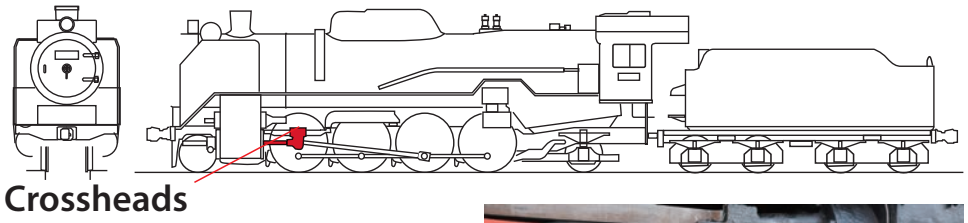
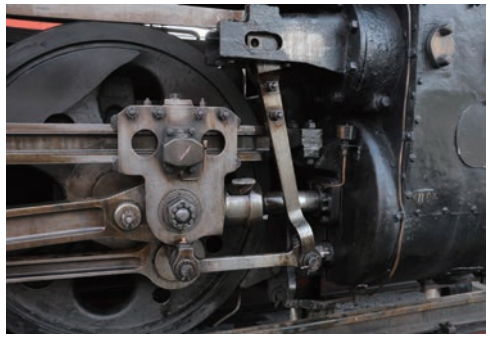
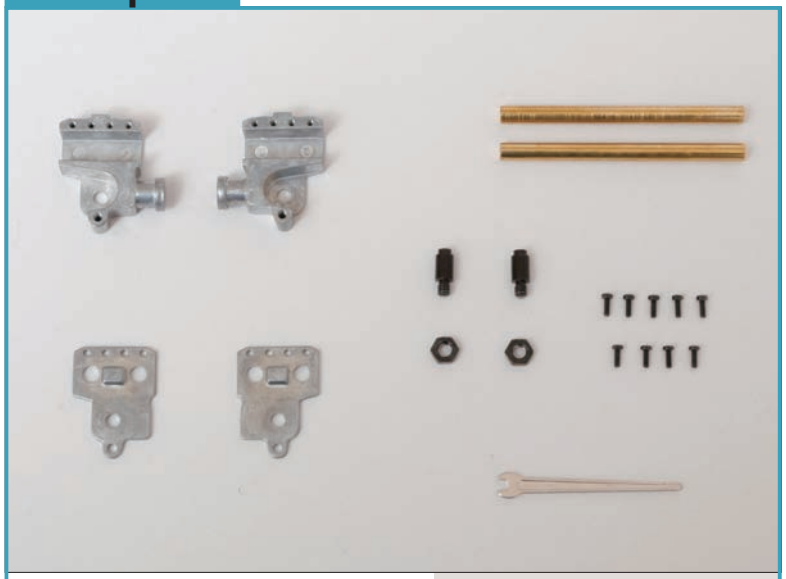
The crossheads





Your parts



Right crosshead
Left crosshead
Right outer crosshead
Left outer crosshead
Piston rods × 2
Crosshead pins × 2
Nuts × 2
4mm hexagonal head screws × 9
Wrench

Required tools

Pliers
Tweezers
Epoxy adhesive

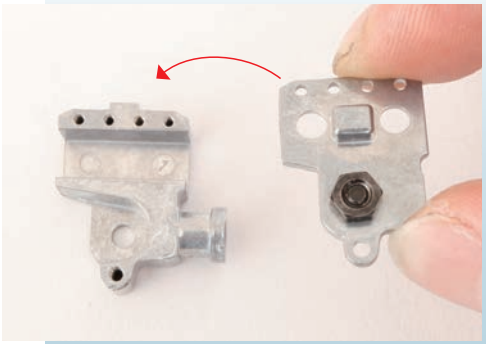
Useful tool:
2.2mm nut driver

1 Fitting the crosshead pin


Insert a crosshead pin into the right outer crosshead.


Tighten a nut onto the thread of the crosshead pin.

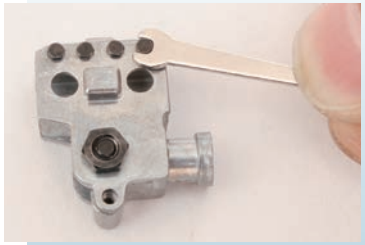
2 Assembling the crosshead



Place the right outer crosshead onto the right crosshead, aligning the four holes at the top.

Place a hexagonal head screw into each of the four holes (circled) of the right crosshead.

