

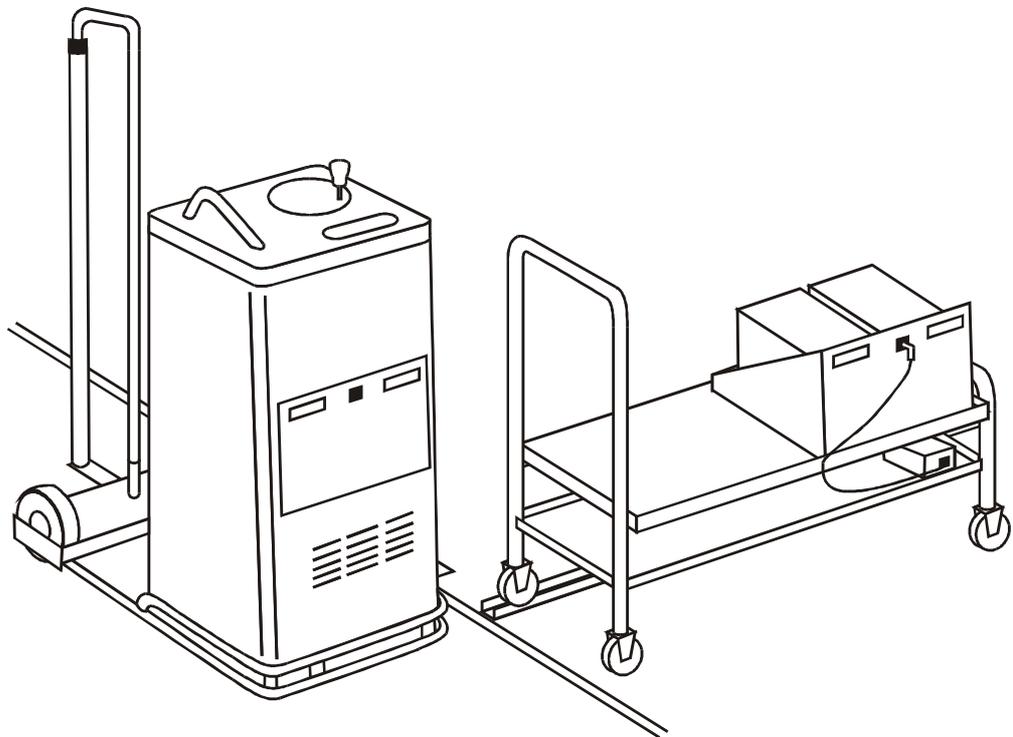


**WARNING!**

Do not use the truck before first reading through the OPERATOR'S MANUAL.

**NOTE!**

Keep for future reference.



# Operator's Manual

**GB**

## Ergomover 620 AC-TT

Valid from serial number: 3000AI-

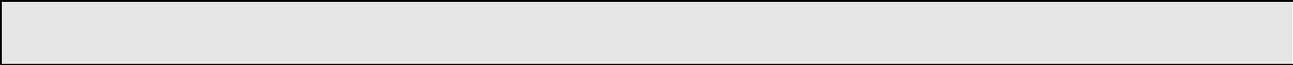
Order number: 212908-040

Issued: 2003-04-16 ITS

BT Products AB  
S-595 81 MJÖLBY SWEDEN

Valid only for serial number:

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## **It is important that you read this Operator's Manual for your own safety!**

Before you start to use this truck it is of extreme importance that you have **read** the contents of the entire Operator's Manual to be able to use the truck in a **safe** and **efficient** manner.

This Operator's Manual contains information on how you should use the truck, safety regulations and how to keep the truck in a safe condition by following daily service routines.

Always follow the warnings given in this Operator's Manual and on the truck to avoid accidents and incidents from occurring.

*BT Products AB*

## Table of Contents

<b>Safety regulations</b> .....	<b>3</b>
Warning symbols .....	3
General safety regulations .....	4
<b>Warning and information plates and symbols</b> .....	<b>6</b>
<b>Presentation of the truck</b> .....	<b>7</b>
Intended application of the truck .....	7
Forbidden application of the truck .....	7
Truck data .....	7
Truck dimensions .....	8
Identification plate .....	8
<b>Main components</b> .....	<b>9</b>
<b>Controls and instruments</b> .....	<b>10</b>
Control panel .....	10
Troubleshooting .....	12
<b>Driving</b> .....	<b>13</b>
Control .....	13
Starting the truck .....	14
Braking and changing the direction of travel .....	14
Parking the truck .....	14
Automatic parking brake .....	14
Emergency brake .....	15
<b>Battery</b> .....	<b>16</b>
Valve-vented traction batteries .....	16
Liquid-filled traction batteries .....	16
Charging the battery .....	16
Cleaning .....	17
Changing the battery .....	17
Laddbord .....	18
<b>Maintenance</b> .....	<b>21</b>
Cleaning and washing .....	22
<b>Transporting and storing the truck</b> .....	<b>24</b>
Lifting the truck .....	24
Storing the truck .....	24
Starting after a period of disuse .....	24
<b>Recycling/discarding</b> .....	<b>25</b>
Discarding the battery .....	25
Scrapping the truck .....	25

# Safety regulations

## Warning symbols

*Always follow the warnings given in this Operator's Manual and on the truck to avoid accidents and incidents from occurring.*

## Warning levels

Warning texts regarding safety provide information on the risks, describe the consequences and instruct how to avoid accidents.



