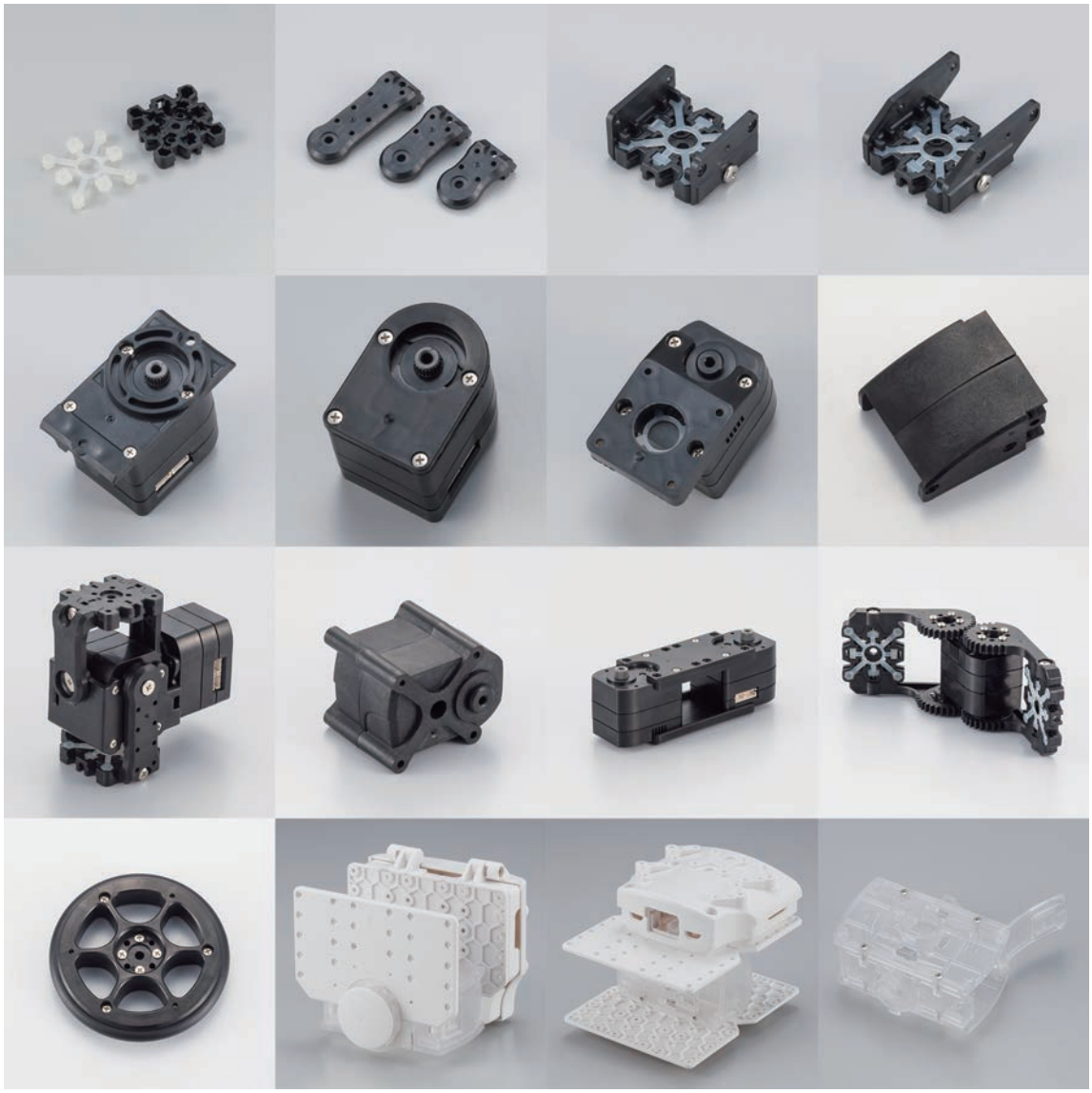
KONDO®



KXR Frame Parts Assembly Manual

Support Information

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Service Dept.

support@kondo-robot.com

Ver.1.0

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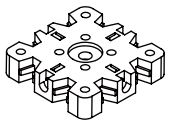
KXR Frame Parts List

■KXR Frame Parts-1



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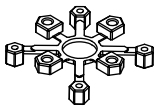
Joint base



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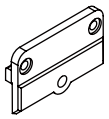
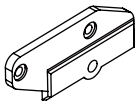
Joint nut



No.02305
Joint frame
3300A



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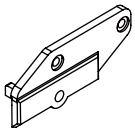
Joint frame
3300B-a



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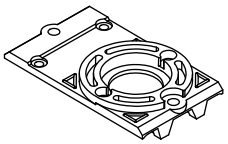
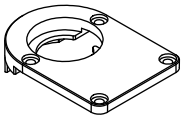
Joint frame
3300B-b



No.02306
Arm supporter
3300A



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Arm supporter
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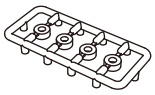

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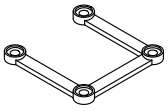
Supporter B
Spacer



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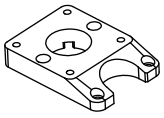
Supporter B
Spacer 2



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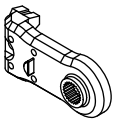
Bottom spacer
3300



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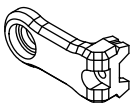
Cross upper
arm-28



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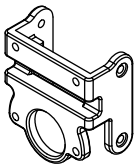

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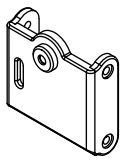
frame



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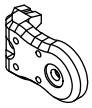

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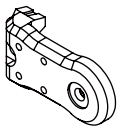
Upper arm
3300-20



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Upper arm
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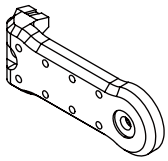

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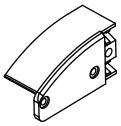
Upper arm
3300-38



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Angle
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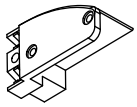

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Angle
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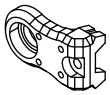
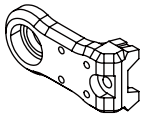


No.02304
Bottom arm
3300-20



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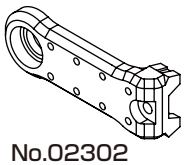
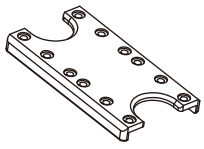
Bottom arm
3300-26



No.02302
Bottom arm
3300-38



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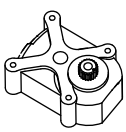
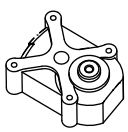
Flat frame

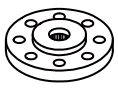


No.02309
Dummy servo
-Upper

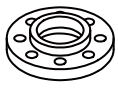


No.02309
Dummy servo
-Bottom

No.02314
Cable guide X



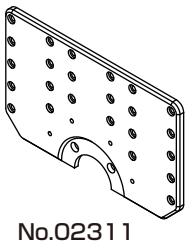
No.02157
Little diameter
horn B



No.02159
Little diameter
free horn C

KXR Frame Parts List

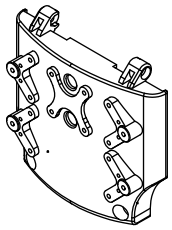
■KXRFrame Parts-2



No.02311
Body panel

No.02311
Panel spacer

No.02311
Lock ring cap



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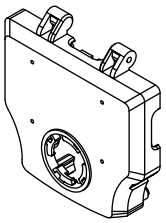
Backpack cover



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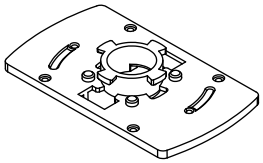
Backpack base



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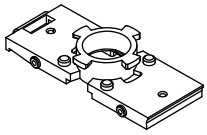

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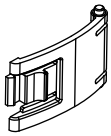
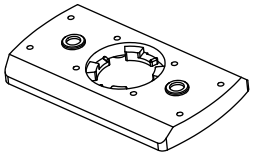
BT Side plate



No.02313
BT Hatch

No.02313
Lock ring



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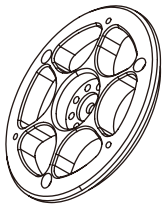

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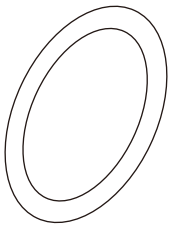
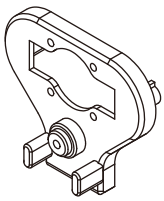
Servo wheel Φ60



No.02320
Tire Φ60

No.02320
wheel spacer



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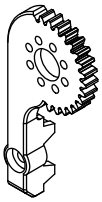
Sensor base A
(for Option)



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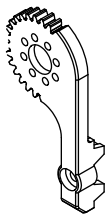
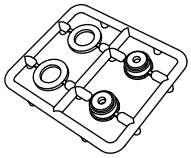
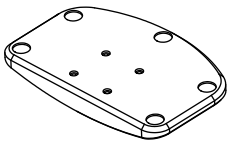
Gripper A-a



No.02318
Gripper A-b



No.02318
Gripper A
Spacer/Bush



No.02310
Sole S-03

Joint Base

■Assemble the joint base.

No.02300
Joint base
(10sets)

No.02301
Joint nut
(20pcs)

No.02323
Parts Bag C
Joint set
(10sets)

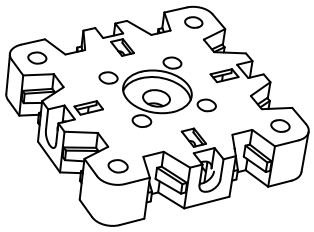
A base part for joint-related parts. Mounting arm parts and frame parts to a joint base allows servos to be assembled.

Ex.

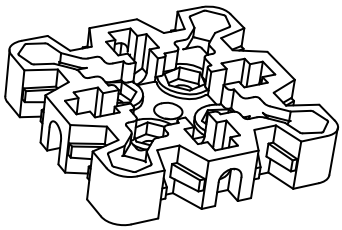
Insert the plastic joint nuts and secure with screws.

Plastic joint nuts can also be used instead of M2/M2.6 metal nuts.

Horn side

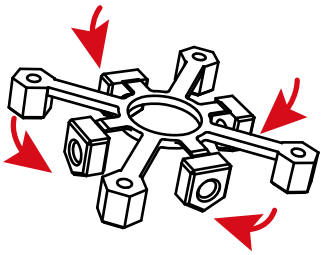


Nut side

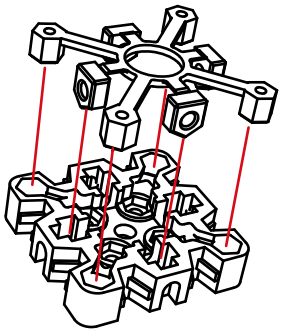


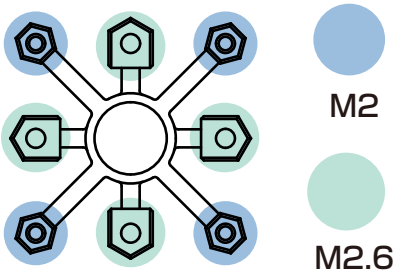
Depending on the part, make sure it is mounted in the correct direction.

①Bend all M2.6 parts.

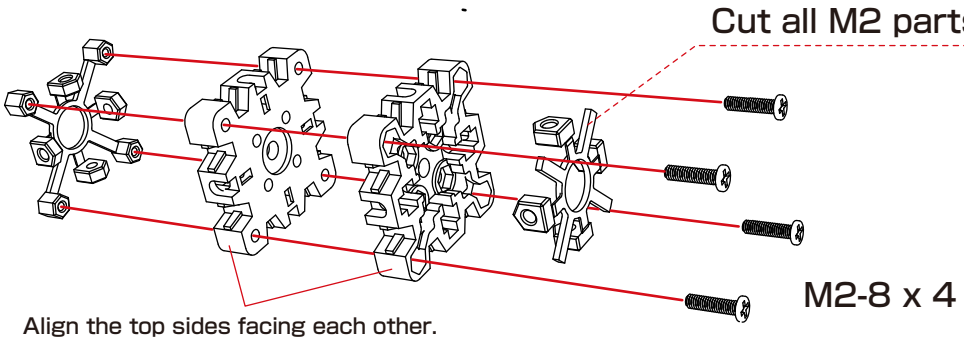


②Attach to joint base.





Double Joint Base



Align the top sides facing each other.
(The nut side faces out)

■Assemble the joint frame

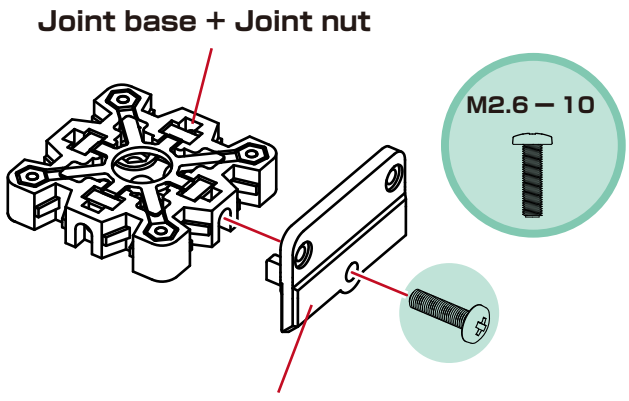
No.02305
Joint frame
A+B set
(4sets each)

No.02323
Parts bag C
Joint set
(4sets each)

Frame part that secures the servo case from the bottom or side when the servo case is in the upright position. Use it together with a joint base. Also, it can be combined with arm servo B and mounted perpendicularly to the body plate.There is a regular A set and a B set that is offset, so choose which set to use based on the application.

Ex.

①-1.



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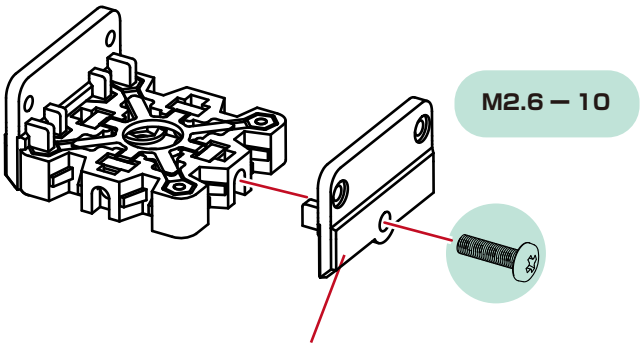

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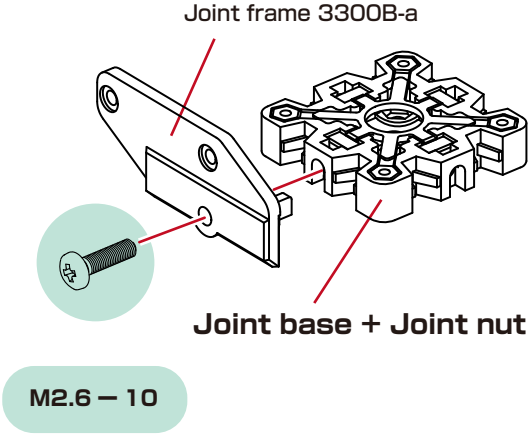

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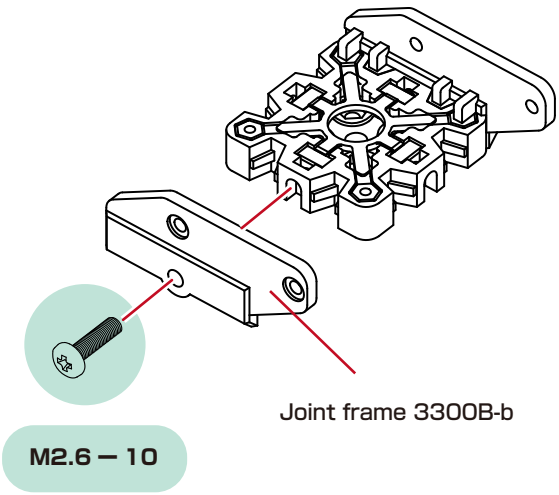
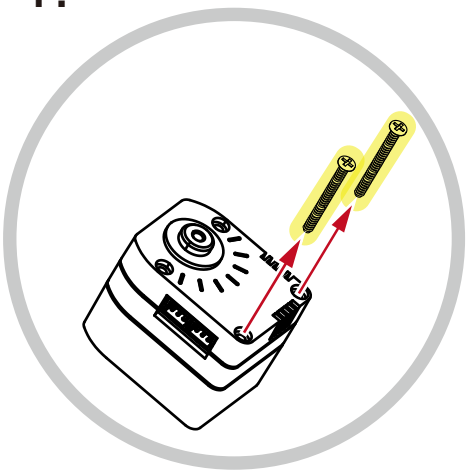


Joint Frame

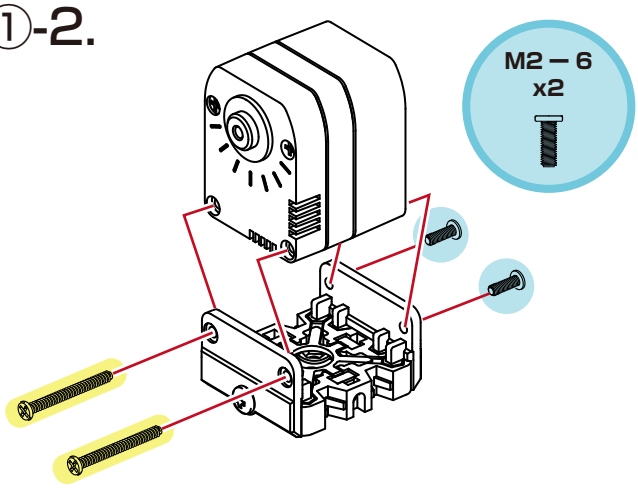
<Servo attachment example>

①-1.



