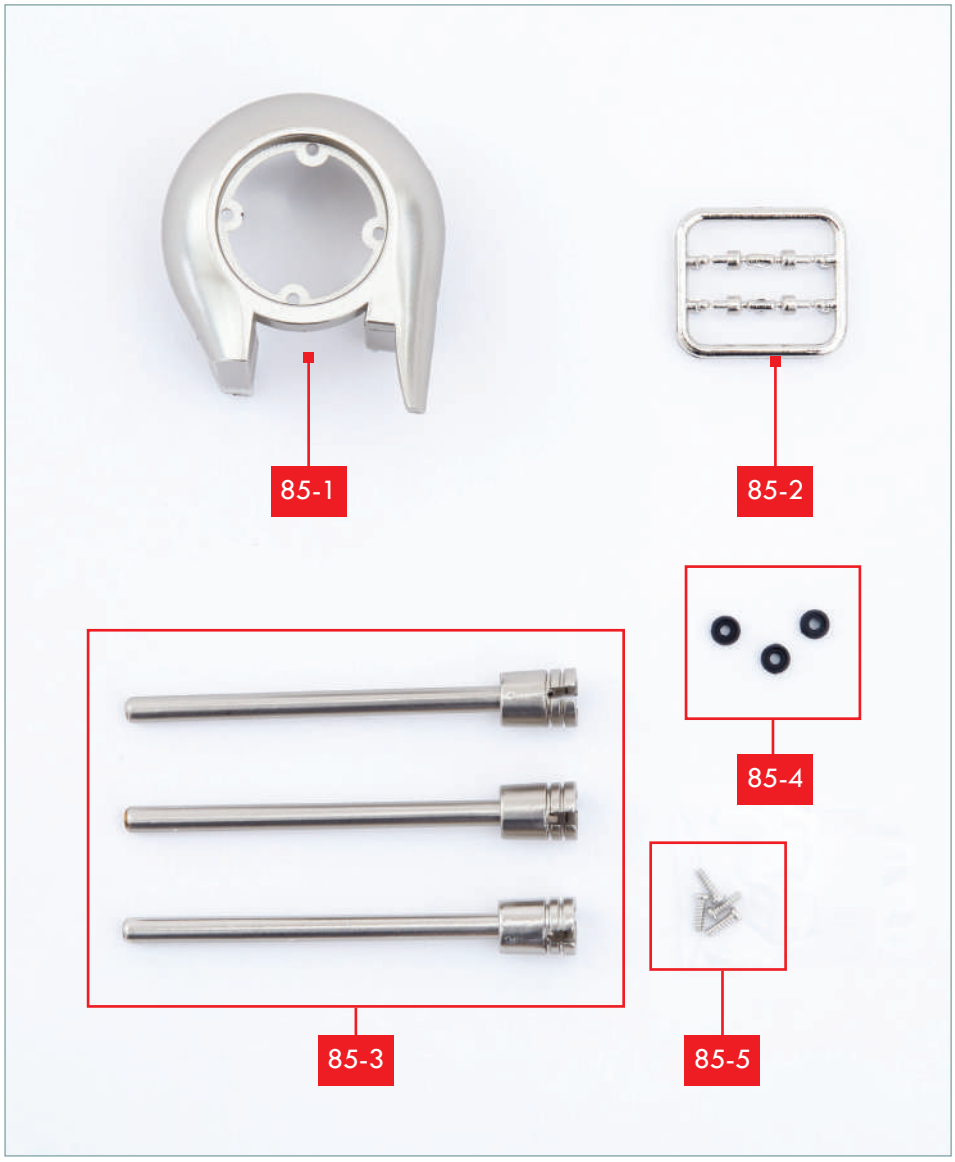
STAGE 85: EXTEND THE LOWER LEFT ARM, AND CONNECT IT TO THE HAND

Affix the left hand to the lower arm by constructing three arm shafts and four muscle springs.

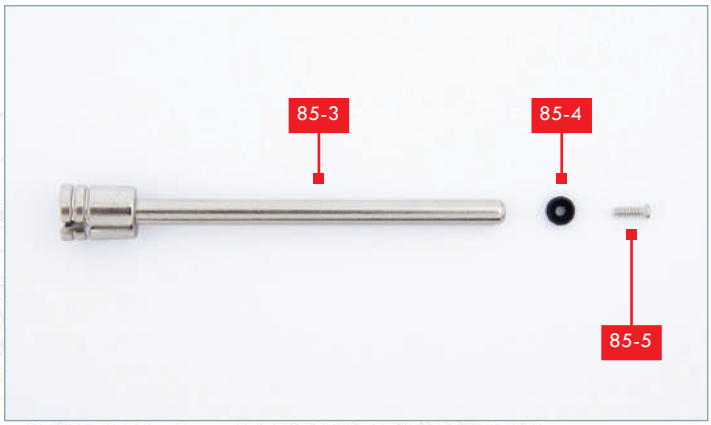


LIST OF PIECES

85-1	Left leg joint section
85-2	4x Left hand muscle connector
85-3	3x Lower arm shaft
85-4	3x Rubber washers
85-5	4x PB screws (2x6 mm) (1 spare)

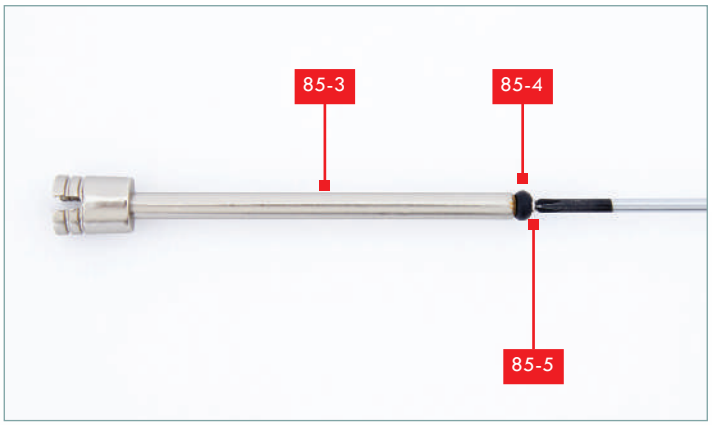
YOU WILL ALSO NEED

Hand assembly from stage 84, arm assembly from stage 82, fine crosshead screwdriver, gel-type superglue and a cocktail stick, tweezers (optional).



STEP 1

Take one of the lower arm shafts **85-3**. Fit a rubber washer **85-4** on to the end of it. Have a PB 2x6 mm screw (**85-5**) ready.

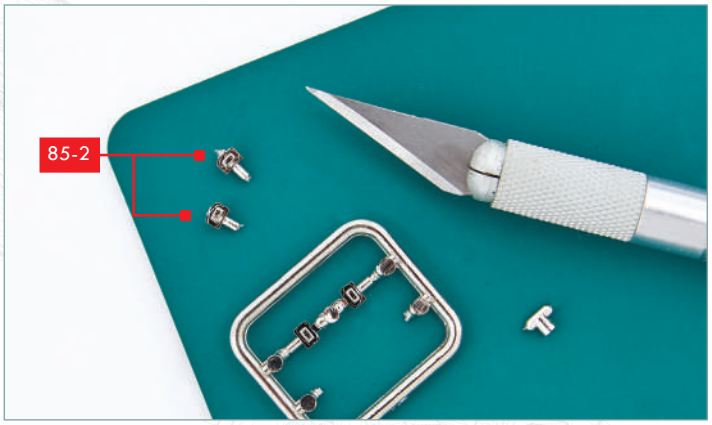


STEP 2

Fix the rubber washer **85-4** in place with a PB 2x6 mm screw. Do not over tighten it – the washer should just about be able to revolve.

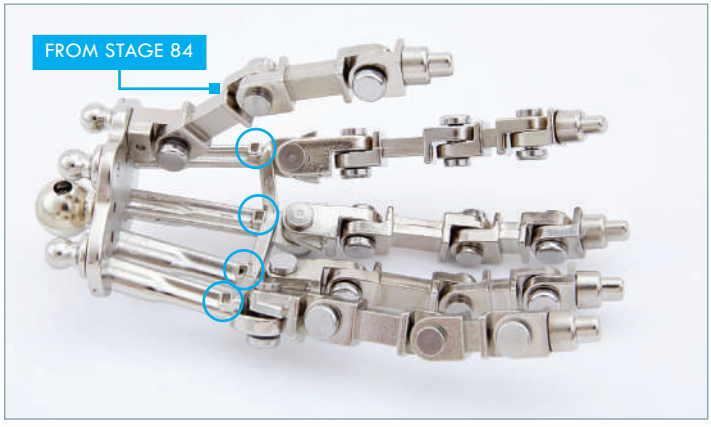
STEP 3

Repeat to fit the remaining two rubber washers **85-4** to the other two lower arm shafts **85-3**.



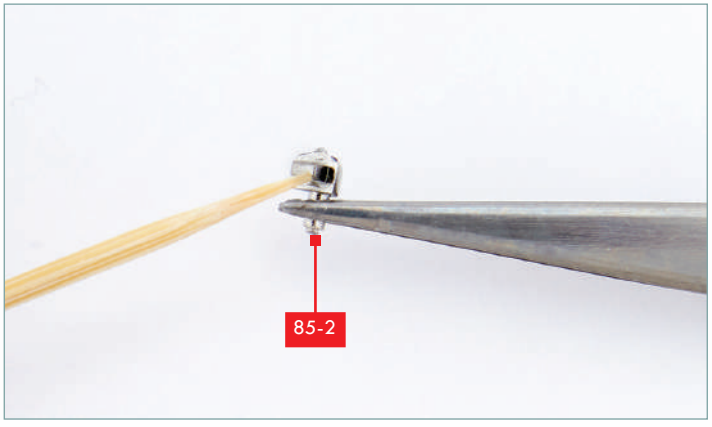
STEP 4

Cut the muscle (spring) connectors **85-2** from the frame.



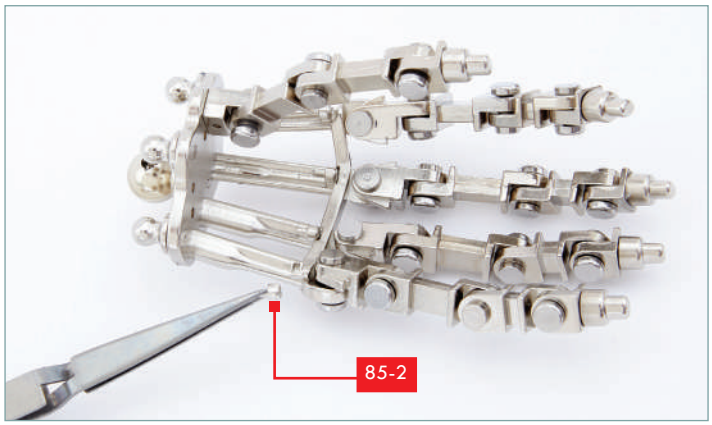
STEP 5

Take the hand assembly from stage 84. Identify four rectangular sockets (circled), one at the base of each finger.



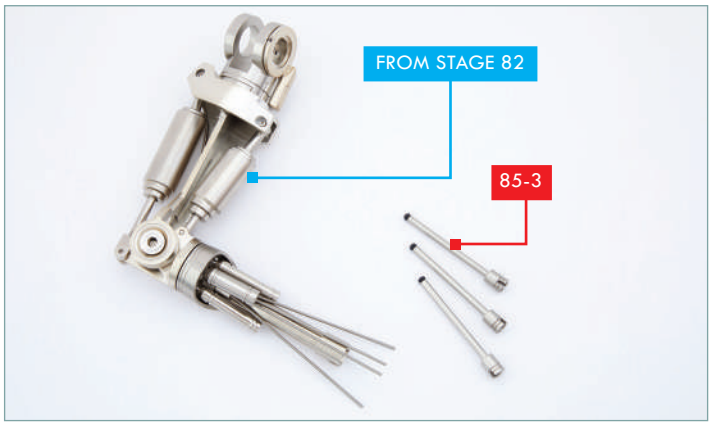
STEP 6

Holding the long, cylindrical 'tail' of the first connector **85-2**, apply a little superglue to the rectangular peg.



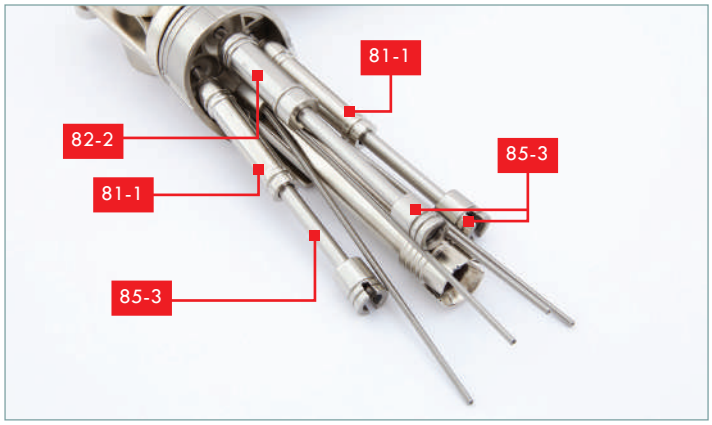
STEP 7

Fit the connector **85-2** into one of the rectangular sockets in the hand. Repeat to fit all four connectors in place.



STEP 8

Take the left arm assembly from stage 82 and the three lower arm shafts (with rubber washers) **85-3**.

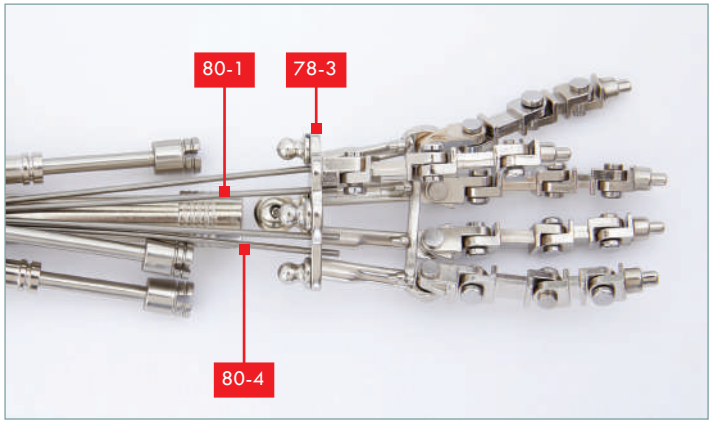


STEP 9

Fit the three shafts **85-3** into the three hollow shafts already fitted to the lower arm (two x **81-1** and one x **82-2**). Insert the ends with rubber washers first.

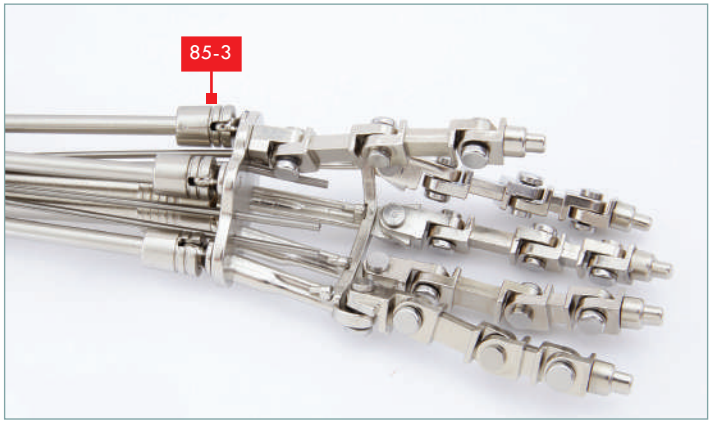
STEP 10

Take the hand assembly from step 7. Check that the larger ball joint is firmly fixed. Identify four holes in the base of the hand **78-3** (circled). The springs will pass through these holes.



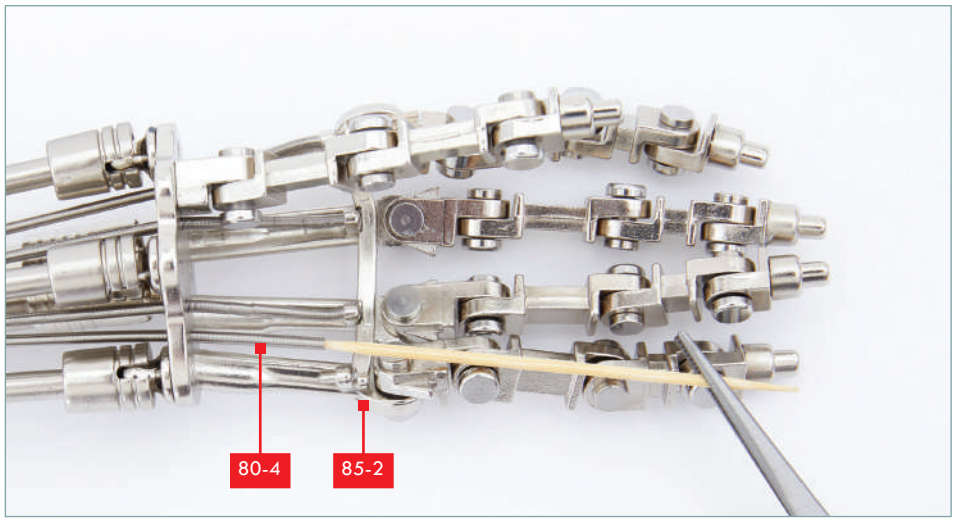
STEP 11

Thread the four muscle springs **80-4** through the corresponding holes in the base of the hand **78-3**. Apply a little lubricant to the large ball joint and check that the socket on part **80-1** is directly aligned with it.



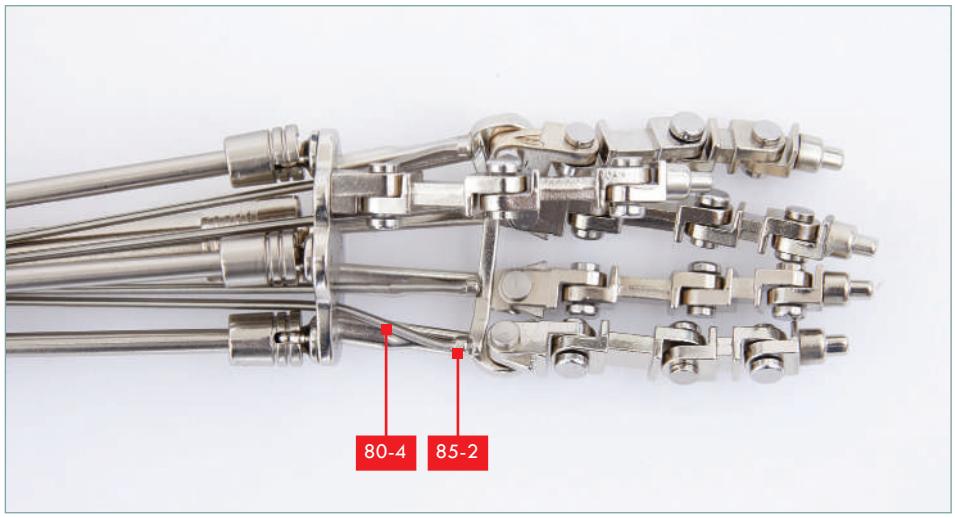
STEP 12

Fit the sockets on the lower arm assembly over the ball joints on the base of the hand. You will need to push the larger socket **80-1** firmly over the larger ball joint until it clicks in place. Take care to apply the pressure without twisting it at an angle. Fit the other three sockets **85-3** over the smaller ball joints.



