

Manual Stair Robot SR1750 HE

Battery power



Stairrobot

Type number : SR 1750 HE
Serial number :
Year of construction : 2016
Owner :

Manufacturer :



AATA International b.v
Kerkstraat 79
2377 AX
The Netherlands

Tel : 0031-(0) 7133 103 36
Fax : 0031-(0) 7133 172 43

e-mail: info@aata.nl
<http://www.aata.nl>

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Preface

AATA International is an innovative and dynamical company, specialised in stair climbing equipment. Stairrobots are active in over 30 countries worldwide.

This manual is written for machine operators and for technician who take care for the maintenance of the machine. Although the tiniest details are not set out, the manual is a useful help for people who are dealing with the machine on a daily basis.

The stairrobot SR 1750 HE has been used for over 20 years by many well known companies and transport contractors worldwide who are involved in the movement of heavy loads into and out of customers premises.

The stairrobot SR 1750 HE is designed to carry unit loads weighing up to 1000 kg up- and down stairs. The accessory equipment, stair approach ramp, manoeuvring dolly and the turntable, have been designed to assist the movement up to and onto the stairs and the take off from the top and journey to the final destination.

This manual should be used in conjunction with the cd-rom instruction video, which is placed on the inside of the manuals cover.

Read this manual and view the instruction cd-rom carefully before putting the SR 1750HE into operation. Always take note of the safety rules as mentioned in chapter "safety".

A copy of this manual should be kept with the machine, so the operator has it at his disposal.

AATA International b.v.

Table of contents

Preface.....	3
Table of contents	4
Survey of standards.....	5
Survey of standards.....	5
1. Technical data.....	6
2. Description main components stair robot SR 1750 HE	
2.1 Drive.....	7
2.2 Transmission and brake.....	7
2.3 Tracks.....	7
2.4 Controls.....	8
2.5 Hydraulic levelling platform.....	8
2.6 Descent adjuster	9
2.7 Hydraulic motor and Pump	
3. Ancillary equipment	
3.1 Loading ramp.....	10
3.2 Turntable.....	11
3.3 Winch	11
3.4 Dolly	11
4. Safety	
4.1 General safety precaution.....	12
5. Operators procedure	
5.1 Pre-use inspection.....	14
5.2 Loading.....	15
5.2.1 The correct position of the load.....	15
5.2.2 Loading procedure	16
5.3 Ascending.....	17
5.4 Descending	18
5.5 Unloading	19
6. Trouble shooting chart.....	20
7. Track replacement	22
8. Electrical system chart.....	24
9. Hydraulic system chart	25
10. Parts.....	26
10.1 Parts list.....	27

Survey of standard

We declare that the construction of the stairrobot SR1750HE is according to the provisions of EC-Directives 89/392/EWG.


Applied harmonized standard:


NEN-EN 60034-5; NEN 10034-6; NEN 10072-2

Applied national standards, directives and technical specifications:

IEC 34-5; IEC 34-7; IEC 72-1

Survey of symbols

	Not (or not completely) observing the operating instructions can lead to serious accidents or damage
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	Danger as a result of electric tension
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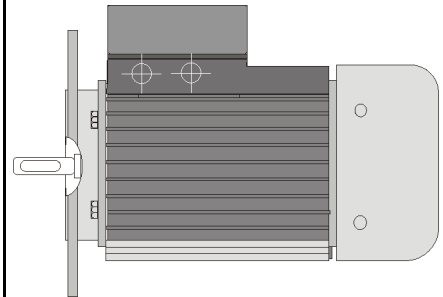
1. Technical data SR 1750 HE

Description	Value	Units
Speed	3 /1.5	Metres p/minute
Lifting capacity	max. 1000	Kg.
Maximum angle	Max. 45	° Degrees
Weight	175	Kg.
Weight including standard accessories	232	Kg.
Colour	~~	~~
Length	1185	Mm
Width	720	Mm
Height	320	Mm
Length loading ramp	1180	Mm
Width loading ramp	720	Mm
Drive-motor: single phase low noise AC		
Thermal cut-out		
Drive-motor capacity	750	W
Drive-motor power	24vDC	V
Hydraulic-motor: single phase low noise AC with thermal cut out		
Hydraulic-motor capacity	210	W
Hydraulic-motor power	24DC	V
Hydraulic-pump: built directly on the hydraulic Motor		
Hydraulic-pump capacity	0,8	ltr/per minute
Action pressure max.	100	Bar
Capacity oil tank	0,5	Ltr
Control: remote control manually operated		
4-button switch	24	V
Mains	24 dc	V
Extension cord (cupper wire)		
Extension cord length		

2 Description main components stairrobot SR 1750 HE

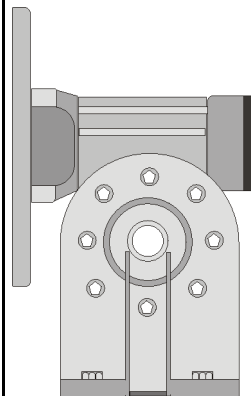
2.1. Drive

- 24 volt DC motor white cooling fan.



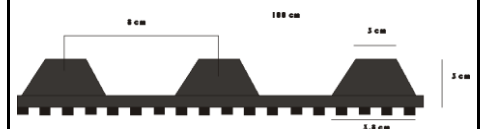
2.2. Transmission and brake

- Worm-gearbox built directly onto the driving motor
- The worm-wheel reduction forms an effective brake for the (loaded) StairRobot on the staircase



2. 3. Tracks

- Internally and externally toothed caterpillar tracks, specially designed for smooth stair climbing



