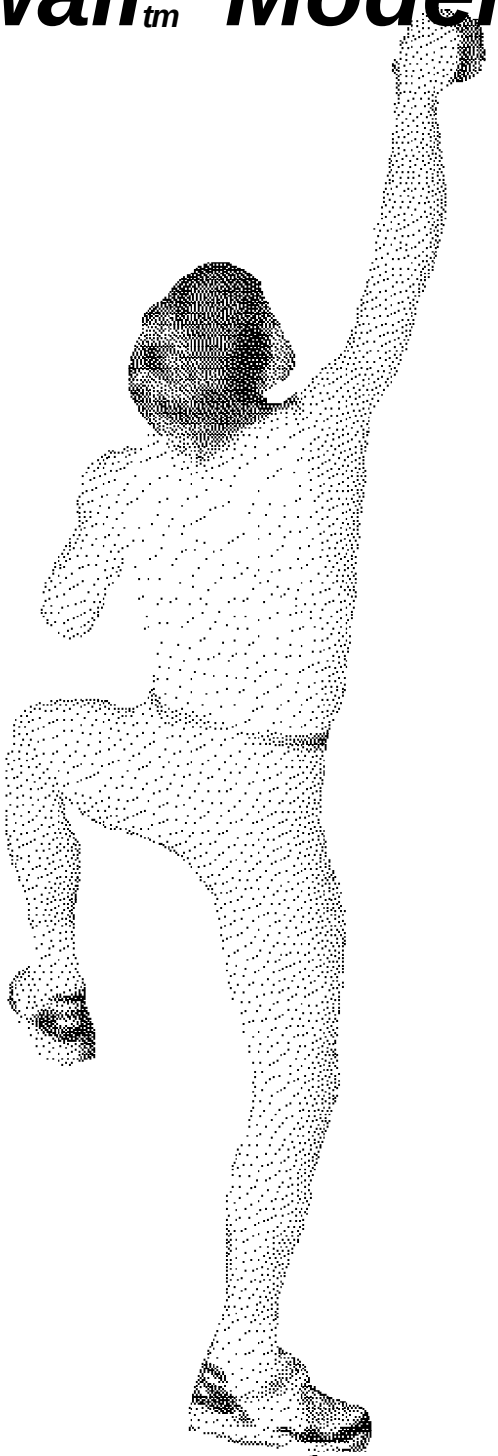
Installation Manual

Treadwall$_{tm}$ Model S



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TREADWALL Installation Manual

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. Look for Handy-Tips. They are closely guarded secrets that have been handed down from installer to installer. The order of assembly is important at certain points, so read each page. A video accompanies this manual, and it is highly recommended to review it before the installation

Requirements:

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

2 Stepladders *eight foot* and *sturdy* are absolutely required. If you don't have them, rent them!

Other tools:

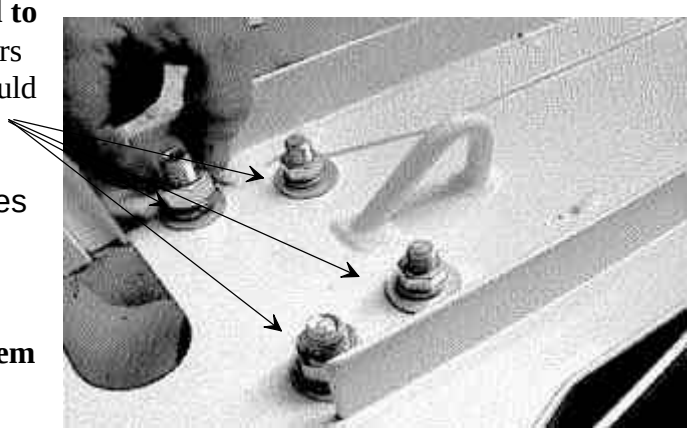
VSR Electric drill with bits (and extension cord if it is not cordless)
Combination wrench set - particularly the sizes 3/8", 9/16", 3/4".
Socket wrench set - particularly the sizes 3/8", 9/16", 3/4".

8" crescent wrench	Vice-grip pliers
Flat file and 1/2" rat-tail file	Allen wrench set
Pair of pliers with nippers	Screwdrivers
Tape measure	Loktite thread-lock
Small jar or tube of Vaseline	Knife
Cigarette lighter	2 carpenter's aprons
Work gloves	Eye protection
Hand cleaner	Spray cleaner and rags

Handy-Tip: Use a canvas carpenter's apron. It saves a lot of time!

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.

All nuts, bolts and washers are shipped attached to the appropriate parts. The bolts, nuts, and washers are in the proper orientation and order and they should be kept the same way during assembly.



Handy-Tip: We like to leave the mainframes wrapped till the end. It cuts down on scratches.

Once the parts are unpacked and laid out, **check them against the list**, and look them over for shipping damage.

UNPACKING

Set up a neat and organized workspace. It makes the whole job more pleasant and contributes to safety. Removing everything from the packing and discarding the packing materials is an important first step, particularly since you will be working with ladders.

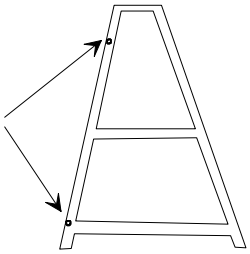
You should have some sort of table-high surface to put tools and small parts on where they will be easy to find and out of the way

The panels go on last, so **put them to one side** until needed
In addition you will need a long space out of the way where you can lay out all the long parts

FRAMES

- **Assemble the frames**
- The ***side frames*** come in two parts - top and bottom. Each bottom section has angled joints that slide into the top section
- Make sure the frames are lined up right way around - see handy tip below.
- Do the joints one at a time - first **tap the rear one all the way down, then do the front.**

Handy-Tip: Don't assemble the frames wrong-way around. They're hard to take apart! Top and bottom sections each have 5/8" holes for horizontal braces on the rear leg. Find these holes and make sure they are on the same leg when you assemble.



The ***horizontal braces*** are long rectangular tubing with L-shaped fittings welded to each end.

- **Attach a horizontal brace to the left frame.** It goes on the back near the bottom
- Notice that the horizontals have ***tabs with holes*** at each end. These must face up.

Handy-Tip: Put a little Vaseline on the threads. Make sure everything is lined up right. If the bolt feels cross-threaded don't force it in.

