

939 E



Manual
English/Svensk

Monark 939 E

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Product Information

Congratulations on your new Ergometer, 939 E.

Monark 939 E is designed to perform stress tests when connected to an ECG device. When connected to a PC or terminal, the bike can be used to perform Max and SubMax cardiovascular tests, calculate VO_2 capacity and more. The bike can also be used for normal exercise.

Each 939 E are calibrated at the factory. This means that you can begin to use the ergometer directly after assembly. However, if the user wishes to verify the scale calibration please read the instruction for "Calibration" in this manual.

NOTE!

The use of Monark 939 E can be physically strenuous. Always consult a doctor before beginning an exercise program and stop immediately if feeling faint or dizzy.

Features

- Large, well-balanced flywheel 22 kg (48 lbs)
- Scale, easy to calibrate
- Adjustable saddle with quick release lever
- Adjustable handlebar with quick release lever
- Stable frame, solid steel tubes
- Rust protected and powder painted frame
- Wheels for easy transport
- Big RPM display

Width: 550 mm (22") at handlebar
640 mm (25") at support tubes

Length: 1240 mm (49")

Height: 1260 mm (50") at handlebar
790-1160 mm (31-46") at seat

Weight 58 kg (128 lbs)

Included: Calibration weight 4 kg

Power adaptor USA (part.no: 9339-66)

Power adaptor others (part.no: 9339-67)

Chestbelt for pulse detection (only PC model)

USB - serial adapter (only PC model)



Battery: 2 x 1.5 V, R14

Storage temp: -10°C - +60°C

Work.temp: 0°C - +50°C

Operating Instruction

Cycle adjustments

Seat height should be adjusted to a comfortable position. A suitable height is a slightly bent knee when the middle of the foot is straight above the pedal axle with the pedal is in its lowest position. To adjust the seat height turn the quick release bolt on the saddle post approximately one revolution and pull it out.

See *fig: Adjustments*.

The handlebar setting shall give a comfortable position when cycling. During longer exercise sessions it is recommended to occasionally change handlebar position. To adjust the handlebar, loosen the quick release lever. See *fig: Adjustments*.

When using Polar chest belt it is important, at the first time to identify the chest belt with the pulse receiver by standing close to it (max 60 cm).



Fig: Adjustments.
 1) Quick release bolt
 2) Quick release lever

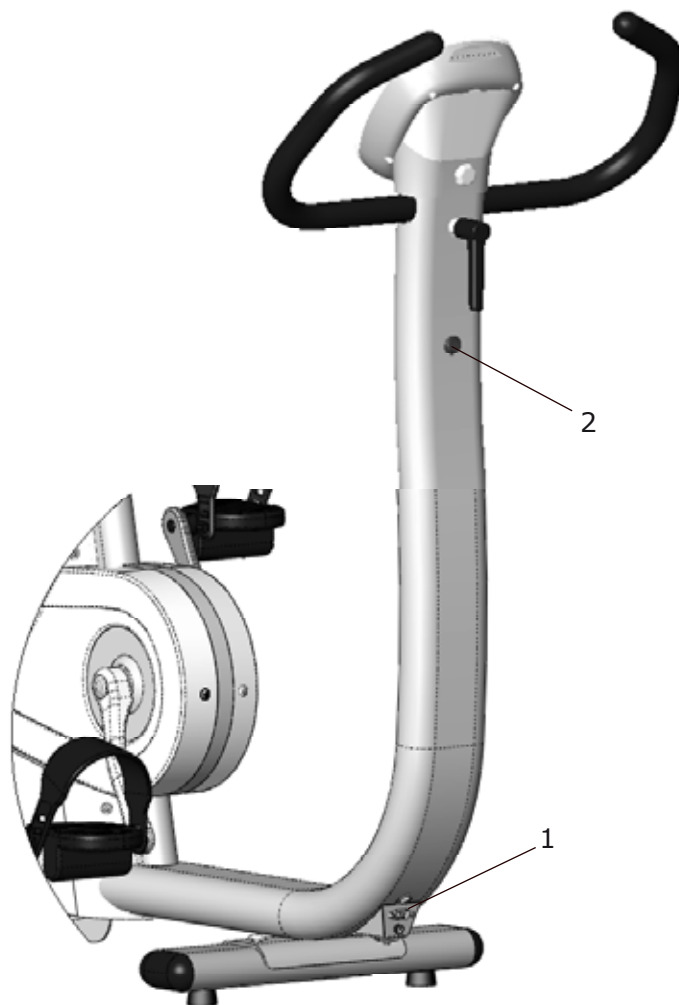


Fig: Power connection
 1) Serial port connection, external unit
 2) Switch (on/off)

RPM meter

The RPM figures on the LCD screen are large and easy to read. The screen turns on automatically when the pedals are moved and turns off after three minutes of inactivity.