2. 4. Controls

- Remote control (2 metres cable attached) manually operated 4-button switch

Press a button to drive

Red button emergency stop
Turn to reset



Press and the platform will lower



Press and the platform will lift



Press and the stairrobot will drive forward

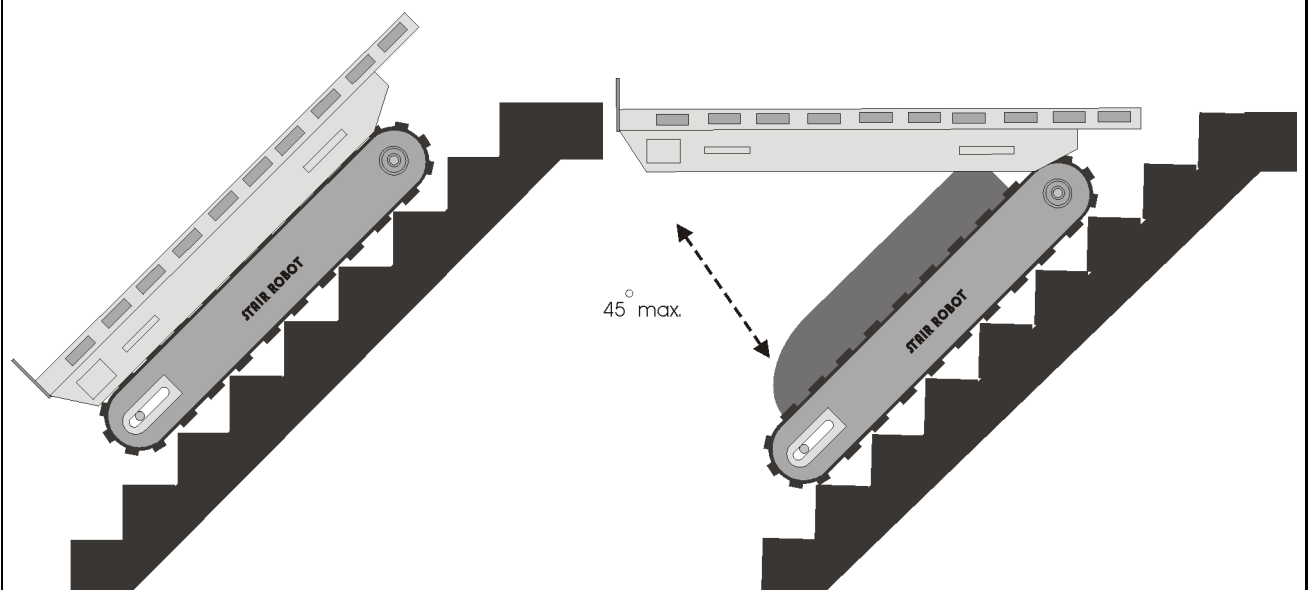


Press and the stairrobot will reverse

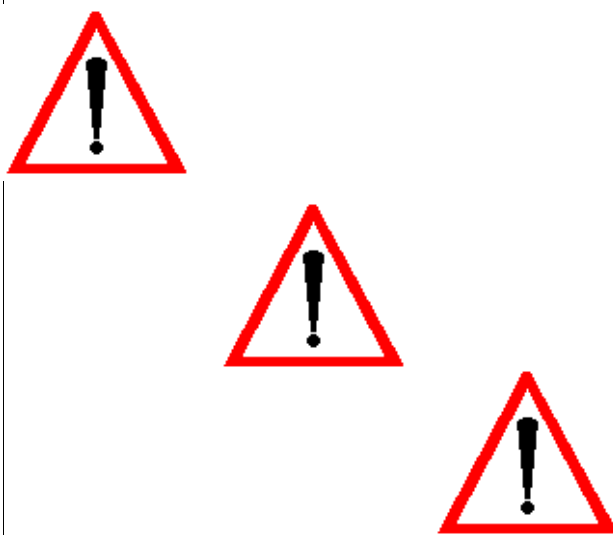


2. 5. Hydraulic-levelling platform

- To increase stability the platform can be adjusted to the angle of the staircase by a hydraulic cylinder



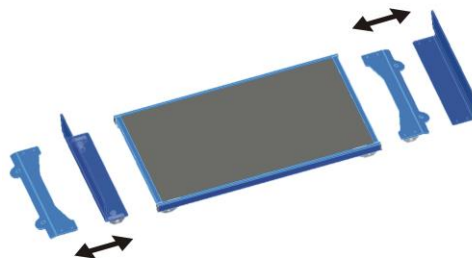
- The platform is equipped with 2 doublefunctioning cylinders
- Its maximum is 90
- It can both push and pull



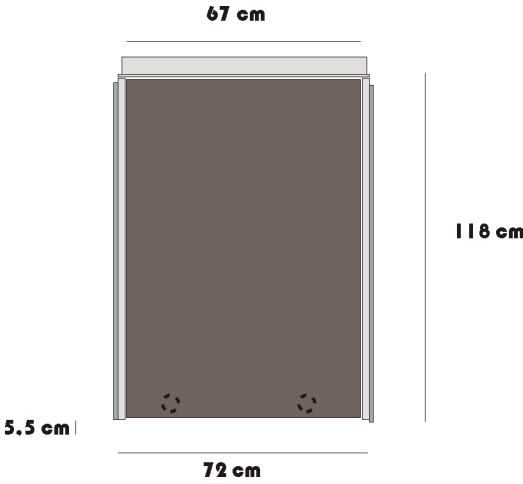
- If the load needs to be moved from a horizontal to a vertical position, please be aware of the fact that the machine is **NOT** capable of doing so without any additional features. As soon as the weight is lifted to such an extent that it will pull at the machine, the load will lift the machine and there will be **NO** control over the load. If the load is not being pushed back in such a way that the lowering is controlled, the load will force the machine to fall over.
- When the platform is used to lift a load from a vertical to a horizontal position on the stairrobot, the load should be guided up to the point where it is within the reach of the machine.
- **This is a part which should be practices with a small, lightweight object before trying the actual large object.**

2. 6. Ramp


The ramp is designed and attached in such a way that it can easily be removed and attached again, by using two locknuts which can be found at the bottom. These locknuts should be turned towards each other in order to unlock them and make it possible for the ramp to be removed. Attaching the ramp can be done at both the front and backside of the machine.



3.1. Loading ramp

<ul style="list-style-type: none">• The loading ramp is designed to fit neatly into the stairrobots lifting platform. It provides a safe ridged platform to transport the load from the floor-surface to the load-position on the robot.• The ramp connection is designed in such a way that it can be easily removed and attached. By moving the two locknuts, which can be found at the bottom towards each other, the entire construction is being unlocked and the ramp connection. Can now be removed from/reattached to the front/back side of the hydraulic plateau	 <p>The diagram shows a rectangular loading ramp. The top width is labeled 67 cm. The right height is labeled 118 cm. The bottom width is labeled 72 cm. The left thickness is labeled 5.5 cm. At the bottom, there are two small circular locknuts.</p>
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3.2. Turntable

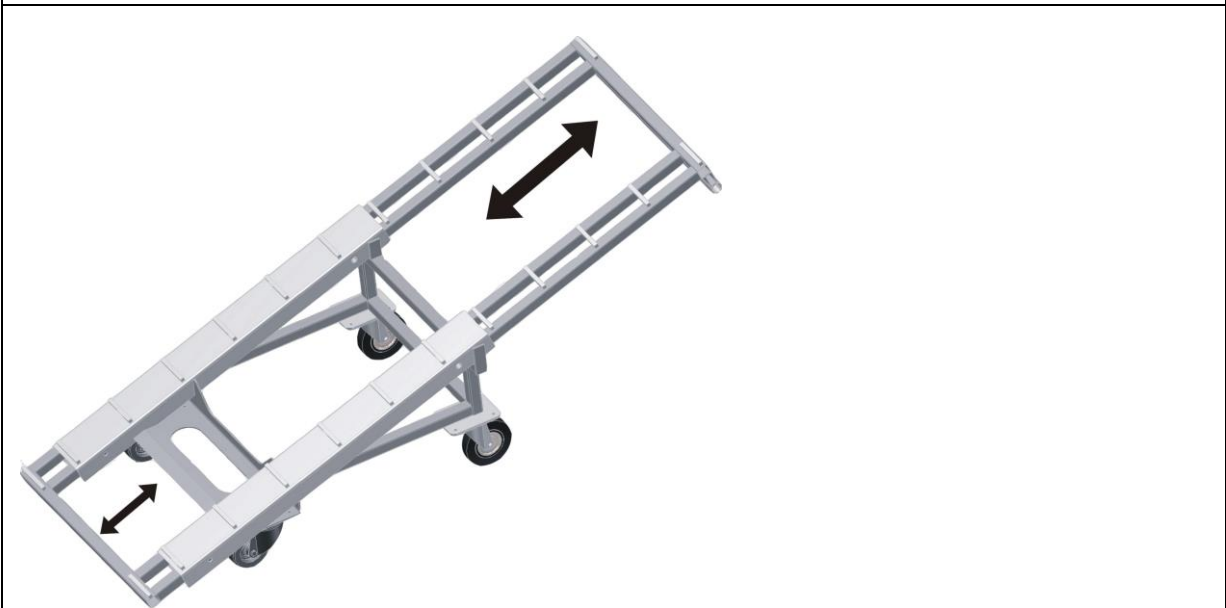
<ul style="list-style-type: none">• The turntable is a circular piece of equipment Ø 610 mm, h. 40 mm. constructed out-of two disks of block board with hard-plastic surface to eliminate friction. It is used to alter the direction of travel for the (loaded) StairRobot. There are finger grips on either side for easy lifting or carrying.	 <p>The diagram shows a circular turntable with a central hole and several finger grips around the perimeter. It is shown from a perspective view, highlighting its thickness.</p>
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3.3. Winch option

<ul style="list-style-type: none">• By using the included winch in combination with the ramp, cargo can be easily pulled up on the hoist plateau of the SR 1750 HE.	
	

