

5" Gauge 15xx Class



Assembly Instructions

Silver Crest Models Limited
2 Gresley Close
Daventry
Drayton Fields Industrial Estate
NN11 8RZ

27th August 2025

INTRODUCTION

The following pages contain detailed assembly drawings, reference photographs and parts listings (See contents).

As part of our quality control process our engineer Mike Pavie has already assembled two pre-production prototypes and a production kit. All three models have been proven in steam. Mike has written these instructions by reference to his experience in assembling the production kit.

We are confident that you should enjoy a trouble free build, but recognise that some customers are complete novices and may need a little bit of advice as the build progresses.

If you need assistance, or advice, please initially contact Mike by email. Briefly explain your query and include your name and contact telephone number so Mike can call you back. If you do not have access to email please contact Mike by telephone.

Email: mike@pavie.plus.com Telephone: 07474 719480.

When you come to steaming your engine there is an instructional video on our website at the link below:

<https://kingscalelivesteam.co.uk/5gauge/gallery.php>

Enjoy building your GWR 15xx Class kit!

GWR 15xx CLASS INSTRUCTIONS

INTRODUCTION

CONTENTS

ASSEMBLY INSTRUCTIONS

STAGE 1 - 7

APPENDIX 1

THE DRAWINGS

APPENDIX 2

PARTS LIST BOXES 1 - 9

APPENDIX 3

PHOTOGRAPHS BOXES 1 - 9

APPENDIX 4

STAGE BUILD PHOTOGRAPHS 1 - 7

WRITTEN ASSEMBLY INSTRUCTIONS



1500 kit construction. Section 1 Frame Assembly

Unpack box 8 and unwrap all the components. With reference to the parts list and the photos, identify each part.

Note that all the kits have been pre-assembled for quality control and all the screws required are loose in the actual components. All engines have been air tested and a small percentage will have been test steamed for Quality Control purposes.

Tools required for this section are:

3mm, 5mm, 5.5mm , 7mm Hex nut spinners. (Wera supply suitable tools) 3/32 inch af allen key and a 16mm open ended spanner).

Locate and lay out the following parts:

L/H and R/H main frames
Front and rear Buffer beams
Rear frame stretcher
Brake cylinder stretcher
Axle pump stretcher
Centre frame stretcher

Secure the buffer beams to the frames and with reference to the photos and drawings fit the stretchers, leave all the screws loose at this stage. Note, to fit the brake shaft remove the bronze frame bearings. Replace the bearings once the shaft has been fitted

.

Before fitting the axle pump stretcher remove the suction and delivery pipes using a 16mm spanner. Fit the banjo bolts back loosely to retain the balls. Set the pipes aside for later.

Lay the frame assembly upside down on a flat surface and check using a try square for alignment. Finally tighten all the screws and recheck the assembly is true and square.

With reference to the drawings and photos add the following parts:

Rear sandboxes
Exhaust Y pipe
Front and rear guard irons (longer ones to front)
Reverser lower pivot bracket

Left and right footplate support brackets
Side tank rear support brackets
Gear frame support girders
Toolbox

If desired, paint the bright steel screw heads black where appropriate and red on the buffer beam faces

1500 kit Assembly stage 2

Locate the following parts:

Front platform box 8
Lubricator box 7
Wheel sets box 5
Brake assembly box 7
Coupling rods box 8
Front buffer beam steps box 8

Tools required:

5.5mm and 6mm nut spinner
5.5 mm and 6mm open ended spanners
3mm Allen key

Hold the lubricator under the front beam and align the screw holes, place the front platform above and fit the 3 hex head screws. Check alignment and tighten the screws.

Lay the chassis upside down on a soft surface.

Fit left and right front buffer beam steps
(longer side of treads to rear)

Fit the 3 wheel sets. Note the leading axle eccentric is towards one side and must align with the lubricator crank.

The centre axle eccentric will align with the axle pump ram.

Fit 12 off horn stay bolts

Connect the lubricator arm and the axle pump ram.

Fit the brake gear assembly and connect to the cranks on the rear shaft.

Fit left and right coupling rods and secure the front and rear crank pin screws and washers to retain the rods.

Check the wheels revolve freely.

1500 kit Section 3

Cylinders and valve gear

Refer to drawings 4,5,6.

Tools required:

10mm af spanner

3,5,5.5,6,7 mm nut spinners

3mm flat screwdriver

2.5,3mm ball end allen key

Parts required:

L/H and R/H cylinder assembly box 2

Cylinder slide bars box 7

Weighshaft box 8

Connecting rods box 8

L/H and R/H gear frames box 8

Return cranks and eccentric rods box 8

Smokebox saddle box 7

Before attaching the cylinders it is convenient to fit the connecting rods to the crossheads

Offer up a cylinder and locate the connecting rod big end on the crankpin. With the chassis upside down fit the lower cylinder bolts and leave slightly loose.

Fit the second cylinder then turn the chassis up the right way and fit the remaining bolts. Finally tighten the cylinder bolts.

Slide the smokebox saddle between the frames and fit the 8 securing screws from inside. This is a bit awkward due to limited access . A ball ended allen key helps .

Fit the R/H gear frame and then pass the weighshaft through the frames, through the R/H lifting link and into the outer bearing.

Repeat this procedure on the L/H gear frame. Then tighten all the frame securing screws.

Position the R/H lifting link so there is equal clearance each side of the radius rod and secure the 2 hex screws.

Position the lifting link so that the die block is central in the expansion link. Check by swinging the link, making sure the valve rod does not move

Position the L/H lifting link in the same relative position and tighten the securing screws. It should be possible to swing each expansion link without any valve rod movement. Fine adjustment may be required to achieve this.

Fit the L/H and R/H slidebars

Fit the 2 return cranks (make sure the taper is clean) and fit the allen screws from behind the wheel. There is a cut out in the frames above each axle box to allow fitment and tightening the screws. Tighten just enough to create some resistance to moving the return crank.

Fit the eccentric rods

Set the return cranks as follows:

Working on one side at a time position the crosshead to front dead centre. Position the return crank approximately 90 degrees behind the crank pin when the wheel is turning in forwards direction (return crank trails crank pin by 90 degrees when running forwards).

Now move the lifting link full travel up and down the expansion link. The valve spindle should not move. If it does move then note the direction and shift the return crank to correct. Double check on the back dead centre. When the crank is correctly positioned there should be no (or very little) movement of the valve when the die block is moved from full forward to full reverse position. When this is achieved fully tighten the allen screw from behind.

Repeat on the other side of the engine.

Finally recheck both sides as described.

Fit the front sand boxes and the front tank support girder.

1500 assembly Stage 4

Drain cock shaft and pipework.

Additional tools required: 10mm ,8mm 6mm open ended spanners

Locate drain cock shaft (Box 8) and the operating rod (longer of the 2 black rods).

With the chassis upside down connect the drain cock operating mechanism.

Remove the operating levers and pass the shaft through the frame brackets. The longer arm between the frames.

Locate and secure the 2 small outer levers and connect to drain cock operating rods.

Fit the operating rod and using some wire, secure it to the rear brake cross shaft for now.

While the chassis is upside down refit the delivery and suction pipes previously removed from the axle pump.

Pipework

All the pipes are in box 7

With reference to the photos identify each pipe (note if you feel a pipe needs bending to fit then you have selected the wrong pipe). Everything has been trial assembled.

Fit the double water valve assembly to the rear stretcher, note the injector water pipe must pass through the hole in the R/H frame. You will need to release this pipe and refit through frame.

Fit the injector to the water inlet pipe to provide a datum for the remaining steam and delivery pipes. Refer to the photos.

On the left side fit the steam brake pipe and the bypass valve assembly. Connect the axle pump delivery pipe to the bypass valve lower union.

Remove the 3 valve spindles and back nuts from the water valves.

Footplate

Remove the footplate from the cab assembly(Box 9)

Attach the draincock operating lever to the footplate (Box 8)

Offer the footplate up to the chassis, pass the lower end of the draincock lever past the bypass valve plumbing and guide the 3 water valve bodies through the holes in the footplate.

Secure the footplate with countersunk screws and secure the water valve back nuts.

Connect the lower end of the draincock lever to the operating rod beneath the footplate.

Fit the pole reverser (Box 7)

Fit the left and right cab steps (Box 8)

1500 assembly Stage 5

Boiler

Remove the safety valve (there is a spare gasket supplied if needed)

Remove the water gauge blow down pipe and the steam brake valve from the boiler manifold

Position the firebox upper cover .

Offer up the boiler barrel cladding (box 4) and pull the lower edges together with tape.

Link the boiler bands with the joint strips and connect the firebox cover at the rear with the single 3mm screw.

Locate the smokebox rear ring (box 4)

Apply a bead of high modulus black heat resistant silicon to the inside of the rear flange (the cut outs are in the front flange to clear the smokebox handrail fasteners).

Push the ring on to the boiler and secure with the 3 screws

Attach the smokebox (box 3)

To make fitting the steam pipes easier, remove and put aside the smokebox front ring , door, lamp iron and step. Also remove the chimney by unscrewing the petticoat pipe from inside the smokebox.

Ensure the 2 firebox support screws are flush with the upper face of the blocks on the mainframes.

Lower the boiler into position ensuring the firebox passes between the frames and the smokebox rests on the saddle.

Secure the smokebox to the saddle.

Fit left and right steam pipes (place tape over steam inlet holes while removing the 8 cap screw to avoid loosing one in the valve chest).

Using the silicon sealer, bead seal around the steam pipes from inside the smokebox. (Geocell plumber flue is ideal).

Also seal around the blast pipe boss.

Screw in the blastpipe and align and connect the blower pipe, tighten the back nut.

Replace all parts removed for access.

Refit the safety valve

Fit valve bonnet and top feed covers (Box 4)

Connect the pipework to the boiler manifold and check valves paying careful attention to the photos.

Refit water gauge blow down and steam brake valve.

You should be left with just 3 pipes facing the front of the loco which will connect to the left sidetank.

1500 kit assembly Stage 6

Front end details and sidetanks

Locate the 3mm oil feed pipes.

Identify left and right. The pipes will pass under the smokebox saddle and emerge in front of the front sandboxes for connection to the oil delivery check valves on the main steam pipes.

Fit the outer steam pipe covers (Box 8)

Fit the cylinder upper platforms (Box 8)

Note the engine is getting heavy and some means of safely placing it on its side will be needed for the next stage.

Lay the engine on its left side.

Position the R/H firebox side cover and offer up the sidetank.

Locate and fit the 4 off rear fixing screws first. Fit the 4 off hex screw at the front cross girder. Note, these screws will need a long thin 3mm af spinner and are quite hard to fit. As an alternative there is a bag of phillips screws provided should you choose to use these for ease of tightening.

Locate and secure the water balance pipe.

Turn the engine on to its right side and repeat the foregoing sequence on the left side.

Attach the 3 water pipes to the rear of the L/H tank

Fit the front and rear cross ties (the tanks are a snug fit to the boiler and may need pulling together to align the screws).

1500 Kit assembly Stage 7

Cab. Final details and valve timing check

Before fitting the cab, remove the Steam brake valve also remove the pressure gauge and syphon pipe.

Manoeuvre the cab spectacle plate over the rear of the boiler.
You may need to release the pipes on the left tank to ease fitting.

With the cab in position attach to the footplate. Some screws are fitted from below and some from within the cab.

Refit the pipe work and fittings removed for access.

Remove the R/H cab door, fit the reach rod. Replace the door.

Using a spot of super glue attach the number plates (works drawing shows them central to the cab area approximately 38mm up from the lower edge).

Attach the brass window frames to the cab front using a touch of super glue. The wider frames go inside the cab and should be aligned with the window cut out. The outer frames (thinner ones) locate in the etched location on the outside front face.

Finally fit the rear vacuum pipe to the rear buffer beam.

Air test

Apply about 20 psi compressed air to the boiler. The easiest way is to connect the air supply to the boiler test adapter fitted to the central tapping on the steam manifold.

Run in forwards and reverse direction. If the engine is able to run slowly in each direction the valve timing will be quite close.

Apply some resistance to the wheels and run listening to the exhaust beats which should be regular. Try in either direction.

If the timing needs adjustment the best way to determine the point of admission is to attach rubber tubes to the drain cock pipes and immerse in water. You should see bubbles at the point when the piston reaches the start of each stroke.

If adjustment is needed remove the valve chest front cover , slack the locknut on the valve crosshead before turning the valve spindle. Use a piece of tight fitting rubber hose to turn the valve spindle. Make a note of how many turns and in which direction you have moved the spindle in case you have gone the wrong way. Remember the piston valves are inside admission.

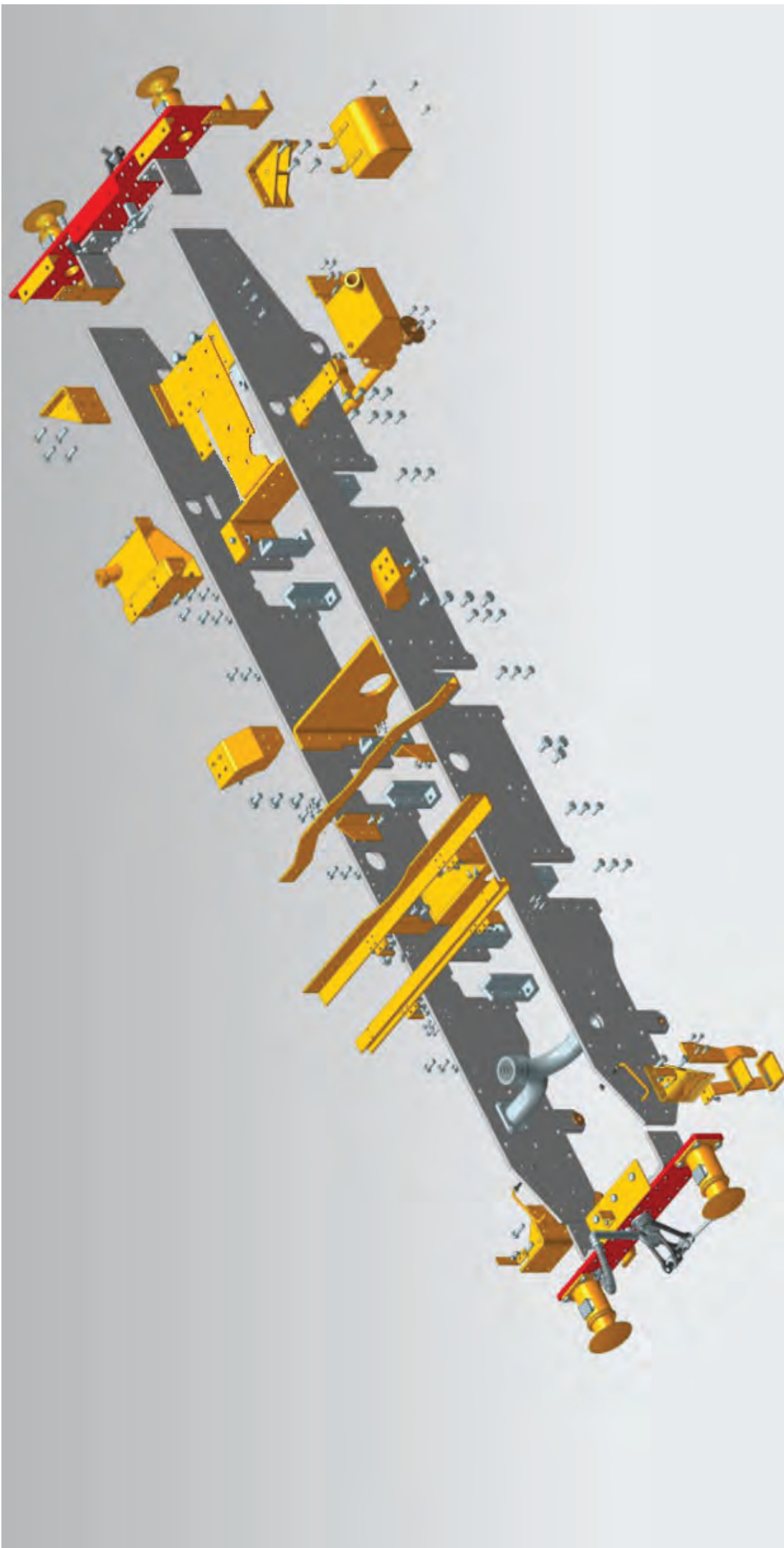
Running instructions will be by video taken at the track.

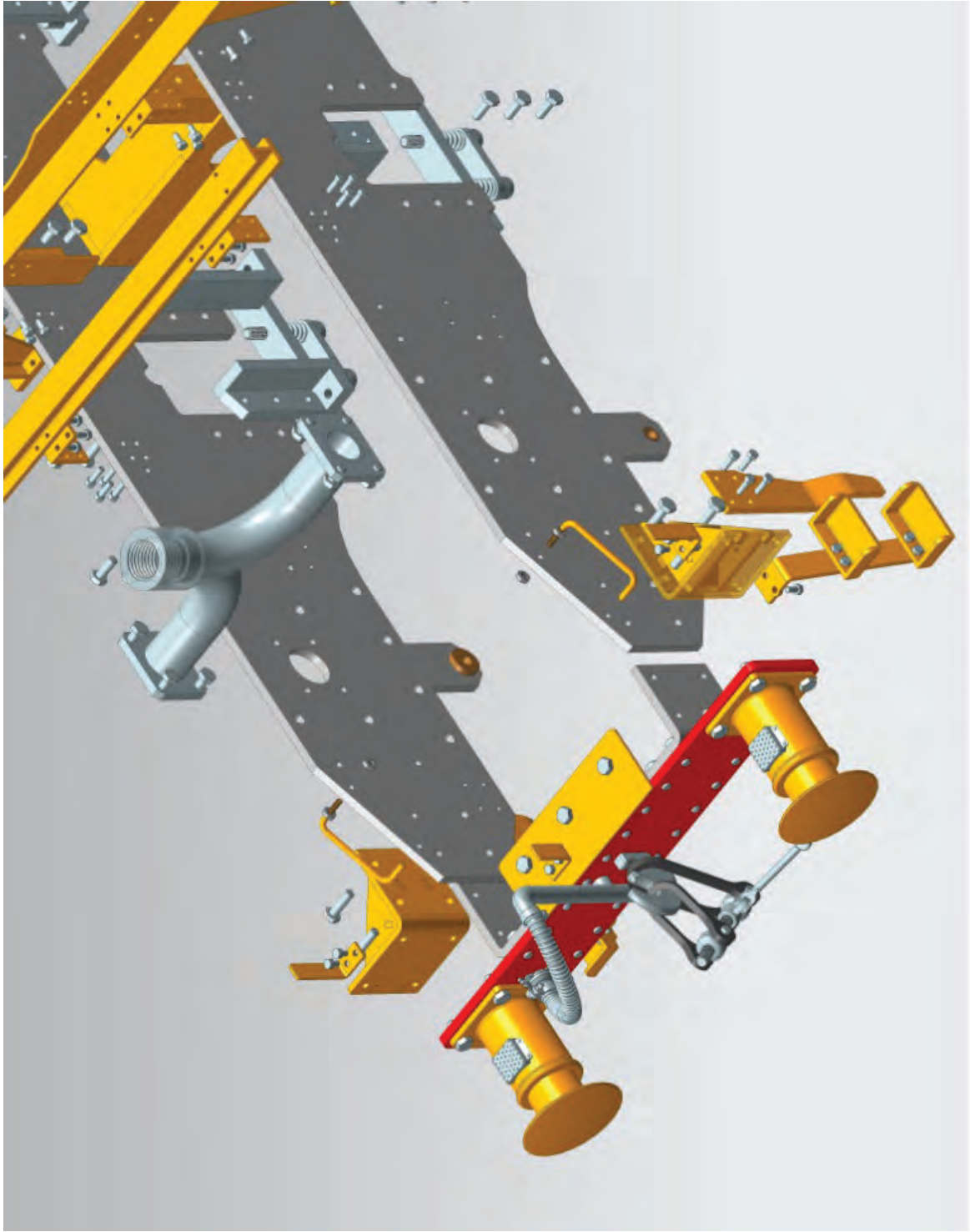
When presenting the engine for boiler test you will need the Silvercrest shell certificate and the test adapter provided. The test adapter is threaded 5/16 X 32 female.

