3/5/2020

Pediatric PowerStep

Pediatric Body Weight Support and Treadmill System

(BWS-TS)

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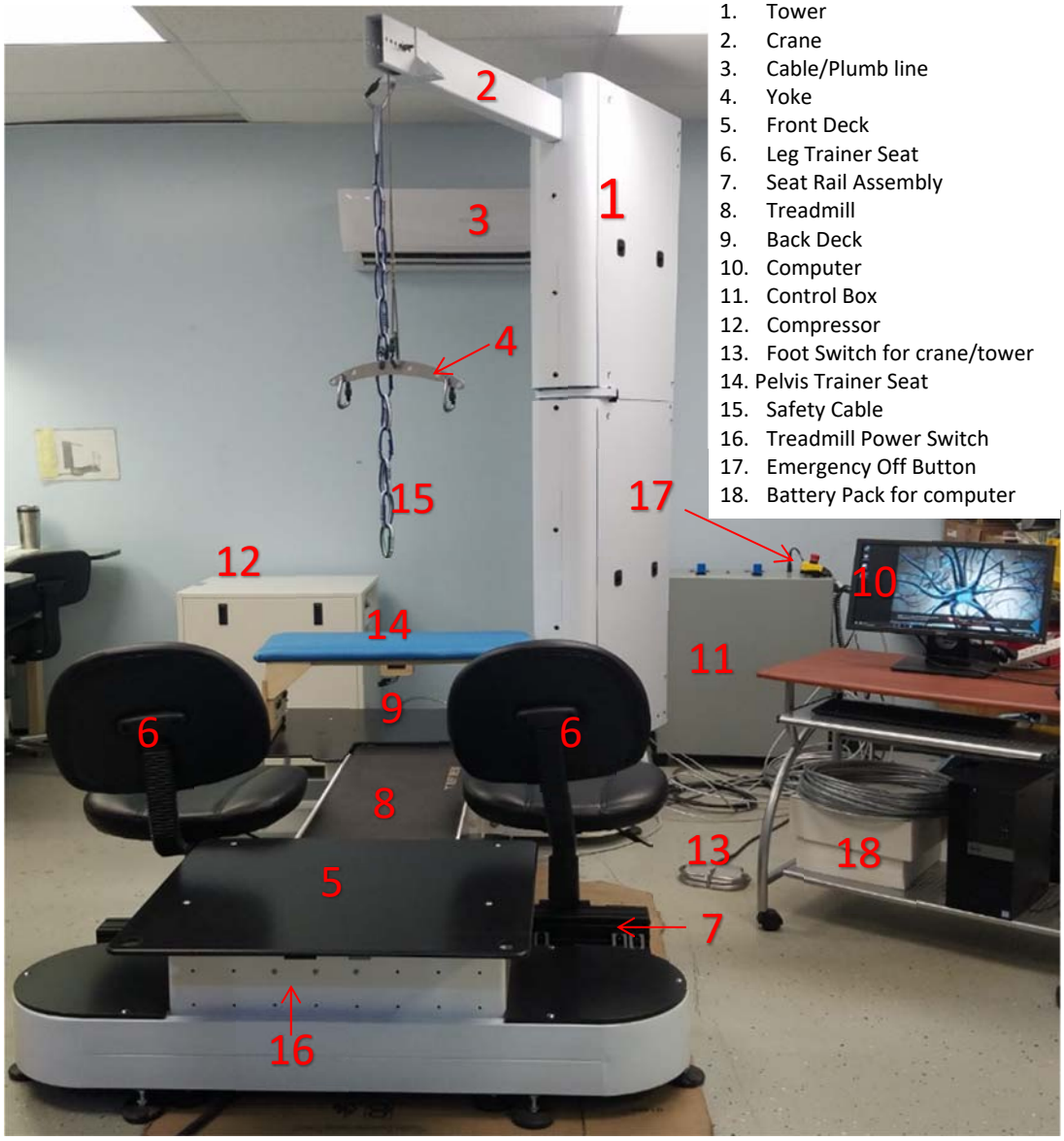
IMPORTANT! Read all instructions carefully before using this product. Retain owner's manual for future reference. For customer service, please contact: operations@powerneurorecovery.com.

Phone number: 502-930-5797.

This unit is for use by specially trained personnel (eg. physical therapists, occupational therapists, activity-based technicians) that are familiar with activity-based locomotor training. For this specific training, you may contact operations@neurorecoverylearning.com. You may also review the learning opportunities related to activity-based locomotor training at: www.neurorecoverylearning.org.

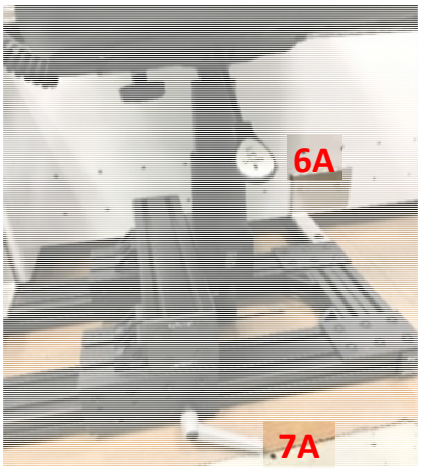
1. Getting to Know the Pediatric Body Weight Support (BWS) and Treadmill System



1. Tower
2. Crane
3. Cable/Plumb line
4. Yoke
5. Front Deck
6. Leg Trainer Seat
7. Seat Rail Assembly
8. Treadmill
9. Back Deck
10. Computer
11. Control Box
12. Compressor
13. Foot Switch for crane/tower
14. Pelvis Trainer Seat
15. Safety Cable
16. Treadmill Power Switch
17. Emergency Off Button
18. Battery Pack for computer

1. Tower - This is the area of the BWS where the main components (pneumatic cylinders, etc) are housed. It has 2 locked panels on each side and will be accessed only by PowerNeuroRecovery personnel or personnel specifically trained by the PowerNeuroRecovery team.
2. Crane - This part of the system allows you to load the clients on/off the treadmill safely. It is controlled by the foot switch control (number 13).
3. Cable - This is also known as the plumb line. This supports the client through body weight support by connecting the yoke to the internal control system.
4. Yoke - This is where the harnessed client is connected to the body weight support system. Carabineers are used to connect the harness to the yoke.

5. Front Deck - This is the platform in front of the client. It can be used for personnel or activities to engage the client while training. It also covers the treadmill motor.
6. Leg Trainer Seat - This is for the activity-based personnel engaging the lower extremities of the client. The Leg trainers' seats move up and down by pulling the lever up on the side of the chair, similar to adjustments of height on an office chair (see 6A in figure below).
7. Seat Rail Assembly - This connects the leg trainer seats to the Treadmill frame and allows the seats to move forward and backwards along the length of the treadmill.
    a. Rotate the handle near the floor (see 7A in figure below) Counter-clockwise to unlock the horizontal position control.
    b. Move the seat to desired position. *Note: this works best when not actively sitting in chair while attempting to move along the track.*
    c. Rotate handle Clockwise to lock position.
    d. If you need to loosen or tighten handle more, but it is hitting floor; grab the handle and pull out, away from treadmill to dis-engage handle from locking screw. Rotate handle. When you release handle back towards the treadmill the handle will re-engage with the screw to allow you to continue to loosen or tighten.



8. Treadmill Belt - This is the area of the system where the client will stand and step.
9. Back Deck - This platform holds the pelvis trainer seat.
10. Computer - This will have the NCC BWS software needed to run the body-weight support treadmill system.
11. Control Box - This consists of pneumatic and electrical components to control BWS-TS. Gauges on the top of the box show current air pressures on the large and small cylinders. Blue knobs allows users to adjust the pressures in the large (regulator A) and small (regulator B) cylinders as instructed by the NCC-BWS software.
12. Compressor - This generates and stores the air with desired pressure in order to use for linear movements of both the large and small cylinders.

13. Foot Pedals - This is the control for the rotation of the crane. The crane will only move a fixed distance to the left and right. There are built in pauses to assist with appropriate center positioning of the client on the treadmill belt, see additional details in Chapters 6 and 8, “Transferring Wheelchair Client onto the BWS System” and “Transferring Client Off the BWS System to a Wheelchair” respectively.

14. Pelvis Trainer Seat – This adjustable bench is placed on the back deck for the pelvis trainer to sit on. Depending on the client and trainer’s height, the trainer may also stand for maintenance of best body mechanics.

15. Safety Cable - The cable ensures that in the event of failure of BWS system, the client is still safely supported. **The safety cable should be attached at the same length as the plumb line above the yoke, during transition on and off the treadmill using the crane it will need to be adjusted for length.**

16. Treadmill Power Switch - This switch is located underneath the front deck of the system. It is used to power on the treadmill prior to starting a session.

