

The Ball Gate Assembly: Technical Information

Two half-moons attached together and connected to a single motor. The position of the left half-moon is sensed by two reed switches. A small magnet is located under the left moon. When the reed switch is activated, it will be at 0 VDC, the other will be opposite, +5 VDC.

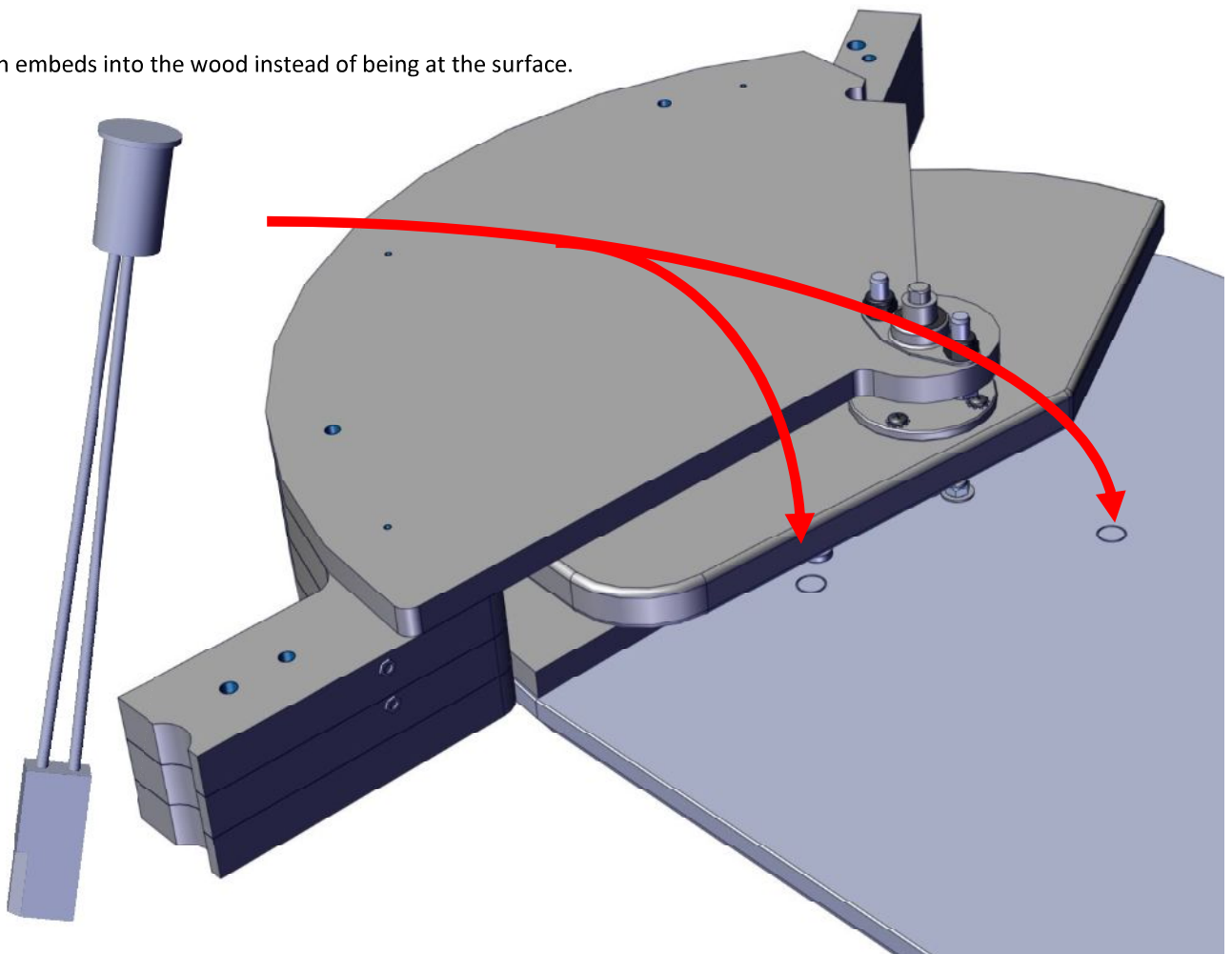
On the main board at J14, pins 1 and 2 supply the voltage to the ball gate motor. Pins 3 and 4 are the sense lines used to determine the position of the ball gate. Located underneath the left side of the ball gate is a magnet. When the gate is closed this magnet activates the sensor attached to pin 3 taking the signal to ground. Pin 4 will be at +5 VDC. When the gate opens, pin 4 will go to ground and pin 3 will have +5 VDC on it.

