PACK 5

THE TERMINATOR™

BUILD THE T-800

1:2 SCALE

THE MOST LEGENDARY CYBORG IN SCIENCE FICTION HISTORY!

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AGORA MODELS

THE TERMINATOR™

BUILD THE T-800

PACK 5

CONTENTS

T-800 ASSEMBLY: STAGES 41–50

IDENTIFYING YOUR COMPONENTS: Each of your Terminator packs is divided into stages. Each stage contains a number of components, and can be identified by referring to the images in your assembly guide or the number located on the sticker on the back of each stage. Each number begins with '77' and is followed by a further three digits. The last three digits indicate the number of each stage. For example, 77 001 indicates stage 01, 77 002 indicates stage 02, etc.

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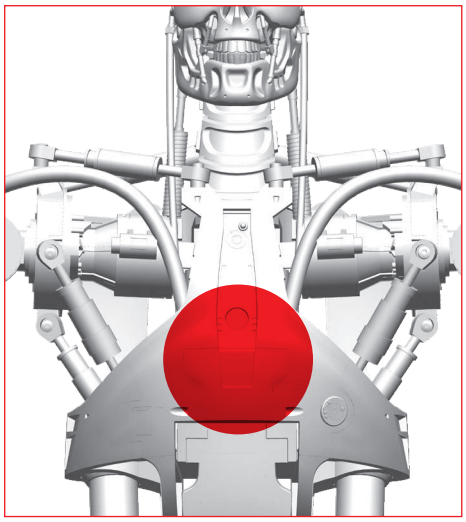
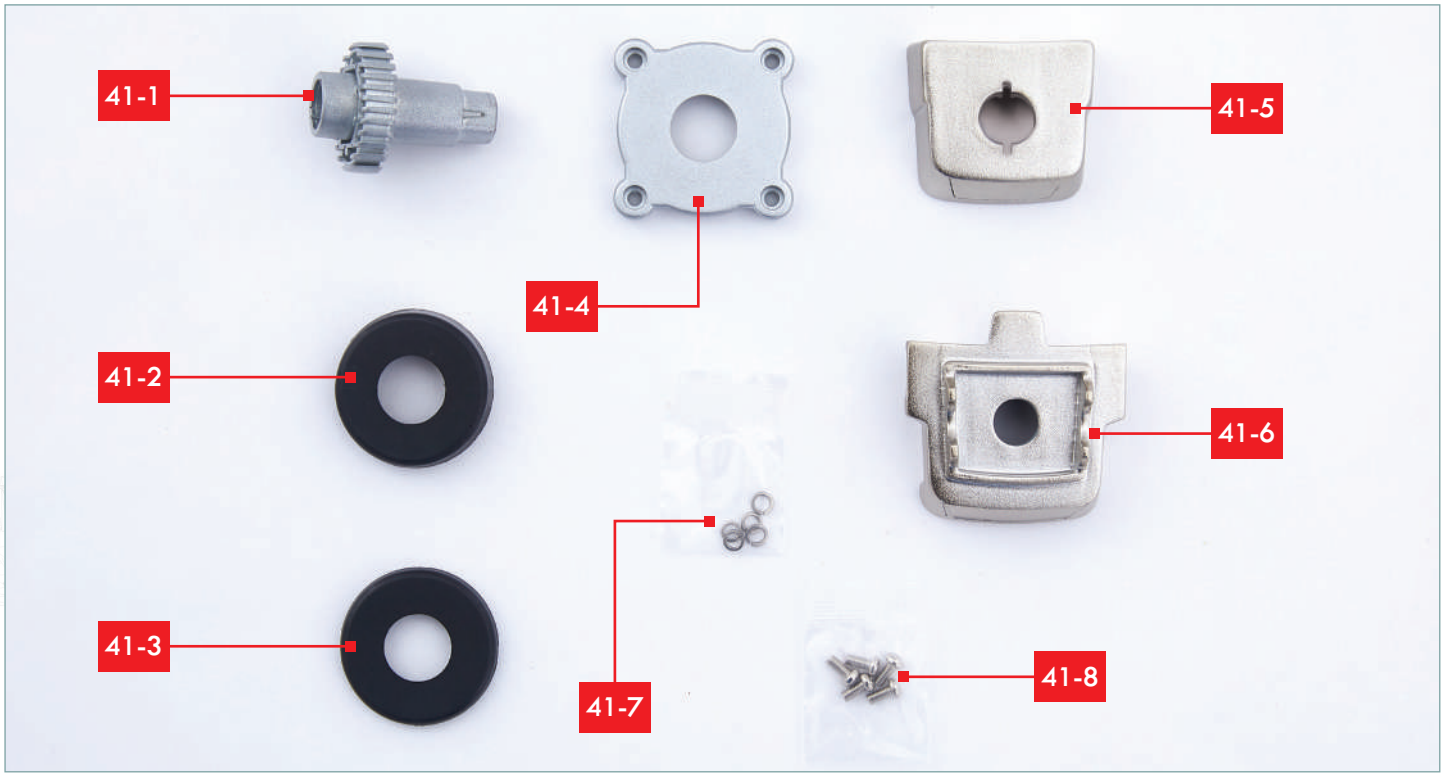
STAGE 41: FITTING A VERTEBRA AND CASING

Assemble and insert a vertebra casing to further extend the Terminator T-800™'s spine.





LIST OF PIECES

41-1	Vertebra spindle	**41-5**	Vertebra (small)
41-2	Vertebra casing (deeper)	**41-6**	Vertebra (larger)
41-3	Vertebra casing (shallower)	**41-7**	Five M3 spring washers (1 spare)
41-4	Vertebra connector	**41-8**	Five PM 3 x 6mm screws (1 spare)

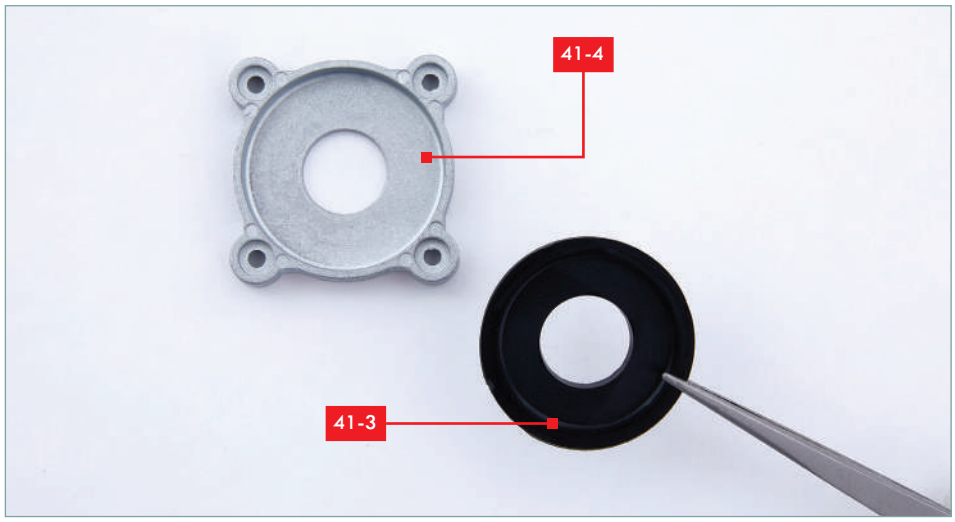
YOU WILL ALSO NEED

A cross-head screwdriver.

Tweezers (optional).

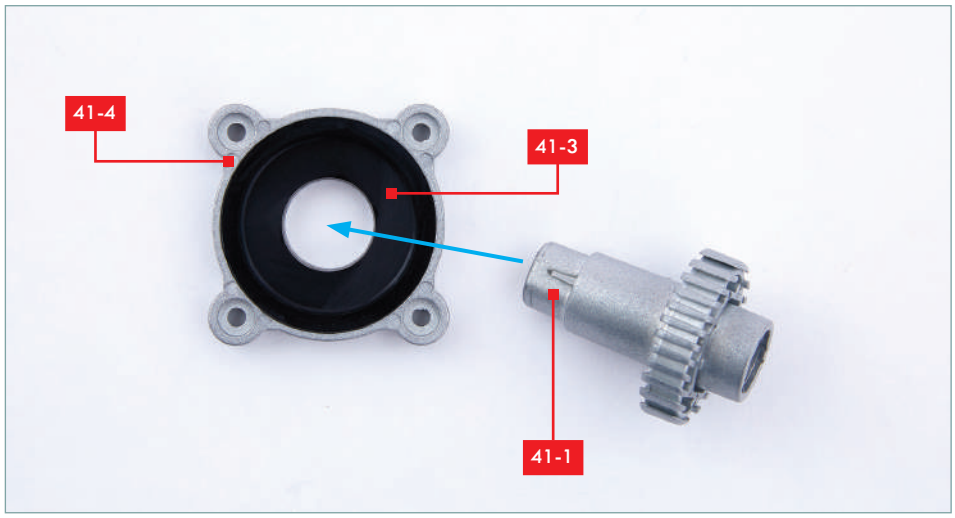
A pair of fine-nosed pliers pliers (optional).

All the parts that you have assembled so far, apart from the battery box.



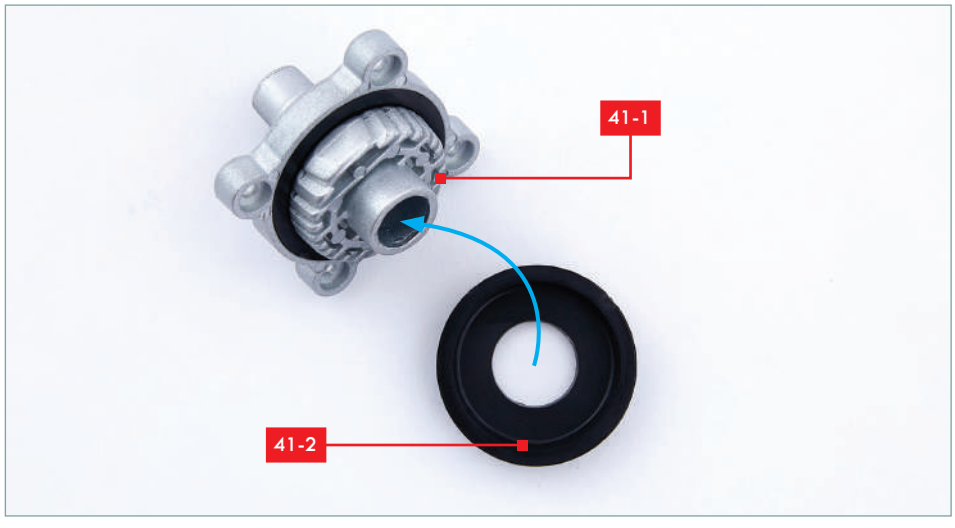
STEP 1

Fit the vertebra casing **41-3** into part **41-4**. Note that parts **41-3** and **41-2** are similar. Part **41-3** has a shallower recess, and should be positioned recess side up as seen in this photo, so that the edge of the rim of part **41-3** is level with the rim of part **41-4**.



STEP 2

Fit the longer shaft of part **41-1** into the hole in the assembled parts **41-3**/**41-4**.

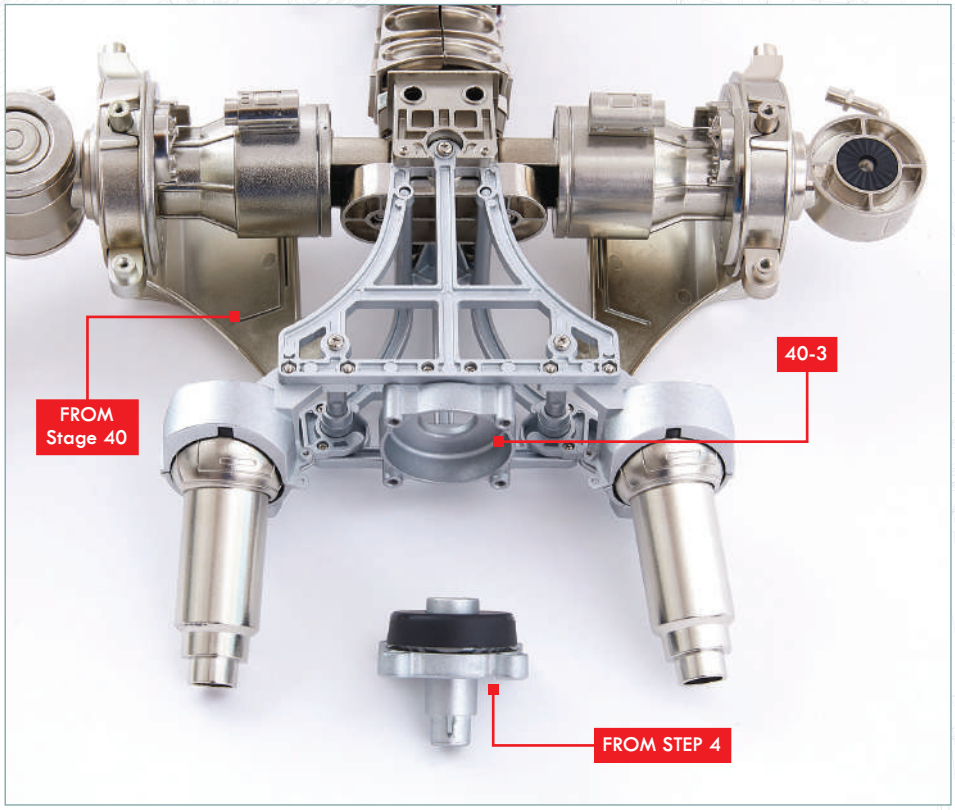


STEP 3

Take the second vertebra housing **41-2** and fit it over the short shaft of the vertebra **41-1**.

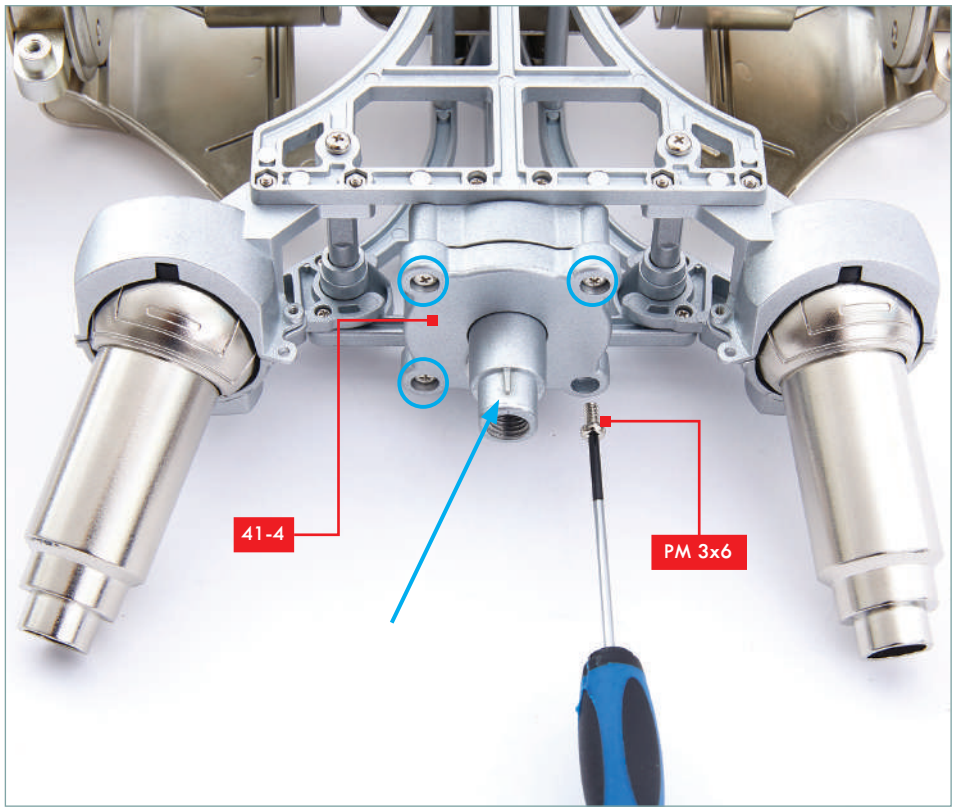
STEP 4

This shows the vertebra casing **41-2** in place. The rim of part **41-2** butts up to the rim of part **41-3**, which is inside the recess of part **41-4**.



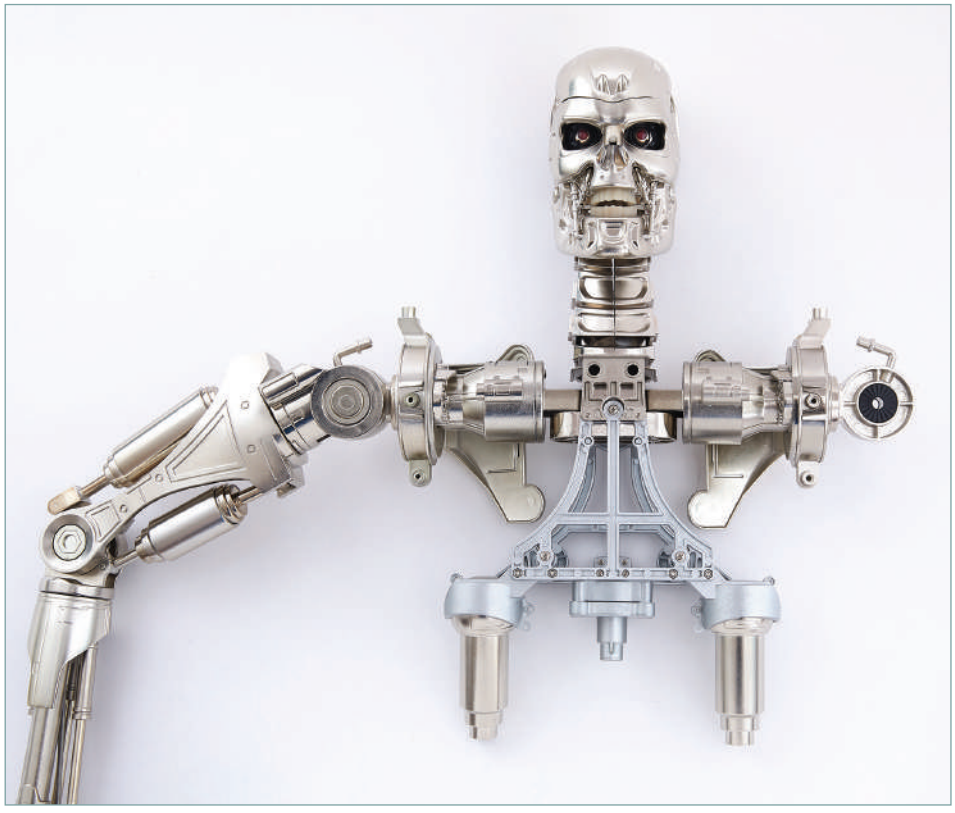
STEP 5

Place the assembly from stage 40 on your worktop, so that you can access part **40-3**. Have the assembly from step 4 ready, as shown.



STEP 6

Take four **PM** 3 x 6mm screws and fit an **M3** spring over them. Align the spline on part **41-1** to face the front as shown by the blue arrow. Fit the screws into the four holes on the underside of part **41-4** (circled) and tighten to hold the part in place. As described in stage 39, if the springs are a tight fit, squeeze them around the screw with fine-nosed pliers.

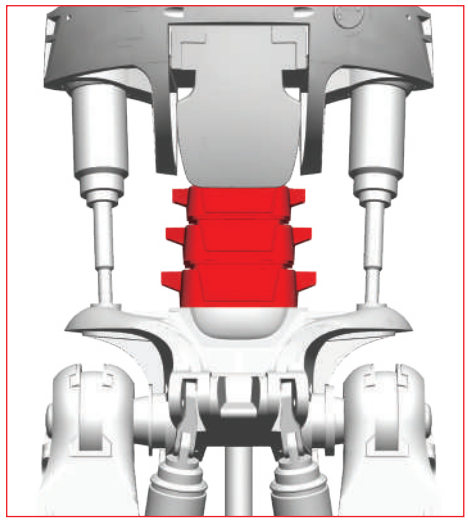


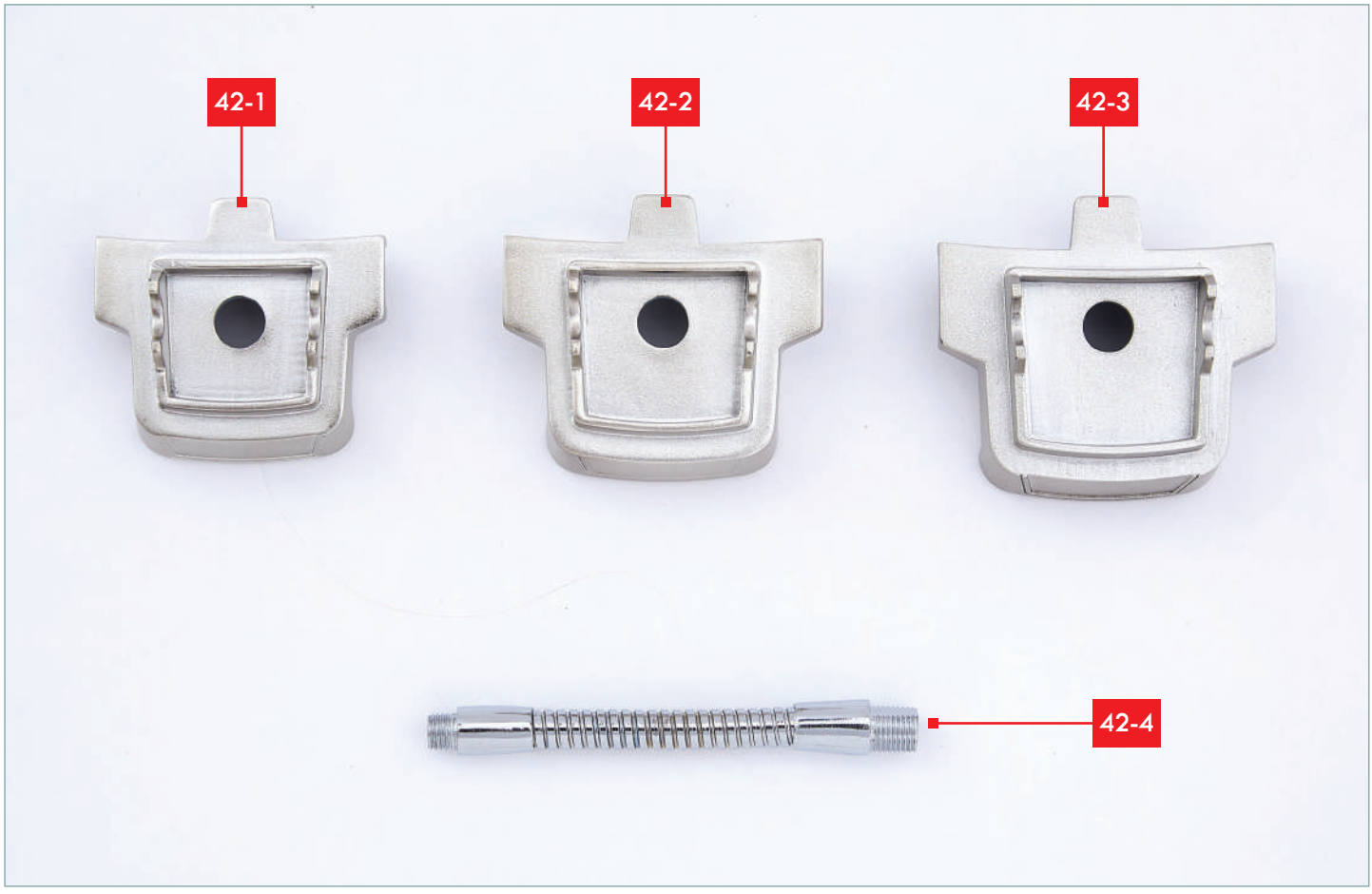
STAGE COMPLETE!

The next vertebra has been fitted to the base of the thoracic cage. The other two vertebrae supplied (**41-5** and **41-6**) will be used in the next stage.

STAGE 42: FITTING FIVE VERTEBRAE

The spine continues to take shape as you combine the vertebrae from stage 41 with the new pieces from this stage.





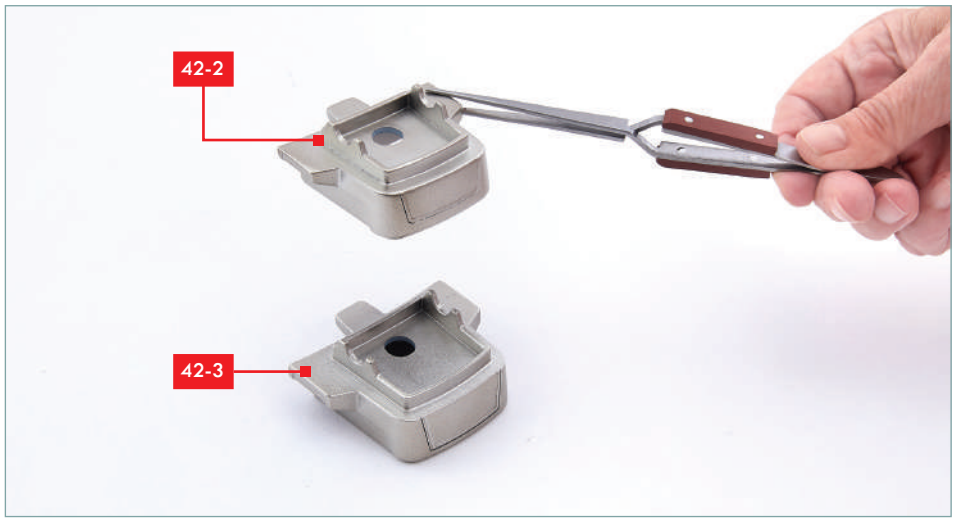
LIST OF PIECES

42-1	Vertebra (smaller)
42-2	Vertebra (medium)
42-3	Vertebra (larger)
42-4	Spinal cord

YOU WILL ALSO NEED

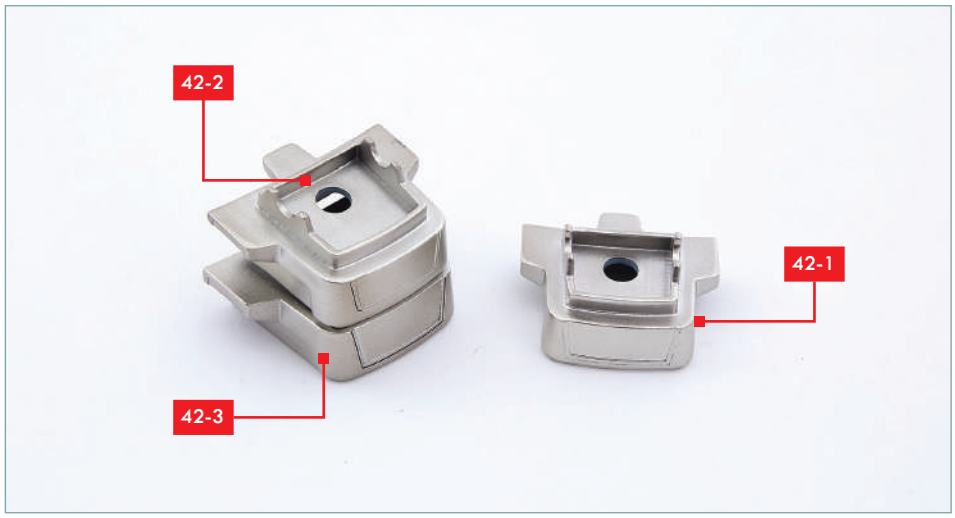
Parts 41-5 and 41-6 from stage 41.

The assembly from stage 41.



STEP 1

Place the largest vertebra, **42-3**, on your work surface and position the next in size, **42-2**, on top of it so that the rim on part **42-3** fits into the hollow in part **42-2**.

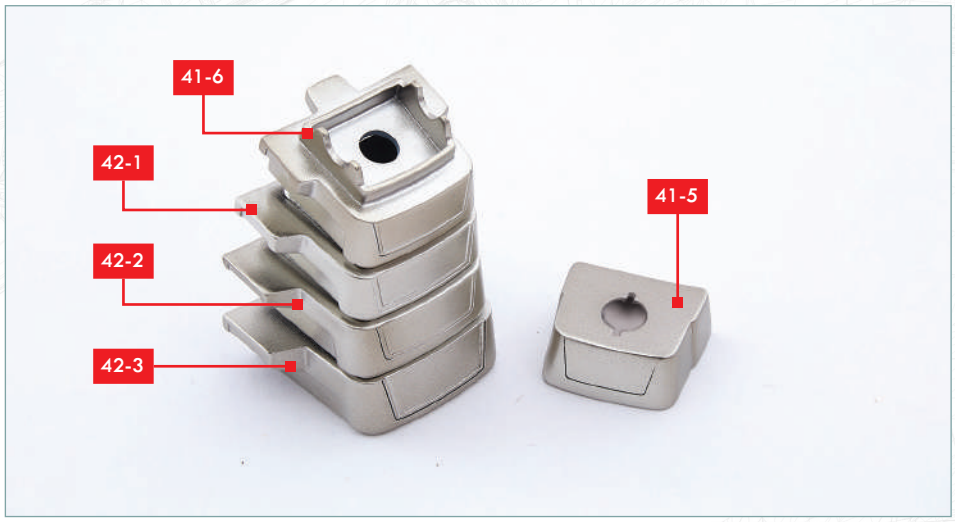


STEP 2

Note that the fit is not tight – there is 'wobble' room between the vertebrae. Next, take part **42-1**.