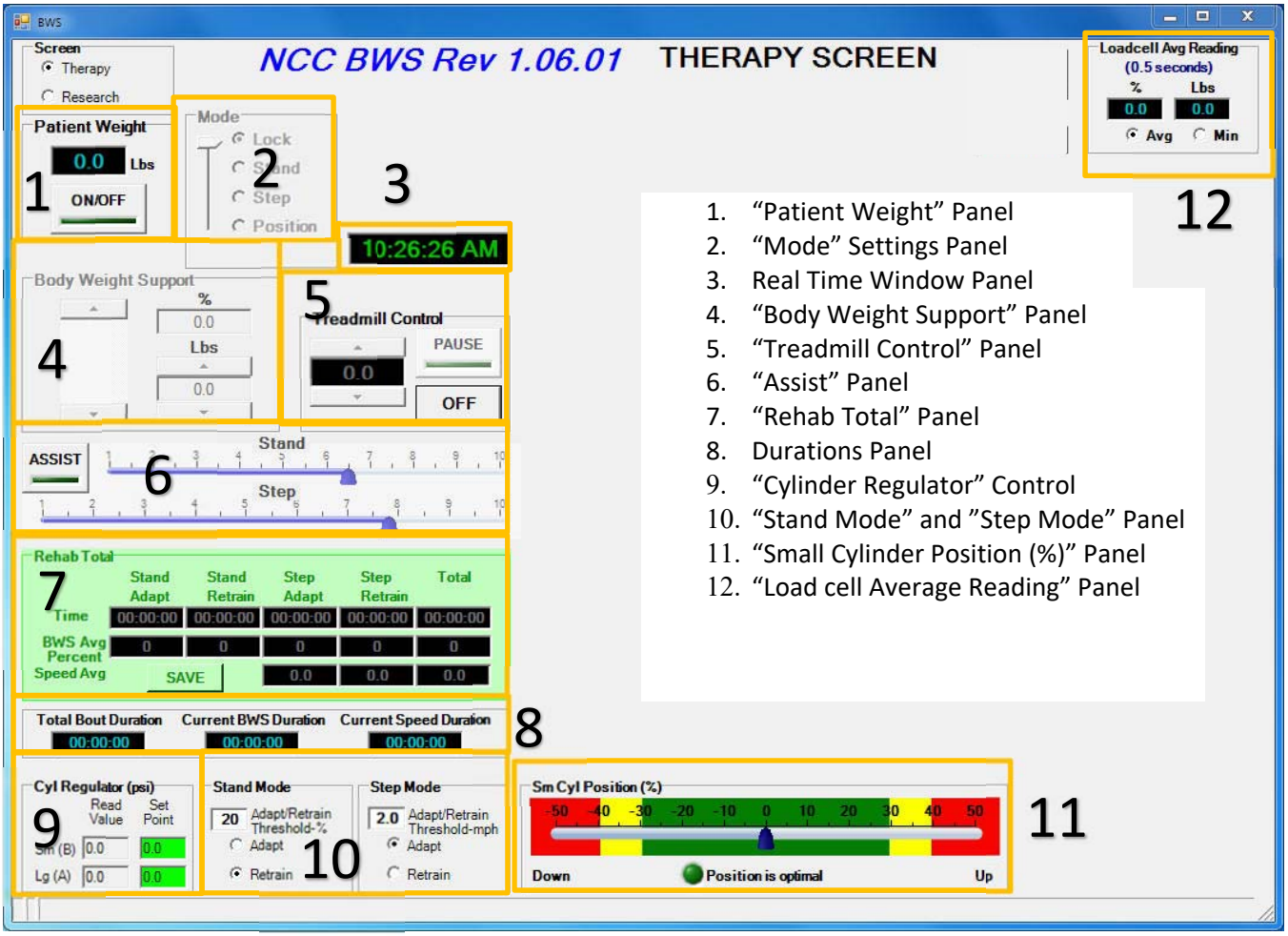
17. Emergency Stop – The emergency stop button is used to STOP ALL movements of the body weight support and treadmill system. If the Emergency Stop button is pressed, please follow the instructions in Chapter 12 for “Emergency Stop”.

18. Battery Pack for Computer – In the event of a loss of power to the system, the treadmill and compressor will turn off. However the battery pack allows the computer and software to remain functional in order to safely transition the client off the treadmill.

2. IMPORTANT SAFETY INFORMATION

- **In case of ANY emergency, press the red emergency stop button (17) Immediately. It will shut down all components of the System.**
- **Do not stand or place other objects in rotational pathway of the tower (1) while operating crane/tower with the foot pedals (13).**
- **Check the rotational pathway of the tower (1) and crane (2) to ensure nothing is in the way of or blocking the Crane-Tower rotation.**
- **When transferring a harnessed client from their chair to the treadmill, always hold onto the harness/client to control movement while rotating the tower.**
- **Keep the yoke cable directly over the client, not at an angle, as the client is lifted and/or transported to and from the treadmill.**
- **Always attach the safety cable to the yoke during the lift and transfer of a client and during all training sessions. Allow 1-2 loops of extra length at attachment to allow body weight support to function and so that the safety effectively supports the client should they stumble or fall.**

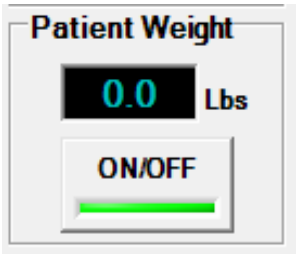
3. Getting to Know the NccBWS Software



1. "Patient Weight" Panel
2. "Mode" Settings Panel
3. Real Time Window Panel
4. "Body Weight Support" Panel
5. "Treadmill Control" Panel
6. "Assist" Panel
7. "Rehab Total" Panel
8. Durations Panel
9. "Cylinder Regulator" Control
10. "Stand Mode" and "Step Mode" Panel
11. "Small Cylinder Position (%)" Panel
12. "Load cell Average Reading" Panel

This section is to familiarize the user with the software, NccBWS. You will learn about each functional panel of the software. This will ensure you are prepared prior to running a session with a client.

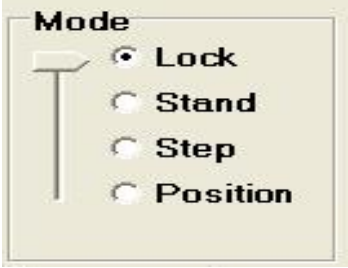
1. Patient Weight Panel



a. The "On/Off" button controls the NccBWS software program as well as BWS-TS.
   - When system is in the OFF position, all features of the NccBWS software are deactivated and the large and small cylinders are locked in place and all air is bled from the tower system.
   - When system is in the ON position, features of the NccBWS software are activated, air is allowed to flow into the large and small cylinders, but remain locked until taken out of the "Lock" mode.

b. Follow instructions in Chapter 4 or 5 for "Creating/Loading a New Client Configuration" and "Loading a Returning Client Configuration" respectively. The client's weight is displayed in pounds.

2. Mode Settings Panel



a. "Lock" mode means the treadmill system is locked into place.
   - The cable inside of the treadmill will not move when this is in place.
   - The software will not calculate time passing for overall, stand or step modes.
   - The Emergency Stop Button will stop the treadmill controls **immediately** and puts the BWSTS in "Lock" mode while maintaining the set BWS. See Chapter 12, "Emergency Stop", for instructions on how to proceed after the Emergency Stop is engaged.

b. "Stand" mode enables you to adjust the client's partial body support while in standing.
   - This indicates that the system is ready to increase the BWS to allow the child to stand with the best alignment.
   - This mode is optimal for transitioning the client on/off the treadmill, attaching the yoke, adjusting the harness and the yoke, trainer rotation and standing therapeutic activities.

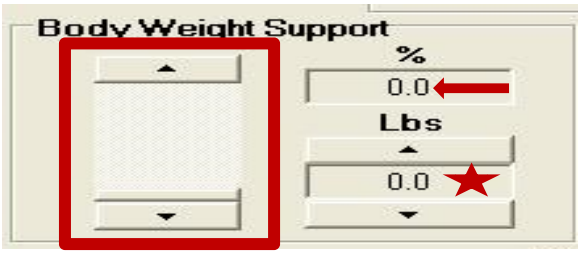
c. "Step" mode enables the treadmill speed control.
   - When selecting step, the small cylinder position (%) will automatically reposition before registering step.
   - Body weight support and treadmill speed will be available to be adjusted while in this mode.

d. "Position" mode re-centers the small cylinder so clients have room for the natural up and down movement during stepping.
   - While in step mode, a trainer may select this mode to 'recalibrate' the software to the client's position. See Chapter 3.11, "Small Cylinder Position (%) Panel", for additional details.