ケースビス
x2

①-2.



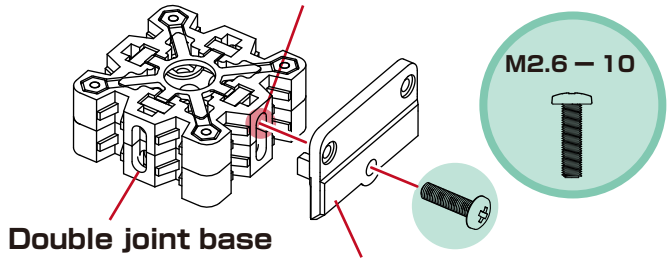
＊It can also be mounted horizontally.

<Double joint base attachment example>

＊Joint frame 3300A is used, but other combinations are possible.

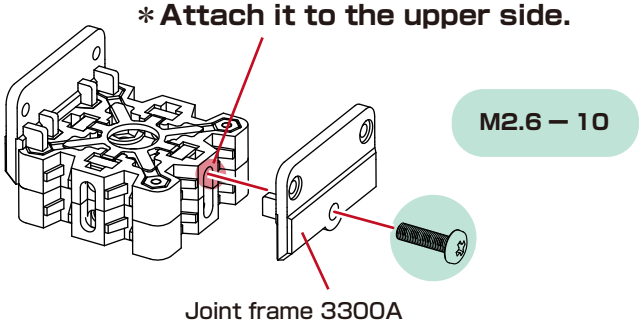
①-1.

＊Attach it to the upper side.



①-2.

＊Attach it to the upper side.



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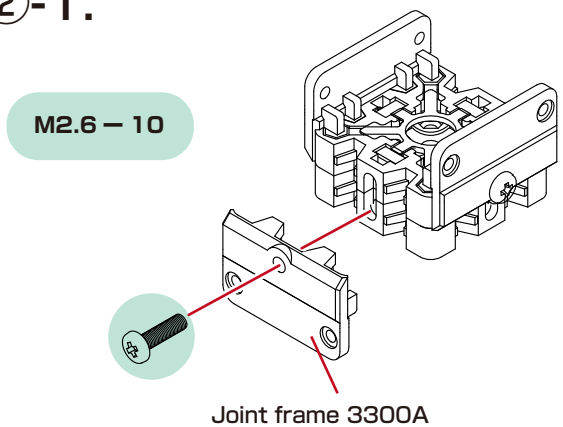
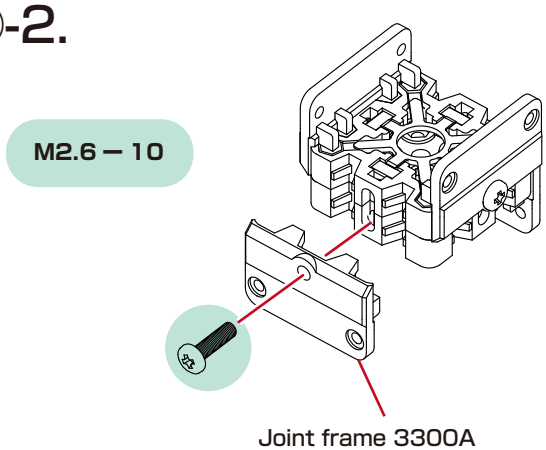
②-1.



②-2.



Arm Supporter A

■Assemble the Arm Supporter A

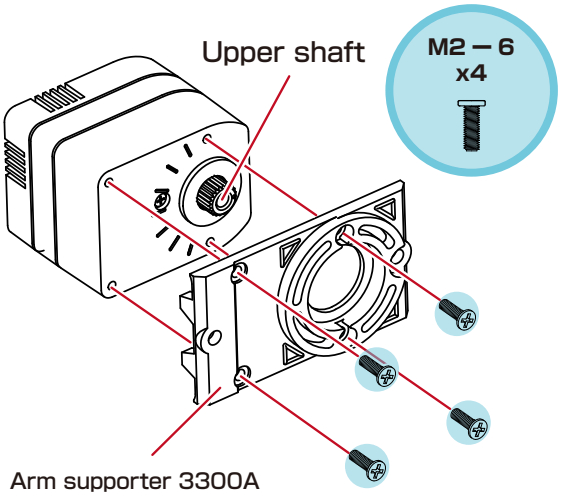
No.02306
Arm Supporter
3300A
(4sets)

No.02323
Parts Bag C
Joint Set
(4sets)

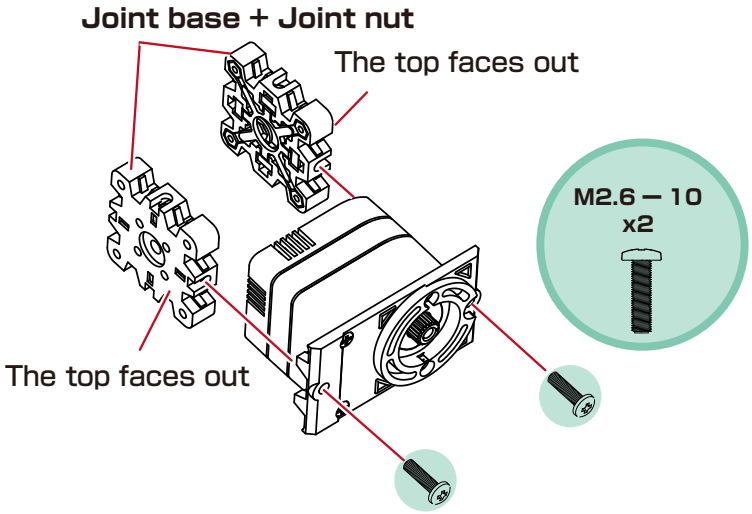
Ex.

This arm supporter reduces wobbling when a horn is attached to the joint base and used as a cantilever. It can also be used as the robot's shoulder shaft servo by mounting a joint base to the top and bottom of the supporter and securing it to the body panel.

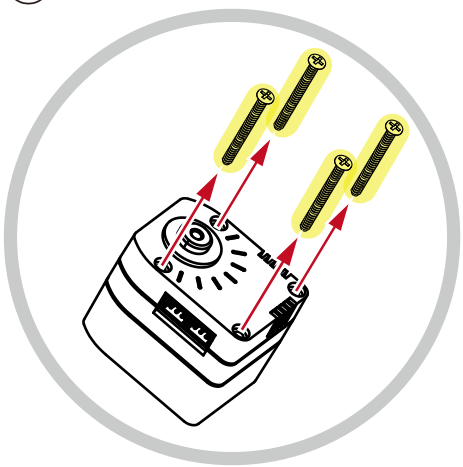
①-1.



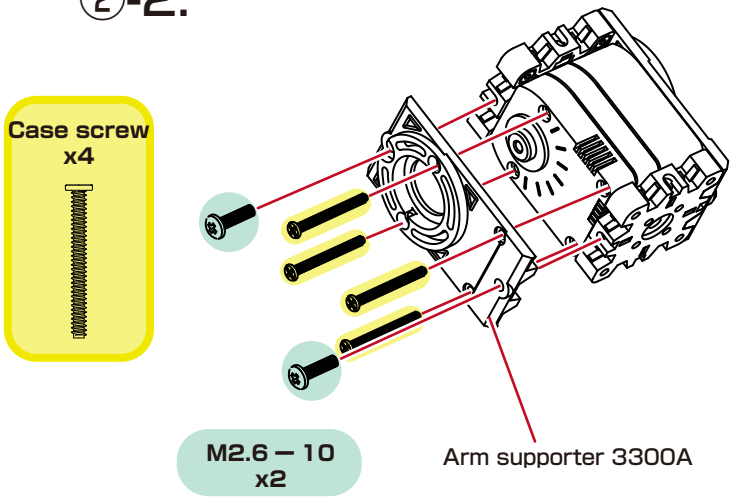
①-2.



②-1.



②-2.

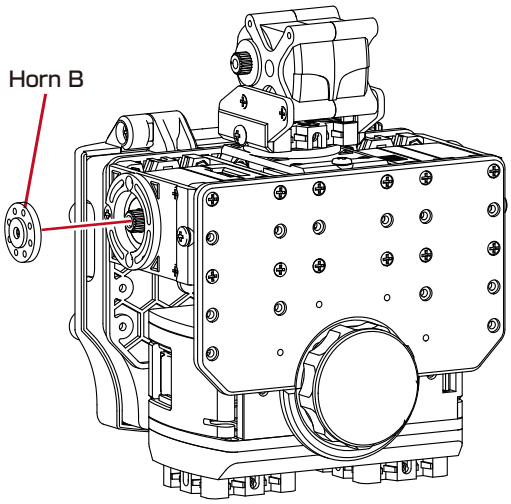


＊It can also be used only on the top side but is stronger when attached to both sides.

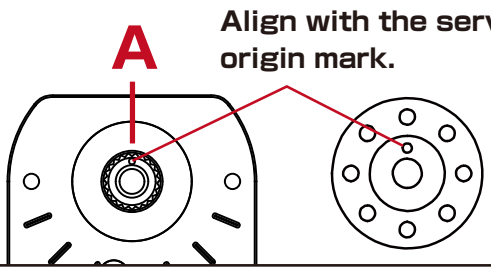
Arm Supporter A

③-1.

<Ex.L2>



Points on Attaching to Upper Shaft

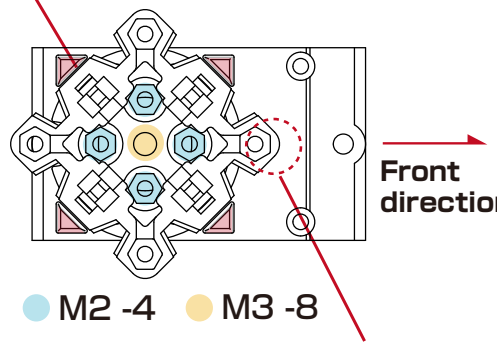


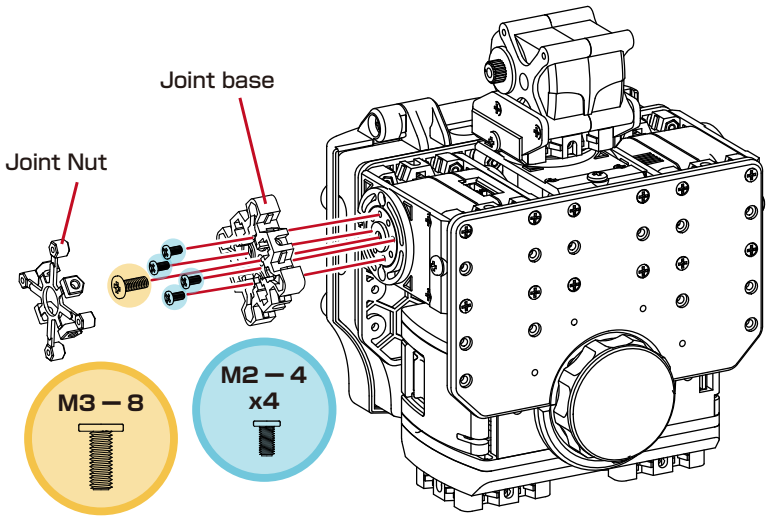
When the origin deviates with the diagram position, lightly insert the arm and rotate to adjust the position. Attach it straight toward the A line.

③-2.

<Ex.L2>

＊Attach at a 45-degree angle in line with the support 2 mark.





＊It would be helpful to use a paint marker pen, etc. to mark the front of the joint so that it is easy to find the origin even if the joint rotates before attaching the arm. (The nut M2 part can also be cut and marked.)

＊Use M3-8. Make sure the screw length is correct.

Arm Supporter B

■Assemble the arm supporter B

No.02315
Arm supporter
3300B
(4sets)

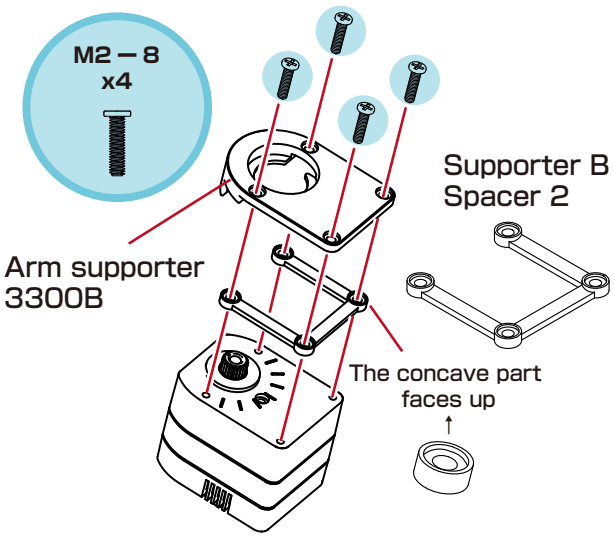
No.02323
Parts bag C
Joint set
(4sets)

This arm supporter reduces wobbling when a horn is attached to the joint base and used as a cantilever. A joint base can be mounted by combining joint frame A or B with a spacer, and the servo can be secured in a horizontal position.

Ex.

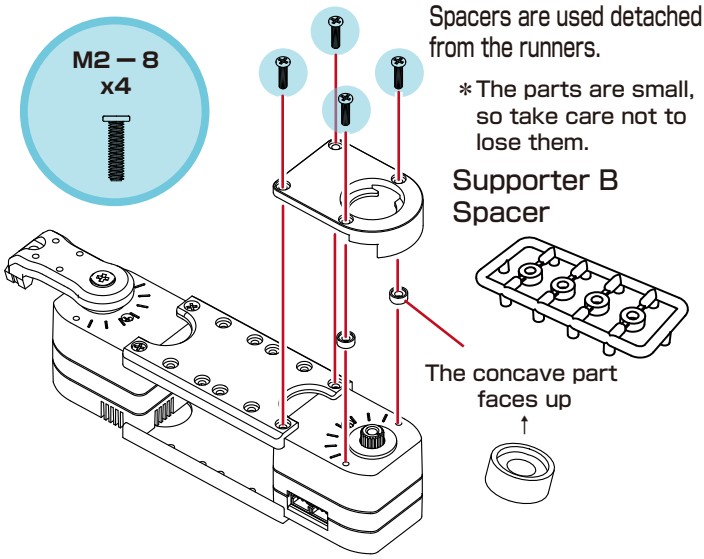
<Installation example for supporter B only>

＊Coupling-type spacers are convenient.



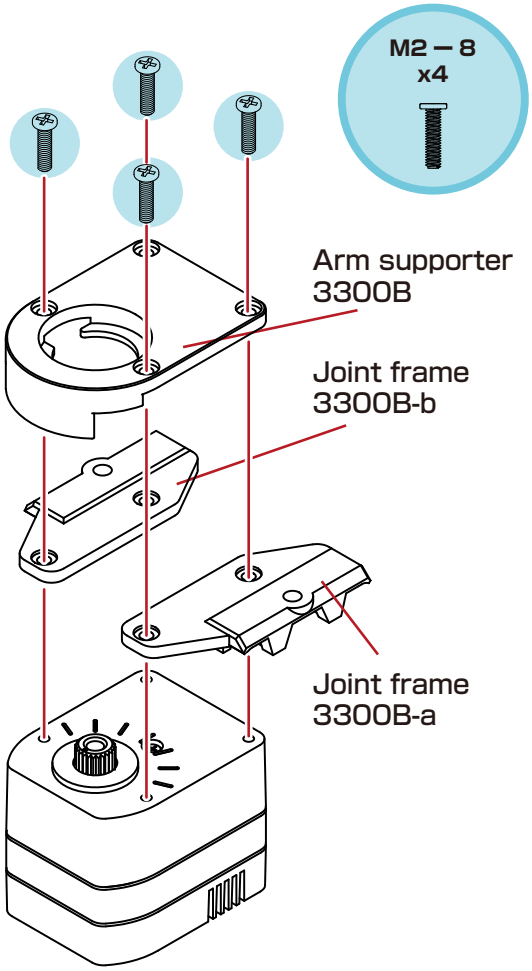
<Frame type installation example 1>

＊Use individual type spacers.



<Frame type installation example 2>

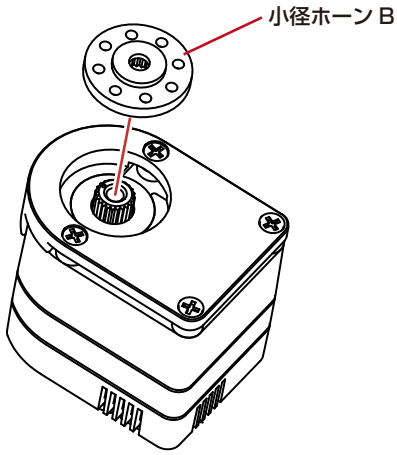
＊Example not using spacers.



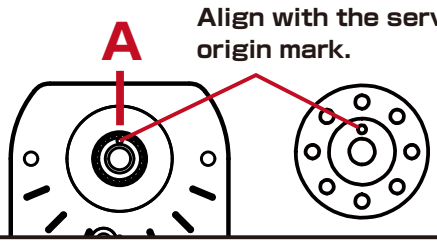
Arm Supporter B

<Example of combination of arm supporter B and joint base>

①Attach the horn B.



