EXPERIMENT MANUAL



MY ROBOTIC PET
Coding Chameleon

Colorful CODING FUN!



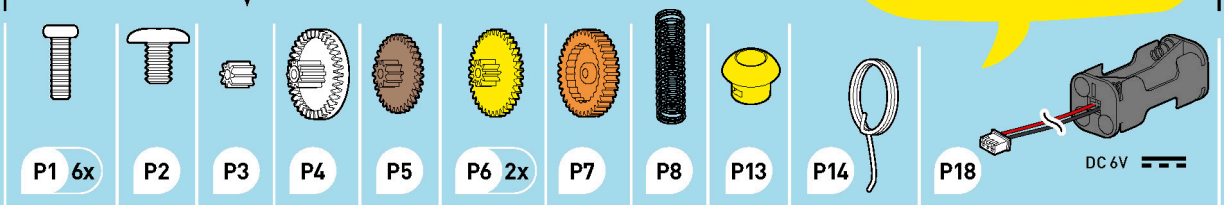
THAMES & KOSMOS

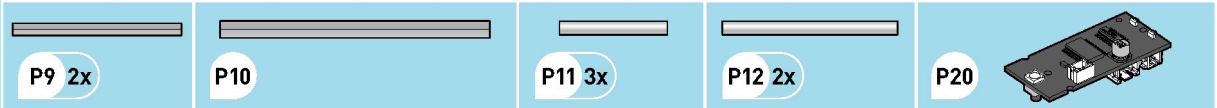
Thames & Kosmos, 89 Ship St., Providence, RI, 02903, USA | 1-800-587-2872 | www.thamesandkosmos.com
Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstr. 5-7, 70184 Stuttgart, Germany | +49 (0) 711 2191-0 | www.kosmos.de

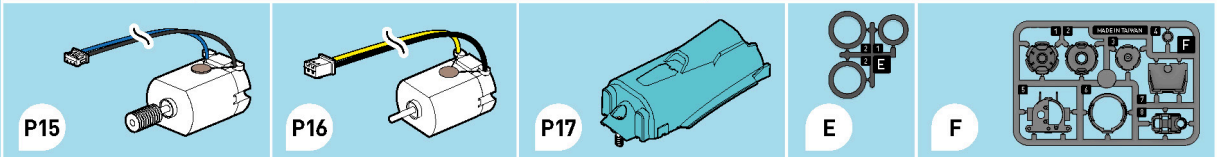
KIT CONTENTS

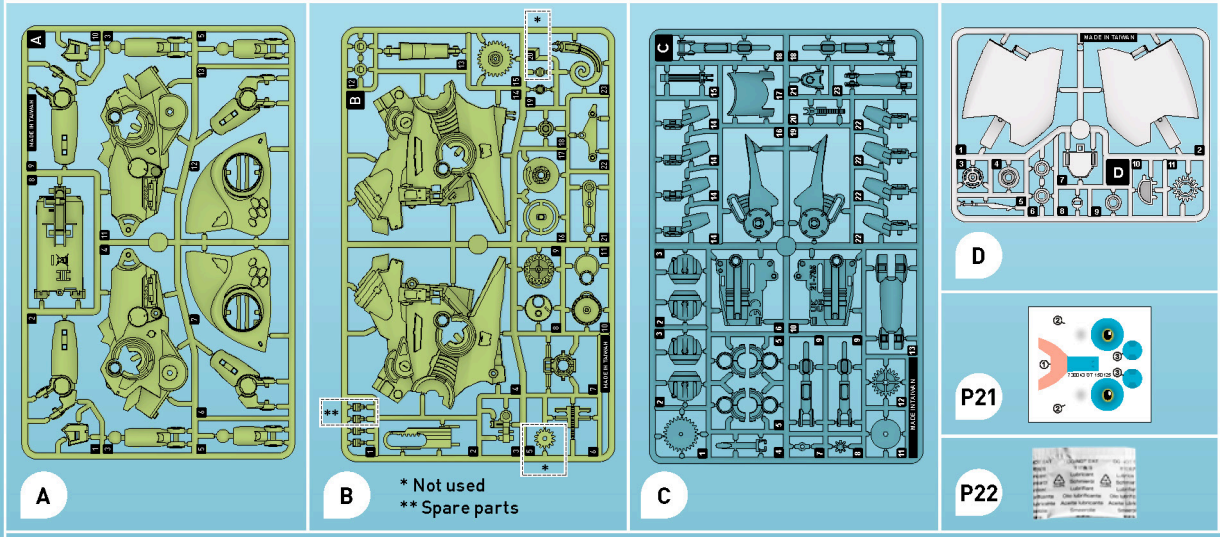
What's inside your experiment kit:

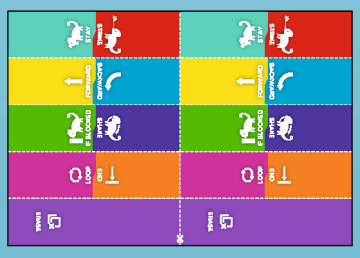
Good to know!
If you are missing any parts, please contact Thames & Kosmos technical support.











Checklist:

✓	No.	Description	Quantity	Part No.
○	P1	Screw	6	730038
○	P2	Wide-head screw	1	730039
○	P3	Small gear	1	730039
○	P4	Gear 36/10T - white	1	730038
○	P5	Gear 32/10T - brown	1	730038
○	P6	Gear 36/10T - yellow	2	730039
○	P7	Gear 36T - orange	1	730039
○	P8	Spring	1	730040
○	P9	Hexagonal shaft - short	2	730038
○	P10	Hexagonal shaft - long	1	730039
○	P11	Round shaft - short	3	730038
○	P12	Round shaft - long	2	730039
○	P13	Cap	1	730040
○	P14	String	1	730037

YOU WILL ALSO NEED:

4 AAA batteries (1.5-volt, type LR03), small Phillips-head screwdriver (PH1), diagonal cutter or scissors and nail file, marker or pen, ruler, cup, paper towel, cotton swab, white paper

TABLE OF CONTENTS

Kit Contents ..... **Inside Front Cover**
Safety Information 2
Important Information 3

Adventure Comic Part 1 4

ASSEMBLY BEGINS ON PAGE 8
Assembling the Front Gear Box 9
Assembling the Rear Gear Box 22
Assembling the Legs 27
Assembling the Tail 29
Assembling the Head 30
Coding Cards and Eye Stickers 33

Adventure Comic Part 2 34
Installing and Changing Batteries 36
Information for Proper Handling 37
Operating Instructions 38
Troubleshooting 46
Your Own Programs 48

TIP

YOU WILL FIND ADDITIONAL INFO IN THE CHECK IT OUT SECTIONS ON PAGES 44 AND 45.



Woohoo!
Let's go!



✓	No.	Description	Quantity	Part No.
○	P15	Motor with worm gear (blue and black cables)	1	730042
○	P16	Motor (yellow and black cables)	1	730041
○	P17	Battery compartment cover with screw	1	730044
○	P18	Battery compartment with connecting cable	1	730045
○	P19	Sheet with coding cards	1	730046
○	P20	Circuit board	1	730047
○	P21	Sticker sheet	1	730043
○	P22	Non-toxic lubricant packet	1	723607
○	A	Frame A with parts A1–A13	1	730031
○	B	Frame B with parts B1–B23	1	730032
○	C	Frame C with parts C1–C23	1	730033
○	D	Frame D with parts D1–D11	1	730034
○	E	Frame E with parts E1–E2	1	730036
○	F	Frame F with parts F1–F8	1	730035

620507-02-220126

WARNING!

Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled.

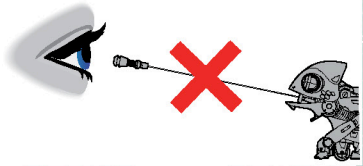
WARNING: This toy is only intended for use by children over the age of 8 years, due to accessible electronic components. Instructions for parents or caregivers are included and shall be followed.

Keep packaging and instructions as they contain important information.

WARNING! Some parts of this kit have functional sharp points, corners, or edges. Do not injure yourself!

Only to be operated when fully assembled. Proper assembly must be checked by an adult before use.

To avoid injury, do not look directly into the robot's mouth or point the mouth at other people or animals.



Safety for Experiments with Batteries:

» To operate this kit, you need four AAA batteries (1.5-volt, type LR03), which could not be included in the kit due to their limited shelf life. Inserting, removing, and replacing batteries should be done by an adult or under adult supervision.
» Avoid a short circuit of the batteries. A short circuit can cause the wires to overheat and the batteries to explode.
» Different types of batteries (e.g. rechargeable battery and non-rechargeable battery) or new and used batteries are not to be mixed.
» Do not mix old and new batteries.
» Do not mix alkaline, standard (carbon-zinc), or rechargeable (nickel-cadmium) batteries.
» Batteries are to be inserted with the correct polarity (+ and -). Press them gently into the battery compartment (see page 36). This page also explains how to insert, remove, and change the batteries.
» Non-rechargeable batteries are not to be recharged. They could explode!
» Rechargeable batteries are only to be charged under adult supervision.
» Rechargeable batteries are to be removed from the toy before being charged.
» Exhausted batteries are to be removed from the toy.
» The supply terminals are not to be short-circuited.
» The wires are not to be inserted into socket outlets.
» Avoid deforming the batteries.
» Dispose of used batteries in accordance with environmental provisions, not in the household trash.
» Dispose of electrical equipment/electrical parts separately and in accordance with environmental regulations.
» The toy is not to be connected to more than the recommended number of power supplies, this means only use the included battery box.
» Remove batteries from the toy (robot) if it is not in use for an extended period.

THE RIGHT TOOL

Using the right tool can make assembling your models easier and it can also make your models work better in the end. It is best to cut the plastic parts out of their frames with a small diagonal cutter (such as those used for electronics work) or model pliers. Using these tools, the parts can be precisely cut so that no burrs remain on the parts and there is no need to file them down.
If you don't have these pliers at home, you can use scissors and a nail file. Normal scissors do not cut as precisely as a diagonal cutter, so you may have to file some of the rough edges down with the nail file.



Notes on Disposal of Electrical and Electronic Components:

The electronic components of this product are recyclable/reusable. For the sake of the environment, do not throw them into the household trash at the end of their lifespan. They must be delivered to a collection location for electronic waste, as indicated by the following symbol:



Please contact your local authorities for the appropriate disposal location.

IMPORTANT INFORMATION

Dear parents and supervising adults,

Children want to explore, understand, and create new things.
They want to try things and do it by themselves. They want to gain knowledge!
They can do all of this with Thames & Kosmos experiment kits.
With every single experiment, they grow smarter and more knowledgeable.

— Before building and experimenting, read the instructions together with your child and discuss the safety instructions. Support your child with advice and a helping hand, especially during tricky assembly steps or experiments.

— To prevent damage to the work surface on which your child is building and experimenting, provide them with a mat or other surface protection.

— Provide your child with a diagonal cutter, or scissors and a nail file, and supervise them until you trust that they can handle it safely on their own.

— Building the robot is an exciting, educational project and takes several hours. It is best to build it in a place where the materials can be left lying around so that it does not have to be constantly moved back and forth.

— And, most importantly, have fun with your Coding Chameleon!

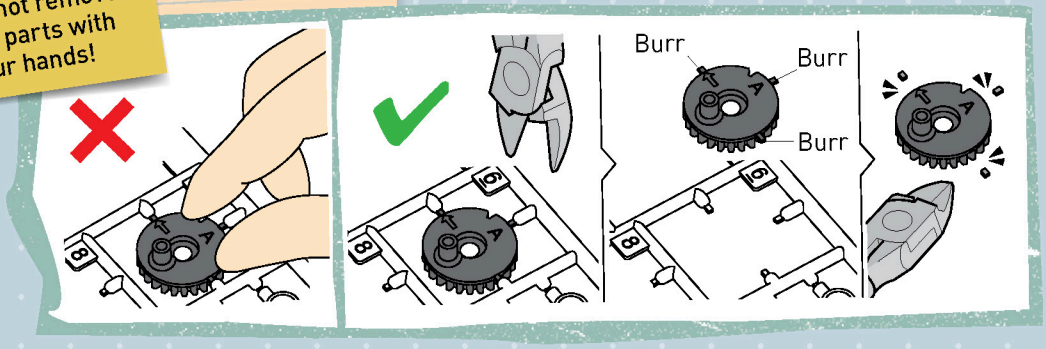
TIP

IMPORTANT:

REMOVE THE PARTS FROM THE FRAMES ONLY WHEN THEY ARE NEEDED. REMOVE EXCESS MATERIAL BEFORE ASSEMBLY WITH THE HELP OF A DIAGONAL CUTTER OR A NAIL FILE.



Do not remove the parts with your hands!




CARL
... HUNTING ON PLANET SHROOM


WHILE EVERYONE ELSE IS COZY IN BED, TOM AND IZZY ARE STILL BUSILY WORKING.
WHERE OTHER PEOPLE SEE ONLY JUNK, HEROES SEE ENDLESS POSSIBILITIES.
THE THRUST MUST BE INCREASED BY A FACTOR OF 10.
WE NEED MORE BOOST ...
... TO OVERCOME GRAVITY.
I FOUND SOMETHING!
THIS IS THE PIECE WE NEEDED!
HMM ... THAT JUST MIGHT WORK!
... AS LONG AS IT ISN'T BROKEN.
DON'T WORRY! THIS SMALL LEAK WILL BE EASY TO PLUG.
ALRIGHT, LET'S GET TO WORK!


IZZY CAN REPAIR ANYTHING. SHE IS A GENIUS WHEN IT COMES TO MECHANICS.
TOM, ON THE OTHER HAND, IS A SCIENTIST THROUGH AND THROUGH ...
... HE'S ALWAYS GAME TO TRY AN EXPERIMENT!
TOGETHER THEY CAN BUILD ANYTHING!
I THINK IT'S READY!
YES! WE DID IT!
NOTHING CAN STOP US NOW!
WHERE SHOULD WE GO FIRST?
WHEREVER WE WANT!
WE CAN GO ANYWHERE!


HERE WE ARE. I STILL HAVE MY RESERVATIONS ABOUT THE CONSUMPTION OF EXTRATERRESTRIAL MUSHROOMS, IZZY.
FIDDLE-FADDLE! DID YOU FIND THAT RECIPE FOR DELICIOUS MUSHROOM SOUP?
I WAS GOING TO, BUT THEN I STUMBLED ON A FASCINATING THREE-HOUR DOCUMENTARY ABOUT CHAMELEONS ...
WHAT? I'M HUNGRY, TOM!
FASCINATING CREATURES, CHAMELEONS. THEY'RE EXTREMELY ...
IF THE NEXT WORD ISN'T "DELICIOUS," I'M NOT INTEREST—
HEY, WHAT'S THAT?
A WEIRD EYE-FLY, AND IT'S STEALING OUR TRIBUFFHEXOMERATSCUBITOR, IZZY!
YOU MEAN OUR SPACESHIP KEY?
I'LL GET IT!
CAREFUL ... CAREFUL ...
AAAND ...
OOF!
OH SHOOT! AFTER IT!
WITHOUT THE TRIBUFFHEXOMERATSCUBITOR WE'LL NEVER GET OUT OF HERE! WE HAVE TO GET IT BACK!
I HAVE AN IDEA!
BUT HOW, TOM? THOSE CREATURES HAVE REALLY GOOD EYES!
OR AT LEAST ... EYE.
LET ME GUESS ...
CONTINUED ON PAGE 34



REFINED Robotic Reptile

Chameleons are cool! Now you can assemble your own pet chameleon. So grab your tools, set aside some time, and get to work on the assembly!

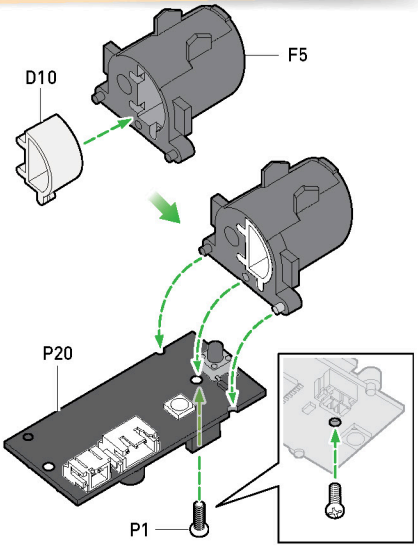
ASSEMBLY VIDEO

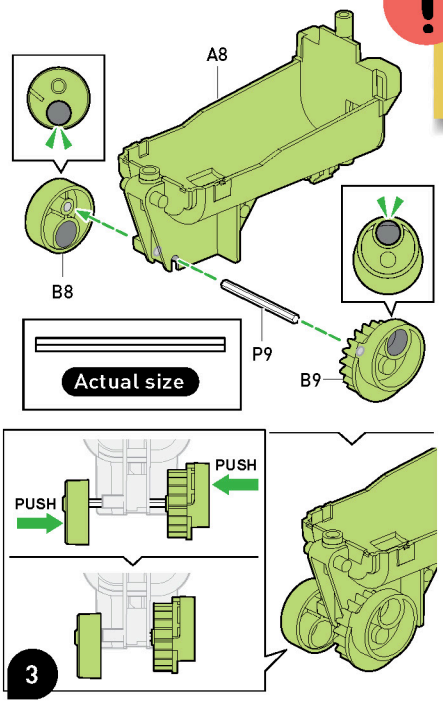
Scan this QR code for a step-by-step assembly video.

ASSEMBLING THE FRONT GEAR BOX

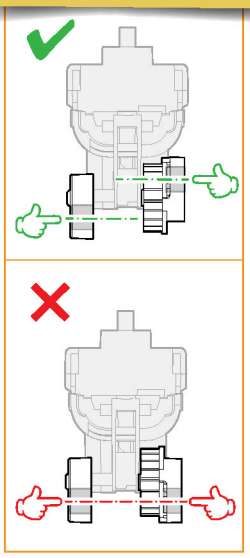
TIP

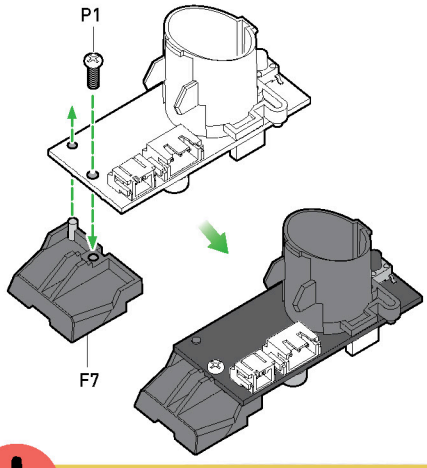
BEFORE INSTALLING THE CIRCUIT BOARD, YOU CAN READ AN EXPLANATION OF ITS MOST IMPORTANT COMPONENTS ON PAGE 45.



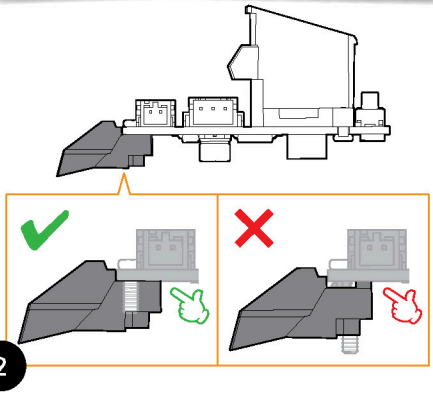


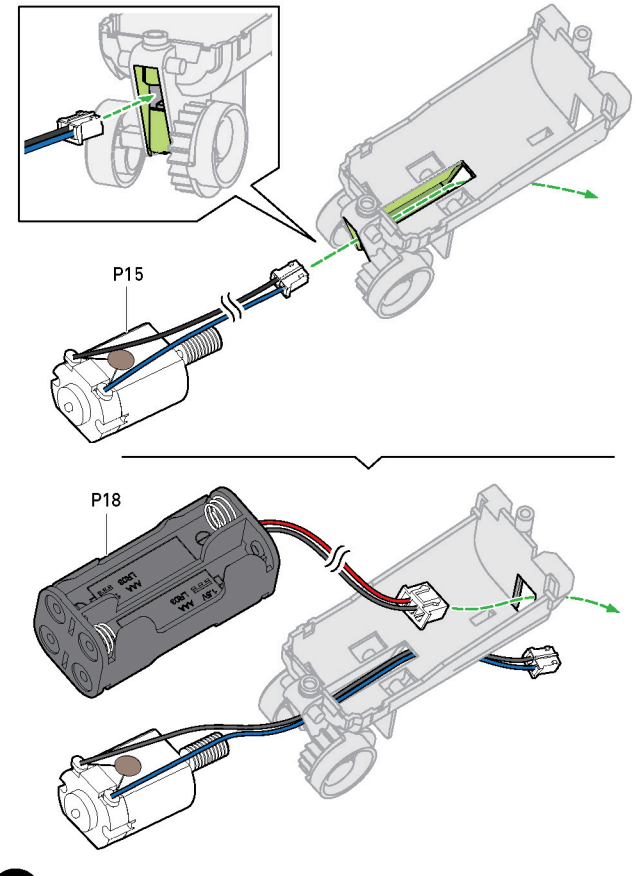
Make sure B8 and B9 are aligned as shown.

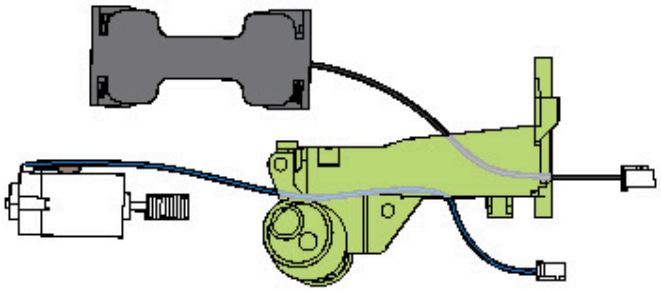




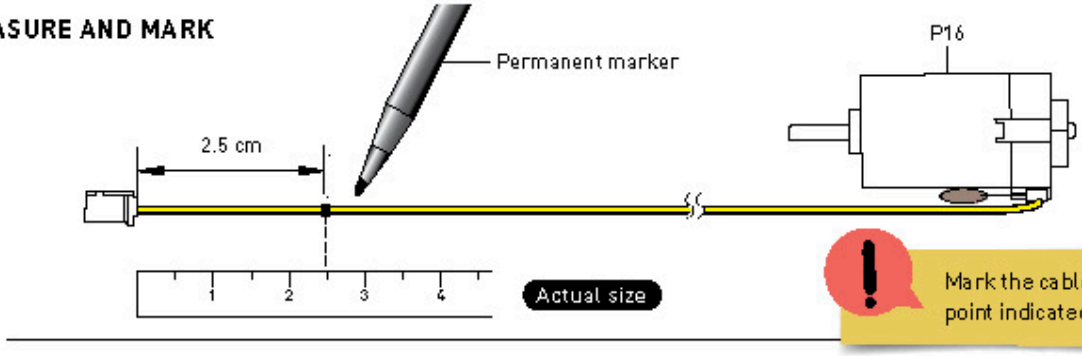
Make sure there is no gap between F7 and P20.



