

Manual for Monark 891 E 891 E Wingate Option



891 E
Art. No: 90891



891 E Wingate Option
Art. No: 90891-2



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Important

Read the manual carefully before using the cycle
and save it for future use.

Monark Exercise AB

Monark has 100 years' experience of bicycle production. The Monark tradition has yielded know-how, experience, and a real feel for the product and quality. Since the early 1900s, Monark's cycles have been living proof of precision, reliability, strength and service. Those are the reasons why we are now the world leader in cycle ergometers and the market leader in Scandinavia in transport cycles.

We manufacture, develop and market ergometers and exercise bikes, transport bikes and specialized bicycles. Our largest customer groups are within health care, sports medicine, public authorities, industry and postal services.

For more information: <http://www.monarkexercise.se>



Monark 891 E and 891 E Wingate Option

NOTE!

This manual covers two models - 891 E and 891 E Wingate Option. Watch therefore, for which sections apply to your bike.

Congratulations on your new Ergometer!

The renowned weight basket system from Monark is self adjusted and doesn't need calibration. It is adapted for use in rehabilitation, development and following-up for people with physical disabilities. Ideal for exercise from a wheel chair.

It is provide with a break, which controls by putting weights in a weight basket. 891 E and 891 E Wingate Option is stable arm ergometers qualified for tests of fitness and endurance of the upper body. The renowned weight basket system from Monark is self adjusted and doesn't need calibration.

891 E is adapted for use in rehabilitation, development and following-up for people with physical disabilities.

891 E Wingate Option has rpm-controlled dropping of the weight basket and test time up to 99 minutes. This together improves safety and opportunities for optimal testing.

The easy-to-use Windows-based software has more setting possibilities with clear presentation graphics. Thanks to double sensors, faster electronics and improved mechanics, performing anaerobic tests is now more efficient and less complicated.

Additional information regarding submaximal tests with an arm ergometer is available on our website, www.monarkexercise.se. You find the publication "Upper body fitness" if you click on "Sports & Medical" - "Tests and studies" - "Tests" - "Protocols".

NOTE!

The Astrand test is developed for leg ergometer. Therefore, these tables are not directly compared to when the test is performed on arm ergometer.

NOTE!

Use of the product may involve considerable physical stress. It is therefore recommended that people who are not accustomed to cardiovascular exercise or who do not feel completely healthy, should consult a physician for advice.

Facts about 891 E

- Adjustable stand for optimal position
- Control lever for releasing weight basket from sitting position.
- Electronic meter with heart rate
- Powder painted
- Wheels for easy transport

Width

700 mm (27 ½")

Length

1500 mm (59")

Height

1660 mm (65 1/3")

Weight

Ergometer 25 kg (55.1 lbs), stand 35 kg (77.2 lbs), totally 60 kg (132.3 lbs). Delivered with 3.9 kg weights.

Included

- Chest belt
- Weight kit consisting of:
 - 4 pcs. 0.1 kg (0.2 lbs)
 - 1 pcs. 0.5 kg (1.1 lbs)
 - 3 pcs. 1.0 kg (2.2 lbs)

Serial number

The serial number is placed according to *Fig: Serial number*.

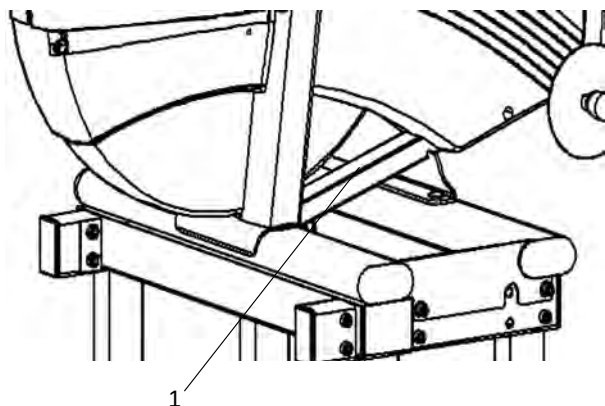


Fig: Serial number (1)

Facts about 891 E Wingate Option

- Adjustable stand for optimal position
- The weight basket is released by a push button mounted on the cover
- Electronic meter with heart rate
- Powder painted
- Wheels for easy transport

Width

700 mm (27 ½")

Length

1500 mm (59")

Height

1660 mm (65 1/3")

Weight

Ergometer 26 kg (57.3 lbs), stand 35 kg (77.2 lbs), totally 61 kg (134.5 lbs) Delivered with 3.9 kg weights.

Included

- Chest belt
- PC software
- Power adaptor
- Weight kit consisting of:
 - 4 pcs. 0.1 kg (0.2 lbs)
 - 1 pcs. 0.5 kg (1.1 lbs)
 - 3 pcs. 1.0 kg (2.2 lbs)

Technical data power adaptor

Output voltage: +9V DC

Current: 500 mA

Polarity: Minus (-) in the middle of connector. See *Fig: Polarity*.

(Art. No. 9384-650, USA Art. No: 9384-62)

Serial number

The serial number is placed according to *Fig: Serial number*.



Fig: Polarity

Features 891 E and 891 E Wingate Option

Meter instructions

Display		
Pedal revolution (RPM)	0-250	rev. / min.
HR	50-240	bpm
TIME	0:00-99:59	min:sec
SPEED	0-99	km / h or mph
DISTANCE	0.0-99.9	km
FORCE	0.0-7.0	kp
Calories (CAL)	0-999	kcal
WATT	0.7 x RPM	watt

Batteries: 2 x 1.5 V, R6 (AA)

Storing temperature: -10° C - +60° C

Operating temperature: 0° C - +50° C

Press any key or move the pedal gives a signal to the meter that activates all functions.

At the display for heart rate (HR) a heart symbol is lit which means that the computer is trying to find a pulse signal from an external source (chestbelt with electrodes, Art. No: 9339-98 is delivered with the ergometer). If the meter cannot find such a signal the HR function is automatically turned off after 30 seconds. When the function is turned off the heart symbol is not lit any more. The heart rate function can be turned on again by pressing a key.

The timer starts automatically when pedals are moved. Meter values for Time, Distance and Calories can be set to zero by pressing the RESET button for more than two seconds.

The watt reading in the display is depending on the pedalling speed. The watts can accordingly be adjusted by increasing or decreasing the pedalling speed.

Calories are calculated all the time.

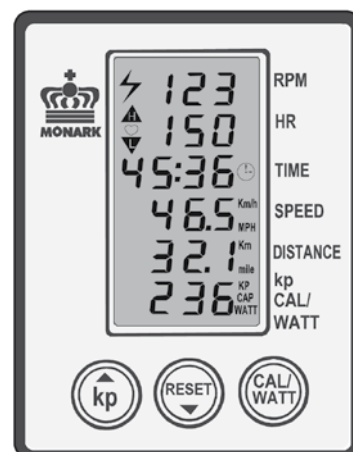
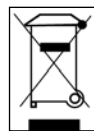
Calories

There have been different theories on how to calculate this, since it depends on several factors and this means that it can only be seen as an estimate.

We have chosen the following formula that we think complies with the results given for a standard cycle position.

As a standard calculation when we display calories on our calibrated bikes we use: 1 minute with 100W gives 7 kcal.

It is easy to convert watts to calories if it was on the flywheel (the formula is $1W=0,2388 \times 10^{-3}$ kcal/s with four decimals), but when you normally show calories you want to show the total amount of calories your body has used during your training, not only the calories "burnt" on the flywheel.



891 E

To receive the correct value for calories and watts the workload (kp) has to be set on the display. Kp value correspond to the total weight in the weight basket (weight of the basket, including the weights in it).

Example: The workload is 2.1 kg (weight basket 0.1 kg + 2 x 1 kg weight). Press the kp key to the left on the meter. Down in the display window figures is now flashing (kp). Increase in step by 0.1 with kp button (up arrow) alt. the RESET button (down arrow) until the value is consistent with the weight basket, in this case 2.1. After that press the CAL/WATT button to either show the CAL or WATT figures. At further press on the CAL / WATT-button the display toggles between calories and watts.

891 E Wingate Option

To get correct readings for calories and watts the kp value on the electronic meter has to be set to the same value as the workload that is the weight of the basket including the weights in it. The rubber plates are included in the calibrated weight of the 1 kg weight basket.