STEP 3

Fit vertebra **42-1** on top of vertebra **42-2**. The next piece to add is part **41-6**.

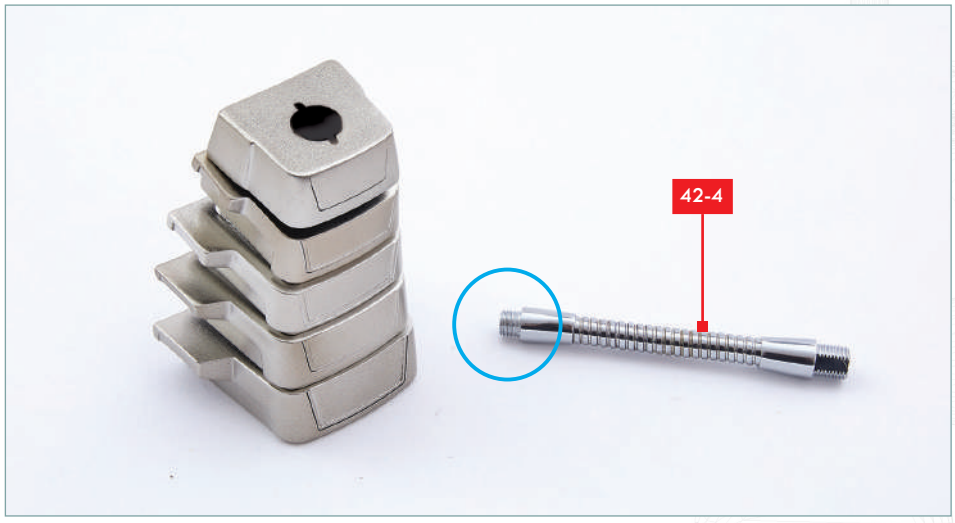


STEP 4

Position vertebra **41-6** on top of vertebra **42-1**. The next piece to add is part **41-5**.

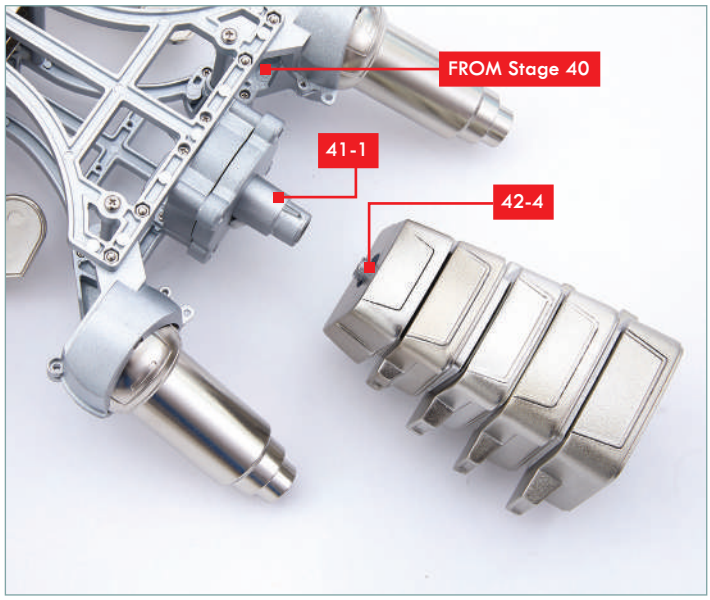
STEP 5

The five vertebrae are now assembled, with the smallest, **41-5**, on top of the pile.



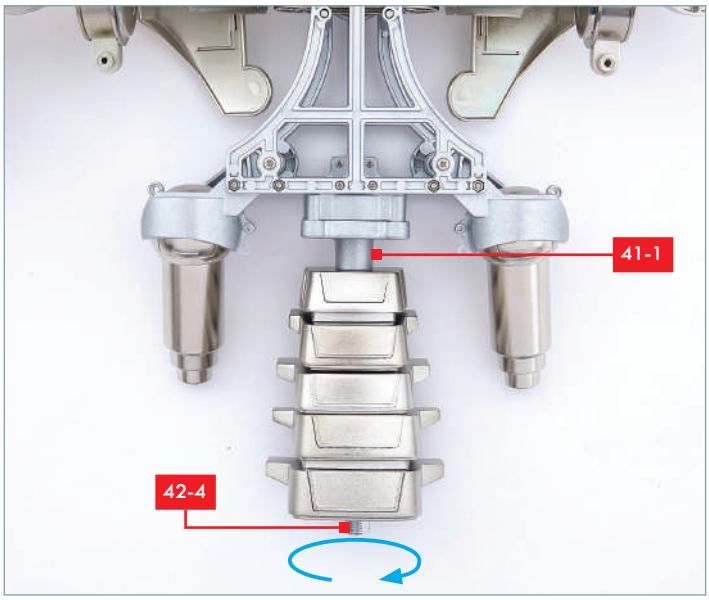
STEP 6

Take the spinal cord **42-4**. Note that one end (circled) has a narrower 'cuff' than the other.



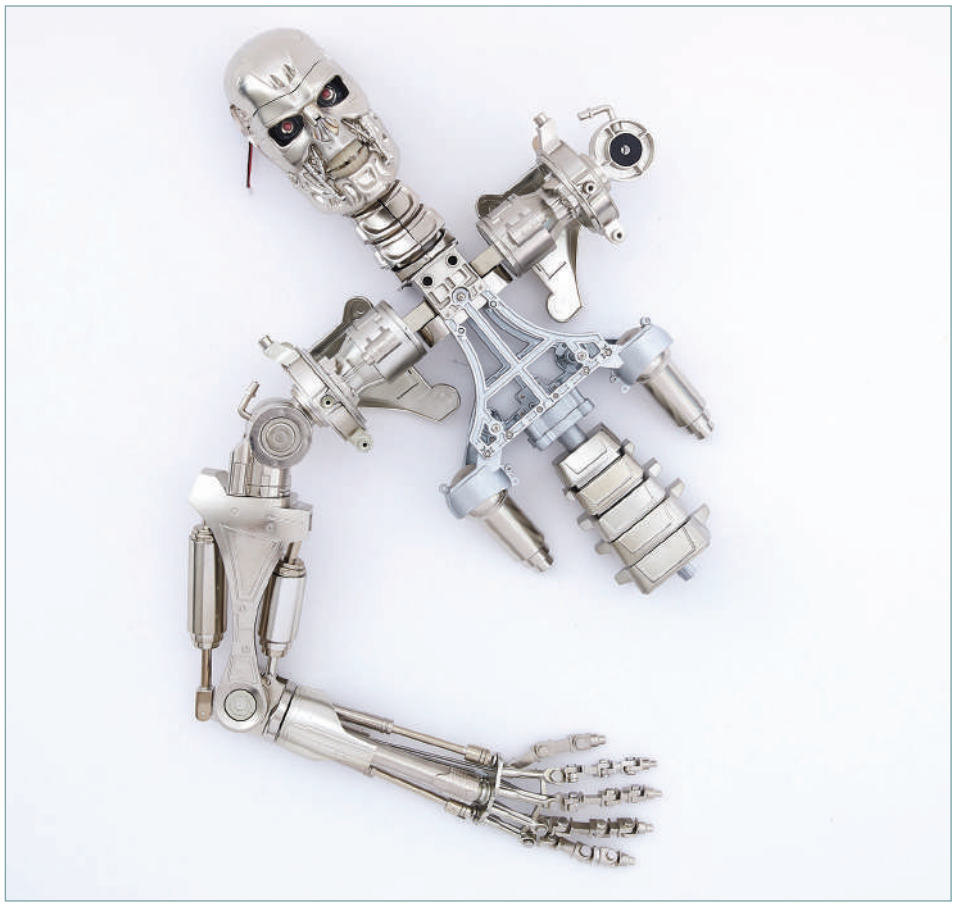
STEP 7

Fit the narrower end of the spinal cord **42-4** through the centre of all five vertebrae so that it is at the top. Place the assembly from stage 41 on your work surface.



STEP 8

Fit the top end of the spinal cord **42-4** into the open end of part **41-1**. Tighten part **42-4** by turning by hand, as indicated by the arrow.



STAGE COMPLETE!

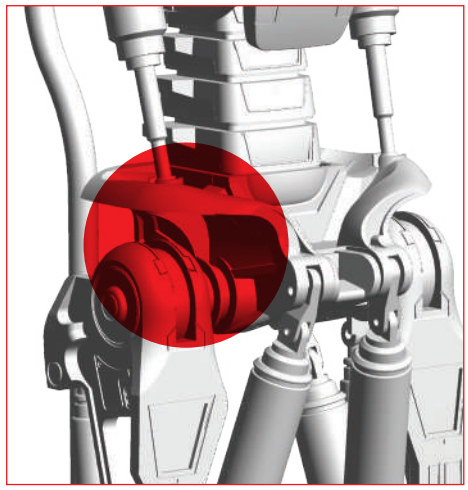
Five graduated vertebrae have been fitted to the thoracic cage structure.

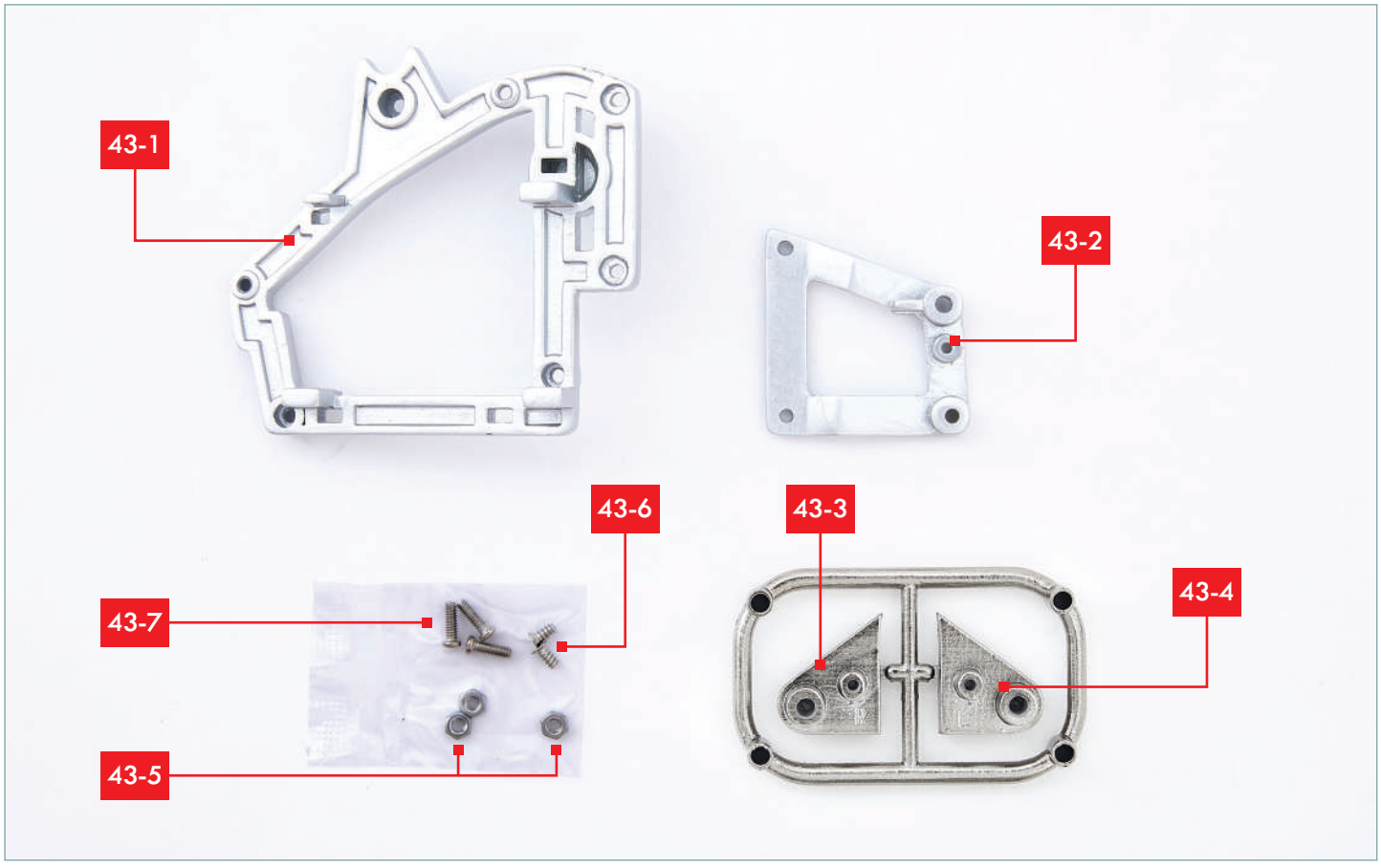
EXPERT TIP!

Your model is growing fast, and needs to be stored carefully. We found that a plastic 'under-bed' storage box, lined with bubble wrap, was a convenient shape.

STAGE 43: STARTING WORK ON THE PELVIS

You will begin to assemble the pelvis, onto which the Terminator T-800's legs will be mounted.





LIST OF PIECES

43-1	Pelvic frame (right)	**43-5**	Three M2 nuts (1 spare)
43-2	Pelvic frame (right)	**43-6**	Two KB 2 x 4mm screws (1 spare)
43-3	Pelvic plate (right)	**43-7**	Three PM 2 x 6mm screws (1 spare)
43-4	Pelvic plate (left)		

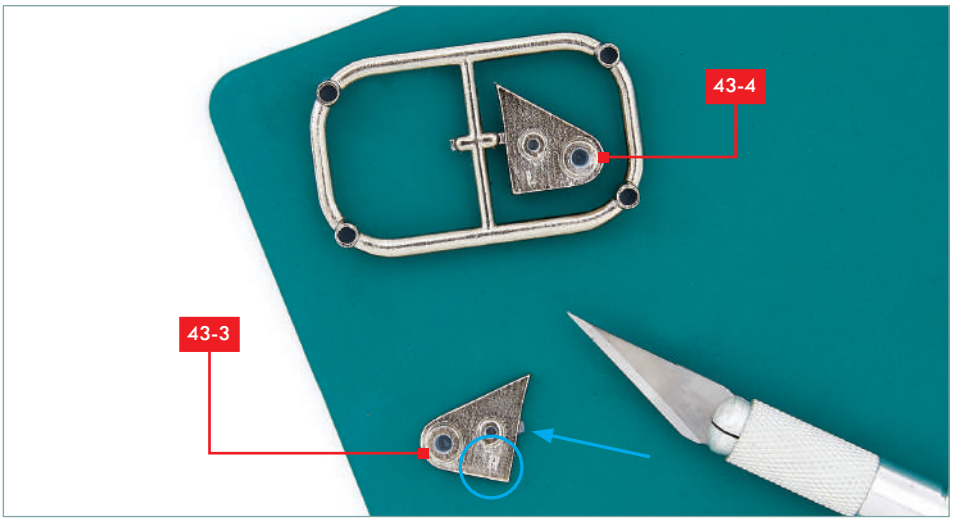
YOU WILL ALSO NEED

A cross-head screwdriver.

Tweezers (optional).

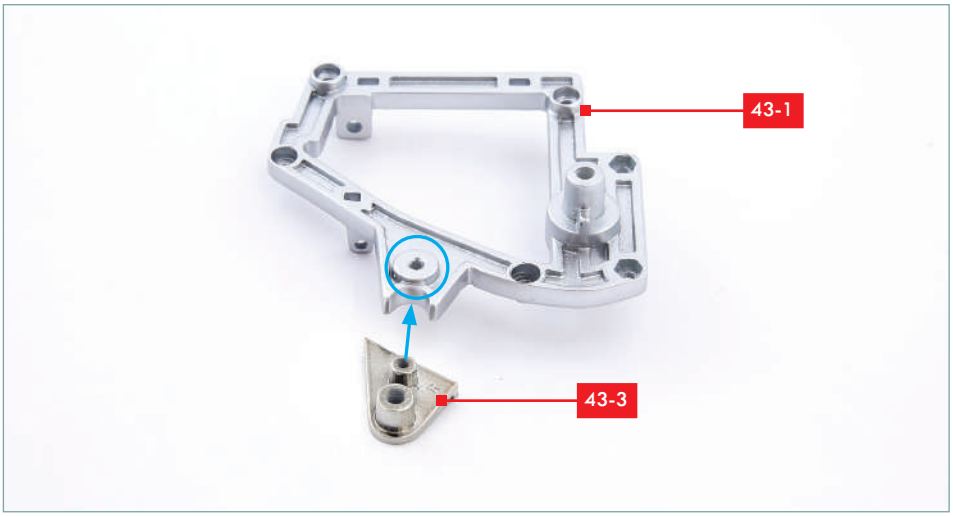
A sharp craft knife and suitable cutting surface.

A fine file.



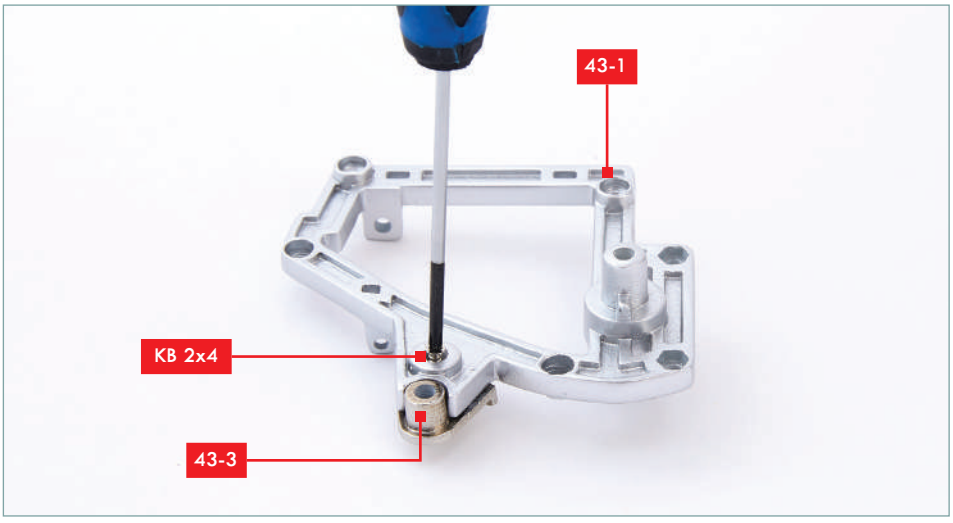
STEP 1

Cut the right pelvic plate **43-3** (marked R, circled) from the frame. Use a fine file to smooth any roughness where it has been removed from the frame (arrow).



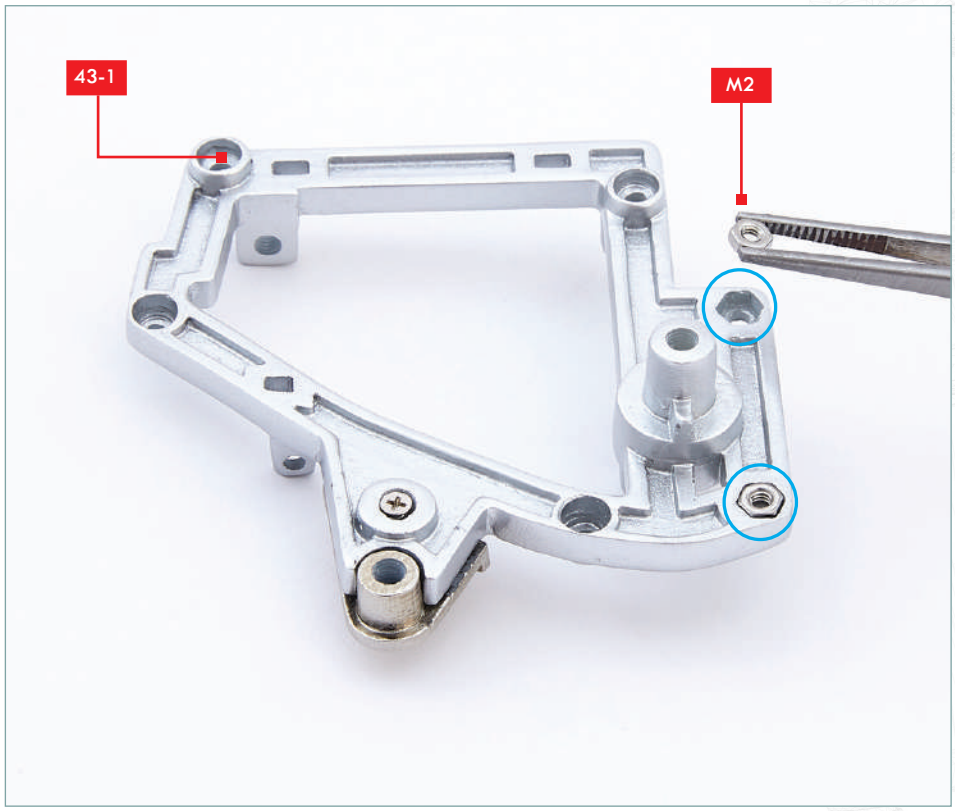
STEP 2

Position the pelvic frame **43-1** on your work surface as shown. Fit the smaller raised socket on the plate **43-3** into the hole in part **43-1** (circled). It fits in from beneath when the parts are in the orientation shown here.



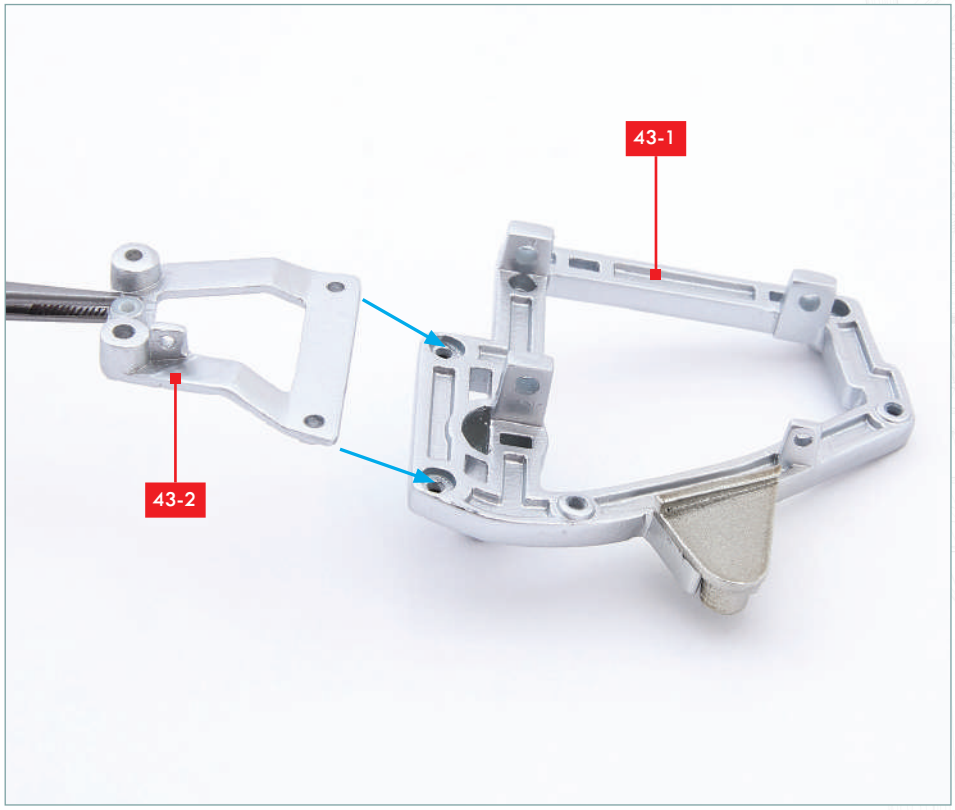
STEP 3

Fix part **43-3** in place with a **KB** 2 x 4mm screw.



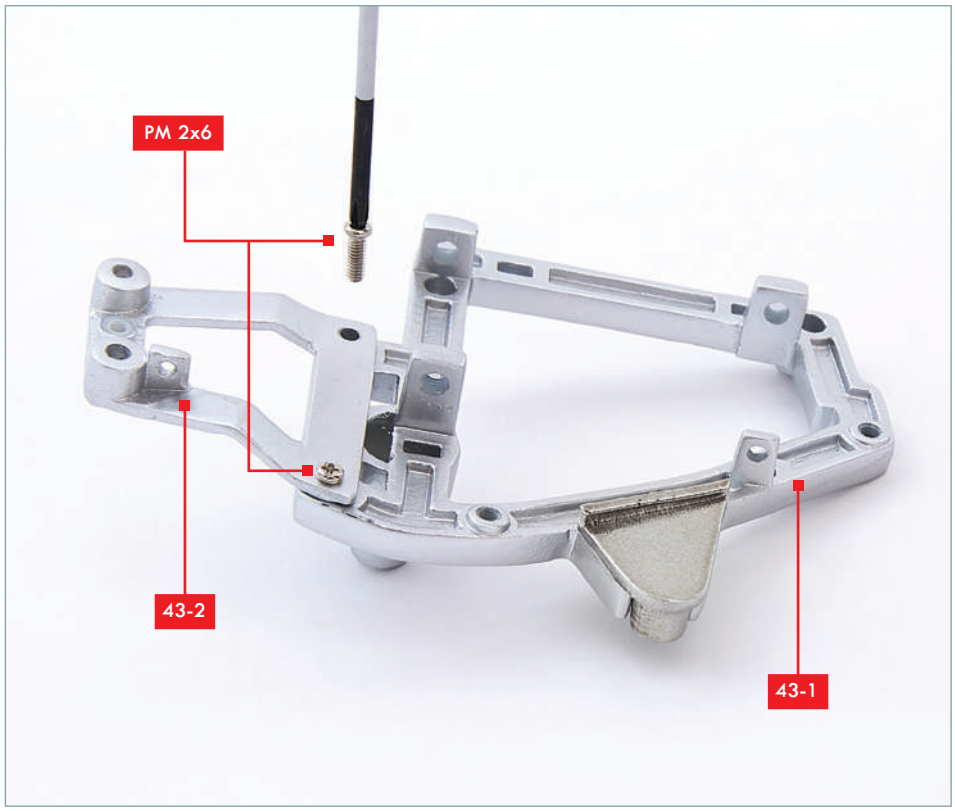
STEP 4

Fit an **M2** nut into each of the two hexagonal recesses (circled) in part **43-1**.



STEP 5

Turn part **43-1** over, taking care that the nuts do not fall out. Take the pelvic frame **43-2** and align the two screw sockets with the recesses on part **43-1**, as indicated by the arrows. Note that there are raised areas on the underside of part **43-2** that fit into the recesses.



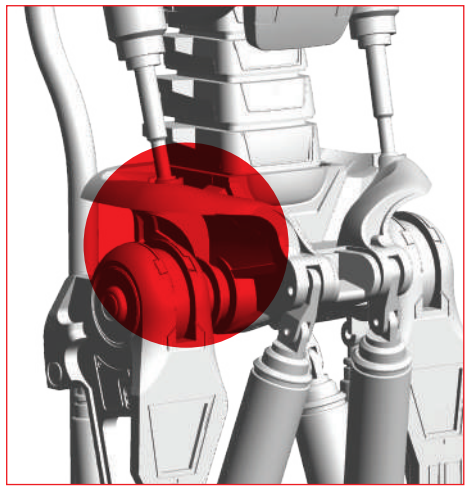
STEP 6

Fix the two parts together with two **PM** 2 x 6mm screws.

