

## 1. Disclaimer

These instructions explain the installation procedures for the LED kit specifically for use in a Stern Pirates of the Caribbean pinball machine. The author will not accept any responsibility for damages to your machine. Please follow the instructions and install at your own risk.

## 2. Tools Required

The following tools are required or may be useful for the LED kit installation:

- 7/64" drill bit
- Variable speed drill
- Phillips screw driver
- 1/4" nut driver
- 5/16" nut driver
- Soldering iron

The following materials are required for the LED kit installation:

- 60/40 rosin core solder

The following parts are included in your kit (see figure 1):

- (1) LED harness with 5 LEDs
- (1) zip tie
- (1) Power harness with connector
- (1) Heat shrink



**Figure 1.** Parts included in LED modification kit.

## 3. Installation

These instructions are divided into a few sections for ease of installation.

NOTE: I recommend reading this entire document BEFORE you attempt installation to familiarize yourself with the modification procedures.

### 3.1 Ship Removal

Remove the ship assembly following the instructions in the Stern manual on p.83. I would suggest marking the connectors for ease of re-installation. The 5/16" nut driver will be required for this task. Make sure you lower the sails and sink the ship before removal. There will be three connectors and one cable clamp to remove.

Note: To ease removal of the ship you should remove one cable clamp on the bottom of the playfield. Also, there are two wires going to the optical board 3 below the ship. It will make things easier if you remove J3 and J4 wires. You may also remove the sails before removing the ship. If this is attempted, take care not to break them - they are very delicate. I did not remove the sails to accomplish this modification.

Note: After removal, raise the ship by rotating the back end of the ship in the assembly to complete the modification.

### 3.2 Molded Ship Hull Modification

Remove the five phillips screws holding the molded ship hull to the assembly to remove the hull. Once the hull is removed, use a variable speed drill with a 7/64" drill bit to drill the inside of each of the five lower cannons. Drill from the front of the ship towards the back. Once the bit is all the way through, drill from the back to make sure the hole is the correct width. Take care and go slow as not to damage the cannon barrels. The drill bit should fit inside the barrels perfectly. Figure 2 illustrates the drill procedure from the front. Figure 3 shows the back of the ship after all five holes are drilled.



**Figure 2.** Drilling the cannon holes.



**Figure 3.** Completed cannon holes viewed from back.

After the five holes are completed, install the LEDs on the wire harness by pushing them into the holes. Use your thumb to press them in. The LEDs should insert almost all the way into each hole so the wires will be flush with the hull (see figure 4). The wire harness should hang towards the back of the ship when properly installed. Ensure that the screw holes are not blocked by the wiring harness.



**Figure 4.** Completed LED installation.

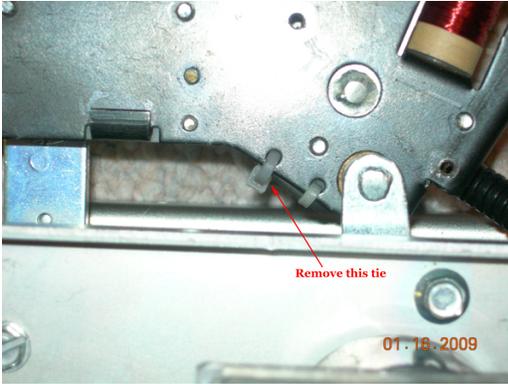


**Figure 5.** Routing under mini coil stop.

### 4. Molded Hull Re-installation

After the LED harness is installed, the hull can be matched to the ship assembly. The connector will be routed under the small sail release solenoid, so the mini coil stop will have to be removed to allow this (see figure 5). After routing the cable, re-install the mini coil stop. Next, at the bottom of the assembly are two nylon zip ties holding the original cabling. Remove the zip tie closest to the front of the ship (see figure 6) but be careful not to cut into the cabling. Route the LED harness down to the position where the zip tie was following the other cable as close as possible. Install the included zip tie around BOTH cables. Your cabling should look like this figure 7 when done.

Once the zip tie is securing the harness, loop the harness through the cable clip with the other wires (see figure 8). The remaining cabling can be routed through the corrugated tubing that the other cabling is in. Re-install the 5 screws into the hull starting with the 2 top



**Figure 6.** Zip tie to remove.



**Figure 9.** Completed LED installation.



**Figure 7.** Completed zip tie installation.

ones. Congratulations! You can now reinstall the ship. The ship should look like Figure 9.



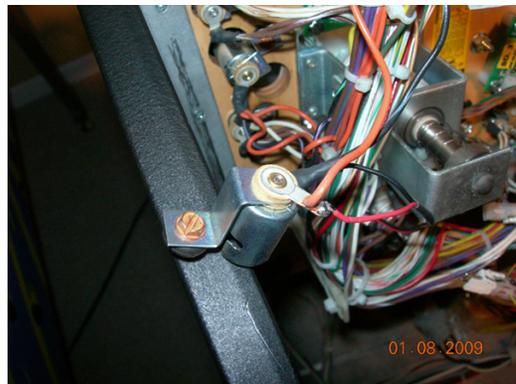
**Figure 8.** Routing through cable clip.

## 5. Power Harness installation

Locate the ship flasher socket underneath the playfield to the left of the ship and right above optical board 1. Remove the flasher socket using a 1/4" nut driver.

Remove the heat shrink from the black lead on the socket. Using a soldering iron, remove the black lead from the socket. Now solder the red lead on the power harness to the leg with the orange wire at the bottom of the socket. Take the provided heat shrink and place it over the original black lead from the socket. Route the black lead from the power harness through the heat shrink the same way. Solder both black leads to the other leg on the socket ensuring the heat shrink is far enough away to remain cool. After the two black leads are soldered, install the heat shrink over the wires as close to the socket as possible. Use a heat gun or hair dryer to shrink the heat shrink. After completion, your installation should look like figure 10. Reinstall the flasher on the playfield.

An alternative to soldering is to use alligator clips for a temporary installation. This is not necessarily recommended, but it is an option.



**Figure 10.** Completed power harness installation.

## **6. Completion and Testing**

After the ship is re-installed and the power harness is soldered on the ship flasher, the two connectors can be joined. This completes the installation, put your pin back together and power it up. The installation can be tested by going into the service menu under diagnostics. Choose flashers and go to cycling flash lamp menu and close the coin door. As the flashers cycle, look for the LEDs to light with the ship flasher. If this test is successful - congratulations and enjoy your new modification.