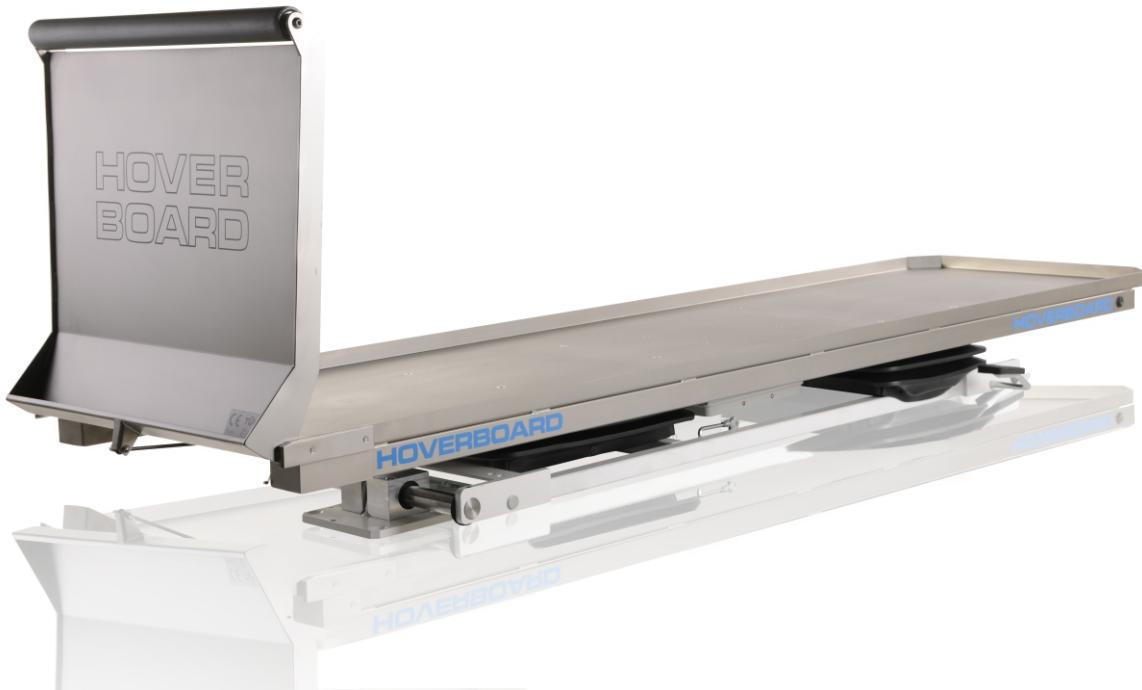


# HOVERBOARD®

## Vienna + Milano

### Repair manual

Edition: 1/2015



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Images don't necessarily illustrate the delivered contents and are not true to scale.

Damages caused by operating errors, incorrect assembly or repair are excluded of liability.

Subject to technical changes for reasons of the continuous development.

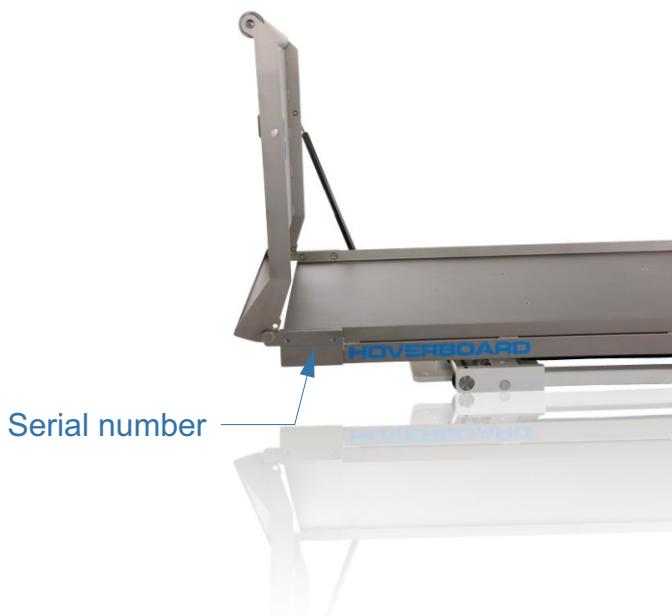
## 1. Serial Number

You will find the serial number on a sticker below the right ramp-holder.

