

Animateclay.com ArmaBenders Owners Manual (Version 2)

ArmaBenders Manual



Version 2

Thank you for buying an ArmaBenders Armature Kit from Animateclay.com.

We believe they are the best, most modular stop motion armature kits on the internet, and are of the finest quality. If you should have any questions about your kit, don't hesitate to contact us. We're here to help.

Note from Marc Spess: This kit uses mostly metric parts since it is made in Japan. The manual also contains some grammatical errors as it was written by Tetsu to describe his work. I made as many changes as I could to make things clear. If you have any questions or don't understand any part of this manual please contact us at Marc@animateclay.com

The delicate movement and joint strength of ArmaBenders will satisfy your professional as well as hobby needs. This product is a kit of a ball-joint steel armature designed for stop-motion films and requires assembly. A lot of light metals were used to achieve a dramatically light weight armature.

[1] Specification & Features

Product: general purpose ball-joint steel armature kit Main Material: brass and aluminum Ball-Joints: 12 Height: 5-12 inches recommended (less or above possible) Weight: depends on the parts composition.

The puppet armature of the size and proportion that the user likes can be made only by the combination of basic units.

It is possible to make not only a human body but also a creature like a dinosaur, monster etc. If additional kits or optional arm additions are combined, a more complex armature can be made.

Each unit and optional kit parts can be attached and detached easily with basic tools such as a small screw driver, needle nosed pliers or the included hex wrenches. Switching, changing and removing parts is extremely easy to do.

[2] Contents of Kit

Ball joint unit: 6 pairs (12 units) These are composed of the following parts.
Block (normal/ multi purpose/ arm) *Arm block is kit B only. Socket plate
Shaft with balls (big ball/ small ball) Screw fixer and screw

Extender Independent multi purpose block Screws (contain spares) Hex-head wrench Tie-down for stage fixation Brass pipe and aluminum wire kit B only
Parts case Manual

[3] How to Use

3-1 Preparation for Construction of Armature

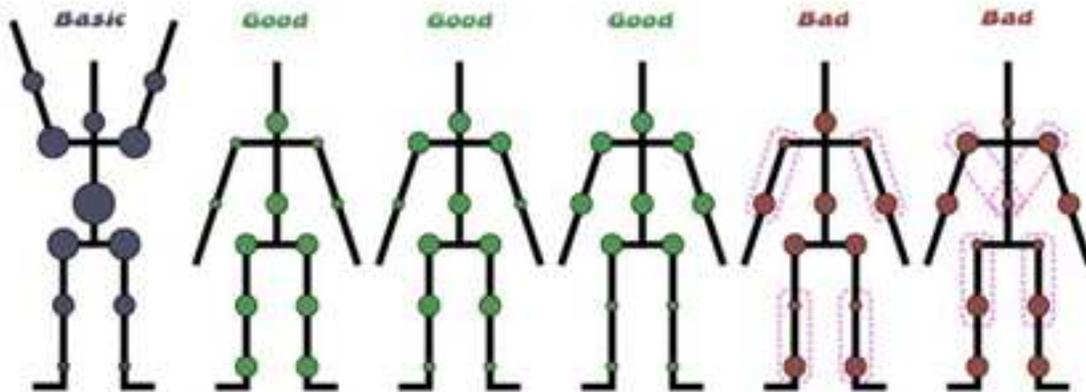
The proportion design etc. are prepared before the armature is actually constructed.

Draw a picture of your puppet in full-scale "1:1" on a piece of paper to get the correct proportions.

Draw the position of the joints on it.

Decide the size of the ball joints used for each joint.

Chips: The largest dimension "width" of the armature kit is at the hips where the largest ball joints are used. This is less of a problem if you construct a large puppet.



Decide where to arrange the ball joint units of the kit on your character sketch. Confirm the parts composition of each ball joint unit all at the same time. Exchange complete parts between ball joint units according to "4-2 Construction of Ball Joint Unit" when you want to change the combination of the ball and the socket plates.



Block Change



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Block Change

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Decide the needed length of the shafts. The recommended maximum length of the shaft is just half length of the pair unit. Consider the use of the extenders if you want to add extra length. The usage of the extender is described in "3-3 Extension By The Extender".

