Build Guide
Model 13: Bamboo 4x4 Winch Truck

3D printed radio controlled
4WD scale model.

www.3dsets.com
3D Sets Facebook

Version 1.0.0

Bamboo 4x4 Winch Truck version 1.0.0 technical specs.

- Dimensions: 56,5cm, length, 23,7 cm width, 35 cm height
- Model weights roughly 2,7 kg (including battery)
- Permanent rear wheel drive with opened differential (locked differential alternatively)
- Remote controlled steering, speed control and winch mounted in rear bumper
- Suspension with real springs and dampers for good on-road capabilities
- Reduction BeltDrive 4x4 gearbox with 1:10 gear ratio
- Doors, hood and storage box can be manually opened
- Removable battery cover under flatbed with spare tire

Before you start

- Get ready all tools.
- Buy necessary parts that cannot be printed (screws, bearings, motor etc.), these parts are listed on next page.
- Make sure that your printer is calibrated well – print our “calibration part” to ensure that you can fit bearings on shafts properly! Calibration part is located on “Print 0 - Calibration”.
- Use higher printing temperatures – use about 210-215°C for PLA to have firm layer adhesion!
- Use some heat-resistant filament (PC Blend) for specific drivetrain parts noted later in this Guide!

- Build guide is divided on steps and subassemblies. Subassembly is a sequence, where you will make some independent sub-part like gearbox, axles etc. Later you will install subassembly in the car.

- Bamboo 4x4 Winch Truck includes 2 different wheel designs. Both designs shares the same tire dimension, so feel free to choose the right design for you:

- For “Wheel E”, print plates with “Wheel E” in name.

- For “Wheel I”, print plates with “Wheel I” in name.

Are you new to the Radio Controlled models?

Don't worry, Radio Controlled (RC) models are not as complicated as they can look! However, it's a good to know some basics before you will start buying parts.
Most mechanical parts in our products will be 3d printed on your own printer, so we will focus here on RC electronics.

On-line beginners guides:

- Steemit.com – a basic introduction to RC car models
- Instructables.com – another beginners guide, general (not focused on car models)
- Youtube – a nice video showing RC electronic basics

If you have any questions regarding our models, feel free to ask us (or other 3D Sets builders) on our Facebook discussion group, available here: Facebook – 3D Sets

Bamboo 4x4 Winch Truck– version 1.0.0: What do you need?

- **LINKS for PARTS PURCHASE! ➡ list of required non-printed parts is here (continuously updated): click for non-printed parts spreadsheet**

- Print Filament: To print this model you will need around 3000 g of print filament in total,. We print our models from PLA material. If you will use the geared gearbox with 540DC motor, you should use **ASA/Prusament PC Blend filament for Motor Pulley, Motor Frame**, as it has better temperature resistance. **For the differential gears its recommended to use Prusament PC Blend**. You can use variable color for chassis and body. Tested and recommended filament: Fillamentum PLA Extrafill or Prusament PLA.
- Gearboxes choices (more info about gearboxes is on page 53):
    - **BeltDrive 4x4 gearbox** (recommended option):
        - Model is driven by brushless motor **3530** - size
        - **Timing belts: HTD 144-3M-06 (HTD profile, 144 mm long, 3 mm teeth distance, 6 mm wide) – 4 pcs**
        - All other parts can be printed from PLA or other filaments
    - **Geared Gearbox** (older design):
        - Model is driven by 540 DC motor (27 T)
        - All gears and shaft are 3D printed. Don't use PETG, ASA or ABS for gears!
- Steering servo in standard size (39x19,5x38,5mm) – minimum torque: 10kg, optimum 20kg
- Speed controller (ESC) max size 40x30x25mm
- Winch is driven by Micro DC Gear Motor 6V: Micro DC Gear Motor 6V 30rpm
- To control the winch you will need Speed controller (ESC) max size 40x30x25mm: Motor Speed RC ESC
- material for Winch Rope: Super Strong Braided Wire Fishing Line 100LB (0,6mm) or FDDL Lure As Gift The 100M 88LB (line number 8.0)
- Ball Bearing 10x15x4 mm - 6700ZZ: 38 pcs. (or less depending on gearbox type and axles configuration)
- Shock -Coil springs, inner diameter max 18mm, length 75-90mm: 4 pcs.
- Rubber tires - Outer Diameter: 110mm, Inner Diameter: 46-48mm
- 7.2V (2S) Battery with dimensions max 138x48x26mm
- We recommend 3 channel radio for this model - for option control the winch.
- Electric connectors: 2 pairs (battery connectors, motor <–> ESC connectors)
- Twin cable & soldering equipment
- Clear Binding Covers, or any transparent foil up to 0,5 mm thick – material for "Glass".
- Grease and Thread Locker for securing fasteners on moving parts

Bamboo 4x4 – Winch Truck – version 1.0.0: Required hardware

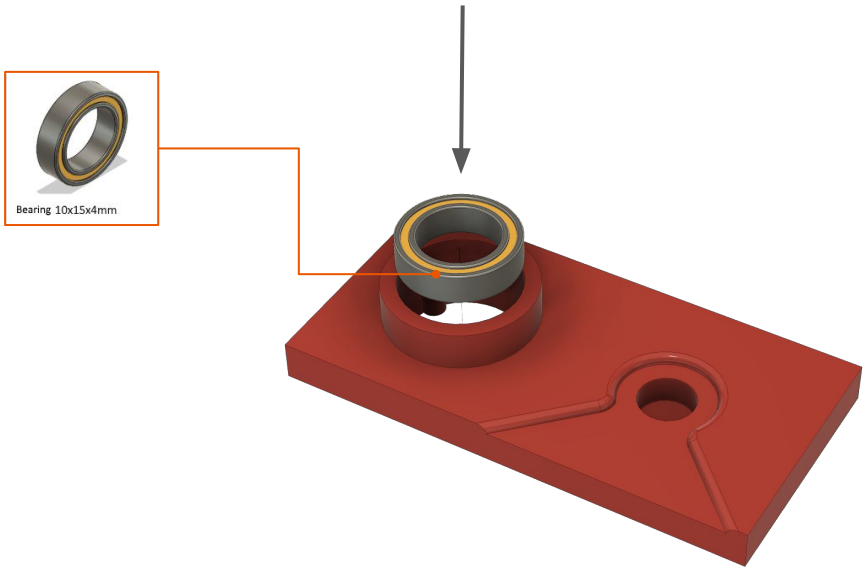
Screws and nuts (in metric size):

- M2x6: 163 pcs.
- M2x8: 34pcs.
- M2x10: 82pcs.
- M2x12: 21pcs.
- M2x16: 20pcs.
- M3x6: 21pcs.
- M3x8: 32 pcs.
- M3x10: 55 pcs.
- M3x12: 28pcs
- M3x16: 39pcs.
- M3x20: 4 pcs.
- M3x25: 8 pcs.
- M3 nuts: 36 pcs.
- M3 locknuts: 15 pcs.
- M3x6 Socket(!) Head: 2 pcs.
- M3x10 Socket(!) Head: 2 pcs.
- M3x6 Set Screw : 2 pcs.

with wheels E - 148 pcs., with wheels I - 163 pcs.

Check 3d printer calibration!

Please at first test whether the bearing can be inserted into the calibration part. If you have problems or the bearing fits too loose, please make sure that the printer is properly calibrated. Dimensions of the printed parts should match dimensions of the 3d model.



Bamboo 4x4 Winch Truck – Chassis

In this procedure you will assemble the chassis and rear body of the car.

Required print plates:

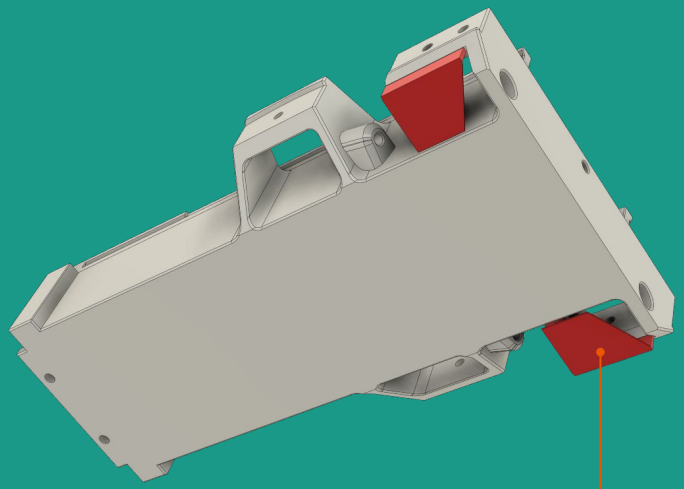
- “Print 0 - Calibration”
- “Print 2 - Chassis 2”
- “Print 3 - Chassis 3”
- “Print 4 - Chassis 4”
- “Print 5 - Chassis 5”

Non-printed parts:

- Screw M3x6 socket head: 2 pcs.
- Screw M3x8: 6 pcs.
- Screw M3x10: 9 pcs.
- Screw M3x12: 5 pcs.
- Screw M3x16: 1 pcs.

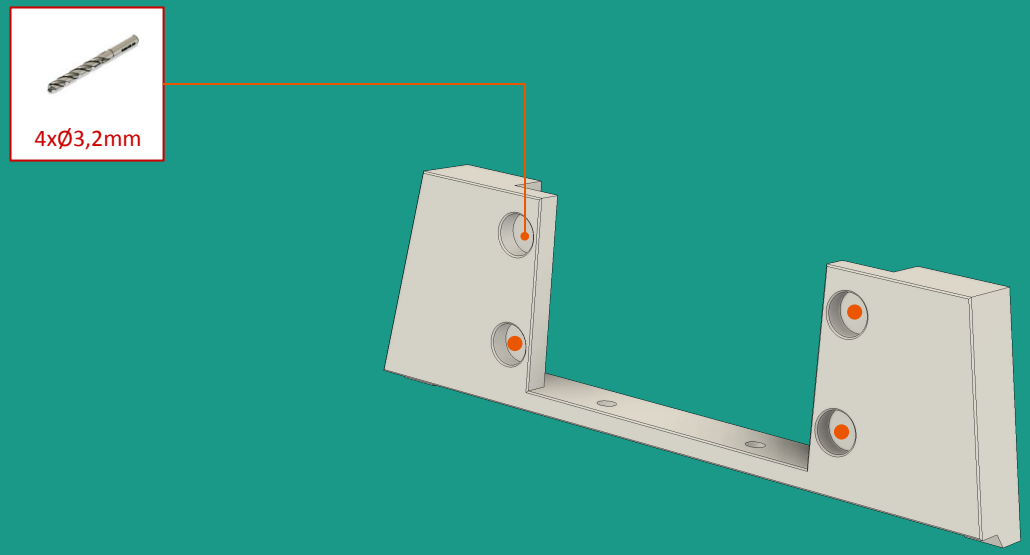
Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!

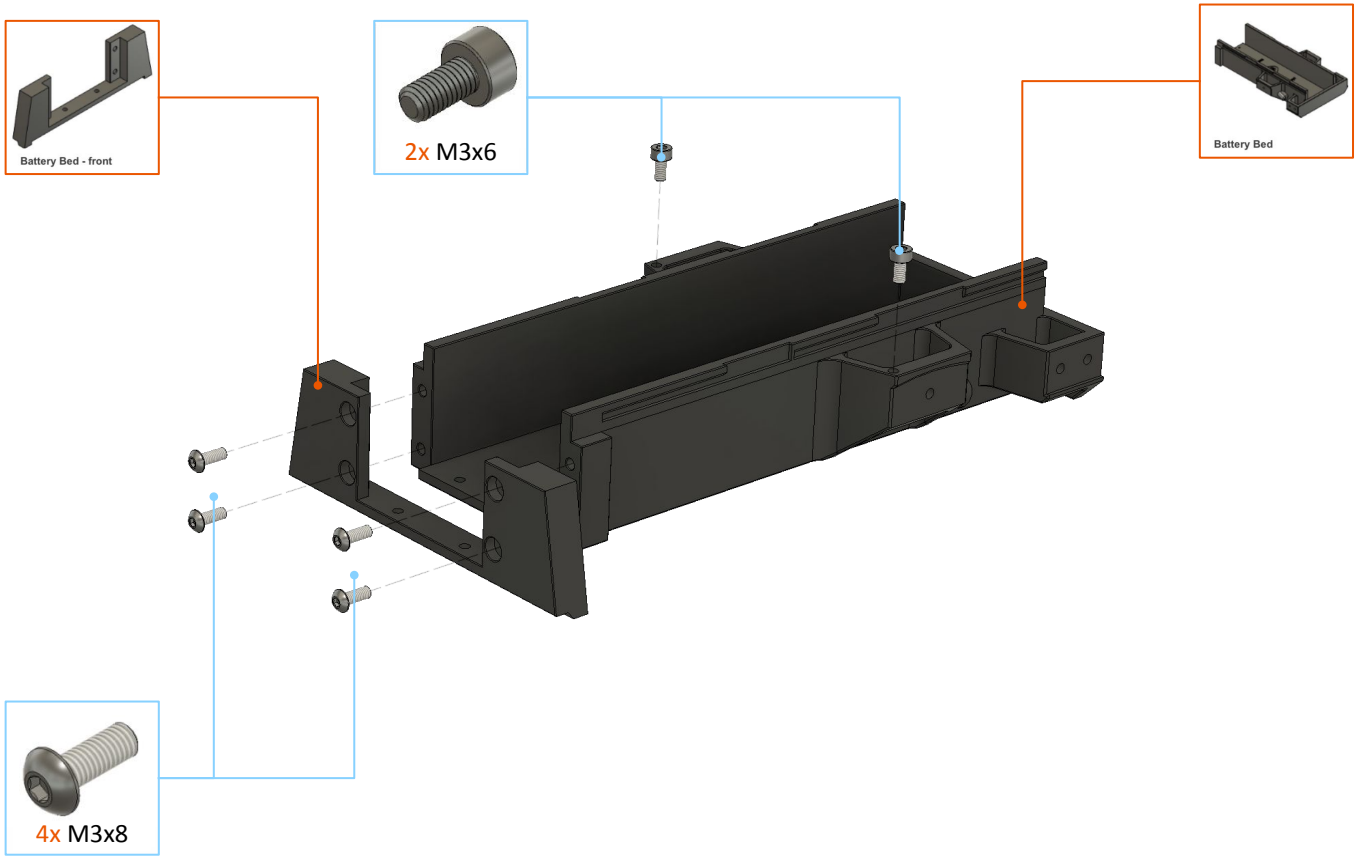


Postprocessing – drilling holes

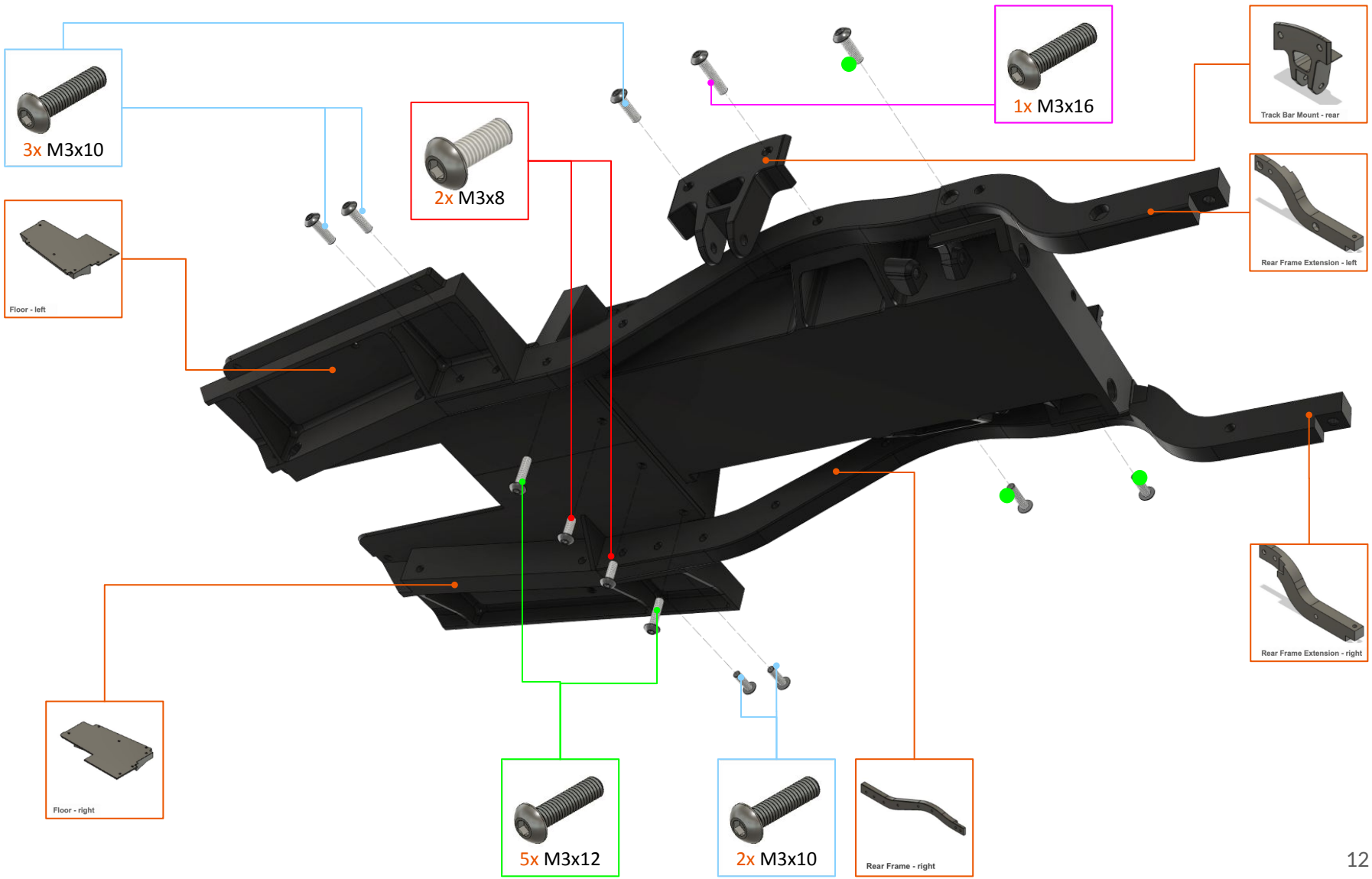
Please carefully drill through the marked holes that have not been printed through to make printing easier.



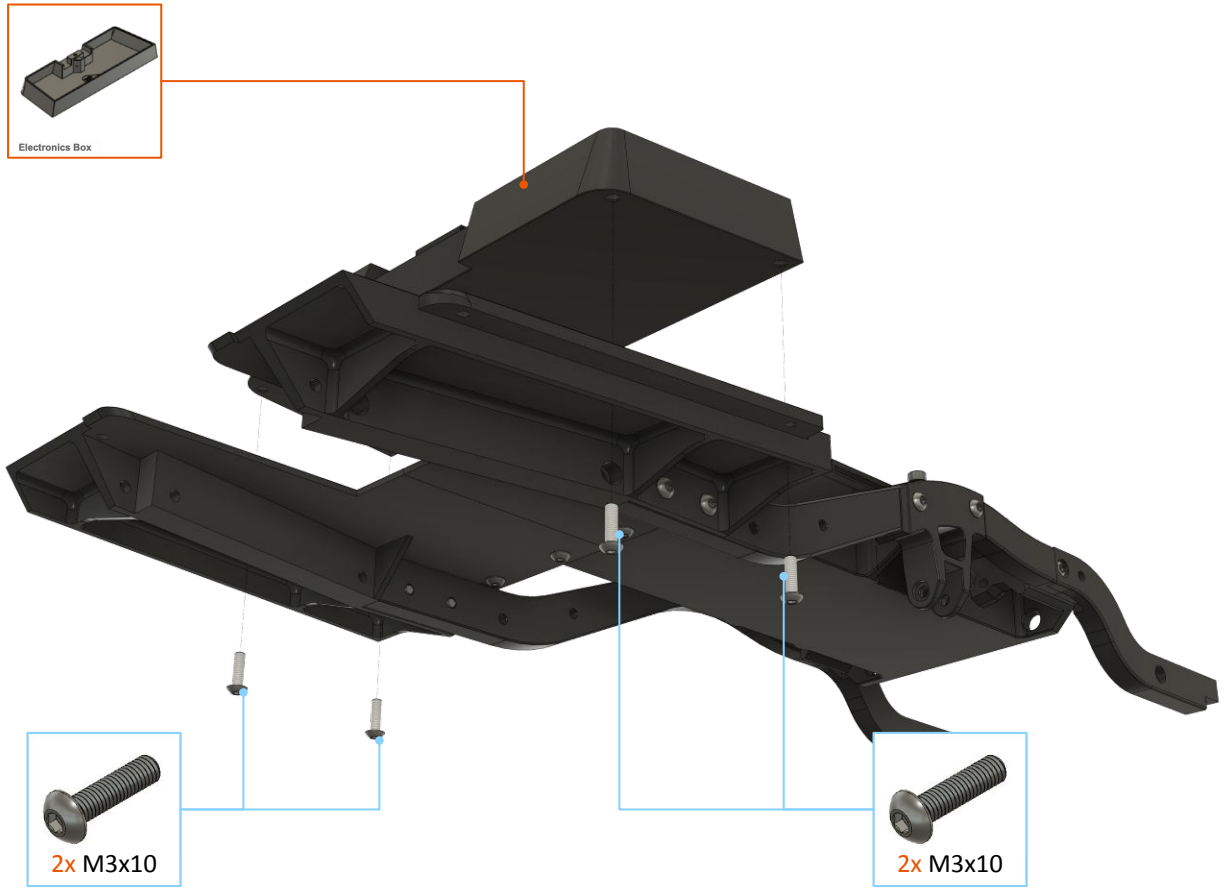
Chassis - step 1/3



Chassis - step 2/3



Chassis - step 3/3



Bamboo 4x4 Winch Truck – Front Body

In this procedure you will assemble the front bodywork of the car.

Required print plates:

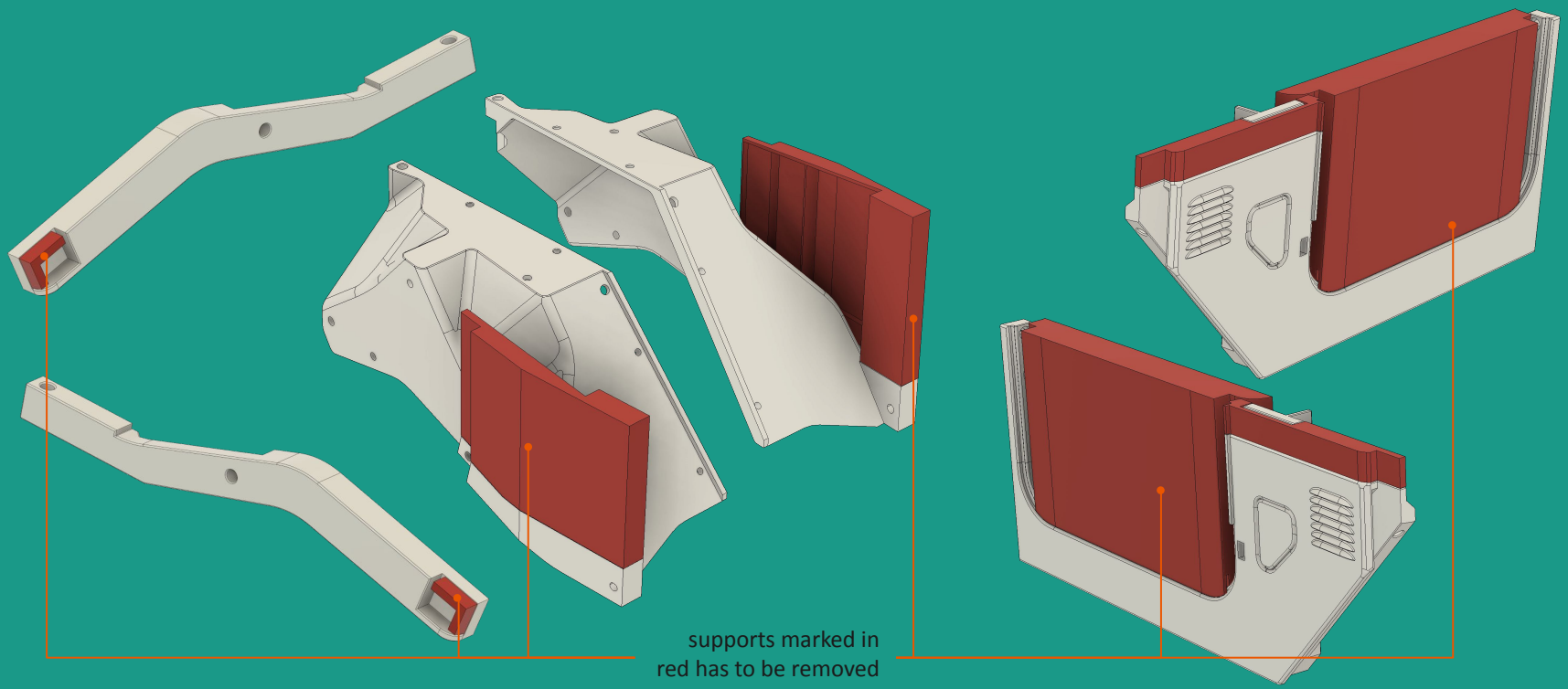
- “Print 2 - Chassis 2”
- “Print 7 - Front Wheelhouse”
- “Print 8 - Body 1 + Hinges + Dashboard”
- “Print 9 - Body 2 - Side Body Panel”
- “Print 10 - Body 3 - Front Window - bottom”
- “Print 11 - Body 4 - Front Body + Fender Flare”
- “Print 12 - Interior 1 + Details 1”
- “Print 13 - Lights 1”
- “Print 14 - Front Grill”

Non-printed parts:

- Screw M2x6: 12 pcs.
- Screw M2x10: 1 pcs.
- Screw M3x6: 4 pcs.
- Screw M3x8: 4 pcs.
- Screw M3x10: 8 pcs.
- Screw M3x12: 3 pcs.
- Screw M3x20: 2 pcs.

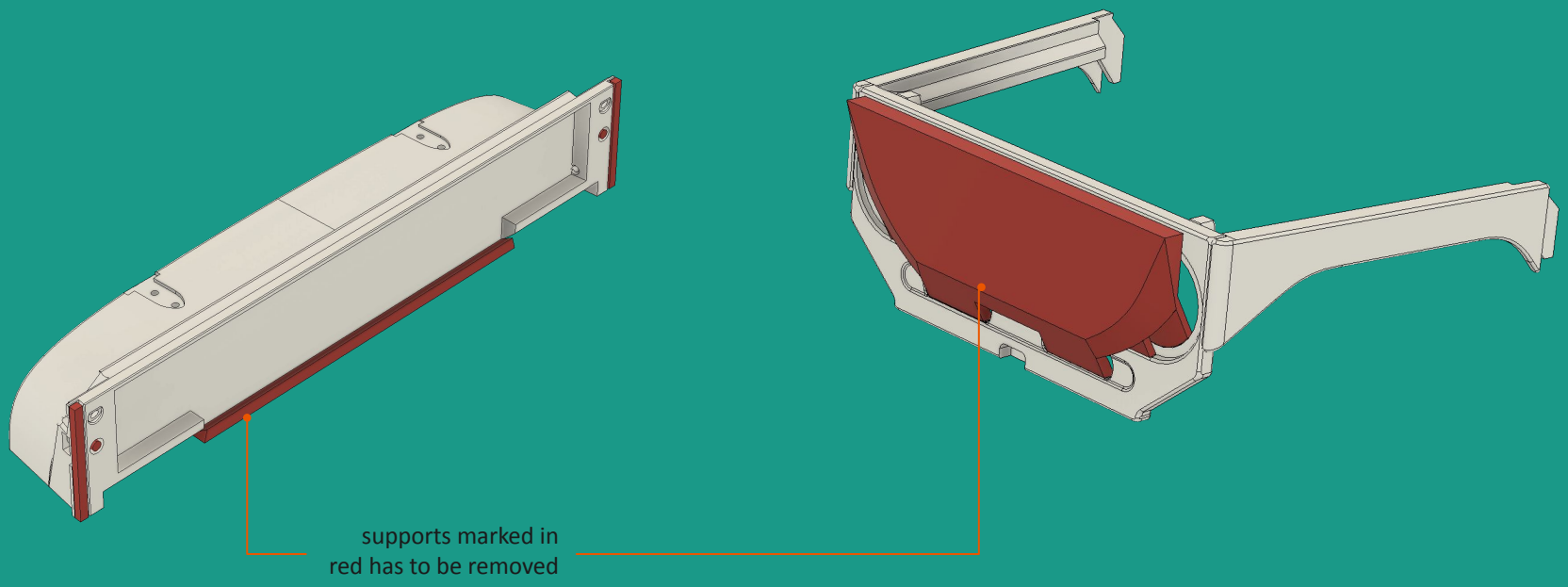
Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



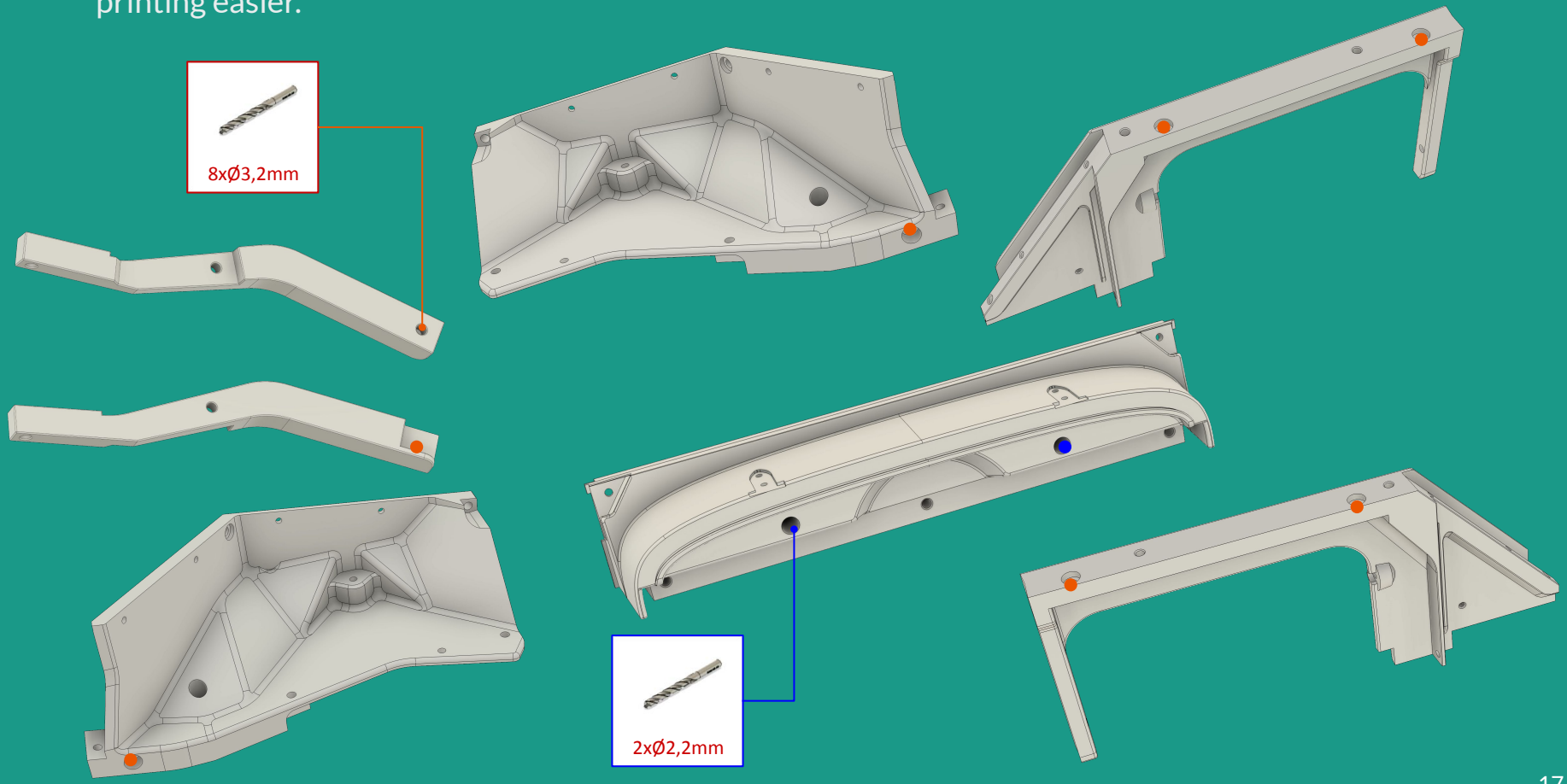
Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



Postprocessing – drilling holes

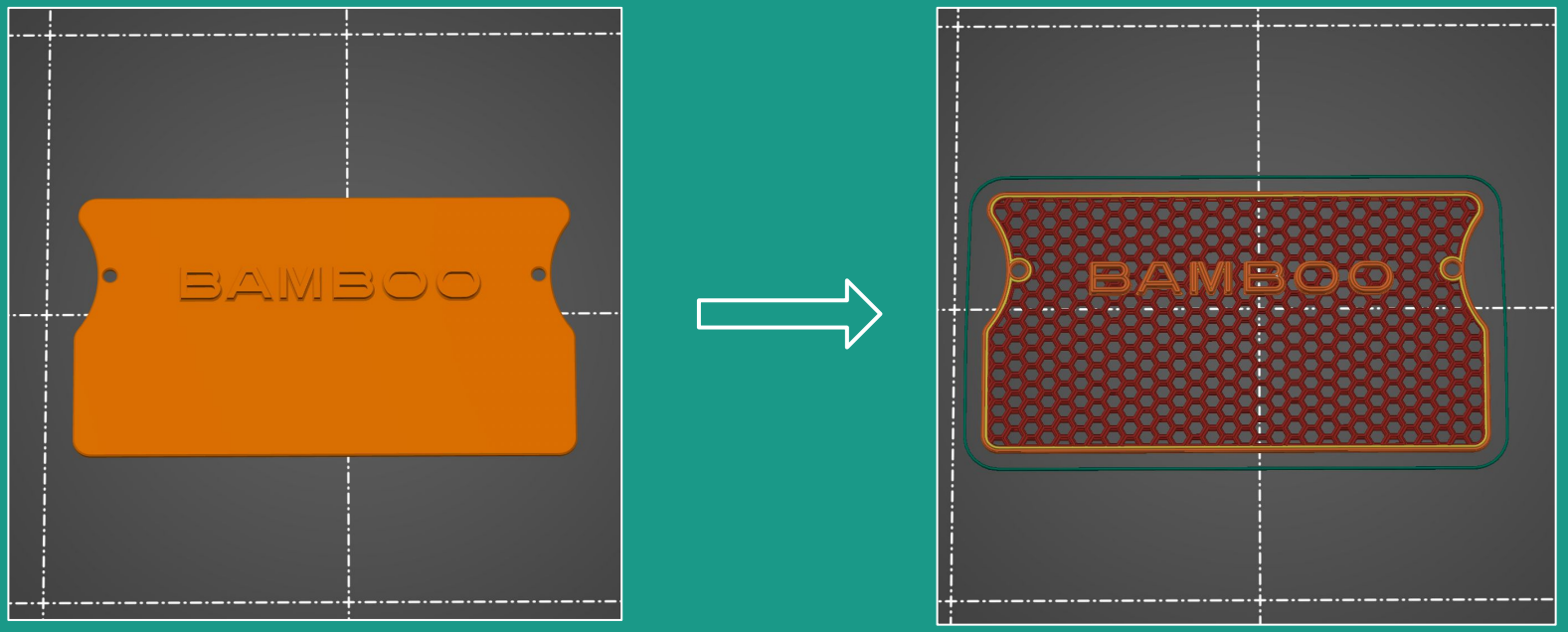
Please carefully drill through the marked holes that have not been printed through to make printing easier.



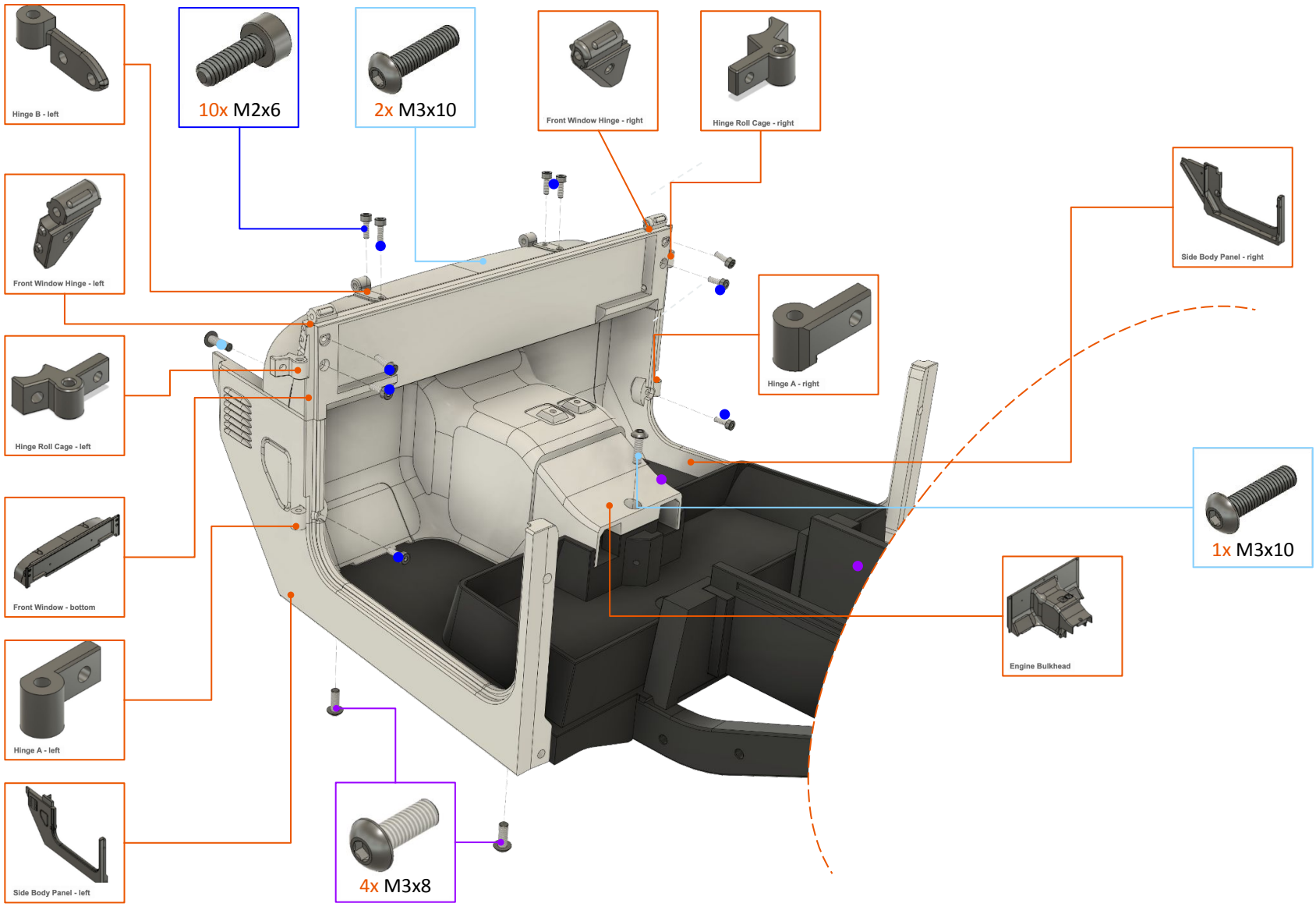
Front Radiator Screen

If you will print the part “Front Radiator Screen” from the .stl file instead of printing from provided gcode, please use following slicer setup:

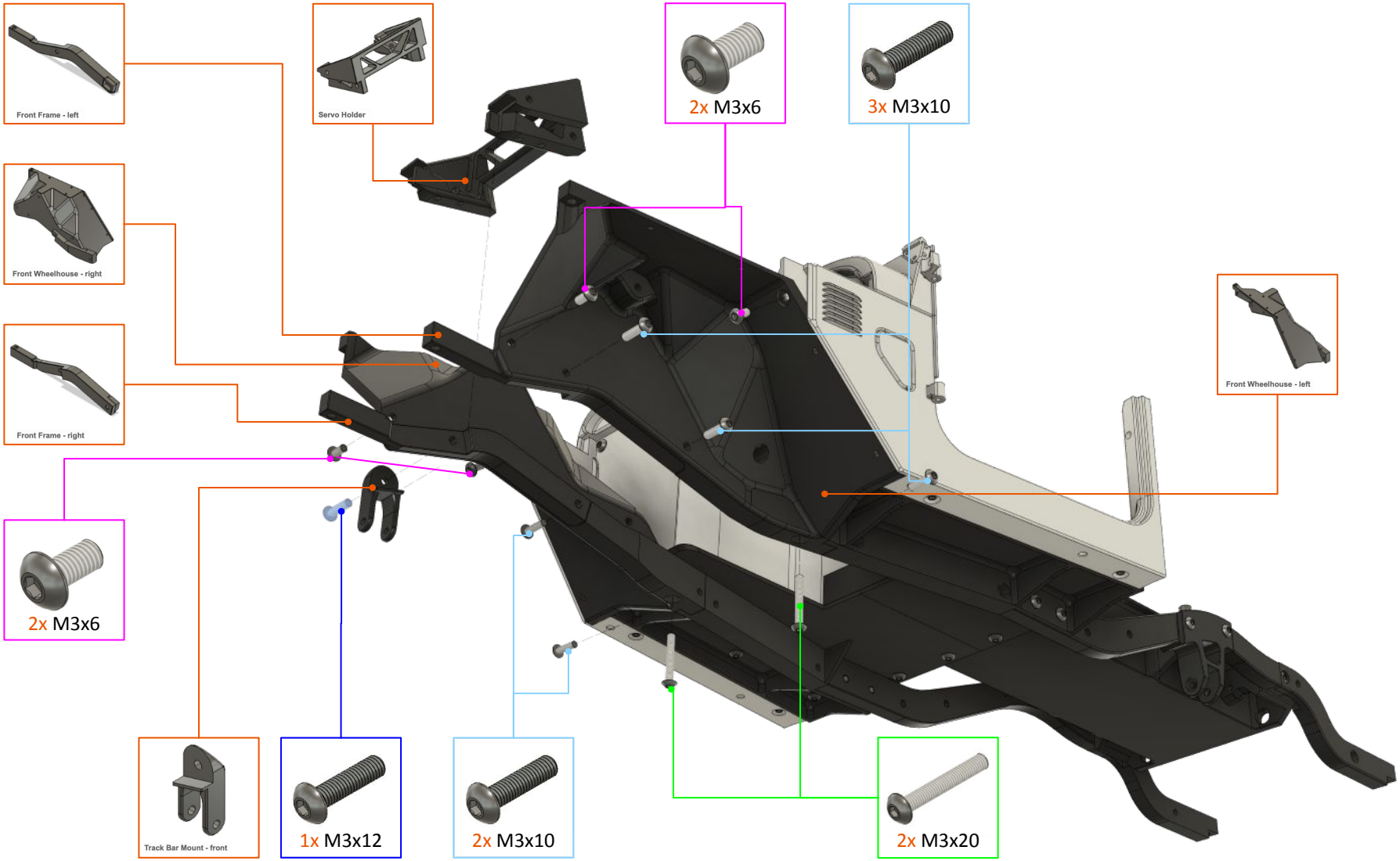
- Solid layers - Top / Bottom (0 layers)
- Infill density: 30%
- Infill type: Honeycomb
- Perimeters: 2



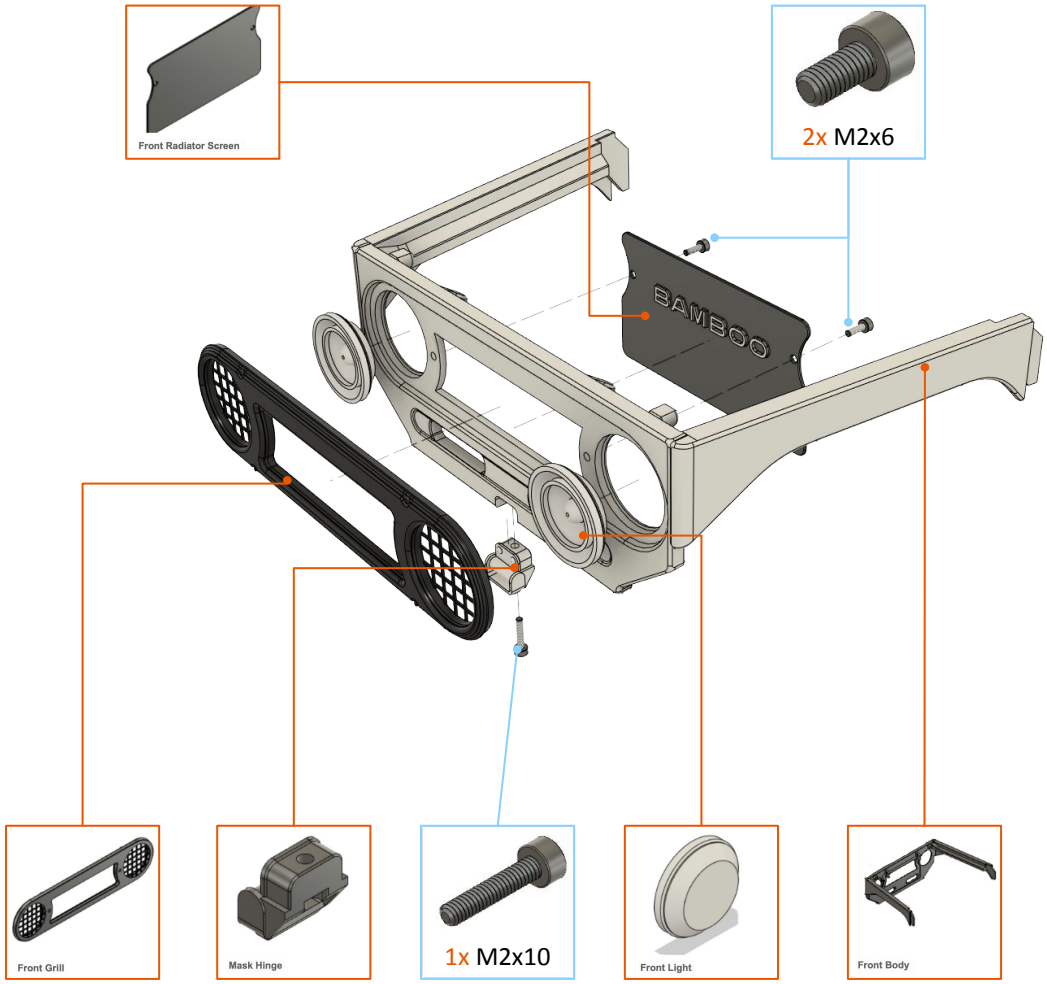
Front Body - step 1/4



Front Body - step 2/4



Front Body - step 3-4/4



Bamboo 4x4 Winch Truck – Interior

In this procedure you will assemble the Interior of the car.

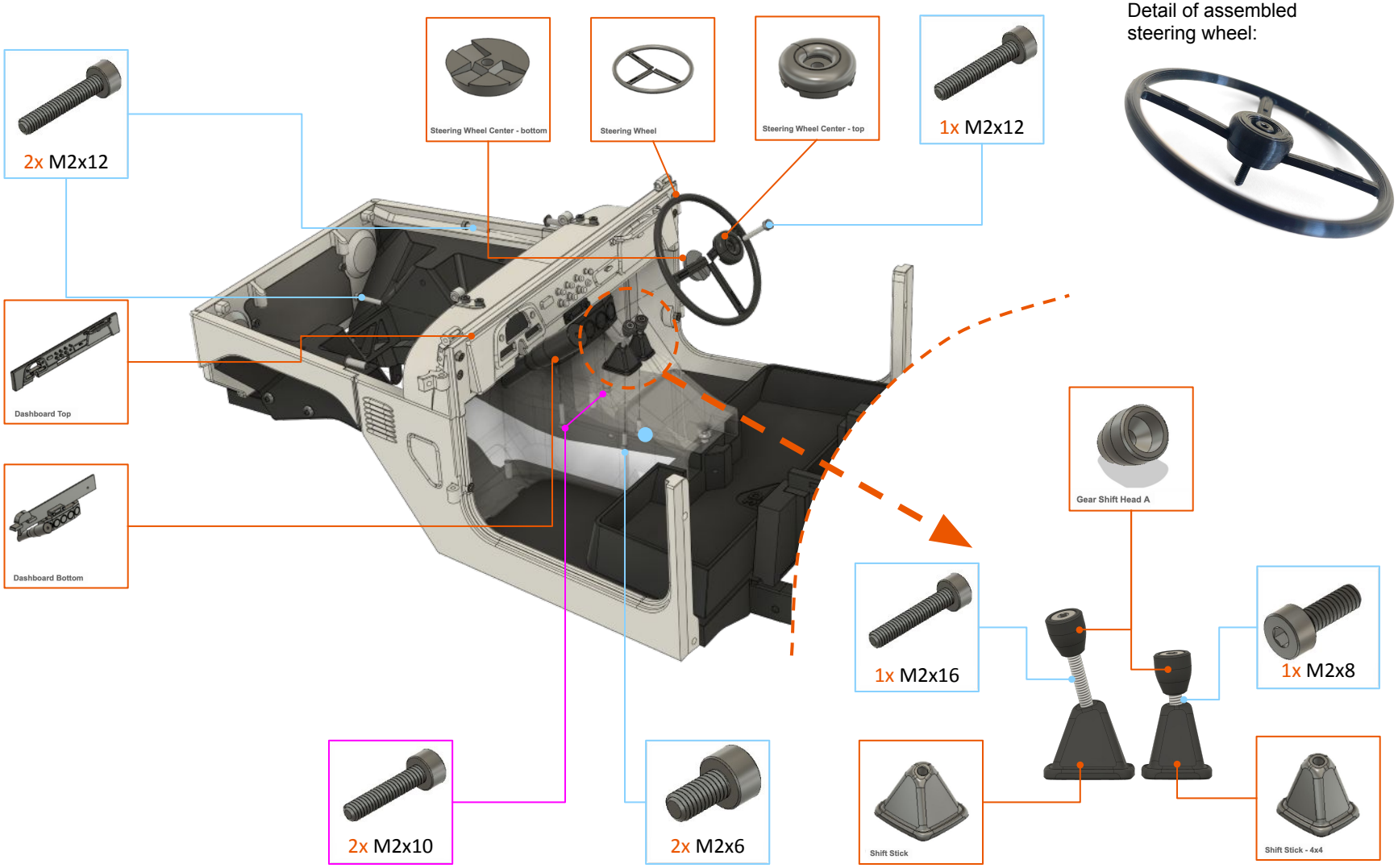
Required print plates:

- “Print 8 - Body 1 + Hinges + Dashboard”
- “Print 12 - Interior 1 + Details 1”

Non-printed parts:

- Screw M2x6: 2 pcs.
- Screw M2x8: 1 pcs.
- Screw M2x10: 2 pcs.
- Screw M2x12: 3 pcs.
- Screw M2x16: 1 pcs.

Interior – step 1/1



Detail of assembled steering wheel:

Bamboo 4x4 Winch Truck – Front Lights & Fenders

In this procedure you will assemble the Lights and Fenders with protection tubes.

Required print plates:

- “Print 11 - Body 4 - Front Body + Fender Flare”
- “Print 13 - Lights 1”
- “Print 15 - Lights 2 + Rear Light Holder + Rear Bumper”
- “Print 20 - Front Fender Tube”
- “Print 21 - Licence Plate rear”

Non-printed parts:

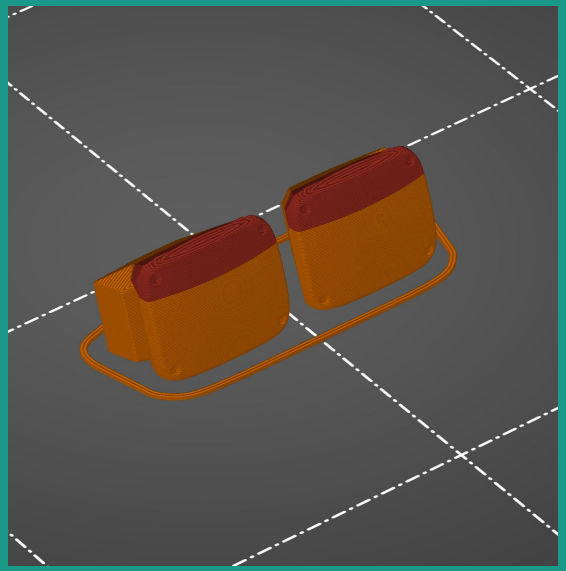
- Screw M2x10: 4 pcs.
- Screw M2x12: 4 pcs.
- Screw M2x16: 2 pcs.

