

NewWalk

Operation Manual

Senior Design Team 526



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Table of Contents

1.0 Project Overview	2
2.0 Overview of Components	3
2.1 Forearm Supports & 2.2 Hand Grips	3
2.3 Top Frame	4
2.4 Gas Shocks	4
2.5 Bottom Frame	5
2.6 Front Wheels	5
2.7 Back Wheels	5
3.0 Assembly	6
4.0 Device Operation	6
4.1 Before Initial Use	6
4.2 Top Frame Height Adjustment	6
4.3 Armrest Angle Adjustment	7
4.4 Using the walker when walking	7
4.5 Maintenance	7
5.0 Troubleshooting	8
6.0 General Warning & Safety Instructions	8

1.0 Project Overview

The Aging populations and individuals with physical limits often transition walking to wheelchair- quickly. The goal of this project is to design an improved assistive mobility device that helps the user maintain physical activity to help stay out of a wheelchair. Our design, the NewWalk, improves three key features of current walkers: posture influence, adjustability, and weight transfer. Current walkers require users to reach out in front of them causing bad posture and potential back problems. The NewWalk, however, features forearm supports at roughly elbow height that allow for the user to stand upright while still getting the support needed. These arm supports also feature height, width, and angle adjustment whereas current walkers feature height adjustment at best. This wide range of adjustability allows for a perfect fit for every individual. The direction and weight placement between the user and device also poses a problem. Most walkers require the user to bend over and places the weight on their hands which can get tiring and cause joint stress. To improve on this, the NewWalk transfers weight directly to the shoulders. Also, to relieve stress on joints, the NewWalk features gas shocks for the two forearm supports. The improvements made by the NewWalk device will adjust to a large range of users and improve their overall quality of life.

2.0 Overview of Components

The NewWalk consists of 7 major components which are indicated on the figure to the right, starting with the top most component. The components are as follows:

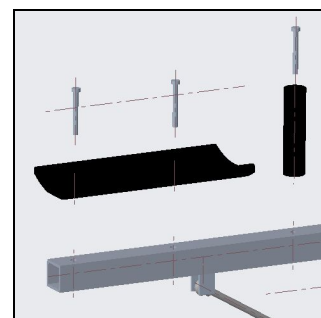
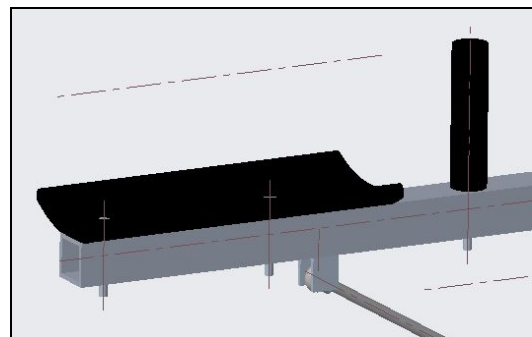
- (1) Forearm Supports x2
- (2) Hand Grips x2
- (3) Top Frame
- (4) Gas Shocks x2
- (5) Bottom Frame
- (6) Front Wheels x2
- (7) Back Wheels x2

Further description of these components can be seen within the next following pages.



2.1 Forearm Supports & 2.2 Hand Grips

The forearm supports and hand grips are 3D printed, the forearm supports have a layer of polyurethane foam to provide comfort. These components can be seen in the picture to the right.



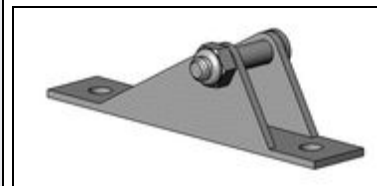
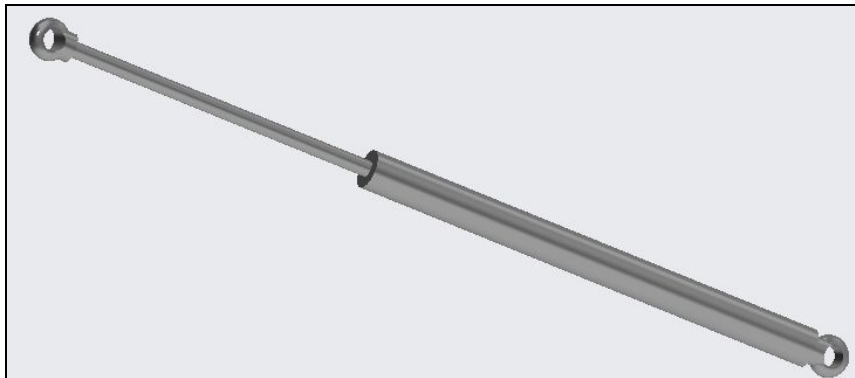
2.3 Top Frame