Chips: The reason to limit the length of the shafts is to avoid vibrations of the upper body when a long shaft is used on the leg areas. The extenders keep your kit rigid and limits the springyness. Arms and necks don't usually have this problem, but extenders can be used to make these areas much longer

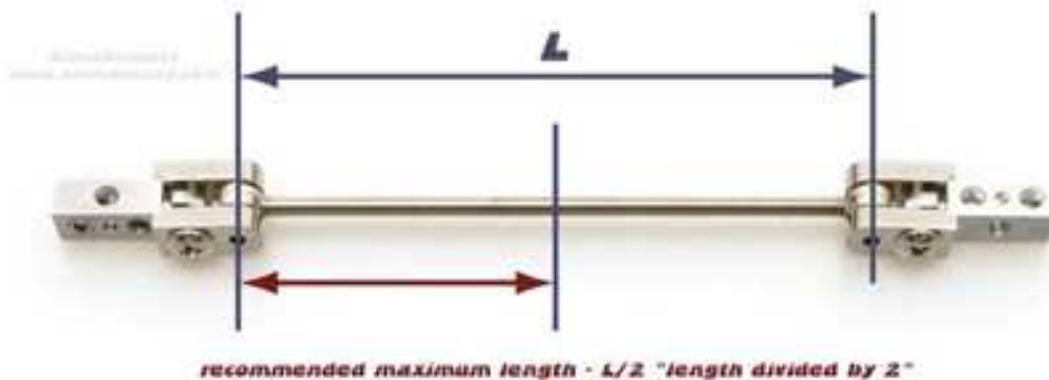
depending on your needs.

3-2 Cutting and Construction of Ball Joint Units

Let's start actual construction! You will need to cut the shaft area of the ball & shaft. After cutting it you screw the shaft into the block area of the other ball joint unit or the independent multi purpose block.

The shaft is made of brass with nickel plating. You can easily remove the plating with metal tools, even after placing tape over them.

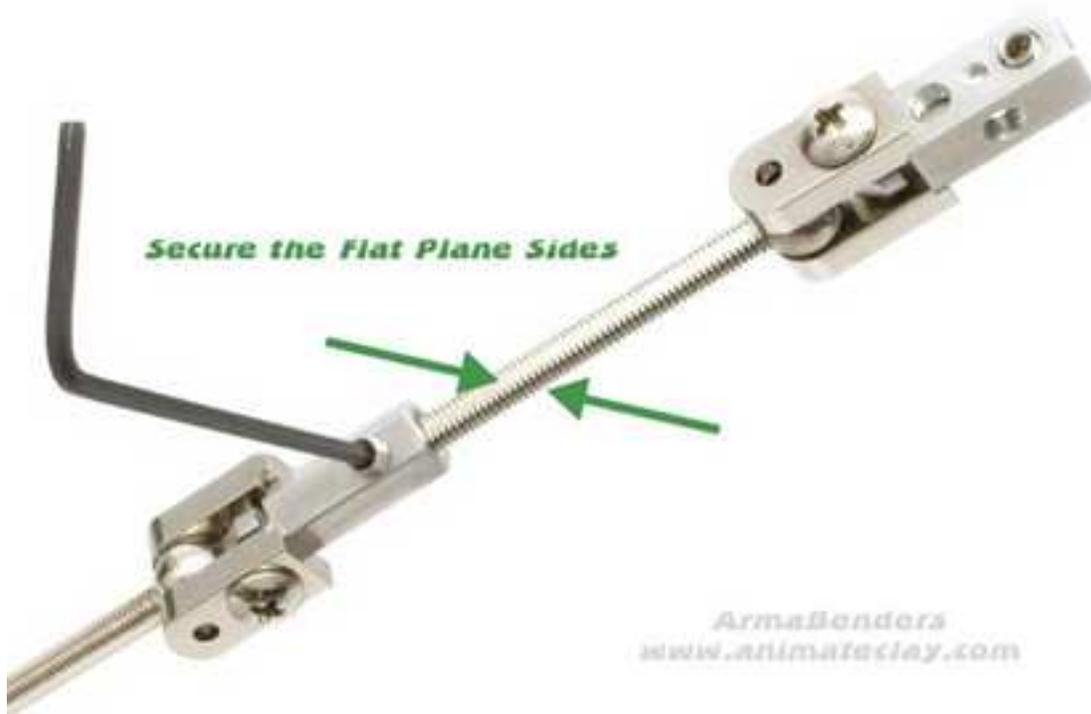
Cut the shaft of ball & shaft with a hack saw or dremel cut-off wheel. Take care not to damage the ball. Clamp only the shaft area into your vice - not the balls. When the ball is damaged or transformed, the movement of the joint may become irregular during animation. Do not throw away the shafts after chopping them off. You can later apply them to the arms or the head later



Remove any sharp corners that there may be with a grinding wheel on your Dremel tool, or with the included emery paper.



Screw the shaft in the block and tighten it down with the included hex-head screws. Make sure the point of the hex-head screws touch the smooth/flat side of the shaft. Otherwise, the thread of the shaft can become damaged.