3. Real Time Window Panel

a. This panel displays the real time of the training session.

4. Body Weight Support Panel



This panel allows the trainer to adjust the BWS to assist the client in maintaining appropriate kinematics and alignment during the session.

a. Adjust the body weight support by using the up and down arrows in the large column on the left (indicated by bold box).

b. Dragging the bar up or down will stress the BWS. Dragging the bar is not recommended.

c. The percent (%) reading (red arrow in figure above), indicates the percentage of body weight selected on the slider bar. The percentage will adjust accordingly as the BWS is adjusted.
d. The pounds (lbs) reading (red star in the figure above) indicates the poundage of support the system is providing the client based on percent body weight support selected and the weight input on the Patient Weight panel. The amount of support can be adjusted with the arrows above and below the pounds reading.

5. Treadmill Control Panel

This allows the trainer to adjust the treadmill speed during step mode.

a. Treadmill controls are only available when in "Step" mode.
b. Speed shown in black box is reported in miles per hour (mph).
c. Increase/decrease the treadmill speed with the up and down arrows.
d. "Pause" button allows the treadmill to decelerate to a stop when activated/pushed, indicator at bottom of button turns bright green. When "Pause" button pushed again/deactivated, it will gradually accelerate to the same speed as when "Pause" button was initially activated. This button is not used to transition between standing and stepping bouts.
e. "Off" button will decelerate the treadmill to a stop and reset the speed value to 0.0 mph. This button should be used when transitioning between standing and stepping bouts during a client's session on the treadmill.

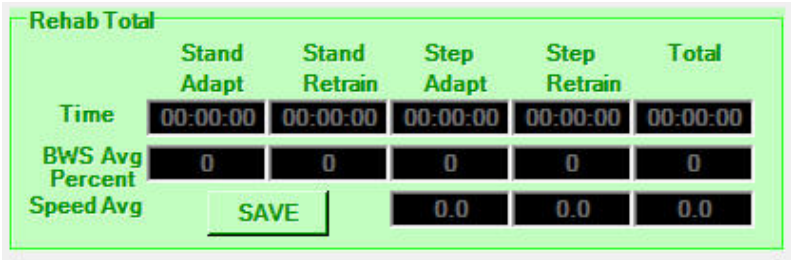
6. Assist Panel

The Assist button allows the assist function to turn on/off (paired with stand assist)

a. Stand Assist - Increasing Stand Assist value on the slide level controller will decrease the margin of movement while in "Stand" mode.
b. Step Assist - Increasing Step Assist value on the slide level controller will decrease the margin of stabilization while in "Step" mode.
c. At the lowest assistance level (1), the system will only provide the amount of body weight support specified in the Body Weight Support panel (X%) and expects the client to provide the remaining support (Y% = 100 – X%). If the client cannot provide the Y% support, the system will allow the client to drop until they are caught by the safety cable, the limits of the large or small cylinder, or a trainer physically stops/catches them.
d. At the highest level of assistance (10), the system will provide as much support as needed so the client does not drop in the event the client is unable to provide the amount of support the system expects them to provide (Y%).

7. Rehab Total Panel

This panel generates the rehab totals from your treatment session.



a. Time - populates when parameters are within the designated treatment session categories (i.e. stand adapt, stand retrain, step adapt, step retrain and total) in hh:mm:ss format.
b. BWS Average Percent - averages the body weight support across the session in each of the session categories.
c. Speed Average - Averages the treadmill speed across the session in each of the session categories.
d. Stand Adapt and Stand Retraining - time will calculate while treadmill is in “Stand” mode. The threshold between the two can be adjusted in the “Step” mode panel. (Chapter 3.10, “Stand and Step Mode Panel”).
e. Step Adapt and Step Retraining - time will calculate while in step mode. The threshold between the two can be adjusted in the “Step” mode panel (Chapter 3.10, “Stand and Step Mode Panel”).
f. Total - This is a total of all four fields.
g. Save - This allows for saving of the fields above. They can be accessed by clicking the “Rehab Total” folder shortcut on the computer desktop.

8. Duration Panel

a. The Total Bout Duration - Shows time spent in the current stand or step mode. Time will reset when a different mode is selected.
b. Current BWS Duration - Shows time spent at the current BWS. Time will reset when the level of BWS is changed.
c. Current Speed Duration - Shows time spent at current treadmill speed. Time will reset when the speed is changed.

9. Cylinder Regulator (psi) Panel

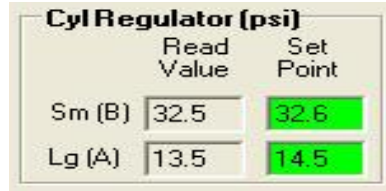


Fig 9A

Fig 9B

a. This panel allows for the BWS system to be set to the optimal pressure for each individual client during a training session on the computer (Fig 9A.). The computer will notify the user at the beginning of loading a client for adjusting to the individuals settings.
b. Small (B) Cylinder and Large (A) Cylinder "Read" Valves are actual air pressure (in psi). [Fig 9A.]
c. Small (B) Cylinder and Large (A) Cylinder "Set Point" Values are the optimal air pressure valve settings (in psi) for the body weight support of a specific client.
d. These values are reached by turning the blue pressure regulator knobs on top of the Control Box prior to starting the training session. (Fig 9B.)
Note: it is better to adjust the knobs to the desired setting by INCREASING the pressure (turning knobs clockwise) rather than decreasing the pressure (turning knob counter-clockwise).
e. The "Set Point" values and the "Read Value" should be similar to each other. The trainer will be notified as the Set Point box will turn green.
f. The "Set point" windows should stay green during an optimal training session. However, both values could fluctuate between green and yellow.
g. The yellow color indicates a caution that the regulators are no longer in optimal support, but the BWS will still work. The speed is not affected by the regulator colors.
h. If the color fluctuates to red, the system will stop working.

10. Stand and Step Mode Panel

a. The adapt/retrain threshold % for "Stand" mode can be adjusted based on the client's ability to maintain their kinematics.
b. "Step Mode Panel" – Adjusts threshold for adapt and retrain based on the age of the child. Note this also may be adjusted based on the maintenance of appropriate kinematics of the client. Recommended step retraining thresholds are outlined below:
    - Ages 1-2 should have a minimum threshold of 1.0 mph
    - Ages 3-5 should have a minimum threshold of 1.5 mph
    - Ages 6-12 should have a minimum threshold of 2.0 mph

Note: the value in the window reflects the % Body Weight Support or Treadmill Speed parameter for the selection below it (either Adapt or Retrain)

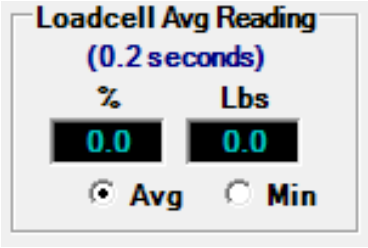
11. Small Cylinder Position (%) Panel

a. In "Stand" mode the small cylinder is locked and does not change.
b. In "Step" mode, the small cylinder position reading fluctuates based on the movement of the cable and the yoke.
c. The optimal range for the small cylinder is within the green (±30) region.
d. The yellow color indicates less then optimal position of the small cylinder (±30 to ±40).
e. If the small cylinder goes into the red range (±40 to ±50) the system will give an error message at the top of the screen that the small cylinder is at the end of the range and provides sub-optimal conditions for stepping.
f. If the small cylinder position is fluctuating between yellow/red, the trainers may reposition the system by clicking "position" mode. This must be done while one of the client's legs is in stance phase of the step cycle in order for the body support system to accurately calculate.

   Remember: Because this process may move the yoke through the plumb line cable to adjust to the new optimal position, it is important to notify the team prior to repositioning.

12. Load Cell Average Reading Panel

This panel shows the actual weight (in pounds) sensed by the load cell. The percent is calculated from the load cell reading and the weight input in the Patient Weight panel.

