TREADWALL™

Model AM

INSTALLATION MANUAL

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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".

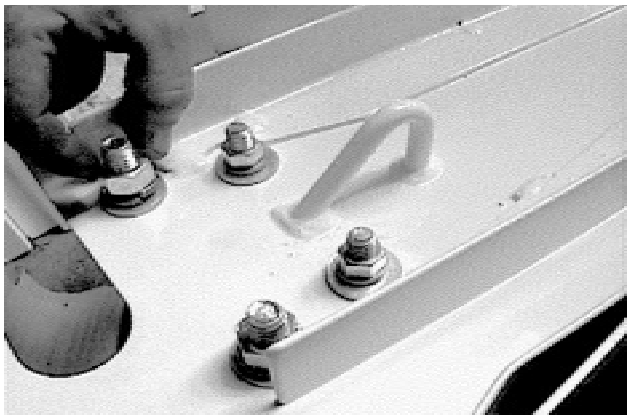
8" crescent wrench	Vice-grip pliers
Flat file and 1/2" rat-tail file	Allen wrench set
Pair of pliers with nippers	Screwdrivers
Tape measure	Loktite thread-lock
Small jar or tube of Vaseline	Knife
Cigarette lighter	2 carpenter's aprons
Work gloves	Eye protection
Hand cleaner	Spray cleaner and rags

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

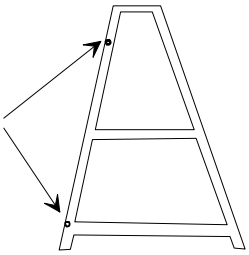
Set up a neat and organized workspace. It makes the whole job more pleasant and contributes to safety. Removing everything from the packing and discarding the packing materials is an important first step, particularly since you will be working with ladders.

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 till you need them.

FRAMES

- **Assemble the left frame**
- The ***side frames*** come in two parts - top and bottom. Each bottom section has angled joints that slide into the top section
- The rear joints are tagged for left and right - make sure they line up correctly.
- 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.
- Bolt goes through frame and threads into horizontal end. Do not over-tighten.

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.

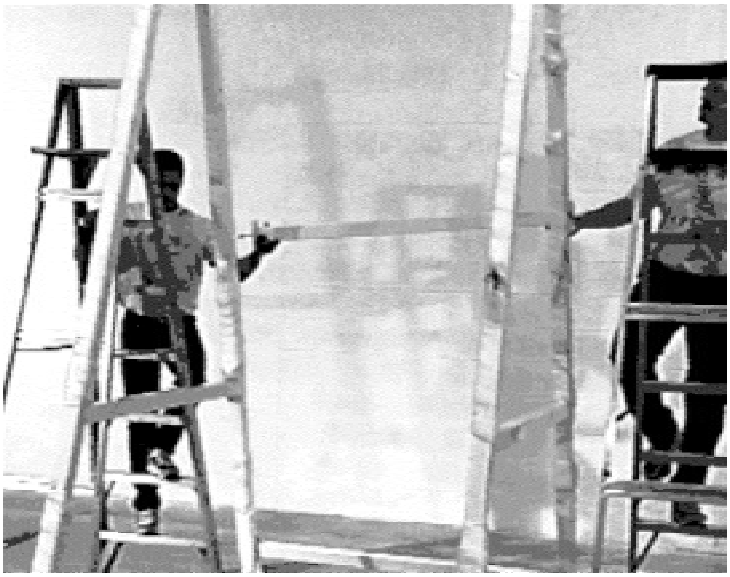
- **Rest the other end of the horizontal brace on the ground.** It will support the left frame.
- **Put together** the right frame.
- **Line up the right frame** with the horizontal and **bolt it on.**

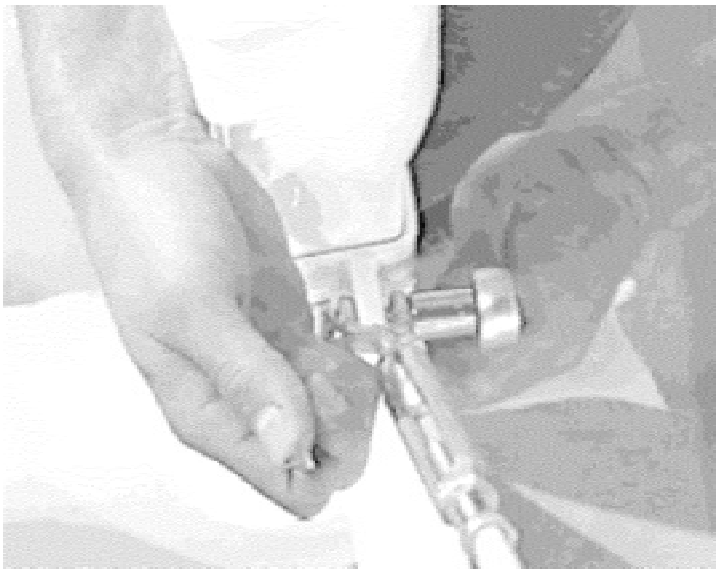
Now the frame is beginning to take shape.

