MeArm

Assembly Manual for V1.0

This assembly manual is based on a work by Scott Pierce (www.spiercetech.com)

Hardware and software source files can be found at: www.mearm.io

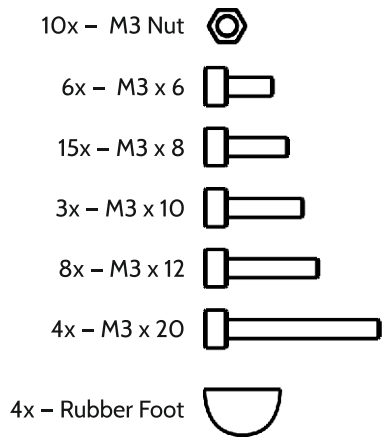
Introduction

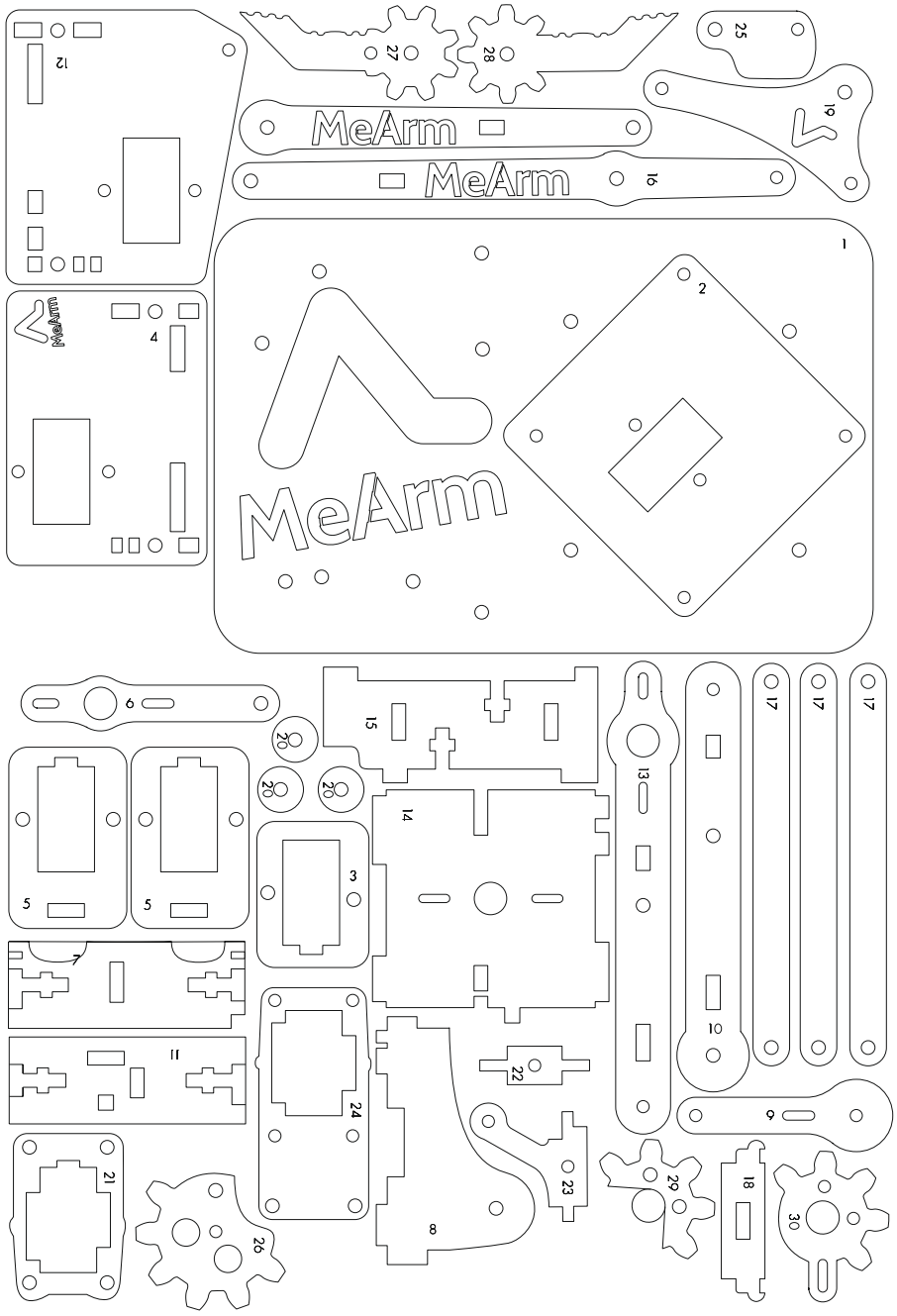
Thank you for supporting the MeArm project!
This manual is for the construction of the MeArm. It should be built with a set of calibrated servos. See the Brains Board document for details of servo calibration.

