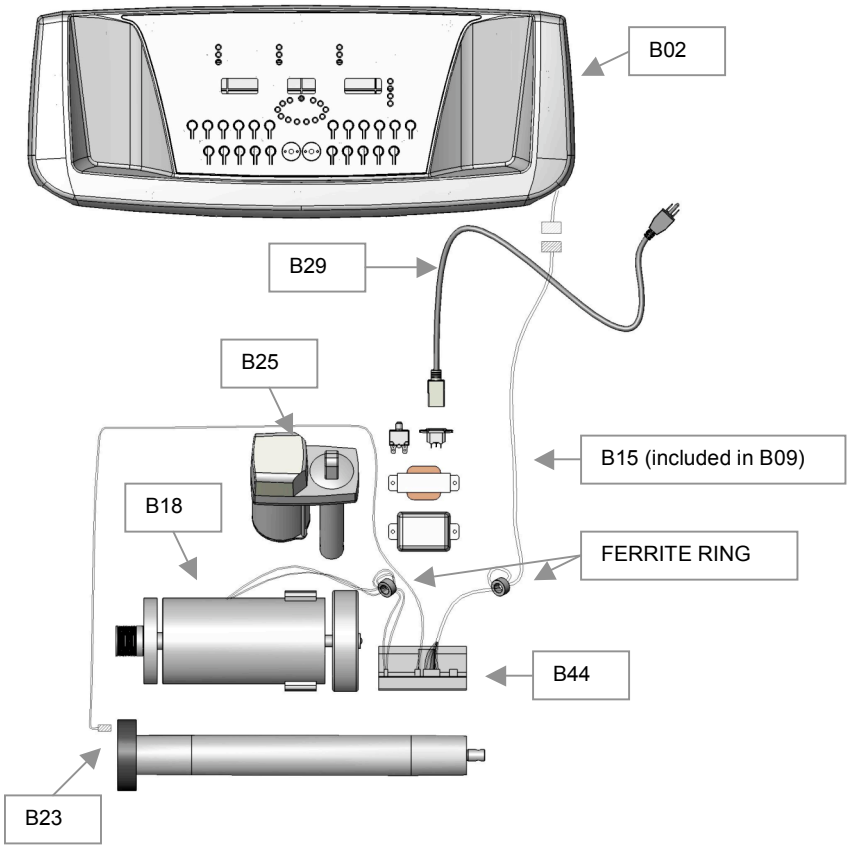

Figure 1 Tunturi T10 and T20 electrical components and their connections (numbering refers to spare part diagram)

2.1 SERVICE MENUS

2.1.1 Engineering Mode

1. Enter the engineering mode after switching the treadmill POWER ON by pushing first 'SELECT' and then 'ENTER' and hold buttons pressed simultaneously
2. The SPEED window shows the treadmill software version number, TIME window shows the software design year and DISTANCE window shows the design date in "MM.DD" format
3. Press 'ENTER' to show LDU version number (Display control software)
4. Press 'ENTER' to show ISP version number

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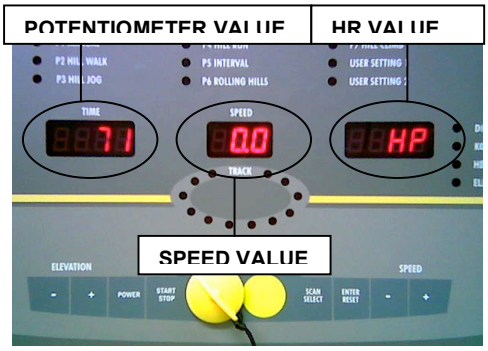
5. Press 'ENTER' to enter **KM/MILE switch mode**, 1 for KM, 0 for MILE
   - Switch between the KM or MILE setting by pressing SPEED +/- or ELEVATION +/-
6. Press 'ENTER' to show **total distance**
7. Press 'ENTER' to show **total usage hours**
8. Press 'ENTER' to return to the normal mode

2.1.2 Testing Mode

1. Enter the testing mode after switching the treadmill POWER ON by pushing first 'SELECT' and then 'SPEED DOWN' and hold buttons pressed simultaneously
2. LED scanning mode for verifying display functionality
3. Press 'ENTER' to scan DATA LINES to verify display functionality
4. Press 'ENTER' to scan SACN LINES to verify display functionality
5. Press 'ENTER' to scan LED's to verify display functionality
6. After pressing 'ENTER' the TIME window shows "test" and the keypad functionality can be tested (the value displayed changes when a button is being pressed)
7. Press 'ENTER' to enter IO mode (TIME display shows lift motor potentiometer value, SPEED reads speed from speed sensor and DISTANCE shows heart rate pulse)
   - Press 'START' to test lower board relay (a "click" sound) and then press 'ELEVATION UP' for 2 seconds to increase the elevation to 8%. Press 'ELEVATION DOWN' to decrease the elevation to minimum percentage 0%
   - Press 'SPEED UP' to increase speed value and 'SPEED DOWN' to decrease speed value.



Press 'ENTER' to repeat above test or 'SELECT' and ' SPEED DOWN' buttons simultaneously to return to the normal mode

2.1.3 Lift motor calibration

The lift motor calibration is done manually by following the following steps:

1. Drive the lift motor to 0% from user interface (inclination display must be 0%)
2. Switch off the treadmill and unplug the power cable
3. Remove motor cover
4. Fold up the running deck
5. Loosen two screws (A) attaching the lift motor nut (B) to the incline frame (Figure 2)
6. Adjust the lift motor nut (B) so that there is 9 mm gap between the upper end of the nut and the lift motor frame (Figure 2)
7. Tighten the screws (A) and verify correct elevation by measuring (Figure 3)

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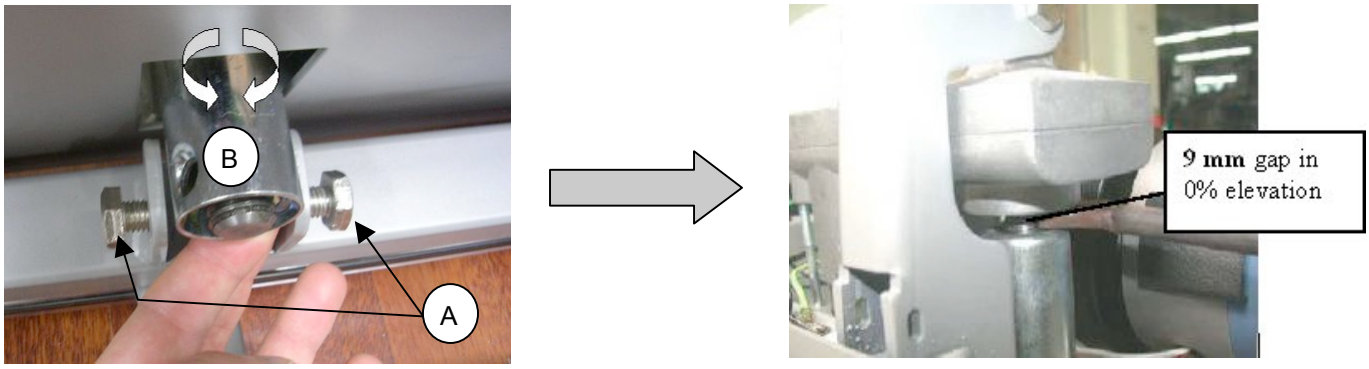

Figure 2 Adjusting lift motor to 0% position

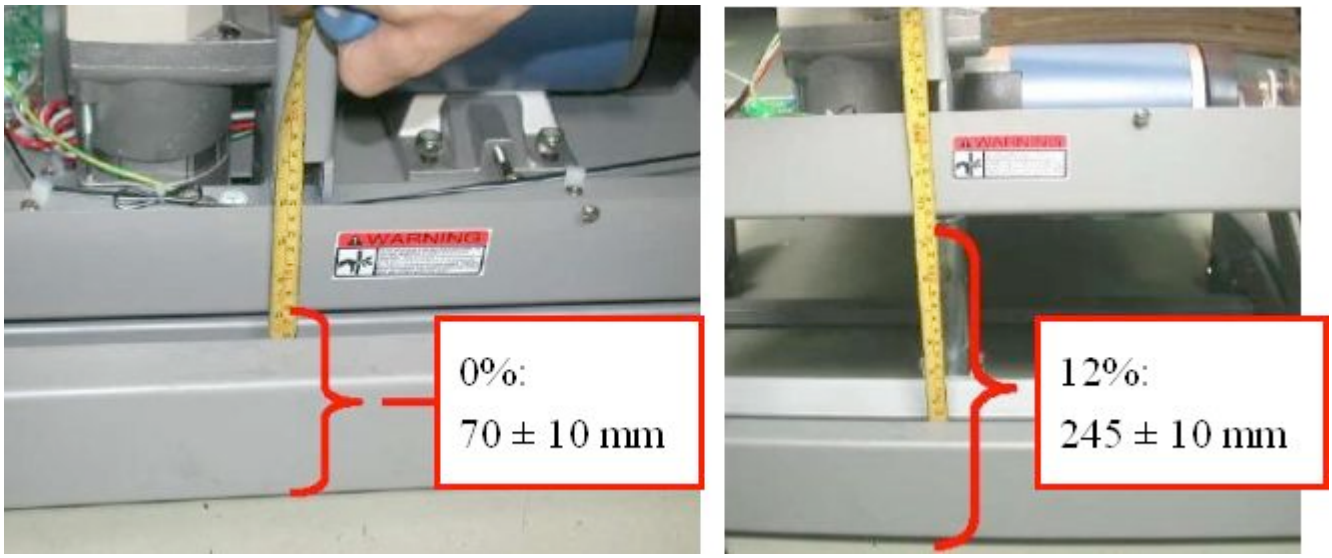

Figure 3 Measuring correct lift motor positions

Lift motor calibration is needed if any of the following has taken place:

- The lift motor has been removed from the frame
- The actual and the displayed elevation angle doesn't match

Table 1 Lift motor potentiometer value table for the Tunturi T10, T20 & T30

Elevation	Lift motor I/O
0 %	90 ± 30
1 %	170 ± 30
2 %	240 ± 30
3 %	320 ± 30
4 %	400 ± 30
5 %	490 ± 30
6 %	590 ± 30
7 %	700 ± 30

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8 %	810 ± 30
9 %	940 ± 30
10 %	1090 ± 30
11 %	1240 ± 30
12 %	1420 ± 30

The values in the Table 1 are reference information for troubleshooting only.

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3 ERROR TEXTS

To facilitate the maintenance, error codes on display refer to internally found malfunctions; error codes as such aren't malfunctions, they merely point to observed problem. As a general rule, when a source of malfunction is located, it should not be repaired, but instead replaced with a new component. Error texts can be removed from the display by disconnecting the treadmill power cable for about 10 seconds.

When an error text occurs, the first thing to do, if not any obvious visible reasons found, is to try to repeat it after being switched off and on again.

E1

Instruction in the owner's manual:

> **"Speed sensor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The error will appear if the upper board can not receive pulses from the speed sensor for 10 seconds.

Possible reasons:
- Speed sensor not properly assembled, the distance between the magnet and the speed sensor should be less than 3mm.
- Speed sensor cable disconnected
- Meter cable has a poor connection at some point
- Magnet missing from the front roller pulley
- Front roller not rotating at all due to loose drive belt

Check the distance between the speed sensor and the flywheel and ensure that the speed sensor is properly attached to the motor frame. Check also speed sensor connections.

Error can be reset also by re-inserting the safety key.

E6

Instruction in the owner's manual:

> **" Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The error message appears when voltage is being supplied to the lift motor but it doesn't move.

Possible reasons:
- Lift motor power cable disconnected
- Lift motor electronically damaged preventing the movement

Error can be reset only by disconnecting the power cable.

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Instruction in the owner's manual:

> **"Lift motor error. Unplug the electrical cord from the wall outlet and from the treadmill, wait 1 minute and turn the power switch on again. If treadmill recovers to normal operation, you may continue to use the treadmill. Otherwise, call the dealer for service."**

The values the lift motor potentiometer is sending are not within the preset limits. Check the potentiometer I/O value from the service menu (Chapter 2.1.2) and compare it to minimum and maximum reference values in chapter 2.1.3. The potentiometer value is also displayed on the user interface when “error 7” appears.

If the readout from the potentiometer is **1** the software is not picking any signal from the potentiometer
Possible reasons:

- Lift motor rotation sensor (potentiometer) cable disconnected
- Lift motor rotation sensor has poor internal contact thus providing incorrect values
- The second connection cable between user interface and lower board disconnected

If the readout from the potentiometer is **not 1** and it differs from reference values adjust potentiometer (Figure 4) to obtain correct value.