- **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.





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

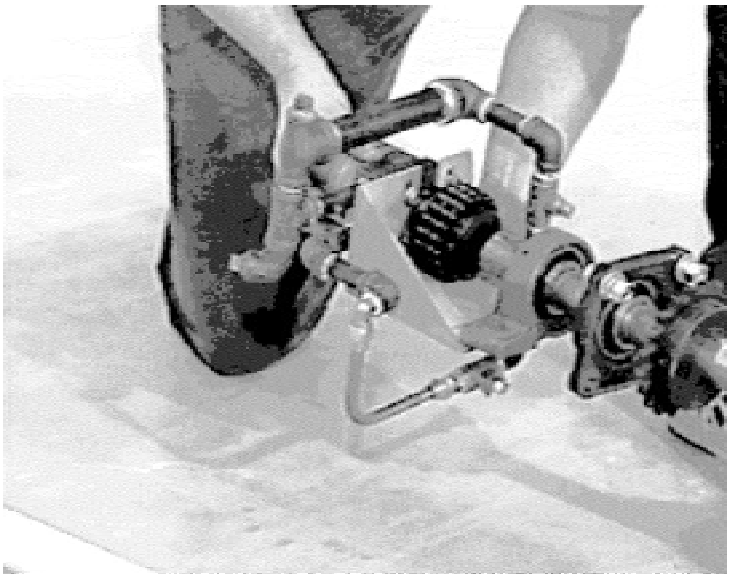
- **Attach shackle** to top horizontal tab.
- **Attach turnbuckle** to the tab at the opposite end of bottom horizontal.
- **Install second X-brace** and tighten turnbuckles evenly

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

Shaft and Pump

Examine the main shaft which installs to the top of the frame. It has four bearings and two sprockets. One of the sprockets is welded to the shaft. The other sprocket is keyed to the shaft, but it is free to slide for self alignment. One end of the shaft has a key for the pump coupling. **Remove the tape from the pump key and clean the end of the shaft carefully.**

Install the pump before raising the shaft onto the frame

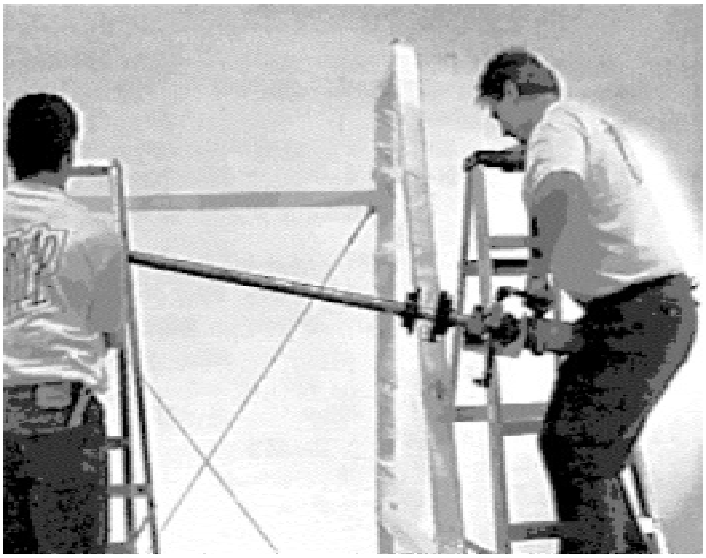


- Support the end of the shaft, **line up the pump carefully, and slide it onto the shaft.**

Handy-Tip: The pump is attached to a mounting plate. The bolts should be loose so that the pump can slide freely up and down.

- Note that the pump mounting-plate goes under the bearing and the slots line up with the bearing holes.

Handy-Tip: If the pump doesn't go onto the shaft easily, it's usually because it isn't lined up right. Use a little Vaseline. Make sure the setscrew is loose enough.



Raise the shaft to top of the frames.

- Position the ladders slightly in front of the frames as shown.
- The pump goes to the right

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!

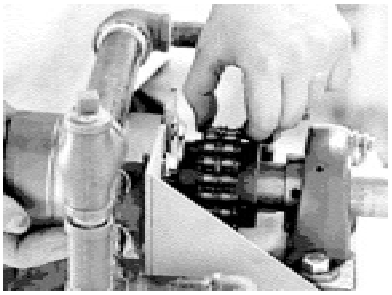
- **Tighten the bearing-bolts** down firmly to the frame tops.

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.

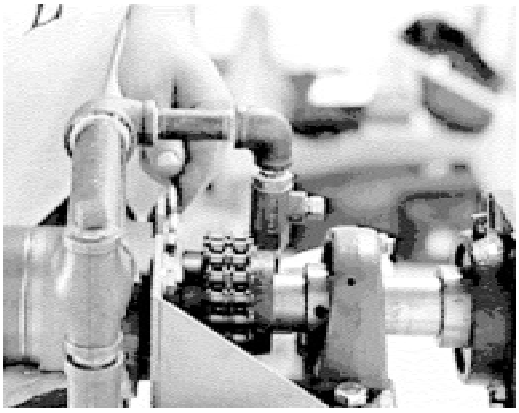
Try turning the main shaft by hand. It should turn easily but with some resistance. If it is locked up, make sure that the two valves are open.