Calibrate Servos First!

Parts

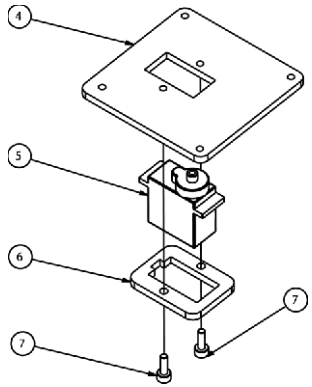
Building the MeArm Requires the following fasteners. These profiles are actual size (if printed gatefold on A4 sized paper).
The acrylic parts list is shown for reference. Small differences may occur as the product is improved over time.
Construction requires a small cross head screwdriver and 2.5mm hex key.
Additional screws for the servo arms are included in the servo





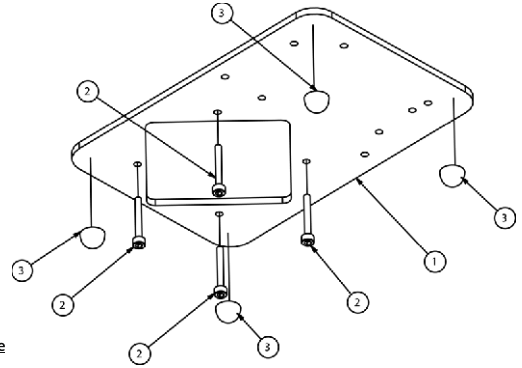
Before fixing together align screw holes on Base Plate(1), Pivot Servo Plate(4) and Base Servo Retainer(6) for later reference

PARTS LIST			
ITEM	PART NAME	QTY	PART NUMBER
1	Base Plate	1	
2	M3 x 20mm Screw	4	
3	Rubber Foot	4	
4	Pivot Servo Plate	1	
5	Servo Motor	1	
6	Base Servo Retainer	1	
7	M3 x 8mm Screw	2	
8	M3 Nut	4	

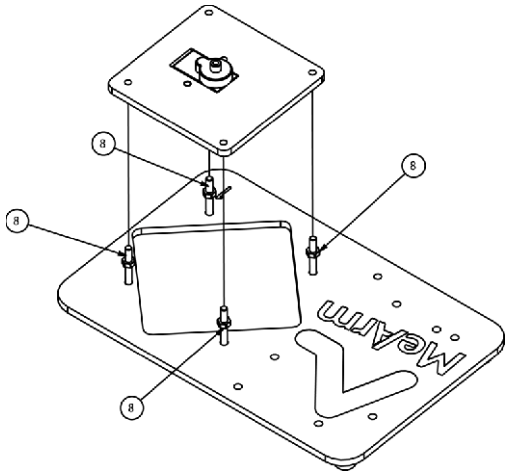


Insert Servo Motor into top side of Servo Retainer
Insert Servo Motor into bottom side of Pivot Servo Plate
Insert (2x) M3 x 8mm Screws through bottom of Servo Retainer and fix to Pivot Servo Plate

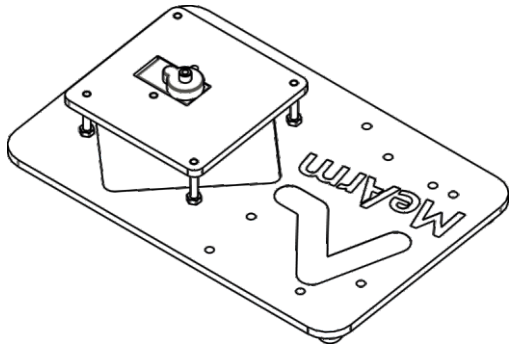
Note: The screws self tap. Do not over tighten as this will strip the hole



Attach Rubber Feet to underside of Base Plate
Insert (4) 20mm Screw though from underside of Base Plate

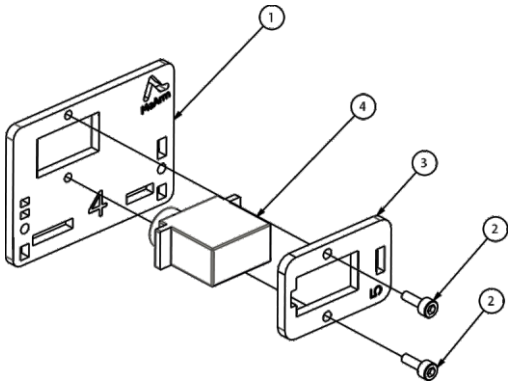


Thread (1x) Nut half way down each of the (4x) 20mm Screws.
Screw each of the 20mm Screws into the mating holes on the Pivot Servo Plate until the end of the screw is flush with the top



