
MVTB Series

Motorized Vertical Tooling Bar



Assembly & User's Manual



Helping the World Measure TM



Since 1927

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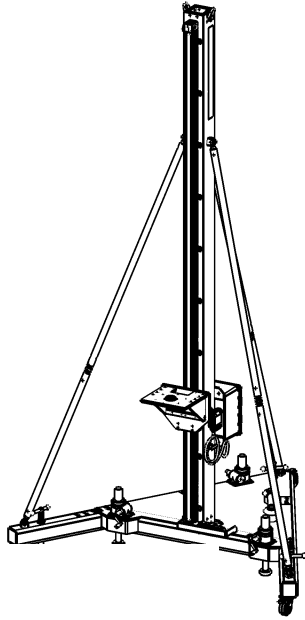
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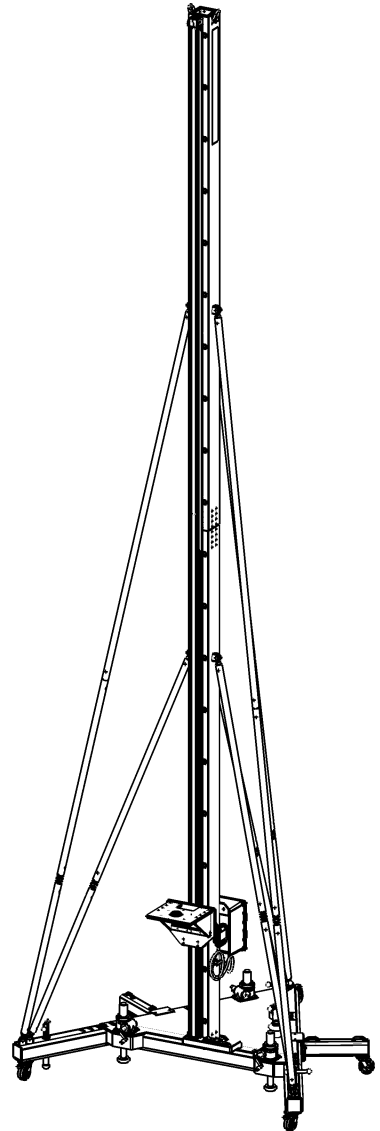
Thank you for purchasing a Brunson Motorized Vertical Tooling Bar (MVTB).

Remember that our customer support does not stop after shipment of a product—we are here to help you with any measurement challenges that you may have.

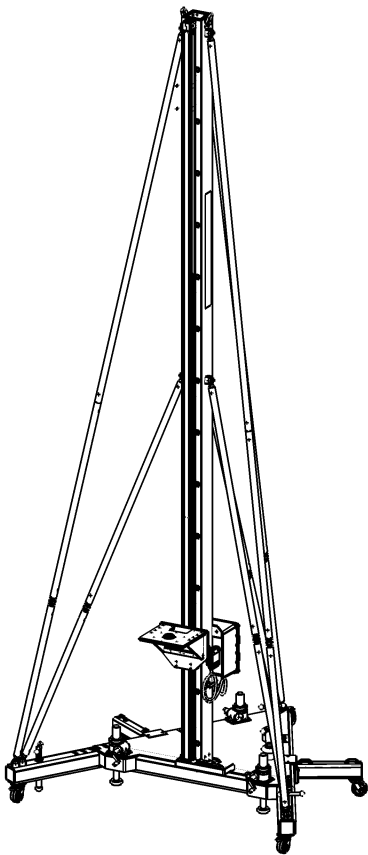
Model 17'



Model 34'



Model 25'



MVTB Series Motorized Vertical Tooling Bar

Congratulations and thank you for your purchase of a Brunson MVTB. We believe that our stands are the finest available, providing a rock-solid base to meet all of your metrology needs. We have been in the measurement industry since 1927, so we fully understand the importance of a stable, rugged, and durable metrology platform. At Brunson, HELPING THE WORLD MEASURE™ is more than our motto; it truly reflects our passion and dedication to the metrology world.

General Information

Please take a moment to review this manual. It contains important safety and operational information for the stand. For future reference, please record the model and serial number for the stand in the space provided.

Model Number _____

Serial Number _____

Safety Precautions

Static (non-moving) stability:

- These stands are designed for level surfaces. Operating a stand on non-level surfaces increases the tipping hazard.

Dynamic (moving) stability:

- Stands should only be moved when no instrumentation / equipment is attached and the shelf is in its lowest/home position).
- Stands should be moved no faster than a normal walking pace over smooth, level surfaces. Tall stands can be moved by manually pushing or pulling, or by towing with a powered vehicle.

TO MINIMIZE THE TIPPING HAZARD, DO NOT MOVE THE STAND FASTER THAN THE SPEED INDICATED ON THE YELLOW WARNING LABEL ON THE BASE.

- Avoid sudden starts and stops.

Some models include two outriggers that attach to the stand tribrach to enhance dynamic stability. When included, ensure outriggers are securely attached (as described later in this manual) prior to moving stand.

These stands are designed for indoor use only. Wind (or other external) loading was not considered when determining stability.

Do not exceed the load capacity of the stand for any attached instrumentation / equipment. The maximum load capacity is listed in Table 1.

It is the responsibility of the end user to ensure that any instrumentation or equipment attached to the stand is safely secured.

Model	Stand weight		Max load capacity	
	lbs	Kg	lbs	Kg
MVTB-17'	2863	1299	150	68
MVTB-25'	3070	1393	150	68
MVTB-34'	3252	1475	150	68



WARNING!

This is the safety alert symbol. This symbol alerts you to hazards that can hurt you and others, and/or cause damage to equipment. Additional information specific to the hazard will be included with this warning.

Unpacking and Setup

The components for this stand are shipped in several crates. Please refer to the following instructions for guidance on stand assembly and setup.

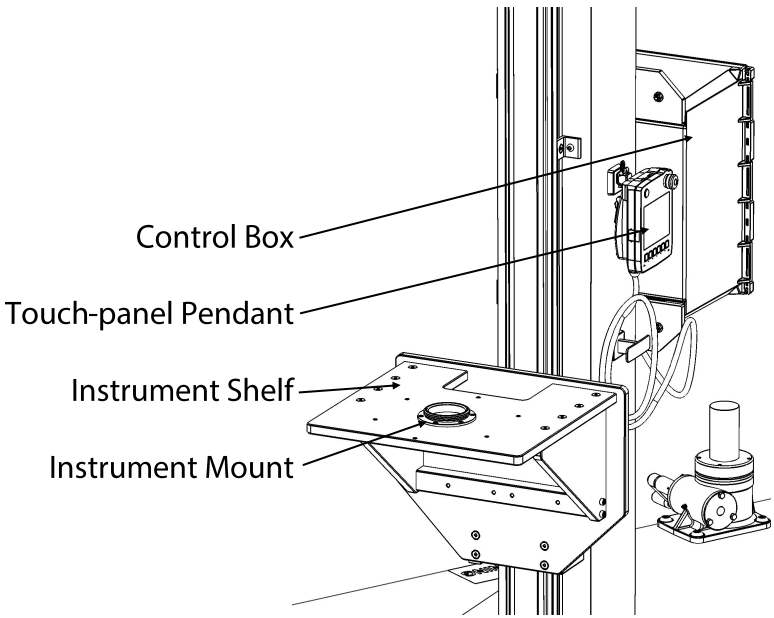
Required Tools:

- Overhead crane or forklift - 40 ft. [12m] ground clearance for MVTB-34'; 30 ft. [9m] for MVTB-25'; 23ft. [7m] for MVTB-17', 2500 lbs. [1100 kg] minimum lift capacity.
- Man Lift - Dependent on MVTB height (see above for estimates)
- Torque wrench - 4-40 lb-ft [5-50 Nm]
- Allen wrench set. (metric and imperial)
- Adjustable wrench (2)
- Wood blocks (4)

Torque Specifications:

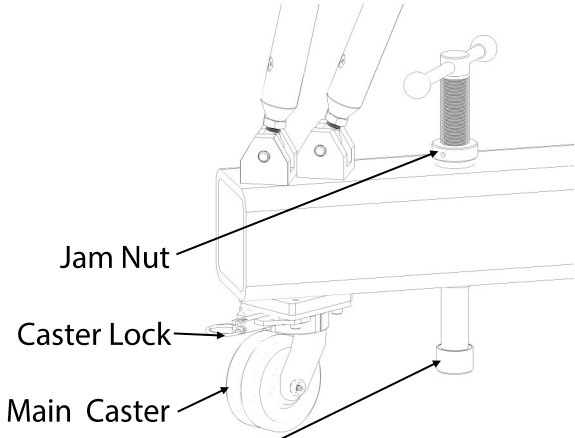
- 1/2-13 fasteners - 27 lb-ft [37Nm]
- 5/8-11 fasteners = 54 lb-ft [73 Nm]
- Shoulder bolts - N/A, hand tight + 1/4 turn

(The MVTB-34' is illustrated here, but other models in this family are substantially similar.)