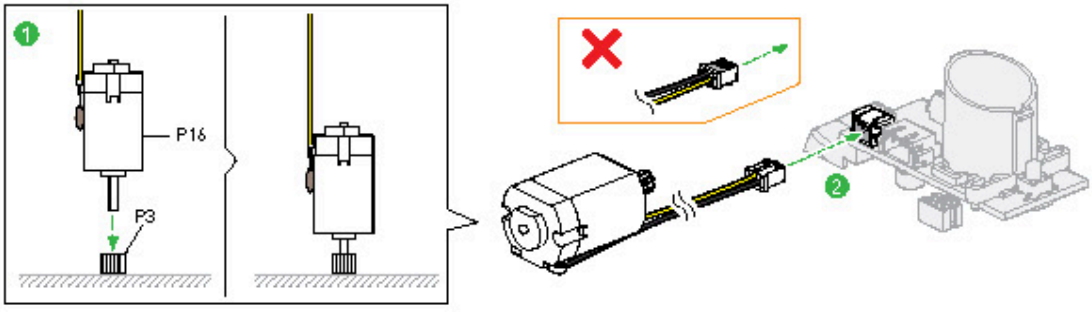




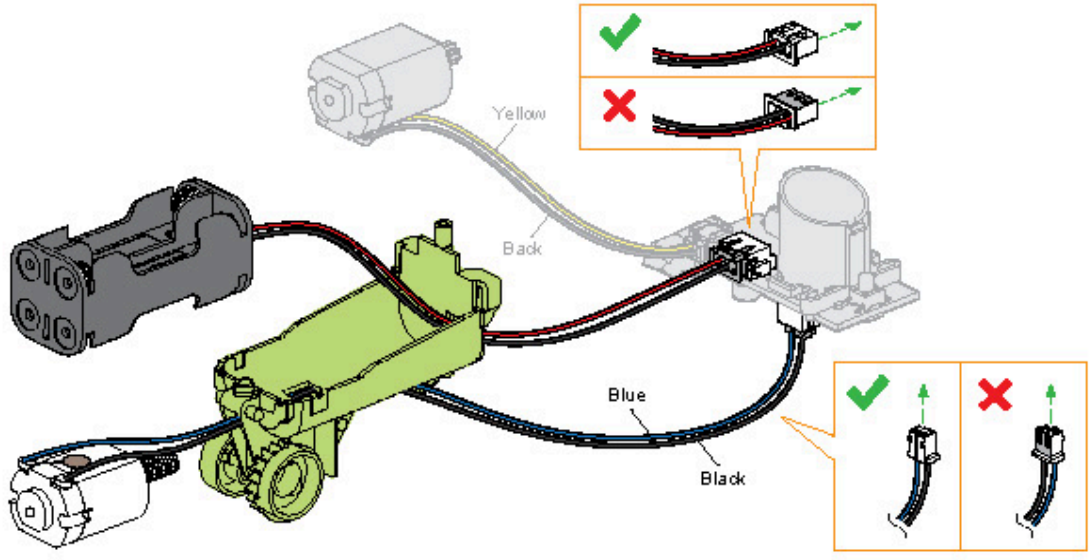
MEASURE AND MARK



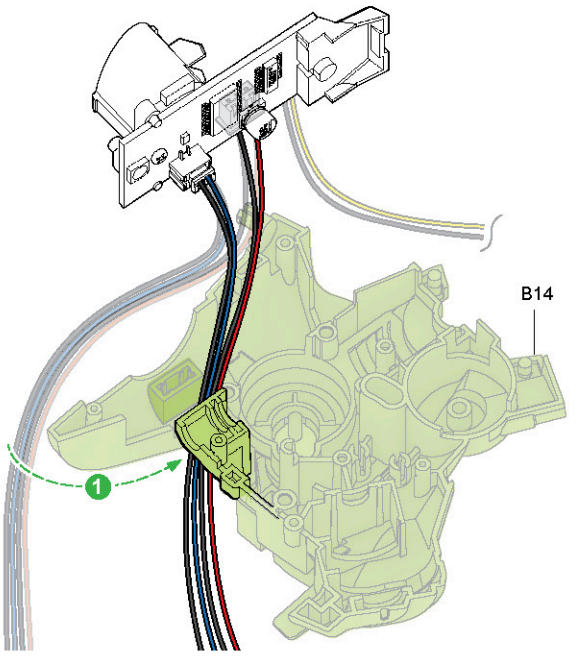
Mark the cable at the point indicated.

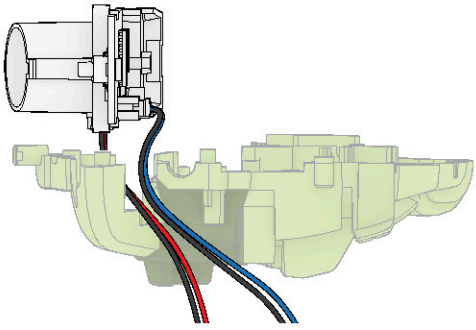


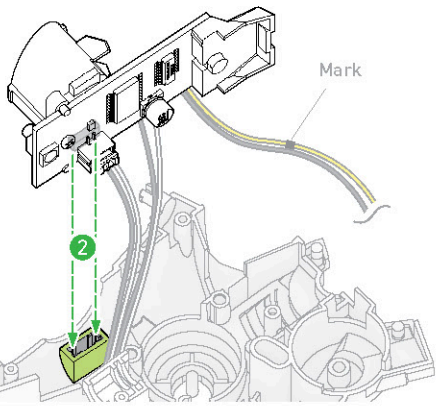
5



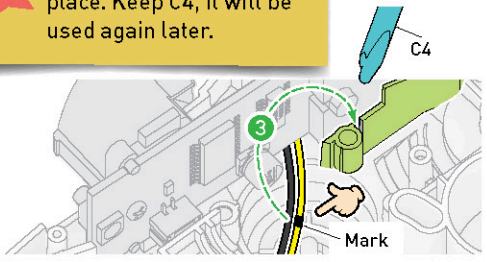
6

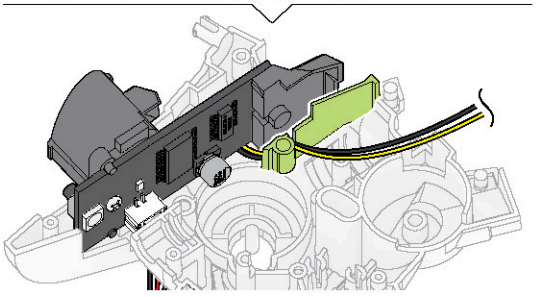






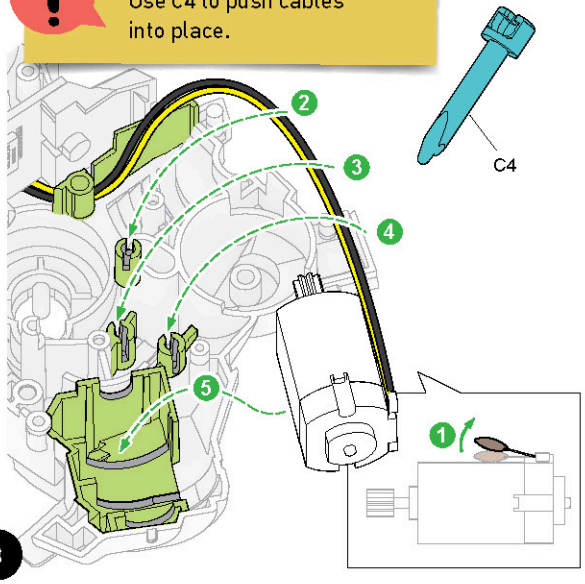
Use C4 to push cables into place. Keep C4, it will be used again later.

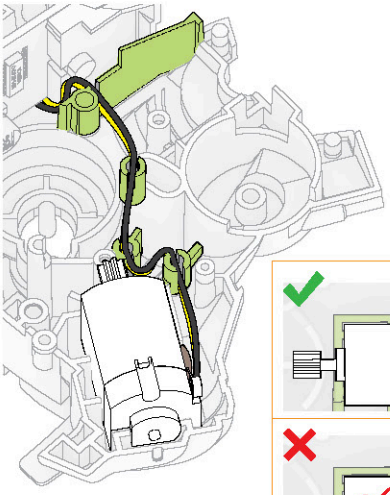


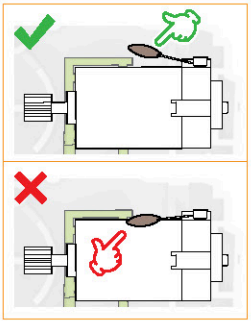


7

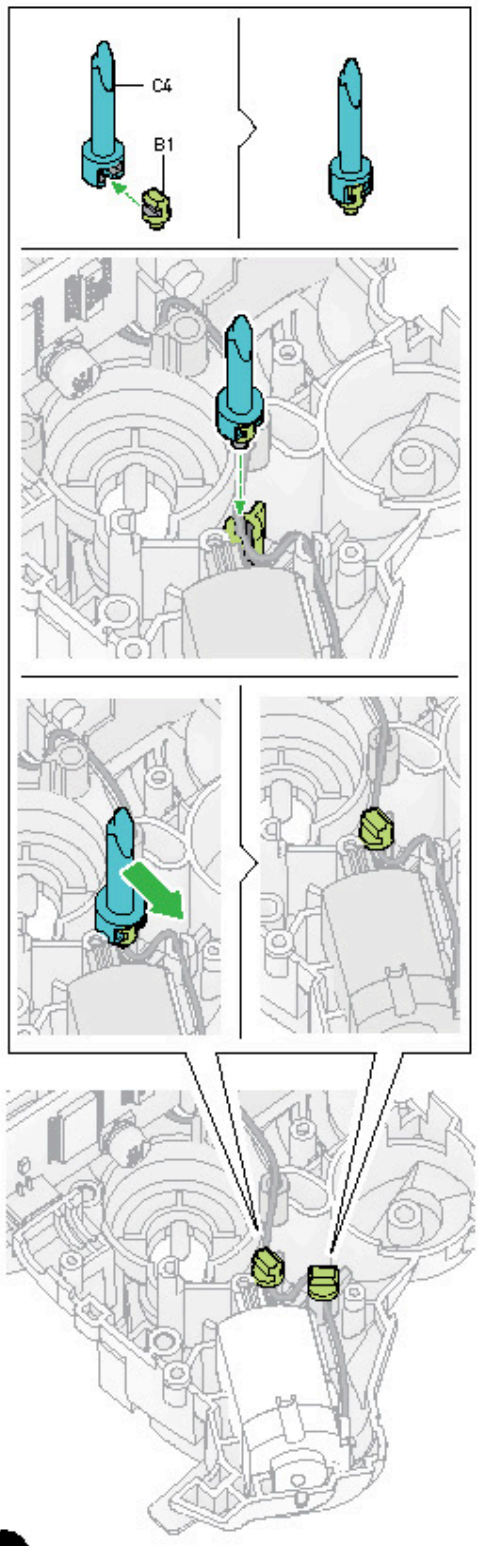
Use C4 to push cables into place.





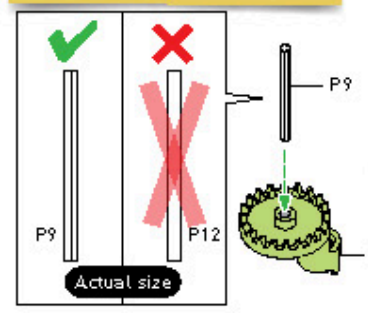


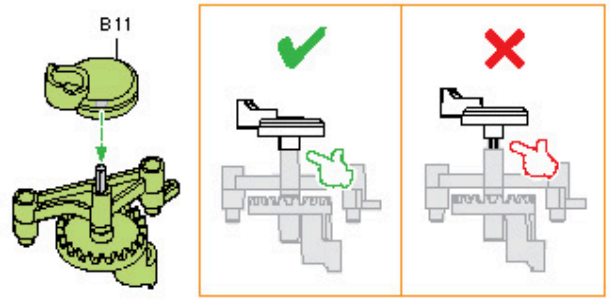
8

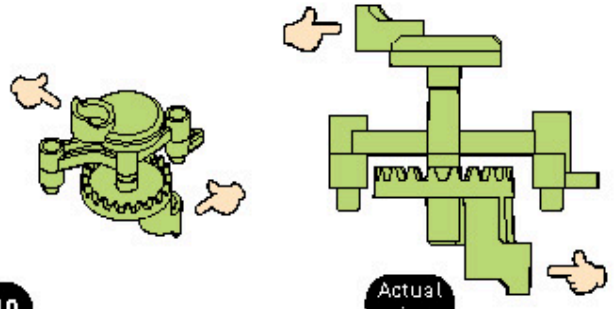


9

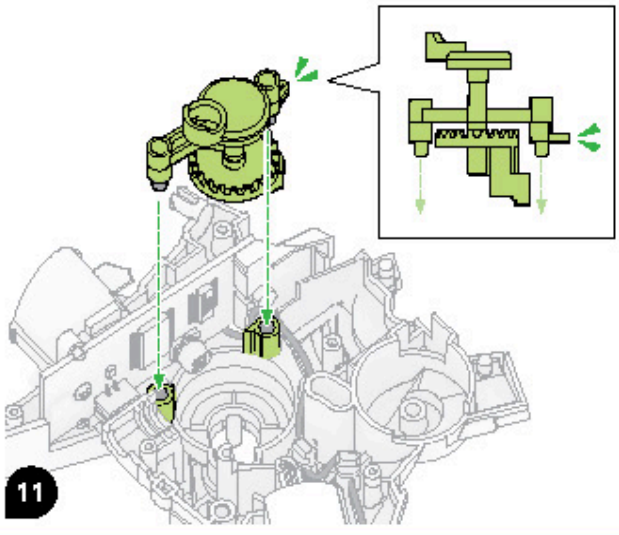
Make sure to use the hexagonal shaft (P9).







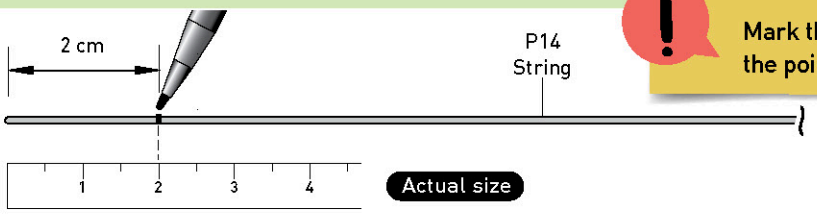
10



11

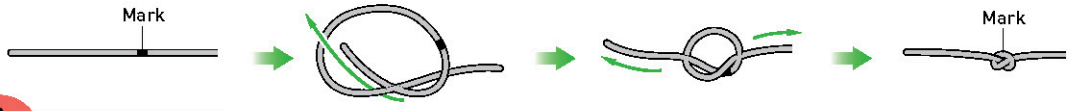


MEASURE AND MARK

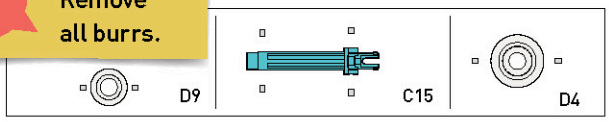


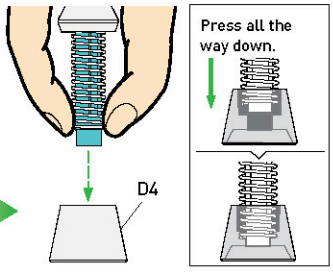
Mark the string at the point indicated.

12

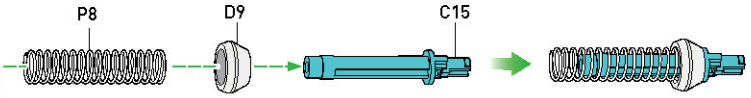


Remove all burrs.

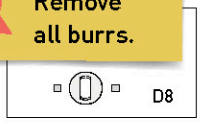




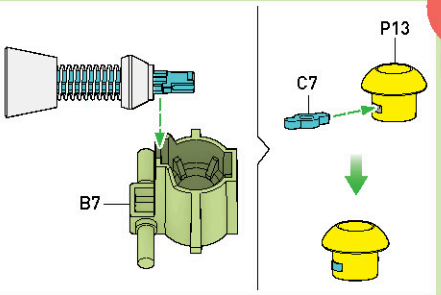
13

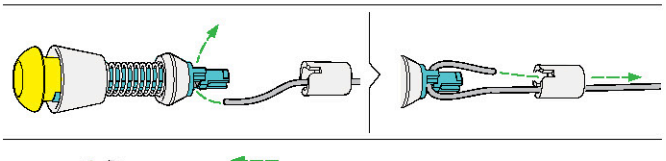


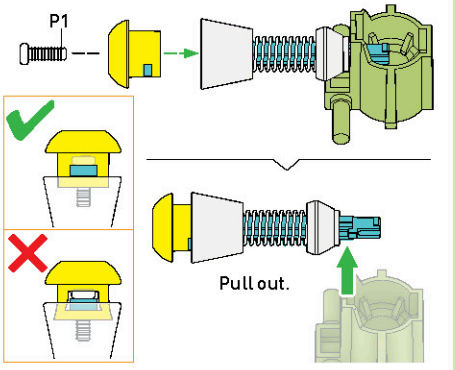
Remove all burrs.

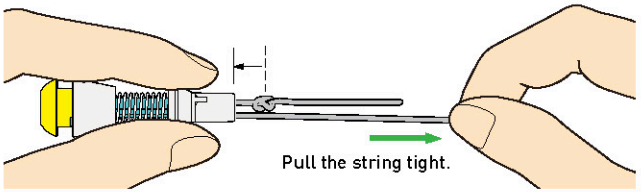








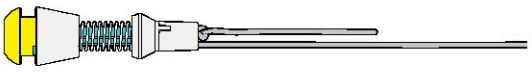




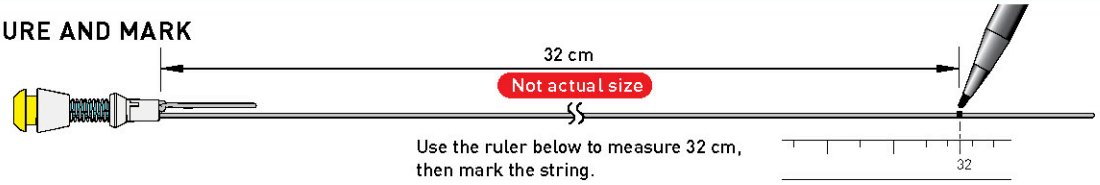
Do not overtighten the screw.

14

15

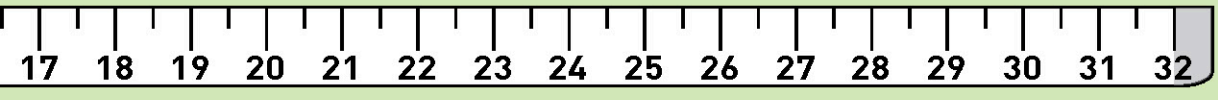


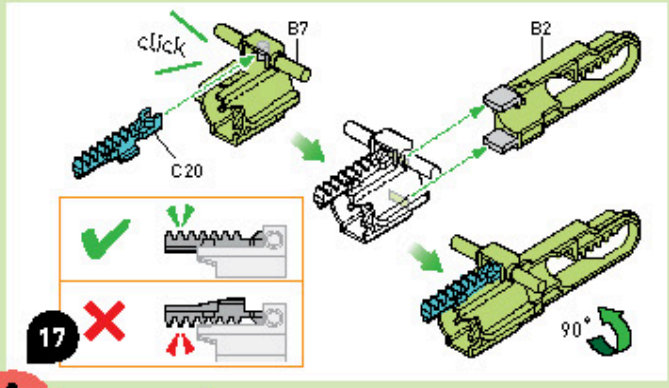
MEASURE AND MARK

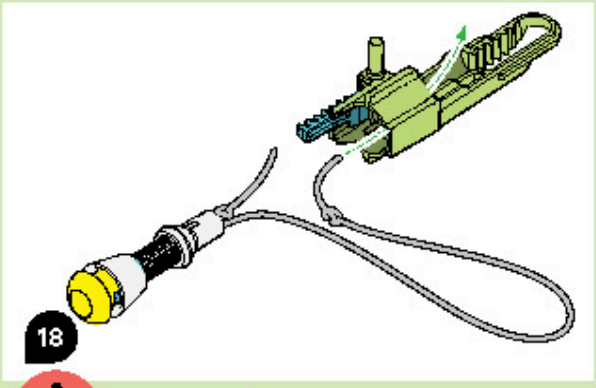


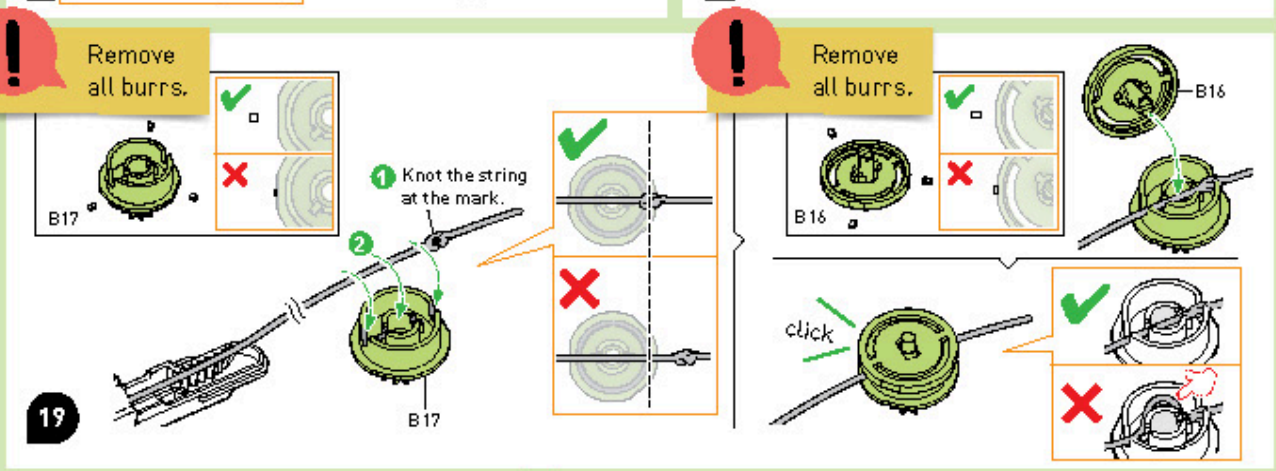
16

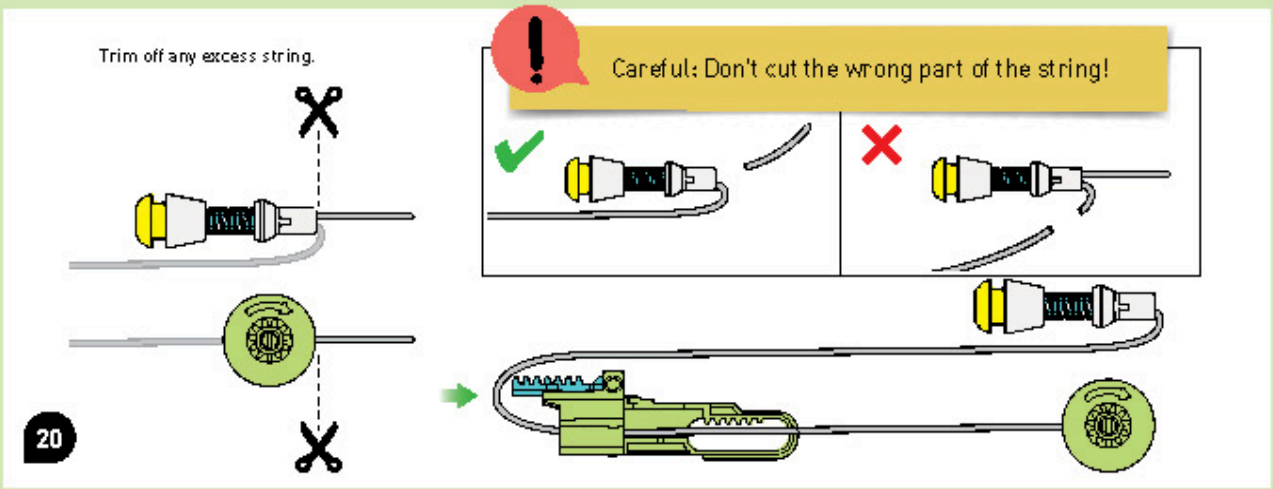


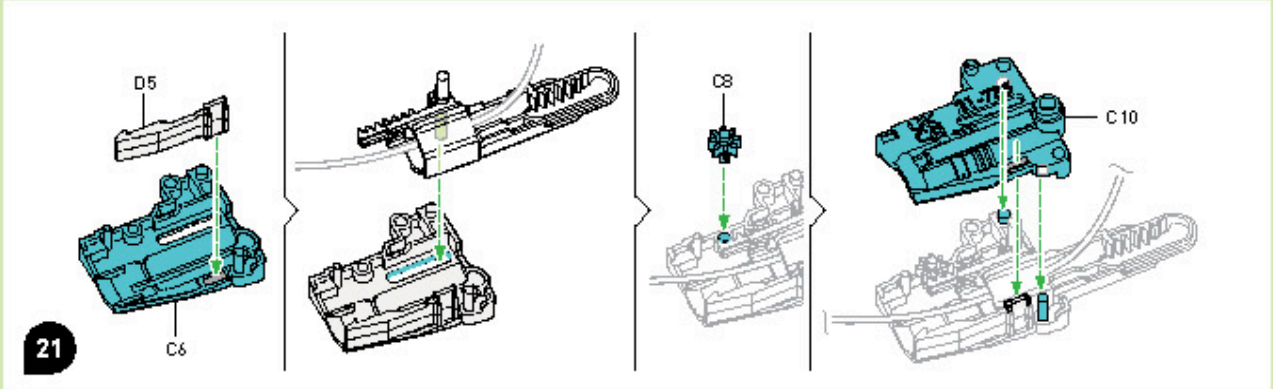



click
B7
B2
C20
90°
17


18

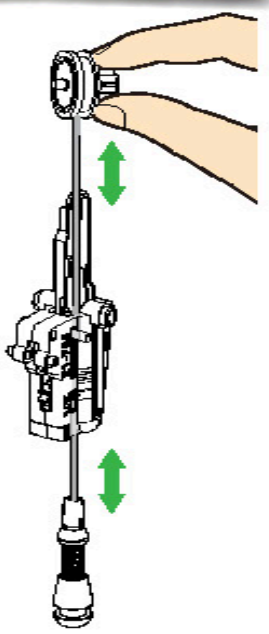

Remove all burrs.
B17
1 Knot the string at the mark.
2
B17
Remove all burrs.
B16
B16
click
19