3.4. Dolly

- The dolly is constructed of square steel fittings with four heavy-duty swivel wheels for easy movements. An extendable frame can be pulled out to increase stability while driving the StairRobot on the dolly. The lead-off ramp is used to connect the dolly with the stairway

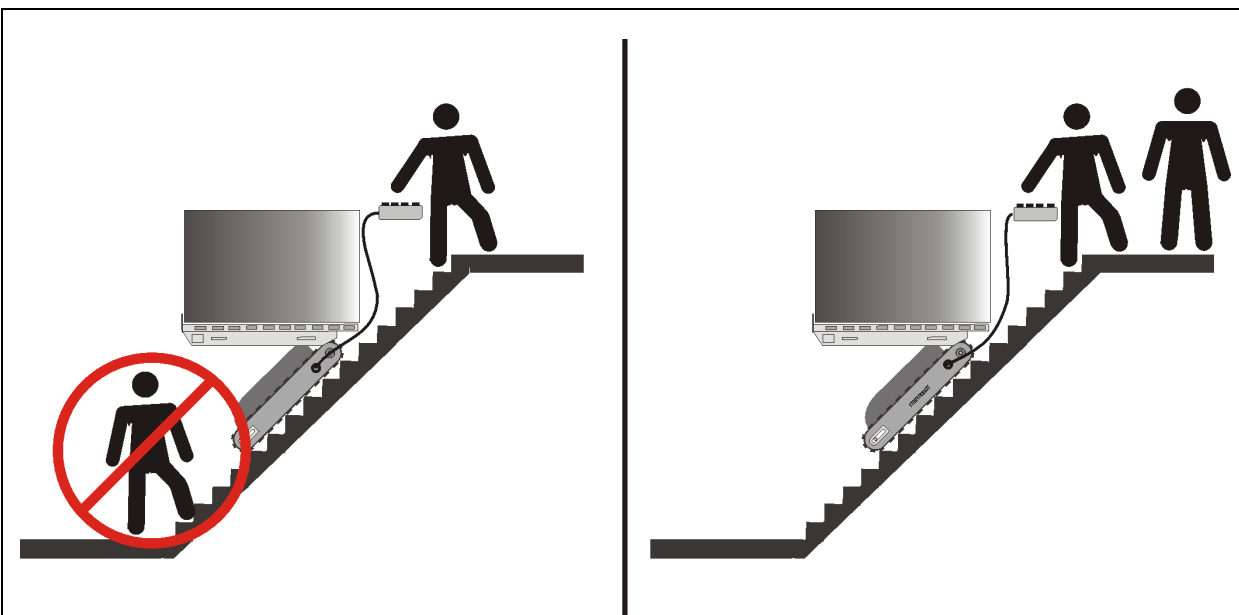


4. Safety

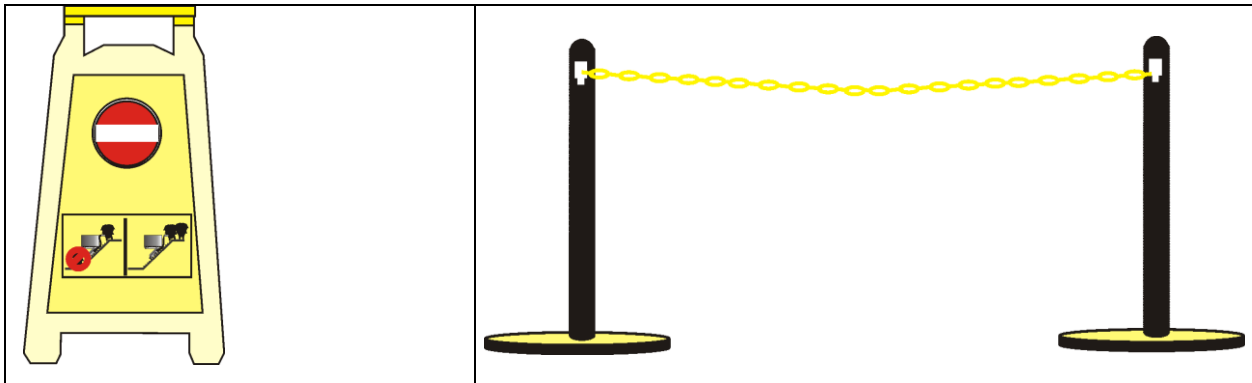
4.1. General safety precaution




- It is not permitted to make alterations to the machine.
- Everybody who is working with the machine has to be acquainted with the safety rules and has to act upon them.
- Two operators are required to operate the stairrobot
- Always check the surroundings where the stair-robot will be deployed.
- Assure that the angle of the stairs is not more than 45 °



- Make sure that no operator or other person is underneath the (loaded) Stairrobot during operation
- Secure the working area using warning boards or blocking ribbon



	<ul style="list-style-type: none">• To avoid misuse by unauthorised persons, don't leave the machine unattended.• Within the path of the machine there may be no obstructions.• Make sure the environment of the machine is dry, clean and illuminated sufficiently.• With the machine in operation it is forbidden to be within the operation area of this apparatus.• Before taking the machine into operation the machine operator has to be certain that nobody is located within the operating area of the machine.• If the machine is used into the darkness, the operation position has to be illuminated sufficiently (about 50 lux).• The machine may only be used for the intended activities.• Inspection and maintenance activities have to be done before operation• During inspection and maintenance the machine may not be used for other purposes• The local action and safety rules have to be acted upon.• Make sure you never walk under the robot during operation.
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- Keep electrical switch boxes closed in order to prevent contact danger.
- Never drive the machine over a cable or extension cord
- Make sure the mains connection is grounded properly
- Make sure that no person stands on a cable or extension cord
- Make sure that the extension cord is unrolled completely

5 OPERATORS PROCEDURE

5.1. Pre-use inspection

To ensure proper working and safe operation of the SR 1750 HE StairRobot:

- Check that there are no exposed wires
- Check
- Check that the pendant cable is secure in the pendant and at the machine end
- Check that no cable has been deformed. If a deformation is found the use of the machine should be postponed until the cable has been repaired
- If on the dolly; drive the robot of the dolly on a flat surface, listen for excessive or unusual noises from any part of the machine
- Check that the ramp will raise to it's full extend and that it's not leaking oil. When fully extended the ramp should cause the platform's front edges to be in firm contact with the floor and the tracks to be lifted of the floor at the front end about one centimetre
- Irregularities are best noticed by rising the ramp repeatedly to it's full up position and then quickly pressing the down button to release the pressure. If, while the ramp is fully extended the top of the cylinder moves more than 5 mm either towards the front or the back of the Robot then the machine should not be used
- It is quite usual for some oil to be present around the top of the cylinder, however with the up-button pressed and the pump running there should be no oil running down the outside of the cylinder
- Check that the down-button permits the ramp to descend, and in addition check that the descend adjuster permits the speed of the descend to be altered. From fully extended to fully closed should take no less than 25 seconds with an applied load of 80 Kilogram
- Check that no rubber blocks on the tracks are severely damaged or torn off
- Check that the tracks are Proper track tolerance at point F is +/- 10 mm (pulled by hand)
- Check the drive-tooth side of the tracks for exposed stringing cords or damage
- Check that nothing has been trapped between the tracks and the robot
- Check that when going from forward to reverse direction on the pendant button the delay before the tracks start moving in the opposite direction is no longer than one

second. Any longer time indicates sloppiness in the drive chain which should be investigated

- Check that the platform sits down on the lower base when lowered
- Check that the castors of the dolly can move in all directions and are not jammed
- Check that the cable of the winch has not been deformed

If there are no defects found the machine is ready for use. If a defect is found do not use the machine until the Stair-Robot is repaired.