### **WARNING!**

*Warns that accidents can occur if the instructions are not followed.*

*The consequences are serious personal injury or possibly death and/or large material damage.*

### **NOTE!**

*Marks the risk of a crash/breakdown if the instructions are not followed.*

## Ordinance symbols



### **SAFETY SHOES**

*When the directive for safety shoes is given, safety shoes must always be worn to avoid personal injury.*



### **PROTECTIVE GLASSES**

*When the directive for protective glasses is given, protective glasses must always be worn to avoid personal injury.*

## General safety regulations

Always carry out daily service before the truck is used, see chapter *Daily service and function checks*. The working order of all safety equipment, guards and safety switches should be checked before you use the truck. Such safety equipment must not be disengaged or removed.

The battery must be secured in its intended compartment. The battery shall have a weight that corresponds with the information stated on the truck's identification plate.

The truck must not be used if it is damaged or has faults that affect safety or its safe use. The truck may not be used if it has been repaired, modified or adjusted unless it has been checked and approved by personnel authorised by BT.

## Operating the truck

The truck is designed and produced to be your tool when transporting, collecting and leaving loads.

If the truck is to be used in cold storage rooms the truck must be especially built for this type of use.

It is **not permitted** to use the truck for purposes that it has not been designed and produced for, e.g. the following applications:

- In areas where the atmosphere contains dust or gases that can cause fires or explosions.
- To tow other trucks.
- To transport/lift passengers.

## Personal protective equipment

- Always wear safety shoes with steel toe caps when using the truck.

## Fire

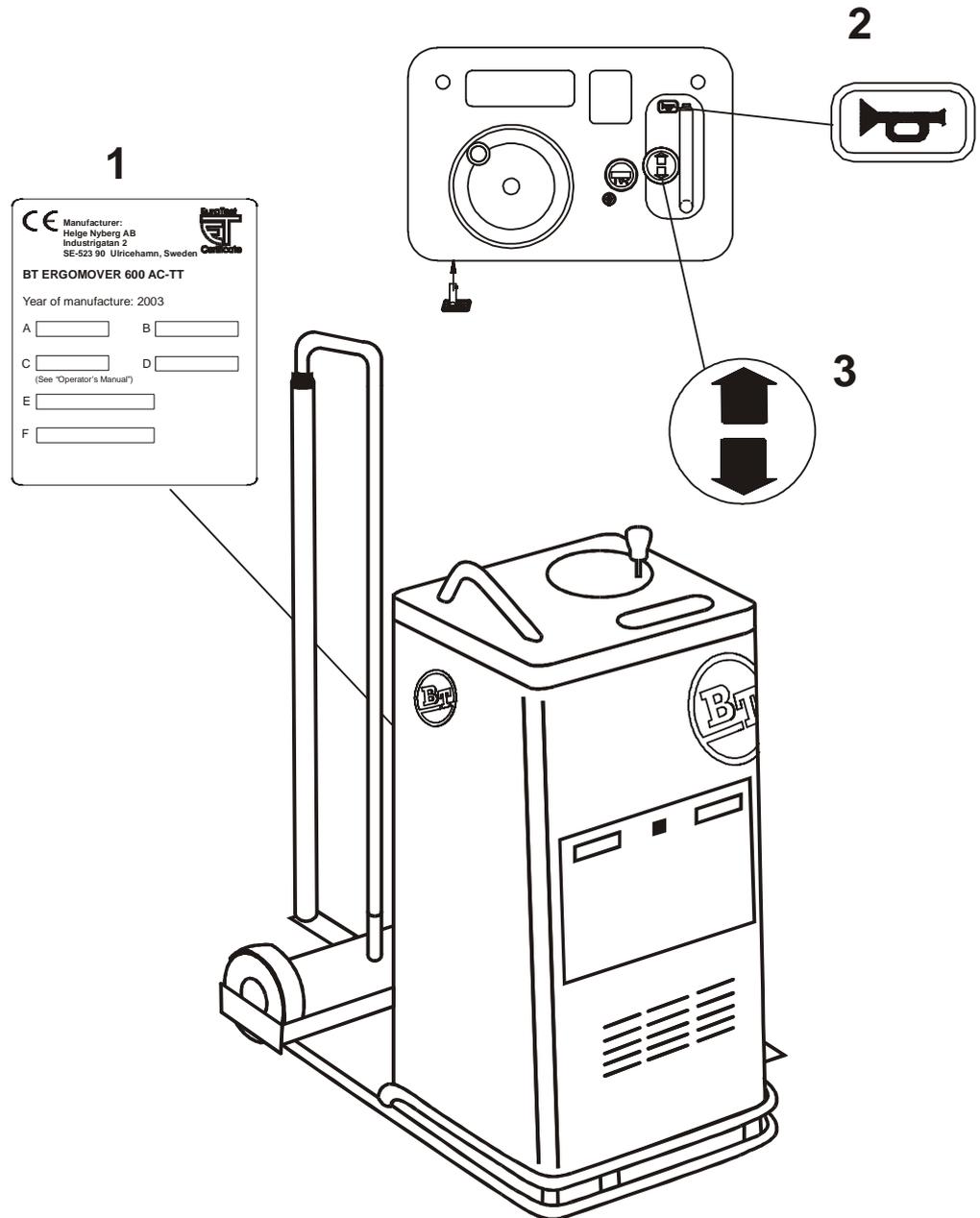
In the event of fire, use a powder fire extinguisher for electrical materials (type ABE, Class I).

## Operator's responsibility

- The truck shall only be driven with care, good judgement and in a responsible manner.
- Only handle loads that are stable and arranged in a safe manner.

# Warning and information plates and symbols

The figure shows the position and significance of the plates and symbols located on the truck.



