

**Operation Manual**

Team 510

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EML 4552C: Senior Design II

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March 28, 2025

## Project Overview

Ghost Controls specializes in automatic gate openers and related accessories, such as solar panels and keypads. The focus of this project is based upon the ZombieLock, an additional lock sold by Ghost Controls to add security to residential gate when closed. The product unlocks as the user prompts the gate to open and locks automatically when closed. The current ZombieLock exhibits issues over time as the weight of the gate causes the lock to misalign with the receiver. The objective of this project is to adapt the receiver mechanism to address these customer issues. The goal is to ensure reliable engagement of the lock, maintain ease of installation, and extend the lifetime of the product.



Fig 1. Complete Receiver Assembly

## Components

### *Guiding Ramp*

The guiding ramp is made of Aluminum 6061 and has a black powder coated finish. It is a single, solid piece that adapts to the ZombieLock receiver to provide a ramp for the ZombieLock. The ramp aids in guiding the lock into the receiver. The four (4) chamfered holes in the bottom are designed to drain any water that would otherwise be stuck between the receiver and the guiding ramp. The four (4) holes in the backing plate are used for securing the ramp to the receiver.



Fig 2. Guiding Ramp

### *Adjustment Plate*

The adjustment plate is made of Aluminum 6061 and has a black powder coated finish. It features two (2) mounting slots that offer 1.52 inches of horizontal adjustment and a vertical slot that allows for a total of 3.54 inches of vertical adjustment with 0.885 inches between each increment.



Fig 3. Adjustment Plate

### **Assembly**

The design consists of two (2) components, an adjustment plate and a guiding ramp, that work with the existing ZombieLock lock and receiver. There are four (4) possible configurations for the assembly. These four options are shown below.



Fig 4. Right Hinged Gate 1



Fig 5. Left Hinged Gate 1



Fig 6. Right Hinged Gate 2



Fig 7. Left Hinged Gate 2

The step by step assembly instructions are as follows:

1. Mounting the Adjustment Plate

- a. Position the adjustment plate onto the gate post nearest the free-floating end of the gate at the desired height. The plate must be level and aligned with ZombieLock when the gate is at the closed position.

- b. Mount and secure the adjustment plate to the gate post with the two (2) lag bolts provided.

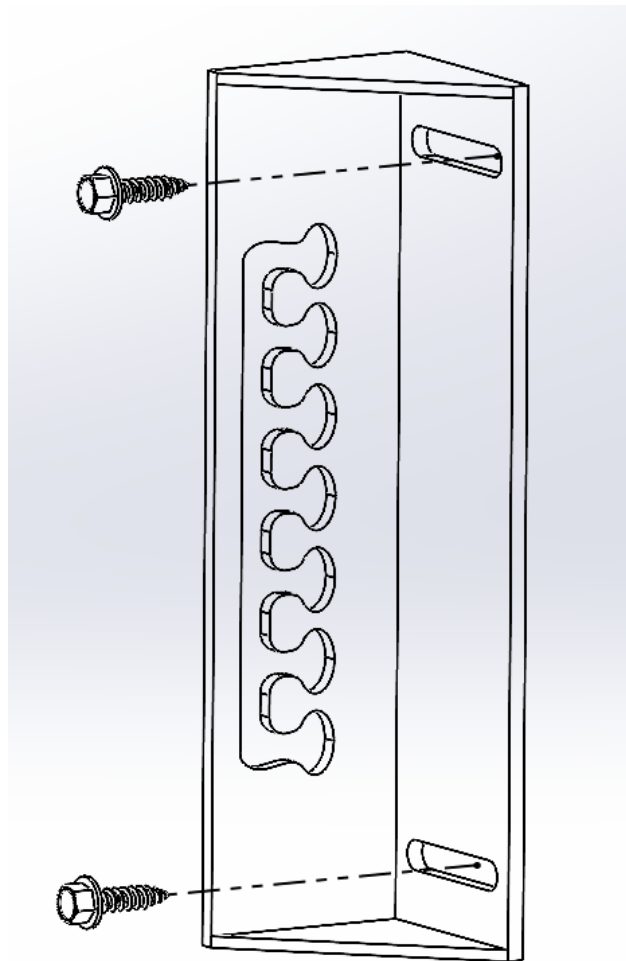


Fig 8. Adjustment Plate Assembly

## 2. Attaching the Ramp to the Receiver

- a. Slide the receiver into the ramp in the direction that the gate closes.
- b. If using the configurations shown in figures 4 and 5, secure hardware into the back of the ramp and receiver as per the diagram in figure 9.

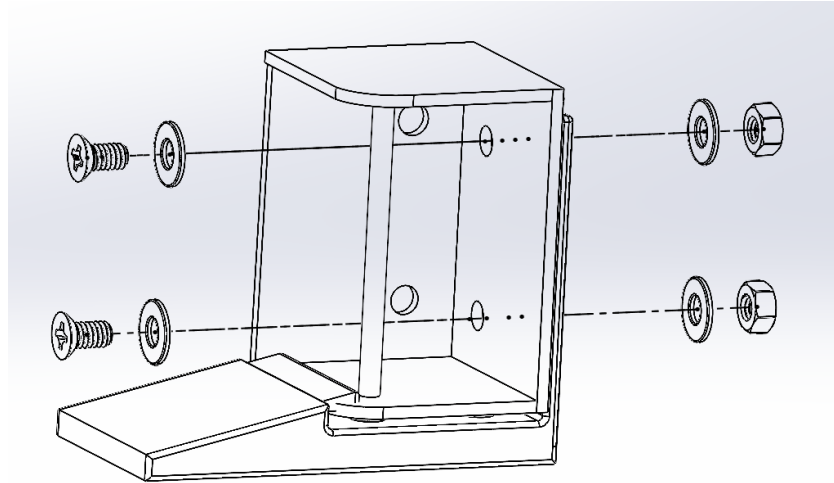


Fig 9. Ramp Assembly

- c. If using the configurations shown in figures 6 or 7, skip to step 3c.
- 3. Connecting the Receiver to the Adjustment Plate
  - a. Position the receiver so the remaining holes in the receiver face the adjustment slot.
  - b. Secure hardware through these holes in the receiver and adjustment plate as per diagram in figure 10. Skip to step 3e.
  - c. Position the receiver so the holes in the receiver and guiding ramp both line up with the adjustment slot.
  - d. Secure hardware through the receiver, guiding ramp, and adjustment plate as per diagram in figure 11.
  - e. Ensure bolts are not too tight as to impede movement through the adjustment slots.

#### 4. Final Adjustments

- a. Make any necessary horizontal adjustments by loosening the lag bolts securing the adjustment plate to the gate post and retightening them in the desired location.
- b. Make any necessary vertical adjustments by moving the receiver within the adjustment plate slots.