Points on Attaching to Upper Shaft



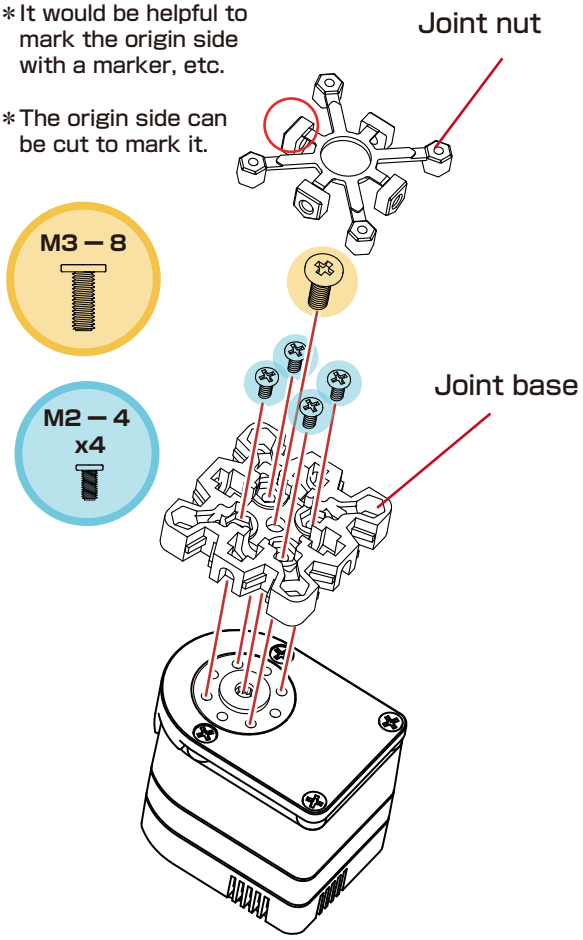
When the origin deviates with the diagram position, lightly insert the arm and rotate to adjust the position. Attach it straight toward the A line.

---

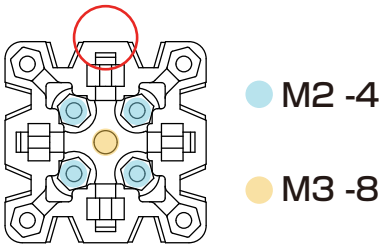
②

＊It would be helpful to mark the origin side with a marker, etc.

＊The origin side can be cut to mark it.

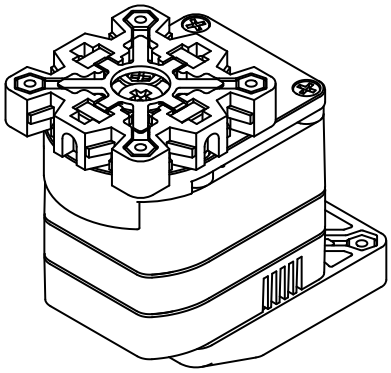


＊Mark the origin direction with a marker, etc.
This is helpful because it allows you to find the origin even if it rotates unexpectedly.



＊When putting the horn and joint together, there is less for the screw to bind on, so use M3-8. Make sure the screw is the right length.

Supporter B + Joint base



Bottom Spacer

■Assemble the bottom spacer

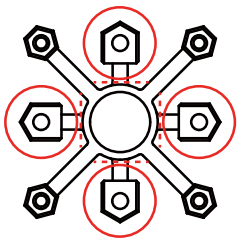
No.02316
Bottom spacer
3300
(4sets)

No.02323
Parts bag C
Joint set
(4sets)

Spacer part used on the bottom of the servo case. Inserting this spacer makes it possible to secure a servo with its shaft upright in places like the body plate where a joint base can be secured.

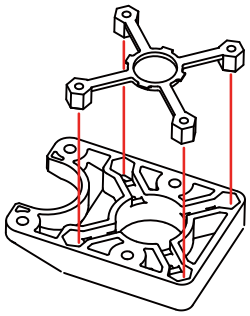
Ex.

①-1.Cut all M2.6 parts.

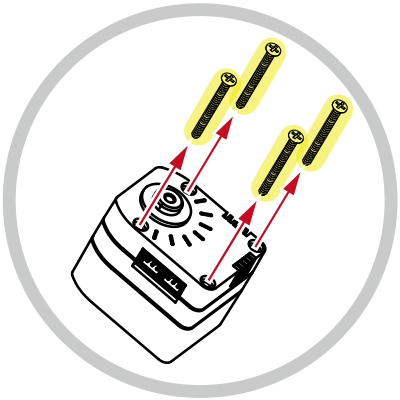


It can be used as a nut, so keep it for future use.

①-2.



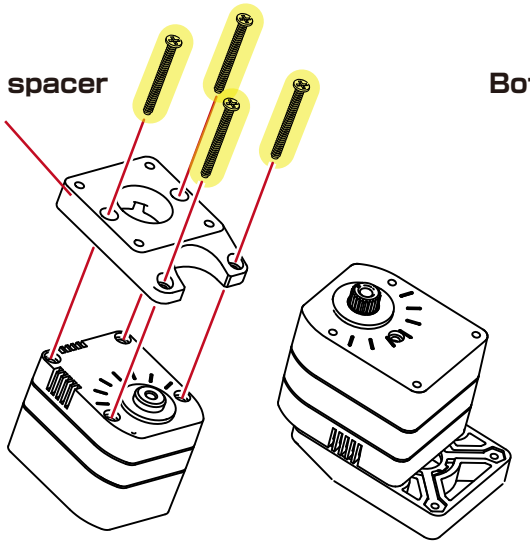
②Detach the case screw.



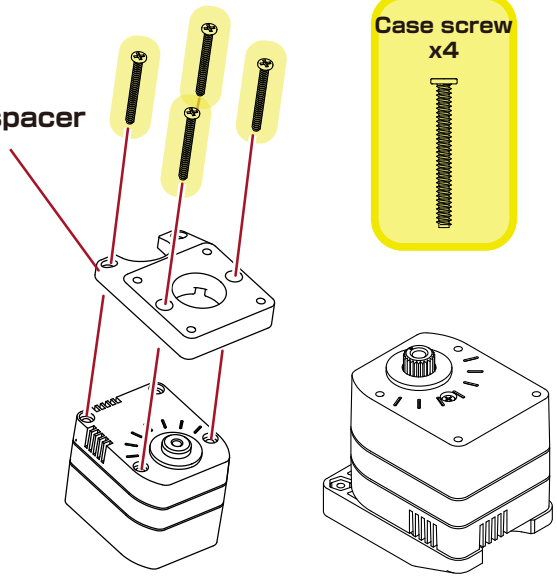
③

*Choose the installation direction.

Bottom spacer



Bottom spacer



Case screw
x4

Cross Frame

■Assemble the cross frame

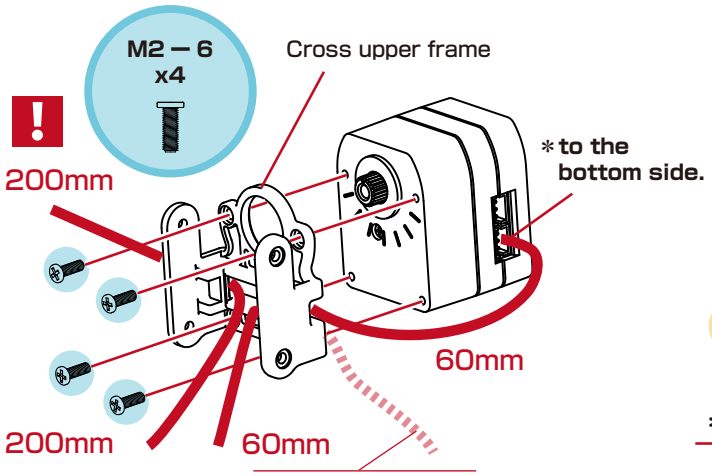
No.02307
Cross frame
3300 set
(4sets)

A frame parts set for securing KRS-3300 in an orthogonal state. You can align the heights of two servo shafts, which allows for a more compact mounting space.

Ex.

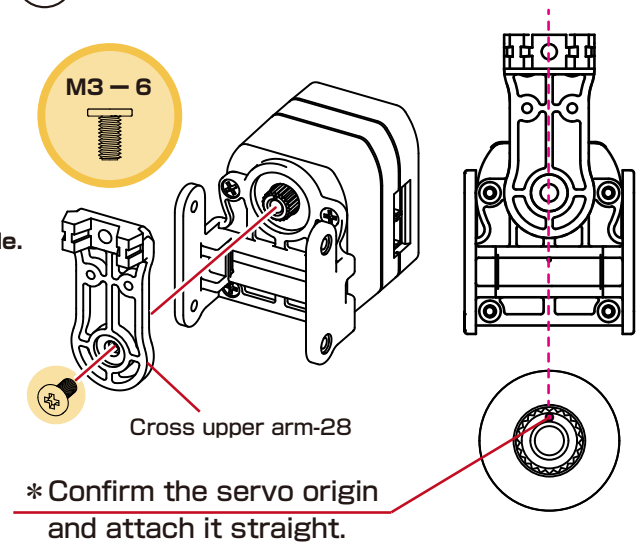
! Always attach the cross upper frame after feeding the cable through. Make sure it is oriented so that the 160 mm cable comes out the outer side of the leg. Ensure that there is no twisting or pinching that would put excessive force on the cable.

① Wire the cable to the cross upper frame and attach to the servo.



＊Determine the length of the cable and its direction based on the robot you are building.

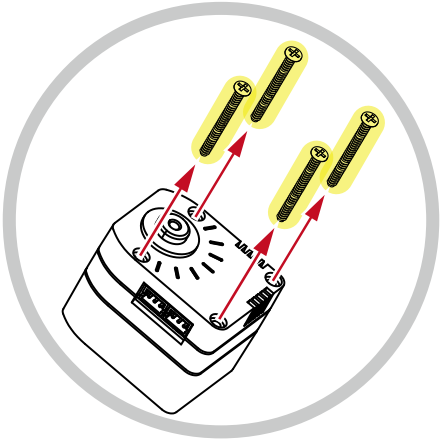
②

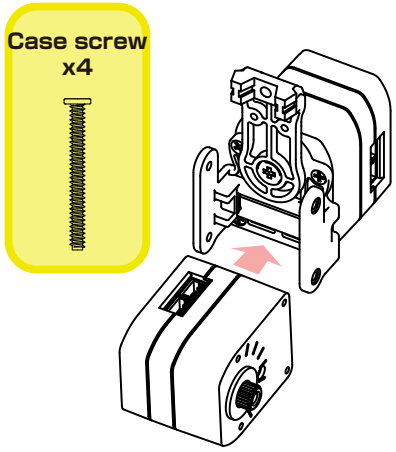


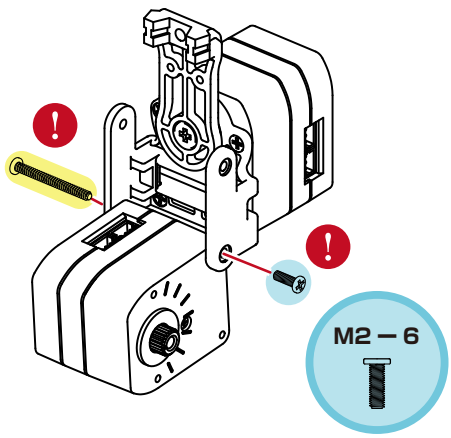
＊Confirm the servo origin and attach it straight.

③ ③-1. Detach case screws. ③-2. Attach as shown in the diagram.

! Tighten the temporary screws.



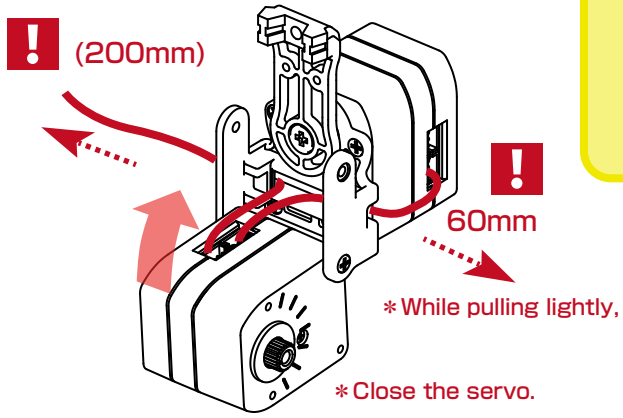




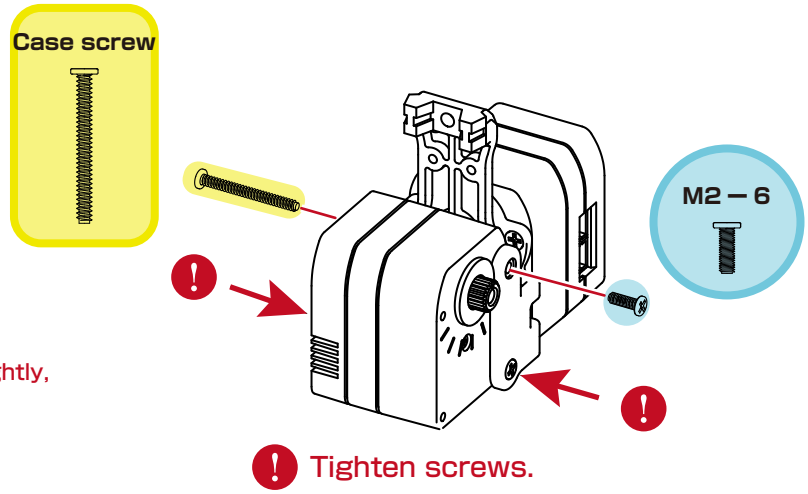
Cross Frame

Close the servo while pulling lightly on the cable (make sure the 60 mm cable is not too tight).
Whichever connector is used, it has no effect on operations, but be sure the cable is not overlapped or pinched.

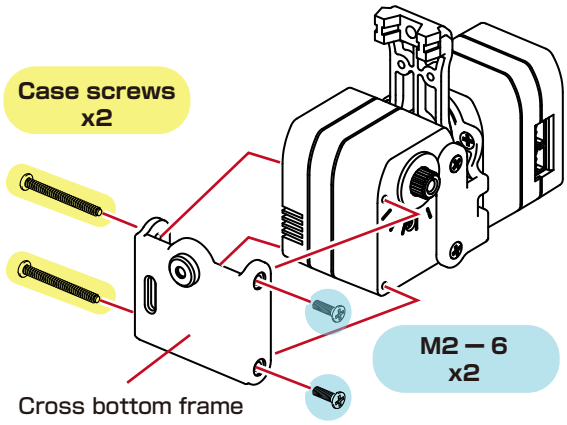
③-3.



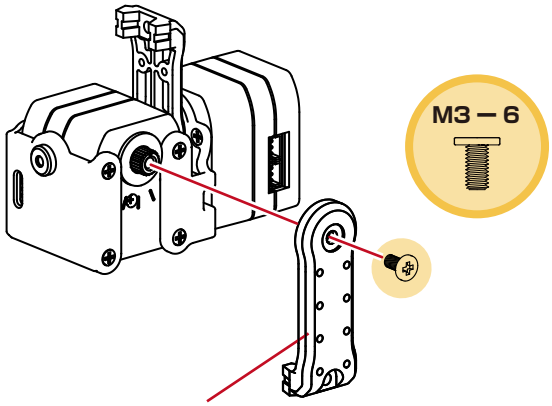
③-4.

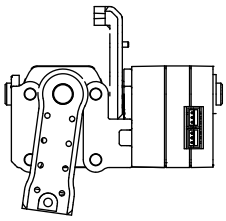


③-5.



③-6.

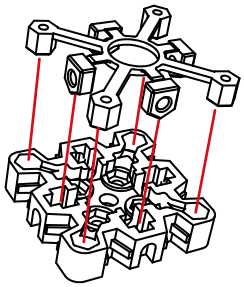


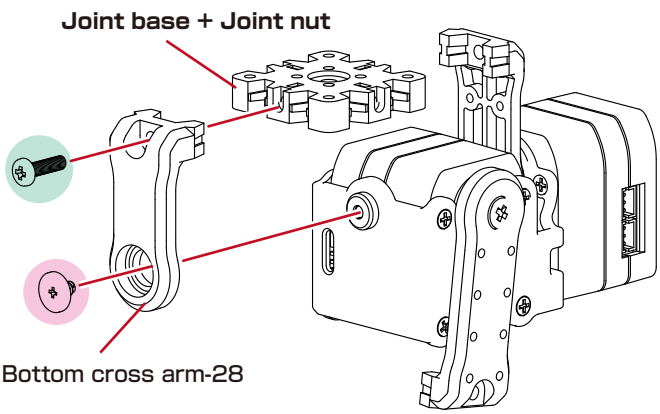


Attach as shown in the diagram.

④

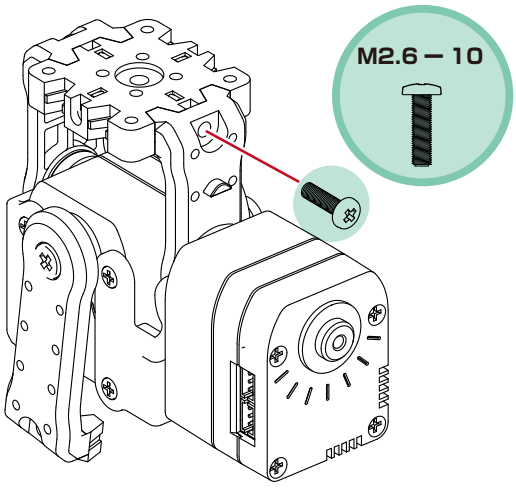
Assemble the Joint base A.