It contains the production date:

**SN 15093** means: Year 2015, calendar-week 09, 3rd system.

Please always convey the serial number for exchange or spare part orders !



## 2. Technical data

- \* Hoverboard for various Roll-in-stretchers acc. EN 1865.
- \* System height: 125 mm (lowered)  
180 mm (operating height)
- \* The total height varies depending on vehicle specifications
- \* Total length including closed loading ramp 2050 mm
- \* Total weight 79 kg
- \* Maximum loading capacity exceeding 400 kg
- \* Maximum loading capacity in hovering position > ca. 250 kg
  
- \* Ignition AND main switch ON: Device ready  
Ignition OR main switch OFF: Device lowered (eg. for reanimation, loading)
  
- \* Electric connection: brown = ground (pin 31)  
red = positive (ignition) (pin 15)
  
- \* Power max. 16 A at 12 Volt DC. Working circuit fused in the vehicle,  
control circuit fused at 5A in the switchbox.

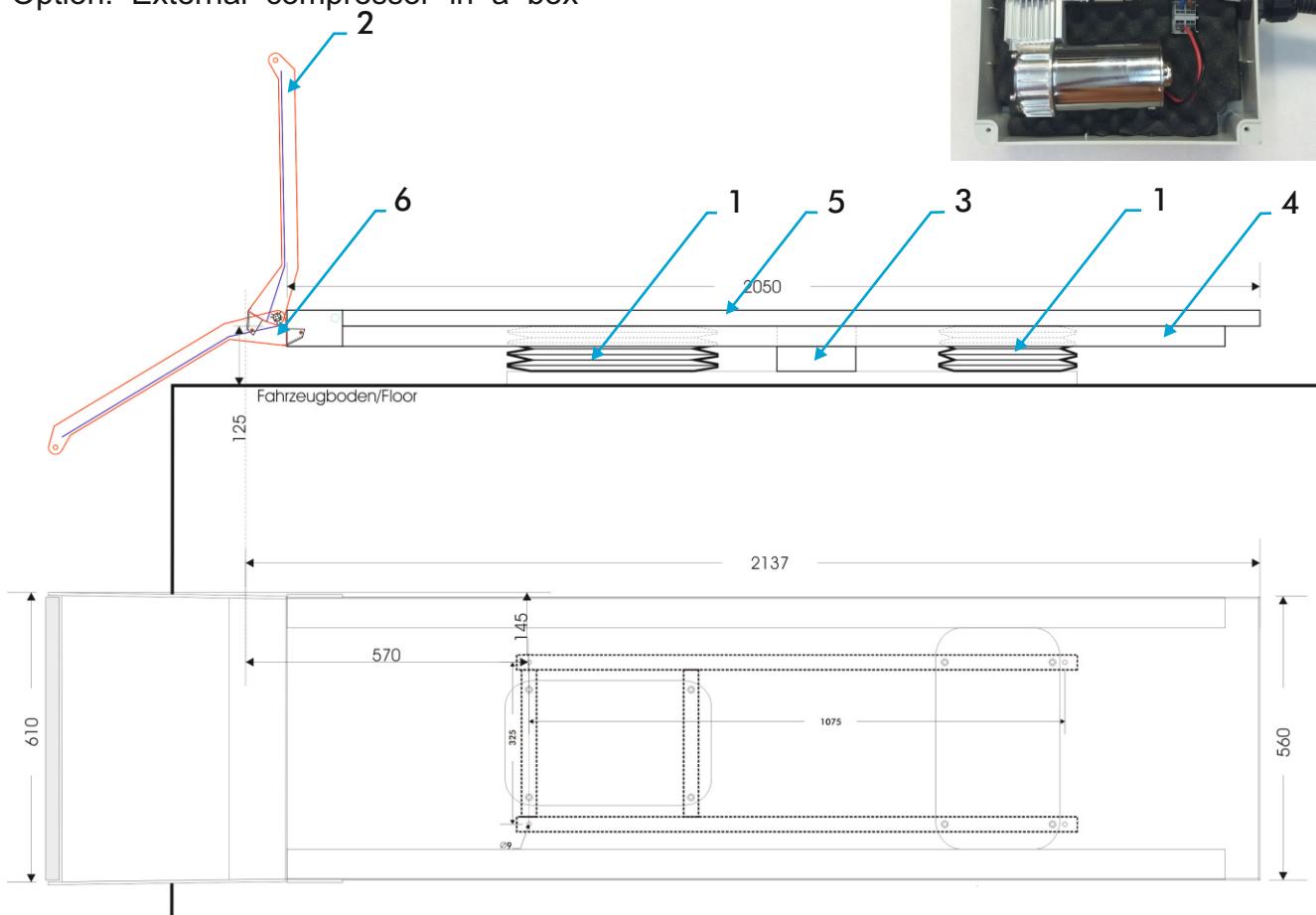
## 2. Technical data

- 1... Pneumatic suspensions with automatic weight adjustment 40-250 kg and hydraulic shock absorber. Suspension stroke 95 mm.
- 2... Loading ramp with cylindric roller.
- 3... Switch box, contains:
  - a) relay 12V DC
  - b) magnetic valves 12V DC
  - c) terminal block
  - d) noise insulation
  - e) compressor
- 4... Air pressure tank (4 litres) with pressure switch
- 5... Stretcher mounting panel
- 6... Gas spring



Option: External main switch

Option: External compressor in a box



### 3. Functional principle

- \* After successfull assembly and electric connection, start ignition of vehicle and turn on the external main switch.

The external compressor will fill the air supply tank (4) up to approx. 8,5 bar and the Hoverboard is ready for operation.