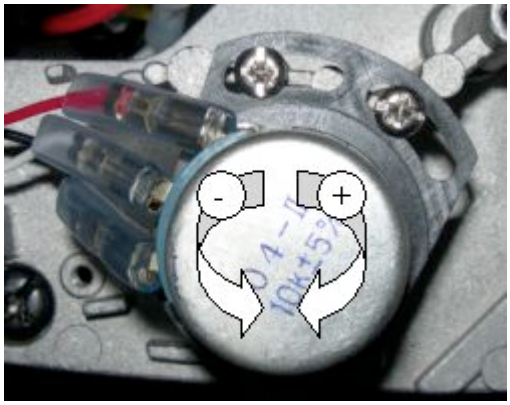

Figure 4 Lift motor potentiometer adjustment and how it affects on readout value

Error can be reset also by re-inserting the safety key.

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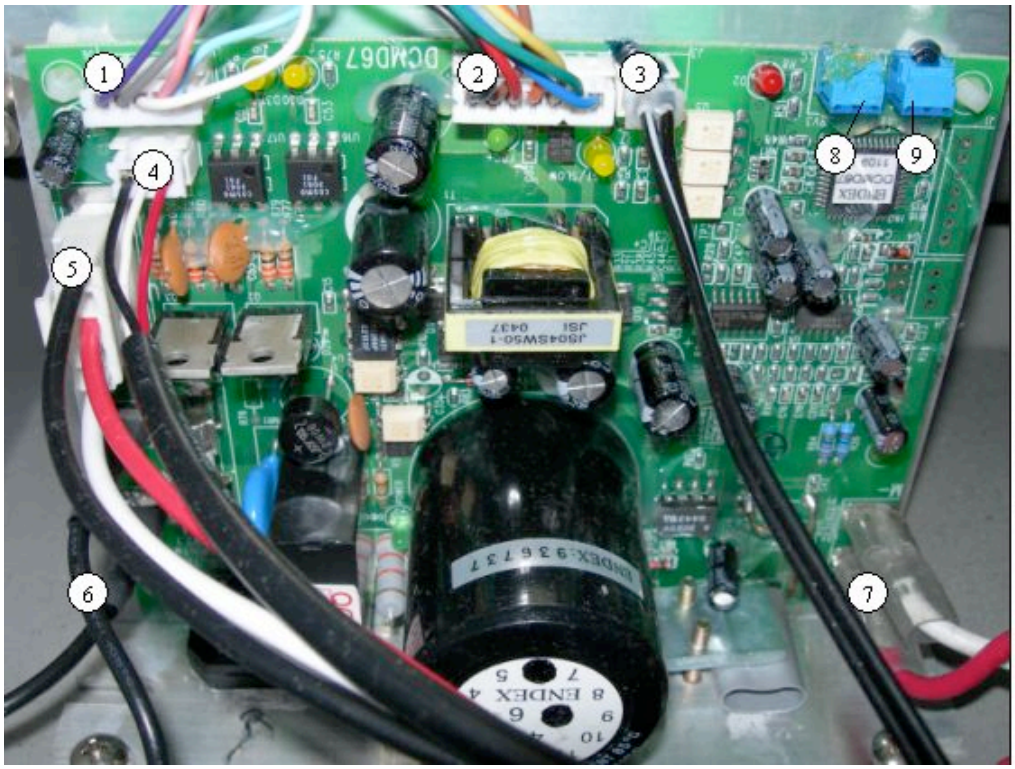
4 APPENDICES

1. LOWER BOARD AND CONNECTOR LOCATIONS



Connectors

1. User interface
2. User Interface #2
3. Speed sensor
4. Lift motor position (readout from potentiometer)
5. Lift motor power, VAC
6. Power IN, VAC
7. Motor power, VDC

Components

8. Adjustment of current supplied to the motor [torque]
9. Adjustment of voltage supplied to the motor [speed]

Figure 5 Lower board connectors and components

2. TECHNICAL DATA

T10

Length (storage position)	185 cm (83 cm)
Height (storage position)	133 cm (175 cm)
Width	88 cm
Weight	94 kg
Running surface	47 x 133 cm
Speed	0.8-16.0 km/h
Elevation range	0-12 %
Motor.....	2.0 HP

T20 & T30

Length (storage position)	190 cm (82 cm)
Height (storage position)	144 cm (186 cm)
Width	86 cm
Weight	99 kg
Running surface	51 x 141 cm
Speed	0.8-20.0 km/h
Elevation range	0-12 %
Motor.....	2.0 HP

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The T10 treadmill meets the requirements of the EU's EMC Directives on electromagnetic compatibility (89/336/EEC) and electrical equipment designed for use within certain voltage limits (73/23/EEC). This product therefore carries the CE label.

The T10, T20 and T30 treadmills meet EN precision and safety standards (EN-957).

Due to our continuous policy of product development, Tunturi reserves the right to change specifications without notice.

3. TROUBLESHOOTING

- Treadmill is making knocking noise
  - he best way to start finding the root cause of the problem is to listen to the frequence of the noise. For example, the running belt seam overlaps a roller twice per revolution, should this be the frequency of the noise, the belt needs to be adjusted or replaced. If the noise has significantly higher frequency it is likely to be caused by a damaged front or rear roller bearing.
  - Adjust the rear foot to make the treadmill deck even with the floor

- Heart rate readings are inaccurate
  - The motor wires needs to be wrapped through a ferrite ring and twisted around each other in order to prevent possible heart rate reading interference
  - Home appliances, e.g. TV and mobile phone, and electric network can generate interference. Try using equipment in different environment

- Circuit breaker (6A) trips repeatedly
  - Check that the treadmill is running mechanically free
  - Check belt lubrication
  - If the wall outlet voltage is lower than normal the required current is higher and might cause the breaker to trip

4. SPARE PART DIAGRAMS

Please refer to the next page.

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Technical Information 01/2007

Roughening of the potentiometer´s shaft 13th of February 2007

Date of Change:
8th of February 2007

NOTE! The change, roughening the potentiometer's shaft, is taken into production as of February 8, 2007. The change concerns the following Tunturi and Bremshey treadmills starting from serial number 7B : T20 new, T30 new, T40 new, Trail, new Pacer, Control, Hercules run-FIT and Batavus T3/T4/T5.

Description:

Due to uncertainty concerning the service actions to the treadmills in case of the E7 error code, please find below instructions how to remove the E7 error.

The E7 error code indicates that the values the lift motor potentiometer sends are not within the preset limits. The potentiometers' I/O value can be checked in the console's service menu by first pressing the SELECT button, then the SPEED DOWN button and by holding both down for two seconds. Thereafter the console lights will flash indicating that the engineering mode has been entered. Press the ENTER button five times to check the value of the potentiometer; it is shown in the TIME window. Compare it to the minimum and maximum reference values in table 1 (*2nd page). The potentiometer value is also displayed on the console when the E7 error code appears. Exit the engineering mode by the same key sequence as in entering.

If the readout from the potentiometer is **1** the software is not picking any signal from the potentiometer
Possible reasons:

- Lift motor rotation sensor (potentiometer) cable disconnected
- Lift motor rotation sensor has poor internal contact and is thus providing incorrect values
- The second connection cable between the console and the lower board is disconnected
- The potentiometer has lost its calibration and rotated to minimum

If the readout from the potentiometer has lost its calibration setting and it differs from reference values, adjust potentiometer (Figure 1) to obtain correct value.

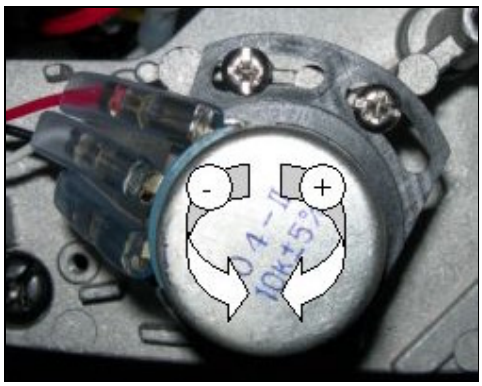


Figure 1 Lift motor potentiometer adjustment and how it affects on readout value

If the potentiometer has lost its position it can be lifted up by removing the two attachment screws. Turn the potentiometer shaft to obtain the correct setting and place the potentiometer back to the lift motor.

To ensure that the potentiometer maintains the correct calibration setting, use pliers to press some ridges to the potentiometers shaft. This will ensure the adhesiveness by increasing the rougness of the shaft before inserting it back to its counterpart (see below).

* Table 1 Lift motor potentiometer value table

Elevation	Lift motor I/O
0 %	90 ± 30 (1,1 ± 0,1 kΩ)
1 %	170 ± 30
2 %	240 ± 30
3 %	320 ± 30
4 %	400 ± 30
5 %	490 ± 30
6 %	590 ± 30
7 %	700 ± 30
8 %	810 ± 30
9 %	940 ± 30
10 %	1090 ± 30
11 %	1240 ± 30
12 %	1420 ± 30 (8,54 ± 0,1 kΩ)

The values in the

* Table 1 are reference information for troubleshooting only. Resistance is measured from black and white wires (see picture in 3rd page).

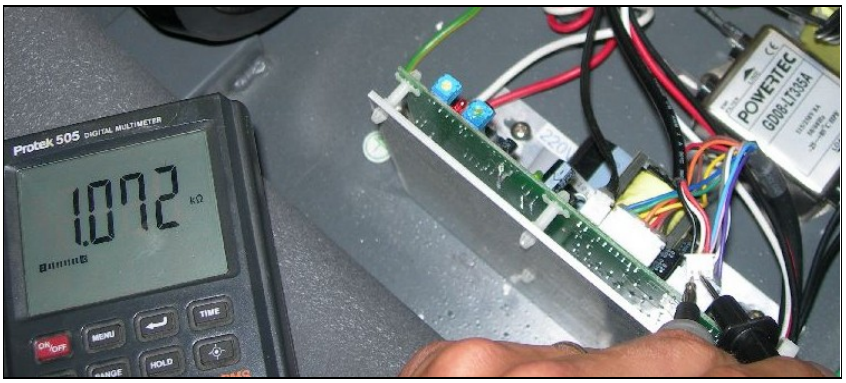


Figure 2 The lift motor potentiometer resistance at 0 % inclination (measurement between the black and white wires)

Best regards,

Accell Fitness After Sales

TREADMILLS
BELT AND DECK REPLACEMENT
Bremshey & Tunturi T10 - T40

1. Remove the power cord.

2. While the tread is folded up- Remove the rear covers by loosening the securing screw on the bottom of both and sliding them off.
Remove the screws for the metal finger guards that are screwed to the end of the deck and take out the guards.

3. Fold down the tread and loosen the motor cover screws and take off the motor cover. Remove the two securing screws on the side landing areas and slide them off the back.

4. Remove the securing screws for the deck. Make sure the locations are noted as well for the mounting screws and brackets that secure the landing areas.

5. Loosen the two securing bolts for the rear roller by turning counter clockwise. It is a good idea to count the number of turns as this will help when the roller is re-tensioned. Remove the bolts and slide the roller up and then out sidewise from the tread.

6. Slide the deck out sideways from the frame.

7. Mark the bolt position of the right side bolt that secures the drive roller to the frame. This is critical as this bolt controls the angle that the belt tracks down the bed. Once marked so that it can be returned to the same position- remove it and slide the belt off the roller.

8. Install new belt on the front roller and re-install bolt. Reverse the removal procedure. Shift the various brackets for the landing areas onto the new deck.

9. After belt is installed it will need to be lubed, tensioned, and the tracking checked.

TREADMILLS

USING COMMUTATOR CLEANER STONE

Bremshey & Tunturi Models

1. **Remove power from tread. Take off motor cover and remove brush port cover.**

2. **Remove brush retainer spring clip and slide brush out of slide.**

3. **Insert commutator stone and press against copper commutator.**

4. **Rotate motor by hand while pressing stone end against commutator. Move it back and forth to clean all the area the brush touches. Only needs to be done on one side.**

5. **Replace brushes. Make sure the brush clips are seated firmly. Re-install brush port covers.**

BREMSHEY TREADMILLS
CHANGING FROM MILES TO KM
Scout Model

1. **During the power ON position (initial mode), first Hold the ENTER /SELECT button then press and hold the SPEED + button together to enter the Service Menu.**

2. **Incline window shows model number, distance window the software version, kcal window the year, time window the date, speed window the diameter of roller.**

3. **Press ENTER / SELECT - the window shows LDU version and ISP version**

4. **Press ENTER / SELECT to enter KM/MILE switch mode, Press SPEED + - or INCLINE + - to select KM or MILE.**

The "+" button will give you KM and a "1" in the window, the "-" button will give you Miles and a "0" in the window.