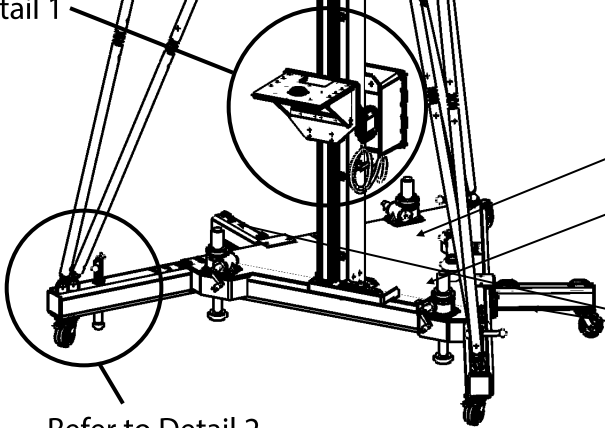
Detail 1

Braces (6)



Detail 2

Refer to Detail 1



Refer to Detail 2

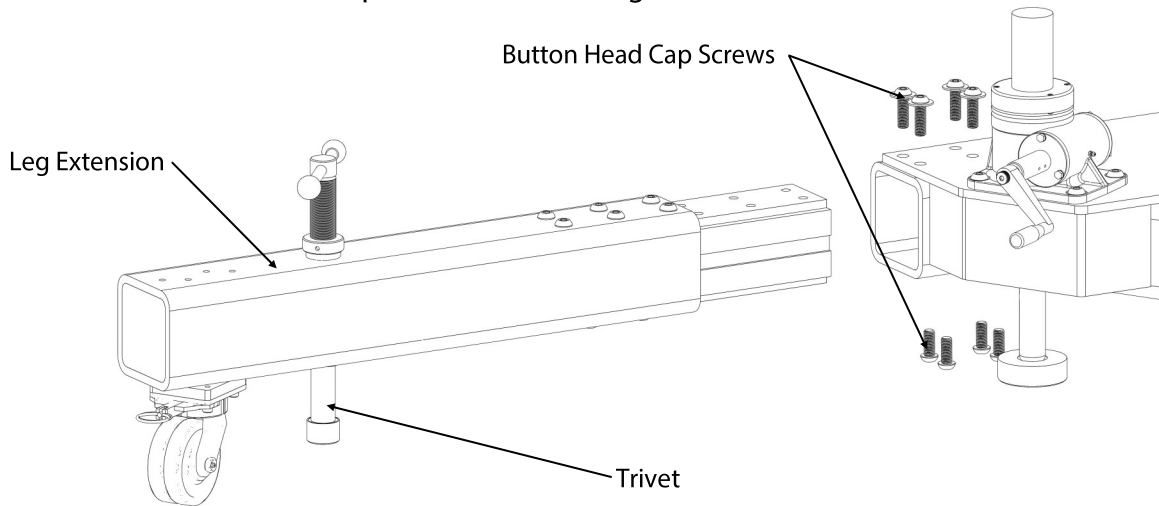
Jack Screw

Towbar (shown stowed)

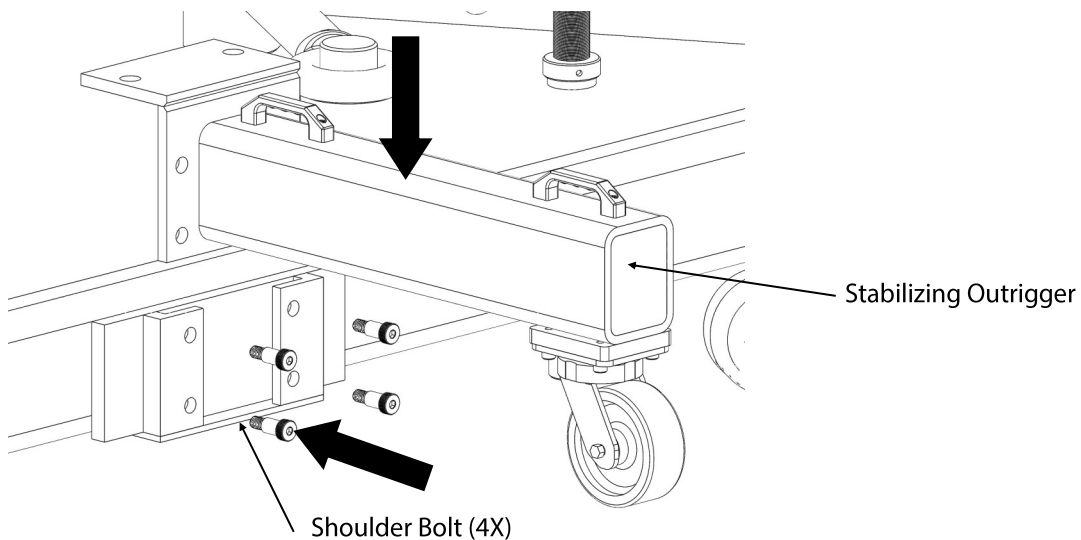
Outriggers (2)
(not supplied on all models)

Base Assembly

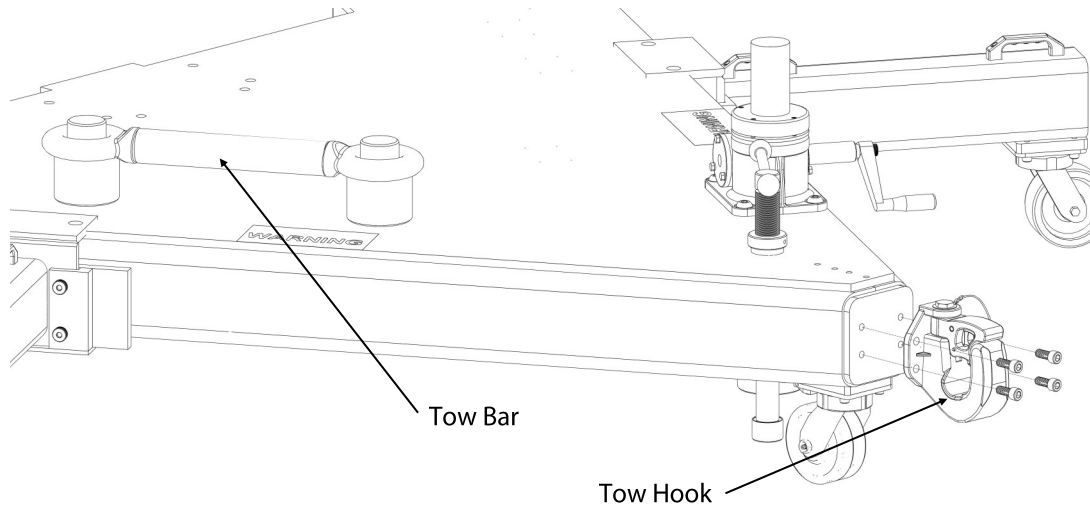
- Before removing the base from the crate, install the leg extensions by sliding into main base and installing 5/8-11 button head cap screws, and washers if present.
- Repeat for the other leg extension.



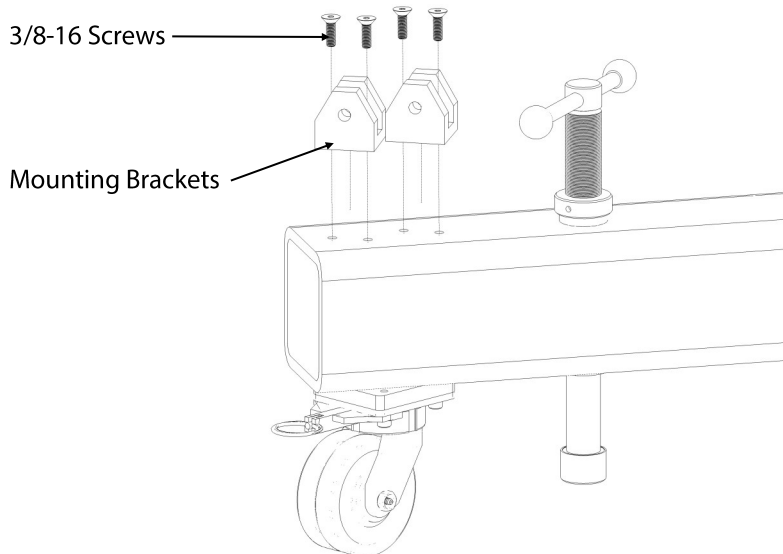
- Use overhead lifting device to remove base from crate (approx. 2200lbs. [998 kg]).
- Lower trivets to prevent base from rolling.
- Install outrigger (where applicable—25', 34') in stabilizing position. Install and tighten 5/8" shoulder bolts (4 places).
- Repeat with outrigger on opposite side of base.