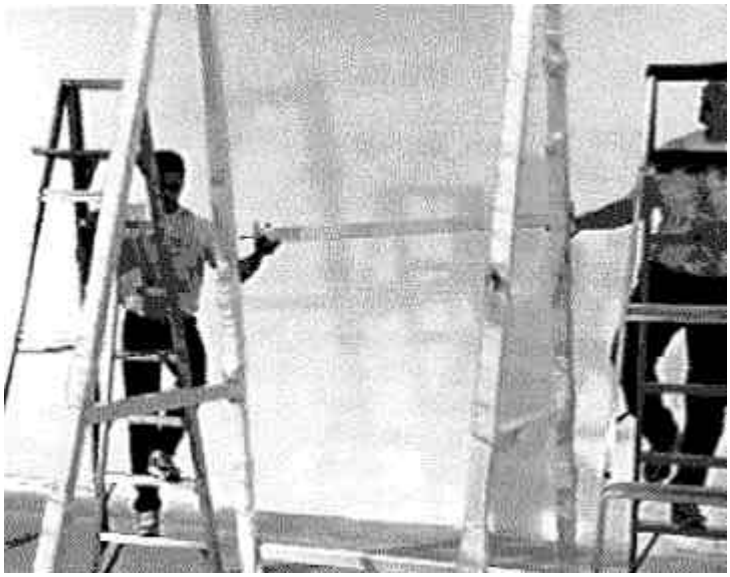
- **Rest the other end of the horizontal brace on the ground.** It will support the left frame.
- **Put together** the right frame.

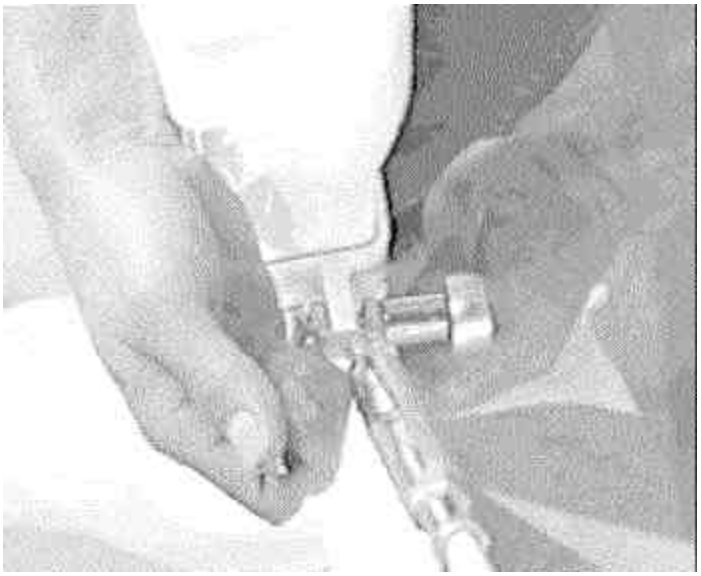
Now the frame is beginning to take shape.

- **Position the ladders** towards the back of the frame and **bolt on the upper horizontal.**

Make sure ***the tabs are pointing down.***

Handy-Tip: If those pesky tabs aren't oriented right then you won't be able to put on the x-bracing.

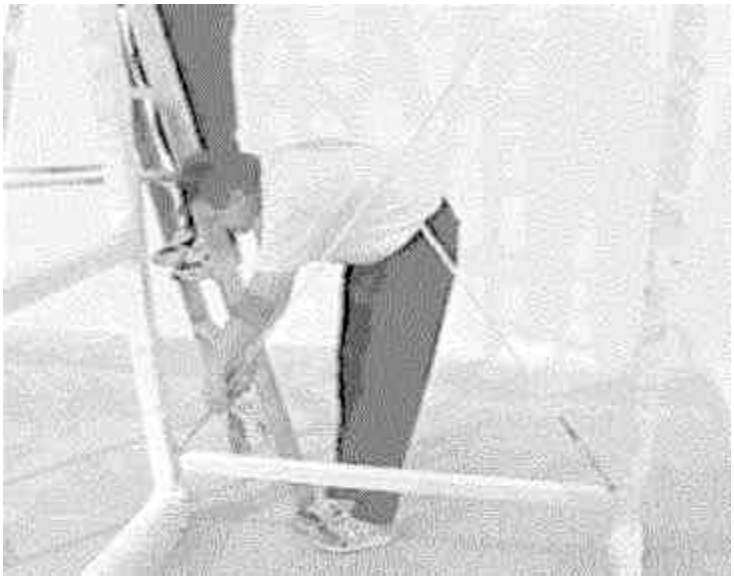




X-bracing in the back makes the frame solid. The ***x-bracing*** is a pair of 3/8" painted steel rods with turnbuckles.

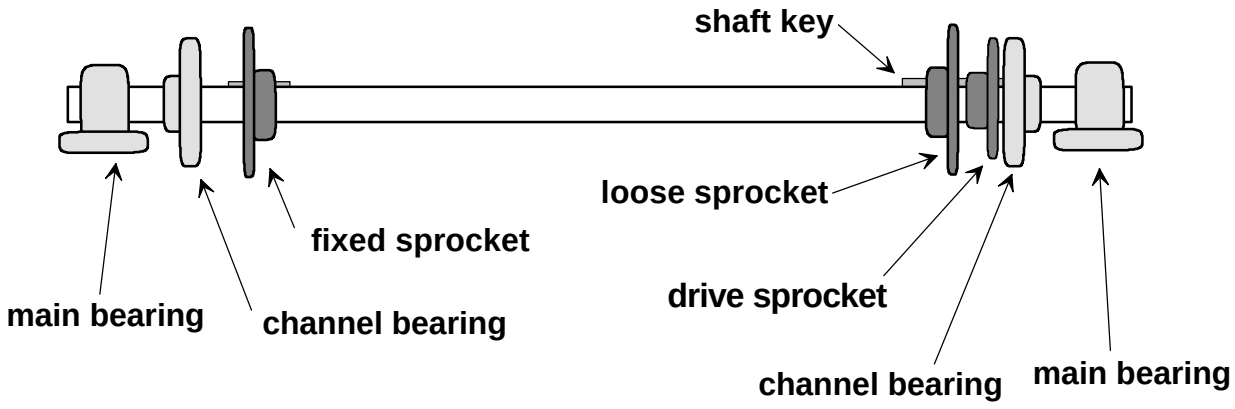
- **Loosen the turnbuckles** on the two x-braces so that they are almost at their maximum length.
- **Attach shackle** to top horizontal tab.
- **Attach turnbuckle** to the tab at the opposite end of bottom horizontal.
- **Install second X-brace** and tighten turnbuckles evenly

Handy-Tip: These turnbuckles are what keeps the frame straight. You will adjust them later to align the machine.