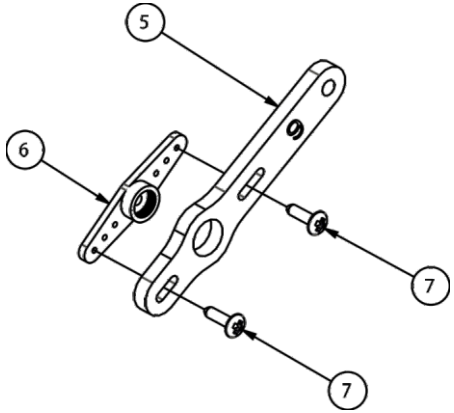
Tighten the Nuts rest of the way down

ITEM	PART NAME	QTY	PART NUMBER
1	Left Arm Servo Plate	1	4
2	M3 x 8mm Screw	2	
3	Servo Retainer	1	5
4	9 Gram Servo	1	
5	Long Servo Arm	1	6
6	Servo Double Arm	1	
7	Servo Mount Screw	2	
8	Servo Screw	1	

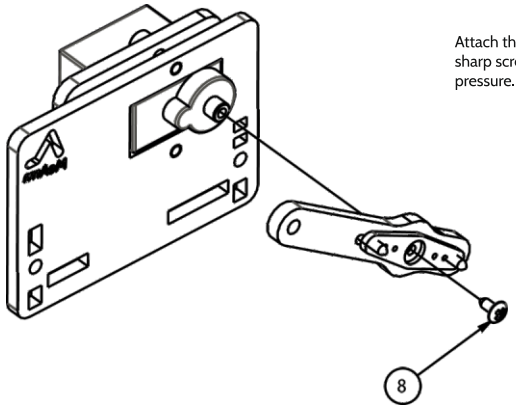


Slide Servo Retainer over the bottom end of the Servo and insert cable through rectangular hole

Insert (2) M3 x 8mm Screws into the Servo Retainer and attach to Left Arm Servo Plate

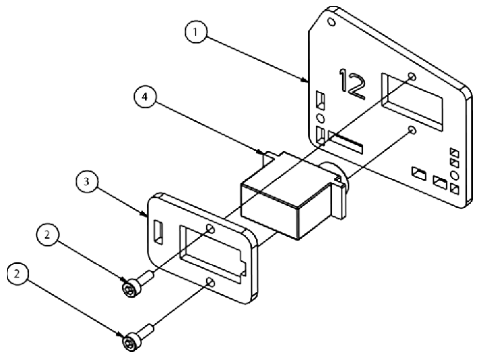


Attach the Servo Arm to the Long Servo Arm Extension using the sharp screws in the servo pack. These will self tap with a little pressure.



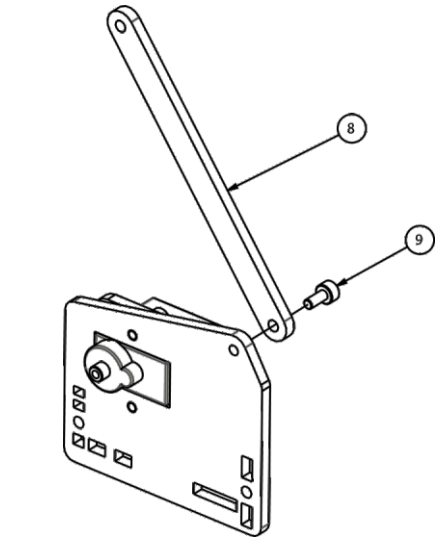
Attach the Long Servo Arm Extension assembly to the **calibrated** servo motor (using the Brains Board Guide as a reference for position).
Use the machine screw from the servo pack to secure in position

ITEM	PART NAME	QTY	PART NUMBER
1	Right Arm Servo Plate	1	12
2	M3 x 8mm Screw	2	
3	Servo Retainer	1	5
4	9 Gram Servo	1	
5	Right Arm Base Joint	1	13
6	Servo Double Arm	1	
7	Servo Mount Screw	2	
8	Parallel Linkage	1	17
9	M3 x 6mm Screw	1	
10	Servo Screw	1	

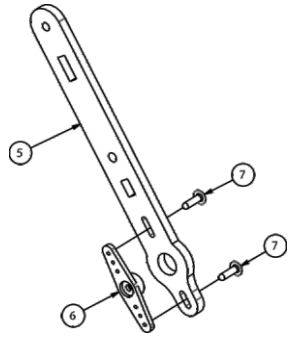


Slide Servo Retainer over the bottom end of the Servo and insert cable through rectangular hole

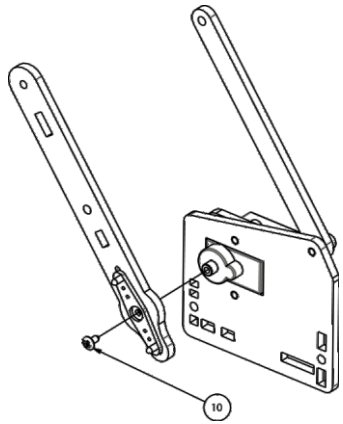
Insert (2) M3 x 8mm Screws into the Servo Retainer and attach to Right Arm Servo Plate



Insert 6mm Screw into Parallel linkage and attach to Right Arm Servo Plate.



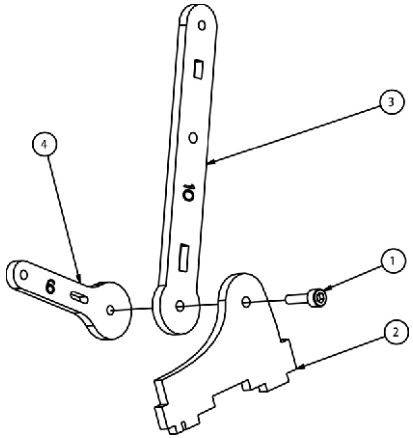
Attach the Servo Arm to the Right Arm Base Joint using the sharp screws in the servo pack. These will self tap with a little pressure.



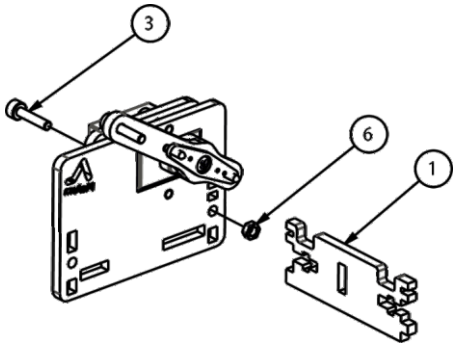
Attach the Right Arm Base Joint assembly to the **calibrated** servo motor (using the Brains Board Guide as a reference for position).
Use the machine screw from the servo pack to secure in position

PARTS LIST			
ITEM	PART NAME	QTY	
1	M3 x 10mm Screw	1	
2	Left Arm Mount Tablet	1	8
3	Left Arm Base Joint	1	10
4	Short Servo Arm	1	9
5	Arm Bottom Plate	1	14
6	Servo Double Arm	1	
7	Servo Mount Screw	2	

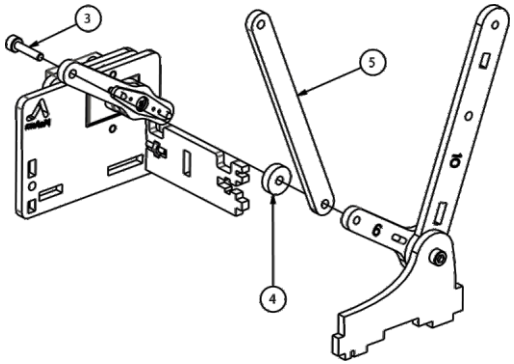
ITEM	PART NAME	QTY	PART NUMBER
1	Front Arm Base Cross Member	1	7
2	Back Arm Base Cross Member	1	11
3	M3 x 12mm Screw	3	
4	Spacer	1	20
5	Parallel Linkage	1	17
6	M3 Nut	2	



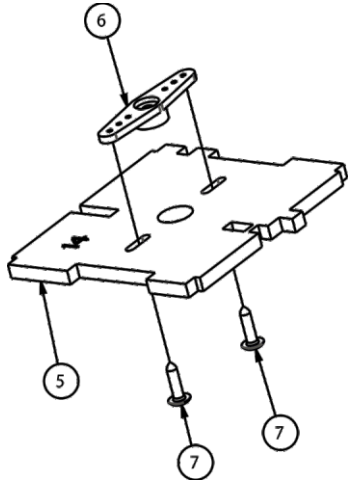
Fix parts shown together using 10mm Screw. These should move freely. This assembly is known as the pig.