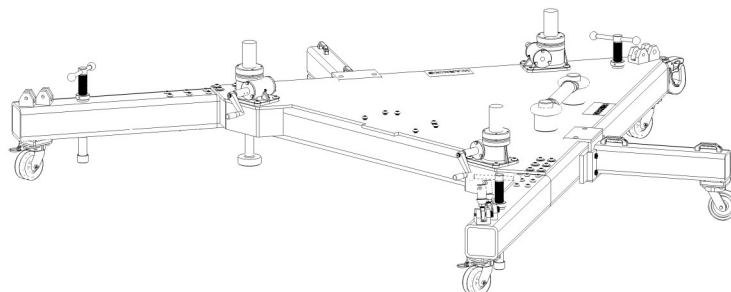
- Install Tow Hook using 1/2-13 X 1" cap screws (4X)



- Install mounting brackets using 3/8-16 X 1.25" (2 each) flat head cap screws (6X for 25' and 34', 3X for 17') near trivets.

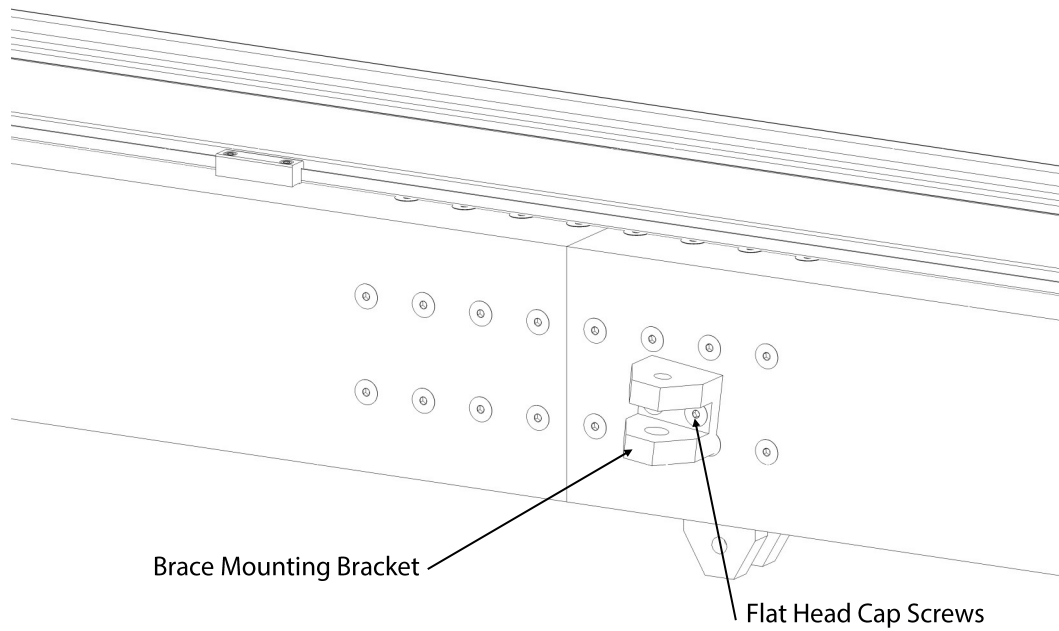


Assembled Base



The Backbone

- Attach brace mounting bracket with 3/8-16 X 1.25 flat head cap screws. There are 3 brackets—left side, right side, and back (bottom in shipped orientation) for 17' stands. 6 brackets are required for the 25' and 34' stands. Back/bottom brackets may have to be installed once backbone is vertical.



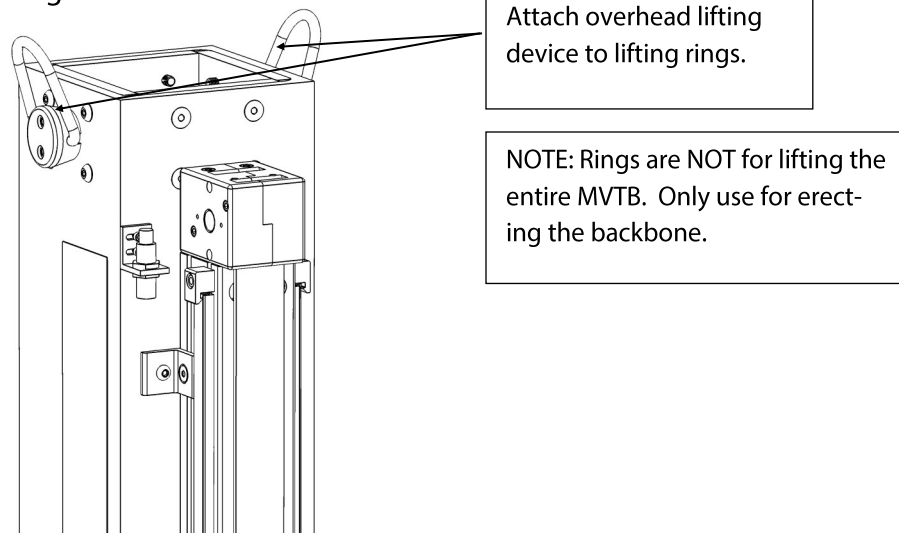
Erecting the Backbone

Caution: Lifting the backbone should be performed by skilled personnel only.

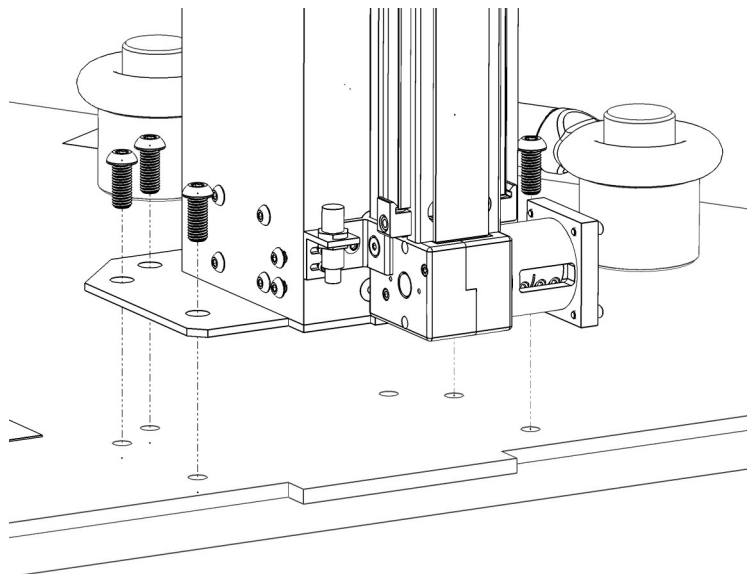
Caution: Do NOT remove lifting device until all bolts and braces are tightened.

Caution: Do NOT attempt to lift the entire assembled MVTB with the overhead device. Only lift the backbone and actuator assembly.

- Use overhead lift to raise the backbone and actuator off the wood blocks/crate in a vertical orientation. Approx. 909lbs (412 kg) - depending on MVTB height.