Shaft

Examine the main shaft which installs to the top of the frame. It has four bearings and three sprockets. At one end of the shaft the sprocket is keyed and fixed, and at the other end, the pair of sprockets are keyed.



Note that the ***fixed sprocket*** goes to the left. The ***loose sprocket*** remains free to slide back and forth so that it can self-align when the panels are in place. The smaller ***drive-sprocket*** will be fastened down with setscrews when the drive chain is installed.

Raise the shaft to top of the frames.

- Position the ladders slightly in front of the frames as shown.

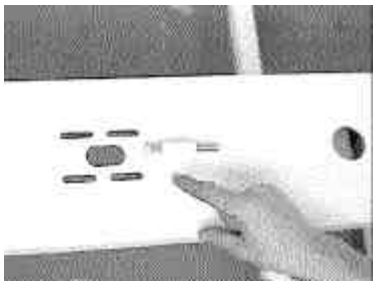
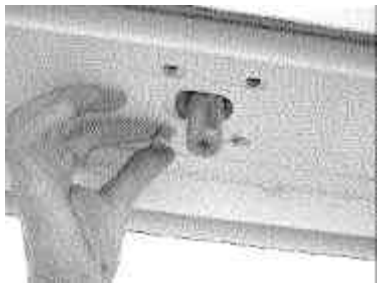
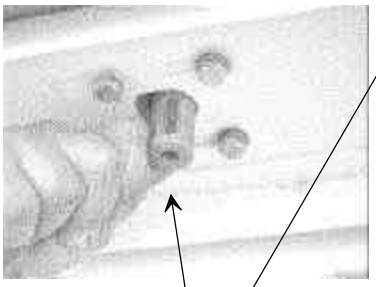
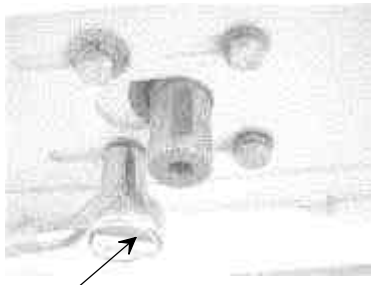
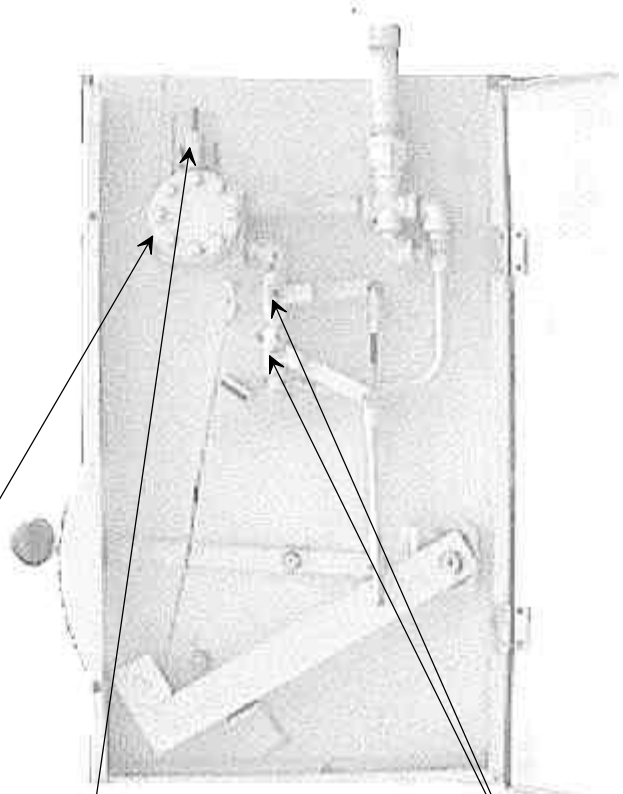
Handy-Tip: Take the 1/2 x 4 1/2" bolts up the ladder with you. Put them in place - through the bearings and frame - as soon as the shaft is up to keep it from slipping. Safety First!

- **Tighten the bearing-bolts** down firmly to the frame tops.

Attach control panel to Right Channel.

- The ***channels*** are largest pieces of the Treadwall. They are marked right and left. When the Treadwall is fully assembled, the ends of the climbing panels slide down the slots on the inside of the channels.
- The ***control panel*** has a hinged cover and contains the hydraulic pump and control machinery that runs the braking system.



Take a moment to look at the pump assembly. This is the heart of the Treadwall. The pump is attached to an oil reservoir and a simple circuit with two valves. When these valves are open, the oil circulates freely as the shaft turns the pump. If either valve is closed, the circuit is blocked, the oil cannot circulate, and the pump is locked up.

- **Find the right channel** and lay it down on two chairs with the smooth side facing up.
- **The control panel is attached to the channel** using the four bolts that hold the pump to the control panel. Remove these bolts and use them to attach the panel to the channel through the slotted holes in the channel. Each bolt must have a flat washer to slide against the channel and a lock washer to hold it tight.
- **The long tensioning bolt on the channel** will push the pump down (along with the whole panel) to adjust the drive chain tension. For now, the panel should be adjusted to the top of the mounting slots
- **<u>Important:</u> Do not overtighten the mounting bolts.** The four bolts should be just tight enough to compress the lockwashers fully. The tensioning bolt must be able to push the pump down without loosening the pump mounting bolts. This is important for future adjustment of the drive chain.

Install channels

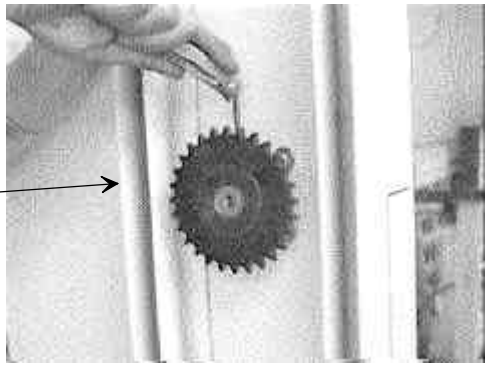
The channels will now be raised and bolted onto the main shaft.

