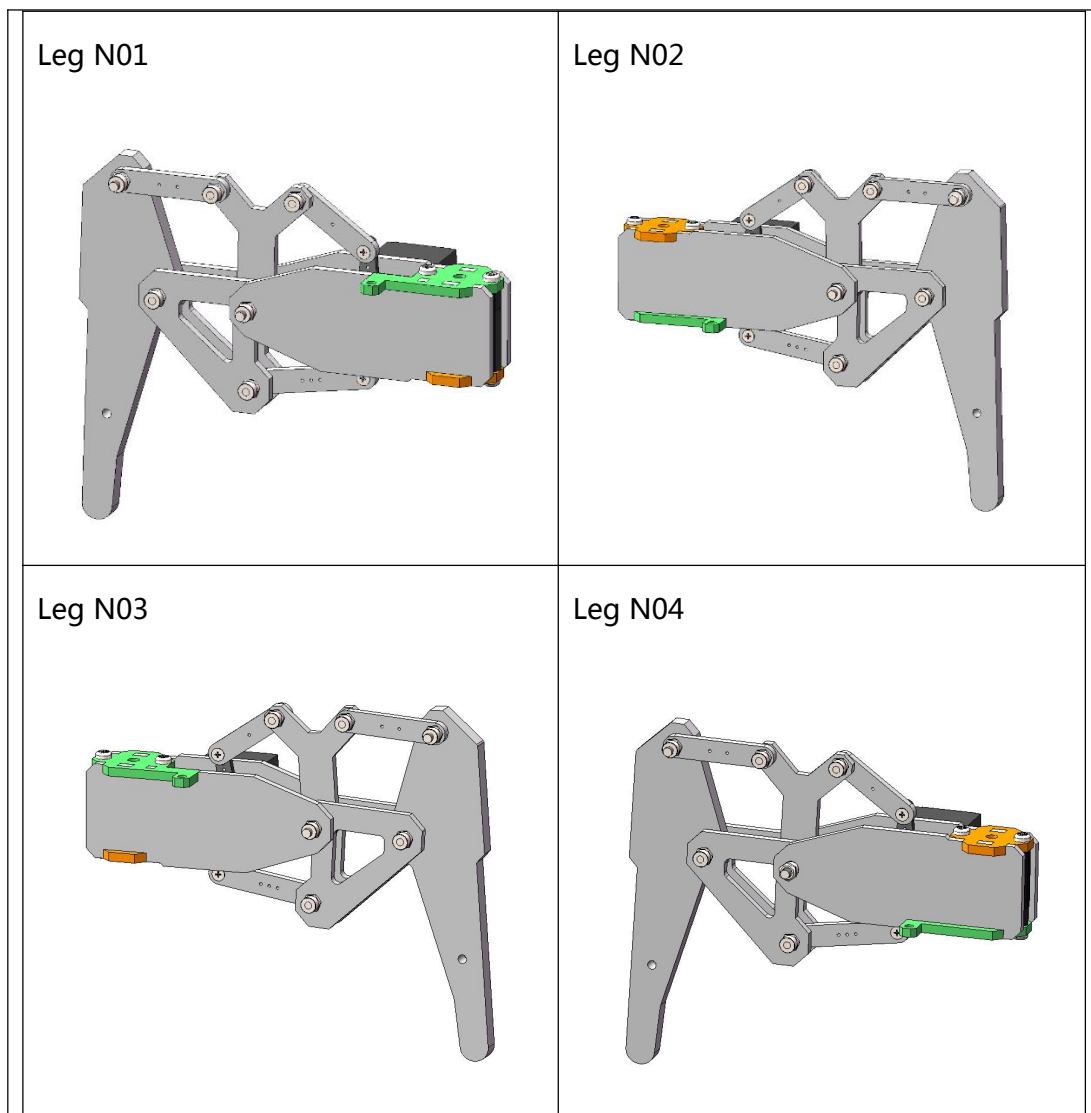


Lesson 6 Assembly of DarkPaw

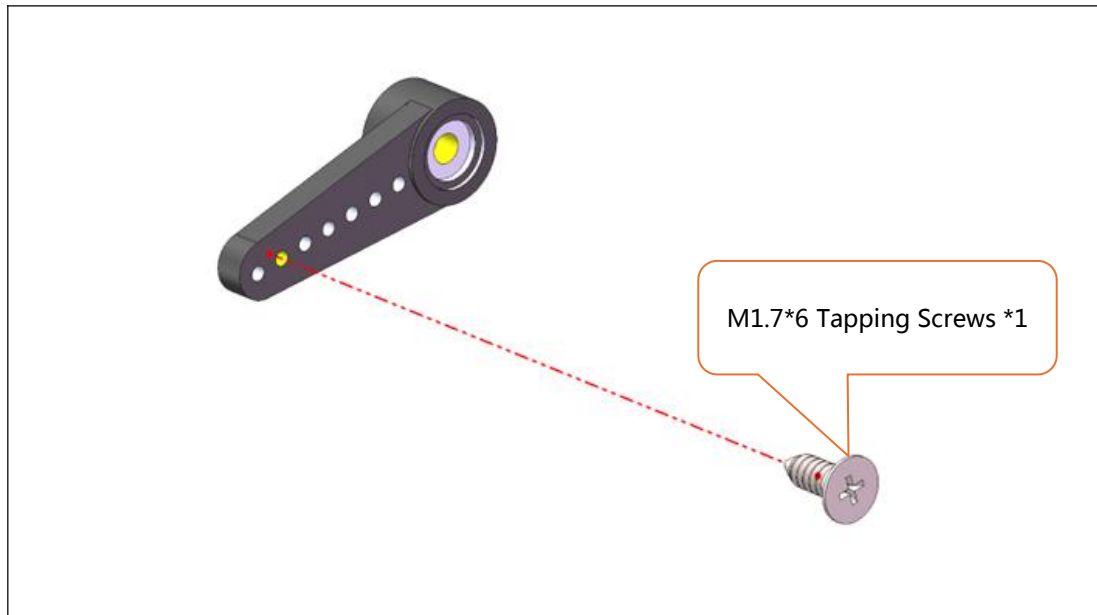
Quadruped Robot

6.1 Precautions Before Assembly

1. The four legs of this robot differ from each other as follows. Please pay attention to these differences during the assembly process.

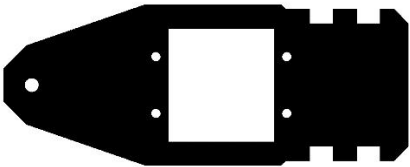



2. During the assembly process, it is recommended to use the mounting holes shown in the figure to fix the servo rocker arms.

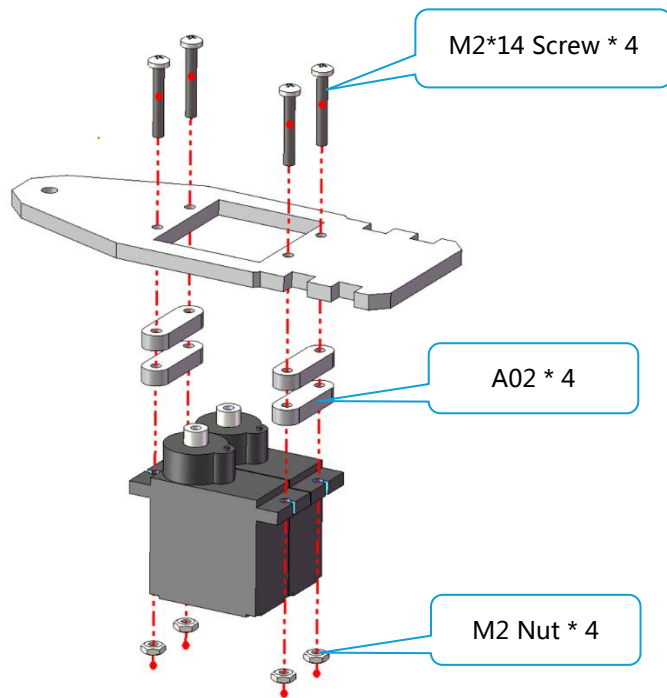


6.2 Assembly of Leg N01

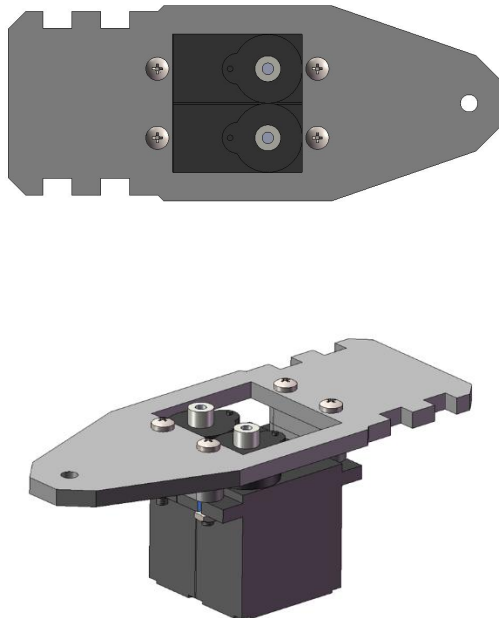
1. Fix two **Servos** to the part **A01** using four pieces of part **A02**, four **M2*14 Screws** and four **M2 Nuts**. (There is a protective paper on the surface of the acrylic, you can tear off the protective paper.)

A01	
A02	

Assemble the following components:



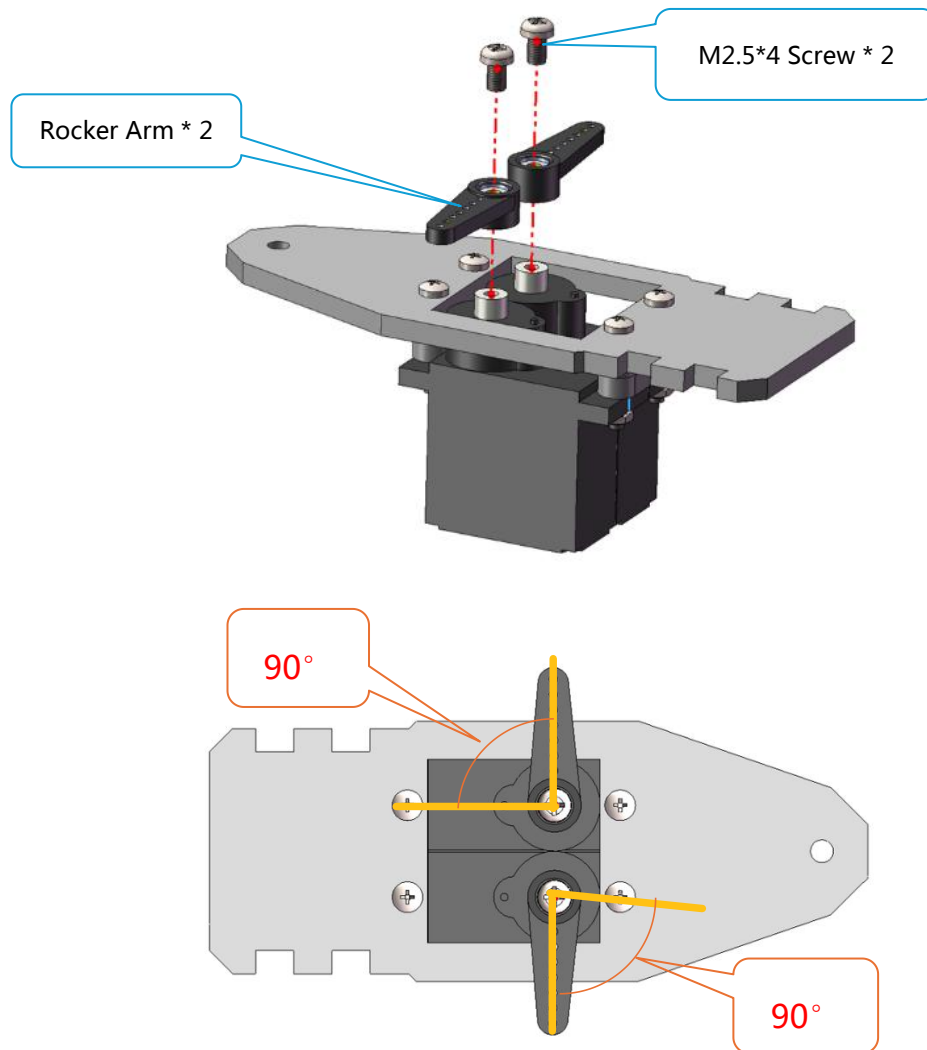
After Assembly:



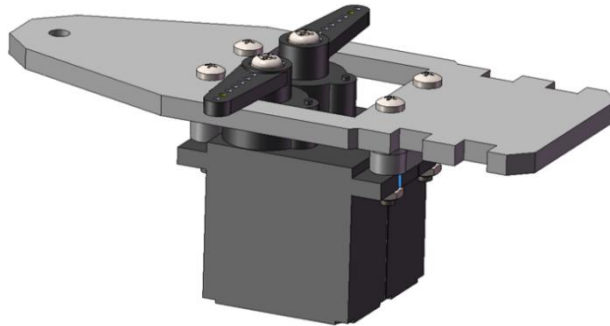
2. Fix two **Rocker Arms** to the servos using two **M2.5*4 Screws** from the servo kit.

(Install the rocker arm at the angle depicted in the picture, assembling it as close to a 90 - degree angle as possible.)



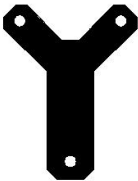
Assemble the following components:



After Assembly:



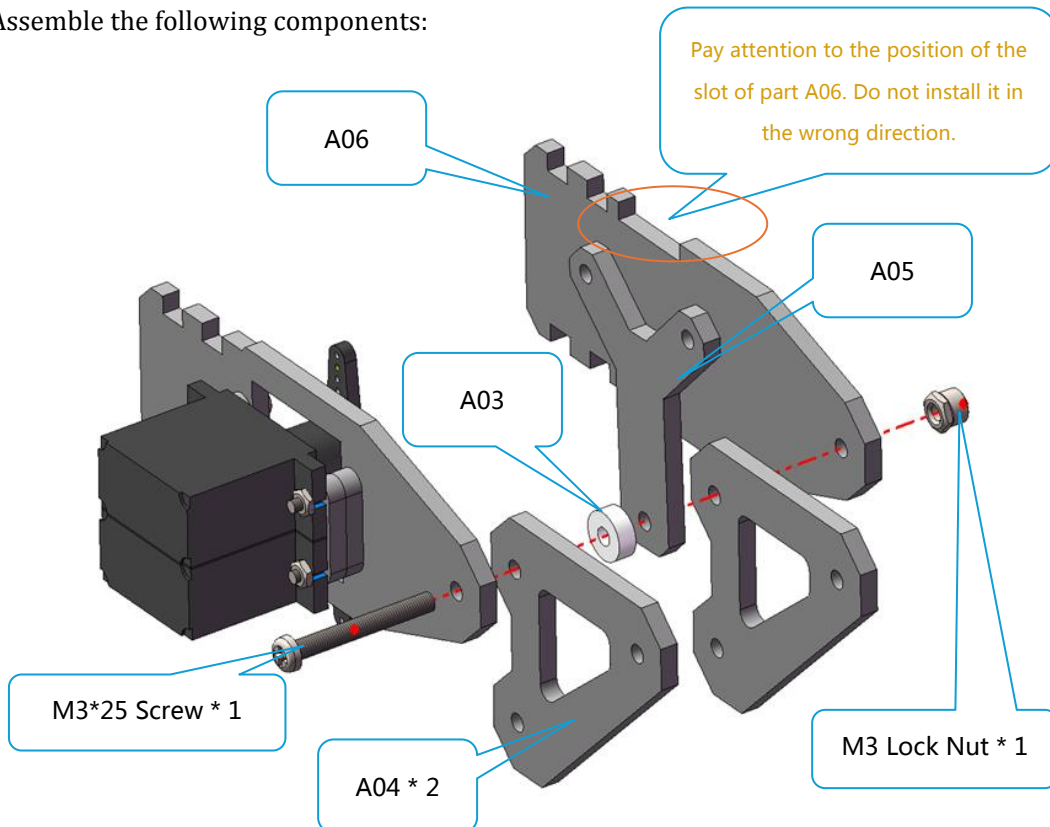
3. Connect part **A03** , two pieces of parts **A04**, part **A05** and part **A06** using an **M3*25 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

A03	
A04	
A05	

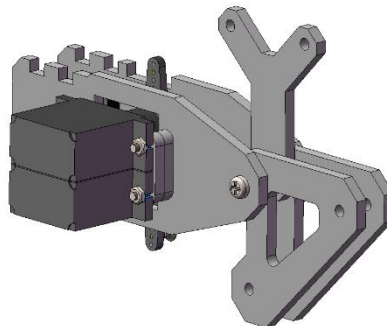
A06



Assemble the following components:



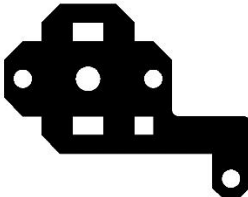
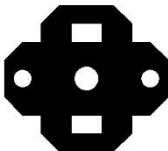
After Assembly:



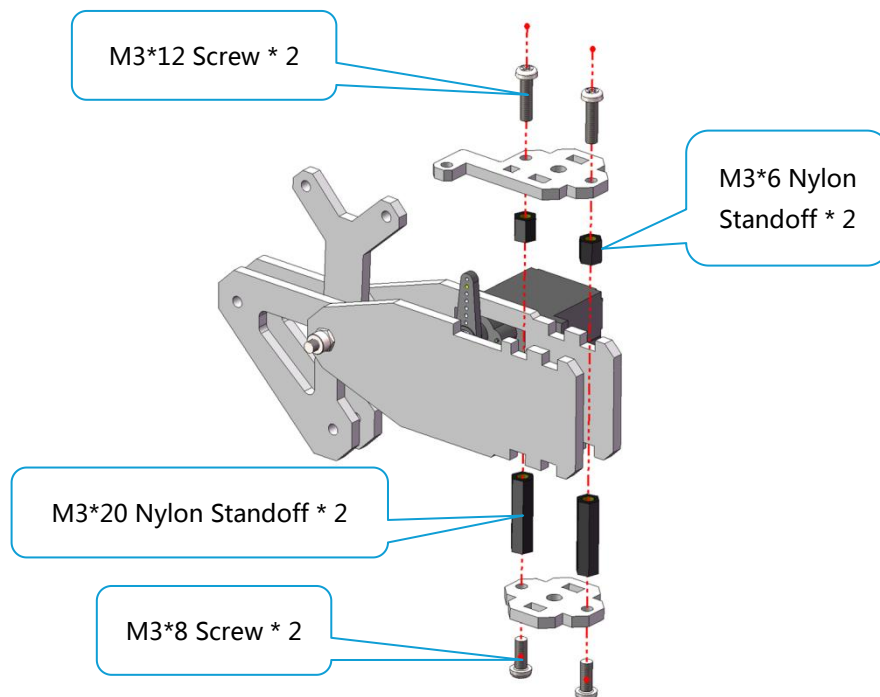
4. First, snap parts **A07** and **A08** into the corresponding slots of parts **A01** and **A06**.

Then, fix them using two **M3*20 Nylon Standoffs**, two **M3*6 Nylon Standoffs**,

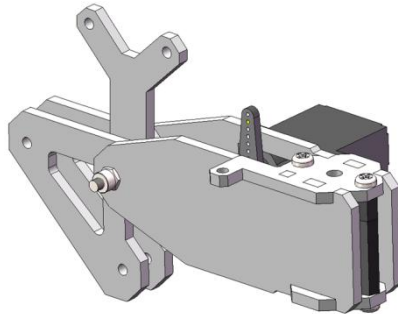
two **M3*8 Screws** and two **M3*12 Screws**.

A07	
A08	

Assemble the following components:



After Assembly:



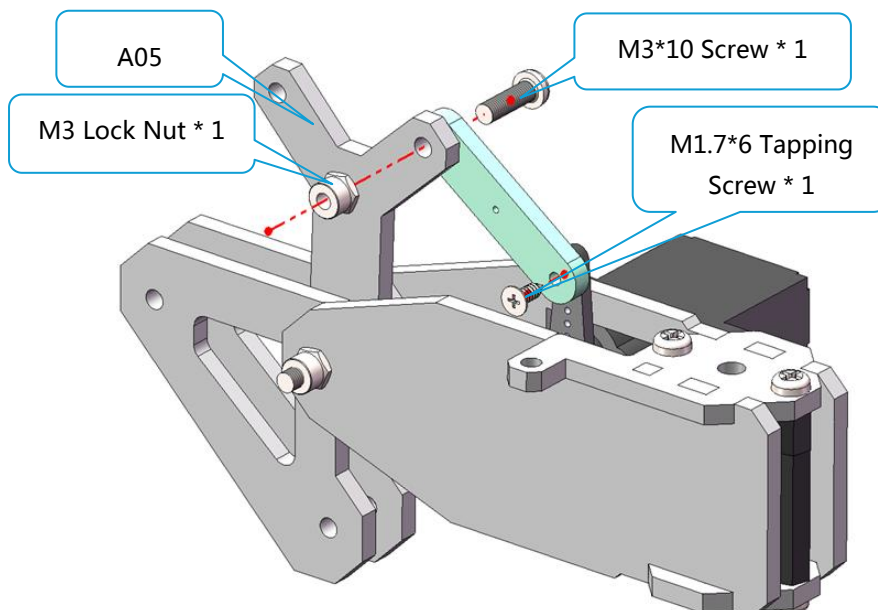
5. First, connect part **A09** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

Then, connect part **A09** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

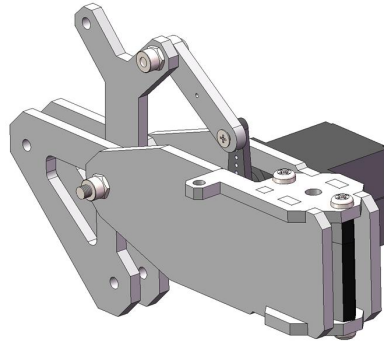
A09



Assemble the following components:





After Assembly:

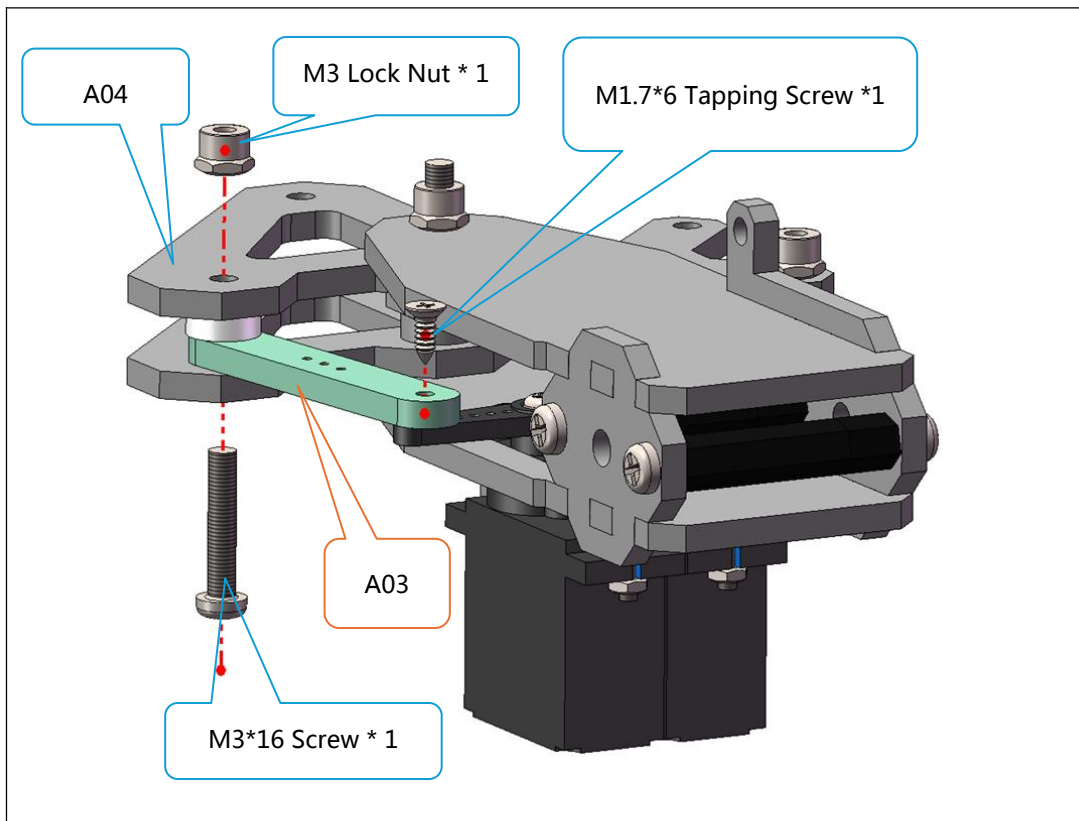


6. First, connect part **A10** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

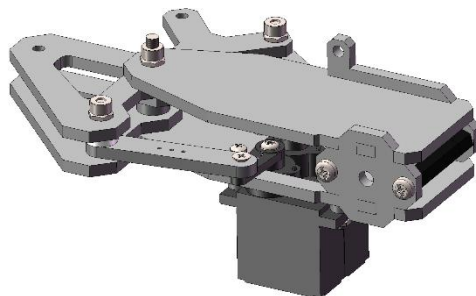
Then, connect part **A10** to part **A04** using one piece of part **A03**, an **M3*16 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

A10	
A03	

Assemble the following components:

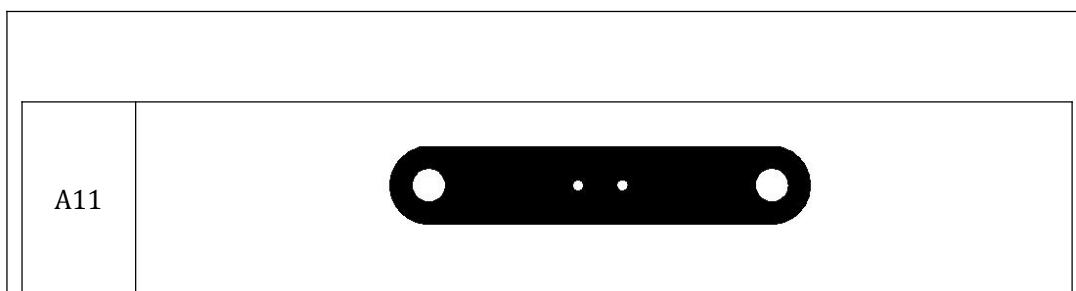


After Assembly:

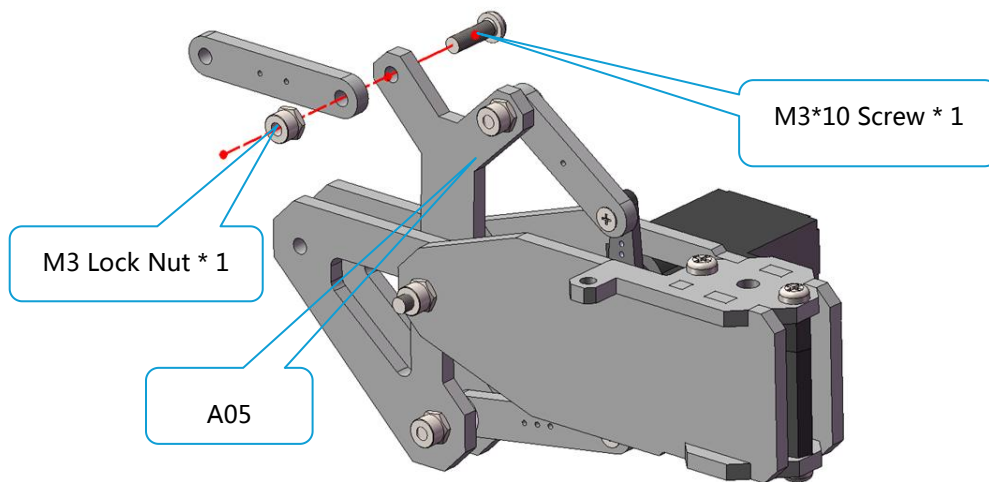


7. Connect part **A11** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**.

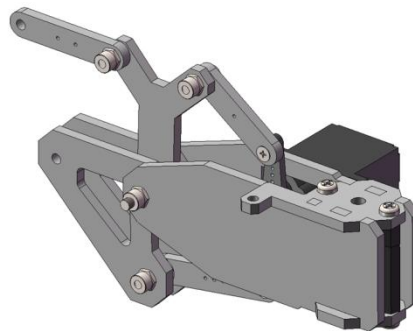
(Please note that the lock nut should not be tightened too much.)