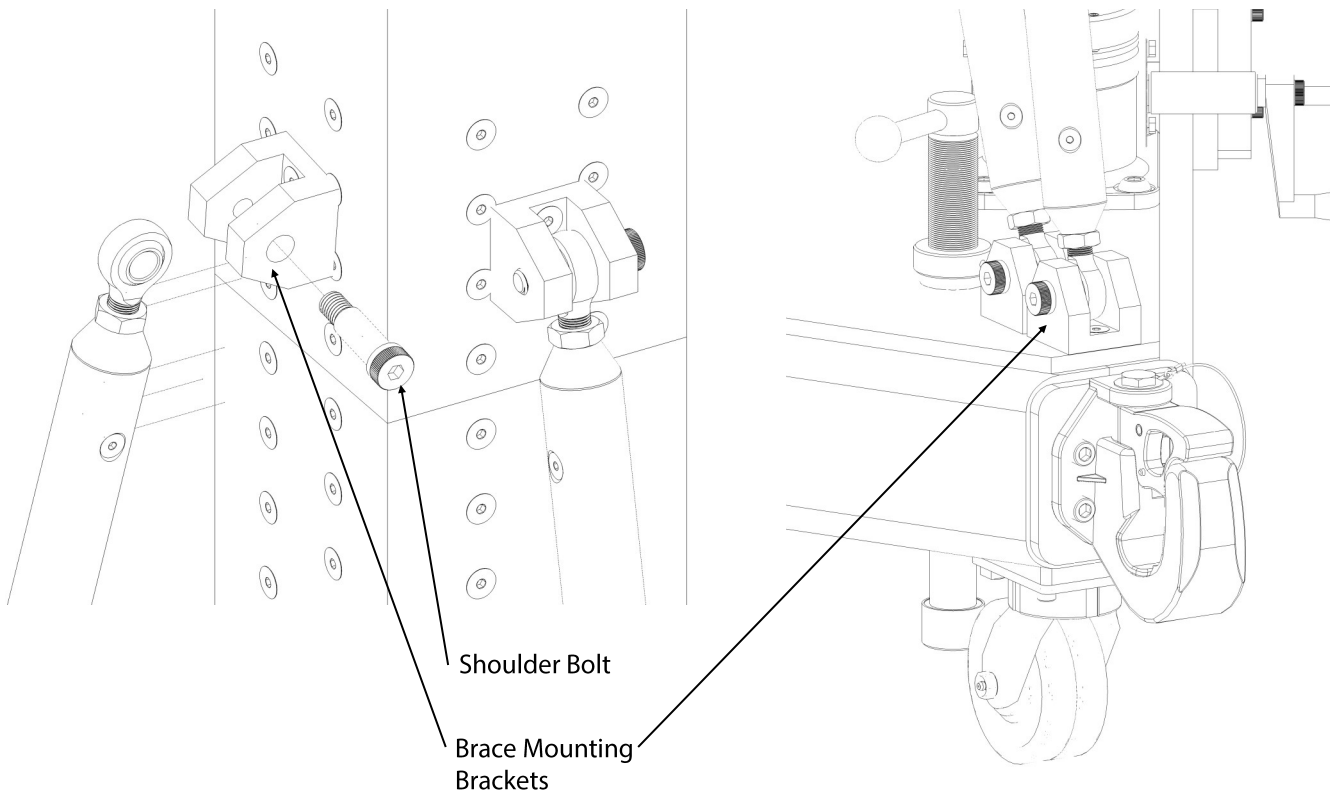
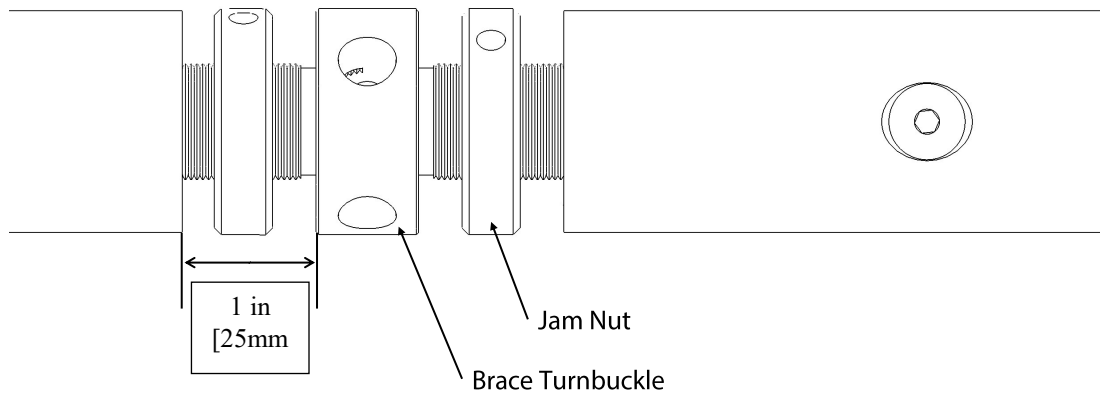
- Align to the tapped holes in the base, and bolt down with 5/8-11 X 1.5 BHCS. Torque screws to 54 lb-ft [73 Nm].



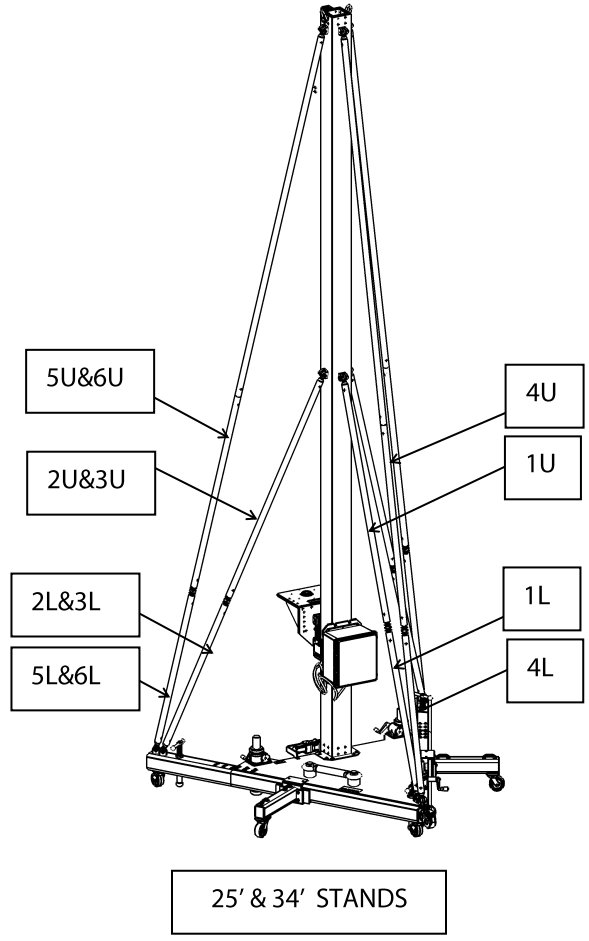
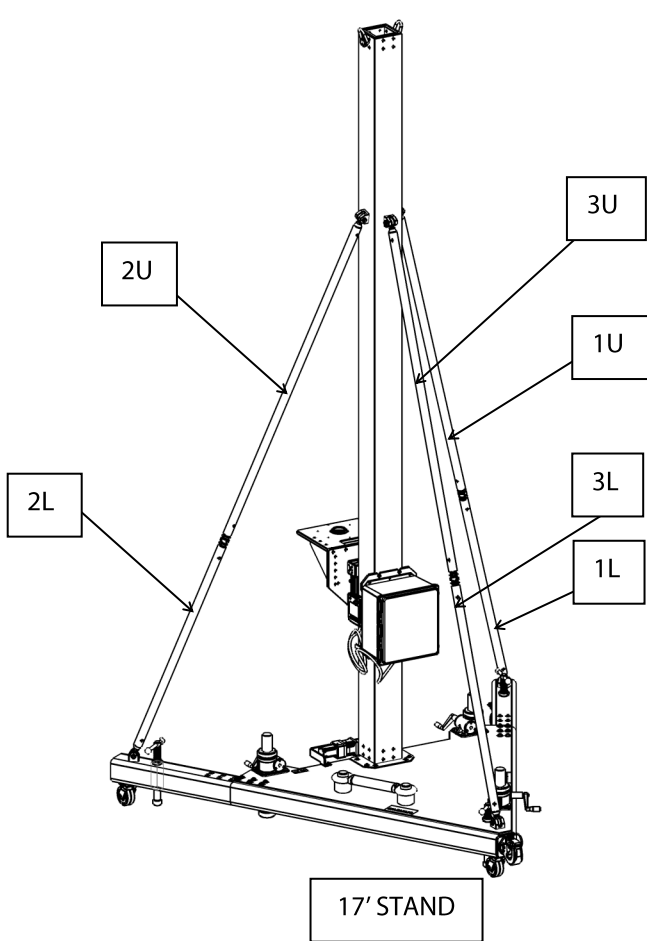
Braces

- Install braces to corresponding mounting brackets using 5/8-11 shoulder bolts. Braces are numbered and should be assembled on the floor before being set in place.

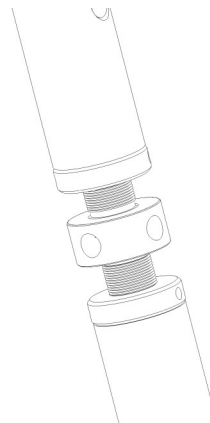
Note: Braces are different lengths. Use the numbering system to assemble and place. It is recommended that the braces be assembled with approx. 1 in [25mm] of thread showing on each side of the turnbuckle; this will simplify the next step.