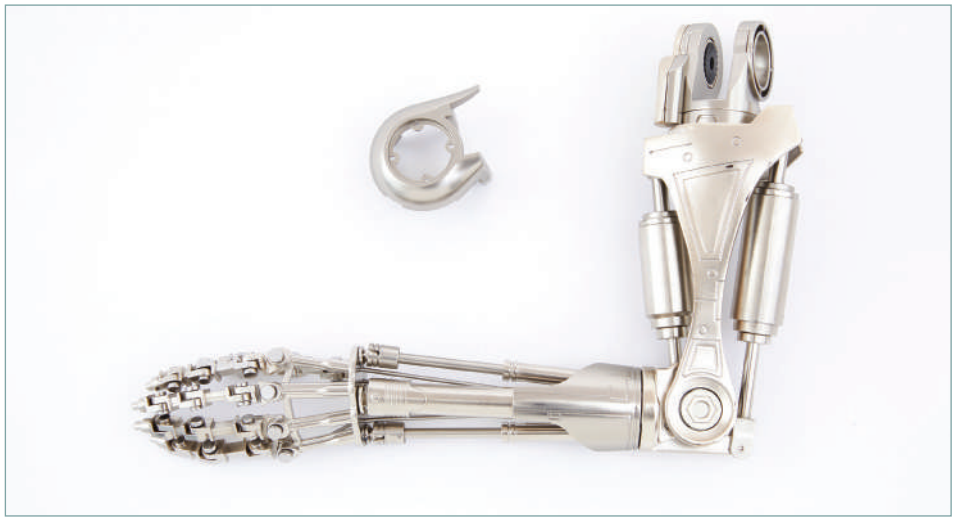
STEP 13

Ensure that the four springs **80-4** are still running through the holes in the base of the hand. Using a cocktail stick, apply a little superglue inside the end of the first spring and fit it onto the tail of the corresponding connector **85-2.** (You may find it easier to twist the springs clockwise as you fit them). Repeat the process for the remaining three springs as shown below.



STEP 14

The photograph shows the four springs **80-4** connected to parts **85-2.**

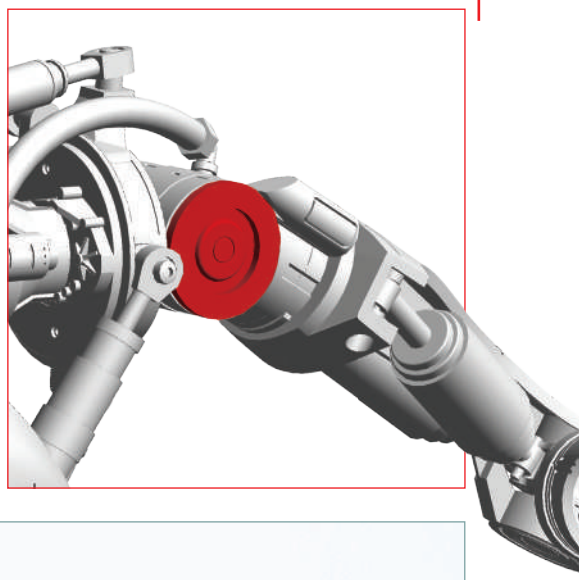


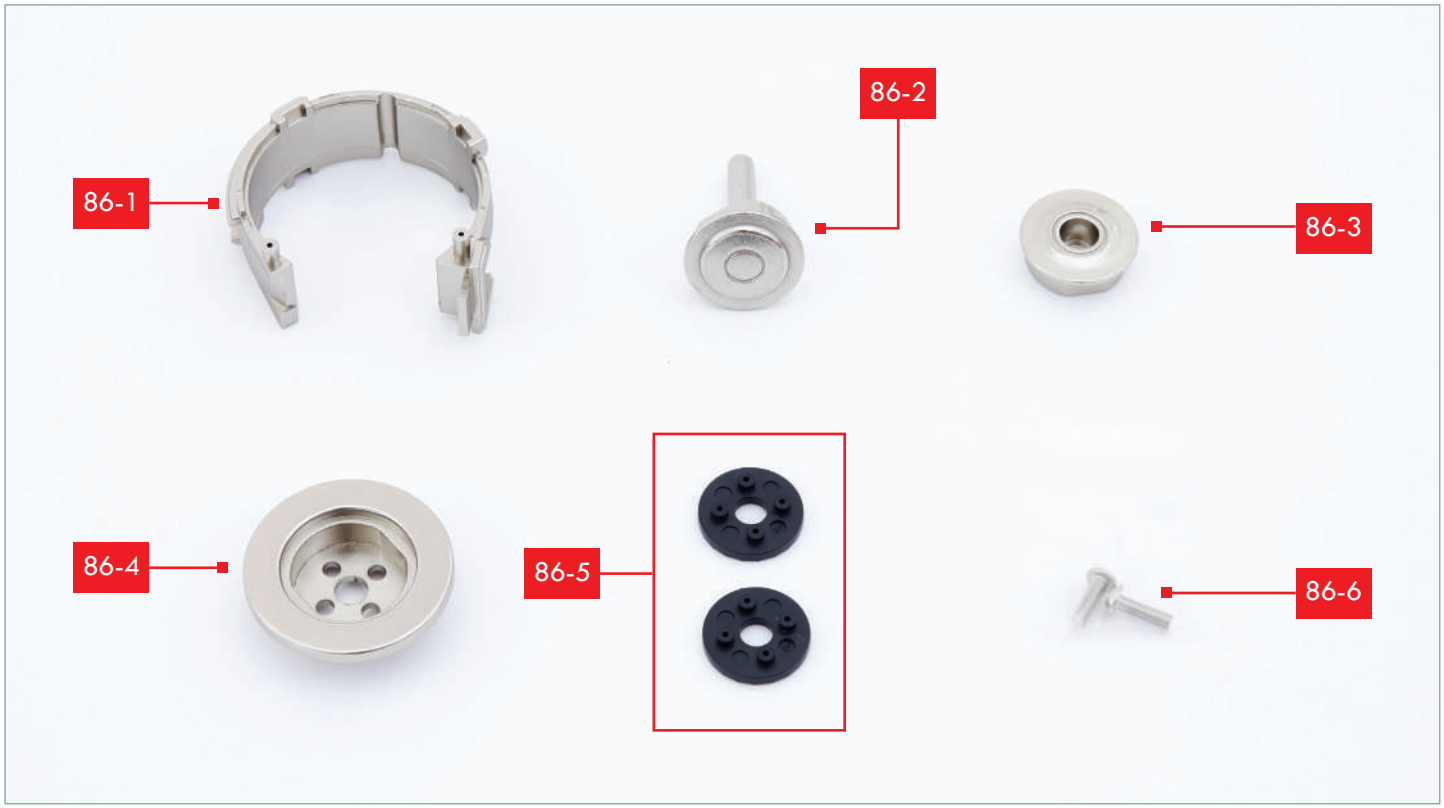
STAGE COMPLETE!

The left hand has been connected to the arm, with spring muscles in place. Part **85-1** will be used in a future stage.

STAGE 86: ASSEMBLE THE SHOULDER, AFFIX THE LEFT ARM TO THE BODY, AND COLLECT A HIP JOINT

Put the shoulder together, and add some symmetry to your T-800 Endoskeleton by connecting the left arm.



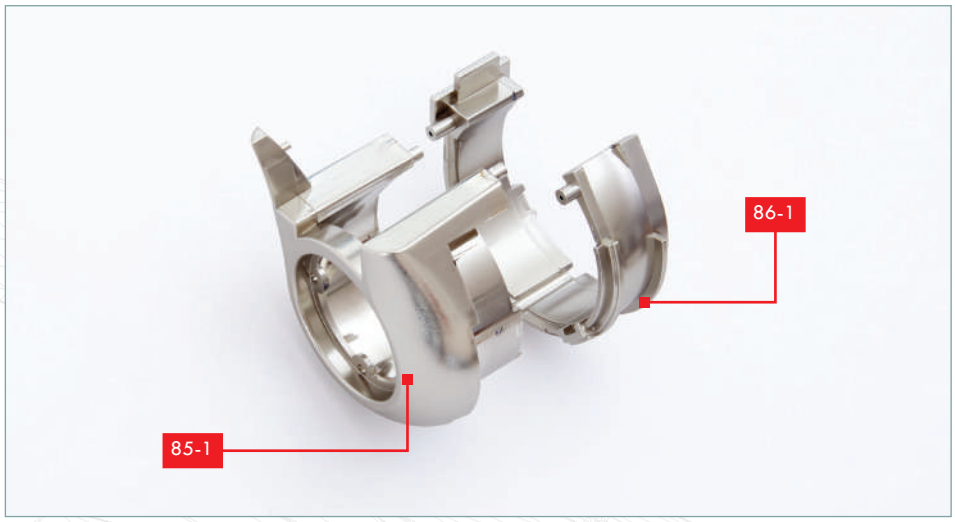


LIST OF PIECES

86-1	Left leg joint section
86-2	Left shoulder pin
86-3	Left shoulder joint cap
86-4	Left shoulder joint connector
86-5	Left shoulder joint washer (the second washer will be used in a later stage)
86-6	2x PM Allen screws (3x10 mm) (1 spare)

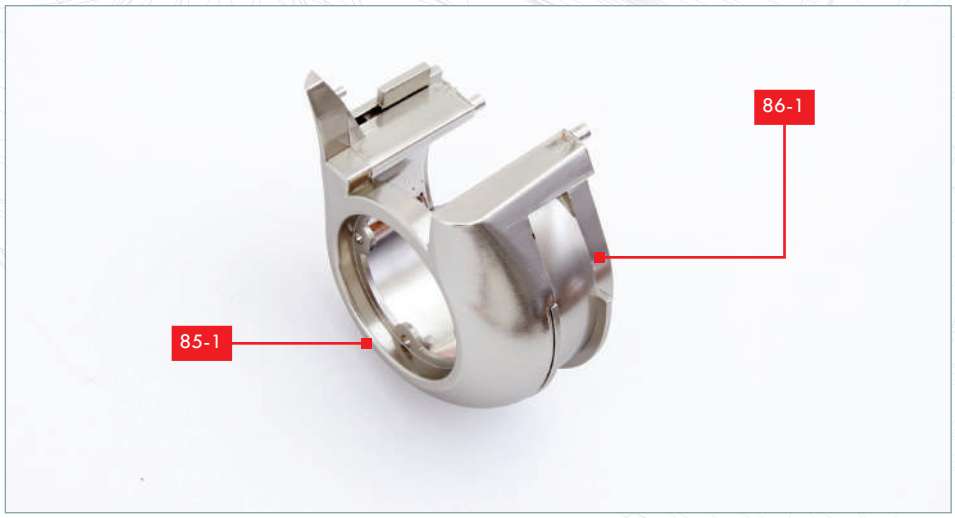
YOU WILL ALSO NEED

Arm assembly from stage 85, body assembly from stage 71, Allen key supplied with stage 26, gel-type superglue and a cocktail stick, tweezers (optional).



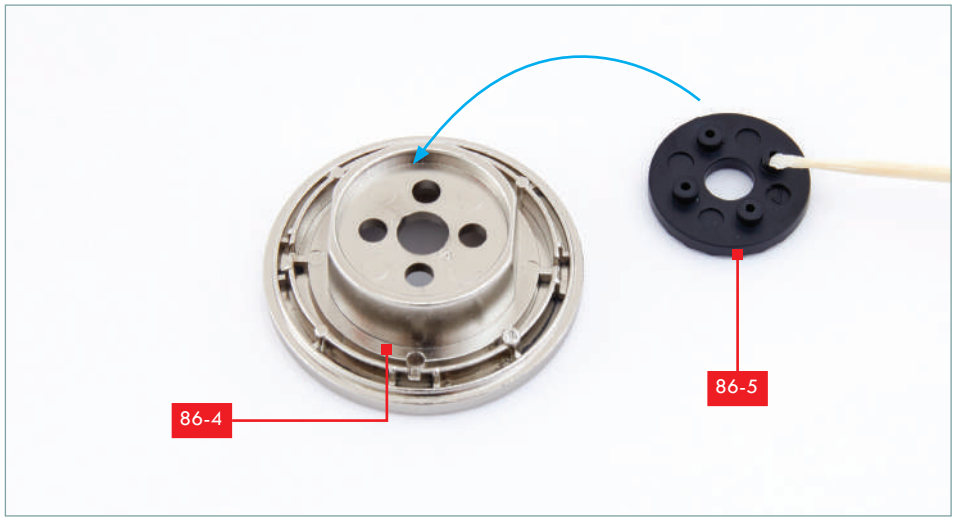
STEP 1

Take the two left shoulder joint sections **85-1** and **86-1** and arrange them as shown.



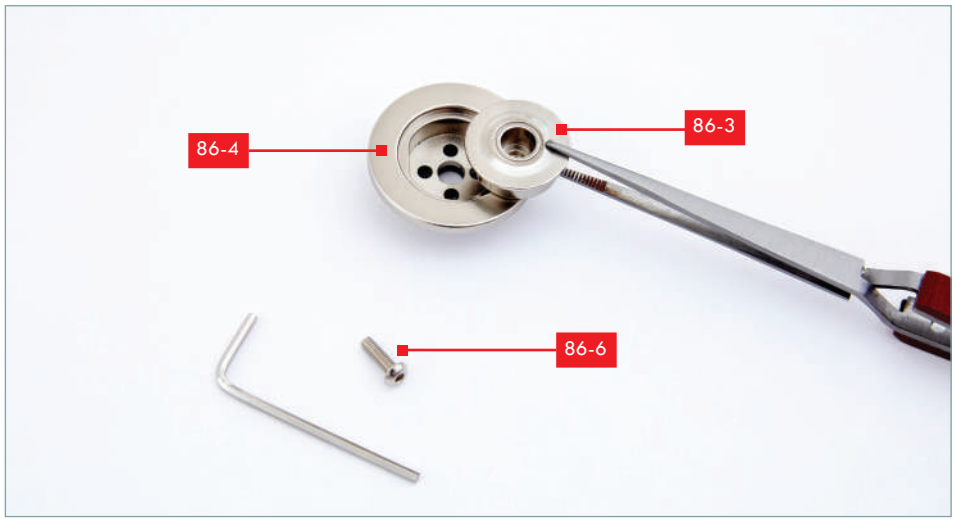
STEP 2

Push the parts together to create a shoulder joint as shown. No glue is needed.



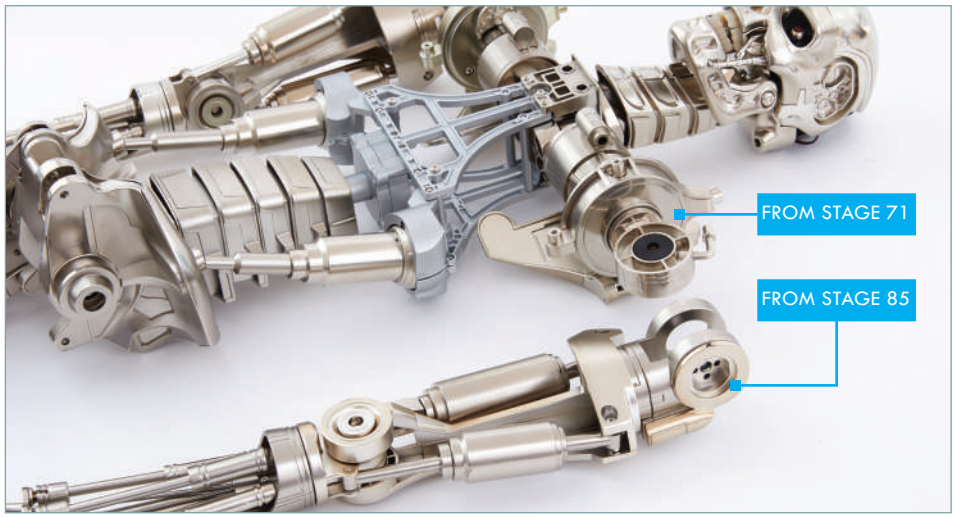
STEP 3

Apply a little superglue to the four pegs on the shoulder joint washer **86-5**. Fit the washer into the recess on part **86-4** as indicated.



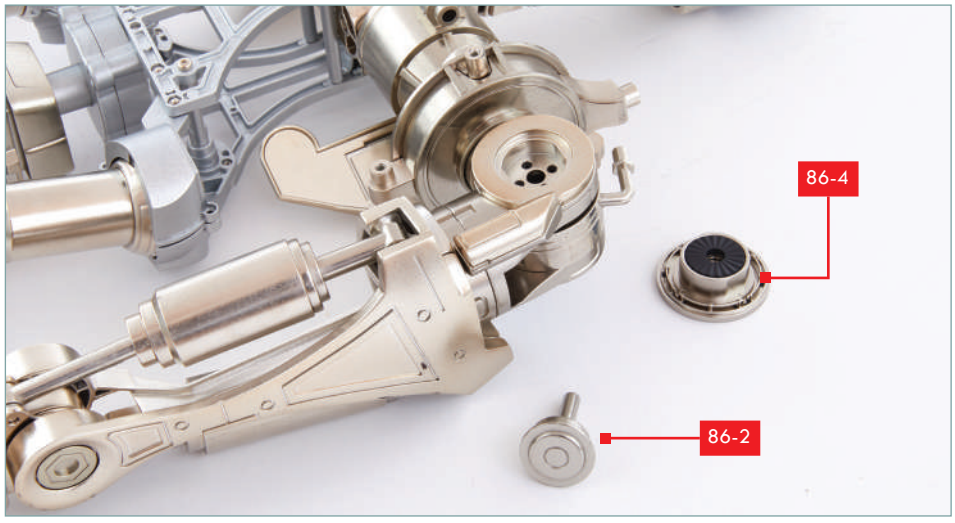
STEP 4

Turn part **86-4** over and fit the shoulder joint cap **86-3** into the recess, as shown. Have a PM 3x10 mm Allen screw (**86-6**) and Allen key ready.