Turn Signal Front Glass:

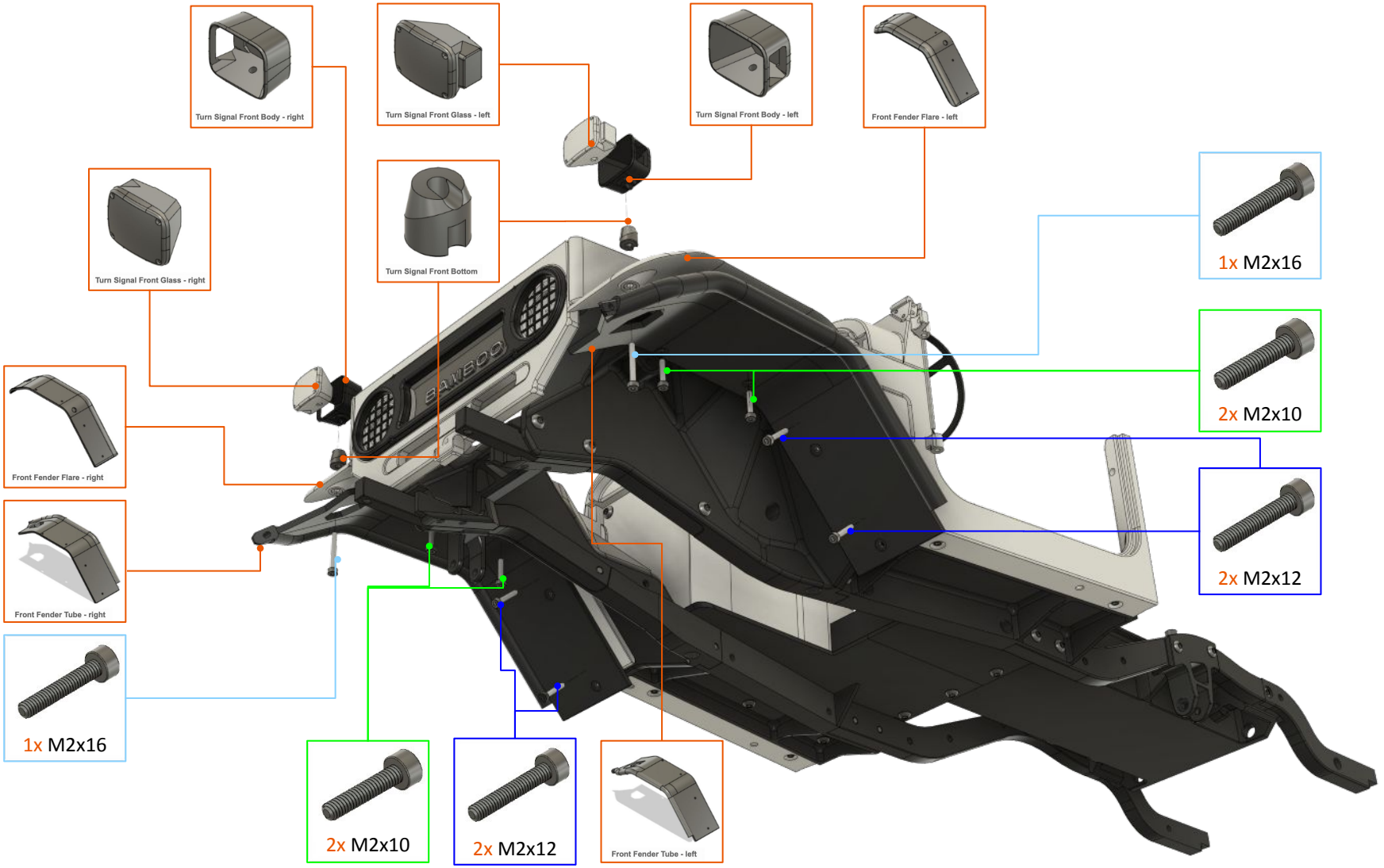
You can print Turn Signal Front Glass with filament changes to achieve color results. Please, setup filament changes in layer heights described below (setup is for layer height 0,15mm):

Turn Signal Front Glass:

- Layer 66 - height 9,95mm



Front Lights installation 1/1



Bamboo 4x4 Winch Truck Hood & Front Window

In this procedure you will assemble the Window of the car and Hood.

Required print plates:

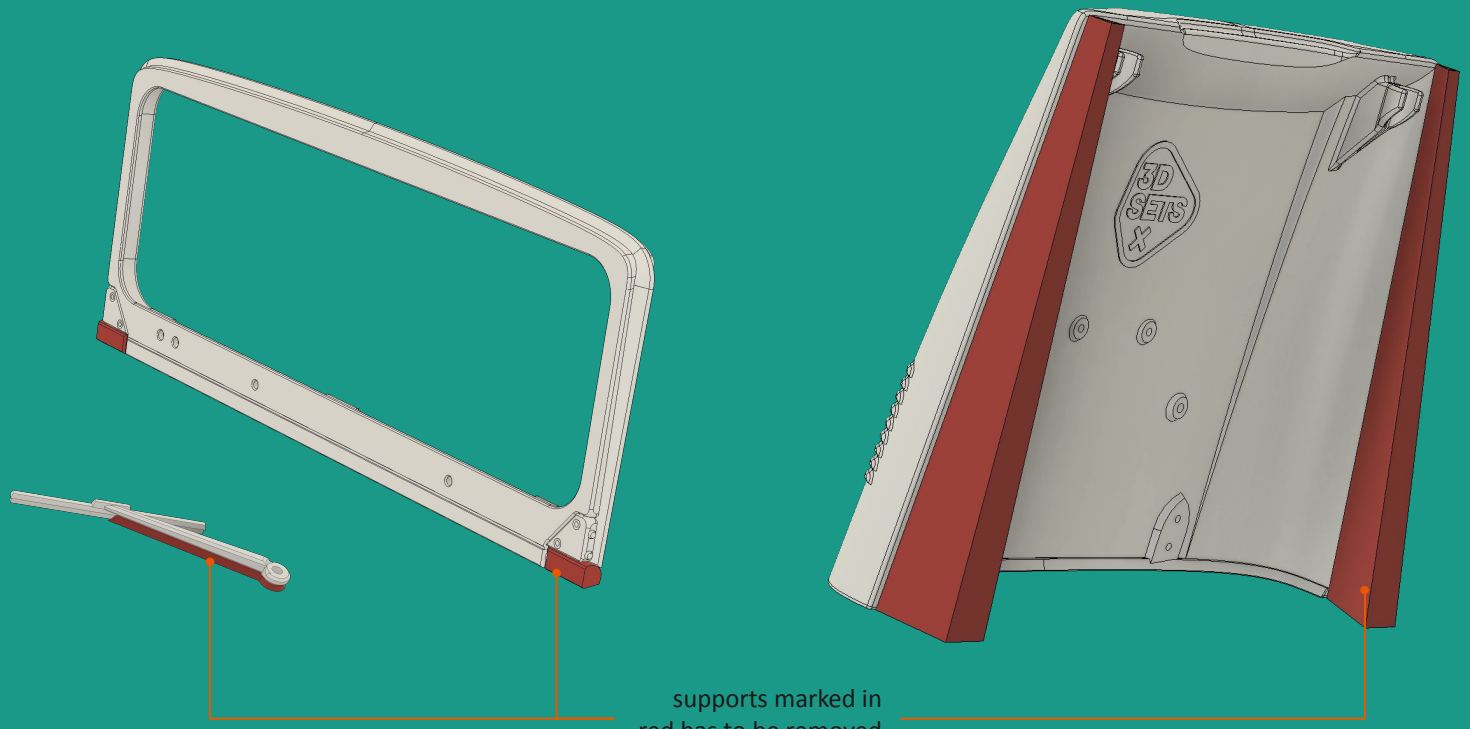
- “Print 16 - Body 5 - Hood”
- “Print 17 - Body 6 - Front Window + Side Step”
- “Print 18 - Front Window Frame + Switch Holder”
- “Print 27 - Details 2”

Non-printed parts:

- Screw M2x6: 8 pcs.
- Screw M2x8: 2 pcs.
- Screw M2x10: 2 pcs.
- Screw M2x16: 2 pcs.

Postprocessing – removing supports

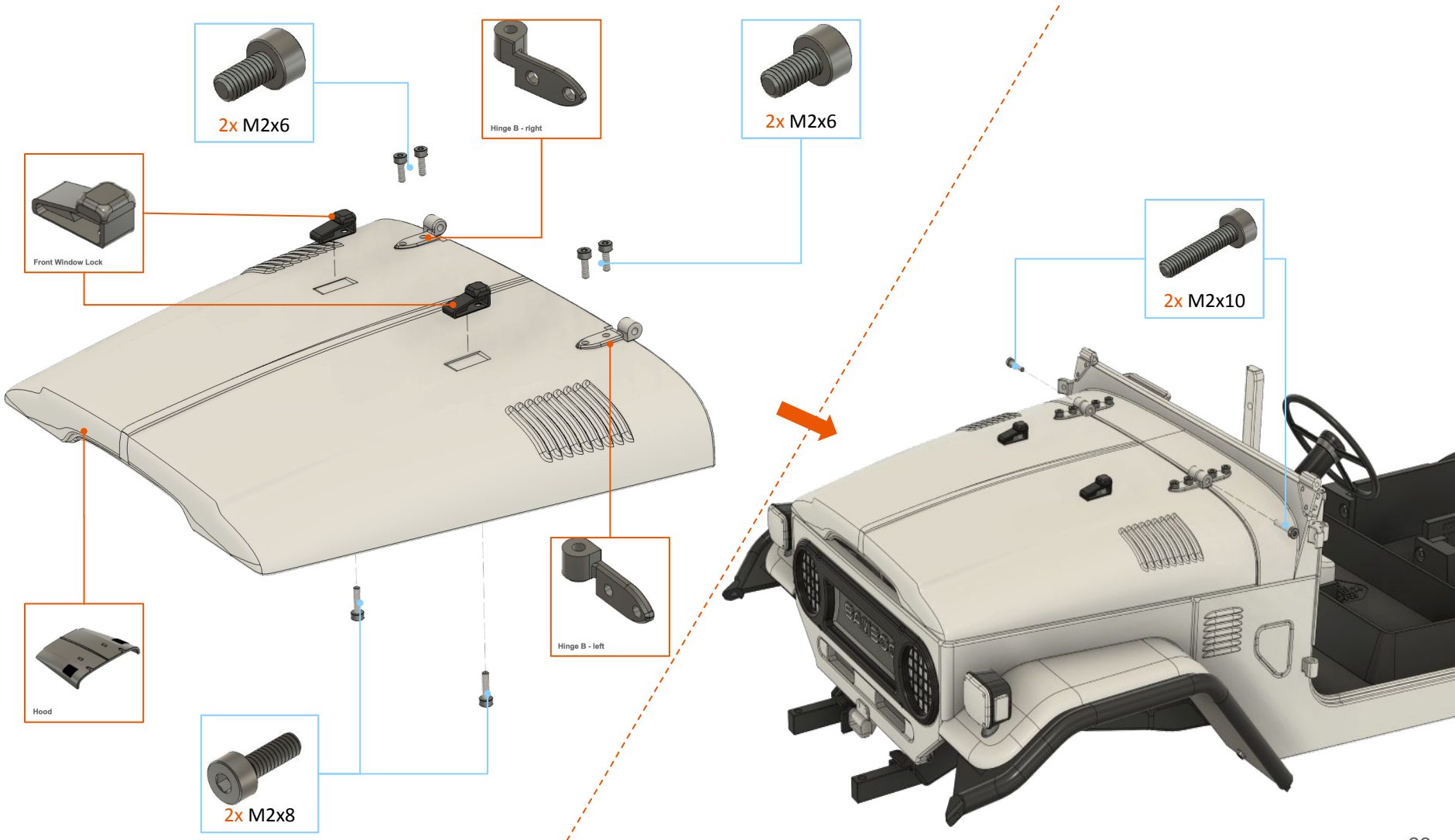
Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



Postprocessing – drilling holes

Please carefully drill through the marked holes that have not been printed through to make printing easier.

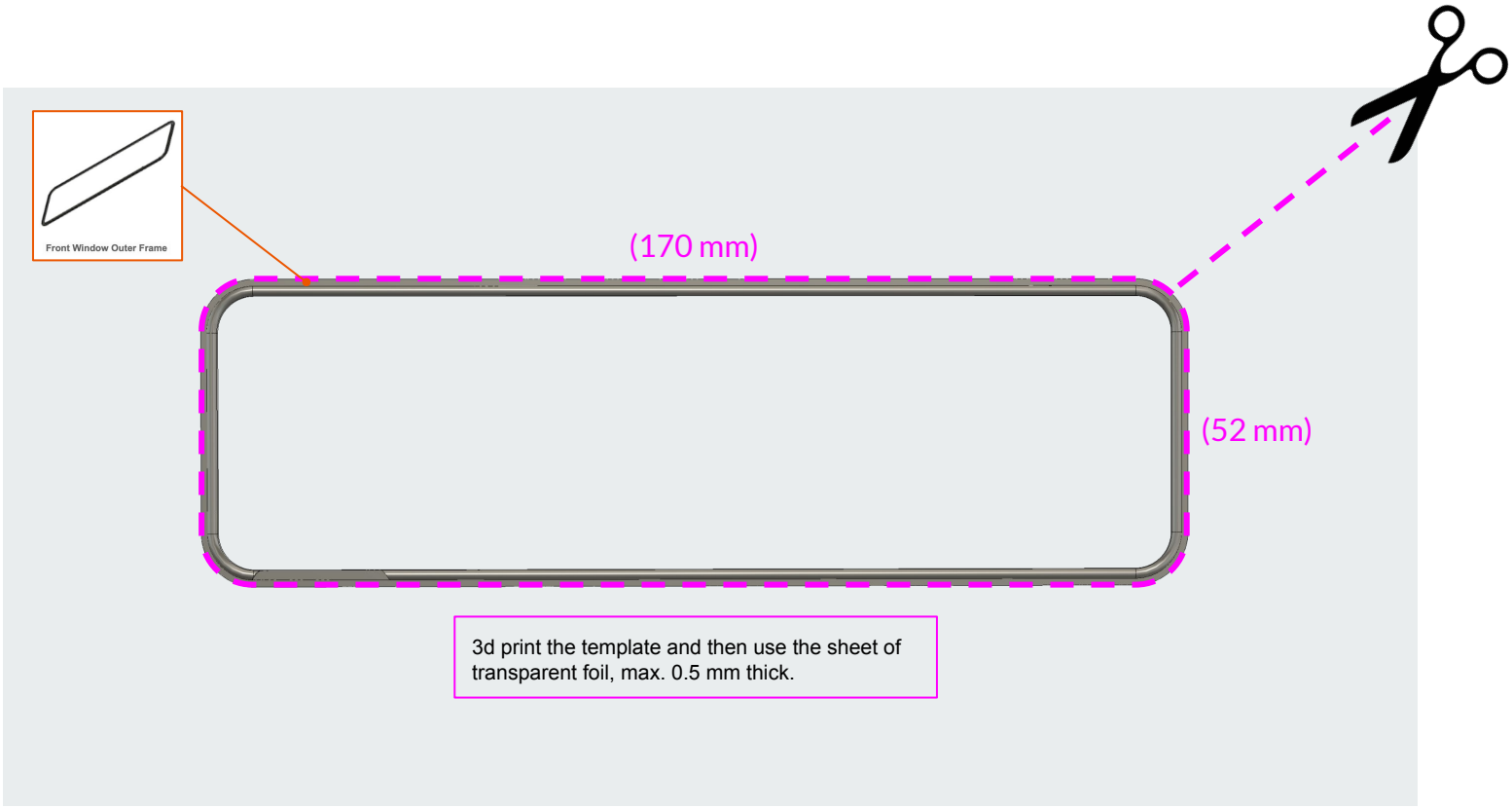
Hood – step 1-2/2



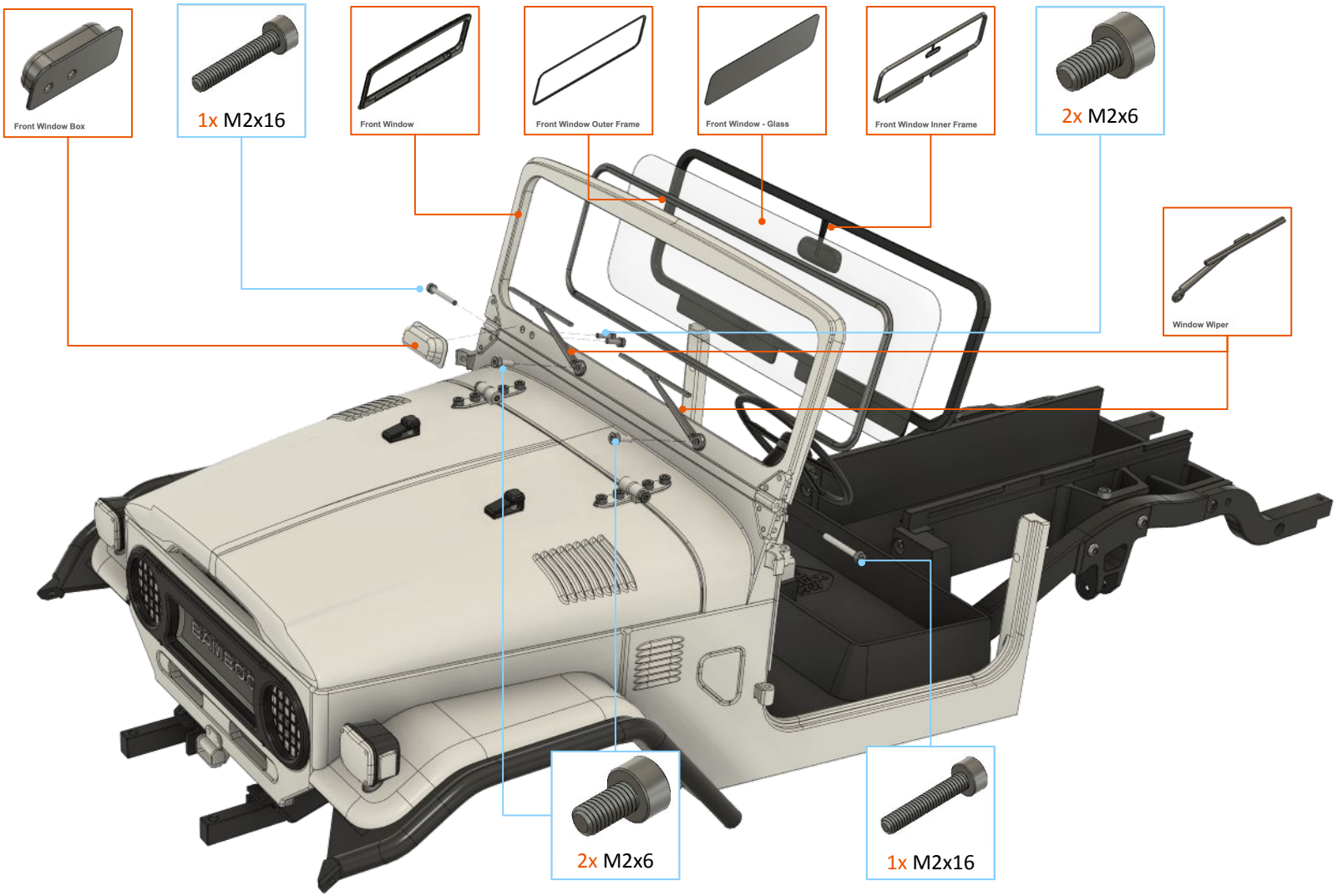
Front Window Glass

At first, you will make a “glass” from any transparent foil up to 0.5 mm thick. Thicker material is more durable than thinner, but we found that “Clear Binding Covers” are OK.

Place the printed template on the foil, sketch the shape to foil and then cut the foil by scissors or sharp knife.



Front Window 1/1



Bamboo 4x4 Winch Truck – Roof

In this procedure you will assemble the Rear Body of the car and Roof.

Required print plates:

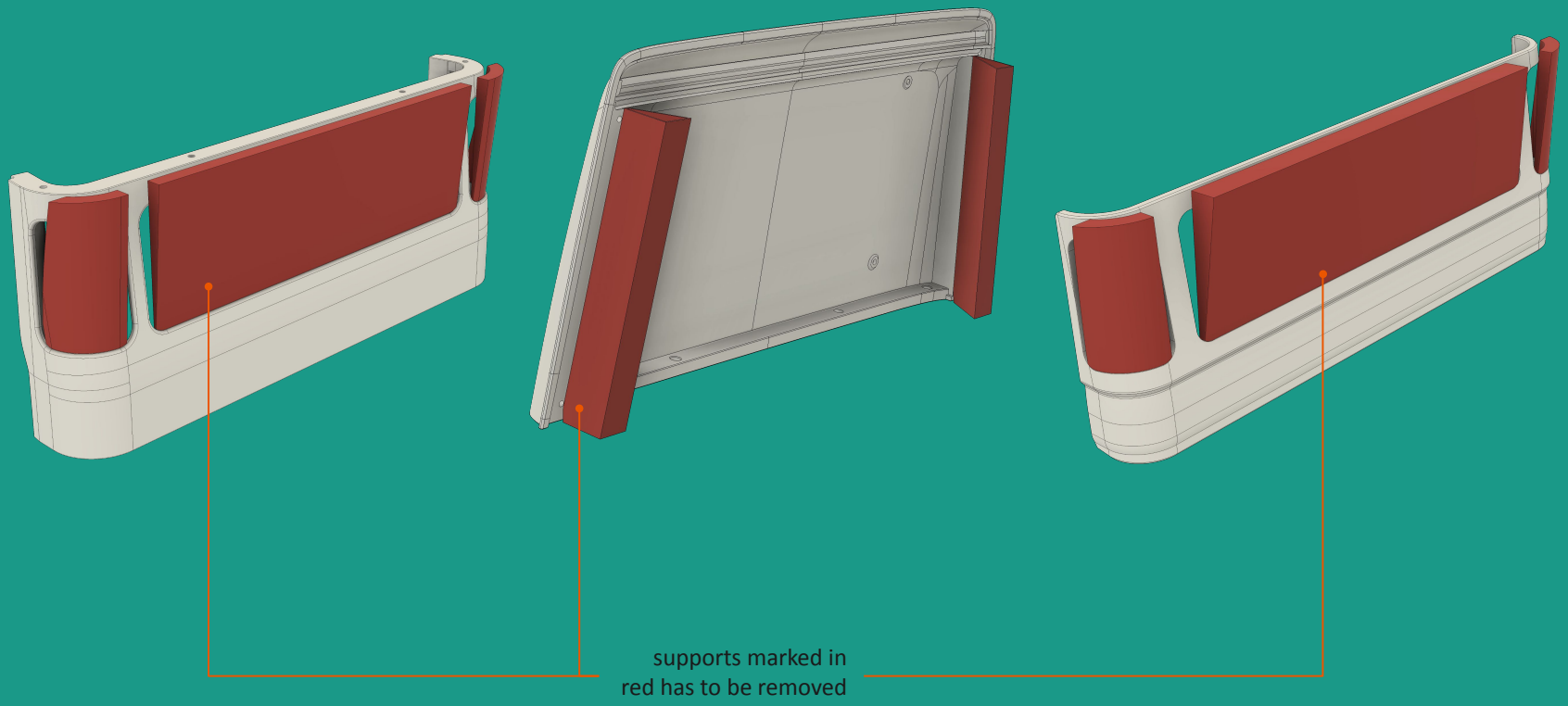
- “Print 22 - Rear Body + Upper Bar”
- “Print 23 - Rear Window”
- “Print 24 - Rear Window Inner Frame!
- “Print 25 - Window Glass - template”
- “Print 26 - Roof”

Non-printed parts:

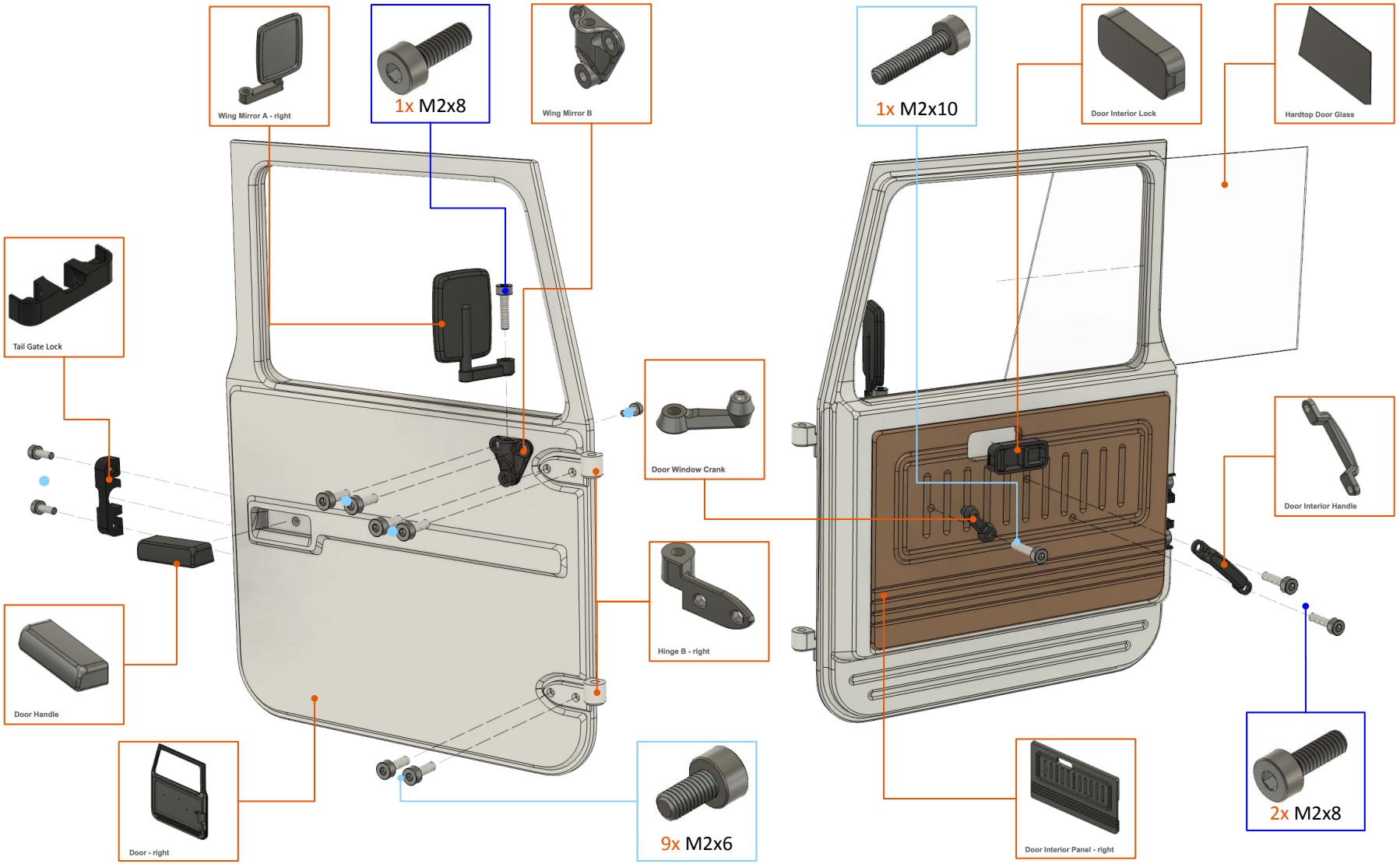
- Screw M2x6: 8 pcs.
- Screw M2x10: 4 pcs.
- Screw M3x8: 4 pcs.
- Screw M3x10: 2 pcs.
- Screw Socket Head M3x10: 2 pcs.
- Screw M3x12: 2 pcs.

Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!

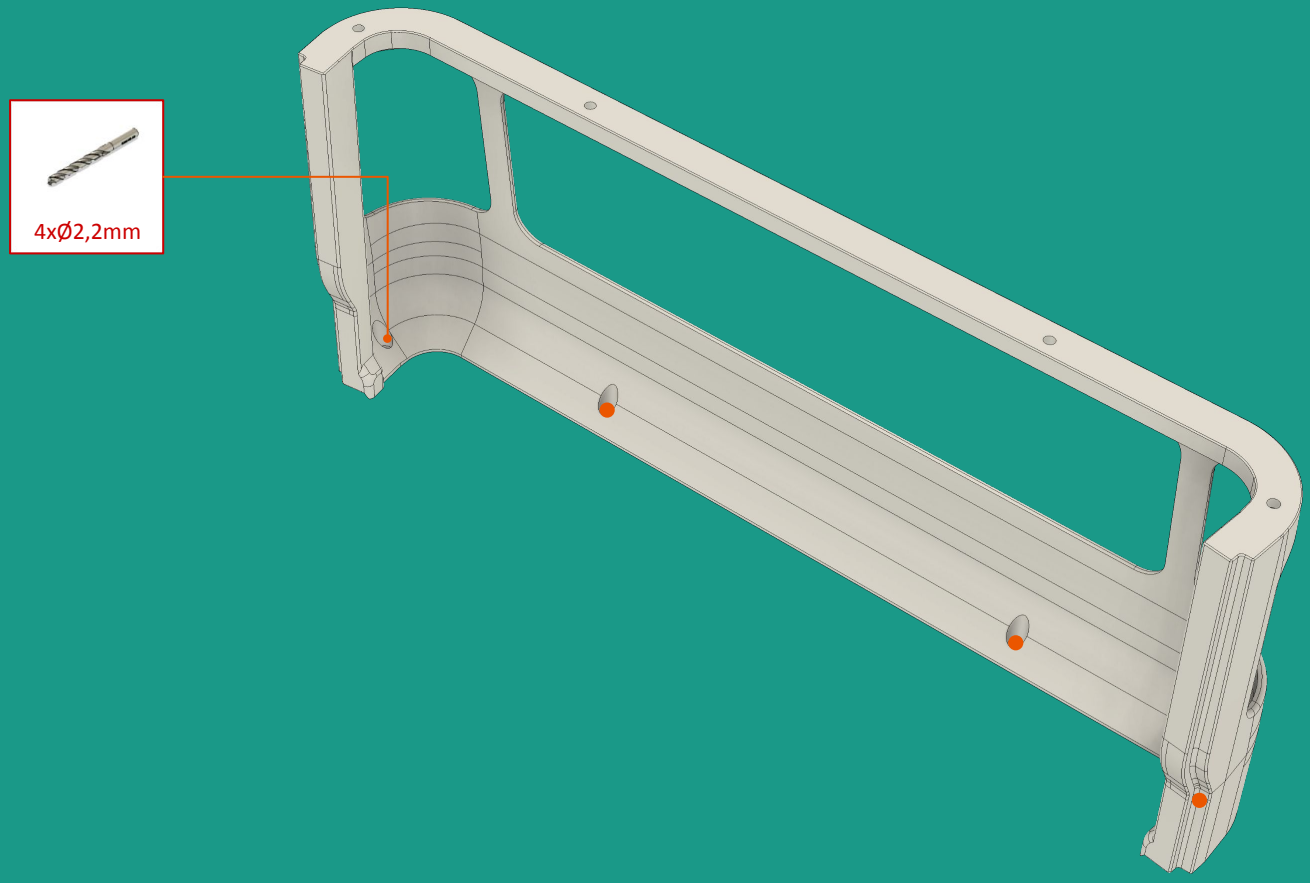


Door – right


Wing Mirror A - right
1x M2x8
Wing Mirror B
1x M2x10
Door Interior Lock
Hardtop Door Glass
Tail Gate Lock
Door Window Crank
Door Interior Handle
Hinge B - right
Door Handle
Door - right
9x M2x6
Door Interior Panel - right
2x M2x8

Postprocessing – drilling holes

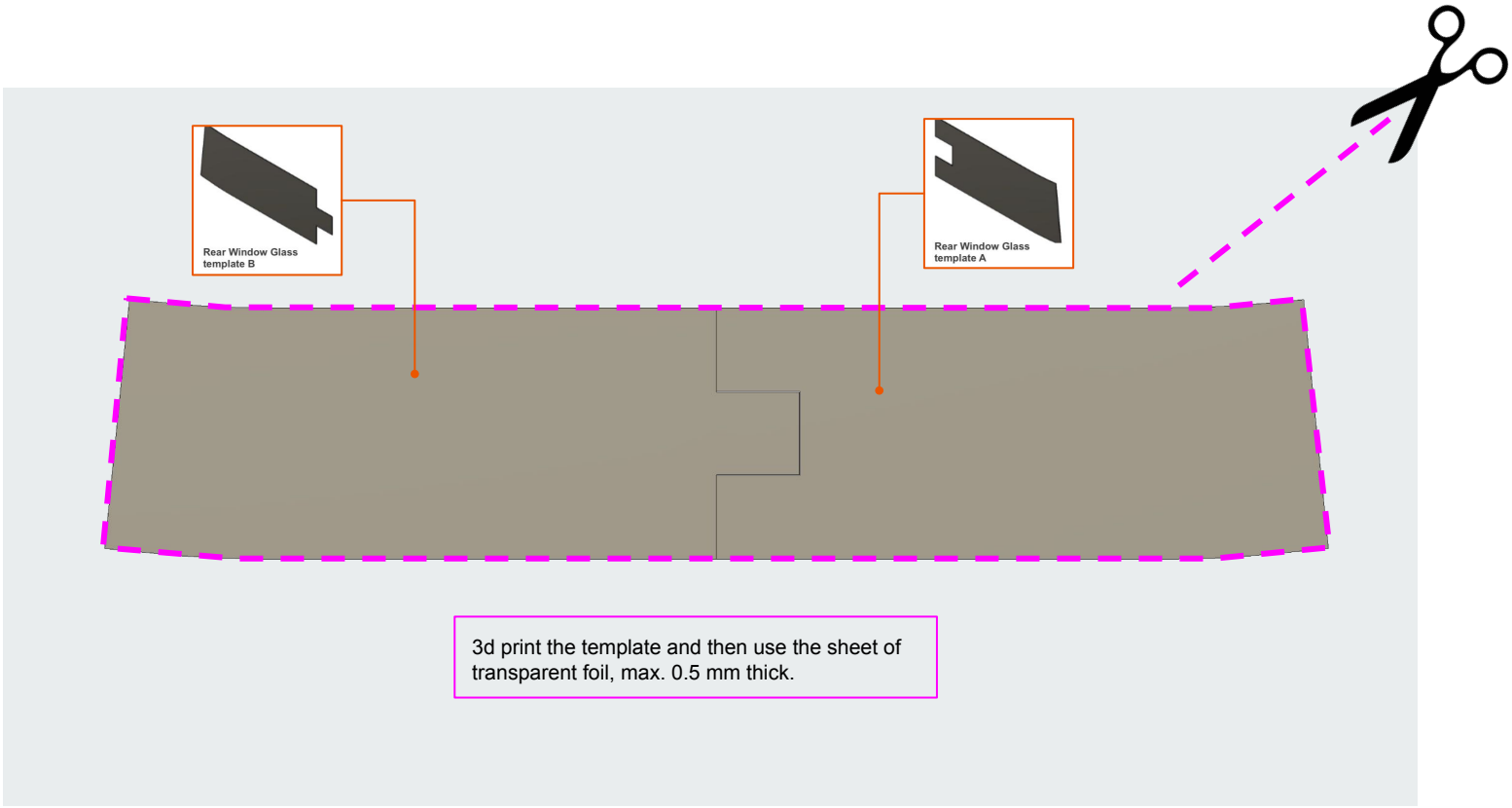
Please carefully drill through the marked holes that have not been printed through to make printing easier.



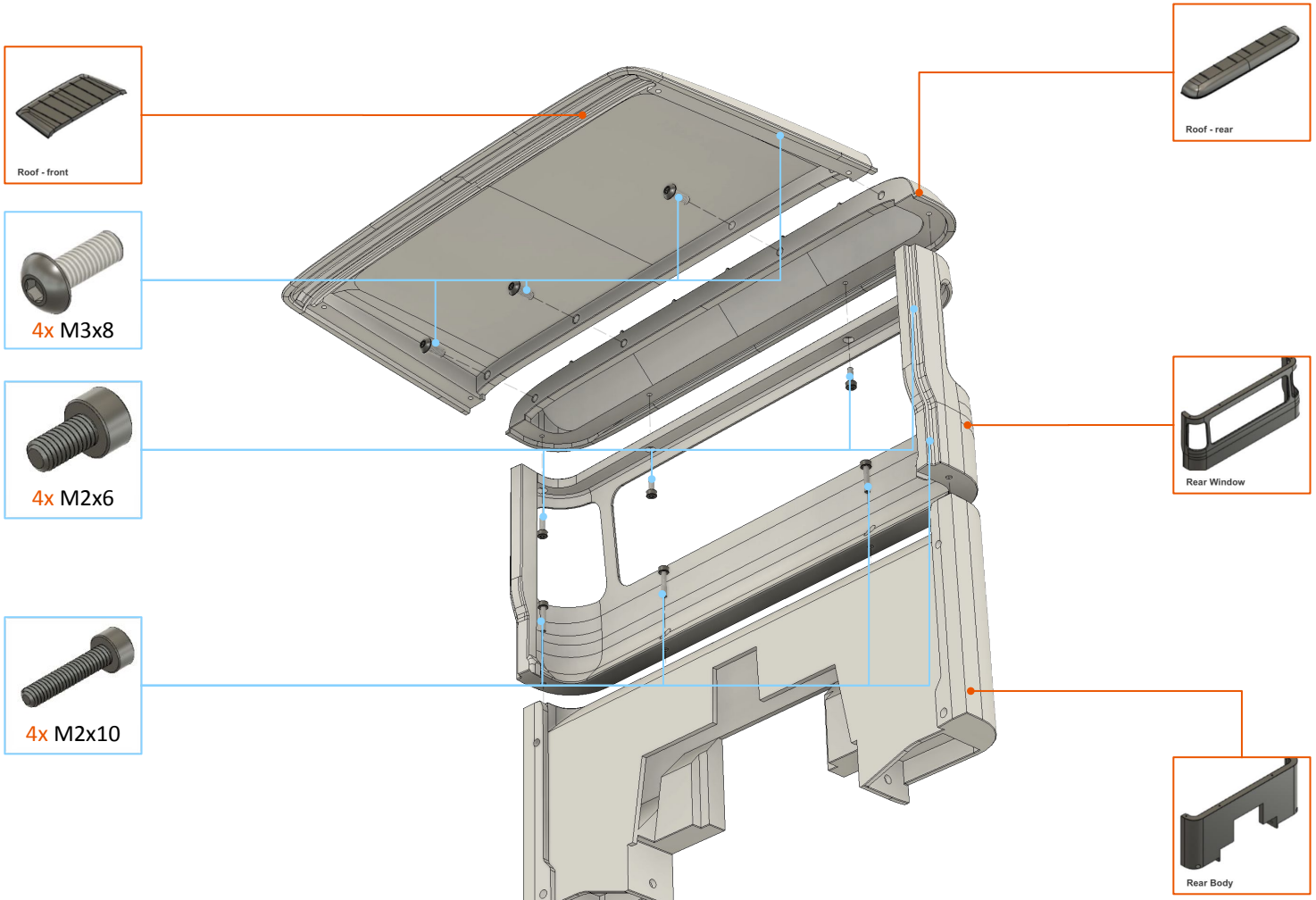
Rear Window Glass

At first, you will make a “glass” from any transparent foil up to 0.5 mm thick. Thicker material is more durable than thinner, but we found that “Clear Binding Covers” are OK.

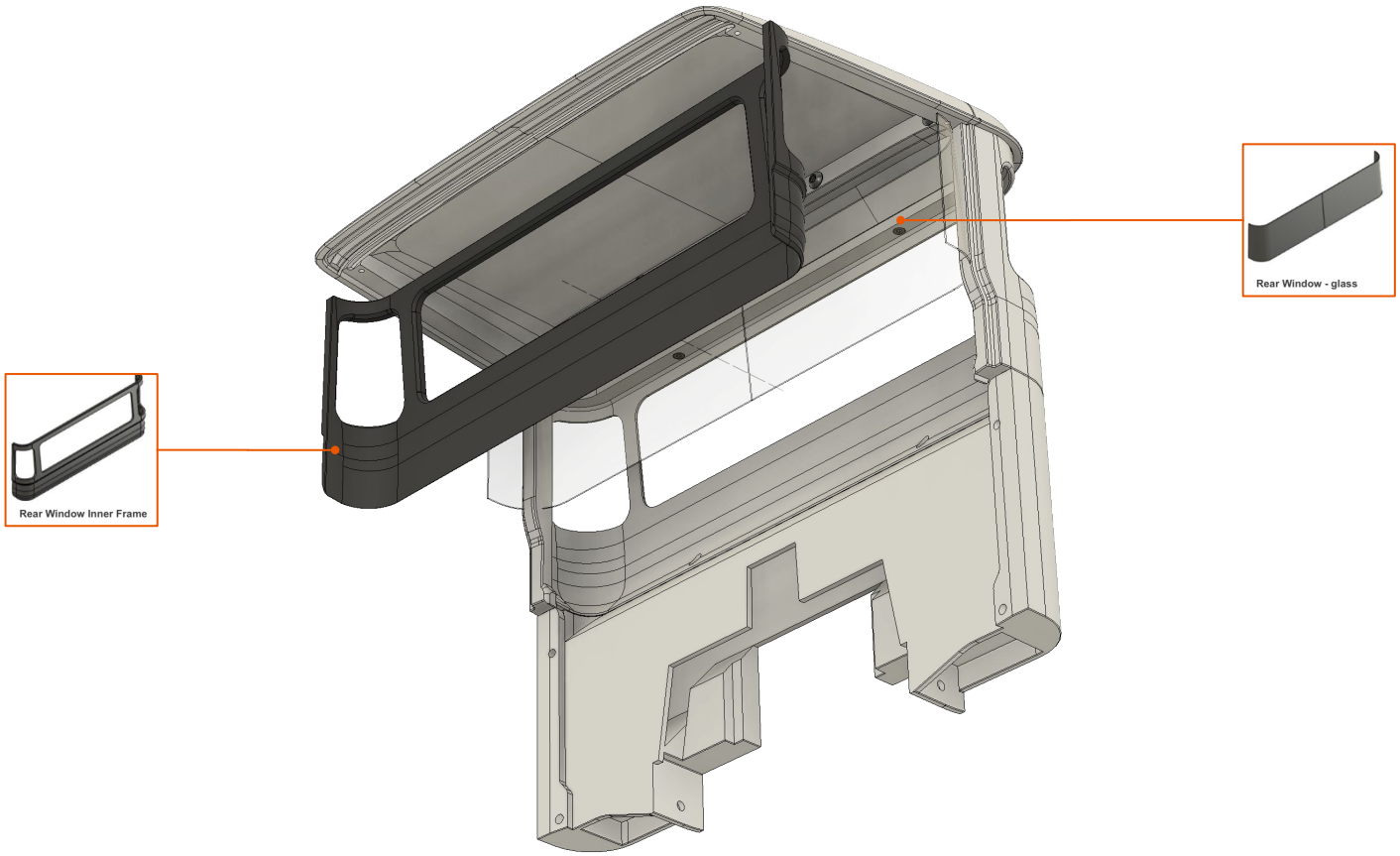
Place the printed template on the foil, sketch the shape to foil and then cut the foil by scissors or sharp knife.



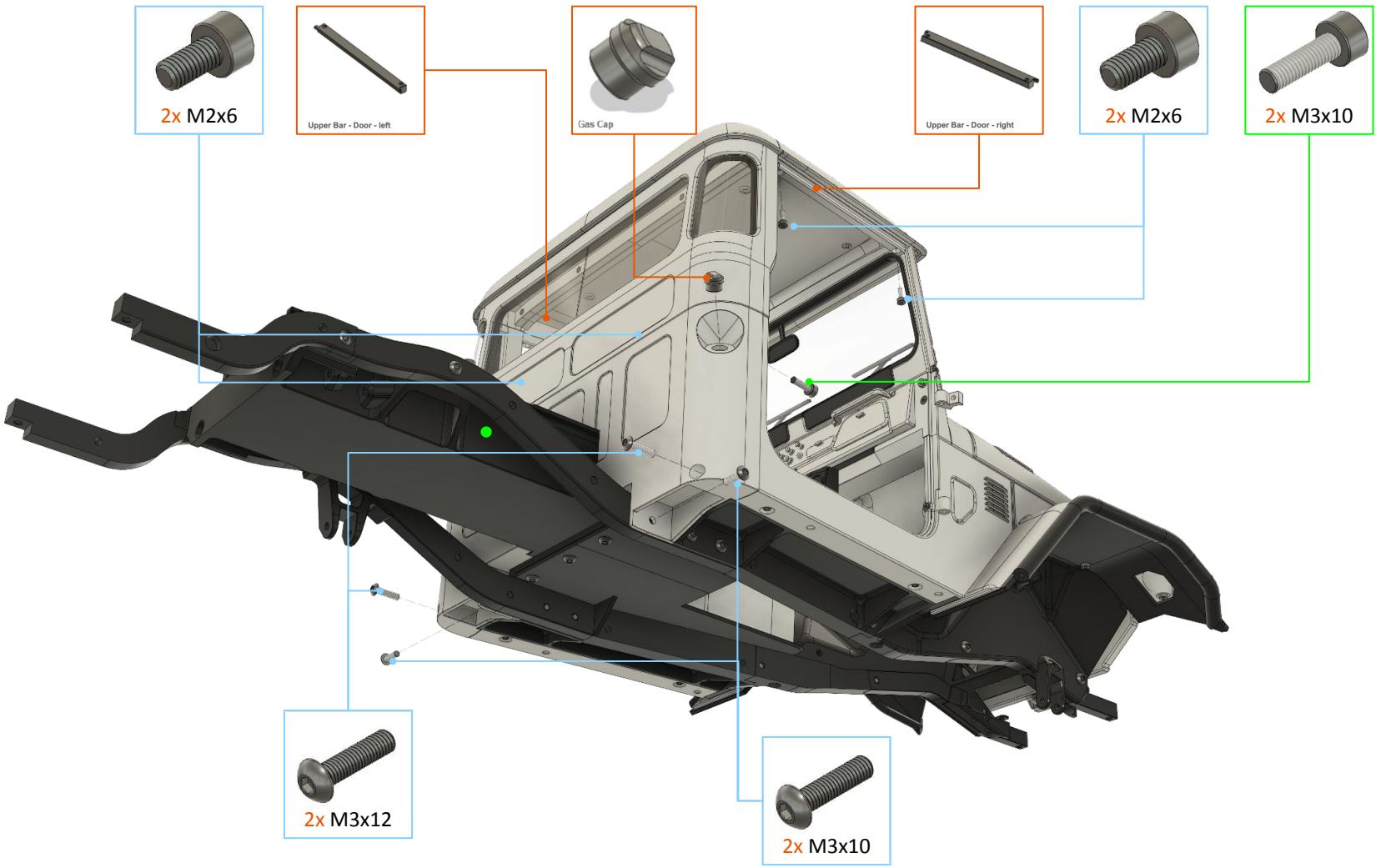
Roof & Rear Body - step 1/3



Roof & Rear Body - step 2/3



Roof & Rear Body - step 2/2



Bamboo 4x4 Winch Truck – Front Bumpers & Side Support

In this procedure you will assemble the Front Bumper and rear reinforcements

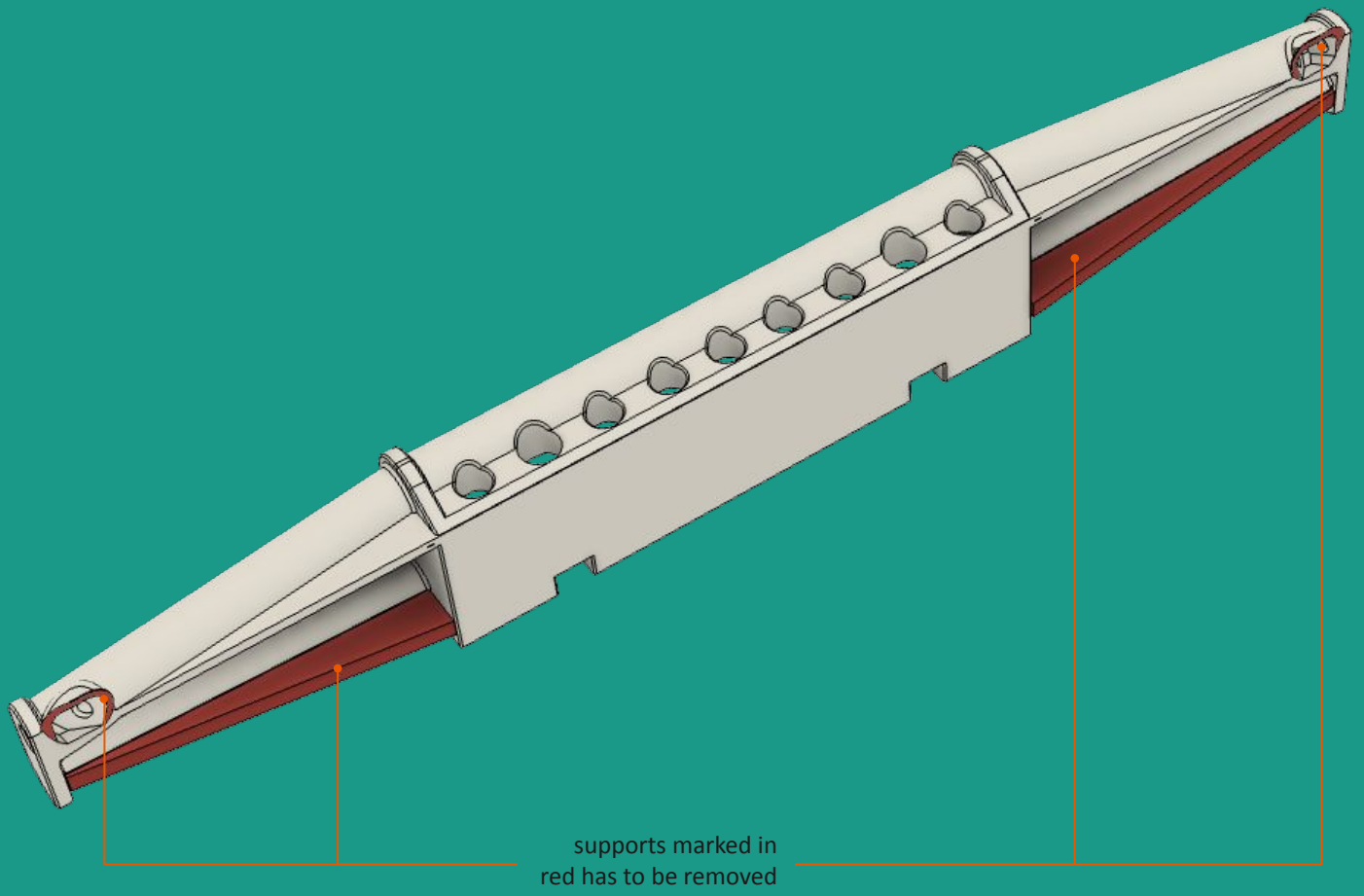
Required print plates:

- “Print 6 - Chassis 6”
- “Print 28 - Details 2”
- “Print 28 - Front Bumper”
- “Print 29 - Servo Protection Plate”
- “Print 30 - D-Ring Shackle”
- “Print 32 - Side Support”

Non-printed parts:

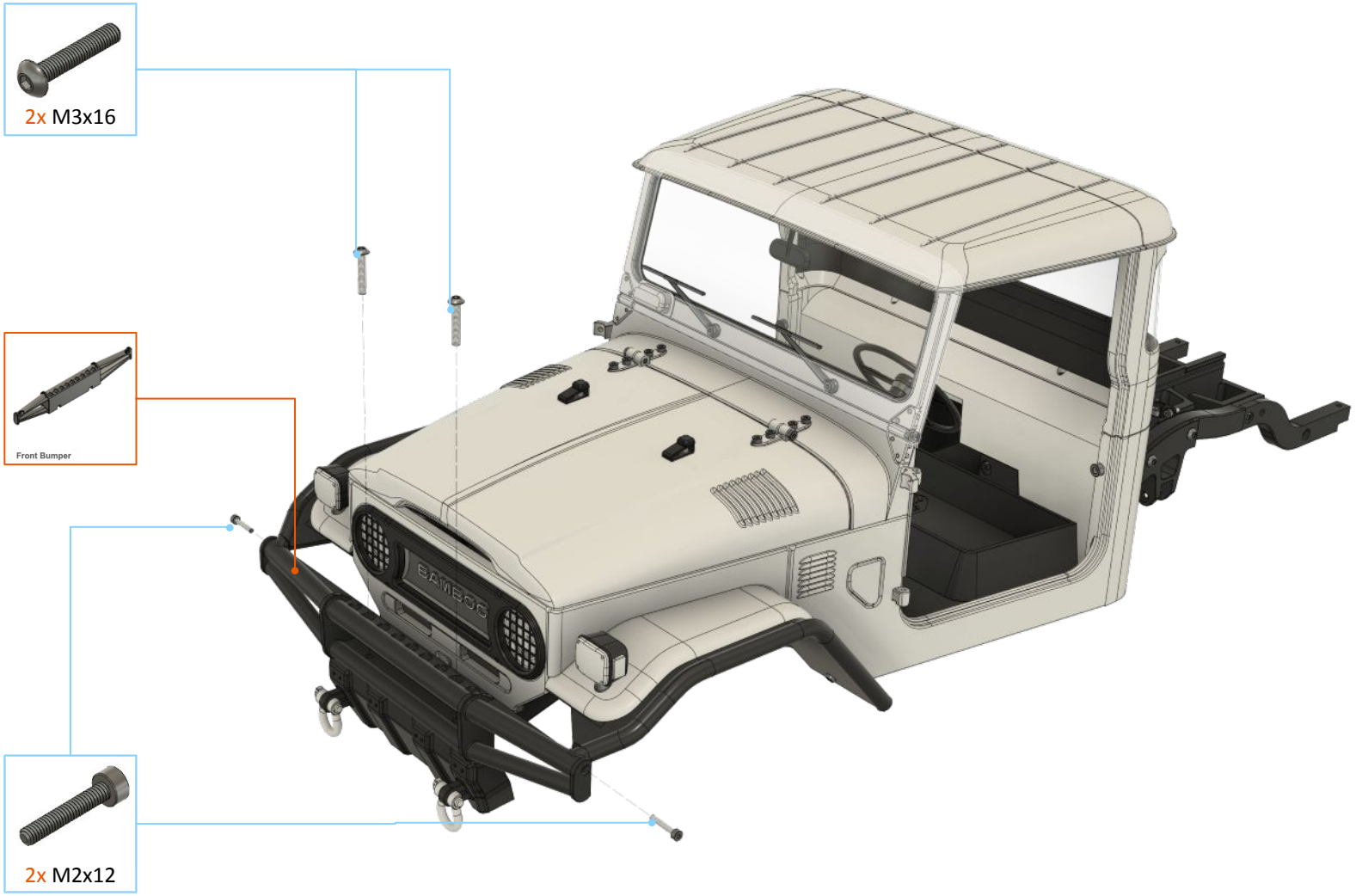
- Screw M2x12: 4 pcs.
- Screw M3x6: 1 pcs.
- Screw M3x12: 4 pcs.
- Screw M3x16: 2 pcs.