Aligning the pump.

Proper alignment is very important to the operation of the Treadwall and the service life of the pump.



- **Wiggle the chain on the pump coupling with your fingers.** When the pump is tightened down properly, this little chain should feel loose all around.



bolts so that you can align the motor horizontally **and re-tighten them.**
- **Check** the coupling chain for looseness - redo the above steps if you cannot wiggle it.
- Try **turning the main shaft** by hand. It should turn as easily as before.

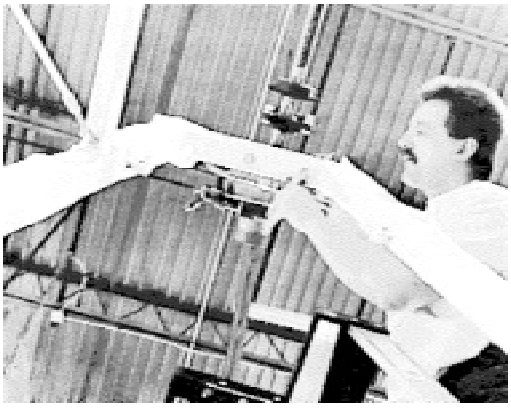
Handy-Tip: Sometimes it's necessary to loosen and re-tighten the coupling setscrews to adjust the pump for in-and-out alignment.

Handy-Tip: We find that tightening in the following order is the easiest way to align.

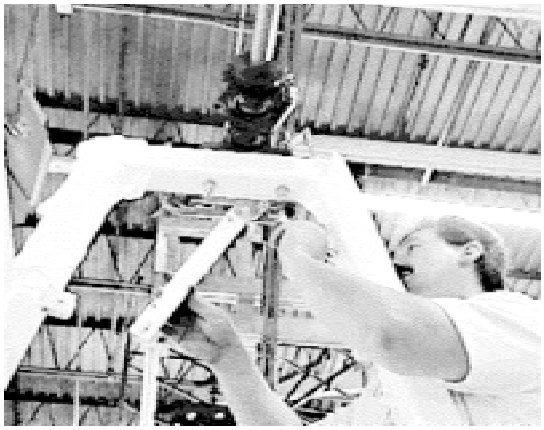
- First, **align the pump up and down** and tighten the four motor-mounting bolts.

Handy-Tip: Use a 9/16" open end wrench. Don't try to use a crescent wrench. It's too frustrating!

- Second, **loosen the two large bearing**



With the pump in place and aligned, it is time to **install the main valve lever.**



- The main lever is about 15" long and 2" wide with a pulley at one end and a silver piece bolted on the other end that fits on the valve stem.
- Note that there is a small hole near the pulley. This hole goes toward the rear of the machine.
- **Attach the main lever to the lower valve.**

Handy-Tip: Be careful putting the nut onto the valve stem. It is very easy to cross-thread. Use a little Lock-Tite on the nut to keep it from loosening.

Install the weight

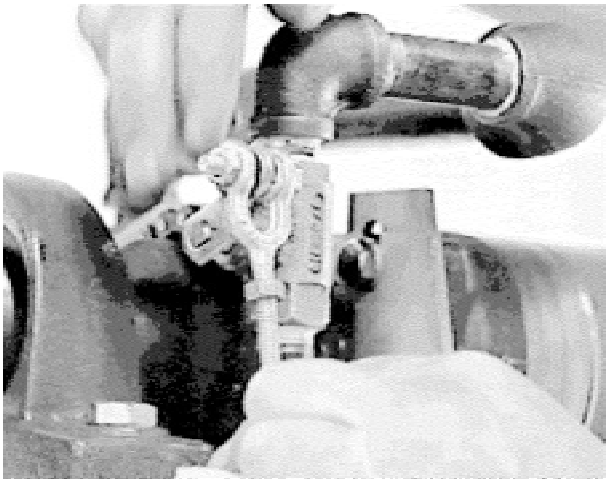
- The ***weight*** is cylindrical steel, about 7" long with a string
- There is a small pulley at the back of the right frame.
- **Put the string up through the pulley** and **tie it to the small hole** in the main lever.
- The lever will be pulled toward the back of the machine.

Handy-Tip: When the lever is pulled back by the weight, the main shaft is free to turn. When the lever is pulled forward, the main shaft is locked up.

The resistance valve is the upper valve. It provides a constant, adjustable resistance to compensate for the weight of the climber.

- There are two levers. The ***resistance lever*** is the chrome lever that protrudes from the front right frame. At the other end of the long rod, at the top of the front frame leg, is the turnbuckle and the ***valve lever*** that attaches to the valve stem. **Find these two levers** and identify them.