3-3 Extension by using Extenders

To extend the shaft, the extender is placed between the ball joint unit and the shaft. Six extenders are included in the kit.

The connection method of the shaft and the extender is the same as the shaft and the block. Screw the shaft in the extender, and fix the shaft with the hex-head screws. The points of a hex-head screws touch the smooth/flat side of the shaft. Otherwise, the threads on the shaft can get damaged.



Screw the thread part of the extender until it stops in the block part of the ball joint unit. And, loosen the extender until the flat plane area that adjoins the thread part of the extender is located right under the hex-head screw holes. Tighten and fix hex-head screws.



You can screw together two extenders in a series to make extra long appendages. But we do not recommend this because the the odds of a part failing grows with the more parts you add. Buy the long extenders for long armed or long legged characters.

3-4 Use of Independent Multi Purpose Block

Use the independent multi purpose block for the part where two or more shafts such as chests and waists are connected. Strength is insufficient when all you use are the included hex-head screws, especially if you apply a lot of force on the armature during animation. In this case, it is necessary to reinforce them with the flange nuts that come with the kit.



3-5 Use of Arm Blocks

The Arm blocks of 1 pair (2 units) are attached to kit B. You can fix 3mm in diameter pipe to the arm blocks. Bond the aluminum wire to the one side of the pipe with the epoxy adhesive. Exchange the aluminum wire with the pipe when it is damaged. If you add the arm block of the option to kit A, the same function as kit B or any more can be provided for it. If a remaining shaft is used to relay the normal block and the arm block, the length of the pipe for the exchange is always minimum. The minimum length doesn't depend on the total length of the arm.

Kit A

use a remaining shaft, M3 bolt or rod with a diameter of 2.5mm or less can be used. User makes the hand