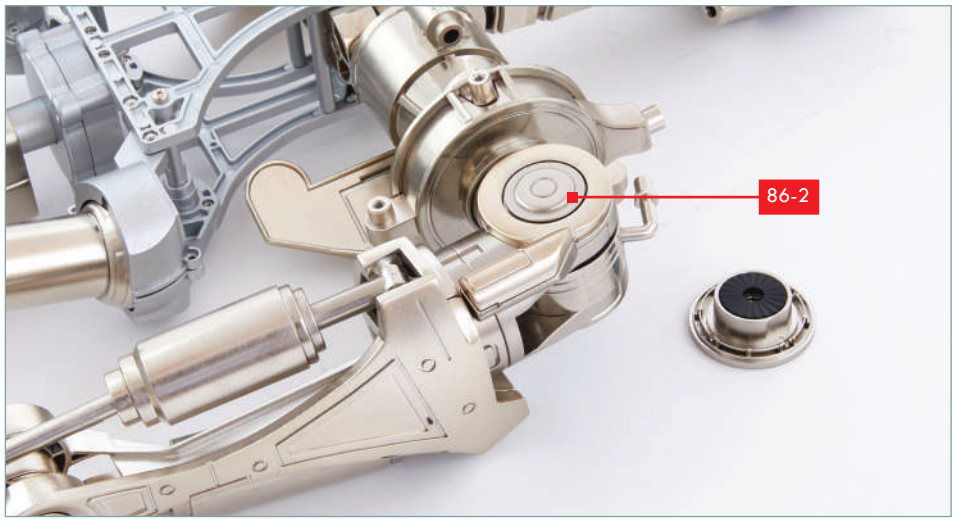
STEP 5

Take the main model assembly from stage 71 and the left arm from stage 85. Lay them on your worktop so that you can access the left shoulder joint.



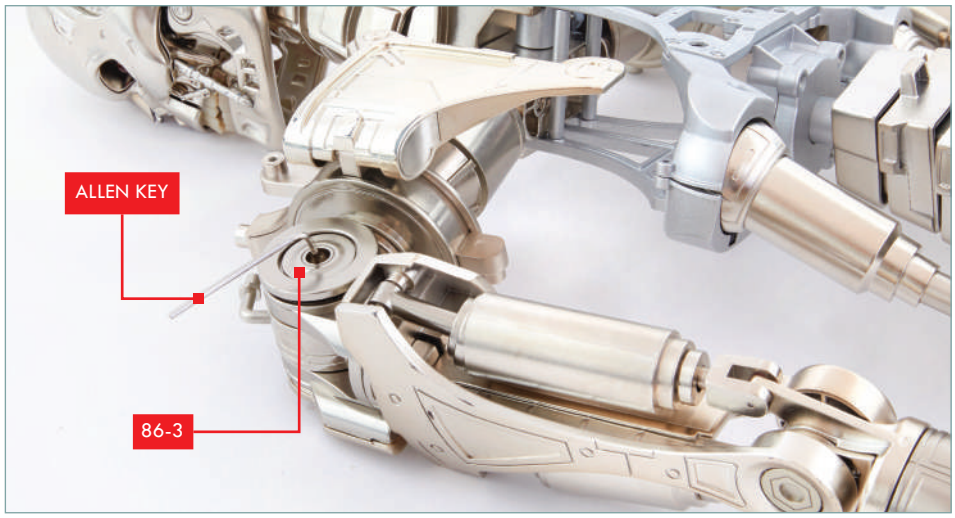
STEP 6

Fit the two parts of the shoulder joint on the top of the left arm over the shoulder joint on the side of the body. Have the shoulder joint pin **86-2** and the other parts of the shoulder joint **86-4**/**86-3**/**86-5** ready.



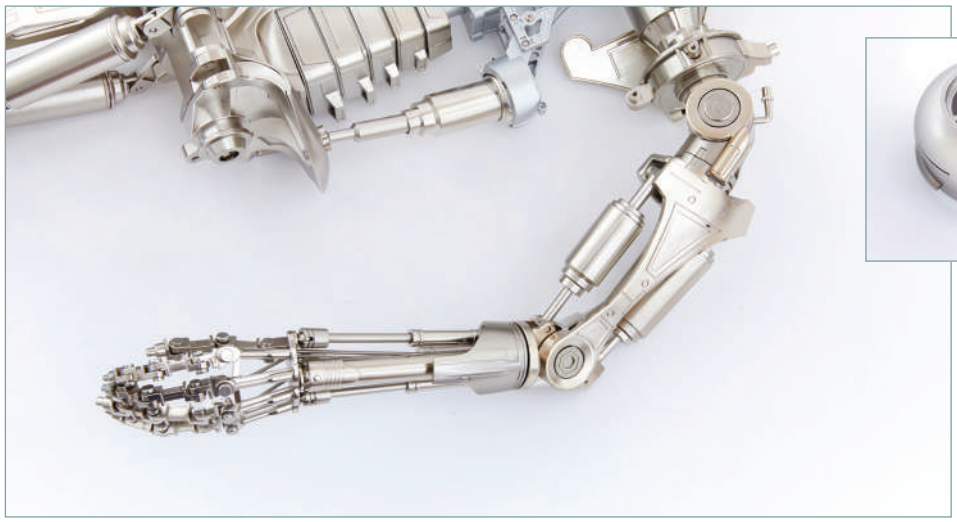
STEP 7

Fit the shoulder joint pin **86-2** into the shoulder joint, inserting it from the front of the model.



STEP 8

Holding the pin **86-2** in place, turn the model over. Fit the assembly **86-4**/**86-3**/**86-5** into the back of the shoulder joint. Fix in place with the hex socket PM 3x10 mm Allen screw.

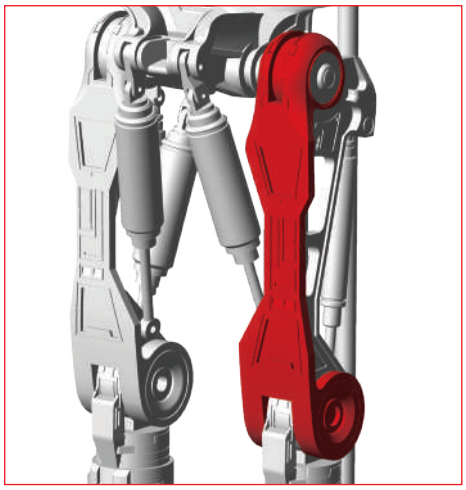


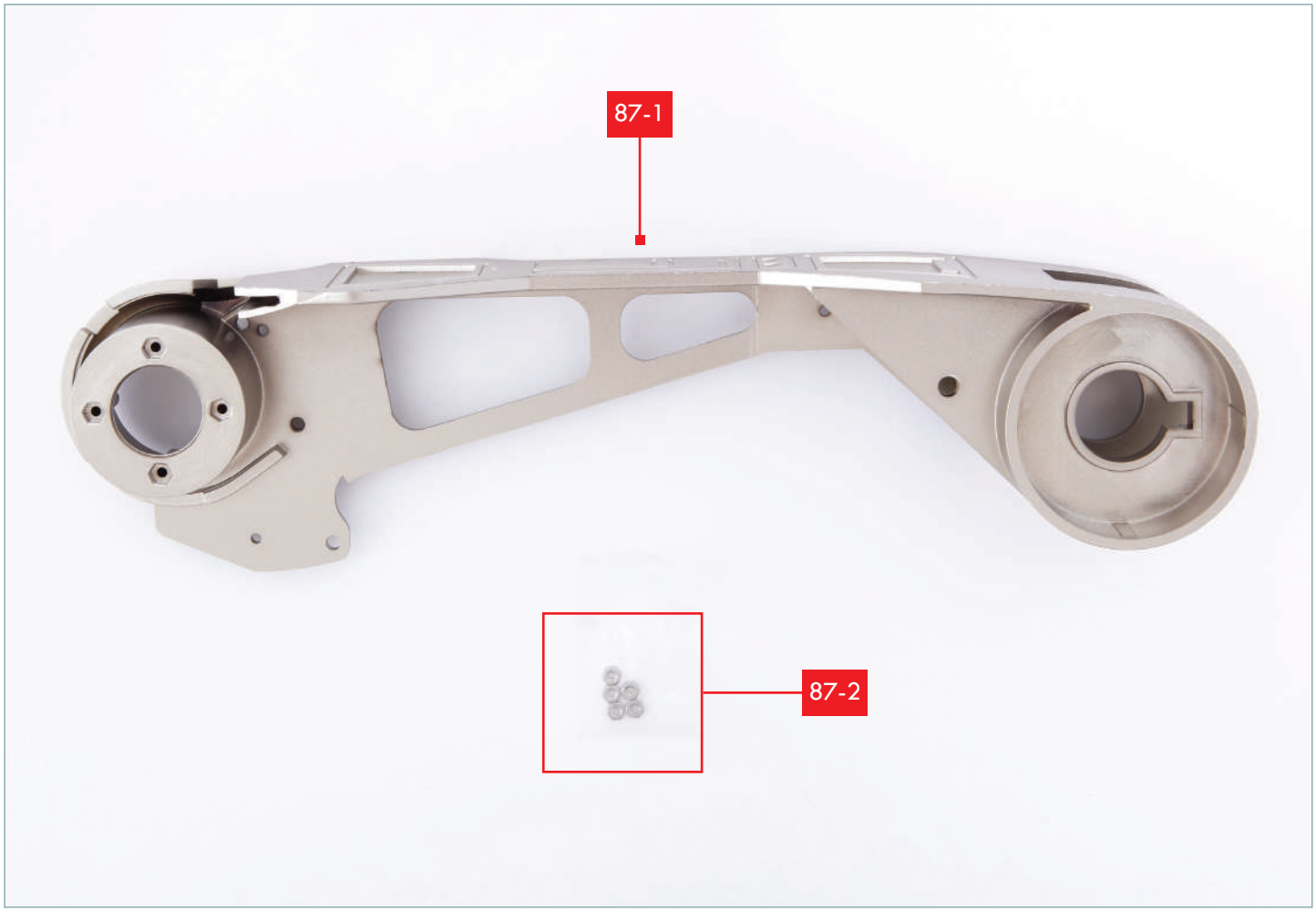
STAGE COMPLETE!

The left arm has been connected to the rest of the model. The hip joint assembly **85-1**/**86-1** and the spare washer, part **86-5**, (above) will be used in a future stage so store them carefully.

STAGE 87: FITTING A JOINT MECHANISM TO THE LEFT THIGH

Combine a left leg joint assembly with the new thigh component.



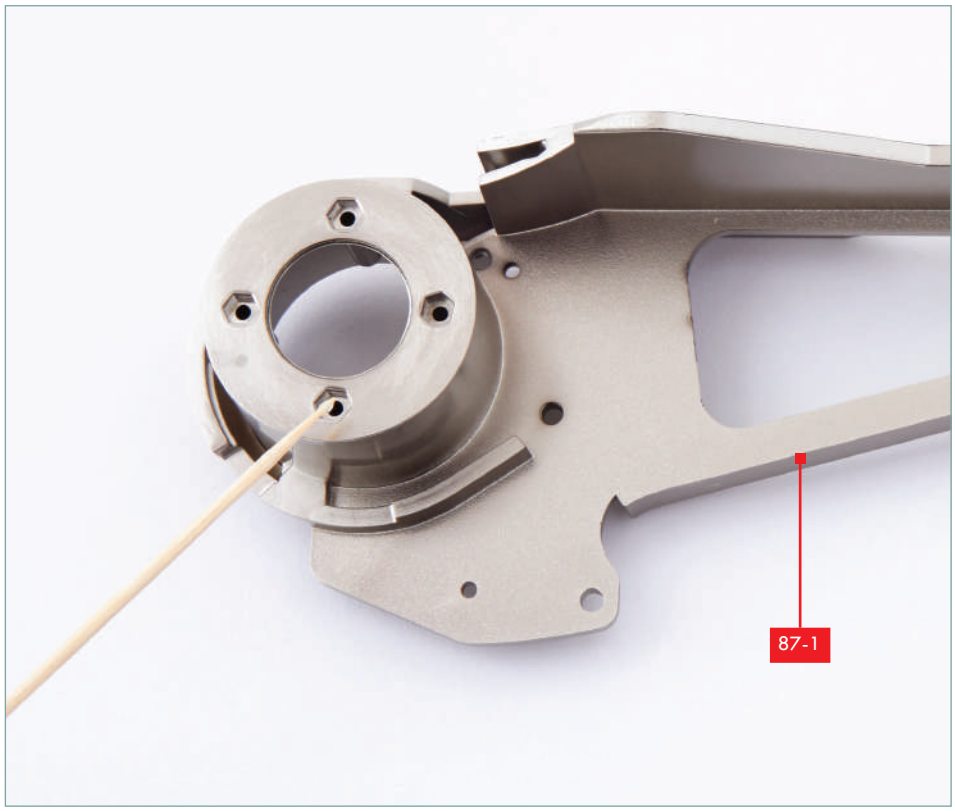


LIST OF PIECES

87-1	Left thigh
87-2	5x M2 nuts (1 spare)

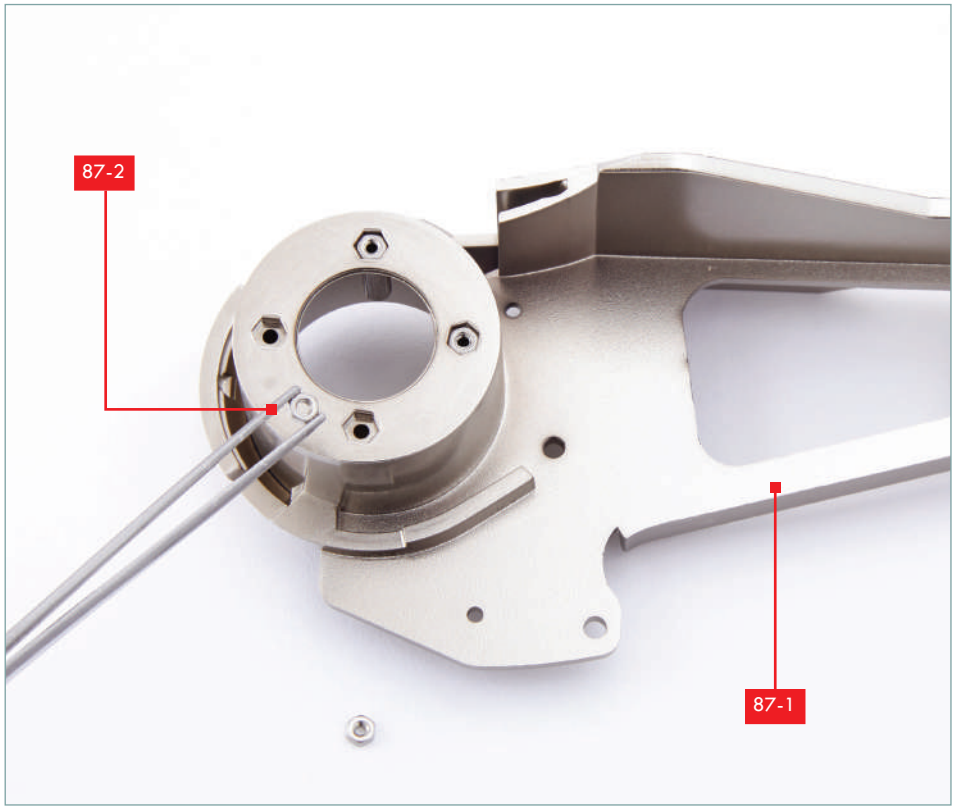
YOU WILL ALSO NEED

Leg joint assembly from stage 86, superglue and a cocktail stick, tweezers (optional).



STEP 1

Take the left thigh, part **87-1**. One at a time, apply a little superglue in the hexagonal recesses in the 'hip' end of the thigh.

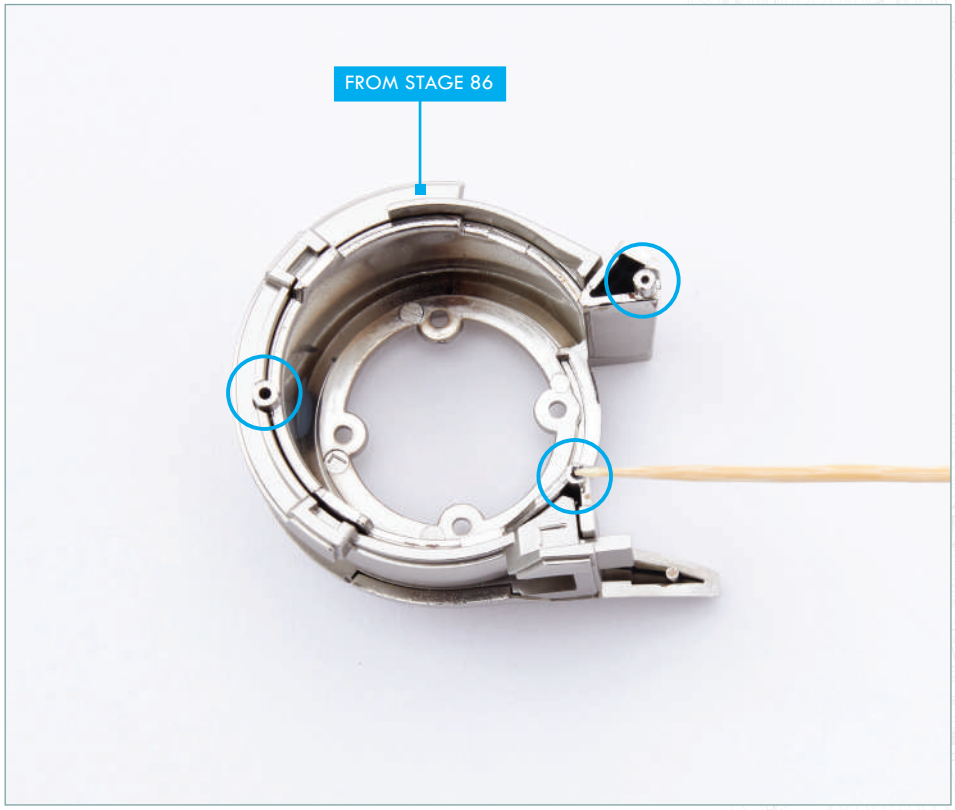


STEP 2

After applying glue to a recess, fit an **M2** nut (**87-2**) in place, ensuring the nut sits flat in the recesses.