If the magnet sensors are not flush to the wood surface, the magnet will not activate the sensor causing the ball gate to move pass the closed or open position. When this occurs, the ball gate will shut down and only a power cycle will allow the ball gate to work again.

If after checking that the ball gate is not having a sensor problem, look at the linkage for any of the Grubb screws that might have gotten loose. Also look at the connector rod and make sure it is slotted and not rounded out.

**** Note **** If the game doesn't see the open or close reed switches it will open the ball gate and not attempt to run the ball gate motor again until you power cycle the game.

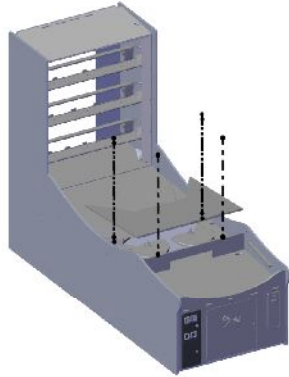
Reed switch embeds into the wood instead of being at the surface.



Ball-gate Assembly

Step 1: Ball-gate Removal

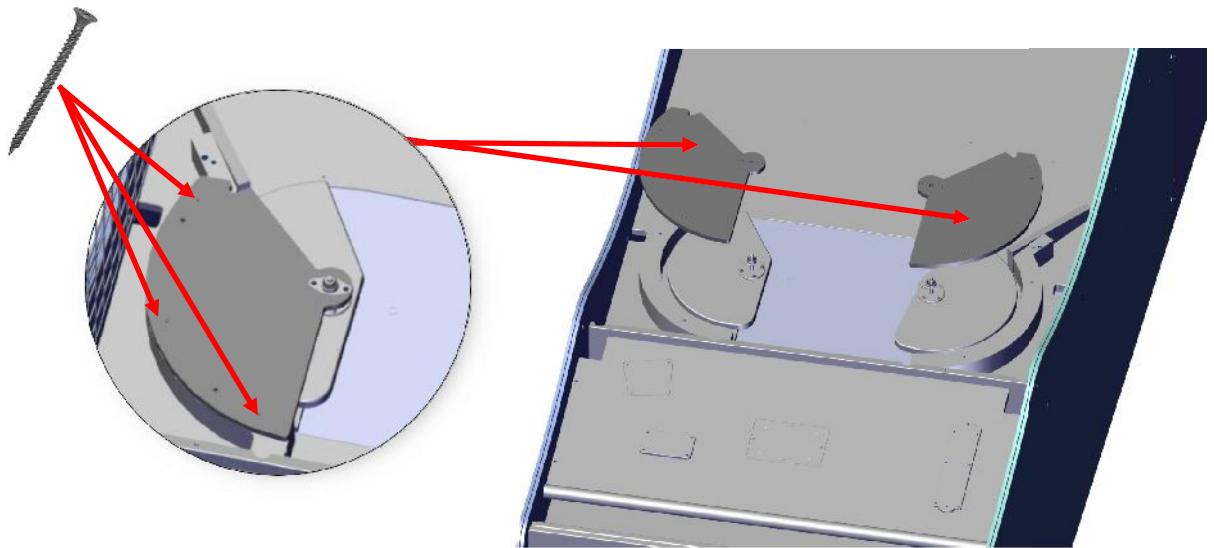
Remove the wood panel ball gate cover as shown.



The cages, canopy, support bars, and rebound have been removed for clarity.