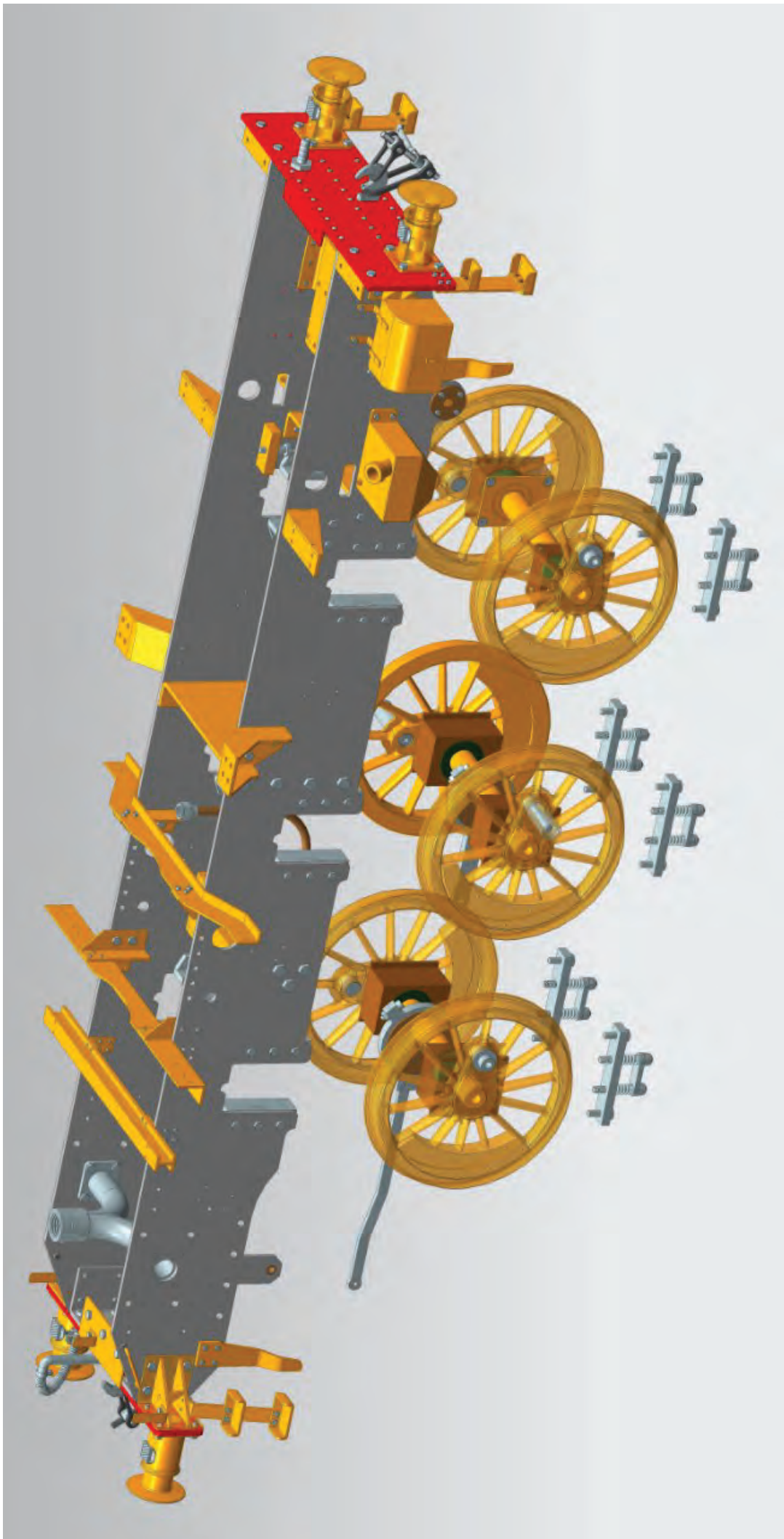
APPENDIX 1

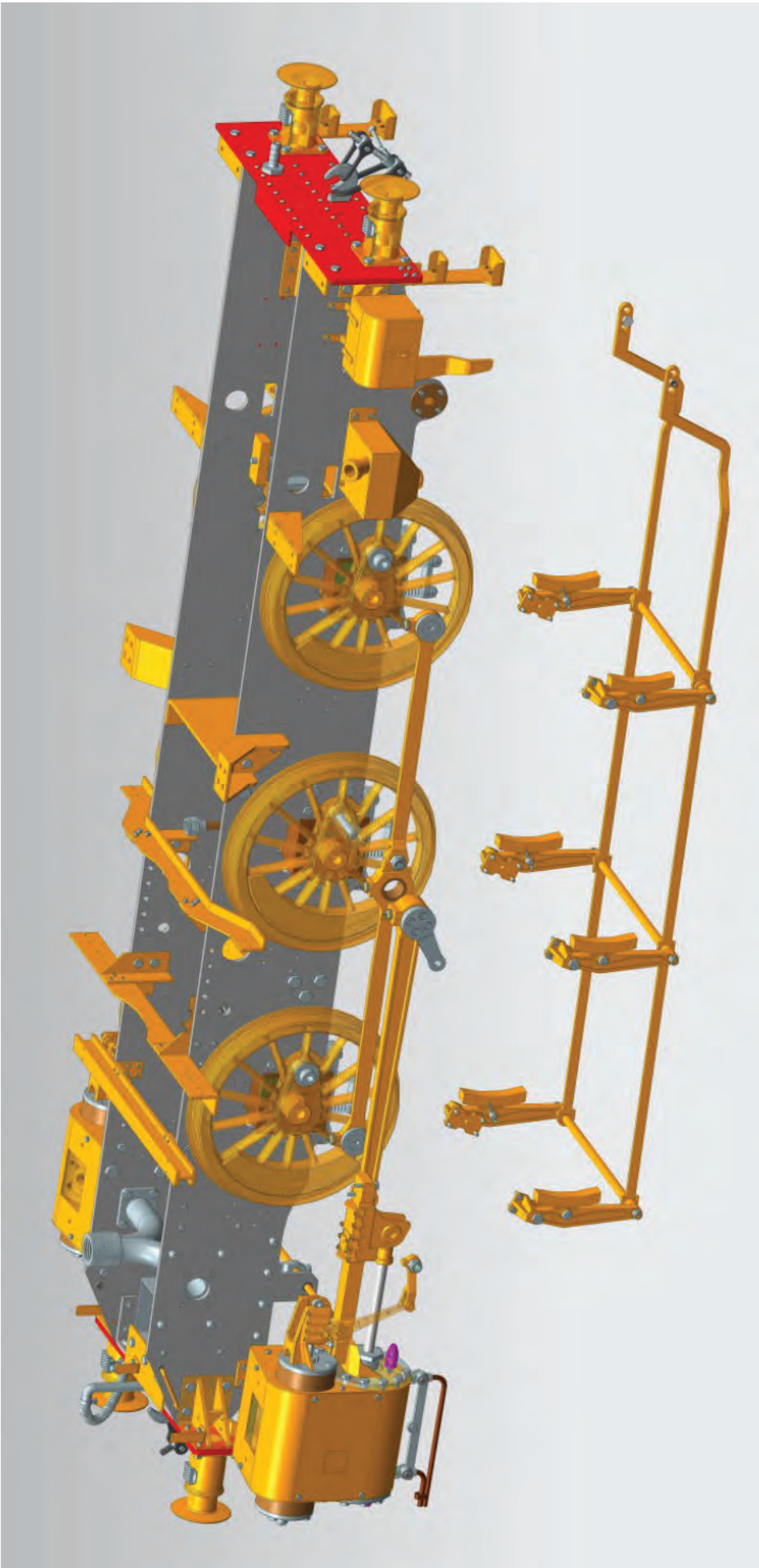


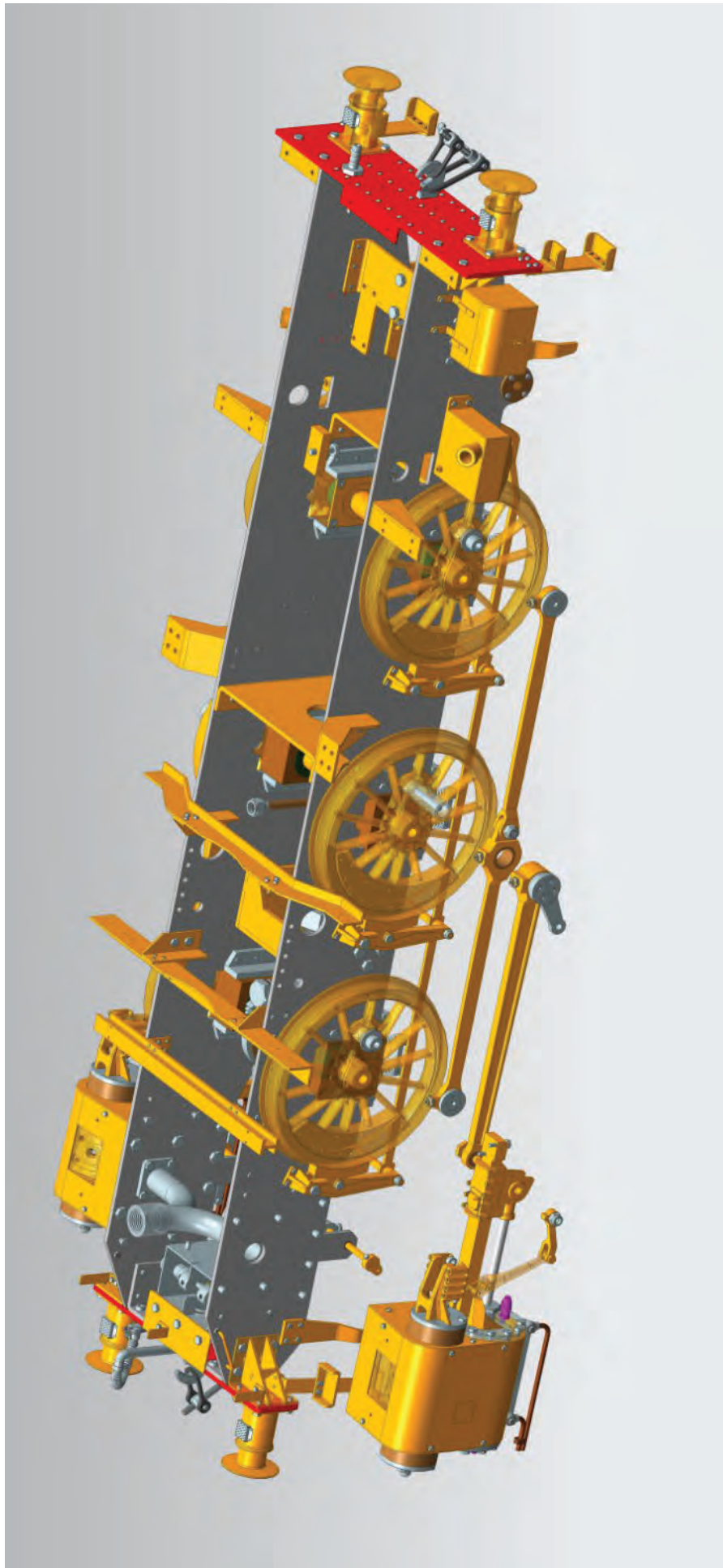
THE DRAWINGS

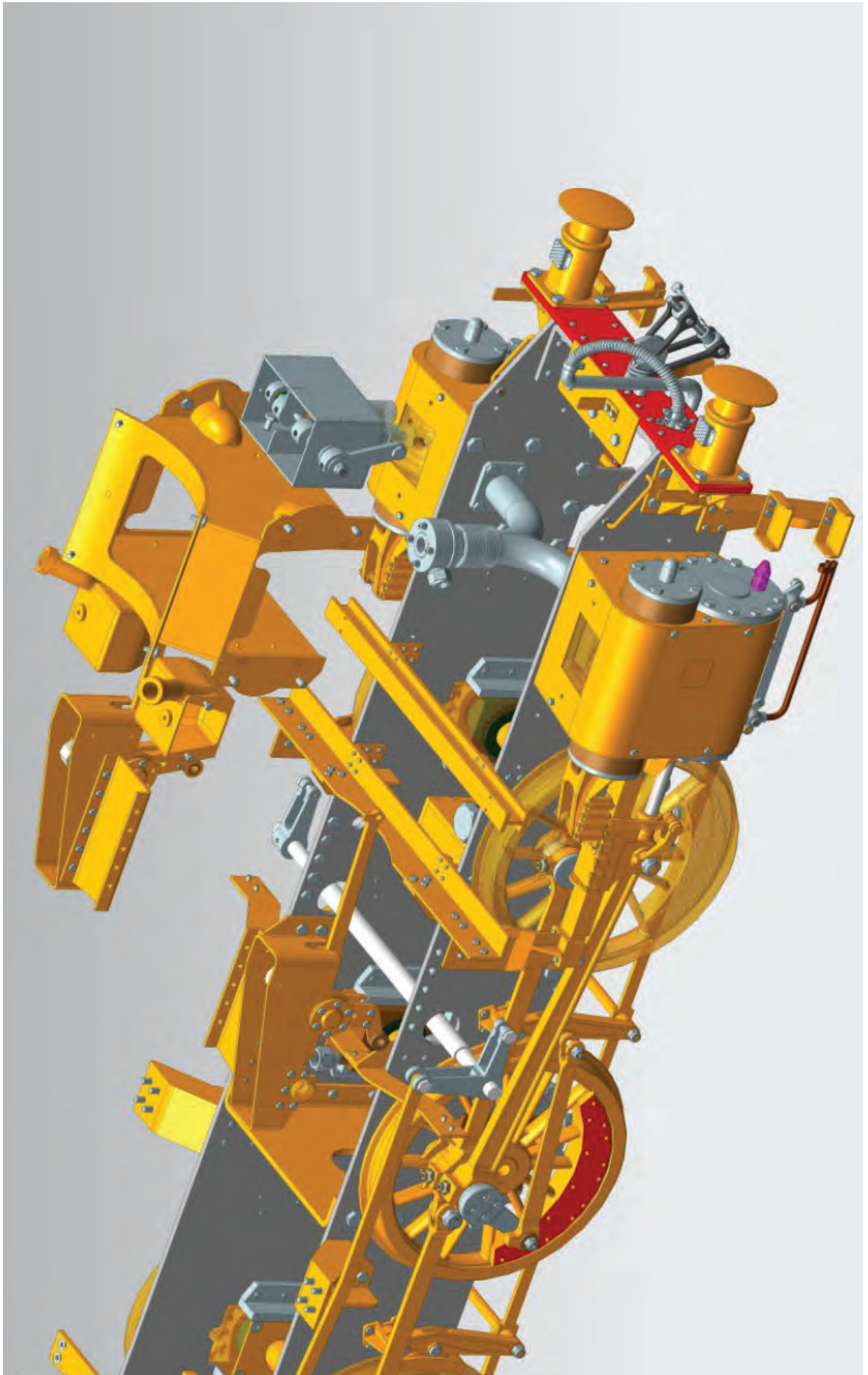


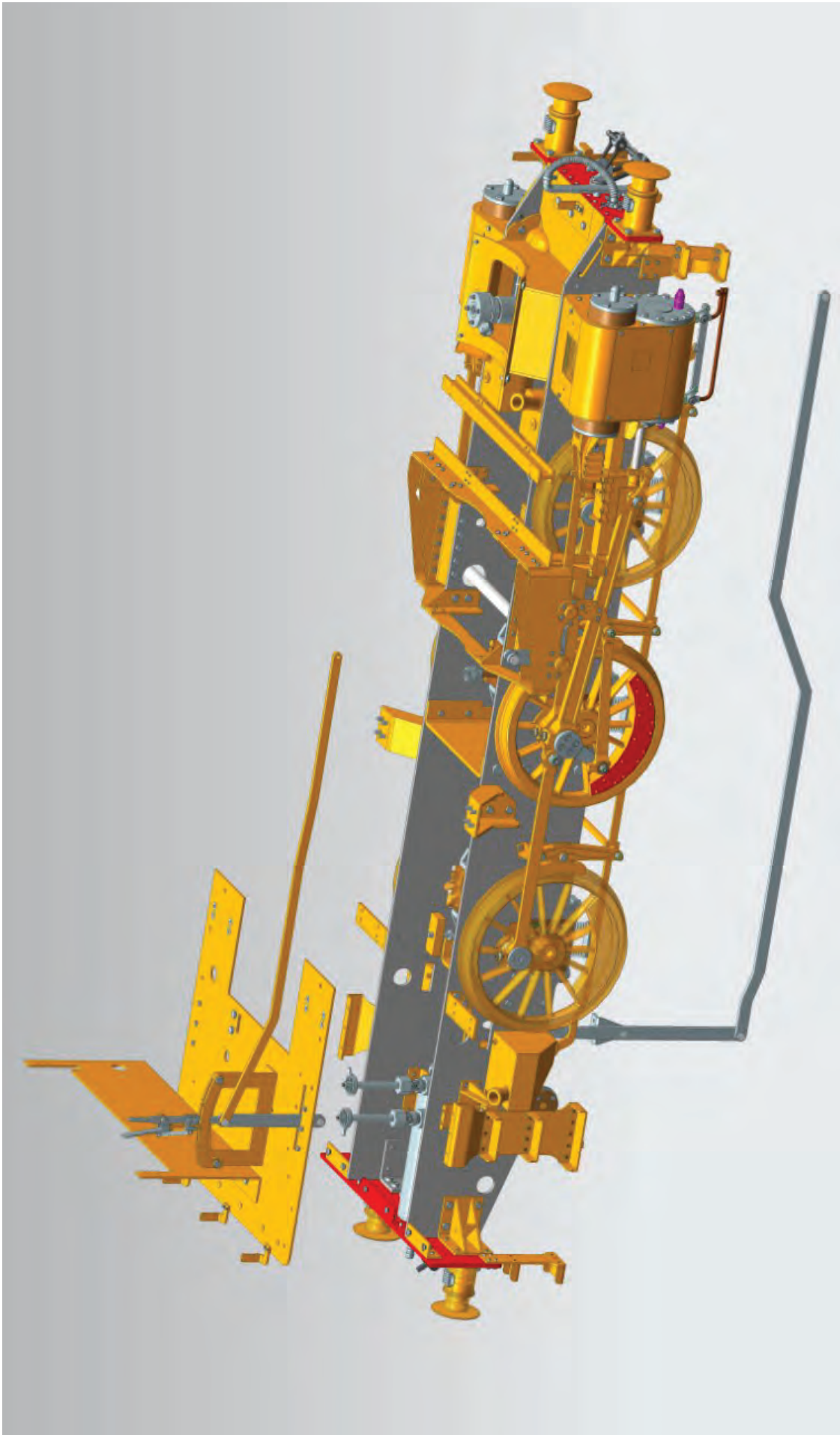


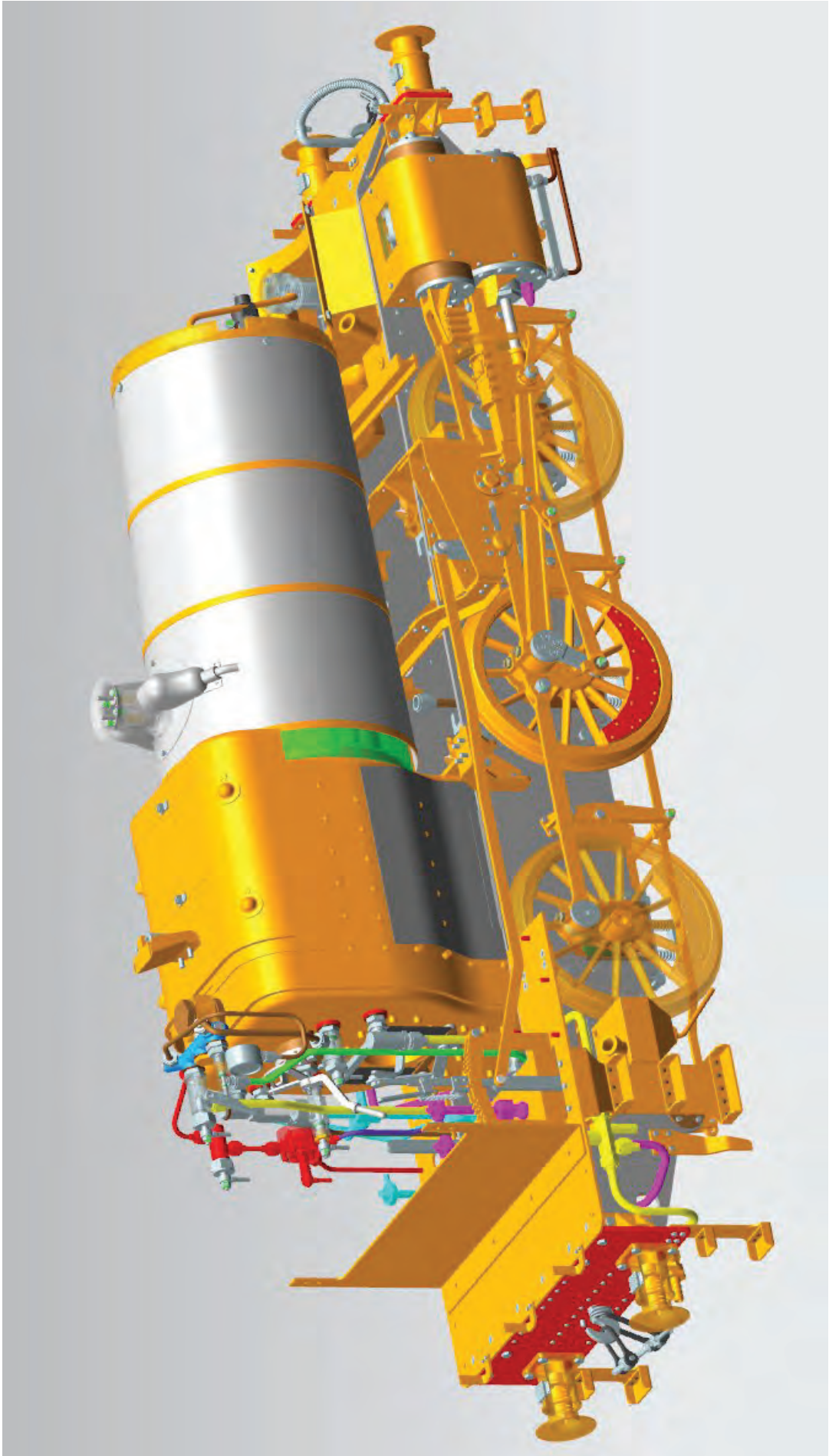


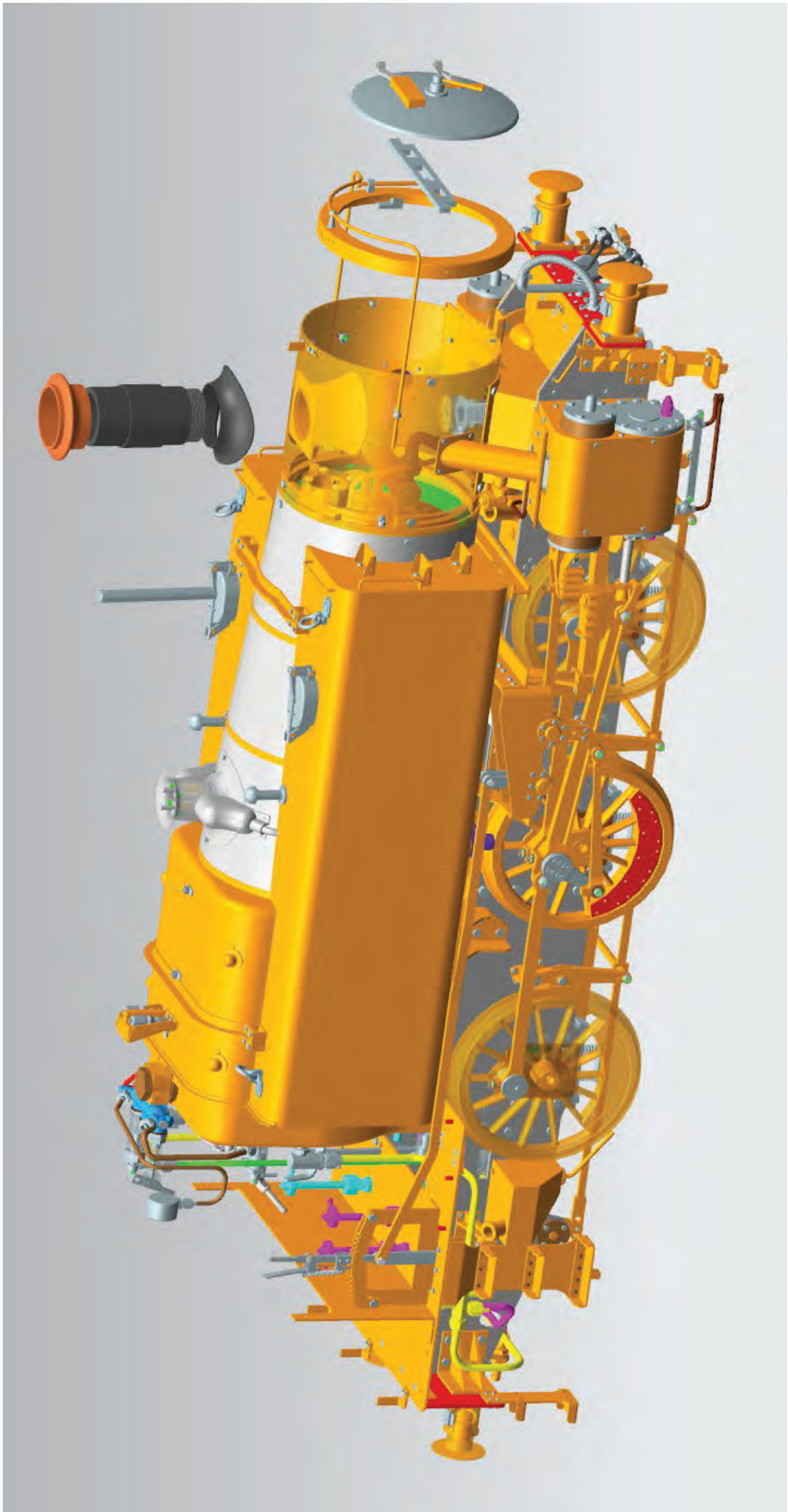


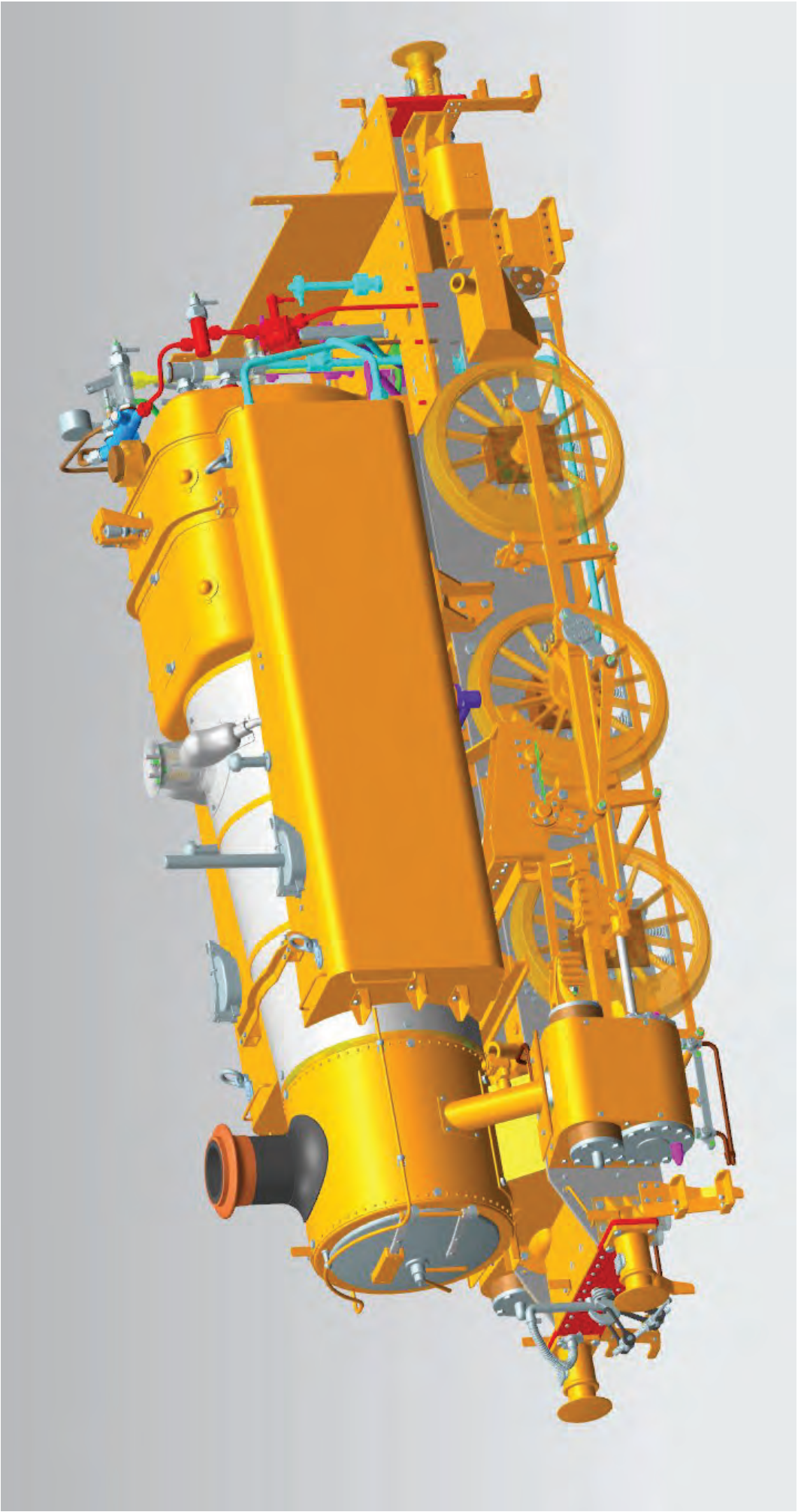


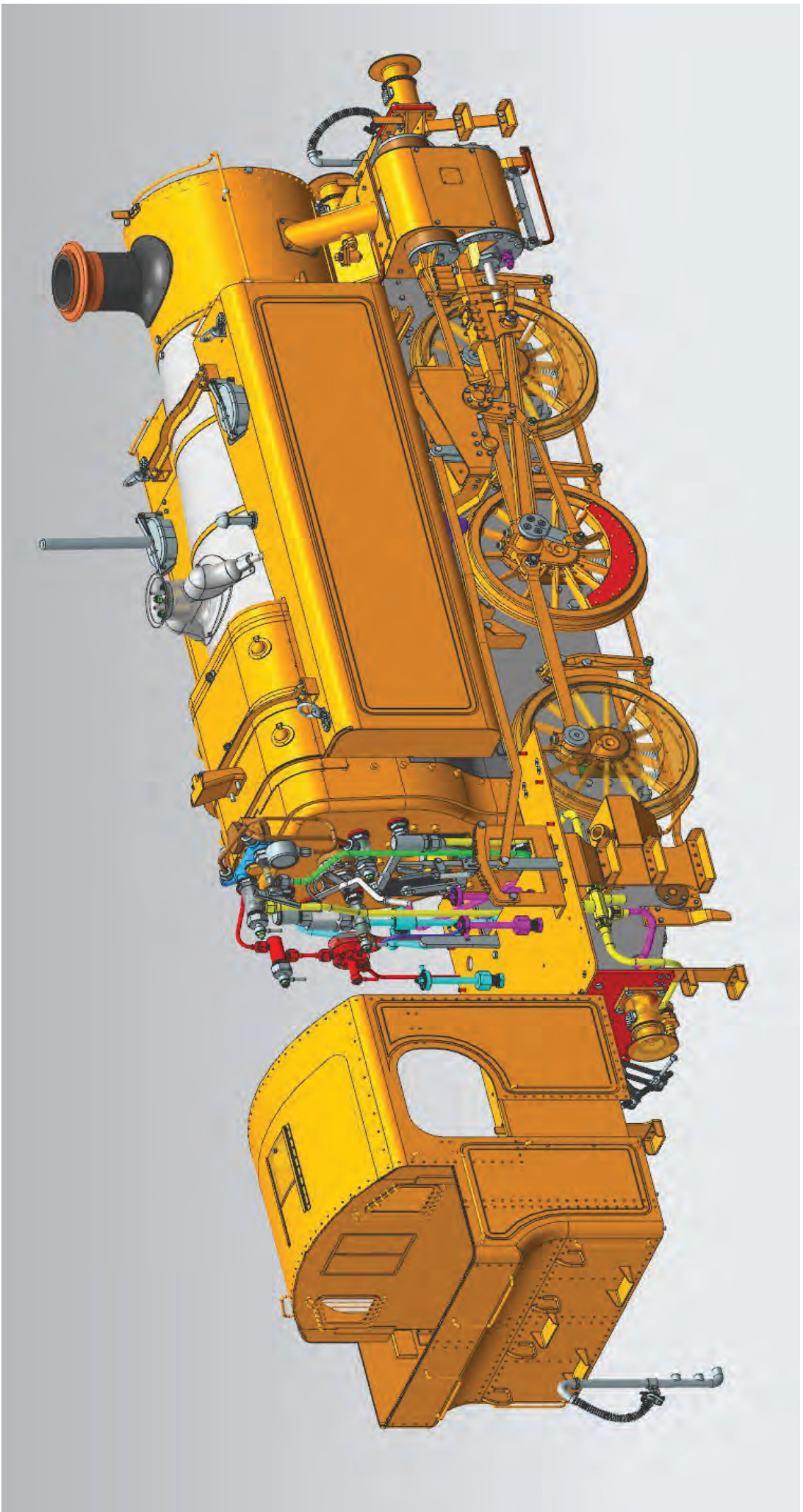












APPENDIX 2



PARTS LIST BOXES 1-9

1500 Kit Parts list

Box 7 contents

Smokebox saddle
2 cylinder slide bars
Pole reverser
Brake assembly
Pipework

Box 2 contents

2 cylinder assemblies

Box 5 contents

3 wheel sets

Box 3 contents

Smokebox complete

Box 1 contents

Fire box cover
Whistles
Tank tie bars

Box 6 contents

2 side tanks

Box 4 contents

Boiler outer casing
Top feed covers
Smokebox rear ring
Safety valve bonnet

Box 9 contents

Cab

Cab number plates

Separately Included

4 x brass window frames

2 x firebox side covers

3 x boiler band connectors

Assortment of Phillip Head screws (optional)

