

TREADWALL® M4 Install Manual

Model Pro

The manual is arranged as a checklist. As you go through we encourage you to check off the steps.

The Treadwall is a large, but not complicated machine. None of the steps in this manual are particularly difficult, but it is important to follow all of the steps carefully. *The order of assembly is important at certain points, so read each page.*

The drawings on the following pages clarify some of the trickier points. We suggest you review them before you begin and refer to them when noted in the manual.

IMPORTANT: *The Treadwall transformer is designed for use with 110 volt 60 or 50 cycle AC current. It supplies 12 volts DC at 1.5 amps to the Treadwall. Users with different supply voltages must use a conversion transformer or other means to provide the proper voltage.*



Requirements:

Treadwall installation is a full day's work for two people. The installers should have mechanical aptitude and some experience with mechanical assembly.

One Stepladder six-foot and sturdy is required. If you don't have one, rent it!

Other tools:

VSR Electric drill with bits (and extension cord if it is not cordless)

Combination wrench set - particularly the sizes 3/8", 9/16", 3/4".

Socket wrench set - particularly the sizes 3/8", 9/16", 3/4".

Hammer

Screwdrivers

Work gloves

Pair of pliers with nippers

Knife

Vice-grip pliers

Hand cleaner

A couple of short (3-5 foot) pieces of 2x4 wood and some misc. blocks

8" crescent wrench

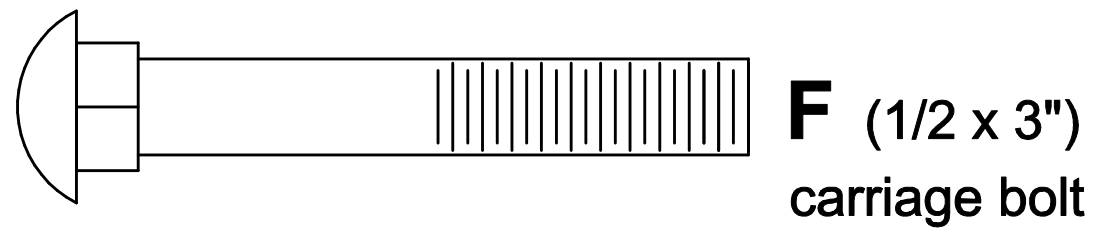
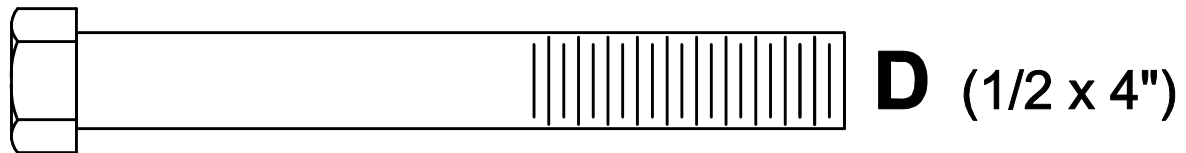
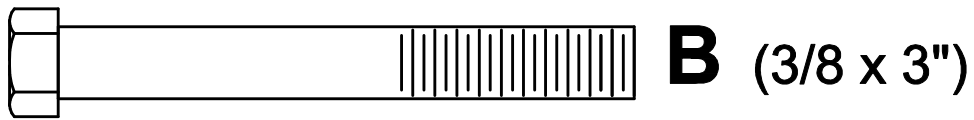
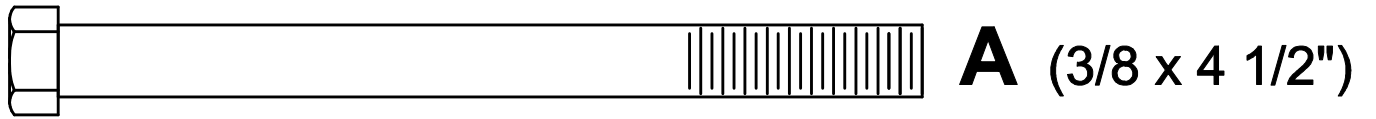
Tape measure

Allen wrench set

2 carpenter's aprons

Eye protection

Spray cleaner and rags



Setup and unpacking:

Set up a neat and organized workspace. It makes the whole job more pleasant and contributes to safety. Remove the packing materials from the work area – you will be working with ladders.

You should have some sort of table-high surface to put tools and small parts on where they will be easy to find and out of the way. In addition you will need a long space out of the way where you can lay out all the long parts.

The panels go on last, so put them to one side until needed.

- ❑ **Remove wrapping** from large parts being careful not to damage the surfaces. Take small parts out and unwrap them. Don't unwrap the rock holds until the end.

Check the parts against the list, and look them over for shipping damage. ***You must make damage claims within 10 days of delivery***