Assemble the following components:



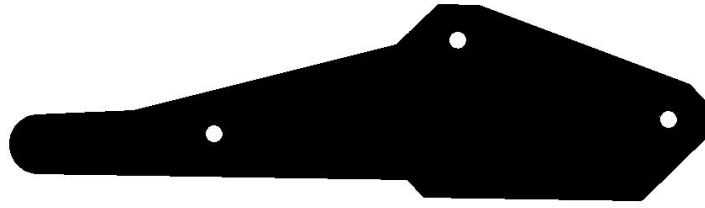
After Assembly:



8. Connect part **A12** to both part **A11** and part **A04** using two **M3*16 Screws** and two **M3 Lock Nuts**. (Please note that the lock nut should not be tightened too much.)

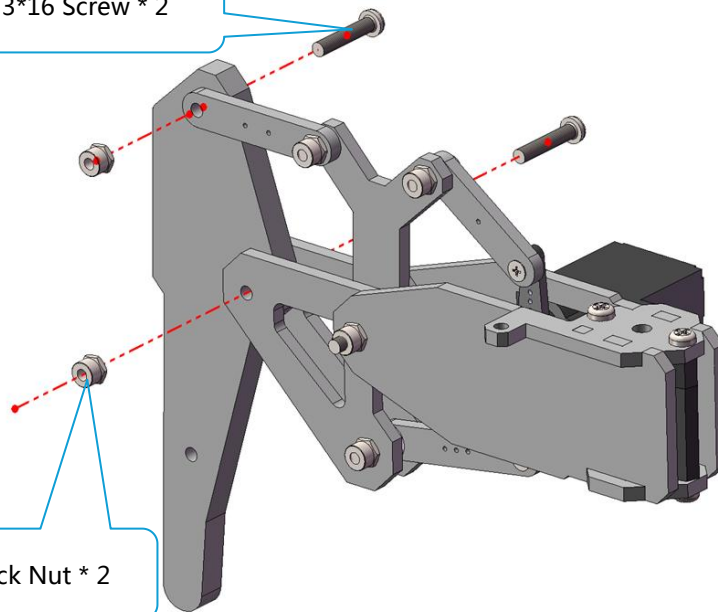


A12

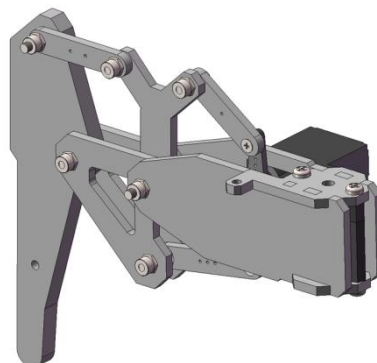


Assemble the following components:

M3*16 Screw * 2



After Assembly:

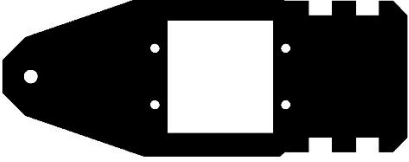



6.3 Assembly of Leg N02

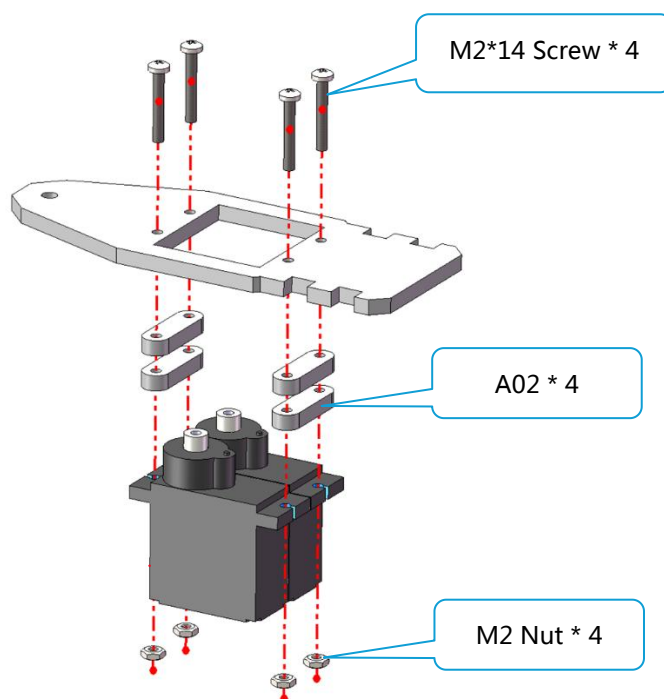
1. Fix two **Servos** to the part **A01** using four pieces of part **A02**, four **M2*14 Screws**

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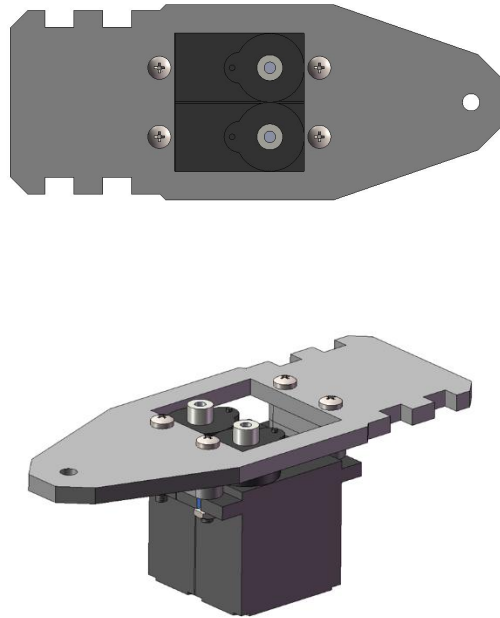
and four **M2 Nuts**. (There is a protective paper on the surface of the acrylic, you can tear off the protective paper.)

A01	
A02	

Assemble the following components:



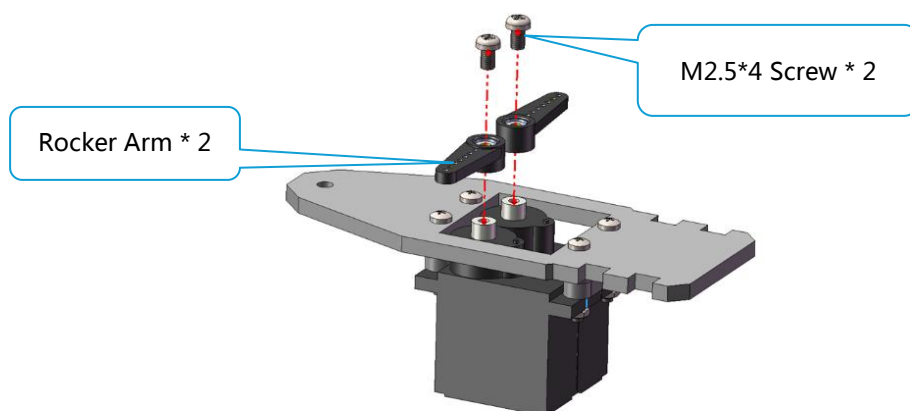
After Assembly:

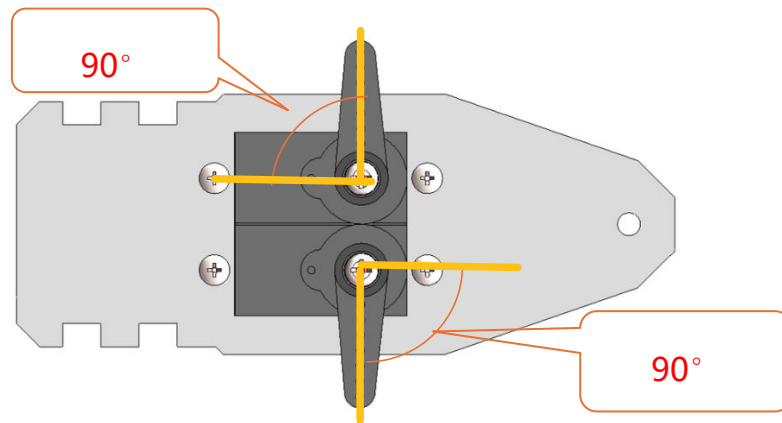


2. Fix two **Rocker Arms** to the servos using two **M2.5*4 Screws** from the servo kit.

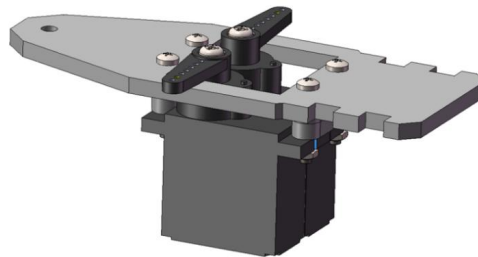
(Install the rocker arm at the angle depicted in the picture, assembling it as close to a 90 - degree angle as possible.)

Assemble the following components:





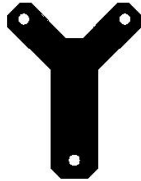



After Assembly:

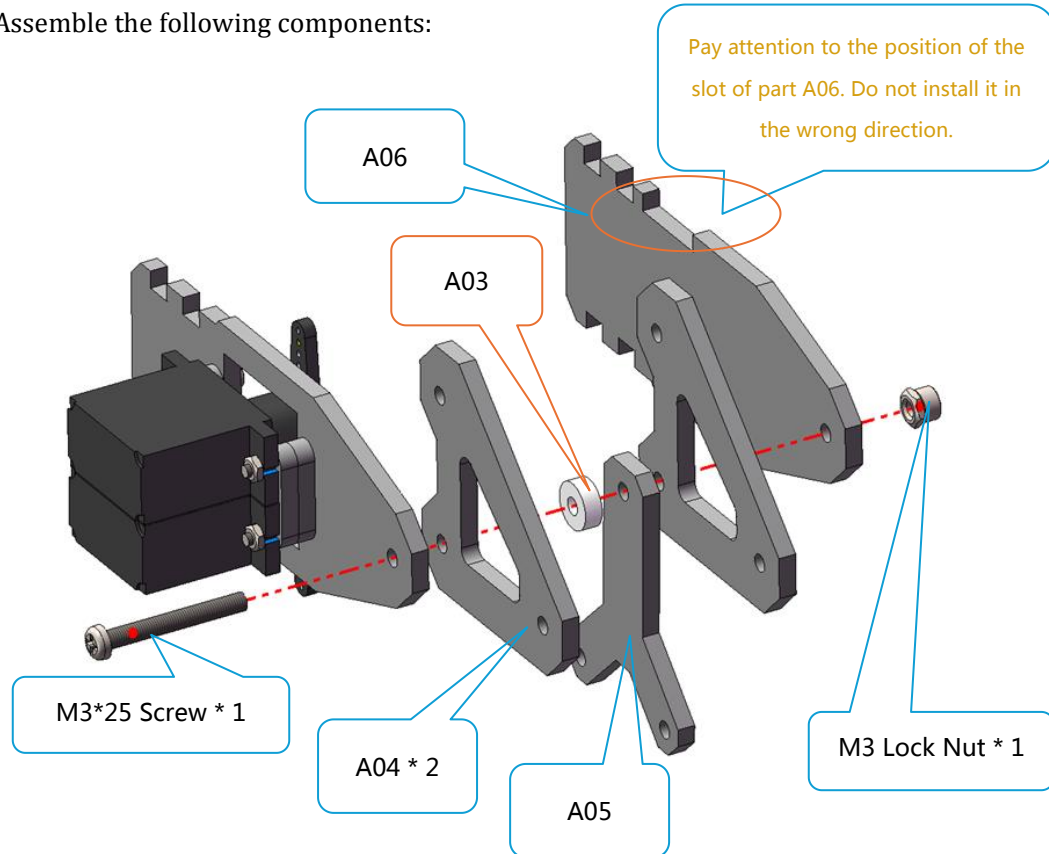


3. Connect part **A03**, two pieces of parts **A04**, part **A05** and part **A06** using an **M3*25 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.).

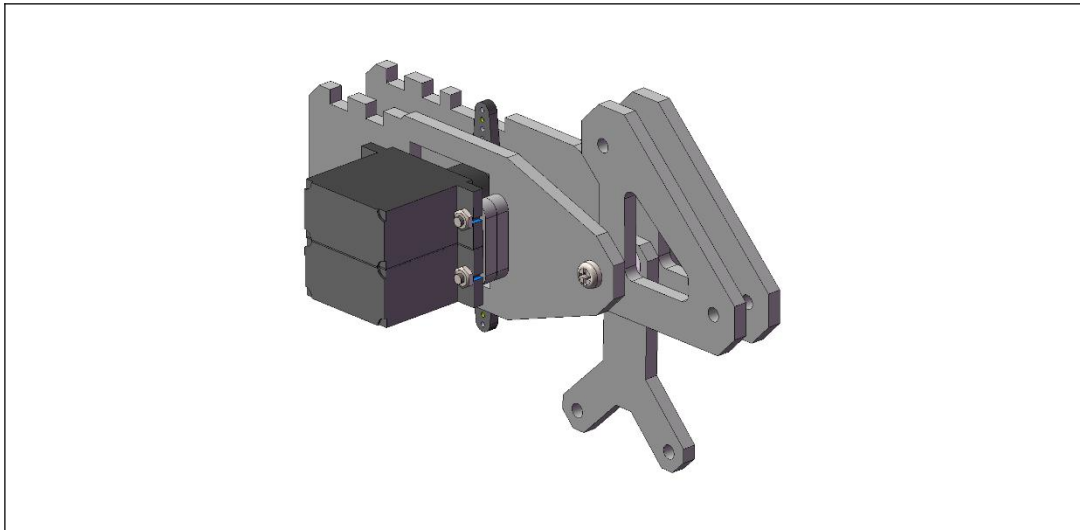
A03	
A04	

A05	
A06	

Assemble the following components:

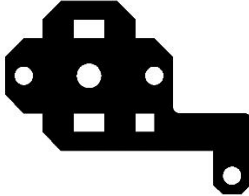
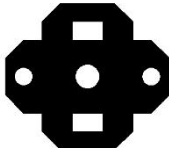


After Assembly:

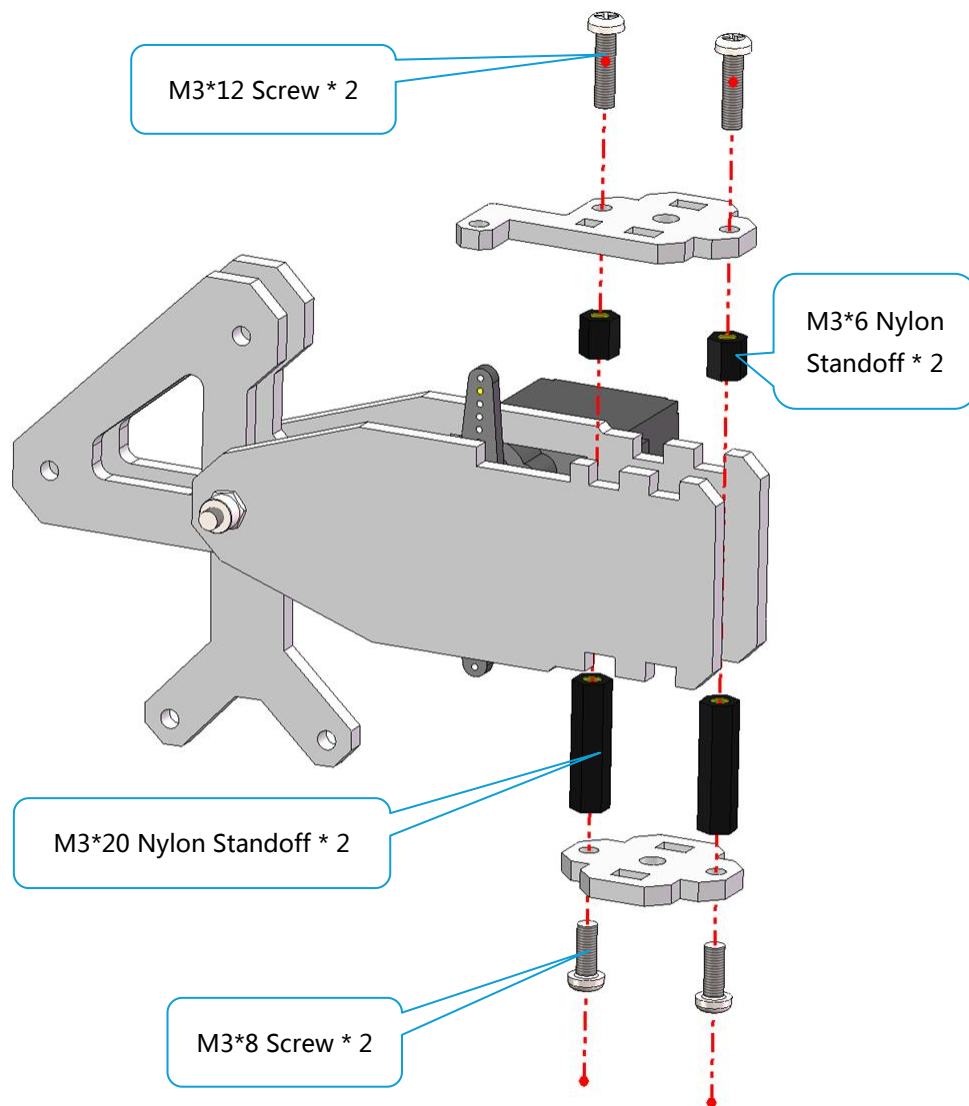


4. First, snap parts **A07** and **A08** into the corresponding slots of parts **A01** and **A06**.

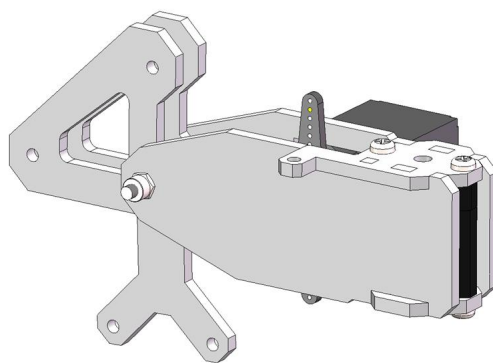
Then, fix them using two **M3*20 Nylon Standoffs**, two **M3*6 Nylon Standoffs**, two **M3*8 Screws** and two **M3*12 Screws**.