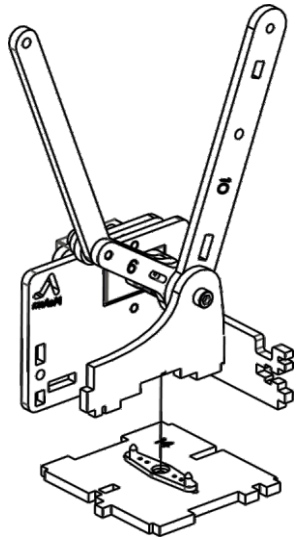
Insert (1) 12mm Screw, add nut and Front Arm Base Cross Member and tighten. Stop before you break it.



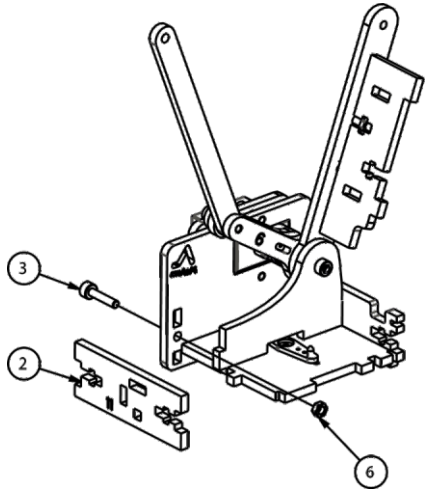
Insert the Pig into the Front Arm Base Cross Member and using 12mm Screw attach the Pig to the Long Servo Arm Extension



Attach the Servo Arm to the Arm Bottom Plate using the sharp screws in the servo pack. These will self tap with a little pressure.

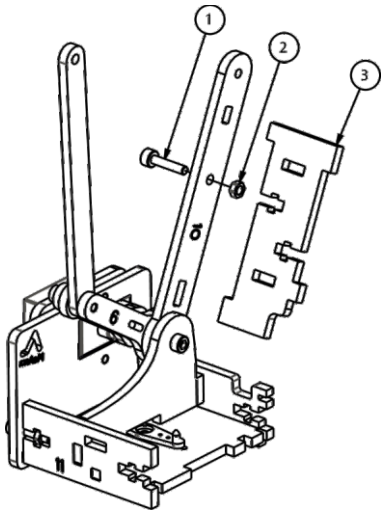


Insert the Arm Bottom Plate into the Left Arm Servo Plate at a diagonal angle and lever into place on the Pig Section.

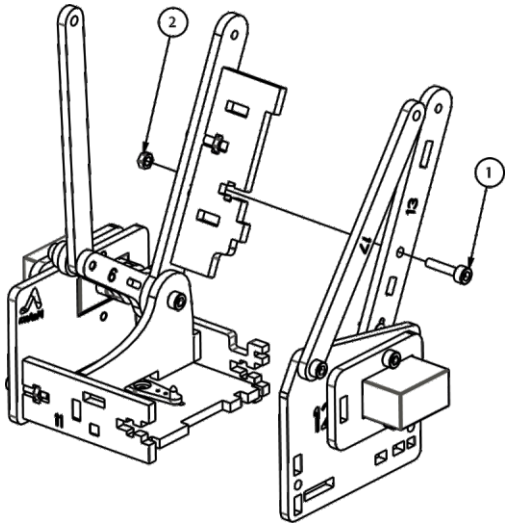


Insert (1) 12mm screw, add nut and Rear Arm Base Cross Member and lever carefully onto the rear of the Pig and the Arm Bottom Plate.

RTS LIST			
ITEM	PART NAME	QTY	PART NUMBER
1	M3 x 12mm Screw	4	
2	M3 Nut	4	
3	Main Arm Cross Web	1	15