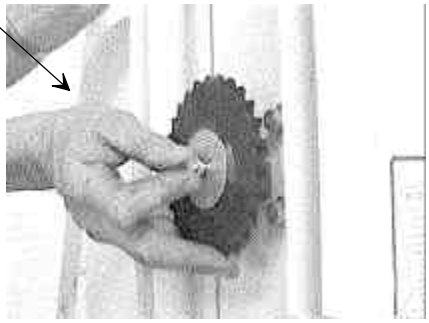
- **Hook the right channel onto the shaft** just inside of the square channel-bearing. This channel with the control panel attached is quite heavy - definitely a two person job. One person on the ground must hold the channel in place while the ladder person bolts it onto the bearing. *Only install the bottom two bolts in each bearing at this time.*

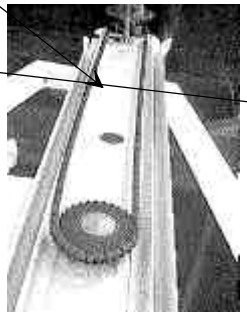
Handy-Tip: Installing the second bolt is easiest if the channel is lifted slightly from below.

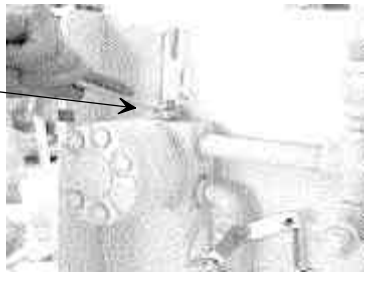
- **Install the left channel** likewise on the other end of the shaft.

Install the Drive Chain









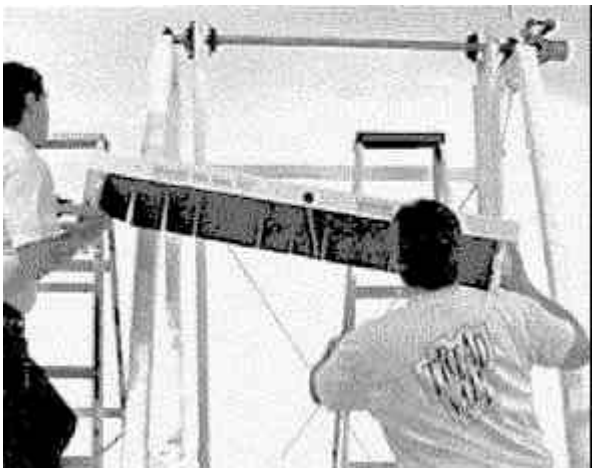
- The drive chain connects the pump with the main shaft
- **Install the small sprocket** onto the pump shaft and tighten the setscrews securely
- **Install the large fender washer** over the sprocket. This safeguards the sprocket if the setscrews become loose.
- **Install the #40 drive chain** between the pump and the sprocket on the upper shaft.
- **Align the upper sprocket** and tighten the setscrews.
- **Use the long tensioning bolt above the pump** (on the outside of the channel) to push down the pump until all slack is taken out of the drive chain.
-

Handy-Tip: **<u>Important</u> -** This chain will stretch during installation and the first two weeks of use and require adjustment. The adjustment is very easy as long as the pump-mounting bolts are not too tight (they should be just tight enough to compress the lockwashers).The simple adjustment procedure is on the inside of the panel door. *Make sure that a responsible person at the Treadwall location understands the procedure and the necessity of this adjustment.*

Install shroud

The ***shroud*** is a large part with "Treadwall" printed on it in big letters. It goes between the two channels at the top of the machine.

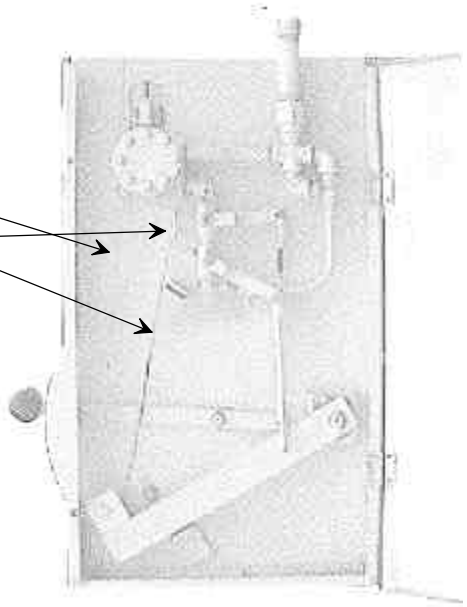
- Place the ladders as shown, and **lift the shroud** to the top of the channels.
- **Bolt** onto the top bearing holes with 1/2" bolts and special spacers. These special parts are separately packed in the hardware box with instructions.



Attach the pulley line to the main lever.

- The end of the line that comes out of the right end of the pulley bar goes to the main lever.
- **Bring the line down** into the control panel, through the pulley in the main lever, and up to the loop just under the pump. Tie the control line securely to this loop

Handy-Tip: If this line comes loose it could pull out of the shroud. You don't want this to happen! Tie it securely!



The ***bottom shaft*** is a 1" diameter shaft with two large sprockets. One sprocket is welded on and the other is loose.

- The welded sprocket goes to the left.
- **Place the shaft** into the two bearings at the bottom of the channels. Slide the bearings all the way on - up to the stop-collars.
- **Tighten the bearing setscrews,** but leave the bearing mounting bolts loose so that the bearings can slide up and down in the slots

Handy-Tip: If the shaft doesn't go into the bearings easily, remove the bearings from the channel and slip them onto the shaft. It's much easier, and faster in the long run.

The ***back guard*** is a long flat piece with wing ends. This attaches between the channels at the back near the bottom.

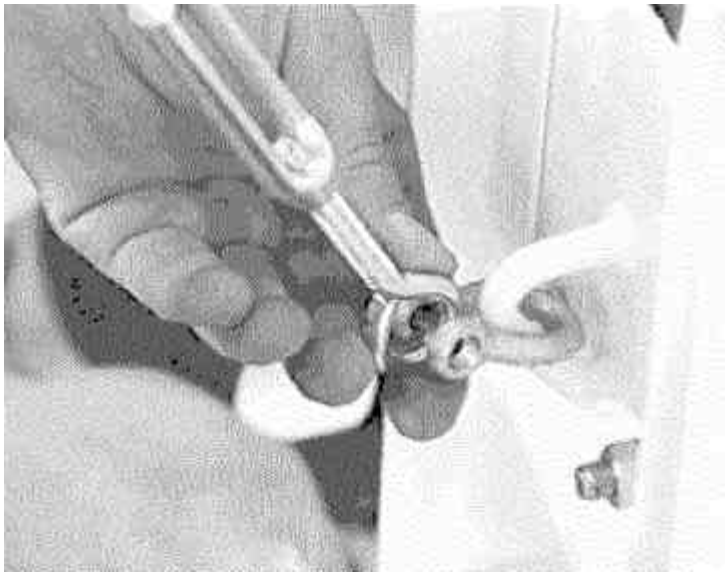
Handy-Tip: Look at the ends of the back-guard. The straight edge goes up. The angled edge goes down.