A07	
A08	

Assemble the following components:



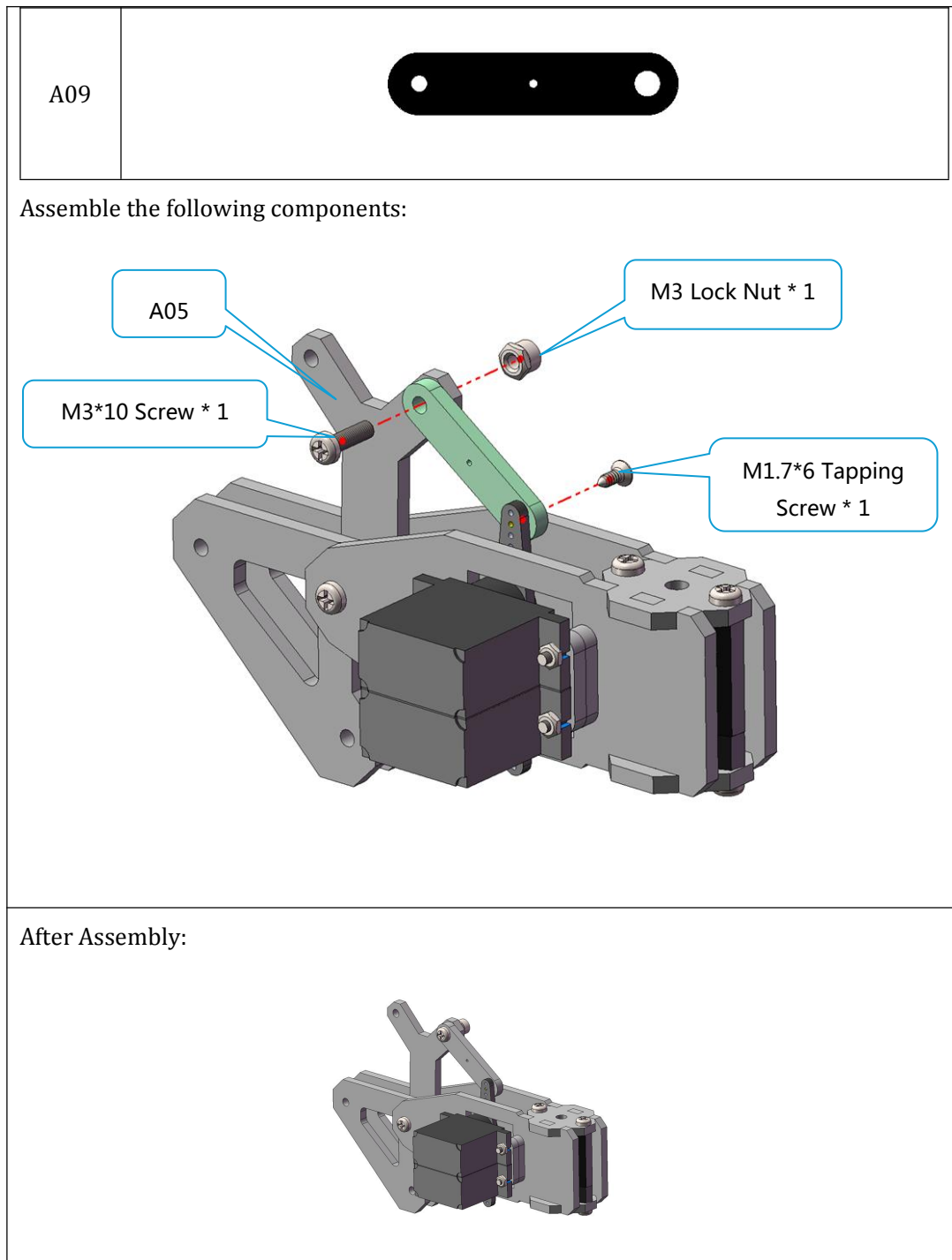
After Assembly:



5. First, connect part **A09** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

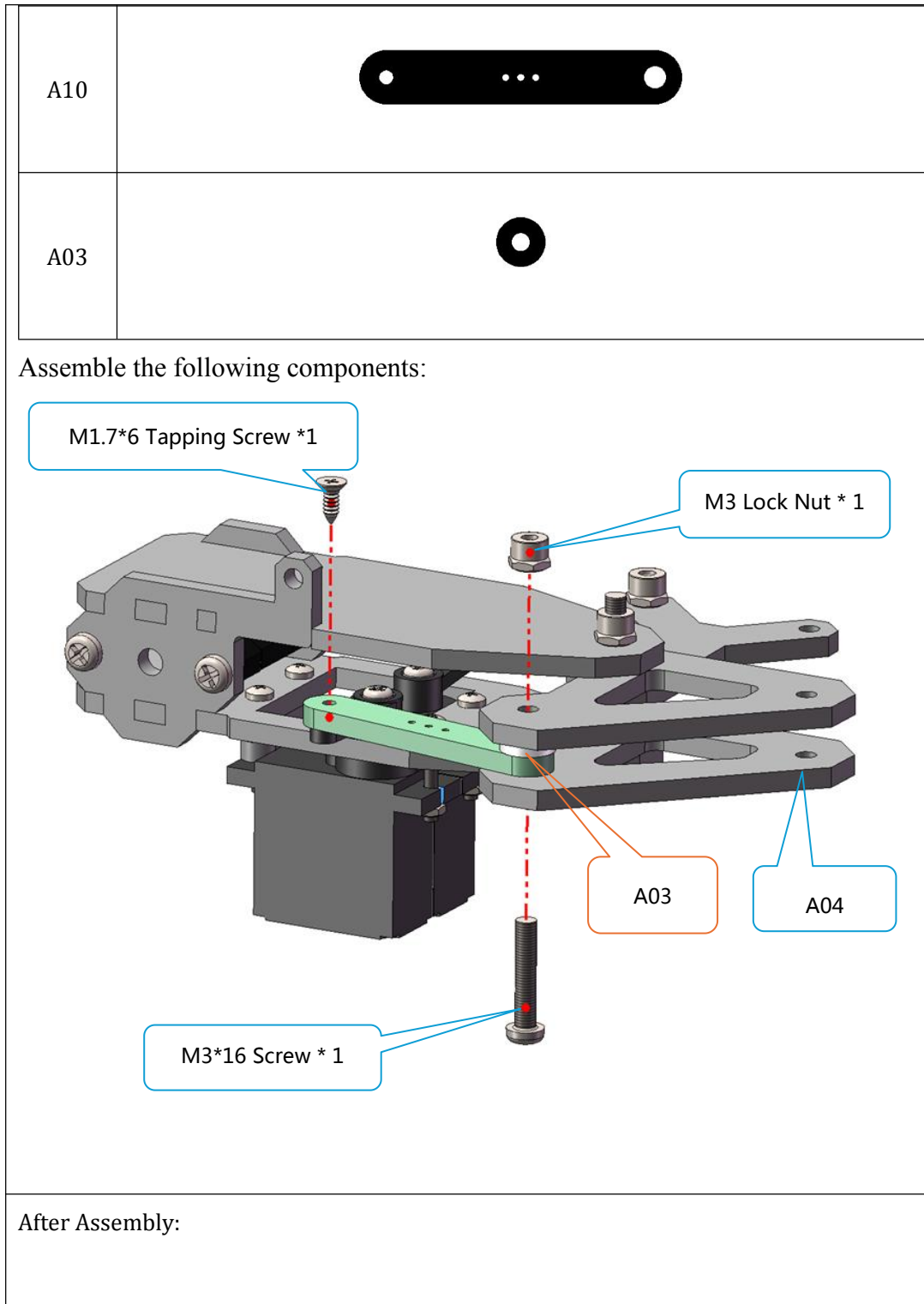
Then, connect part **A09** to part **A05** using an **M3*10 Screw** and an **M3 Lock**

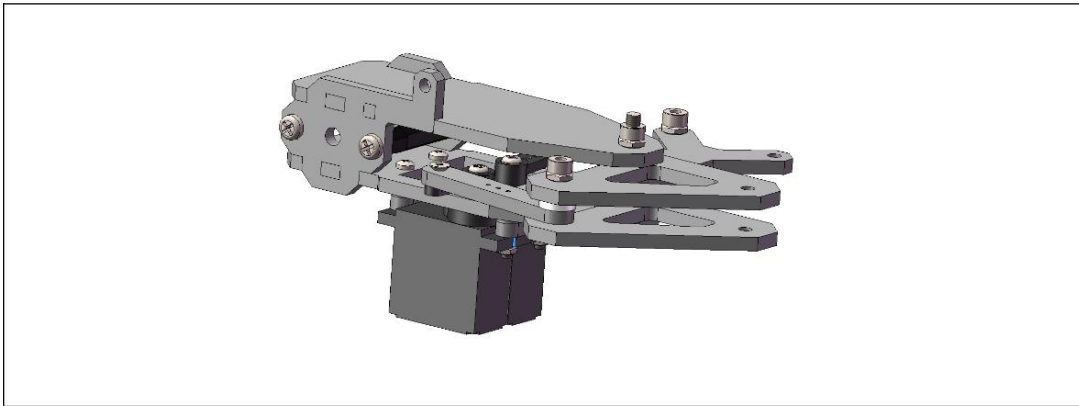
Nut. (Please note that the lock nut should not be tightened too much.)



6. First, connect part **A10** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

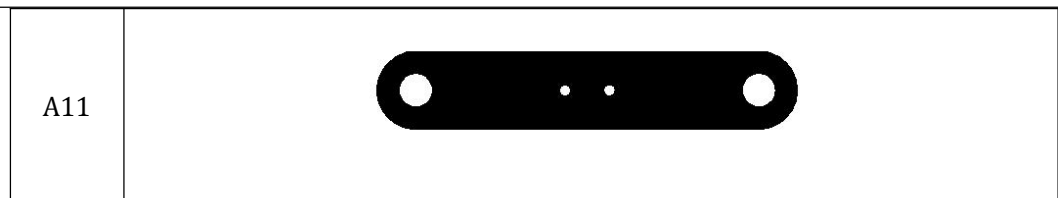
Then, connect part **A10** to part **A04** using one piece of part **A03**, an **M3*16 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)



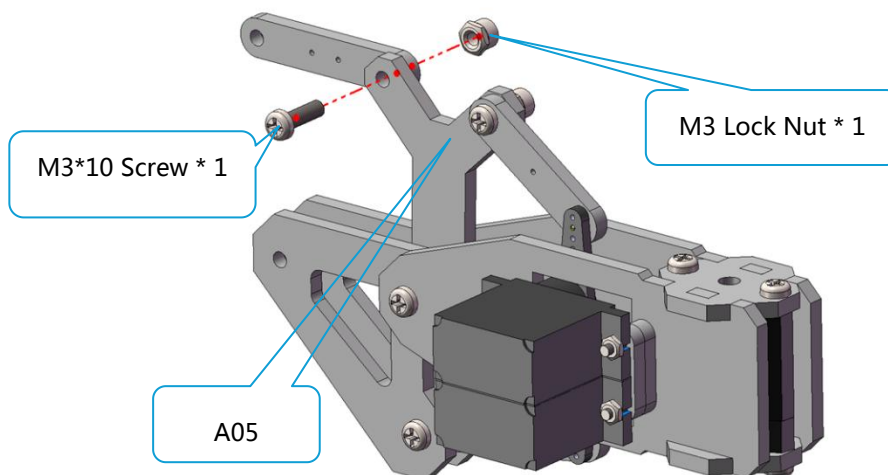


7. Connect part **A11** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**.

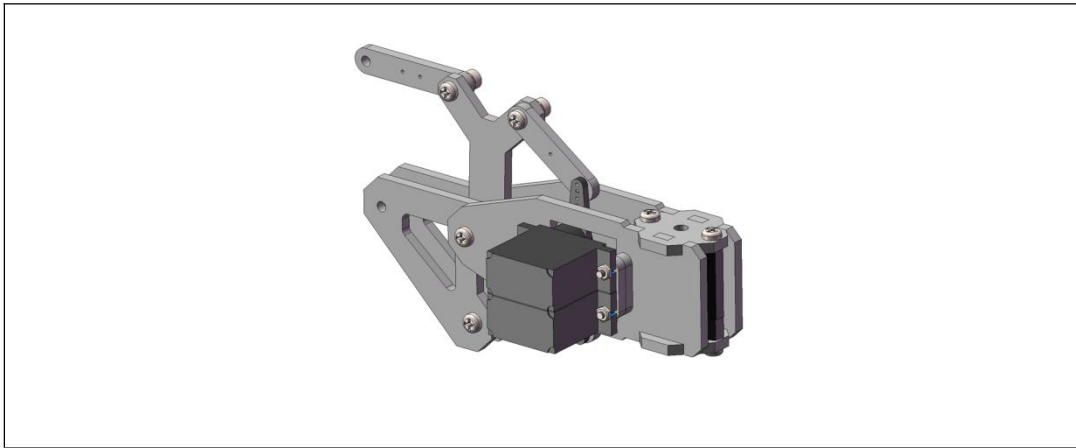
(Please note that the lock nut should not be tightened too much.)



Assemble the following components:

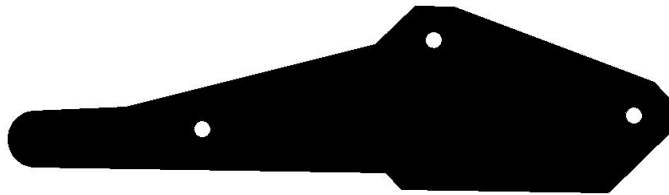


After Assembly:



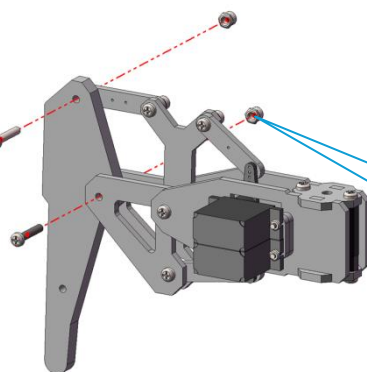
8. Connect part **A12** to both part **A11** and part **A04** using two **M3*16 Screws** and two **M3 Lock Nuts**. (Please note that the lock nut should not be tightened too much.)

A12



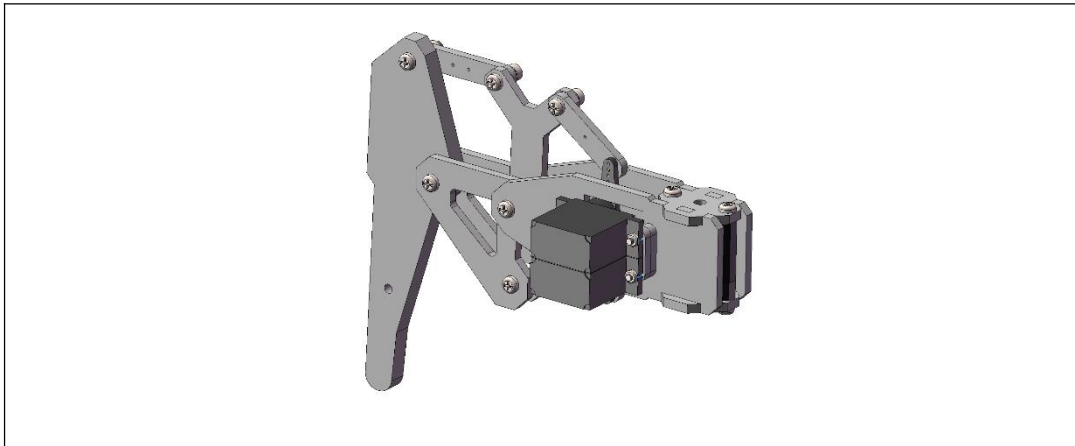
Assemble the following components:

M3*16 Screw * 2



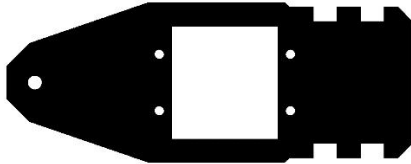

M3 Lock Nut * 2

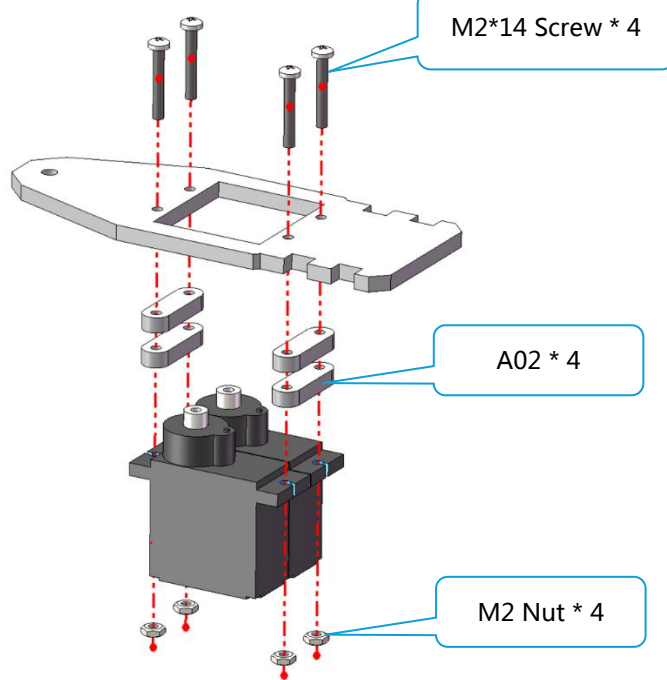
After Assembly:



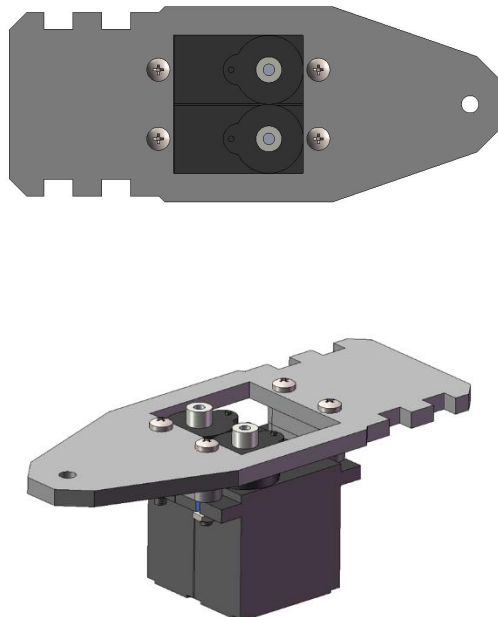
6.4 Assembly of Leg N03

1. Fix two **Servos** to the part **A01** using four pieces of part **A02**, four **M2*14 Screws** and four **M2 Nuts**. (There is a protective paper on the surface of the acrylic, you can tear off the protective paper.)

A01	
A02	
Assemble the following components:	



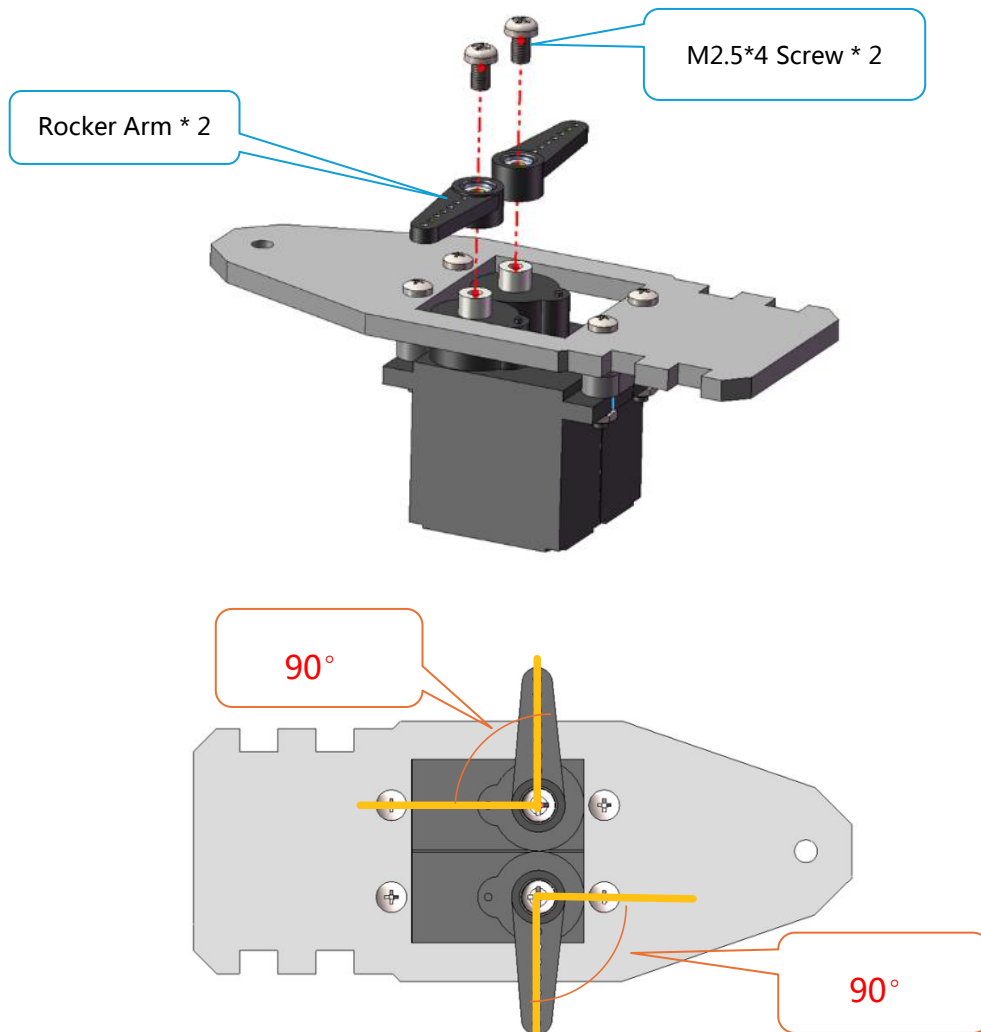
After Assembly:



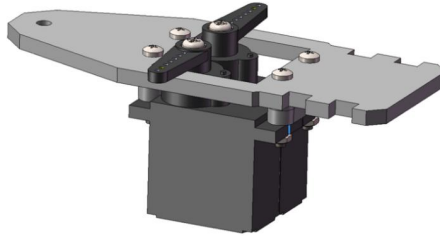
2. Fix two **Rocker Arms** to the servos using two **M2.5*4 Screws** from the servo kit.

(Install the rocker arm at the angle depicted in the picture, assembling it as close to a 90 - degree angle as possible.)



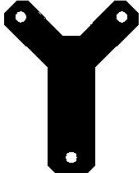

Assemble the following components:



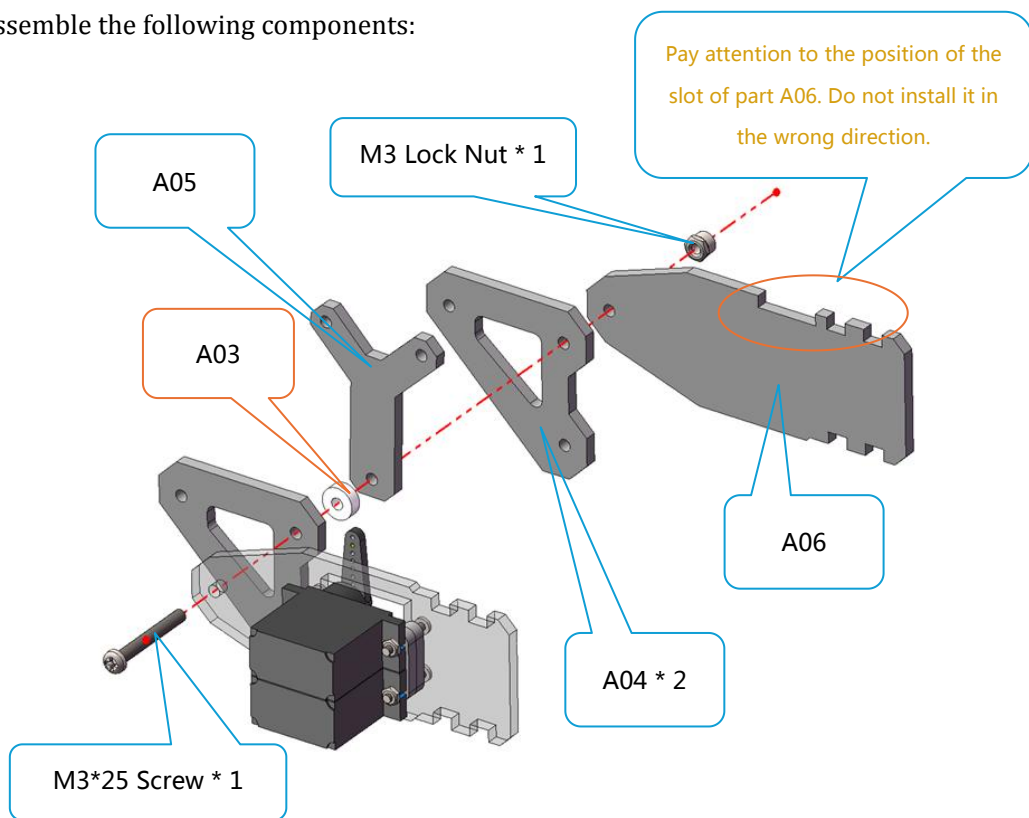
After Assembly:



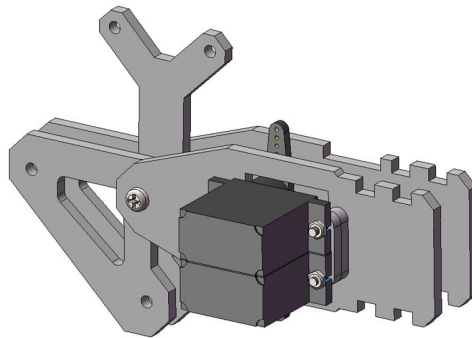
3. Connect part **A03** , two pieces of parts **A04**, part **A05** and part **A06** using an **M3*25 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much).

A03	
A04	
A05	
A06	

Assemble the following components:

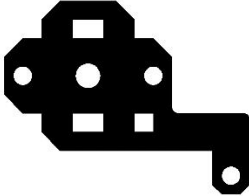
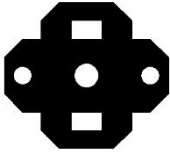


After Assembly:

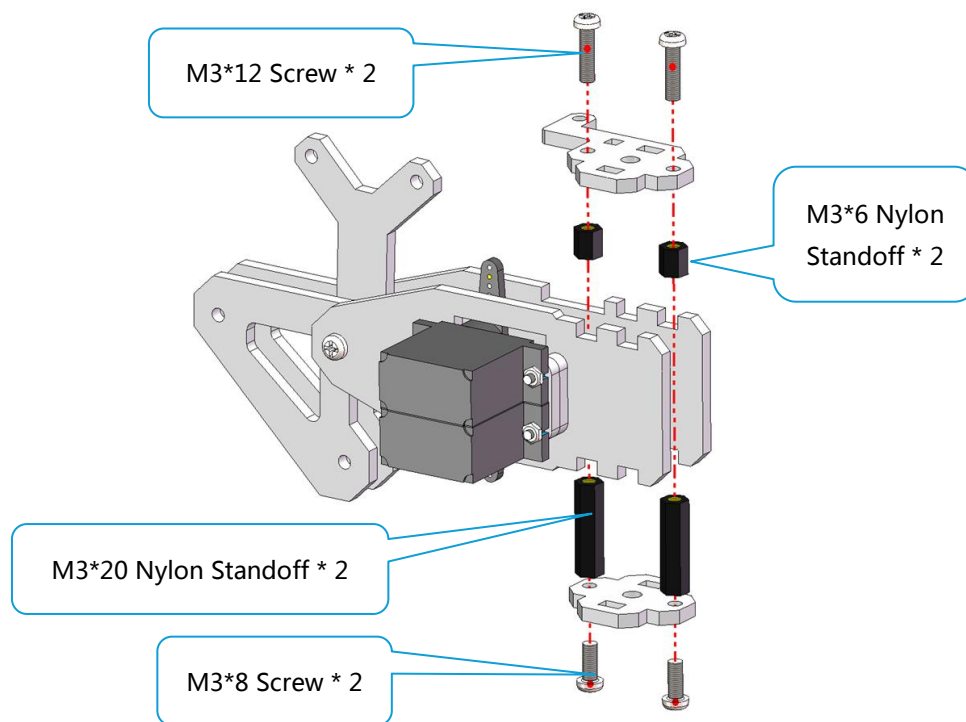


4. First, snap parts **A07** and **A08** into the corresponding slots of parts **A01** and **A06**.

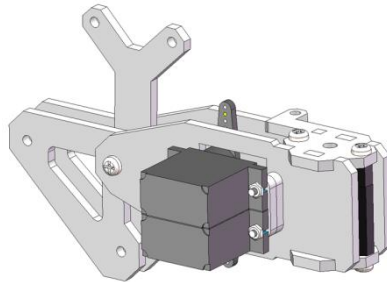
Then, fix them with two **M3*20 Nylon Standoffs**, two **M3*6 Nylon Standoffs**, two **M3*8 Screws** and two **M3*12 Screws**.