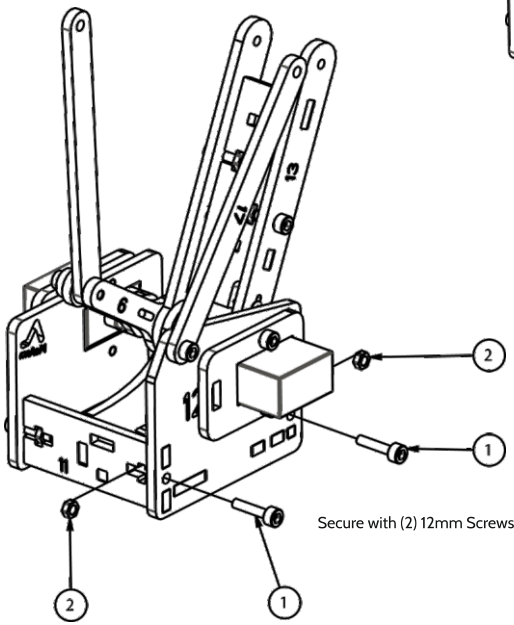


Using 12mm Screw and Nut attach Main Arm Cross Web



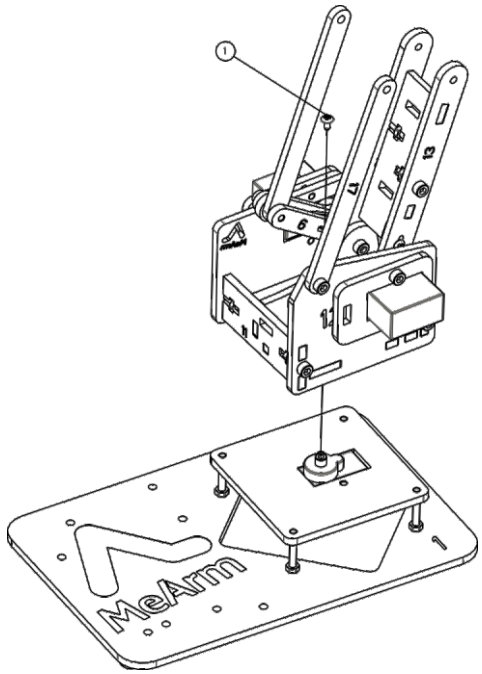
Bring the right and left assemblies together securing with a 12mm Screw and Nut in the Main Arm Cross Web.

This part is tricky. Be gentile and have some patience. Small adjustments of the parts will allow it all to push together.

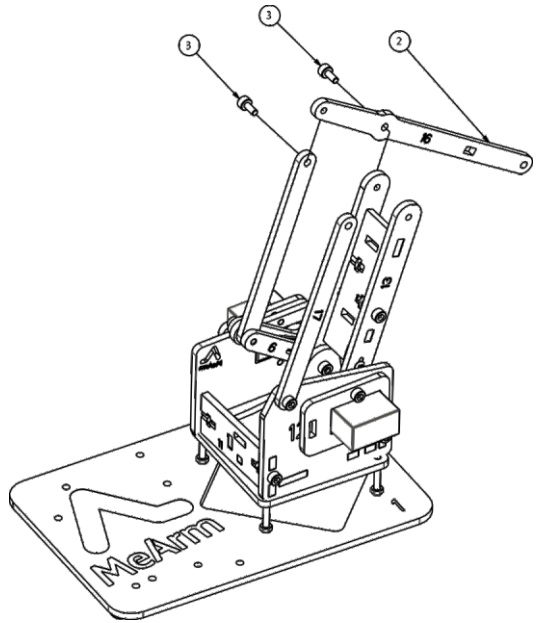


Secure with (2) 12mm Screws and (2) Nuts

ITEM	PART NAME	QTY	PART NUMBER
1	Servo Screw	1	
2	Left Wrist Joint	1	16
3	M3 x 6mm Screw	2	

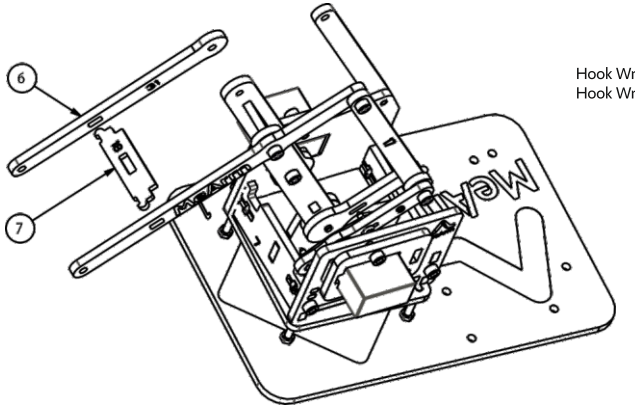


Attach Arm Assembly to Base using small machine screw from Servo Pack.