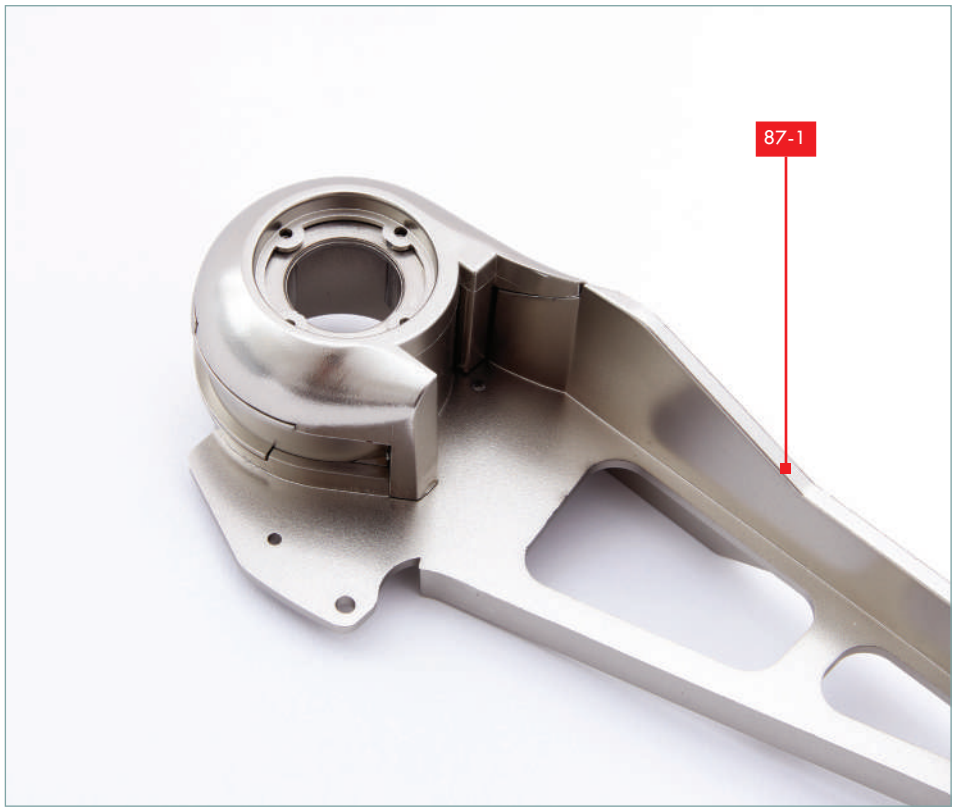
STEP 3

Fit all four **M2** nuts in place then take the leg joint assembly from stage 86. Check how it fits over the end of the thigh **87-1**.



STEP 4

Turn the joint assembly from stage 86 so that you can access the inside. Apply a little superglue to the three raised pegs (circled).



STEP 5

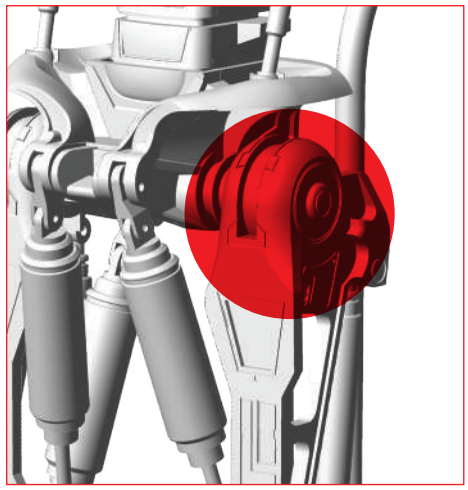
Fit the leg joint assembly in place on the end of the thigh.

STAGE COMPLETE!

A joint has been fitted to the top of the left thigh.

STAGE 88: ASSEMBLING THE LEFT HIP JOINT

Attach the left hip to the pelvis after constructing the interior joint.

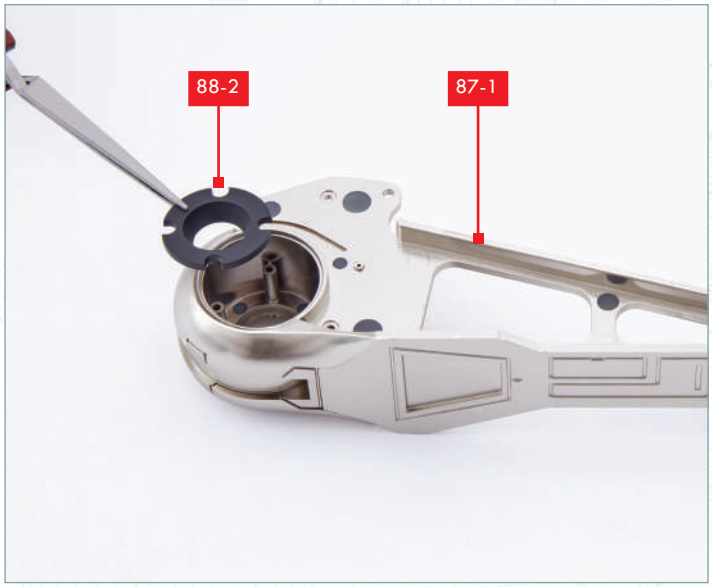


LIST OF PIECES

88-1	Hip joint	88-5	Outer cap for hip joint
88-2	Inner casing for hip joint	88-6	5x PM screws (2x18 mm) (1 spare)
88-3	Outer casing for hip joint	88-7	2x PM screws (3x8 mm) (1 spare)
88-4	Domed cap for hip joint		

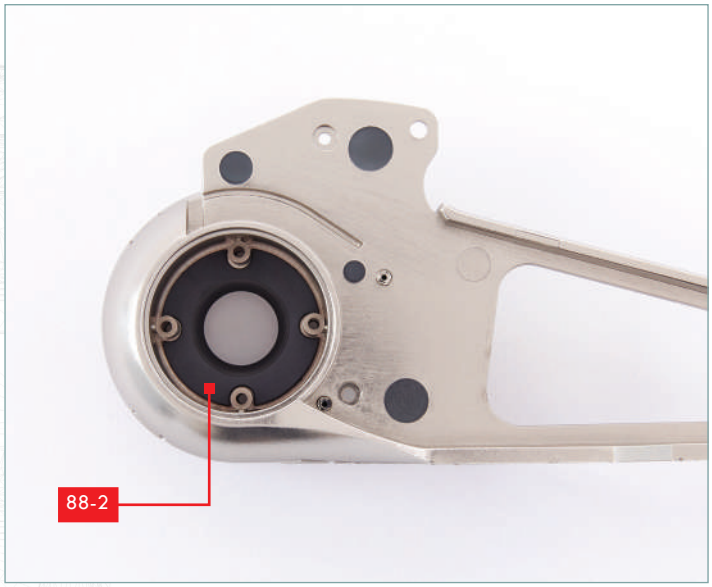
YOU WILL ALSO NEED

The thigh assembly and model assembly from previous issues, a fine cross-head screwdriver, superglue and a cocktail stick, tweezers (optional).



STEP 1

Take the thigh from stage 87 and place it in the orientation shown. Fit the inner hip joint casing **88-2** into the opening for the hip joint. The flat surface of part **88-2** is upwards, as shown.

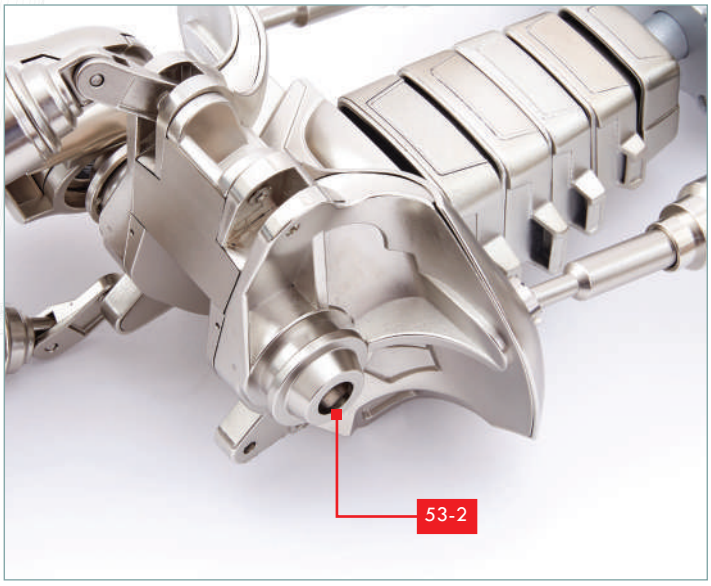


STEP 2

Ensure that the recesses in part **88-2** fit around the screw sockets inside the joint.

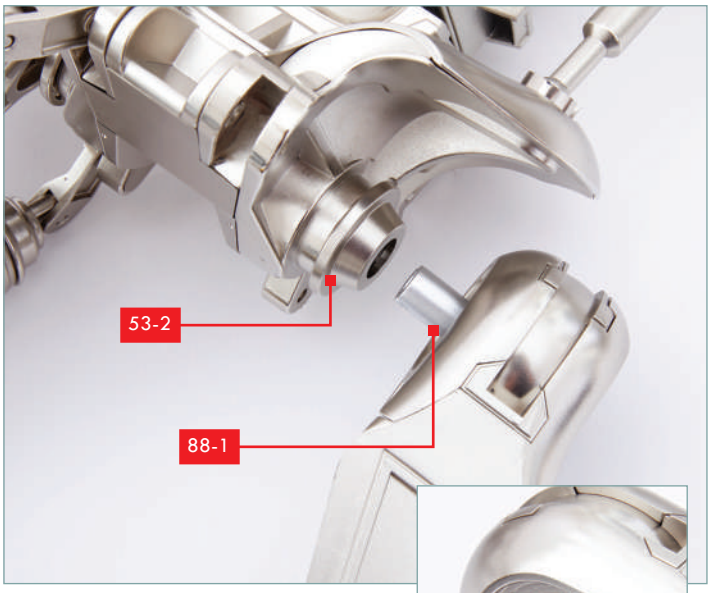
STEP 3

Fit the hip joint **88-1** inside the joint opening so that it sits in the inner joint casing **88-2**.



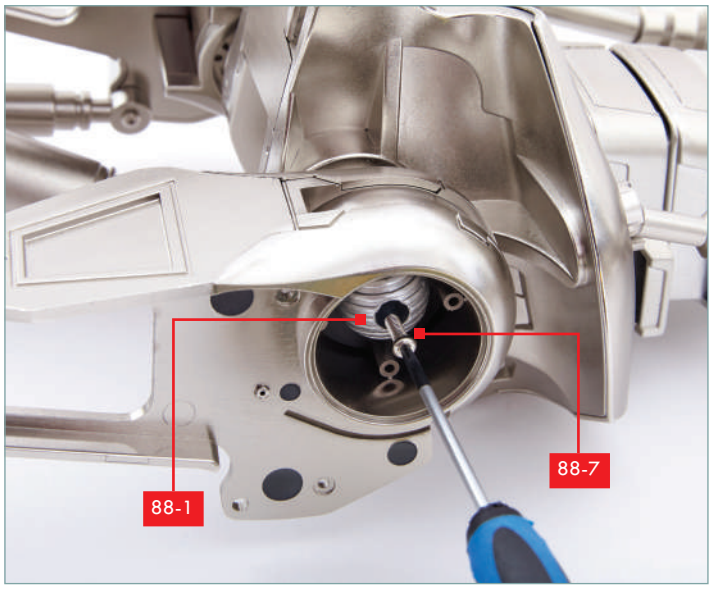
STEP 4

Take the model assembly and identify the hip socket **53-2**.



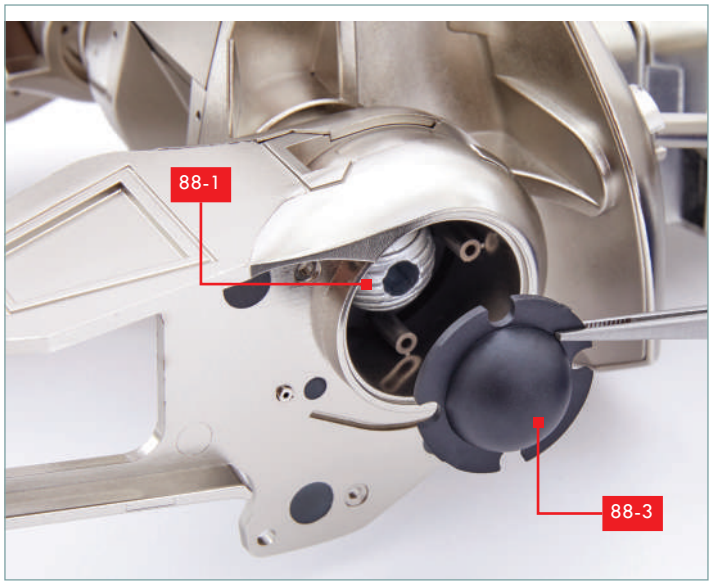
STEP 5

Fit the stem of the hip joint **88-1** into the hip socket **53-2**. Note that there are two notches on the hip socket **88-1** that have to be fitted over raised bars inside the hip socket (see arrows on inset).



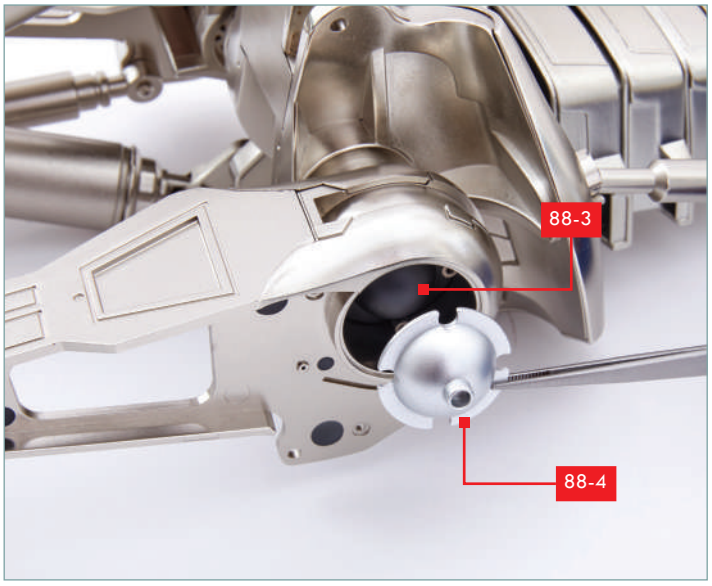
STEP 6

Fix part **88-1** in place with a PM 3x8 mm screw (**88-7**). At this stage, the joint will be quite loose.



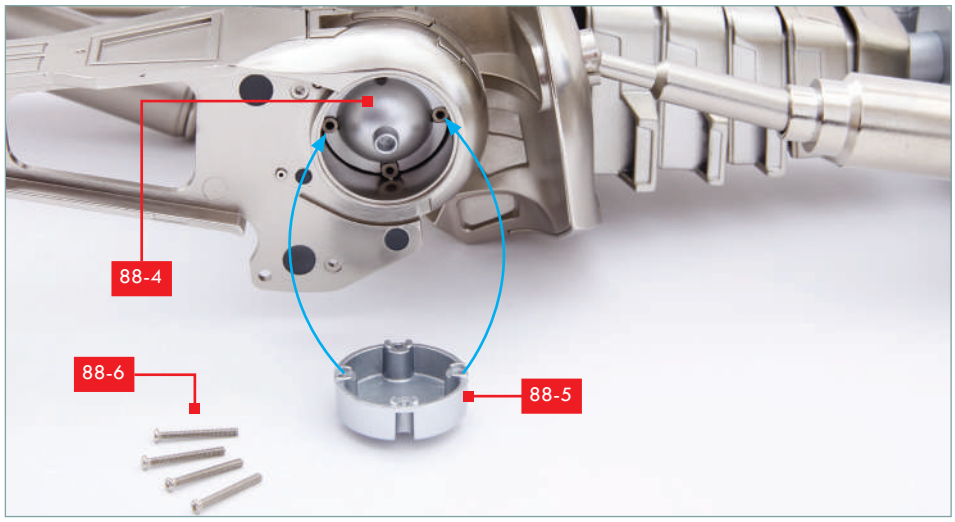
STEP 7

Fit the outer hip joint casing **88-3** over the ball of the hip joint **88-1** so that the notches round the edge of part **88-3** fit around the raised screw sockets on the inside of the hip joint.



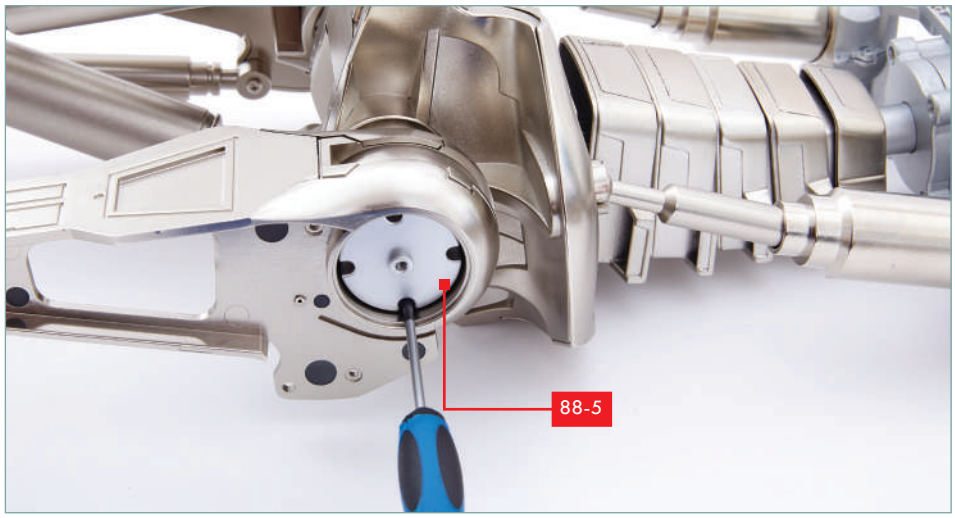
STEP 8

Fit the metal domed hip joint cap **88-4** over the casing **88-3**. Again, the notches in part **88-4** fit around the raised screw sockets.



