SandMaster GMK4000

Construction Manual Dump Truck

Servonaut

This model is a semi-scale replica of a large dump truck. The individual components are made of **steel, aluminum and PVC.** All components are prefabricated and **partly powder coated and mounted**. The instruction is broken down in **assembly groups** to make it easier for less experienced modelers and even beginners. The model is designed for an **operating voltage of 3S Lipo or 12 Volt NiMH.**

The assembly groups:

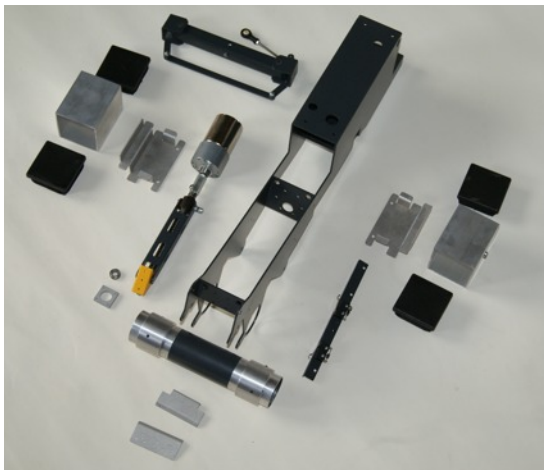
- cabin
- main frame (powdered, mounted)
- front carriage
- dumper body
- rims and tire
- lighting (optional boards)
- electronics (optional parts)

Tools you need

- cutter
- phillips head screwdriver PH Gr. 1
- phillips head screwdriver PH Gr. 0
- allen head screwdriver 1.5 mm
- allen head screwdriver 2 mm
- allen head screwdriver 3 mm
- socket wrench 8 mm
- flat nose pliers small
- side cutters
- screw locking - loctite medium strength
- windshield glue
- acrylic paste

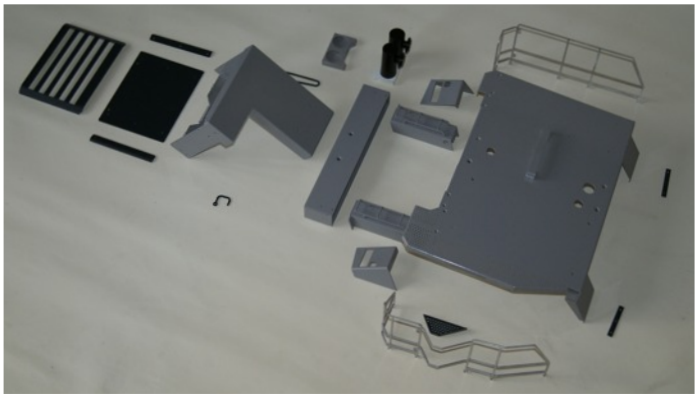
The main frame
consisting of:

- frame
- rear axle
- front axle
- tilt drive
- tanks
- lighting carrier
- steering servo



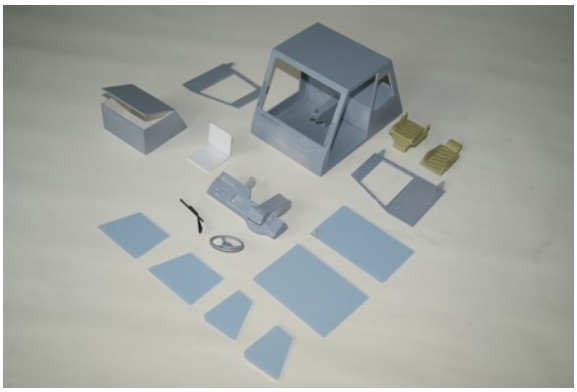
The front carriage
consisting of:

- base plate
- bumper
- ladders
- hood with grill
- railing
- air filter unit



Cabin consisting of:

- main cabin
- dashboard
- steering wheel
- seats
- doors
- window set
- receiver box
- wiper and handles

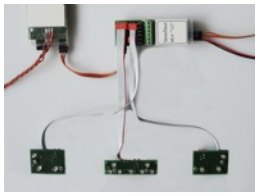


Dumper Body consisting of:

- dumper body welded
- side cut out profile
- front cut out profile
- beams
- side dirt deflector
- mudflap holder
- stone rod

Recommended optional accessories:

Servonaut GMK Licht
Circuit board set with adapter for S20 and ML4
(S20 and ML4 not included!)



Servonaut S22
ESC (electronic speed controller) with BEC supply

Servonaut MFX/MF8
Mini ESC for tilting drive

Servonaut ML4
Mini light set

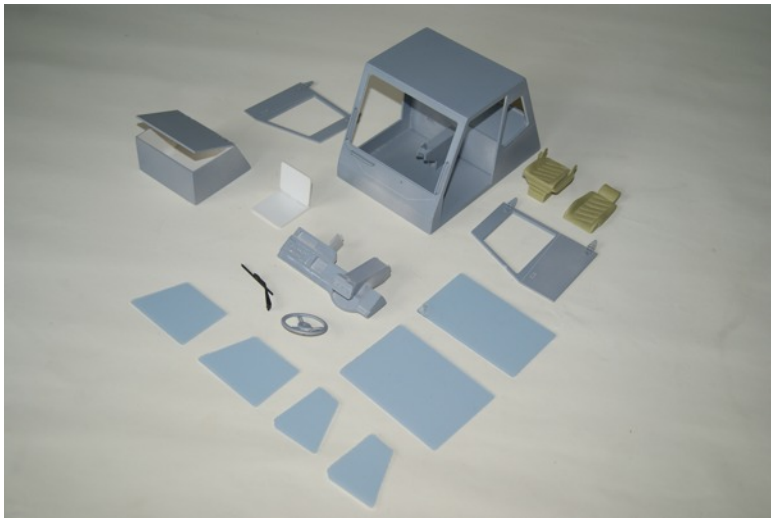
Servonaut SM3
Sound module

Servonaut Zwo4 E6
6-channel receiver for Servonaut
Zwo4 radio system

LiPo 2600mAh 3S1P 11.1V
DC voltage: 11.1V
Type: 3S1P
Capacity: 2600mAh
Dimensions: LxWxH 115 x 34 x 26 mm

Parts cabin

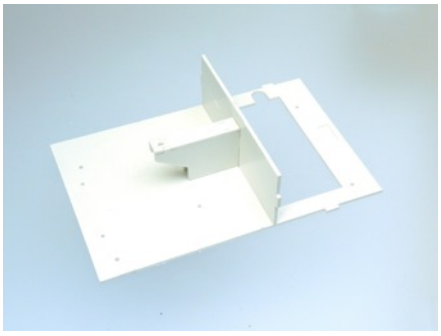
1	driver's cabin
1	bottom plate
1	dashboard
1	box cabin
4	hinge 7x 12
2	hinge 8x 12
32	lenshead screw M1,4x3
1	glue Ruderer 530
2	handle
1	wiper
1	window set
1	seat