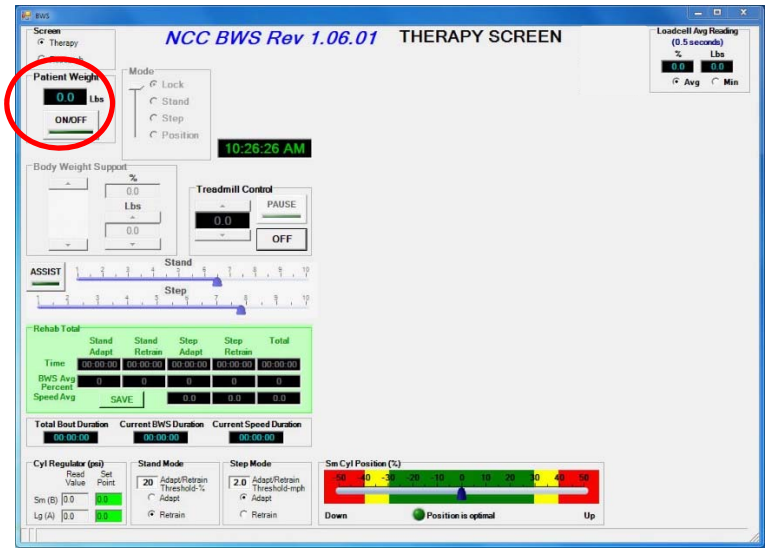


4. Creating/Loading a New Client Configuration

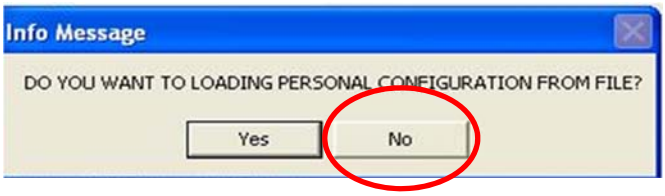
Use this step if you are loading a client into the NccBWS software for the FIRST time. Prior to doing this, you will need to know the client's weight (in pounds) and the weight of the yoke and harness (in pounds).

1. Turn on the computer and open the "NccBWS" Software.

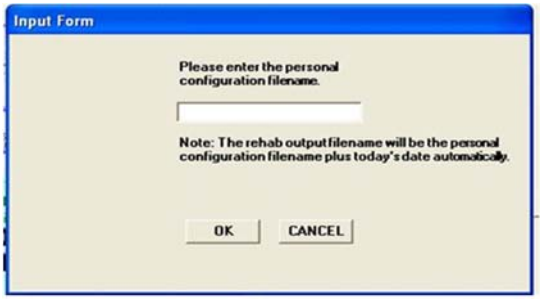
2. Click "on/off" button to turn on the BWS.



3. Click the "No" button when the software asks you if you want to load a personal configuration from a file.



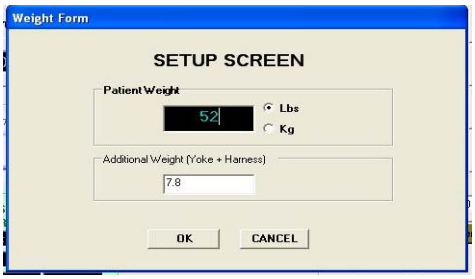
4. Create the client's personal "ID". Any consistent method for the creation of the ID will be appropriate. However, we recommend not using any identifying information such as name, etc.



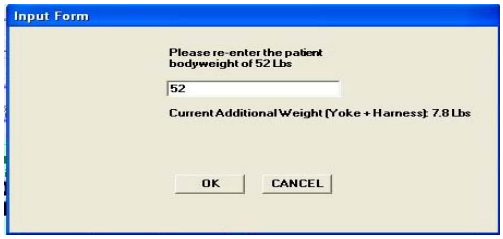
5. Enter the client's weight to the tenths place in the first box (shaded black). Then add the weight of the harness and the yoke combined in the second box (shaded white). [Please note: Yoke plus harness weight

may be different than displayed in picture below. Amount can be updated by clicking in the box and typing new value.]

- Small yoke weight with 4 carabineers = 0.71 pounds
- Large yoke weight with 4 carabineers = 0.94 pounds
- Weigh the client's harness only and add to the appropriate yoke amount above for the total for the white box in this screen.



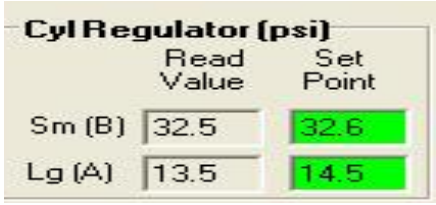
6. Re-enter the client's weight, on the next pop up screen. In this screen, you will see the statement "Current additional Weight" where the yoke and harness weight is accounted for.



7. Next, the pressure settings screen will pop up. Note, the pressure is given in BAR.

8. On the control box, turn the knobs clockwise to increase the pressure and adjust Regulator A and B to their designated settings as indicated by the pop-up box on the computer. Note, be sure to use the numbers for BAR pressure (blue numbers in picture below).
Hint: always arrive at designated pressure while INCREASING pressure (turning knob clockwise). If the pressure is too high when system is turned on, decrease pressure to a value below the designated pressure and then increase back to the designated pressure.

9. Once you move the regulators to their appropriate values, check the Cylinder Regulator values on the computer to ensure if they match up with the values on the pressure gauges (in psi), and that the Set Point values are green.

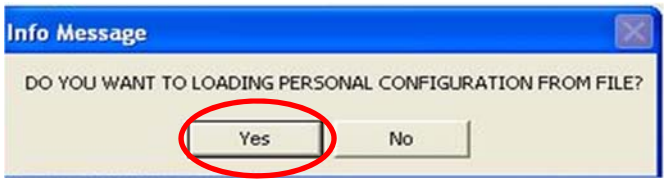


5. Loading a Returning Client Configuration

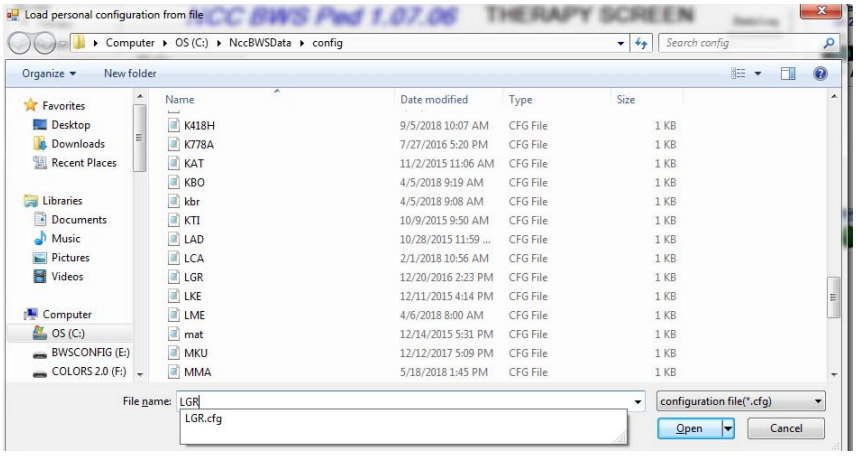
1. After the first time you add a client into the NCC BWS software, you will use the following steps to load their configuration. Please note, the client's weight should be updated monthly to account for growth.

2. Click the on/off button.

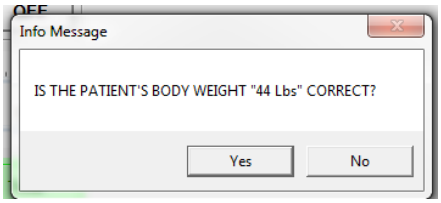
3. A pop-up window will state "System is pressurizing. Wait 2 minutes." Click OK.
4. "Click "Yes" when prompted to load a configuration.



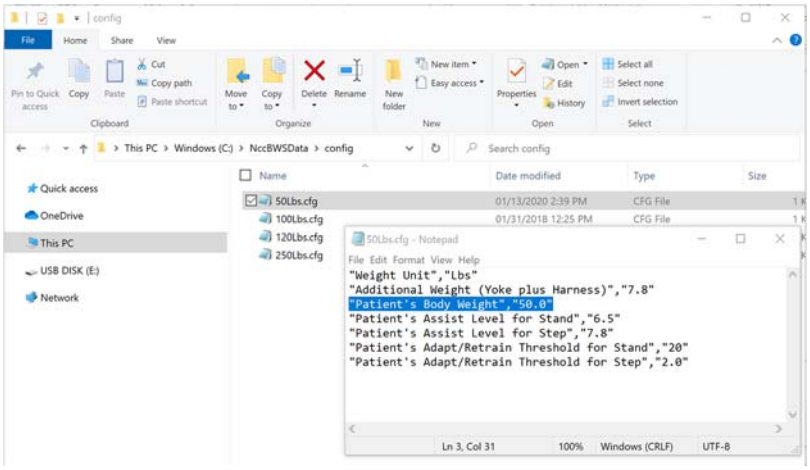
5. Then choose the specific file you are looking for with the client's ID.