Example: The workload is 3 kg / 6.6 lbs (weight basket 1 kg / 2.2 lbs + 2 x 1 kg / 1.1 lbs weight). Press the kp key to the left on the meter. Down in the display window figures is now flashing (kp). Increase in step by 0.1 with kp button (up arrow) alt. the RESET button (down arrow) until the value is consistent with the weight basket, in this case 3.0. After that press the CAL/WATT button to either show the CAL or WATT figures. At further press on the CAL / WATT-button the display toggles between calories and watts.

Do not expose the meter to direct sunlight or extremely high temperature. Do not use any dissolvents when cleaning. Use only dry cloth.

Heart rate 891 E and 891 E Wingate Option

A person's heart rate can be measured with a chest belt that senses the electronic output of the heart. The chest belt is standard equipment.

Fuss-free HR measurement requires that the belt is correctly placed. When it is correctly fitted the logo on the belt will be central and readable, outward and upright, by another person. Before putting on the belt, clean the skin where the belt is to be placed. The chest belt should be secured at a comfortable tension around the mid section, just below the breast muscle, see *Fig: Placement of the chest belt*. Moisten the electrodes before use, see *Fig: Electrodes on the back of the chest belt*. To make contact with the HR receiver on the bike, the distance should not be more than 100 cm / 39 1/3". It is especially important when first used to identify the chest belt with the sensor, by standing close to get the HR (maximum 60 cm / 23 2/3").

NOTE! Electromagnetic waves can interfere with the telemetry system. Cellular phones are not allowed to be used near the bike during test.

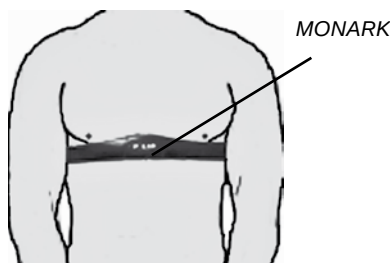


Fig: Placement of the chest belt

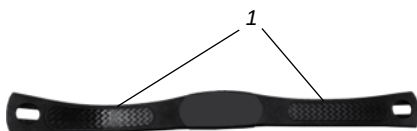


Fig: Electrodes on the back of the chest belt (1)

Work load control Monark 891 E

Monark Ergonomic 891 E is a test device, applied with a braking system, where the brake force can be adjusted with weights on a weight carrier. Weights are available in 0.1 kg / 2.2 lbs, 0.5 kg / 1.1 lbs and 1.0 kg / 2.2 lbs. This allows the brake load to be varied with 0.1 kg / 0.2 lbs. NOTE! 0,1 kg is the minimum weight, which is the weight of the weight carrier. The weight basket can also be set in its upper free/resting position and does then not give any work load at all. Disengage the basket by pushing the knob (1). See *Fig: Adjustments*.

Power measurement

The cycle is designed to measure the power on the flywheel, because tests/protocols are made for it (for example Åstrand's and YMCA).

Settings

To adjust the height on the support stand pull the handle (2) outwards. Turn the handle clockwise to raise the stand and counterclockwise to lower it.

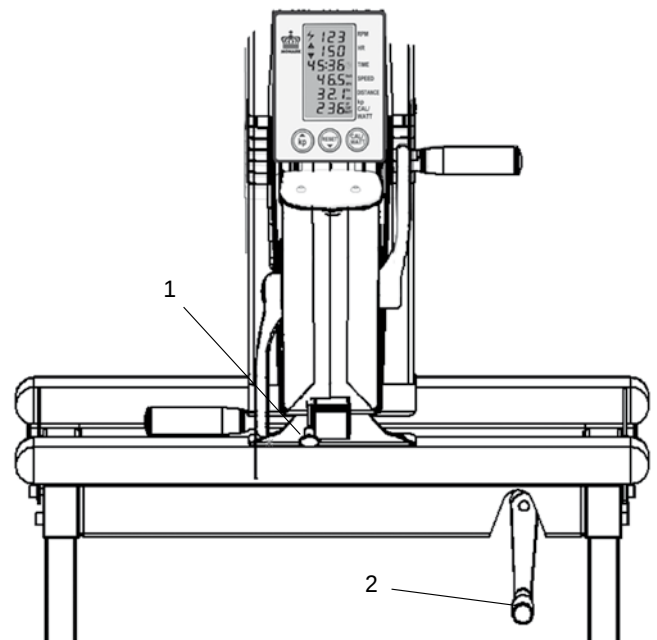


Fig: Settings

- 1) Disengagement knob
- 2) Handle, support stand

Work load control 891 E Wingate Option

Through pedalling the test person supplies kinetic energy to the flywheel. The flywheel is then braked by means of a brake belt/cord which runs around the flywheel. The workload is changed either by using other pedalling speed or by increasing or decreasing the tension of the brake belt/cord against the flywheel by place weights in the weight basket. Weights are available in 1 kg / 2.2 lbs, 0,5 kg / 1.1 lbs and 0,1 kg / 0.2 lbs. This makes it possible to vary the workload from 1 kp up to maximum 11 kp in steps of 0,1 kp. Braking power is expressed in kp where mass 1 kg / 2.2 lbs gives the braking force 1 kp.

NOTE! 1 kg /2.2 lbs is the lowest work load that can be set as this is the weight of the basket itself. A weight basket that only weighs 0,5 kg /1.1 lbs is available as an option. The weight basket can also be set in its upper free/resting position and does then not give any work load at all. The weight basket is released by pushing the release button(1), on the cover. See *Fig: Workload adjustment*.

Power measurement

The cycle is designed to measure the power on the flywheel, because tests/protocols are made for it (for example Åstrand's and YMCA).

Settings

To adjust the height on the support stand pull the handle(2) outwards. Turn the handle clockwise to raise the stand and counterclockwise to lower it. See *Fig: Adjustments*.

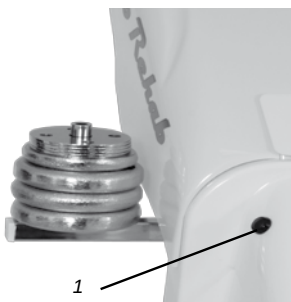


Fig: Workload adjustment
1) Release button

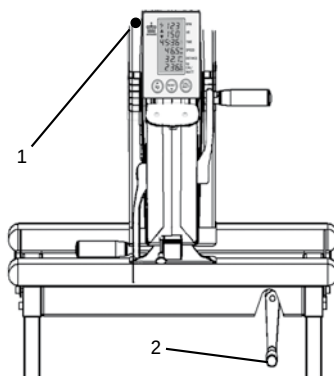


Fig: Settings
1) Release button
2) Crank for height adjustment
of table stand

Anaerobic tests 891 E Wingate Option

Model 894 E has a computer for anaerobic testing and makes the bike possible to connect to an external PC, PC-cable is included. A Windows application, included in the bike, makes it possible to make a lot of different type of anaerobic tests for ex. Wingate tests and so forth. The anaerobic tests can easily be set from 5 up to 300 seconds duration. For a closer explanation of the application look in the program manual, "Monark Anaerobic Test Software User Manual".

NOTE! To carry out anaerobic tests must cycle computer equipped with power from a wall outlet. Connect the supplied power adaptor into an appropriate wall outlet (230V). The circular connector on the secondary cable from the power adaptor is connected to the corresponding socket on the cycle under the instrument cover on the right side. PC cable is connected into the serial port underneath and to a serial port on an external PC. See *Fig: Brake device*. The LED's on the top of the instrument panel indicates both that there is power to the unit and that the weight basket in its upper position / neutral. If the weight basket produces resistance it must be moved up in its upper locked position where it does not give any workload. Then the LED is lit - with a delay of about five seconds - indicating that the computer and cycle is in a ready position for a test.