1500 Kit Parts list

Box 8 Contents

2 Mainframes
Front buffer beam
Rear buffer beam
Rear frame stretcher
Brake cylinder stretcher
Axle pump stretcher
Centre frame stretcher
Connecting and coupling rods
L/H and R/H gear frames
Rear vacuum pipe
Reverser lower pivot bracket
Front platforms
Exhaust Y pipe
Toolbox
Weighshaft
Drain cock operating lever
Footplate support brackets
Cab steps
Front buffer beam steps
Front and rear guard irons
Rear sandboxes
Front sandboxes
Gear frame support girders
Rear sidetank support brackets
Front sidetank support girder
Cylinder platforms
Reach rod, cylinder drain operating rod
Valve gear eccentric rods
Return cranks
Outside Steam pipe covers
Drain cock cross shaft
Screw couplings
Lubricator

APPENDIX 3



PHOTOGRAPHS BOX CONTENT 1-9

Box 1



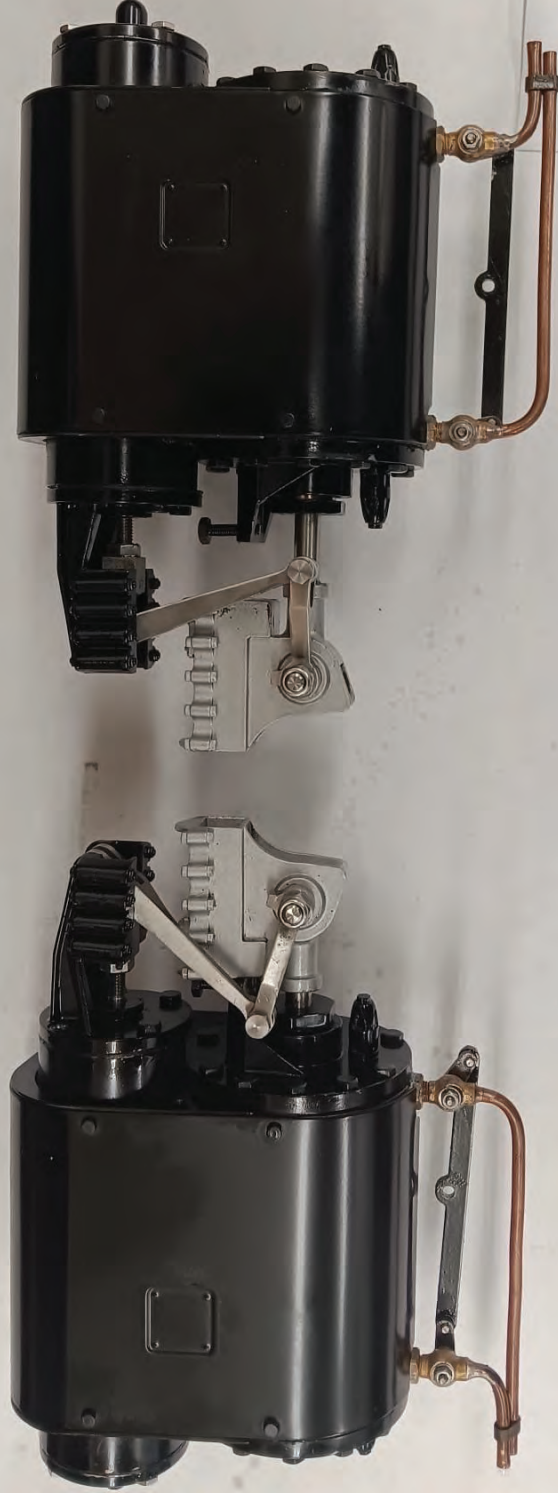
Whistle

Tank Tie Bars



Firebox Cover

Box 2



Cylinders

Box 3

Smokebox



Box 4

Safety Valve
Bonnet



Top Feed
Cover

Boiler Case

Smokebox Ring





Wheel Sets

Box 5



Tanks

Box 6



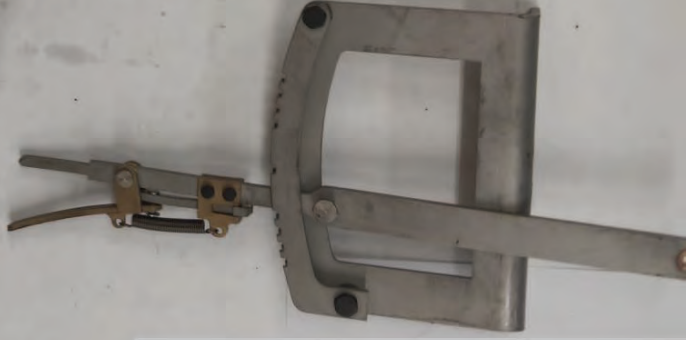
Box 7



Brake
Assembly



Pole
Reverser





Smokebox
Saddle

Box 7



Slide Bars

Box 8



Drain Cock
Shaft

Screw
Couplings

Box 8



Lubricator

Return
Crank

Box 8

Reach Rod

Drains
Rod

Weigh Shaft

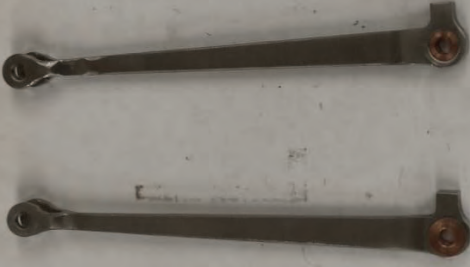


Box 8

Gear Frames



Box 8



Tank Front
Support

Eccentric Rods

Box 8



Connecting and
Coupling Rods

Box 8



Drain Cock
Lever

Rear Vacuum Pipe

Box 8



Steam Pipe Covers

Cylinder
Platforms

Box 8



Toolbox

Front Platform

Box 8



Exhaust
Pipe



Reverser Lower
Pivot

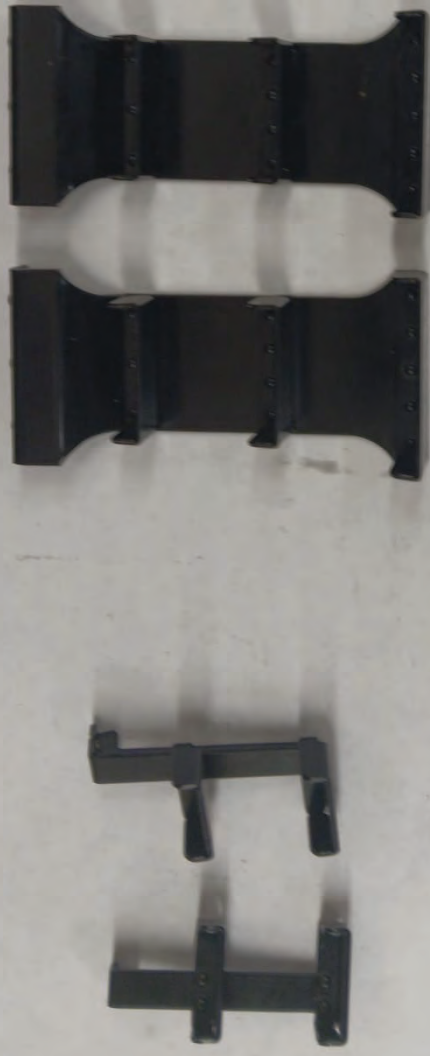
Box 8



Footplate
Supports

Guard Irons

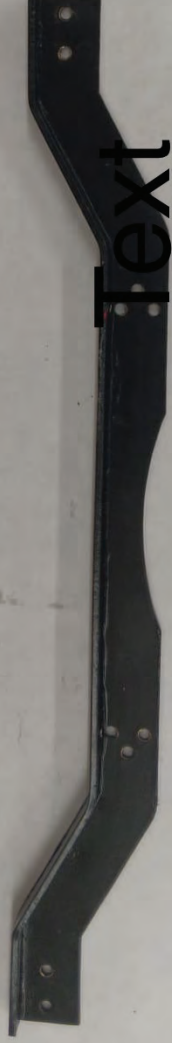
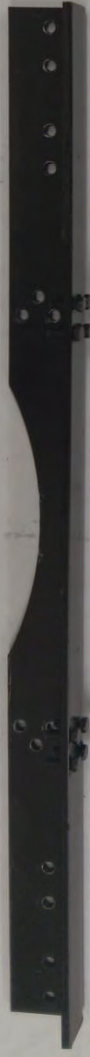
Box 8



Front
Steps

Cab
Steps

Box 8



Text

Gear Frame
Supports

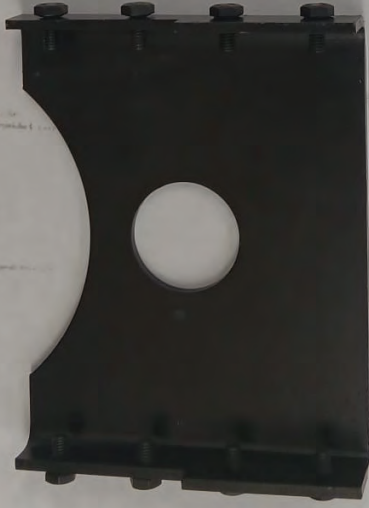
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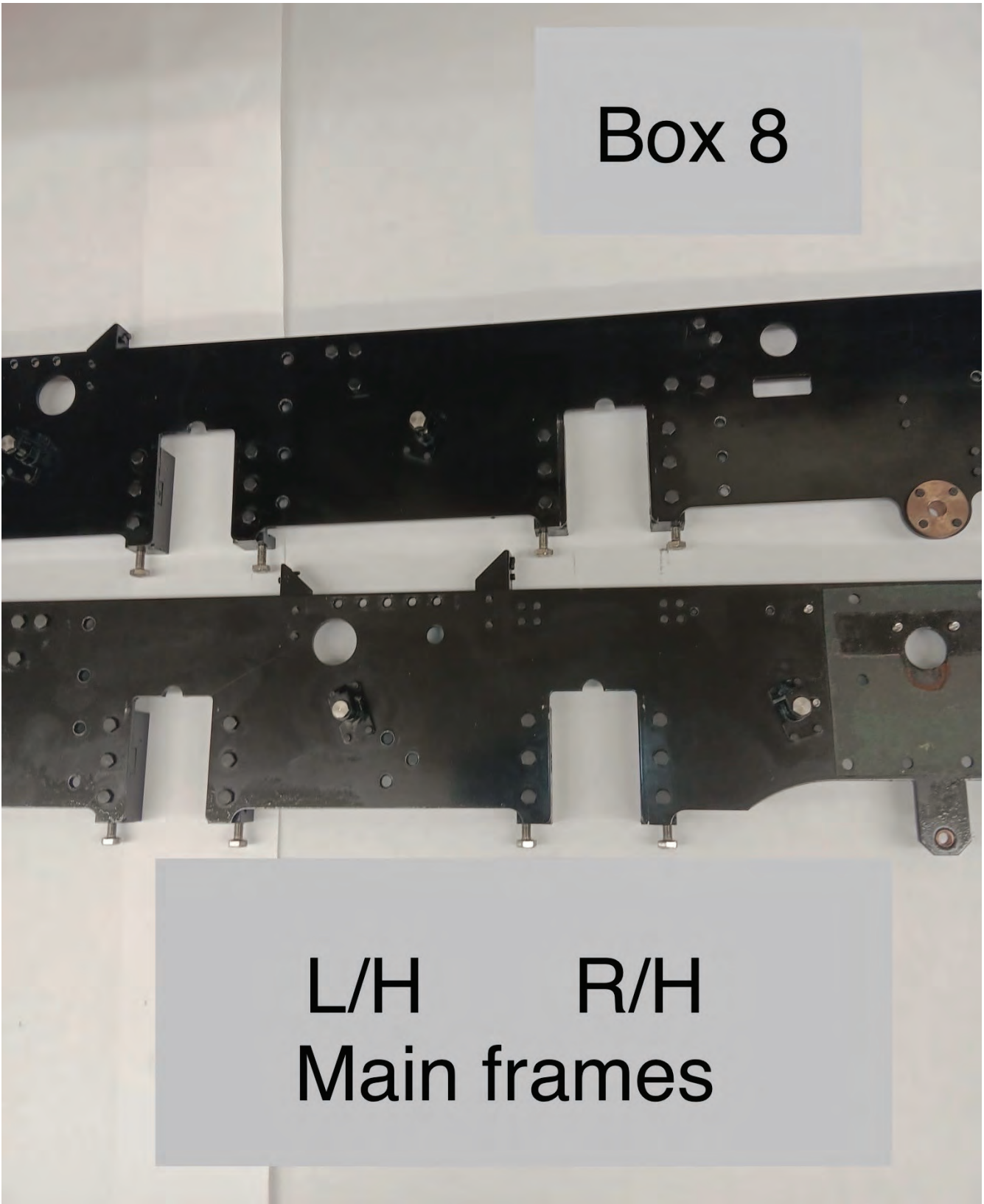
Front
Sandboxes

Rear
Sandboxes

Box 8



Centre Stretcher



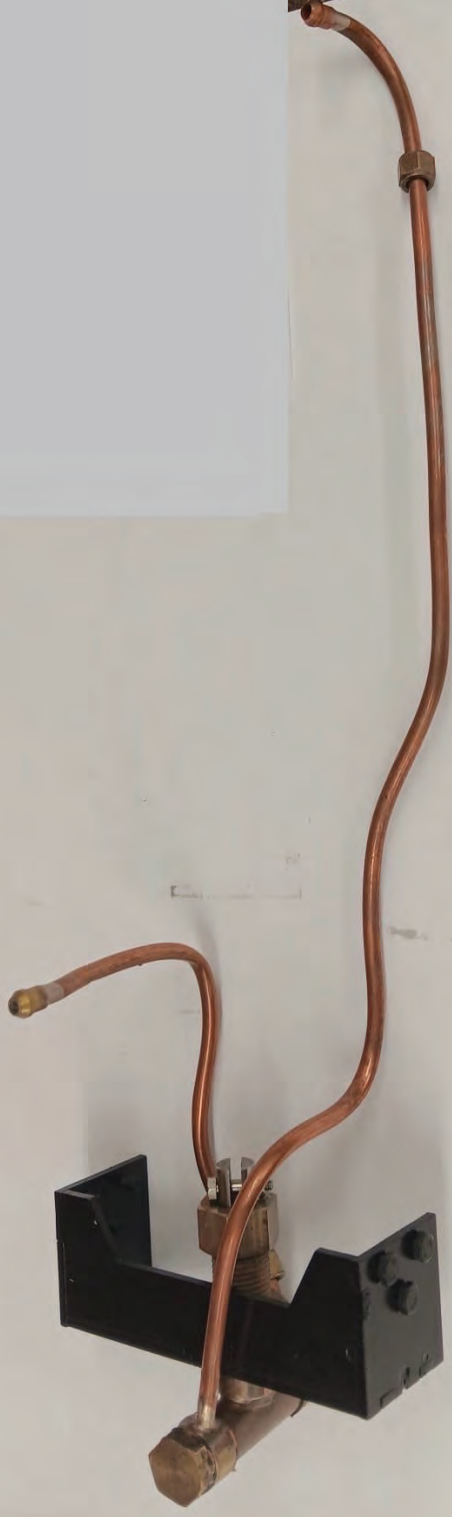
Box 8

The image shows two black metal main frames for a vehicle, likely a truck or bus. The frames are positioned horizontally, one above the other. They are made of heavy-duty metal and feature numerous bolt holes and mounting points. The top frame has a white plastic component attached to its left side. The bottom frame has a white plastic component attached to its right side. The frames are resting on a light-colored surface.