6. A box will pop up to verify the body weight. {The client's body weight is verified during therapeutic evaluations that occur ~every month. Please update accordingly.}
   a. Click "Yes" if the body weight is confirmed.



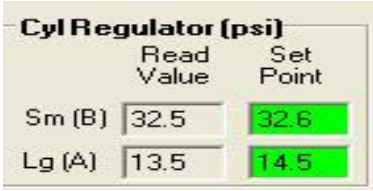
   b. If the client's weight has changed, click "No". Then the window with the list of all client's ID will pop up. Right click on the client's name, then select "Edit". Change the "Patient's body weight" pounds to accurately reflect their current weight. Save and exit.



7. Then the pressure settings screen will pop up.

8. Then physically adjust Regulator A and B to their appropriate settings as indicated by the pop-up box on the computer. *Hint: always arrive at designated pressure while INCREASING pressure (turning knob clockwise). If the pressure is too high when system is turned on, decrease pressure to a value below the designated pressure and then increase back to the designated pressure.*

9. Once you move the pressure gauges to their appropriate values, check the Cylinder Regulator (the values on the computer) to see if they match up with the values on the pressure gauges (in psi), and see if the values are green.



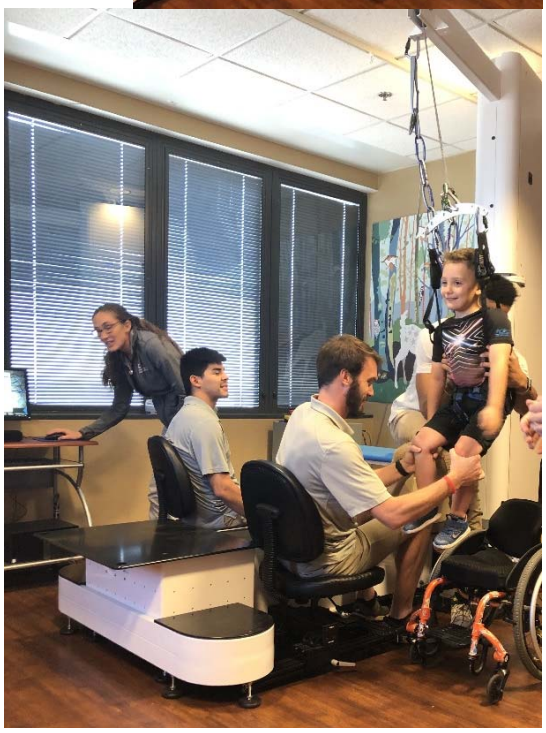
10. Now, the client's appropriate file is loaded and the system will be in "Lock" mode.
The system is now ready to start a training session.

6. Transferring Wheelchair Client onto the BWS System

The Treadmill system is equipped with a crane that will assist the trainers to lift the child onto the body weight support treadmill system. The client must already be harnessed to use this feature of the BWS system.

Trainer Roles during transfer:
Left leg trainer: assist client from the Front
Pelvis or Right leg trainer: assist client from Behind
Computer 'trainer': control the NccBWS software and Foot Pedal controls for the crane/tower rotation.

1. The client should be seated in their wheelchair and positioned next to the Left leg trainer seat while facing towards the front of the treadmill and their back to the tower of the unit. Please remember to position the wheelchair within the distance that the crane can move.
2. Lock the wheelchair by engaging the wheel locks or turning off controller on powered chairs.
3. Rotate the crane counter-clockwise until the yoke is positioned directly over the client's head
4. On the computer, switch from "Lock" mode into "Stand" mode.
5. The trainers should manually pull the yoke towards the client until the yoke is ~1-2" above the clients head. If the center of the yoke is not directly over the clients head, rotate the crane clockwise or counter-clockwise as needed until centered. Note: The cable should NOT be angled when attached to the client to prevent swinging when lifting the client.
6. Attach the harness using the included carabineers. Make sure the yoke doesn't come into contact with the client's head while attaching.
7. Attach the safety cable to the yoke.
8. Position a minimum of two trainers (one at the legs and one at the pelvis/trunk) to aid with the lift and movement of the client. Use more trainers as needed to ensure safe movements.
9. Increase the body weight support by clicking the arrows until the client is clear of the wheelchair. The percentage of body weight support will be high and can possibly be over 100% to actually lift client out of chair.
10. Rotate the crane in a clockwise direction to position client over the center of the treadmill.
    a. While continuing to press down on rotation pedal, the rotation will pause several times near the center of the treadmill. **The 2nd pause will center the crane over the center of the treadmill**. Adjust the crane position so the client is centered on the treadmill.



b. The trainer positioned behind the client will guide the pelvis once the client is in the appropriate position. The trainer positioned in the front of the client will guide both legs into extension and support the legs while the remaining trainer moves safely into position into a leg trainer seat next to the treadmill belt. Once the first leg trainer is seated and safely supporting the client, the other leg trainer can release their hold of the legs and move to the open leg trainer seat next to the treadmill belt.

11. Adjust the length of the safety cable. Pull the safety cable tight to the safety cable carabineer on the yoke, then give 2 loops of slack before attaching cable to the carabineer. Make sure the extra length of safety cable is not touching the client; can use carabineers to move out of the way.
12. Once the leg and pelvis trainers are in position, the computer trainer will lower the client to the appropriate BWS (as indicated by their Stand Adaptability score on the Pediatric NeuroRecovery Scale). If this is the client's first time on the treadmill (i.e. - this is their initial evaluation), then the therapist is ready to do the treadmill assessment.

7. Transferring Ambulatory Client onto the BWS System

If a client can ambulate, there are steps and platforms at the front of the treadmill. It is easier if the client is already harnessed when using this feature of the BWS system.

1. A therapist and/or trainer should assist the client as they go up the stairs at the front of the treadmill system and maintain contact with the client throughout the process of connecting the harness to the overhead yoke and safety cable. Two leg trainers and pelvic/trunk trainer should be seated and in place throughout the process.
2. The client should transition from the front deck of the treadmill system onto the treadmill belt and stop while standing directly underneath the crane and yoke.
3. On the computer, switch from "Lock" mode into "Stand" mode.
4. The trainers should manually pull the yoke towards the client until the yoke is ~1-2" above the clients head. If the center of the yoke is not directly over the clients head, rotate the crane clockwise or counter-clockwise as needed until centered.
5. Attach the harness using the included carabineers. Make sure the yoke doesn't come into contact with the client's head while attaching.
6. Attach the safety cable to the yoke. Pull the safety cable tight to the safety cable carabineer on the yoke, then give 2 loops of slack before attaching cable to the carabineer. Make sure the extra length of safety cable is not touching the client; can use carabineers to move out of the way.
7. If needed, the therapist and trainer(s) should assist the client in turning 180 degrees on treadmill to ensure their back is towards the crane.
8. Once the leg and pelvis trainers and client are in position, the computer trainer can adjust the level of body weight support to the appropriate BWS (as indicated by their Stand Adaptability score on the Pediatric NeuroRecovery Scale). If this is the client's first time on the treadmill (i.e. - this is their initial evaluation), then the therapist is ready to do the treadmill assessment.

8. Transferring Client Off the BWS System to a Wheelchair

1. On the computer, switch into “Stand” mode.
2. Position the wheelchair:
   a. Near the Left leg trainer seat,
   b. In a locked/off position,
   c. Back of the chair toward the tower
3. Adjust the length of the safety cable to a longer length (enough to reach the client’s wheelchair).
4. If able, the client should squat. Otherwise the Left leg trainer will hold their legs into a seated-like position (squat) over the treadmill belt.
5. The right leg trainer will come around to the side of the treadmill with the wheelchair and assist from a standing position with the client’s trunk.
6. Increase the level of body weight support using the arrows until the client is clear of treadmill belt while still in squatting position.
7. Rotate the crane in a counter-clockwise direction until client is over the wheelchair.
8. The pelvis trainer should remain on pelvis and hand off the client to the trunk support trainer as the rotation is in process.
9. Slowly lower the level of body weight support while the client is guided into their wheelchair.
10. Once the client is safely in their wheelchair with BWS at 0%, detach harness from yoke and guide the yoke upwards out of contact with the client or trainers’ heads. Before the yoke is at the highest position, switch to “Lock” mode.

9. Transferring Ambulatory Client Off the BWS System

1. On the computer, switch into “Stand” mode.
2. Slowly lower the level of body weight support to 0%.
3. Detach harness from yoke and guide the yoke upwards out of contact with the clients’ heads.
4. A therapist and/or trainer should assist the client as they transition from the treadmill belt to the front deck and then down the steps at the front of the unit.