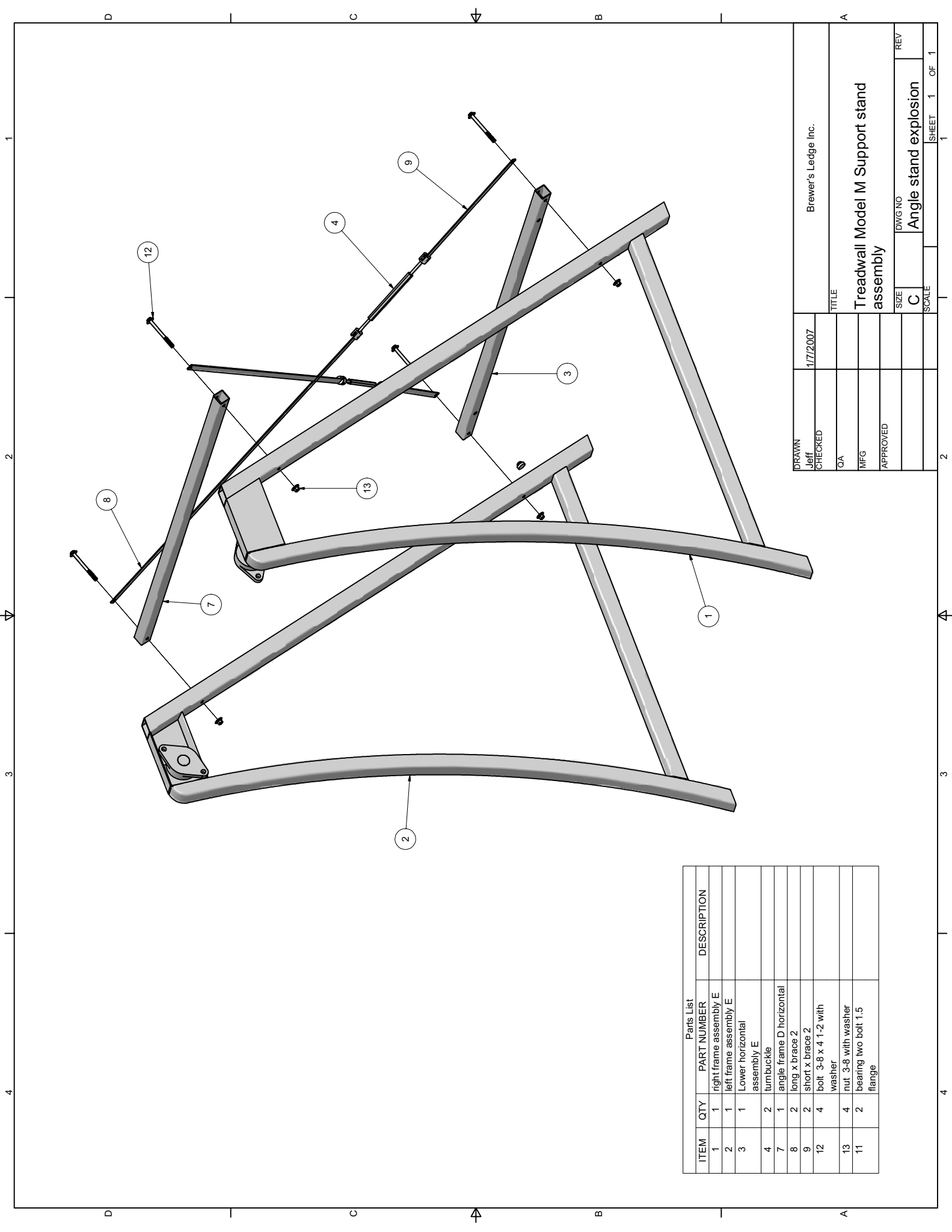
The panels go on last, *put them aside* along with the metal reinforcing bars (“stiffies”) and handholds until needed. You will also need a space big enough to lay out the long parts.

All references to “right”, “left”, “downwards”, etc refer to the finished unit as viewed from the front.

Support Frames: See diagram next page

- The *support frames* are left and right-handed - curve goes to the front - short shafts point inwards. The right side has a wire installed.
- *Support Frame Horizontal Braces* are the longest pieces of square tubing - with a single hole at each end and no tabs attached. One has two rubber bumpers.
- *X- braces* are long and short flat strips with holes in the ends.

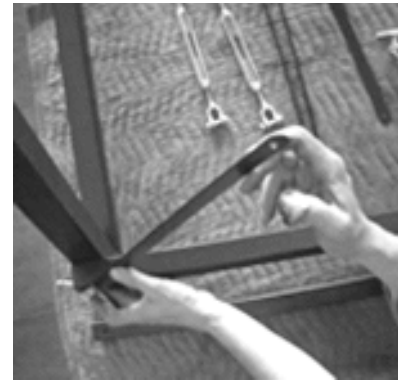
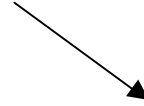




Parts List		
ITEM	QTY	DESCRIPTION
1	1	right frame assembly E
2	1	left frame assembly E
3	1	Lower horizontal assembly E
4	2	turnbuckle
7	1	angle frame D horizontal
8	2	long x brace 2
9	2	short x brace 2
12	4	bolt 3-8 x 4 1-2 with washer
13	4	nut 3-8 with washer
11	2	bearing two bolt 1.5 flange

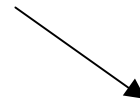
DRAWN Jeff	1/17/2007	Brewer's Ledge Inc.	
CHECKED		TITLE	
QA		Treadwall Model M Support stand assembly	
MFG		SIZE C	DWG NO
APPROVED		SCALE	REV
			Angle stand explosion
			SHEET 1 OF 1

- **Attach the horizontal brace with rubber bumpers** - using "A" bolts (3/8x4 1/2") - to the lower hole at the back of the right frame. Rubber bumpers face into the frame. The same bolt holds on a short x-brace.



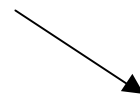
- **Repeat on the left frame.** Both x-braces should point up diagonally

- **Bolt on the upper horizontal** with "A" bolts (3/8" x 4 1/2"), The long x braces are attached to this horizontal at each end and point down diagonally.



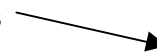
- **Find the two turnbuckles** and turn out the two jaw ends of each turnbuckle equally to almost their maximum length.

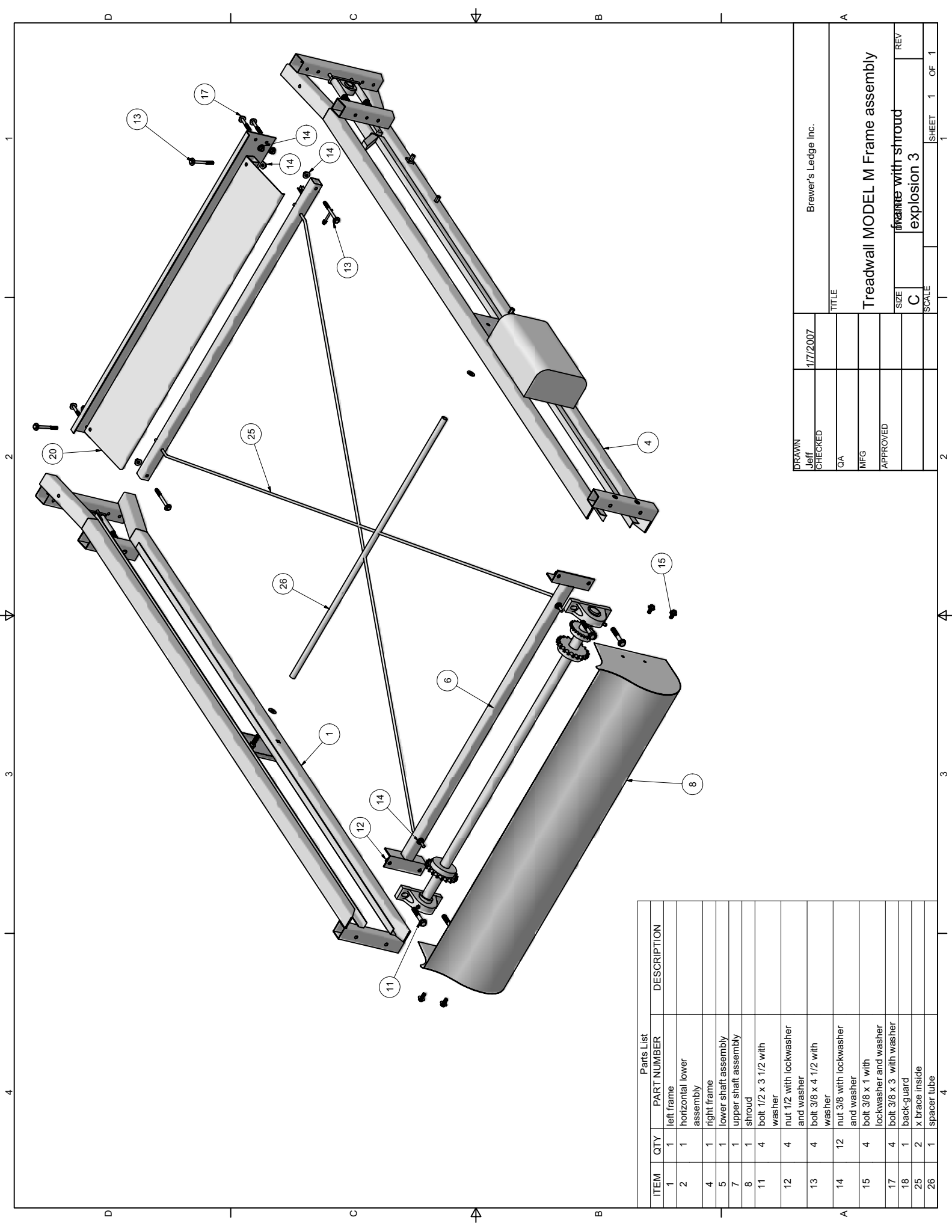
- **Attach a turnbuckle to the cross brace** at each side of the Treadwall, connecting the short and long cross-braces together. Securely tighten the bolts on each jaw.