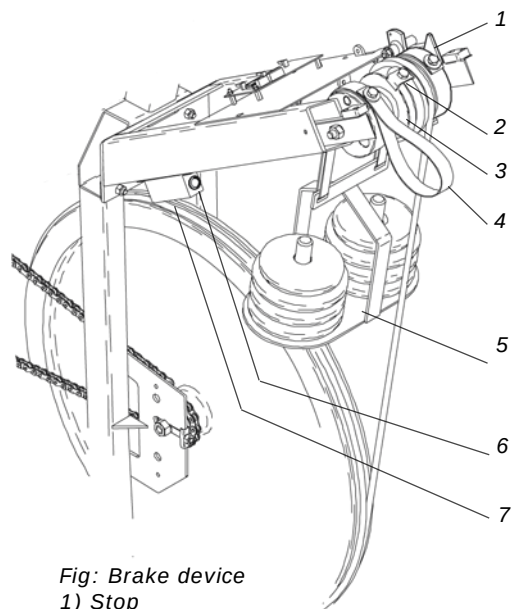


Fig: Brake device
1) Stop
2) Cord bracket
3) Tension center
4) Return strap
5) Weight basket
6) DC connector
7) Data output

Adjustment brake cord tension 891 E

At first check that the brake cord is lying correct on the flywheel surface, see *Fig: Brake cord* and *Fig: Brake device*. Loosen the stop lever(2) from the tension centre(1). Put 1 kg in the weight basket(4). Rotate the flywheel by hand. The basket shall now lift up so the distance to the flywheel is at least 150 mm / 5.9" and maximum 190 mm / 7.5". If this is not the case the brake belt has to be loosened or tightened a little at the tension centre. Lock the weight basket in its upper position with the stop(3) and after that loosen the lock washer(5) somewhat so that the cord length can be adjusted. If the basket is too low, shorten the belt somewhat. If the basket is too high, lengthen the cord somewhat. Tighten the bracket again and check that the distance between the weight basket and flywheel is between 150 and 190 mm when the flywheel is rotated by hand.

NOTE!

To receive correct workload it is important to place the weight basket according to the description above. If the basket hangs too low it may touch the flywheel. If the basket is too high, wrong workload may obtain.

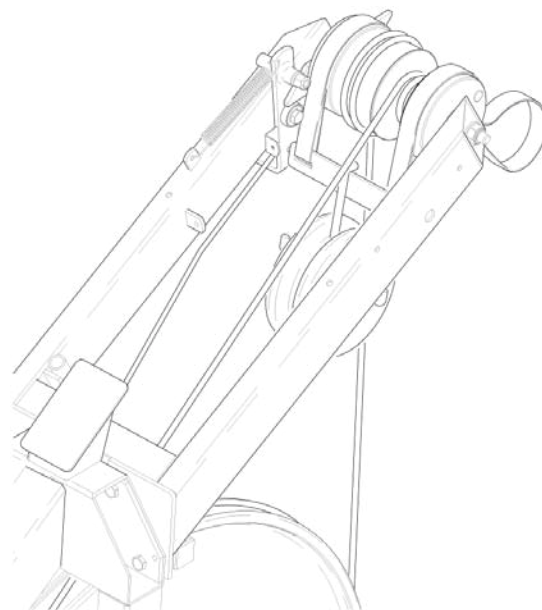


Fig: Brake device

- 1) Tension center
- 2) Stop lever
- 3) Stop
- 4) Weight basket (0.1 kg)
- 5) Locking clip

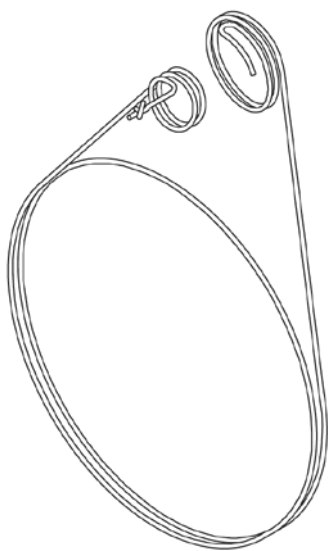
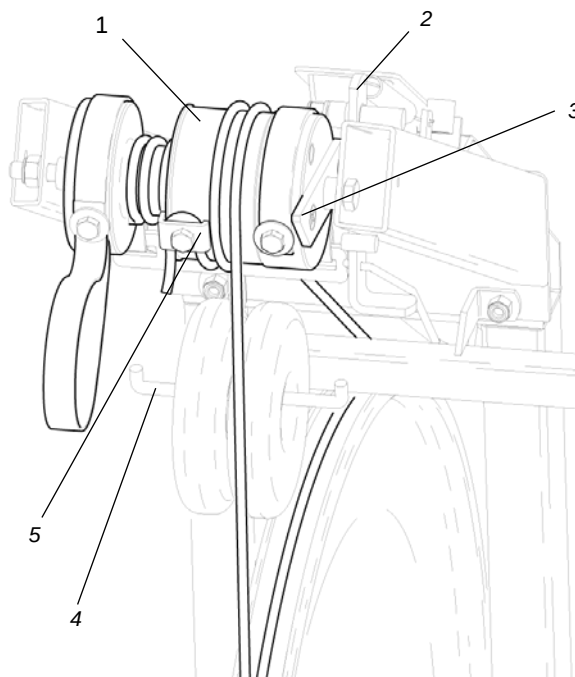


Fig: Brake cord



Adjustment brake cord tension 891 E Wingate Option

Check at first that the brake belt is lying correct on the flywheel brake surface. See *Fig: Brake cord* and *Fig: Brake device* If the weight basket is in its upper position, press the release button. The basket will fall down and increase the tension of the brake belt/cord against the flywheel.

Put 3 kg in the weight basket(5). See *Fig: Brake device*. Rotate the flywheel by hand. The basket shall now lift up so the distance to the flywheel is at least 40 mm / 1 1/2" and maximum 60 mm / 2 1/3". If this is not the case the brake belt has to be loosened or tightened at the tension centre (3). Lock tension centre again, in its upper locking position, with the stop (1) and then release the lock brace (2) for the brake line so that its length can be adjusted. If the basket is too low, shorten the belt somewhat. If the basket is too high, lengthen the cord somewhat. Tighten the bracket again and check that the distance between the weight basket and flywheel is between 40 and 60 mm when the flywheel is rotated by hand.

NOTE!

To receive correct workload it is important to place the weight basket according to the description above. If the basket hangs too low it may touch the flywheel. If the basket is too high, wrong workload may obtain.

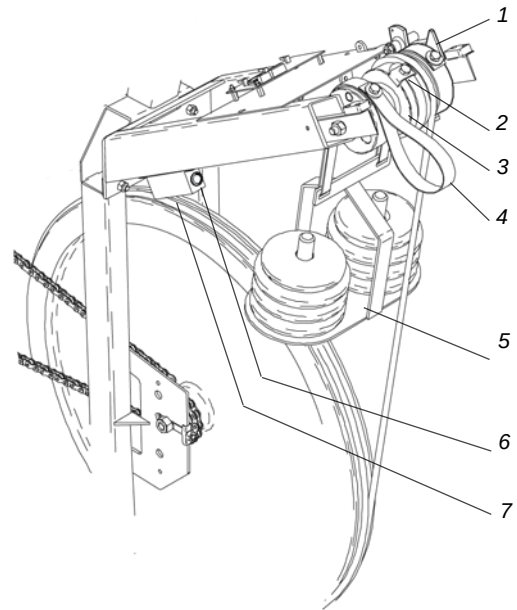


Fig: Brake device

- 1) Stop
- 2) Cord bracket
- 3) Tension center
- 4) Return strap
- 5) Weight basket
- 6) DC connector
- 7) Data output