10. Running a Treatment Session with a Client

Prior to Treatment Session

1. Before the client arrives, turn on the BWS treadmill system equipment components:
   a. Treadmill system is plugged in and the treadmill switch is on. (see page 4)
   b. Compressor is turned on.
   c. The computer is on and "NccBWS" software loaded.
   Note: Treadmill must be turned on and allowed to boot up for 2 minutes prior to opening the "NccBWS" software. If not, the treadmill will not respond to commands from the computer.
2. Follow the instructions in Chapter 4 or 5 for "Creating/Loading a New Client Configuration" and "Loading a Returning Client Configuration" respectively.
3. When the client arrives, place client in an appropriate sized harness.
4. Follow the instructions in Chapter 6 or 7 for "Transferring Wheelchair Client to the BWS System" and "Transferring an Ambulatory Client to the BWS System" respectively.

Conducting the Treatment Session

During the treatment session, use the "Mode" panel to transition between "Stand", "Step" and "Position" as appropriate.

1. Before starting a stepping bout, adjust the BWS (using the arrows) as assessed during Step Retraining.
2. Switch mode to "Step" mode.
3. Adjust the speed (using the arrows) as assessed during evaluation of Step Retraining.
4. Use the "Off" button under the "Treadmill Control" Panel to stop the treadmill at the end of stepping bout or if stopping is indicated during the stepping bout.
5. Once the treadmill belt has stopped moving and the client is in stance with equal weight bearing, change the mode to "Stand".
6. If the software indicates a need for repositioning (the blue arrow points to the red area of the scale, or the computer screen prompts the user to reposition with red text), the computer user should select the "Position" mode during stepping while the client is in stance phase for either leg, notify the step team before repositioning as a slight readjustment of the plumb cable may be noted.

Finishing a Treatment Session

1. Follow the instructions in Chapter 8 or 9 for “Transferring Client Off the BWS System to a Wheelchair” and “Transferring Ambulatory Client Off the BWS System” respectively.
2. Ensure the system is ready to be turned off.
   a. The level of BWS should be set to 0%
   b. System should be in “Lock” mode.
3. If desired, save the session data by clicking on the “Save” button located in the “Rehab Total” panel.
4. Turn the system off by clicking the “On/Off” button in the “Patient Weight” panel. Note: a popup message will ask if you would like to save the session data (even if you have already saved the data in the previous step).

5. Turn off the computer system, treadmill and compressor. *Note: if there are multiple sessions throughout the day, can leave compressor, treadmill and computer turned on until the end of the day. It is recommended that the compressor is turned off when not in use for 2 hours or more.*

11. Yoke Replacement

The system comes with a small and large yoke to be used depending on the size of the child. The carabineers connecting the harness to the yoke should be directly over the shoulder attachments on the harness. If the harness straps are between two holes, make sure straps are angled slightly laterally, never medially. If the straps are angled medially, move the carabineers to the next holes closer to the center of the yoke. If there is no other hole, you will need to change the yoke to the smaller size.

1. Open the NccBWS software from the shortcut on the desktop of the computer.
2. Turn the system on by pressing the “On/Off” button in the “Patient Weight” panel.
3. Load any existing configuration file.
4. Switch to “Stand” mode.
5. Pull the yoke down to a convenient position to work with and switch back to “Lock” mode.
6. Remove yoke from the BWS cable carabineer and place new yoke on the carabineer.
7. Transfer remaining carabineers (safety cable, harness) from yoke just removed to the new yoke on the system.

12. Emergency Stop

In the case of ANY emergency, press the red emergency stop button!

Engaging the emergency stop button will stop the treadmill belt and the software will automatically move to "Lock" mode.

Remove Participant from BWS System

Follow these instructions to transition participant off the BWS system.

1. Lift up on the red portion of the emergency stop button. Some buttons may need to be rotated while pulling up. Others just need a little extra upward force.
2. On the computer, there will be a warning window that popped up about setting BWS level to 0 before exiting program. Press "OK". The program will still be running and set to the "Lock" mode with your previous setting for level of BWS
3. You can now put the system into "Stand" or "Step" mode. *If "Step" mode is selected, the treadmill will not respond to speed settings until you follow instructions under 'Resume Step Training'.*
4. Follow normal procedure for transitioning participant off the BWS system (see Chapter 8 or 9, "Transferring Client Off the BWS System to a Wheelchair" and "Transferring Ambulatory Client Off the BWS System" respectively).

*NOTE – If you have followed the instructions to 'Remove Participant From BWS System', the treadmill will not work until you also follow instructions #1-7 under 'Resume Step Training' below.

Resume Step Training

After resolving the situation that caused the emergency stop button to be engaged, follow these instructions to resume training. Follow the order exactly, if some items are performed out of order, the treadmill will not run and you will need to start from the beginning of the instructions again.

1. Lift up on the red portion of the emergency stop button. Some buttons may need to be rotated while pulling up. Others just need a little extra upward force.
2. Turn treadmill power off by flipping the switch under the front deck down to the "Off" position.
3. Wait 2 minutes for the internal treadmill computer to power down completely.

4. While waiting, turn NccBWS program 'Off' by pressing the "On/Off" button in the "Patient Weight" panel. You will be prompted to save your rehab data. Follow your normal routine if you typically save this data or write down any of the session data.
    a. Close the window for the NccBWS program by pressing the red 'X' in the upper right hand corner of the window.
    b. Do not re-start the program at this point!
5. Turn treadmill power on by flipping the switch under the front deck up to the "On" position.
6. Wait 2 minutes for the internal treadmill computer to fully re-boot.
7. After the 2 minutes, re-open the NccBWS software from the shortcut on the desktop of the computer. **This will re-establish communication with the treadmill.**
8. In the NccBWS software, press the "On/Off" button in the "Patient Weight" panel and re-load the client's configuration file.
9. While still in "Lock" mode, set the level of BWS support to the same percentage when the emergency stop was engaged. *Note: switching to "Stand" mode while client is attached and BWS is set to 0% will cause the weight of client to pull the yoke down until safety cable catches the client.*
10. Resume the treatment session.