- **Tighten the turnbuckles** evenly and firmly so that they are about the same length. You will do a final adjustment later to align the machine.

- **Check the bearings.** They should be tight on the shafts and flush with the ends of the shafts.





Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1		left frame
2	1		horizontal lower assembly
4	1		right frame
5	1		lower shaft assembly
7	1		upper shaft assembly
8	1		shroud
11	4		bolt 1/2 x 3 1/2 with washer
12	4		nut 1/2 with lockwasher and washer
13	4		bolt 3/8 x 4 1/2 with washer
14	12		nut 3/8 with lockwasher and washer
15	4		bolt 3/8 x 1 with lockwasher and washer
17	4		bolt 3/8 x 3 with washer
18	1		back-guard
25	2		x brace inside
26	1		spacer tube

DRAWN	1/7/2007	Brewer's Ledge Inc.	
CHECKED		TITLE	
QA		Treadwall MODEL M Frame assembly	
MFG		SIZE	frames with shroud explosion 3
APPROVED		SCALE	
		REV	
		SHEET	1 OF 1

Core wall assembly: See drawing - facing page

The M4 core section has two channel-frames and various shafts and horizontals that connect them together. You assemble it face down on the ground, and lift it into position.

The right frame is the one with the control panel box pre-mounted.

Assemble starting from the top – the top shaft and top horizontal member - and work down. *Leave bolts loose until the entire assembly is complete – then go back and do the final tightening.*

Refer to the drawings to make sure you are orienting all parts correctly.

- **Lay down the two channel frames on edge.** There are channels on the inside of each frame that will guide the climbing panels. Lay the channel frames on their edges with these channels facing towards each other, about 4 feet apart. The bottom ends of the channel frames (“flared”) should be centered inside the assembled support frame. Prop up the channels with 2x4 blocks so that the narrower top end is off the ground, *The ball valve handle should not be touching the ground.*

Main Shaft

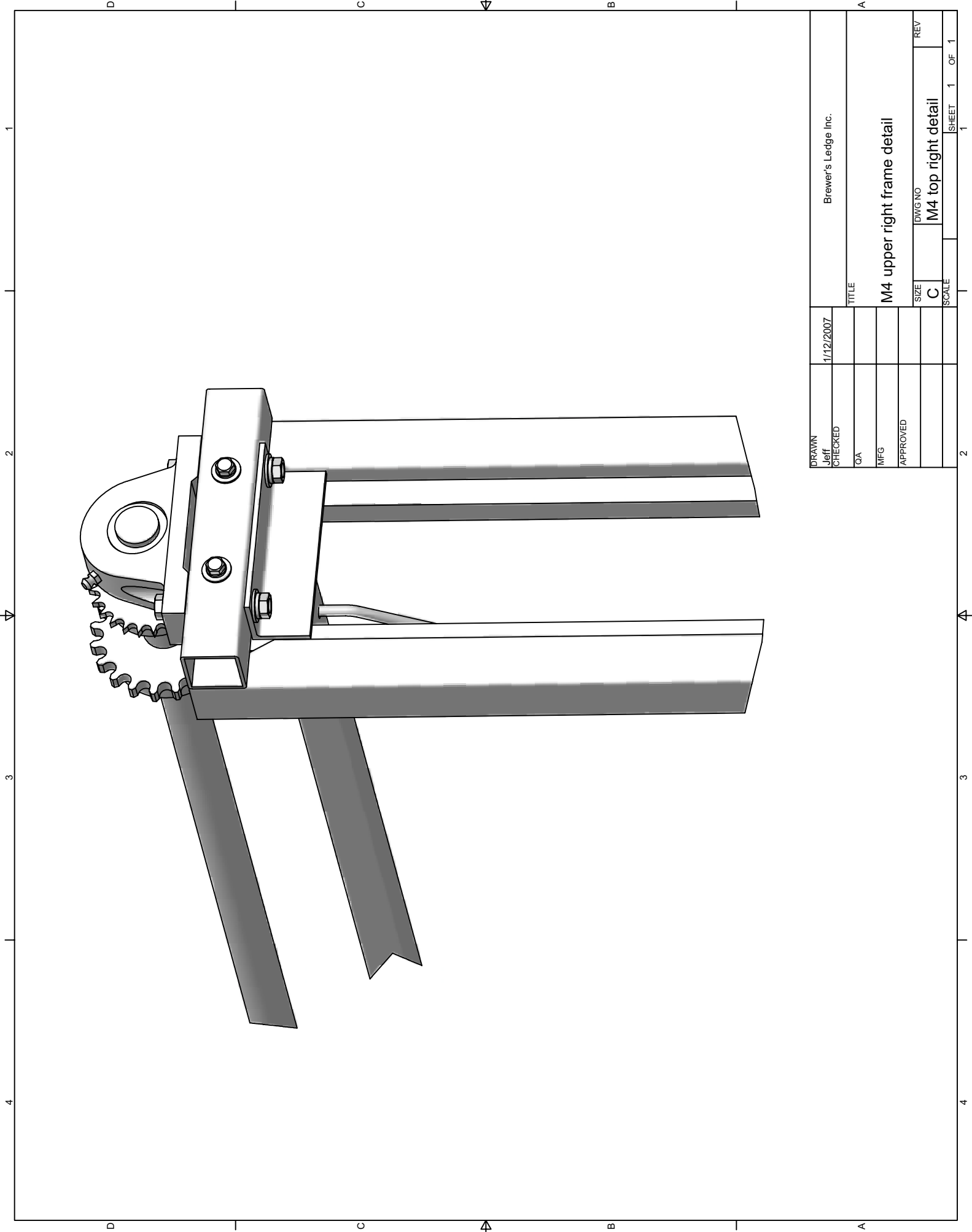
The main shaft has four bearings and three sprockets. **The end with two sprockets goes to the right.**