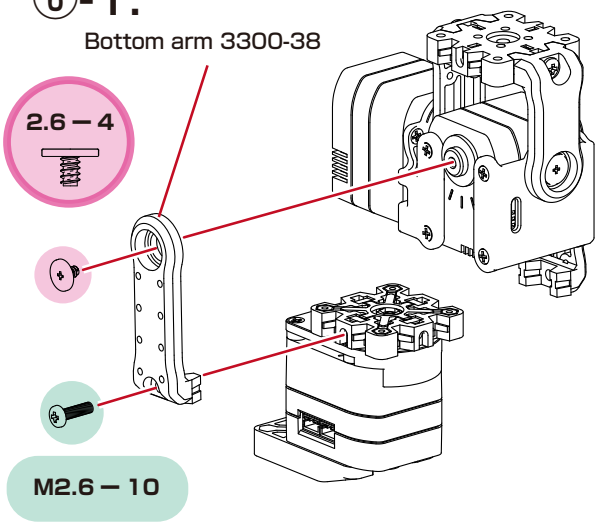
Cross Frame

⑤

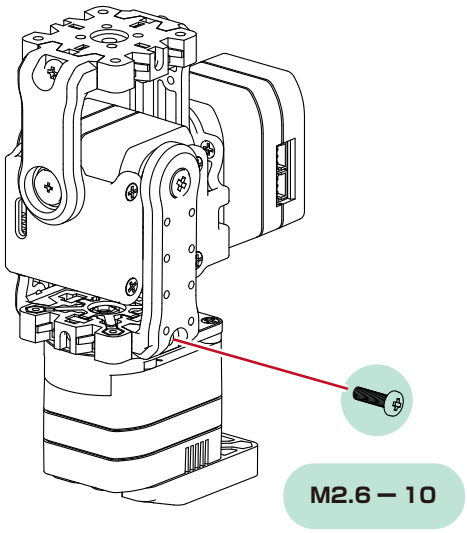


⑥ ⑥-1.

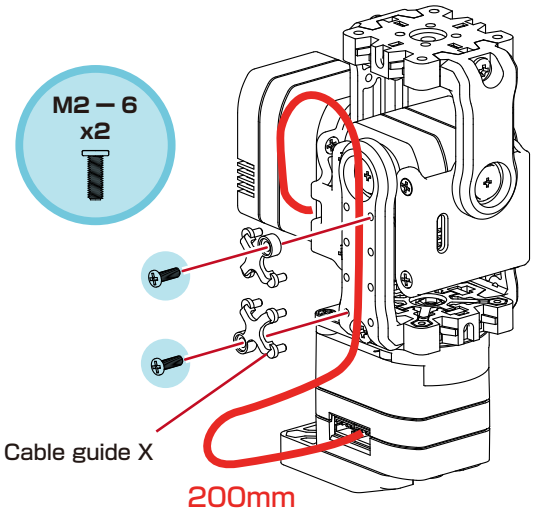
Bottom arm 3300-38



⑥-2.

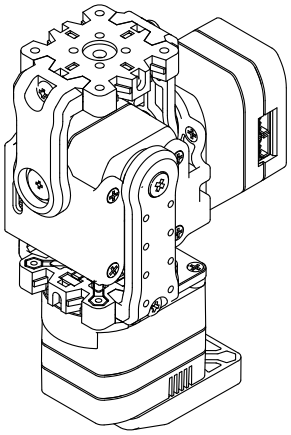


⑦



＊Put a bend in the cable to prevent too much force from being placed on it when the servo is moved manually.

Cross Flame



■Assemble the arm

No.02302
Servo arm
3300A(38mm)
(2sets)

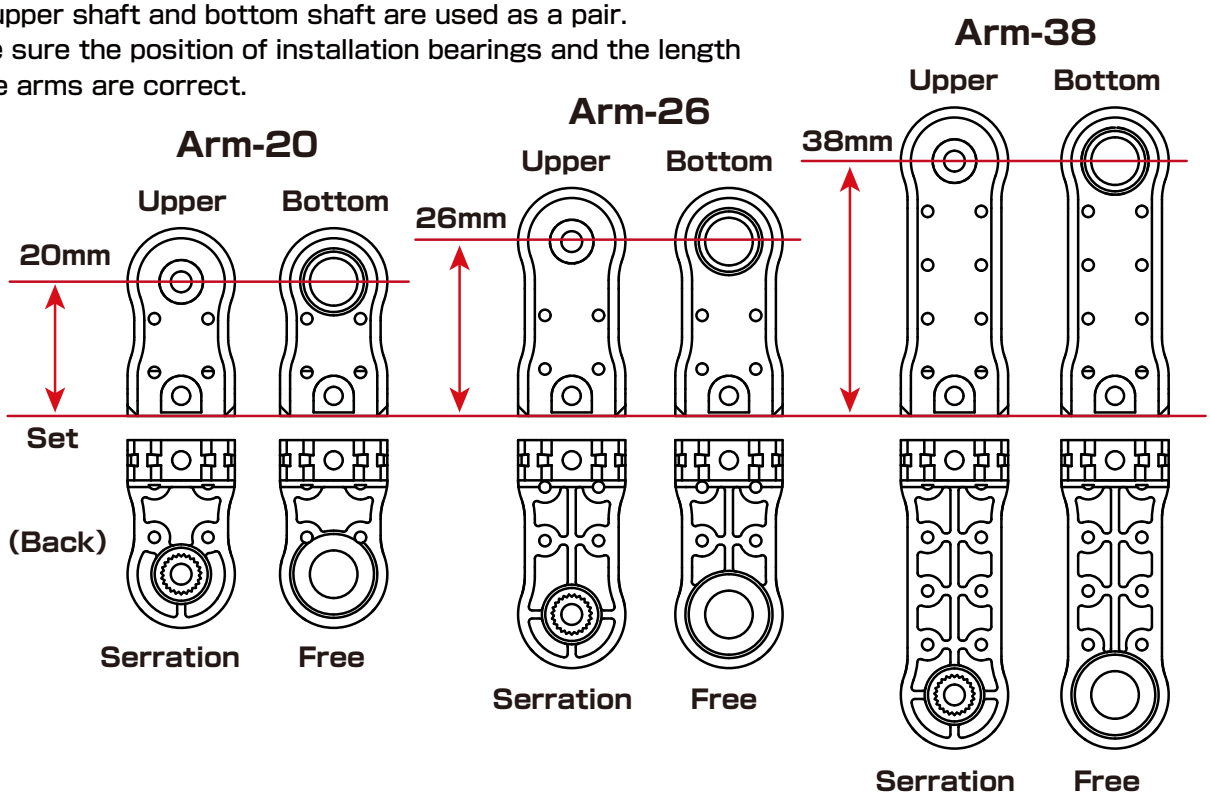
No.02303
(26mm)
No.02304
(20mm)

No.02322
Parts bag B
Arm set
(4sets)

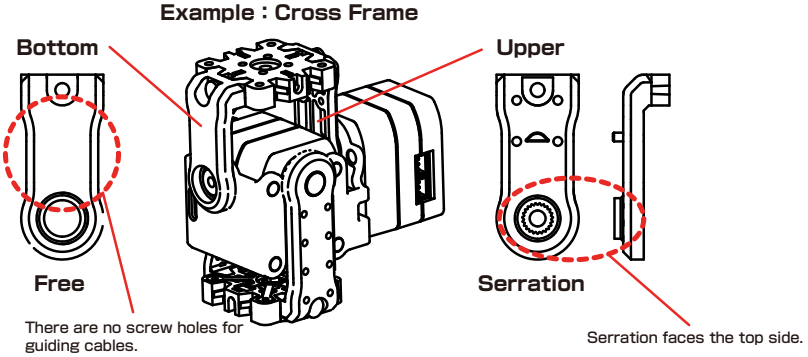
Servo arm used with the KXR series. It can also be used with the KRS-3300 series. The arm has mounting holes for cable guide X, so cable can also be secured to the arm.

Ex.

This part supports and rotates the servo with two shafts.
The upper shaft and bottom shaft are used as a pair.
Make sure the position of installation bearings and the length of the arms are correct.



Caution: Cross upper arm-28 is exclusively with the cross upper frame.

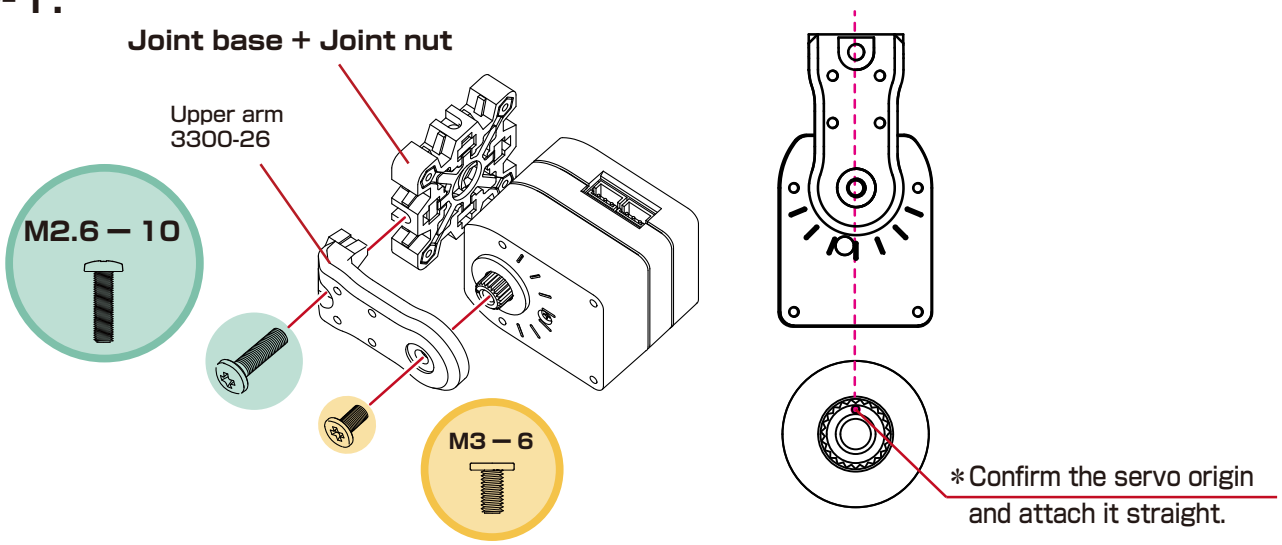


■Assemble the arm

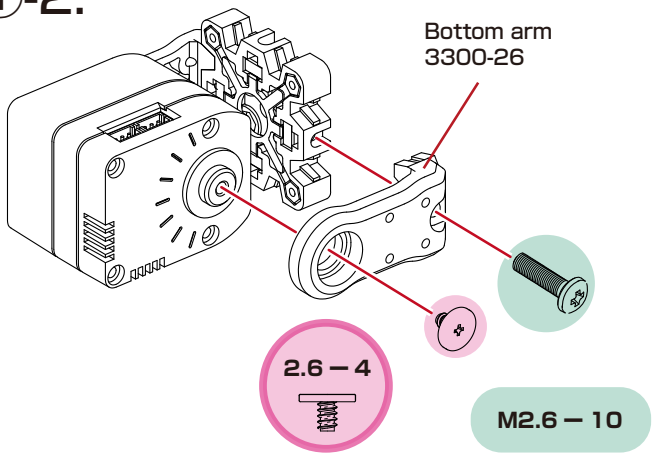
<Example of combination with servo/joint base>

＊The example uses arm-26, but others are the same.

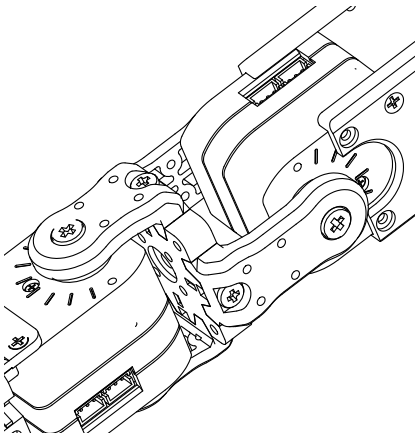
①-1.



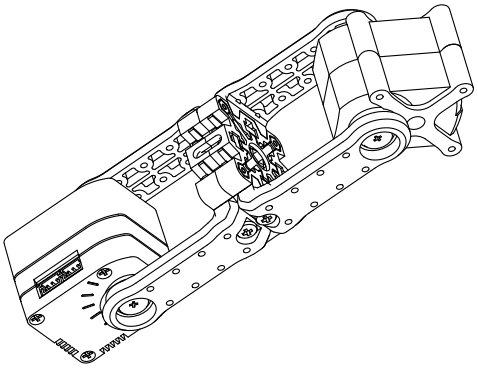
①-2.



＊Cross mount to joint base



＊Mount in same direction to double joint base



Angle Bracket

■Assemble the angle braket

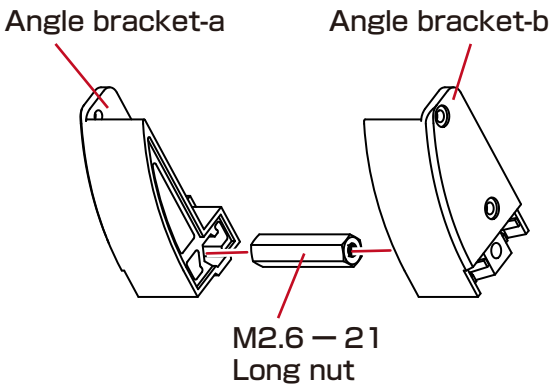
No.02308
Angle bracket
(2sets)

No.02323
Parts bag C
Joint set
(4sets)

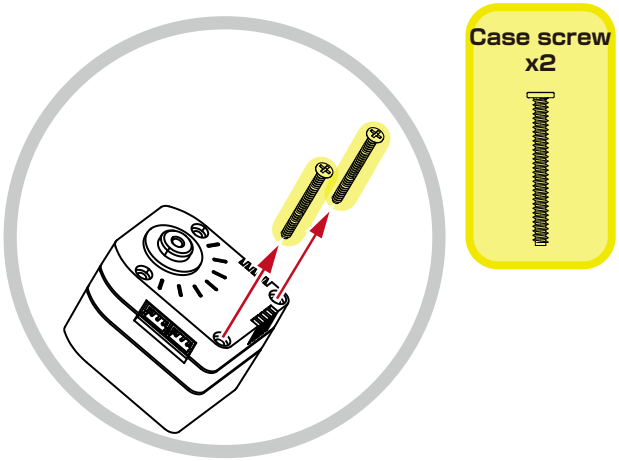
Bracket part for perpendicularly mounting a servo and arm. With humanoid robots, it is used in knee area.

Ex.

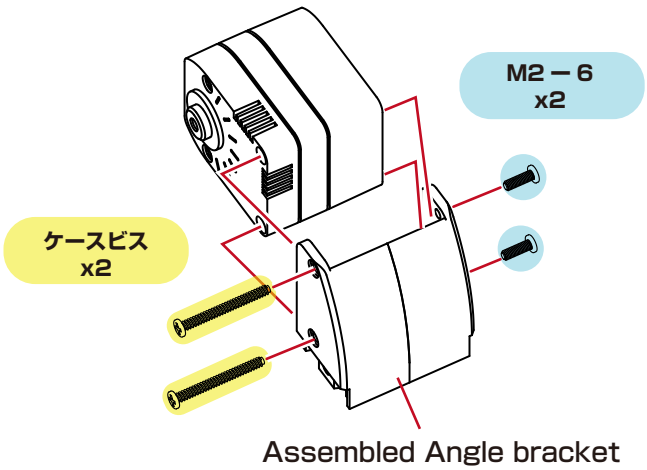
①-1.



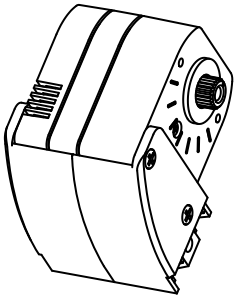
①-2.



①-3.

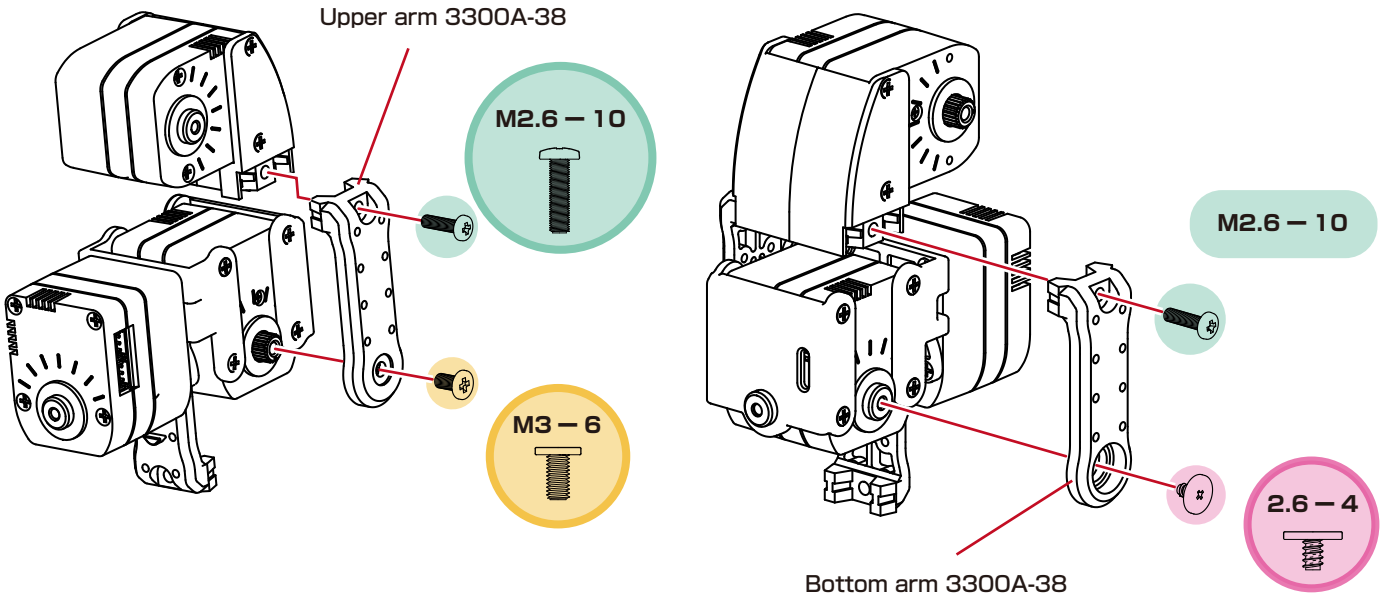


Angle Bracket



Angle Bracket

<Example of combination with cross frame>



■Assemble the Flat frame

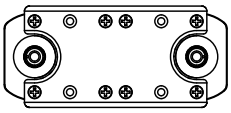
No.02319
Flat frame
3300
(2sets)

No.02323
Parts bag C
Joint set
(2sets)

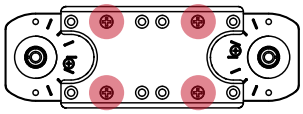
Frame set for connecting servos. There are multiple holes for securing servos, so adjustments can be made to the length depending on the application.