3 Tightening the hex screws



Tighten the hexagonal screws into the four holes, using the wrench supplied with this stage.

Assemble the left crosshead, following the same process as for the right.

Tip!

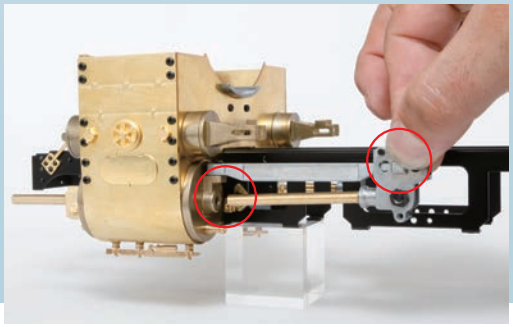
If you have a 2.2mm nut driver, tightening the hexagonal screws into place will be easier.

4 Fitting the piston rods

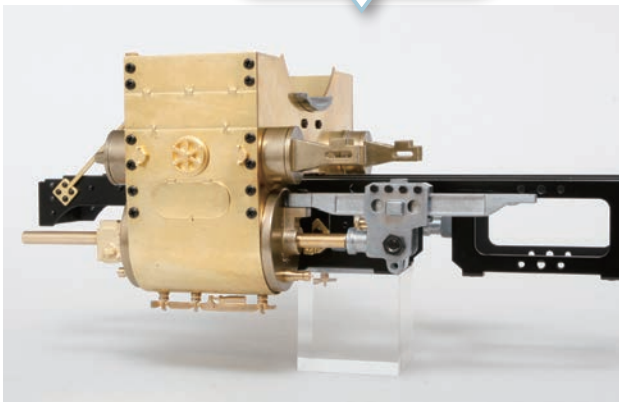
Apply some epoxy adhesive to one end of each of the piston rods.

Insert the piston rods into the holes in the cylindrical projections of the crossheads.

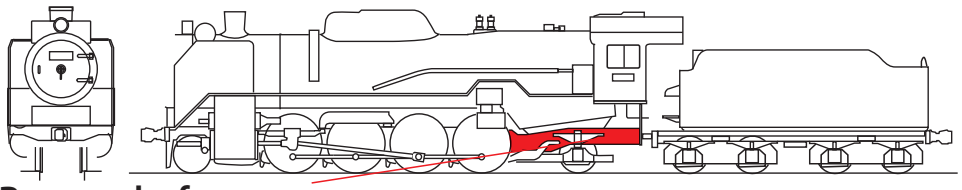
Temporarily fit each crosshead to the rest of the assembly by placing it over the motion bars and sliding the piston rod into the hole in the cylinder cover.



Assembled parts



The rear underframe



Rear underframe

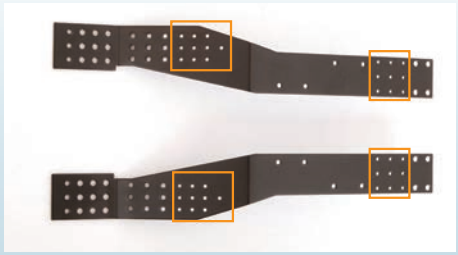
Your parts

Right rear underframe
Left rear underframe
Rivets × 40 (including 2 spares)

Required tools

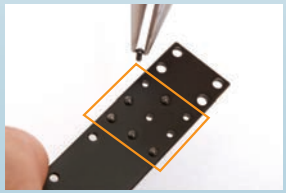
Pliers
Instant adhesive
Masking tape

1 Fitting the rivets

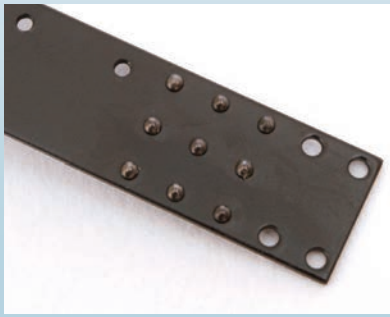


Position the two rear underframe parts as shown, and identify the highlighted sets of holes. Make sure they are positioned this way, with the middle raised, when fitting the rivets.

The rivets are very small, but if you grip them from the top, as shown here, they are easier to hold.



Insert the rivets into the highlighted holes on the underframes.



This is how the rivets should appear in the underframe.

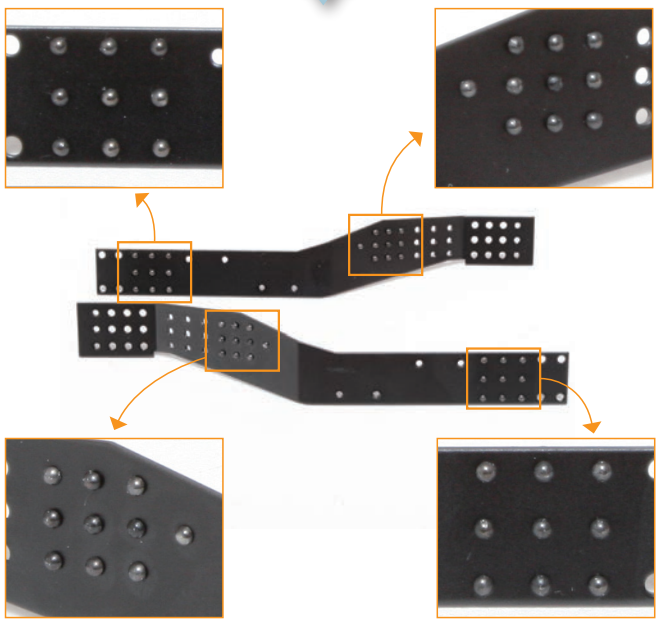
2 Securing the rivets

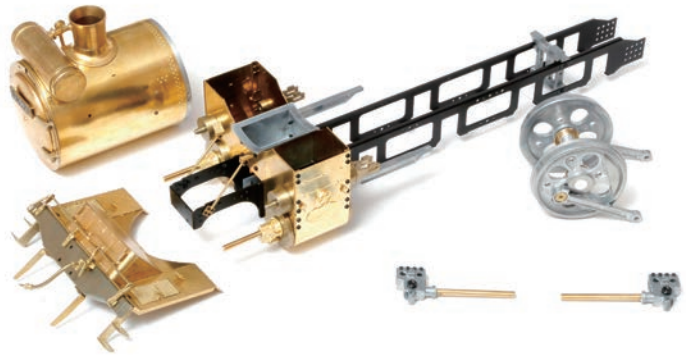
One method of securing the rivets is to place and glue them one at a time, but this can be very frustrating and time consuming. The better method is to use masking tape.

Cover the area where the rivets are with masking tape, pressing the tape on either side of the rivets so that they are held lightly in place.

Turn the underframe over and apply a small amount of glue to the back of each rivet. Repeat these steps to fit all of the 38 rivets in place.

Assembled parts





The crossheads have been removed.

Check the photo on the left to confirm that you have now assembled all the parts shown.

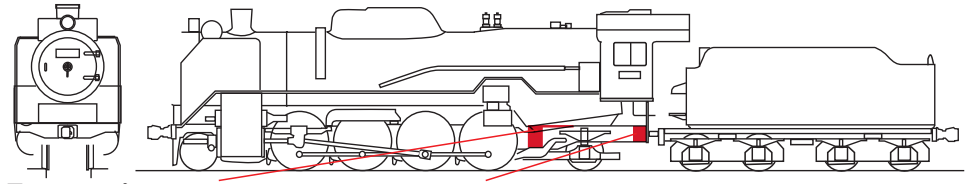
Maintenance

Make sure that after handling any of the brass parts you wipe away any grease or dust from the surface to keep them clean.

Storage

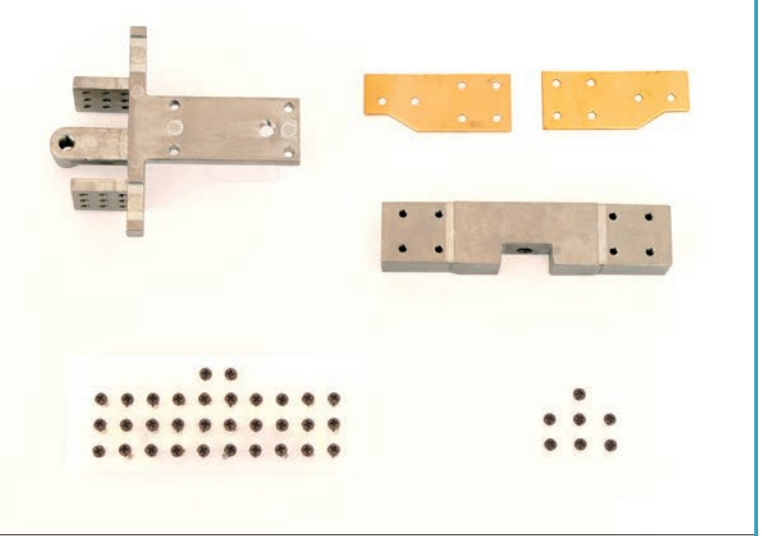
As the build proceeds, you will accumulate more and more parts that can't yet be assembled. You may want to use a box, such as one with changeable compartments, as shown above, to store your separate assemblies.

The expansion support, rear support and rear plates



Expansion support, rear support and rear plates

Your parts

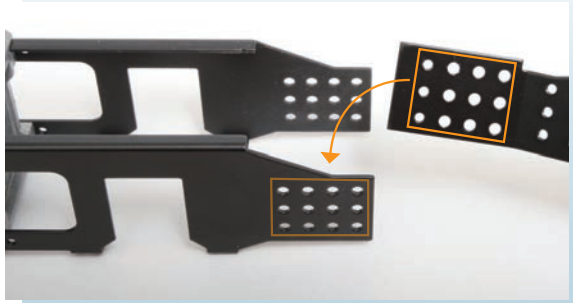


Expansion support
Rear plates × 2
Rear support
5mm screws × 32
2mm screws × 7

Tools and materials

Phillips screwdriver

1 Fitting the rear underframes

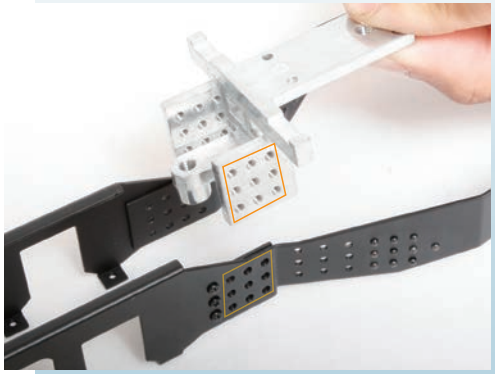


Place the main underframe assembly as shown, and position the left rear underframe on the inner surface of the assembly, aligning the 12 holes of both.

Repeat this process to fit the right rear underframe to the main underframe.

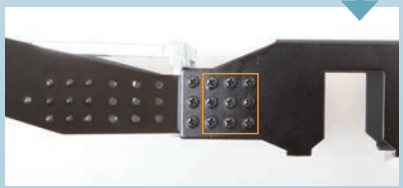
Tighten three 2mm screws into the highlighted holes to secure the two underframe parts together.

2 Fitting the expansion support



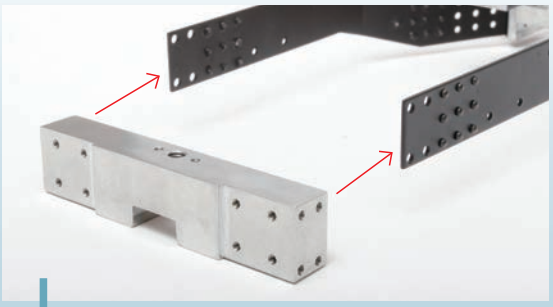
Place the expansion support into the gap where the underframes join the main underframe, aligning the nine highlighted holes of both.

Tighten a 5mm screw into each of the nine holes, securing the underframe assembly to the support.

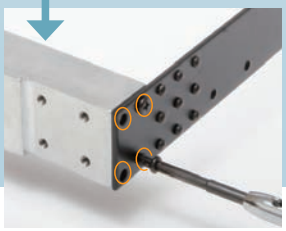


Turn the assembly over and repeat for the other side.

3 Fitting the rear support



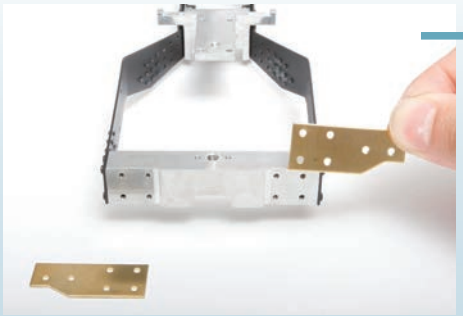
Position the rear support between the two ends of the underframe. Align the four holes at the ends of the underframe with the four on each side of the support.



Tighten a 5mm screw into each of the four holes (circled).

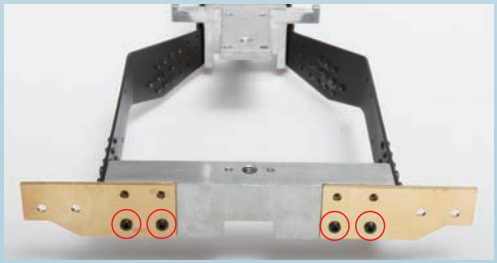
Repeat for the other side.

4 Fitting the rear plates



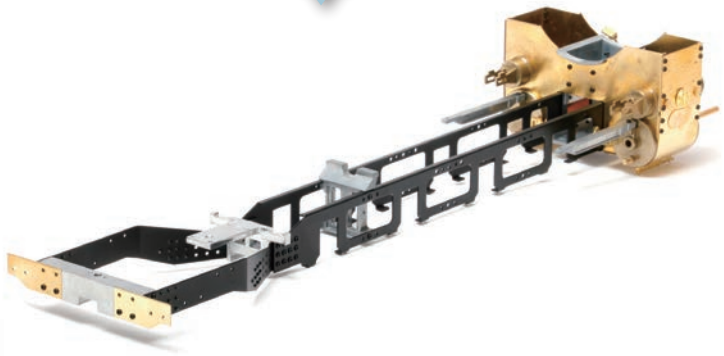
Tighten two 5mm screws into the two bottom holes of the right rear plate.

Position the two rear plates as shown, and locate the four holes on either side of the rear support.

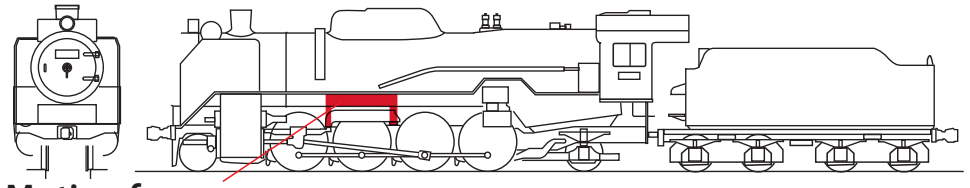


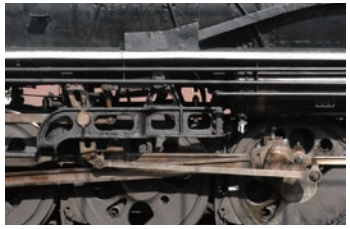
Tighten another two 5mm screws into the two holes at the bottom of the left rear plate.

Assembled parts

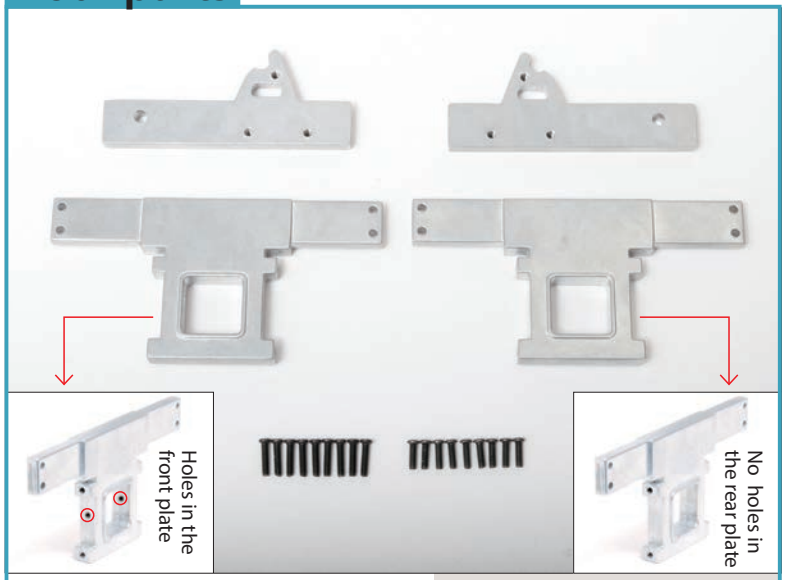


The motion frame





Your parts

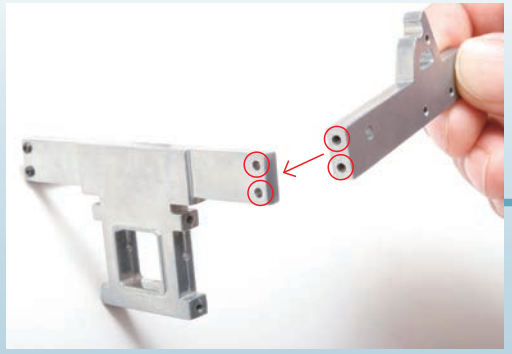


Motion frame side plates × 2
Motion frame front plate
Motion frame rear plate
8mm screws × 9
6mm screws × 9