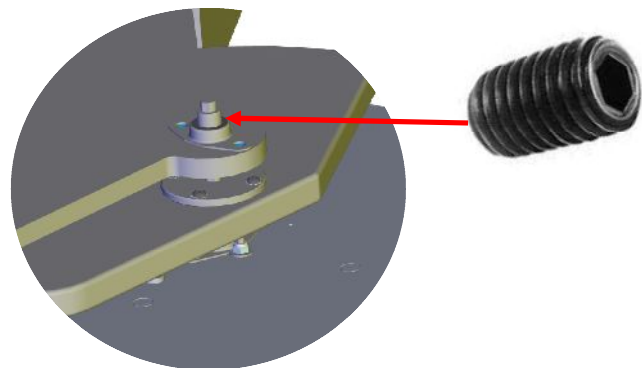
Step 2: Ball-gate Removal

Remove three woodscrews on each side as shown below. Remove these screws on both sides.



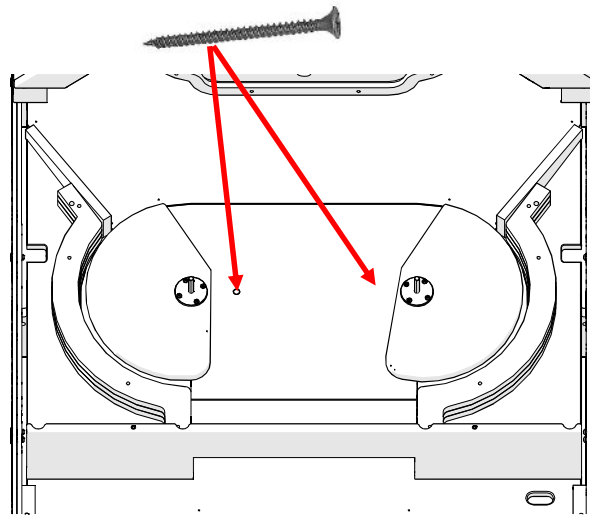
Step 3: Ball-gate Removal

Loosen the 5/64 Allen set screw. Lift the ball deflectors



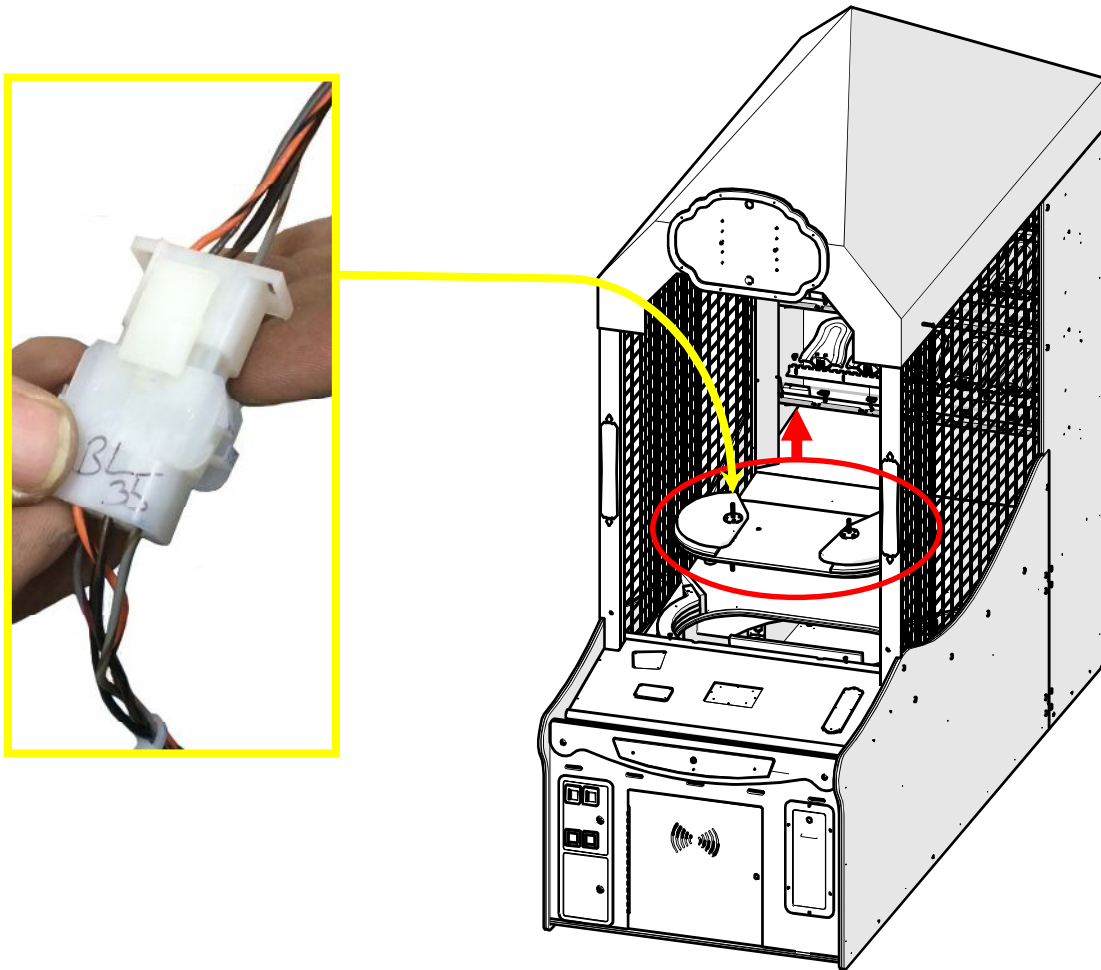
Step 4: Ball-gate Removal

There are two black wood screws that hold the ball gate assembly to the cabinet. They are shown below. Remove them.