1. Identification plate
2. Signal/Horn
3. Travel direction selector

## Presentation of the truck

This is a towing truck designed for internal light goods handling. The truck is used to pull trolleys on which goods is loaded. Thanks to the high level of manoeuvrability and flexibility, the truck can be used just about anywhere where carts are used today.

Model 620 AC-TT is a towing truck that can tow a maximum of 10 trolleys with a total load on the tow bar of  $F=180\text{ N}$ .

## Intended application of the truck

The truck is designed for transporting goods indoors, in heated premises with smooth floors.

## Forbidden application of the truck



The truck is designed for handling goods indoors. It is not permitted to use the truck for other purposes including the following:

- To transport/lift passengers
- To be driven or stored outdoors or in cold premises

## Truck data

The table provides information regarding some technical data, which is of value with daily use of the truck.

Truck type	620 AC-TT
Rated capacity, kg	500
Travel speed, km/h	8
Gradient with rated load, %	10
Weight incl. batteries, 50Ah C5, kg	200
Continuous noise level, dB A	70
Full body vibration value, $\text{m/s}^2$	1,5

## Truck dimensions

The truck's dimensions and weight (mm)	620 AC-TT
Width incl. bumper wheels	600
Length incl. bumper wheels	1415
Height	1100
Instep height	65
Floor clearance	40
Wheel base	765
Turning radius without load handler	1700
Turning radius with load handler	1900
Load handler, B x L	400 x 600

## Identification plate

The illustration shows the identification plate used on the truck.

**CE** Manufacturer:  
Helge Nyberg AB  
Industrigatan 2  
SE-523 90 Ulricehamn, Sweden



**BT ERGOMOVER 600 AC-TT**

Year of manufacture: 2003

A  B

C  D

(See "Operator's Manual")