A07	
A08	

Assemble the following components:



After Assembly:



5. First, connect part **A09** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

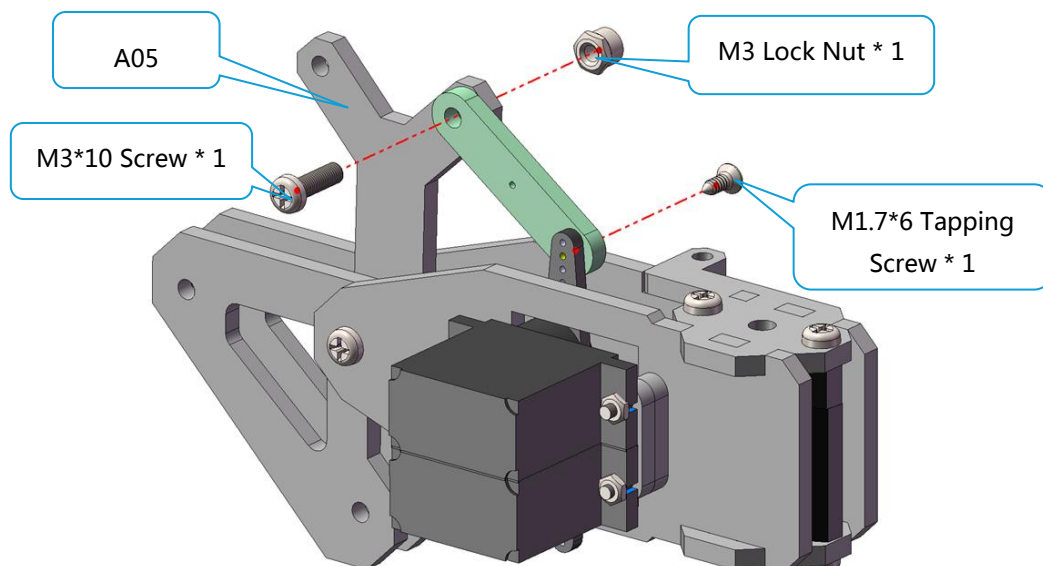
Then, connect part **A09** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**.

(Please note that the lock nut should not be tightened too much.)

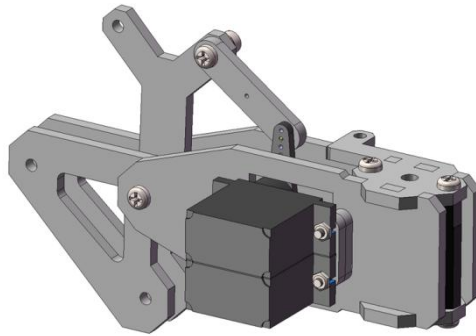
A09



Assemble the following components:

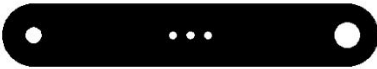



After Assembly:

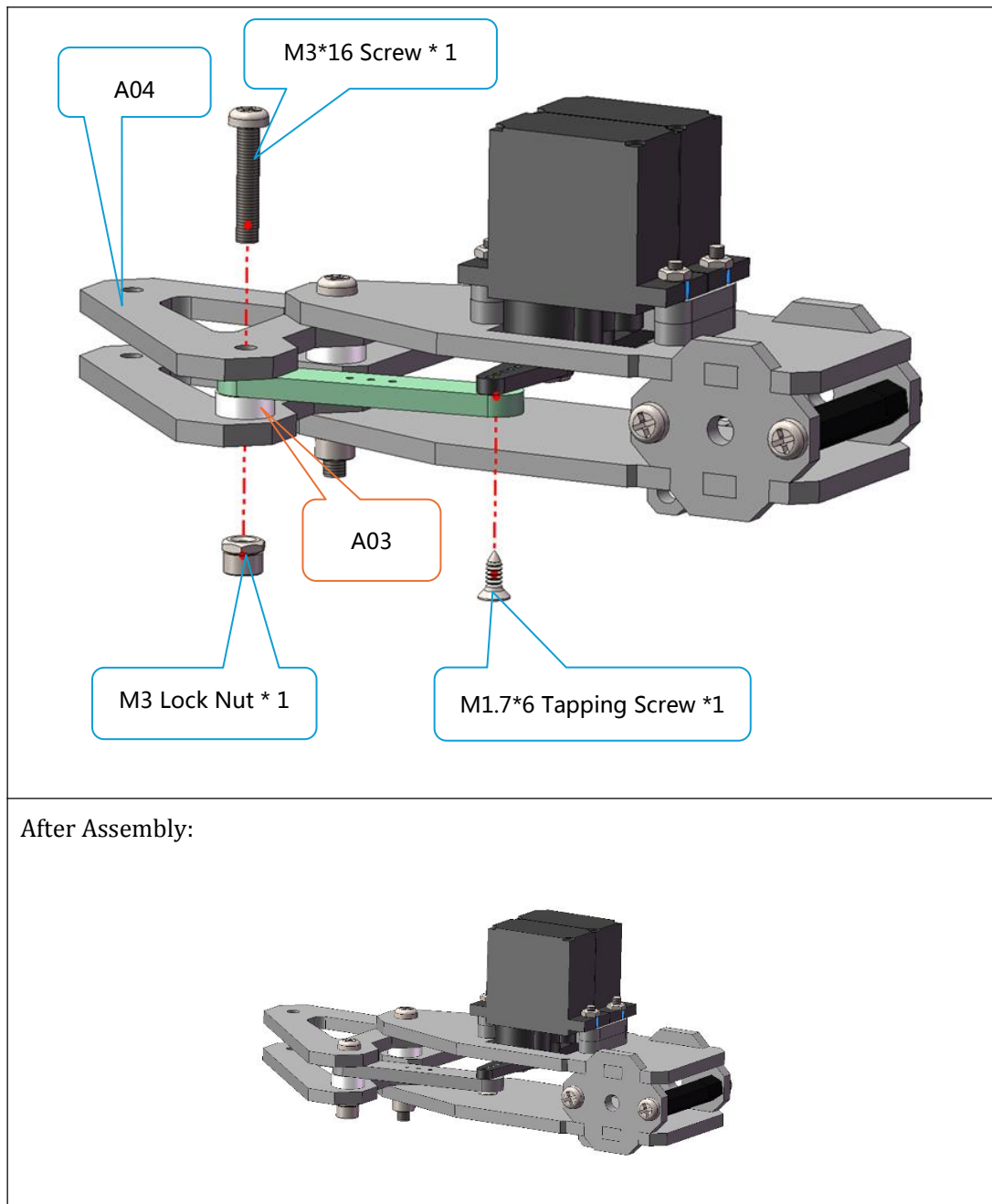


6. First, connect part **A10** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

Then, connect part **A10** to part **A04** with one piece of part **A03**, an **M3*16 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

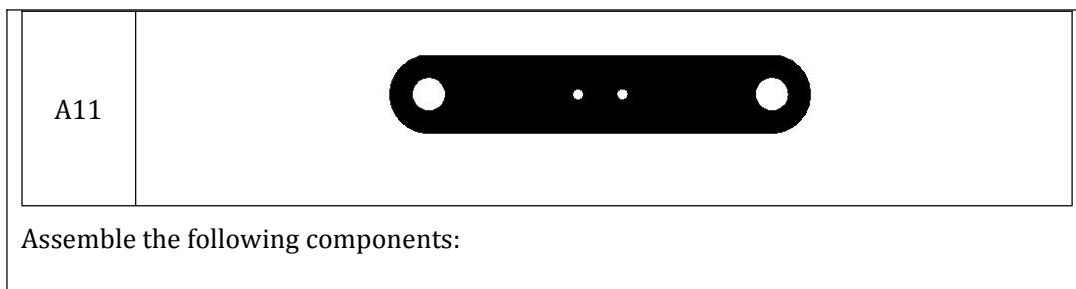
A10	
A03	

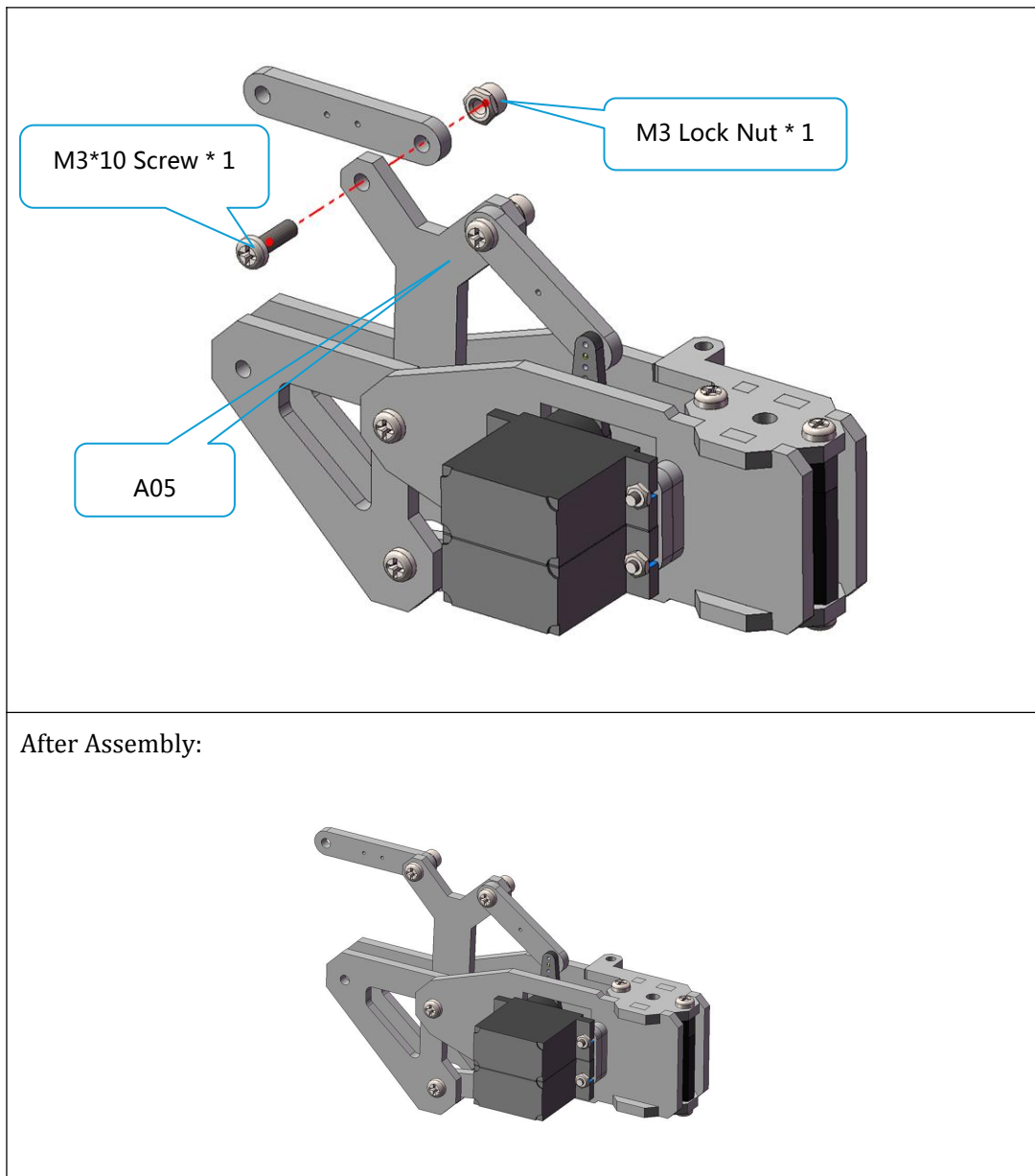
Assemble the following components:



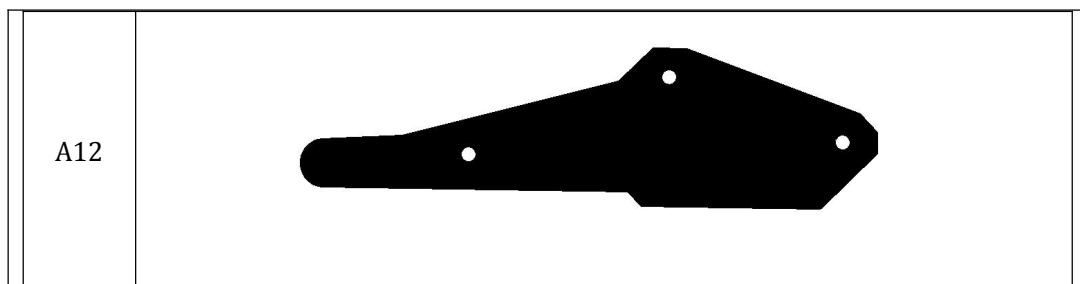
7. Connect part **A11** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**.

(Please note that the lock nut should not be tightened too much.)

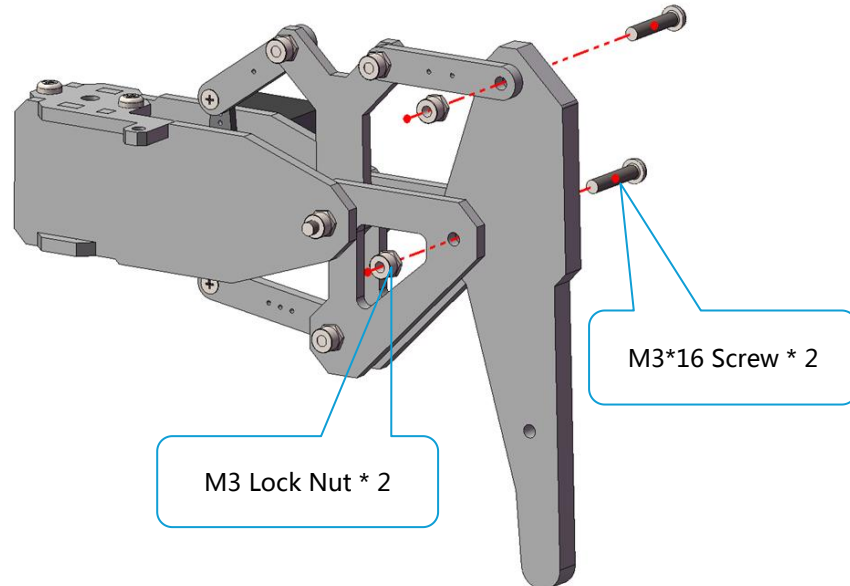




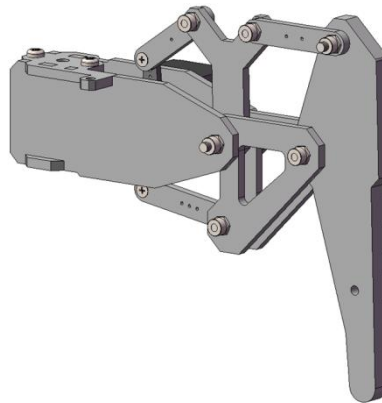
8. Connect part **A12** to both part **A11** and part **A04** with two **M3*16 Screws** and two **M3 Lock Nuts**. (Please note that the lock nut should not be tightened too much.)



Assemble the following components:

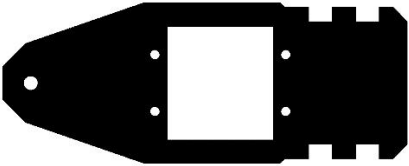



After Assembly:

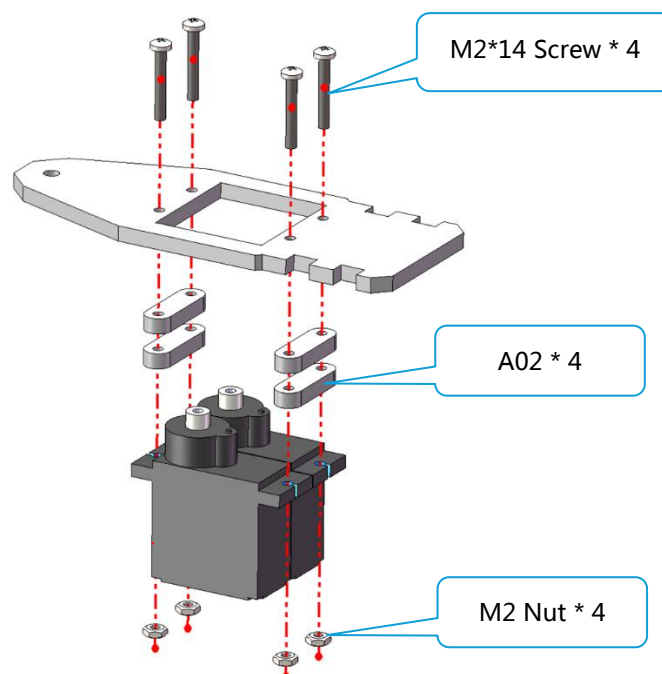


6.5 Assembly of Leg N04

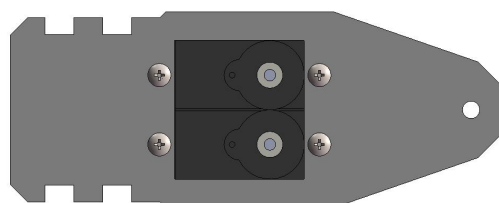
1. Fix two **Servos** to the part **A01** using four pieces of part **A02**, four **M2*14 Screws** and four **M2 Nuts**. (There is a protective paper on the surface of the acrylic, you can tear off the protective paper.)

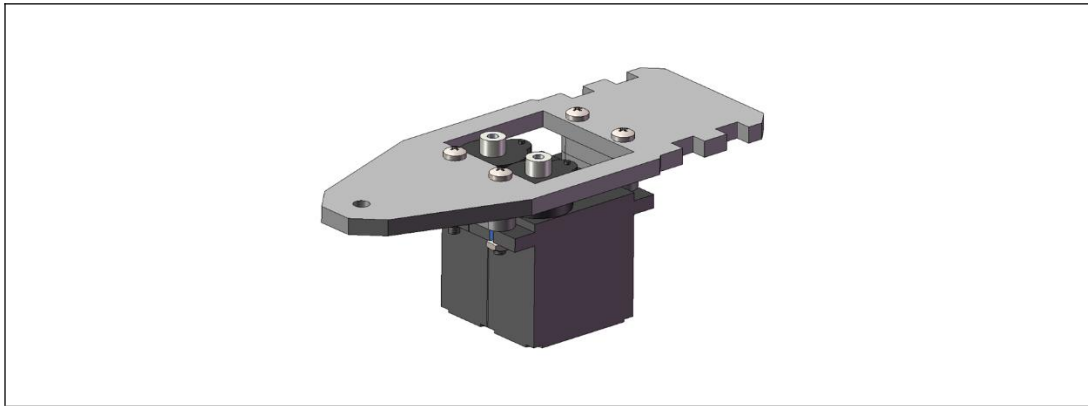
A01	
A02	

Assemble the following components:



After Assembly:

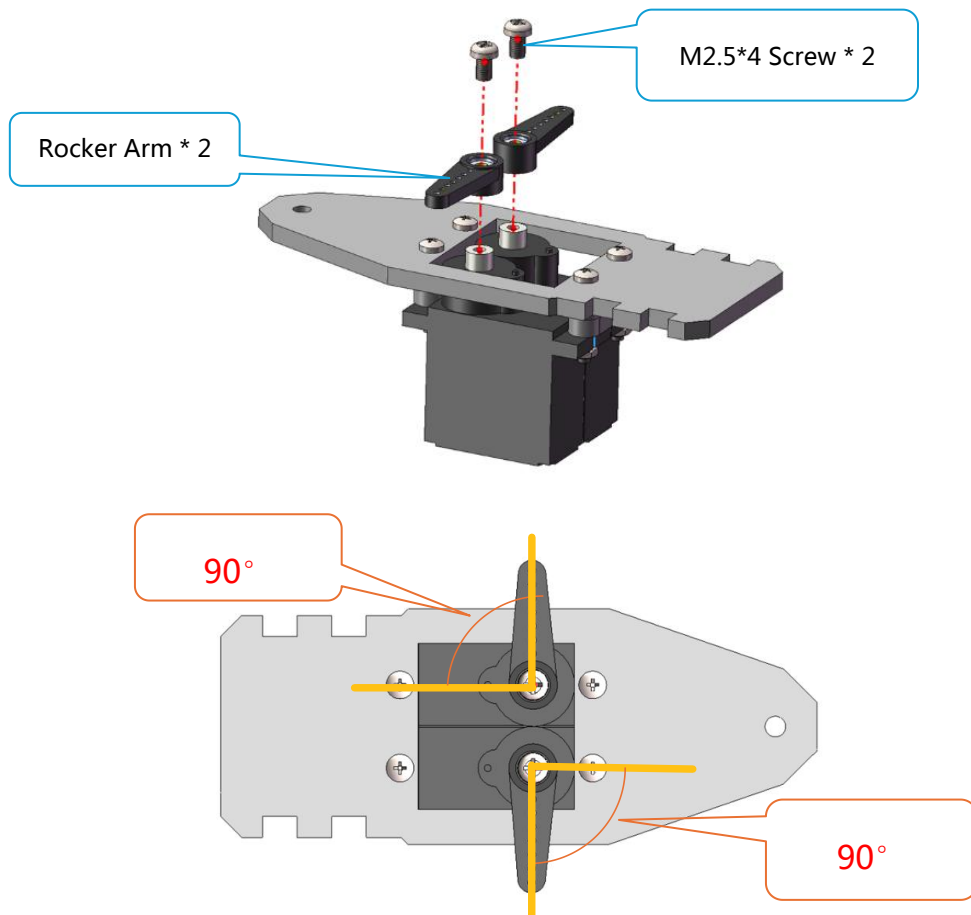




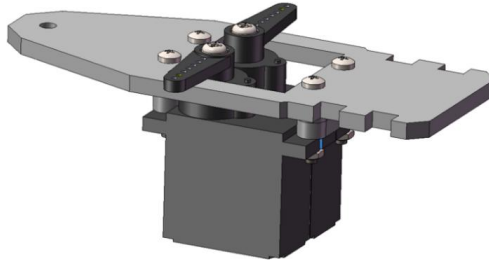
2. Fix two **Rocker Arms** to the servos using two **M2.5*4 Screws** from the servo kit.

(Install the rocker arm at the angle depicted in the picture, assembling it as close to a 90 - degree angle as possible.)