- **Bolt the backguard** onto the two channels with 3/8" bolts

There is ***x-bracing*** that goes between the two channels. It is 5/16" rod with a turnbuckle at one end and shackles at both ends.

- The turnbuckles go to the bottom.
- **Attach the shackles** to the loops on the channels.
- Leave the turnbuckles loose for now. They will be adjusted, tightened and secured later.

Handy-Tip: These rods are meant to keep the wall from swaying. They do not need to be too tight, and the turnbuckles should never be over-tightened.



The ***Adjuster-pipe*** is a long pipe with a chrome sliding ring at one end.

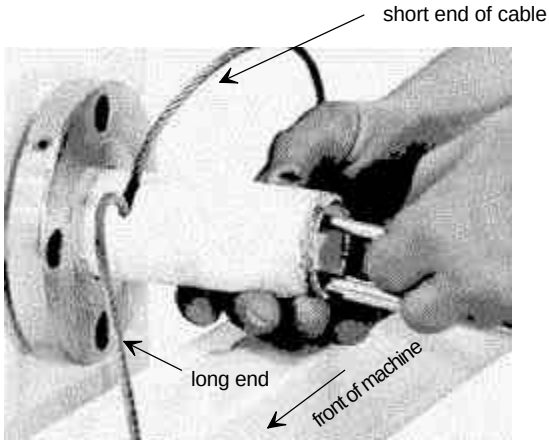
- **Slide the adjuster-pipe** into the channels from the right-hand side.
- The chrome ring goes to the right
- The x-braces go to either side of the adjuster-pipe.
- If there is insufficient clearance at the right of the Treadwall, the adjuster pipe can be installed with the wheel to the left.

Handy-Tip: The chrome ring locks the pipe from turning when it pushed onto the stud that is welded onto the channel. This helps when installing the cables.

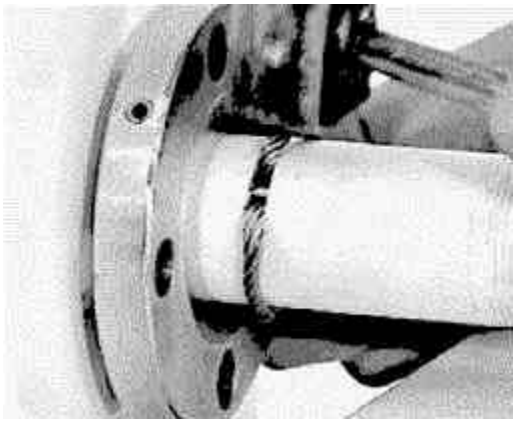
The ***spacer-bar*** is a piece of 1 1/2" square tubing with a threaded hole at each end for bolting.

- **Bolt the spacer-bar between the two channels** about one foot above the adjuster pipe.
- The x-braces go to either side of the bar.
- Use the lowest of the small holes.
- The right bolt helps secure the control panel.

The ***adjuster cables*** wrap around the pipe and attach to the frame. In the hardware box there are two long (3" x 1/4") bolts that are used to secure them into the adjuster-pipe.



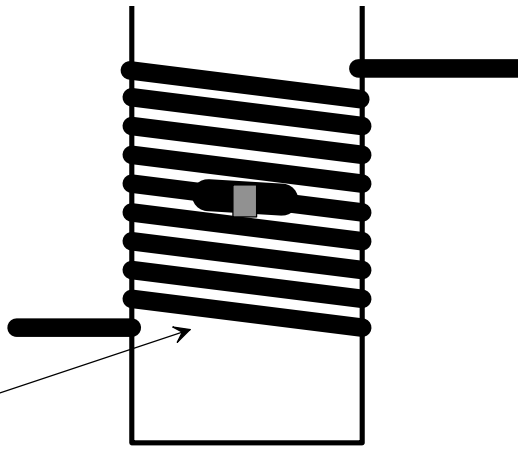
- Note that each cable has a kink. *The kink is nearer the front end of the cable.*
- **Take one cable and push the bend into the small slot** at the right end of the pipe. *The short end of the cable should going towards the back of the machine. (After winding, the cable passes under the pipe and the front loop goes towards the front of the machine.)*
- **Push the 1/4" bolt into the end of the pipe** and through the loop of cable inside the pipe to secure the cable.



- **Pull the cable up** to remove the slack and **spread the cable** out over the ends of the slot.
- **Hammer the cable down** where it comes out of the slot to flatten it against the pipe.

Handy-Tip: No need to whale it to death - just flatten the cables nicely around the pipe.

Use this diagram that shows the direction of the wind for the cables on both sides of the machine.



- **Lock the pipe** from turning with the chrome ring before winding the cables. Also, **turn out the turnbuckle** to its full extension.
- **Hang the turnbuckle** on the upper small loop on the back of the frame.
- While winding, make sure that the cables form nice neat coils on the pipe.

Handy-Tip: Notice that the winds form a left-hand thread pattern.

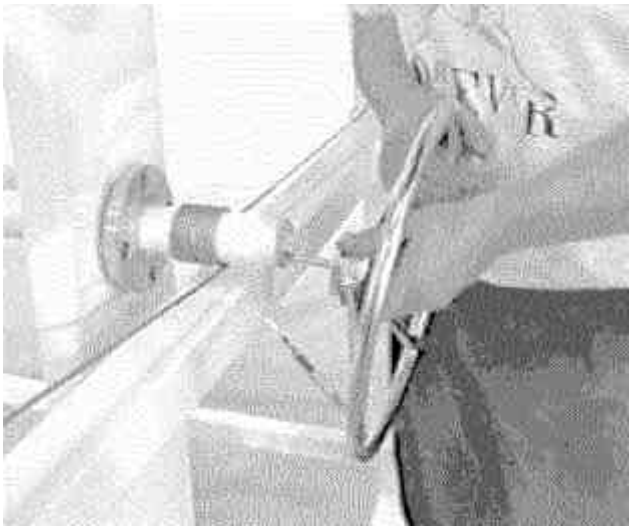
- **Wind the short end first** and attach the loop to the holder at the front of the frame with the clevis pin and cotter pin.
- **Wind the long end** of the cable while keeping tension so that it will not loosen.
- The cable slips through the large loop at the back of the frame and hooks to the turnbuckle . It will be obvious when you have the right number of turns.
- **Tighten the turnbuckle** to take out as much slack as possible on each side.

Handy-Tip: Be careful not to pinch your fingers in the cables. Cable guards will be installed later.