E

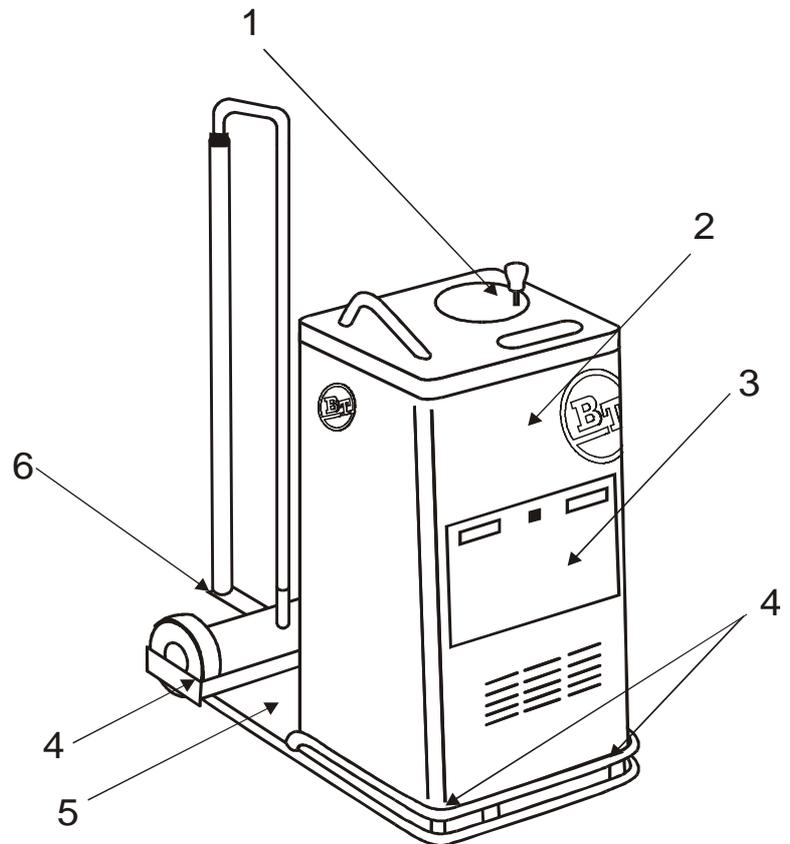
F

Item	Text	Unit
A	MODEL	
B	SERIAL NO	
C	RATED CAPACITY	kg
D	MAXIMUM SPEED	km/h
E	BATTERY TYPE	
F	WEIGHT WITH BATTERIES	kg

# Main components

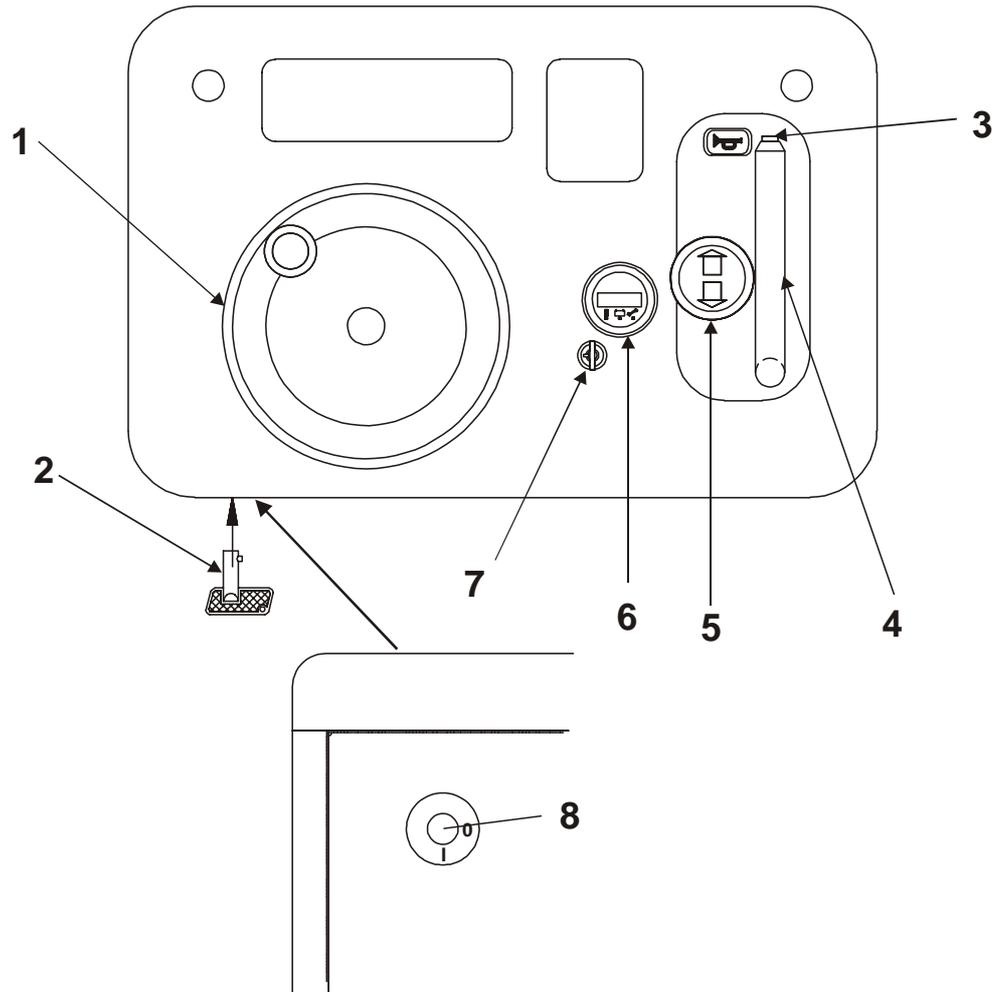
## Model 620 AC-TT

1. Control panel with steering wheel and control lever
2. Powerpack with removable front panel
3. Battery cassette
4. Lifting points
5. Safety switch (contact mat)
6. Tow bar



# Controls and instruments

## Control panel



1. Steering wheel
2. Master key
3. Horn button
4. Handrail
5. Control lever
6. Combi instrument
7. Key switch
8. Master switch

### Steering wheel (1)

The steering wheel is located to the left when the driver is standing in the truck.

### Master key (2)

- Insert the master key in the master switch (8) situated on the inside of the chassis where the operator stands on the truck.

### Horn button (3)

The horn sounds as long as the button is pressed.

### Handrail (4)

- For added support and to promote safe driving, let the right hand rest on the handrail while driving.

### Control lever (5)

The control lever controls speed and motor brake (reversing).

- Move the control lever forwards for driving, and backwards to brake the truck.

### Combi instrument (6)

The combi instrument displays the hour counter, battery indicator and error codes. When the master key switch or the key switch is switched on, all three LEDs (green, yellow and red) light briefly, and subsequently only the green LED continues to light - the display shows the number of hours power has been switched on. The LEDs then start blinking - the display shows the number of hours the truck has been driven. After this, the yellow LED lights - the display shows the remaining battery capacity as a percentage (%). The batteries should be recharged when the capacity falls to 10%.

### Key switch (7)

- First switch on the master switch, then start the truck using the key.

Please note that the key switch only disconnects operating current and not the battery power supply.

### Master switch (8)

The master switch is located on the inside of the chassis when the driver is standing in the truck.

## Troubleshooting

If the truck appears to lack power or if it fails to start, proceed as follows:

1. Make sure that the key switch is in position **I** and that the safety switch/contact mat is pressed down by the operator. If the safety switch/contact mat is pressed down and the battery indicator is lit but the truck still fails to start, check that the electric cables to the safety switch/contact mat has not been loose or damaged.
2. Check the battery voltage. If the battery indicator shows less than 10% capacity, the batteries should be charged. With a very low battery voltage, the truck can only be driven at 3 km/h. This occurs when the battery capacity is less than 2%. If the power is switched off in this state, please wait 3-5 minutes before driving the truck again. Do not park the truck with poorly charged batteries since this could cause damage to the batteries.
3. Remove the keys from the key switch and the master switch and open the battery cover. Check that the battery cable terminals are firmly in contact with the battery posts and that the cables are not damaged.
4. Check the battery fuse. If it has blown, the reason must always be determined before a new fuse is fitted. It will blow only if a short circuit has occurred in the cables or connectors.
5. Check the control lever for damage or loose electrical cables. Adjustments may only be done by an authorized service technician!
6. The parking brake is not released even though the control lever is activated and the safety switch/contact mat is pressed down. If the parking brake is not energized, it will immediately be applied. Check that none of the cables to the brake is broken or damaged. Check that there is power at the brake at startup and with the safety switch/contact mat activated. If there is current, the brake itself is faulty and must be replaced.
7. If the above checks do not reveal any defects but the truck still fails to perform normally, the fault may be in the electronics. The electronics are a reliable part of the truck, but they are also sensitive and demand special knowledge for adjustments or repairs. If the electronics are suspected of being faulty, get in touch with our Service Department for information of how to proceed.

# Driving

The key switch and the master key are important to the operator and to safety. The key switch is provided to a unique key to prevent unauthorized use of the truck. Note that the key switch only disconnects the operating current for motor control and applies the parking brake.

The master key disconnects battery power (the battery indicator goes out when one of the key switches is switched off).

## Model 620 AC-TT

The load should be uniformly distributed on the trolley/trolleys and firmly secured so that it will not fall off or throw about while driving. The trolleys used must conform to the BT's technical specifications.

