

The background of the page is a dark gray, semi-transparent image of a robotic arm. The arm is shown in a curved, extended position, with its joints and various components visible. The letters 'RMPA' are printed on several parts of the arm, including the main body and the end effector. The overall aesthetic is technical and industrial.

RMPA

Instruction

Instructional videos

<https://www.harda.net/products/mongda-arpal>

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Introduction

Welcome to start your fun journey in the mechanical manipulation from assembly by referring to this instruction book.

Armpal is a board game intended for 1-4 players of a variety of ages, including many elements such as assembly, mechanical manipulation, and battling. Armpal operators can access to different gaming modes by replacing game kits. In addition to the supplied kits and recommended gaming modes, Armpal also provides an opportunity for DIY enthusiasts to play to their abilities and to use their imagination to apply coating or design new gaming modes.

Please attentively read instructions and warnings prior to setup!

Warnings

Be aware that this product is not a toy!

Children under three are forbidden to be in contact with this product! Please place this product at a place away from children under three to reach.

The assembly part of this product is intended for people above 14 to collect, display and play with. Please do not give it to children at or below 13. Please strictly refer to the instructions for operation! This product (along with its package) shall stay away from infants and children.

While the game is designed for people above nine after its assembly is completed. Plays between nine and 14 should operate under adult supervision. Please do not give it to children at or below eight. This assembled product (along with its package) shall stay away from infants and children.

Warnings



Warnings on suffocation risks of small parts

Do not take any tiny parts into your mouth. All parts of this product shall be kept at a place away from infants and children to avoid suffocation.

Warnings on magnetic parts

This product contains small magnetic parts, so it is not intended for children below eight

Warnings on suffocation of plastic packing bags

The plastic packing bags inside are not toys, so they should be kept away from infants and children to avoid suffocation. Never use or place this product on cribs, bed, strollers or playpens.

Warnings on sharp objects

Dis-assembly with excessive strength may cause splinters on wooden materials of this product. So please do not touch edges of the parts and part boards with bare hands, to avoid scratches.

Warnings on inflammable wooden materials

Please keep this product with wooden materials away from open fire or source of ignition.

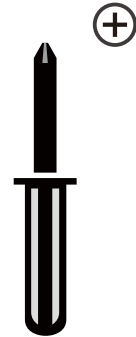
Necessary Tools



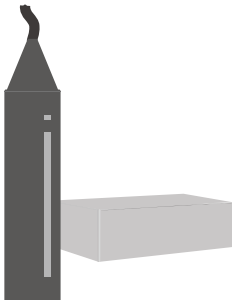
**Measuring tape
or straightedge**



Scissors



**Cross-head
screwdriver**



Candle or wax



Black marker



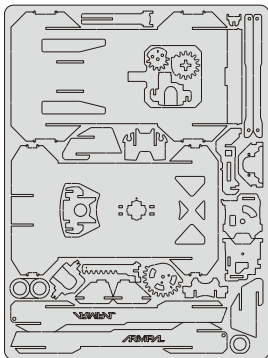
Cups and water



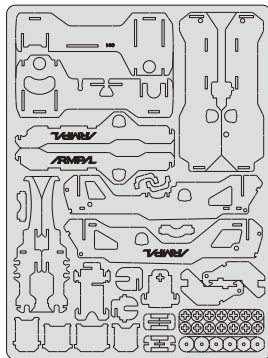
Wooden parts shall not contact grease; Hydraulic tubes shall not contact grease and wax!

List of Parts

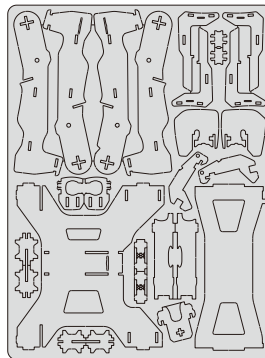
Part board



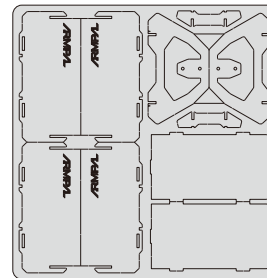
A22 -- A45



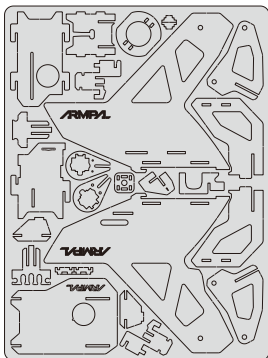
C01 -- C27



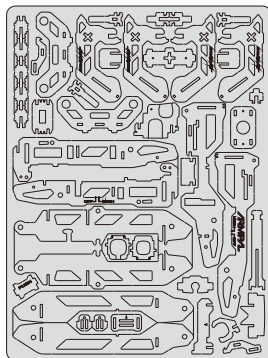
C28 -- C46



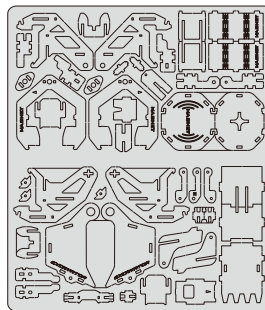
F01 -- F11 OPTIONAL



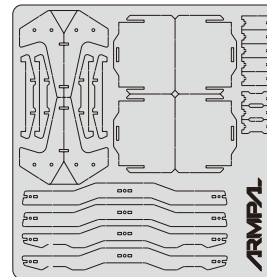
A01 -- A21



B01 -- B33



E01 -- E16 OPTIONAL
D01 -- D19



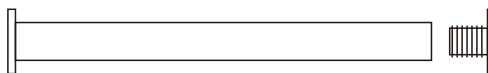
Part

self-tapping screw (long)



x 30

joint shaft 55mm



x 1

self-tapping screw (short)



x 8

joint shaft 50mm



x 1

rubber band



x10

shaft (long)



x 1

shaft (short)



x 1

magnet (black)



x 2

magnet (Silver)



x 2

shaft sleeve (large)



x 1

shaft sleeve (small)



x 1

Part

Spring (long)



x2

Spring (short)



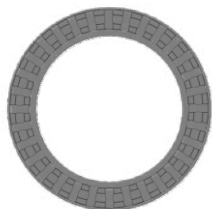
x1

bearing



x1

plane bearing



x1

gaskets



x1

binding band



x2

grease



x1

syringe



x1

Part

hydraulic cylinder (large)



x 6

push rod (large)



x 6

hydraulic cylinder (small)



x 4

push rod (small)



x 4

piston (small)



x 4

piston (large)



x 6

bypass valve



x 10

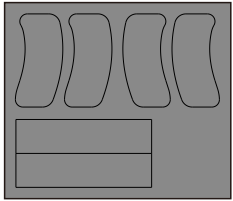
bypass valve base



x 10

Part

sponge mat



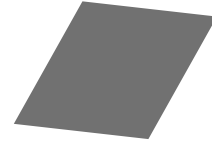
x 1

lint mat



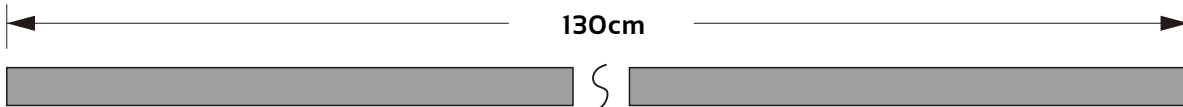
x 1

abrasive paper



x 1

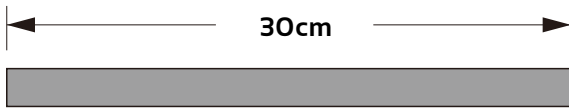
hydraulic tube



x 2



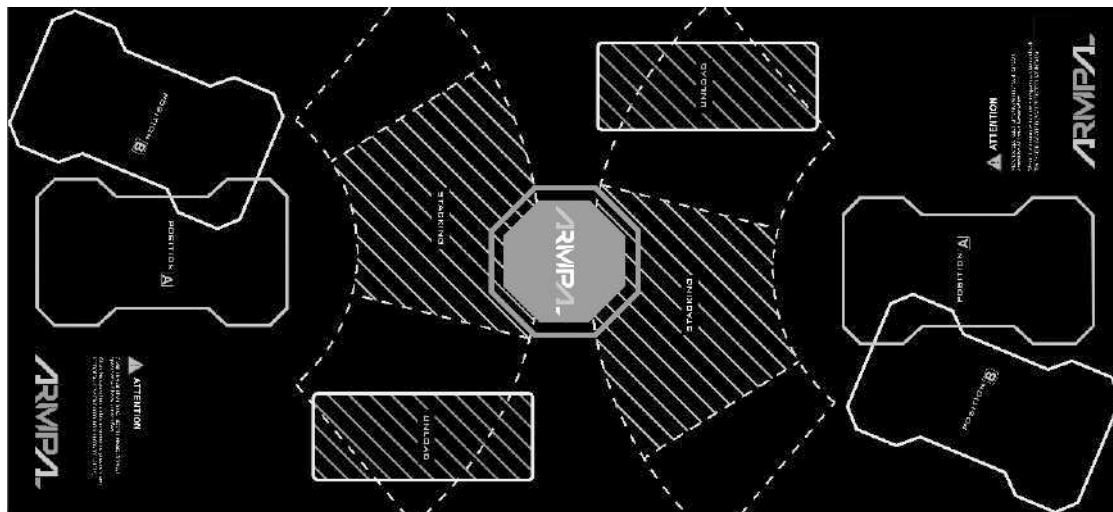
x 3



x 1

Part

table mat (optional)



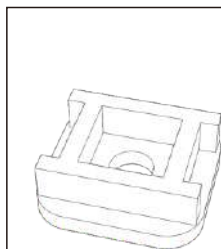
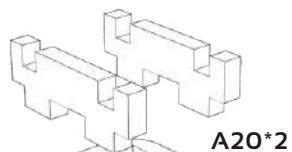
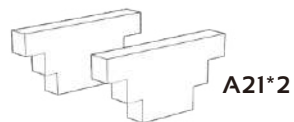
wood block



Assembly of Hydraulic System

Hydraulic System

1



2



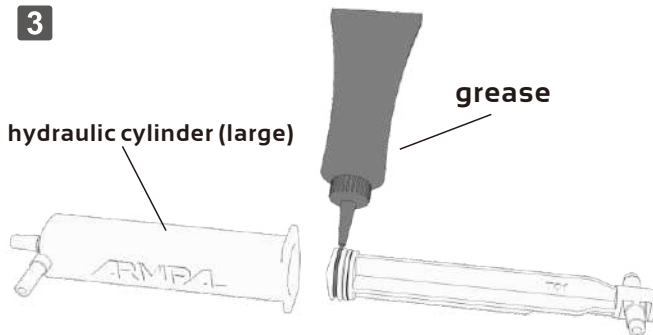
piston (large)



push rod (large)

3

hydraulic cylinder (large)



Use sufficient grease to enhance performance

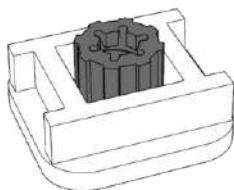
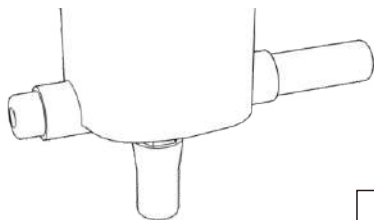
4



x6

Hydraulic System

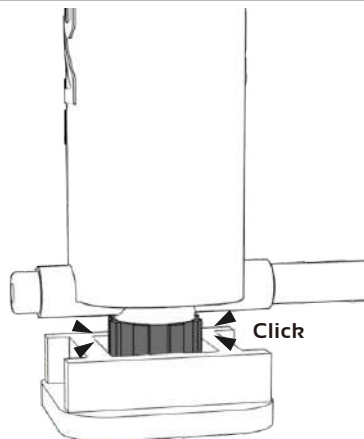
5



bypass valve base

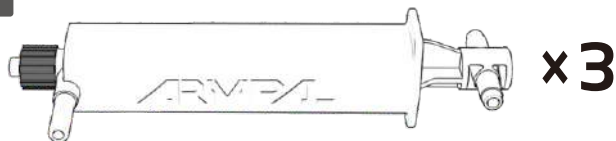


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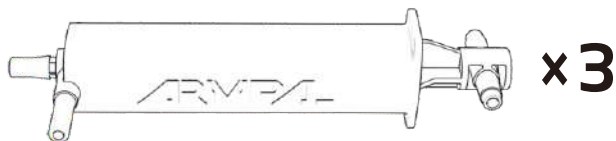


x3

7

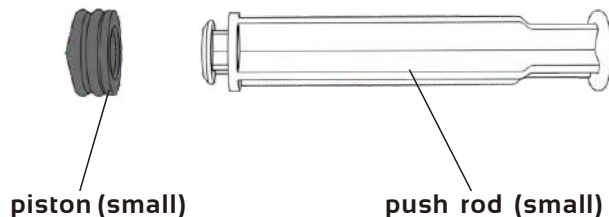


Hydraulic module (large) with bypass valve base



Hydraulic module (large) without bypass valve base

8

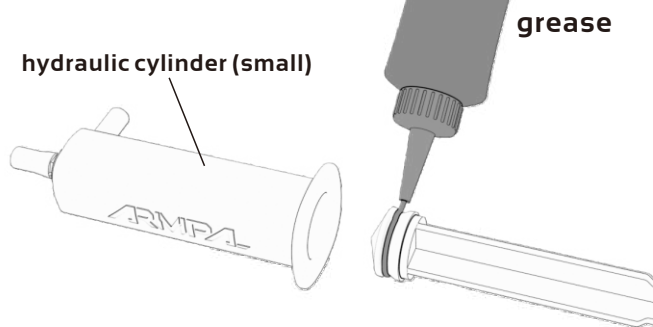


piston (small)

push rod (small)

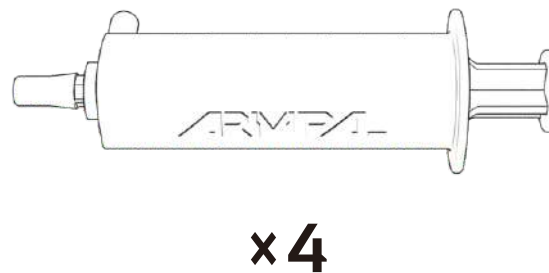
Hydraulic System

9

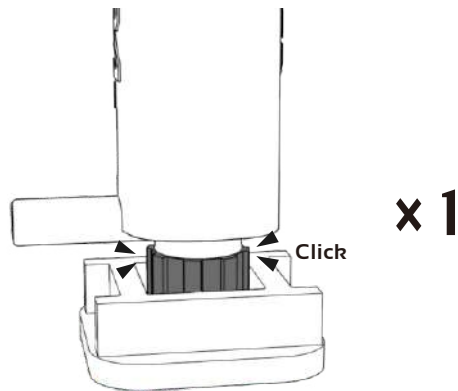


Use sufficient grease to enhance performance

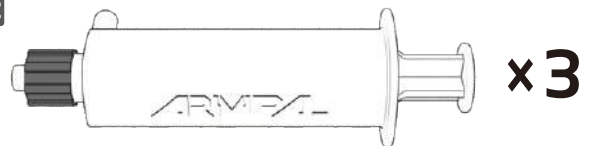
10



11



12

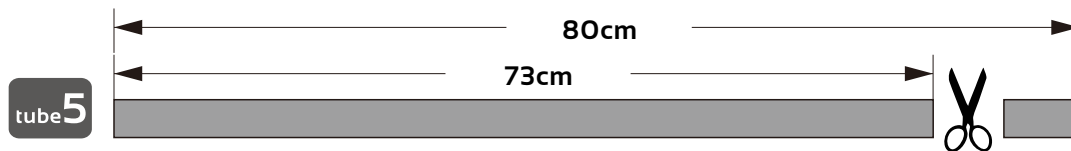
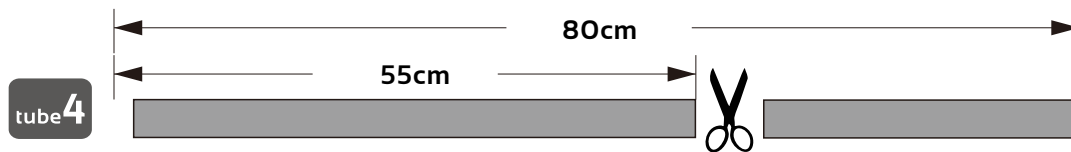
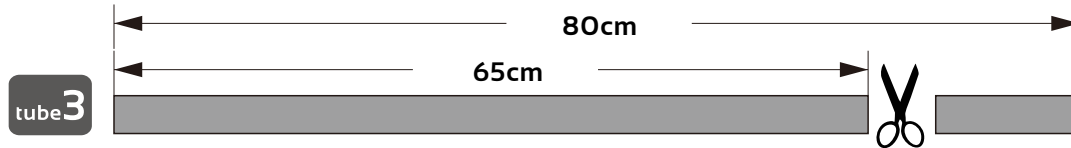
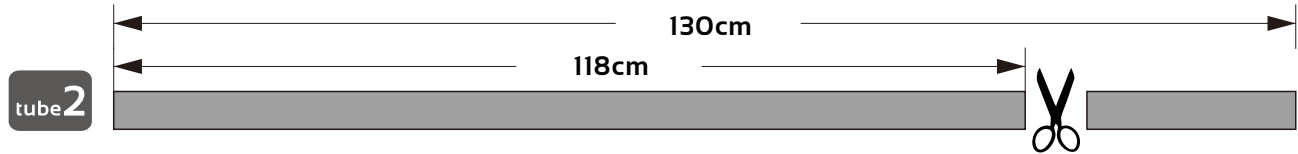
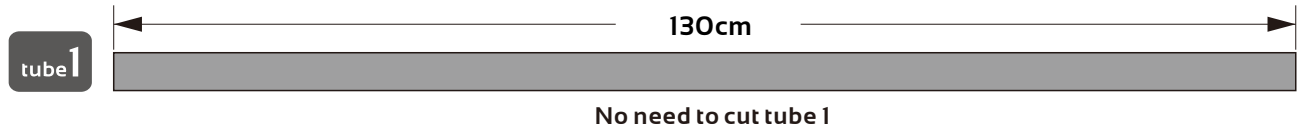


Hydraulic module (small) with bypass valve base

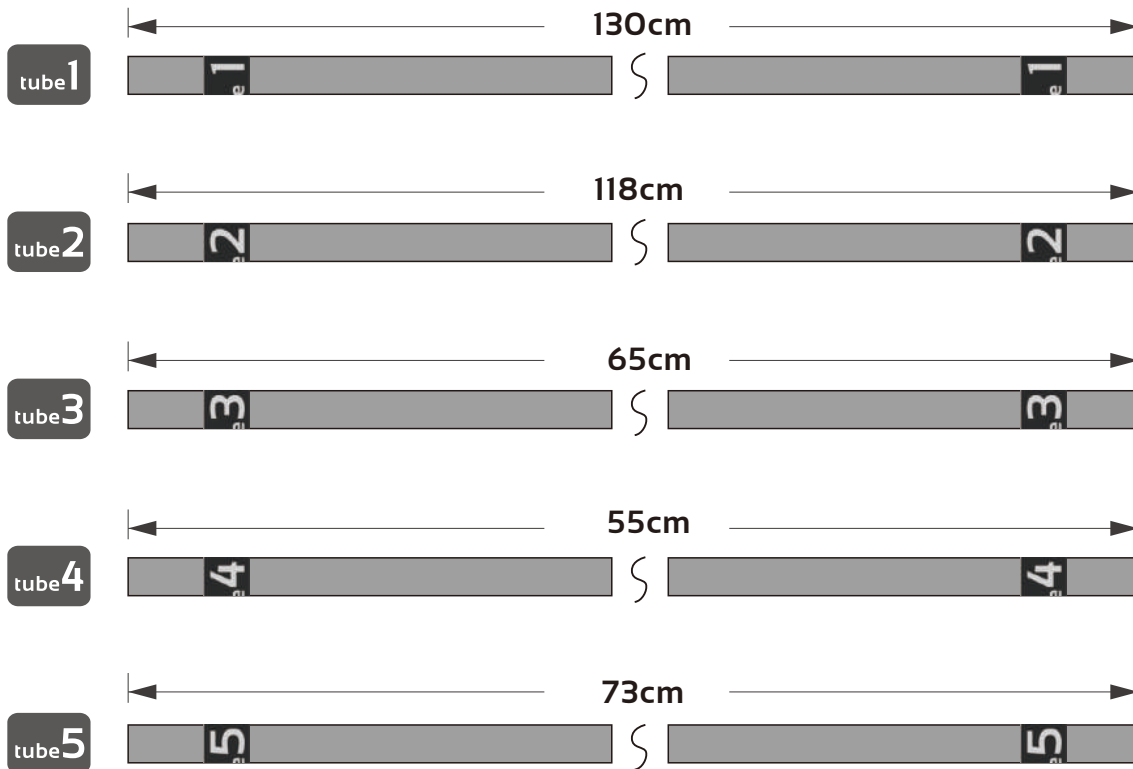


Hydraulic module (small) without bypass valve base

Hydraulic System



Hydraulic System

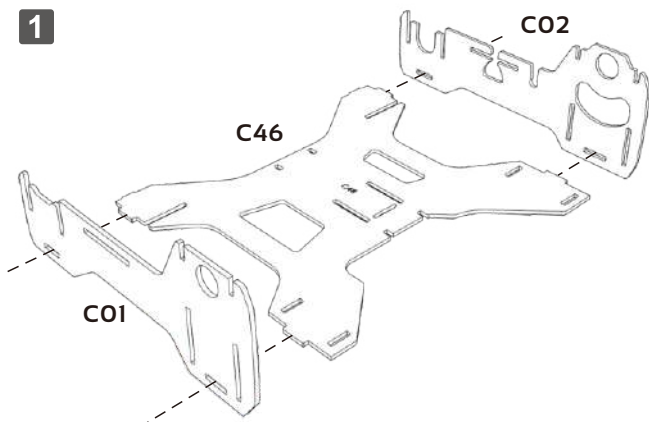


Affix number stickers onto both ends of the tube

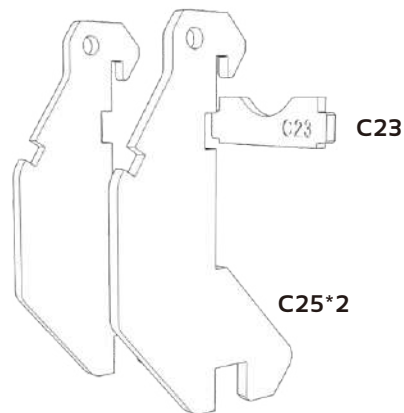
Assembly of Handle

Handle

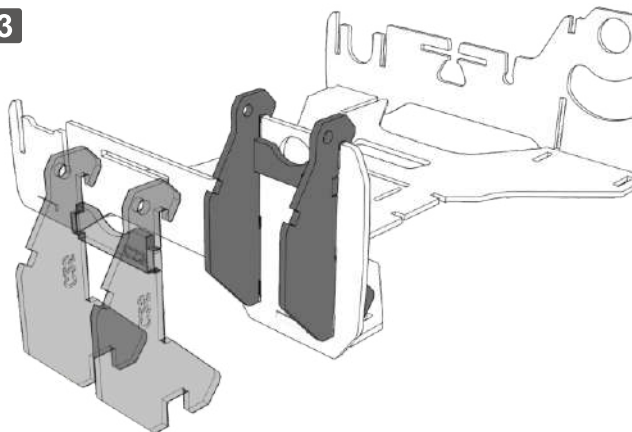
1



2



3

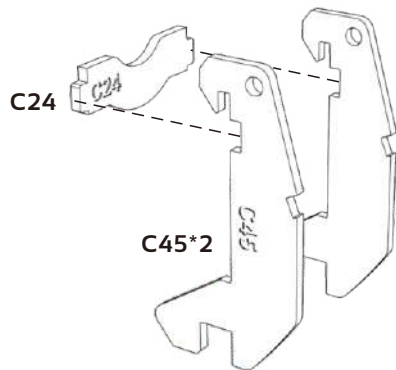


4

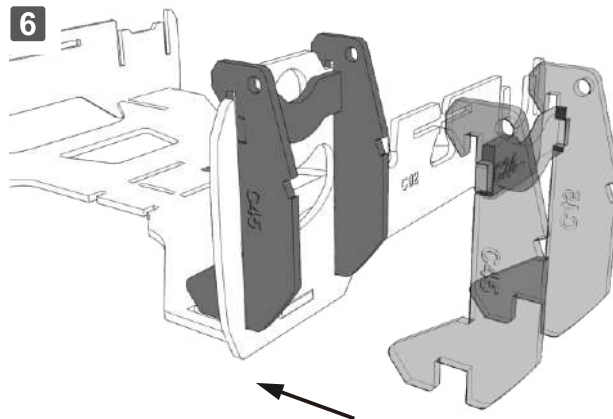


Handle

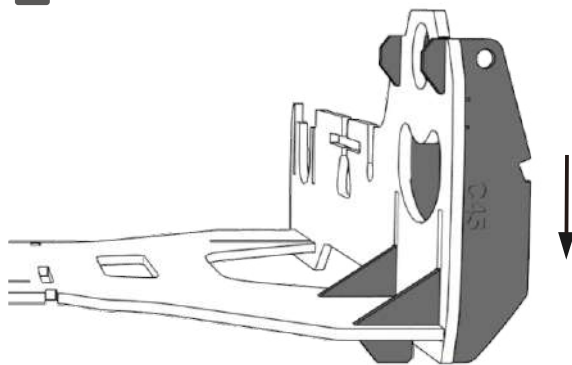
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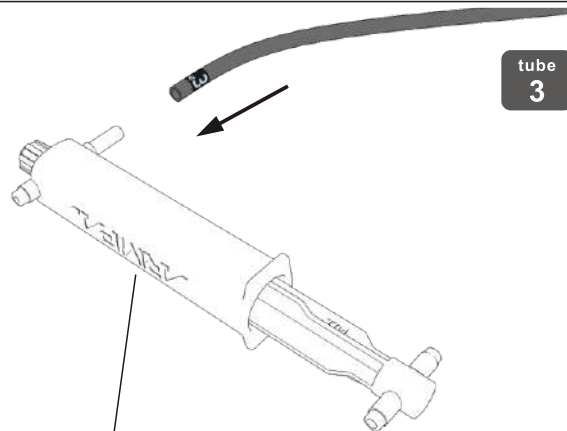
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7



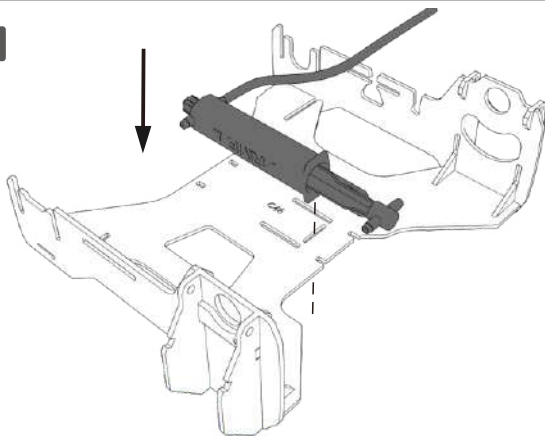
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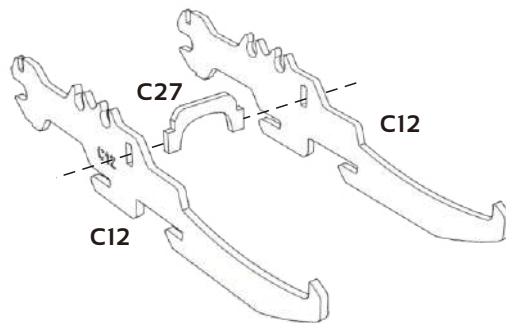
Hydraulic module (large) with bypass valve base

Handle

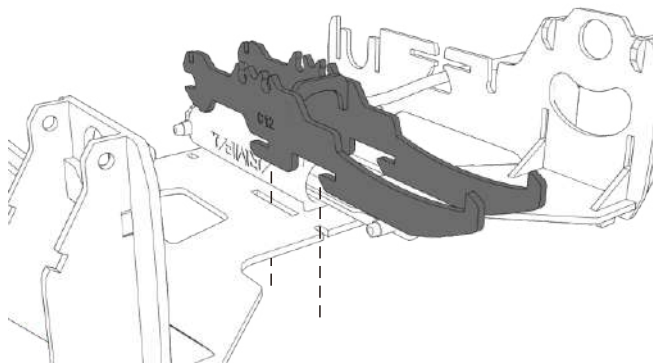
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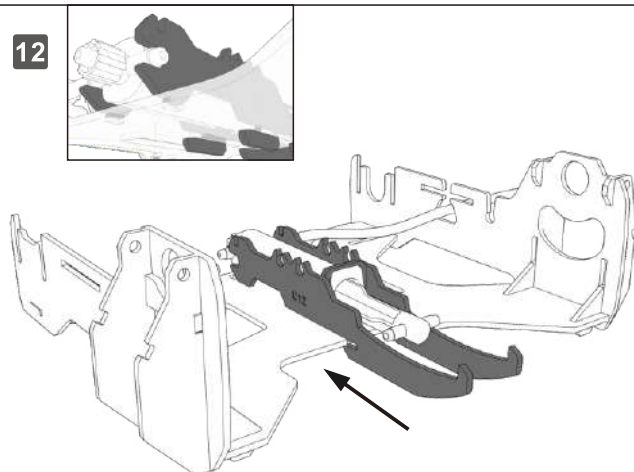
10



11

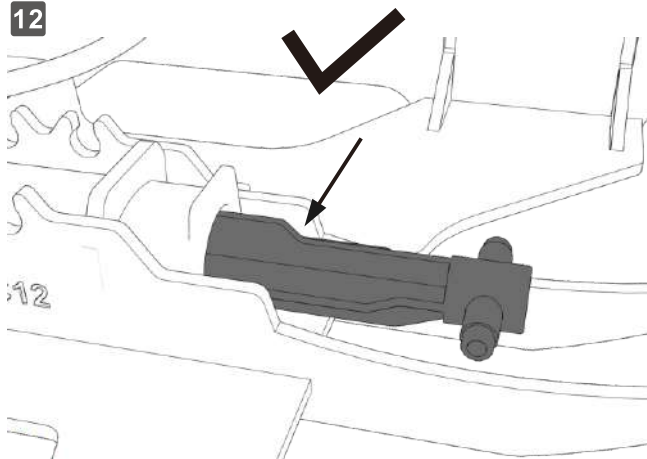


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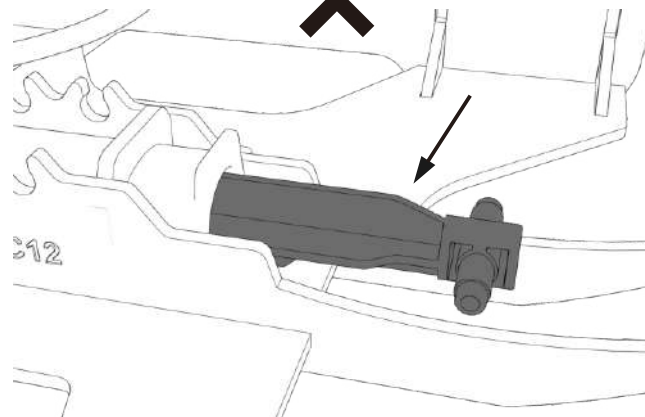