Kit B

a long tube is used for long arms



Kit A+C

extend arm with remaining shaft, tubes are shortest with this setup



swap the arm blocks to create the same configuration as kit B

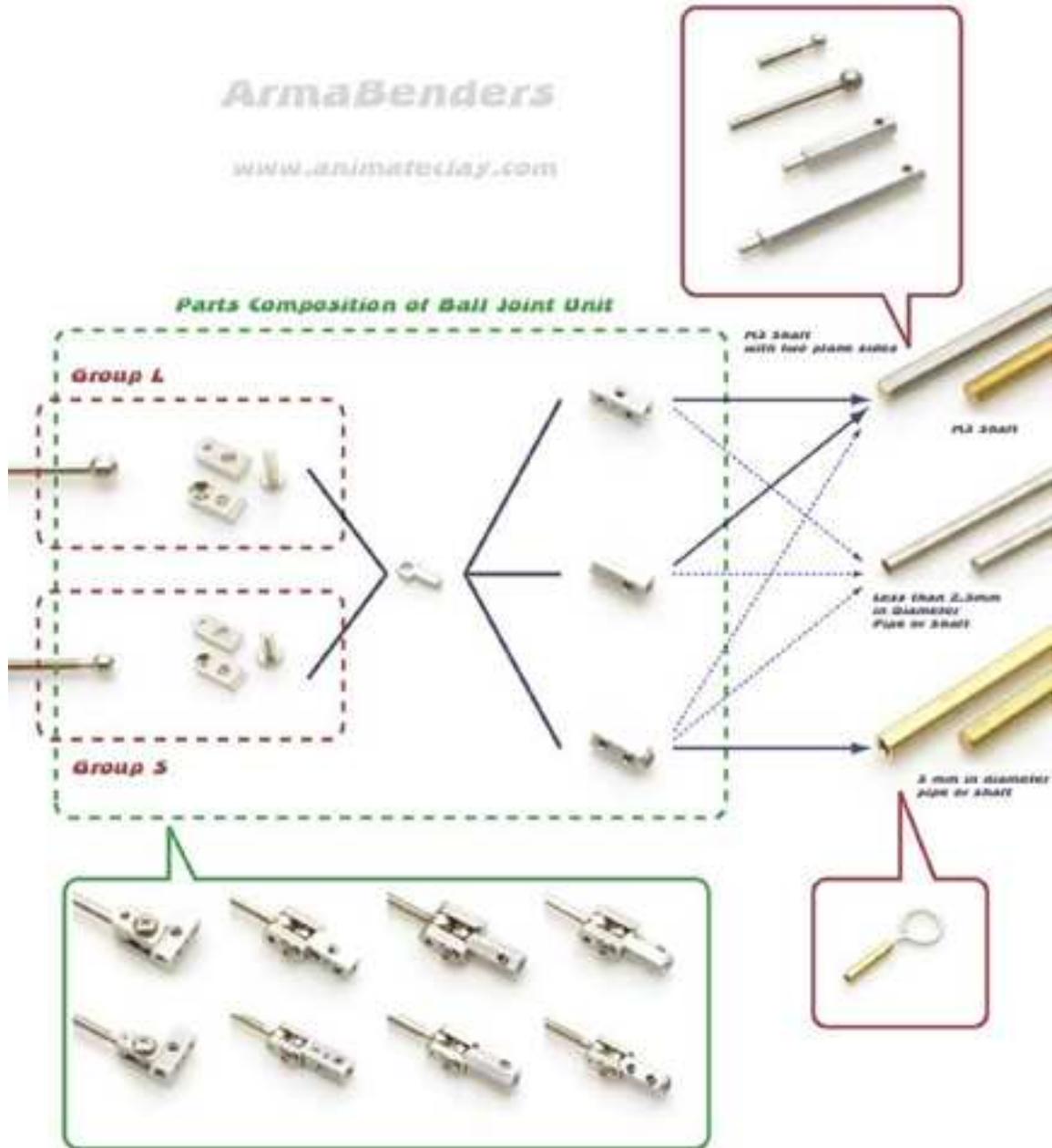


[4] Details of Ball Joint Unit

6 parts compose one ball joint unit. You can control strength, the size, and the function of the entire unit by changing the kind and the composition of those parts. We show the most basic setup method of the ball joint here. You can use this manual when you re-assemble the parts or exchange parts of the ball joint units mutually.

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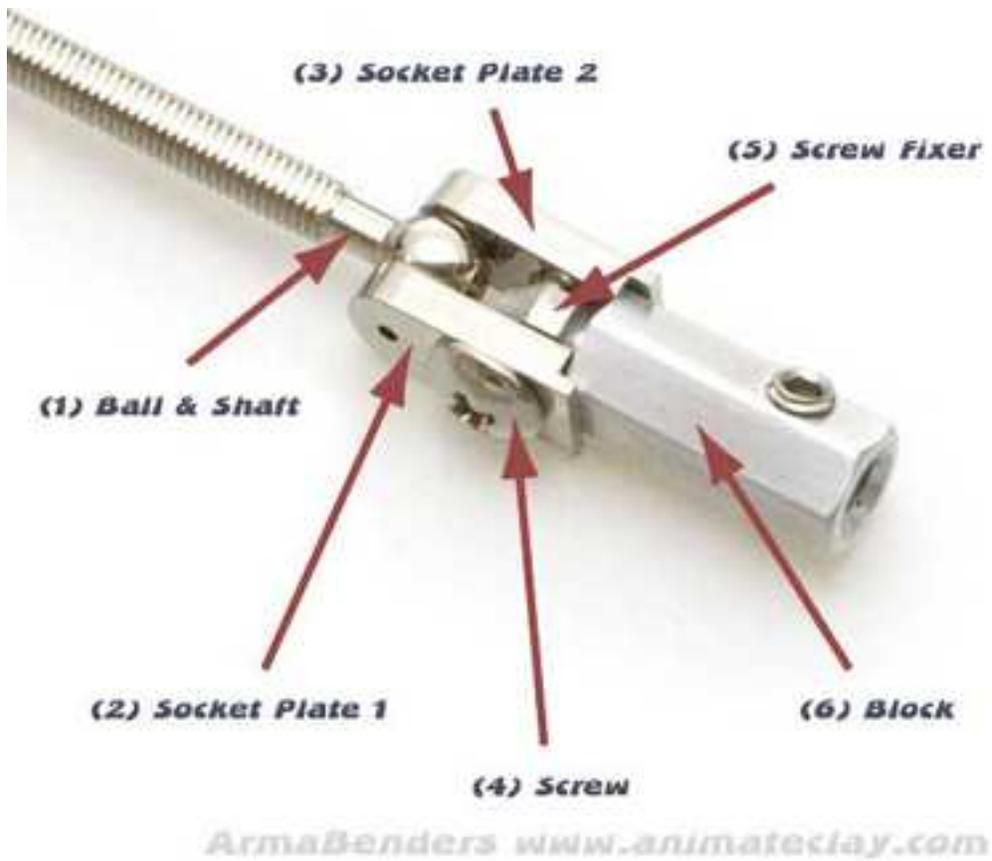


Special note: The ball joint units are already assembled beforehand when you buy a kit. This explanation is only if you decide to take all the essembled parts apart and if you forget where each piece goes.

4-1 Parts Composition of Ball Joint Unit

1 ball joint unit is composed of the following 6 parts.

(1) Ball & shaft (2) Socket plate 1 (have a hole) (3) Socket plate 2 (have a hole with screw thread) (4) Screw (5) Screw fixer (6) Block



Note: As for (1) in the kit, two parts are combined.