### Hitching trolleys:

- Reverse the truck up to the trolley.
- Turn the key switch to **0** to prevent unintentional movement of the truck.
- Connect the trolley to the truck.
- Ensure that the connecting device is properly locked.



### WARNING!

*Exercise maximum care when towing trolleys.*

*With a heavy load, braking suddenly while turning may cause the trolley and truck to turn over!*

## Control

The pedal/contact mat on the floor in the driver compartment serves as a safety switch and must be pressed down to enable the truck to be used, see picture in chapter *Main components*. This prevents inadvertent starting.

The truck is manoeuvred by means of the steering wheel and a control lever which controls speed and motor brake (reversing).

The control lever is moved forwards to drive the truck forwards, and backwards to brake the truck.

If the pedal/contact mat is released, the parking brake operates automatically. Continuing to move the control lever backwards from the neutral position causes the truck to reverse. Moving the control lever forwards again operates the brake during reversing.

## Starting the truck

- Insert the master key and turn it.
- Insert the key in the key switch and turn it.
- Press down the pedal/contact mat and keep it constantly pressed down while driving.
- Move the control lever forwards and drive the truck smoothly to preserve the batteries, to reduce wear and to ensure safety.
- Drive carefully over thresholds and major surface irregularities.

## Braking and changing the direction of travel

- Brake (reverse motor) by moving the control lever backwards until the truck stops. If you continue to hold the control lever in the rearward position the truck will begin to reverse. Take care when reversing.

## Parking the truck

Before leaving the truck, make sure that the truck is stationary and the automatic parking brake has been applied (a "click" is heard).

- After parking the truck, always remove the keys from the key switch and from the master switch. If the truck is left stationary with the battery power switched on, the batteries may be discharged and could sustain serious damage.
- Always remove the key from the key switch to prevent unauthorized persons from driving the truck.

## Automatic parking brake

The motor is equipped with an electromagnetic parking brake. This operates as soon as the pedal/contact mat is released. The parking brake is capable of keeping the truck stationary on any gradient that the truck can climb.

The parking brake is delayed briefly before it is applied, in order to avoid a jerky stop. The delay is preset at the factory and must not be altered, since it may be dangerous if the delay time is too long.

## Emergency brake

If motor brake should fail, the parking brake can be activated by switching the master key to **0**.



### **WARNING!**

*Risk of being thrown forward onto the control panel.*

*If the master key is switched to 0 while the truck is travelling at high speed, the truck will jerk violently.*

*This way of applying the brake should be used only in emergency situations.*

# Battery

The truck is equipped with two 12 V batteries connected in series.

## Valve-vented traction batteries

The truck is equipped as standard with valve-vented traction batteries. These are maintenance-free, since they need not be topped up at any stage during their life cycle.

The distinctive features of these batteries include:

- they are intended for electric vehicles
  - traction
- the electrolyte is in solid form
  - no liquid can leak out of the battery, not even if the battery case should break
- closed cell with safety valve
  - no topping up with liquid is necessary
  - very low gas emission

## Liquid-filled traction batteries

We do not recommend the use of liquid-filled batteries, in order to avoid the spillage of acid which is aggressive and may cause corrosion damage.

If liquid-filled batteries still are used, the electrolyte level should be checked at regular intervals, and the batteries should be topped up with distilled water when necessary. In addition, the electrolyte density should be regularly checked.

**NOTE!** Ordinary car batteries must never be used. These are not intended for powering electric vehicles.

## Charging the battery

The truck is equipped with an external charger.

It is important to use a charger recommended by us for the batteries that are being used.

Before charging, the keys must always be removed from the key switch and from the master switch.

## Battery

- Arrange a parking place where an earthed 220 V wall socket is available and where it is suitable to leave the truck parked at the end of the working day. Also make arrangements in this place for accommodating the maintenance materials and spares.
- Remove the master key.
- Connect the charger to an earthed 220 V wall socket. The charger will charge the batteries automatically and will then switch over to trickle charging as long as the charger is connected.

**NOTE:** If the batteries have been entirely discharged, it is important to recharge them immediately.

New batteries must be discharged and recharged about 20 times before they achieve full capacity.



**NOTE!**

*Always follow your local industrial safety regulations for lead-acid batteries. In addition, your factories inspector should approve the battery charging station.*

## Cleaning

- Keep the batteries clean, and remove any dirt and oxides. Leakage current may occur on a dirty battery.

## Changing the battery

The batteries stand on a removable battery cassette. Before changing the batteries, always remove the key from the master switch.

**Procedure:**

- Release the catch through the holes at the front of the cassette and push in. The lock will be released and the cassette can then be withdrawn.

**NOTE!** A battery cassette weighs up to 65 kg. So arrange a low table next to the truck to enable the battery cassette to be transferred quickly onto this table.

- Slacken off the battery cable clips. Note how the battery cables are connected.
- Disconnect both cable clips from one battery at a time (raise the plastic cover and lift off the clip).

## Battery

- Change the batteries and replace the clips. Red is the positive pole (+) and blue is the negative pole (-). Repeat the procedure with the next battery.

**NOTE!** Make sure that the short separate cable runs from the positive pole (+) on one of the batteries to the negative pole (-) on the other.

- When the cassette is slid back into the powerpack, ensure that the lock has closed. Check that the cassette cannot be pulled out.