Ex.

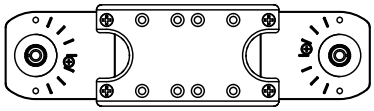
＊With the flat frame, the leg length can be adjusted by changing the attachment position. In this project example, the Middle type is used.



Short

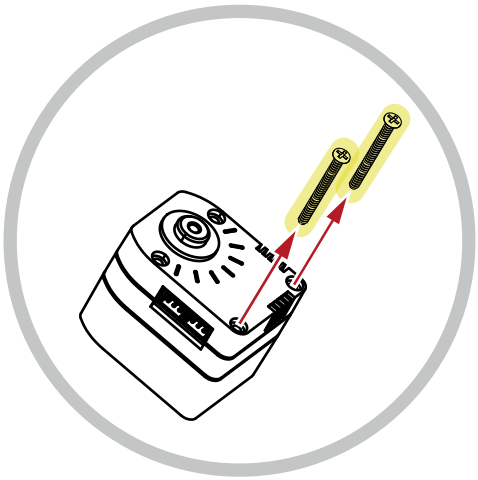


Middle

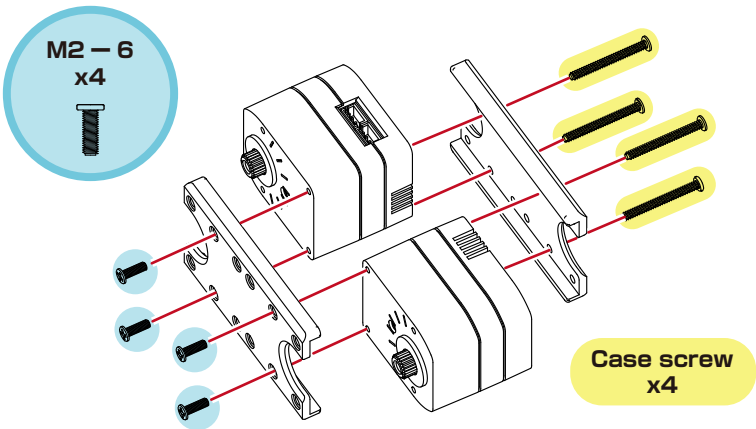


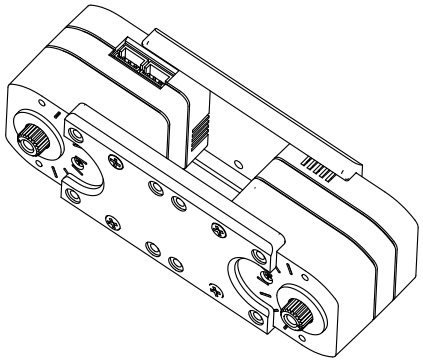
Long

① Detach the case screws.



②

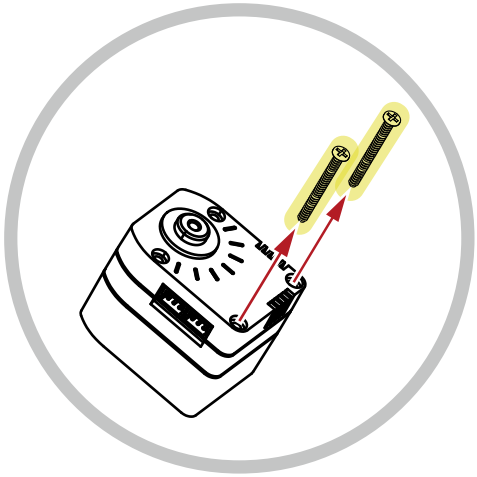


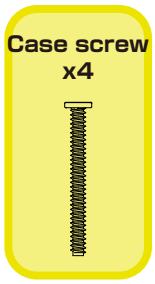


Flat Frame

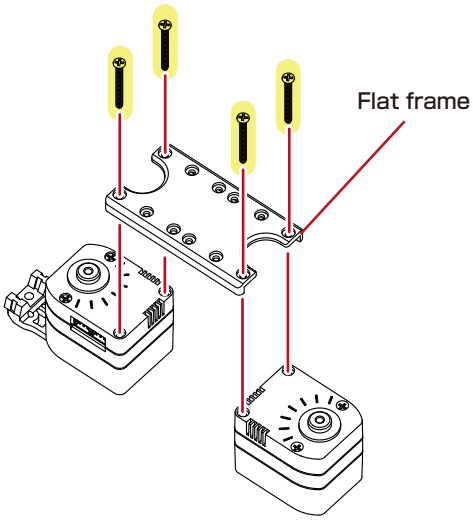
<Example of combination with wheel>

① Detach the case screws.

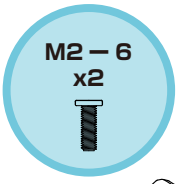


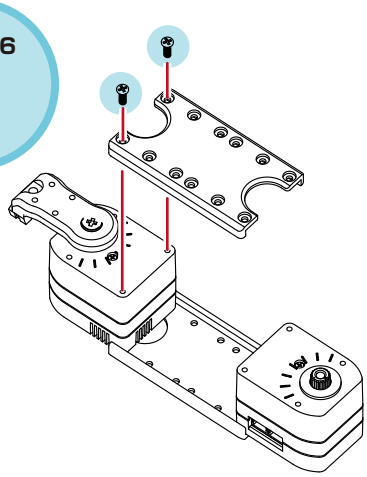


②

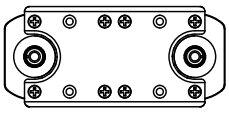


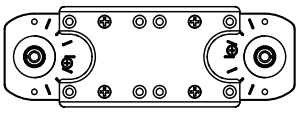
③

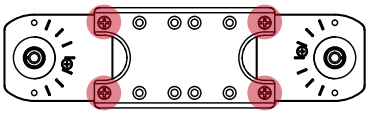




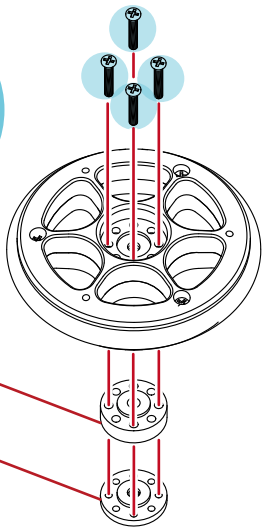
＊In this project example, the Long type is used.





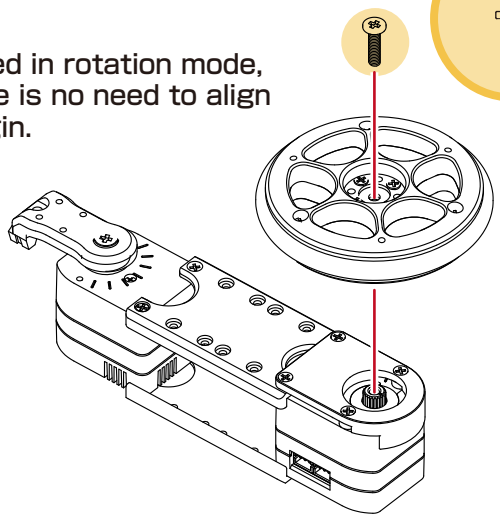


④



⑤

＊It is used in rotation mode, so there is no need to align the origin.



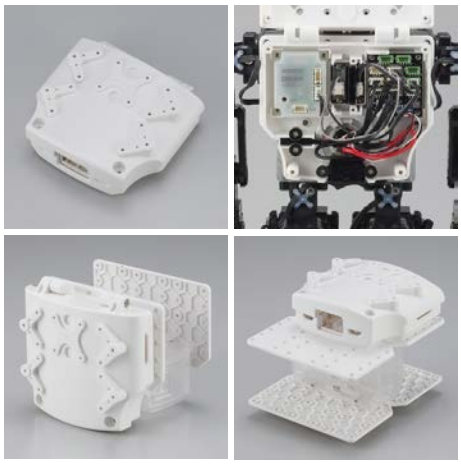
■Assemble the backpack

No.02312
Backpack set
(KXR)
(1set)

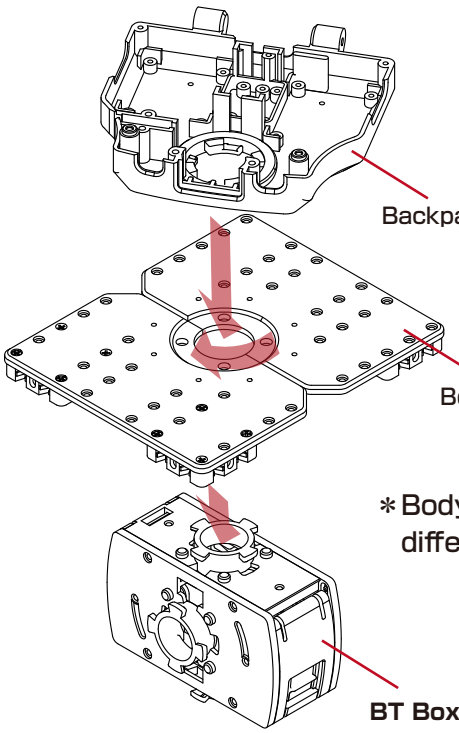
No.02321
Parts bag A
Body parts set
(1set)

Backpack set used with the KXR series. You can mount the RCB-4mini control board, KRR-5FH receiver, two KRG-4 gyro sensors, and a RAS-3 acceleration sensor (new product).

Ex.

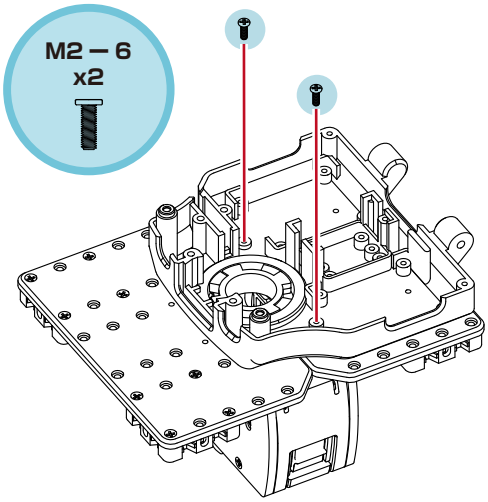


① Rotate until it clicks into place.



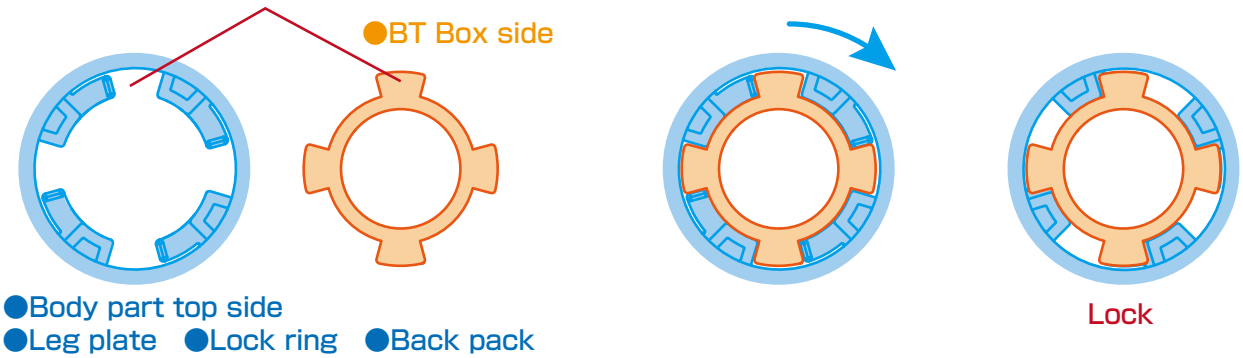
＊Body part combinations differ with the robot.

②

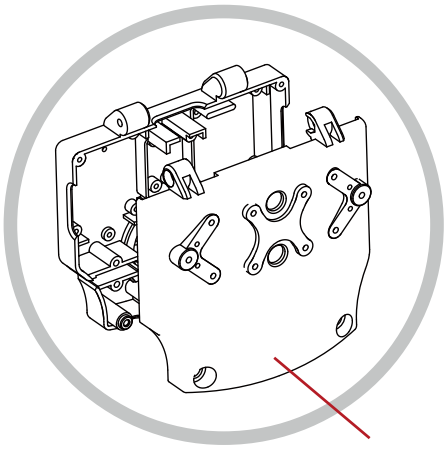


About the lock portion for the BT box and body parts

①Align the notch and protrusion, and attach.　②Rotate until it clicks into place.

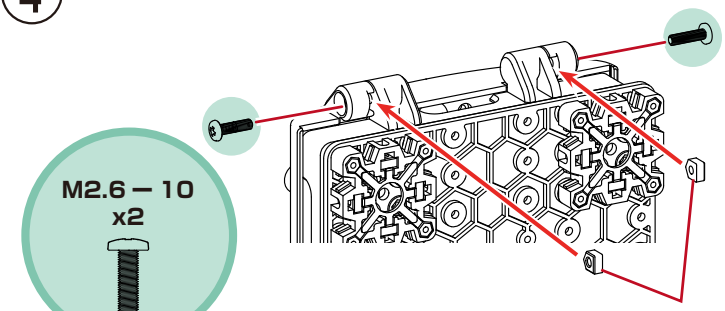


③

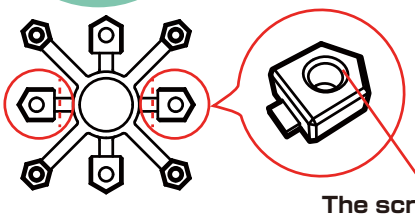


Backpack cover

④



Use the M2.6 part of joint nuts



M2.6 Nut

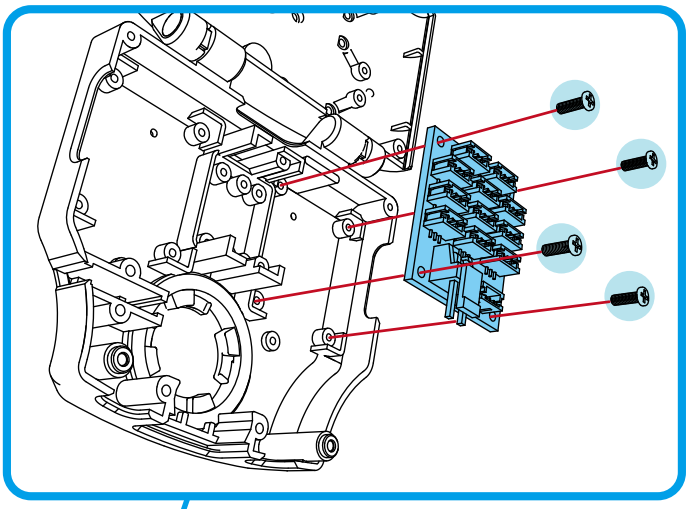
The screw side (facing out) is the side with bevelling around the holes.

⑤Attach the electronic components.

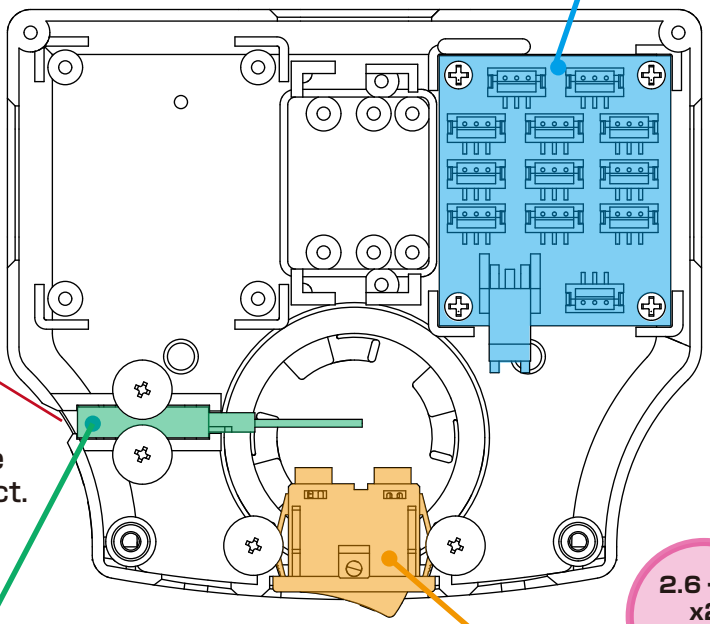
*Please refer each manuals.