L/H R/H
Main frames

Box 8

Axle Pump



Box 8



Front Buffer
Beam



Rear Buffer
Beam

Box 8



Rear
Stretcher



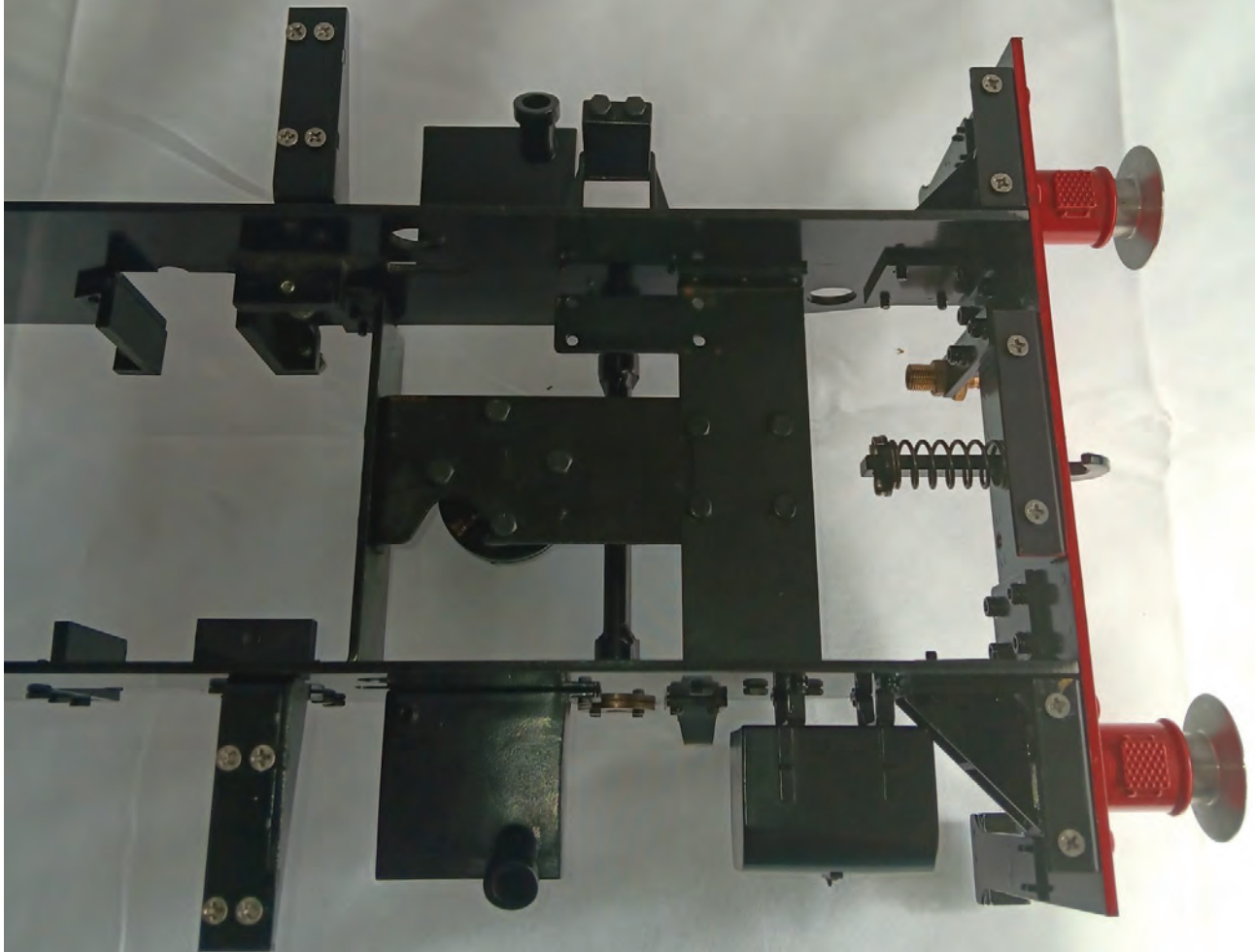
Brake
Cylinder
Stretcher

APPENDIX 4

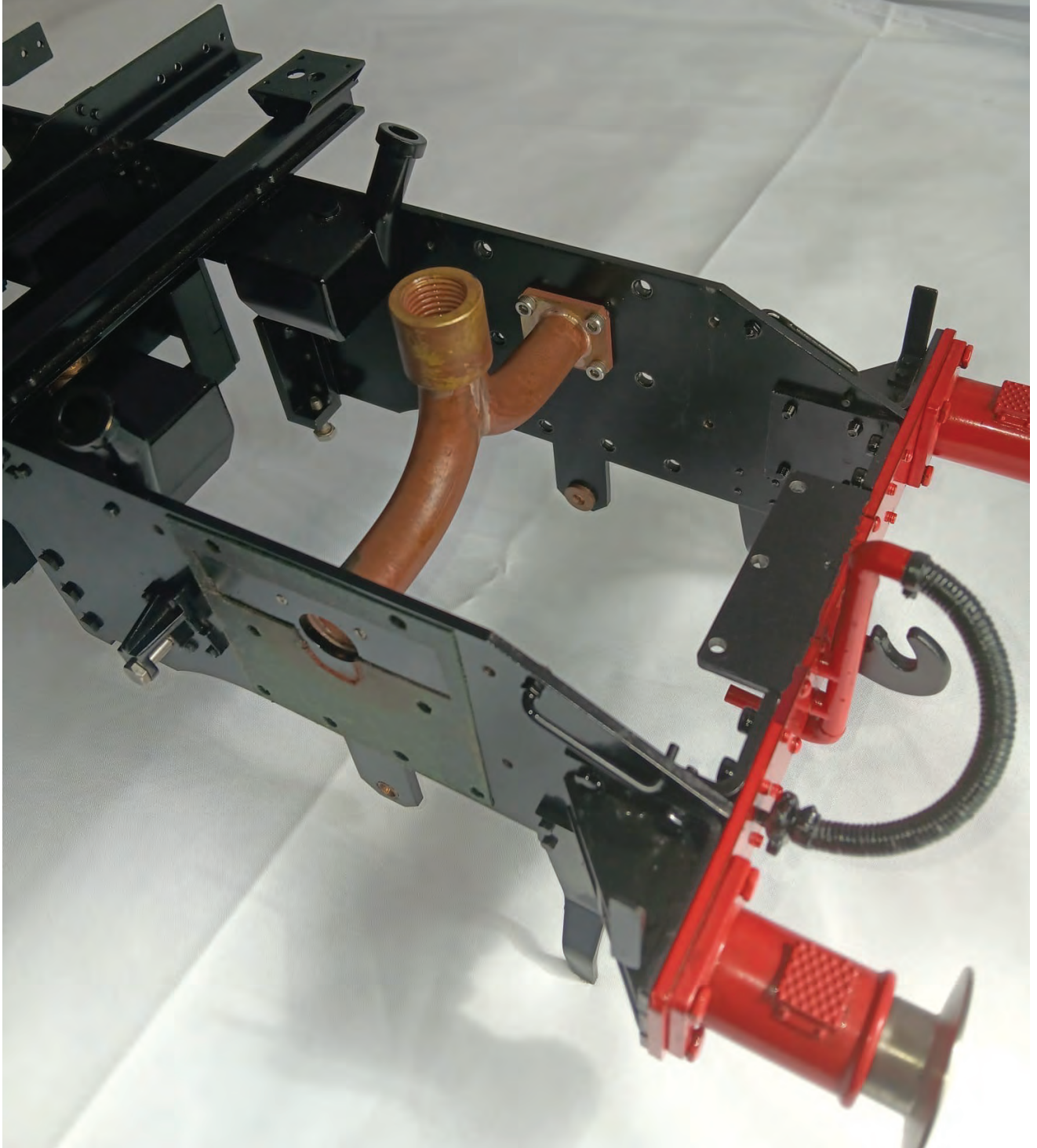


STAGE BUILD PHOTOGRAPHS 1-7

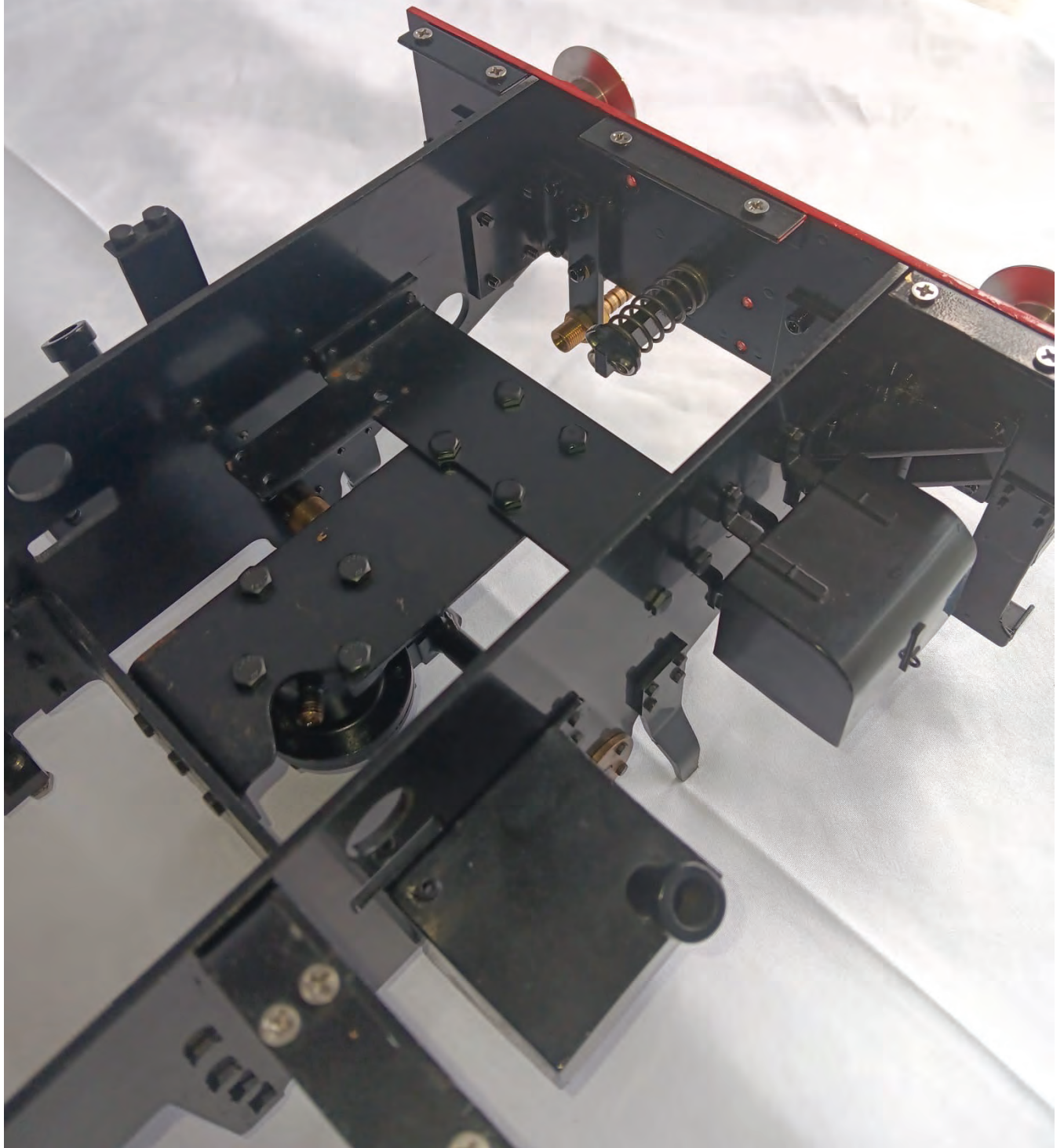
Build Stage 1



Build Stage 1



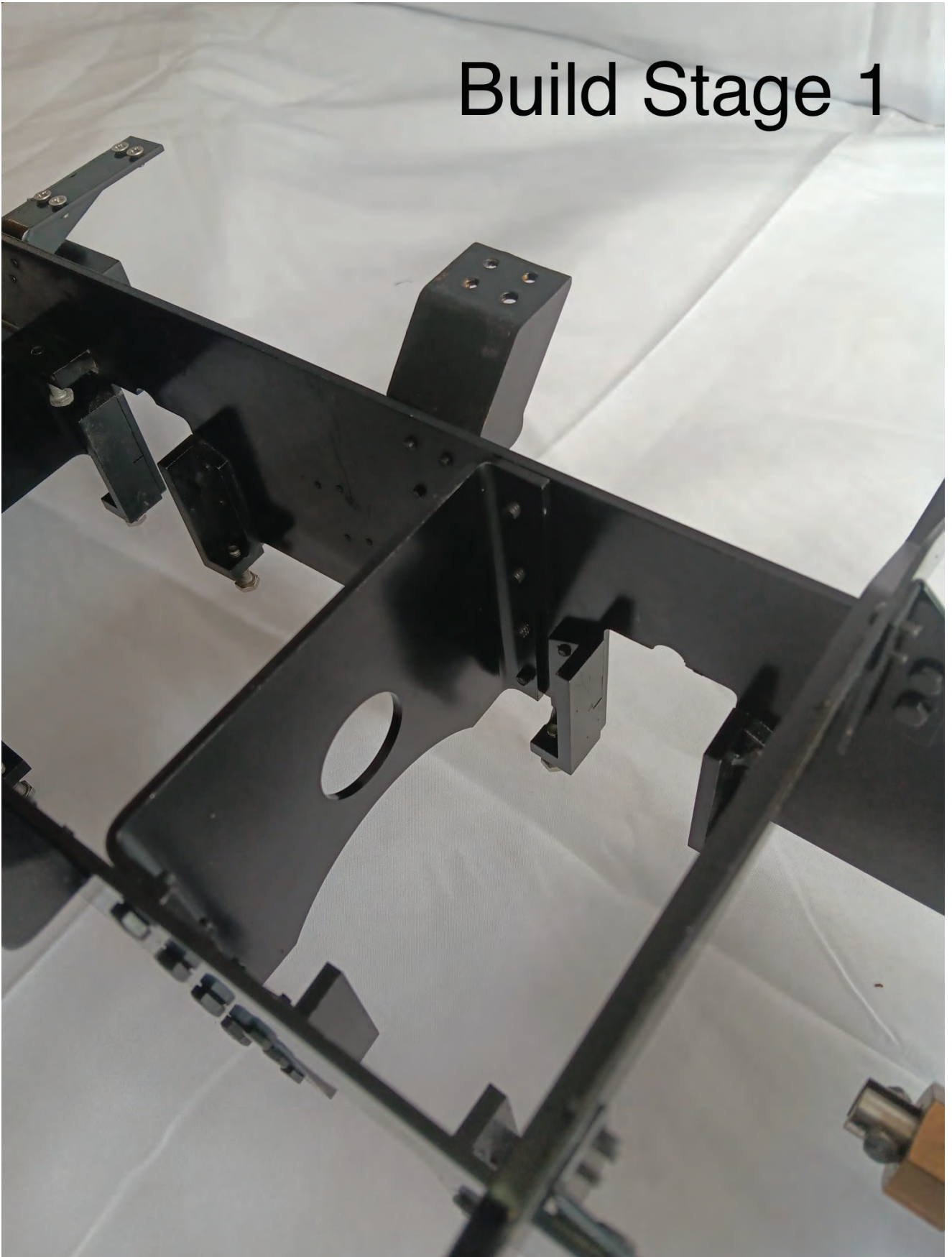
Build Stage 1



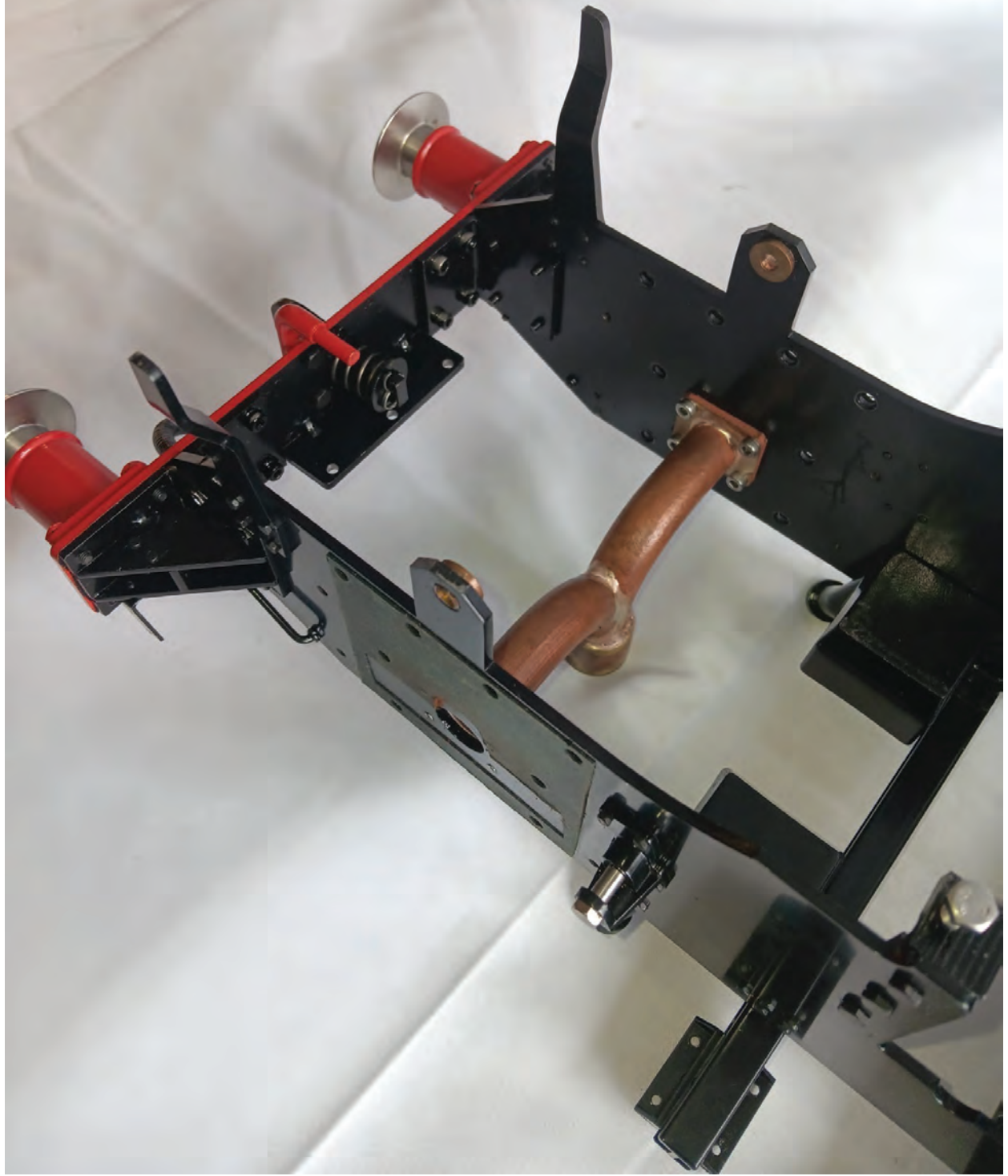
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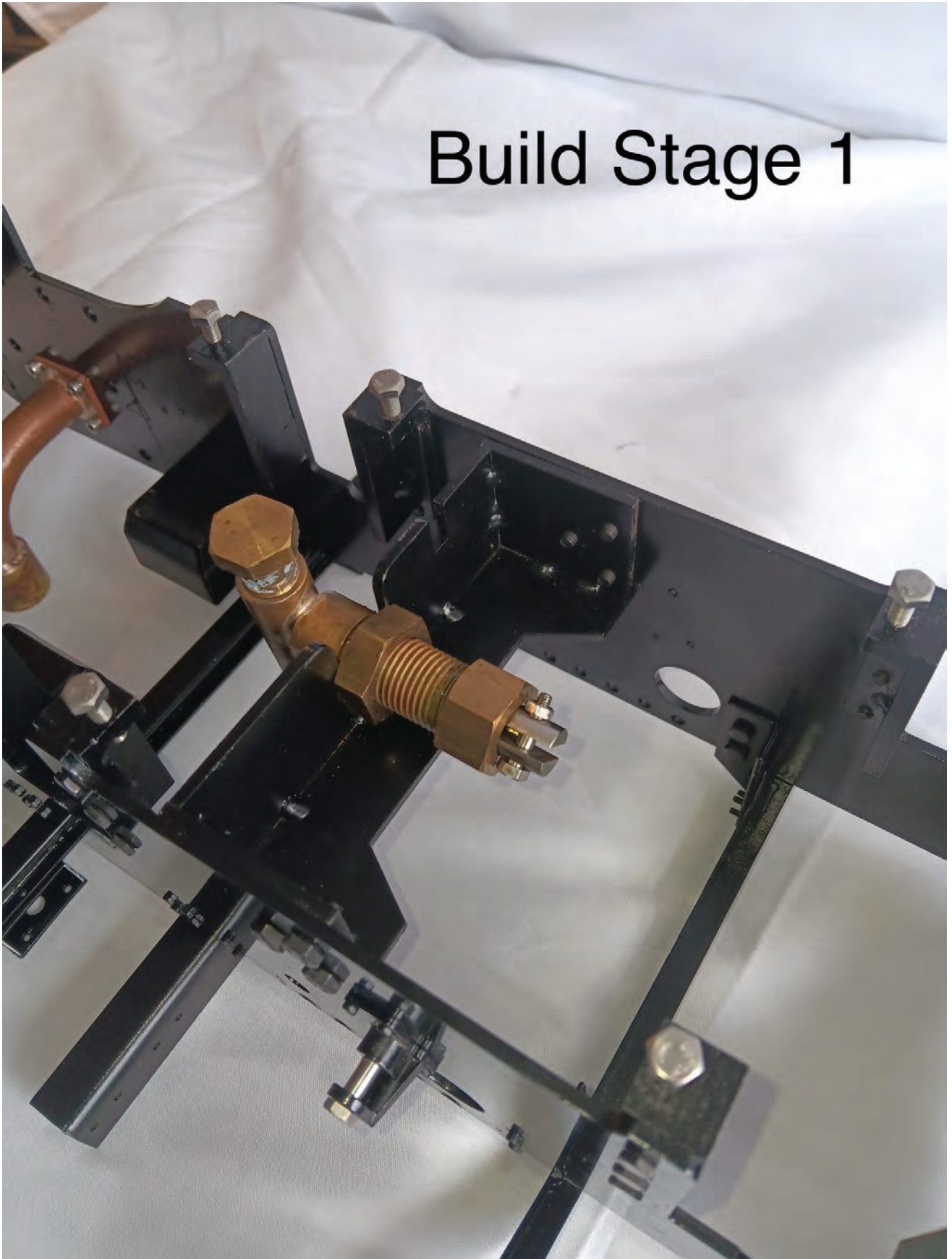
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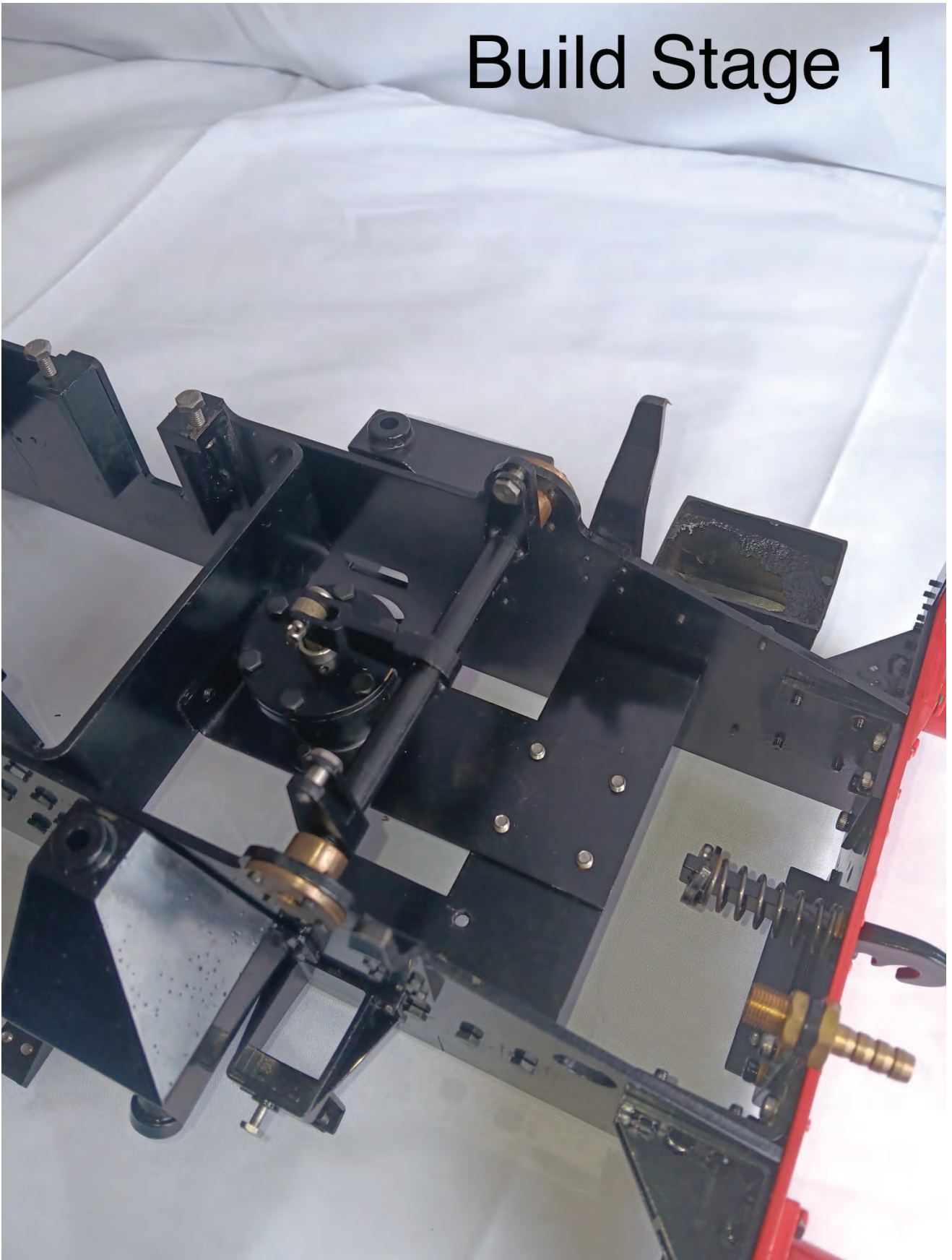
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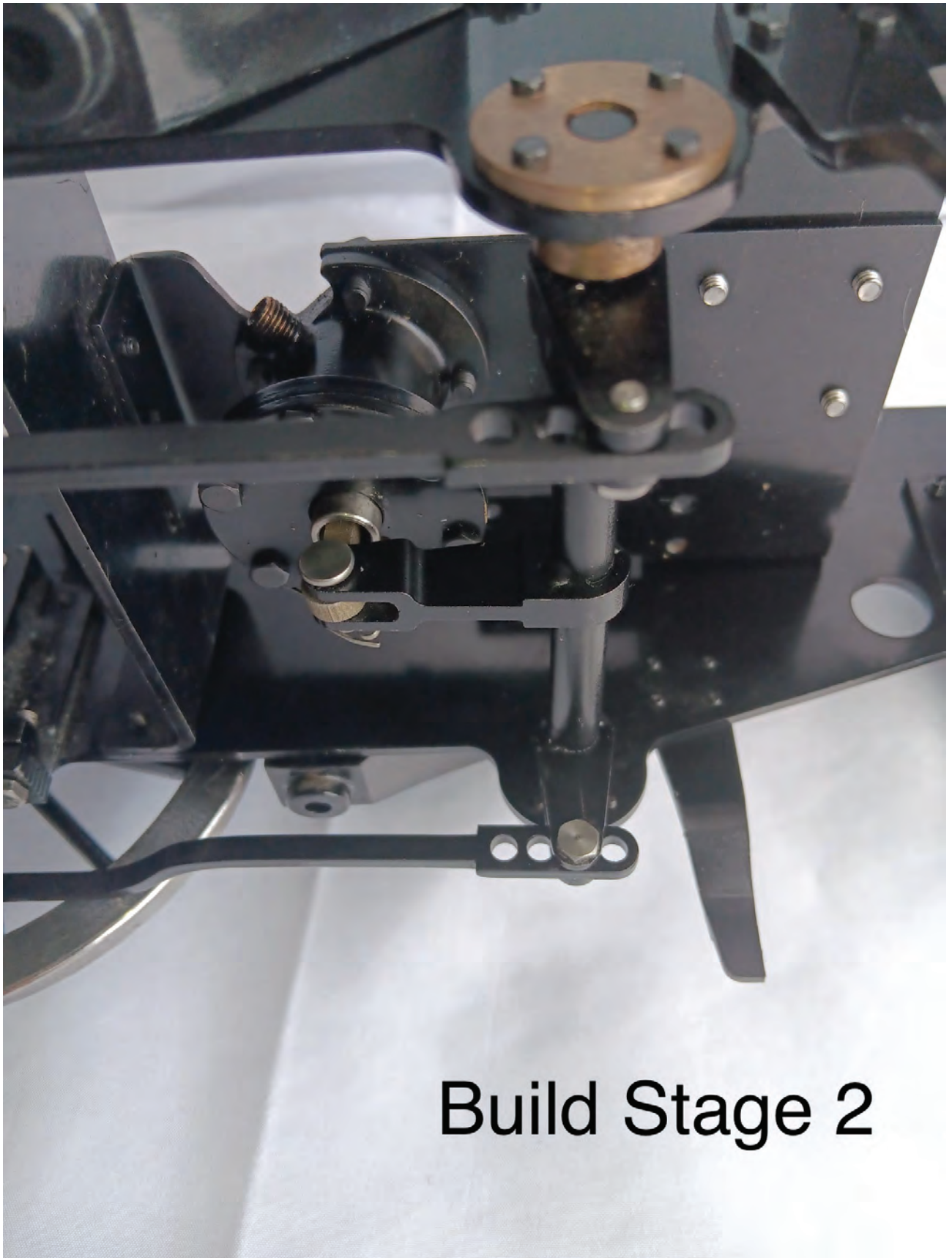