Required Tools

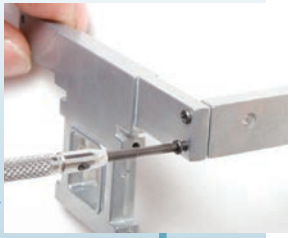
Phillips screwdriver

1 Assembling the front motion frame

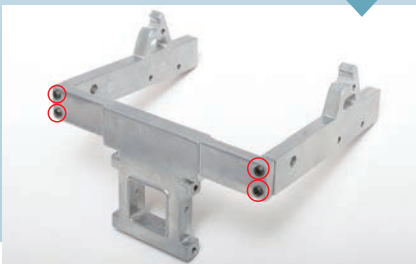


Identify the two circled holes on one of the side motion plates and align them with the two circled holes of the front motion plate.

Tighten an 8mm screw into each of the holes on the front motion plate, securing the side plate to it.

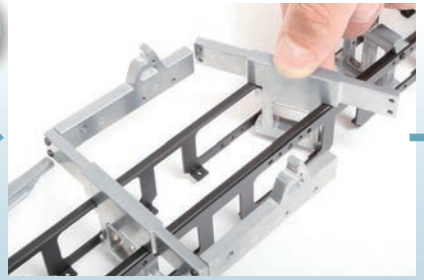


Repeat for the other side plate.

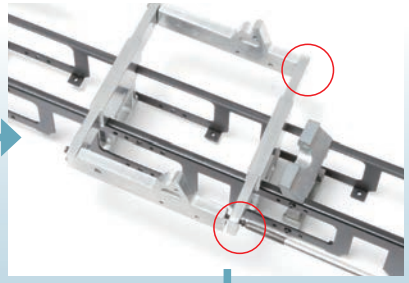


2 Assembling the motion frame

Slot the motion frame assembly into the underframe, as shown, engaging the upper parts of the underframes with the slots in the side of the front motion plate (circled).



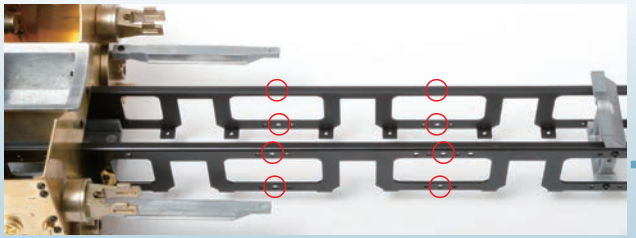
Slide the rear motion plate into place on the main underframe, inserting it sideways and then turning into position, as with the front plate.



Tighten an 8mm screw into each of the four holes (circled) of the rear plate, securing it to the rest of the motion frame.

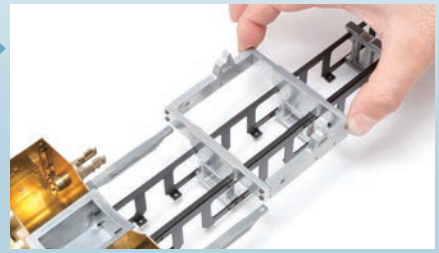
If you are having trouble tightening the screws, slide the frame along the underframe to a more accessible point.

3 Fitting the motion frame

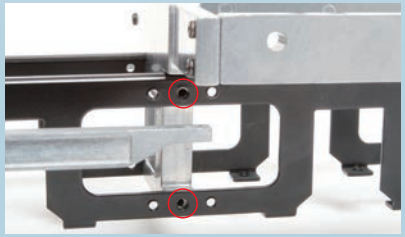


Locate the eight circled holes on the underframe where the motion frame will be positioned.

(For clarity, the motion frame has been removed.)

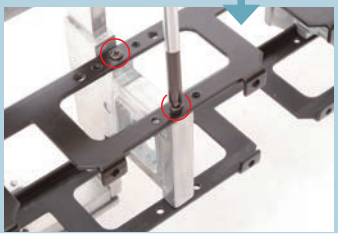


Slide the motion frame assembly into position on the underframe.



Align the holes of the motion frame with those of the underframe, identified above.

Half-tighten a 6mm screw into each of the eight holes, to hold the motion frame in position. Then fully tighten all the screws.



Assembled parts