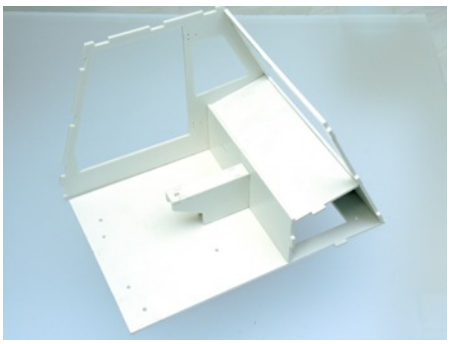


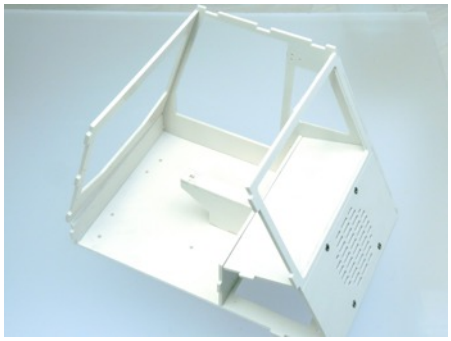
Assembling the cabin

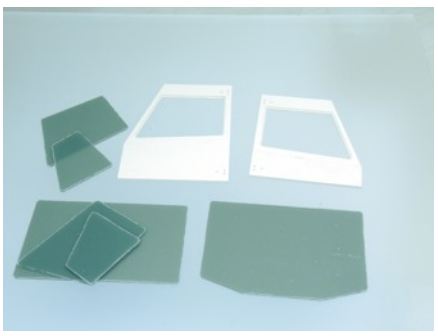
Since the PVC pieces fit very tightly assemble them once before glueing them together. The noses of the parts should overlap a little to minimize the gap and make it easier to fill afterwards. Use the enclosed PVC glue Ruderer 530. This adhesive dissolves the surface - so make sure to work accurate to avoid surface damage.

- Connect parts 1,2 and 3 (see p. 8) to build the center console.
- Connect center console with bottom plate (part 1) and dividing wall (part 2). (see p. 8)
- Connect the right side panel, the intermediate bottom and the rear wall. (see p. 8)
- Mount front 1 and front 2 (see p. 8). Front 1 is slanted on the upper side.
- Mount left side wall and the roof. The roof direction is marked (V = front), turn the mark inside so it is invisible from the outside. (see p. 8)
- Screw the doors to the side panels with two hinges and screws M1,4 x 3 mm each.



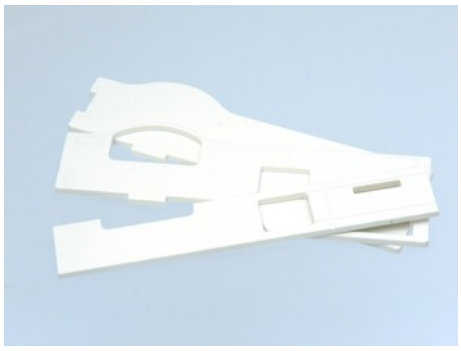


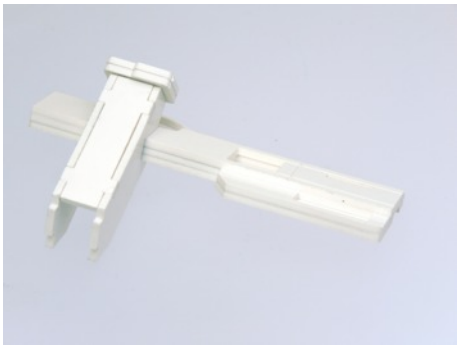




Dashboard

- Glue parts 1, 2 and 3 together to form the dashboard. (see p. 11)



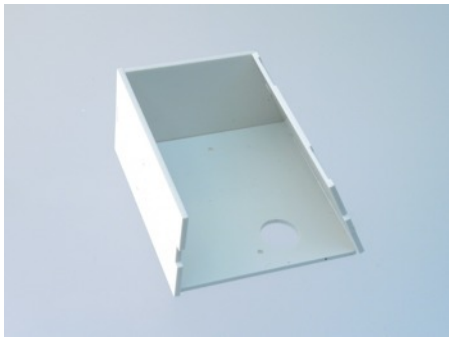


- Connect parts 4, 5, 6, 10a und 10b to form the steering column. Attach it at the bottom of the dashboard.

- Mount the bottom plate and the right support panel and then the side parts (parts 8 and 9).
- Attach the rear wall of the dashboard (part 11).
- After grinding and painting mount the steering wheel (part 13). Use the spacer (part 12) and a countersunk screw M2 x 10 mm.
- Finally screw the dashboard to the cabin with two countersunk screws M2 x 4 mm from the bottom.

Receiver box

- Glue side panels, front and rear together then insert the bottom. (see p. 12) **Attention: Check the right position of the holes!**



- Attach the lid to the rear wall with the hinges. Use eight lenshead screws M1,4 x 3 mm.
- Paint the finished parts.
- After painting glue carpet and mount seats.
- Glue the windows into the window frames (for example with the UHU Plast Special) - **don’t use CA glue!**
- Attach wipers and handles.
- Screw the cabin to the painted front carriage.

Important tips

Source: uhu.com

Glueing

- **Don’t use CA glue for the windows!** We recommend a special windshield adhesive, for example the UHU Plast Special.

Painting

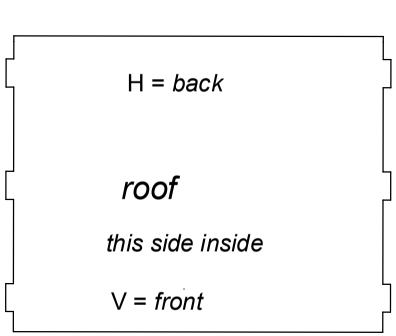
- Use sandpaper type 120 to smoothen glued surfaces. Fill holes and gaps with fine surface filler and sandpaper it again. After letting it dry sand it wet with type 400 sandpaper. Then you can apply a ground coat and finally paint it.
- For twin-tone coloring: Paint the lower part first. After letting it dry cover the lower part with masking tape then paint the upper part and the inside.
- Recommendation: We achieved best results with the products from Voss Chemie - CAR-SYSTEM (german brand). They are available at car dealerships as spray or in a small can.