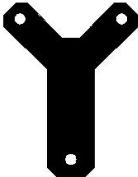

Assemble the following components:



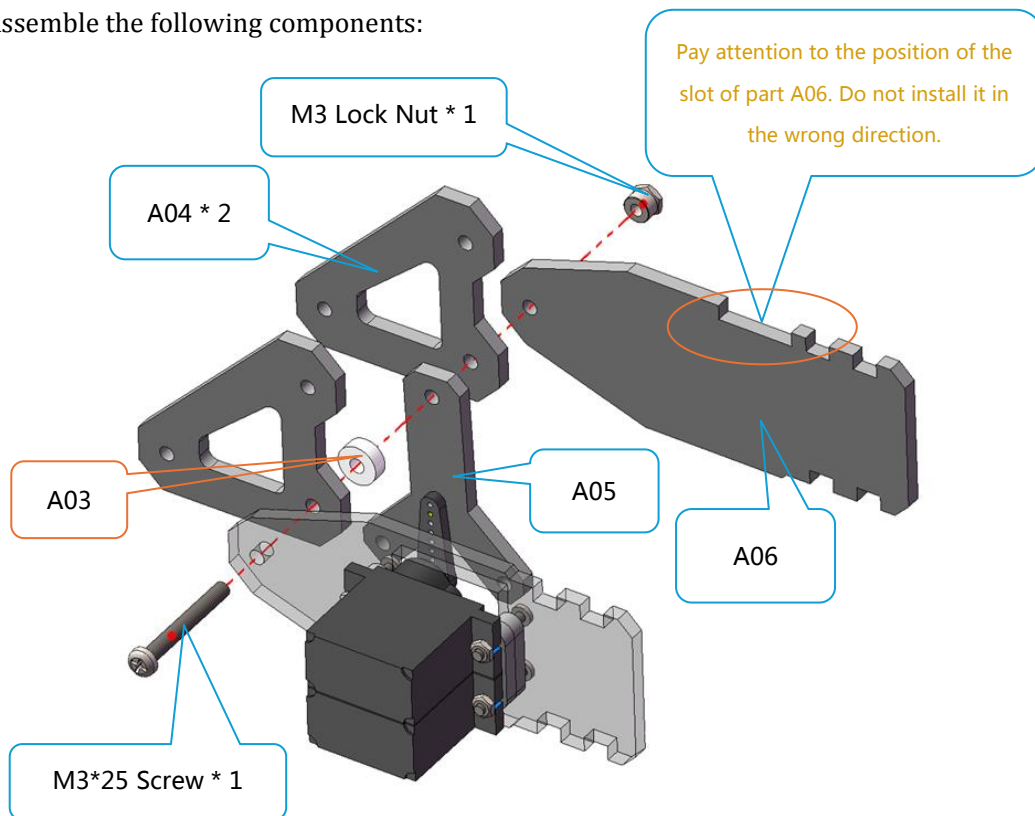
After Assembly:



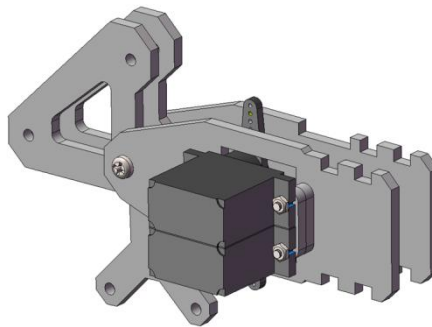
3. Connect part **A03**, two pieces of parts **A04**, part **A05** and part **A06** using an **M3*25 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

A03	
A04	
A05	
A06	

Assemble the following components:

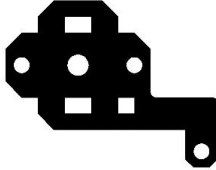
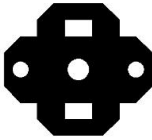


After Assembly:

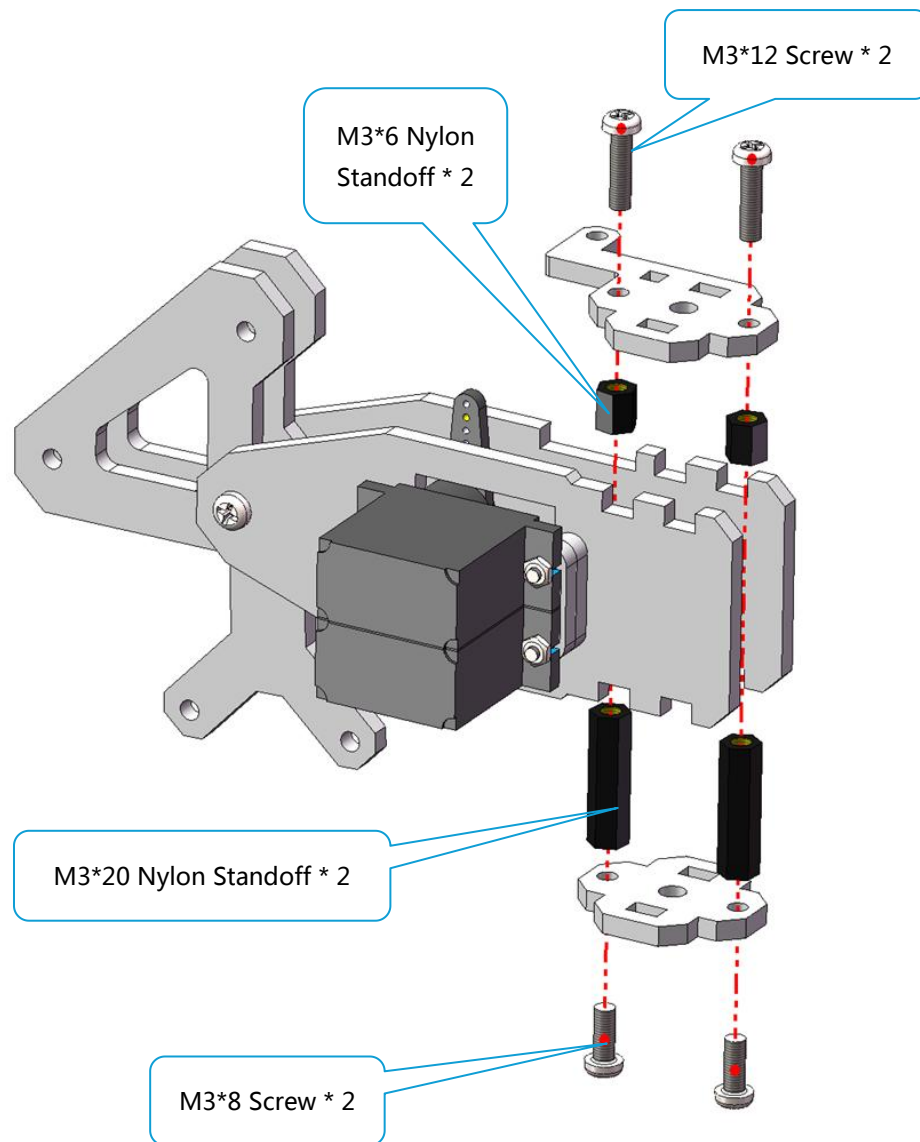


4. First, snap parts **A07** and **A08** into the corresponding slots of parts **A01** and **A06**.

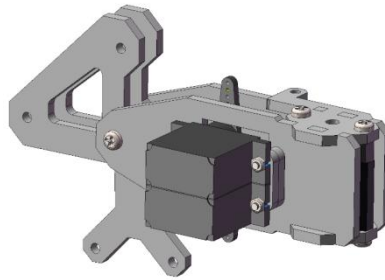
Then, fix them with two **M3*20 Nylon Standoffs**, two **M3*6 Nylon Standoffs**, two **M3*8 Screws** and two **M3*12 Screws**.

A07	
A08	

Assemble the following components:



After Assembly:



5. First, connect part **A09** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

Then, connect part **A09** to part **A05** using an **M3*10 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

A09



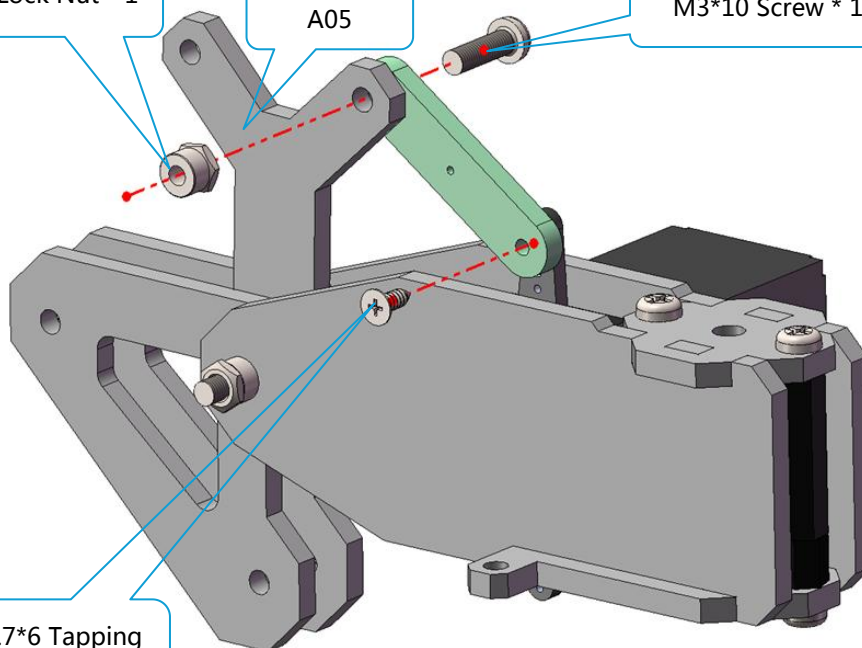
Assemble the following components:

M3 Lock Nut * 1

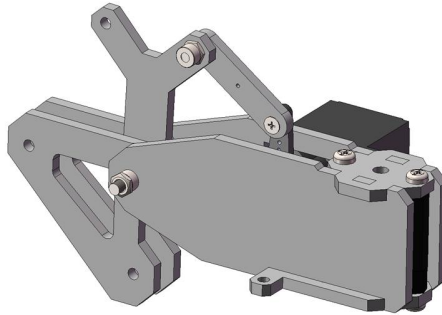
A05

M3*10 Screw * 1

M1.7*6 Tapping
Screw * 1





After Assembly:

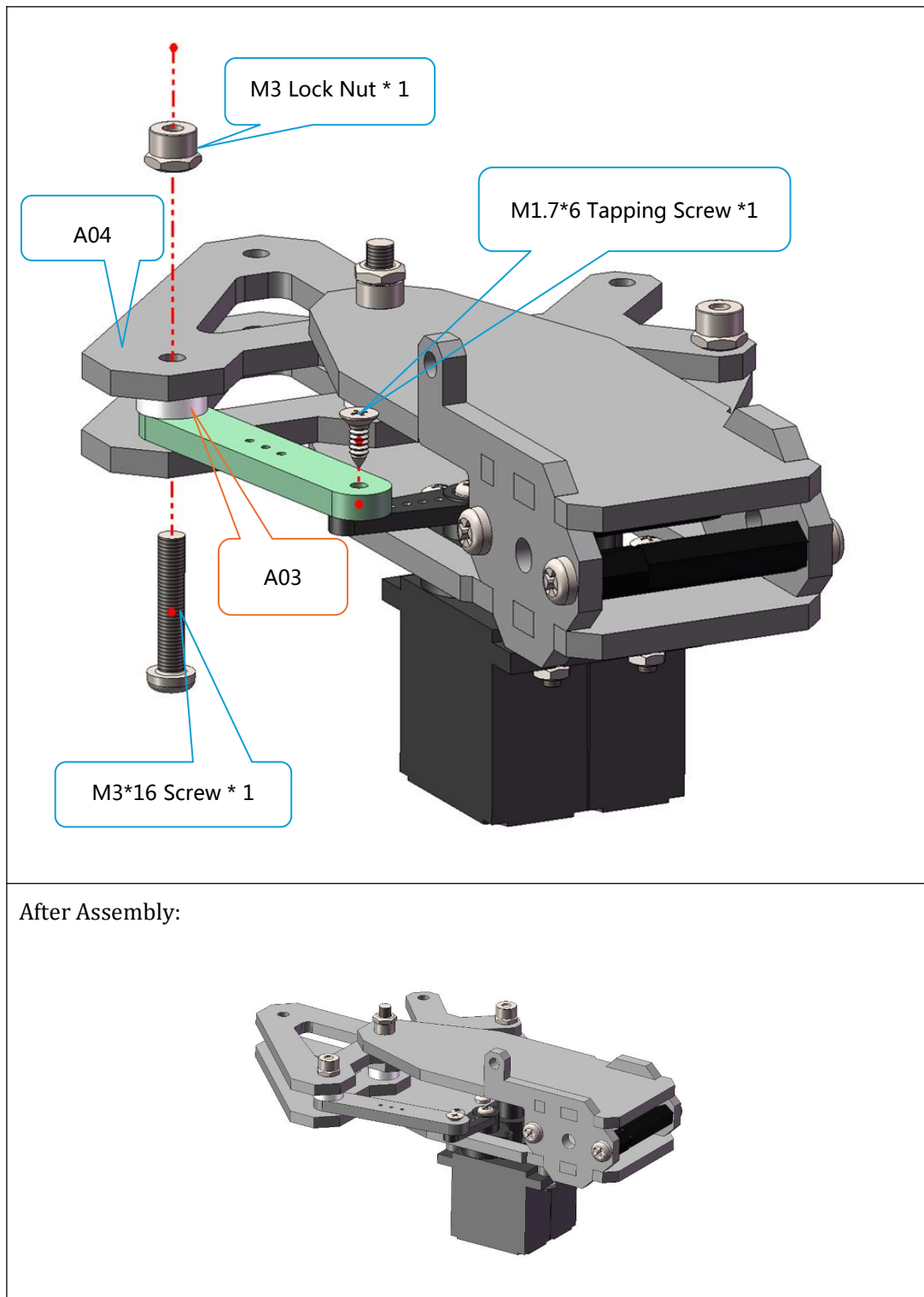


6. First, connect part **A10** to the **Rocker Arm** using an **M1.7*6 Tapping Screw**.

Then, connect part **A10** to part **A04** using one piece of part **A03** an **M3*16 Screw** and an **M3 Lock Nut**. (Please note that the lock nut should not be tightened too much.)

A10	
A03	

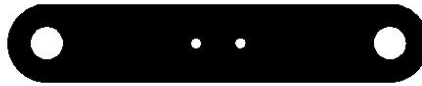
Assemble the following components:



7. Connect part **A11** to part **A05** with an **M3*10 Screw** and an **M3 Lock Nut**.

(Please note that the lock nut should not be tightened too much.)

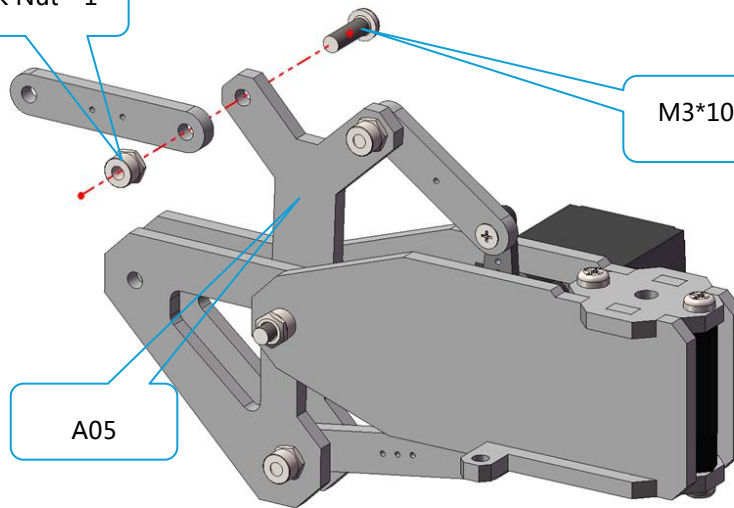
A11



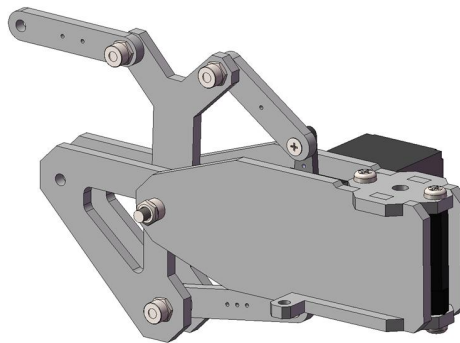
Assemble the following components:

M3 Lock Nut * 1

M3*10 Screw * 1

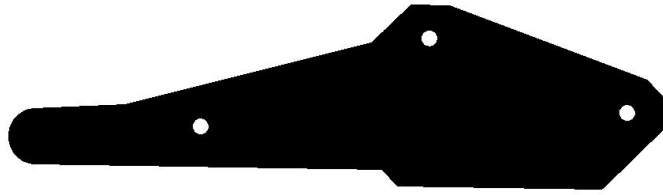


After Assembly:

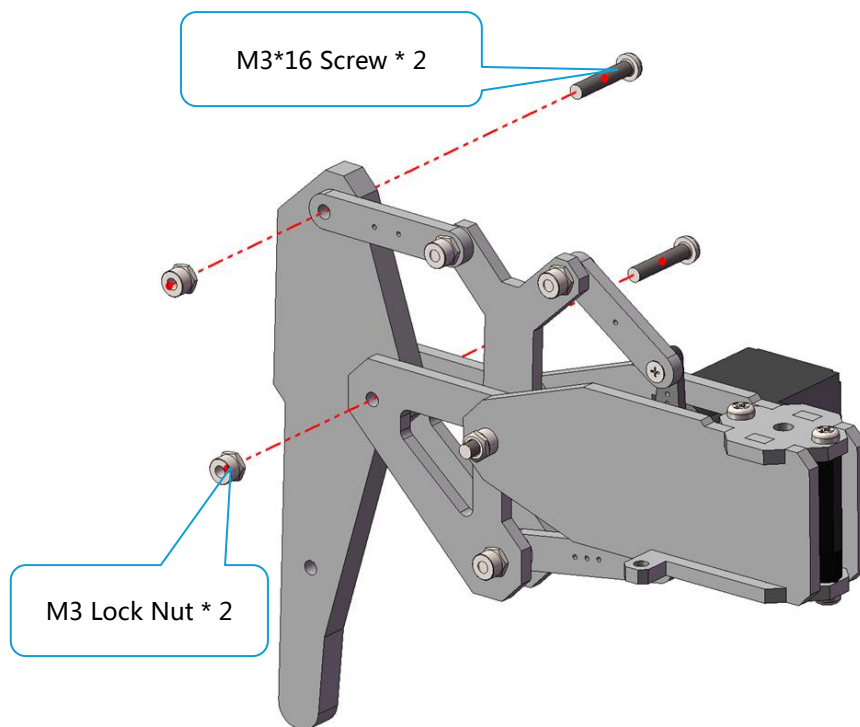


8. Connect part **A12** to both part **A11** and part **A04** with two **M3*16 Screws** and two **M3 Lock Nuts**. (Please note that the lock nut should not be tightened too much.)

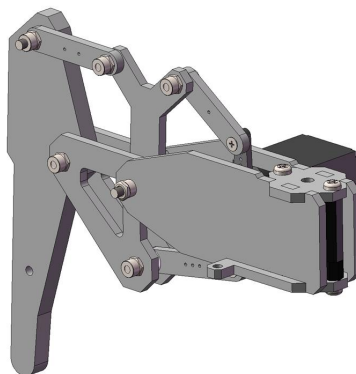
A12



Assemble the following components:

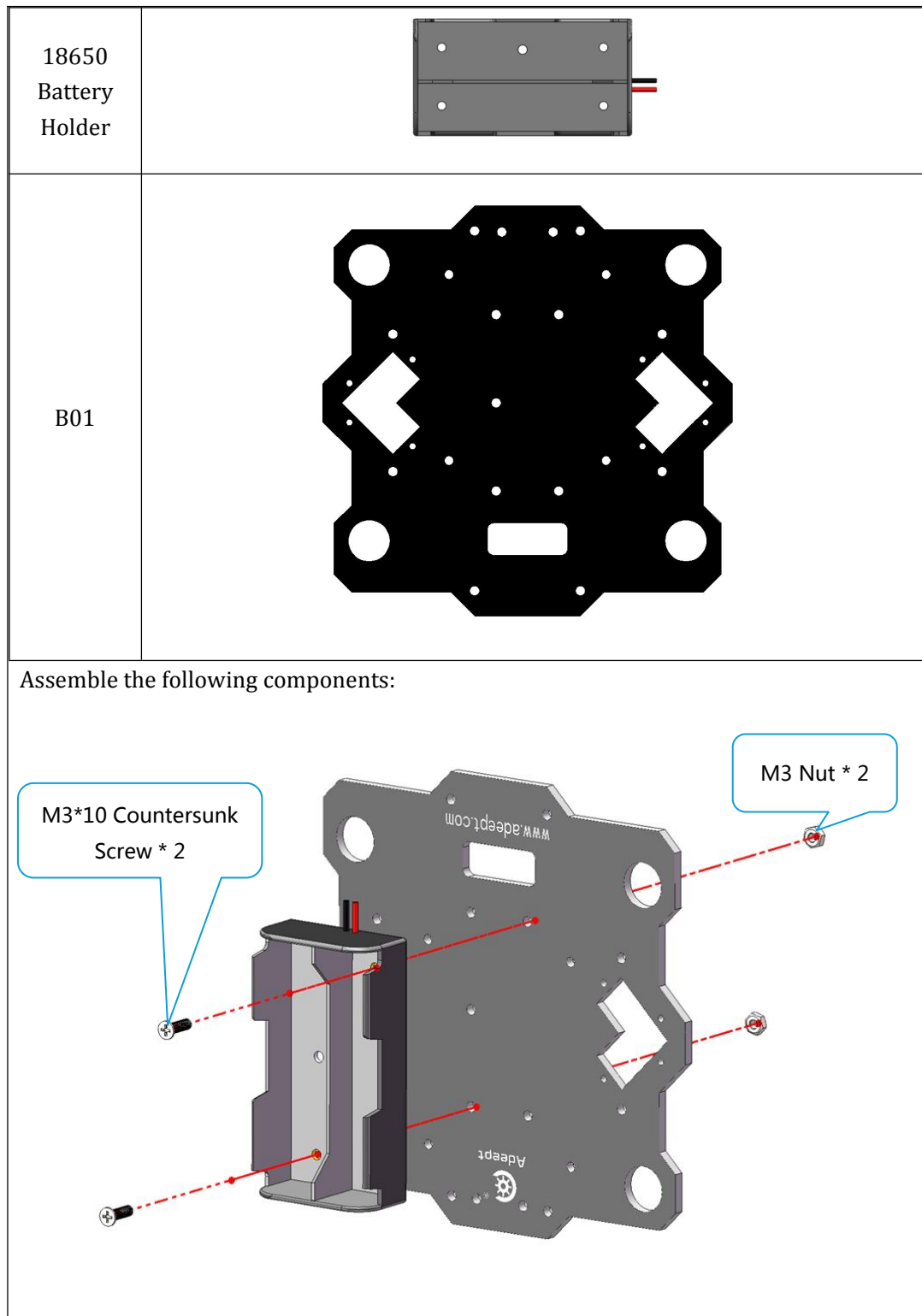


After Assembly:

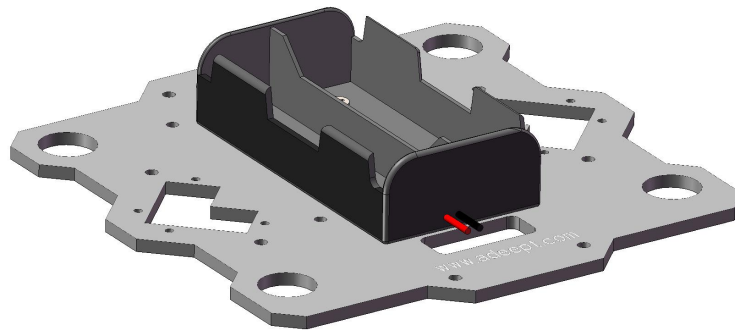


6.6 Assembly of Robot Body

1. Fix the **18650 Battery Holder** to **B01** using two **M3*10 Countersunk Screws** and two **M3 Nuts**. (Note the wire outlet position of the 18650 Battery Holder.)