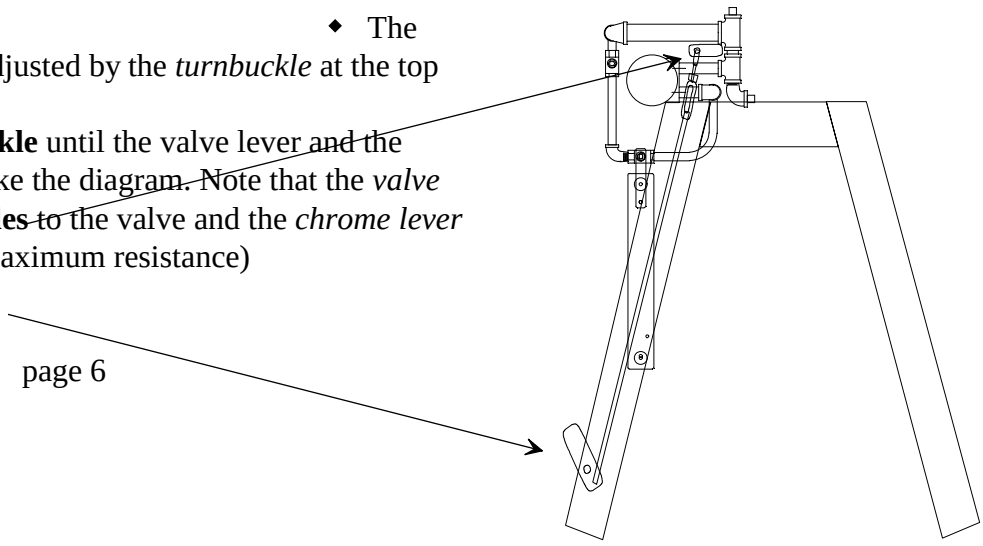
- **Remove the nut from the resistance valve** and turn the valve stem with a crescent wrench to line up with the *valve lever*.



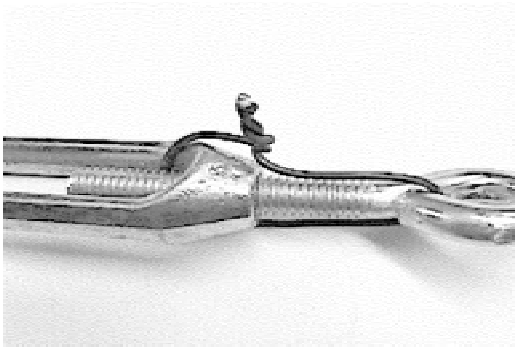
Handy-Tip: Be very careful not to drop the nut (or anything else) down the front leg! (The voice of experience speaks.) If you do lose the nut, it is 3/8 x 24.

- **Put the *valve lever* onto the valve** and replace the nut on tightly. Be careful not to cross-thread.

- The *resistance lever* is adjusted by the *turnbuckle* at the top of the rod
- **Adjust the turnbuckle** until the valve lever and the chrome lever look like the diagram. Note that the *valve lever* is at **right angles** to the valve and the *chrome lever* is **all the way up** (maximum resistance)



- When the turnbuckle is properly adjusted, **wire it closed** so that it cannot get out of adjustment. Put a loop of wire through the turnbuckle body and up through the turnbuckle eye and twist it closed. This will prevent the turnbuckle from turning.



Handy-Tip: Now that the resistance lever is connected to the resistance valve, the resistance lever can be used to lock up the shaft and release it.

Channels

The next step is to install the channels.

- The ***channels*** are the largest pieces of the Treadwall. They are marked left and right.
- **Hook the right channel onto the shaft** between the sprocket and the large square bearing.
- **Bolt the channel onto the square bearing** with two bolts. The upper two bearing holes are not used.

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

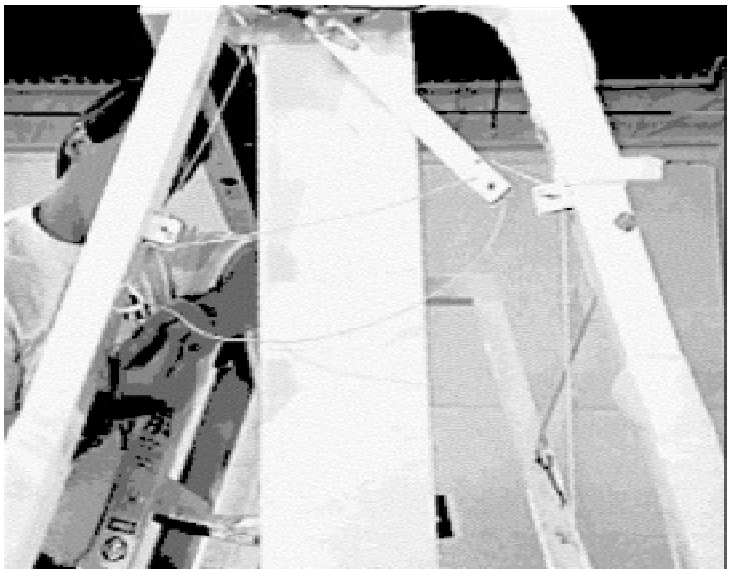
- **Install the left channel.**

The ***pulley-bar*** 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 pulley-bar** to the top of the channels.
- **Bolt** into place with the 3/8" bolts.