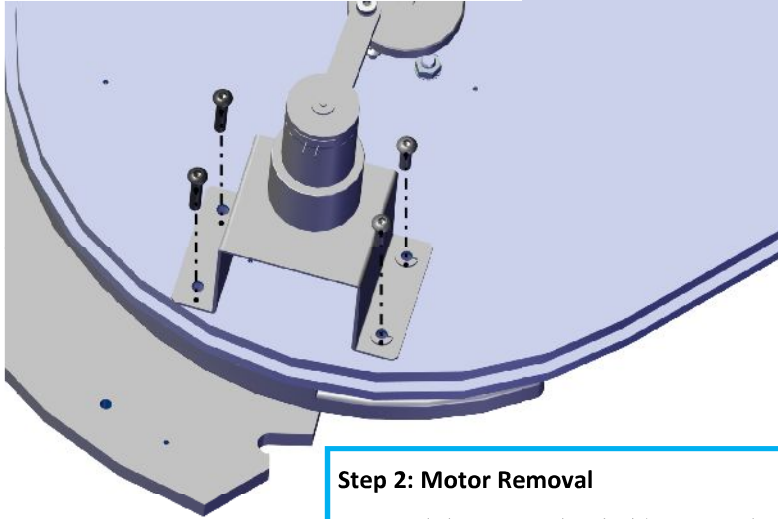
Step 5: Ball-gate Removal

Lift the ball gate straight up and unplug the wire harness before lifting the ball gate assembly out.



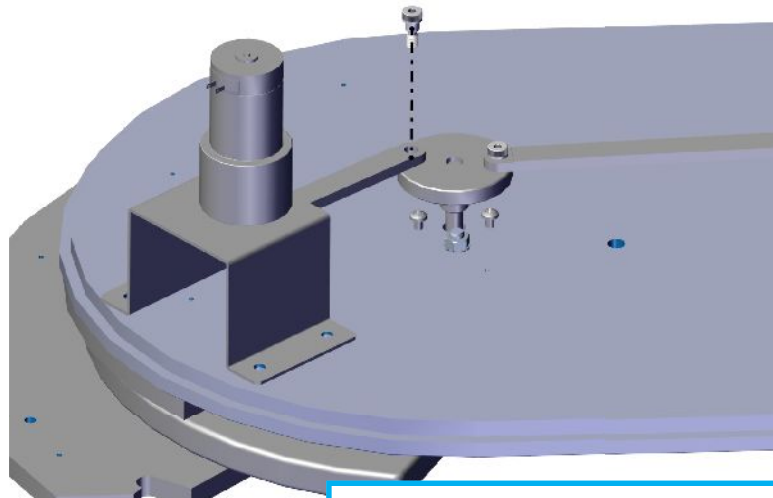
Step 1: Motor Removal (REMOVE BALLGATE ASSEMBLY BEFORE PROCEEDING)

Flip the ballgate assembly over and remove the four Allen screws and lock washers shown.