- \* The Hoverboard works automatically --> when the pressure supply has lowered to approx. 8 bar, the compressor switches on for approx. 2 minutes again. This allows constant operating pressure.
- \* By opening the loading ramp (2) and/or turning off the ignition, the Hoverboard is automatically lowered to allow an easy and energy-efficient loading and unloading.
- \* For correct loading and unloading please follow the instructions of the (transport-) stretcher.  
Pay attention to the correct locking of the (transport-) stretcher on the Hoverboard.
- \* For reanimation, turn off the external main switch and the Hoverboard will lower immediately.

#### C A U T I O N !

Always hold the stretcher while opening the loading ramp !!

### 4. Error analysis

- \* Turn on ignition of the vehicle
- \* Check external fuse (in the vehicle)
- \* Turn on main switch
- \* Close and open loading ramp a few times (to cause pressure decrease)
- \* **Does the compressor start running ?**

**No:** Continue with 5A

**Yes:** There is insufficient air pressure in the tank !  
Wait for ca. 3 minutes, then step on the Hoverboard:

**Does the Hoverboard rise when loaded with at least 80 kg ?**

**No:** Continue with 5C

**Yes:** System is leaking slightly > remove Hoverboard according to chapter 6.  
Then follow instructions in leak detection (chapter 5G).

## 5. Repairs

For checks and repairs at the electric components please keep ready some screwdrivers and a multimeter.

For checks and repairs at the pneumatic components please keep ready

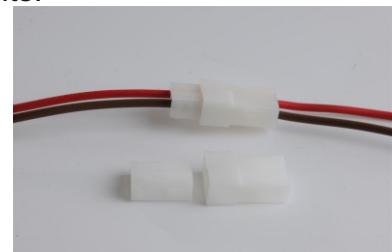
- \* Some screwdrivers and spanners
- \* A manometer (qualified for 10 bar)
- \* External power-source of 12 V DC, min 15 A (for example vehicle's battery)

### A) Power supply

Disconnect the power supply cable from the Hoverboard and check with your multimeter, if there is a voltage of 12-14 Volts.

