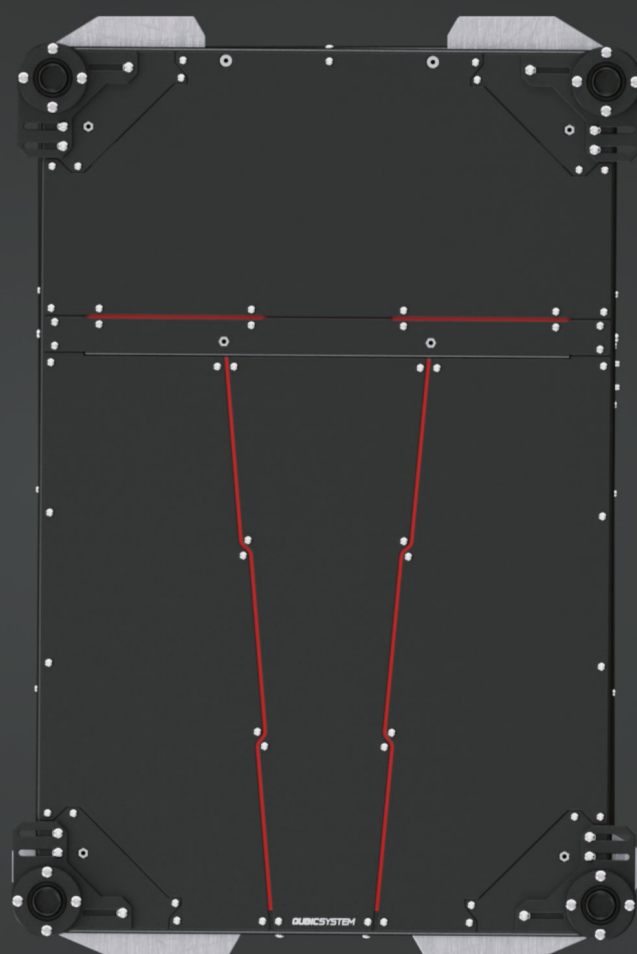


USER MANUAL





Motion Systems, the manufacturer of Qubic System, would like to thank you for choosing the QS-TP1, an innovative product that helps you to develop highly reliable training and entertainment solutions that reproduce key immersive elements, such as surface textures, acceleration, engine vibrations and vehicle dynamics for multiple types of land, air or sea vehicles. Our motion system has been designed to deliver the most realistic simulation experience. We hope you enjoy your new Qubic System!

Our experts are ready to assist you:
[QubicSystem.com/contact](https://qubicsystem.com/contact)

The latest version of this User Manual, including available **translations**, can be accessed through the **Qubic System documentation repository**. Scan the QR code to access the available language versions.

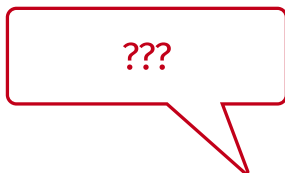


qubicsystem.com/uqstp1

We have prepared video recordings demonstrating the potentially most challenging stages of the machine assembly. Scan the QR code or enter the address in your web browser to access the playlist.



qubicsystem.com/uqstp1video



ASK SUPPORT

Our experts are ready to assist you:
MotionSystems.eu/Support



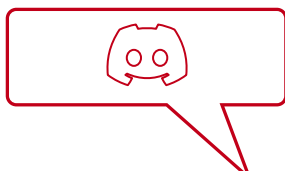
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DISCORD YOU ASK, WE ANSWER

Join our discord server to ask questions:
QubicSystem.com/Discord

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1. SAFETY PRECAUTIONS

Read all safety instructions before installing and using this product. Save this document for future reference. If ownership of this product is transferred, be sure to include this manual.

The following colored frames are used in this manual to draw attention to important information or warnings:

INFO

The instructions included in this frame indicate information that is considered important, but not injury- or damage-related.

WARNING

The instructions included in this frame indicate a dangerous situation that, if not avoided, could result in a user injury or device damage.

1.1. GENERAL SAFETY

WARNING



Keep hands and feet away from the moving parts when device is in motion.

WARNING



Always ensure that cockpit attachment points can withstand forces generated by the QS-TP1 (approved construction or tested for expected load). Check the cockpit for loose mounting points.

WARNING



To reduce the risk of burns, fire, electrical shock, injury or mechanical damage always **TURN OFF THE POWER SUPPLY** before plugging and unplugging the QS-TP1.

Dangerous voltage levels can be present in the Power Cabinet for a few minutes after turning off the machine.

WARNING



The device is intended solely for individuals **OVER THE AGE OF 16**. In case of use by individuals with limited physical, sensory, or mental capabilities, strict supervision is required. Read safety instructions before using the device.

- Use the QS-TP1 only for its intended purpose, according to instructions.
- Unplug the QS-TP1 from the power supply if it is not used for an extended period of time or when there is a need to perform hardware installation, maintenance, service or repair.
- Turn off the QS-TP1 when it is not in use.
- The QS-TP1 was designed for indoor use only - **DO NOT** store or use the product outdoors.
- Keep the QS-TP1 away from heat sources, high humidity, water, and other liquids. **DO NOT** store in places where water vapor condensation may occur due to low temperatures.
- **DO NOT** disassemble the Power Cabinets or actuators. Any tampering with or altering the product will void the warranty, pose a serious risk of electric shock, and may irreparably damage the product.
- If the device starts emitting unusual noises, smoke, or indicating that the device is not working properly, **STOP** using the QS-TP1 immediately and contact technical support.
- **DO NOT** cover the ventilation holes in the Power Cabinet.
- Keep the power cord plug and the socket dry, clean and dust-free.
- Protect the power cord from being damaged by being stepped on, rubbed against, or pinched.
- **DO NOT** use the QS-TP1 if the ambient temperature is below 5°C (41°F) or above 40°C (104°F).
- **DO NOT** use the QS-TP1 if it has been damaged, or any component is broken or missing. Please contact technical support.
- **DO NOT** use attachments or replacement parts not recommended or approved by the manufacturer. If you must replace a damaged power cord, use only certified products with the same rating as the one being replaced.
- Connect the QS-TP1 to a correctly grounded outlet only.
- If you want to increase safety level of the system, you can add external safety devices. For detailed information check section **10** on page **132**.
- Use only certified components and fasteners when installing seat, seat belts and other accessories to QS-TP1.

WARNING

Stop using the QS-TP1 immediately and contact technical support when the machine starts to emit unusual noise, smoke or any other suspicious behavior indicating the machine is not working properly.

1.2. HEALTH AND SAFETY INSTRUCTIONS

The safety of Qubic System users is the top priority. To protect users and bystanders against injuries caused by mechanical parts movement and electrical connectivity, the following instructions must be strictly performed.

WARNING

As with any mechanical device, the user is responsible for inspecting the condition of the machine prior to use and adhering to safe operating procedures.

Even though possibilities with QS-TP1 are broad, some things should be kept in mind when the place for the rig is chosen. Motion Systems **DOES NOT** approve exceeding or ignoring any of these points and **IS NOT** responsible for malfunctions or failures that are the results of these actions.

- **DO NOT** use the QS-TP1 on very soft or fragile surfaces like rubber, glass, or foam.
- Ensure that all QS-TP1 modules are mounted properly.
- Be aware that QS-TP1 will crawl a little in every direction during operation. Those movements could damage the surface in the long term. The manufacturer, its subsidiaries, and their partners are not responsible for any floor damages.
- **DO NOT** mount the rig in tight or cluttered spaces – remember that QS-TP1 moves and nothing should restrict its motion range.
- Seatbelts and other harnesses should be mounted to parts of the motion rig that move in the same way as the seat. **DO NOT** attach them to any static part or ground.
- Cables must not be stretched and should be kept in a way that prevents them from getting under actuator or any part that can crush or tear them.
- If you want to use the QS-TP1 in an unusual application, and you are not sure that the desired setup is feasible, please contact the distributor/reseller.

What must be checked before turning on the device:

- Check if cables are mounted properly – they are not stretched or loosely connected to the socket.
- Check if there are no objects in the motion range of the platform.
- Check that all elements are properly fixed.
- Check if there are no sharp edges nearby.
- Check if everyone around is aware of the machine's rapid movements.
- Make sure that no one stands in the range of motion (minimum 1.5 m).
- Motion Lock button should be mounted close to the operator or user of the machine – it has to be easily reachable in every situation.
- Check Motion Lock button **AT LEAST** once a month to reduce the possibility of unknown failure – more information available in chapter 8 on page 123.

How to safely turn on and use the QS-TP1:

- When the QS-TP1 is turned on, it requires a Motion Lock button cycle and then performs a start-up calibration. For details go to section **2.10** on page **14**.

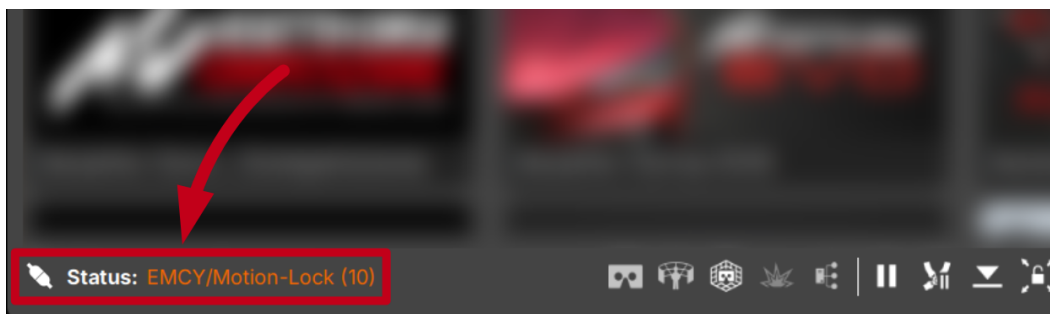
WARNING

In order to perform a calibration, QS-TP1 will move after turning the power on and cycling the Motion Lock button. Stay in the safe distance from that movement and do not try to interrupt it.

- **DO NOT** interrupt or change the weight of payload mounted to the QS-TP1 during start-up calibration.
- Before getting on or off the machine **ALWAYS** activate Motion Lock (press the red button).
- In case of game crash or freeze, the Motion Lock button must be pressed before getting off the machine.

INFO

To check if the QS-TP1 is in the Motion Lock mode - go to the QubicManager application main window. Platform status is displayed in the lower left corner of the main application window. Motion Lock engaged:



INFO

Motion Lock input is not SIL/PL (safety integrity level/performance level) rated and **DOES NOT** guarantee safety. If you wish to achieve specific SIL/PL ranking, consider introducing a power cut-off device that is controlled by an external safety relay and cuts off the power to all Power Cabinets. Example application of the power cut-off contactor can be found in section **10.3.2** and **10.3.3** on pages **136** and **138**.

WARNING



Dangerous voltage levels are present in the Power Cabinet and cables during the operation and for up to a few minutes after turning off the machine.

- For VR Headset users:
 - Remove the VR goggles before entering or exiting the rig.
 - Ensure that the VR Headset is not limiting the operation range of QS-TP1.
 - Check if the whole VR setup is not in range of motion of the machine.
 - **DO NOT** place the connection loosely under the motion rig.

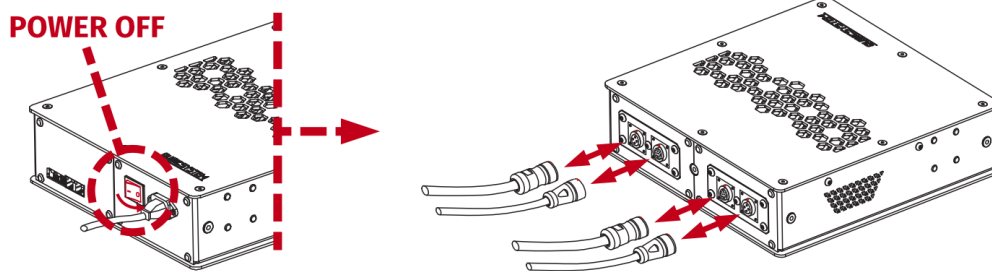
INFO

It is **recommended** that the connected PC is capable of running the game at stable 90 frames per second or more when a VR Headset is used. Lower values can cause VR sickness.

- **DO NOT** use QS-TP1 if you are pregnant, tired, or under the influence of alcohol or drugs.
- **STOP USING** the QS-TP1 immediately if pain, fatigue or any discomfort appears.
- For every two hours of using the system, we recommend at least **15 MINUTES OF BREAK**.
- **DO NOT** put your hands or legs in the actuators' range of motion!
- **DO NOT** use the QS-TP1 around small children or pets.
- **DO NOT** pull the wires connecting the actuators with the power cabinets.

WARNING

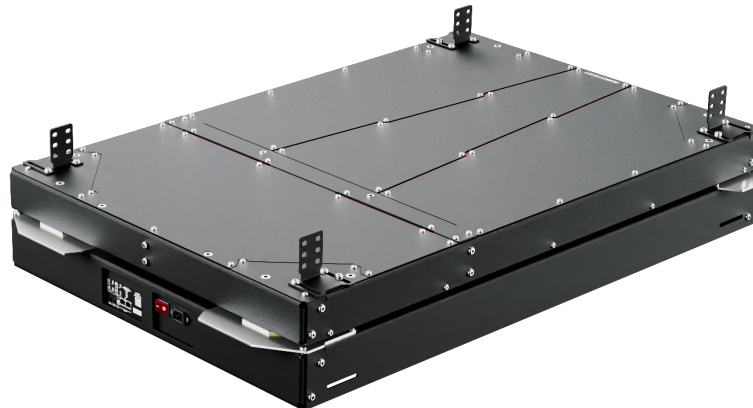
In case of any service operations - plugging and unplugging the actuator must **ALWAYS** be performed with Power Cabinet's power switched OFF.



Always make sure that all PUSH-PULL connectors are plugged **all the way in** - ring lock **MUST** click into place. Loose connections may result in serious actuator damage.

2. PRODUCT DESCRIPTION

QS-TP1 is 2DoF (Degree of Freedom) motion platform delivering **SURGE** and **YAW** movements. Traction loss characteristics are dedicated for vehicle simulations and lateral acceleration capabilities for aircraft simulators. It utilizes two longitudinal linear motion actuators with a dedicated Power Cabinet under the floor to replicate longitudinal and lateral acceleration. It perfectly replicates oversteer and acceleration/braking effects. Full system only requires 1.5 square meters of space.



2.1. SYSTEM COMPONENTS

A full working QS-TP1 system consists of fully assembled traction loss base platform with motion provided by the **QS-210 2DoF** actuators setup, and an **QS-MC6** communication set.

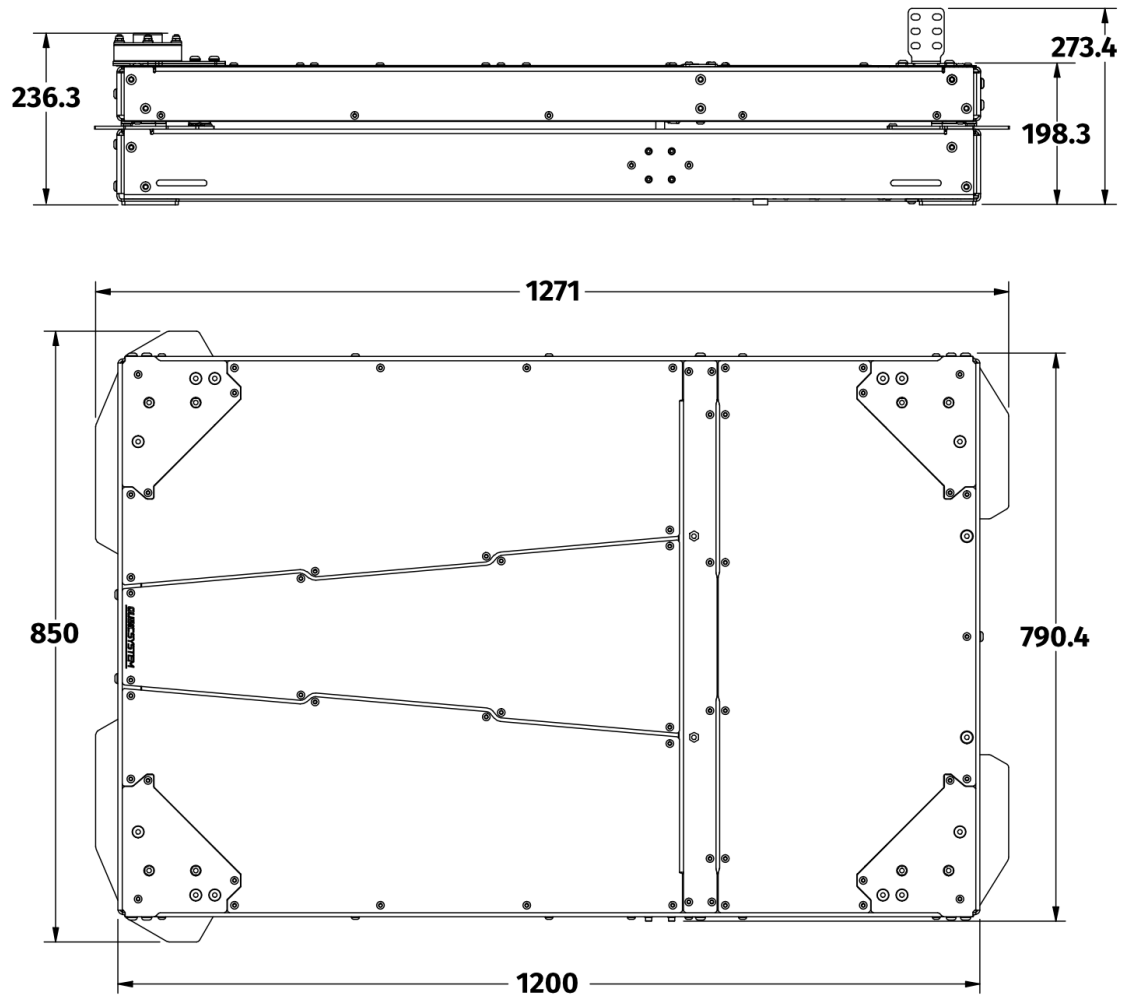
One QS-MC6 communication set, consisting of an M10 controller and a Motion Lock button, is required to connect the platform with a PC. If you already own a Qubic System vertical actuator motion platform which connects via M10 controller, only the QS-210 2DoF actuator setup is required.

If you are to use the QS-TP1 as a standalone traction loss platform, the QS-MC6 set is required. It is not included with the QS-TP1 and must be purchased separately.

INFO

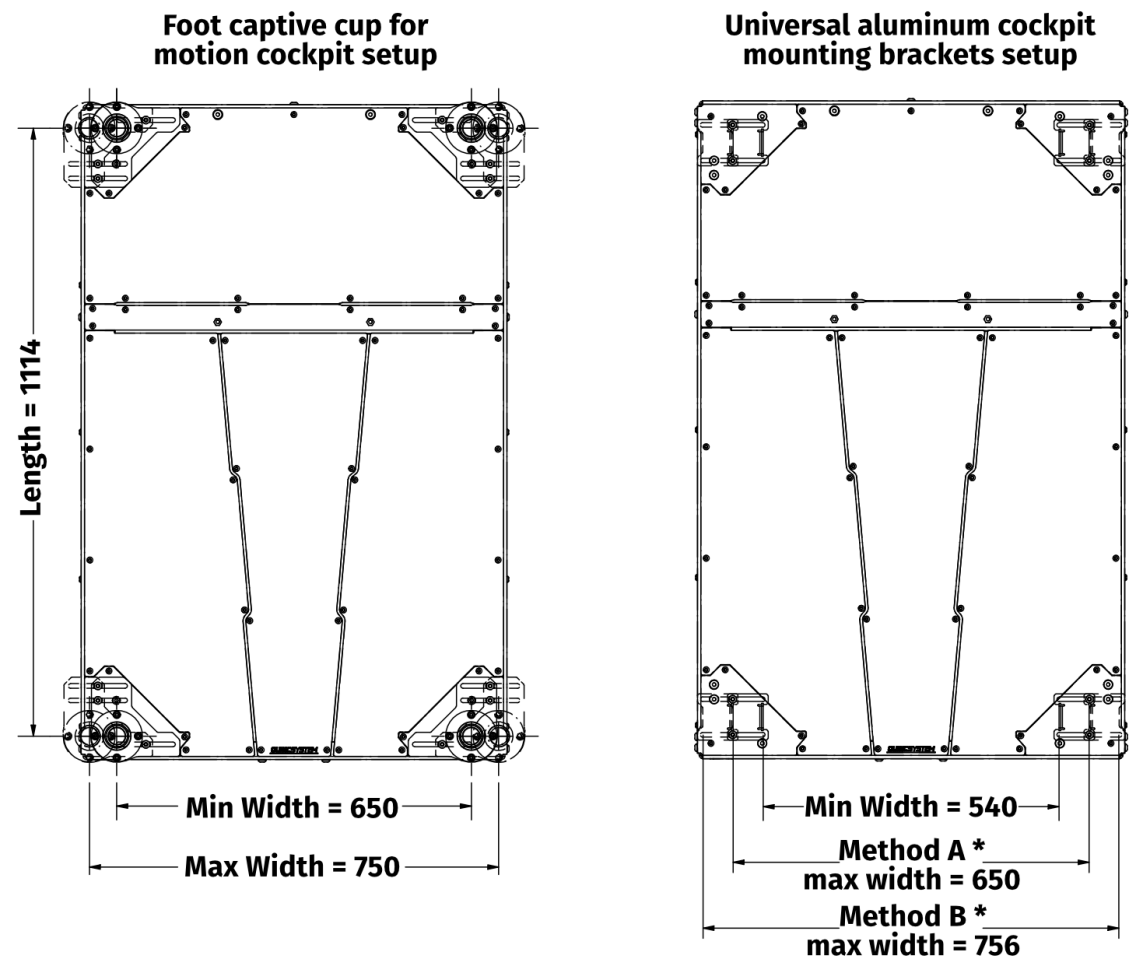
For a full assembly parts and tools list, go to section **3** on page **17**.

2.2. DIMENSIONS

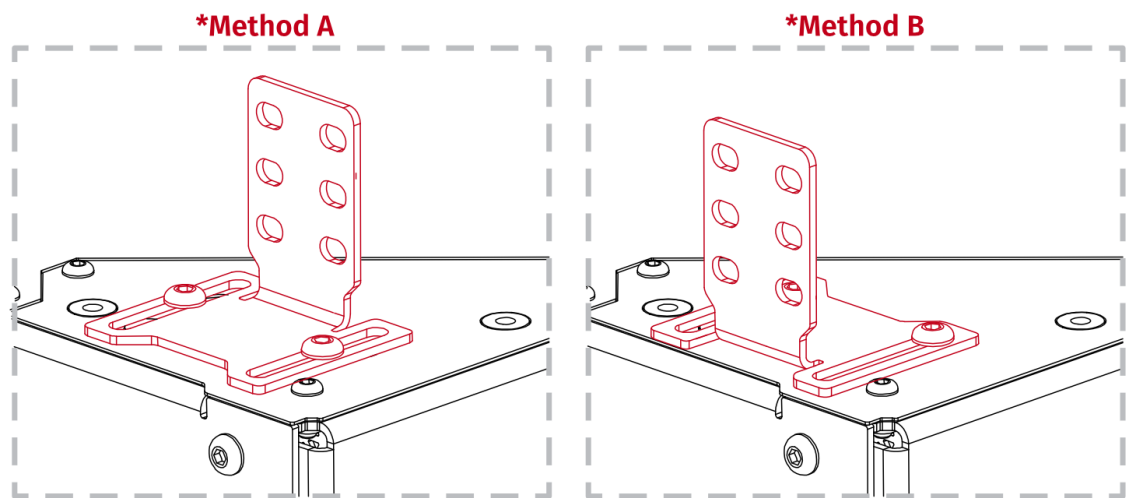


ALL DIMENSIONS IN MILLIMETERS

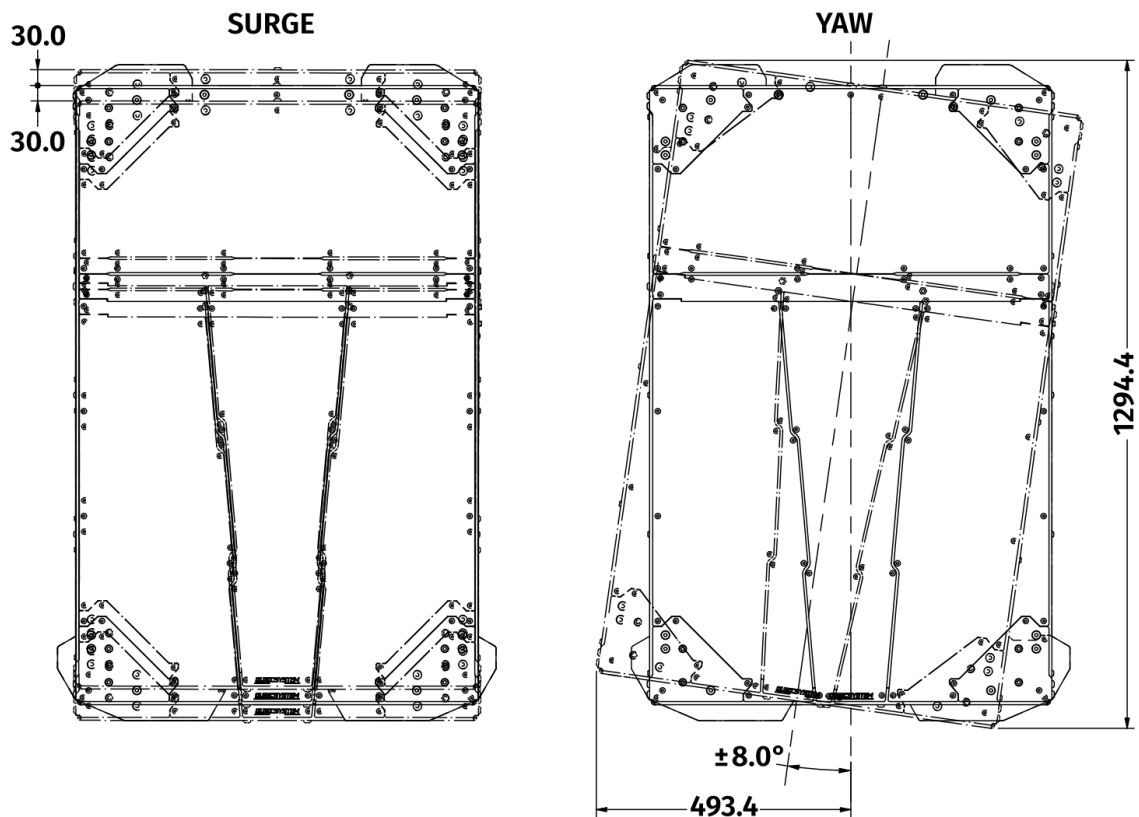
2.2.1 COMPATIBLE COCKPIT WIDTH RANGE



ALL DIMENSIONS IN MILLIMETERS



2.3. EXCURSIONS



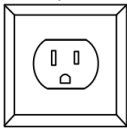
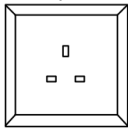
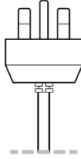
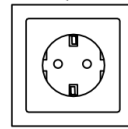
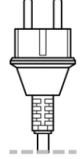
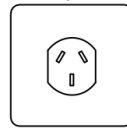
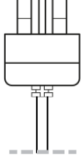
2.4. SYSTEM SPECIFICATION

QS-TP1		
Architecture	2DOF	
Actuator stroke	60 mm	
Platform weight	With QS-210 — 86 kg	Without actuators — 63 kg
Maximum payload	Heavy duty — 250 kg	Performance — 200 kg
Excursions		
Yaw	-8.0°, 8.0°	
Surge	-30.0 mm, 30.0 mm	
Performance mode		
Motion	Velocity	Acceleration
Yaw	100°/s	1000°/s ²
Surge	400 mm/s	0.6G*

*Value of acceleration is limited for safety reasons.

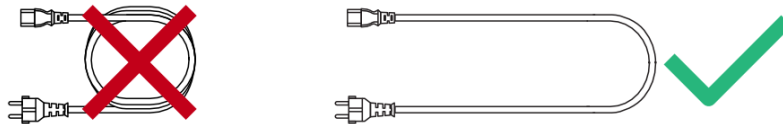
2.5. POWER REQUIREMENTS

QS-TP1 requires a 120/230 $\pm$ 10% VAC 50-60 Hz single phase with ground and neutral connection.

USA/CAN 120 V/60 Hz  Type B plug Nema 5-15p  Rated for 125V/15A 3x 2.08 mm ² (14AWG)  C13 IEC-60320	UK 230 V/50 Hz  Type G plug BS 1363 P3  Rated for 250V/10A 3x 0.75 mm ²  C13 IEC-60320	EU 230 V/50 Hz  Type F plug CEE 7/7  Rated for 230V/10A 3x 0.75 mm ²  C13 IEC-60320	AU 230 V/50 Hz  Type I plug AS/NZS-3112-1  Rated for 230V/10A 3x 18 AWG  C13 IEC-60320
---	---	---	--

INFO

Always **UNWIND THE CABLE COMPLETELY** when using a cable reel and untangle an extension cord before connecting the device to the power supply.



WARNING

- The device is **NOT** intended to be used in an IT earthing/grounding system.
- The product must be connected to the mains power supply with a protective earth (**PE**) and a residual current circuit breaker (**RCCB**).

If you experience issues such as unexpected shutdowns or resets during simulation, it is recommended to inspect the power cables and power source. The use of cables that do not meet the specified requirements may lead to malfunctions. To ensure proper device operation, replace any non-compliant cables with ones that meet the required specifications.

2.6. POWER CONSUMPTION

The table below contains power consumption data for QS-TP1:

Voltage [V]	Converter specification		Breaker specification		Power consumption	
	Average Power [kVA]	Peak Power [kVA]	Average Current [A]	Peak Current [A]	Average Power (stress test) [kW]	Average Power (typical game) [kW]
Heavy-Duty mode (tested with 150 kg of payload)						
230	0.85	0.90	4	10	0.34	0.03
120	0.80	0.85	7	17	0.34	0.03
Performance mode (tested with 105 kg of payload)						
230	0.95	1.00	5	14	0.40	0.02
120	0.80	0.85	7	23	0.43	0.03

With heavy payload and/or intensive simulation - average power consumption may rise.

INFO

- Q-MODE is unavailable for QS-TP1.
- 2DoF single set of QS-210/220 works only in Heavy-Duty mode with QS-TP1.

2.7. ENVIRONMENTAL CONDITIONS

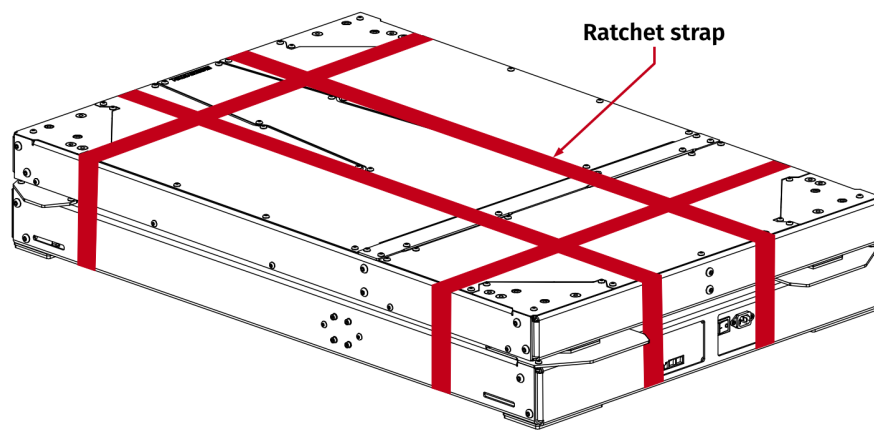
The QS-TP1 should be operated within ambient conditions as specified below:

- Indoor use and storage only
- Temperature: 5° - 40° Celsius / 41° - 104° Fahrenheit
- Humidity: 0% - 70% (without water vapor condensation)
- Maximum altitude: up to 2000 m / 6561 ft

2.8. TRANSPORTATION

Transportation of an assembled machine is possible in two ways:

- Once jacked up and put on moving dollies - flat orientation of the QS-TP1 only.
- The machine can be lifted and rotated **ONLY** once it is secured with ratchet straps. The cockpit and top frame installation must be removed.



WARNING

- **Power OFF** the machine before performing any transportation attempt.
- **DO NOT** transport the machine with any equipment installed on the top frame.
- **DO NOT** try to lift and rotate the machine without strapping the two frames together with ratchet straps. Both frames **MUST** be secured together. Attempting to rotate the QS-TP1 without the ratchet straps will cause both frames to slide apart, possibly injuring the persons involved and damaging the internal links between the frames.

2.9. ANCHORING

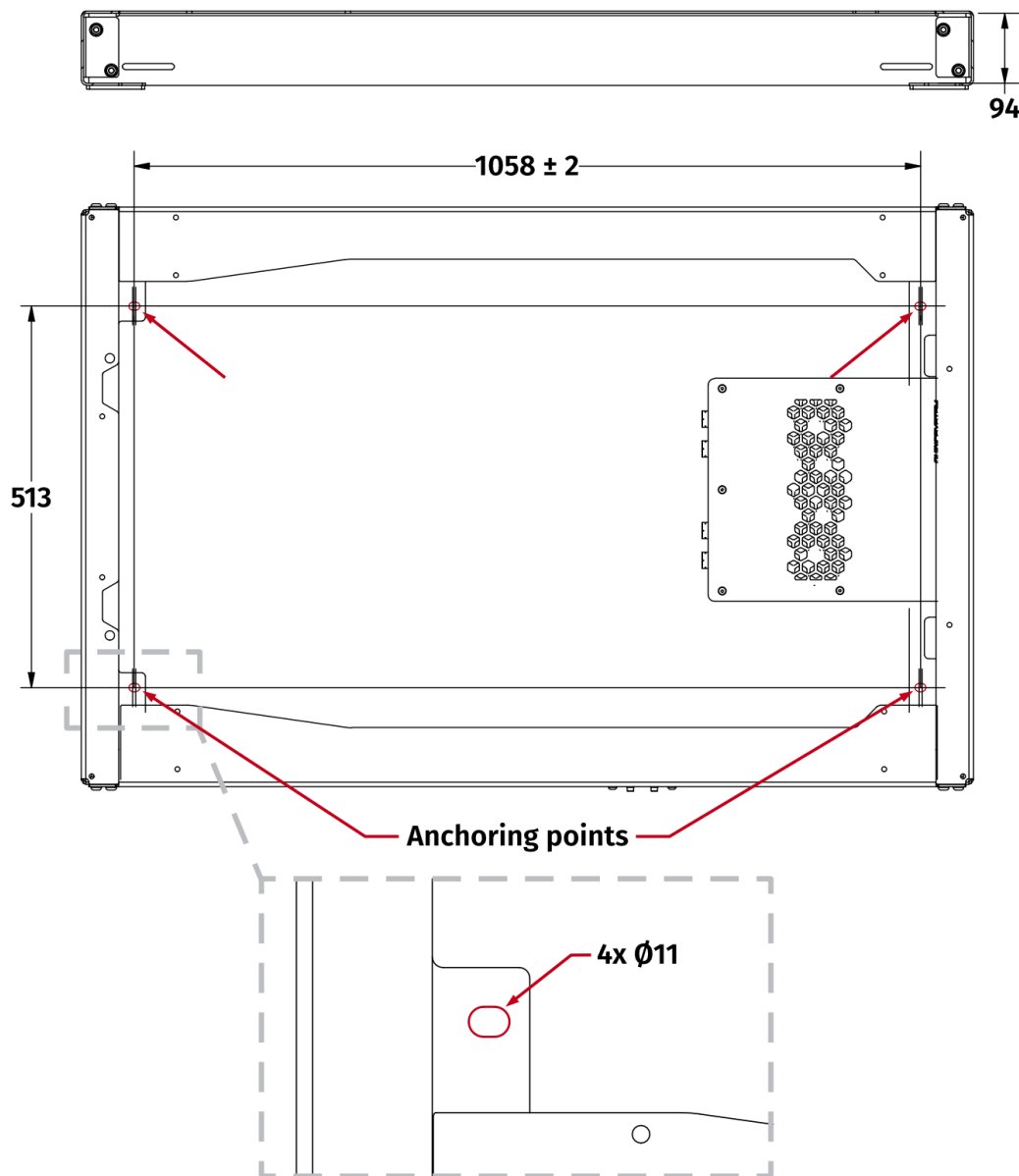
It is **recommended** to anchor the platform to the ground. Anchoring will not limit QS-TP1's performance. It is intended to prevent QS-TP1 from moving during gameplay, damaging the floor and colliding with the surrounding.

Anchoring bolts are not included and must be selected according to the type of surface on which the QS-TP1 is installed.

The floor should be dry and free of dirt. Inspect the rubber pads on the lower frame and clean them if necessary

WARNING

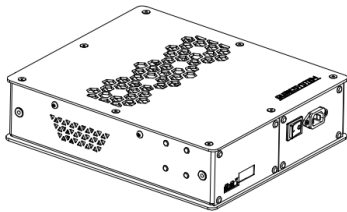
ONLY a correctly squared frame with equal diagonal dimensions can be anchored. Go to section 4.2 on page 34 for details.



2.10. COLD START PROCEDURE

QS-210, QS-220, QS-V20, QS-CH2, and QS-S25 motion systems require one complete cycle of the Motion Lock switch whenever power is restored after being cut off or during the start-up. Follow the steps below:

1. Verify that the motion platform is OFF - the power switch on the Power Cabinet is not backlit, and **QubicManager** displays an Offline status.

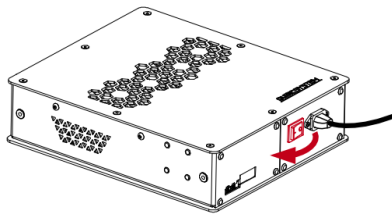


Platform's power is **OFF**

QubicManager bottom left corner:

Status: Offline/Waiting for nodes (4)

2. Turn the Power ON. The platform will not move.

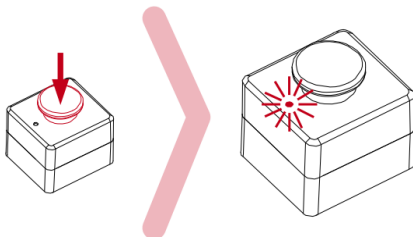


Platform's power is **ON**

QubicManager bottom left corner:

Status: Press and release Motion-Lock (5)

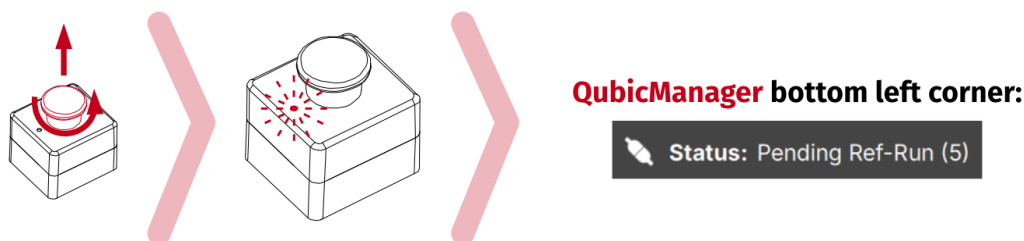
3. Press the **Motion Lock button** - diode emits constant light. The platform will not move.



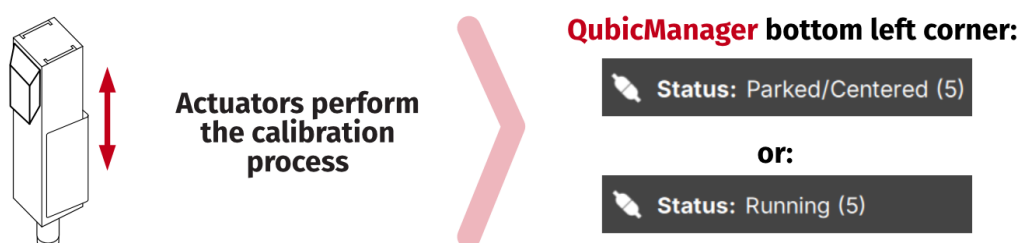
QubicManager bottom left corner:

Status: EMCY/Motion-Lock (5)

4. Turn the **Motion Lock button** counterclockwise - diode blinks. The system will perform start-up calibration. Do not change the payload.



5. If the status displays **Parked/centered** or **Running** - the motion platform is ready for operation.



INFO

- If the status displays **Status: Parked/Centered (5)** - no need to perform a Cold start procedure, the platform is ready for operation.
- If the platform was already powered ON while starting the QubicManager and status displays **Status: Press and release Motion-Lock (5)** - start from step 3.
- If the Motion Lock was already engaged during start-up and the status displays **Status: EMCY/Motion-Lock (5)** - no need to cycle through the stages, start from step 4.
- For the procedure to work, M10 controller must be powered on (via USB) - QubicManager does not have to be running.

2.11. GLOBAL PAUSE START-UP

To protect the user from unexpected machine movement, the Global Pause function is enabled by default on application startup.

If the game remains paused for more than 5 seconds, Global Pause is activated automatically to prevent the device from starting before the user is ready (e.g. seat belts are not fully fastened), which is especially useful in environments with frequent driver changes, such as racing simulator centers. When active, Global Pause is indicated by a voiceover message, an active button at the bottom of the program and a highlighted yellow frame around the button panel.



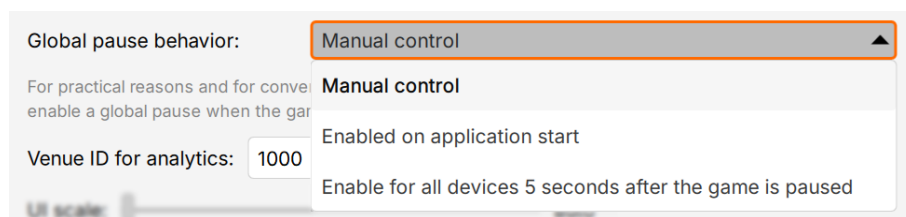
There are convenient ways of managing the global pause function using hotkeys and special buttons to disable it:

- Stream Deck button (for VR users)
- Joystick or Button Box button (for VR users)
- Hotkeys: Scroll Lock or Win + Shift + especially
- Icon on the web interface
- 3rd party application that is able to trigger `mosy://toggle-pause`

INFO

For more detailed information about global pause behavior and configuration, including pause mapping and deactivation, refer to the **Help & Tutorials** → **Automatic Global Pause** article available in QubicManager.

It can also be disabled completely in **QubicManager** → **Software Configuration** → **General settings** (scroll down) → **Global pause behavior** by selecting Manual control.



The following types of behavior are available for global pause:

- **Auto-enable 5s after the game is paused** - QubicManager automatically enables global pause after the game is paused for at least 5 seconds. User explicit action is required to turn off the global pause. This is the default configuration.
- **Enabled on application start** - Global pause is enabled automatically on Qubic Manager start, but once it is disabled by the user, no automatic actions are performed.
- **Manual control** - Global pause is never automatically enabled, user has full control.

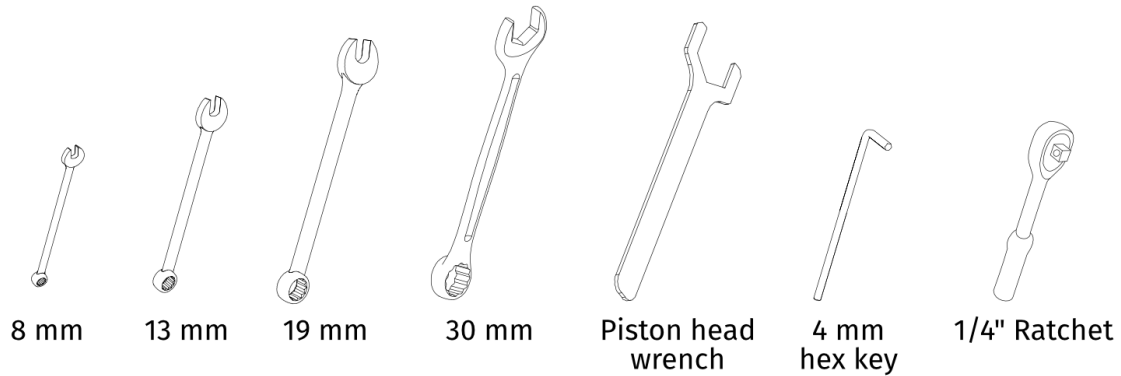
WARNING

Disabling the Global Pause function is performed at the **user's own responsibility** and should only be done by users who understand the operation of the device and are aware of the associated risks.

3. LISTS OF ASSEMBLY PARTS AND TOOLS

3.1. ASSEMBLY TOOLS

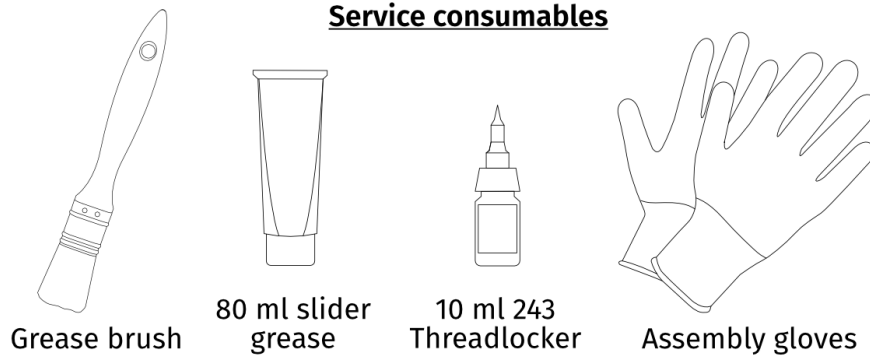
Combination and allen wrenches



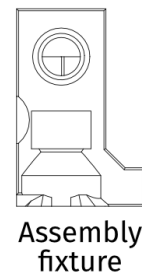
1/4" Drive accessories



Service consumables



Assembly tools



Tape measure will also be required during assembly and is not included.

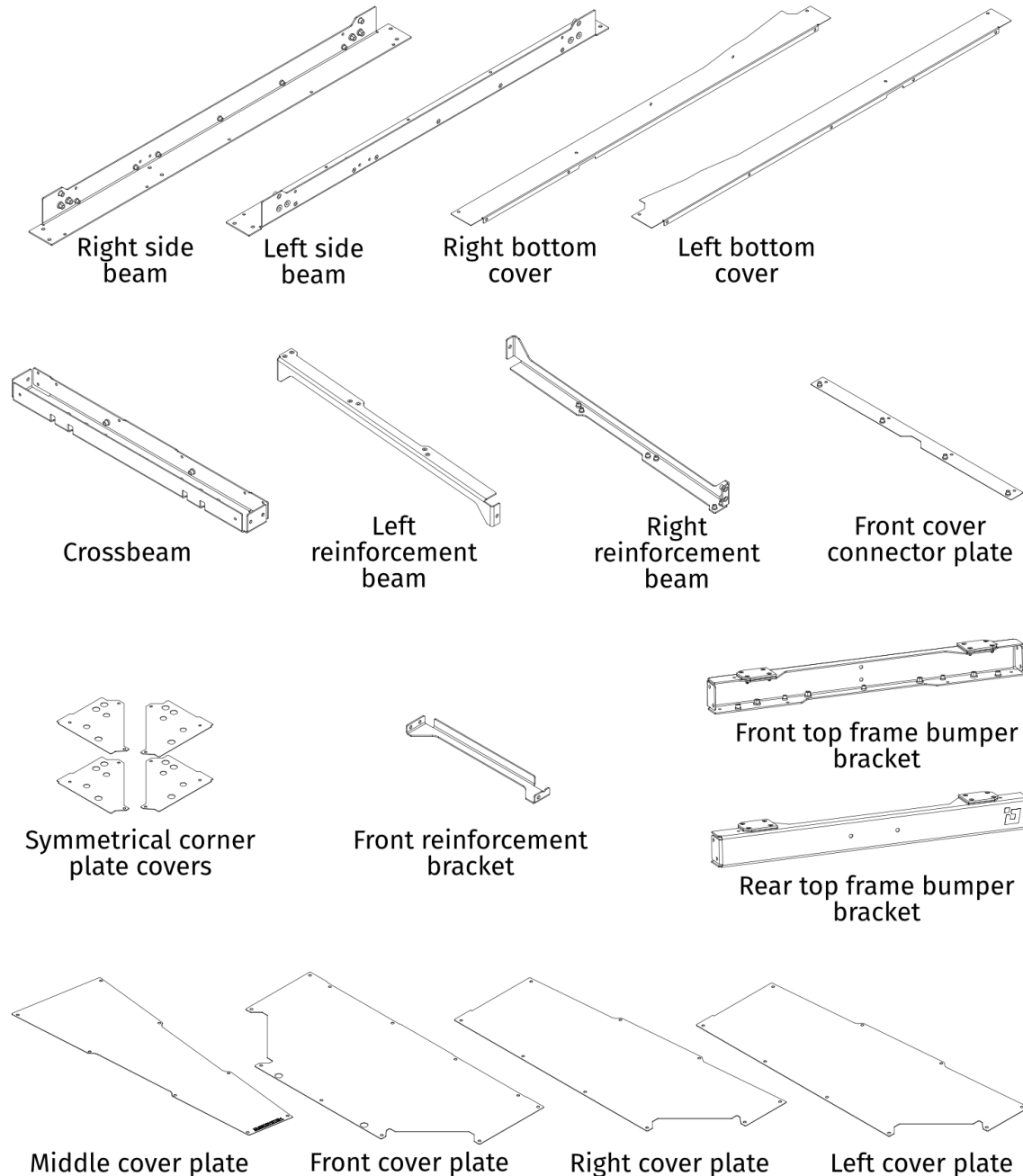
INFO

Assembly tools are provided for convenience and to allow the assembly process to be started immediately. If you have access to good-quality hand or power tools, they may make the assembly process easier. However, **DO NOT** apply excessive torque when using an impact wrench. Refer to the torque specifications provided in section 4.1 on page 26.

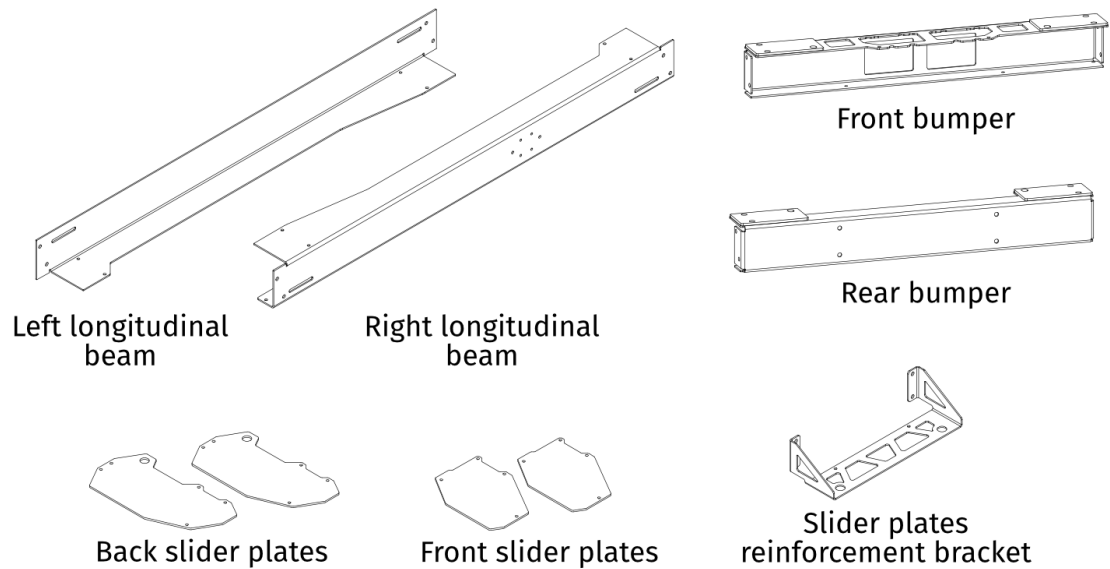
3.2. ASSEMBLY PARTS AND ACCESSORIES

The following is a visual reference list of the assembly components, divided into stages according to the assembly procedure described in this manual:

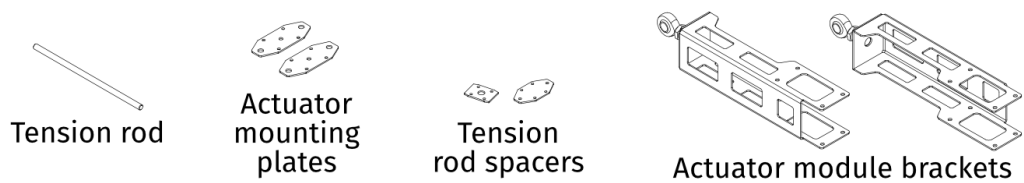
Top frame components



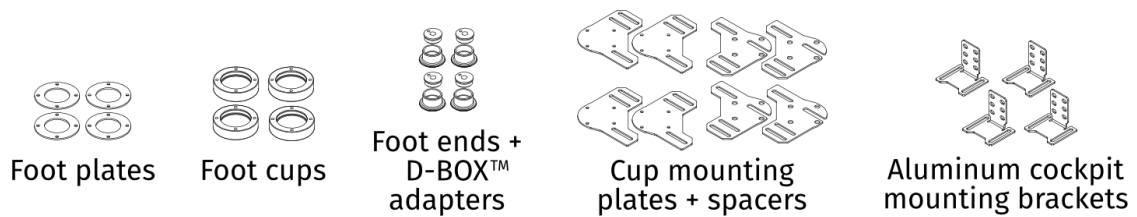
Bottom frame components



Frame joining components



Cockpit mounting components



3.3. COMPLETE COMPONENT, HARDWARE AND TOOLS LISTS

List of **assembly hardware** – total quantities:

Component	Qty	Spare	Total
Bolts and screws			
Bolt M5 x 25 (DIN 912)	8	4	12
Bolt M12 x 60 (DIN 931-1)	1	–	1
Bolt M12 x 70 (DIN 931-1)	1	–	1
Bolt M20 x 60 (DIN 931-1)	2	–	2
Bolt M20 x 110 (DIN 931-1)	2	–	2
Bolt M12 x 30 (DIN 933)	4	–	4
Countersunk bolt M8 x 16 (DIN 7991)	4	–	4
Bolt M6 x 12 (ISO 7380-1)	37	4	41
Bolt M6 x 16 (ISO 7380-1)	28	4	32
Bolt M6 x 20 (ISO 7380-1)	30	4	34
Bolt M6 x 25 (ISO 7380-1)	8	2	10
Bolt M6 x 40 (ISO 7380-1)	16	2	18
Bolt M8 x 16 (ISO 7380-1)	32	6	38
Bolt M8 x 20 (ISO 7380-1)	35	8	43
Bolt M8 x 25 (ISO 7380-1)	12	2	14
Low head bolt M6 x 20 (BN 1206)	4	–	4
Set screw M5 x 25 (DIN 913)	4	–	4
Nuts			
Nut M12 (DIN 439)	4	–	4
Nut M20 x 1.5 (DIN 439)	2	–	2
Self-locking flanged nut M5 (DIN 6926)	8	8	16
Self-locking flanged nut M6 (DIN 6926)	84	10	94
Self-locking flanged nut M8 (DIN 6926)	31	6	37
Self-locking nut M12 (DIN 985)	6	2	8
Self-locking nut M20 (DIN 985)	4	4	8
Washers			
Washer A 5.3 (DIN 125)	8	–	8
Washer A 8.4 (DIN 125)	8	2	10
Washer A 13 (DIN 125)	6	–	6
Washer A 21 (DIN 125)	2	–	2
Spherical washer M12 (DIN 6319 C)	2	–	2
Spherical washer M21 (DIN 6319 C)	4	–	4
Wedge-lock washer M8	12	2	14
Wedge-lock washer M20	2	–	2

Other components			
Assembly fixture	1	–	1
Tension rod head (GISW 12 FLURO)	2	–	2
Piston rod head (PGA KR20 MGK)	2	–	2
Piston rod adapter	2	–	2
O-ring 18 x 2.5	2	–	2
O-ring 30 x 5	2	–	2
O-ring 58 x 7	4	–	4
Height-adjusting vibration isolator (DVA.4-20-8-M6-10-55)	2	–	2
T-slot nut M8	8	2	10
Tension rod support (SK12)	4	–	4
Actuator support (SK20)	4	–	4
Supplied by the meter			
Spiral hose (WSN15 S ERGOM, black)	2 x 1 m	–	2 m
EPDM noise-dampening strip, 6 mm wide, 2 mm thick	5.8 m	–	5.8 m
TOTAL (counted items)	444	72	516

List of **tools** provided for assembly:

Tool	Qty
Ratchet 1/4"	1
Hex key long – 4.0 mm	1
Combination wrench 8 mm	1
Combination wrench 13 mm	1
Combination wrench 19 mm	2
Combination wrench 30 mm	2
Custom piston head wrench	1
Hex bit socket 1/4" – 3 mm	1
Hex bit socket 1/4" – 4 mm	1
Hex bit socket 1/4" – 5 mm	1
Socket 10 mm, 1/4" drive	1
Extension bar 1/4" – 51 mm	1
Assembly gloves, size 8	1
Slider grease, 80 ml	1
Threadlocker 243, 10 ml	1
Grease brush	1
TOTAL	18

List of **assembly components** – shipping box contents:

Component	Qty
BOX 1 – Bottom frame module (sheet 8, 8 items, 8 pcs)	
Rear bumper bracket	1
Front bumper bracket	1
Right side beam	1
Left side beam	1
Left longitudinal beam	1
Right longitudinal beam	1
Right bottom cover	1
Left bottom cover	1
BOX 2 – Top frame module (sheet 9, 14 items, 14 pcs)	
Front reinforcement bracket	1
Right reinforcement beam	1
Left reinforcement beam	1
Slider plates reinforcement bracket	1
Front top frame bumper bracket	1
Crossbeam	1
Rear top frame bumper bracket	1
Tension rod	1
Middle cover plate	1
Right cover plate	1
Left cover plate	1
Front cover plate	1
Front cover connector plate	1
41 mm wrench	1
BOX 3 – Cockpit & actuator parts (sheet 10, 14 items, 42 pcs)	
Aluminum cockpit mounting bracket	4
Foot plate	4
D-BOX™ actuator adapter	4
Foot end	4
Foot cup	4
Actuator module bracket	2
Actuator mounting plate	2
Tension rod spacer – bottom frame	1
Symmetrical corner plate cover	4
Cup mounting plate	4
Cup mounting plate spacer	4

Tension rod spacer – top frame	1
Front slider plate	2
Back slider plate	2
TOTAL (36 items)	64

INFO

The set also includes stickers with the **Qubic System** logo, provided for your own use.