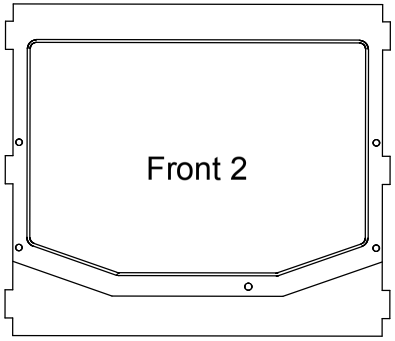
Fine surface filler

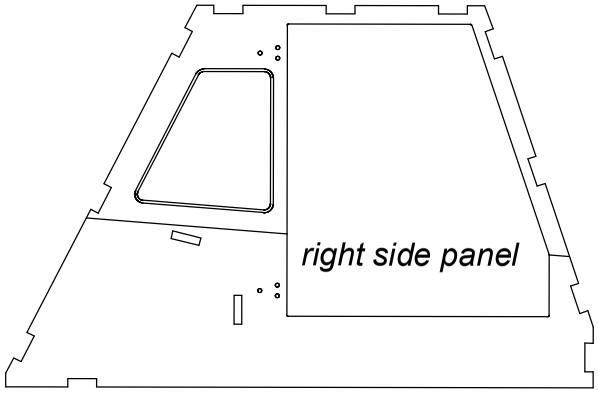
Spray filler

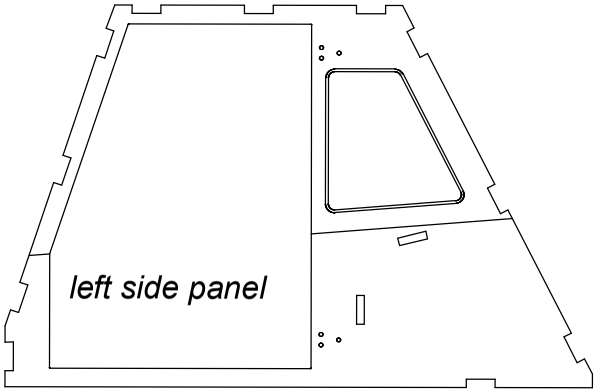
Source: www.carsystem.org

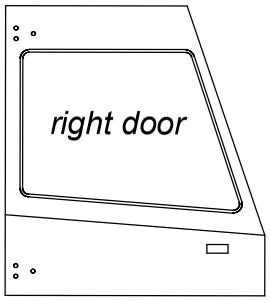
Overview parts cabin

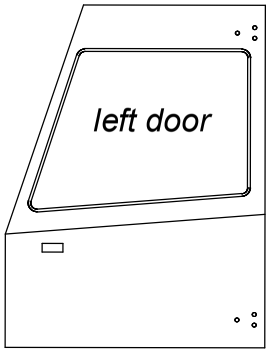


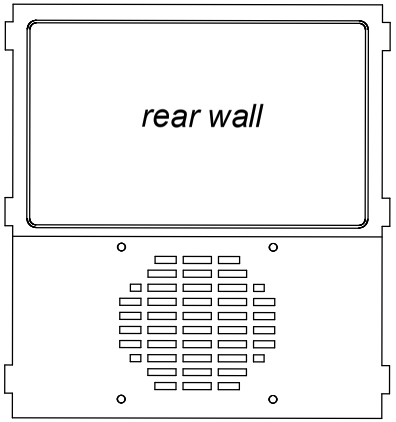


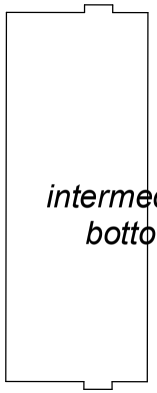


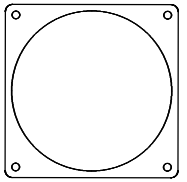










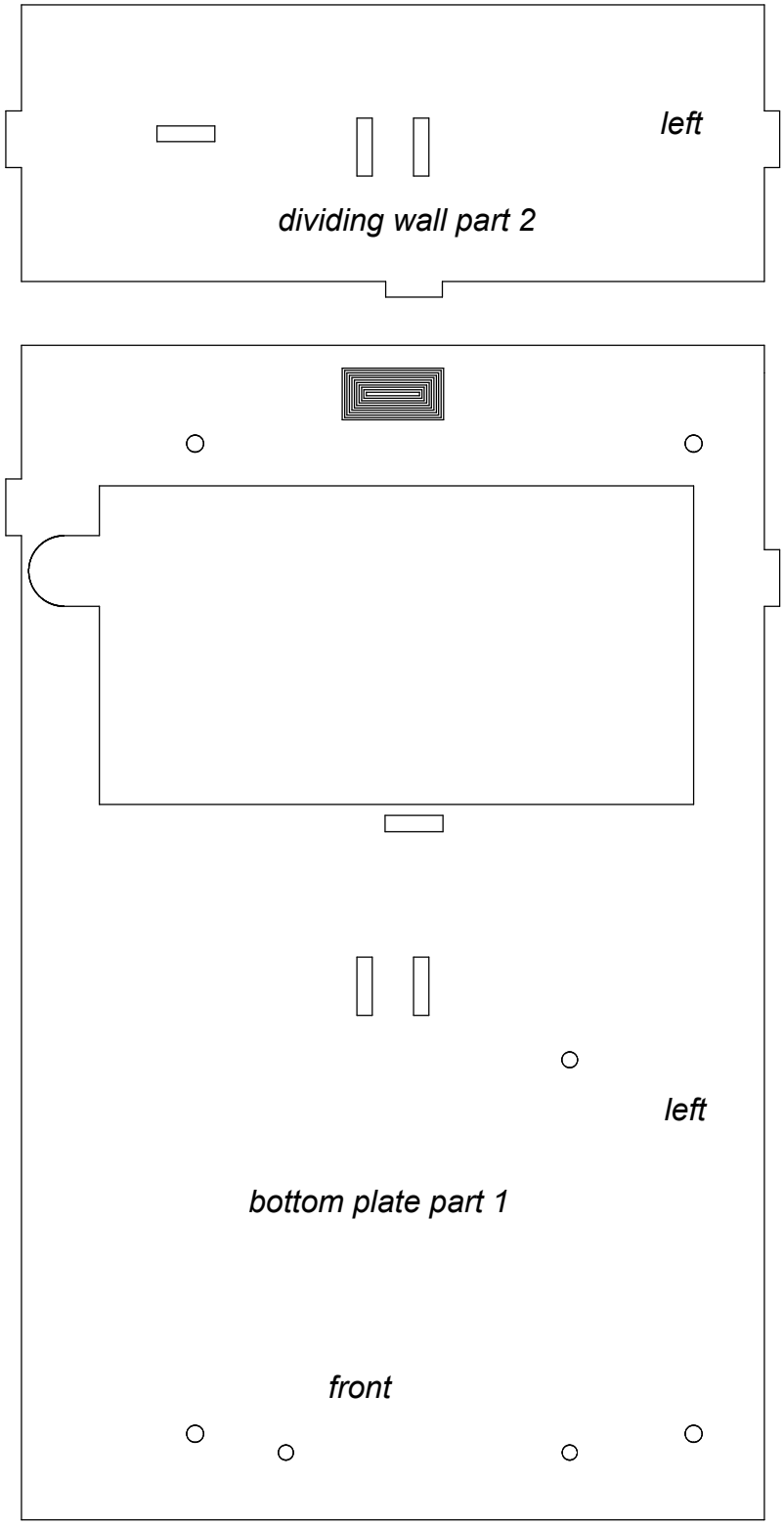


speaker
mounting ring

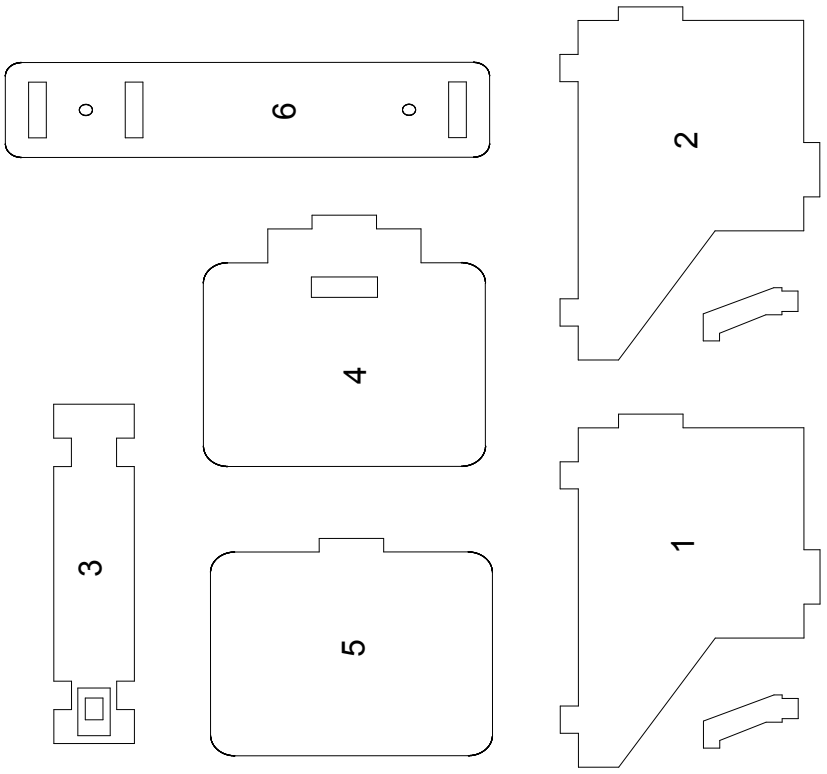
doorstop right

doorstop left

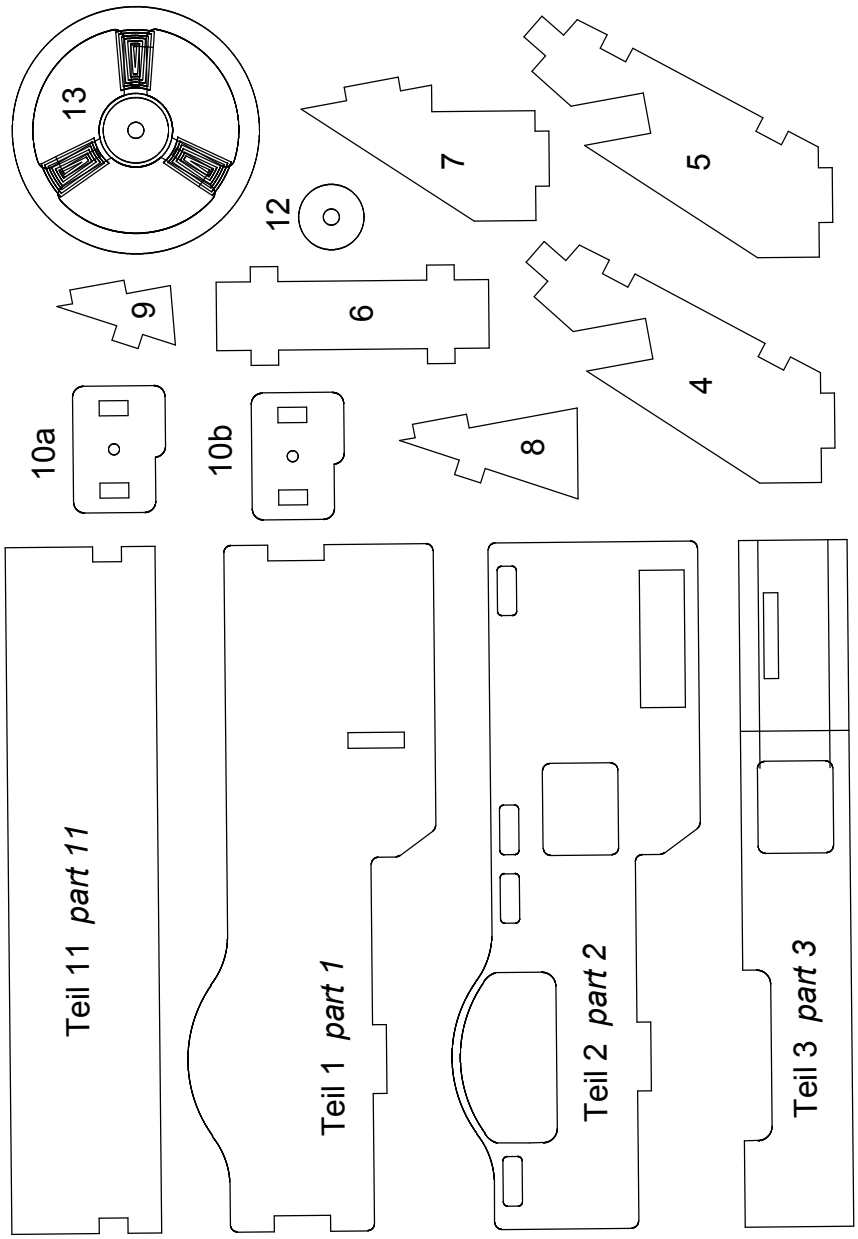
Overview parts bottom plate