- No:**
- \* Ignition of the vehicle switched on ?
  - \* Fuse in the vehicle blown ?
  - \* Cables in the vehicle worn ?

**Yes:** Continue with B



### B) External main switch

Check continuity of the external main switch by connecting multimeter at the plug.

- No:** Main switch turned off or faulty.

**Yes:** Continue with C



### C) Compressor

Connect the red pressure hose in the vehicle to the manometer.

Then plug the compressor to a battery (12 V)  
only for a few seconds and watch the manometer.

Check, if the pressure increases above 10 bar within 5 seconds.

- No:** Compressor is faulty.

**Yes:** Continue with D



## 5. Repairs

### D) Microswitch

Disconnect one of the 2 yellow wires.  
Check continuity between those pins at pressed clip.

**No:** Microswitch is faulty.

**Yes:** Continue with E



**For the following checks and repairs you need to remove the Hoverboard from the vehicle. Please refer to chapter 6 for correct removal !**

### E) Pressure switch

The grey wires should be connected well to the pins of the pressure switch. Then connect external compressed air supply and manometer instead of the black tube at that distribution block.

Check continuity between the grey wires and rise the air pressure continuously, but slowly.

At about 8,5 bar, the pressure switch should turn off.

If you then lower the pressure slowly, it should switch on at 8 bar.

If not, the pressure switch should get readjusted by turning the setscrew between the pins.

If it is not possible to match to the above values, the pressure switch is faulty.



### F) Relay

This is a customary power relay.

Apply voltage (12 V DC) between

pin 85 (green) and pin 86 (black)

and check continuity between pin 30 and 87 (both red).

**No:** Relay is faulty.

**Yes:** Continue with G



## 5. Repairs

### G) Leak detection

If there's a big leak in the system, the compressor will run until it gets so hot, that the internal thermal switch will turn it off.

So if the compressor is OK (passed the test in C) and runs for more than 5 minutes till it finally stops, there's probably a leak anywhere in the system.

After removal of the Hoverboard (chapter 6) open the switchbox and connect the red tube to an external air supply.

Then connect power supply 12 V DC, use leak detection spray to find the leak and seal it - change tube - change affected components.

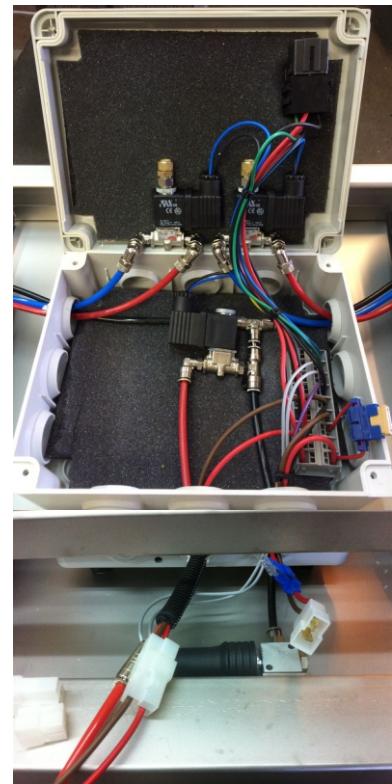
### H) Magnetic valves, Electric function

You will find them in the internal switchbox,  
a blocking valve at the bottom and  
2 directional valves fixed at the cover.

Remove both wires (black, blue) of the valves from the terminal block and apply voltage (12 V DC). When connecting and disconnecting, you should hear the valve switch (click/clack).

**No:** Magnetic valve is faulty.

**Yes:** Continue with I



### I) Magnetic valves, pneumatic function and leakage

After removal of the Hoverboard (chapter 6) connect the manometer at the black tube instead of the air tank.