4. ASSEMBLY

WARNING

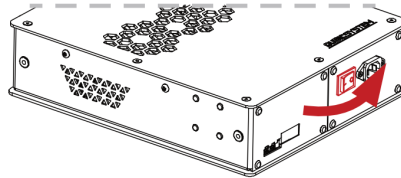
- Assembly of this product requires **basic technical knowledge** and mechanical aptitude. Proper assembly is essential for safe operation and for achieving the intended motion feedback performance.
- The assembly procedure is written in **chronological order**. Changing the sequence of the steps is not recommended and may complicate the assembly process or lead to incorrect installation.
- After completing each section, it is recommended to **review all steps** and verify that no step has been overlooked.
- Proceed with each step only after reading the complete instruction and analyzing the corresponding illustration.

4.1. PRE-INSTALLATION GUIDELINES

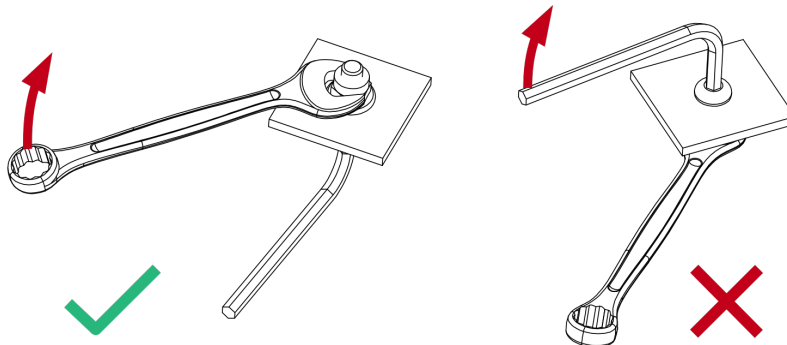
WARNING



- **DO NOT** power on the device at any stage of the assembly unless explicitly instructed to do so.
- Before starting the assembly, make sure that the power switch on the Power Cabinet is in the **OFF** position.



- Good practice is to apply torque on the nut and use the allen key/combination wrench only to hold the bolt in place.



- **DO NOT** reuse self-locking nuts. If a self-locking nut is removed, it must be replaced with a new one before reassembly.
- After completing each assembly, always verify that all fasteners have been tightened correctly and, where specified, to the required torque. With the progression, access to these bolts might become limited.

-
- Clearing at least a 2 by 2 meters of free installation space is recommended before starting the assembly process.
 - Wear protective gear during assembly - gloves are included.
 - Keep the work area clean and uncluttered.
 - If possible, complete the entire assembly in a single session or within a short period of time. Always keep track of completed steps. Perform the assembly in an order compliant with manual (chronological order).

WARNING

Use a small amount of medium strength threadlocker on all mounting bolts that are not screwed in with a self-locking nut (with the exception of cover plates bolts).

Hardware Size Reference

Throughout this manual, all bolts, nuts, and washers are shown in 1:1 scale at the bottom of each page. You can place the corresponding hardware directly over the illustrations to identify and verify the correct size without measuring. For the reference to be accurate, the manual must be printed on A4 paper at 100% scale.

A compiled list of used hardware in 1:1 scale is also printed and included with QS-TP1 separately.

Symbols used in this manual

Throughout this manual, symbols are used to indicate actions that are required or prohibited. The meaning of each symbol is explained below:



This step requires the use of included threadlocker.



Do not use the threadlocker in this step.



Torque the bolts/nuts to specification.



Leave the bolts/nuts loose. They will be torqued later.

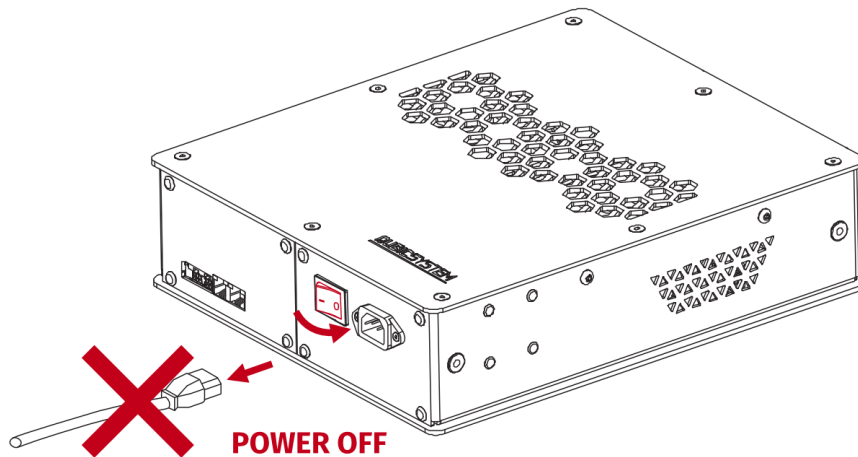
Bolt tightening torque values

Bolt	Size	Torque [Nm]	Torque [ft-lbs]
DIN 912	M5	7 Nm	5.2 ft-lbs
DIN 931-1	M12	35 Nm	26 ft-lbs
DIN 931-1	M20	100 Nm	73.8 ft-lbs
DIN 933	M12	35* Nm	26* ft-lbs
ISO 7380-1	M6	9.5 Nm	7.0 ft-lbs
ISO 7380-1	M8	23 Nm	17.0 ft-lbs
BN 1206	M6	7 Nm	5.2 ft-lbs

*For temporary bolting the tension rod to the rear bumper - 15 Nm (11 ft-lbs).

WARNING

The Power Cabinet must be switched **OFF** and disconnected from the power supply throughout the entire assembly process. **DO NOT** switch it on or reconnect it at any stage unless explicitly instructed to do so.



Video tutorials

We have prepared video recordings demonstrating the potentially most challenging stages of the machine assembly. Scan the QR code or enter the address in your web browser to access the YouTube playlist.

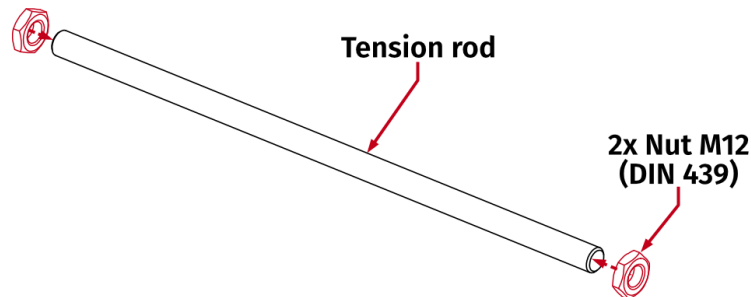


qubicsystem.com/uqstp1video

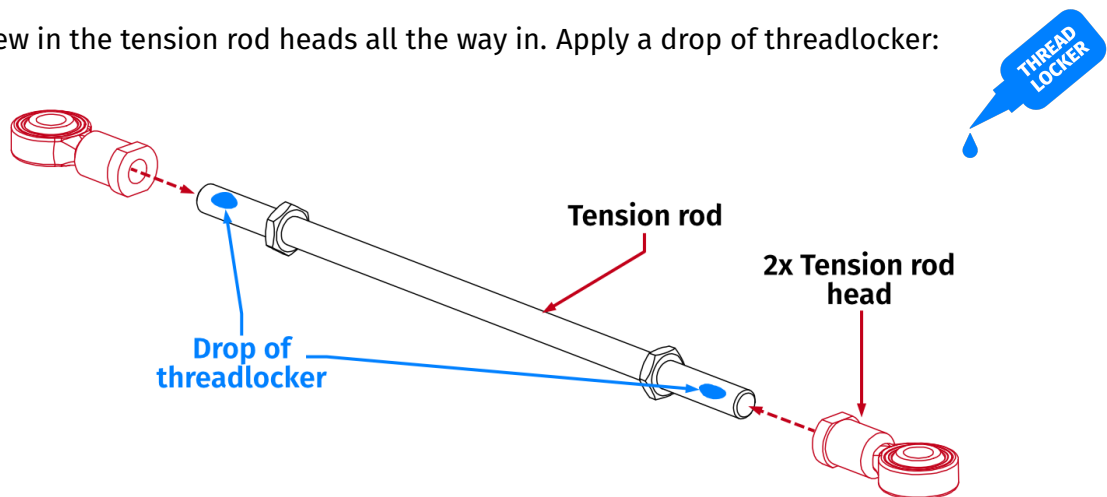
4.2. BOTTOM FRAME ASSEMBLY

1. Assembly procedure starts from assembling a tension rod.

a) Screw in the nuts onto the threaded bolt:



b) Screw in the tension rod heads all the way in. Apply a drop of threadlocker:

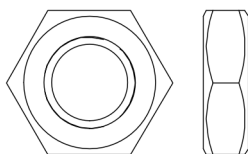


INFO

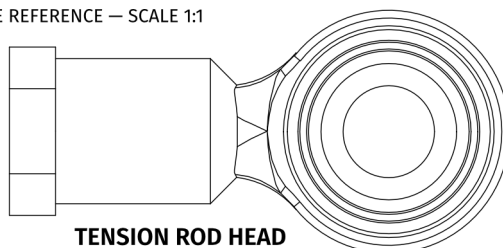
Medium strength threadlocker takes at least 5-10 minutes to start the hardening process. Perform the assembly and length adjustment (next seven steps) continuously.

For practice, it is suggested to assemble it without threadlocker first, then repeat the procedure with threadlocker.

HARDWARE SIZE REFERENCE — SCALE 1:1

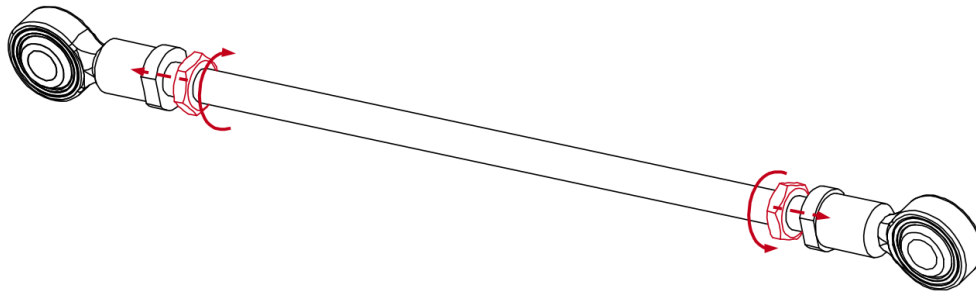


NUT M12 (DIN 439)

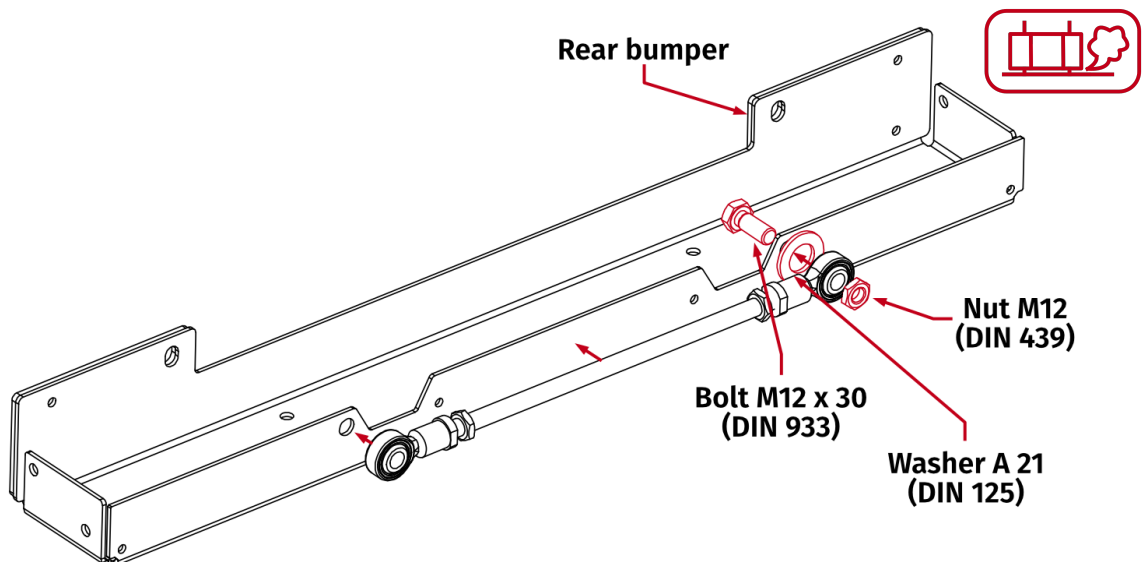


TENSION ROD HEAD

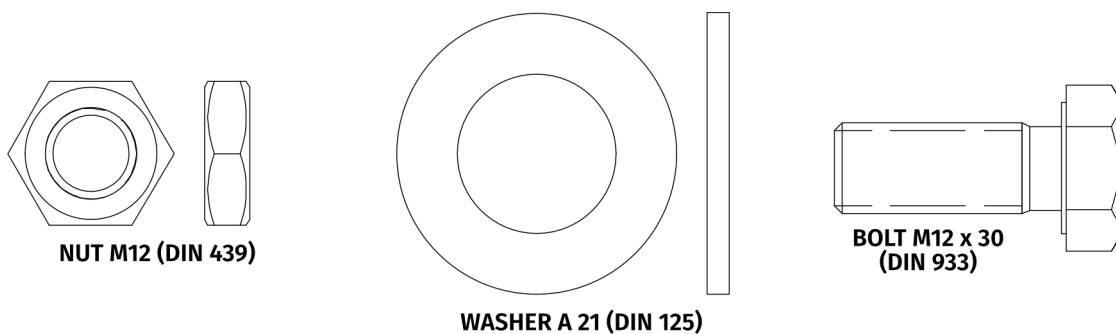
c) Run the nuts up against the rod heads by hand. **DO NOT** lock them against the rod heads yet:



2. Mount the tension rod to the rear bumper bracket. Insert **one** M12 bolt only - hand tight, **DO NOT** torque it down yet.



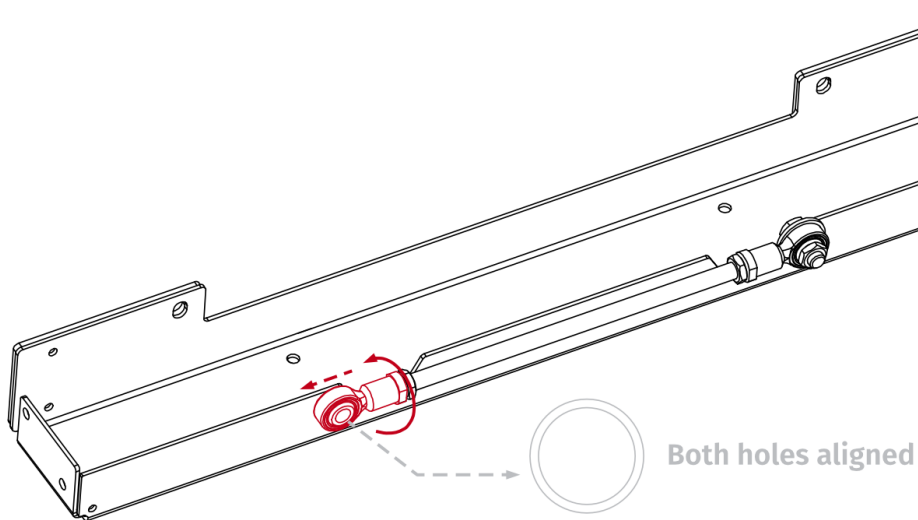
HARDWARE SIZE REFERENCE — SCALE 1:1



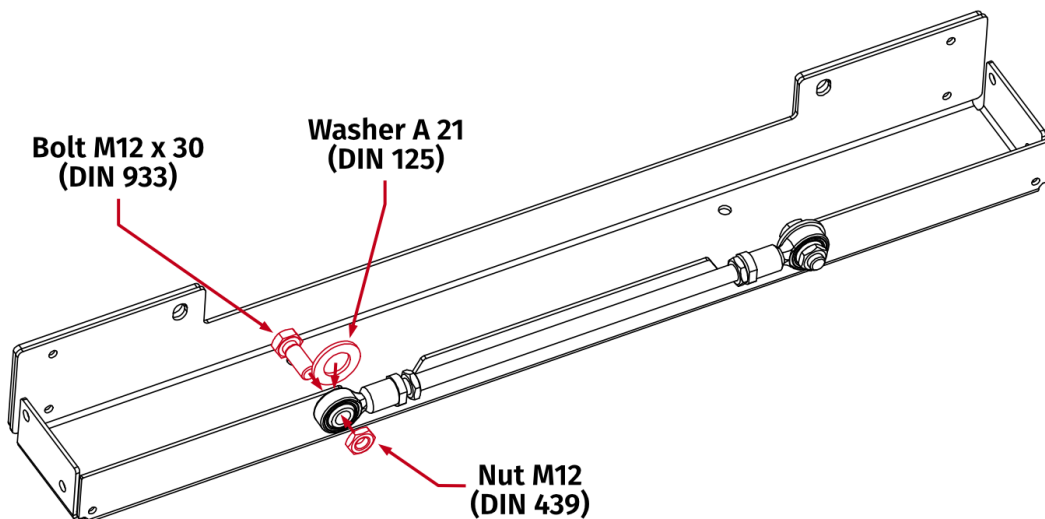
-
3. Adjust the second tension rod head so that its hole aligns with the second reference hole.

WARNING

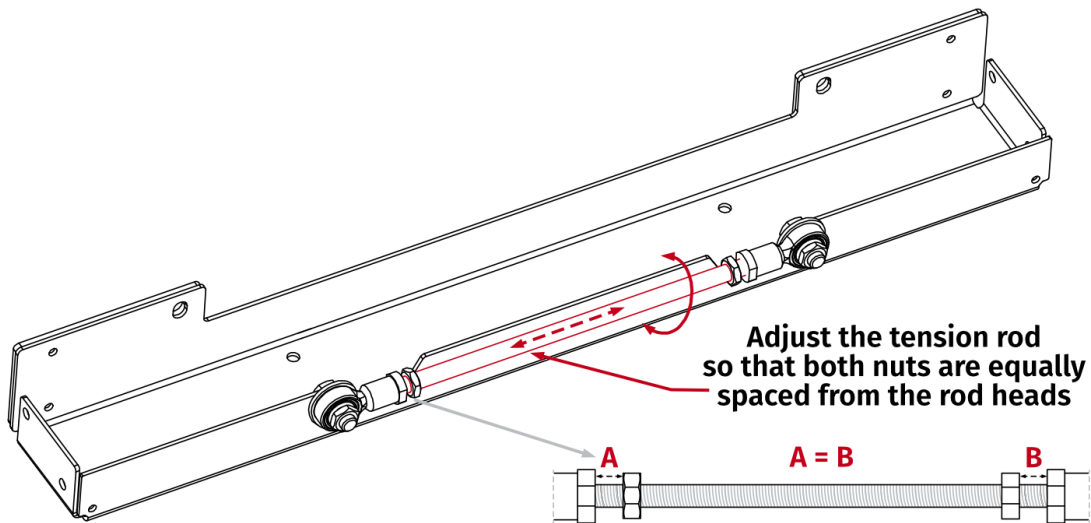
This step is related to machine geometry. Failure to perform this step correctly may result in component collisions.



4. Bolt in the second tension rod head. **DO NOT** torque it down yet.



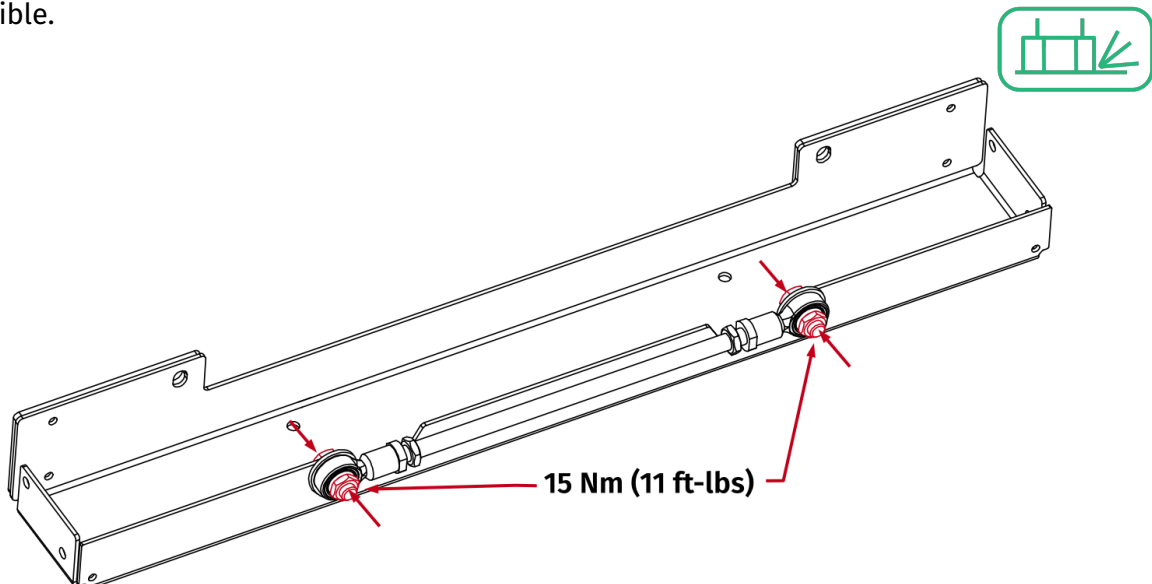
5. Set the length of the tension rod so that **both** rod heads are spaced equally from the nuts - use the nuts as the reference points.



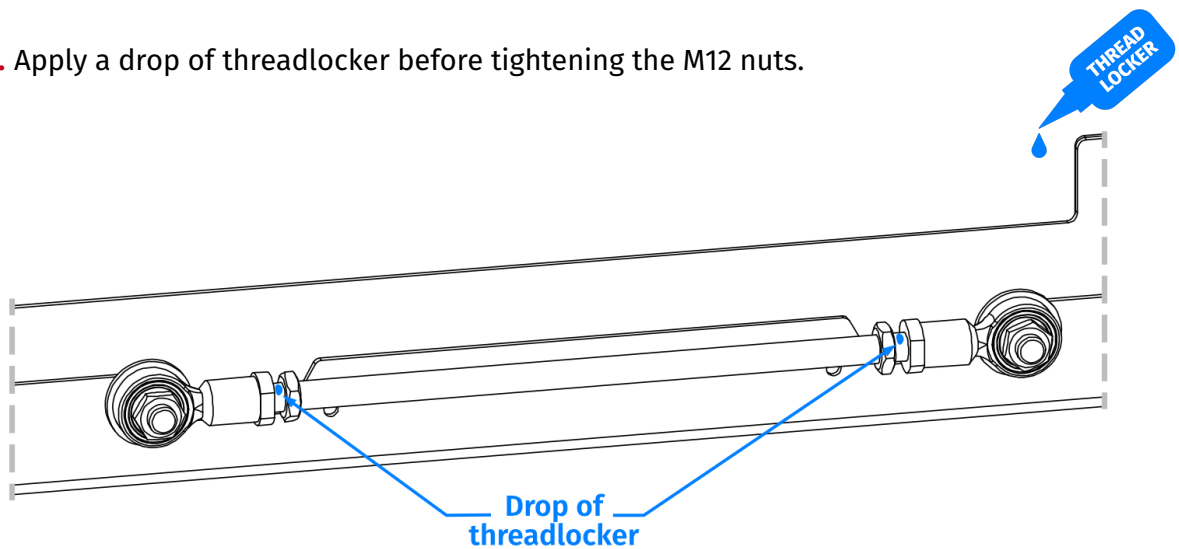
WARNING

Make sure that each of the rod heads is screwed in equally. They **must be** engaged by an equal amount of threads on both sides.

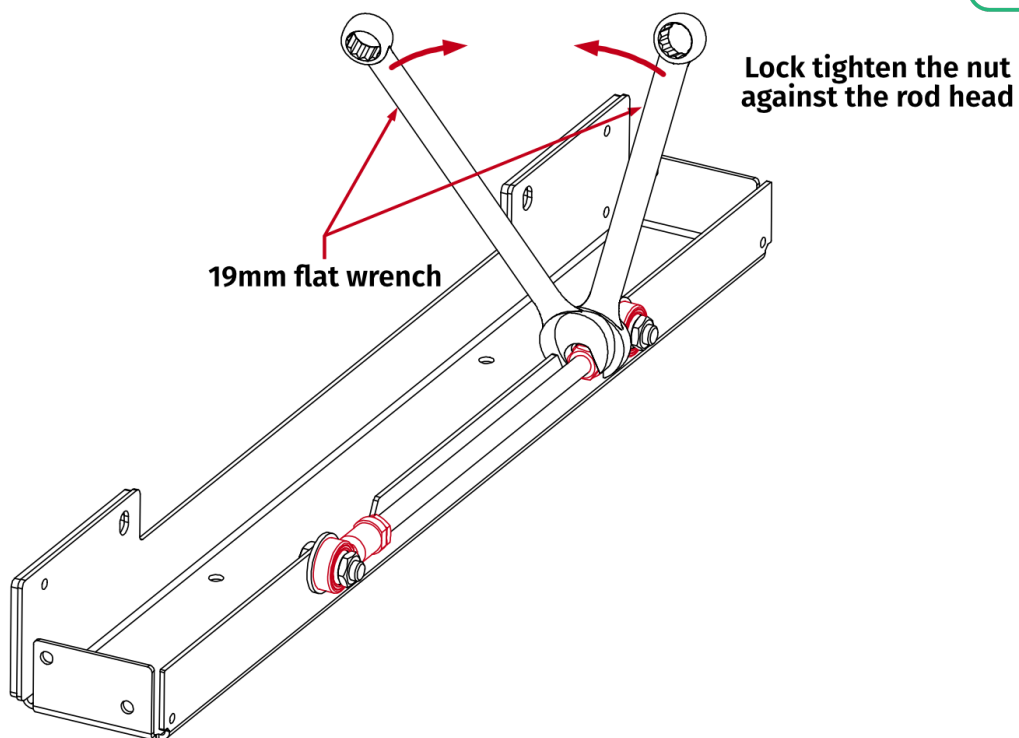
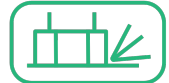
6. Torque both M12 bolts to 15 Nm (11 ft-lbs) - use two 19 mm wrenches.
Note: any marks left by the washers will be covered by the slider plates and will not be visible.



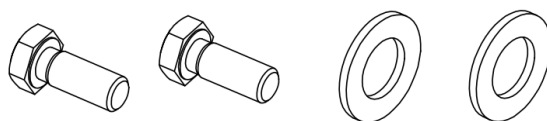
7. Apply a drop of threadlocker before tightening the M12 nuts.



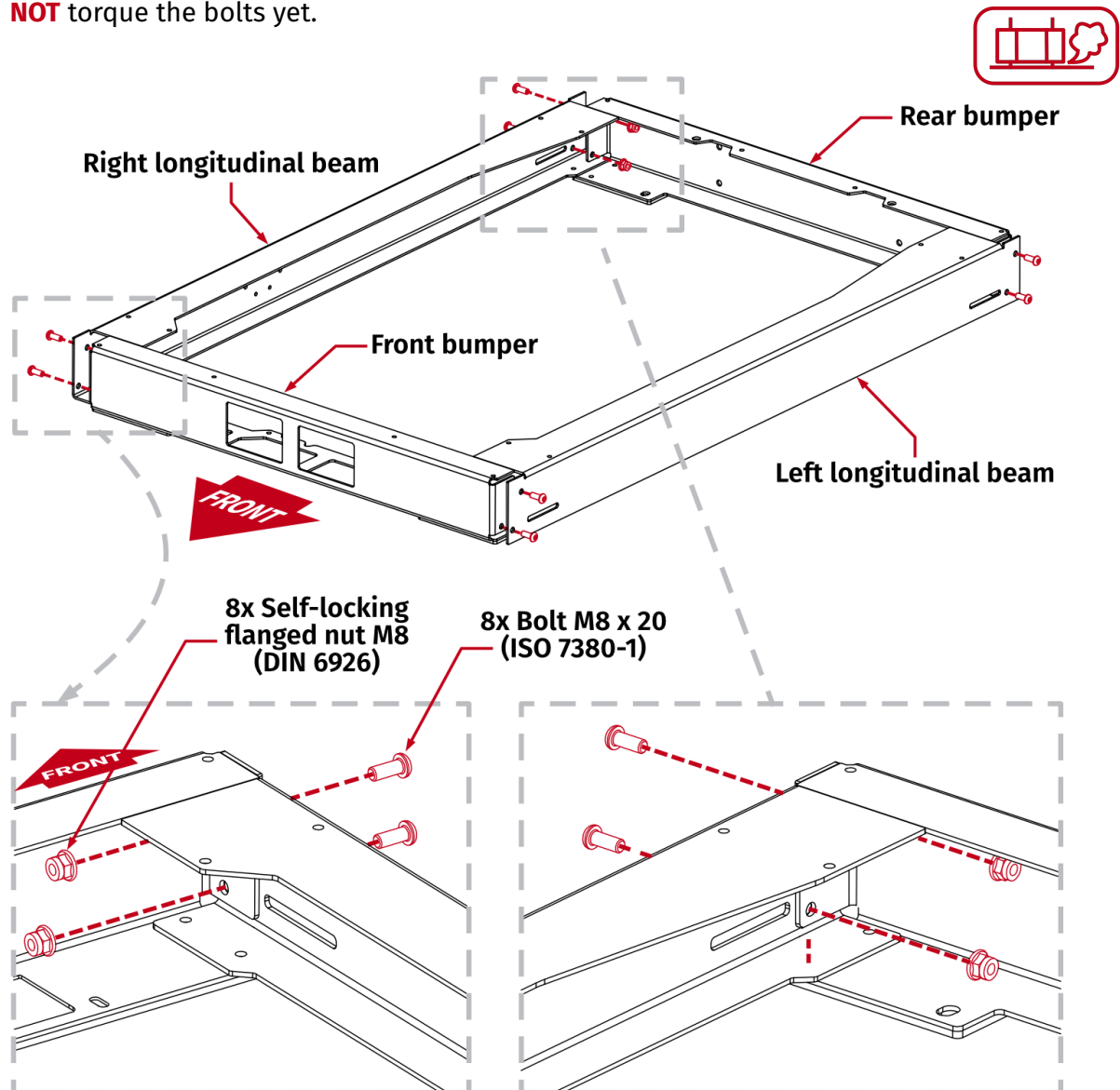
8. Lock **both** nuts against the rod heads using a lot of force. Two 19 mm wrenches will be required - one for the nut and a second one to hold the rod head in place.



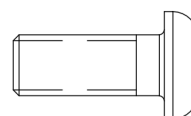
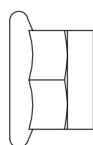
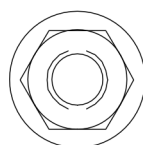
9. Once both rod heads are locked in place perfectly to the size, unscrew the assembly from the rear bumper. Retrieved M12 bolts and washers will be needed later in the assembly.



10. Assemble the frame together - two longitudinal beams, front and rear bumpers. **DO NOT** torque the bolts yet.



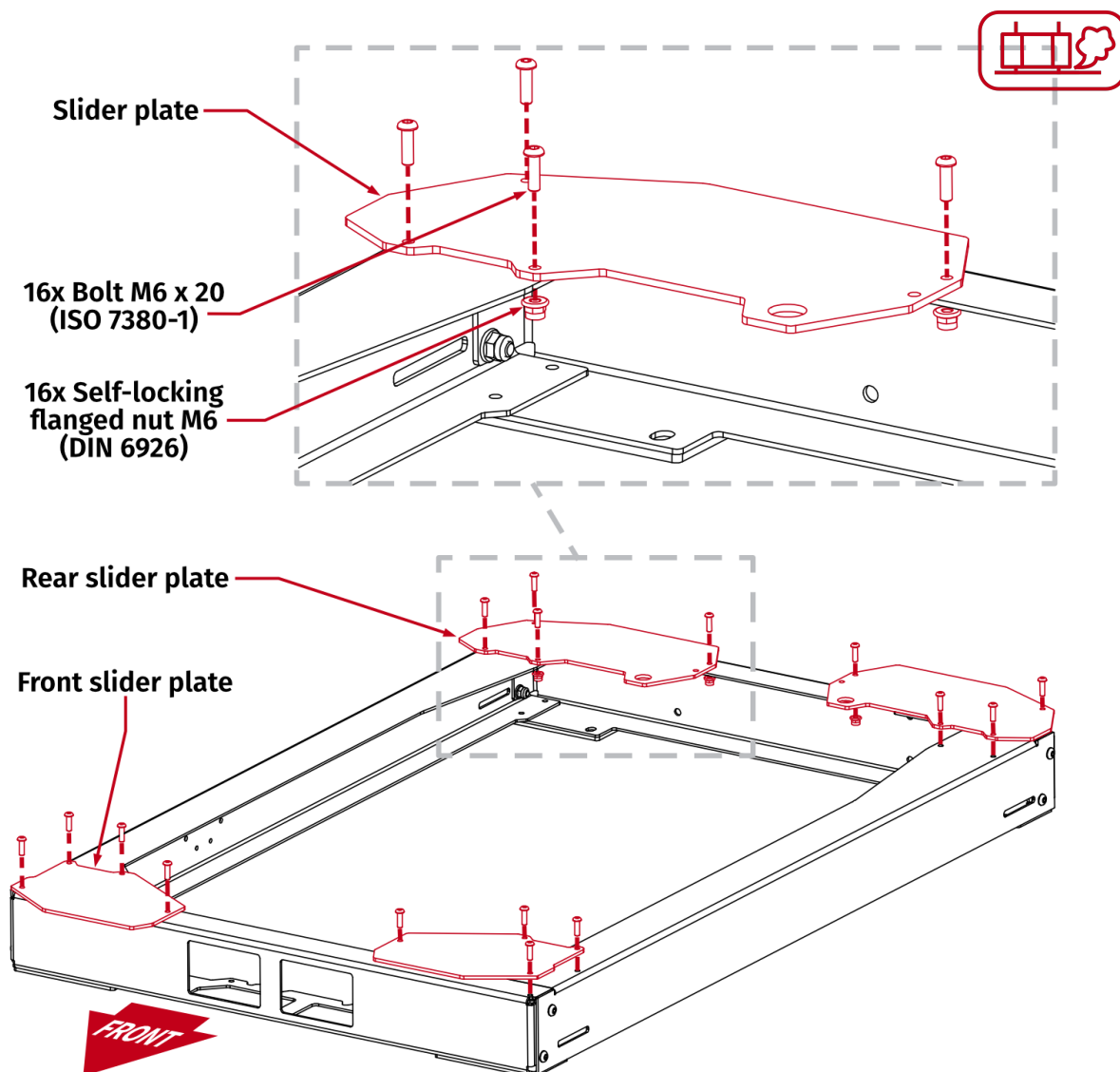
HARDWARE SIZE REFERENCE — SCALE 1:1



SELF-LOCKING FLANGED NUT M8 (DIN 6926)

BOLT M8 x 20 (ISO 7380-1)

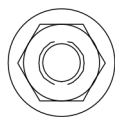
11. Mount the slider plates on top of the bottom frame. **DO NOT** torque the bolts yet.



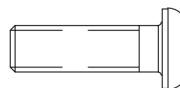
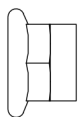
INFO

The slider plates may have residual manufacturing marks, such as printed markings. The two pairs of plates are mirror images of each other. Install them with any imperfections facing down.

HARDWARE SIZE REFERENCE — SCALE 1:1



SELF-LOCKING FLANGED NUT M6 (DIN 6926)



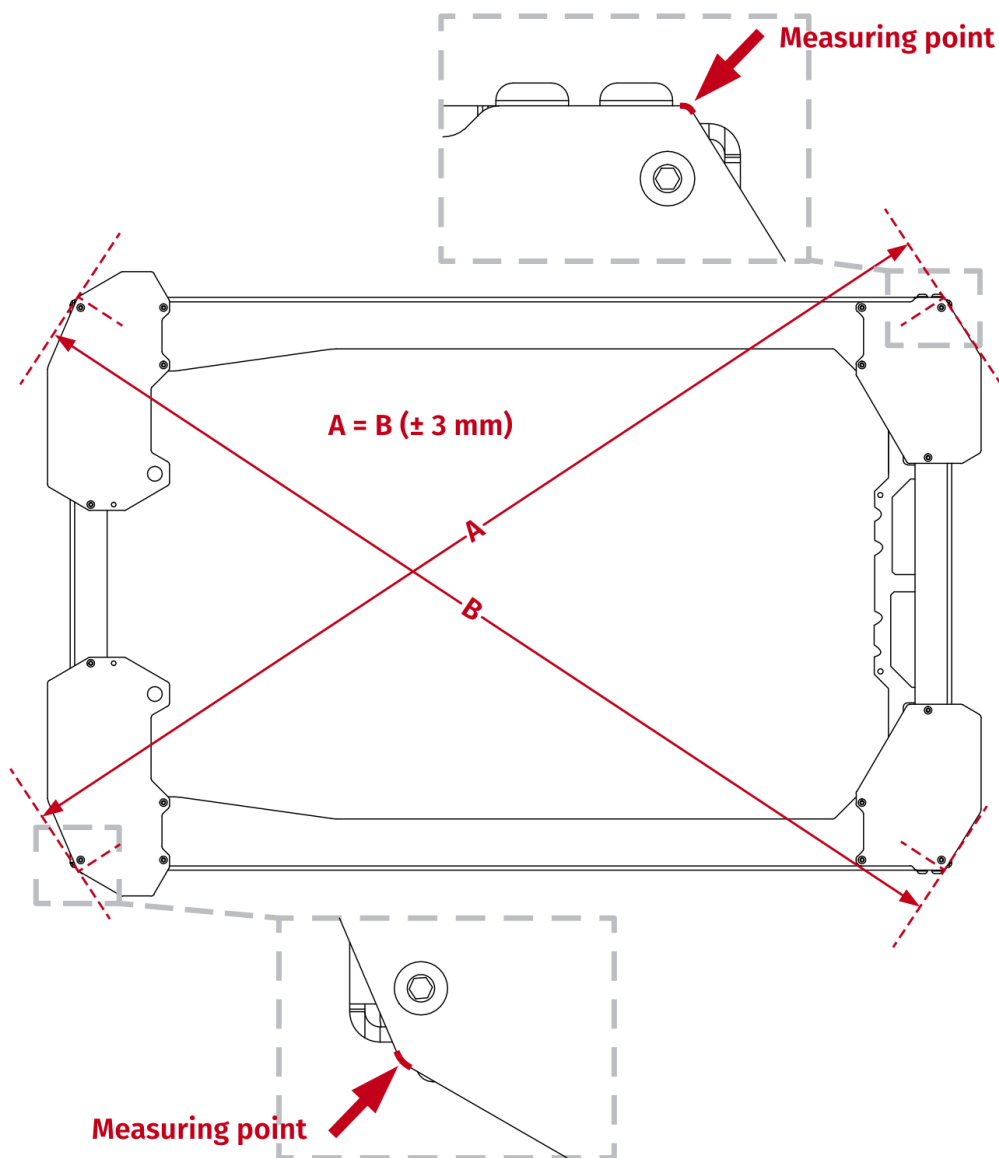
BOLT M6 x 20 (ISO 7380-1)

WARNING

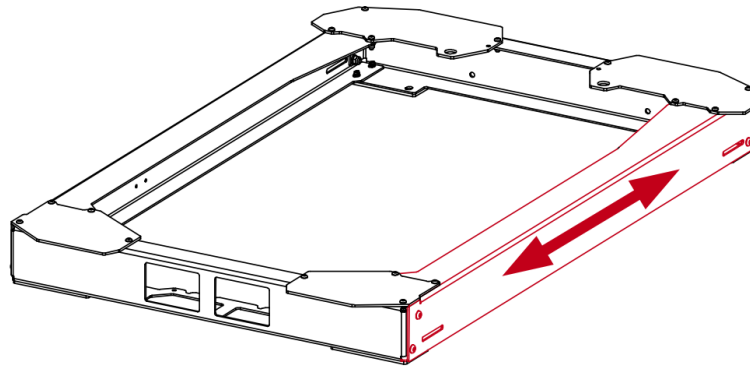
This step is related to machine geometry. Failure to perform this step correctly may result in component collisions.

12. Check the dimensions of the frame's diagonals.

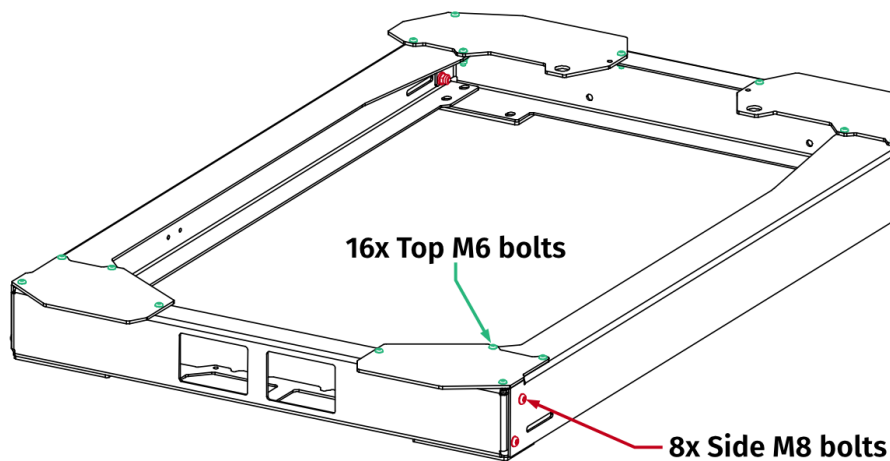
a) Measure the diagonals as shown in the illustration below, with both A and B measured between the same corresponding points. The difference between A and B must be as small as possible, with a maximum tolerance of **3 mm**.



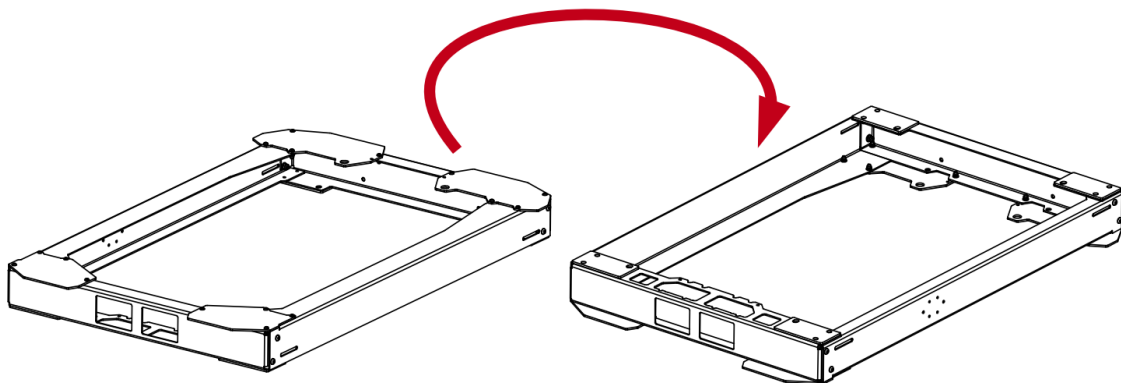
b) If one of the dimensions is too large, grab the side (longitudinal) beam and move it back and forth. Check the dimensions of the diagonals again. Repeat until the result is achieved.



c) When the A and B dimensions are within tolerance to each other - tighten the bottom frame bolts to specification. First, torque **M6 bolts** evenly (top bolts only) to 9.5 Nm - 7 ft-lbs. Then proceed to the **M8 bolts** (side bolts) - 23 Nm - 17 ft-lbs. Check the dimensions of the frame's diagonal again.

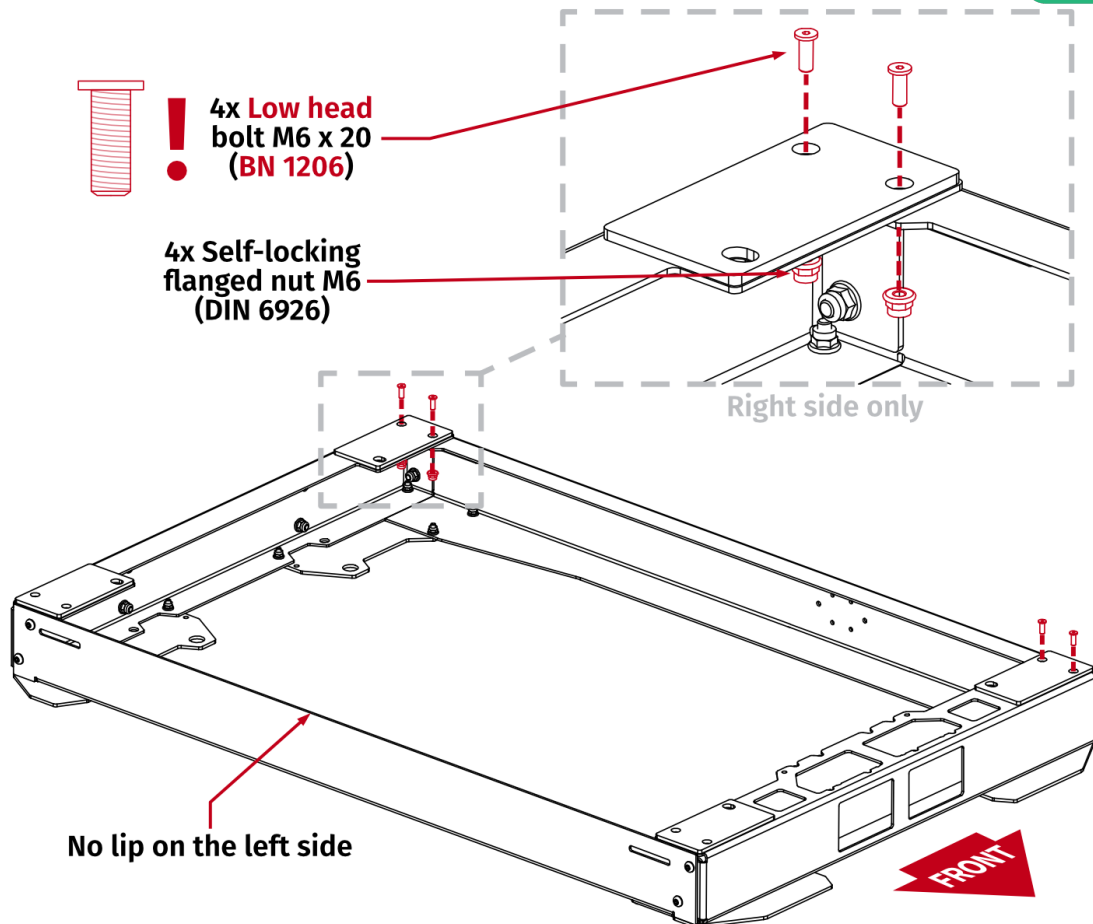
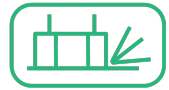


13. For easier assembly, it is recommended to turn the frame upside down.



14. Bolt the right longitudinal beam using the bottom countersunk holes and special **low head bolts - BN 1206**. Torque them down - 7 Nm (5.2 ft-lbs).

Notice that the lip is present on right side only. The holes on the opposite side are not used for machine assembly.



HARDWARE SIZE REFERENCE — SCALE 1:1

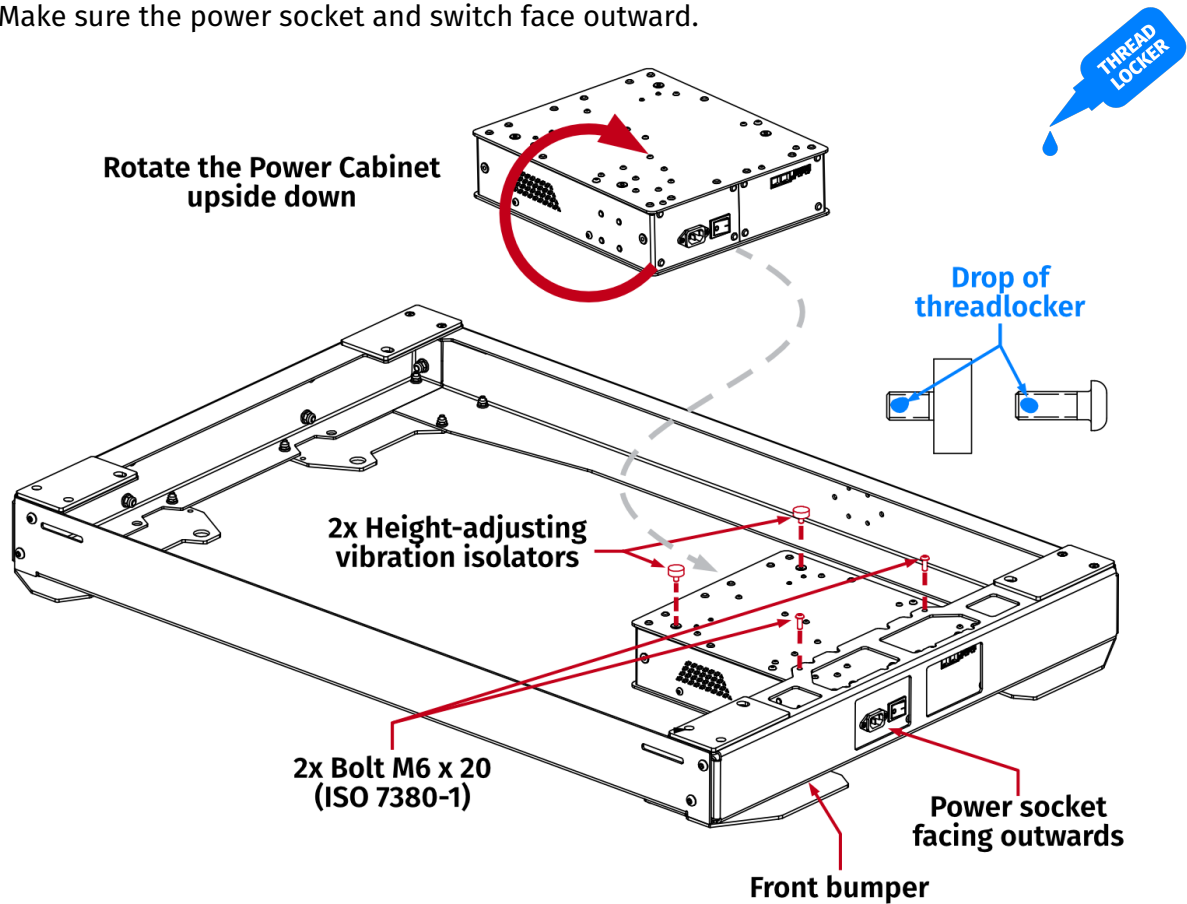


SELF-LOCKING FLANGED NUT M6 (DIN 6926)

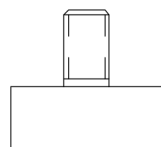


BOLT M6 x 20 (BN 1206)

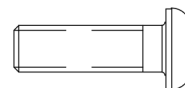
- 15.** Rotate the Power Cabinet upside down and mount it to the front bumper bracket. Apply a drop of threadlocker to each bolt. Fully screw in the height-adjusting vibration isolators for the default setup. Make sure the power socket and switch face outward.



HARDWARE SIZE REFERENCE — SCALE 1:1

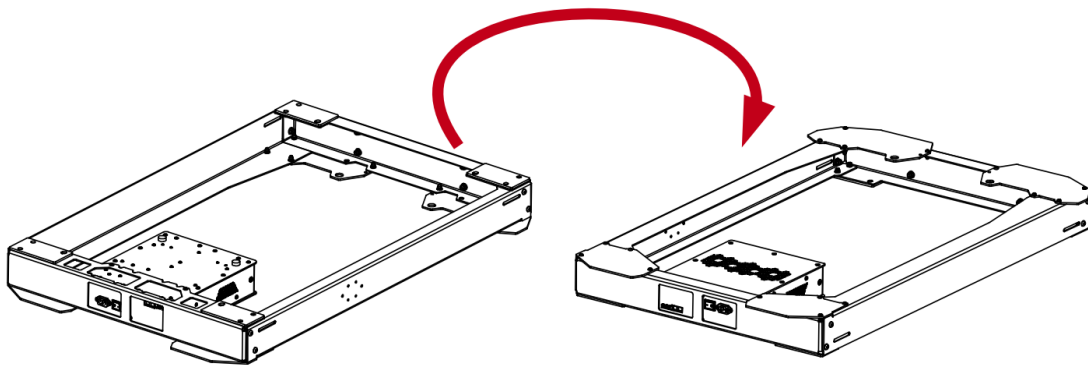


HEIGHT-ADJUSTING VIBRATION ISOLATOR



BOLT M6 x 20 (ISO 7380-1)

- 16.** Return the frame to its original orientation. It is recommended to check the diagonals of the frame again.



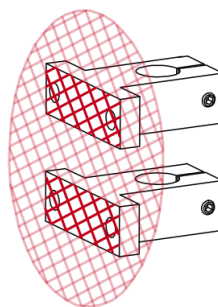
TIP

At this stage, it is recommended to move the bottom frame to its final location and anchor it to the ground.

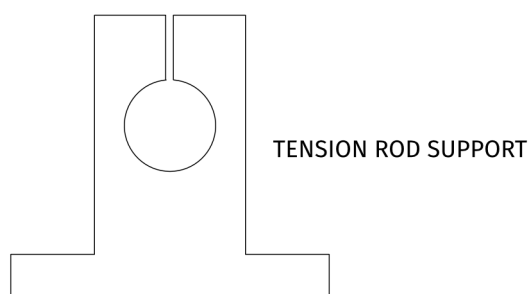
After the last step was completed, the assembly weighs 24.5 kg (54 lbs), but it will become considerably heavier and the installed actuators will make handling the machine more difficult. Refer to section **2.9** on page **13** for anchoring details.

- 17.** Assemble a tension rod (from the very first step of the assembly) with tension rod supports:

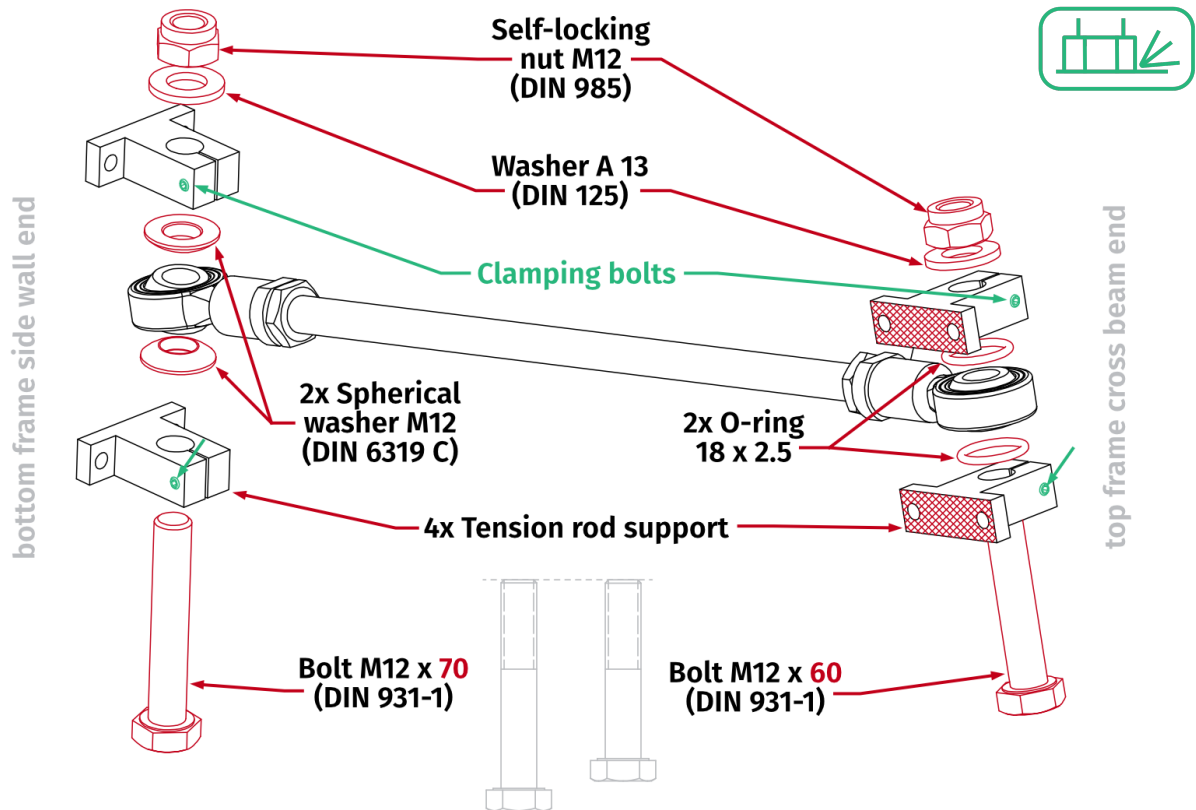
- a)** Assemble all components as shown in the illustration, but do not torque the bolts yet. Notice that the tension rod is assembled using different hardware on each end.
- b)** Ensure to line up the tension rod supports as illustrated before torquing down M12 bolts.



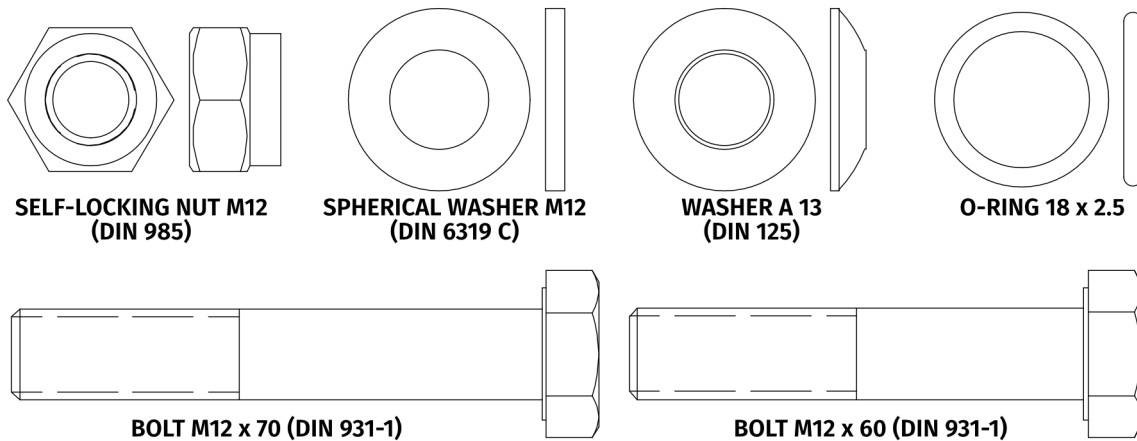
HARDWARE SIZE REFERENCE — SCALE 1:1



- c) Torque both M12 bolts to 35 Nm (26 ft-lbs). This step requires two 19 mm wrenches.
- d) Screw down the **clamping bolts** on tension rod supports to 2.5 Nm (1.8 ft-lbs).