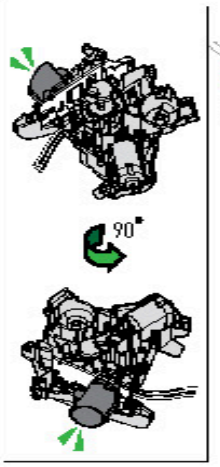

Trim off any excess string.
Careful: Don't cut the wrong part of the string!
20

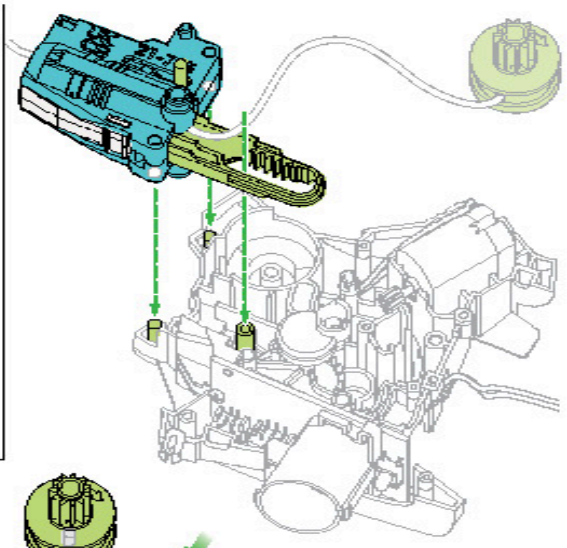

D5
C6
C8
C10
21

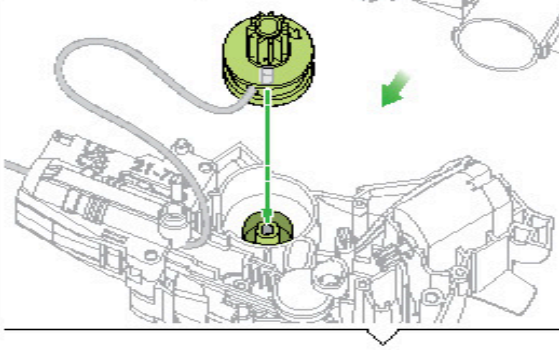
FUNCTION TEST

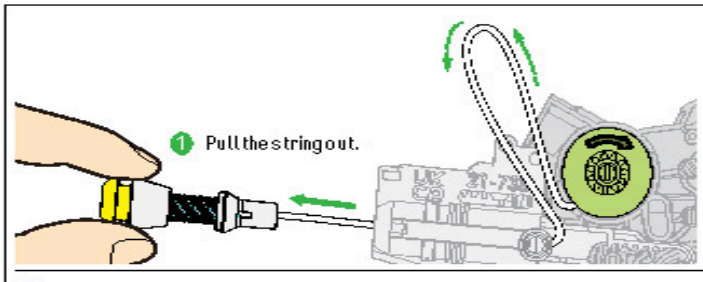
The string must move smoothly and easily.



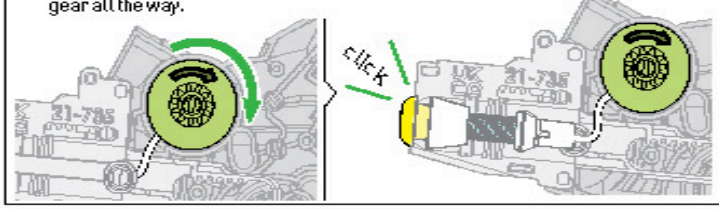


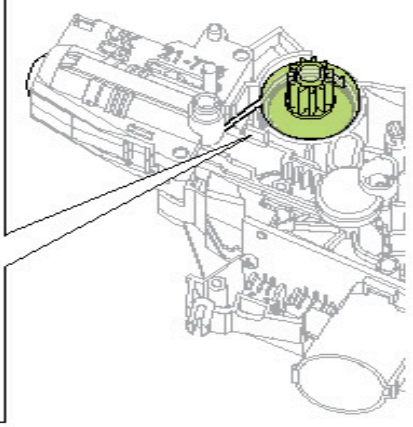




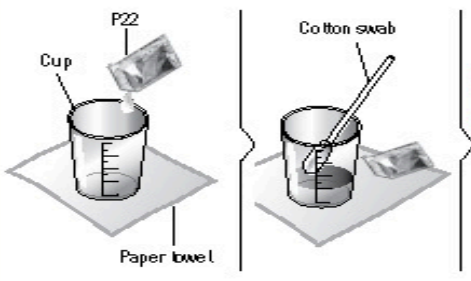


2 Retract the string by winding the gear all the way.





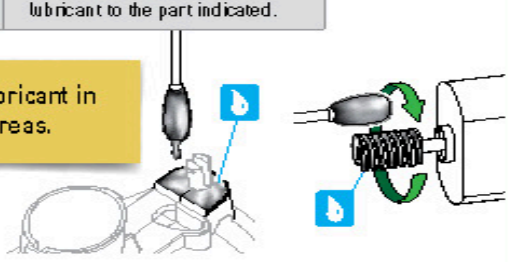
22

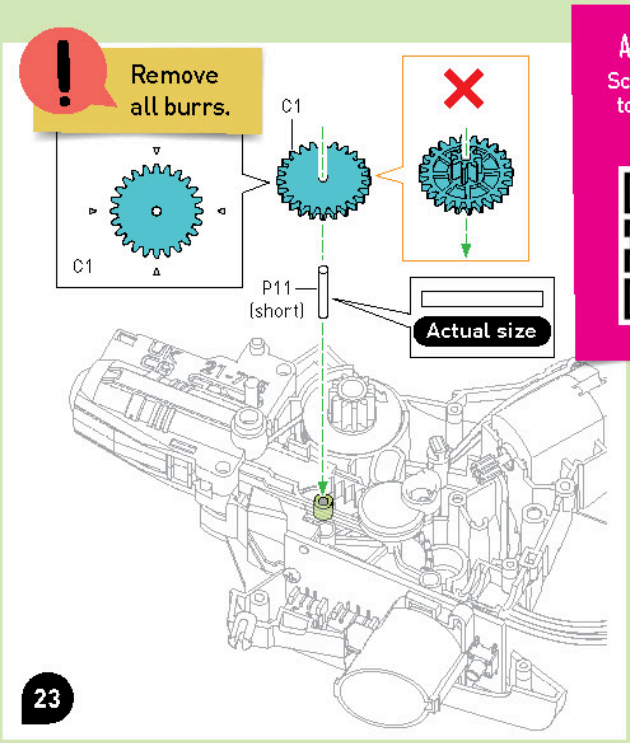


= Apply Lubricant

When you see this symbol, apply lubricant to the part indicated.

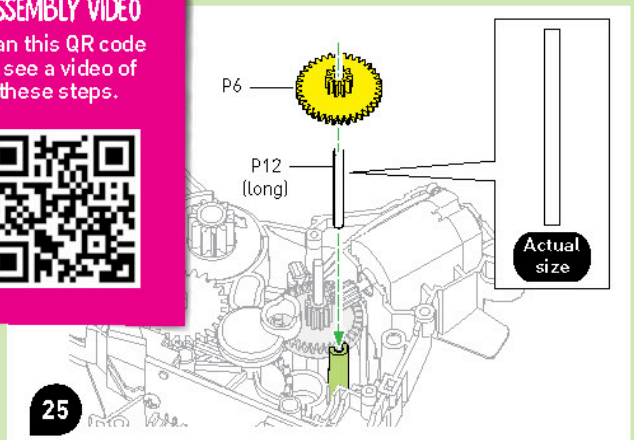
Only apply lubricant in the shaded areas.

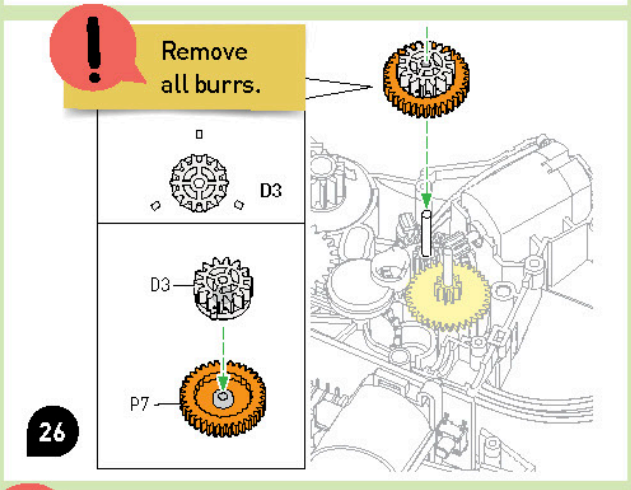


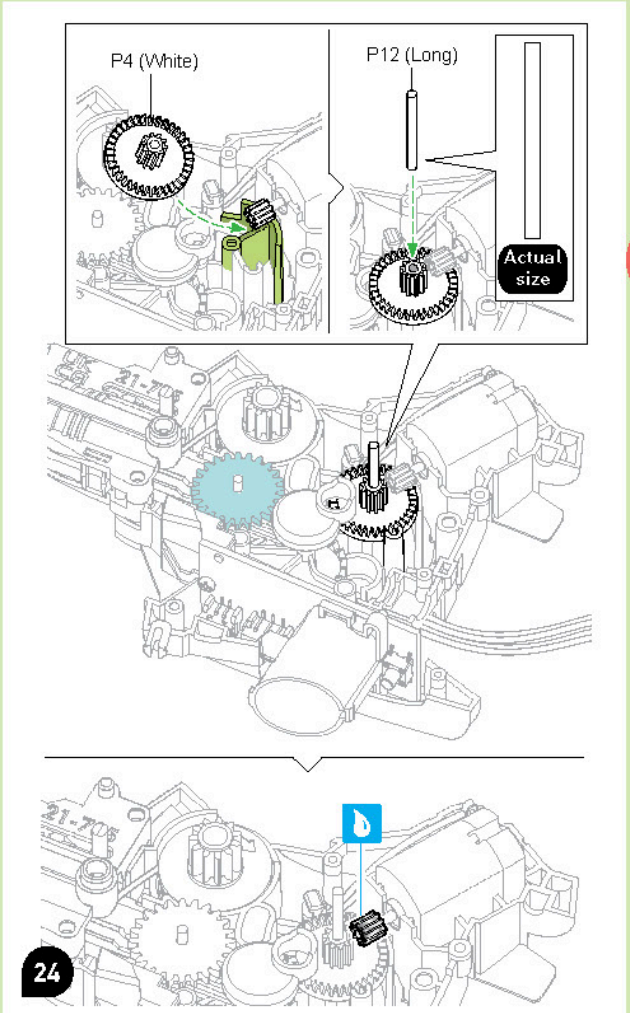


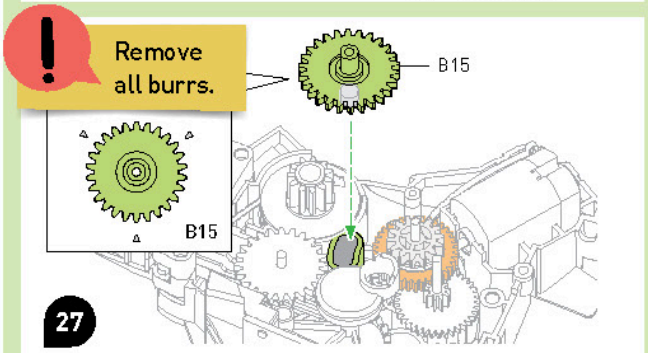
ASSEMBLY VIDEO

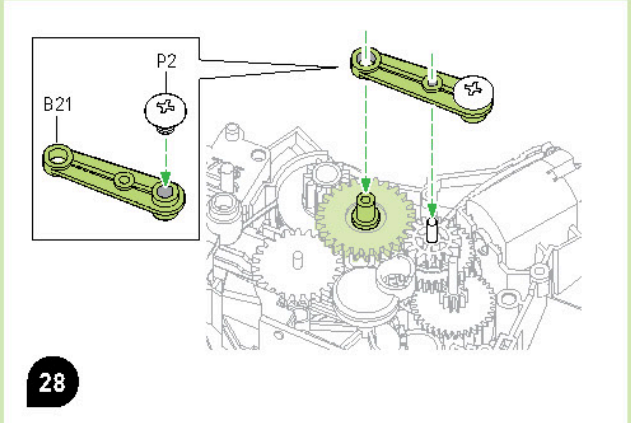
Scan this QR code to see a video of these steps.

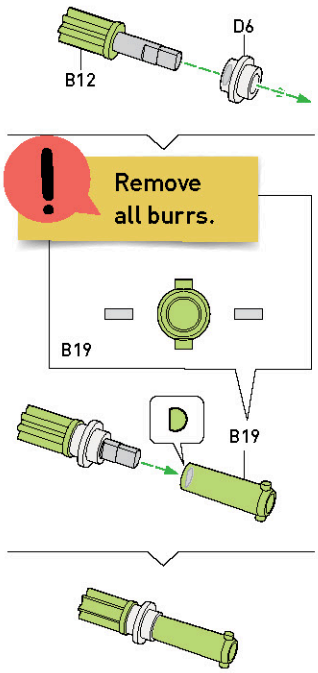




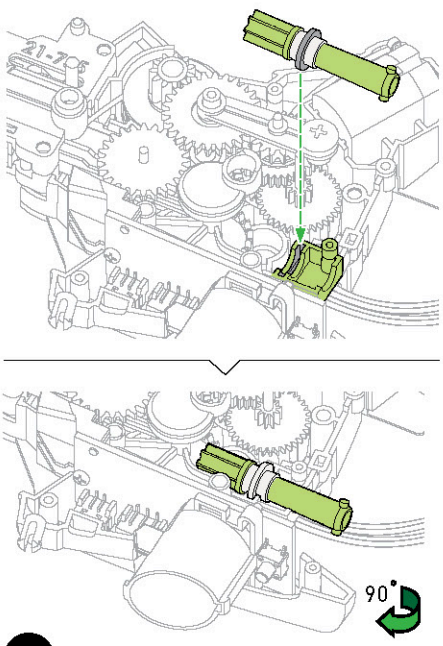




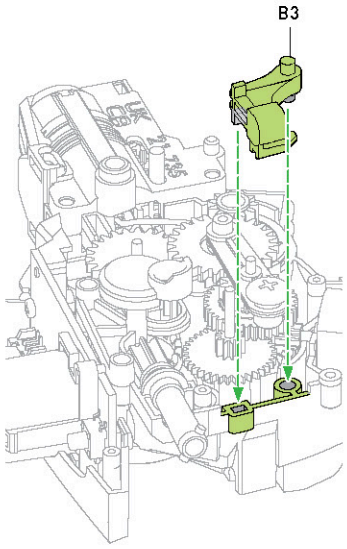




29

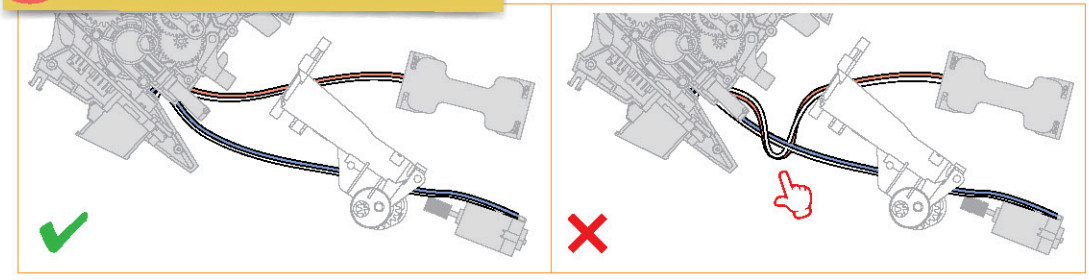


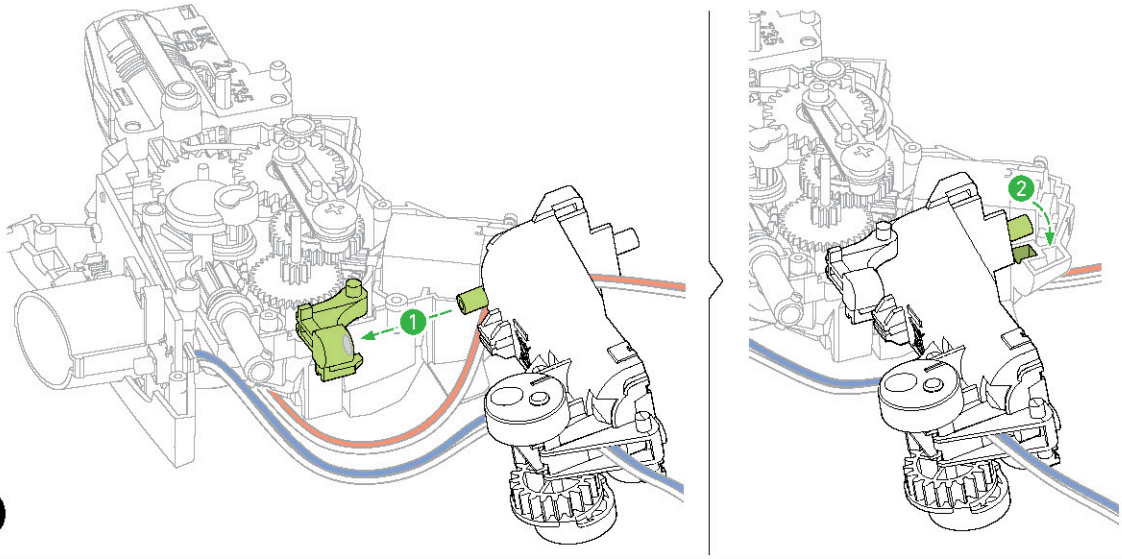
30



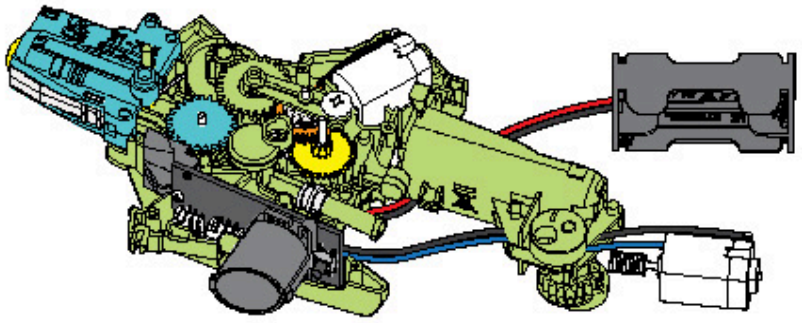
31

Be careful not to tangle the cords.

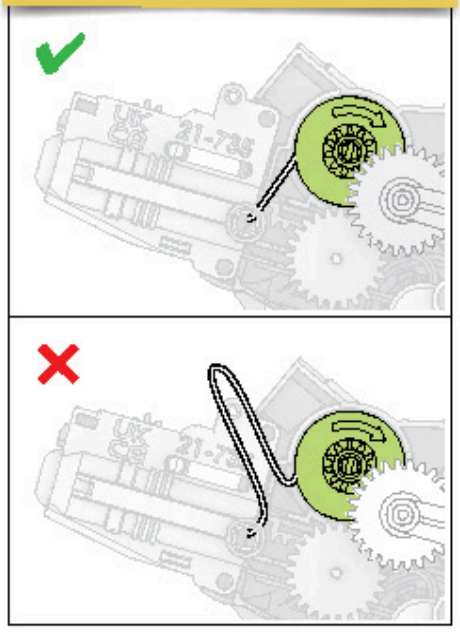


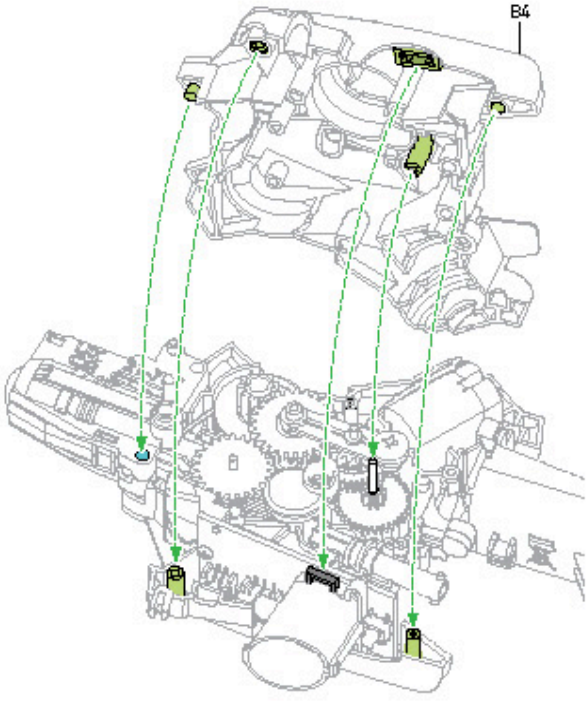


32

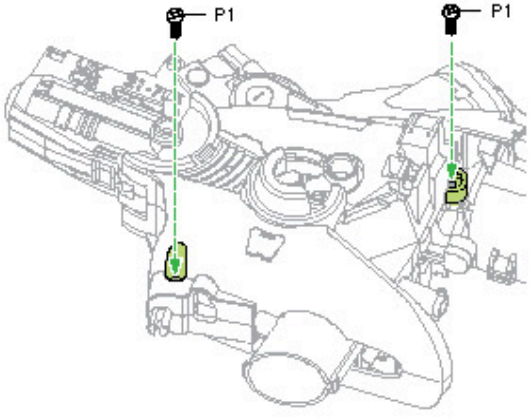


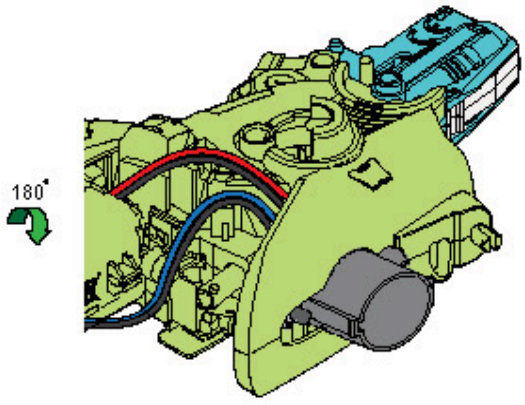
Make sure that the string is completely wound.