The console then flashes a quick series of numbers as it changes to your selection.

Easiest way to check which you are in is to look at starting speed = 0.5 for Miles, 0.8 for Km.

5. **Press ENTER / SELECT – the window shows total distance.**

6. **Press ENTER / SELECT – the window shows total hour.**

7. **Press ENTER / SELECT – the console goes back to initial mode.**

BREMSHEY TREADMILLS
TESTING & IO MODE BUTTON PUSHES
Scout Model

TO ENTER TESTING MODE

1. **Turn on the treadmill and place safety key in position.**

2. **Push and HOLD the "Enter/Select" key and then push and HOLD the "Start/Stop" key. Console will go into LED testing mode.**

3. **Push "Enter/Select"key to go through the various modes until "0.0" appears in the SPEED window (6 pushes). Potentiometer values will show in the Time window.**

Compare values to chart in service manual for lift calibration.

Check DISTANCES of the lift nut and frame per the manual.

BREMSHEY TREADMILLS
TESTING & 10 MODE BUTTON PUSHES
Ambition Model

TO ENTER TESTING MODE

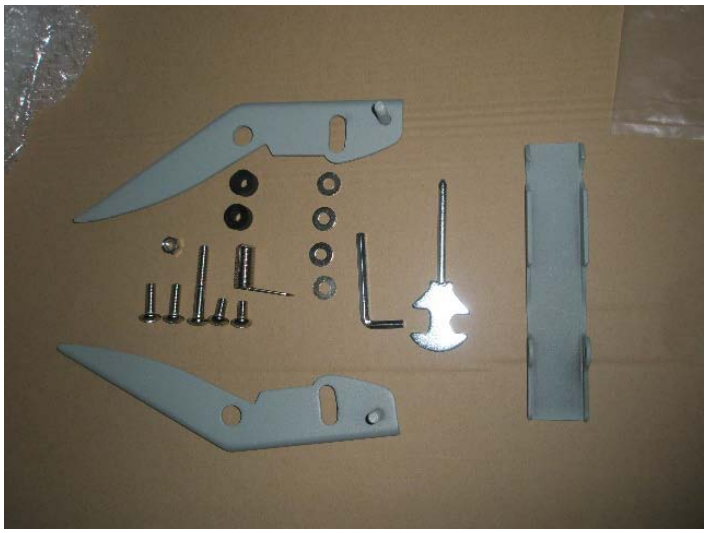
1. **Push POWER button then push and hold the “SELECT” and “SPEED DOWN” button simultaneously.**

2. **Push “SELECT” button top go through categories to get to “IO” Mode**

Bremshey Treadmill s

Folding Kit Installation Instructions

**** IMPORTANT: Before proceeding ensure the treadmill is unplugged and at 0 elevation.****



Bremshey Treadmill Folding Kit BRETRFOLD-KIT

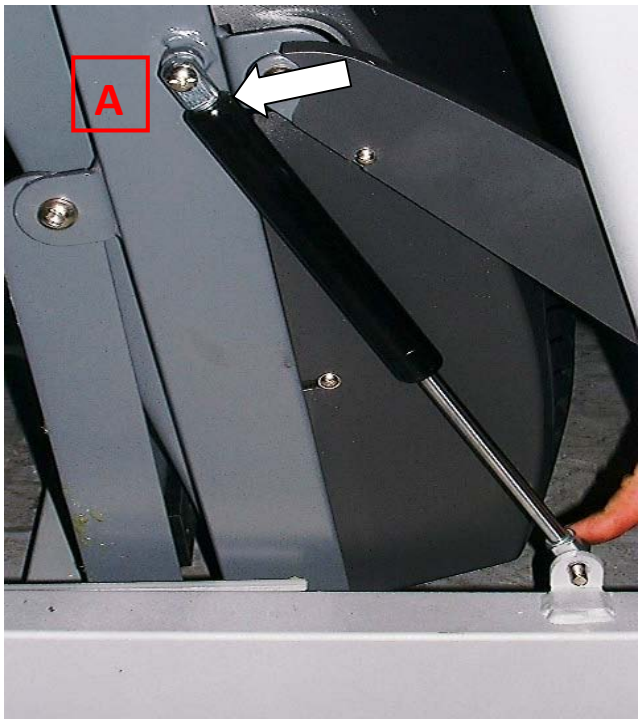
Step 1:

Important: One Side at a Time

With treadmill in Folded Position, on level surface, slightly tilt and wedge treadmill to opposite side being worked on such that the rear wheel is off the floor. Remove wheel bracket from frame. Remove transport wheel from original bracket and install on the replacement bracket. Install new wheel bracket. Repeat on other side.

Remove centre locking lever and spring, replace with new locking lever and spring

Test unfolding motion, should be significantly smoother.



Step 2: ONLY If Necessary

With treadmill in Folded Position, remove gas shocks (one side at a time). Unscrew end from the gas shock, at canister end **A**, insert M8 lock washer and reinstall shock.

Repeat on other side.

Test unfolding motion.

To unfold the treadmill, hold the handle bar firmly with the left hand, (opposite if left-handed) using your right hand, grasp the upper bar of the bed frame and push in towards the face of the console, step on the locking lever to lift it clear of the locking bar and then pull the bed forward toward you. ****Note**: Never fold treadmill when in an elevated position.

What Creates Static Shock On Treadmills...
...And How To Avoid It

How A Static Shock Is Created

Static electricity occurs when positive (+) or negative (−) electrical charges collect on an object's surface. This happens when two objects or materials are either rubbed together or pressed together, then pulled apart.

When two materials with different electrical potentials are brought together, a static shock or electrostatic discharge (ESD) can occur.

Treadmills have all the necessary conditions to create large amounts of static charge. They have materials that move and rub together:

- Rollers and belt.
- Deck and belt.
- Motor drive belt and motor axle.
- User's shoes and belt.
- User's clothing rubbing against itself.

Most treadmills will be grounded against ESD with grounding wires going from the electronics to the frame of the machine. From there the machine is grounded using a three-pronged plug into the wall.

Additionally, the tread will have very fine metal wires running through it to help reduce static build up on the belt caused by the friction between the belt and the rollers.\

As long as all electrically charged components are grounded to the frame, there is little chance of ESD. The one thing that complicates the situation is the friction between the user and the tread.

As a person walks or runs on the treadmill, the friction between their shoes and the tread create a static charge around the user.

When the user then touches the treadmill frame or heart rate contact pads, the electric charge "jumps" from the user to treadmill frame, causing ESD or a static shock.

ESD can be uncomfortable – even painful for the user and destructive when it involves electronic components.

The question then is...

What can be done to reduce or eliminate the incidence of electric shock between the user and the machine?

How To Reduce Build-Up of Static Electricity And ESD While Using The Treadmill

Very simply, there are only two things you can do to reduce or eliminate static shock to a person using the treadmill:

1. Physically ground the user to the machine.
2. Optimize environmental conditions.

Physically Ground The User To The Machine

The fact a person gets a shock proves the machine is grounded properly. Static will only travel from a charged material to a neutral material. If the machine was charged, there would be no discharge of electricity.

The surest way to eliminate shocks is to physically ground the user to the machine using a device such as an anti-static wrist strap.

With an anti-static strap, any electric charge that builds up around the user, is immediately directed to the frame of the machine.

While an anti-static strap will eliminate static discharge, it can be annoying to the user.

The other alternative is to...

Optimize Environmental Conditions

Certain conditions can be controlled to reduce, if not eliminate, the occurrence of static shock. They include:

- Air humidity
- Clothing
- Treadmill lubrication

Air Humidity – Dry air contributes to static shock. In the winter especially, treadmills should be moved away from heat vents. If possible, the room should be humidified to help bring air humidity up and reduce static charge.

Clothing – Performance clothing made of polyester has seen a huge increase in popularity. Unfortunately, these materials conduct static charge more easily than natural cotton fibres. Switching from synthetic to natural fibres may help to reduce static charge.

Treadmill lubrication – If the treadmill's belt and deck are not adequately lubricated, more friction is created, resulting in higher levels of static.

While static shock problems are not specific to one particular make or brand of treadmill, we at Accell Fitness are always working to ensure our users experience a more comfortable workout, free of static shocks. If you have any suggestions on how we can improve our product, we'd love to hear from you.


BREMSHEY
TREADLINE
3 6 9

Rear Drive Ellipticals

TUNTURI®

Orbit Elliptical Trainer Service Manual

BREMSHEY SPORT®

- Power machine up (If no power refer to Trouble-Shooting guide)
- Check resistance mechanism works from min/max. Electronic and manual. (If no power refer to Trouble-Shooting guide)
- Feedback on meter. RPM etc (If no power refer to Trouble-Shooting guide)
- Use machine on range of resistance levels and check for noise and smoothness of operation (If no power refer to Trouble-Shooting guide)

Power Supply List

Models	Power Supply Type
Plus, Control, Control Hre, Discovery	9 volt dc 1000ma – Centre Pin Positive
Fit, Trend, Spirit	4 x 'AA' size batteries
Ergo	Via combined transformer/control box
Competition, Explorer	26 volts ac 1500ma– Centre Pin Positive

General Troubleshooting Guide

No power to meter

1. Correct power supply? See list. (Or batteries, for mechanical brake models)
2. Check power output from PSU
3. Check connection from PSU socket in machine. Move the plug, is power intermittent? See section
4. Check all intermediary wiring connections.
5. Try new meter.
6. Internal PCB on ECB brake models

No RPM reading

1. Check all intermediary wiring connections.
2. Check sensor magnet (See section 2)

No Handgrip pulse

1. Check connections and wiring from sensor to meter.
2. Check suitability of user.
3. Try new meter

No Ear Sensor Pulse

1. Check Ear Sensor replace.
2. Check Jack Plug/Socket for damage

No HR signal from chest belt.	1. Try new Battery in HR belt 2. Check correct positioning of belt (See Owner's Manual) 3. Check for interference from other electronic devices. (See Owner's Manual) 4. Try new meter.
No resistance (Electronic) For manual resistance models see 'Brake Mechanism'	1. Check RPM reading (See section above 'No RPM reading) 2. Check profiles on display increase.(If not, probably a meter problem) 3. Check condition of wiring and connections from Meter through to servo-motor/internal PCB. 4. Can you hear servo-motor operating? If yes, may be brake mechanism problem (See section 2) 5. If not above – it will be necessary to investigate internally. (See section 2)
Resistance settings at minimum and maximum incorrect.	1. Adjust brake mechanism (See section 2).
Noise (Transmission)	1. Belt is misaligned and or damaged/worn (See section 3)
No transmission	1. Belt may have disengaged from rear drum (See section 3)

Section 1

Opening up covers for internal repair and adjustment.

To access the internal components of the Orbit it is necessary to remove one or both sides of the main cover sets. In order to do this it will be necessary to disconnect the foot tube from the rear drum axle. In general, access to the transmission is gained by removing left covers and brake system requires right-hand.

Models with foot tube height adjustment.

1. Unscrew adjuster and allow tube to move to lower position.

2. Remove cap from rear axle (if applicable). Remove locking nut, washer and spacer. Withdraw foot tube assembly away from drum. If necessary rotate the drum until the tube eases off.

Models without foot height adjuster

1. Remove cap, securing nut and washers from swinging arm pivot point.

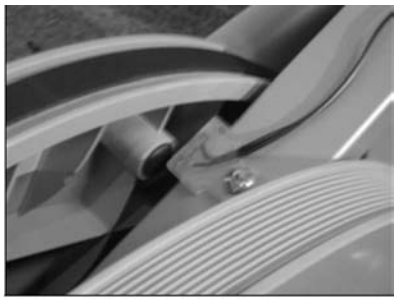
1. Remove cap from rear axle (if applicable). Remove locking nut, washer and spacer. Withdraw complete foot tube and swing arm assembly away from drum. If necessary rotate the drum until the tube eases away.

The covers can now be removed. Depending on the model concerned there may be more than one cover to remove. There are several screws located on the perimeter of the covers. Some of these locate into the frame and some into the lugs within the cover itself. (Please be aware of the screw positions and types. Note: Before removing the covers from a machine powered by mains transformer it will be necessary to remove the power socket from the rear of the cover. To do this, remove all screws. Reach inside the cover and grip the power socket whilst removing the thin nut from the outside of the socket and carefully withdraw the socket and cable assembly. Reverse procedure when work complete.