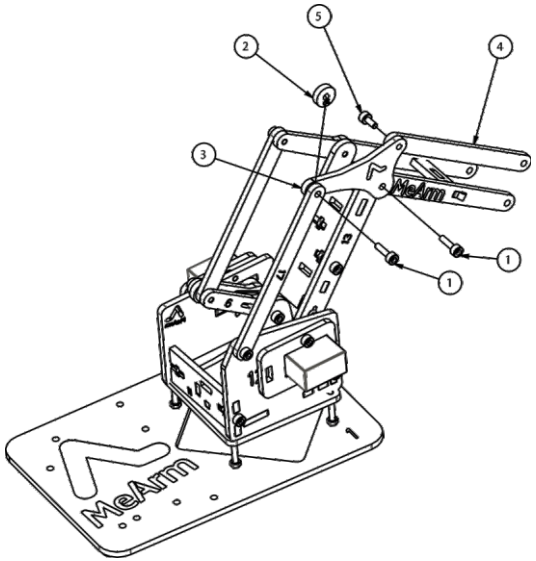


Attach using (2) 6mm Screws

ITEM	PART NAME	QTY	PART NUMBER
1	M3 x 10mm Screw	2	
2	Spacer	1	20
3	Parallel Linkage Connector	1	
4	Parallel Linkage	1	17
5	M3 x 6mm Screw	1	
6	Right Wrist Joint	1	31
7	Wrist Joint Connector	1	18



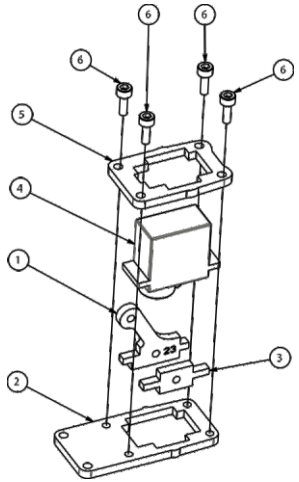
Hook Wrist Joint Connector into Right Wrist Joint
Hook Wrist Joint Connector Assembly into Left Wrist Joint



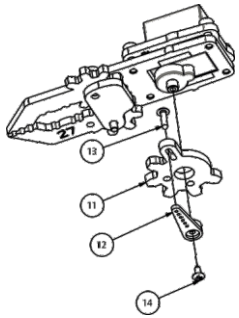
Secure Right Wrist Joint with Parallel Linkage Connector and a 10mm Screw

Attach Parallel Linkage (from Right Servo Plate) to the Parallel Linkage Connector using 10mm Screw and a Spacer.

Attach final Parallel Linkage to the Parallel Linkage connector using a 6mm screw.

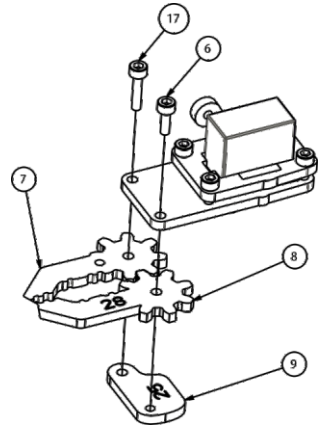


Insert Servo into Clamp Top Servo Mount
Slide Right and Left Wrist Attachments into the Clam Top Servo Mount as shown
Slide the Clamp Bottom Servo Mount over the Servo
Insert (4x) 8mm Screws into the Clamp Top Servo Mount and attach to the Clamp Bottom Servo Mount

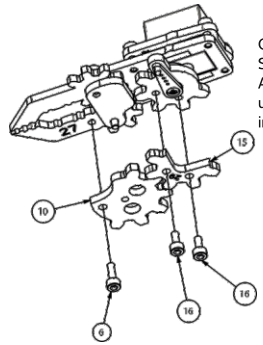


Attach Servo Single Arm to Top Servo Gear and attach to calibrated servo (using the Brains Board Guide as reference).

ITEM	PART NAME	QTY	PART NUMBER
1	Right Wrist Attachment	1	23
2	Clamp Bottom Servo Mount	1	24
3	Left Wrist Attachment	1	22
4	9 Gram Servo	1	
5	Clamp Top Servo Mount	1	21
6	M3 x 8mm Screw	6	
7	Left Gripper	1	27
8	Right Gripper	1	28
9	Gripper Plate	1	25
10	Gripper Gear	1	26
11	Top Servo Gear	1	30
12	Servo Single Arm	1	
13	Servo Mount Screw	1	
14	Servo Screw	1 5	
1	Bottom Servo Gear	1	29
16	M3 x 6mm Screw	2	
17	M3 x 12mm Screw	1	