Postprocessing – removing supports

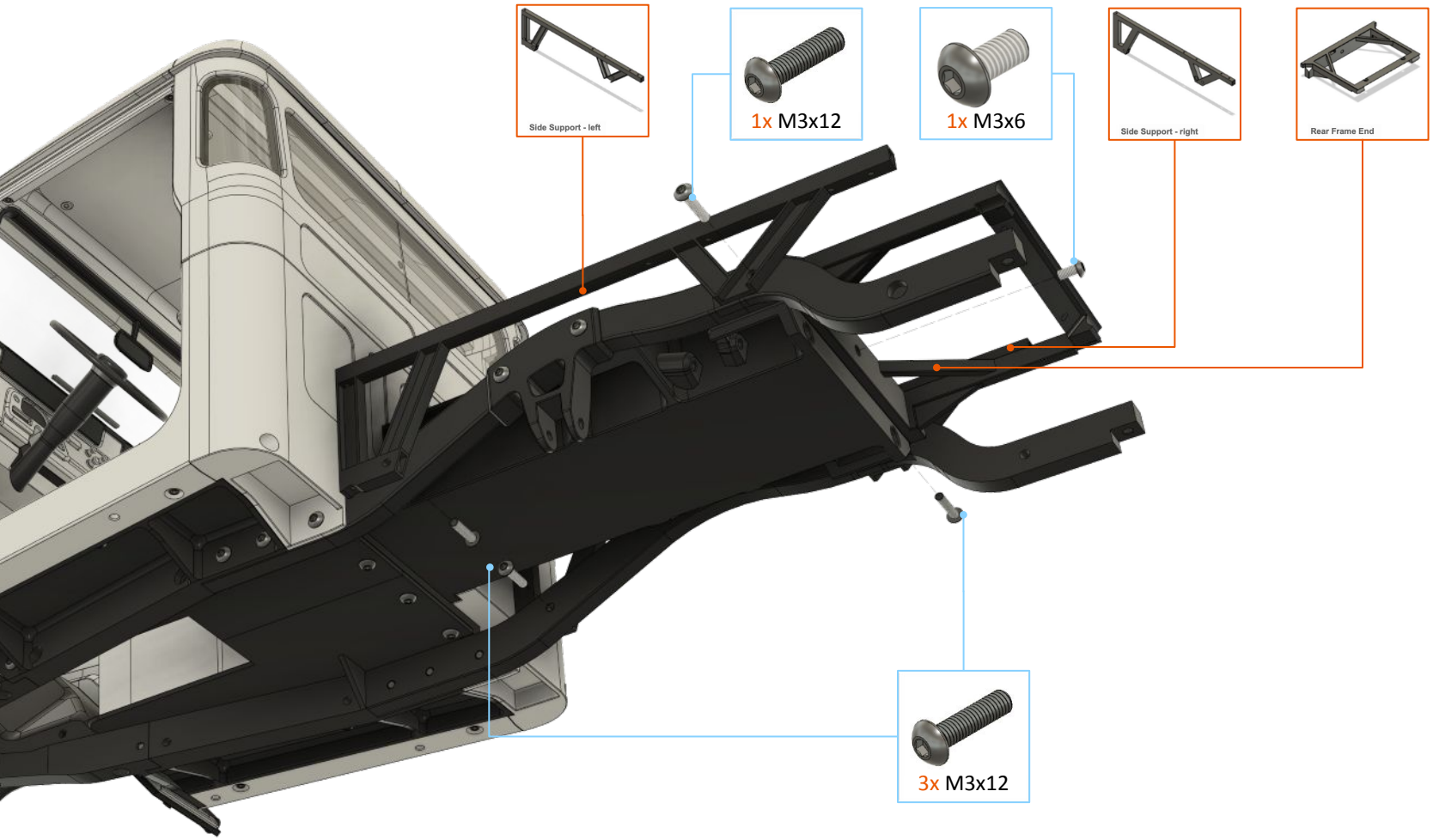


Front Bumper - step 1/2

Front Bumper - step 2/2



Rear Reinforcements - step 1/1



Bamboo 4x4 Winch Truck – Rear Lights

In this procedure you will assemble the rear lights

Required print plates:

- “Print 13 - Lights 1”
- “Print 15 - Lights 2 + Rear Light Holder + Rear Bumper”
- “Print 21 - Licence Plate rear - change filament”

Non-printed parts:

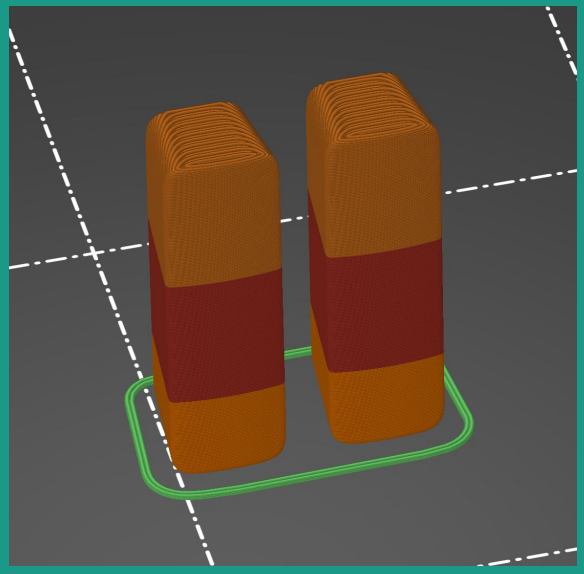
- Screw M2x10: 4 pcs.
- Screw M2x12: 2 pcs.
- Screw M3x8: 4 pcs.

Rear Lights:

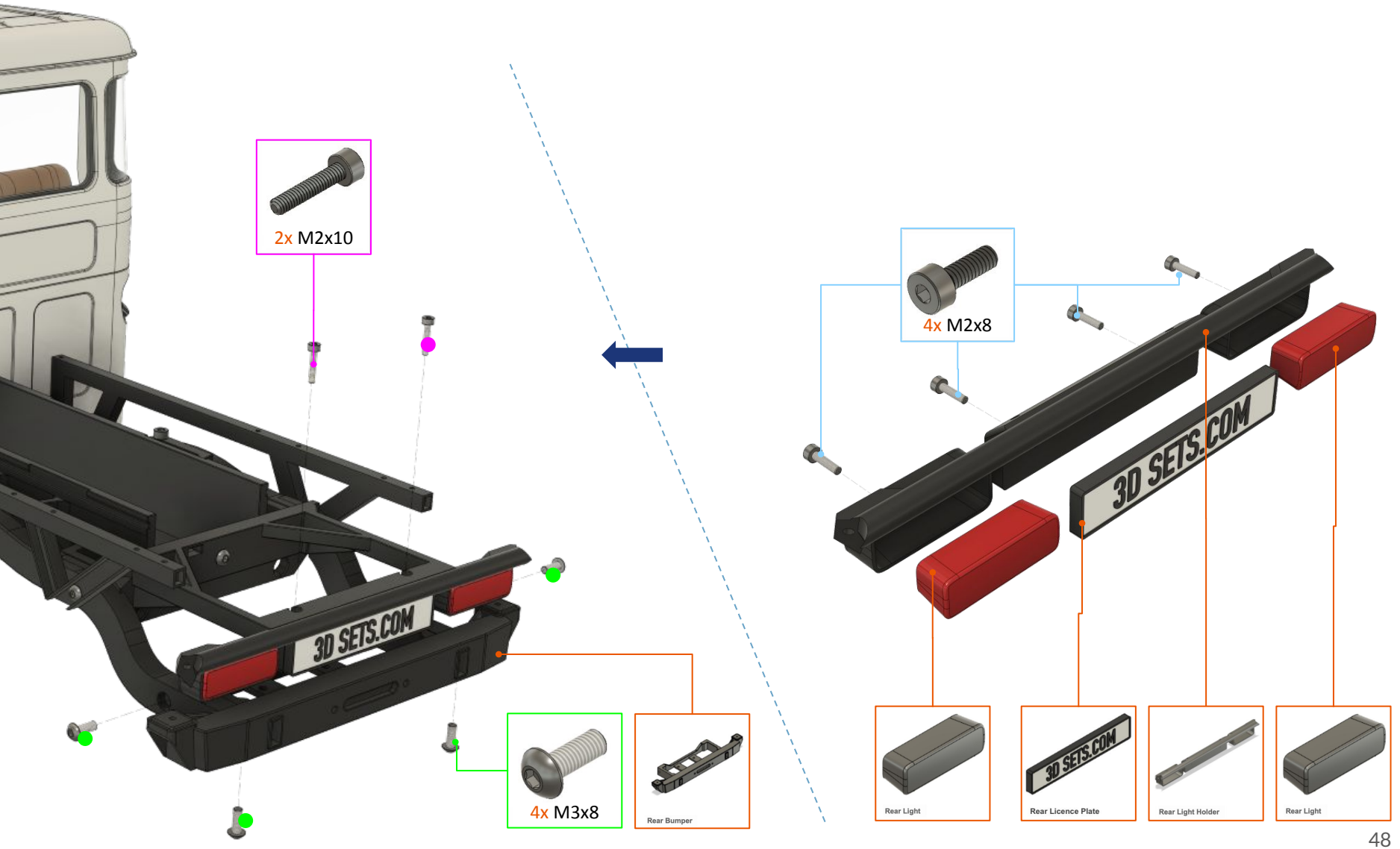
You can print Rear Lights with filament changes to achieve color results. Please, setup filament changes in layer heights described below (setup is for layer height 0,15mm):

Rear Lights:

- Layer 51 - height 7,7mm
- Layer 128 - height 19,25mm



Rear Lights - step 1/1



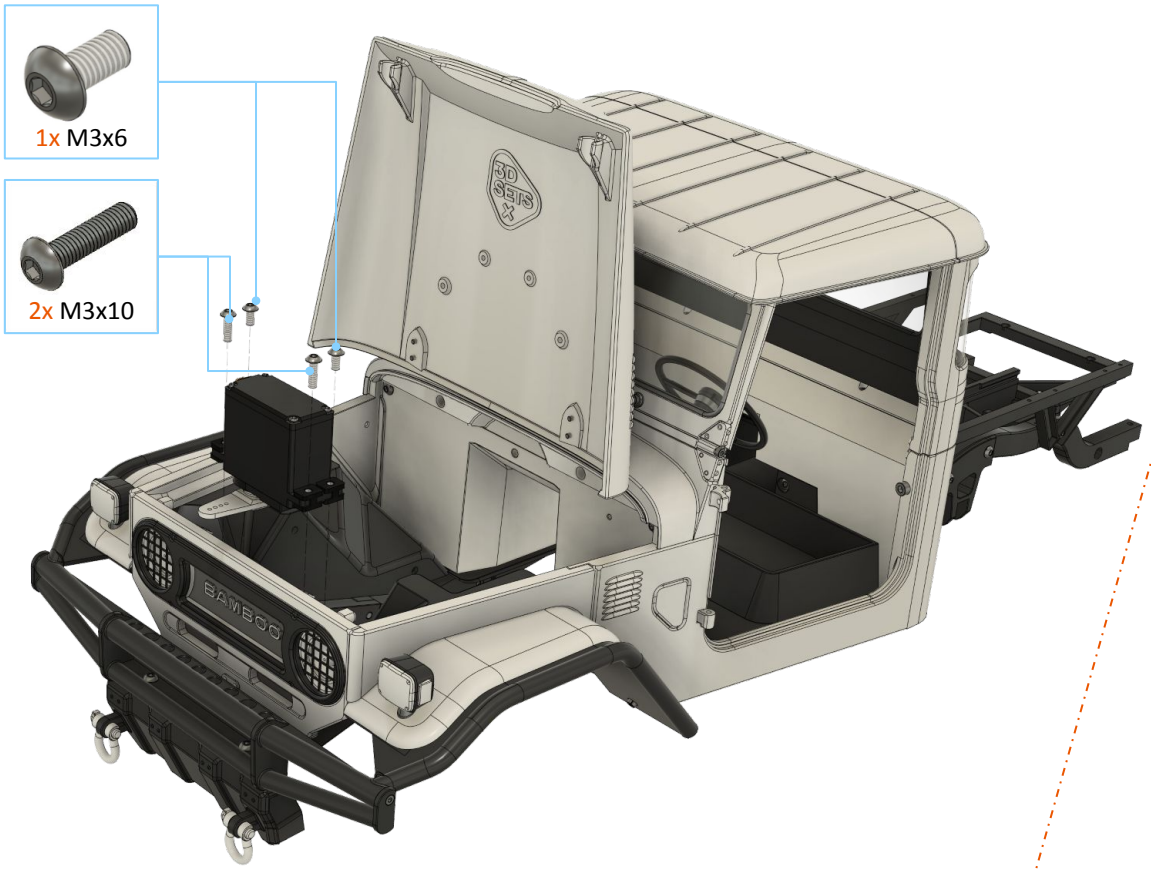
Bamboo 4x4 Winch Truck – Steering Servo Installation

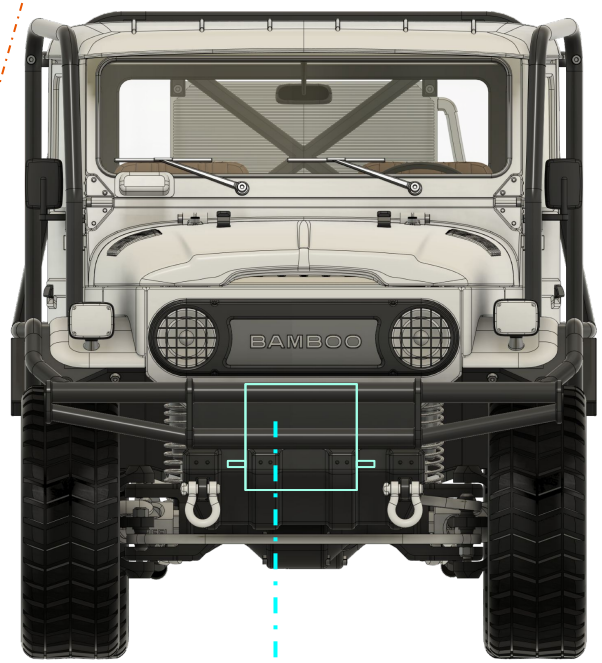
In this procedure install electronic steering servo.

Non-printed parts:

- Screw M3x6: 2 pcs.
- Screw M3x10: 2 pcs.
- Steering Servo

Steering Servo Installation 1/1





Axle Arms

In this procedure you will assemble the Axle Arms and Steering Rods. These parts consists of “arms” and “ball joints” and they need to be pressed together.

Required print plates:

- “Print 0 - Calibration”
- “Print 1 - Chassis 1”

Non-printed parts:

- Grease
- Any Hammer or Vise (for pressing)

Arms + Ball joints

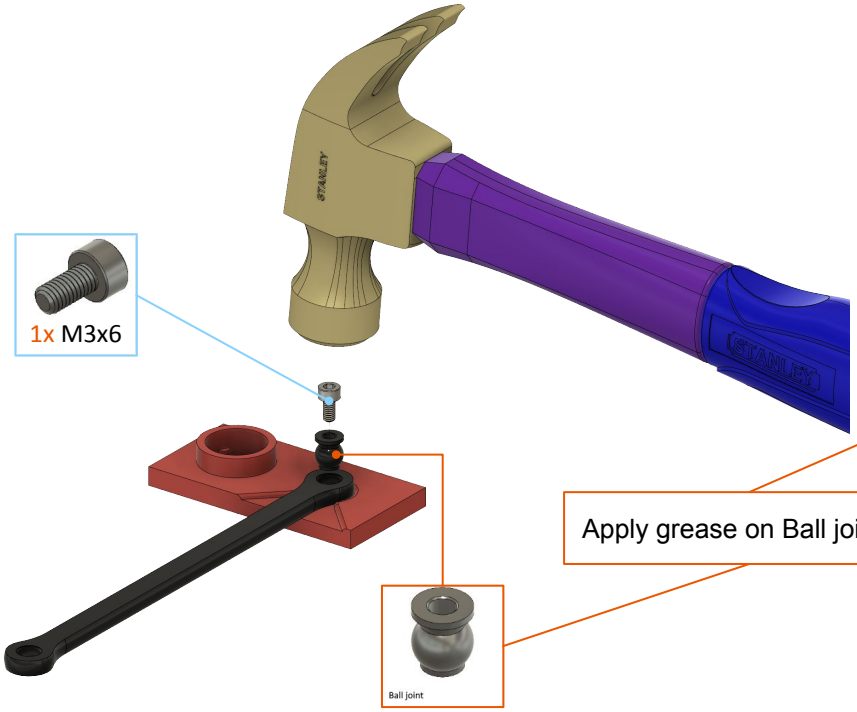
Press Ball joints in arm ends. Pay attention to combine parts correctly!
Ball joints requires correct orientation on specific arms – check next page!

Option A: use a hammer

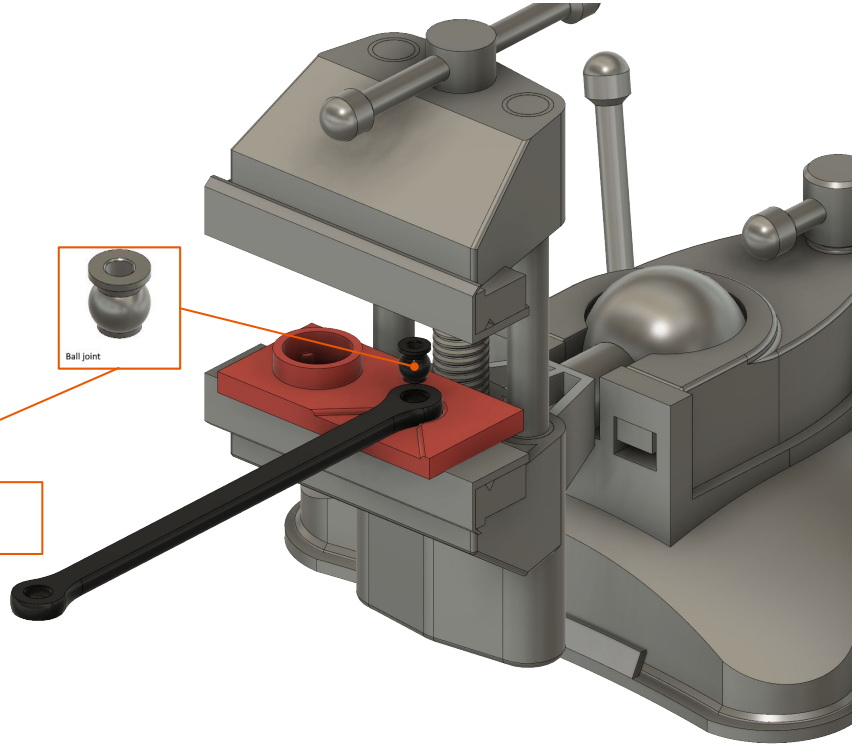
Be careful as you can break the arm if you use too much force!

Option B: use a Vise

This is a prefered method as you can proceed slowly.



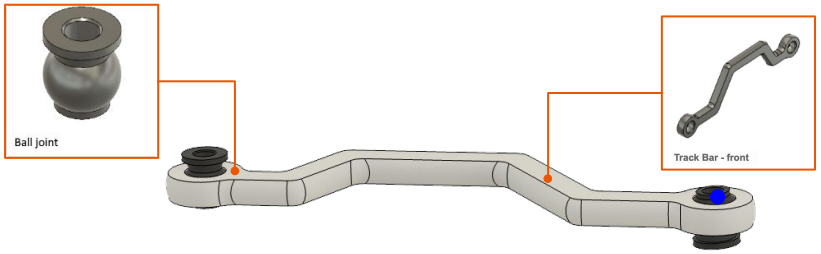
Apply grease on Ball joint.

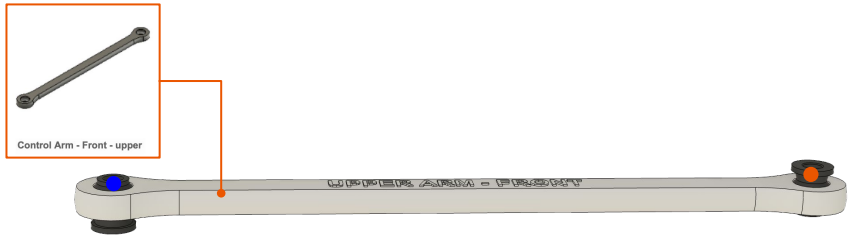


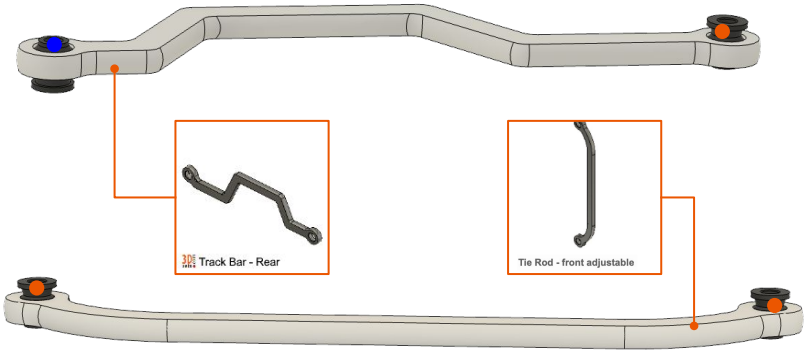
See this step on YouTube video

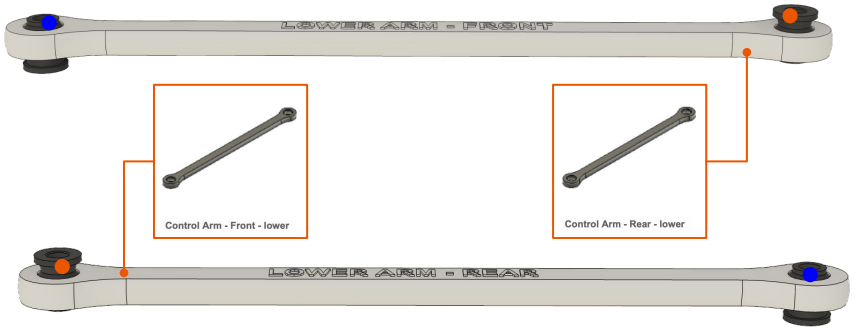
Arms + ball joints

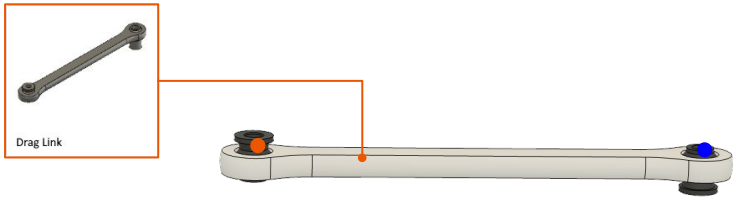
On the pictures below are rendered final Rear Arms assemblies. Please note that some Rear Arms requires opposite Ball joint orientation!











Bamboo 4x4 Winch Truck – Centre of the Chassis

In this procedure you will assemble the Centre of the Chassis with Arms.

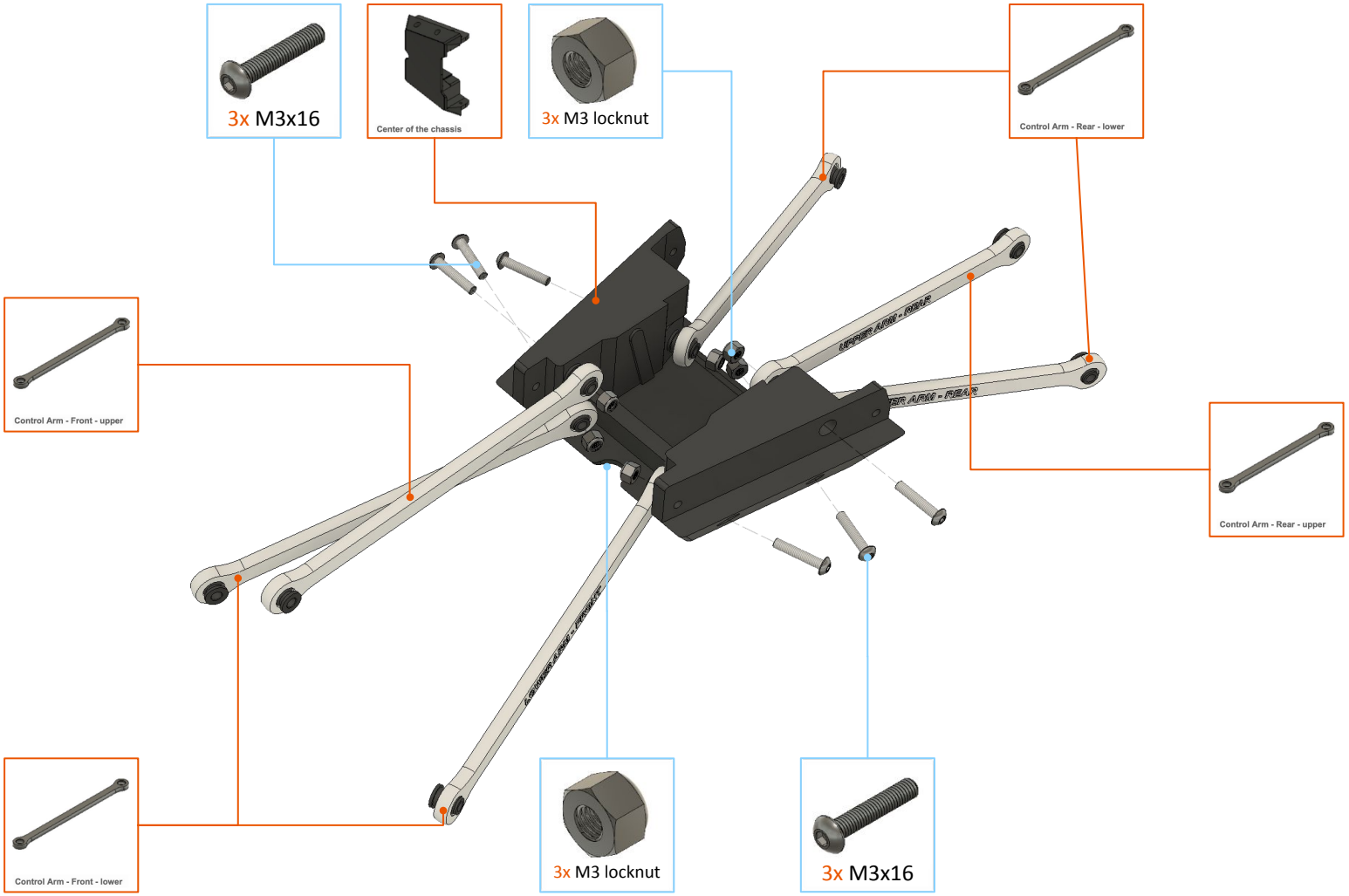
Required print plates:

- “Print 1 - Chassis 1”
- “Print 6 - Chassis 6”

Non-printed parts:

- Screw M3x16: 6 pcs.
- M3 Lock Nut: 6 pcs.

Centre of the Chassis 1/1



Bamboo 4x4 – Gearbox choice

There are two different gearboxes available for Bamboo 4x4:

new *BeltDrive 4x4*
classic *Geared Gearbox*

New *BeltDrive 4x4* features:

- silent running
- brushless 3530 motor compatible
- requires timing belts HTD 144-3M-06
- easy to print
- 2S-3S battery compatible
- slightly faster than geared gearbox
- can be printed from various filaments

New *BeltDrive 4x4* is **recommended choice**. It can handle more power (up to 3S battery) and is very silent. It is compatible with all 3D Sets 4x4 models.

For BeltDrive 4x4, proceed to next page (57).

Classic *Geared Gearbox* features:

- noisier than *BeltDrive4x4*
- 540-size DC 27T motor compatible
- uses 3D printed gears
- requires more 3D printing experience
- 2S battery compatible
- slower than *BeltDrive 4x4* gearbox
- requires high-quality PLA or high-strength filament (PC Blend, Nylon..)

Classic *Geared Gearbox* is good choice if you have previous experience with and if you require 540 DC 27T motor and maximum precision of throttle response.

For Geared Gearbox, proceed to page 73.

BeltDrive 4x4 Gearbox

In this 8-step procedure you will assemble belted gearbox with the motor. The whole gearbox can be printed from PLA, unless you will drive in some extreme conditions or in very hot environment. To complete this task, get the following parts ready:

Required print plates:

- “Print 44A - Belt Drive Gearbox - 1”
- “Print 45A - Belt Drive Gearbox - 2”
- “Print 46 - Shafts”

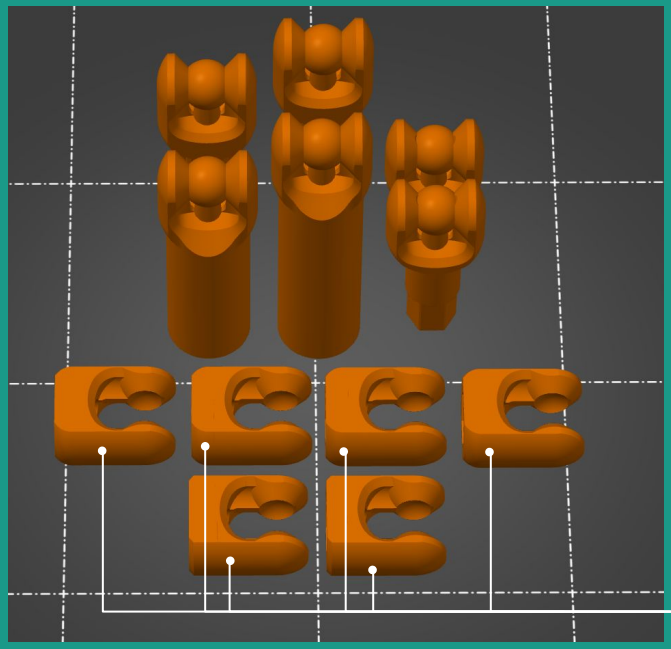
Non-printed parts:

- Screw M3x6: 3 pcs.
- Screw M3x8: 9 pcs.
- Screw M3x10: 2 pcs.
- Screw M3x12: 8 pcs.
- Screw M3x16: 8 pcs.
- Screw M3x25: 6 pcs.
- M3 nuts: 22 pcs.
- Electric motor: 1 pc.
- Bearings: 10 pcs.
- Timing Belt: 4 pcs.

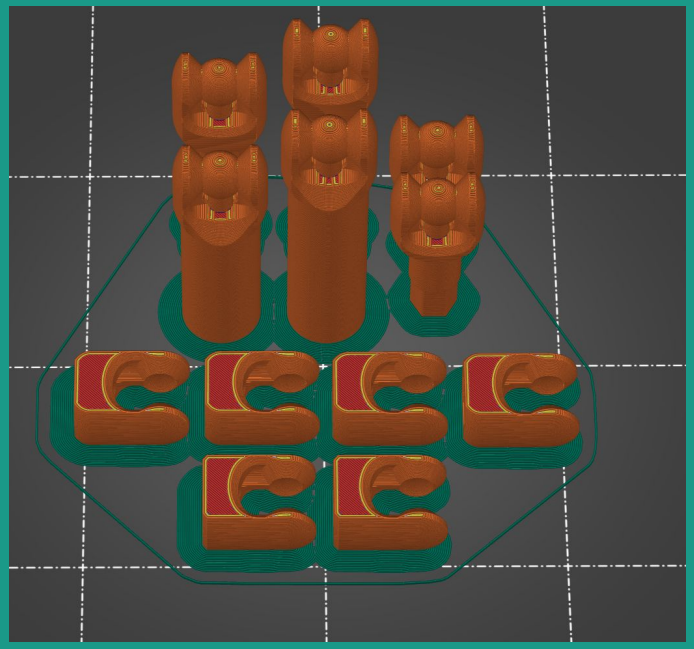
Shafts

If you will print the part “Shafts” from the .stl file instead of printing from provided gcode, please use following slicer setup:

- Infill density: 100%
- Infill type: Rectilinear
- Perimeters: 3

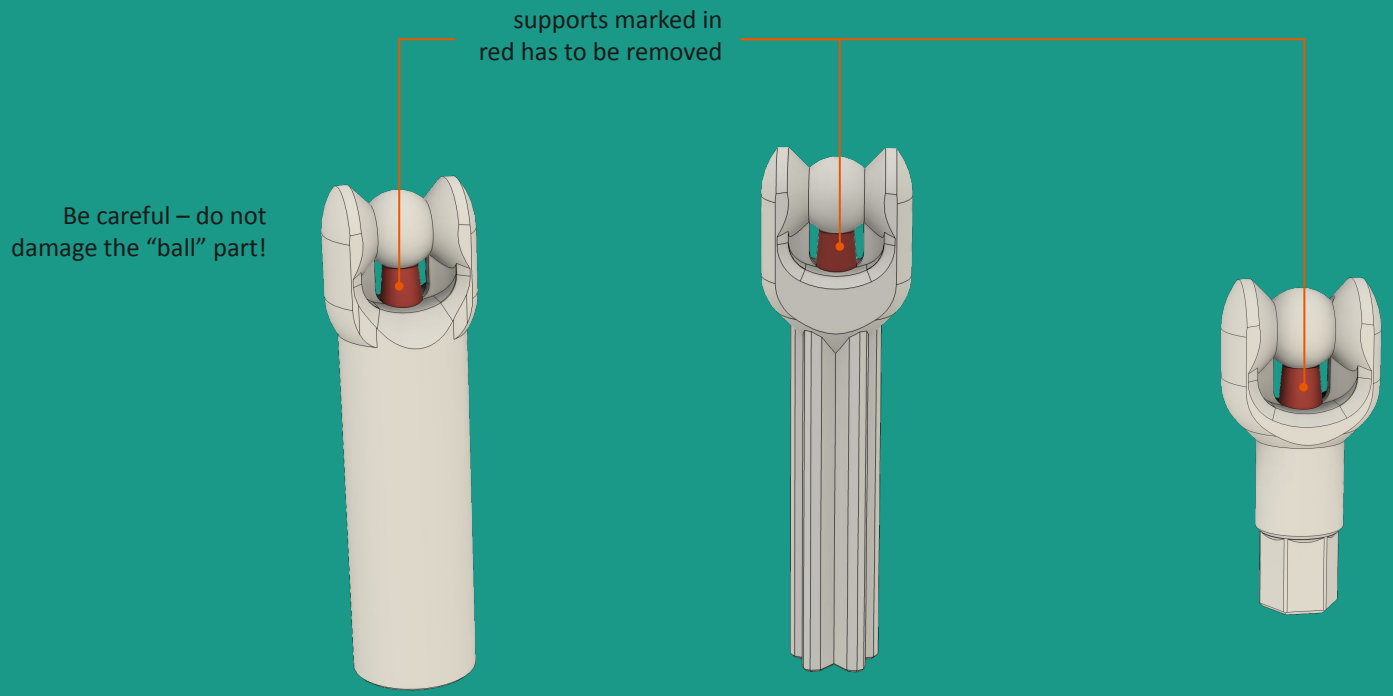


correct printing bed orientation of the Drive Shaft - Cardan and Front Wheel Shaft – **marked part MUST LAY FLAT** on the bed!



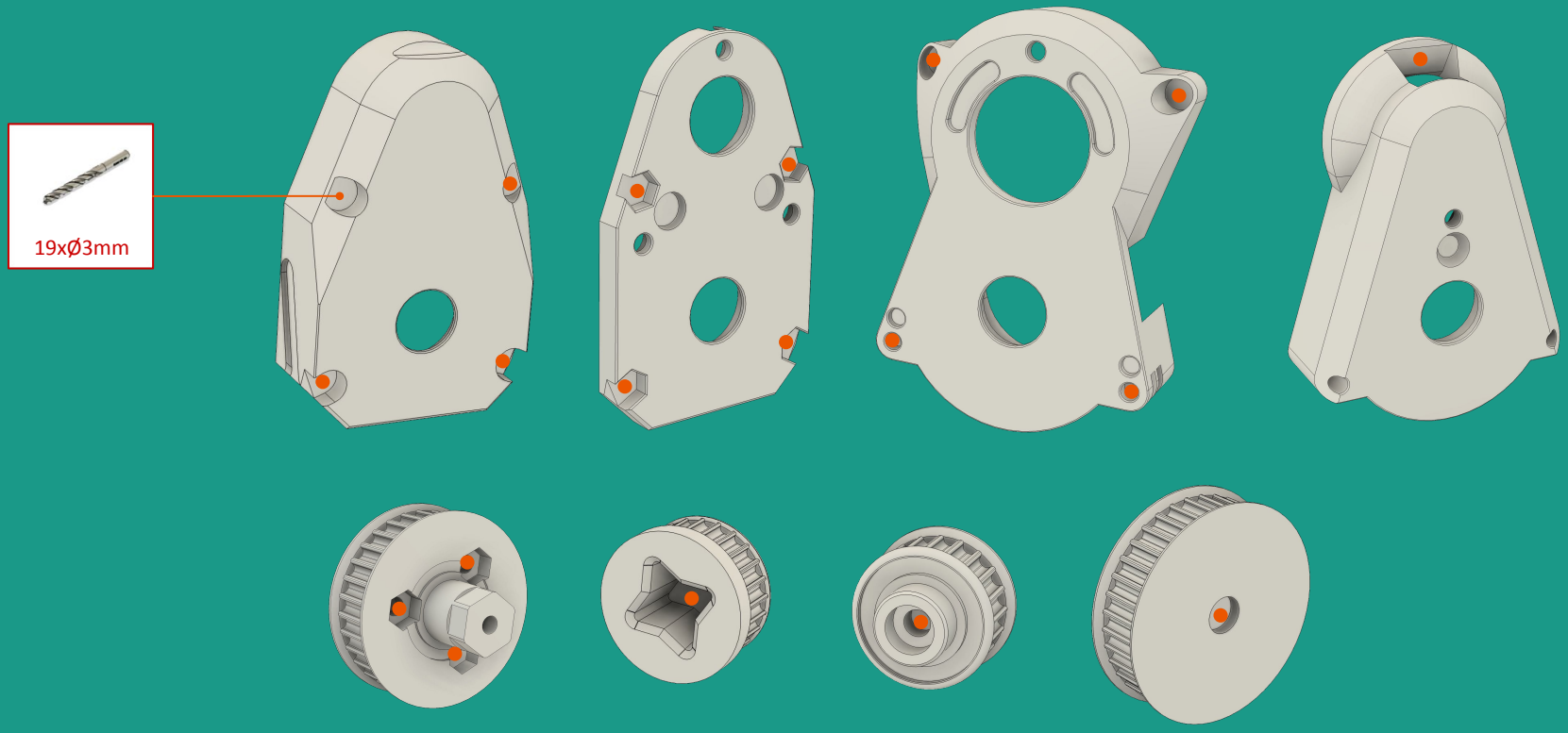
Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



Postprocessing – drilling holes

Please carefully drill through the marked holes that have not been printed through to make printing easier.



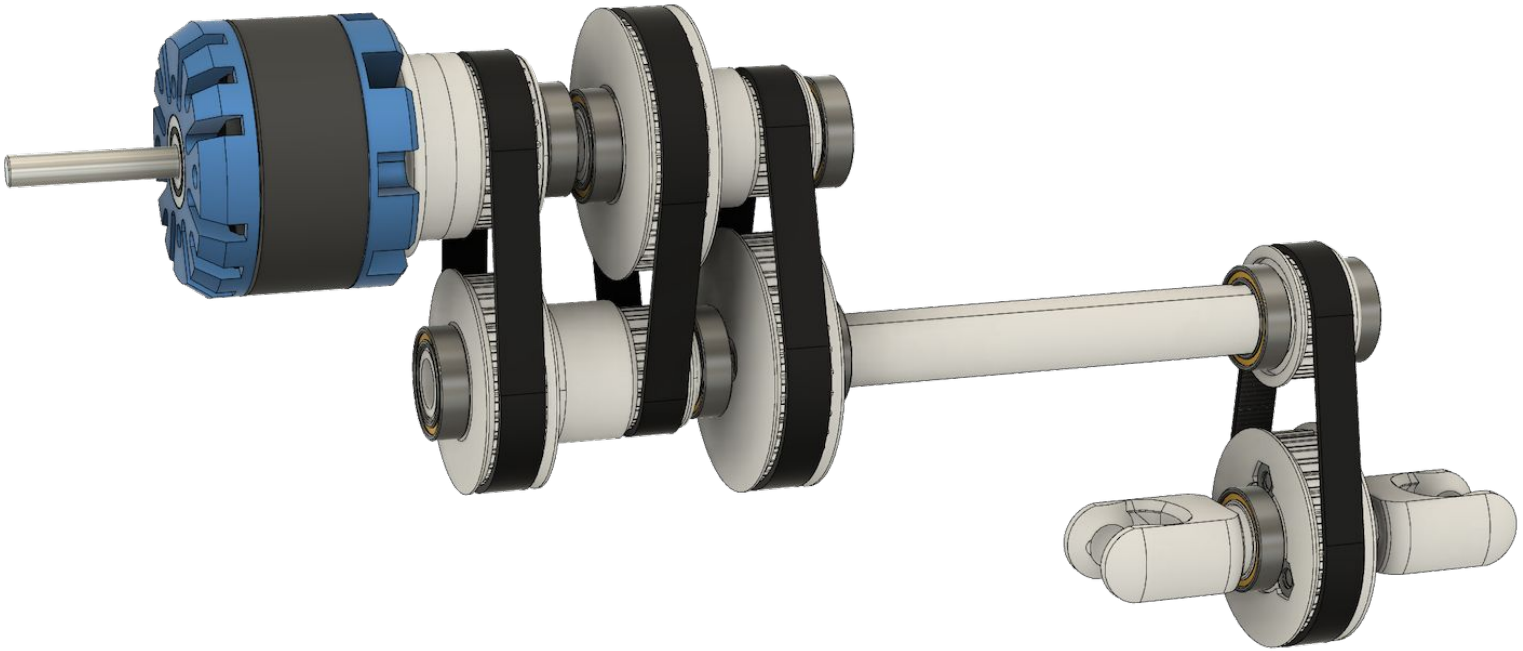
BeltDrive 4x4 Gearbox – introduction

BeltDrive 4x4 Gearbox uses **4 identical timing belts** – HTD 144-3M-06 (HTD profile, 144 mm long, 3 mm teeth distance, 6 mm wide).

BeltDrive 4x4 Gearbox is **compatible with all 4x4 3D Sets models**, so you can use it in your older Rancher/Landy without any modifications.. With this gearbox model is moving faster and has more power. Gearbox is very **silent and reliable** when assembled properly. Gearbox work with brushless outrunner **750**-1000 kV and **2S**-3S battery

Please check motor temperature by hand if you are driving in rough terrain or for long periods! If you are using model in hot weather, please print gearbox case (enclosure) from PET-G or other heat resistant material.

Internal belts/pulley configuration is shown below:



Important features

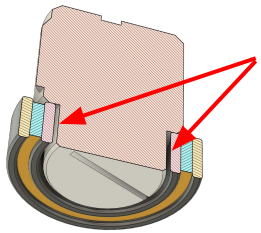
Bearings calibration

It is very important to check if small 3d printed shaft ends fit the bearings properly, because such small printed objects may shrink too much.

There are two sizes of the "*Pulley Shaft small*" parts (located on print "Belt Drive Gearbox - 2"):

"*S" = standard size;* *"L = larger size*

Please try if the "S" sized part fits the bearing without any gap. The bearing must hold on place firmly, otherwise, the gearbox can be damaged! If there is any gap between the bearing and printed part, then use a slightly larger "L" sized part.



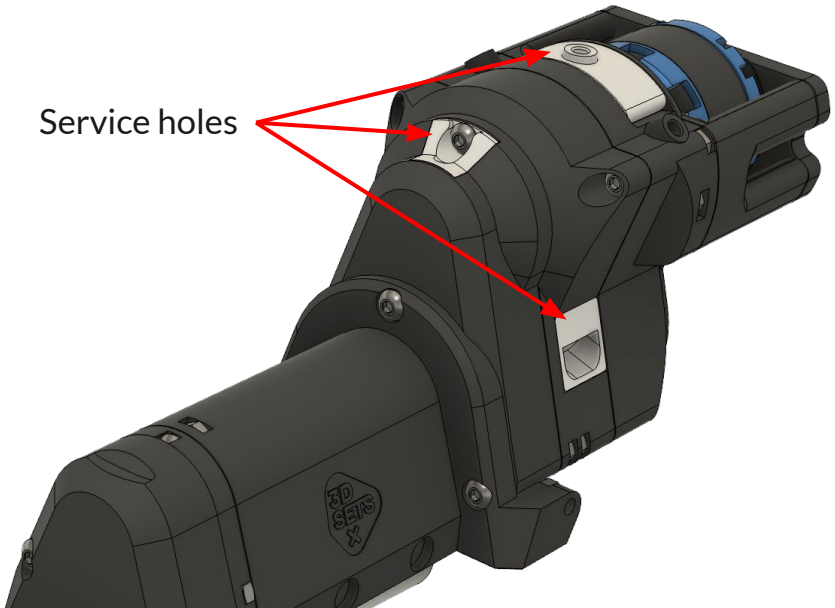
Is there any gap? Then use the "L" marked part!

Service holes

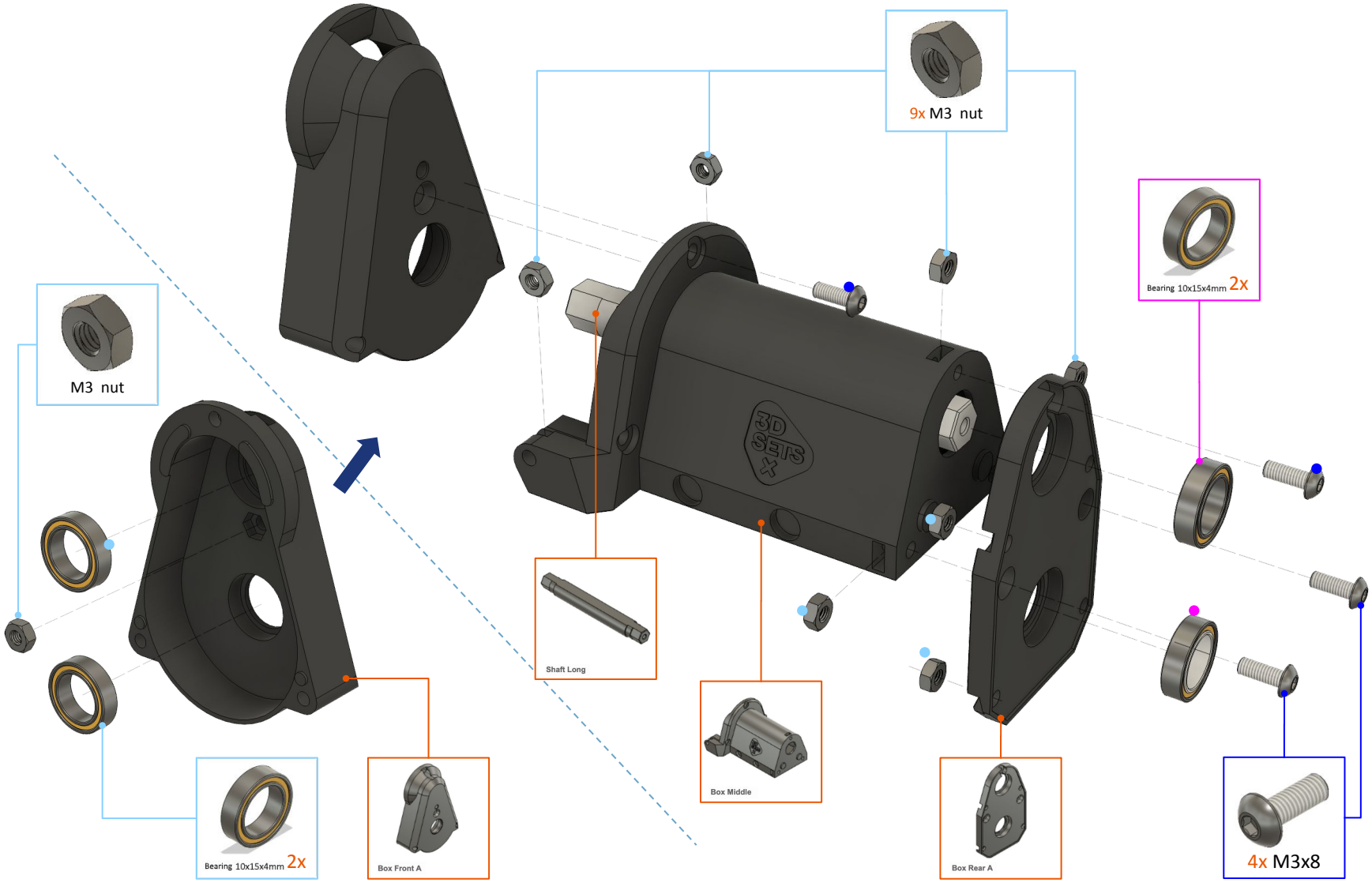
BeltDrive 4x4 v1.1 features 3 service holes with covers. These holes have following purposes:

- to help assembly of the gearbox; you can use the tip of the screwdriver to place belts in their position on the pulleys
- allows you to check the internals of the gearbox without disassembling (heat, noises, wobbling, etc.)

Service holes are marked white on the picture below:



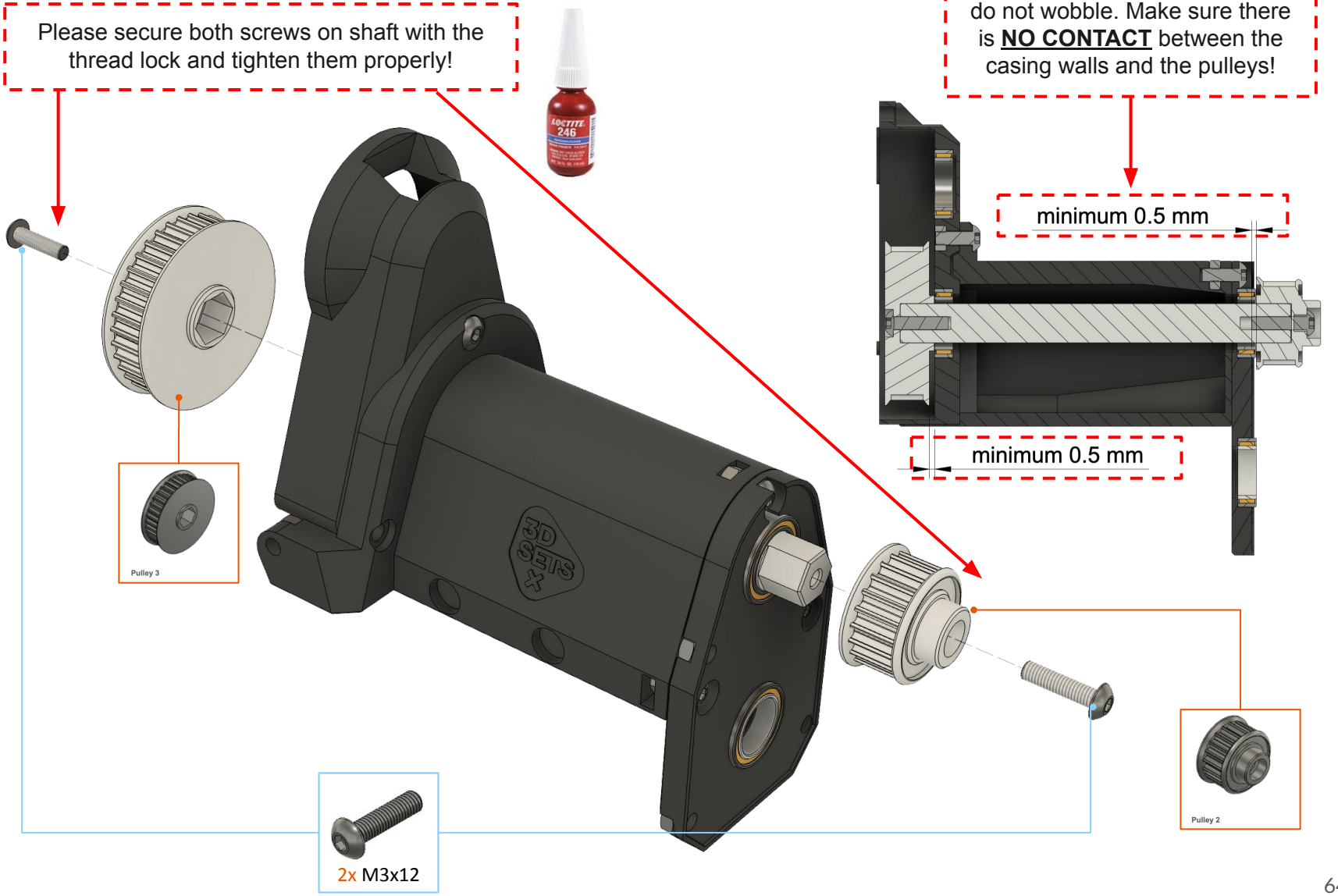
BeltDrive 4x4 Gearbox – step 1/9



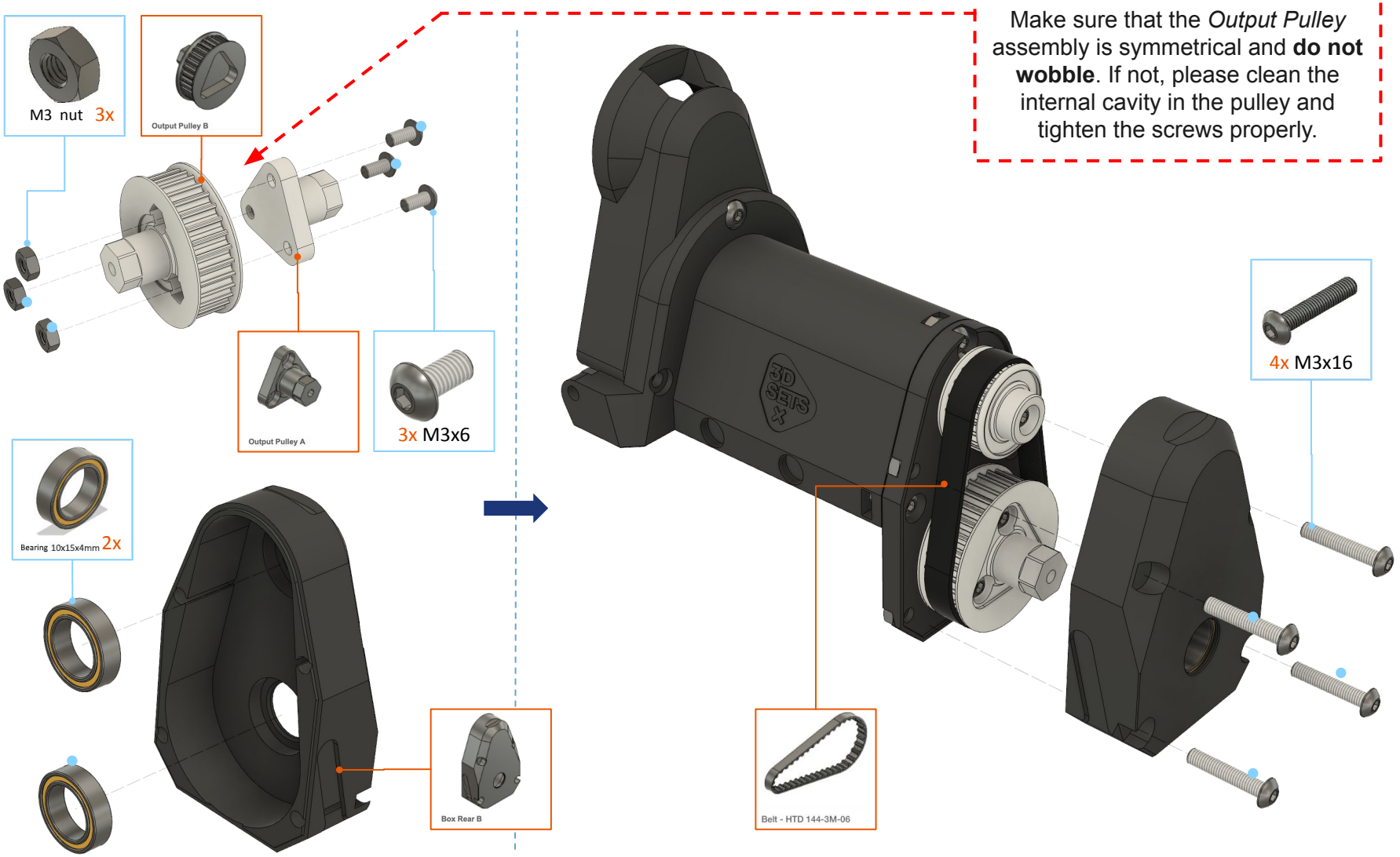
BeltDrive 4x4 Gearbox – step 2/9

Please secure both screws on shaft with the thread lock and tighten them properly!