Section 2

Speed Sensor & Resistance Mechanisms

The speed of rotation is measured by a reed/proximity switch mounted next to the left rear drum. One or two small magnets are mounted in the rear drum and at each pass the switch opens and closes sending a ‘pulse’ to the meter either directly or via the control circuit board in the case of electromagnetically braked units.



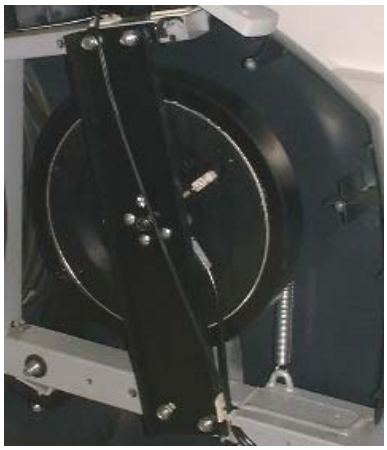
Resistance Mechanisms

There are 3 types of brake control used. The first 2 consist of a flywheel unit with an expanding and contracting central magnetic unit activated by a cable. These are controlled mechanically by the rotation of a control knob or electromechanically by use of a servo-motor. The third type is electromagnetic which employs an external coil which when powered slows the rotation of the flywheel.

Manual Resistance Control

There 3 basic components to this type.

Brake control knob
Brake flywheel mechanism
Cable connection (This may be located at the top of the tube or at the lower end depending on the model)



Problem	**Action to rectify**
Resistance can be achieved but max and min settings incorrect.	1. Brake cable requires adjusting at the flywheel brake end, or: 2. Brake cable requires adjusting at connection between upper and lower cable.
Resistance doesn't change or is not smooth	1. Check cable is moving freely at all points. Adjust cable or change parts as necessary.

The cable adjuster can be used to set the correct positions for maximum and minimum resistance. The securing nut (a) should be released and the adjusting nut turned to increase or decrease the tension of the cable. Observe the position of the brake slider. When it is moved towards the center of the flywheel the resistance is at its least and further away the resistance is at its greatest. (The principle is similar to setting a servo-control system shown later)

Servo Motor Resistance Control

The servo-motor is located next to the flywheel unit. When a resistance level is selected via the display meter, either by manual key presses or via a program change, power is supplied to the motor causing it to rotate, pulling the brake cable in or out depending on the rotational direction. In order for the servo-motor to operate the electronics must receive pulses from the flywheel speed sensor (See section on speed sensor). There is a slight delay between receiving the first pulse and the servo-motor operating. Therefore, in order to test the servo-motor brake mechanism the sensor must receive constant pulses by rotating the rear drum.

Operation

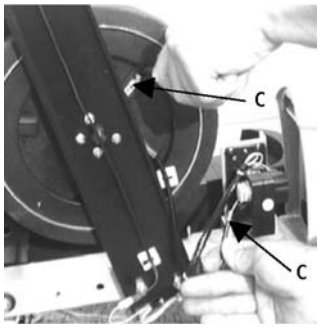
As suggested earlier, in order to test the servo-motor unit it is necessary to simulate the product in use. In models with a 'Manual' program (Control, Plus & Discovery) this can be achieved by rotating the rear drum by hand. Note: It can be made easier by removing the drive belt from the rear drum (See section).

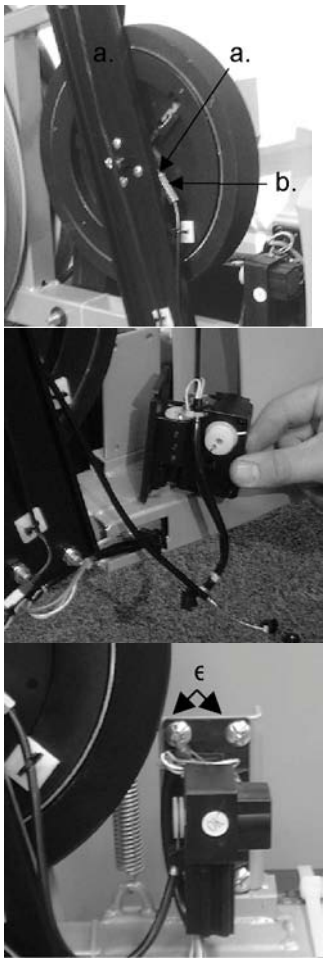
Replacing the servo-motor unit

If it is established that the servo-motor will not respond as it is faulty it will be necessary to exchange it.

1. First remove the servo-motor brake cable (a) from the flywheel brake mechanism. To achieve this, the tension must be released from the cable. In order to do this the securing nut (b) should be released and the adjusting nut turned to decrease the tension of the cable. Push the flywheel slider (c) down with a screwdriver and the release the outer cable sleeve (d) from the servo-motor securing point. Now lift the cable over the motor capstan (e) and then slide out the cable end from the capstan slot.

    Detach the electronic cables from the servo-motor to the wiring set. Undo the 4 screws (e) that mount the servo-motor to the frame and remove the motor unit.





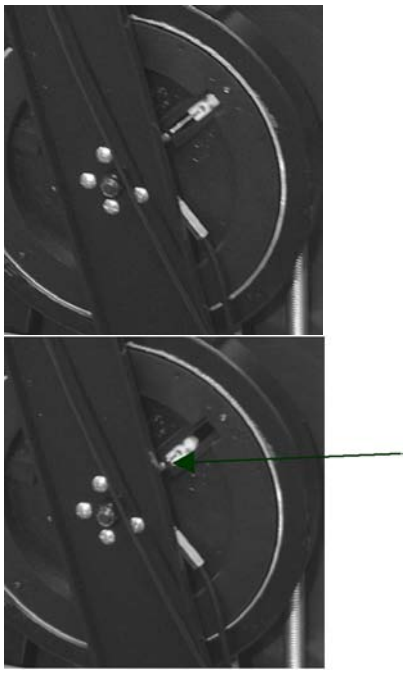
Refit new servo-motor by reversing the above procedure. Taking care to refit the cable around the motor capstan in the correct direction and avoiding strain on the cable which may damage the motor gearing mechanism. It will then be necessary to calibrate the new motor.

Calibrating the servo-motor and flywheel brake cable

It is important that the brake mechanism is set up so that it is possible to achieve the correct minimum and maximum settings. If a user

complains that either of these settings are incorrect or a new servo-motor is fitted the following procedure should followed.

1. Whilst rotating the rear drum, increase the resistance with the meter keys to maximum checking that the cable and flywheel slider is moving freely.
2. Whilst rotating the rear drum, decrease the resistance with the meter keys to minimum checking that the cable and flywheel slider is moving freely.
3. At minimum setting check that the braking resistance is minimal and that there is a 2mm gap between the bottom of the slider and its case.



Minimum Resistance
Maximum Resistance

Electromagnetic Resistance Control

2m
m
gap

e

d

c

b
.

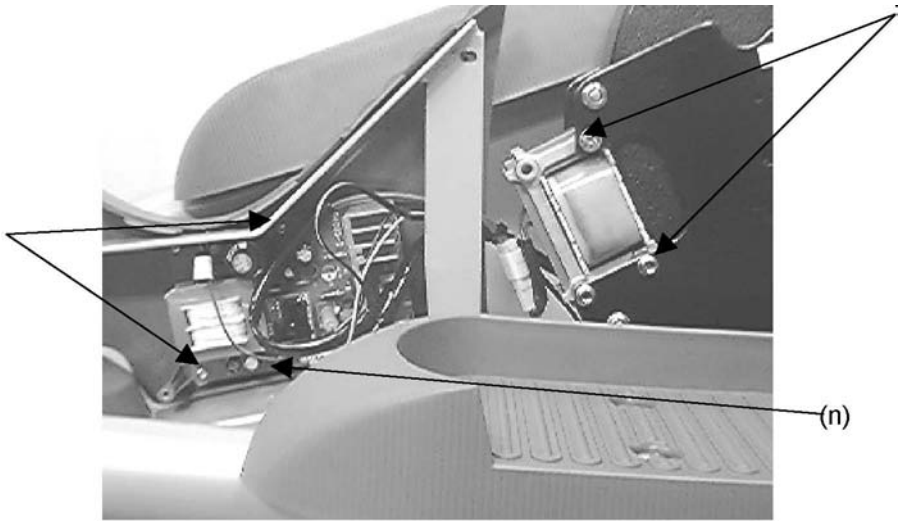
a
.

a
.

With this system, data is sent from the display meter to the brake control circuit board as a resistance level is selected either via a key press or a program. The board in turn supplies power to the electromagnetic brake coil to increase the magnetic field in order to apply the resistance.

If it is not possible to apply or control the resistance the fault is typically found within the brake control circuit. However, failure within the wiring set or the meter can also be a cause. It is quite rare for the electromagnetic coil to fail. The resistance values for the coil can be increased by adjusting the trimpot on the circuit board (n). However, great care should be taken with small adjustments and testing in order to avoid unstable resistance control.

The circuit board can be replaced by removing 4 x screws fixing it to the frame (l) and unplugging the cables. If required, the coil can be detached by removing the bolts (m)


(n)

(n)

(m)

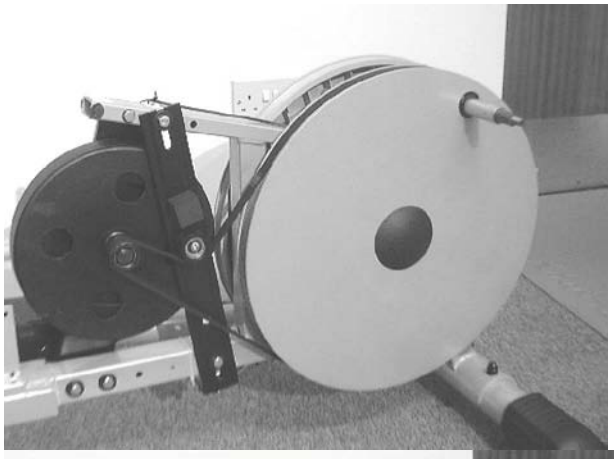
(l)

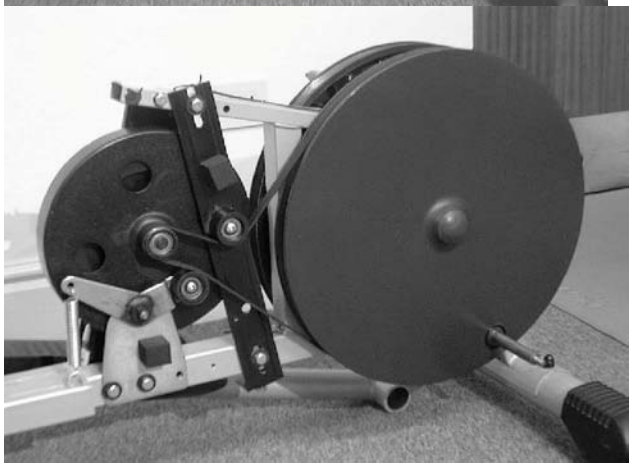
Section 3

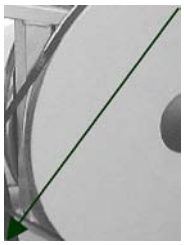
Flywheel & Transmission

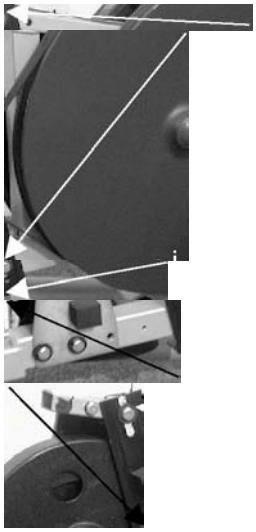
Drive belt transmission

The transmission system consists of a rear drum which drives the resistance flywheel via a grooved belt which is adjusted and controlled with a tensioning wheel device. This system has varied between models and the 2 main different systems are shown below.









Type 1 Type 2

Transmission Belt.

The transmission belt if not correctly aligned tensioned can cause noise and long-term damage to the belt and other associated components. It will be necessary to remove both covers and disconnect both foot –tubes to work on transmission problems.

If the drive belt has removed itself or is worn/damaged after replacing the belt it will be necessary to check the tension and alignment to establish the cause of the failure.