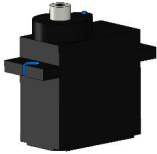


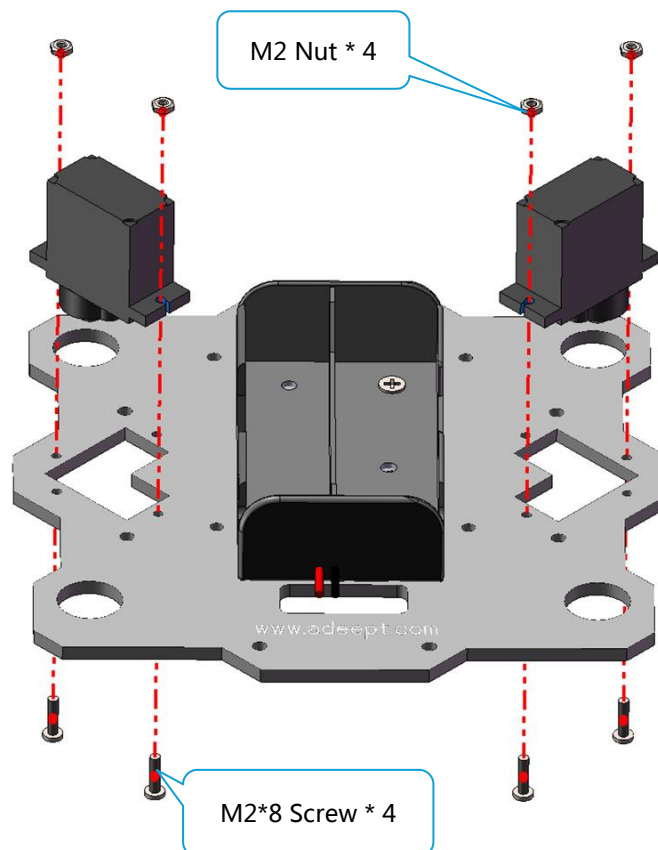
After Assembly:

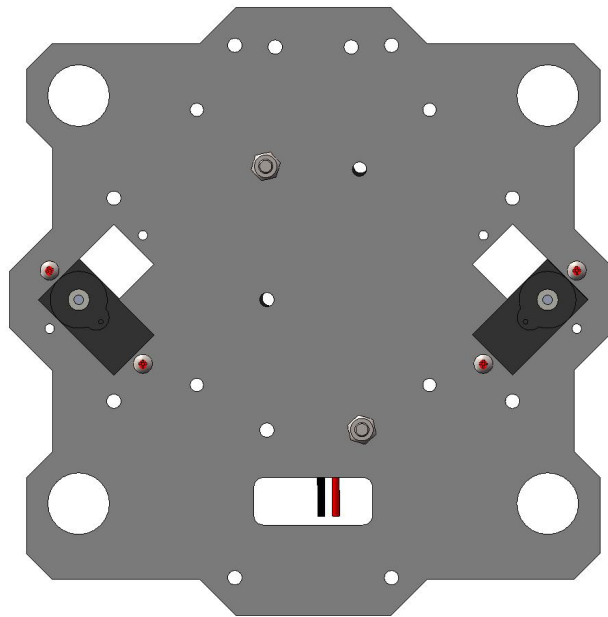


2. Fix two **Servos** to part **B01** using four **M2*8 Screws** and four **M2 Nuts**.

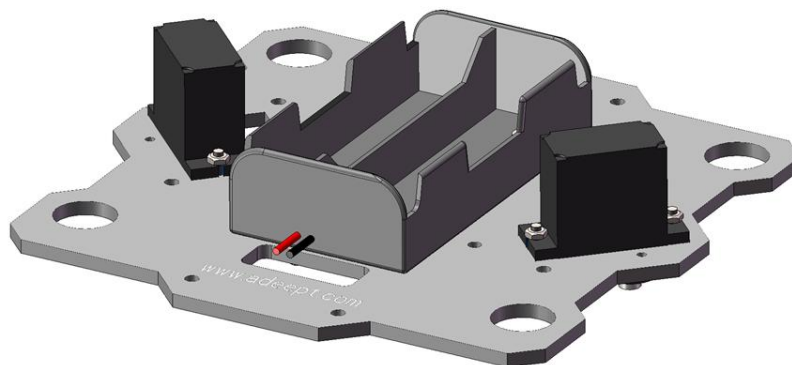
Assemble the following components:

Servo	
-------	--



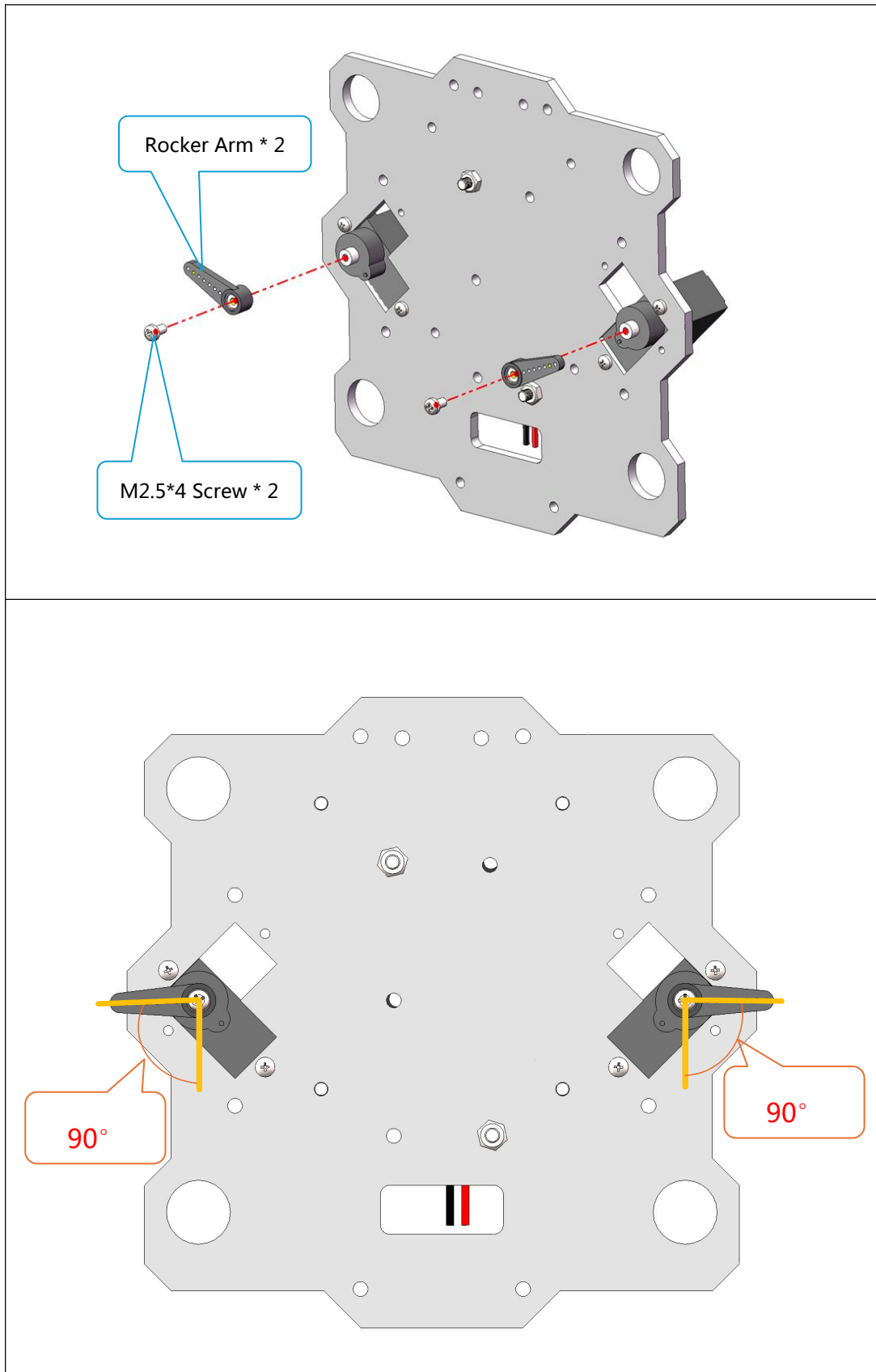


After Assembly:

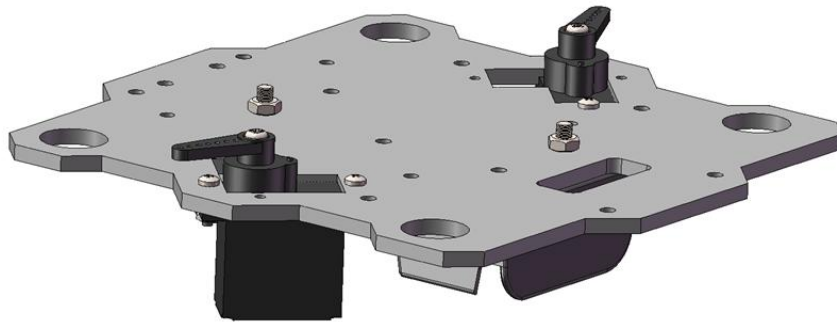


3. Fix two **Rocker Arms** to the servo with two **M2.5*4 Screws** from the servo kit. (Install the rocker arm at the angle shown in the picture, and assemble it as close to a 120 - degree angle as possible.)

Assemble the following components:



After Assembly:

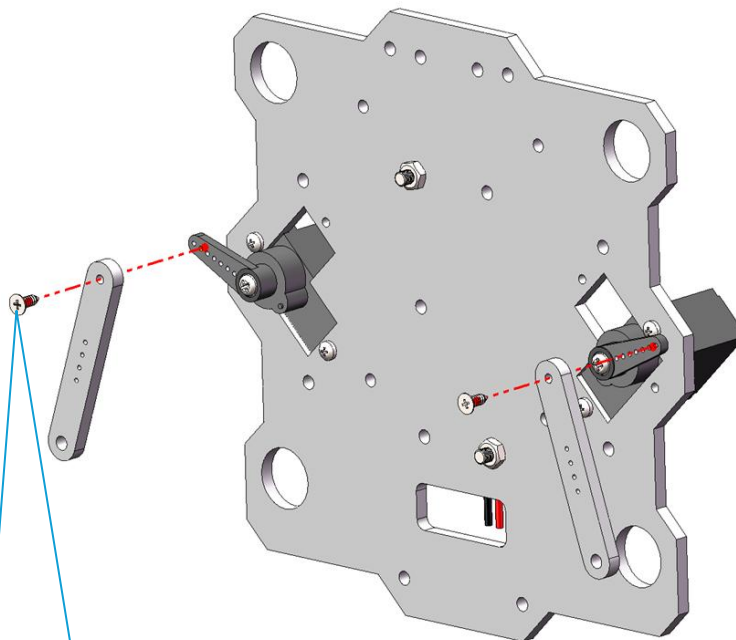


4. Fix two parts **B02** to the **Rocker Arm** using two **M1.7*6 Tapping Screws**.

B02

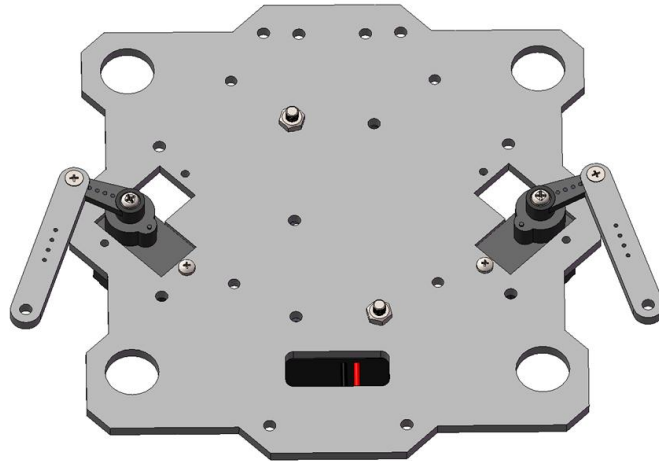


Assemble the following components:

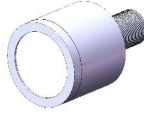

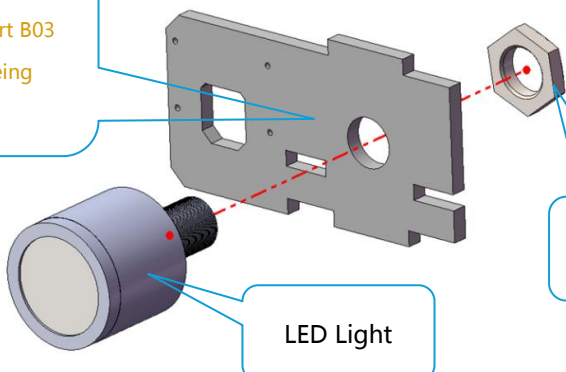


M1.7*6 Tapping Screw * 2

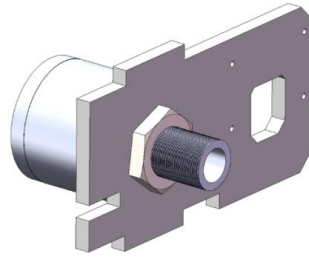
After Assembly:



5. Fix an **LED Light** to part **B03** using a **M10 Nut**.

LED Light	
B03	
<p>Assemble the following components:</p> <div><p>Pay attention to the front and back sides of part B03 to prevent it from being installed incorrectly.</p><p>M10 Nut * 1</p><p>LED Light</p></div>	

After Assembly:

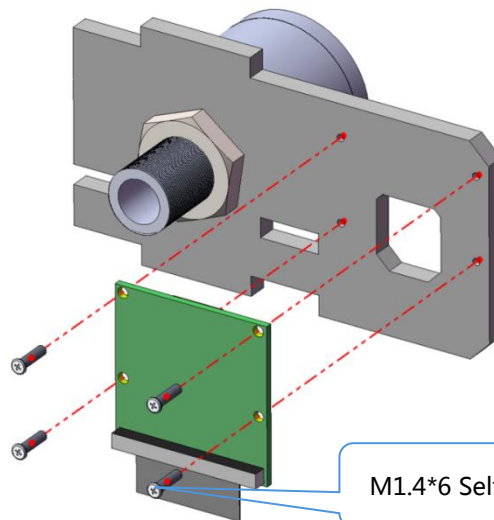


6. Fix the **Camera Module** to part **B03** using four **M1.4*6 Tapping Screws**.

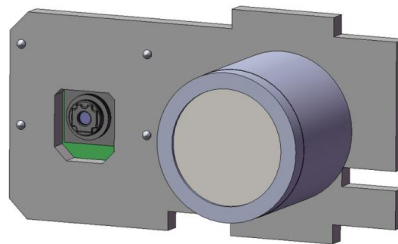
Camera Module



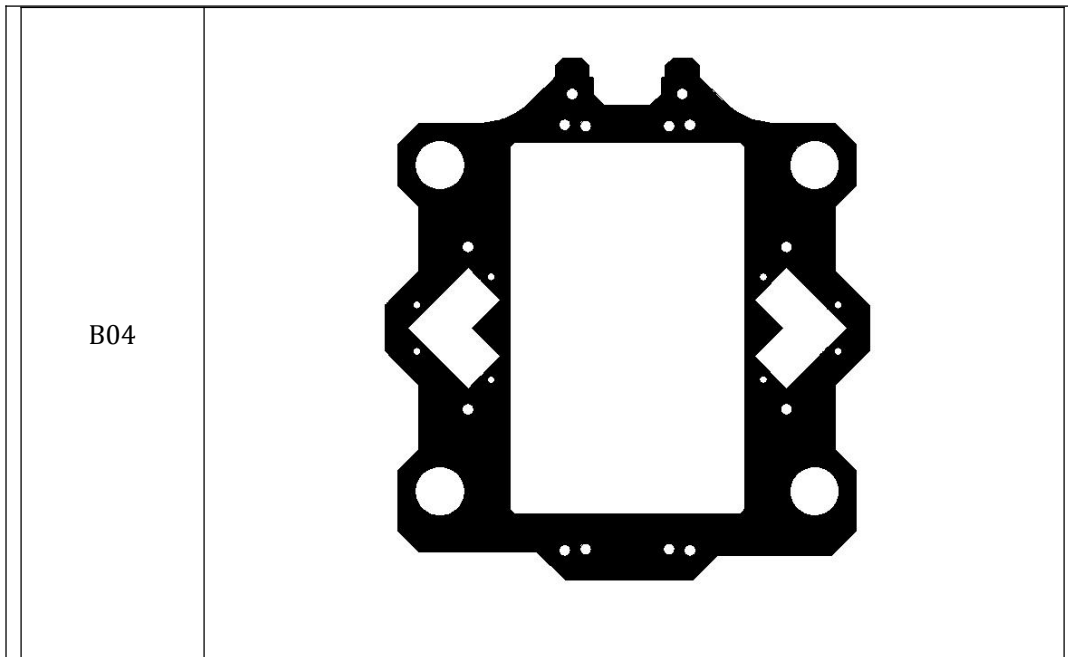
Assemble the following components:



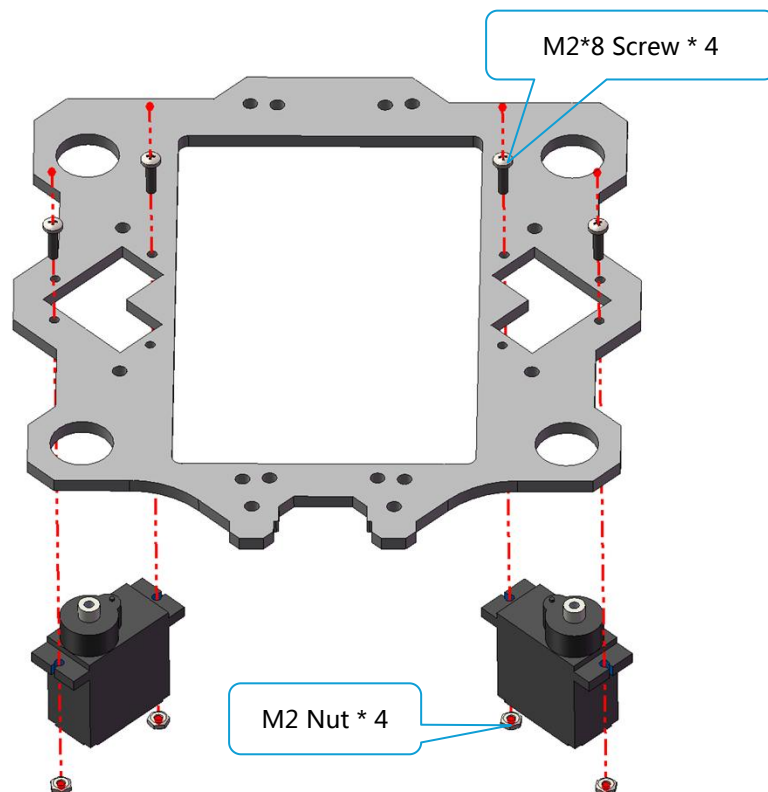
After Assembly:



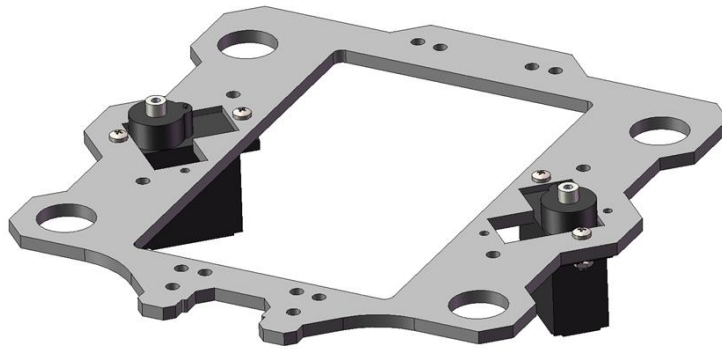
7. Fix two **Servos** to part **B04** using four **M2*8 Screws** and four **M2 Nuts**.



Assemble the following components:

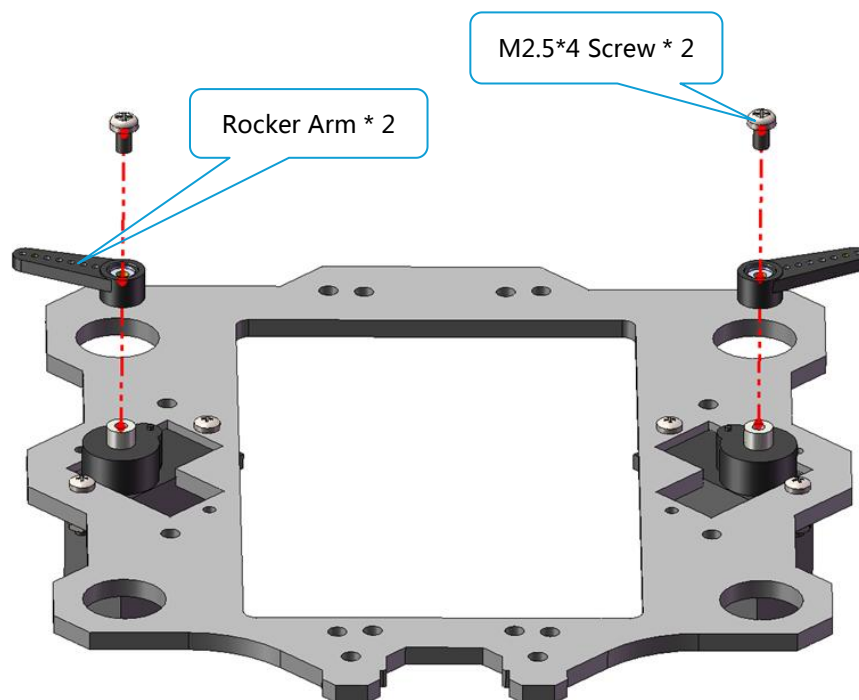


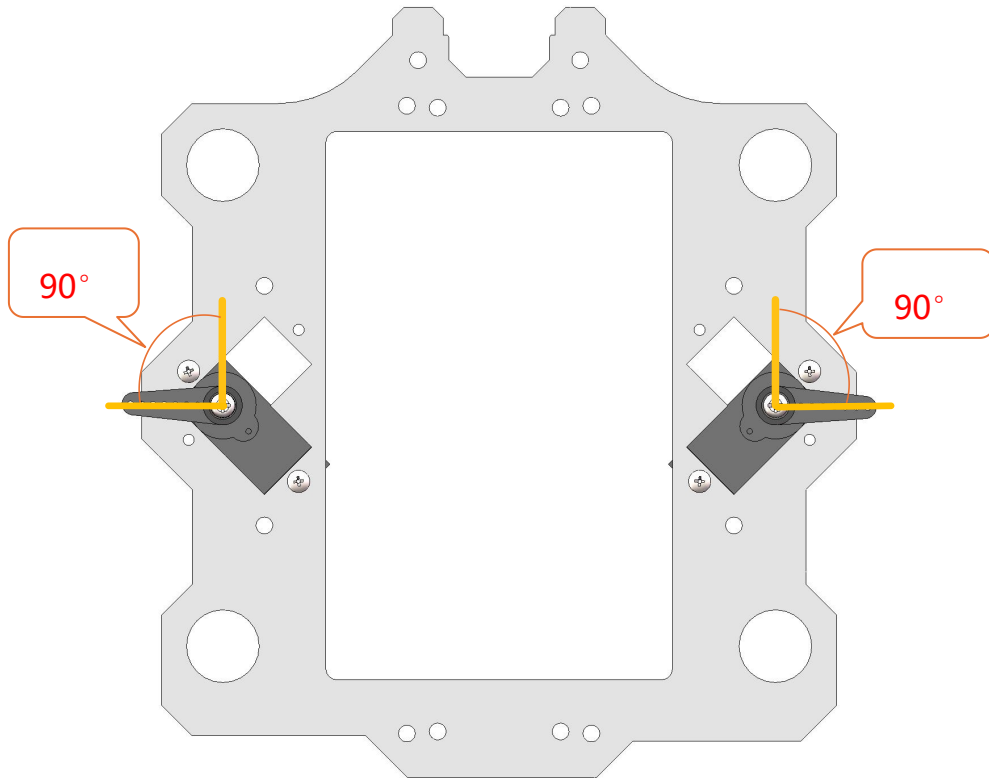
After Assembly:



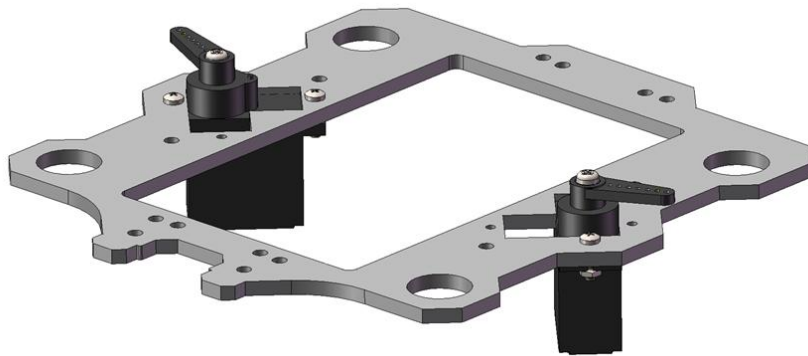
8. Fix two **Rocker Arms** to the servo using two **M2.5*4 Screws** from the servo kit. (Install the rocker arm at the angle shown in the picture, and assemble it as close to a 120 - degree angle as possible.)