Overview parts console and second seat

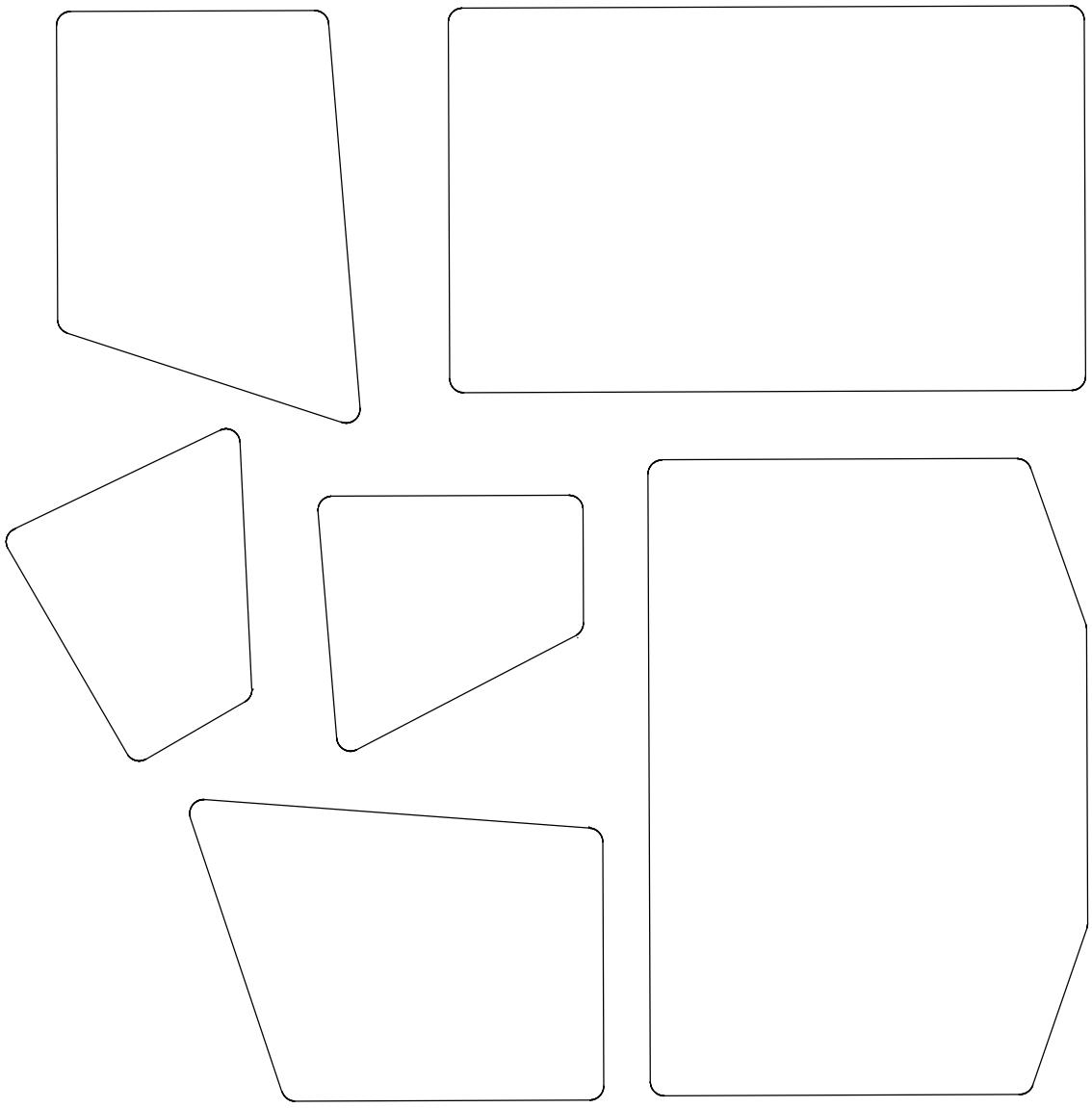


Overview parts dashboard

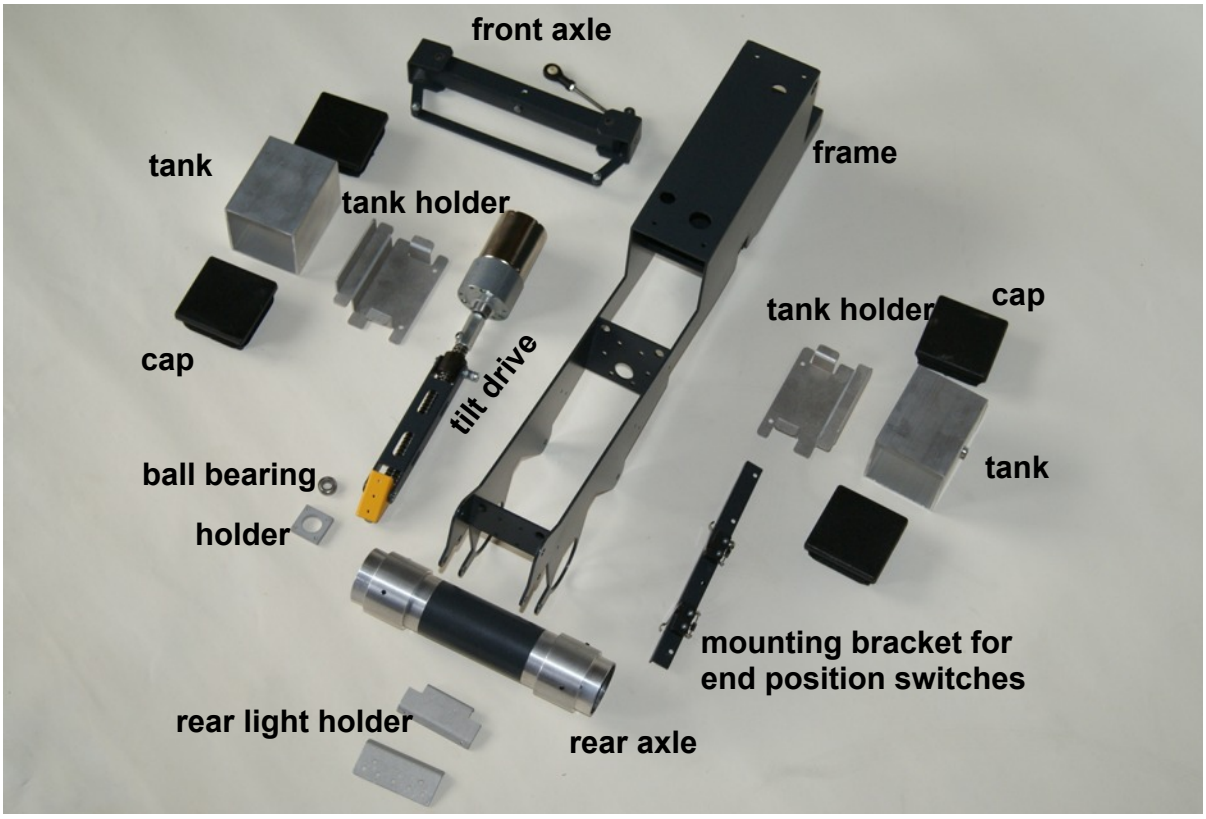


Overview parts receiver box

Window Set



Main frame



Parts main frame

1	frame steel
1	metal plate (E shaped)
1	front axle - Grundkörper
1	steering arm left
1	steering arm right
1	tie rod
1	Servo tie rod R+L Gewinde M 3
3	lenshead screw M3x12
1	washer 3,1 mm
3	lock nut M 3
1	joint head M 3 links
1	joint head M 3 rechts
8	plain bearing
3	metal bolt 5 x 20 DIN 7
3	headless scres M3x5 DIN 913
4	ball bearing 11x5x4
1	rear light holder A
1	rear light holder B
