

Angry Birds - Theory of Operation: How the Game Works

The game uses a mechanical plunger that has an optic sensor to fire a solenoid which will launch a ball at the screen. The plunger sensor determines the position of the plunger. When the plunger is in the rest position the optic sensor will output to the I/O board +5 VDC to connector P8, pin 6 (gray/violet wire). When the plunger is pulled away from the sensor the voltage will drop to less than a volt. Once the plunger is returned to the rest position the voltage will be back at +5 VDC. This sequence informs the game to launch a ball.

**** NOTE **** A bad plunger sensor will not go below a volt when unblocked. Although the computer will report in test mode a plunger sensor to be good if the voltage only goes down to 1.9 volts (more than a volt) but in game mode the game will not fire the solenoid.

There is also a ball cup optic sensor to determine if a ball has been loaded into the ball tray. This sensor will be at +5 VDC when no ball is present. When a ball has been loaded the sensor will be at 0 VDC. This can be checked at the I/O board's connector 8, pin 2 (gray/orange wire). If for any reason this sensor doesn't detect a ball present, it will interrupt the process of firing the solenoid in order to load a ball.

**** NOTE **** The optic sensor will become dirty over time and require cleaning. Wipe with cloth.

Once the game has sensed the state change on the plunger sensor and at the same time senses that a ball is waiting in the ball tray it will output from the I/O board at connector J3, pin 1 (yellow/violet wire) a 5 VDC pulse to the high voltage board. The high voltage board combines two 48 VDC power supplies in order to output 90 volts of DC power to the solenoid. The high voltage power supply releases the stored voltage to the solenoid once it detects this 5 VDC pulse at connector J3, pin 1.

**** NOTE **** When testing for 90 VDC, if you use the cabinet as ground, the solenoid will read 90 VDC and if you touch the solenoid and the cabinet, you will get shocked with 90 VDC!