Assemble the following components:





After Assembly:

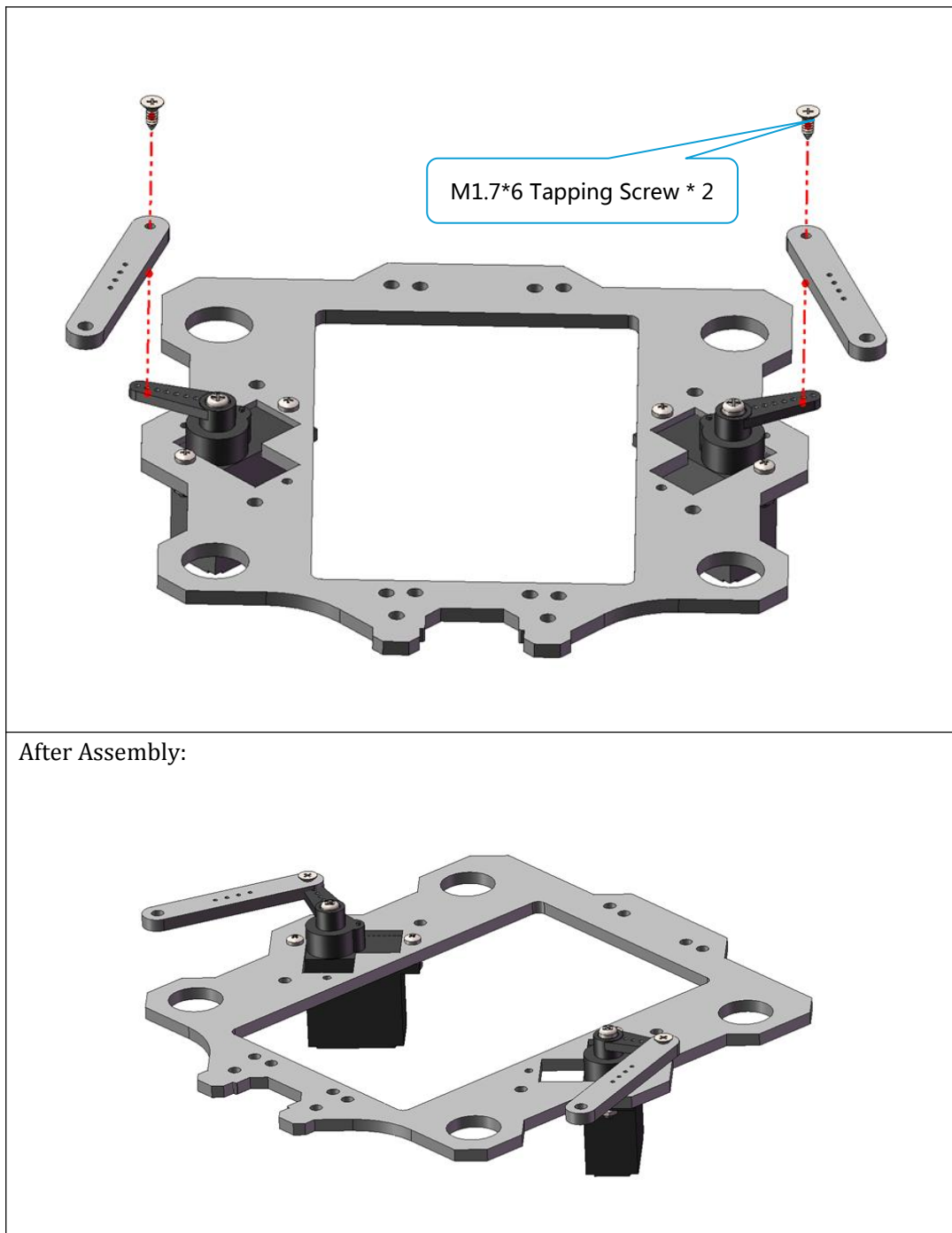


9. Fix two parts **B02** to the **Rocker Arm** using two **M1.7*6 Tapping Screws**.

B02	
-----	--

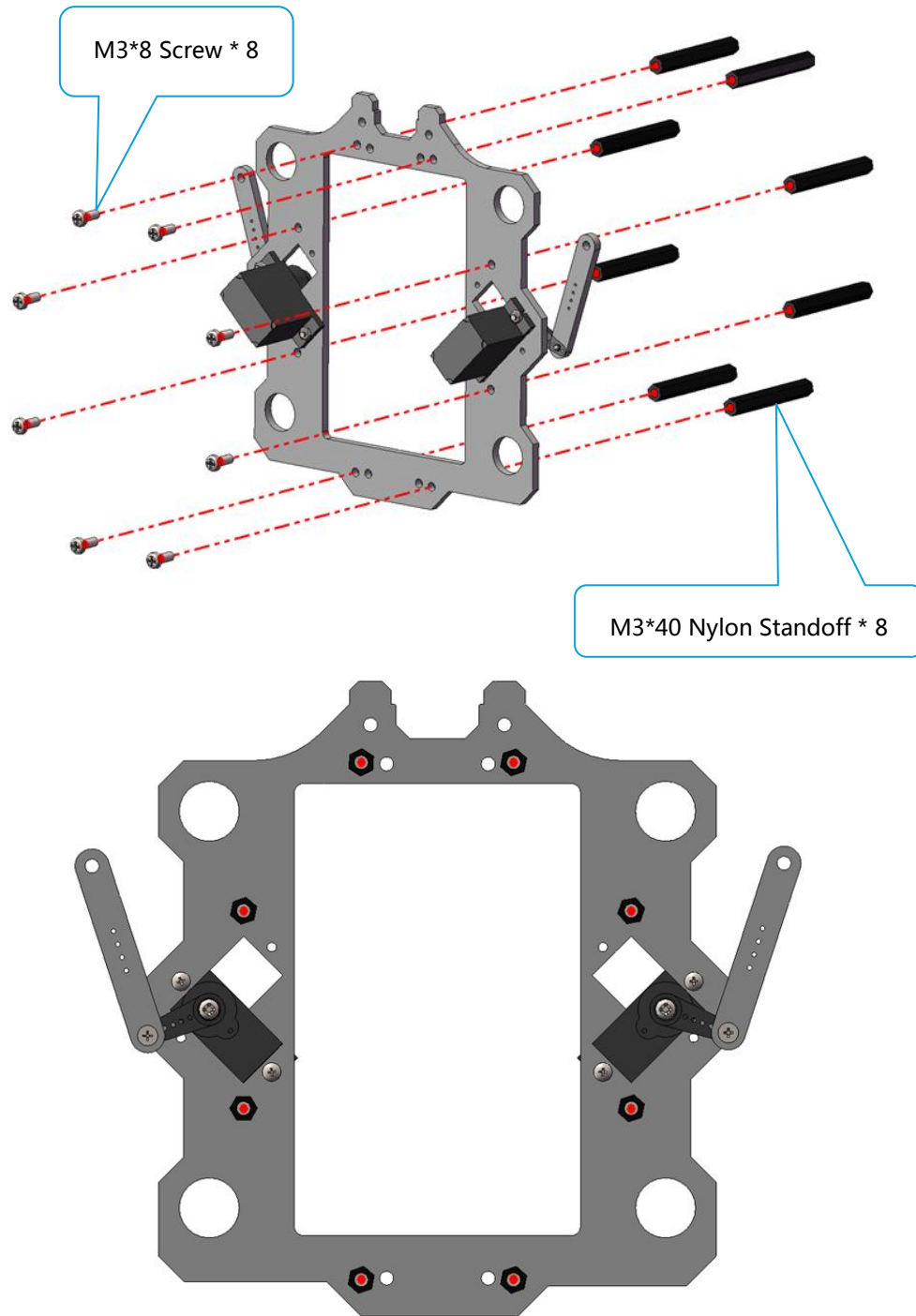


Assemble the following components:



10. Fix eight **M3*40 Nylon Standoffs** to the assembled part **B04** using eight **M3*8 Screws**.


Assemble the following components:



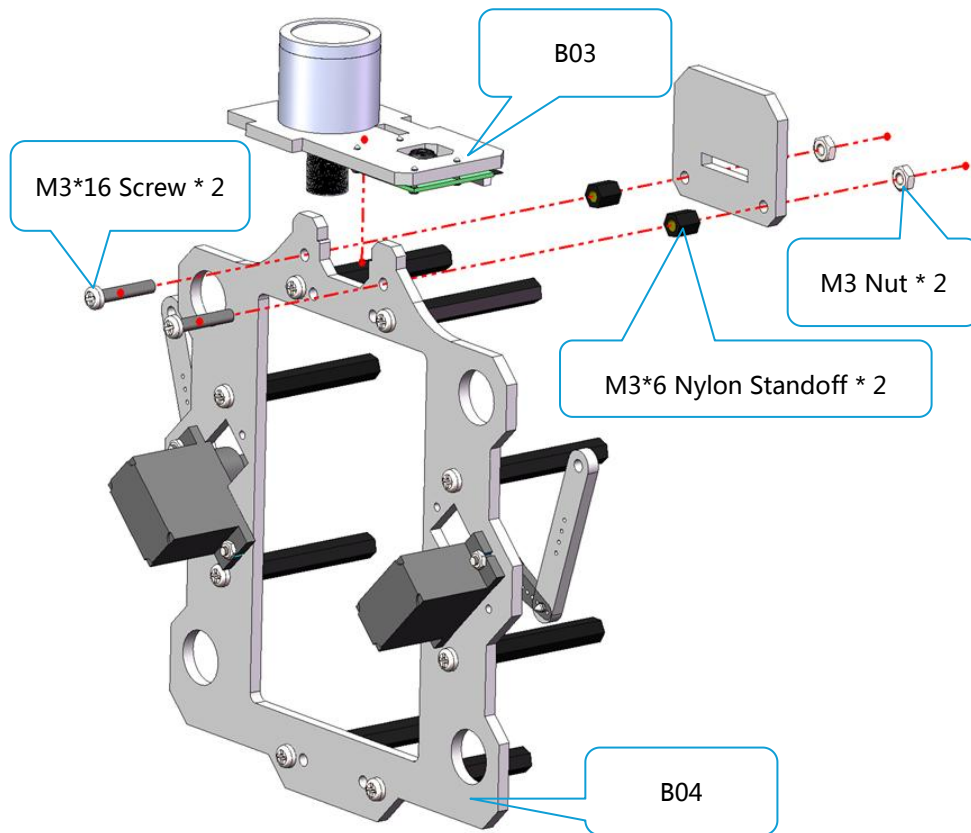
After Assembly:



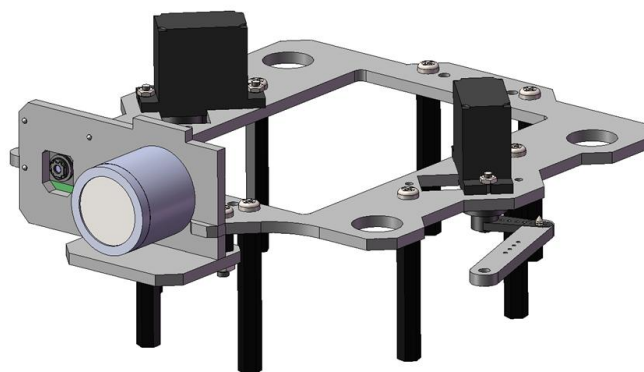
11. First, precisely snap the assembled part **B04** into the corresponding slot of the assembled part **B03**. Then, use one piece of part **B05**, two **M3*16 Screws**, two **M3*6 Nylon Standoffs** and two **M3 Nuts** to fasten them together.

B05	

Assemble the following components:

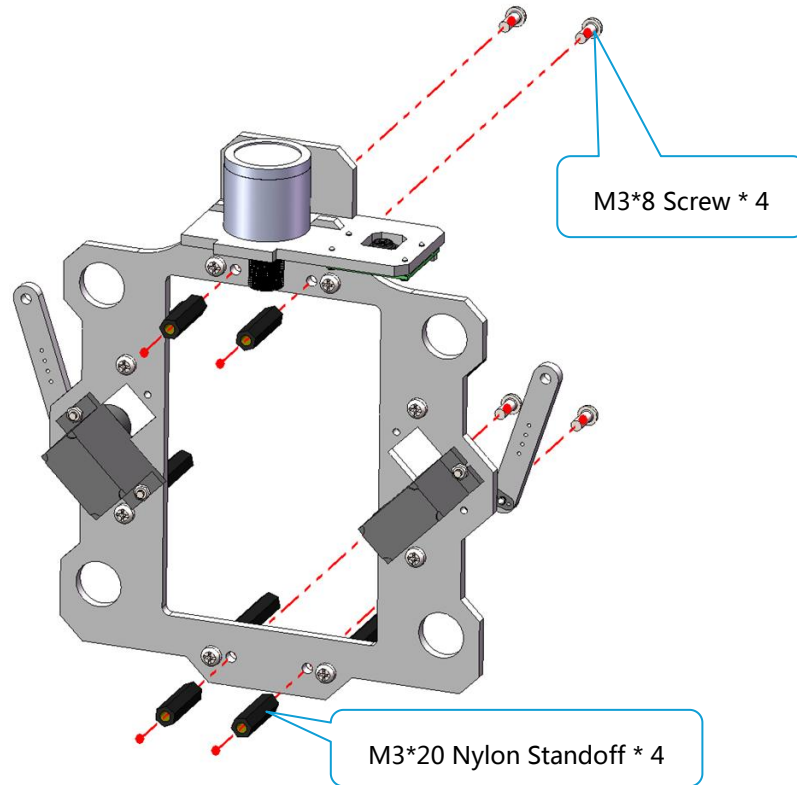


After Assembly:



12. Fix four **M3*20 Nylon Standoffs** to the assembled part **B04** using four **M3*8 Screws**.

Assemble the following components:



After Assembly:



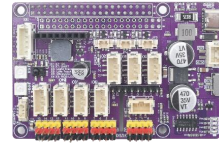
13. Fix the **Adept Robot HAT V3.2** to the **Raspberry Pi Board** (which is not included in this kit, you need to purchase it separately) using four **M2.5*10+6**

Copper Standoffs, four **M2.5*21 Copper Standoffs** and four **M2.5*7 Screws**.

(NOTE: Don't forget to plug the camera cable into the corresponding slot on the Raspberry Pi board!!!)

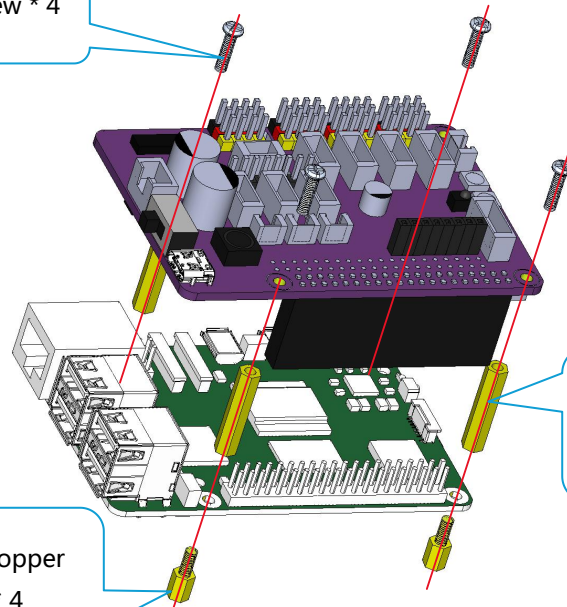
Adeept Robot HAT

V3.2



Assemble the following components:

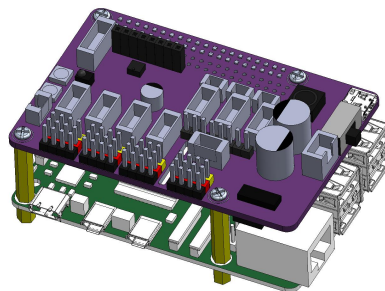
M2.5*7 Screw * 4



M2.5*21 Copper
Standoff * 4

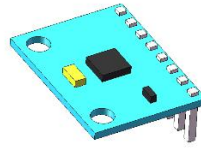
M2.5*10+6 Copper
Standoff * 4

After Assembly:

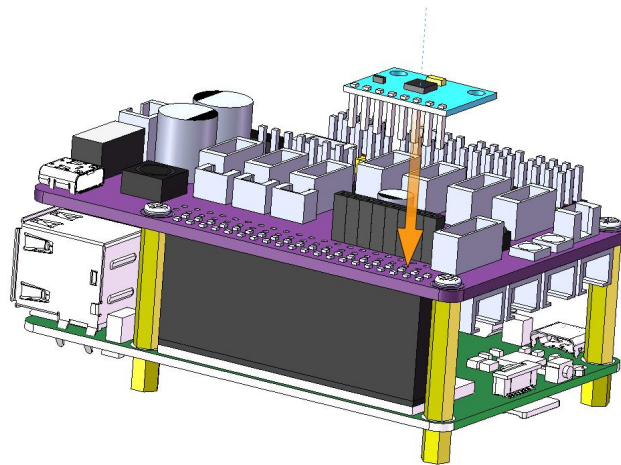


14. Fix the **MPU-6050** to the **Adeept Robot HAT V3.2**.

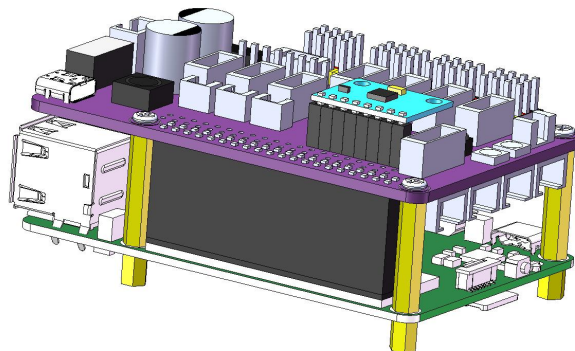
MPU-6050



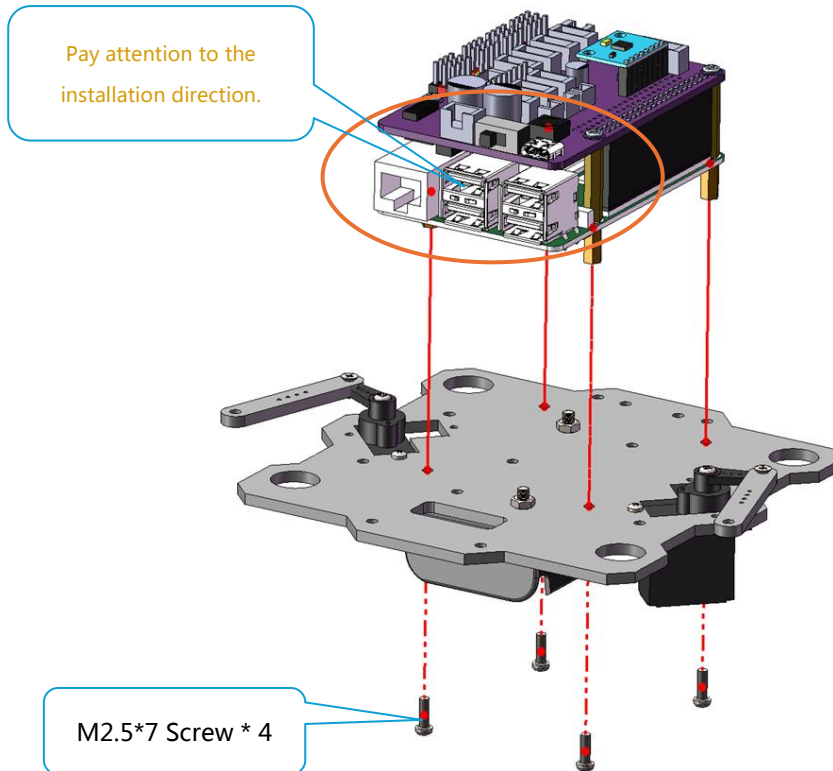
Assemble the following components:



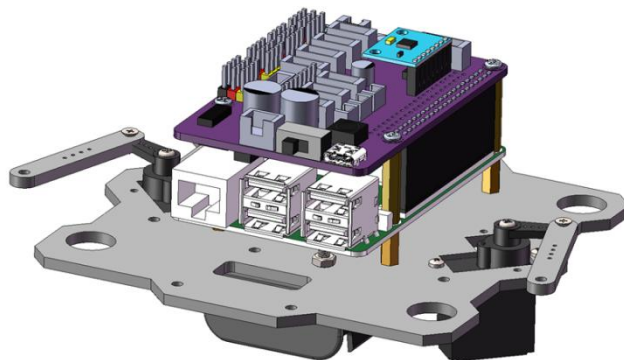
After Assembly:

15. Fix the assembled **Raspberry Pi Board** to part **B01** using four **M2.5*7 Screws**.

Assemble the following components:



After Assembly:

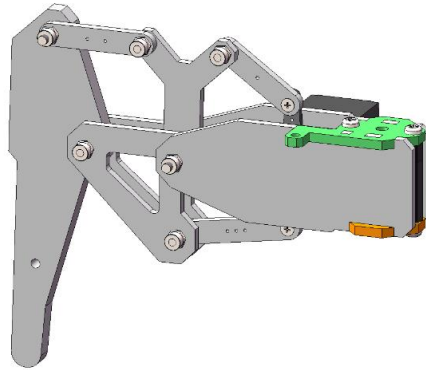


6.7 Fix Legs to the Robot Body

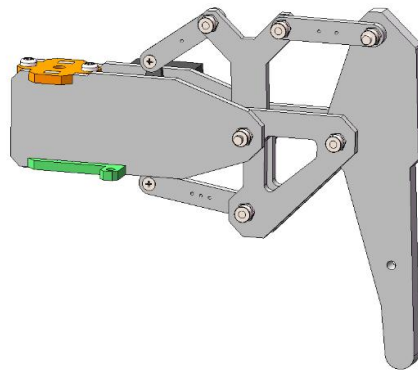
1. Fix **Leg N01** to both part **B01** and part **B04** using a **M4*55 Screw**, two **Bearings**, two **Metal Washers**, two **Rubber Washers** and an **M4 Lock Nut**.

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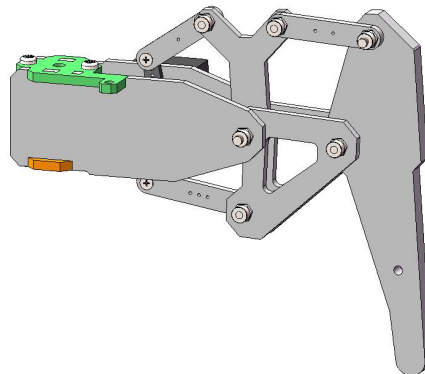
Leg N01