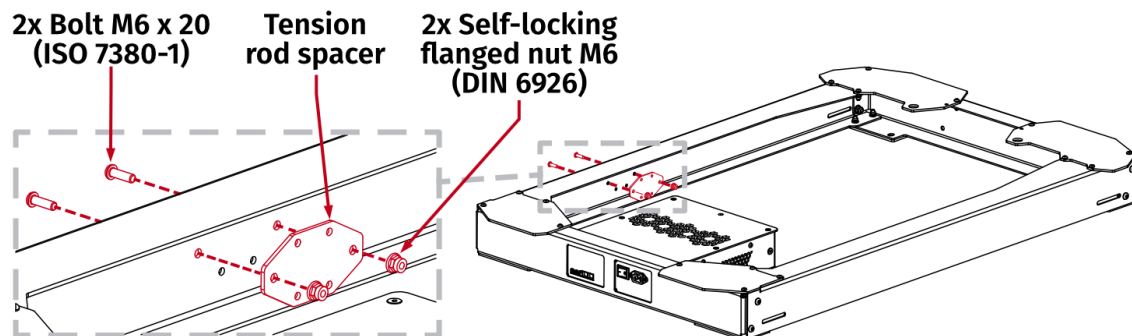


HARDWARE SIZE REFERENCE — SCALE 1:1

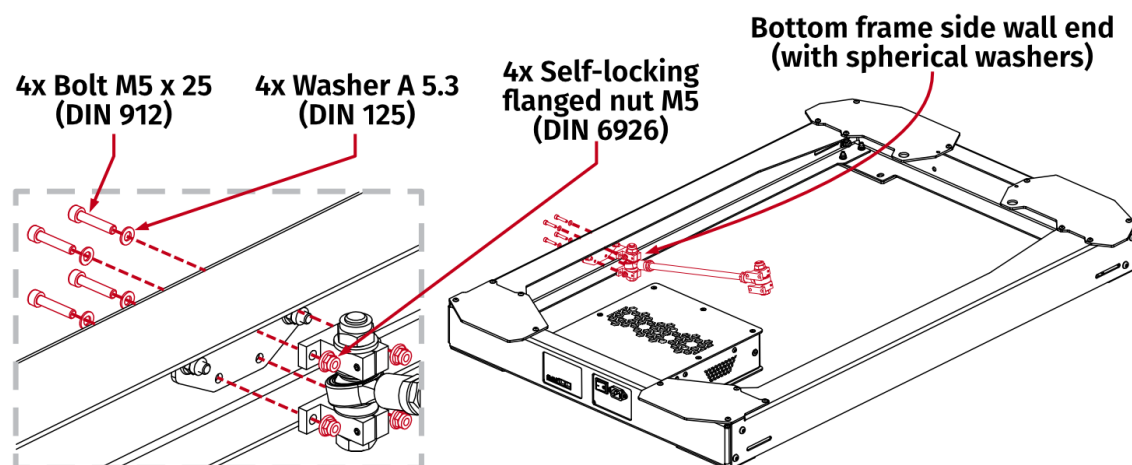


18. Mount the tension rod to the bottom frame side wall.

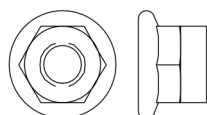
a) Install a tension rod spacer. **Skipping this step will result in incorrect machine geometry.**



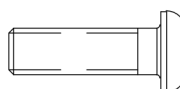
b) Mount the tension rod on top of the spacer plate - the end with spherical washers. **DO NOT** omit the washers.



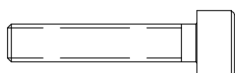
HARDWARE SIZE REFERENCE — SCALE 1:1



SELF-LOCKING FLANGED NUT M6 (DIN 6926)



BOLT M6 x 20 (ISO 7380-1)



BOLT M5 x 25 (DIN 912)



WASHER A 5.3 (DIN 125)

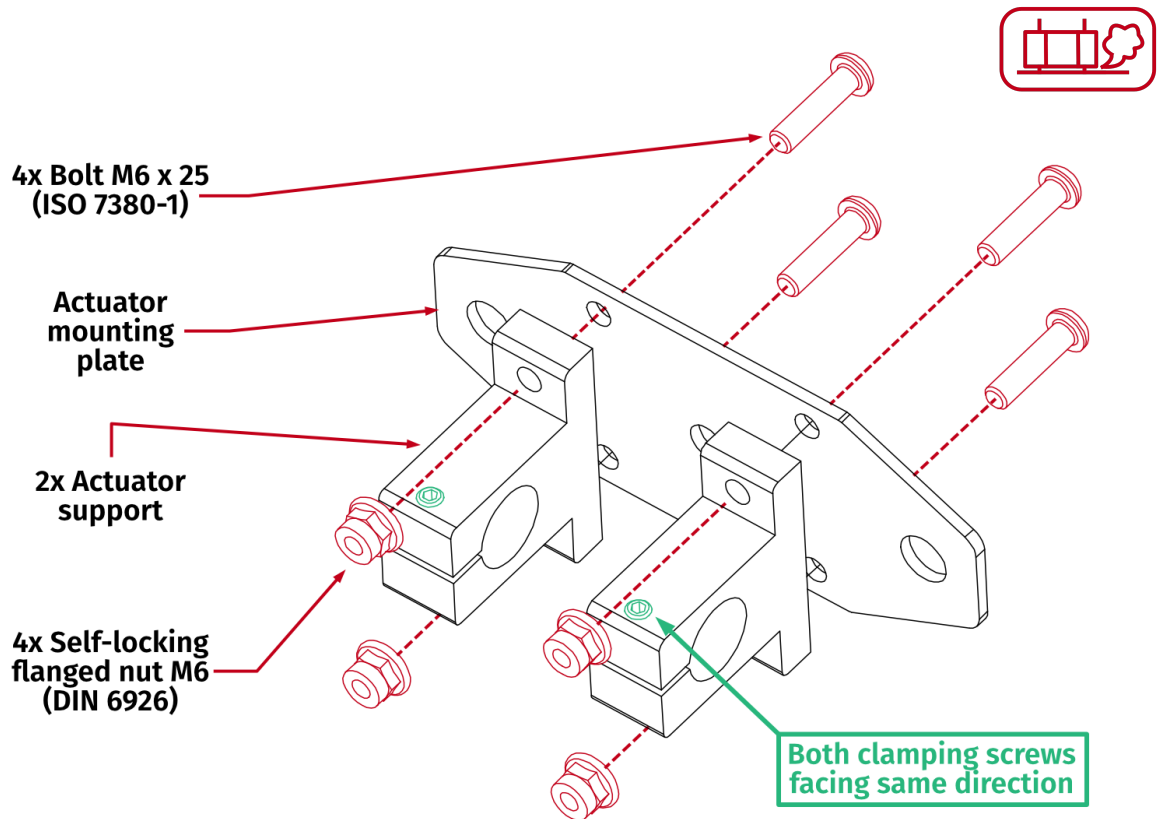


SELF-LOCKING FLANGED NUT M5 (DIN 6926)

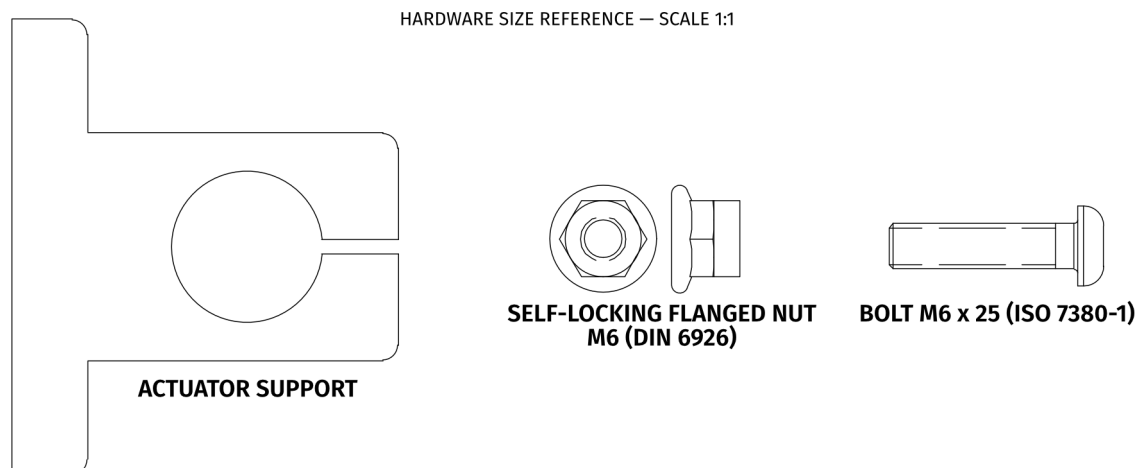
4.3. TOP FRAME ASSEMBLY

Top frame assembly starts with a crossbeam assembly, to which later the actuators are attached.

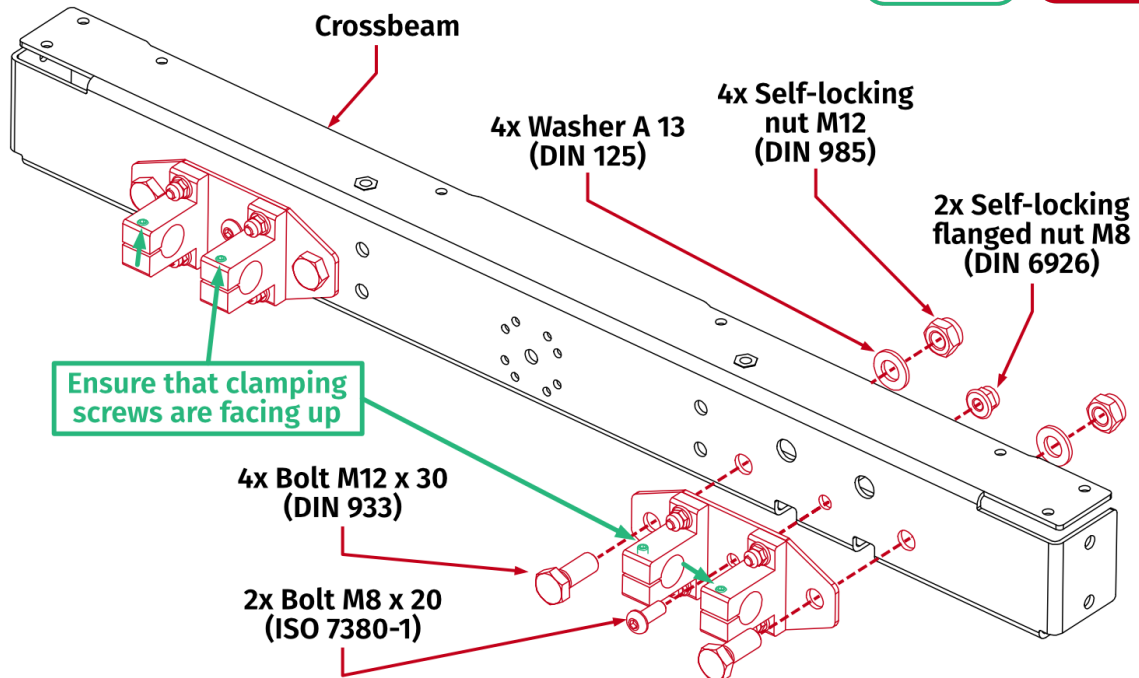
1. Assemble **two** actuator mounting plates and actuator supports together. **DO NOT** torque the M6 screws yet (they will be torqued down once the actuators are attached):



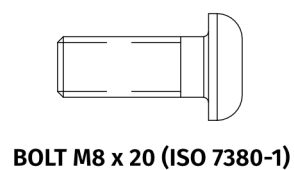
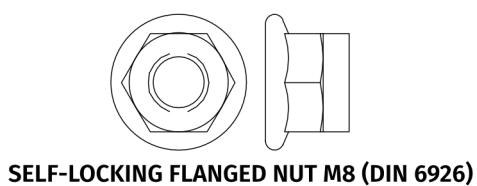
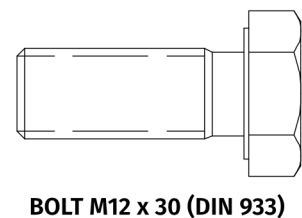
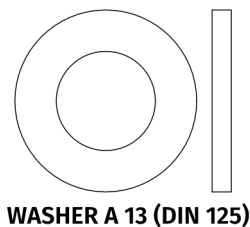
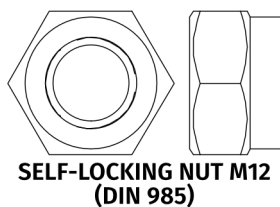
Repeat the process for the other actuator mounting plate.



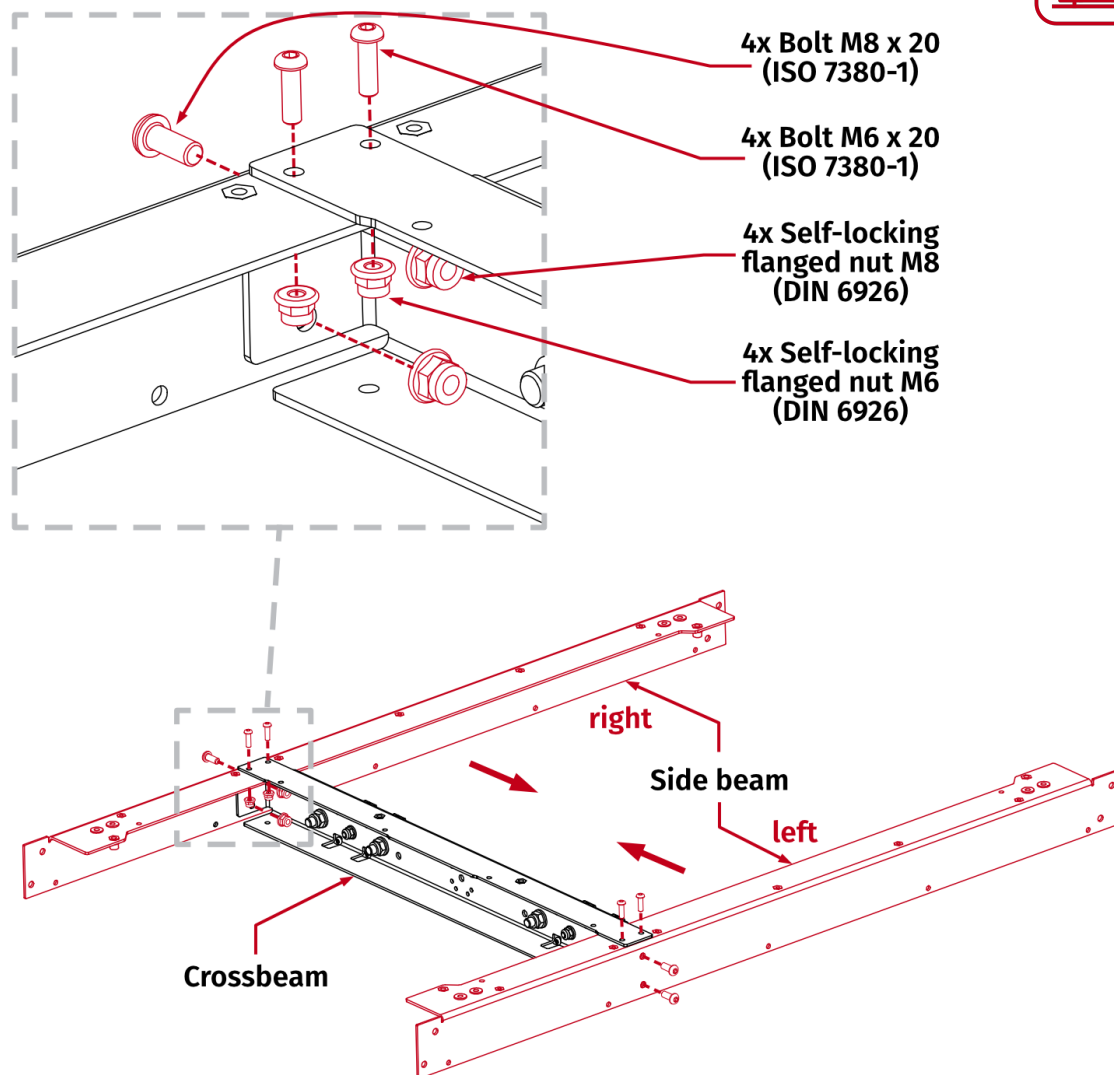
2. Attach the actuator brackets to the crossbeam. Torque M8 (23 Nm - 17 ft-lbs) and M12 (35 Nm - 26 ft-lbs) bolts, still do not torque M6 bolts. For later convenience, ensure that **clamping screws** are facing up:



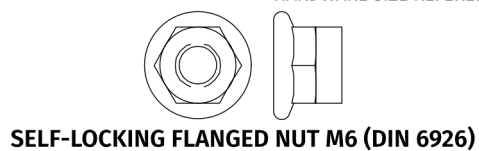
HARDWARE SIZE REFERENCE — SCALE 1:1



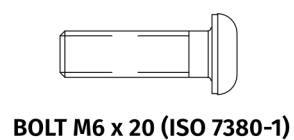
3. Mount the side beams to the actuator supporting crossbeam. **DO NOT** torque the bolts yet.



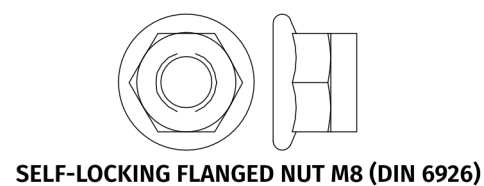
HARDWARE SIZE REFERENCE — SCALE 1:1



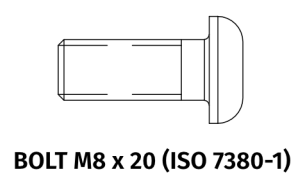
SELF-LOCKING FLANGED NUT M6 (DIN 6926)



BOLT M6 x 20 (ISO 7380-1)

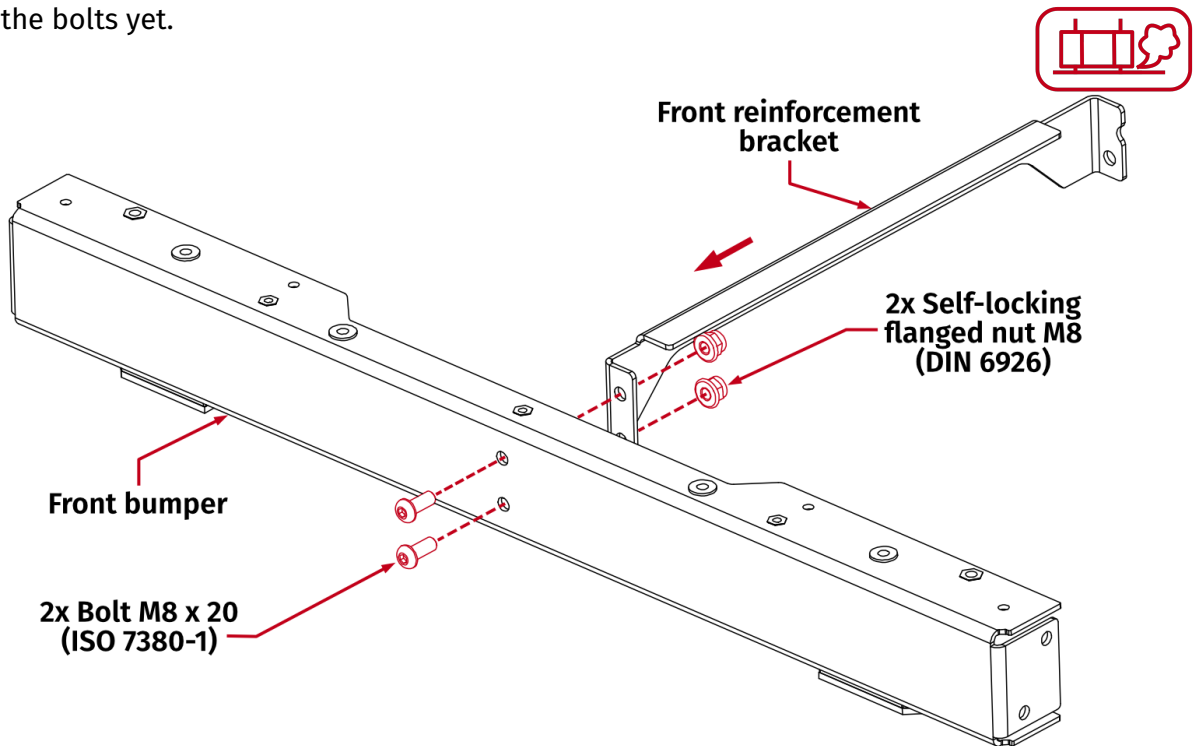


SELF-LOCKING FLANGED NUT M8 (DIN 6926)

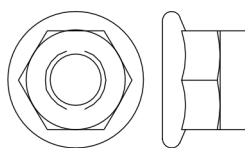


BOLT M8 x 20 (ISO 7380-1)

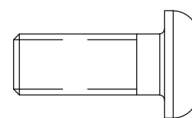
4. Attach the front reinforcement bracket to the front bumper bracket. **DO NOT** torque the bolts yet.



HARDWARE SIZE REFERENCE — SCALE 1:1

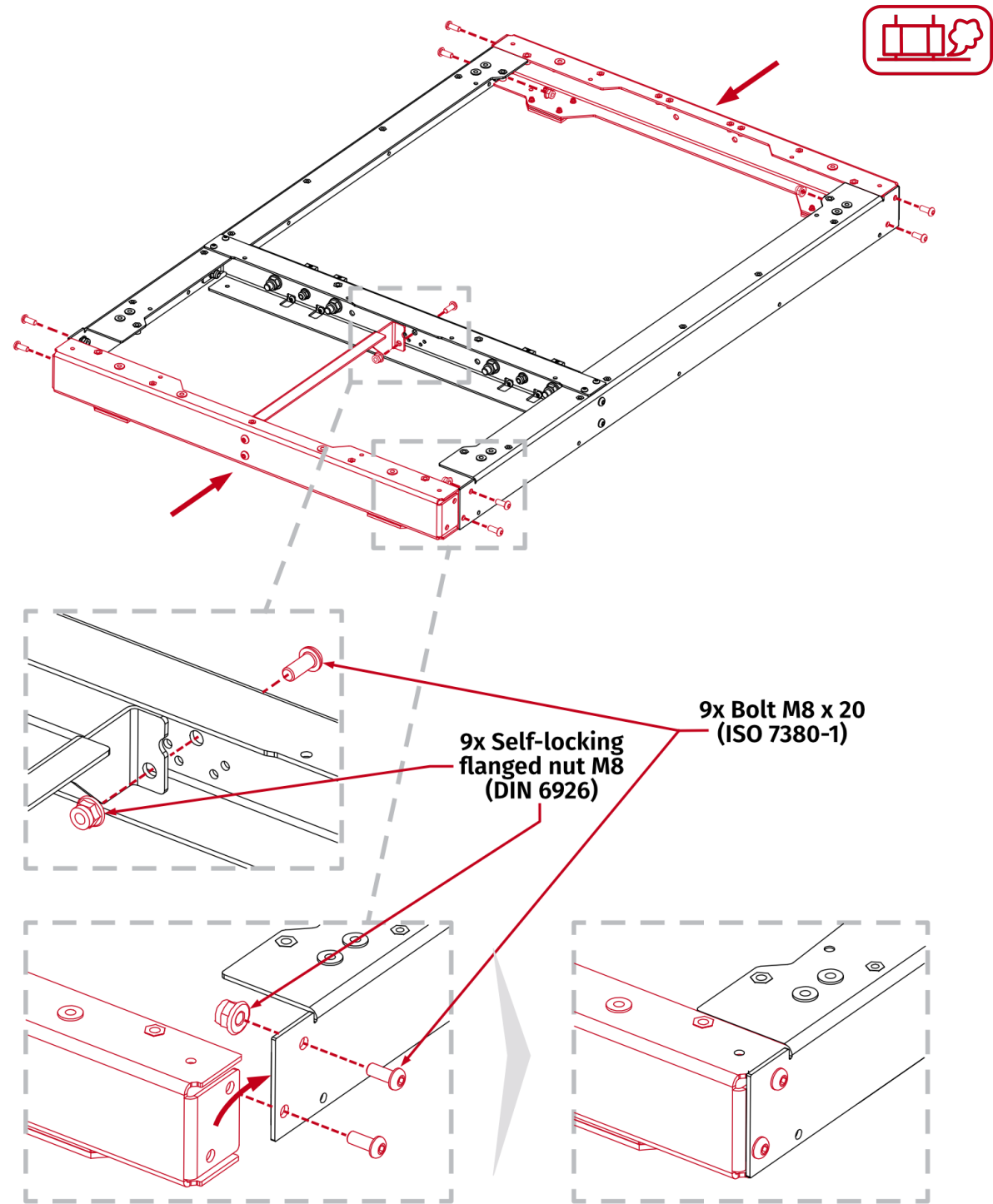


SELF-LOCKING FLANGED NUT M8 (DIN 6926)

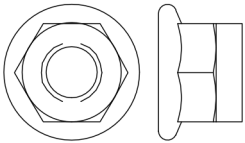


BOLT M8 x 20 (ISO 7380-1)

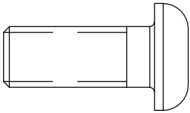
5. Mount the front and rear bumpers to the frame. **DO NOT** torque the bolts yet.



HARDWARE SIZE REFERENCE — SCALE 1:1

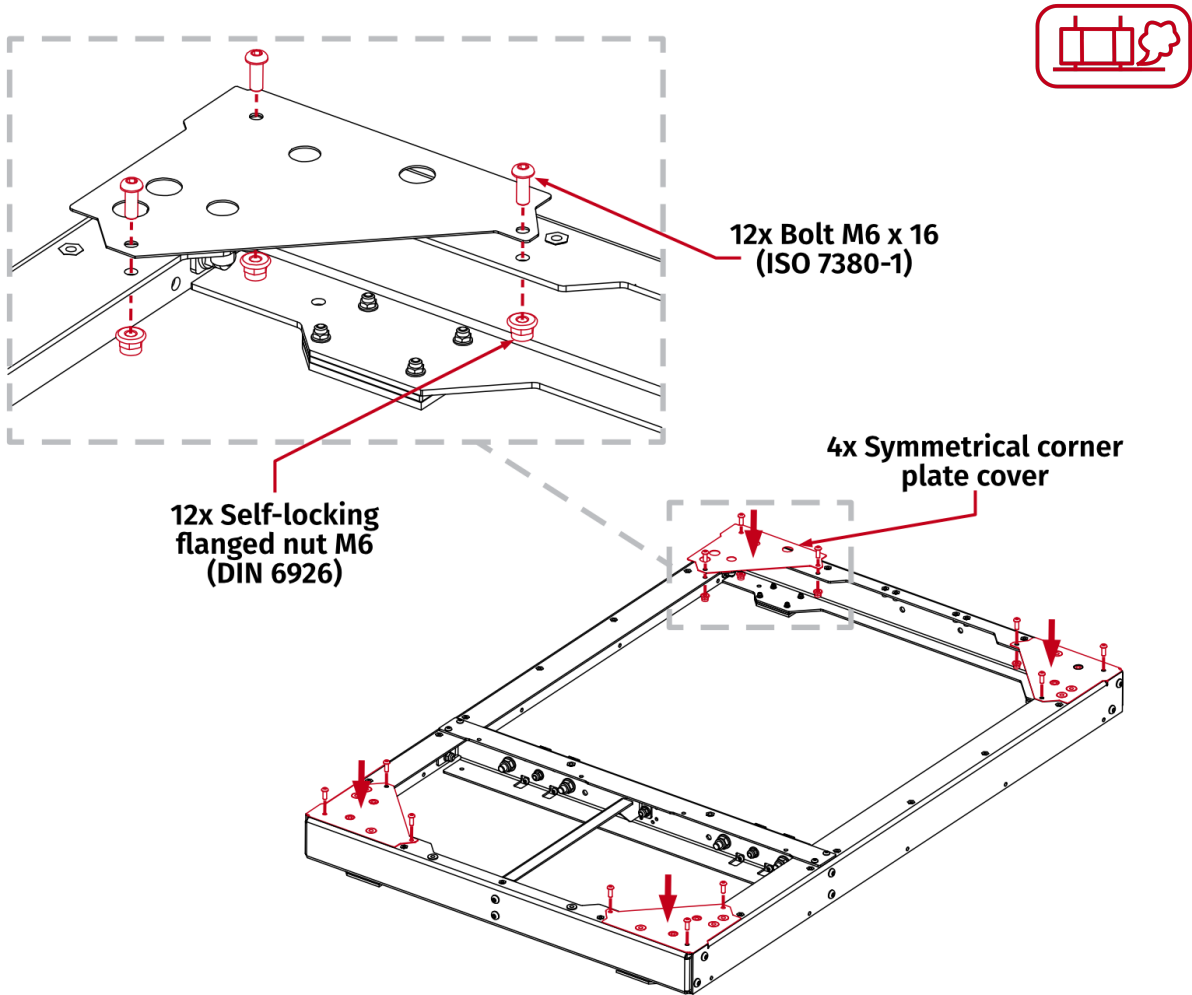


SELF-LOCKING FLANGED NUT M8 (DIN 6926)

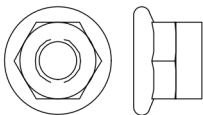


BOLT M8 x 20 (ISO 7380-1)

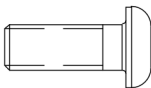
6. Mount the corner plate covers (they are symmetrical). **DO NOT** torque the bolts yet.



HARDWARE SIZE REFERENCE — SCALE 1:1



SELF-LOCKING FLANGED NUT M6 (DIN 6926)



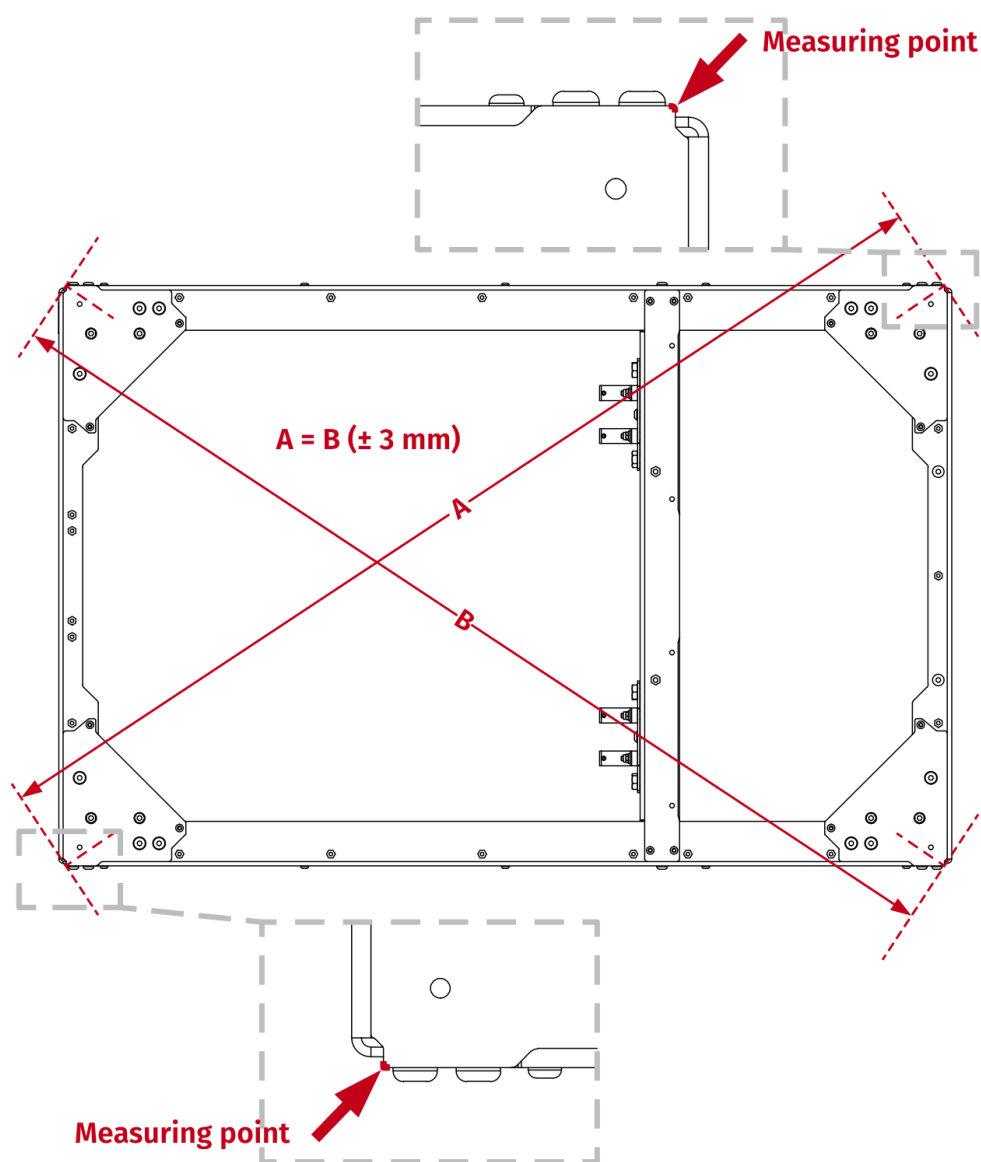
BOLT M6 x 16 (ISO 7380-1)

WARNING

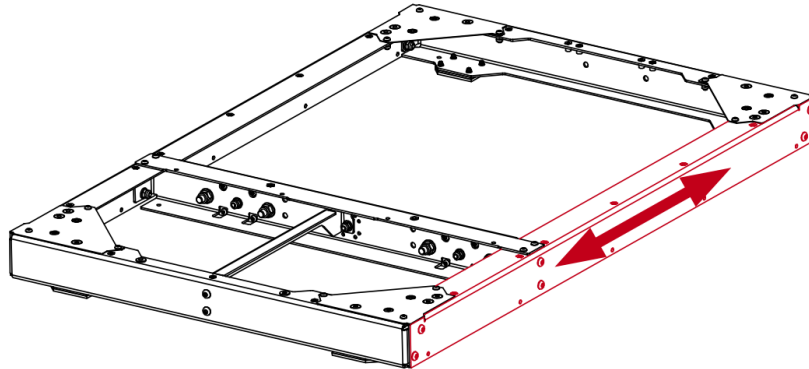
This step is related to machine geometry. Failure to perform this step correctly may result in component collisions.

7. Check the dimensions of the frame's diagonals.

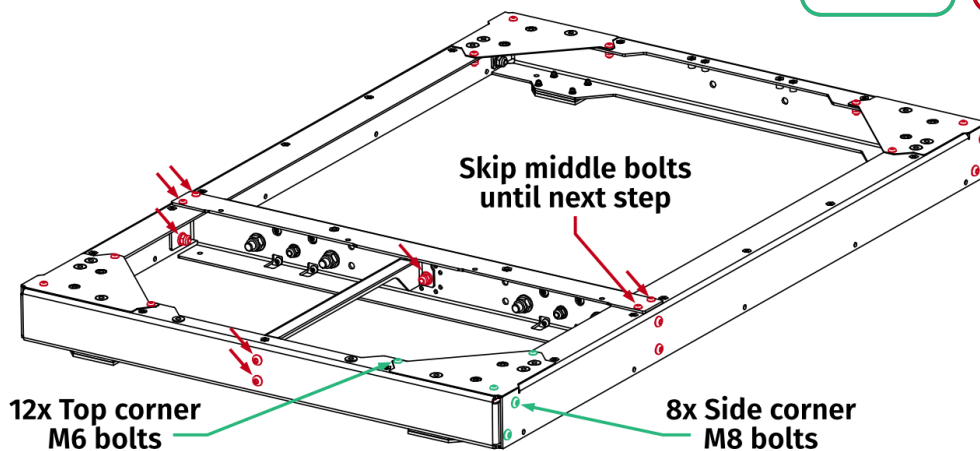
a) Measure them as per the illustration below, with both A and B at the same corresponding points. The difference between A and B must be as small as possible, with a maximum tolerance of **3 mm**.



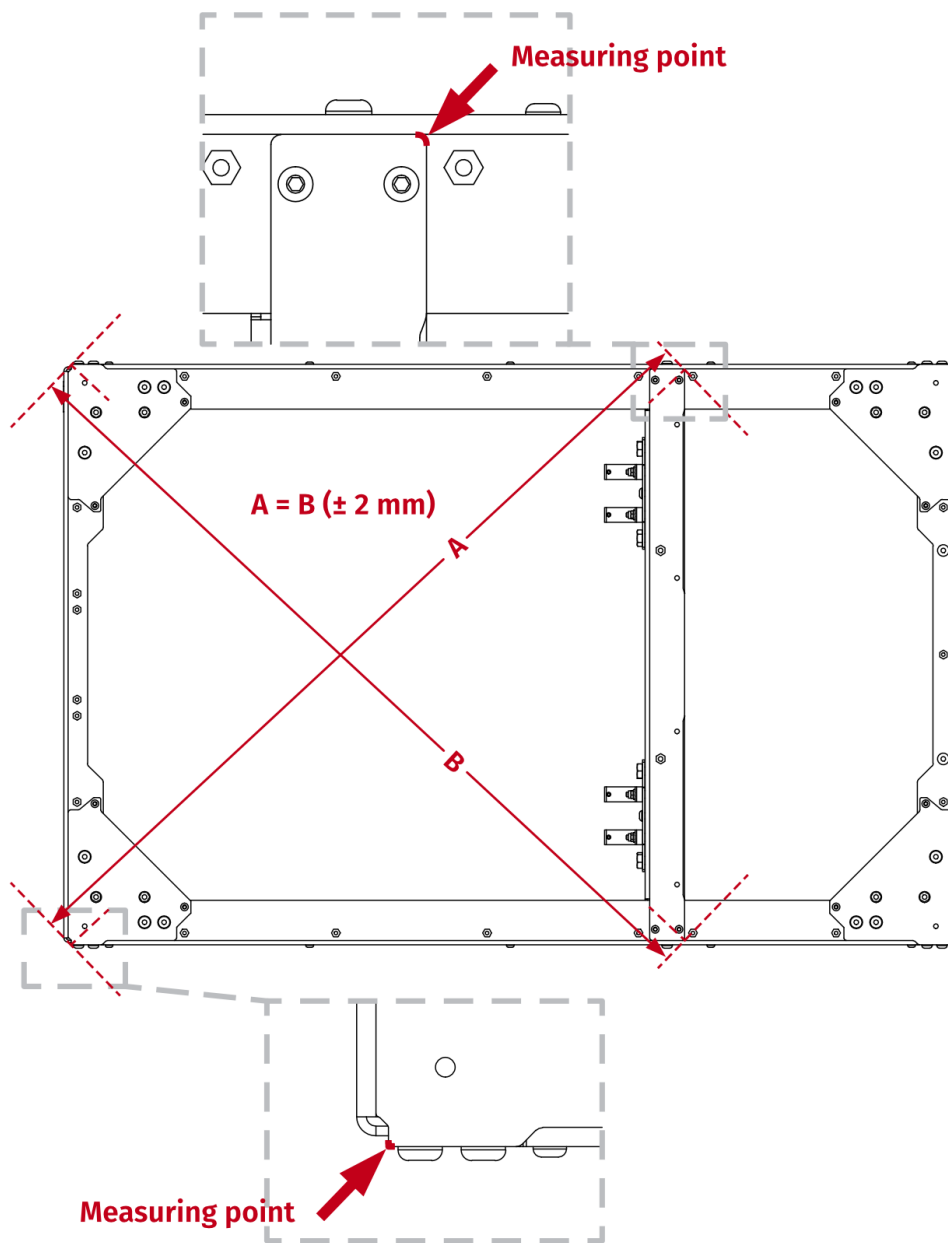
b) If one of the dimensions is too large, grab the side (longitudinal) beam and move it back and forth. Check the dimensions of the diagonals again. Repeat until the result is achieved.



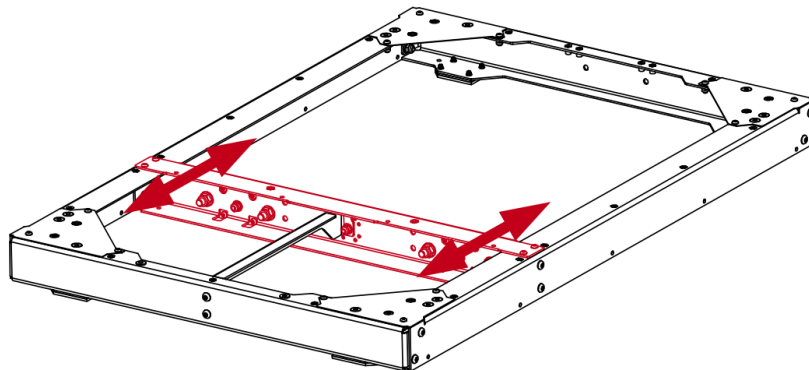
c) When the A and B dimensions are within tolerance to each other - tighten the outer frame bolts to specification. First, torque top corner M6 bolts evenly (9.5 Nm - 7 ft-lbs). Then proceed to the side M8 bolts (23Nm - 17 ft-lbs). Check the dimensions of the frame's diagonal again. **DO NOT** torque bolts from middle parts of the frame, as shown in the picture below.



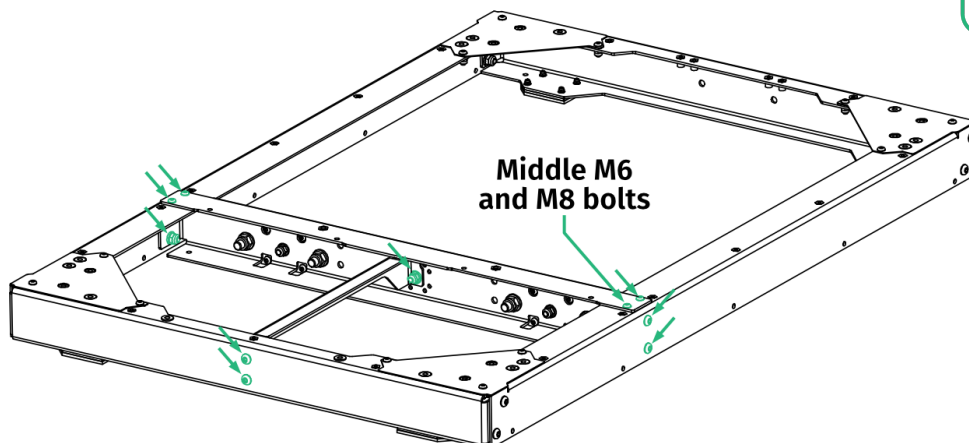
d) Check the dimensions of the smaller frame's diagonals - measure them as per the illustration below (both A and B at the same exact points). Distance A and B must be as close as possible (maximum tolerance limit for dimensional differences is **2 mm**).



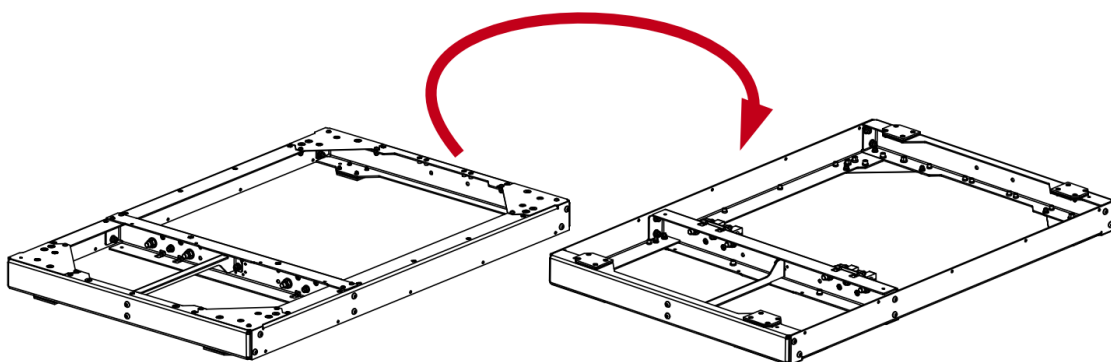
e) If one of the dimensions is too large, grab the frame and move it longitudinally back and forth. Check the dimensions of the diagonals again. Repeat until the result is achieved.



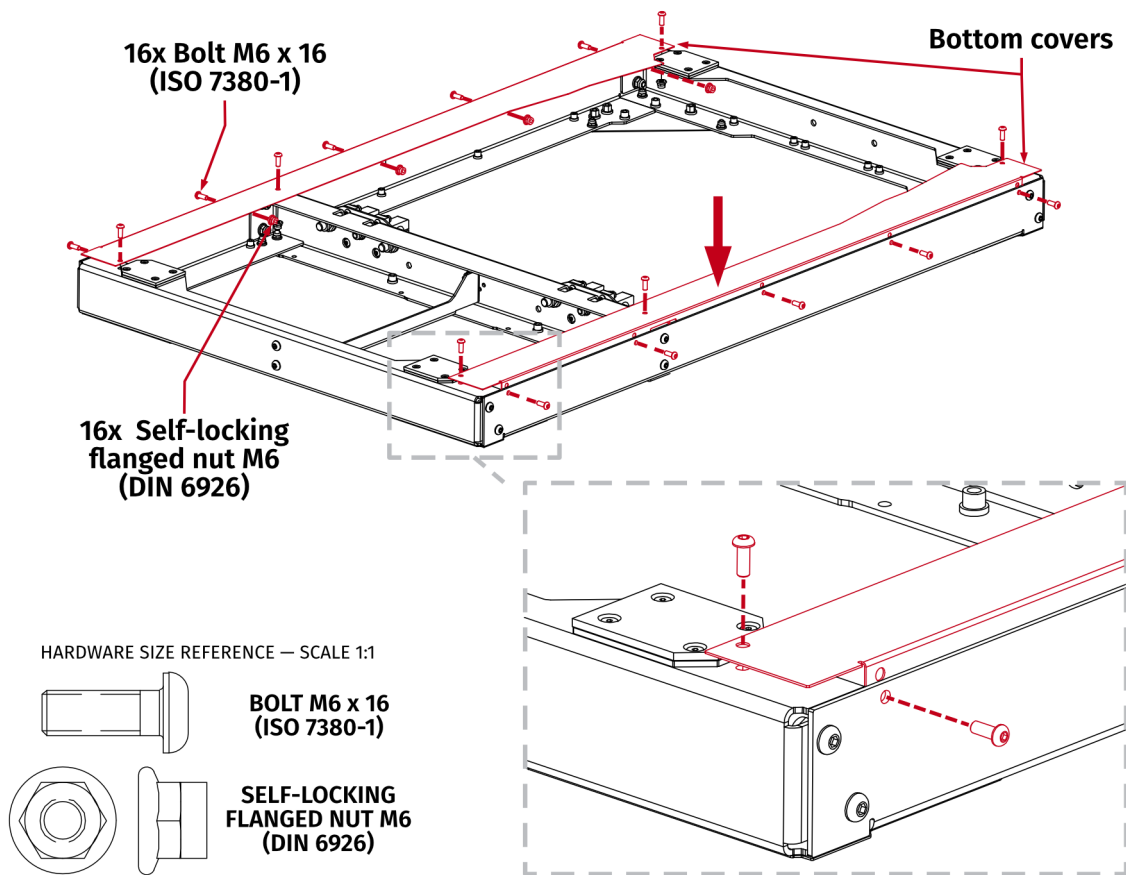
f) When the A and B dimensions are within tolerance to each other - tighten the middle frame bolts to specification. First, torque M6 bolts evenly (horizontal bolts) to 9.5 Nm - 7 ft-lbs. Then proceed to the M8 bolts (vertical bolts [23Nm - 17 ft-lbs]). Check the dimensions of the frame's diagonal again.



8. For easier assembly, it is recommended to turn the frame upside down.

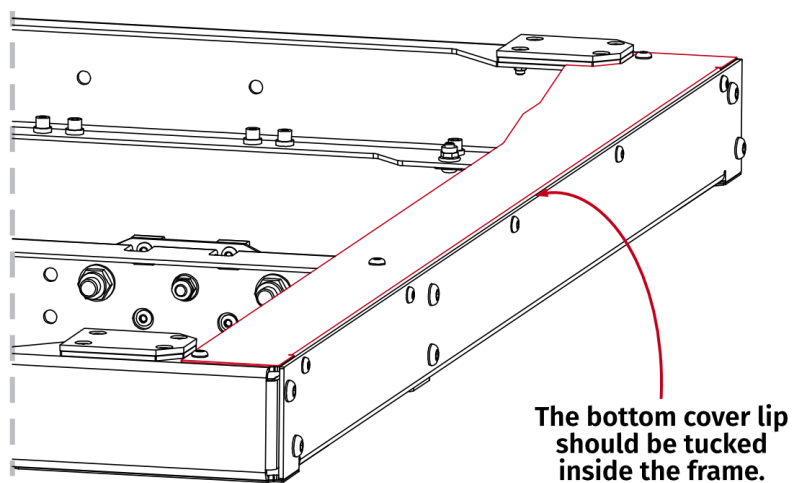


9. Mount the bottom covers. The frame can then be rotated back to its original position (it is recommended to check the diagonals of the frame again).



INFO

Ensure that the cover lip is tucked inside the frame:



4.4. ACTUATORS ASSEMBLY

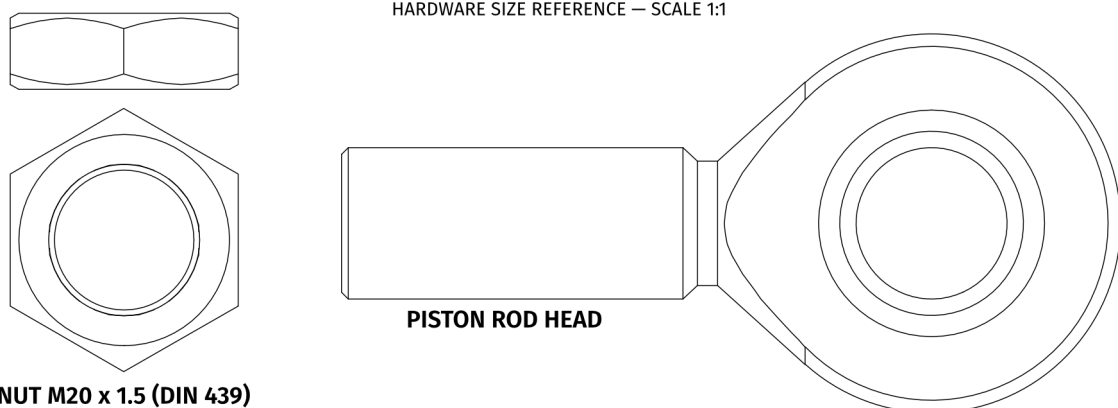
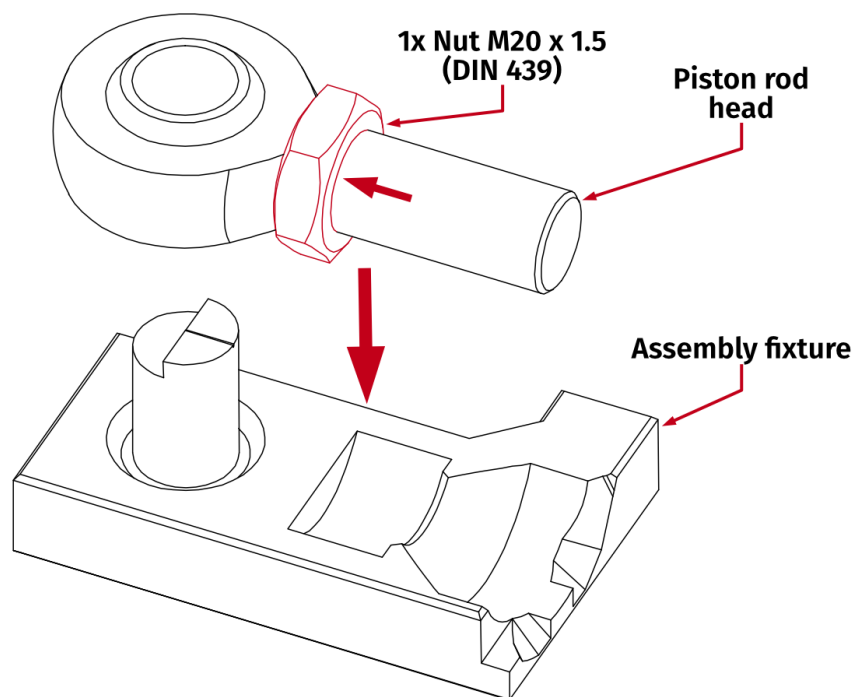
Before mounting the actuators to the platform, they must first be assembled correctly. High **precision** and careful **attention** to detail during this process are essential.

WARNING

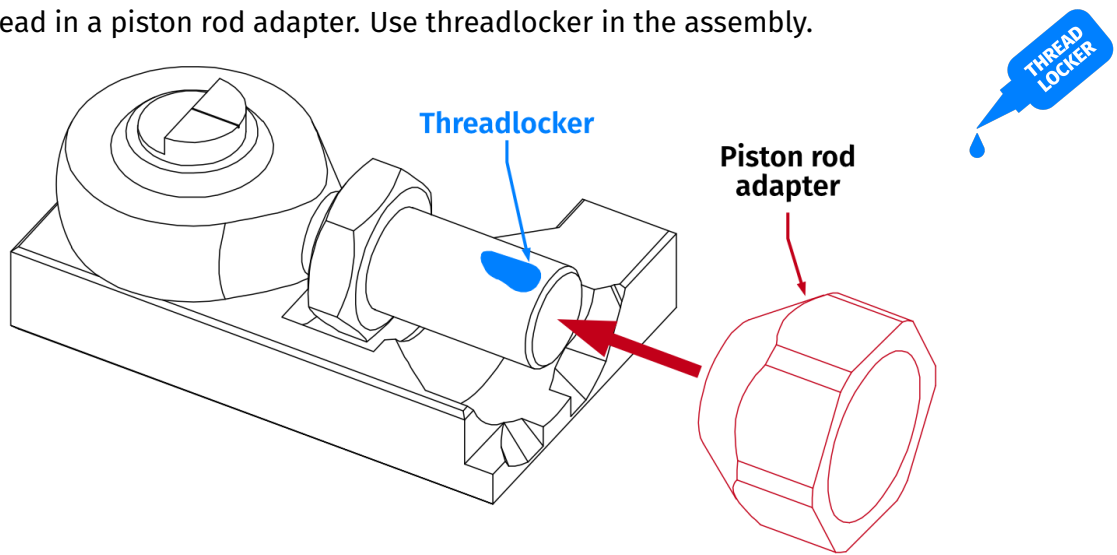
Once this procedure has been started, **do not** interrupt the assembly process until **Step 9** has been completed.

If any part of the procedure is unclear, perform a **test assembly** of the piston rod head from steps **1-7** without threadlocker before final installation.

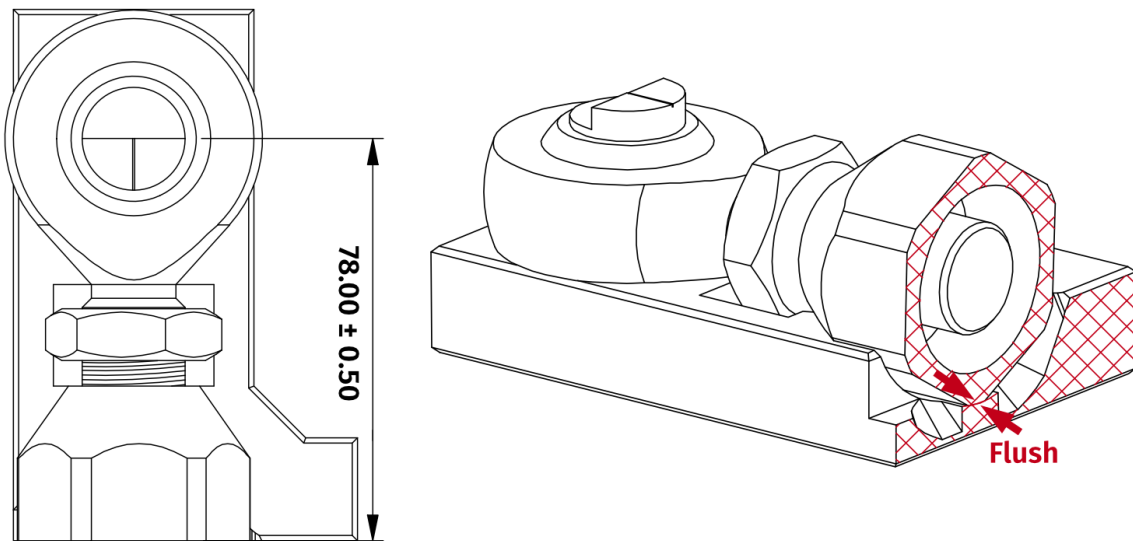
1. Assemble a piston rod head. Use the included assembly fixture for reference. Thread the M20 nut onto the rod head until it reaches the end of the thread.



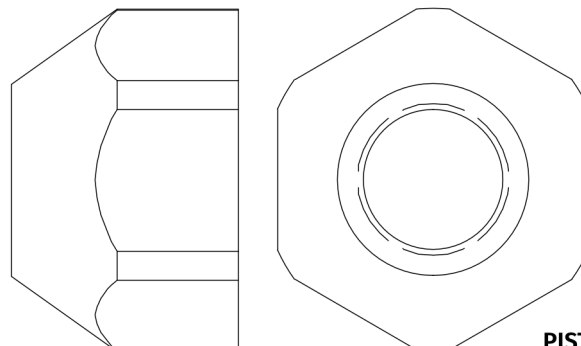
-
2. Thread in a piston rod adapter. Use threadlocker in the assembly.



3. The piston rod adapter must be threaded in until it is flush with the edge of the assembly fixture (or measuring 78 mm from the edge to the center of rod head ball insert).