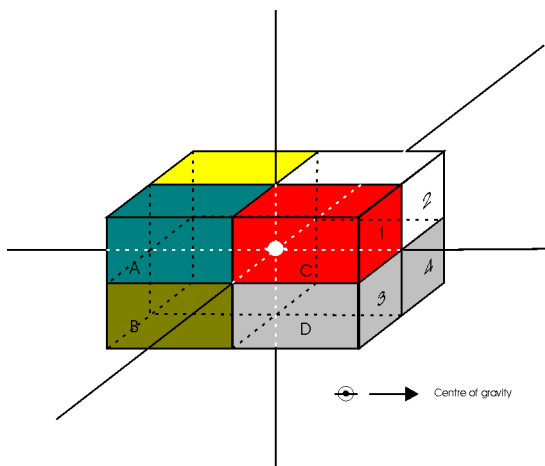
5.2. Loading

5.2.1 The correct position of the load

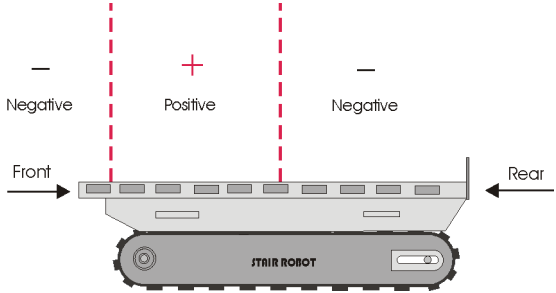
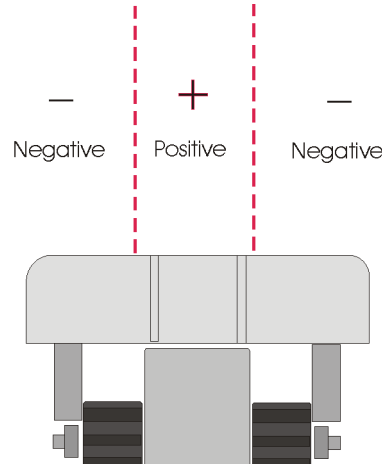


- If the load is not placed in the correct position on the lifting platform, the Stair robot can get instable during the process of climbing or descending a staircase. This can cause the robot to fall down the stairs resulting in serious damage and injuries.

- The objective is to create an optimal centre of gravity position for the loaded stairrobot considering the 'weight distribution' of the load



- Before positioning the load on the lifting platform the centre of gravity of the load has to be determined

	<ul style="list-style-type: none"> • Position the load on the platform with the centre of gravity of the load end forward (in positive area) • Position the load with the centre of gravity of the load as low as possible to the lifting platform.
	<ul style="list-style-type: none"> • The centre of gravity of the load should be within the positive area between the tracks.

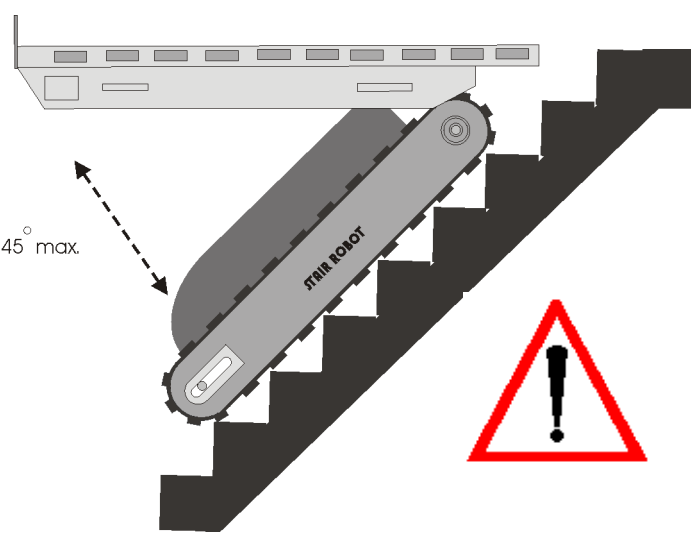
5.2.2. Loading procedure

- Start the procedure by securing the area for loading. Move the dolly with the stair robot into the desired position for loading.
- Always unroll extension power cable and connect with the robot before connecting to mains
- Reverse the Robot of the dolly, fit the loading-ramp into position at the front of the robot
- Slot the winch into the lifting platform at the rear of the stairrobot
- Pull the winch-hawser out and connect it with the load. The load can now be winched into position on the stairrobot, one man operating the winch and one man guiding the load of the ramp onto the platform. While operating the winch the lifting platform will rise until the platform has reached the same gradient as the loading-ramp
- Connect the load secure to the lifting platform. Note: never fit any straps to the chassis-bracket
- If the load is secured to the stairrobot the winch and loading ramp can be removed
- Always remove the winch from the stairrobot before ascending the stairway because it adds length to the dimensions of the stairrobot
- Turn the descent-adjuster maximum clockwise

- Lift the platform +/- 10 cm by pushing the up-button
- Push the down-button to lower the platform and turn the descent adjuster counter clockwise until the platform starts to descent. Lower the platform
- The stairrobot can now be driven back on the dolly; use the up-button to keep the 'platform level' in horizontal position

5.3. Ascending

Load level

	<ul style="list-style-type: none"> • Ideal load level is obtained by adjusting the platform to the gradient of the stairs or dolly • The objective is to maintain a horizontal level of the platform during operation. • Note: do not lower the platform over its balance point, the Stair robot will get instable during the process of climbing or descending a staircase. This can cause the robot to fall down the stairs resulting in serious damage and injuries.
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- Move the loaded stairrobot on the dolly with the forward end towards the bottom of the stairs
- Fit the lead on ramp between the dolly and second or third step on the stairs.
- Secure a load support strap (6 m) to the reverse end of the stairrobot. Place the strap across the forward end of the load to be held by one of the operators.
- Both operators should move on to the stairs and make sure that no person is beneath the stairrobot
- One operator will use the remote control button panel and drive the loaded stairrobot up the stairs. The other will firmly hold the load support strap; this will enable him to 'feel' the balance of the load. He also uses it to restrain the load if necessary and helps its forward movement at the top of the stairs
- The control operator will press the forward button to drive the stairrobot over the lead on ramp and up the stairs. He will keep the load level by adjusting the platform position using the up or down button.
- The up or down button can be pressed simultaneously with either forward or reverse



Press and the platform will lower



Press and the platform will lift



Press and the stairrobot will drive forward



Press and the stairrobot will reverse

- The stair robot can be stopped at any stage by just releasing the buttons
- When arriving on top of the stairway; stop the stairrobot on the stairs and place the dolly in position at the top of the stairs in front of the stairrobot. Pull the extendable frame out of the dolly to increase stability
- Start the forward movement again
- Note: expect a change of gradient from the level of the stairs to the gradient of the dolly
- When the stairrobot has reached the 'point of balance', the operator holding the load support strap should assist in the movement by gently pulling the load support strap, to ease the load downward. The other operator should keep the ideal load level during this operation. The stairrobot can then be driven forward to settle onto the dolly
- Transport dolly and load to the unloading point or to the next flight of stairs to continue upwards.

5.4. Descending

- Make sure that the stairway is secured and no person can enter the stairway.
- To descent the stairrobot down the stairway the loaded stairrobot has to be first driven onto the dolly, as previously described for ascending
- Move the loaded stairrobot on the dolly with the downward end towards the edge of the top of the step and stop 10 cm away.
- One operator will drive the stairrobot using the control panel while the other operator will steady the load firmly using a load support strap.
- Press the reverse button to drive the robot from the dolly and down the stairs
- The up and down button is used to maintain ideal load level
- By reversing slowly, 5 cm at a time, and stopping at the 'point of balance' the control operator will be able by pressing the up button gently alter the centre of gravity so as to lower the reverse end tracks onto the top of the stairs.
- The dolly should be moved aside when the stairrobot is fully on the stairs.
- Drive the robot in reverse down the stairs steadying the movement throughout by using the a load support strap
- Depending on the gradient, the stair robot will ride on the edge of two or three steps at once. The rubber tracks pressing firmly onto the stairs
- On some stairs it may be found that occasionally two of the rubber treads ride on the stair edge and when the third tread releases it's grip the stairrobot will move down

suddenly about 2,5 cm until all three treads grip once more. This occurrence should be expected by the operators and the stair robot should be driven on without a pause

- Before arriving at the bottom of the stairs the dolly and the lead on ramp should be placed in position with the lead on ramp resting on the second or third step.
- Drive the stairrobot of the stairs and onto the dolly keeping the ideal load level by using the up or down button
- Transport dolly and load to the unloading point or to the next flight of stairs to continue downwards.

5.5. Unloading

- Start the procedure by securing the area for unloading. Move the dolly with the stair robot into the desired position for unloading.
- Reverse the Robot of the dolly, fit the loading-ramp into position at the front of the robot
- Slot the winch into the lifting platform at the rear of the stairrobot
- Pull the winch-hawser out and connect it with the load. Disconnect the load from the lifting platform
- The load can now be lowered to floor level, one man operating the winch and one man guiding the load of the ramp onto the floor. While lowering the load the lifting platform will rise until the platform has reached the same gradient as the loading-ramp
- If the load is on the floor the winch and loading ramp can be removed



- All these techniques should be practised with a light load first


6 Trouble shooting chart

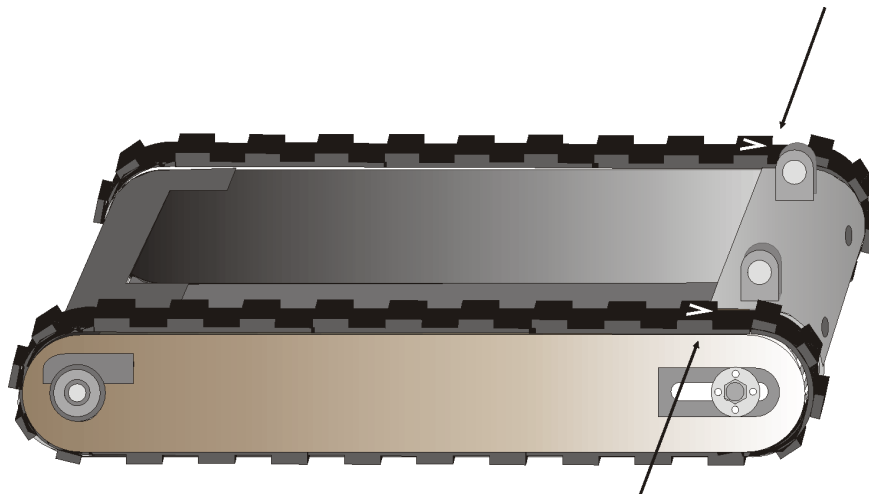
The stairrobot SR 1750 HE is designed and built to function for several years with little maintenance. In case a problem occurs please make the following checks. If the problem continues to exist please contact your local dealer


Symptom	Possible cause	Solution
<ul style="list-style-type: none"> Main motor does not work 	<ul style="list-style-type: none"> No current 	<ul style="list-style-type: none"> Check electrical wires and connections Check magneto switches Check capacitors
<ul style="list-style-type: none"> Hydraulic pump-motor does not work 	<ul style="list-style-type: none"> No current 	<ul style="list-style-type: none"> Check electrical wires and connections Check magneto switches Check capacitors
<ul style="list-style-type: none"> Main motor stops 	<ul style="list-style-type: none"> Motor overheated 	<ul style="list-style-type: none"> Wait several minutes
<ul style="list-style-type: none"> Hydraulic pump-motor stops 	<ul style="list-style-type: none"> Motor overheated 	<ul style="list-style-type: none"> Wait several minutes
<ul style="list-style-type: none"> Hydraulic platform does not lift completely 	<ul style="list-style-type: none"> Possible oil-shortage 	<ul style="list-style-type: none"> Refill oil with spindle oil; check oil in oil-tank;
<ul style="list-style-type: none"> Platform is not fully descending 	<ul style="list-style-type: none"> Relay switch is not working 	<ul style="list-style-type: none"> Check connections
<ul style="list-style-type: none"> Oil leak cylinder 	<ul style="list-style-type: none"> Cylinder gasket worn out 	<ul style="list-style-type: none"> Replace O-ring and Back-up ring with repair toolkit
<ul style="list-style-type: none"> Platform is not winching up. 	<ul style="list-style-type: none"> Relay switch is not working 	<ul style="list-style-type: none"> Check connections
<ul style="list-style-type: none"> Platform is not fully descending 	<ul style="list-style-type: none"> Relay switch is not working 	<ul style="list-style-type: none"> Check connections

7 Replacing tracks

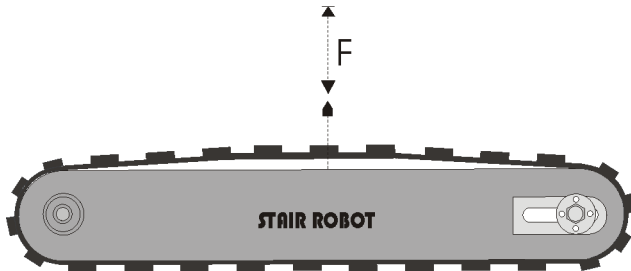
Drawing (2.)

-  After replacing tracks make sure that the > marks on both tracks are in the same direction and position



- Proper track tolerance at point F is +/- 10 mm (pulled by hand) drawing (3.)
-  Make sure that the distances A1A4 are equal on both sides of the

Drawing (3.)

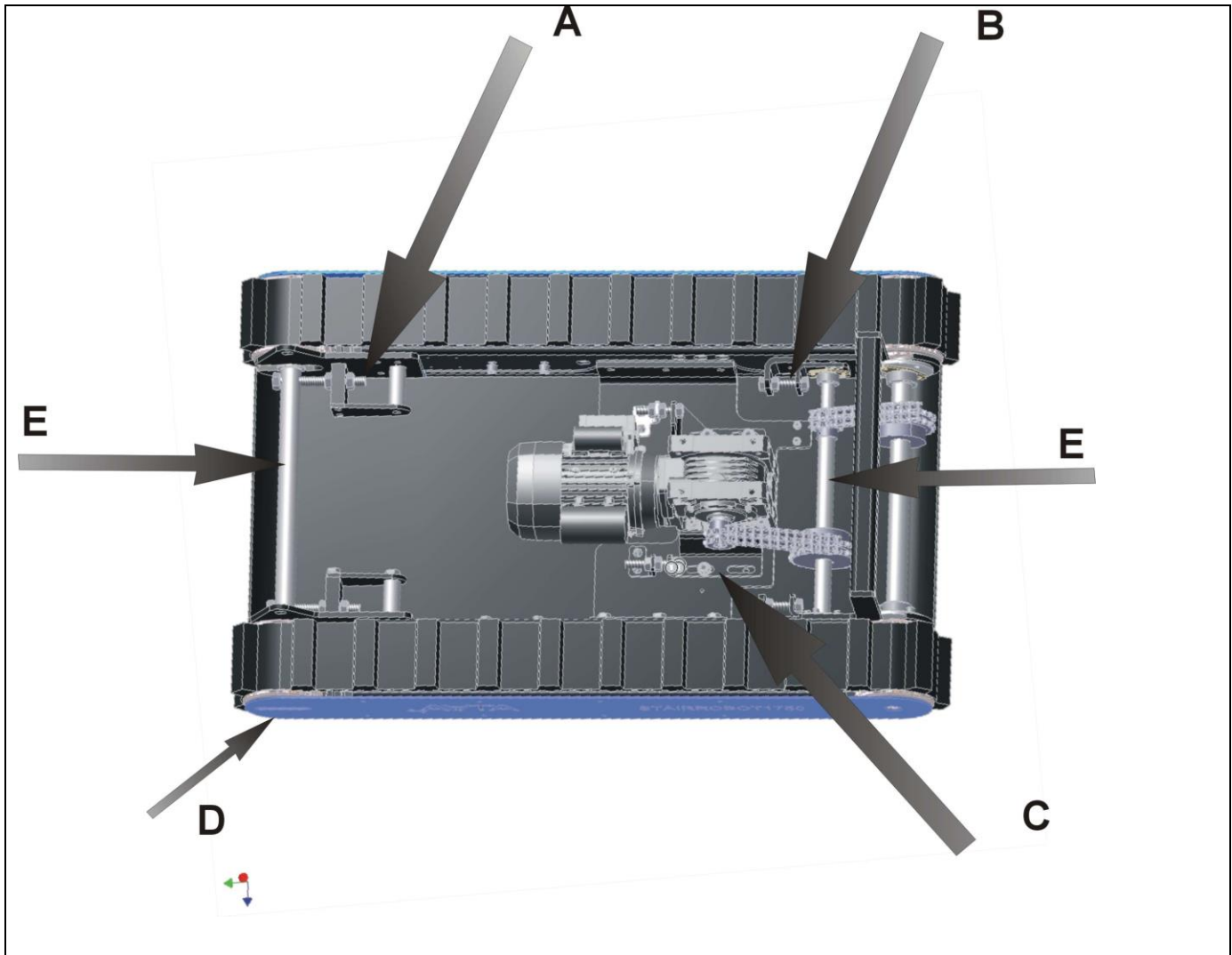


7.2 Track stretching

1. Loosen the bolts at position D (both left and right)
2. Loosen the adjusting nuts at position A (both left and right) in such a way that the poly wheels can slide back, this creates a space which allows you to switch the track.
3. Replace the track (see sketch 2), in such a way that it is attached to the robot, facing the proper direction .
4. Stretch the track by turning the adjusting nuts A at both the left and right side at the same time.
5. **It is highly important that the distance between left and right is equal between the shaft and the point of attachment.**
6. Secure the stretch nut with the locknuts.
7. Check the tension (see sketch 3)

Stretching of the chains

1. Loosen the locknuts left and right of position B.



2. Loosen the bolts of the wormwheelcasing base-plate and the locknut of the adjusting nut position C.
3. Stretch the chain (from the camshaft to the wheelshaft) by tightening the bolts of position B.
4. Make sure that the distance between left and right stays equal, the shaft has to stay parallel in the robot. After this, re-secure the locknut left and right.
5. Now stretch the chain that goes from the camshaft to the wormwheelcasing by tightening nuts of the adjusting bolts. Make sure left and right stay equal and that the wormwheel stays parallel in the machine. Re-secure the base-plate bolts and re-secure the locknuts of the adjustment system.
6. Check all bolts and nuts.
7. Now run the robot both backward and forward and check the tension of the chains again.
8. Secure the bolts of position D to both sides of the machine.

8 Electrical system

Status Indicator Flashes Slowly, Pauses, Then Flashes Slowly Again (even with throttle released)

The controller safety circuits have operated and the controller has been prevented from moving the vehicle.

This indicates that there is a trip. Please follow this procedure:

Switch off the vehicle.

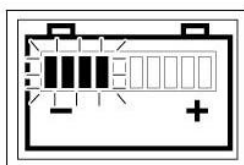
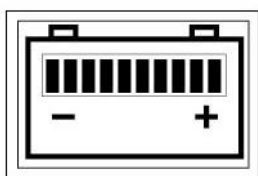
Make sure that all connectors on the vehicle are mated securely.

Check the condition of the battery.

If the fault persists, count the number of flashes after a pause and then try using the self-help guide in Section 8.3.

Switch the vehicle on again and try to drive. If the safety circuits operate again, switch off and do not try to use the vehicle.

Below is a list of self-help actions. Use the following table before contacting the service agent. Go to the number in the list that matches the number of flashing bars and follow the instructions.



1 Bar 	The battery needs charging or there is a bad connection to the battery. Check the connections to the battery. If the connections are good, try charging the battery.
2 Bar 	There is an open circuit connection to the motor. Check all connections between the motor and the controller.
3 Bar 	The motor has a short-circuit to one of the battery connections. Contact the service agent.
4 Bar 	Not used.
5 Bar 	Not used.
6 Bar 	The controller is being inhibited from driving.
7 Bar 	A throttle or direction switch error is indicated. Ensure that the throttle and / or direction switches are in the rest / neutral position before turning on the vehicle.
8 Bar 	A controller error is indicated. Ensure that all connections are secure and the battery is fully charged.
9 Bar 	The solenoid brake has a bad connection. Check the solenoid brake and its associated wiring.
10 Bar 	An excessive battery voltage has been applied to the controller. Check the battery and its associated wiring.

Battery charging.

Put the charger plug in to the plug of the stairrobot on the side
Charging time will be about 5 hours.

Battery bank:

4 pair of 2 x cpw50-12 Battery
2 pairs on one side.

Charge them only with the supplied charger,

Other equipment can damage the battery banks.

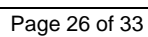
Charge them regularly so that they never become lower than 11,0 volt per battery,

Repairing the battery banks can only be executed by qualified personnel.