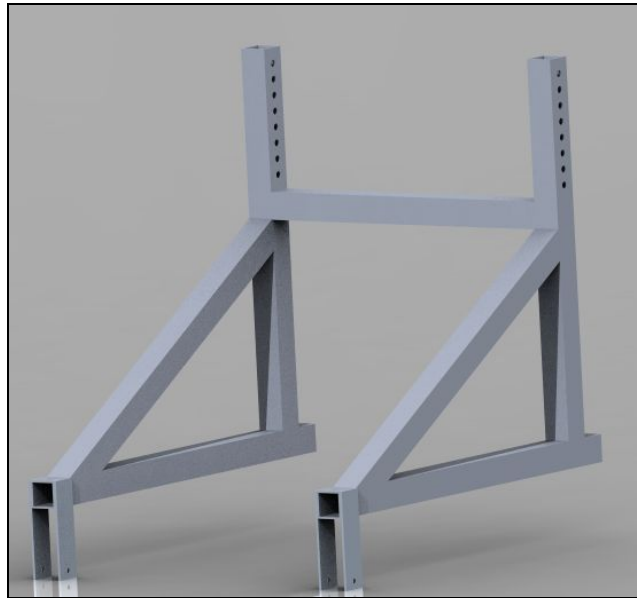
The top frame of the NewWalk can be seen in the figure above. The conjunction between the horizontal and vertical piece was partly welded and put together by a machinist, so tampering is highly unrecommended. The gas shocks shown in the figure can be seen in further detail in *2.4 Gas Shocks*.

2.4 Gas Shocks

The NewWalk has gas shocks that give the user a more comfortable experience when going over rough terrain. They are attached to the top frame by a heavy duty eyelet mounting bracket which is also shown below.



2.5 Bottom Frame



The bottom frame of the NewWalk is a single, welded component. This is the biggest and most sturdy component of the walker which is comprised of aluminum.

2.6 Front Wheels

The front wheels are polyurethane rubber caster wheels. Each wheel features a lock that provides the user the ability to stop the wheel from spinning. A figure of the component can be seen to the right.



2.7 Back Wheels

The back wheels are polyurethane rubber wheels which allows for easy turning. To connect the wheels to the device, a wheel axle was used. These two components, combined, make up the major component of the back wheel. They can be seen in the figures to the right.



3.0 Assembly

Basis assembly Tips

Follow the basic point when you assemble your walker.

- Read and understand the “general warning & safety instructions” before assembly.
- Collect all pieces necessary for each assembly step.
- Using the recommended wrenches, turn the bolts and nuts to the right(clockwise) to tighten, and the left (counterclockwise) to loosen, unless instructed otherwise.
- When attaching 2 pieces, lightly lift and look through the bolt holes to help insert the bolt through the holes.
- The assembly requires 1 or 2 people.

4.0 Device Operation

4.1 Before Initial Use

Prior to using the device, decide what angle you want the armrests to be set on. It is recommended that for stationary use the armrests should be at 90° and for nonstationary use the armrests should be at 130°. Once decided, the armrest angle can be adjusted by following section *4.3 Armrest Angle Adjustment*. Once adjusted, make sure that all four wheels are making sturdy contact with the ground and then step into the walker. Before you begin walking, make sure that your arms are tightly gripping the hand grips and your forearms are comfortably laying on the forearm supports.

4.2 Top Frame Height Adjustment

- To determine proper height, stand upright behind the walker with shoulders relaxed, arms hanging at your side and eyes looking straight ahead. Standing in this position, the hand grips (2.2) of the walker should be adjusted to a height, which is even with the wrists
- To adjust the handlebar height, remove the height adjustment hand nut and screw from the frame (2.3).
- Slide the handlebars in the walker frame until they are at the proper height and the holes in the handlebars and frame are aligned. Place the screw through the aligned holes in the handlebars and frame.