<Control board>
RCB-4mini
<COM Port>
ZH Conversion cable
<Power switch>
LV Power source switch herness
<RC Receiver>
KRR-5
<Gyro sensor>
KRG-4 2x
<Accelerometer>
RAS-3

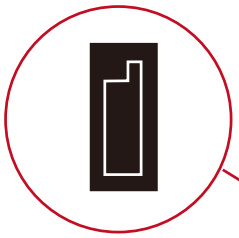
⑤-1. Attach RCB-4mini



M2－6
x4



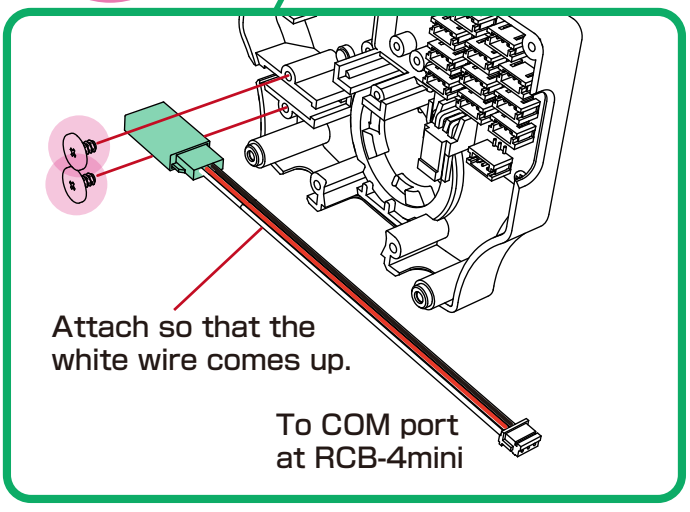
COM port



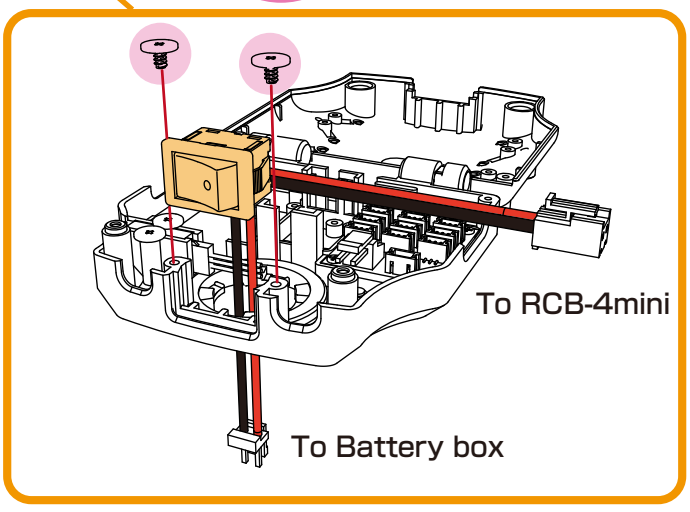
＊When inserting the connector, make sure the direction is correct.

2.6－4
x2

2.6－4
x2



⑤-2. Attach ZH Conversion cable



⑤-3. Attach LV Power Source Switch Harness

<Connect wire>

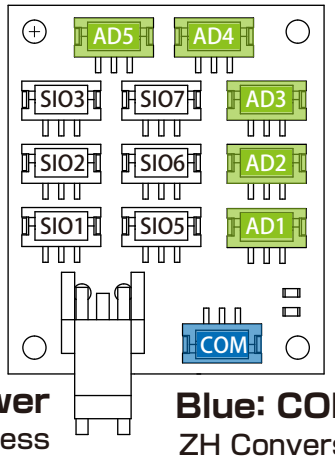
White: SIO port
Servo/receiver, etc.

Green: AD port
Sensor, etc.

Connect the Servo/KRR-5.

*Connect ID 0 to SIO 5-7.

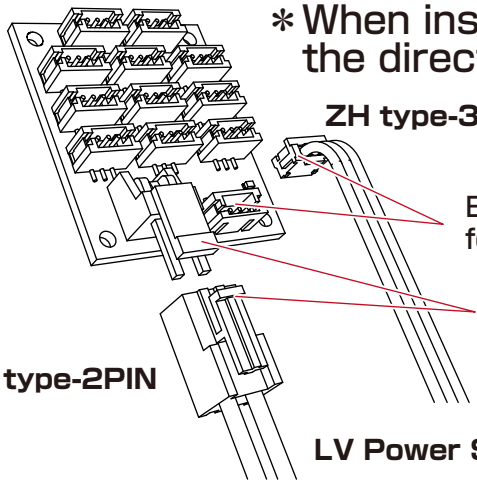
*Connect KRR-5 to SIO 5-7.



Connect the KRG-4/RAS-3.

Power
LV Power Source Switch Harness

Blue: COM port
ZH Conversion cable (PC)



*When inserting the connector, make sure the direction is correct.

ZH type-3PIN

Be careful of the protruding direction and do not force it in.

Be sure to confirm the lock/guide direction and that it is not connected backward.

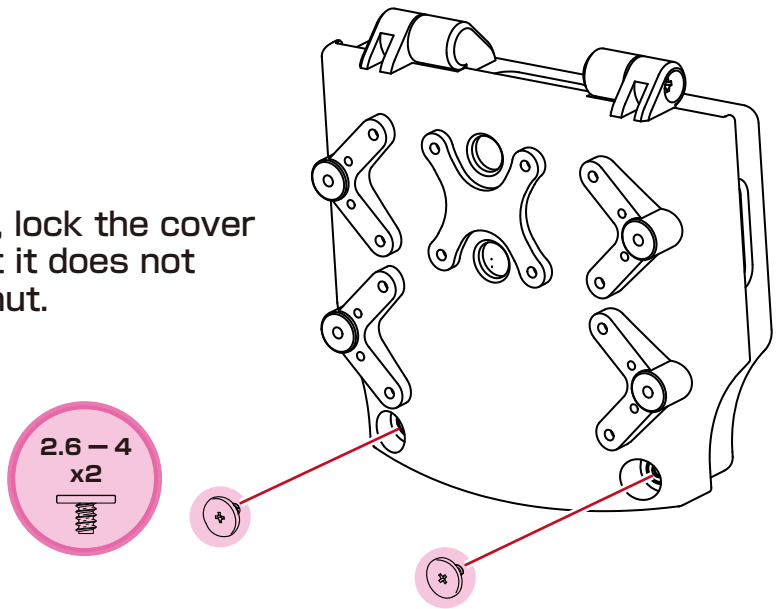
VH type-2PIN

ZH Conversion cable

LV Power Source Switch Harness

■Cover lock

When operating the robot, lock the cover with 2.6-4 screws so that it does not unexpectedly open and shut.

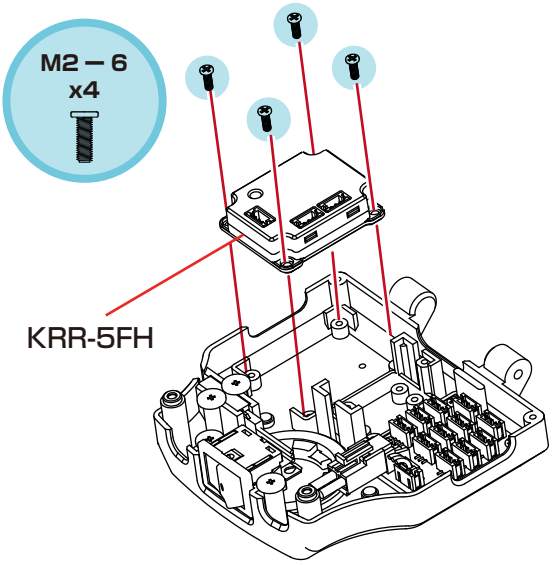


■Method for Mounting on Backpack

*Please refer each manuals.

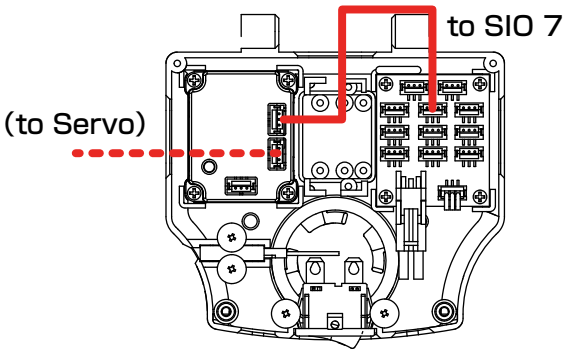
KRR-5FH : Receiver for wireless controller

Enables wireless operations with KRC-5FH.



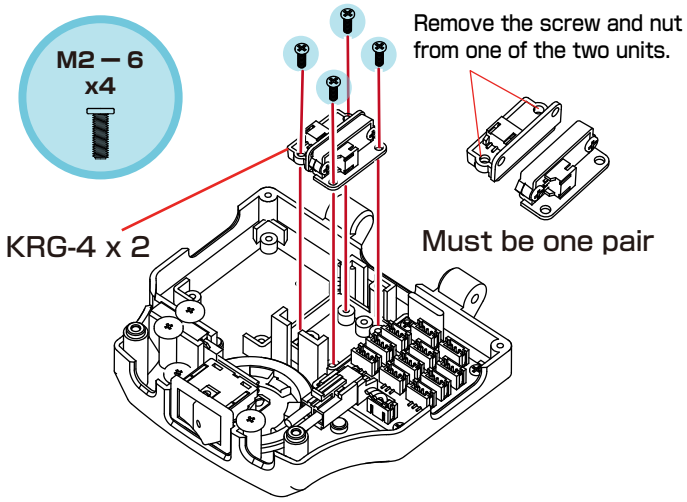
Example :

Connect KRR-5FH to the RCB-4mini's SIO port.
*The sample motion uses the port in the diagram.
If a servo is connected, remove it and connect it to the KRR-5FH port.
It does not matter which of KRR-5FH's SIO ports is used; it has no impact on operations. Also, daisy chain connection is possible just as with servos.



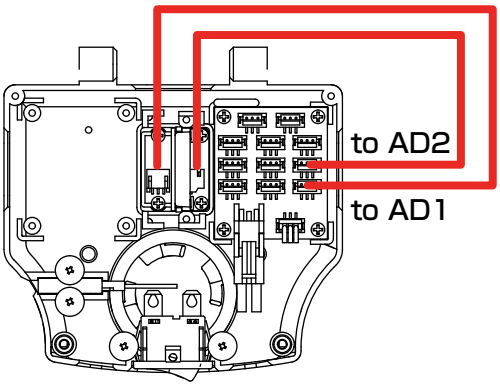
KRG-4 : Gyro sensor

Robot movements are stabilized by correcting postural changes.



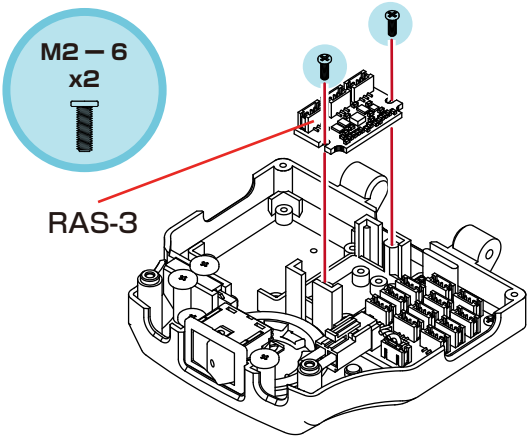
Example :

Connect KRG-4 and the RCB-4mini AD port.
*The sample motion uses the port in the diagram.



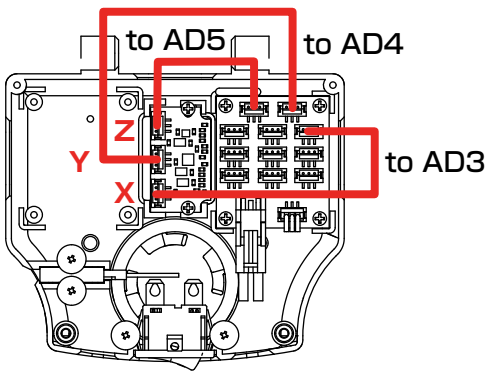
RAS-3 : 3 Axis Accelerometer

Used to determine the robot' s posture by detecting the tilt of its body.



Example :

Connect the RAS-3 and RCB-4 mini's AD port.
*The sample motion uses the port in the diagram.
Front-back determined with AD4 (Z axis). (KXR-L2)



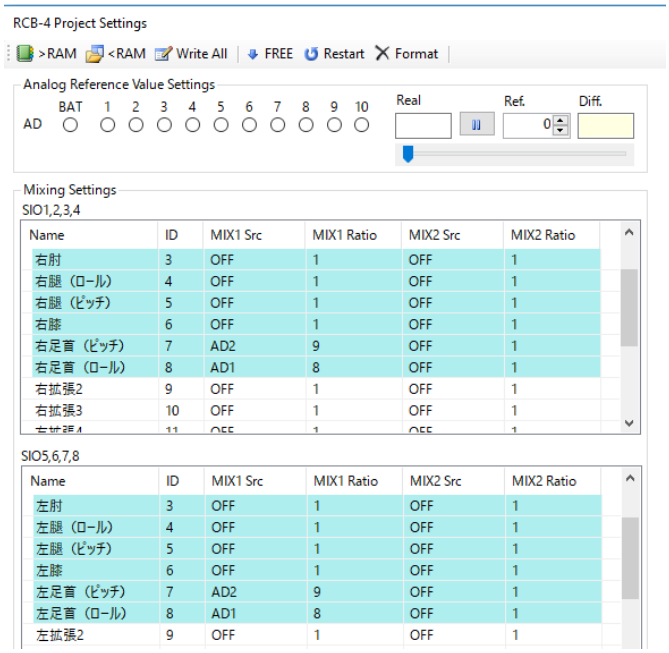
■KXR-L2

<Recommended settings>

▼SIO 2.	Port(Gyro)	MIX1
ID7:Right Ankle(Pitch)	AD2	+9
ID8:Right Ankle(Roll)	AD1	+8

▼SIO 6.	Port(Gyro)	MIX1
ID7:Left Ankle(Pitch)	AD2	+9
ID8:Left Ankle(Roll)	AD1	+8

<Ex:Setting Window of HTH4>



BT(Battery) Box

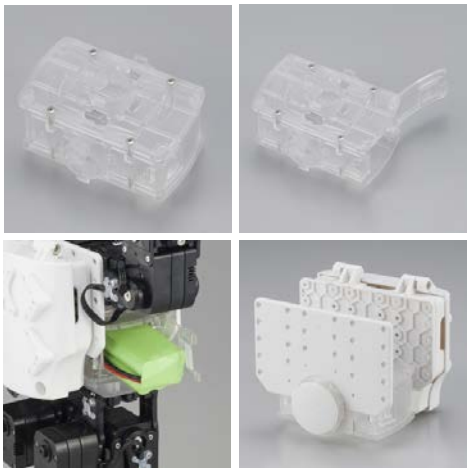
■Assemble the BT(Battery) box

No.02313
Battery box
(KXR)
(1set)

No.02321
Parts bag A
Body parts set
(1set)

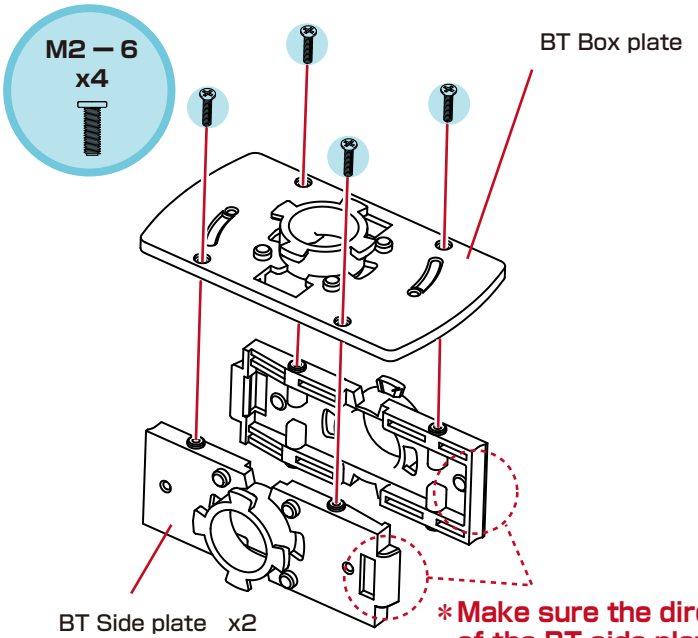
Battery box used with KXR. ROBO power cell E type and F2-850 ROBO power cell can be mounted.

Ex.

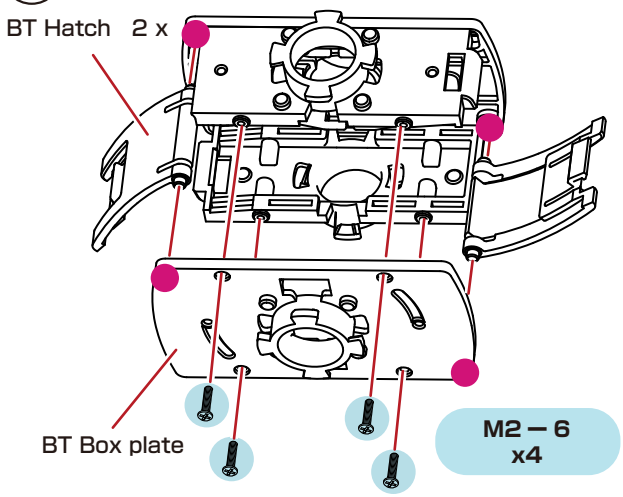


＊Wire as appropriate depending on the robot you’ re building.