- **The upper Horizontal** (with the “tee” ends) is bolted-on along with the upper shaft. **VERY IMPORTANT: The ends are oriented with the flange down – see the drawing on the next page.**

ALSO IMPORTANT: The tee end of this horizontal will not fit through the opening in the channel-frame without twisting it 90 degrees. Make sure that both tee ends are in place in the channel frames and aligned before attaching either side. Use “D” bolts (1/2” x 4”) each side.

Leave the bolts somewhat loose.





D C B A

1 2 3 4

DRAWN	1/12/2007	Brewer's Ledge Inc.	
JEFF		TITLE	
CHECKED		M4 upper right frame detail	
QA		SIZE	REV
MFG		C	
APPROVED		DWG NO	M4 top right detail
		SCALE	
			SHEET 1 OF 1

D C B A

1 2 3 4

- ❑ **Install the spacer tube** onto the two studs found in the middle of the channels. This tube maintains spacing in the mid-section. It will be adjusted later. The hollow ends of the tube fit over each stud. (Image shows x-bracing which goes in later)



- ❑ **Slide the Bottom Axle** into the bottom bearings, which come pre-mounted on the channels. Make sure the bearings are snug against the shaft collars at each end of the shaft and tighten the setscrews on the bearings. It is much easier install the shaft if you remove one bearing from the frame. Take out the two rubber plugs and partially withdraw the two rods to remove the bearing.



There is one sliding sprocket on the bottom shaft: this goes to the right. It remains loose.

- ❑ **Install the bottom horizontal** using “A” bolts (3/8” x 4½”).

NOTE: Extra washers are installed under the head of this bolt to raise the bolt up higher. There should be 3 washers under the head of the bolt (see drawing opposite page 11). Make sure the small tab with a switch is at the bottom of the bar and on the right side. Leave somewhat loose.



- ❑ Attach the “bullet” connectors on the switch to the frame wires.

- ❑ **Install the Rear Guard** using “A” bolts (3/8” x 4½”), one each side. Leave somewhat loose.



- ❑ **Install the Bottom Plate** to the bottom of the channel frames using “B” bolts (3/8” x 3”), two each side (see the exploded drawing at the beginning of this manual.) Leave somewhat loose.

- ❑ **Install the two internal cross-bracing rods.** These are long 3/8" rods that are threaded and bent each end. Insert each into holes in the lower horizontal. *Where they cross the spacer-tube in the middle of the wall, one rod should go under and one should go over the tube so that the tube is in-between the rods.*



- ❑ **Insert them into upper horizontal** by flexing the rods slightly, Assemble with nuts and washers.

- ❑ **Tighten** so that threads showing at all ends are approximately even, bottom and top as well as side to side. Do not over-tighten – firm but not hard.



- ❑ **Tighten** all the bolts you have installed. Tighten firmly, but not enough to distort the frame tubing.

- ❑ **Mount the Top Shroud** onto the top of the channels. Use (4) "C" bolts (3/8" x 1") that go into threaded inserts on each side. Tighten. The logo should be facing down (front of the Treadwall).



Lifting the Core into place

- **Place blocks of 2x4 wood at least 24" long under the bottom of the channel frames.** These should extend out so that when the core assembly is tilted upright, the foot of each channel frame is resting entirely on the blocks – 1 ½" above the floor level.

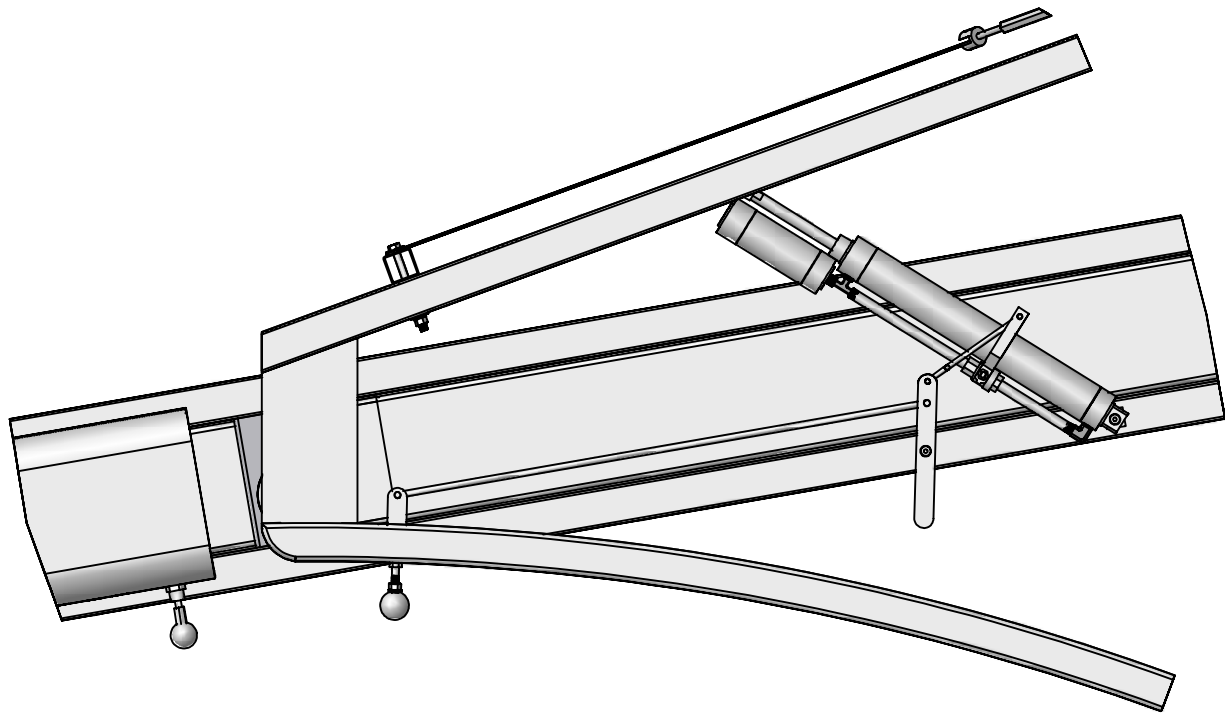
Use three persons to lift up the core into standing position!