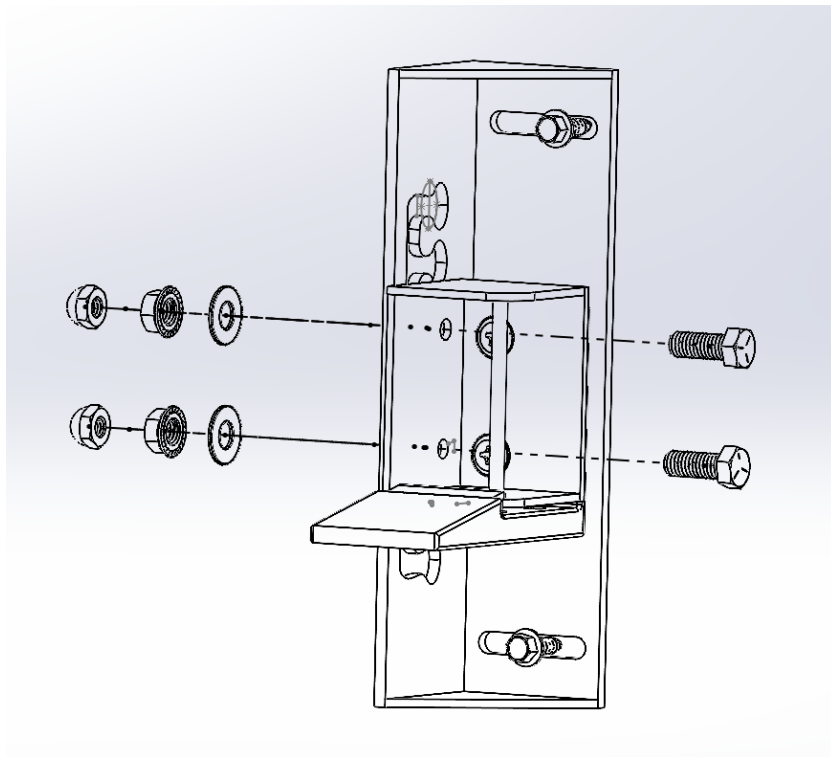


Fig 10. Complete Assembly



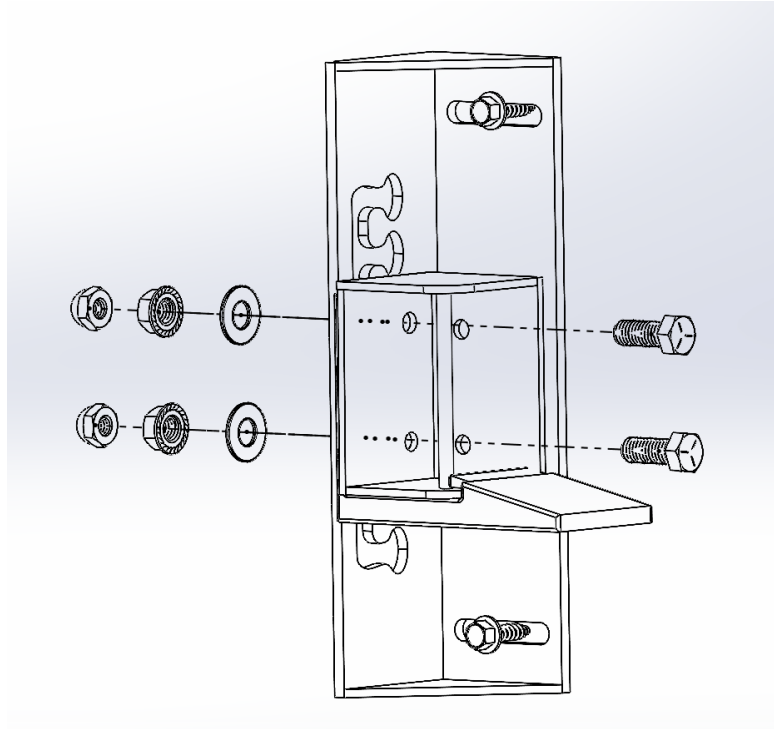


Fig 11. Complete Assembly

### Operation Instructions

Once the product is secured to the gate post, no bolts or screws should be adjusted. As the gate sags over time, the ramp guides the ZombieLock into the receiver. Eventually, the gate will sag past the bottom of the ramp and the gate will fail to close and lock. At this time, move the ramp and receiver down the adjustment plate one notch. This movement will lower the ramp accounting for the sag of the gate, allowing the lock to once again slide into the receiver. This movement can also be done preemptively if the user notices the lock hitting close to the bottom of the ramp.

### **Troubleshooting**

If misalignment presents in the vertical direction that is beyond the range of the ramp and adjustment plate, unscrew the lag bolts from the gate post to separate the adjustment plate from the gate post. Ensure the receiver is at a higher position in the adjustment plate and align receiver with the lock on the gate. Before screwing the lag bolts back into the gate post, guarantee the components are aligned in the horizontal and vertical direction.

### **Warranty and Support**

The product will be consistent with the Limited Warranty for Ghost Controls products. The product must be registered under Product Registration within 90 days of receiving the part for any claim to be considered. The warranty covers:

- Defects in materials and workmanship of the product
- Proper installation as specified by the assembly section
- Single family residential use only

The warranty is in effect for 18 months following the terms of the date of the original purchase of the product. Only the original purchaser of the product is covered under Limited Warranty and is not transferable to subsequent owners. Ghost Controls will provide a replacement part for any defective parts within the warranty term free of charge. Ghost Controls will cover shipping cost for US customers.