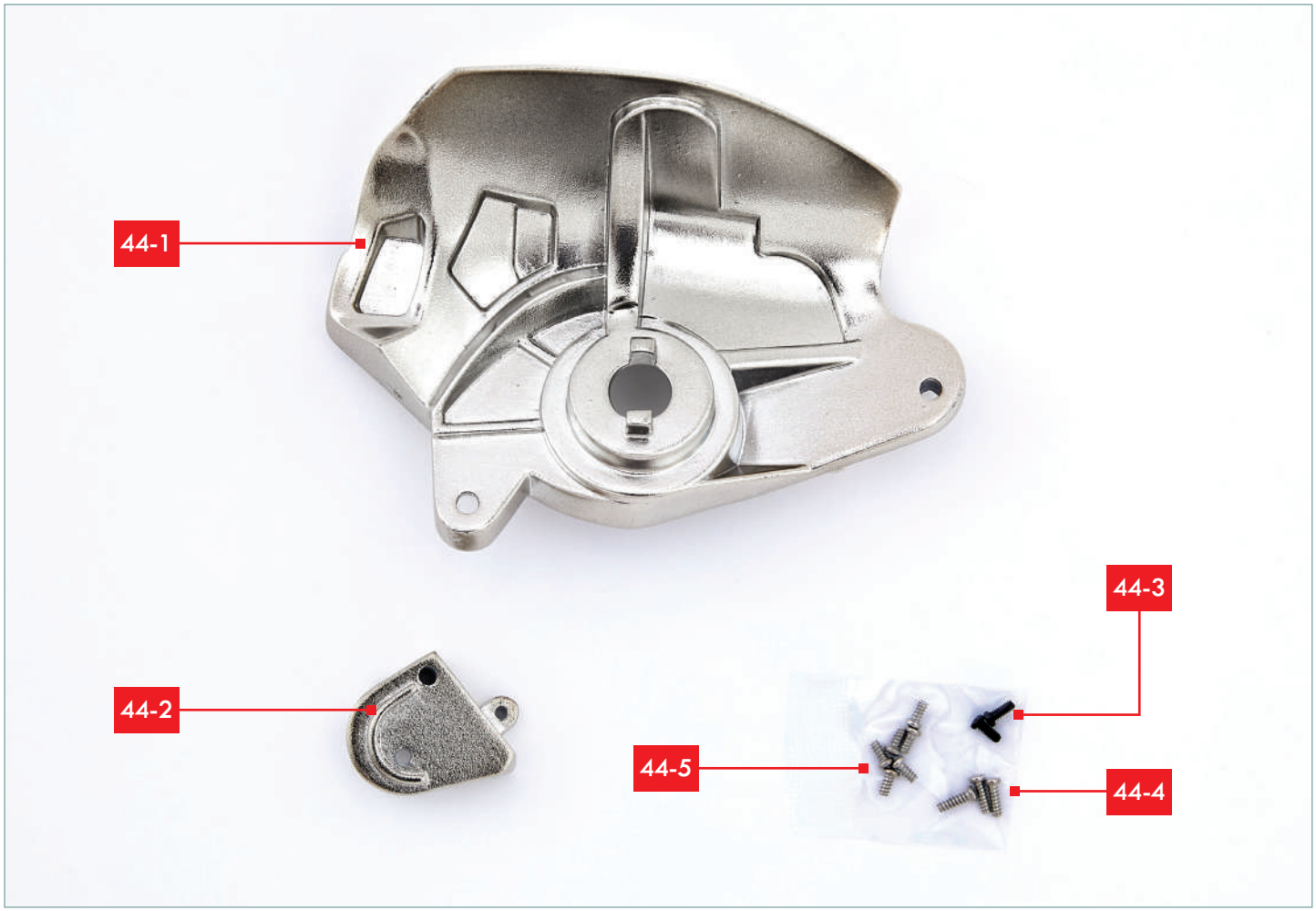
STAGE COMPLETE!

Pieces of the right pelvic frame have been assembled. The left pelvic plate **43-4** will be used in a future stage. We suggest that you leave it attached to the frame at this stage.

STAGE 44: WORKING ON THE RIGHT PELVIS



Extending the pelvis, by attaching the pelvic frame to the pelvic girdle.



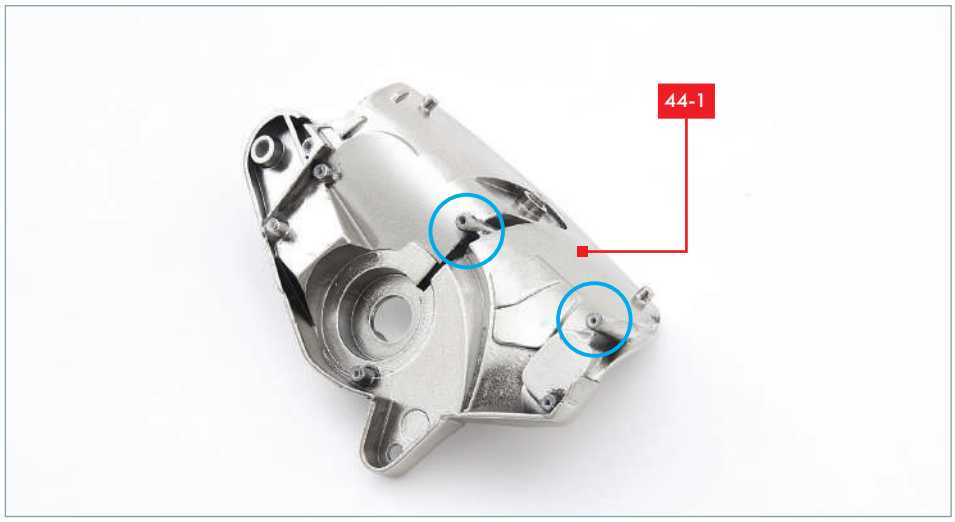
LIST OF PIECES

44-1	Pelvic girdle (right)	**44-4**	Three PB 2 x 6mm screws (1 spare)
44-2	Pelvic girdle detail (right)	**44-5**	Six PB 2 x 4mm screws (1 spare)
44-3	Two PM 2 x 4mm screws (1 spare)		

YOU WILL ALSO NEED

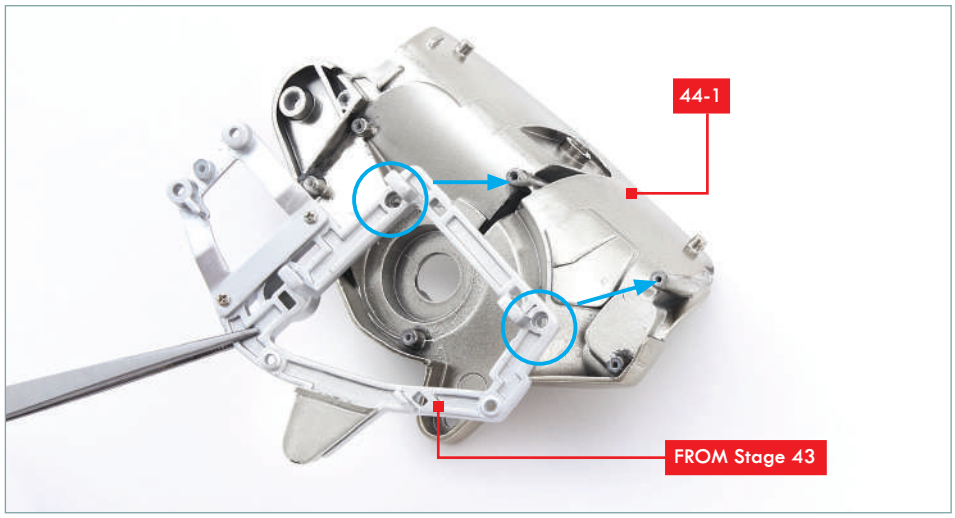
A cross-head screwdriver.

Right pelvic frame from the previous stage.



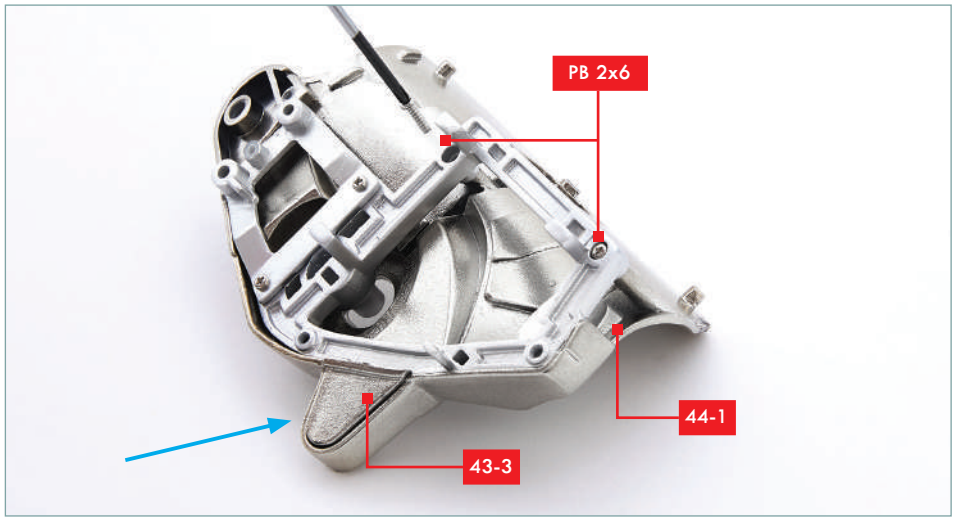
STEP 1

Position the right pelvic girdle **44-1** on your work surface and identify the fixing points for the pelvic frame (circled).



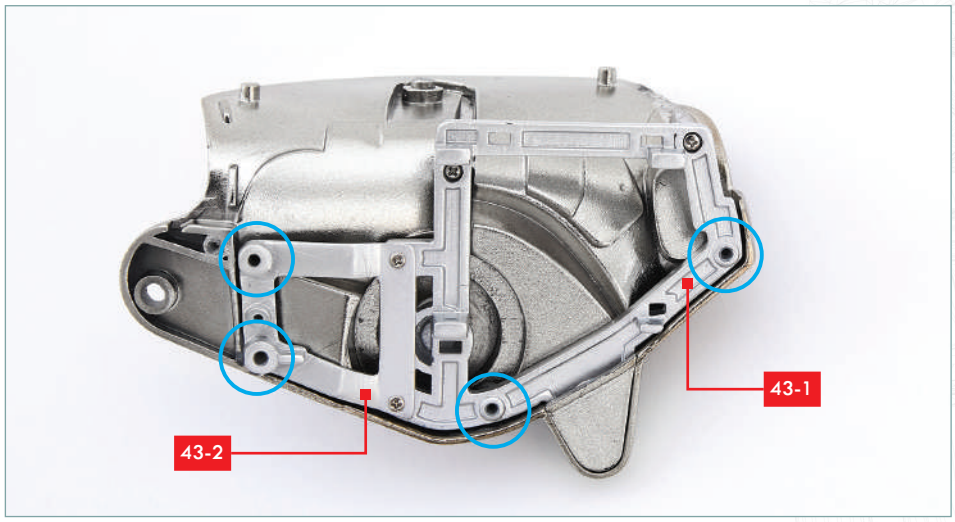
STEP 2

Take the pelvic frame assembly from stage 43 and position it on the pelvic girdle **44-1** so that the screw holes (circled) align with the fixing points identified in step 1.



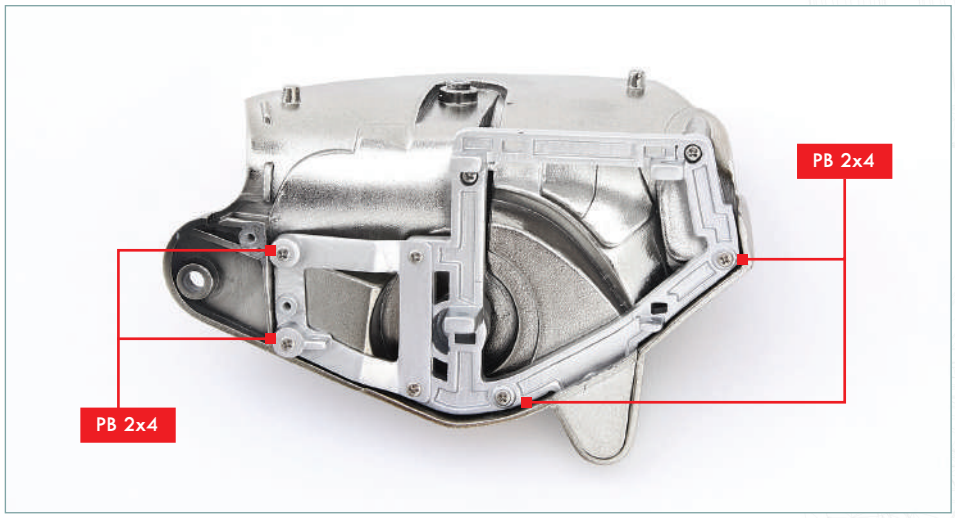
STEP 3

When in place, the outer edge of the frame should fit neatly into part **44-1**, with the pelvic plate **43-3** in the matching recess in part **44-1** (arrow). When correctly positioned, fix in place with two **PB** 2 x 6mm screws.



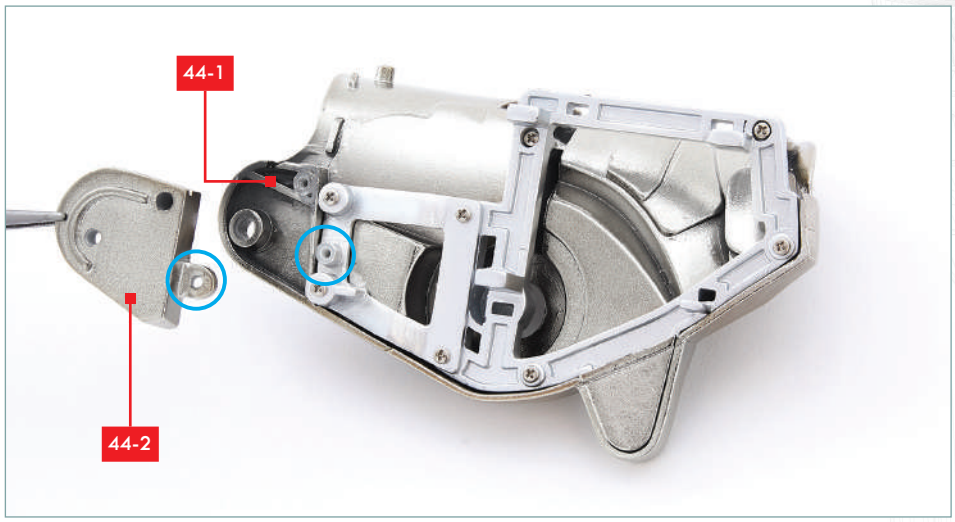
STEP 4

Identify the four fixing points (circled) on pelvic frame parts **43-1** and **43-2**.



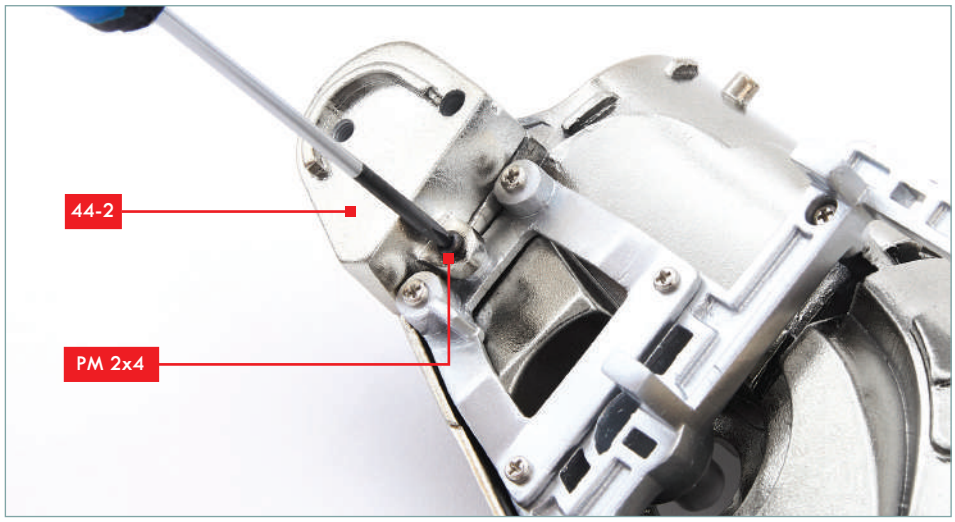
STEP 5

Use four **PB** 2 x 4mm screws to fix the pelvic frame in place, as shown here.



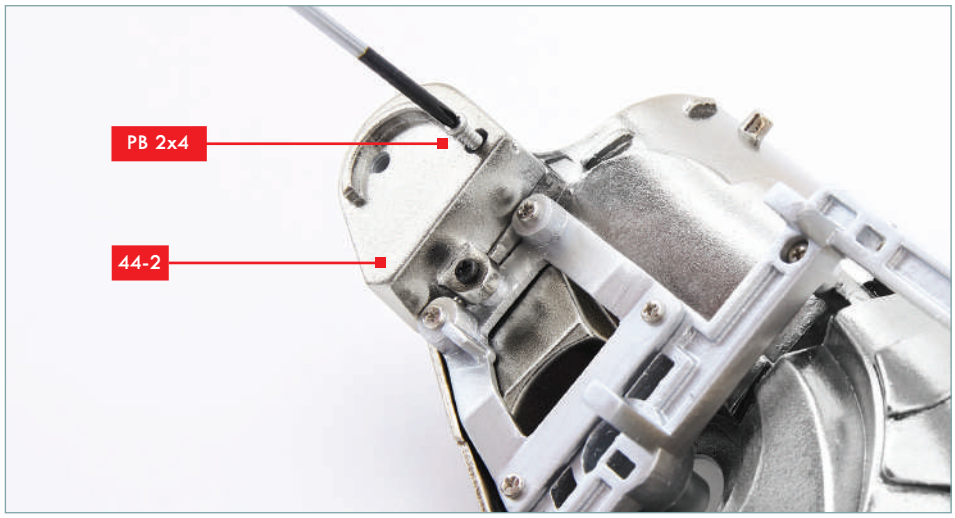
STEP 6

Take the pelvic girdle detail **44-2** and fit it against the rounded end of part **44-1** so that the screw holes (circled) are aligned.



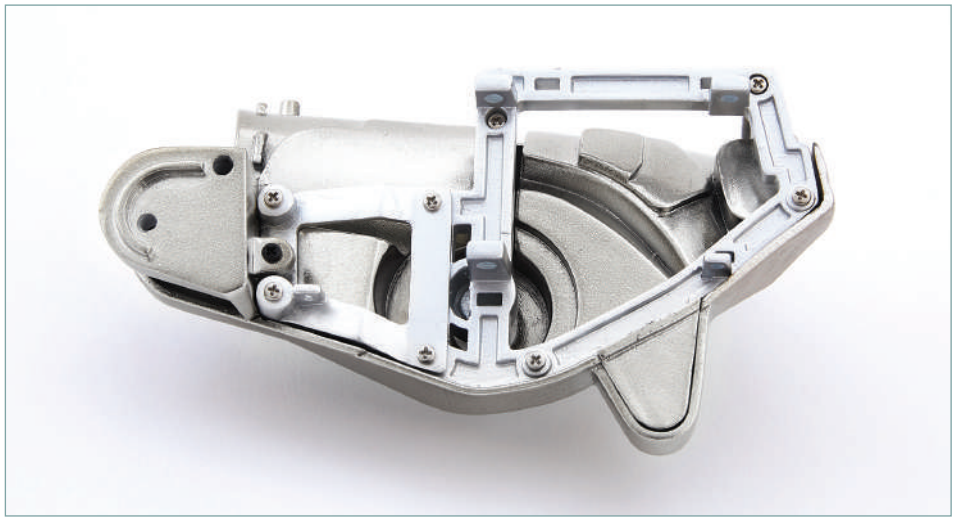
STEP 7

Fix part **44-2** in place with a **PM** 2 x 4mm screw.



STEP 8

Take a **PB** 2 x 4mm screw and fit it into the screw socket at the corner of part **44-2**. Tighten the screw to fix the parts together.

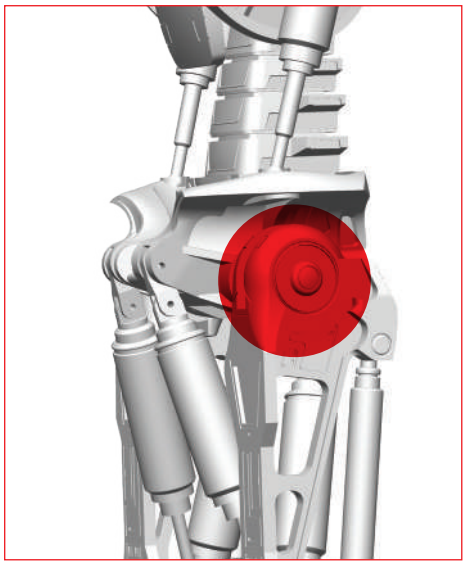


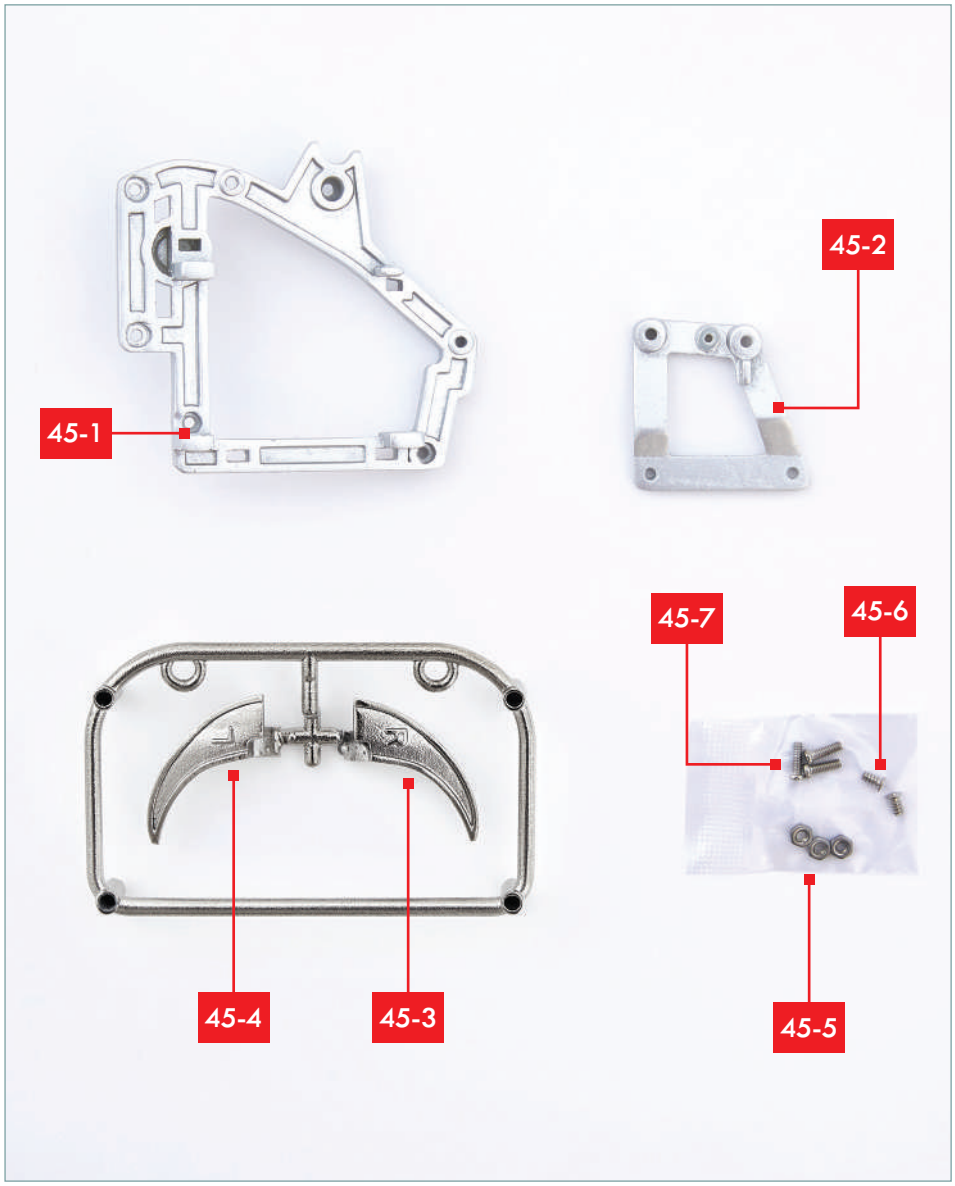
STAGE COMPLETE!

The pelvic frame and a detail have been attached to the right pelvic girdle.

STAGE 45: THE LEFT PELVIC FRAME

Extend the pelvis by completing the left pelvic frame and adding detail to the right.





LIST OF PIECES

45-1	Pelvic frame (left)
45-2	Pelvic frame (left)
45-3	Pelvic girdle detail (right)
45-4	Pelvic girdle detail (left)
45-5	Three M2 nuts (1 spare)
45-6	Two KB 2 x 4mm screws (1 spare)
45-7	Three PM 2 x 6mm screws (1 spare)

YOU WILL ALSO NEED

A sharp craft knife and cutting surface.

A cross-head screwdriver.

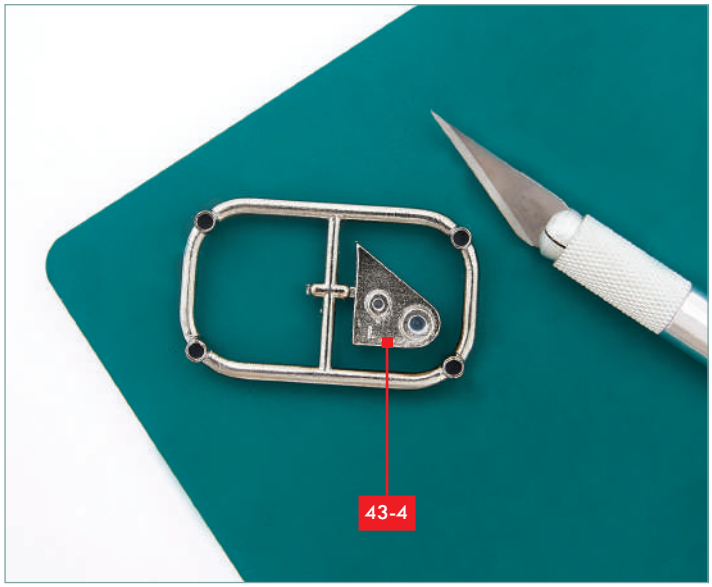
Tweezers (optional).

Fine file.

Left pelvic plate 43-4 supplied with stage 43.

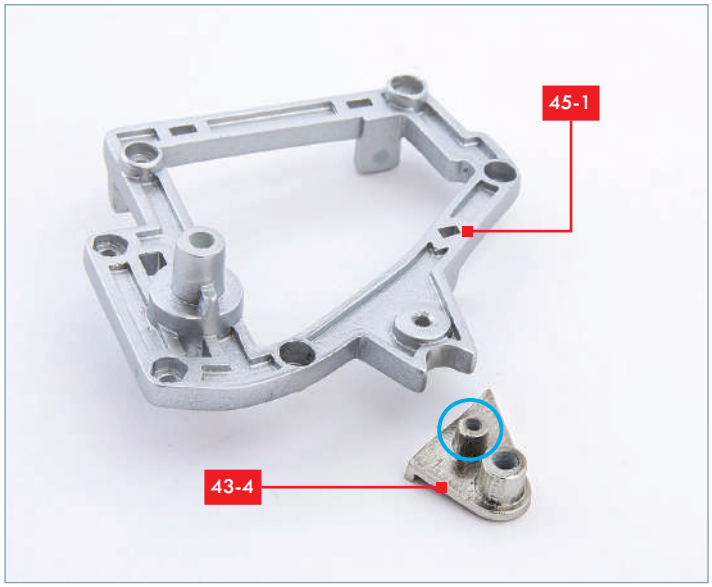
Right girdle assembly from stage 44.

Superglue and a cocktail stick.



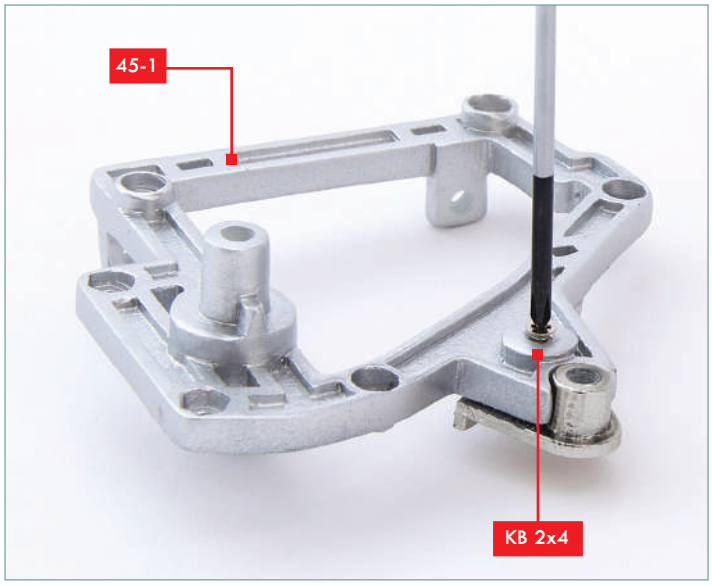
STEP 1

If you have not already done so, cut part **43-4** from the frame and remove any rough edges with a fine file. Take care when using a craft knife; it is advisable to work on a cutting mat or other suitable surface.



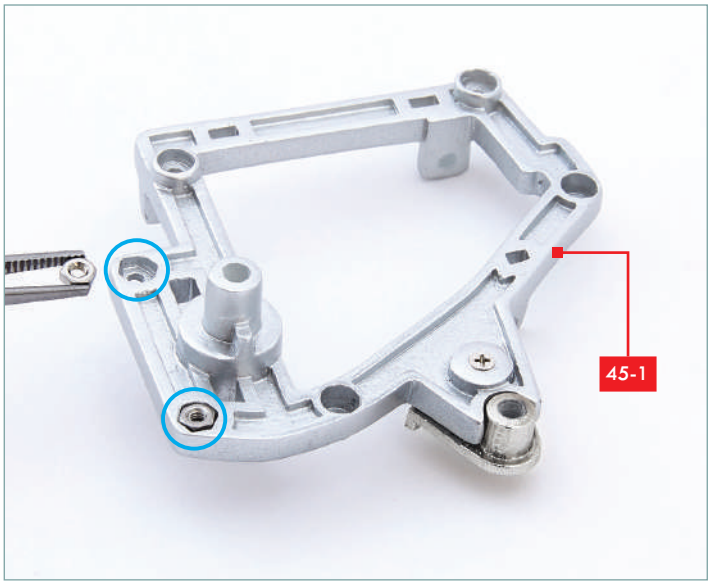
STEP 2

Take the pelvic frame **45-1** and position it as shown. Fit part **43-4** under the matching shape on the frame so that the raised screw socket (circled) fits into a recess on the frame (the recess is on the underside when viewed from this angle).



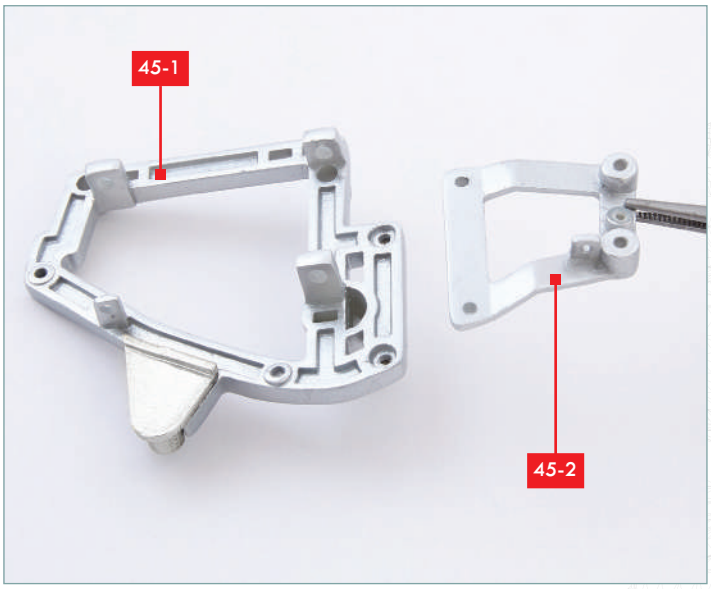
STEP 3

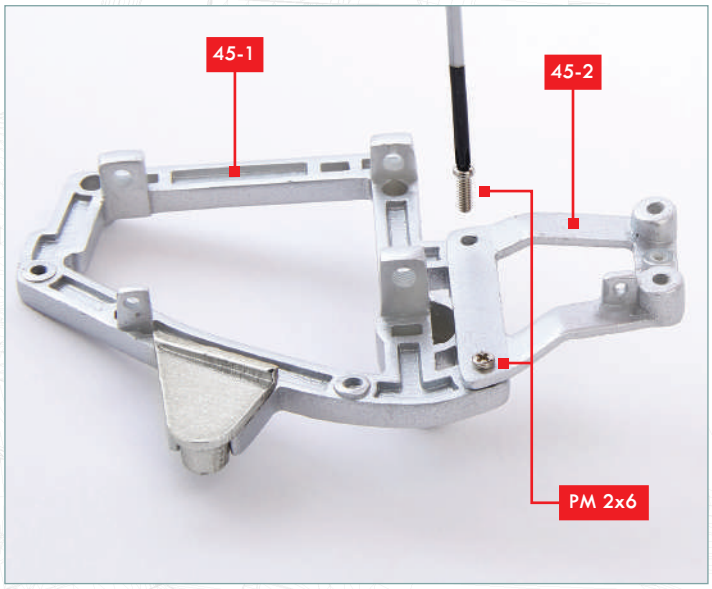
Fix the two parts together with a **KB** 2 x 4mm screw.



STEP 4

Fit two **M2** nuts into the hexagonal recesses in part **45-1** (circled).



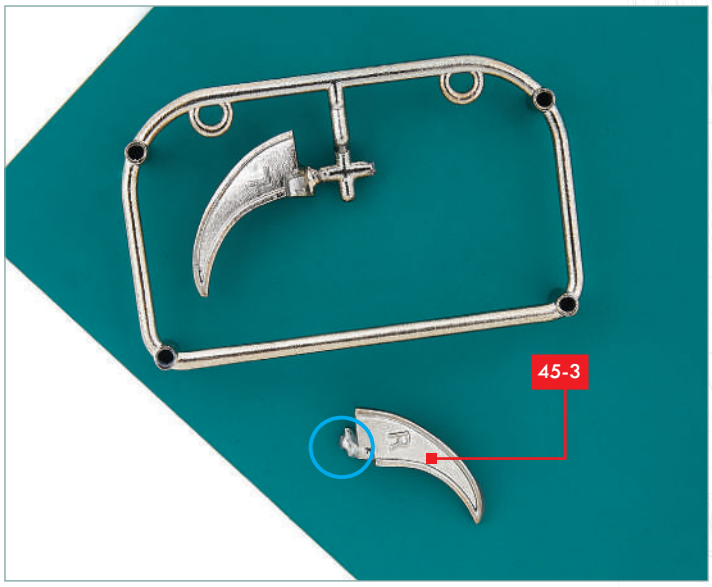


STEP 5

Turn the frame **45-1** over, ensuring that the nuts stay in place. Position part **45-2** so that the two screw holes align with the recesses in part **45-1**. Note that there are raised areas around the holes in part **45-2** (on the underside, when viewed from this angle), which fit into the recesses in part **45-1**.

STEP 6

Fix the pelvic frame **45-2** to part **45-1** with two **PM** 2 x 6mm screws.

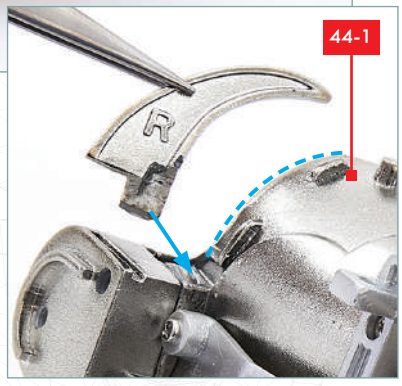


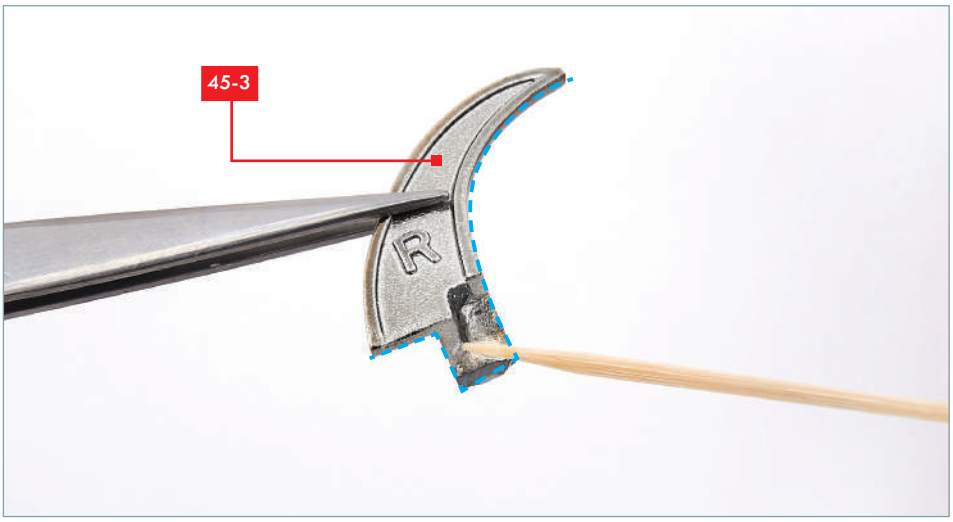
STEP 7

Cut the right pelvic detail **45-3** from the frame, ensuring that the 'foot' (circled) is still attached. Remove any roughness where it was joined to the frame.

STEP 8

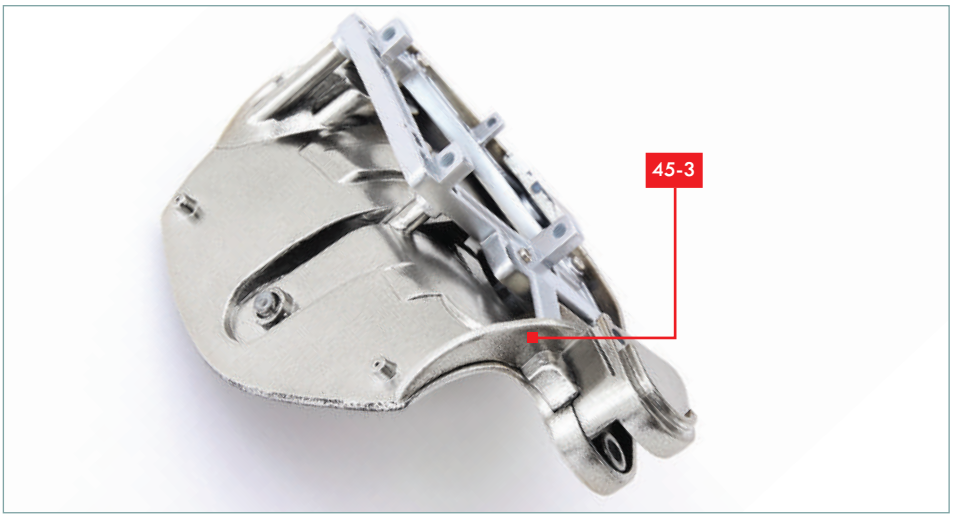
Check the fit of part **45-3** at the end of the assembly from stage 44. The 'foot' fits into a recess (arrow, inset), and the inner curved edge fits against part **44-1**, between the edge of part 44-1 and the two raised tabs (dotted line, inset).





STEP 9

Apply a very small amount of superglue to the edges of part **45-3** that will be in contact with the assembly from stage 44 (highlighted with a blue dotted line).



STEP 10

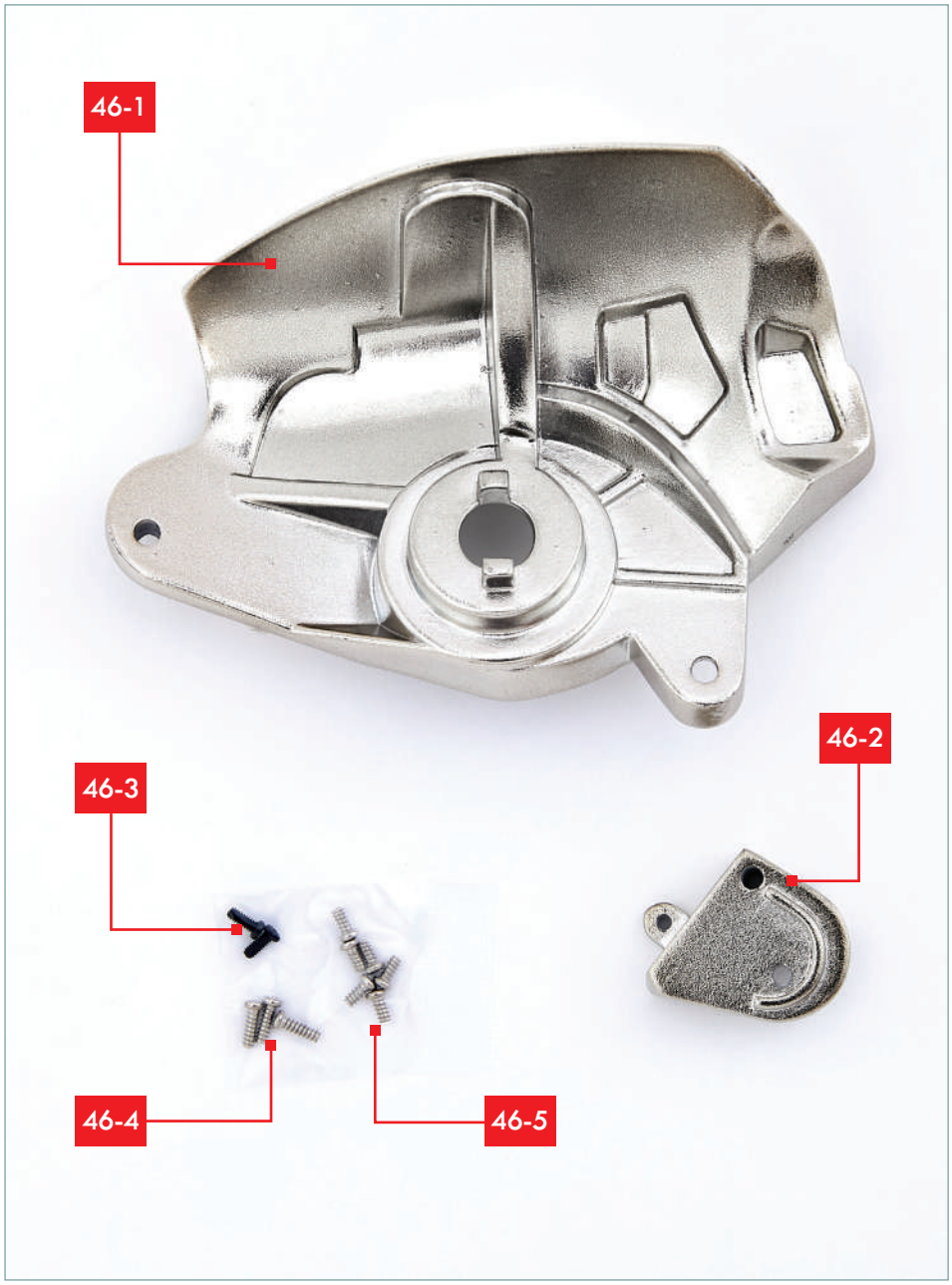
Fix part **45-3** in place (seen here from the opposite side) ensuring that all the glued edges are in contact.

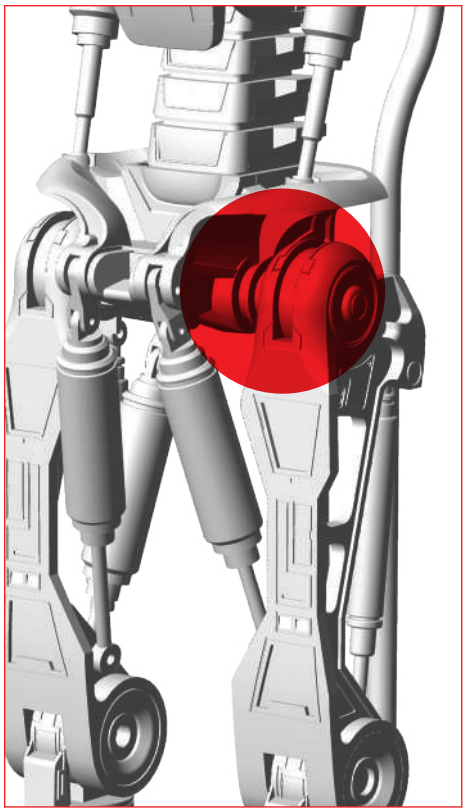
STAGE COMPLETE!

The left pelvic girdle frame has been assembled, and a detail has been attached to the right pelvis. Part **45-4** will be used in a future stage. We suggest that you leave it on the frame at this stage.

STAGE 46: WORKING ON THE RIGHT PELVIS

Combine the assembled left pelvic frame from the previous stage with this stage's components.





LIST OF PIECES

46-1	Pelvic girdle (left)
46-2	Pelvic girdle detail (left)
46-3	Two PM 2 x 4mm screws (1 spare)
46-4	Three PB 2 x 6mm screws (1 spare)
46-5	Six PB 2 x 4mm screws (1 spare)

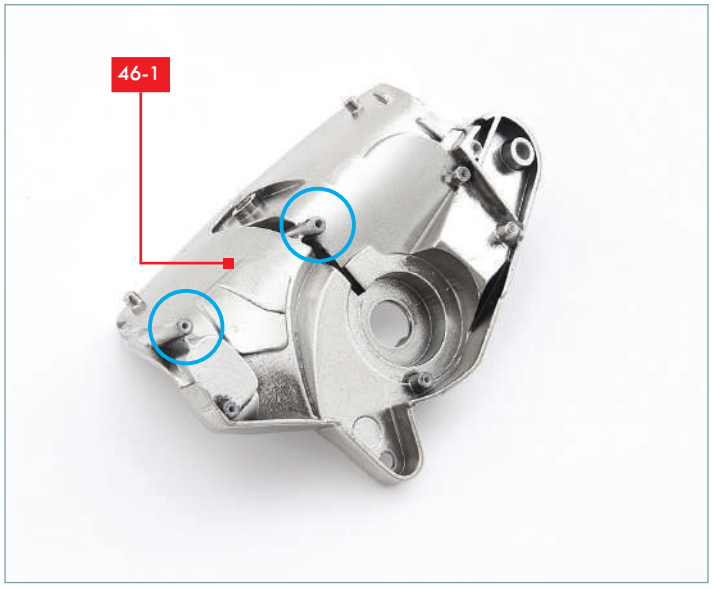
YOU WILL ALSO NEED

A cross-head screwdriver.

Left pelvic frame and pelvic accessory 45-4 from the previous stage.

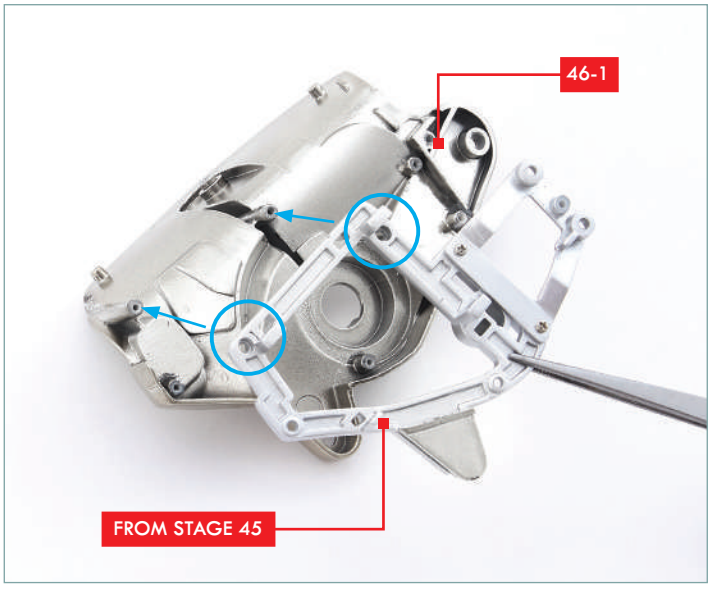
Fine file.

Superglue and cocktail stick.



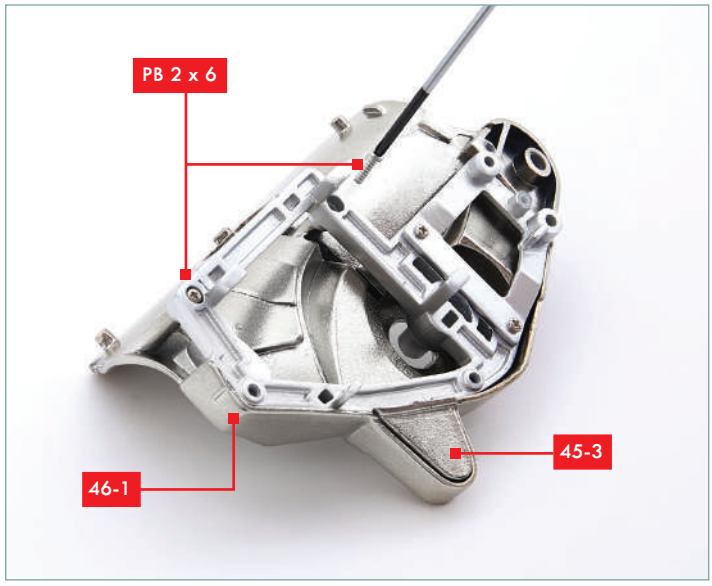
STEP 1

Position the left pelvic girdle **46-1** on your work surface and identify the fixing points for the pelvic frame (circled).



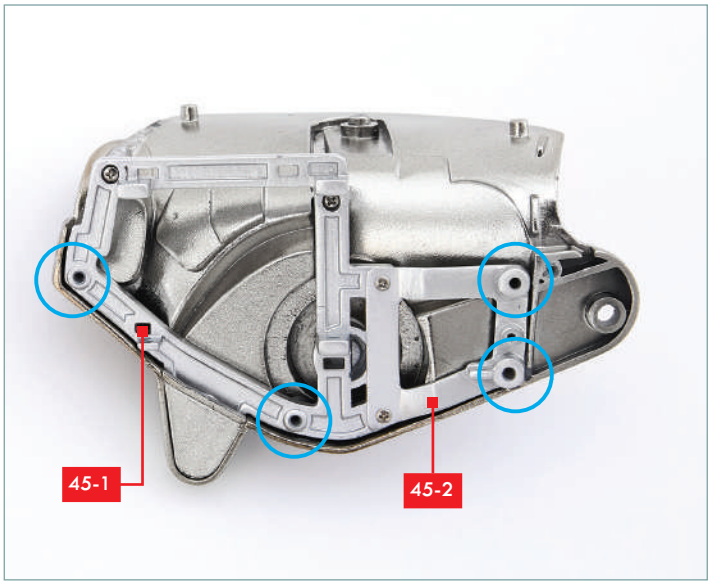
STEP 2

Take the pelvic frame assembly from stage 45 and position it on the pelvic girdle **46-1** so that the screw holes (circled) align with the fixing point identified in step 1.



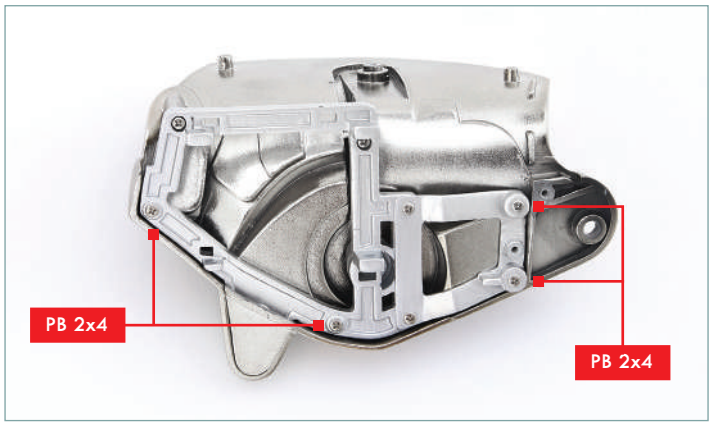
STEP 3

When in place, the outer edge of the frame should fit neatly into part **46-1**, with the pelvic plate **45-3** in the matching recess in part **46-1**. When correctly positioned, fix in place with two **PB** 2 x 6mm screws.



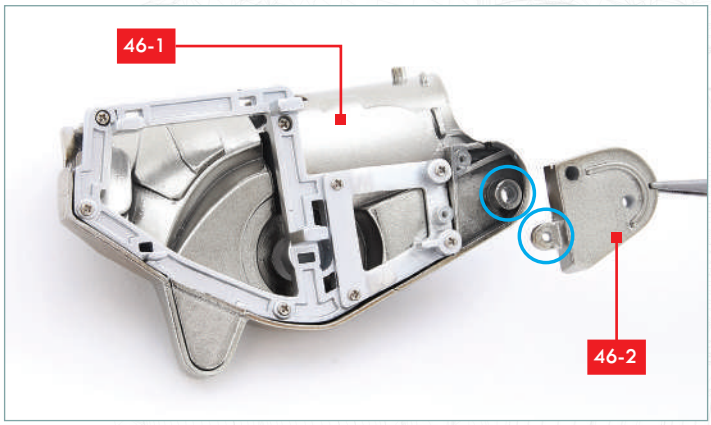
STEP 4

Identify the four fixing points (circled) on pelvic frame parts **45-1** and **45-2**.



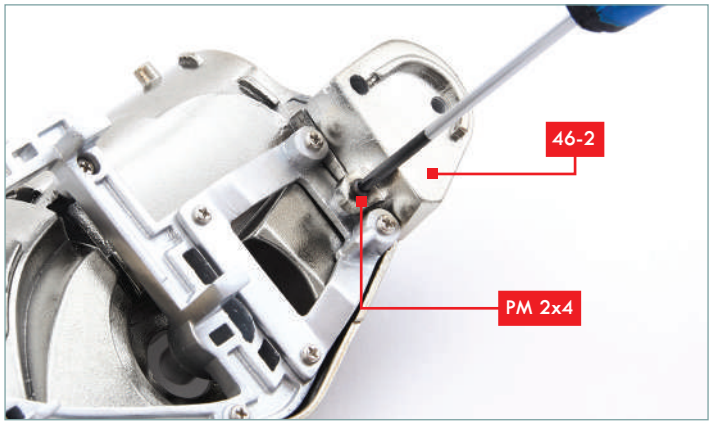
STEP 5

Use four **PB** 2 x 4mm screws to fix the pelvic frame in place, as shown here.



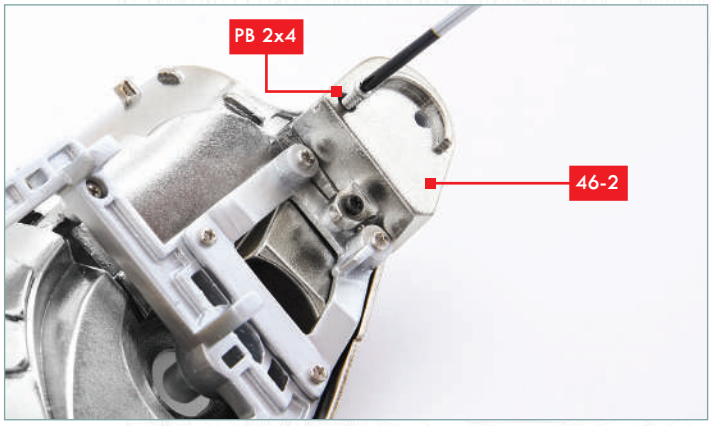
STEP 6

Take the pelvic girdle detail **46-2** and fit it against the rounded end of part **46-1** so that the screw holes (circled) are aligned.



STEP 7

Fix part **46-2** in place with a **PM** 2 x 4mm screw.

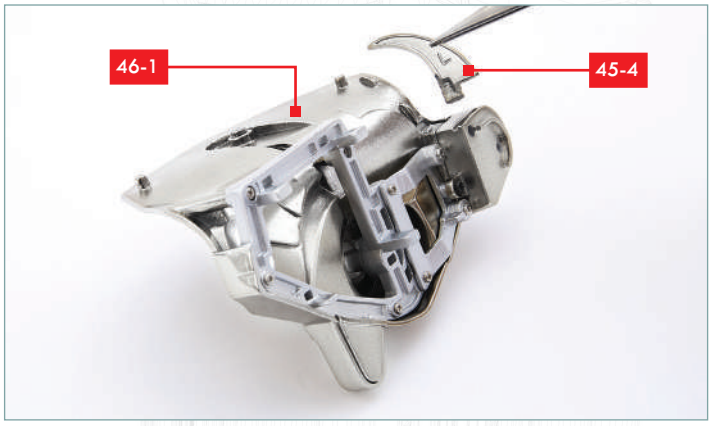


STEP 8

Take a **PB** 2 x 4mm screw and fit it into the screw socket at the corner of part **46-2**. Tighten the screw to fix the parts together.