Appendix I: Treadmill Parts

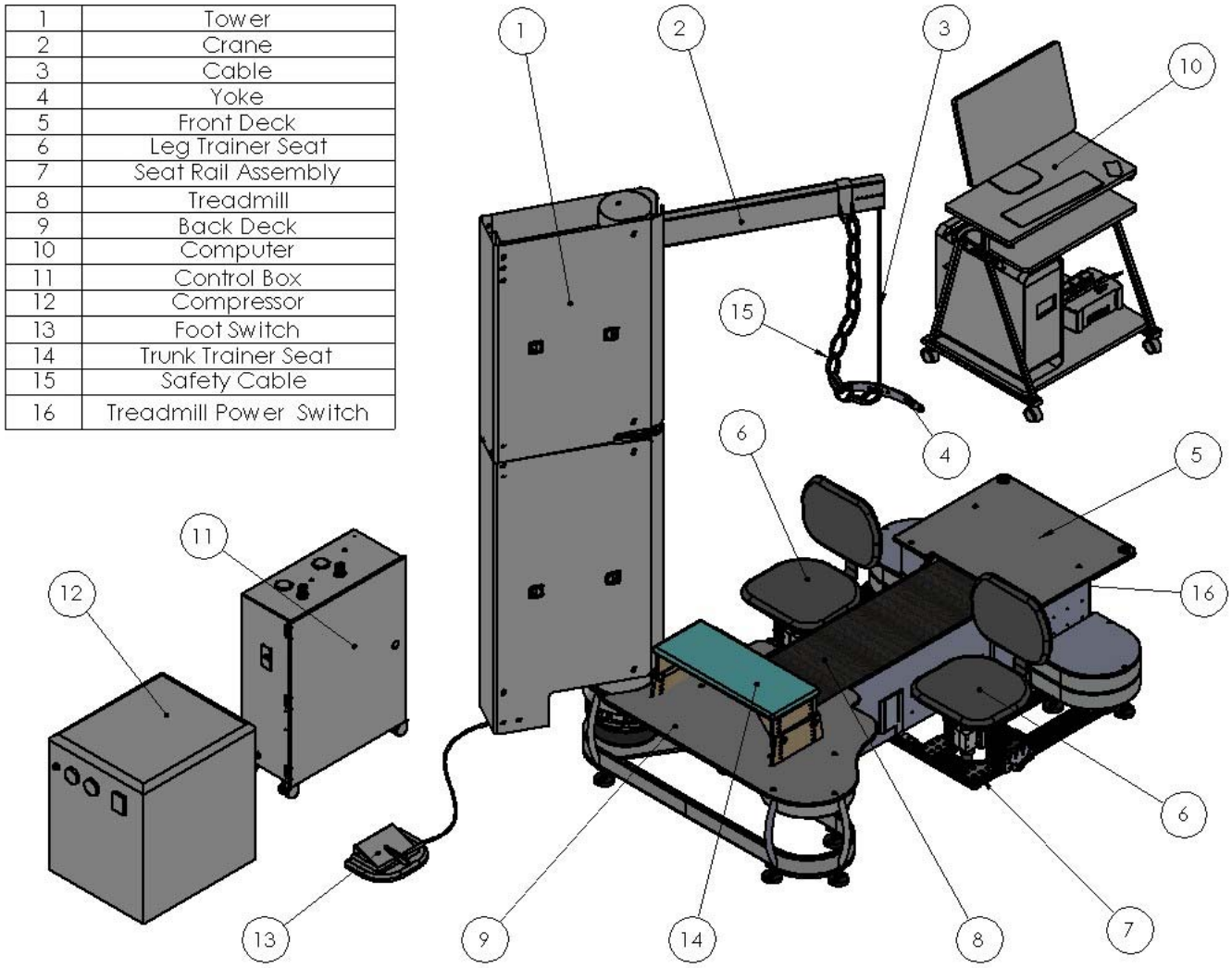


Figure 1. Treadmill Diagram

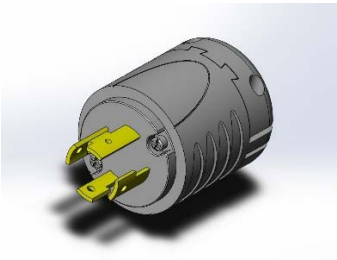


Figure 2. Plug for treadmill system- Turn lock connector. Grounded Four-Blade Straight Plug, NEMA L14-30

Parts/Accessories included with the treadmill system:

Safety Cable			
ME16603	Safety Cable	Metolius Ultimate Daisy Chain (Blue/green)	1
Yoke			
CM19-121015	Small pediatric yoke	Small pediatric yoke	2
CM19-121015	Large pediatric yoke	Large pediatric yoke	2
Carabineer			
Carabineer	Carabineer	Black Diamond Positron Screwgate Carabineer	5
Harness			
Small	Harness for Toddler	(up to ~3 years of age)	1
Medium	Harness for Child	(~3 years to ~8 years)	1
Large	Harness for Preteen	(~8 years to ~12 years)	1
Adult small	Harness for Teen	(~13 years to ~17 years)	1

Appendix II: Warranty Information

"Total Care" Extended Warranty

Each new Pediatric PowerStep system includes a one year warranty.

Power NeuroRecovery, Inc. offers the Pediatric PowerStep Service Agreement Warranty Program to provide preventive maintenance and service to your system. Pediatric PowerStep Service Agreement Warranty covers all Body Weight Support Treadmill (BWST) components (mechanical, electrical and pneumatic), and also includes labor, service visits and a preventative maintenance service visit for the Pediatric PowerStep system.

Pediatric PowerStep Service Agreement does not cover equipment that is misused, abused, or not used in accordance with the Pediatric PowerStep User Manual, and/or equipment damaged through Acts of God, such as fire, flood or wind.

Pediatric PowerStep Service Agreement Warranty includes the following:
• All mechanical, electrical and pneumatic components of the BWST system.
• Patient Harnesses, Treadmill, Compressor are not included.
• Labor costs associated with repairs and maintenance.
• Travel and lodging expenses associated with service personnel to complete the requested service.
• On-site service will routinely begin within 5 business days after phone support service has been completed.
• Technical phone support during the hours of 9:00 A.M. to 5:00 P.M, Eastern Time, 5 days a week.
• Two-hour response time from phone call or email contact.
• Software upgrades on current operating system
• Annual Preventative maintenance. If a repair visit is required, preventative maintenance will be performed during that visit. If multiple systems are covered by the service agreement within a provider network in a single city, the service engineer will additionally inspect and complete maintenance on those systems during the service call.

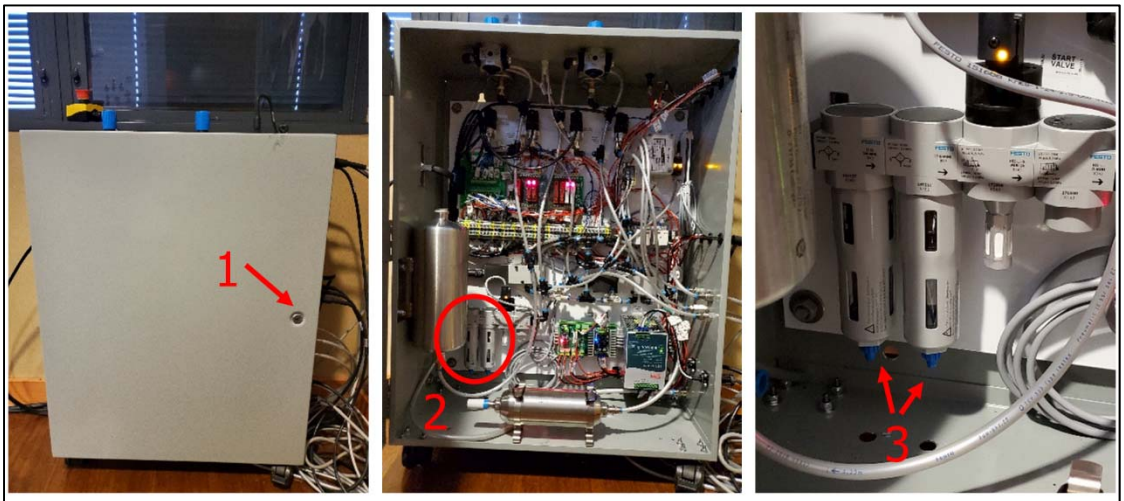
Contact PowerNeuroRecovery about the price for the Pediatric PowerStep Service Agreement Extended Warranty. Be sure to ask about discounts for multiple units and multi-year contracts. You can email directly at Operations@PowerNeuroRecovery.com or visit the website at https://PowerNeuroRecovery.com/.

Appendix III: General Maintenance/Troubleshooting

Preventative Maintenance Activities

Annual servicing by a Power NeuroRecovery representative is required to maintain your Pediatric PowerStep unit. Service plans are available through our contact information below. Regular preventative maintenance performed by the end-user is also recommended to ensure optimal device performance. Before performing any maintenance activities, ensure that the treadmill, air compressor, and computer are de-energized and shut down unless otherwise instructed.

Maintenance Requirements		
Maintenance Requirements	**Required Frequency**	**Log Sheet Reference Number**
Visually inspect unit cable and the connection to the yoke. Ensure connection is not loose. Check cable for any tears, fraying, etc and contact Power NeuroRecovery for a replacement if needed.	*Weekly*	*1*
Drain water reservoir on the air compressor. Refer to the provided California Air Tools 8012DSPC manual or file: https://www.californiaairtools.com/air-dryer-ultra-quiet-oil-free-air-compressors/cat-8010dspc/ *for further details.*	*Weekly*	*2*
Plug in and engage the air compressor. Check cut-out and cut-in pressures on the front of the air compressor. These should be ~100 psi and 80 psi respectively. If needed, adjust these as described in the provided manual or refer to http://www.jun-air.com/product_detail.aspx?ProductID=578&ProductTypeID=49 for further details.	*Weekly*	*3*
Visually inspect the connections on the large and small cylinder inside the Pediatric PowerStep tower. Remove the 2 access panels on one side of the tower. Confirm no connections to the cylinders and pulley are loose and the cable has no signs of wear, fraying, etc. Refer to figure 2.	*Weekly*	*4*
Visually inspect all carabineers. Ensure there is not much wear on them. Check them for any serous wear and replace with new carabineers if needed. (If wear is ~1/2 thickness of carabineer, needs to be replaced)	*Monthly*	*5*
Drain the supply line filters on the pneumatics panel inside the Pediatric PowerStep control box. Drain the filters by opening the stops at their base and collecting the runoff water. Refer to figure 1.	*Monthly*	*6*
Treadmill Maintenance: Flip the deck every 1-3 years, change the belt every 3-5 years, and change the motor brushes every 3-8 years. Check the drive belt tension after the first 6 months of steady use, and keep an eye on the walking belt so it doesn't get off-center. Please check: http://tufftread.com/service-2/ .	*Yearly*	*7*