**WARNING!**

*The battery poles must not be short-circuited by any object made of metal or other conductive material, since the battery could then explode and cause serious damage and injuries.*

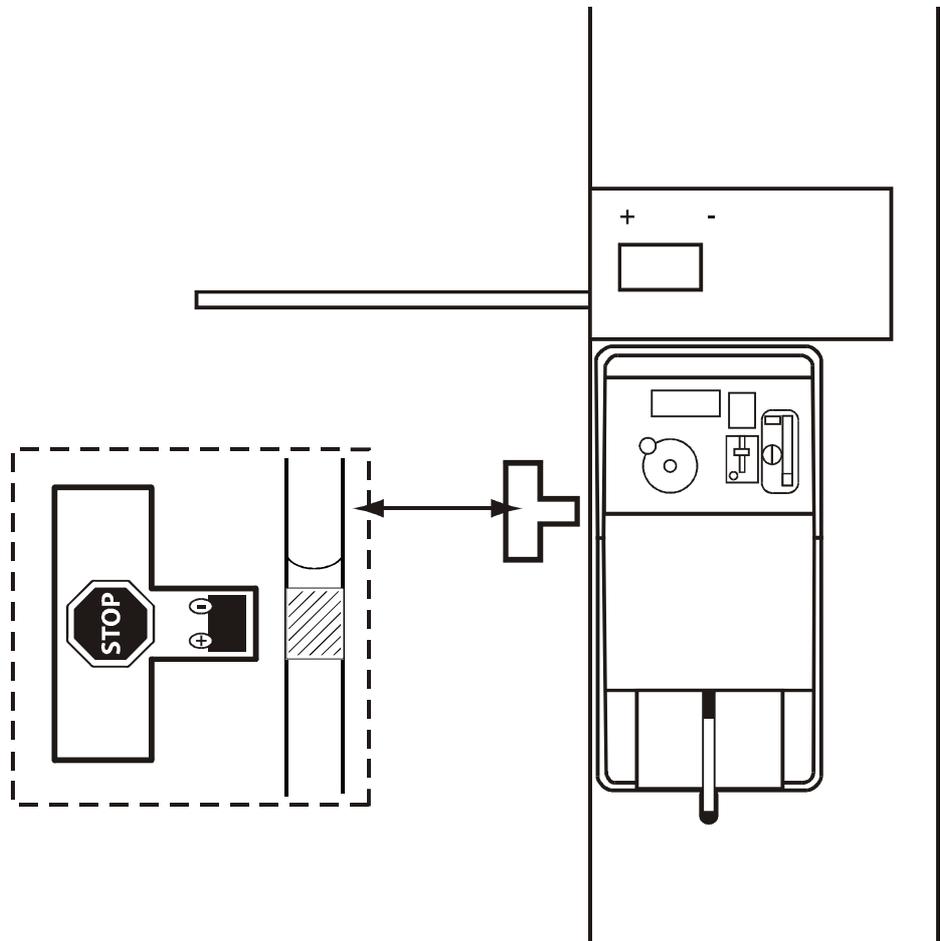
## Charging table

### Placement of the charging table and the STOP sticker

The U profile is supplied separately from Europil (it is not supplied together with the truck).

1. Place the U profile on the floor.
2. Align the charging table with the U profile.
3. Drive the truck to the charging table
4. Align the STOP sticker with the yellow marking on the truck and attach it.