Replacing the drive belt

Type 1

1. Slacken off the vertical tensioning bar by loosening the upper and lower locking bolts (f) and then remove lower adjusting bolt (g)
2. Remove the belt rotating by the drum clockwise whist feeding the belt off the flywheel boss. (See diagram 16 below) **(Warning! Be careful not to trap fingers at this point.)**

3. Before replacing the belt ensure that the grooves of the rear drum and resistance flywheel boss are cleared off any dirt or debris.
4. We recommend that at this point the lower adjuster bolt is unscrewed, the spring that is sometimes located at the bottom of the vertical tensioning bar is removed, and the adjusting bolt re-fitted but not tightened. The spring can be discarded as it is not absolutely required.
5. Set the rear drum so that the axle stub is in a vertical position. Introduce the belt by fitting it over the resistance flywheel boss (groove side down) and under the upper tension wheel (h).
6. Run the belt on to the rear drum by feeding it round the top of the drum whilst rotating the drum in a clockwise direction. Continue to rotate the drum whilst forcing the belt to remain in place with your hand. Please ensure that at this point the belt remains on the resistance flywheel boss by observing its position during rotation. (See diagram 17 below)**(Warning! Be careful not to trap fingers at this point.)**

k

J

h
.

g

f

Diagram 16

Diagram17

7. Adjust the drive belt tension. Screw the lower adjusting bolt until a satisfactory tension is achieved. The recommended tension should be set so that with firm pressure the drive belt can only be deflected in one direction by approximately 3 mm at the point shown. Inadequate tension can cause the belt to slip producing a squealing noise and unsmooth action Too greater tension will place undue pressure on the rear drum and bearings. When set re-tighten upper and lower locking bolts.

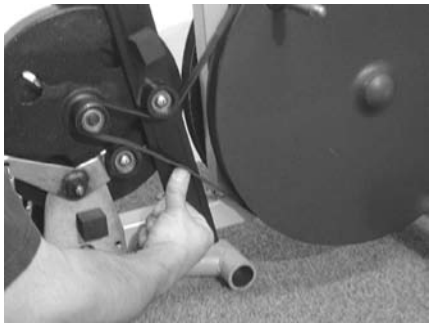


Diagram 18

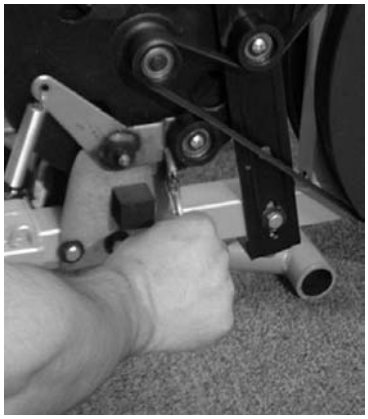
8. Checking and setting belt alignment. Rotate drum in an anti - clockwise direction (simulating forward motion in use). Observe the belt alignment. Rotate the drum in the opposite direction (simulating reverse motion in use). Observe the belt alignment. If the belt runs out of line it may be caused by incorrect tolerance of frame components.

9. Dressing the belt. We recommend that at this point that both sides of the belt are ‘dressed’ with light coating of French chalk as this can reduce noise and increase longevity of the belt.

Type 2 transmission

1. Slacken off the vertical tensioning bar by loosening the upper and lower locking bolts (h) and then remove lower adjusting bolt (i). Unhook the spring attached to the floating tension wheel and let the wheel and arm fall away. (J)
2. Remove the belt rotating by the drum clockwise whist feeding the belt off the flywheel boss. Se diagram 16 above) **(Warning! Be careful not to trap fingers at this point.)**
3. Before replacing the belt ensure that the grooves of the rear drum and resistance flywheel boss are cleared of any dirt or debris.
4. We recommend that at this point the lower adjuster bolt (i) is unscrewed, the spring that is sometimes located at the bottom of the vertical tensioning bar is removed, and the adjusting bolt re-fitted but not tightened. The spring can be discarded as it is not absolutely required. If you wish to remove the vertical tensioning bar then unscrew and remove the upper and lower locking bolts completely and the bar can be removed.
5. Set the rear drum so that the axle stub is in a vertical position. Introduce the belt by fitting it over the resistance flywheel boss (groove side down) and under the upper tension wheel (k), under over the top of the floating tension wheel.
6. Run the belt on to the rear drum by feeding it round the top of the drum whilst rotating the drum in a clockwise direction. Continue to rotate the drum whilst forcing the belt to remain in place with your hand. Please ensure that at this point the the belt remains on the resistance flywheel boss by observing its position during rotation. (See diagram 17 above)**(Warning! Be careful not to trap fingers at this point.)**
7. Adjust the drive belt tension. Screw the lower adjusting bolt until a satisfactory tension is achieved. The recommended tension should be set so that with firm pressure the drive belt can only be deflected in one direction by approximately 3 mm at the point shown. Inadequate tension can cause the belt to slip producing a squealing noise and unsmooth action Too greater tension will place undue pressure on the rear drum and bearings. When set re-tighten upper and lower locking bolts.
8. Checking and setting belt alignment. Rotate drum in an anti - clockwise direction (simulating forward motion in use). Observe the belt alignment. Rotate the drum in the opposite direction (simulating reverse motion in use). Observe the belt alignment. If the belt runs out of line it may be caused by incorrect tolerance of frame components. Now reattach the floating tension arm spring so that the wheel is now applying pressure to the drive belt. Rotate the drum as indicated previously. If the belt moves out of alignment the floating arm assembly may need to be adjusted by bending the floating wheel arm in or out. If the belt is running out (towards the covers) bend the arm towards the frame. If the belt is running in (towards the frame) bend the arm towards the covers. Only a small amount of movement may be necessary to realign the belt. This operation can be assisted if the floating wheel assembly is removed from the machine by unscrewing the securing nut.
9. Dressing the belt. We recommend that at this point that both sides of the belt are ‘dressed’ with light coating of French chalk as this can reduce noise

and increase longevity of the belt.



Rear drum assembly

The rear drum assembly consists of 2 drum covers, 2 flywheel cross frame/axle units and one set of bearings. The following is a description of how the unit assembles/disassembles and failures associated with each component. Remove the foot-tubes, main covers and flywheel belt as previously outlined to access this area.

Drum cover and cross frame assembly

1. Check for problems within the rear drum assembly. Rotate the assembly checking for noise or unsmooth rotation which may indicate worn bearings. If there is a presence of lateral fluctuation during rotation this may cause belt misalignment and lead to noise problems. This can be an indication that the cross frames are distorted.
2. Check for play within the assembled units; Grab hold of the right drum and attempt to move in and out. If there is any lateral movement this could indicate that the securing bolt is loose. However, re-tightening this may only be a partial solution as wear may have already occurred on the cross frame axle joint. The cross frames often need to be replaced in this situation. Finally
3. Remove cap from the centre of the right-hand side drum cover.

4. Separating drum cover and cross frame assemblies A standard (Shimano style) crank puller and adaptor will be required.(see later for details)
5. Remove the securing bolt and replace it with the adaptor until approximately 5mm is still exposed above the internal face of the right side cross frame
6. Screw the crank puller into the internal thread of the right side cross frame until firm.
7. Use a wrench to turn the top half of the extractor tool until the 2 units are separated. Remove extractor tool and adaptor.

7. If required, remove the left side assembly by the following method: Remove the circlip and washer located on the end of the axle (projecting through the right side) and then pull the left side unit away. If the unit cannot be pulled off, tap the end of the axle gently with a soft faced hammer until removed.

Details of the extractor adaptor tool

The adaptor can be made by cutting a piece of 8 x 1.25 mm threaded steel rod to 25mm in length and cutting a slot into so that it can be turned using a slot–head screwdriver. (See diagram below)

–
–
–
–
–
–
–
–

Changing Rear Drum Brace Assembly Frame bearing

1. Place a long drift through the centre hole of one bearing so that it rests against the inner side of the opposite bearing.
2. Tap the end of the drift with a hammer until the one bearing is removed.
3. Repeat the removal process with the other side. Be careful to remove the bush which separates the 2 bearings.
4. To re-fit new bearings push one bearing into the frame housing and tap lightly with a soft faced hammer until the face of the bearing is flush with the top of the frame. Great care should be taken not to damage the bearing.
5. Replace the separating bush and then re-fit second bearing as above.

Rear Drum covers

The covers are identical except that the speed sensor is mounted within the left-hand unit which is the drive belt side. If the drive side unit is worn or cracked the items can be exchanged providing that the speed sensor magnet is relocated.

Noises produced by the drum covers

Each cover is secured to the cross frame units by 8 screws if one or several of the mounting posts are damaged this can produce a ‘creaking’ noise under pressure. Also, this can lead to external cracks in the drum cover faces. A further service point can be to separate the drums from the cross frame and lubricate every contact point with grease.

Resistance Flywheel assembly

The resistance flywheel rotates on a fixed axle using 2 sealed bearings held in place by an internal circlip on the drive belt side and a nylok nut on the other. If the bearings fail this will result in a ‘rumbling’ noise. It may be necessary to isolate the flywheel by detaching the drive belt as shown previously. To replace the bearings:

1. Remove the foot-tubes, covers, drive belt & vertical tensioning bar using previously outlined procedures. In some models it may also be necessary to remove the rear drum & brace assembly or the as floating tension arm as outlined previously.
2. Slacken off the nylok nut on the non drive belt side of the flywheel axle by around 2 turns. To remove any friction, lightly tap the end of the axle with a soft faced hammer.
3. Remove the internal circlip from the centre of the flywheel assembly.
4. From the drive belt side, slide the flywheel off of the axle.

Replacing Resistance Flywheel bearings

1. Place a long drift through the centre hole of one bearing so that it rests against the inner side of the opposite bearing.
2. Tap the end of the drift with a hammer until the one bearing is removed.
3. Repeat the removal process with the other side.
4. To re-fit new bearings push one bearing into the bearing housing and tap lightly with a soft faced hammer until the face of the bearing is flush with the top of the flywheel face. Great care should be taken not to damage the bearing.
5. Re-fit second bearing as above.

Section 4

Bearings and joints

The linkages between the swing arm, foot-tube and rear brace involve 3 main joints and bearings. These are often a source of noise or unsmooth operation and therefore attention is often required.

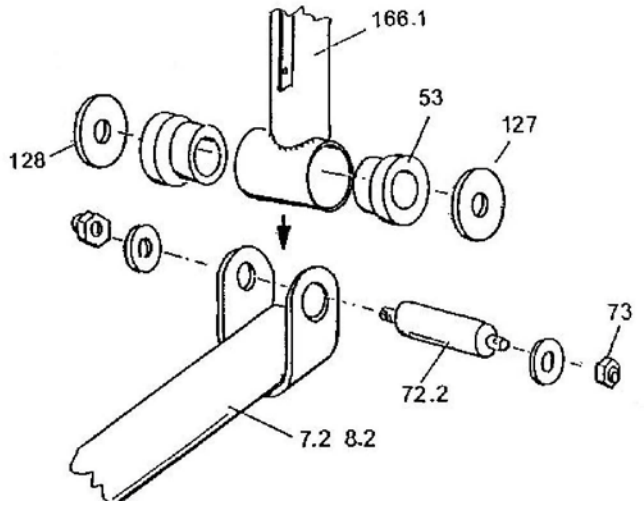
Swing arm joint

The swing arms are mounted on to the handle bar axles and locked in place by a nylock nut supported by 2 washers. Inside each swing arm joint there is a combination of a sealed bearing and sinter bearing. It is very important that these areas are well lubricated with grease and this should be carried out as a part of a general service. The bearings are very seldom a problem and replacement is rarely required.

Lower Swing arm to foot-tube joint

The 2 components are connected via an axle through the lower swing arm which has sinter bearing bushes inside. The axle is secured by 2 nylok nuts and supporting washers (See diagram). It is very important that these areas are well lubricated with grease and this should be carried out as a part of a general service. The joint must

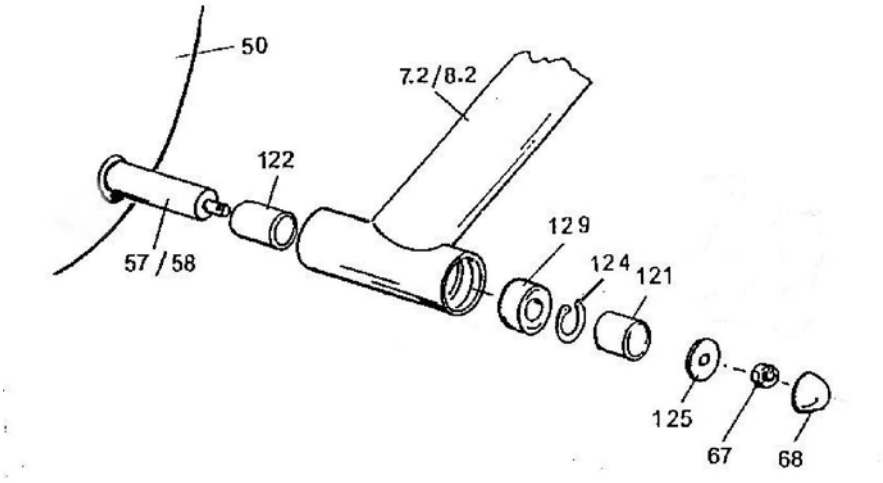
be isolated to check its performance by either detaching the lower swing arm tube from the upper or detaching the foot-tube from the rear drum (See earlier) It is important that the combination of components is correctly assembled and adjusted. The inner nut of the pair should be fully tightened first. Then the outer nut should be tightened so that the joint is correctly adjusted. There should be sufficient rotation of the joint allowed without ‘pinching’ or lateral movement.