4	lenshead screw M 2 x 6mm
1	axle tube
2	axle tube ring
2	bearing ring
4	bearing 55x35x10
2	motor GM32 1:71
6	headless screw M3x5 DIN 913
10	lenshead screw M3x4
1	seering servo DES 707 BBMG
2	washer 5,3 mm
2	tank
4	tank caps
4	zip tie
2	tank holder
4	lenshead screw M3x4

Parts rims

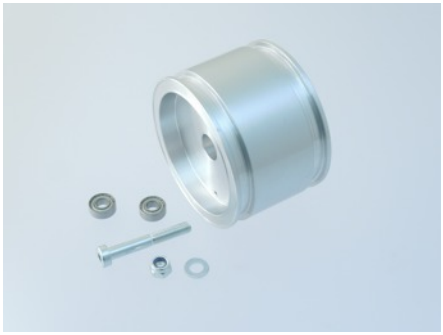
2	rim rear
2	rim front
2	rim insert rear
2	rim insert front
2	hub cap
2	hub ring
2	hub bracket rear
4	countersunk screw M2x4
48	allen head screw M2x3
8	allen head screw M2x6
2	headless screw M4x5 DIN 913
2	wheel bolt inbus 5 x 35
2	lock nut M 5
2	washer 5,3mm
4	ball bearing 11x5x4
6	tires 18 x 33.00