4.3 Armrest Angle Adjustment

The walker armrest angle can be set to a 90° or 130°. When changing the armrest angle remove the angle adjustment pin. Set the armrest to the desired position and lock the angle position with the angle adjustment pin.

- For Stationary use, set armrest angle to 90°.
- For Mobility use, set armrest angle to 130°.

4.4 Using the walker when walking

For proper positioning and use of your walker, imagine a line drawn across the back of the rear wheels. Part of one foot should be slightly ahead of that line as you walk.

4.5 Maintenance

Your walker should be checked periodically to ensure the wheels are functioning properly and that all nuts and bolts are secure. This ensures safe use of the device

Contact us using one of the group members emails if you encounter any problems or for information regarding repairs or maintenance. Almost all of the walker's components were purchased through the website McMaster.com. To make replacements, part numbers for each item can be seen below.

List of parts and part numbers:

Ball Bearing , Flanged, Open with Extended Inner Ring, for 5/16" Shaft (6383K215)

Resilient Polyurethane Foam Sheet Ultra Soft, 12" x 12" x 1/2" (86375K114)

Gas Spring, 15.63" Extended Length (9416K17)

End Fitting for Gas Spring Eyelet, M6 Thread Size, 0.32" ID (9416K84)

Heavy Duty Eyelet Mounting Bracket, for 0.32" ID (9416K29)

Threaded-Stem Swivel Caster with 1/2"-13 Thread and 4" Diameter Firm Polyurethane Wheel (2437T18)

Easy-Turn Polyurethane Wheel with Sealed Ball Bearing, 4" Diameter x 1" Wide (8946T66)

Zinc-Plated Steel Wheel Axle 5/16" Diameter x 2-1/4" Long (23595T13)

18-8 Stainless Steel Hex Nut 10-24 Thread Size (91841A011)

18-8 Stainless Steel Hex Head Screws 10-24 Thread Size, 2-1/2" Long (92314A255)

18-8 Stainless Steel Binding Barrel and Screw 1/4"-20 Thread Size, for 1-1/2"-1-5/8" Material Thickness (99637A318)

Aluminum Unthreaded Spacer 3/4" OD, 1/8" Long, for 5/16" Screw Size (92510A586)

5.0 Troubleshooting

- If user has issues pushing walker while in use, clear all objects that are blocking the wheels. Check that the front castor wheel(s) swivels freely.
- If after you clear all object and the still do not rotate stop using the walker and get the wheels replaced.
- If you have issues inserting the height adjustment pin into the frame, make sure the top frame holes and bottom frame holes are properly aligned and then insert the height adjustment pin.
- If the top frame does not slide into the bottom frame, check to see if the adjustment pin is removed. If the issue still persists, remove the top frame by sliding it out of the bottom frame and check to see if there are any objects in the bottom frame. Once the frames are checked and cleared of any objects, slide the top frame back into the bottom frame.

6.0 General Warning & Safety Instructions

TO ENSURE YOUR SAFETY IN USING THE WALKER, THE FOLLOWING WARNINGS AND SAFETY INFORMATION AND ALL INSTRUCTIONS MUST BE FOLLOWED.

- **DO NOT use this product without first reading and understanding the instructions contained in this operation manual.** If you are unable to understand the assembly, operation, or troubleshooting, contact a healthcare professional or group member (title page) before use - otherwise serious bodily injury or product damage may occur.
- **DO NOT** exceed the maximum weight capacity or serious injury could result: 250 lbs.
- **DO NOT** use the walker if there is apparent damage or if any parts are missing. If there are missing or damaged parts, please visit McMaster.com or contact a group member.
- **DO NOT** hang anything from the walker handles or frame. This may cause the walker to tip, resulting in bodily injury or walker damage.
- **DO NOT** use the walker to walk backwards, down gradients or to climb stairs, curbs, or to go over obstacles. Serious risk of fall or injury may occur.
- **DO NOT** perform any adjustments to the walker while it is in use
- **Consult with** your doctor, physical or occupational therapist, or other qualified healthcare professional regarding the proper height adjustment for maximum support.
- **ALL WHEELS** must be in contact with the floor at ALL TIMES. This will ensure the walker is properly balanced.
- **Please** store the walker in a safe environment.