Connection to an external unit

To use the bike it has to be connected to an external device such as an ECG device or a PC. The external unit is connected to the serial data connection port (1) on the lower front of the bike. See *fig: Power connection*. The enclosed cable is to be used for that, or the USB-serial adapter which is included in the PC model.

The bike has a default setting to be used/connected to a terminal (option part.no 9339-51) or a PC. For information about the enclosed PC software please refer to the software manual.

If the bike is going to be connected to an ECG device, you must change the settings on its internal computer. This setting can be changed directly on the bike with the scale indicator on the left side of the bike or with an external Terminal unit.

Setting of commando type (PC or ECG Device):

First check the brake belt tension. If the belt is too tight loosen it a little by moving the force indicator to about 4 kp and hold it there for a few seconds. Then the force-adjusting servo will loosen the belt tension. To be sure that indicator positions are correct then do a calibration. See "Electronic calibration".

1. Press the switch(2) to turn off the power, see *fig: power connection*.
2. Adjust the scale mechanically so that 0 index on the scale and indicator are in line.
3. Move the indicator to 6 kp and hold it there.
4. Turn on the power again. The green LED on the lower left side of the bike is lit up when there is power to the bike.
5. Hold the indicator at 6 kp until two beeps are heard.
6. Move the indicator to the settings that corresponds with the type of external unit you are connecting to:
 - 0 = mode for use with PC or Terminal.
 - 1 = mode for Siemens Megacart ECG
 - 2 = mode for other ECG devices
7. Hold at this position until two beeps are heard and after that move the indicator to 0 again.
The system is now restarting in chosen mode.

Terminal:

When using a Terminal unit (part.no 9339-51) do as follows:

1. Connect the Terminal to the bike using the enclosed cable.
2. Connect power to the bike.
3. When the main menu is displayed on the LCD screen press 99 and the hidden service menu shows up.
4. Press 6, "Settings".
5. Press ENTER (normally 13 times) until the display "Command type" shows up.
 - a) Press 1 and ENTER if the bike is connected to a Siemens Megacart ECG device.
 - b) Press 2 and ENTER if the bike is connected to other ECG device with an ergoline protocol for communication.
 - c) Press 0 if the bike is connected to a Terminal or PC.
6. After that press 0 two times to go back to main menu.

For more information about advanced communication with the bike please read the Technical Reference Manual.

Service

Warranty

EU countries private use

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

EU countries professional use

Monark 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 do so at its expense for the cost of materials but not for labour or shipping.

Other countries

Monark 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 do so at its expense for the cost of materials but not for labour or shipping.

Service check & Maintenance

To keep your Ergometer in good shape you should make a regular service.

- Keep your Ergometer clean and properly lubricated.
- 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.

- When cleaning and lubricating be sure to check that all screws and nuts are properly tightened.
- Be sure that all moving parts as crank and flywheel are working normal and that no abnormal play or sound exists. I.e. play in bearings causes fast wearing and with that follows a highly reduced lifetime.
- 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 pedaling.
- Check that the chain is snug and there is no play in the pedal crank
- Be sure that the pedals are moving smoothly, and that pedal axle is clear of dirt and fibers
- Check that the pedal crank is secure to the crank axle
- Check that pedals, chain and freewheel sprocket are lubricated
- Check that the handlebars and seat adjustment screws are lubricated
- Be sure that the brake belt does not show significant signs of wear

Transport

At transport it is recommended to have a little tension in the brake belt to secure it from falling off of the flywheel.

Please note: The production number of your Ergometer is placed according to *fig: Serial number*.