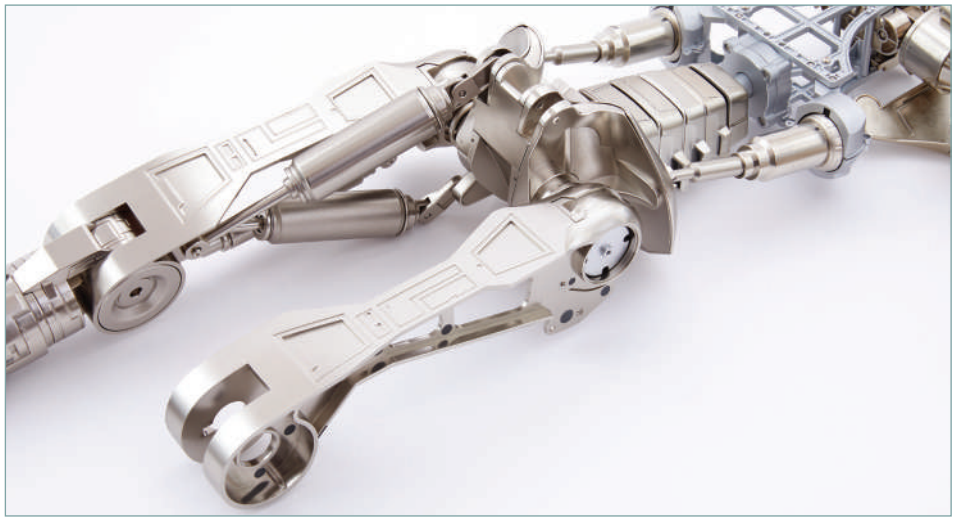
STEP 9

Take the outer cap for the hip joint **88-5** and note that there are slightly raised parts on either side of the screw holes. These will fit around the raised screw sockets on the inside of the hip joint, as indicated by the arrows. For the next step, you will need four PM 2x18mm screws (**88-6**).



STEP 10

Fit the outer cap **88-5** over part **88-4** so that the screw holes are aligned. Fix in place with four PM 2x18 mm screws.

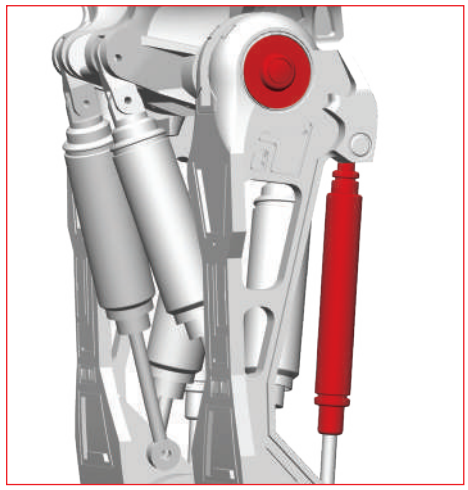


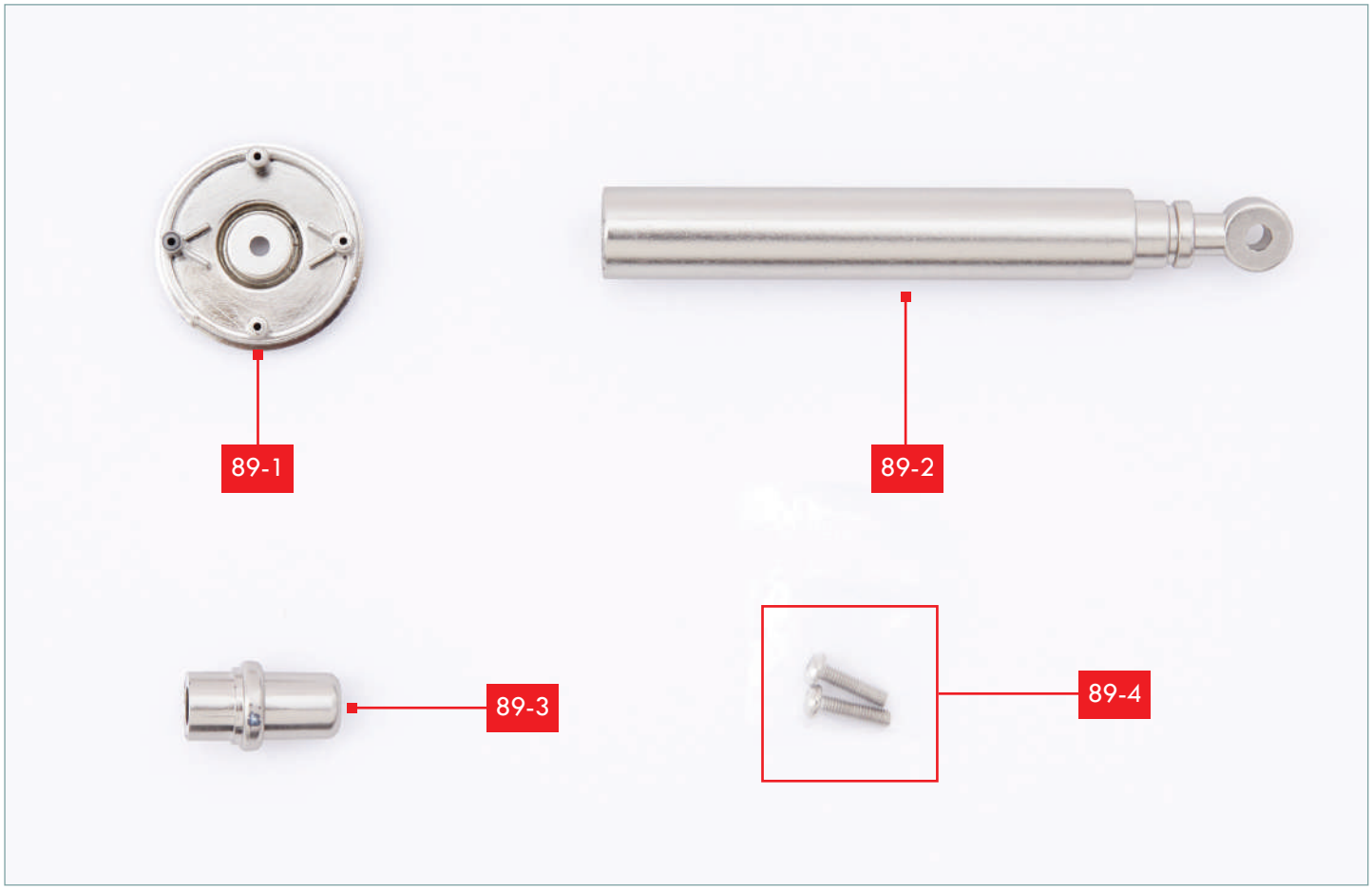
STAGE COMPLETE!

The left thigh has been attached to the pelvis.

STAGE 89: FINISHING THE LEFT HIP JOINT AND ASSEMBLING A LEG PART

Attach a hip plate to the left hip, and construct a piston-like bone for the left leg.



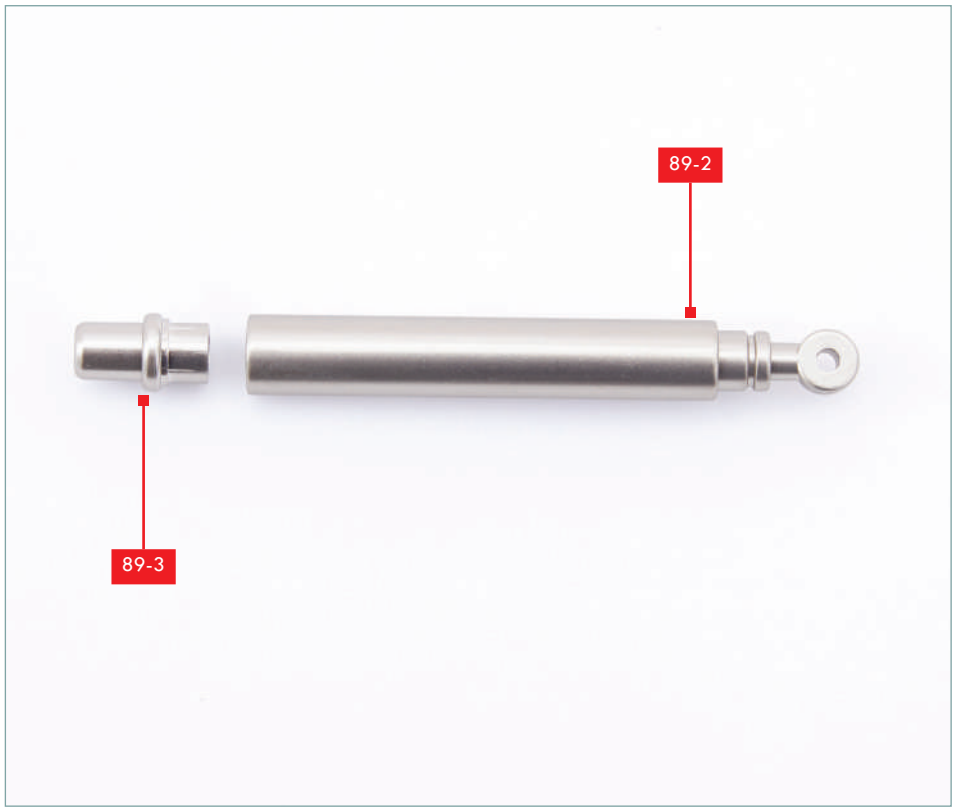


LIST OF PIECES

89-1	Hip plate
89-2	Left leg part
89-3	Left leg part insert
89-4	2x PM Allen screws (3x12 mm) (1 spare)

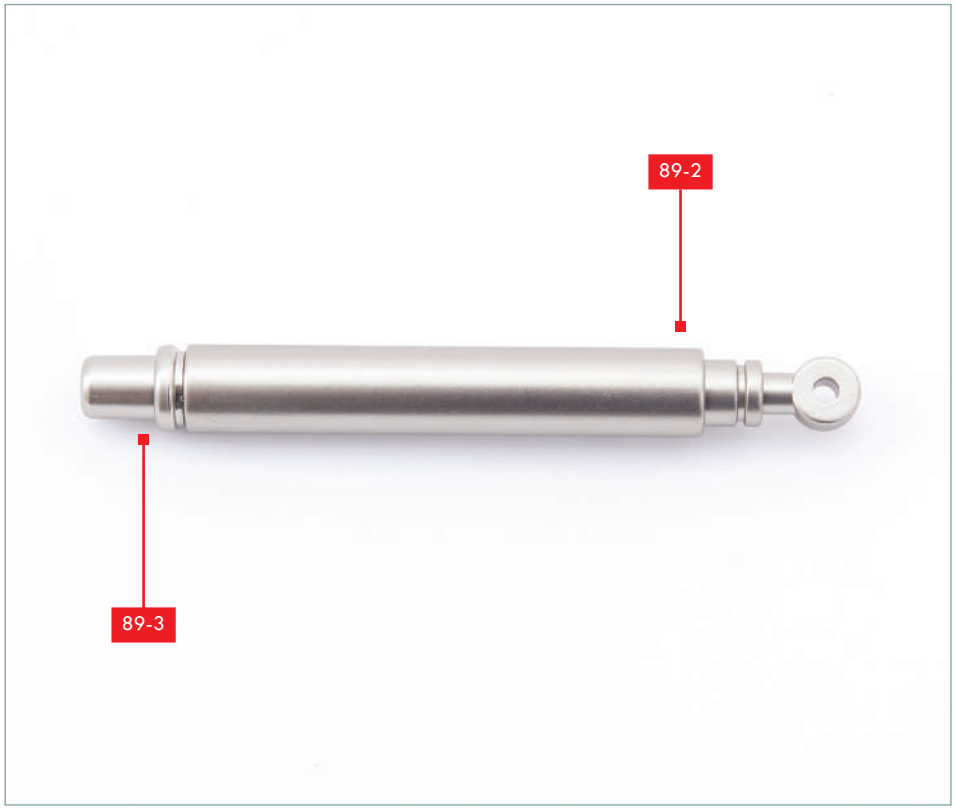
YOU WILL ALSO NEED

The model assembly from the previous stage, Allen key supplied with stage 26.



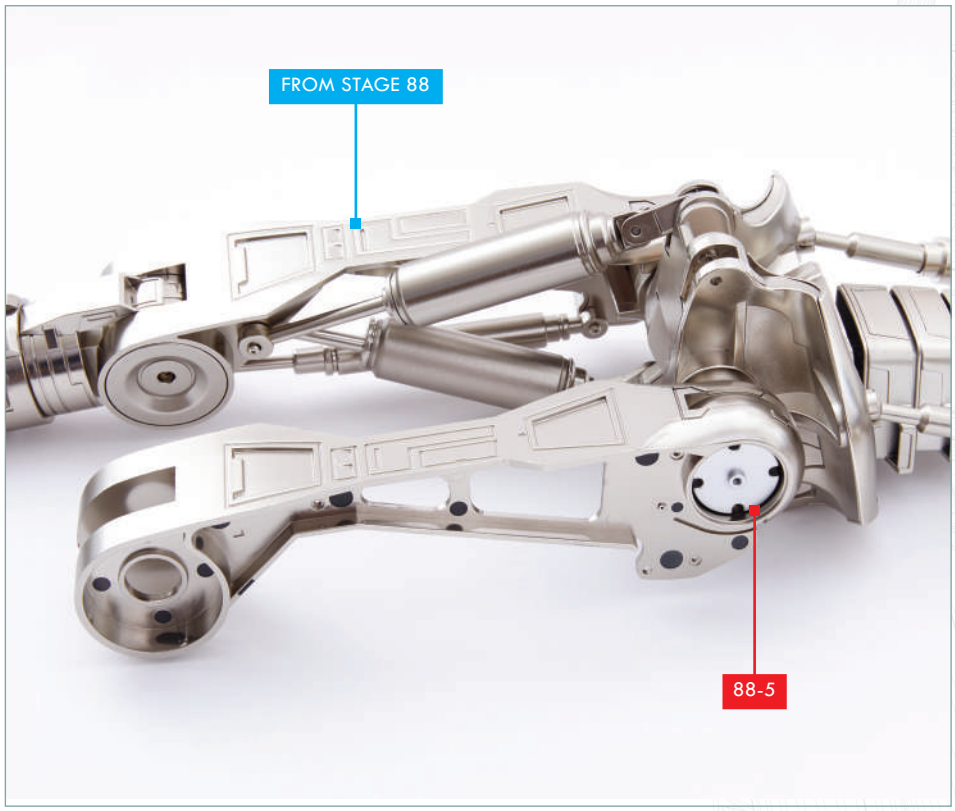
STEP 1

Take the leg part **89-2** and the insert **89-3.**



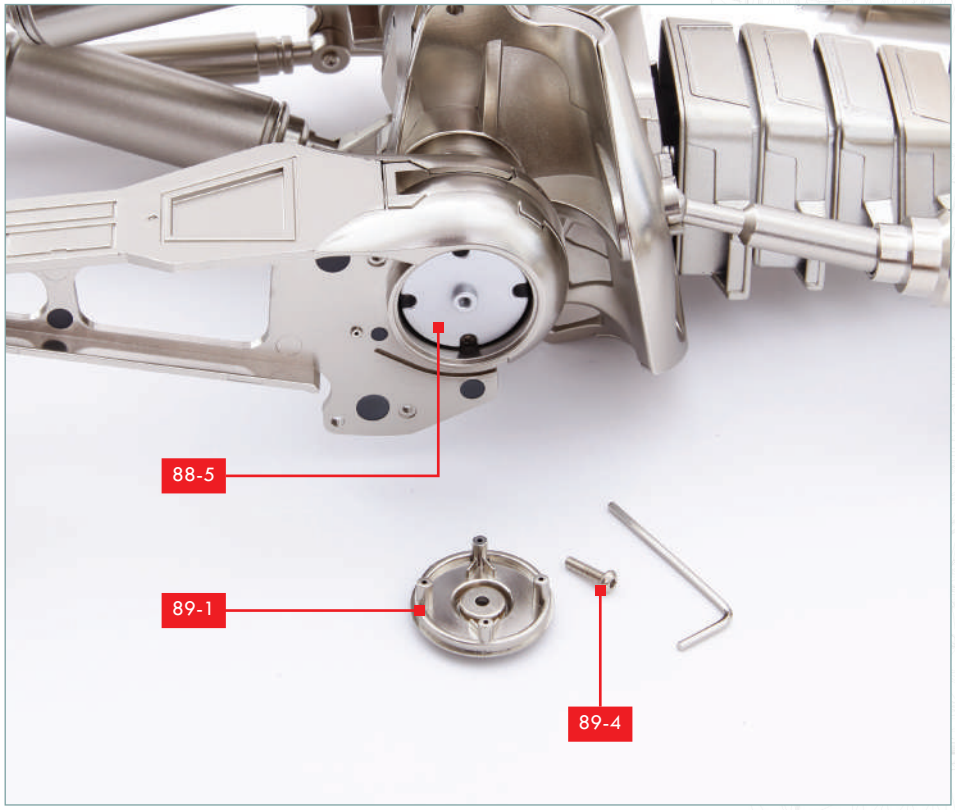
STEP 2

Fit the insert **89-3** into the open end of part **89-2.** It is a tight fit, so no glue is needed.



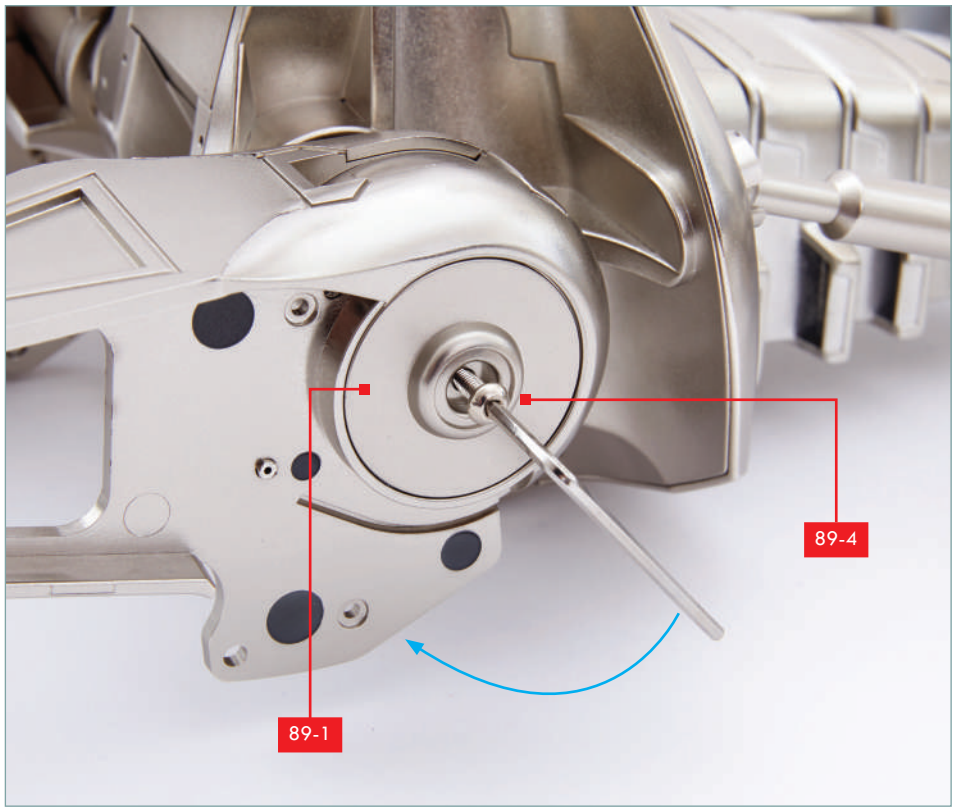
STEP 3

Lay the model on your work surface as shown so that you can access the hip joint and hip cap **88-5**.