	17'	25'	34'
1 LOWER / 1 UPPER	59" (1499mm) / 88.5" (2248mm)	59" (1499mm) / 88.5" (2248mm)	59" (1499mm) / 88.5" (2248mm)
2 LOWER / 2 UPPER	59" (1499mm) / 91" (2311mm)	59" (1499mm) / 91" (2311mm)	59" (1499mm) / 91" (2311mm)
3 LOWER / 3 UPPER	59" (1499mm) / 91" (2311mm)	59" (1499mm) / 91" (2311mm)	59" (1499mm) / 91" (2311mm)
4 LOWER / 4 UPPER	-	59" (1499mm) / 219" (5563mm)	59" (1499mm) / 219" (5563mm)
5 LOWER / 5 UPPER	-	59" (1499mm) / 220" (5588mm)	59" (1499mm) / 220" (5588mm)
6 LOWER / 6 UPPER	-	59" (1499mm) / 220" (5588mm)	59" (1499mm) / 220" (5588mm)

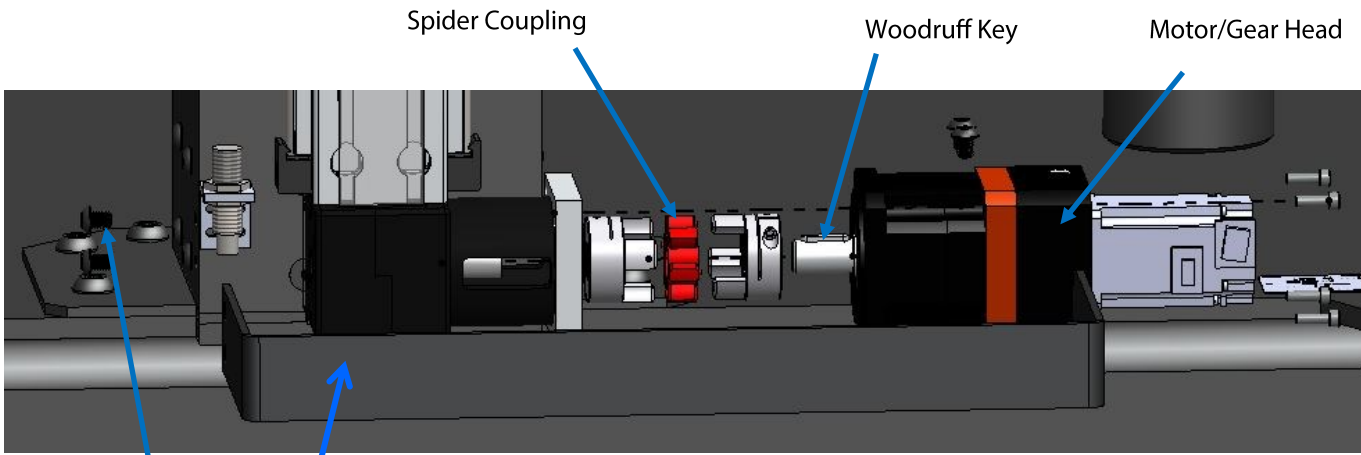


- Tension the braces using turnbuckles. Braces should be snug—hand tight plus 1/4 turn. Tighten jam nuts to brace side of turnbuckle. Do not attempt to make the braces rigid, they will still have 'play' from the eye bolts and flexing due to length.
- Release from the overhead lift.



Mounting the Drive Motor

- Move shelf carriage to approximately 4" (100mm) above the lowest point of actuator. Support carriage to prevent it from falling.
- Install motor and gear reduction head as shown below. Ensure spider coupling is installed for full spider engagement, and woodruff key containment. See torque table below for fastening specifica-



- Install motor guard to base, and backbone using supplied screws.

Table 3— Tightening Torques		
Fastening screws		
Thread	M _A [Nm] with base	
	Steel	Aluminium
M 5	5.4	5.4
M 6	9.0	9.0
M 8	22.0	19.0



WARNING!

Do not remove motor/gear reduction head unless shelf is at lowest point, and supported.

Damage to components and personal injury may occur if shelf is not secured prior to motor and/or gear reduction head removal.



Actuator

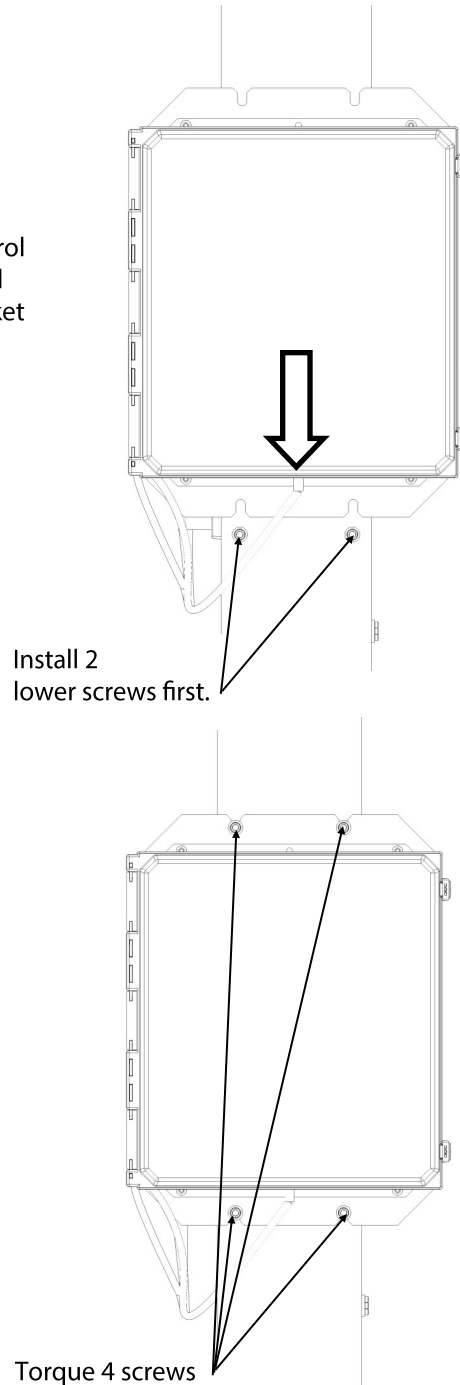
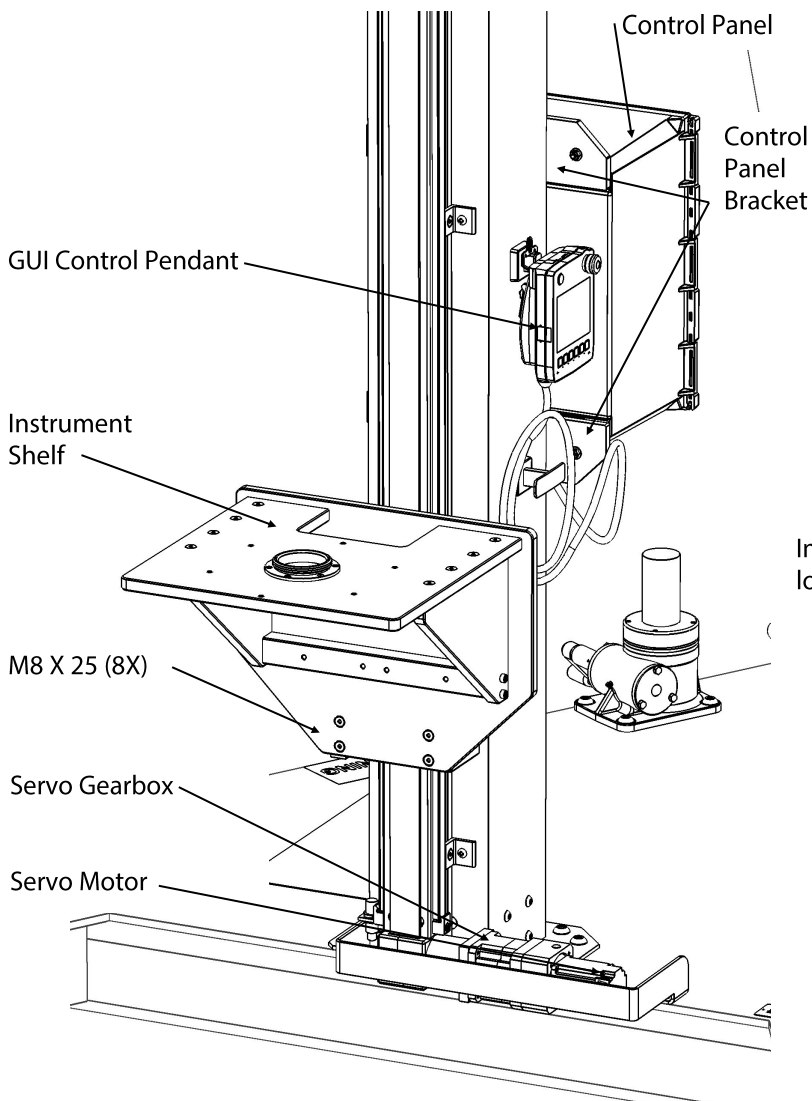
Brunson MVTB 17', 25', and 34' models are supplied with a Macron Dynamics belt driven actuator, MSA14H. Actuator belt and cart are shipped pre-tensioned, and should not require adjustment.