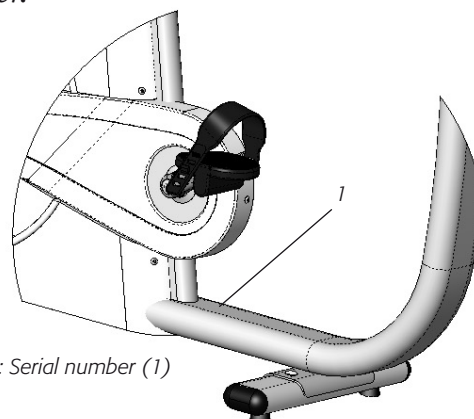


Fig: Serial number (1)

Batteries

The batteries are in a separate package at delivery. The batteries may need to be replaced upon assembly. To replace the batteries at any time, remove the battery hatch on the backside by loosening it in the upper end first. The batteries, 2 x 1.5V size C (R14), can then easily be replaced. See *fig: Batteries*.

NOTE: Be sure to put batteries in correct position.

Put on the battery hatch again.



Fig: Batteries

Replacement of brake belt

When replacing the brake belt, remove the left cover. Connect power to the bike and move the indicator/pendulum to 4 kp (3). Hold it there until brake belt is loose. Move the pendulum to 0 again. Loosen the brake belt from the pendulum hub, screw and lock washer (1). Take it apart at the spring (2) and remove it from the bike. See *fig: Brake belt*.

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".

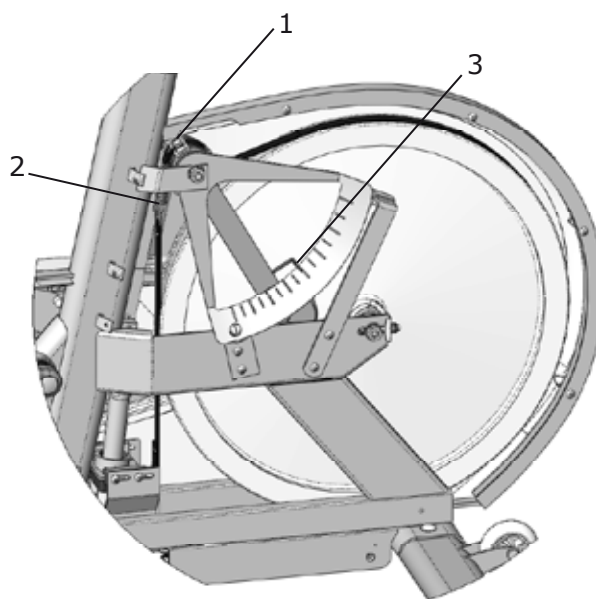


Fig: Brake belt
 1) Screw and lock washer
 2) Spring
 3)Pendulum/pointer at 4 kp

Brake belt contact surface

The brake belt should be regularly checked to ensure that it has not suffered excessive wear. If it looks worn it should be replaced. 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 brake belt contact of the flywheel surface should then be ground off with fine sand paper and any dust removed with a clean dry cloth.

Remove left cover. Loosen possible tension in the brake belt by moving the indicator to 4 kp. Hold it there until the belt is loose. Take off the brake belt to the side. Grind with a fine sand paper. See *fig: Brake belt contact surface*. 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".

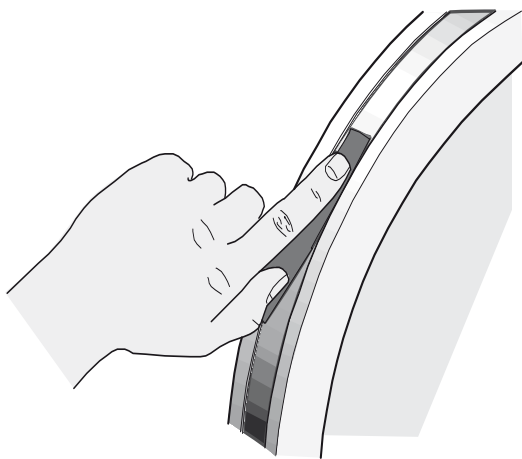


Fig: Brake belt contact surface

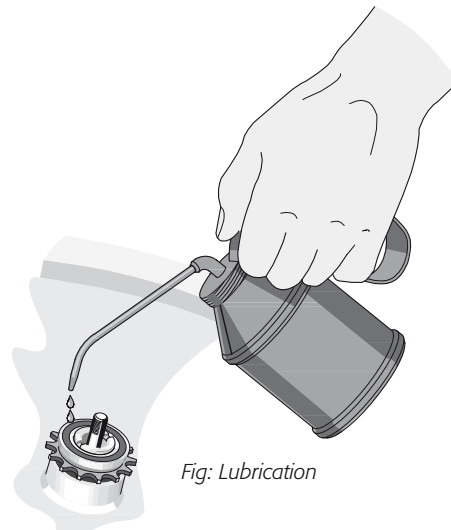


Fig: Lubrication

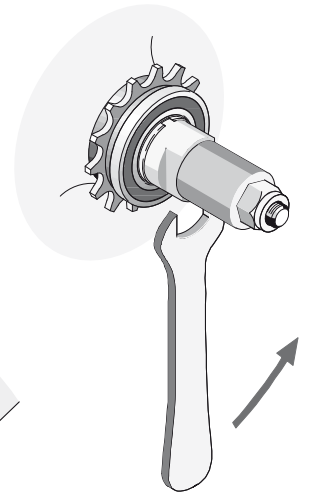


Fig: Special remover (part no: 9100-14)

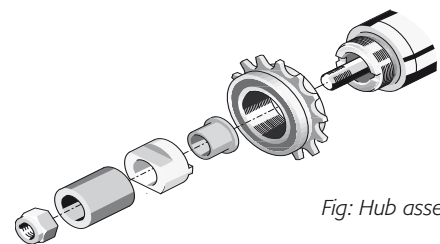


Fig: Hub assembly

Freewheel sprocket

When replacing the freewheel sprocket remove left and right frame cover. Dismantle the chain as described in part "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 (part No. 9100-14) in the adapter and place the spacer and axle nut outside. See *fig: Special remover*. Replace sprocket-adapter and assemble the new parts in reverse order according to the above.

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

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

Chain 1/2" x 1/8"

It is strongly recommended to keep the chain clean. Dirt build-up on the chain will cause excess wear. A chain lubricant and solvent for normal road bikes may be used.

Check the lubrication and tension of the chain in regular intervals. In the middle of its free length the chain should have a minimum play 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 chainwheels. Therefore it is always recommended to keep the chain play as little as possible. 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 replace the chain remove left and right frame cover. To adjust the chain the hub nuts should be loosened. Loosening or tightening the nuts on the chain adjusters will then move the hub and axle forward or backward. Adjust according to above recommendation. Then tighten the nuts on the hub axle again. See *fig: Chain adjustments*.

Loosen the chain adjuster as much as possible. Dismantle the chain lock and remove the chain. 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 of the chain. Use a pair of tongs for dismantling and assembling the spring.

See *fig: Chain replacement*.

Adjust chain adjusters to allow chain play according to above. Tighten axle nuts firmly. Put on frame covers again.

NOTE: At assembly the flywheel has to be parallel with the centerline of the frame otherwise the chain and chain wheels makes a lot of noise and wears out rapidly.

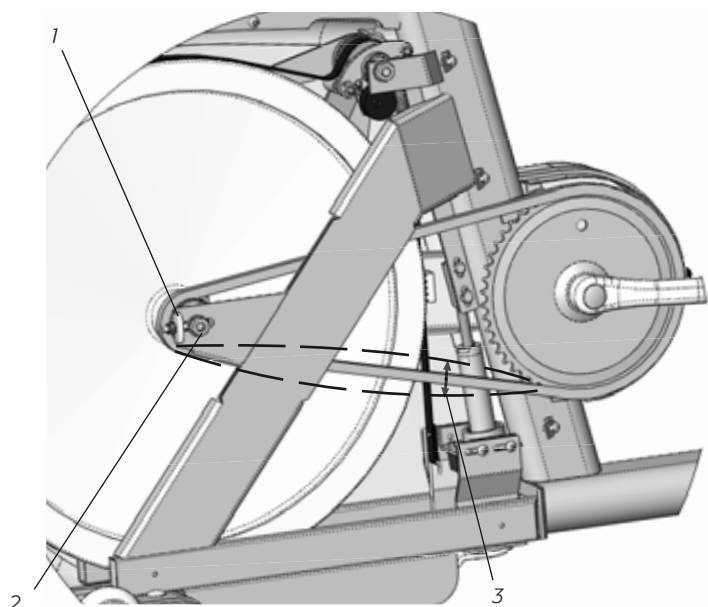


Fig: Chain adjustments
 1) Chain adjuster
 2) Axel nut
 3) Chain play

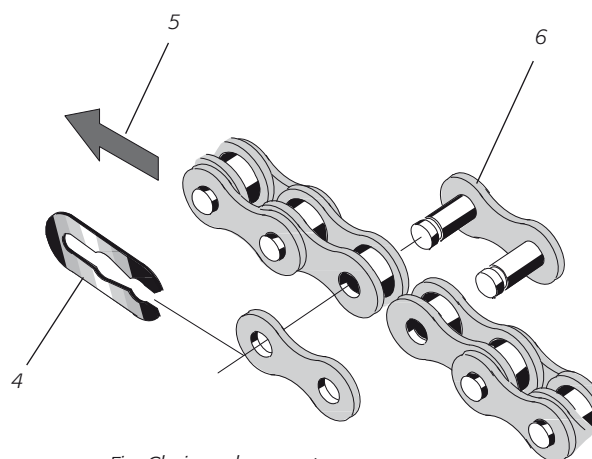


Fig: Chain replacement
 4) Lock spring
 5) Movement direction
 6) Chain lock

Crank bearing

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

Flywheel bearing

The bearings in the flywheel are lifetime greased and require normally no maintenance. If problem arises, please contact your Monark dealer.

Power on crank or flywheel

939 Ergometer adapted to ECG-work tests is set to measure the power on the crank.

939 Ergometer adapted to fitness tests is set to measure the power on the flywheel.

A sticker, placed on the display, see *fig: EKG-sticker*, informs that the ergometer is set to measure the power on the crank.



Fig: EKG-sticker



Scale - zero adjustment

Connect power to the bike. Loosen possible tension in the brake belt by moving the indicator to 4 kp. Hold it there until the belt feels loose. Then move the indicator to 0 again. Now check if the indicator is aligned with the 0-index on the scale. If adjustment is needed, loosen the lock nut (1) and then change the position of the scale board, so that it will have its 0-index in line with the indicator/moving pointer. Tighten the lock nut after the adjustment. See *fig: Scale adjustment*.

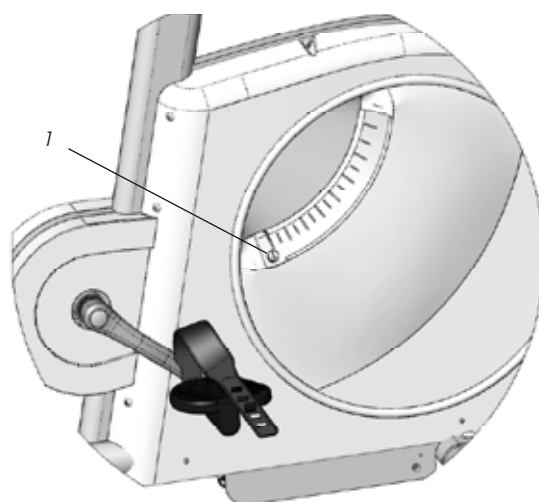


Fig: Scale adjustment
1) Lock nut

Mechanical calibration

Although all Ergometers are calibrated at the factory the user may wish to verify this by performing a mechanical scale calibration. If so please do the following.

Loosen possible tension in the brake. See "Scale - zero adjustment". Check that scale 0-index is in line with the pointer (1). See *fig: Calibration*. If adjustment is needed adjust according to "Scale -zero adjustment".

A checked and approved weight (4), 4 kg (our part number 9000-211), is attached at (5).

See *fig: Calibration*.

At the correct calibration, the indicator should point at 4 kp on the scale.

If there is a deviation adjust the pointer to the correct position by adjusting the weight inside the pendulum (2). To do this the left cover has to be removed. To adjust the position of the weight the locking screw, in the center of the pendulum (3), must be loosened.

If the pointer shows too low the internal weight must be moved somewhat upwards. If the pointer shows too high the adjustment weight is moved down a little. This process is repeated until pointer is in the correct position.

Check the scale calibration once a year or if required due to service.

Electronic calibration

1. Press the switch(2) to turn off the power, see *fig: power connection* in part "Connection to an external unit".
2. Adjust the scale mechanically so that 0 index on the scale and indicator are in line.
3. Move the indicator to 6 kp and hold it there.
4. Turn on the power again. The green LED on the lower left side of the bike is lit up when there is power to the bike.
5. Hold the indicator at 6 kp until one beep is heard.
6. Move the indicator to 0 kp and wait for one beep
7. Move the indicator to 2 kp and wait for one beep
8. Move the indicator to 4 kp and wait for one beep .
9. Move the indicator to 6 kp and wait for two beeps.
10. Move the indicator to 0 again.

Calibration is done.

The indicator can now be used to set the bike in different modes.

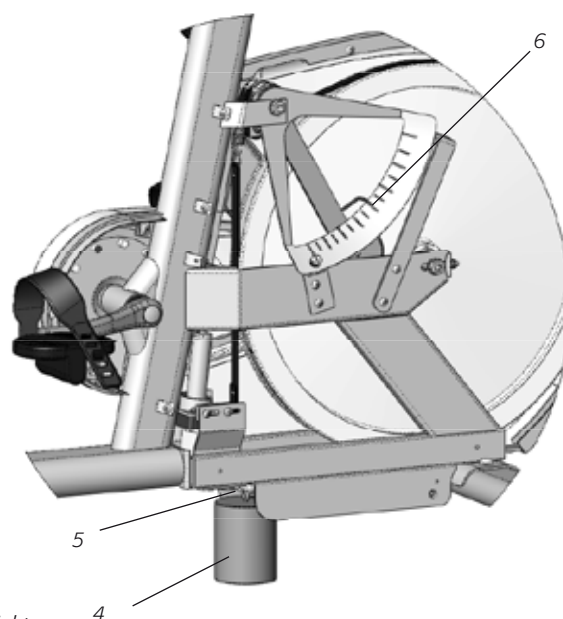
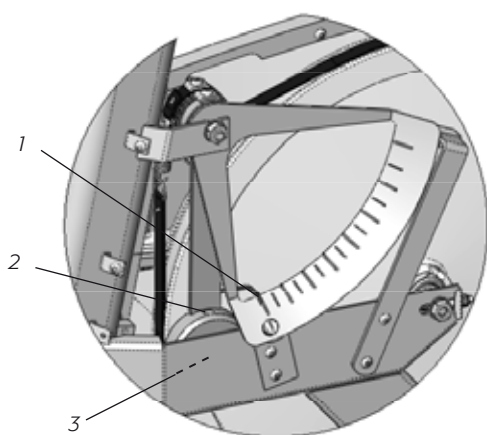
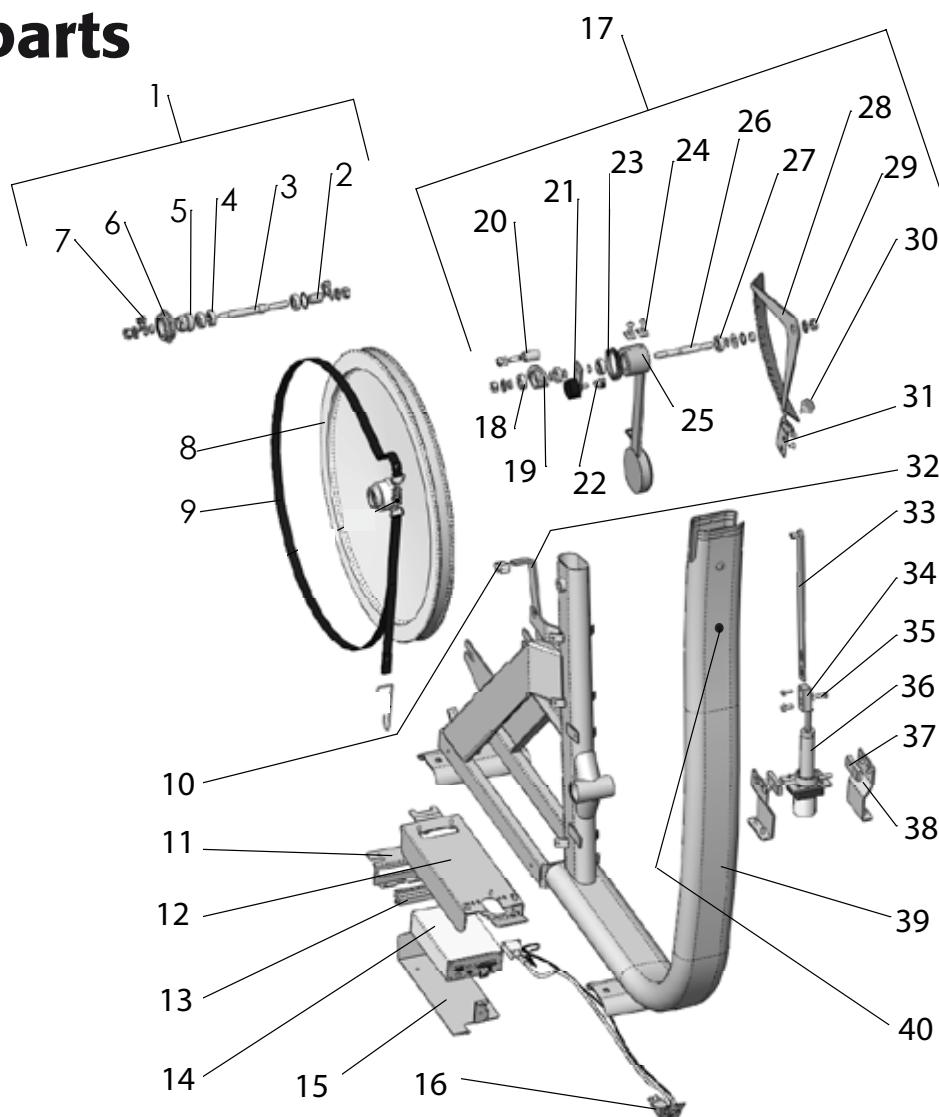
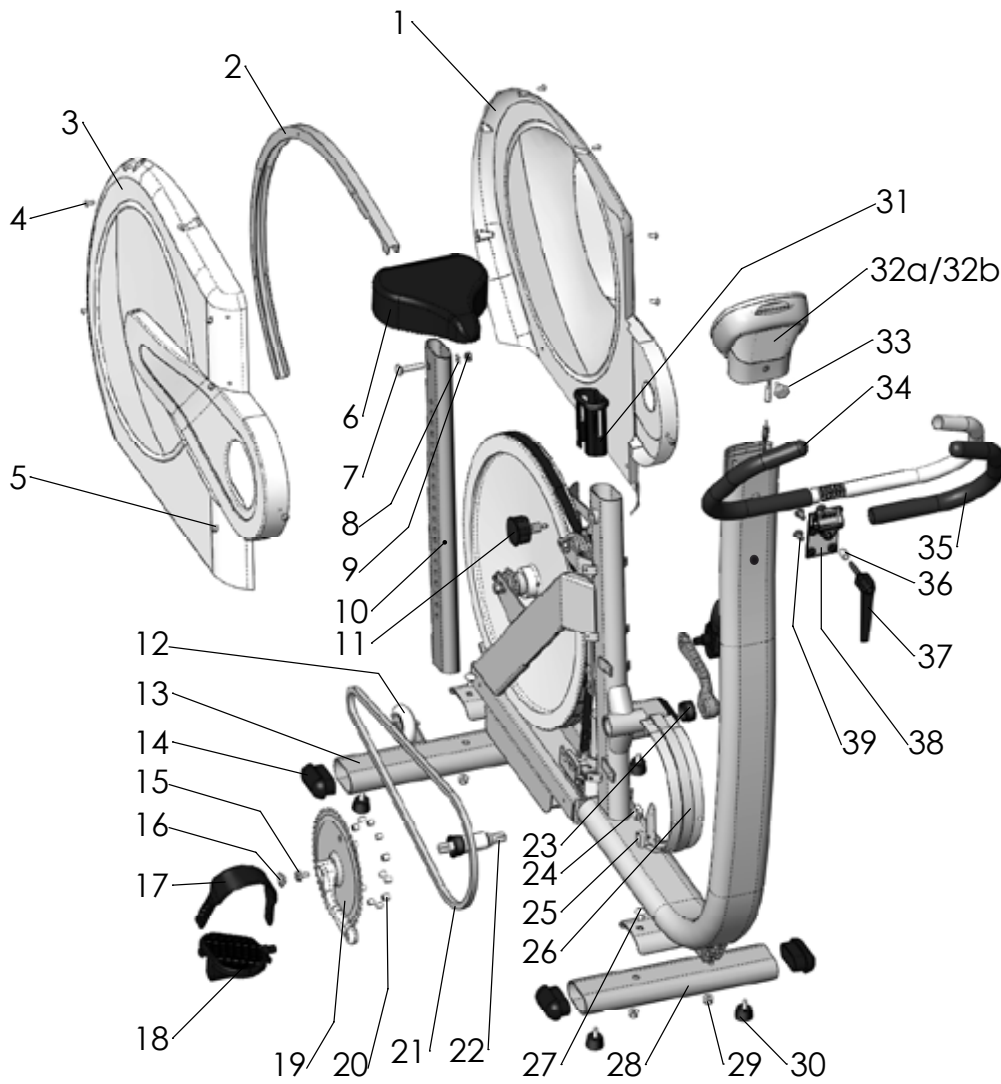


Fig: Calibration
 1) Pointer at 0-index
 2) Adjustment weight
 3) Locking screw
 4) Calibration weight
 5) Hook for calibration weight
 6) Pointer at 4 kp

Spare parts



Pos.	Qty.	Art.no.	Description	Pos.	Qty.	Art.no.	Description
1	1	9300-24	Wheel suspension complete set	21	1	9338-62	-Potentiometer w bracket
2	1	9300-17	-Bush, 23mm	22	1	9303-52	-Gear wheel
3	1	9300-18	-Axle	23	1	9303-54	-Belt
4	3	19001-6	-Bearing 6001-2z	24	2	9126-77	-Joint clamp
5	1	9106-14	-Connection	25	1	9338-18	-Weight lever
6	1	9106-13	-Sprocket	26	1	9338-13	-Swing axle
7	1	9000-12	-Chain adjuster (pair)	27	2	19001-6	-Bearing 6001-2Z
8	1	9300-3	Flywheel	28	1	9328-803	-Plate with kp-scale
9	1	9328-64	Brake belt, complete	29	2	5799	-Nut
10	2	9300-99	Plastic stop	30	1	9000-105	-Screw M5x10
11	1	9338-29	Contact plate	31	1	9328-29	Scale lock
12	1	9338-28	Bracket for box	32	1	9328-62	Stop
13	1	9338-31	Contact complete	33	1	9338-19	Stay
14	1	9338-24	Electronic box	34	1	9338-17	Adapter servo
15	1	9338-30	Cover plate	35	3	14323	Screw M6x16
16	1	9338-142	Contact bracket complete	36	1	9338-57	Tension device complete
17	1	9338-100	Pendulum complete	37	2	9338-15	Bracket for tension device
18	2	19001-5	-Bearing 6000-2Z	38	2	9338-16	Bracket for motor
19	1	9338-12	-Lever for pot. & servo	39	1	9338-1	Frame
20	1	9328-801	-Axle w. bearings, complete	40	1	9338-58	Switch, ON/OFF with cable



Pos.	Qty.	Art.no.	Description	Pos.	Qty.	Art.no.	Description
1	1	9338-59	Frame cover, left	23	1	8966-176	Support casing for BB-bracket
2	1	9328-4	Aluminium profile	24	1	9328-162	Crank sensor w. 1750mm cable
3	1	9338-60	Frame cover, right	25	1	9326-162	Sensor black w. 100mm cable
4	9	5675-9	Screw M5x6,5	26	1	9309-3	Holder for chain cover
5	21	5673-9	Screw M5x12	27	4	9300-12	Screw M8x16
6	1	4994-5	Saddle	28	1	9328-5	Support tube, front
7	1	5605-1	Screw M8x46	29	4	5845	Locking nut M8
8	1	5864	Washer	30	4	9328-26	Rubber foot
9	1	5775	Nut	31	1	9328-131	Bushing f. saddle post
10	1	9328-130	Saddle post	32a	1	9338-23-1	Display (without pulse)
11	1	9328-132	Locking knob	32b	1	9338-23-2	Display (with pulse)
12	1	9328-37	Transport wheel complete (pair)		1	9338-21	-Polar receiver
13	1	9328-6	Support tube, rear	33	1	9000-105	Screw, M5x10
14	4	9328-51	Plastic cap, blue	34	1	9328-7	Handlebar, complete
15	2	8523-115	Screw M8x1x20	35	1	9328-72	-Handgrip (pair)
16	2	8523-2	Dust cover for crank	36	1	9326-89	Spacer
17	1	9300-207	Footstraps (pair)	37	1	9100-280	Lever, complete
18	1	9300-220	Pedal (pair)	38	1	9328-8	Handlebar clamp
19	1	9300-432	Steel crank set, complete	39	4	9337-38	Screw M8x16
20	13	9374-16	-Magnet		1	9000-211	Calibration weight, 4 kgs
21	1	9326-55	Chain, 98 L with chain lock		1	9339-853	Chest belt Polar T34 complete
22	1	8966-175	BB cartridge bearing		1	9339-851	Strap for chest belt, Polar