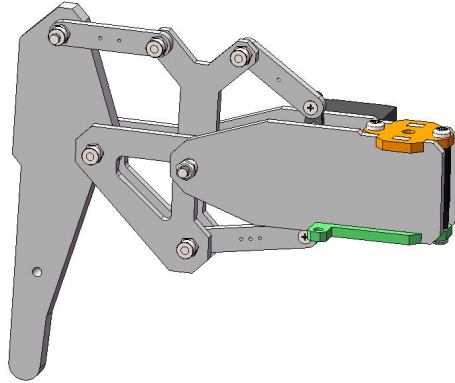
Leg N02



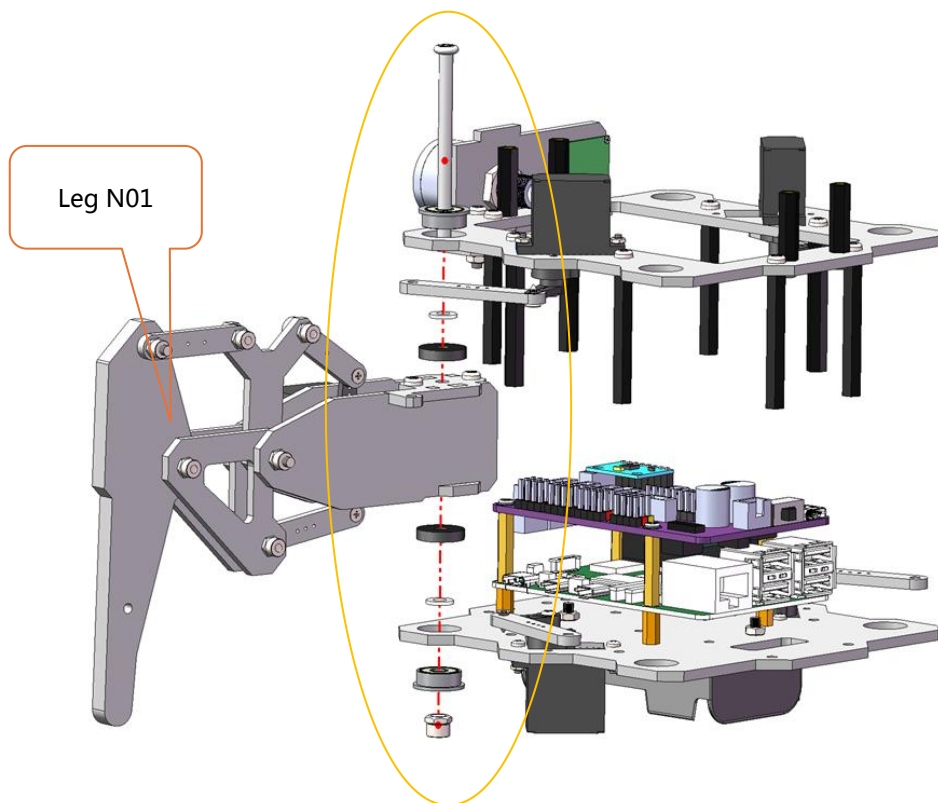
Leg N03

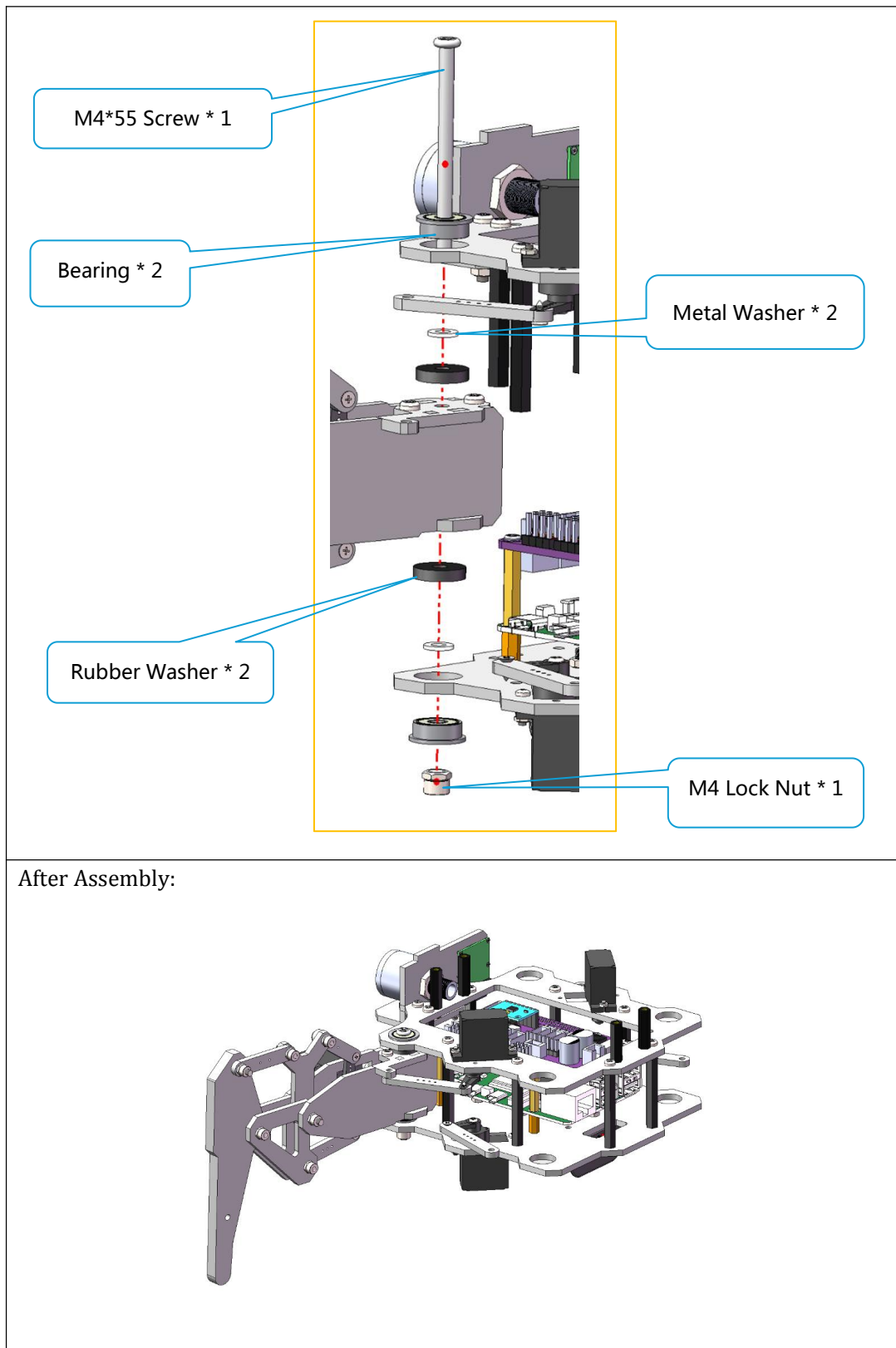


Leg N04



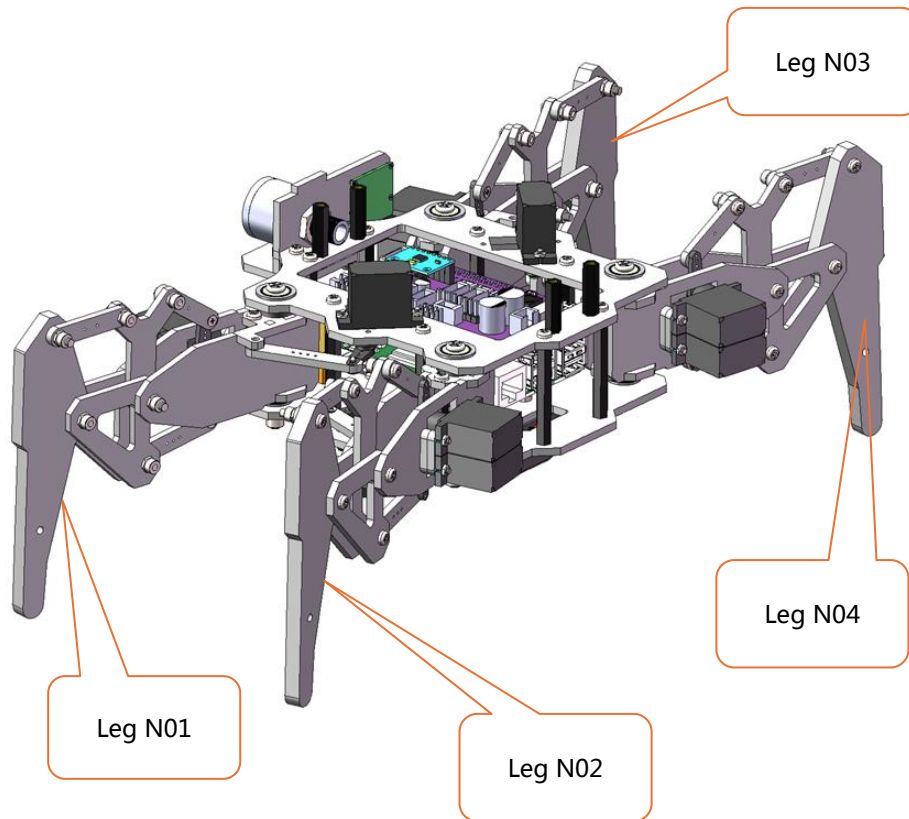
Assemble the following components:





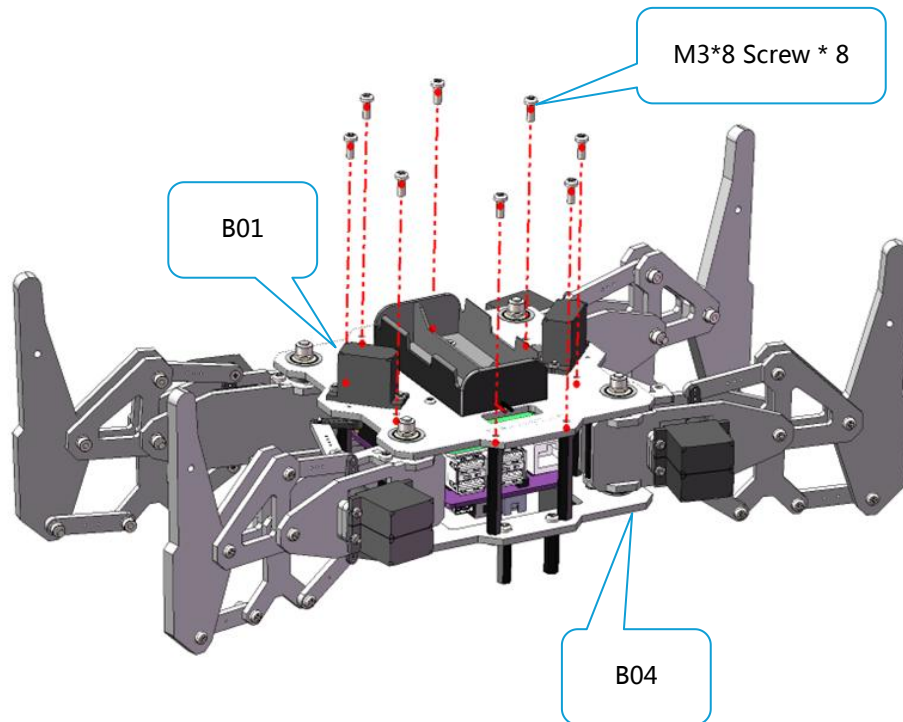
2. Fix another three **Legs** in the same manner as you did with **Leg N01**.

After Assembly:

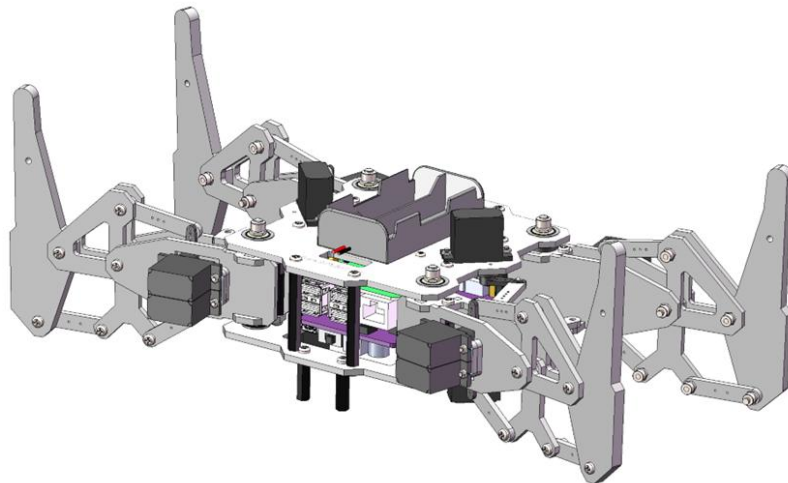


3. Use eight **M3*8 Screws** to fix the assembled parts **B01** and **B04** together.

Assemble the following components:

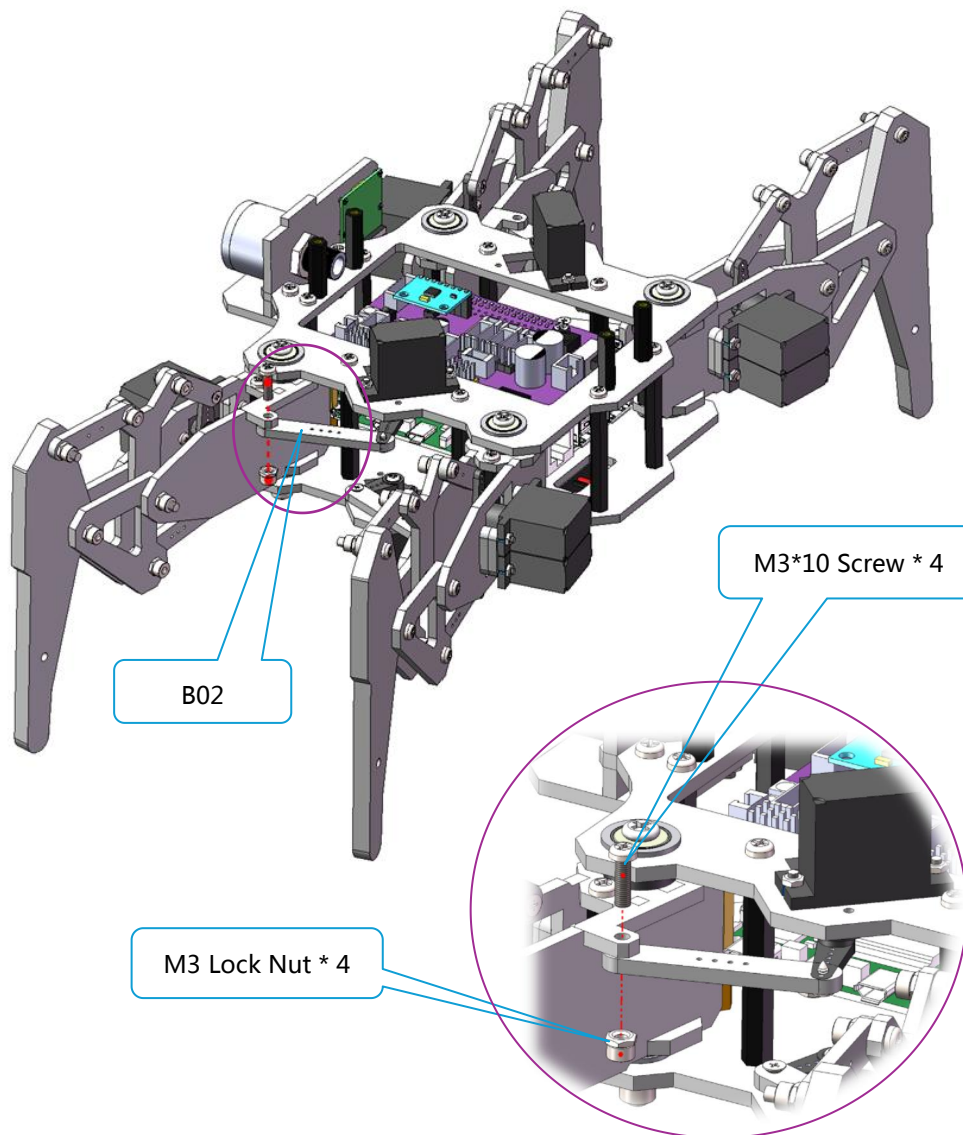


After Assembly:

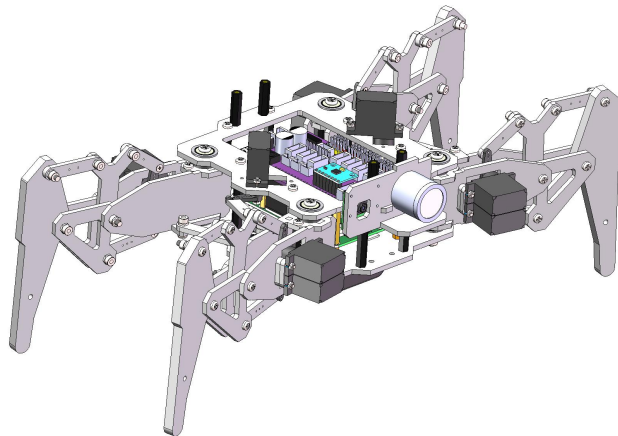


4. Connect part **B02** and four Legs using four **M3*10 Screws** and four **M3 Lock Nuts**. (Please do not tighten these lock nuts too tightly)

Assemble the following components: (Assemble four sets)

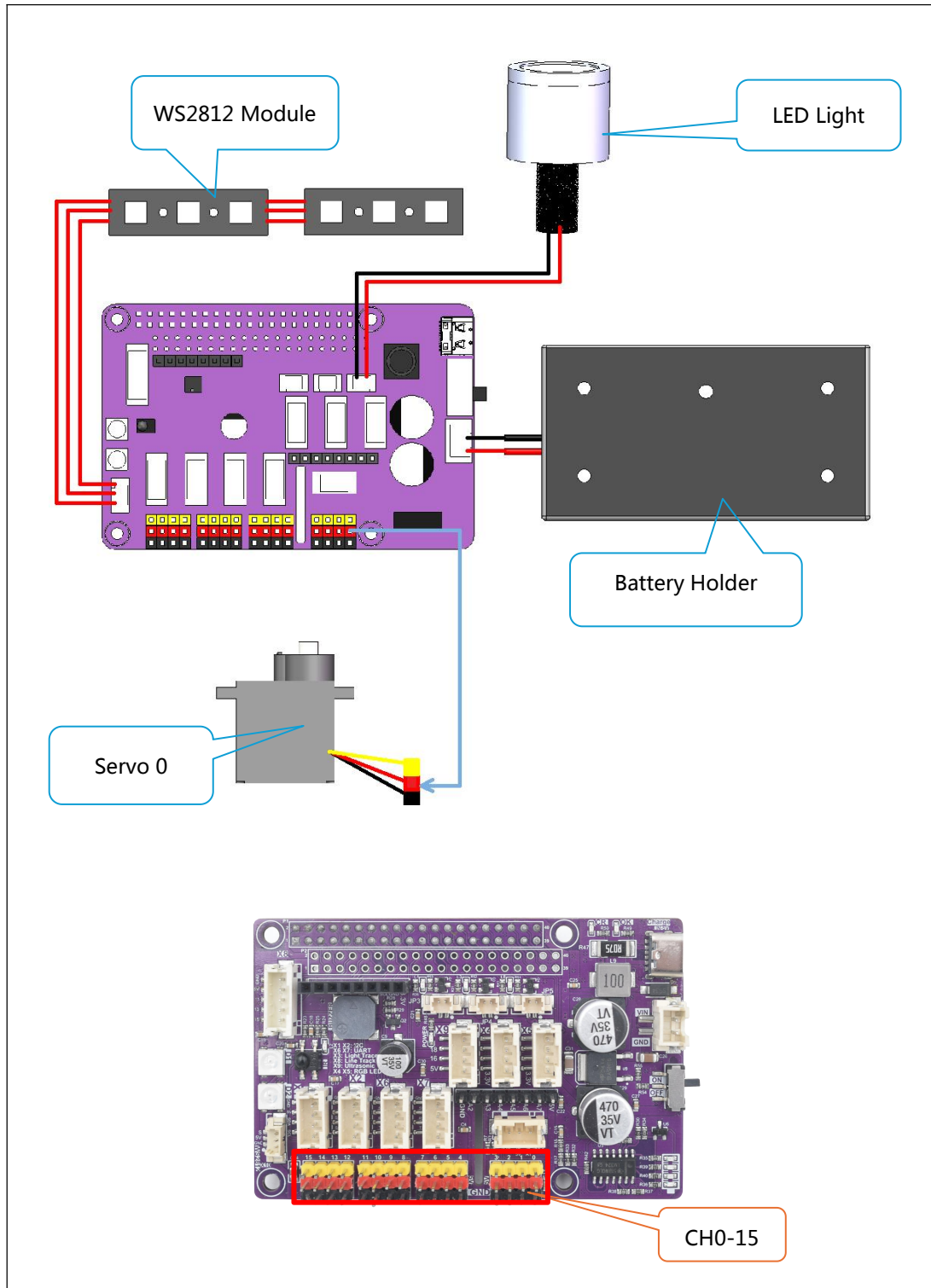


After Assembly:



6.8 The Wiring of the Adeept Robot HAT V3.2

1. Connect the components as shown in the figure. The cables must be matched with the ports.



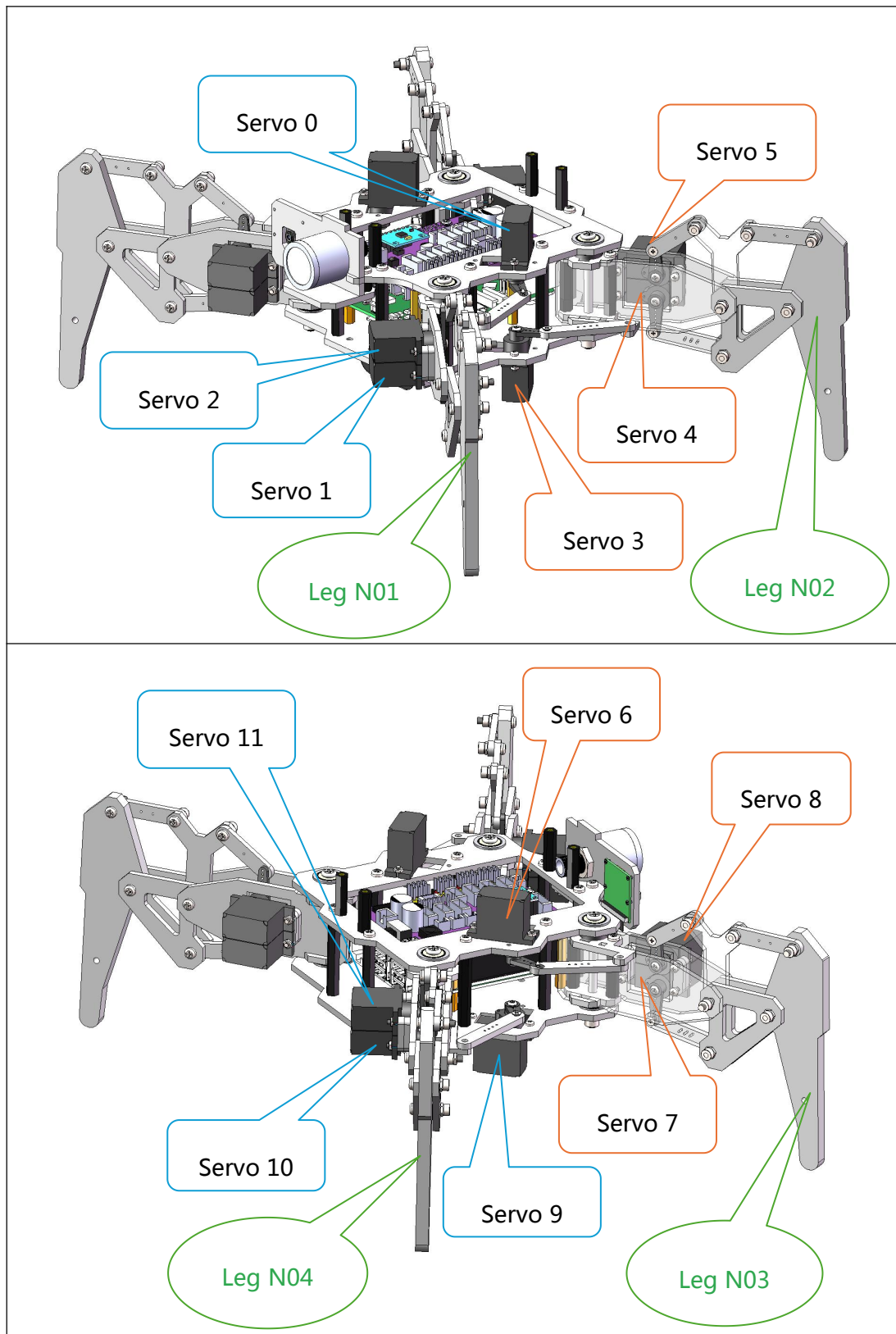
According to the numbering, install the servos into the ports. Note that you should not reverse the polarity of the servo wiring. Please refer to the diagram above for the wiring connection.

The corresponding PWM numbers of the driver board to the servos.

Left leg		Right leg
Leg 1	Robot body	Leg 3
Leg 2		Leg 4

Left leg	Servo 2	Servo 0	Servo 5
	Servo 1	Servo 3	Servo 4

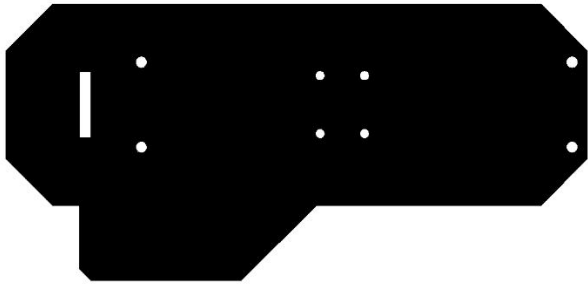
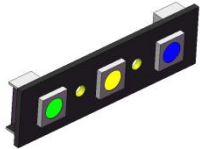
Servo 11	Servo 6	Servo 8	Right leg
Servo 10	Servo 9	Servo 7	



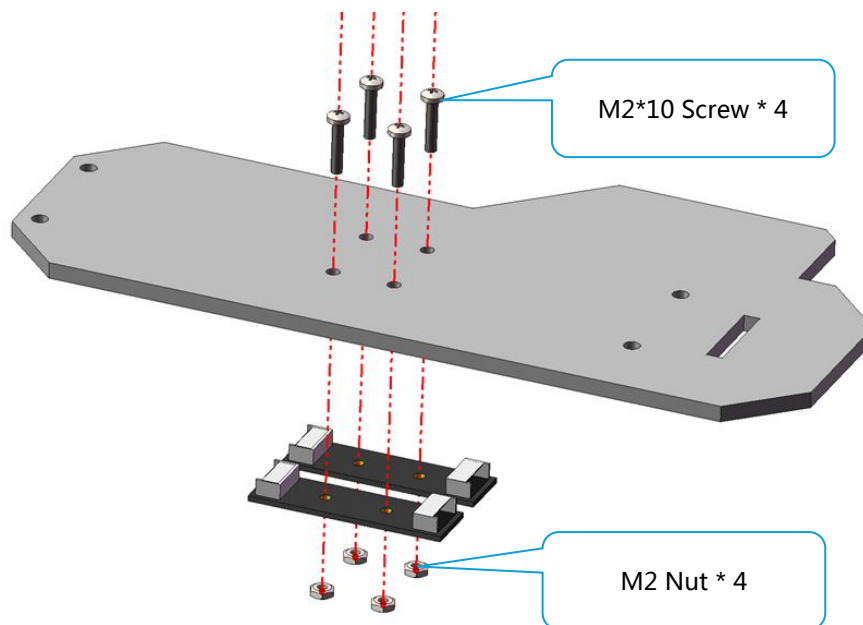
6.9 Assembly of Cover

1. Fix two **WS2812 RGB LED** onto part **B06** using four **M2*10 Screws** and four **M2**

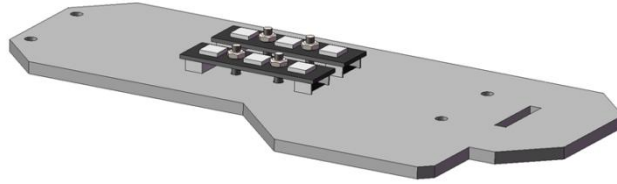
Nuts.

B06	
WS2812 RGB LED	

Assemble the following components:

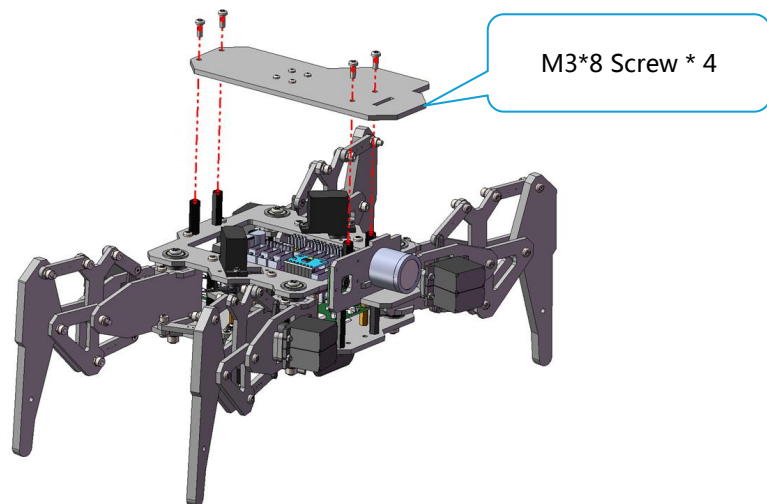


After Assembly:



2. Fix **B06** to the assembled **B04** using four **M3*8 Screws**.

Assemble the following components:



The complete appearance of the robot after assembly:

