

# PneuWeight™

## Assembly Manual



### Key Benefits

- ◆ Orthopedic patients
- ◆ Knee, hip & ankle injury
- ◆ Back problems
- ◆ Gait training
- ◆ Cardiovascular
- ◆ Overweight patients
- ◆ Respiratory ailments
- ◆ Neurological patients

Patent 5181904

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Rev 014

Revised Feb 26, 2014

Genuine Pneumex Equipment

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## **Preface**

This manual contains the operating instructions and service requirements for the PneuWeight Unweighting System. The manual is designed for use by clinical staff and it is expected that the clinicians will instruct their patients and clients in the proper use of the system and its accessories. The PneuWeight systems are intended to be used as unweighting or offloading devices not as a hoist. Please read the manual carefully, noting the Safety Requirements in Appendix A, before using the PneuWeight Unweighting System.

## **Liability Notice**

Failure to follow the conditions set forth below shall absolve Pneumex, Inc. from any responsibility for the safety, reliability, and performance of this equipment.

Each operator must read the operator manual in full before using the product for the first time.

Each independent user must be instructed in the proper use of the system and its accessories.

The electrical wiring within the system's settings, and the electrical installation of the compressor must comply with the applicable local or provincial requirements. The equipment must be used in accordance with the instructions for use. It is suggested that operators of PneuWeight Stations receive approved training and certification from Pneumex, Inc. or their designee before operating the equipment. Please call Pneumex at 800-447-5792 to find out more about our training and certification programs.

## Using the PneuWeight™

The PneuWeight™ Unweighting system uses pneumatic power provided by a small compressor and the PneuVest™ to support the patient. The PneuWeight's™ unweighting capacity of 0 to 300 lb. allows the patient to perform low-impact kinetic exercises in an upright, functional position. Activities such as walking, running, stair climbing, jumping and balance may all be performed safely while unweighted. If a patient loses their balance or starts to fall the PneuWeight™ systems will support the patient's entire body weight.

The Drop Stop is a mechanical safety stop which can be used in conjunction with the pneumatic safety.

The center of the Unweighting system is the PneuVest™. This Unweighting harness fits the patient like a snug vest with a strap positioned under the buttocks. The vest allows the patient to exercise in an upright, controlled and safe position. It effectively grips the body to support all or part of the patients weight.

**You MUST bolt Double systems to the floor using the holes in the base straps. . Use the pre-drilled holes in the base straps.**

**You will need four 3/8" bolts of appropriate type for your floor — concrete, wood, composite, etc. We recommend you contact your building contractor for correct bolts.**

We recommend a weekly inspection of cables. All Cable Assemblies should be replaced at least every six months. Failure to do so may result in failure of cable and injury.

## Indications for use

- ◆ Acute and chronic backs
- ◆ Back pain
- ◆ Ruptured disc - herniated / bulged
- ◆ Chronic headache / upper thoracic tightness
- ◆ Post surgical
- ◆ Osteoporosis
- ◆ Knee, hip & ankle injury
- ◆ Orthopedic patients
- ◆ Cardiovascular
- ◆ Overweight patients
- ◆ Respiratory ailments
- ◆ Neurological patients
- ◆ Assist in lifting wheelchair patients

## Contraindications

- ◆ Tumors on the spine
- ◆ Respiratory conditions which are exacerbated by pressure on the rib cage.

**This can sometimes be compensated for by taking more weight through the legs or by using a thoracic vest.**

# Components

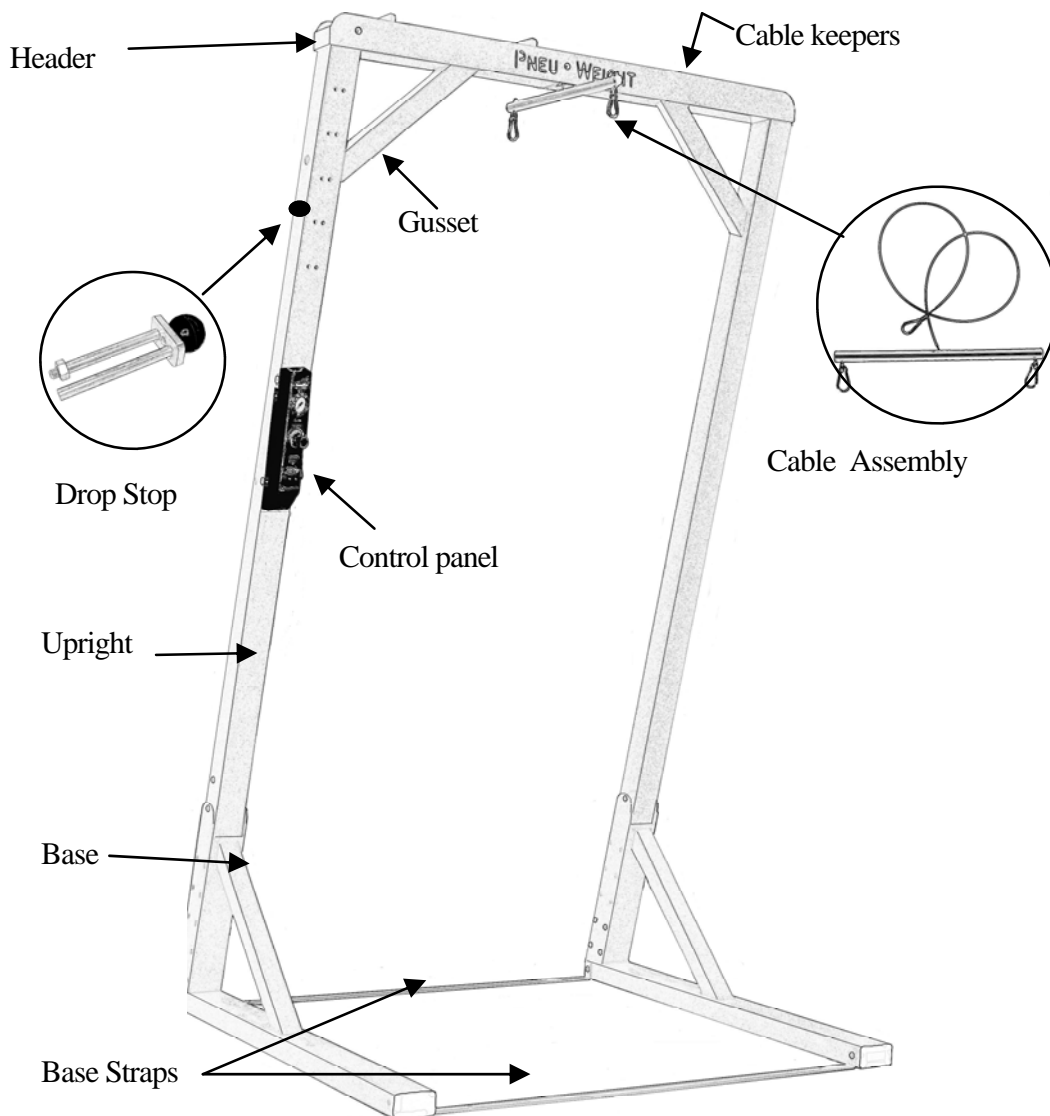
## Single PneuWeight

Box #1 - Two base supports: package includes instructions, installation hardware, air hose, and one PneuVest

Box #2 - Two upright posts , cable assembly and control panel

Box #3 - One header beam assembly

Box #4 - Compressor (if ordered)



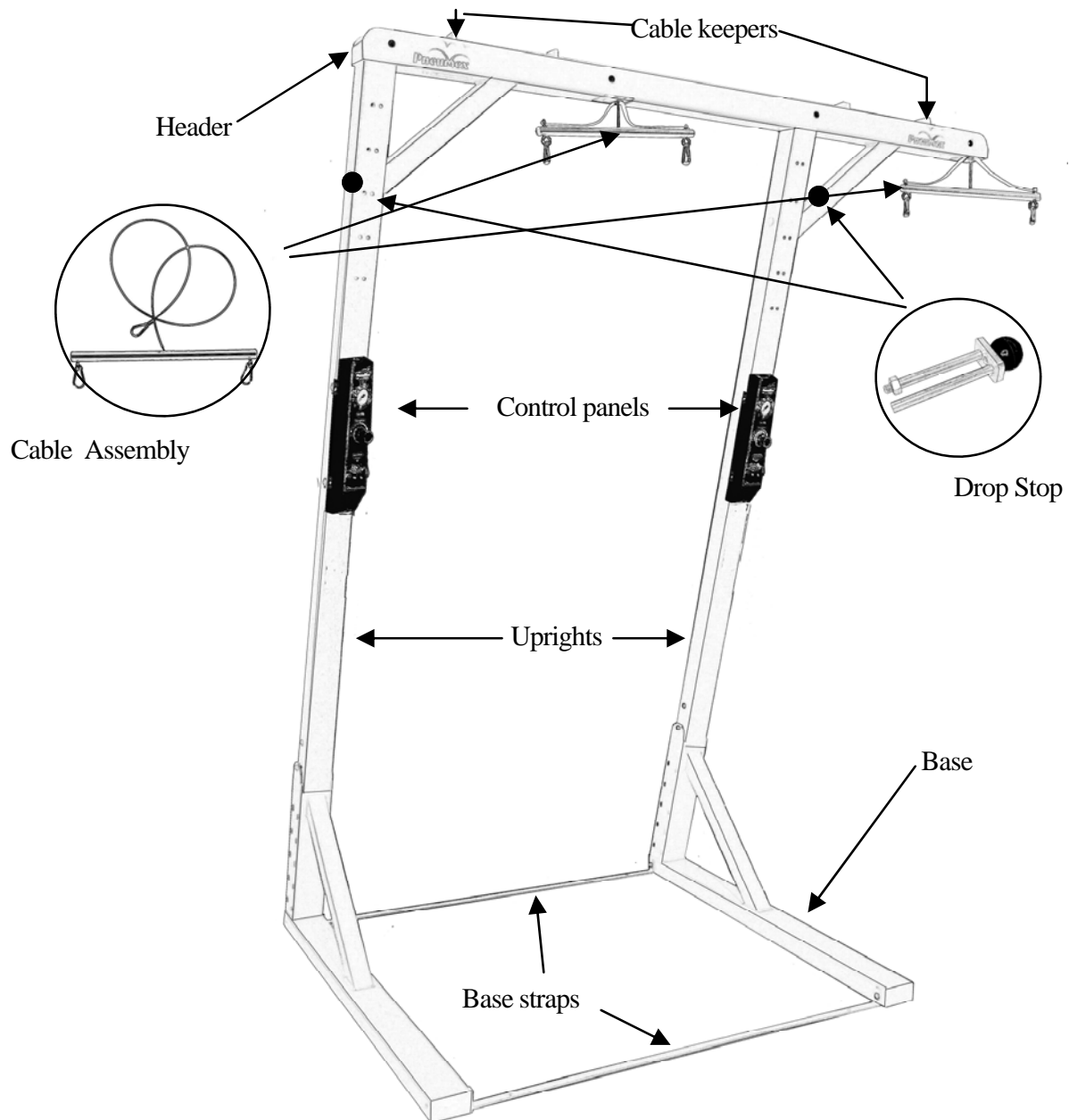
## Double PneuWeight DPW

**Box #1** - Two base supports: package includes instructions, installation hardware, air hose and two PneuVests

**Box #2** - Two upright posts, cable assembly and control panels

**Box #3** - One header beam assembly

**Box #4** - Compressor (if ordered)





# Unpacking

## Tools required: sharp knife

1. Cut all tape and remove corrugated and plastic wrapping.
2. Remove the operator/service manual, air hose, and vest(s) and store them temporarily in a safe place.
3. The unweighting bar and the air hose are tucked inside the uprights for safety during shipping.

Dual systems have two control panels.

# Installation

## Electrical Requirements

The compressor requires an appropriate AC line. Refer to the manual supplied by the compressor manufacturer for electrical requirements.

## Ceiling Height

Before assembling, determine how high to make the system. The series of holes in the bottom  $\frac{1}{3}$  of the bases provides 4 height options, progressively changing by 3 inches (7.6 cm). The total height on a dual system can be set to any of the following:

7 ft. 11 in. (2.41m) – using top pivot hole in base

8 ft. 2 in. (2.49 m) – 2nd pivot hole

8 ft. 5 in. (2.57 m) – 3rd pivot hole

8 ft. 8 in. (2.64 m) – bottom pivot hole

For installation, the ceiling height should be at least 1 inch (2.5 cm) higher than the final system height.

When determining the desired height consider the following:

- At minimum height (uprights fully inserted into the base), the system accommodates users up to 6 feet 4 inches (1.93m) tall.
- If the ceiling is a drop ceiling, can the tiles be removed, the system installed above the suspended ceiling, and the tiles replaced?
- If it is a sheet rock ceiling, can you cut the sheet rock and frame in the area above for more clearance?

### **Type of use**

The type of exercise equipment used under the system affects the required height. For example, if you are using a treadmill whose walking surface is 6 inches (15.2 cm) from the floor, you should add 6 inches (15.2 cm) to the frame height.

**It is recommended the unit be bolted to floor. Use the pre-drilled holes in the base straps. You will need four 3/8" bolts of appropriate type for your floor — concrete, wood, composite, etc. We recommend you contact your building contractor for correct bolts.**

**You MUST bolt PneuWeight systems to the floor using the holes in the base straps.**

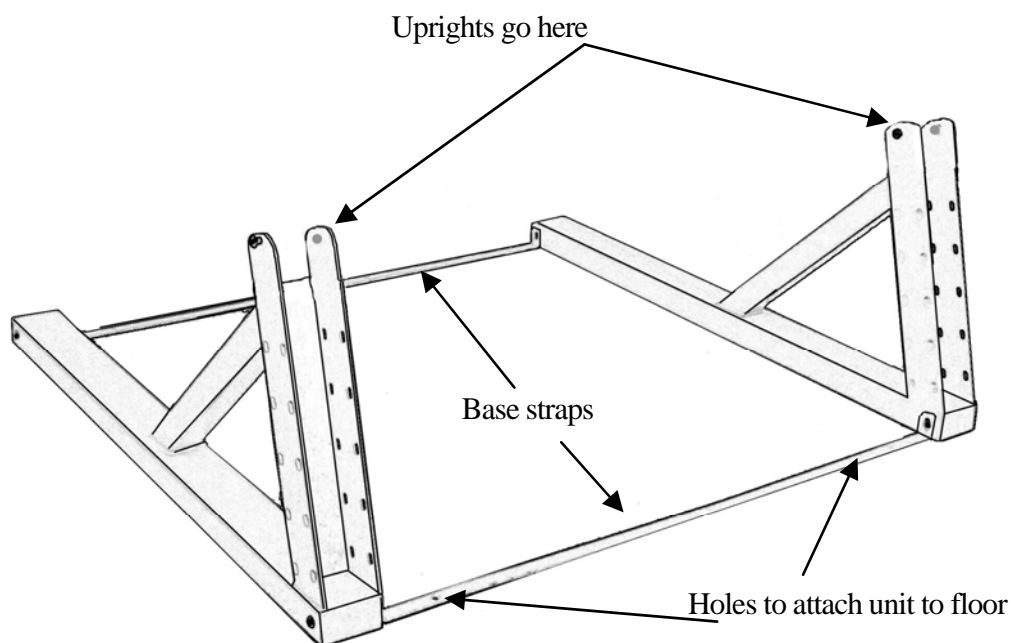
# Assembly

## Tools required

- 7/32 in. x 6 in. "T" handle hex key (provided) for majority of assembly
- 7/32 in. short arm hex key (provided) use on base straps
- Air hose (provided) Single 20' - Double 40'
- "T" air fittings (provided) Single 1 fitting - Double 2 fittings

## Bases

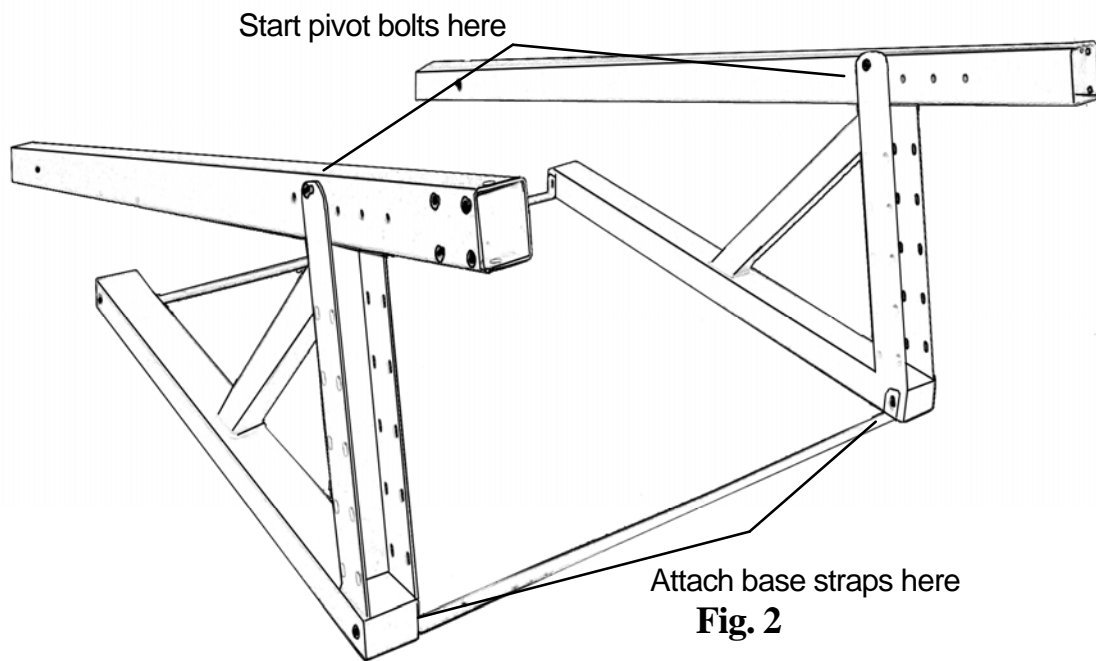
1. Place the bases facing the same direction, with the open face closest to the wall, about 41 in. (1 m) apart (the length of the base straps)
2. Attach the base straps between base as shown in **Fig. 1** using 4 each 3/8 in. x 1/2 in. bolts (provided)



**Fig. 1**

## Uprights

1. Start 2 each 3/8 in. x 1/2 in. pivot bolts into the threaded holes at the top of the base. **See Fig . 2**
2. Rest uprights on base, with the control panel facing down, aligning the pivot bolt with correct height adjustment hole (see page 16, ceiling height section) **See Fig. 2.**
3. Tighten the pivot bolts on bases into pivot holes in uprights



Attach base straps here

**Fig. 2**

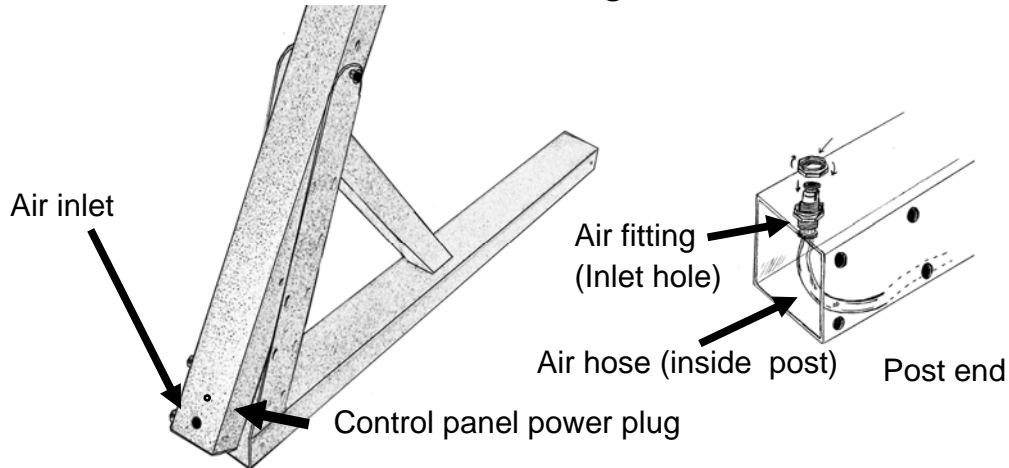
Repeat steps 1-3 for each base and upright

## Routing the Air Hose

The air hose to the compressor is from the bottom of the upright post (call Pneumex for instructions when routing air hose through a hanging ceiling).

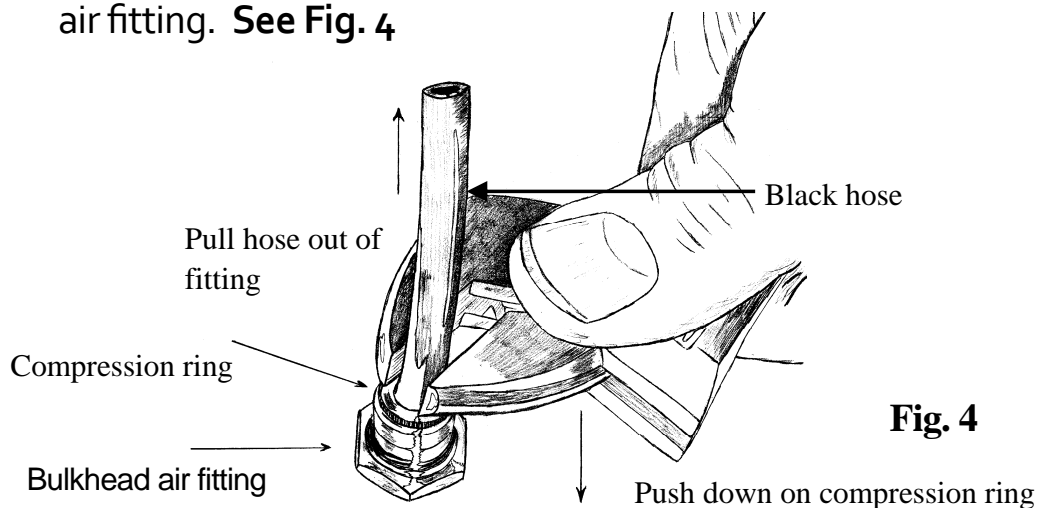
## Remove Black Hose Before Use

1. Remove the plastic wrap from base of upright and pull air fitting out the bottom (should have short black hose attached).
2. Remove one nut from the air fitting, then insert black hose and fitting through air inlet hole in upright top hole. **See Fig. 3**  
Note: Black hose not shown in Fig. 3



**Fig. 3**

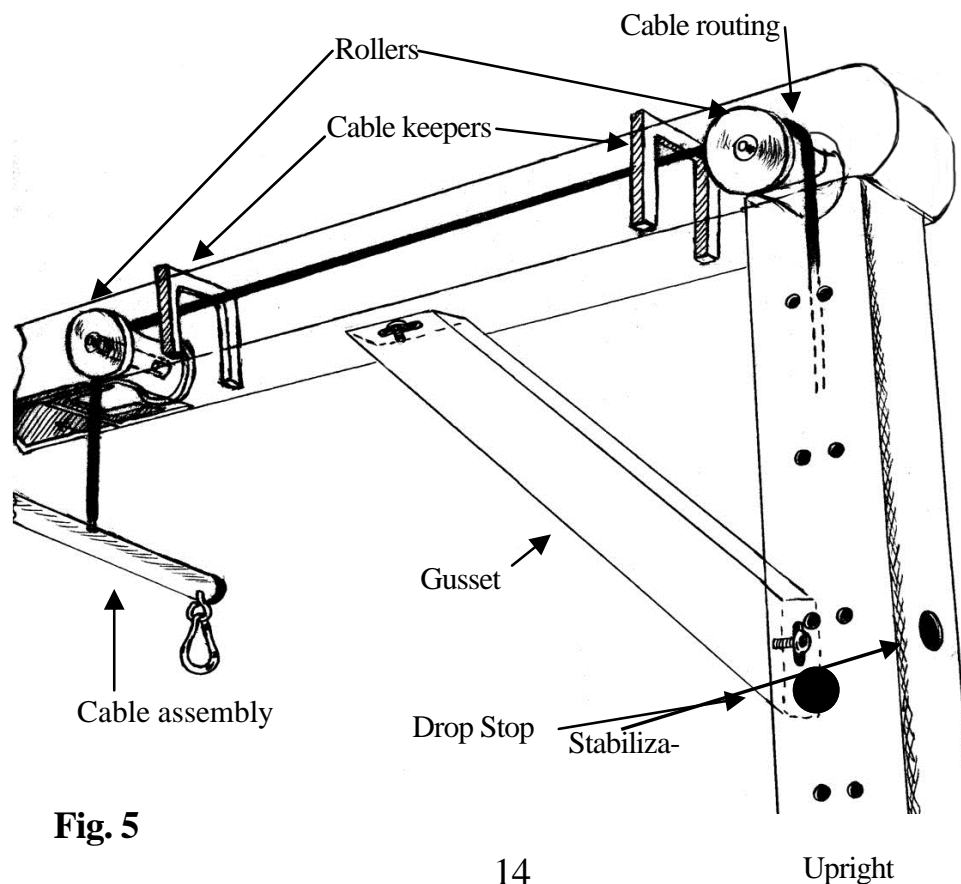
3. Slip nut (removed in step 2) over black hose and while pulling firmly on black hose tighten nut on air fitting.
4. Black hose can now be removed by compressing lock ring on air fitting. **See Fig. 4**



**Fig. 4**

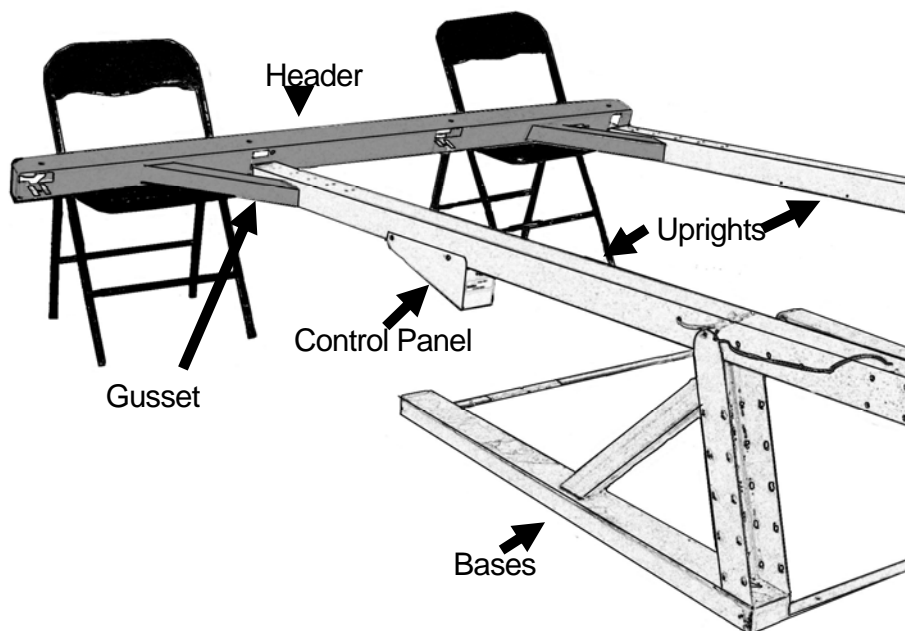
## Headers

1. Unhook and pull the cable assembly out through the top of each upright.
2. Remove the  $\frac{3}{8}$  in. x  $\frac{3}{4}$  in. bolt and washer from the top of each upright.
3. Position the header assembly on two chairs align the uprights.
5. Remove the  $\frac{3}{8}$  x  $\frac{3}{4}$  in. bolts and washers from the gussets on the header.
6. Pass the cable assembly (remove the snap hooks from eye bolts) and cable through the hole in the header beam; through the cable keepers (pull out keepers and replace over cable), over the rollers, and back down through the center hole. **See Fig. 5**



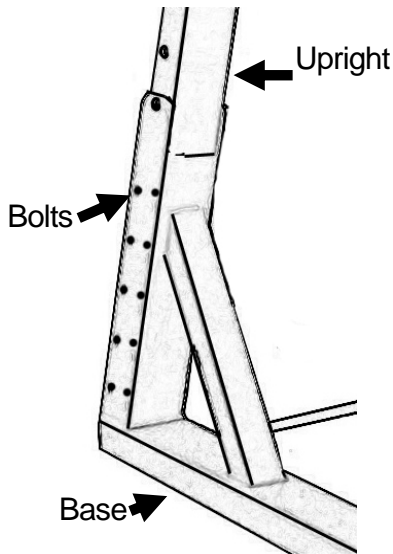
**Fig. 5**

7. Slide the header assembly over the ends of the uprights, lining up the bolt holes in the top and on the gussets.
8. Secure the gussets to the uprights by inserting the 3/8 in. x 3/4 in. button head bolts and washers (use caution not to drop bolt washer inside of upright during this step).
9. Insert the 3/8 in. x 3/4 in. button head bolts and washers in the top of the header beam (stabilization bolt).
10. Tighten all bolts securely. Tighten stabilization bolts first then tighten gusset bolts (this keeps unit from binding).
11. For proper stability, make sure the stabilization bolt is securely installed in the header beam.



**Double systems – pass each additional cable assembly and cable through the corresponding holes in the header beam, through the cable keeper, over the rollers, and back down through the appropriate hole.**

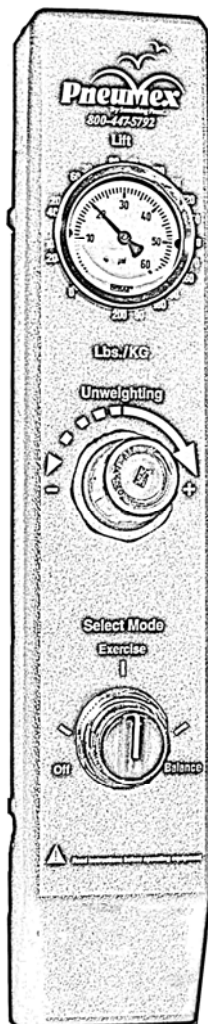
8. Remove bolts 3/8 x 1/2 at bottom of uprights (four each upright)



9. Raise the upright and header assembly to a vertical position (using a second person is recommended for safety.)

10. Insert the four (3/8 x 1/2) bolts in the base (while still holding unit vertical). Repeat for each upright and tighten securely. Unit will now stay upright.

11. Your Unit has an **Analog Control Panel** it is shipped connected and ready to use.



Gauge/Control		Function
Unweighting pressure gauge		Indicates the number of pounds/kilograms the system is Unweighting
Unweighting regulator knob		Gradually increases (+) or decreases (-) the amount of Unweighting lift)
Mode selector switch		Provides choices of Exercise, Balance, or Off (OFF-EX-BAL)



# Attaching the Air Compressor

Read the instructions supplied by the manufacturer of the air compressor before using the compressor.

**Single PneuWeight** – Push one end of air hose supplied with the system into fitting on air compressor, route hose to your PneuWeight (use a route that is out of the way of foot traffic) . You can cut hose to desired length and push hose into air fitting on your PneuWeight. Use “T” fitting supplied with unit to route air from your Single unit to other pneumatic equipment or to a second upright if you have a Double PneuWeight. A Double PneuWeight is supplied with two “T” fittings so if needed you can route air to other equipment.

Turn on the air compressor and open valve. Refer to the compressor manual for operating instructions.

Check for air leaks (hissing) and tighten fittings if necessary. Any loosening caused by shipping is noticeable during initial operation.

**If you find a hole in any point of the air line, you must replace that line. Tape will not hold during operation of the high pressure system.**

# Safety Requirements

- The PneuWeight systems are intended to be used as un-weighting or offloading devices not as a hoist.
- Do not start the PneuWeight System until you are sure the vest is properly secured.
- Do not operate this equipment in the presence of flammable anesthetic mixtures.
- To avoid potential safety problems, use parts and accessories that meet specifications given in this manual.
- The compressor must be on an appropriate electrical circuit. Read the manual supplied by the compressor manufacturer before using the compressor with the PneuWeight System.
- Before each use, inspect the air tubing for damage, pinched areas, and leaks. Inspect the power receptacle for damage. Do not use if the integrity of these items is questionable.
- Check all rollers for any wear or grooves
- If customer is walking 3-5 mph or less unit does not need to bolt to floor; however at 5 mph or more it is recommended the unit be bolted to floor. Use the pre-drilled holes in the base straps. You **MUST** bolt double systems to the floor using the holes in the base straps.

We recommend a weekly inspection of cables. All Cable Assemblies should be replaced at least every six months. Failure to do so may result in failure of cable and injury.

# Instructions

1. Turn on the air compressor. Refer to the compressor manual for compressor operating instructions.
2. **WARNING: Ensure that all personnel and equipment are clear of the unit as sudden system pressurization can cause the cable assembly to retract rapidly.**
3. Fit the vest correctly to the subject as described in the PneuVest manual and connect the vest securely to the unweighting bar.
4. Select desired weight to be unweighted,
5. Select **Exercise or Unweight**. and enter desired weight to be removed
6. For activity with up to 30 inches (76.2 cm) vertical motion, leave the select mode knob on **Exercise**.
7. For activity with less than 6 inches (15.2 cm) vertical motion, set the select mode knob to **Balance**. This will ensure that the user remains upright.
8. As an extra safety step you can use the **Drop Stop which** is a mechanical safety stop that can be used in conjunction with the pneumatic safety. Firmly insert fork into upright post, make sure nut is tightened to prevent fork from vibrating loose during exercise. Have patient bend knees or pull downward on cable assembly to check length of drop. If drop is too long move Drop Stop to next lower level.
9. To lower patient, press the Lower button and hold for 2 seconds.
10. Disconnect the person from the system and remove the vest.

## Exercise Mode

Exercise mode lets the user perform long vertical movements, such as jumping or stair climbing, with consistent Unweighting over the full range of movement. All Unweighting adjustments are done in Exercise mode. Turn the PneuWeight™ Mode selector switch to exercise mode and using the regulator dial in the desired amount of weight to be un-weighted. Note: the usual protocol to determine the amount of weight to be removed is "pain-free" or "pain tolerable". This will usually be around 30% to 50% of body weight.

The exceptions are:

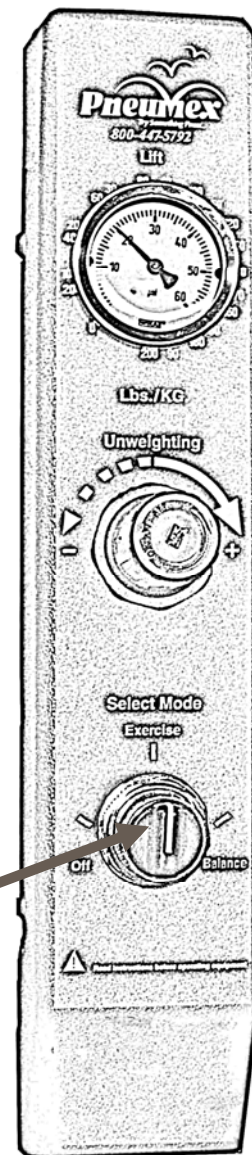
**Post surgical**-in many cases will be percentage weight bearing dictated by M.D.

**Neurological or spinal cord injury (SCI)**- to stabilized or normalized upright state. Quite often this will entail removal of close to 100% of body weight to assist in lift and then adding weight back to patient as desired.

**Sciatica** - quite often require 70% + of body weight off in early stages.

**Exercise Mode**

re-



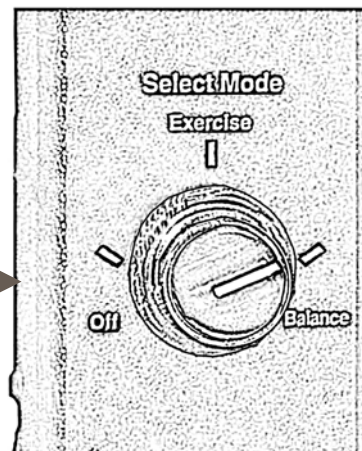
## Balance Mode

Balance mode lets the user perform exercises involving less vertical movement, such as walking, running, or balance activities, without fear of falling. The system supports the entire body weight during loss of balance, allowing a fall of no more than three to six inches. Balance mode frees the assistant to use both hands while assisting the user. The majority of treadmill activities will be done in the balance mode. The exercise mode is used for adjusting the amount of Unweighting when performing activities that require more vertical oscillation than balance mode allows, e.g. retraining sit to stand or step up/step down activity. You may want to show the patient they cannot fall in the system.

To decrease the distance the system will allow a patient to come down:

### **Balance Mode**

More weight can be removed before switching to balance.



**Patient can stand on their tiptoes or a stool before switching to balance**

## OFF

OFF mode releases the air from the system quickly. This mode can be used to re-weight a person quickly if desired.

# PneuVest

A correctly fitted PneuVest vest is the key to successful unweighting. When choosing a vest, select one that corresponds to the user's **waist** size, The vests are color-coded.

***See the PneuVest instruction booklet***

## **Attaching the Vest to the Cable Assembly**

1. Each shoulder strap on the vest has a D-ring that attaches to the cable assembly. Adjust the upright posture of the person being unweighted by moving the D-ring back or forth on the straps. For example, to flex the person, slide the D-ring backward. To extend the person, slide the D-ring forward.
2. Attach the D-rings to the safety snaps on the cable assembly.
3. Use the control panel to unweight.

## **Attaching a wheelchair user to the Cable Assembly**

You may need to use extension chains to connect wheelchair users to the cable assembly.

1. Place the wheelchair under the cable assembly (for treadmills, you may need to use a ramp to place the person under the bar).
2. Pull the cable assembly down and connect the to the extension chains..
3. Attach the D-rings on the vest securely to the clips on the extension.

Unweight the person from the chair and remove the chair. Adjust the extension as needed.

Before unweighting anyone, be sure the waist belt is snug and that the safety snaps (carabineers) are closed completely.

After unweighting, ask the subject if the vest feels uncomfortable. Be sure that the vest is not wedged into the underarms and that it does not restrict breathing. Be sure that the leg straps are not tight enough to restrict circulation in the legs. Readjust the vest as necessary.

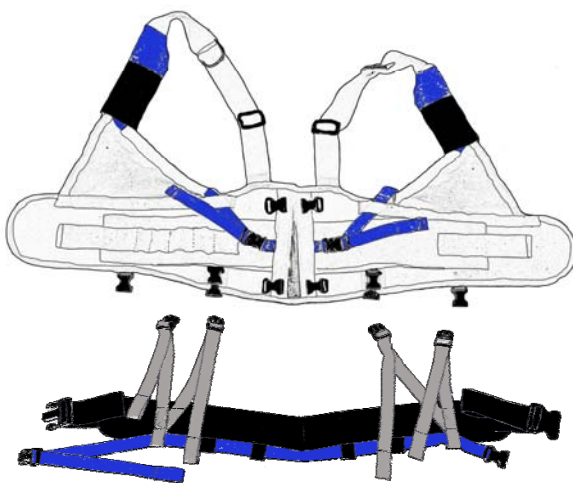
### Correcting Vest Problems

If the vest rides up under the arms, re-weight and pull the vest down. Have the person tighten the abdominal muscles, then re-tighten the waist straps and leg straps. The Jo Straps can help to keep the vest in place. See PneuVest manual for instructions.

If the chest strap is too tight during exercise, loosen it.

If the leg cuffs ride up, re-weight if necessary and replace the cuff centering the front leg strap on the thigh. Some people like the cuff

higher up on the thigh, but for most patients the cuff is more comfortable just above the knee. Pull the strap around cuff snugly. If the leg straps are too tight, or seem to pinch, try changing the position higher or lower on the thigh.



PneuVest Vectors with IT Strap

# Troubleshooting

Problem	Possible Cause	Solution
System will not unweight	System Leak	Check for leaks. Replace as necessary
	Compressor not set to correct psi	Set compressor to 100 psi
	Kinked hose	Check hoses for kinks
System unweights only partway	Subject weighs more than 300 lb. (91 kg)	Increase the compressor setting to 120 psi. The maximum lift is
Installed new control panel, but system still leaks	Fittings are leaking	Reseat or replace the fittings
In Exercise mode, cable assembly will not retract	Air compressor disconnected or leaking	Check connections and air hose
	Compressor not set to correct psi	Check compressor setting
Installed new control panel, but system does not work	Compressor not set to correct psi	Check compressor setting
	Hoses not connected, kinked or connected incorrectly	Check hoses inside control panel. Be sure they are connected securely to the proper fitting



# Replacing the Cable Assembly

Replace the cable assembly if it appears frayed or worn.

1. Remove the control panel.
2. Pull the cotter pin and the clevis pin from the top of the pneumatic cylinder. Cable will fall as soon as you pull the clevis pin.  
***Use caution not to drop any parts into post.***
3. Remove the cable by pulling it out from the top of the upright.
4. Install the new cable down from the top of the upright.
5. Reinstall the clevis pin and the cotter pin.
6. Replace the control panel.

We recommend a weekly inspection of cables. All Cable Assemblies should be replaced at least every six months. Failure to do so may result in failure of cable and injury.

# Specifications

Model	Weight	Shipping Wt.
Single	135 lb (61 kg)	145 lb (66 kg)
Double	170 lb (77 kg)	180 lb (82 kg)

The following specifications apply to all models.

Unweighting capacity	0-300 lb (136.36 kg)
Operating Modes:	
Exercise	0-30 in. (0-76 cm) vertical motion
Balance	Pneumatic stop limited down motion
Floor space (w x d)	
Single and Double	48 in. x 48 in. (121 cm x 121 cm)
Height OD.	Adjustable 7 ft.11 in. to 8 ft. 8 in. (2.4 m to 2.64 m)
Air hose OD./ID.	0.25/0/17
Compressor air fitting	¼ MPT
Compressor power requirements	Refer to compressor manual supplied by compressor manufacturer.

We recommend a weekly inspection of cables. All Cable Assemblies should be replaced at least every six months. Failure to do so may result in failure of cable and injury.

# Maintenance

## Cleaning

Use a soft cloth rinsed in warm water to clean the exterior surfaces.

## Disinfecting

Use procedures established for your facility. The vest can be washed with a mixture of water and disinfectant such as Lysol or equivalent. Do not use bleach on the vest or the color will fade.

## Schedule Service

No scheduled service is required. For service, call Pneumex

## Preventive Maintenance

Routinely check the air hose, air fittings, and compressor for leaks. Check the unweighting bar and cable for loose wires or fraying.

## Air Compressor

Drain the air compressor at least once a week. For compressor maintenance and service information, refer to the manual supplied by the compressor manufacturer.

## Your Warranty

If a product purchased from Pneumex does not operate properly, Pneumex will repair or replace it at no charge, for up to one year from the date shipped. In the course of repair or replacement, Pneumex may send you written recommendations on how to prevent a problem from occurring again. Pneumex reserves the right to withdraw this warranty if recommendations are not followed. The customer is responsible for freight charges both to and from Pneumex in all cases.

This warranty does not apply to compressors which are covered by the compressor manufacturers.

This warranty is exclusive and is in lieu of all other warranties whether written, oral or implied, including the warranty of fitness for any particular purpose. Pneumex liability is in all cases limited to the replacement price of its product. Pneumex shall not be liable for any other damages, whether indirect, consequential, or incidental arising from the sale or use of its products.

Pneumex sales personnel may modify this warranty, but only by signing a specific written description of any modifications.

*Pneumex*



Pneumex Equipment



*treat. restore. thrive.*

PneuThera Treatment Protocols