Handle

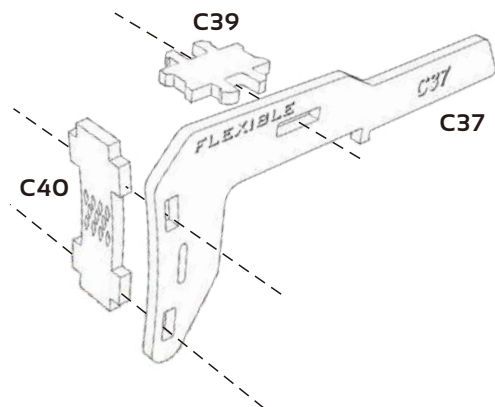
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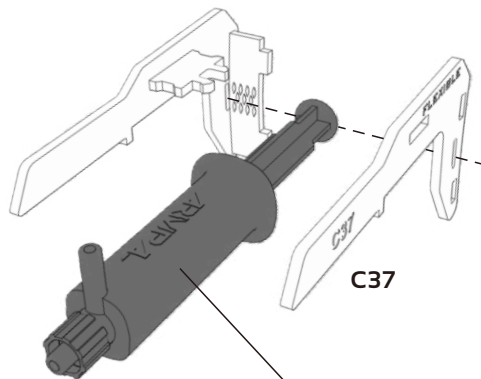
X



13



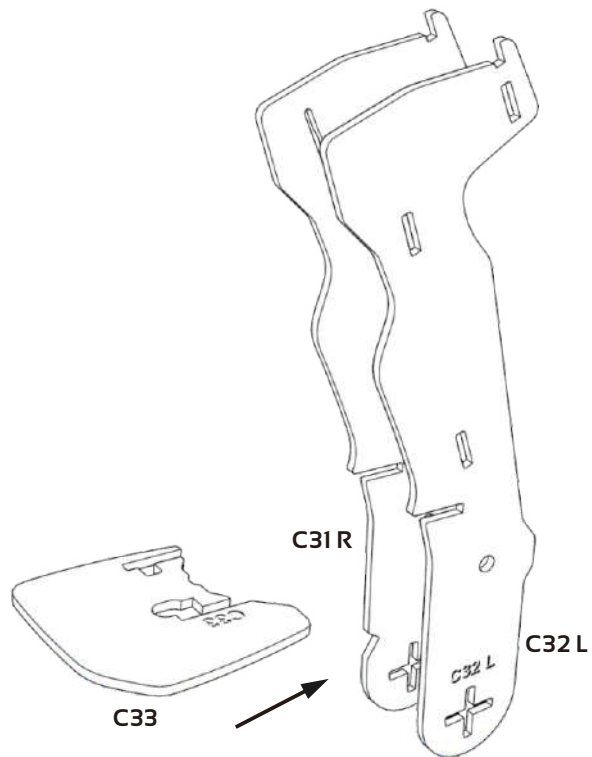
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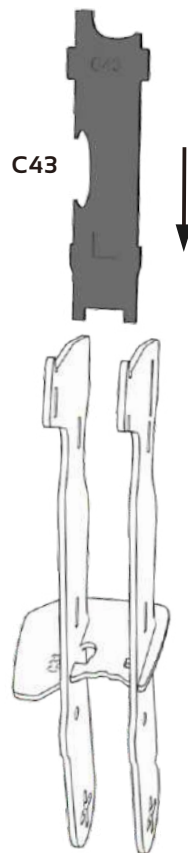
Hydraulic module (small) with bypass valve base

Handle

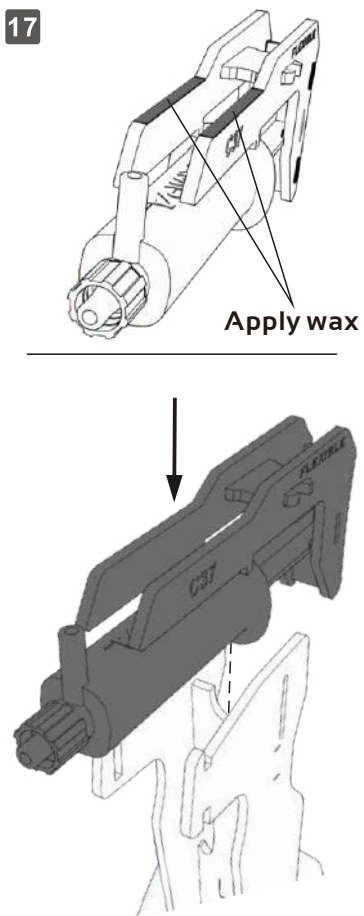
15



16

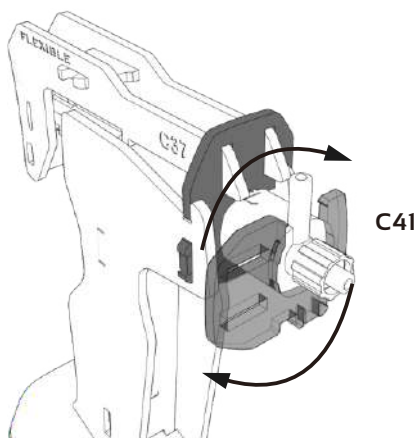


17

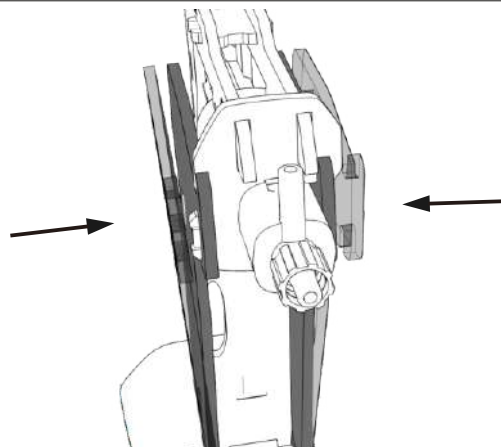


Handle

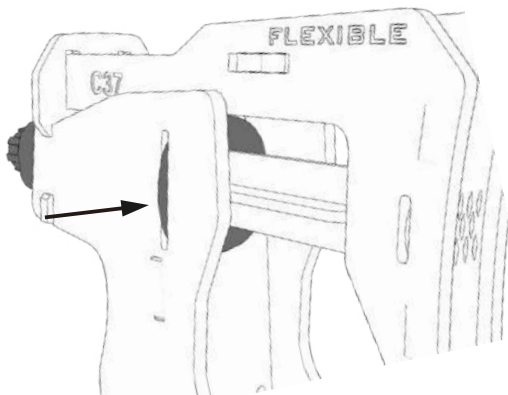
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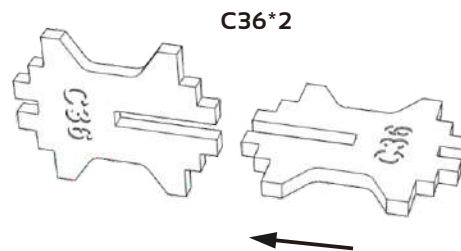
19



Final position

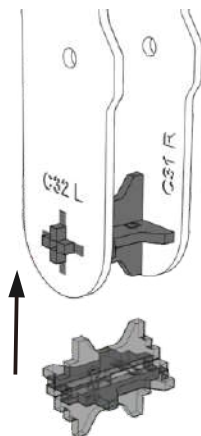


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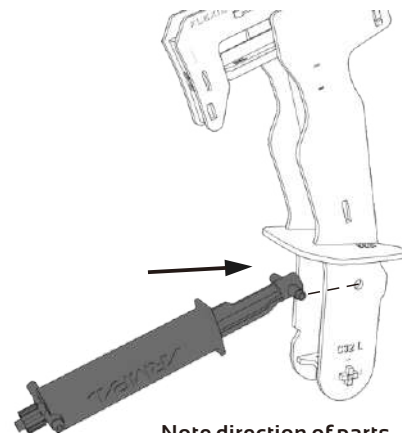
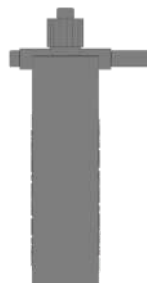
Handle

21



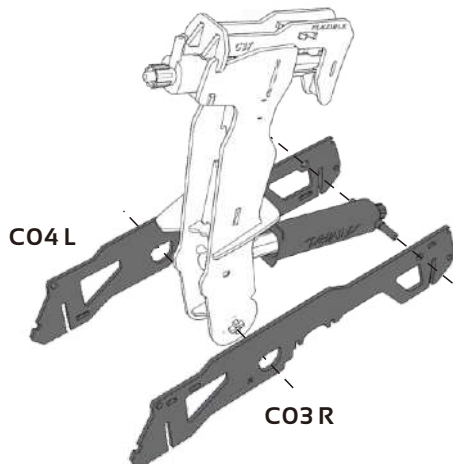
22

Hydraulic module (large)
with bypass valve base

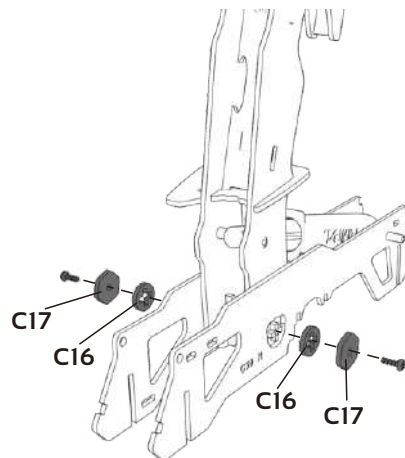


Note direction of parts

23

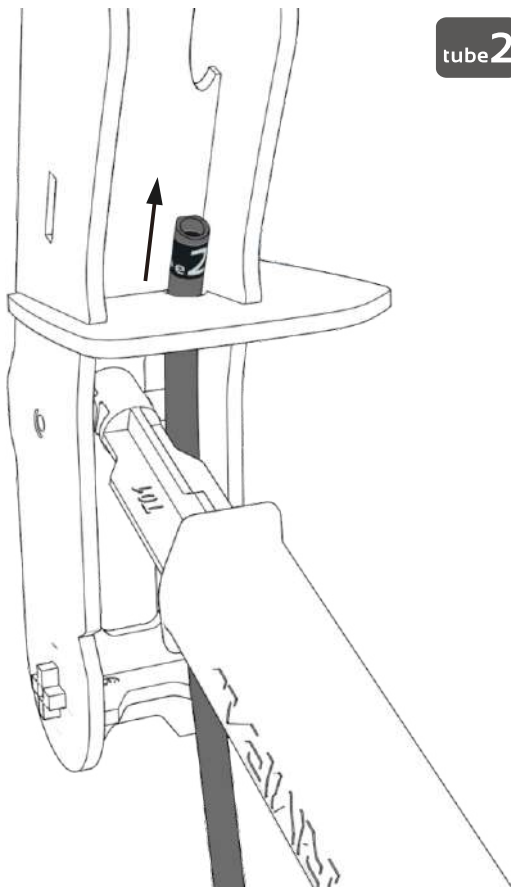


24



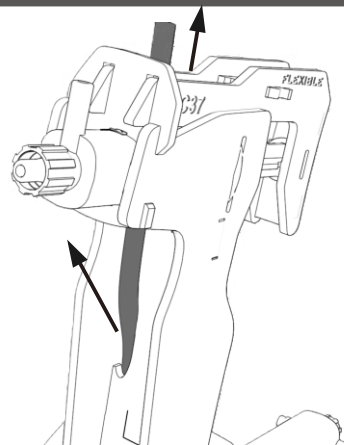
Handle

25

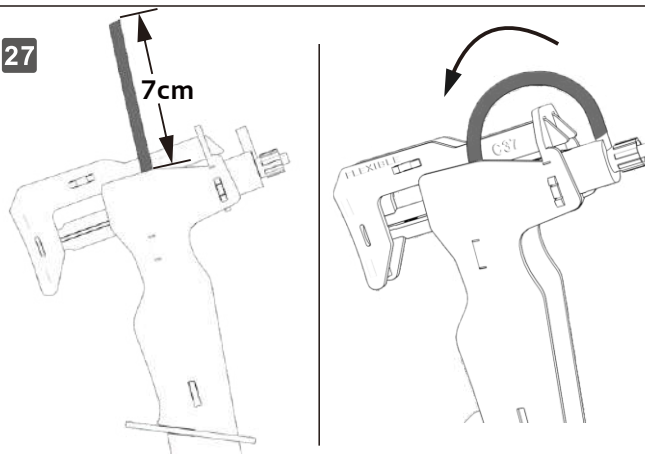


tube 2

26

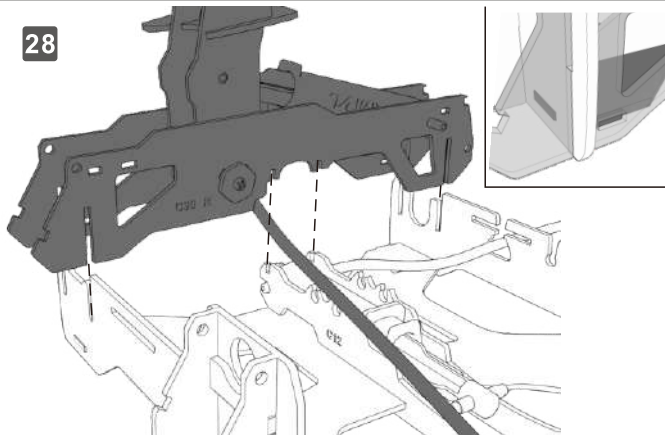


27

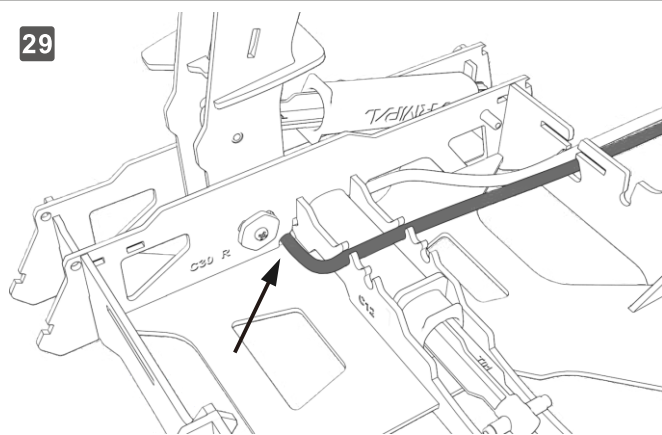


Handle

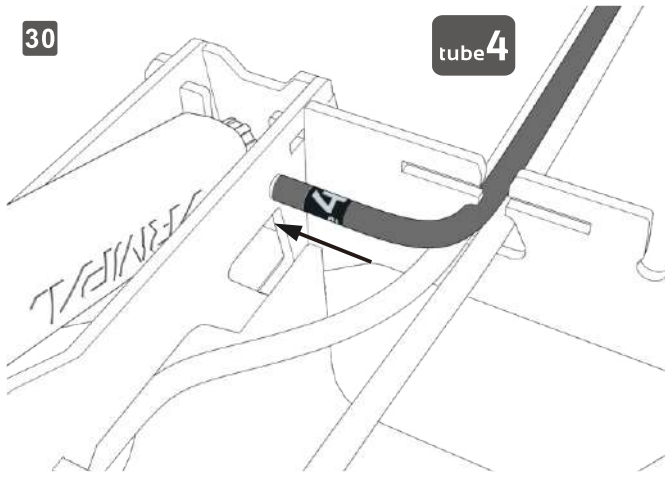
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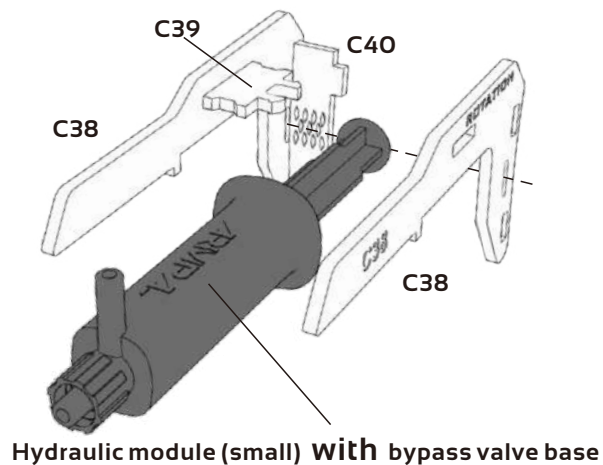
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30

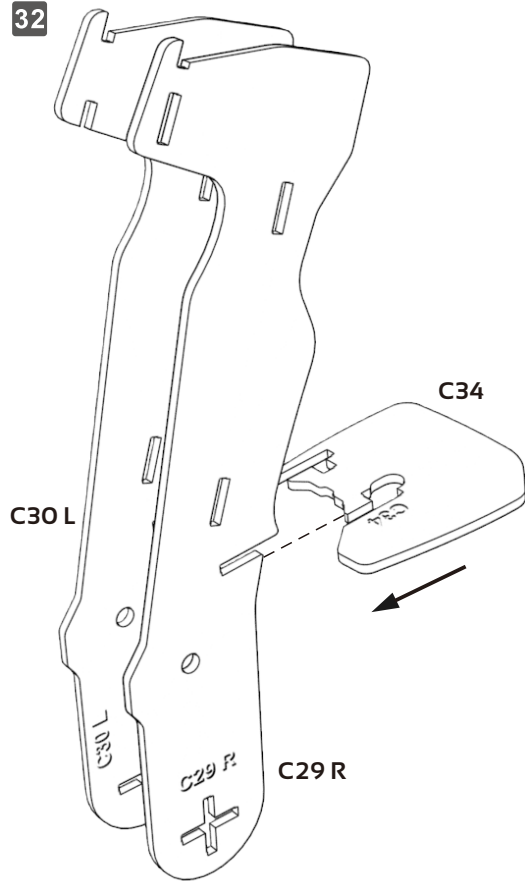


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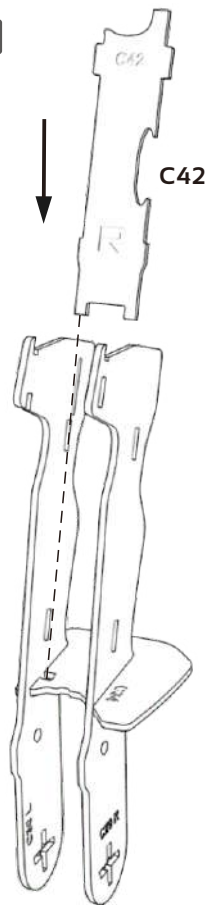


Handle

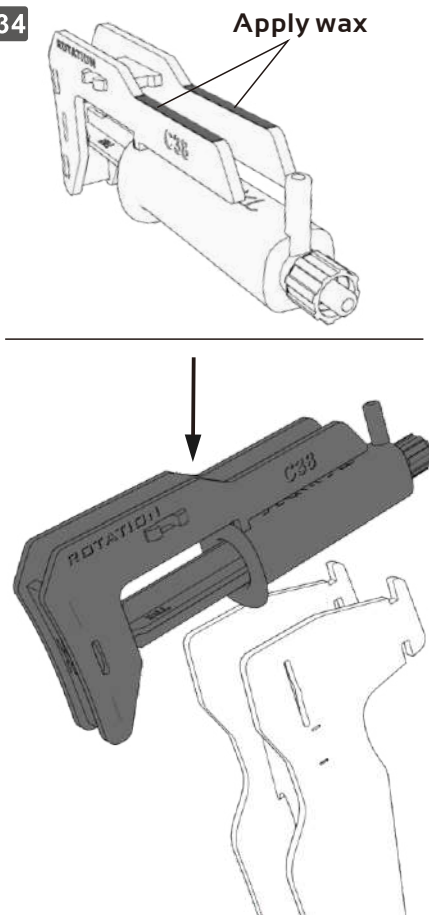
32



33

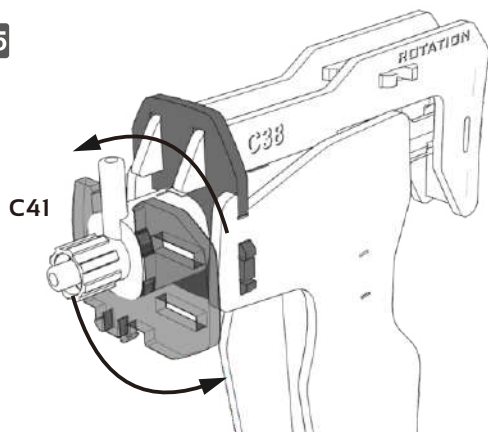


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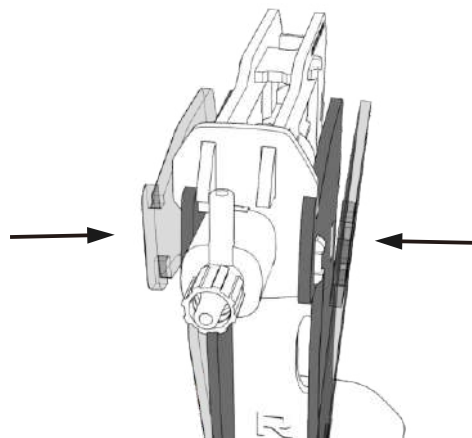


Handle

35

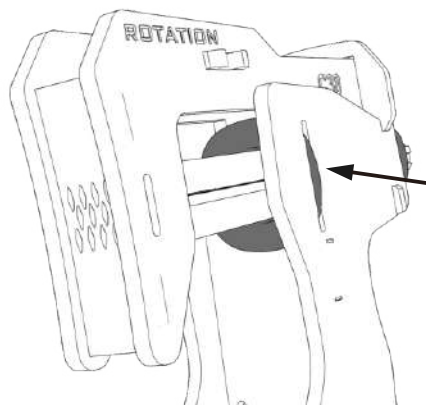


36



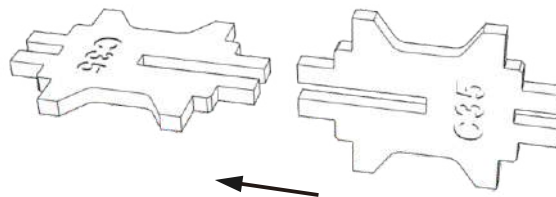
37

Final position



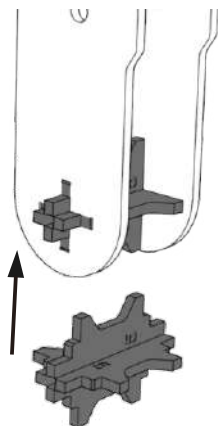
38

C35*2



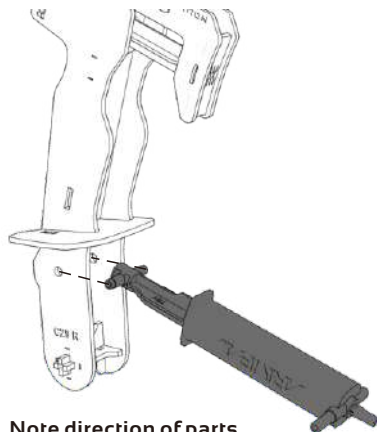
Handle

39



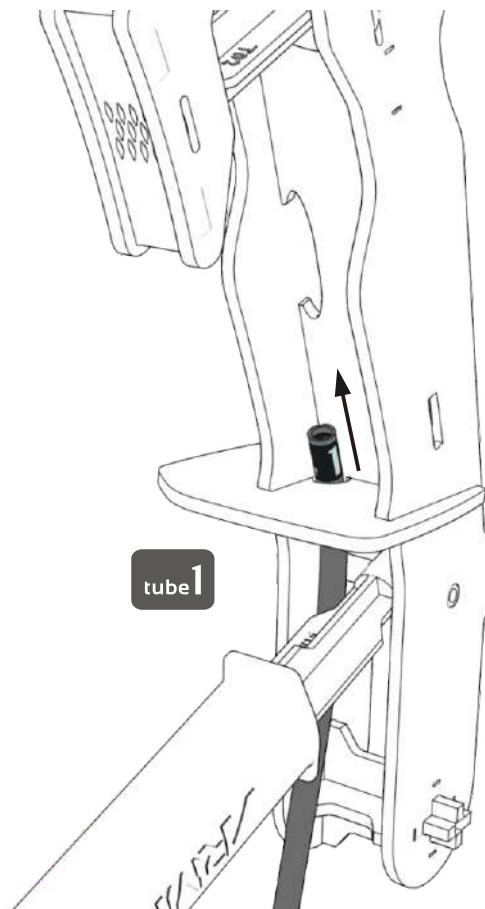
40

Hydraulic module (large)
without bypass valve base



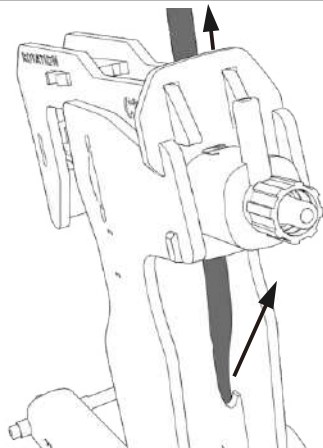
Note direction of parts

41

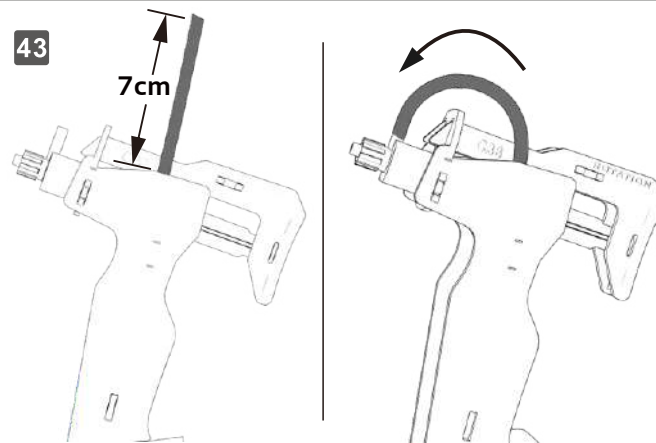


Handle

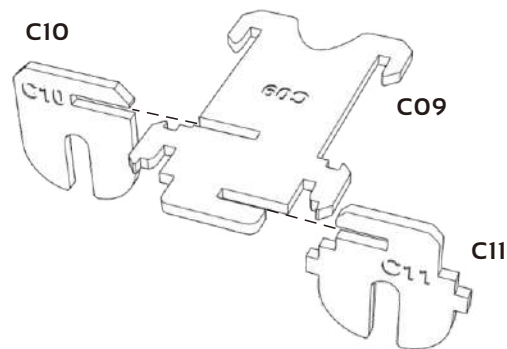
42



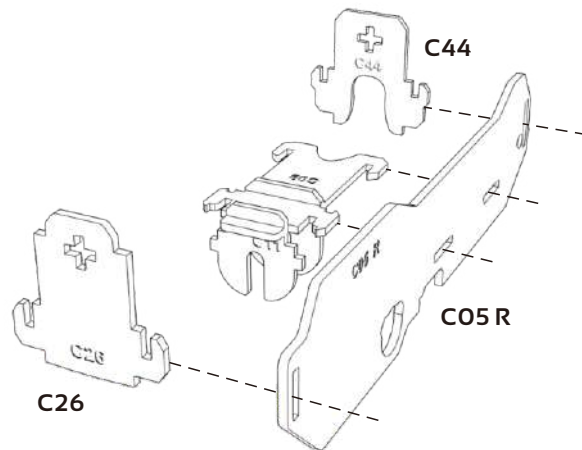
43



44

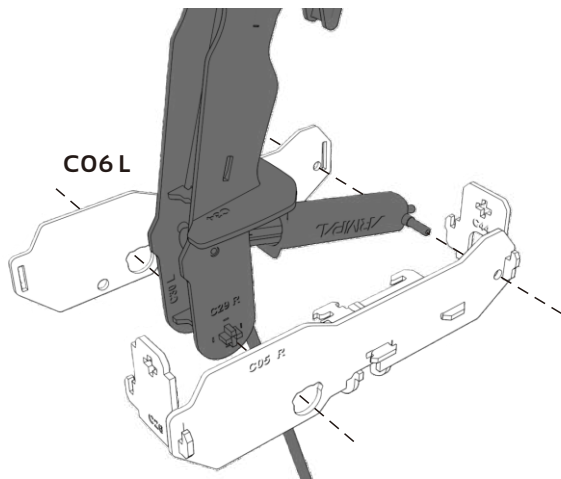


45

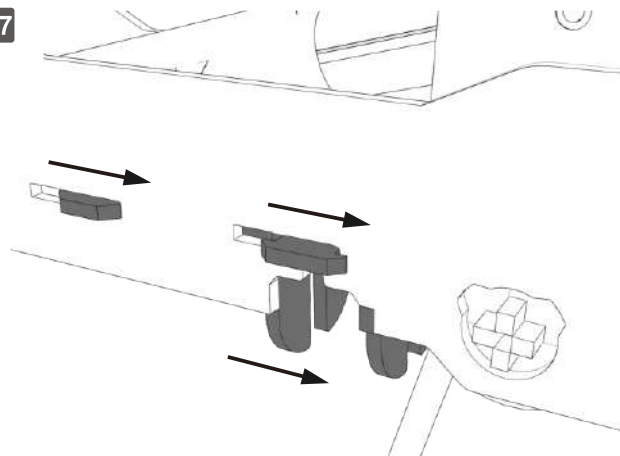


Handle

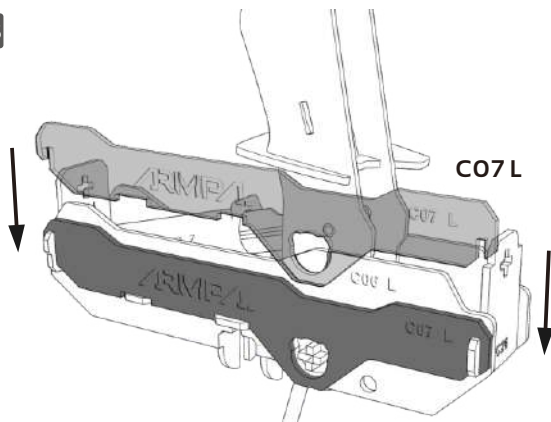
46



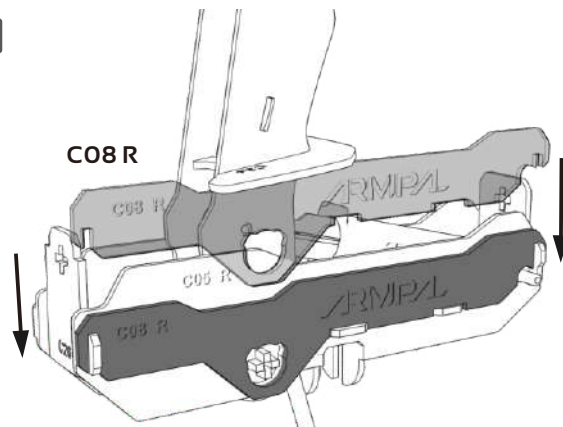
47



48

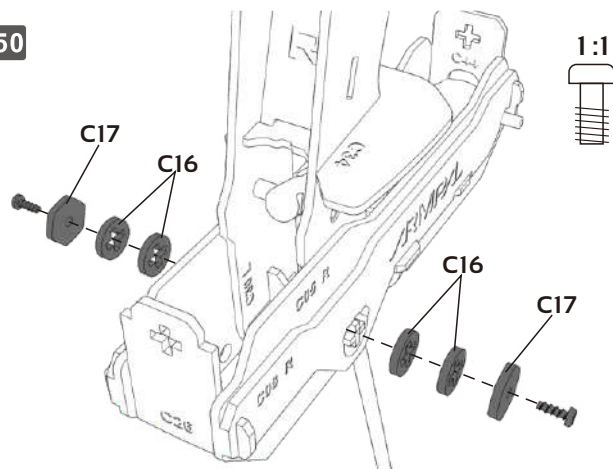


49

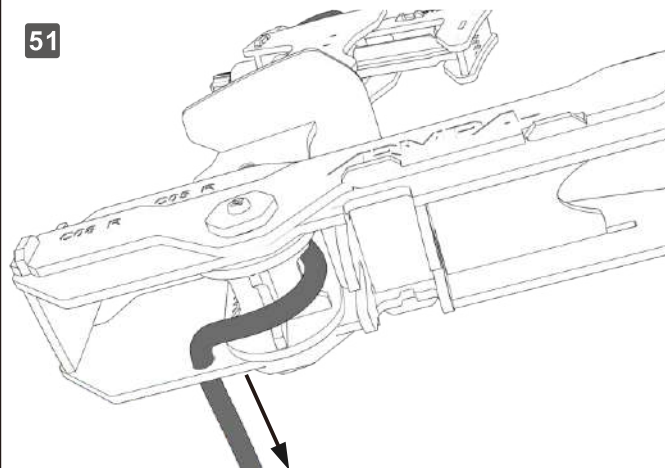


Handle

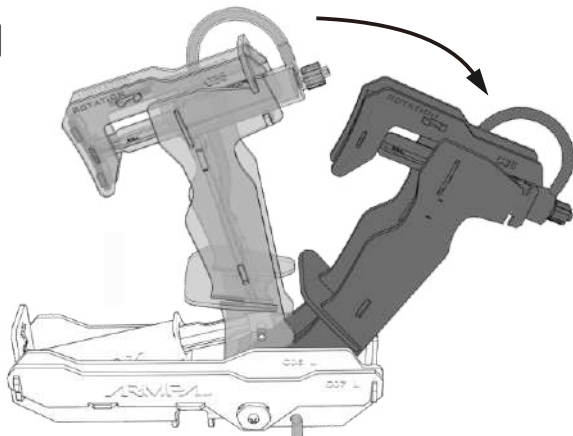
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51