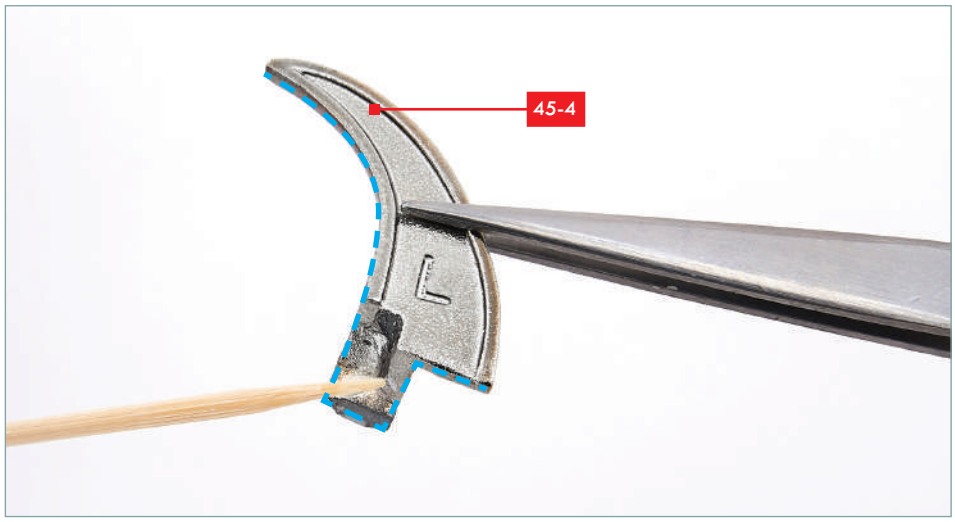
STEP 9

Cut the left pelvic detail **45-4** from the frame, ensuring that the 'foot' is still attached (see STEP 10 before cutting). Remove any roughness where it was joined to the frame.



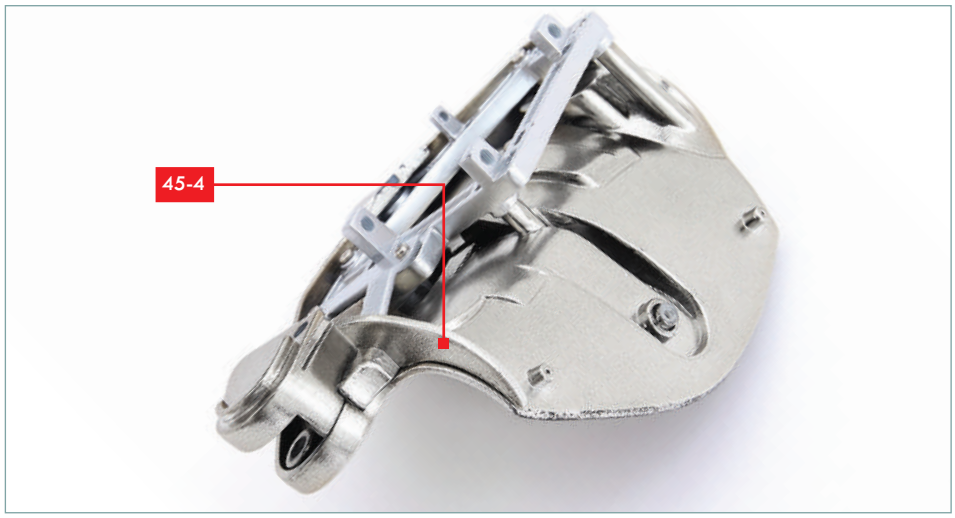
STEP 10

Check the fit of part **45-4** at the end of the assembly from step 8. The 'foot' fits into a recess, and the inner curved edge fits against part **46-1**, between the edge of part **46-1** and the two raised tabs.



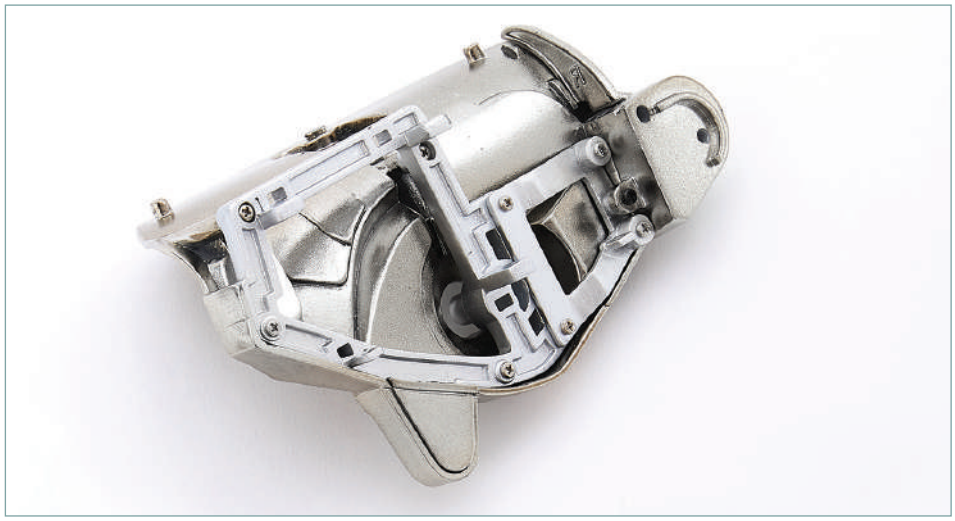
STEP 11

Apply a very small amount of superglue to the edges of part **45-4** that will be in contact with the assembly (highlighted with a blue dotted line).



STEP 12

Fix part **45-4** in place (seen here from the opposite side) ensuring that all the glued edges are in contact.

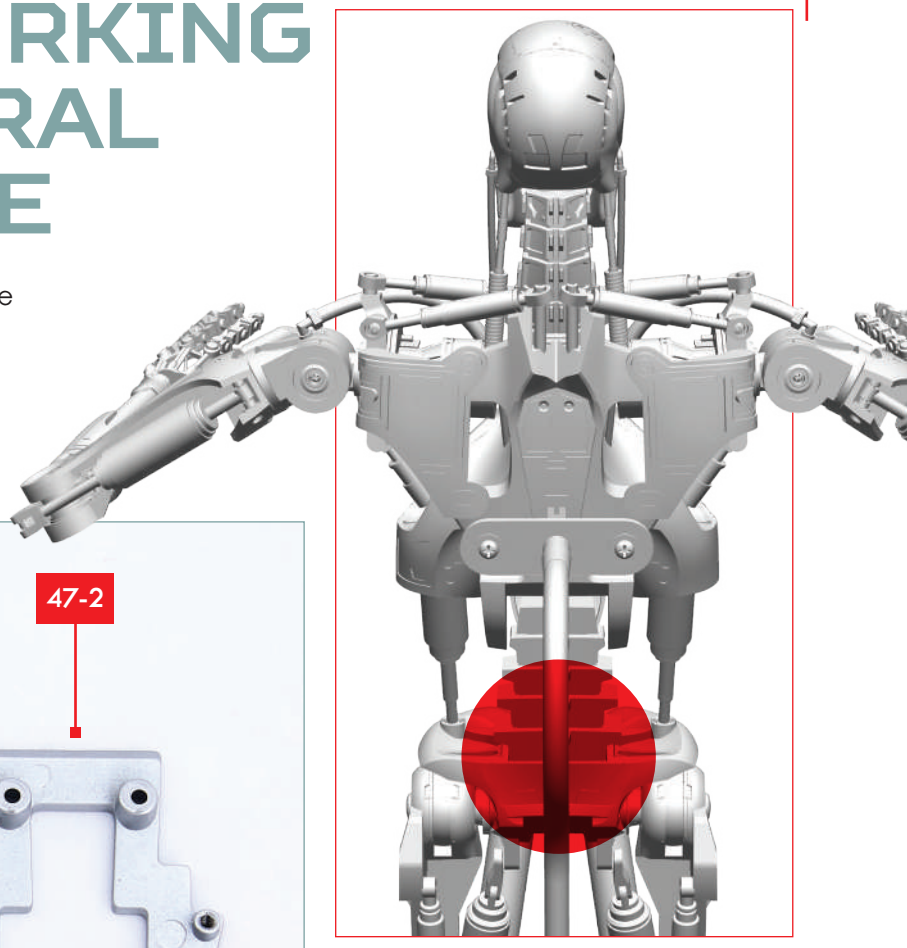


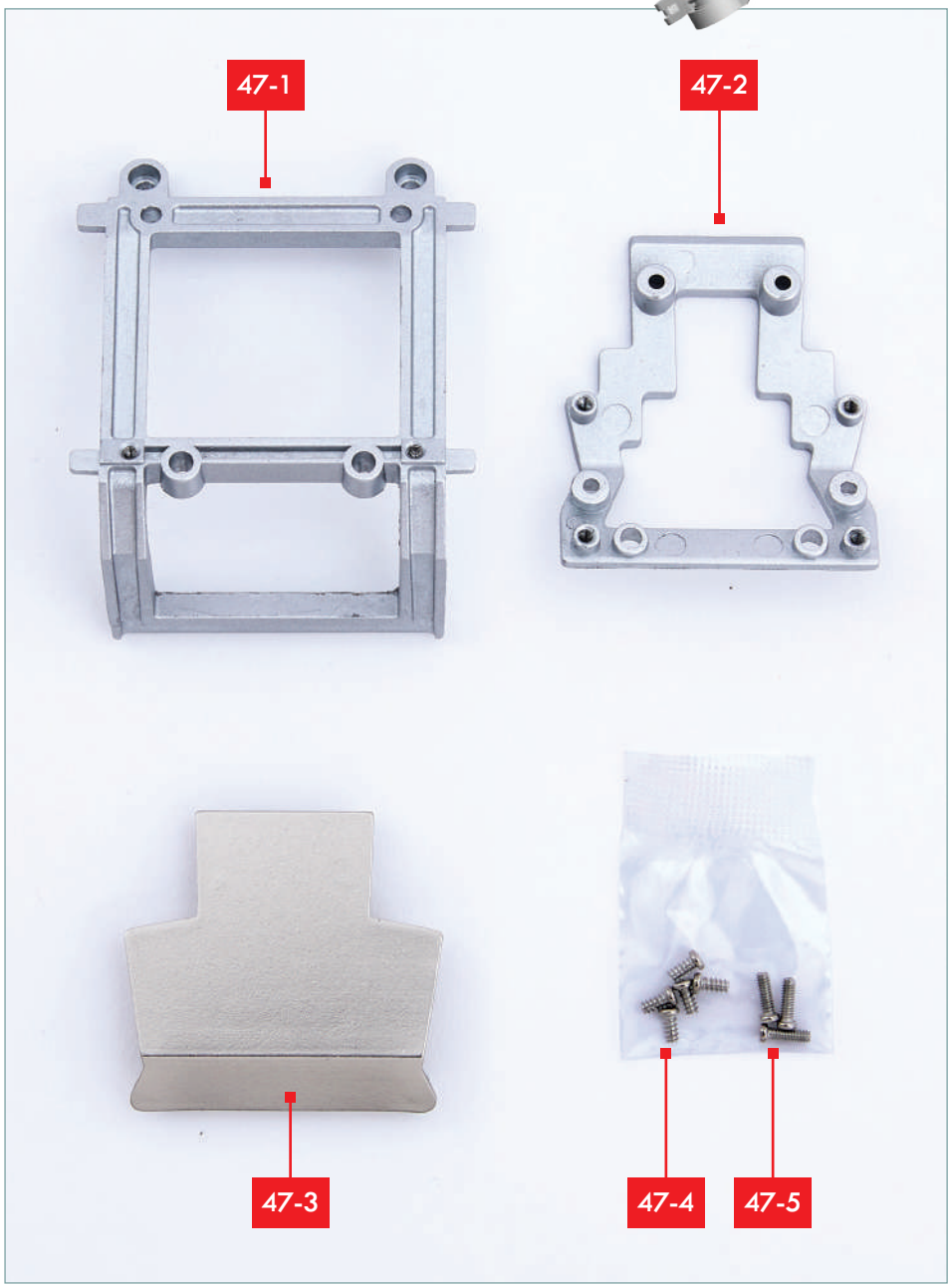
STAGE COMPLETE!

The left pelvic frame and details have been attached to the left pelvic girdle.

STAGE 47: WORKING ON THE CENTRAL PELVIC FRAME

In this stage, you will assemble the connective frame that links the pelvis together.



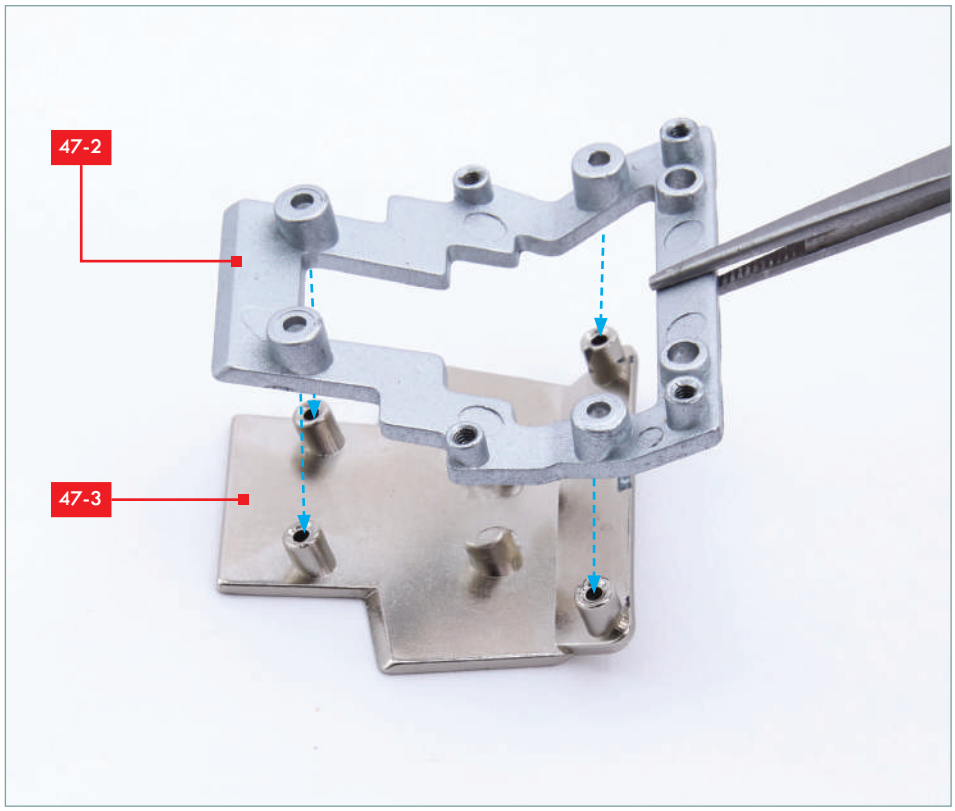


LIST OF PIECES

47-1	Pelvic frame (rear section)
47-2	Pelvic frame
47-3	Lower panel of pelvis
47-4	Five PB 2 x 4mm screws (1 spare)
47-5	Three PM 2 x 6mm screws (1 spare)

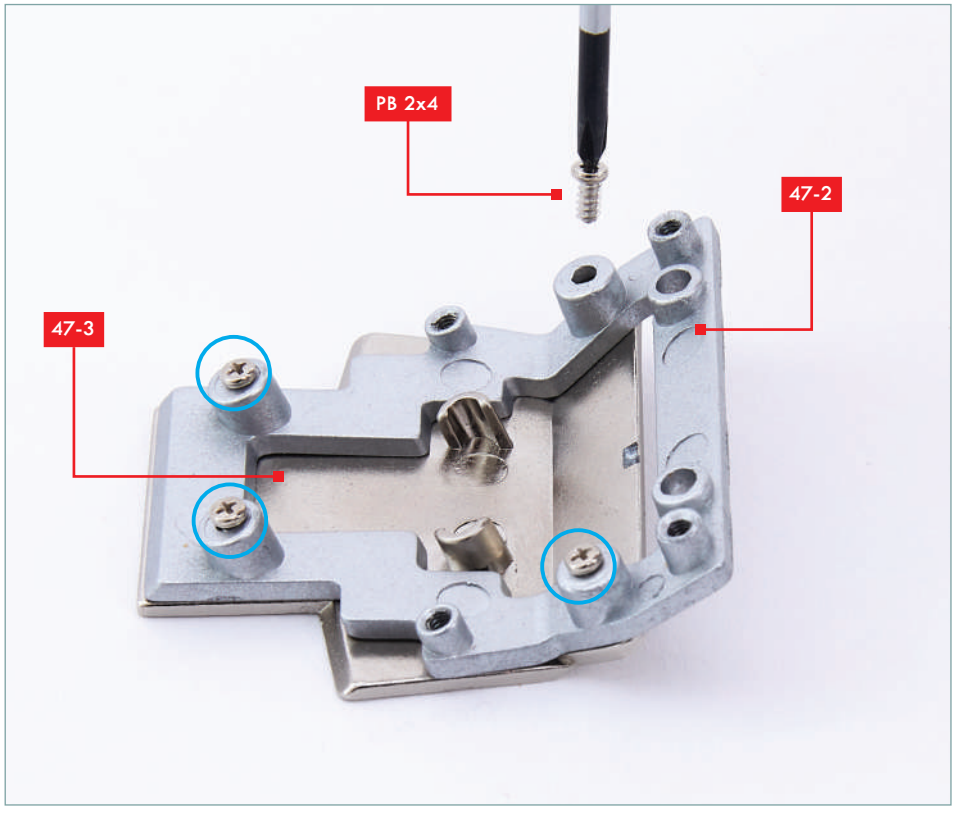
YOU WILL ALSO NEED

A cross-head screwdriver.



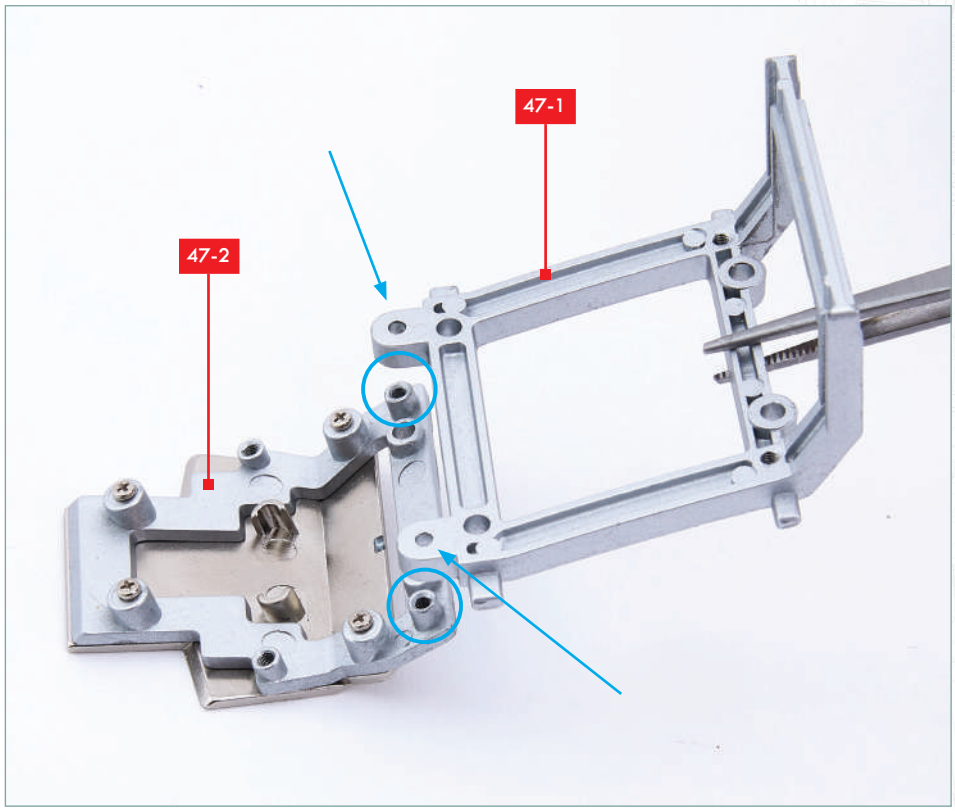
STEP 1

Take the lower panel of the pelvis **47-3** and the pelvic frame **47-2**. Check how the two parts fit together: raised screw sockets on part **47-3** fit into sockets on part **47-2**, as indicated by the dotted lines.



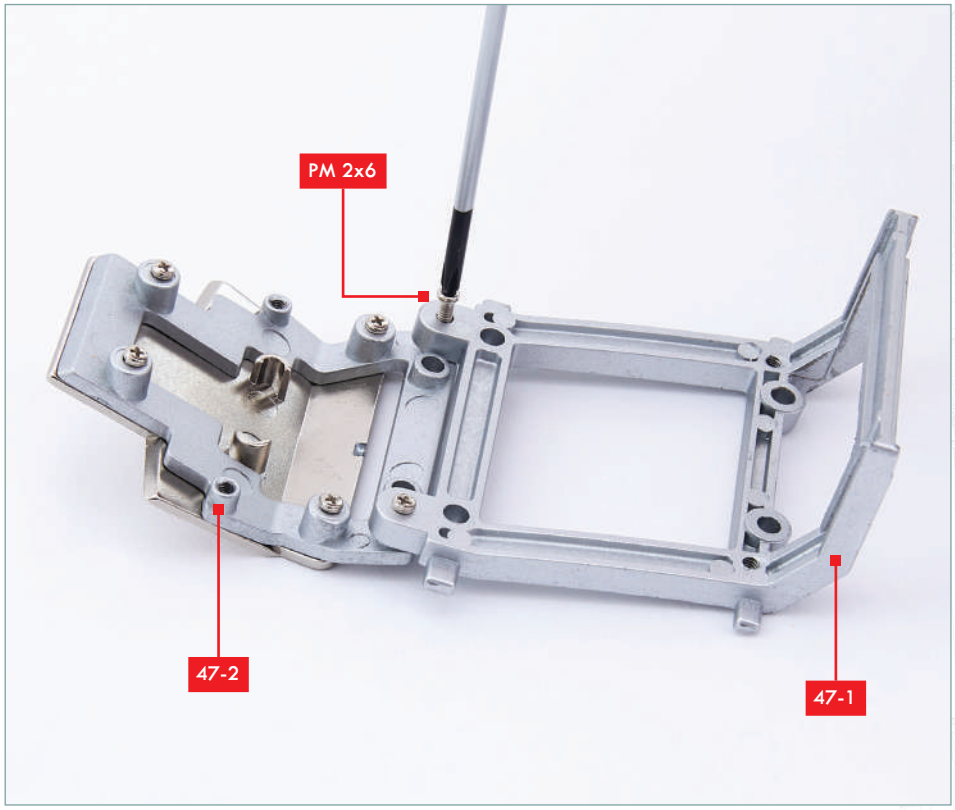
STEP 2

When you are happy with the fit, fix the two parts together with four **PB** 2 x 4mm screws (circled in blue).



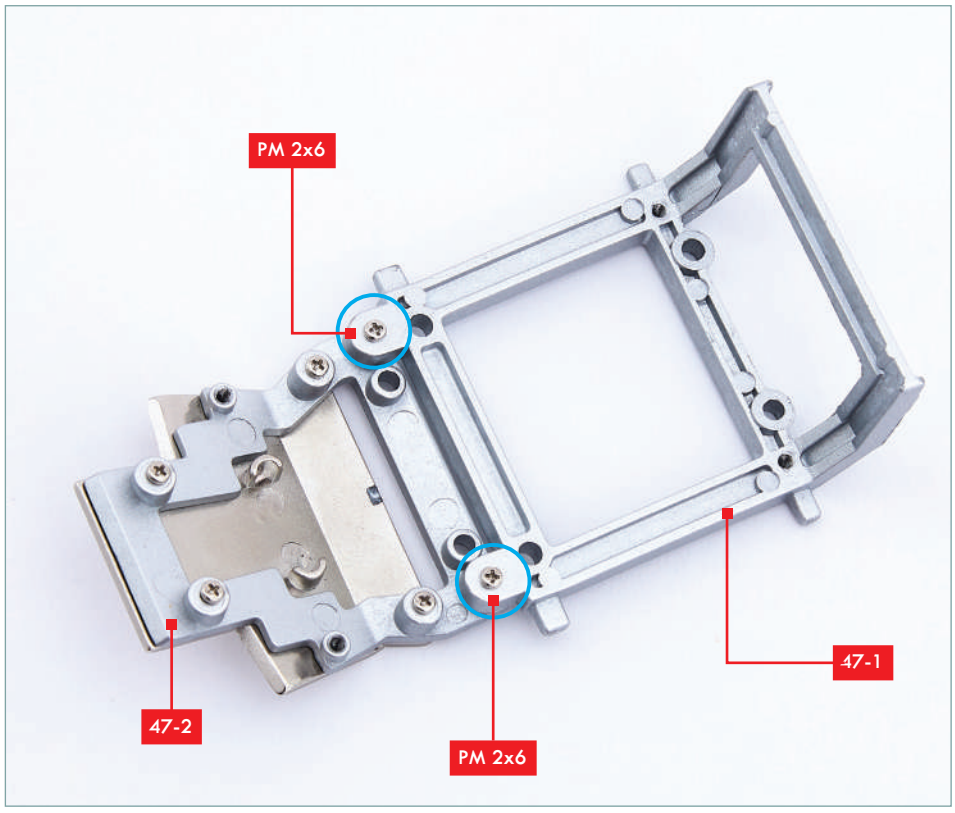
STEP 3

Take the rear part of the pelvic frame **47-1** and identify the two tabs with screw holes in them (arrows). Align the holes in the tabs with the raised screw sockets on part **47-2** (circled).



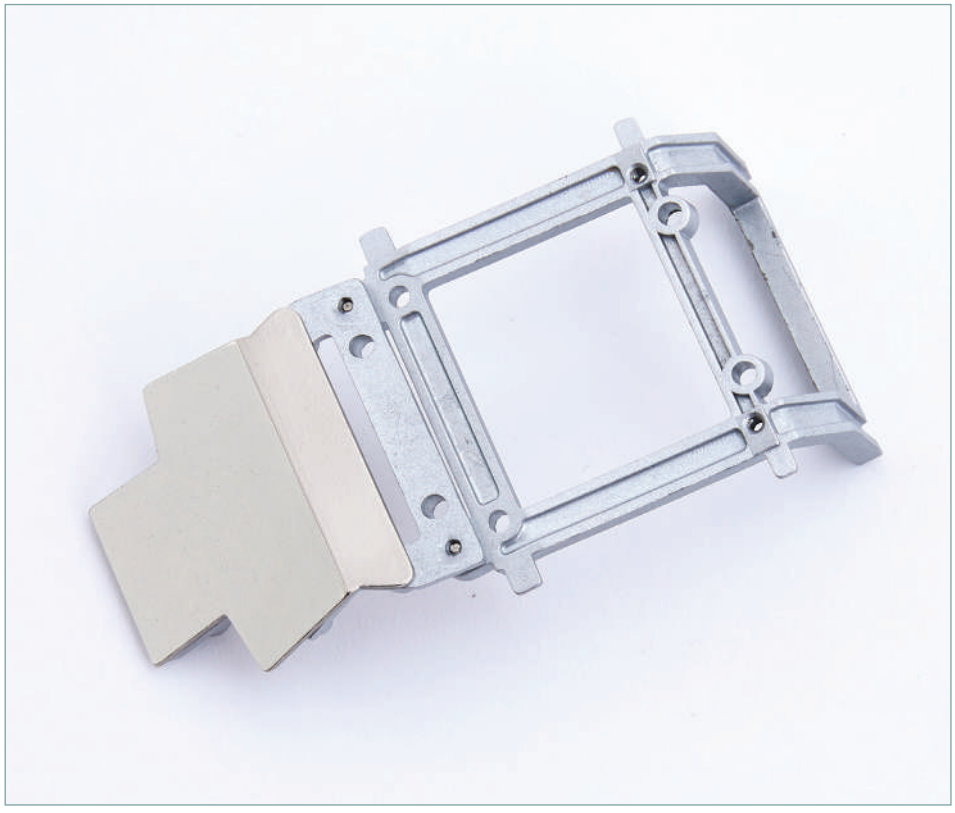
STEP 4

Fix together the two sections of pelvic frame, **47-1** and **47-2** using two **PM** 2 x 6mm screws.



STEP 5

This shows the frame parts fixed together, with the **PM** 2 x 6mm screws circled.