Periodic lubrication of the rails may be necessary. See Macron Dynamics user manual regarding lubrication (page 9, and bottom of page 15).

Macron Dynamics user manual is included at the end of this document.

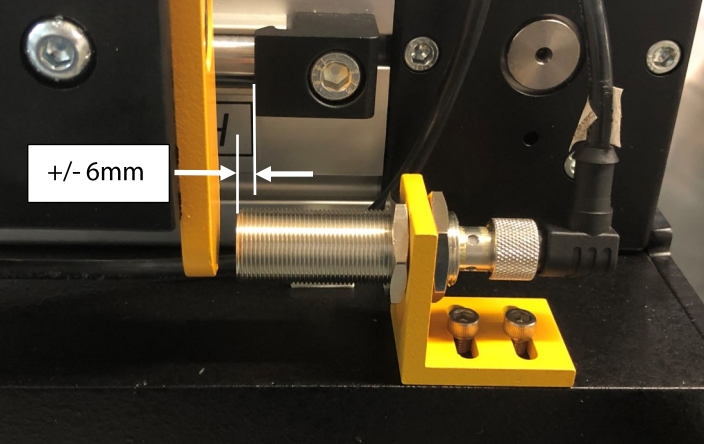
Create Motion

- Install the instrument shelf using M8 X 25 flat head cap screws (8X). Tighten to 22 Nm / 16 lb-ft.
- Mount the control panel and brackets to the tapped holes in the back of the back bone using four 3/8-16 socket head bolts.



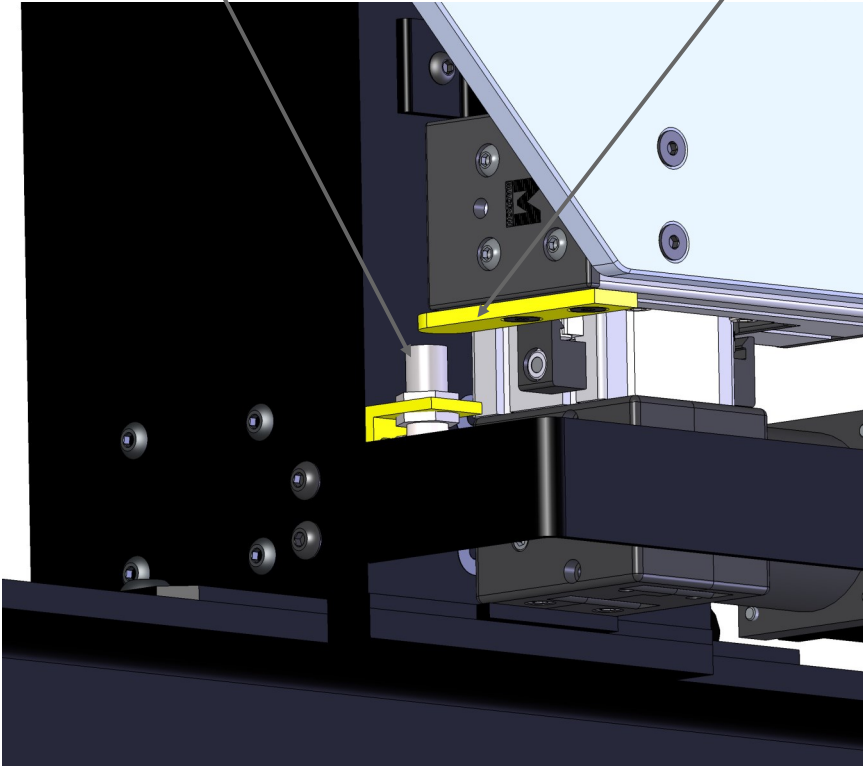
Stand Operation

- Install the proximity sensors. Cables have been set to the correct length. The longest cable is attached to the top bracket sensor. shorter cable is attached to the lower bracket sensor. Set the distance from the front of the sensor to the black bracket shown to +/- 6mm.



Lower proximity sensor

Lower proximity sensor trigger / magnetic switch

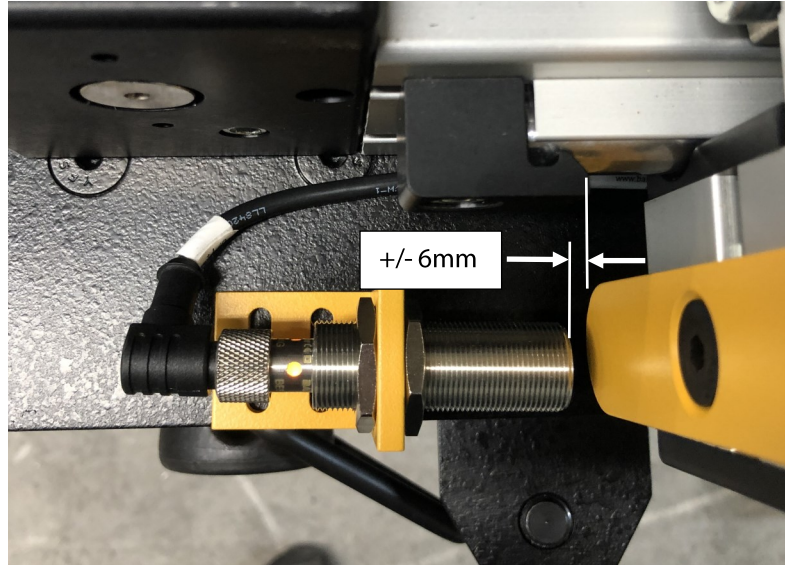


CAUTION: INCORRECT POSITIONING OF PROXIMITY SENSORS CAN CAUSE SEVERE DAMAGE TO THE ACTUATOR.

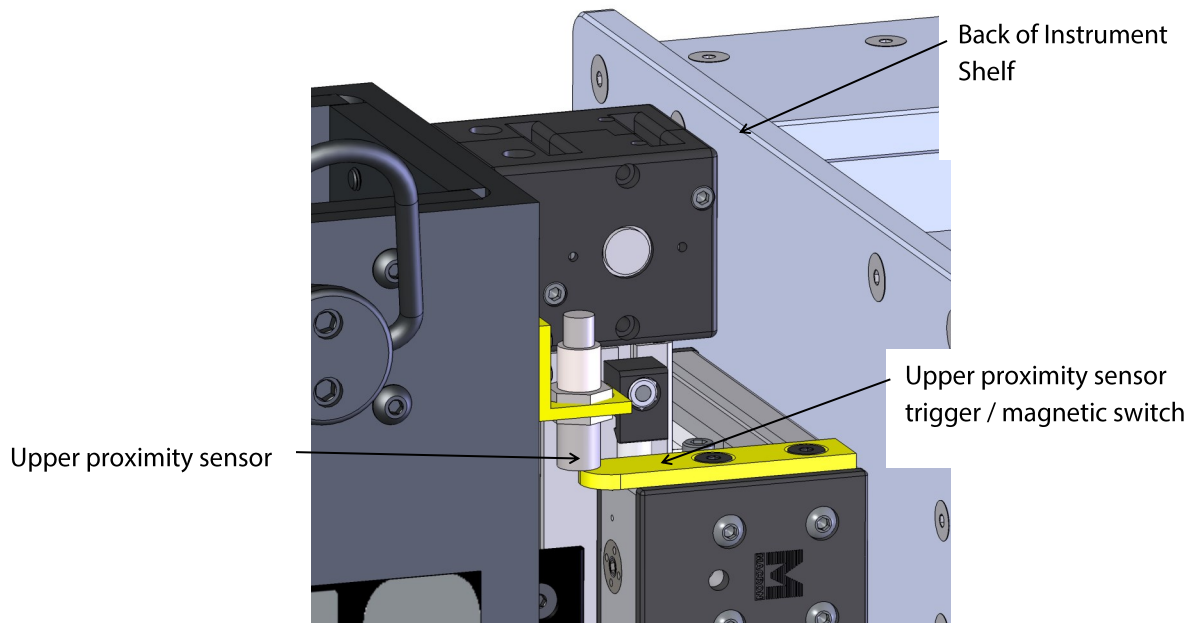


WARNING!