Connect the red tube to compressor (or external air supply), open the switchbox and connect power supply 12 V DC. The compressor will start and both air springs should inflate.

**None:** Magnetic blocking valve is faulty.

**Yes, but just one:** One of the directional valves is faulty.

**Yes, both:** First, disconnect the power supply and then the air supply.  
Then check manometer:  
Does pressure in the tubes decrease remarkable ?

**Yes:** One of the directional valves is faulty, lets air pass to vent.

**No:** Air tank or fitting leaks.

## 6. Removal

For some analysis and repairs, it is necessary to remove the Hoverboard.  
Please proceed as follows:

- \* Remove the stretcher from the hoverboard.
- \* Remove the 4 screws **at the base-frame** (where it is fastened **to the vehicle !**)

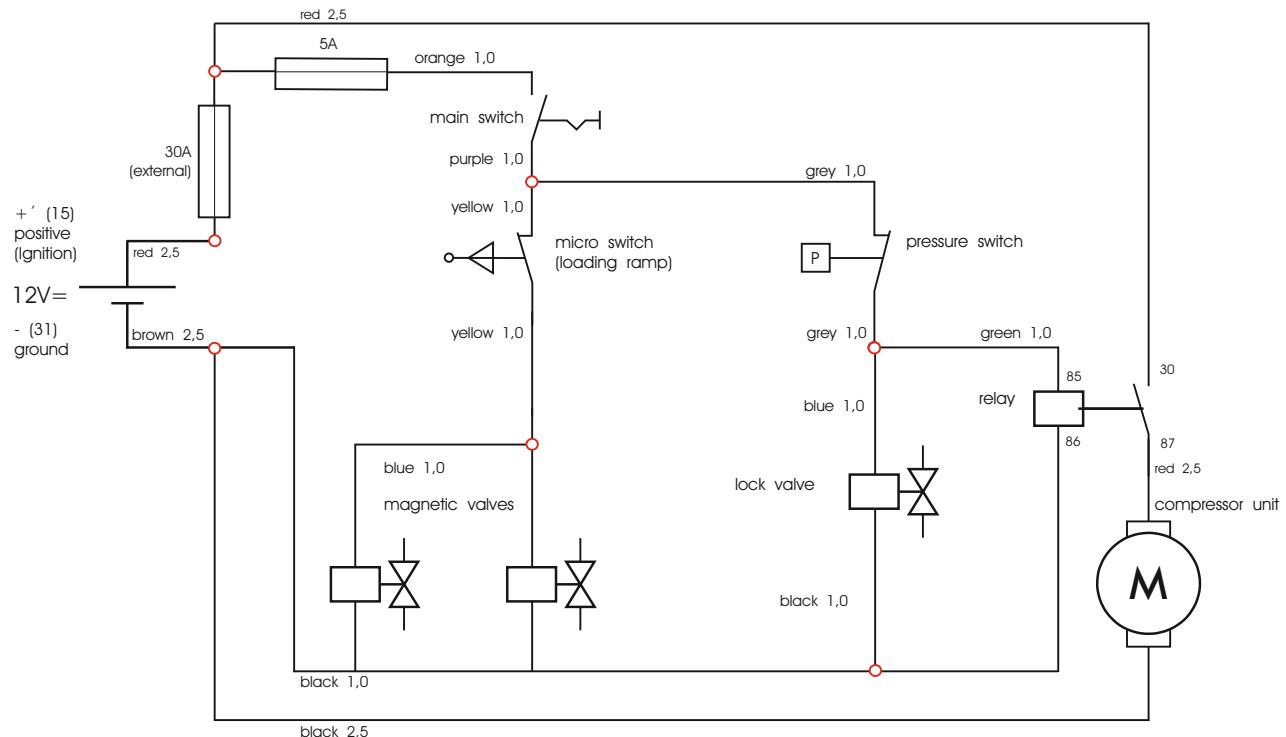


**Never remove the screws upside the platform !**

- \* Unplug all electrical and pneumatic connections.
- \* Invert the Hoverboard upside down (in the vehicle or outside).
- \* Remove the 4 screws at the cover of the switchbox.  
Then open the cover > **Caution !**  
2 magnetic valves are connected to the cover !
- \* Now all components are accessible for all possible repairs, see chapter 5.

Have always a good trip with your  
**HOVERBOARD®**

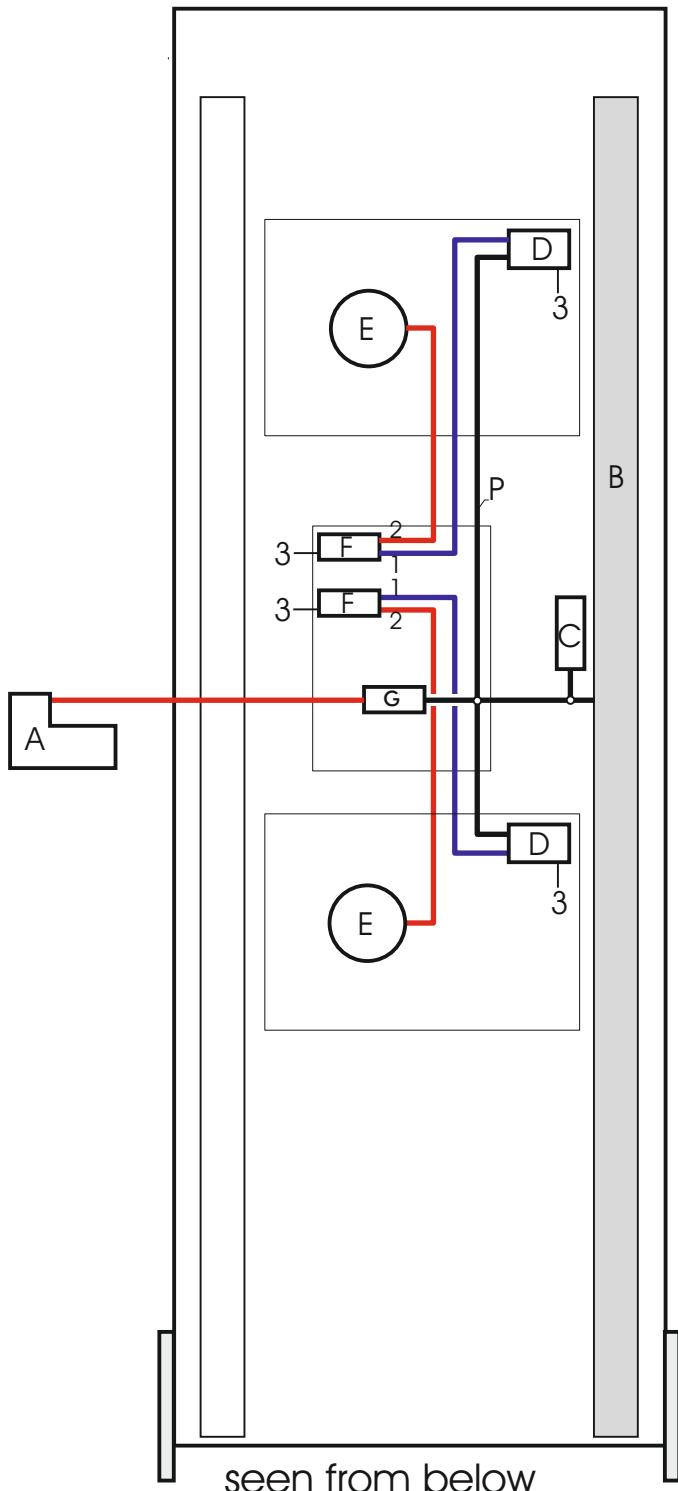
## 7. Circuit diagram



## 8. Connection layout

target	colour	cross-section	target	colour	cross-section
micro switch	yellow	1,0	magnetic valve	blue	1,0
lock valve	blue	1,0	magnetic valve	blue	1,0
micro switch	yellow	1,0	relay (85)	green	1,0
lock valve	black	1,0	pressure switch	grey	1,0
jumper			pressure switch	grey	1,0
jumper			main switch	purple	1,0
jumper			magnetic valve	black	1,0
jumper			magnetic valve	black	1,0
relay (86)	black	1,0	compressor	brown	2,5
main switch	orange	1,0	main switch	black	1,0
compressor	red	2,5	ground	brown	2,5
relay (87)	red	2,5	fuse 5A	red	1,0
relay (30)	red	2,5	fuse 5A	red	1,0
			positive 30A	red	2,5

## 9. Pneumatic layout



tube colours

Red	= working circuit
Blue	= inter-valve-circuit
Black	= supply circuit

Parts

- A... external compressor
  - B... air supply tank
  - C... pressure switch
  - D... level control valve
  - E... air cushion
  - F... magnetic valve
  - G... lock valve
- P ... pressure supply  
1... magnetic valve > supply  
2... magnetic valve > working press.  
3... air release