The ***large chrome wheel*** screws onto the end of the pipe

- **Push the wheel** over the threaded lock-rod and screw it onto the pipe.
- Lock the pipe with the chrome ring and **tighten the wheel hard.**
- **Screw the round plastic knob** onto the lock-rod.
- **Lubricate the cables** with silicone spray lube.
- Unlock the pipe and **turn the wheel** to move the channels back and forth several times to make sure the cables are working properly. **Grab the cables** behind the adjuster pipe and pull and push them hard to work out extra slack. If the cable sticks up in the middle of the coil where it enters the hole in the pipe, knock it down with the hammer. **Tighten the turnbuckles** one more time.

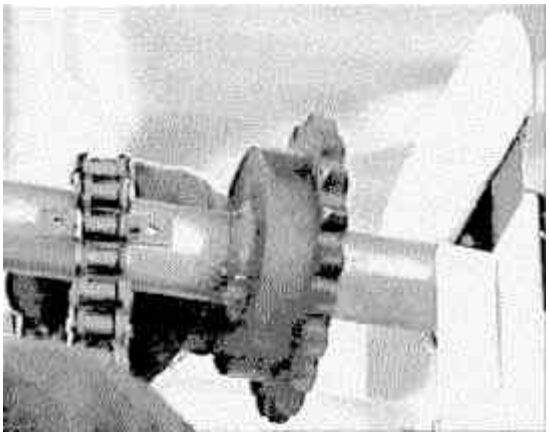
Handy-Tip: Lube the cables with silicone spray. They will last much longer and stretch to their final length faster.



The ***main chains*** come in a cardboard box.

- **Place the box on edge and cut off the top.** This way the chains can be pulled out of the box in a controlled fashion.

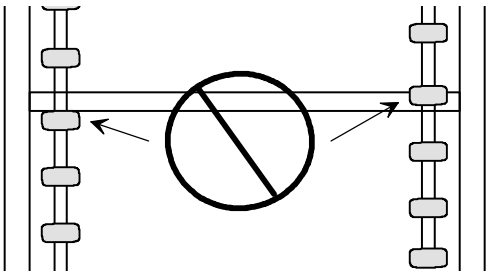
Handy-Tip: The chains are greasy. Wear gloves and protect the floor for the next operation.

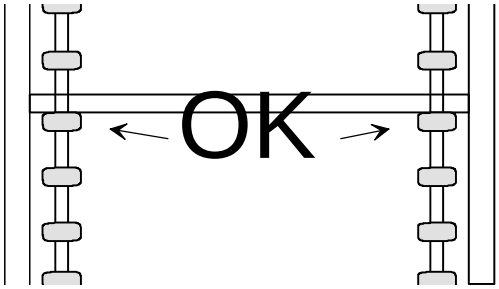


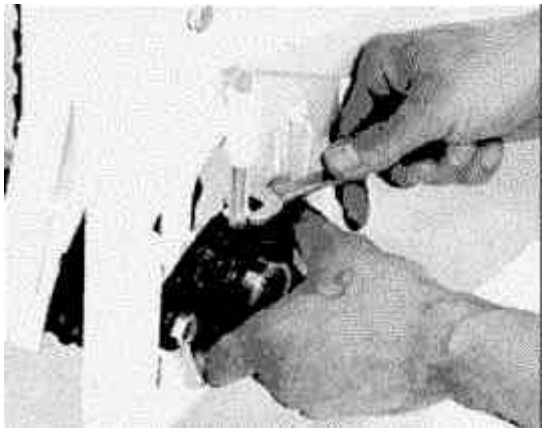
- **Lock the shaft** with the resistance lever (set all the way to "slow").
- The chains have tabs with holes for mounting the panels. When the chains are wrapped around the sprockets, the tabs must face out.
- **Lift one chain** up to the main shaft and drape it over the shaft next to one of the sprockets.
- Continue to **move the chain around** the shaft until the two ends are equal at the bottom.
- **Lift the chain** onto the sprocket.
- **Masterlink** the ends of the chain together before putting on the other chain.

The chains must be synchronized so that the tabs with holes are directly across from each other. If you don't do this, the Treadwall will not work!

- When the second chain is in place, **line up one of the chain tabs** with the horizontal spacer bar. Check that the other chain is also lined up with the other end of the spacer bar. If the tabs don't line up, adjust the chains until they are synchronized.







- With the chains in place and synchronized, **place them in the sprockets of the lower shaft.**
- Use the long push-bolts adjusters to **take up excess slack in the chains.**

Handy-Tip: Don't make them too tight - just take up the slack. If the chains are too tight, the Treadwall will be sluggish.

- **Tighten the bearing mounting-bolts.** Only tighten these bolts enough to flatten the lockwashers. This way, future adjustments can be made without loosening the bolts

PANELS

Putting on the ***panels*** is admittedly a tedious job, but it goes better if you are organized. **Be careful not to drop any panels and do not lean them upright against anything** - if they fall over they will be damaged.

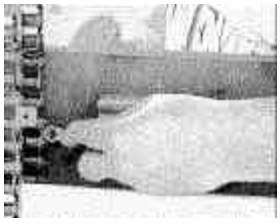
- You will need a 1/8" Allen wrench and a 3/8" combination wrench or a 3/8" socket wrench
- A VSR battery-operated drill with an adjustable clutch used with a 1/8" Allen bit speeds the job up considerably.
- *Important Align the sprockets.* After the first panel is installed, rotate it around by pulling the chains down until the panel has made one complete rotation. This will align the sliding sprockets on the two shafts. You may have to tap the sprockets into alignment with a hammer.

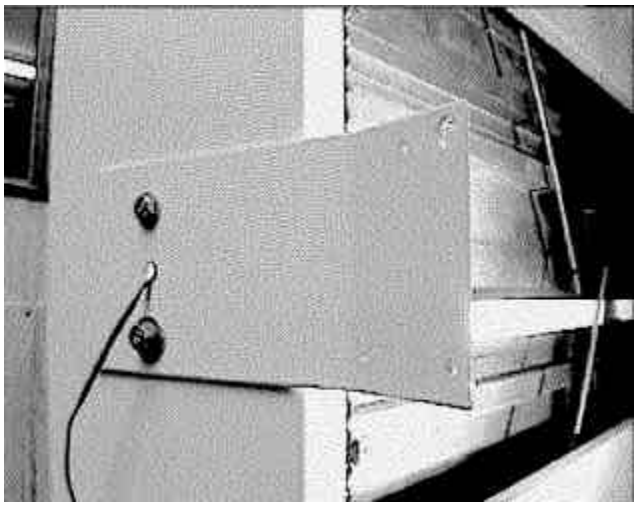
Handy Tip: Check the chains again to make certain that they are still synchronized.