STEP 4

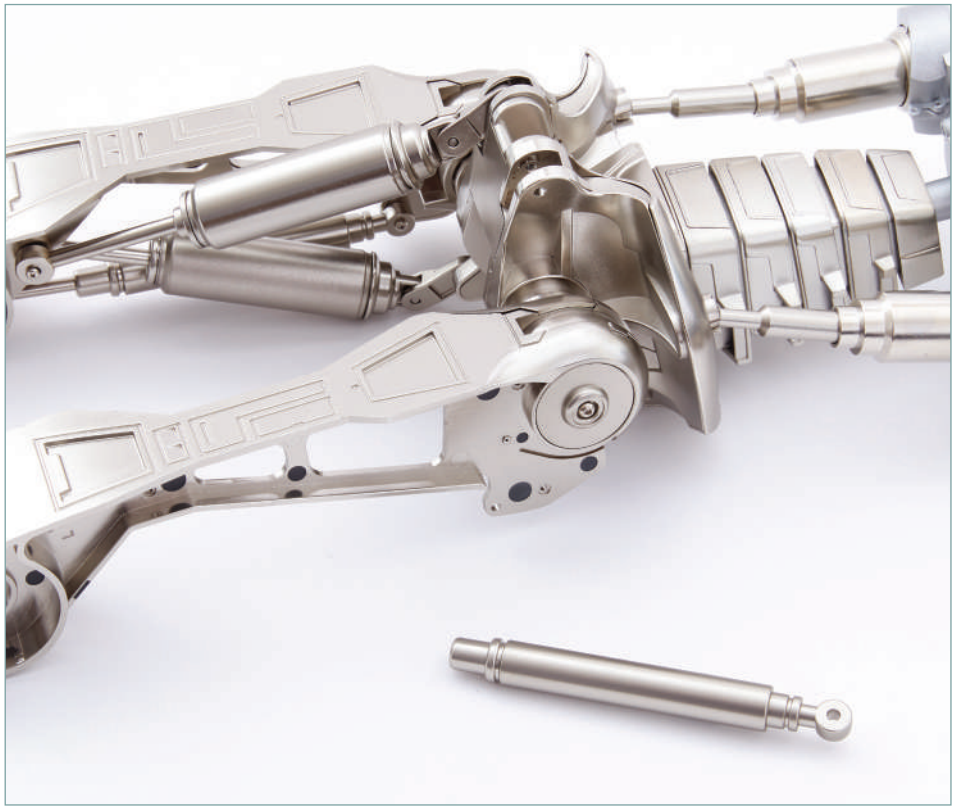
Take the hip plate **89-1** and the PM 3x12 mm Allen screw **89-4**. Note there are four pegs on the inside of part **89-1**. These will fit into the four sockets in the hip cap **88-5**.



STEP 5

Position the hip cap **89-1** over the hip joint opening so that the pegs are located in the holes in part **88-5**. Fit the PM 3x12 mm Allen screw **89-4** into the screw hole and tighten it with an Allen key.

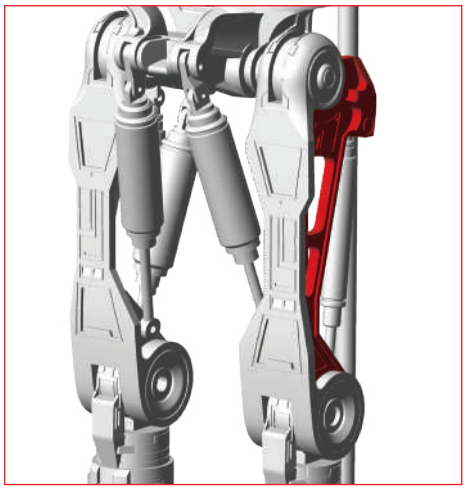
Do not overtighten: there should be movement in the joint. The thigh section can move backwards and forwards (as if walking) and also move slightly out to the side.



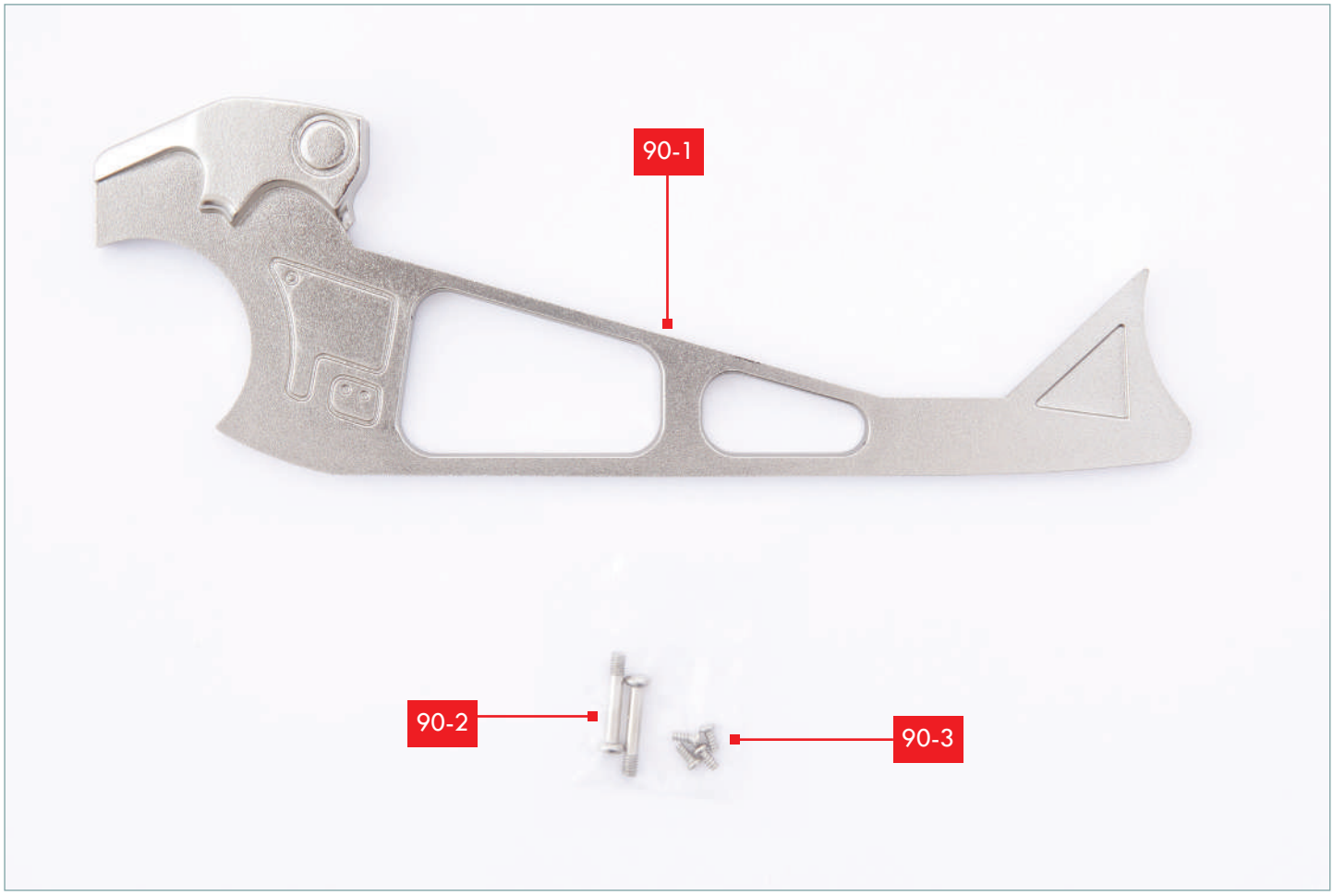
STAGE COMPLETE!

A plate has been fitted to the outside of the left hip and a leg part has been assembled. Keep the assembly **89-2**/**89-3** safely aside until it is needed in the next stage.

STAGE 90: FITTING PARTS TO THE LEFT THIGH



Attach a leg plate to the upper left thigh, and connect a leg bone to the resulting assembly.

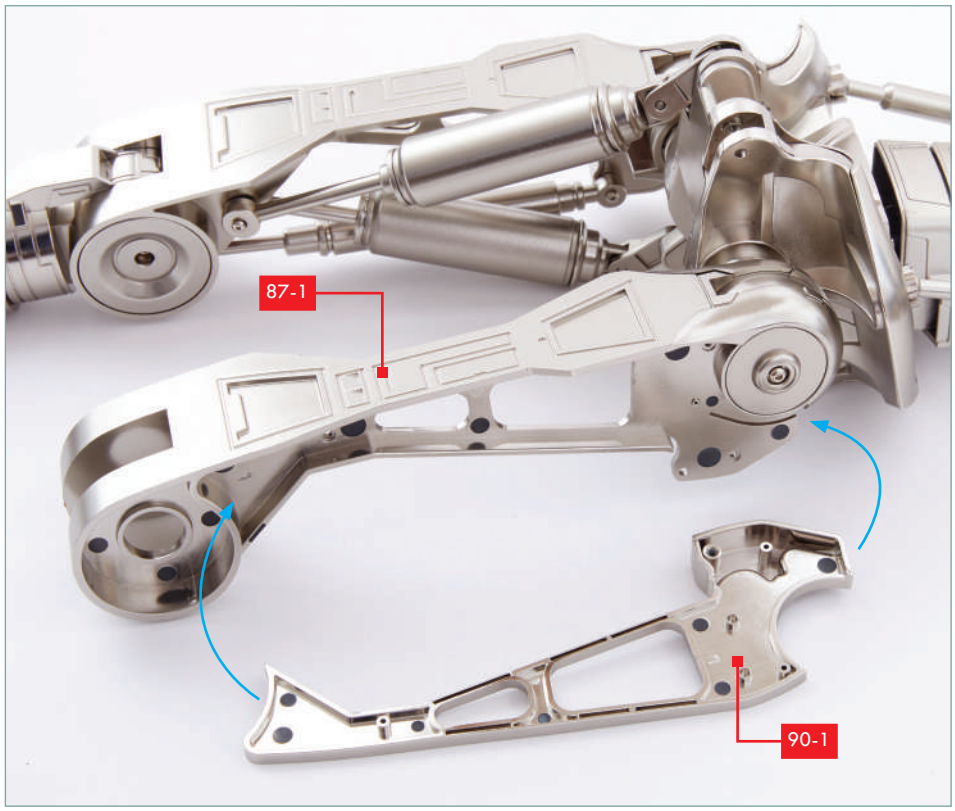


LIST OF PIECES

90-1	Left leg plate
90-2	2x PM screw (3x16 mm) (1 spare)
90-3	4x PB screws (2x4 mm) (1 spare)

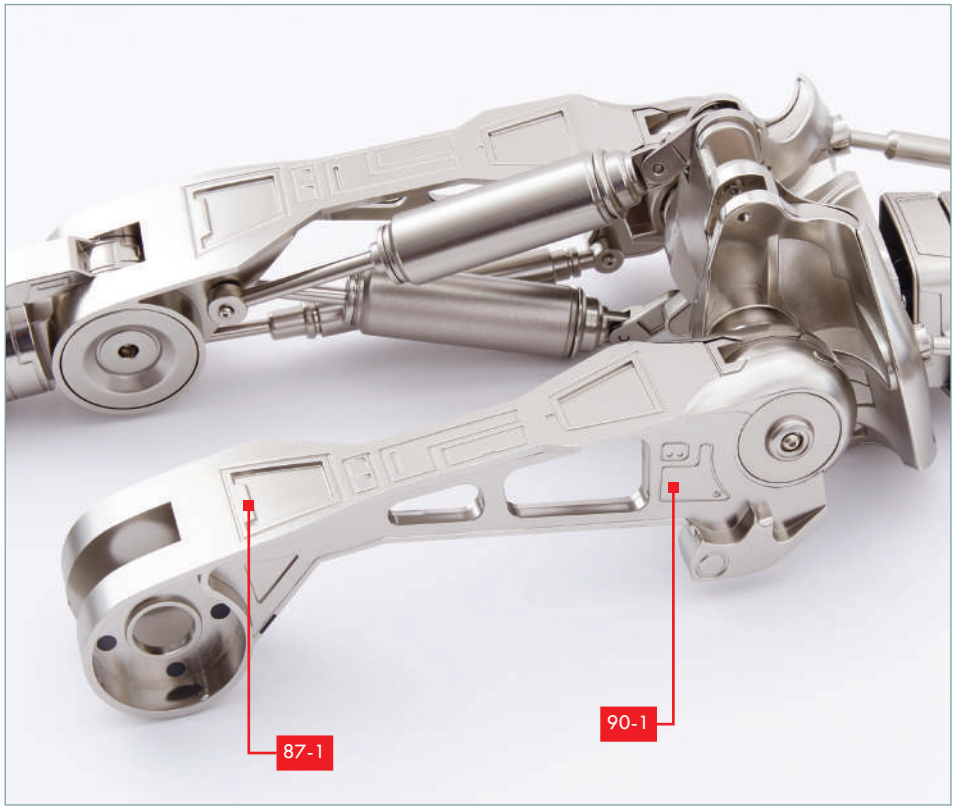
YOU WILL ALSO NEED

The model assembly from the previous stage, a fine cross-head screwdriver.



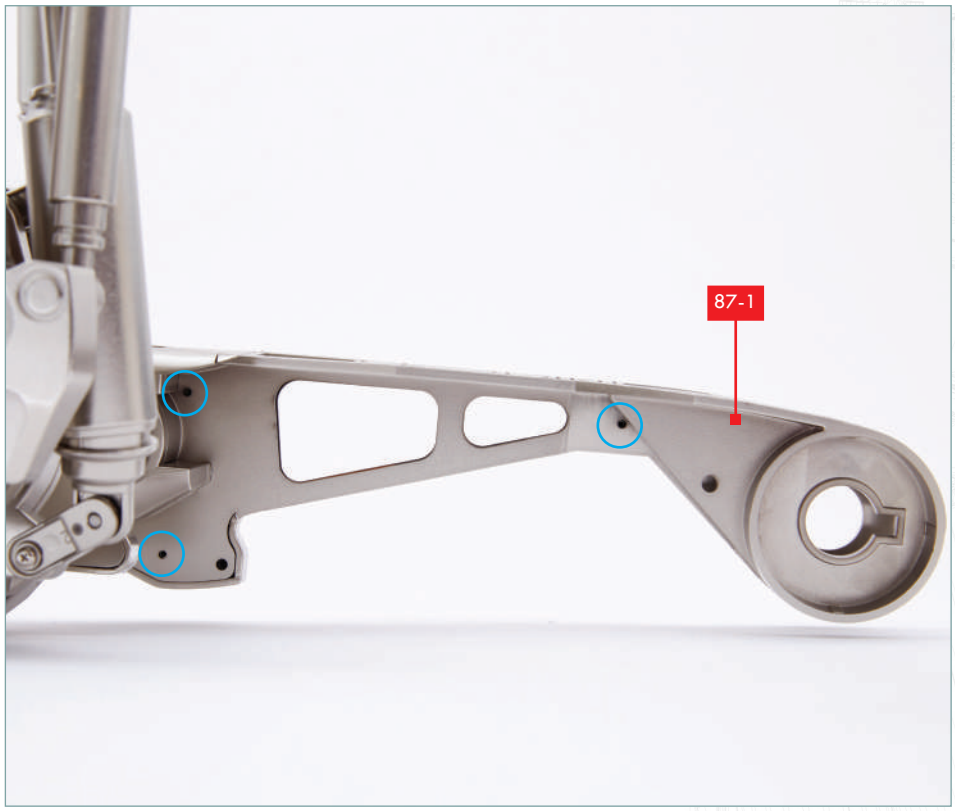
STEP 1

Lay the model on your work surface as shown so that you can acces the outer face of the left thigh **87-1**. Position the leg plate **90-1** in front of the model assembly in the orientation shown. The arrows indicate how the leg plate **90-1** fits into the thigh **87-1**.



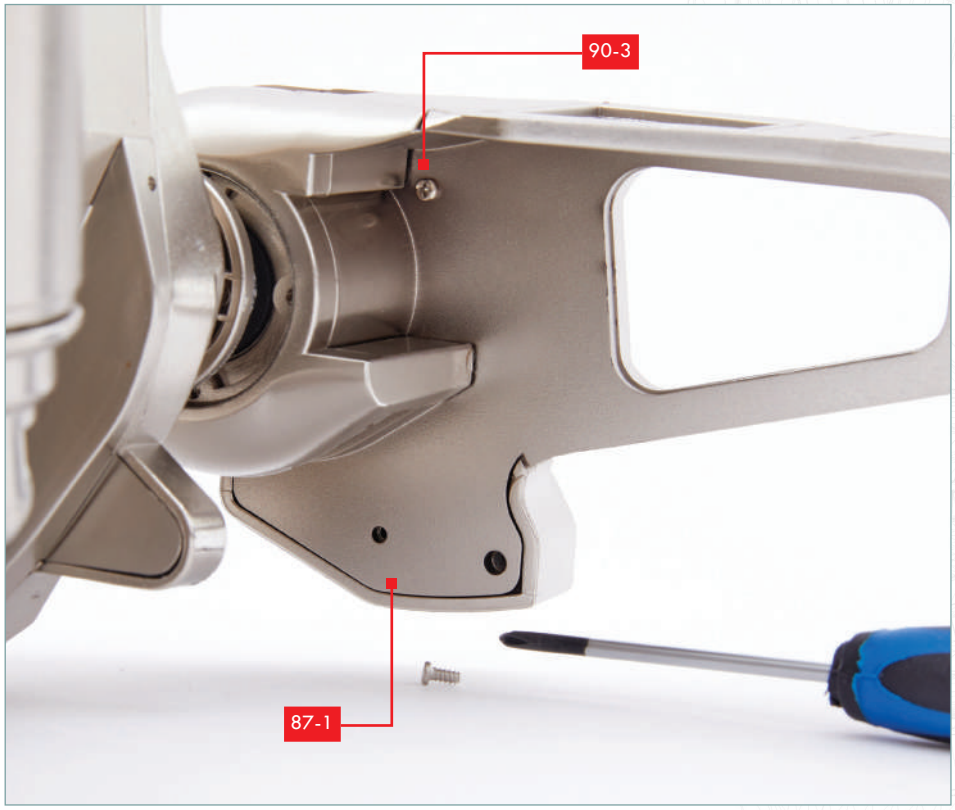
STEP 2

Fit the leg plate **90-1** into the recessed area in the thigh **87-1**.