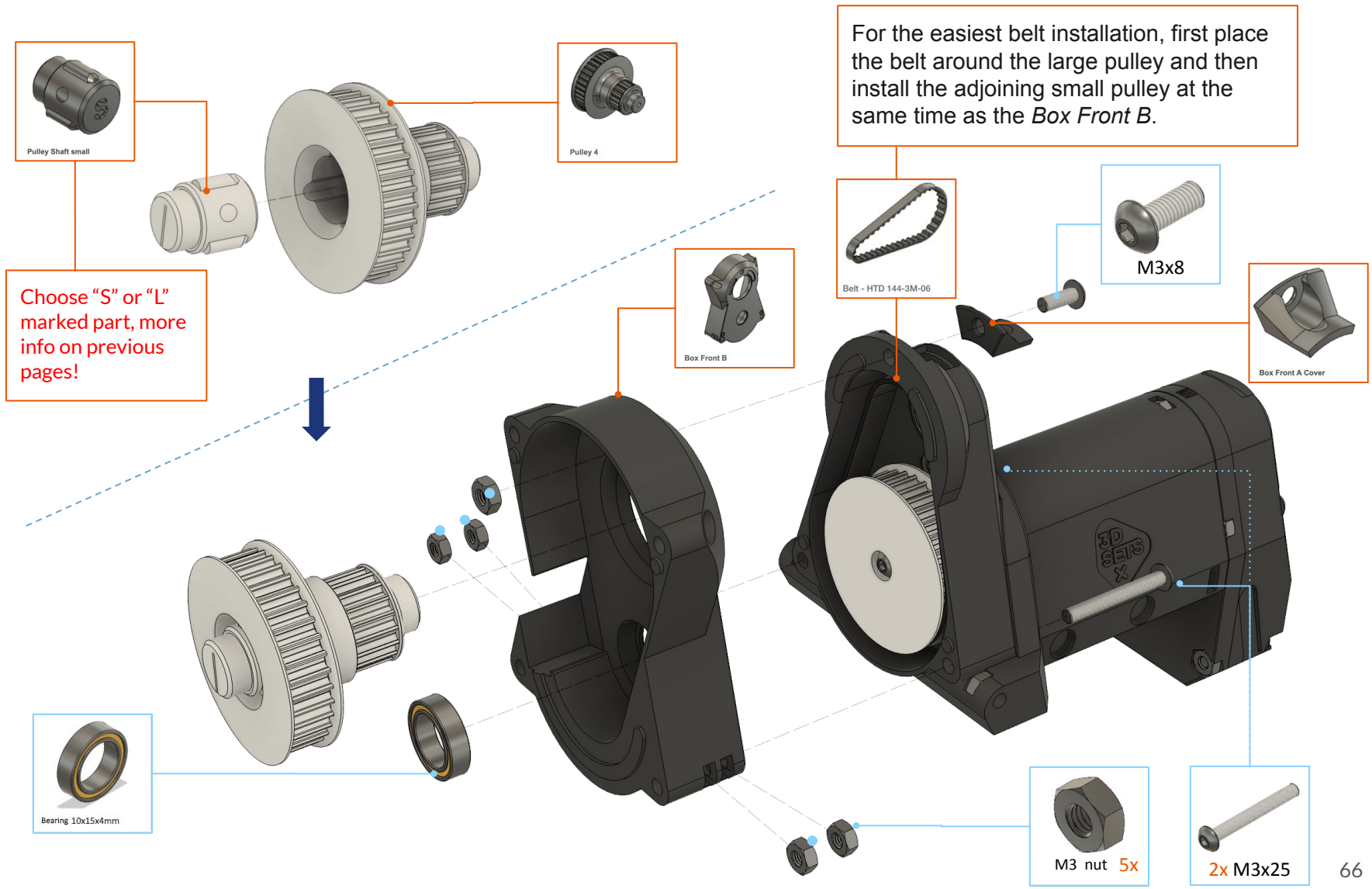
Double check that the pulleys are **peripendicular** to the shaft and do not wobble. Make sure there is **NO CONTACT** between the casing walls and the pulleys!



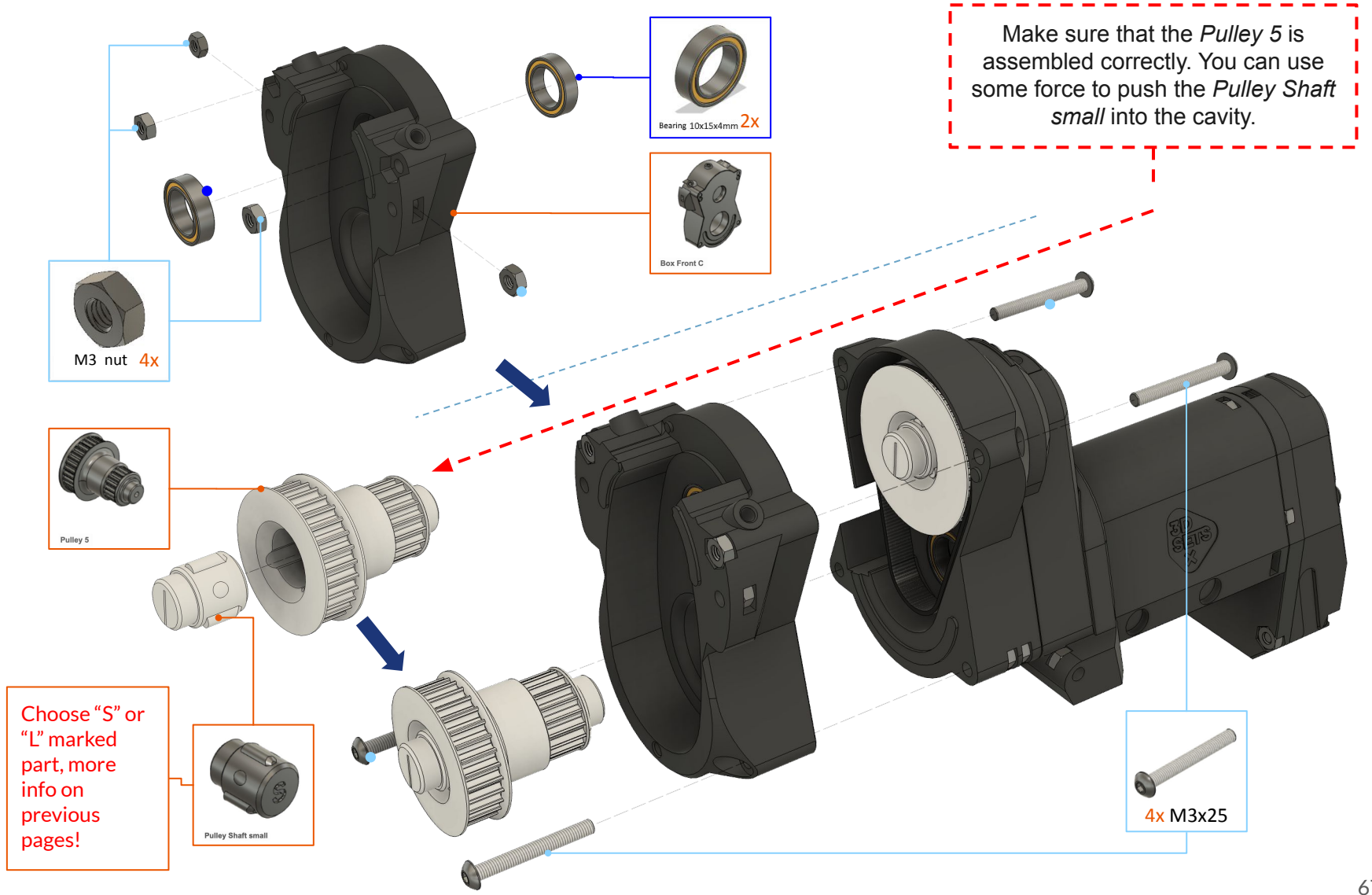
BeltDrive 4x4 Gearbox – step 3/9



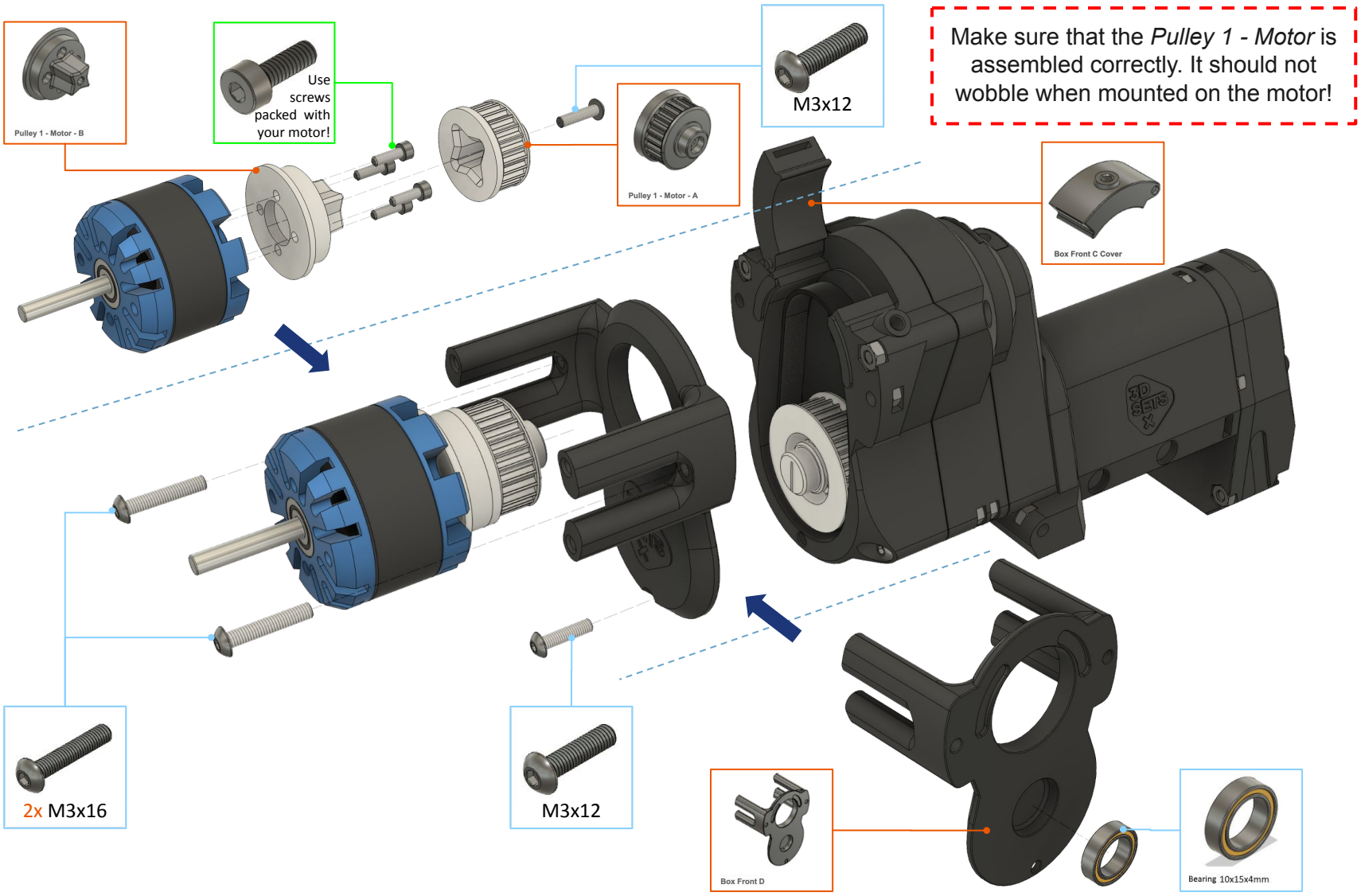
BeltDrive 4x4 Gearbox – step 4/9



BeltDrive 4x4 Gearbox – step 5/9

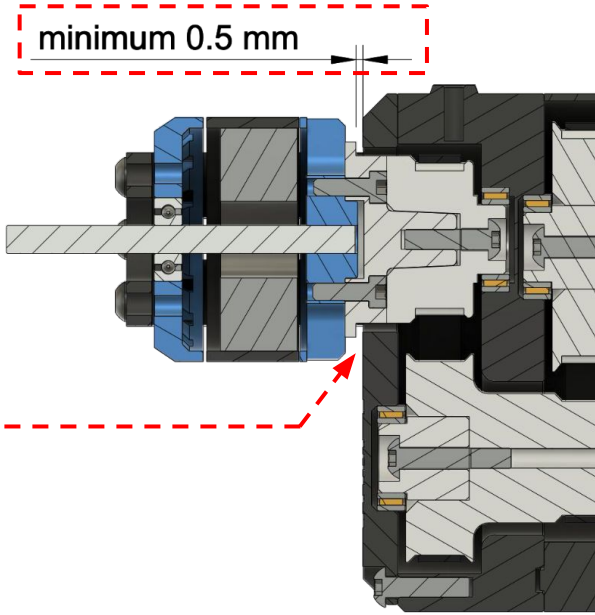


BeltDrive 4x4 Gearbox – step 6/9

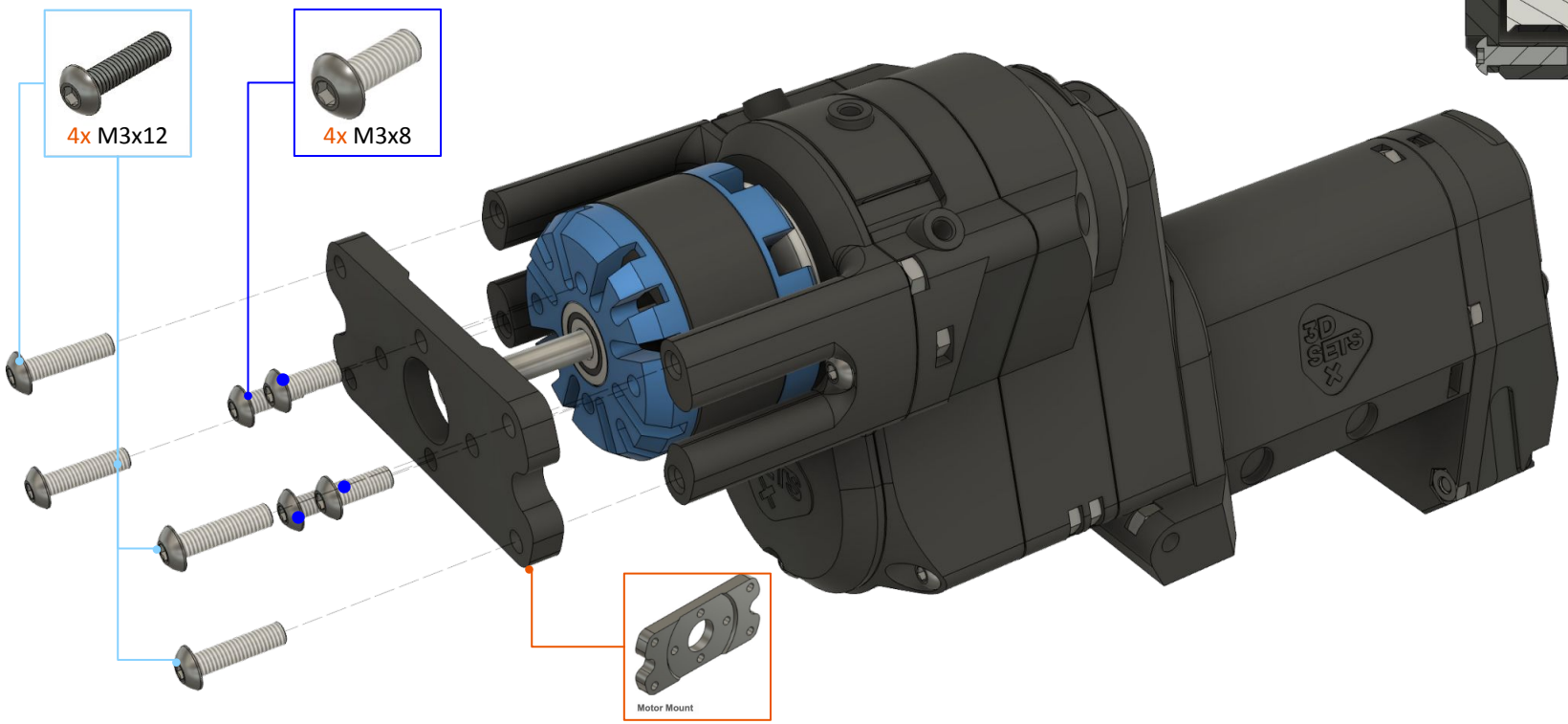


Make sure that the *Pulley 1 - Motor* is assembled correctly. It should not wobble when mounted on the motor!

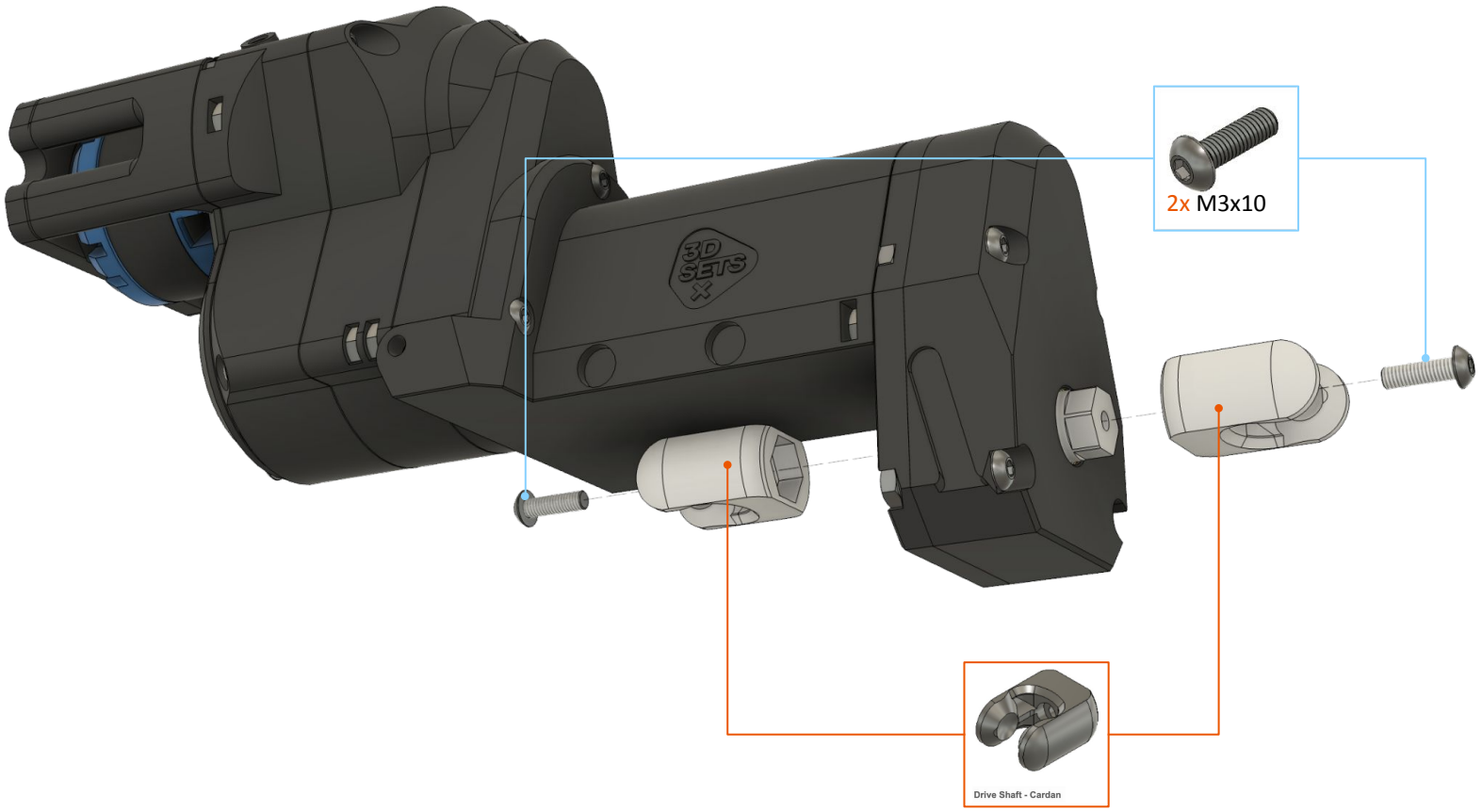
BeltDrive 4x4 Gearbox – step 7/9



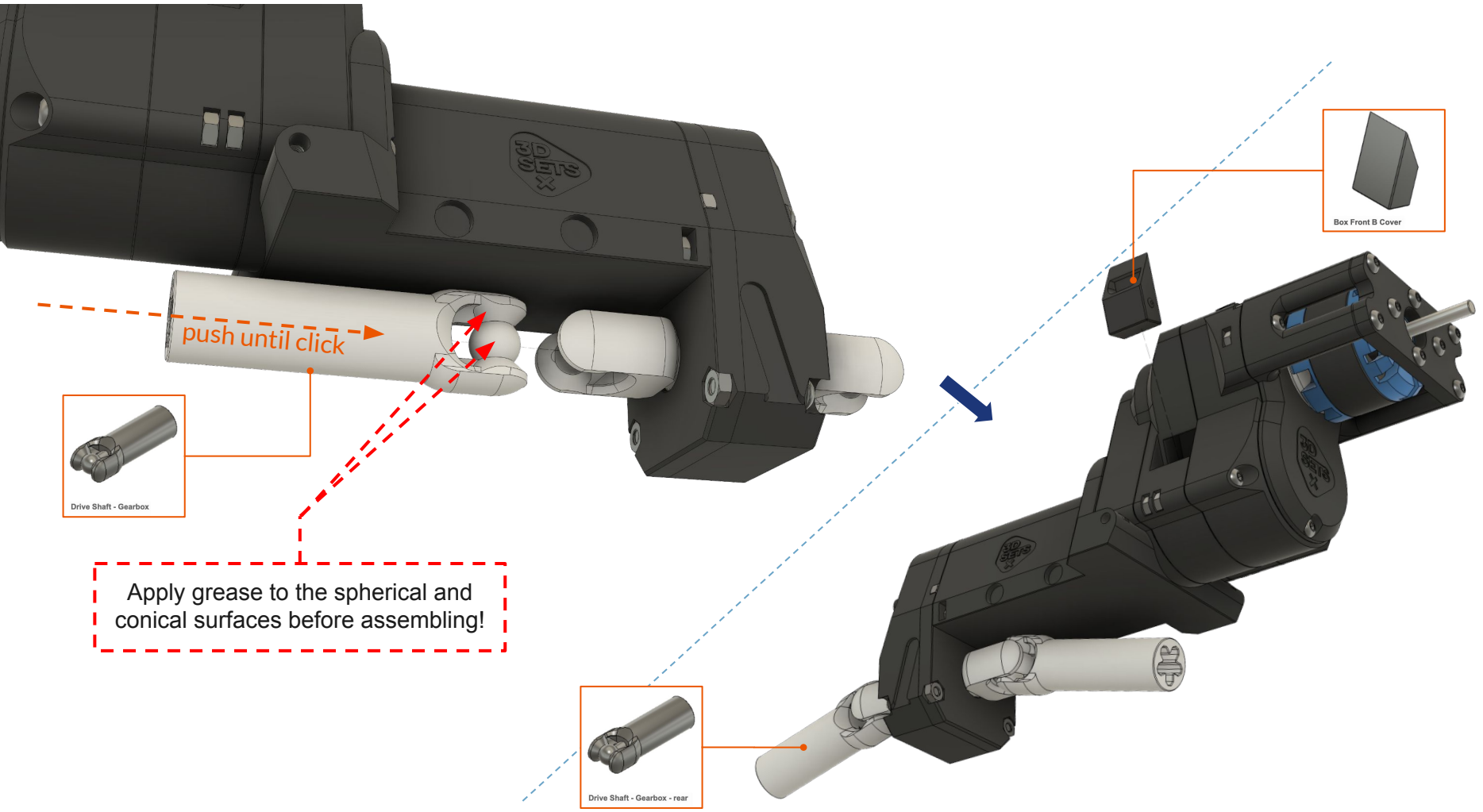
It is very important to check proper motor position - there must be **<u>0.5-1 mm clearance</u> between the *Pulley 1 - motor* rim and the *Box Front D***! If these parts are too close together, you can adjust their position by underlaying the *Motor Mount* with washers to achieve the correct clearance.



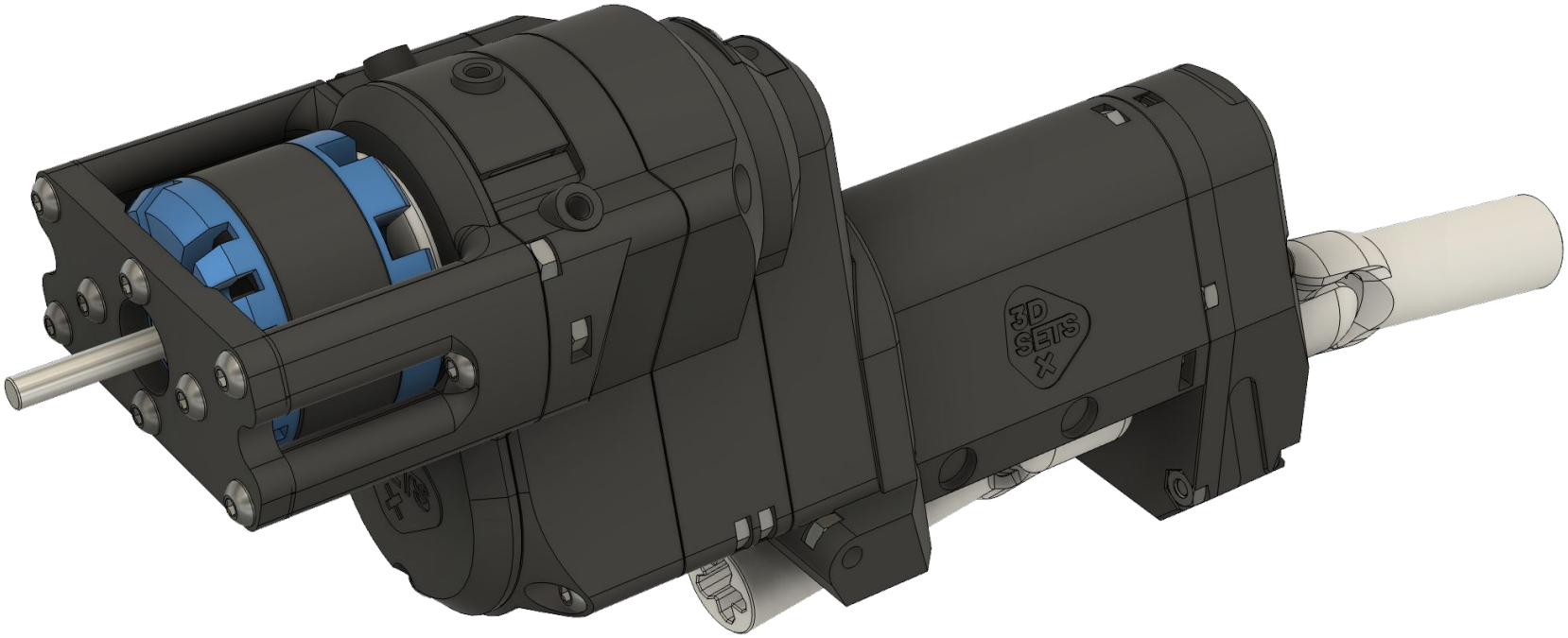
BeltDrive 4x4 Gearbox – 8/9



BeltDrive 4x4 Gearbox – 9/9



BeltDrive 4x4 Gearbox – finished



Geared Gearbox

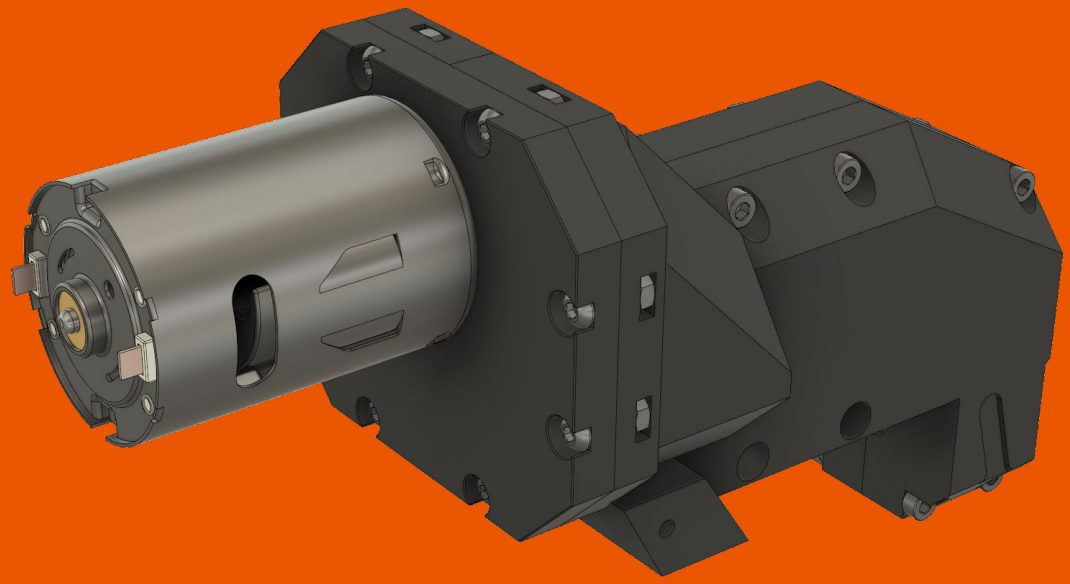
In this 8-step procedure you will assemble the gearbox with the motor. To complete this task, get the following parts ready:

Required print plates:

- “Print 44B - Geared Gearbox - 1”
- “Print 45B - Geared Gearbox - 2”
- “Print 46 - Shafts”

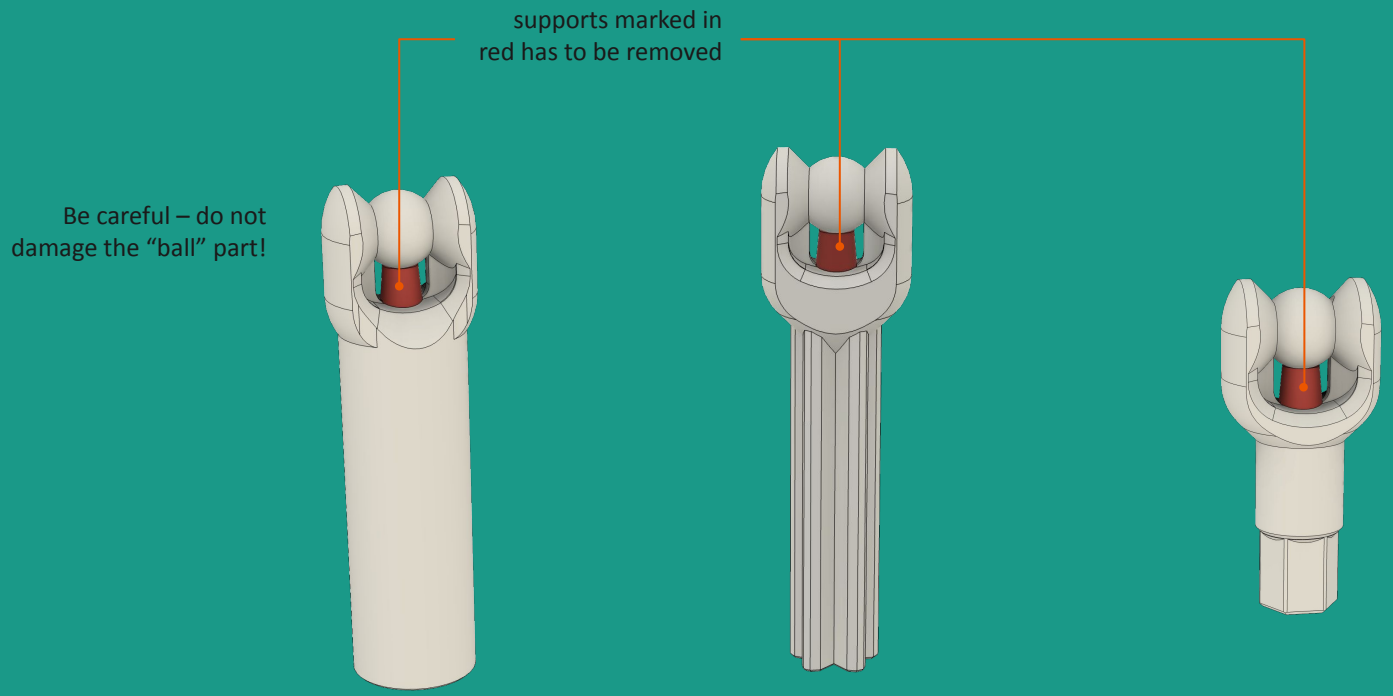
Non-printed parts:

- Screw M3x10: 12 pcs.
- Screw M3x25: 7 pcs.
- M3 locknuts: 7 pcs.
- M3 nuts: 10 pcs.
- M3x6 setscrew: 2pcs.
- Electric motor: 1 pc.
- Bearings: 12 pcs.
- Grease

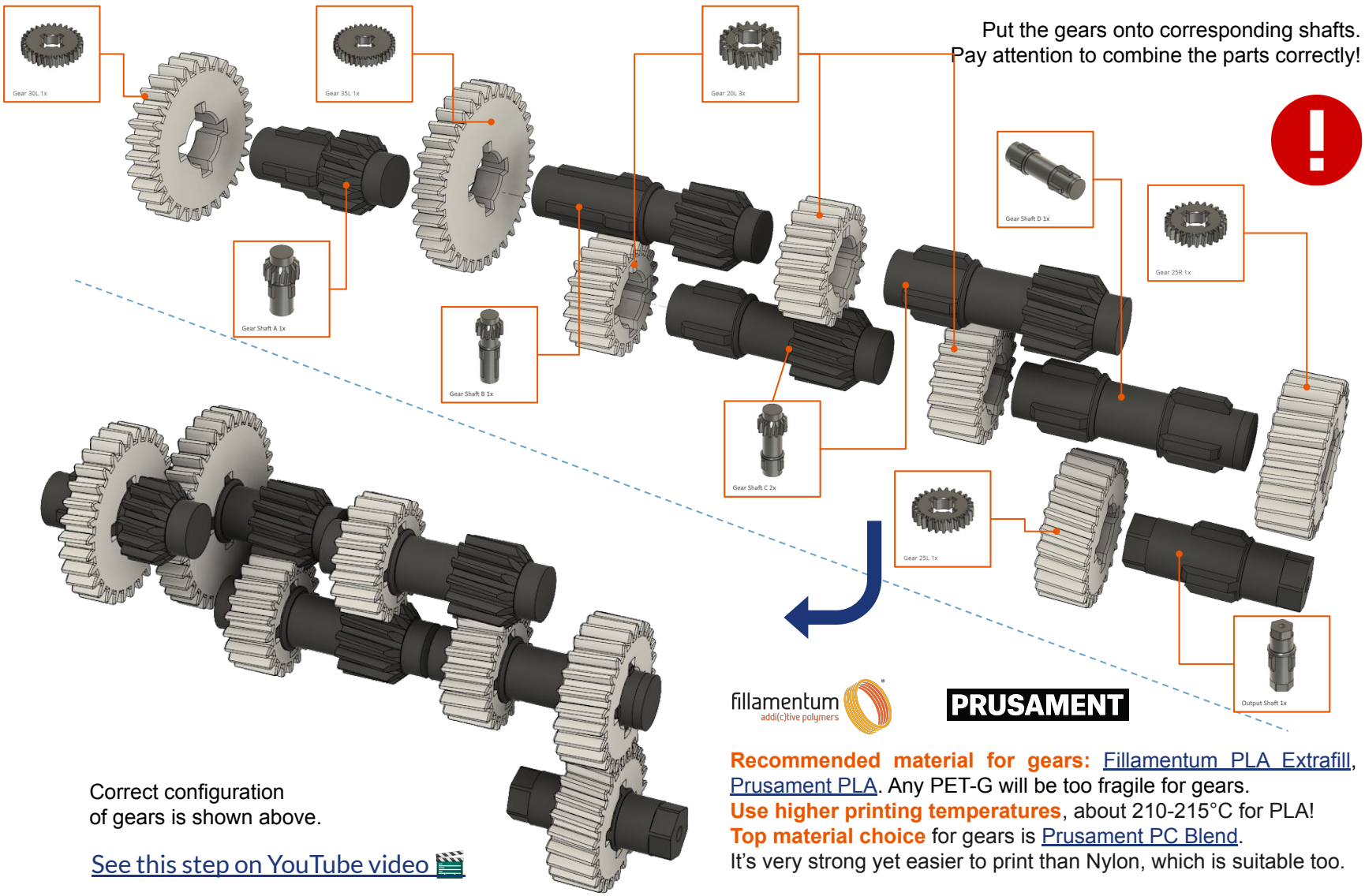


Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



Geared Gearbox – step 1/8



Put the gears onto corresponding shafts.
Pay attention to combine the parts correctly!

Correct configuration
of gears is shown above.

See this step on YouTube video

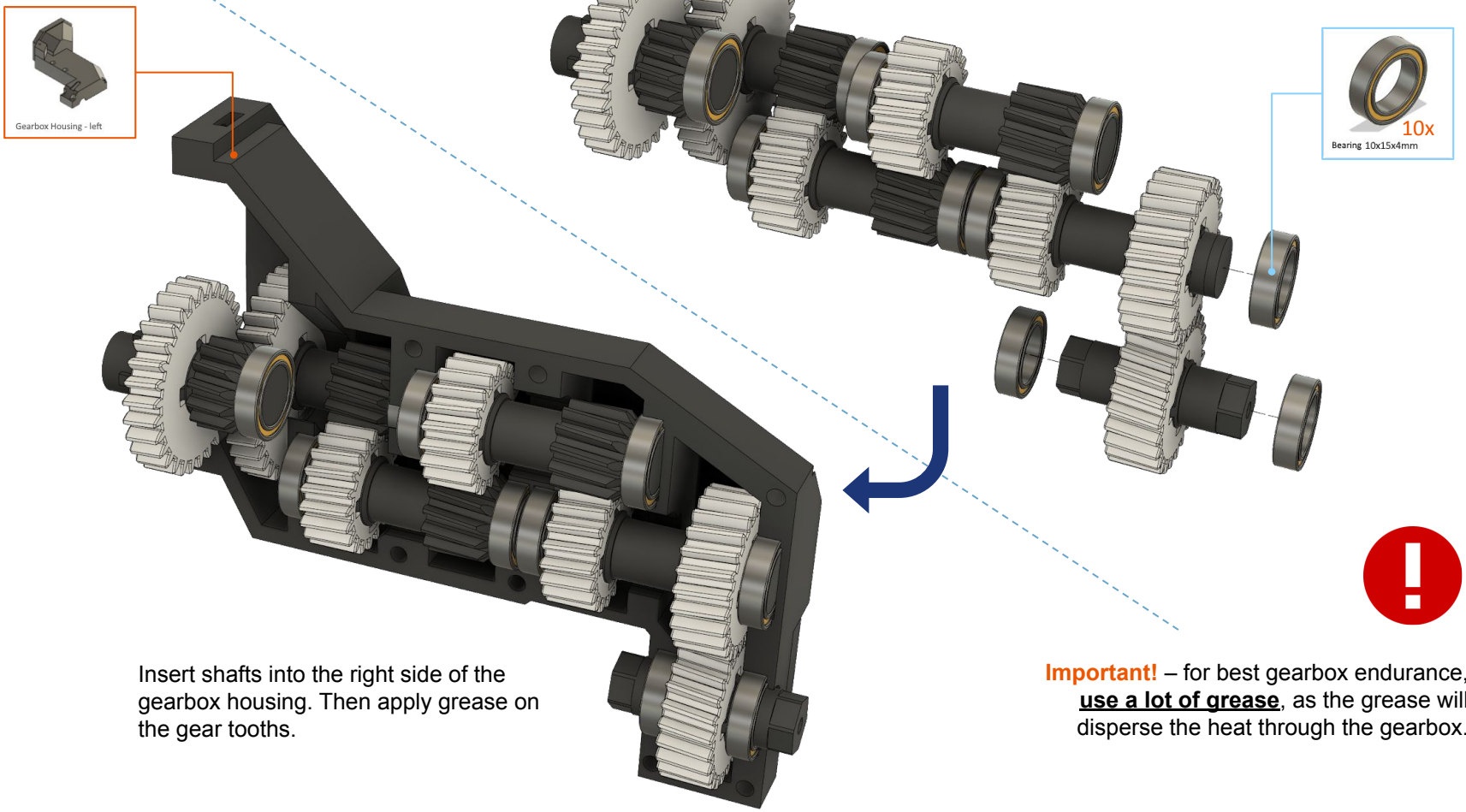
fillamentum
addi(c)tive polymers

PRUSAMENT

Recommended material for gears: Fillamentum PLA Extrafill, Prusament PLA. Any PET-G will be too fragile for gears.
Use higher printing temperatures, about 210-215°C for PLA!
Top material choice for gears is Prusament PC Blend.
It's very strong yet easier to print than Nylon, which is suitable too.

Geared Gearbox – step 2-3/8

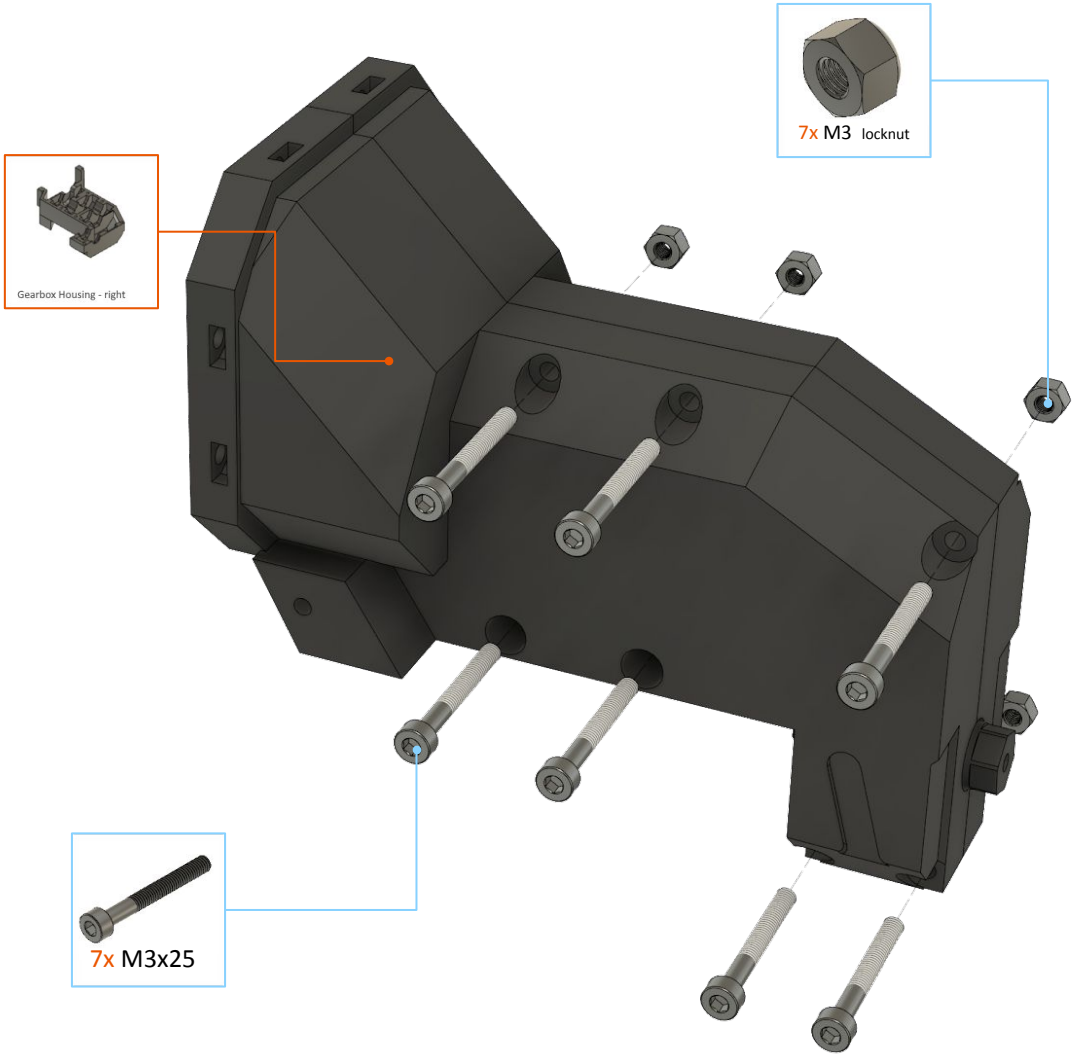
Put the bearings on each shaft end. If you printed and checked the “Test part” with a bearing successfully, bearings should fit smoothly.



Insert shafts into the right side of the gearbox housing. Then apply grease on the gear tooths.

Important! – for best gearbox endurance, **use a lot of grease**, as the grease will disperse the heat through the gearbox.

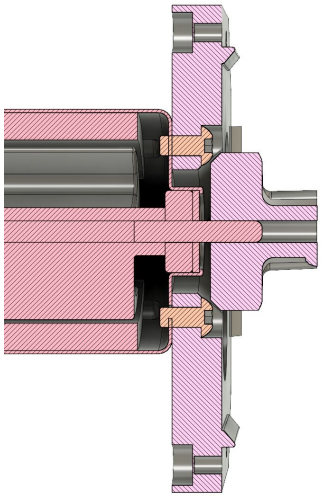
Geared Gearbox – step 4/8



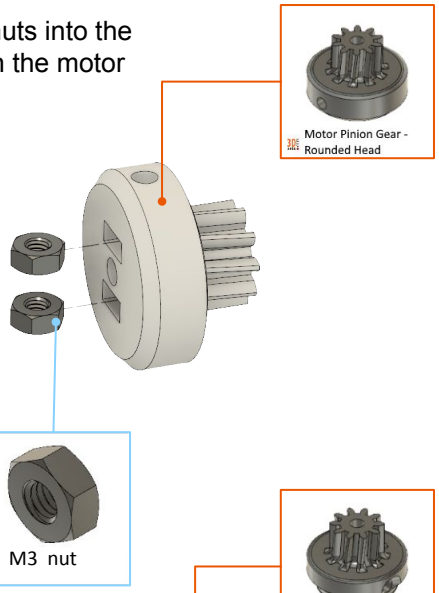
Geared Gearbox – step 5/8

Motor pinion – version A:

use this pinion if you are using “round head screws”

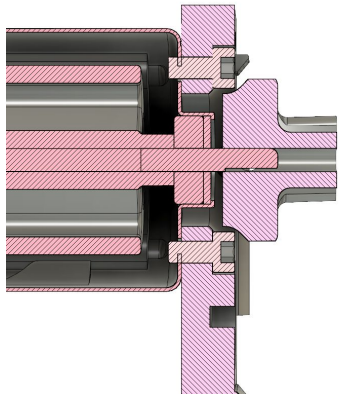


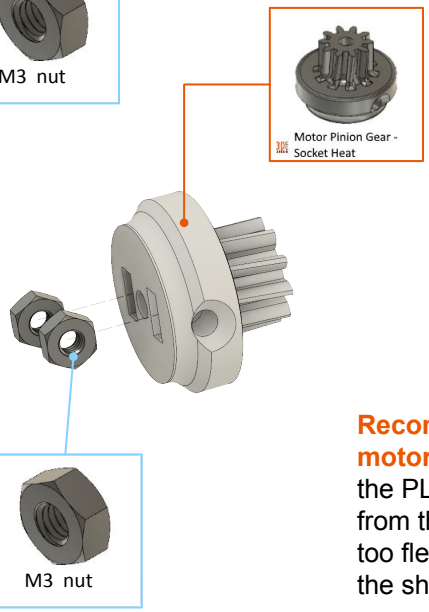
Insert nuts into the holes in the motor pinion.



Motor pinion – version B:

use this pinion if you are using “socket head screws”



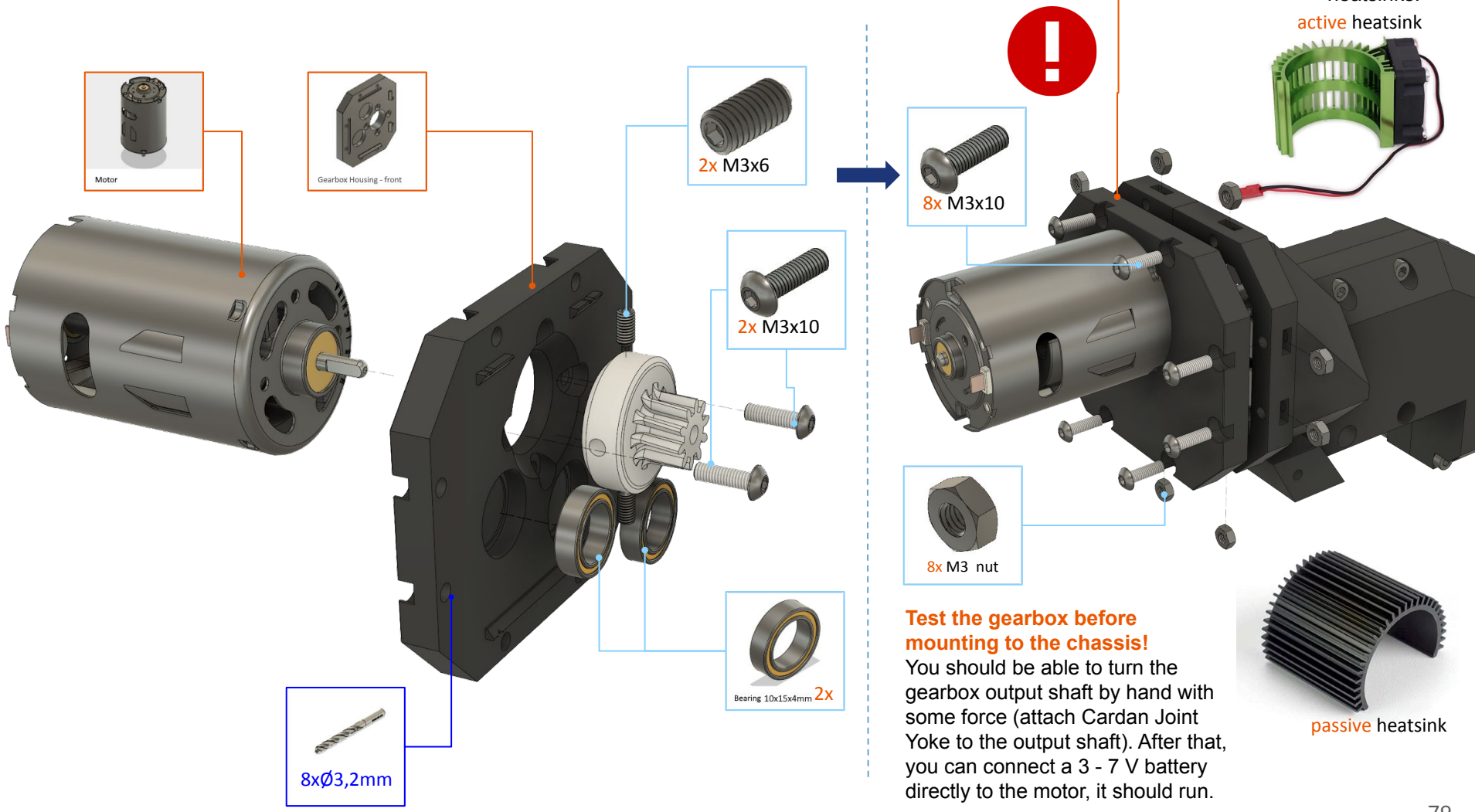


Recommended material for motor pinion: ABS or CPE, as the PLA can melt due the heat from the motor shaft and PET is too flexible (pinion will slip from the shaft).