- Set the upper sensor in the same way as the lower sensor.



- When the power is on the sensor will light up when working. When the sensor is "tripped" by the steel bracket on the instrument shelf the light will turn off. Verify that each sensor works using a piece of scrap steel.

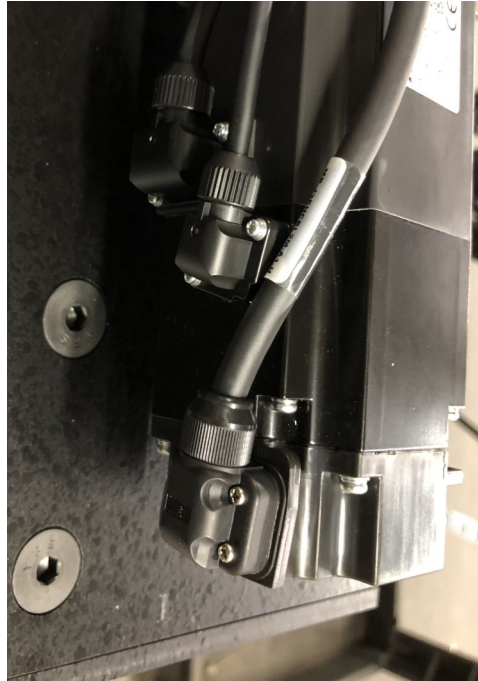


- Attach the control and feedback cables to the servo motor. A coiled cable wrap has been provided to manage the servo and proximity sensor cables as they travel from the motor to the control panel.



Motor cable hookup

Kollmorgen

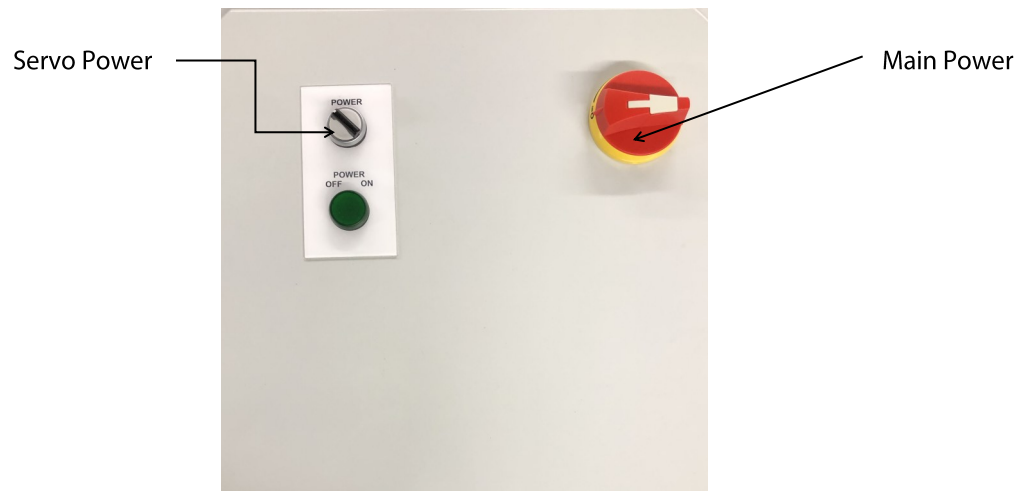


Motor cable hookup

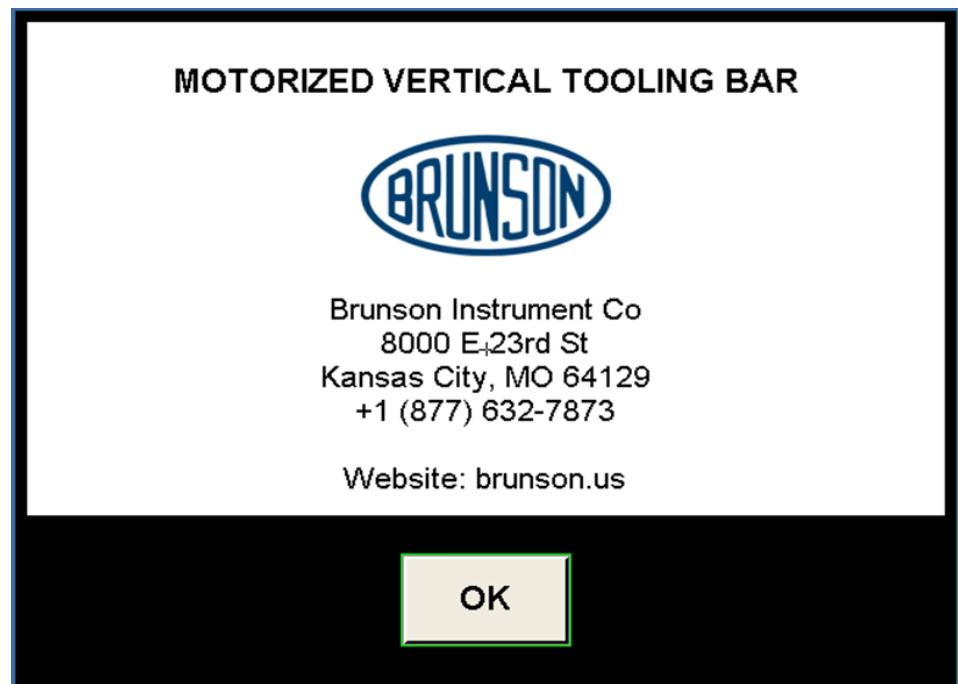
Mitsubishi

Control Panel

- The control panel can now be plugged into power. The MVTB requires 100-240 VAC single phase, 50-60 Hz, 1000 watts minimum. Turn on the main power, the red knob. Next turn the black switch to power on the servo control. The green light will turn on, and after 10-15 seconds there will be an audible click heard at the motor.



- The graphic control panel will start up on main unit power up and display this screen;



Splash Screen
Press 'OK' to proceed.

Upon first start-up after assembly the control panel will display alarm 25.1 (home position lost) and not operate. To clear the alarm:

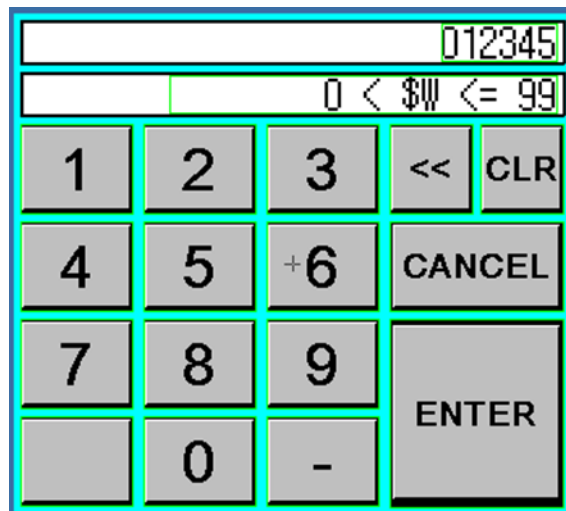
1. SETUP menu >> LOGIN >> code "7873" enter.
2. FACTORY SET-UP >> press HOME MODE enable >> SET HOME. (screen will not change)
3. Turn the control panel power off for 30 seconds.
4. Turn power on; the alarm should be cleared and the Jog function enabled.

Home (zero) position will be incorrect.