Handy-Tip: If you position the ladders right, you can hold the pulley bar on your shoulder while you put in the bolts - much more comfortable!

Attach the pulley line to the main lever.



- The end of the line that comes out of the right end of the pulley bar attaches to the main lever.
- **Untie this end of the line** from the ring. Leave the ring on the other end of the line.
- **Bring the line through the small pulley** at the front of the frame, through the pulley in the main lever, and forward again to the small loop under the frame pulley.
- **Tie the line** to the small loop.

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

The ***back guard*** is a part that looks a little like the pulley-bar but lighter. This attaches between the channels at the back near the bottom.

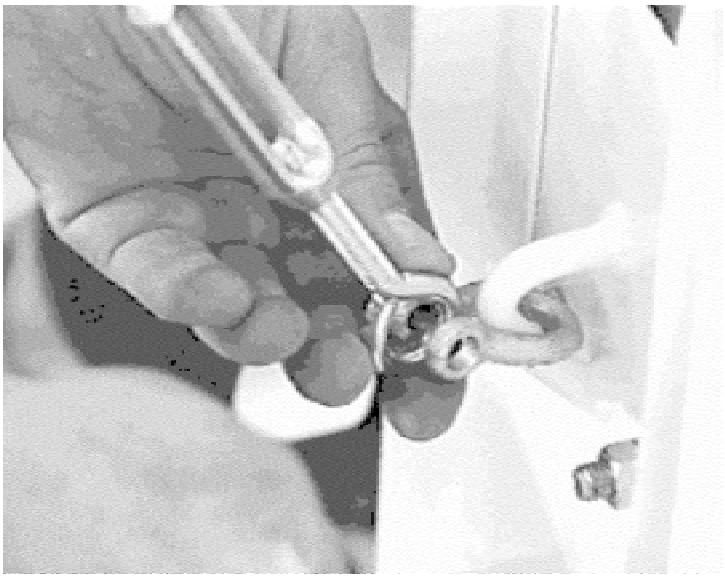
Handy-Tip: Look at the ends of the back-guard. The straight edge goes up. The angled edge goes down.

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

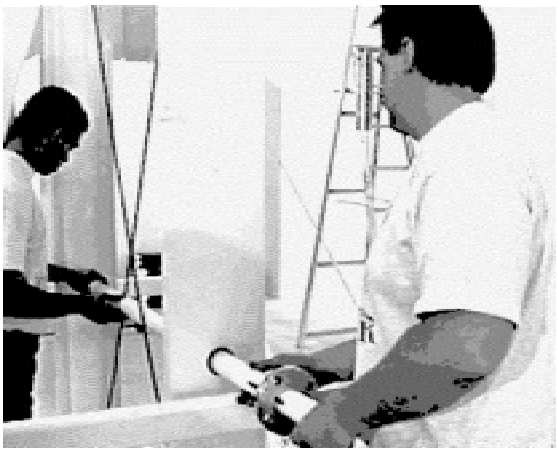
There is ***x-bracing*** that goes between the two channels. It is 5/16" rod with a turnbuckle at one end and shackles at both ends.

- 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 and tightened 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.



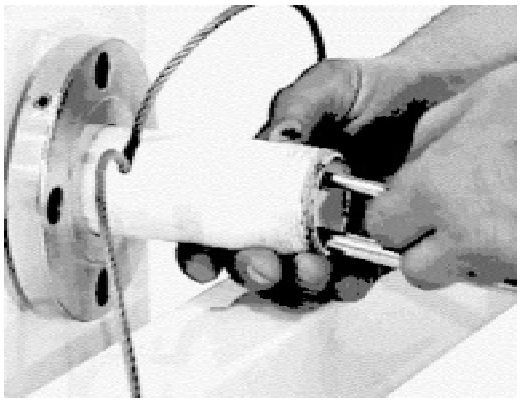
- **Slide the adjuster-pipe** into the channels from the right-hand side.
- The chrome ring goes to the right
- The x-braces go to either side of the adjuster-pipe.

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 tab 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.
- There is a bracket welded at one end of the spacer. It goes right, facing up.

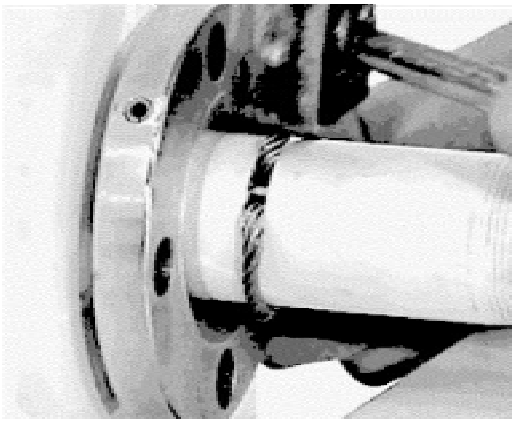
The ***adjuster cables*** wrap around the pipe and attach to the frame. They come packaged with a long 1/4" bolt that is used to secure them into the adjuster-pipe.