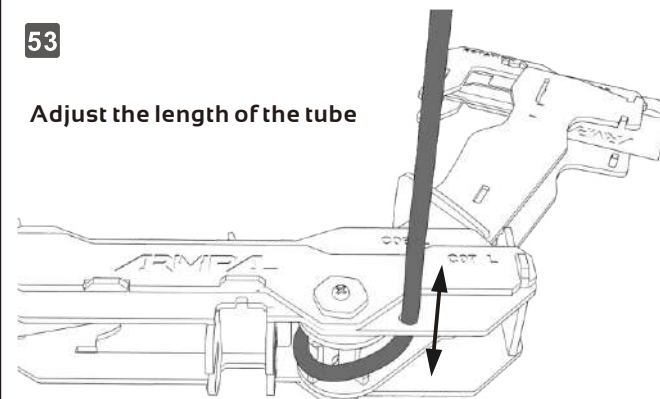


52



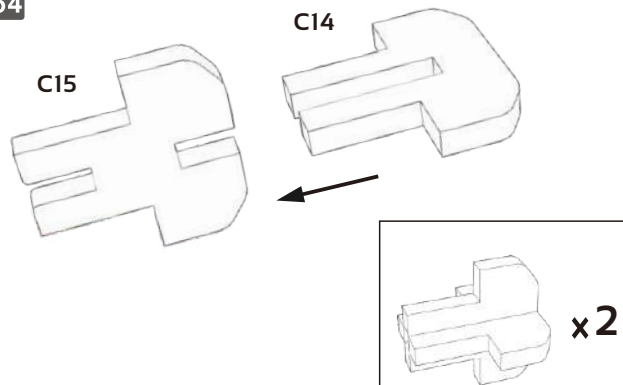
53

Adjust the length of the tube

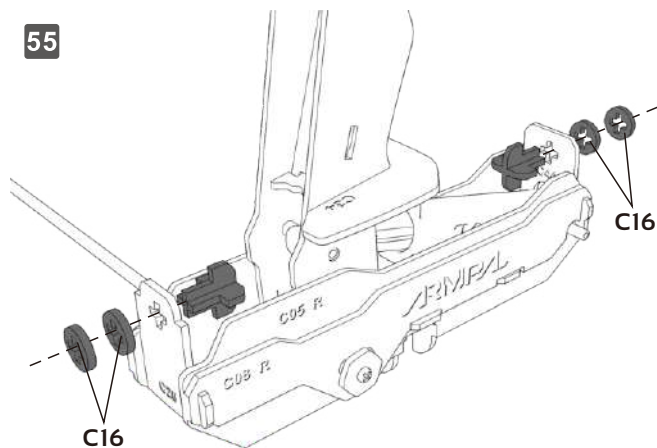


Handle

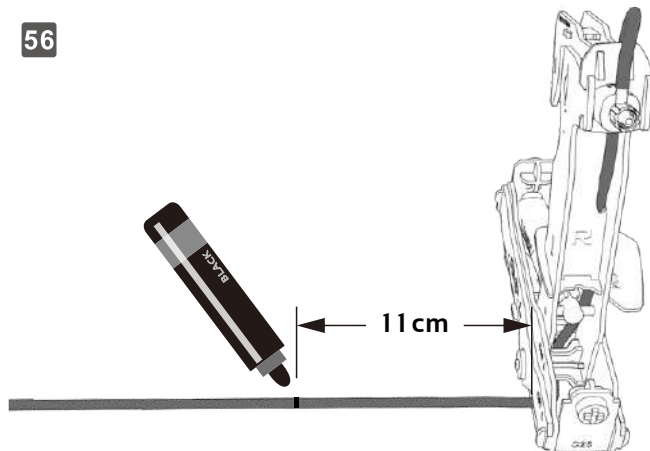
54



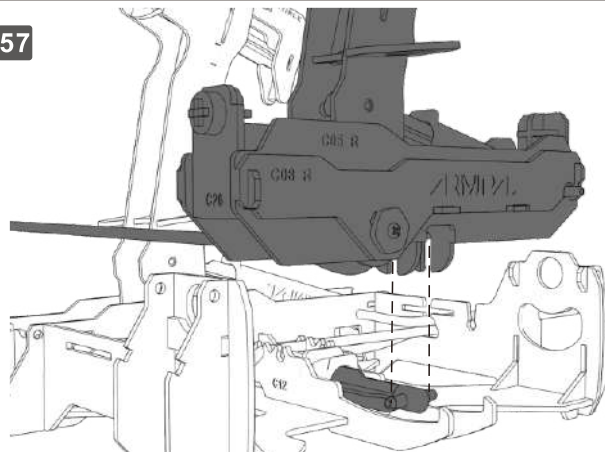
55



56

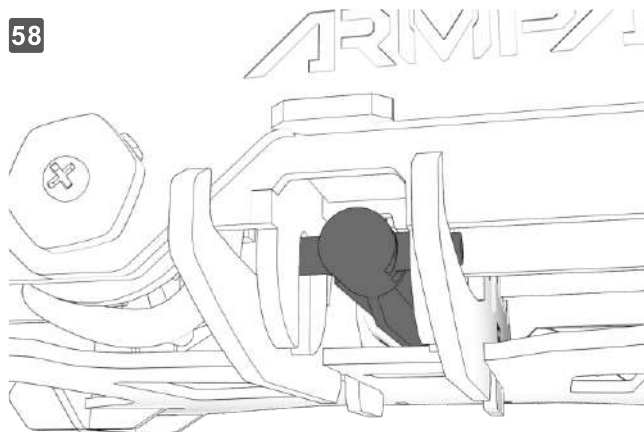


57

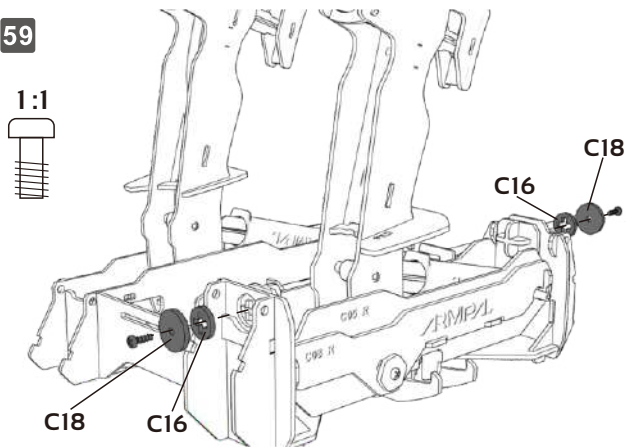


Handle

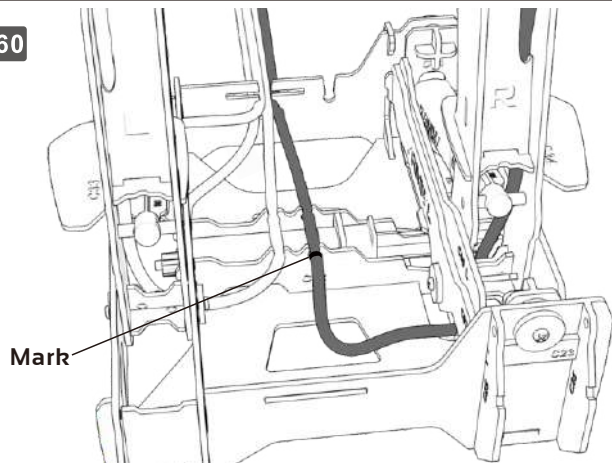
58



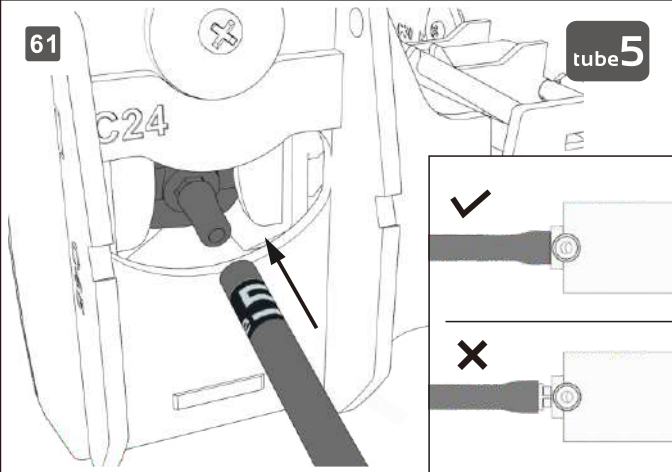
59



60

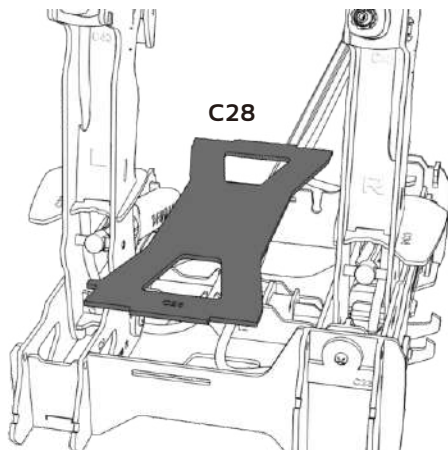


61

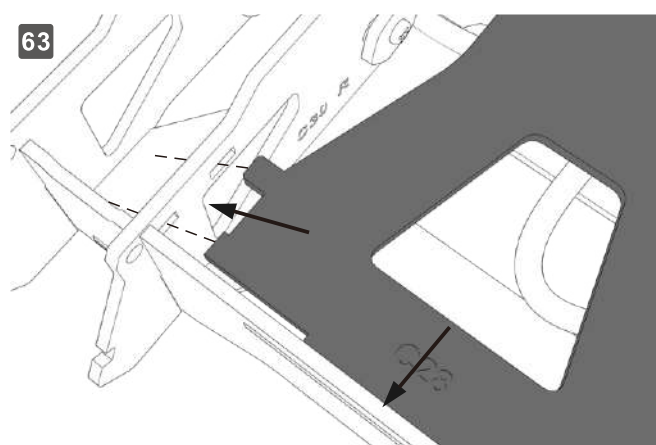


Handle

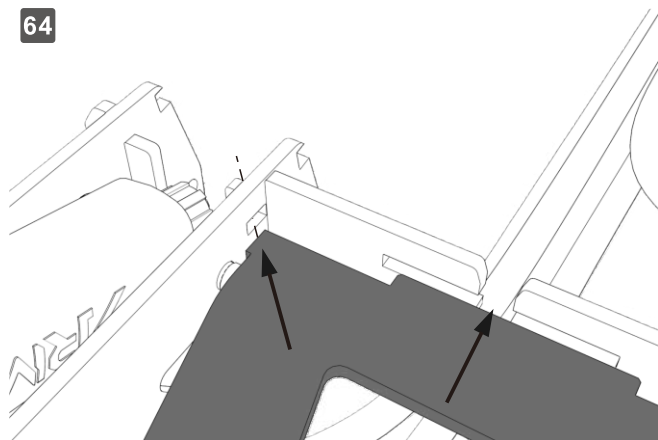
62



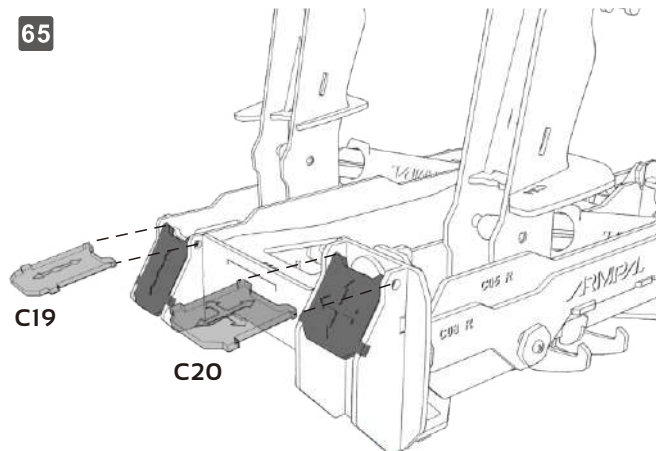
63



64

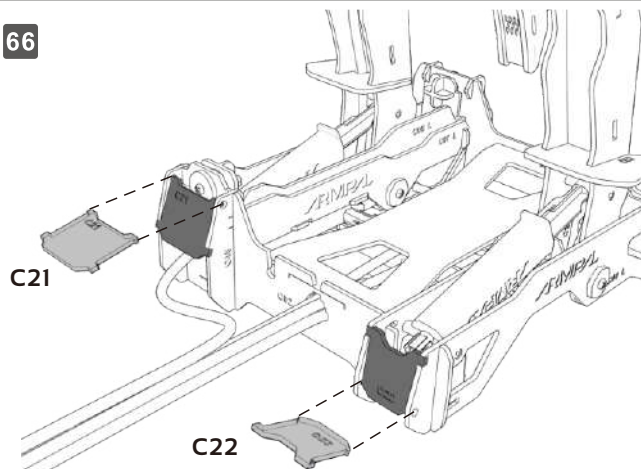


65

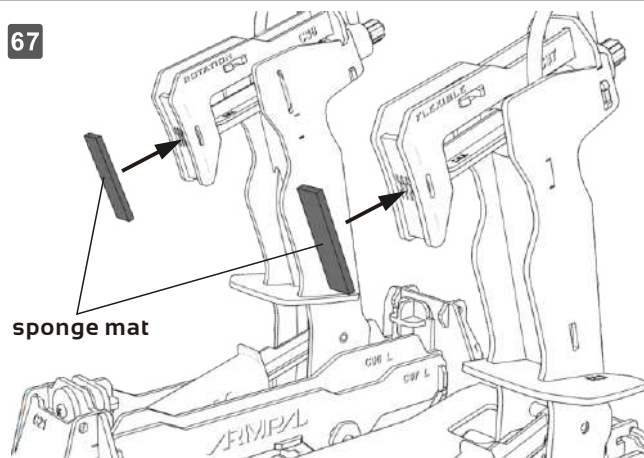


Handle

66

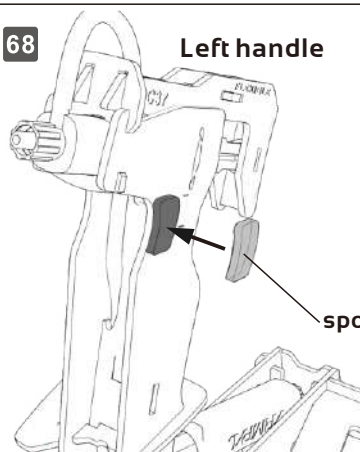


67



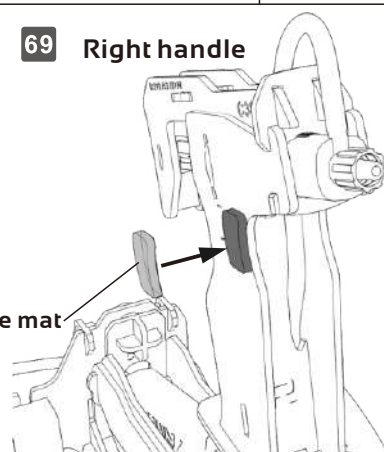
68

Left handle



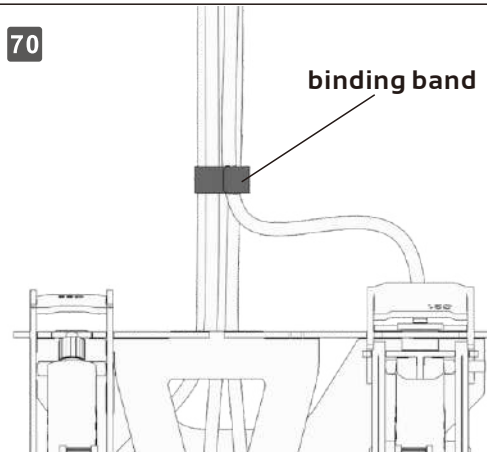
69

Right handle



70

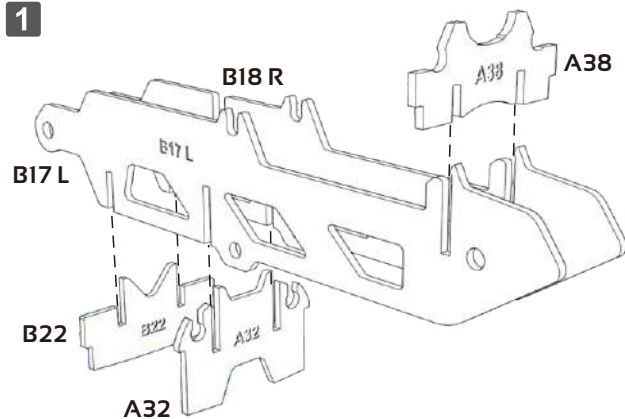
binding band



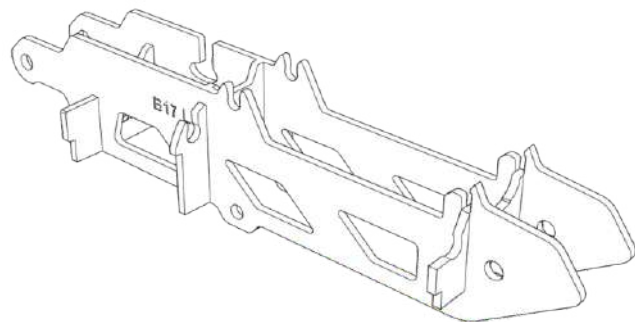
Assembly of Mid-arm

Mid-arm

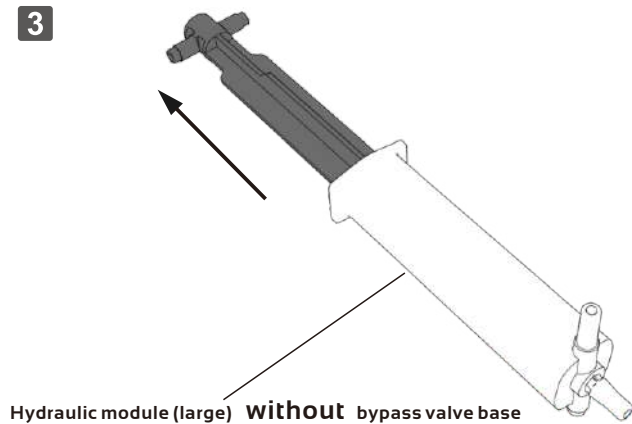
1



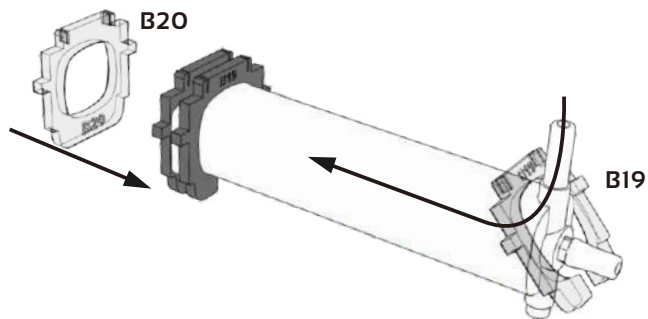
2



3

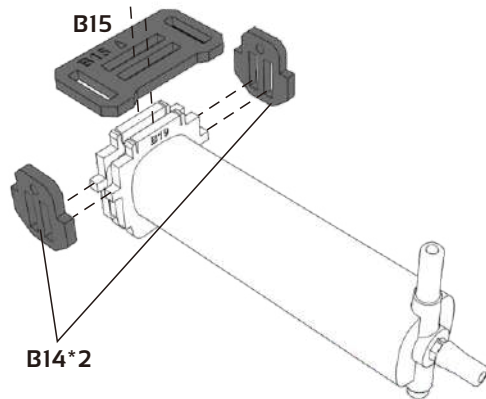


4

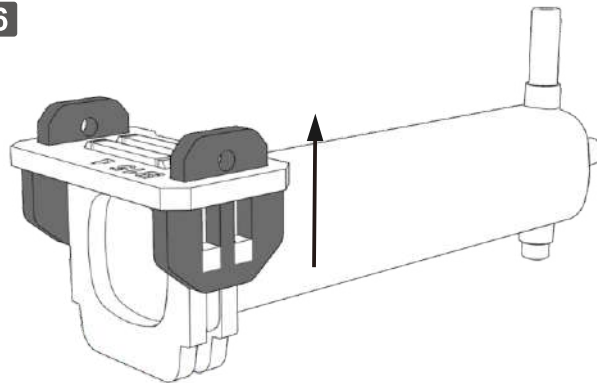


Mid-arm

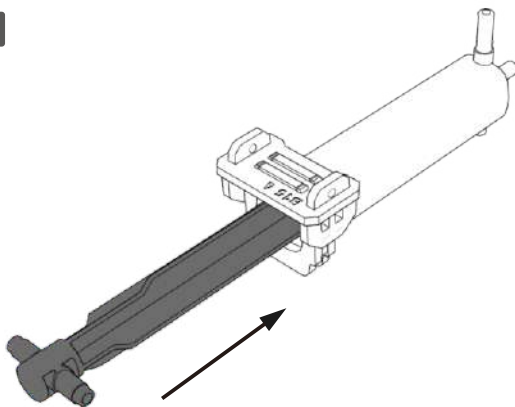
5



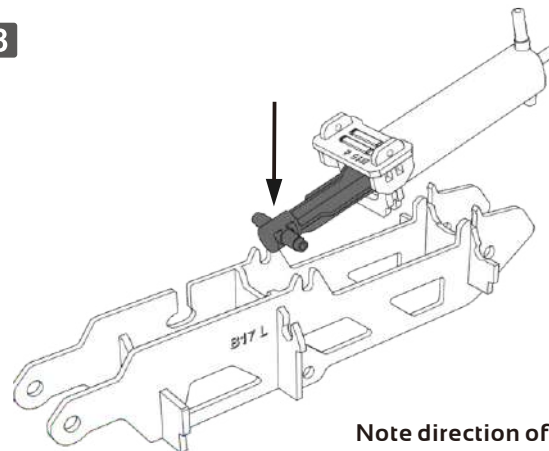
6



7



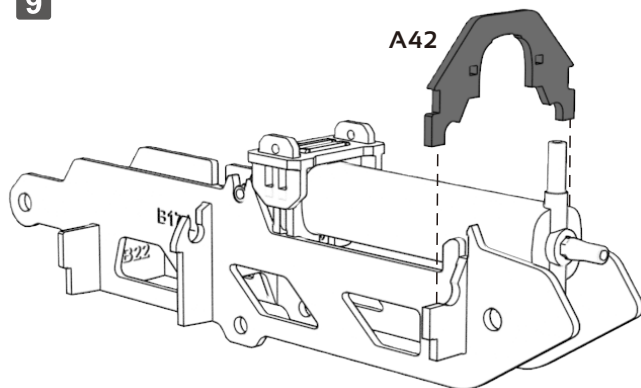
8



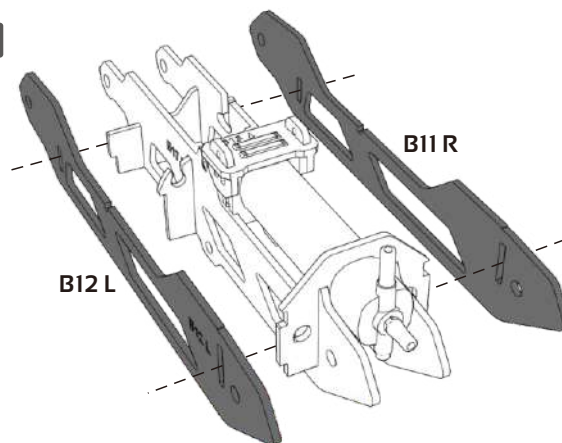
Note direction of parts

Mid-arm

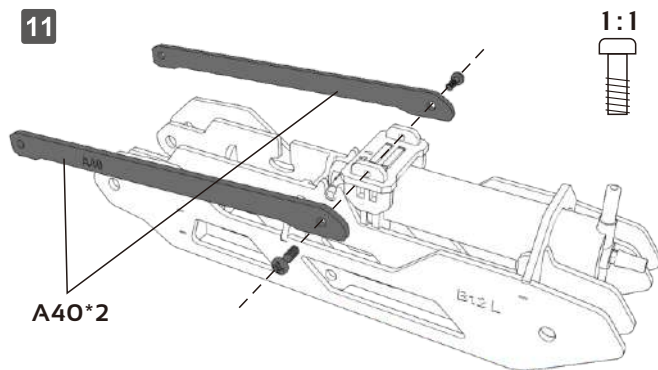
9



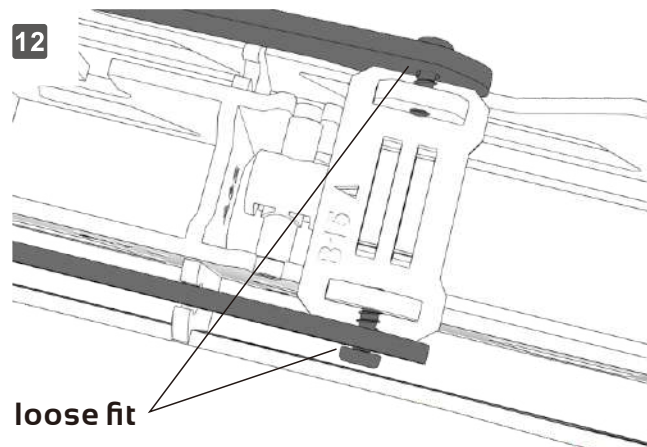
10



11



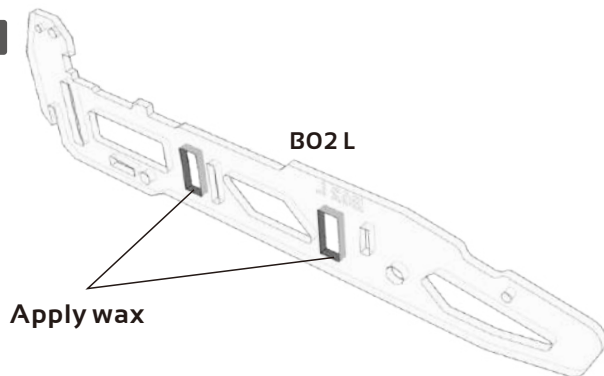
12



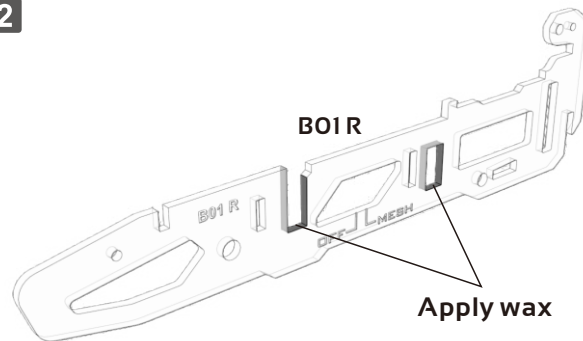
Assembly of Front arm

Front arm

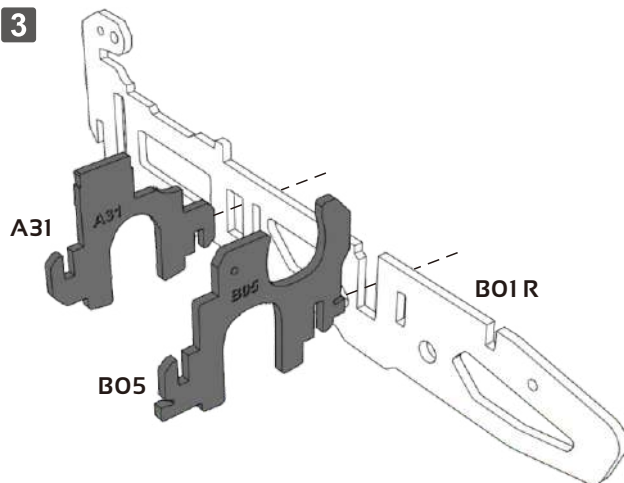
1



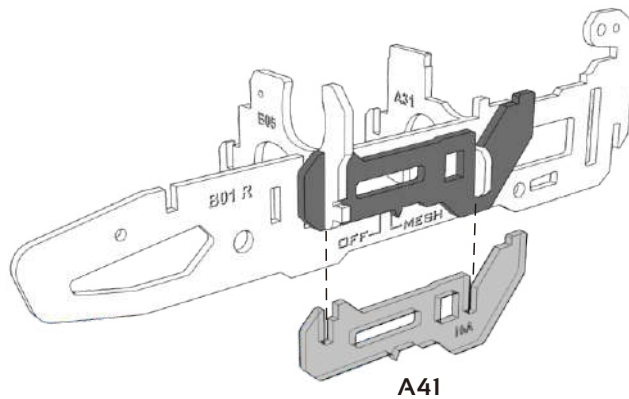
2



3

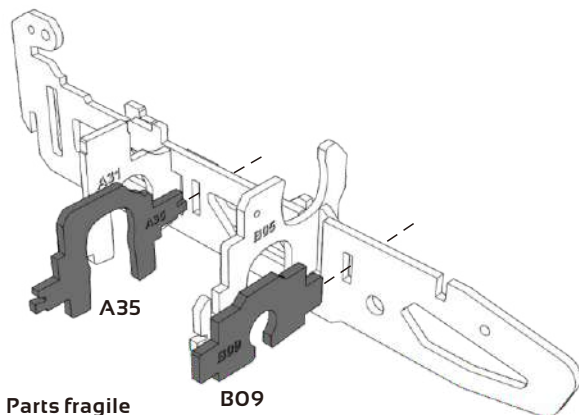


4



Front arm

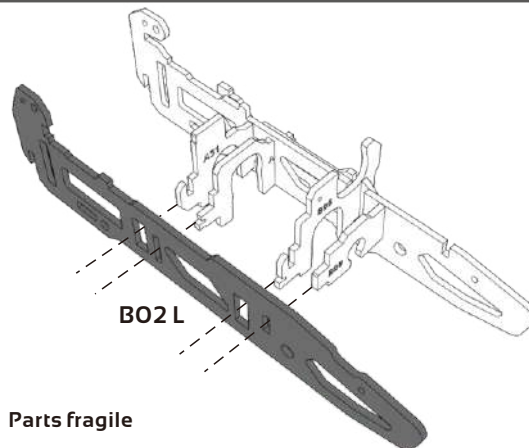
5



 Parts fragile

B09

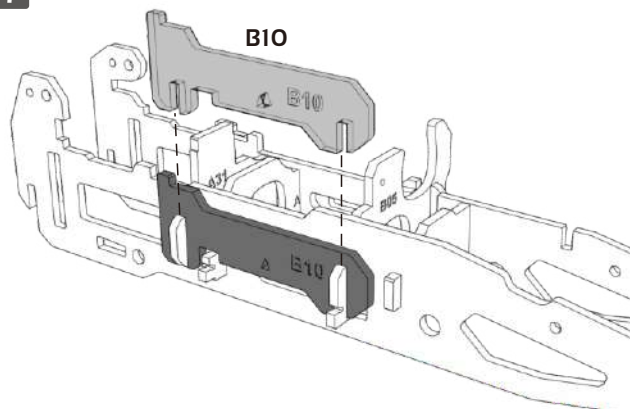
6



 Parts fragile

B02 L

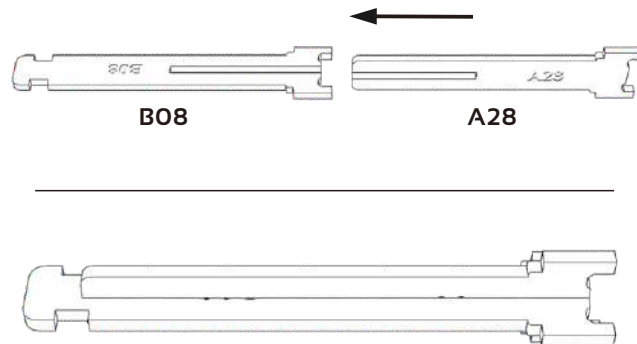
7



B10

E10

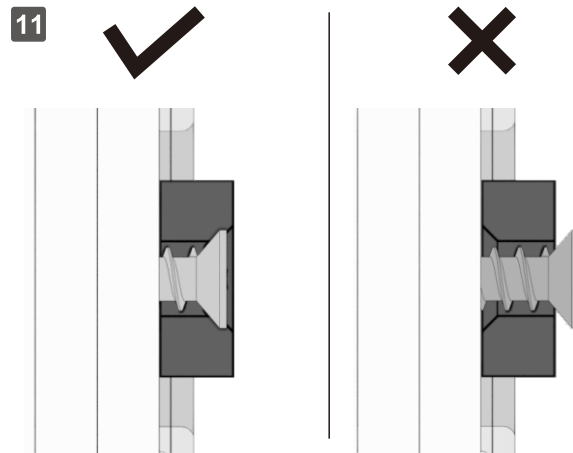
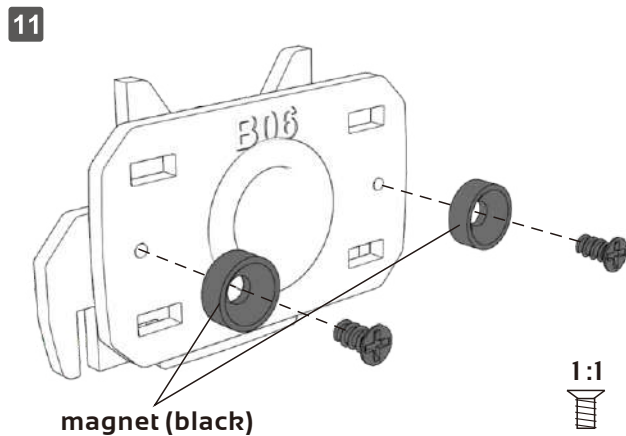
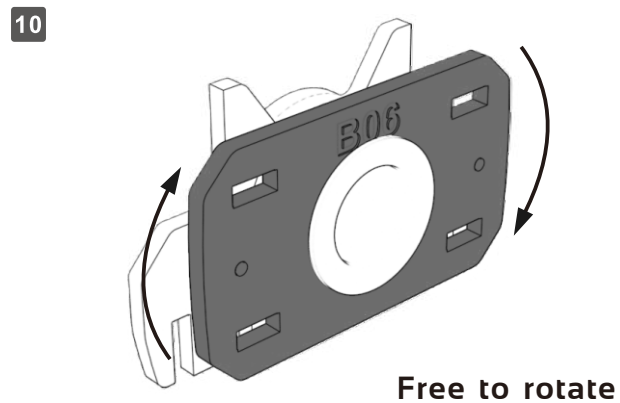
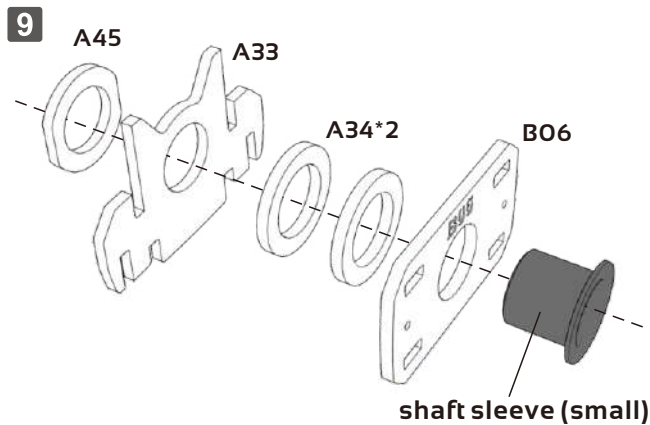
8



B08

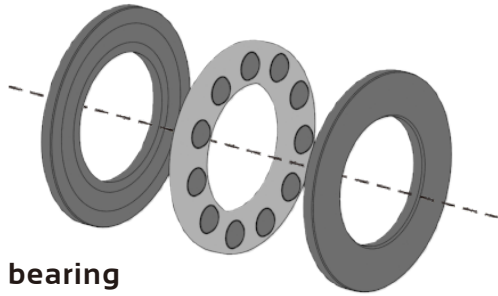
A28

Front arm

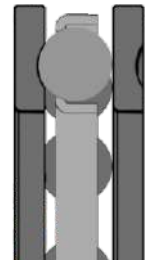
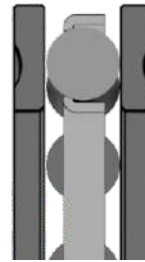
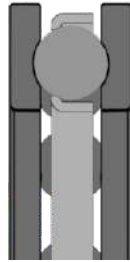


Front arm

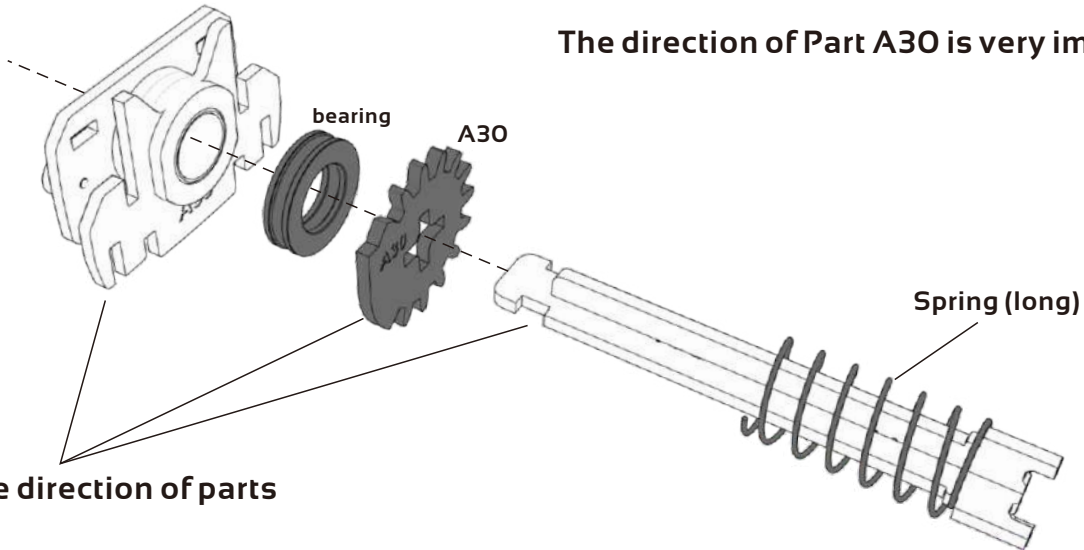
12



bearing



13

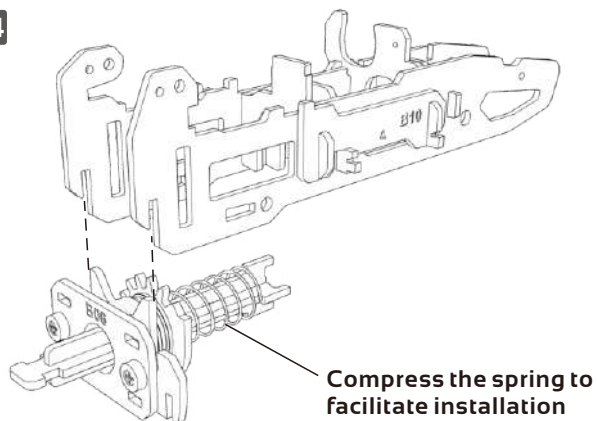


Note direction of parts

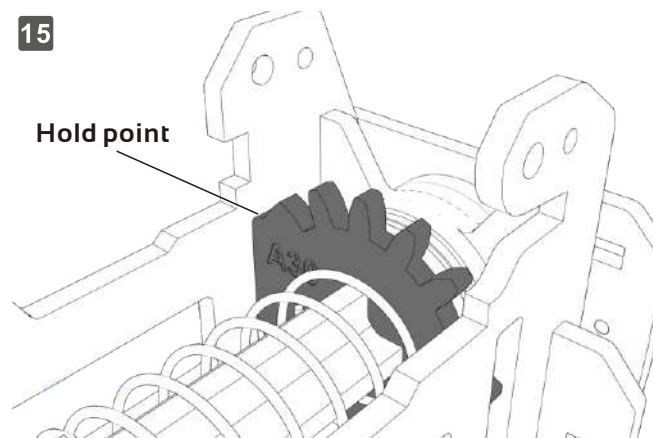
The direction of Part A30 is very important!

Front arm

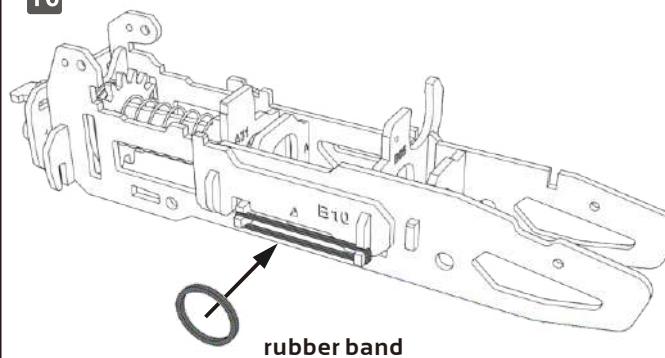
14



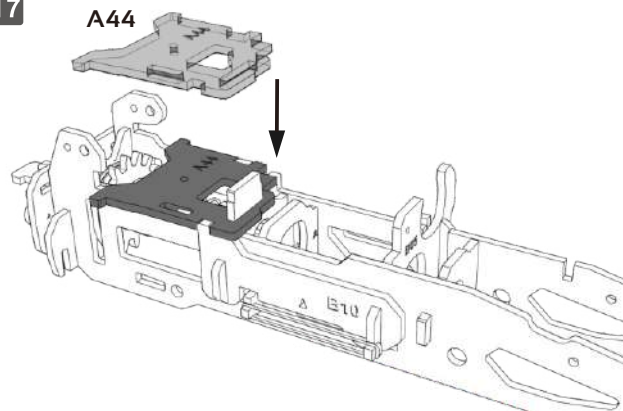
15



16

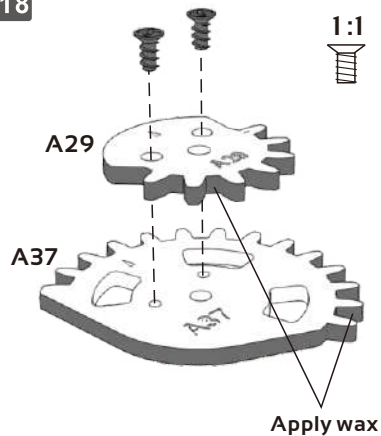


17

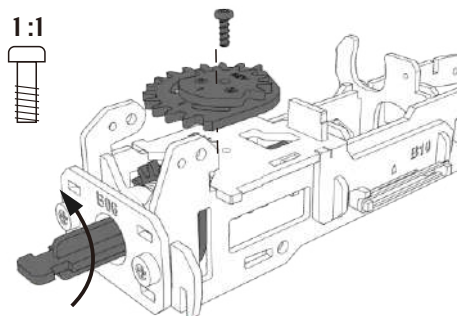


Front arm

18

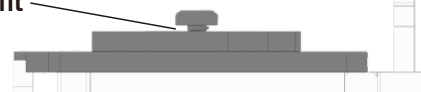


19

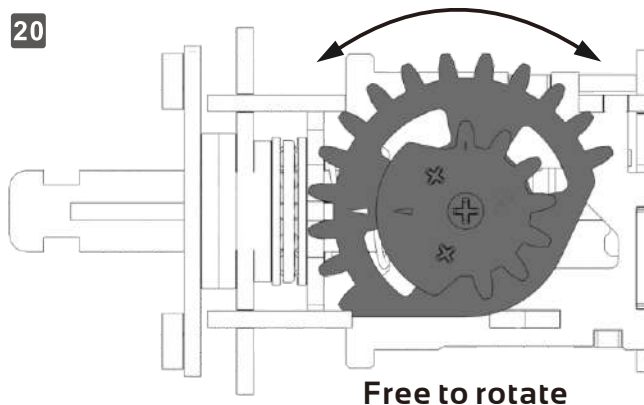


Rotate to the hold point

loose fit

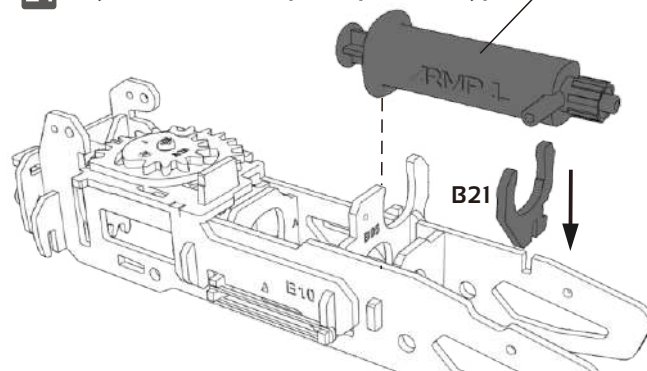


20



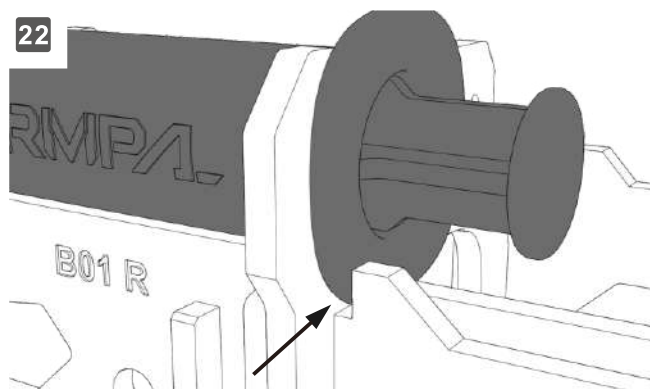
21

Hydraulic module (small) with bypass valve base

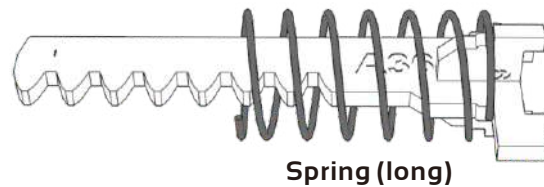
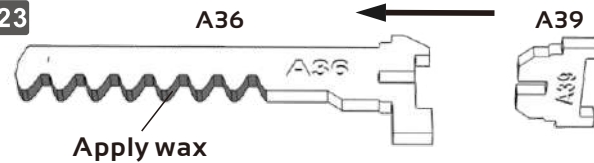


Front arm

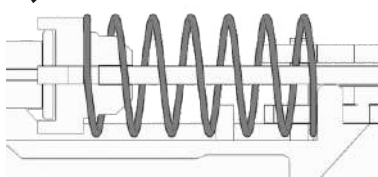
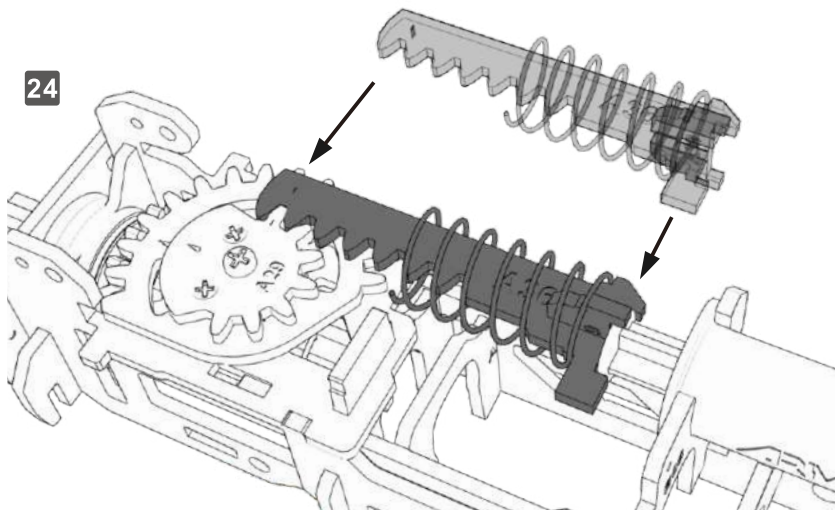
22



23

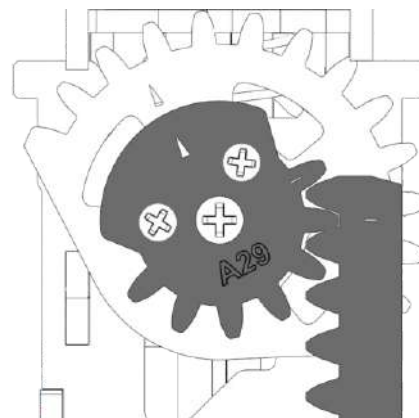
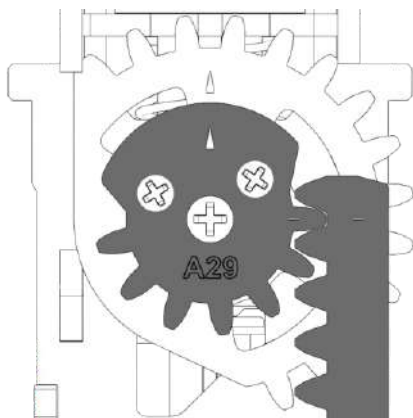


24

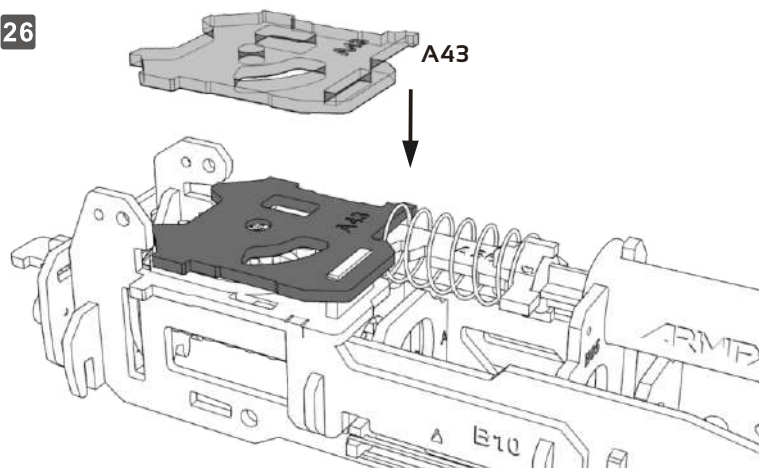


Front arm

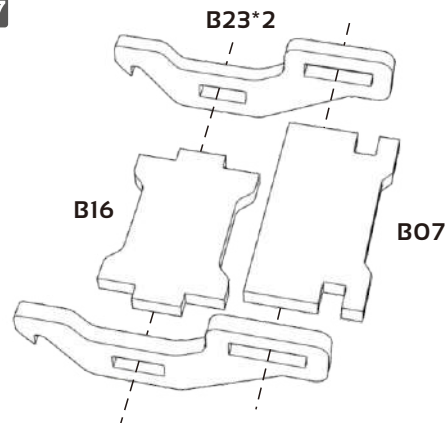
25



26

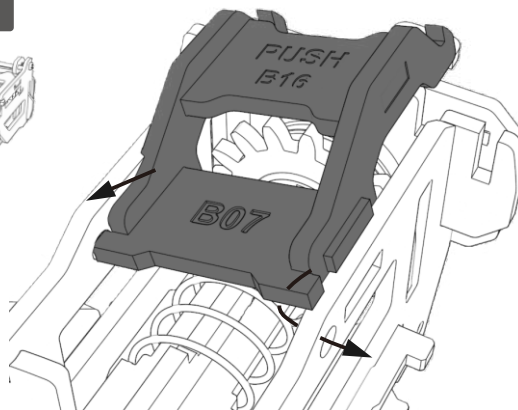
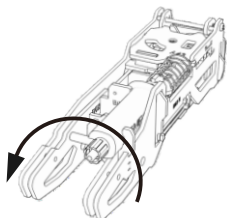


27

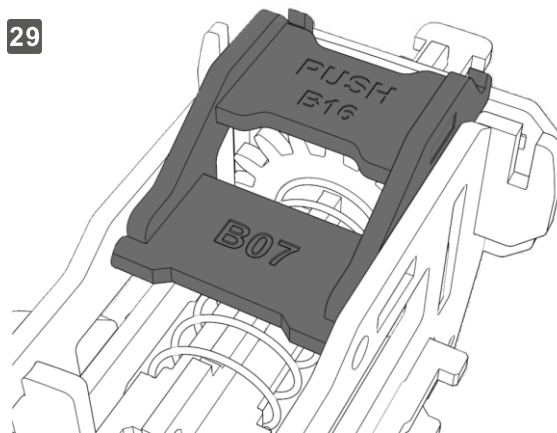


Front arm

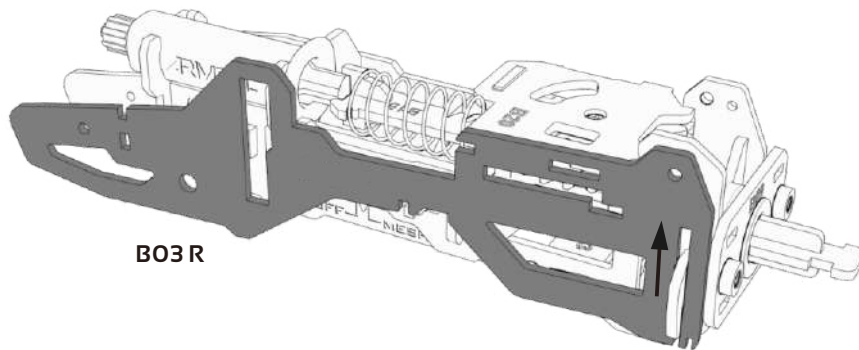
28 Bottom



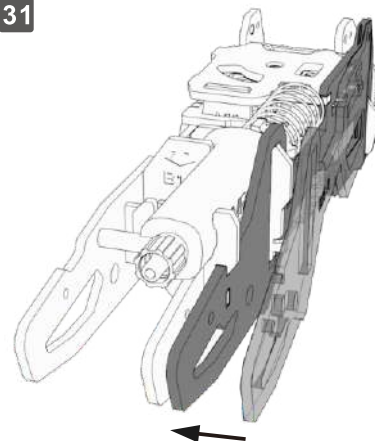
29



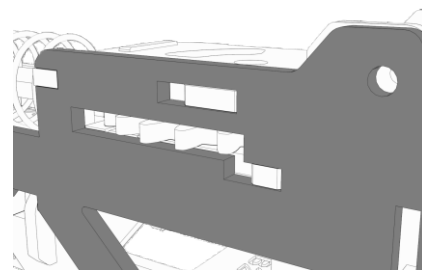
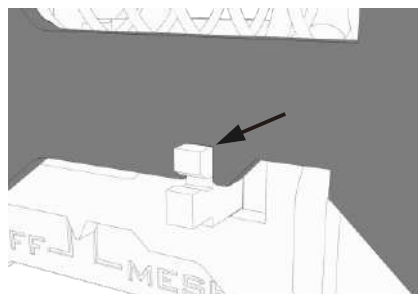
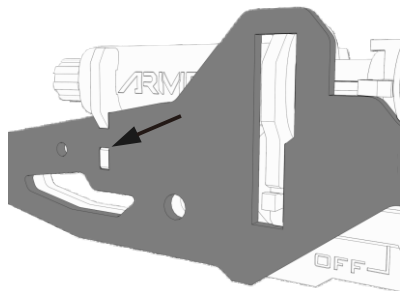
30



31

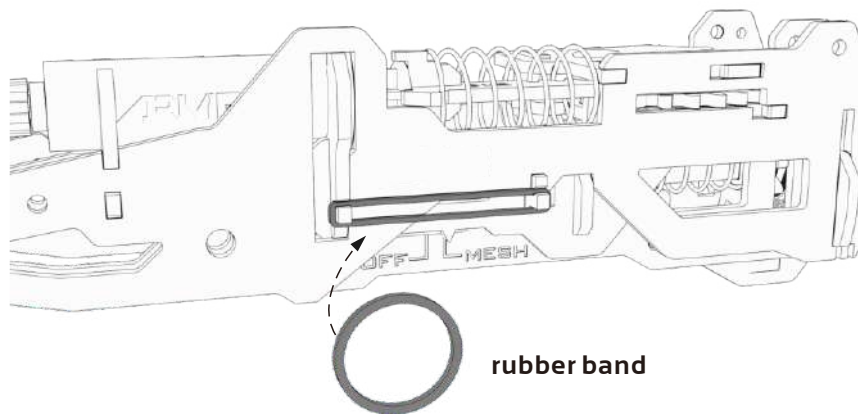


Front arm

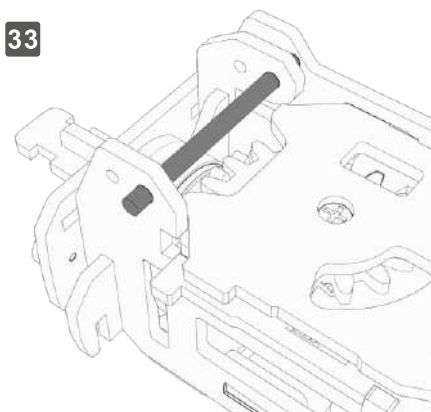


Final position

32



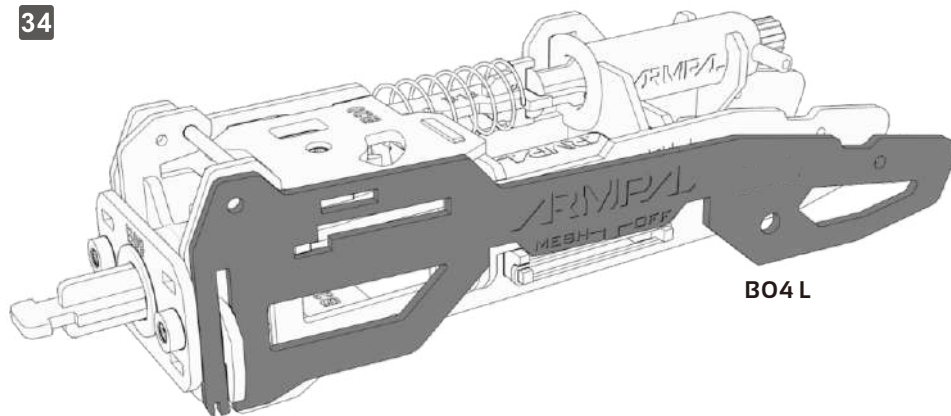
33



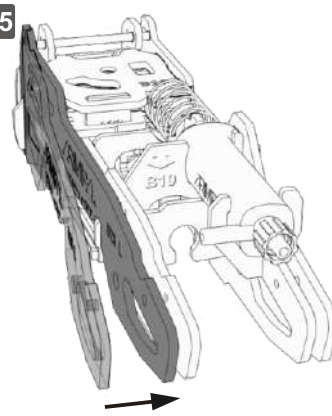
shaft (long) 1:1

Front arm

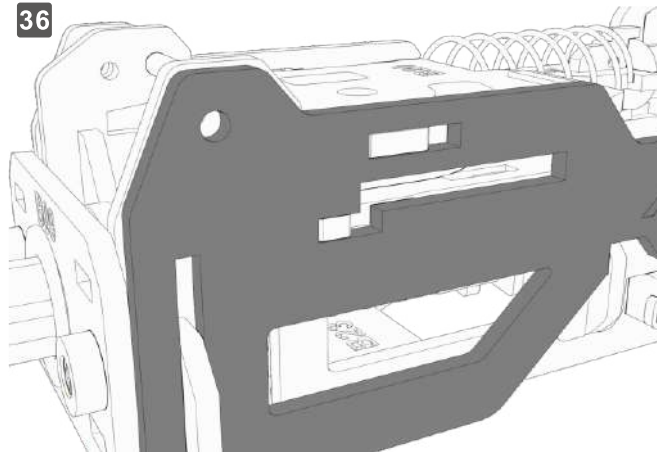
34



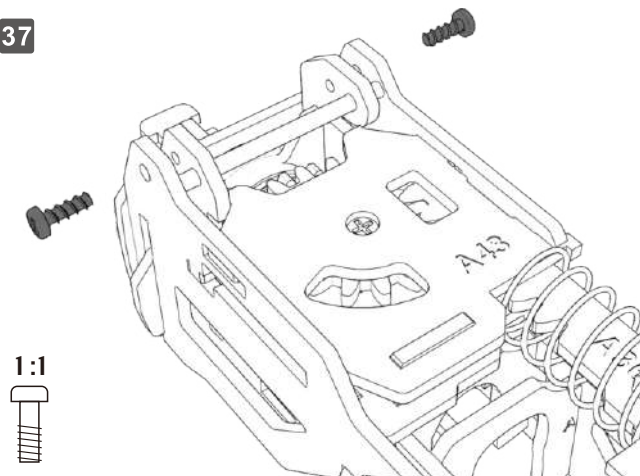
35



36

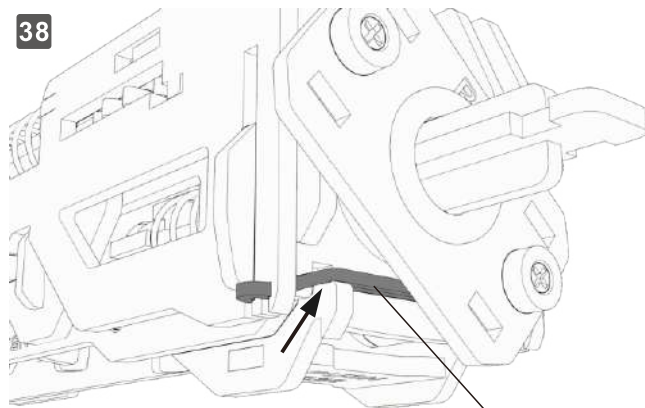


37



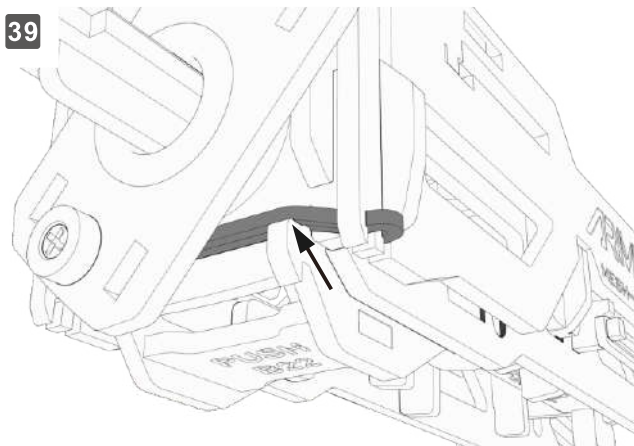
Front arm

38

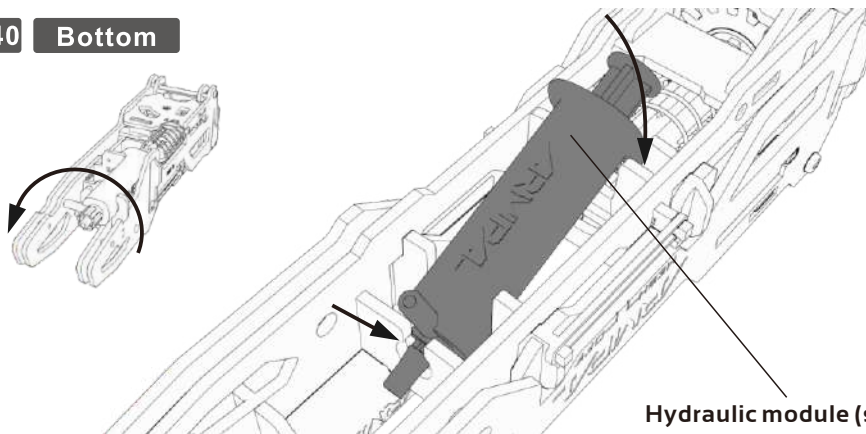


rubber band

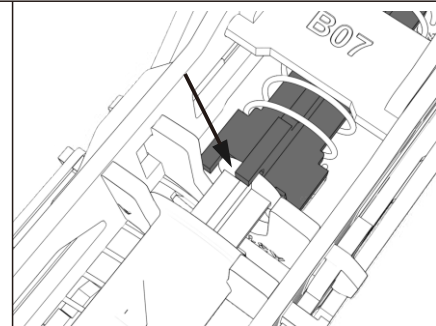
39



40 Bottom

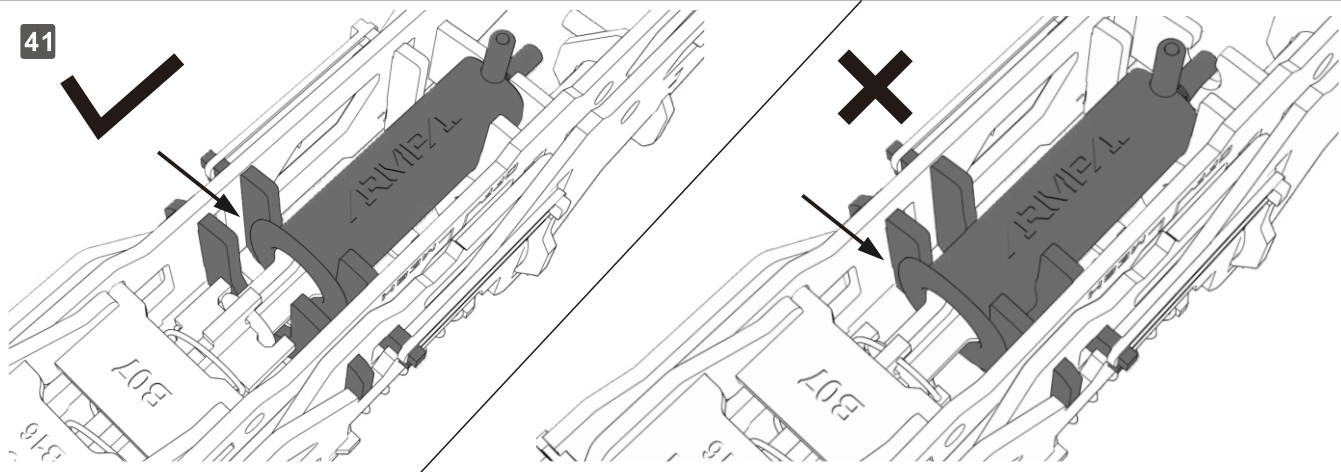


Hydraulic module (small) **without** bypass valve base

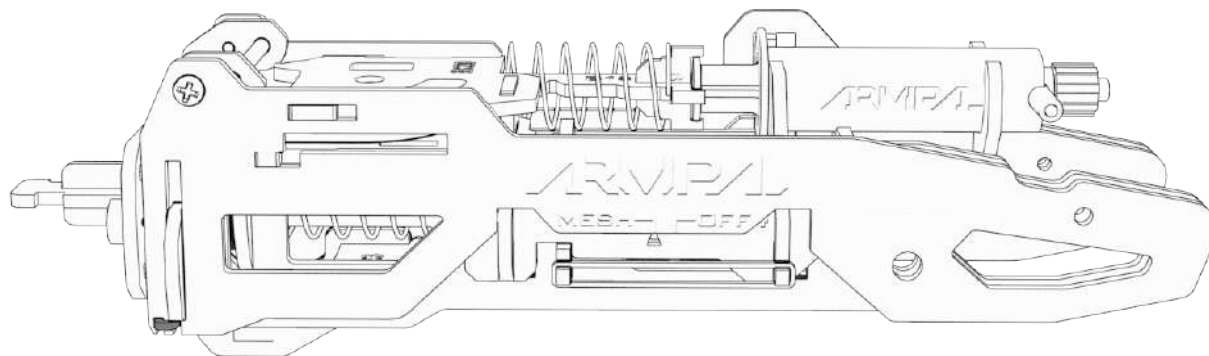


Front arm

41



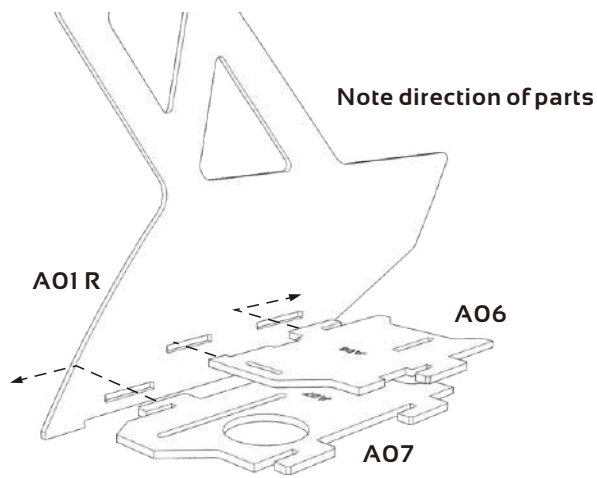
42



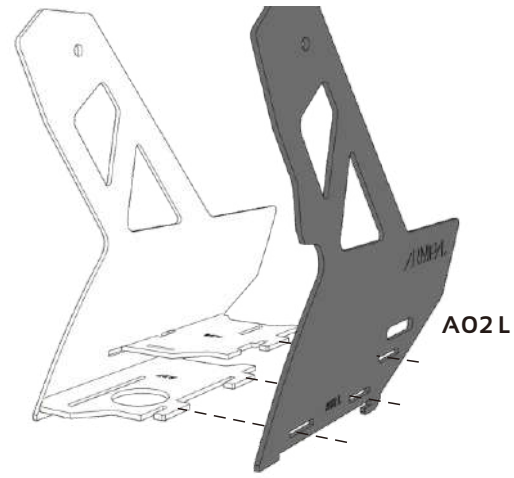
Assembly of Bogie

Bogie

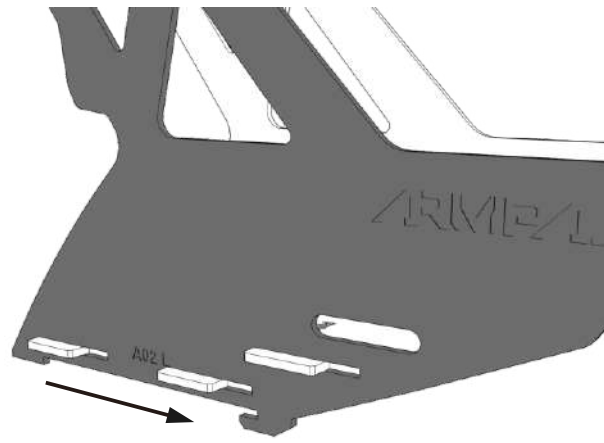
1



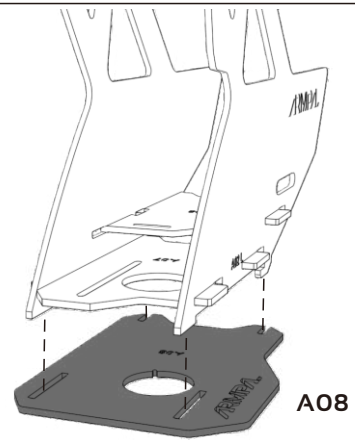
2



3

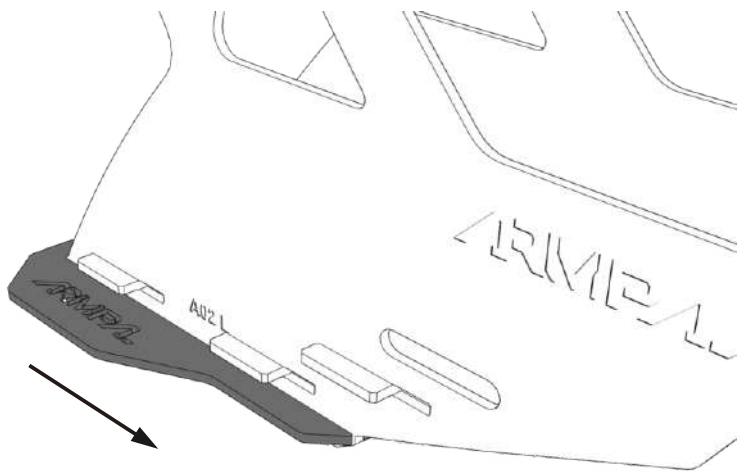


4

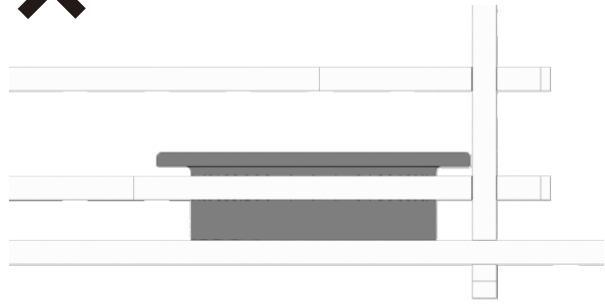
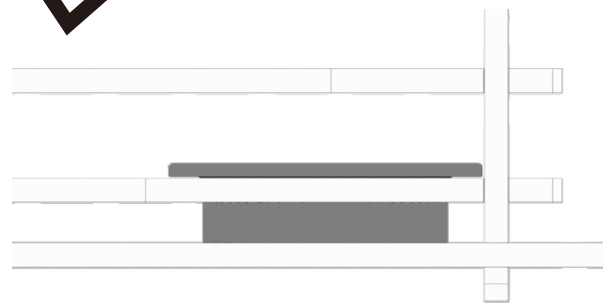
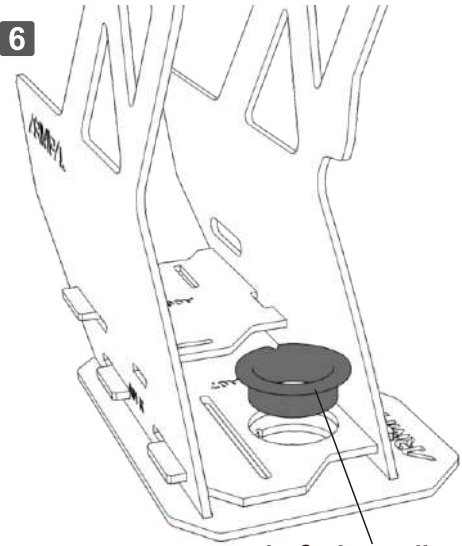


Bogie

5

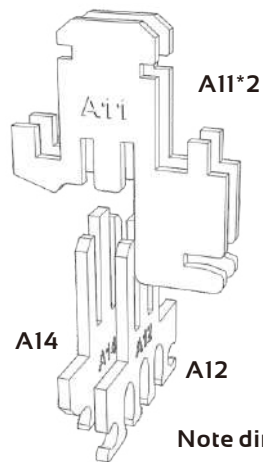


6



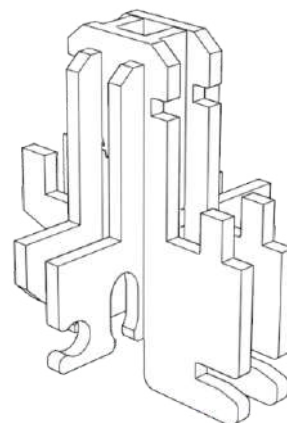
Bogie

7



Parts fragile

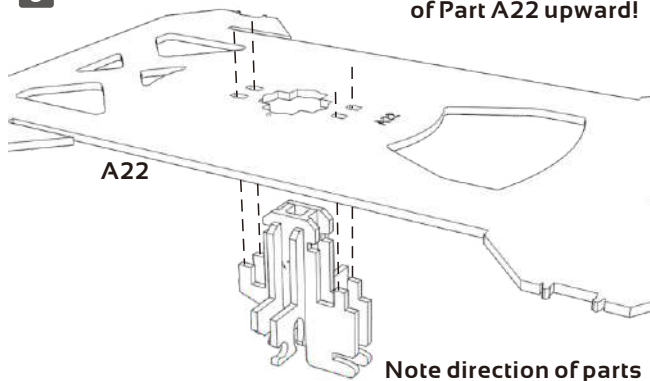
8



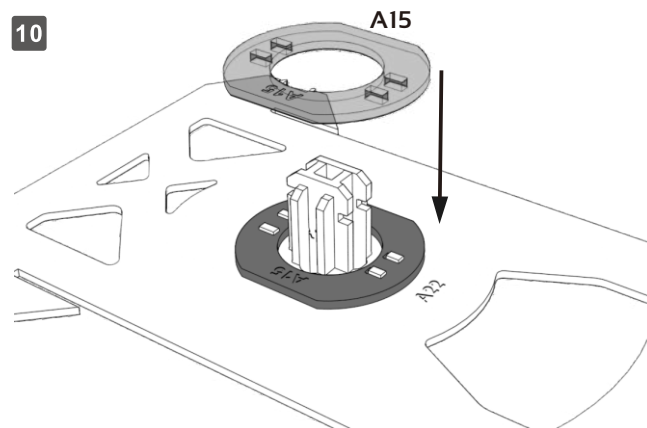
Check the direction of parts

9

Keep the side with characters carved on of Part A22 up!

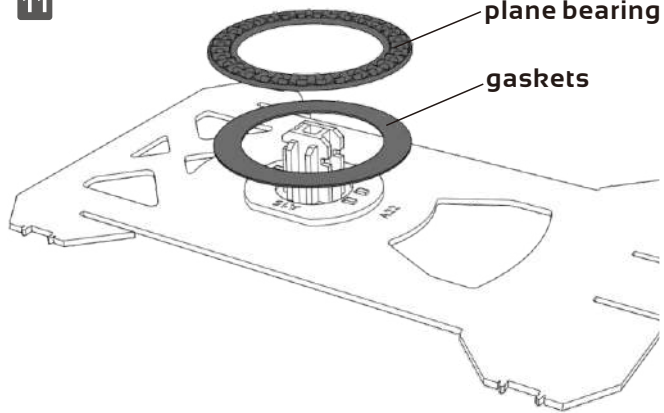


10

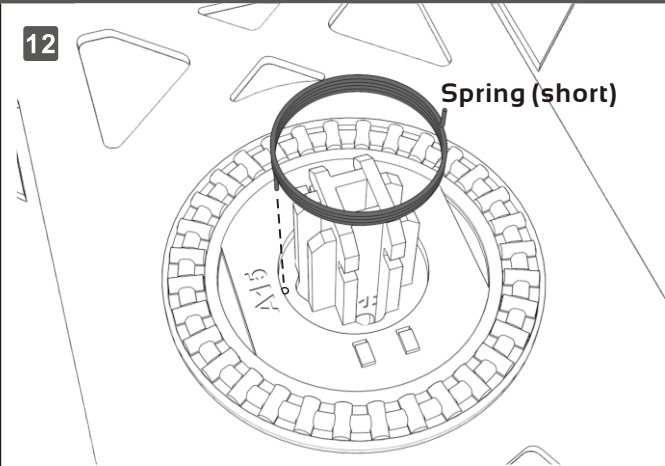


Bogie

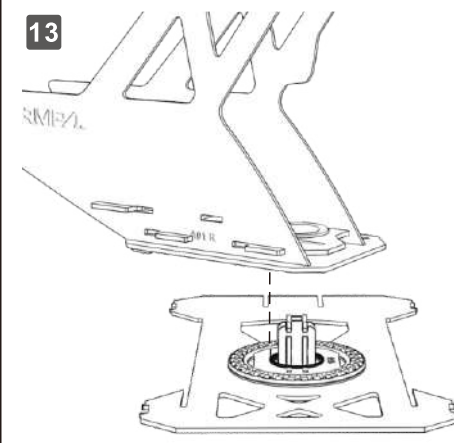
11



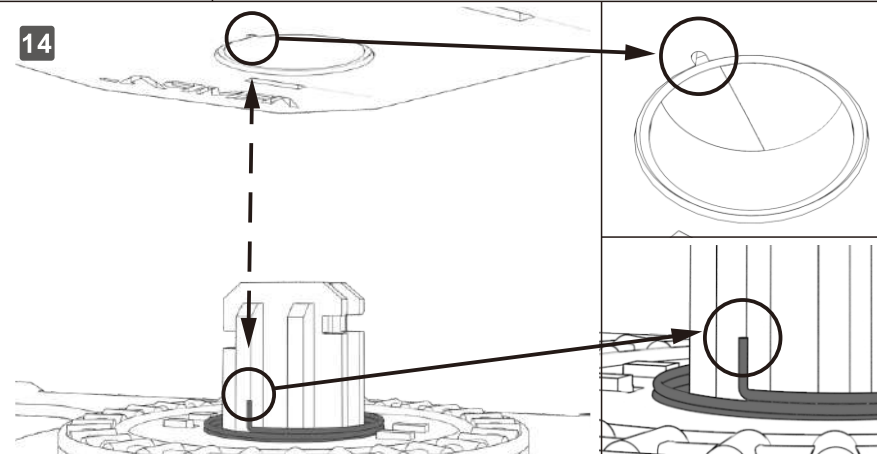
12



13



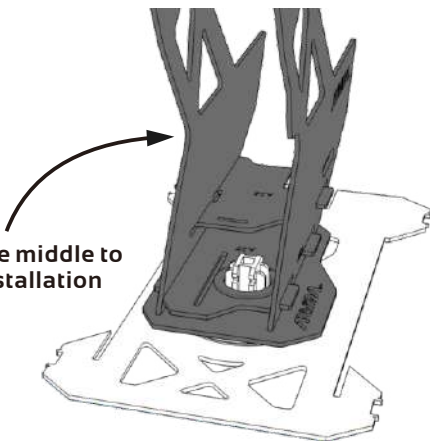
14



Bogie

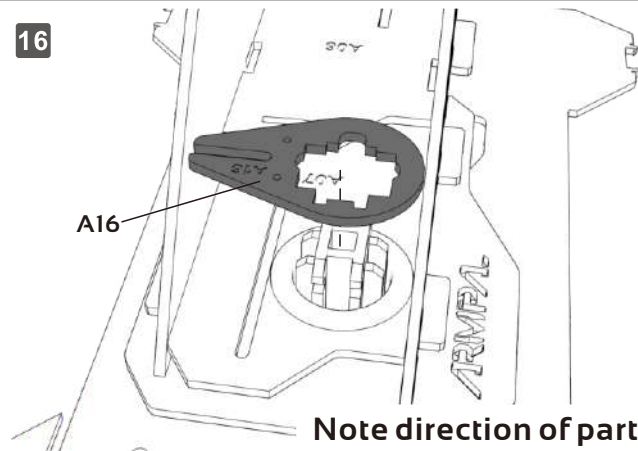
15

Rotate to the middle to facilitate installation



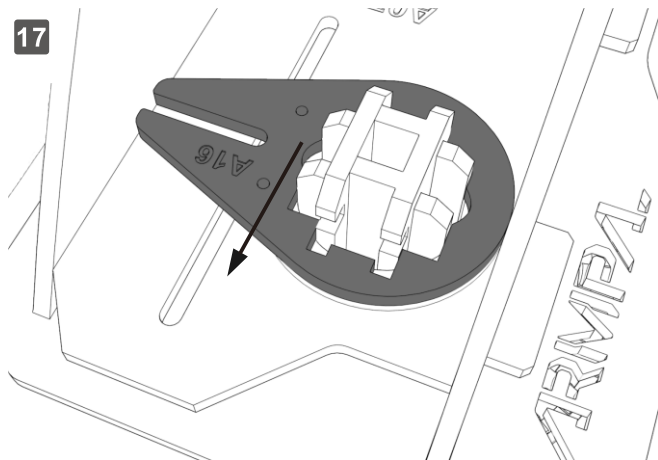
16

A16



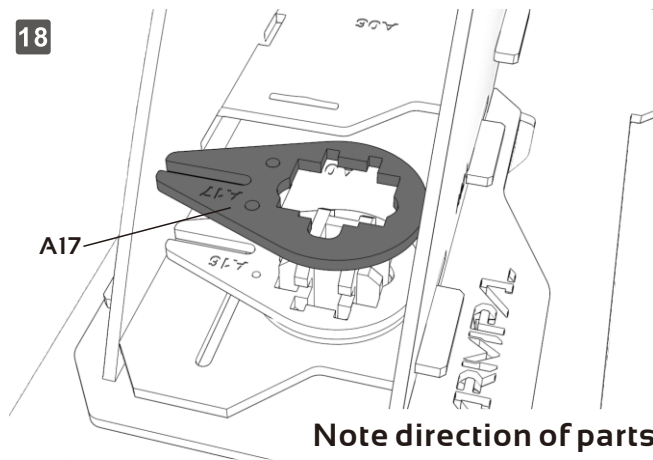
Note direction of parts

17



18

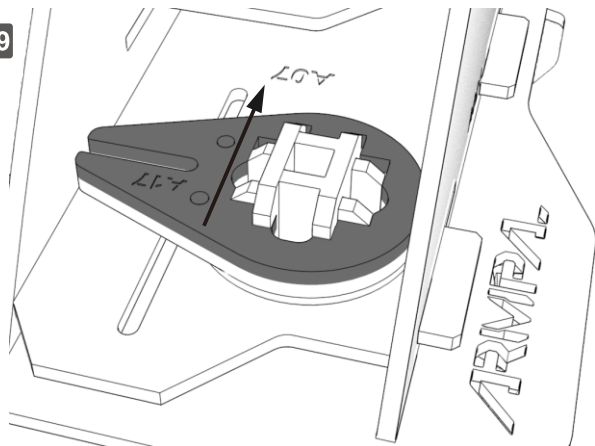
A17



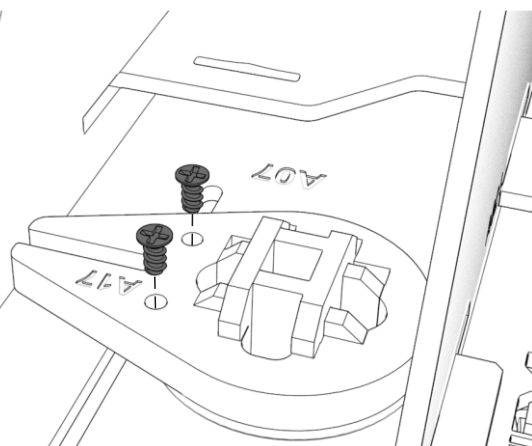
Note direction of parts

Bogie

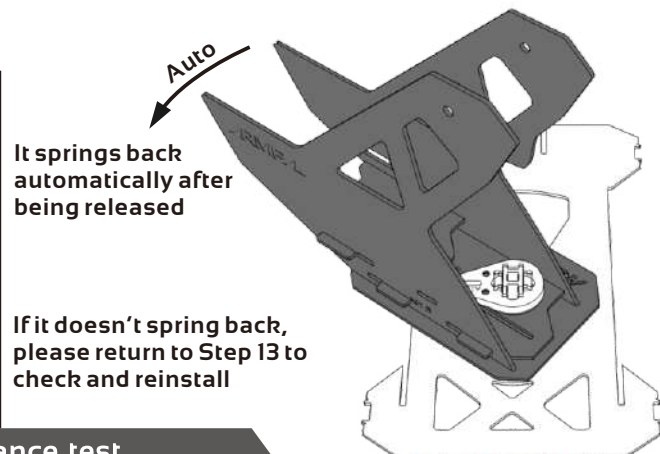
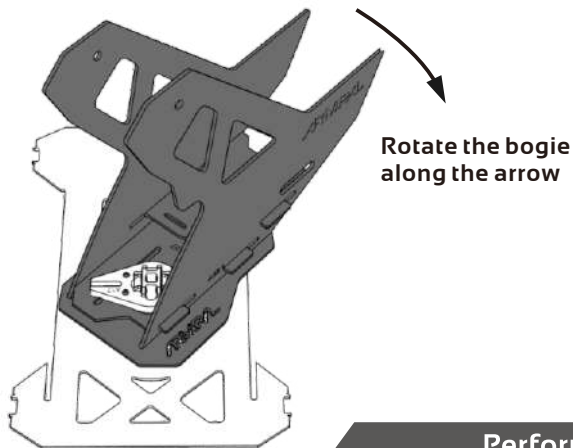
19



20



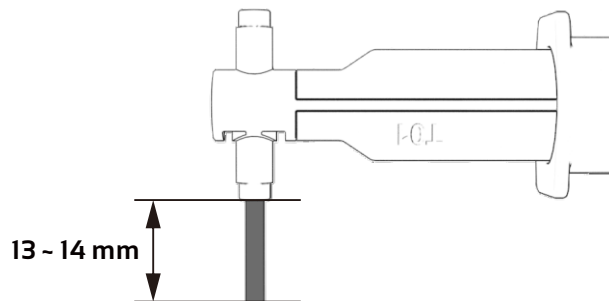
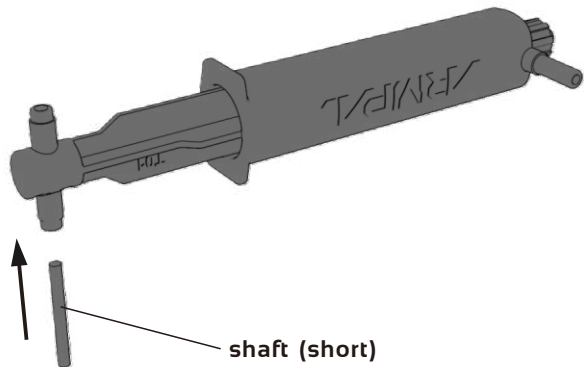
21



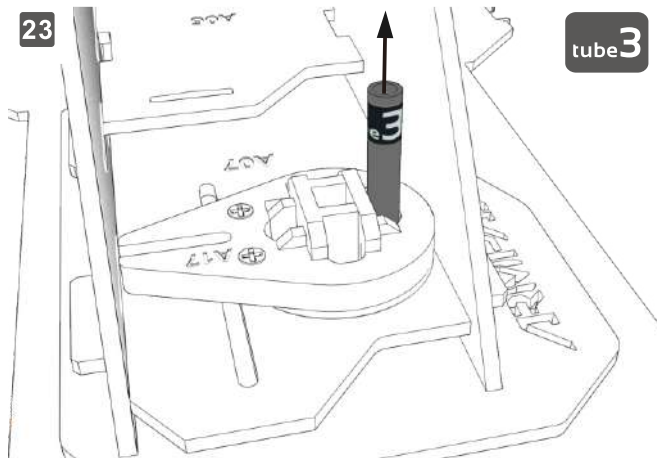
Performance test

Bogie

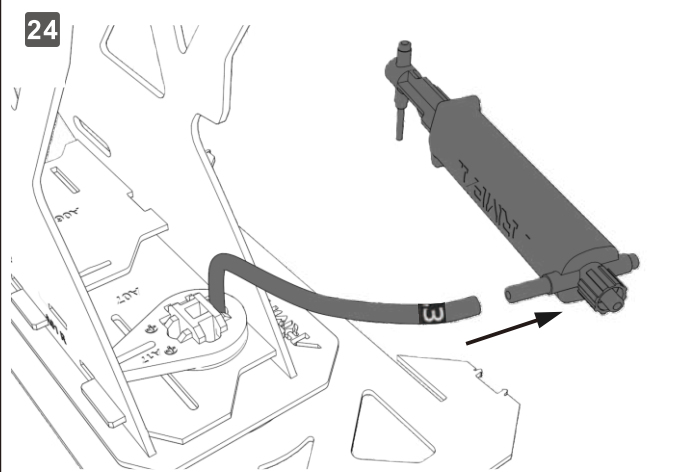
22 Hydraulic module (large) with bypass valve base



23

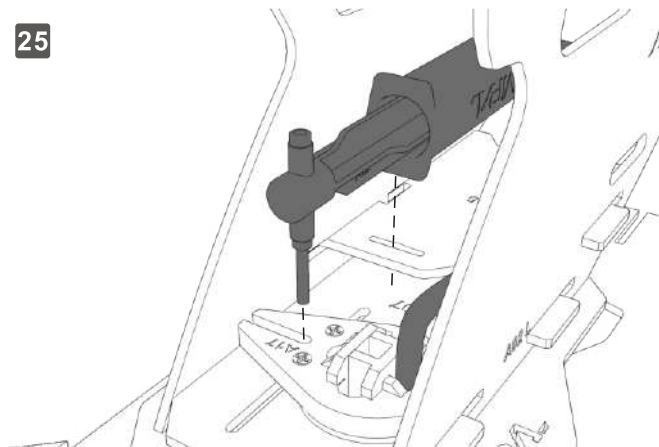


24

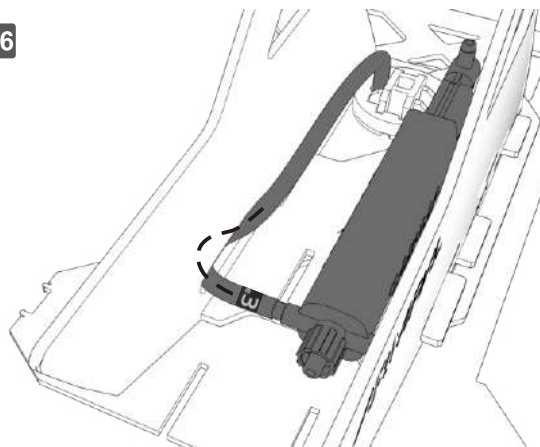


Bogie

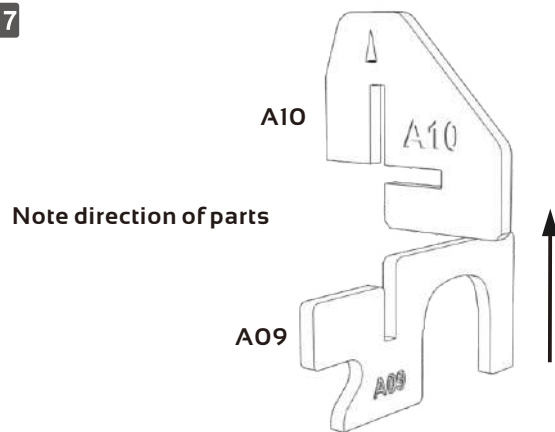
25



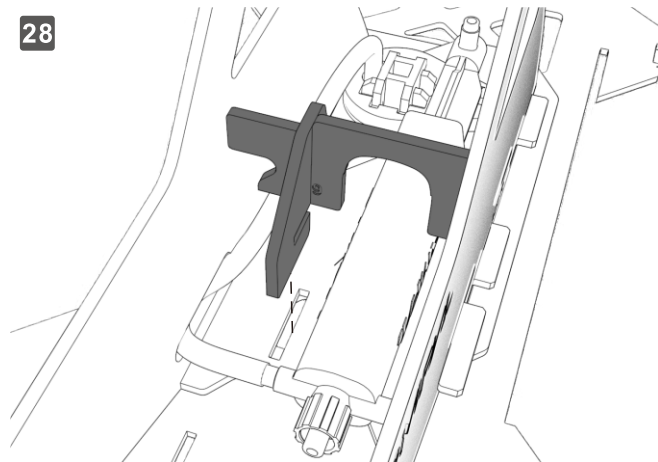
26



27

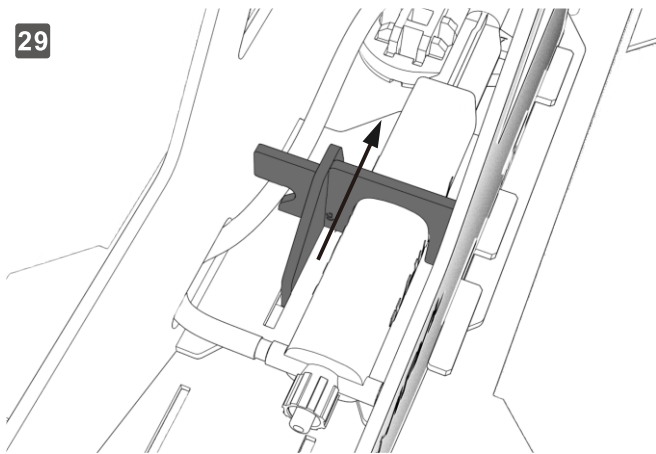


28



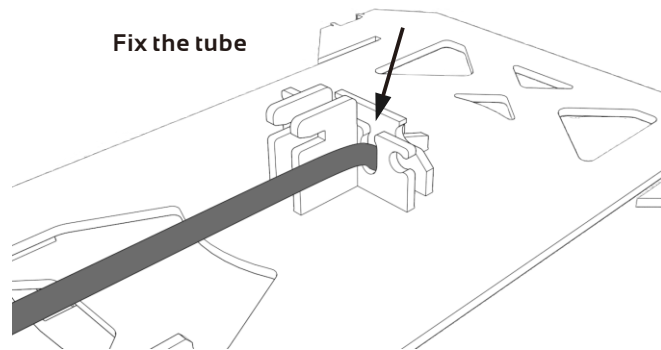
Bogie

29

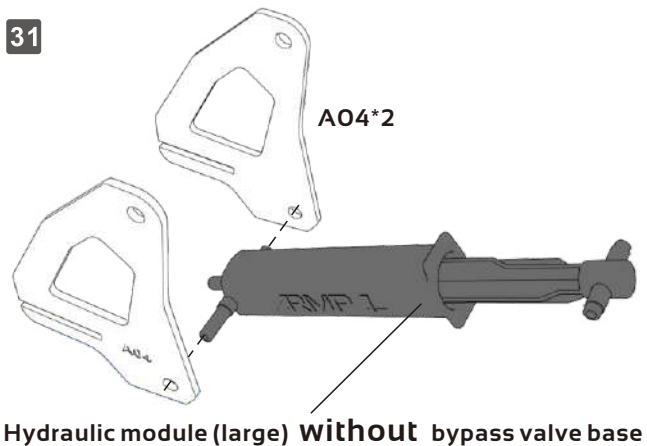


30

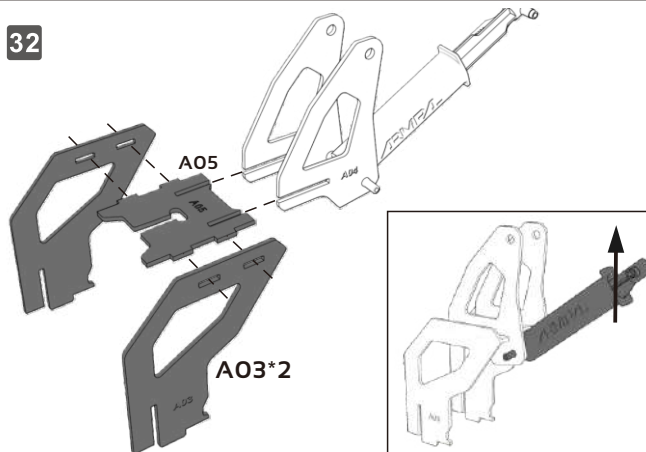
Bottom



31

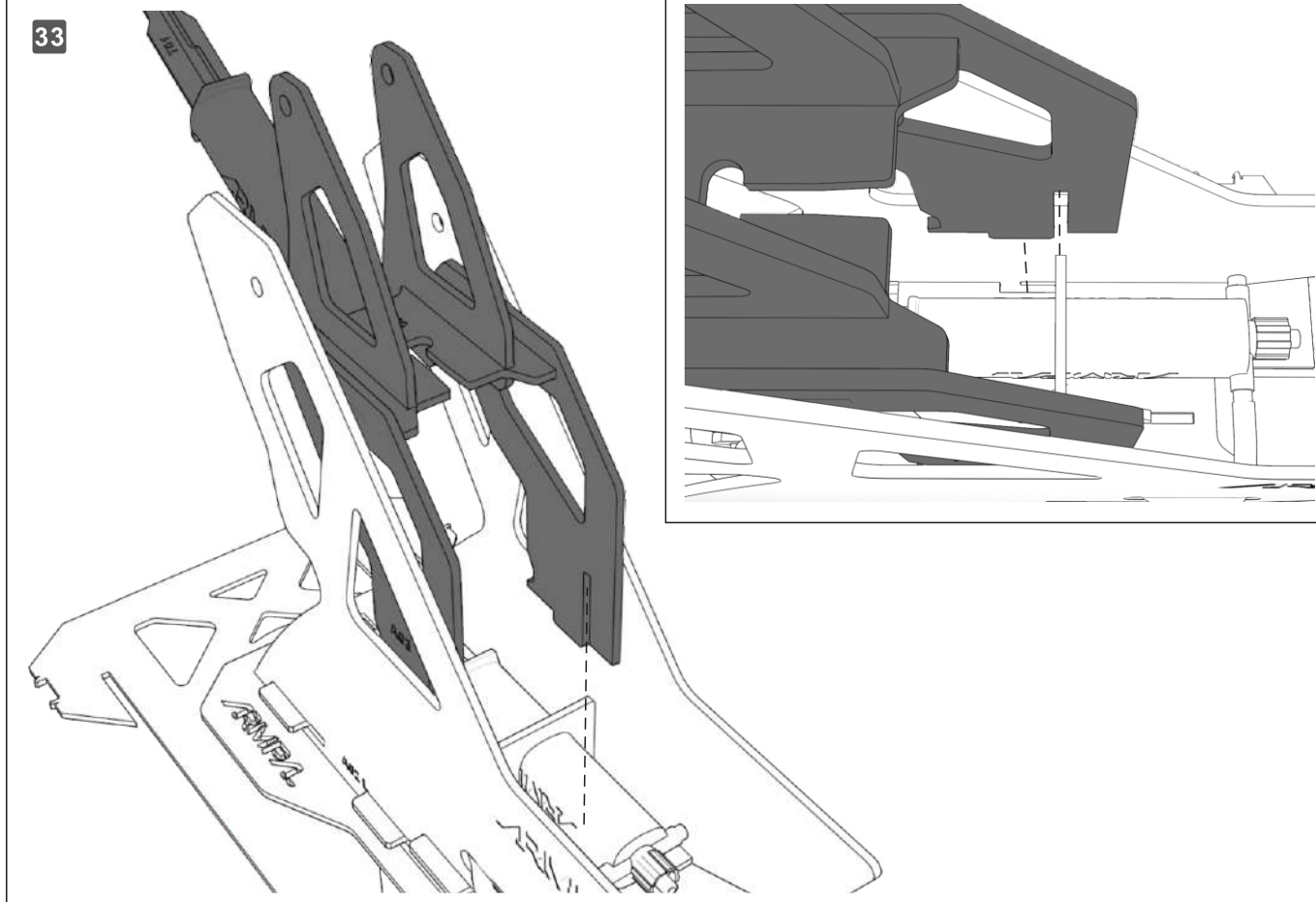


32



Bogie

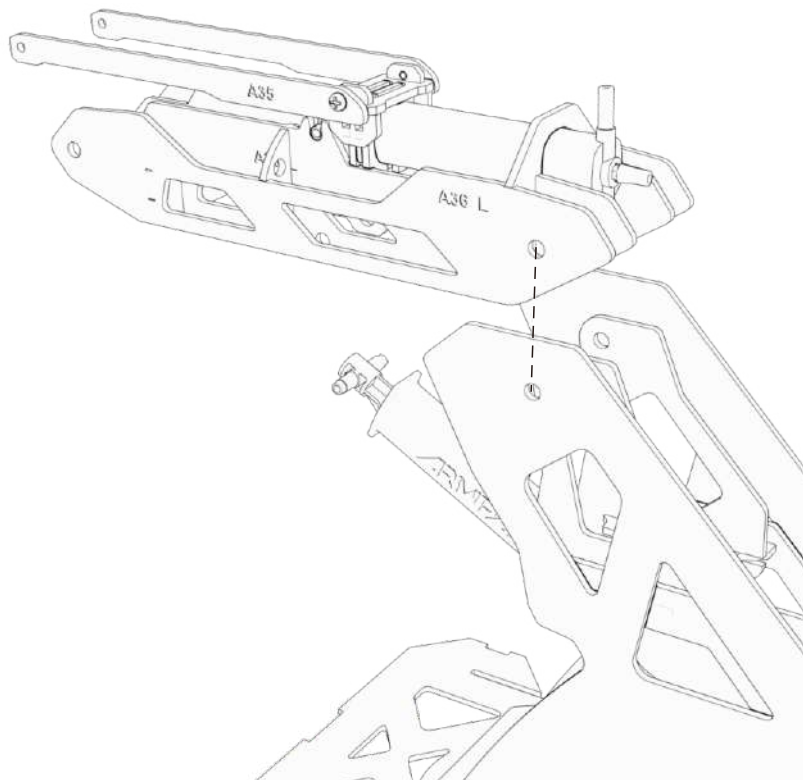
33



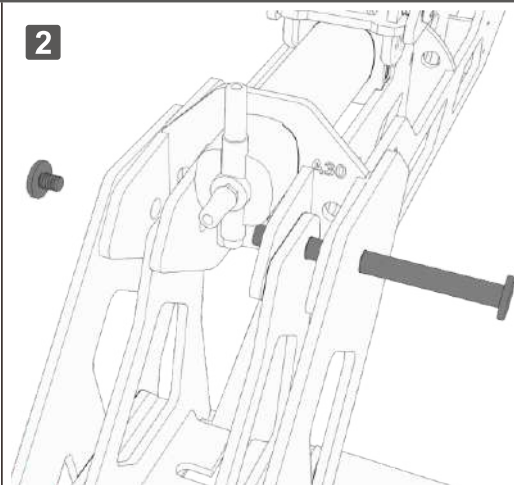
Assembly of Main frame and Handle

frame and Handle

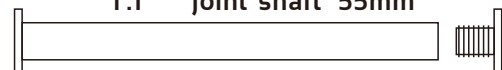
1



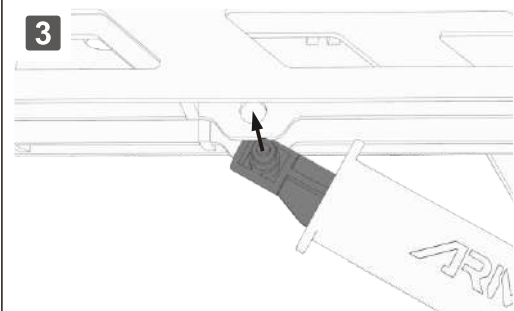
2



1:1 joint shaft 55mm

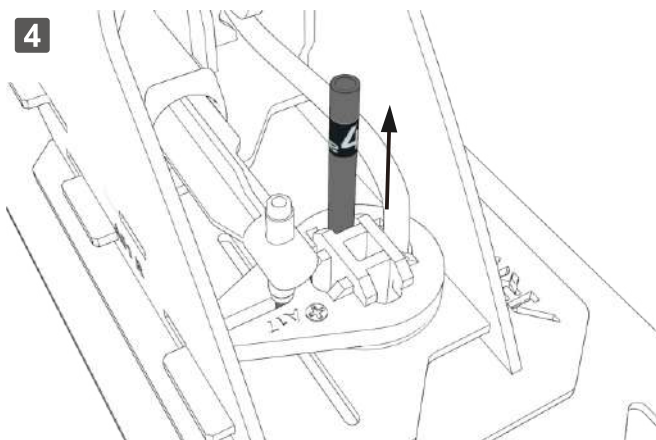


3

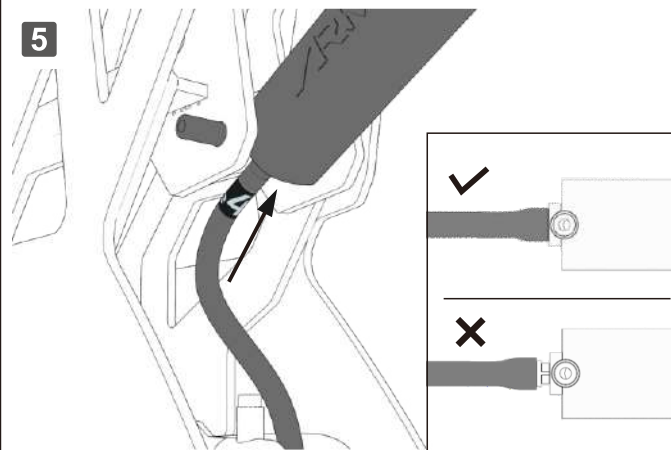


frame and Handle

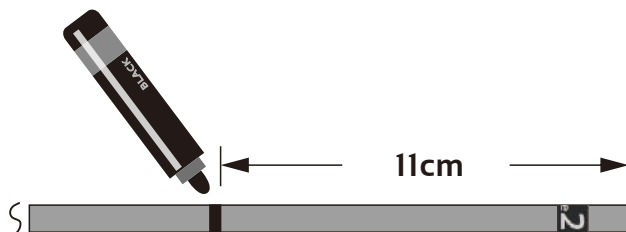
4



5

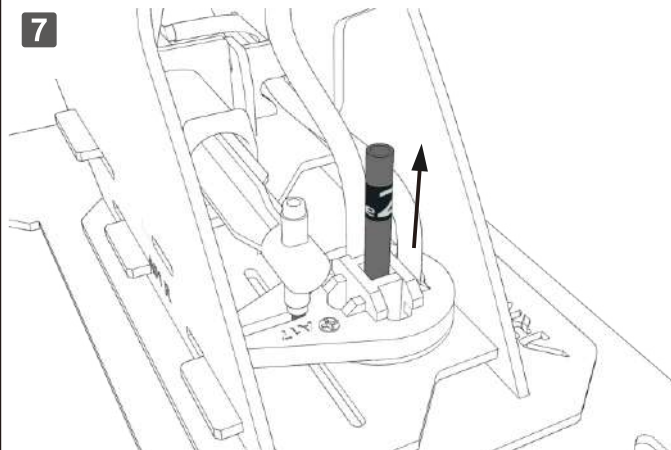


6



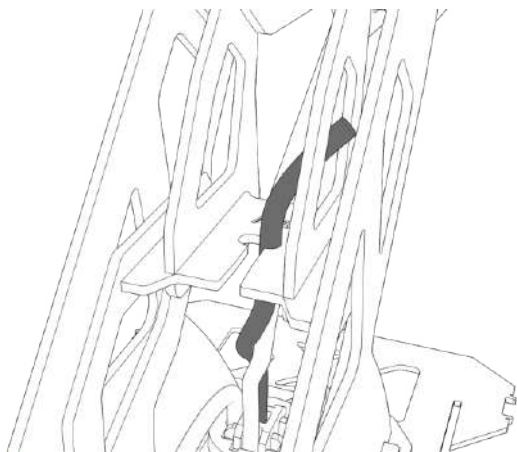
Mark a length of 11cm

7

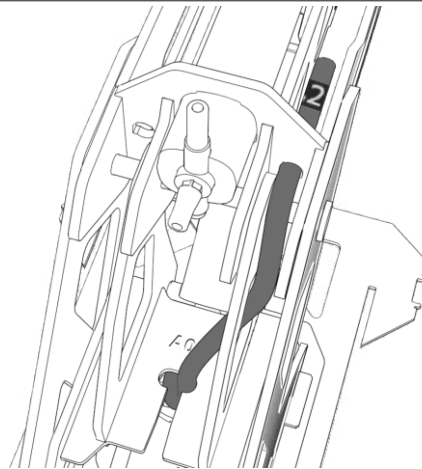


frame and Handle

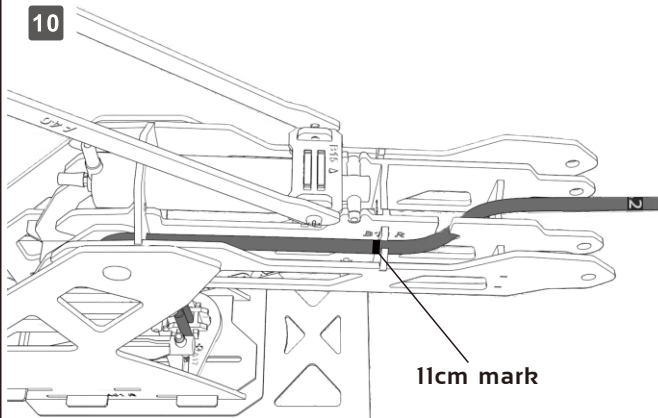
8



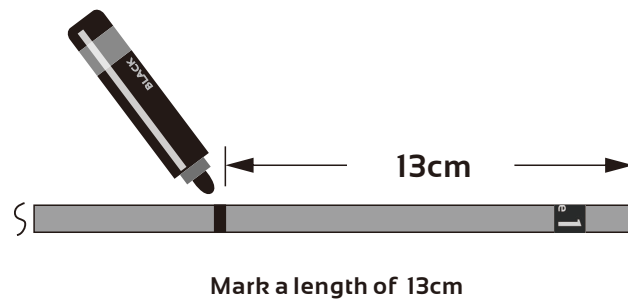
9



10

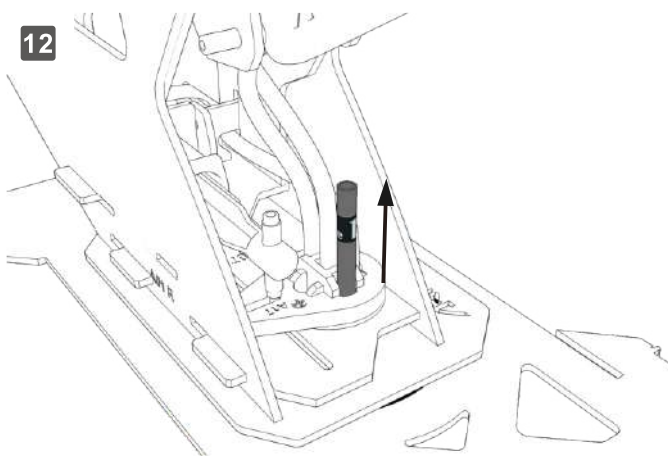


11

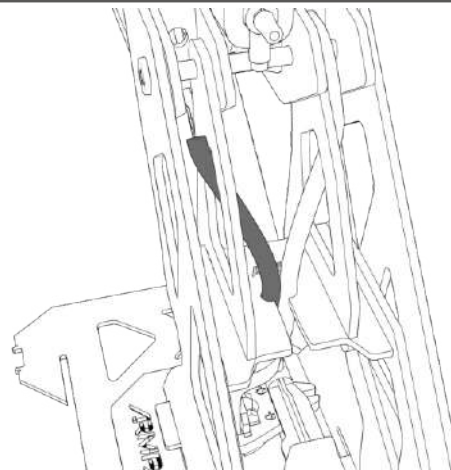


frame and Handle

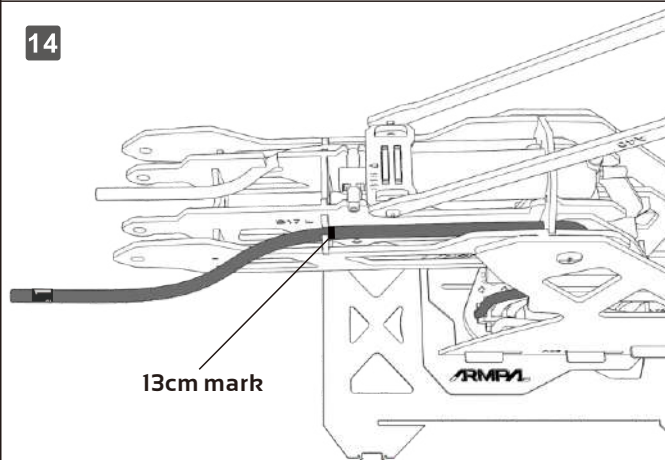
12



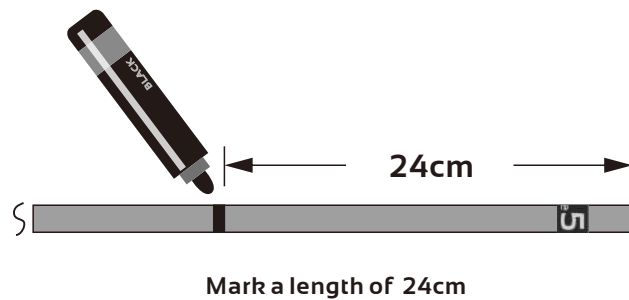
13



14

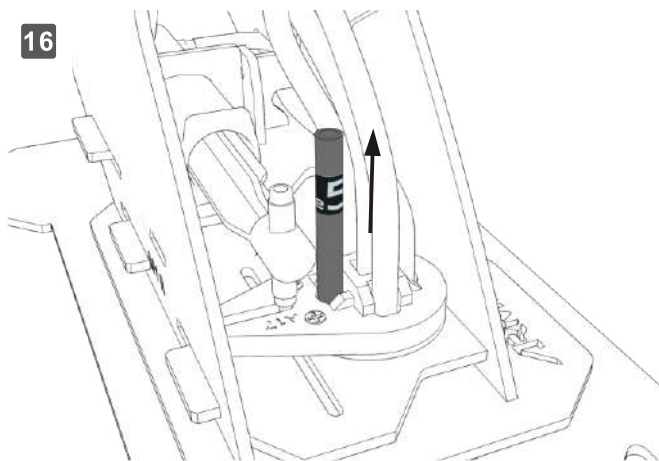


15

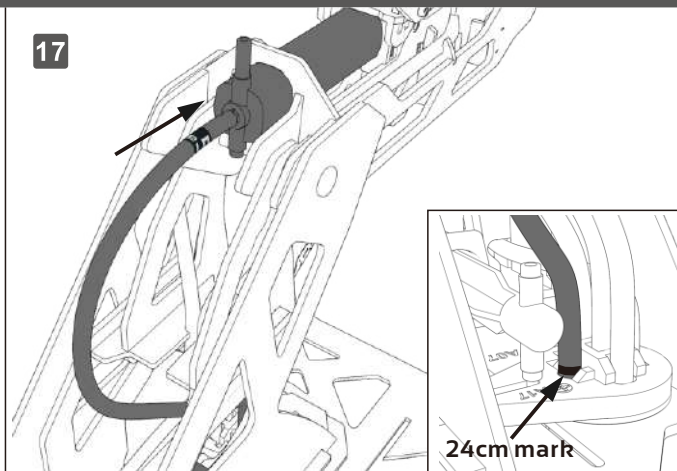


frame and Handle

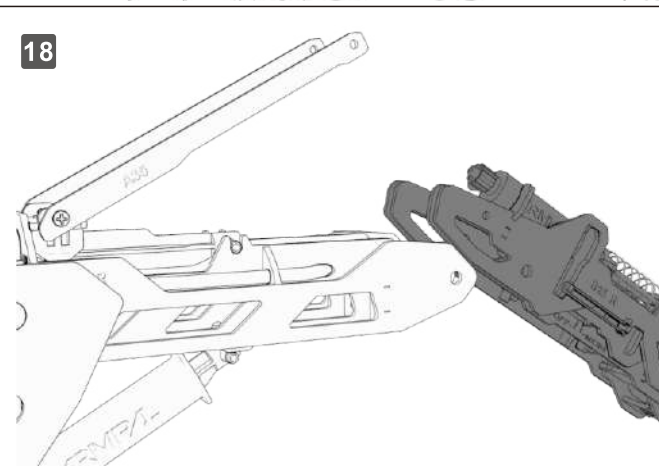
16



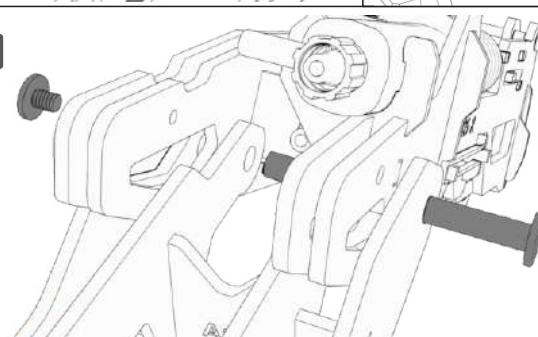
17



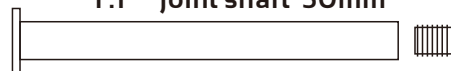
18



19

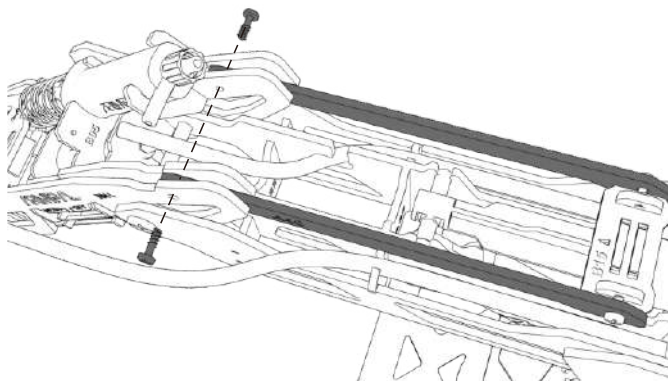


1:1 joint shaft 50mm

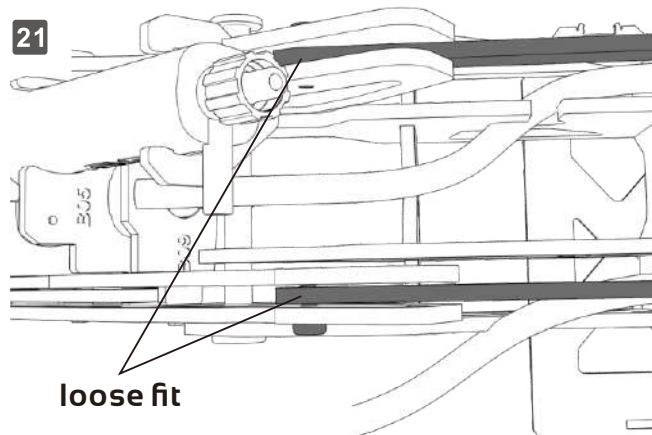


frame and Handle

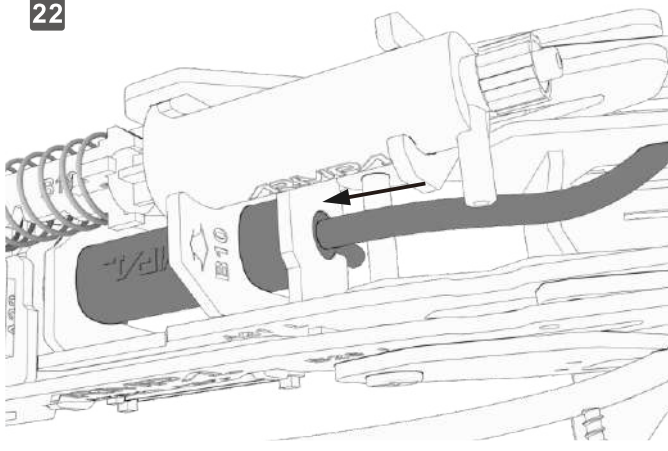
20



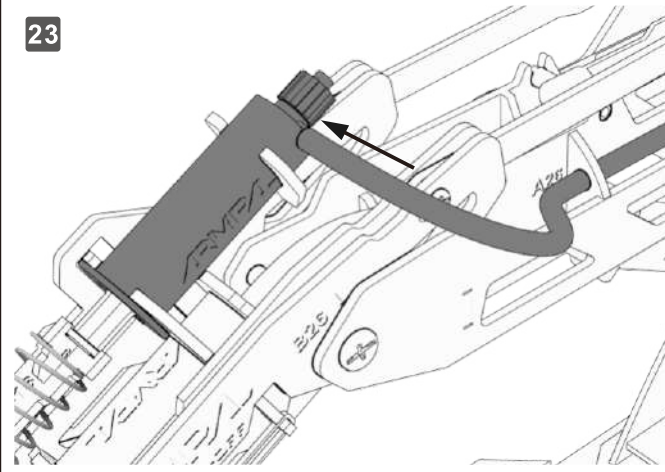
21



22

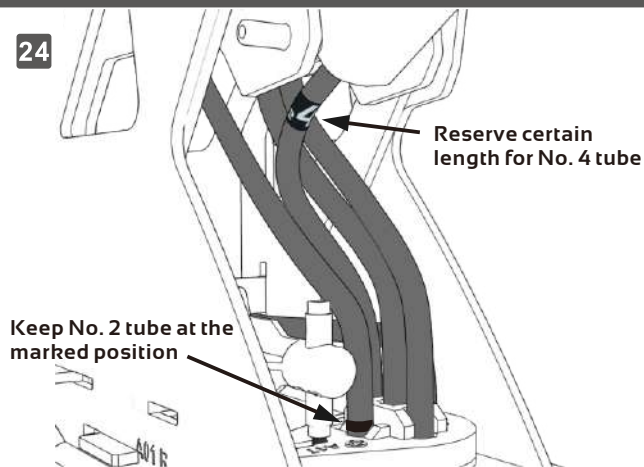


23

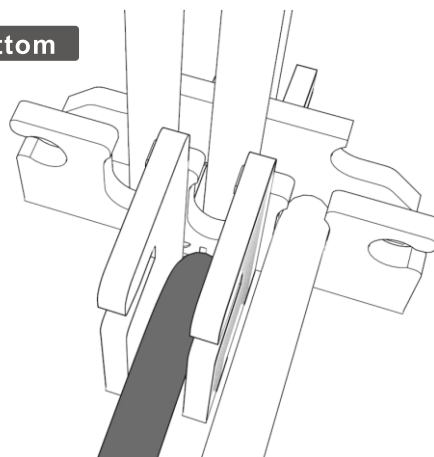


frame and Handle

24

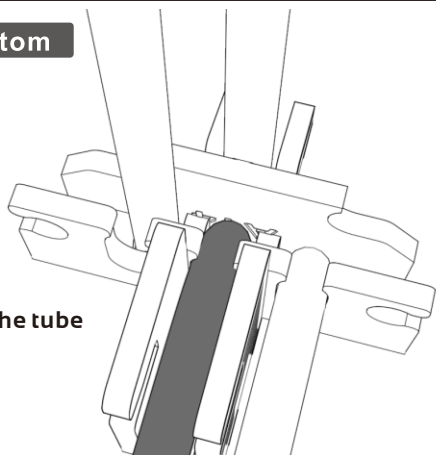


25 Bottom



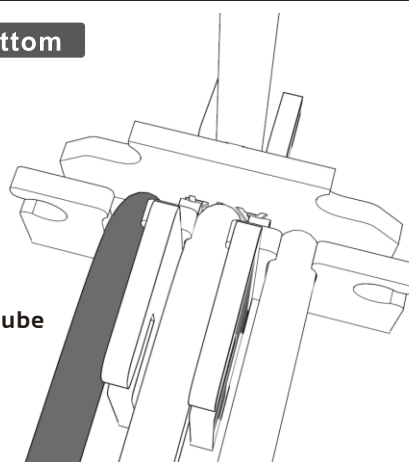
26 Bottom

Fix the tube



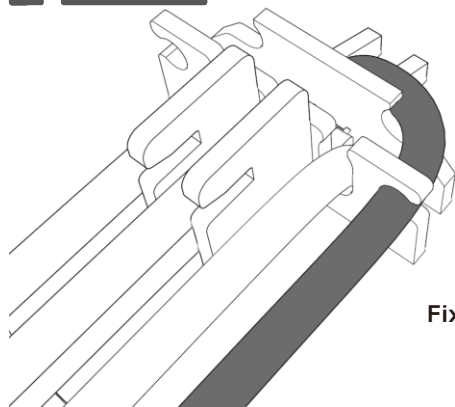
27 Bottom

Fix the tube

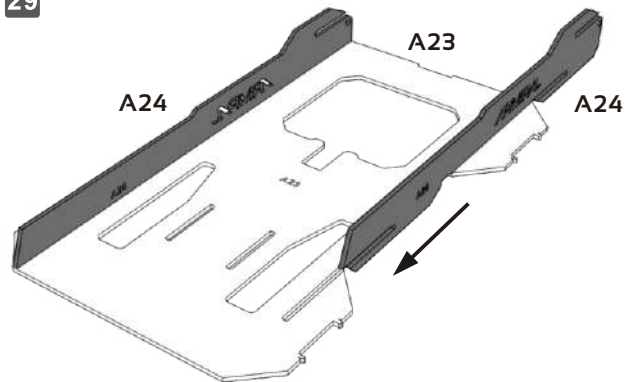


frame and Handle

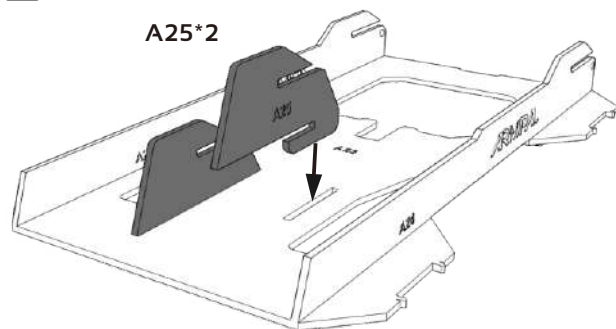
28 Bottom



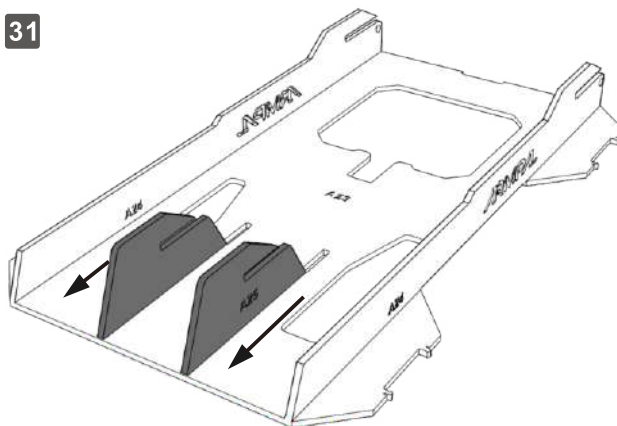
29



30

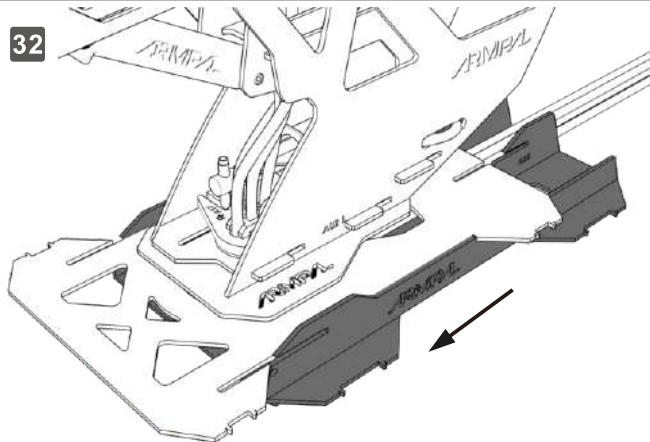


31

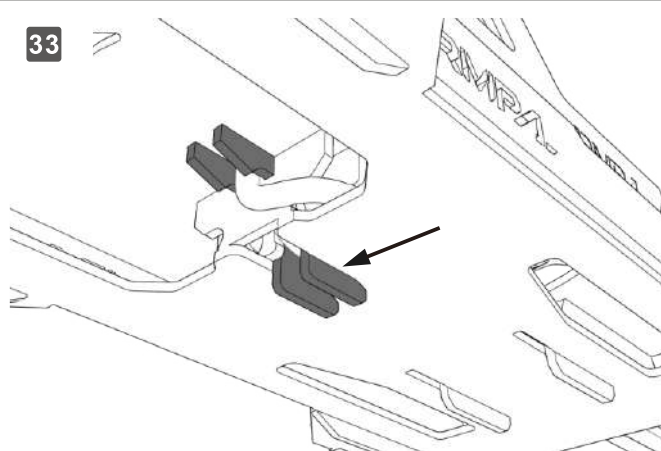


frame and Handle

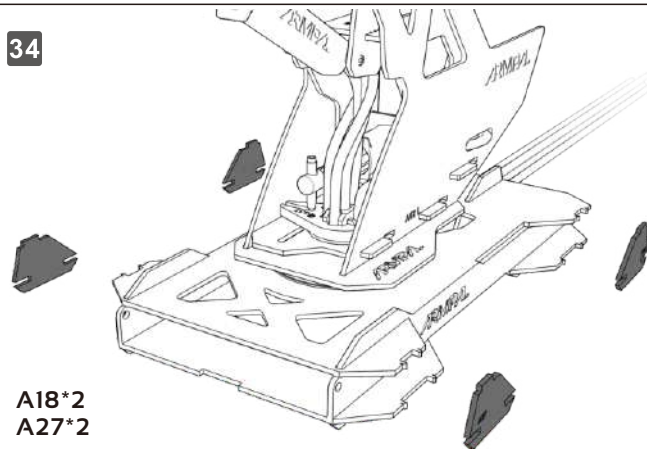
32



33

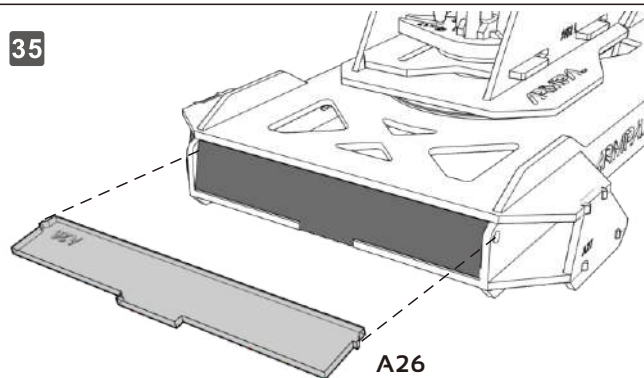


34



A18*2
A27*2

35



A26

The personalized version uses V23 parts

Liquid Filling

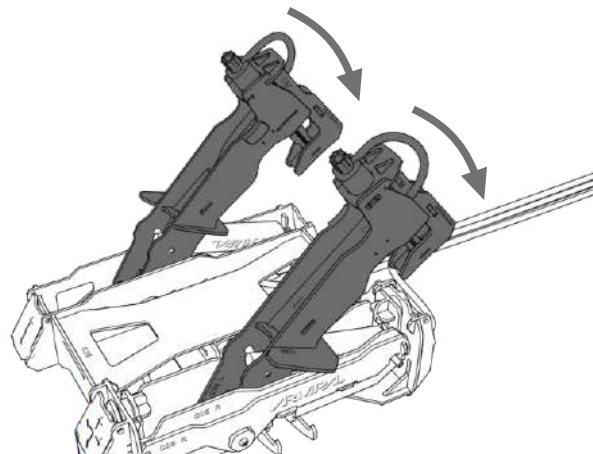
Liquid Filling

Pistons of all hydraulic cylinders shall be maintained at the lowest position when liquid filling is in progress.

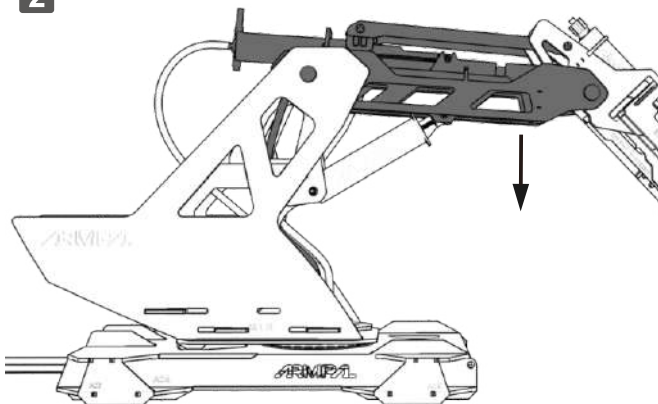
Improper operation will lead to leakage! Please operate in strict accordance with the procedure.

To dismantle the bypass valve, please press the hydraulic cylinder with your hand, instead of directly stressing the wooden parts.

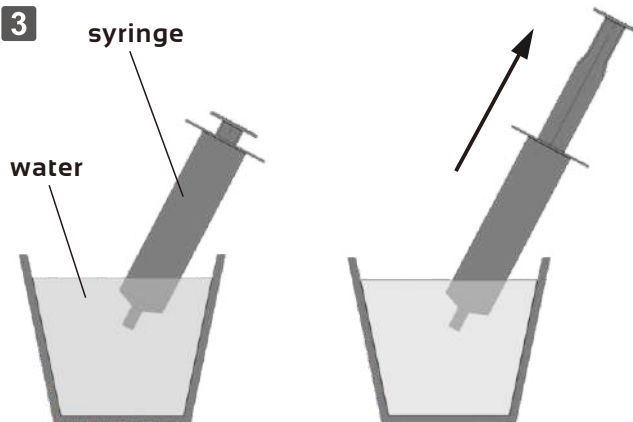
1



2

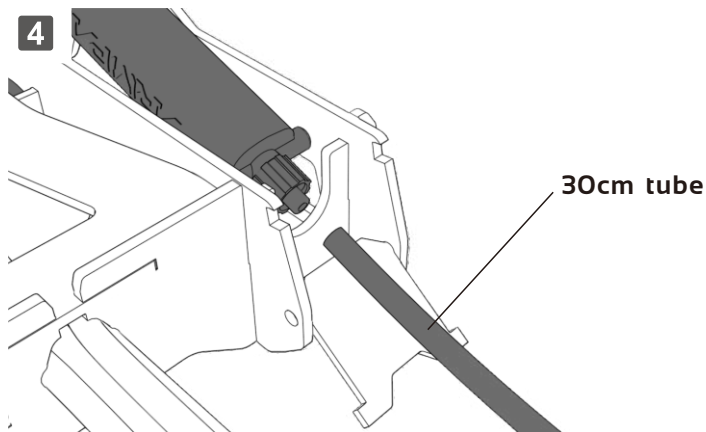


3

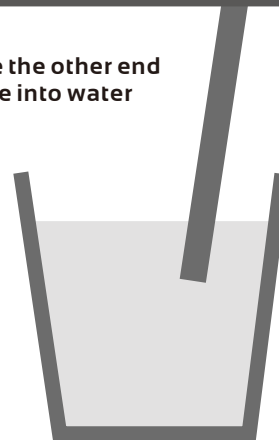


Liquid Filling

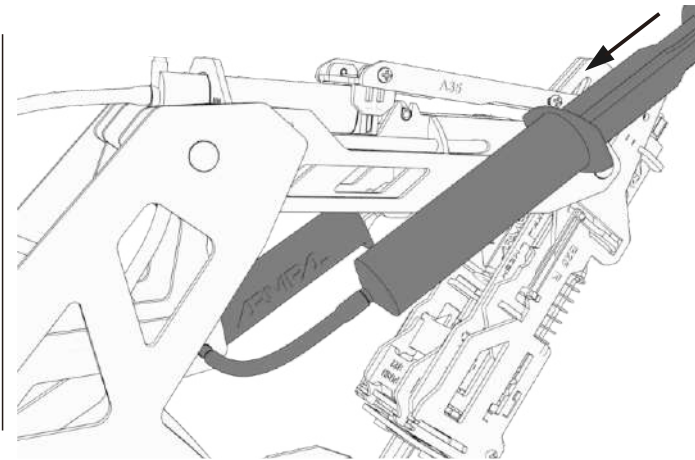
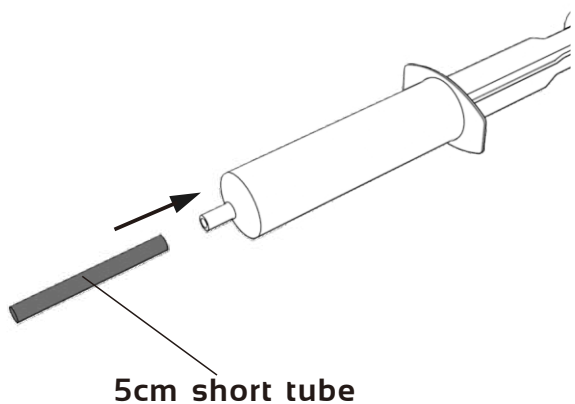
4



Submerge the other end of the tube into water

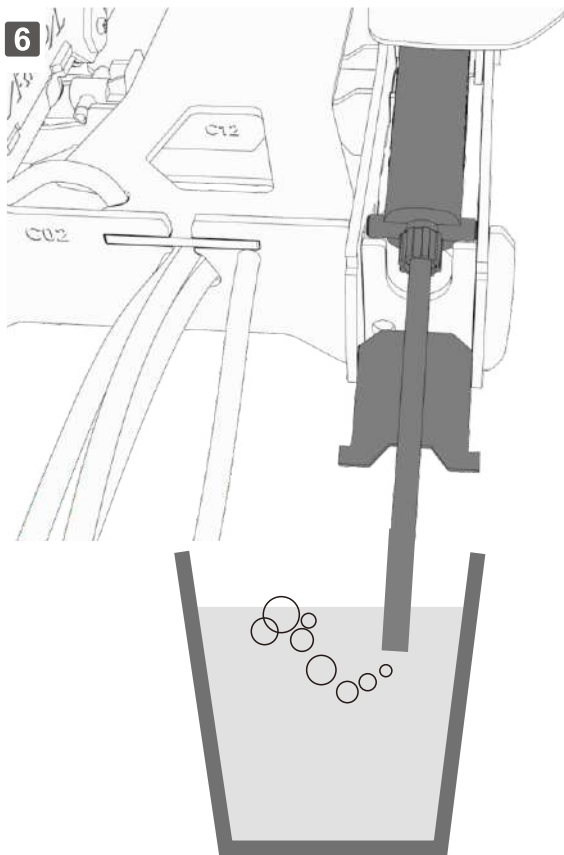


5



Liquid Filling

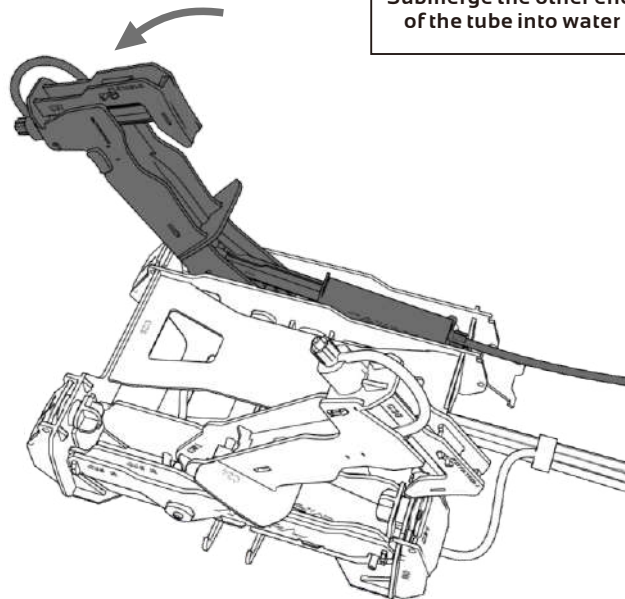
6



Fill system - vent air from system

7

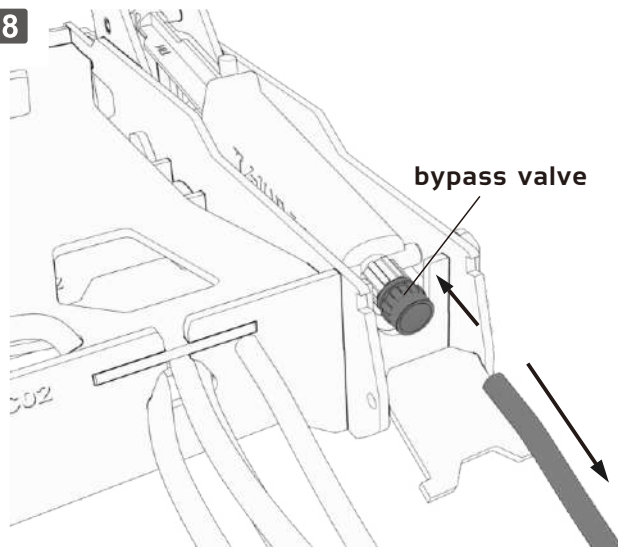
Keep the other end of the water tube submerged into water, and pull the left handle backward to fill the hydraulic cylinder up with water



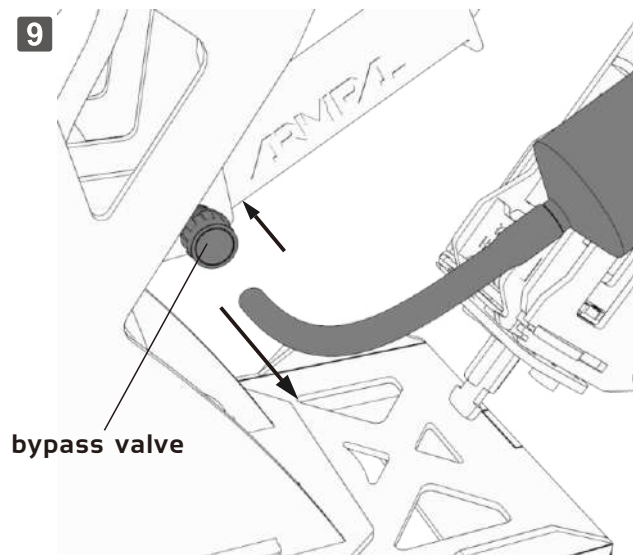
Submerge the other end of the tube into water

Liquid Filling

8



9



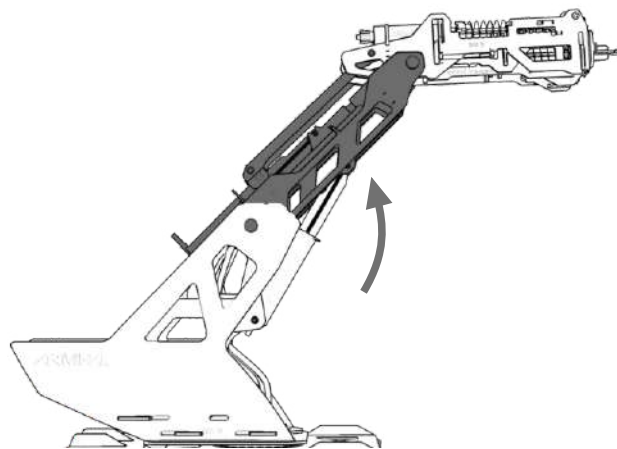
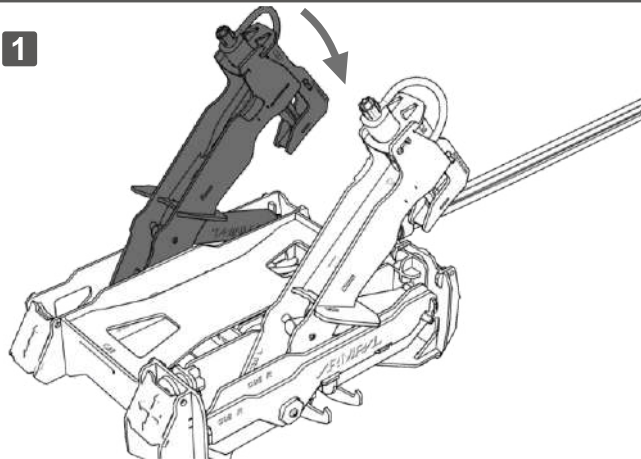
It's not allowed to remove all short tube at the same time for venting or remove two bypass valves in the same tube at the same time!

Improper operation will lead to leakage! Please operate in strict accordance with the procedure.

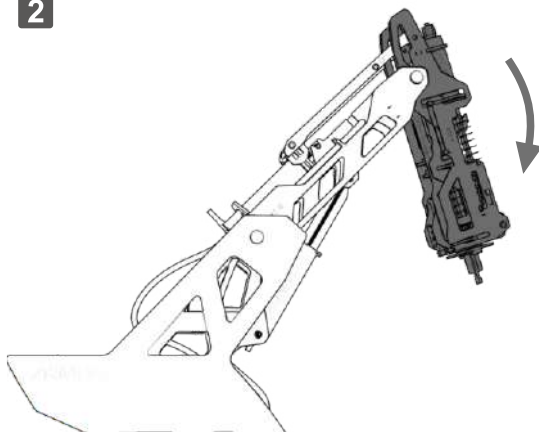
To dismantle the bypass valve, please press the hydraulic cylinder with your hand, instead of directly stressing the wooden parts.

Liquid Filling

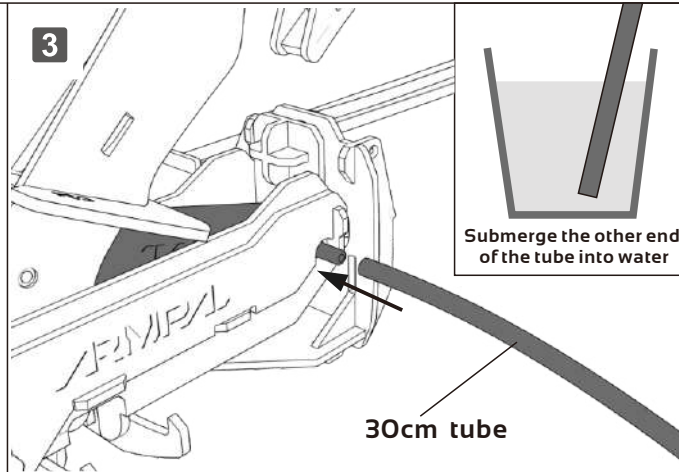
1



2

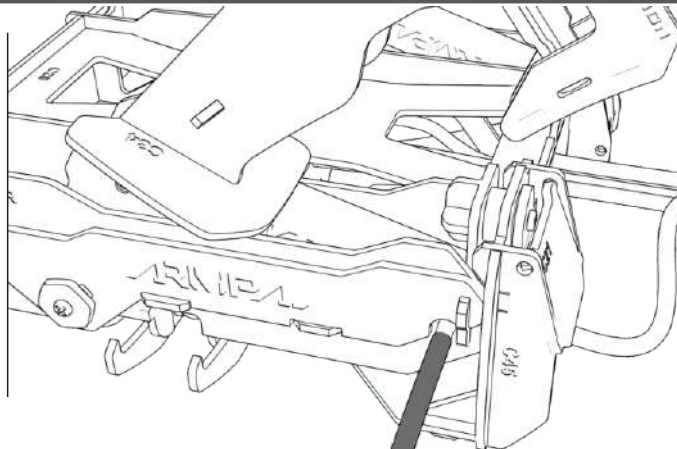
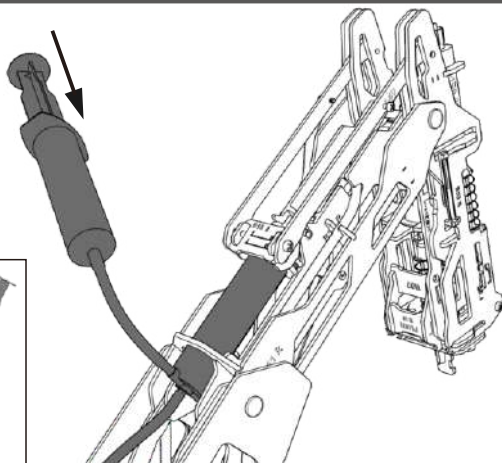


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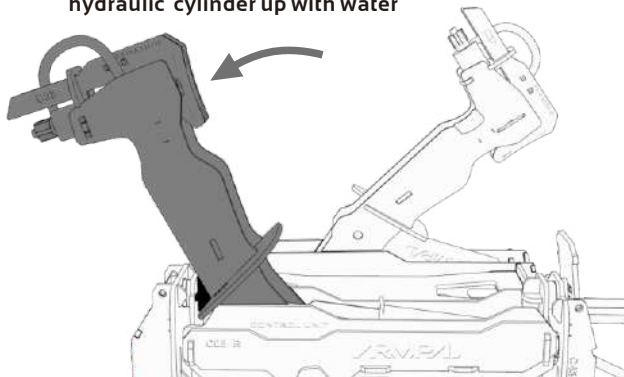
Liquid Filling

4



5

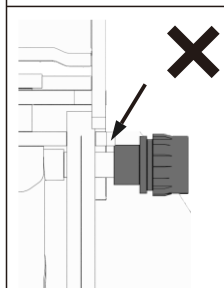
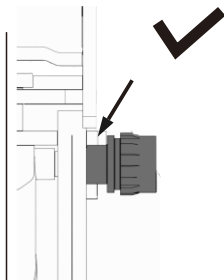
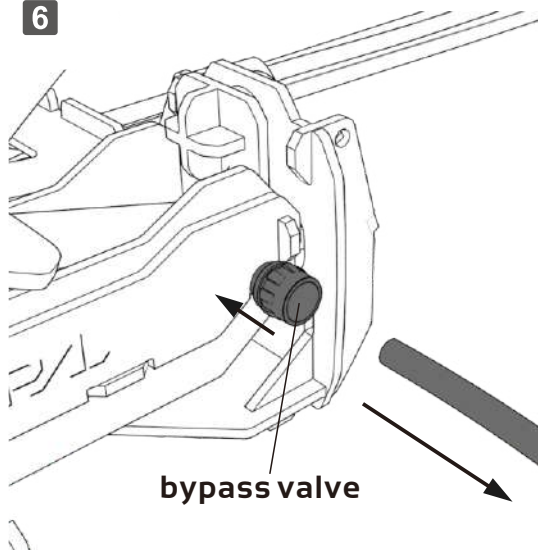
Keep the other end of the water tube submerged into water, and pull the right handle backward to fill the hydraulic cylinder up with water



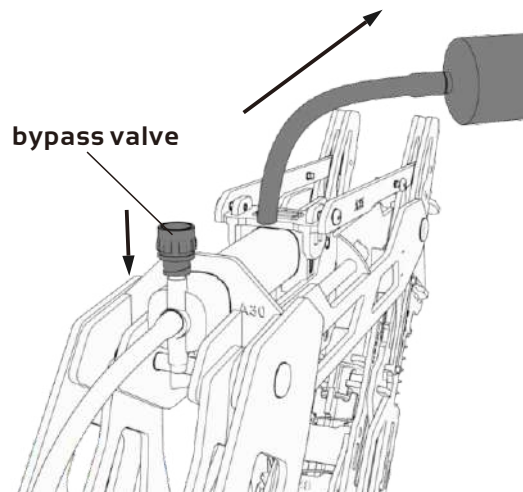
Fill system - vent air from system

Liquid Filling

6



7



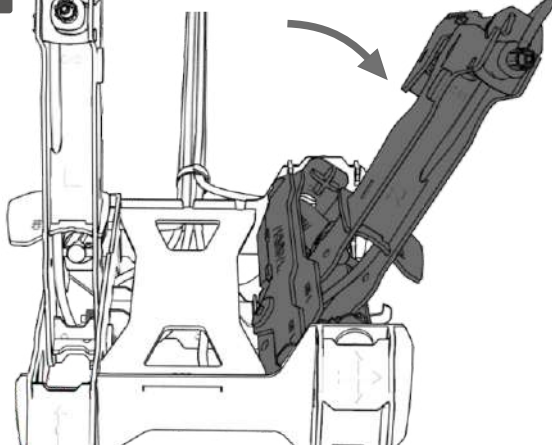
It's not allowed to remove all short tube at the same time for venting or remove two bypass valves in the same tube at the same time!

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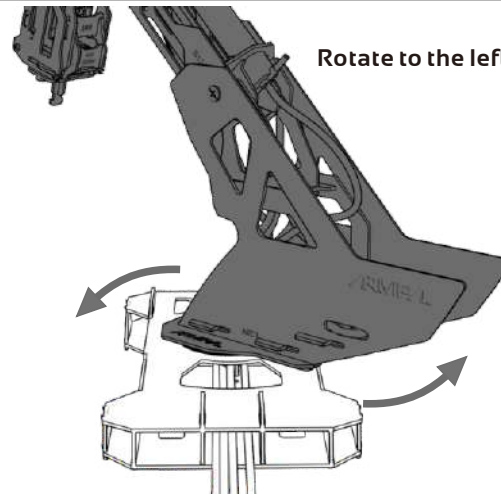
To dismantle the bypass valve, please press the hydraulic cylinder with your hand, instead of directly stressing the wooden parts.

Liquid Filling

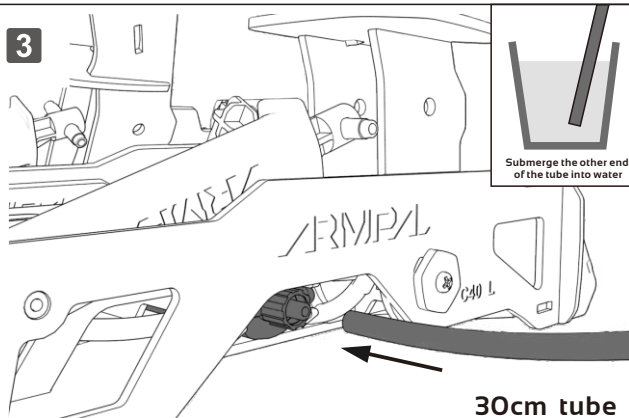
1 Pull the right handle rightward to the end



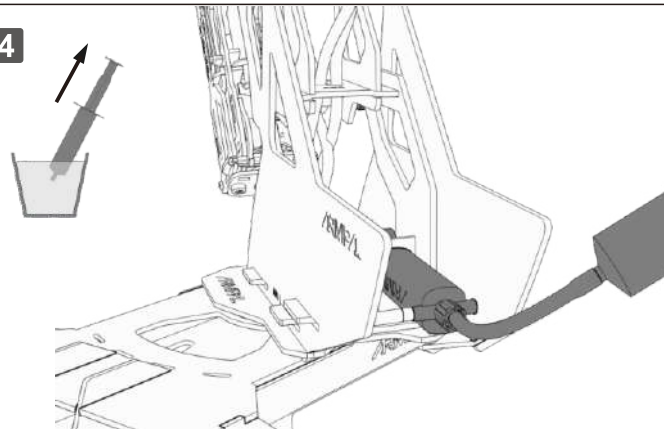
2 Rotate to the leftmost side



3



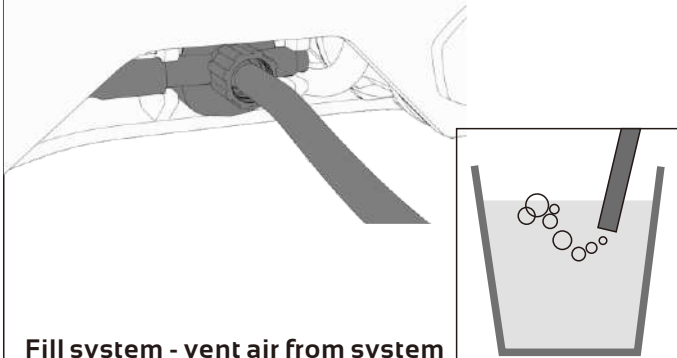
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Liquid Filling

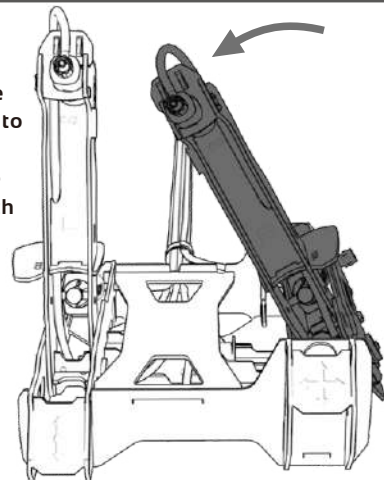
5

ARMIPA



6

Keep the other end of the water tube submerged into water, and pull the right handle leftward to fill the hydraulic cylinder up with water

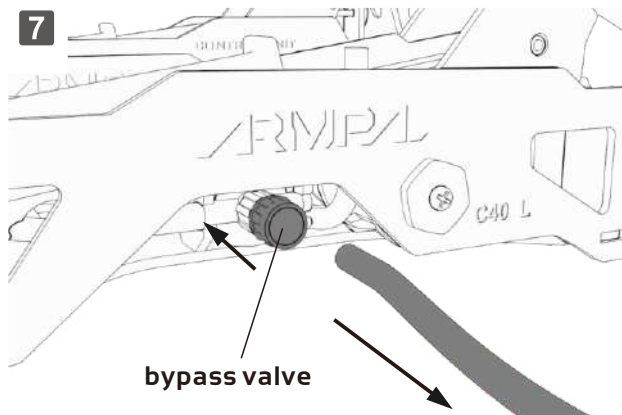


7

ARMIPA

C40 L

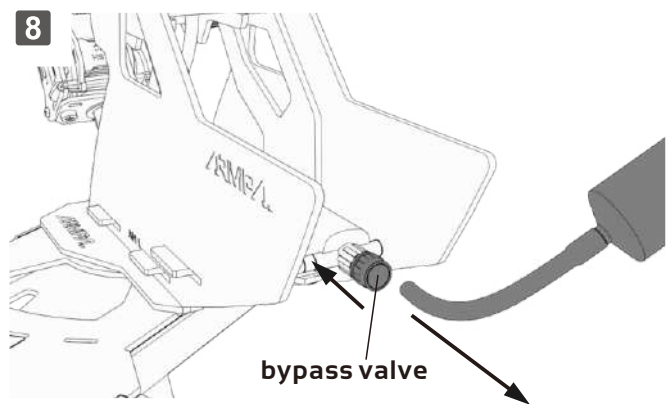
bypass valve



8

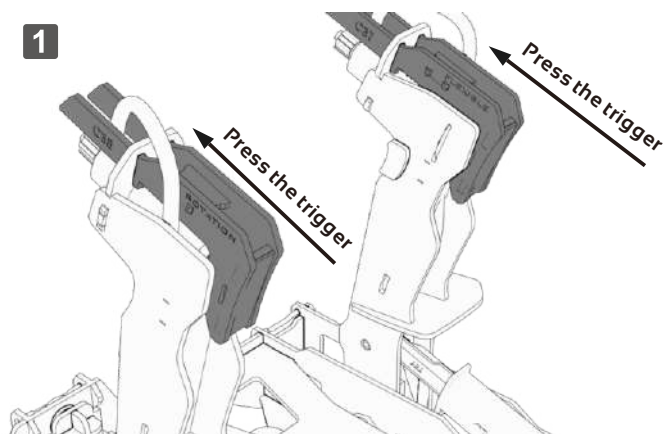
ARMIPA

bypass valve

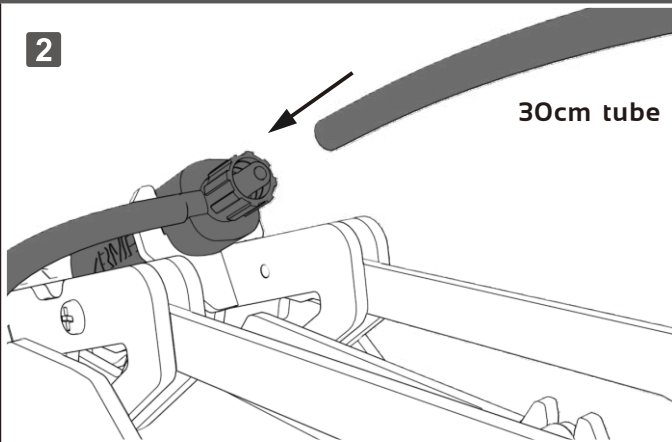


Liquid Filling

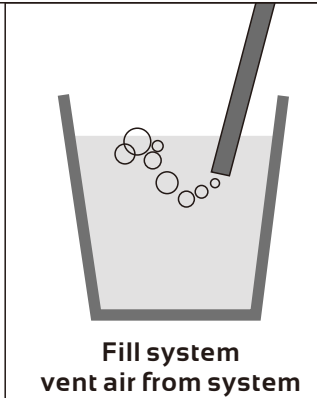
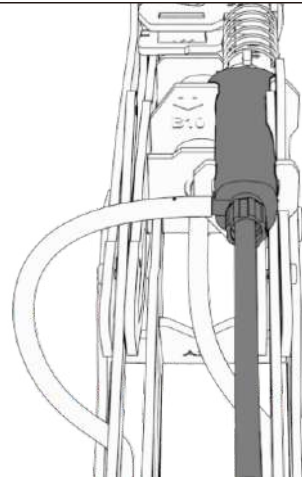
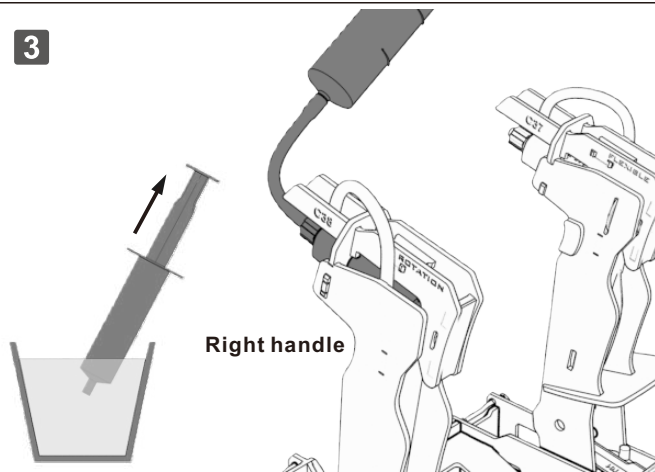
1



2

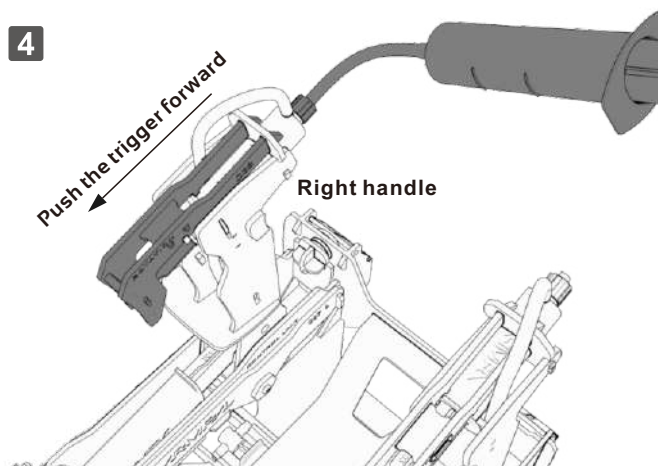


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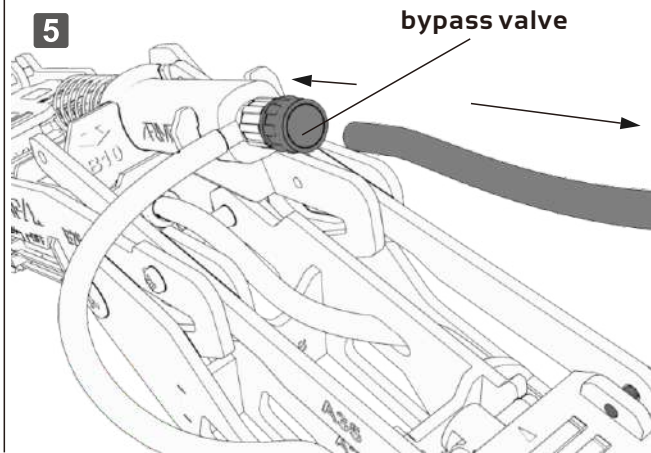


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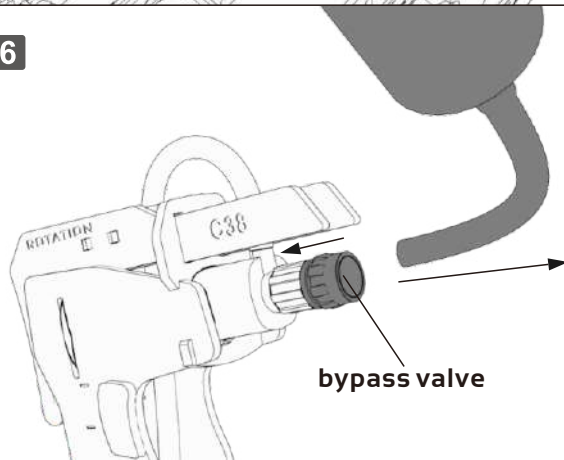
4



5



6



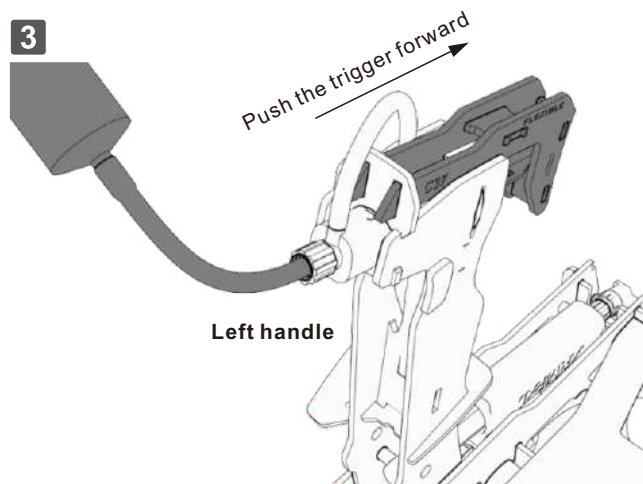
It's not allowed to remove all short tube at the same time for venting or remove two bypass valves in the same tube at the same time!

Improper operation will lead to leakage ! Please operate in strict accordance with the procedure.

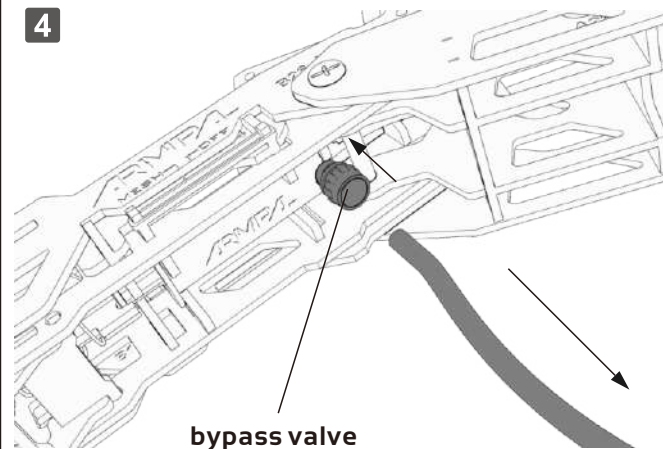
To dismantle the bypass valve, please press the hydraulic cylinder with your hand, instead of directly stressing the wooden parts.

Liquid Filling

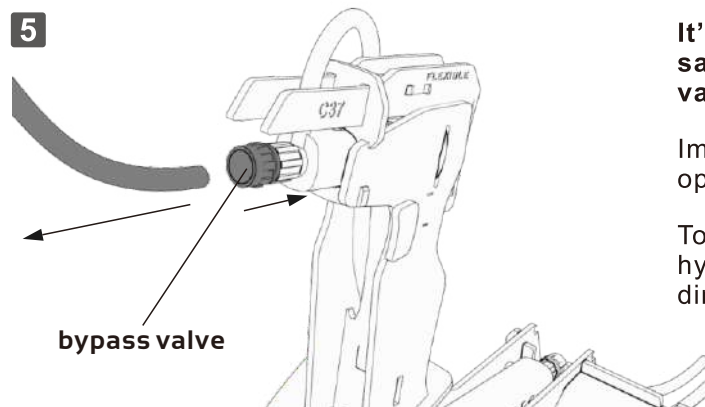
3



4



5



It's not allowed to remove all short tube at the same time for venting or remove two bypass valves in the same tube at the same time!

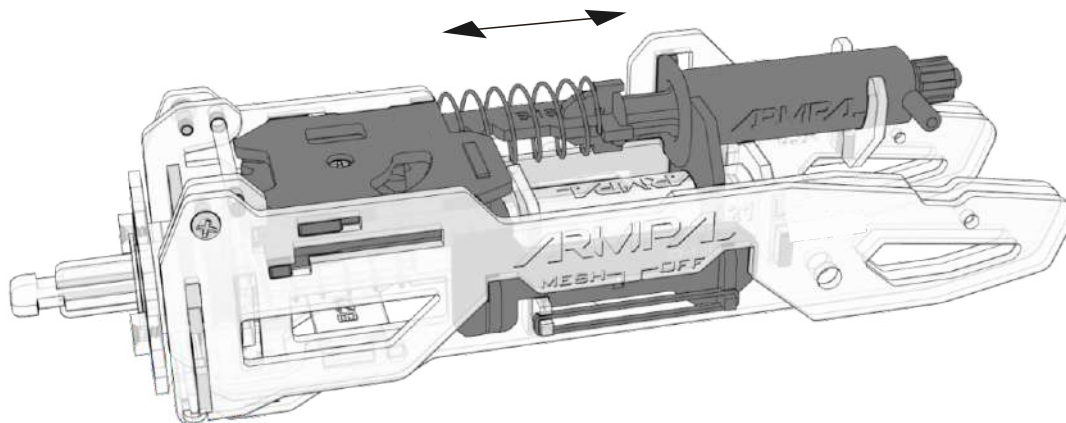
Improper operation will lead to leakage ! Please operate in strict accordance with the procedure.

To dismantle the bypass valve, please press the hydraulic cylinder with your hand, instead of directly stressing the wooden parts.

Operating Instructions for Front Arm Clutch

Operating Instructions for Front Arm Clutch

The clutch operates automatically. When a different actuating kit is installed, some mechanism in the front arm will be left unused or it's required to control other mechanism. The clutch makes it possible for the front arm to switch over functions at different modes and to avoid any damage from inadvertent operation. Besides, the clutch can also operate manually to correct engaging position of gears (for details, please refer to “troubleshooting”).

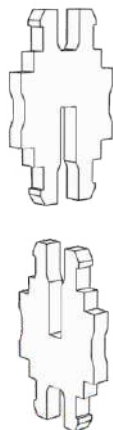


Assembly of Clamp

Clamp

1

B25*2

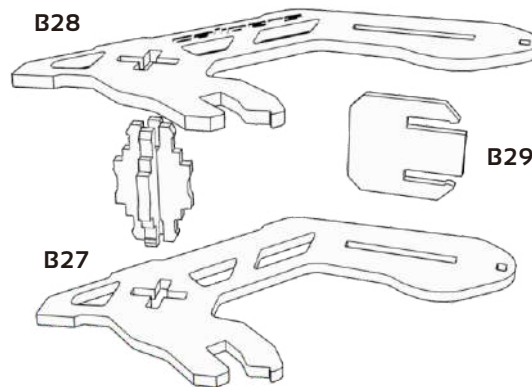


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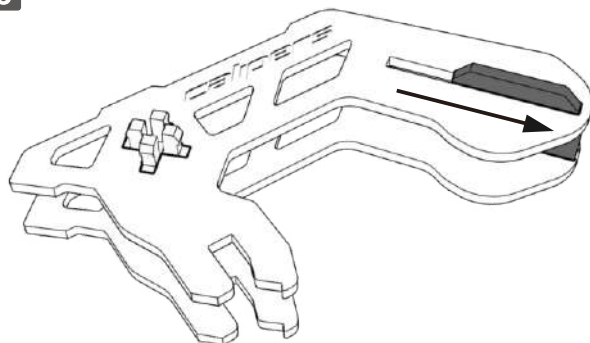
B28

B29

B27



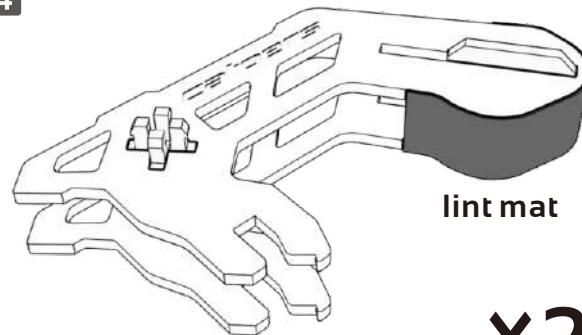
3



4

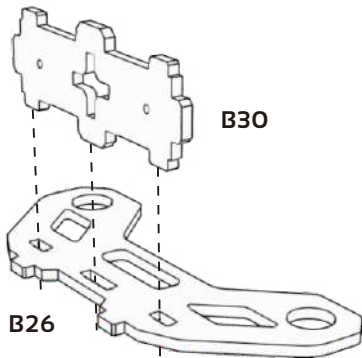
lint mat

x2

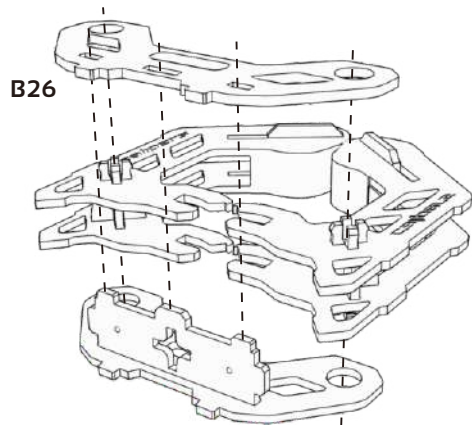


Clamp

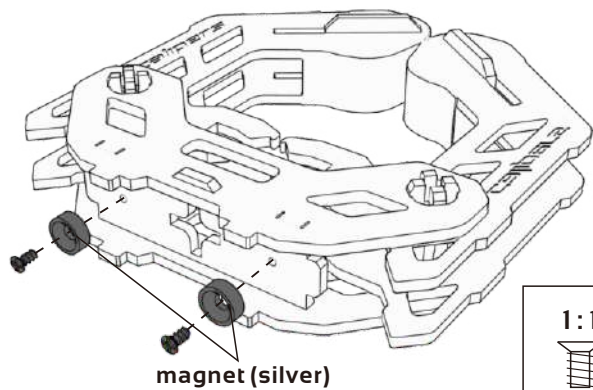
5



6



7

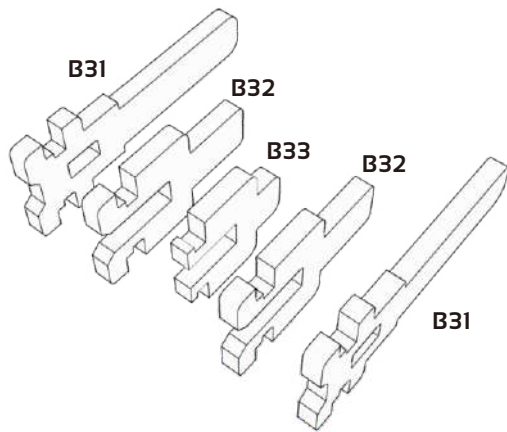


magnet (silver)

1:1

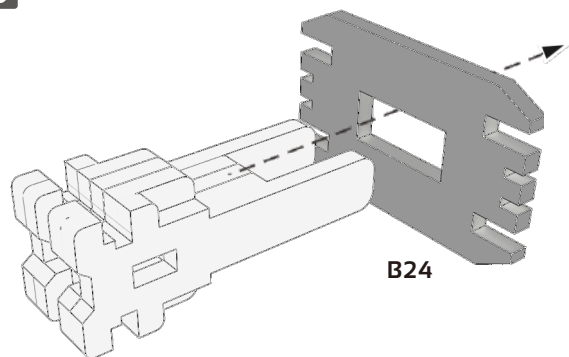


8

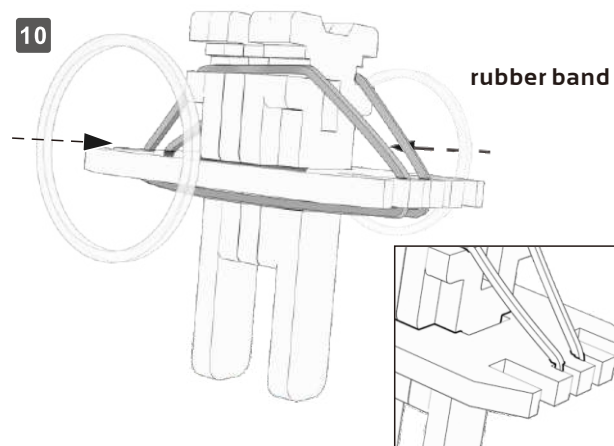


Clamp

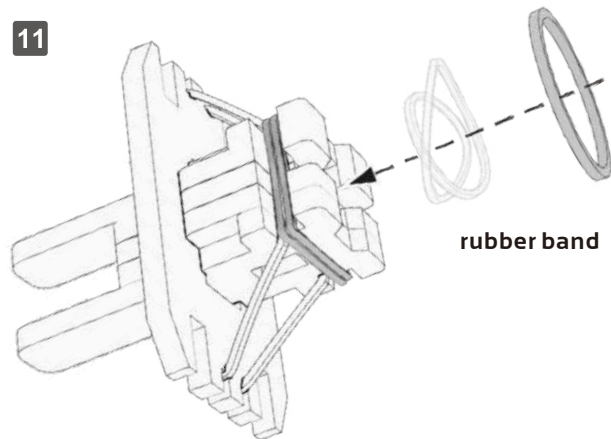
9



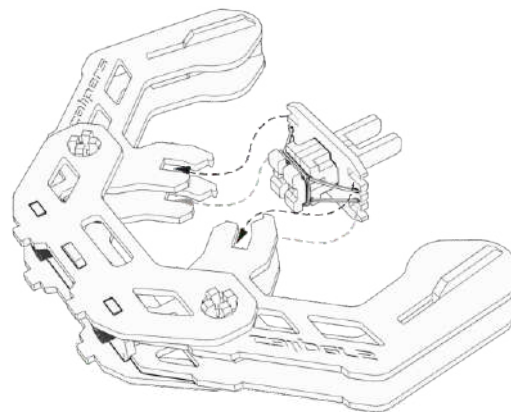
10



11

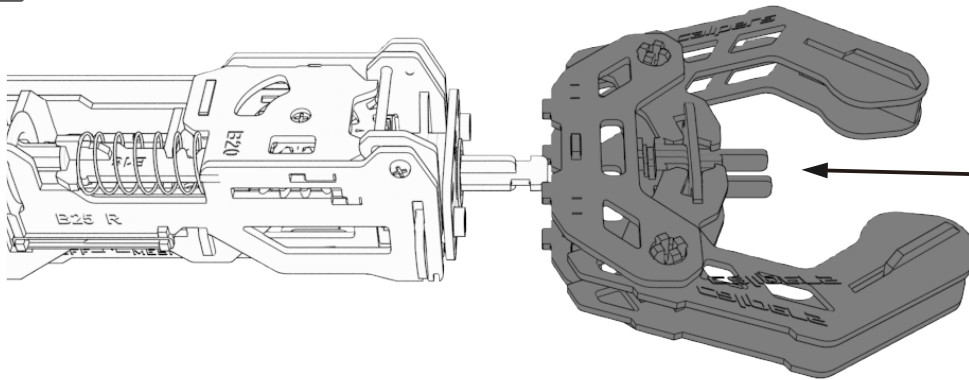


12

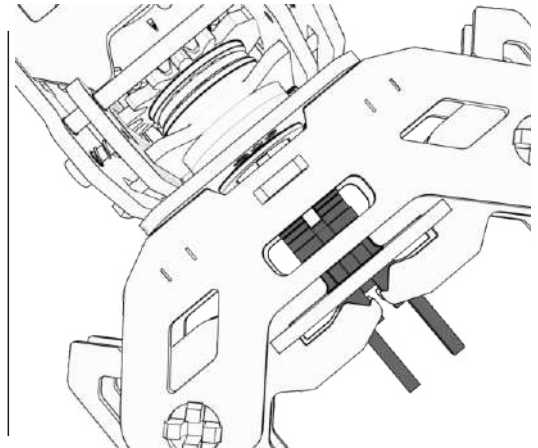
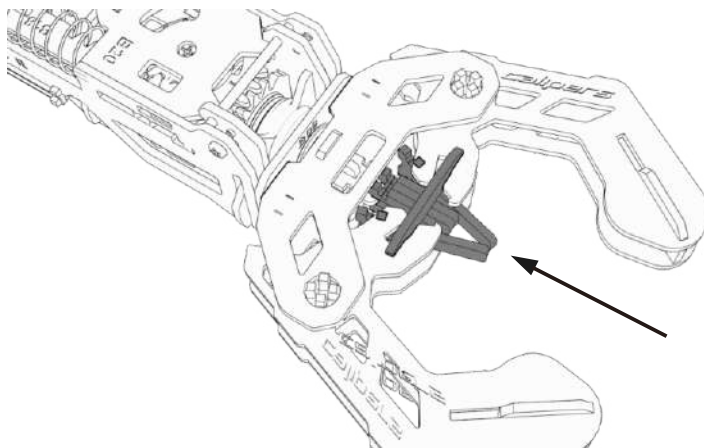


Clamp

13



14



Common Troubleshooting

Common Troubleshooting

Maximum angles/length cannot be achieved in operation in all directions, and operation responses slowly in all directions.

1. Check the hydraulic system for excessive air. If there is excessive air, please go back to “hydraulic system venting” for operation.
2. Check if the handle is stuck at some position. If the handle is stuck, please go back to “handle assembly” to check if the assembly is correctly completed.

There is excessive resistance to operate the handle or the handle is impossible to be pushed (pressed)/operation responses slowly in all directions.

1. Check if the related hydraulic tube is badly bent. If yes, please go back to the related installation step to check if the hydraulic tube is correctly assembled.
2. Check if the related hydraulic cylinder piston is stuck. If yes, stably force to relieve the issue with hand (don't operate with excessive strength).

The clamp fails to rotate to maximum angle

1. Check the hydraulic system for excessive air. If there is excessive air, please go back to “hydraulic system venting” for operation.
2. Check if the part is stuck at some position. If yes, please go back to “front arm assembly” to check if the assembly is correctly completed.
3. Apply wax on moving parts.

Common Troubleshooting

The clamp fails to rotate from the correct starting position

1. Please go back to “front arm assembly” to check if the gear is correctly engaged. If the arrow is not pointing to the right ahead, or B05 position is incorrect, please manually operate the clutch to OFF. Return the gear to seat and disengage the clutch to MESH.
2. Check gear rack position. If the position is incorrect, please go back to “front arm assembly” to realign the gear rack.

Front arm clutch fails to operate

1. Check if rubber bands on both sides are broken. If yes, please replace.
2. Check if the clutch is stuck at some position. If yes, please go back to “front arm assembly” to check if the assembly is correctly completed.
3. Apply wax on moving parts.

Magnetic lifting silo fails to disengage/engage

1. Check the rope length. If the rope length is not OK, please go back to “magnetic lifting silo assembly” to adjust the rope length.
2. Check if the parts are stuck. If yes, please go back to “magnetic lifting silo assembly” to check if the assembly is correctly completed.

Excavator bucket/magnetic lifting silo fails to secure on the front arm

1. Check if the rubber band of latch under the front arm has come apart. If yes, please re-mount the rubber band.
2. Please go back to “front arm assembly” to check if B21/B22/B23 are correctly assembled and engaged.

Common Troubleshooting

Water leakage

1. Locate the leakage. Re-connect the hydraulic tubes or bypass valves, and then go back to “hydraulic system venting” to operate.
2. The wooden parts that have become wet should be wiped with clean tissue immediately and then placed in a well-ventilated place. Do not put them under direct sun exposure. Perform “hydraulic system venting” when the parts have become totally dried up.

Hydraulic tubes become loose

1. If the hydraulic tubes become loose repeatedly, cut the end that has come apart by 1cm and then have it hooked up again.

MongDa Reeo