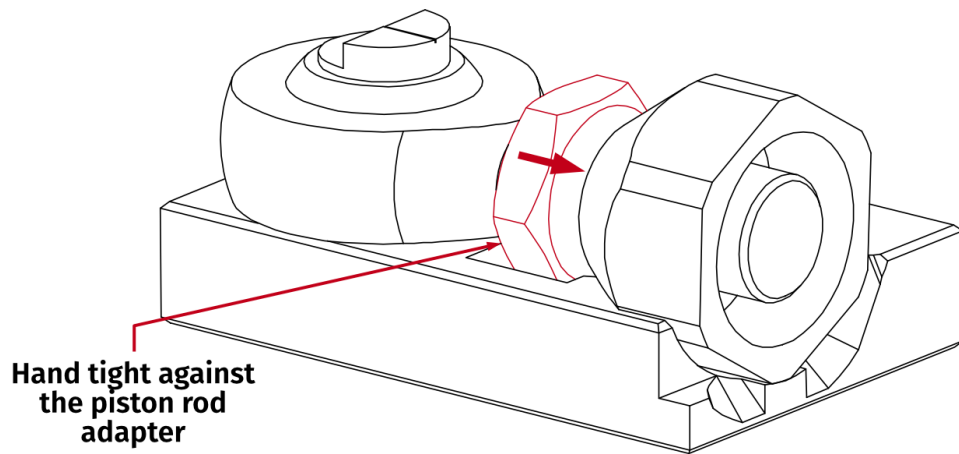


HARDWARE SIZE REFERENCE — SCALE 1:1

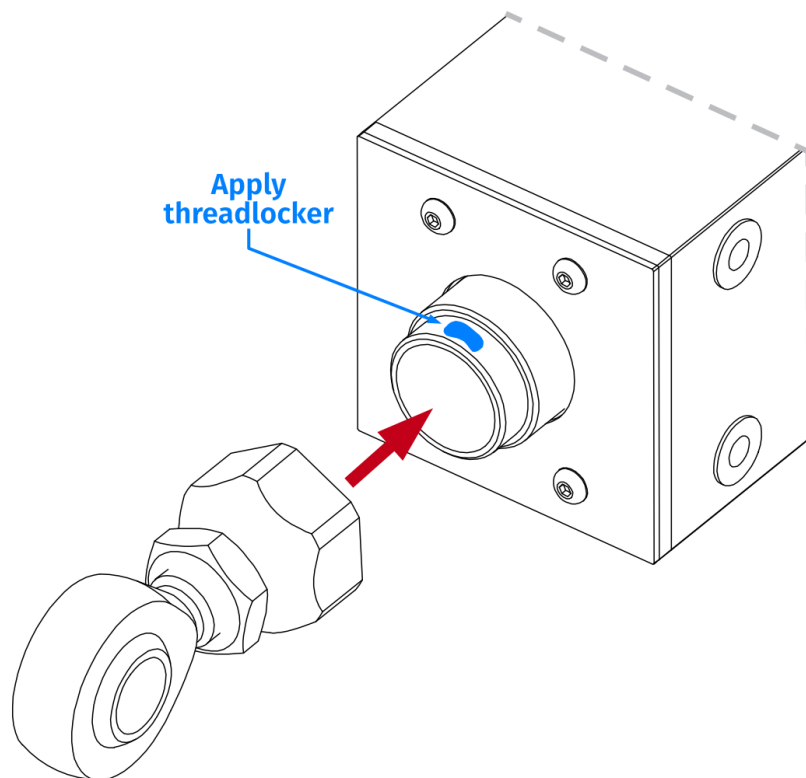


PISTON ROD ADAPTER

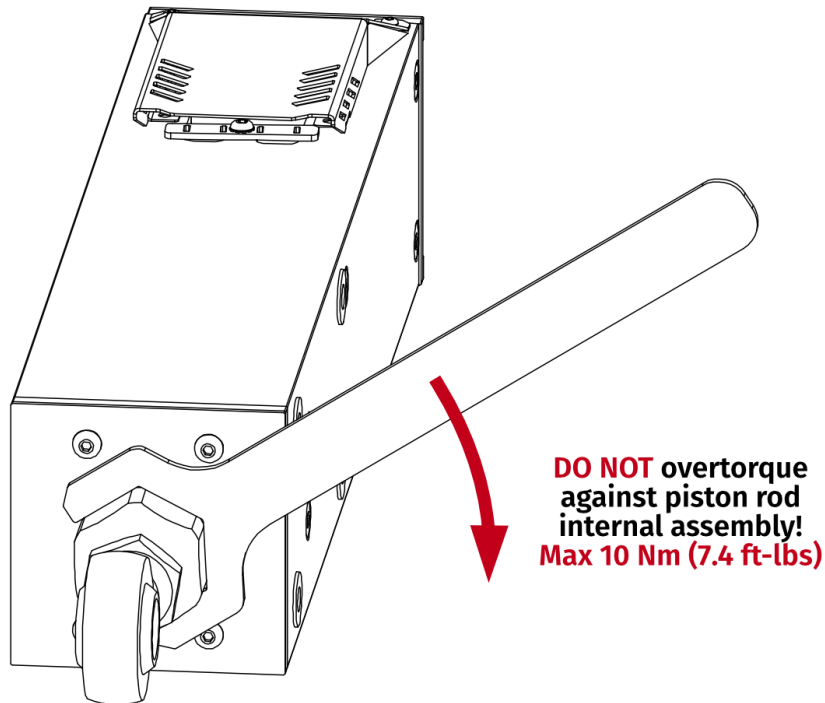
4. After measuring the dimensions to be correct, tighten the nut against the piston rod adapter **by hand** only.



5. Install the piston rod head assembly into the piston rod of the actuator, using the threadlocker. **DO NOT** torque the assembly.

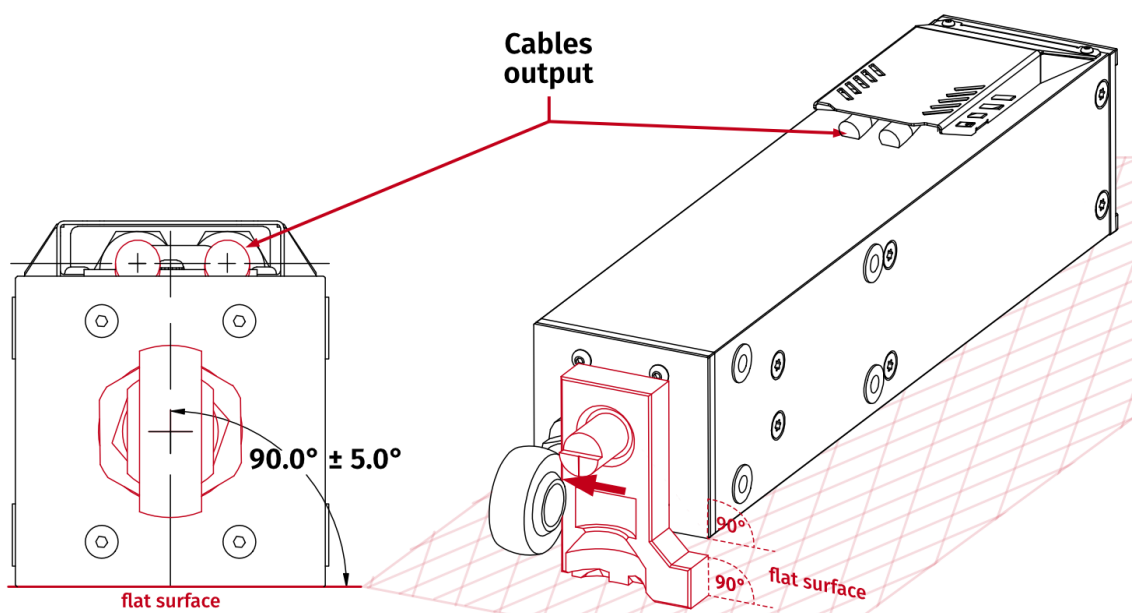


6. Carefully tighten the piston rod head assembly. **DO NOT** overtighten the nut against the piston rod, as this may damage the internal piston rod assembly - apply a **maximum** torque of 10 Nm (7.4 ft-lbs).

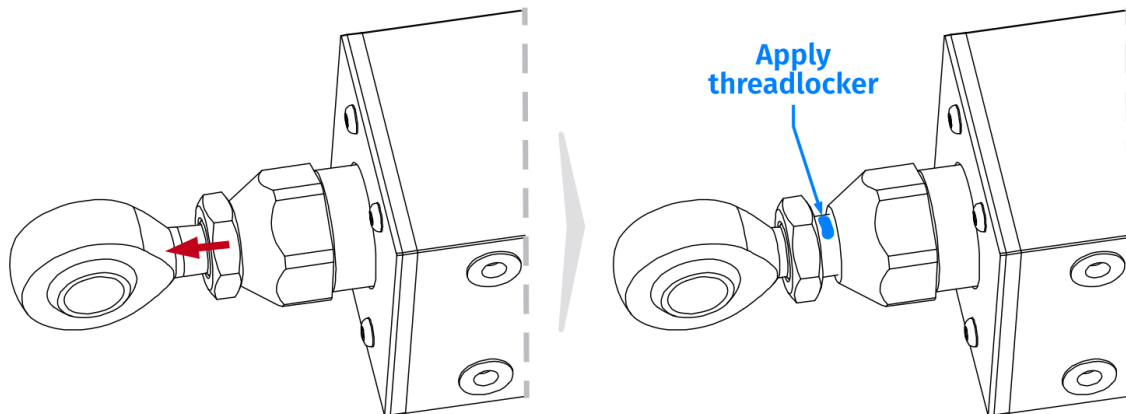


7. Position the piston rod head relative to the actuator to ensure correct alignment. **DO NOT** rotate the rod head more than 90° to either side. It should be perpendicular in relation to cable output.

Use the assembly fixture to verify the correct piston rod head orientation. Place the fixture against the side of the rod head assembly while keeping both the fixture and the actuator on the same flat surface.



8. Unscrew the nut from the piston rod adapter until it reaches the end of the thread - apply threadlocker.



9. Lock the M20 nut against the piston rod adapter using a 30 mm wrench for the nut and a 41 mm wrench for the piston rod adapter. Torque the M20 nut to 20 Nm (15 ft-lbs).

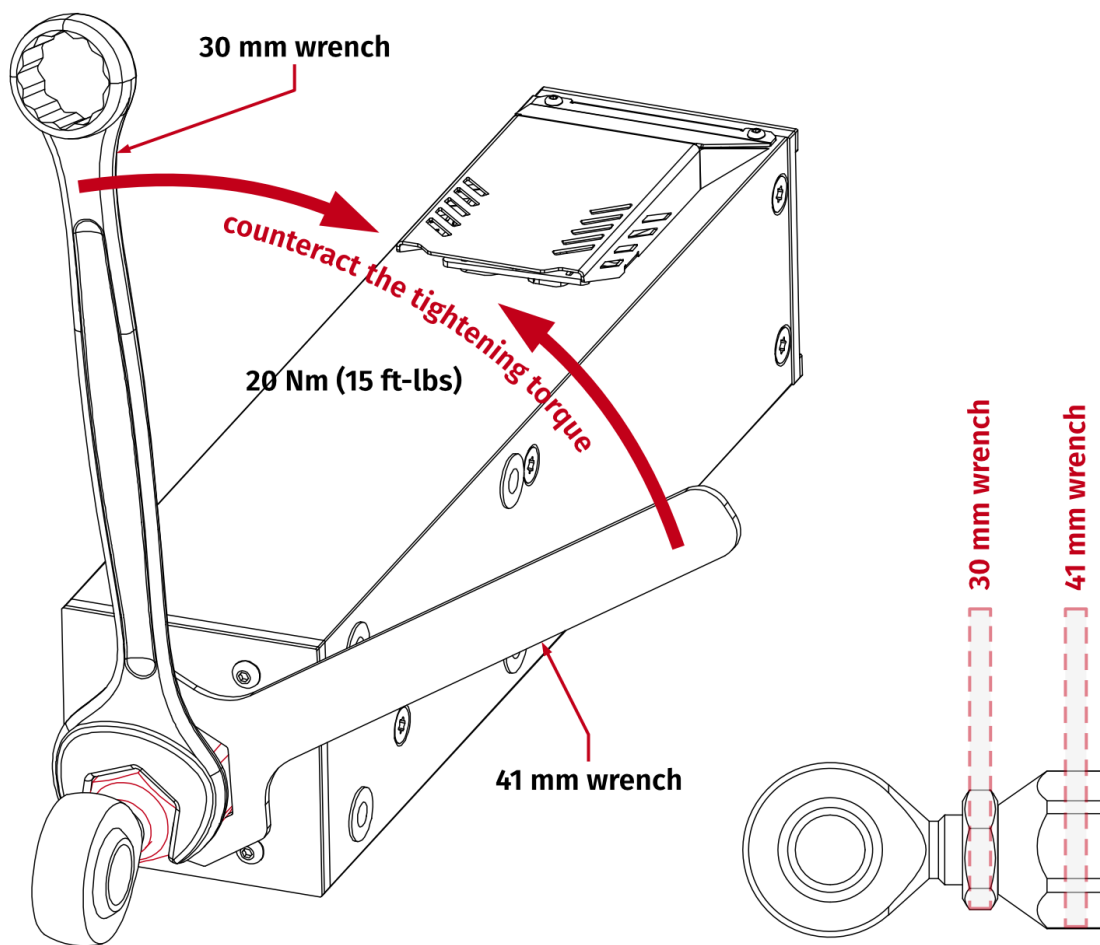
WARNING

When tightening the M20 lock nut, always counterhold the larger nut using a 41 mm wrench. **All tightening torque must be transferred exclusively between the two wrenches. DO NOT** apply any rotational stress to the piston rod, as this **WILL** damage the internal assembly.

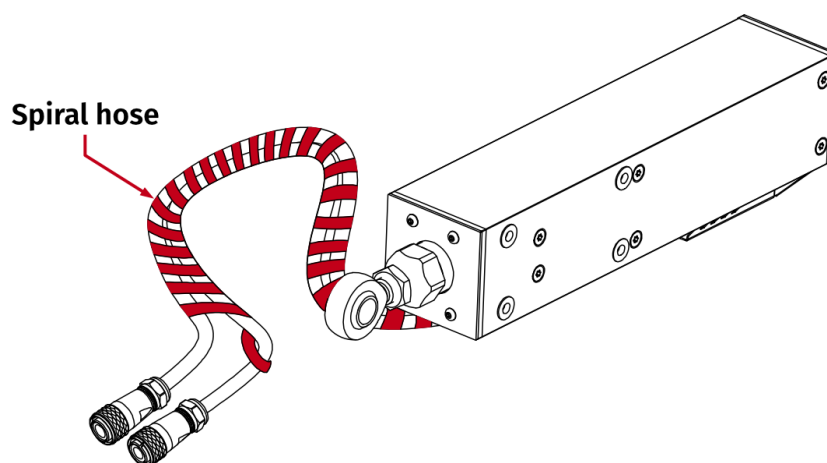
INFO

The piston rod head may rotate slightly while the lock nut is being tightened - maximum tolerance is **5°**. If this occurs, loosen the lock nut, rotate the piston rod head slightly counterclockwise, and re-tighten the lock nut.

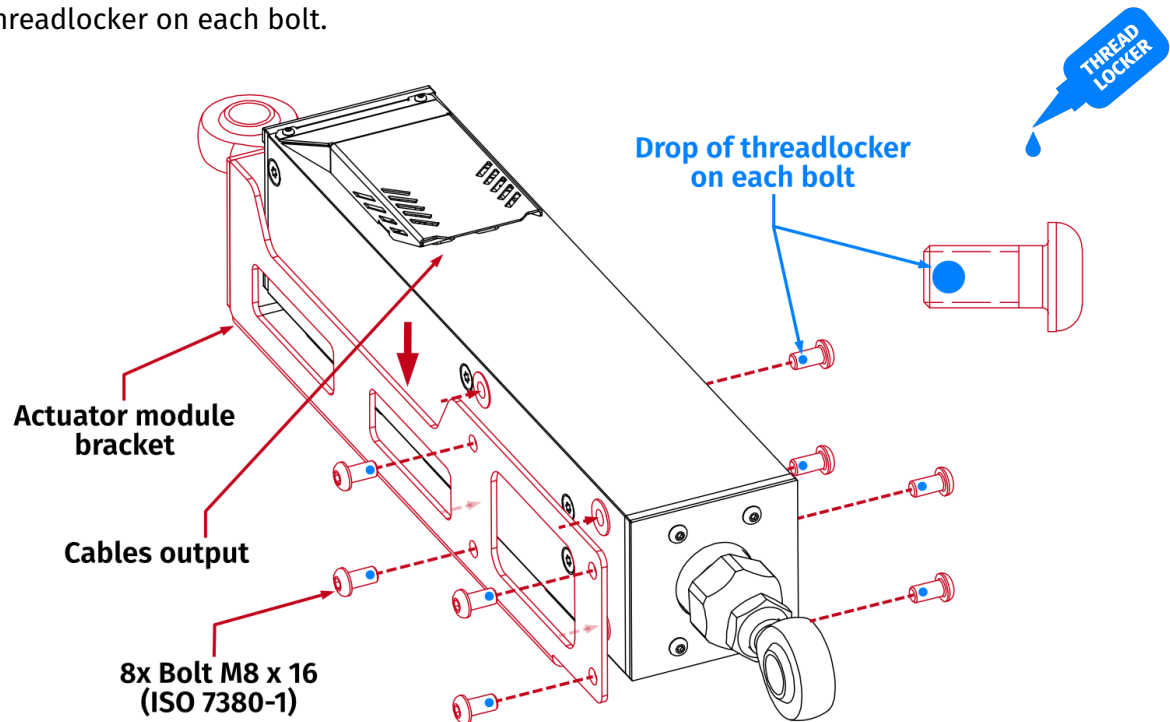




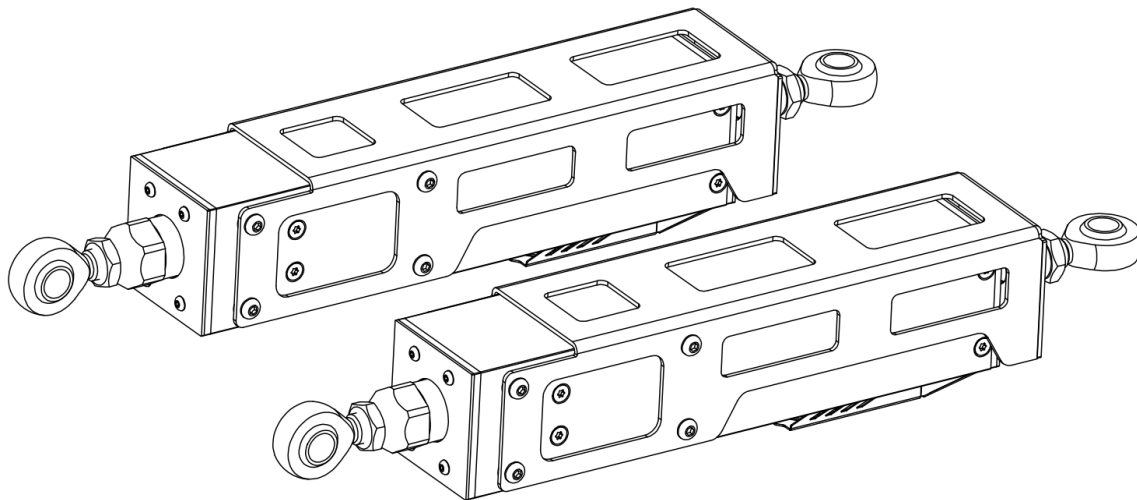
10. For ease of future maintenance and to reduce the risk of cable damage, wrap a spiral hose around each pair of the actuator's cables:



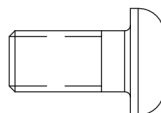
- 11.** Mount the actuators into the actuator module brackets. Use a drop of the included threadlocker on each bolt.



- 12.** Repeat the full assembly process for the second actuator (steps **1** to **11**).



HARDWARE SIZE REFERENCE — SCALE 1:1



BOLT M8 x 16 (ISO 7380-1)

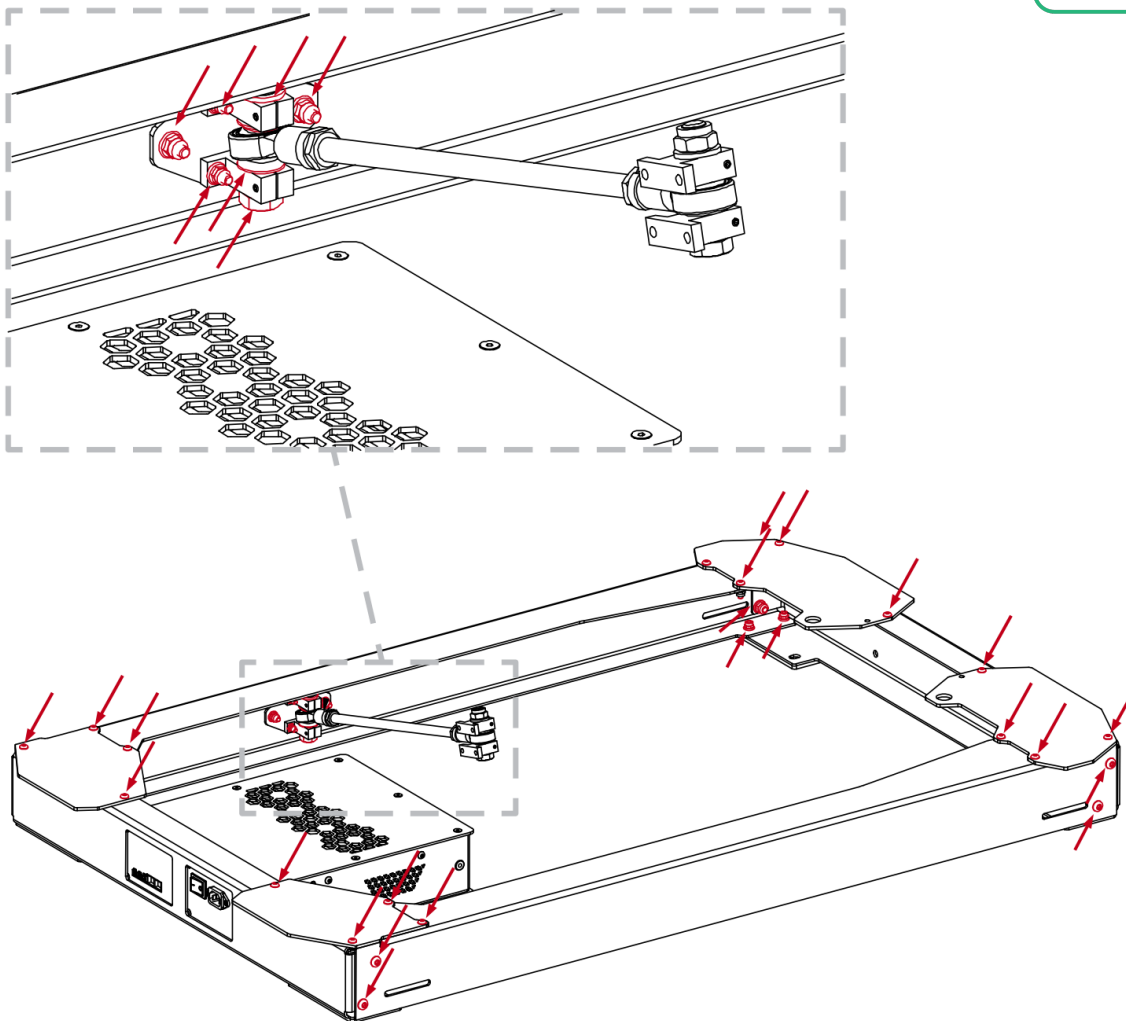
4.5. ATTACHING THE UPPER AND LOWER FRAMES TOGETHER

Joining the frames together starts by installing the actuator assembly to the bottom frame.

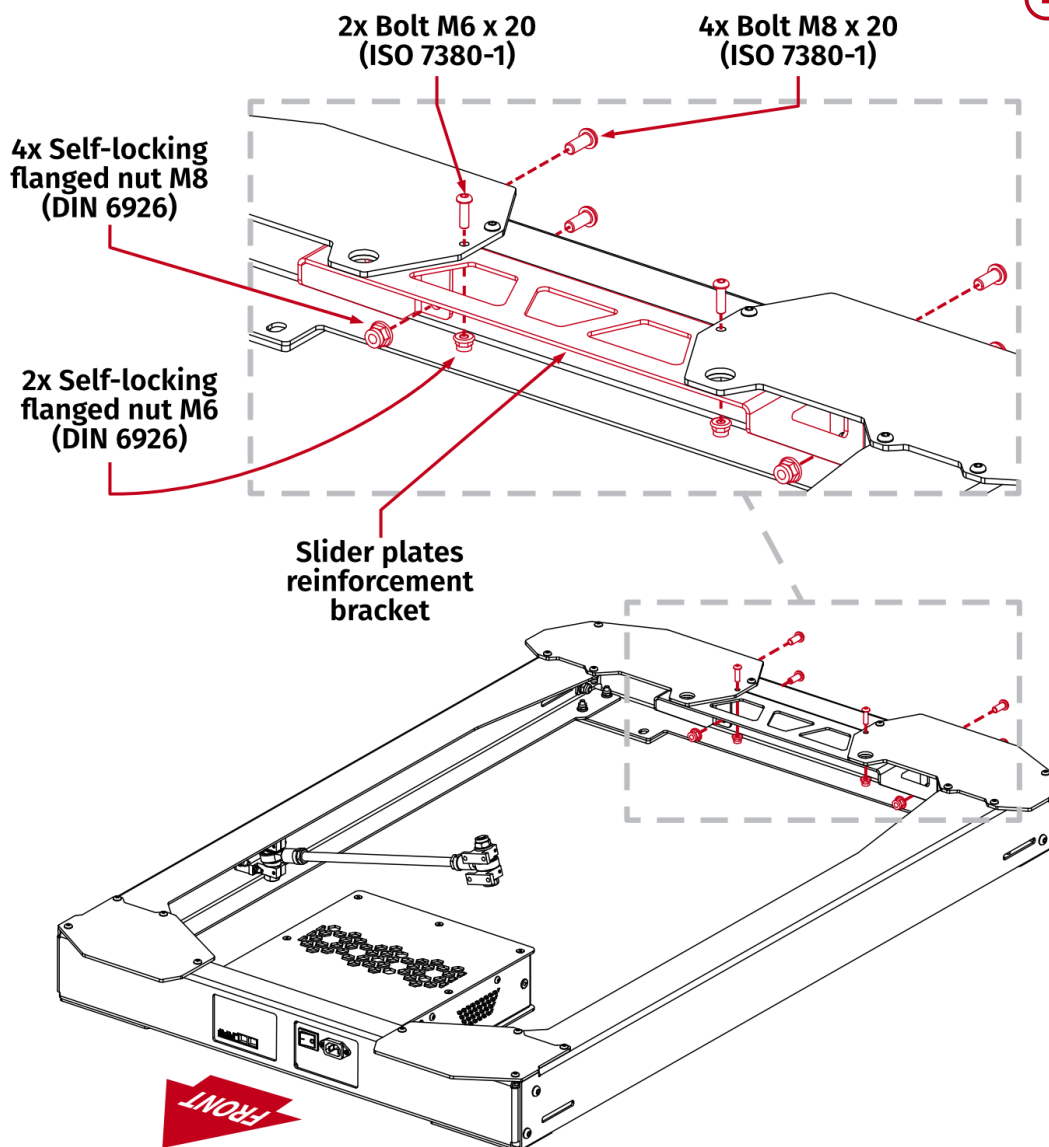
WARNING

Before proceeding with attaching both frames together, all the bolts used so far must be checked if they are torqued down to specification.

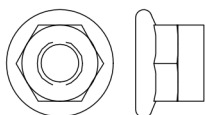
1. Bottom frame: check if all the bolts installed so far are torqued down. Firmly grasp the rod head and move it in every direction to check for any play. If any play is detected, inspect the mounting bolts and tighten them if necessary.



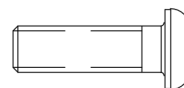
2. Install the slider plates reinforcement bracket. **DO NOT** torque the bolts initially - they need to be correctly aligned with the actuator later.



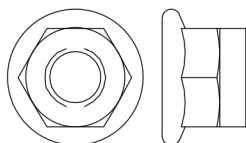
HARDWARE SIZE REFERENCE — SCALE 1:1



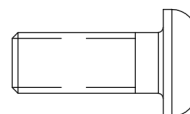
SELF-LOCKING FLANGED NUT M6 (DIN 6926)



BOLT M6 x 20 (ISO 7380-1)



SELF-LOCKING FLANGED NUT M8 (DIN 6926)

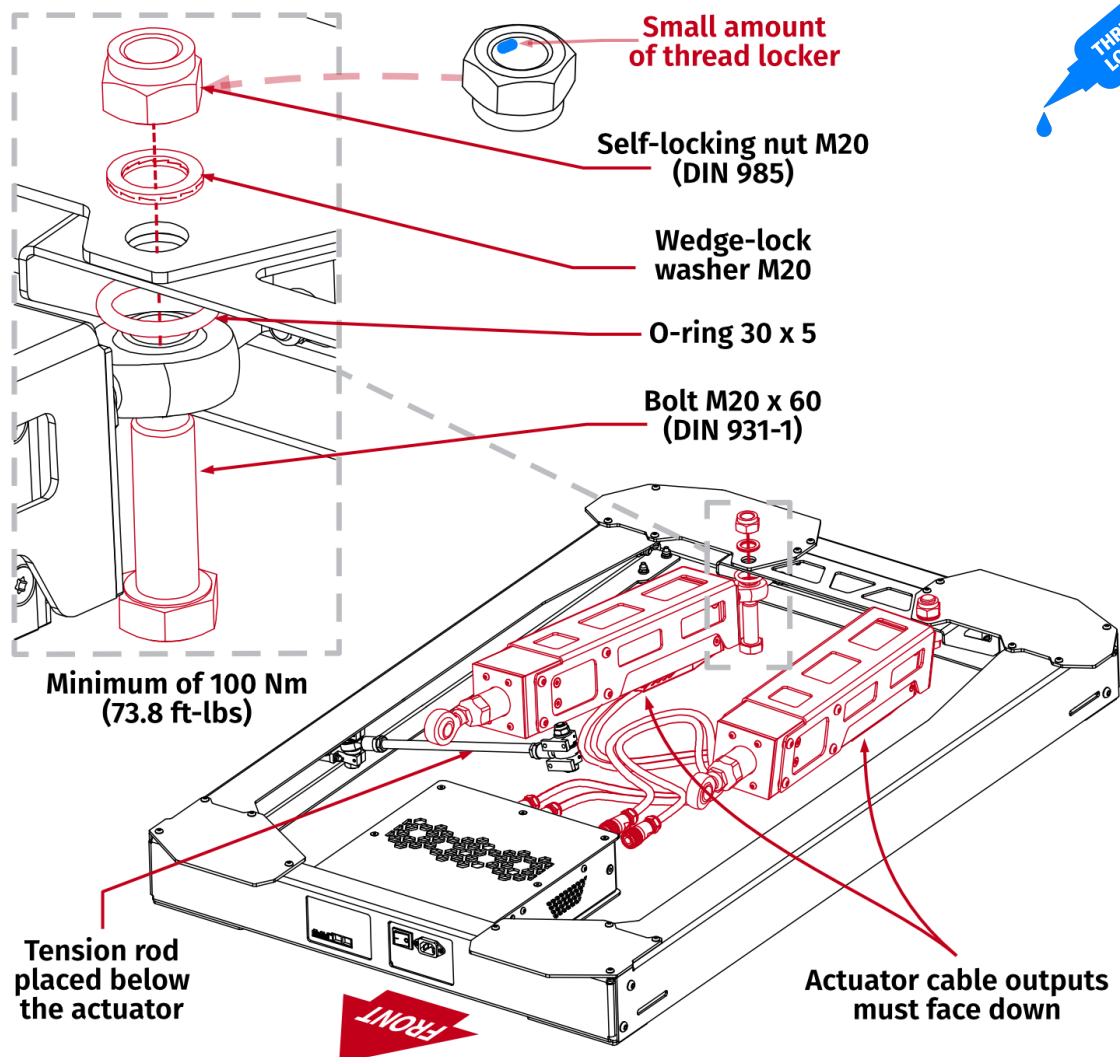


BOLT M8 x 20 (ISO 7380-1)

3. Attach both actuators to the back slider plates - the cables output must face downward. Put a small amount of threadlocker on the inside of the M20 locking nut. Torque the M20 bolt with full strength (minimum of 100 Nm [73.8 ft-lbs]).

WARNING

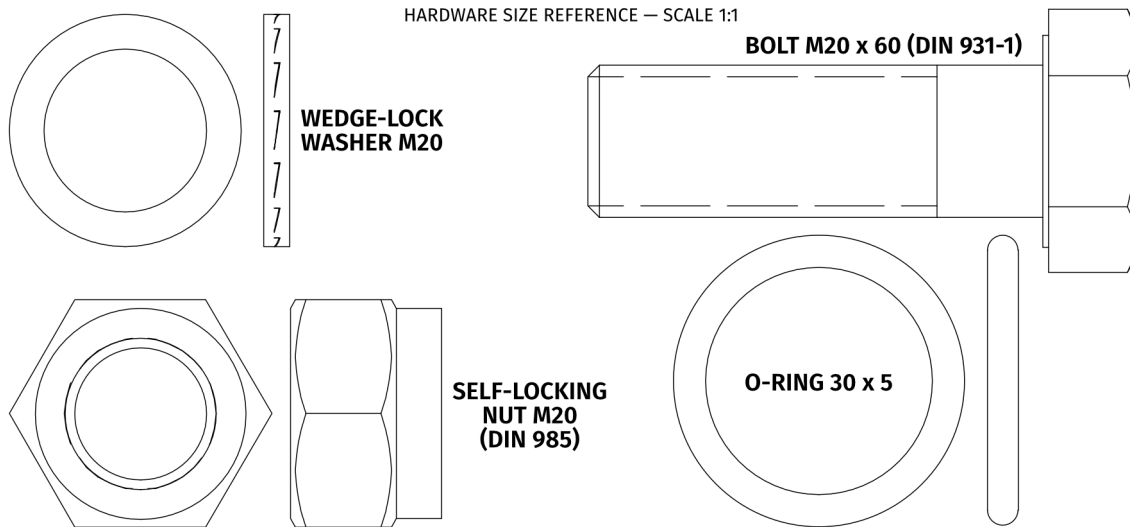
Keep in mind that self-locking nuts are not to be reassembled. If there is a need to dismount the actuator, the M20 self-locking nut **MUST** be replaced.



INFO

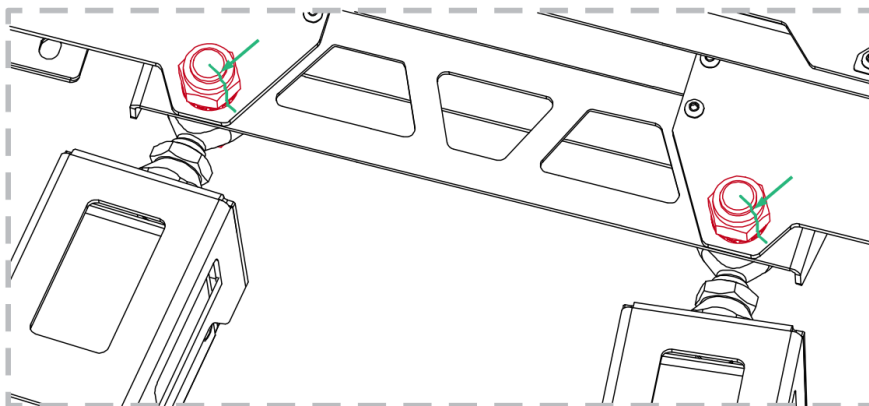
Ensure that the tension rod and actuator cables are placed below the actuators.

HARDWARE SIZE REFERENCE - NEXT PAGE →

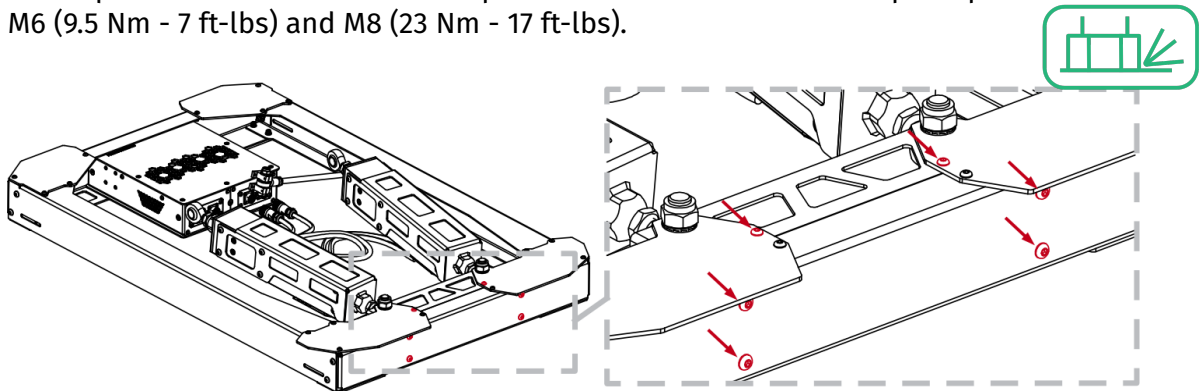


4. Use an oil marker (not included) to mark the position of the actuator mounting nuts, making it easy to check that they have not loosened due to vibrations. Draw a continuous oil-mark line from the bolt, across the nut, and all the way to the slider plate.

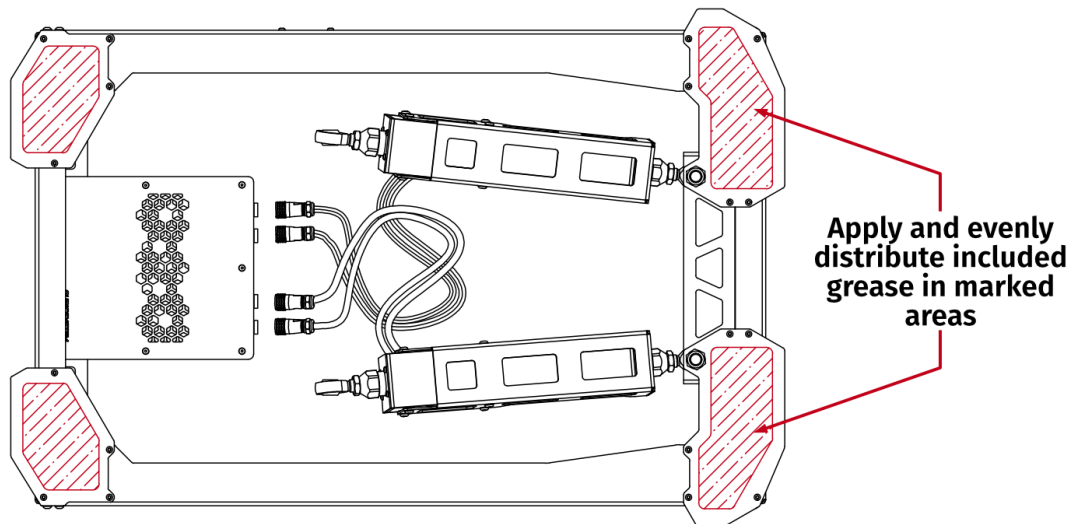
For maintenance details go to **8.1** on page **123**.



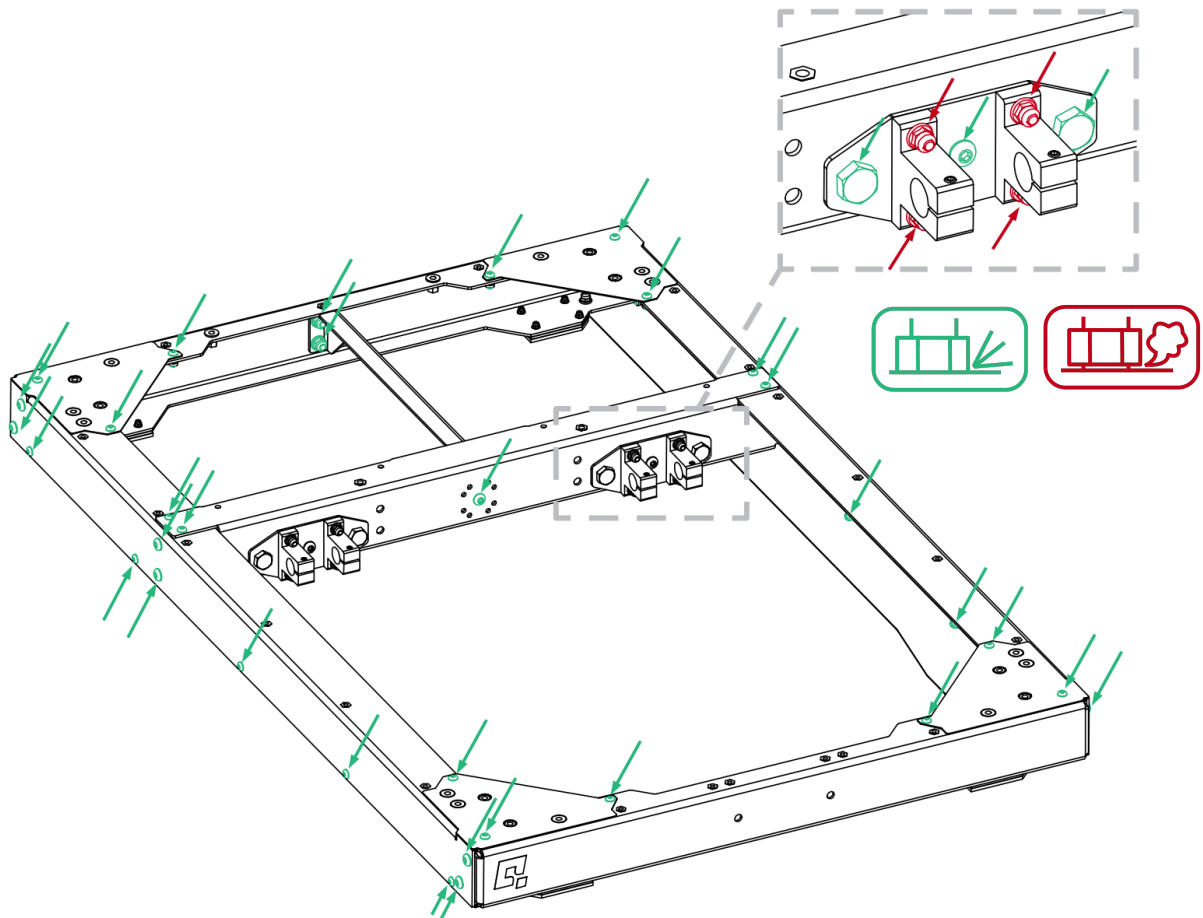
5. Torque the bolts from the slider plates reinforcement bracket up to specification - M6 (9.5 Nm - 7 ft-lbs) and M8 (23 Nm - 17 ft-lbs).



-
- 6.** Wear protective equipment before proceeding to the next step.
- 7.** Make sure the slider plates are clean. Apply and evenly distribute a thin layer of sliding grease on the marked area of the plates.



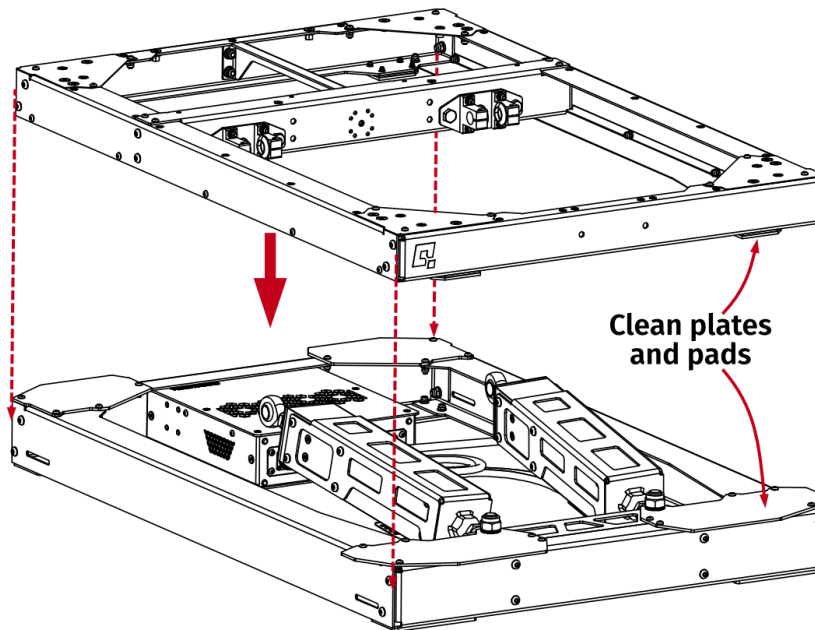
- 8.** Top frame: check if all the bolts installed so far are torqued down. Leave out the bolts that mount actuator supports (marked **red**) - they remain loose until later in the assembly.



- 9.** Transfer the upper frame into the bottom frame - align the walls to be flush from all sides. **Ensure no dirt or lint is on the bottom of slider pads of the top frame before setting it on top of the bottom frame.**

INFO

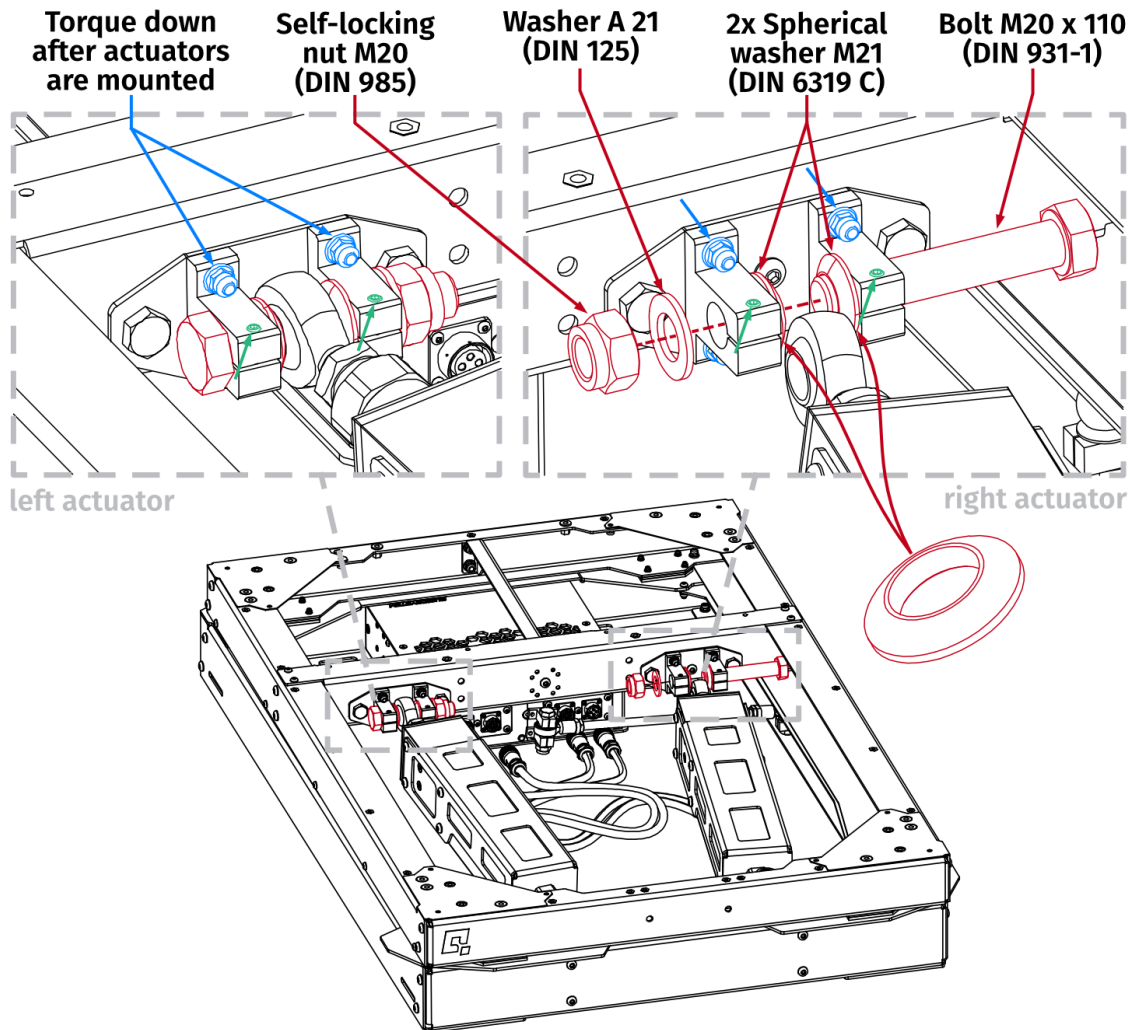
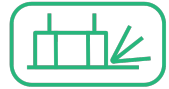
The top frame alone at this stage weighs 24 kg (53 lbs). This step may require a second person to help carry the frame.



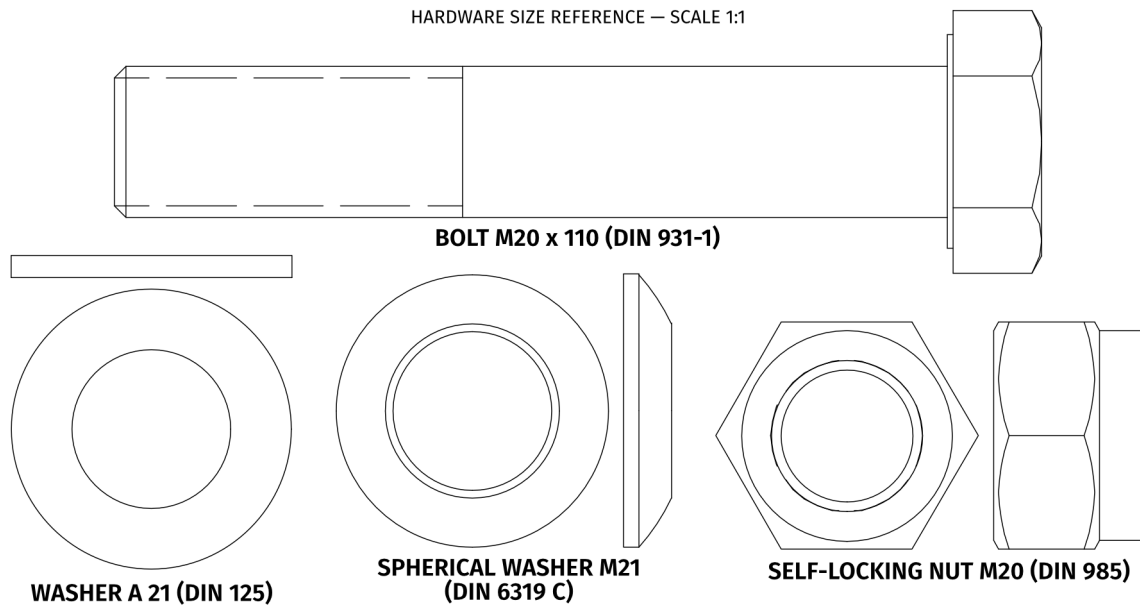
- 10.** Connect **both** actuators' rod heads to the top frame crossbeam (actuators' piston rod might need manual retracting/extending to reach the mounting point):
- a)** Torque the M20 bolts with full strength (minimum of 100 Nm [73.8 ft-lbs]).
 - b)** Screw in the **clamping bolts** (max. 7 Nm [5.2 ft-lbs]).



c) Torque the **M6 mounting bolts and nuts** (9.5 Nm - 7 ft-lbs).
You will need a ratchet with an extension.



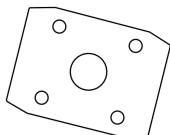
HARDWARE SIZE REFERENCE — SCALE 1:1



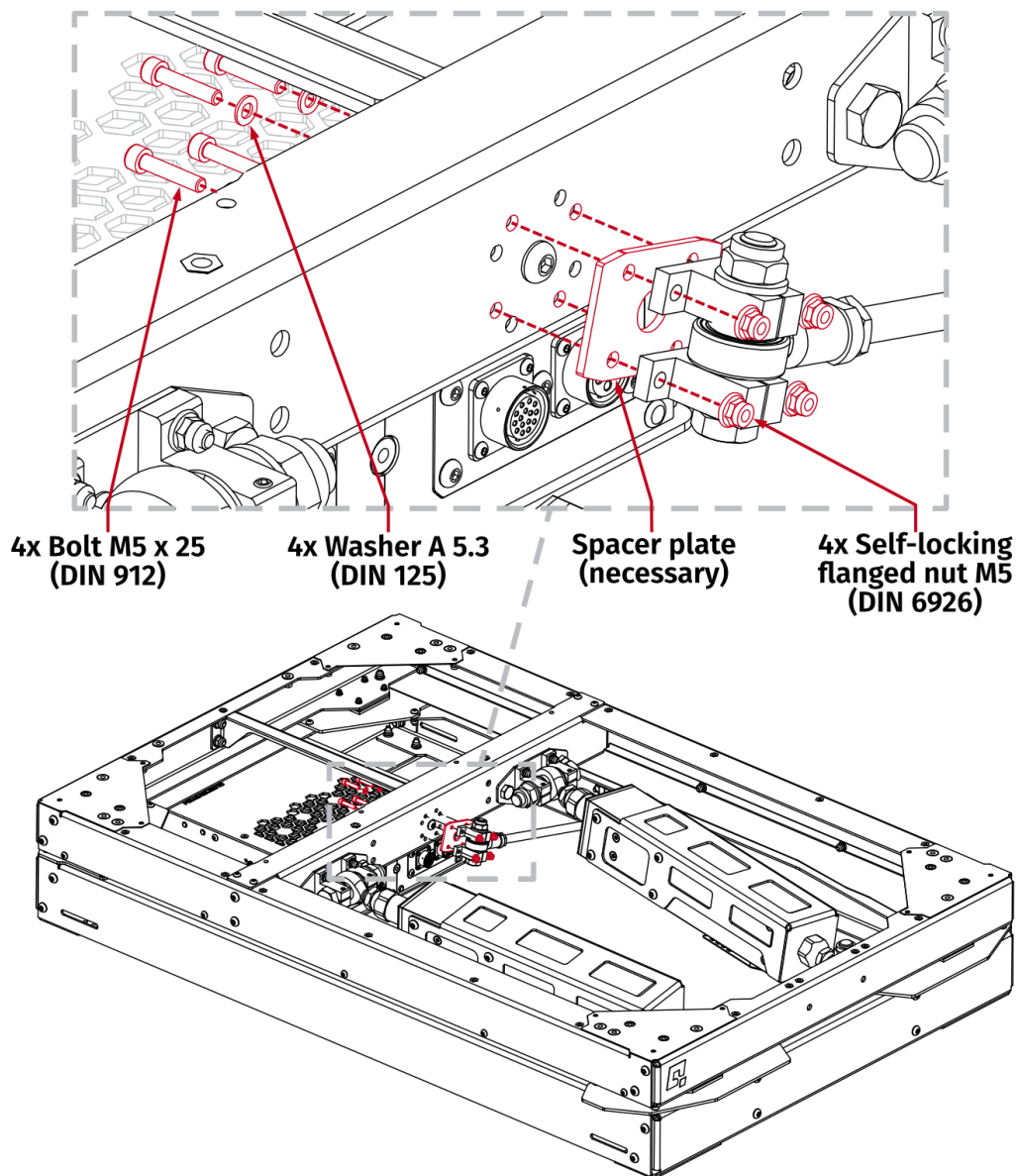
11. Mount the second end of the tension rod to the crossbeam. Align the top frame as needed to align the bolts with the holes. **DO NOT** omit the washers.

WARNING


THIS WAY UP



Using the tension rod spacer is **obligatory** - otherwise the tension rod will collide with the crossbeam.



