

PARTIAL PLATFORM GRABBER TEST

GROUP 4

2nd December 2016
Version 5

Abstract

This test aimed to determine whether the thin lego wings on the grabber would be able to slide under the block and not simply push the block. It was determined that the wings were too thick, and not lying flush with the ground, which caused the design to push the block, and never slide the wings underneath.

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1 BACKGROUND

1.1 Edit History

Jake Zhu: 2016-10-28, Initial set up

Jake Zhu: 2016-11-05, Made testing case based on time to test efficiency and created a separate document for each design.

Jake Zhu: 2016-11-05, Idea scrapped. Hardware team wants qualitative data. Merged all the Grabber Tests.

Quentin Norris: 2016-11-05, Did testing and qualitative analysis for the partial platform grabber.

Benjamin Willms: 2016-11-07, Edited and expanded on all sections.

Benjamin Willms: 2016-11-13, Edited the procedure and the test report to better represent the test that was performed.

Benjamin Willms: 2016-11-14, Added the abstract

1.2 Test Information

Testers: Quentin

Author: Quentin, Ben and Jake

Hardware Version: Partial Platform Grabber

Software Version: N/A

2 GOAL

: To see whether the partial platform grabber will slide under the blocks smoothly.

3 PROCEDURE

Setup:

1. Build a prototype of the grabber.

Test:

1. Place the blocks at random (within the boundaries of the grabber, to simulate proper collection being completed) left and right positions in front of the grabber
2. Slide the grabber along the ground towards the block
3. Observe whether the grabber successfully slides under the block

4 EXPECTED RESULT

It is expected that the partial platform will successfully slide under the block in every case.

5 TEST REPORT

Our design for the partial platform includes thin lego wings on either side lying approximately flush with the ground. These are supposed to slide under the block to allow lifting (not currently possible as the wings are too short; this test will see if sliding under the blocks is possible with the materials we currently have access to). Our tests will check if the wings are sufficiently thin and slippery enough to actually slide under the blocks instead of simply pushing it around the playing field.

Trial	Success?
1	False
2	False
3	False
4	False
5	False
6	False
7	False
8	False
9	False
10	False

The lego wings used to slide under the block and lift it were unfortunately slightly too thick, and not quite as flush to the ground as possible. Therefore all the trials failed with the grabber simply pushing the blocks.

6 CONCLUSION

The entire idea behind this design is to use friction to grab and release the blocks. The problem is that the blocks are so light, that the force of friction between them and the ground is extremely small. This makes the partial platform need to be extremely thin and smooth to allow the design to work. The platform must also be strong enough to not shred when rubbed along the ground. This narrows the possible materials to be used as the platform down into a small number of possibilities, and we do not have any on hand that would likely fill this role.

7 ACTION

This design will not be implemented in hardware version 1, as further research into materials must be done to make this design a success. This design should be kept as a possibility for future iterations of the design, as it would use no motors for collection and grabbing, freeing up a motor slot for another use.

8 DISTRIBUTION

Hardware Team