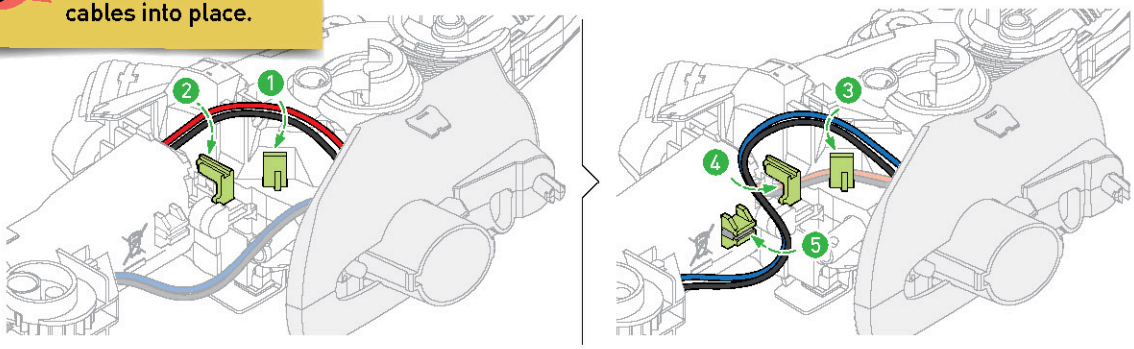
33

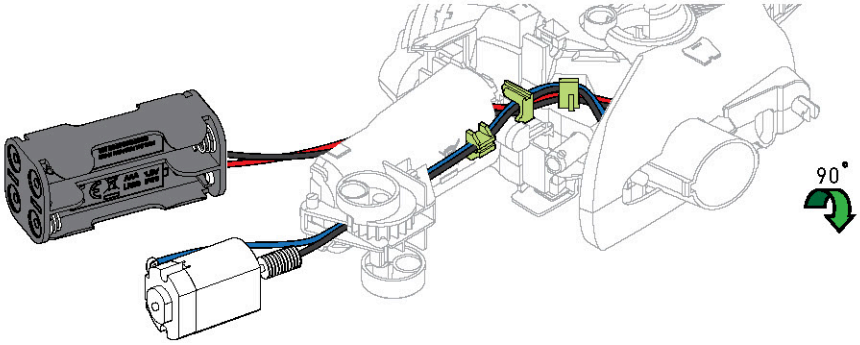




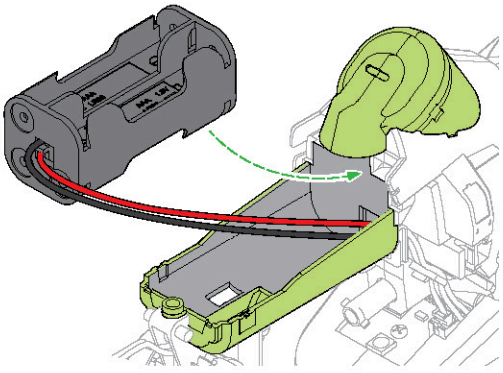
34

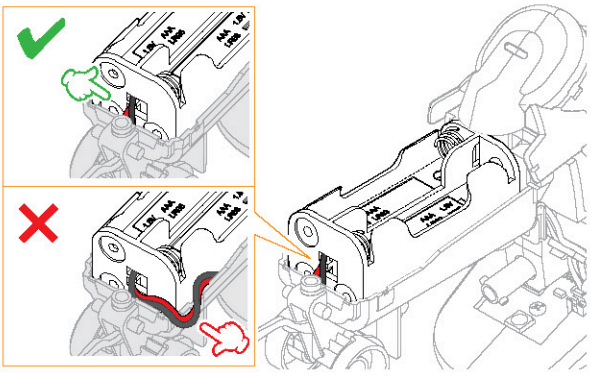
Use part C4 to push cables into place.



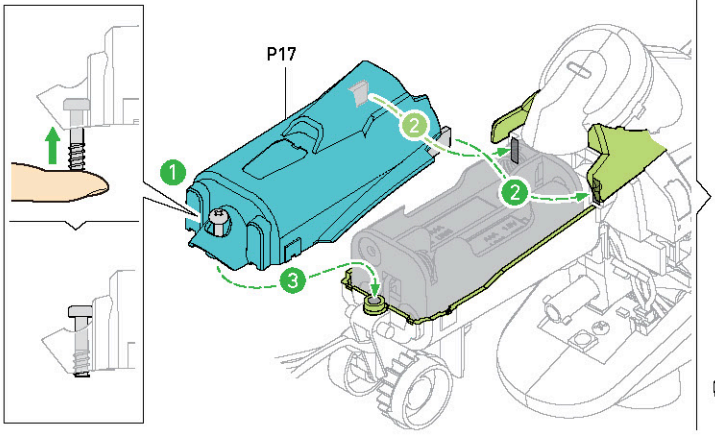


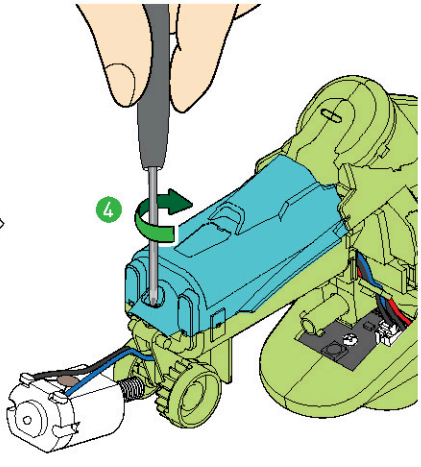
35





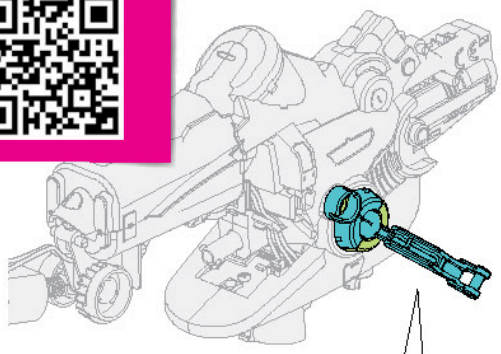
36



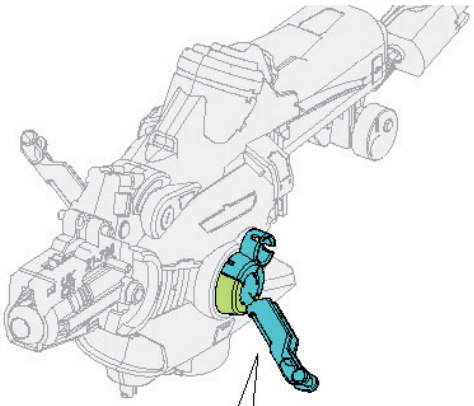


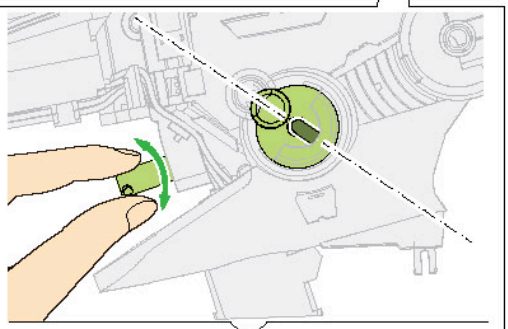
37

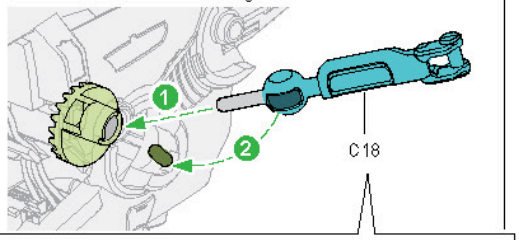
ASSEMBLY VIDEO
Scan this QR code to see a video of these steps.

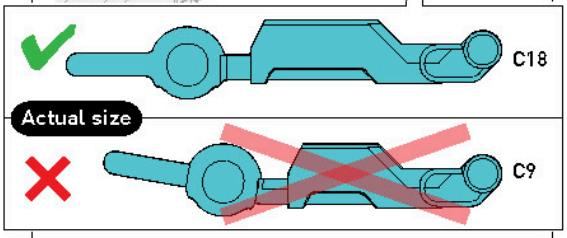


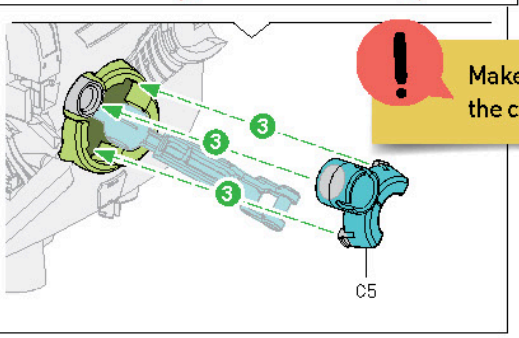




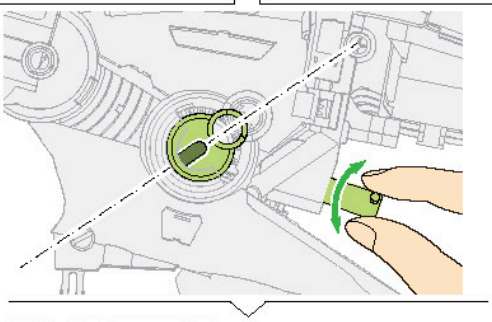


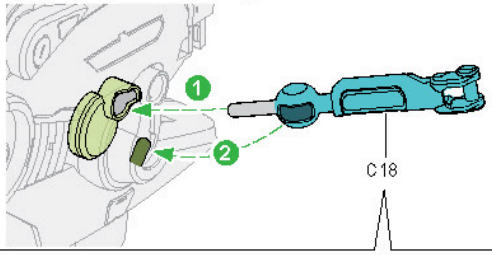


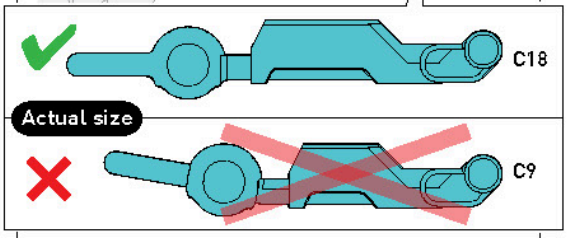


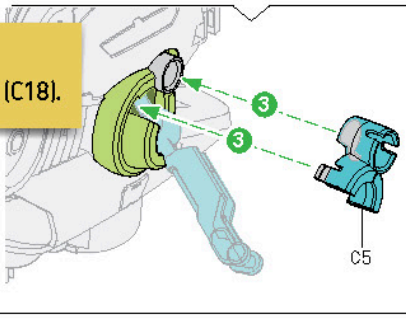


38



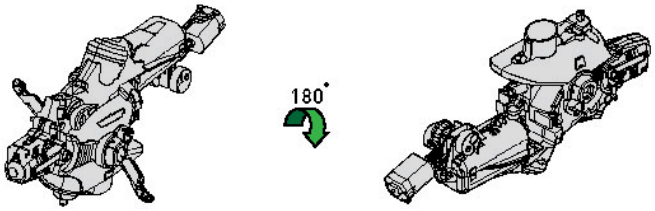


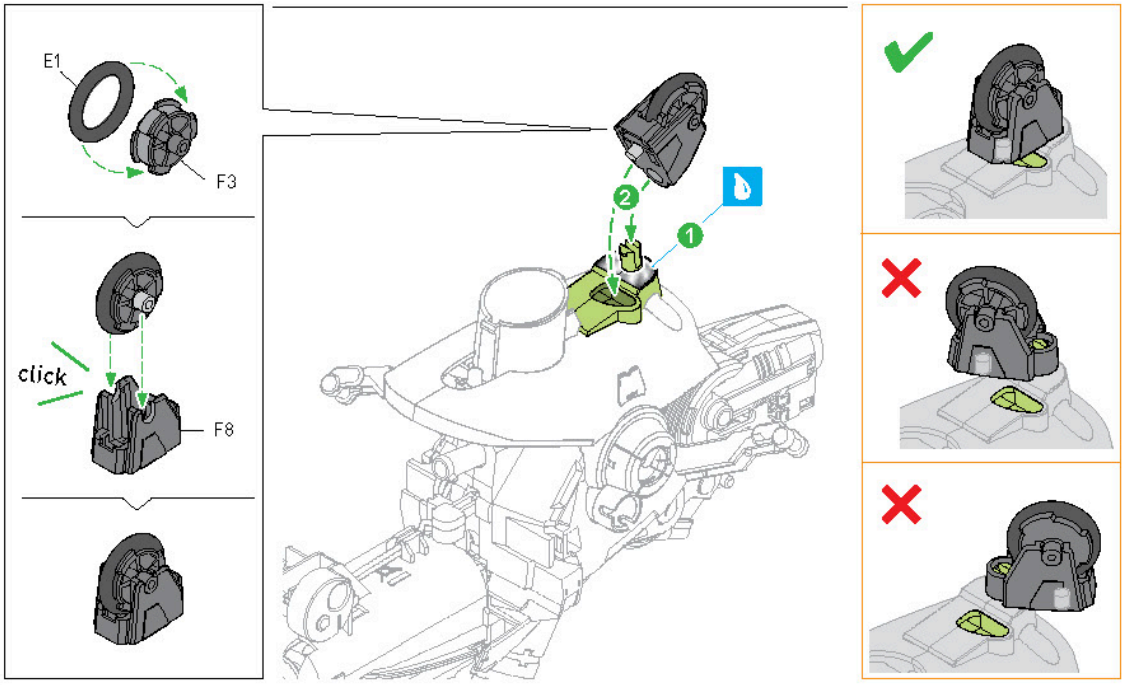




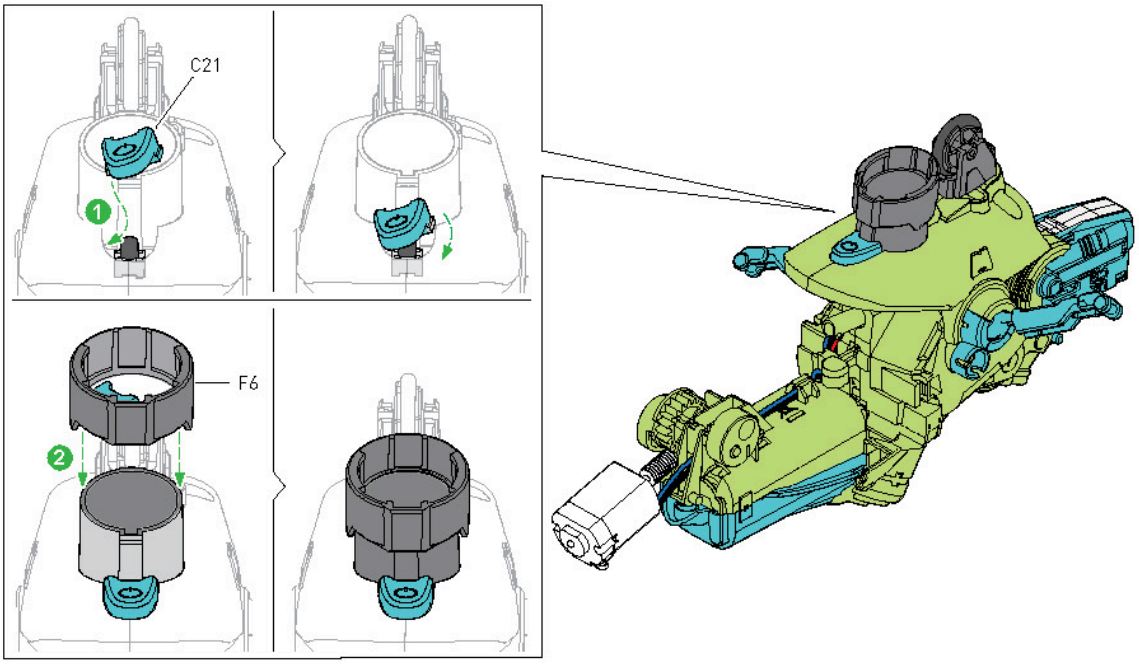
39

Make sure to use the correct parts (C18).

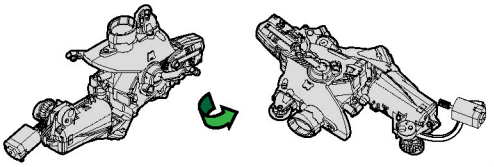


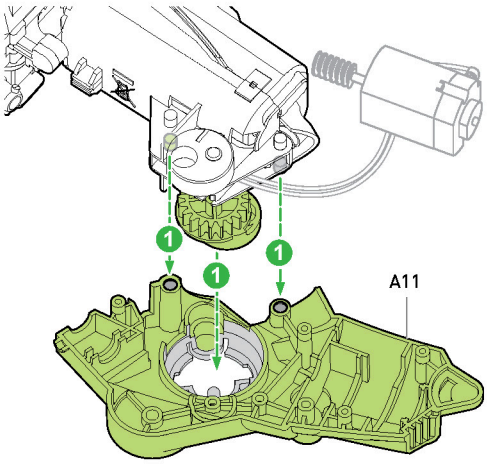


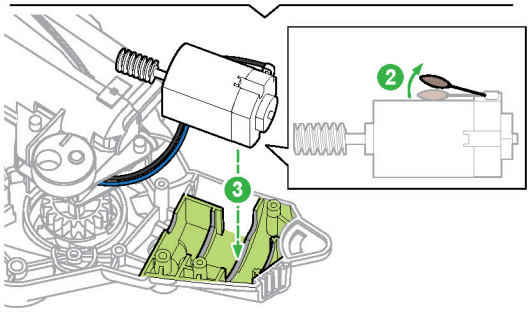
40

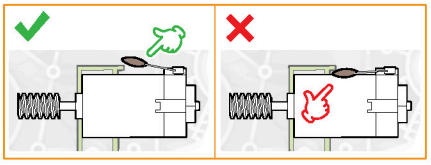


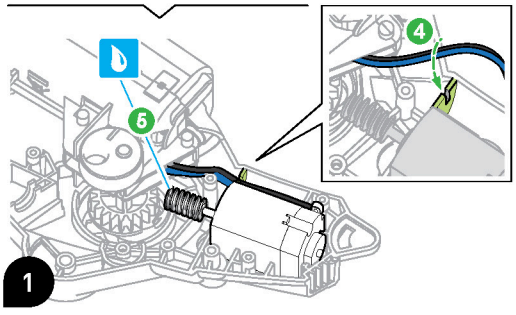
41







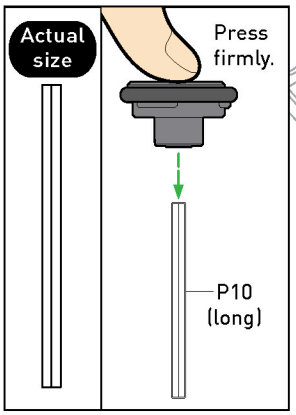


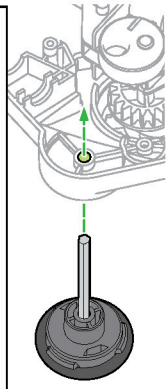


1

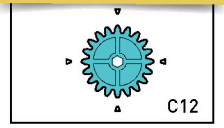
ASSEMBLY VIDEO
Scan this QR code to see a video of these steps.

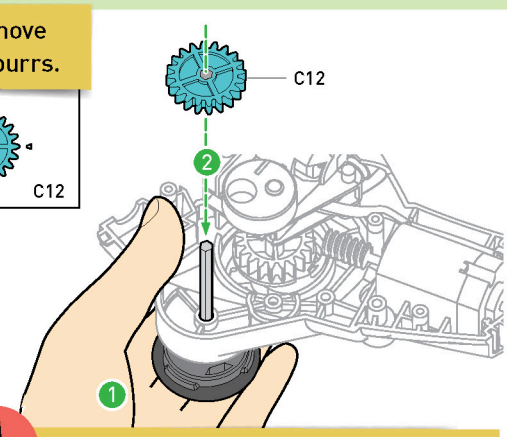
3





Remove all burrs.

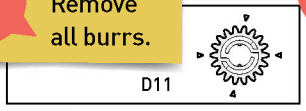




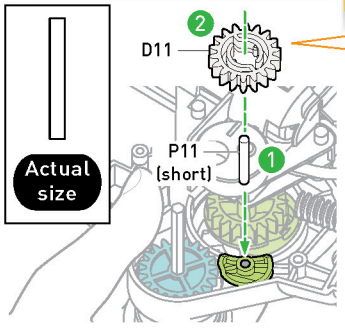
4

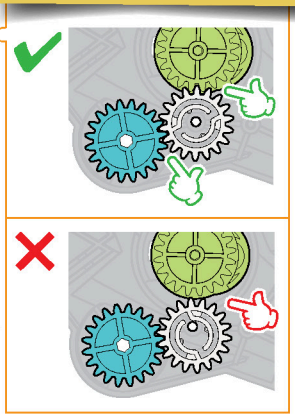
For steps 4–11, hold the wheel from the bottom with your hand.

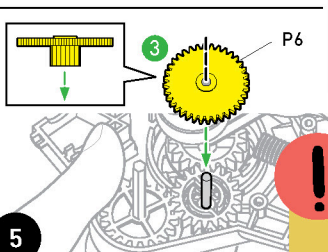
Remove all burrs.



Make sure the teeth of D11 mesh with the teeth of the blue and green gears.



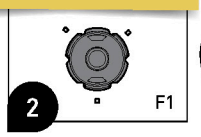


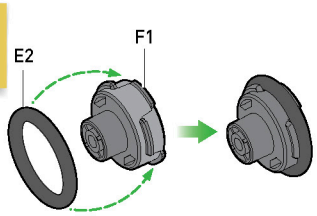


Make sure P6 nests inside D11.

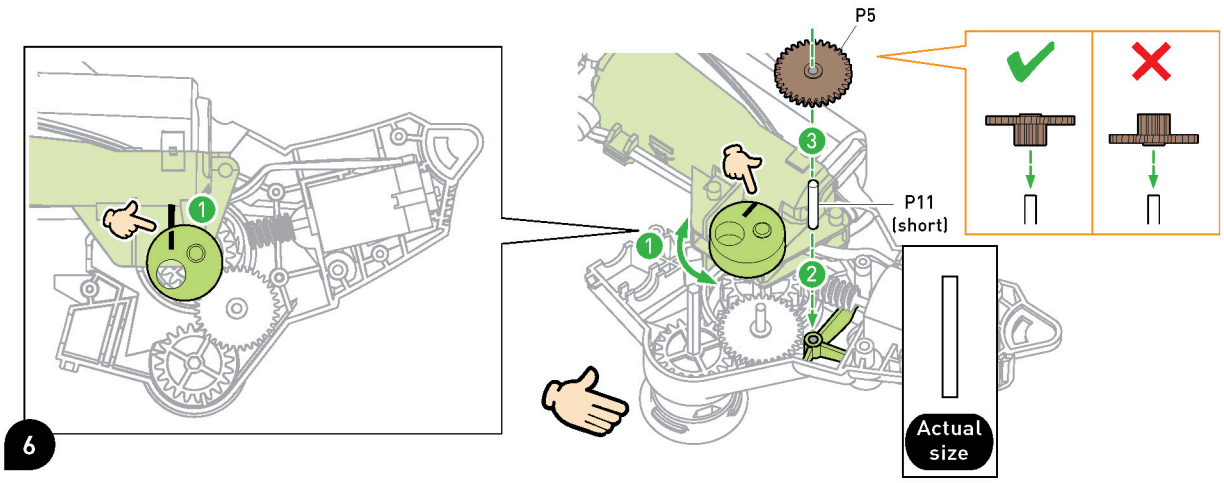
5

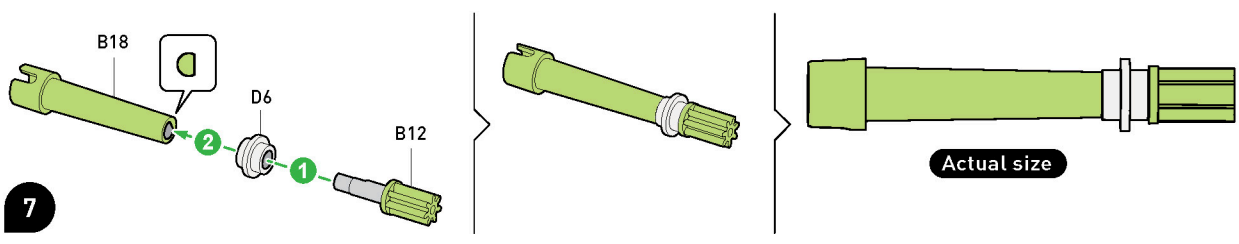
Remove all burrs.