- **Lift up the core Assembly.** Make sure it is centered well on the wood blocks. After lifting, the core assembly should be standing upright inside of the support frame, resting on 2x4 blocks so that it is 1 ½" above the floor. **Make sure one person supports the assembly at all times until it is secured to the support stand.**
- **Move the Support Stand** until the bearings are in the middle of the channel frames.
- **Insert the carriage bolts - "F"** (1/2" x 3") into the square holes in the frames and through the bearings. Put on the nuts and washers, but leave loose. *The heads of the carriage bolts have a flat side. This side should face in towards the climbing wall.*
- **Slip the second bolt – "E"** (1/2" x 1 3/4") into back hole of each bearing. You will need to use a lever to pry up the core assembly slightly – one side at a time. Tighten all bearing bolts
- Remove the wood blocks after you attach the Hydraulic Angle Adjuster (below).

Hydraulic Angle Adjuster: See drawing

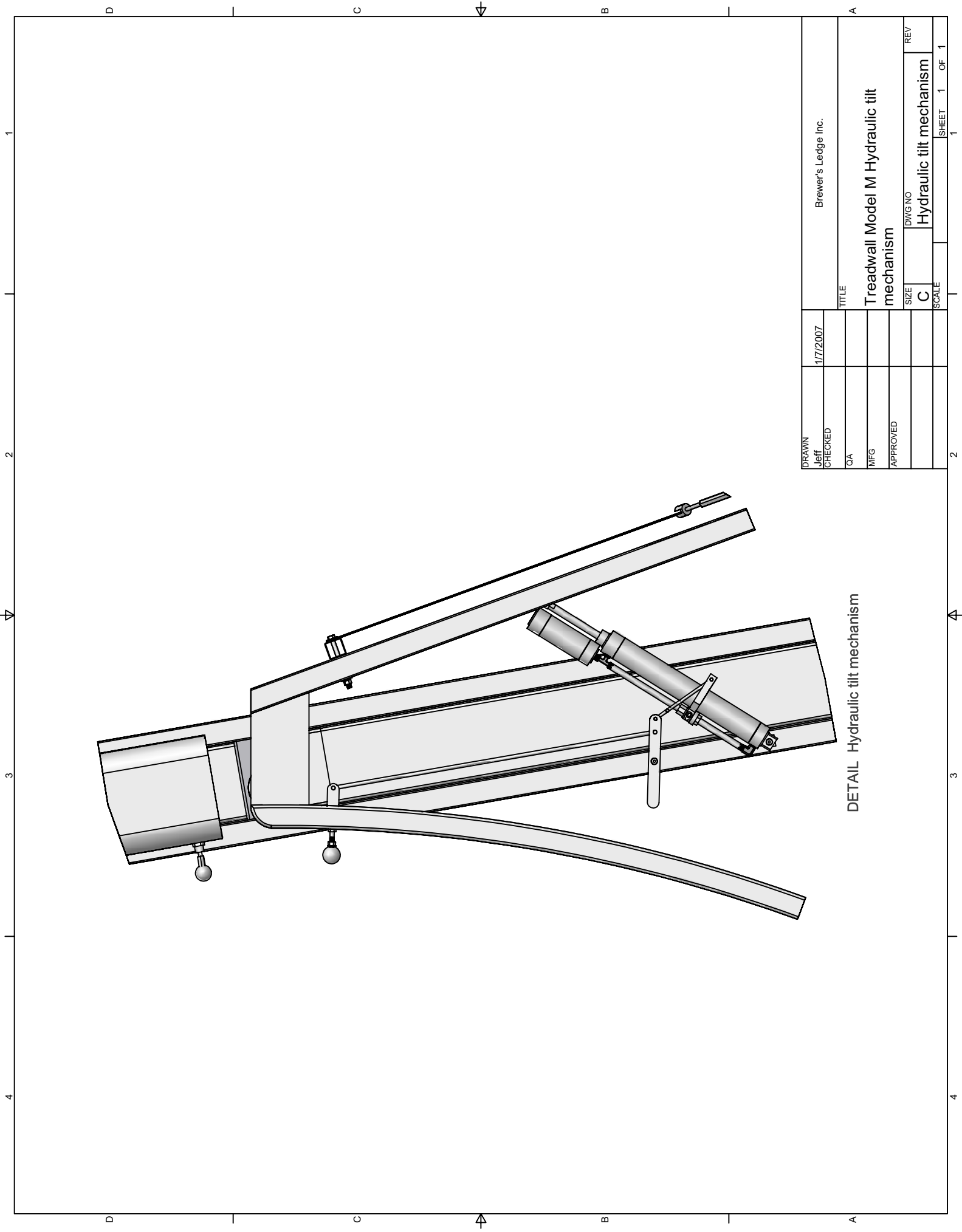
- **Mount the Angle Adjuster Cylinder** using the special bolts that are taped into the ends. Mount the end with a reservoir first – it goes onto the back of the support frame (see the drawing at the end of this manual). Leave the valve lever closed until this end is mounted. Next, open the valve and pull down the cylinder rod until you can mount this end to the attachment point on the channel frame.





DETAIL Hydraulic tilt mechanism

DRAWN	1/17/2007	Brewer's Ledge Inc.	
JEFF		TITLE	
CHECKED		Treadwall Model M Hydraulic tilt mechanism	
QA		SIZE	DWG NO
MFG		C	Hydraulic tilt mechanism
APPROVED		SCALE	REV
			1
			1
			1



- ❑ **Attach the chrome Lever** to the valve.
- ❑ **Test the angle adjustment** - release the valve and push the wall back, then release it to swing forward.