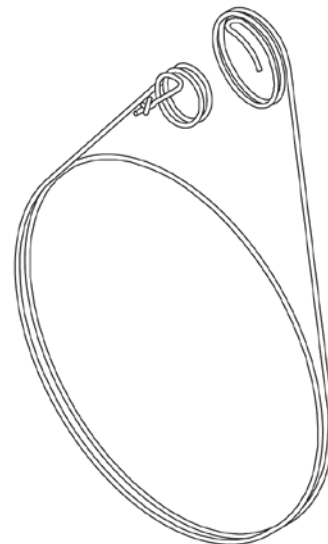


Fig: Brake cord

Troubleshooting guide 891 E

Symptoms	Probable Cause / Corrective Action
The weight basket moves up and down	The brake belt contact surface may need to be ground off. See description in section “Brake belt contact surface”.
The weight basket touch the flywheel	- The brake cord is probably not enough tightened. - The basket can be loaded with a lot of weight. Tighten the brake cord. See the section "Adjustment brake cord tension".
According to test the bike seems to give too high workload	The brake cord may be too tighten. Loosen the cord according to section “Adjustment brake cord tension”.
There is a click noise when pedalling (increases with the weight)	- The pedals are not tight. Tighten them or change pedals. - The crank is loose. Check, tighten. - The base bearing is loose. Contact your dealer for service.
Scratching sound is heard when pedalling	Check that the carriage block is taken off and that none of the covers is scratching.
There's a click noise and a squeak noise when pedalling	Loosen the chain.
No heart rate	- Check the chestbelt (battery). Wet the thumbs and place them on the electrodes. A low clicking sound will appear near battery lid while you click on the electrodes with one thumb. - Check that the chest belt is positioned correctly on test person and tight enough. Check that the electrodes are wet. In hard cases it is necessary to use a contact gel or a mixture of water with a few drops of washing-up liquid. The level for HR signal can vary from person to person. Put chest belt on another known person who has a good pulse reading.
Uneven heart rate	Use an external unit, for example a HR watch, to check if it also indicates an irregular pulse. If this is the case, there is probably disturbance in the room. Magnetic fields from high voltage cables, elevators, fluorescent tube etc. can cause the disturbance. Other electronic equipment could be placed too close. Move the bike to a different location in the room or change rooms. If an irregular HR remains it should be checked manually. If the HR remains irregular at work the person's health should be examined.

Troubleshooting guide 891 E Wingate Option

Symptoms	Probable Cause / Corrective Action
There is a click noise when pedalling (increases with the weight)	- The pedals are not tight. Tighten them or change pedals. - The crank is loose. Check, tighten. - The base bearing is loose. Contact your dealer for service.
Scratching sound is heard when pedalling	Check that the carriage block is taken off and that none of the covers is scratching.
There's a click noise and a squeak noise when pedalling	Loosen the chain.
The Display is not working	Check that the batteries are OK.
Time counting does not start	Check if the brake belt is too tight so the magnet will not pass the sensor. This will result in no signal from sensor. There is a video available on website www.monark.net which describes adjustment.
Bike would not start Weight basket does not lock in upper position	- Power adaptor is not connected. - Main switch is not in ON position. Located on bike's right side underneath tension device. - The power jack is not functioning, the fuse is blown. - Incorrect type of power adaptor is used. A marking label should be found with the text "Peak bike 894 E". - Power adaptor is broken and needs to be replaced.
The yellow LED lamp will not light up when the weight basket is hoisted up (should light within 2-3 seconds after the basket been hoisted up)	- Check that magnets on both sides of tension device have not fallen off and without damages. - Check so basket lock sensor and basket drop sensor are working properly and also connected to correct ports on bike's circuit board. <i>See Fig: Connections on circuit board.</i>
Problems with the sensors	Technical advice how to check sensors of magnetic type: - Unplug the sensor on bike's circuit board. - In the jack in the end of sensor cable measure with a summer or an ohmmeter then angle the magnet in near of the sensor. A signal should be heard or value approx. 0 ohm displayed on ohm meter.
No heart rate	- Check the chestbelt (battery). Wet the thumbs and place them on the electrodes. A low clicking sound will appear near battery lid while you click on the electrodes with one thumb. - Check that the chest belt is positioned correctly on test person and tight enough. Check that the electrodes are wet. In hard cases it is necessary to use a contact gel or a mixture of water with a few drops of washing-up liquid. The level for HR signal can vary from person to person. Put chest belt on another known person who has a good pulse reading.
Uneven heart rate	Use an external unit, for example a HR watch, to check if it also indicates an irregular pulse. If this is the case, there is probably disturbance in the room. Magnetic fields from high voltage cables, elevators, fluorescent tube etc. can cause the disturbance. Other electronic equipment could be placed too close. Move the bike to a different location in the room or change rooms. If an irregular HR remains it should be checked manually. If the HR remains irregular at work the person's health should be examined.
The weight basket moves up and down	The brake belt contact surface may need to be ground off. See description in section "Brake belt contact surface".
The weight basket touch the flywheel	The brake cord is probably not enough tightened. The basket can be loaded with a lot of weight. Tighten the brake cord. See the section "Adjustment brake cord tension".
According to test the bike seems to give too high workload	The brake cord may be too tight. Loosen the cord according to section "Adjustment brake cord tension".

Troubleshooting guide 891 E Wingate Option

Symptoms	Probable Cause / Corrective Action
Communication could not be established between the bike and the computer	Data cable between the bike and the computer is not connected or it is damaged. Incorrect type of data cable is used. Correct type 0-modem cable. Start button in Monark software has not been activated. Communication settings within the Monark software is not correct. Try to change COM-port. In the software's menu click on – <pre> graph LR A[File] --> B[Settings] B --> C[Search Connection] </pre> Choose the suggested COM-port in the box to the right and confirm by click OK. The computer's serial port is broken or its settings are incorrect. Contact your network administrator to check the computer and software installation. Alternative you could try to install Monark software on a different computer. Technical accessory, COM-port tester (Art. No: 9394-525) can be used if you have problems with the communications between bike and PC. Procedure: 1. Connect the data cable between the COM-port tester and the bike. 2. Connect power adaptor and turn the main switch to ON. 3. The green LED on the COM-port tester should light up. This will indicate that the bike's circuit board is powered on. 4. When the weight basket is hoisted up, the red LED on the tester flash briefly. The same thing will happen when the weight basket is dropped again. 5. When a person starts to pedal the bike the red LED on COM-port tester will flash in the same tact as the RPM. If all expected flashes could be seen on the COM-port tester the bike can be consider being without malfunction. The communication problems is probably caused by the PC where the PC program is installed. Its COM-port could be broken or has an incorrect driver. If that is the problem please contact your network administrator for control of program installations. Alternative you could try to install Monark software on a different computer. If a USB-Serial adapter is used to connect the bike to a laptop, make sure the drivers are installed.
No RPM visible in Monark software	Start button in Monark software has not been activated. Check that the sensor on flywheel is working properly and that it is connected to the correct port on the bike's circuit board. See <i>Fig: Connections on circuit board</i>. Make sure that no magnet on the left side of the flywheel has loosened. See <i>Fig: Sensor and magnets on flywheel</i>.
Any problems with the computer software	• Send an email to the software developer HUR labs support: software@hur.fi

Troubleshooting guide 891 E Wingate Option

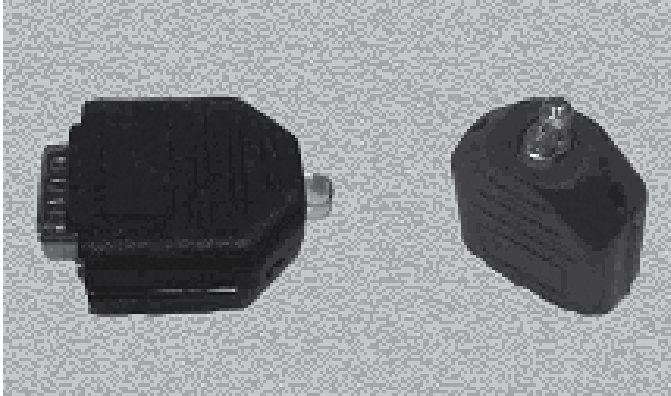


Fig: COM-port tester

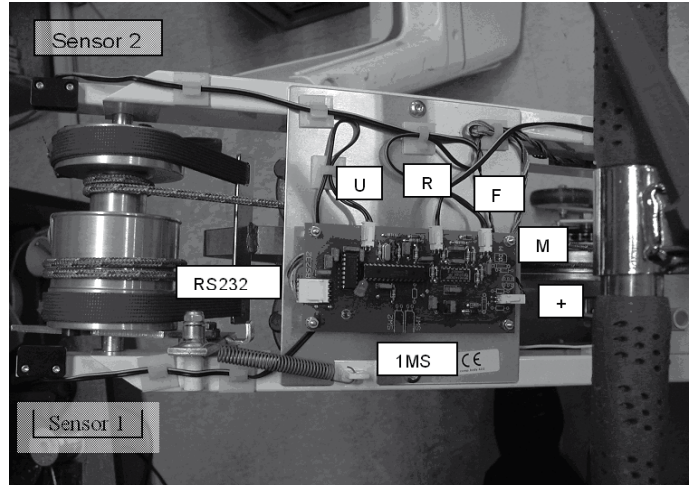


Fig: Connections on circuit board

Connector U: Sensor 1

Connector F: Sensor 2

Connector R: Sensor on flywheel

Connector +: Power supply (red/black wire)

Connector M: Magnet

Connector RS232: Communication cables (5 pcs.)