Geared Gearbox – step 6-7/8

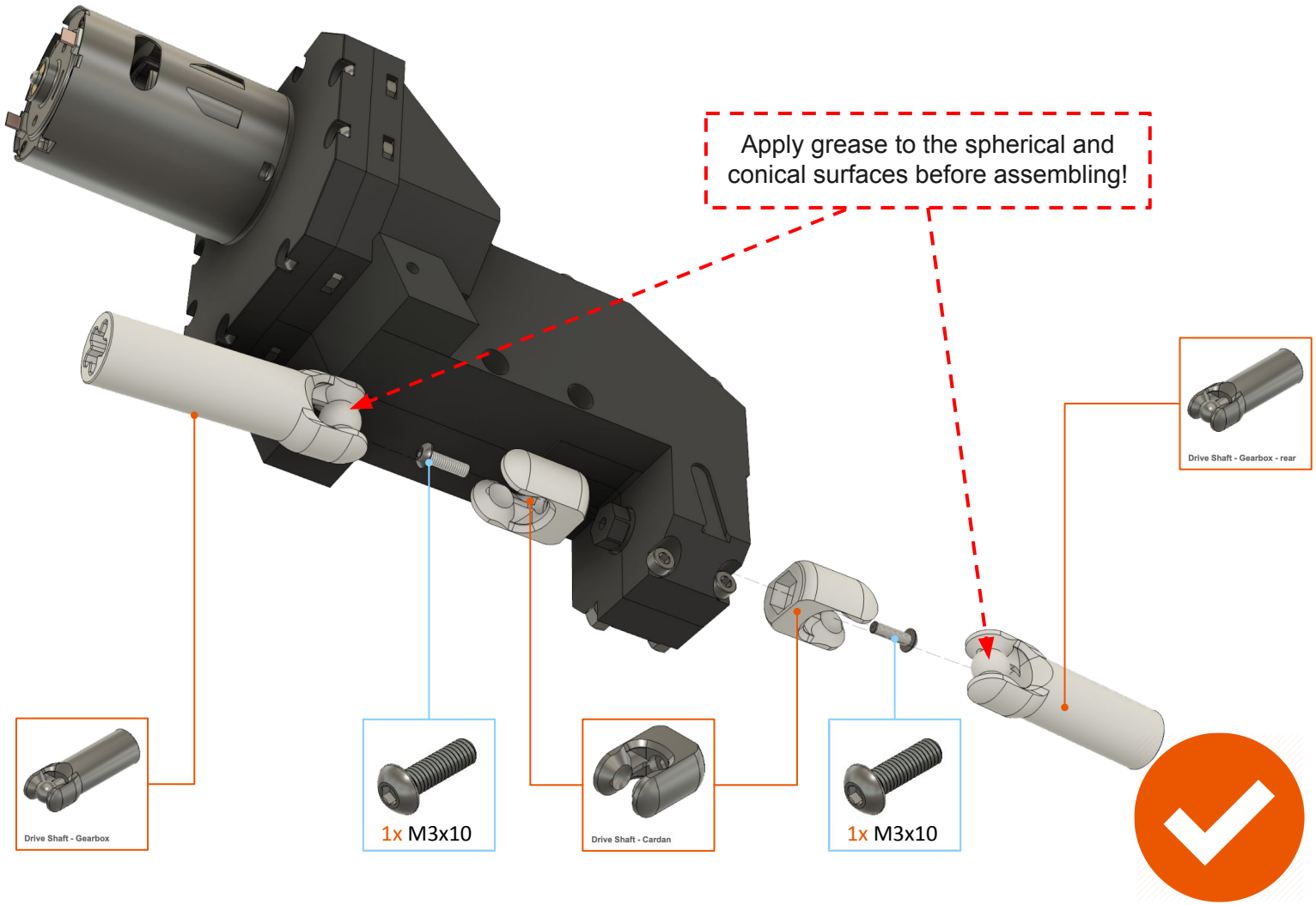
Now mount the motor and bearings to their positions.
Then install the motor pinion on motor shaft.

Recommended material for "Gearbox housing - front": ABS, ASA, CPE or PET-G, as the PLA can melt due to the heat from the motor if you drive continuously or in warm weather. It is strongly recommended to install an optional motor heatsink, preferably active! Purchase links are **here** or use any similar heatsinks.



Test the gearbox before mounting to the chassis!
You should be able to turn the gearbox output shaft by hand with some force (attach Cardan Joint Yoke to the output shaft). After that, you can connect a 3 - 7 V battery directly to the motor, it should run.

Geared Gearbox – step 8/8



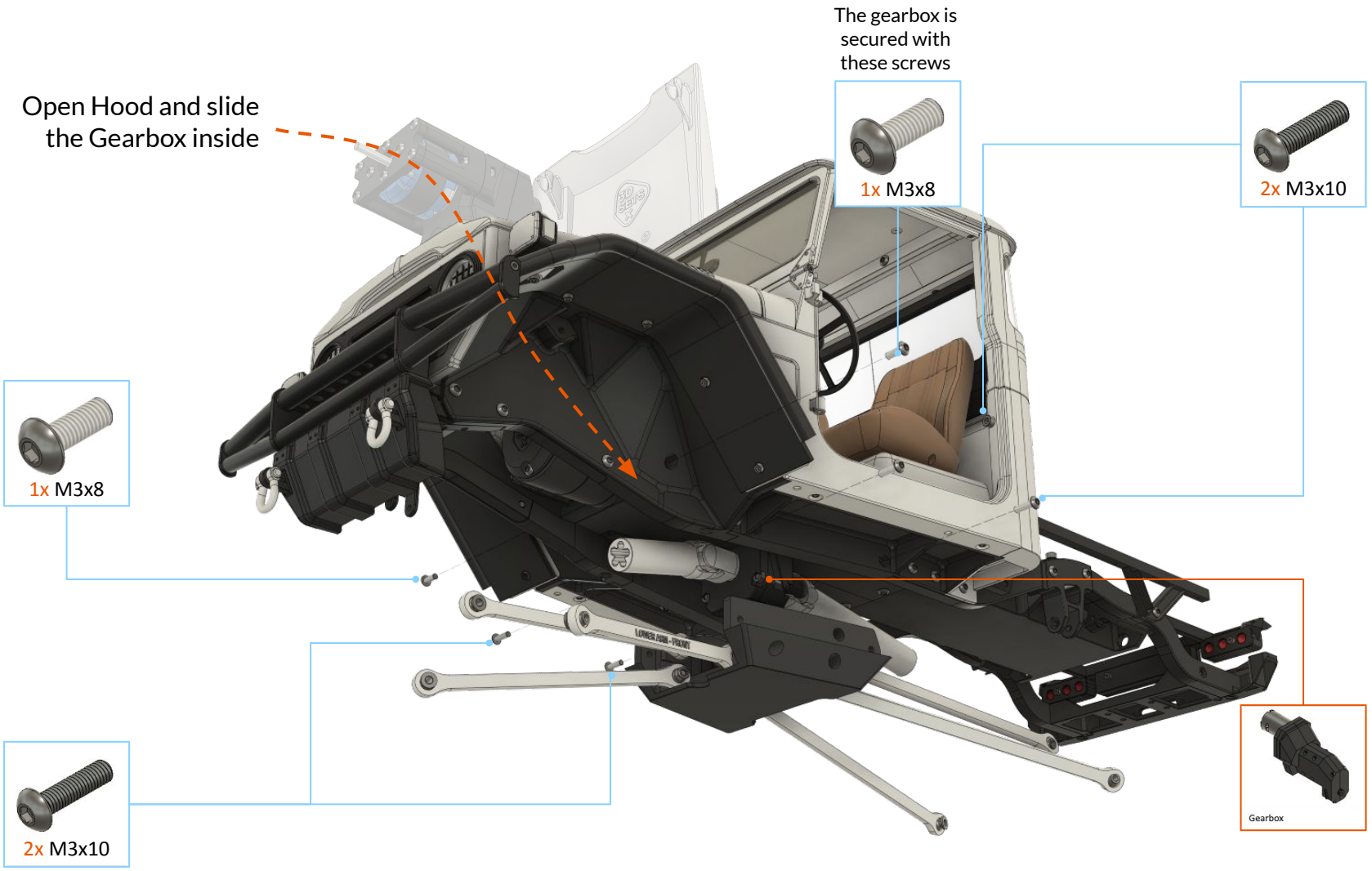
Bamboo 4x4 – Gearbox Installation

In this 1-step procedure you will install Gearbox.

Non-printed parts:

- Screw M3x8: 2 pcs.
- Screw M3x10: 4 pcs.

Gearbox Installation



Bamboo 4x4 Winch Truck – Electronics & Seats

In this 2-step procedure you will install all electronics equipment and cables.

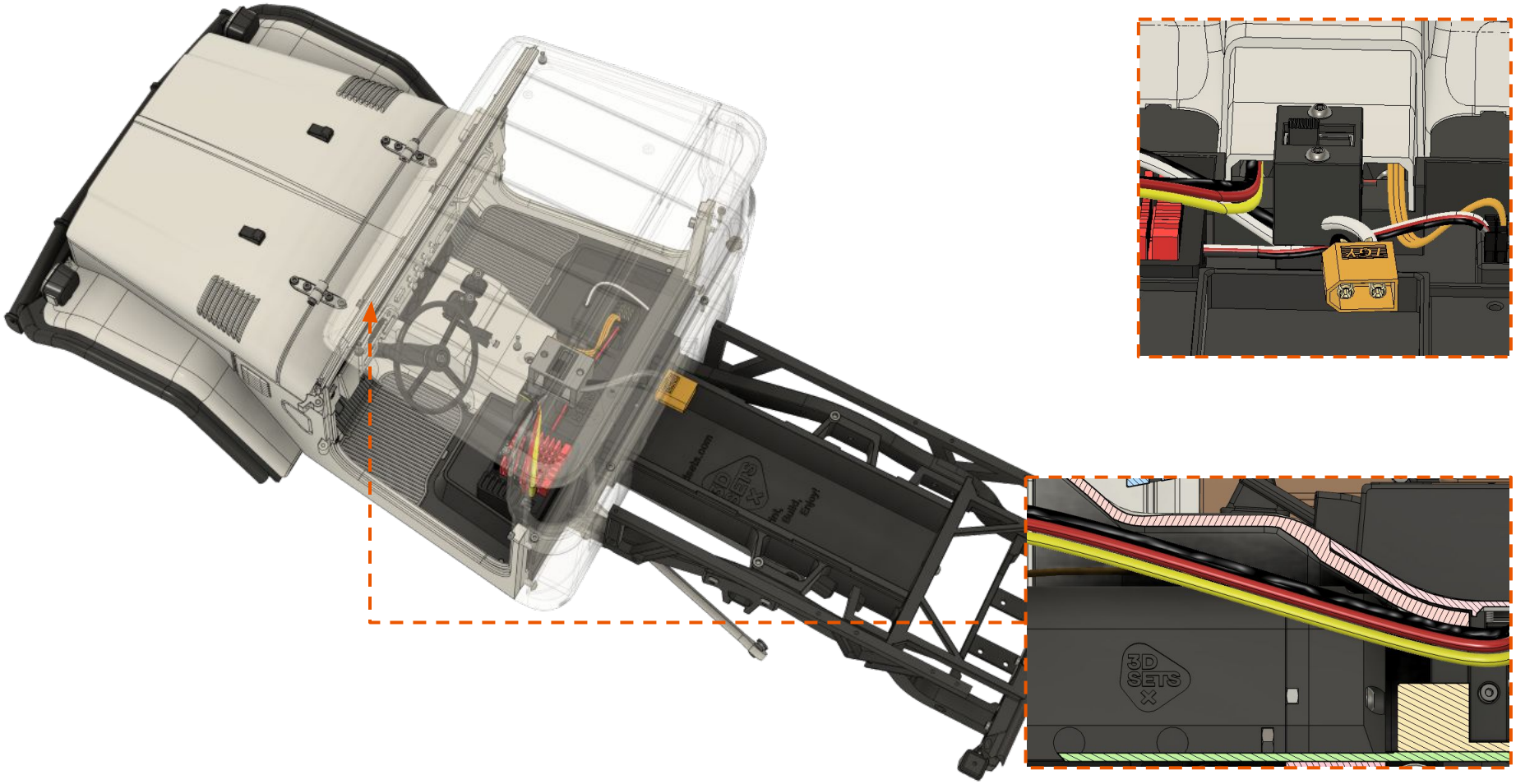
Required print plates:

- “Print 12 - Interior 1 + Details 1”
- “Print 18 - Front Seats Box”
- “Print 19 - Front Window Frame + Switch Holder”
- “Print 31 - Seats”

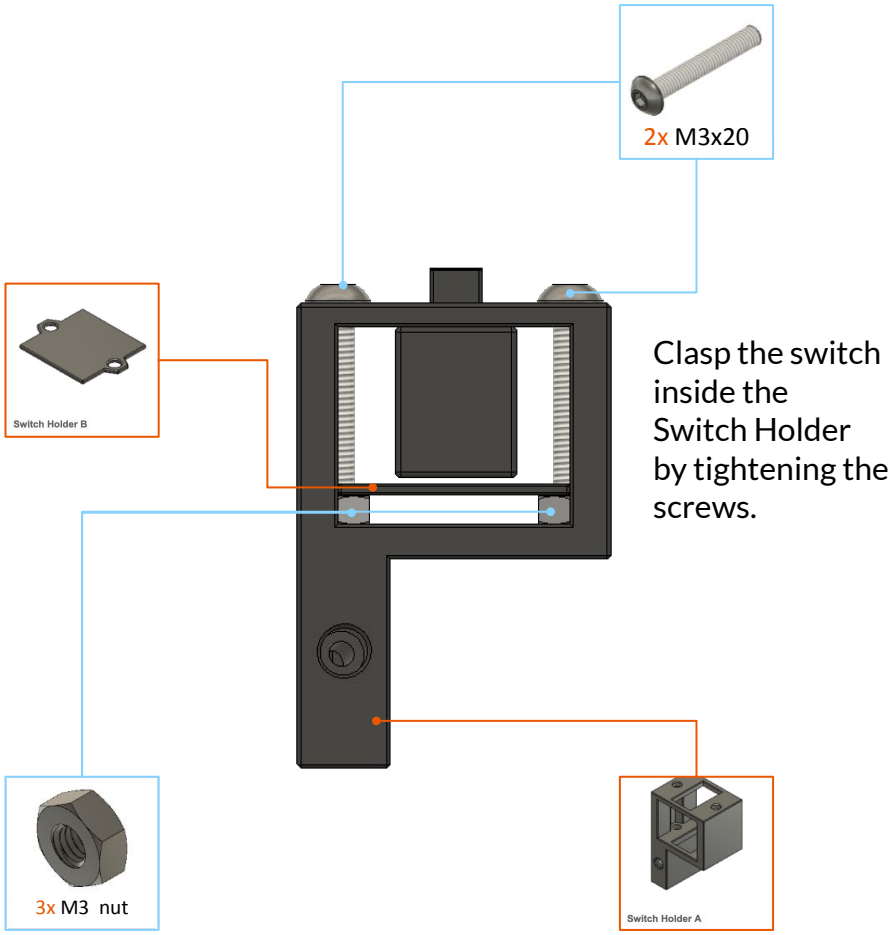
Non-printed parts:

- Screw M2x6: 6 pcs.
- Screw M2x8: 2 pcs.
- Screw M2x10: 1 pcs.
- Screw M3x12: 4 pcs.
- Screw M3x20: 2 pcs.
- M3 Nut: 2 pcs.

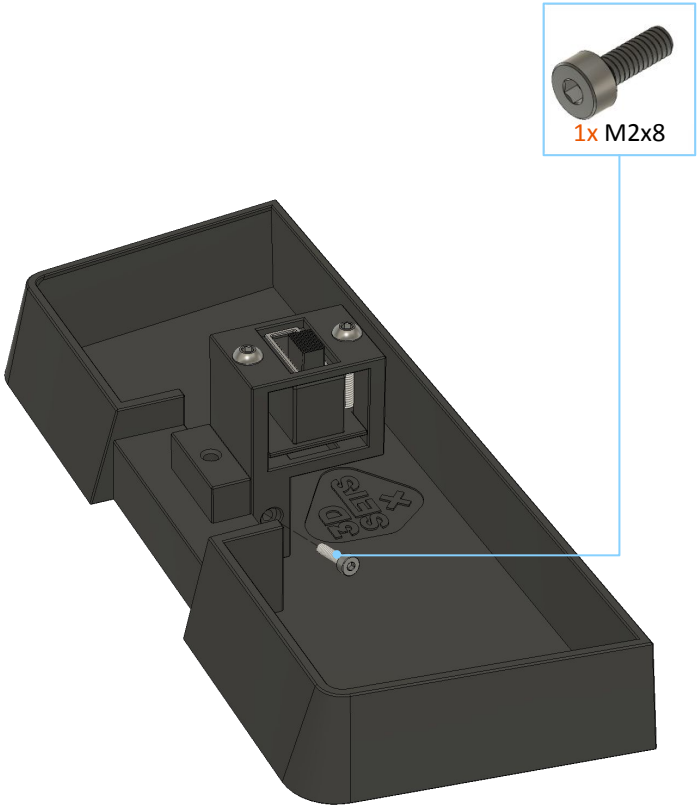
Electronics and wire layout



Switch Holder

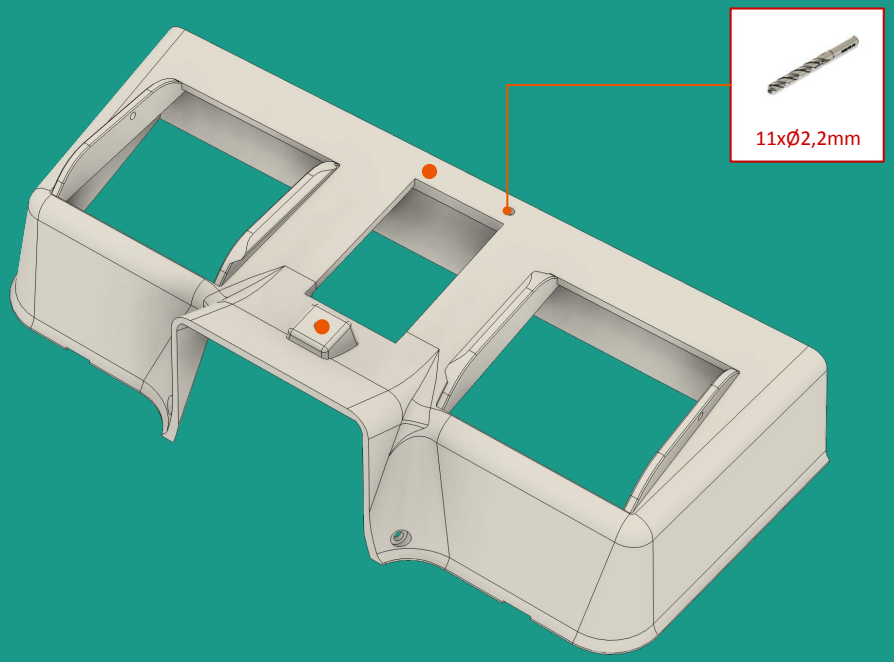


Clasp the switch inside the Switch Holder by tightening the screws.

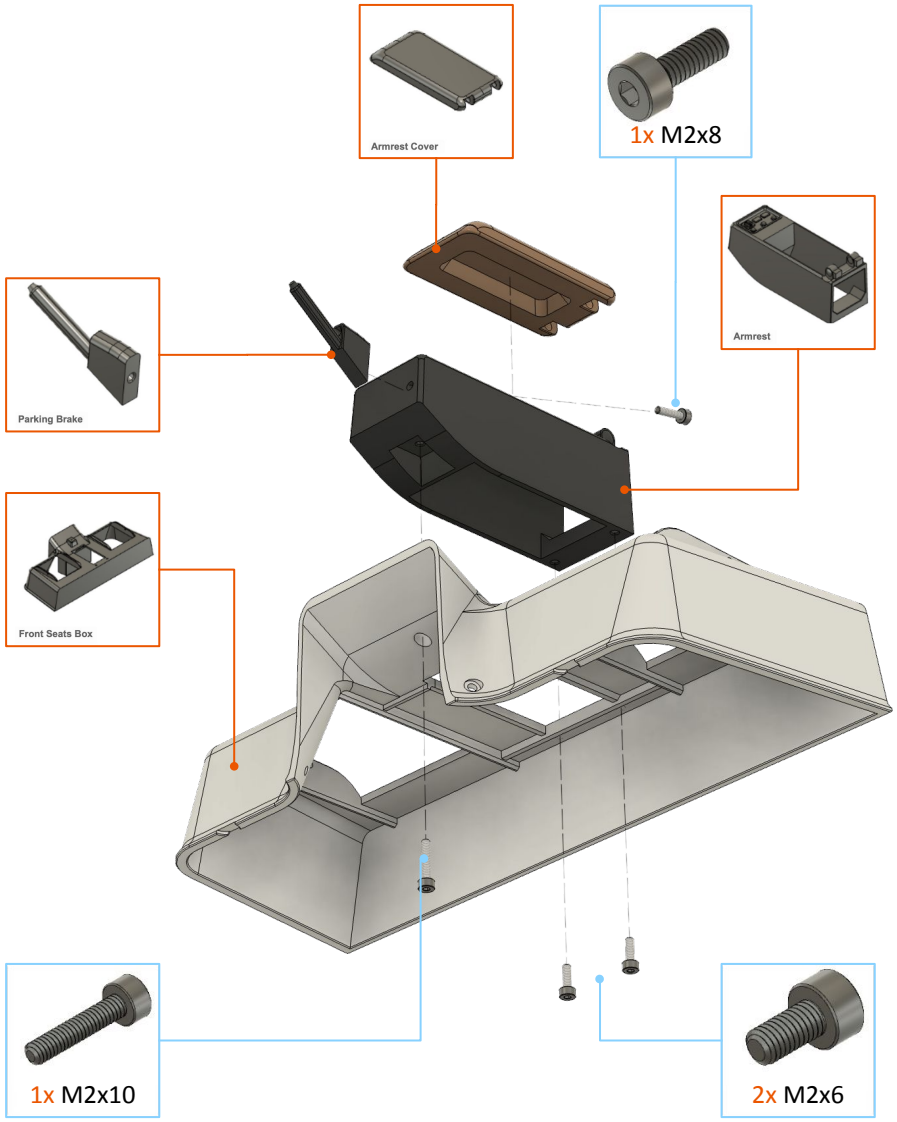


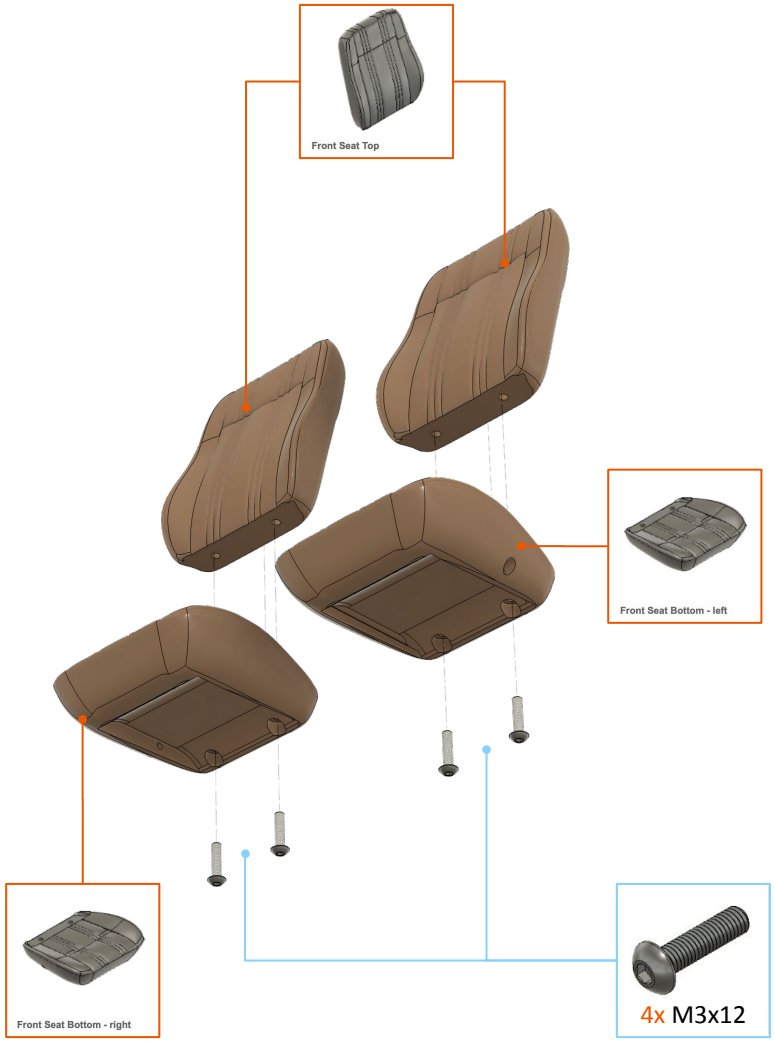
Postprocessing – drilling holes

Please carefully drill through the marked holes that have not been printed through to make printing easier.

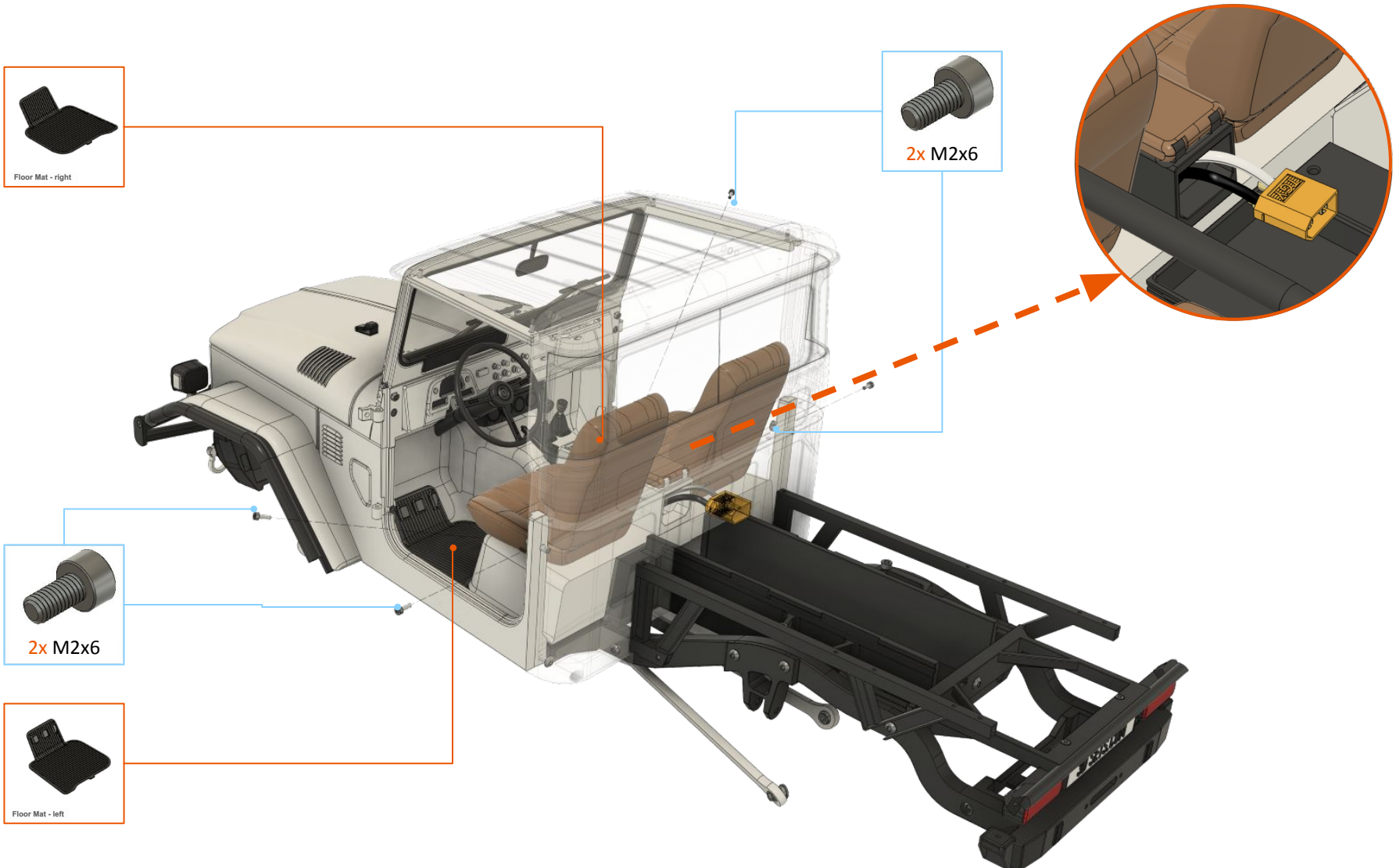


Front Seats – step 1/2





Front Seats Installation



Bamboo 4x4 Winch Truck – Flatbed & Side Tube Steps

In this 2-step procedure you will install all electronics equipment and cables.

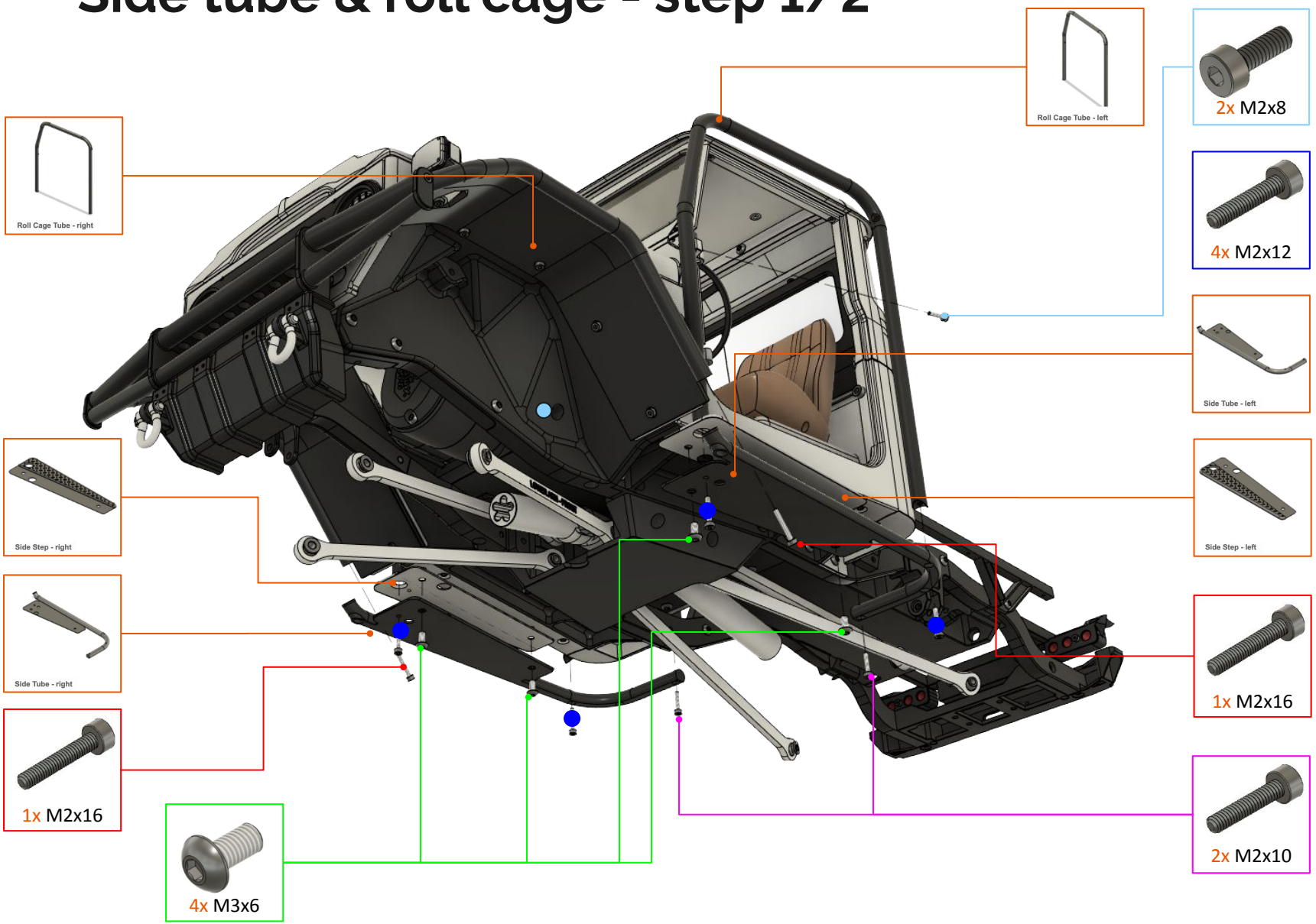
Required print plates:

- “Print 33 - Side Tube right + Roll Cage Tube right”
- “Print 34 - Side Tube left + Roll Cage Tube left”
- “Print 35 - Flatbed A + Roll Bar 1”
- “Print 36 - Flatbed B+C + V-Shape”

Non-printed parts:

- Screw M2x8: 16 pcs.
- Screw M2x12: 4 pcs.
- Screw M2x16: 6 pcs.
- Screw M3x6: 4 pcs.

Side tube & roll cage - step 1/2

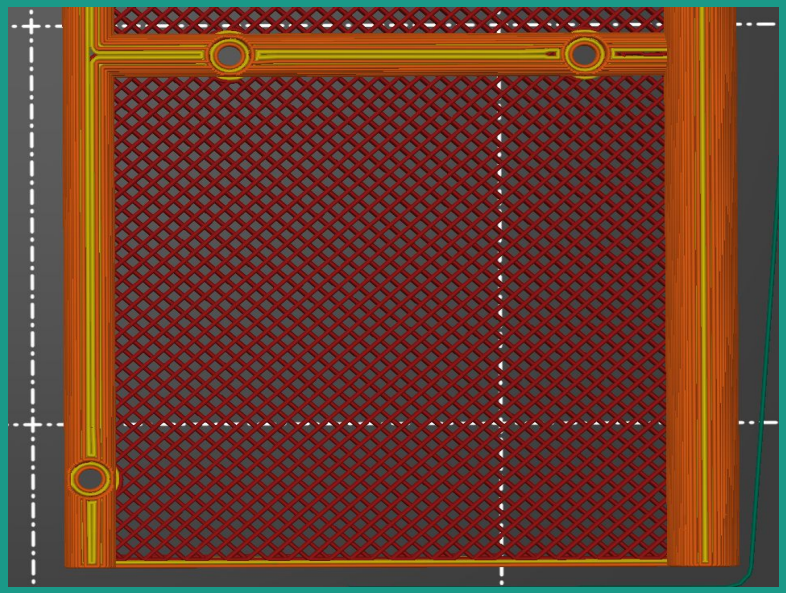


FlatBed - change print settings

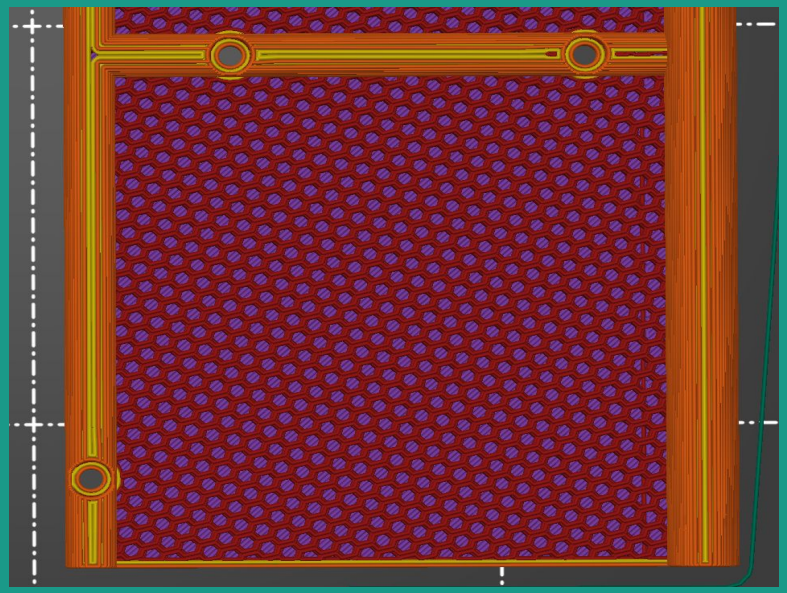
You can modify print setting for print FlatBed, you can change infill density, infill type or bottom layers.

For example:

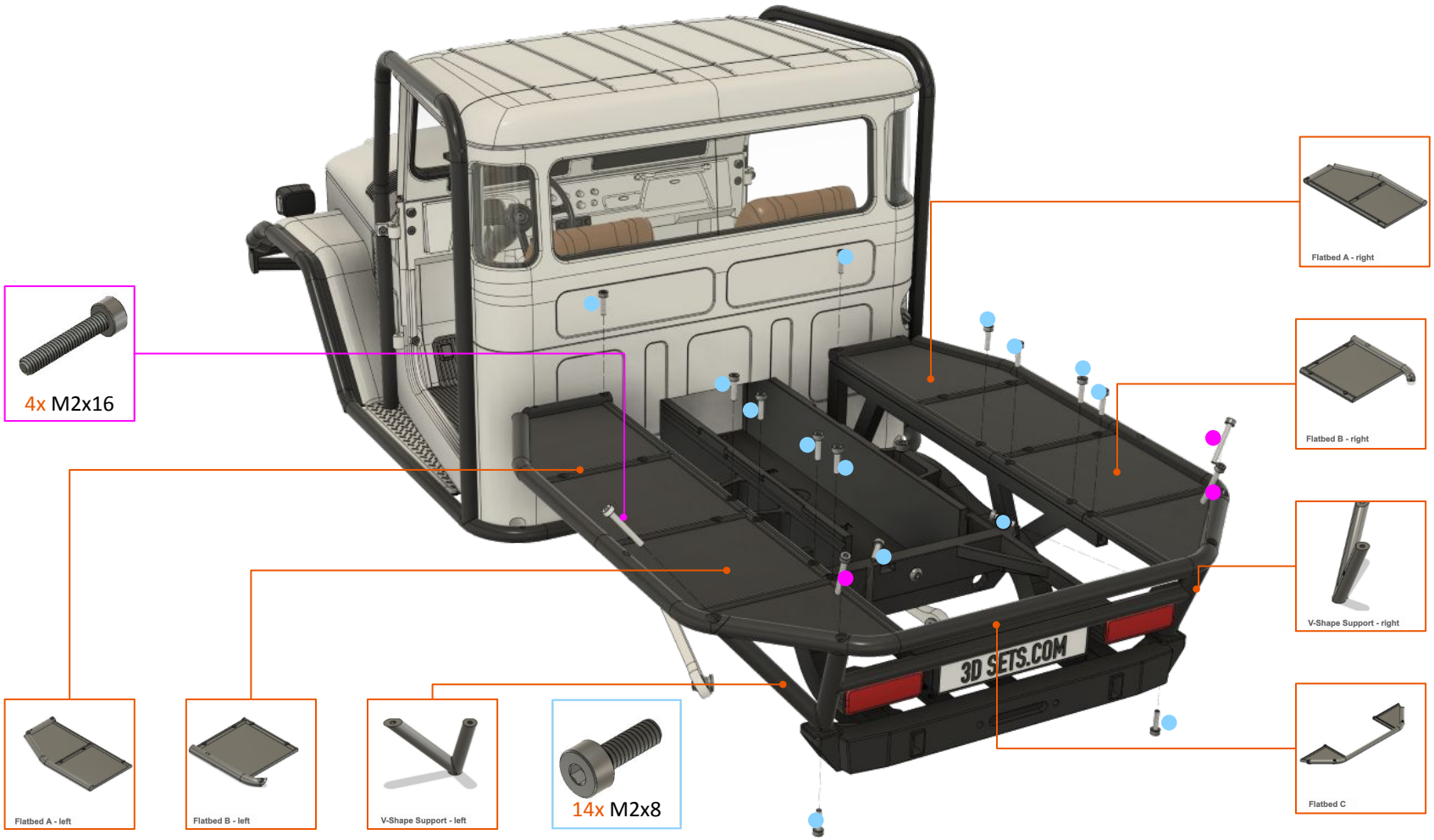
- Infill density: 30%
- Infill type: Rectilinear
- Perimeters: 3
- Top layers: 0
- Bottom layers: 0



- Infill density: 40%
- Infill type: Honeycomb
- Perimeters: 3
- Top layers: 0
- Bottom layers: 5



Flatbed - step 2/2



Bamboo 4x4 Winch Truck – Roll Cage & Rear Fenders

In this 2-step procedure you will install all electronics equipment and cables.

Required print plates:

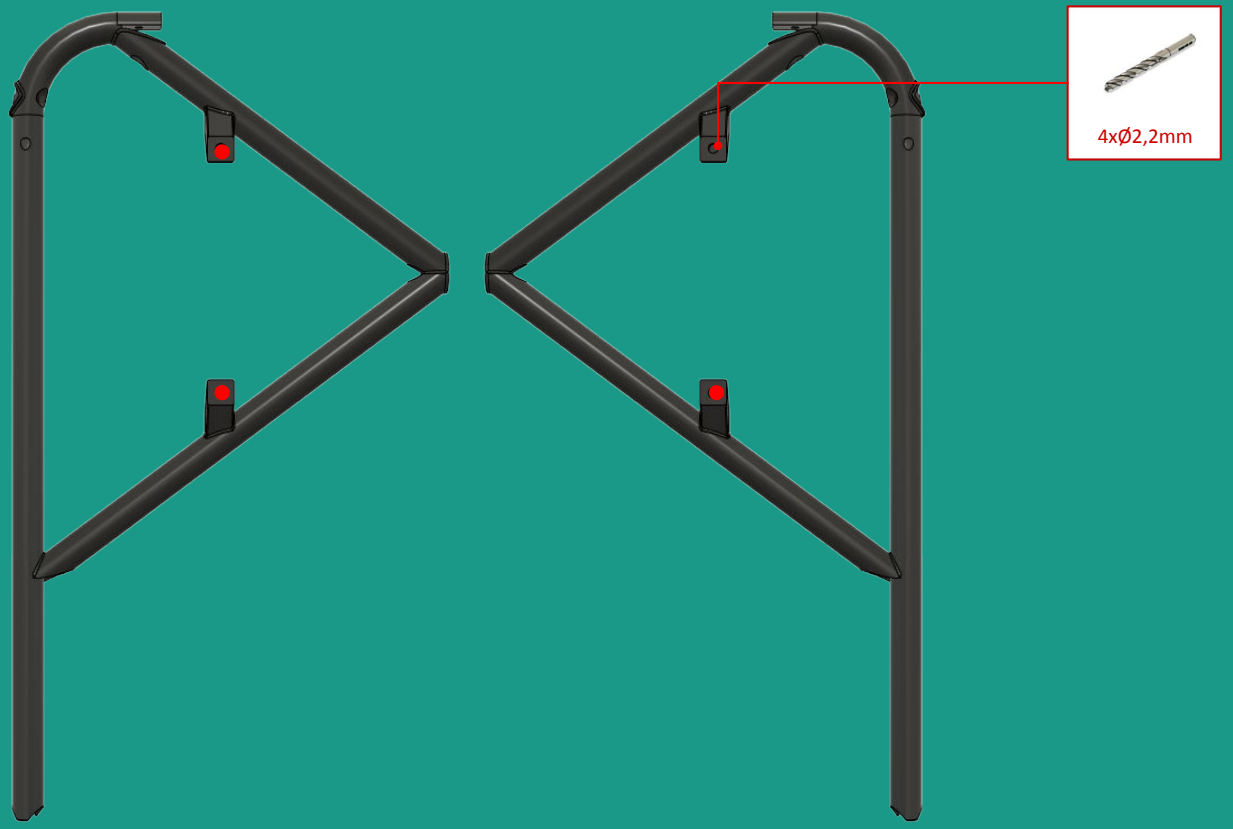
- “Print 15 - Lights 2 + Rear Light Holder + Rear Bumper”
- “Print 27 - Details 2”
- “Print 30 - D-Ring Shackle”
- “Print 35 - Flatbed A + Roll Bar 1”
- “Print 37 - Rear Fender”
- “Print 39 - Roll Bar 2”
- “Print 40 - Fan”
- “Print 41 - Offroad Radiator”

Non-printed parts:

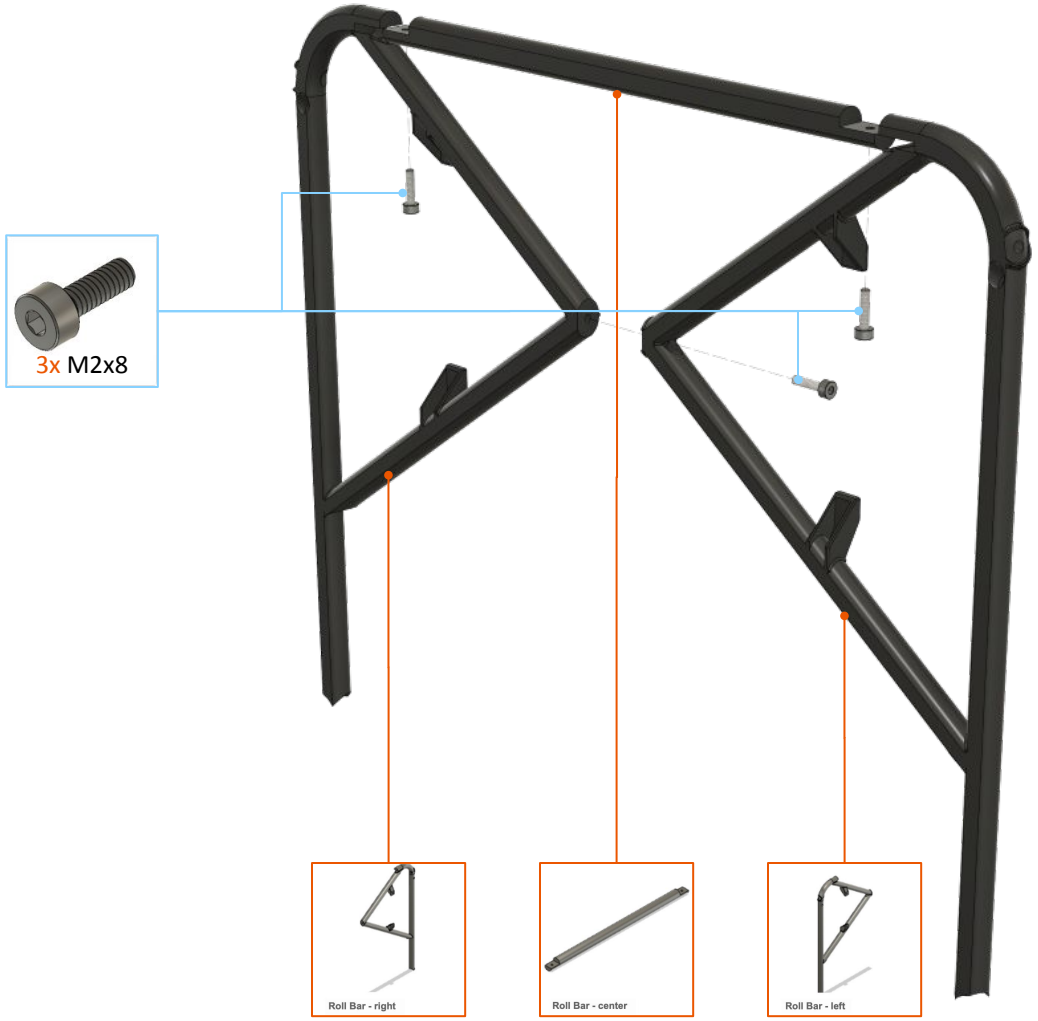
- Screw M2x6: 26 pcs.
- Screw M2x8: 7 pcs.
- Screw M2x10: 2pcs.
- Screw M2x12: 4 pcs.
- Screw M2x16: 6 pcs.

Postprocessing – drilling holes

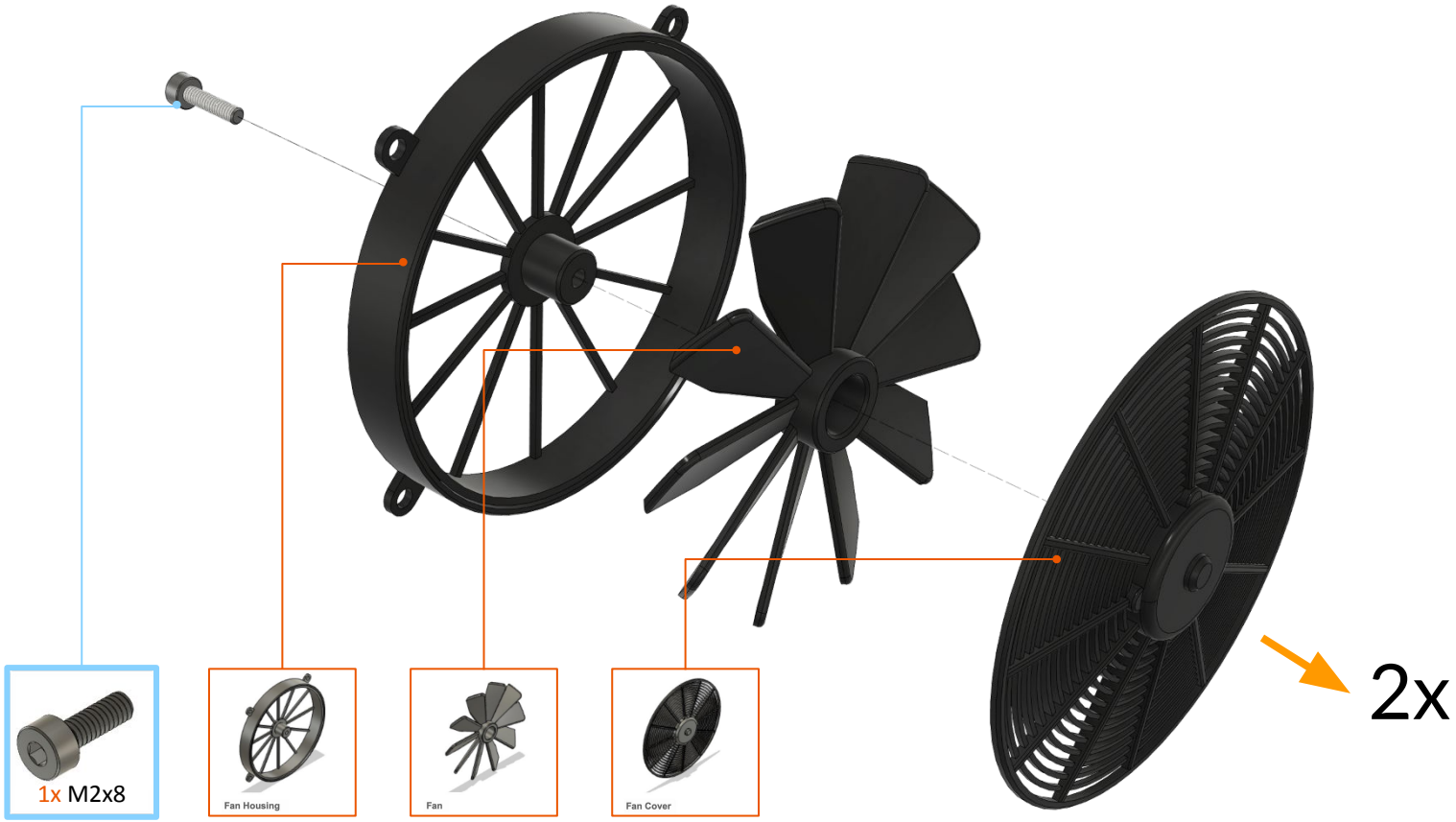
Please carefully drill through the marked holes that have not been printed through to make printing easier.