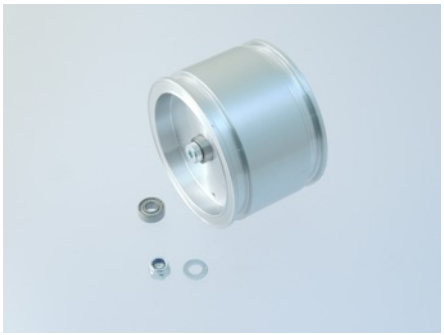
Parts tilt drive

1	motor RB 35 pro69
1	bearing flange
1	ball bearing 12x6x4mm
1	threaded spindle 10x3, L= 145 mm
1	shaft coupling 6/M 6
1	threaded nut
1	dumber body lifiting lever
1	dumper body carrier
1	bolt 3mm
2	circlips 3mm
2	micro switch
2	diode 4001
1	mounting bracket for switches
1	lenshead screw M 3x4
1	lenshead screw M 3x12
3	nut M3
1	washer 3,1 mm
4	countersunk screw m 2x8 mm
2	countersunk screw M 2x4 mm
4	zip tie black small
1	cable 2 x 0,4 mm²

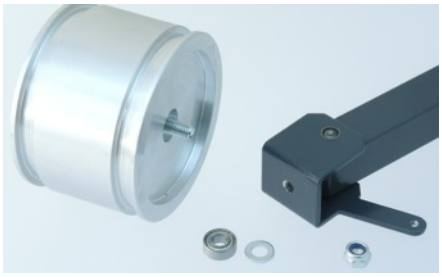
Main Frame

Front wheel rim





- Insert the ball bearing 11 x 5 x 4, in the rims - two per rim
- Stick a screw M5 x 35mm into the rim from the outside, put a washer 5.3mm from the inside on the screw
- Screw it to the steering knuckle and lightly tighten it until the rim sticks
- Now loosen the screw again until the rim rotates easily and without allowance for clearance
- Now lock it with a nut from the inside of the steering knuckle. To make it easier loosen the headless screw M3 and remove the bolt.



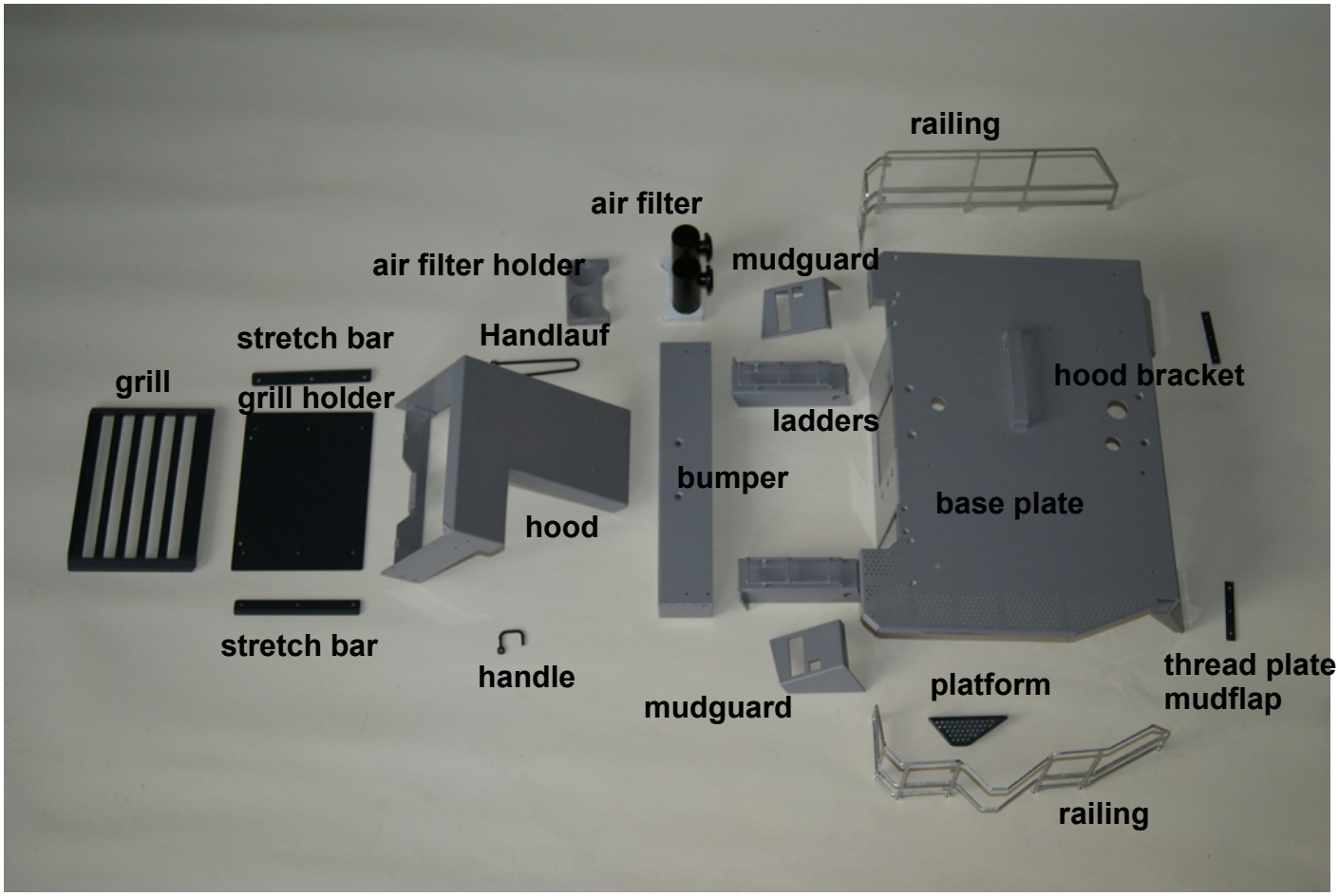
Rear wheel rim

- Screw the headless screws M4 x 5 mm to the rims, put the rim on the ball bearings of the rear axle
- Check that the headless screws are jammed on the flattened surface of the motor shaft
- Use a screw locking to secure the headless screw (loctite not included)

Rim inserts

- Use ten allen head screws M2 x 3 mm to attach the outer ring to the base plates of the rim inserts.
- Attach the hub of the front wheel rim with four allen head screws M2 x 3mm.
- Attach the hub of the rear wheel rim with a countersunk screw from the back, the lid from the front with a M2 x 3mm countersunk screw.
- After painting stick the black foil on the rims to give them more depth visually.
- Screw the inserts to the rims with two allen head screws each M2 x 6 mm.
- Mount the tires onto the rims.

Front carriage



Parts front carriage

1	base plate
1	hood
1	grill
1	aluminium net
1	sticker anti-slip mat
1	air filter holder front
1	air filter holder back
2	airfilter set (2 parts)
2	mudflap small
31	countersunk screw M2x4
6	lenshead screw M 2x4
4	lenshead screw M 3x4
6	countersunk screw M 3x4
2	countersunk screw M 3x6
2	allen head screw M2x4
2	allen head screw M2x6
2	thread plate mudflap
1	railing set (2 parts)

Front carriage

- Screw the hood bracket to the base plate of the front carriage with two countersunk screws M2 x 4 mm from below.
- Now attach the base plate with four countersunk screws M3 x 4 mm to the frame.