Connector 1MS: Button to release the weight basket

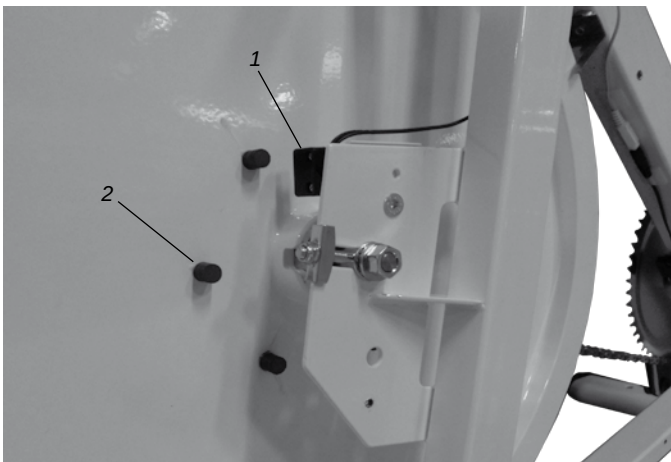


Fig: Sensor and magnets on flywheel

1) Sensor

2) Magnets (6 pcs.)

Service

Note that the text about service and maintenance is universal and that all parts may not be relevant to your bike.

Warning

Make sure the voltage indicated on the appliance corresponds to the local mains voltage before making connections.

Warranty

EU countries - Private use

If you are a consumer living in the EU you will have a minimum level of protection against defects in accordance with EC Directive 1999/44/EC. In short, the directive states that your Monark dealer will be liable for any defects, which existed at the time of delivery. In case of defects, you will be entitled to have the defect remedied within a reasonable time, free of charge, by repair or replacement.

EU countries - Professional use

Monark Exercise products and parts are guaranteed against defects in materials and workmanship for a period of one year from the initial date of purchase of the unit. In the event of a defect in material or workmanship during that period, Monark Exercise will repair or replace the product. Monark Exercise will not, however, refund costs for labour or shipping.

Other countries

Monark Exercise products and parts are guaranteed against defects in materials and workmanship for a period of one year from the initial date of purchase of the unit. In the event of a defect in material or workmanship during that period above, Monark Exercise will repair or replace (at its option) the product. Monark Exercise will not, however, refund costs for labour or shipping.

Service check and Maintenance

It is important to carry out a regular service on your ergometer, to ensure it is kept in good condition.

Service action:

- We recommend isopropyl alcohol to disinfect the surface of the bike. Use a damp but not wet cloth to clean the surface you wish to disinfect.
- Always keep the bike clean and well lubricated (once a week).
- Periodically wipe the surface with a rust preventative, especially when it has been cleaned and the surface is dry. This is done to protect the chrome and zinc parts as well as the painted parts (4 times per year).
- Check now and then that both pedals are firmly tightened. If not the threading in the pedal arms will be damaged. Also check that pedal arms are firmly tightened on the crank axle, tighten if necessary. When the Ergometer is new it is important to tighten the pedals after 5 hours of pedalling (4 times per year).
- Check that the pedal crank is secure to the crank axle (4 times per year).
- Be sure that the pedals are moving smoothly, and that the pedal axle is clear of dirt and fibres (4 times per year).
- When cleaning and lubricating be sure to check that all screws and nuts are properly tightened (twice a year).
- Check that the chain is snug and there is no play in the pedal crank (twice a year).
- Check that pedals, chain and freewheel sprocket are lubricated (twice a year).
- Be sure that the brake belt does not show significant signs of wear (twice a year).
- Check that the handlebars and seat adjustment screws are lubricated (2 times per year).
- Be sure that all moving parts, crank and flywheel are working normally and that no abnormal play or sound exists. Play in bearings causes fast wearing and with that follows a highly reduced lifetime.
- Check that the flywheel is placed in the center and with plane rotation.

Batteries

If the meter is battery-operated, the batteries are in a separate package at delivery. If the storing time has been long the battery power can be too low to make the computer act correctly. Batteries must then be changed.

Flywheel bearing

The flywheel bearing is long-term greased and requires no supplementary lubrication. If a problem arises, please contact your Monark dealer.

Crank bearing

The crank bearing is greased and normally requires no supplementary lubrication. If a problem arises, please contact your Monark dealer.

Transportation

During transport the brake cord should be tightened to prevent it from falling off the flywheel.

Replacement of brake belt

To replace the brake belt remove covers if necessary. Make sure that the belt is loose.

Alt. 1: To loosen the brake belt on pendulum bikes with engine, connect power to the unit and raise the pendulum to 4 kp. Hold it there until brake belt is loose. Please note how the belt is assembled. Remove it from the bike. Attach the new brake belt and assemble the bike in reverse order.

Alt. 2: To loosen the brake cord on cycles with a weight basket set the basket to its upper position. Loosen the lock washer that is holding the cord and remove it from the tension center. Loosen or cut off the knot on the other end of the cord and then remove the whole cord from the bike. When assembling a new brake cord, first enter one end into the hole in the tension center, and tie a knot and let the knot fall into the bigger part of the hole. Lock the end of the cord with the lock washer.

Alt. 3: To loosen the brake belt on the bike remove all tension. Please note how the belt is assembled. Remove it from the bike. Attach the new brake belt and assemble the bike in reverse order.

NOTE!

When replacing the brake belt it is recommended to clean the brake surface. See "Brake belt contact surface".

Brake belt contact surface

Deposits of dirt on the brake belt and on the contact surface may cause the unit to operate unevenly and will also wear down the brake belt. The contact surface of the flywheel should be smoothed with fine sandpaper and any dust removed with a clean dry cloth.

Remove any potential covers and all workload on the brake belt and then remove it. Grind with a fine sand paper. Grinding is easier to perform if a second individual cautiously and carefully pedals the cycle.

Irregularities on the brake belt contact surface are removed by means of a fine sand paper or an abrasive cloth. Otherwise unnecessary wear on the brake belt may occur and the unit can become noisy.

Always keep the brake belt contact surface clean and dry. No lubricant should be used. We recommend replacing the brake belt when cleaning the contact surface. In regard to assembly and adjustment of the brake belt, see "Replacement of brake belt".

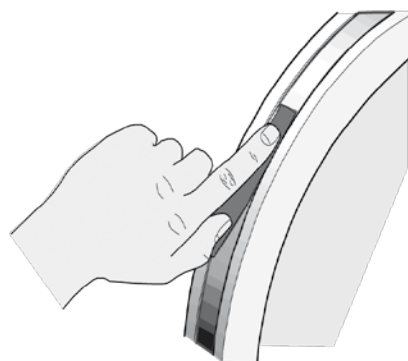


Fig: Brake belt contact surface

Chain 1/2" x 1/8"

Check the lubrication and tension of the chain at regular intervals. In the middle of its free length the chain should have a minimum play (3) of 10 mm (1/4 inch). See *Fig: Chain adjustments*. When the play in the chain is about 20 mm (3/4 inch) the chain must be tightened. Otherwise it will cause abnormal wear of the chain and sprockets. Therefore it is always recommended to keep the chain play as small as possible. Loosen the hub nut (2) on both sides and tense the chain with the chain adjuster(1) when needed.

When the chain has become so long that it can no longer be tightened with the chain adjusters it is worn out and shall be replaced with a new one.

To adjust or replace the chain, remove covers if required.

To adjust the chain the hub nuts (2) should be loosened. Loosening or tightening the nuts on the chain adjusters (1) will then move the hub and axle forward or backward. Then tighten the nuts on the hub axle again. See *Fig: Chain adjustments*.