HARDWARE SIZE REFERENCE — SCALE 1:1



WASHER A 5.3 (DIN 125)

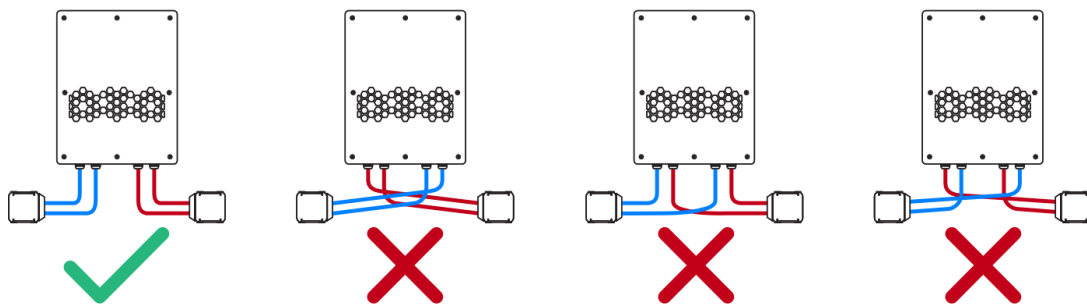
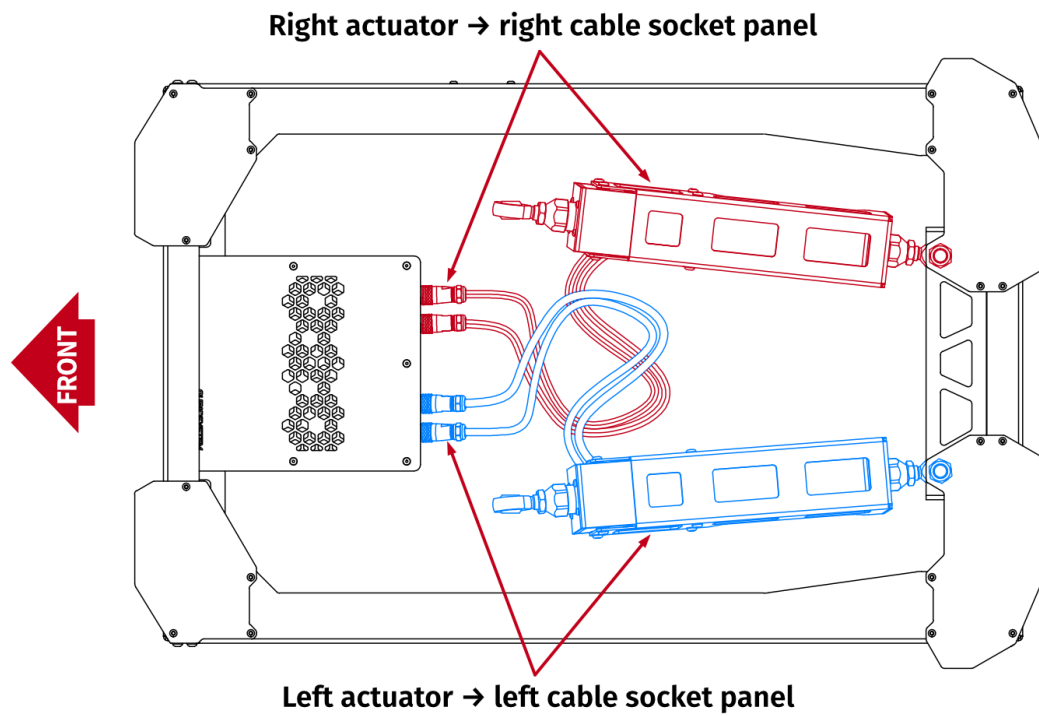


SELF-LOCKING FLANGED NUT M5 (DIN 6926)



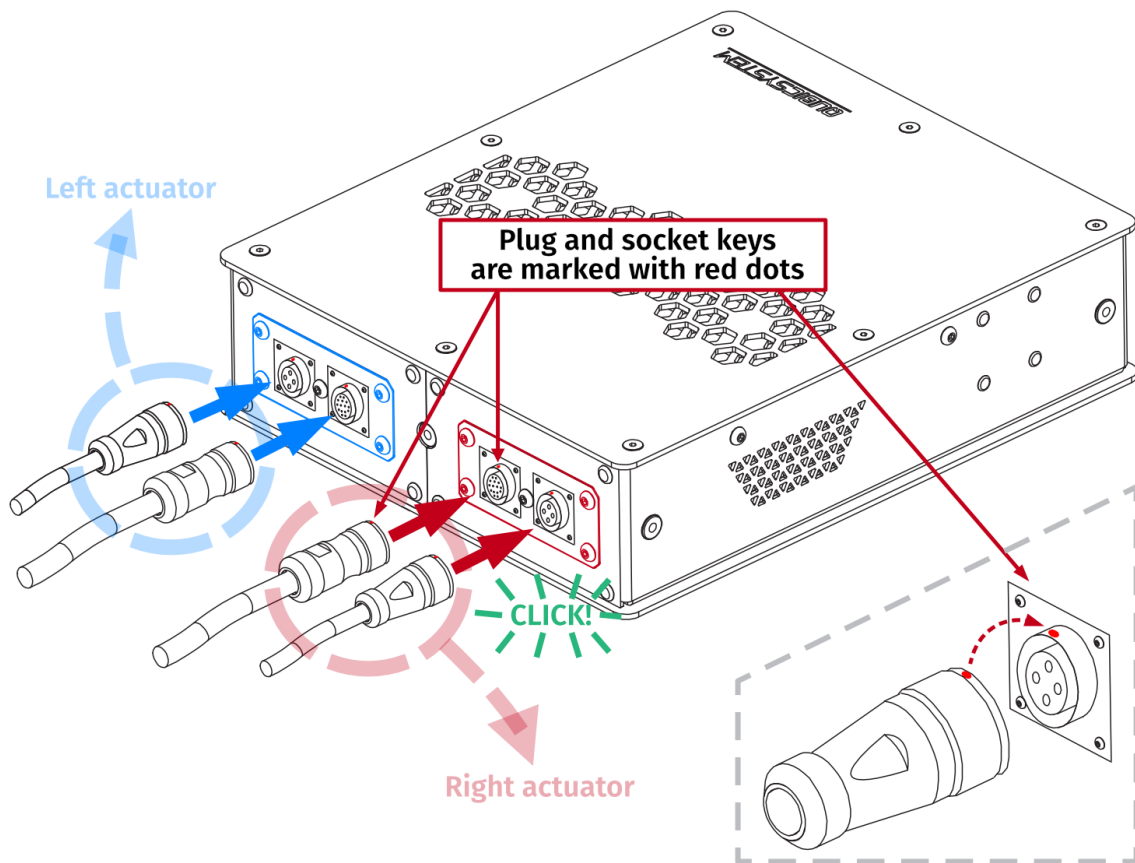
BOLT M5 x 25 (DIN 912)

12. Connect push-pull actuator connectors to the Power Cabinet according to the illustration. **DO NOT** mix the actuator plugs between the socket panels.



WARNING

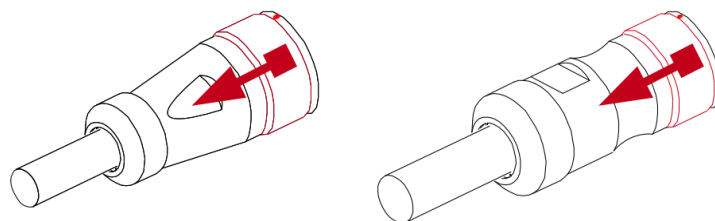
Plugging and unplugging the actuator must **ALWAYS** be performed with Power Cabinet's power switched OFF.



WARNING

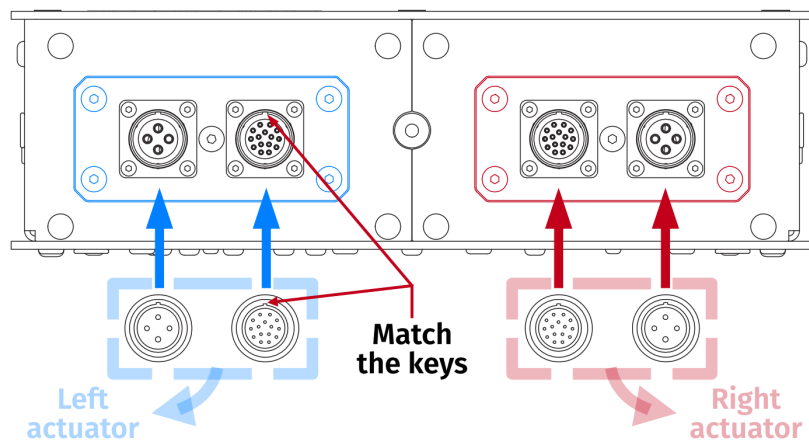
Always make sure that all PUSH-PULL connectors are plugged **all the way in** - ring lock **MUST click** into place. Loose connections may result in serious actuator damage.

To disconnect the plug, first pull on the metal ring to release the lock and then pull the plug to disconnect:



NEVER pull on the plug by the cable

Keep in mind the order of connecting the actuators. The left socket panel is for odd number actuators, and the right socket panel is for even number actuators.



WARNING



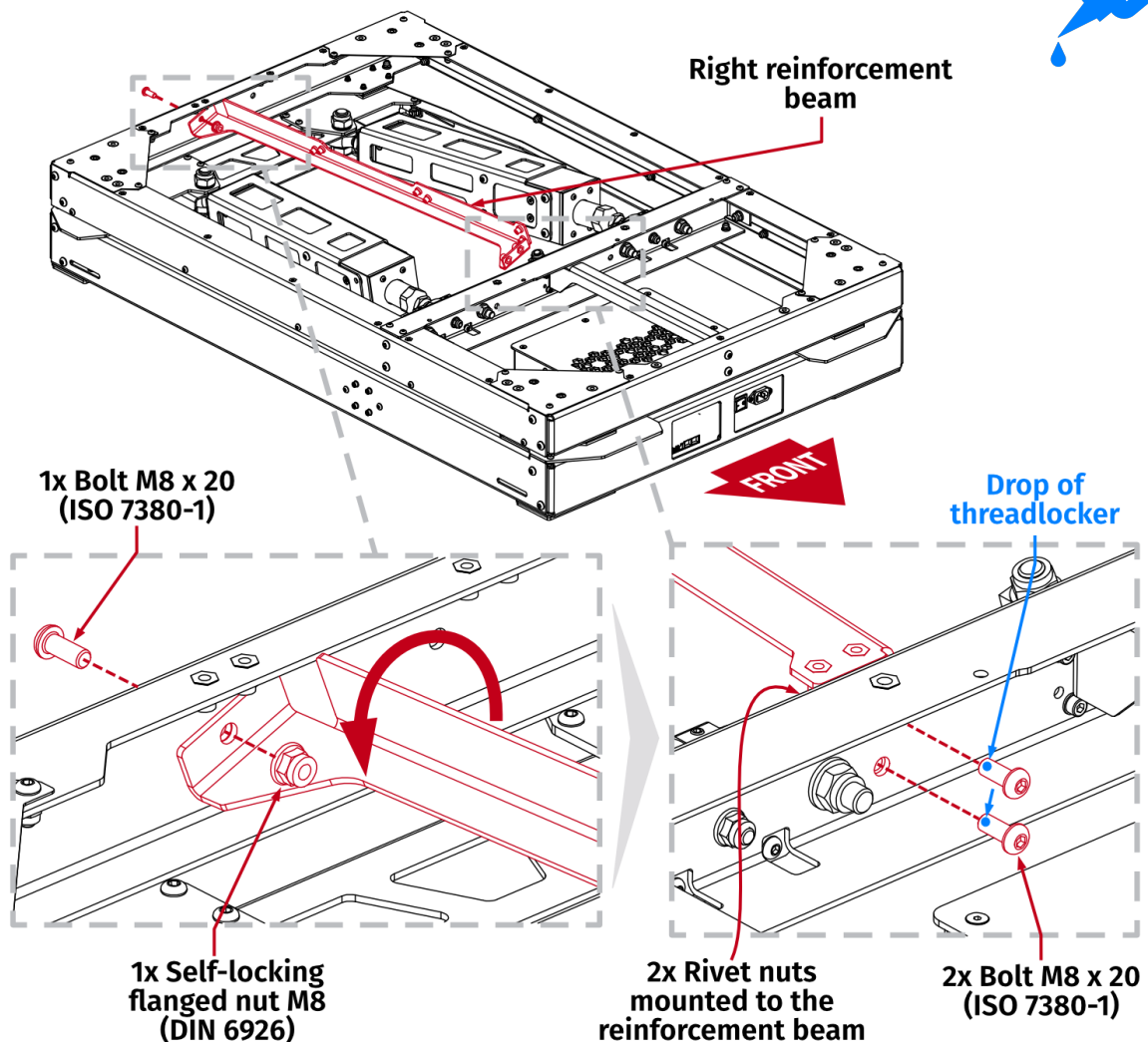
Under **NO** circumstances plug a QS-210 actuator into a QS-220 Power Cabinet and a QS-220 actuator into a QS-210 Power Cabinet. That **WILL** lead to irreversible damage to the actuators and will **NOT** be covered by the warranty.

13. Bolt in the reinforcement beams into the back section of the top frame.

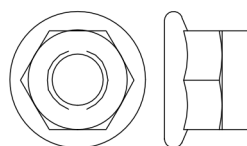
a) Insert the beam into the frame. The beams are not symmetrical - refer to the illustration below.

b) Secure it with the rear M8 bolt — **DO NOT** torque it yet. It will be torqued after the middle cover is installed. Rotate the beam to match the holes in the front.

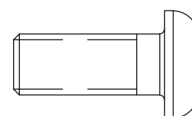
c) Screw in the two front M8 bolts. Apply a drop of threadlocker and torque down the **front** bolts (23 Nm - 17 ft-lbs).



HARDWARE SIZE REFERENCE — SCALE 1:1

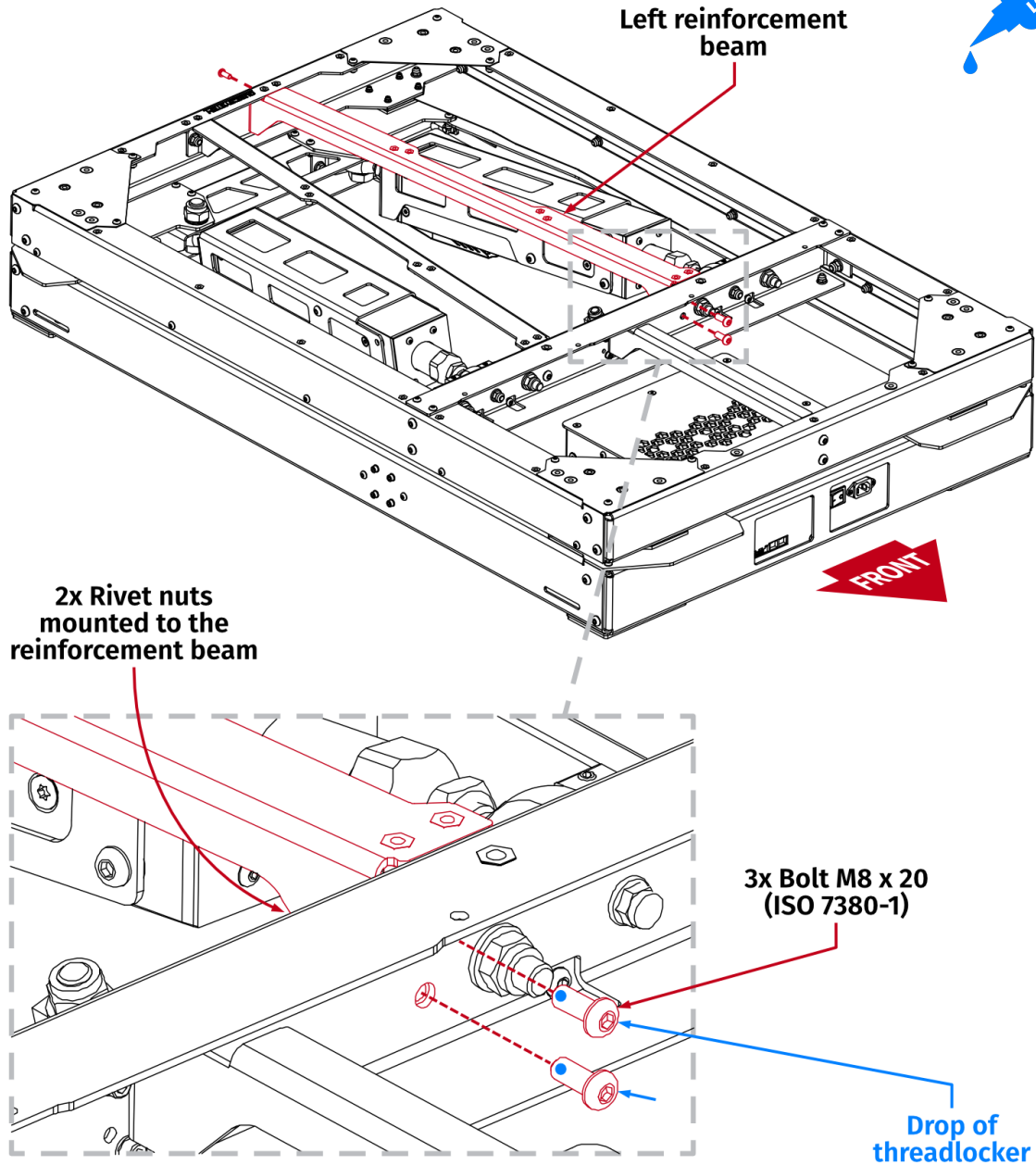


SELF-LOCKING FLANGED NUT M8 (DIN 6926)

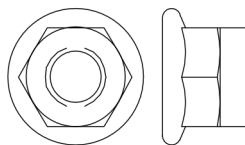


BOLT M8 x 20 (ISO 7380-1)

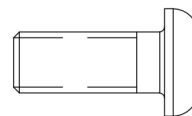
d) Repeat the procedure for the second reinforcement beam.
DO NOT torque the rear bolt. Apply a drop of threadlocker and torque the **front** bolts (23 Nm - 17 ft-lbs).



HARDWARE SIZE REFERENCE — SCALE 1:1

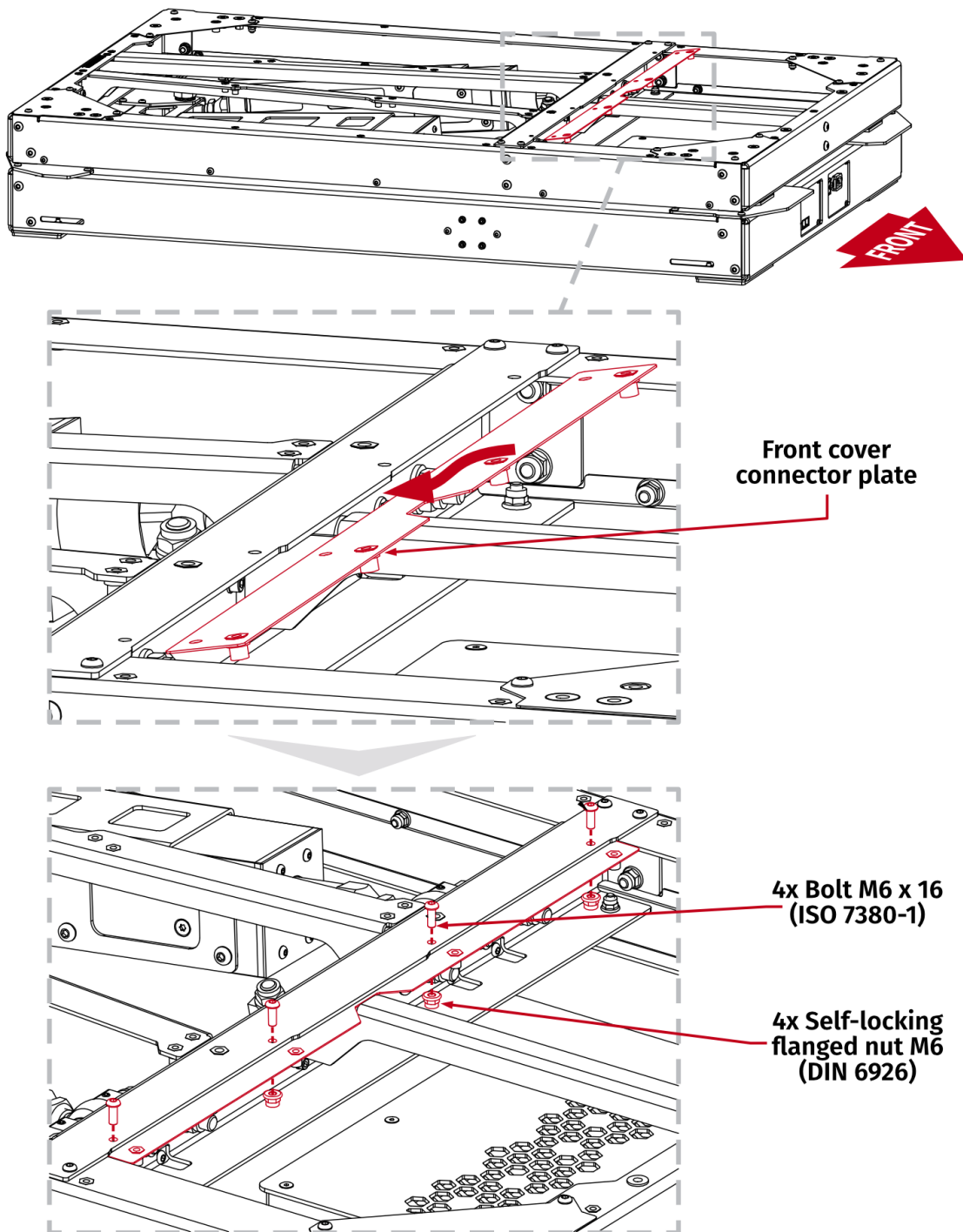


SELF-LOCKING FLANGED NUT M8 (DIN 6926)

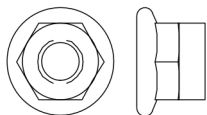


BOLT M8 x 20 (ISO 7380-1)

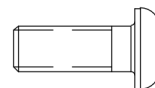
- 14.** Install front cover connector plate. Slide it underneath the crossbeam and mount it.



HARDWARE SIZE REFERENCE — SCALE 1:1



SELF-LOCKING FLANGED NUT M6 (DIN 6926)



BOLT M6 x 16 (ISO 7380-1)

4.6. PRE-OPERATION TESTS



At this stage, the device is incomplete and not ready for operation. All work on the machine must be performed with **EXTREME CAUTION** until the protective cover panels are installed.

WARNING



- **DO NOT** place hands, neck, or head under, on or between the frames, around the actuators or slider plates.
- **BEWARE** of the machine's sudden movements and motion envelope.

WARNING



DO NOT step on the actuators, cables or Power Cabinet.

Before mounting the shielding panels and installing the cockpit on top of the motion platform - it is recommended to perform a **pre-operation test** to verify the machine's correct connections and proper alignment of the top frame. Doing so at this stage ensures suitable access to the actuators and tension rod links, if there is such a need. This also allows the user to detect any errors or incorrect assembly before the rest of the rig is built-up, reducing the possibility of potential damage.

DO NOT connect or power up the machine yet.

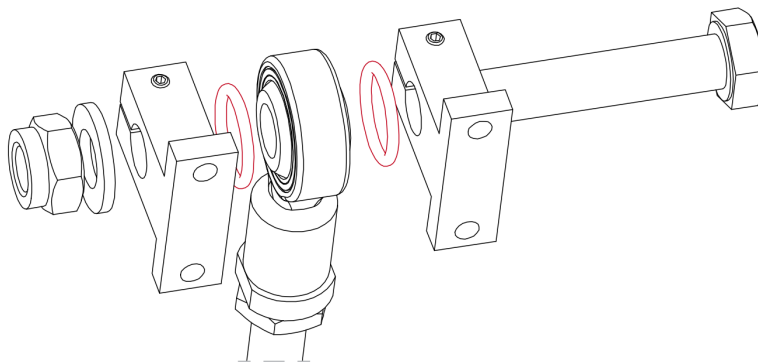
1. To ensure that the platform will not move excessively during the tests and later operation - the platform must be placed on a dry, clean and smooth surface.

TIP

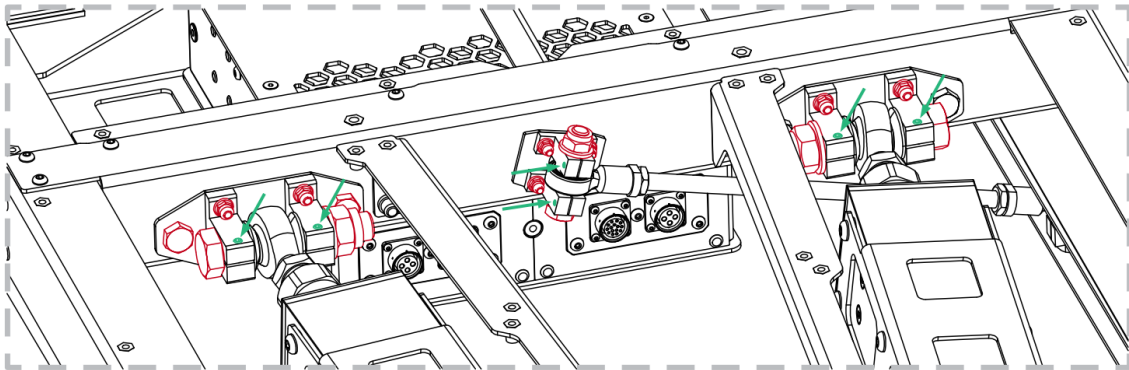
Rubber gym flooring mats have been found to provide good adhesion and can help prevent the machine from moving during testing or gameplay.

Front part of the platform:

2. Verify that O-rings are present on both sides of the rod head. The rod head should not rotate freely and should offer noticeable resistance when turned by hand.

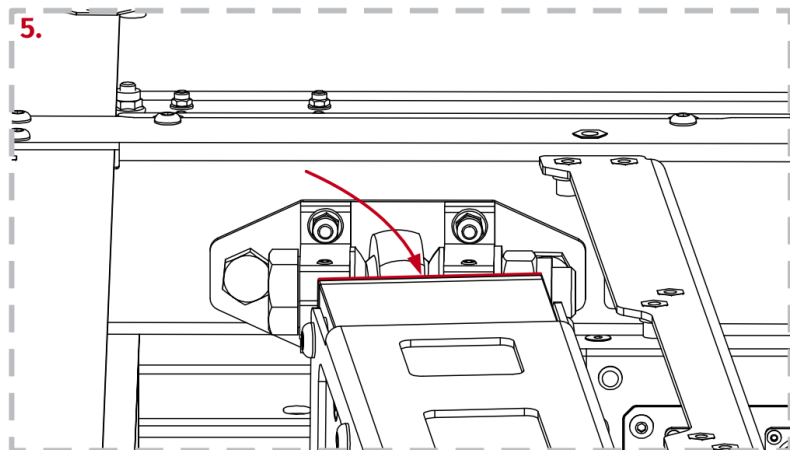
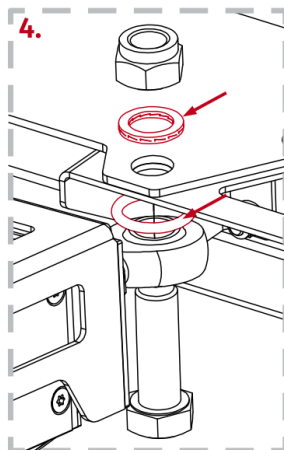


3. Ensure that all bolts marked in **red** and **green** have been tightened.

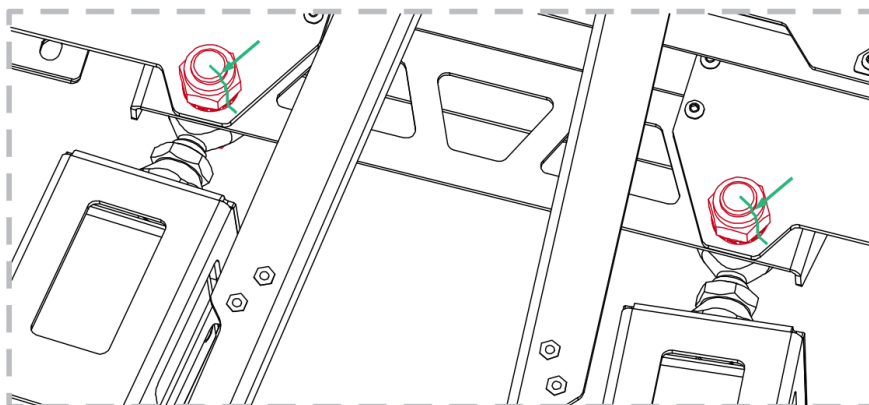


Rear part of the platform:

4. Verify that the O-rings and wedge-lock washers are present on both sides of the rod head. The rod head should not rotate freely and should offer noticeable resistance when turned by hand.
5. Make sure that both actuators are level - top edge should be close to parallel to the ground level.



6. Good practice is to use an oil marker to mark the position of the actuator mounting nuts, making it easy to check that they have not loosened due to vibrations. Their position must be checked after the first 10 hours of operation, then after 100, and finally after 400 hours of operation.



The complete machine:

INFO

Clearance should only be checked by gently pulling the rod heads; do not retighten the self locking nuts at this stage, as it will damage the threadlocker and nylon insert. If any looseness or play is detected due to insufficient tightening, the self locking nut must be replaced. Apply threadlocker to the new nut and tighten it securely to the specified torque.

7. Check for loose joints between the bottom and top frame before powering up:
- yank on the actuators in all directions a few times (**DO NOT** stand on the actuators)
 - yank on the tension rod and all rod heads
 - try to force the top frame to move in the forward (surge) and rotational (yaw) direction
- ✓ What is **acceptable**:
- ✓ very slightly loose ball inside the rod head
 - ✓ actuators and tension rod can slightly move around their axis
 - ✓ you are able to lift the back of the top frame up from the slider plates - the platform will later be loaded down by a cockpit's and user's weight
 - ✓ when manually forcing surge and yaw motion, the frame will move very slowly.
- ✗ What is **unacceptable**:
- ✗ any of these components click, knock or visibly move freely. They must be located and torqued down (or replaced if defective).

If no faults are found, go over the assembly section of the manual from the beginning to verify that no step of the process has been omitted.

You may proceed **ONLY** if **no** defects were found in the assembly of the platform.

INFO

If you encounter any defects or assembly issues and are unsure how to correct them, please contact technical support at QubicSystem.com/TechnicalSupport. Our Discord server is also available as a place where you can obtain technical assistance and information (9.4 on page 131).

4.7. TOP FRAME COVER PLATES

INFO

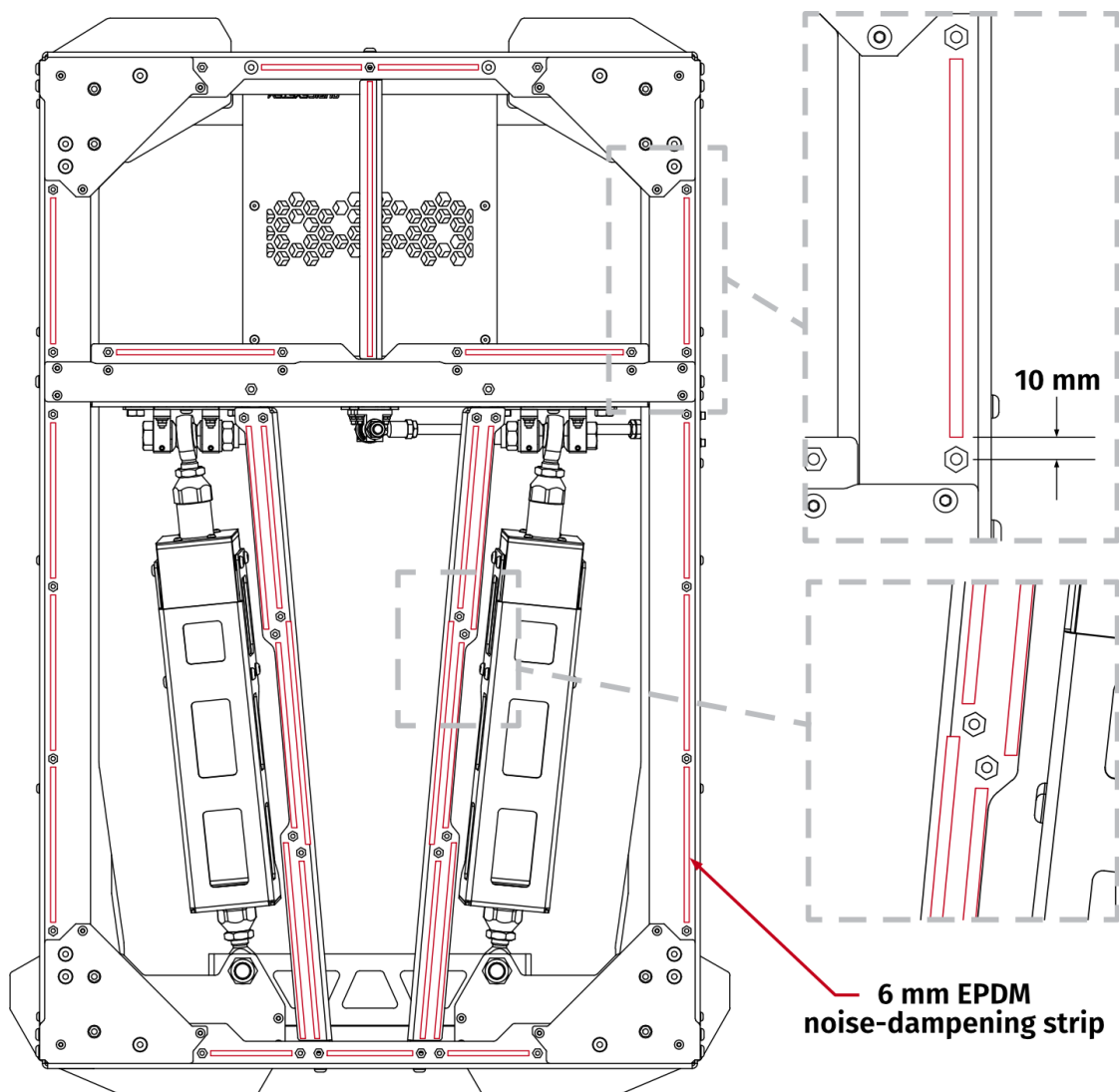
The top frame cover must be installed only when the assembly and non-powered testing are concluded. After the cover and cockpit are installed - the access to the inside of QS-TP1 will be limited.

WARNING

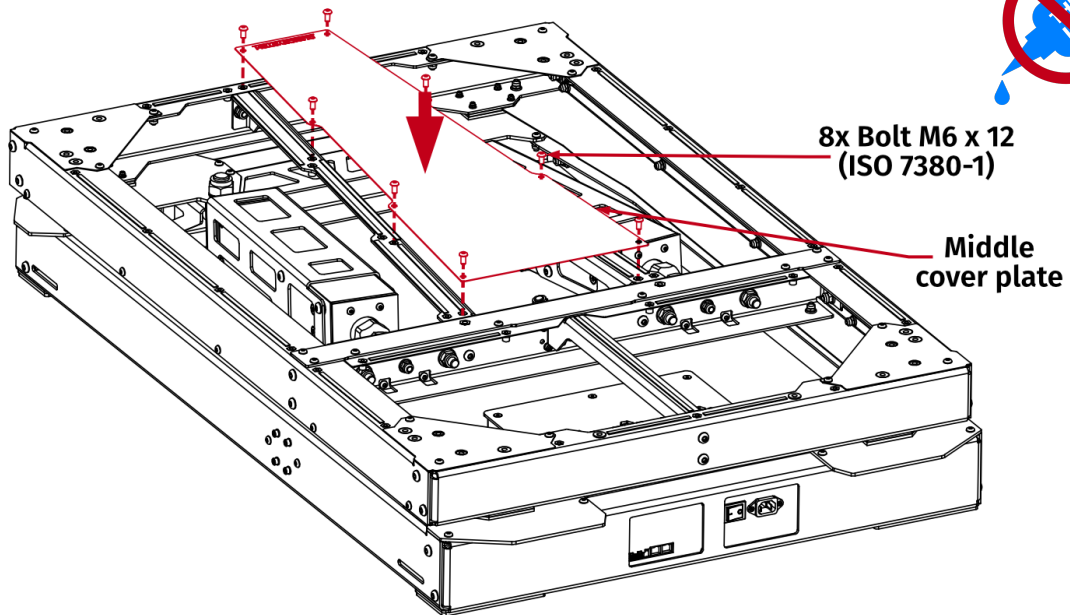
Power **OFF** the platform before performing on it any work.

1. Apply self-adhesive EPDM noise-dampening strips between the rivet nuts along the edge of the cover plate mounting surface (for reference see the next steps with illustrations). Start the strip 10 mm from a rivet nut, apply it continuously along the edge, and trim it so that it ends 10 mm before the next rivet nut.

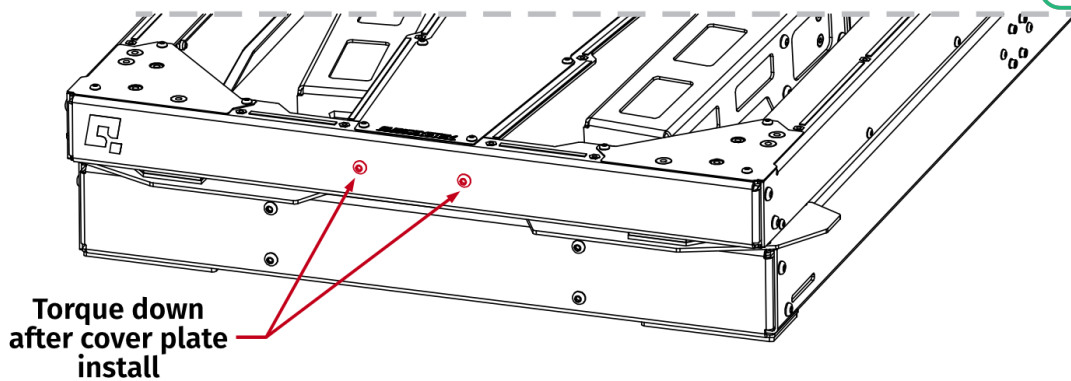
Test-fit the covers first without the EPDM strips to determine where to install the strips so that they remain hidden.



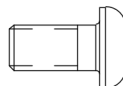
-
- 2.** Install only the middle cover plate. First screw the bolts in evenly, then torque them down to 9.5 Nm (7 ft-lbs). Do not use threadlocker.



- 3.** Torque the rear bolts which mount the left and right reinforcement beams (23 Nm - 17 ft-lbs).

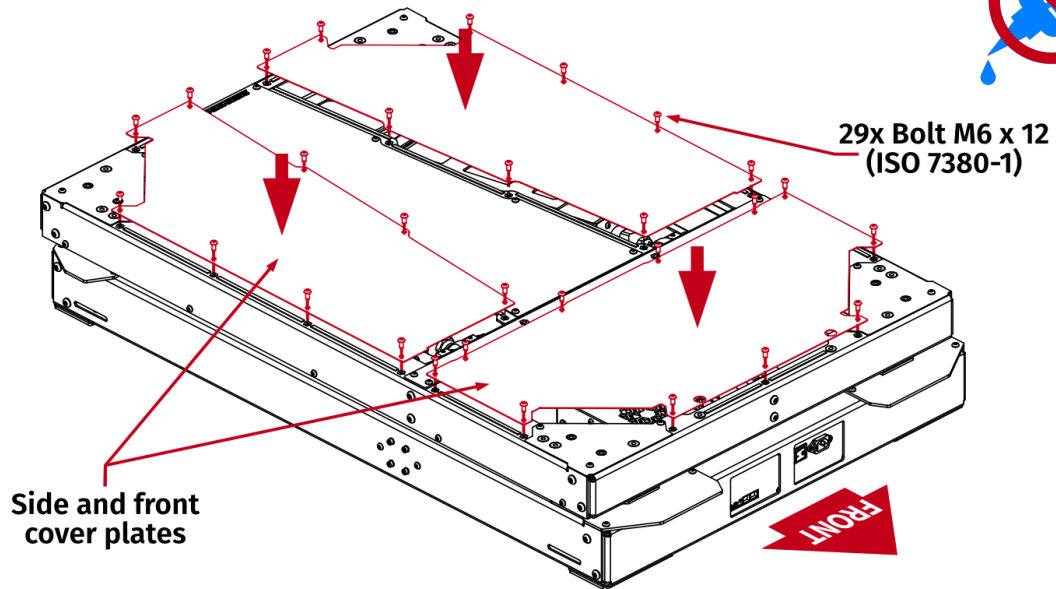
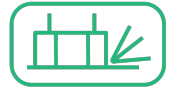


HARDWARE SIZE REFERENCE — SCALE 1:1



BOLT M6 x 12 (ISO 7380-1)

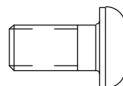
- 4.** Install the remaining side and front cover plates. Use the method as before - first screw the bolts in evenly, then torque them down to 9.5 Nm (7 ft-lbs). Do not use threadlocker.



INFO

Removal is the reverse of installation.

HARDWARE SIZE REFERENCE — SCALE 1:1



BOLT M6 x 12 (ISO 7380-1)

4.8. POWERED OPERATIONAL TESTS

Read the following sections in their entirety to familiarize yourself with their contents before proceeding with the testing procedures.

INFO

The powered operational test in summary:

1. Connect the QS-TP1 according to diagrams and install QubicManager software.
2. Power up the QS-TP1, wait for the reference-run to finish
3. Bring the platform to exact center position
4. Check if the frames are aligned perfectly
5. Perform first kinematic Surge test (test no. 1)
6. Perform second kinematic Surge test (test no. 2)
7. Perform first kinematic Yaw test (test no. 3)
8. Perform second kinematic Yaw test (test no. 4)

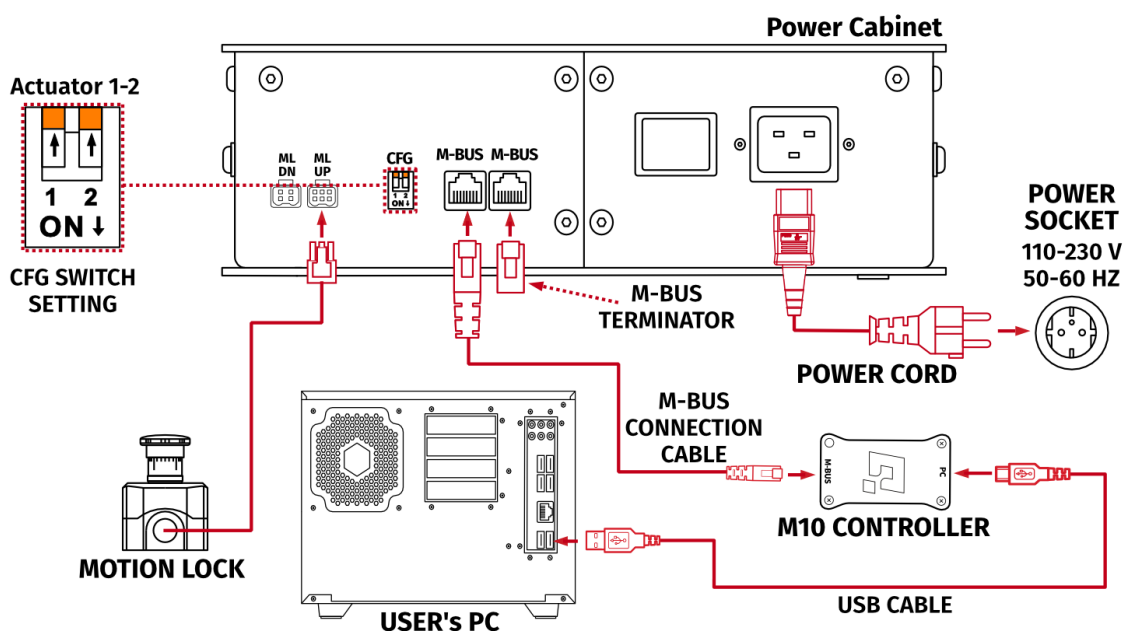
Throughout the kinematic testing procedures, check the QS-TP1 for any defects, errors, or abnormal behavior according to the **acceptance criteria** listed in the following sections.

4.8.1 CABLE CONNECTIONS

Connect the QS-TP1 as instructed on the diagram below. CFG DIP switch setting must remain at 1-2 default position. QS-MC6 (which contains M10 controller, Motion Lock button and necessary connection cables) set is required to establish communication with a PC.

KEEP the Motion Lock button near the user.

DO NOT turn on the power switch yet.



WARNING

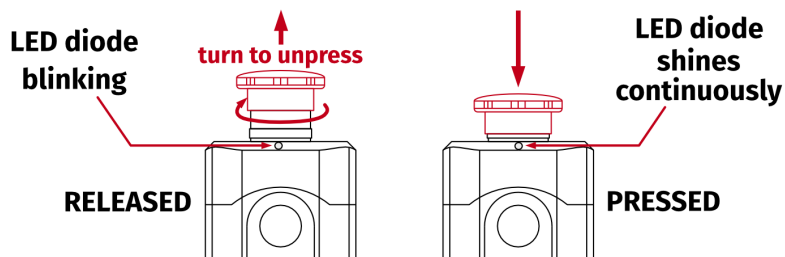


- Make sure that nothing and no one is in close proximity to an active platform. Keep at least 0.5 m (1.6 ft) away from the machine at all times.
- Before testing, check the machine's grip on the floor by pushing it. If it moves only with significant resistance, it is acceptable.

INFO

Motion Lock button operation instruction:

- Motion Lock button **RELEASED** - once the QS-TP1 is powered, it will move whenever it receives any type of input signal (calibration, gameplay input, diagnostic motor position input).
- Motion Lock button **PRESSED** - the QS-TP1's actuator power supply is cut-off, no input signal will activate it.



4.8.2 SOFTWARE INSTALLATION

To download the software visit: QubicSystem.com/Download

Once the QS-TP1 is installed and connected correctly:

1. Download **Qubic Manager Software**.
2. Proceed with the installation steps and launch the application.
3. Turn on the system by switching on the power switch button on the Power Cabinet.
4. Cycle through the Motion Lock button positions - press and unpress it (go to section 2.10 on page 14 for details on the procedure).
5. Turn off Global Pause in the lower right corner.

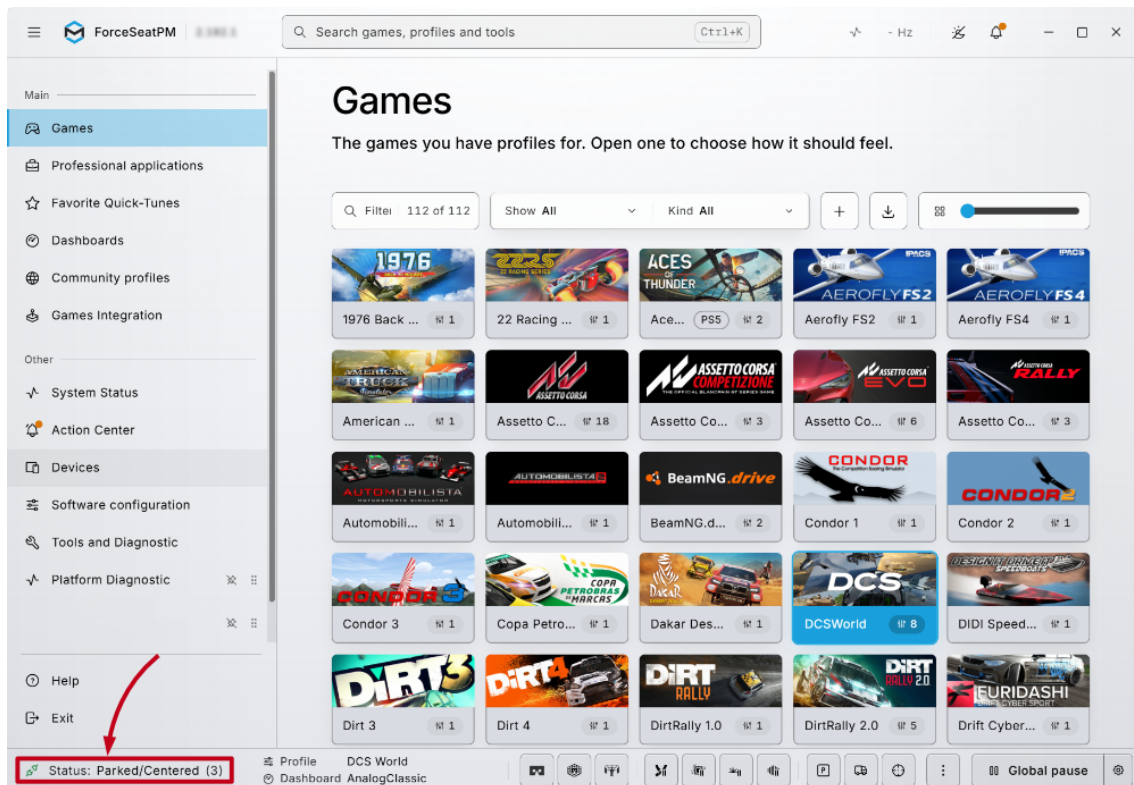
WARNING: the platform will perform a start-up calibration.



WARNING

- **DO NOT** change the payload during the start-up calibration.
- **DO NOT** enter the cockpit during the start-up calibration.

6. If Qubic Manager has recognized the QS-TP1 correctly, the status of the machine visible in the lower left corner will change to **Parked/Centered**.



WARNING

If the device did not connect correctly:

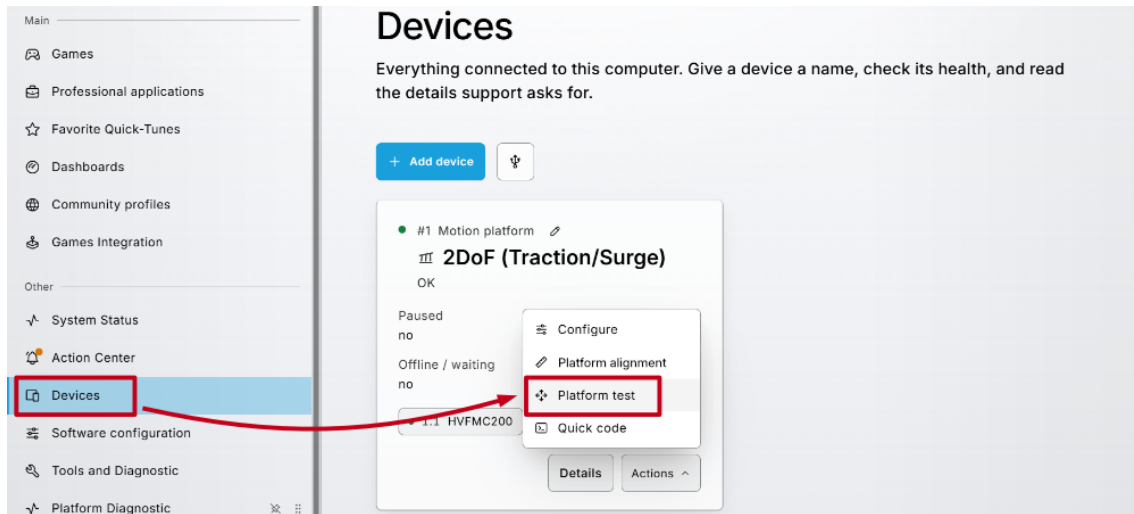
- Go over the cable connections - compare the connections to the diagram again, look for loose plugs or damaged cords.
- Go to **Troubleshooting** section on page 126.

4.8.3 GEOMETRY CALIBRATION

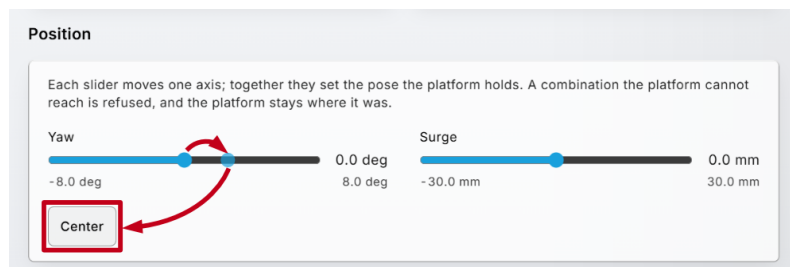
After the platform has completed the reference run (the “Parked/Centered” status is displayed in the bottom-left corner of QubicManager), the top frame will move away from the center. This is a normal behavior and indicates that the platform is ready for operation.

However, to check the correct geometry of both frames, return the top frame to the center position:

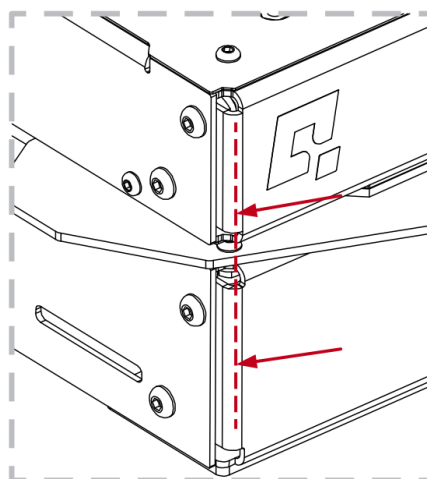
1. Go to QubicManager → Devices → expand the Actions menu → Platform test.



2. Use the sliders to move the platform away from center → click "Center" button.



3. Check if the upper and lower frames are parallel (perfectly aligned on the sides) by observing the rear corners of the frames.



4. If misalignment is noticeable (the upper frame is shifted forward/backward or twisted to the side - 5.5 mm of deviation is within tolerance) go to QubicManager → Devices → expand the Actions menu → Platform alignment.

Click the arrows to align both frames together. If misalignment is present in the longitudinal axis, use the Surge alignment.

Platform alignment

2DoF (Traction/Surge) - TRIMMING - SURGE - YAW - SURGE

The traction unit is trimmed as yaw and surge: yaw turns it, surge moves it forward and back. There is nothing to measure here - adjust and watch the unit settle.

Traction unit

Yaw turns the unit by moving its two actuators against each other; surge moves both together. Each adjustment moves the unit briefly and returns it, so the change can be seen. The two share one range, so an axis stops as soon as either actuator reaches its end.

Yaw

Surge

↶

- 5

↷

↓

0

↑

Actuators: left - 5 %, right 5 %

Adjustments take effect at once, but are only kept through a power cycle once saved.

Save

Make sure to save the changes in order to preserve them.

INFO

If the software alignment is already at its limit and misalignment is still present:

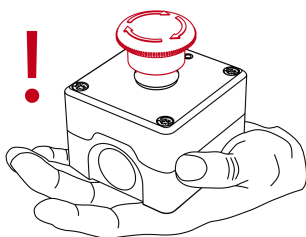
- Sideways misalignment: go back to the tension rod setup and assembly step; verify its dimensions.
- Yaw misalignment: the piston rod head may not be assembled or installed correctly.

Go back to the relevant steps and verify the assembly.

4.8.4 KINEMATIC TEST PROCEDURES

The kinematic and dynamic tests must be performed using a sinusoidal Surge and Yaw motion (separately) at maximum speed, amplitude and two frequencies. Kinematic tests are performed in **four stages**.

WARNING



During kinematic testing, the user is allowed to approach and observe the machine; however, touching the machine or inserting any part of the body inside it is strictly prohibited.

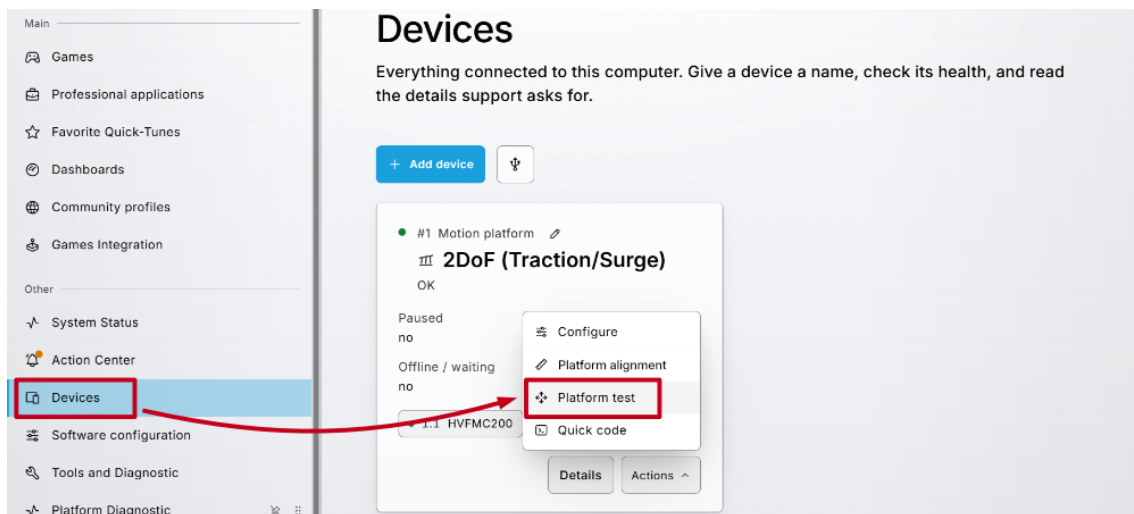
During testing, the user must keep the Motion Lock button in their hand at all times. **If, in any stage of the testing, you encounter any defects or abnormal noises - push Motion Lock button immediately to avoid damage.**

Four test stages to perform:

1. Surge 30 mm at 0.5 Hz frequency
2. Surge 30 mm at 1.0 Hz frequency
3. Yaw 8° at 0.5 Hz frequency
4. Yaw 8° at 1.0 Hz frequency

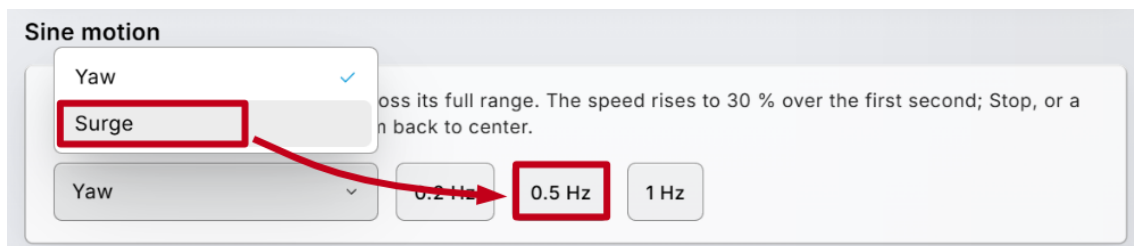
In order to perform the test:

1. Go to QubicManager → Devices → expand the Actions menu → Platform test.



2. Expand the motion menu → pick Surge → click 0.5 Hz

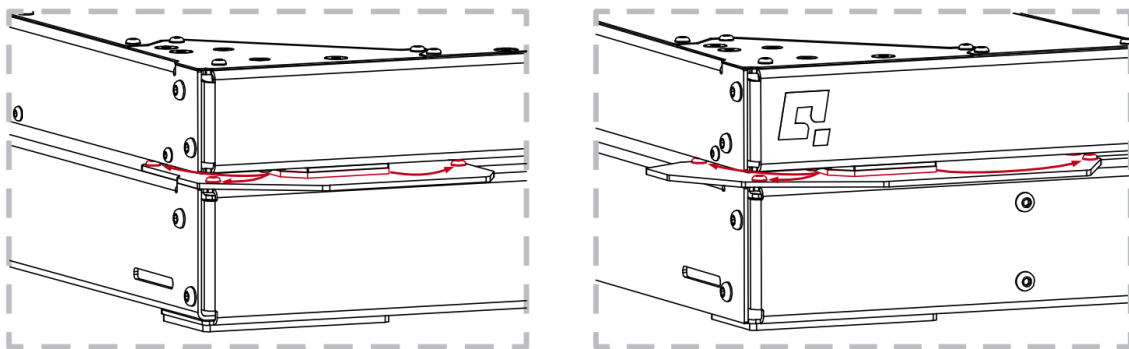
WARNING - the platform will begin the motion.



3. Observe and listen to the platform's behavior, using the acceptance criteria provided in the following section. Proceed only after confirming that the platform is operating correctly.
4. Click Stop button or wait for the motion command to finish. Proceed to the next steps: Surge 30 mm at 1.0 Hz frequency → Yaw 8° at 0.5 Hz frequency → Yaw 8° at 1.0 Hz frequency.

4.8.5 ACCEPTANCE CRITERIA DURING MOTION TESTS

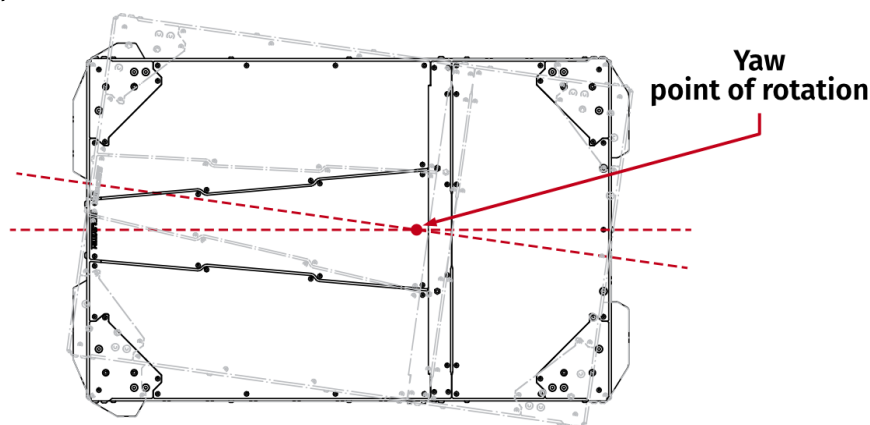
- At a frequency of 0.5 Hz, check for collisions, jamming, and smooth operation. Audibly and visually inspect for looseness. Make sure that the slider pads do not hit the protruding bolts.