Build Stage 1

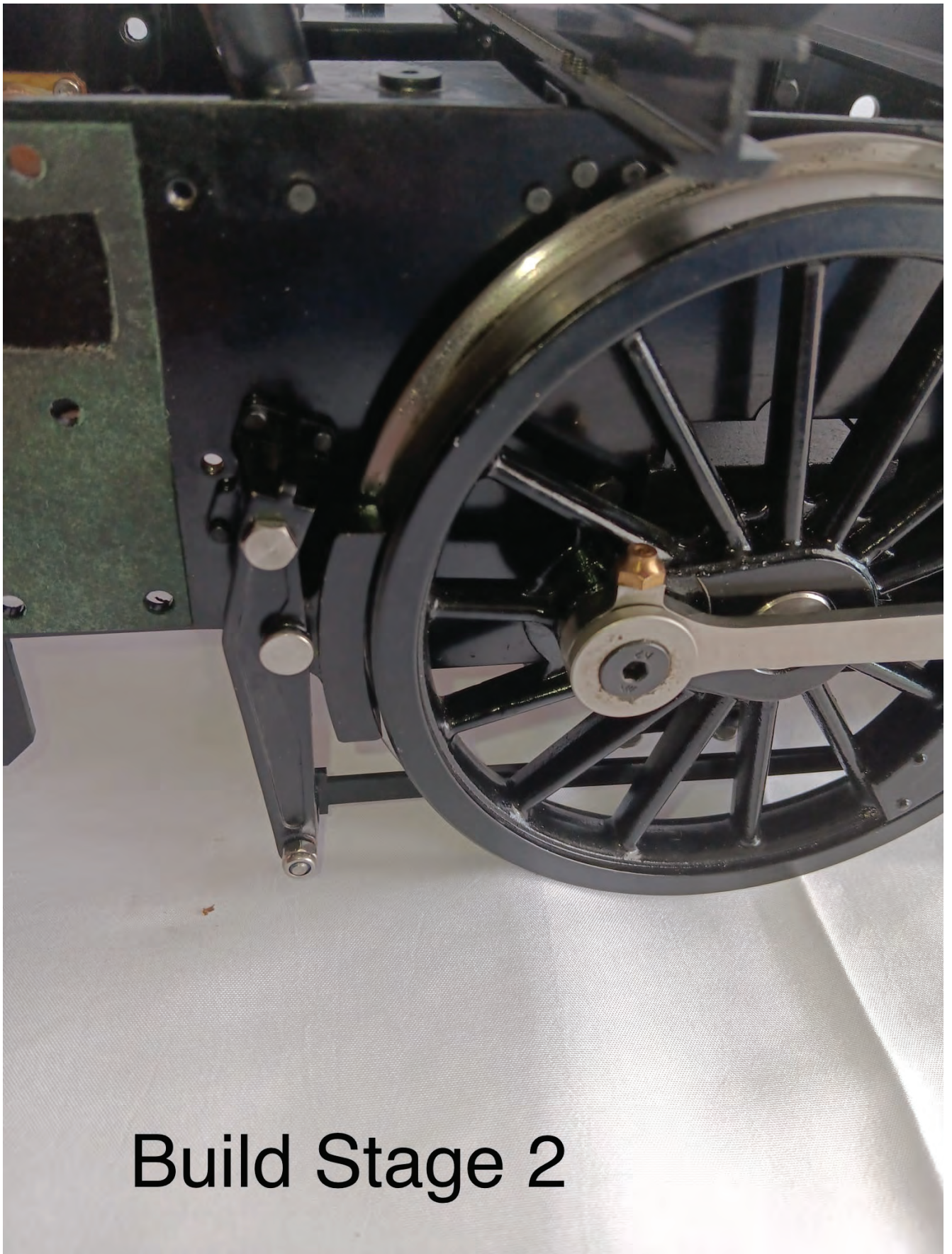


Build Stage 1

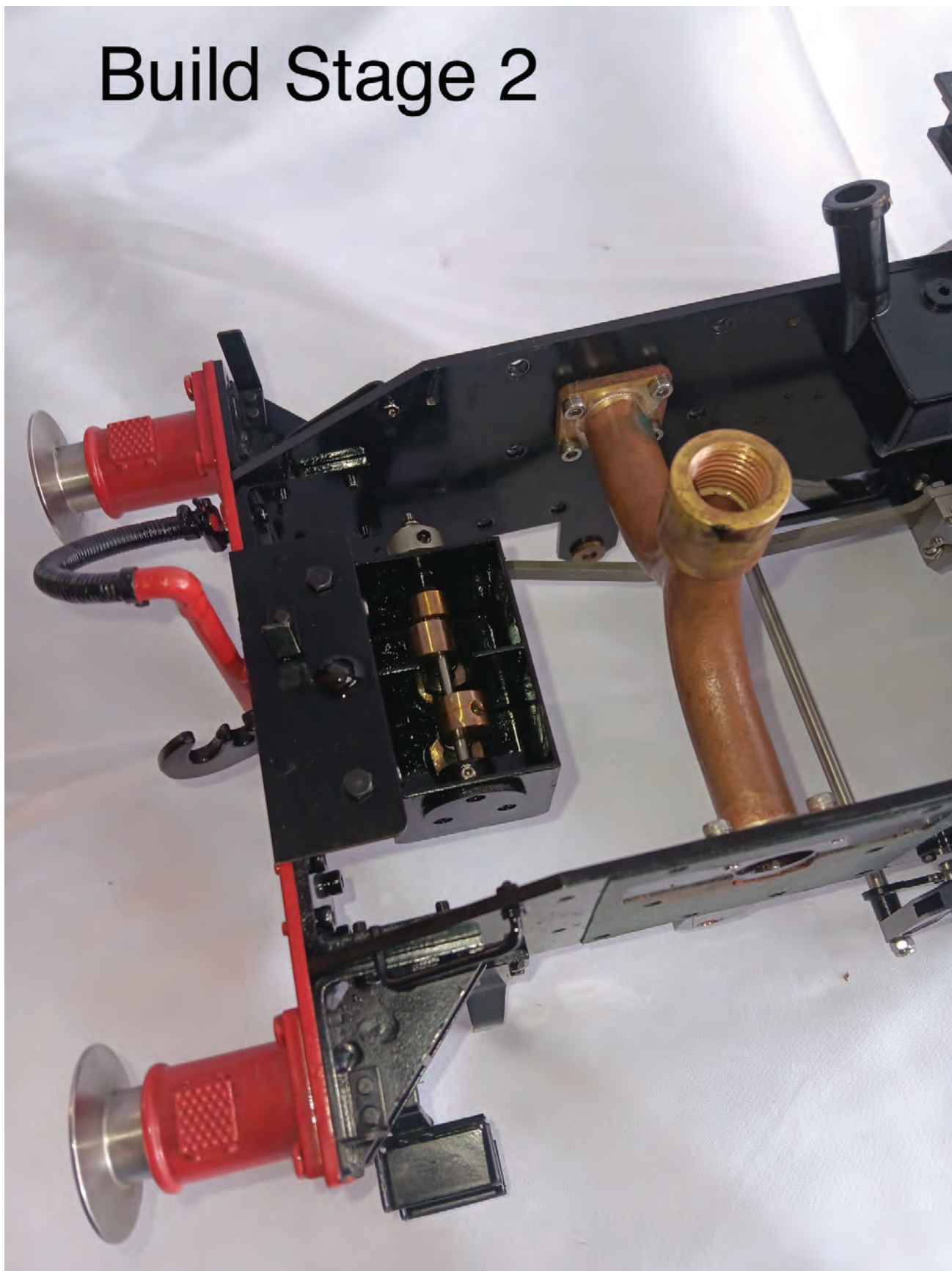


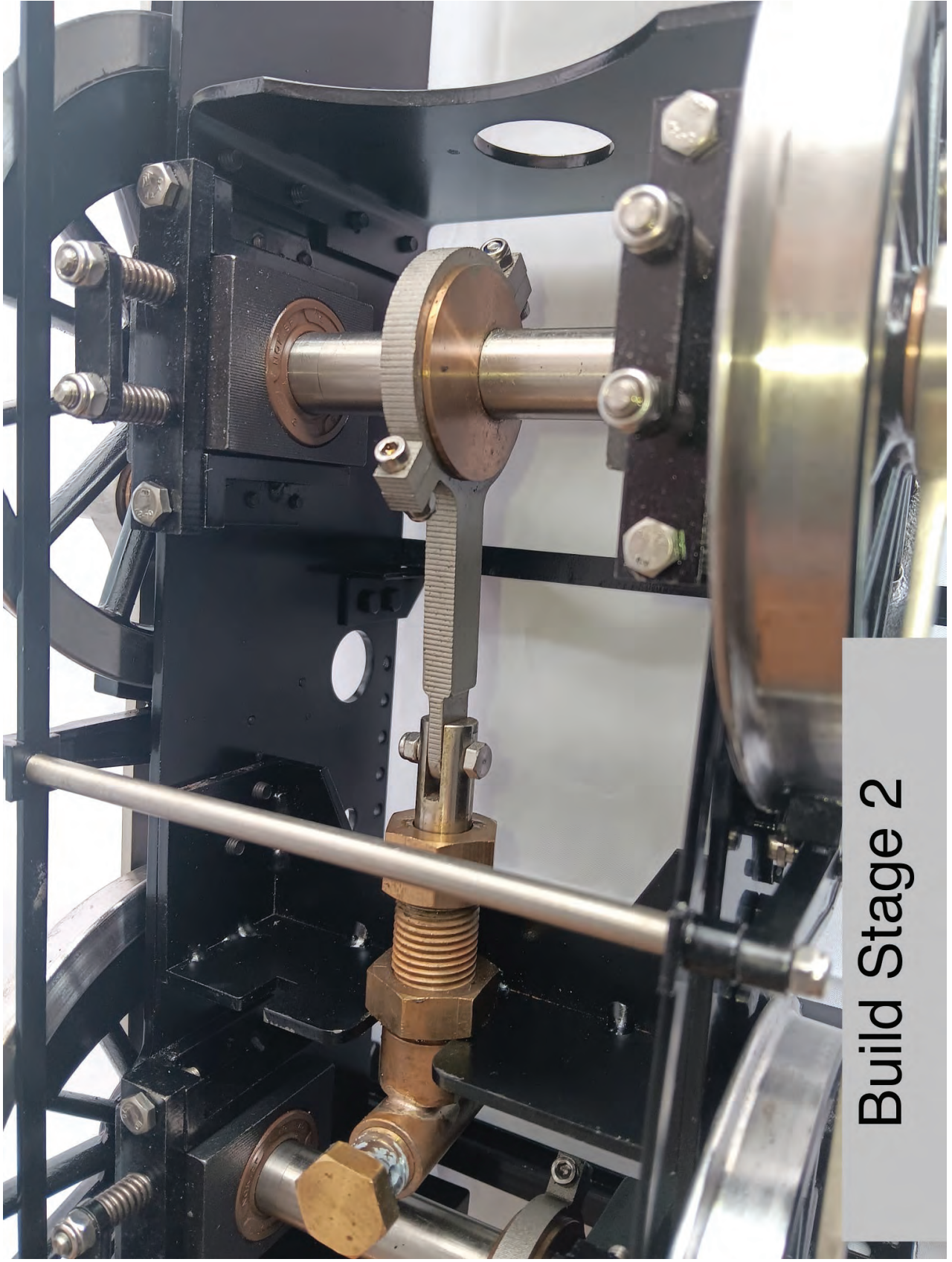


Build Stage 2

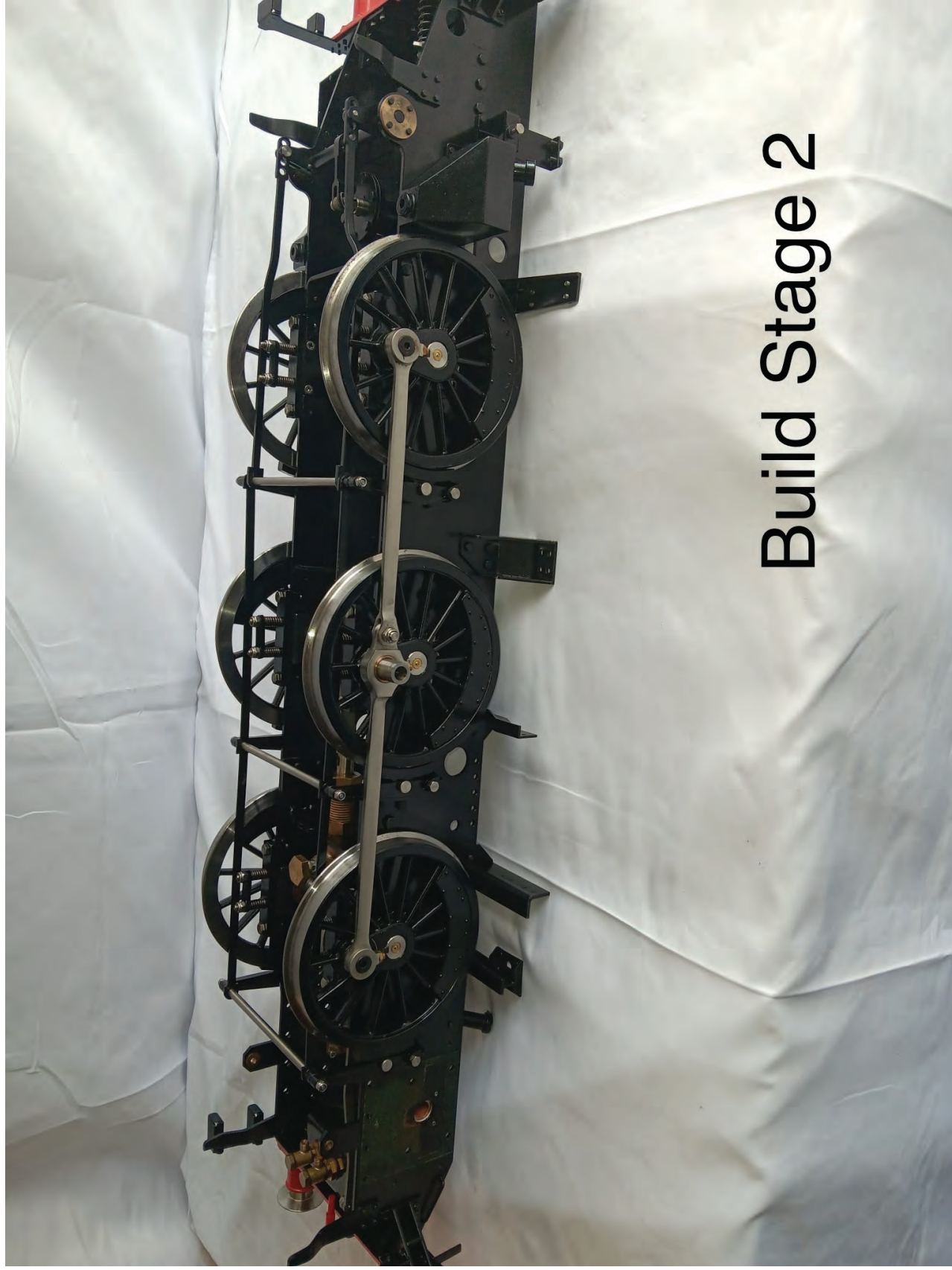


Build Stage 2

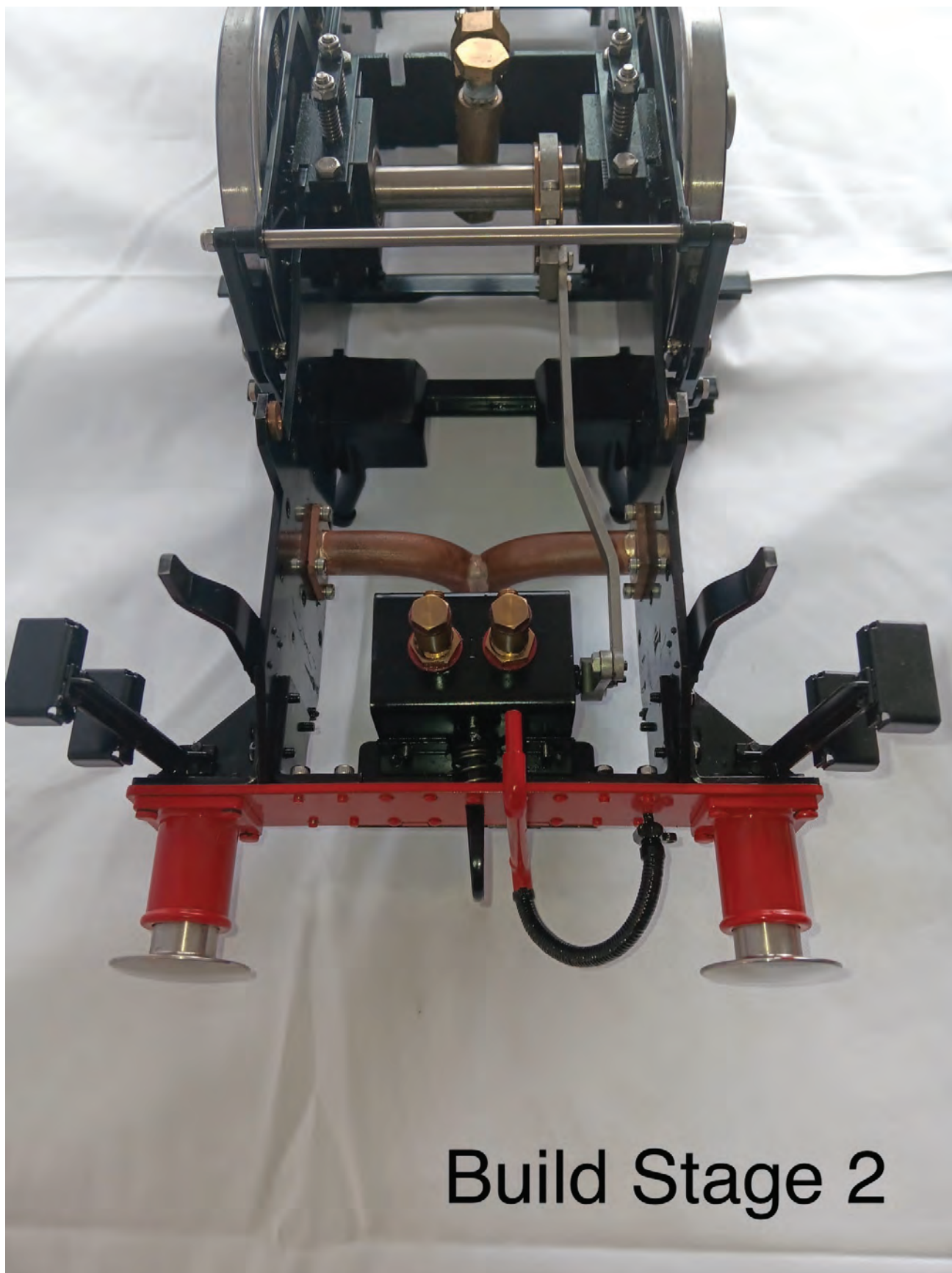




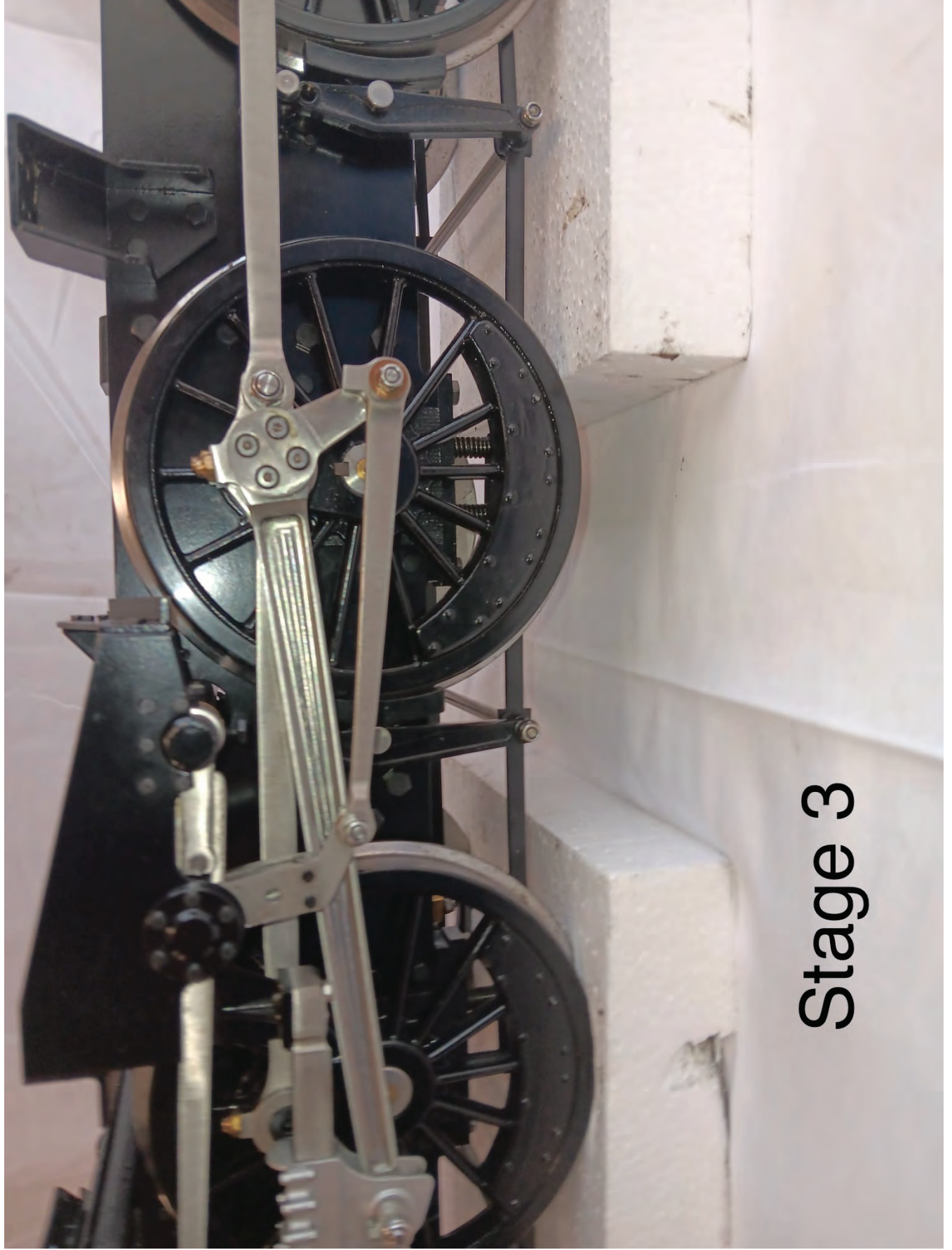
Build Stage 2



Build Stage 2

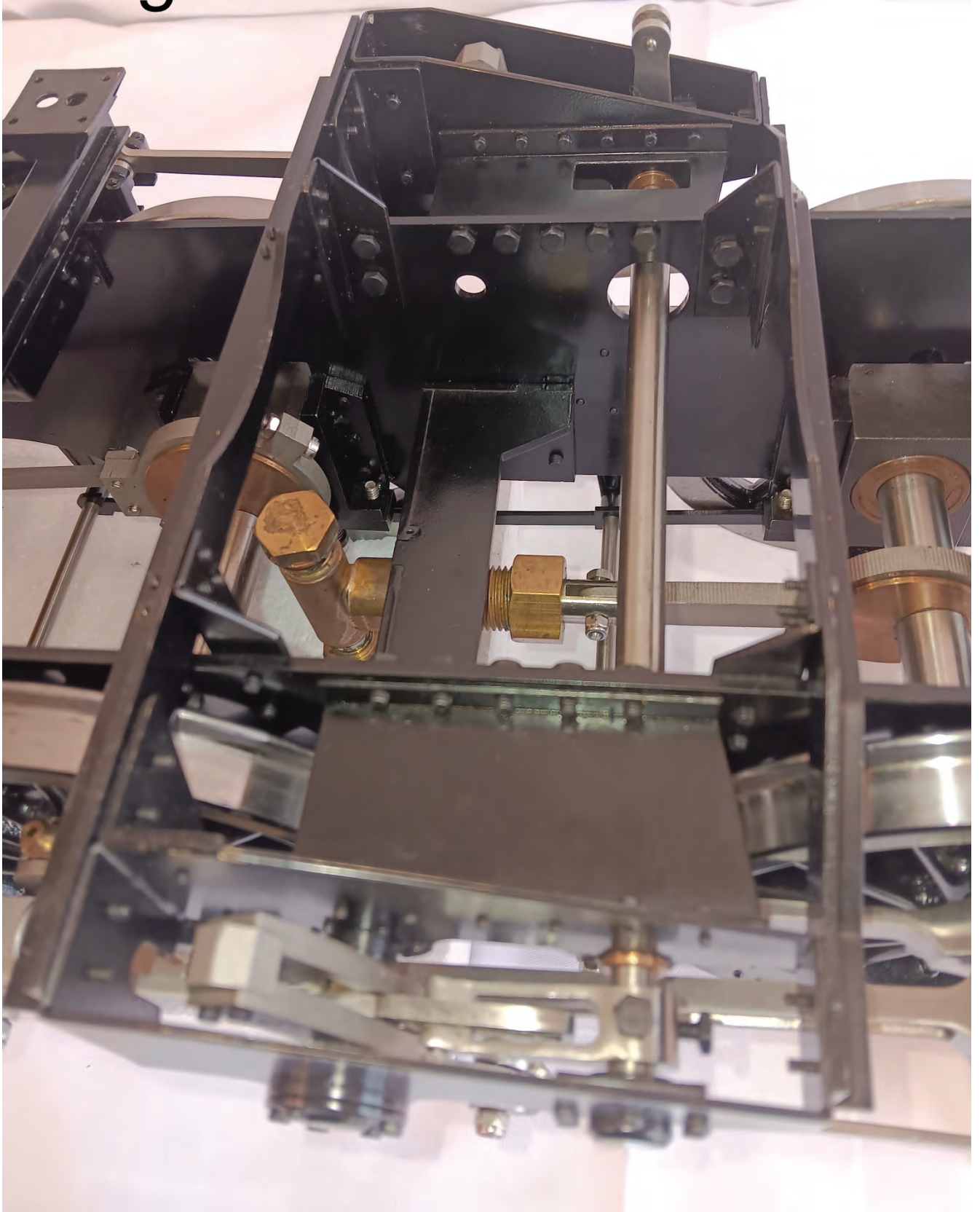