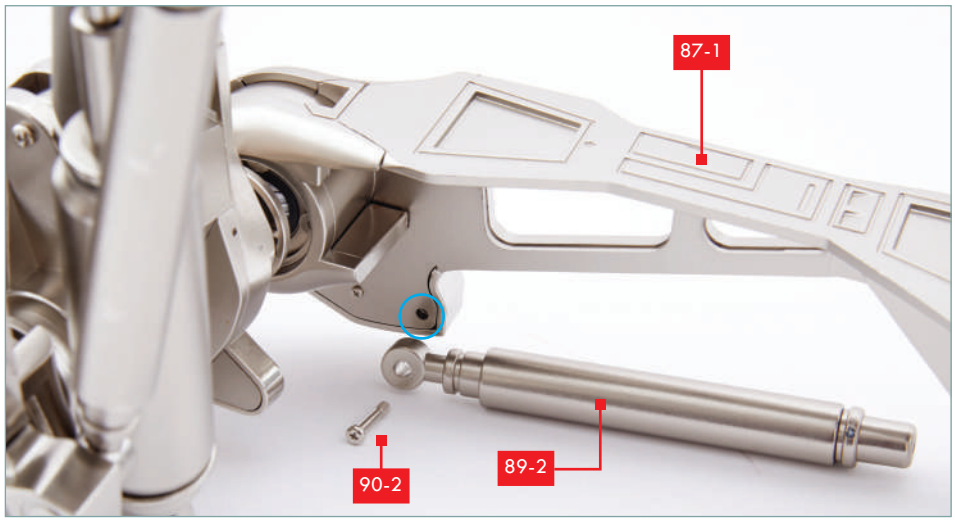
STEP 3

Holding the leg plate **90-1** in place, turn the model around and lift the right leg out of the way so that you can access the inside of the thigh **87-1**. Identify the three small screw holes in part **87-1** (circled in blue)



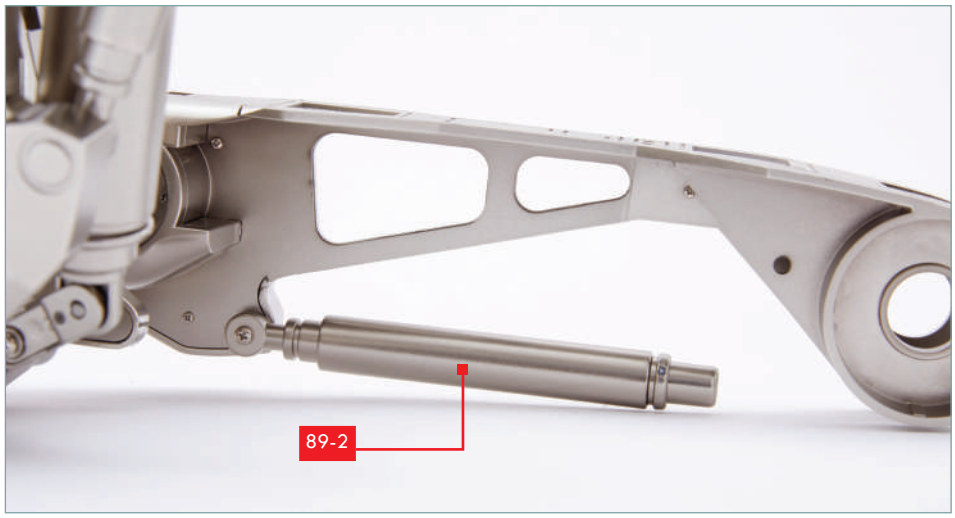
STEP 4

Fix part **90-1** in place using three PB 2x4 mm screws (**90-3**).



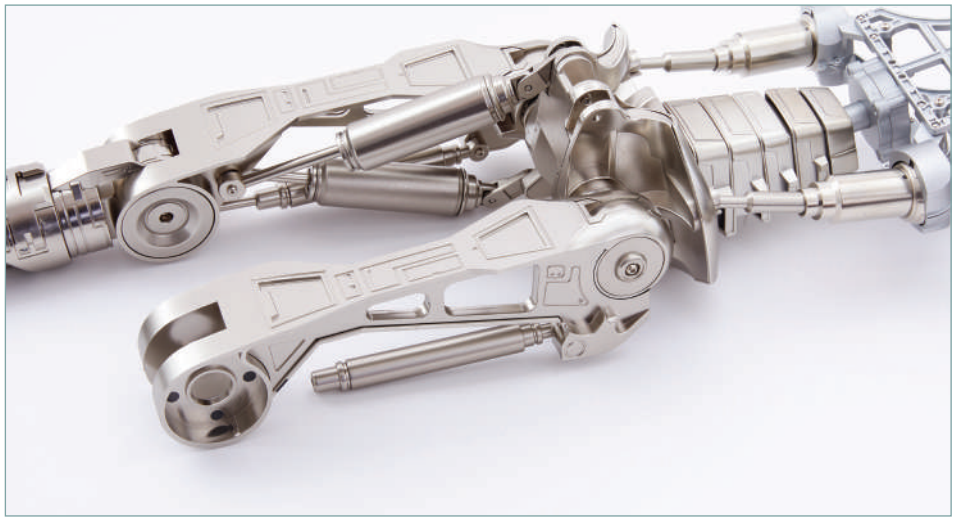
STEP 5

The loop on the leg part **89-2** is attached to the thigh **87-1** using a PM 3x16 mm screw (**90-2**). Align the loop with the screw socket in part **87-1**, circled in blue.



STEP 6

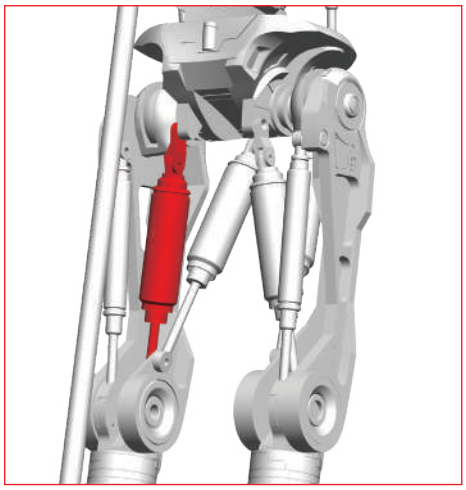
Fix the leg part **89-2** in place, as shown.



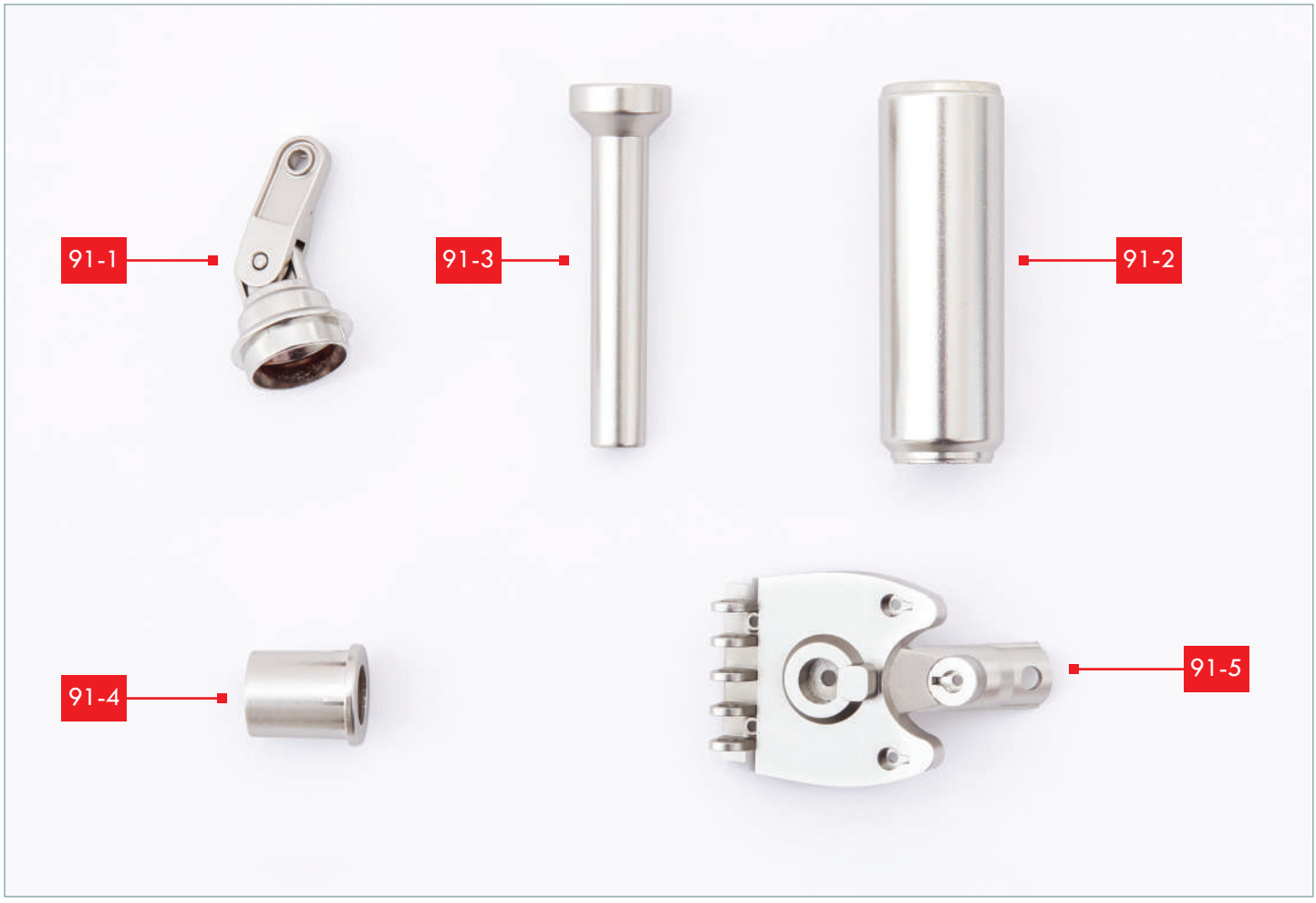
STAGE COMPLETE!

A plate has been fitted to the outside of the left thigh and a leg part has been attached.

STAGE 91: ASSEMBLE A MUSCLE FOR THE LEFT THIGH



Connect the elements of the thigh muscle, and collect the first piece of the left foot.



LIST OF PIECES

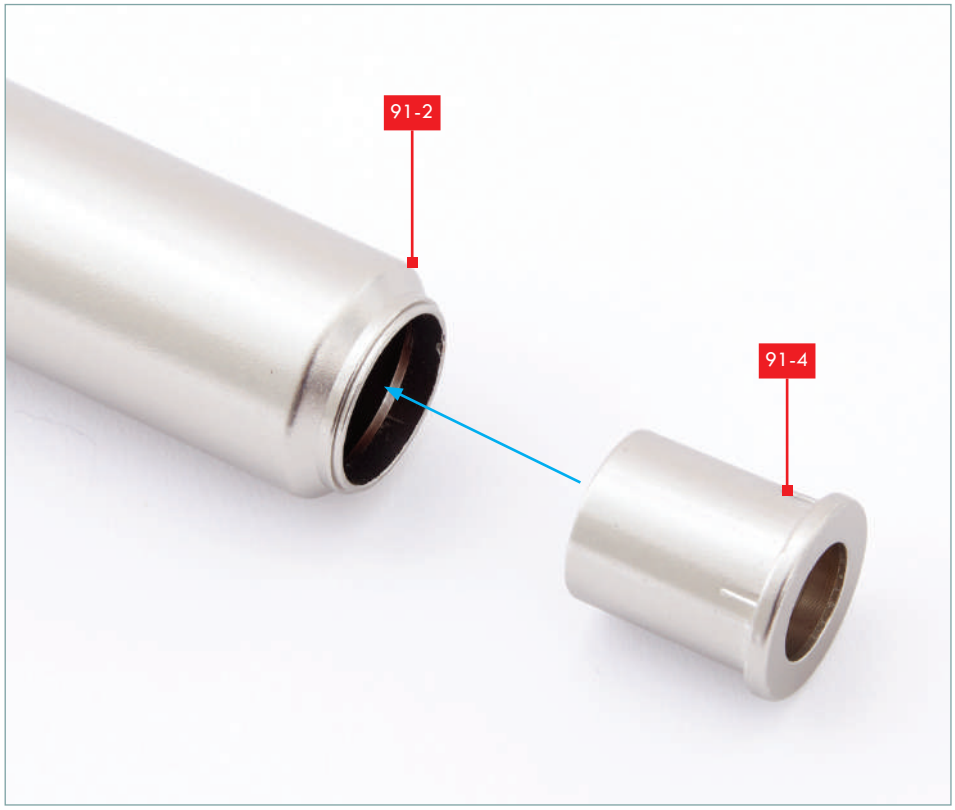
91-1	Muscle connector	91-4	Muscle cap
91-2	Left thigh muscle	91-5	Left foot
91-3	Inner left thigh muscle		

YOU WILL ALSO NEED

Superglue and a cocktail stick.

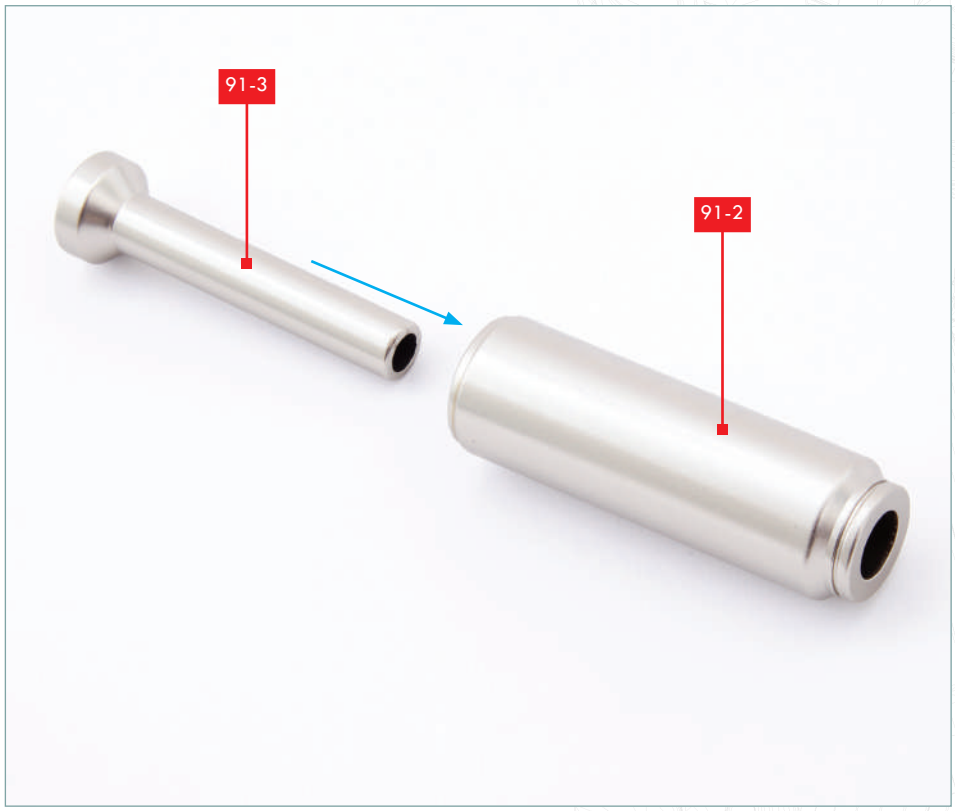
STEP 1

Take the muscle cap **91-4** and apply a little superglue around the side of the part, beneath the rim, as shown.



STEP 2

Fit the muscle cap **91-4** into the narrower end of the left thigh muscle **91-2.**



STEP 3

Take the inner muscle **91-3** and fit it into the other end of the muscle **91-2**, inserting the narrower end first.

STEP 4

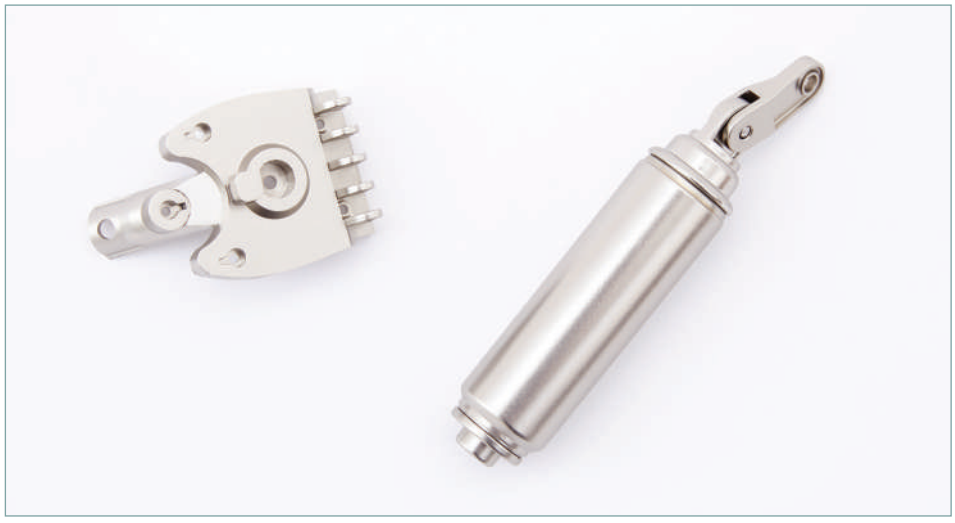
Once inserted, the inner part of the muscle can slide in and out of the muscle cap **91-4**, but the wide end of the inner muscle prevents it from sliding through the cap.