- At a frequency of 1 Hz, check whether the machine is not moving on the floor, and is not blocking itself - runs smooth, fast and quiet.

✓ **Normal** machine behavior:

- ✓ Smooth and quiet looping (sinusoidal) motion in both Surge and Yaw.
- ✓ During Surge sinusoidal motion, the top frame follows a very minor curved path rather than moving in a perfectly straight line. This is a normal characteristic of the platform's mechanical design and is not perceptible to the user during normal operation.
- ✓ Equal Yaw (rotational) excursions to the left and right, and equal Surge excursions to the front and rear.
- ✓ During Yaw motion, the point of rotation is located directly behind the crossbeam of the top frame.



✓ Behavior requiring **further inspection**:

- ✓ A natural, low-intensity rubbing sound may occur as the upper slider plates move across the lubricated lower plates. This sound is unavoidable during normal operation. Ensure that the plates are properly greased and that there is no metal-to-metal contact or any dry spots along the slider travel path.

WARNING: Always perform re-greasing with the machine powered **OFF**.

- ✓ Slight movement or creeping of the machine in any direction may occur, particularly on smooth or slippery floors. If necessary, secure or anchor the machine to prevent unwanted movement. Rubber gym flooring mats have been found to provide good adhesion and can help prevent the machine from moving during testing or gameplay.

WARNING: Always perform any securing or immobilization procedure with the machine powered **OFF**.

X Unacceptable behavior:

- X** Non-smooth, irregular, or stuttering movement - may indicate a collision, excessive friction, or a faulty actuator.
- X** Collision between any two components at the end of the sinusoidal motion, indicated by a clicking or knocking sound - indicates incorrect machine geometry and/or improper assembly or damaged components.
- X** Any collision sound coming from any part of the machine at any stage of the test - indicates improper assembly or damaged components.
- X** Friction noise between any two metal components at any part of the machine - indicates improper assembly or damaged components.
- X** Reversed motion patterns (for example surge to the front instead of to the rear) indicate that the actuators are connected to the wrong slots.
- X** Any metal component rubbing against or contacting any cable - indicates incorrect cable routing.
- X** The two frames moving apart vertically - indicates an incorrect input signal, improper assembly or damaged components.

If expected correct behavior is reached, you may proceed to the next assembly steps. **DISCONNECT** the platform and power it **OFF** before performing any work on the machine.

INFO

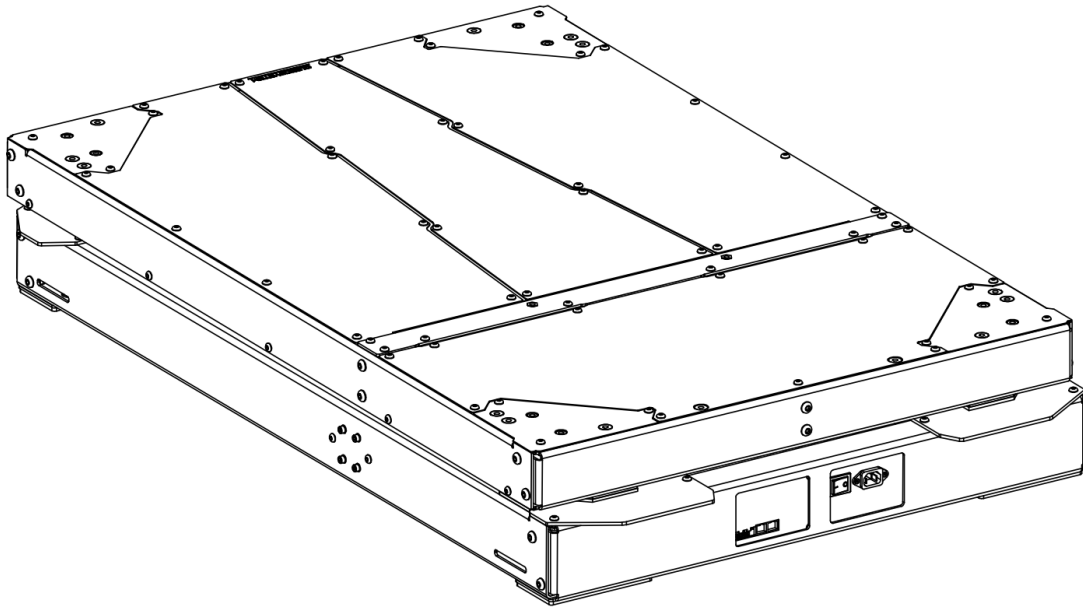
If you encounter any defects, assembly issues or unexpected platform behavior and are unsure how to correct them, please contact technical support at **Qubic-System.com/TechnicalSupport**. Our Discord server is also available as a place where you can obtain technical assistance and information (**9.4** on page **131**).

TIP

After testing the powered operation, wipe off grease residue moved to the edges of the slider plates with a soft and dry cloth.

5. POST-ASSEMBLY SUMMARY

At this stage, if the instructions have been followed correctly and chronologically, the machine is fully assembled and ready for the cockpit installation to be continued:



- Installation of a custom aluminum profile cockpit is available with the included brackets - **6.1** on page **88**.
- Installation of a motion platform with QS-210 or QS-220 actuators is available with the included actuator captive cups and brackets - **6.2** on page **94**.
- Make sure to connect the machine correctly - set the DIP switches according to your setup, details in section **7.1** on page **109**.
 - CFG 1-2 for QS-TP1 only
 - CFG 3-4 for a QS-motion platform 2DoF
 - CFG 5-6 for a QS-motion platform 3DoF
 - QS-H13 and QS-BT1 do not need to be included in the CFG switch circuit (they connect independently via USB)
- It is recommended to create a single Motion Lock circuit for all QubicSystem machines in the ecosystem and use a single Motion Lock button which stops all devices at once - section **7.4** on page **112**.
- Ensure that the Motion Lock button is mounted within immediate reach of the user, taking into account the restricted movement caused by being strapped into a seat with a racing harness.
- **Always ensure that bystanders are aware of the machine's dynamic capabilities and range of motion to prevent injury during operation of the motion platform.**

6. INTEGRATION WITH A COCKPIT

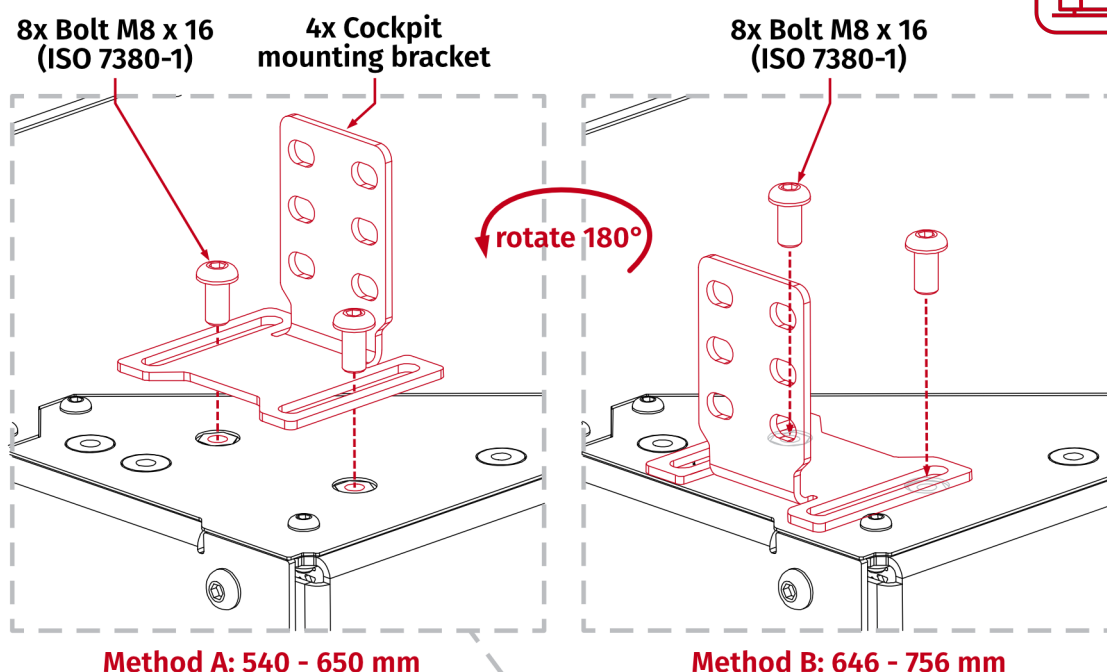
Proceeding with the installation should only be considered if the QS-TP1 is fully assembled, tested in motion, and with all bolts torqued to specification.

6.1. CUSTOM ALUMINUM PROFILE COCKPIT INSTALLATION

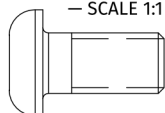
There are two methods of installation available, which enable a wider range of supported cockpit widths:

- Mounting method A - 540-650 mm of cockpit width (21.26-25.60 in.)
- Mounting method B - 646-756 mm of cockpit width (25.43-29.76 in.)

Install the included cockpit mounting adapter brackets. **DO NOT** torque the bolts yet. Match your cockpit's width to one of the two mounting methods (cockpit mounting bracket bottom surface facing inside or outside):



HARDWARE SIZE REFERENCE
— SCALE 1:1



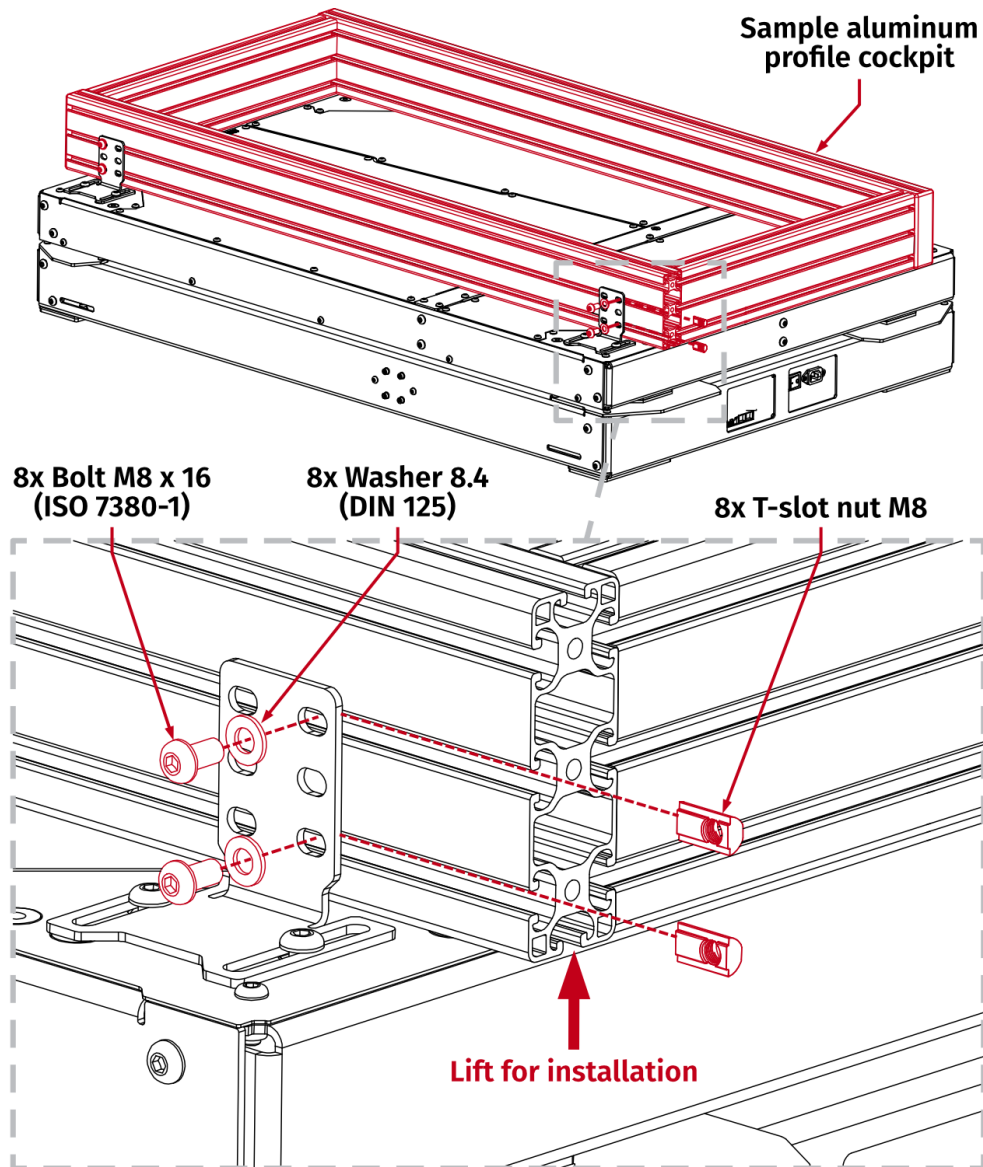
BOLT M8 x 16
(ISO 7380-1)

TIP

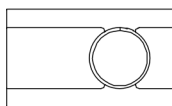
For easier installation, remove any unnecessary accessories from the cockpit to reduce its weight. If this is not possible, two-person handling may be required.

Mounting method A:

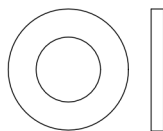
A 1. Install your aluminum profile cockpit on the QS-TP1's top frame. Align the cockpit's longitudinal center axis with the top frame's longitudinal center axis. Your cockpit will need lifting to align mounting bolts with T-slot nuts.



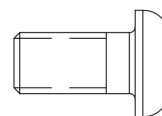
HARDWARE SIZE REFERENCE — SCALE 1:1



T-SLOT NUT M8

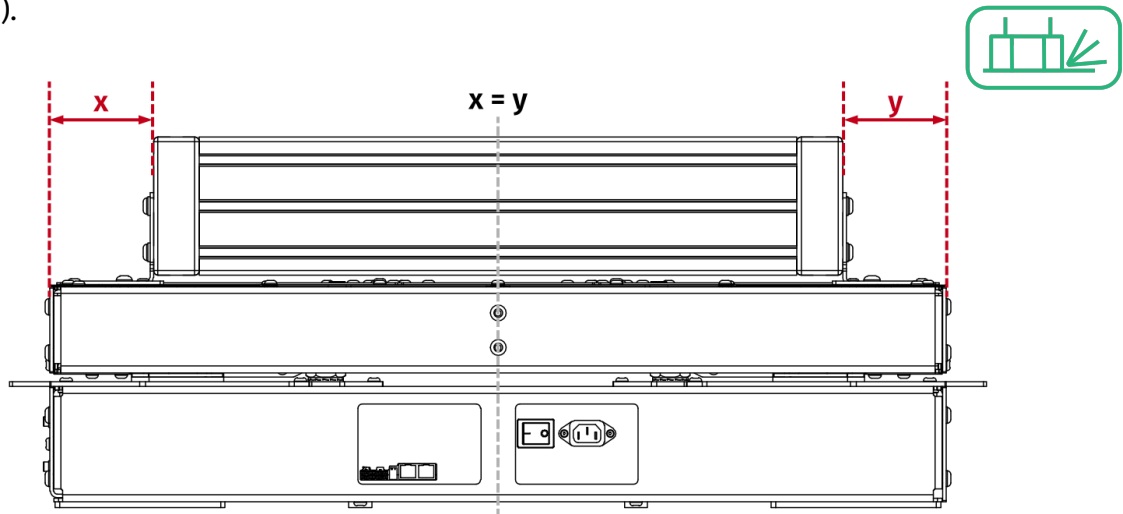


WASHER A 8.4 (DIN 125)



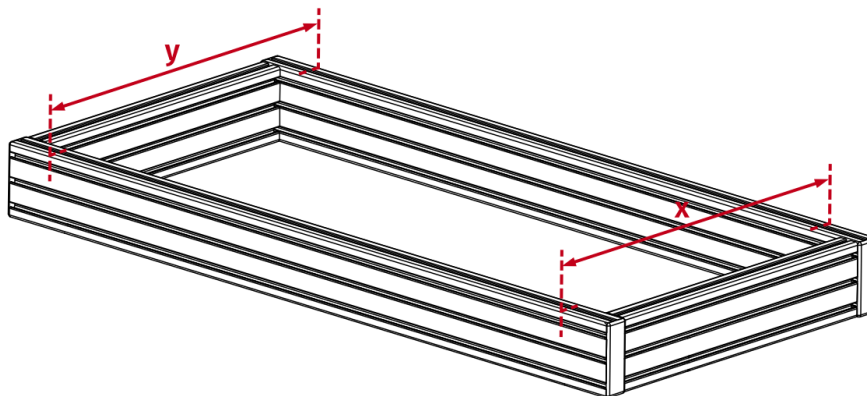
BOLT M8 x 16 (ISO 7380-1)

A 2. Make sure that the cockpit is installed directly in the QS-TP1's longitudinal axis. Measure the distance from the side of the cockpit to the edge of QS-TP1's top frame - it must be equal at all four corners. Torque all M8 bolts used for installation (23 Nm - 17 ft-lbs).

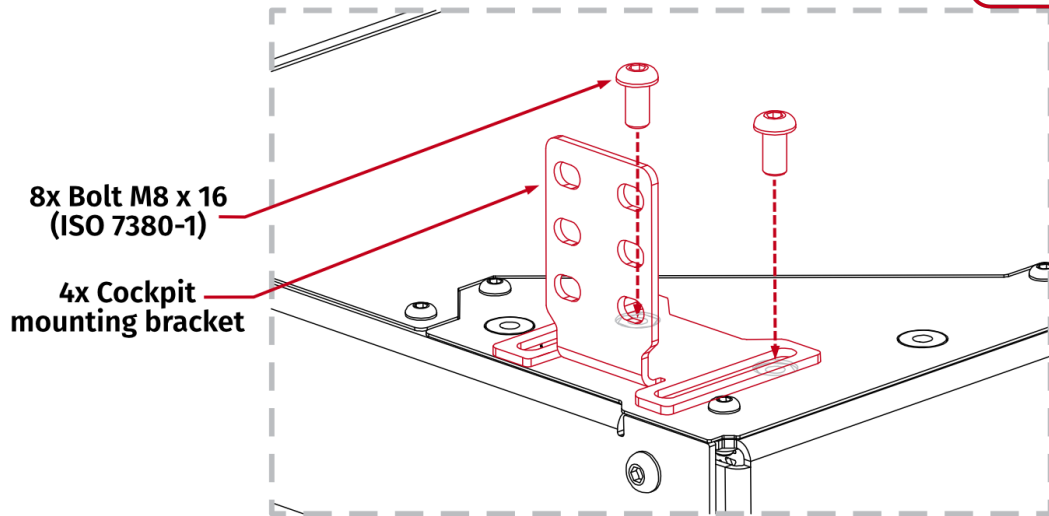


Mounting method B:

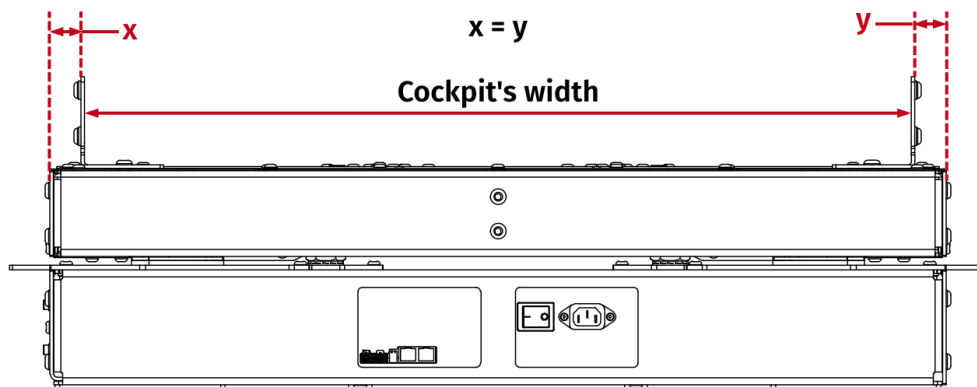
B 1. Measure the width of your cockpit precisely in the mounting spots. It is recommended to measure both the front and the back.



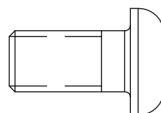
B 2. Rotate the mounting bracket 180° from the A method and install them on the QS-TP1. Do not torque the bolts yet.



B 3. Adjust the adapters so that their overall length matches the cockpit length exactly. Position them symmetrically, with equal clearance from the edges on both sides.

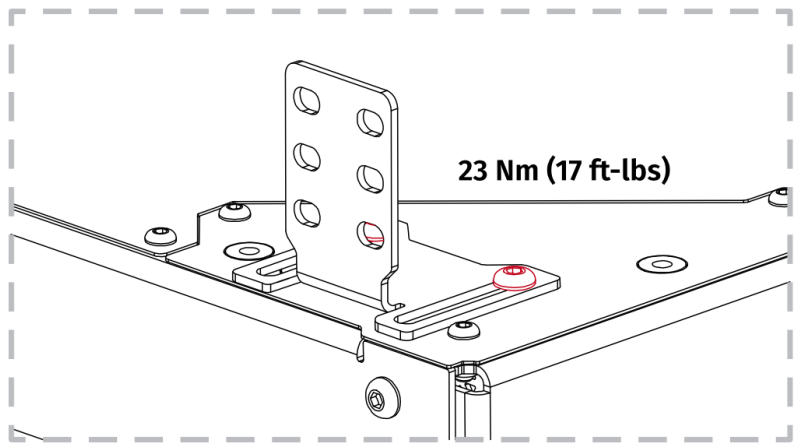


HARDWARE SIZE REFERENCE — SCALE 1:1

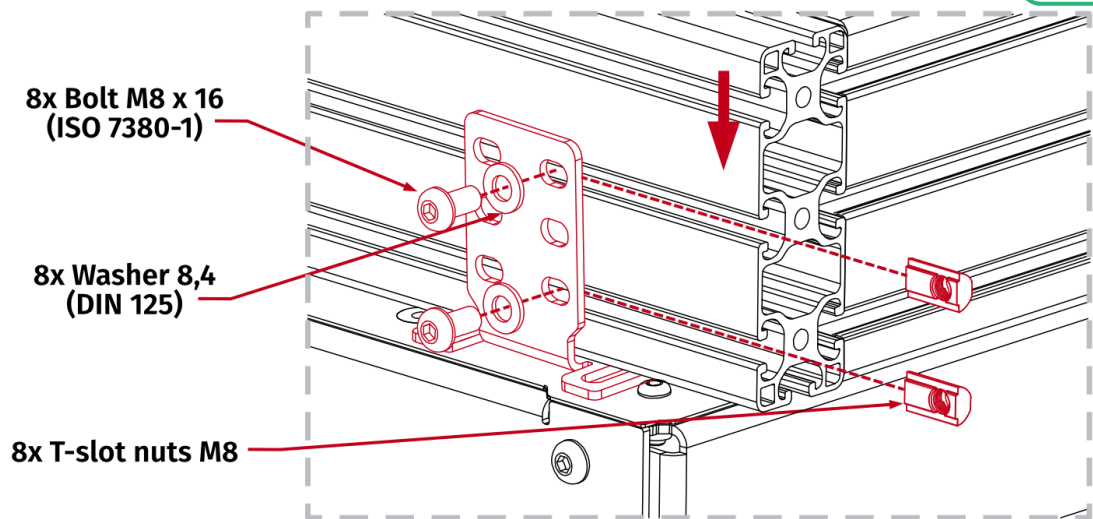


BOLT M8 x 16 (ISO 7380-1)

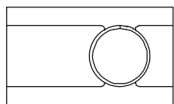
B 4. After the adapters have been adjusted perfectly, torque them to 23 Nm (17 ft-lbs). Once the cockpit is installed on top, the bolts will no longer be accessible.



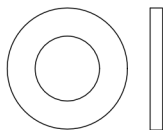
B 5. Install the aluminum cockpit to the adapters. Torque all the mounting bolts to 23 Nm (17 ft-lbs).



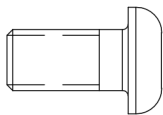
HARDWARE SIZE REFERENCE — SCALE 1:1



T-SLOT NUT M8

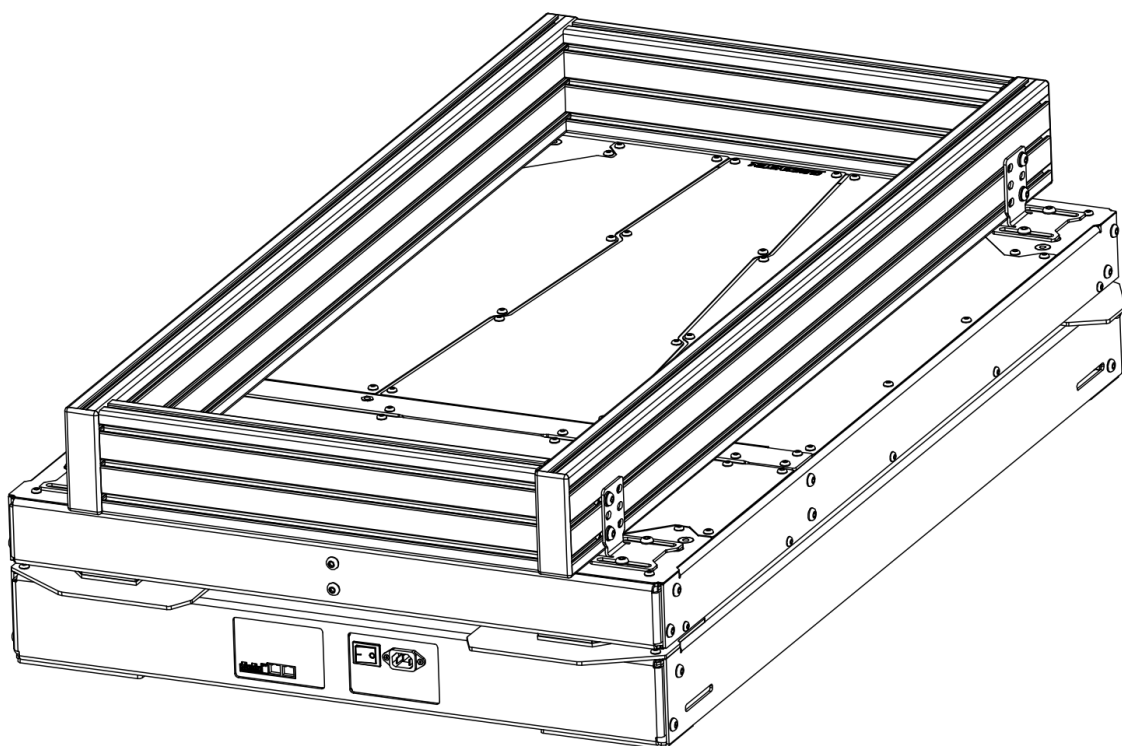


WASHER A 8.4 (DIN 125)



BOLT M8 x 16 (ISO 7380-1)

Illustration of a finished assembly (method A)

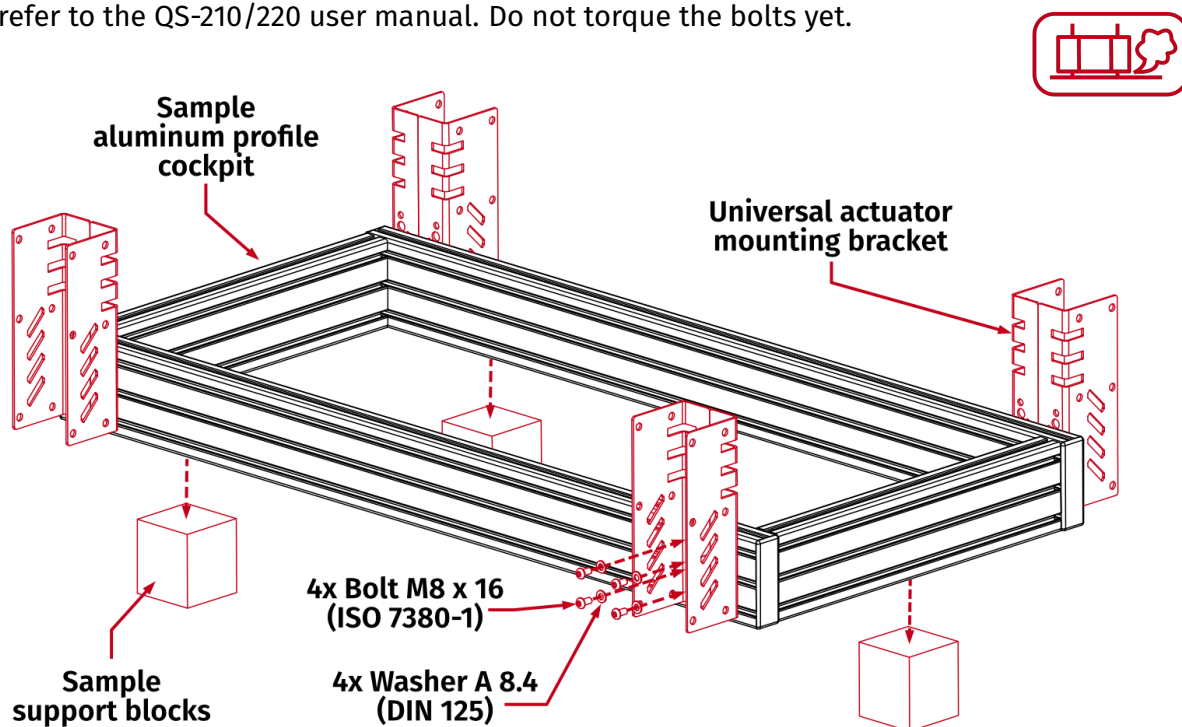


6.2. QS-210/QS-220 VERTICAL ACTUATORS INSTALLATION

Pre-installation information:

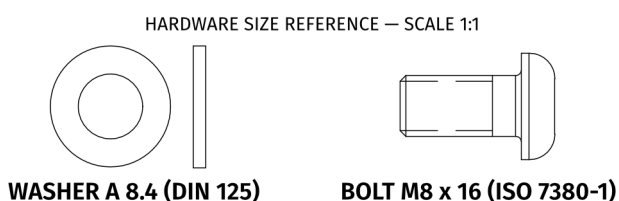
- Placing a motion cockpit on a QS-TP1 must be performed with vertical actuators already installed to a rigid cockpit, with captive cups installed.
- The longitudinal position of the vertical actuators has to be corrected to fit QS-TP1's mounting points. Lateral adjustment and longitudinal dimensions are available in step 2. (6.2 on page 95).
- For details on the vertical actuator mounting procedure - refer to the QS-210 or QS-220 user manual.

1. Mount the actuator universal adapter to your aluminum profile cockpit. For details refer to the QS-210/220 user manual. Do not torque the bolts yet.



TIP

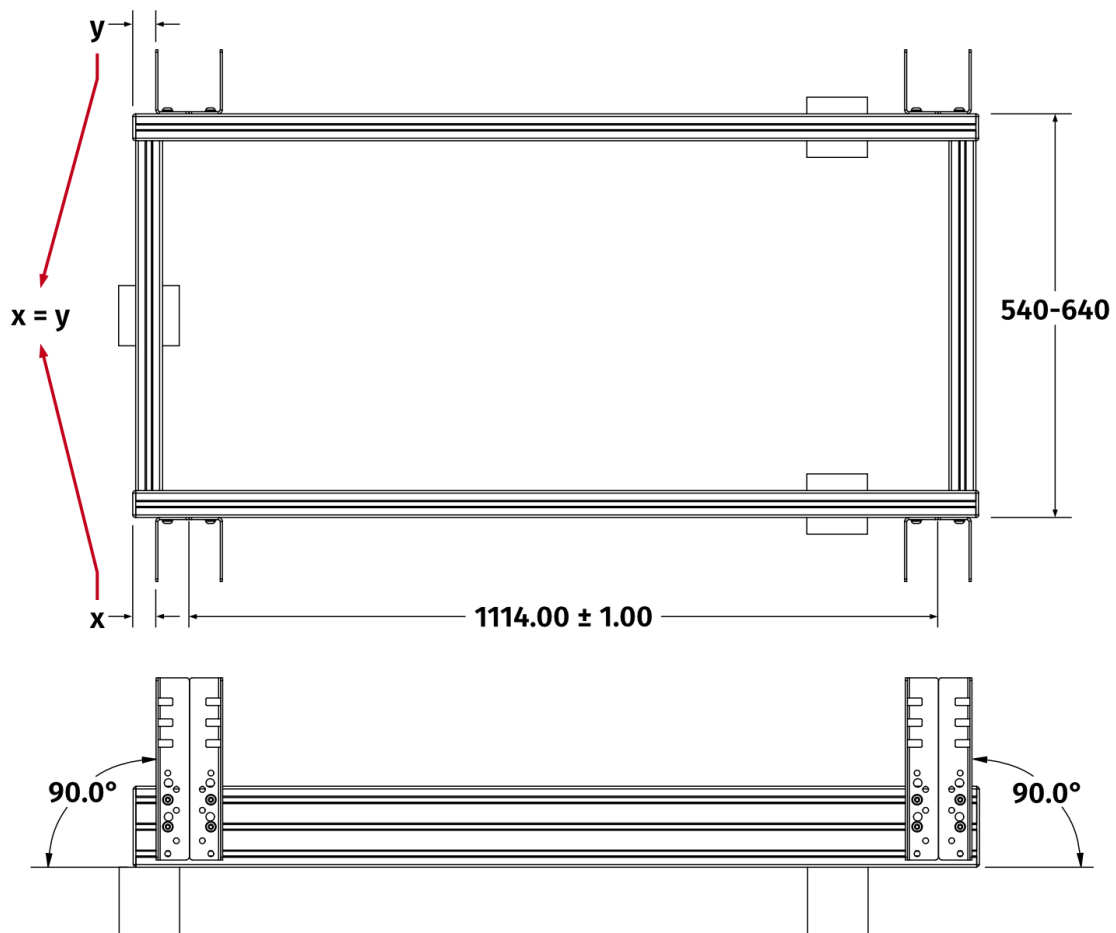
For easier installation, remove any unnecessary accessories from the cockpit to reduce its weight. If this is not possible, two-person handling may be required.



2. Make sure to position the adapter bracket within specified dimensions to fit the QS-TP1's captive cups. The actuator mounting brackets **must be** perfectly perpendicular to the ground (or cockpit's side profiles) and with equal width from the edges of the cockpit (forming a perfect rectangle).

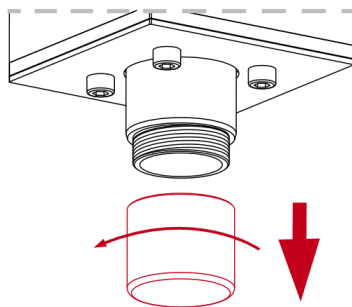
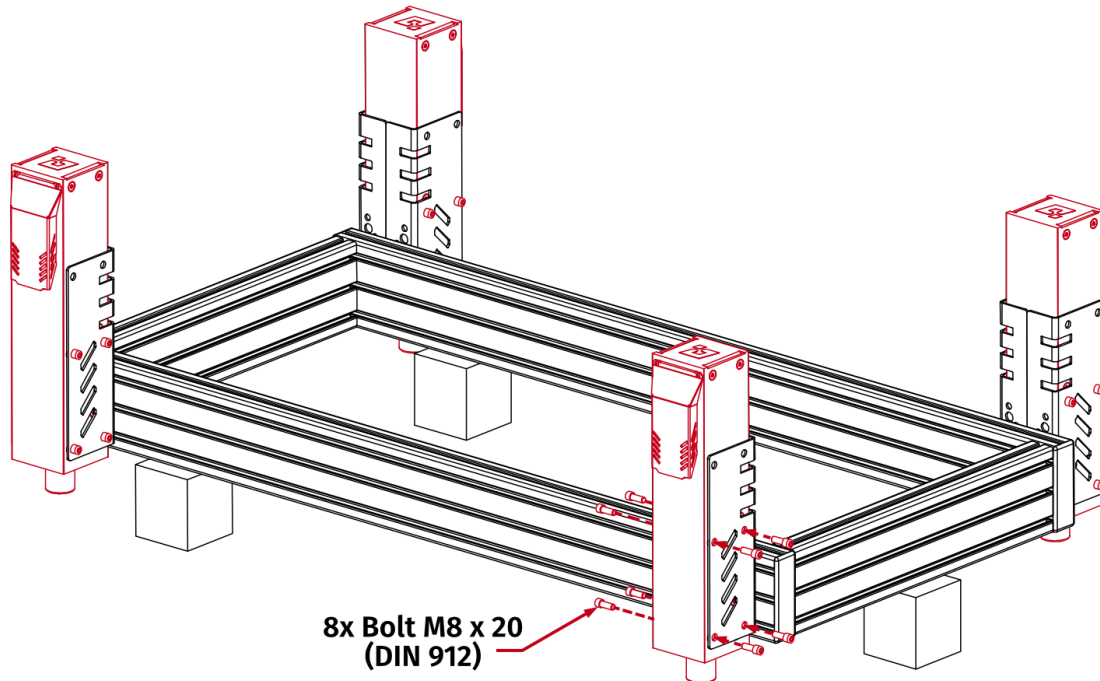
INFO

Cup mounting plates allow **only** for lateral adjustment (between 540 and 640 mm). For longitudinal adjustment - position the vertical actuators precisely according to the dimensions.



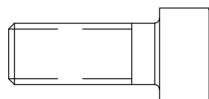
3. Lift your cockpit in the air high enough to clear the height of the actuators mounted to the sides. You can place it temporarily on support blocks or car jack stands.

Install the actuators, refer to the QS-210/220 user manual.

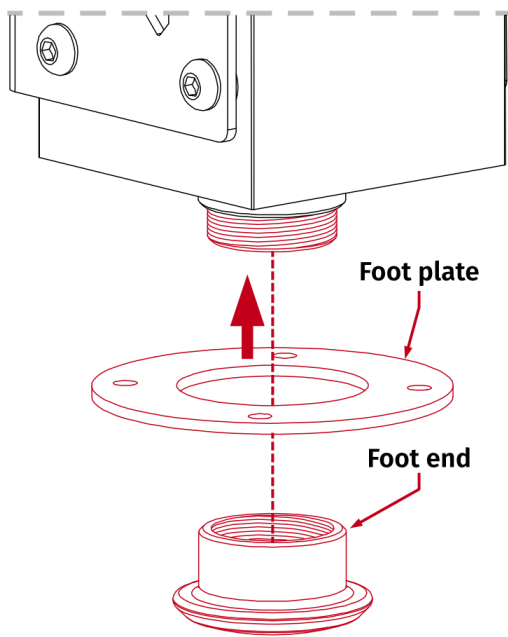


4. If plastic actuator feet are installed into piston rods, remove them by unscrewing them counterclockwise. In case they are seized from previous usage - use work gloves with thick rubber coating to ensure better grip and protection from abrasion.

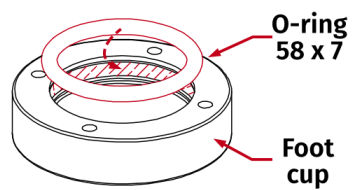
HARDWARE SIZE REFERENCE — SCALE 1:1



BOLT M8 x 20 (DIN 912)

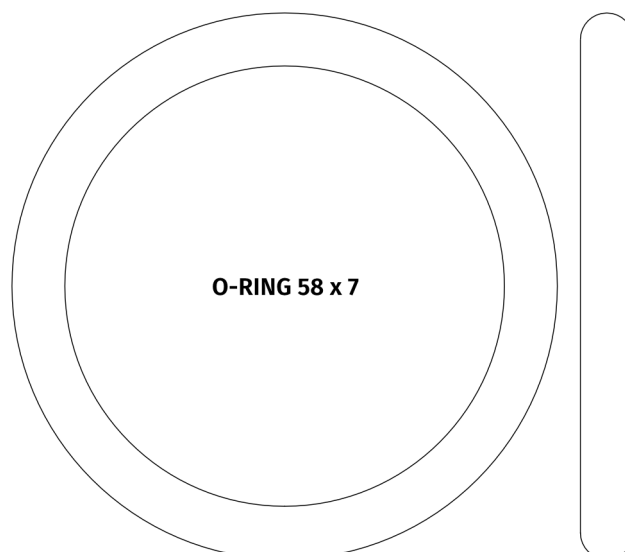


5. Slide the foot plates into the piston rods and screw in the foot ends. **DO NOT** overtorque, they must be screwed in manually.



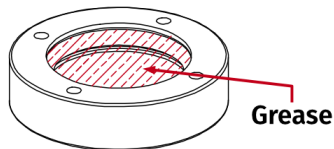
6. Insert rubber O-rings into the foot cups.

HARDWARE SIZE REFERENCE — SCALE 1:1

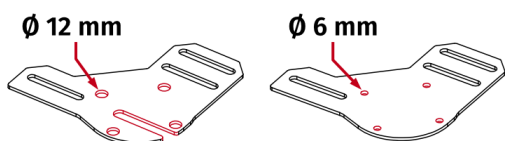


WARNING

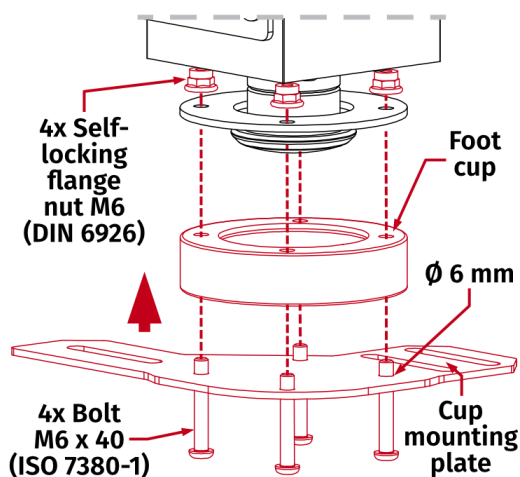
Wear protective equipment before proceeding to the next step.



7. Distribute a thin layer of sliding grease in all four cups and spread it flat and level on the bottom and the o-ring.



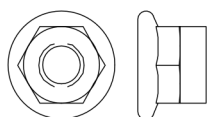
Notice: There are two types of cup mounting plates - 6 mm and 12 mm holes with a cutout. Ensure to use the correct one for the next step.



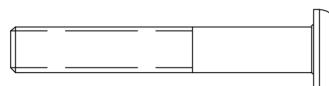
8. Install the **6 mm** cup mounting plates with the foot cups into the foot plates. Torque the bolts up to specification (9.5 Nm - 7 ft-lbs).

Note: the bolts **MUST** be inserted from below, otherwise the cockpit will not mount to QS-TP1 correctly.

HARDWARE SIZE REFERENCE — SCALE 1:1

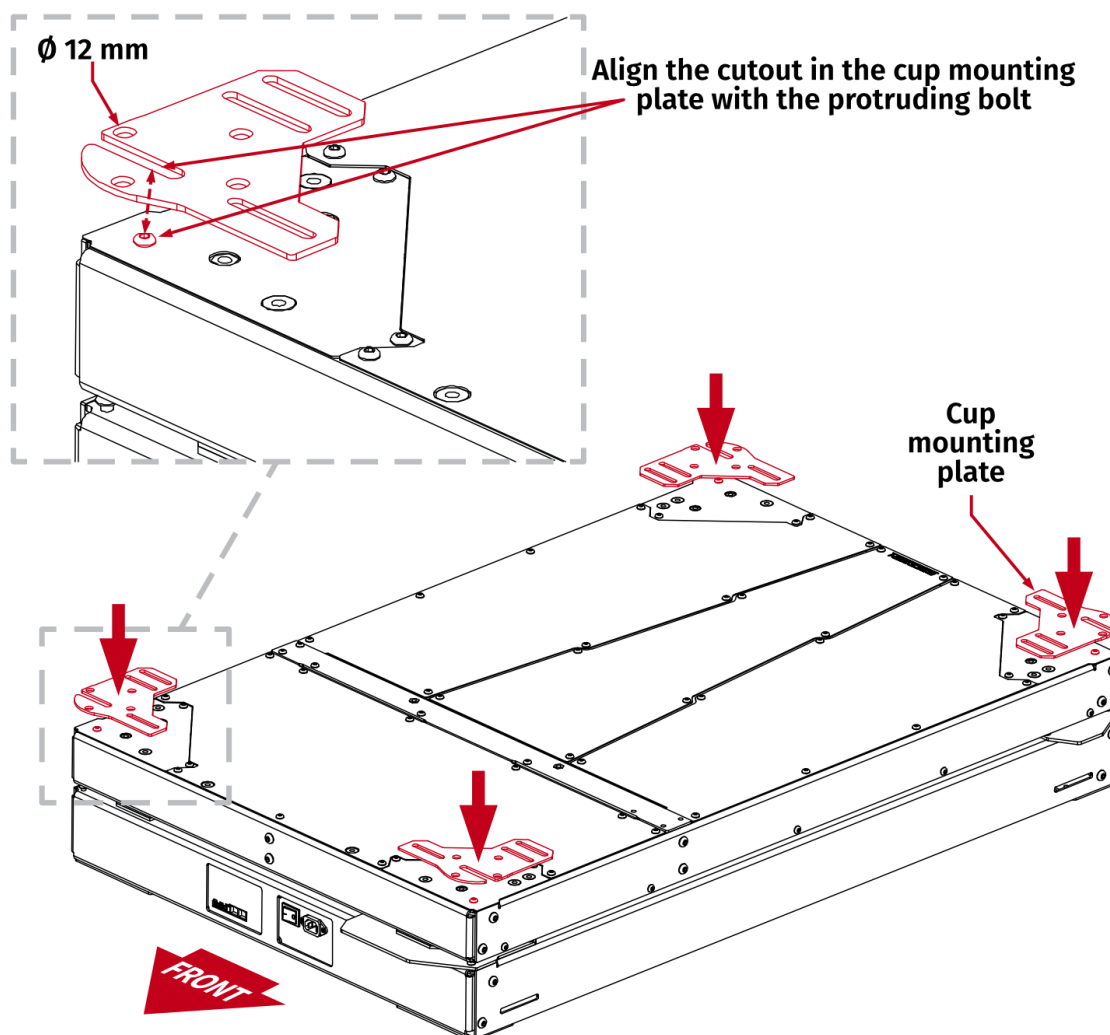


SELF-LOCKING FLANGED NUT M6 (DIN 6926)



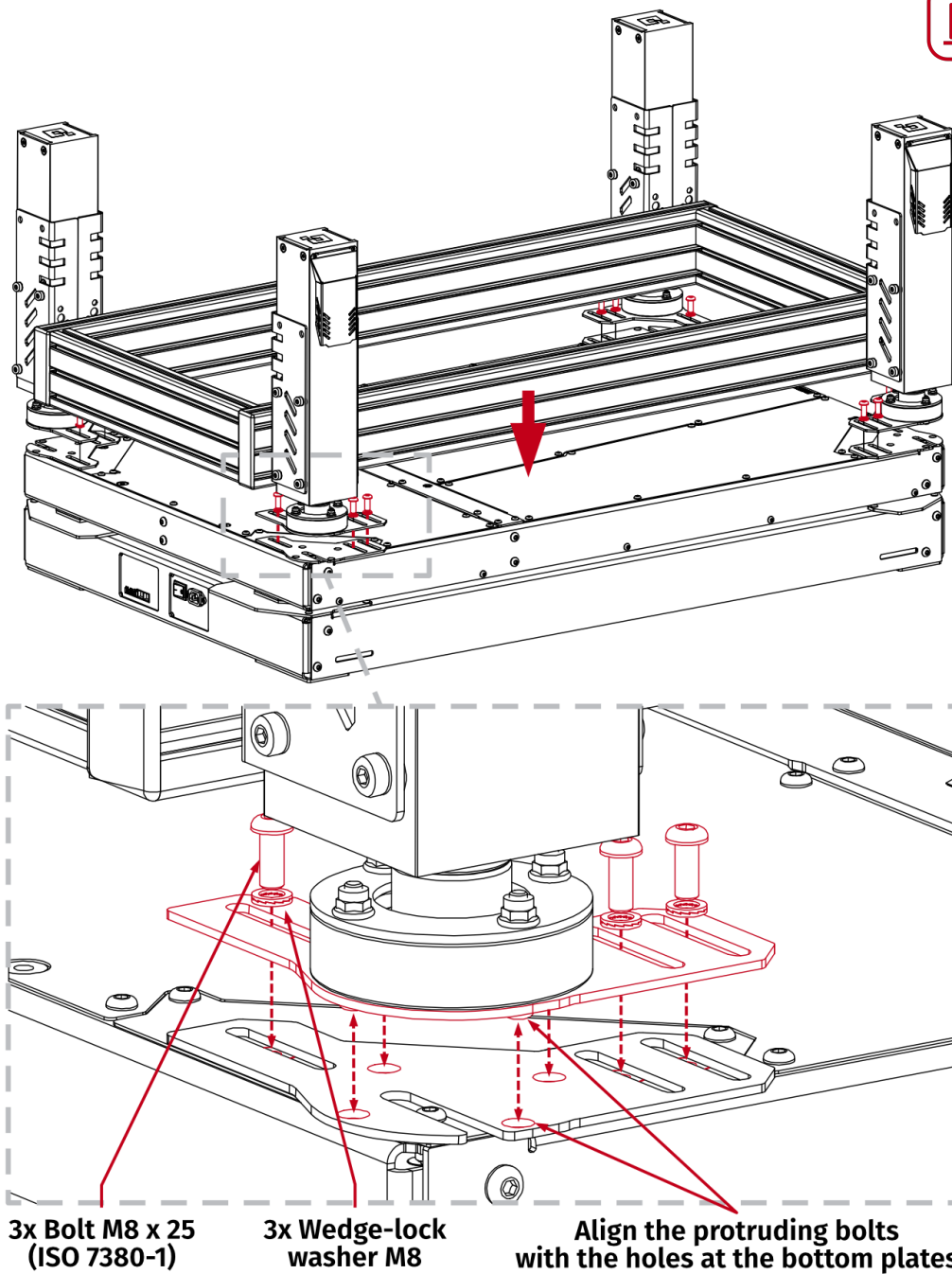
BOLT M6 x 40 (ISO 7380-1)

-
9. Place 12 mm cup mounting plates on the top frame. Align their cutout with the top frame's protruding M6 bolt. Refer to the illustration:

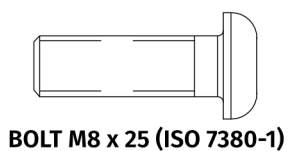


10. Place your cockpit on the QS-TP1's top frame. Align the cup mounting plates with the bottom 12 mm cup mounting plate. Protruding bolts from the bottom should slide into correct position. Ensure both plates are aligned.

Screw in the M8 bolts with wedge-lock washers **manually**. Do not torque them down yet.

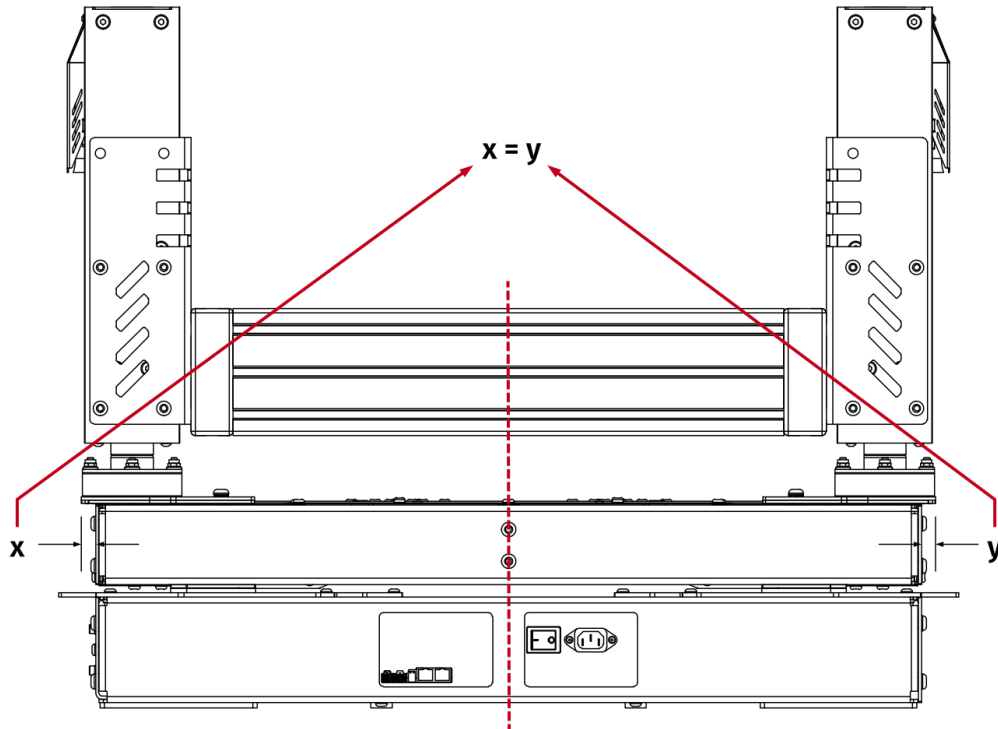


HARDWARE SIZE REFERENCE — SCALE 1:1



11. Ensure that the cockpit centerline is **perfectly** aligned with the QS-TP1 centerline.

a) Verify the alignment by measuring the distance between the mounting plate and the edge of the QS-TP1 at all four corners. All measurements **must be** equal.



b) Torque all 12 mounting bolts to 23 Nm (17 ft-lbs).

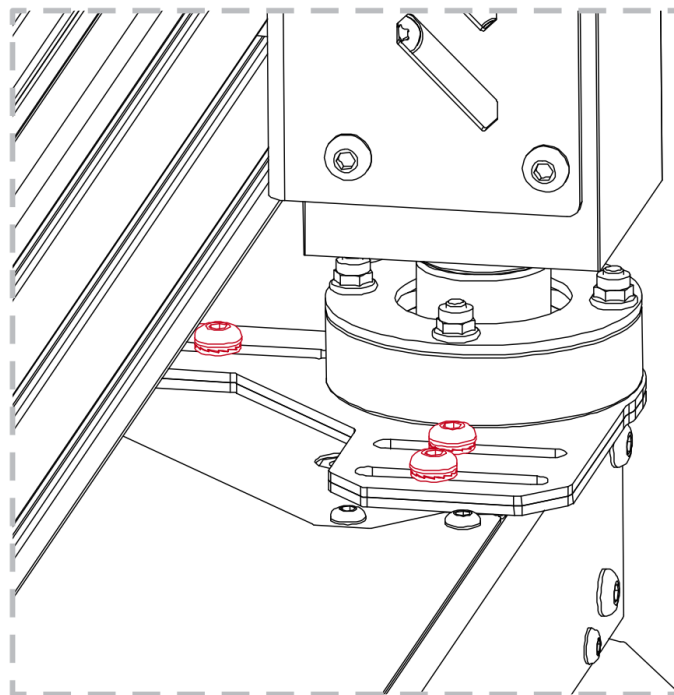
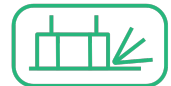
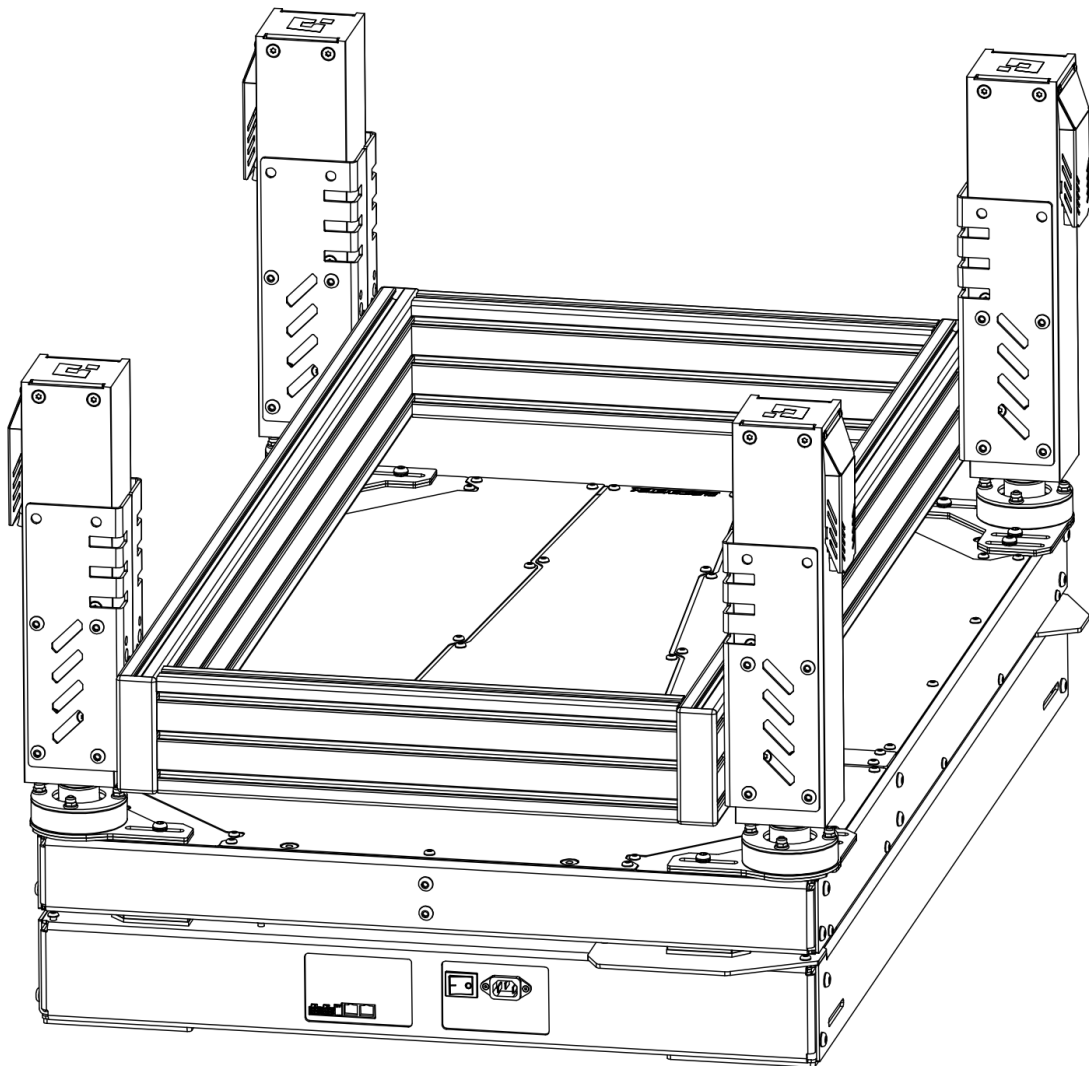


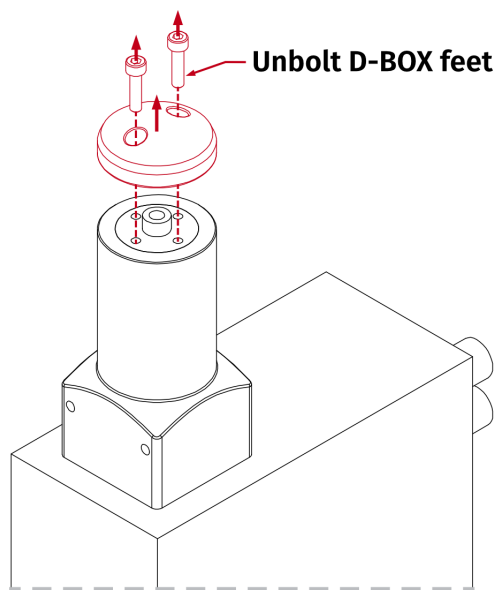
Illustration of a finished assembly:



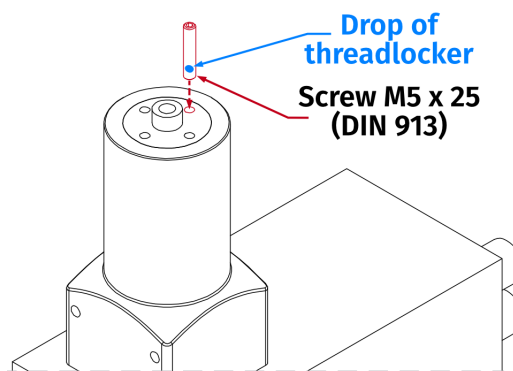
6.3. D-BOX™ G5 VERTICAL ACTUATORS INSTALLATION

Pre-installation information:

- Placing a motion cockpit on a QS-TP1 must be performed with the D-BOX™ G5 actuators already installed to a rigid cockpit, with captive cups installed.
- The longitudinal position of the D-BOX™ G5 actuators has to be corrected to fit QS-TP1's mounting points. Lateral adjustment and longitudinal dimensions are the same as for the QS-210/QS-220 actuators - refer to step 2. (6.2 on page 95).
- For details on the D-BOX™ G5 actuator mounting procedure - refer to the D-BOX™ documentation delivered with your G5 actuators.