(1)(2)(3)(4) are grouped into two groups of Large and Small.

Group L: Big size group Group S: Small size group

Group L



Group S

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(5) and (6) can be used for any group L and group S.



(5) Screw Fixer

In addition, (6) divides into three kinds by the usage.

(6-1) Multi purpose block (6-2) Normal block (6-3) Arm block



(6-1) Multi Purpose Block



(6-2) Normal Block



(6-3) Arm Block

You can use (6-1) such as the foot ahead because the socket plate can be installed to it by changing the angle. It can be used also to connected parts of the chest and the waist and not only the ball joint unit.

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(6-2) is part only for the ball joint unit.



(6-3) can fix 3mm in diameter shaft without screw thread. Chiefly, the metal pipe for the arm etc. are attached.



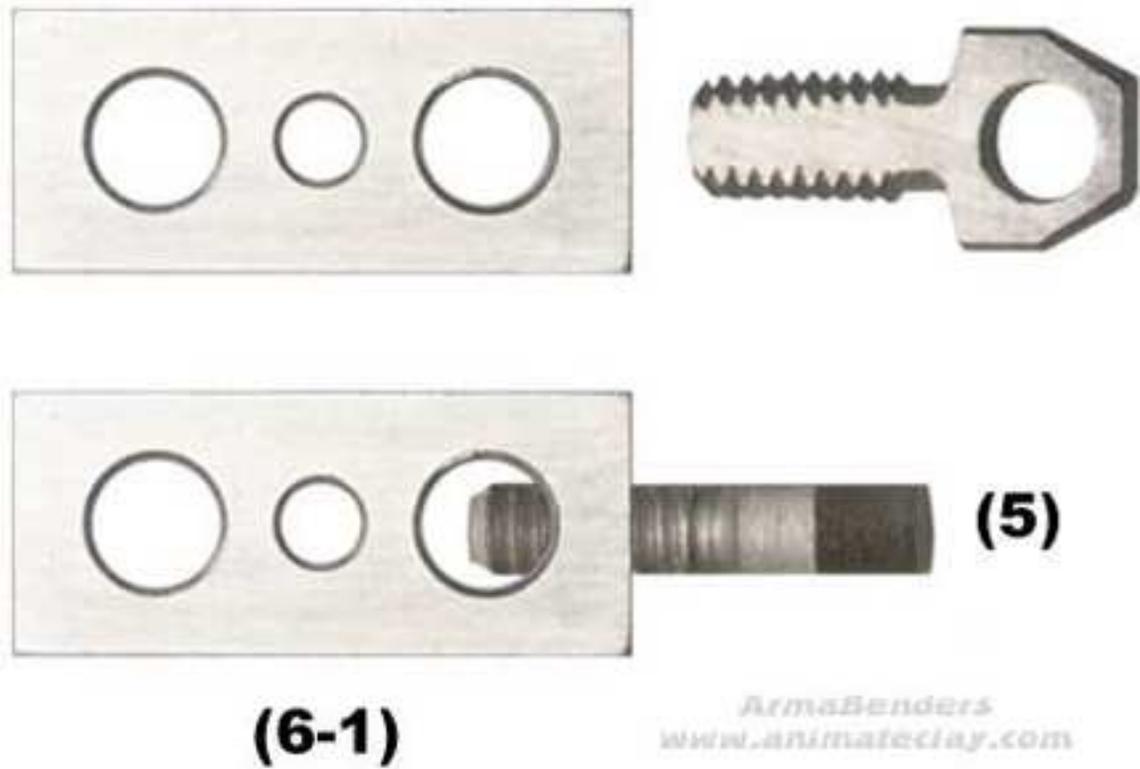
4-2 Construction of Ball Joint Unit

We show standard way to assemble the ball joint unit. Here, let's combine group L, (5), (6-1).