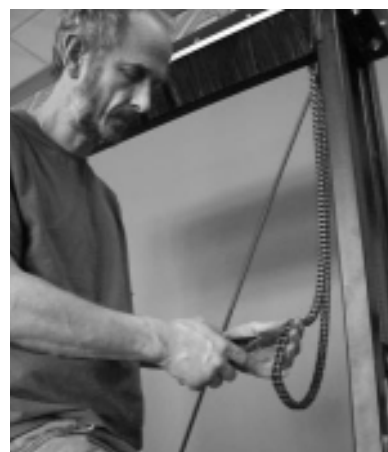


Installing the Drive Chain

The *drive chain* connects the pump with the main shaft. It controls the wall speed.

- ❑ **Install the #40 drive chain** between the pump and the sprocket on the upper shaft. Drape it over the top sprocket and around the pump sprocket. Connect the ends with the master link. The chain will seem very loose at this point.

The pump unit should be in its highest position to allow the Drive Chain to reach around the lower sprocket. It is mounted this way at the factory, but can slide down a bit, so check and correct if needed..



- ❑ **Open the hinged control panel** by removing the small screw that holds it closed (don't lose the little screw!). Above the pump you will find a long "tensioning" bolt that is used to adjust the chain.

- ❑ **Use the tensioning bolt** to push down the pump until the slack is removed from the drive chain. If this chain is too tight, the Treadwall will not work properly. Just take out the slack, but do not make the chain "bar tight". **Important** - This chain will stretch during installation and the first two weeks of use and require adjustment.



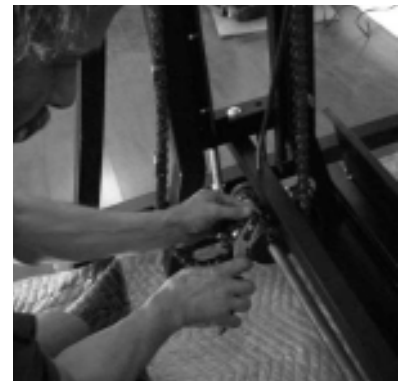
The Proximity Switch

- The *proximity switch* sensor controls the counter-timer. It is pre-wired into the control panel, but it is not mounted in order to prevent damage during transit. Mount it as shown in the photo using the stainless steel band clamp on the accumulator. Position the sensor so that the center of the magnets on the pump sprocket pass directly under the sensor with about 1/8" clearance.



The Main Chains:

- **Remove one chain from the box.** The *main chains* are coiled and have mounting tabs for the panels. One person should hold the coil on edge and unwind it while the other raises the chain over the shaft. Wear gloves and protect the floor with a piece of cardboard or blanket.
- **Lift one chain** up to the main shaft and drape it over the shaft next to one of the sprockets.
Make sure the chain tabs are facing out!
- **Move the chain around** the shaft until the two ends are equal at the bottom.
- **Lift the chain** onto the top sprocket.
- **Pry up the lower shaft at this end** using a length of 2x4. You can slip the 2x4 under the shaft and hook it over the back-guard support to lift the shaft up enough to attach the chain.
- **Attach the ends of the chain together** under the sprocket using the master link on the chain.
The spring clip should be on the inner side of the chain – this helps to locate the master link if you need to find it later.



The second chain is installed the same as the first, but during installation of the second chain, perform the all-important synchronization step:

- **Adjust both chains until they are synchronized.**
Before attaching the second master link, line up one of the chain tabs on each chain with the horizontal spacer tube. Check that the two tabs are aligned with each other against the spacer tube. If the tabs don't line up, adjust the second chain until they do.

The chains must be synchronized so that the tabs are directly across from each other. If the synchronization is off by even one sprocket-tooth the Treadwall will not operate.

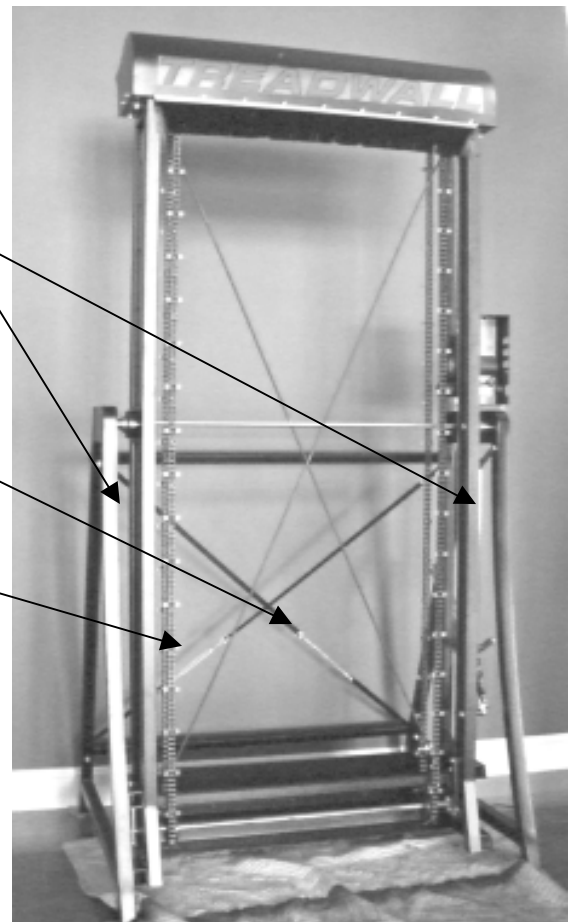
Later in the installation, if you find that the synchronization is off, give us a call. We have a quick fix.



External x-bracing adjustment:

The x-bracing at the rear of the support frame must be adjusted and tightened. It should be adjusted so that the support frames are parallel to the channel frames.

- **Inspect the Treadwall** by looking straight-on at the two gaps between the channel-frames and the support-frames. If the frames are parallel, the turnbuckles just need to be tightened. If the gaps are not parallel, the turnbuckles need adjusting:
- **If the top of the support frame is too far right** – loosen the right turnbuckle and tighten the left.
- **If the top of the support frame is too far left** – loosen the left turnbuckle and tighten the right.
- **Tighten the turnbuckles firmly** when the adjustment is complete.



Installing the Panels

Putting on the *panels* is a tedious job, but it goes better if you are organized and have the basic tools.