To replace the chain, loosen the chain adjusters as much as possible. Dismantle the chain lock (6) and remove the chain. Use a pair of tongs for dismantling spring. Put on a new chain and assemble the chain lock. The spring of the chain lock should be assembled with the closed end in the movement direction (5) of the chain. Use a pair of tongs for dismantling and assembling the spring (4). See *Fig: Chain replacement*.

NOTE! At assembly the flywheel has to be parallel with the centerline of the frame. Otherwise the chain and sprockets make a lot of noise and wear out rapidly.

Then assemble the removed parts as above but in reverse order.

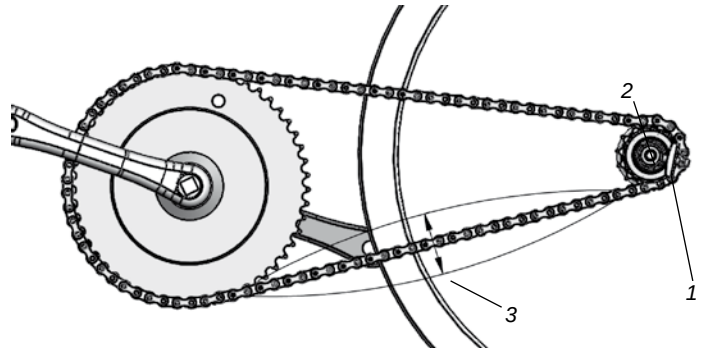


Fig: Chain adjustments

- 1) Chain adjuster
- 2) Axle nut
- 3) Chain play

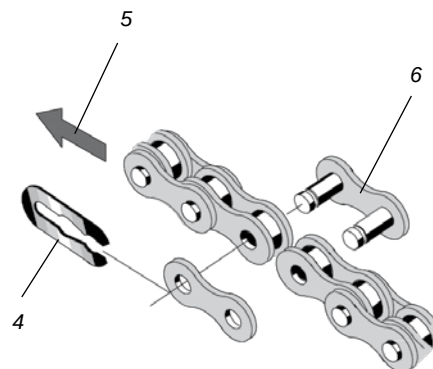


Fig: Chain replacement

- 4) Lock spring
- 5) Movement direction
- 6) Chain lock

Freewheel sprocket

When replacing the freewheel sprocket remove frame covers if necessary. Remove the chain according to section "Chain 1/2" x 1/8".

Loosen the axle nuts and lift off the flywheel. Remove the axle nut, washer, chain adjuster and spacer on the freewheel side. Place the special remover (Art. No: 9100-14) in the adaptor and place the spacer and axle nut outside. See *Fig: Special remover*.

NOTE! Do not tighten the axle nut completely. It must be possible to loosen the sprocket-adaptor half a turn.

Replace sprocket-adaptor and assemble the new parts in reverse order according to the above.

The sprocket should be lubricated with a few drops of oil once a year. Tilt the cycle to make it easier for the oil to reach the bearing. See *Fig: Lubrication*.

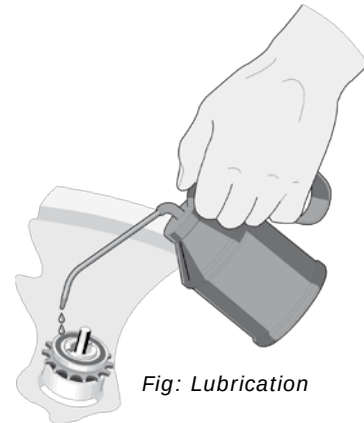


Fig: Lubrication



Fig: Special remover
(Art. no: 9100-14)

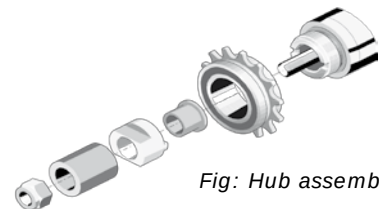
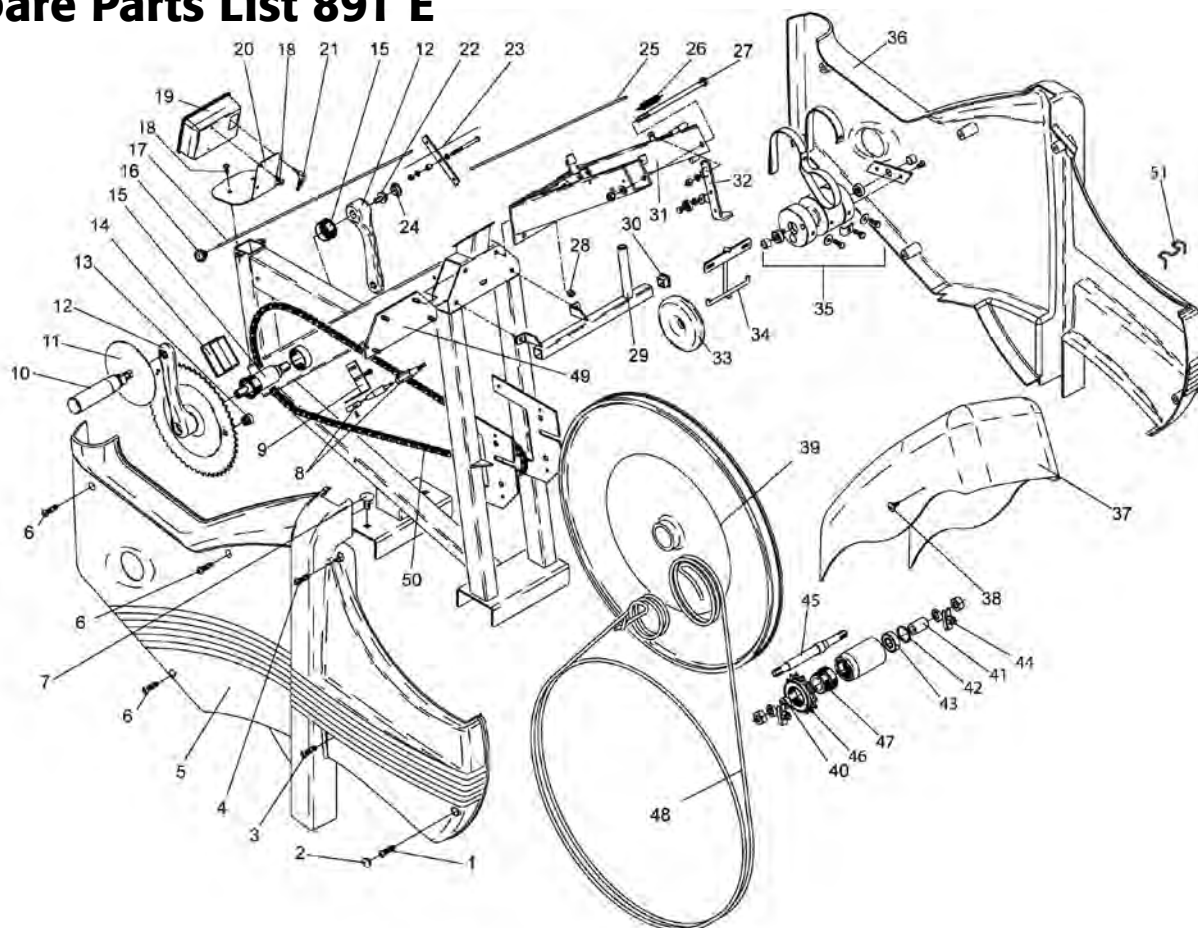