Roll bar - step 1/7

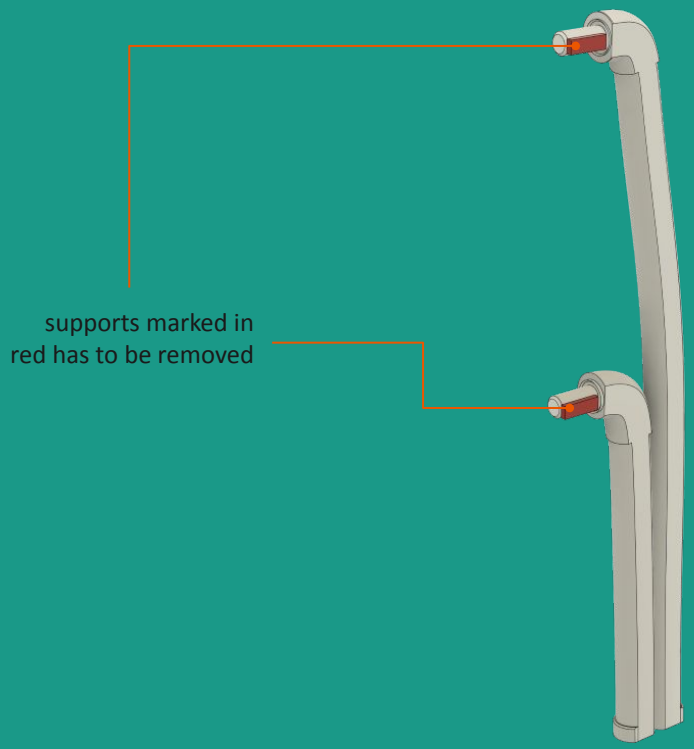


Fan - step 2/7

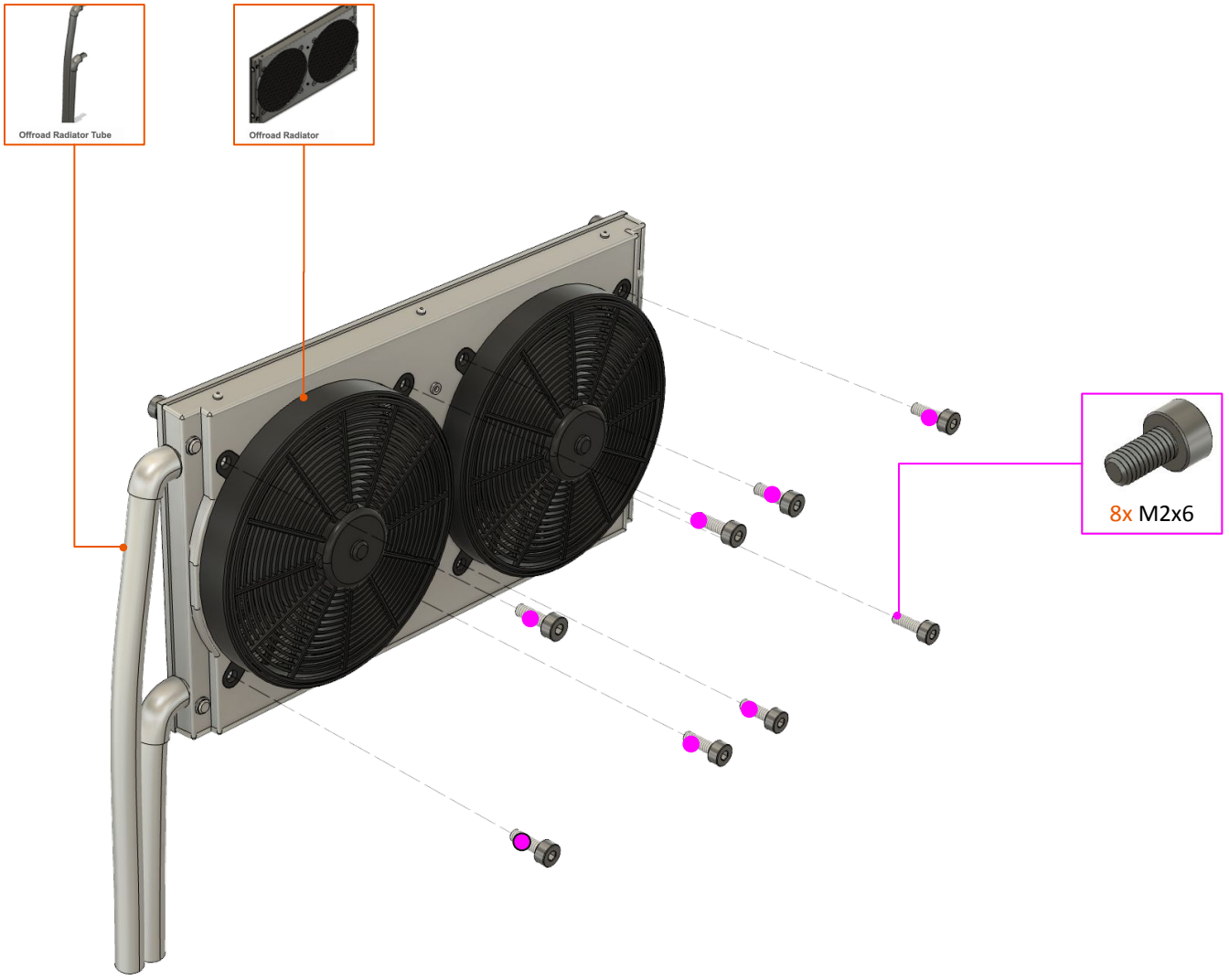


Postprocessing – removing supports

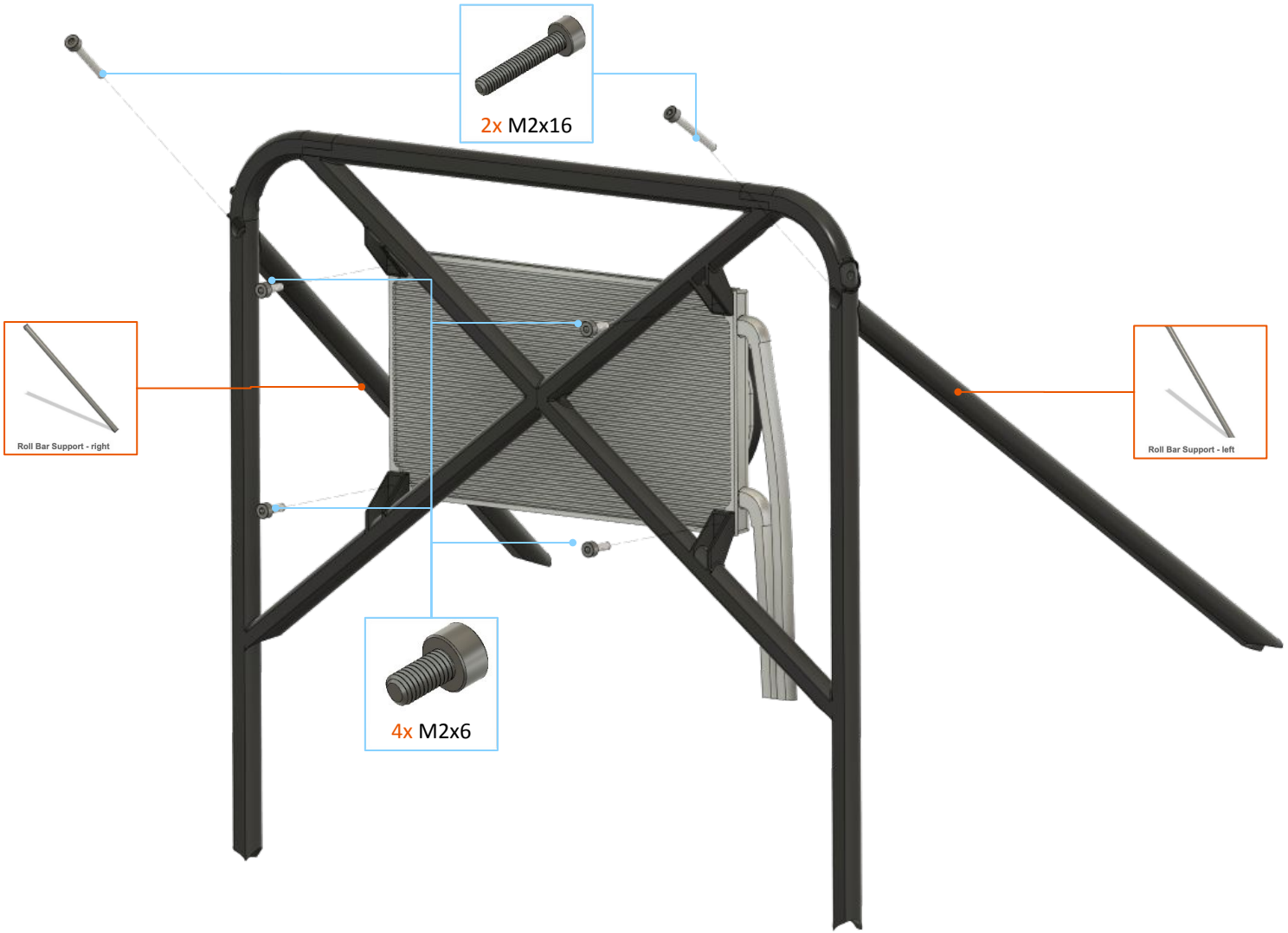
Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



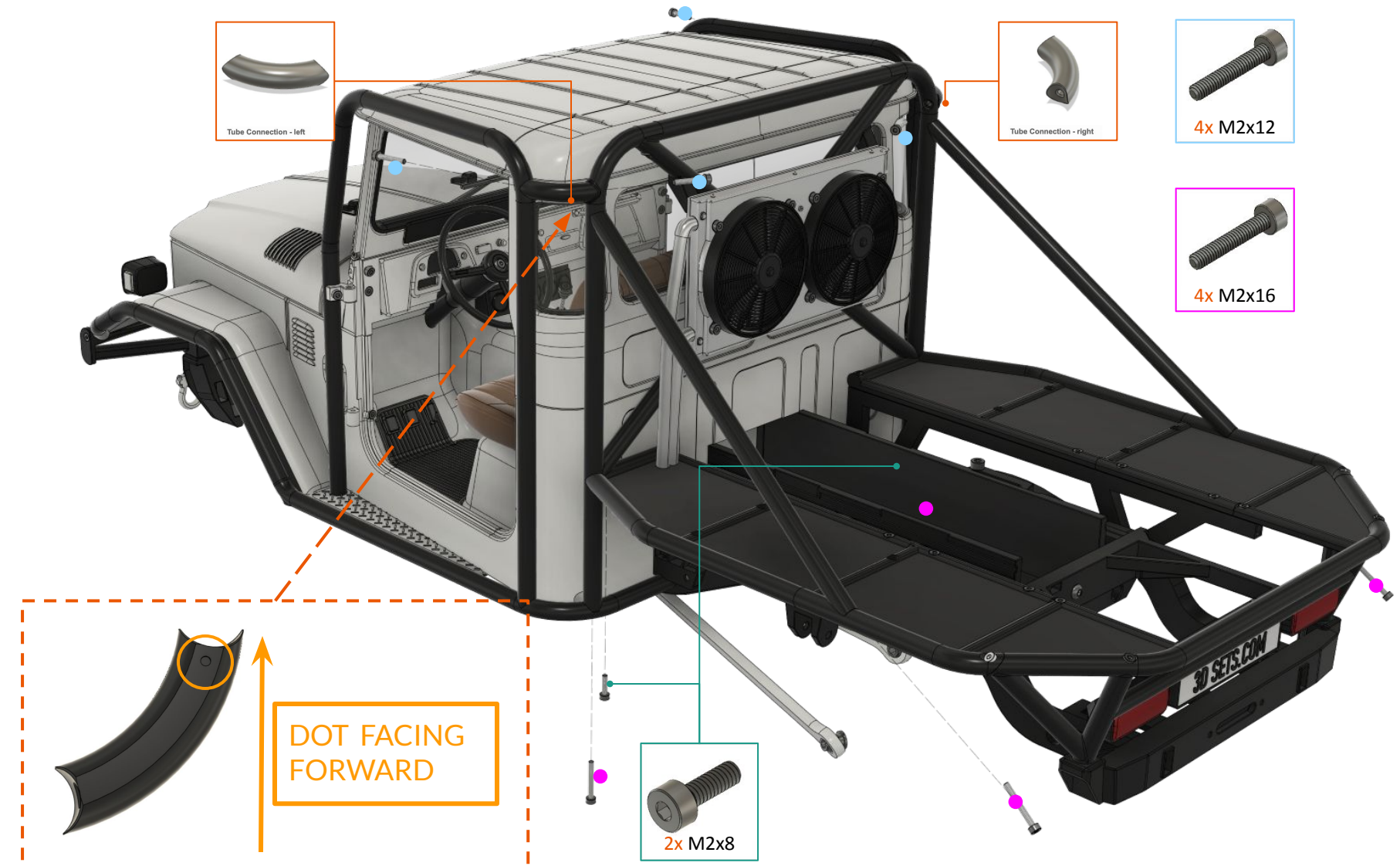
Radiator - step 3/7



Roll Bar - step 4/7



Roll Bar - step 5/7



Rear Fenders - step 6/7

Rear Shackles - step 7/7

Bamboo 4x4 – Axles choice

There are two different axles available for Bamboo 4x4:

With new *Opened Differential*
With *No Differential (locked)*

New *Opened Differential* features:

- Medium print and assemble difficulty
- Excellent for indoor driving and exterior hard surfaces
- Excellent maneuverability and small turning radius
- Low drivetrain/gearbox stress

Classic *No Differential* features:

- Easier to print and assemble
- Excellent for heavy terrain driving
- Not recommended for hard surfaces (interior floors etc.) – using locked differentials on both axles results in high stress on drivetrain/gearbox parts.

Both types of axles <u>can be combined</u> to achieve optimum performance:

Front Opened Diff.

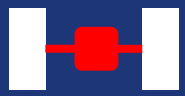
Ideal for interior driving or normal use on the yard

Rear Opened Diff.

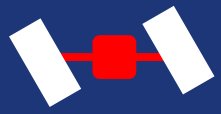
Front Opened Diff.

Recommended setup – good on all surfaces

Rear No Diff.

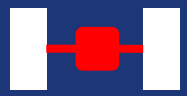


Front No Diff.



Ideal for heavy terrain. Not for hard surfaces.

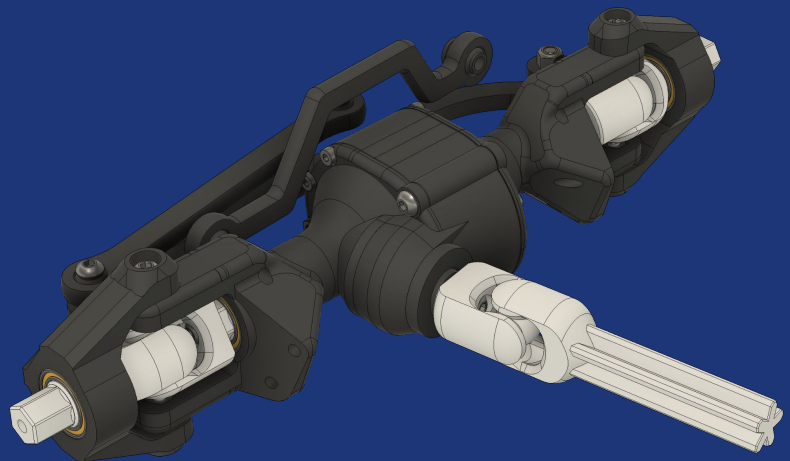
Rear No Diff.



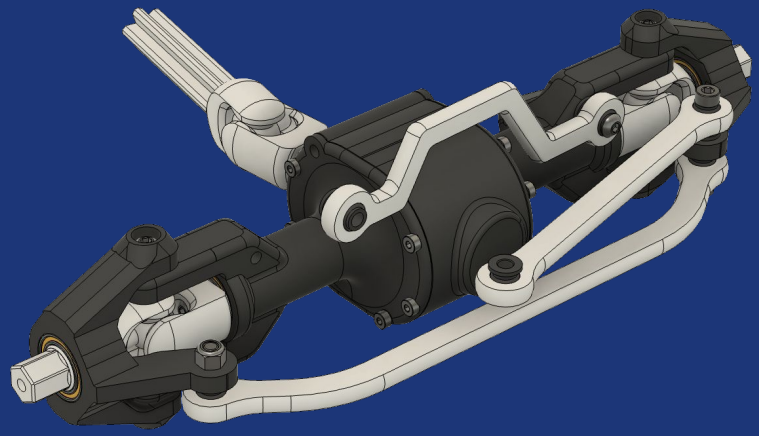
Front Axle

On the previous slide, you chose your preferred Axles configuration. Let's start with Front Axle first:

For Front Axle with Opened Differential, proceed to next page (105).



For Front Axle with No Differential, proceed to page 111.

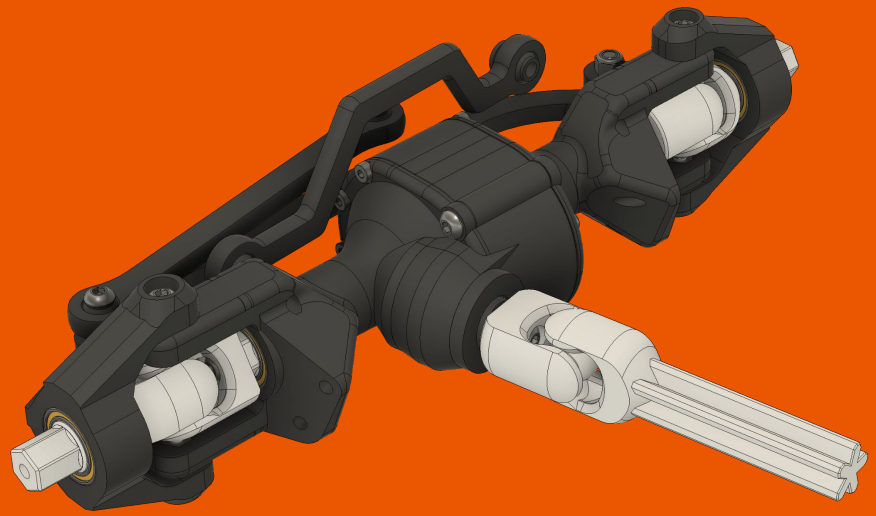


Front Axle – with Differential

In this 6-step procedure you will assemble the front axle. The axle includes a open differential, driveshaft and complete steering assembly.

Required print plates:

- “Print 46 - Shafts”
- “Print 47B - Differential Axe - 1”
- “Print 48B - Differential Axe - 2” - **print from PLA or PC Blend**



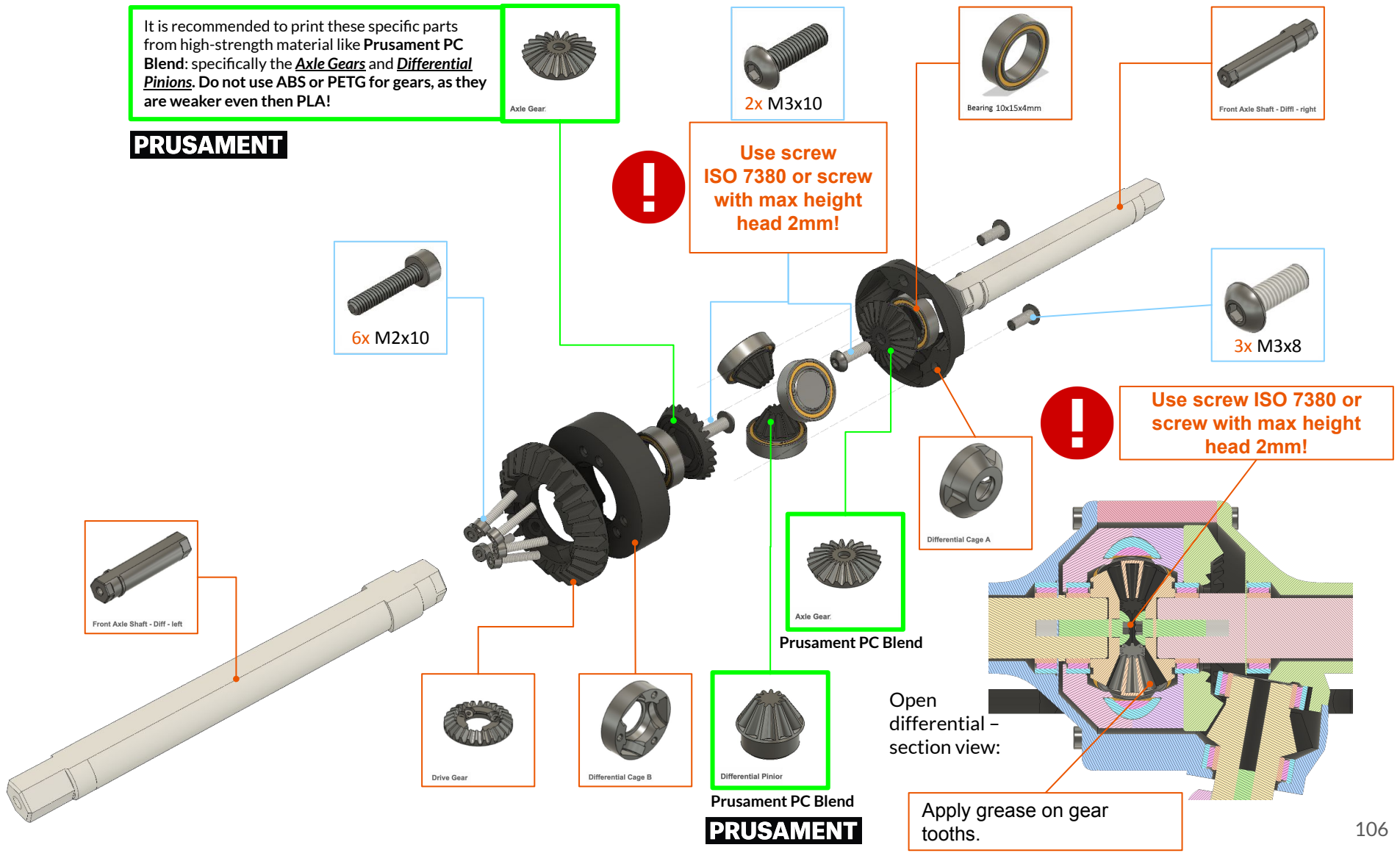
Non-printed parts:

- Screw M2x10: 18 pcs.
- Screw M3x8: 3 pcs.
- Screw M3x10: 10 pcs.
- Screw M3x16: 2 pcs.
- Screw M3x25: 1 pcs.
- Nut M3: 4 pcs.
- Locknut M3: 2 pcs.
- Bearing: 15 pcs.
- Grease

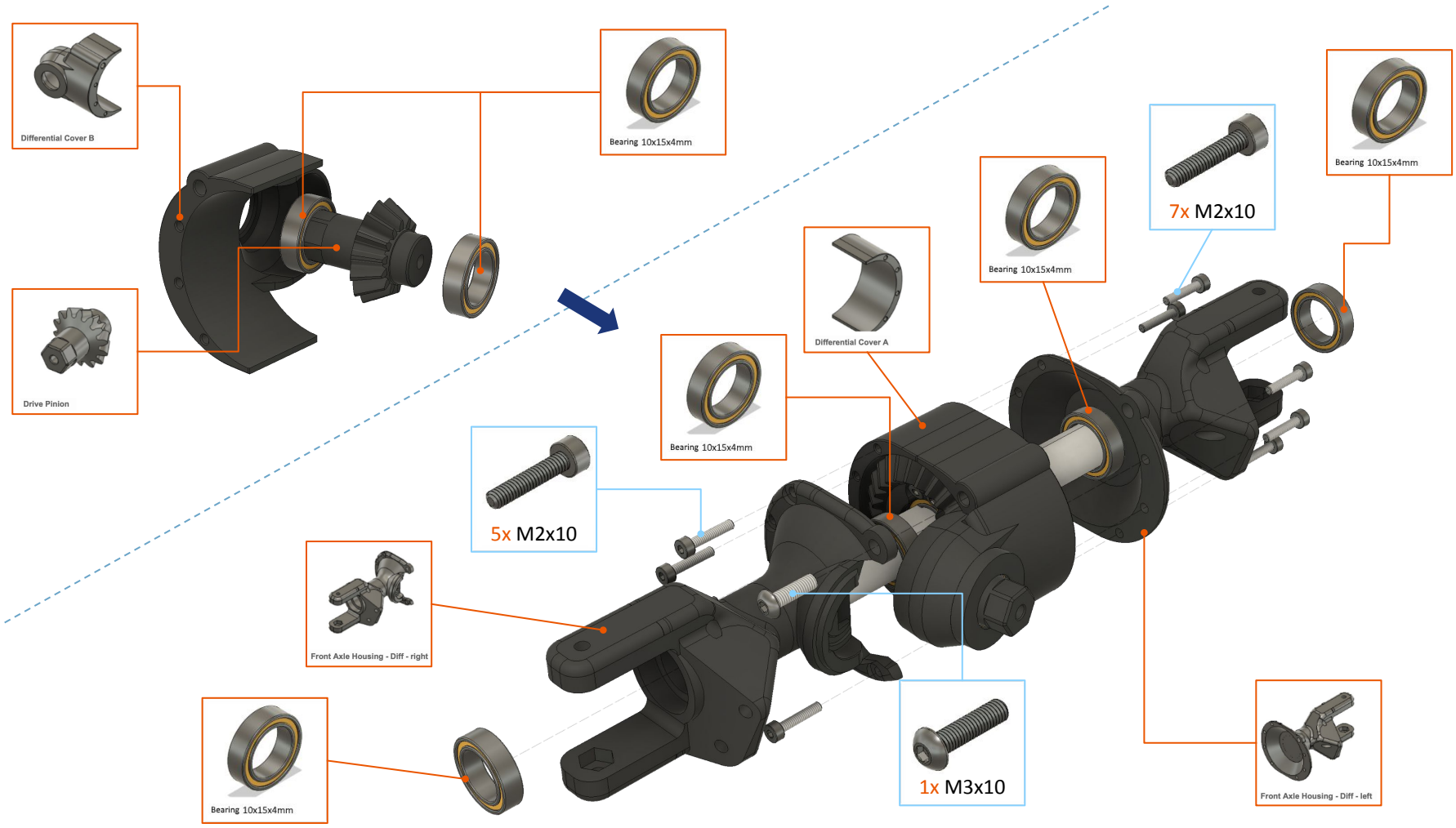
Front Axle (with differential) – step 1/6

It is recommended to print these specific parts from high-strength material like **Prusament PC Blend**: specifically the ***Axle Gears*** and ***Differential Pinions***. **Do not use ABS or PETG for gears, as they are weaker even then PLA!**

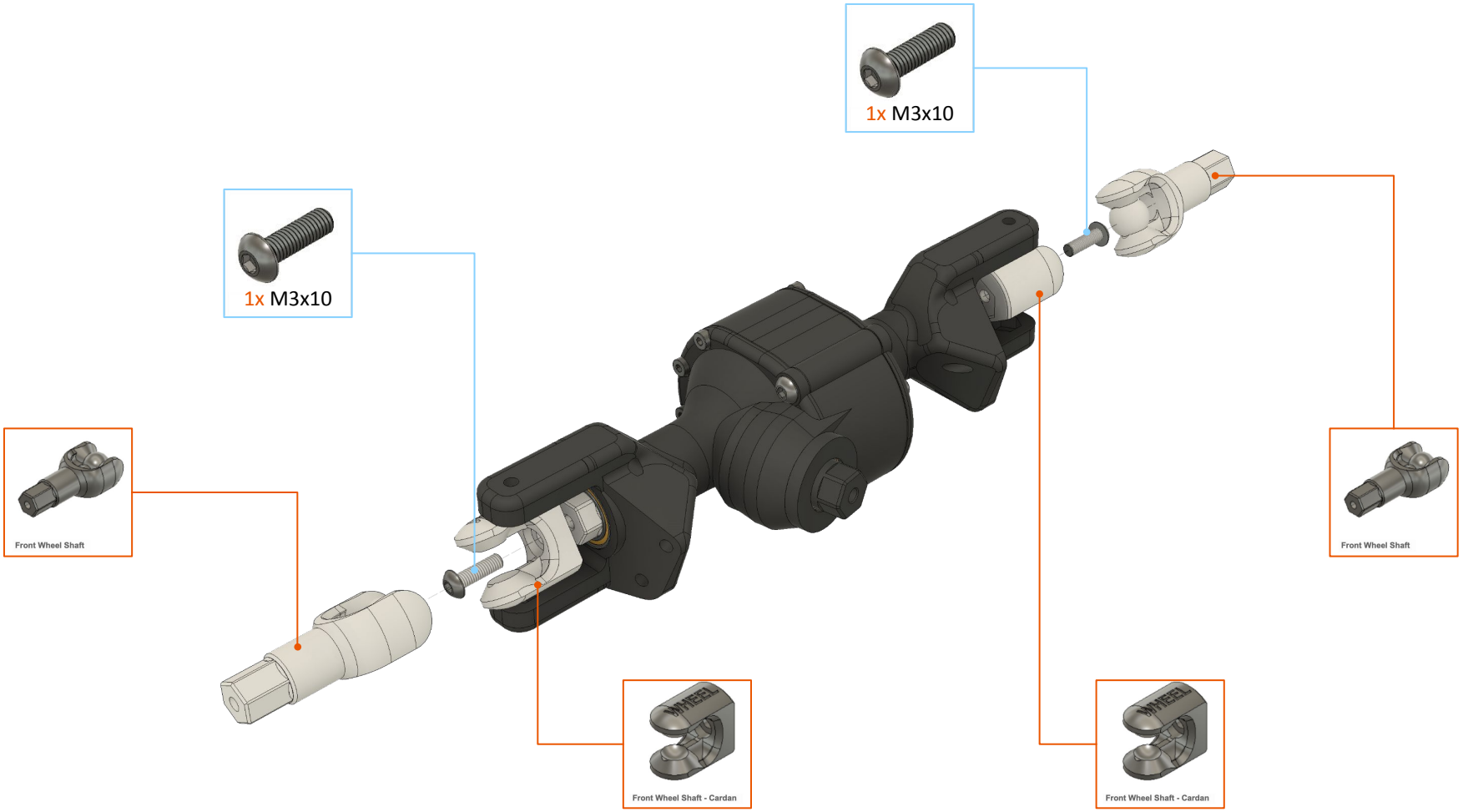
PRUSAMENT



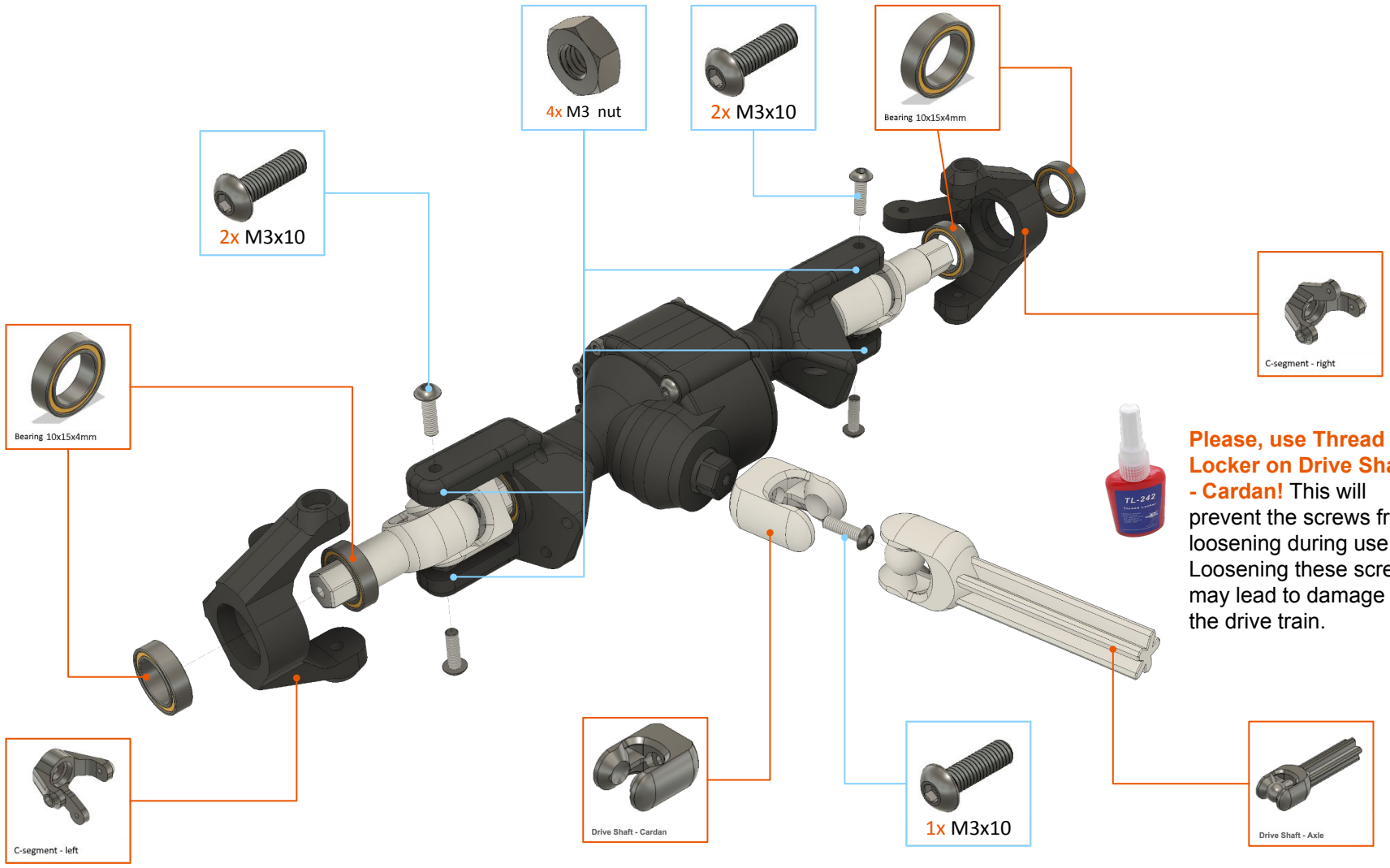
Front Axle (with differential) – step 2-3/6



Front Axle (with differential) – step 4/6

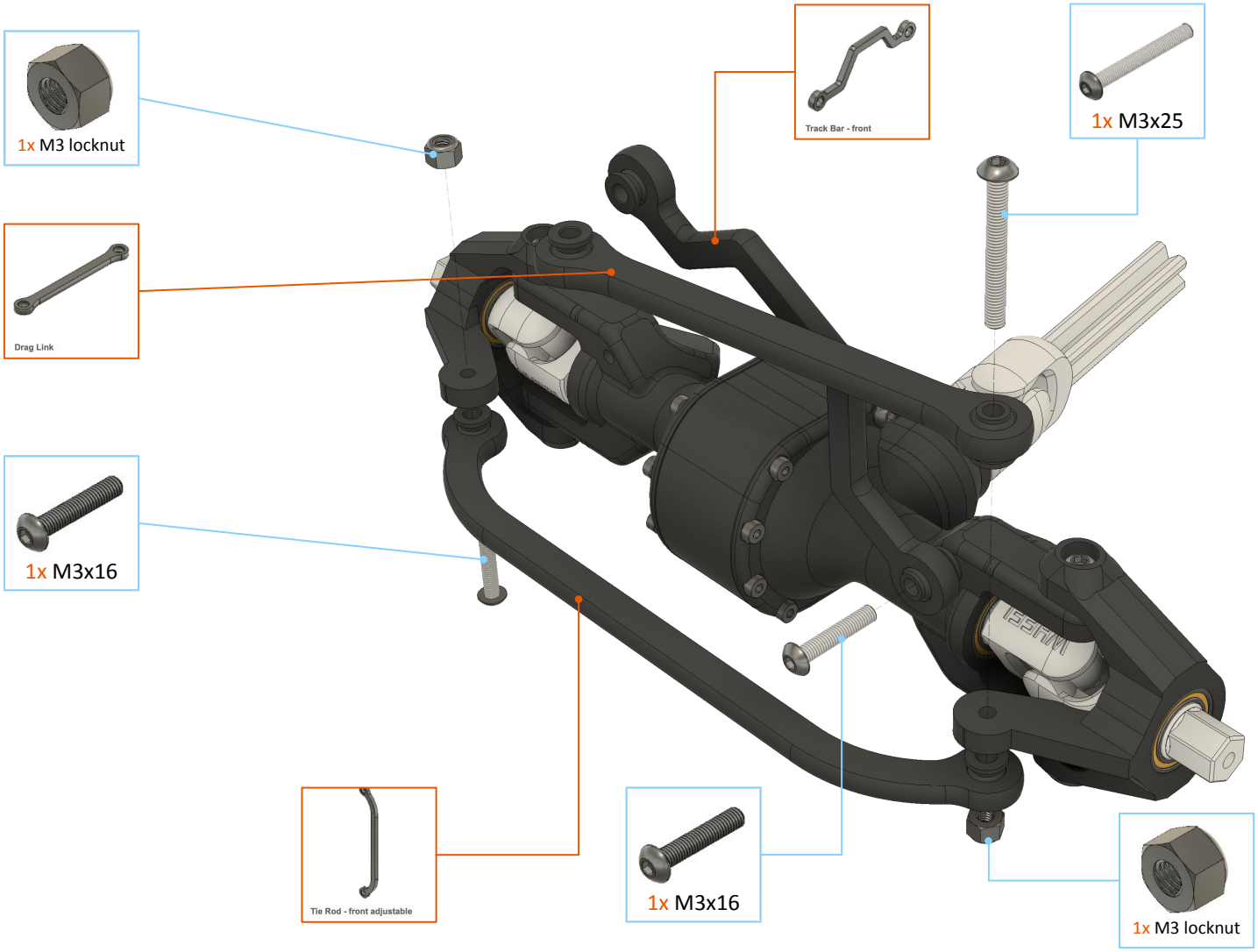


Front Axle (with differential) – step 5/6



Please, use Thread Locker on Drive Shaft - Cardan! This will prevent the screws from loosening during use. Loosening these screws may lead to damage to the drive train.

Front Axle (with differential) – step 6/6



Front Axle – No Differential

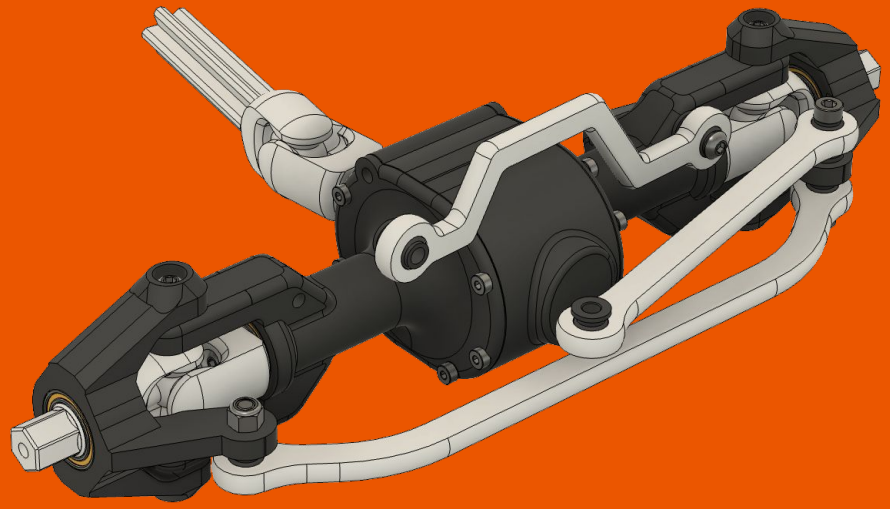
In this 10-step procedure you will assemble the front axle. The axle includes a locked differential, driveshaft and complete steering assembly.

Required print plates:

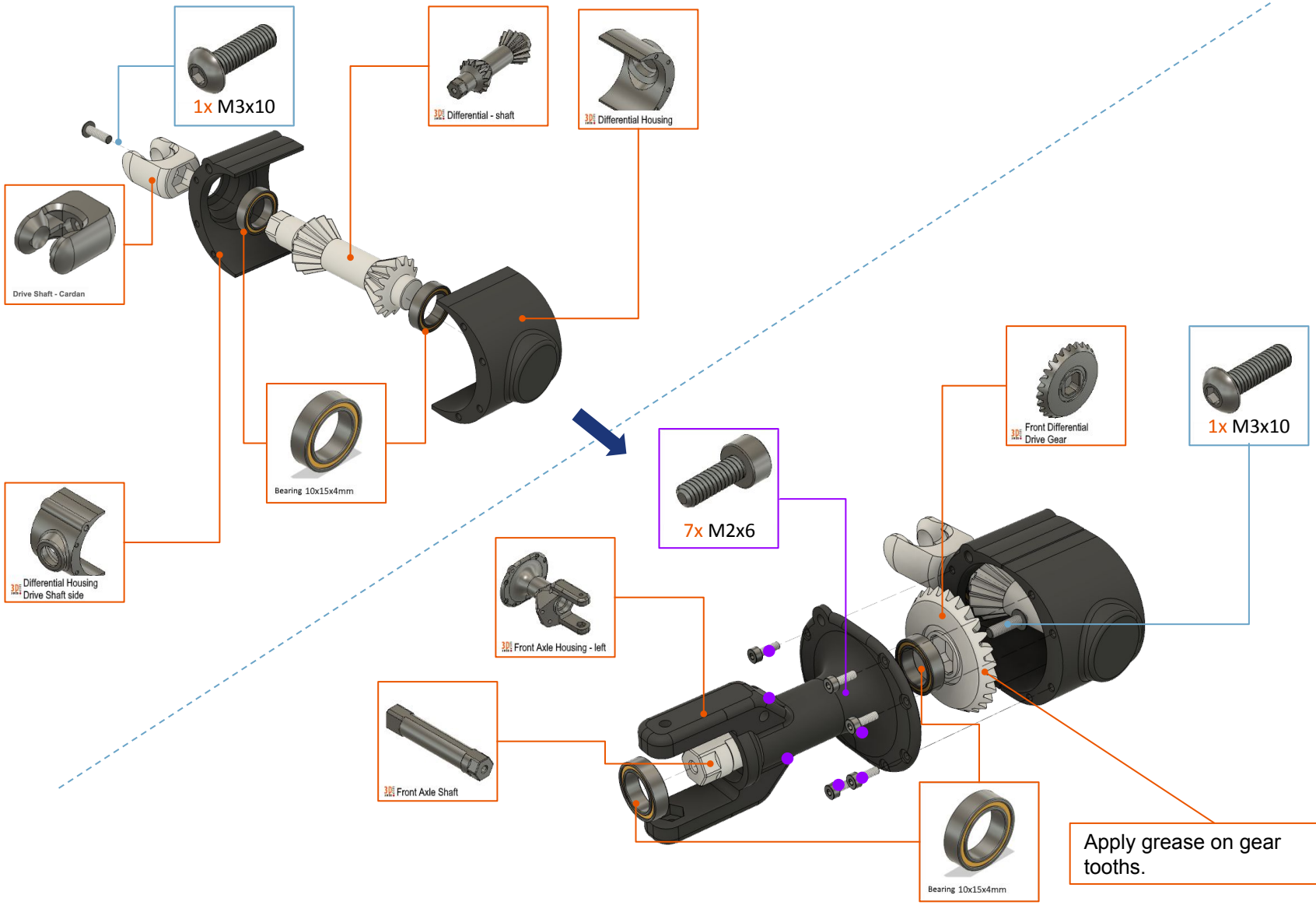
- “Print 46 - Shafts”
- “Print 47A - Locked Axle - 1”
- “Print 48A - Locked Axle - 2”

Non-printed parts:

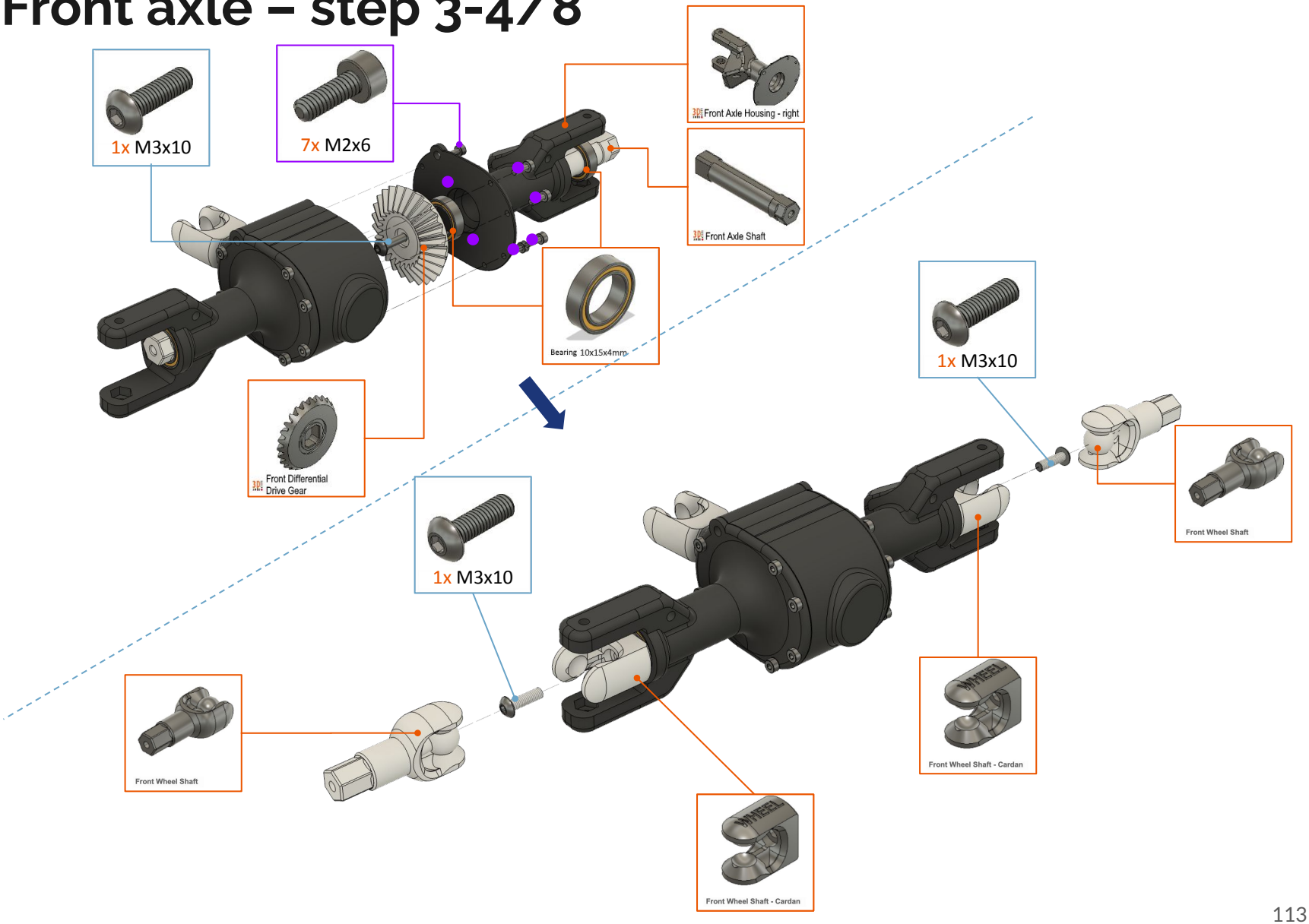
- Screw M2x6: 14 pcs.
- Screw M3x10: 9 pcs.
- Screw M3x16: 2 pcs.
- Screw M3x25: 1 pcs.
- Nut M3: 4 pcs.
- Locknut M3: 2 pcs.
- Bearing: 10 pcs.
- Grease



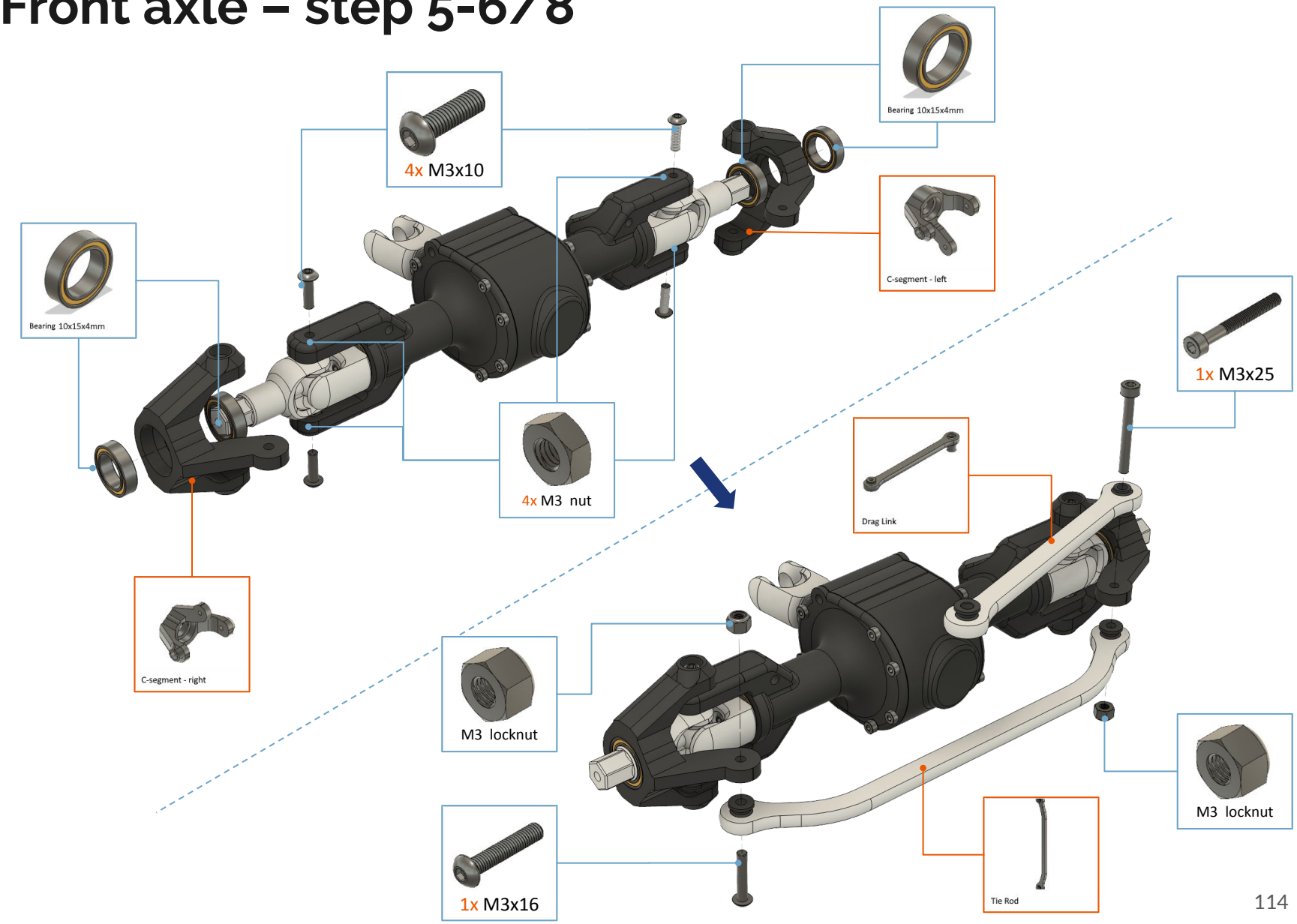
Front axle – step 1-2/8



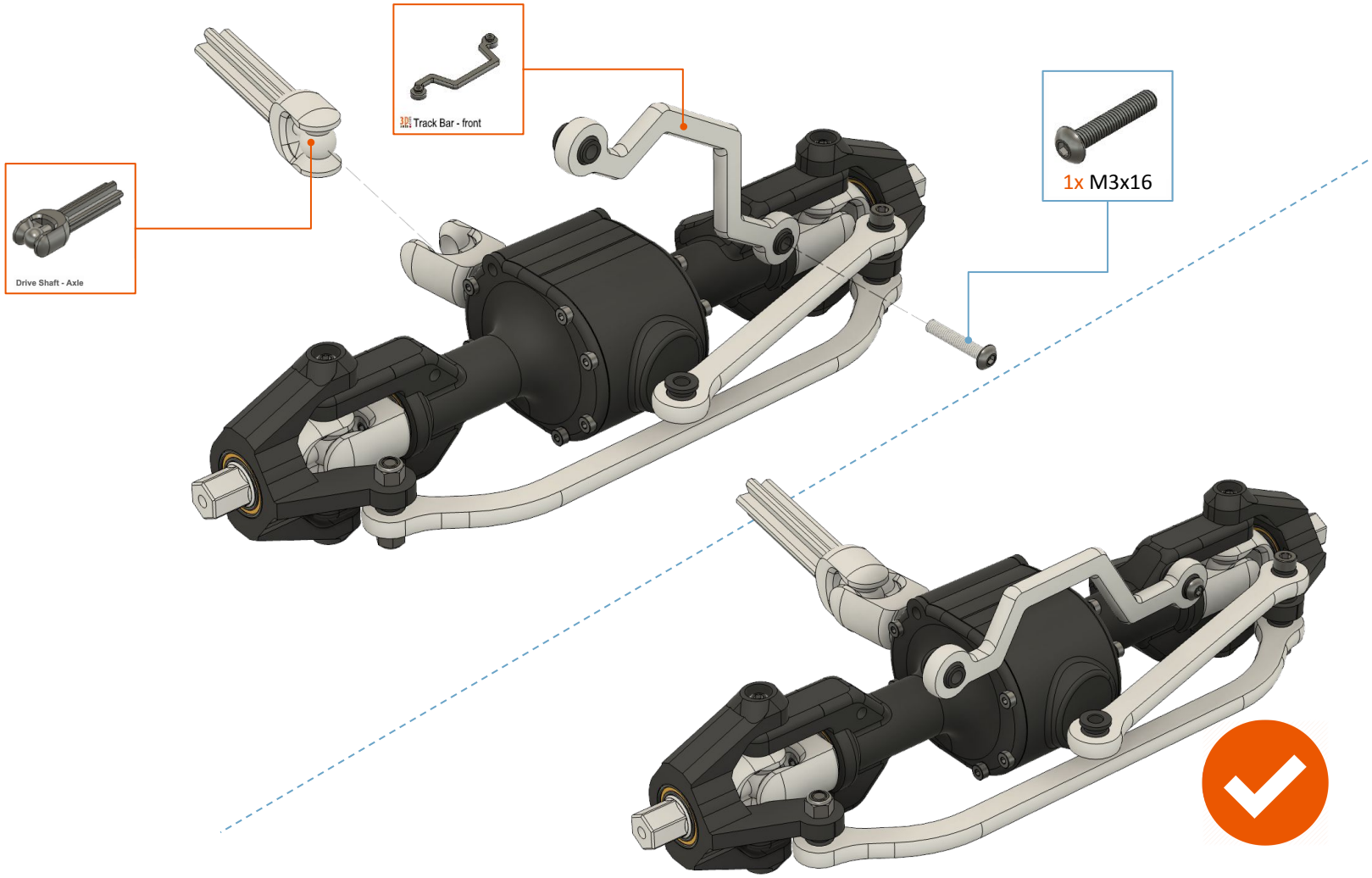
Front axle – step 3-4/8



Front axle – step 5-6/8



Front axle – step 7-8/8



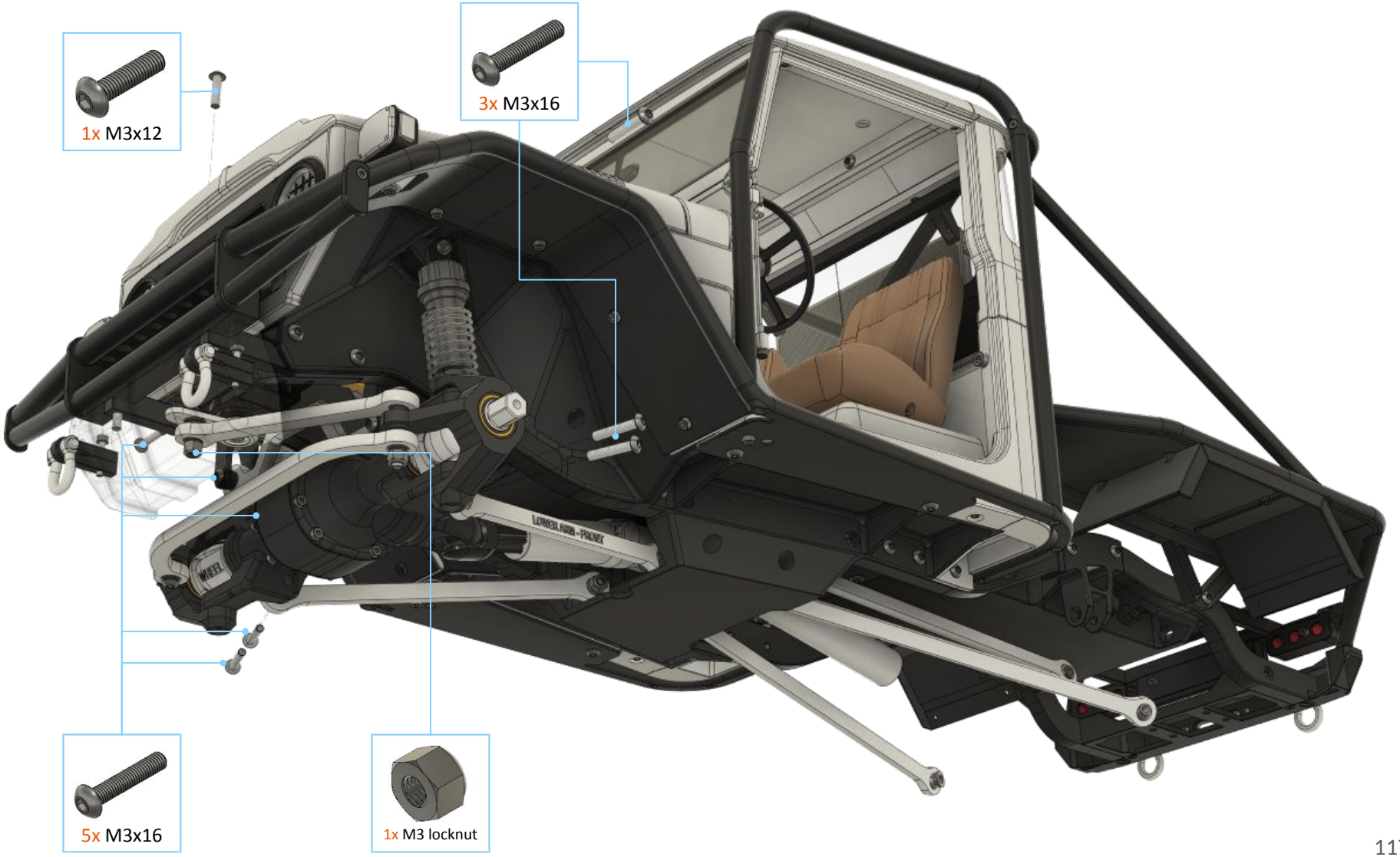
Front Axle Installation

In this 1-step procedure you will install Front Axle.