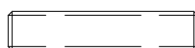


1. Unscrew the bolts and remove the original D-BOX™ feet from all four actuator piston rods. The removed feet and their bolts are **not** used any further in this procedure - store them together with the rest of the D-BOX™ accessories.

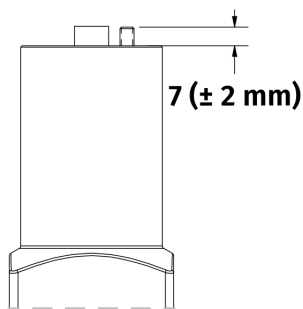


2. Screw the M5 x 25 set screw into the threaded indexing hole in the piston rod. It works as an anti-rotation pin. Apply a drop of threadlocker and use maximum of 5 Nm (3.7 ft-lbs).

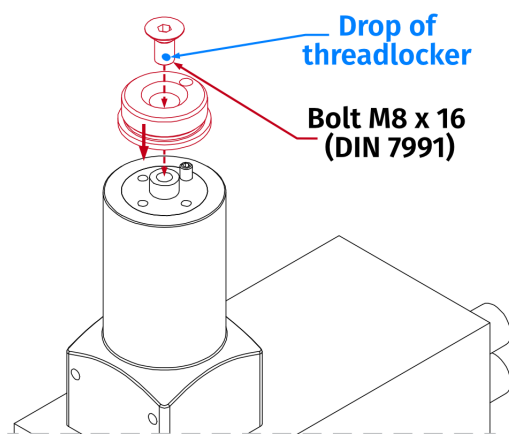
HARDWARE SIZE REFERENCE — SCALE 1:1



SCREW M5 x 25 (DIN 913)



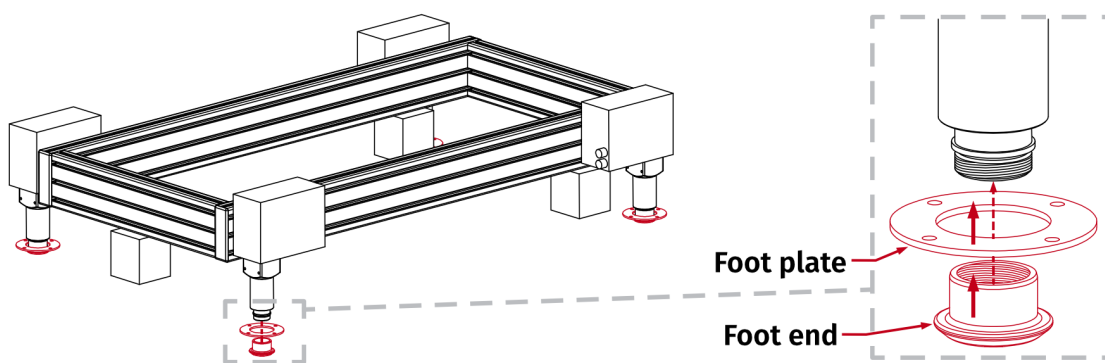
3. Set the protrusion of the screw to 7 mm (± 2 mm), measured from the face of the piston rod. Repeat the measurement on all four actuators.



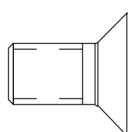
4. Place the foot adapter on the piston rod - align its cutout with the protruding set screw - and bolt it down with the M8 x 16 countersunk bolt (DIN 7991). Apply a drop of threadlocker to the bolt. Use the maximum of 15 Nm (11 ft-lbs).



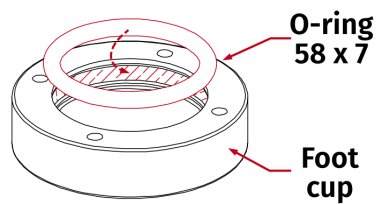
5. Slide the foot plates onto the piston rods and screw in the foot ends. **DO NOT** over-torque, they must be screwed in manually.



HARDWARE SIZE REFERENCE — SCALE 1:1



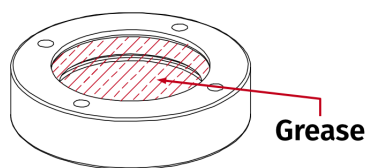
BOLT M8 x 16 (DIN 7991)



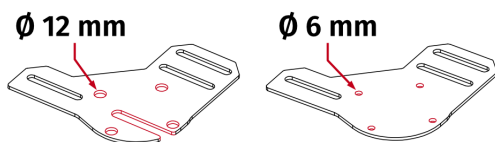
6. Insert rubber O-rings into the foot cups.

WARNING

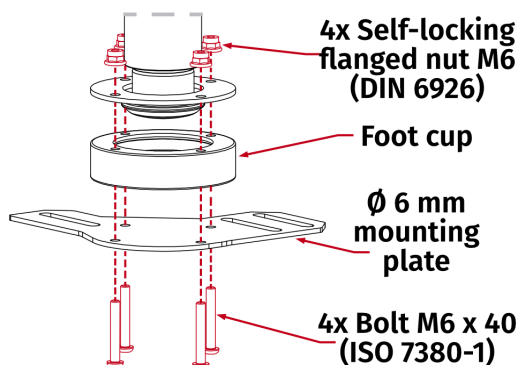
Wear protective equipment before proceeding to the next step.



7. Distribute a thin layer of sliding grease in all four cups and spread it flat and level on the bottom and the o-ring.



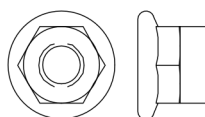
Notice: There are two types of cup mounting plates - 6 mm and 12 mm holes with a cutout. Ensure to use the correct one for the next step.



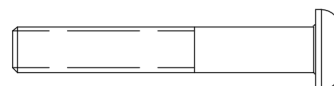
8. Install the **6 mm** cup mounting plates with the foot cups into the foot plates. Torque the bolts up to specification (9.5 Nm - 7 ft-lbs).

Note: the bolts **MUST** be inserted from below, otherwise the cockpit will not mount to QS-TP1 correctly.

HARDWARE SIZE REFERENCE — SCALE 1:1

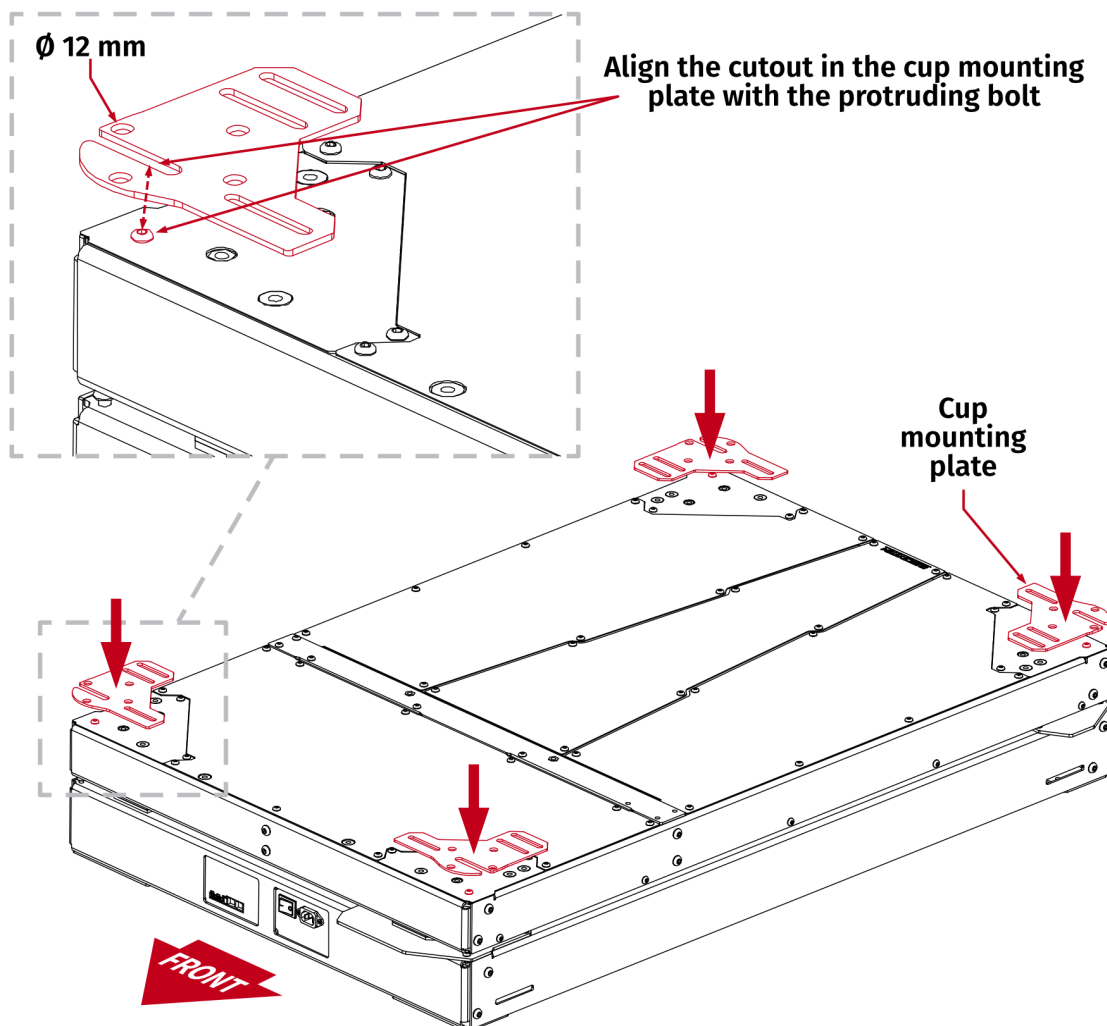


SELF-LOCKING FLANGED NUT M6 (DIN 6926)



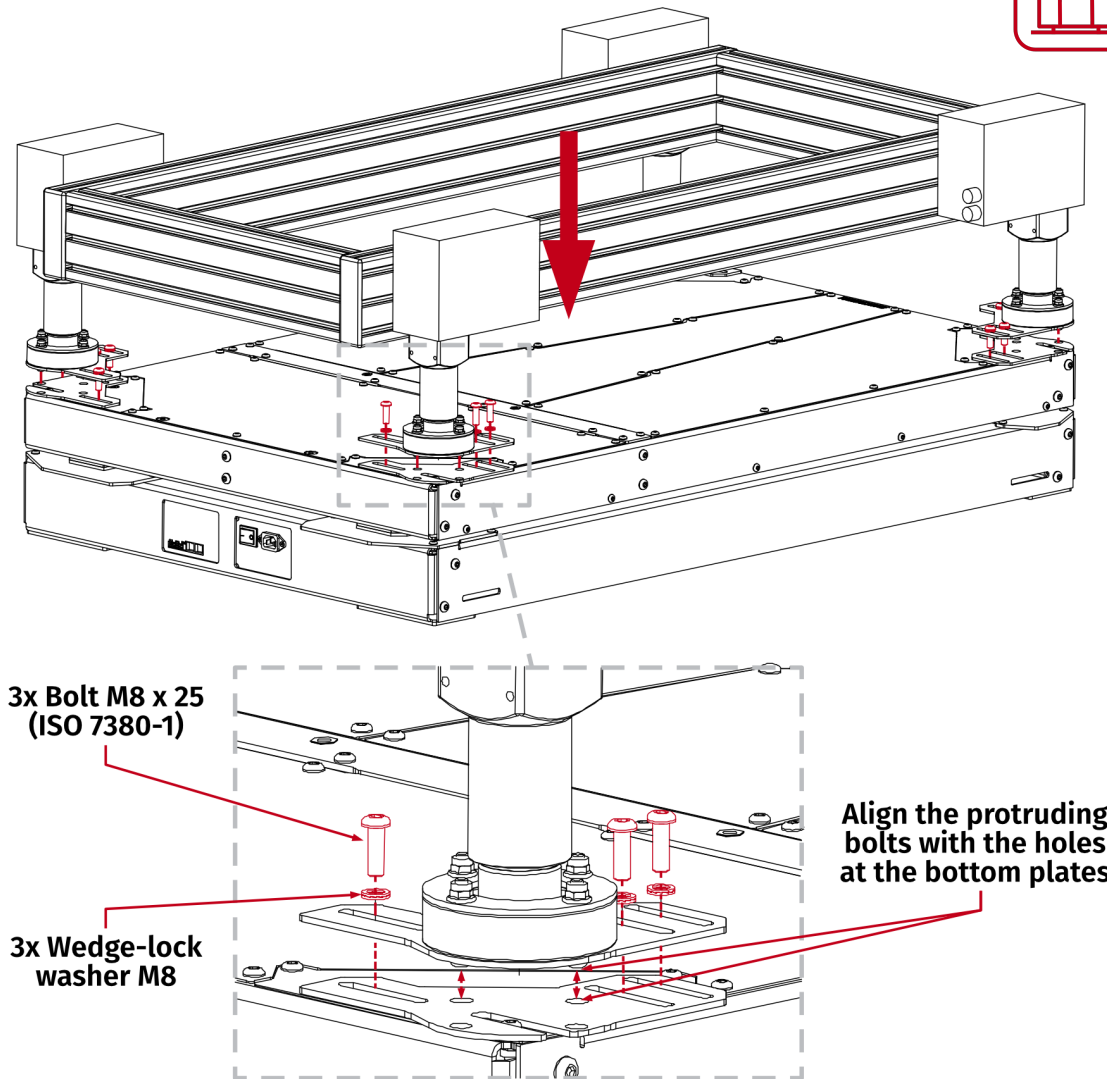
BOLT M6 x 40 (ISO 7380-1)

9. Place 12 mm cup mounting plates on the top frame. Align their cutout with the top frame's protruding M6 bolt. Refer to the illustration:



10. Place your cockpit on the QS-TP1's top frame. Align the cup mounting plates with the bottom 12 mm cup mounting plate. Protruding bolts from the bottom should slide into correct position. Ensure both plates are aligned.

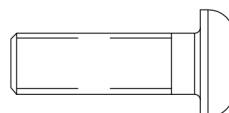
Screw in the M8 bolts with wedge-lock washers **manually**. Do not torque them down yet.



HARDWARE SIZE REFERENCE — SCALE 1:1

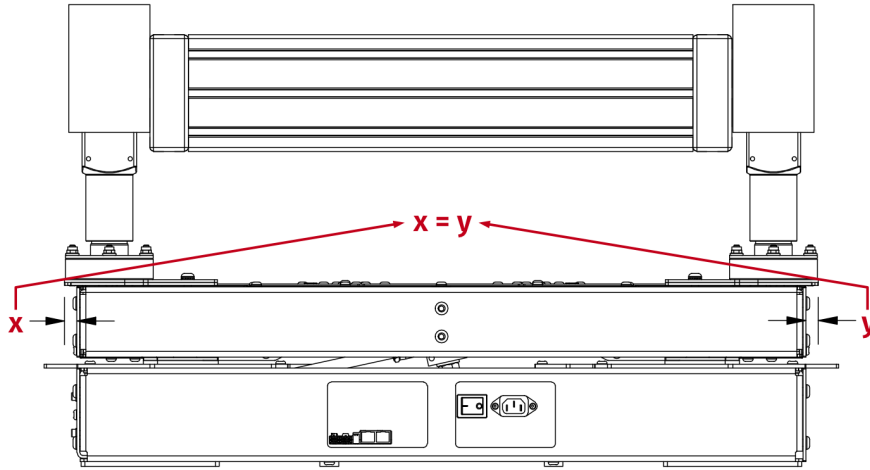


WEDGE-LOCK WASHER M8



BOLT M8 x 25 (ISO 7380-1)

11. Ensure that the cockpit centerline is **perfectly** aligned with the QS-TP1 centerline.
- a) Verify the alignment by measuring the distance between the mounting plate and the edge of the QS-TP1 on both sides. All measurements **must be** equal.



- b) Torque all 12 mounting bolts to 23 Nm (17 ft-lbs).

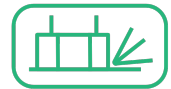
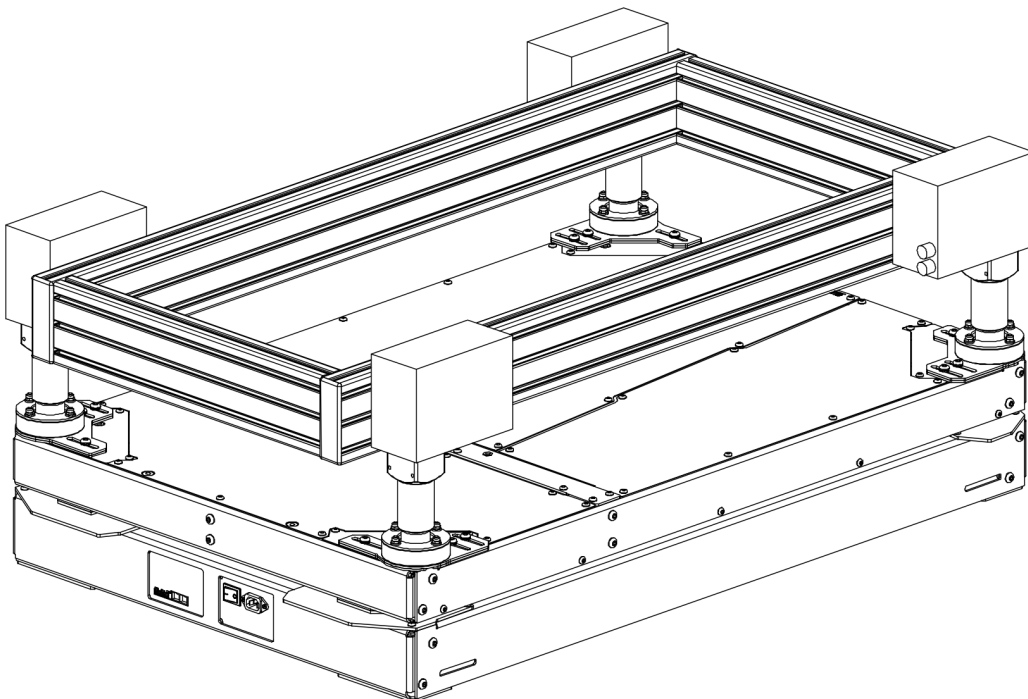


Illustration of a finished assembly:



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7. CONNECTION DIAGRAMS AND SOFTWARE INSTALLATION

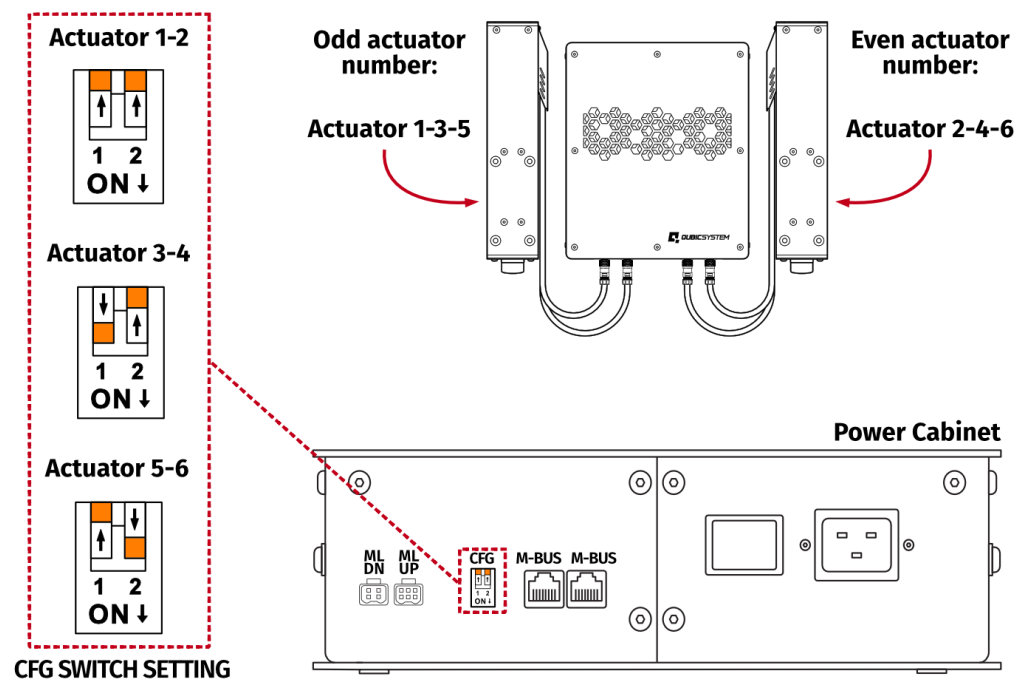
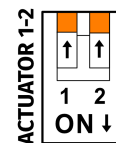
7.1. CFG SWITCH CONFIGURATION

CFG switches need to be set to appropriate positions in accordance with the actuator number. The actuator number can be found on the sticker on the Power Cabinet. By default they are set accordingly to the connected actuator number.

If you want to change the layout of the actuators you need to change the CFG switches setting by switching to the number of the actuators they represent.

INFO

Default factory setup is both DIP switches UP:



WARNING

- The CFG switch **CANNOT** be set in the same position in either of the Power Cabinets.
- When changing the CFG switch setting, the main power must be **SWITCHED OFF**.
- When changing the CFG switch setting **FIRMLY SET THE SWITCH** into the lower or upper position. Do not leave the switch in the floating position (neither up nor down position), otherwise the device will not work.

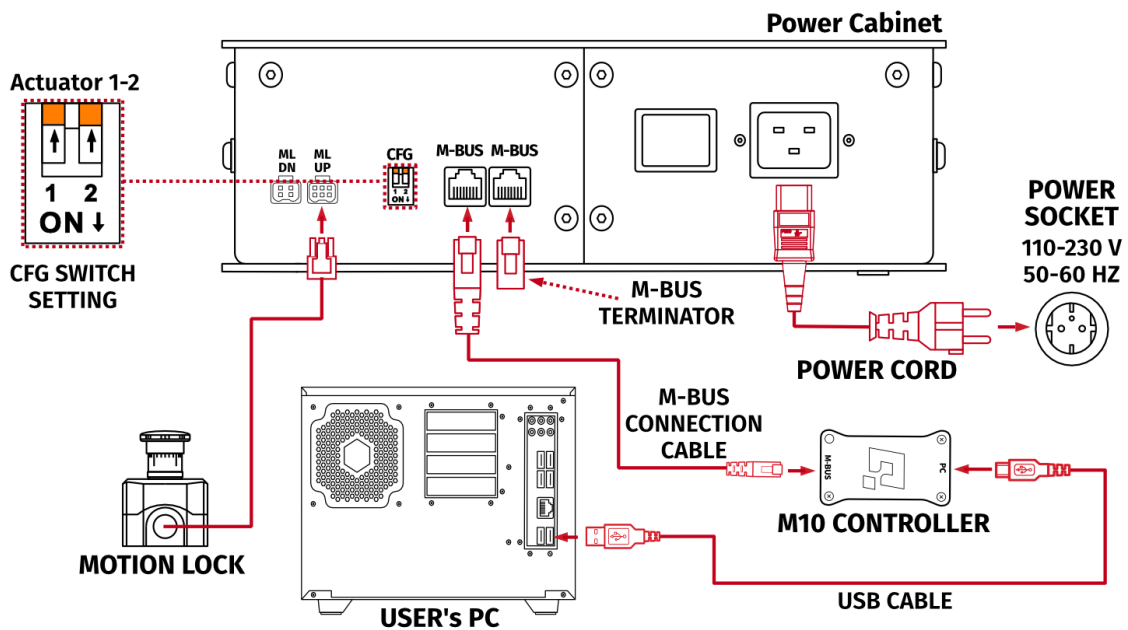
7.2. CONNECTING QS-TP1 INDEPENDENTLY WITH USER'S PC

This section refers to 2DoF traction loss QS-TP1 platform used independently.

CFG DIP switch setting and connection diagram for 5DoF setup (4 vertical actuators + QS-TP1) are on page 111.

INFO

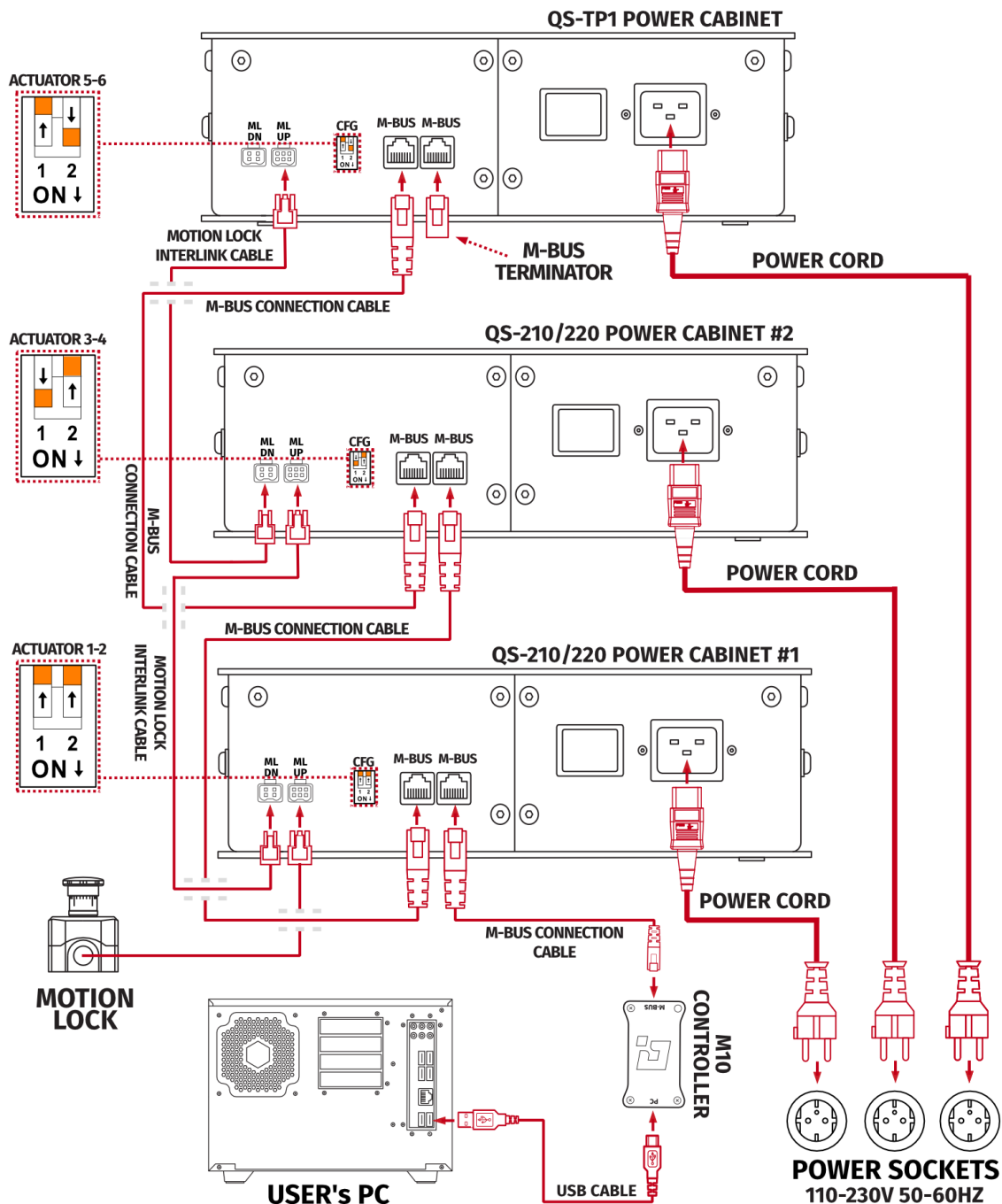
If you are running QS-TP1 independently: QS-MC6 set (including M10 controller, Motion Lock button and M-Bus terminator) is required. It is not included in a QS-TP1 set and has to be purchased separately.



INFO

- Keep the CFG switches according to the appropriate layout. Check section 7.1 on page 109
- Insert the M-BUS terminator into the unused M-BUS port in the QS-SB2 Power Cabinet.

7.3. CONNECTING QS-TP1 WITH QS-210/220 3DOF



INFO

- The order of connecting the cables is not important, you can connect the M10 controller or Motion Lock button to either one of the Power Cabinets.
- When connecting QS-TP1 with a 3DoF set of QS-210/220, the CFG switches in the QS-TP1 must be set to the actuator 5-6 setting (as shown on **109** in section **7.1**).

7.4. QS-TP1 WITH QS-210/220 2DOF AND 3DOF, QS-DD-20 MOTION LOCK DIAGRAMS

Neither QS-DD-20 nor QS-BT1 need an M-BUS connection with any Power Cabinet. They communicate via USB cable directly with the PC.

INFO

The order of Motion Lock connection between any QubicSystem Power Cabinets is irrelevant. Only QS-DD-20 (discontinued direct drive base) must be first in the ML circuit.

INFO

For more information on cable connections of other Qubic System devices go to [Qubic System User Manuals](#) and find your device.

WARNING

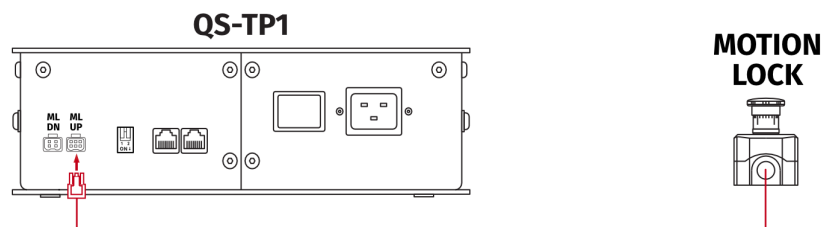
All Motion Lock connections must be performed with **power switched OFF**.

INFO

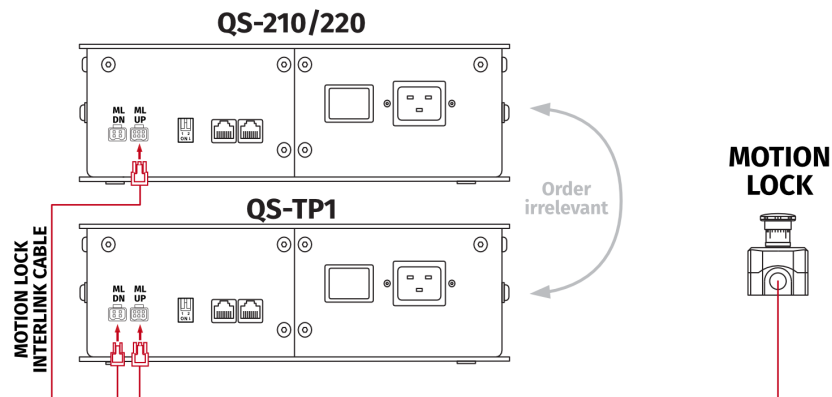
- Motion Lock interlink cables have different ML/UP (6 pin) and ML/DN (4 pin) plugs on each side.
- We recommend including QS-TP1 in the Motion Lock circuit, if you are running other QS-series devices. Refer to diagrams below.
- Motion Lock can be plugged into any Power Cabinet in the circuit but in order to create a working safety-stop system - **ALL** Power Cabinets in the circuit must be connected together with Motion Lock interlink cables.

The diagrams below show Motion Lock connections with QS-TP1 and QS-series devices.

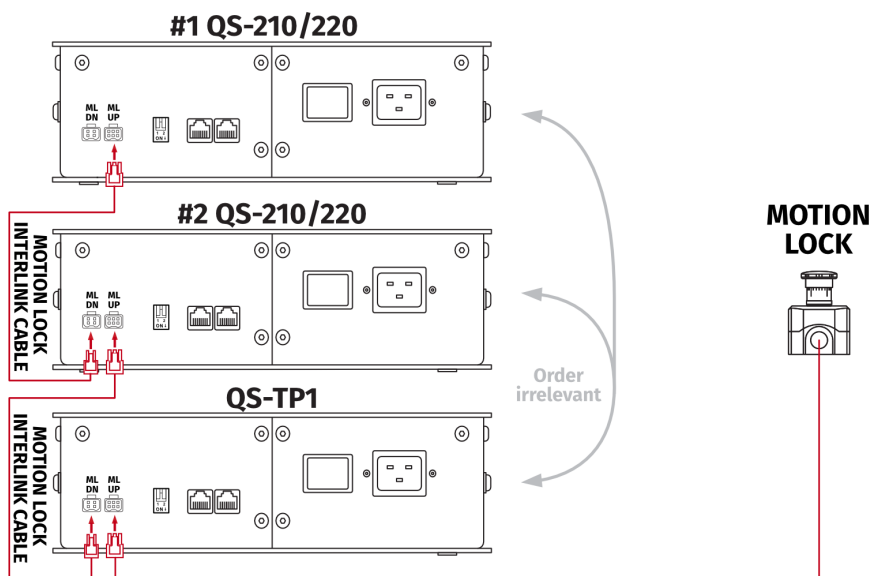
1. QS-TP1 with Motion Lock button.



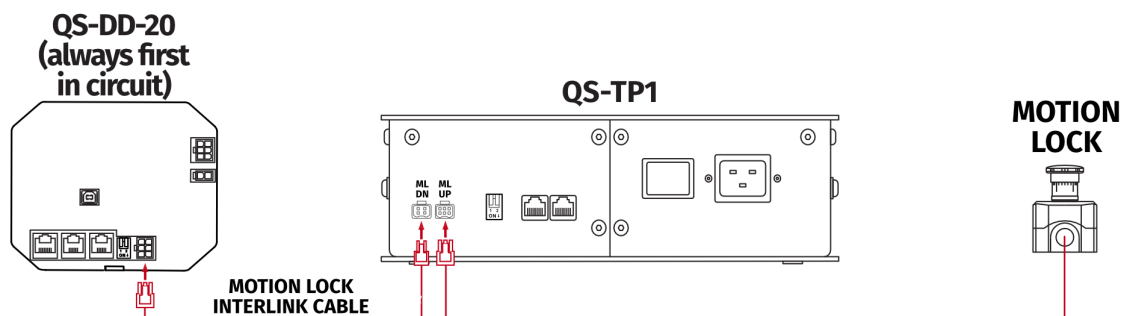
2. QS-TP1 with a 2DoF (QS-210/220).



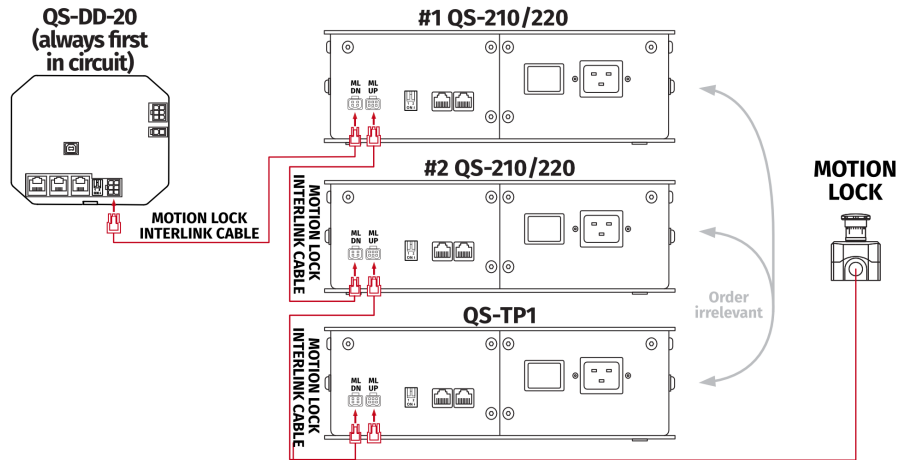
3. QS-TP1 with a 3DoF (QS-210/220).



4. QS-TP1 with a 2DoF (QS-210/220) and a direct drive steering wheel (QS-DD-20).

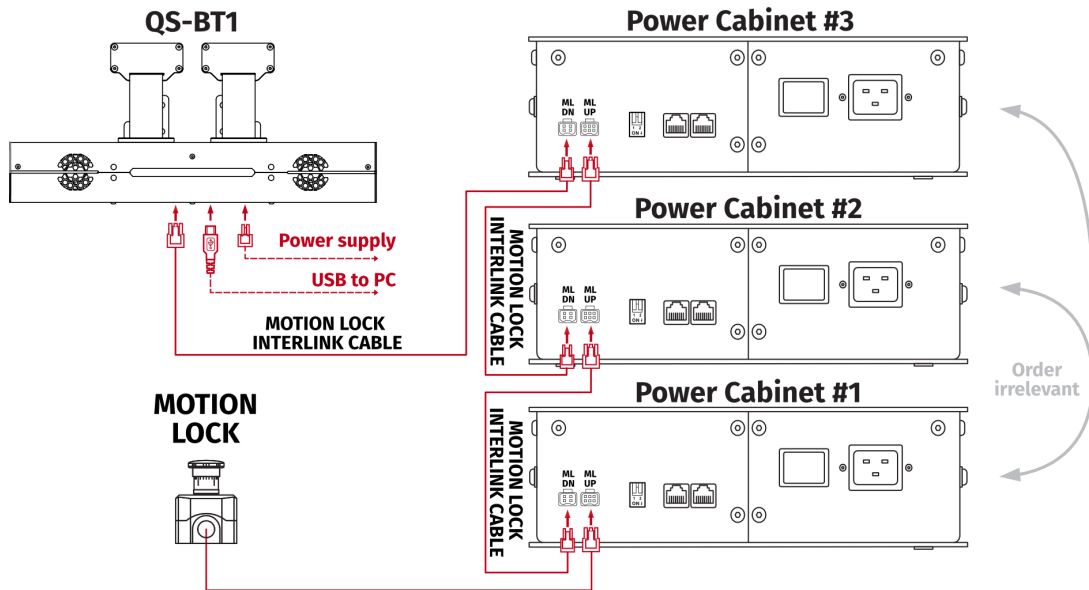


5. QS-TP1 with a 3DoF (**QS-210/220**) and a direct drive steering wheel (**QS-DD-20**).



6. QS-TP1 with a 3DoF (**QS-210/220**) and a (**QS-BT1**) belt tensioner.

More QS-BT1 Motion Lock connection diagrams can be found in the QS-BT1 user manual - QubicSystem.com/uqsbt1.



TIP

If you want to implement a non-factory Motion Lock switch - go to section **10.4** on page **139**.

7.5. SOFTWARE INSTALLATION

To download the software visit: [QubicSystem.com/Download](https://qubicsystem.com/Download)

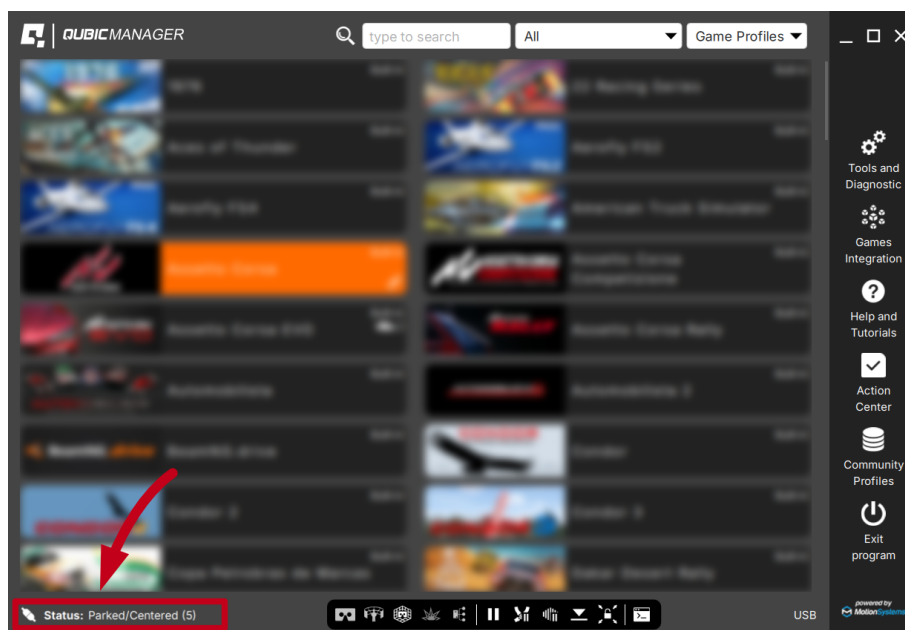
Once the QS-TP1 is installed and connected correctly:

1. Download **Qubic Manager Software**.
2. Proceed with the installation steps and launch the application.
3. Connect the power connection cord to the wall socket.
4. Turn on the system by switching on the power switch button on the Power Cabinet.
5. Cycle through the Motion Lock button positions - press and unpress it (go to section **2.10** on page **14** for details on the procedure).
6. The QS-TP1 will perform a start-up calibration.

WARNING

- **DO NOT** change the payload during the start-up calibration.
- **DO NOT** enter the cockpit during the start-up calibration.

7. If Qubic Manager has recognized the QS-TP1 correctly, the status of the machine visible in the lower left corner will change to **Parked/Centered** (after Global Pause has been disabled - details in section **2.11** on page **15**).

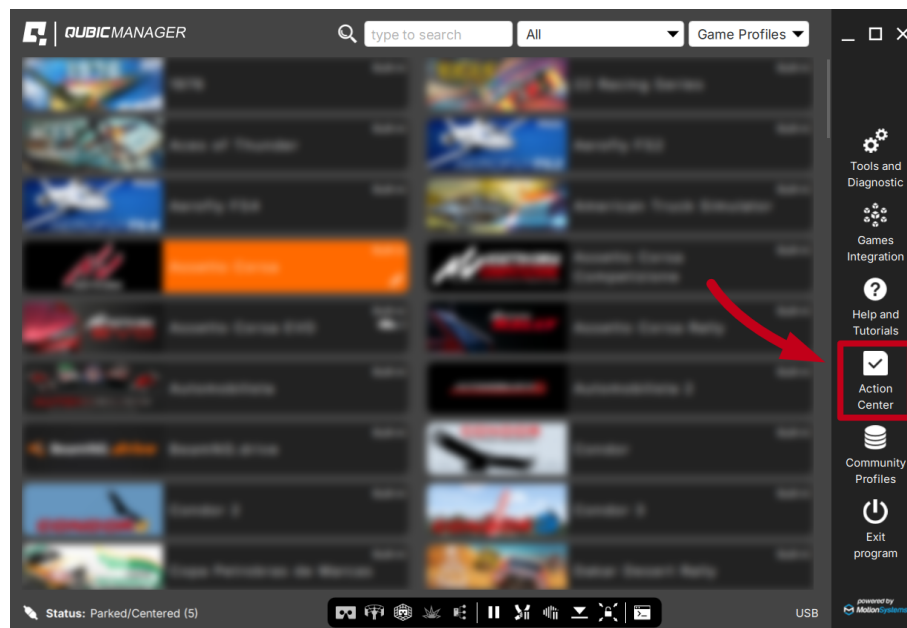


WARNING

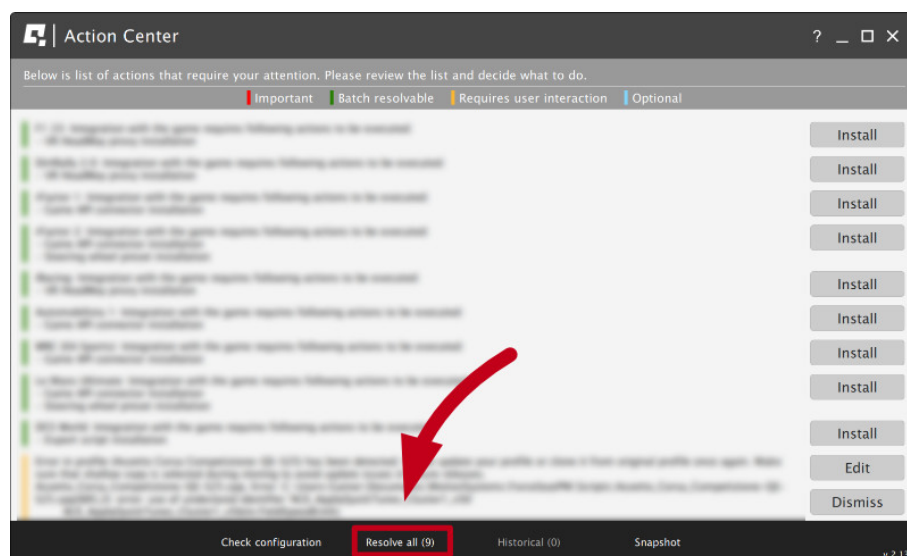
If the device did not connect correctly:

- Go over the cable connections - compare the connections to the diagram again, look for loose plugs or damaged cords.
- Go to **Troubleshooting** section on page **126**.

8. Check **Action Center** on the right side panel for a list of actions that require attention:



9. It is possible to solve them one by one or by pressing the **Resolve All** button. Firmware update may require additional confirmation in the dialogue box.

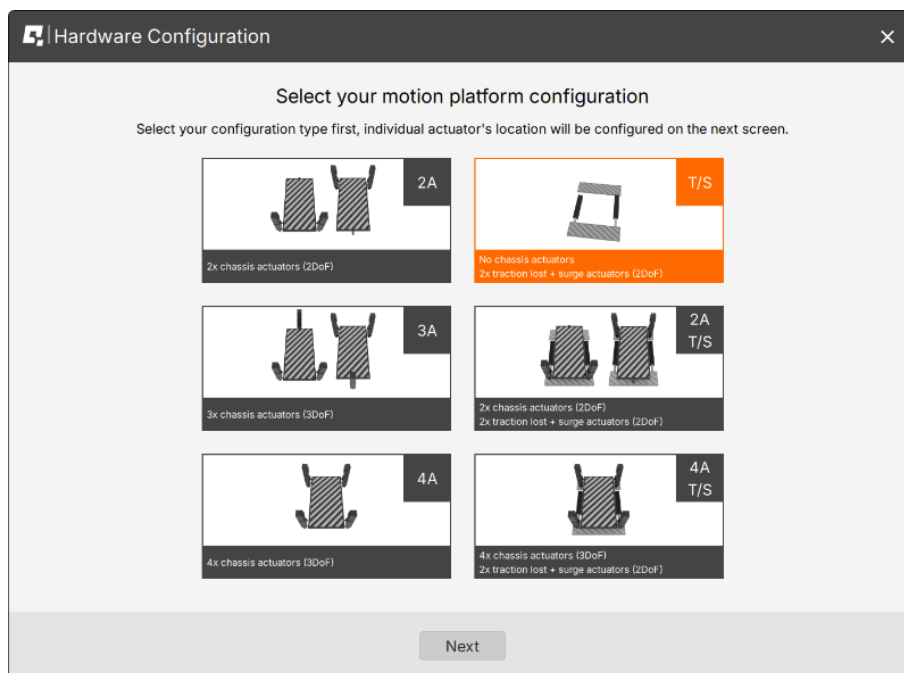


10. Go to **Tools and Diagnostics** → **Devices** and select **Configure**.

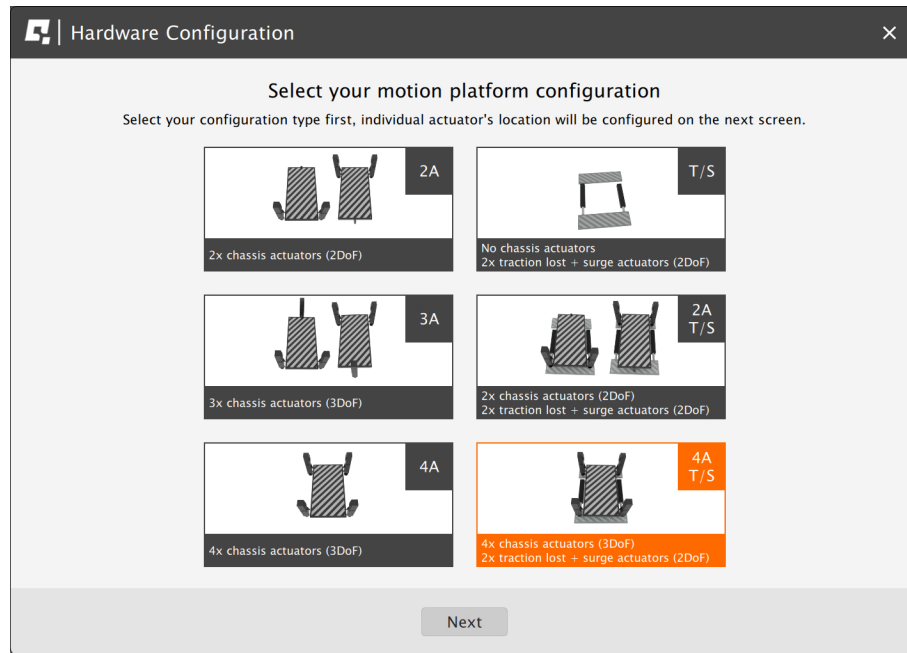
Below are all recognized devices including motion platforms and accessories.

Device #1:	OS-4xx					Configure
Serial number:	XXXXXX-XXXXXX-XXXX-XXXXXX	(copy to clipboard)				Levelling
Status:	OK					Quick Codes
Firmware:	141.16	Temperature (C):	N/A	Hardware ID:	54	
Work time:	1h 05m 17s	Up time:	0h 21m 02s	Features:	default	
Paused:	no	Parking:	finished (normal)	Offline:	no	
Device #1.1:	HVPMC100					
Serial number:	XXXXXX-XXXXXX-XXXX-XXXXXX	(copy to clipboard)				
Status:	OK (33)					
Firmware:	144.30	Temperature (C):	24, 31	Hardware ID:	58	
Work time:	-	Up time:	0h 20m 29s	Features:	default	
Device #1.2:	HVPMC100					
Serial number:	XXXXXX-XXXXXX-XXXX-XXXXXX	(copy to clipboard)				
Status:	OK (33)					
Firmware:	144.30	Temperature (C):	24, 31	Hardware ID:	58	
Work time:	-	Up time:	0h 20m 29s	Features:	default	

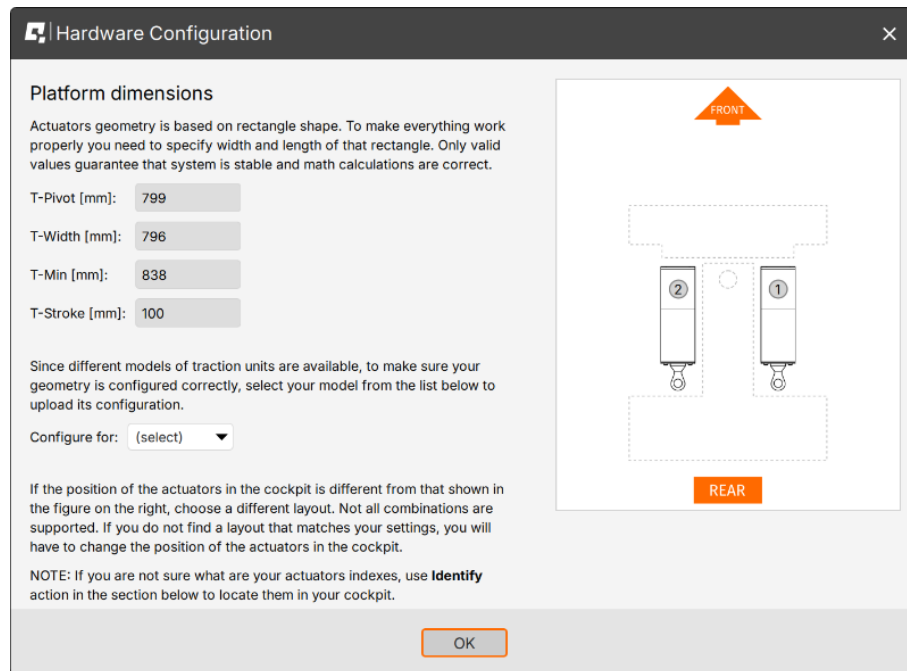
11. Choose the correct layout variant from the list (traction loss).



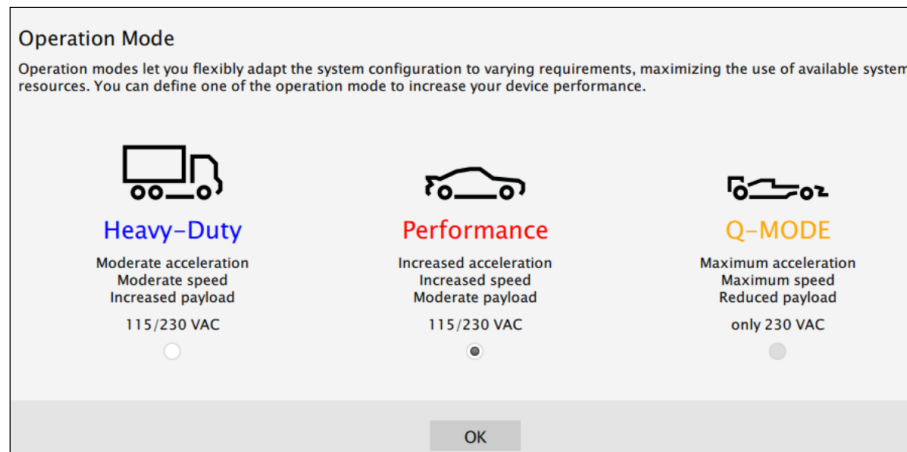
For QS-210/220 3DoF setup with traction loss control (QS-TP1): Choose the correct layout variant from the list (4A T/S setup).



12. Platform dimensions for QS-TP1 are entered by default. In case of a 5DoF platform (4A T/S), for dimensions between the vertical actuators of QS-CH1 or QS-210/220 - follow the instructions in the window or refer to the user manual of the specific QS-device (QubicSystem.com/User-Manuals).



13. Scroll down and choose one of the operation modes:



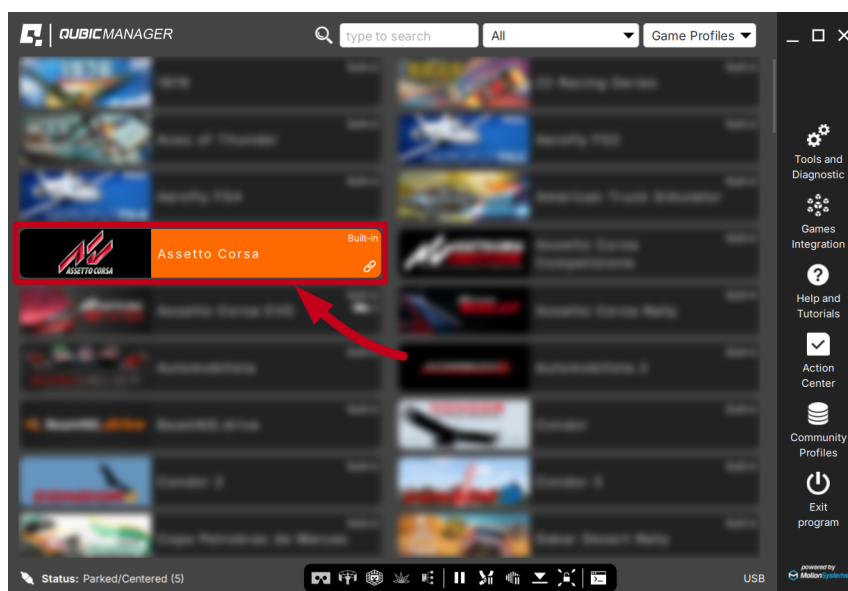
INFO

- Q-MODE is unavailable for QS-TP1.
- 2DoF single set of QS-210/220 works only in Heavy-Duty mode with QS-TP1.

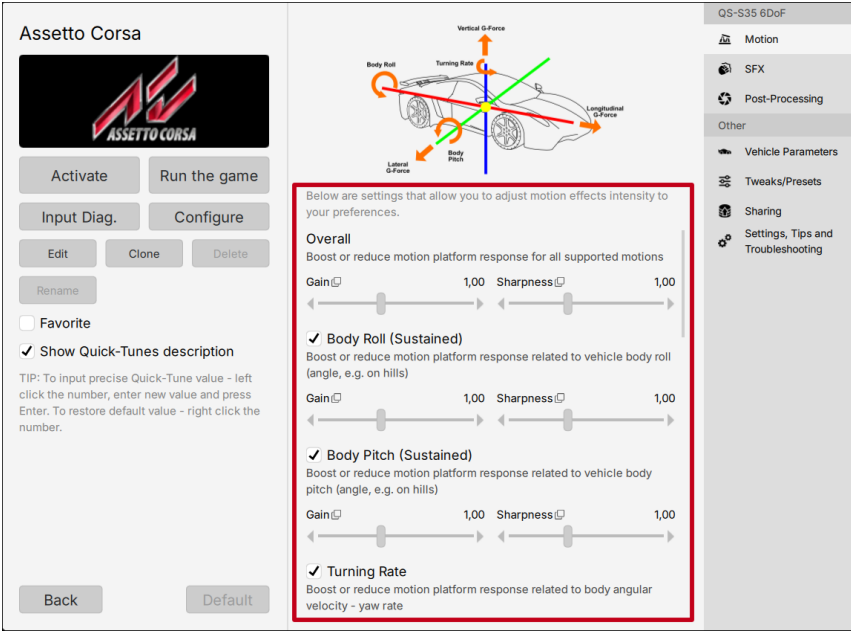
- 14.** Close the configuration and return to the main application window. Choose the game and check profile details by clicking on the game tile.