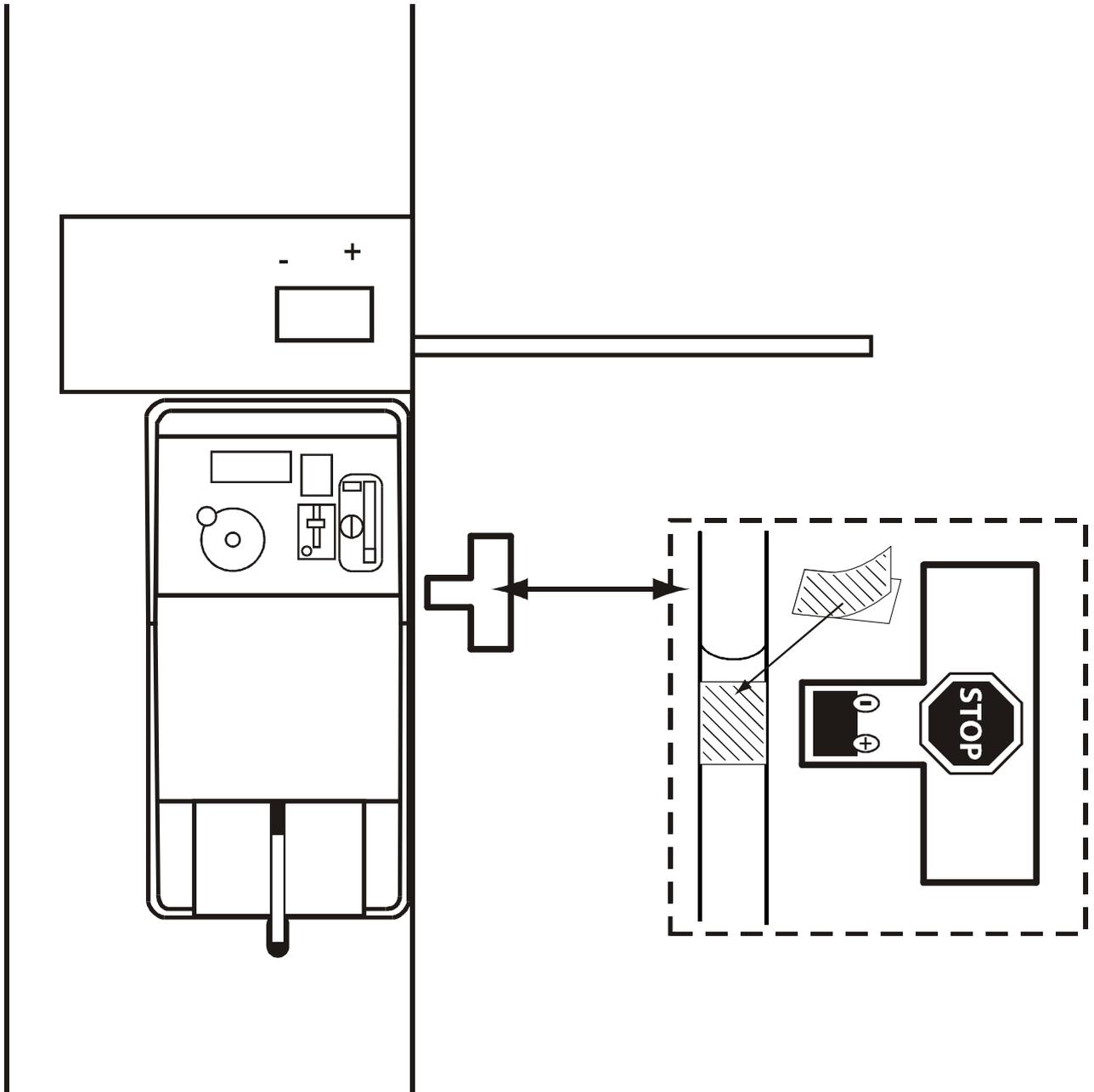
## Battery



### Charging from the other side of the truck aisle

- Loosen the charging table plate, rotate it 180°, and secure the plate again.
- Move the battery charger to the other side of the charging table. Remove the yellow sticker on the truck and attach the extra sticker on the other side of the truck. (The extra yellow sticker is included in the delivery of the truck.)

# Battery

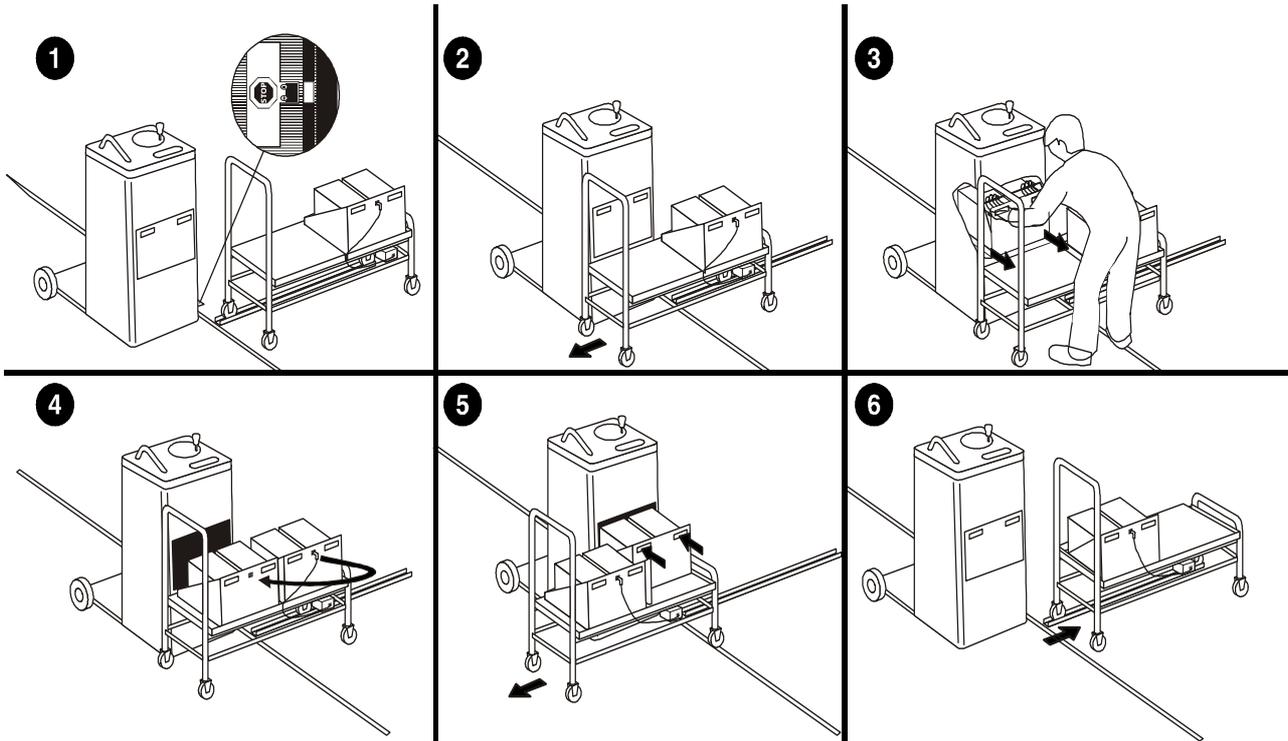


## Changing battery cassette

The BT Ergomover 620-TT is designed for intensively and multi-shift operation. Therefore truck is equipped with an easy removable battery cassette. An extra battery cassette is included for quick battery changing. The changing of the battery cassette is done at a charging table.

The charging table has a built-in in charger.

- To change the battery cassette - follow the step by step instruction below:



# Maintenance

## Powerpack with front panel and side plates

The truck's powerpack has an easily removable front panel. Turn the key switch to the position **0** and remove the master switch key. Open the rotating lock at each side of the powerpack, let the panel fall forwards, then lift it out. The interior will be easily accessible for inspection and maintenance. If necessary, the side panels can be removed. The side panels are attached to the inside of the back edge with two screws.