①



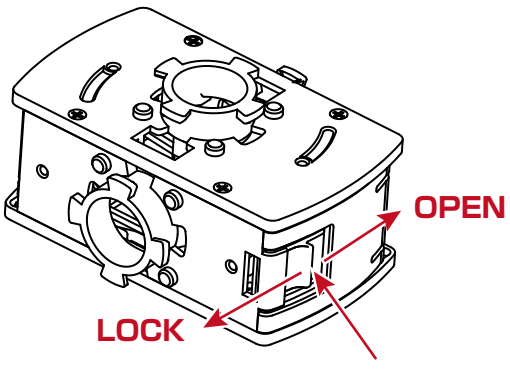
②



● Hinge positions

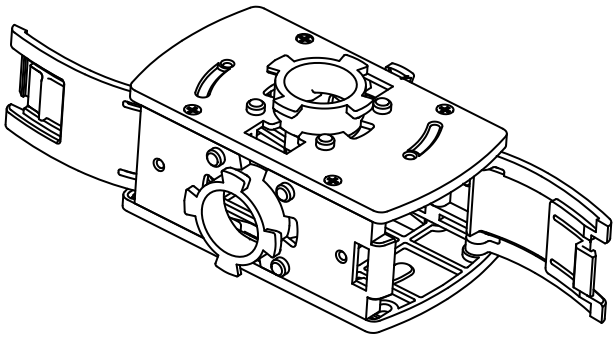
＊If installation proves difficult, try temporarily securing the BT box plate and inserting one BT hatch at a time.

Opening/closing hatch



Push and slide.

Both sides open the same way.



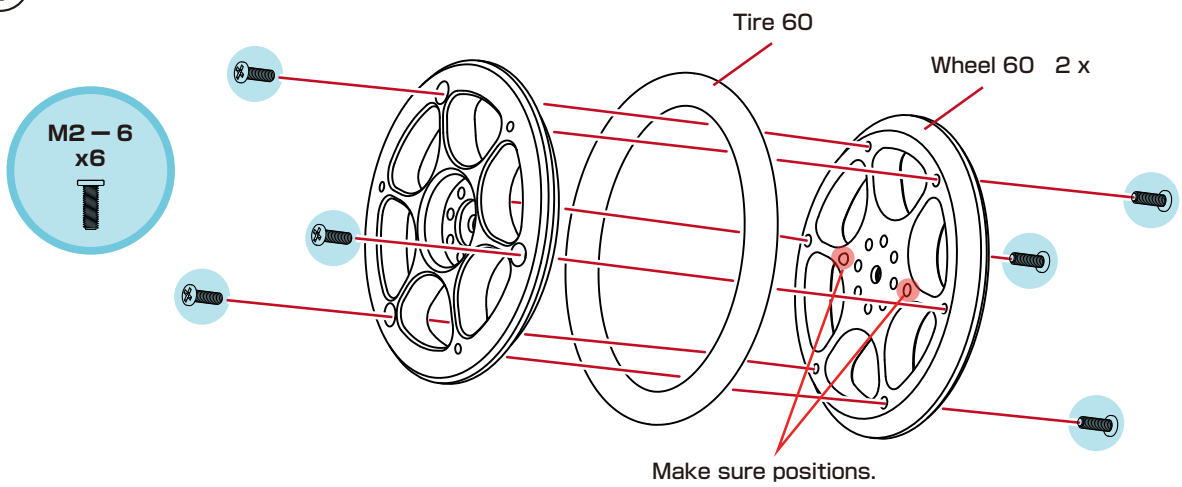
■Assemble the servo wheel

No.02320
Servo wheel（φ60）
(2sets)

Ex.

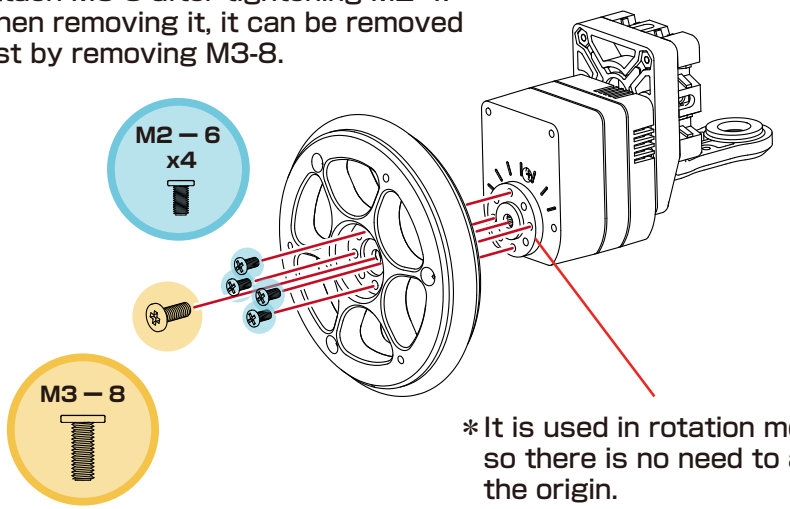
Wheel parts set for servos. You can directly mount a wheel to a servo via small-diameter horn B. KRS-3301/3304 for ICS3.6 can be continuously rotated 360° by using a serial manager and setting to rotation mode.

①Assemble the wheel and tire.



＜Wheel mounting example 1: When directly mounting to a servo＞

＊Attach M3-8 after tightening M2-4.
When removing it, it can be removed just by removing M3-8.

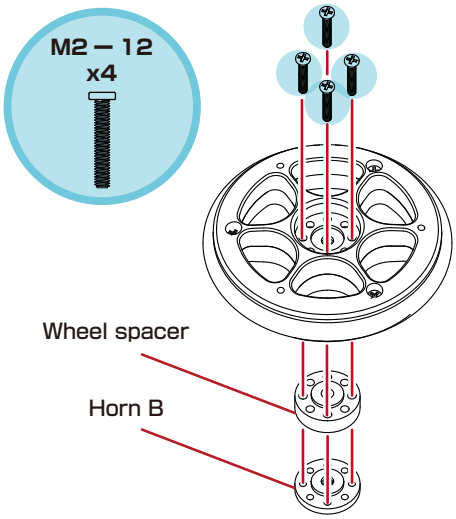


＊It is used in rotation mode, so there is no need to align the origin.

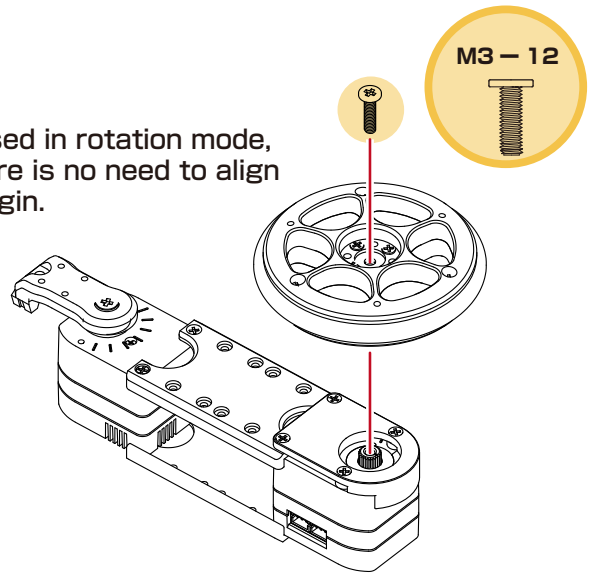
Servo Wheel

<Wheel mounting example 2: When using a supporter>

①



②



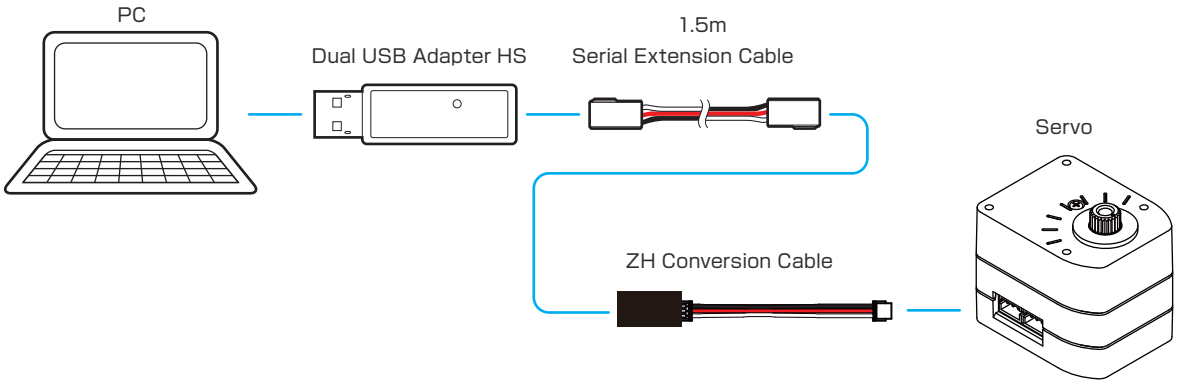
＊It is used in rotation mode, so there is no need to align the origin.

＊When using a wheel spacer, always use M3-12 (longer screw than standard).

Servo Wheel　Rotation Mode

● Connection

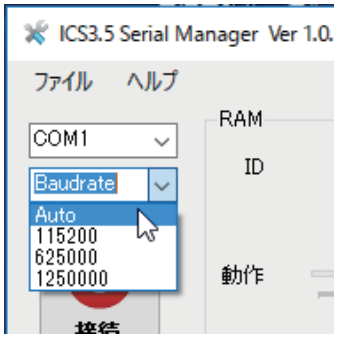
Connect the servos to the Dual USB Adaptor HS and serial extension cable with ZH conversion cable.



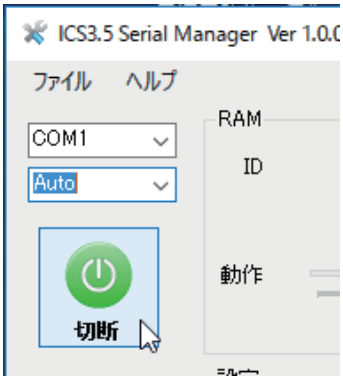
● Change the “Rotation Mode”

1. Select the COM number confirmed above in “Dual USD Adaptor HS COM Confirmation.” In the image, COM1 is selected, but the COM number differs depending on the computer you use, so always select the confirmed number.

2. Set the speed for servo communications. If you select “Auto,” it will automatically connect in line with the communication speed.

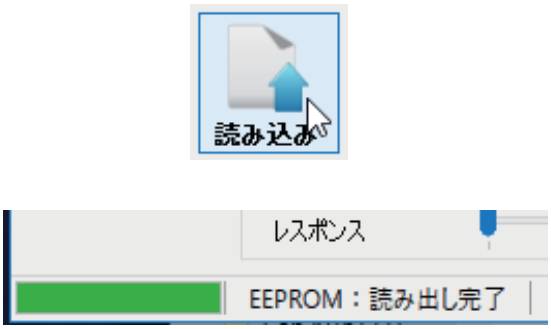


When the communication speed is selected (KRS-3301 ICS at factory shipment is 115200) and the “Connect” button changes to “Disconnect,” the process is complete. When the connection is complete, the IDs will automatically switch based on the servos.

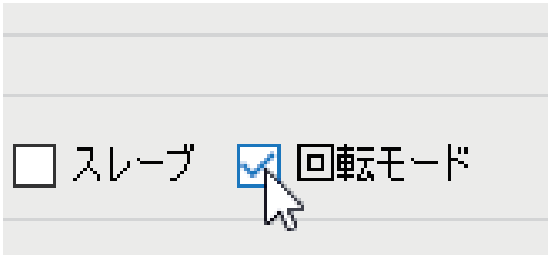


The ○ and □ mark on the ID sticker is unrelated to the ID, so confirm only the number.

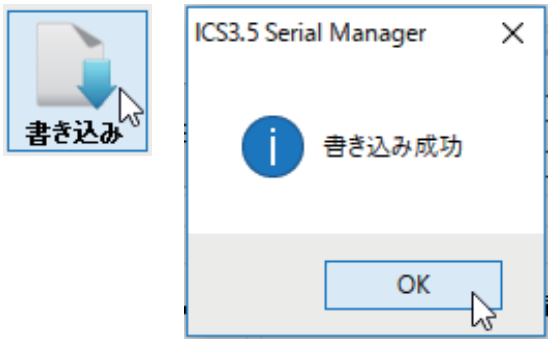
3. Press the “Read” button and incorporate the servo settings into Manager. If successful, “Read Complete” will be displayed in the lower-left box. If it fails, “Acquire Failed” will be displayed, so confirm the procedures and press the “Read” button again. In particular, be sure that Dual USB Adaptor HS is in “Serial Mode.”



4. Put a checkmark in “Rotation Mode.” (in the flag item in the middle of the window)



5. Press the “Write” button. When the “Write Successful” dialog box is displayed, the process is complete. Close the dialog box by pressing the OK button.



The above is the method for changing the “Rotation Mode” setting. Repeat procedures 3-7 and change the remaining servos to the rotation mode.

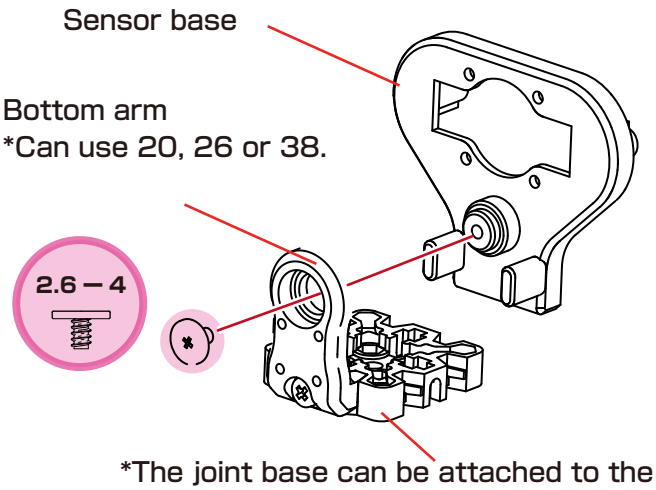
■Method for Mounting Sensor Base

No.02317
Sensor base A
(2pcs)

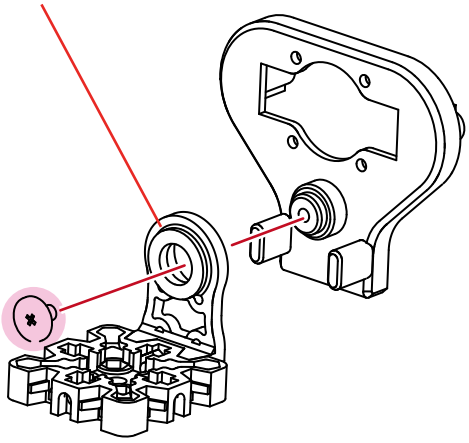
Ex.

Sensor part for securing a PSD sensor. It can be combined with a bottom arm to secure a sensor base in the upright position on the joint base. Can be installed in various places, including the robot head, backpack cover, etc.

①Attach the sensor base to the joint base.

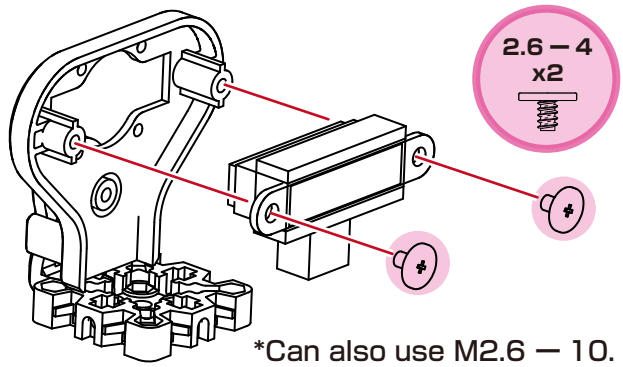


*Can also be attached by reversing the direction.



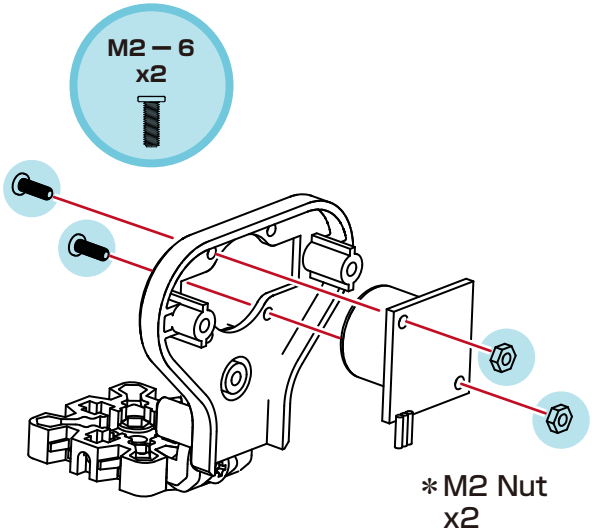
*The joint base can be attached to the necessary area, whether body or neck, etc.

②-1.PSD Sensor



*Can also use M2.6 — 10.

②-2.USRX-1



＊M2 Nut
x2

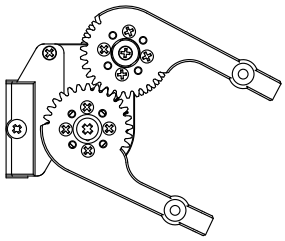
■Assemble the gripper

No.02318
Gripper hand set

Parts set for building a gripper hand. You can build a mechanism that opens and closes with a servo. Recommended for hands on humanoid and arm-type robots and for heads on animal models.

Ex.

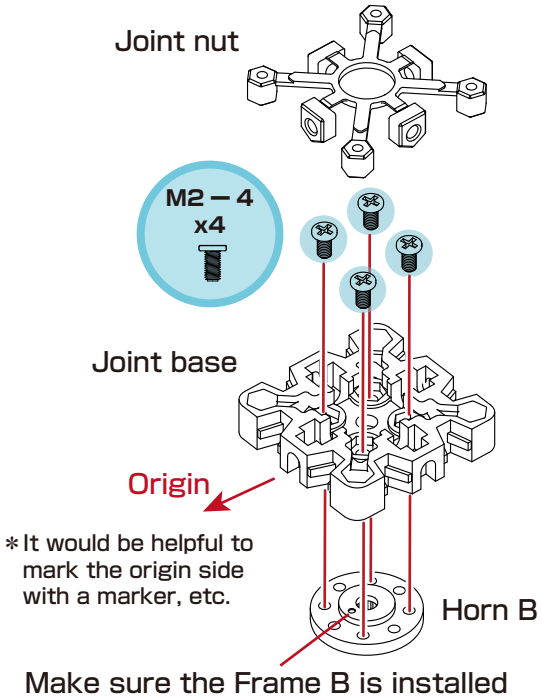
Be aware that servos and frame parts for securing servos used on this page are not included in the gripper hand set.
The example uses a mounting position like the one at right. The position may be changed as necessary.