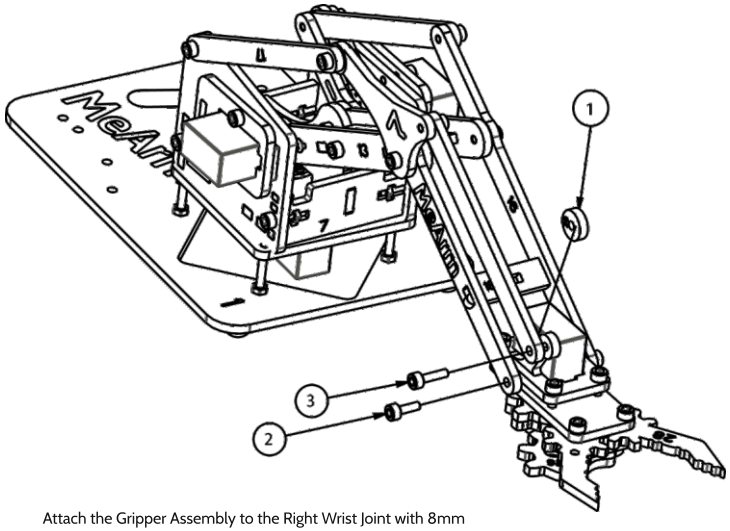


Attach Right Gripper with 8mm Screw into Gripper Plate
Insert 12mm Screw to keep assembly in place (does not tighten yet)

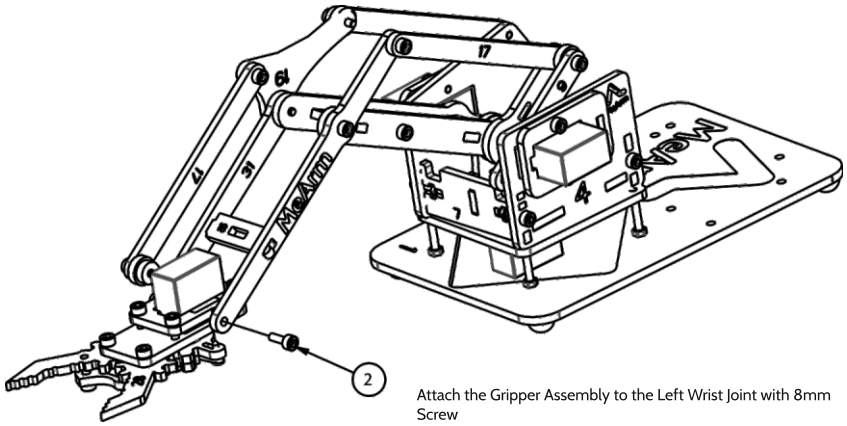


Connect Bottom Servo Gear using 6mm Screws.
Attach Gripper Gear with 8mm Screw from underside and 12mm Screw (previously inserted from above

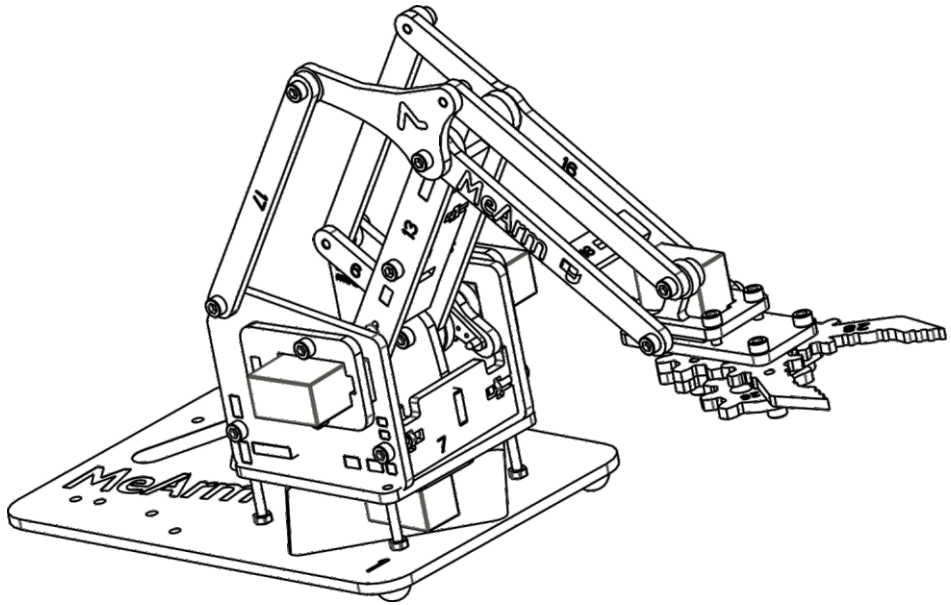
PARTS LIST			
ITEM	PART NAME	QTY	PART NUMBER
1	Spacer	1	20
2	M3 x 8mm Screw	2	
3	M3 x 10mm Screw	1	



Attach the Gripper Assembly to the Right Wrist Joint with 8mm Screw
Connect the Parallel Linkage with a 10mm Screw and Spacer



Attach the Gripper Assembly to the Left Wrist Joint with 8mm Screw



Congratulations!

Now you've completed your MeArm! See the Brains Board Guide for the next steps!