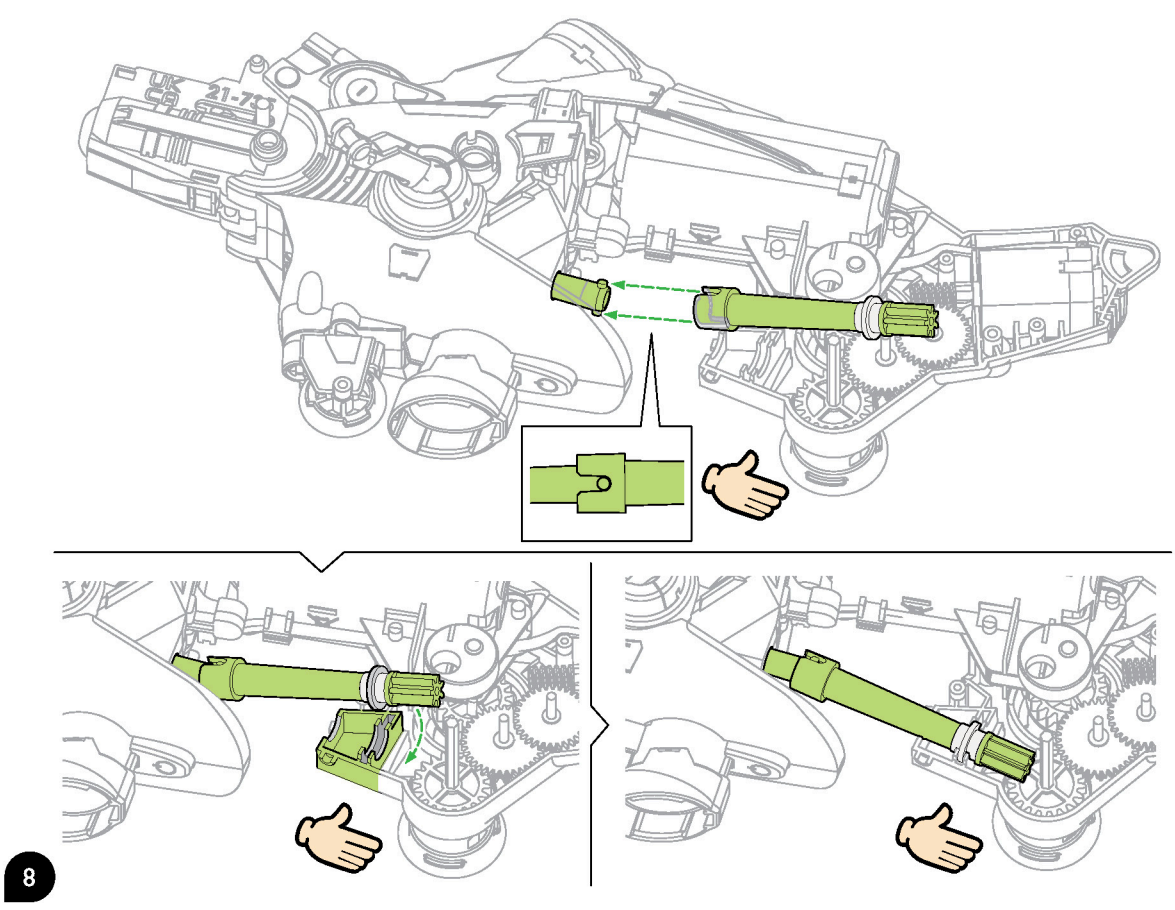


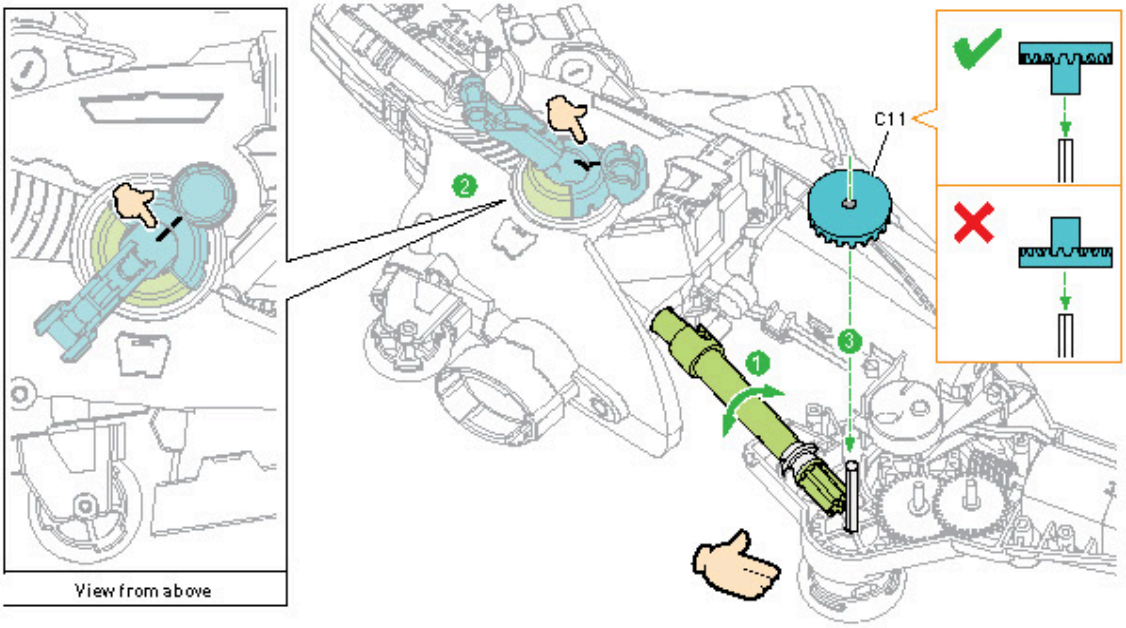


2


P5
P11
(short)
Actual
size
6

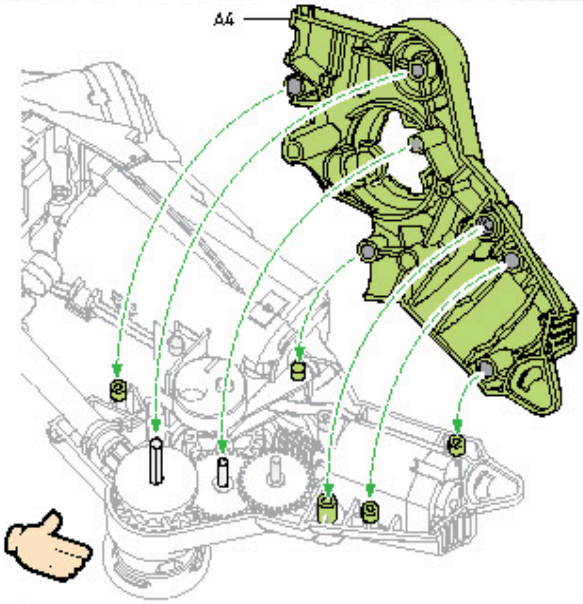

B18
D6
B12
Actual size
7

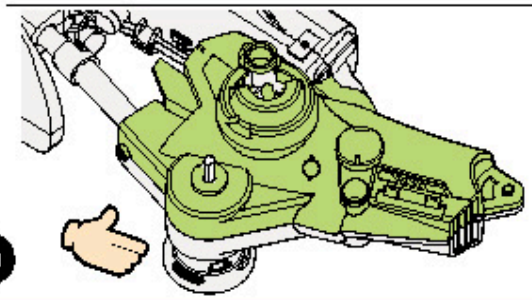

8



9

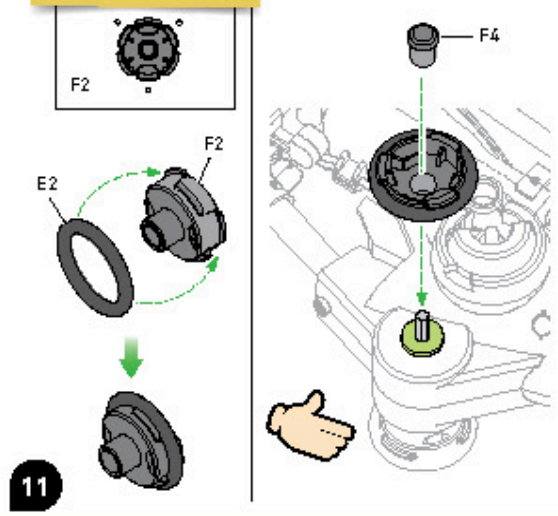
Be very careful with this step and take your time. Make sure that the axle and wheel do not slip out.



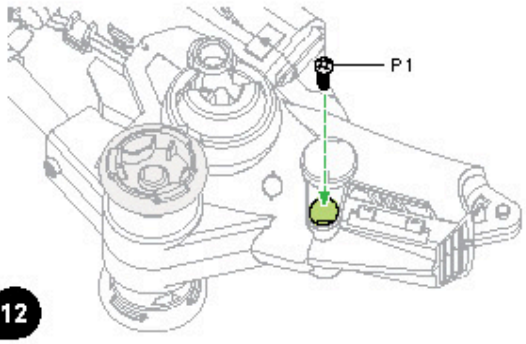


10

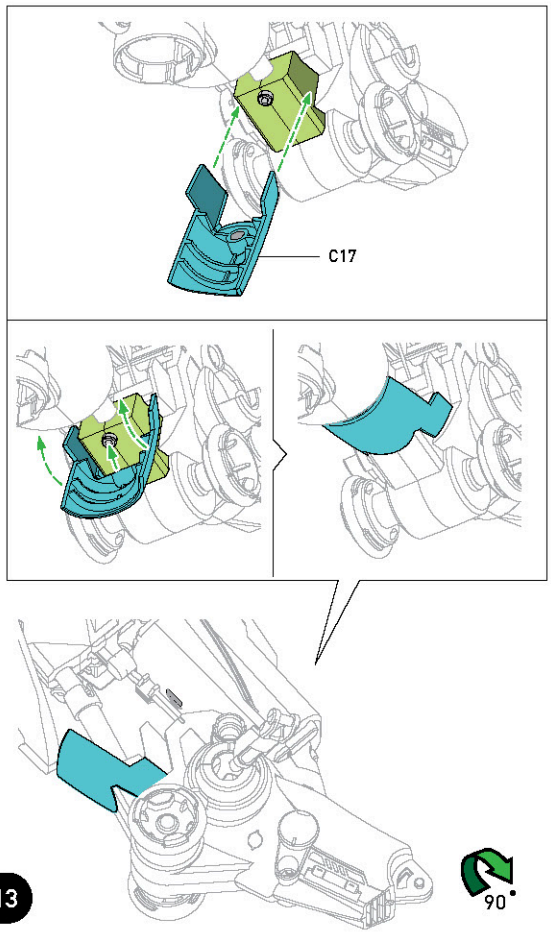
Remove all burrs.



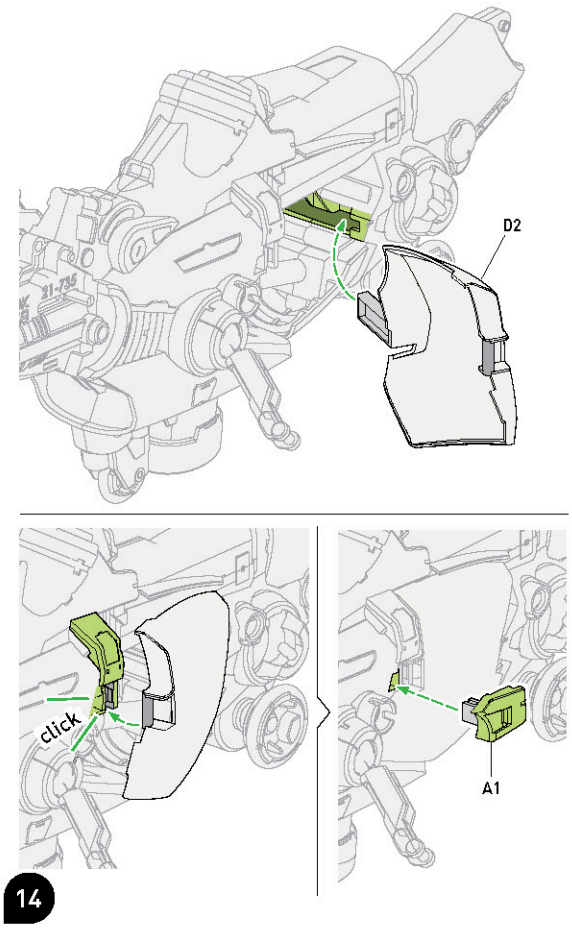
11



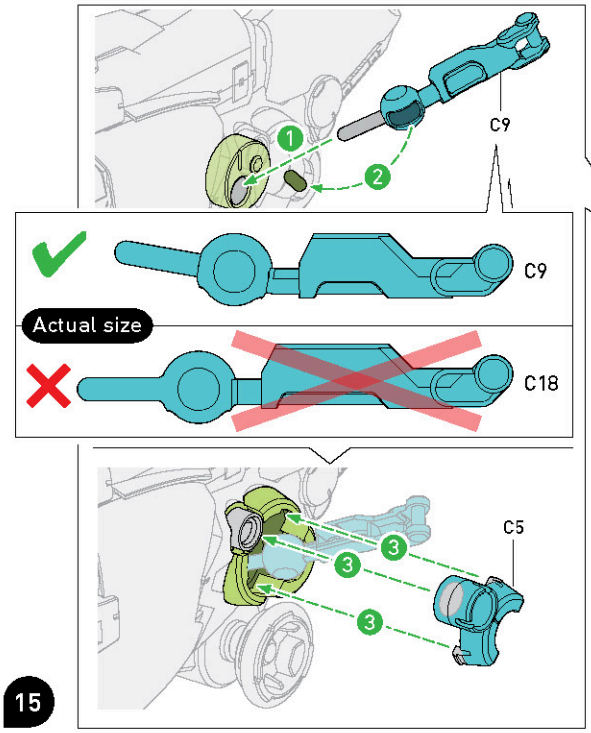
12



13

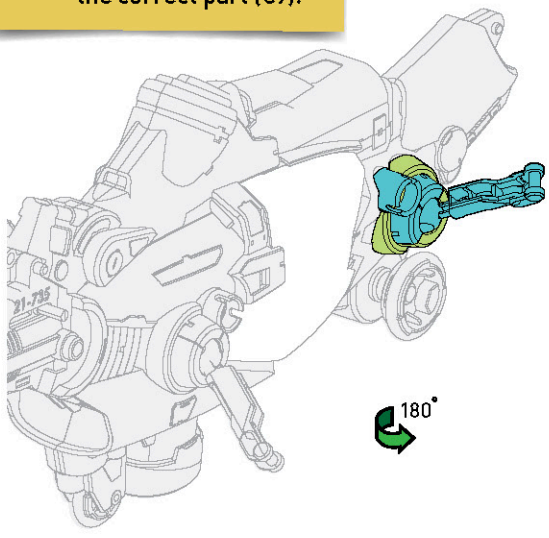


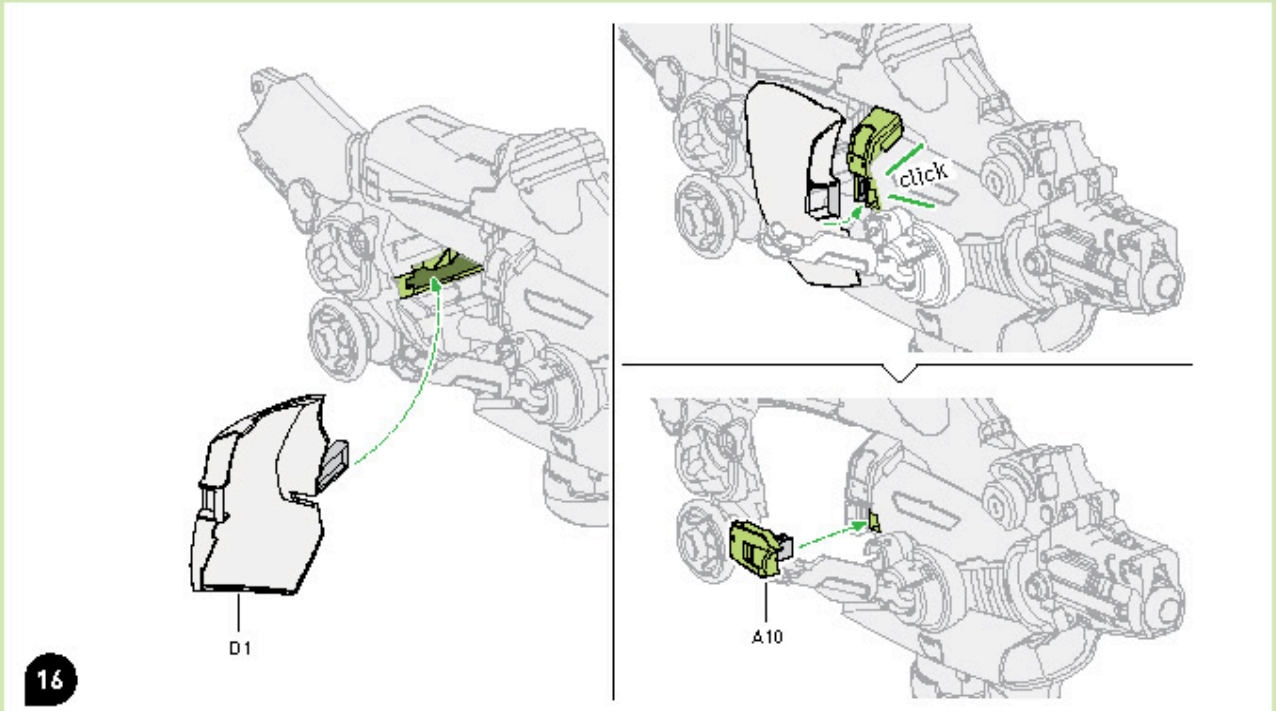
14



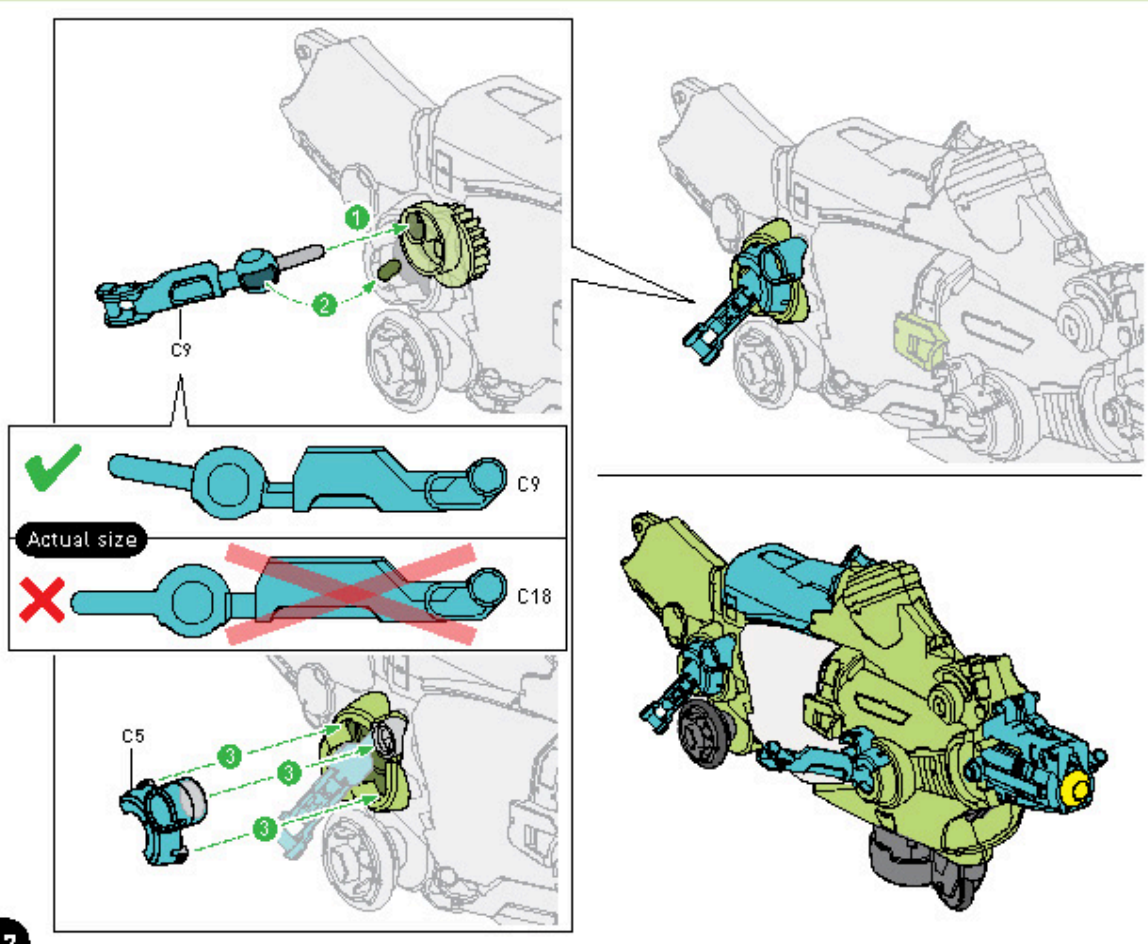
15

Make sure to use the correct part (C9).