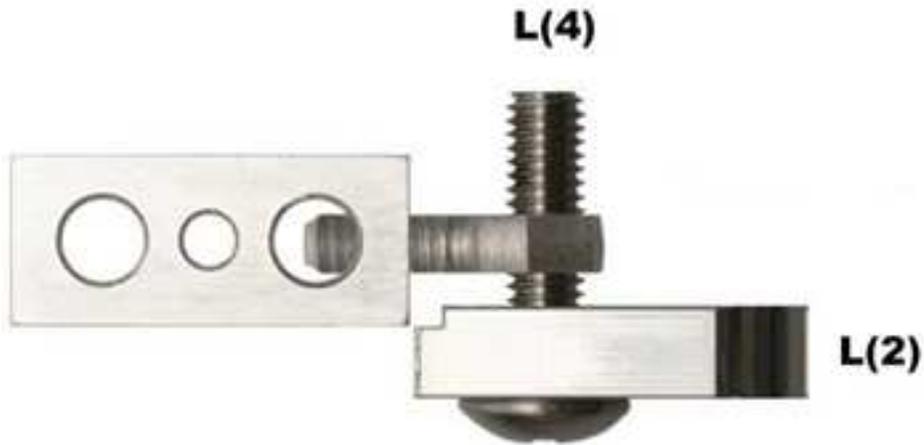
Necessary parts



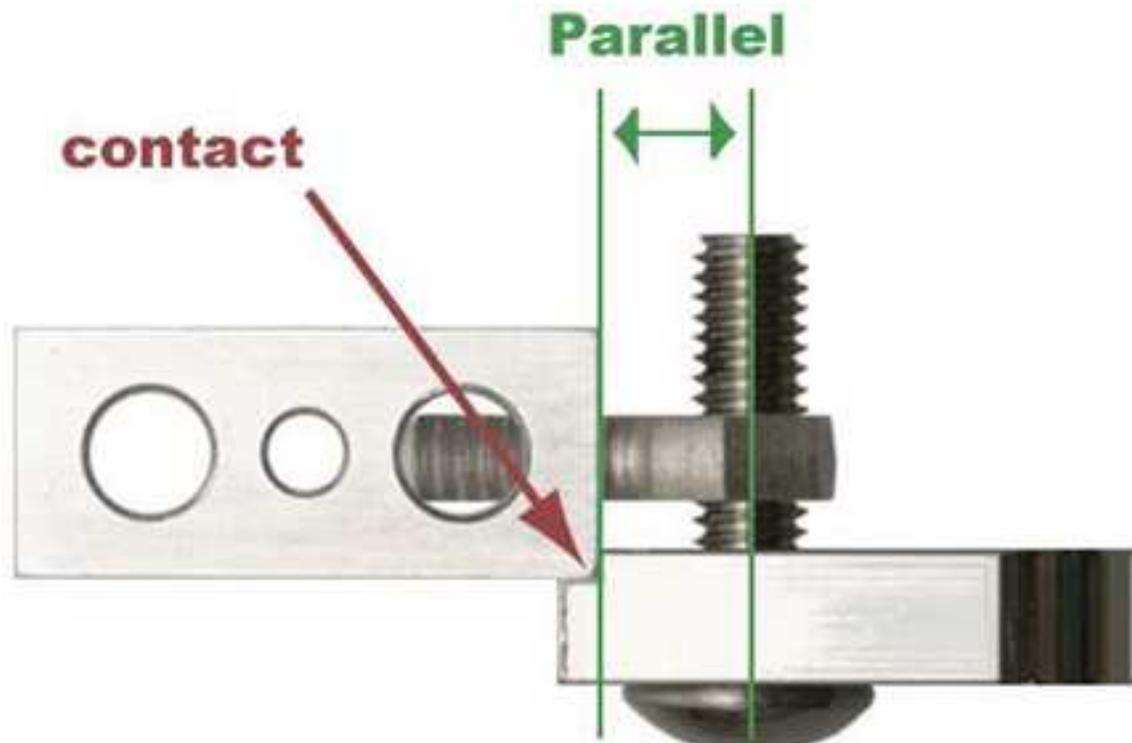
Screw (5) in (6-1).



Insert S(4) in the hole of S(2) and in the hole of (5).



Screw or loosen the screw part of (5) so that (6-1) may become parallel to S(4).



Placing S(1) by S(2)/ S(3), screw S(4) in S(3). (5) has entered (6-1) too much when S(3) doesn't neatly fit in (6-1). Detach S(2)/ S(3) and S(4) once, and loosen (5) a little. And, try again.