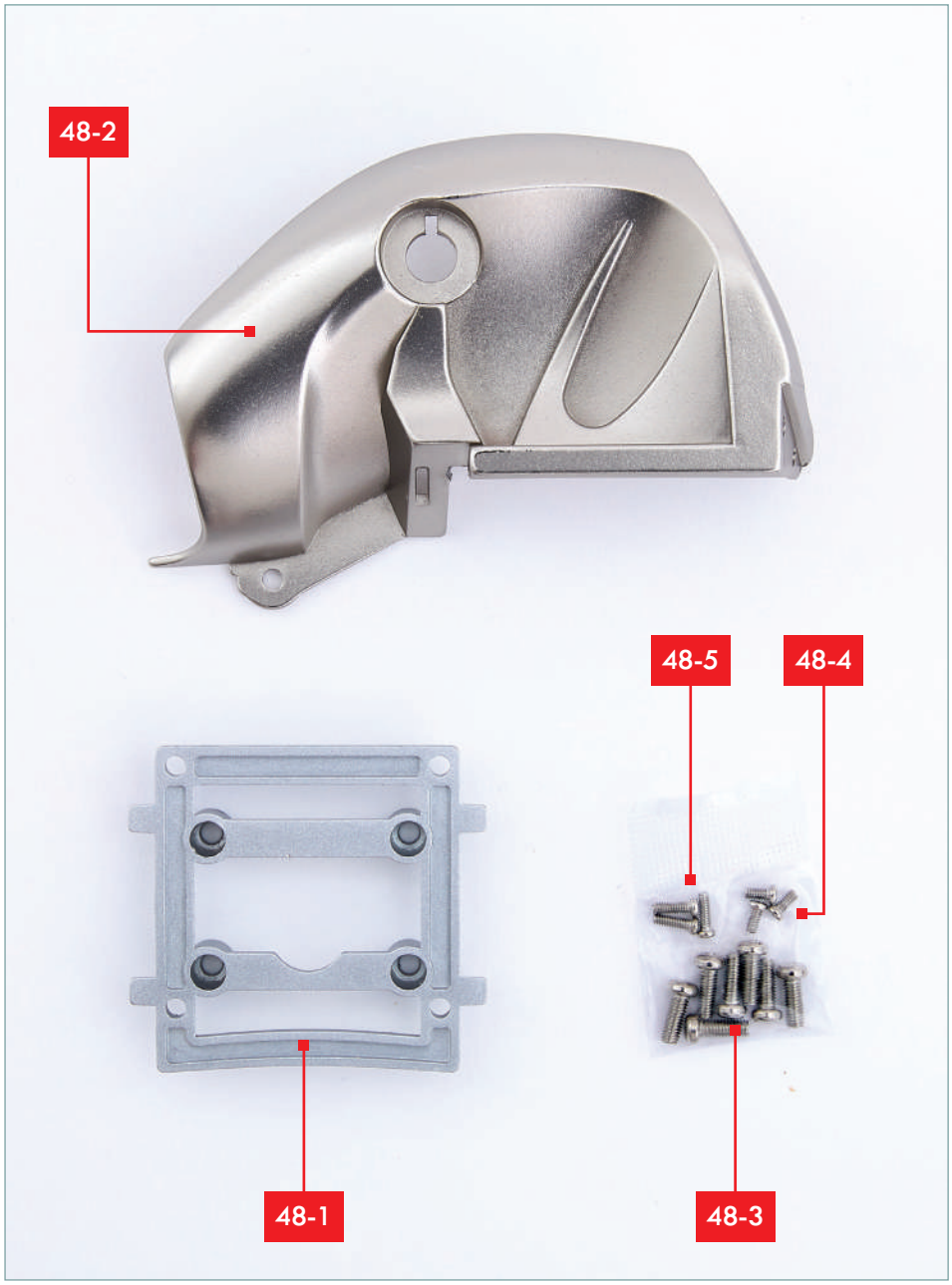


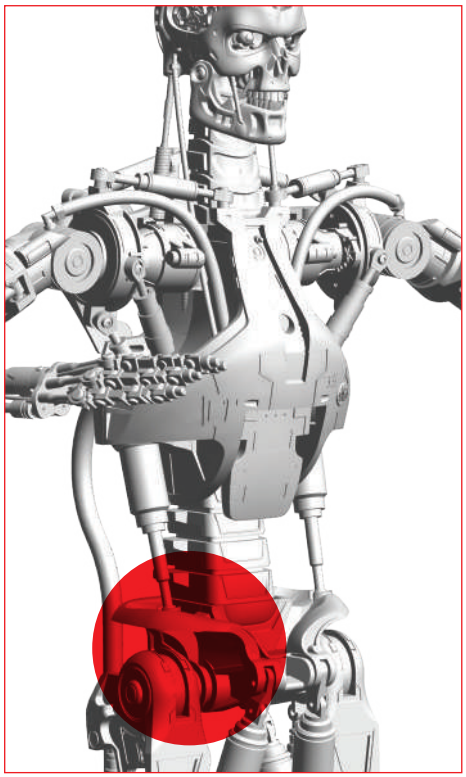
STAGE COMPLETE

The central frame for the pelvis has been assembled, together with a panel of the pelvis.

STAGE 48: ASSEMBLING THE PELVIS

You will now assemble the pelvis, connecting the left, central, and right pelvic frames.





LIST OF PIECES

48-1	Pelvic frame
48-2	Pelvic shield (right)
48-3	Seven PM 3 x 8mm screws (1 spare)
48-4	Three PM 2 x 4mm screws (1 spare)
48-5	Three PM 2 x 6mm screws (1 spare)

YOU WILL ALSO NEED

A cross-head screwdriver.

Tweezers (optional).

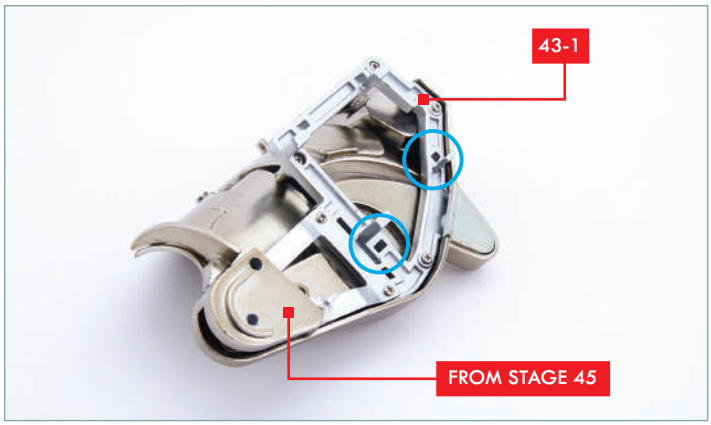
Fine file (if necessary).

Left pelvic assembly from stage 46.

Pelvic frame assembly from stage 47.

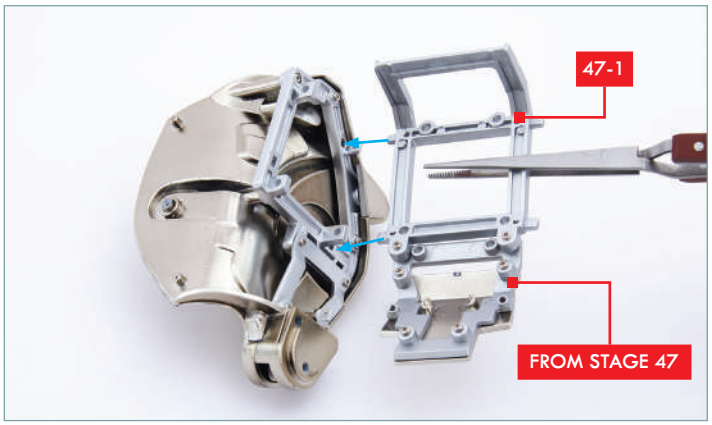
Right pelvic assembly from stage 45.

Superglue and a cocktail stick.



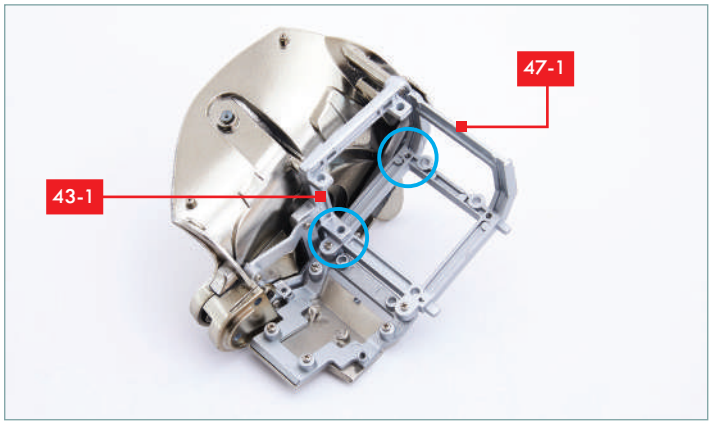
STEP 1

Take the assembly from stage 45. Identify two slots in the pelvic frame **43-1** (circled in blue) where the central frame will fit. The slot on the left is below a tab, and the one on the right is above a tab.



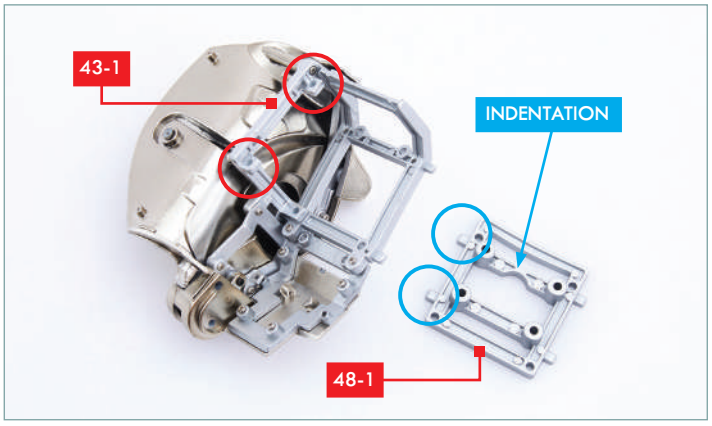
STEP 2

Take the pelvic frame assembly from stage 47 and position it as shown. The two tabs on the side of part **47-1** fit into the slots identified in step 1, as indicated by the arrows. (The tabs are a tight fit, so you may need to file them down slightly to do this.)



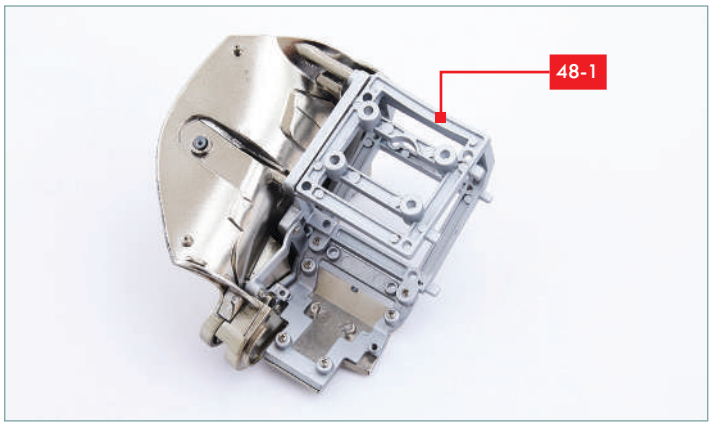
STEP 3

When correctly assembled, check the areas circled in blue. The screw holes on the tabs on part **43-1** (described in step 1) align with screw holes on the frame **47-1**.



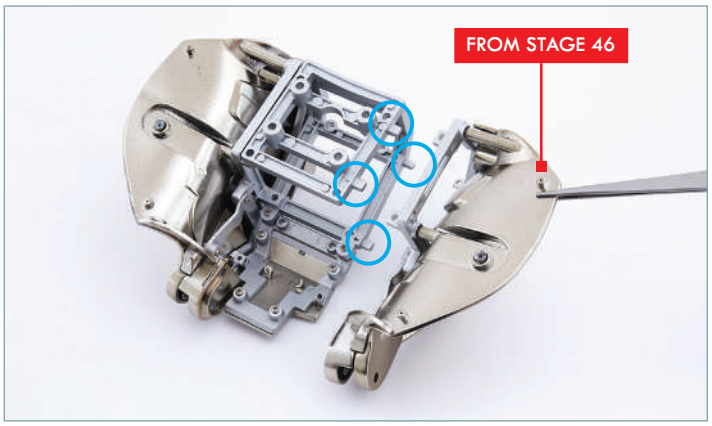
STEP 4

Identify the next two slots, in the upper bar of frame **43-1** (circled in red). Take part **48-1** and arrange it in the orientation shown. The tabs on the side of **48-1** (circled in blue) fit into the slots.



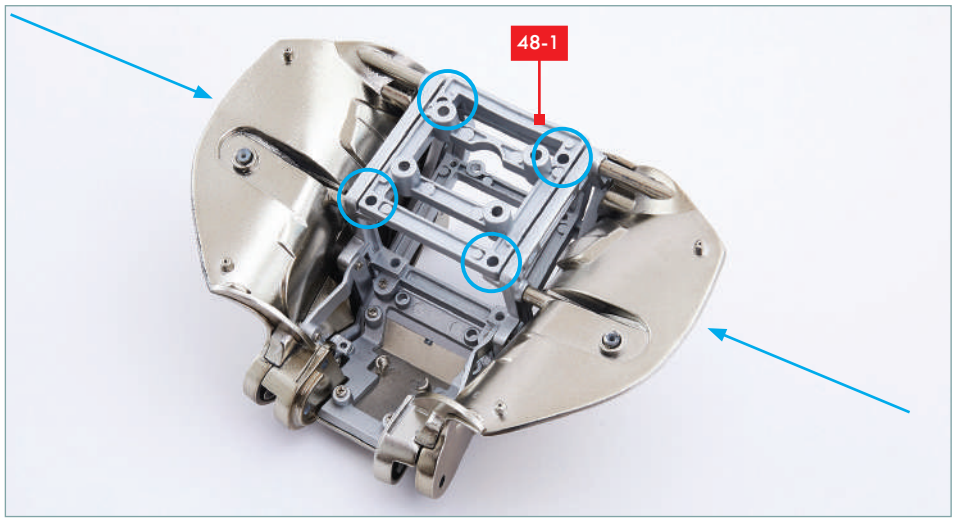
STEP 5

Fit the tabs into the slots. (Again, it is a tight fit, so you may need to file the tabs down to do this.)



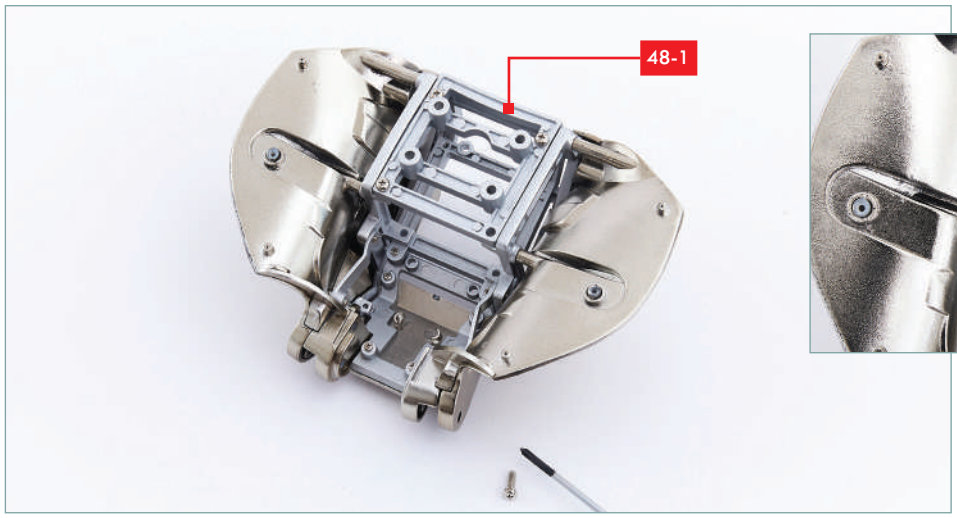
STEP 6

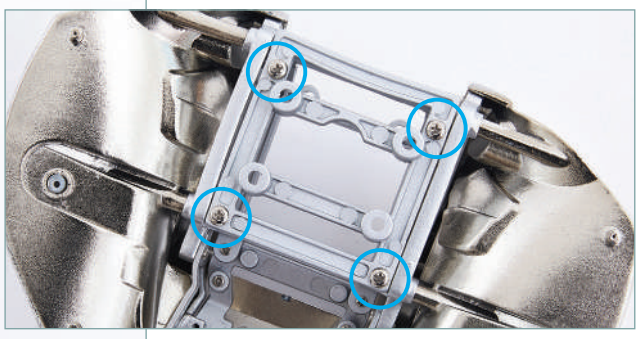
Take the assembly from stage 46. This is a mirror image of the parts from stage 45, and has to be fitted to the central elements of the pelvic frame in the same way as described in the previous steps. This time, all four tabs (circled) have to be fitted at the same time.



STEP 7

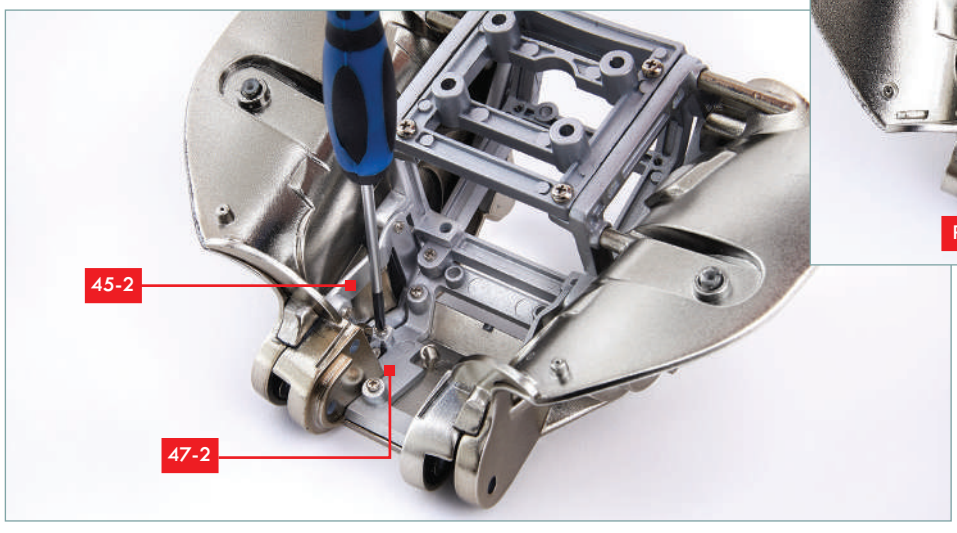
The tight fit of the tabs creates a fairly stable assembly, but ensure that the parts are pushed as close together as possible. The screw holes near the corners of part **48-1** (circled) should align with screw holes on tabs in the frames on either side.

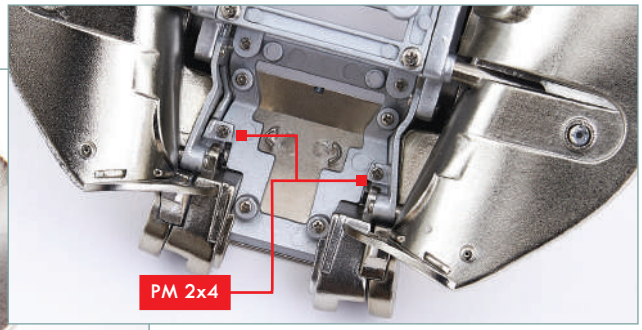




STEP 8

Fix the two sides of the pelvis to the central part of the frame with four **PM** 3 x 8mm screws (circled, inset).



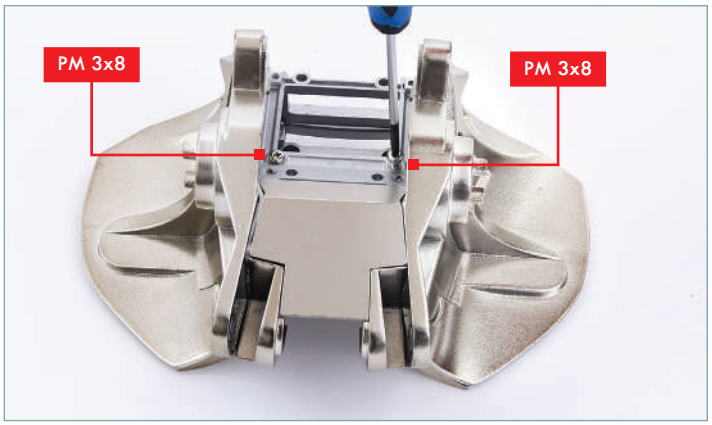


STEP 9

Identify the screw hole in the tab on part **45-2** (the framework of the right side of the pelvis). Ensure it is correctly aligned with a screw hole in part **47-2**. Fix in place with a **PM** 2 x 4mm screw. Repeat on the other side of the pelvis (inset).

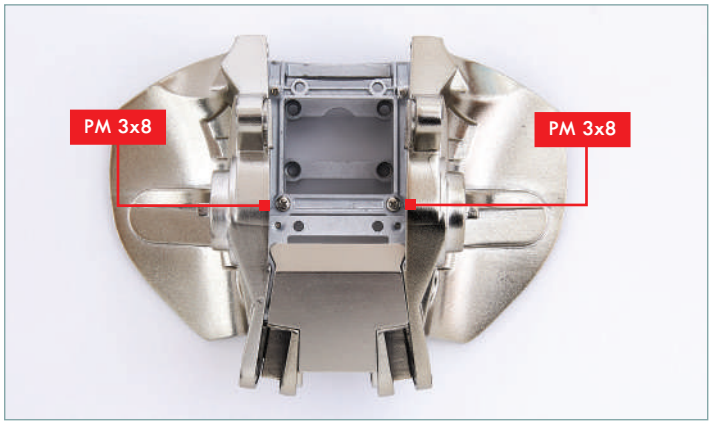
STEP 10

Turn the assembly over and identify the next two fixing points (circled).



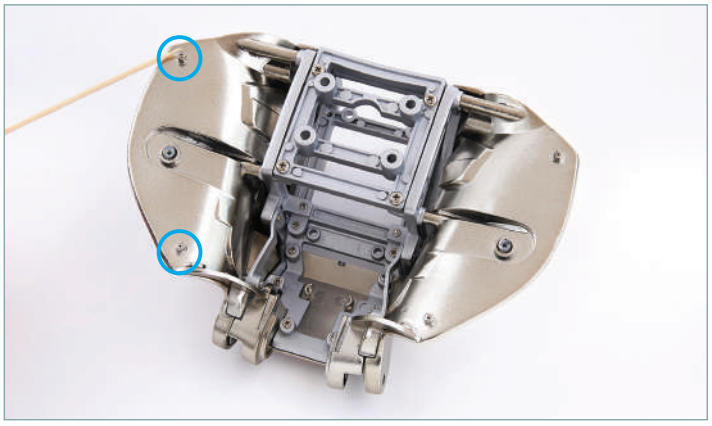
STEP 11

Fix the lower part of the pelvic frame in place with two **PM** 3 x 8mm screws.



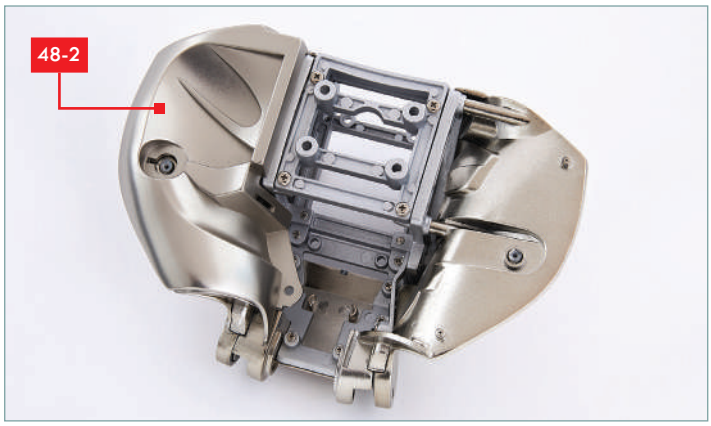
STEP 12

This shows the two **PM** 3 x 8mm screws in place, looking from directly overhead.



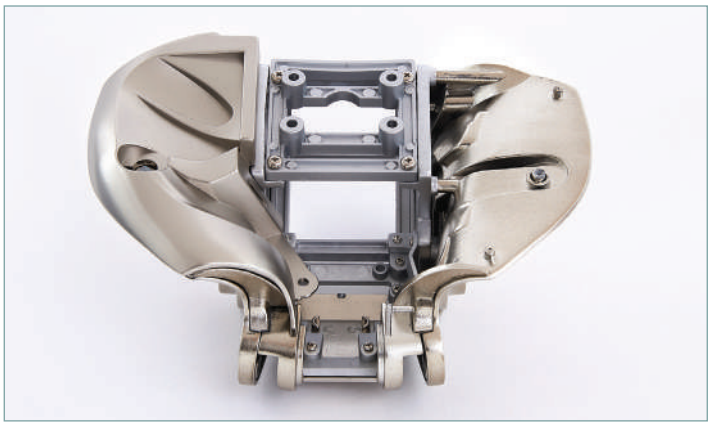
STEP 13

Turn the pelvis the right way up again. Apply a little superglue to the sides of the two pegs (circled) on the right hand side.



STEP 14

Take the right pelvic shield **48-2** and fix it to the top of the glued pegs on the right hand side of the pelvis, as shown.

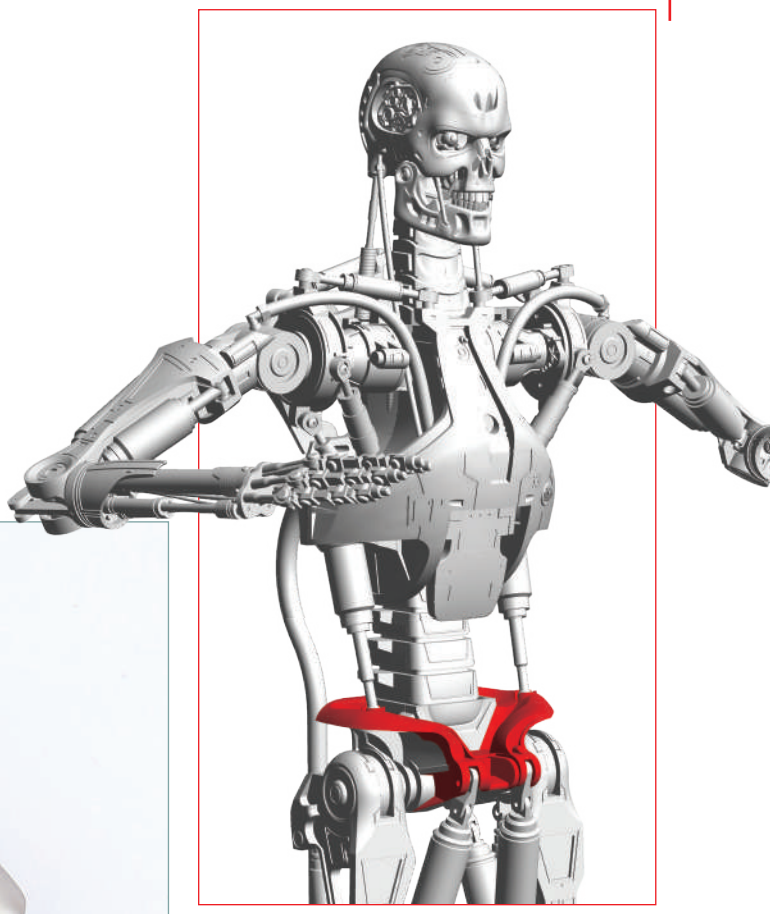


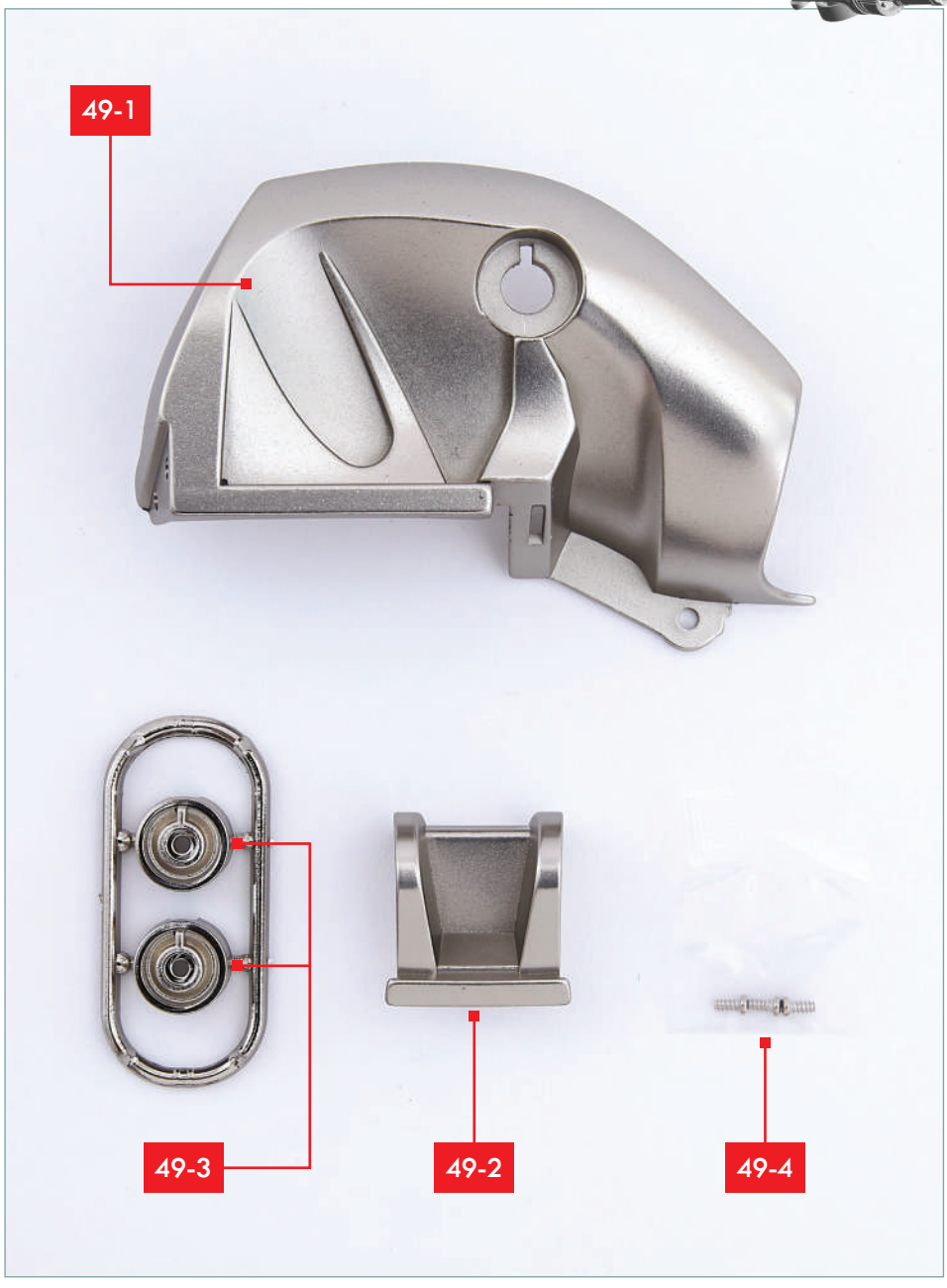
STAGE COMPLETE!