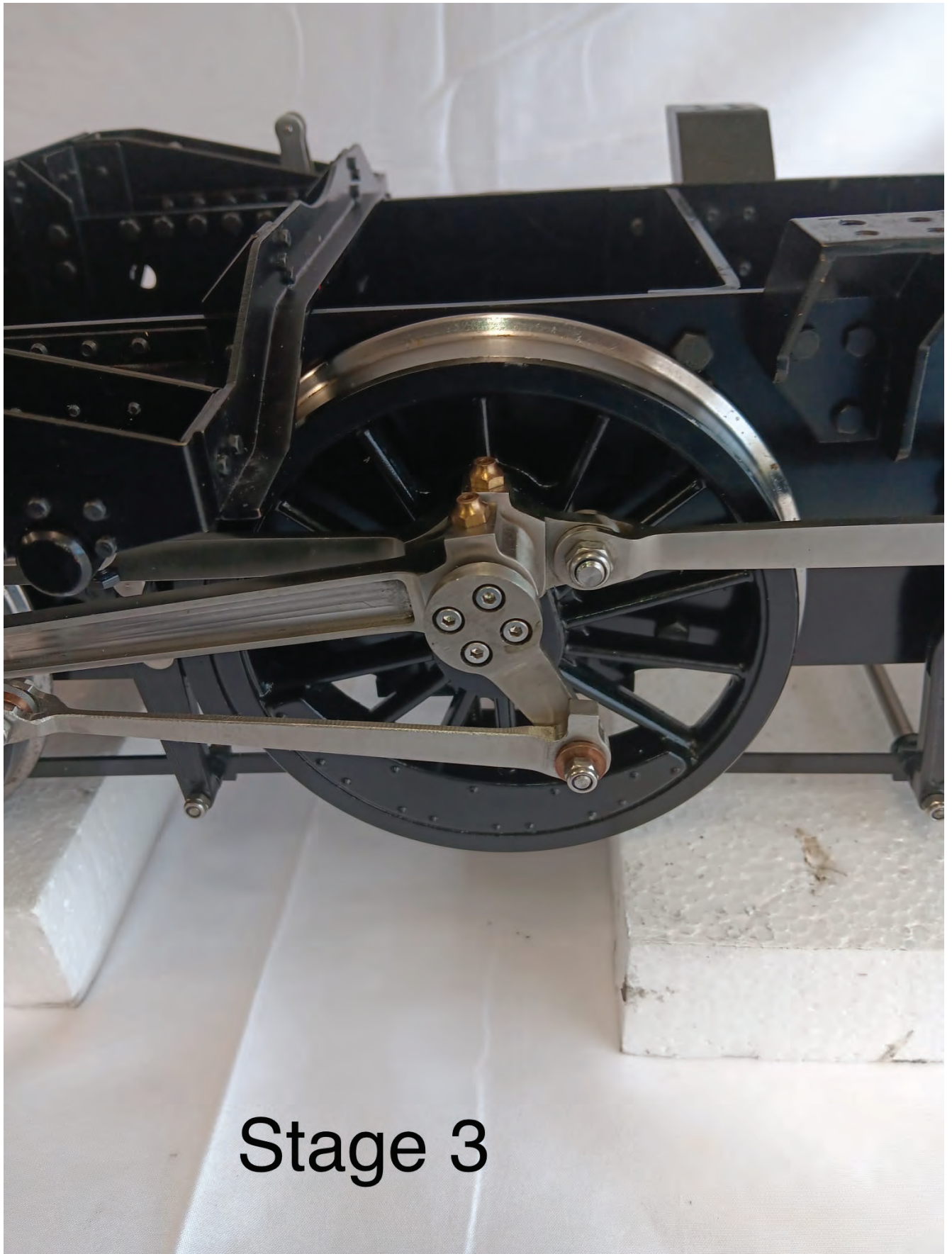
Build Stage 2



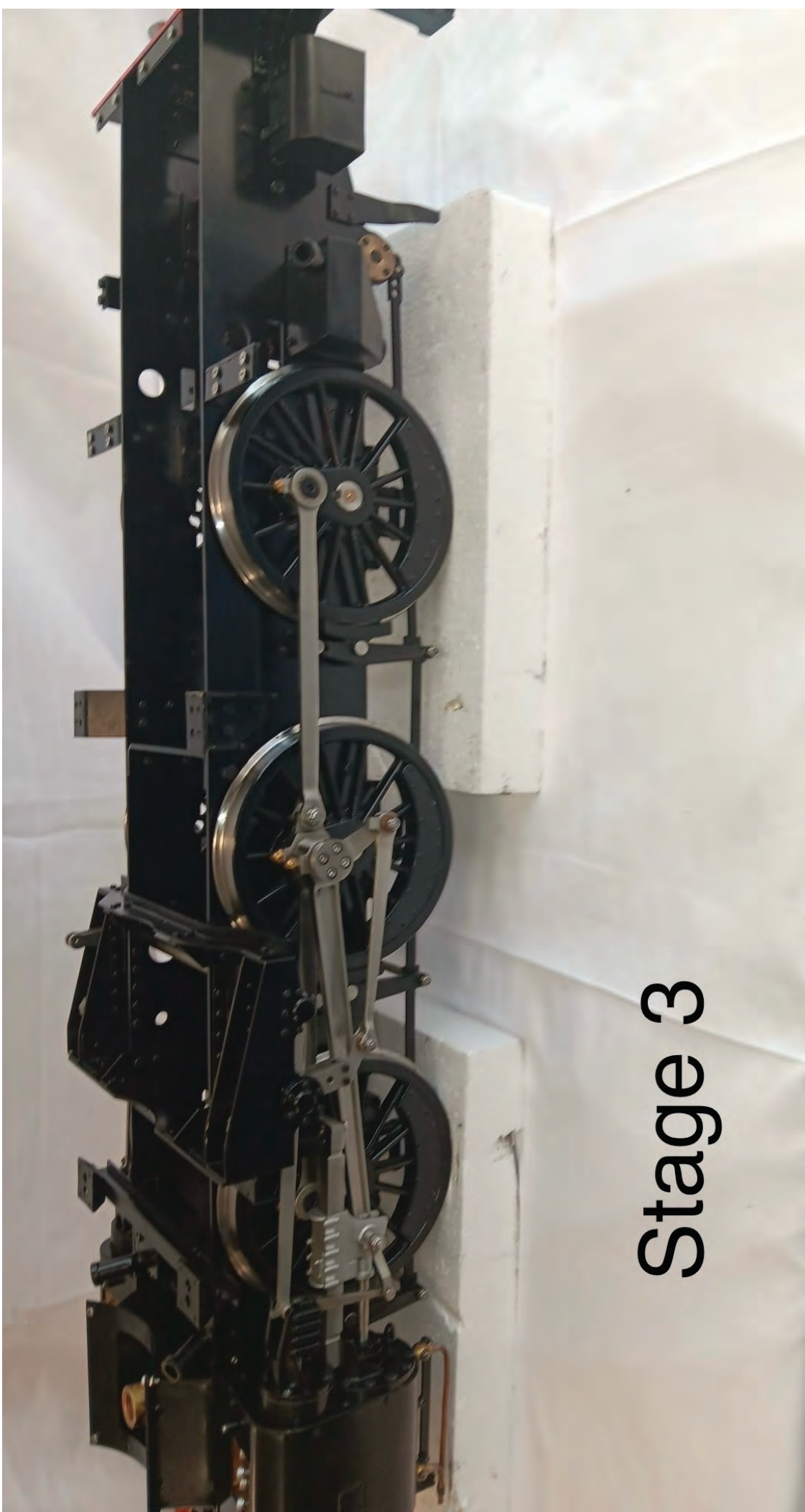
Stage 3

Stage 3

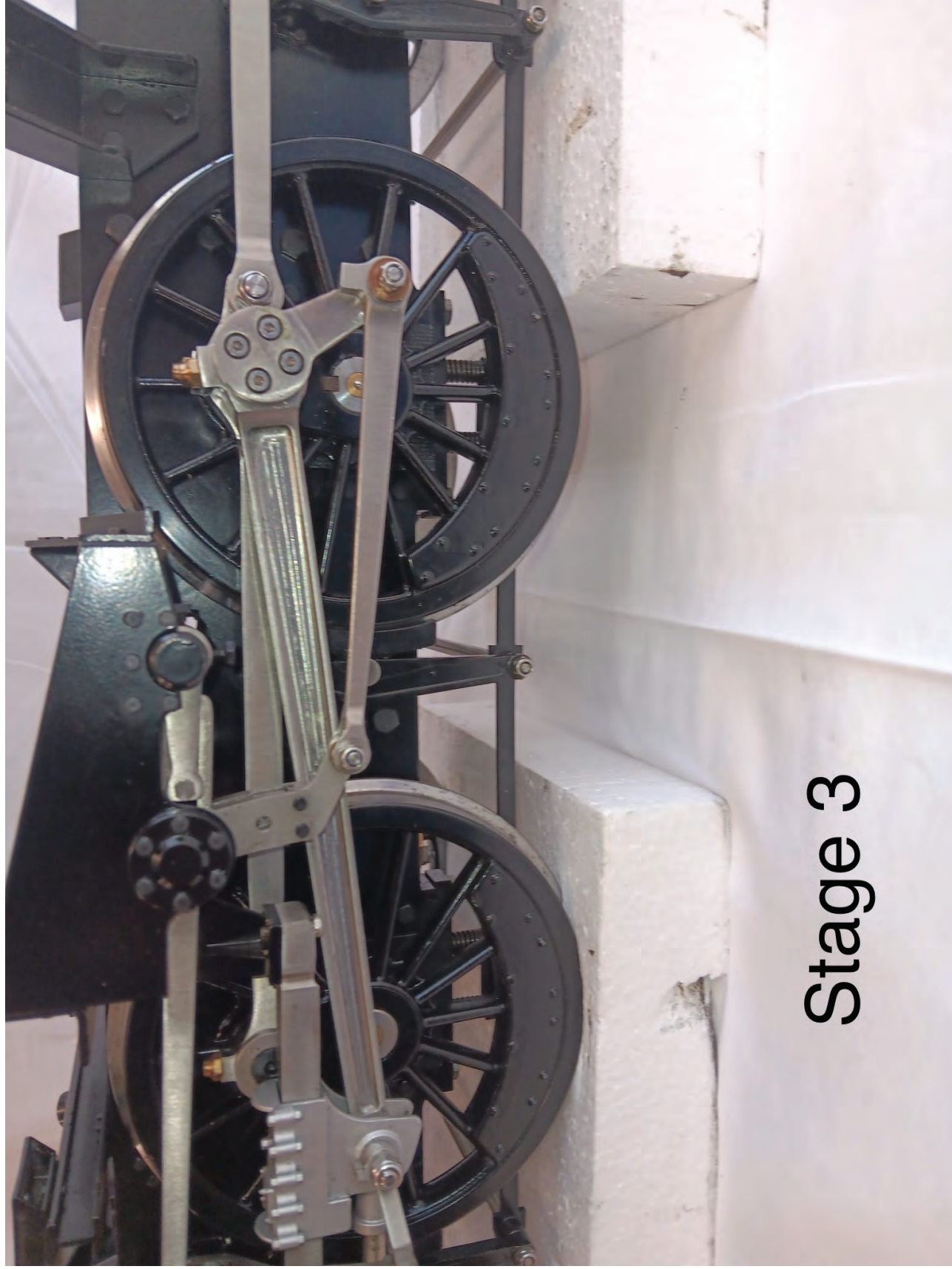




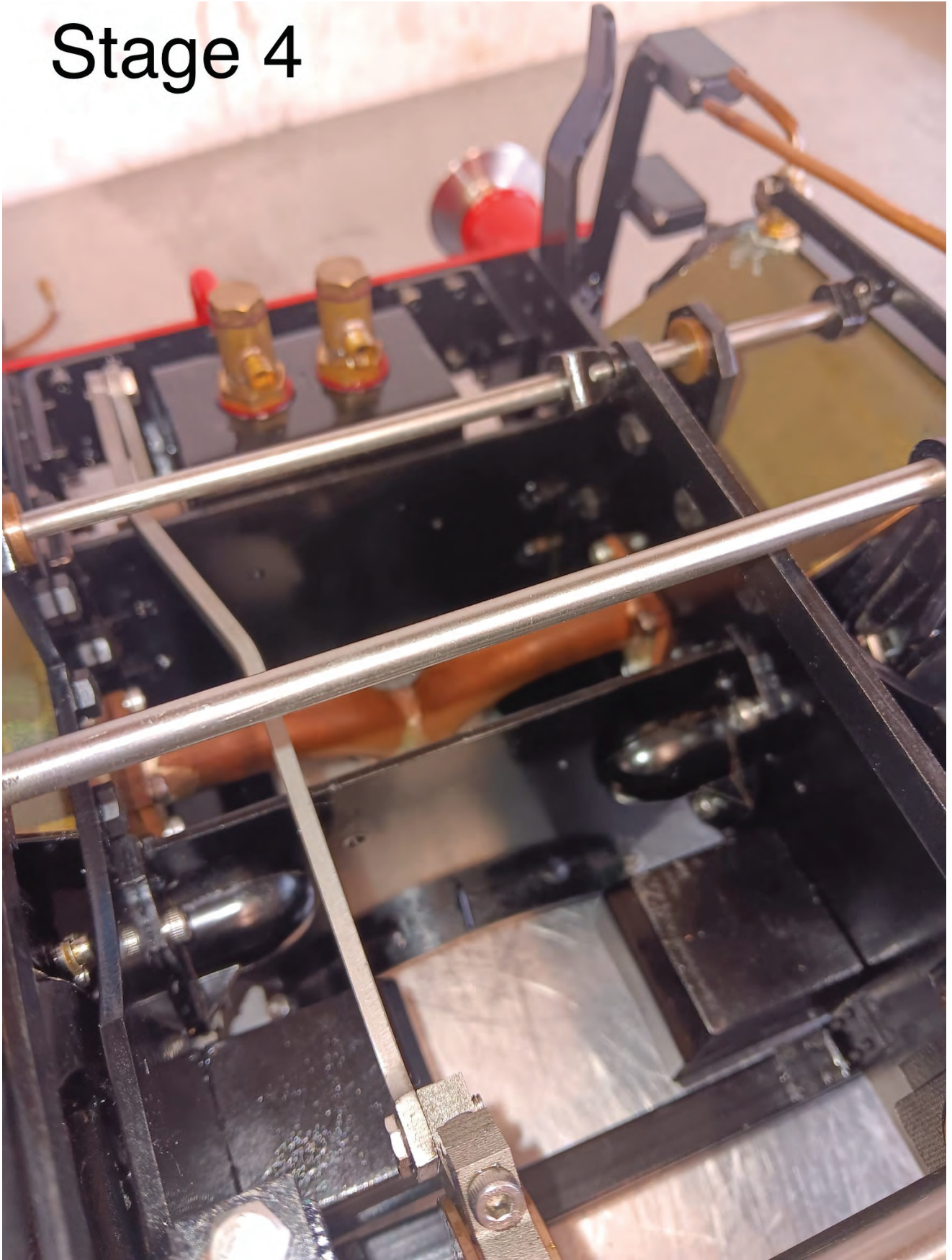
Stage 3



Stage 3



Stage 4



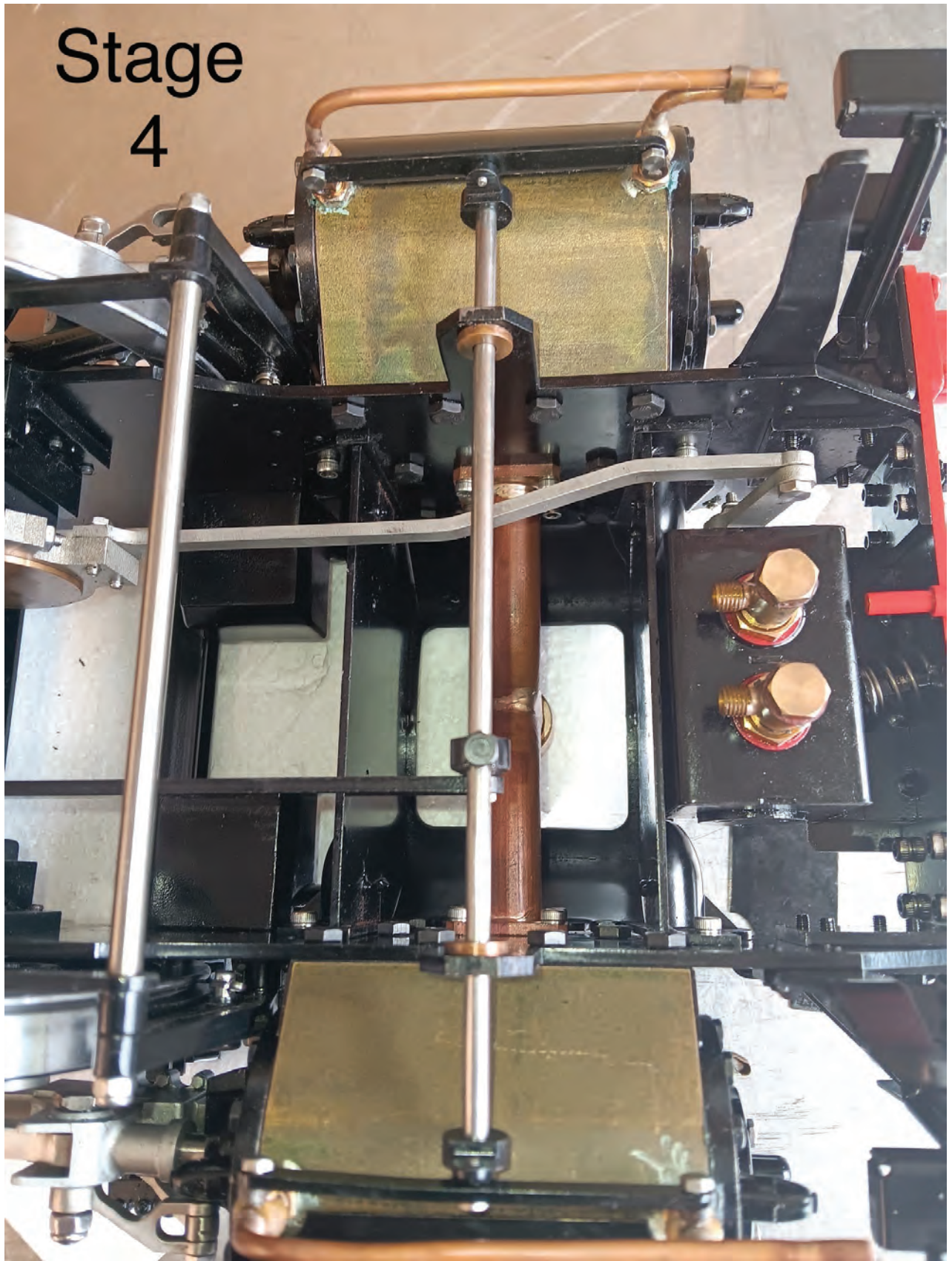
Stage 4

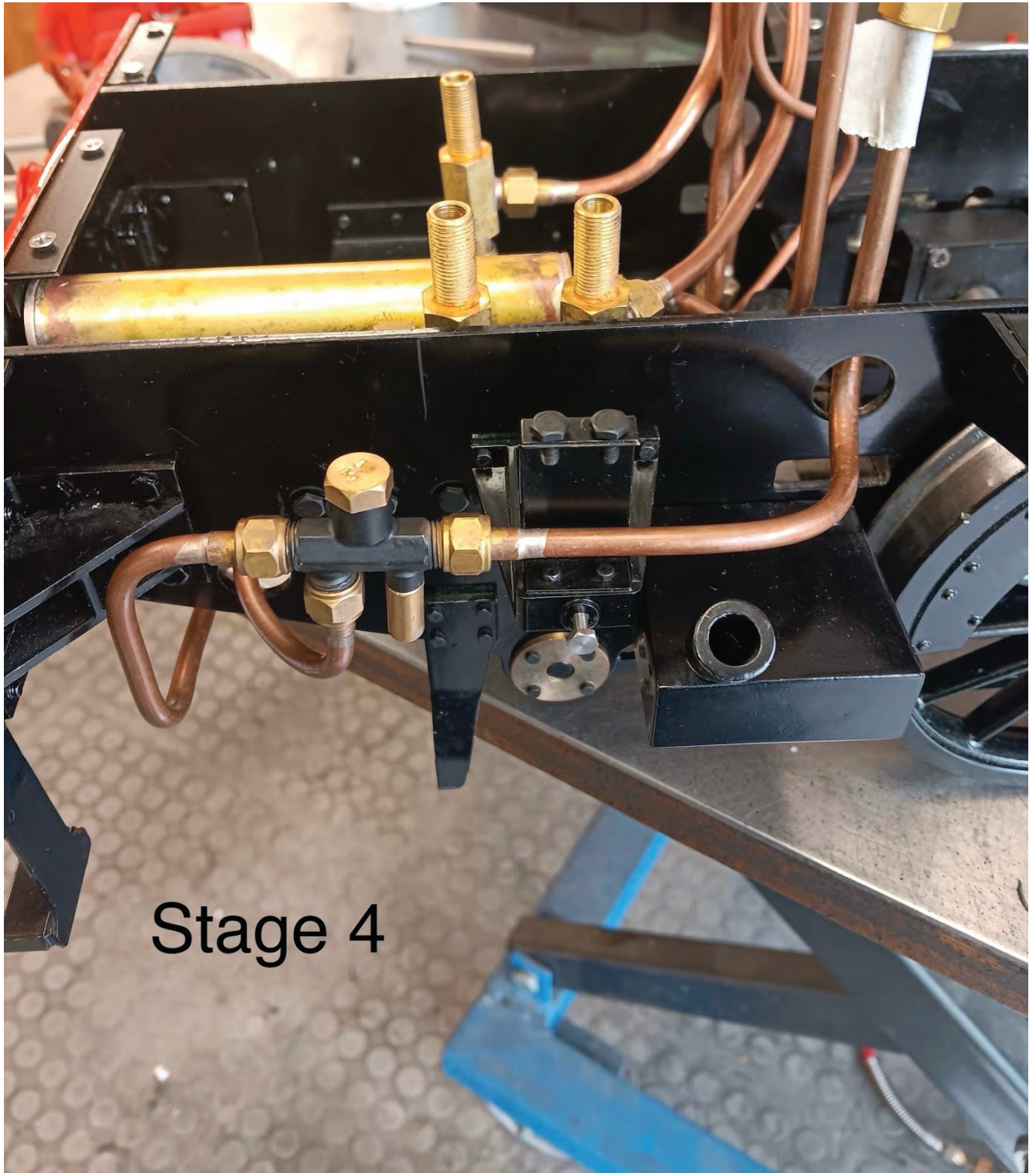


Stage 4



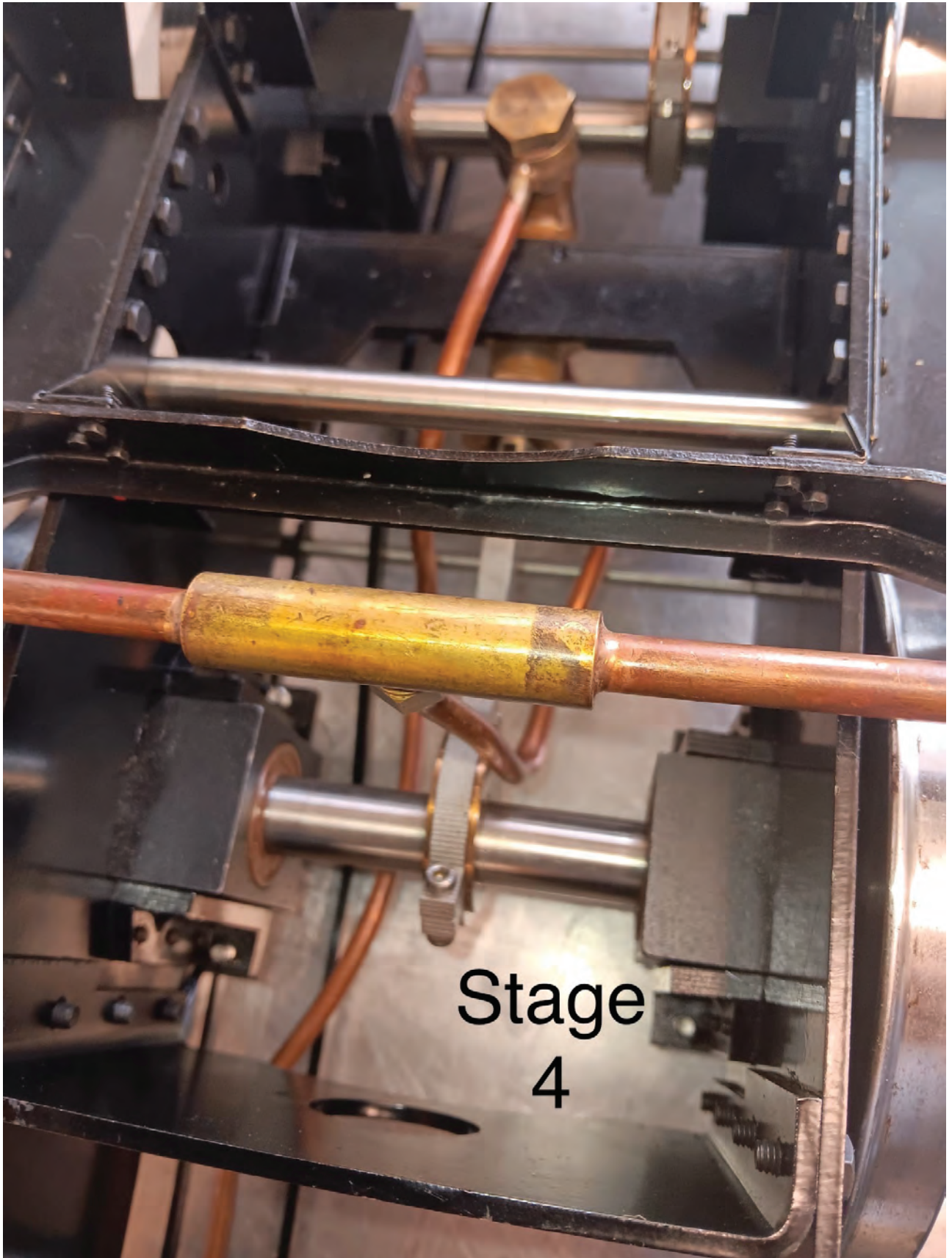
Stage
4