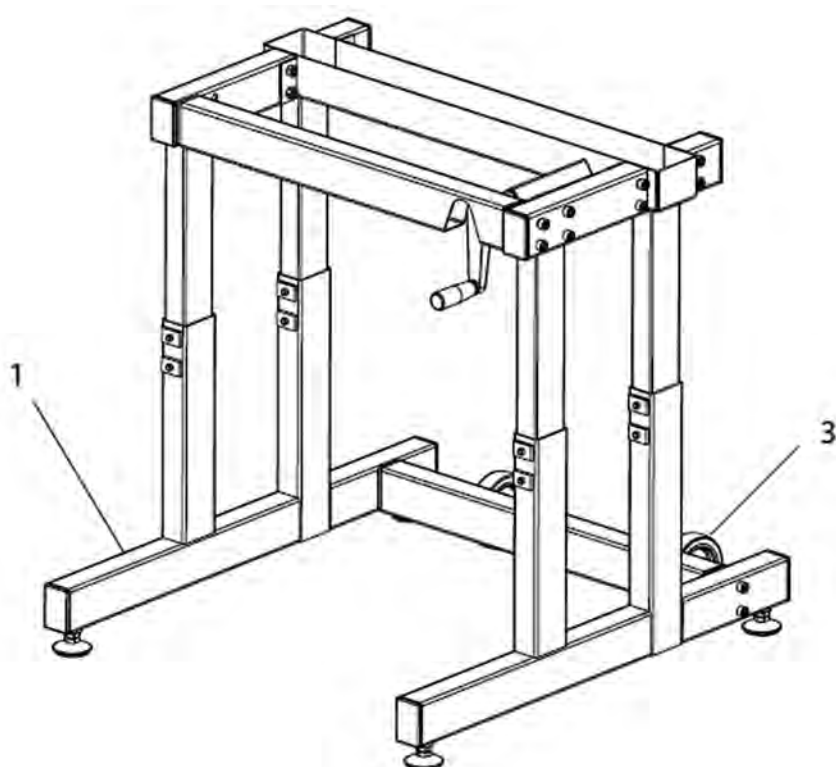
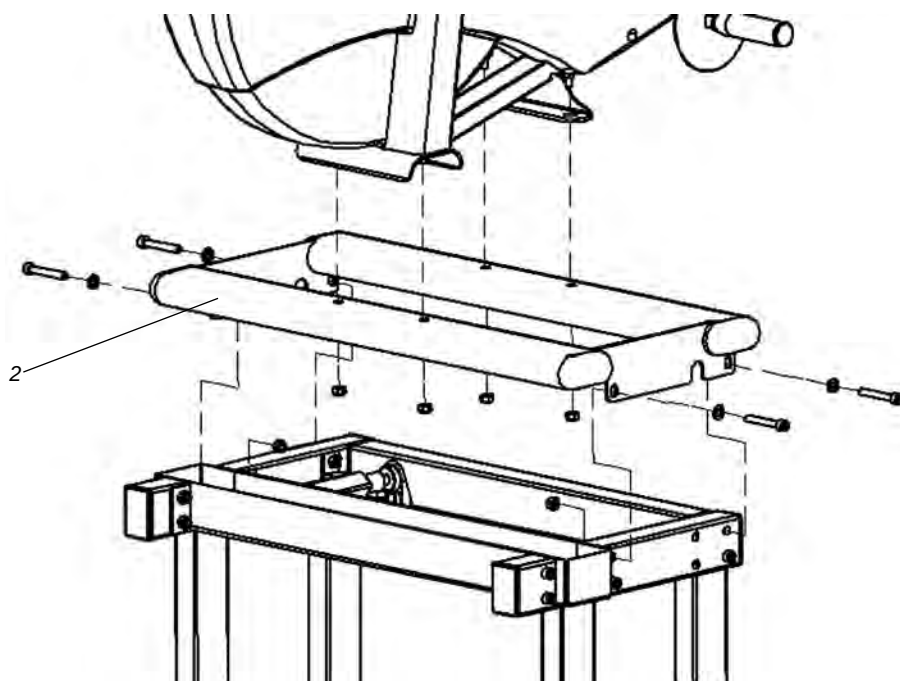
Fig: Hub assembly

Spare Parts List 891 E



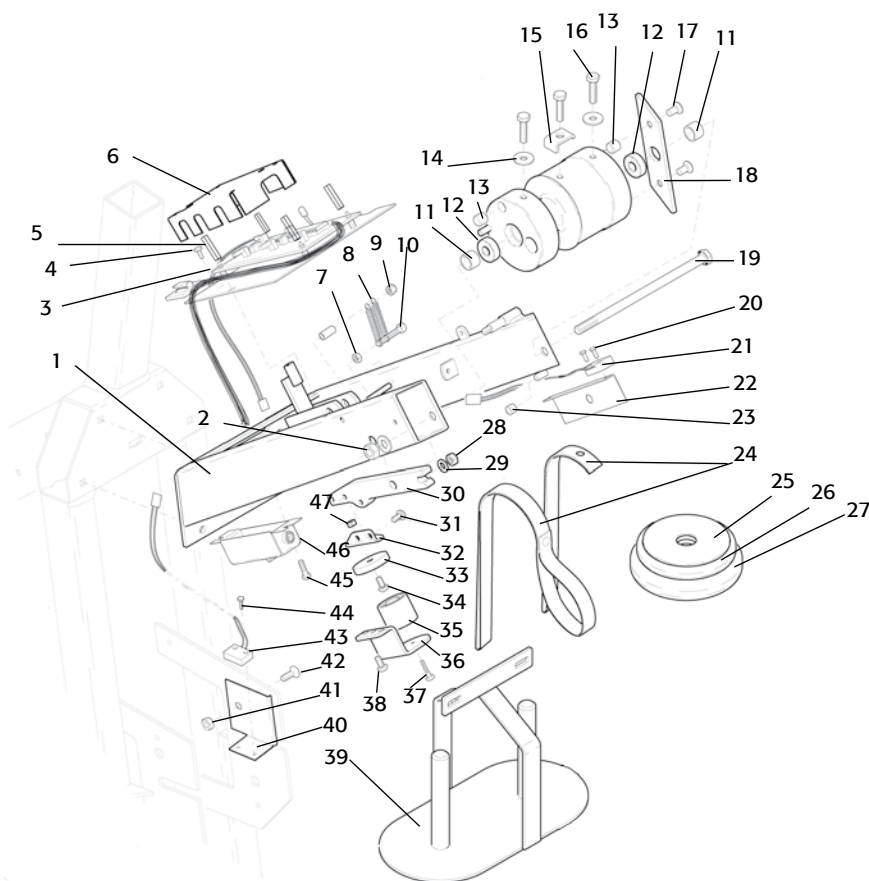
Pos.	Qty.	Art. No.	Description	Pos.	Qty.	Art. No.	Description
1	1	5683	Screw	27	1	14374	Screw
2	10	9306-12	Plastic plug	28	4	5843-9	Locking nut
3	2	5673-9	Screw	29	1	9374-29	Weight holder
4	1	5681	Screw	30	2	9302-28	Plastic cap, black
5	1	9391-62	Frame cover, right	31	1	9374-9	Frame for equipment
6	3	5671-19	Screw	32	1	9374-150	Stop lever, complete
7	2	9300-12	Screw	33	1	9391-400	Weight set, complete
8	1	9326-162	Sensor with 100 mm cable	34	1	9391-25	Weight basket 0.1 kg
9	1	9326-166	Holder for sensor	35	1	9374-20	Tension device, complete
10	1	9145-71	Handle, pair	36	1	9391-61	Frame cover, left
11	2	9371-71	Handcover	37	1	9391-141	Instrument cover
12	1	9300-450	Steel crank set, complete	38	2	5675-9	Screw
13	1	9326-164	Magnet	39	1	9391-3	Flywheel with freewheel sprocket
14	1	9391-55	Plastic cap, black	40	1	9000-14	-Spacer 5 mm
15	1	8966-175	BB cartridge bearing, complete	41	1	9300-17	-Spacer 23 mm
16	1	9391-44	Knob	42	1	9000-15	-Locking ring SgH 028
17	1	9391-40	Push rod	43	2	19001-6	-Bearing 6001-2z
18	4	5673-9	Screw	44	1	9000-12	-Chain adjuster, pair
19	1	9391-70	Digital meter	45	1	9300-18	-Axle, length 132 mm
20	1	9391-26	Meter holder	46	1	9106-13	-Sprocket, 14t
21	1	9326-263	Cable	47	1	9106-14	-Connection
22	2	8523-115	Screw	48	1	9324-30	Brake cord
23	1	9391-43	Link, complete	49	1	9374-60	Bracket for frame
24	2	8523-2	Dust cover for crank	50	1	9300-5	Chain 116 links incl. lock
25	1	9391-41	Push rod	51	1	9384-45	Belt control
26	1	9100-20	Spring		1	9339-98	Chest belt