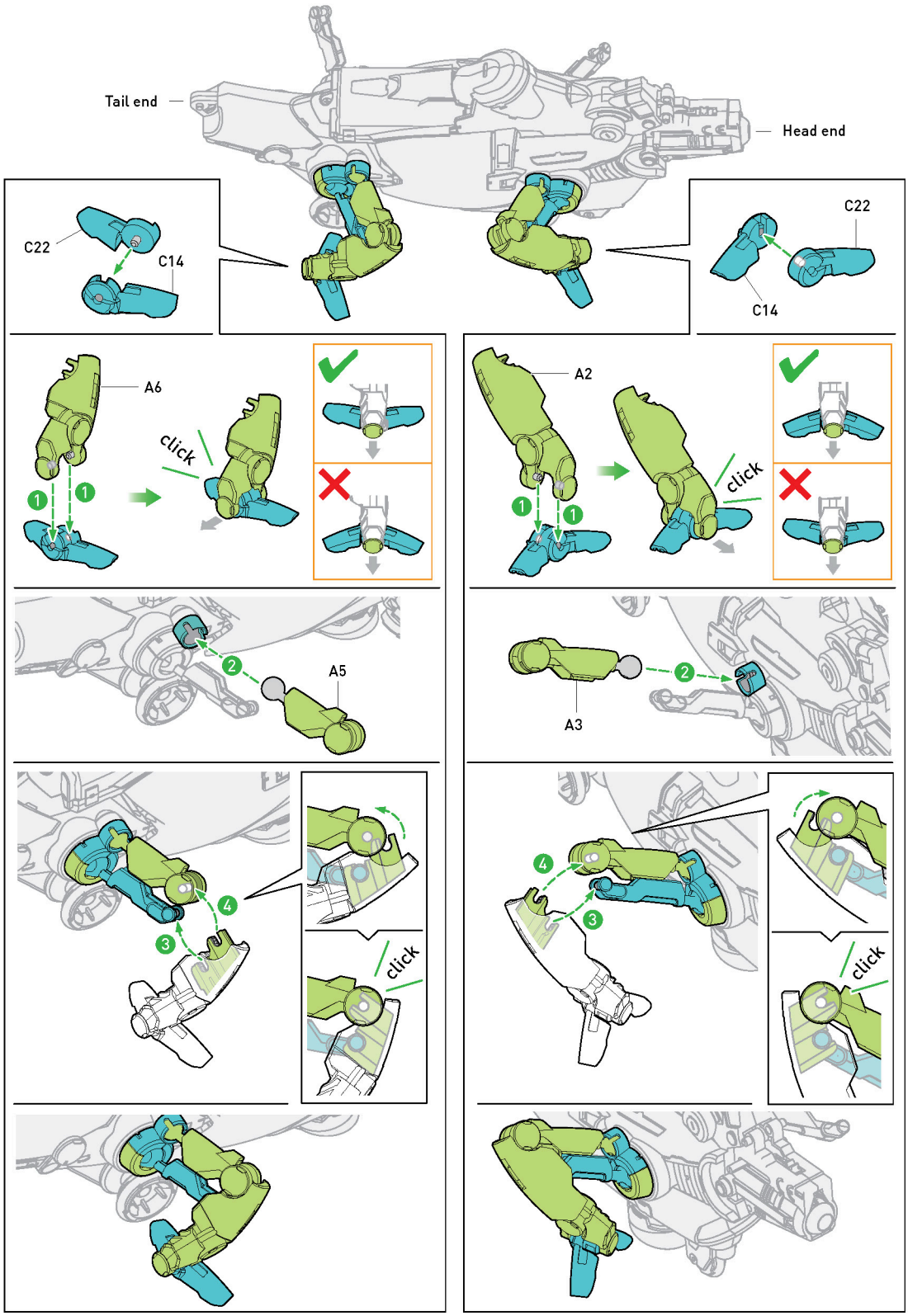


16

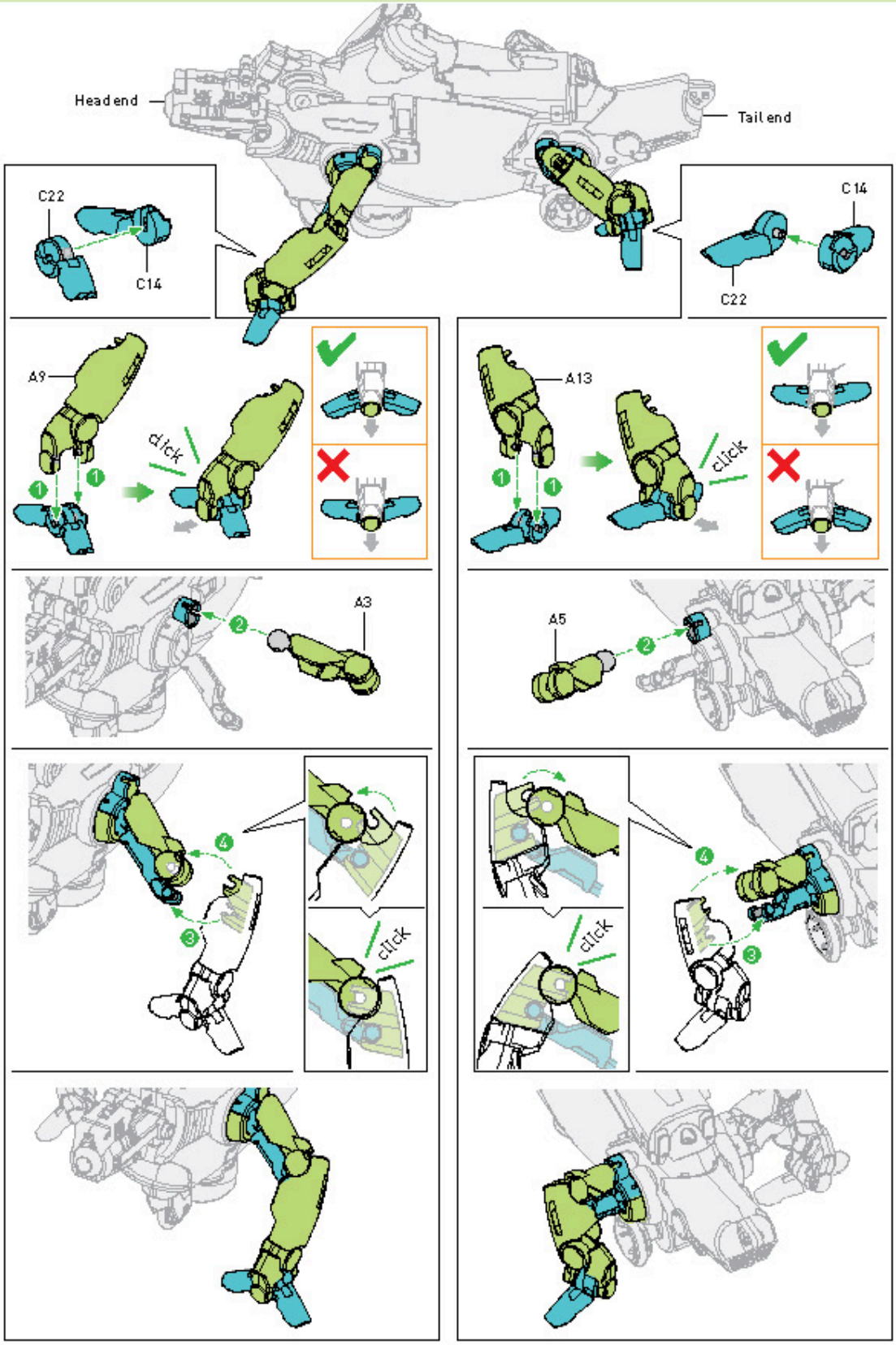


17

ASSEMBLING THE LEGS

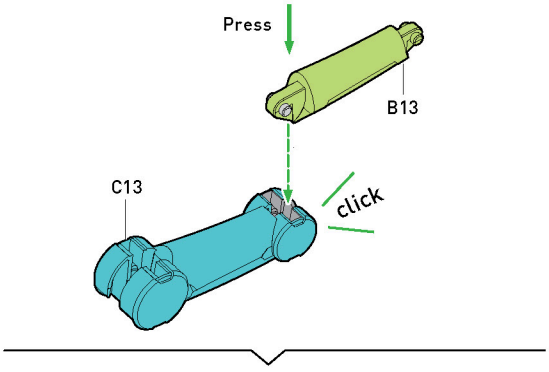


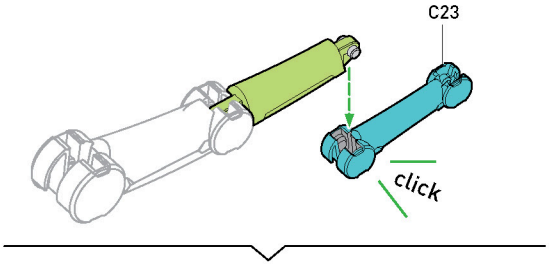
1

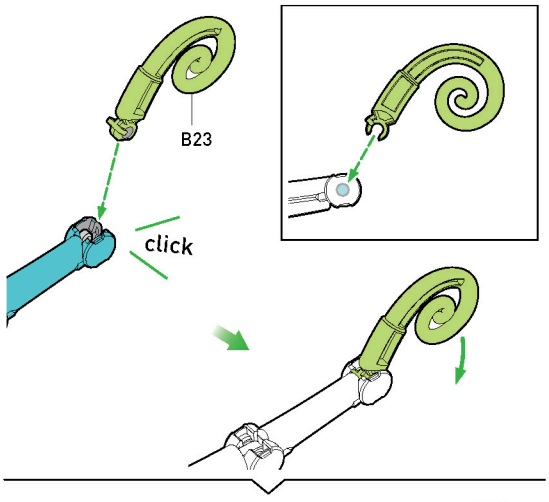

Head end
Tail end
C22
C14
C14
C22
A9
click
A13
click
A3
A5
click
click

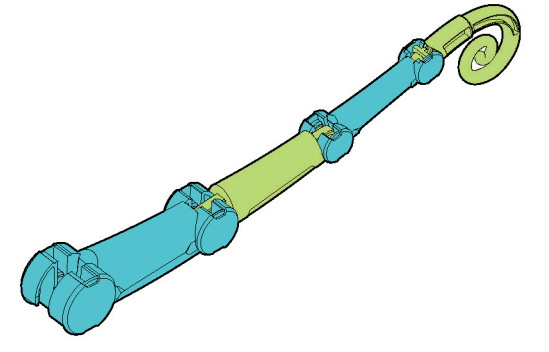
2

ASSEMBLING THE TAIL

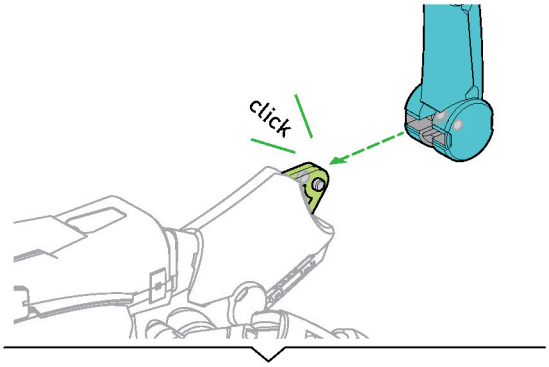


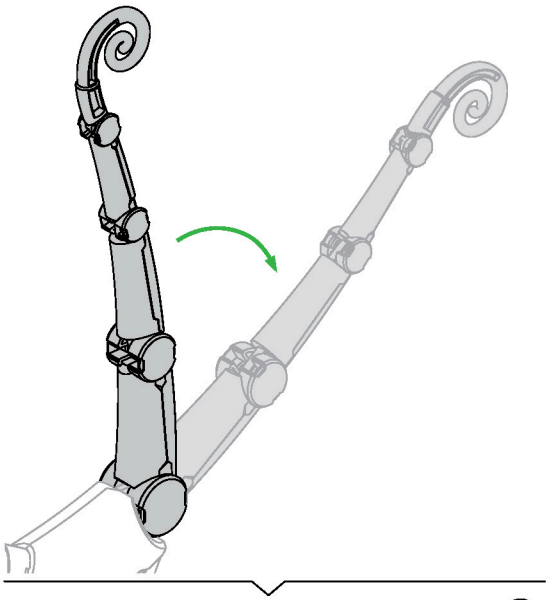


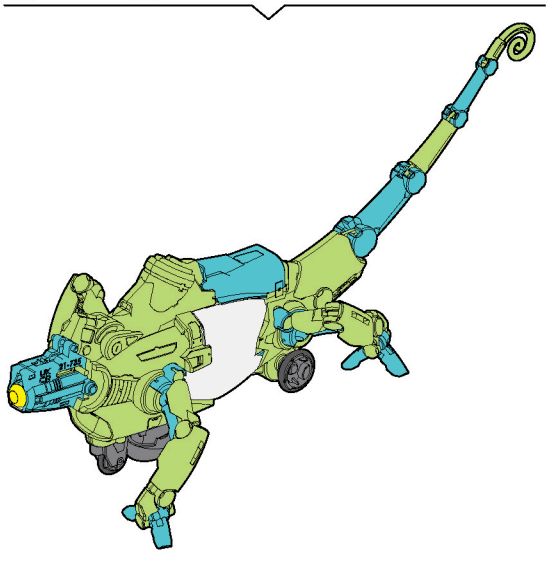




1



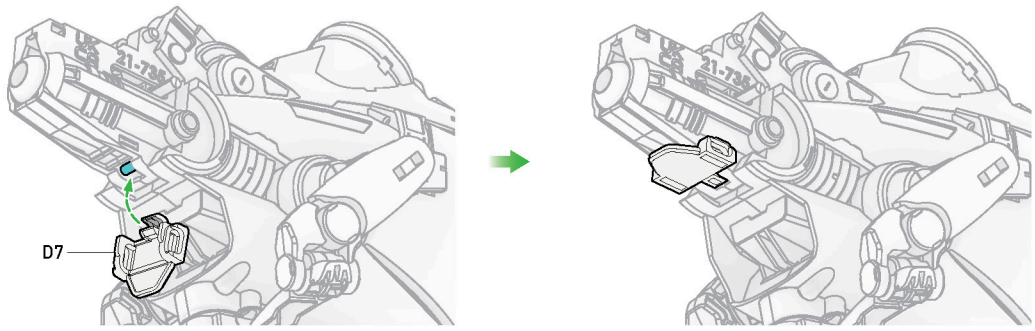




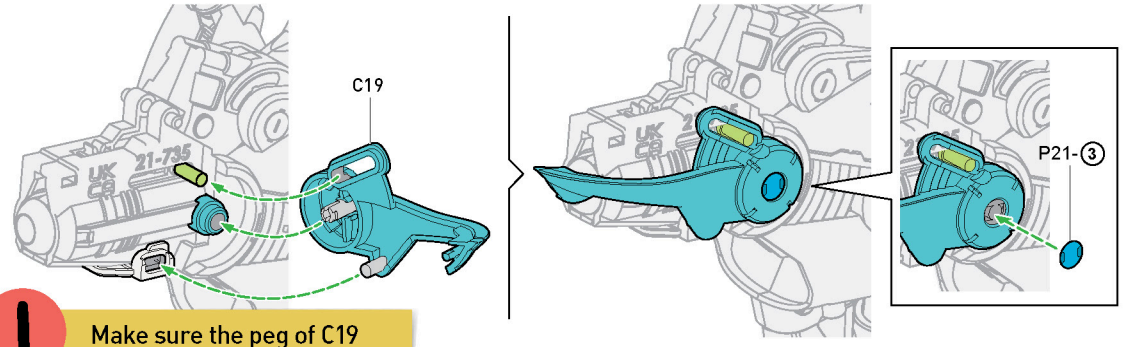
2

ASSEMBLING THE HEAD

1

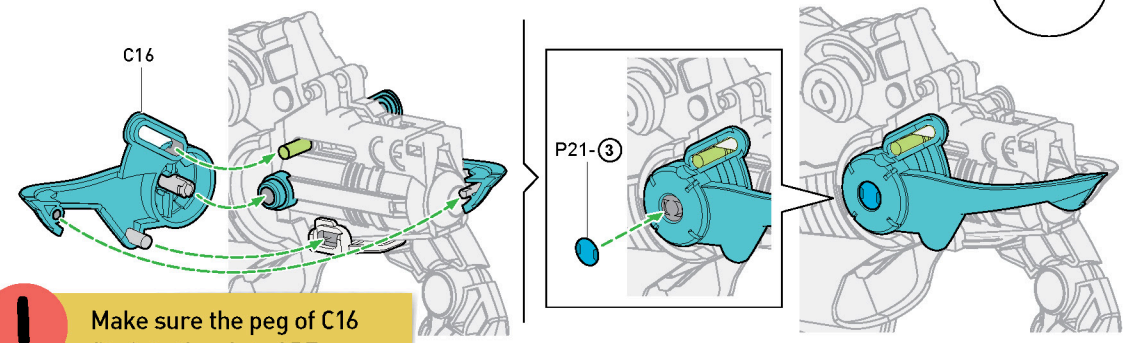


2



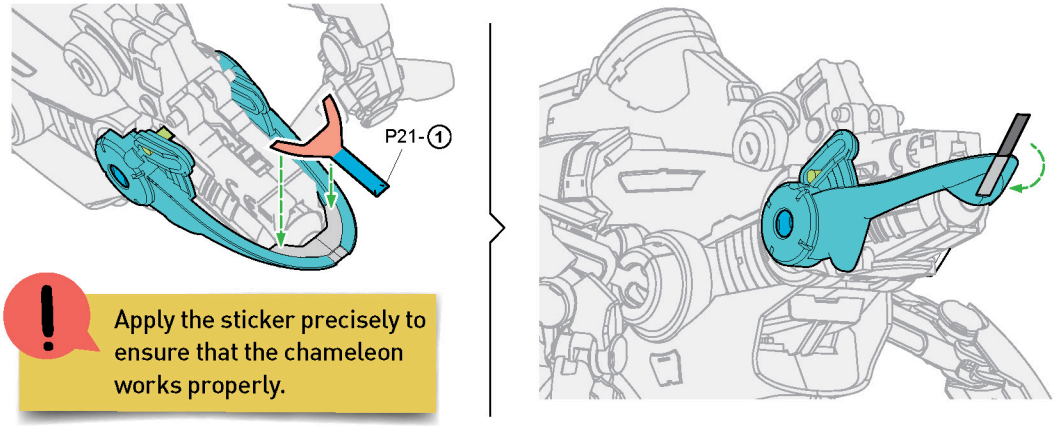
Make sure the peg of C19 fits into the slot of D7.

3

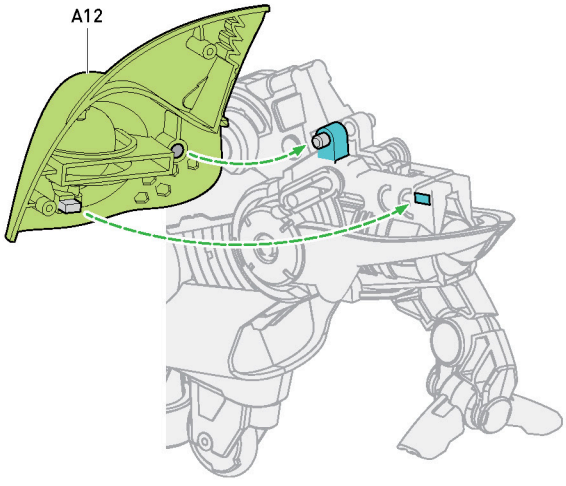


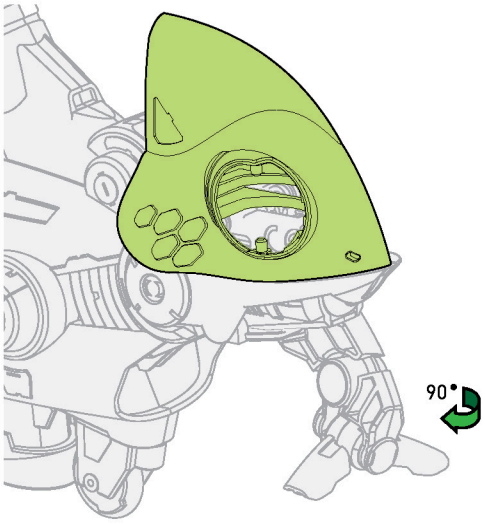
Make sure the peg of C16 fits into the slot of D7.

4

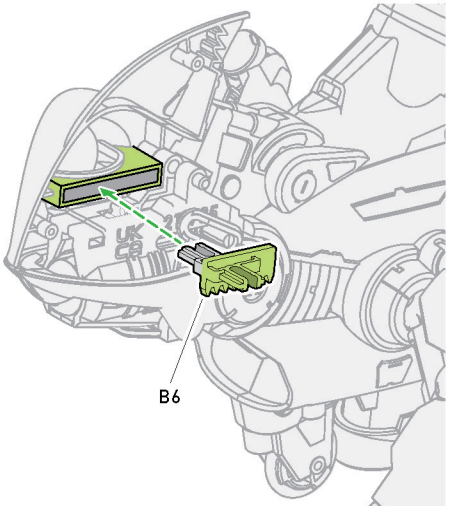


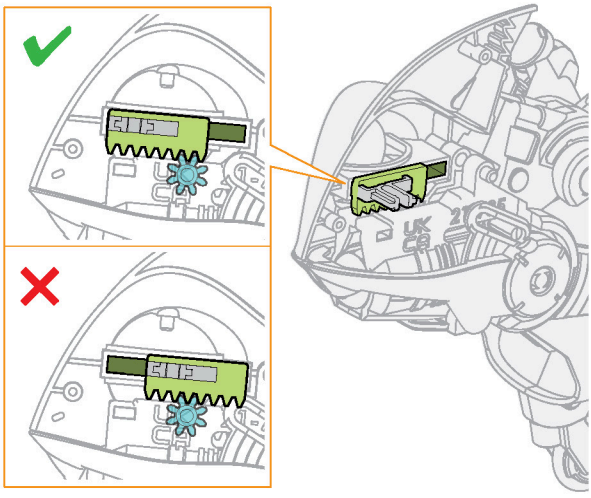
Apply the sticker precisely to ensure that the chameleon works properly.



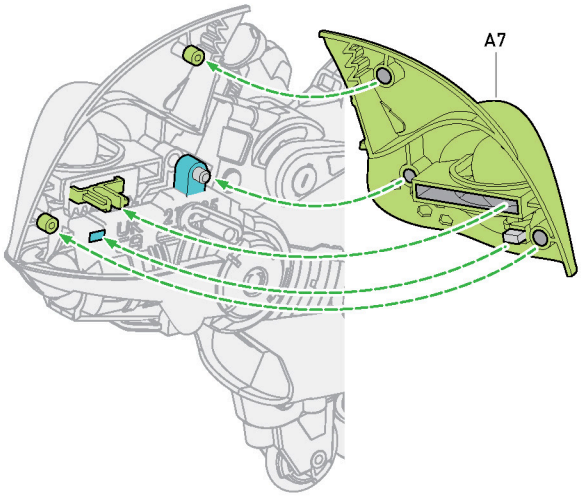


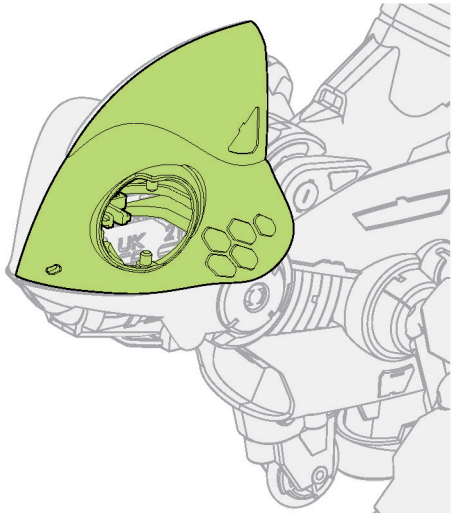
5



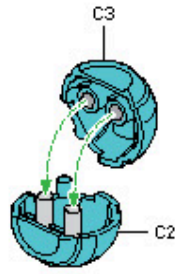


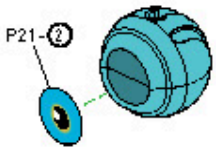
6





7

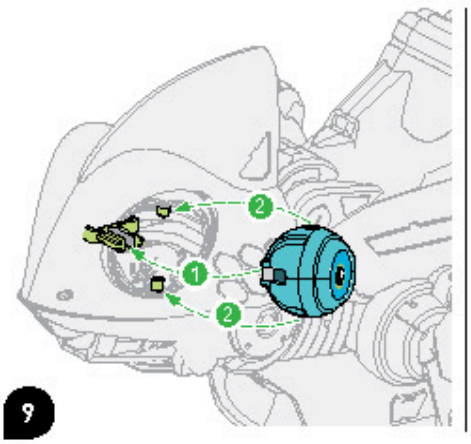




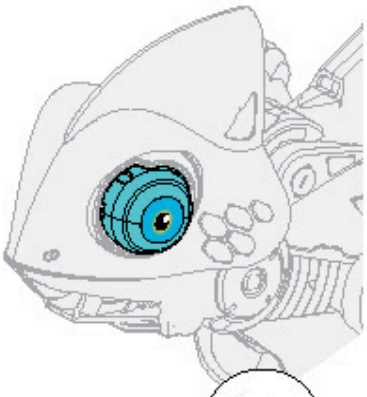


2x

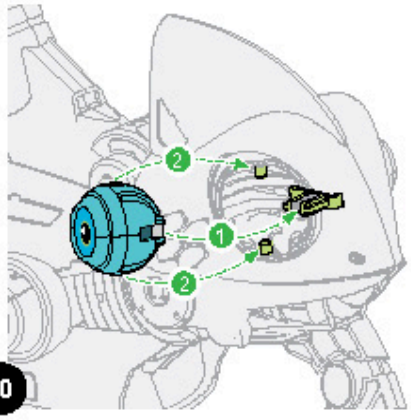
8



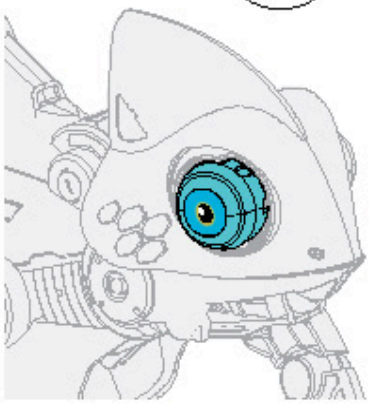
9

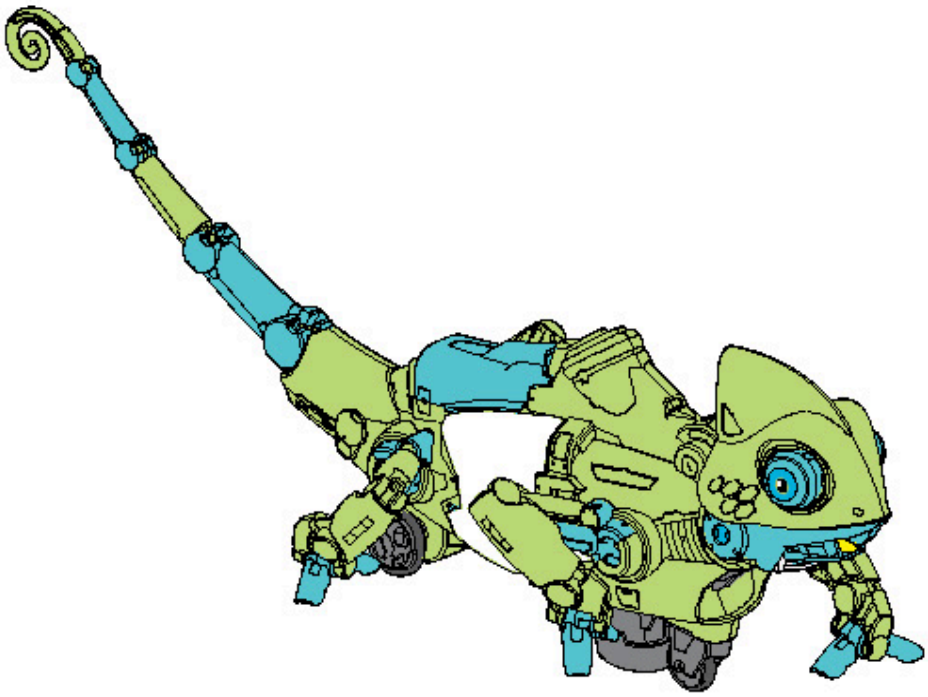


180°



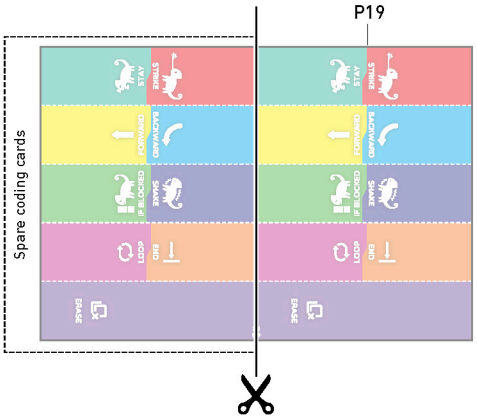
10





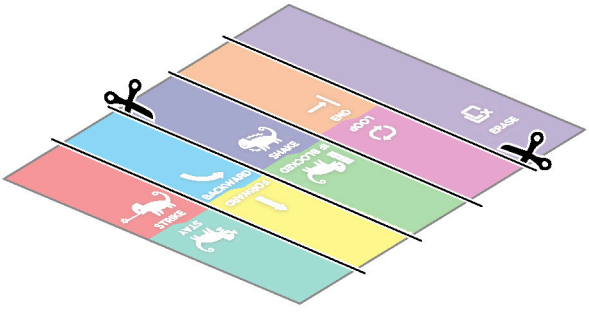
Done!