Foot-tube to rear drum brace joint.

The foot-tube is connected to the rear drum brace via the axle stub. Inside the foot-tube joint is a sealed self-aligning bearing held in place by an internal circlip. Either side of the bearing are 2 differently sized bushes (121 & 122. The components are secured in place by a nylok nut and washer. The self-aligning bearings rarely require attention but if required removal can be made by removing the circlip and carefully tapping out the bearing, replace with a reverse procedure. When re-assembled the nylok nut must be fully tightened. If there is any lateral play between the joint and the rear drum brace axle this may be due to play occurring

within the area between each bush (121 & 122) and the self-aligning bearing. To correct this it may be necessary to replace either or both of the bushes or use shimming washers to reduce the space.



ELLIPTICALS

Servo Motor Replacement Procedure

Bremshey Ambition & Control & Tunturi C20

1. Un-plug main power supply.

2. Remove screws on both side of the shroud and take cover off.

3. Loose tension wire from tension motor.

4. Unplug power supply wire to tension motor.

5. Un-screw the 4 mounting screws to remove old tension motor.

6. Re-attach new tension motor.

7. Re-connect the power supply wire to tension motor.

8. Re-plug in the main power supply wire.

9. Run the elliptical for 10 second so the computer can reset the motor.

10. Adjust the tension wire adjuster on the other end of the wire connection to the tension device so NO THREADING can be seen (turn clockwise all the way in)

11. Re-attach the tension wire to the motor by inserting the “locking piece” into the motor and thread the wire COUNTER CLOCKWISE to the motor wheel and lock the wire.

12. Replacement of motor is completed and we can put shroud cover back.

ELLIPTICALS
CRANK PULLER MODIFICATION
Bremshey & Tunturi C10, C20 Models

TO ADD BOLTS IN

1. **We have a stock bolt which can be used with the Shimano style crank puller to remove the pedal cranks for these models.**

2. **As you know- these models have a small hole for the securing bolt that does not allow the end of a standard puller to contact the axle that it normally pushes against.**

3. **Use bolt- pt# 60.06.035.32- to put into the axle.**

4. **It has an Allen style head which comes through the hole just enough to allow the puller to thread in securely and still pull off the Right side crank piece.**

TUNTURI®
THE MOTOR – *it's you.*

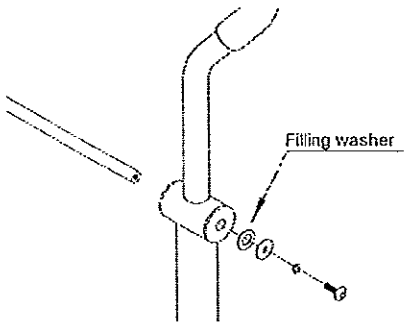
Technical Information 04/03

16.06.03

Product	C3	C4	C6
From serial number	3G06776	3G01626	3G...

Reason for Change:

The horizontal main axle of the moving arms is lengthened. Friction between the arms and the main frame causes a disturbing noise even if the parts are lubricated, and therefore the friction is now avoided by lengthening the axle. Due to production tolerances, the arms may sometimes be too loose for comfortable training, and therefore we have included 8 filling washers in the package. The instructions (included also in the package) for using the washers are as stated below:



If the arms appear to move too much sideways, please carry out the following procedure: Remove the assembly bolt from either end of the metal shaft, place one or more of the 0.15 mm spacers provided on to the shaft, as shown in the picture and then re-fit the assembly bolt.

Best Regards
Mikko Aittokallio

Front Drive Ellipticals & Bikes

BREMSHEY SPORT®
Fit for Life

TUNTURI®

Technical product matrix

2007-08

			Console		
					
Resistance system	**Bikes**	**Crosstrainers**	**T-Gen**	**Colour LCD**	**B&W LCD**
Electromagnetic brake	E80/E85/E80L/E80R	C80/C85	x		
	E60/E60R	C60/C65	x		
	E40/E45	C40/C45	x		
	E30/E30L/E30R	CE30/CE35		x	
Servo motor	E25	CF30/CF35		x	
	F35	***			x
Manual	F30/F20	C20/C25			x

1.

2.

3.

Bremshey EMS

Bremshey Servo

Bremshey Manual

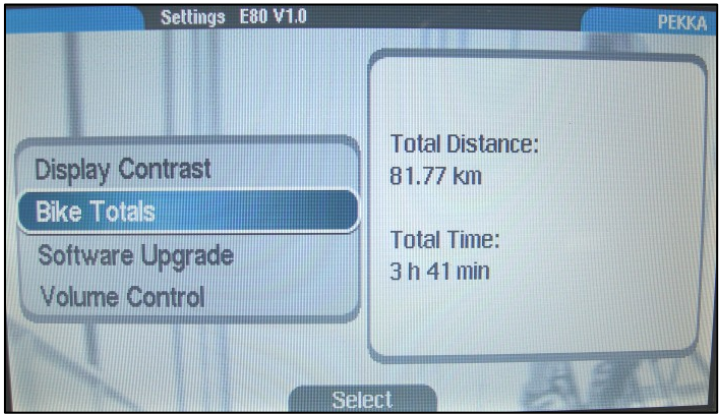
MEMBER OF ACCELL GROUP

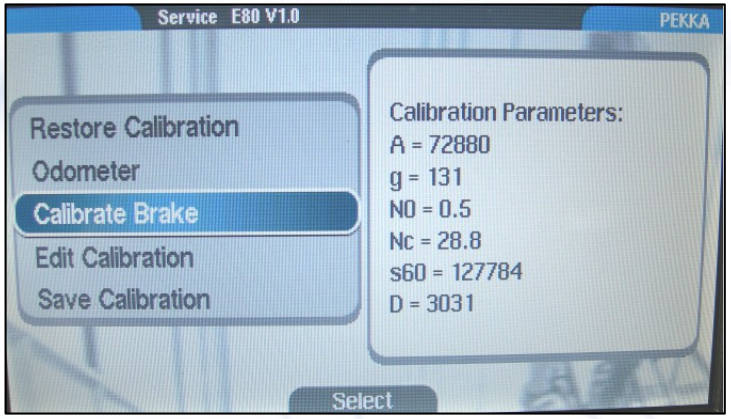
Service menu

•Public <u>settings menu</u> features:

- Display contrast adjustment
- Bike total values (resettable)
- Software uprgade
- Volume control

•<u>Service menu</u> can be accessed from settings menu by pressing ZOOM-button and rotating wheel minimum 5 clicks CCW and then minimum 5 CW.





Brake calibration (Electromagnet, EMS)

•Electromagnet brake calibration parameters are fine-tuning values according to which the software calculates and adjusts the current to the electromagnetic brake

•Brake can not be re-calibrated without a dynamometer

•The distance between the electromagnet and the flywheel is the most significant factor in resistance system (fixed construction)

Brake re-calibration (Electromagnet, EMS)

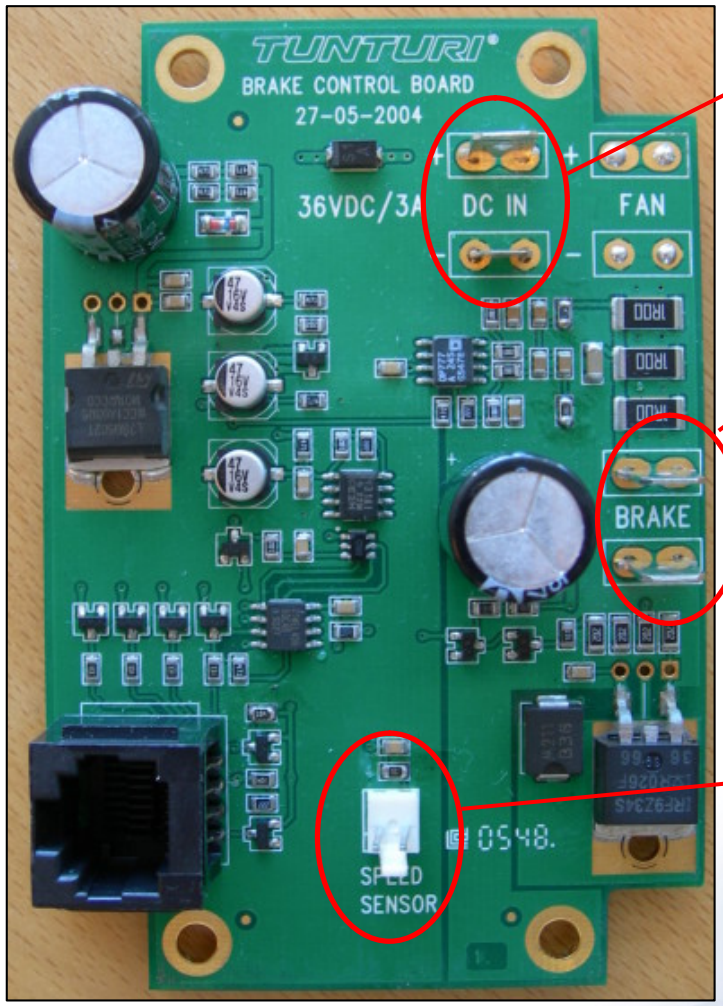
•Calibration settings should be restored after changing the user interface or lower board!

- Parameters stored both in the user interface memory and lower board memory (EEPROM)
- Parameters also written on the product frame

Parameter	Default value	Minimum	Maximum
A	29000	20000	40000
g	115	50	200
N0	2.0		5.0
Nc	42.0		50.0
N100	46.0	25.0	60.0
s60	111111	100000	120000
D	0	0	10000

SAVE: User interface (UIF) → Lower board (EEPROM)

RESTORE: Lower board (EEPROM) → User interface (UIF)



- DC voltage in from transformer (26VDC)
  - Can be measured with a multimeter
- DC voltage supplied to electromagnet (0-30 VDC, pulse width modulated)
  - Voltage level increases whilst resistance is adjusted higher → ~30VDC is maximum resistance
- Speed sensor signal voltage (3,3 VDC)

Error codes

FAULT 101

“Saving parameters into EEPROM failed!”

•Can appear only when one is manually saving parameters to lower board memory (saving to EEPROM)

Possible reasons:

•Poor connection between the user interface and lower board

•Lower board memory is damaged and the lower board needs to be replaced

Error codes

FAULT 1

“Brake fault detected!”

•The error can only appear when voltage is supplied to the electromagnet.

Possible reasons:

•Poor connection between the user interface and lower board

•Defective lower board

•Poor connection between the lower board and the electromagnet

•Defective electromagnet (measure electromagnet coil total resistance, it should not be zero or infinite)

Updating software

- The software of the Tunturi C40-C85 can be updated via USB connection by uploading the new software from a PC (PC cable not included!)
- The C80/85 can be updated also with a memory stick
- Latest update software versions and instructions available on Tunturi Extranet
- Always use the latest software version available

C4045-07_V1_0_upgrade.exe

Technical specification

- Switch for KM/MILE display on the back of console
- No service menu available (total values not recorded)
- All user interfaces have in-built HR receiver

MEMBER OF ACCELL GROUP

ACCELL FITNESS

2. 3.