STEP 5

Take the muscle connector **91-1**. Apply a little glue around the side of the part, beneath the rim, as shown.

STEP 6

Fit the connector **91-1** into the wider end of the left thigh muscle **91-2**.

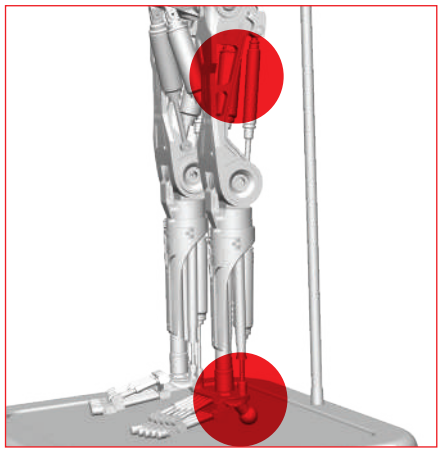


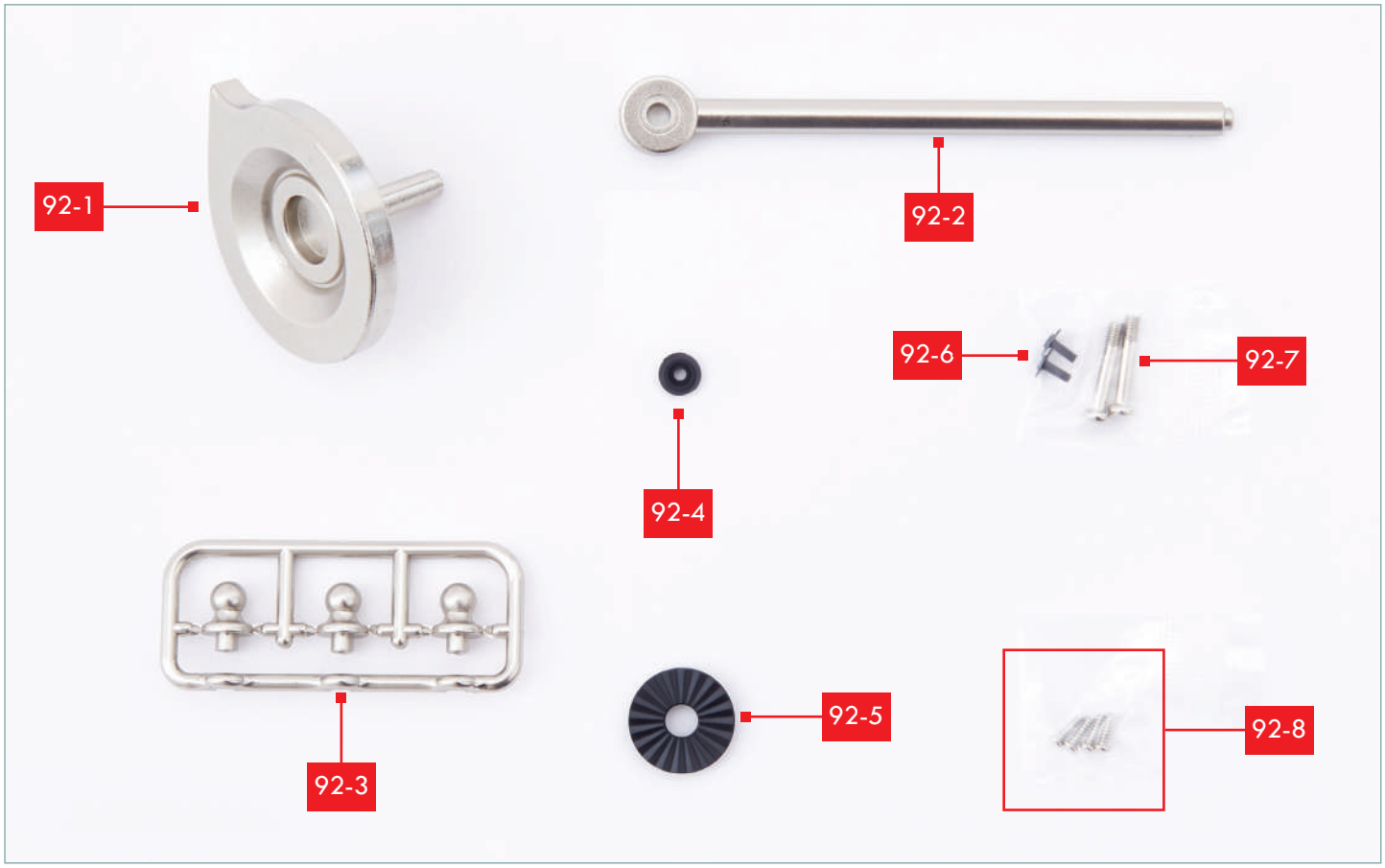
STAGE COMPLETE!

A left thigh muscle has been assembled. The foot part will be used in a future stage. Store the parts carefully until needed.

STAGE 92: KNEE, MUSCLE, AND FOOT: MAKE PROGRESS ON THE LEFT LEG

Construct a knee joint, build a tendon, detail a foot, and attach a muscle.





LIST OF PIECES

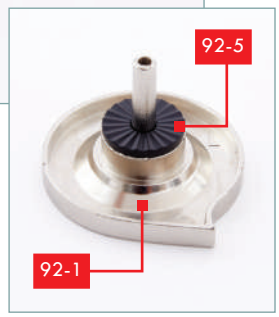
92-1	Knee joint	92-6	2x PWM screws (2x5 mm) (1 spare)
92-2	Muscle tendon	92-7	2x PM screws (3x16 mm) (1 spare)
92-3	Details for left foot	92-8	4x PB screws (2x6 mm) (1 spare)
92-4	Rubber washer for tendon		
92-5	Centre part for joint		

YOU WILL ALSO NEED

Foot part 91-5 supplied with the previous stage, the left thigh muscle assembled in the previous stage, the model assembly from stage 90, a fine crosshead screwdriver.

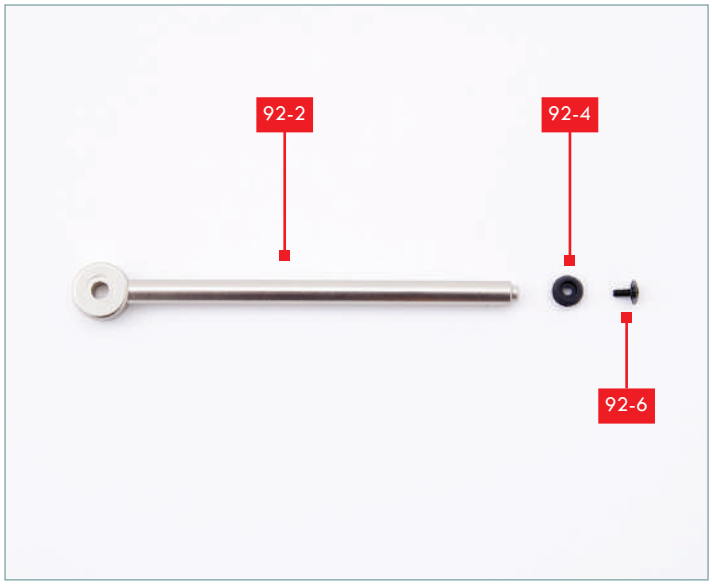
STEP 1

Take the centre part for the knee joint **92-5** and apply a little superglue to the three raised studs.



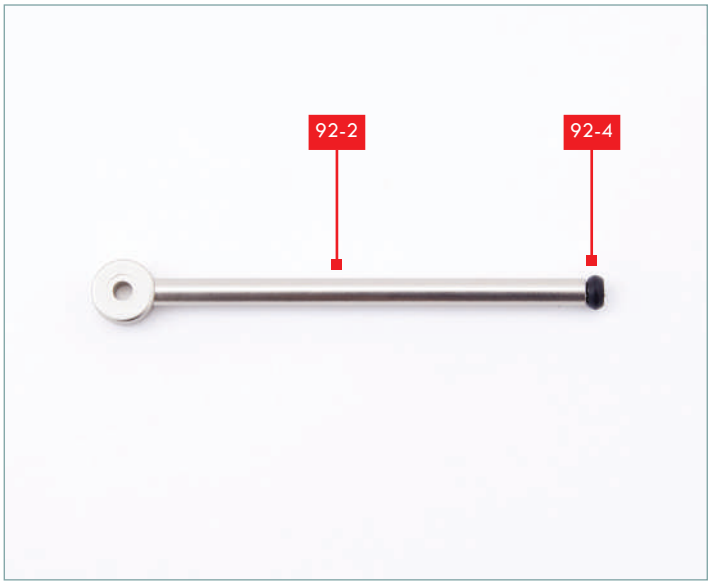
STEP 2

Fit part **92-5** on to the pin of the knee joint and fix it in place, ensuring that the three studs on part **92-5** fit into the sockets in part **92-1**. The inset shows the centre part **92-5** in place on part **92-1**.



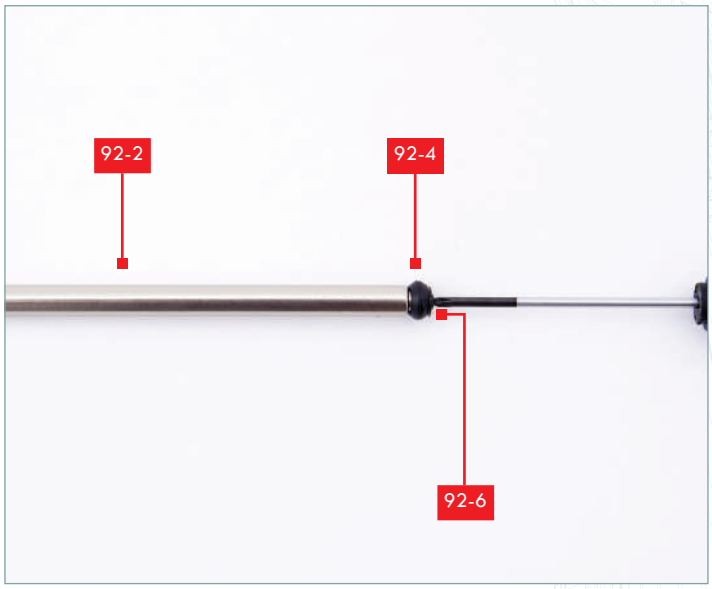
STEP 3

Take the tendon **92-2**, the rubber washer **92-4** and one of the PWM 2x5 mm screws (**92-6**). Note that one side of the rubber washer has a deeper recess.



STEP 4

Fit the rubber washer **92-4** over the end of the tendon **92-2**, with the recessed side of the washer fitting over the shaped end of the tendon.

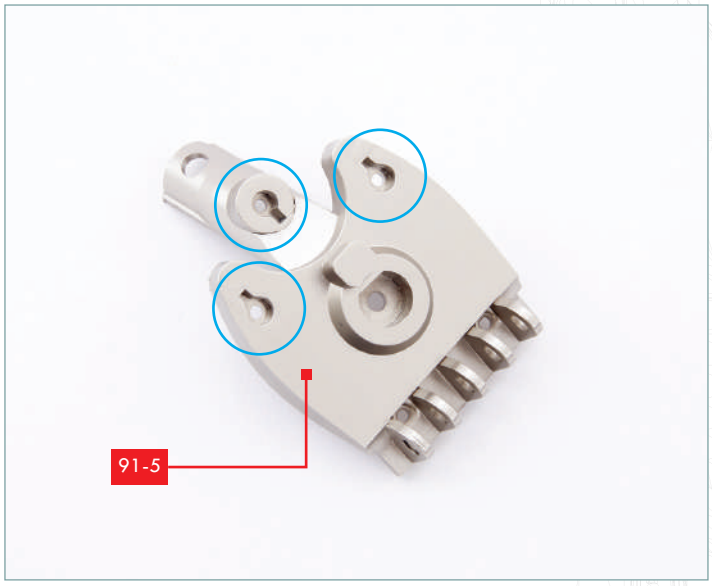


STEP 5

Fix the washer **92-4** in place on the end of the tendon **92-2** using a PWM 2x5 mm screw. Do not over-tighten the screw.

STEP 6

Remove the foot details from the frame **92-3.**

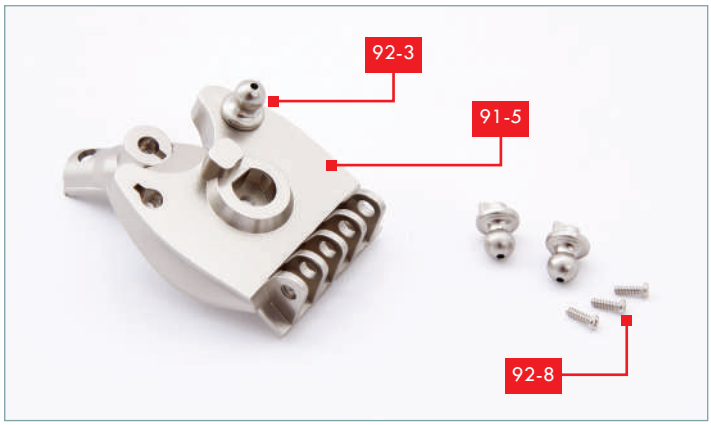


STEP 7

Take the foot **91-5,** supplied with the previous stage. Identify the three sockets on part **91-5** (circled) for the foot details **92-3.**

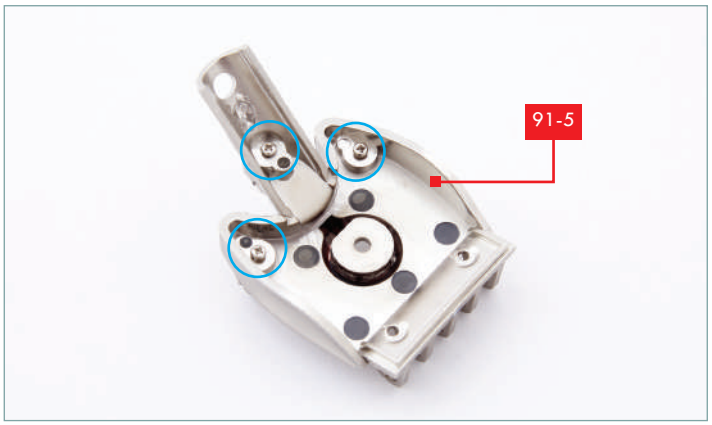
STEP 8

Note that the sockets in part **91-5** are shaped like keyholes to accommodate the tabs on the sides of the details from frame **92-3** (arrow).



STEP 9

One at a time, fit the details **92-3** into the sockets in part **91-5**, as shown. You will need three PB 2x6 mm screws (**92-8**).

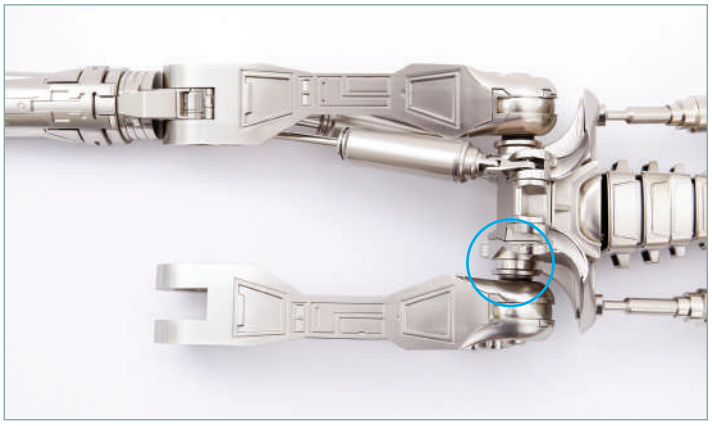


STEP 10

After fitting each detail **92-3**, turn the foot **91-5** over so that you can fix the detail in place using a PB 2x6 mm screw. This shows the three screws (circled) used to fix the details in place.

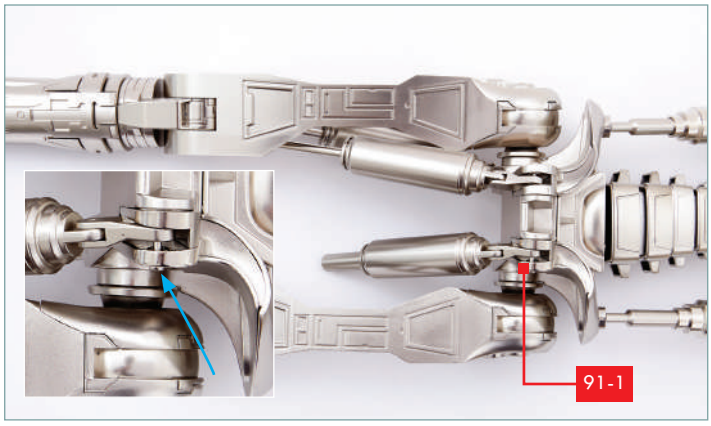
STEP 11

Take the thigh muscle assembled in stage 91 and a PM 3x16 mm screw (**92-7**). Note the shape of the connector **91-1**.



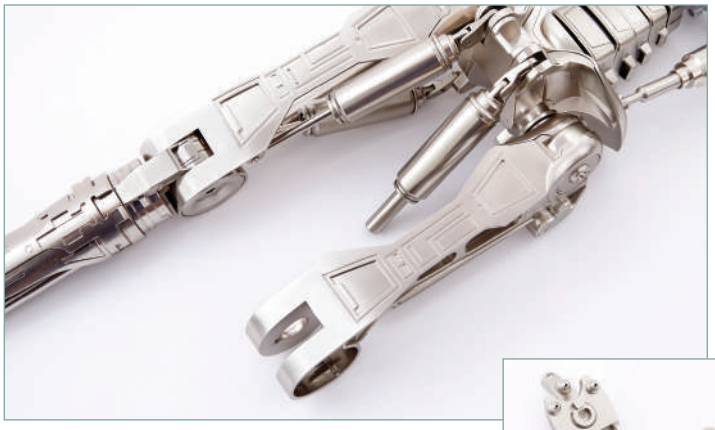
STEP 12

Take the model assembly. Identify the fixing point on the front of the hip (circled), where the muscle connector will be attached.



STEP 13

Noting the orientation of the muscle connector **91-1**, position it between the flanges on the front of the hip and fix in place with a PM 3x16 mm screw. The screw head is on the outer side of the fixing flange (arrow, inset).



STAGE COMPLETE!

Various parts of the left leg have been assembled: part of the knee joint, a tendon and the foot. A muscle has been fitted to the left hip.