

# Wegmans Bread Tray Lift Assist

By








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# Project Status

- Planned on creating device for end of assembly line that would increase ergonomics
  - Slow return to home
  - Loading height
- Budget met

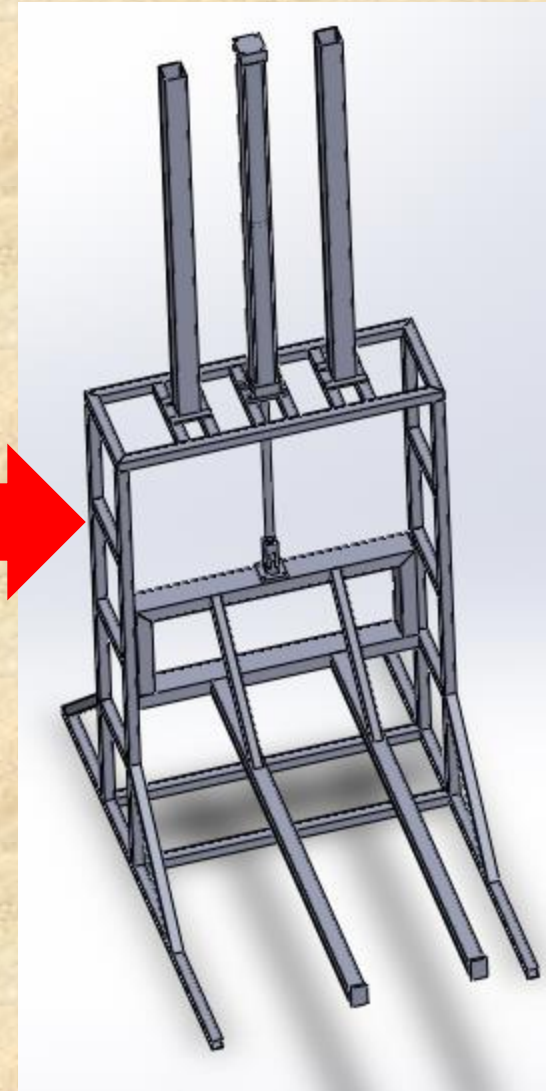


# Deliverables

- Maintain minimum 33 inches loading height – **loading height of about 37 inches**
- Allow food no closer then 6 inches to the floor 
- Locking mechanism at bottom 
- End Cap on Forks 
- Hand Guarding 
- 2 inch hard stop for foot safety 
- Ease of use for operator 
- Reset Time – **slower then anticipated, about 15 seconds compared to 6 originally planned**
- Mobile, stable, and safe 

# Changes In design

- “Proof of concept”
- Different rates
- Different weights
- Cost Reduction
- Size Reduction



# Final Design



# Internal Workings

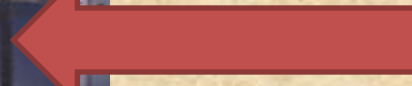
Reset Switch



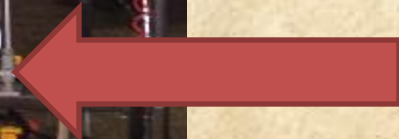
Reset Switch



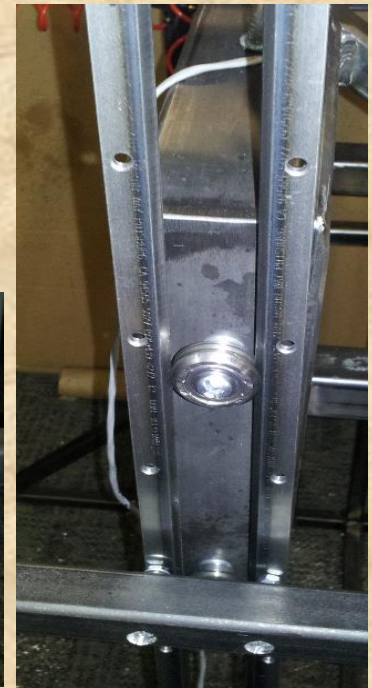
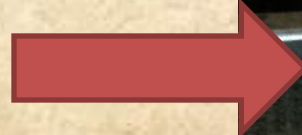
Spring