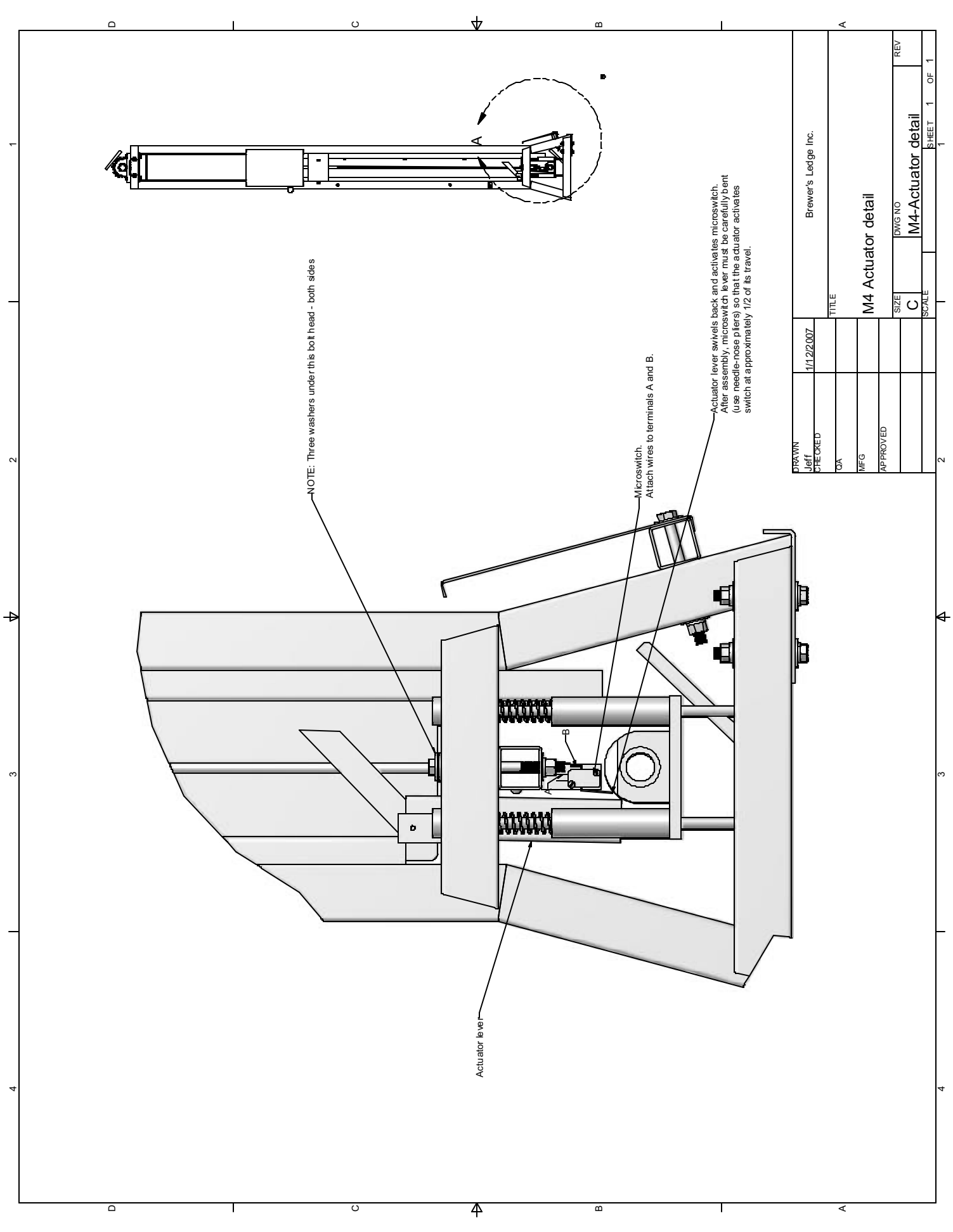
You will need a 3/8" socket wrench and a battery-operated drill with an adjustable clutch fitted with a #2 Phillips bit. A carpenter's apron to hold the bolts and nuts is very helpful.

- ❑ **Install a reinforcing channel (“stiffy”)** onto the back of each panel before bolting to the chains. The stiffy slips into the holes when properly aligned. If the stiffy is a tight fit, you can place the panel face down on the floor and step on the stiffy to push it into place.
- ❑ **Attach the stiffy to the panel** There is a bag of short round-head bolts in the hardware box. Screw in one of these bolts to hold on the stiffy.

Notice on the front of the panel that there are three equally spaced holes near the center. We like to attach this bolt to the middle of these holes..

- ❑ **Adjust the spacer tube.** There should be enough space between the channel-frames so that a climbing panel can be put into the channels diagonally and rotated to a horizontal position without binding. The panels may bind because the channel-frames bow in slightly. The spacer tube must be adjusted to compensate. When the adjustment is correct, the panels in the center of the wall will have about 3/8" of side-to-side movement. Turn out the nuts at the ends of the spacer tube, pushing the channel-frames apart to adjust the clearance. Adjust equally from each end.





NOTE: Three washers under this bolt head - both sides

Microswitch.
Attach wires to terminals A and B.

Actuator lever swivels back and activates microswitch.
After assembly, microswitch lever must be carefully bent
(use needle-nose pliers) so that the actuator activates
switch at approximately 1/2 of its travel.

DRAWN	1/12/2007	Brewer's Ledge Inc.	
CHECKED		TITLE	
QA		M4 Actuator detail	
MFG		SIZE	DWG NO
APPROVED		C	M4-Actuator detail
		SCALE	REV
			1
			1
			1

- ❑ **Slip the first panels into the front of the channels.** If you have trouble rotating them down into the horizontal position, adjust the spacer tube as detailed in the previous paragraph.



- ❑ **Bolt the panel on.** The nuts go to the rear. Make the bolts firm, but not tight enough to sink the heads into the panels. Use a very low setting (typically 3-5) on the drill clutch.

- ❑ **Rotate the first panel around by pulling the chains down until the panel has made one complete rotation.** This will align the sliding sprocket on the bottom shaft. You may have to tap the sprocket into alignment with a hammer. (image shown is model PE for illustration only)



- ❑ **Check the display while you are rotating this first panel.** Plug in the transformer and connect the wires at the back of the right Angle Support Frame. The display should come on. As you rotate the wall, the “distance” count should reflect the movement. Adjust the sensor if needed.

IMPORTANT: The transformer is designed for use with 110 volt 60 or 50 cycle AC current. It supplies 12 volts DC at 1.5 amps to the Treadwall. Users with different supply voltages must use a conversion transformer or other means to provide the proper voltage.