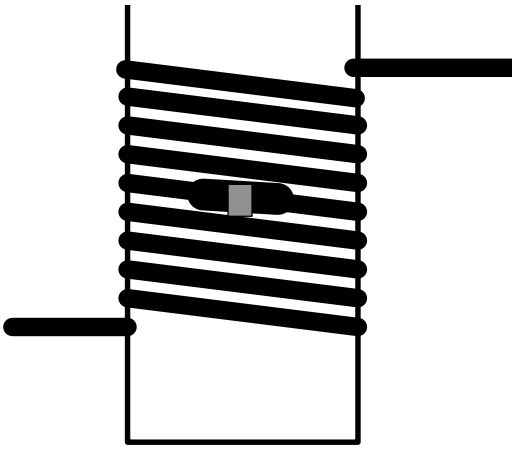
- Each cable has a shackle at one end, a turnbuckle at the other, and a bend in the middle.
- **Take one cable and push the bend into the small slot** at the right end of the pipe. *The shackle end of the cable must be going towards the back of the machine. (After winding, the cable passes under the pipe and the shackle 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.
- While winding, make sure that the cables form nice neat coils on the pipe.
- **Wind the shackle end first** and attach the shackle to the loop at the front of the frame.

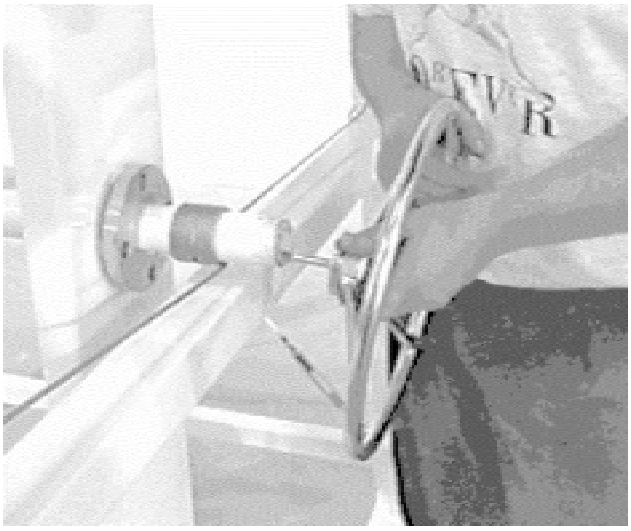
Handy-Tip: Notice that the winds form a left-hand thread pattern.

- **Wind the turnbuckle end** while keeping tension on the cable so that it will not loosen.
- The turnbuckle slips through the large loop at the back of the frame and hooks to the upper small loop. 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.

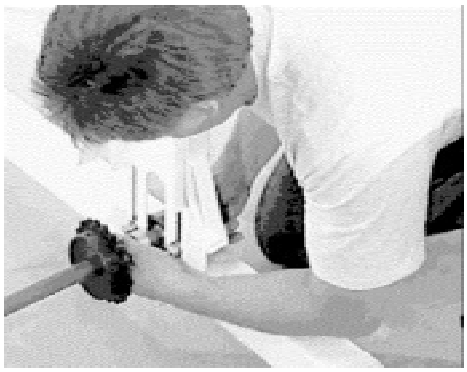
Handy-Tip: Be careful not to pinch your fingers in the cables. Cable guards will be installed later.

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.
- Unlock the pipe and **turn the wheel** to move the channels back and forth several times to make sure the cables are working properly. Tighten the turnbuckles one more time.



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



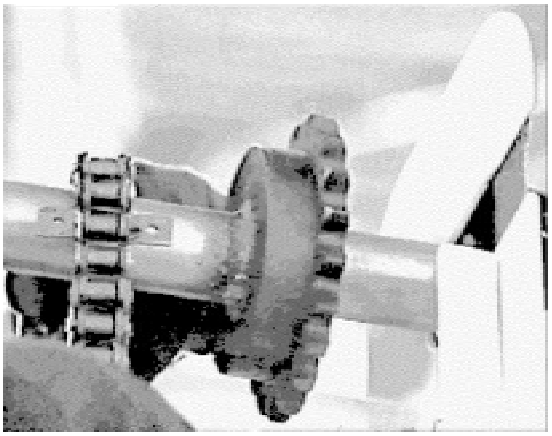
- The welded sprocket goes to the left.
- **Place the shaft** into the two bearings at the bottom of the channels. Slide the bearings all the way on - up to the stop-collars.
- **Tighten the bearing setscrews,** but leave the bearing mounting bolts loose so that the bearings can slide up and down in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

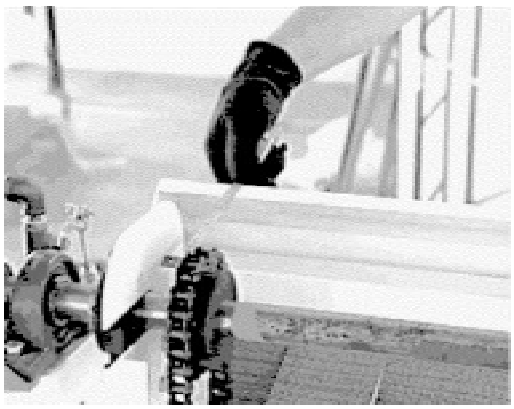
The ***main chains*** come in a cardboard box.