- **Install a reinforcing channel** onto the back of each panel before bolting to the chains. The reinforcer slips into the holes when properly aligned.
- Slip the panels into the front of the channels and bolt to the chains.
- The nuts go to the rear. Make the bolts firm, but not tight enough to sink the heads into the panels.

- **Use the resistance lever** to hold the panels in the right position for bolting
- As you progress, and the panels are moving up the back of the machine, it will become harder and harder to move the wall around. This is normal.
- **Bolt on the panels** until there are only three left.

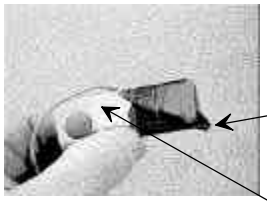
Handy-Tip: Our favorite tool combination is a VSR drill and a ratchet wrench with a 3/8" socket. Also, use a carpenter's apron to hold the bolts and nuts.

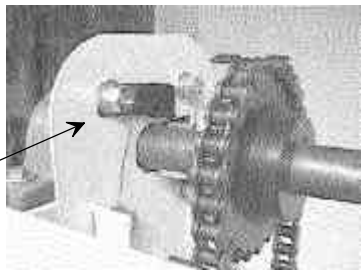




Mount the Climbometer bracket

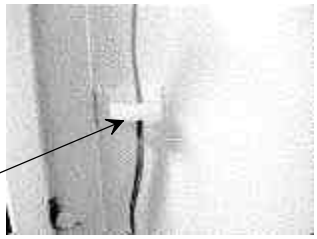
- The ***bracket*** for the time-distance-calorie counter mounts onto the left channel where there are three holes in a row.
- **Mount the bracket** with the bolt through the top hole. The bottom is the same bolt that mounts the spacer bar inside the wall.

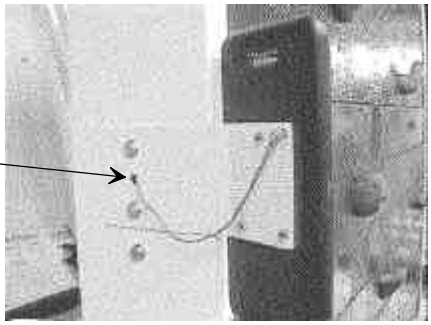




The ***proximity switch*** is mounted on a small bracket.

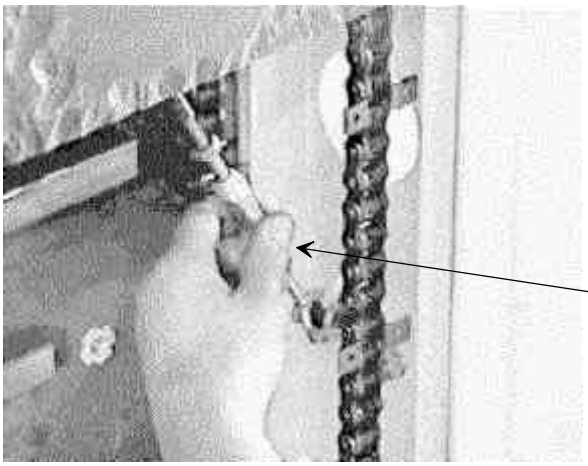
- **Attach the proximity switch** inside the top of the left channel using the lower front bolt of the large square bearing.
- **Place the 3 magnets** on the shaft. The magnets are held onto the shaft by magenetic attraction. A label on the shaft indicates their location. Adjust the magnets until the center of the magnets pass under the proximity switch with a 1/8" gap.
- **Test the Climbometer.** *Two magnets must pass the proximity switch for the Climbometer to register one foot.*
- **Lead the wires** down the inside of the channel and through the wire hold-downs. The plug and wire exit through the center hole in the Climbometer bracket. Mount the Climbometer as shown and plug in the wire.
- **Turn the shaft** a few times to test the Climbometer It should register one foot each time **two magnets** pass the switch.



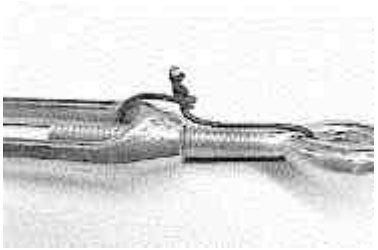


FINAL ADJUSTMENTS

When all but three panels are installed, **make the following final adjustments**

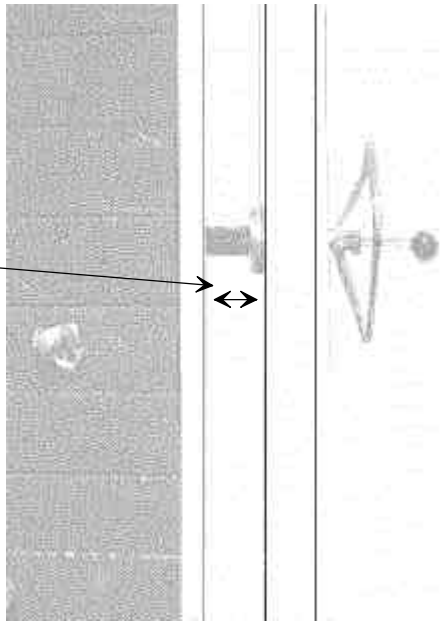


- At the bottom of the wall, look at the ends of the panels. The panel ends should not touch the channels on either side. **Adjust the channel interior x-bracing** so that there is an equal space between the channels and the ends of the panels at each side of the machine. **<u>Moderately</u> tighten** these turnbuckles (finger tight - no more) and tighten down their locknuts firmly.
- Use wire or a nylon cable tie to **secure the turnbuckle** and keep it from loosening up.