The two sides of the pelvis have been joined together and a decorative finish has been fitted on the right-hand side of the pelvis.

STAGE 49: ADDING DETAILS TO THE PELVIS

Adding details to the left of the pelvis with the left pelvic shield.





LIST OF PIECES

49-1	Pelvic shield (left)
49-2	Pelvic plate
49-3	Two pelvic sockets
49-4	Three PB 2 x 5mm screws (1 spare)

YOU WILL ALSO NEED

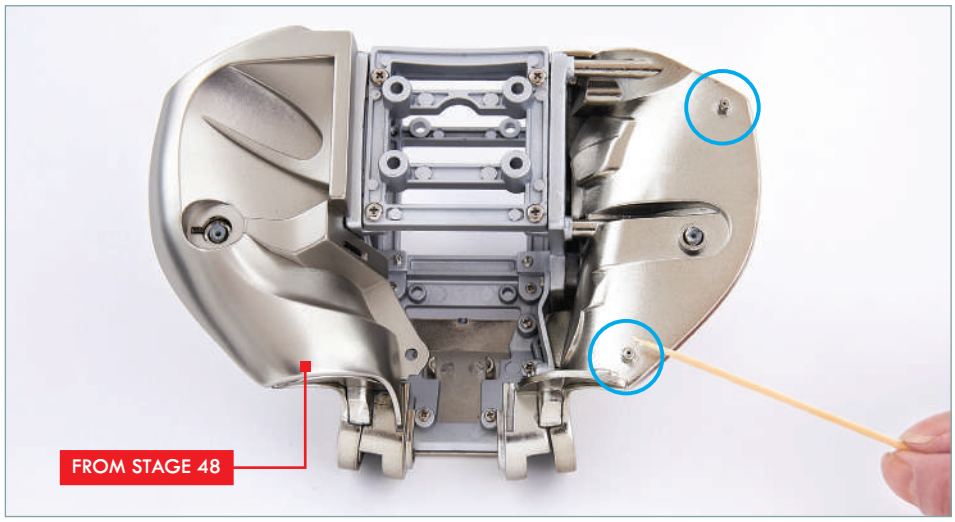
A cross-head screwdriver.

Tweezers (optional).

Craft knife and suitable cutting surface.

Pelvic assembly from stage 48

Superglue and a cocktail stick.

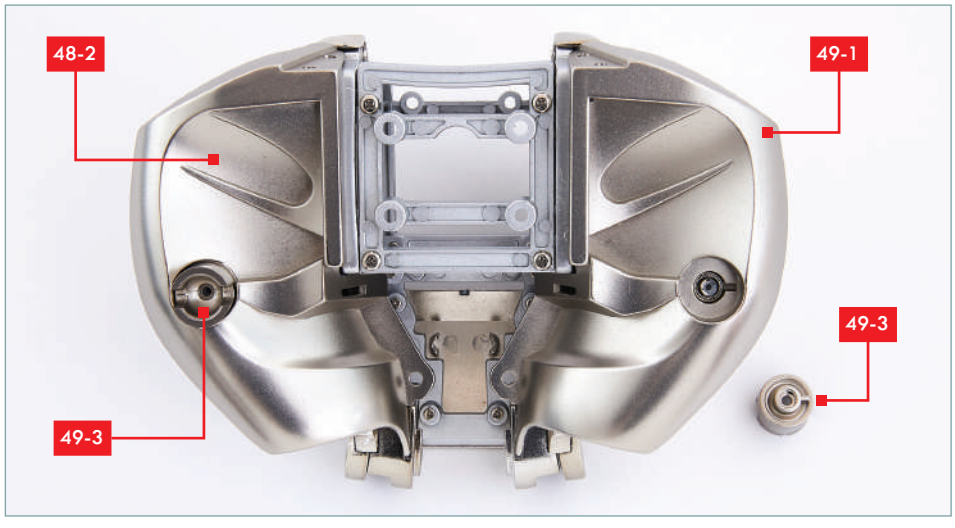


STEP 1

Take the assembly from stage 48. Identify the two pegs on the left side of the pelvis (circled), and after test-fitting, apply a little superglue around the sides. Fit the left pelvic shield **49-1** in place, as described in the previous stage for the right shield.

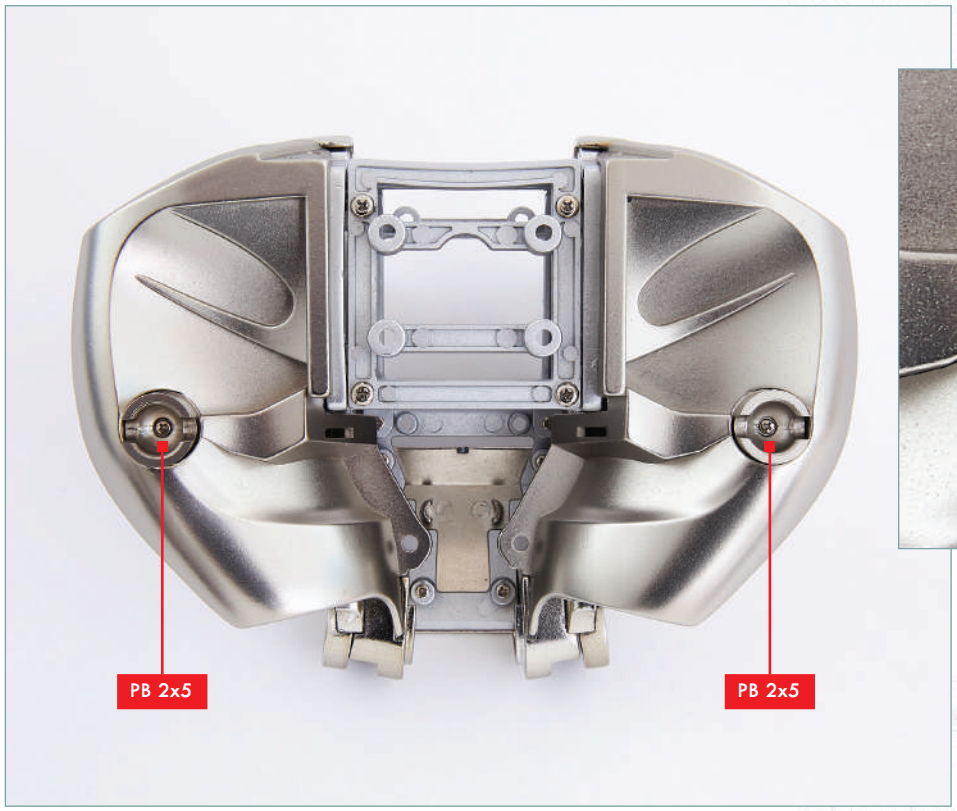
STEP 2

Cut the two sockets **49-3** from the frame, and smooth the surface at the cutting points if necessary.



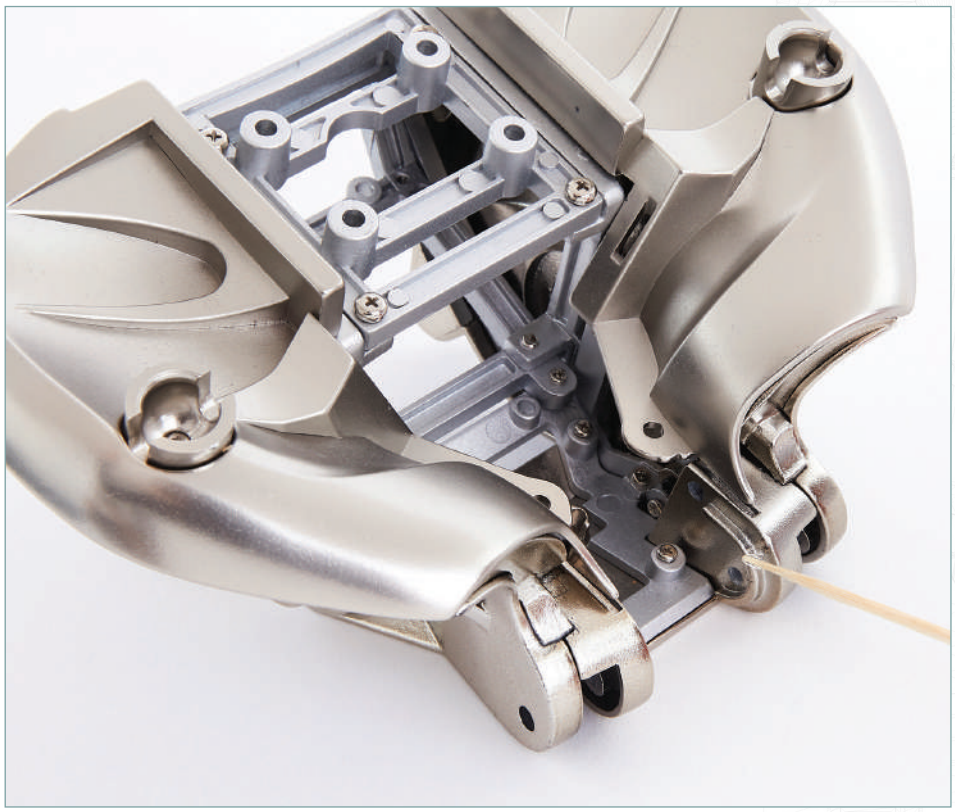
STEP 3

Fit the sockets **49-3** into the pelvic shields **48-2** and **49-1**. Note that there is a bar on the underside of each socket that fits into the slot in the recess in the shields.



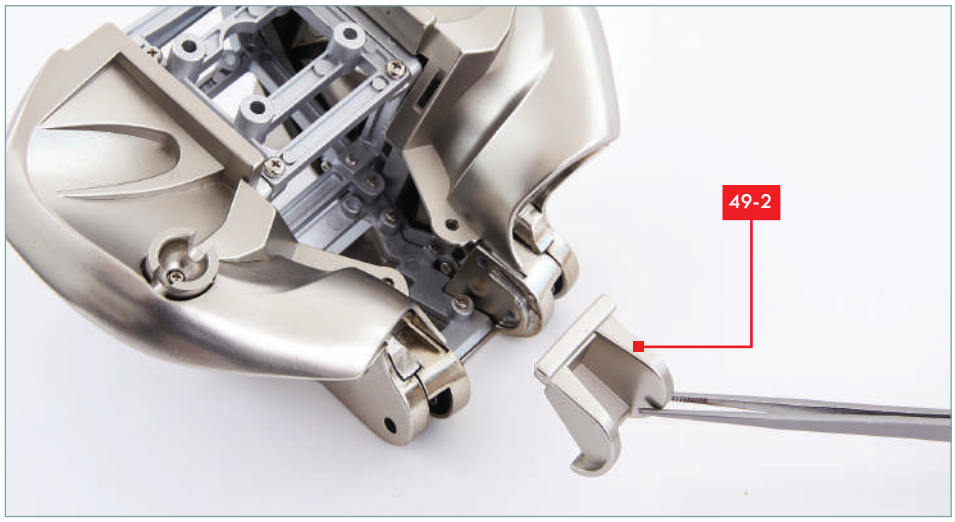
STEP 4

Fix each of the sockets in place with a **PB** 2 x 5mm screw.



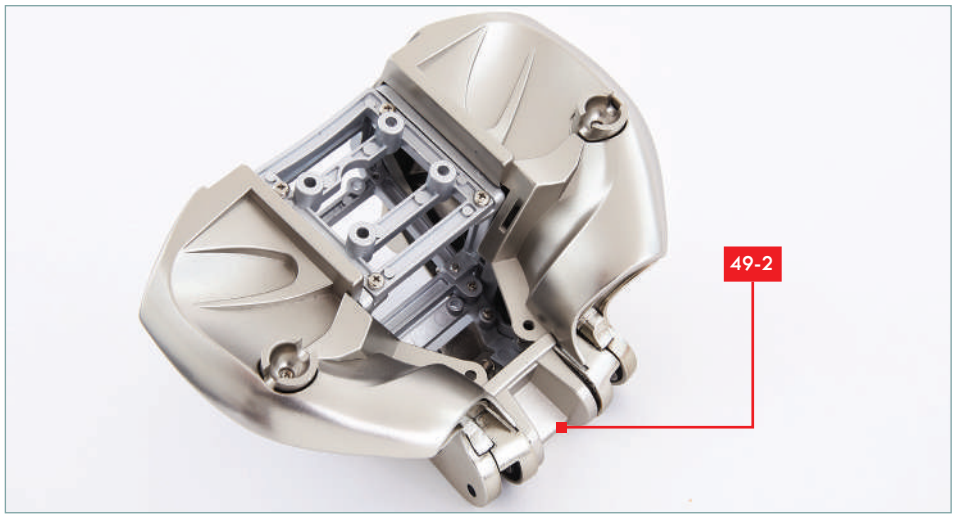
STEP 5

On either side of the front of the pelvis, there is a recess that follows the curve of the pelvis. After test-fitting, apply a little superglue around each recess.



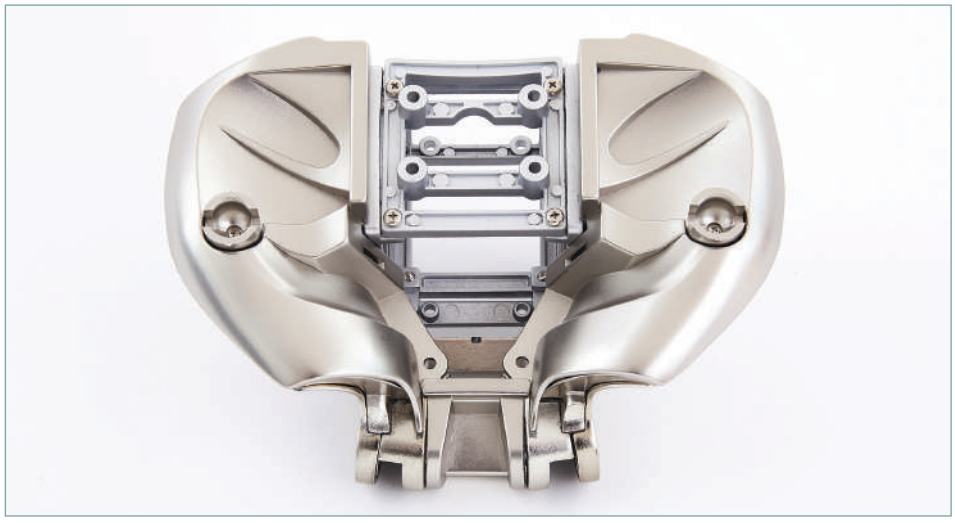
STEP 6

Take the pelvic plate **49-2** and position it in the orientation shown, so that you can fit it into the gap in the front of the pelvis.



STEP 7

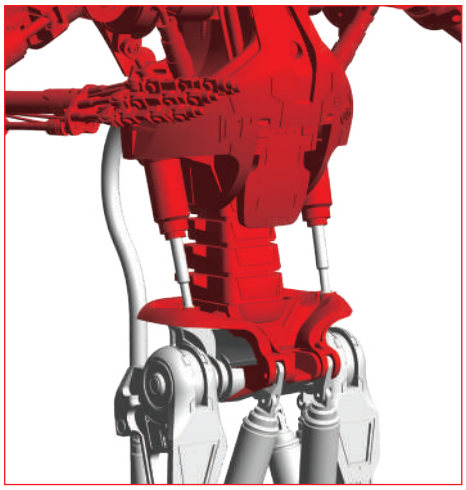
Fit the plate **49-2** in place as shown.



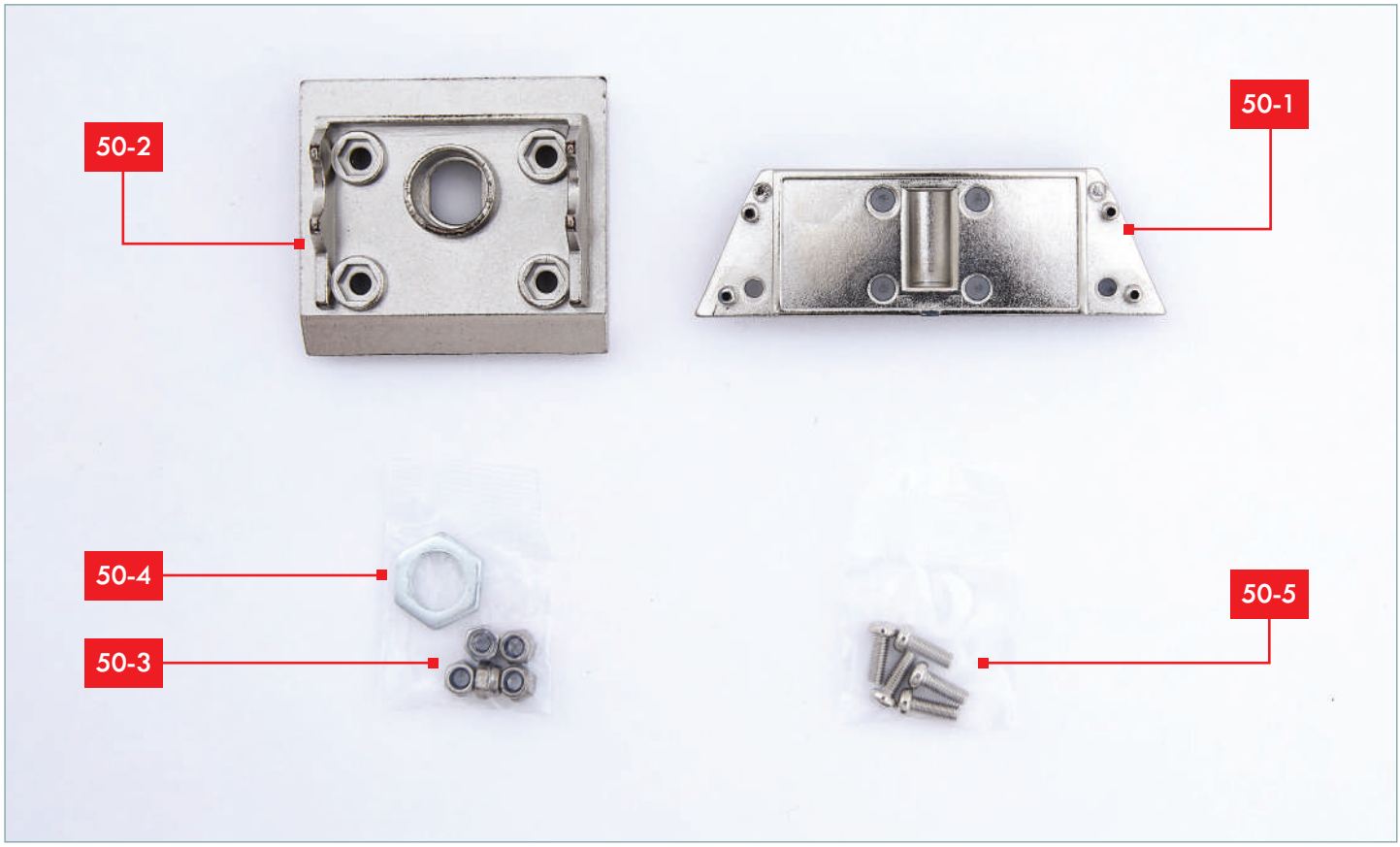
STAGE COMPLETE!

Further details have been added to the pelvis.

STAGE 50: FITTING THE PELVIS TO THE SPINE



The Terminator™ T-800 takes another step towards completion as you attach the pelvis to the existing endoskeleton body.



LIST OF PIECES

50-1	Pelvic plate
50-2	Connection plate
50-3	Five M3 lock nuts
50-4	M10 nut
50-5	Five PM 3 x 8mm screws (1 spare)

YOU WILL ALSO NEED

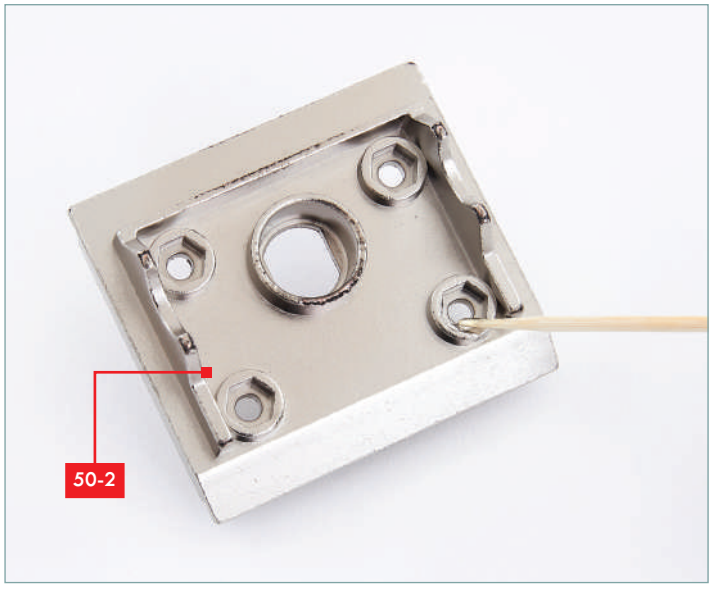
A cross-head screwdriver.

Tweezers (optional).

Complete assembly from stage 42.

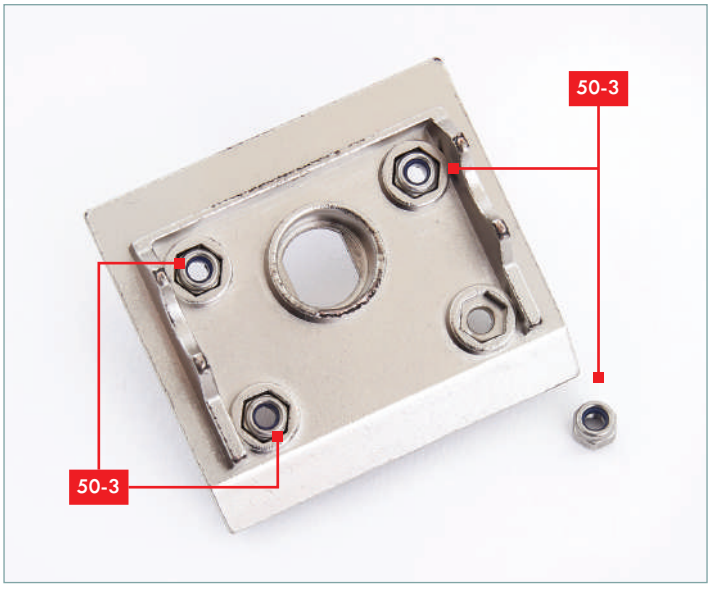
Pelvic assembly from stage 49.

Superglue and a cocktail stick.



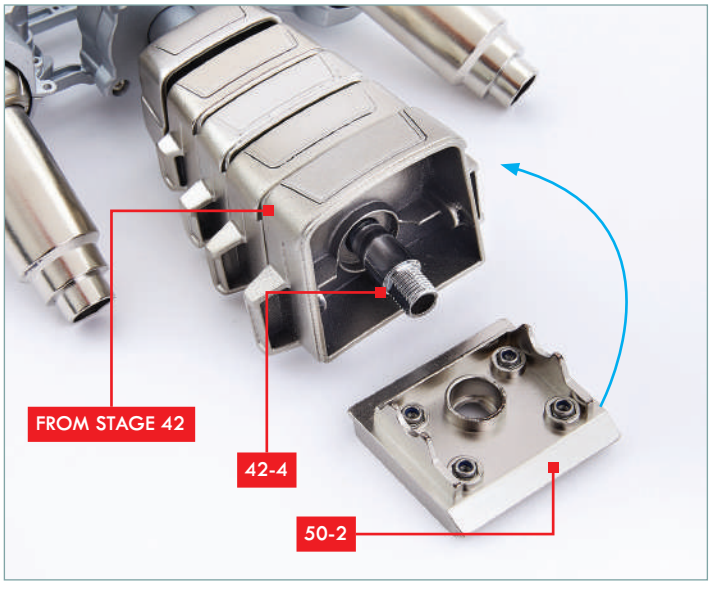
STEP 1

Take the connection plate **50-2**. Apply a little superglue in each of the four hexagonal recesses.



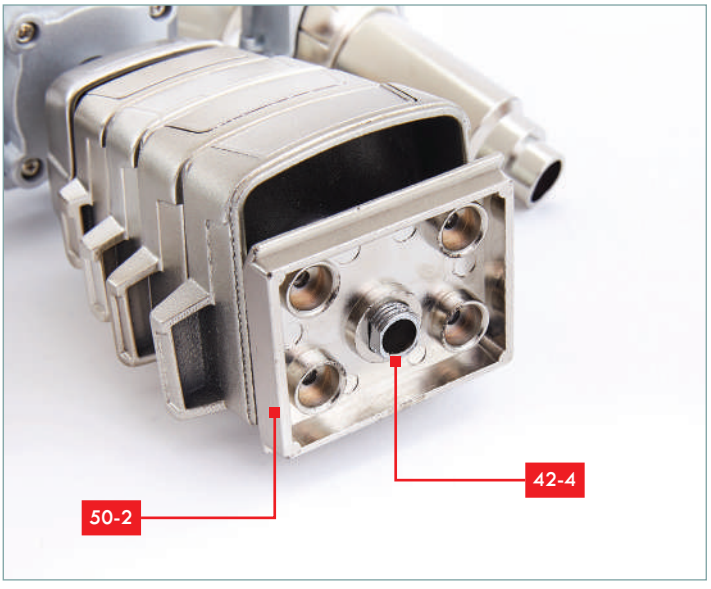
STEP 2

Fit an M3 lock nut **50-3** in each of the recesses. Note that the nuts have one flat side and one side with a rim. The flat sides fit into the bases of the recesses.