- **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.
- 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.
- **Repeat** for the other chain.

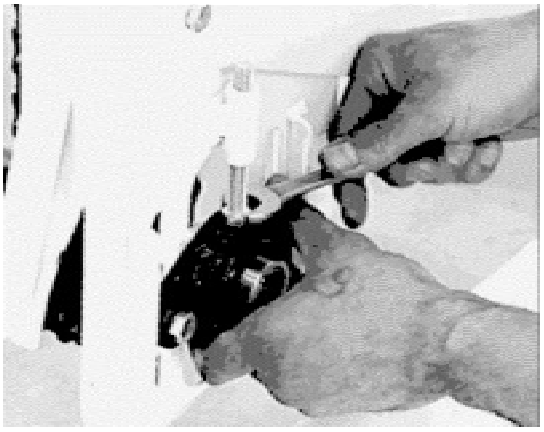




The chains must be synchronized so that the tabs are directly across from each other. If you don't do this, the Treadwall will not work!

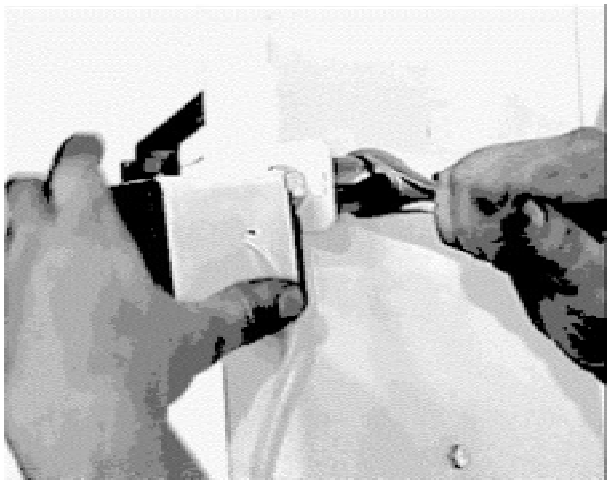
- With a tape measure, **synchronize the chains** by measuring the tabs from the top of the pulley bar.
- **Work the chains around** the sprockets until the tabs measure the same distance from the top of the pulley bar at both sprockets.

- 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.**



The ***counter*** is in a small box with a stud and protruding wires.

- **Mount the counter** onto the bracket on the front of the right channel.
- The lockwasher and special nut go behind the bracket.
- **Tighten the nut,** but leave slightly loose so that the counter can swivel with tension.

Handy-Tip: The counter swivels so that the climber can see it from all angles.

The ***microswitch*** is mounted on a bracket that is welded to the spacer-bar.

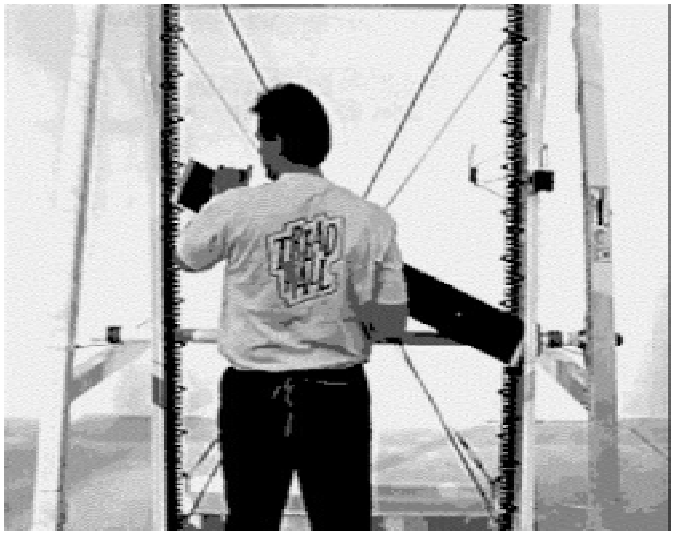
- **Bolt on the microswitch** with the bendable lever *pointing towards the back* of the machine.

Handy-Tip: The lever will be adjusted later when the panels are up.

- **Push the wires** through the center hole in the channel and **attach** them to the top and bottom terminals of the microswitch.
- Use wire-ties to hold the wires to the spacer bar
- Click the switch a few times to test the counter.

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.

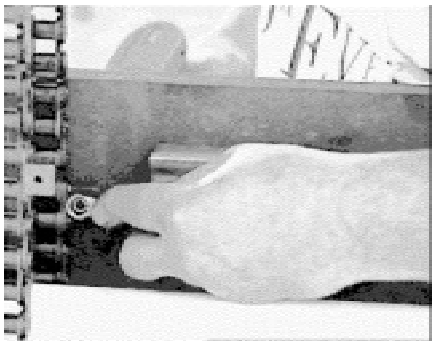
Handy-Tip: Our favorite combination is the VSR drill and a ratchet wrench with a 3/8" socket. Also, use a carpenter's apron to hold the bolts and nuts.