## **10. Spare parts**



**30206 compressor set**



**30066 pressure switch,  
pre-finished**



**30050 magnetic valve  
pre-finished**



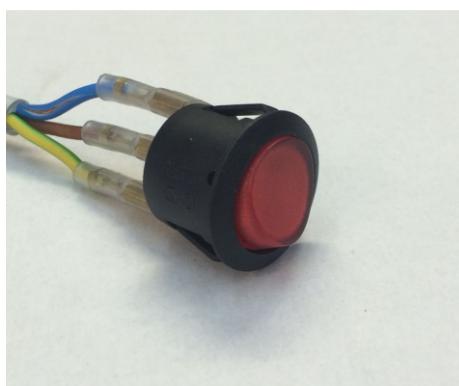
**30052 lock valve**



**30290 level control valve**



**30071 micro switch**



**30263 main switch**



**30251 fuse holder  
30253 fuse 5A**



**30520 relay**

## **10. Spare parts**



**30100** air suspension  
pre-finished

**30080** bellows

**30310** air cushion



**30300** shock absorber

**30110** gas spring 200 N  
**30113** gas spring 450 N

**30341** brass bushing



**50114** ramp bracket right  
**50115** ramp bracket left

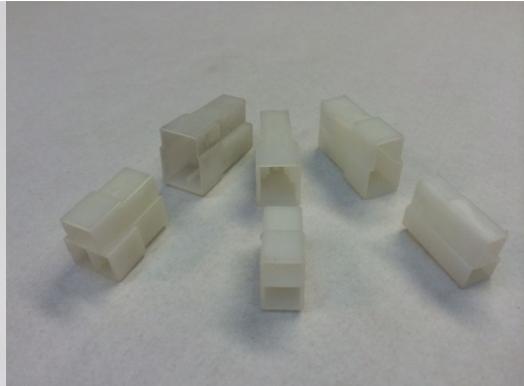
**30342** cable gland

**30343** stop bushing

## **10. Spare parts**



**30220** switch box



**30500** connector 2 wires (right)

**30501** connector 3 wires (left)

**30502** connector 2 wires (mid)



**30121** roller

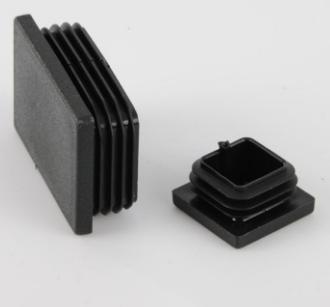


**30170** terminal block



**30400** button 6 mm

**30401** button 8 mm



**30350** plug 30 x 30

**30361** plug 60 x 40



**30240** pressure hose red

**30241** pressure hose blue

**30242** pressure hose black