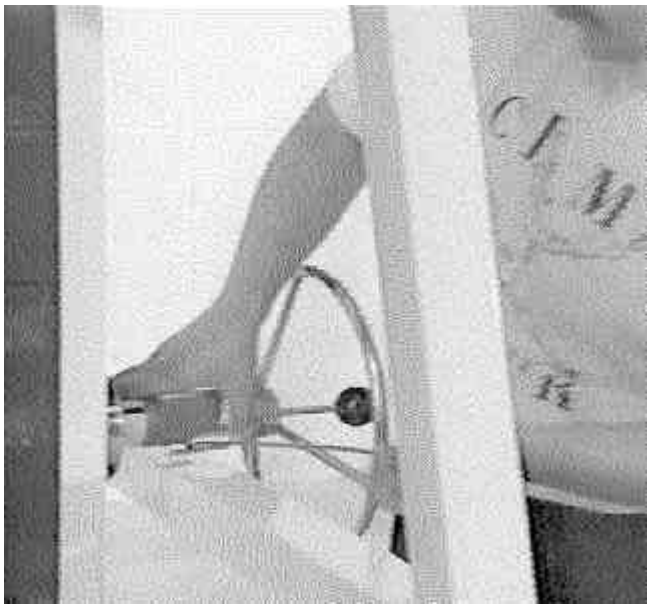
- The main frames must be aligned with the frame x-bracing in the back. Measure the distance between the frame cross-brace below the chrome wheel and the side of the right channel. This space should be 3 1/2". **Adjust the rear turnbuckles** to make this space 3 1/2". To increase the gap, loosen the right turnbuckle and tighten the left. To reduce it, loosen left and tighten right.

Handy-Tip: If this alignment is off, it may be difficult to lock the chrome ring on the adjuster pipe to the channel - the spacing will be wrong.



The ***cable-guards*** are short channel-shaped pieces with two long hooks that hold them onto the cables.

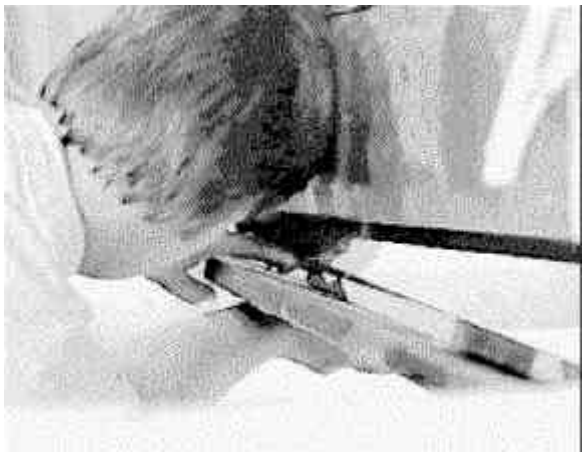
- To install the cable guard, loosen the cable turnbuckle a few turns, and while holding the cable coils from unwinding, take off the front shackle.
- The cable guard will sit over the coils. Hook one of the hooks over the rear part of the cable and slide the guard over the coils.
- Still holding the coils from the bottom, work the front part of the cable under the other hook and re-attach the shackle to the frame.
- Check that the coils are still even and re-tighten the turnbuckle.
- When both guards are installed, run the wall back and forth a few times to see that it works smoothly, and tighten the turnbuckles once more.



Handy-Tip: The cables will stretch. Check them every day for the first two weeks. Every month after that. Keep them tight!

The last three panels are installed by slipping them in from the bottom.

REMEMBER to <u>complete the Alignment Manual before closing the last panel !!</u>



- Run 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 at the channel bottom to access the nuts for tightening.
- Double check the orientation of each panel.
- Be careful not to pinch yourself.
- 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 access hole

The fabric ***side covers*** fit into hooks on the frames.

- **Use the black o-rings** to attach the side covers. Loop an o-ring into each grommet and back through itself.

- **Bolt the holds** firmly onto the panels.
- Use about one hold per panel and distribute them fairly evenly across the width of the machine.

Handy-Tip: Distribute the colors fairly evenly too - that way climbers can use the colors to make different routes.

- ***Very important*** **- Don't allow larger holds to overlap onto the next panel.** The holds supplied with the Treadwall are designed so that they cannot overlap, but other holds you might want to put on may be larger.
- Each hold has a positive edge. Generally speaking, these positive edges should face up so that the climb will not be too intimidating.

Short round-head bolts are provided to help attach the panels to the reinforcing channels (especially any panel that doesn't have any holds on it). Screw one of these bolts into each panel in one of the three center holes.

- **Attach the belt line to the spring clip** on the control line at the middle of the shroud.

Handy-Tip: To adjust the control line, the climber stands in front of the machine and pulls the line through the line-locks until all the slack is taken up. The excess line is stuffed into the pocket on the belt.

- **Attach the two post pads** under the cables on either side of the machine.
- **Use cable ties -** position them under the frame member.

- **Place the mat** between the frames.

Make sure the Alignment Manual and installation registration is completed and mailed to Brewer's Ledge in the enclosed envelope. This is very important.

Cleaning up the machine completes the Treadwall installation.

Handy-Tip: Congratulations!

Installation Checklist - Treadwall®

Unloading/Carry-in

- ☐ Check for damage - sign freight receipt "**with exception**" if you have any doubts!
- ☐ Make sure space is sufficient...Height? Room to put in adjuster pipe after channels?

Assembly of Treadwall®

- ☐ Main frames.
- ☐ Horizontals.
- ☐ Main X-Bracing.
- ☐ Main shaft.
  Use two ladders and two persons!
- ☐ Remove hardware from both channels.
- ☐ Hang left channel.
- ☐ Counter wiring into left channel clips.
- ☐ Magnets on shaft.
- ☐ Mount hydraulic box on right channel.
  Make sure to leave it in upper position.
- ☐ Hang right channel.
- ☐ Insert lower shaft.
  Loosen bearing bolts first - it helps.
- ☐ Mount rear guard.
- ☐ Spacer Bar and counter bracket.
- ☐ Mount internal (channel) X-Bracing.
  Leave loose.
- ☐ Adjuster pipe and cables and guards.
- ☐ Drive chain (smaller, single chain).
  Align sprockets, tighten all set screws!
- ☐ Two main chains.
  Check that tabs are aligned.
- ☐ Top shroud.
  Make sure end spacing is clear.
- ☐ Counter sensor mounted and adjusted.
  Uses front-left shroud bolt. Adjust clearance.
- ☐ #1 wall panel.
  Run #1 panel all around to align sprockets.
- ☐ Mount all but last three wall panels.
- ☐ Put on holds and center bolts.
- ☐ Adjust internal X-bracing and safety wire them.
- ☐ Adjust exterior X-bracing.
- ☐ Adjust drive chain.
  Leave quite loose.
- ☐ Adjust two main chains.
  Approx. 3/8" flex at three empty panels.

☐ Check lower bearing bolts - firm but still "slides"
☐ Mount and check counter.
☐ Finish panels and holds.
☐ **Climb for few rotations. TEST! Re-align if necessary. Check for stiffness.**
☐ Sidecovers, mat , instructional panel, and clean unit.

☐ Train staff on maintenance and usage.
☐ **Fill out delivery receipt and send to Brewer's Ledge Inc..**