- The panels slip 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.

Every second panel must be flipped end-for-end so that the holes alternate.

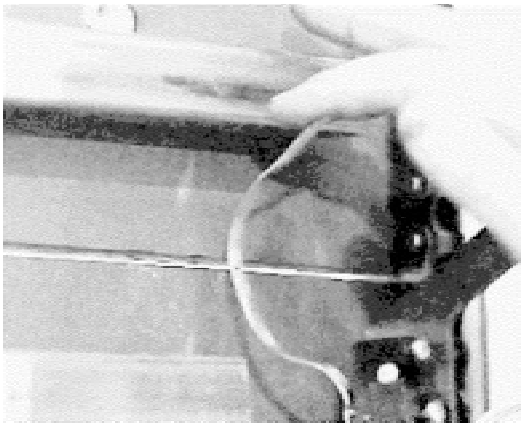
Handy-Tip: If you don't alternate the panels, the counter will not work properly. Double check each panel for orientation!

- **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.



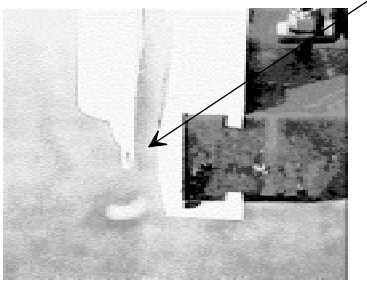
FINAL ADJUSTMENTS

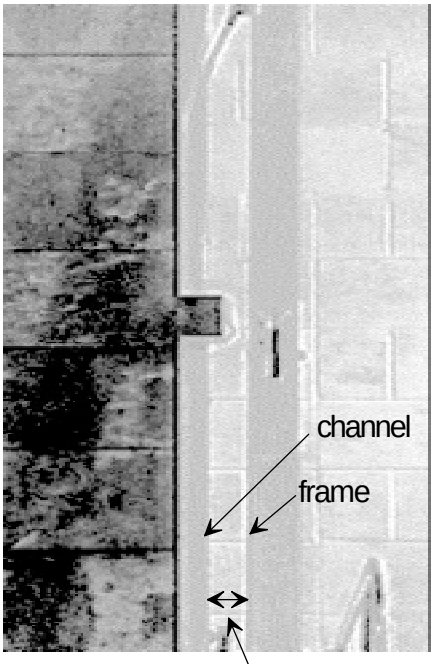
When all but three panels are installed, **make the following final adjustments**



- **Bend the microswitch lever** so that it clicks on every other metal brace (on the back of the panels). **Move the wall up and down** to make sure it works properly in both directions.

- **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. Wire the turnbuckles closed for extra security.





- 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". **Adjust the rear turnbuckles** to make this space 3". 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>

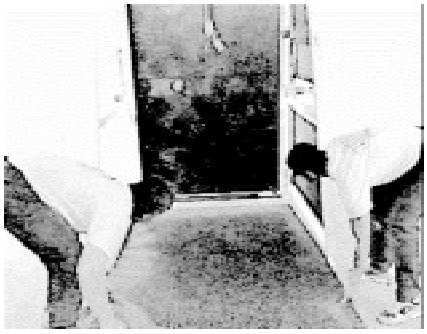
- Run the panels around until the gap is at the bottom front.
- Slip in the panels one at a time and install the bolts. Use the side openings at the channel bottom to access the nuts for tightening.
- Double check the orientation of each panel.
- Be careful not to pinch yourself.
- The last panel is somewhat awkward - be patient. Put the bolts and nuts in with the panel at the bottom.

- The large sheet-metal ***pump cover*** fits over the hydraulic assembly and slips under two lugs at the top of the right frame.
- **Position the cover** and push it into place.

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

- The small upper cover goes inside on the right. The brake lever and weight are in-between the two upper covers.
- **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.

- **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 the larger holds to overlap onto the next panel.**
- Each hold has a positive edge. Generally speaking, these positive edges should face up so that the climb will not be too intimidating.

- **Attach the harness line to the ring** on the control line at the middle of the pulley-bar.

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 harness.

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!

T R E A D W A L L™

Three simple adjustments set the Treadwall to match your climbing workout.

The harness **- adjusts for the climber's height.**
Stand on the ground in front of the Treadwall and pull the control-line through the spring-loaded harness locks. When the line is tight, it is adjusted for your height.

The resistance lever **- adjusts for your weight.** More resistance makes the wall go slower. Less resistance speeds it up. Adjust to match your speed for smooth climbing.

The wheel **- adjusts for angle.** The steeper the angle, the harder the climb. Turn wheel slightly to take off pressure. Pull out black knob to unlock wall. Adjust angle with wheel and push knob back to lock chrome ring onto stud.

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