①

①-1.

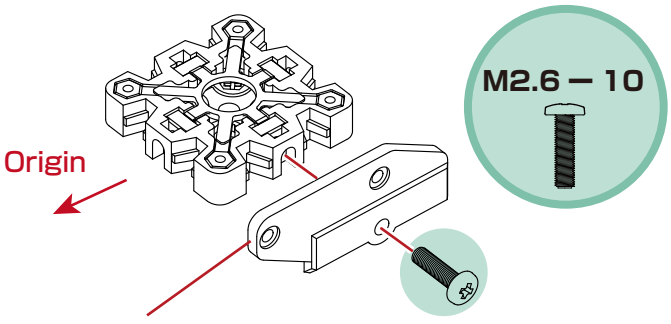
To attach a pivot just before the gripper, first assemble small-diameter horn B and the pivot servo. If not necessary, do not attach.



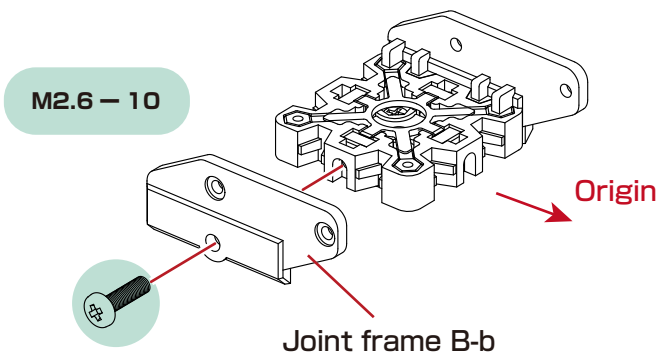
＊It would be helpful to mark the origin side with a marker, etc.

Make sure the Frame B is installed so that the origin faces the front.

①-2.

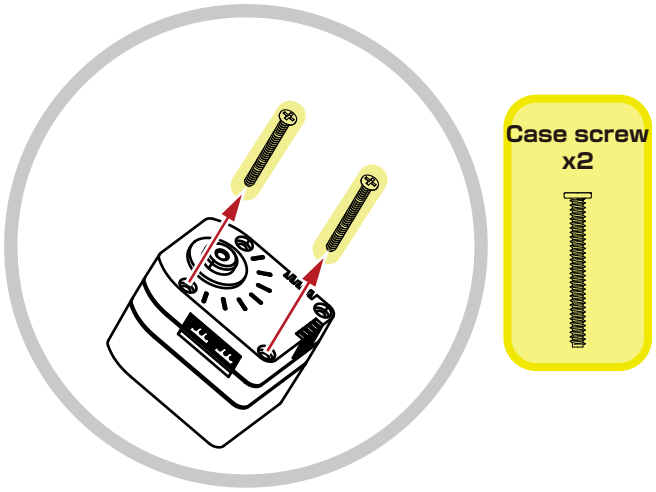


①-3.

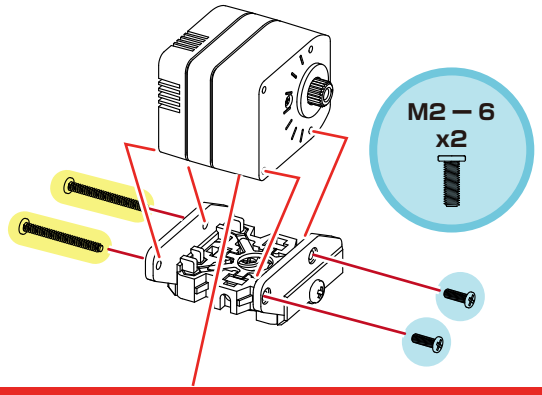


Gripper

②-1. Detach the case screw.

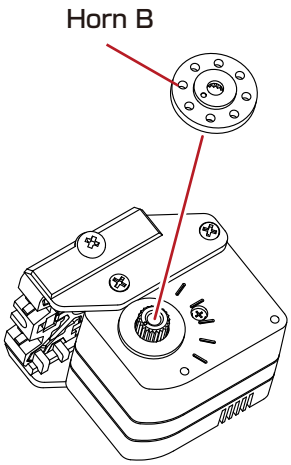


②-2.

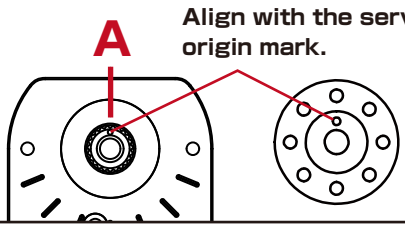


In the example, wiring can be done after assembly, but depending on the mounting position, connectors could be hidden, so connect cables as necessary beforehand.

②-3.



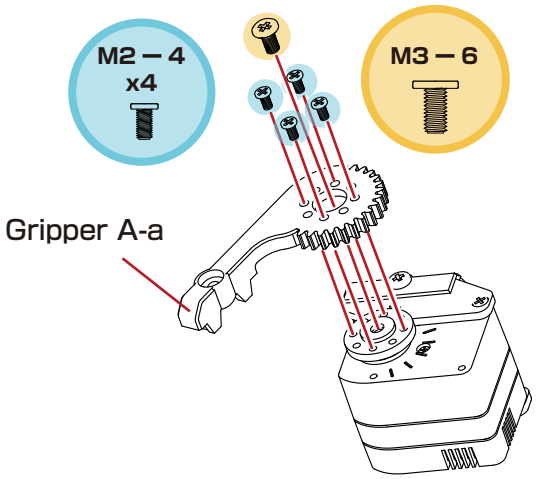
Points on Attaching to Upper Shaft



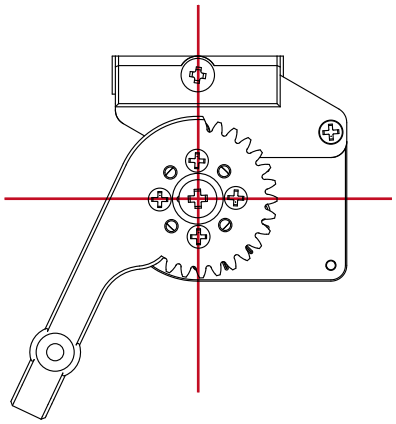
When the origin deviates with the diagram position, lightly insert the arm and rotate to adjust the position. Attach it straight toward the A line.

③

③-1. Attach the gripper A-a.

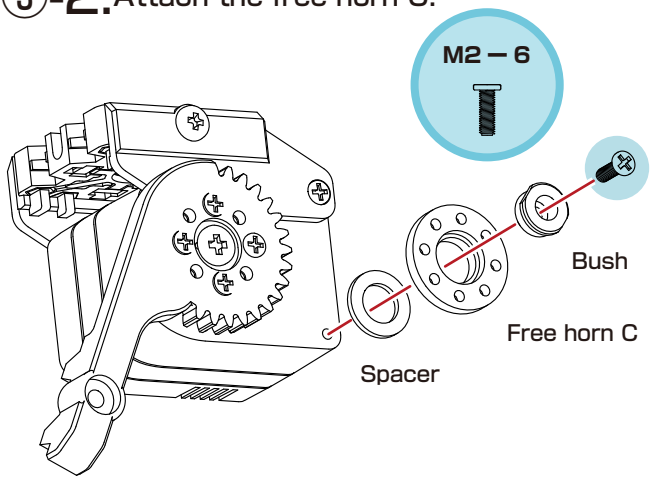


<Installation Angle Reference Diagram>

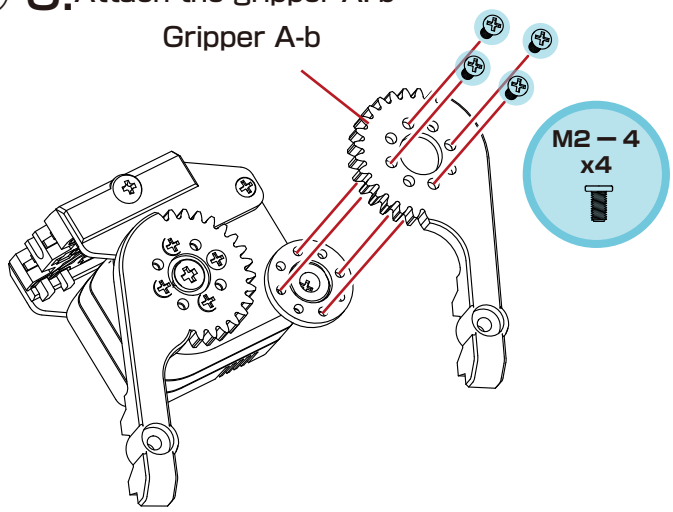


Gripper

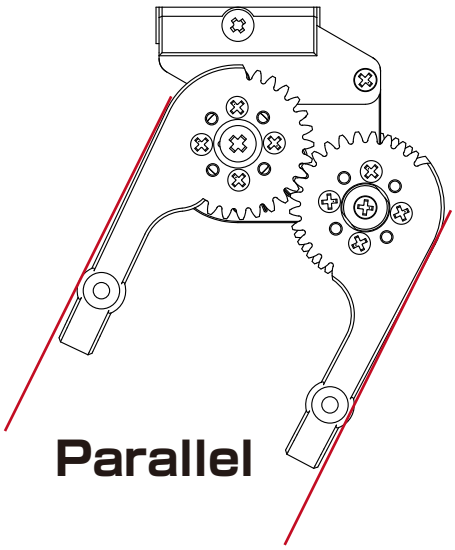
③-2. Attach the free horn C.



③-3. Attach the gripper A.-b

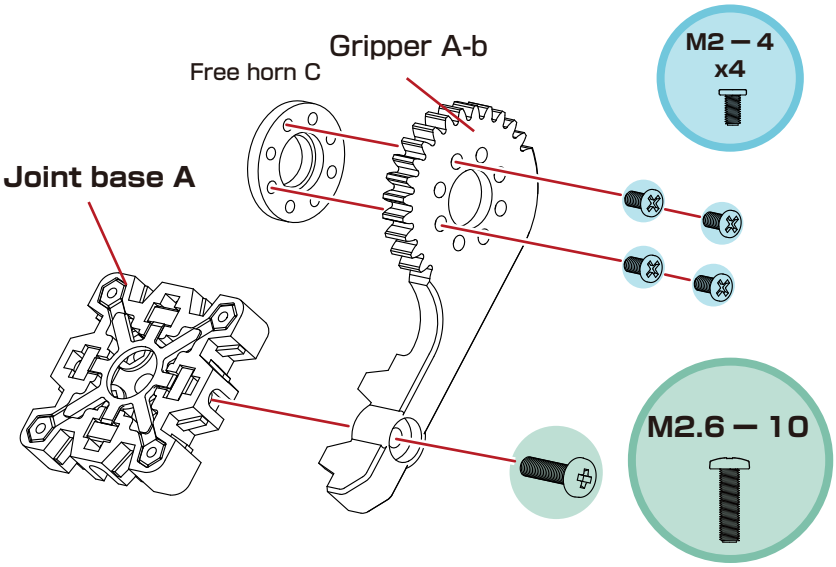


<Installation Angle Reference Diagram>

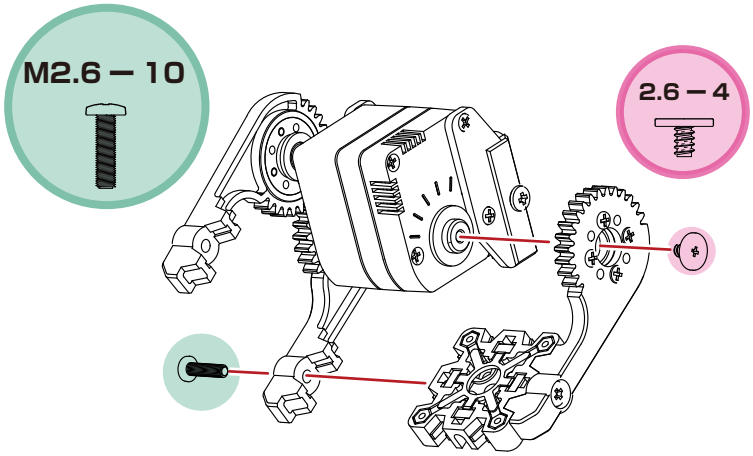


④

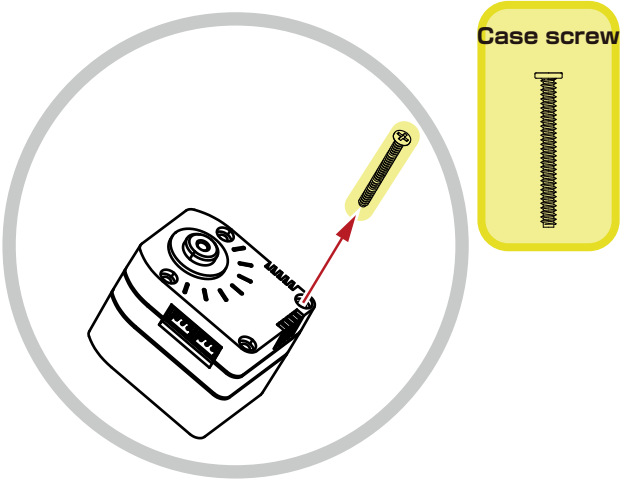
④-1. Attach the free horn C and joint base A to the gripper A-b.



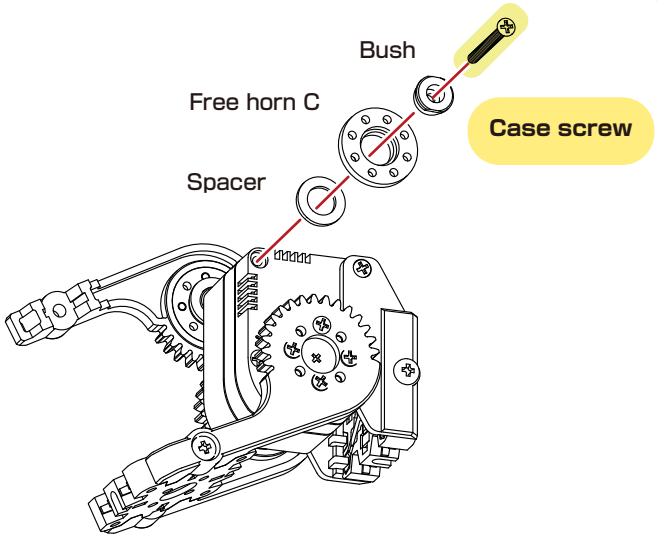
④-2. Attach the Gripper A-b to the Bottom shaft.



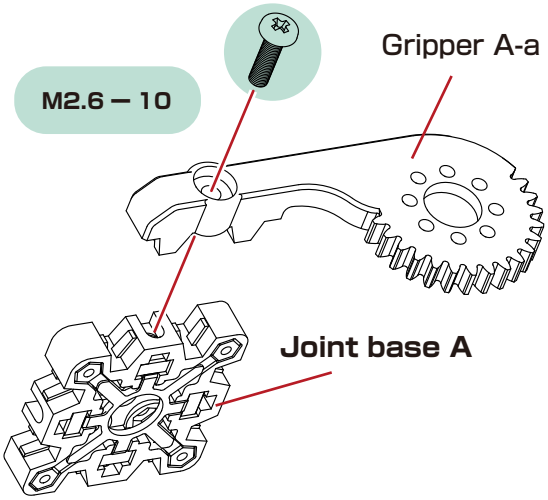
④-3. Detach the Case screw.



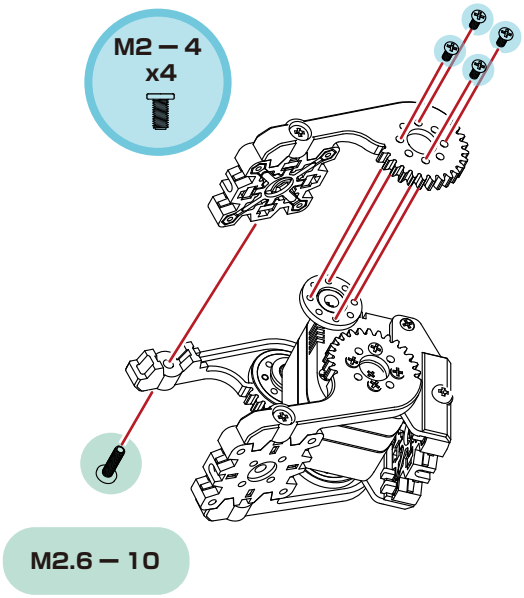
④-4. Attach the Free horn C.



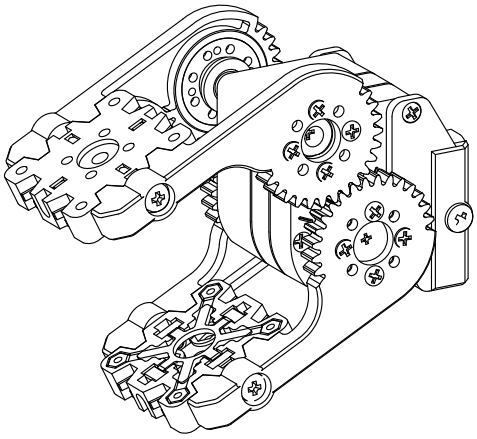
④-5. Attach the Gripper A-a to the Joint base A.



④-6. Attach the Gripper A-a.



Gripper

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