Spare Parts List 891 E and 891 E Wingate Option

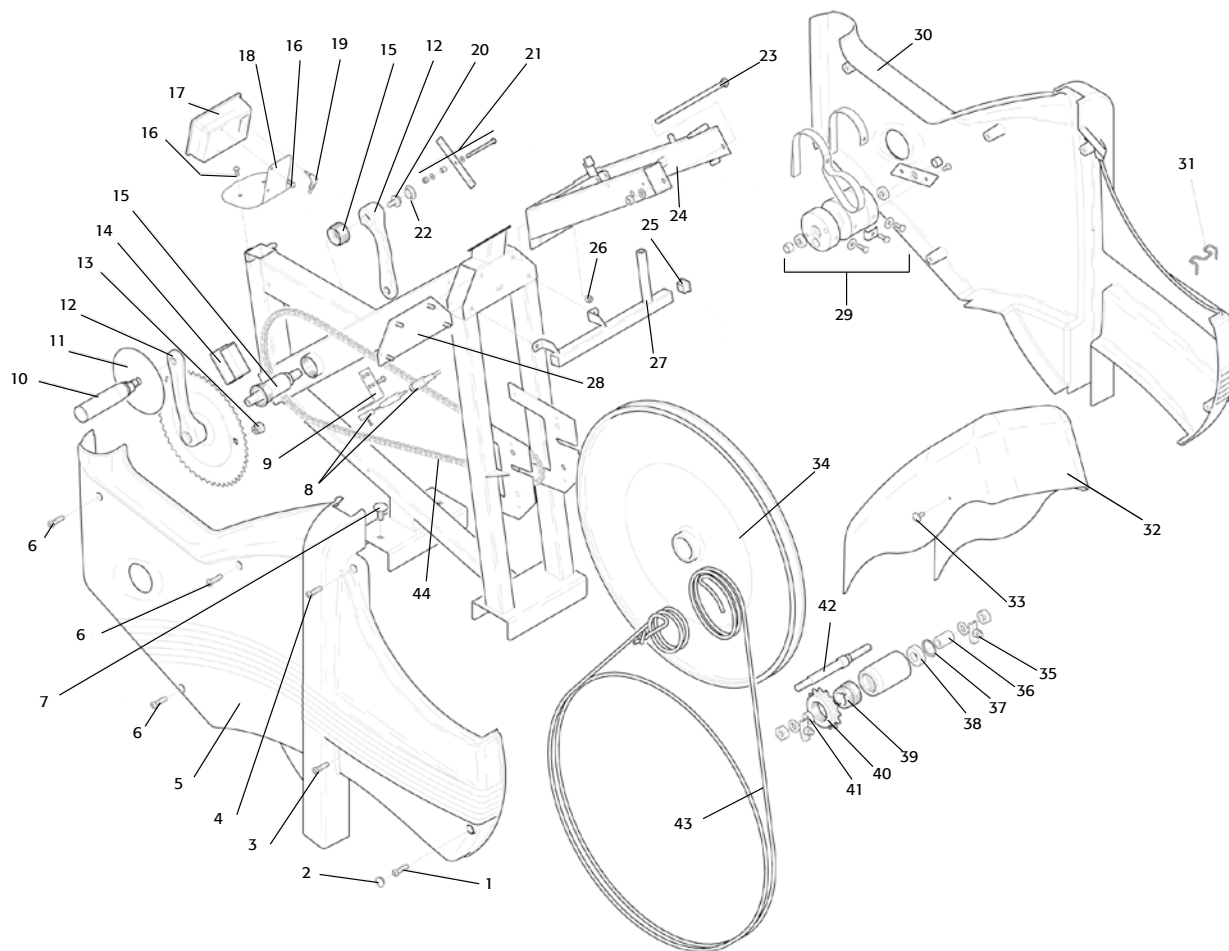


Pos.	Qty.	Art. No.	Description	Pos.	Qty.	Art. No.	Description
1	1	9391-83	Table stand, height adjustable, complete	3	2	9000-29	Transport wheel, complete
2	1	9391-95	Upper part	1	1	9391-8-10	Skrew set

Spare Parts List 891 E Wingate Option



Pos.	Qty.	Art. No.	Description	Pos.	Qty.	Art. No.	Description
1	1	9374-9	Frame for equipment	25	4	9102-30	Weight 0.1 kg / 0.2 lbs
2	1	5844	Locking nut M8	26	1	9102-27	Weight 0.5 kg / 1.1 lbs
3	1	9394-10	Electronic set	27	3	9102-26	Weight 1.0 kg / 2.2 lbs
4	4	72658	Screw M3x8	28	1	5842-9	Nut M5
5	4	9394-432	Spacer nut	29	1	5862	Washer 6x19x1
6	1	9394-431	Cover for electronic set	30	1	9384-33	Magnet arm
7	1	5842-9	Locking nut M5	31	2	5673-9	Screw M5x12
8	2	9384-36	Spring	32	1	9384-37	Holder
9	1	5767-9	Nut M5	33	1	9384-34	Magnet plate
10	1	9384-35	Stop screw M5x30	34	1	14303	Screw M5x13
11	2	9127-37	Spacer 8.5x12, L 13	35	1	9384-32	Electro magnet
12	2	19088-6	Ball bearing 608-2z	36	1	9384-31	Magnet bracket
13	2	9374-37	Magnet	37	3	5673-9	Screw M5x12
14	2	5862	Washer 6x19x1	38	1	5670	Screw M4x10
15	1	9324-70	Self-locking cap with washer 5878	39	1	9324-25	Weight basket
16	3	14323	Screw M6x16	40	1	9374-23	Holder for sensor
17	2	14379	Screw M6x16	41	1	5843-9	Locking nut M6
18	1	9374-21	Stop	42	1	14380	Screw M6 x 12
19	1	14374	Screw M8x160	43	1	9326-169	Sensor with cable 620 mm
20	4	9103-41	Screw 4x9.5	44	2	9103-41	Screw 4x9.5
21	2	9326-270	Sensor with cable 390 mm	45	4	5675-9	Screw M5x6,5
22	2	9374-22	Holder for sensor	46	1	9374-240	Contact holder with cables
23	1	9374-12	Damper	47	1	5842-9	Nut M5
24	1	9324-26	Suspension belt		1	9384-650	Power adaptor



Pos.	Qty.	Art. No.	Description	Pos.	Qty.	Art. No.	Description
1	1	5683	Screw M5x75	24	1	9374-9	Frame for equipment
2	10	9306-12	Plastic plug	25	2	9302-28	Plastic cap, black
3	2	5673-9	Screw M5x12	26	4	5843-9	Locking nut M6
4	1	5681	Screw M5x40	27	1	9374-29	Weight holder
5	1	9391-62	Frame cover, right	28	1	9374-60	Bracket for frame
6	3	5671-19	Screw M5x20	29	1	9374-20	Tension device, complete
7	2	9300-12	Screw M8x16	30	1	9391-61	Frame cover, left
8	1	9326-162	Sensor with 100 mm cable	31	1	9384-45	Belt control
9	1	9326-166	Holder for sensor	32	1	9391-141	Instrument cover
10	1	9145-71	Handle, pair	33	2	5675-9	Screw M5x6,5
11	2	9371-71	Handcover	34	1	9391-3	Flywheel with freewheel sprocket
12	1	930-450	Steel crank set, complete	35	1	9000-12	-Chain adjuster, pair
13	1	9326-164	Magnet	36	1	9300-12	-Spacer 23 mm
14	1	9391-55	Plastic cap, black	37	1	9000-15	-Locking ring SgH 028
15	1	8966-175	BB cartridge bearing, complete	38	2	19001-6	-Bearing 6001-2z
16	4	5673-9	Screw M5x12	39	1	9106-14	-Connection
17	1	9391-70	Digital meter	40	1	9106-13	-Sprocket, 14 t
18	1	9391-26	Meter holder	41	1	9000-17	-Spacer 5 mm
19	1	9326-263	Cable	42	1	9300-18	-Axle, length 132 mm
20	2	8523-115	Screw M8x1x20	43	1	9384-47	Brake cord
21	1	9391-43	Link, complete	44	1	9300-5	Chain 116 links incl. lock
22	2	8523-2	Dust cover for crank		1	9339-98	Chest belt
23	1	14374	Screw M8x160		1	9300-365	Software
					1	9338-20	USB-Serial converter



Version 1311
Art. No: 7950-310