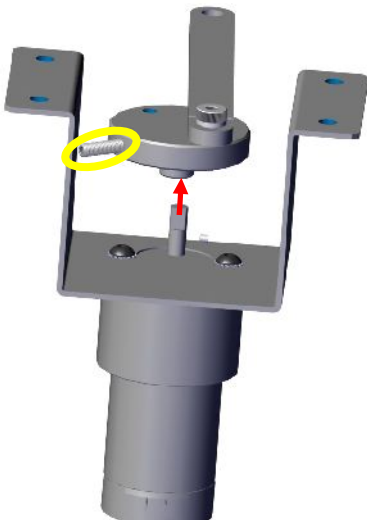
Step 2: Motor Removal

Remove the Screw that holds motor shaft to the ball deflector shaft. This screw has Loctite applied to it and could be difficult to remove.



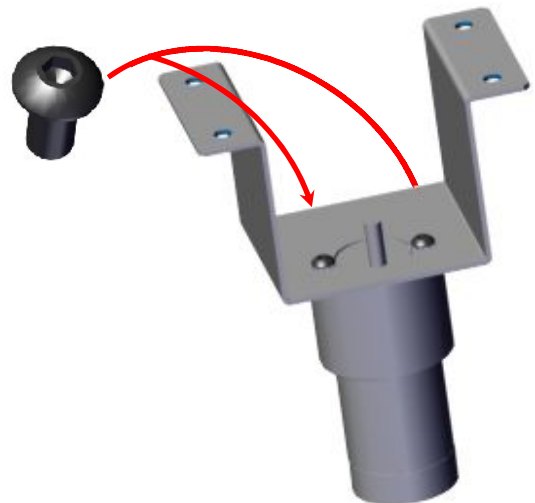
Step 3: Motor Removal

Loosen the grub screw that holds the motor cam shaft to the motor. This grub screw also has Loctite applied to it and could be difficult to loosen. Lift the cam shaft off.