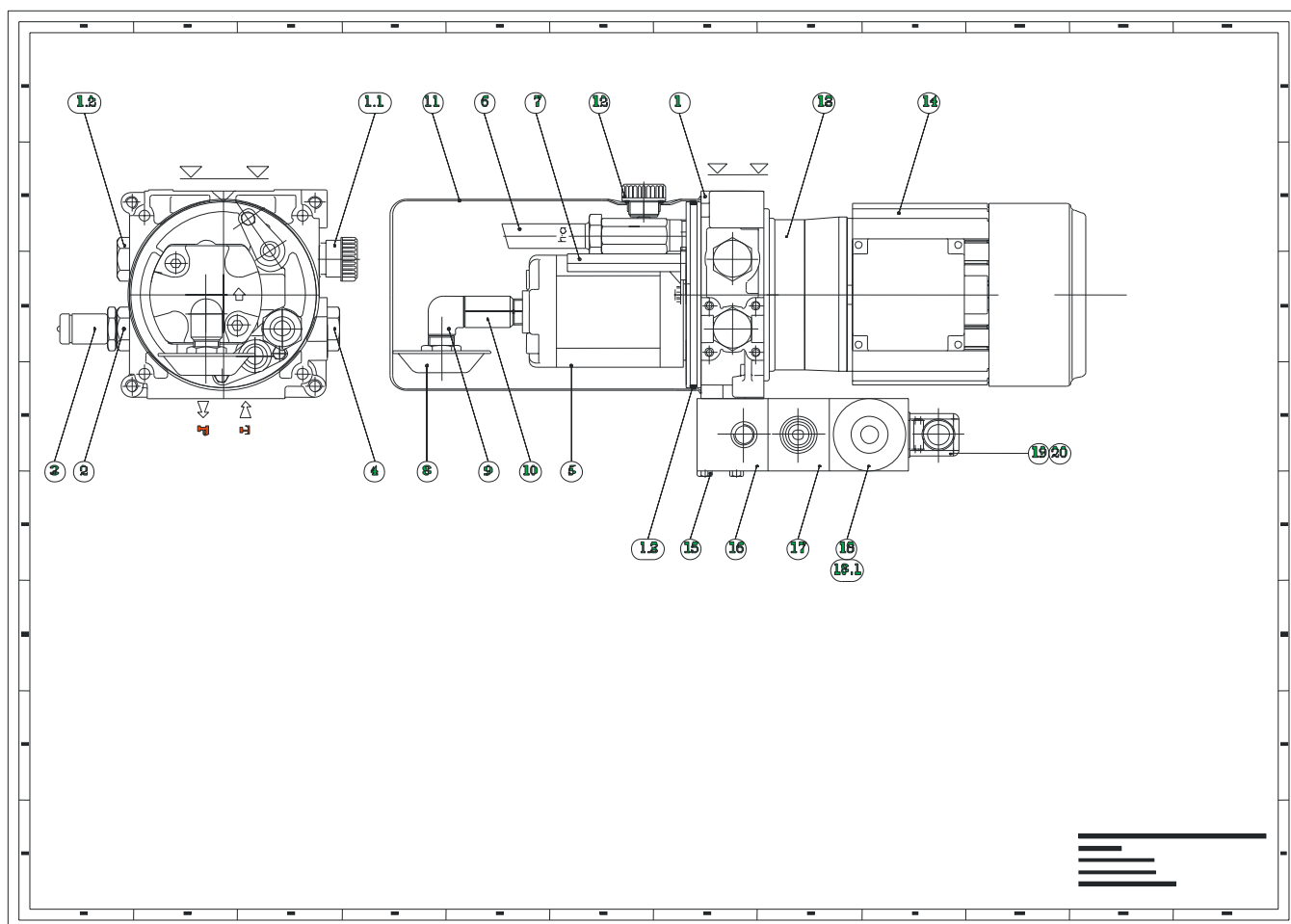
External power supply.

The external power is only for operating the stairrobot and not for charging.

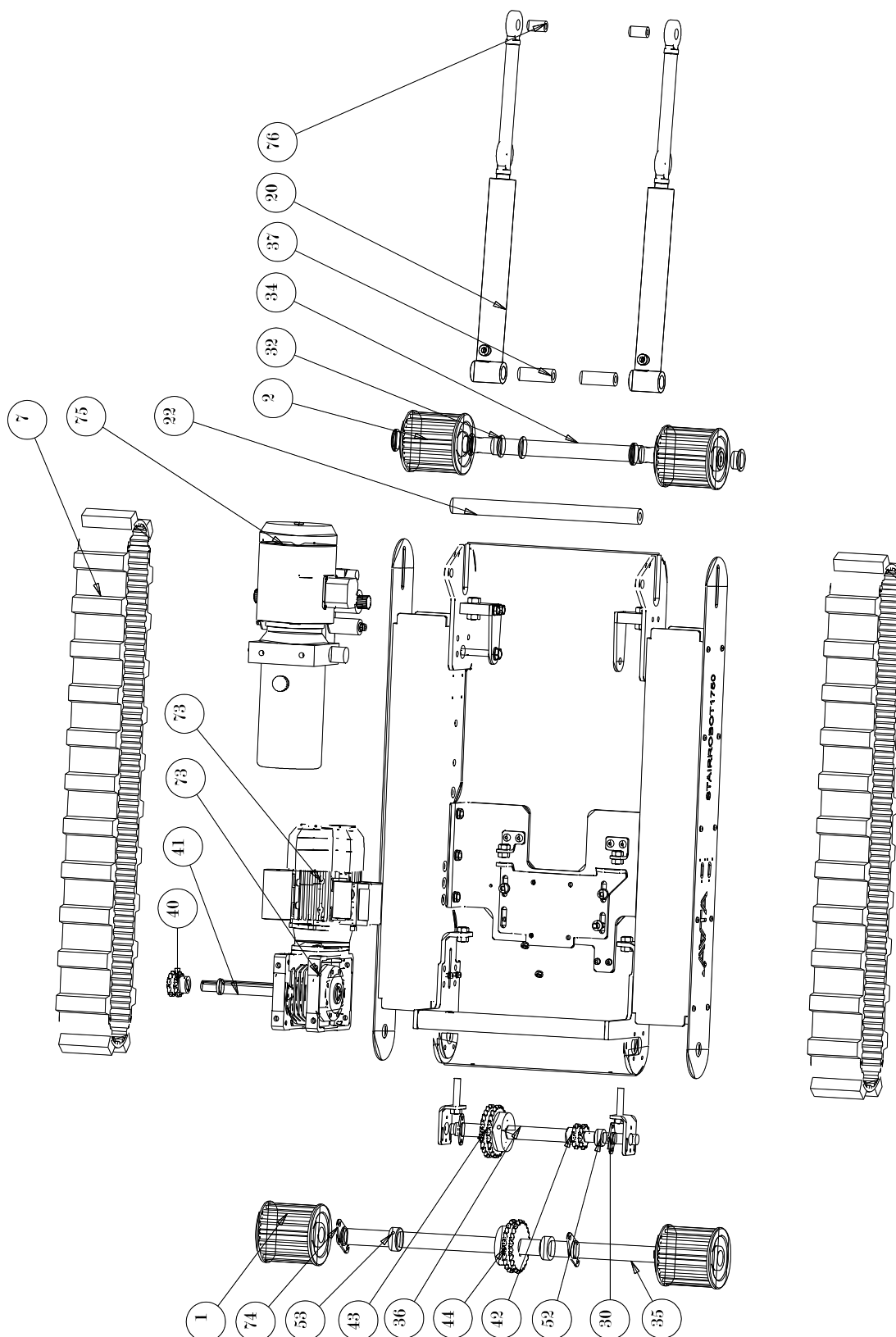
By plugging in the power supply unit in the stairrobot you are helping the battery banks
To extend the working time.