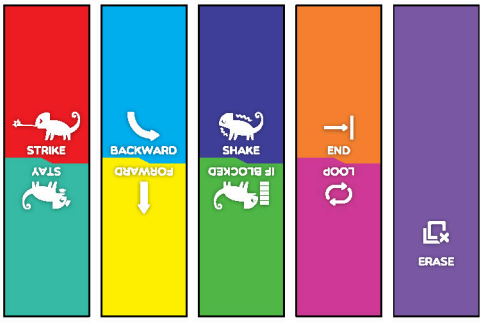
CODING CARDS



Use scissors to carefully cut along the dotted lines. You will learn how to use the coding cards on page 41.

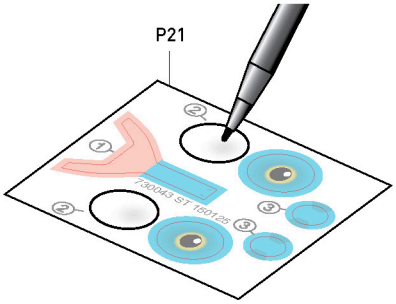
1



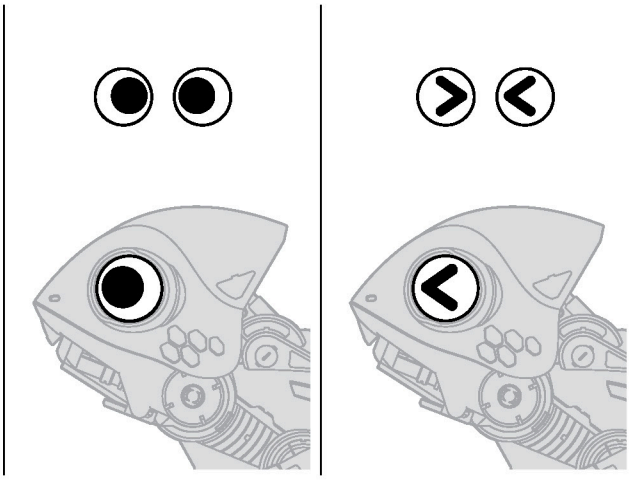


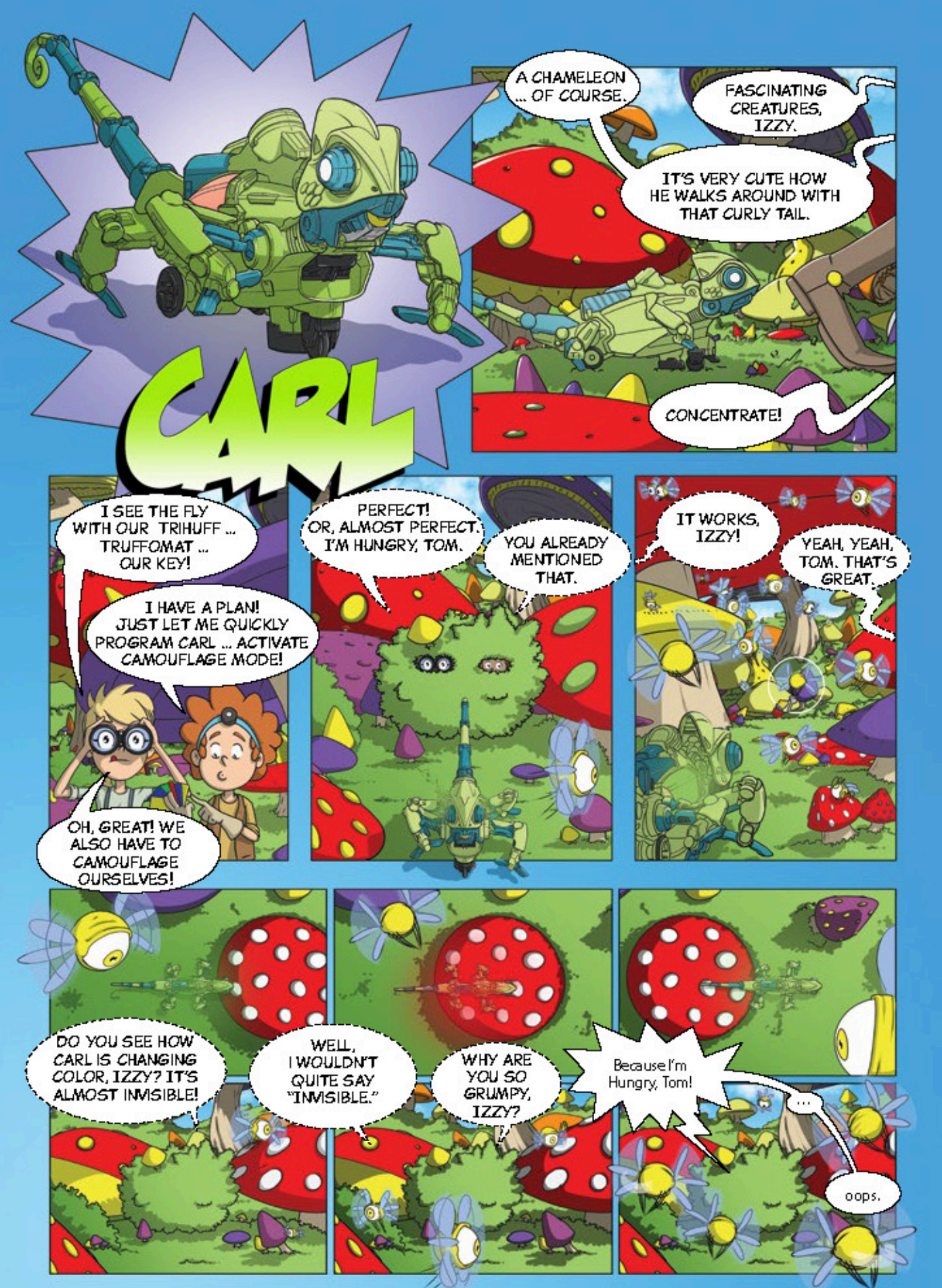
2

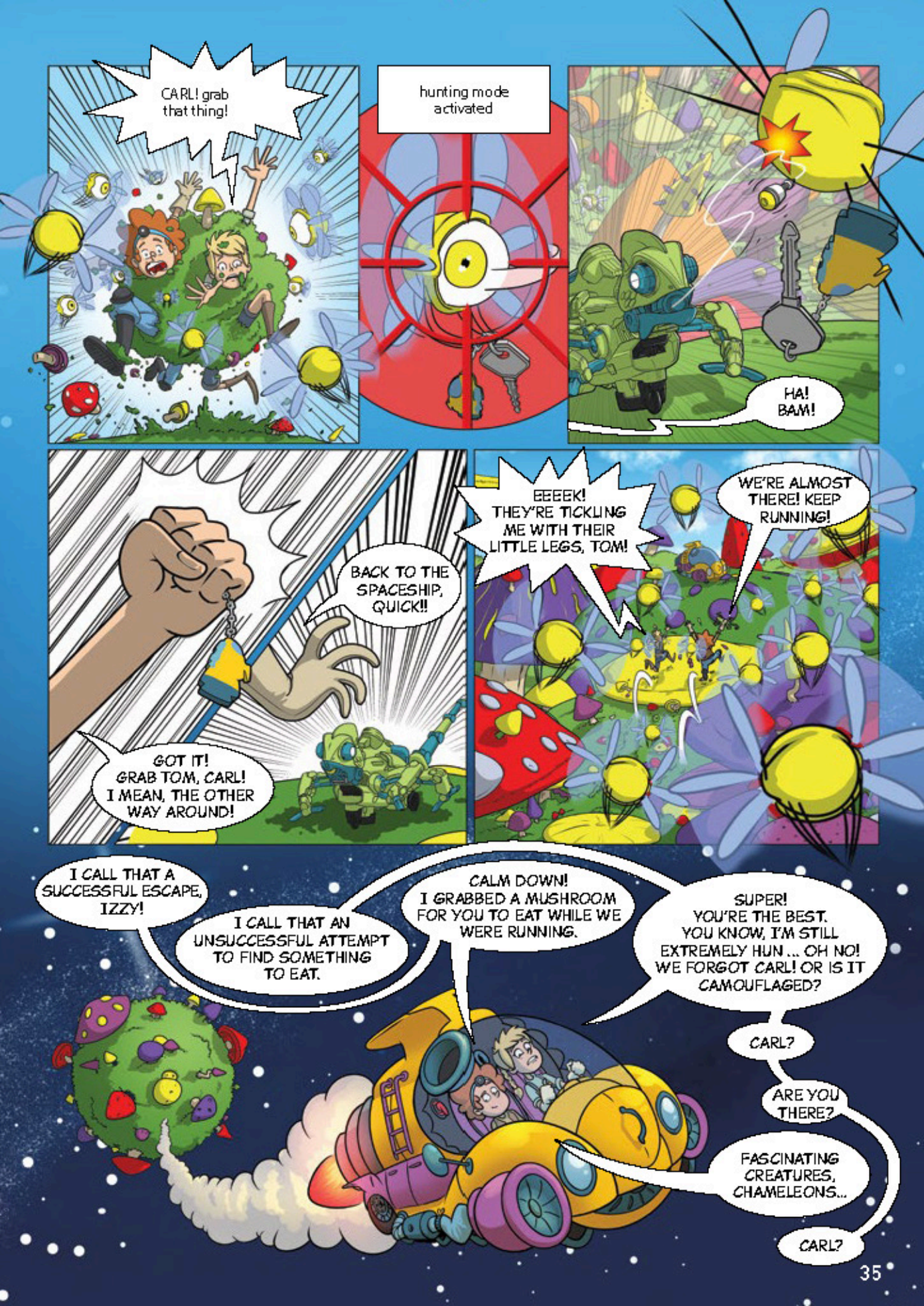
EYE STICKERS



You will find a total of four eye stickers on the sticker sheet. One pair of eyes is already printed. You can redesign the white pair of eyes again and again using a white board marker.

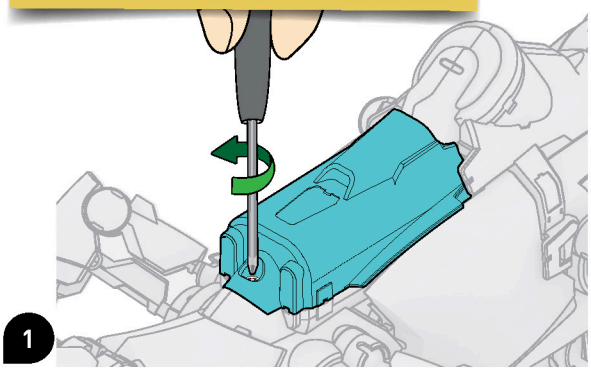



CARL
A CHAMELEON ... OF COURSE.
FASCINATING CREATURES, IZZY.
IT'S VERY CUTE HOW HE WALKS AROUND WITH THAT CURLY TAIL.
CONCENTRATE!
I SEE THE FLY WITH OUR TRIHUFF ... TRUFFOMAT ... OUR KEY!
I HAVE A PLAN! JUST LET ME QUICKLY PROGRAM CARL ... ACTIVATE CAMOUFLAGE MODE!
OH, GREAT! WE ALSO HAVE TO CAMOUFLAGE OURSELVES!
PERFECT! OR, ALMOST PERFECT. I'M HUNGRY, TOM.
YOU ALREADY MENTIONED THAT.
IT WORKS, IZZY!
YEAH, YEAH, TOM. THAT'S GREAT.
DO YOU SEE HOW CARL IS CHANGING COLOR, IZZY? IT'S ALMOST INVISIBLE!
WELL, I WOULDN'T QUITE SAY "INVISIBLE."
WHY ARE YOU SO GRUMPY, IZZY?
Because I'm Hungry, Tom!
...
oops.


CARL! grab that thing!
hunting mode activated
HA! BAM!
BACK TO THE SPACESHIP, QUICK!!
GOT IT! GRAB TOM, CARL! I MEAN, THE OTHER WAY AROUND!
EEEEK! THEY'RE TICKLING ME WITH THEIR LITTLE LEGS, TOM!
WE'RE ALMOST THERE! KEEP RUNNING!
I CALL THAT A SUCCESSFUL ESCAPE, IZZY!
I CALL THAT AN UNSUCCESSFUL ATTEMPT TO FIND SOMETHING TO EAT.
CALM DOWN! I GRABBED A MUSHROOM FOR YOU TO EAT WHILE WE WERE RUNNING.
SUPER! YOU'RE THE BEST. YOU KNOW, I'M STILL EXTREMELY HUN ... OH NO! WE FORGOT CARL! OR IS IT CAMOUFLAGED?
CARL?
ARE YOU THERE?
FASCINATING CREATURES, CHAMELEONS...
CARL?

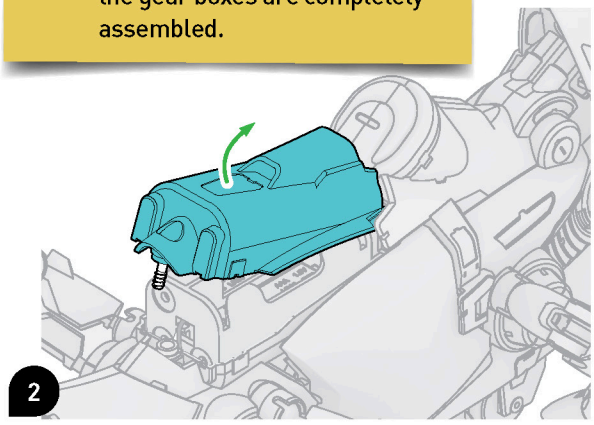
INSTALLING AND CHANGING BATTERIES

Loosen the screw with a Phillips-head screwdriver. The screw will remain in the cover.

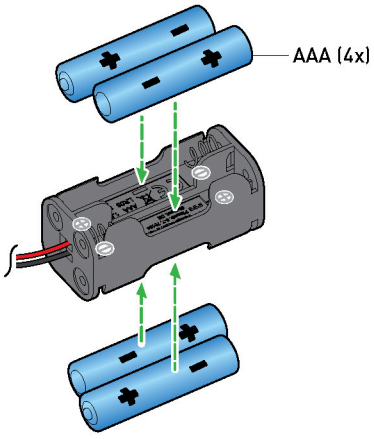


1

Only insert the batteries after the gear boxes are completely assembled.



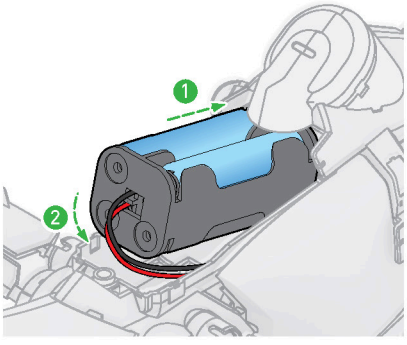
2

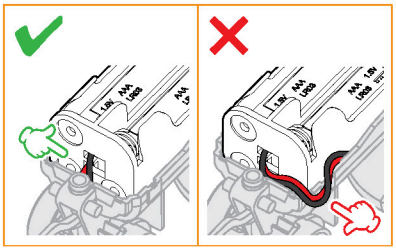


3

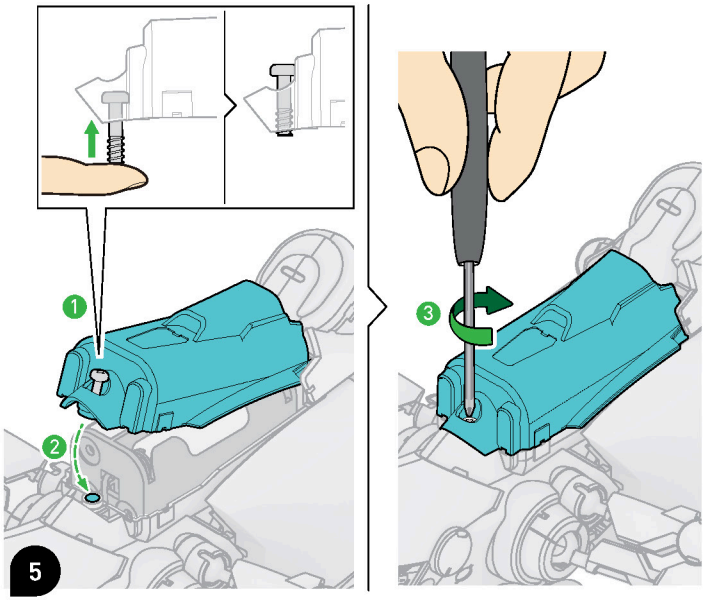
When inserting the batteries, make sure the polarity (+/-) is correct. Please also note the instructions on handling batteries on page 2.

Inserting, removing, and changing the batteries should be done by an adult. Make sure that the robot is switched off before opening the battery compartment.





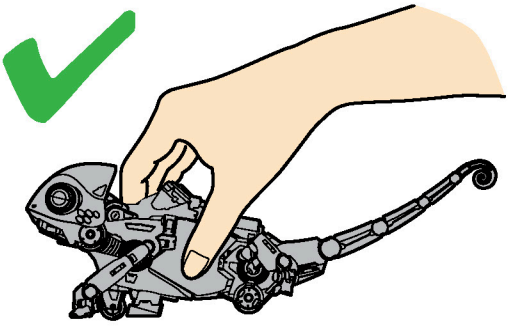
4

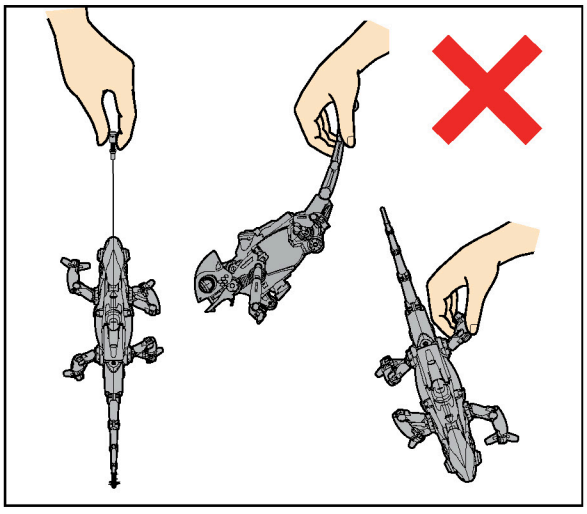


5

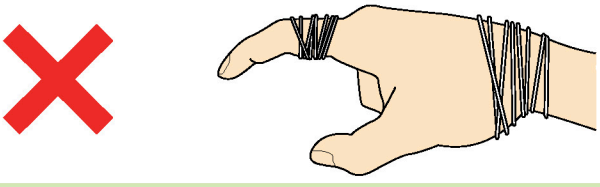
INFORMATION FOR PROPER HANDLING

When you lift the chameleon, grab it by the white part of its belly. Carl does not like being lifted by its tongue, tail, or legs.

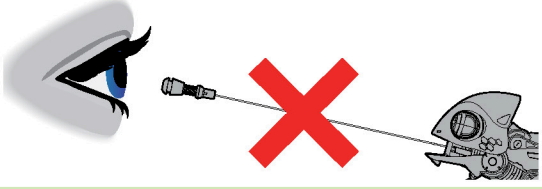




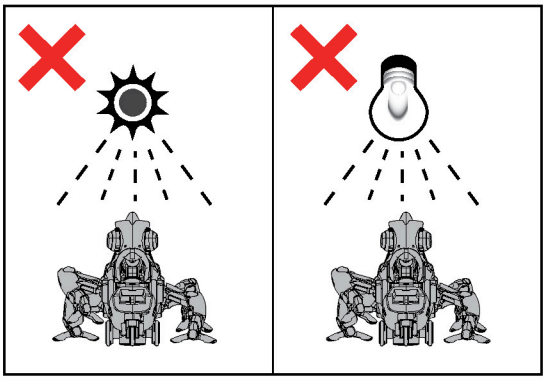
Never wrap the string around body parts!



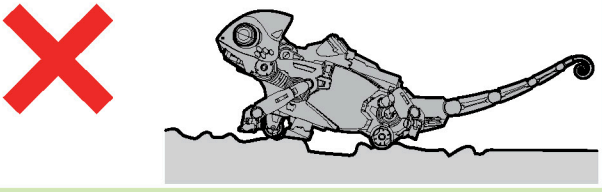
WARNING: Do not aim at eyes or face.
When playing, do not look directly into the mouth or point the mouth at other people or animals.



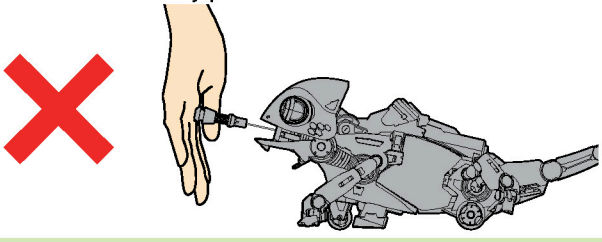
Avoid operating Carl in strong light, such as bright sunlight or very bright halogen lamps.
Note: Exposure to bright light may impact the chameleon's sensor and cause malfunctions.



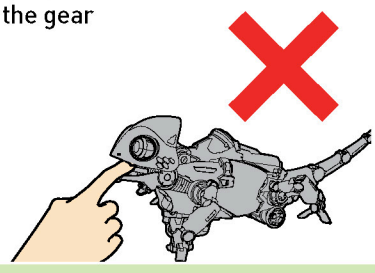
Carl doesn't like uneven surfaces or carpets. Always provide Carl with a flat surface.



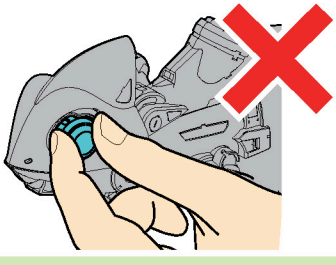
Never block the tongue shot with your hand or other body part.



Do not place your hands, fingers or hair near the gear mechanism.



Don't move Carl's eyes with your hands.





TALENTED Robo-lizard

You showed skill and perseverance during assembly. Now Carl wants to show you what it can do. And that's quite a lot. So put in the batteries, read the operating instructions, and off you go!

TROUBLESHOOTING

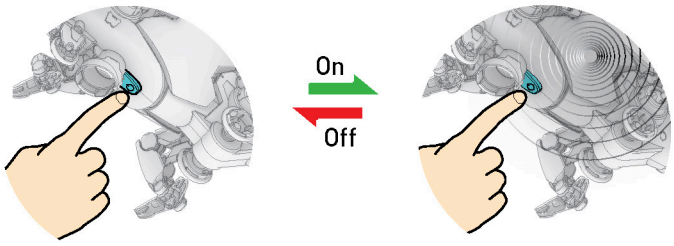
If Carl doesn't work as expected, see the troubleshooting guide on page 46, or scan this QR for a video:

OPERATING INSTRUCTIONS

Turning on and off

Press and hold Carl's button until the light turns on or off.

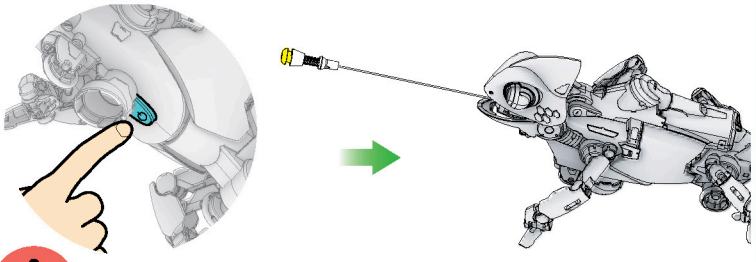
After turning on, Carl is in pet mode.



After two minutes without input, Carl turns itself off.

Tongue function test

When in pet mode, you can test the tongue function by pressing the button.