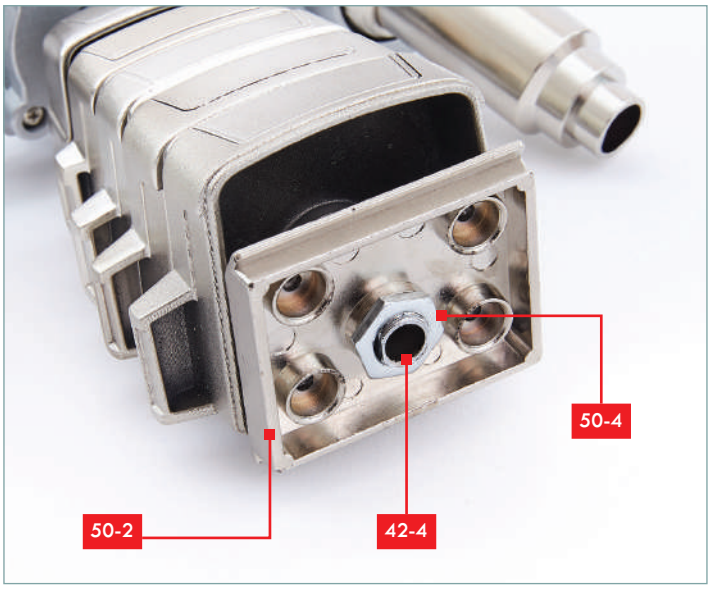
STEP 3

Take the assembly from stage 42 and lay it down on your work surface so that you can access the end of the spinal cord **42-4**. Part **50-2** will be fitted to this as indicated by the arrow. Note that the sides of the spinal cord are flat, so that it will fit into the shaped hole in the centre of part **50-2**.



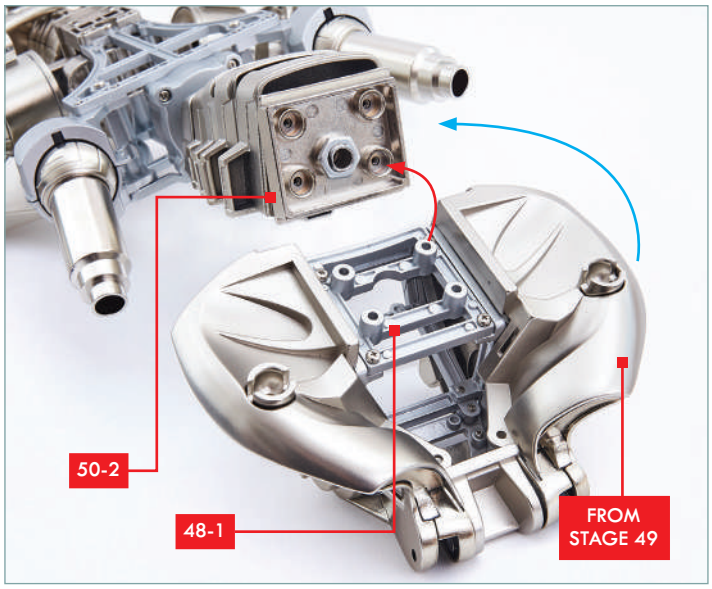
STEP 4

Carefully note the orientation and fit the connecting plate **50-2** on to the end of the spinal cord **42-4** as shown.



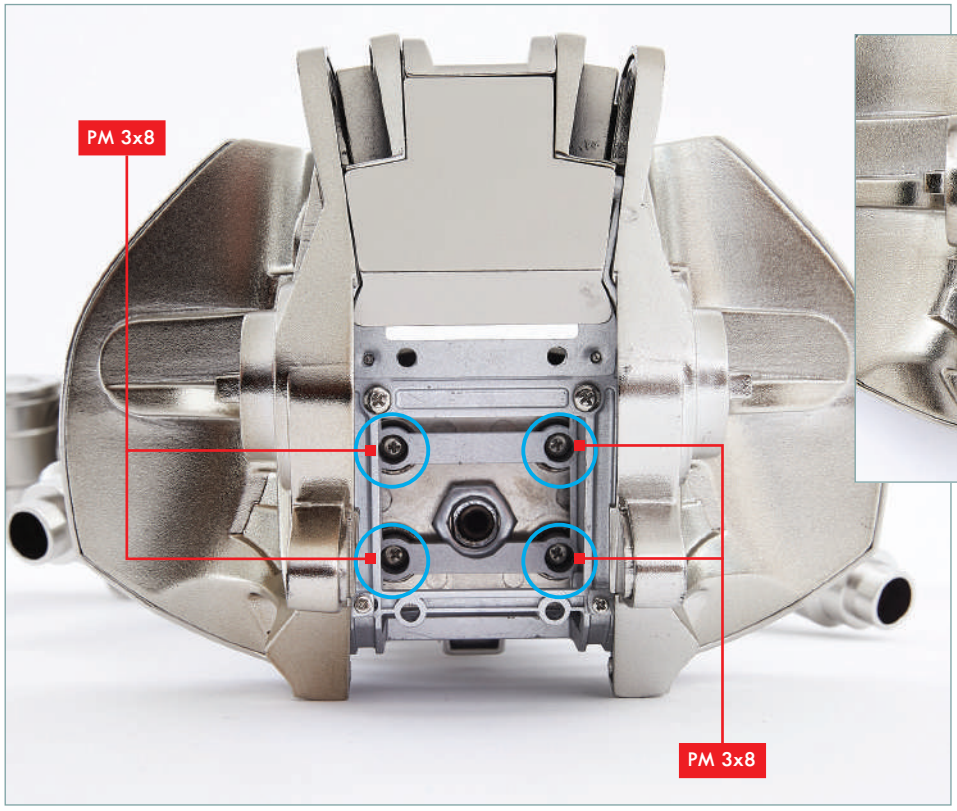
STEP 5

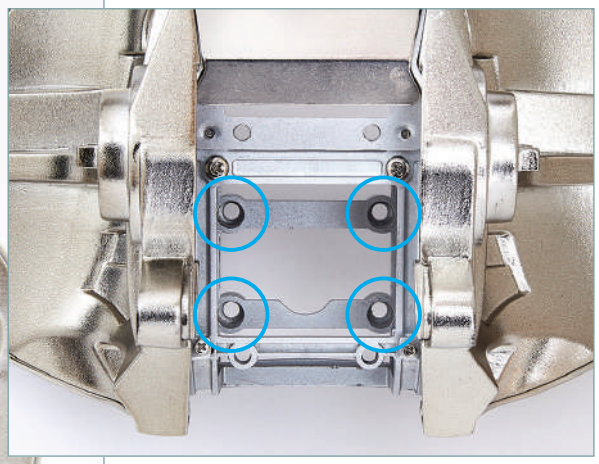
After checking the spinal cord **42-4** is still fully tightened, fix the connecting plate **50-2** in place by tightening the M10 nut **50-4** on to the end of the spinal cord, as shown. If necessary gently tighten with a suitable spanner or pair of pliers taking care not to over-tighten.



STEP 6

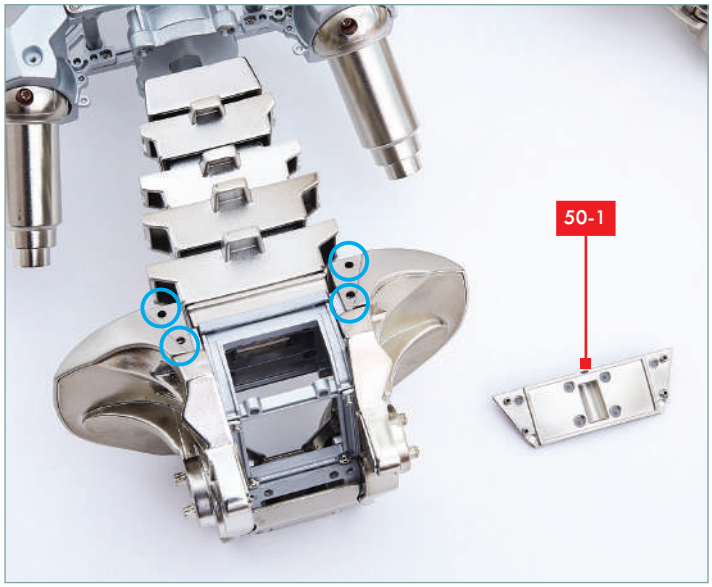
Take the pelvis assembly from stage 49 and position it in the orientation shown. Once lifted into position (blue arrow), the four raised screw holes in part **48-1** will fit into the recesses in the connecting plate **50-2** (we have indicated the fit of one of these with a red arrow).





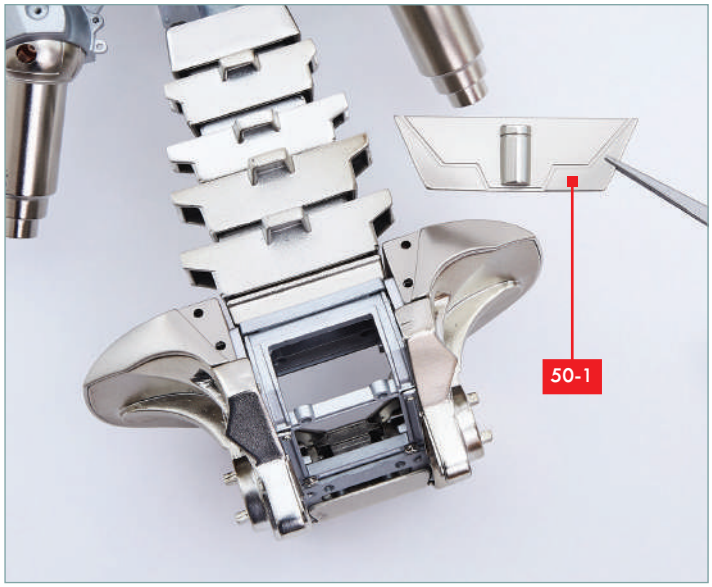
STEP 7

The inset shows the pelvis assembly viewed from beneath. Identify the four screw holes (circled). Position the pelvis assembly against the connecting plate and fix in place from beneath with four PM 3 x 8mm screws. (The screws are anchored in place by the M3 nuts that were glued to the connecting plate in steps 1 and 2.)



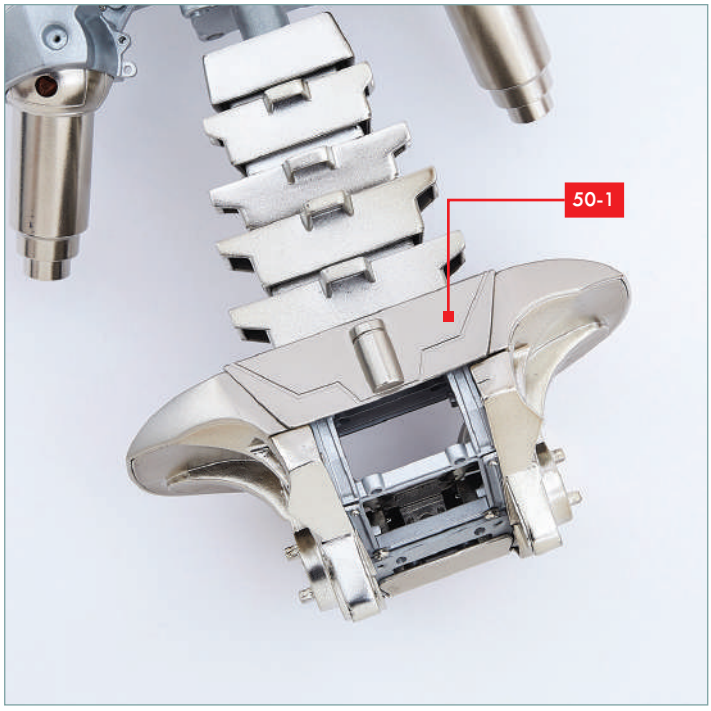
STEP 8

Take the pelvic plate **50-1** and identify the four raised pegs on the back of the plate, near the corners. Part **50-1** fits across the back of the pelvis at the base of the spine. The four pegs fit into the four holes (circled).



STEP 9

After test-fitting, position the pelvic plate **50-1** across the base of the spine as shown in the next step.



STEP 10

Once in position, the ends of the plate **50-1** butt up neatly with the sides of the pelvis, as shown.

STAGE COMPLETE!

The pelvis has been fitted to the base of the spine.

BLADE RUNNER

A grizzled bounty hunter tracks down four escaped replicants, struggling with both his deadly career and what it means to be human in the process.

Built around the rhythms and hues of a classic film noir, and set in the rain-slicked streets of LA in an alternate 2019, *Blade Runner* sets former police officer Rick Deckard against four replicants, indistinguishable-from-human creations who have returned to Earth — where they are forbidden — after escaping from an off-world colony. Tasked with finding and 'retiring' (killing) the replicants, Deckard becomes increasingly uneasy in his quest, particularly when he falls for Rachael, an experimental — and highly illegal — replicant who works for the Tyrell Corporation (inventor and source of all replicants) and who is initially unaware she is artificial. Though Deckard on one level succeeds in retiring all four replicants, Tyrell and many of his key technicians are murdered, and Deckard's own life is only spared when chief replicant Roy Batty saves him from falling off a roof, shortly before Batty himself reaches the end of his four-year existence and dies. Questioning everything, and deeply discomforted, Deckard escapes LA with Rachael, leaving his job and mission behind him.

HOW MUCH FOR A REPLICANT?

The same strange economies at work in the androids of *Alien* (#4) are also found in the replicants of *Blade Runner*. The replicants themselves are works of art — near-perfect simulacra of human beings with false memories but real, grown bodies. And works of art like the four escapees in *Blade Runner* itself are both expensive and hard to come by. The film explains *some* of the limitations baked into the Nexus 6 model of replicants — their four-year lifespan is both a technical limitation Tyrell has not yet surpassed, and a way to prevent them developing immunity to the iconic Voight-Kampff test: one of the few ways of telling humans apart from replicants. Their human memories are a

ABOVE: Harrison Ford as Rick Deckard prepares to quiz a potential replicant using the Voight-Kammpf test, a key weapon in a Blade Runner's meagre arsenal. (Photo: AF archive / Alamy Stock Photo)

ABOVE: Sean Young as Rachael, the unwitting replicant. [Photo: Moviestore Collection Ltd / Alamy Stock Photo]

FILM DATABLAST

Director: Ridley Scott
Screenplay: Hampton Fancher and David Peoples (from a novel by Philip K. Dick)
Producers: Michael Deeley, Hampton Fancher, Brian Kelly, Ivor Powell, Charles de Lauzirika (2007 Final Cut), Paul Prischman (2007).
Composer: Vangelis
Director of Photography: Jordan Cronenweth
Editors: Marsha Nakashima, Terry Rawlings
Cast: Harrison Ford (*Rick Deckard*), Rutger Hauer (*Roy Batty*), Sean Young (*Rachael*), Edward James Olmos (*Gaff*), M. Emmet Walsh (*Bryant*), Daryl Hannah (*Pris*), William Sanderson (*J.F. Sebastien*), Brion James (*Leon Kowalski*), Joe Turkel (*Dr. Eldon Tyrell*), Joanna Cassidy (*Zhora*), James Hong (*Hannibal Chew*), Morgan Paull (*Holden*)
Year: 1982
Duration: 110-117min (depending on the cut)
Aspect Ratio: 2.20:1 (70mm), 2.39:1
Country of Origin: USA

way to control the obsessional behaviour that comes from being born fully-formed and aware of the brevity of their existence.

But again, if the society has the technology to create these perfect — and in many ways far superior — replicants, why are they being used as slaves for the human off-world colonisation effort, when less humanlike automatons could complete the same jobs with fewer moral quandaries and fewer murderous malfunctions? The fact that an entire class of Blade Runners exists to 'retire' rogue replicants suggests that this is a regular occurrence,

"IT SEEMS YOU FEEL OUR WORK IS NOT A BENEFIT TO THE PUBLIC." — RACHAEL

"REPLICANTS ARE LIKE ANY OTHER MACHINE — THEY'RE EITHER A BENEFIT OR A HAZARD. IF THEY'RE A BENEFIT, IT'S NOT MY PROBLEM." — DECKARD

even before replicants were made illegal on Earth. What is the percentage of failure among replicants that can both support a series of armed, freelance detectives and still be palatable to the public at large?

Of the four surviving replicants at the beginning of the film, three — Batty, Kowalski, and Zhora — were designed for combat or assassination, while the fourth, Pris, is described as a 'basic pleasure model' for military personnel. Again, while high intelligence, strength, speed, and resilience would be welcome qualities, particularly in the unknown off-world environments, many of their duties would surely be better accomplished by Terminator Endoskeleton-like robots with hard-coded moral limits and no pesky human qualities to get in the way of their workload. The fact that the Nexus 6 models have a lifespan designed to limit the development of their emotions suggests that the replicant program is a series of dangerous compromises — which is, of course, a major theme of the film. Like the scientists in *Jurassic Park*, Tyrell and his ilk didn't stop to think if they *should* create humanlike life, only that they *could* — and that it would make them a profit.

If we delve into what we're shown on screen, perhaps we find something of an answer. The replicants have organic, genetically-engineered parts. They're not androids, they're artificial humans. Perhaps it's far cheaper for the Tyrell Corporation to vat-grow a series of replicants and implant them with human memories and personalities (and then transport them into space and, presumably, distant planets!) than it is to engineer a fully robotic servant class from scratch. It's entirely possible that there is a Roy Batty in every colonisation defence platoon on every planet out there, or at least a replicant with a similar body, background, and implanted set of memories. Given the

computer technology on display in the alternate 2019 of *Blade Runner* is several steps behind the rest of its vision of the future, it's entirely possible that its genetic and memory-implanting technology is far in advance of its dabblings in AI and mobile telecommunication.

The *real* answer as to why these humanlike replicants were sent into the worst of off-world environments with a bundle of emotions and human memories, of course, is that without them, there would be no film, and certainly not a film that grapples with the moral ambiguities of Deckard's mission, and with what it means to be human, as effectively as this one.

DECKARD: REPLICANT OR HUMAN?

The question of Deckard's humanity is both one that forms the thematic backbone of the entire movie, and one that is perhaps more satisfying when left unanswered. The question of 'human or replicant' breaks down under the incisive eye of the film — less a harsh binary and more a sliding scale. Do the replicants' poetic visions of beauty make up for their violent actions? Does Deckard's essentially murderous career make him less human? Is Rachael's love for Deckard true, or the result of pre-programming, and, given humans are a bundle of hormones, societal expectations, and nerve impulses anyway, is there really any difference? These are the questions that resonate and — like the Voight-Kammpf test — provoke different empathic responses in audiences long after the credits have rolled.

"I'VE SEEN THINGS YOU PEOPLE WOULDN'T BELIEVE. ATTACK SHIPS ON FIRE OFF THE SHOULDER OF ORION. I WATCHED C-BEAMS GLITTER IN THE DARK NEAR THE TANNHAUSER GATE. ALL THOSE MOMENTS WILL BE LOST IN TIME... LIKE TEARS IN RAIN. TIME TO DIE." — BATTY

Blade Runner also complicates the Deckard question because the various different cuts of the film come down more strongly on one side of the ambiguity than the other. The original, studio cut, with a Harrison Ford voiceover and a more unambiguously 'happy' ending, underscores the idea that Rachael, as an experimental replicant, does not have a four-year lifespan, but otherwise does not make any explicit reference to Deckard's artificiality. The Director's Cut and Final Cut, meanwhile, which remove the voiceover and make structural changes to the film, do not address Rachael's lifespan, but introduce several elements that draw attention to Deckard's nature. Primarily, Ridley Scott adds a dream sequence in which Deckard sees a unicorn; then, in the final scene, Gaff visits Deckard's apartment, leaving him an origami unicorn. The suggestion is that Gaff is aware of Deckard's implanted memories and dreams — and, perhaps, that the whole sad affair has been constructed to test a new model of replicant, while retiring the previous models. The Final Cut additionally introduces a scene where Deckard's eyes, out of focus in the background, briefly catch the light with a replicant's tell-tale glow.

Director and star have had differing opinions on Deckard's status from day one, with Scott saying Deckard is a replicant, and Harrison Ford fully convinced he was human. Obviously as the director, Scott had the final say!

Interestingly, *Blade Runner 2049*, despite being set thirty years after the first film, was still written to allow the speculation to continue; characters in the film entertain both possibilities while fully confirming neither. The only thing we do know, after seeing the second film, is that Deckard was not an unmodified Nexus 6 model, as Ridley Scott had mentioned in interviews. As he appears in the film as an older man, he would otherwise be long-past his inbuilt expiration date. ■

ABOVE: Rutger Hauer, as Roy Batty, runs out of life on a rainslicked rooftop. [Photo: ScreenProd / Photononstop / Alamy Stock Photo]

SKIN GRAFTS, SKIN TRANSPLANTS, AND ARTIFICIAL FLESH

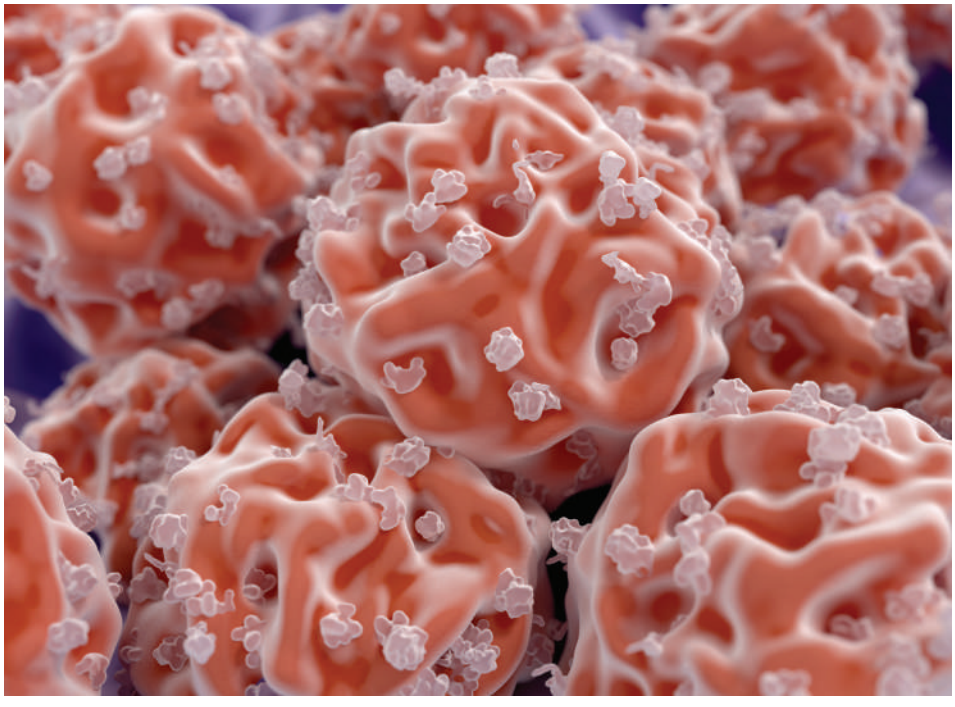
Truly organic artificial skin, such as that draped over the T-800 Endoskeleton, is the dream of modern medicine. We take a look at the latest advances in bioengineered technologies.

A MOST AMAZING ORGAN

As the largest and most important organ (without it, we're just a collection of muscles, bones, and evaporated liquids), skin is an essential and incredibly useful part of the human body. The average adult has over 22 square feet of skin on their bodies, each part of which protects the inner organs of the body from temperature extremes, harmful chemicals, and the DNA-disrupting UV rays of sunlight. From preventing infections and generating vitamin D, to providing us with the sense of touch that links us with the world, skin does it all — and more. Its regenerative properties are also remarkable — many everyday cuts and slices, given care and time, will heal up with barely a scar.

But it is skin's manifold and varied nature that makes it so difficult to replace when the body's own healing methods are overwhelmed by excessive damage — particularly that caused by second-, third-, or even fourth-degree burns, by aggressive cancers, or by antibiotic-resistant diseases and their aftereffects, like necrotizing fasciitis.

In those instances, where a patient cannot heal on their own, skin grafts are required. Taken from the patient's own body — itself a tortuous process — skin grafts often take a great deal of time to heal, both at the site of implantation, and at the donor site elsewhere on the body. Skin transplants, meanwhile, rely on a cocktail of drugs in order to prevent the host body rejecting the skin of the donor, and are often used as a temporary measure to stem infection before an actual graft can



be implanted. Beyond the skill of the surgeon, it's the unpredictable risk of rejection in operations like headline-grabbing face transplants, the first of which was carried out in Spain in 2010, which makes them a true high-wire act of medicine. Although the human body is exceptionally resilient and most skin grafts successfully take, the road to recovery is long, painful, and often results in secondary psychological complications for the patient, such as depression and anxiety.

So the holy grail for surgeons and those researching regenerative medicine is either to rapidly grow replacement skin for a patient in the lab, using bioengineering, or to find a method of stimulating the regrowth of the skin on the patient, such as injecting stem cells into the area to stimulate tissue growth.

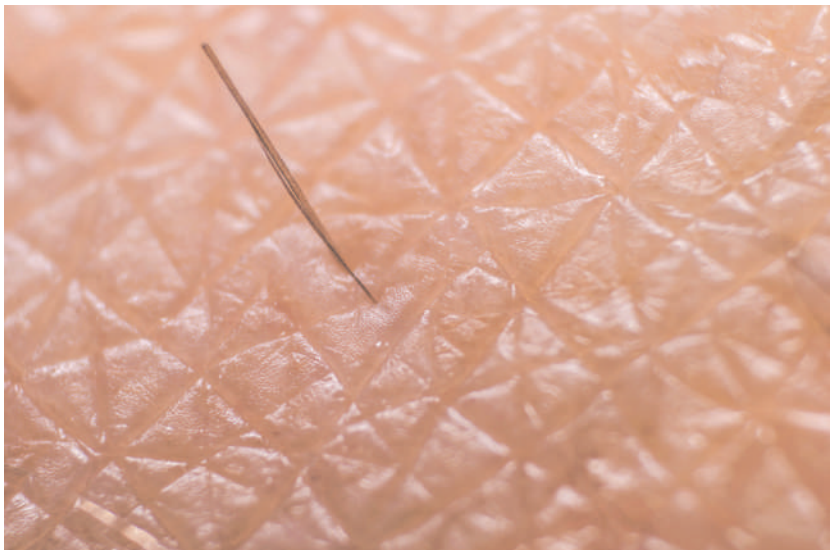
SKIN IN THE GAME

One of the most exciting developments in artificial skin research came from the RIKEN Centre for Developmental Biology in Japan, in 2016. In concert with collaborators from the Tokyo University of Science and other leading lights of Japanese science, researchers successfully grew complex skin tissue in the laboratory, including the sebaceous glands for oil production, sweat glands, and the follicles required to let hair grow. The tissues were implanted into living mice, and formed proper connections with the muscle fibers and nerve systems around them.

There has been an increasing amount of research into bioengineered tissue over the last fifteen years, though, while implantable skin 'sheets' of epithelial tissue (the thin outer layer of skin) have been grown in the lab, the absence of sweat-glands and oil ducts prevented them from working as normal tissue. The creation of functional skin that integrates with existing tissues is a major step forward.

RIKEN's technique — pioneered on mice — uses iPS cells developed in culture into clumps of embryoid tissue. This was implanted into immune-deficient mice (who would not reject the foreign matter), where the clumps developed into differentiated cells, as actual embryos do. This tissue was then transplanted into the skin tissue of other mice, where — taking its cues from the cells around it — it developed into integumentary tissue, the cells between the inner and outer layers of the skin. Though different in composition to natural tissue, the implanted tissue still made normal connections with the surrounding layers of skin, allowing it to function as natural skin would.

While it is still a far cry from a pain-free injection of skin-restoring cells, this technique is an incredible step in the right direction.■



"AT THE MOMENT, IPS CELLS ARE ONLY BEING USED TO AID WITH PATIENT-SPECIFIC DRUG DISCOVERY AND TRACKING DOWN THE SOURCE OF INDIVIDUALIZED DISEASE."

IPS CELLS

Induced pluripotent stem cells were pioneered in the lab of Shinya Yamanaka in Kyoto, Japan, in 2006. 'Pluripotent' in this context means 'the ability to develop into many different forms of cells'. iPS cells can be generated directly from adult cells in the body, negating many of the moral and legal qualms around the use of embryonic stem cells, which require the destruction or manipulation of human embryos.

Pluripotent stem cells are the most promising branch of research for regenerative medicine, as they can be reproduced indefinitely, can be induced to develop into every other cell type in the human body, and could potentially be held in reserve to replace cells in a patient lost to disease, damage, or even old age. Additionally, because they are taken directly from adult tissues, they can be made in a way that matches them to a patient, so that tissues grown from a particular person's iPS cells will never be rejected by their body once reimplanted — as the body will always recognize the iPS cells as its own.

At the moment, iPS cells are only being used to aid with patient-specific drug discovery and tracking down the source of individualized disease, but the hope is that they will be able to be used therapeutically within the next decade.

Currently, the derivation of iPS cells can take 3-4 weeks for human cells, with very low efficiencies, but this time is being reduced, and the efficiency being increased, with every new development in the field.

OPPOSITE: Artist's impression of artificial flesh over a metal robotic arm. [Photo: Shutterstock]

LEFT: An illustration of pluripotent stem cells under the microscope. [Photo: Shutterstock]

ABOVE: An extreme macroscopic close-up of a single human hair, embedded in skin. [Photo: Shutterstock]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