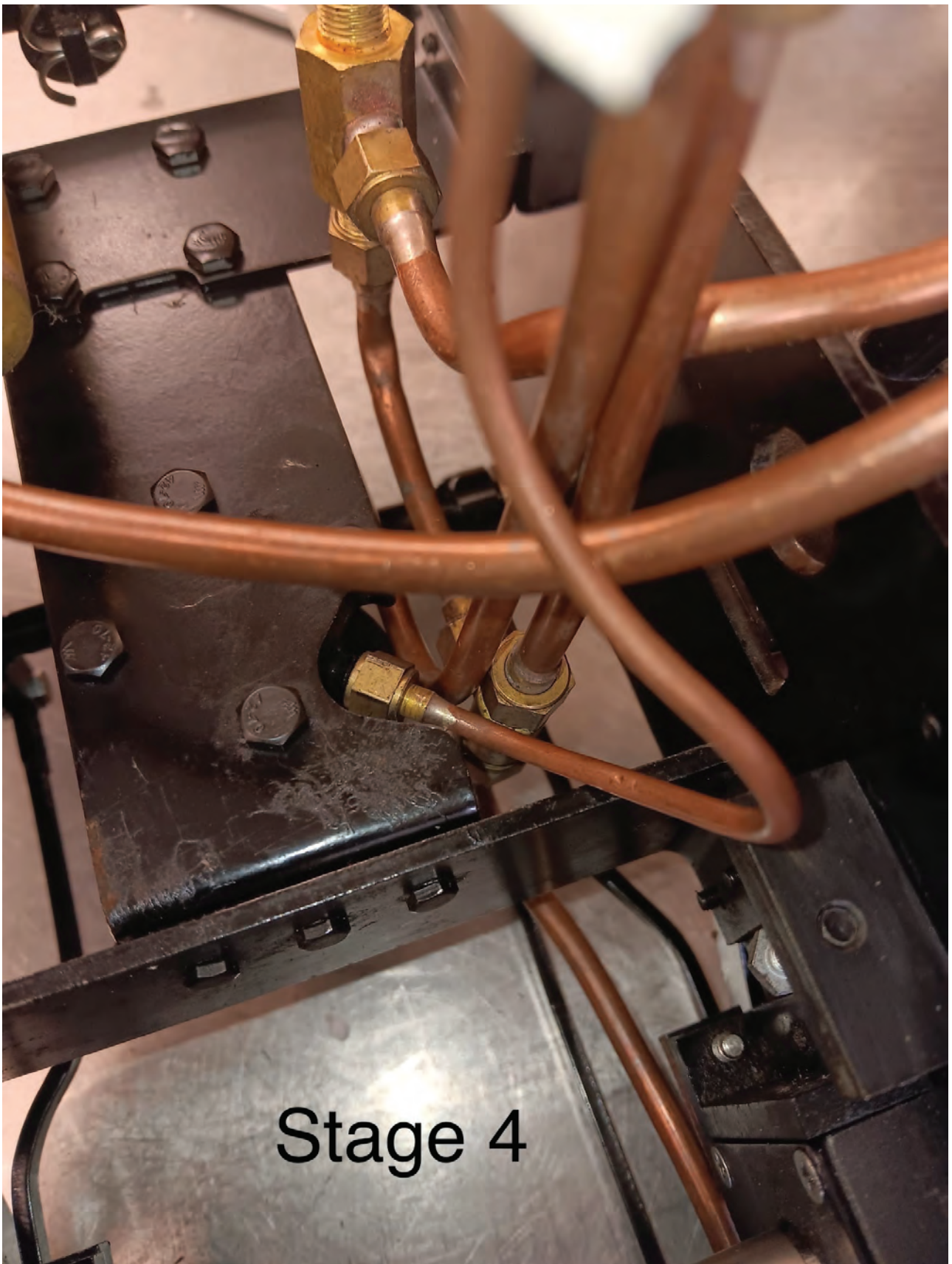




Stage 4

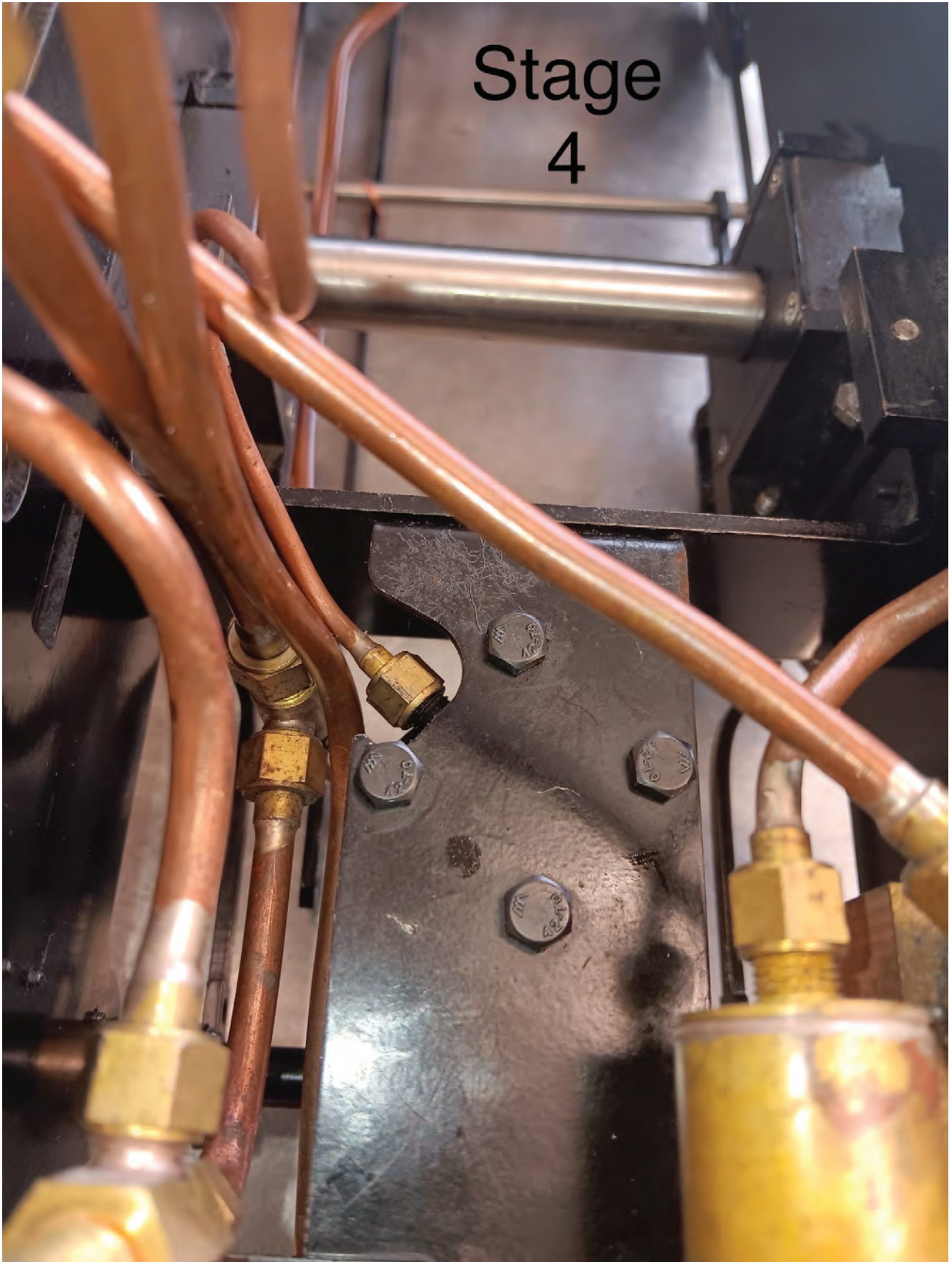


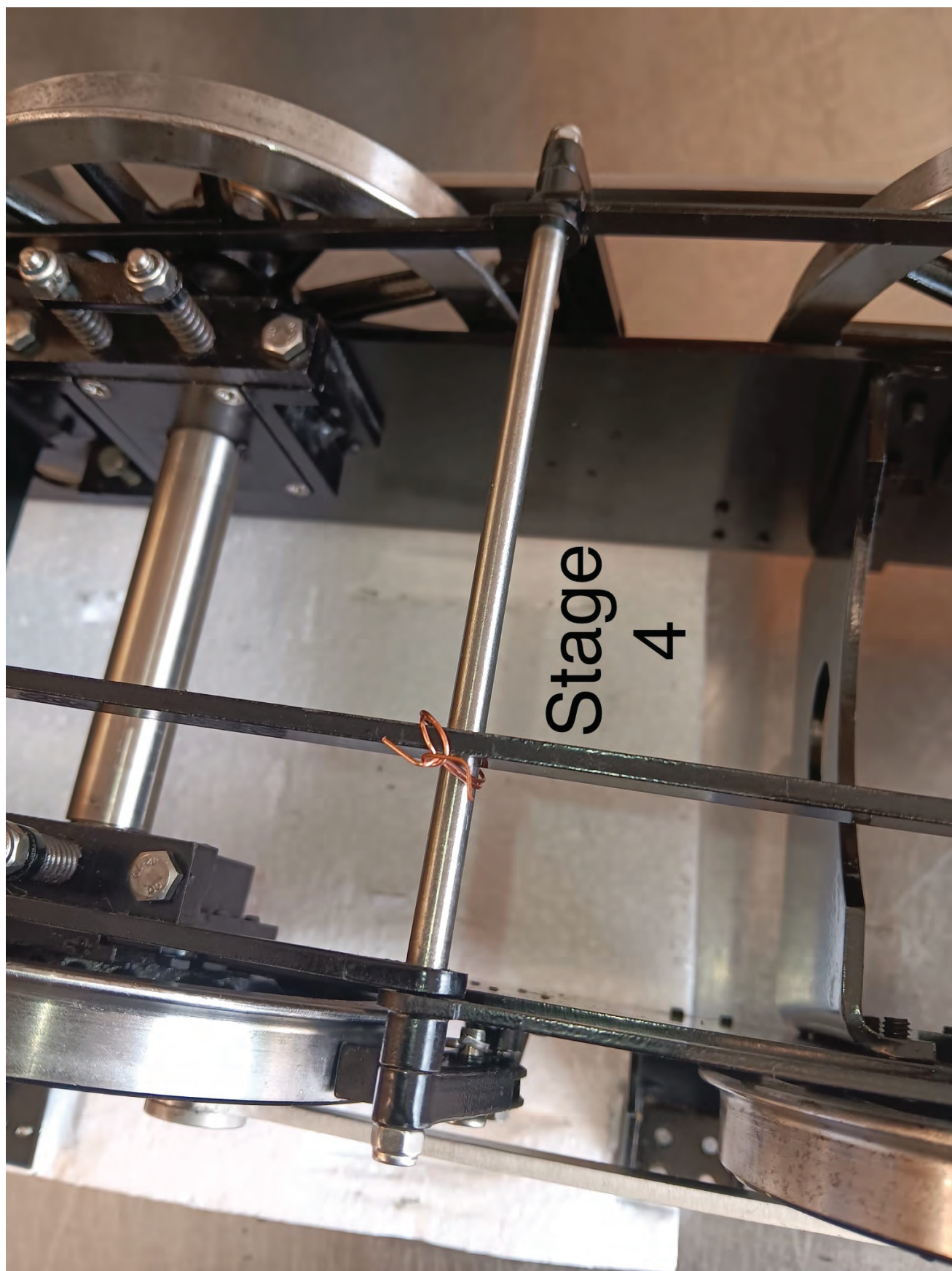




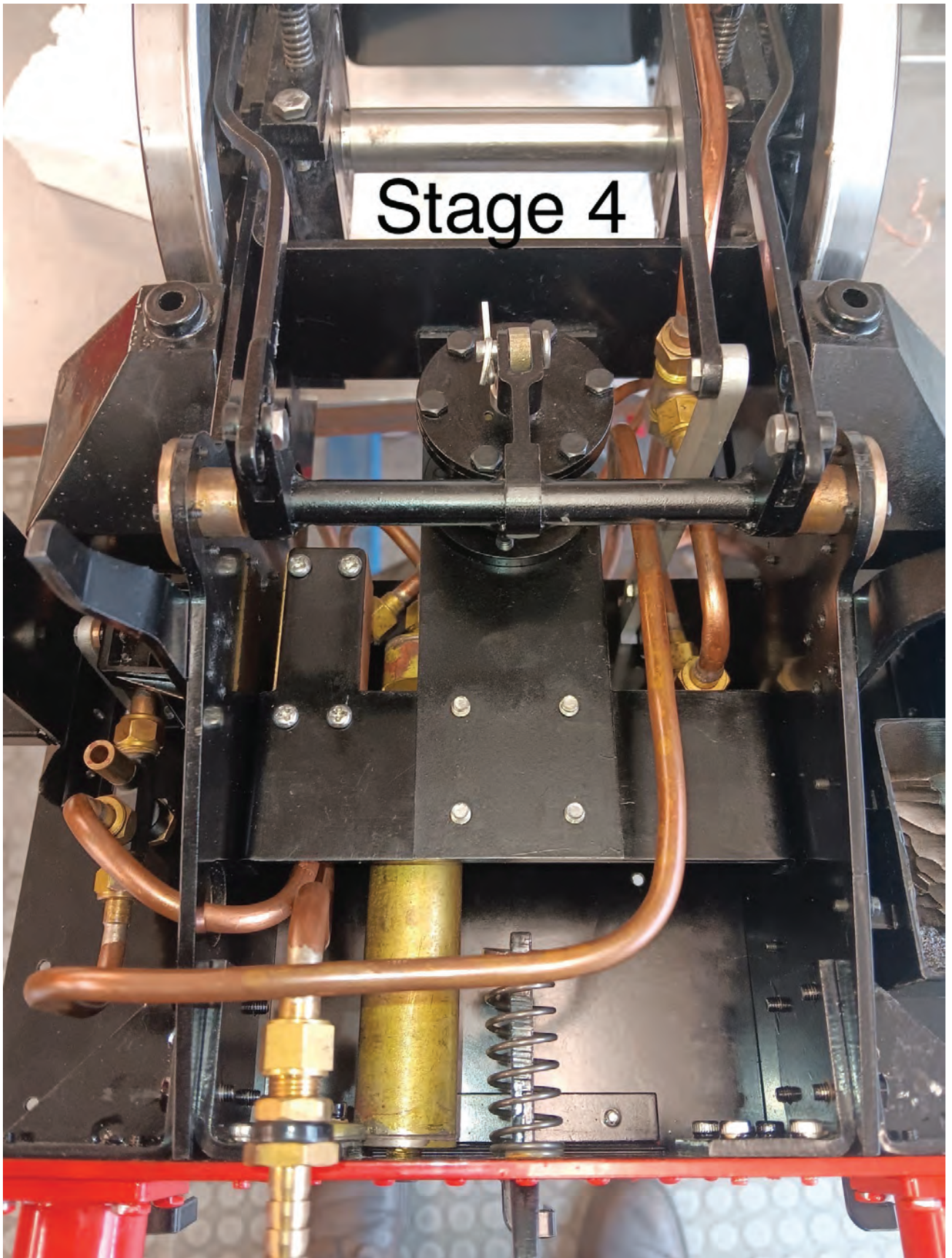
Stage 4

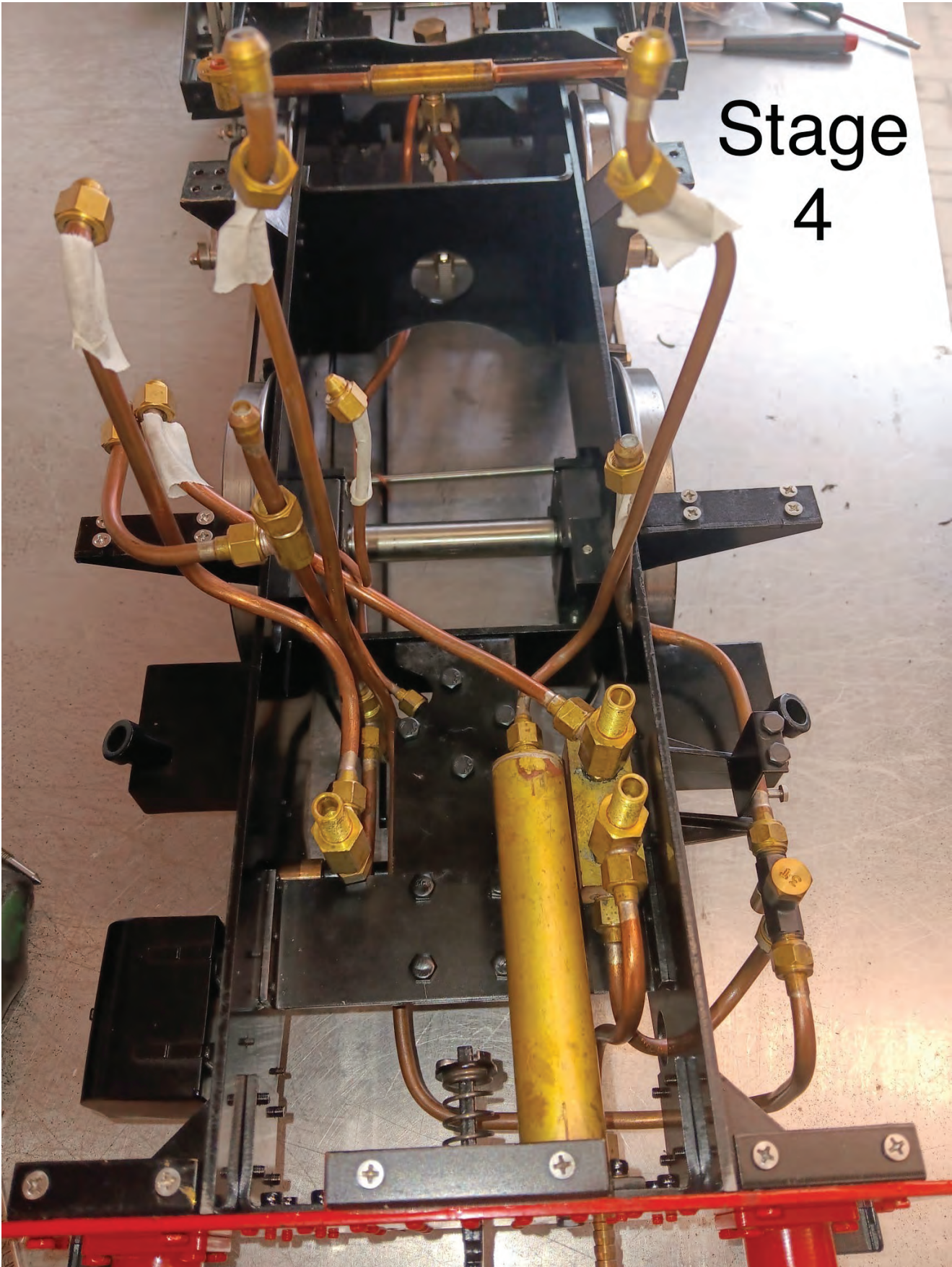
Stage
4



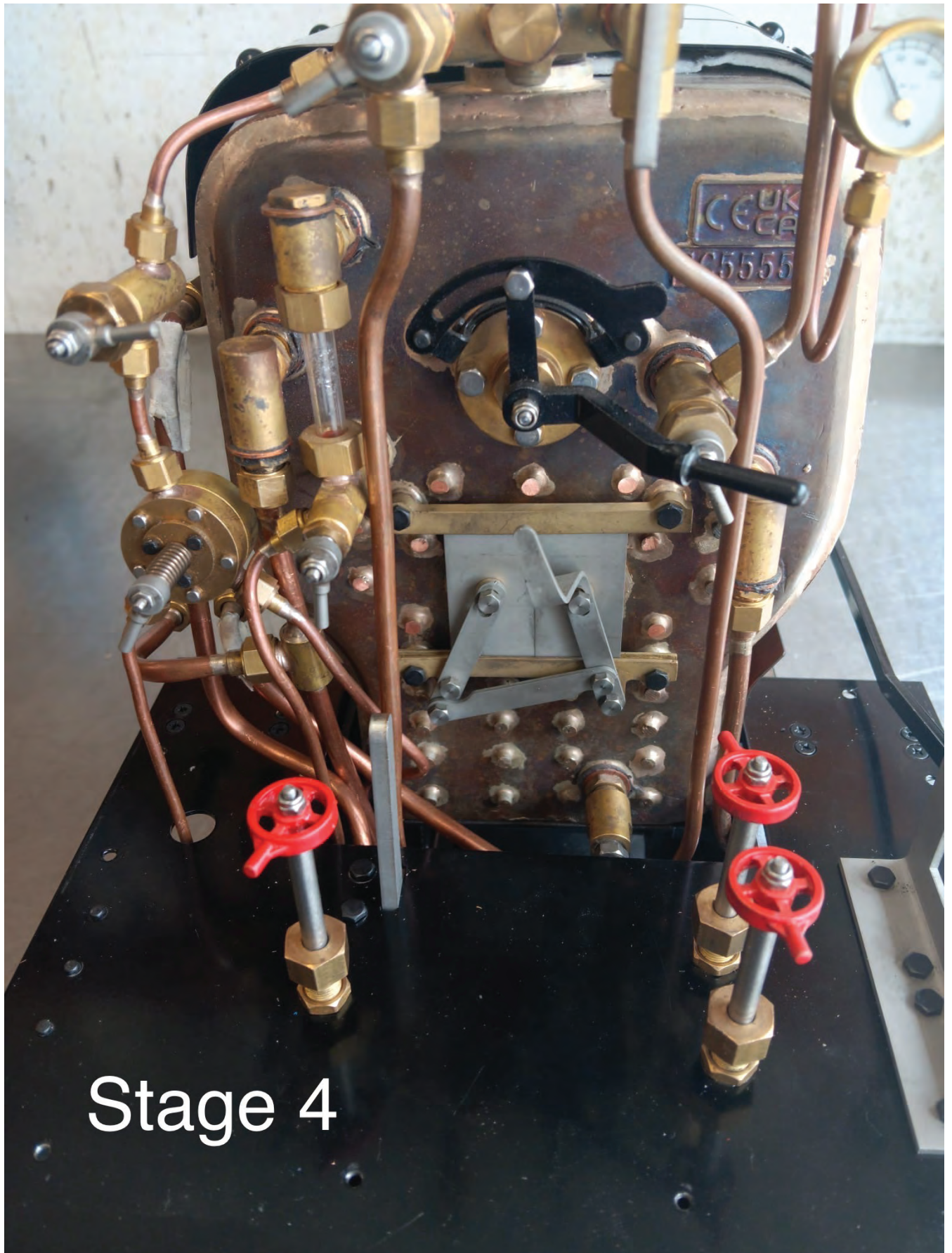


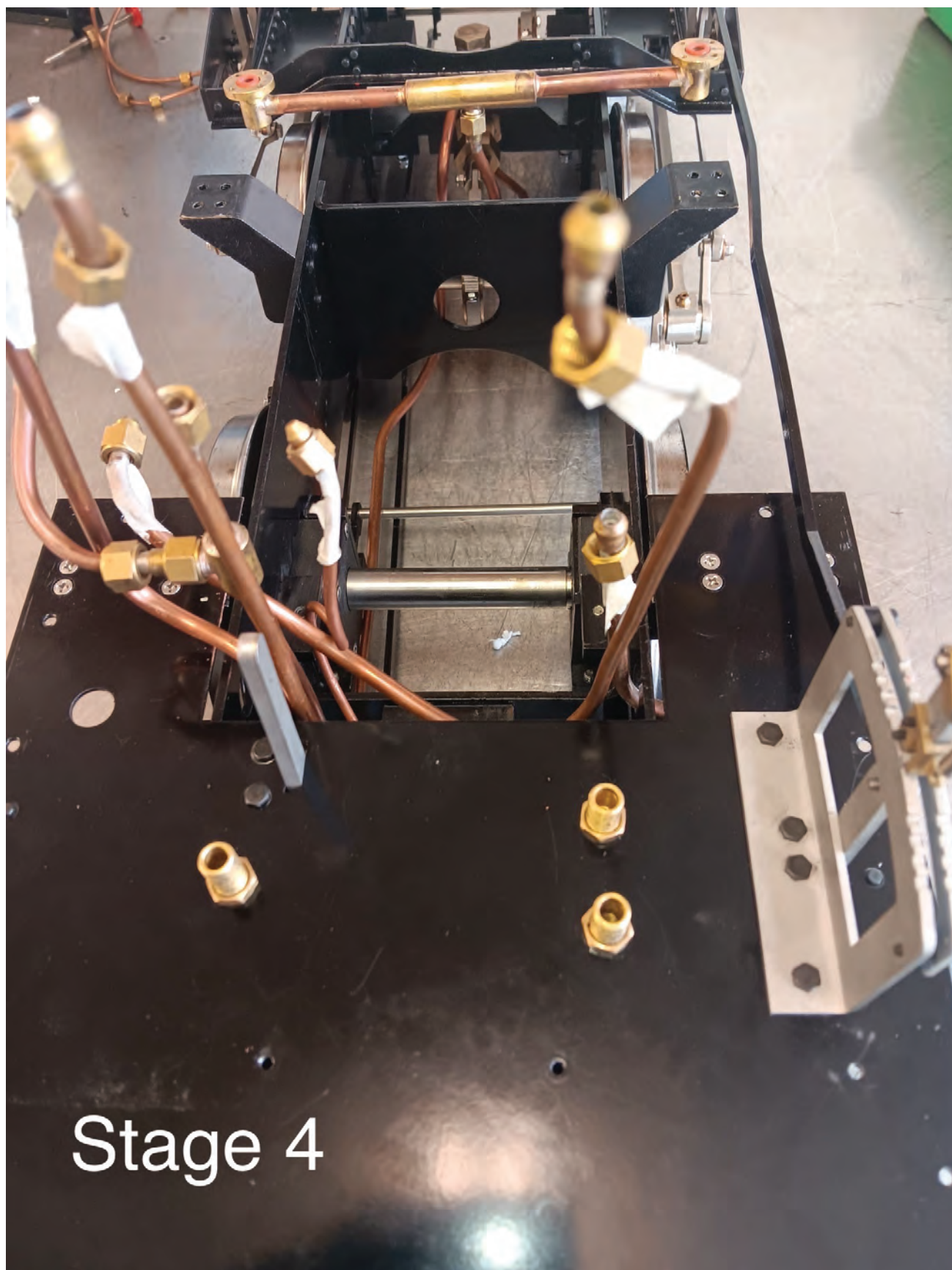
Stage 4





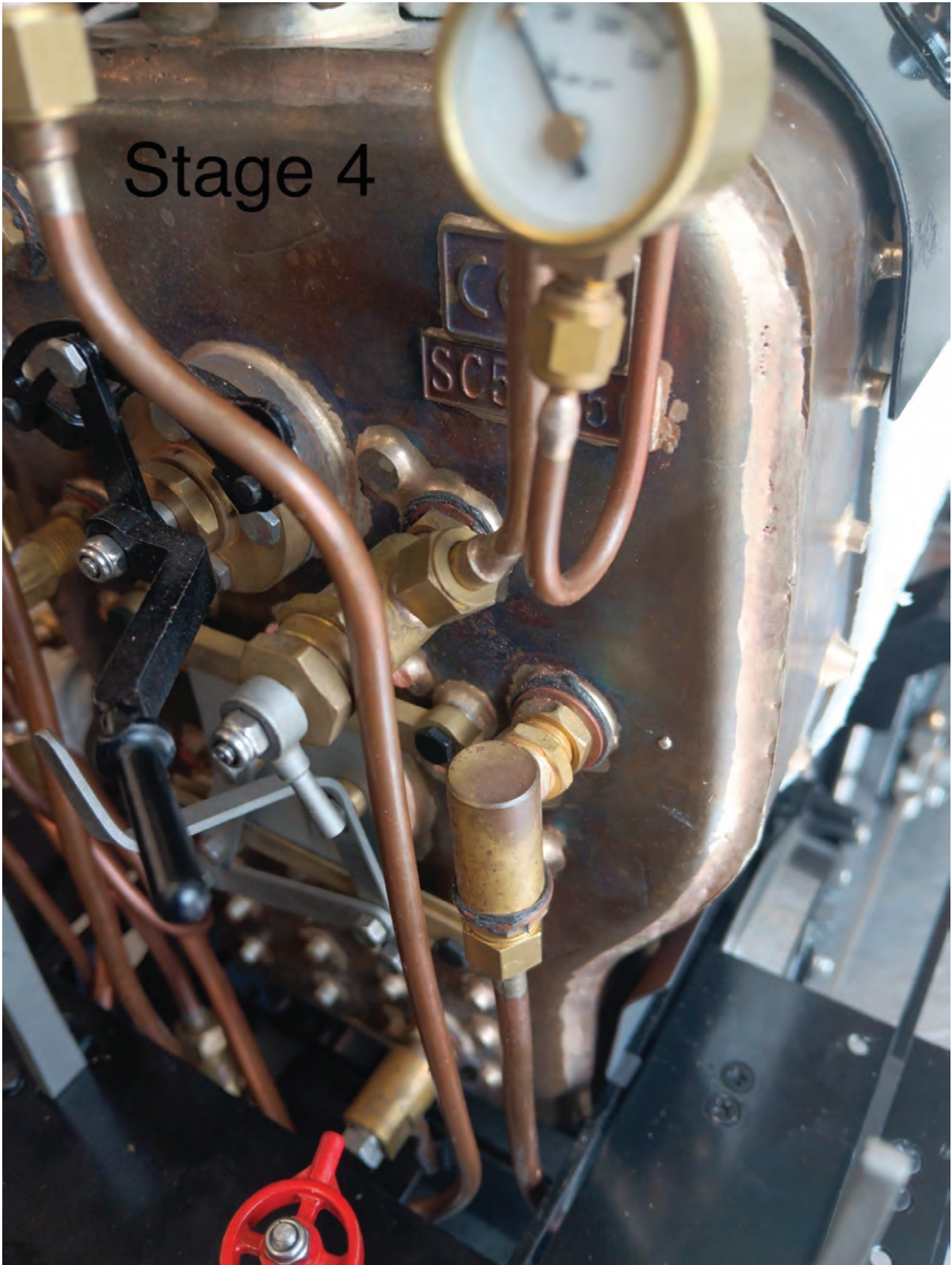
Stage
4



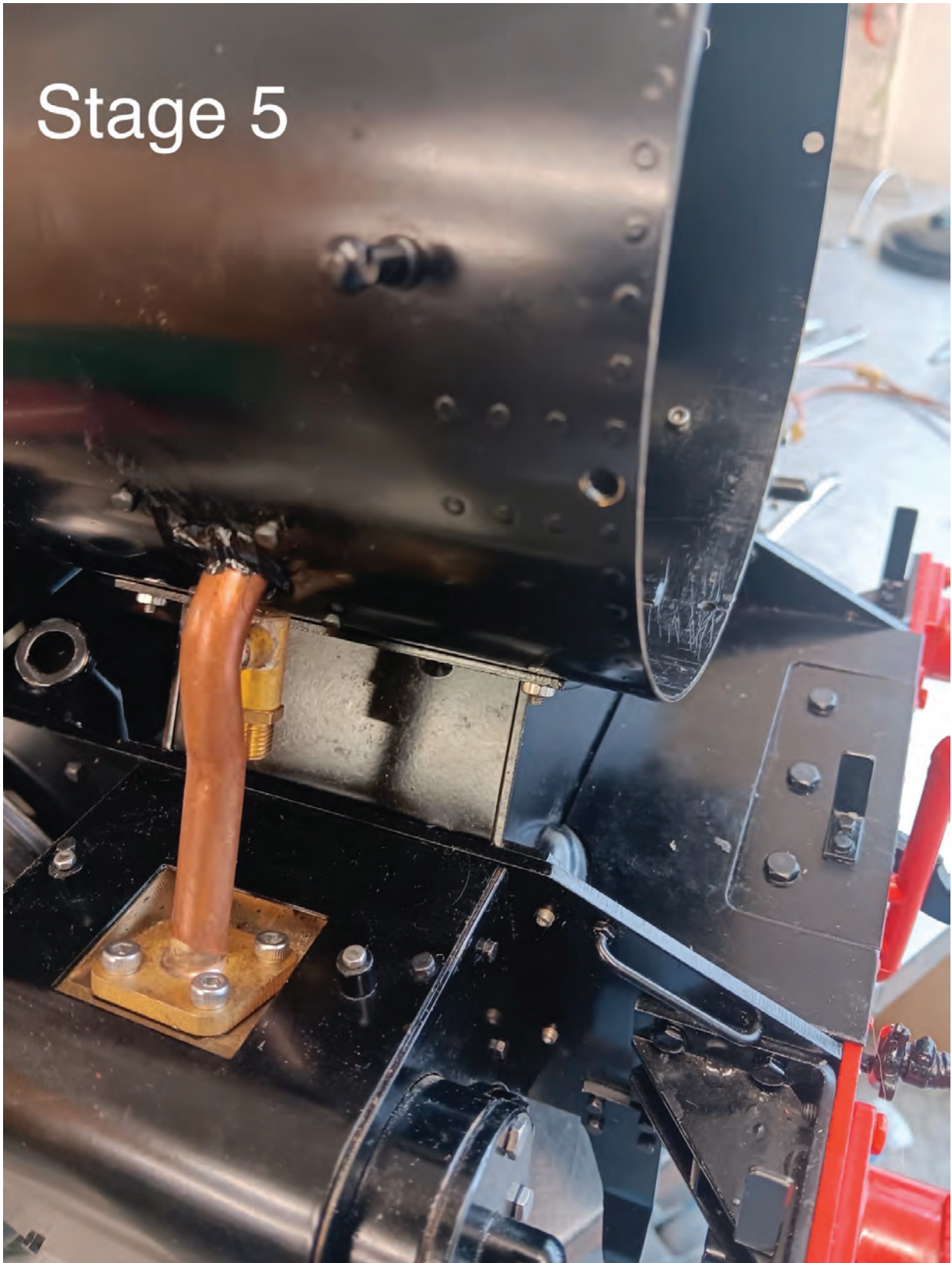