If the tongue does not extend and retract automatically, see page 46 for help.

The 3 play modes

Press the button twice in a row to switch between the different play modes.

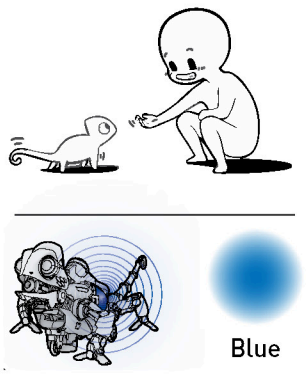
Turn on → Carl lights up green = Pet Mode
Press 2x → Carl lights up blue = Wild Mode
Press 2x → Carl lights up purple = Coding Mode
Press 2x → Carl lights up green = Return to Pet Mode

The color sensor and infrared sensor might not work as expected in bright sunlight or under halogen lights.

1 PET MODE



2 WILD MODE

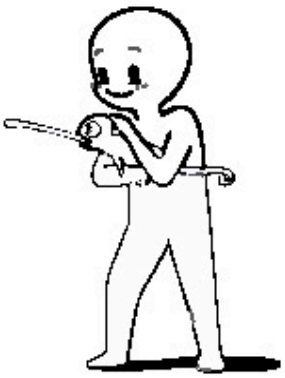


3 CODING MODE



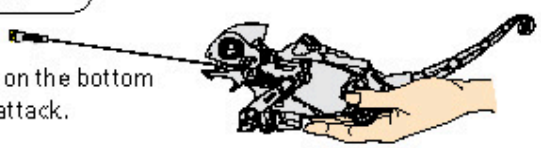
1 PET MODE

Green



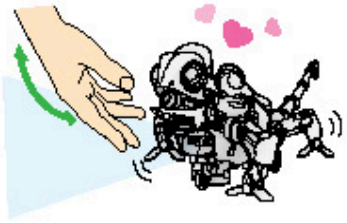
In this mode, Carl behaves like a pet. It wants to be petted and play with you.

TONGUE ATTACK



Hold down the button on the bottom to trigger the tongue attack.

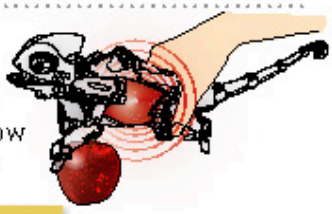
PET



Gently stroke Carl's chin. It shows its appreciation with movements. When Carl is stroked repeatedly, it will happily sway and flash rainbow colors.

> **!** Make sure your hand is in the sensor area, which is located below the mouth.

COLOR CHANGE



You can hold Carl with the color sensor on all kinds of colored surfaces to make it glow in the same color.

> **!** Note that Carl cannot detect dark or gray tones.

2 WILD MODE

Blue



In this mode, Carl becomes a wild hunter who wants to catch prey or, depending on the situation, flee.

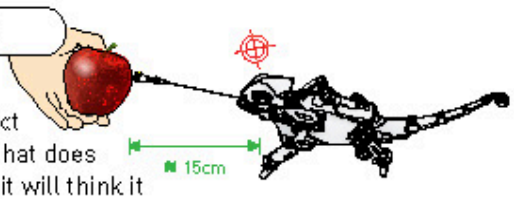
> **!** In wild mode, Carl will roam freely to explore its environment. Play on an open floor space (not on tables or raised surfaces).

MOVEMENT



Move your hand in front of Carl's sensor area. If you move away, it will follow you; if you get too close, it will back away.

TONGUE ATTACK



If Carl discovers an object about 15 cm (6 in) away that does not move for 3 seconds, it will think it is prey and launch a tongue attack.

CAMOUFLAGE



In wild mode, Carl will always glow the color of the ground to camouflage itself.

3 CODING MODE

Purple

In this mode, all functions can be freely programmed using the color cards.



Description of the Color Cards

Actions

Forward
Move forward.

Backward
Move backward in a right turn.

Strike
Quickly extend and retract the tongue.

Stay
Stop and observe your surroundings.

Shake
Vibrate.

Condition

If blocked
If...then command: If there is an obstacle in front of Carl, it will execute the following command. If not, it will repeat the previous command (if one has been programmed).

Program ends

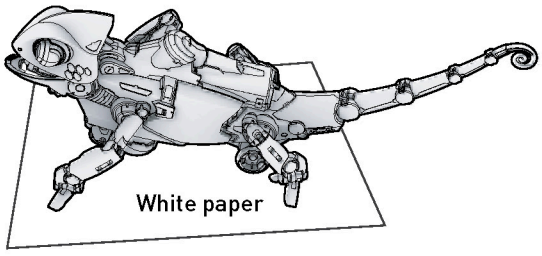
End
If you complete the programming with this command, your program will be executed exactly once.

Loop
If you complete the programming with this command, your program will be executed in a continuous loop.

Erase

Erase
Use this card to clear all commands.

HOW TO PROGRAM



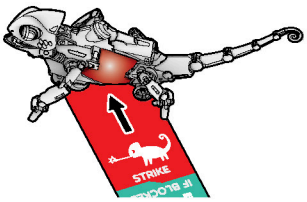
You will need a white surface or a white sheet of paper as a base.

→ Place Carl on a white surface.

→ As soon as Carl's belly lights up white, you can start programming.

If Carl is not standing on a white surface in **coding mode,** it will communicate this by shaking.

1



You can program up to 32 commands, one after the other.

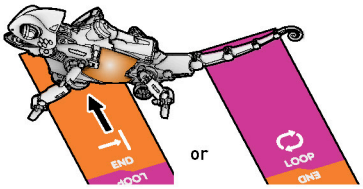
2

To program a command, simply slide the corresponding color card under the color sensor.

→ After each command, Carl lights up in the color of the card to signal that the command has been recorded.

→ Remove the color card. Once Carl glows white again, you can proceed with the next command.

The cards must be slid underneath Carl's color sensor.



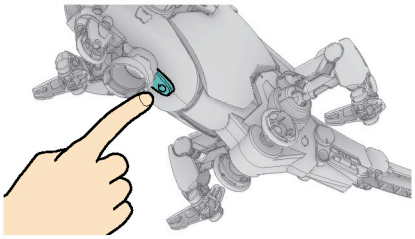
3

Complete programming:

→ Use either the END or LOOP card to complete programming.

→ Carl lights up in the corresponding color of the card and shakes.

→ This completes the program.



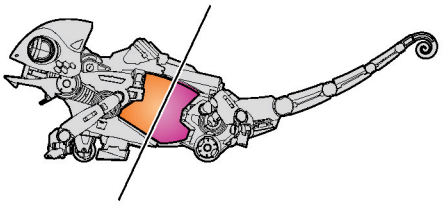
Run the program:

→ Press the button on the underside once to start the program.

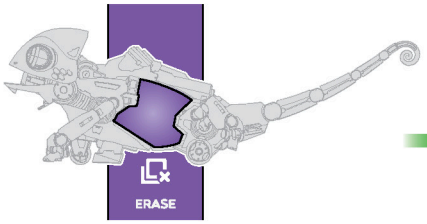
→ To interrupt the program, press the button again.

While the program is running, no color cards can be read.

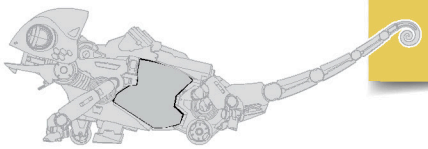
Unless you delete the program, Carl will glow orange or pink next time you put it in coding mode, depending on which card you used to complete your program. Carl remembers the program — even if it is turned off and on again.



DELETE THE PROGRAM



To delete the program, scan the purple "Erase" card. Carl will flash purple twice.



When Carl's belly gradually dims, all commands are deleted.

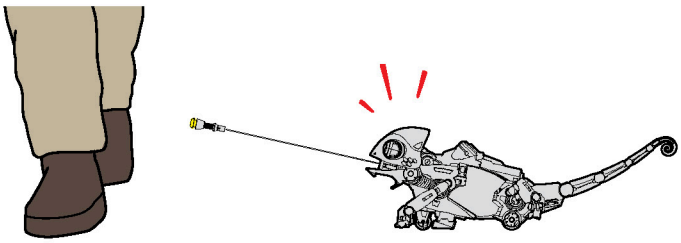
When programming, make sure that you do not accidentally scan a purple object.

EXAMPLE PROGRAMS

The trap



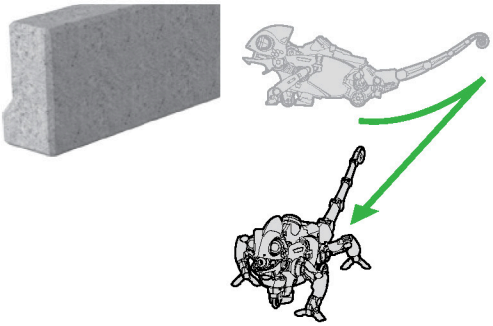
Place Carl discreetly in a corner or behind a door. As soon as someone walks past, Carl will perform a tongue attack.



Evasive maneuvers



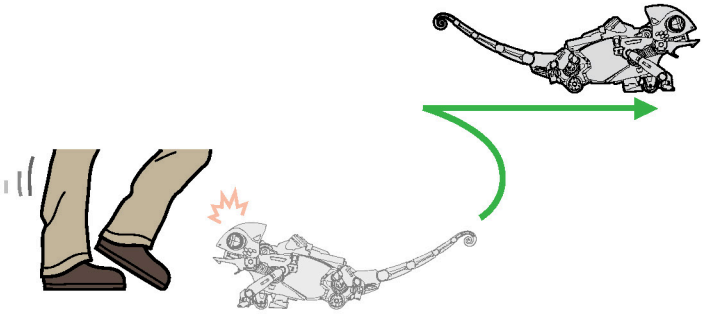
Carl moves forward until encountering an obstacle, and then changes direction and continues walking.



Flight



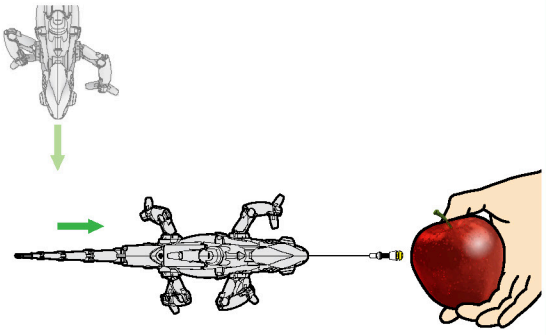
Carl stands still and waits. As soon as an object approaches, Carl flees.



Hunter



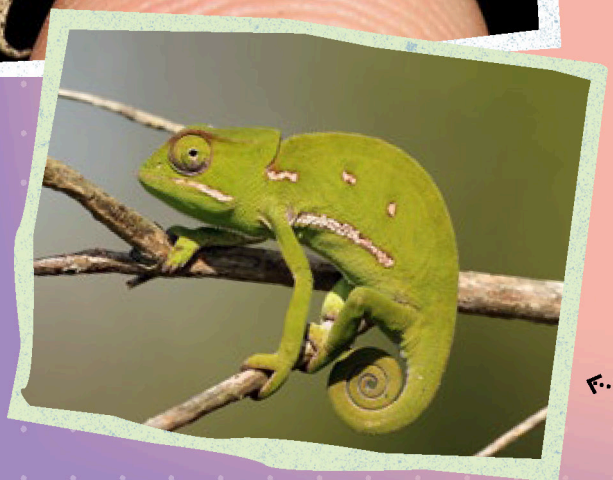
Carl walks to a specific spot, lies in wait, and then performs a tongue attack.



Bionic-Chameleon

Chameleons are fascinating animals. Carl, the Coding Chameleon, imitates some of their special features. When technology tries to imitate nature, it is called bionics — a fusion of the words biology and technics (for technology). A well-known example of a bionics application is Velcro, which was inspired by burdock burrs.





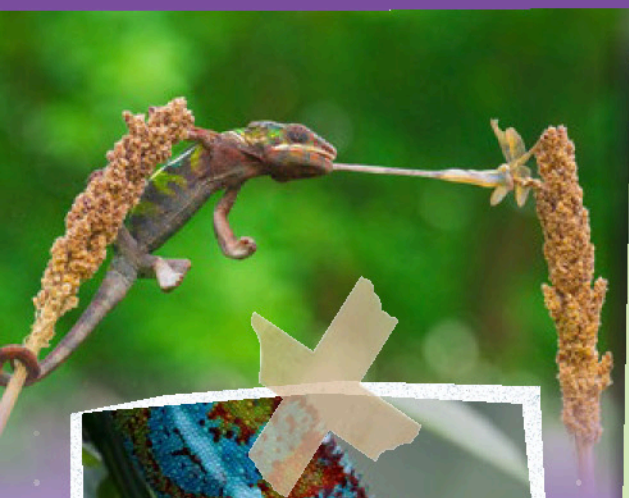


COLOR PLAY

It is a common misconception that chameleons adapt their body color to their surroundings in order to camouflage themselves. They do indeed do this sometimes, but their extraordinary color changes should primarily be understood as a kind of language. Chameleons communicate with their body color. A relaxed chameleon is often green, while an aggressive animal turns red. If a male wants to impress a female, he turns as bright and conspicuous as possible. Chameleons can also regulate their body temperature through the color of their skin.

ASTOUNDING VARIETY

NOT ALL CHAMELEONS ARE THE SAME. IN FACT, THERE ARE OVER 200 SPECIES OF CHAMELEON WORLDWIDE. THE BODY SIZE OF ADULTS VARIES FROM A TINY TWO AND A HALF CENTIMETERS TO OVER HALF A METER IN LENGTH. CARL RESEMBLES A LOBE-TAILED CHAMELEON AND IS ABOUT THE SAME SIZE.







Carl's CHAMELEON Characteristics

- Color changes
- Tongue firing
- Moving eyes independently
- Typical chameleon gait

You may be wondering how Carl can perform all these functions. This requires a sophisticated interaction between mechanics and electronics. The mechanics consist of the many components and gears. They enable the typical chameleon-like movements, from shooting out the tongue to moving the legs and eyes.

The whole thing is controlled by the electronics.

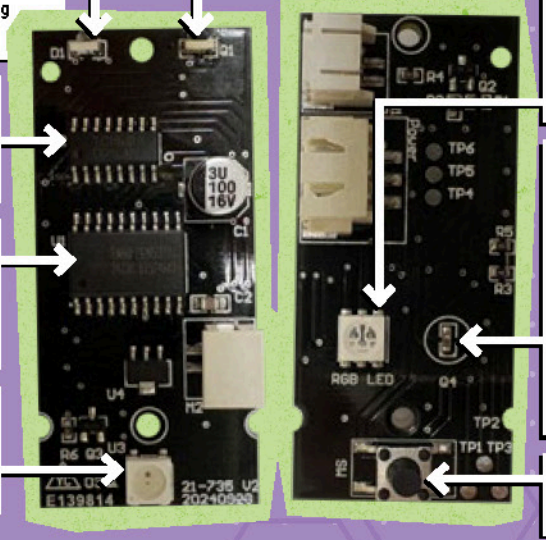
The circuit board contains Carl's brain and sensory organs, so to speak. Here is an overview of the most important parts:

The two components together form the infrared sensor (transparent = infrared transmitter, black = infrared receiver). This allows Carl to measure distances. This way, Carl can follow you and knows when targets are at the right shooting distance for a tongue attack.

Engine control: This microcontroller is responsible for controlling the two motors.

Microprocessor: This is Carl's "brain." It's where all signals are processed and Carl's programming is carried out.

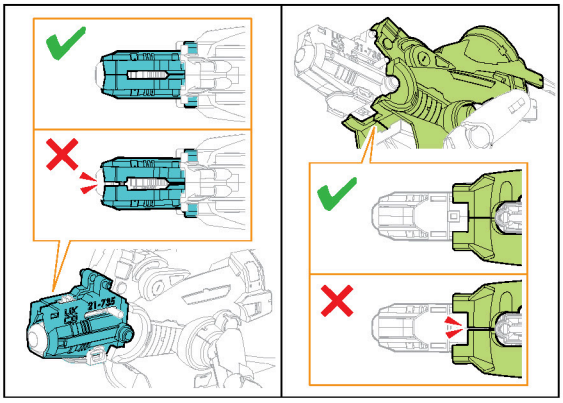
RGB-Light Diode: Makes Carl's belly glow in any color by mixing red, green, and blue light.

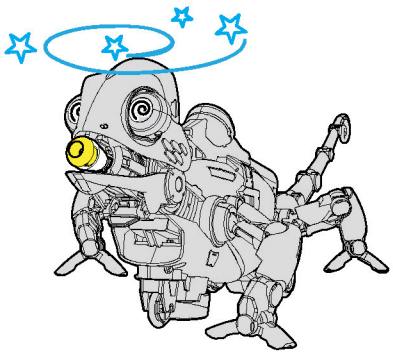


RGB-Light Diode: This is the lighting for the color sensor. It emits neutral white light beams that reflect off surfaces and are measured by the color sensor.

Color sensor: This small component measures the wavelength of reflected light. When light hits a colorful surface, some wavelengths of light are absorbed, and others are reflected. This is actually what gives the coding cards — and all other objects — their color. This allows the sensor to determine the color of the surfaces its light reflects off of.

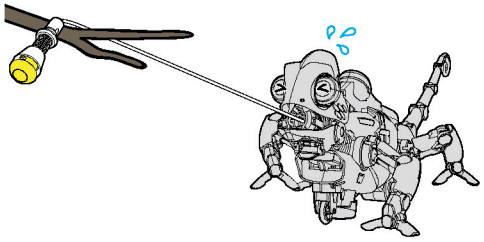
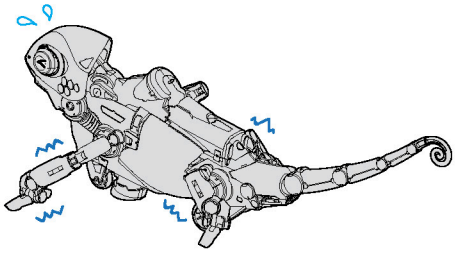
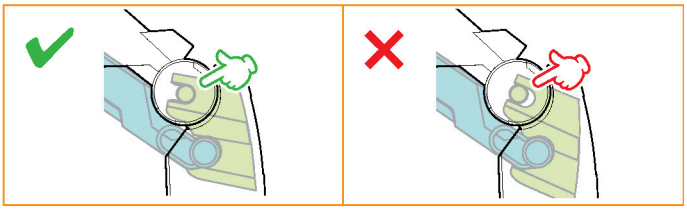
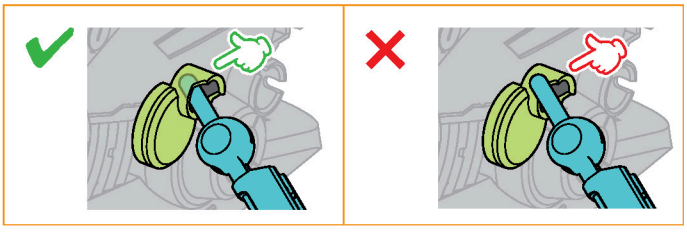
Switch: This piece allows you to operate Carl.

PROBLEM	SOLUTION
A Carl doesn't turn on/there is no light when the button is pressed.	1. Check that the batteries are correctly installed. 2. Check that the cables are correctly connected to the circuit board (page 10, steps 5–6).
B Carl lights up but does not move.	1. Check that the cables are correctly connected to the circuit board (page 10, steps 5–6). 2. Check that the gears in the tail end are connected correctly and haven't been displaced.
C The tongue attack doesn't work correctly.	1. Switch to mode 1 (pet mode) and follow the tongue function test on page 39. 2. If the tongue does not eject, turn the power off and check that the head is correctly assembled (pages 30-32), and ensure the front gear box is sealed with no gaps.  Then turn the power on and perform the tongue function test as described on page 39. 3. Make sure the screw in the tongue was not overtightened (step 14 on page 13). 4. If the tongue still does not work properly, you will need to open the front gear box. (Scan the QR code on the left for a video showing how to do that.) a. Check step 19 on page 14, and ensure the burrs were cut off properly. b. Check step 22 on page 15. c. Ensure the gears are correctly assembled (pages 16–17, steps 23–30. d. Check step 33 on page 18. Put Carl back together, then perform the tongue function test as described on page 39.

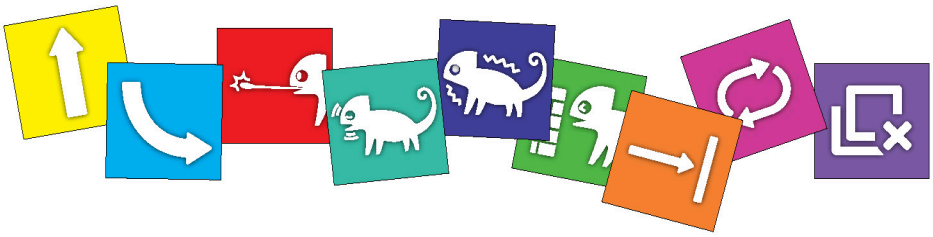


TROUBLESHOOTING VIDEO

Scan this QR for a video showing how to take Carl apart, fix any issues, and put it back together:

PROBLEM	SOLUTION
D The tongue does not retract properly. 	1. Turn Carl off. 2. Adjust the string so that it is straight and not tangled. 3. Check that the head is correctly assembled (see pages 30-32). Then turn the power on and perform the tongue function test as described on page 39. 4. Bright sunlight or the light from bright halogen lamps can impair the function of the sensors, which can lead to malfunctions. Contact tech support if you suspect this.
E Carl walks unevenly or makes clicking noises when walking. 	1. Check that the joints on the legs (parts A6, A2, A9, A13) are properly engaged (see pages 27 and 28).  2. Check that the rod ends of parts C9 and C18 are correctly in place (see page 20, steps 38–39, as well as pages 25–26, steps 15–17).  3. If the legs and/or wheels are still not work properly, you will need to open the rear gear box. (Scan the QR code on the left for a video showing how to do that.) Ensure the gears are correctly assembled (pages 22–24, steps 3–9). Then put Carl back together and check if the legs and wheels are moving smoothly.
F Carl's front legs are not moving.	Check steps 29–30 on page 17 and steps 7–8 on page 23 and make sure the parts are connected properly.

On this page you can put together your own programs. Decide which commands Carl should execute and color the boxes in the corresponding colors of the command cards.



Your program name:

Your program sequence:

© 2025 Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstrasse 5–7, 70184 Stuttgart, Germany

This work, including all its parts, is copyright protected. Any use outside the specific limits of the copyright law is prohibited and punishable by law without the consent of the publisher. This applies specifically to reproductions, translations, microfilming, and storage and processing in electronic systems and networks. We do not guarantee that all material in this work is free from other copyright or other protection.

Project manager and text: Jonathan Felder
Technical product development: Deryl Tjahja, CIC Components Industries Co., Ltd., Taiwan
Comic: Daniel Alles
English language editing: Ava Tessitore and Hannah Mintz
Manual layout: Studio Gibler, Stuttgart
Manual design concept: Atelier Bea Klenk, Berlin
Manual illustrations: CIC Components Industries Co., Ltd., Taiwan
Manual photos: Jamie Duplass (all tape strips); Glaw, F, Köhler, J., et al., p. 44 b; Charles J. Sharp, p. 44 m; (all previous: published under CC BY-SA 4.0); HUNGUACH679PNG, p. 8 t; jean52Photosstock, p. 44 t; Pixel-mixer, p. 45 mt; (all previous: Pixabay); Wirestock, p. 45 tl, (© Adobe Stock);

Packaging design concept: Peter Schmidt Group, Hamburg
Packaging layout: Studio Gibler, Stuttgart
Packaging photos: CIC Components Industries Co., Ltd., Taiwan

The publisher has made every effort to identify the owners of the rights to all photos used. If there is any instance in which the owners of the rights to any pictures have not been acknowledged, they are asked to inform the publisher about their copyright ownership so that they may receive the customary image fee.

1st English Edition © 2025 Thames & Kosmos, LLC, Providence, RI, USA
Thames & Kosmos® is a registered trademark of Thames & Kosmos, LLC.

Distributed in North America by Thames & Kosmos, LLC. Providence, RI 02903
Phone: 800-587-2872; Web: www.thamesandkosmos.com

Printed in Taiwan/Imprimé en Taiwan
We reserve the right to make technical changes.

Do you have any questions?
Our tech support team will be glad to help you!

Thames & Kosmos US
Email: support@thamesandkosmos.com
Web: thamesandkosmos.com
Phone: 1-800-587-2872

620507-03-270126