INFO

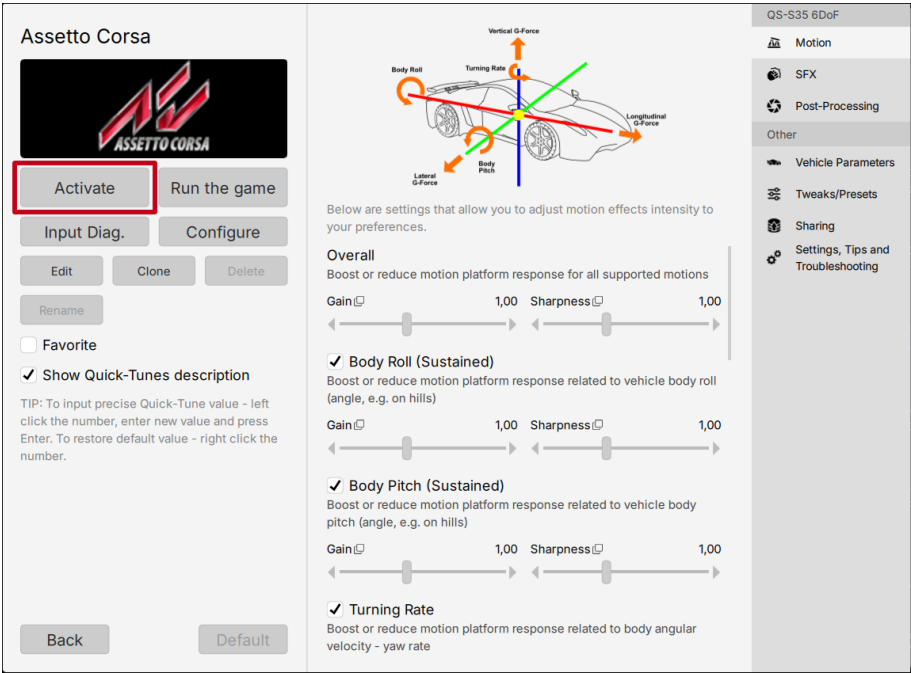
Default profiles are integrated with the software and do not require additional installation. The list of supported games is available at: QubicSystem.com/Supported-games.



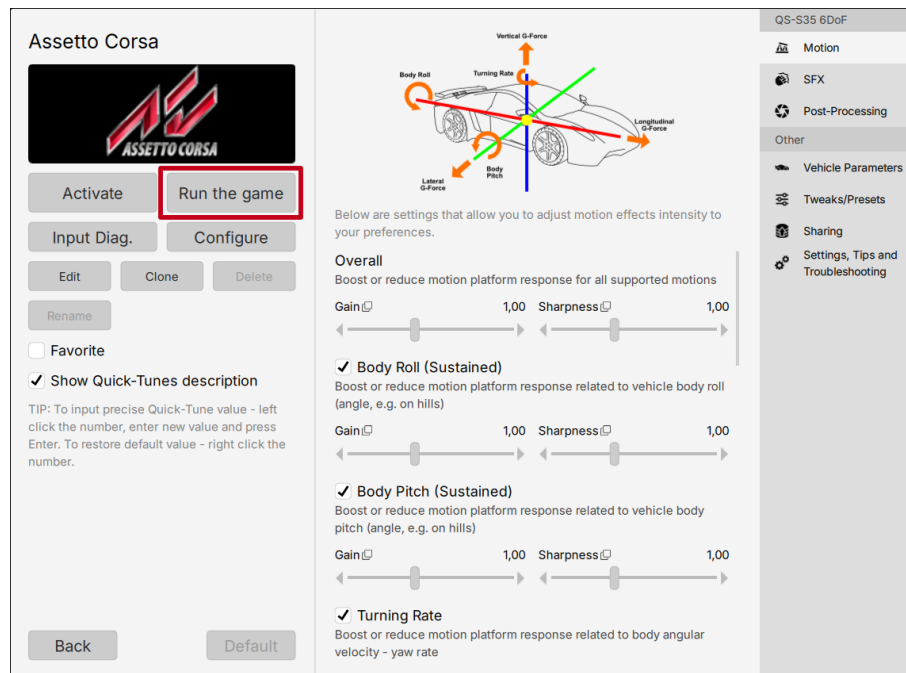
- 15.** Adjust the motion effects intensity to your preferences in the game profile window. Scroll down to see all of the settings.



16. Activate a profile by clicking the **Activate** button.



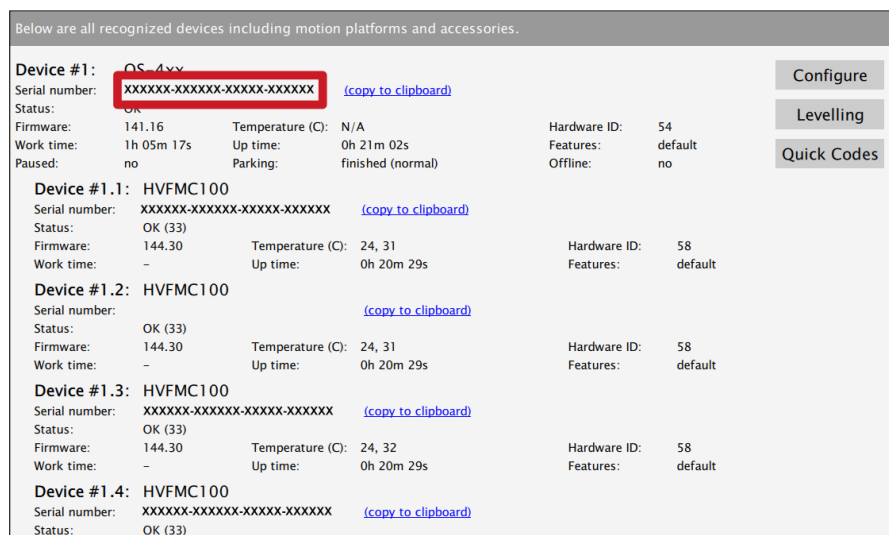
17. Launch the game by clicking the **Run the game** button.



18. You can also adjust the settings during the game simulation by pressing **ALT+TAB** and switching between the applications - once the profile is active changes will apply instantly.

INFO

If you need the serial number to activate other software licenses such as ForceSeatMI or ForceSeatDI, it can be found in the QubicManager. After connecting the QS-TP1, go to **Tools and Diagnostics** → **Devices**. The serial number is visible under the device name:



WARNING

The software is provided “as is”, without warranty of any kind, express or implied, including but not limited to the warranties of merchantability, fitness for a particular purpose, and non-infringement. In no event will the authors or copyright holders be liable for any claim, damage, or other liability, whether in an action of contract, tort or otherwise, arising from, out of, or in connection with the software or the use or other dealings in the software.

The software sends anonymous usage data to the Motion Systems company. The data is used to improve the software and game profiles. The data is not used for advertising purposes.

8. MAINTENANCE AND CLEANING

INFO

Cleaning should be conducted every 160 working hours or once a month.

To see the working hours counter, go to **Tools and diagnostics** → **Devices**. It is displayed in the QS-TP1 device listing:

Device #1:				(copy to clipboard)	
Controller S/N:					
Status:	OK				
Firmware:		Temperature (C):	N/A	Hardware ID:	
Work time:	XXXhXXmXXs	Up time:		Features:	default
Paused:	no	Parking:	finished (normal)	Offline/Waiting:	no

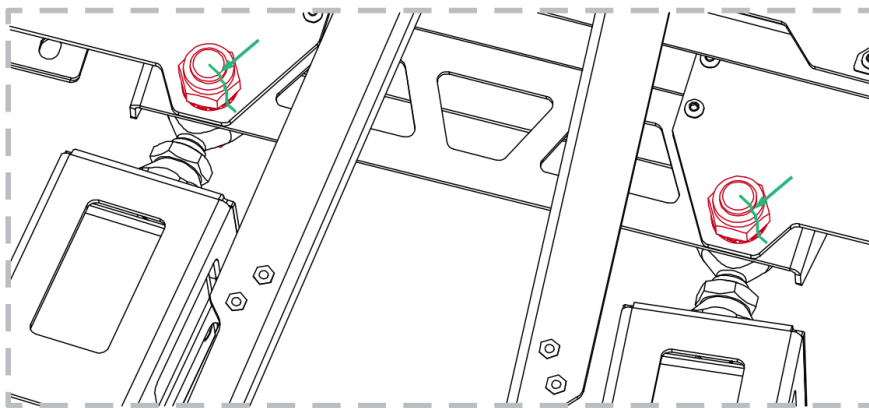
To minimize the risk of abnormal heating that can result in system failure, keep the QS-TP1 uncovered, clean and dust-free. Cleaning the unit should be performed with a soft, dry cloth. **DO NOT** use solvents or cleaners that may corrode or damage materials of parts used in the QS-TP1 in any other way.

If any of the above-mentioned elements is dirty or dusty, use a clean cloth to remove it. Isopropyl alcohol can be used to remove contamination caused by lubricants.

8.1. CHECKING THE BOLTS

During assembly it was suggested to use an oil marker to mark the position of the actuator mounting nuts, making it easy to check that they have not loosened due to vibrations. There should be a continuous oil-mark line from the bolt, across the nut, and all the way to the slider plate.

Their position must be checked when additional vertical linear actuators are installed on top of the QS-TP1- full 4- or 5-DoF motion system. The first check should be performed after 10 hours of operation, followed by checks after 100 and 400 hours of operation.



8.2. CHECKING THE MOTION LOCK BUTTON

At least once a month check if the Motion Lock button is working correctly:

1. Before anyone steps into the platform - turn on the QS-TP1.
2. Push the red Motion Lock button. Device status will change:



3. The machine should stop and not react to any signal.
4. With a correct profile activated, proceed to a game or a simulation and engage movement.



If the Motion Lock button works correctly - the platform does not react or move in any way.



If the Motion Lock button does not work correctly - the platform proceeds to simulate motion from the game/simulation. Check the cable connection and repeat the test. If the problem persists - **DO NOT** use the platform, power it off and contact technical support immediately.

8.3. GREASING THE SLIDER PLATES

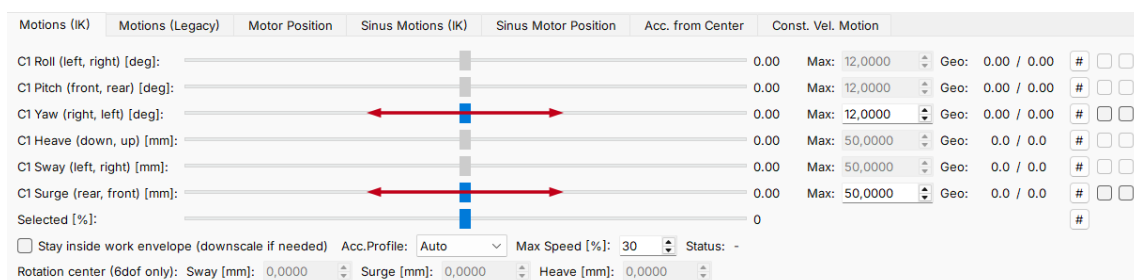
If the QS-TP1 starts emitting squeaky noises during operation - the device is not broken but needs to be greased.

WARNING

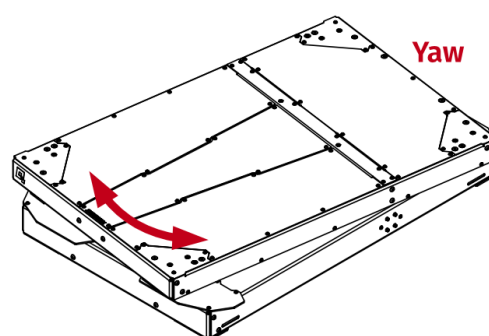
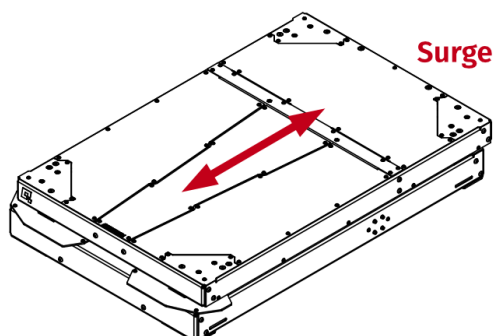
This procedure requires the user to work on a powered-on motion platform. Whenever approaching the machine to perform any action, **first press the Motion Lock button**.

For example: device powered → surge forward → push the Motion Lock button → wipe the slider plates → deactivate Motion Lock → surge backwards → push the Motion Lock button → wipe the slider plates → continue as required.

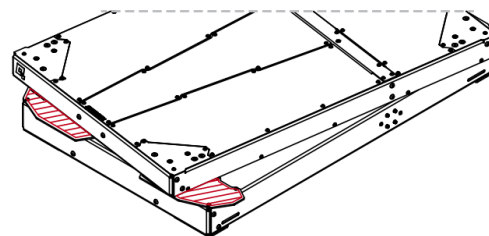
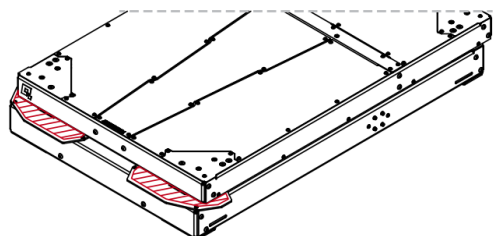
1. Go to QubicManager → Tools and diagnostic → Platform diagnostics.



-
2. In Platform diagnostics window move the platform to the maximum front position (surge slider). You can also use yaw slider to expose a larger part of the slider plate.



3. Spray some penetrating oil on the rear metal plates.



4. In Platform diagnostics move the platform back and forth and to the sides (Yaw slider) so that it cleans the plates itself.
5. Wipe off penetrating oil residue and any dirt that will be moved to the edges of the plates with a soft and dry cloth.
6. Use a **SMALL AMOUNT** of included sliding grease (replacement: bearing grease, red, lithium based, NLGI-2) on the back metal plates.
7. Move the platform back and forth and to the sides so it distributes the grease evenly and until the squeaks are gone.
8. Wipe off any grease residue collected on the sides with a soft and dry cloth.
9. Repeat the process for front slider plates.

INFO

The greasing process must be performed **ONLY** if QS-TP1 starts emitting squeaky noises.

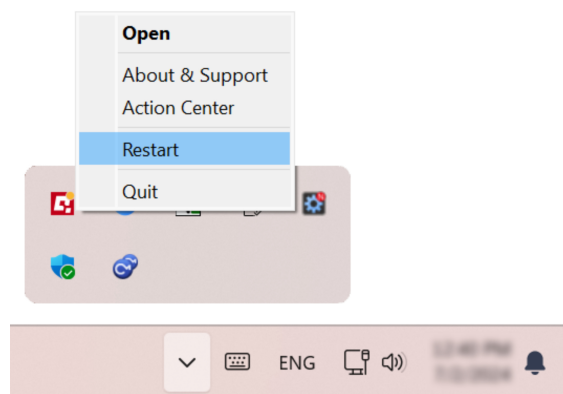
9. TROUBLESHOOTING

WARNING

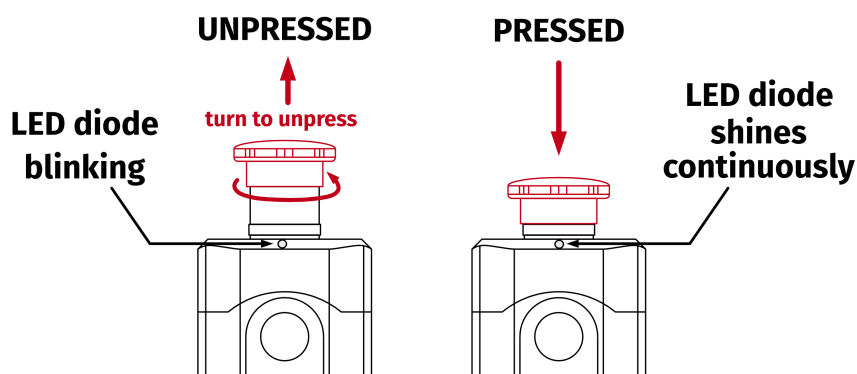
DO NOT attempt to do any repairs by yourself. It could be dangerous and will result in loss of warranty! Repairs should be consulted with technical support and then performed by a qualified technician.

Before contacting technical support, try this:

- Check Action Center in QubicManager.
- Check all cable connections in the device.
- Restart QubicManager application by right-click on the application icon in the system tray and selecting **Restart**:



- Check Motion Lock Switch position (should be unpressed to activate the motion):



- Try different USB ports (also try bypassing the USB hub by a direct PC connection).
- If a problem occurred abruptly, it could be caused by a thermal protection. Turn off the QS-TP1, disconnect it from power outlets and wait at least 15 minutes to let it cool down. Try turning it on again later.
- In case of any unclear electrical issues, strange behavior or abnormal work conditions, contact technical support.

9.1. QUBICMANAGER DEVICE STATUSES

-  **Status: Not connected** - no device is detected. If status appears while devices are connected - indicates that firmware update failed (requires firmware recovery) or M10 controller or USB connection is at fault. Check USB connection for loose connections, try different USB ports, bypass any USB hubs, swap USB cable for a different one.
-  **Status: Offline/Waiting for nodes (9)** - Power Cabinets are disconnected or not powered. If this status appears during operation - check power cords, power switches, CFG DIP switches configuration and M-BUS connection cables.
-  **Status: Running** - the device is in simulation/receives input signal.
-  **Status: Paused** - the device is paused (Pause button at the bottom of the QubicManager window).
-  **Status: EMCY/Motion-Lock (5)** - Motion Lock system has been triggered. Unpress the Motion lock button, check the Motion Lock button cable/connection. In a setup with no Motion Lock button - check the Motion Lock jumper.
-  **Status: Press and release Motion-Lock (9)** - the device is waiting for a cold start procedure (more details on page 14).
-  **Status: Pending Ref-Run (9)** - the device is performing calibration/reference run. **DO NOT** change the payload.
-  **Status: Parking/Centering** - the device is parking (the game/simulation was paused or no telemetry input is available).
-  **Status: Parked/Centered (5)** - the device achieved parking position and is in stand-by mode. It is powered, connected and ready to be operational.
-  **Status: Connected with issues** - there is an issue with the connection or power - check the working status in Tools and diagnostic → Devices.

INFO

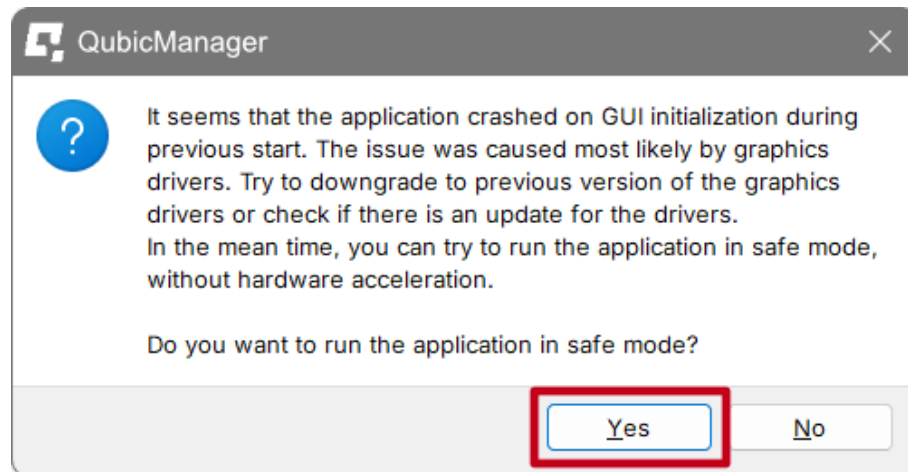
- **ALL** diagnostics and cable connection inspections **MUST** be performed with the device powered **OFF**.
- If any of error statuses persist after performing the troubleshooting steps - please contact technical support.

9.2. COMMON PROBLEMS WITH SOLUTIONS

- **Problem:** QubicManager software crashes on launch with an OpenGL error.

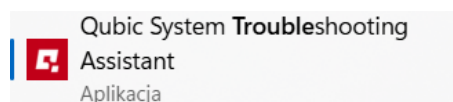
Solution long-term #1: This issue is caused by graphics drivers. Try to downgrade to a previous version of graphics drivers or check for updates.

Solution short-term: To open the app, click **OK** on all the operating system errors. Restart the QubicManager software and you will be presented with a window:

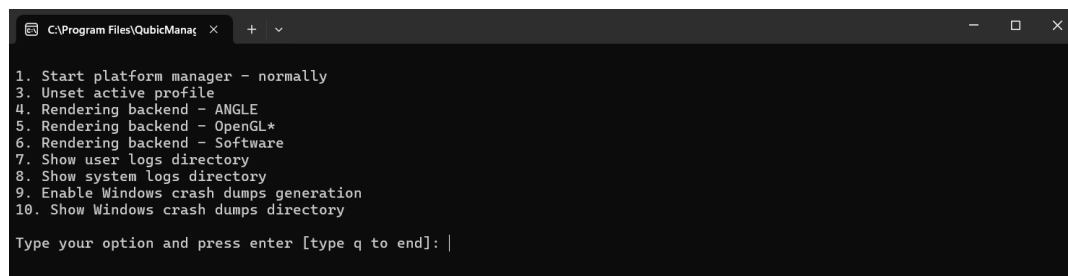


Click "YES" if you want run the application in Safe Mode (it will run a little slower).

Solution long-term #2: In order to overwrite the OpenGL rendering backend permanently, type in **troubleshooting** in Windows search bar. Select **Qubic System Troubleshooting Assistant**.



In the prompt window, type **6** on your keyboard and click **Enter**. Restart the QubicManager application.



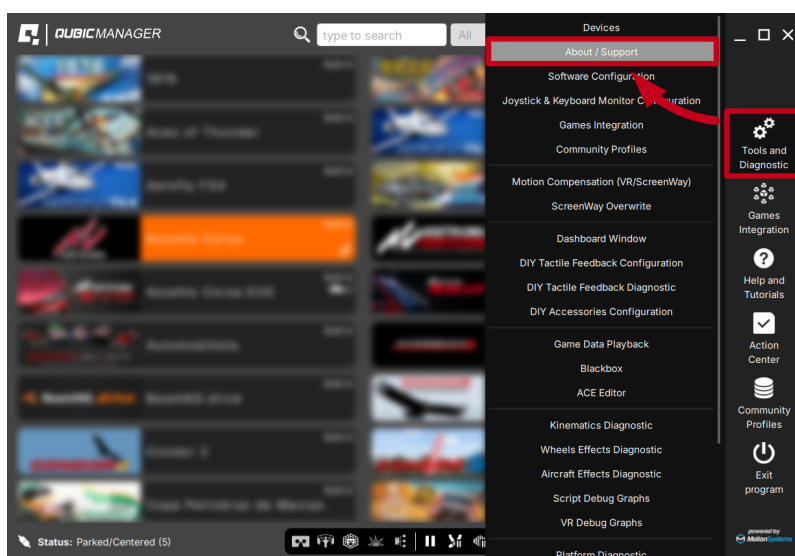
9.3. CREATING A SNAPSHOT

A snapshot is the easiest and fastest way to diagnose a problem. If you send in the zip file generated in the snapshot menu along with a description of the problem, technical support receives all the necessary information about the product and its configuration. It can be then analyzed to provide the best solution.

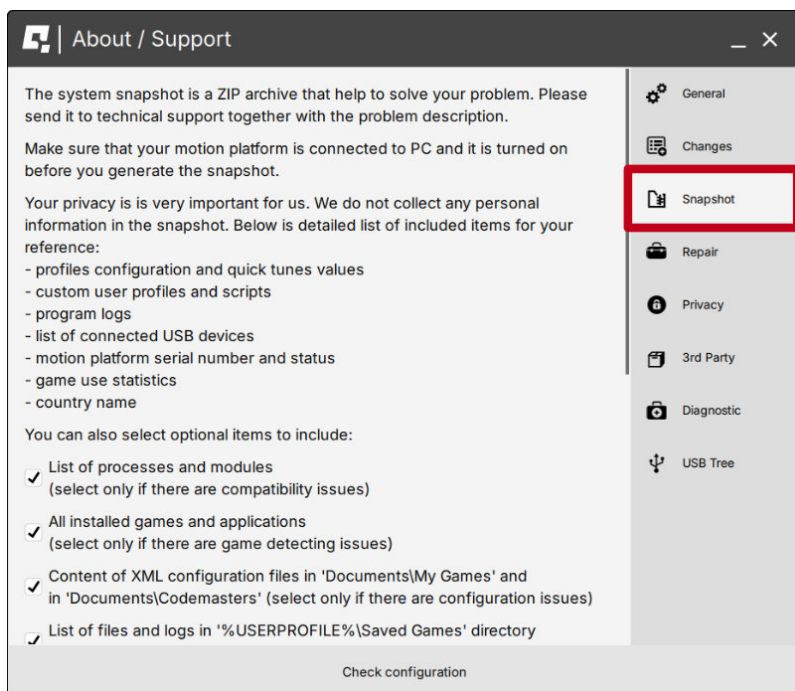
INFO

The QS-TP1 and all interconnected Power Cabinets **MUST BE** be powered up when creating the snapshot.

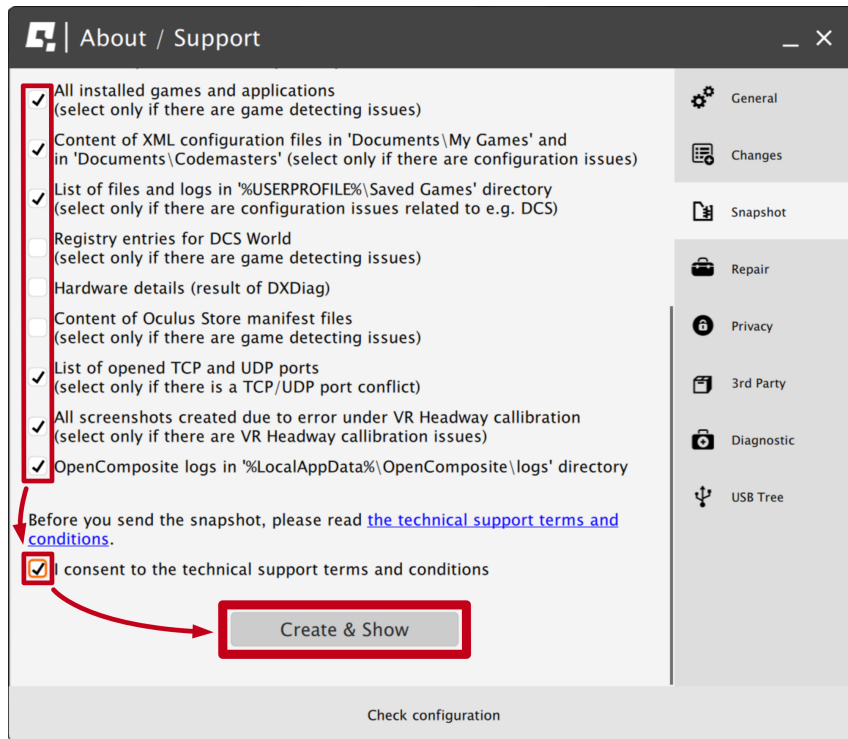
1. Open the main window of the QubicManager application.
2. Go to **Tools and Diagnostic** → **About / Support**.



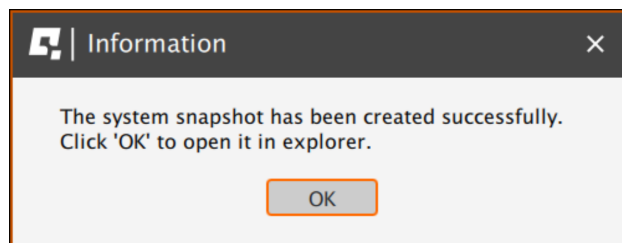
3. Open the **Snapshot** window:



4. Select data that will be included in the snapshot.
5. Scroll down, consent to the technical support terms and conditions and select **Create & Show**:

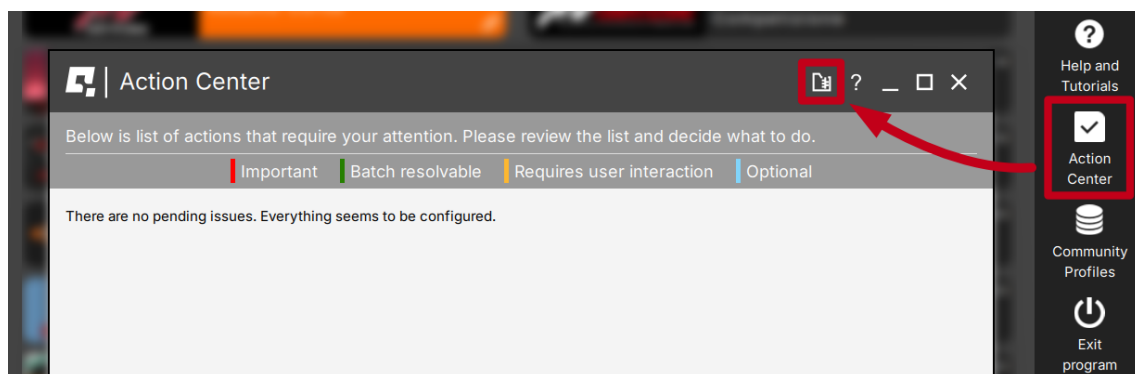


6. The snapshot has been created, click the **OK** button - the folder with the snapshot ZIP file will open.



7. Attach the snapshot ZIP file to your support request.

Alternatively, click Snapshot icon in the top-right corner of the Action Center:



9.4. DISCORD CHANNEL

We strongly recommend joining our discord channel, where our growing community is sharing amazing tips and ideas of how to set up, use and tune the Qubic System products. You can also send questions for our staff or get answers directly from the community.

Join our discord channel by following the invitation link:

QubicSystem.com/Discord



10. ADVANCED APPLICATIONS

INFO

Examples shown in this section describe optional application of external safety and power cut-off devices. If you wish to expand the functionality of your motion system, read the whole section to have a good understanding of how to apply and what functionality to expect. Apply at your own discretion.

WARNING

Motion Lock input is not a SIL/PL (safety integrity level/performance level) rated and **DOES NOT** guarantee safety. If you wish to achieve specific SIL/PL ranking, consider introducing a power cut-off device that is controlled by an external safety relay and cuts off the power to all QS-SB2. Example application of the power cut-off contactor can be found in section **10.3.2** and **10.3.3**.

INFO

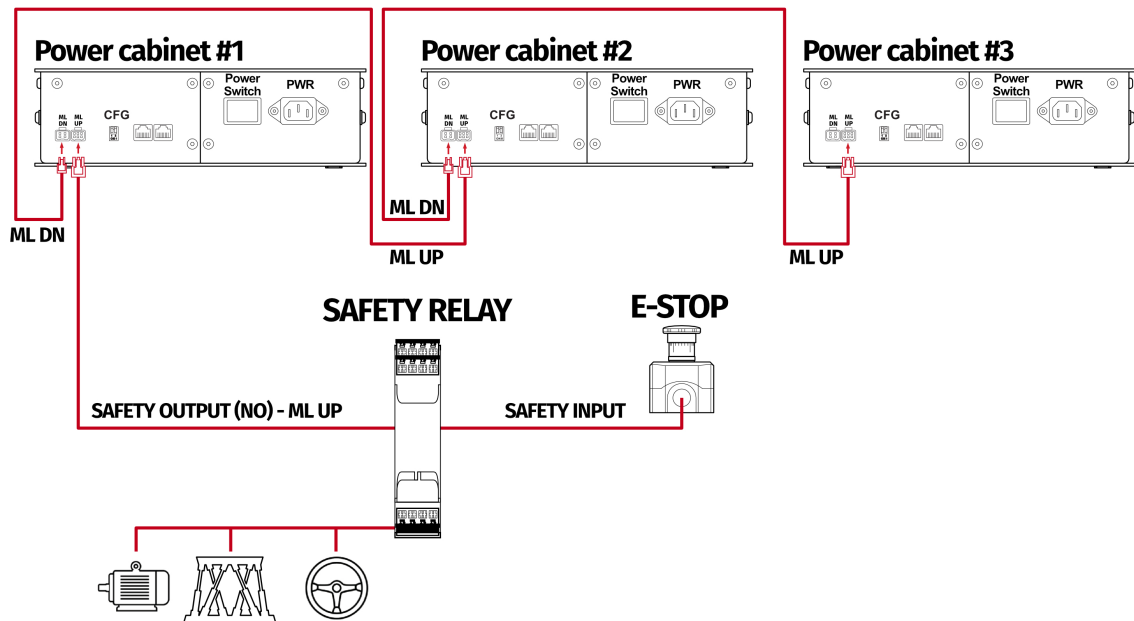
When applying safety relay to the Motion Lock :

- Use input cables according to your safety relay manual.
- Use output cables according to your safety relay manual and cross section no less than 0,75 mm²
- Implementing an additional safety relay requires deactivating Motion Lock cycle procedure at the power up. In order to do that, go to "Tools and diagnostics" → "Devices" → click "Quick codes" next to a "HVFC200" item → enter code "7c2f47a2" → click "Execute" → wait for the operation to finish → repeat for every HVFC200 with an unique Serial Number (every second item).

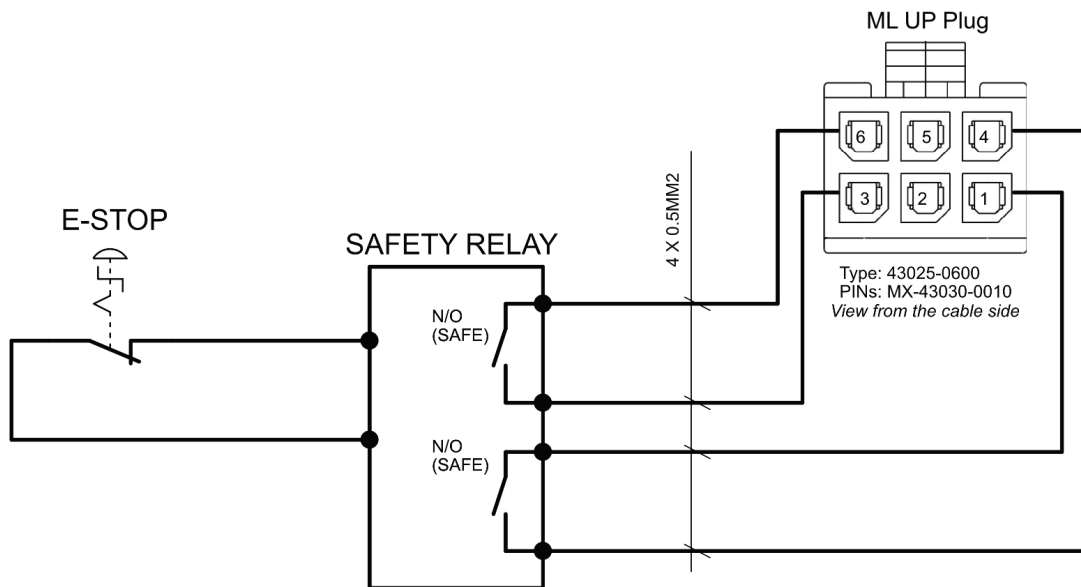
10.1. ADDING ADDITIONAL DEVICES TO THE MOTION LOCK CIRCUIT

If there is necessity to stop other devices, apart from the QS-TP1, ML (Motion Lock) and additional user devices can be controlled by safety relay outputs. In the example application, the E-STOP button is connected to the external safety relay. When the E-STOP is triggered, the safety relay will activate the Motion Lock function, which will stop motion of the platform and additional devices.

Example application of single-channel safety relay that controls ML and additional devices:



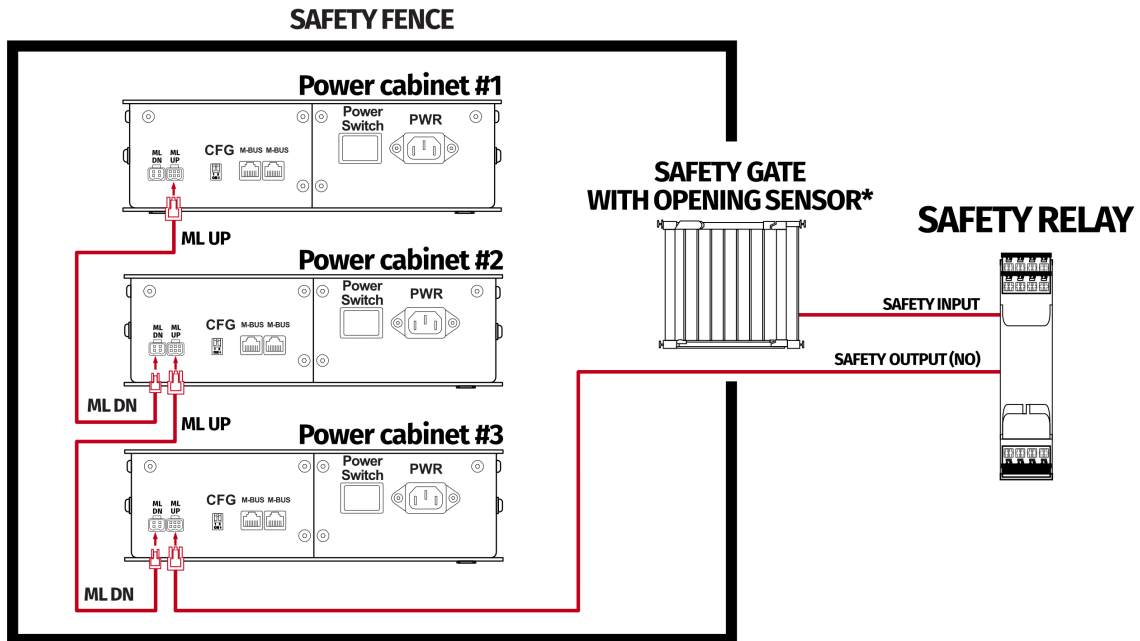
Example wiring diagram of application of one-channel safety relay with E-STOP button:



10.2. IMPLEMENTING THE WORKING ZONE PROTECTION

To protect bystanders from accidental hit from moving parts of the platform, safety gate with opening sensor* can be connected to safety relay input for activating ML function. When the gate opens, the safety relay output activates the ML (Motion Lock) function and stops the motion of the platform.

Example application of safety gate opening sensor:



*Check your safety relay manual for list of applicable sensors

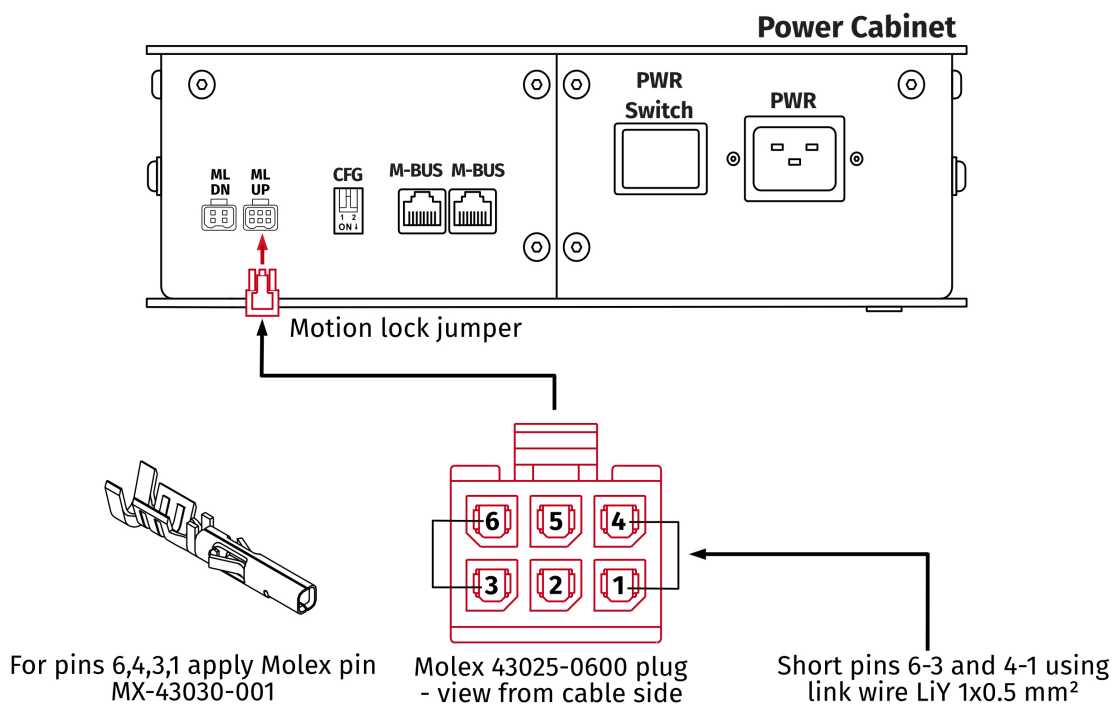
10.3. INCREASING SAFETY LEVEL

WARNING

Modifications of the safety system, involving application of the power line contactors, shall be performed only by somebody competent. A competent person is a qualified and knowledgeable person, who because of their training and experience has the knowledge required to apply those changes. It is user responsibility to commission modification of the safety system to a competent person, experienced with industrial wiring practices, which will be required to undertake the installation. Commissioning shall be undertaken by a trained electrical technician experienced in safety installations.

10.3.1 ASSEMBLING MOTION LOCK JUMPER

To apply solutions which require using power line contactors, Motion Lock connection cables in the QS-SB2 power cabinet needs to be replaced with jumpers. To prepare a jumper, you need to assemble recommended connector as shown below:



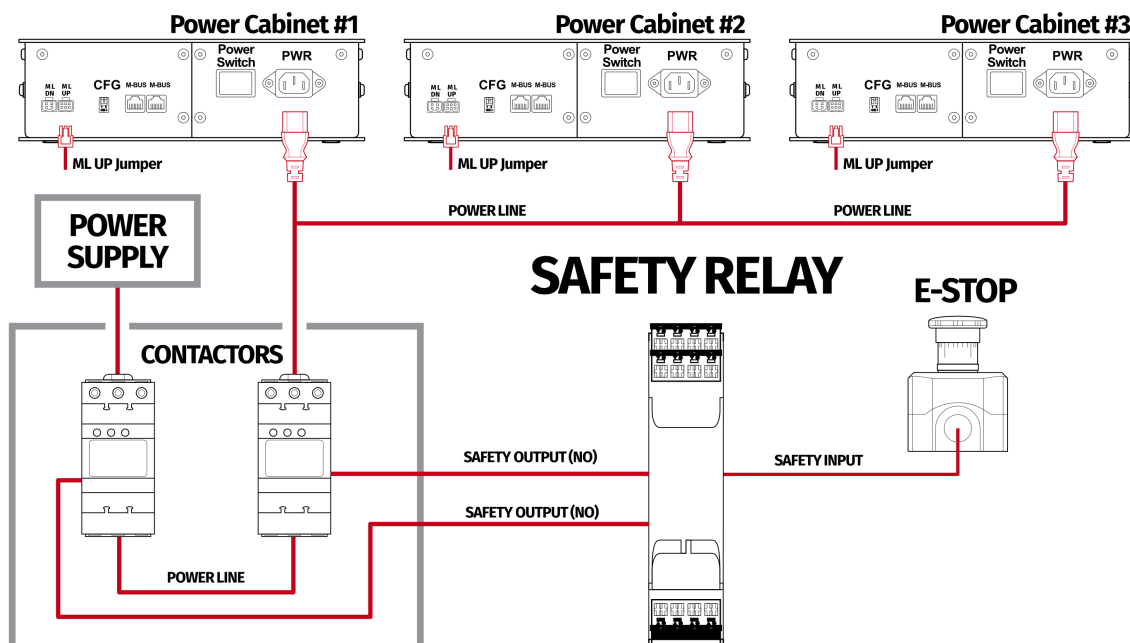
10.3.2 ADDING POWER-CUT CIRCUIT WITH E-STOP BUTTON

If specific SIL/PL rated level needs to be achieved, it might be necessary to install a power cut-off device. Two contactors connected in series and controlled by safety relay can be used to provide or cut-off power line to QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the contactors, thus cutting-off the power to the platform. To apply this solution, ML UP connection cables needs to be replaced with prepared jumper as described in section 10.3.1.

INFO

To achieve required safety performance level it is necessary to perform safety risk assessment at user site.

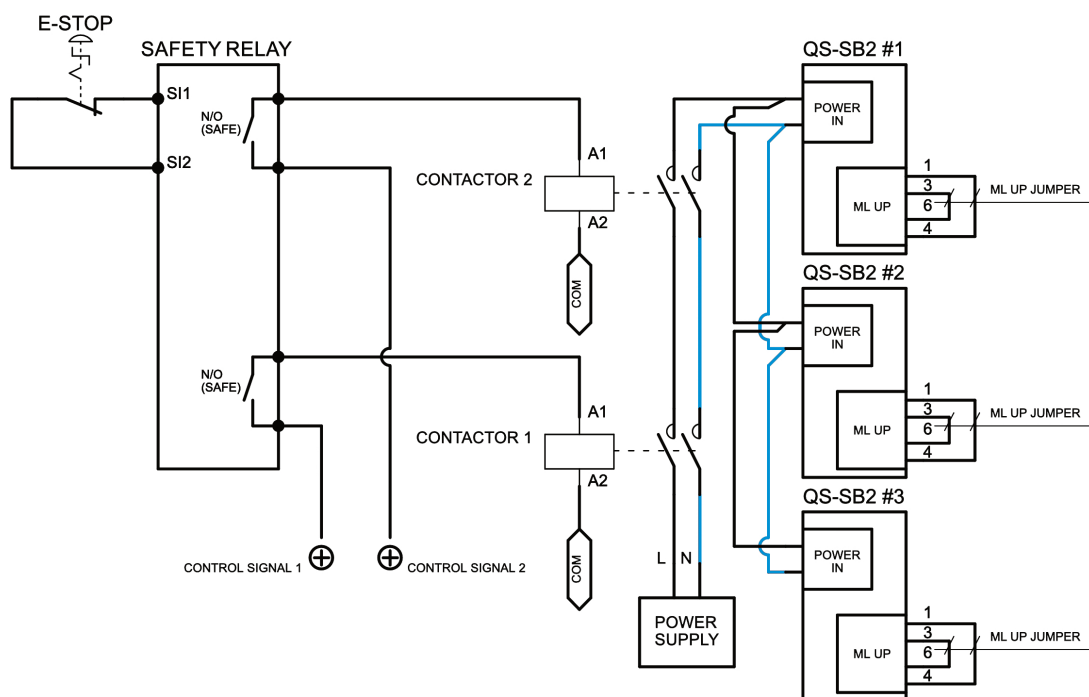
Example application of power line contactors and E-STOP button:



INFO

In order to increase SIL/PL level it's a good practice to apply well-known contactors of two different manufacturers in order to decrease probability of failure resulting from serial production.

Example wiring diagram of application of power line contactors and one-channel safety relay with E-STOP:



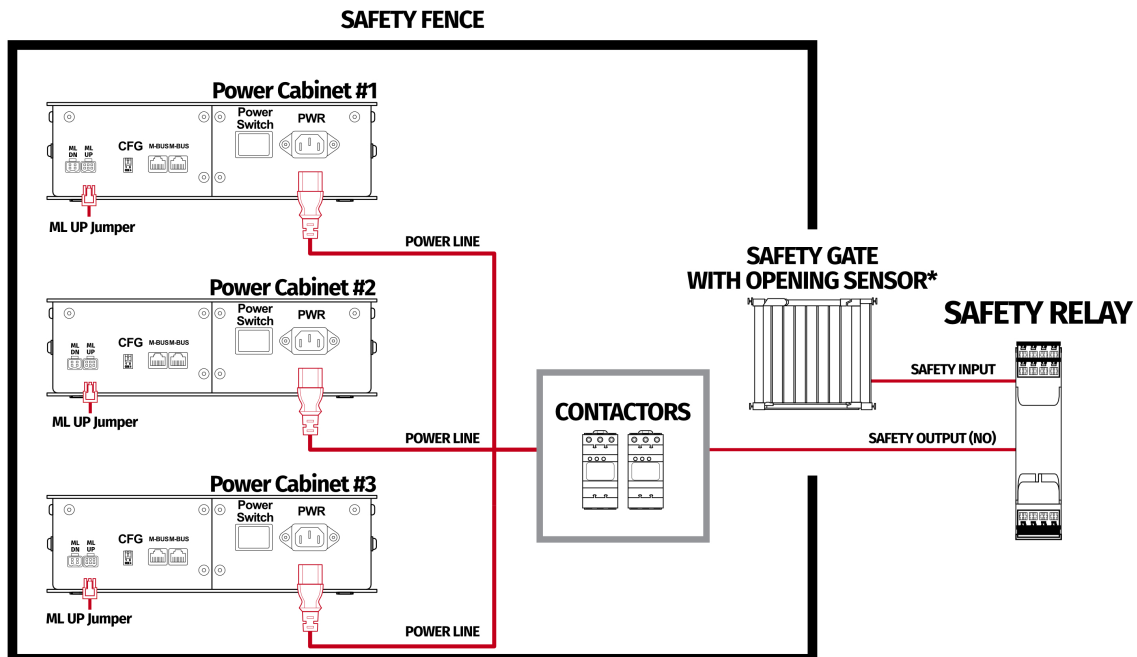
INFO

PE (protective grounding/earthing) connection is omitted for better transparency

10.3.3 IMPLEMENTING THE WORKING ZONE PROTECTION WITH POWER-CUT CIRCUIT

In example application contactors connected in series provide power line to the QS-SB2 power cabinets. When safety function on safety relay input is triggered, a safety relay will switch off the power contactors, thus cutting-off the power to the platform.

Example application of power line contactors with safety gate opening sensor:



*Check your safety relay manual for list of applicable opening sensors

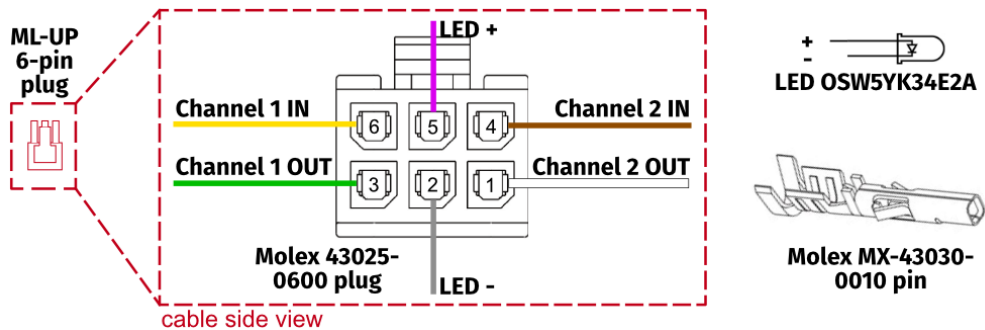
INFO

When applying safety relay and contactors to the power line remember to:

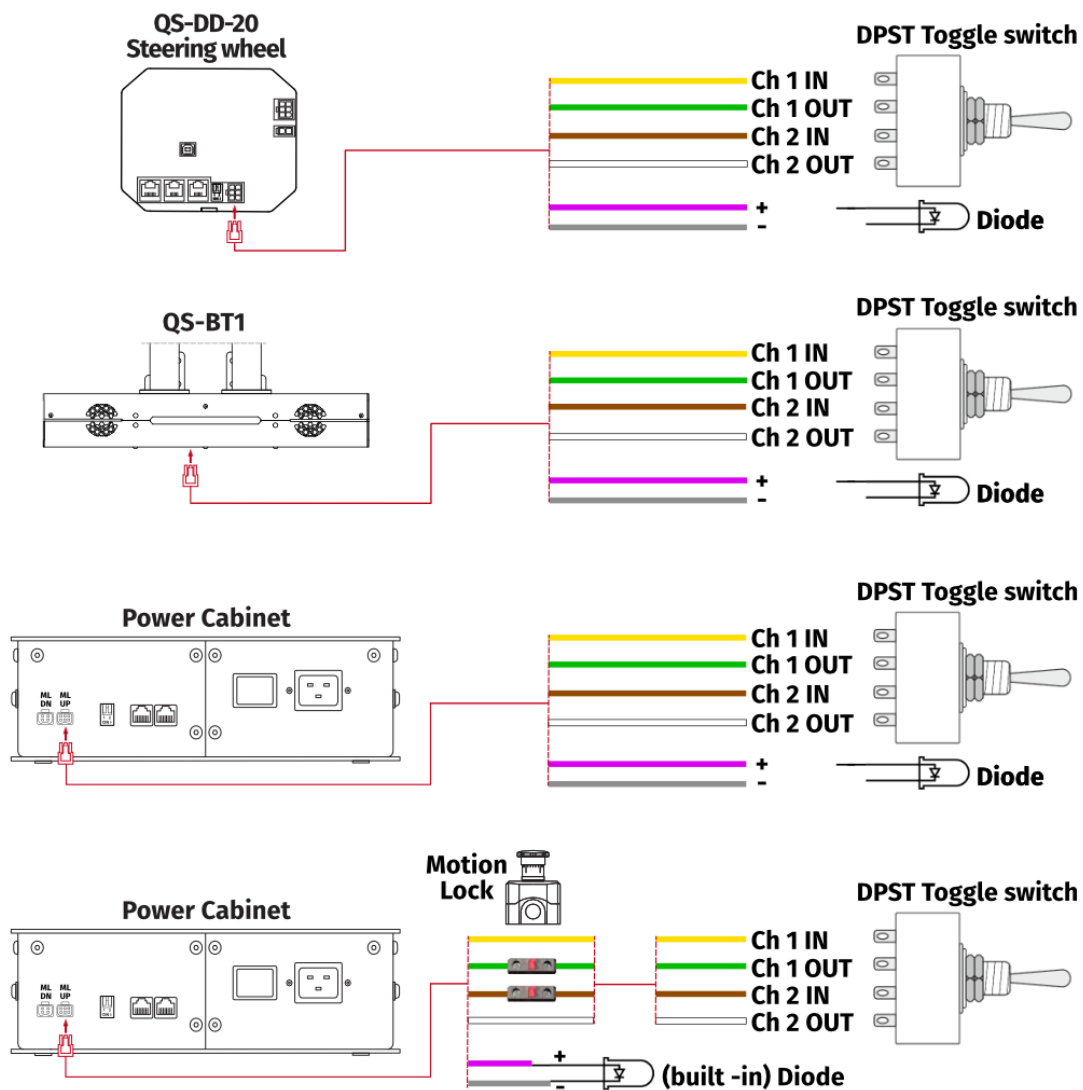
- Use control cables according to your safety relay manual
- Power line cables shall be chosen accordingly to power requirements of motion system. See power requirements of specific motion system.

10.4. IMPLEMENTING NON-FACTORY MOTION LOCK SWITCH

For non-factory Motion Lock plug setup, you must assemble plug and connectors as shown below:



If you want to assemble custom Motion Lock switch or a button box setup (only Double Pole Single Throw switch compatible) using QubicSystem Motion Lock interlink cable, follow the diagrams below:



11. CONFORMITY INFORMATION



The QS-TP1 meets the requirements of CE marking and relevant regulations of the EMC Directive 2014/30/EU.



The QS-TP1 meets the requirements of FCC 47 CFR Part 15, Class B digital device.

12. ENVIRONMENTAL IMPACT AND DISPOSAL



DO NOT dispose of this product with standard household waste but drop it off at a collection point for the disposal of Waste Electrical and Electronic Equipment for recycling.

QS-TP1 is shipped with wooden cases/cardboard boxes. If the packaging is no longer needed, it can be fully recycled.

QS-TP1 is an advanced device and if stored or disposed of incorrectly it could harm the environment or/and other people. When the device is no longer in use it should be disposed in environmental safe manner in compliance with applicable local work and environmental protection regulations. If no other agreement of disposal was concluded, the device shall be dismantled for disposal as follows:

- Metal parts should be scrapped.
- Electric and electronic components should be disposed of in the specialized disposal center.
- Other materials should be sorted and disposed of accordingly to the local law and regulations.

13. LIABILITY DISCLAIMER

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages caused by one or more of the following:

- The product has been modified, opened, or altered.
- Failure to comply with assembly instructions.

-
- Inappropriate or abusive use, negligence, an accident (an impact - for example).
 - Normal wear.

INFO

If permitted under applicable law, Motion Systems and its subsidiaries disclaim all liability for any damages unrelated to the material or manufacturing defect with respect to the product (including, but not limited to, any damages caused directly or indirectly by any software, or by combining the QS-TP1 with any unsuitable element or other elements not supplied or not approved by Motion Systems for this product).

14. WARRANTY

Motion Systems warrants to the consumer that this product shall be free from defects in materials and workmanship, for a warranty period which corresponds to the time limit to bring an action for concerning this product.

For commercial customers there is a one (1) year limited warranty, starting on the original date of purchase.

For non-commercial customers there are two (2) years warranty, starting on the original date of purchase.

Within the warranty period, the product will be repaired or replaced free of charge, excluding shipping charges.

This warranty shall not apply:

- If the product has been modified, opened, altered, or has suffered damage as a result of inappropriate or abusive use, negligence, an accident, normal wear, or any other cause unrelated to a material or manufacturing defect (including, but not limited to, combining the QS-TP1 with any unsuitable element, including in particular power supplies, chargers, or any other elements not supplied or approved by Motion Systems for this product).
- In the event of failure to comply with the instructions provided by technical support.
- To software (said software being subject to a specific warranty).
- To accessories (cables, cases, for example).
- If the product was sold at public auction or if the product has suffered damage as a result of force majeure: flood, fire, earthquake, storm.

This warranty is non-transferable. No new warranty period commences if the product is repaired or replaced. Your statutory rights towards the seller are not affected or restricted by this warranty. Motion Systems, and their partners are not liable for any indirect, incidental, or punitive damages from use of this product. In case of malfunction during the warranty period immediately contact technical support.

15. COPYRIGHT

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16. MANUFACTURER INFORMATION

Qubic System is a brand
that belongs to **Motion Systems**

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Poland



Motion Systems homepage



QubicSystem homepage

INFO

In support queries please contact your reseller.