Bumper

- Screw the two ladders to the bumper with one M2 x 4mm and one M2 x 6 mm allen head screw each, the long screw at the back.
- Push the bumper and ladders onto the frame from the front and attach it with two countersunk screws M3 x 4mm screws on the frame, the ladders each with two countersunk screws M2x4mm to the base plate.
- Mount the air filters, first the one in the front with a M2 x 4 mm from below.
- Glue the inlet funnel to the casing and place it in the front bracket.
- Place the second bracket with the two holes on the air filters and screw it on from below.
- Attach the filters to the brackets with two countersunk screws M2 x 4mm from the back.

- Screw the railings to the base plate with two countersunk screws M2 x 4mm, the platform (in front oft the drivers door) with two allen head screws M2 x 4mm to the base plate.
- Attach the cabin from below with four M3 x 4mm lenshead screws (Be careful the thread is made of PVC!)

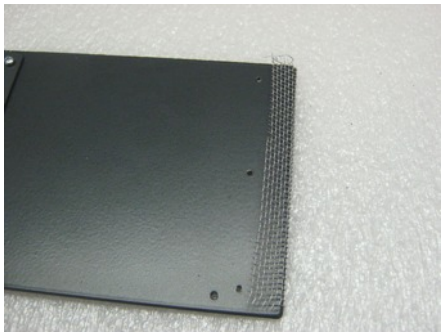
- Attach the receiver box from above with two M2 x 4mm lenshead screws.

- Mount the tanks - screw the holders to the frame with lens-head screws M3 x 4mm.
- Press the plastic caps into the holes of the tanks and attach the tanks with zip ties to the holders.
- Tip: Use double-sided tape to keep the tanks in position - it makes it easier to tighten the zip ties.

Hood

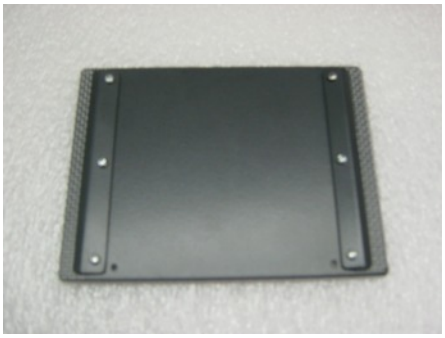
- Insert the clamping bracket from below and attach it with countersunk screw M2 x 4mm.
- Insert the lower crossbar (upstand to the front) and attach it with countersunk screw M2 x 4mm from the outside.

- Put the alu net on the cover plate and stretch it with the bars - use lenshead screws M2 x 4mm to fasten it.

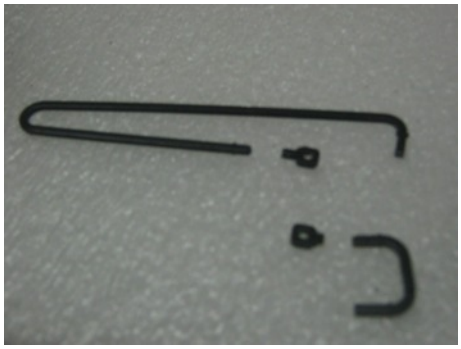


- Attach the cover plate to the crossbar from the front with lenshead screws M2 x 4mm.

- Insert the grill at the front and attach it with four countersunk screws M2 x 4mm.



- Paint handle and handrail, remove hooks afterwards with a wire cutter and place handles in the holes on the hood.



Parts dumper body

1	dumper body welded steel
1	sidewall reinforcement alu 4 mm
1	protecting metal sheet
2	mudflap big 1mm
2	mudflap holder
2	holder stone deflector rod
2	side dirt deflector
2	stone deflector rod
2	plain bearing
2	circlips 5mm
1	tilt shaft
8	countersunk screw M2x4
21	countersunk screw M2x3
14	countersunk screw M2x6
4	countersunk screw M2x8
6	beam long
2	beam short (place in 3rd position)
1	sticker set

Dumper Body

- Attach the three reinforcement plates for front and sides to the dumper body with countersunk screws M2 x 3mm.
- Attach the beams as well, the one that is split in half fits where the tilt drive is positioned later.
- After painting the body press the bearing of the tilt shaft into the rotation point of the dumper body.
- Attach the stone deflector rod and mud flap holders.
- Use acrylic paste to glue the protecting metal sheet into the dumper body (paste not included).
- Attach the dumper body to the tilt drive with three countersunk screws M3 x 6mm.
- Mount the body, connect with 5mm shaft and fasten with two circlips.

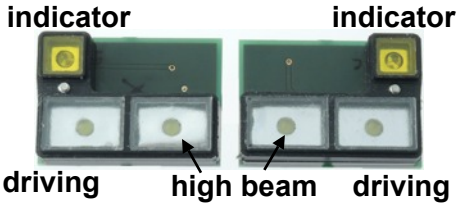
- Attach the side dirt deflectors to the dumper body above the wheels with a countersunk screw M2 x 6mm.
- Stick the foam rubber stickers on the contact area on the underside of the dumper body.
- After painting stick anti-slip mats and decorative stickers on the dumper.
- Screw the mud flaps into the holders with five countersunk screws M2 x 4mm in the back and three in the front, use the matching thread plates.

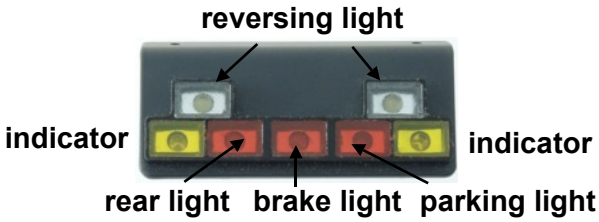
Headlights and rear lights

- Glue the chrome foil into the light casings then close with matching glass.

- Mount the headlights into the front plate and the rear lights into the rear bracket. You can stick 3mm LEDs in from the back - alternatively use the additional Servonaut LED circuit boards GM-KLicht (see picture on the right).

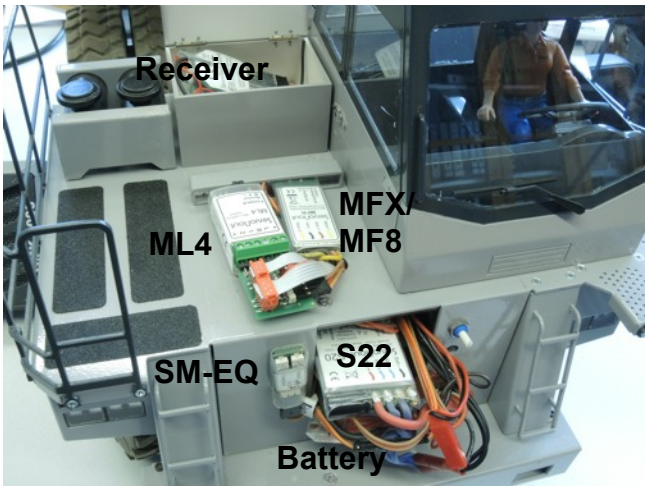
- For glueing we recommend a windshield adhesive, for example the UHU Plast Spezial.