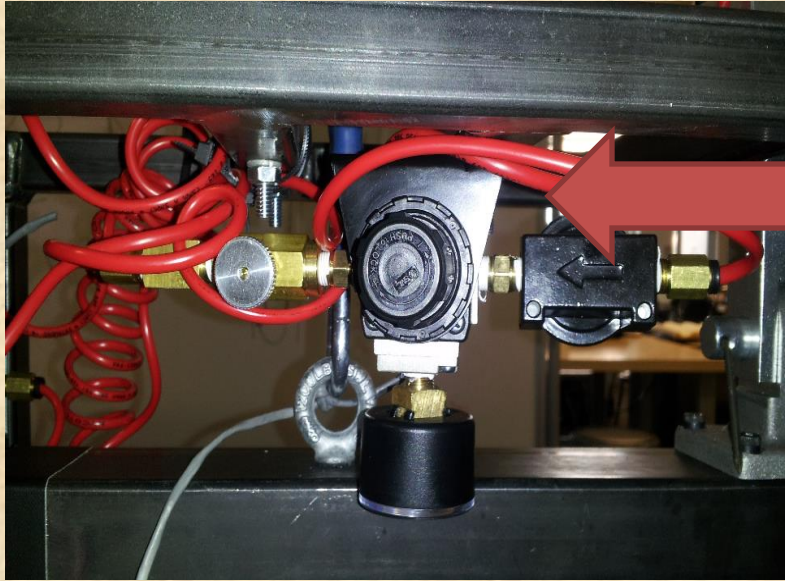
Air Piston Assembly



Guiding  
Tracks



# Internal Workings Continued



Air  
Regulator



Limit Switch



**VIDEO**



# Testing Times

Variables	Values	Units
Air Regulator	35	psi
Weights	10	lbs
Tray	5.5	lbs
Dolley	15	lbs

Weight (lbs)	Distance From Ground	
	Test 1 (in)	Test 2 (in)
0	33.5	33.5
15	35	35
30.5	38	38
46	38	37.5
61.5	36	36
77	36	37
92.5	37.5	37.5
108	35.5	35.5

Action	Tme		
	Test 1 (sec)	Test 2 (sec)	Test 3 (sec)
push button	2.6	2.8	3.0
total up time	18.2	17.5	17.2




# Changes to Improve Design/ Retro Fitting

- Larger air tubing- return speed rate is limited because of tubing selected
- Vertical track supports instead of horizontal- allows track to be stiffer
- Front support beam- gives front guard more support

# Scheduling Accuracy

- Redesign of System (POC): **Completed on Time**
- Ordering Parts: **3 weeks late** (due to Redesign)
- Assembly and In-house Testing: **Completed on Time**
- Delivery: **N/A**
  - Conflicting times between Wegmans and team
    - Positive: lots of attention/exposure at Imagine RIT
    - Negative: unable to get any data/feedback from employees
- Final Meeting: **On Schedule**

# Risk Assessment Outcome

- Redesign of System  • Had to redo SD1 in 3 weeks of SD2
- Delay time fabrication  • One week late: Devoted more time than anticipated to make up for lost time
- Assumption of air system  • Realized the need for larger tubing to purge the system faster

# Ergonomic Impact

- NIOSH Lifting Equation:
  - When setting tray on ground: 1.7
  - With Bread Tray Lift Assist: 1.4
    - Analysis of only 36" and below
- Percent Improvement:

>>17.6%

# Overall Impact

- Provided proof of concept
- Laid groundwork and changes needed to work as desired
- Helped ergonomics
- Adjustable features (spring, air pressure, air speed)



# What did we learn?

- Design process from start to finish
- Customer relations
- Ability to present ideas, take customer input, and incorporate into next process
- How to function as a team to accomplish an elaborate task
- Deeper knowledge of air systems
- Creating a BOM on a budget
- Teamwork and division of labor
- Troubleshooting

**Questions?**