Non-printed parts:

- Screw M3x12: 2 pcs.
- Screw M3x16: 7 pcs.
- Lock Nut M3: 1 pcs

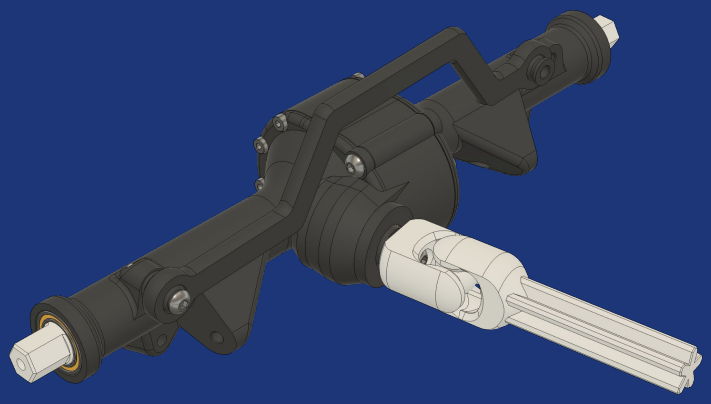
Front Axle Installation



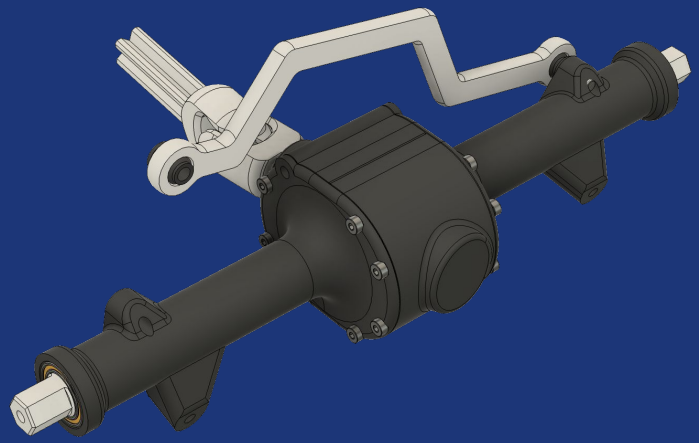
Rear Axle

On the slide 103, you chose your preferred Axles configuration. Continue with the Rear Axle:

For Rear Axle with Opened Differential, proceed to next page (119).



For Rear Axle with No Differential, proceed to page 123.



Rear Axle with Differential

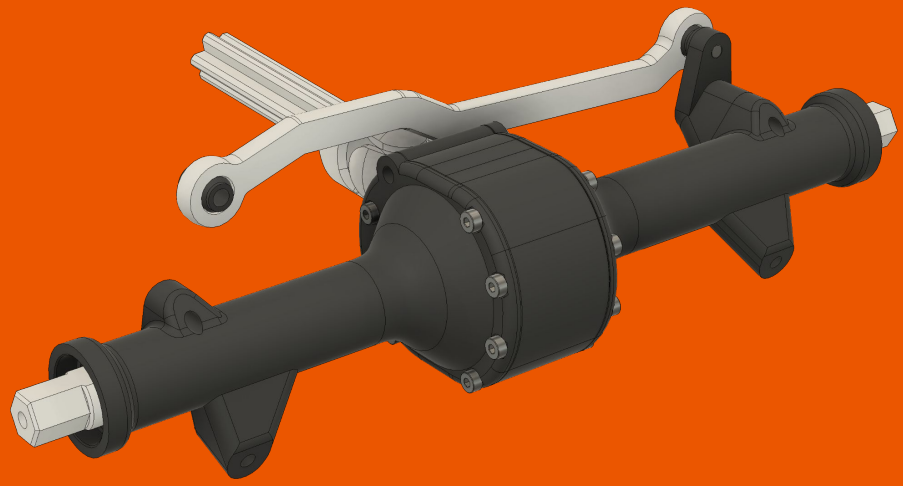
In this 4-step procedure you will assemble the rear axle. The axle includes a locked differential and driveshaft.

Required print plates:

- “Print 1 - Chassis 1”
- “Print 46 - Shafts”
- “Print 47B - Differential Axe - 1”
- “Print 48B - Differential Axe - 2” - **print from PLA or PC Blend**

Non-printed parts:

- Screw M2x10: 18 pcs.
- Screw M3x8: 3 pcs.
- Screw M3x10: 4 pcs.
- Screw M3x12: 1 pcs.
- Screw M3x16: 1 pcs.
- Bearings: 11 pcs.
- Grease
- Thread Locker

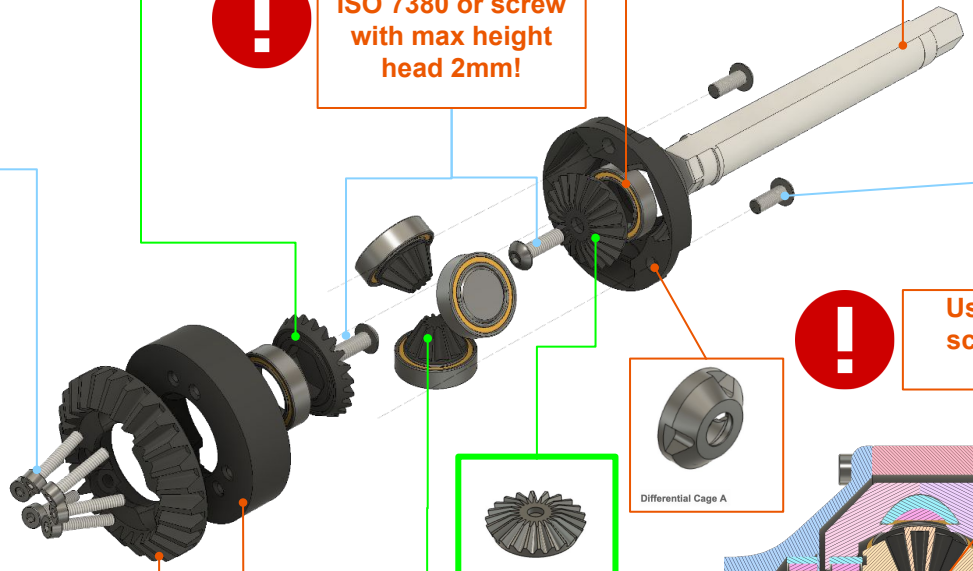


Rear Axle (with differential) – step 1/4

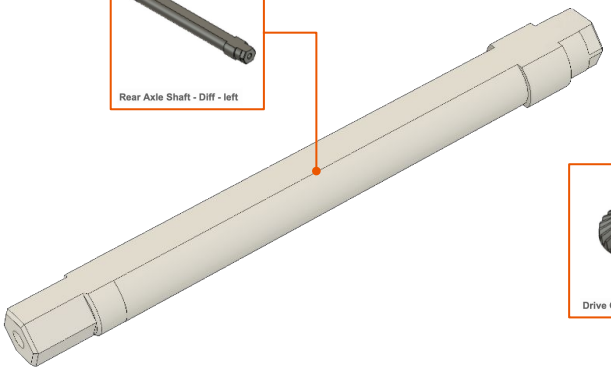
It is recommended to print these specific parts from high-strength material like **Prusament PC Blend**: specifically the ***Axle Gears*** and ***Differential Pinions***. **Do not use ABS or PETG for gears, as they are weaker even then PLA!**

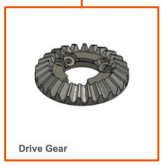
PRUSAMENT

Use screw ISO 7380 or screw with max height head 2mm!



Use screw ISO 7380 or screw with max height head 2mm!



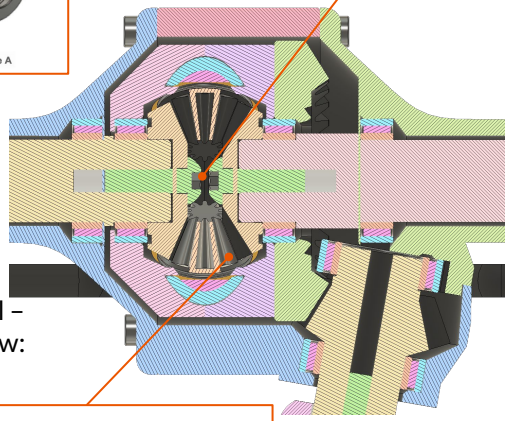


Prusament PC Blend

PRUSAMENT

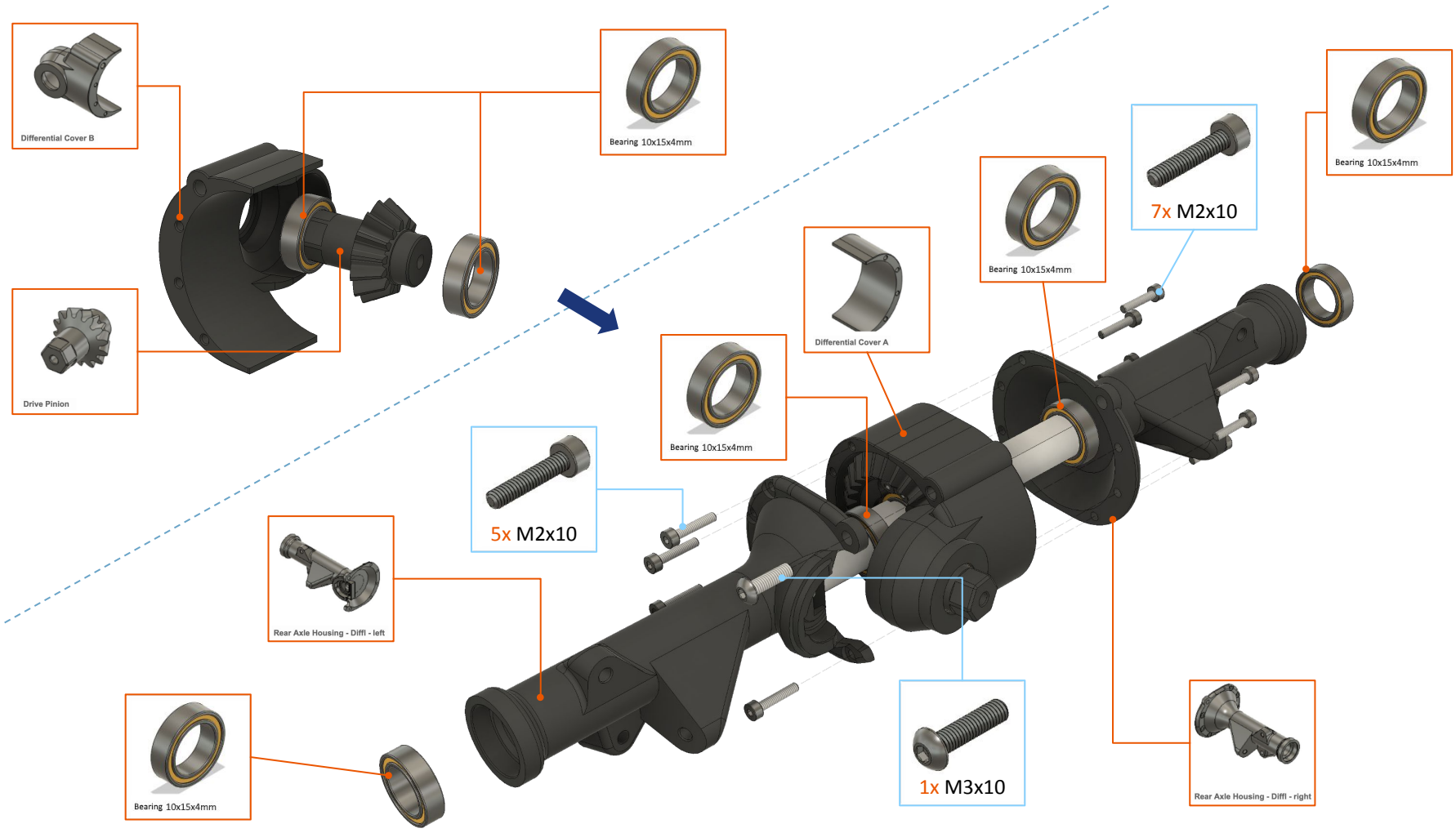
Prusament PC Blend

Open differential – section view:



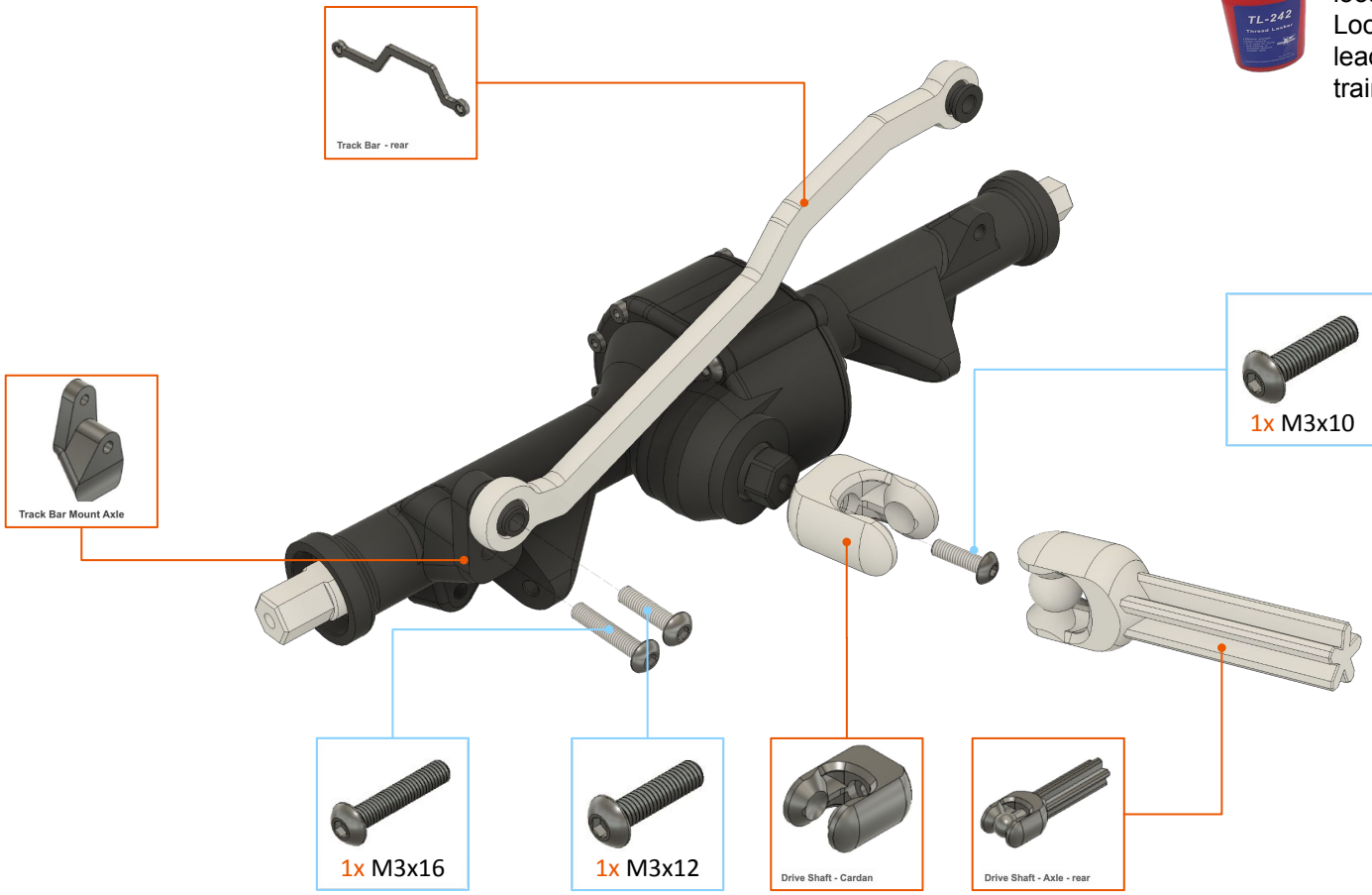
Apply grease on gear tooths.

Rear Axle (with differential) – step 2-3/4



Rear Axle (with differential) – step 4/4

Please, use Thread Locker on Drive Shaft - Cardan! This will prevent the screws from loosening during use. Loosening these screws may lead to damage to the drive train.



Subassembly #2 – Rear axle

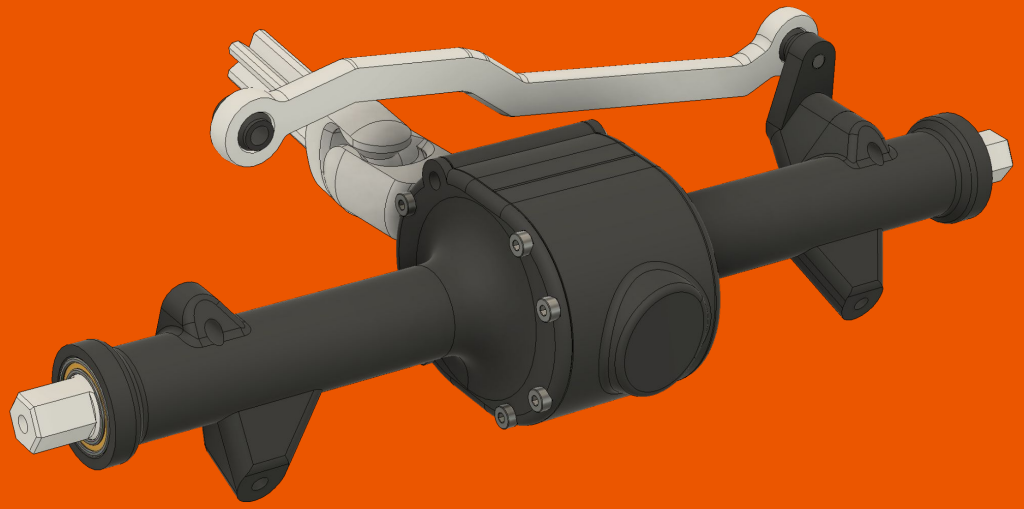
In this 6-step procedure you will assemble the rear axle. The axle includes a locked differential and driveshaft.

Required print plates:

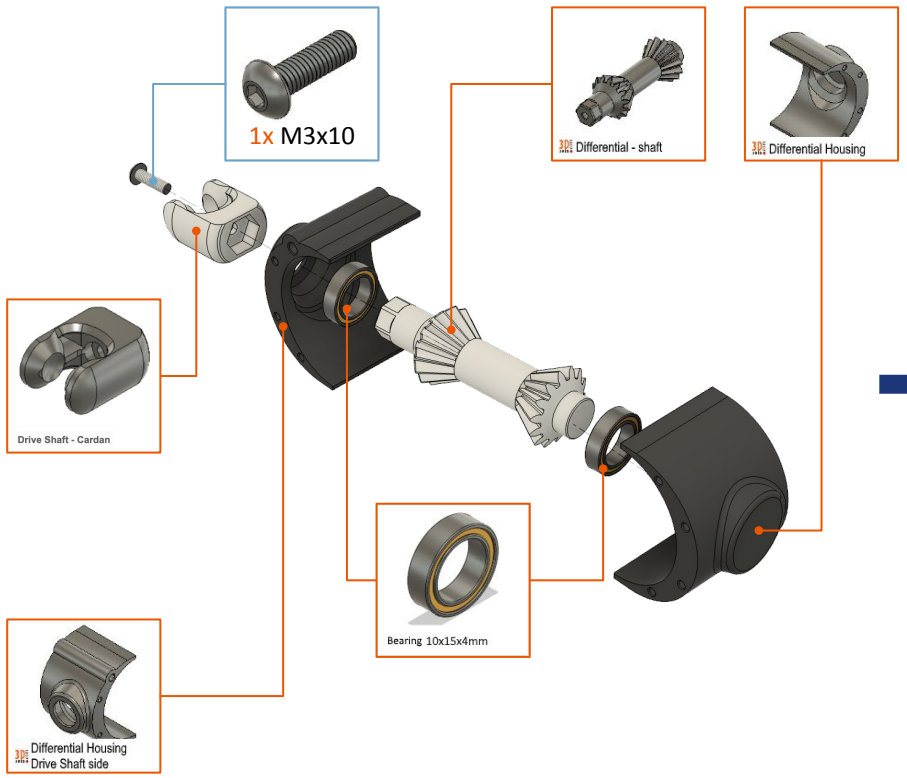
- “Print 1 - Chassis 1”
- “Print 46 - Shafts”
- “Print 47A - Locked Axle - 1”
- “Print 48A - Locked Axle - 2”

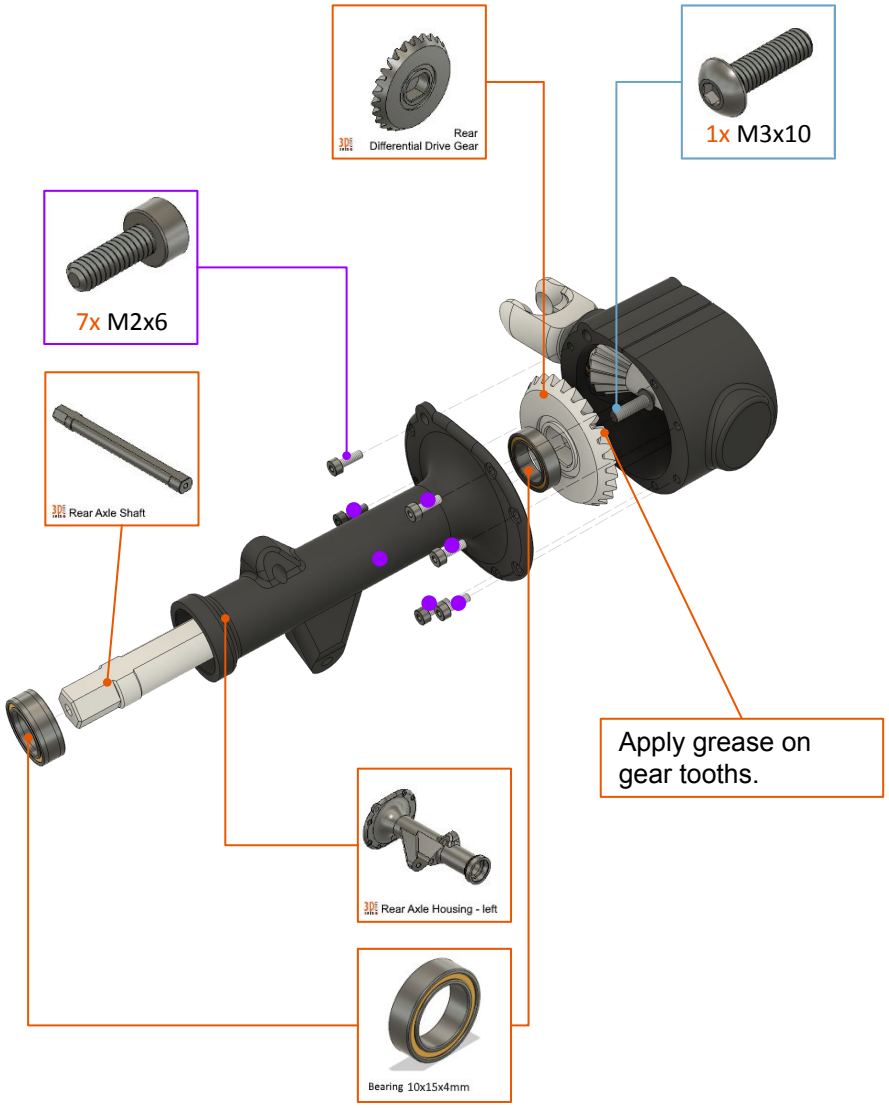
Non-printed parts:

- Screw M2x6: 14 pcs.
- Screw M3x10: 3 pcs.
- Screw M3x12: 2 pcs.
- Screw M3x16: 1 pcs.
- Bearings: 6 pcs.
- Grease
- Thread Locker



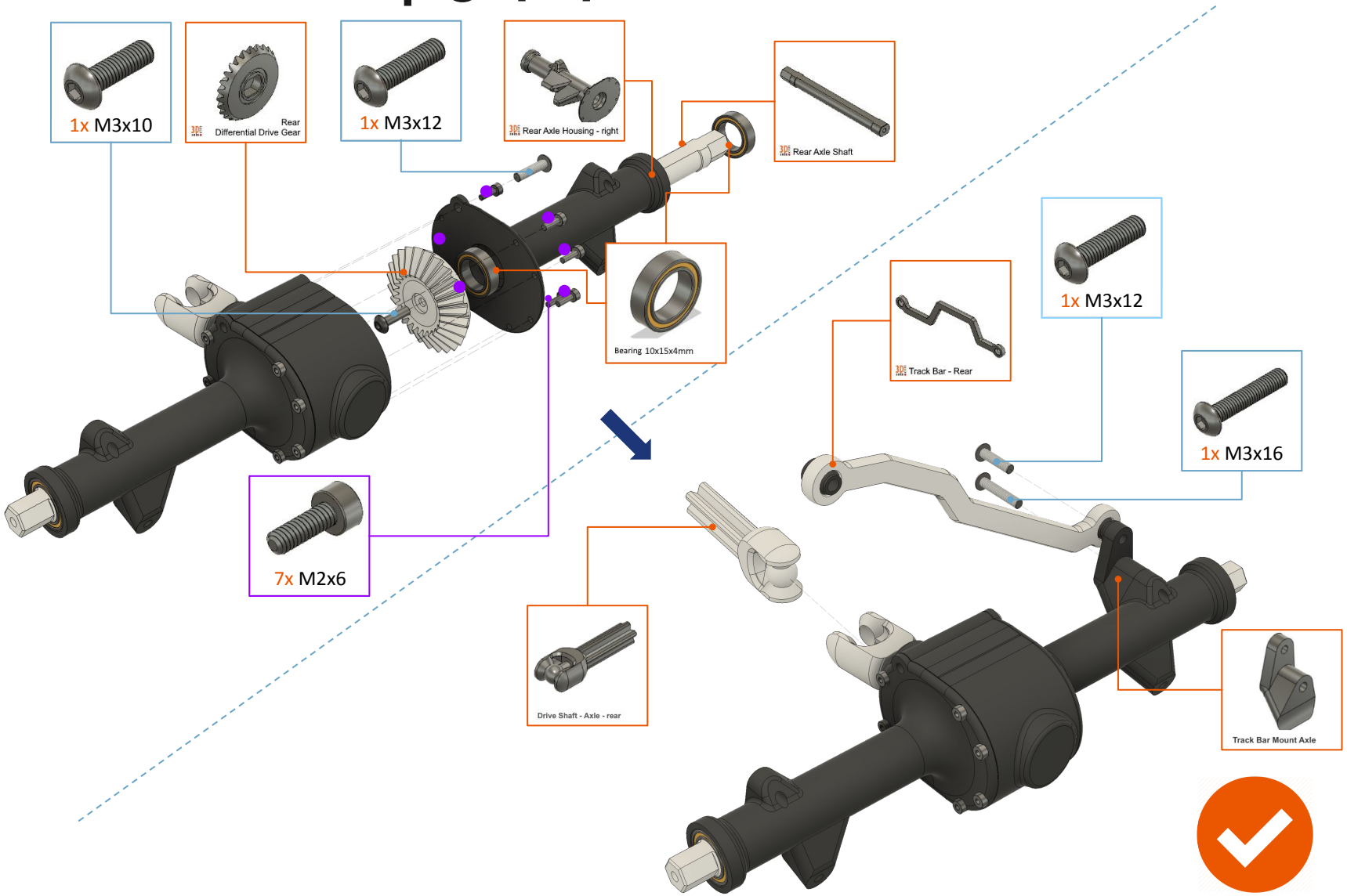
Rear axle – step 1-2/4





Recommended material for differential gears & cardan joints: PLA, as it is rigid enough for this purpose.

Rear axle – step 3-4/4



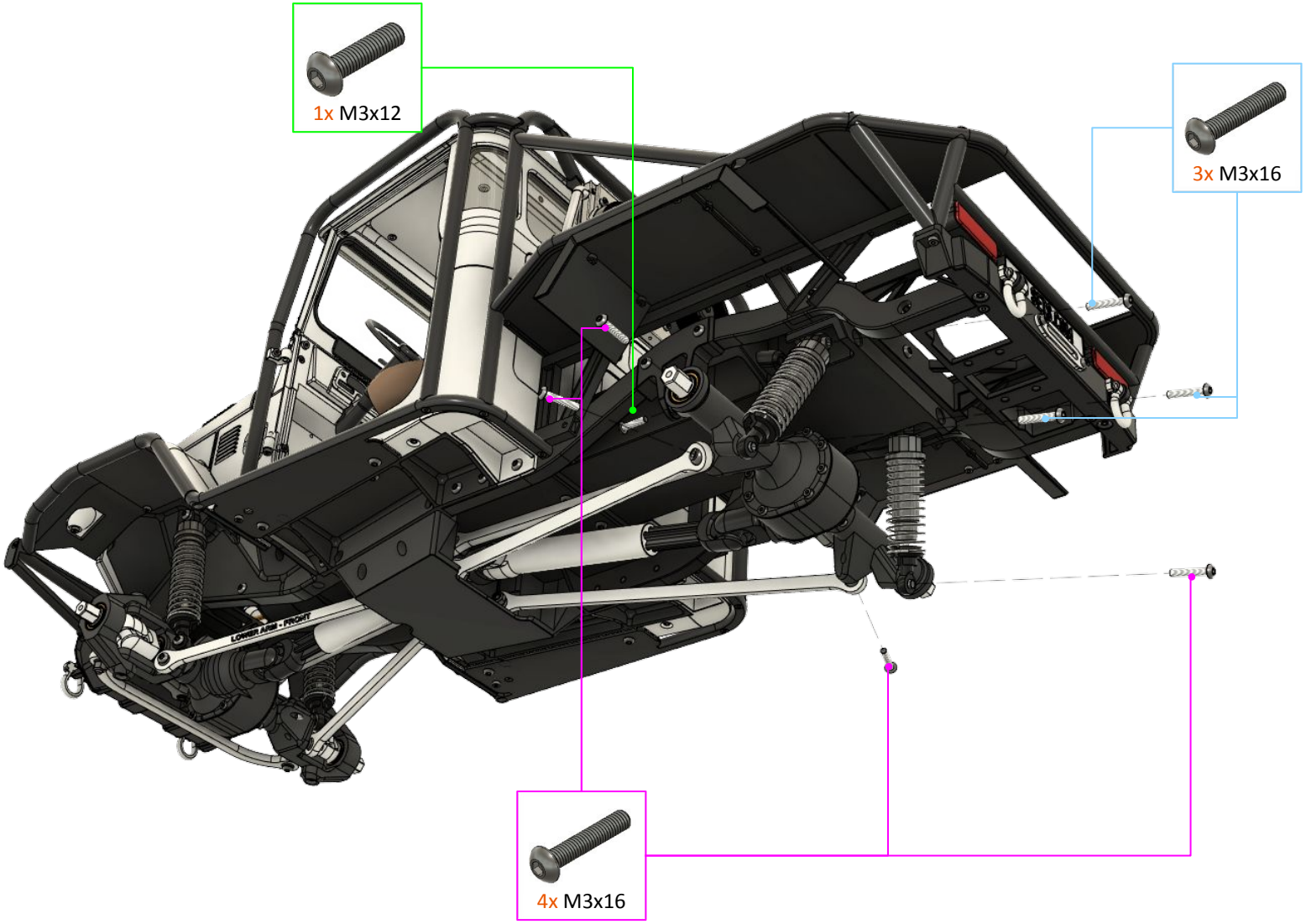
Rear Axle Installation

In this 1-step procedure you will install Rear Axle.

Non-printed parts:

- Screw M3x12: 1 pcs.
- Screw M3x16: 7 pcs.

Rear Axle Installation



Doors

In this 8-step procedure you will assemble the Front Doors, Rear Doors and Spare Wheel Carrier.

Required print plates:

- “Print 12 - Interior 1 + Details 1”
- “Print 25 - Windows Glass - template”
- “Print 27 - Details 2”
- “Print 49 - Door 1”
- “Print 50 - Door Interior Panel”

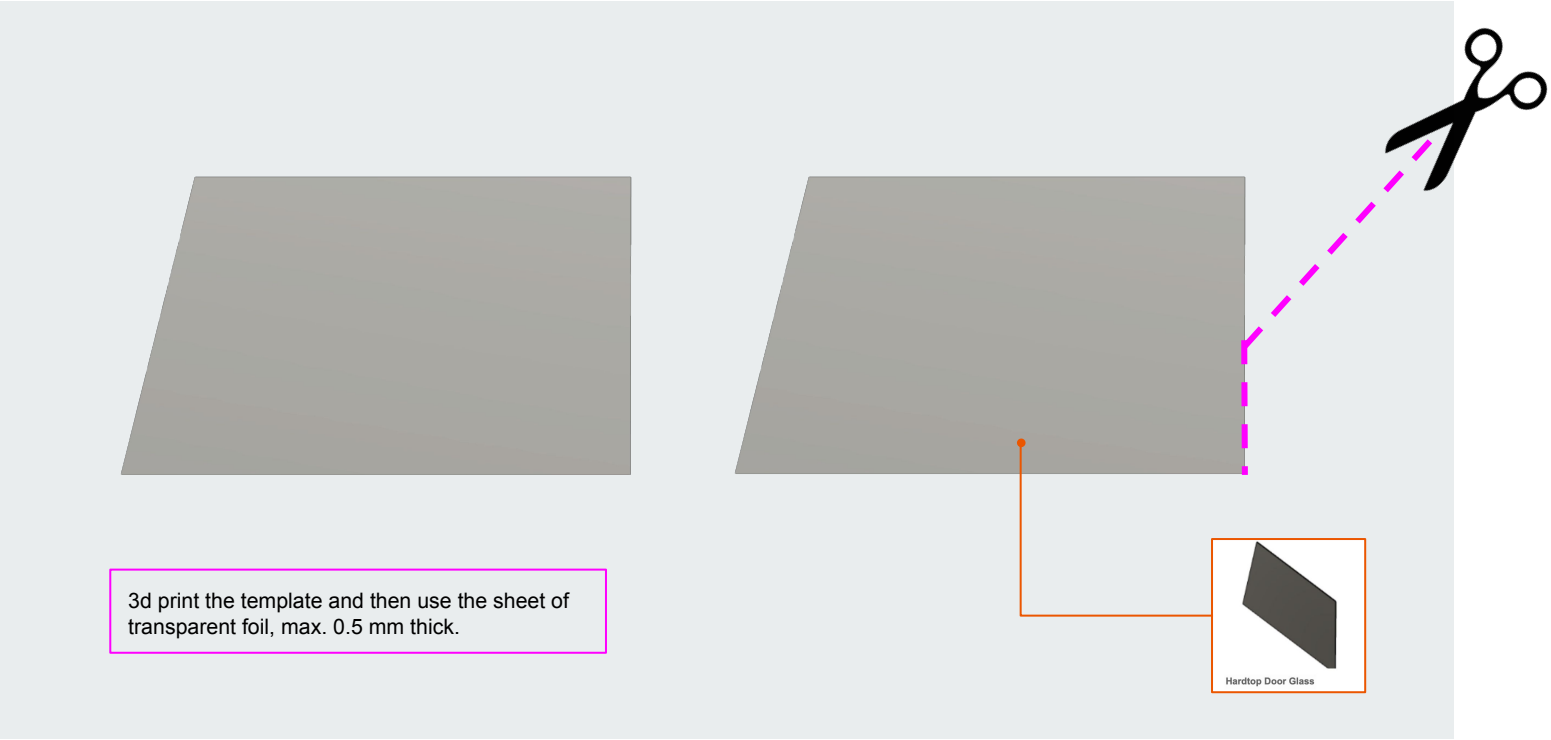
Non-printed parts:

- Screw M2x6: 18 pcs.
- Screw M2x8: 6 pcs.
- Screw M2x10: 6 pcs.
- Screw M3x8: 4 pcs.

Window Glass

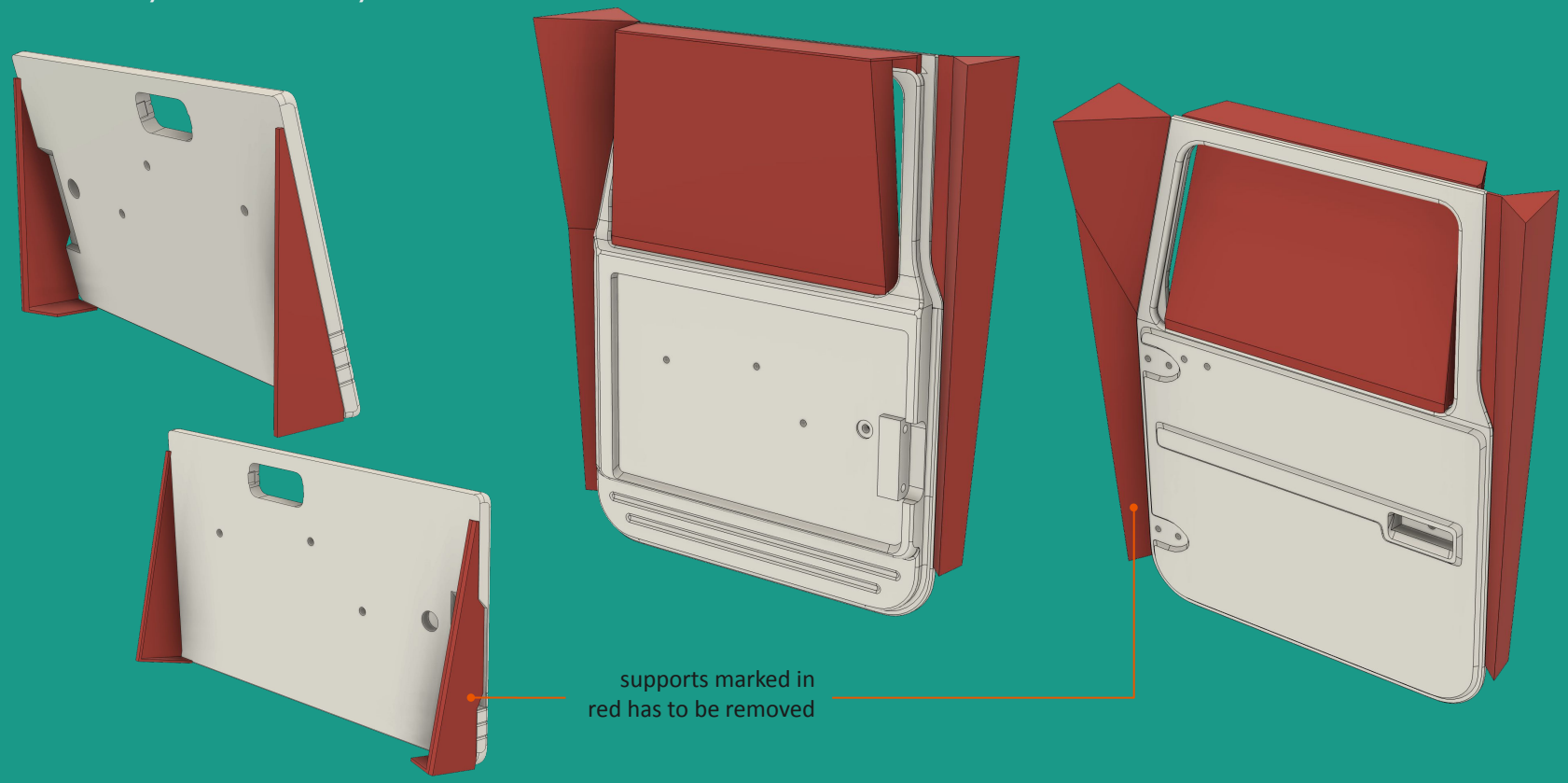
At first, you will make a “glass” from any transparent foil up to 0.5 mm thick. Thicker material is more durable than thinner, but we found that “Clear Binding Covers” are OK.

Place the printed template on the foil, sketch the shape to foil and then cut the foil by scissors or sharp knife.

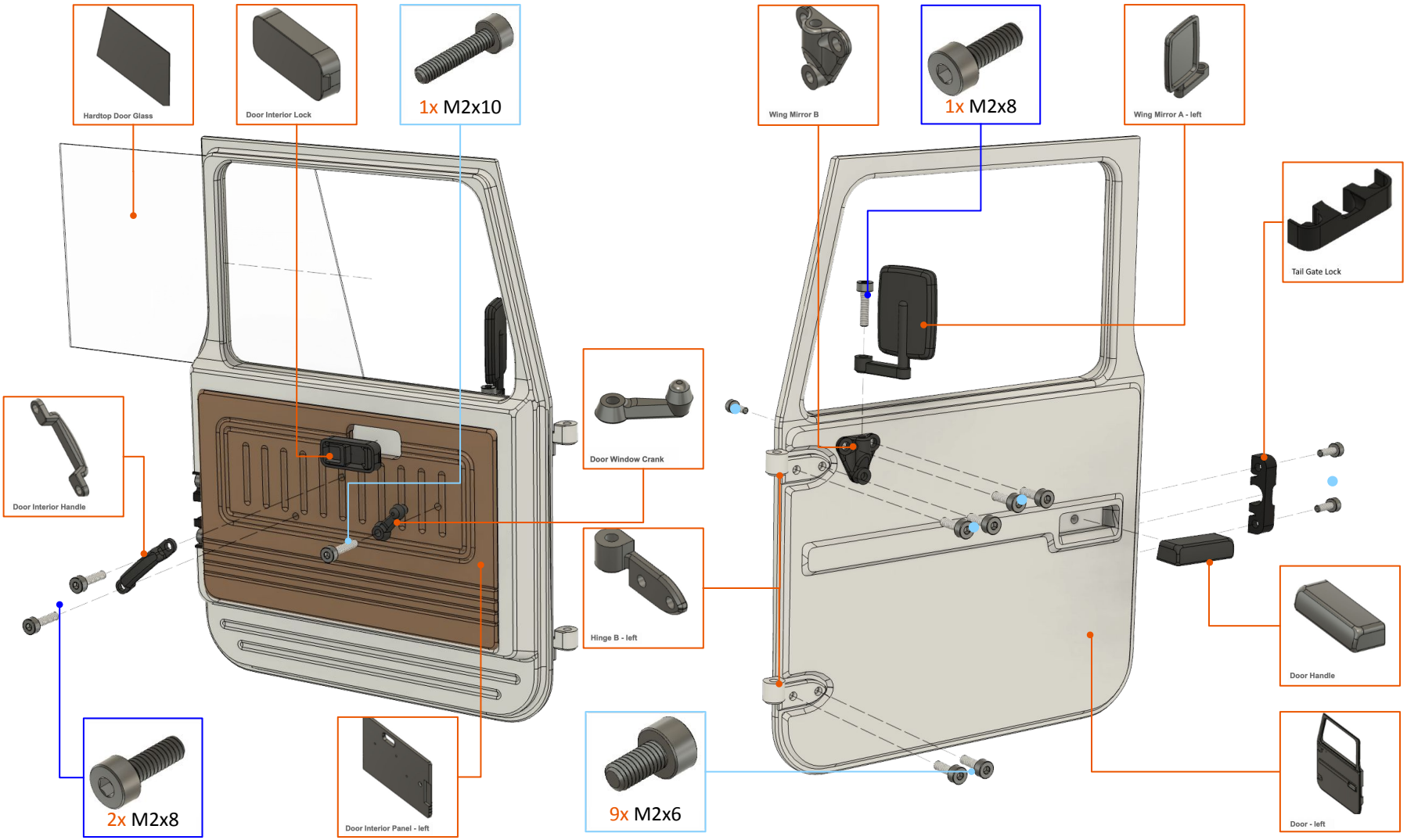


Postprocessing – removing supports

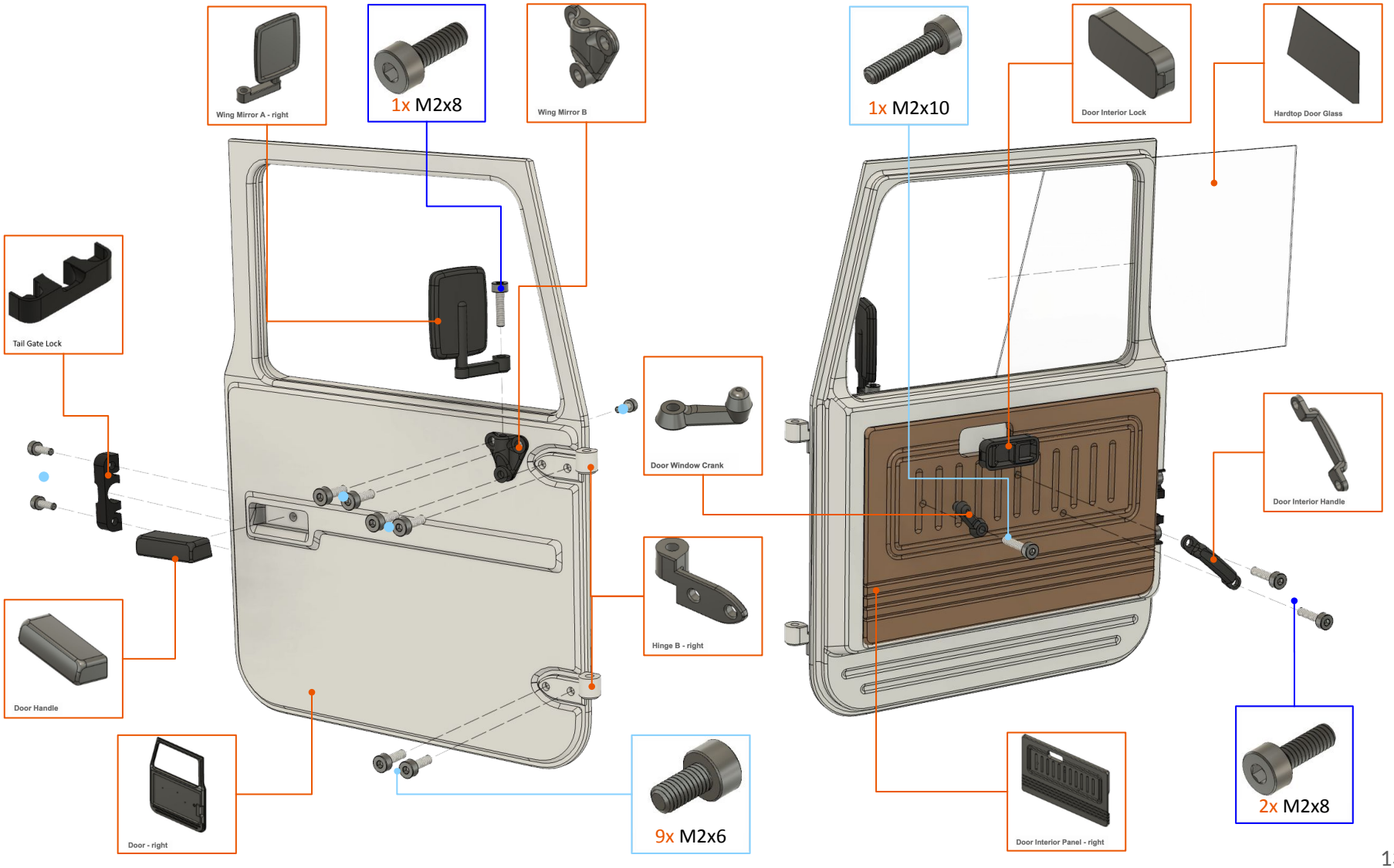
Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!



Door left


Hardtop Door Glass
Door Interior Lock
1x M2x10
Wing Mirror B
1x M2x8
Wing Mirror A - left
Tail Gate Lock
Door Interior Handle
Door Window Crank
Hinge B - left
Door Handle
2x M2x8
Door Interior Panel - left
9x M2x6
Door - left

Door – right


Wing Mirror A - right
1x M2x8
Wing Mirror B
1x M2x10
Door Interior Lock
Hardtop Door Glass
Tail Gate Lock
Door Window Crank
Door Interior Handle
Hinge B - right
Door Handle
Door - right
9x M2x6
Door Interior Panel - right
2x M2x8

Doors Installation

Flatbed & Winch

In this 8-step procedure you will assemble the Front Doors, Rear Doors and Spare Wheel Carrier.

Required print plates:

- “Print 38 - Flatbed”
- “Print 42 - Winch”
- “Print 43 - Winch 2”

Non-printed parts:

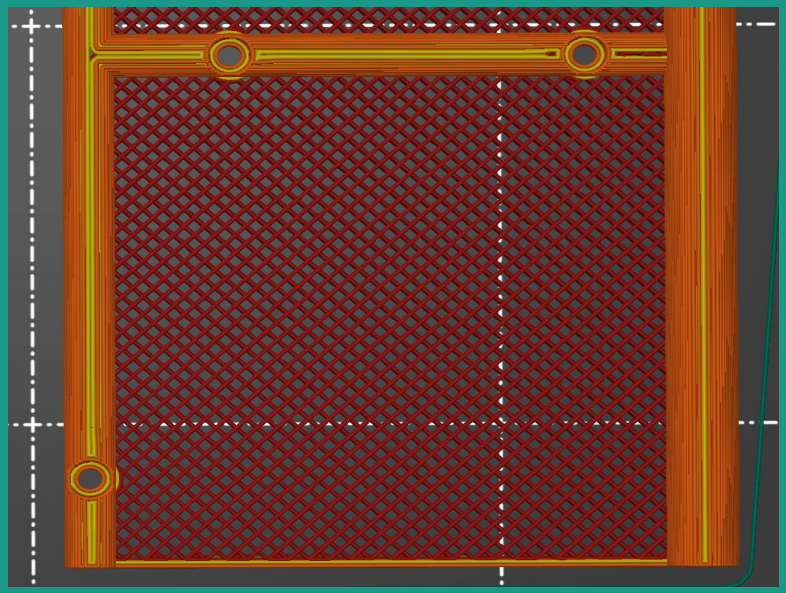
- Screw M2x6: 8 pcs.
- Screw M3x6: 4 pcs.
- Screw M3x10: 4 pcs.
- Bearing 10x15x4 (6700ZZ): 2 pcs.

FlatBed - change print settings

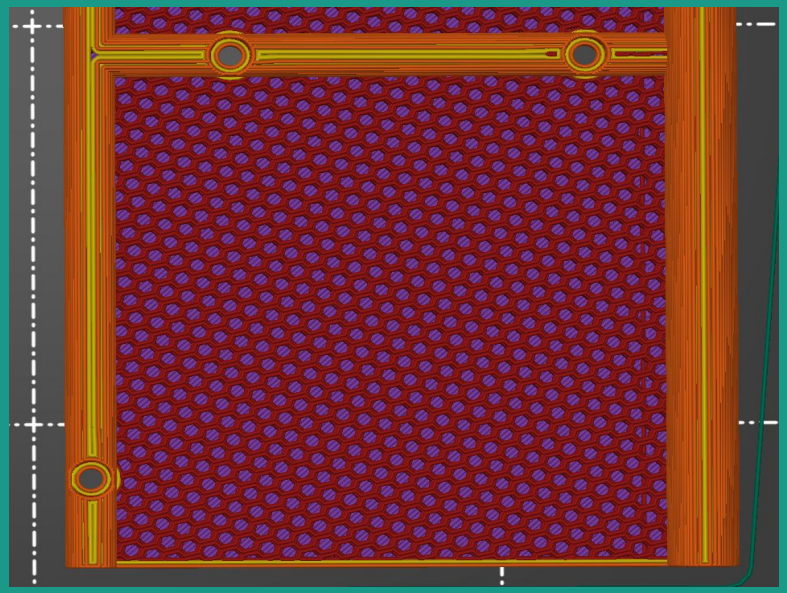
You can modify print setting for print FlatBed, you can change infill density, infill type or bottom layers.