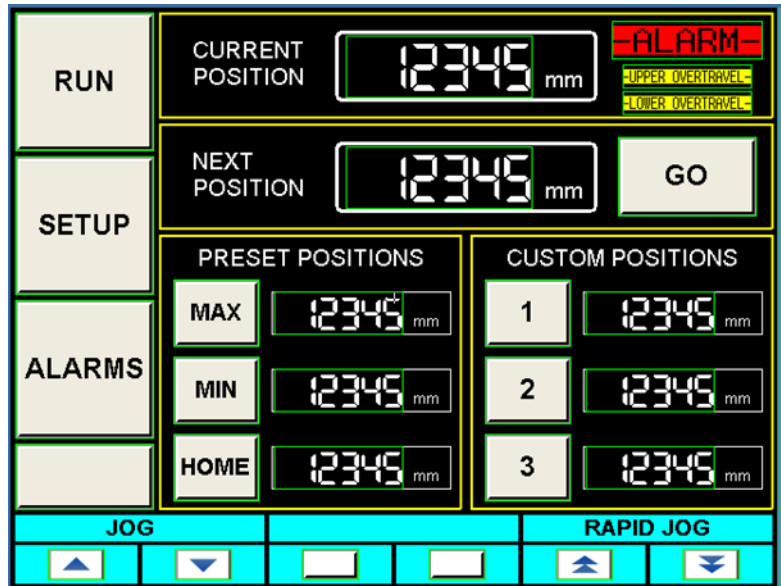
5. SETUP menu>> LOGIN >> code "7873" enter.
6. FACTORY SET-UP >>
7. Jog the MVTB shelf down until the lower proximity sensor is tripped.
8. HOME MODE enable >> SET HOME (current position will change to 0) >> HOME MODE disable.
9. RUN menu. Current position should = 0

These procedures should only be required after assembly of the MVTB and installation of the motor. A brief video of the set home procedure can be found at <https://youtu.be/DMVa1IOXIPU>

- For all number entry fields, this display will show. Key in the number, then press Enter to confirm.

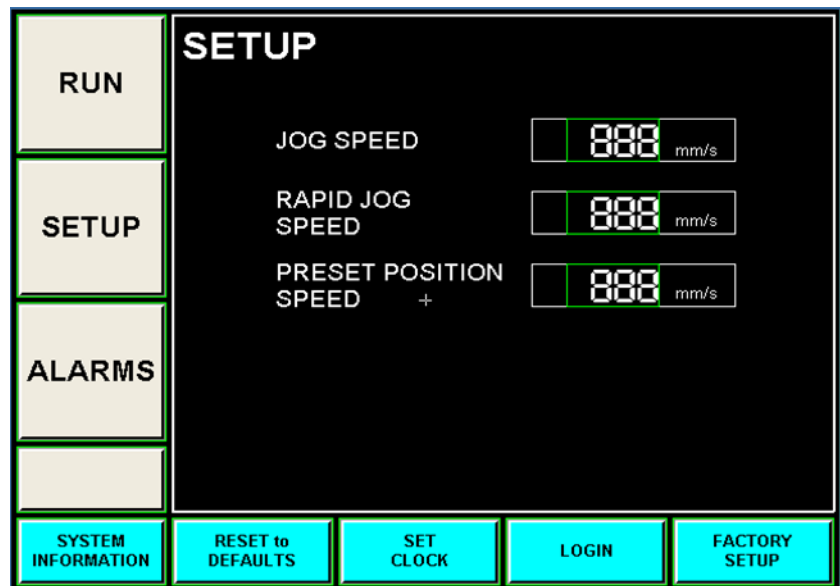


- The main interface screen will then be displayed. If no numbers are present, wait until you hear the click from the motor (as mentioned in the previous section).



Main Screen

- To perform initial setup, click the setup button. The screen below will show. Set the clock to your location. If at any time you wish to return to factory settings, press the 'RESET to DEFAULTS' button.



Setup Screen

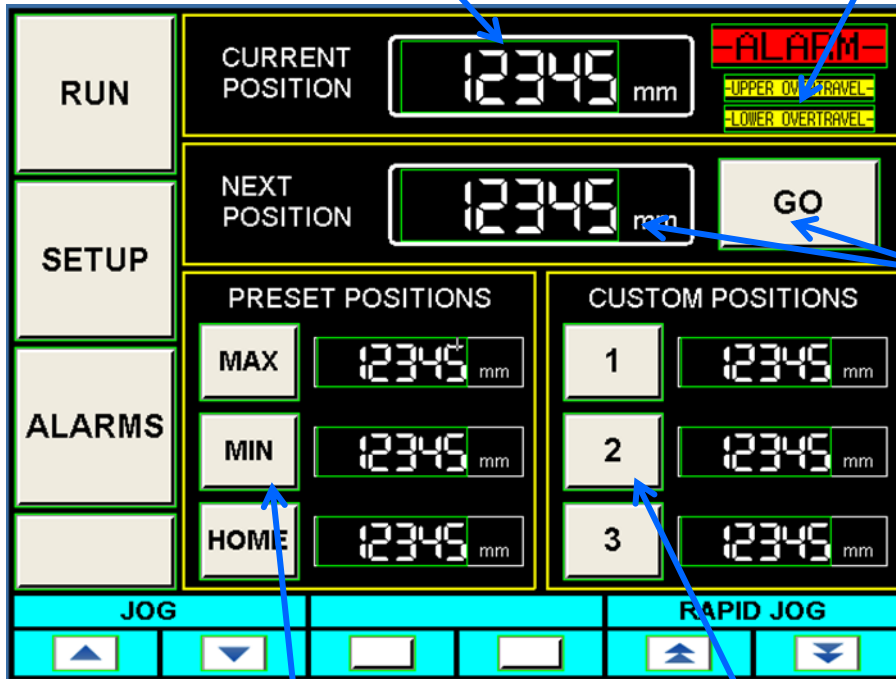
- Set the jog and rapid jog speeds as desired. The maximum is factory set and can not be changed. Press the RUN button to return to the main screen.

Alarm warnings.

ALARM—general warning. See ALARMS tab.

Current carriage position
(measured at lowest point)

Upper or Lower Overtravel—carriage
has reached its max. or min. and will
not go further.



Next position. Carriage will
travel to this point when
GO is pressed.

Main Screen

MAX & MIN are factory set.

HOME can be user set. Press the
numbers to get the input popup.

Custom Positions can be
changed by user. Positions will
be saved in memory.

- All lower preset or custom positions will be accessible by pressing the associated button, then pressing go. Carriage will travel to specified location.
- To manually jog the carriage, press the physical white buttons below the arrows for JOG or RAPID JOG. Arrows specify direction of travel. These buttons use the speed inputs selected on the SETUP screen.

- Should your MVTB experience any issues, and alarm will be logged on the ALARM PAGE. You may clear these once the problem has been rectified by pressing RESET.

ALARMS			
OCURRED	COMMENT	RESET	
19/01/31 16:18	F301 Motor Overheated	16:18	<div style="background-color: red; color: black; text-align: center; padding: 5px; margin-bottom: 5px;">RESET</div> <div style="background-color: cyan; text-align: center; padding: 5px; margin-bottom: 5px;"> </div> <div style="background-color: cyan; text-align: center; padding: 5px; margin-bottom: 5px;"> </div> <div style="background-color: cyan; text-align: center; padding: 5px;">EXIT</div>
19/01/31 16:18	F302 Motor Overspeed	16:18	
19/01/31 16:18	F303 Motor Run Away	16:18	
19/01/31 16:18	F304 Motor Foldback	16:18	
19/01/31 16:18	F314 Motor Phase Loss	16:18	
19/01/31 16:18	F405 BiSS Watchdog Fault	16:18	
19/01/31 16:18	F406 BiSS Multi Cycle Fault	16:18	
19/01/31 16:18	F407 BiSS Sensor Fault	16:18	
19/01/31 16:18	F423 NV Fail - Extended Multiturn	16:18	
19/01/31 16:18	F439 Following Error	16:18	
19/01/31 16:18	F501 Bus Over Voltage \mp	16:18	
19/01/31 16:18	F502 Bus Under Voltage	16:18	
19/01/31 16:18	F524 Drive Foldback	16:18	
19/01/31 16:18	F525 Output Over Current	16:18	
19/01/31 16:18	F531 Power Stage Fault	16:18	
19/01/31 16:18	F570 Phase Loss	16:18	
19/01/31 16:18	F602 Safe Torque Off	16:18	
19/01/31 16:18	Servo Drive Fault	16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
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19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	
19/01/31 16:18		16:18	

Alarm Screen

Stand Brace Maintenance

- The turnbuckles on the support braces occasionally need to be tightened. The recommendation is that they are firmly “snug” (hand tight plus ¼ turn) and inspected monthly. Do not attempt to make the braces rigid, they will still have “play” from the eye bolts and the flexing due to length.

Actuator Clamp Maintenance

- The fasteners holding the actuator clamps were torqued at the factory and painted with marking paint. Visually inspect marking paint periodically to ensure no movement has occurred. If movement has occurred, re-torque fasteners to 32 in lbs [3.6 Nm].

Actuator Maintenance

- Periodic lubrication of the rails may be necessary. See Macron Dynamics user manual regarding lubrication (page 9, and bottom of page 15).

Macron Dynamics user manual is included at the end of this document.

Weekly Maintenance

- On a weekly basis, the three jack screws should be lowered and raised to maintain lubrication distribution on internal components.



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