Stage 4



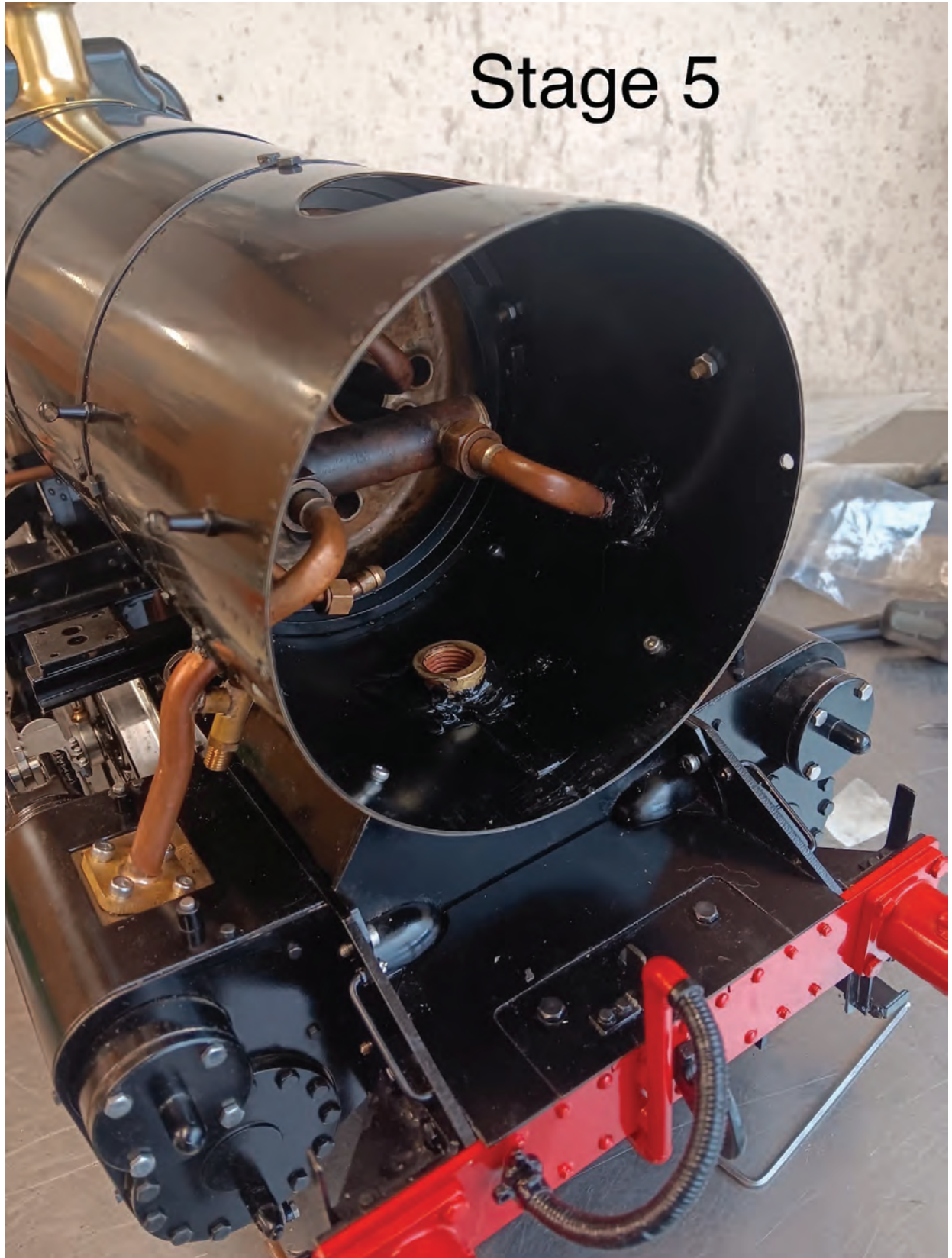
Stage 5



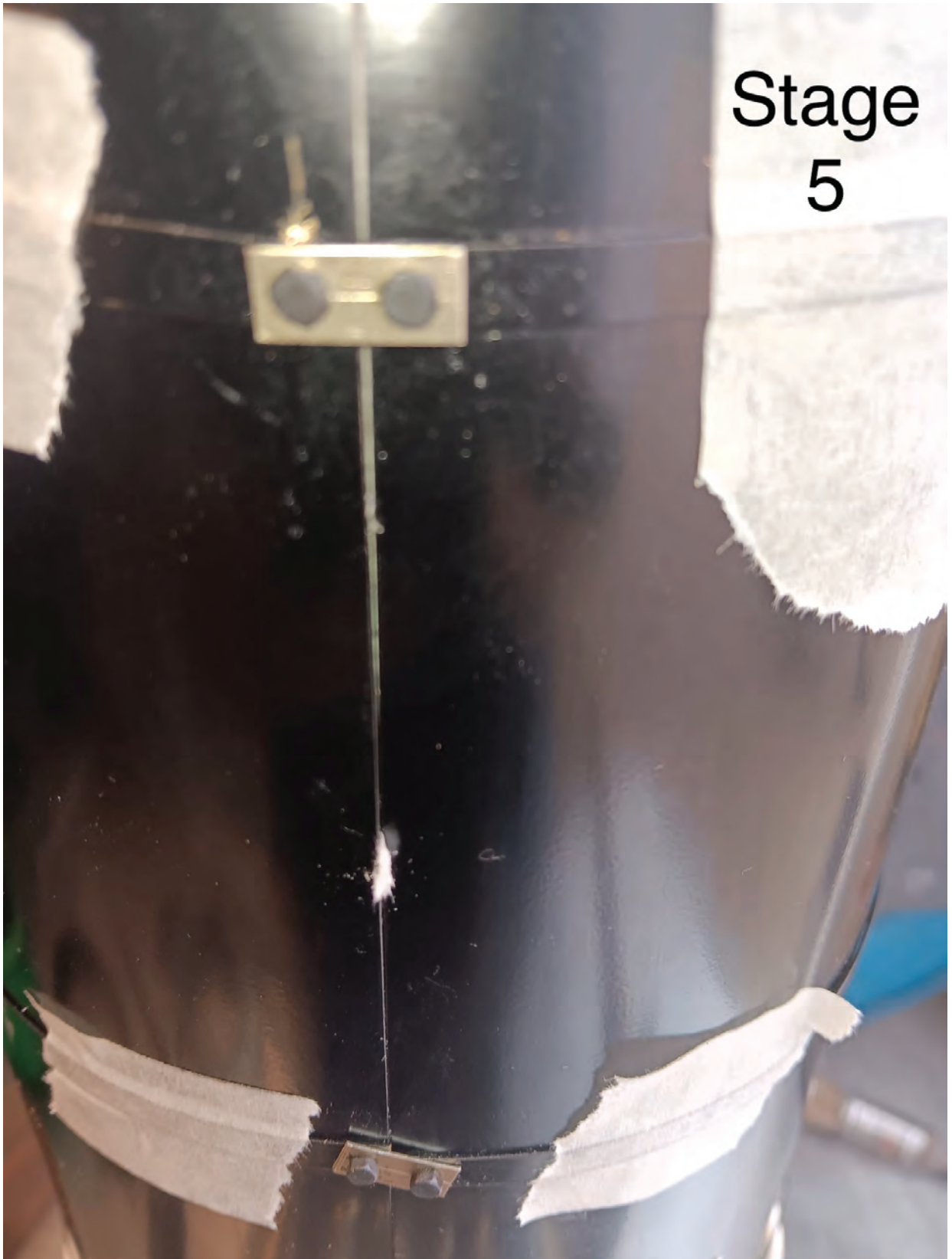
Stage 5



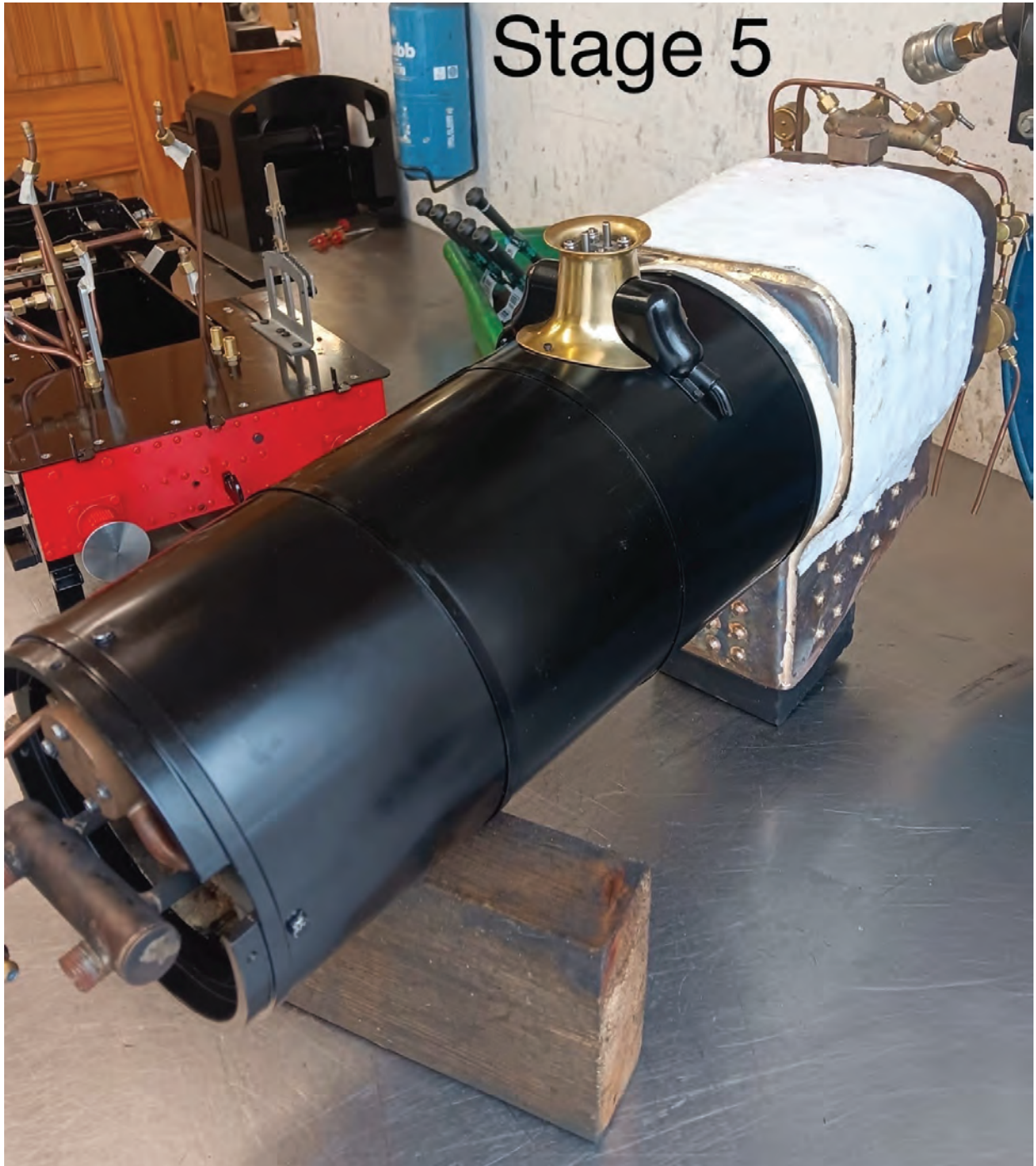
Stage 5



Stage
5



Stage 5



Stage 6



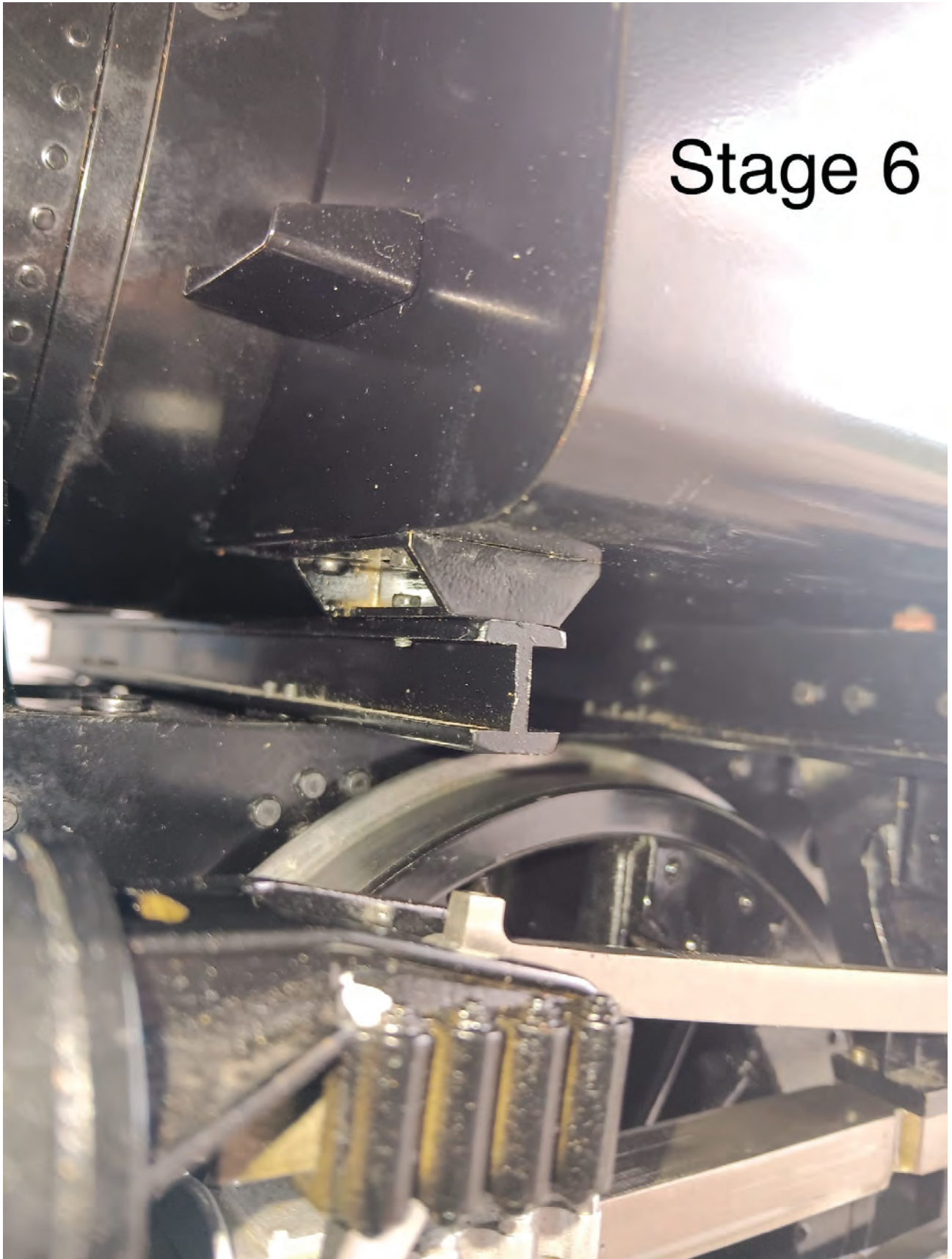
Stage 6



Stage 6



Stage 6



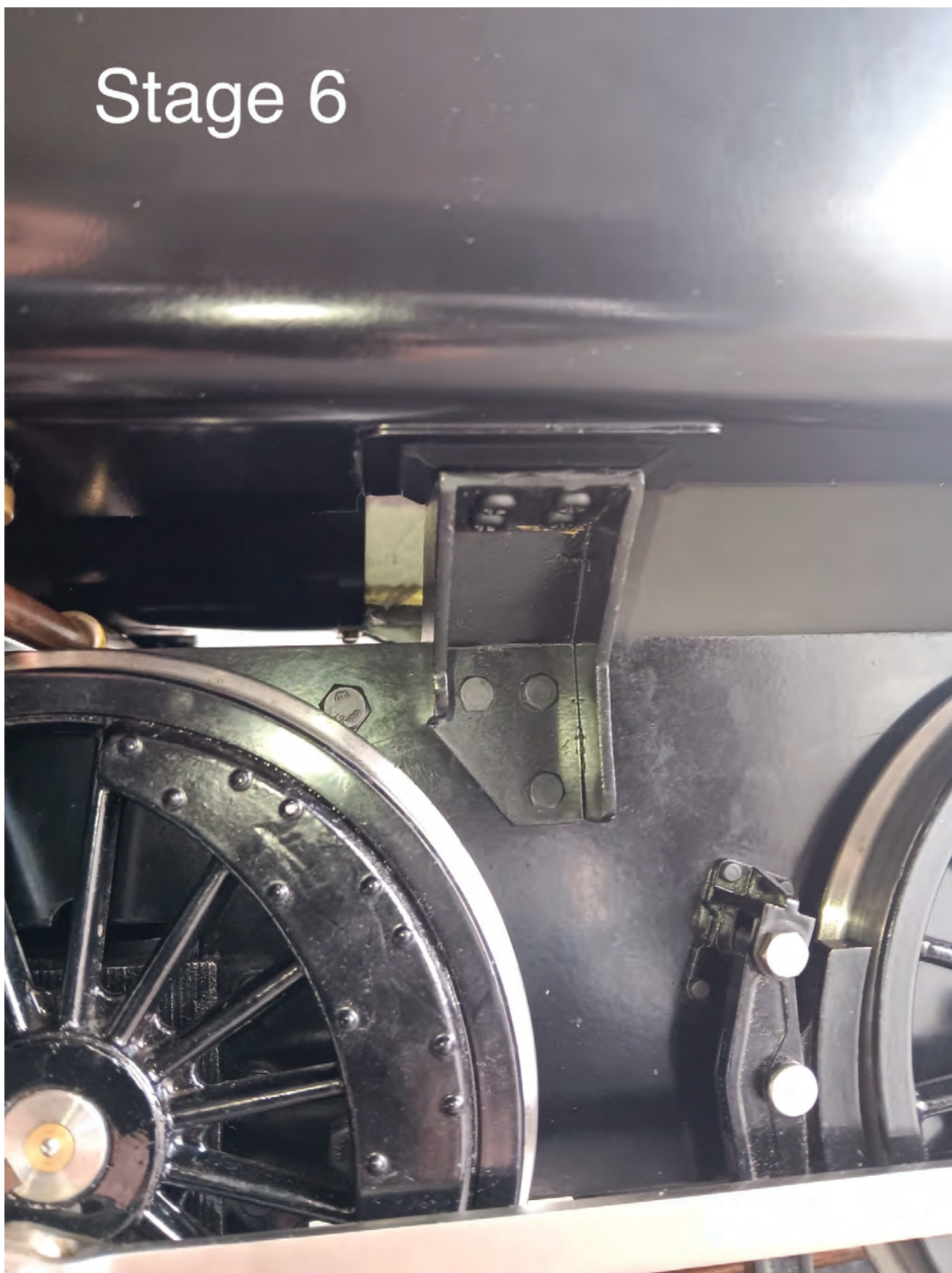
Stage 6



Stage 6



Stage 6



Stage 7



Stage 7





Stage 7