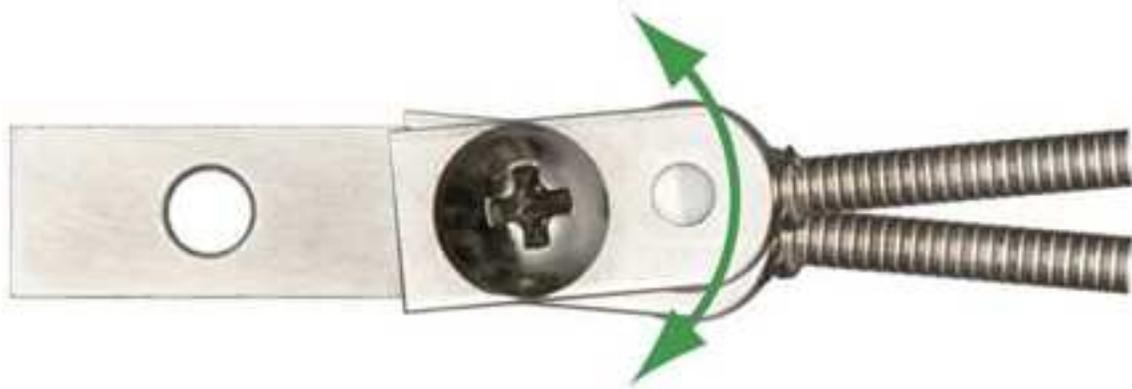
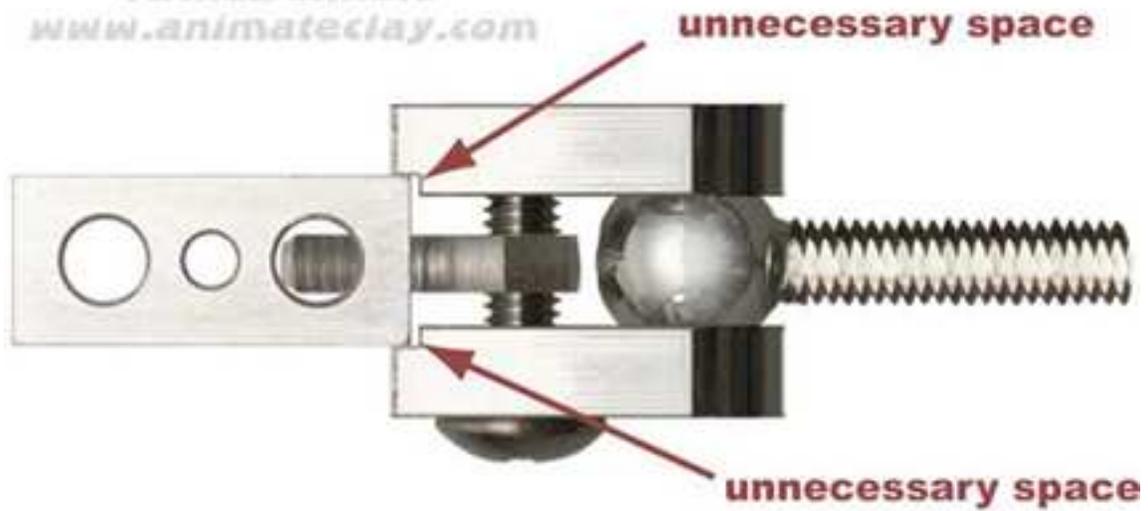
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Tighten S(4), and move S(1). (5) has entered (6-1) too much when the shaft of S(1) rotates around the axis. Unnecessary pressure hangs between S (2)/S(3) and (6-1). Detach S(2)/ S(3) and S(4) once, and loosen (5) a little. And, try again.



Entering of S(4) to (6-1) is insufficient if there is Loosening between S(2)/ S (3) and (6-1). There is unnecessary space between S(2)/S(3) and (6-1). Detach S(2)/ S(3) and S(4) once, and tighten (5) a little. And, try again. According to the above-mentioned procedure, decide the best position of (5).



Do fitting between the ball of S(1) and S(2)/S(3) . First of all, tighten S(4) and move S(1). Next, tighten S(4) by pressure that is a little stronger than the pressure finally used. And move S(1). Finally, loosen it to pressure that uses it, and move S(1).



In the combination with (6-1), the installation position of the socket plates can be variously changed.



Attention: Never stop the screw fixer with the screw from side. It might damage the screw fixer, and make the movement of the ball joint discontinuous.

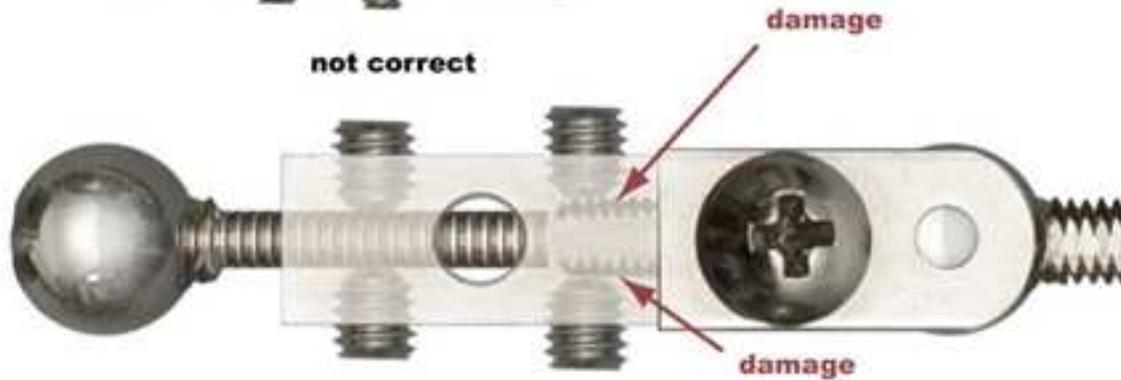
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correct



not correct



[5} Attention and Chips

* Adjust the tightening pressure of the ball by yourself. The best pressure changes by animator's idea.