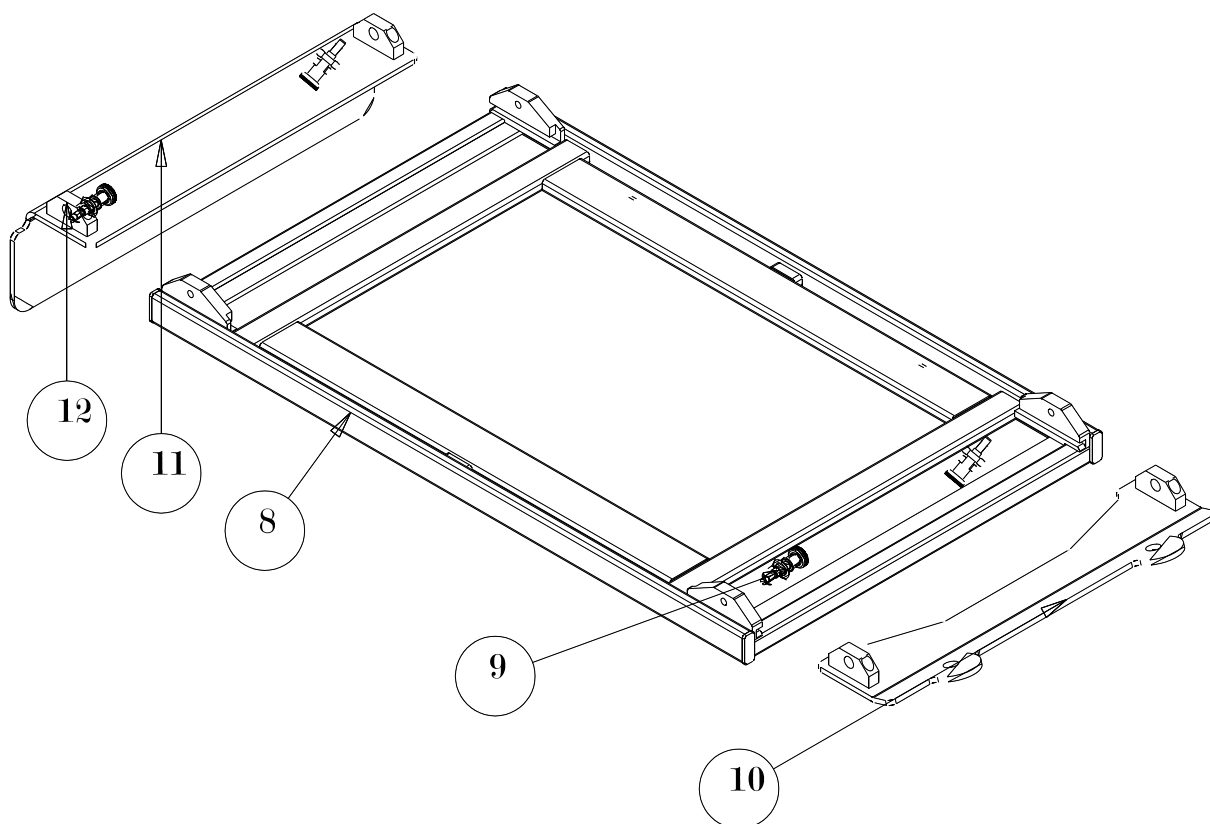
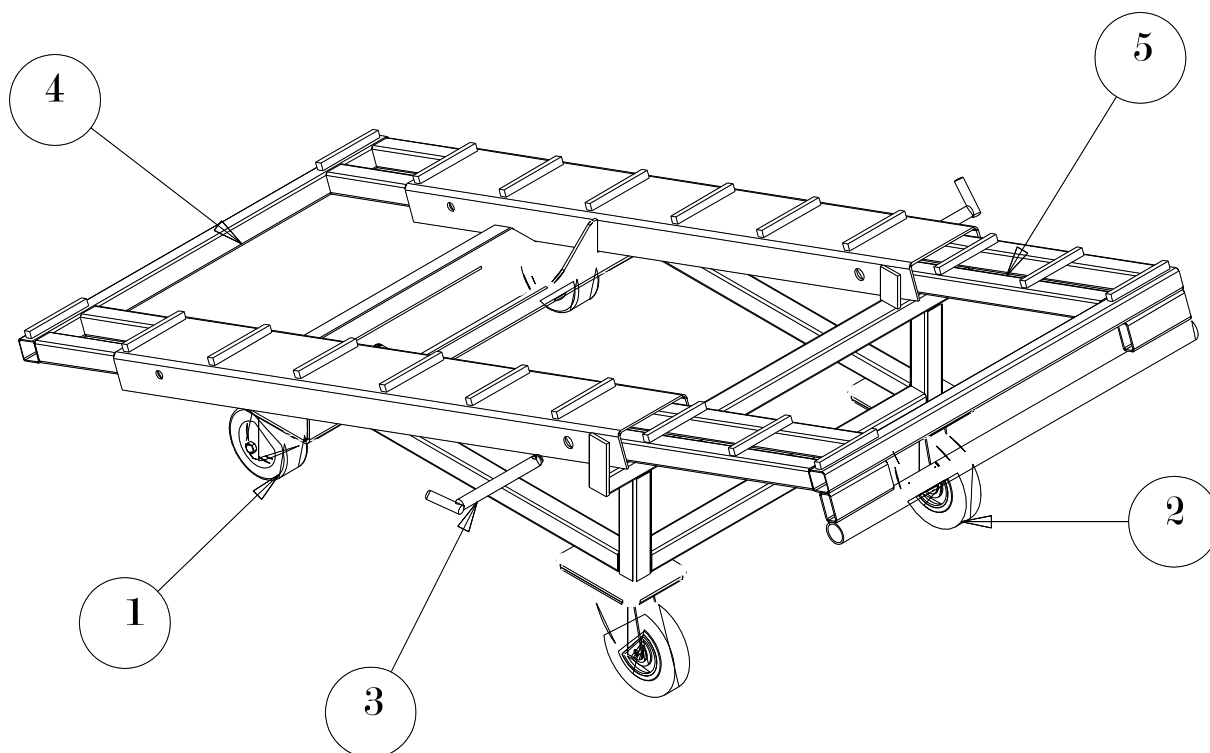


9 Hydraulic system



△	20	1	connector with rectifier "B"	
	19	1	connector with rectifier "A"	
	18.1	1	solenoid 24Vdc	1750.301
	18	1	dir. control valve 24Vdc	
	17	1	overcentre valve	
	16	1	final block "C"	
	15	1	stack bolts 1 section	
	14	1	electric motor 0,18kW-230Vac	
	13	1	motor kit "R" MC size 63	
	12	1	filler/breather	
	11	1	tank T02 MC	
	10	1	male/female stud adaptor	
	9	1	elbow adaptor G3/8"	
	8	1	suction filter G3/8"	
△ △ △	7	1	kit return relief valve	
	6	1	semikit return pipe	
	5	1	pump kit "A" PHR 0,25cc	
	4	1	plug	
	3	1	measure point 1/4"	
	2	1	plug with 1/4"	
	1.3	1	O-ring 110,72x3,53	1750.302
	1.2	1	check valve	1750.303
	1.1	1	relief cartridge	1750.304
	1	1	Module MC4 complete	1750.300





10.1. Glossary of parts

Nr.	Artikel nummer	omschrijving	omschrijving
1	1750. 012	Polly wheel driving	Polly wheel driving
2	1750. 013	Polly wheel front	Polly wheel front
7	1750. 100	track	track
20	1750. 330	Hydro cylinder	Hydro cylinder
22	1750. 201	axel lifting platform	axel lifting platform
30	1750. 202	Baring	Baring
32	1750. 203	Baring	Baring
34	1750. 014	Front axel	Front axel
35	1750. 015	Rear axel driving	Rear axel driving
36	1750. 016	Driving axel	Driving axel
37	1750. 204	Baring cylinder	Baring cylinder
40	1750. 210	Cog wheel	Cog wheel
41	1750. 017	Gearbox axel	Gearbox axel
42	1750. 211	Cog wheel	Cog wheel
43	1750. 213	Cogwheel	Cogwheel
44	1750. 214	Cogwheel	Cogwheel
52	1750. 215	Couple ring	Couple ring
53	1750. 216	Couple ring	Couple ring
72	1750. 001	Gearbox	Gearbox
			Main motor
74	1750. 205	Baring	Baring
75	1750. 300	Hydro unit	Hydro unit
76	1750. 206	Baring hydro cylinder	Baring hydro cylinder
	1750. 500	Dolly	Rollback
1	1750. 530A	Back wheel	Back wheel
2	1750. 532A	Front wheel	Front wheel
3	1750. 533	Locking pin	Locking pin
4	1750. 500B	Extending back	Extending back
5	1750. 500C	Extending front	Extending front
		Topboard	
8	1750. 101	Top Plate	Top Plate
9	1750. 555	Locking bold	Locking bold
10	1750. 557	Ramp board plate	Ramp board plate
11	1750. 104	Scoop plate	Scoop plate
12	1750. 556	Mounting locking bold	Mounting locking bold
	1750. 102	Ramp board	
	1750. 103	Turning disk	
	1750. 105	Winck set	
	1750. 105A	Winch	
	1750. 007	Remote controler	

	1750.	008	Remote controler 2 speed	
	1750.	011	Realis hydro unit 24 v	
	1750.		Power connector	