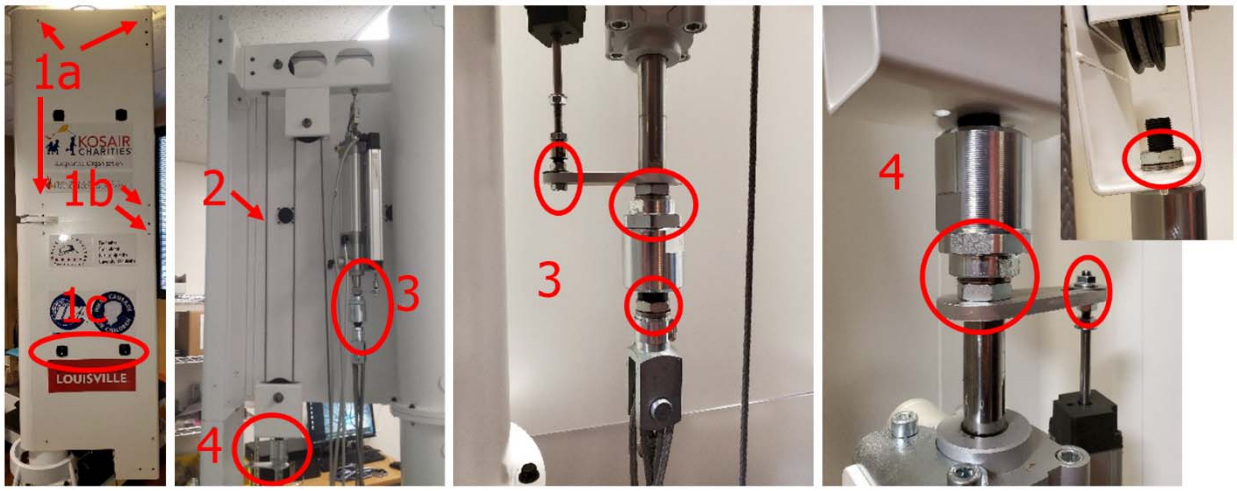


1. Unlock Control Panel.
2. Locate the Supply Line Filters.
3. Rotate blue knob at bottom of filter to drain any water contained in filter. When all water is drained, close the blue knob. Repeat for other filter.

Notes:

- *May want to put a cup or some other container below filter to catch any water being drained.*
- *If there is any air in the system, there will be a loud hissing noise while filter is open.*

Figure 1



1. Remove panels from one side of Tower.
   a. Loosen 3 screws from each panel.
   b. Remove 1 screw from each panel.
   c. Use handles to lift off the loosened screws.
2. Inspect rope inside. Look for any wear spots or fraying.
3. Inspect the connections to the Small cylinder and make sure they are all tight.
4. Inspect the connections to the Large cylinder and make sure they are all tight.

Figure 2

Troubleshooting

Below is a list of possible Important Messages that may pop up on the screen before or during a session followed by causes and solutions.

1. Emergency Stop Button is Activated, System is turned off!!!
   a. Red Emergency Stop button is pressed. Follow instructions in Chapter 12, "Emergency Stop"
   b. Power has been lost.
      i) Building has lost power and UPS backup did not kick in properly.
      ii) Control box is unplugged
      iii) Power cable is frayed or broken. Contact Power NeuroRecovery about a replacement power cable for the control box. **DO NOT CONTINUE TO USE IF CABLE IS FRAYED!**

2. Reached Low End of Large Cylinder, Need to Adjust Harness
   a. Client is short and cable is extended as far as it can go.
   b. The yoke and cable need to be raised ~3".
   c. Increase the distance between top of the client's head and the yoke by adjusting the straps on the harness.

3. Reached Up End of Large Cylinder, Need to Adjust Harness
   a. Client is tall and cable is retracted as far as it can go.
   b. The yoke and cable need to be lowered ~3".
   c. Decrease the distance between the top of the client's head and the yoke by adjusting straps on the harness. Be sure to leave at least 1" gap between top of head and the yoke.
   d. If you cannot lower the yoke and cable enough, the client is too tall for the device.

4. Need to Reposition Patient
   a. Should only appear while in "Step" mode.
   b. Small cylinder position is in the red region, refer to Chapter 3.11, "Small Cylinder Position (%) Panel".
   c. Need to re-position the client by selecting "Position" mode. System will adjust itself and small cylinder position will go back into the green region. After system adjusts, it will automatically switch back to "Step" mode.

5. [Lg / Sm] Cyl Sup Pressure is too low. Please check Reg [A / B] and Air Compressor. System locked!!!
   a. Accompanied by an "Error Message" window.
   b. Pressure is below minimum level of 8 psi.
   c. Check the compressor and its settings.
      i) Plugged in and power switch is flipped to ON position. Switch should light up when turned on and receiving power
      ii) Internal tank pressure is above 100 psi.
      iii) Output pressure is set to 90 psi.
   d. Check the pressure for regulator A (lg) and B (sm) on the control box.
      i) If pressure is below ~0.5bar, turn blue knob until pressure in green range (see Chapter 3.9, "Cylinder Regulator (psi) Panel")

6. Treadmill did not respond, ensure it is operational.
   a. Check the treadmill is plugged in.
   b. Check the power switch is flipped to ON position.
   c. Ensure the treadmill and "NccBWS" software turned on in proper order.
      i) Turn treadmill ON.
      ii) Wait 2 minutes for the treadmill to boot properly.
      iii) Open "NccBWS" software on computer to establish communication with treadmill.

7. [Large / Small] Supply Pressure is [off / too high / too low], System is locked!!!
   a. Check the pressure for regulator A (large) and B (small) on the control box.
      i) If pressure is below ~0.5bar, turn blue knob until pressure in green range (see Chapter 3.9, "Cylinder Regulator (psi) Panel")
   b. Check the compressor and its settings.
      i) Plugged in and power switch is flipped to ON position. Switch should light up when turned on and receiving power
      ii) Internal tank pressure is above 100 psi.
      iii) Output pressure is set to 90 psi.

8. Load Cell Voltage too low ***, System is locked!!!
   a. Contact PowerNeuroRecovery.

9. [Lg / Sm] Linear Transducer Voltage too low ***, System is locked!!!
   a. Contact PowerNeuroRecovery.

10. [Lg / Sm] Pressure Transducer Voltage is too [low / high] ***, System is locked!!!
    a. Contact PowerNeuroRecovery

Problem	**Solution**
System stuck in 'Position' mode.	Jiggle the yoke cable up-and-down a little bit.
	Manually put back into "Step" mode. Check the air pressure for both the large (A) and small (B) cylinder on the control box. Make sure the pressure is set to the green range (see Chapter 3.9, "Cylinder Regulator (psi) Panel")
Pressure not changing when turning blue knobs on control box.	Ensure NccBWS software is open and turned On (client file loaded)
	Check that the compressor is plugged in and turned on; Tank pressure is above 100psi and Output pressure is set to 90psi.
Blue knob on control box will not turn to change the pressure.	Pull up on knob to unlock.

Cannot go above a certain pressure on control box.	Check that the compressor plugged in and turned on; Tank pressure is above 100psi and Output pressure is set to 90psi.
	Trying to set pressure on control box above 90psi or 6bar indicates client weight is above the safety limits of the system (120lbs).
Treadmill not responding to commands or stopping randomly.	Make sure treadmill power is plugged in and treadmill is turned on.
	Treadmill and software turned on in proper order.
	Treadmill USB cable securely plugged into PC. If there are intermediate connectors between treadmill and PC, ensure they are all plugged in securely as well.
	Check the proper power at the outlet using a multimeter and Figure 1 below.
	Check the proper power at the treadmill controller under the front deck. Contact PowerNeuroRecovery for further instructions.
"COM port not available".	Contact PowerNeuroRecovery for further instructions to check or change COM port used for the treadmill.
Treadmill making noise while running.	Make a note about the type of noise, where noise coming from and conditions when noise occurs. Contact PowerNeuroRecovery with descriptions for further troubleshooting.
Yoke cable frayed.	Contact PowerNeuroRecovery about replacement parts.
Safety cable frayed or broken.	
Carabineers have wear spots on them.	
Yoke has wear spots where carabineers connect.	
Large, 'jerky', movements when switching between different modes (Position → Step, Step → Stand, etc)	System needs to be re-calibrated and fine tuning adjustments made. Contact PowerNeuroRecovery to schedule a maintenance call or onsite technician visit if needed.

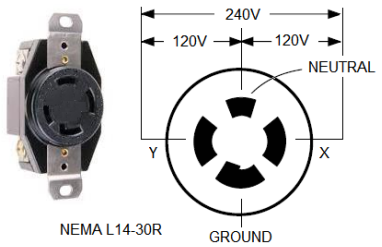


Figure 1