* Tie-down is a screw to secure the puppet to the set floor. You must first drill a 3.2mm in diameter hole into the floor. You screw the male thread of the tie-down into the female screw hole on puppet's foot through the stage. The standard of the screw is M3.



* Make the palm by yourself. The lead or aluminum wire is good for the finger. The making kit a simple arm is attached to kit B.

* Do not tighten the screw too much. You might transform the socket plate, or damage the screw thread.

* Solder is used to connect the ball and the shaft. Do not add the high temperature like melting solder to this product. There is no problem when you use the normal baking temperature in which the foam latex rubber is heated (About 100°C;).

* Brass has a bad influence on the foam rubber. (catalyst poison) In the fabrication process of the puppet, when this product is touched with the rubber that has not cured yet, it is necessary to take the following measures.

Cover the surface of brass with a vinyl/rubber sheet "dental dam", or rubber seat that have already stiffened. Paint the surface of brass with enamel-base paint such as Tamaya or Testors.

The places where the surface of brass is exposed in this product are only two. One is a cutting plane of the shaft that is not inserted to the block. The other is brass pipe for the arm attached to kit B.

* The price specification might change because of enhancing or the improvements to the kits.

[6] Option Parts

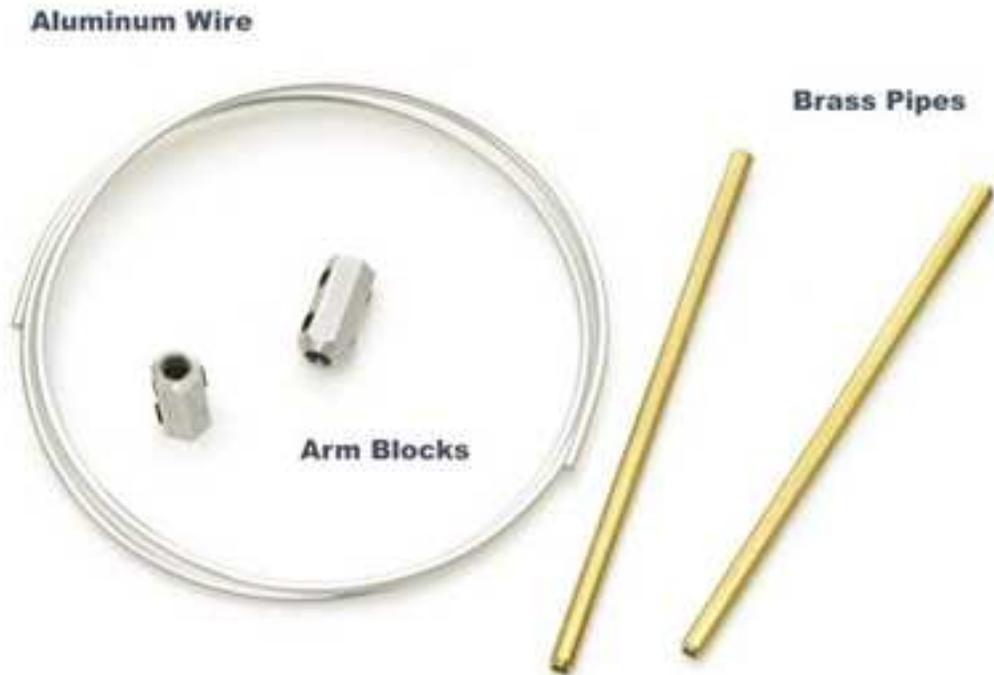
Extender: For extension of shaft. It is the same as the ones included in the kits.



Long extender: For extension of shaft. It is longer than the one of the kit attachment.



Arm block kit: It is a block in which a pipe of 3mm diameter can be fixed. The brass pipe of 3mm diameter and the aluminum wire of ten (** ? **) feet are included in this kit.



[7] Warranty Policy

If after you get the kit and are not happy, you can send it back to us in resellable condition for a full refund. We will not accept returns on kits that have been altered, cut or assembled.

Thanks again for purchasing an ArmaBenders Armature Kit. Is there any missing information in this kit, or anything you would like to know? Please contact us at Marc@animateclay.com