The truck user should check at regular intervals that nothing which could affect safety has happened. Service work may be done by operator, but repairs may be done only by authorized service personnel. Before any maintenance or inspection work is done on the truck, the keys should always be removed from the key switch and from the master switch.

## Daily service by the operator

### Before every shift, check:

- Battery indicator (power and charge status)
- The electrolyte level if liquid electrolyte batteries are used (not recommended)
- Possible damage to the wheels
- The steering function (turn at low speed)
- Travel brake (test brake at low speed)
- Parking brake (truck should not begin to roll)
- Foot pedal/contact mat (truck should not begin to move if the pedal is not depressed)

### After every shift, check:

- That the key from the key switch is removed
- That the master key is removed
- Clean the truck
- Charge the batteries

### Other checks

- Check the electric cables to the motor and parking brake to one side of the drive wheel to make sure that the insulation has not been damaged and that the cables are firmly secured.

After a longer period of use (3 - 12 months, depending on the frequency of use), carry out the following work:

1. Check toothed belt for steering gear. Adjust brake voltage if necessary.
2. Check and grease the thrust bearing for the drive wheel (steering has unlubricated sliding bearings). The bearing is located on the bottom shelf between the batteries. Lift the gaiter and check that there is grease. If necessary, top up with high-temperature bearing grease.
3. Check all electric cables and battery cable clips.
4. Check the brake system.  
Check that travel (reversing) brake works. At max permitted load and speed, stopping distance should be less than 3,5 m. Check that parking brake works and that it keeps the truck stationary at max load and 10% slope.
5. Check the support wheels. If the wheels are worn, fit new wheels.
6. Spring-loaded support wheels:  
The support wheels should have a measured pressure on the floor of approx 195 N. This is attained by fitting washers between the wheel and the spring-fixing, so that the wheel is at 5 mm below floor level (truck is jacked up from the floor during setting).

Changing of the brake pads and other repairs may be done only by an authorized service technician.

## Cleaning and washing

The truck must not be hosed down with water or other liquid (either from a high-pressure hose or from an ordinary water hose).

- Wipe the painted surfaces with a damp piece of cloth and a mild detergent. The print on the plates cannot withstand polish or other chemicals.  
Mild solvents, such as white spirit, may be used for removing heavy dirt from chrome plated or galvanized parts. Alternatively, a scouring or polishing agent may be used.
- Brush the rubber mats or wipe them with a damp piece of cloth and a mild detergent.
- Remove rubbish, etc. from the wheels daily.  
If there are strands or thin fibres on the floor, make sure that these do not become lodged in the wheel hubs. This is particularly important on the castor wheels.

- Any battery acid/gel spillage on the truck must immediately be removed with paper tissue or the like, since the surface will otherwise be damaged. Note that battery acid/gel are aggressive. Personal protective equipment should be used in these cases.

### Service and repairs - competence

The operator may only carry out the work described in this *Operator's manual*. Any other maintenance, service and repair work may be done only by an authorized service technician.

Only a person who has been approved by BT is regarded as an authorized service technician. This work must be done in accordance with our service instructions.



#### NOTE!

***Replacing/adjusting the drive wheels, replacing the parking brake or work on the electrical system must only be carried out by authorised service technicians.***

# Transporting and storing the truck

## Lifting the truck

- Lift the truck from the marked lifting points.
- The truck must be firmly secured when it is transported on a truck, trailer or the like. Use the marked lifting points when securing the truck in place.
- To protect the truck against rain, moisture and cold, do not transport it on an open truck platform or an open trailer.

The truck must not be turned upside down or laid on its side, since battery acid then may leak out.

## Storing the truck

- Make sure that the batteries are fully charged when the truck is taken out of service. If the truck is out of service for a long time, the batteries should be recharged every month. This should be recorded by the operator or the person who is responsible for the charging work.

**NOTE:** The batteries are connected in series to give 24V DC when they are mounted in the truck. If they are removed for storage, they must be connected in series for charging! A special adapter cable for connection in series and suitable for the charging connector should then be used. This cable must be ordered from your supplier.

- Clean the truck and carry out maintenance work before it is taken out of service. Any faults should first be repaired.
- Make sure that the master key is removed and that the key switch is in position **0**. Keep the keys separated from the truck. The entire truck should be protected against dirt, moisture, cold weather, etc.

## Starting after a period of disuse

If the truck has been out of service for more than three months, the operator should go through the various maintenance points before test-driving the truck.

## Recycling/discarding



Batteries are hazardous to the environment and should be returned to the manufacturer for recycling.

### Discarding the battery

When the working life of the battery in the truck is at an end (change to a new battery) or if the entire truck is to be scrapped special regard to environmental risks shall be taken when disposing/recycling batteries.

Spent batteries shall be returned /sent to the manufacturer of the battery or its representatives (see the sign on the battery) for disposal/recycling. You can also return batteries to your local BT-representative who will then take care of returning the battery to the manufacturer.

### Scrapping the truck

The truck consists of parts that contain recyclable metals and plastics. Below is a list of those materials used in the truck's sub-systems.

## Recycling/discarding

<b>Chassis</b>	
Chassis	Steel and rubber mat
Frame powerpack	Steel
Cover plates	Steel
Control panel	ABS-plastic
Drive unit	Steel and cast material
Steering-column gear change	Aluminium, steel and rubber
Chair cushion	Synthetic, polyurethan, wood and metal
Bushings	Polyamide
Painting	Epoxy lacquer
Finishing	Chromium and zinc
Wheels	Polyamide and rubber

<b>Electrical system</b>	
Cables	Copper cores with PVC sheaths
Motors	Steel and copper