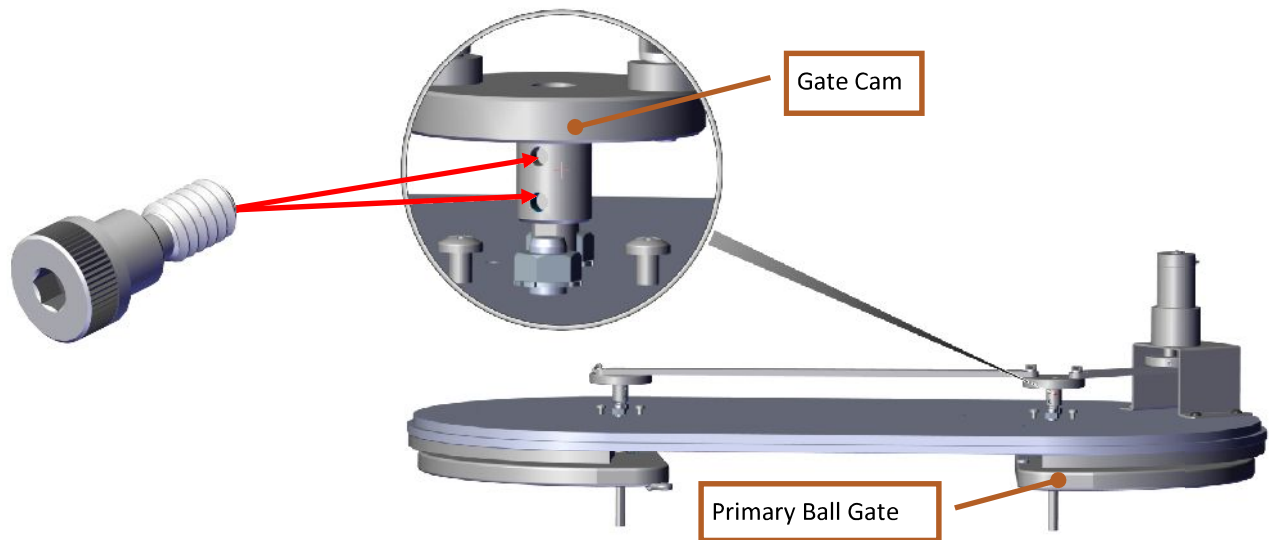
Step 4: Motor Removal

Remove the two screws that hold the motor to the motor mount.



Ball-gate sensors Access

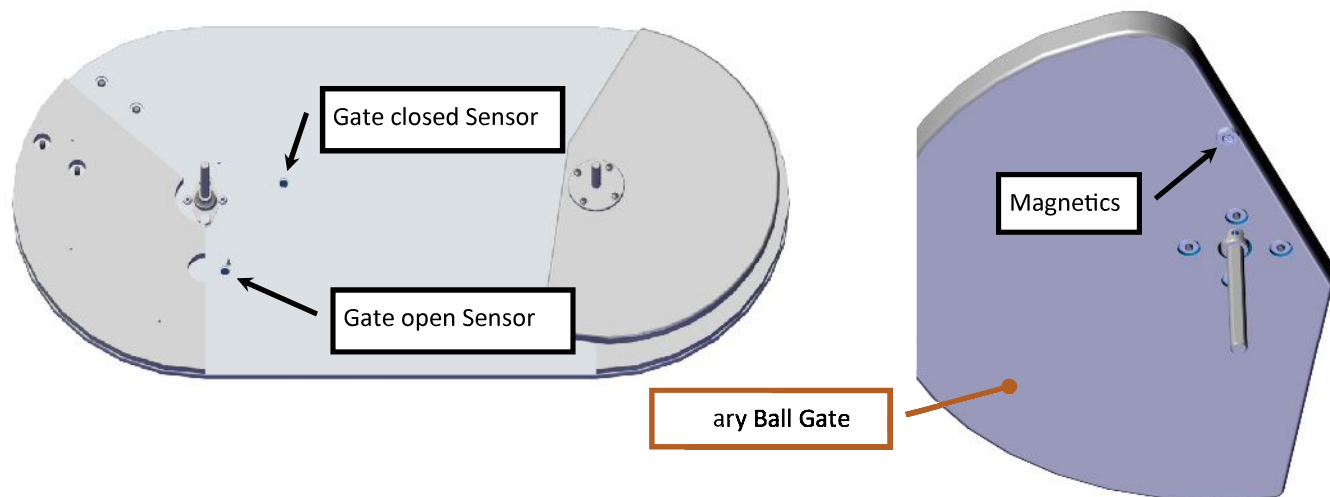
Remove the two screws that hold the gate cam to the Primary Ball gate assembly. Slide the Primary Ball gate assembly out.



Ball-gate sensors Operation

There are two magnetic sensors located under the primary ball gate assembly. The primary ball gate assembly has a magnetic attached underneath so that when the assembly rotates it will pass over one of the two sensors. When the ball gate assembly moves counter clock-wise, it will pass over the sensor for the closed position and stop the assembly. When the ball gate assembly rotates clock-wise, it will pass over the sensor for the open position and stop the assembly. Using a volt meter, when the magnet passes over either of the sensors, that sensor will have no voltage present. When the magnet is not over the sensor it should read +5 volt of DC power. With the power off on the game, the sensor is normally open.

**** WARNING **** Never manually move the Primary Ball Gate assembly as damage will occur to the motor gearbox assembly below.



Ball-gate sensors Removal

To remove a sensor, disconnect the two pin connector. Then unscrew the tie-wrap and push the sensor out. To install a replacement sensor, insert the connector from the top through the hole and push firmly down. Attach the wire harness and re-install the wire tie.