TUNTURI® BREMSHEY SPORT®

Error codes

E-1

E-4

•The errors are usage errors and do not indicate fault in product

<u>Possible reasons:</u>

•E-1: User not wearing HR belt or not holding hand grip HR sensors

•E-4: User settings not within range (for example height 190cm, weight 20kg)

MEMBER OF ACCELL GROUP

Error codes

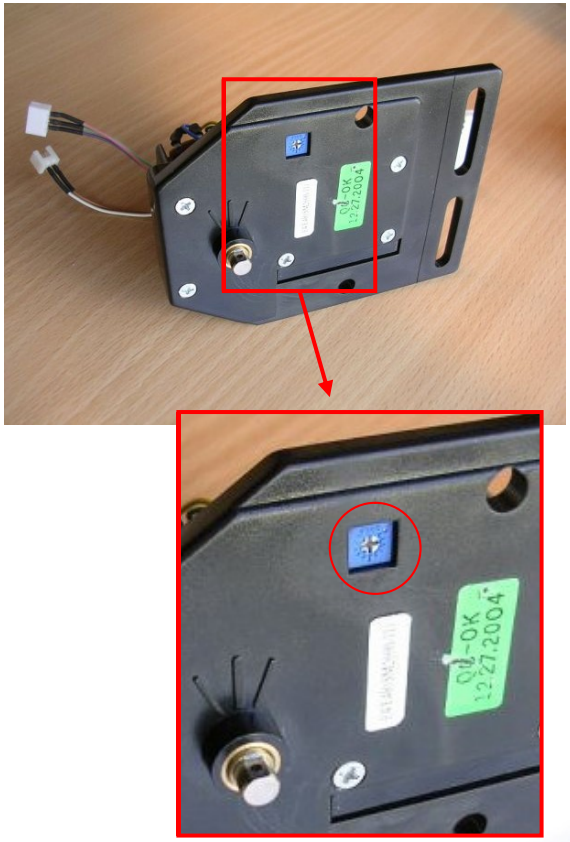
E-2

- Data connection between the user interface and lower card failed [units with electromagnetic brakes]
- Servo motor maximum calibration setting can not be reached [units with servo-adjusted brakes]

Possible reasons:

- Defective cable or connector between the user interface and lower board [electromagnet]
- Servo motor incorrectly calibrated [servo]

Servo motor calibration



CALIBRATING SERVO MOTOR

1. Install servo motor and switch off power
2. Set calibration to minimum by turning blue trimmer clockwise
3. Switch on power and adjust resistance to maximum from meter
4. Slowly adjust trimmer counter-clockwise until the distance from magnet to flyhweel is about 2mm

CALIBRATION SHOULD ONLY BE DONE IF THERE IS ”E-2” ERROR!

VER. 0.90

Service Manual

Tunturi F30, E40, E45, E60, E80 & E85

1 FOREWORD

This Service Manual contains instructions and advice on service procedures for Tunturi bike ergometers E30, E40, E45, E60, E80 and E85 (the mechanical section applies also to the Tunturi fitness bike F30 from 2006 onwards).

The primary intention of this Service Manual is to enhance the reader's knowledge of the structures of the Tunturi bike ergometers E30, E40, E45, E60, E80 and E85 and Tunturi fitness bike F30 (autumn 2006 onwards). Notice that in case of a fault or a malfunction, the component or unit of components in question, and especially the electronic components, are not to be repaired, instead they must be replaced with a new component.

The components of the product frame and their locations with the reference and spare part numbers can best be found in the exploded parts diagrams. Replacing the components does not require special tools, but assumes a certain level of technical competence and familiarity with basic hand tools.

NB! Always when servicing fitness equipment be sure that the power has been switch off and the mains cable is plugged off. Capacitors on the control board will retain voltage even after the unit has been switched off.

VERSION HISTORY

Date	Version	Author	Change description
2006-15-08	0.01	PVI	Initial version
2006-09-05	0.50	PVI	Updated troubleshooting and SW upgrade instructions. Mechanical section missing.
2006-10-03	0.90	PVI	Mechanical section added

2 MECHANICS

2.1 BEARINGS

2.1.1 Bottom bracket bearings (#53)

The bottom bracket bearings (type 6003RS, #53 in diagram) are fitted press-tight to the frame bushing and push-tight on the axle, both secured with locking glue (e.g. Loctite 603). The glue becomes unfastened in +200 degrees Celsius. After heating, the bearings can be removed with a puller (e.g. SKF tool,).

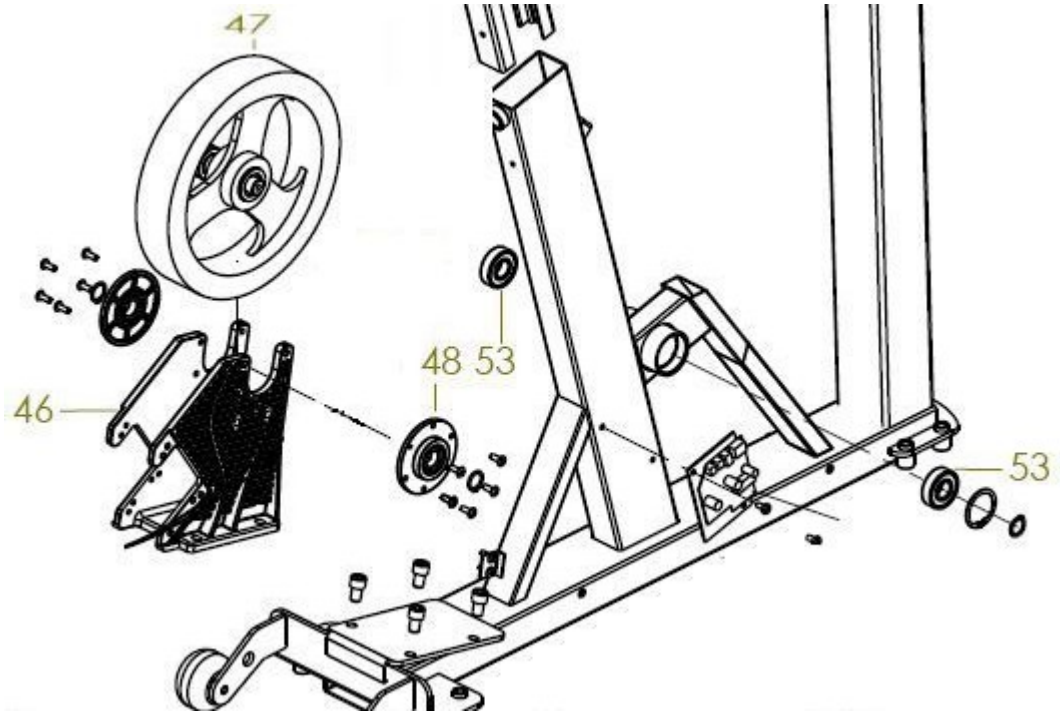


Figure 1 Frame bearings

2.1.2 Flywheel bearings

The roller bearings (type 6003RS) are fitted press-tight to the flywheel (#47). One-way bearing (clutch) is pressed into flywheel between the roller bearings. The flywheel axle is glued to roller bearings (type 6003RS) inside flanges (#48).

3 ELECTRONICS

All ergometers (E30, E40, E45, E60, E80 and E85) have the same electromagnetic brake construction and apart from the E30 all the electronics and wiring are identical excluding user interface.

3.1 SERVICE MENU

The user interface features two menus where technical information can be edited. The first one, *Settings* menu, is a public menu available also to the end user and accessed via normal menus under user settings.

Table 3-1 *Settings* menu

NAME	FUNCTION
Bike totals / Crosstrainer totals	Total training time and distance on the equipment. Use 'CLEAR' to reset both values
SW upgrade	Shows the user interface's software version. See more details about updating the user interface software in chapter 4
Volume control	Set the meter's audio signals on or off
Display contrast	Adjust display contrast

The *Service* menu is for Tunturi service personnel only and can be accessed with following routine

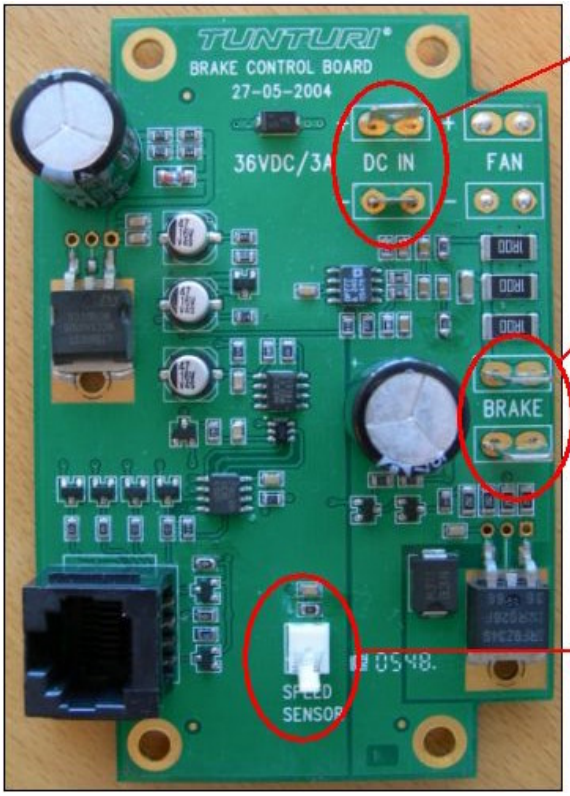
1. Enter *Settings* menu as described above.
2. Hold down 'ZOOM' –button and rotate selection wheel first 5 steps (minimum) counter-clockwise and then 5 steps clockwise.

Table 3-2 *Service* menu

NAME	FUNCTION
Save parameters	Please refer to chapter 5
Restore parameters	Please refer to chapter 5
Odometer	Total training time and distance on the equipment. These values can not be reseted
Calibrate brake	Please refer to chapter 5
Edit calibration	Please refer to chapter 5

Please refer to chapter 5 for closer details about brake calibration parameters.

3.2 LOWER BOARD



- DC voltage in from transformer (26VDC)
  - DC voltage can be measured with a multimeter to ensure lower board is supplied with voltage
- DC voltage supplied to electromagnet (0-~30 VDC, pulse width modulated).
  - Voltage level increases whilst resistance is adjusted higher 0-~30VDC is maximum resistance. To measure the voltage the resistance needs to be adjusted above 0-level and speed sensor must receive pulses.
- Speed sensor signal voltage (3,3 VDC)
  - Signal voltage can be measured to verify the functionality of the board

Figure 2 Possible troubleshooting measurements from lower board

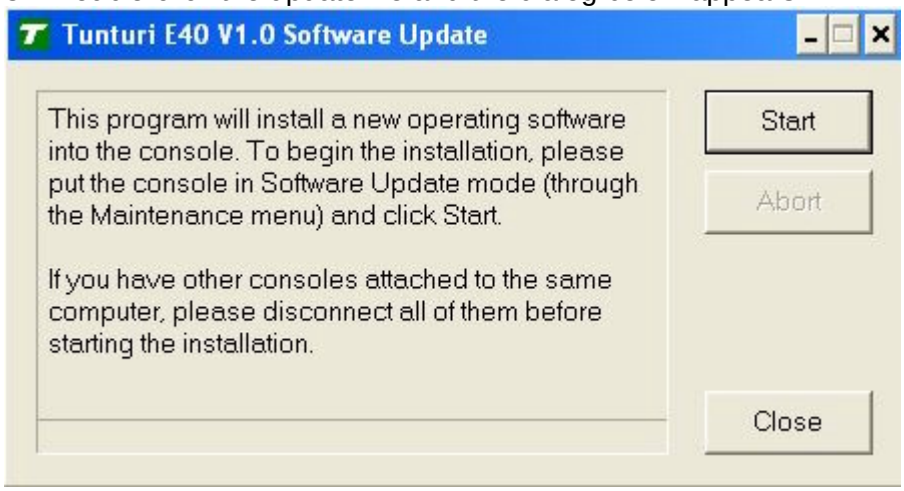
4 UPDATING SOFTWARE

The software of the Tunturi , E40, E45, E60, E80 and E85 can be updated via USB connection by uploading the new software from a PC. The PC needs to be connected to the user interface with USB-cable (comes with the sales package). Before starting the update procedure make sure you have all the following:

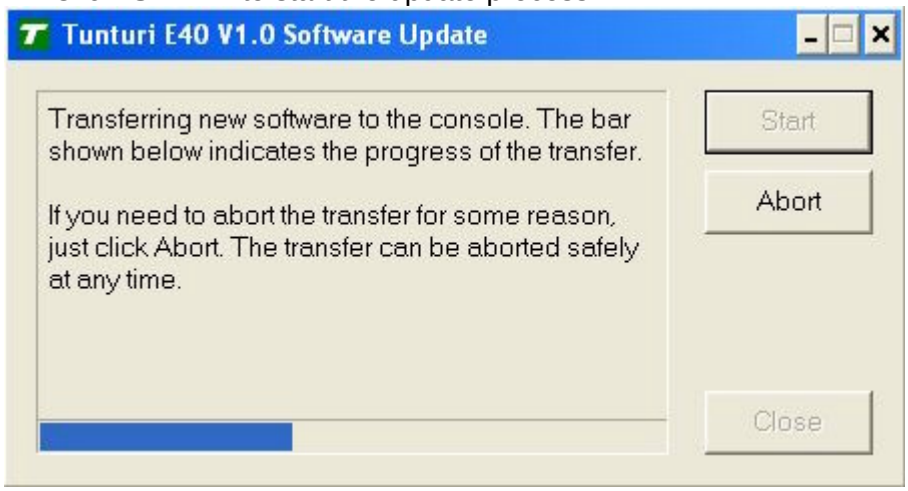
- A PC or laptop with USB port
- USB cable
- A new software file (of *.exe type) available on PC's hard disk. Latest versions of software and version histories are available on Tunturi extranet.