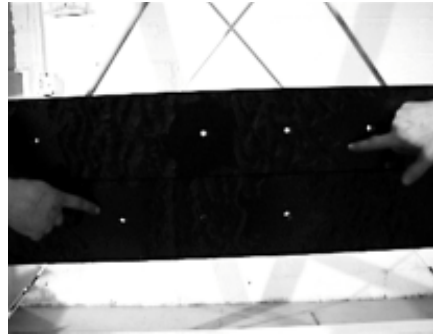
- ❑ **Connect and adjust the actuator switch: See drawing - previous page.**
- ❑ The small microswitch at the bottom of the right channel runs the braking system for the wall. Attach the two “bullet” connectors on the frame wire to the switch if you have not done this earlier. The hinged “actuator” at the bottom of the channel pushes the switch, and when you push this actuator in, you should hear a “click” in the switch.



If necessary, you should adjust the switch by carefully bending the small arm on the switch with a pair of needle-nose pliers until it clicks when the actuator is pushed about 2/3 of the way in.

- **Alternate the panels.** The holes are not symmetrical. During installation every other panel should be turned over so that the holes alternate from side to side.

As you progress, and the panels are moving up the back of the machine, it normally takes a bit of effort to push the front panels down. You will need to lock the front panels to keep them from back sliding up.



- **Use short pieces (12" or so) of 2x3 lumber to lock the wall at the bottom.**

Simply slip them into the space between panels at each end of the bottom of the wall. As the panels try to ride up, the blocking will jam between two panels and hold the wall in place while you work. (image to right is model PE for illustration only)



- **Bolt on the panels** until there is only one left. The last three panels are installed by slipping them in from the bottom. Rotate the panels around until the gap is at the bottom front. Slip in the panels one at a time and install the bolts. Use the side openings to access the nuts for tightening.

- **Tighten the bottom-bearing setscrews.** Check that the bottom bearings are tight up against the shaft stop-collars and that the setscrews are tightened down.



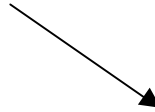
- **Adjust the internal x-bracing** one more time to make sure it is even and tight.

- The last panel is somewhat awkward - be patient. Put the bolts and nuts in with the panel at the bottom or carefully rotate the panel upward until you can reach the nuts through the side.

Installing the side covers and bottom covers

The sheet metal bottom covers simply slip over the bottom bearings and lock into place.

There are four side panels that cover the gaps in the Channel frames. Velcro tabs hold the covers in place. The chamfer on the covers face inward to provide clearance for the welds in the frame opening.



Mounting the Holds

The standard Treadwall hold set has 38 holds of four different colors.

- ❑ **Unpack all the holds** and lay them out on the mat in front of the machine.
- ❑ **Match the holds with hold-bolts.** The bolt should project at least 1" from the back of the hold. A few of the larger holds need longer bolts.
- ❑ **Bolt the holds** firmly onto the panels.

Start with one color and bolt one hold onto each 4th panel. Distribute them evenly from side to side as you go along. Repeat for each color. This will give about one hold for each panel.

Each hold has a positive edge. Generally speaking, these positive edges should face up so that the climb will not be too intimidating, but put a few on as side-grips or under-clings to add interest. Once the holds are on you can fine-tune it by rotating holds and moving a few around.

Each color of holds can be a separate climbing route. Or you can combine colors to make a route. You will find that some routes are much easier than others.

Very important - Don't allow larger holds to overlap onto the next panel. The majority of holds supplied with the Treadwall are designed so that they cannot overlap, but other holds may be larger. Also, holds must not stick out more than 2 1/2" from surface of wall.



Purging the Hydraulic System:

Sometimes when the Treadwall is first assembled, the control system runs a bit rough and noisy - almost a grinding sound - and the wall doesn't descend smoothly. This is due to air in the system that foams into the oil and causes cavitation in the pump. To purge the air, put the wall at the steepest angle, set the cardio dial at the fastest setting, and pull the wall around steadily for about 15 seconds. Let the wall sit for about 5 - 10 minutes, and do it again. If you do this about 3 times, the air will percolate up into the reservoir where it belongs, and the wall will run smoothly.

Mat:

The mat has four loops that attach it to the bottoms of the support frame. To place the mat, pry up each corner with a length of 2x4.

Test climb:

Test the finished Treadwall by climbing for at least 200 feet at various angles. Newly installed Treadwalls will usually run a bit rough because of air in the hydraulic system. When this air has left the oil - usually after a few climbing sessions - the resistance is much smoother. Other than this normal breaking-in, the wall should operate quietly without any binding or other impediments. Test the angle adjuster while climbing - it should work smoothly with little or no "bounce" in the cylinder.

The drive chain should be checked one more time (it stretches at first), and should be re-checked after a couple of weeks of service. *Make sure someone on-site knows how to adjust this chain.*

Check holds for tightness and re-tighten. Adjust any holds that seem awkward or out-of-place.



The last word:

NOBODY LIKES GOING BACK!

Treadwalls get installed in the strangest places, sometimes hundreds of miles from where installers call home. Making that long trip across the panhandle and down through the wastelands to fix some little problem is a project best avoided.

It's the little things that count - at least that is what we have found. Those little tiresome details have a tendency to sneak around to your backside and take a big bite. Here are some things that have shown up on the whack-your-head-and-say-"duh" film clips (and which we have *all* done at one time...):

☹ **Master link or Monster link?**

Every master link has three parts. What if you leave off the plate with two holes? What if the spring clip isn't put on right? It can get pretty ugly!

☹ **What the heck is our display showing?**

Time? Distance? Dow Jones average? Whatever. It isn't gonna work if the sensor and magnets aren't adjusted right. And treat that reed-switch sensor with respect! And make sure the wire is out of harm's way.

☹ **"Bolts and nuts are falling down ♪ falling down ♪, falling down ♪..."**

And for some reason the shroud only has one bolt on the right side!
Yes – it's actually happened. Loss of concentration is my guess.
Check everything before putting on the last panels. Take your time.

☹ **"Chain-chain-chain ♪ chains that fool ♪..."**

Drive Chain too tight? Works great for Ralph but Alice can't budge it. Too loose? Could be worse. Take out all the slack, but don't over-tighten. Check it one last time before leaving, and *make sure someone knows how to adjust it!*

☹ **"Setscrews and turnbuckles -- ♪ --lockwashers, jam nuts -- ♪...these are a few of my least favorite things!"**

Especially when they aren't set, turned, locked and jammed. Just take a couple of minutes to go over those little details and save yourself a big headache.

Call us Brewer's Ledge if you have any questions. We can often answer a question in minutes that will save you much more time trying to understand. Please let us know any comments or suggestions you might have: we are always upgrading the materials as we learn more.

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