Recommended electronics

- Servonaut ESC S22
- Sound module SM3
- Equalizer SM-EQ
- Mini light set ML4
- Mini ESC MFX / MF8
- Loudspeaker Laut16
- LED circuit board set GMKLicht
- 12V NiMH battery oder 3s-Lipo 2200er

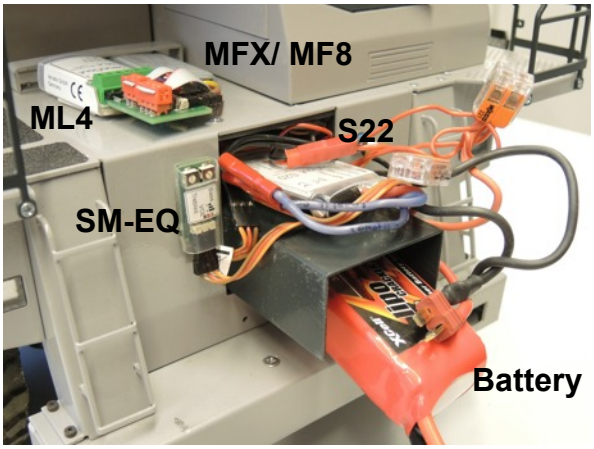


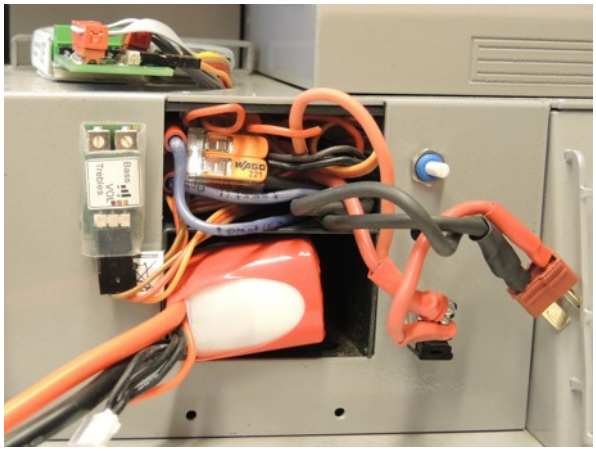
Mounting tips:

- receiver in the box
- sound module and loudspeaker in the driver's cabin

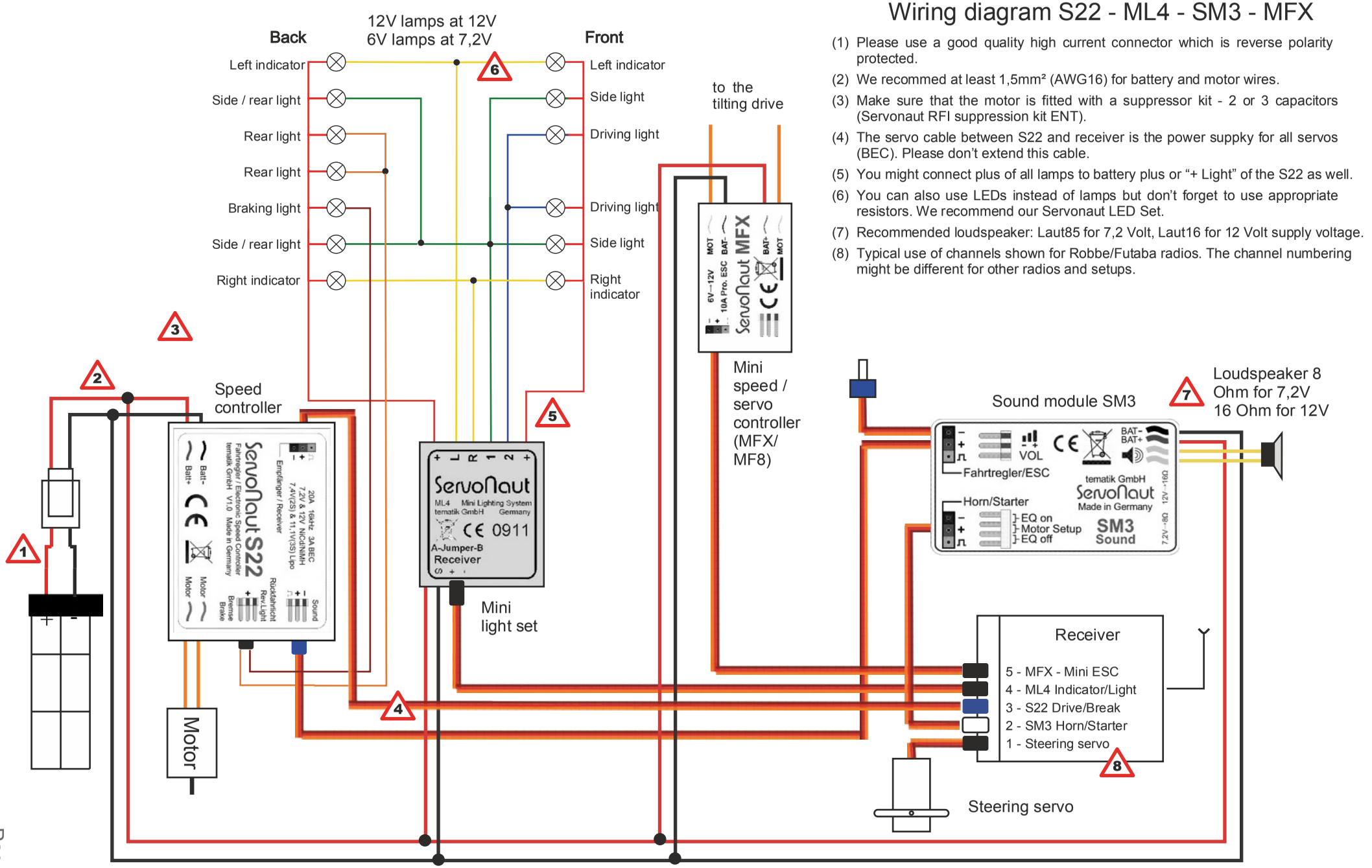
the following all covered by the hood casing/grill later:

- ESC and battery - separated with the aluminium part - in the hood opening (see pictures below)
- equalizer left onto the front (with tape)
- light set and Mini ESC on top





Wiring diagram S22 - ML4 - SM3 - MFX



(1) Please use a good quality high current connector which is reverse polarity protected.

(2) We recommed at least 1,5mm² (AWG16) for battery and motor wires.

(3) Make sure that the motor is fitted with a suppressor kit - 2 or 3 capacitors (Servonaut RFI suppression kit ENT).

(4) The servo cable between S22 and receiver is the power suppky for all servos (BEC). Please don't extend this cable.

(5) You might connect plus of all lamps to battery plus or "+ Light" of the S22 as well.

(6) You can also use LEDs instead of lamps but don't forget to use appropriate resistors. We recommend our Servonaut LED Set.

(7) Recommended loudspeaker: Laut85 for 7,2 Volt, Laut16 for 12 Volt supply voltage.

(8) Typical use of channels shown for Robbe/Futaba radios. The channel numbering might be different for other radios and setups.