To update the software proceed as follows:

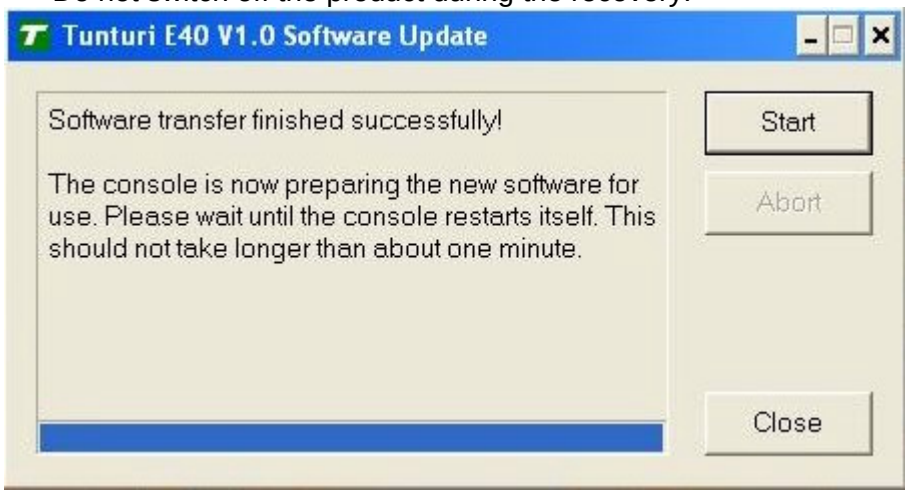
1. Connect the USB cable between the PC and user interface (must be switched on)
2. Go to the *Settings* menu (see instructions in chapter 3.1) and select 'SW UPGRADE'.
   - If 'READY TO BEGIN' is displayed on the user interface's screen, start the update by double-clicking the update file.
   - 'ATTACH USB CABLE' means that the connection hasn't been established. Check connection and restart PC if needed.
3. Double-click the update file and the dialog below appears



4. Click ‘START’ to start the update process



5. The update process will take a minute or less, depending on the size of update file. After the update is completed, the user interface is automatically reseted and the start-up can take up to 30 seconds. Do not switch off the product during the recovery.



After update verify that the new software version is in use by checking the software version number from *Settings – SW Upgrade* menu.

4.1 UPDATING THE E80 AND E85 WITH A USB STICK

The Tunturi E80 and E85 software can also be updated from a USB Flash memory stick. The software update file must be in the root of the flash drive (i.e. not in a folder).

To update the software proceed as follows:
1. Place the USB stick to either of the slots on the back of the console
2. Go to the *Settings* menu (see instructions in chapter 3.1) and select 'SOFTWARE UPGRADE'.
   - Choose 'USB Flash Drive'
   - Choose correct software update file to start update process

NOTE! Do not rename the update files!

5 CALIBRATION

Calibration parameters are fine-tuning values according to which the software calculates and adjusts the current to the electromagnetic brake so that desired pedalling resistance is obtained. Because each unit is calibrated in the production, the parameters compensate mechanical and electrical differences caused by component and assembly tolerances between different units.

The software stores the calibration parameters in two separate places:

- To the user interface's flash -memory
- To the EEPROM -memory located on the lower power board (lower power board memory will be referred as "EEPROM" later in this document)

Storing parameters in two separate places facilitates repairing of a defective product. The need of re-calibrating the brake system can in most of the cases be avoided by restoring the original parameters from either memory. Calibration parameters are also written in the production on a label located on the product frame post near lower board.

Table 5-1 Service menu calibration functions

NAME	FUNCTION
Save parameters	Saves all edited data to EEPROM
Restore parameters	Copies brake calibration parameters from EEPROM to user interface. The parameters will be used only until next start-up, unless separately saved in the memory with 'Save' function
Odometer	Please refer to chapter 3.1
Calibrate brake	Brake can be calibrated with a dynamometer following the instructions on the screen (calibration at 100 and 60 RPM)
Edit calibration	Manually edit brake calibration parameters. Edited parameters must be saved in the memory using the *'Save parameters'* function before exiting the '*Service'* menu to activate them.

NB! One does not need to access the service menu when replacing either user interface or lower board is replaced. The software will automatically detect the modification and function as per described in the chapters 1 - 5.

5.1 CALIBRATION PARAMETERS

At the start-up the software reads calibration parameters from both user interface and EEPROM. It compares the parameters that they are matching and are within preset limits (see Table 5-2).

Table 5-2 Default brake calibration values and limits

PARAMETER	DEFAULT VALUE	MIN. LIMIT	MAX. LIMIT
A	25000	-50%	+50%
g	150	-50%	+50%
N0	20	-50%	+50%
s60	254234	-25%	+25%
D (delta)	0	0	10% of s60 default value

The comparison of the parameters during the start-up can result one of the following options:

1. Both user interface and EEPROM parameters are valid (within the limits) and they are matching together.
2. Both user interface and EEPROM parameters are valid (within the limits), but they are not matching together.
3. Only user interface parameters are valid (within the limits)
4. Only EEPROM parameters are valid (within the limits)
5. Neither memory has valid parameters

1. PARAMETERS VALID AND MATCHING TOGETHER

This is the normal situation. The software will use the calibration parameters read from the EEPROM and use them to control the electromagnetic brake without notifying anything to user.

2. PARAMETERS VALID BUT NOT MATCHING TOGETHER

The most probable reason for this is that the user interface has been in use and transferred to another frame. In this case the software will prioritize the EEPROM parameters over the ones in the user interface. This is because the components that have the most affect on the parameters are on the frame and thus the EEPROM will have more accurate parameters for the new combination.

Following question will be displayed on the display:
"Calibration parameters of User Interface and EEPROM are not equal. Restore brake calibration from EEPROM to user interface? YES / NO"

- YES: The software will use the parameters from the EEPROM for controlling the electromagnetic brake and store them also to the user interface memory.
- NO (or reset): The software will use the parameters from the EEPROM for controlling the electromagnetic brake but will not store them to user interface memory. The question will be displayed again after restart.

Note! The case can also be that a second-hand lower board has been installed to the frame. In such case the correct calibration parameters are on the user interface memory and should not be overwritten with the ones from the EEPROM. One can get the correct parameters in use by first answering 'NO' to the question and after that manually saving the parameters to the EEPROM with 'SAVE' function in *Service – Edit calibration* menu.

3. ONLY USER INTERFACE HAS VALID PARAMETERS

The parameters on the EEPROM are not valid for some reason (e.g. the lower board is a spare part which are not pre-calibrated). Following question will be displayed on the screen:
"Calibration parameters of EEPROM are not valid. Restore brake calibration from User Interface to EEPROM? YES / NO"

- YES: The software will use the parameters from the user interface memory for controlling the electromagnetic brake and store them also to EEPROM.
- NO (or reset): The software will use the parameters from the user interface memory for controlling the electromagnetic brake but will not store them to EEPROM. The question will be displayed again after restart.

4. ONLY EEPROM HAS VALID PARAMETERS

The parameters on the user interface memory are not valid for some reason (e.g. it is a spare part which are not pre-calibrated). Following question will be displayed on the screen:

" Calibration parameters of User Interface are not valid. Restore brake calibration from EEPROM to user interface? YES / NO"

- YES: The software will use the parameters from the EEPROM for controlling the electromagnetic brake and store them also to user interface memory.
- NO (or reset): The software will use the parameters from the EEPROM for controlling the electromagnetic brake but will not store them to user interface memory. The question will be displayed again after restart.

5. NEITHER MEMORY HAS VALID PARAMETERS

User will be notified with following message:
"Brake is not calibrated!"

The software will use the default parameters (see Table 5-2), which will ensure satisfactory accuracy of the ergometer resistance system. To have original parameters in effect again one needs to manually add them to the memory through *Service* menu. Original parameters are written on label attached to the product frame post inside side covers.

5.1.1 CASE EXAMPLES

In this chapter possible service cases are discussed as example.

- **Calibration parameters of User Interface are not valid. Restore brake calibration from EEPROM to user interface? YES / N**
  Possible reasons:
  1. The user interface has been replaced with a new spare part. Answering 'YES' will copy calibration parameters from EEPROM to the user interface and the product is working correctly.

- **Calibration parameters of EEPROM are not valid. Restore brake calibration from User Interface to EEPROM? YES / NO**

  Possible reasons:
  1. The lower board has been replaced with a new spare part. Answering 'YES' will copy calibration parameters from EEPROM to the user interface and the product is working correctly.

- **Calibration parameters of user interface and EEPROM are not equal. Restore brake calibration from EEPROM to user interface? YES / NO**

  Possible reasons:
  1. The user interface has been replaced with second-hand one. It's advisable to copy the calibration parameters from the EEPROM to the user interface by answering 'YES'.
  2. The lower board has been replaced with second-hand one. It's advisable to copy the calibration parameters from the user interface to EEPROM by first answering 'NO' and manually saving the parameters to the EEPROM with *Save parameters* function in *Service* menu.
  3. Both user interface and lower board has been replaced with second-hand ones. After answering 'YES' or 'NO' one needs to manually insert correct parameters the EEPROM. Correct parameters can be found on a label located on the product frame post inside side covers. Insert these parameters to the EEPROM using *Edit calibration* function under *Service* menu. Save the parameters to the EEPROM with *Save parameters.*

6 ERROR CODES

FAULT 1

Brake fault detected!

The error can only appear when voltage is supplied to the electromagnet. The software compares ratio of supplied PWM (voltage) and current and if required amount of current remains too low compared to what it is supposed to be, the error will appear.

Possible reasons:

1. Defective cable or connector between the user interface and lower board
    a. To by-pass existing wiring and eliminate possible problems caused by that it is advisable to remove side cover (right) and connect user interface directly to the lower board.
2. Defective lower board
    a. Measure that lower board is supplying voltage to the electromagnet as per instructed in chapter 3.2
3. Defective cable or connector between the lower board and the electromagnet
4. Defective electromagnet
    a. Measure electromagnet coil total resistance, it should not be zero or infinite. (Disconnect electromagnet cables from lower board before measuring)

FAULT CODE 101

Saving parameters into EEPROM failed! ENTER

Possible reasons:

1. Check connections between the user interface and lower board
    a. To by-pass existing wiring and eliminate possible problems caused by that it is advisable to remove side cover (right) and connect user interface directly to the lower board.
2. Lower board memory is damaged and the lower board needs to be replaced

Please note that the ergometer can be used normally even it gives this error during start-up. The calibration settings in the lower board memory (EEPROM) can however not be edited.

7 APPENDICES

TROUBLESHOOTING

- Bike is making ticking / knocking noise
  - The best way to start finding the root cause of the problem is to listen to the frequency of the noise. For example, the pedal rotates once per revolution, should this be the frequency of the noise, the pedal needs to be tightened up. If the noise has significantly higher frequency it is likely to be caused by rotating parts, i.e. bearings in transmission
  - Adjust the feet to make the bike even with the floor

- Heart rate readings are inaccurate
  - The motor wires needs to be wrapped through a ferrite ring and twisted around each other in order to prevent possible heart rate reading interference
  - Home appliances, e.g. TV and mobile phone, and electric network can generate interference. Try using equipment in different environment

ADAPTOR SPECIFICATION

The E40/45, E60 and E80/85 adaptor is a switching type of power supply instead of traditional linear power supply (as in E30).

On top of the adaptor casing there is a green led indicating whether the transformer is receiving input voltage or not.

Table 3 Switching power adaptor specification for the E40/45, E60 and E80/85

Input	100-240V ~50/60Hz
Output	26 VDC, 2.3A
Plug size	5.5 mm

Table 4 Adaptor specification for the E30

Input	230V
Output	18VDC, 1800mA
Plug size	5.5 mm

The F30 resistance is manually adjusted and run by batteries only.

SPARE PART DIAGRAMS

Please refer to the next page.