For example:

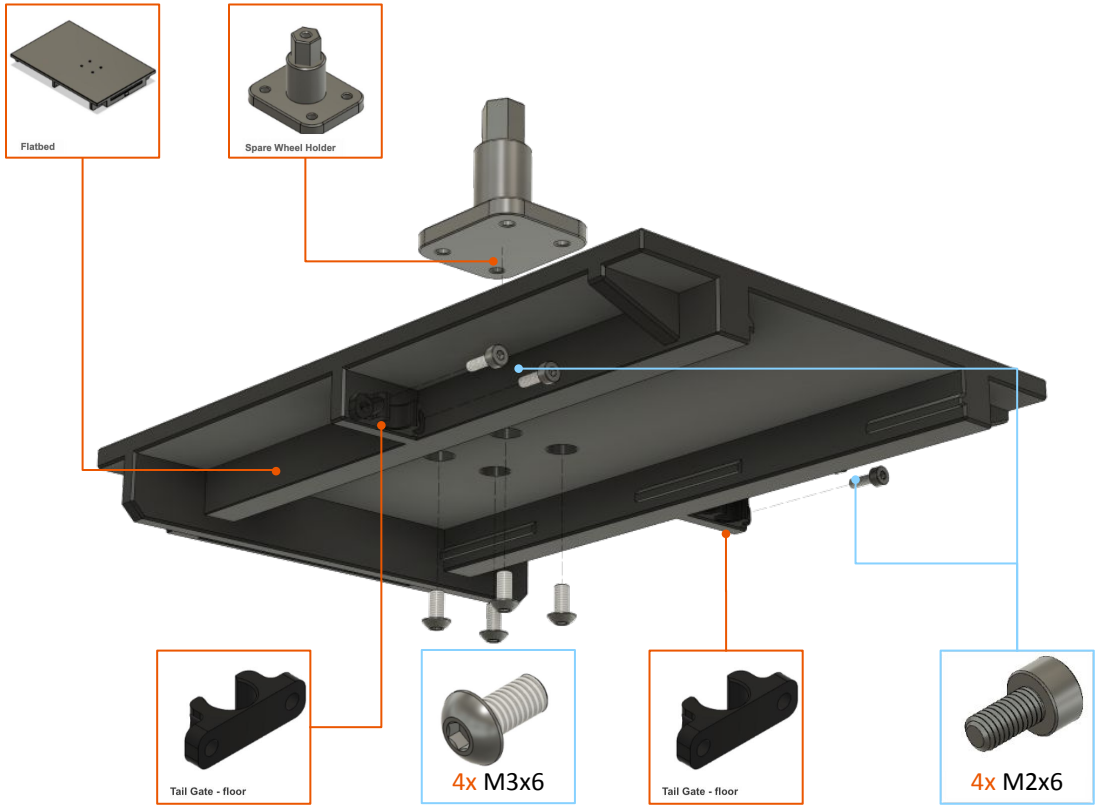
- Infill density: 30%
- Infill type: Rectilinear
- Perimeters: 3
- Top layers: 0
- Bottom layers: 0



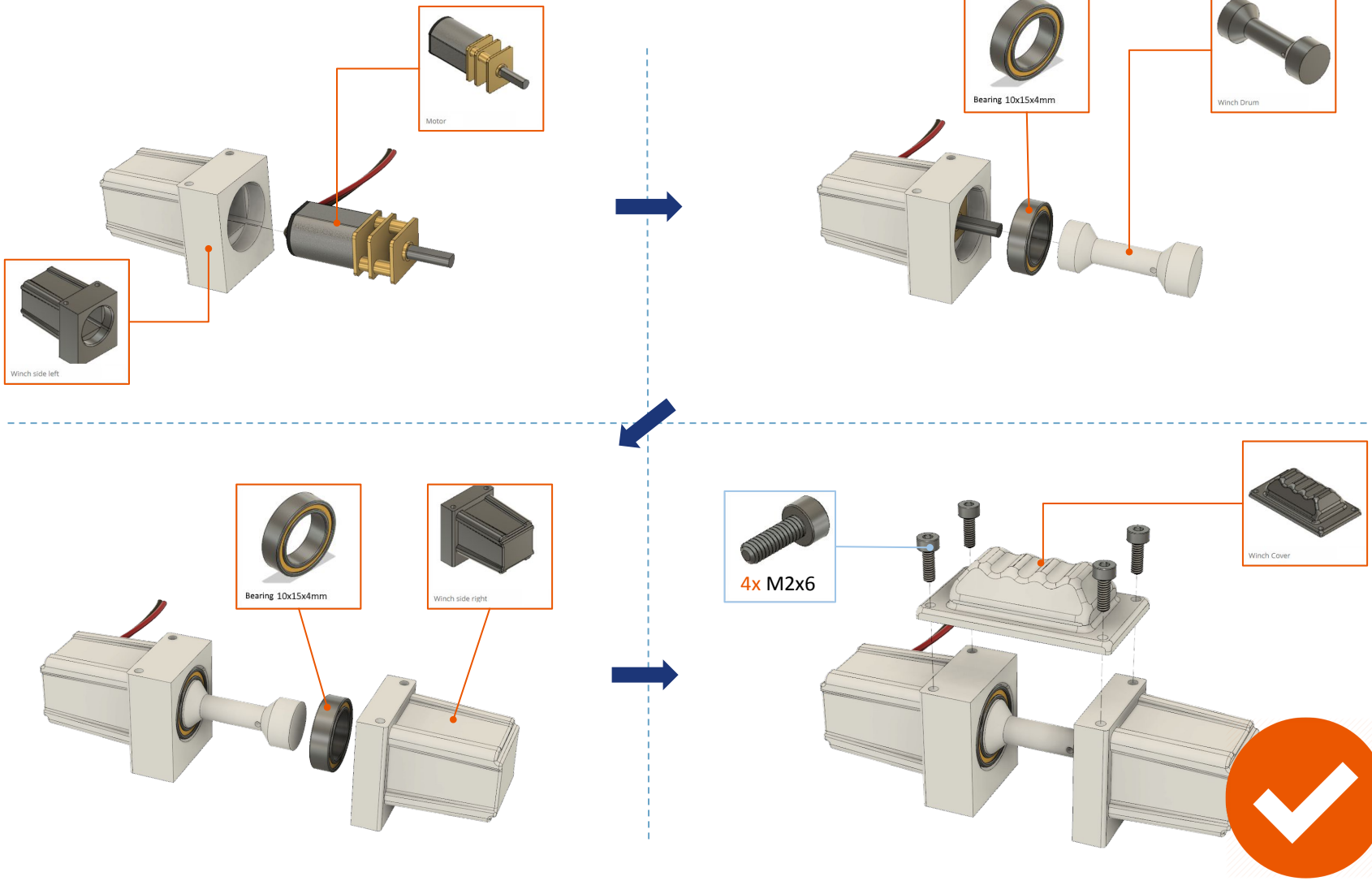
- Infill density: 40%
- Infill type: Honeycomb
- Perimeters: 3
- Top layers: 0
- Bottom layers: 5



Flatbed


Flatbed
Spare Wheel Holder
Tail Gate - floor
4x M3x6
Tail Gate - floor
4x M2x6

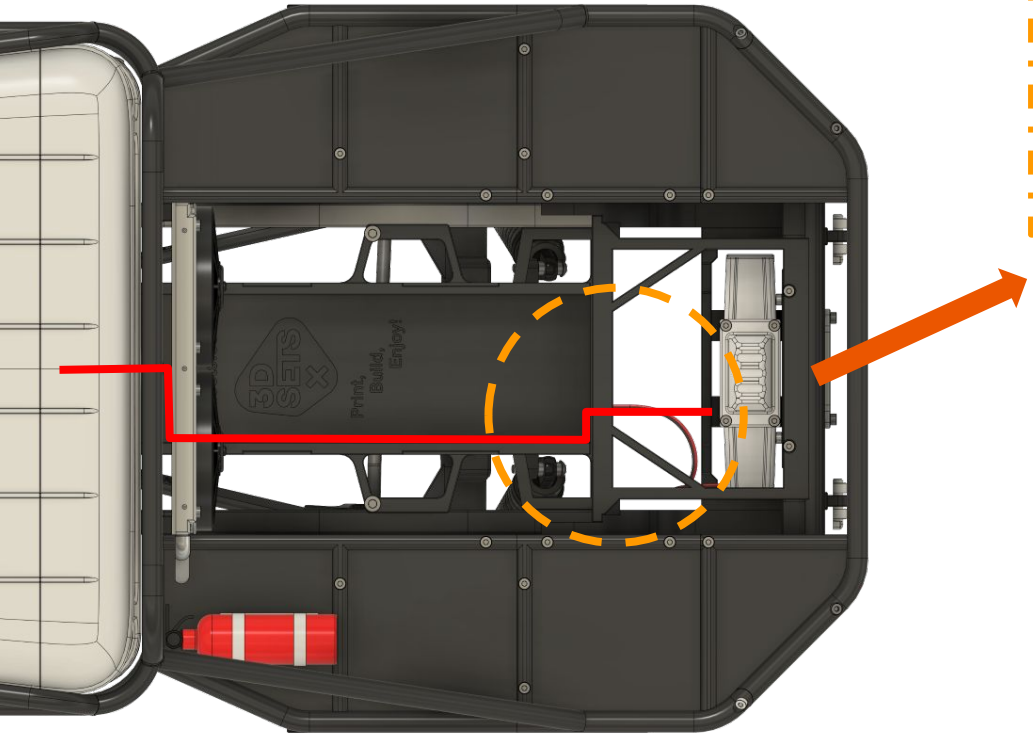
Winch – step 1/1

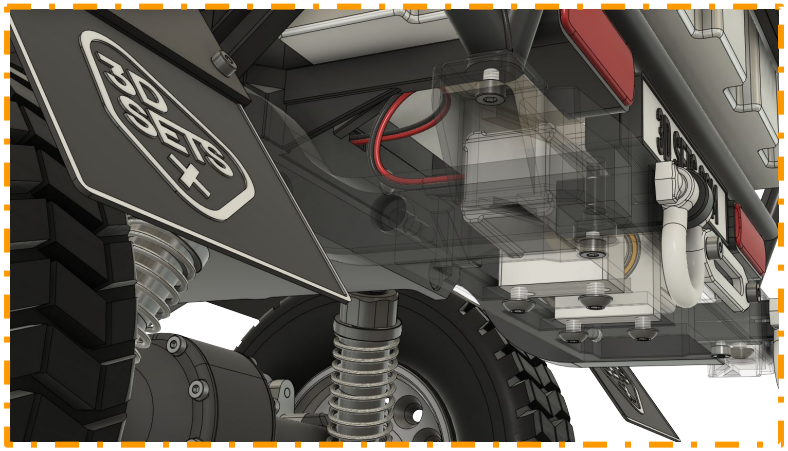


Winch installation

4x M3x10

Placing of wires too Winch





Wheel E

In this procedure you will assemble the Wheel E.

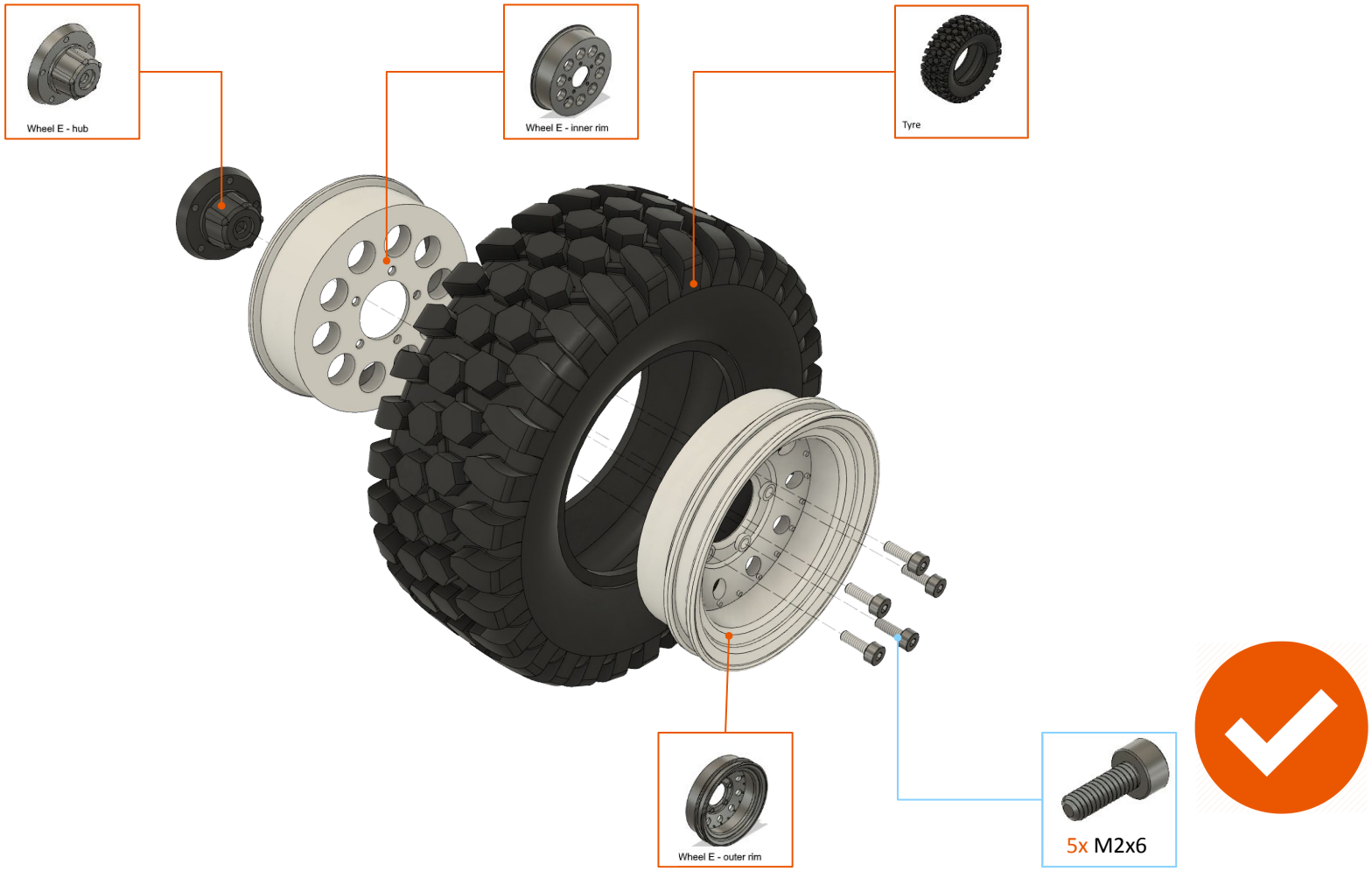
Required print plates:

- “Print 51A - Wheel E - Rim”
- “Print 52A - Wheel E - wheel Hub”

Non-printed parts:

- Screw M2x6: 25 pcs.
- Screw M3x16: 5 pcs.

Wheel E - step 1/2



Wheel I

In this procedure you will assemble the Wheel I.

Required print plates:

- “Print 51B - Wheel I - Rim”
- “Print 52B - Wheel I - wheel Hub”

Non-printed parts:

- Screw M2x6: 40 pcs.
- Screw M3x16: 5 pcs.

Wheel I

Wheel E Installation

Model of the Engine

In this procedure you will assemble the Model of the Engine.

Required print plates:

- “Print 53 - Engine”

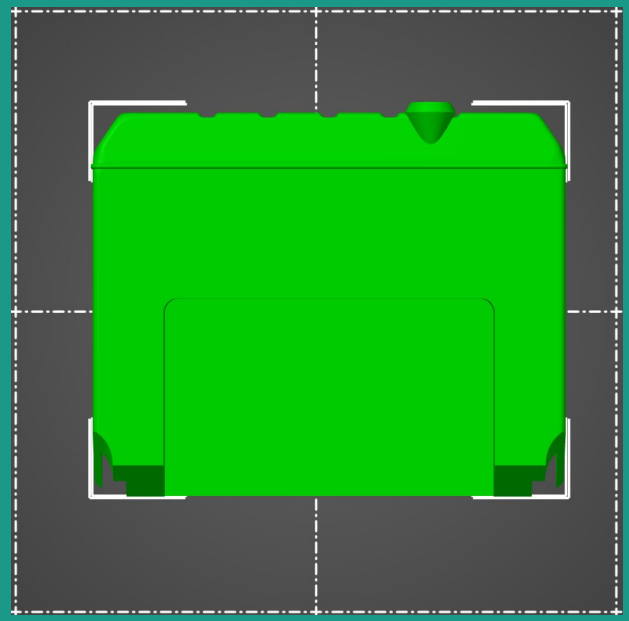
Non-printed parts:

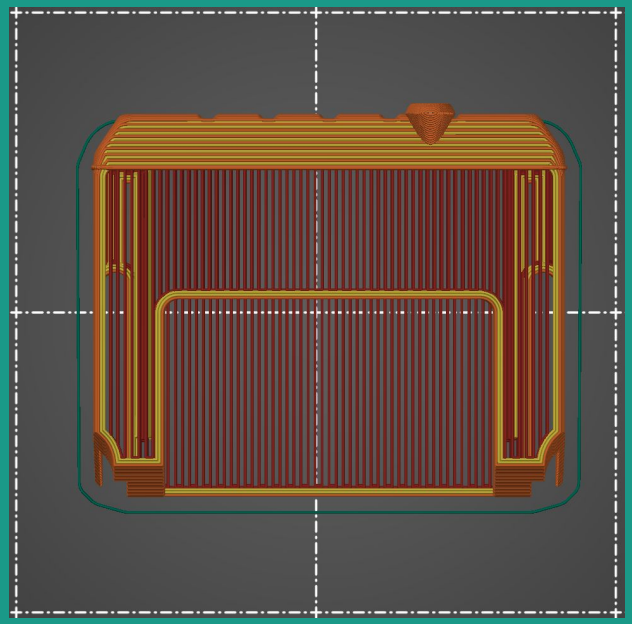
- Screw M2x6: 3 pcs.
- Screw M3x16: 1 pcs.
- Screw M3x6: 3 pcs.

Engine – Radiator

If you will print the part “Engine – Radiator” from the .stl file instead of printing from provided gcode, please use following slicer setup:

- Solid layers - Top / Bottom (0 layers)
- Fill angle: 90 degrees
- Infill density: 40%
- Infill type: Aligned Rectiline
- Perimeters: 3

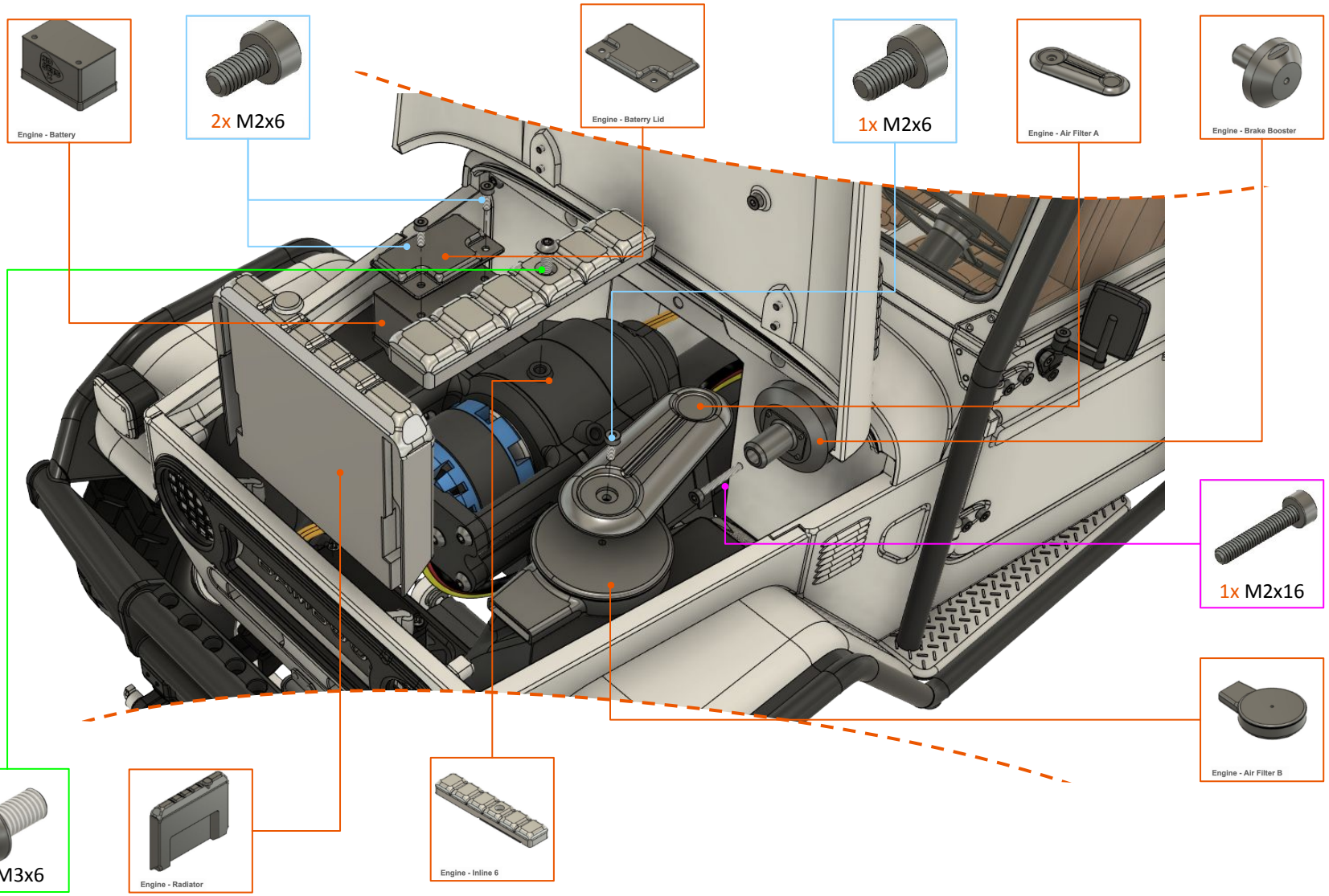




Postprocessing – removing supports

Before you start building, carefully remove printing supports (marked red) integrated to specific parts rendered below. You can use pliers and sharp knife to make the procedure easier. Be very careful as you can harm yourself!

Model of the Engine



Variable accesories

In this procedure you will choose what accessories you wont added on your winch truck

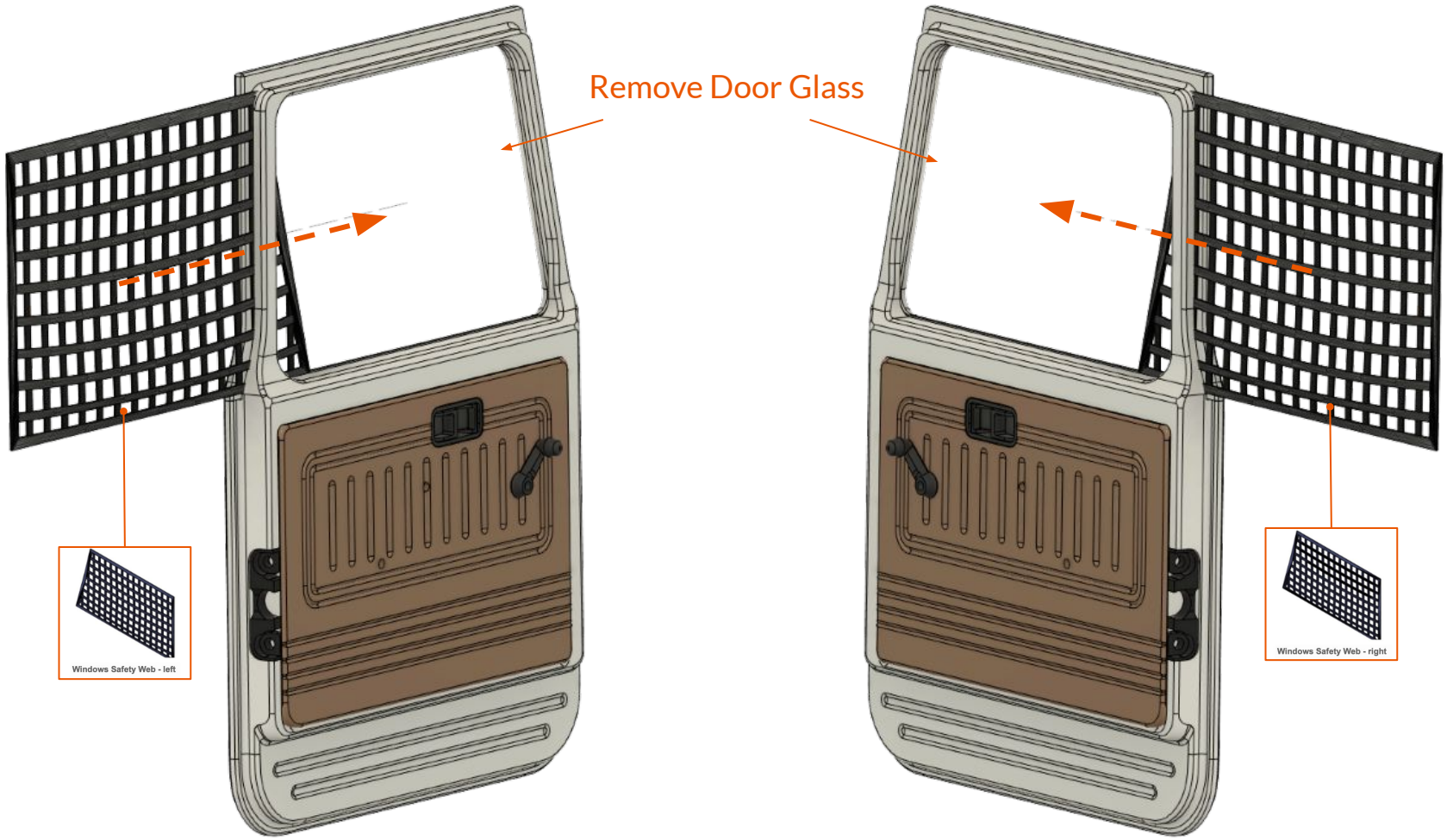
Required print plates:

- “Print 54 - Windows Safety Web”
- “Print 55 - Storage Box”
- “Print 56 - Splash Guard - change filament”
- “Print 57 - Splash Guard Holder”
- “Print 58 - Fire Extinguisher Bottle”
- “Print 59 - Fire Extinguisher”
- “Print 60 - Tool Box”

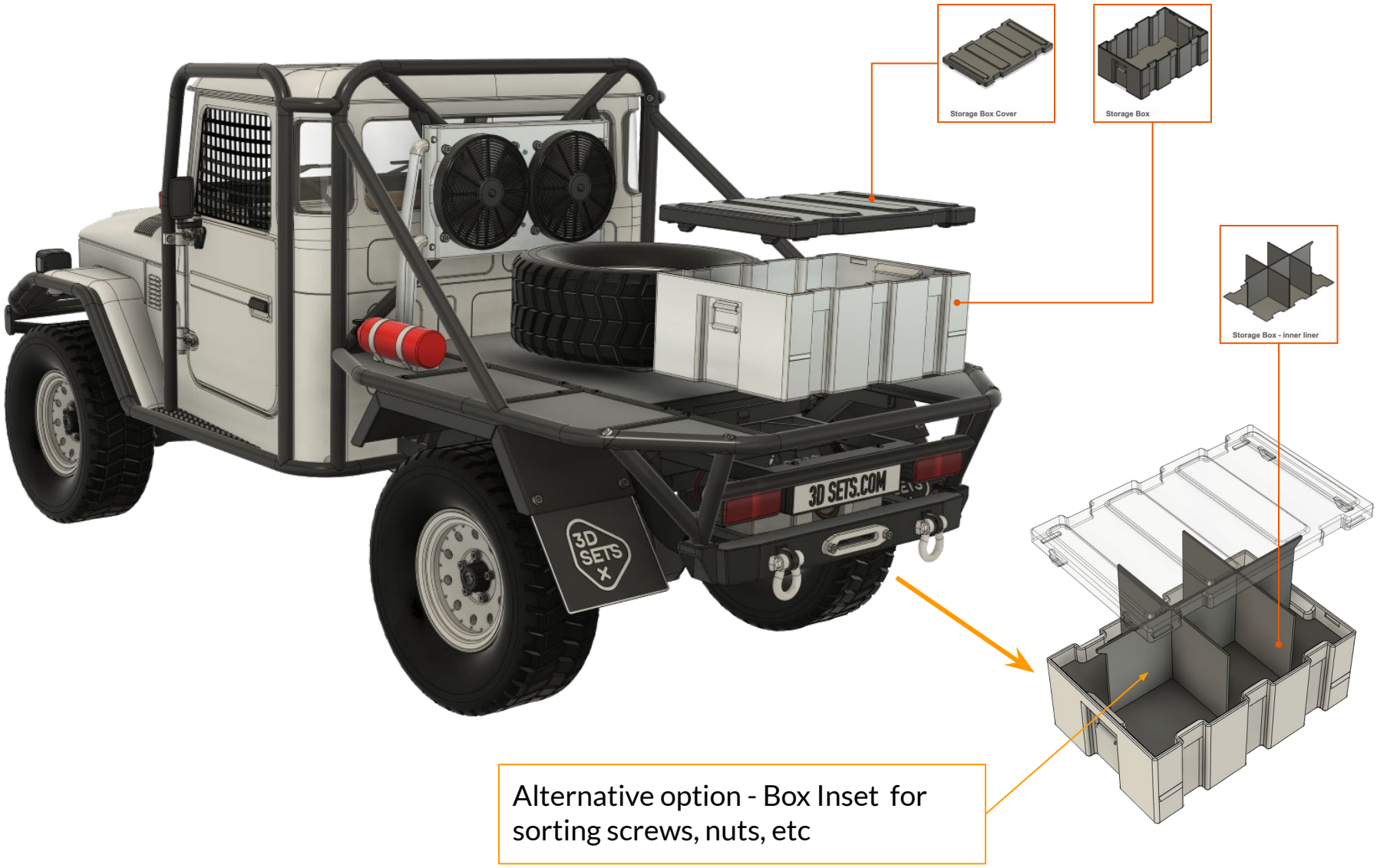
Non-printed parts:

- Screw M2x6: 4 pcs.
- Screw M2x10: 2 pcs.
- Screw M2x16: 2 pcs.
- Screw M3x6: 4 pcs.

Safety Web for Side Windows - Design alternative

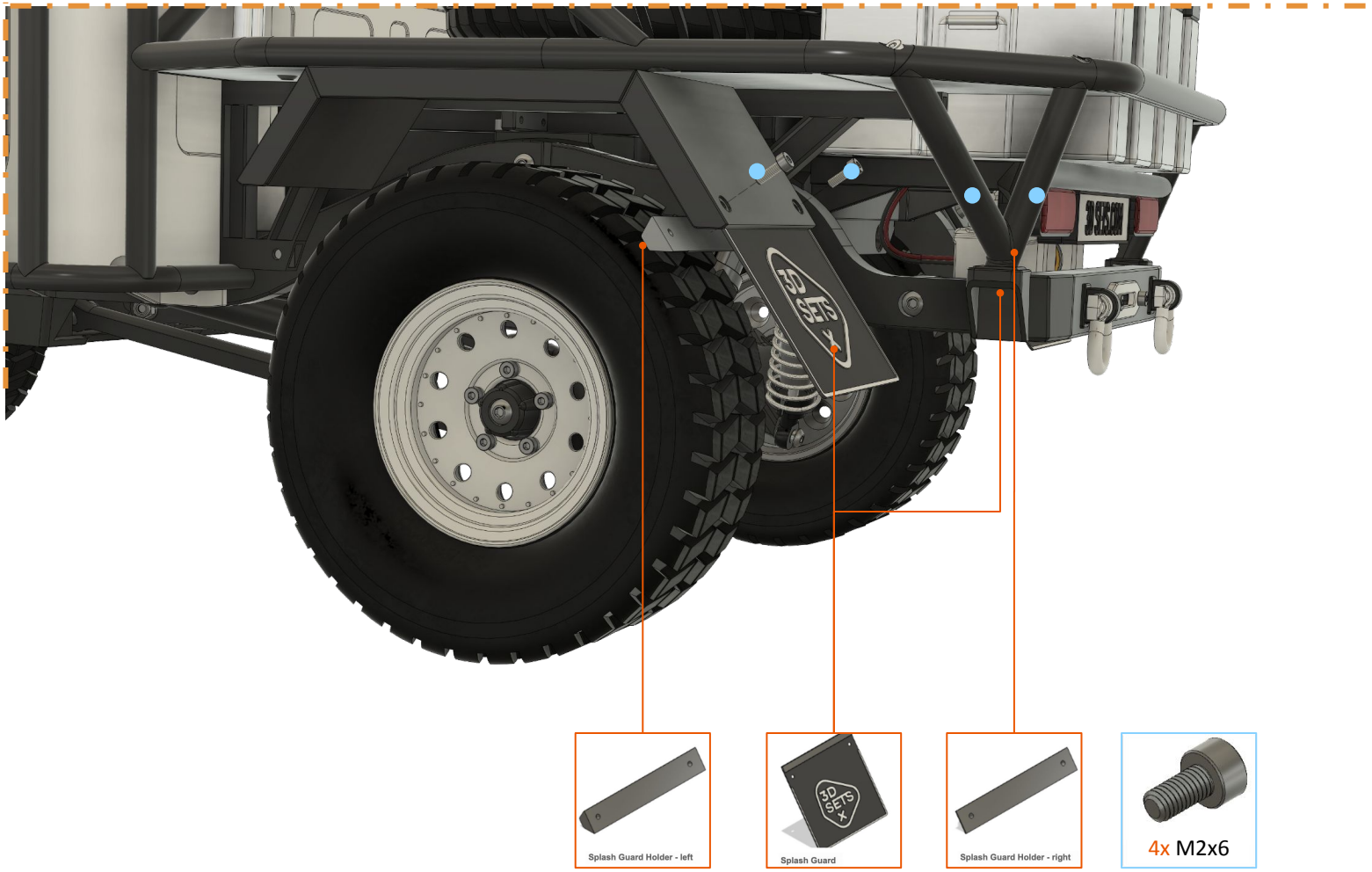


Storage Box on flatbed

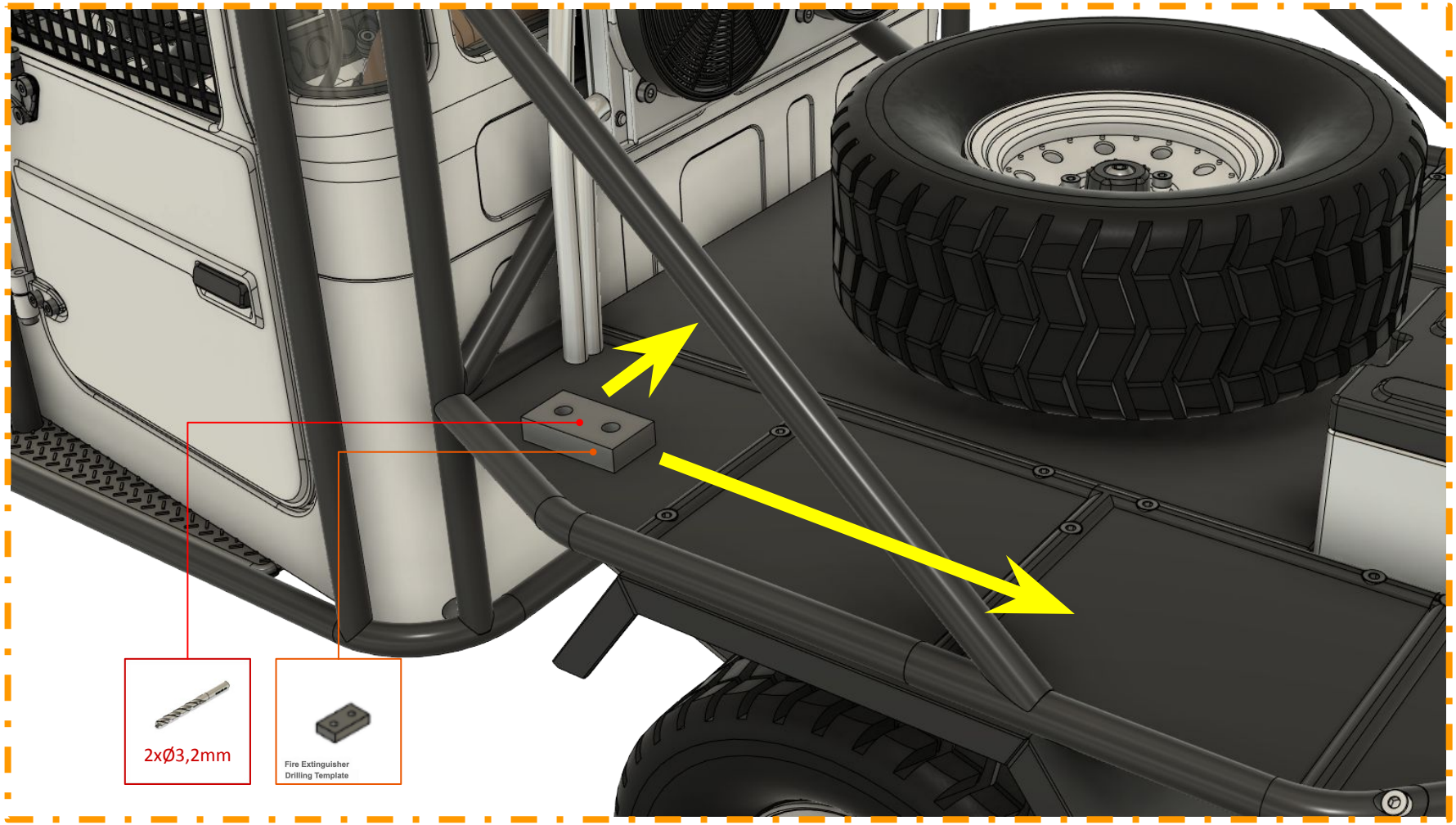


Alternative option - Box Inset for sorting screws, nuts, etc

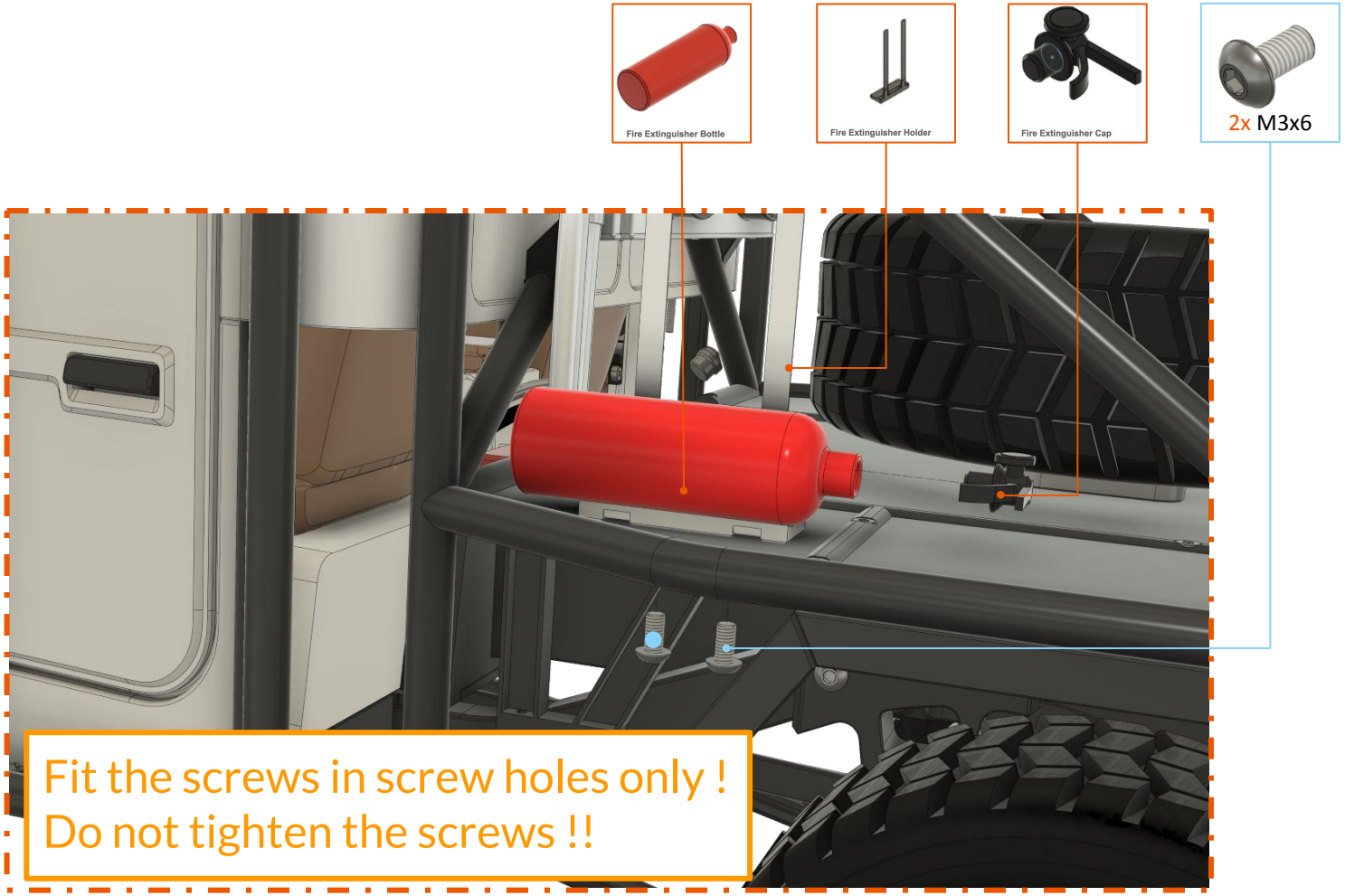
Splash guards installation



Fire Extinguisher - Step 1/3 - place it anywhere

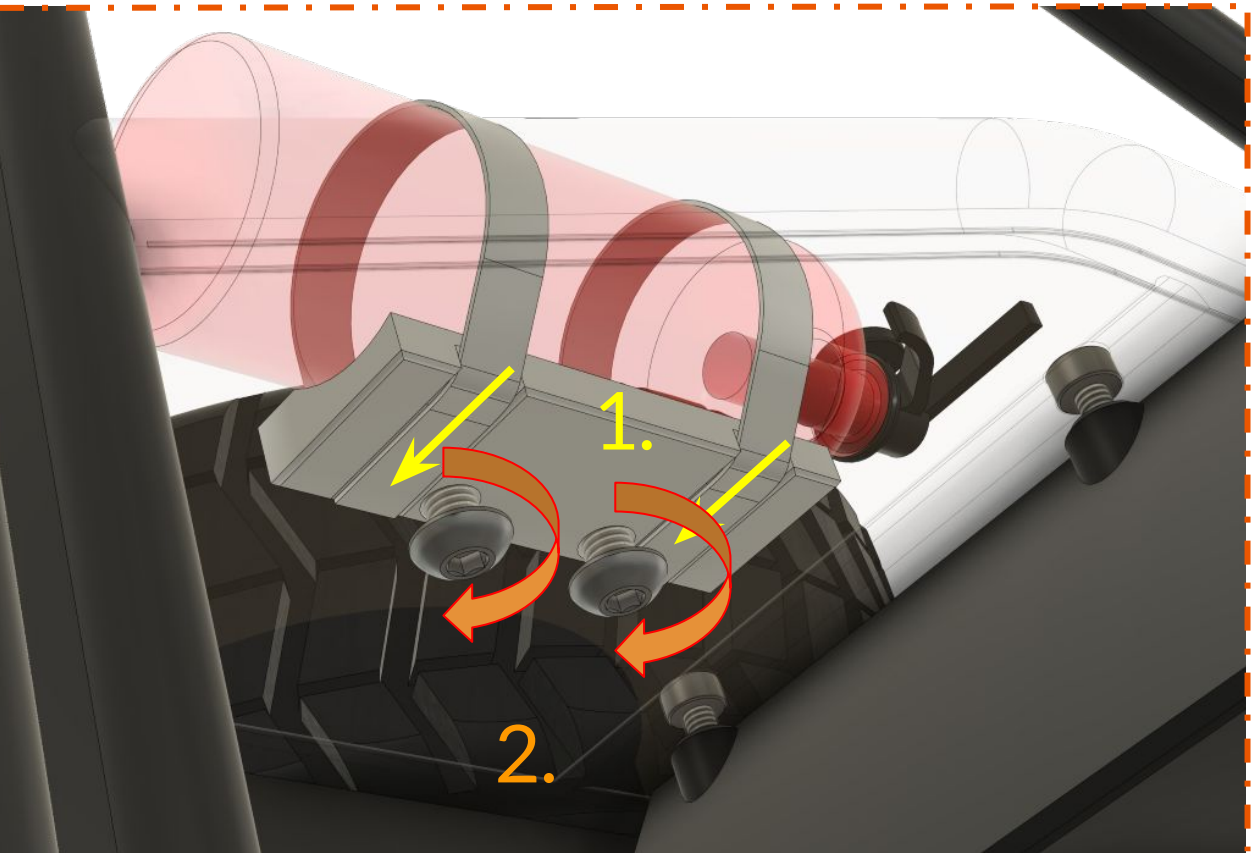


Fire Extinguisher - Step 2/3



Fire Extinguisher - Step 3/3

Step 1 - Bend the straps around the Fire Extinguisher and insert straps into grooves at bottom side of the holder
Step 2 - Tighten the screw NOW !



High-lift Jack

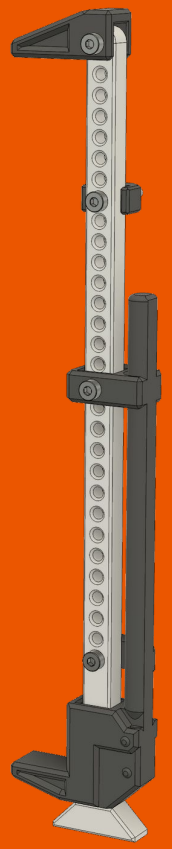
In this procedure you will assemble the High-lift Jack. You can mount it to the right doors or to the hood.

Required print plates:

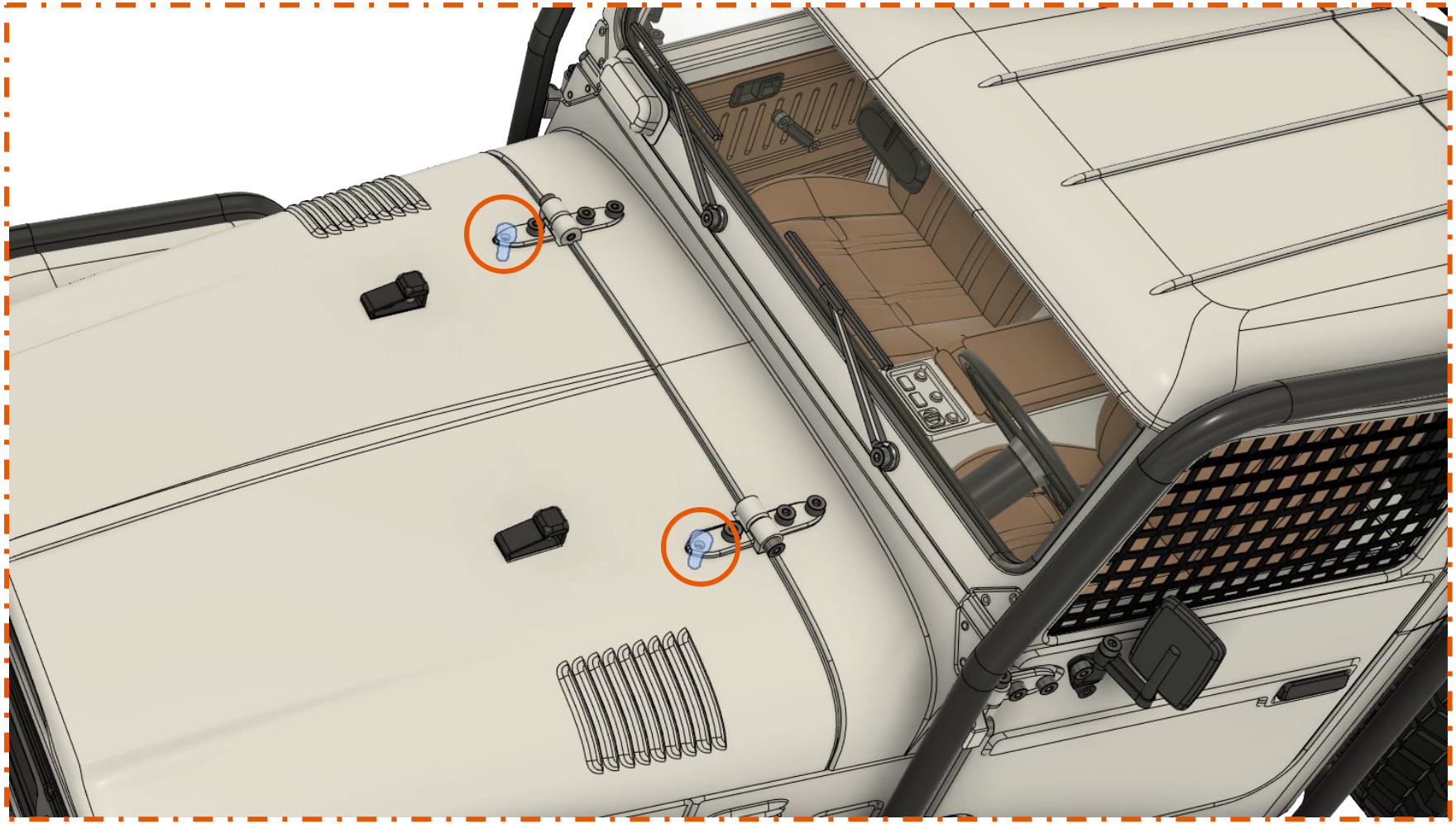
- “Print 61 - Hi-lift Jack - 1”
- “Print 62 - Hi-lift Jack - 2 - Main Body”

Non-printed parts:

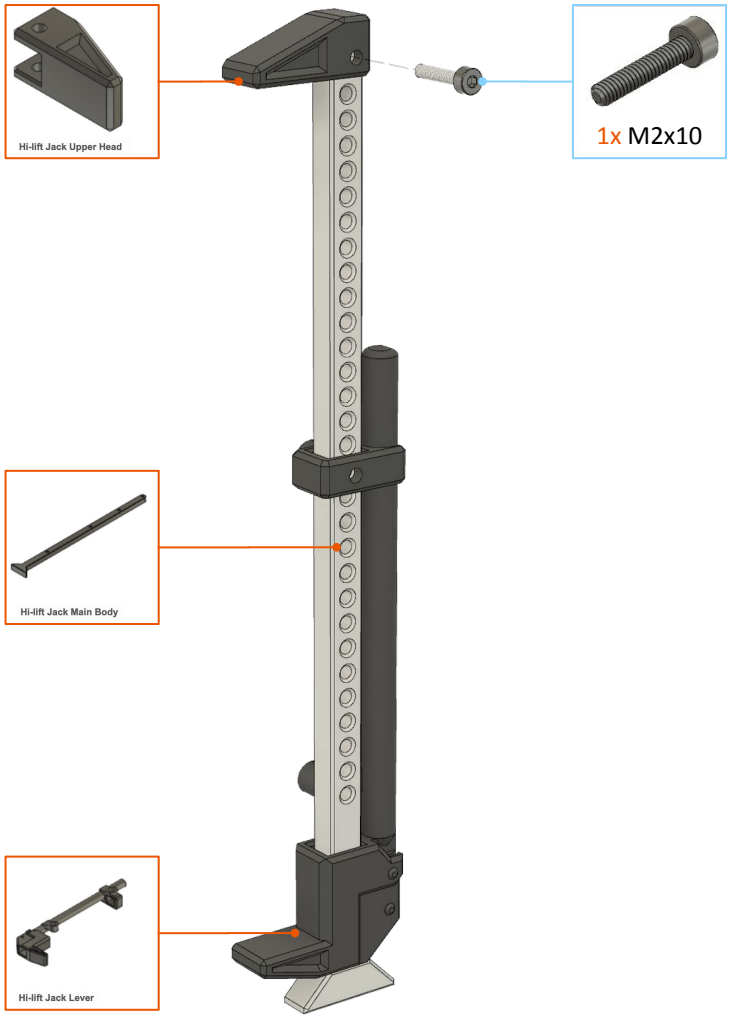
- Screw M2x10: 2 pcs.
- Screw M2x16: 2 pcs.



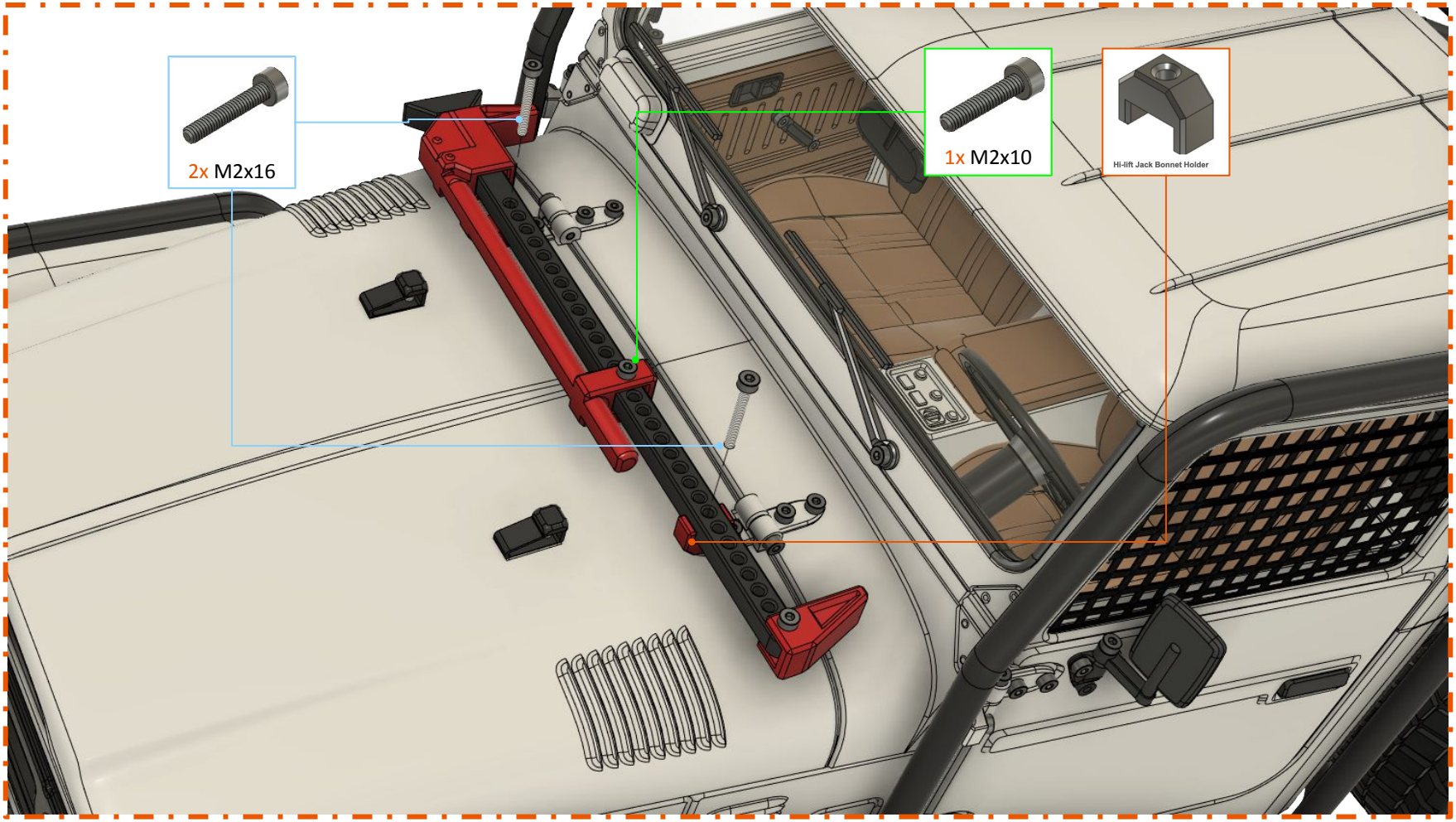
Remove marked screws before High Jack install



High-Lift Jack – step 1/2



High-Lift Jack – step 2/2



Finished model

Finished model

Bamboo 4x4 Winch Truck – general tips

- Always use a proper battery charger. Bad charging of the Li-Pol battery may lead to a risk of fire!
- Disconnect the battery when the model is not used. The small switch on the ESC doesn't disconnect the battery and the ESC may draw a small amount of current even in OFF-state.
- Do not go into water unless you have waterproof electronics!